

GLENFIELD
— & —
KENNEDY
LIMITED

—
WATER
METERS
AND
WATER
WORKS
APPARATUS



GLENFIELD & KENNEDY
(LIMITED)

IRON FOUNDERS

— AND —

HYDRAULIC & SANITARY ENGINEERS

KILMARNOCK

SCOTLAND

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NEDY



FOR COMPLETE INDICES

SEE END OF BOOK.

GLENFIELD & KENNEDY

LIMITED,

KILMARNOCK, SCOTLAND,

HYDRAULIC AND SANITARY ENGINEERS AND IRONFOUNDERS.

ILLUSTRATED, DESCRIPTIVE, AND PRICED
CATALOGUE

OF

**KENNEDY'S PATENT POSITIVE WATER METERS,
GLENFIELD PATENT ROTARY WATER METERS,
ALSO
WATER AND SEWERAGE WORKS APPLIANCES.**

Comprising :

Reservoir Valve Towers, Sluices, Sluice, Relief, Ball, and Air Valves, Hydrants, Street
Standposts, Surface Boxes, Special Pipes, Fire Extinguishing Apparatus, Fountains,
Taps, Ground Cocks, Ferrules, etc., Sewerage and Sanitary Fittings,
Indicating, Recording, and Integrating Instruments.

*[For Pumping Machinery, Hydraulic Machinery, and Irrigation Works Appliances
see separate Catalogues.]*

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FOREWORD.

I N deciding to issue this Edition of our Catalogue without Prices, we were influenced by the fact that under the present abnormal conditions the List Prices of previous Editions are not now applicable.

We will be pleased at all times to quote firm Prices for any of the articles illustrated in the Catalogue.

Glenfield & Kennedy Limited

(AMALGAMATION OF KENNEDY'S PATENT WATER METER COMPANY LIMITED
AND GLENFIELD COMPANY LIMITED)

Have now for 62 years been engaged in the manufacture of their Water
Meter. Their long experience coupled with the great increase of their
business has enabled them to effect in their factory a thorough modernization
of labour. Every part is made completely to order. This greatly facilitates
repairs by enabling them to supply the exact quantity of parts.

METERS

FOR

COLD WATER

The designs are subject to alteration and amendment, and,
while corrections in Catalogue are made from time to time,
Glenfield & Kennedy Ltd. do not guarantee that goods
supplied will be exactly as shewn.

Over 250,000 Kennedy Meters have been supplied to all parts of the world.

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As they manufacture their own India Rubber, they guarantee that all Piston Rollers are made solid, and of the pure "Para" Rubber.

There have been improvements effected in construction of the Meter.

Muirhead's Patent Clutch Arrangement (see detailed description, page 4) is now almost universally adopted.

Pistons are all made of Vulcanite (over 30 years' experience), and other minor improvements in detail have been carried out, adding to the durability and efficiency of the Meter.

A small "Domestic" Meter has been introduced (see page 24).

They recommend that the Cylinder of Meters used to measure water which oxidises iron rapidly, and all those measuring small supplies, should be brass-lined.

Over 220,000 Kennedy Meters have been supplied to all parts of the world.

Appended is a List of a number of the Places where our Meters have been supplied.

Messrs. Glenfield & Kennedy Limited have pleasure in referring any one wishing information to any of them.

ABERDEEN.	DERBY.	NOTTINGHAM.
ACCRINGTON.	DUMBARTON.	OLDHAM.
AIRDRIE AND COATBRIDGE.	DUNDEE.	OSWALDTWISTLE.
ALLERTON.	DUNFERMLINE.	OSWESTRY.
ALLOA.	EAST WORCESTERSHIRE.	OXFORD.
AMSTERDAM.	FALKIRK.	PADIHAM.
ANTWERP.	GALASHIELS.	PAISLEY.
ARBROATH.	GHEENT.	PARIS.
ASHTON-UNDER-LYNE, STALY- BRIDGE, MOSSLEY, AND DISTRICTS.	GIJON.	PERTH.
ATHERTON.	GILDERSOME.	PETROGRAD.
AYR.	GLASGOW.	POOLE.
BAHIA.	GOSPORT.	PORT ELIZABETH.
BARBADOS.	GREENOCK.	PORT GLASGOW.
BARCELONA.	GUERNSEY.	PORTSMOUTH.
BARNSELY.	GUILDFORD.	POTTERIES.
BARROW.	HALIFAX.	PRESTON.
BELFAST.	HAMILTON.	PRETORIA.
BILBAO.	HARTLEPOOL.	REIGATE.
BIRMINGHAM.	HAWICK.	ROCHDALE.
BLACKBURN.	HEXHAM.	SALFORD.
BLOEMFONTEIN.	HEYWOOD.	SALONICA.
BOLTON.	HINDLEY.	SEVILLE.
BOSTON.	HUDDERSFIELD.	SHILDON.
BOURNEMOUTH.	HULL.	SHIPLEY.
BRADFORD.	HYDE.	SINGAPORE.
BRIGHTON.	IRVINE.	SPEZIA.
BRUSSELS.	JERSEY.	SOUTHPORT.
BURNLEY.	KALGOORLIE.	SOWERBY BRIDGE.
BURY.	KENDAL.	ST. HELENS.
CAPE TOWN.	KENLEY.	STIRLING.
CARDIFF.	KIDDERMINSTER.	STOCKTON AND MIDDLES- BROUGH.
CARTHAGENA.	KILMARNOCK.	SUNDERLAND.
CHARKOFF.	KIRKCALDY.	SUTTON, SURREY.
CHARLEROI.	KIRKINTILLOCH.	TARANTO.
CHATHAM.	LAMBETH.	TYLDESLEY.
CHESHUNT.	LANCASTER.	VALENCIA.
CHESTER.	LEEDS.	WALLASEY.
CLECKHEATON.	LEICESTER.	WARRINGTON.
CLEVELAND.	LEIGH.	WARWICK.
COCKERMOUTH AND WORKING- TON.	LIVERPOOL.	WESTHOUGHTON.
COLCHESTER.	MANCHESTER.	WHITEHAVEN.
CONSETT.	MARANHAM.	WINDSOR.
COVENTRY.	MID SUSSEX WATER BOARD.	WINSFORD.
CROYDON.	MONTE VIDEO.	WOLVERHAMPTON.
DARLINGTON.	MOSCOW.	WORCESTER.
DARWEN.	NAPLES.	WORTHING.
	NELSON.	WREXHAM.
	NEWCASTLE-ON-TYNE.	WYNBERG.
	NORTH CHESHIRE.	

Muirhead's Patent Clutch Arrangement.

About 20 years ago Mr. MUIRHEAD, Chief Meter Inspector in Glasgow, patented an improvement on the Kennedy Meter, which we purchased from him and which is applied to Meters of 2" dia. and upwards.

The principle is that, just before the Hammer reverses, a Clutch Gear comes into action and moves the Quadrant, so that the Hammer falls on the Quadrant *in motion* instead of at rest.

This has enabled us to lighten the Hammer and thus lessen the noise of reversing. It has also the advantage of preventing the piston being forced either against the top or bottom of the Cylinder, as has sometimes happened, and broken the piston. The old type of Catches (see No. 33, page 30) cannot be used with this arrangement, but a later Patent of Mr. MUIRHEAD'S for a new Catch (see Nos. 49 and 50, page 30) effectually locks the Four-way Key and prevents it moving across the ports, except just when the Hammer is falling.

A further improvement is that a brass sleeve has been put on the shaft and carries the Quadrant. Thus, supposing, through want of oil, the Quadrant stiffened on the shaft, it could not be reversed by the friction of the turning shaft, as it now works on this fixed bush.

We are now issuing all Meters with this arrangement, which, from enquiries made, we find has given universal satisfaction.

To Purchasers.

The Kennedy Meter delivers a much greater quantity of water per hour (size for size) than any other meter—in some cases 3 times the quantity. Regard should, therefore, be had *not* to nominal size but to *delivering capacity*.

In many cases a Kennedy Meter is fixed of smaller size than the pipe. The *delivery required* should govern the size.

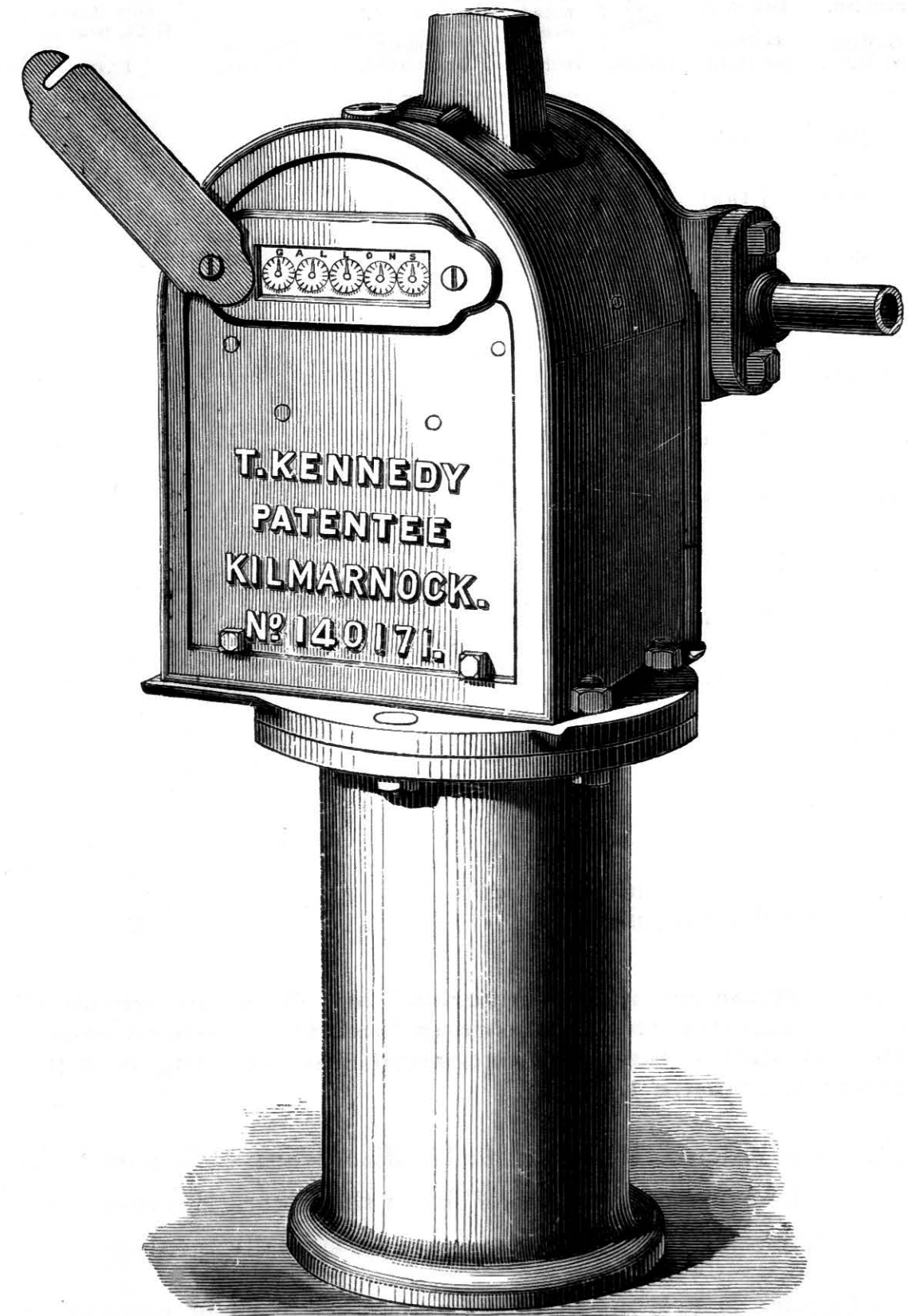
In the Kennedy Meter no delicate mechanism is exposed to the water, and no part moves at a high rate of speed.

The registration is correct at all speeds and pressures. Every Meter is guaranteed correct within one per cent. when sent out. The Kennedy is a *positive* measurer, *not* inferential, and the smallest dribbles are registered.

The Kennedy Meter cannot register against the consumer.

Kennedy Meters are still at work after being 50 years in use. The cost of maintenance is very low when periodic oiling and attention are given. In Britain, G. & K. Ltd. undertake maintenance at a small annual allowance, the charge depending on situation of district and number of Meters to maintain.

Water Meter.



NOTE.—See page 25 for particulars regarding reversing the Inlet and Outlet of the Meters.

Prices.

Nos.	Delivery Recommended. Gallons per Hour.	Occasional Maximum Delivery. Gallons per Hour.	Original Nominal Size. Inches.	Suitable for Pipes of under-noted Sizes. Inches.	PRICE, WITH ROLLING PACKING. UP TO 100° FAH.		Dirt Boxes. H 24, page 26. Extra.	Weight of Meter.		
					Cylinder Brass-lined.	Cylinder Unlined.		Cwts.	Qrs.	Lbs.
No. 0·0	250	600	$\frac{1}{4}$	$\frac{3}{8}$				0	3	7
No. 0	400	1,000	$\frac{3}{8}$	$\frac{1}{2}$				1	0	4
No. 1	600	1,500	$\frac{1}{2}$	$\frac{3}{4}$				1	2	12
No. 0·2	1,000	2,500	$\frac{3}{4}$	1				2	0	6
No. 2	1,700	4,000	1	1 $\frac{1}{2}$				3	0	22
No. 3	3,600	7,500	1 $\frac{1}{2}$	2				5	2	14
No. 4	5,000	10,000	2	3				9	0	21
No. 5	10,000	18,000	3	4				14	1	16
No. 6	16,000	32,000	4	5				20	0	0
No. 7	24,000	50,000	5	6				33	0	0
No. 8	35,000	70,000	6	7				50	0	0
No. 9	50,000	100,000	8	9				80	0	0

6" and 8" Meters have no enclosing plates unless specially required { 6" 8" (Nominal Size.)
Extra.

NOTE.—The "recommended deliveries" are those at which Meters may be worked continuously, the "maximum" are those which may be reached occasionally but should never be exceeded. In ordering it is preferable to use the numbers, column 1.

Unless otherwise ordered, Meters up to 1 $\frac{1}{2}$ " dia. inclusive are issued with connecting flanges suitable for lead pipe of the nominal size of the Meter. If other sizes are required, or connections suitable for iron pipe, this should be specially mentioned.

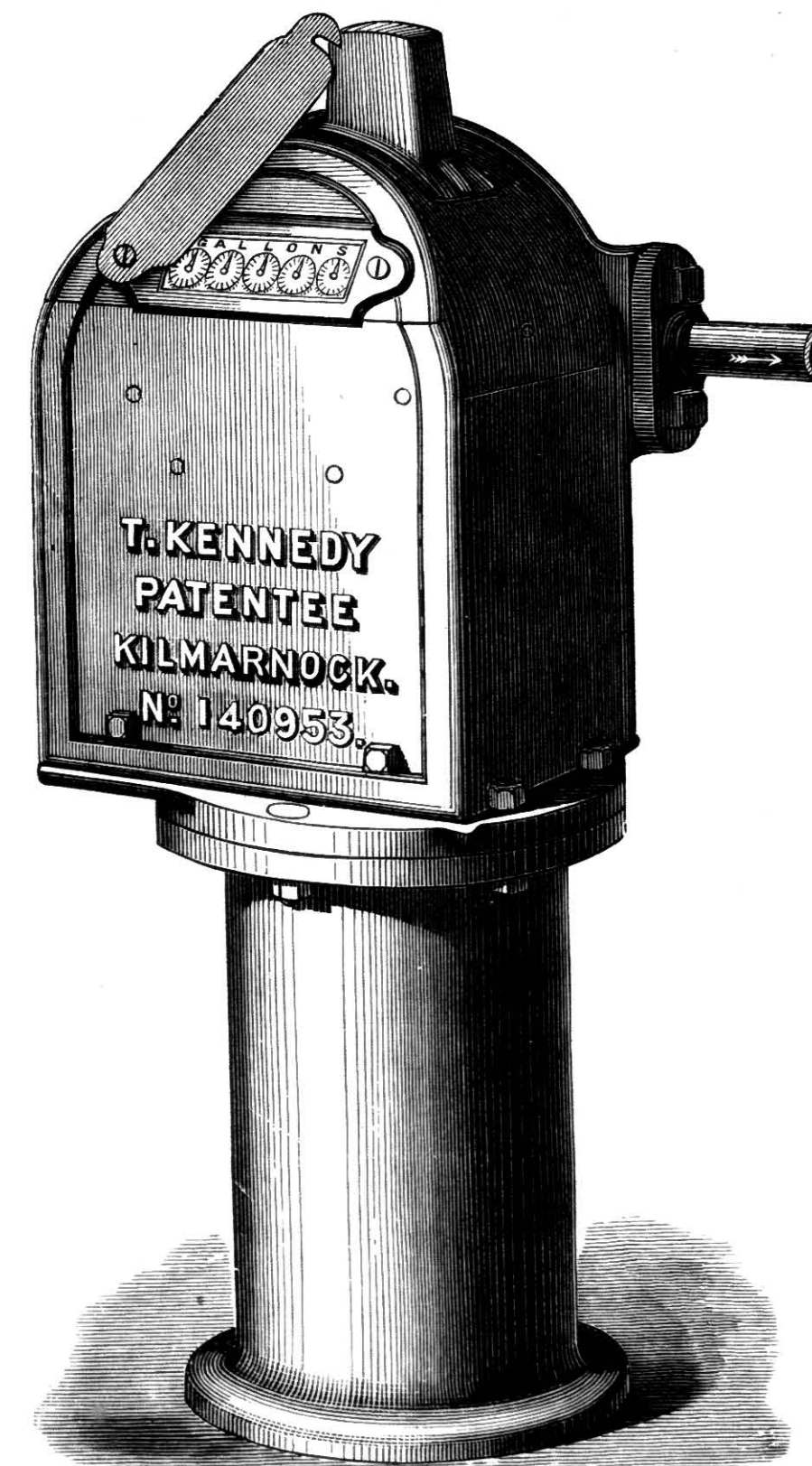
Carriage is Paid on all orders amounting to £3 or upwards.

For Prices and Description of Kennedy "Enclosed" Water Meters, see pages 38 to 40.

For Prices and Description of Rotary Water Meters, see pages 42 and 43.

For Prices and Description of Meters for Hot Water Feed for Steam Boilers and other purposes, see pages 46 to 63.

Water Meter, with Angled Dial.



For Underground Meters.

It is not recommended that Meters be placed underground, but where this is unavoidable, the Meter is furnished with a dial angled to read from above. The working parts of such Meters, consisting of the buffer box, rack, pinion, and cock-gland, should be of gun metal. These are supplied at an extra cost—

For $\frac{1}{4}$ " $\frac{3}{8}$ " $\frac{1}{2}$ " $\frac{3}{4}$ " 1" $1\frac{1}{2}$ " 2" 3" 4" 5" Meters (Nominal Size).
Of

A 24-hour Clock, Drum, and Pencil Arrangement for taking Diagrams
(Including 100 papers for Meters).

Price, extra to any Meter. For Description see page 15.

An 8-day Clock Arrangement can be provided when specially asked for.

Price (including 100 papers for Meters), extra to any Meter.

Packing Cases for Shipment.

Nominal Sizes.

For $\frac{1}{4}$ " $\frac{3}{8}$ " Meter.

nett. Each Case containing 2 Meters.

For $\frac{1}{2}$ " $\frac{3}{4}$ " 1" $1\frac{1}{2}$ " 2" 3" 4" 5" Meters.

nett. Each Case containing 1 Meter.

For 6" 8" Meters.

nett. For large Meters the Gearing only is packed in a Case.

Approximate Weights and Dimensions of Kennedy Meters.

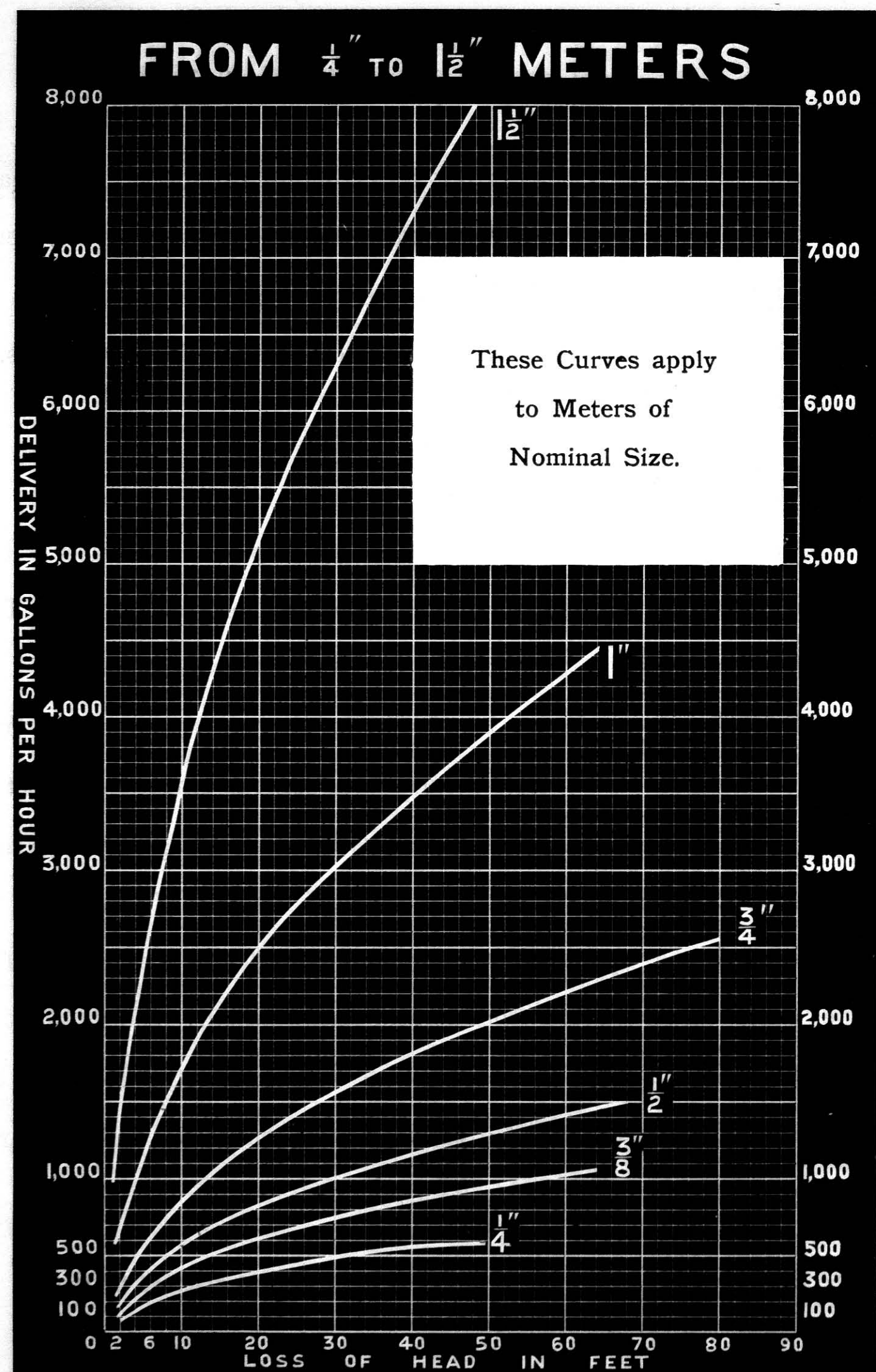
$\frac{1}{4}$ "						$\frac{3}{8}$ " Meters.						Each Case containing 2 Meters.												
Nett, -	Cwts.	Qrs.	Lbs.	Cwts.	Qrs.	Lbs.	Nett, -	Cwts.	Qrs.	Lbs.	Cwts.		Qrs.	Lbs.										
Gross, -	1	2	20	2	1	0	Gross, -	1	3	24	2		2	0										
Dimensions,	35" x 14" x 12"			43 $\frac{1}{2}$ " x 15 $\frac{1}{4}$ " x 13 $\frac{1}{4}$ "																				
$\frac{1}{2}$ "						$\frac{3}{4}$ "						1" $\frac{1}{2}$ " Meters.						Each Case containing 1 Meter.						
Nett, -	Cwts.	Qrs.	Lbs.	Cwts.	Qrs.	Lbs.	Nett, -	Cwts.	Qrs.	Lbs.	Cwts.	Qrs.	Lbs.	Nett, -	Cwts.	Qrs.	Lbs.							
Gross, -	1	2	14	2	0	14	Gross, -	1	3	0	2	1	0	3	1	0	5		2	14				
Dimensions,	27 $\frac{3}{4}$ " x 15" x 14 $\frac{1}{4}$ "			32" x 16" x 15"			40" x 18 $\frac{1}{2}$ " x 17 $\frac{3}{4}$ "			47" x 22" x 21 $\frac{1}{4}$ "														
2"						3"						4"						5" Meters.						Each Case containing 1 Meter.
Nett, -	Cwts.	Qrs.	Lbs.	Cwts.	Qrs.	Lbs.	Nett, -	Cwts.	Qrs.	Lbs.	Cwts.	Qrs.	Lbs.	Nett, -	Cwts.	Qrs.	Lbs.	Nett, -	Cwts.	Qrs.	Lbs.			
Gross, -	9	0	0	14	0	0	Gross, -	9	2	0	15	0	0	20	0	0	33	0	0	33	0	0		
Dimensions,	52" x 27" x 27"			63" x 36" x 32"			75" x 38" x 38"			90" x 46" x 43"														
6"						8" Meters.												For these sizes the Gearing only is packed in a Case.						
1 Cylinder.						1 Case.						1 Cylinder.							1 Case.					
Nett, -	Cwts.	Qrs.	Lbs.	Cwts.	Qrs.	Lbs.	Nett, -	Cwts.	Qrs.	Lbs.	Cwts.	Qrs.	Lbs.	Nett, -	Cwts.	Qrs.	Lbs.		Nett, -	Cwts.	Qrs.	Lbs.		
Gross, -	44	3	0	4	0	12	Gross, -	44	3	0	5	3	0	75	2	0	5		1	0	75	2	0	
Dimensions,	56" x 56" x 50"			40" x 29" x 25"			68" x 65" x 58"			48" x 38" x 23"														

To select the proper size of Meter.

The size should be selected from the absolute capability of discharge of the service. The parts of the Meter made to the nominal size are merely the inlet and outlet for about 1" along the passages; all other parts are greater than that area, while that of the Measuring Cylinder averages, in the various sizes, above 100 times that area.

The aim of the makers has been to reduce the tear and wear, and to retard as slightly as possible the onward flow of the water; that they have succeeded in the latter the subjoined tests will show. They are satisfied that such results cannot be obtained without capacity. If any of their Customers object to the bulk, they can still get average results, by fixing a Meter smaller than the pipe; thus, the effect of placing a 1" Meter on a 1" pipe is equivalent to adding only $3\frac{1}{2}$ yards to the length of that pipe; but the effect of fixing a $\frac{1}{2}$ " Meter on the same pipe would be equivalent to adding 30 yards to the length of it. On the other hand, should the service be unusually short, and the pressure very heavy, it may deliver more water than the Meter is calculated to discharge without injuring itself; in that case, a Meter larger than the pipe should be selected.

See Table showing Length of Pipe in yards, equal to head absorbed by Meter,
page 13.



See similar Diagram for larger Sizes of Meters on page 12.

Deliveries of Meters.

UNDER VARIOUS HEADS.

Size of Meter in Inches. Nominal Size.	Gallons delivered per Hour.	
	Under 16' Head.	Under 3' Head.
$\frac{1}{4}$	345	117
$\frac{3}{8}$	545	153
$\frac{1}{2}$	729	216
$\frac{3}{4}$	1,139	415
1	2,222	831
$1\frac{1}{2}$	4,600	1,820
2	7,160	3,090
3	14,754	6,428
4	24,000	10,070
5	47,420	16,660
6	81,136	27,397
8	108,800	39,960

Tanks were bolted to the inlet and outlet flanges, the head given being the difference of water level in the two tanks.

From the foregoing table the delivery under any head can be calculated, delivery being proportionate to the square root of the heads thus: Required the delivery of a 1" Meter with a head of 20'.

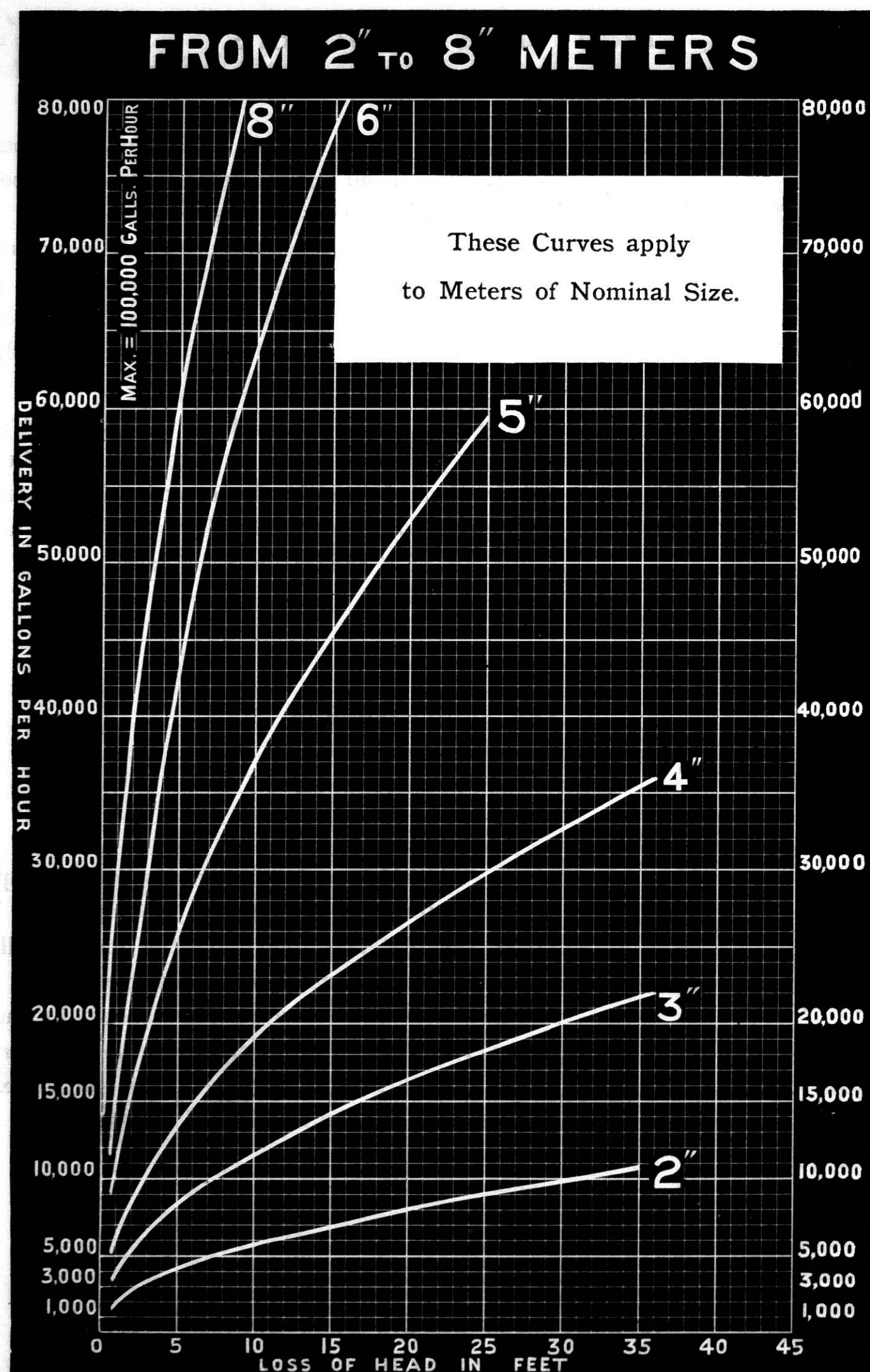
$\sqrt{16} : \sqrt{20} :: 2222, \text{ or } 4 : 4.472 :: 2222 : 2484 \text{ gals.}$
For low pressures where the loss of head due to the friction of Stuffing Boxes, etc., is greater in proportion to the total head, the delivery under a pressure of 3' should form the basis.

Size of Meter in Inches. Nominal Size.	Single Strokes per Min.	Gallons per Stroke, Approximately.
$\frac{1}{4}$	34	0.2
	6	0.15
$\frac{3}{8}$	24	0.23
	6	0.24
$\frac{1}{2}$	20	0.64
	6	0.55
$\frac{3}{4}$	18	0.78
	6	0.68
1	18	1.56
	6	1.36
$1\frac{1}{2}$	15	3.2
	6	2.9
2	15	5.7
	6	5.1
3	15	11.1
	6	10.2
4	15	16.4
	6	14.3
5	7	28
	2	25
6	16	44
	3	35
8	12	70
	3	63.3

PER SINGLE STROKE.

The discharge per stroke varies with the speed of the Meter (see 3" Meter at two speeds). The faster the Meter is delivering the longer will be the stroke and, consequently, the greater the discharge per stroke. The quantity shown by index, however, is correct at all speeds, as it is the *travel of the piston* that is registered on the index in gallons, and *not* the number of strokes.

The lowest head of water under which a Meter will deliver varies from 6" in the largest to 3' in the smallest sizes.



See similar Diagram for smaller Sizes of Meters on page 10.

To find the effect on the delivery of a Pipe, of fixing a Kennedy Meter on it,

Add the equivalent of the Meter to the length of Pipe, and find the delivery for the whole by the usual formula or from Tables. For ordinary pressures use the 16' delivery, and for very low pressures use the 3' delivery.

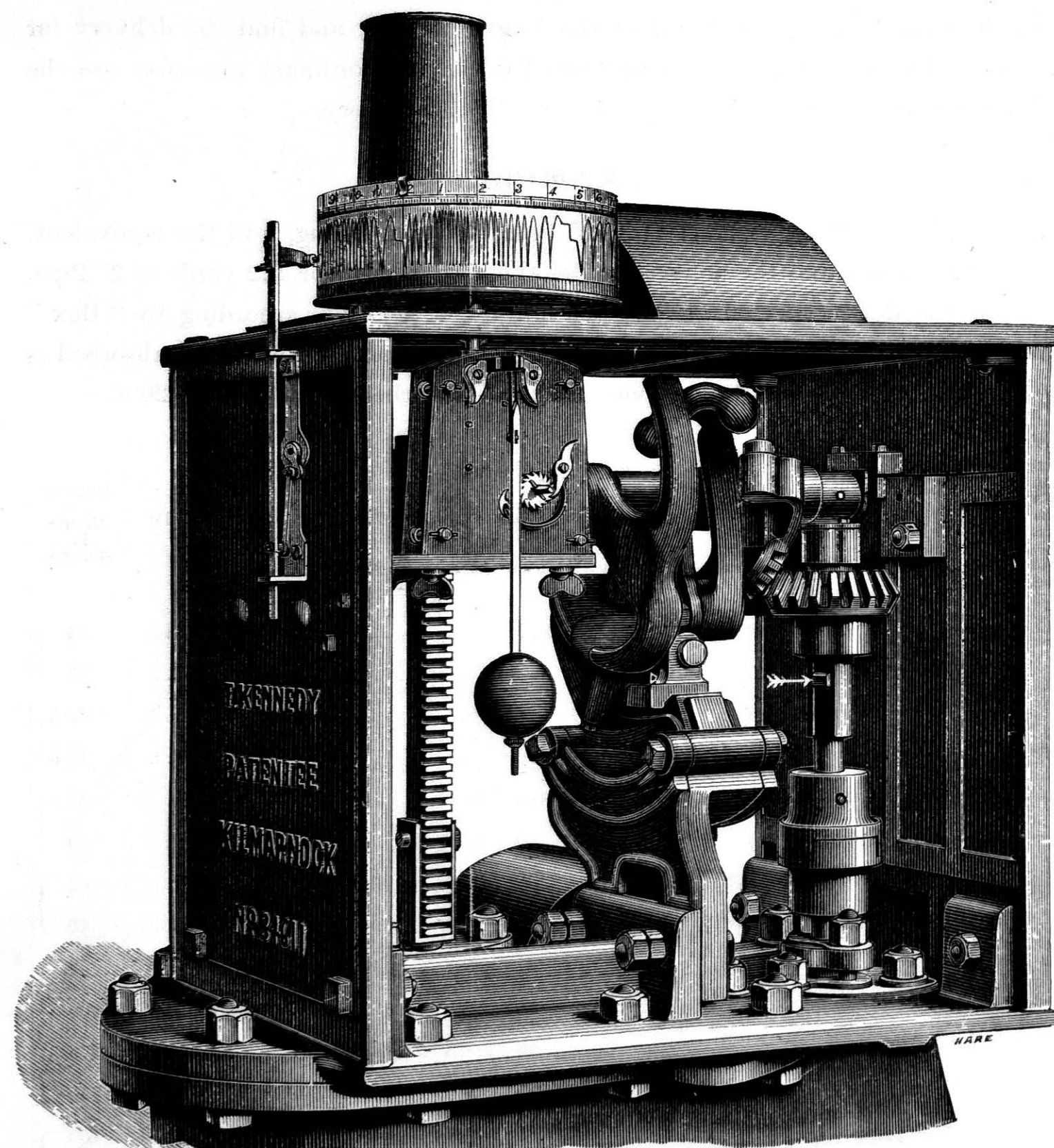
EXAMPLE:

Supposing a $1\frac{1}{2}$ " Meter is fixed on a 2" Pipe, 100 yards long, add the equivalent, viz. 22 yards, and find the delivery under the actual head for 122 yards of 2" Pipe. Thus, if the delivery is 40 gallons per minute, a 2" Pipe, according to "Box" Tables, absorbs in friction .205' per yard of length, and the total head absorbed is $.205 \times 122 = 25'$. For the Pipe alone, the head absorbed is $.205 \times 100 = 20.5'$.

Size of Meter in Ins. Nominal Size.	Head in Feet.	Diameter of Pipe in Inches.												Delivery per Minute in Gallons.
		$\frac{3}{4}$	1	$1\frac{1}{2}$	2	3	4	5	6	7	8	9	10	
		Yards of Pipe equal to head absorbed by Meter.												
1	{	3	.9	3.85	29	122	..	..	..	..	..	..	..	14
		16	.7	2.9	22	93	..	..	..	..	..	..	..	37
$1\frac{1}{2}$	{	3	..	.9	6.2	26	195	822	..	..	..	..	..	30.3
		16	..	.84	5.2	22	168	690	..	..	..	..	..	76.6
2	{	3	..	.28	2.15	9	68	288	880	2180	..	..	..	51.5
		16	..	.28	2.15	9	68	288	880	2180	..	..	..	119
3	{	3	..	..	.5	2.1	16	67	205	530	1090	2130	..	107
		16	..	..	.5	2.1	16	67	205	530	1090	2130	..	246
4	{	3	..	..	..	.85	$6\frac{1}{2}$	27	83	206	445	866	1550	168
		16	..	..	..	.8	6	$25\frac{1}{2}$	78	192	420	815	1450	400
5	{	3	..	..	..	..	2.3	10	30	75	162	318	570	278
		16	..	..	..	..	1.6	$6\frac{1}{2}$	20	50	107	209	375	790
6	{	3	..	..	..	..	..	3.7	$11\frac{1}{4}$	28	60	118	212	456
		16	..	..	..	..	..	2.2	7	17.2	37	72	131	1335
8	{	3	..	..	..	..	..	..	$5\frac{1}{4}$	13	28	55	99	666
		16	..	..	..	..	..	..	$3\frac{3}{4}$	$9\frac{1}{4}$	20	39	70	1813

Water Meter, With Clock and Diagram Arrangement.

For Indicating Waste of Water on District Main.



Referred to in Description on pages 8 and 15.

The Arrow Mark shows the Key referred to on page 25 for reversing the Inlet and the Outlet.

Notes on Deliveries of Meters.

We find that there is a good deal of misunderstanding among our Customers regarding the figures anent the delivery of Meters as given on page 11.

The deliveries there given are from actual experiments made between two tanks, the inlet of the Meter being bolted to one and the outlet to the other.

The deliveries, with the pressures given, are for the Meters alone. The pressure absorbed by each particular service-pipe must be calculated and added to that required by the Meter. The following is the method which we adopt:

The deliveries are taken from Hydraulic Tables by Thomas Box. Take, as an instance, a service consisting, from a large main to the point of delivery, of 30 yards of $1\frac{1}{2}$ " pipe and 70 yards of 1" pipe. The point of delivery is 20' above the main, this main showing a pressure, when the service is delivering, of 100'.

The Hydrostatic pressure at the point of delivery is 80'. The Meter is a 1". We assume a delivery, say 30 gallons per minute. A $1\frac{1}{2}$ " pipe delivering 30 gallons per minute absorbs a pressure of .4877' of pressure per yard of length, and a 1" pipe 3.70'. The total pressure for the pipe is—

$$30 \text{ yards of } 1\frac{1}{2}" \text{ at } .4877 = 14.631$$

$$70 \text{ yards of } 1" \text{ at } 3.7 = 259$$

$$\text{Total for service} = 273.631$$

A 1" Meter, with 16' of head, delivers 37 gallons per minute. The head for 30 gallons is calculated thus—

$$37^2 : 30^2 :: 16 : 10.517$$

$$\text{Total head for service for 30 gallons} = 273.631$$

$$\text{Total head for Meter for 30 gallons} = 10.517$$

$$\text{Grand Total} = 284.148$$

We thus find that the system requires a total head of 284', but the pressure is only 80'. We get at the actual delivery for 80' by the formula—

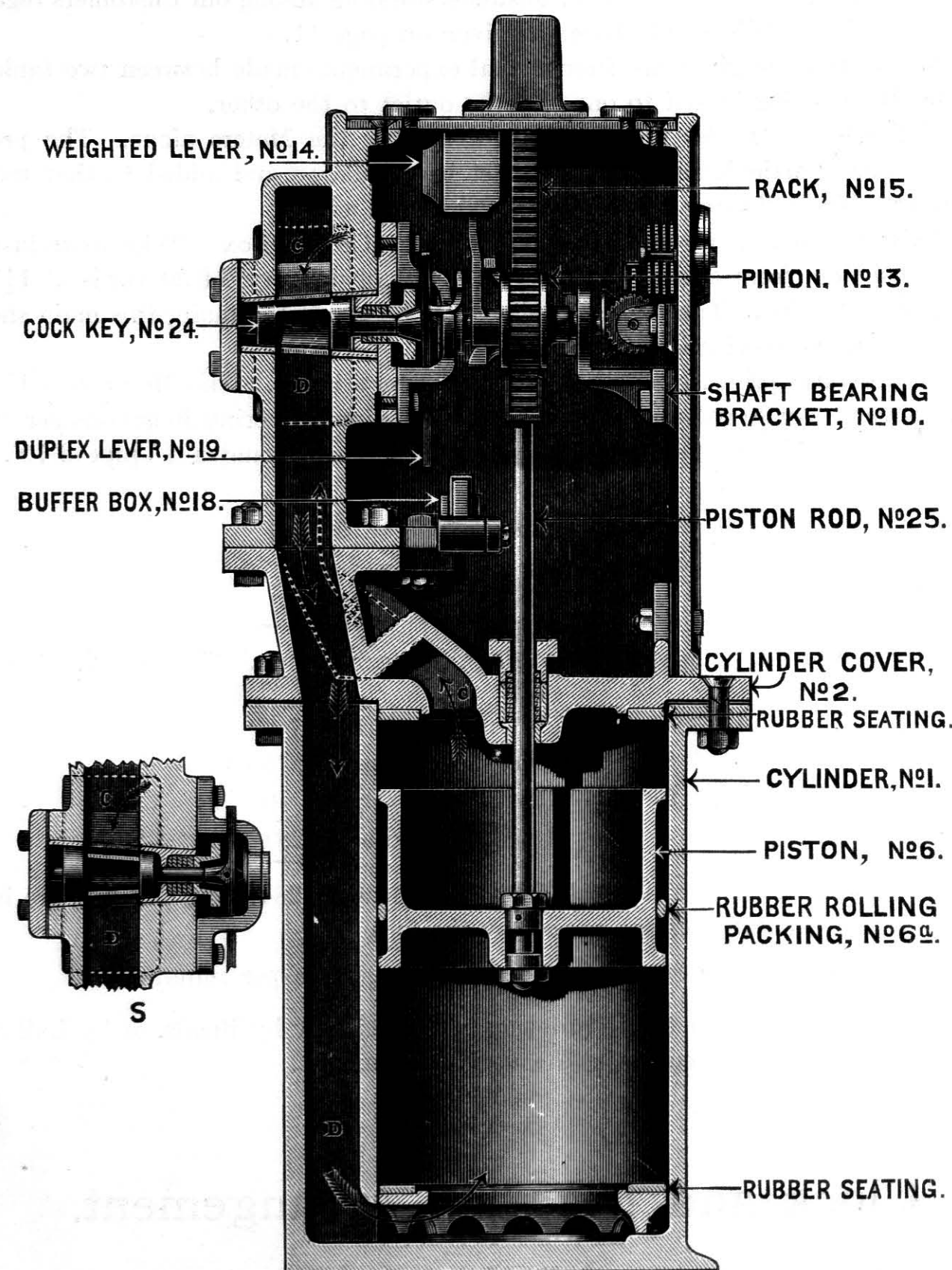
$$\sqrt{284} : \sqrt{80} :: 30 : 15.92 \text{ gallons per minute.}$$

No allowance is made for the retardation of the delivery by Bends, or by Ball or Bib Cock, some forms of which reduce it to a very great extent.

Clock and Diagram Arrangement.

The Clock and Diagram indicates the flow during any portion of the day or week, and is a valuable appendage for showing the waste of water in district main. Each line from top to bottom of diagram, or *vice-versa*, shows the number of gallons of water passed by the Meter, the time being shown by horizontal line at top of Diagram. A Meter can be temporarily placed on a by-pass for checking waste on district, and be removed to another district when waste has been remedied.

Section of Cold Water Meter.



NOTE.—The Numbers given above refer to Sheet of Details, see Plate F, pages 34 and 35.

Description.

(See Opposite Page.)

The Measuring Cylinder (No. 1 Sheet of Details, Plate F, page 34) forms the base of the Meter, and is fitted with a piston (No. 6) of an improved construction. This Piston is made to move perfectly water-tight and almost free from friction, by means of a Cylindrical Ring of India Rubber (No. 6a), which rolls between the body of the Piston and the internal surface of the Cylinder.

Each end of the Cylinder is fitted with an India Rubber Seating on which the Piston forms a water-tight joint if back-pressure should force it to either end of the Cylinder; undue pressure is thus prevented from being thrown on the Piston Roller.

The Piston Rod (No. 25), after passing through a Stuffing Box in the Cylinder Cover (No. 2), is attached to a Rack (No. 15) which gears into a Pinion (No. 13) fixed on the Shaft. The shaft is turned in reverse directions, actuating the Indexing and Reversing gear as the Piston moves up and down.

The Rack is kept in gear and guided in a vertical line by an Anti-friction Roller, which is carried on a Stud projecting from the front-bearing Brackets (No. 10).

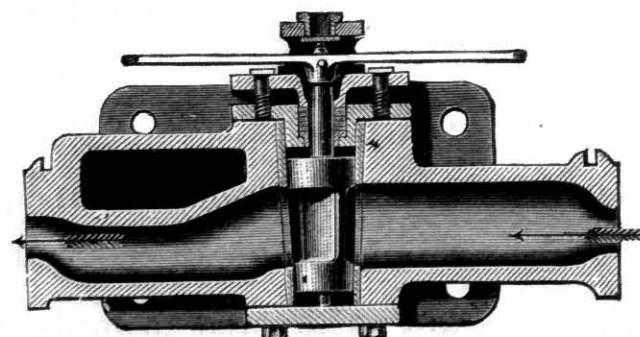
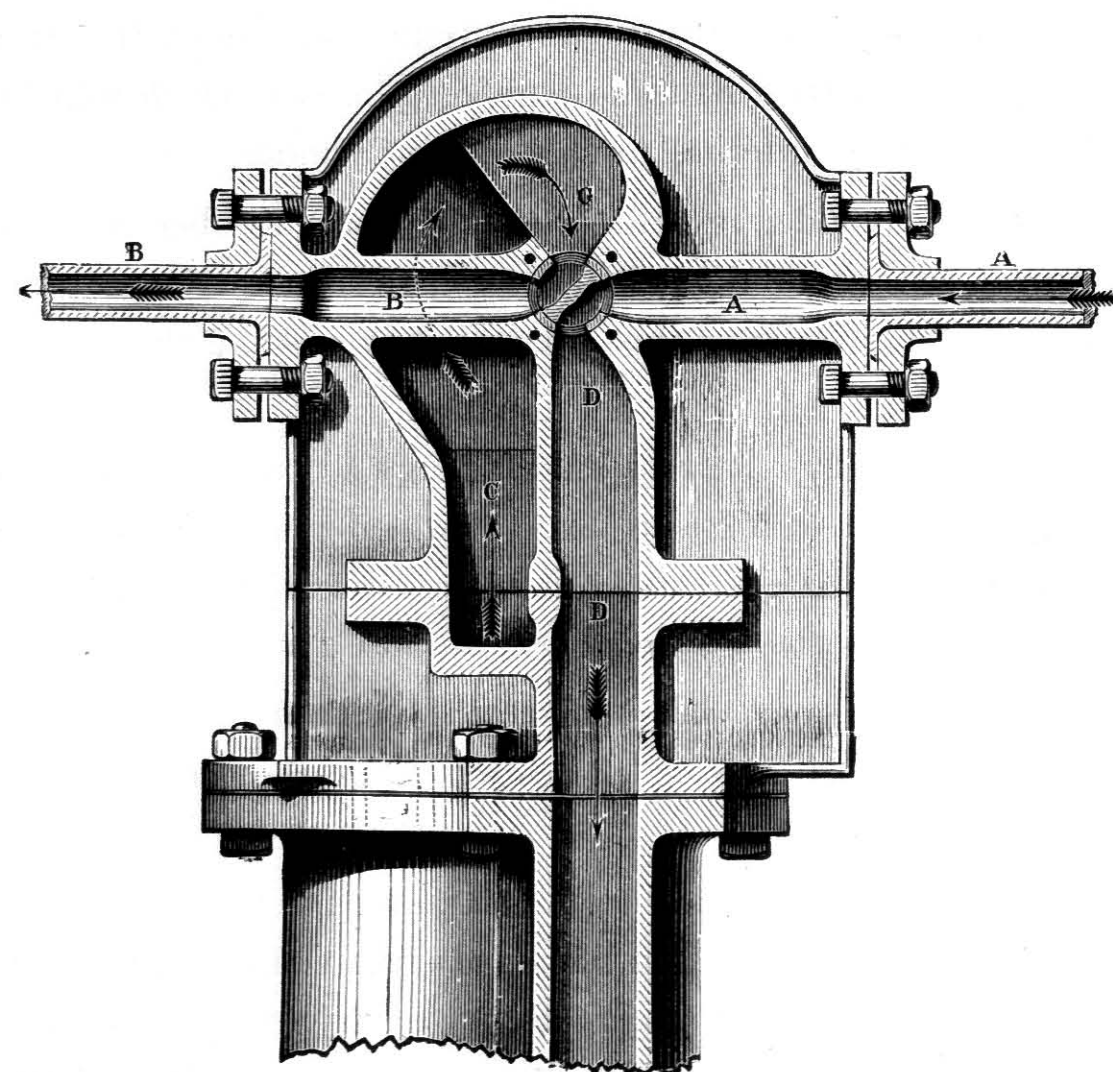
The Cock-key (No. 24), which directs the water alternately above and below the Piston, is placed in the same axial line as the Shaft and is fitted with a Duplex Lever or Key Arm (No. 19), which is actuated by a Weighted Lever (No. 14) carried loosely on the Shaft, and caused to fall alternately on each Arm of Duplex Lever or Key Arm (No. 19).

The Weighted Lever, after reversing the Key, falls on a Buffer faced with India Rubber (No. 18), which, yielding before it and travelling in the same curve, gradually brings it to rest.

Plate F gives a sketch of a Dial and an example of reading. The Drawing of Index Work shows the method of converting the reciprocating motion of the Shaft into the uniform circular motion of the Bevel Shaft and Index.

For Great Britain, the Cock-key is tapered inwards, as shown on large cut; for Abroad, as small cut (S). The reason of the difference is, that so many thousands of Meters are in use in Great Britain that it is considered inadvisable to alter the design for this country, although, of the two, the small cut is the preferable design.

Section of Cock of Water Meter.



Description.

(See Opposite Page.)

Page 18 shows a front Section of Cock-key and Water Passages.

Underneath is a Horizontal Section through centre of inlet and outlet. The Meter is shown in the position of having nearly completed its upward stroke.

The water, entering at the inlet A, is directed by the Cock-key down the passage D to the bottom of the Cylinder and forces up the Piston. The water (which on the previous down-stroke entered above the Piston) is forced up through passage C, passing behind passage B, and is directed by the Cock-key into the outlet passage B. When the Piston has moved up a little farther, the Weighted Lever (No. 14 Plate F, page 35) will pass its centre of gravity and fall on the Key-arm (No. 19 Plate F, page 35), which it will send down till it is stopped by the buffer-box. The key will then be at right angles to its position as shown on page 18.

The water will then be directed from A down C into the top of the Cylinder, forcing the Piston down while the water admitted below during the previous stroke is forced up the passage D and out by the outlet B.

Before the Piston has arrived at the bottom of the Cylinder, the Lifter will have lifted the Weighted Lever from the left side of the Buffer-box and raised it to a vertical position; from there it will have fallen on the right-hand Key-arm, and have brought back the Cock-key to its former position, ready to begin another upward stroke.

Cylinder Cover and Upper Part of Water Meter.

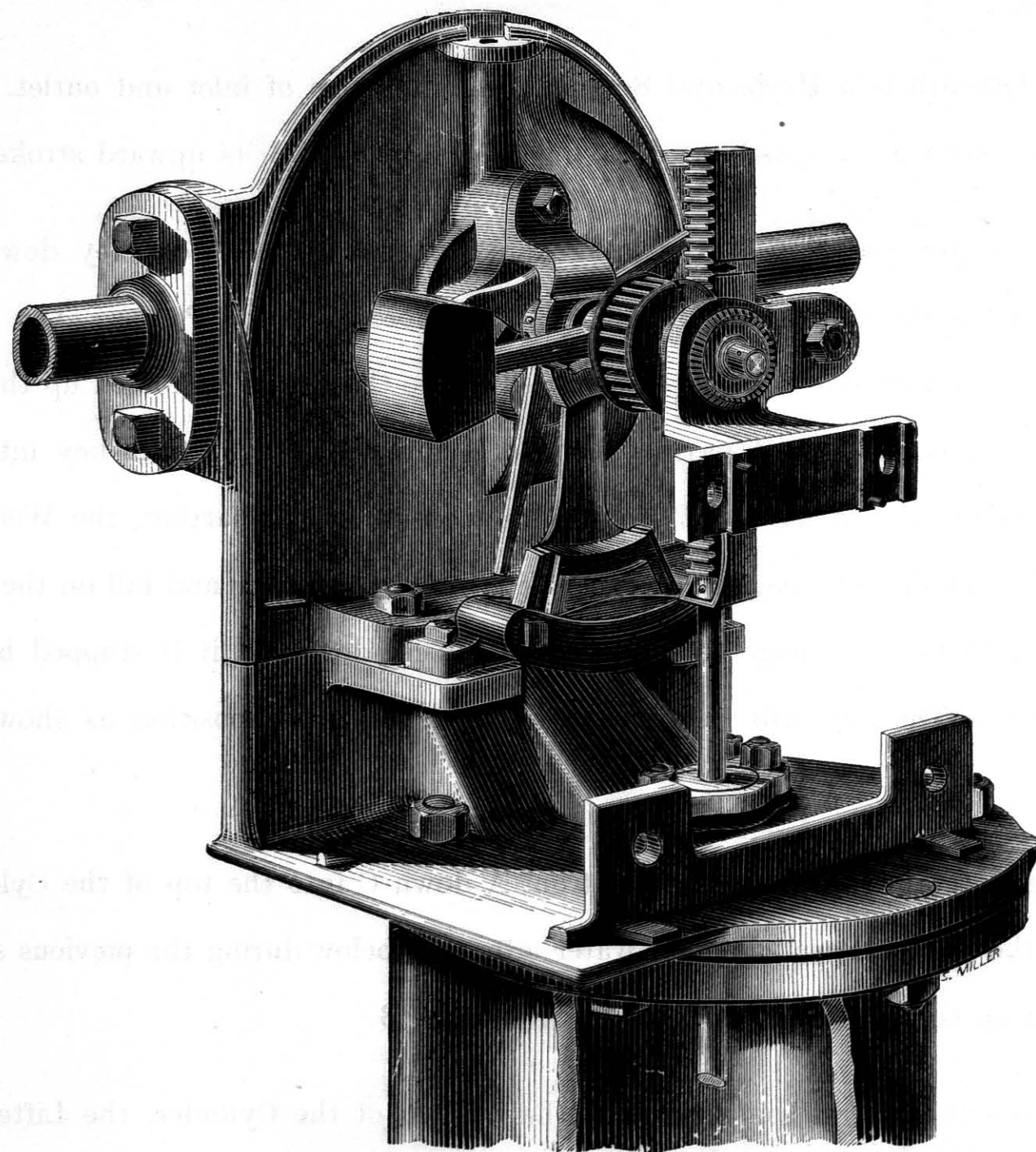


Table of Weights, Etc.

As mistakes have often come under our notice, such as using the wrong size of Piston Roller, and mistaking the size of Meter in ordering details, we think the following Table will be useful.

See also pages 26 and 27.

Bore of Inlet. Nominal Size. Inches.	Dia. of Cylinder. Inches.	Length of Cylinder. Inches.	Dia. of Piston. Inches.	Weight of Meter. Cwts.Qrs.Lbs.	Weight of Piston Roller. Lbs. Oz.	Gallons discharged for each turn of Worm Wheel. Gallons.	Diameter and Distance between Centres and Number of Holes in Connecting Flanges.			
							Oval Flange. Inches.	Distance Centre to Centre of Holes. Inches.	Dia. of Bolts. Ins.	Bolt Holes. Number.
$\frac{1}{4}$ *	5	8	$4\frac{5}{16}$	0 3 0	0 $1\frac{1}{4}$	10	..	..	..	2
$\frac{1}{2}$	6	$6\frac{1}{2}$	$5\frac{5}{16}$	0 3 7	0 $1\frac{3}{4}$	$16\frac{3}{4}$	$3\frac{5}{8} \times 2$	..	$\frac{3}{8}$	2
$\frac{3}{4}$	6	$9\frac{1}{4}$	$5\frac{5}{16}$	1 0 10	0 $1\frac{3}{4}$	25	$4\frac{5}{16} \times 2\frac{1}{2}$	..	$\frac{3}{8}$	2
$\frac{1}{2}$ †	6	15	$5\frac{5}{16}$	....	0 $1\frac{3}{4}$	25	..	..	..	..
$\frac{1}{2}$	$7\frac{1}{2}$	$12\frac{1}{2}$	$6\frac{3}{8}$	1 2 14	0 $3\frac{1}{4}$	$41\frac{3}{4}$	$5\frac{1}{4} \times 2\frac{3}{4}$	..	$\frac{1}{2}$	2
$\frac{3}{4}$	$7\frac{1}{2}$	$15\frac{1}{4}$	$6\frac{3}{8}$	2 0 12	0 $3\frac{1}{4}$	50	$5\frac{1}{4} \times 2\frac{3}{4}$	..	$\frac{1}{2}$	2
1	9	$18\frac{3}{4}$	$8\frac{1}{8}$	3 1 0	0 4	100	$5\frac{1}{2} \times 3\frac{1}{2}$	..	$\frac{1}{2}$	2
$1\frac{1}{2}$	12	$22\frac{1}{2}$	$10\frac{7}{8}$	5 2 14	0 $9\frac{1}{2}$	200	7×5	..	$\frac{5}{8}$	2
2	15	$24\frac{1}{2}$	$13\frac{3}{4}$	9 1 0	0 14	$357\frac{1}{2}$	Dia. $7\frac{1}{2}$	$5\frac{7}{8}$	$\frac{3}{4}$	4
3	18	30	$16\frac{9}{16}$	14 1 16	1 $3\frac{1}{2}$	500	8	$6\frac{1}{4}$	$\frac{3}{4}$	4
4	21	36	$19\frac{3}{8}$	20 0 0	1 $9\frac{1}{2}$	1000	$9\frac{1}{2}$	$7\frac{5}{8}$	$\frac{3}{4}$	4
$5\frac{1}{2}$	24	41	$22\frac{1}{2}$	....	2 0	1000	..	..	..	..
5	25	$41\frac{1}{2}$	$23\frac{1}{2}$	33 0 0	2 0	$1666\frac{1}{8}$	12	10	$\frac{7}{8}$	6
6	30	$42\frac{1}{2}$	$28\frac{1}{4}$	50 0 0	2 13	2254	15	$12\frac{1}{2}$	$\frac{7}{8}$	6
8	40	$42\frac{1}{2}$	38	80 0 0	4 7	4000	18	$15\frac{1}{4}$	1	8

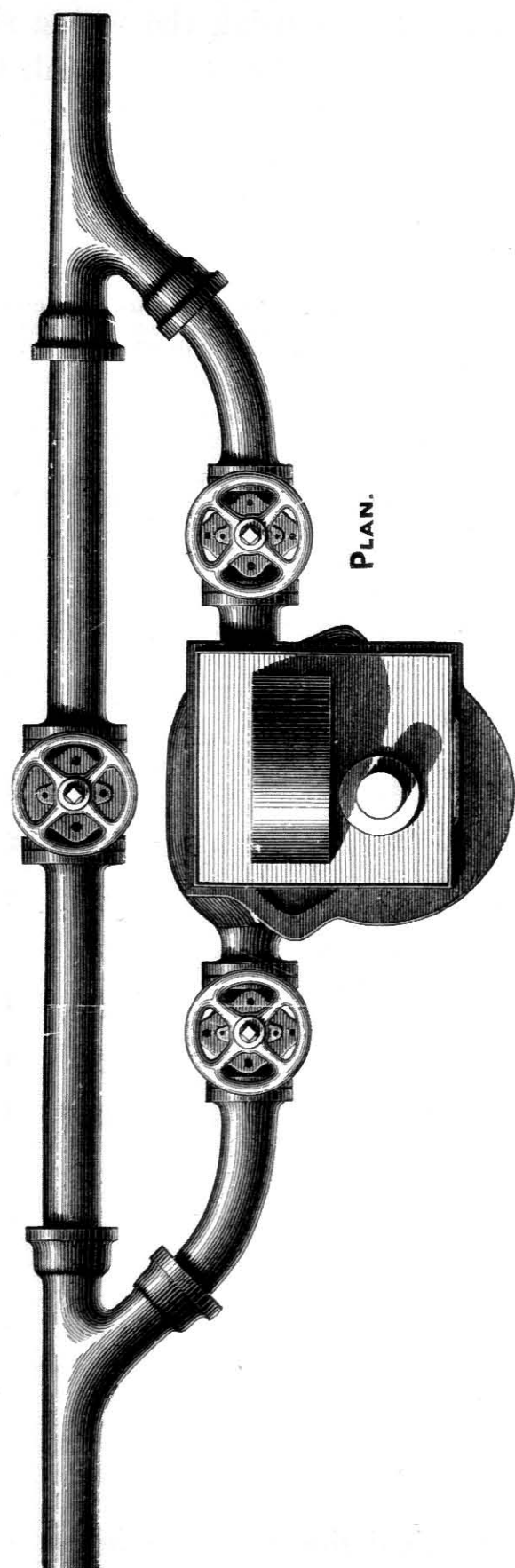
* Old pattern. Present pattern substituted 19th January, 1870.

† Old patterns. None issued since 1856.

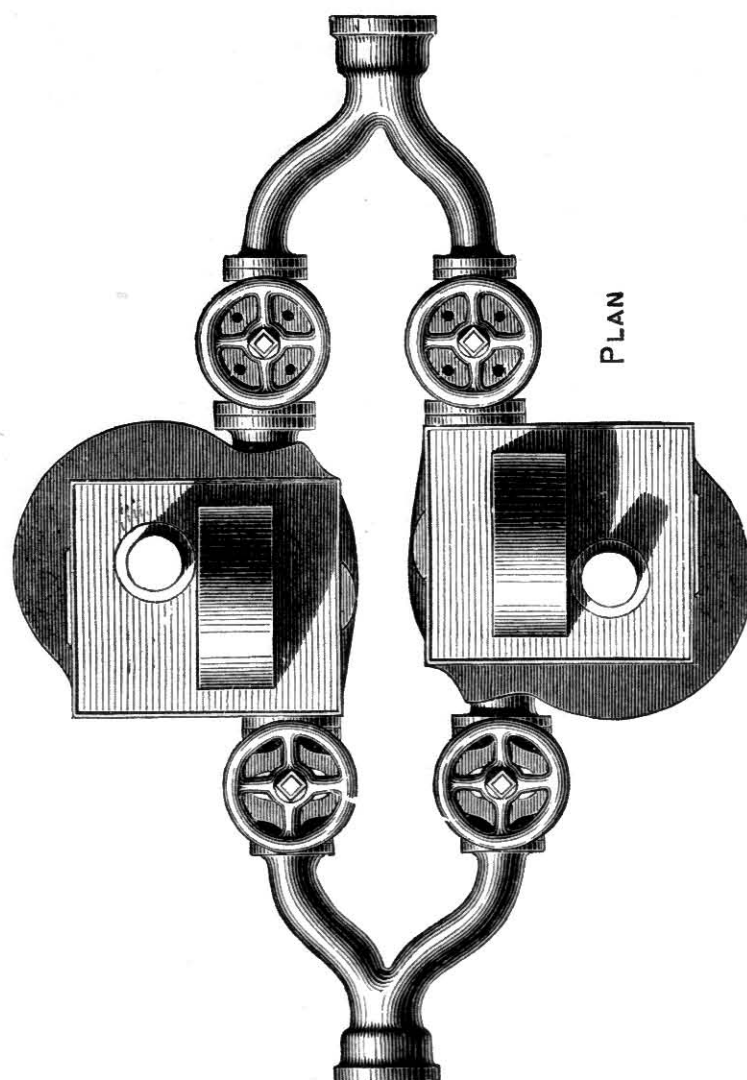
The 2", 3", and 4" Meters have all the vertical line between holes.
The 5" and 6" have horizontal line through centre of bolt holes.
The 8" has vertical line through bolt holes.

Water Meters and Connections.

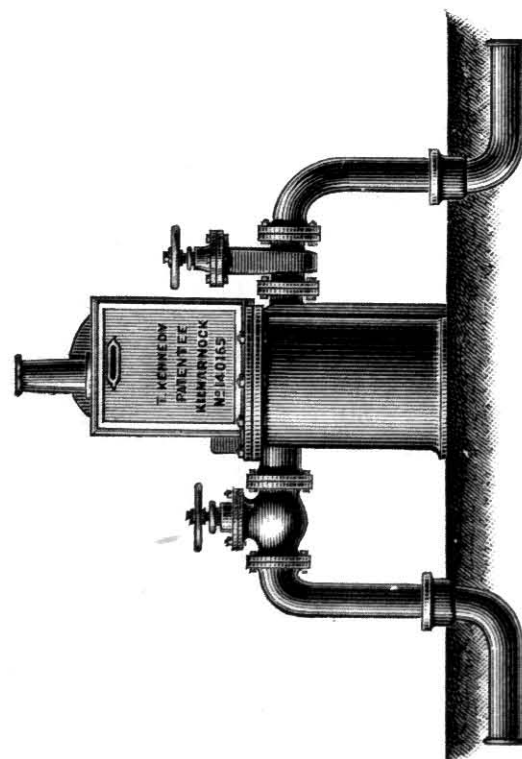
Meter on By-Pass with Valves.



Meters with Breeches Pipes and Valves.



Meter with Bends and Valves.



Pipes and Valves for Meter on By-Pass. Consisting of Branch Pipes, Bends, Straight Pipes, and Valves.

The Valve on outlet side of Meter is preferably a Stop and Check Valve Combined.

Meter. Nominal Size.	Main Pipes and Valves.	BY-PASS.		PRICE. £ s. d.	Approximate Total Weight.		
		Pipes.	Valves.				
Inches.	Inches.	Inches.	Inches.		Cwts.	Qrs.	Lbs.
1	1 1/2	1 1/2	1		1	3	0
1	2	1 1/2	1		2	1	14
1 1/2	1 1/2	1 1/2	1 1/2		2	1	12
1 1/2	2	1 1/2	1 1/2		2	3	12
1 1/2	3	2	1 1/2		4	0	19
2	2	2	2		3	2	7
2	3	2	2		4	2	0
2	4	3	2 1/2		6	1	14
3	3	3	3		5	2	0
3	4	3	3		6	3	22
3	5	4	3 1/2		8	3	21
3	6	4	3 1/2		9	3	7
4	4	4	4		8	0	0
4	6	5	4		11	1	0
4	8	6	5		17	0	0
5	5	5	5		11	0	21
5	8	7	6		19	3	0
5	9	7	6		21	3	7
6	6	6	6		14	2	0
6	8	7	6		20	1	14
6	10	8	7		26	0	14
6	12	8	7		32	3	0

Breeches Pipes and Valves.

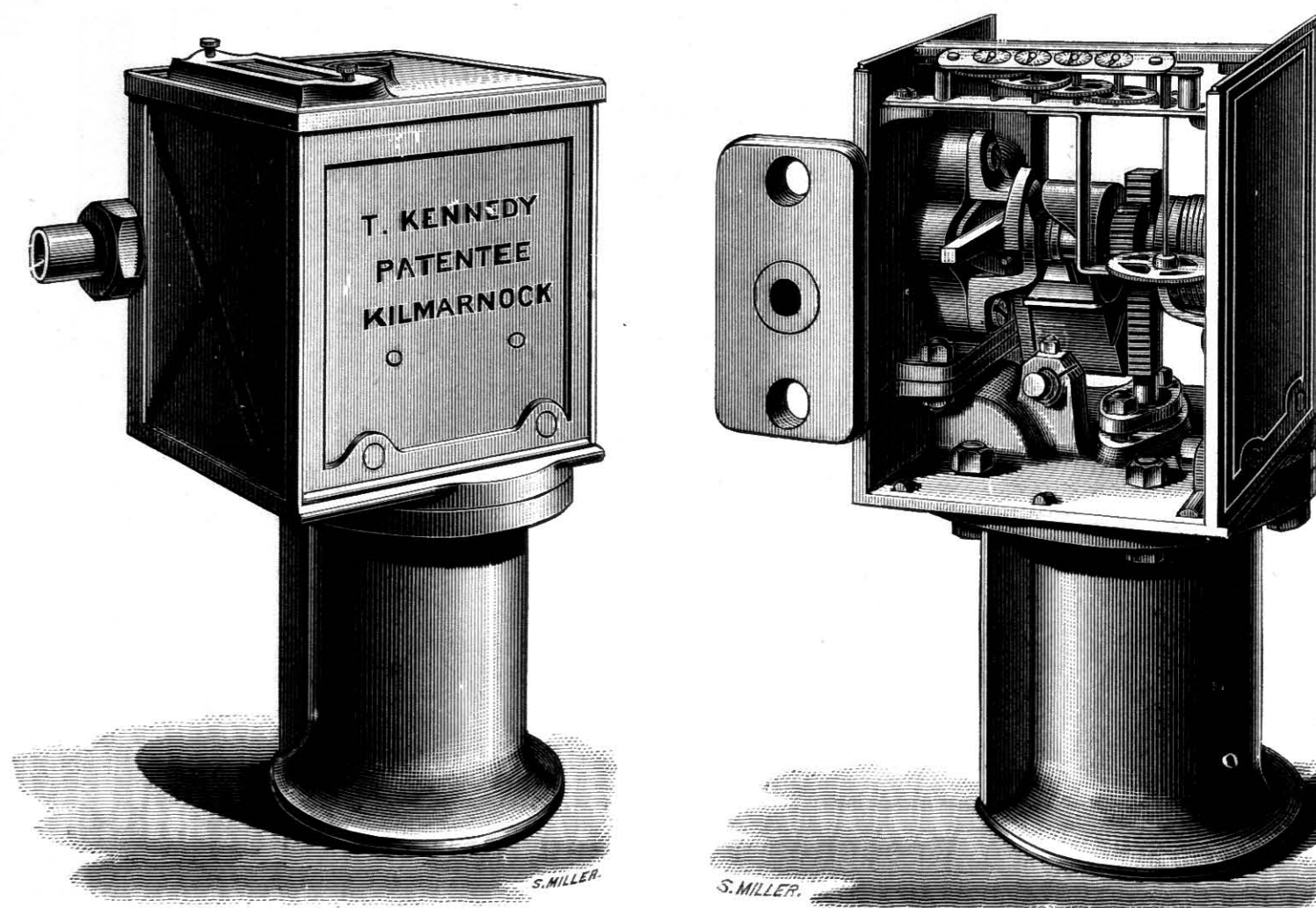
For 2" Meters to suit Main Pipes	2"	3"	4" dia.
Approximate Total Weight	Cwts. Qrs. Lbs. 3 1 0	Cwts. Qrs. Lbs. 3 2 14	Cwts. Qrs. Lbs. 3 3 0
For 3" Meters to suit Main Pipes	3"	4"	5" 6" dia.
Approximate Total Weight	Cwts. Qrs. Lbs. 5 1 14	Cwts. Qrs. Lbs. 5 1 21	Cwts. Qrs. Lbs. 7 1 8 7 1 15
For 4" Meters to suit Main Pipes	4"	6"	8" 10" dia.
Approximate Total Weight	Cwts. Qrs. Lbs. 8 1 6	Cwts. Qrs. Lbs. 8 2 6	Cwts. Qrs. Lbs. 10 1 21 11 1 21
For 5" Meters to suit Main Pipes	5"	6"	8" 10" 12" dia.
Approximate Total Weight	Cwts. Qrs. Lbs. 11 2 0	Cwts. Qrs. Lbs. 11 2 7 14 2 7	Cwts. Qrs. Lbs. 17 0 7 17 1 14
For 6" Meters to suit Main Pipes	6"	8"	10" 12" 14" dia.
Approximate Total Weight	Cwts. Qrs. Lbs. 15 2 0	Cwts. Qrs. Lbs. 15 3 0 18 2 0	Cwts. Qrs. Lbs. 21 0 14 22 3 14

Valves and Bends for Meters.

	Approximate Total Weight.
4 Bends and 2 Valves for 2" Meter	Cwts. Qrs. Lbs. 2 0 14
Do. 3" do.	3 1 22
Do. 4" do.	5 2 3
Do. 5" do.	7 0 22
Do. 6" do.	9 1 12

Carriage Paid on all orders amounting to £3 or upwards.

Kennedy's Patent Domestic Meter.



Scale about one-fourth full size.

This Meter has been specially designed for measuring domestic and other small supplies. It is constructed on the same principle as the ordinary "Kennedy" Meter, and occupies very little space, the dimensions being—length, 7"; breadth, 7 $\frac{3}{4}$ "; and height, 11 $\frac{1}{2}$ "; while the total weight is 26 lbs.

The maximum delivering capacity of the Meter is 200 gallons per hour.

The Meter registers correctly under all pressures, and at a "drop by drop" supply.

PRICE, - - £

When required, this Meter can be fitted with a Patented "Coin-in-Slot" Arrangement at an extra cost of about £

The Meter stops after the fixed quantity has been delivered, and delivers a further fixed quantity when another coin has been inserted.

Meter Fittings.

MESSRS. GLENFIELD & KENNEDY LIMITED supply all forms of Connecting Pipes, Sluice, Back-pressure, and Relief Valves fitted to their Meters, and these are shown in the Catalogue pertaining to Water Fittings by the following numbers:—

Sluice Valves, Figs. A 1, 2, 3, 4, and 5; Back-pressure Valves of 2" and upwards, Fig. H 6; those of 1 $\frac{1}{2}$ " and under, Figs. F 35 to 38; Back-pressure and Stop Valves Combined, Figs. G 16 to 19 (when it is desirable to put a Valve on the outlet of the Meter, one of this form should be used). A Spring Relief Valve (Figs. F 8 and 9 or H 12) should be fixed on the outlet of all Meters subject to concussion; when fixed, the nut on the screw should be tightened till the Valve is just tight at the maximum steady pressure.

Directions for Fixing Meters.

As Meters should be oiled every month, it is necessary to fix them where the upper parts are accessible, and to protect them from frost. For oiling, sperm oil is best. When sent out, the screws fastening down the cover are sealed, to ensure that the Meter arrives at its destination untampered with. The works should be uncovered and the bolts in the Cylinder Cover should be screwed up, as the joint frequently subsides for a few days after being made. When closed, the Meter should be re-sealed.

2" Meter and upwards. Inlet is on right-hand side looking at Index.

When sent out, the hat, for convenience of packing, is fastened inside; the temporary wooden flange must be removed, and the hat screwed on the outside of the top plate.

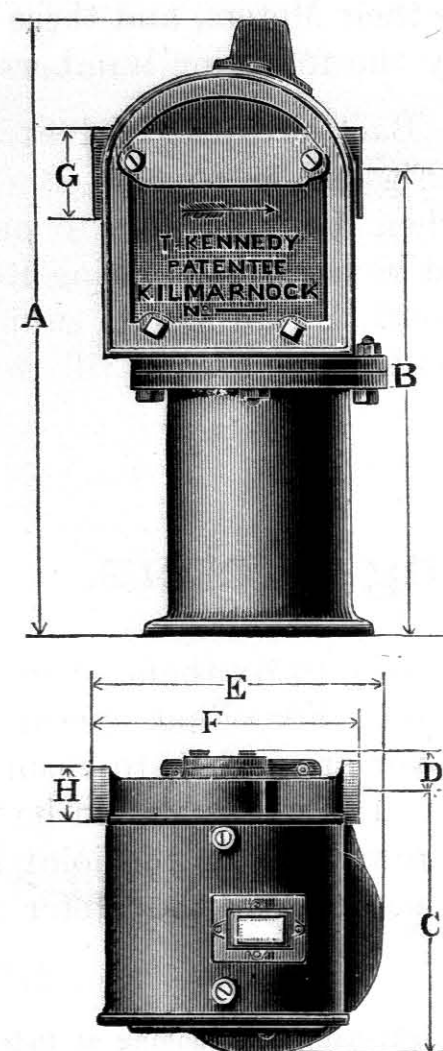
REVERSING THE INLET AND OUTLET.—This is done by drawing the key of the bevel quadrant, turning the upright or quadrant shaft one-fourth turn, and driving up the Key on the Key-bed shown on illustration on page 14. The side marked inlet is then the outlet.

1 $\frac{1}{2}$ " Meter and under. Inlet is on left-hand side looking at Index.

Take off the connecting flange, put the end of the lead pipe through it, cone it out, and flange it over, as shown on the illustration, then joint to the Meter. If wrought-iron pipe is used, the connecting flanges are furnished screwed, if so ordered. Meters of 1 $\frac{1}{2}$ " and under cannot have the inlet and outlet reversed in the manner above described for the larger sizes. To reverse the former, a new Cock with the Key-arm set at right angles must be fitted. If 1 $\frac{1}{2}$ " Meters and under are required to have the inlet and outlet reversed, this should be stated when ordering.

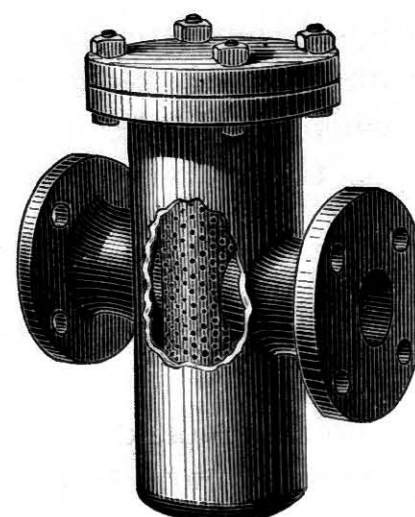
Dimensions of Cold Water Meters.

From $\frac{1}{4}$ " to $1\frac{1}{2}$ ".



Dirt Box.

Fig. H 24.



NOTE.—Dirt Boxes are not generally required for Kennedy Meters, unless there is a considerable amount of suspended matter in the water.

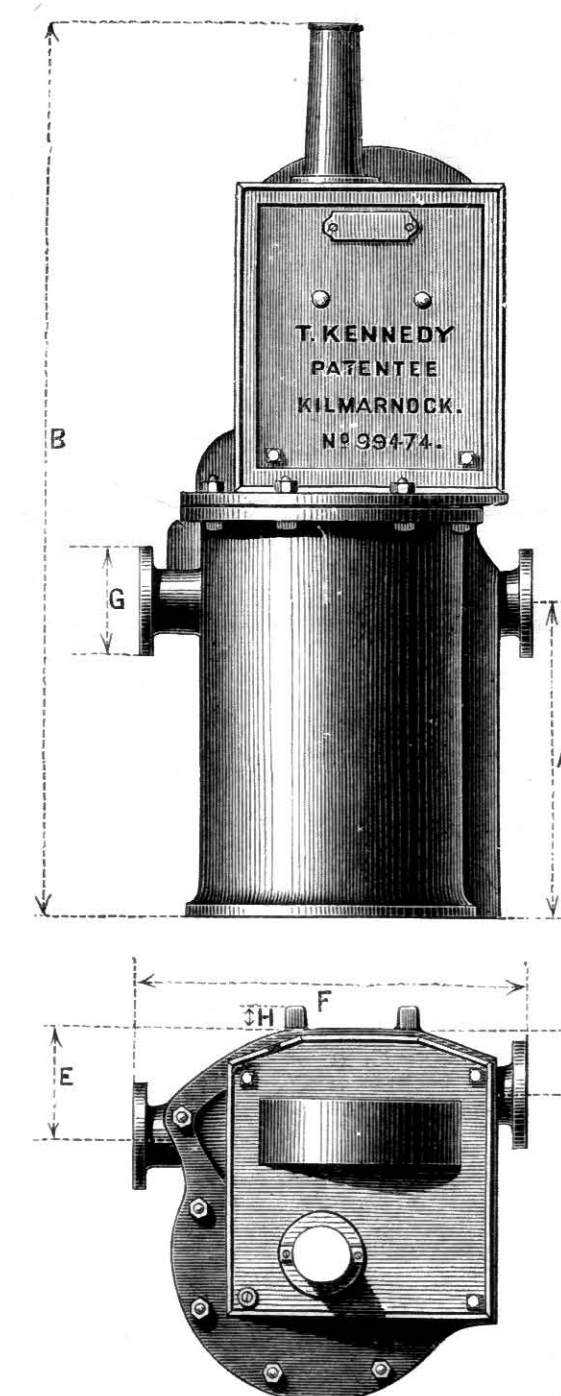
	$\frac{1}{4}$ "	$\frac{3}{8}$ "	$\frac{1}{2}$ "	$\frac{3}{4}$ "	1"	$1\frac{1}{2}$ "
A	16 $\frac{5}{8}$ "	20 $\frac{3}{8}$ "	28 $\frac{3}{4}$ "	34"	42 $\frac{3}{8}$ "	49 $\frac{3}{4}$ "
B	12 $\frac{3}{8}$ "	15 $\frac{1}{4}$ "	21 $\frac{1}{8}$ "	25 $\frac{3}{8}$ "	31 $\frac{5}{8}$ "	37 $\frac{3}{16}$ "
C	9 $\frac{3}{4}$ "	10 $\frac{3}{8}$ "	11 $\frac{3}{4}$ "	12 $\frac{3}{8}$ "	13 $\frac{7}{8}$ "	18"
D	1 $\frac{3}{4}$ "	1 $\frac{3}{4}$ "	1 $\frac{7}{8}$ "	2 $\frac{3}{16}$ "	2 $\frac{7}{8}$ "	3"
E	9 $\frac{3}{4}$ "	11 $\frac{1}{8}$ "	12 $\frac{3}{4}$ "	13 $\frac{7}{8}$ "	16"	19 $\frac{1}{4}$ "
F	8 $\frac{1}{2}$ "	10"	11 $\frac{1}{2}$ "	12 $\frac{3}{8}$ "	15"	17 $\frac{7}{8}$ "
G	3 $\frac{5}{8}$ "	4 $\frac{5}{16}$ "	5 $\frac{1}{4}$ "	5 $\frac{1}{4}$ "	5 $\frac{1}{2}$ "	7"
H	2"	2 $\frac{1}{2}$ "	2 $\frac{3}{4}$ "	2 $\frac{7}{8}$ "	3 $\frac{1}{2}$ "	5"

Dimensions of Dirt Box.

	$\frac{3}{8}$ "	$\frac{1}{2}$ "	$\frac{3}{4}$ "	1"	$1\frac{1}{2}$ "	2"	3"	4"	5"	6"	8"
Extreme Length	9"	9"	9"	11 $\frac{5}{8}$ "	11 $\frac{7}{8}$ "	17 $\frac{1}{2}$ "	22"	28 $\frac{1}{2}$ "	30 $\frac{1}{4}$ "	32 $\frac{3}{4}$ "	35"
Extreme Breadth over Connecting Flanges	8 $\frac{1}{2}$ "	8 $\frac{1}{2}$ "	8 $\frac{1}{2}$ "	10 $\frac{1}{2}$ "	10 $\frac{1}{2}$ "	12 $\frac{1}{8}$ "	14"	16 $\frac{1}{2}$ "	19"	22"	26 $\frac{1}{2}$ "

Dimensions of Cold Water Meters.

2" and upwards.



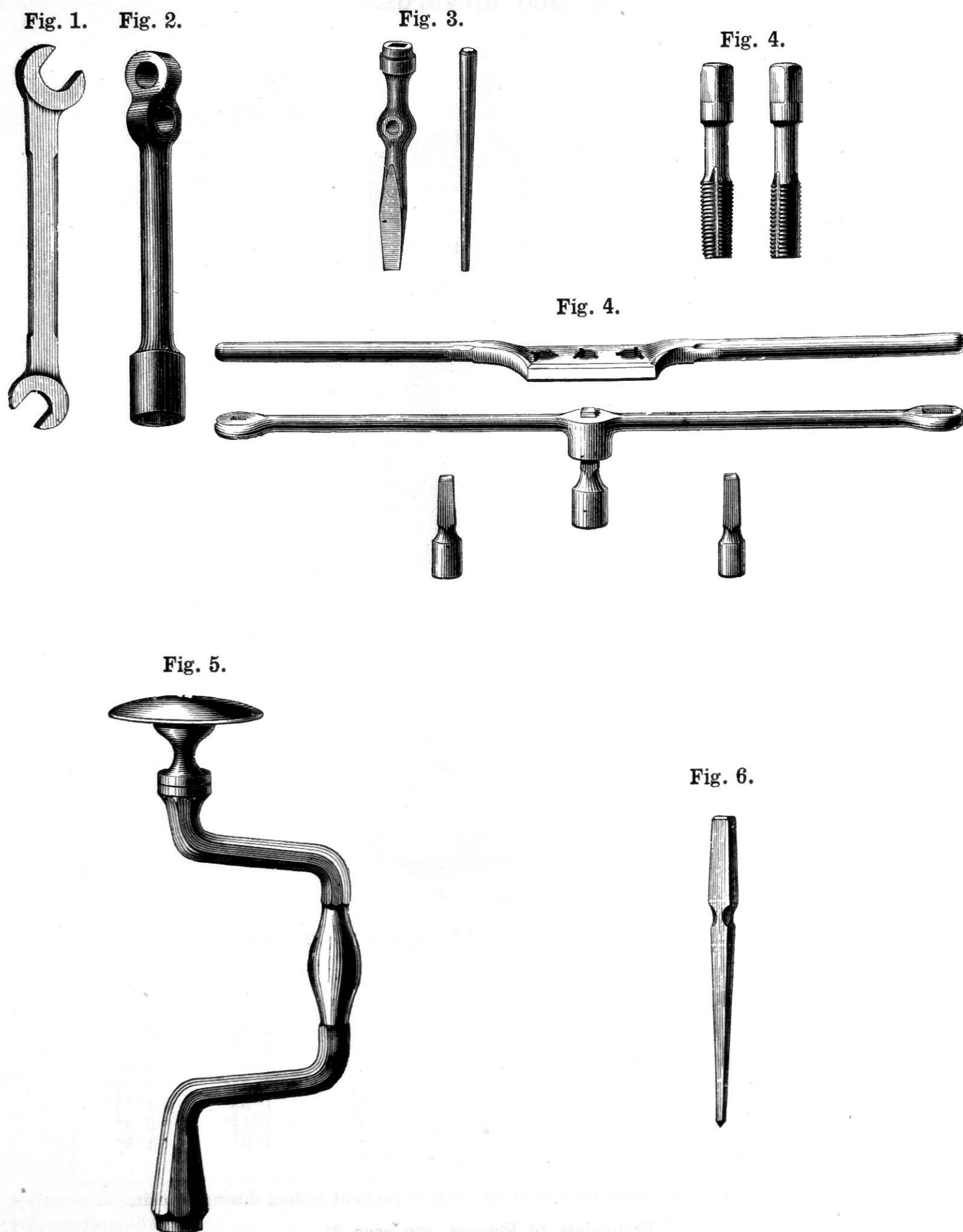
6" AND 8" METERS HAVE NO ENCLOSING PLATES.

	2"	3"	4"	5"	6"	8"
A	1' 6 $\frac{1}{2}$ "	1' 10"	2' 3 $\frac{1}{8}$ "	2' 5 $\frac{7}{8}$ "	2' 4 $\frac{7}{8}$ "	2' 1"
B	4' 6"	5' 7"	6' 7 $\frac{1}{8}$ "	7' 6 $\frac{1}{4}$ "	8' 0"	8' 0"
C	1' 8"	1' 10 $\frac{3}{8}$ "	2' 3 $\frac{1}{8}$ "	2' 4"	2' 9"	3' 9"
D	0' 5 $\frac{5}{8}$ "	0' 7 $\frac{5}{8}$ "	0' 7 $\frac{1}{4}$ "	1' 0 $\frac{1}{8}$ "	1' 5 $\frac{1}{4}$ "	1' 7 $\frac{3}{4}$ "
E	0' 7 $\frac{3}{8}$ "	0' 7 $\frac{5}{8}$ "	0' 11 $\frac{3}{8}$ "	1' 0 $\frac{1}{8}$ "	1' 5 $\frac{1}{4}$ "	1' 7 $\frac{3}{4}$ "
F	2' 0 $\frac{1}{4}$ "	2' 9"	2' 10 $\frac{1}{4}$ "	3' 5 $\frac{1}{4}$ "	4' 1 $\frac{3}{4}$ "	5' 3"
G	0' 7 $\frac{1}{2}$ "	0' 8"	0' 9 $\frac{1}{2}$ "	1' 0"	1' 3"	1' 6"
*H	0' 1 $\frac{1}{2}$ "	0' 1 $\frac{1}{2}$ "	0' 2 $\frac{1}{2}$ "	0' 3"	..	..

* Projection of Horns from back of Cock to prevent rolling during transit.

Particulars of Flanges, see page 21.

Repairing Tools for Water Meters.



Directions for Repairing Meters.

Plates E contain the details of 2" Meters and above ; Plates F, those of 1½" Meters and under. If any part requires renewal, please state, when ordering, the number or name given on the sheet, and the nominal size of the Meter.

When the works have been taken asunder, care must be taken when putting together the large sizes to place the notches in the centre of the bevel quadrant opposite each other, and in all sizes, that the mark-pin in the rack be made to correspond with the notch in the wheel.

Always observe that the Cock-key is free ; if it stiffens, a very slight grind will free it.

When re-packing is required, the packing should be dipped in melted hog's lard ; tallow is too stiff for cold water, and should not be used.

The following tests of accuracy can from time to time be made :—

The Meter, *under any circumstances*, cannot register more than it delivers. If it works with a small flow, or if the outlet cannot be seen, if it cannot be held back while working slowly, it is measuring all the water ; if the index-bevels do not hang at each reverse, and are in gear with the index, it is registering all that it measures : if right in both tests, it is accurate. If wrong in the latter test, the looseness can be traced back till the defect is found ; if wrong in the former, the piston roller should be renewed. The roller should be sprung over the bottom flange of the piston and made free from twists, the cylinder should be wet, or if to be used immediately, suds of yellow soap may be used ; the piston is then shoved down as far as the rolling of the ring will allow, it is then lifted up and bumped down till it rests on the bottom seat.

In jointing the cylinder cover, care must be taken to lay the joint inside the passage to the bottom of cylinder as well as outside. If the joint is of India Rubber, put a ply of paper between it and the cylinder flange to prevent them from sticking. In starting a Meter, the water should be turned on slowly, to allow the air in the pipe and cylinder to escape.

Repairing Tools.

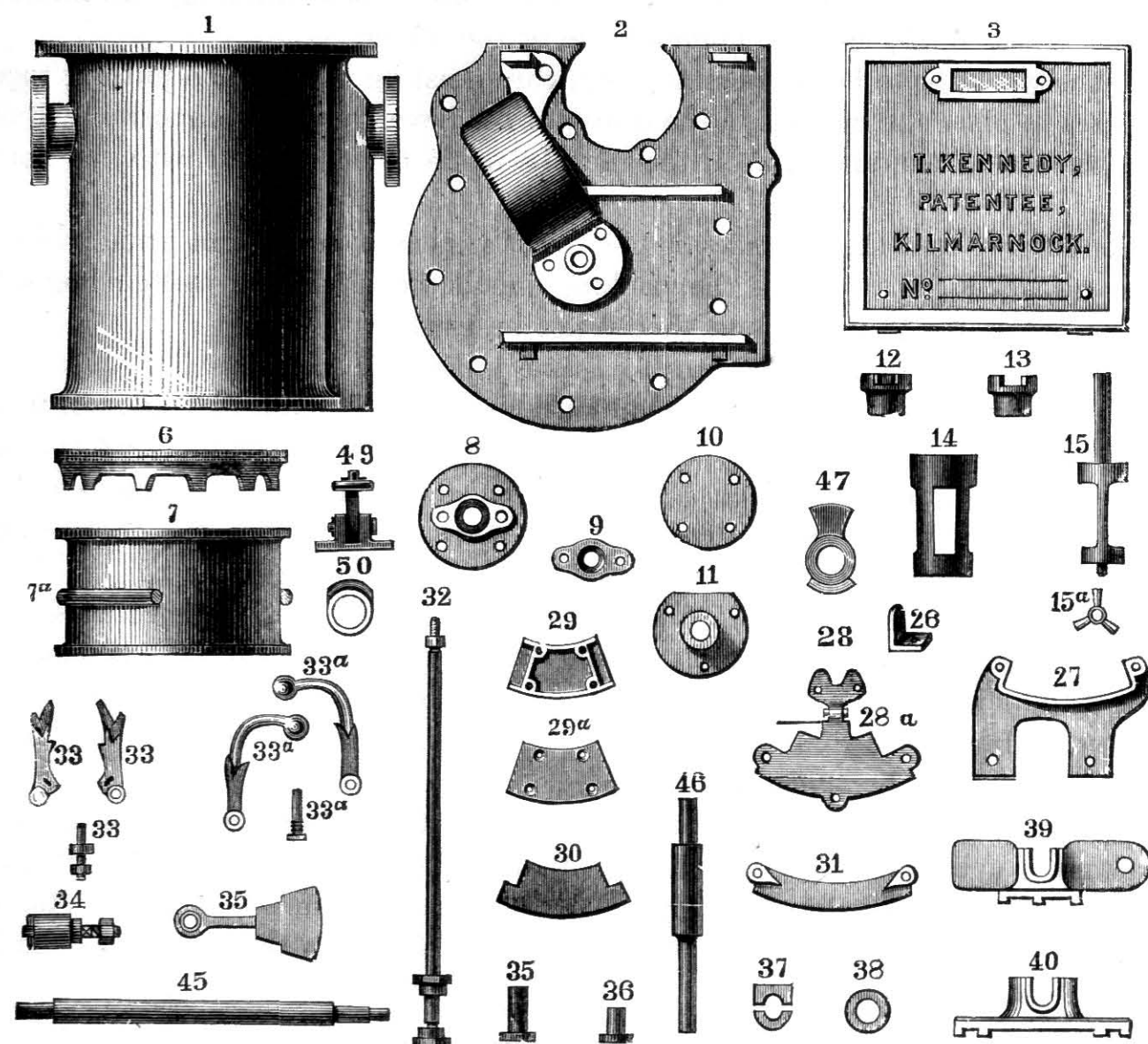
- | | | |
|--|---|---|
| Fig. 1—SPANNERS, to fit all parts of all Meters under 2", | { | No. 1, Steel, polished |
| | | No. 2, do. . . . |
| | | No. 3, do. . . . |
| | | No. 3a, do. . . . |
| Fig. 2—SPANNERS, to fit Cylinder Cover of 2", 3", and 4" Meters, | { | No. 4, Box Key.. |
| | | No. 5, do. .. |
| | | No. 6, do. .. |
| Fig. 3—SCREW-DRIVER, DRIFT, AND BOX KEY, No. 7 | | |
| Fig. 4—TAPS, WRENCH, AND SCREW PLATE for small Pins | | |
| Fig. 5—BREAST BRACE | | |
| Fig. 6—REAMERS, | { | No. 1, for Index Work |
| | | No. 2, for Key Arms, etc. |
| | | No. 3, for Shaft Mounting of large Meters |

ALL SIZES OF TAPERED PINS SUPPLIED.

Carriage Paid on all orders amounting to £3 or upwards.

PLATE E.

Kennedy's Patent Water Meter in Detail.



The names and numbers correspond with 2", 3", 4", and 5" Meters (Nominal Sizes), or No. 4, No. 5, No. 6, and No. 7 Meters.

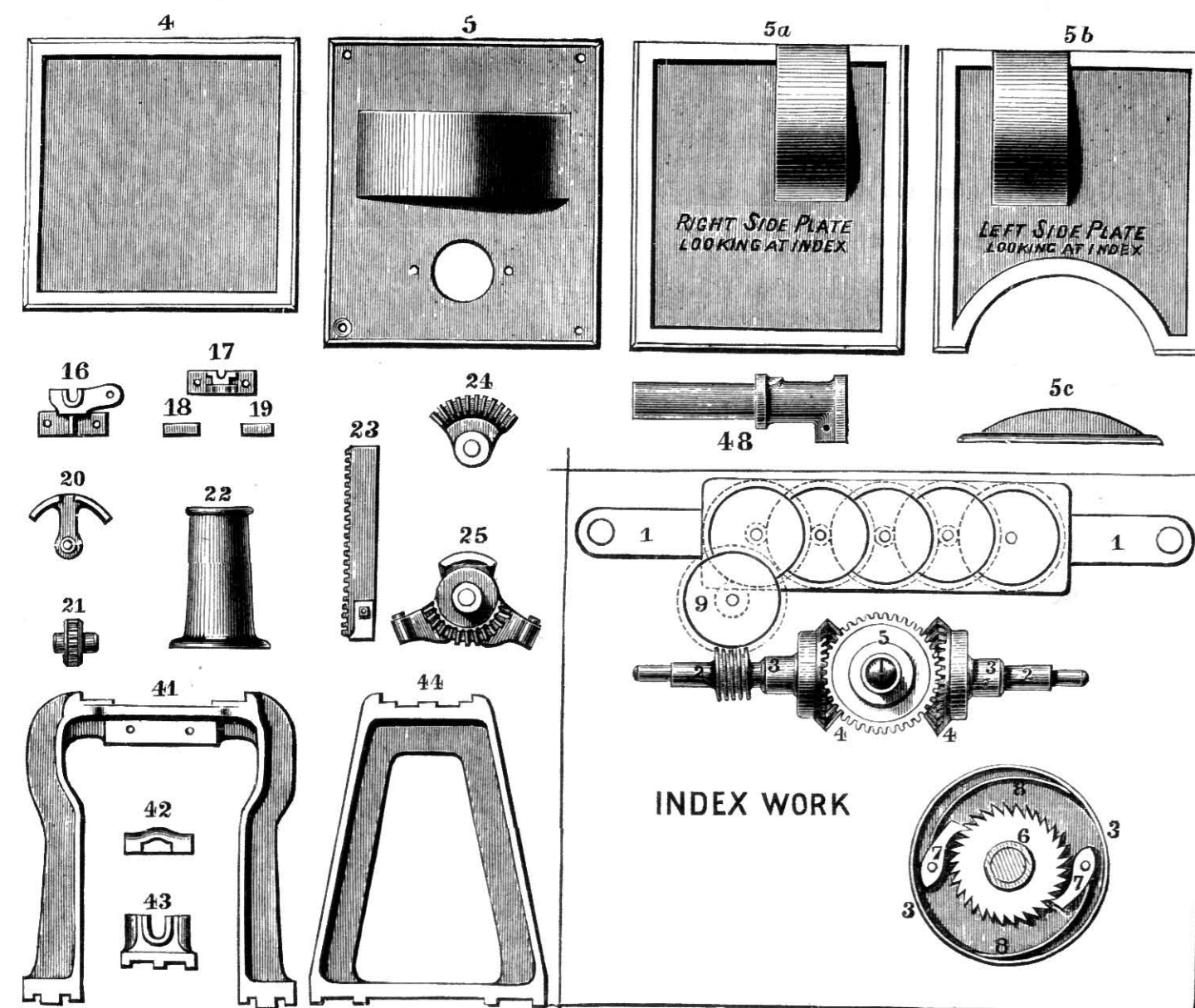
No.	NAME.	No.	NAME.	No.	NAME.
1	Cylinder.	8	Cock Cover and Stuffing Box.	18	Front Bearing Cover.
2	Do. Cover.	9	Cock Stuffing Cover.	19	Back do.
3	Front Plate.	10	Do. Bottom Plate.	20	Lifter.
4	Back do.	11	Piston Stuffing Cover.	21	Rack Pinion.
5	Top Cover Plate.	12	Male Coupling.	22	Hat.
5a	Old 5" Meter Plate.	13	Female do.	23	Rack and Buckle.
5b	Do. do.	14	Four-way Cock Bush.	24	Bevel Quadrant.
5c	Side Plate for enclosing Tumbling Weight.	15	Do. Key.	25	Do. Wheel with Arms.
6	Bottom Seat.	15a	Bearing for Key.	26	Do. Shaft Bracket.
7	Piston.	16	Front Bearing Bracket.	27	Buffer Box do.
7a	Do. Roller.	17	Back do.	28	Catch Plate.
				28a	Do. for Clutch.

Those Details also refer to 6" and 8" Meters.

NOTE.—In ordering any Article, mention the Name or Number, also size of Meter.

PLATE E.

Kennedy's Patent Water Meter in Detail.



The Names and Numbers correspond with 2", 3", 4", and 5" Meters (Nominal Sizes), or No. 4, No. 5, No. 6, and No. 7 Meters.

No.	NAME.	No.	NAME.	No.	NAME.
29&29a	Buffer Box.	39	Front Bearing Pillow Block	1'1 2'2 3'3 4'4 5 6'6 7'7 8'8 9	INDEX WORK.
30	Leather Plate.	40	Back do.		
31	Spring do.	41	Back Bearing Bracket		
32	Piston Rod.	42	Pillow Block Cover		
33	Spring Catches and Stud.	43	Quadrant Shaft Pillow Block		
33a	Ball do.	44	Front Bearing Bracket		
34	Guide Roller and Stud.	45	Main Shaft.		
35	Tumbling Weight and Bush.	46	Quadrant Shaft.		
36	Quadrant Shaft Bush.	47	Clutch.		
37	Front and Back Bearing Bushes.	48	Brass Sleeve for Arm Wheel.		
38	Woollen Stuffing Ring.	49	Stopper Catch.		
		50	Cam for do.		

Those Details also refer to 6" and 8" Meters.

NOTE.—In ordering any Article, mention the Name or Number, also size of Meter.

Price List of Details shown on Plates E.

DETAILS.		NOMINAL SIZES OF METERS.			
No.	NAME.	2"	3"	4"	5"
		£ S. D.	£ S. D.	£ S. D.	£ S. D.
1	Cylinder, unlined.....Each				
1	Do., brass-lined				
2	Do., Cover, including Flat Ring ..				
3	Front Plate				
4	Back do				
5	Top do.				
5c	Tumbling Weight enclosing Plate				
6	Bottom Seat and Flat Ring				
7	Piston, vulcanite, with Air Bush	Prices vary with cost of Rubber, and can be quoted on application.			
7a	Piston Roller				
8	Cock Cover Stuffing Box.....Each				
9	Do. Gland				
10	Cock Bottom Plate				
11	Piston Stuffing Cover				
12&13	Couplings Pair				
14	Four-way Cock Bush				
15	Do. Key				
16	Front Bearing Bracket.....				
17	Back do.				
18&19	Front or Back Bearing Covers				
20	Lifter.....				
21	Pinion				
22	Hat				
23	Rack and Buckle				
24	Quadrant, malleable cast				
25	Bevel Wheel, with Arms, malleable cast ..				
26	Bevel Shaft Brackets				
27	Buffer Box Bracket, including leather. ..				

Price List of Details shown on Plate E

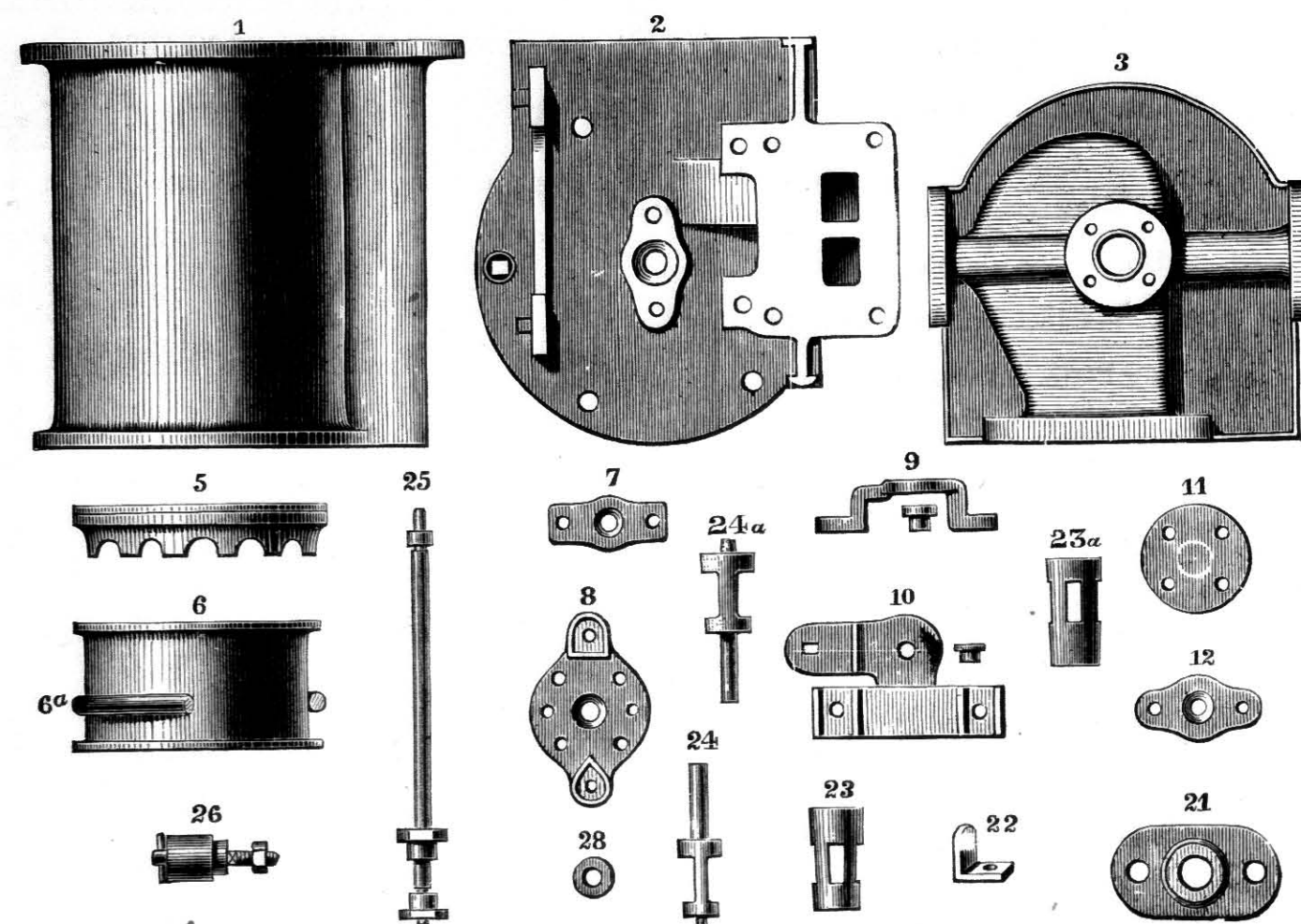
(Continued).

DETAILS.		NOMINAL SIZES OF METERS.			
No.	NAME.	2"	3"	4"	5"
		£ S. D.	£ S. D.	£ S. D.	£ S. D.
28	Catch Plate.....Each				
28a	Do. for Clutch				
29	Buffer Box, including rubber and leather ..				
30	Leather Plate, with leather				
31	Spring Plate				
32	Piston Rod				
33	Spring Catches and Stud				
33a	Ball Catches				
34	Guide Roller and Stud				
35	Tumbling Weight and Bush				
36	Quadrant Shaft Bush				
37	Front and Back Bearing Bushes				
38	Woollen Stuffing Ring				
39	Pillow Block, Front				
40	Do., Back.....				
41	Back Bracket.....				
42	Pillow Block Cover				
43	Do. for Quadrant Shaft				
44	Front Bracket				
45	Main Shaft				
46	Quadrant Shaft				
47	Clutch				
48	Brass Sleeve for Arm Wheel				
49	Stopper Catch				
50	Cam for do.				
	Index, Complete				
	Bevels, do.				

Carriage Paid on all orders amounting to £3 or upwards.

PLATE F.

Kennedy's Patent Water Meter in Detail.



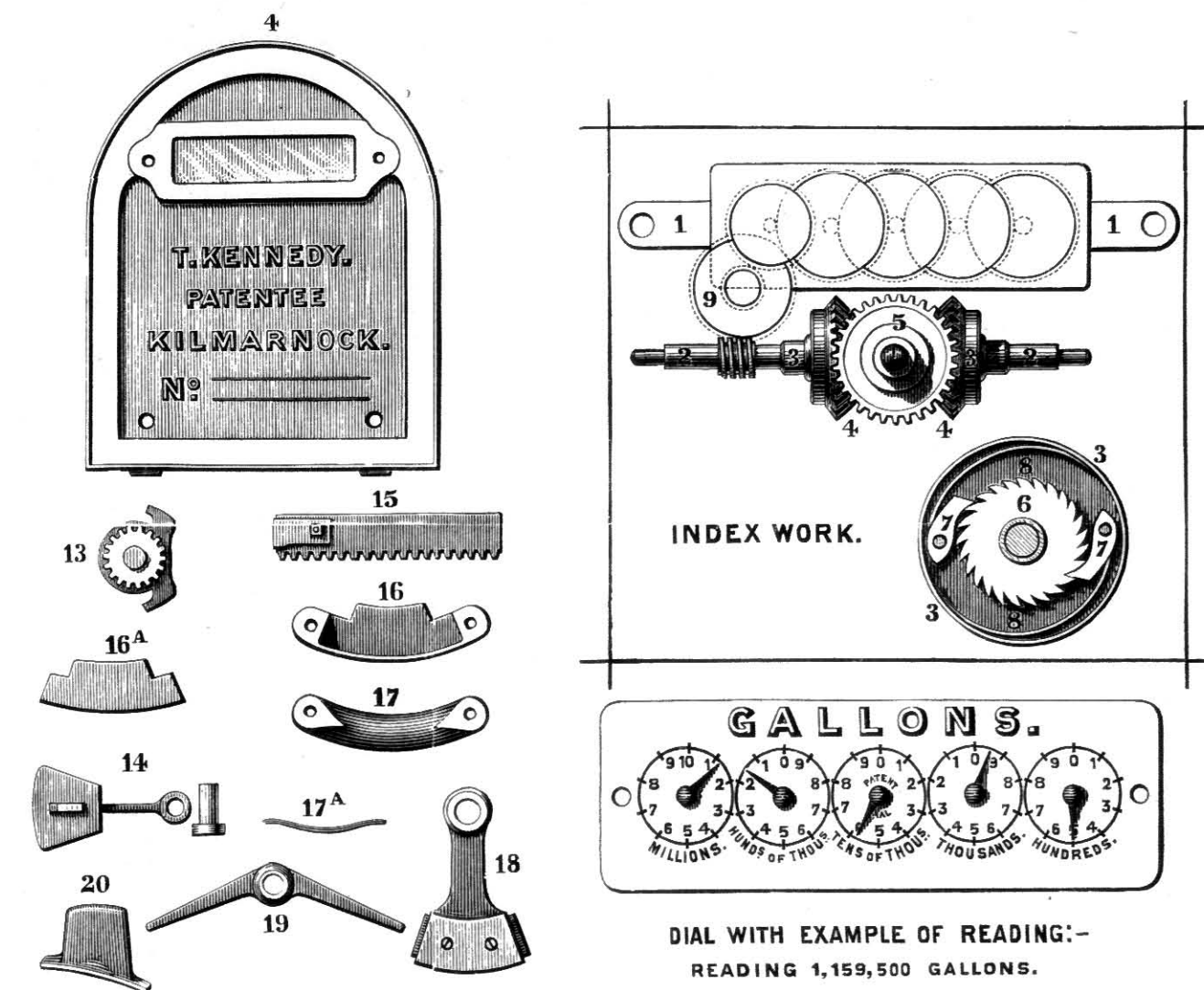
The Names and Numbers Correspond with $\frac{1}{4}$ ", $\frac{3}{8}$ ", $\frac{1}{2}$ ", $\frac{3}{4}$ ", 1", and $1\frac{1}{2}$ " Meters (nominal sizes), or No. 00, No. 0, No. 1, No. 02, No. 2, and No. 3 Meters.

No.	NAME.	No.	NAME.
1	Cylinder.	11	Back Plate of Cock Spindle.
2	Do. Cover.	12	Piston Stuffing Cover.
3	Cock Plate.	13	Rack Pinion and Lifter.
4	Front do.	14	Tumbling Weight and Bush.
5	Bottom Seat and Flat Ring.	15	Rack and Buckle.
6	Piston.	16	Buffer Box Frame.
6a	Do. Roller.	16a	Leather Plate.
7	Cock Spindle Stuffing Cover.	17	Spring Plate.
8	Cock Face Stuffing Box.	17a	Spring.
9	Bridge Back Bearing and Bush.	18	Buffer Box and Brass Hanger
10	Bracket Front do.	19	Key Arms.

NOTE.—In ordering any Article, mention the Name or Number, also size of Meter.

PLATE F.

Kennedy's Patent Water Meter in Detail.



The Names and Numbers correspond with $\frac{1}{4}$ ", $\frac{3}{8}$ ", $\frac{1}{2}$ ", $\frac{3}{4}$ ", 1", and $1\frac{1}{2}$ " Meters (nominal sizes), or No. 00, No. 0, No. 1, No. 02, No. 2, and No. 3 Meters.

No.	NAME.	No.	NAME.
20	Hat.	1·1	INDEX WORK.
21	Flange or Gland for Connecting Pipes.	1·2	Index.
22	Bevel Shaft Bracket.	2·2	Bevel and Screw Shaft.
23	Four-way Cock Bush (gun metal).	3·3	Ratchet Boxes.
23a	Reversed do. (do.) page 16.	4·4	Bevel Wheels.
24	Four-way Cock Key (do.).	5	Leading Bevel Wheel.
24a	Reversed do. (do.) page 16.	6·6	Ratchet Wheels.
25	Piston Rod.	7·7	Steel Catches.
26&27	Rack Guide Roller and Stud.	8·8	Brass Catch Springs.
28	Woollen Stuffing Ring.	9	Index Leading Wheel.

NOTE.—In ordering any Article, mention the Name or Number, also size of Meter.

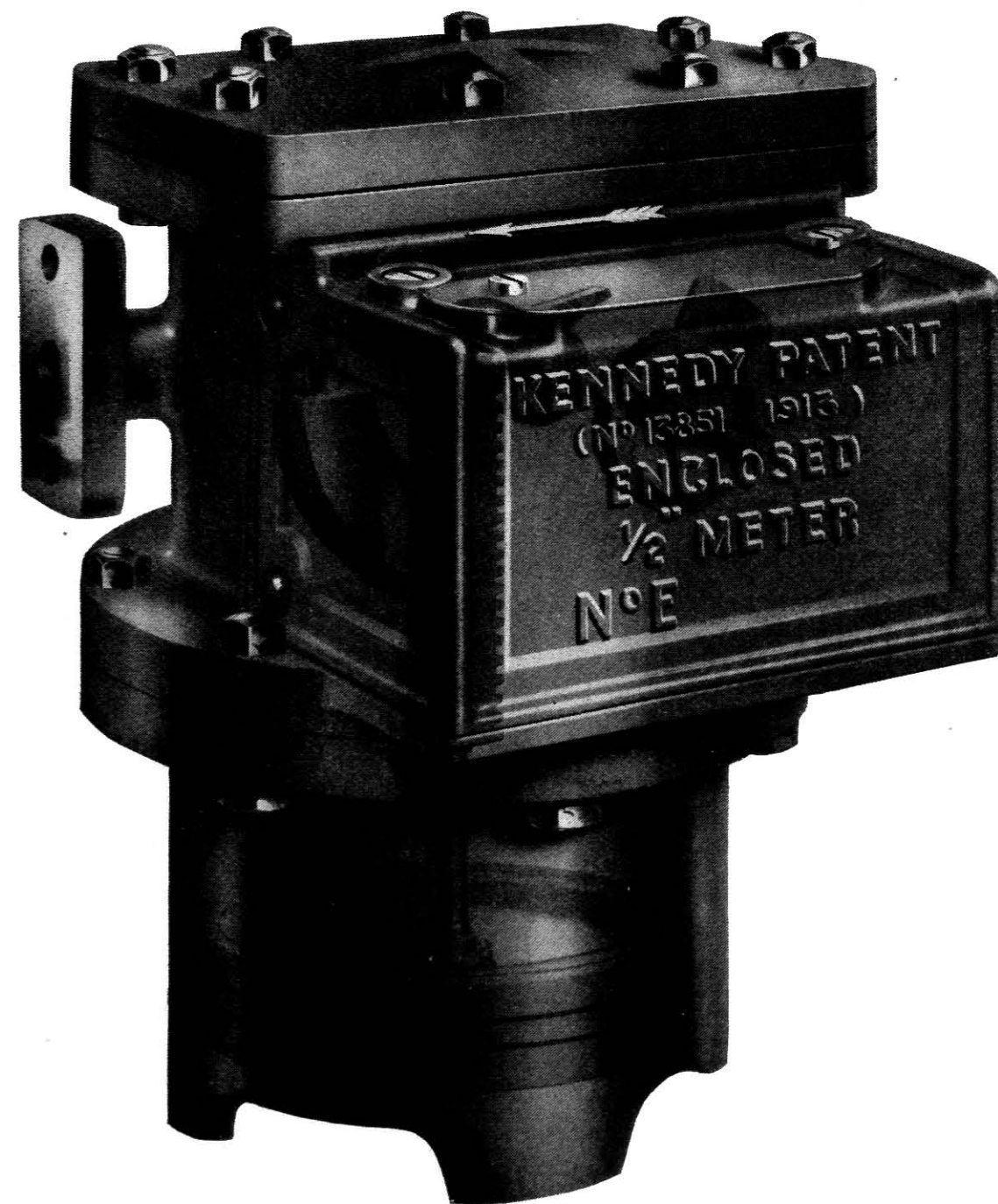
Price List of Details shown on Plate F.

DETAILS.		NOMINAL SIZES OF METERS.					
No.	NAME.	$\frac{1}{4}$ "	$\frac{3}{8}$ "	$\frac{1}{2}$ "	$\frac{3}{4}$ "	1"	1 $\frac{1}{2}$ "
		S. D.	S. D.	S. D.	S. D.	S. D.	S. D.
1	Cylinder, unlined.....Each						
1	Do., brass-lined						
2	Cover.....						
3	Cock, Complete						
4	Front Plate						
5	Bottom Seat and Ring						
6	Piston, vulcanite	Prices vary with cost of Rubber, and can be quoted on application.					
6a	Piston Roller						
7	Cock Spindle Stuffing Cover. Each						
8	Cock Face Stuffing Box						
9	Bridge and Bush						
10	Bracket and Bush						
11	Cock Back Plate						
12	Piston Stuffing Cover						
13	Pinion and Lifter						
14	Tumbling Weight and Bush .						
15	Rack and Buckle.....						
16	Buffer Box Frame.....						
17	Spring Plate						
18	Buffer Box Slide, including Rubber						
19	Key Arms.....						
20	Hat						
21	Connecting Flange						
22	Bevel Shaft Bracket						
23	Four-way Cock Bush						
24	Do., Key						
25	Piston Rod						
26&27	Rack Guide Roller and Stud. .						
28	Woollen Stuffing Ring						
	Index, Complete						
	Bevels, do.						

Carriage Paid on all orders amounting to £3 or upwards.

KENNEDY
“ENCLOSED” WATER METER

The Kennedy Patent "Enclosed" Meter.



The Kennedy Patent "Enclosed" Meter.

THIS Meter, which is extremely simple and substantial, retains the advantages of the well-known Kennedy Meter, and at the same time embodies several improvements.

By enclosing the working parts in the water, we have been able to dispense with the Glands both of the Piston Rod and of the Four-way Key, and this has the advantage of reducing the friction and consequently the loss of head. Incidentally, the risk of trouble due to leakage of Glands is removed.

The only Stuffing Box now employed is on the small spindle which drives the Index, which, being outside the Meter, is accessible for adjustment and examination.

The result of enclosing the working parts and adopting a double cup packing for the Piston is that the height, bulk, and weight of the Meter are considerably reduced.

A patented arrangement on the driving shaft of the Index admits of the latter being adjusted to give the exact amount of water passed without the necessity of any change of the wheel gearing.

Experiments have been carried out during which this "Enclosed" Meter has been run continuously day and night for a long period at rates of delivery greater than the maxima for which it is designed, and the results have shown that the cost of maintenance is considerably less than even in the original Kennedy Meter.

The advantages claimed for this Meter are :

Exactitude of measurement.

Extreme simplicity.

Low first cost.

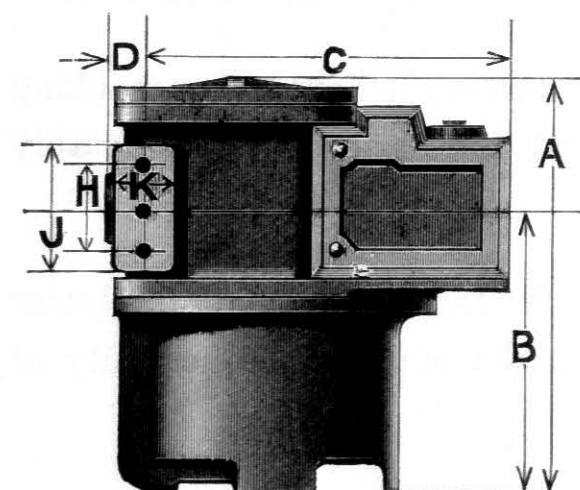
Small Bulk.

Noiseless working.

Low maintenance cost.

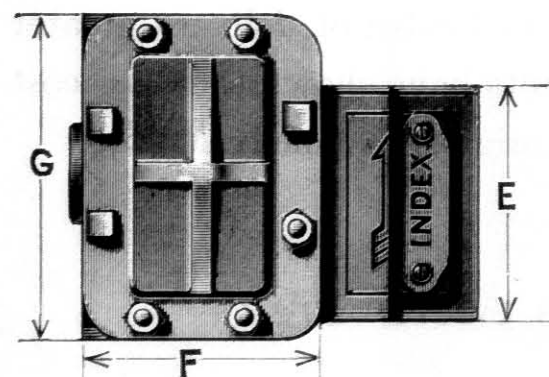
PRICES.

Size of Meter.	Delivery Recommended in Gallons per Hr.	Occasional Maximum Delivery in Gallons per Hr.	Price of Meter	Weight of Meter.		
				Cwts.	Qrs.	Lbs.
$\frac{3}{8}$ "	150	300		0	1	7
$\frac{1}{2}$ "	250	500		0	3	0
$\frac{3}{4}$ "	400	1,000		0	3	14
1"	600	1,500		1	2	4
$1\frac{1}{2}$ "	1,500	3,500		2	1	0
2"	3,000	7,000		6	0	14



DIMENSIONS.

Size of Meter.	A	B	C	D	E	F	G	H	J	K
$\frac{3}{8}$ "	$8\frac{3}{4}$ "	$6\frac{1}{8}$ "	$7\frac{3}{4}$ "	$1\frac{3}{8}$ "	$5\frac{1}{8}$ "	$5\frac{1}{8}$ "	7"	$1\frac{7}{8}$ "	$2\frac{3}{4}$ "	$1\frac{1}{2}$ "
$\frac{1}{2}$ "	$12\frac{5}{8}$ "	$8\frac{5}{8}$ "	$9\frac{1}{8}$ "	$1\frac{1}{2}$ "	$7\frac{3}{8}$ "	$6\frac{5}{8}$ "	$9\frac{1}{8}$ "	$2\frac{3}{4}$ "	$3\frac{5}{8}$ "	2"
$\frac{3}{4}$ "	$14\frac{3}{8}$ "	$9\frac{7}{8}$ "	$9\frac{3}{8}$ "	$2\frac{1}{4}$ "	6"	$7\frac{1}{8}$ "	$9\frac{5}{8}$ "	$2\frac{7}{8}$ "	$4\frac{5}{16}$ "	$2\frac{1}{2}$ "
1"	21"	$13\frac{7}{8}$ "	$10\frac{3}{8}$ "	$2\frac{5}{8}$ "	8"	$8\frac{3}{8}$ "	$13\frac{1}{8}$ "	4"	$5\frac{1}{2}$ "	$3\frac{1}{2}$ "
$1\frac{1}{2}$ "	$26\frac{1}{2}$ "	$17\frac{1}{4}$ "	$11\frac{7}{8}$ "	$2\frac{7}{8}$ "	$9\frac{3}{4}$ "	$9\frac{3}{4}$ "	$14\frac{5}{8}$ "	5"	$6\frac{3}{4}$ "	$4\frac{1}{2}$ "
2"	36"	$23\frac{1}{2}$ "	15"	$4\frac{1}{2}$ "	$9\frac{3}{4}$ "	11"	$20\frac{3}{8}$ "	$5\frac{7}{8}$ "	$7\frac{1}{2}$ " dia.	



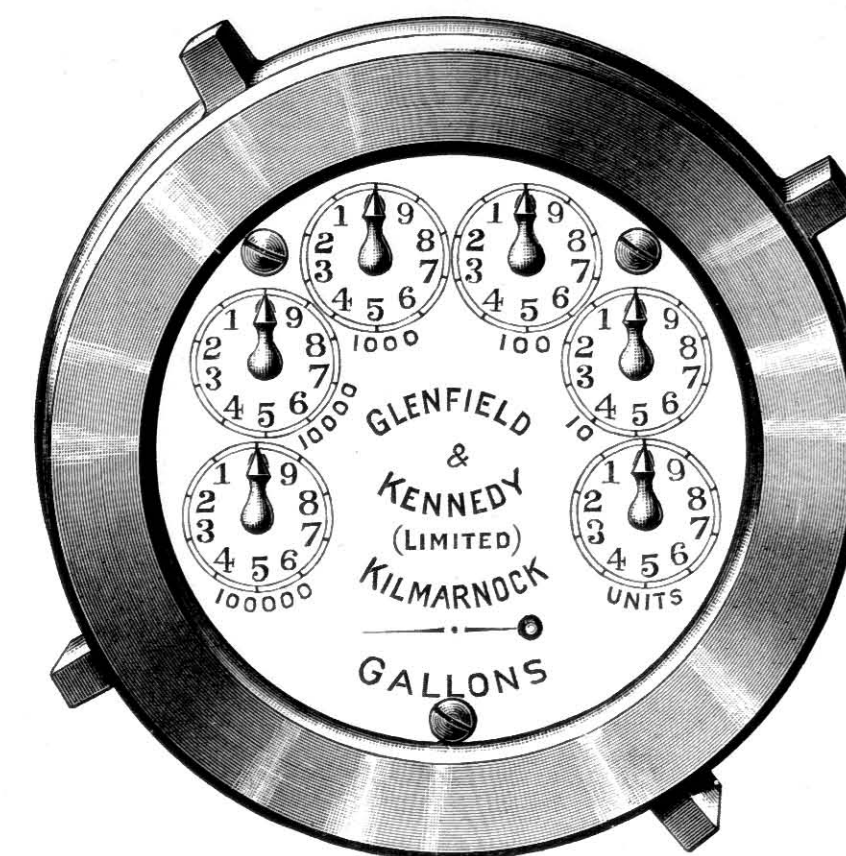
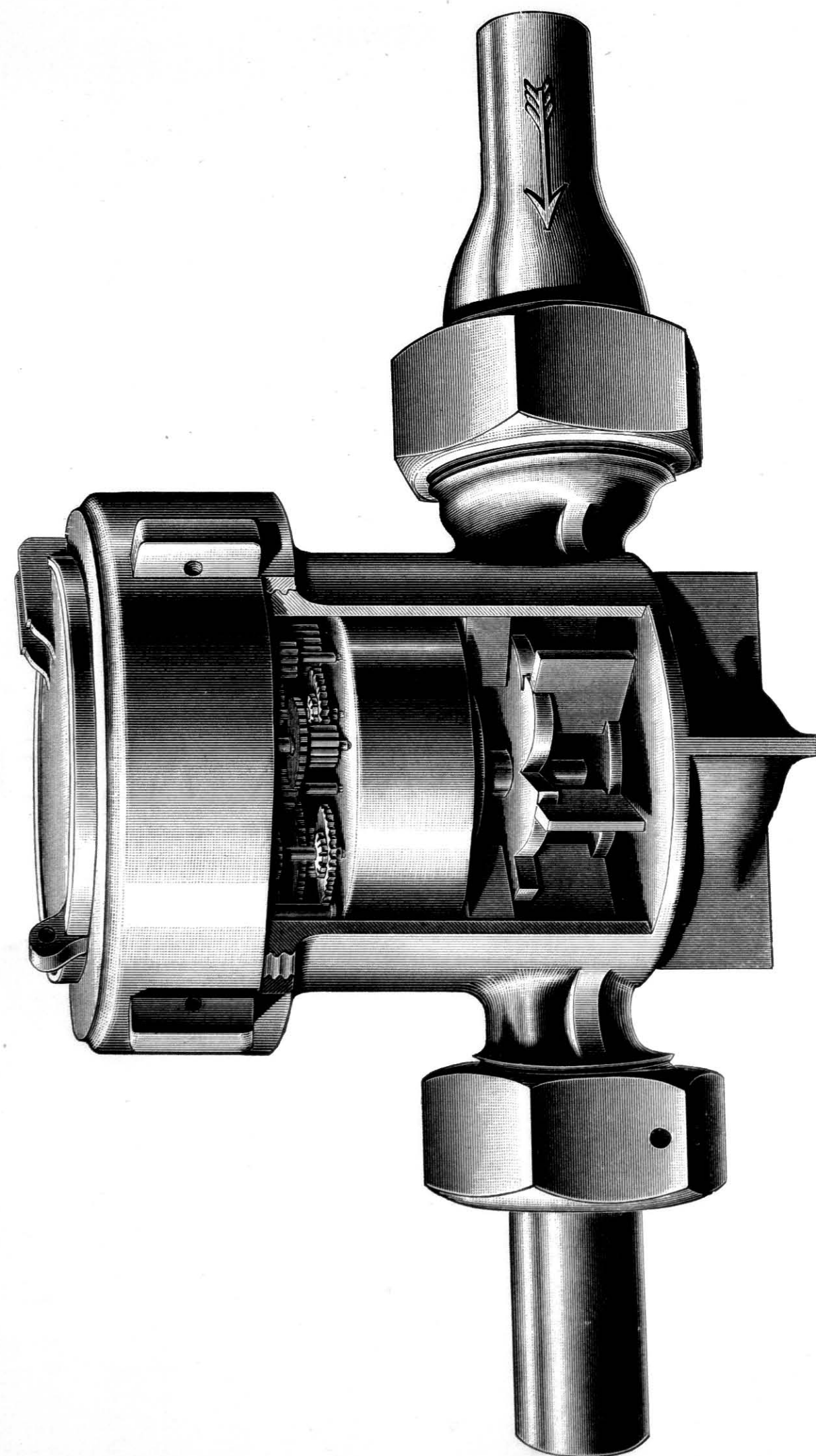
APPROXIMATE SHIPPING WEIGHTS AND DIMENSIONS.

			Nett.			Gross.			Dimensions.
			Cwts.	Qrs.	Lbs.	Cwts.	Qrs.	Lbs.	
$\frac{3}{8}$ "	-	-	3	1	17	3	3	3	50" x 18" x 14" Each Case containing 10 Meters.
$\frac{1}{2}$ "	-	-	1	2	0	1	3	14	36" x 14" x 12" " " 2 "
$\frac{3}{4}$ "	-	-	1	3	0	2	0	18	36" x 14" x 13" " " 2 "
1"	-	-	3	0	8	3	2	7	47" x 16 $\frac{1}{2}$ " x 16" " " 2 "
$1\frac{1}{2}$ "	-	-	2	1	0	2	1	21	27" x 18" x 15" " " 1 "
2"	-	-	6	0	14	6	1	14	39" x 22" x 22" " " 1 "

"GLENFIELD"
ROTARY WATER METER

The "Glenfield" Rotary Water Meter.

Patents Nos. 13440, 18905—1911.



Accuracy.—Although a good Positive Water Meter is the most accurate type, its cost frequently prohibits its use where water is comparatively cheap, and where *extreme* accuracy is not essential.

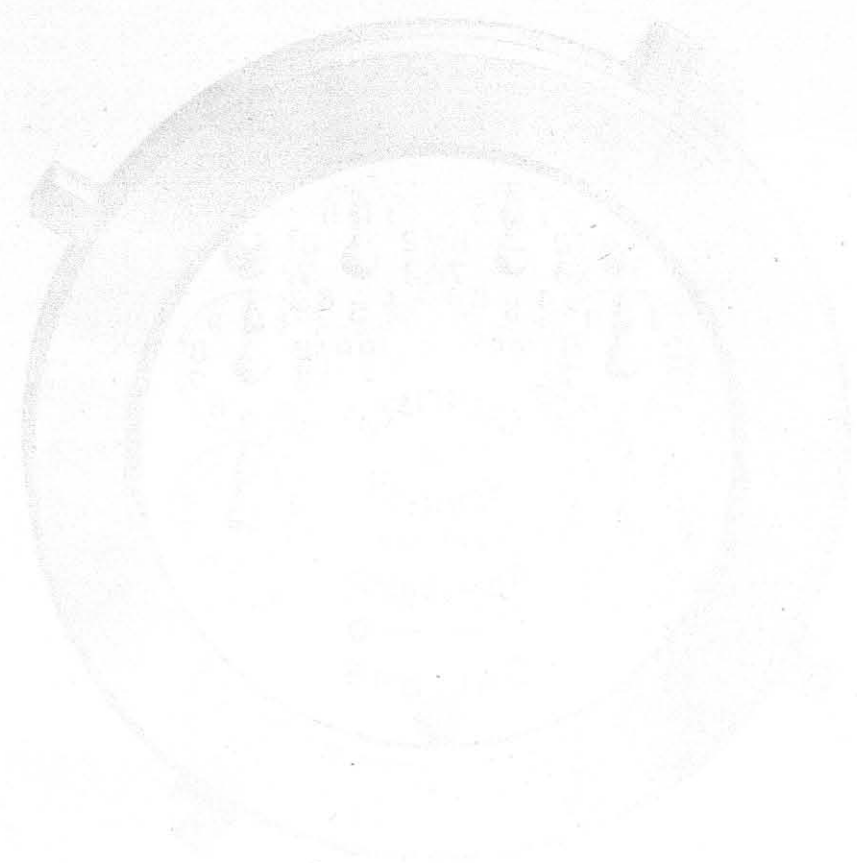
In these cases a Rotary Meter can be used, especially where the water is generally drawn off at full bore and then shut off.

Space and Weight.—Sometimes where space is limited it is impossible to find room for a Positive Meter, and if a portable Meter is required the weight of a Positive Meter is a great disadvantage.

To enable us to meet all conditions, we have put on the market a Rotary Meter, so that where Customers do not feel justified in going to the expense of our well-known Kennedy Meter, we can supply them with Rotary Meters at a lower price.

The illustration on opposite page shows this Meter, for the manufacture of which we have installed special machinery, which will enable us to produce an excellent Meter at a low cost. The Body is of Brass, the Revolving Vane of Celluloid, and the Index Gearing of a Nickel Alloy.

PRICES:		DIMENSIONS.			
	EACH.	Length with Couplings.	Length without Couplings.	Breadth.	Depth.
$\frac{1}{2}$ " " GLENFIELD " ROTARY METER		9"	$4\frac{5}{8}$ "	$3\frac{3}{4}$ "	$4\frac{1}{4}$ "
$\frac{3}{4}$ " " "		$10\frac{1}{4}$ "	$5\frac{1}{2}$ "	$4\frac{1}{8}$ "	$4\frac{3}{8}$ "
1" " "		11"	$6\frac{9}{16}$ "	$4\frac{3}{8}$ "	$4\frac{11}{16}$ "
$1\frac{1}{4}$ " " "		$12\frac{1}{4}$ "	$6\frac{9}{16}$ "	$4\frac{3}{8}$ "	$4\frac{11}{16}$ "
$1\frac{1}{2}$ " " "		$14\frac{1}{2}$ "	$7\frac{5}{8}$ "	$5\frac{1}{4}$ "	$5\frac{1}{2}$ "



48 (Meter Section) CLEMMER & KENNEDY LIMITED, KILMARNOCK

The Kennedy Hot Water Meter

ADVANTAGES

1. The Kennedy Hot Water Meter is a simple, reliable, and accurate instrument for measuring the flow of hot water, oil, and ammoniacal liquor. It is designed to operate at temperatures up to 212°F (100°C) and is suitable for use in a wide range of industrial and domestic applications.

2. The meter is constructed from high-quality materials, including brass and steel, and is designed to withstand the most severe conditions of use. It is also resistant to corrosion and is easy to maintain.

3. The Kennedy Hot Water Meter is a simple and reliable instrument for measuring the flow of hot water, oil, and ammoniacal liquor. It is designed to operate at temperatures up to 212°F (100°C) and is suitable for use in a wide range of industrial and domestic applications.

METERS

FOR

HOT WATER, OIL, AMMONIACAL LIQUOR,

ETC.

49 CLEMMER & KENNEDY LIMITED, KILMARNOCK

The Kennedy Hot Water Meter.

ADVANTAGES.

- Enables most economical fuel to be selected.
- Detects deterioration in quality of fuel.
- Shows necessity for cleaning flues or tubes.
- Detects inefficient stoking.
- Indicates losses through engine defects.
- Indicates losses due to surplus steam discharged at safety valve.
- Indicates other boiler losses, such as leaky blow-off valve, etc.
- Enables most economical cut-off in cylinder to be fixed.

COMPARATIVE VALUE OF COALS.

As ascertained by the Kennedy Hot Water Meter.

(COPY OF ACTUAL TEST SHEET.)

Quality.	Price per Ton.	Pounds Coal Used.	Pounds Water Evaporated.	Pounds Water Evaporated per 1 lb. Coal.	Cost of Evaporating 1000 lbs. Water.
A Nuts,	13/	8,988	64454.8	7.17	9.71 Pence
B Dross,	8/6	11,060	66977.0	6.05	7.52 „
C Nuts,	12/	9,548	64321.5	6.73	9.55 „
D Dross,	11/4	8,354	66583.6	7.97	7.61 „
E Dross,	8/6	9,072	52058.5	5.73	7.94 „
F Dross,	12/	8,680	53453.0	6.158	10.42 „
G Dross,	7/9	10,752	52077.3	4.84	8.57 „

From the above Table it will be observed that the cheapest fuel is not necessarily the most economical in regard to cost of evaporation.

EVERY MODERN BOILER INSTALLATION SHOULD HAVE A
KENNEDY METER FOR MEASURING FEED WATER.

The Kennedy Hot Water Meter.

The advantages of using **Feed Water Meters** are now so generally recognised that these Instruments are being fixed in all up-to-date Installations.

By their means the most economical quality of coal can be ascertained from the cost of evaporation, (say) per 1000 pounds of water.

In our own Works where regular returns are made we have found that the costs thus obtained vary greatly for coal from different sources, the price per ton of coal under test being taken into account. See Table on preceding page.

If as the result of fixing a meter, dross B were used instead of F, the saving would be 2.9 pence per 1000 lbs. (or per 100 galls.) of water. In the case of a 4" meter dealing with 10,000 galls. per hour, the saving would be 290 pence per hour, or £72 10s. per week of 60 hours, which would equal the price of the meter, £55 10s., in 46 hours. In the case of a 1" meter, the saving would amount to the cost of the meter in 112 hours.

A customer has recently informed us that he has been able to effect a saving of £100 per month in his coal bill as the result of fixing one of our 3" meters.

Having obtained a certain standard of evaporation per pound of coal, if the results afterwards fall below this, one or other of the following defects should be looked for :—

- (1) Deterioration in the quality of the fuel.
- (2) Necessity for cleaning the Flues or Tubes of the Boiler.
- (3) Inefficient stoking.
- (4) Examination of Blow-off Valves.

Again, if the total quantities of both coal and water increase without any additional load on the engines, this points to :—

- (1) Leakage of steam past the Pistons or Valves of the Engine.
- (2) Too much steam being blown off at Safety Valve on Boiler.
- (3) Leakage of Drain Cocks.

Another advantage of fixing a Feed Water Meter is that the **most economical rate of expansion in the Engines** can be easily and quickly found by taking the readings on the index of the meter and on the engine counter, and finding from them the consumption per revolution at different rates of expansion.

The Kennedy Hot Water Meter.

THE KENNEDY HOT WATER METER is specially designed for measuring boiler feed, and is extensively used for this purpose.

ITS PRINCIPAL ADVANTAGES ARE:

A. It is **extremely accurate at all speeds**, since it measures the actual distance travelled by the Piston, and not the number of strokes. Thus long or short strokes, due to rapid or slow working, do not affect the accuracy of registration.

B. It causes **very little extra back pressure in the Pumps** on account of its large delivering capacity. For this reason a smaller nominal size of Meter than the size of pipe can often be employed. An examination of the illustrations on pages 50, 52 and 53 will show that the passages are everywhere much larger than the area of the pipe except at the inlet and outlet where the Meter joins the pipe, and where the diameter is consequently made to correspond with the pipe.

C. All parts are of **substantial construction**, and there is no delicate mechanism exposed to the action of the water.

D. If **oiled and cleaned periodically**, the Meter can be maintained almost indefinitely at a very small cost.

E. All parts are made **accurately to gauge** so that Spares can be easily and quickly substituted.

All our Hot Water Meters are **carefully tested with both hot and cold water**, and before being despatched must indicate correctly to within 1 %. The hot water test is conducted on a special boiler designed for the purpose, which enables Meters to be tried at temperatures higher than those at which they are likely to work in practice.

The parts subject to pressure are **tested to 500 lbs. per square inch**, so that our Meters are quite safe for even the highest pressures now in vogue.

Instructions to Attendant.

Before the Meter is inserted the pipes should be thoroughly scoured out so that no scale or grit may be carried into the Meter.

A Meter, like any other piece of mechanism in the Engine Room, should be oiled and cleaned from time to time.

When first started, water should be turned on very slowly to get rid of all the air in the pipes, etc.

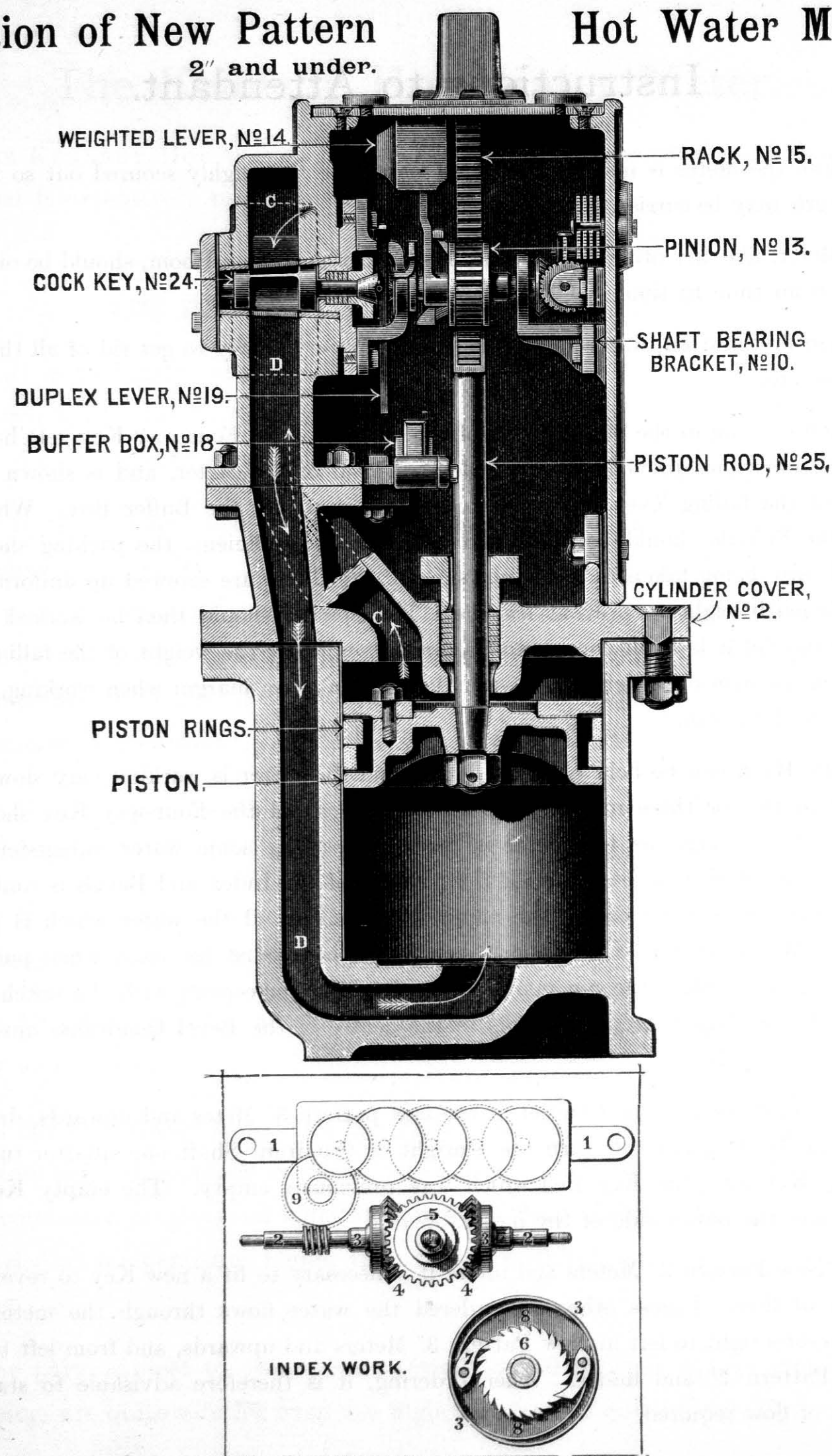
If the packing in the Stuffing Box of the Spindle of the Four-way Key gets hard and dry, this sometimes prevents the complete reversal of the Meter, and is shown by the motion of the falling lever being arrested before it strikes the Buffer Box. When this occurs the Spindle should be oiled, and if this is not sufficient, the packing should be renewed, care being taken that the two sides of the Gland are screwed up uniformly and just sufficiently tight to prevent leakage. The Spindle should then be worked to and fro by hand till it is slack enough to be carried round by the weight of the falling lever resting on the arm on which it falls, thus leaving an extra margin when working, due to the energy of the fall.

If the Rack can be held back by hand when the meter is working very slowly, say a stroke in two or three minutes, the Piston Rings and the Four-way Key should be examined for leakage, as the meter is probably passing some water unregistered. If the Rack cannot be held back, and if the rotation of the Index and Bevels is continuous without any appreciable pause, the meter is measuring all the water which is passing through. When the meter has been taken apart, care must be taken when putting it together again to place the pin mark on the Rack to correspond with the notch in the Pinion. In the larger sizes the marks in the centre of the Bevel Quadrants must come opposite one another.

To reverse the Inlet and Outlet of the new pattern 3" Meter and upwards, draw the Key of the Bevel Quadrant, turn the Upright or Quadrant Shaft one quarter turn and drive the Key into the Key Bed which was previously empty. The empty Key Bed always faces the outlet side of the meter.

For New Pattern 2" Meters and under it is necessary to fit a new Key to reverse the direction of flow. Unless otherwise ordered the water flows through the meter from the Observer's right to left in New Pattern 3" Meters and upwards, and from left to right in New Pattern 2" and under. When ordering, it is therefore advisable to state the direction of flow required.

Section of New Pattern Hot Water Meter. 2" and under.



Description.

The Measuring Cylinder forms the base of the Meter, and is fitted with a Metallic Piston of an improved construction.

The Piston Rod, after passing through a Stuffing Box in the Cylinder Cover, is attached to a Rack which gears into a Pinion fixed on the Shaft. The Shaft is turned in reverse directions, actuating the Indexing and Reversing gear as the Piston moves up and down.

The leading Bevel Wheel (No. 5, see Sketch of Index Work, page 50) is fixed on the Main Shaft, and transmits the right and left rotating motion to the two Bevel Wheels (4.4) attached to the Bevel Shaft (2) by means of the Ratchet Wheel (6) and Catches (7.7). Each wheel (4.4) slips during the motion in one direction, but drives the Bevel Shaft (2) during motion in the other. The Shaft (2) thus always rotates in the same direction, as does also the Worm Wheel attached to it, which thus transmits the motion to the leading Index Wheel (9). The Index, therefore, moves so long as the Piston is moving, so that though the Stroke be long or short, the exact displacement is always recorded. This would not be the case if simply the number of strokes were counted.

The Rack is kept in gear and guided in a vertical line by an Anti-friction Roller, which is carried on a Stud projecting from the front-bearing Bracket.

The Cock-key which directs the water alternately above and below the Piston, is placed in the same axial line as the Shaft, and is fitted with a Duplex Lever, which is actuated by a Weighted Lever carried loosely on the Shaft, and caused to fall alternately on each Arm of Duplex Lever.

The Weighted Lever, after reversing the Key, falls on a Buffer faced with India Rubber which, yielding before it and travelling in the same curve, gradually brings it to rest.

Page 52 shows a Front Section of Cock-key and Water Passages.

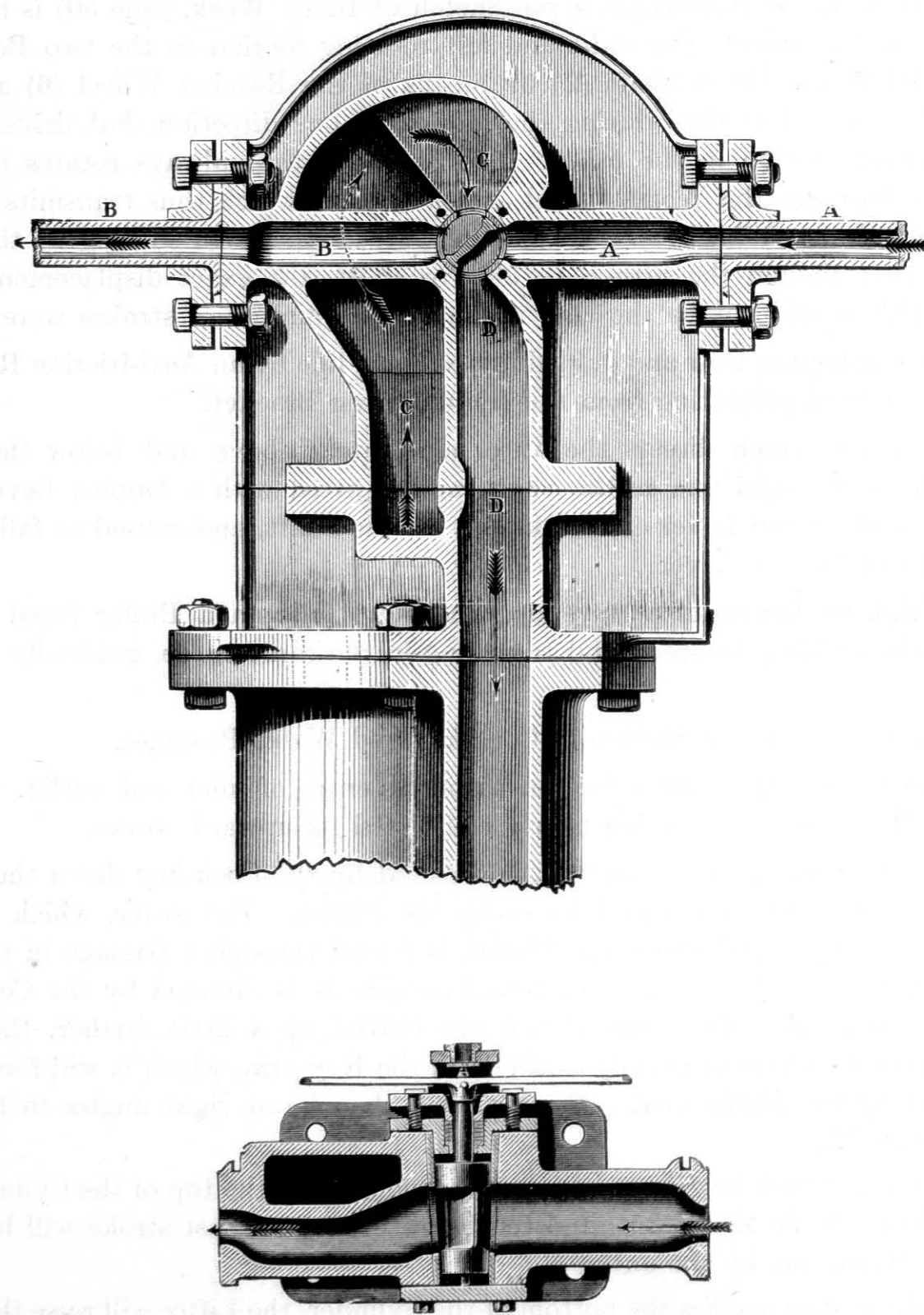
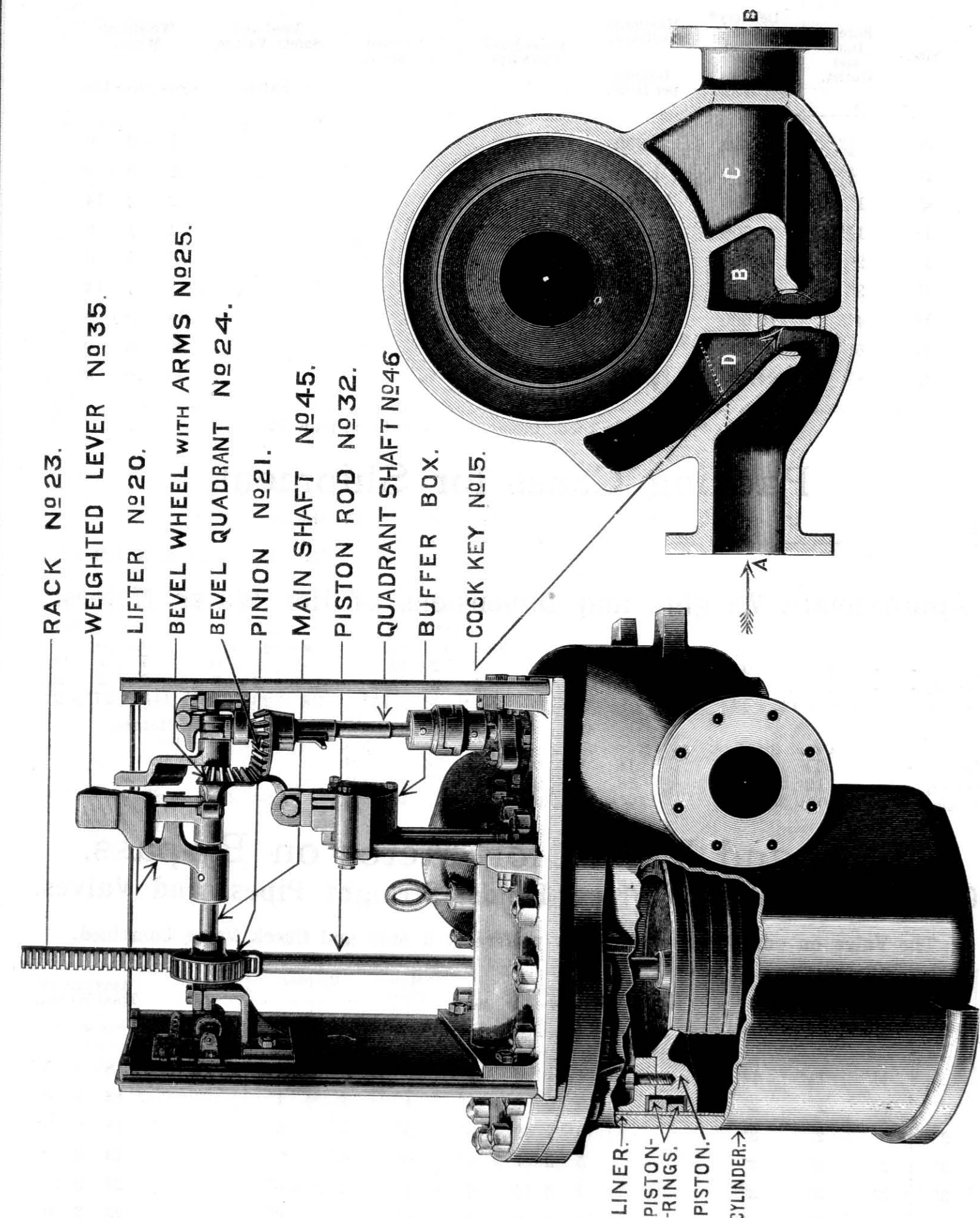
Underneath is a Horizontal Section through centre of inlet and outlet. The Meter is shown in the position of having nearly completed its upward stroke.

The water, entering at the inlet A, is directed by the Cock-key down the passage D to the bottom of the Cylinder and forces up the Piston. The water, which on the previous down-stroke entered above the Piston, is forced through a passage in the Cylinder Cover connecting with C, and passing round outside B, is directed by the Cock-key into the outlet passage B. When the Piston has moved up a little farther, the Weighted Lever will pass its centre of gravity and fall on the Key-arm, which it will force down till it is stopped by the Buffer-box. The Key will then be at right angles to the position shown on page 52.

The water will then be directed from A through C into the top of the Cylinder, forcing the piston down, while the water admitted below during the last stroke will be forced up the passage D and out by the outlet B.

Before the Piston reaches the bottom of the Cylinder, the Lifter will raise the Weighted Lever from the left side of the Buffer-box to a vertical position, from which it will fall on the right-hand Key-arm, and thus bring back the Cock-key to its former position, ready to begin another upward stroke.

Section of Cock of Water Meter.

Section of New Pattern Hot Water Meter.
3" and upwards.

For New Pattern 3" Meters and upwards, the description given on page 51 holds good, except that the Cock-key is vertical, and is connected by Couplings to the Vertical Quadrant Shaft. This Shaft is actuated by the Weighted Lever falling alternately on the projecting Arms of the Bevel Wheel with Arms, which gears with the Bevel Quadrant keyed to the Vertical Quadrant Shaft. The Weighted Lever and the Bevel Wheel with Arms are both loose on the Main Shaft.

Prices.

Size.	Bore of Inlet and Outlet.	Delivery* Recommended.	Maximum Delivery.	Brass-lined Cylinders.	Unlined Cylinders.	Feed and Safety Valves.	Weight of Meter.
		Gallons per Hour.	Gallons per Hour.			Extra.	
A	1/2"	400	850				1 2 0
B	3/4"	600	1,500				2 0 0
C	1"	1,000	2,000				2 2 14
D	1 1/2"	1,700	3,000				4 1 0
E	2"	3,600	5,000				7 1 0
F	3"	5,000	8,000				11 1 14
H	4"	10,000	15,000				18 0 0
K	6"	16,000	25,000				26 2 0
L	8"	24,000	35,000				45 0 0

* For "Deliveries recommended" see note on page 55.

Packing Cases for Shipment.

1/2" 3/4" 1" 1 1/2" 2" 3" 4" 6" 8" Meters.

Each Case containing 1 Meter.

Approximate Weights and Dimensions of Hot Water Meters.

	1/2"	3/4"	1"	1 1/2"	2"	3"	4"	6"	8"	Meters.
Nett, -	Cwts. Qrs. Lbs.	Cwts. Qrs. Lbs.	Cwts. Qrs. Lbs.	Cwts. Qrs. Lbs.	Cwts. Qrs. Lbs.	Cwts. Qrs. Lbs.	Cwts. Qrs. Lbs.	Cwts. Qrs. Lbs.	Cwts. Qrs. Lbs.	
Gross, -	1 2 0	2 0 0	2 2 14	4 1 0	7 1 0	7 2 2	11 1 14	18 0 0	26 2 0	
Dimensions,	25 1/2" x 14" x 14 3/4"	27 1/2" x 14" x 14 3/4"	30 1/2" x 15 1/4" x 15"	38" x 23" x 18"	44 1/2" x 27" x 22"					
Nett, -	3"	4"	6"	8"	Meters.					
Gross, -	11 1 14	18 0 0	26 2 0	45 0 0						
Dimensions,	50" x 30" x 29"	59" x 37" x 36"	66" x 40" x 37 1/2"	84" x 48" x 48"						

Pipes and Valves for Meter on By-pass.
Consisting of Branch Pipes, Bends, Straight Pipes, and Valves.

The Valve on outlet side of Meter is preferably a Stop and Check Valve Combined.

Meter.	Main Pipes and Valve.	By-pass.		Price.	Approximate Total Weight.	Meter.	Main Pipes and Valves.	By-pass.		Price.	Approximate Total Weight.
		Pipes.	Valves.					Valves.	Pipes.		
2"	1 1/2"	1 1/2"	1 1/2"		4 1 0	4"	6"	5"	4"		18 3 5
2"	2"	2"	2"		5 0 0	6"	4"	4"	4"		13 0 0
2"	3"	2"	2"		6 2 19	6"	5"	5"	5"		18 0 0
3"	2"	2"	2"		5 2 7	6"	6"	6"	6"		23 3 0
3"	3"	3"	3"		7 3 15	6"	8"	7"	6"		29 3 16
3"	4"	3"	3"		10 0 0	8"	6"	6"	6"		23 2 0
4"	3"	3"	3"		8 3 12	8"	8"	8"	8"		33 3 0
4"	4"	4"	4"		12 0 6	8"	9"	8"	8"		36 0 0

Notes.

If the water enters the suction of the Feed Pumps under pressure, the Meter may be fixed on the suction side.

Should the level of the suction water be below the pumps, it is generally advisable to fix the Meter on the delivery side, especially if the suction pipes are long and have bends, and if the water is warm.

A Check Valve may, with advantage, be placed between the Meter and the Pump, and as close as convenient to the Meter, or if Valves are fixed next the Meter, one of these should be of the stop and check type (with the valve loose on the spindle) which serves the same purpose.

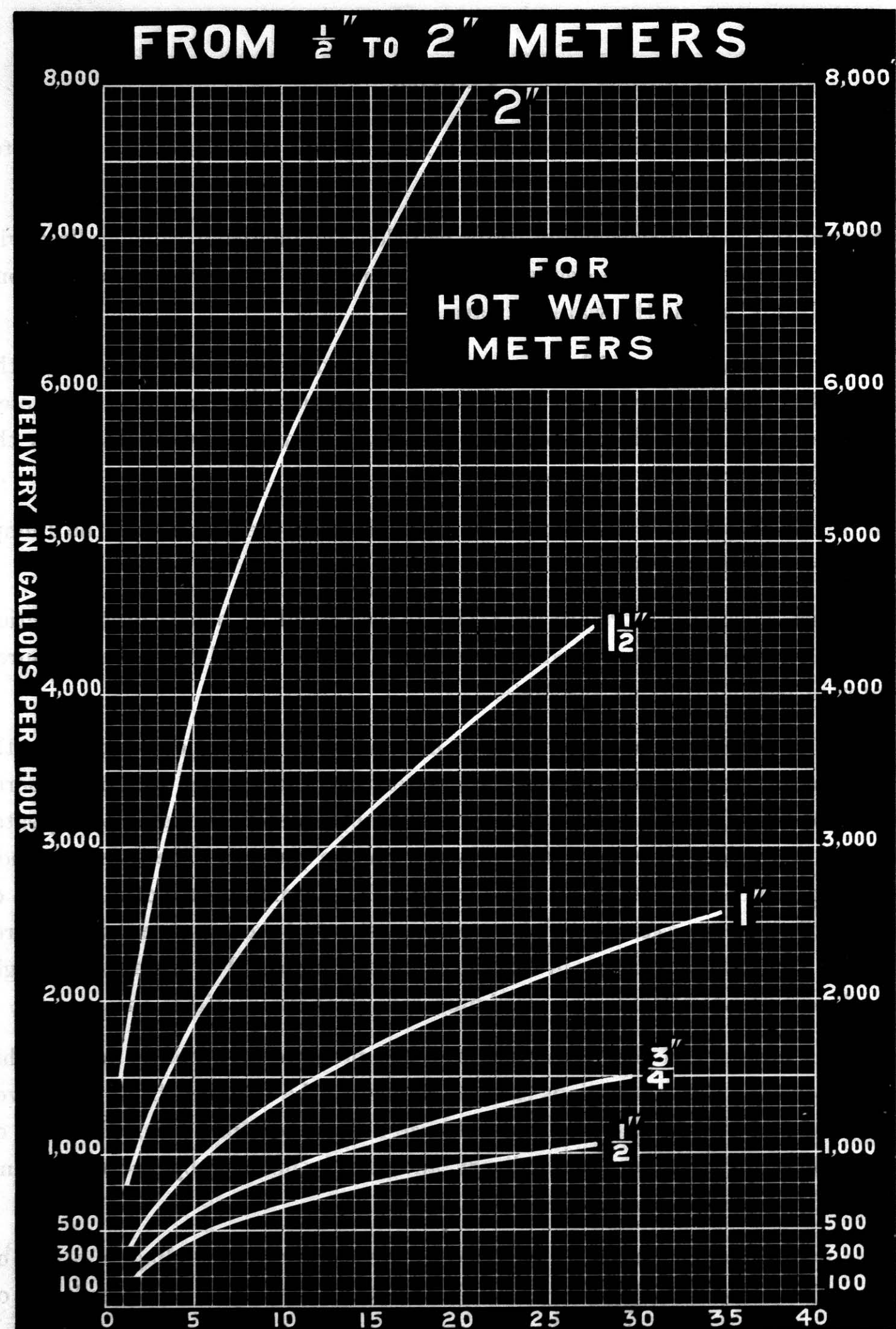
A Relief or Safety Valve should be fixed between the Meter and the Pump, if one does not already exist.

In cases where Injectors are used, the Meter should be placed on the suction side, as otherwise the steam used to drive the Injector would again be measured as water in passing through the Meter.

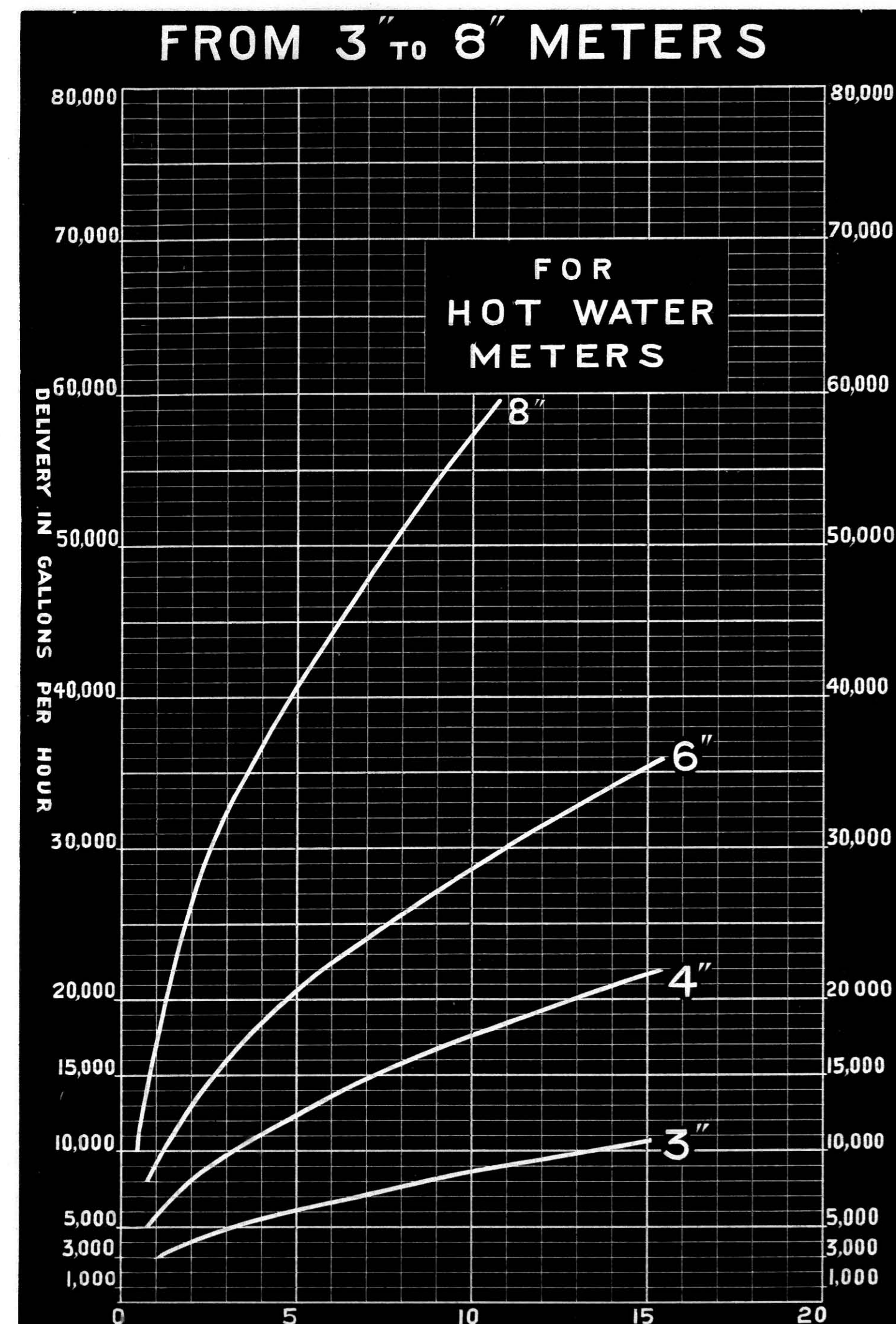
Boiler Feed Pumps are often run at intervals at a high speed, consequently the maximum rate of feed is very much greater than the average rate of evaporation per hour, and of course the Meter must be capable of delivering this greater rate without causing excessive back pressure on the pumps. The safest method in selecting the correct size of Meter is to take the **maximum rate of discharge of which the Pumps are capable.** This maximum should take into account the irregularity in the rate of delivery in certain types of Pumps. For instance in Single Acting Crank Driven Pumps the maximum rate is about 3 1/2 times the average.

Having ascertained the maximum rate, the pressure absorbed in forcing this quantity per hour through various sizes of Meters can be obtained from the Curves on pages 56 and 57, and the most suitable size determined from this. The loss of pressure varies as the square of the delivery, and must be made up by a corresponding extra back pressure on the Pumps.

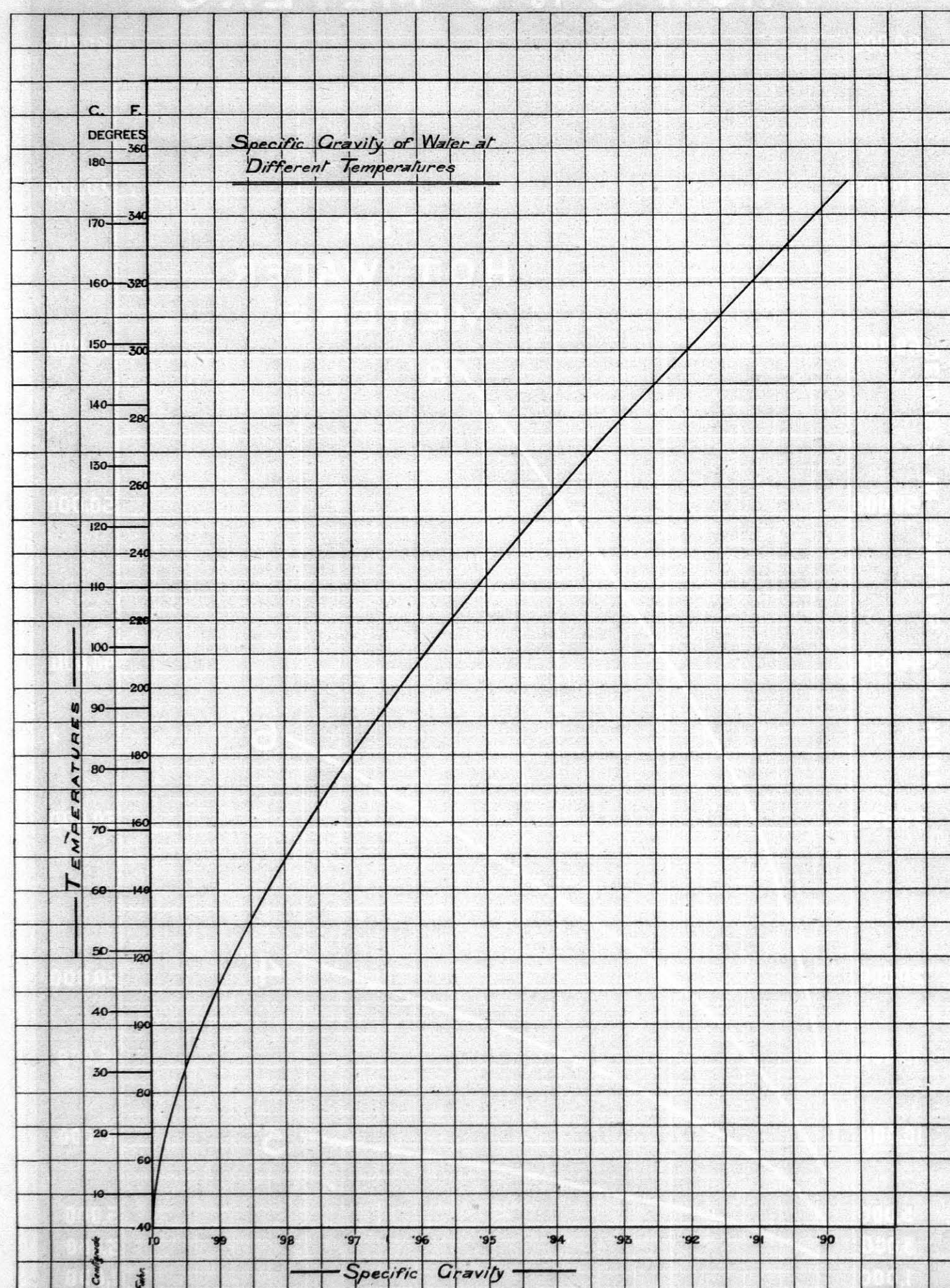
The quantities recommended on page 54 are those corresponding to a loss of pressure of about 5 lbs. per square inch, but deliveries at higher or lower losses of pressure may be obtained from the Curves.



Loss of Pressure in Lbs. per Sq. In.



Loss of Pressure in Lbs. per Sq. In.



The Kennedy Meter.

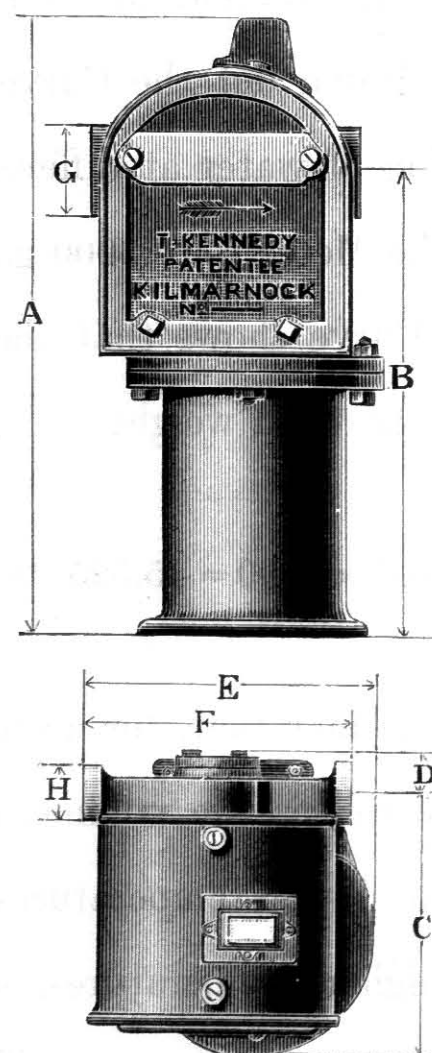
Measures accurately at all temperatures the **volume** of the water which passes through the Measuring Cylinder; but as the density of the water varies with the temperature, it is useful in comparing results of boiler trials to ascertain the corresponding volume at standard temperature or the weight of water. We have drawn out the Curve on page 58, which shows at once the weight of a gallon of water at different temperatures. Suppose the consumpt indicated by the Meter were 5000 gallons, and the temperature of the feed 320° Fahr., the Curve shows that the weight per gallon at this temperature is 9.105 lbs. or the total weight

$$9.105 \times 5000 = 45,525 \text{ lbs.}$$

This calls attention to the fact that, for accurate results, it is necessary to know the temperature as well as the volume, if the former varies much. The Curve also shows that at lower temperatures the percentage expansion per degree is less than at higher temperatures, so that the same variation has less effect at low than high temperatures. Therefore, it is better when possible to fix the Meter on the inlet of the Economiser where the temperature is likely to be lower and more uniform.

Dimensions of New Pattern Hot Water Meters.

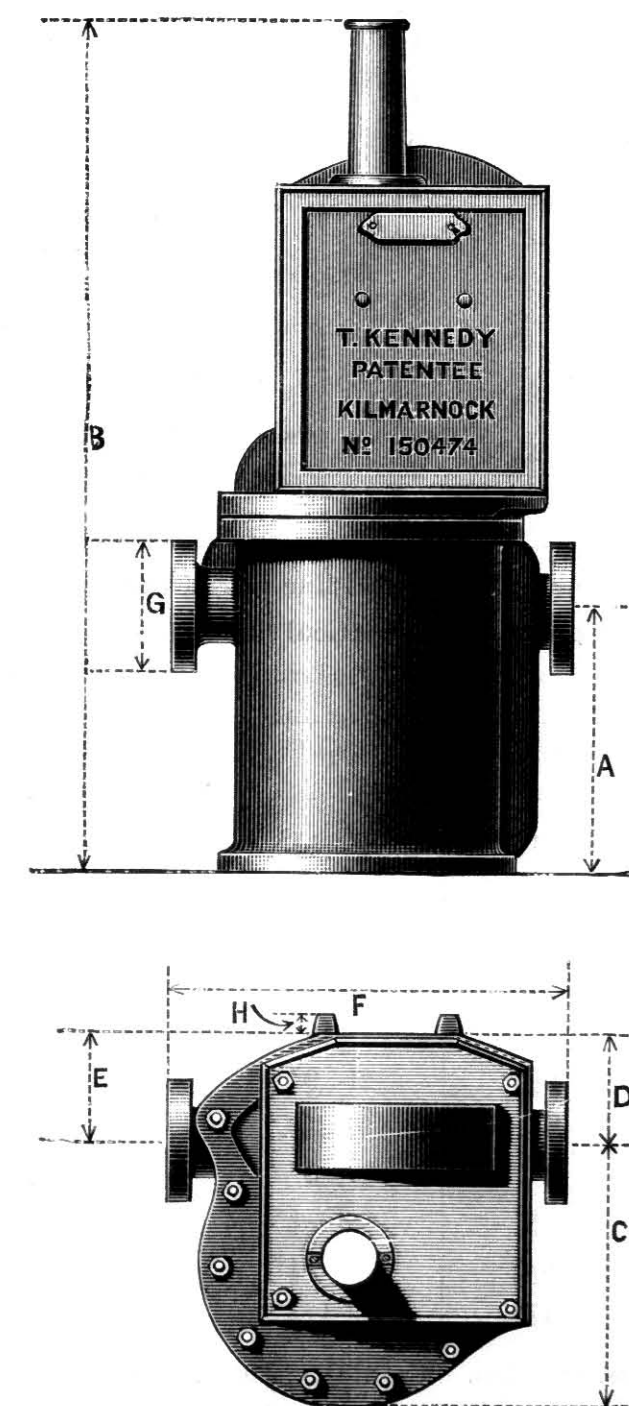
From $\frac{1}{2}$ " to 2".



For Dimensions see page 62.

Dimensions of New Pattern Hot Water Meters.

3" and upwards.



For Dimensions see page 62.

Dimensions of New Pattern Hot Water Meters.

	½"	¾"	1"	1½"	2"
A	1' 9"	2' 3½"	2' 7⅜"	3' 4¼"	3' 11⅛"
B	1' 3¾"	1' 8⅝"	1' 11"	2' 5⅝"	2' 10⅜"
C	10⅜"	1' 0½"	1' 0½"	1' 2¼"	1' 5⅛"
D	1¾"	1⅞"	2½"	3"	4⅛"
E	11⅜"	1' 1½"	1' 2⅝"	1' 4⅜"	1' 9⅛"
F	10"	11½"	1' 0⅝"	1' 7¼"	1' 10⅜"
G	4⅝"	5¼"	5¼"	—	—
H	2½"	2¾"	2¾"	5½" dia.	6½" dia.
Bolts	2—¾"	2—½"	2—½"	4—⅝"	4—⅝"
C. to C. of Holes.	2⅞"	3½"	3½"	4⅛"	5"
Dia. of Cyl.	5⅞"	7⅜"	7⅜"	8⅞"	11⅞"
Weight	Cwts. Qrs. 1 2	Cwts. 2	Cwts. Qrs. Lbs. 2 2 14	Cwts. Qrs. 4 1	Cwts. Qrs. 7 1

In ½", ¾", and 1" Meters the vertical line passes through the bolt holes.

The 1½" and 2" Meters have the vertical line between the bolt holes.

	3"	4"	6"	8"
A	1' 4⅝"	1' 5¼"	1' 3½"	1' 7½"
B	4' 3¼"	5' 2½"	5' 10¼"	7' 0¼"
C	1' 8⅝"	2' 1"	2' 3"	2' 7½"
D	7"	8"	11½"	1' 1"
E	7"	8"	11½"	1' 1"
F	2' 0¾"	2' 9"	2' 11½"	3' 9½"
G	8" dia.	9" dia.	12" dia.	14½" dia.
*H	2"	3"	—	—
Bolts.	8—⅝"	8—⅝"	12—¾"	12—¾"
C. to C. of Holes	6½"	7½"	10¼"	12¾"
Dia. of Cyl.	14⅞"	17⅞"	20⅞"	24⅞"
Weight	Cwts. Qrs. Lbs. 11 1 14	Cwts. Qrs. Lbs. 18 0 0	Cwts. Qrs. Lbs. 26 2 0	Cwts. Qrs. Lbs. 45 0 0

* Projection of Horns at back of Cock to prevent rolling during transit.

In the 3", 4", 6", and 8" Meters the vertical line passes between the bolt holes.

The flanges of Meters, 1½" and upwards, are in accordance with British Standard Table II., which now supersedes our former standard.

To guide us in accurately determining the correct Size of Meter required, please reply to as many of the undernoted queries as possible:—

- (1) What is the diameter of the pipe to which it is proposed to attach the meter?
- (2) Is the water pumped through the meter, or is the supply by gravitation?
- (3) If pumped, is it more convenient to place the meter on the suction or delivery side of the pumps?
- (4) What depth is the level of the suction water below the pumps?
- (5) If above the level of the pumps, what height?
- (6) Or, at what pressure does the water enter the suction of the pumps?
- (7) What is the boiler pressure?
- (8) Will the temperature of the water at the meter ever exceed 100° Fahr.?
- (9) What is approximately the maximum rate of delivery at any time?
- (10) What is the average rate of delivery?
- (11) What type of pump is it proposed to employ (crank-driven or direct-acting)?
- (12) How many plungers or pistons are there?
- (13) Is the pump double or single acting?
- (14) What is the diameter of the plunger or piston, the length of stroke, and the maximum number of double strokes per minute?

Please give any other particulars likely to assist us in determining the maximum rate at which the meter will ever be called on to deliver.

2" New Pattern Hot Water Meters and under have the Inlet on the Observer's left-hand side looking towards the front of the Meter, and 3" and upwards on the right-hand side, unless otherwise specified.

After filling in as many Replies as possible,
please Detach this Sheet and send it
along with Enquiry or Order.

- (1) What is the diameter of the pipe to which it is proposed to attach the meter ?
- (2) Is the water pumped through the meter, or is the supply by gravitation ?
- (3) If pumped, is it more convenient to place the meter on the suction or delivery side of the pumps ?
- (4) What depth is the level of the suction water below the pumps ?
- (5) If above the level of the pumps what height ?
- (6) Or, at what pressure does the water enter the suction of the pumps ?
- (7) What is the boiler pressure ?
- (8) Will the temperature of the water at the meter ever exceed 100° Fahr. ?
- (9) What is approximately the maximum rate of delivery at any time ?
- (10) What is the average rate of delivery ?
- (11) What type of pump is it proposed to employ (crank-driven or direct-acting) ?
- (12) How many plungers or pistons are there ?
- (13) Is the pump double or single-acting ?
- (14) What is the diameter of the plunger or piston, the length of stroke, and the maximum number of double strokes per minute ?

List of a few of the Valve Towers made

SECTION A.

RESERVOIR STANDPOSTS, SLUICES, AND IRONWORK CONNECTED WITH RESERVOIRS AND FILTERS.

The designs are subject to alteration and amendment, and, while corrections in Catalogue are made from time to time, Glenfield & Kennedy Ltd. do not guarantee that goods supplied will be exactly as shewn.

List of a few of the Valve Towers made.

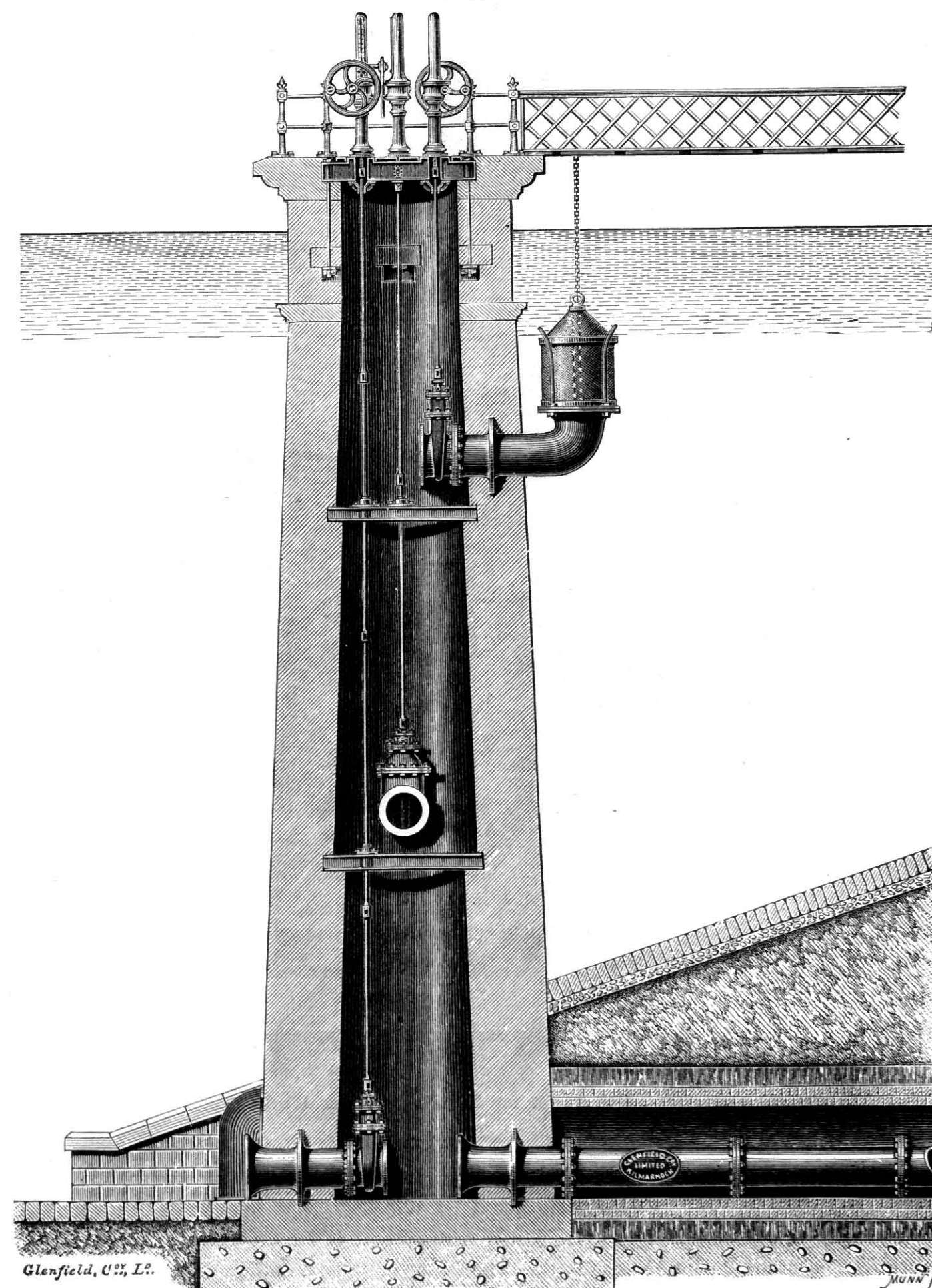
MADE FOR	Fig. Number.	VALVE TOWER.		SLUICES.		Outlet Dia.
		Dia.	Height.	Number.	Dia.	
ROSCOMMON W. W.,	A 60	1' 0"	11' 6"	3	6"	9"
WYNBERG W. W., South Africa, ..	„	1' 0"	42' 0"	2	6"	9"
TOBERMORY W. W.,	„	1' 6"	19' 0"	3	9"	9"
LOCKERBIE W. W.,	„	1' 6"	32' 4"	3	6"	7"
PITTENWEEM AND ANSTRUTHER W. W., ..	„	2' 0"	18' 0"	3	8"	8"
MELROSE W. W.,	„	2' 0"	26' 0"	3	12"	12"
DENNY AND DUNIPACE W. W., ..	„	2' 6"	21' 3"	3	9"	9"
DUNDEE W. W., South Africa, ..	A 68	2' 6"	32' 6"	4	12"	9"
EAST LONDON W. W., South Africa, ..	A 60	3' 0"	28' 6"	3	8"	5"
KILSYTH W. W.,	„	3' 0"	31' 0"	4	7"	9"
FERMOY W. W.,	„	3' 0"	45' 0"	{ 1 2 }	{ 12" 9" }	9"
LARNE W. W.,	„	3' 0"	26' 0"	3	6"	6"
PORTRUSH W. W.,	A 59	3' 0"	24' 0"	3	6"	6"
ELIE WATER BOARD,	A 68	3' 2"	48' 9"	4	18"	24"
HELENSBURGH W. W.,	„	3' 6"	24' 0"	3	12"	12"
MOTHERWELL W. W.,	A 60	3' 6"	32' 3"	3	12"	18"
KILMACOLM W. W.,	„	3' 6"	42' 6"	3	12"	12"
VALE OF LEVEN W. W.,	A 59	3' 6"	56' 0"	{ 2 2 }	{ 12" 15" }	24"
DUNTOCHER W. W.,	A 60	4' 0"	32' 0"	2	18"	24"
GRAHAMSTOWN W. W., South Africa, ..	„	4' 0"	42' 0"	4	18"	12"
KILMARNOCK W. W.,	„	4' 0"	43' 6"	{ 2 2 }	{ 20" 12" }	20"
KILMARNOCK W. W.,	A 59	5' 0"	28' 0"	3	18"	18"
AIRDRIE AND COATBRIDGE W. W., ..	A 60	5' 0"	51' 6"	6	15"	30"
Do.	„	5' 6"	82' 2"	2	24"	24"
BANGOUR ASYLUM, EDINBURGH, ..	„	5' 0"	30' 0"	3	18"	18"
MARGAM W. W.,	A 64	5' to 4'	66' 0"	{ 1 2 }	{ 42" 9" }	48"
CAPE TOWN W. W., South Africa, ..	A 63	6' 0"	55' 0"	3	16"	16"
BIRMINGHAM W. W.,	A 60	6' 0"	22' 6"	2	24"	48"
BUXTON W. W.,	A 63	8' 0"	46' 9"	6	18"	51"
BRADFORD W. W.,	A 61	8' to 7' 6"	52' 9"	{ 2 1 }	{ 18" 24" }	30"
SWANSEA W. W.,	A 59	12' 0"	84' 6"	2	18"	24"

Valve Tower for Reservoirs.

With Sluice Valves and Headstocks and Screening Arrangement.

Fittings arranged on Inlets to suit any Design of Tower.

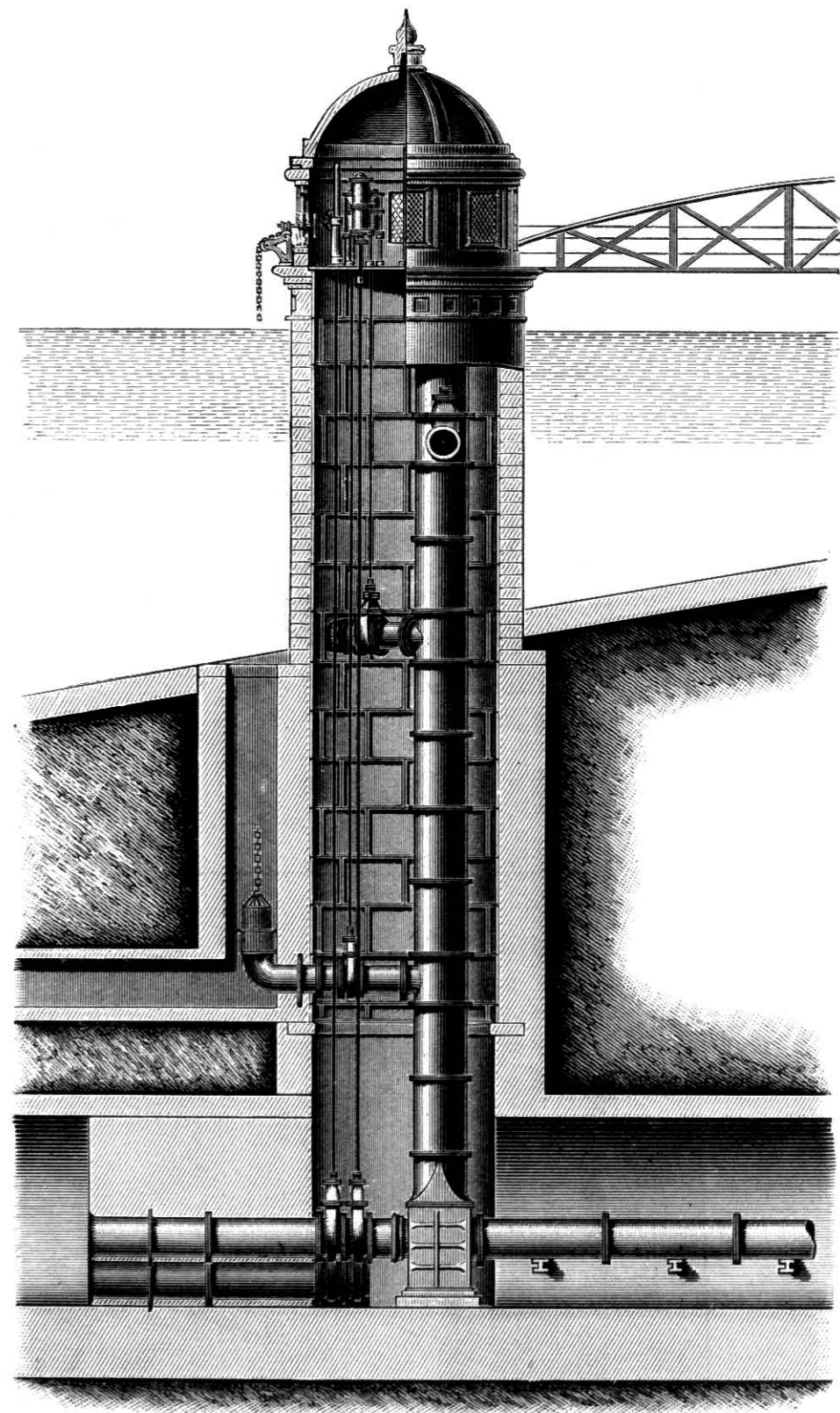
Fig. A 62.



Prices furnished on application.

Valve Tower for Reservoirs.

Fig. A 58.



Above cut represents Valve Tower for Edinburgh Water Works (Talla Supply).

Tower of Masonry or Concrete, lined internally with cast-iron Plates.

Valves worked by Hydraulic Cylinders or Screw Headstocks on top floor.

Strainers raised by Winches.

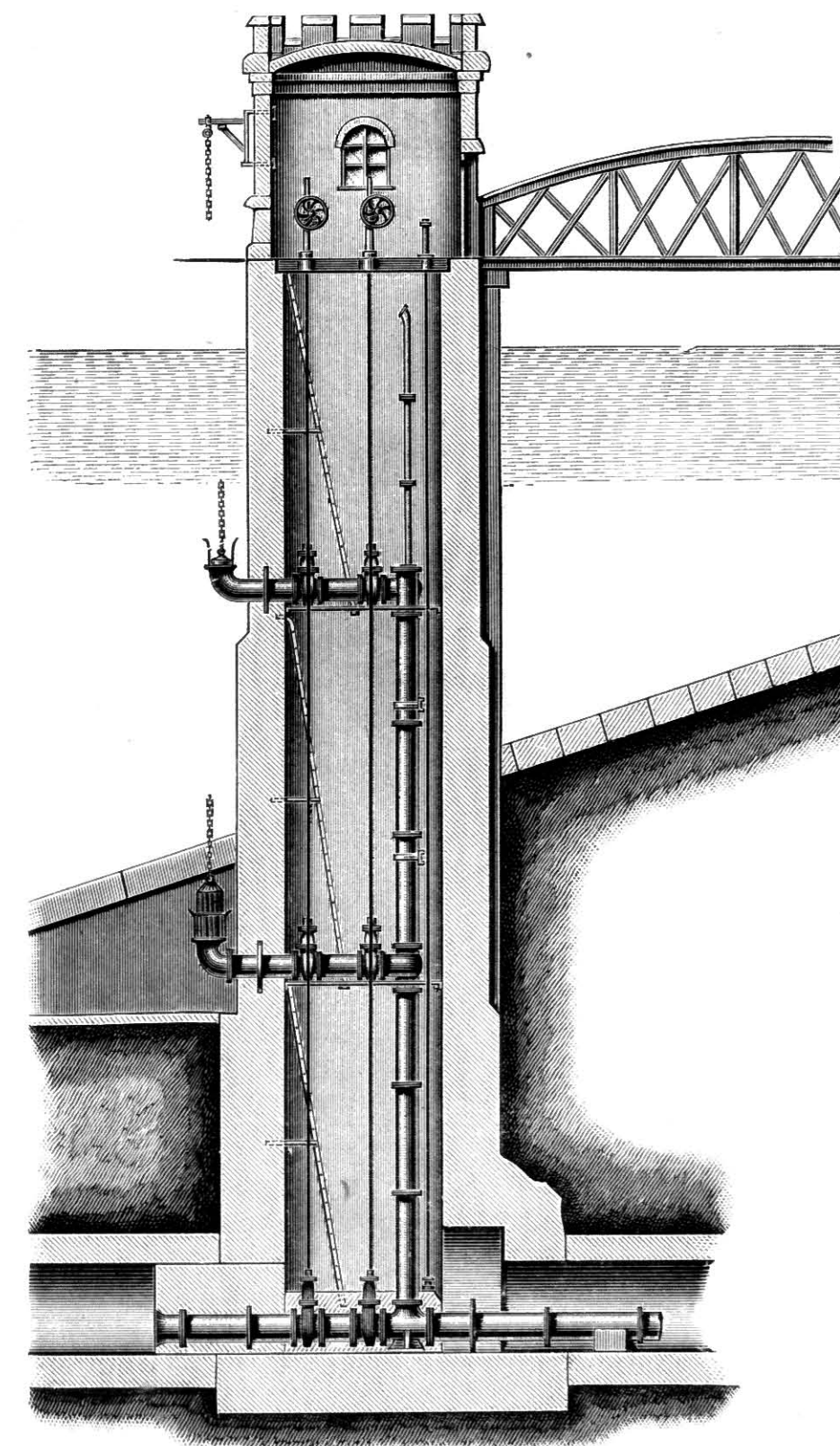
The Pipe connected to inner cast-iron Standpipe is for City Supply.

The other Pipe through Stop in Tunnel is for Compensation Water.

Prices furnished on application.

Valve Tower for Reservoirs.

Fig. A 59.



Made for Swansea Water Works, etc.

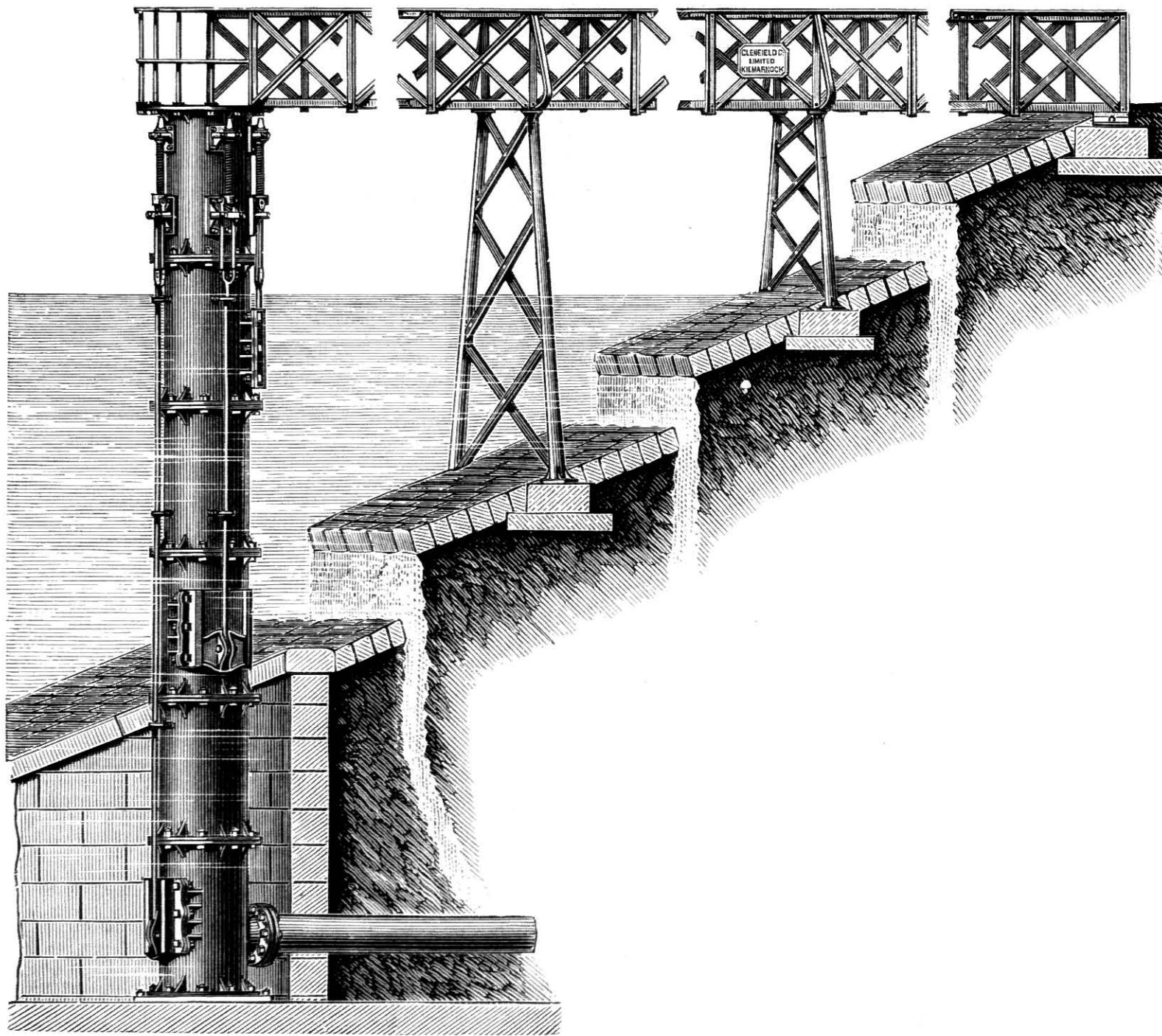
Tower of Concrete. Screw Headstocks are on top floor.

Sluice Valves in duplicate.

Prices furnished on application.

Reservoir Valve Tower and Gangway.

Fig. A 60.

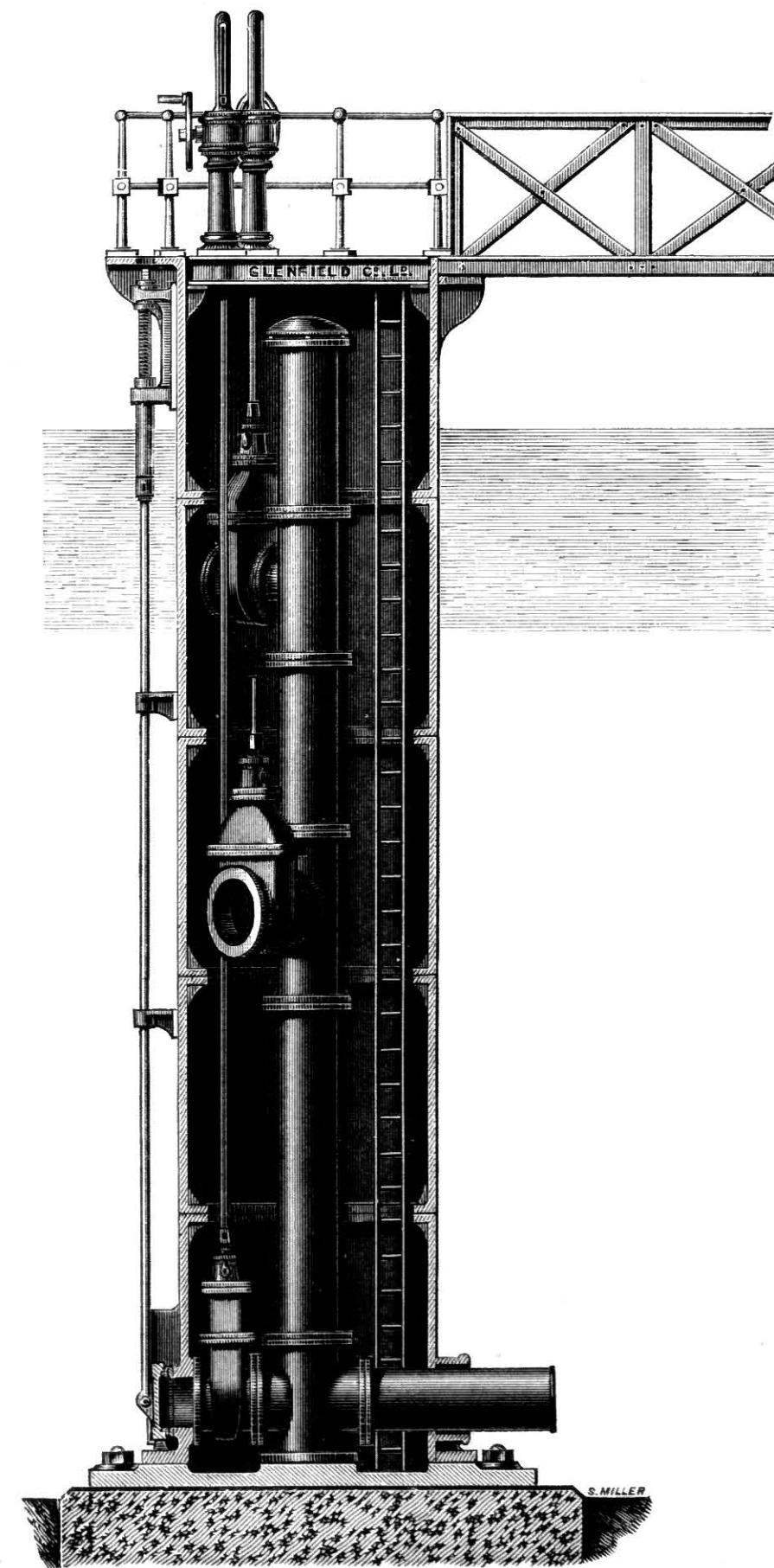


These Valve Towers can be made of any size, from 16" to 5' diameter or even larger, and of any suitable height. The Sluices are made proportionate to the size of Valve Tower and diameter of Outlet Pipe. The Sluices are faced with gun metal. The Screws, preferably of bronze, work in gun-metal nut and step at top. The Gangway can be made any required length, and to any design.

Estimates furnished on application.

Reservoir Valve Tower and Gangway.

Fig. A 61.

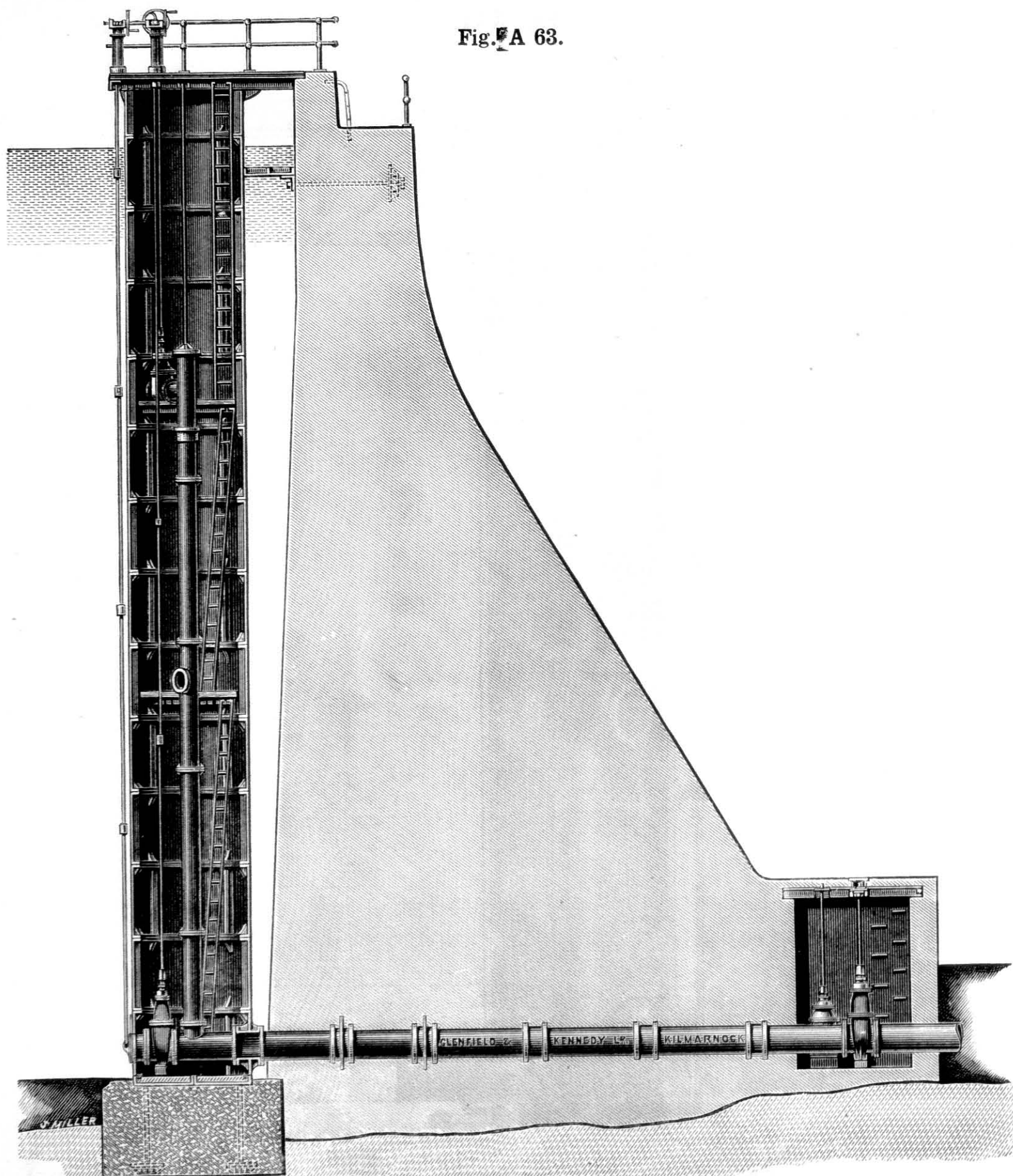


These Valve Towers can be made of any required diameter and of any suitable height, fitted with Single-faced Sluices outside, Double-faced Sluice Valves inside, and having Headstocks at top for working the Sluice Valves. The Sluices and Valves are all faced with gun metal. The Gangway can be made any required length, and to any design.

Estimates furnished on application.

Reservoir Valve Tower.

Fig. A 63.



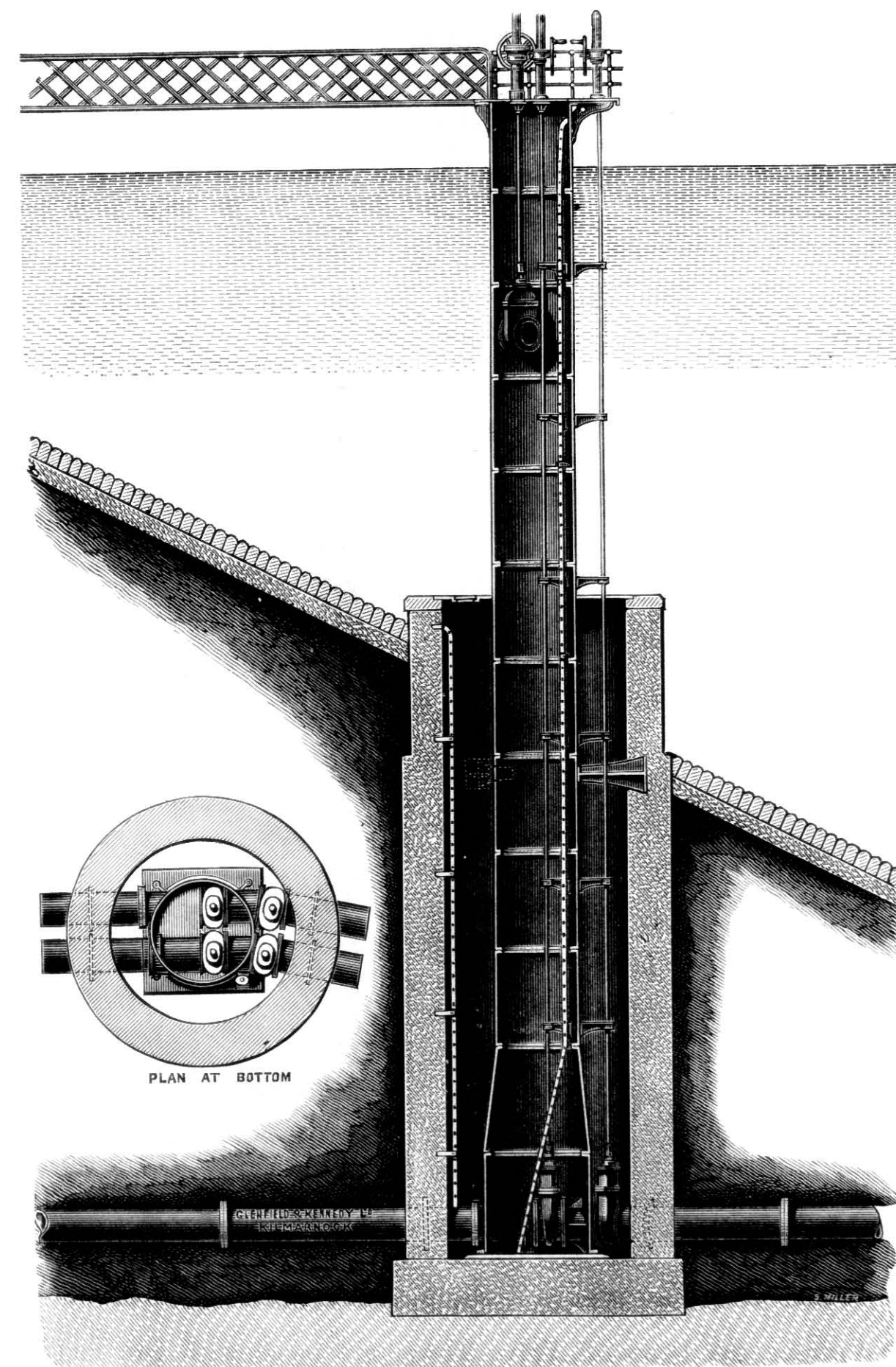
Made for Cape Town, South Africa.

Valve Towers can be made to any required diameter and height. The Single-faced Sluices on outside and Double-faced Sluice Valves on inside have gun-metal faces. Fitted with Headstocks at top for working the Sluices and Valves. The one shown is built up of segmental plates for convenience in handling and transport.

Prices on application.

Reservoir Valve Tower and Gangway.

Fig. A 64.



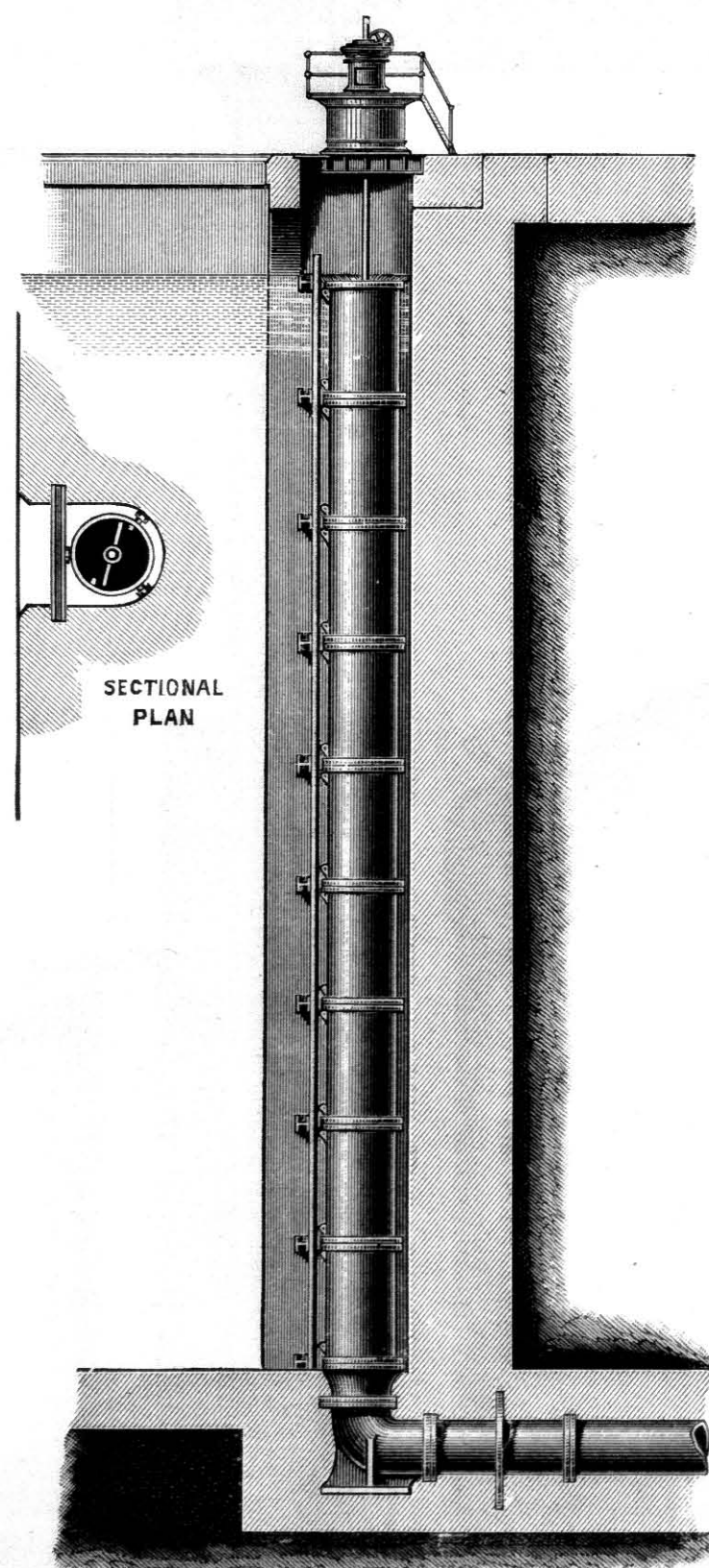
Made for Airdrie and Coatbridge Water Works, etc.

Valve Towers can be supplied of any required diameter and any height. The Sluice Valves and Sluices on openings have gun-metal faces. The Sluice Valves are worked by Headstocks at top and Single-faced Sluices by gearing fixed on outside of Valve Tower. The Gangway can be made any required length and to any design. One of the Draw-off Pipes is an Emptying Pipe, the other is Town Supply.

Prices on application.

Tubular Draw-off Valve Tower for Reservoirs.

Fig. A 69.



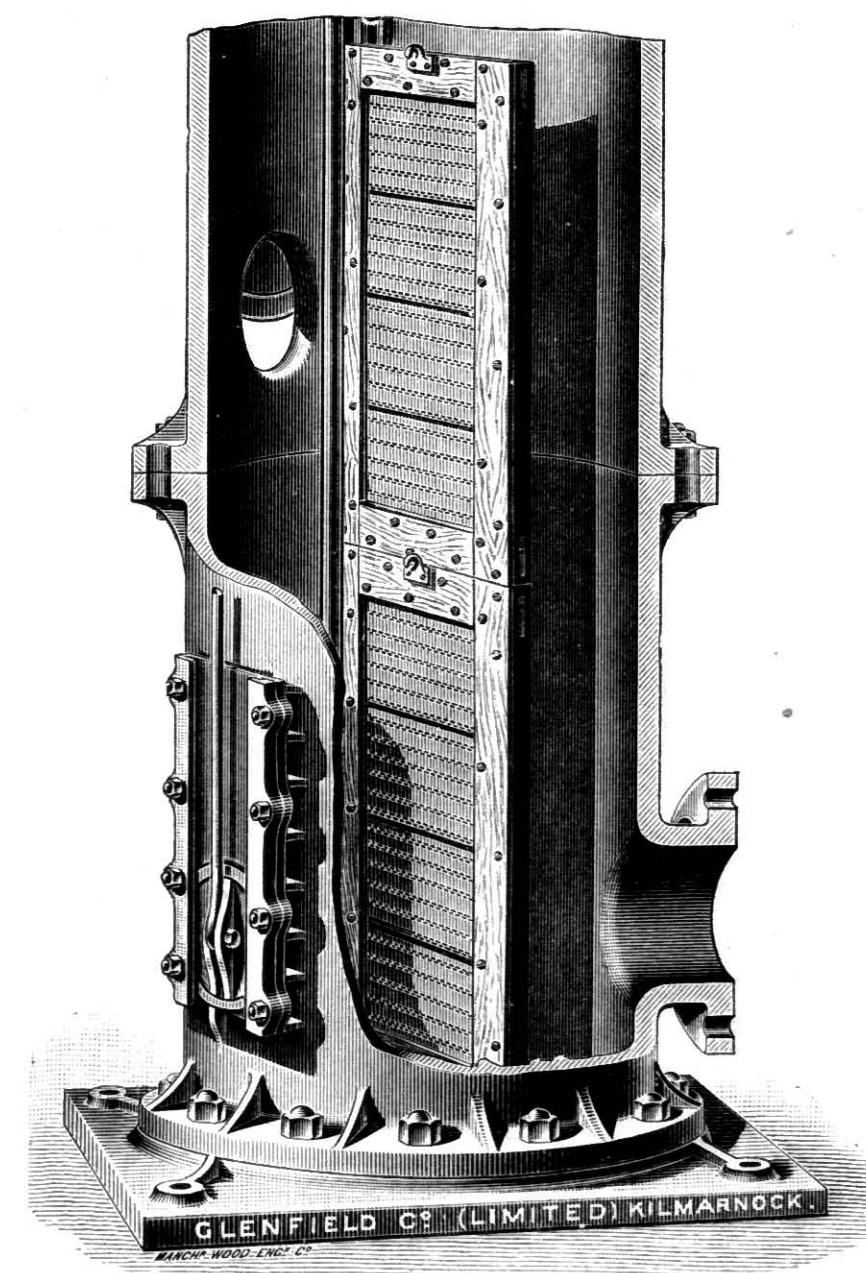
Made for Liverpool (Vyrnwy Supply), Birmingham (Elan Supply), etc.

The Tubes forming the Draw-off Valve Tower are faced with gun metal at ends and guided by vertical rails or guides as shown in plan. The Tubes are raised either by hydraulic or hand power. A Worm Wheel and Indicator at top shows which joint is open, and the level at which water is being drawn off.

Prices on application.

Reservoir Valve Tower, with Screens.

Fig. A 68.

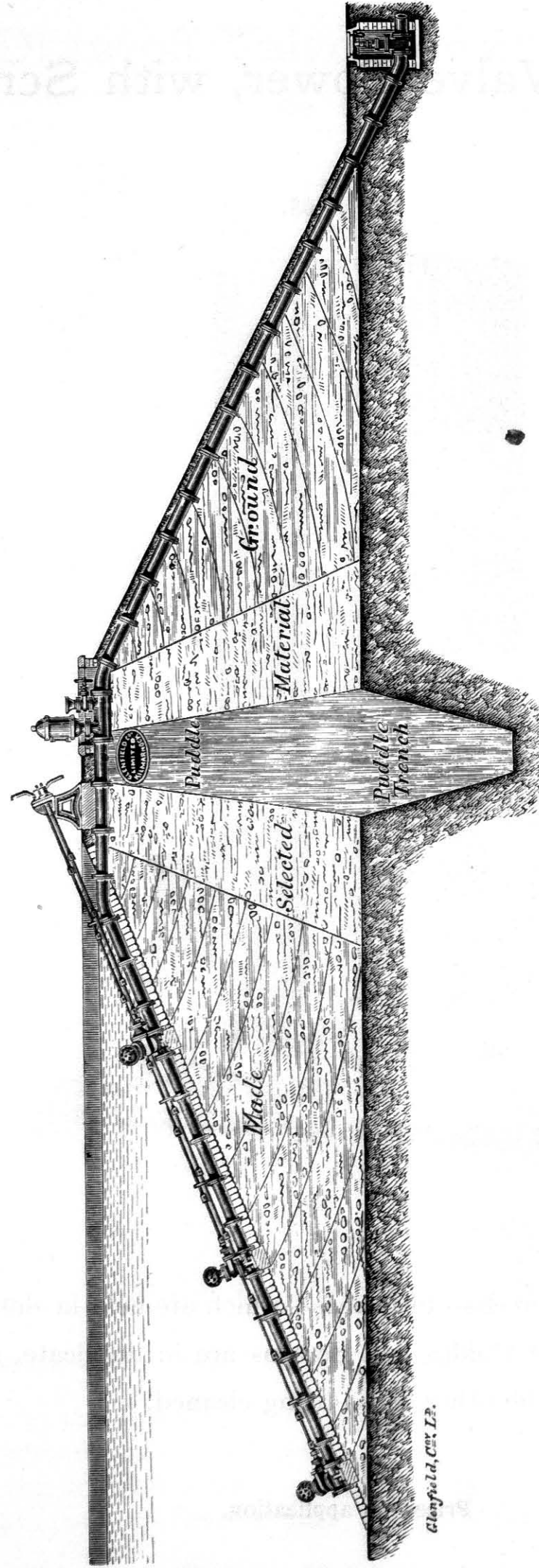


This Valve Tower shows Screens—in frames—which are held in slots or guides cast in the Valve Tower. The Guides and Screens are in duplicate, so that one set of Screens is in use while the other set is being cleaned.

Prices on application.

Syphon Draw-off Pipe for Reservoir.

Fig. A 72.



The water is drawn off at different levels by means of the Sluice Valves, which are worked by

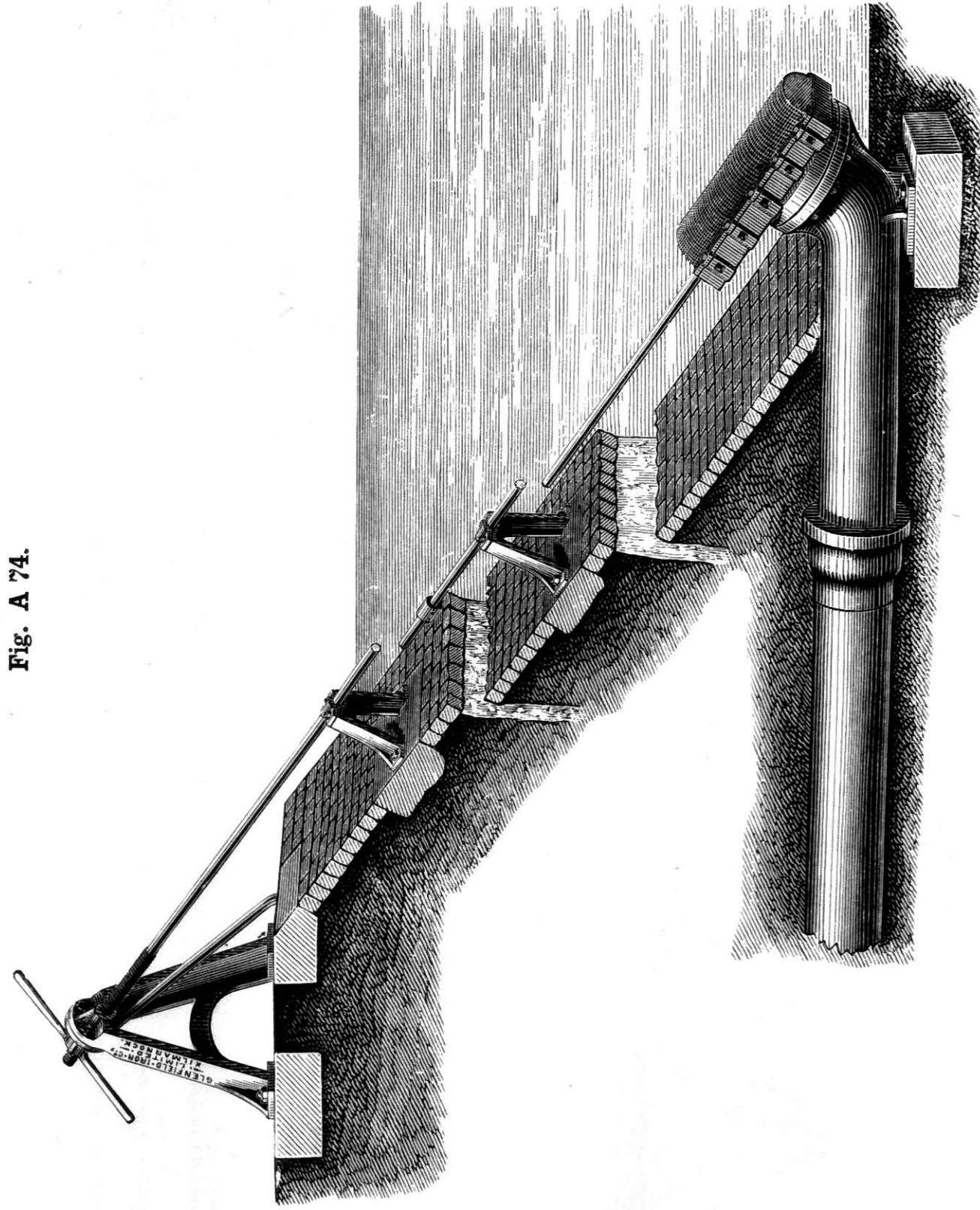
Screw Gearing at top of embankment.

In use at Castlecary, Maryport, Lismore, Whitburn, Newmilns, Bolton, Conconada, Adoni (Madras), etc.

Prices on application.

Reservoir Sluice, with Screen.

Fig. A 74.



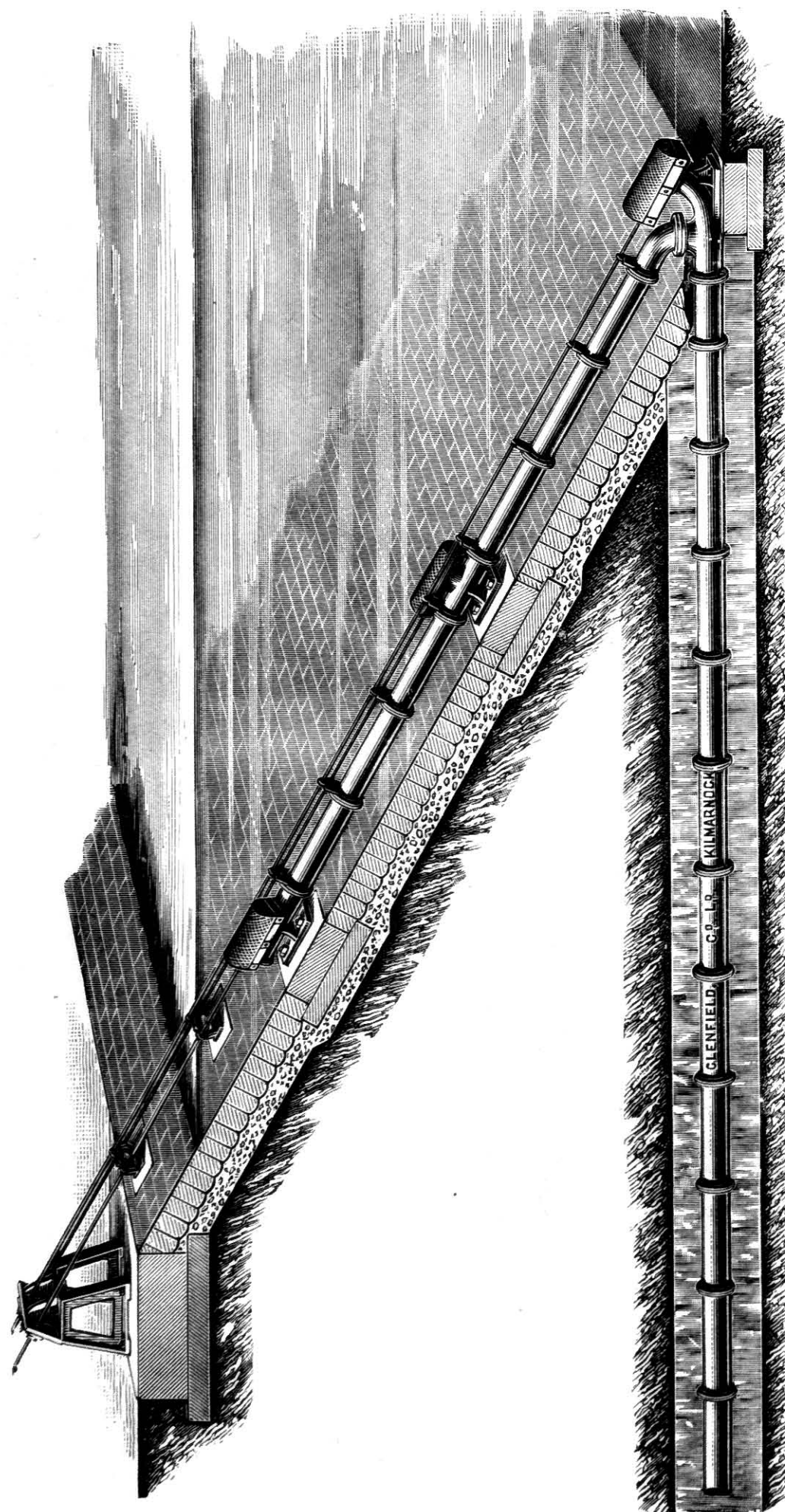
This plan is sometimes adopted where the Reservoir and Outlet Pipe are of small dimensions. The Screen is to prevent foreign matter from getting through the Sluice into the Main Pipes. Or the Screen may be placed on a suitable barge which, by means of rails laid down the embankment, can be withdrawn and cleaned when necessary. This has been done in some instances.

Prices on application.

Reservoir Sluices, with Screens,

To Draw off Water at various Levels.

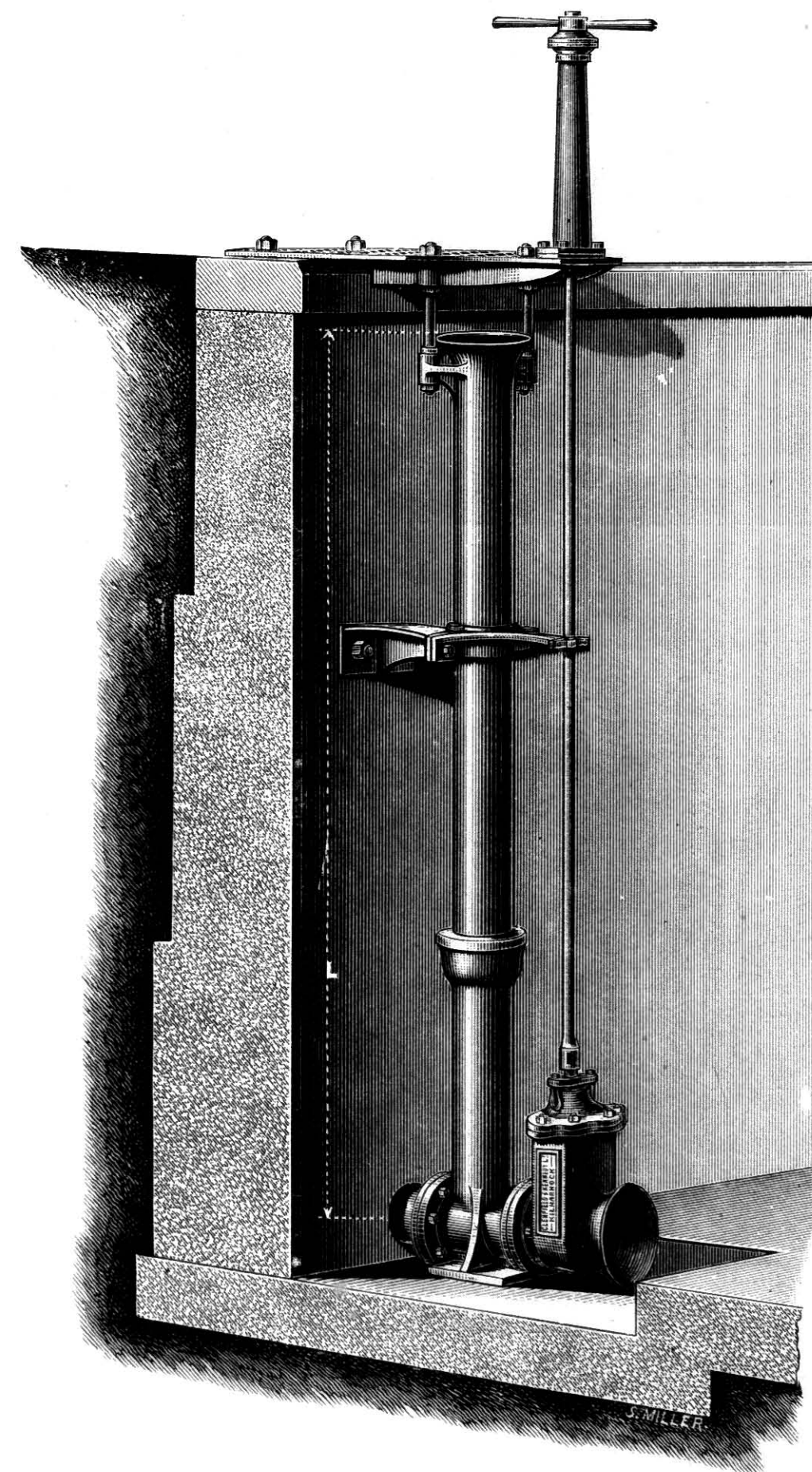
Fig. A 75.



Prices on application.

Reservoir Emptying Pipe and Overflow.

Fig. A 80.



PRICES.

Emptying Pipe, and Valve with Pillar and Bracket at top. Valve has Bell-mouthed Inlet, gun-metal faces, and wrought-iron Lengthening Spindle.

Dia.	Length of Pipe L.	Price.
4"	9'	
4"	15'	
6"	9'	
6"	15'	
8"	9'	
8"	15'	
10"	9'	
10"	15'	
12"	9'	
12"	15'	

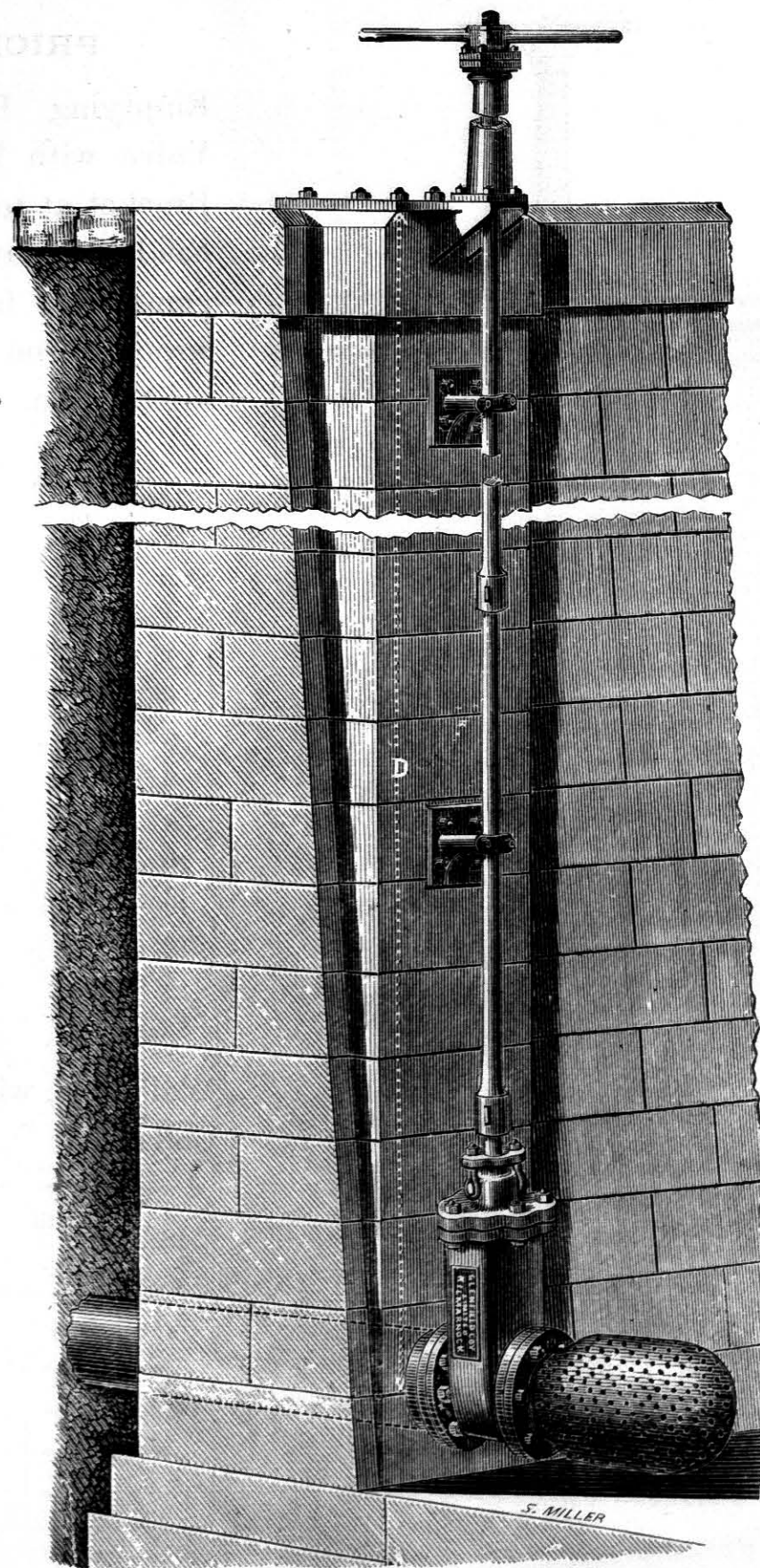
Wall Pipe, with Puddle Collar.

Dia.	Length of Pipe.	Price.
4"	3' 0"	
6"	3' 3"	
8"	3' 6"	
10"	3' 6"	
12"	3' 9"	

The above shows an Emptying Pipe and Overflow combined, with Bell-mouthed Inlet on Valve.

Reservoir Outlet and Valve.

Fig. A 82.



PRICES.

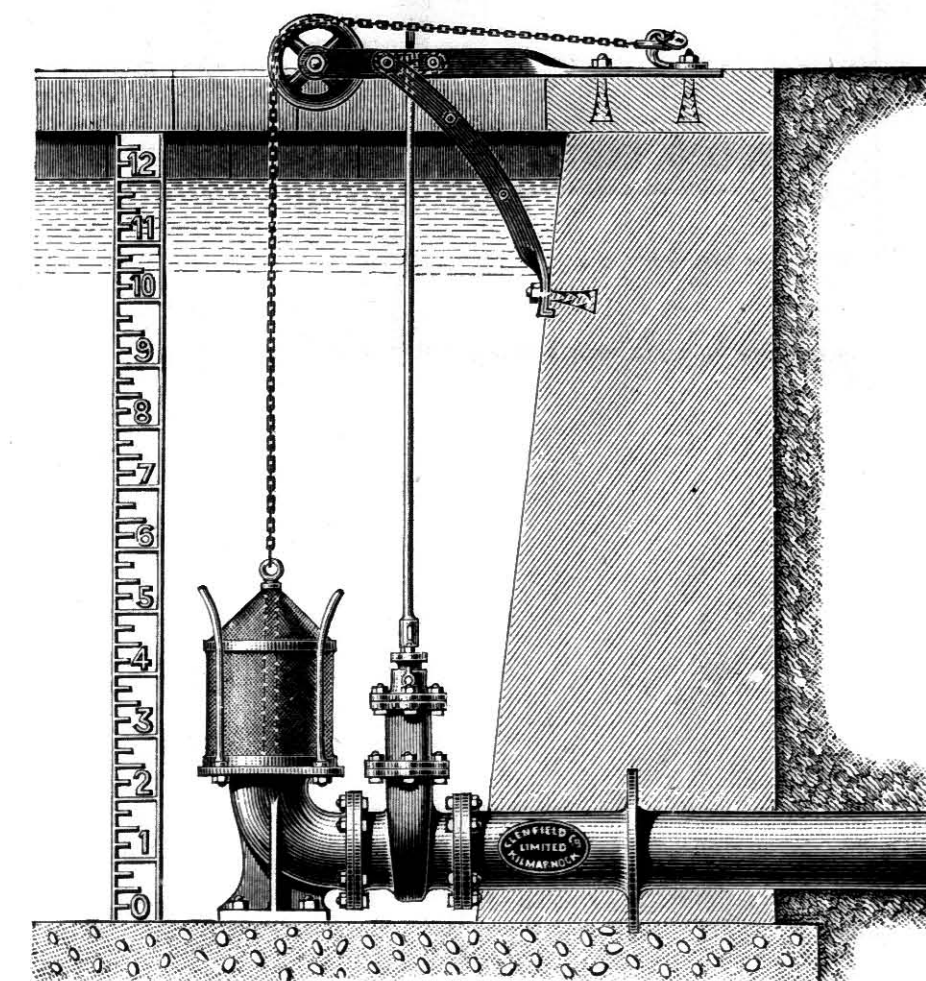
Reservoir Outlet and Valve, with cast-iron Rose, Pillar, and Bracket. Valve has gun-metal faces and wrought-iron Lengthening Spindle.

Dia.	Depth D.	Price.
4"	12'	
6"	12'	
8"	12'	
10"	12'	
12"	12'	

The above shows cast-iron Perforated Pipe on Inlet of Valve to prevent sticks, leaves, etc., getting into the Pipe. The Valve has gun-metal Sliding Spindle, worked by Pillar and Screw at top of wall.

Reservoir Draw-off Valve, with Screen and Indicator Plate.

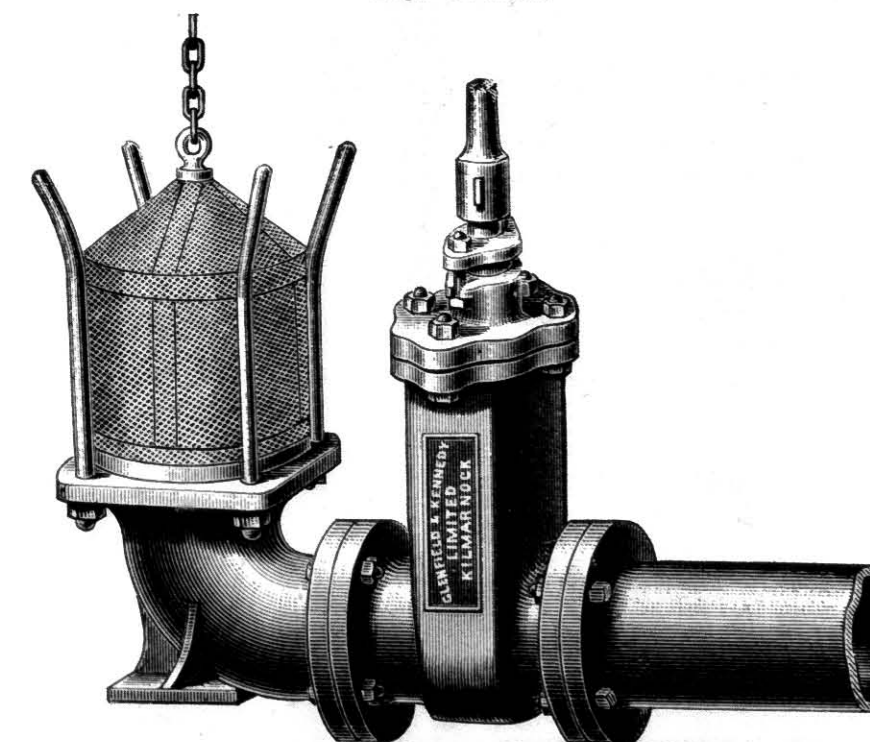
Fig. A 84.



Made to suit any depth of Reservoir.
Prices on application.

Sluice Valve for Draw-off in Small Reservoirs.

Fig. A 202.



Furnished with Bend and Movable Screen on Inlet.
The Valve Rod and Screen are worked by suitable gearing at top of bank.
Prices on application.

Valve Arrangement for excluding Flood Water at Intake.

Fig A 86.

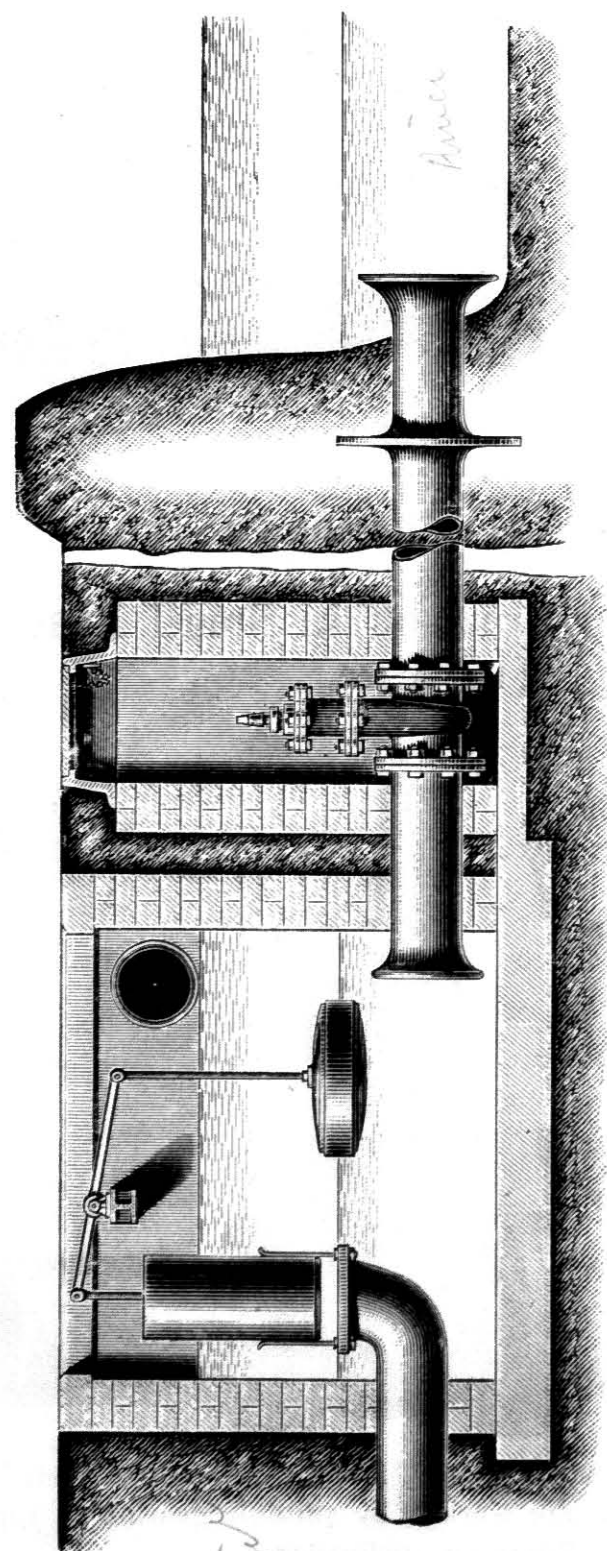
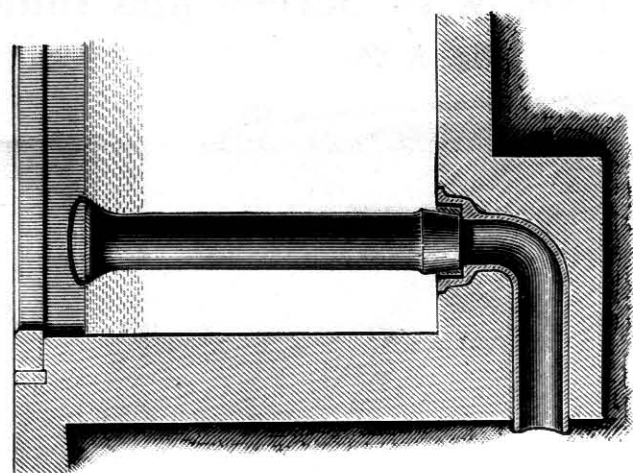


Fig. A 87.



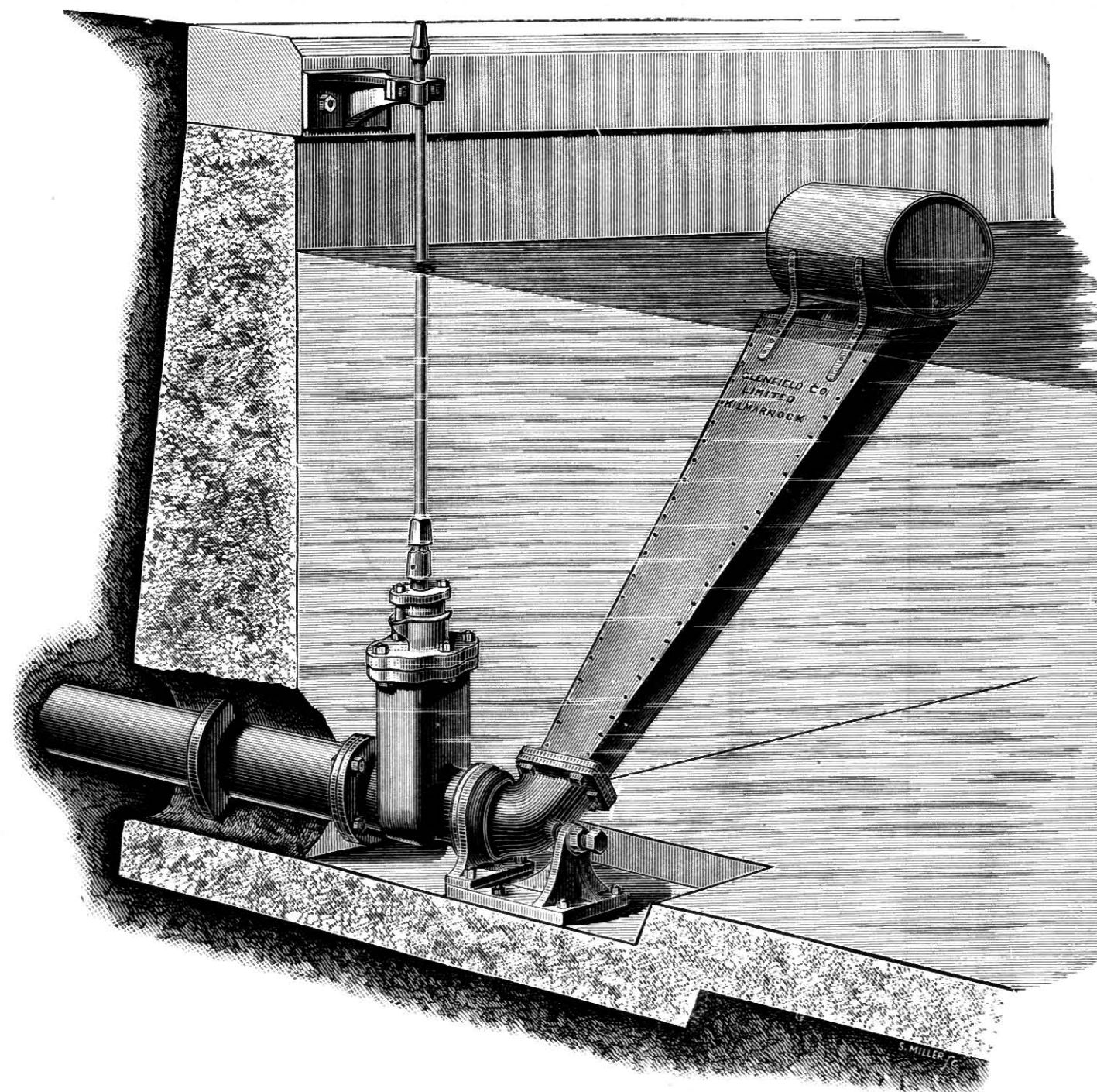
A 86—At "ordinary water level" the water passes freely to Reservoir. When river rises, the Valve on Reservoir Pipe is closed by float, and the flood water thus prevented from entering Reservoir—opening again automatically when river falls.

A 87—Overflow and Scour combined for Shallow Tanks or Cisterns—lifted by hand.

Prices on application.

Drainer for drawing off Clear Liquid from Settling Tanks.

No. 48.



Sole Bracket, Swivel Bend, Galvanized Arm, and Float, ..

Sluice Valve, with Lengthening Spindle, Guide Brackets, Bolts, and Joints, ..
(Valve has gun-metal faces and Nut and forged bronze Spindle.)

Wall Pipe, with Puddle Collar,

Dia. Ins.	Depth of Water. Prices.			
	4 ft.	6 ft.	9 ft.	12 ft.
3				
6				
9				
12				
3	Length of Pipe.			
6				
9				
12				
3	3' 0"			
6	3' 3"			
9	3' 6"			
12	3' 9"			

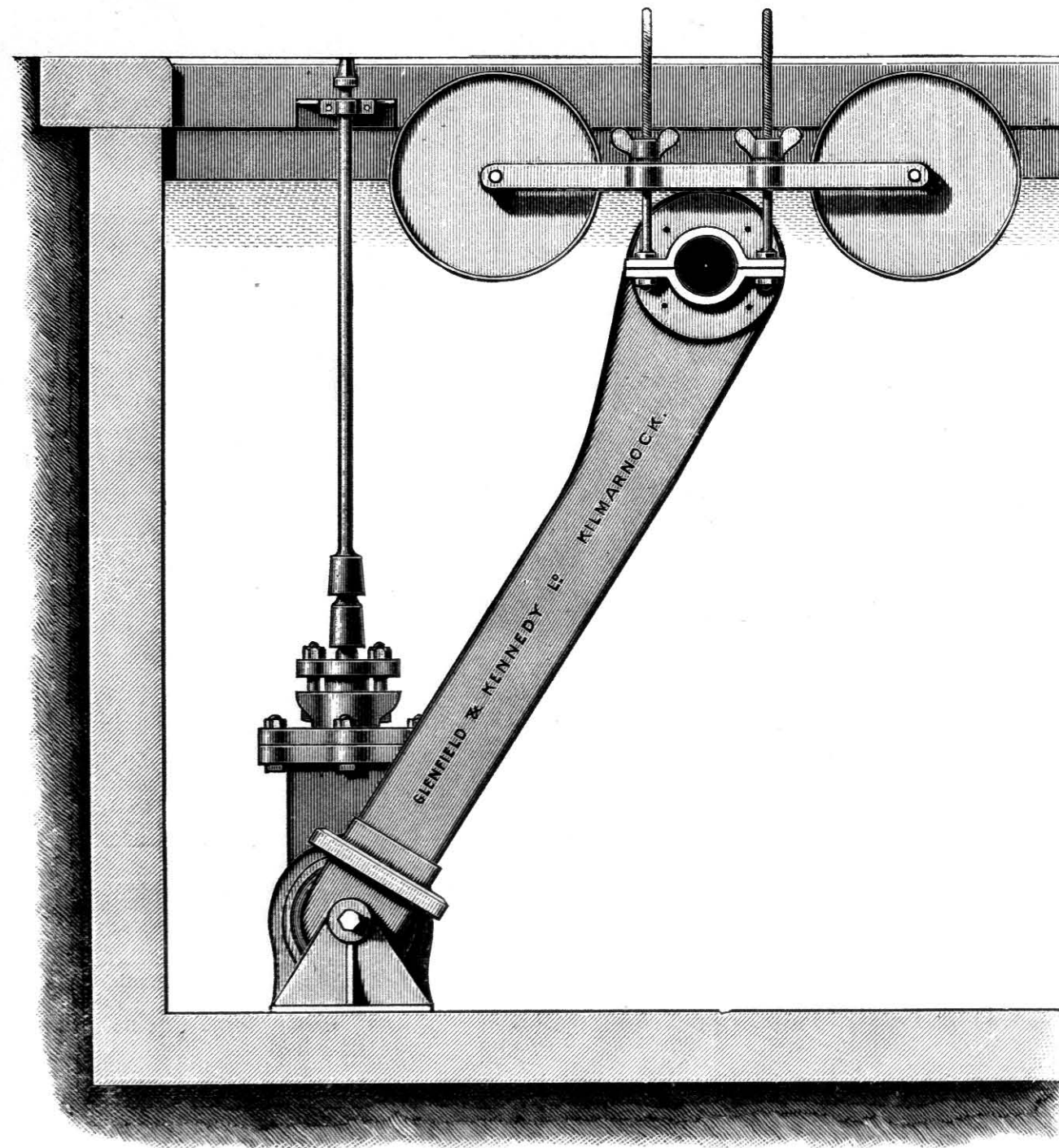
Approximate delivery per hour, { $\frac{3''}{3,300}$ $\frac{6''}{18,600}$ $\frac{9''}{51,000}$ $\frac{12''}{105,000}$ dia. Gallons.

Larger Sizes and other depths—Prices on application. Patterns have been made up to 30" dia. If with Double Float Arrangement, at slightly extra cost.

If required, a Wire Cloth Strainer is put on Inlet to prevent leaves, etc., from entering the Pipes—at slightly extra cost.

Drainer for drawing off Clear Liquid from Settling Tanks.

No. 49.

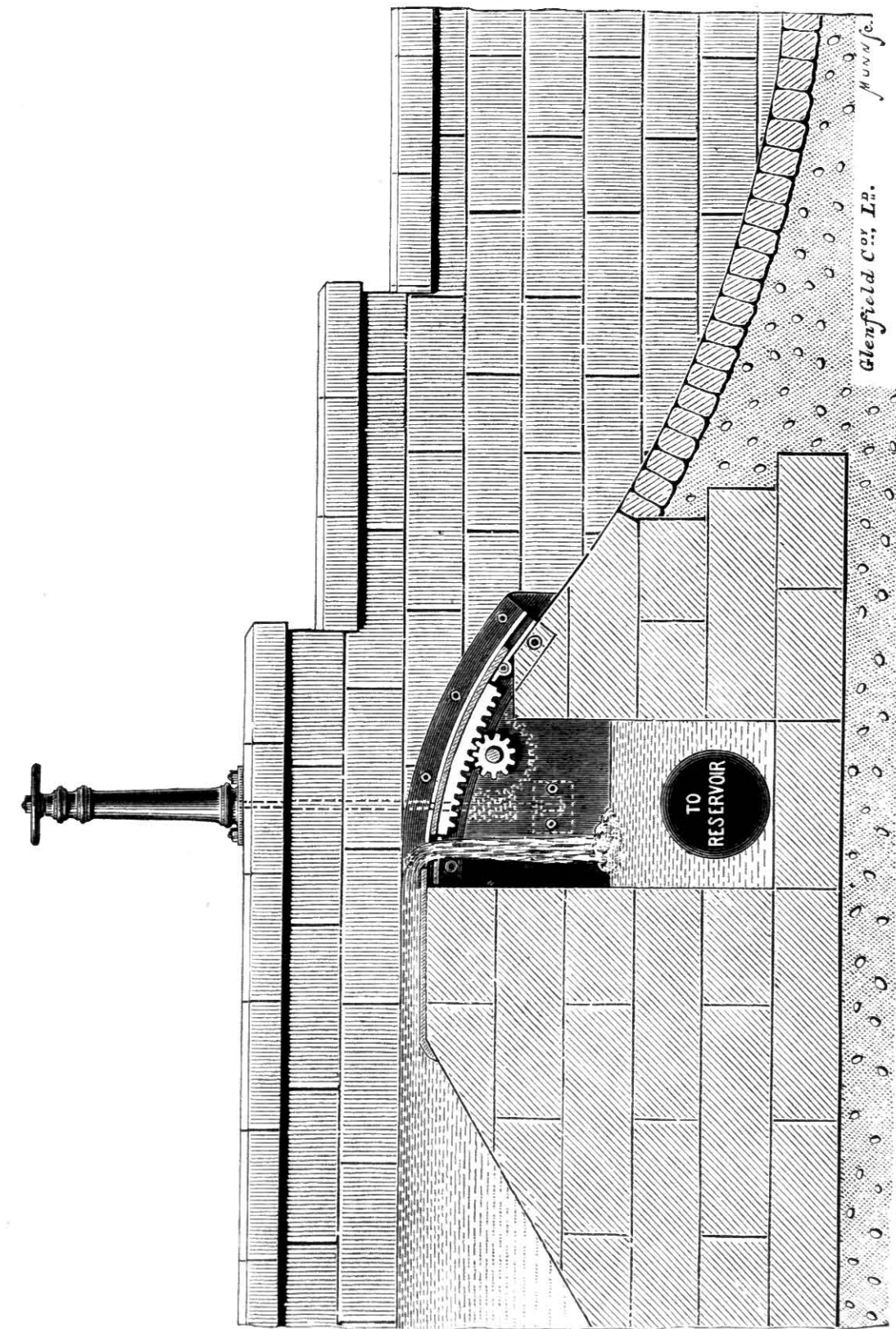


Besides acting as a Drainer, this Floating Arm acts as a Measuring Arrangement, the orifice being always submerged to a known level—adjustable by Suspending Screws. This is sometimes employed as an Automatic Draw-off for Filters.

Prices on application.

Adjustable Leaping Weir for excluding Flood Water.

Fig. A 88.



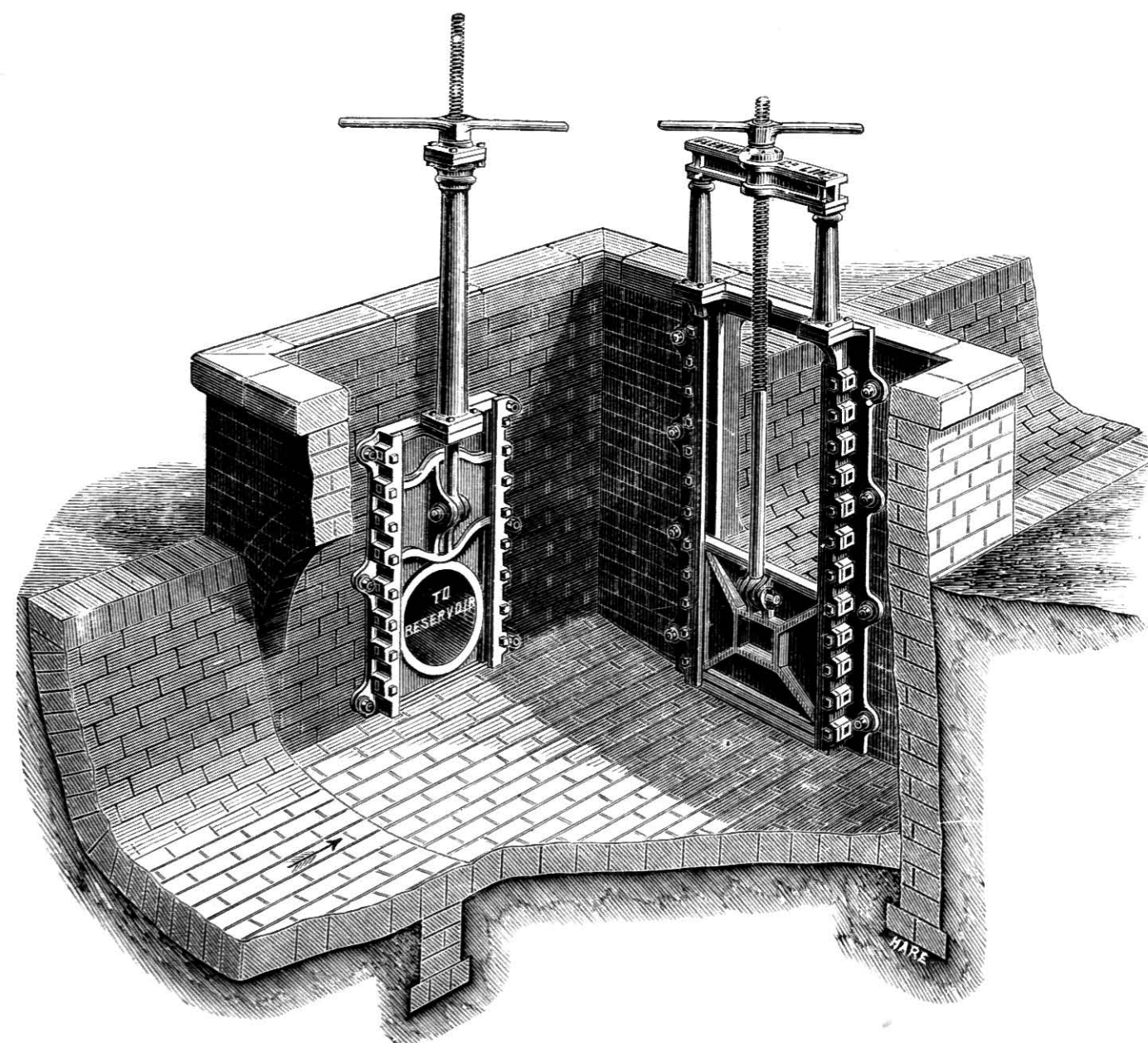
In times of flood, the water leaps the gap and goes down the Byewash.

These have been made in various widths, with special supports for Weir Plate in special cases where width requires them.

Prices on application.

Sluice Chamber.

Fig. A 90.



These Circular and Rectangular Sluices can be made of any size. The Slides and Doors of the Rectangular Sluices are usually lined with gun metal. The Circular Sluices have gun-metal Rings. Both can have cast-iron faces only if desired. Lewis Bolts are supplied for fixing Sluices to masonry. The Rectangular Sluice is used as an Overflow or Scour, as required.

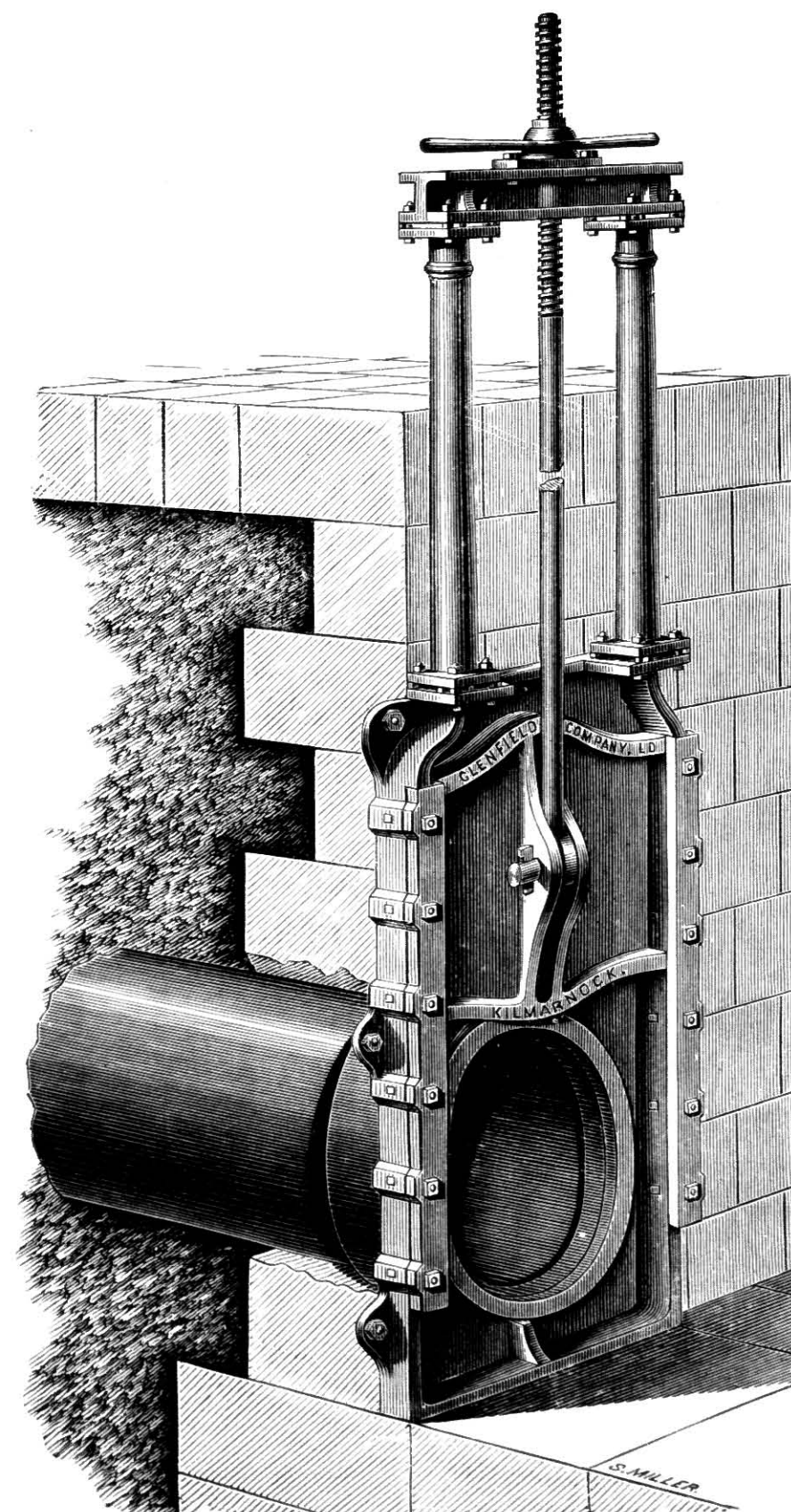
For Dimensions, etc., see pages 25, 26, 27, and 28.

Prices on application.

Reservoir or Wall Sluice, with Pillars.

With two gun-metal Faces, including Pillars and Screw Rod 12 feet long.

Fig. A 91.

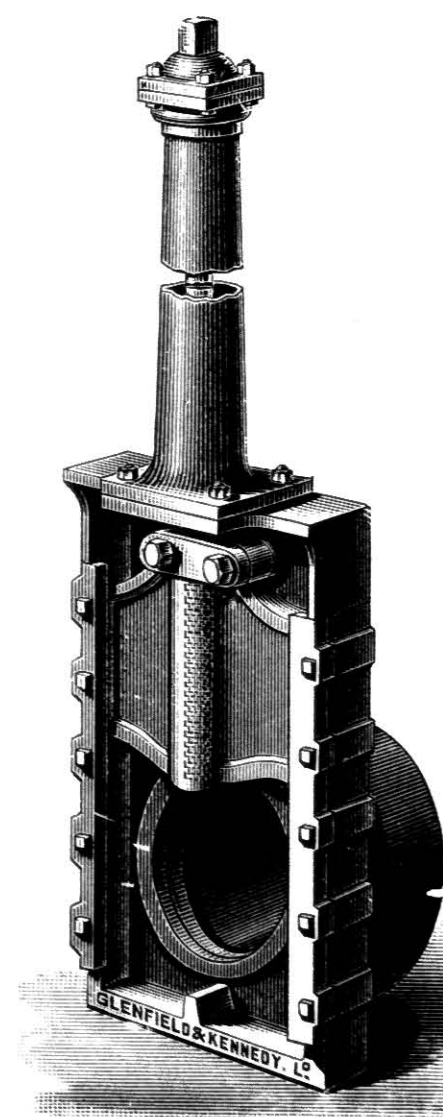


The Screw is usually made of wrought iron working in gun-metal Nut. If desired, the Screw can be made of gun metal, and can be worked by Worm or Spur Wheel Gearing, for large sizes, at extra cost.

Sizes up to and including 20" are usually made with one Pillar only.

On sizes above 20" two Pillars are only employed when Rods are under 6' in length, unless specially ordered.

Fig. A 92.



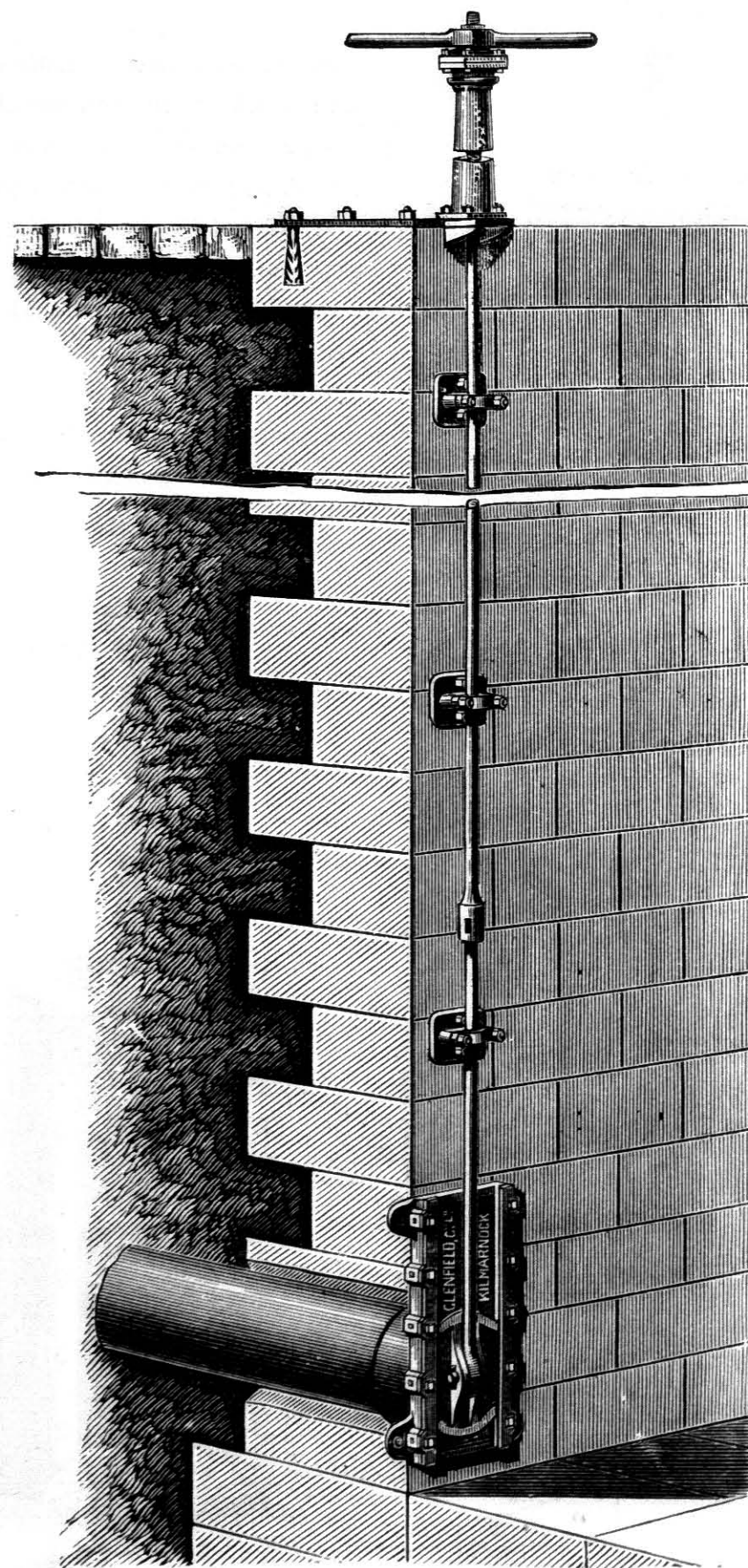
Screw and Nut can be put on back of Door, as shown in A 92, if specially ordered, at a slightly extra cost.

For Prices see next page. For Dimensions, etc., see page 25.

All Castings coated with Dr. Angus Smith's Patent Composition.

Reservoir Sluice, with Rods and Pillar.

Fig. A 93.



PRICES.

Sluice, with two gun-metal faces, Pillar, and wrought-iron Rod working in gun-metal Nut, with the necessary Guide Brackets and Bolts.

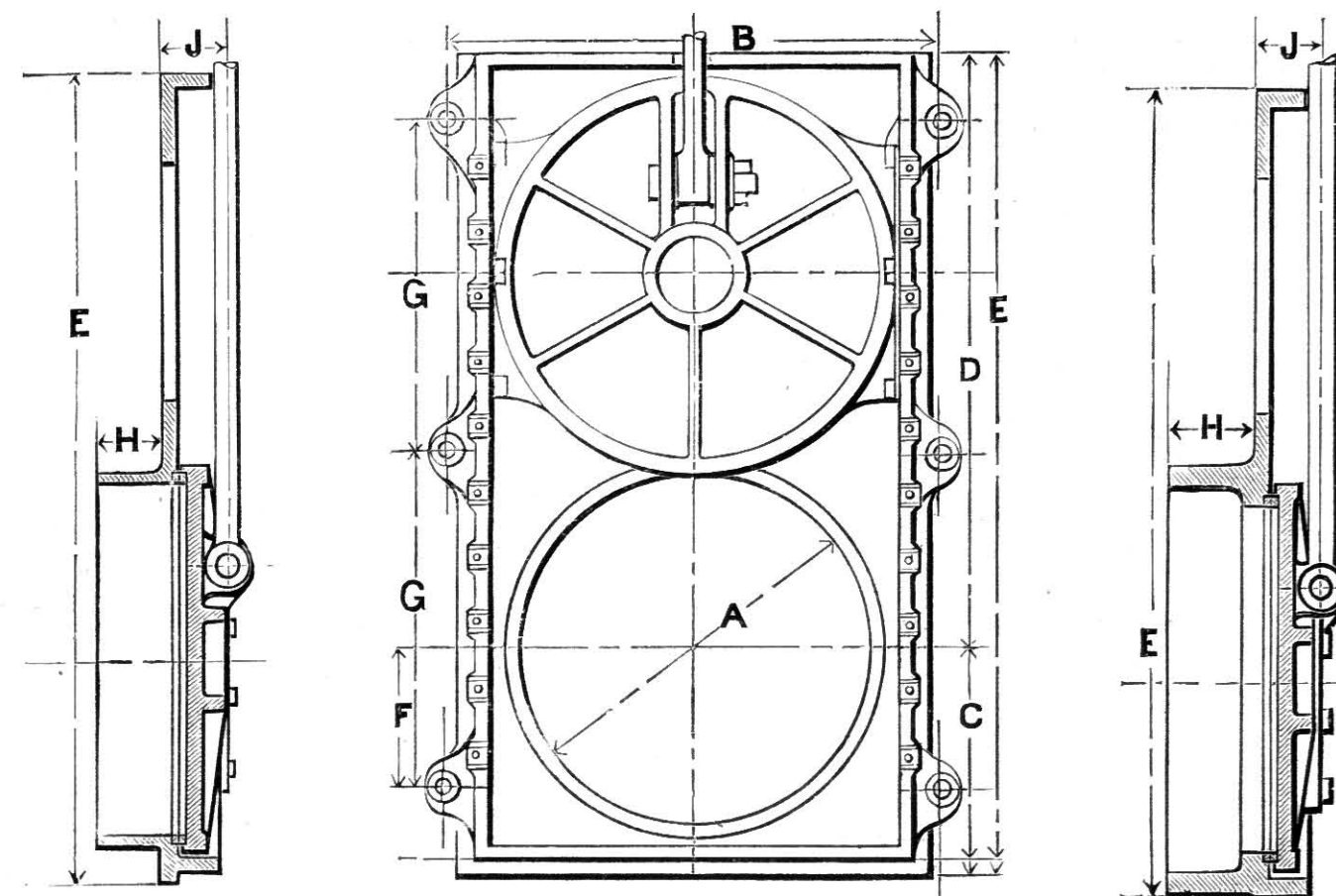
Dia.	Depth.	Price.
4"	12'	
4"	40'	
6"	12'	
6"	40'	
8"	12'	
8"	40'	
10"	12'	
10"	40'	
12"	12'	
12"	40'	
14"	12'	
14"	40'	
15"	12'	
15"	40'	
18"	12'	
18"	40'	
20"	12'	
20"	40'	
22"	12'	
22"	40'	
24"	12'	
24"	40'	

Larger Sizes than 24"—
Prices on application.

For Dimensions, etc., see pages 25, 26, 27 and 28.

All Castings coated with Dr. Angus Smith's Patent Composition.

Dimensions of Single-faced Sluices (Circular).



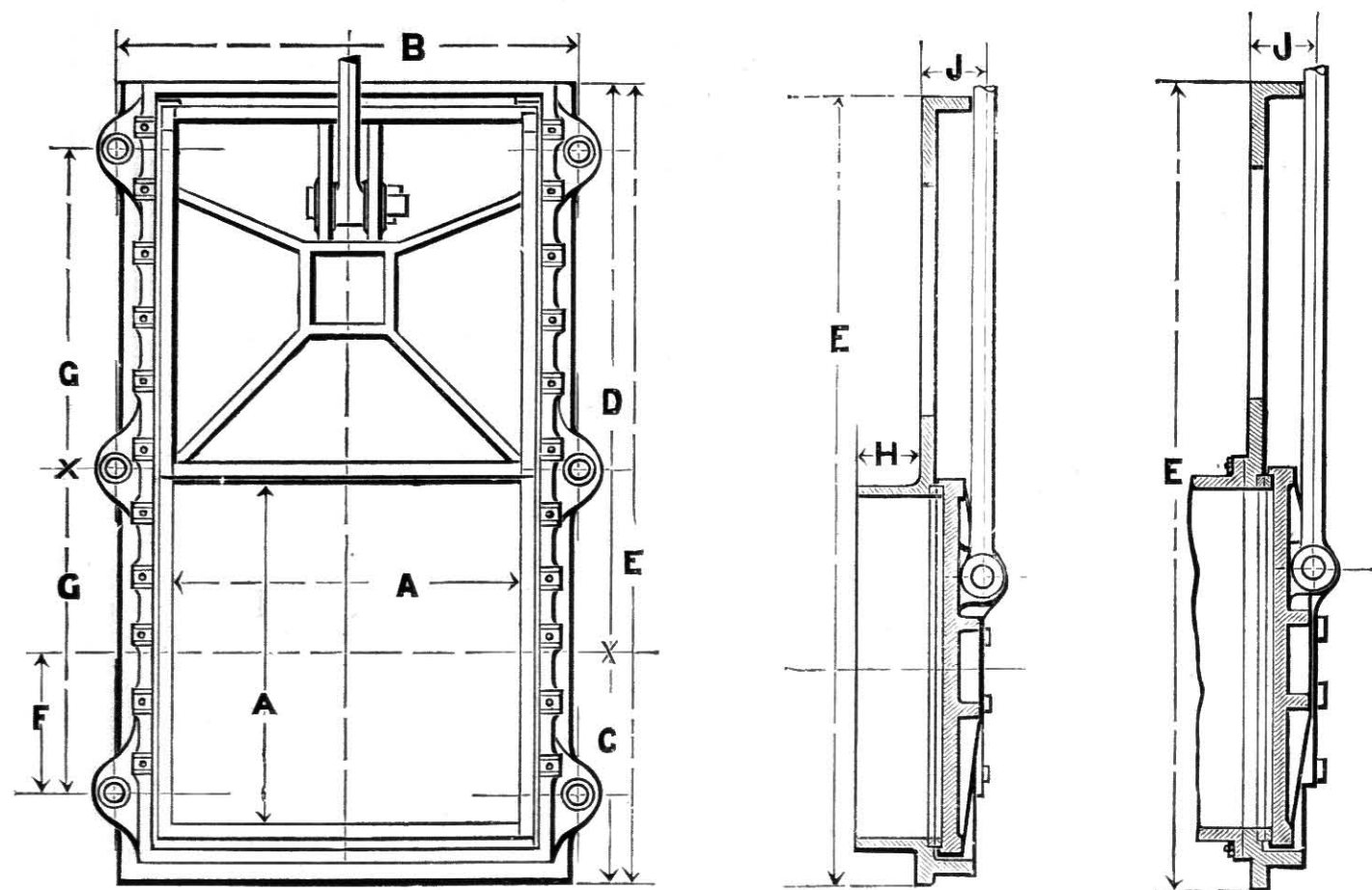
NOTE.—Dimensions subject to alteration (designs being revised).

A	B	C	D	E	F	G	H	J	LEWIS BOLTS.	
									No.	Dia.
4"	10"	3 ⁵ / ₈ "	8 ³ / ₈ "	12"	2 ³ / ₈ "	9 ¹ / ₂ "	3 ³ / ₄ "	2 ³ / ₈ "	4	1"
5"	11"	4 ¹ / ₆ "	10"	14 ⁵ / ₁₆ "	3 ¹ / ₁₆ "	11 ¹ / ₁₆ "	4"	2 ³ / ₈ "	4	1"
6"	12"	5 ¹ / ₈ "	11 ⁵ / ₁₆ "	17 ¹ / ₁₆ "	3 ¹ / ₈ "	13 ³ / ₁₆ "	4 ¹ / ₁₆ "	2 ¹ / ₁₆ "	4	1"
7"	12 ³ / ₄ "	5 ³ / ₈ "	13 ¹ / ₈ "	18 ³ / ₄ "	3 ¹ / ₄ "	13 ³ / ₈ "	4 ¹ / ₈ "	3 ³ / ₈ "	4	1"
8"	14"	6 ¹ / ₄ "	15"	21 ¹ / ₄ "	3 ¹ / ₄ "	15 ¹ / ₄ "	4 ¹ / ₈ "	3 ³ / ₈ "	4	1"
9"	15 ¹ / ₂ "	6 ³ / ₄ "	16 ¹ / ₂ "	23 ¹ / ₂ "	4 ³ / ₈ "	19 ¹ / ₂ "	4 ¹ / ₈ "	3 ³ / ₈ "	4	1"
10"	17"	7 ¹ / ₄ "	18 ¹ / ₄ "	25 ⁵ / ₈ "	5 ¹ / ₈ "	20 ⁵ / ₈ "	4 ¹ / ₈ "	3 ³ / ₈ "	4	1"
12"	18 ¹ / ₂ "	8 ³ / ₄ "	22 ³ / ₄ "	31 ¹ / ₂ "	6"	26"	4 ¹ / ₈ "	3 ³ / ₈ "	4	1"
14"	20 ³ / ₄ "	10 ¹ / ₁₆ "	25 ¹ / ₁₆ "	35 ⁵ / ₈ "	6"	26 ⁵ / ₈ "	5"	4 ¹ / ₈ "	4	1"
15"	21 ³ / ₄ "	11"	26"	37"	7 ¹ / ₈ "	30"	5"	4 ¹ / ₈ "	4	1"
16"	22 ³ / ₄ "	11 ¹ / ₈ "	27 ¹ / ₈ "	39"	7 ¹ / ₈ "	15 ¹ / ₂ "	5"	4 ¹ / ₈ "	6	1"
18"	25 ¹ / ₂ "	12 ³ / ₈ "	31 ¹ / ₈ "	43 ¹ / ₈ "	7 ⁵ / ₈ "	17"	5"	4 ¹ / ₈ "	6	1"
20"	28 ³ / ₄ "	13 ³ / ₈ "	34"	47"	8 ³ / ₈ "	19"	5 ¹ / ₈ "	4 ¹ / ₈ "	6	1"
21"	30 ¹ / ₄ "	13 ³ / ₈ "	37 ¹ / ₈ "	50 ³ / ₈ "	9 ³ / ₈ "	22 ³ / ₈ "	5 ¹ / ₈ "	4 ¹ / ₈ "	6	1"
22"	31 ³ / ₄ "	14"	38 ¹ / ₈ "	52 ³ / ₈ "	10 ¹ / ₈ "	22 ³ / ₈ "	5 ¹ / ₈ "	4 ¹ / ₈ "	6	1"
24"	34"	16"	40"	56"	10 ³ / ₈ "	22 ³ / ₈ "	5 ¹ / ₈ "	5"	6	1"
26"	35 ³ / ₈ "	17 ³ / ₈ "	43 ¹ / ₈ "	61"	12"	25"	6"	5 ³ / ₈ "	6	1"
27"	37 ¹ / ₈ "	18 ³ / ₈ "	45 ¹ / ₈ "	63 ¹ / ₈ "	12 ¹ / ₈ "	26 ¹ / ₈ "	6"	5 ³ / ₈ "	6	1"
28"	38 ³ / ₈ "	18 ³ / ₈ "	47"	65 ³ / ₈ "	12 ³ / ₈ "	27"	6"	5 ³ / ₈ "	6	1"
30"	39 ³ / ₈ "	19 ¹ / ₈ "	49 ¹ / ₈ "	69"	13 ¹ / ₈ "	28 ¹ / ₈ "	6"	5 ³ / ₈ "	6	1"
32"	42"	20 ³ / ₈ "	53"	73 ¹ / ₈ "	14"	30 ¹ / ₈ "	6"	5 ³ / ₈ "	6	1"
34"	44"	21 ¹ / ₈ "	56"	77 ¹ / ₈ "	15"	32"	6"	5 ³ / ₈ "	6	1"
36"	46 ³ / ₈ "	24"	59"	83"	15 ¹ / ₈ "	33 ³ / ₈ "	6 ¹ / ₈ "	6 ¹ / ₈ "	6	1 ¹ / ₈ "
38"	49"	25"	62"	87"	16"	35 ¹ / ₈ "	6 ¹ / ₈ "	6 ¹ / ₈ "	6	1 ¹ / ₈ "
40"	51"	26"	65 ¹ / ₈ "	91 ¹ / ₈ "	16 ³ / ₈ "	37"	6 ³ / ₈ "	6 ³ / ₈ "	6	1 ¹ / ₈ "
42"	53"	27"	68"	95"	17 ¹ / ₈ "	38 ³ / ₈ "	6 ³ / ₈ "	6 ³ / ₈ "	6	1 ¹ / ₈ "
45"	57"	28 ¹ / ₈ "	74 ¹ / ₈ "	103"	18 ³ / ₈ "	42 ³ / ₈ "	6 ³ / ₈ "	6 ³ / ₈ "	6	1 ¹ / ₈ "
48"	60"	30"	78"	108"	20 ¹ / ₈ "	30 ⁸ / ₈ "	7"	7 ¹ / ₁₆ "	8	1 ¹ / ₄ "

Sockets up to and including 24". Larger Sizes Short Spigot Ends.

For Prices see page 24.

Dimensions of Single-faced Sluices (Square).



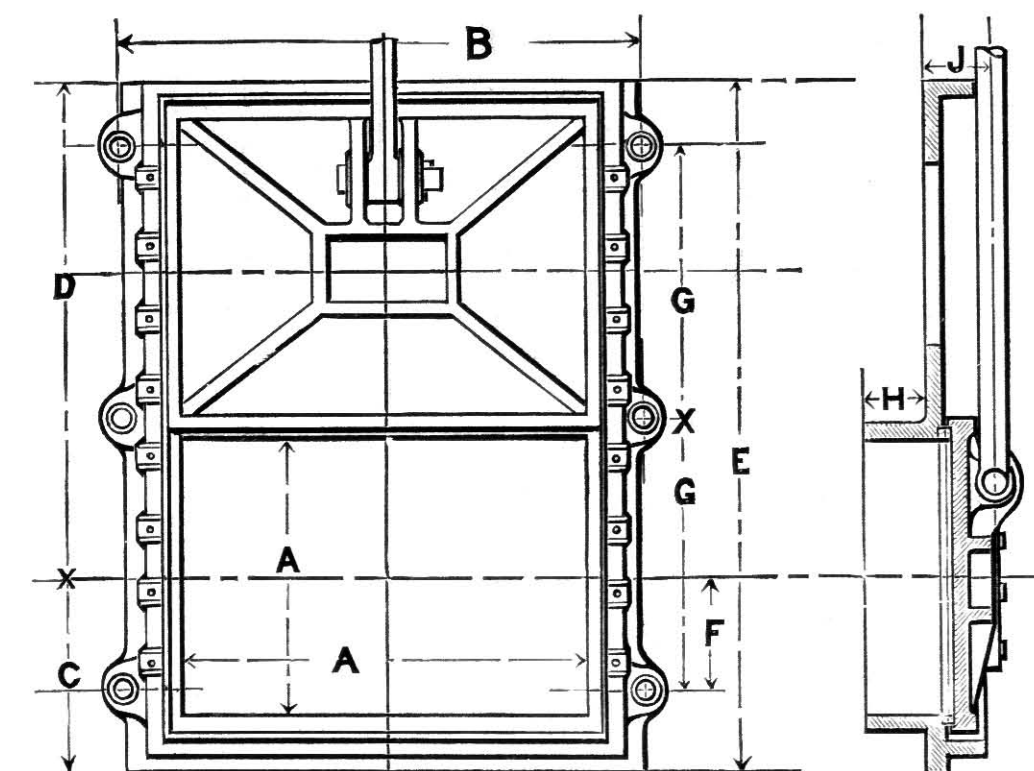
NOTE.—Dimensions subject to alteration (designs being revised).

A	B	C	D	E	F	G	H	J	LEWIS BOLTS.	
									No.	Dia.
Breadth. Height.										
4" x 4"	11"	3 1/2"	8 3/4"	12"	2 1/2"	9 1/2"	3 3/4"	2 1/2"	4	5/8"
5" x 5"	12"	4"	10 1/2"	14 1/2"	3 1/2"	12 1/2"	4 1/2"	2 1/2"	4	5/8"
6" x 6"	13"	5 1/2"	12 1/2"	17 1/2"	3 1/2"	15 1/2"	4 1/2"	2 1/2"	4	5/8"
7" x 7"	14"	5 1/2"	14 1/2"	19 1/2"	3 1/2"	16 1/2"	4 1/2"	2 1/2"	4	5/8"
8" x 8"	15"	6 1/2"	15 1/2"	21 1/2"	3 1/2"	17 1/2"	4 1/2"	2 1/2"	4	5/8"
9" x 9"	16"	6 1/2"	17 1/2"	24 1/2"	4 1/2"	19 1/2"	4 1/2"	2 1/2"	4	5/8"
10" x 10"	17 1/2"	7 1/2"	18 1/2"	26 1/2"	3 1/2"	17 1/2"	4 1/2"	3 1/2"	4	5/8"
12" x 12"	19 1/2"	8 1/2"	22 1/2"	31 1/2"	4 1/2"	22 1/2"	4 1/2"	4 1/2"	4	5/8"
14" x 14"	21 1/2"	9 1/2"	25 1/2"	35 1/2"	5 1/2"	26 1/2"	5 1/2"	4 1/2"	4	5/8"
15" x 15"	24"	10 1/2"	27 1/2"	37 1/2"	6 1/2"	14 1/2"	5 1/2"	4 1/2"	6	1 1/4"
16" x 16"	25"	11 1/2"	28 1/2"	39 1/2"	6 1/2"	15 1/2"	5 1/2"	4 1/2"	6	1 1/4"
18" x 18"	28 1/2"	12 1/2"	31 1/2"	44 1/2"	7 1/2"	17 1/2"	5 1/2"	4 1/2"	6	1 1/4"
20" x 20"	31"	13 1/2"	34 1/2"	48 1/2"	8 1/2"	19 1/2"	5 1/2"	4 1/2"	6	1 1/4"
21" x 21"	32"	14"	36 1/2"	50 1/2"	9 1/2"	20 1/2"	5 1/2"	4 1/2"	6	1 1/4"
22" x 22"	33"	14 1/2"	38 1/2"	52 1/2"	9 1/2"	21 1/2"	5 1/2"	4 1/2"	6	1 1/4"
24" x 24"	36 1/2"	16 1/2"	40 1/2"	57 1/2"	11 1/2"	23 1/2"	5 1/2"	5 1/2"	6	1 1/4"
26" x 26"	39"	17 1/2"	44 1/2"	61 1/2"	11 1/2"	24 1/2"	6 1/2"	5 1/2"	6	1 1/4"
27" x 27"	40"	18 1/2"	45 1/2"	63 1/2"	12 1/2"	25 1/2"	6 1/2"	5 1/2"	6	1 1/4"
28" x 28"	41"	18 1/2"	47 1/2"	65 1/2"	12 1/2"	26 1/2"	6 1/2"	5 1/2"	6	1 1/4"
30" x 30"	43"	19 1/2"	50 1/2"	69 1/2"	13 1/2"	28 1/2"	6 1/2"	5 1/2"	6	1 1/4"
32" x 32"	45"	20 1/2"	53 1/2"	73 1/2"	14 1/2"	31 1/2"	6 1/2"	5 1/2"	6	1 1/4"
34" x 34"	47"	21 1/2"	56 1/2"	77 1/2"	15 1/2"	33 1/2"	6 1/2"	5 1/2"	6	1 1/4"
36" x 36"	47 1/2"	24"	60 1/2"	84 1/2"	14 1/2"	33 1/2"	6 1/2"	6 1/2"	6	1 1/4"
38" x 38"	50"	25"	62 1/2"	87 1/2"	15 1/2"	35 1/2"	6 1/2"	6 1/2"	6	1 1/4"
40" x 40"	52"	26"	65 1/2"	91 1/2"	16 1/2"	37 1/2"	6 1/2"	6 1/2"	6	1 1/4"
42" x 42"	54"	27"	68 1/2"	95 1/2"	17 1/2"	39 1/2"	6 1/2"	6 1/2"	6	1 1/4"
45" x 45"	57"	28 1/2"	73 1/2"	101 1/2"	19 1/2"	42 1/2"	6 1/2"	6 1/2"	6	1 1/4"
48" x 48"	60"	30"	78 1/2"	108 1/2"	20 1/2"	30 1/2"	7 1/2"	6 1/2"	8	1 1/4"

Square Sluices have Short Spigot at Back.

Prices on application.

Dimensions of Single-faced Sluices (Rectangular).



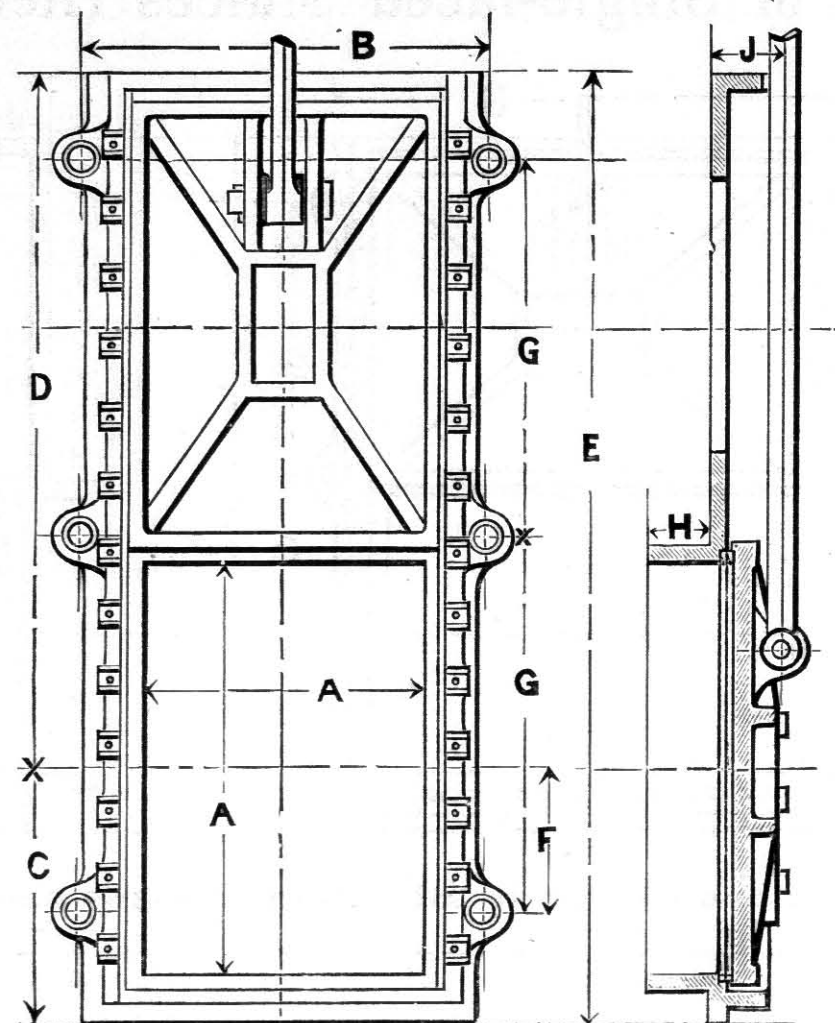
NOTE.—Dimensions subject to alteration (designs being revised).

A	B	C	D	E	F	G	H	J	LEWIS BOLTS.	
									No.	Dia.
Breadth. Height.										
4" x 3"	11"	3 1/2"	6 7/8"	10"	1 7/8"	7 1/8"	3 3/4"	2 3/8"	4	5/8"
5" x 3 1/2"	12"	3 3/8"	8 1/8"	11 1/8"	2 3/8"	9 1/8"	4 1/8"	2 3/8"	4	5/8"
6" x 4"	13"	4 1/8"	9 1/8"	13 1/8"	2 7/8"	11 1/8"	4 1/8"	2 3/8"	4	5/8"
7" x 5"	14"	4 1/2"	10 7/8"	15 1/8"	2 1/2"	10 5/8"	4 1/8"	3 3/8"	4	5/8"
8" x 5"	15"	4 1/2"	11 1/8"	15 1/8"	2 3/8"	10 7/8"	4 1/8"	3 3/8"	4	5/8"
9" x 6"	16"	5 1/8"	12 7/8"	18 1/8"	2 7/8"	13 1/8"	4 1/8"	3 3/8"	4	5/8"
10" x 7"	17 1/2"	5 5/8"	14 3/8"	20 1/8"	2 3/8"	14 3/8"	4 1/8"	3 3/8"	4	5/8"
12" x 8"	19 1/2"	6 1 1/8"	16 1 1/8"	23 1/8"	3 3/8"	17 1/8"	4 1/8"	4 1/8"	4	5/8"
14" x 9"	21 1/2"	7 1/2"	18 1/8"	25 1/8"	3 1/2"	16 1/8"	5 1/8"	4 1/8"	4	5/8"
15" x 10"	24"	7 3/4"	19 1/8"	27 1/8"	3 1/2"	18 3/8"	5 1/8"	4 1/8"	4	5/8"
16" x 11"	25"	8 3/4"	20 1/8"	29 1/8"	4 1/2"	20 1/8"	5 1/8"	4 1/8"	4	5/8"
18" x 12"	28 1/2"	9 1/2"	22 3/8"	31 7/8"	4 1/2"	22 1/8"	5 1/8"	4 1/8"	4	5/8"
20" x 13"	31"	9 3/8"	24 3/8"	34 3/8"	5 1/2"	24 1/8"	5 1/8"	4 1/8"	4	5/8"
21" x 14"	32"	10 1/2"	25 7/8"	36 3/8"	5 1/2"	26 1/8"	5 1/8"	4 1/8"	4	5/8"
22" x 15"	33"	11 1/2"	27 1/8"	38 3/8"	6 1/2"	28 1/8"	5 1/8"	4 1/8"	4	5/8"
24" x 16"	36 1/2"	12"	28 3/4"	40 3/4"	6 3/4"	15 3/4"	5 1/2"	5 1/2"	6	1 1/4"
26" x 17"	39"	13 1/2"	30 3/4"	43 3/4"	7 3/4"	15 3/4"	6 1/2"	5 1/2"	6	1 1/4"
27" x 18"	40"	13 1/2"	32"	45 1/2"	7 1/2"	16 1/2"	6 1/2"	5 1/2"	6	1 1/4"
28" x 19"	41"	14"	33 1/2"	47 1/2"	8 1/2"	17 1/2"	6 1/2"	5 1/2"	6	1 1/4"
30" x 20"	43"	14 1/2"	35 1/2"	49 1/2"	8 1/2"	18 3/4"	6 1/2"	5 1/2"	6	1 1/4"
32" x 21"	45"	15 1/2"	36 3/4"	52"	9 1/2"	20"	6 1/2"	5 1/2"	6	1 1/4"
34" x 23"	47"	16 1/4"	39 1/4"	55 3/4"	10"	21 3/4"	6 1/2"	5 1/2"	6	1 1/4"
36" x 24"	47 1/2"	18"	42"	60"	8 1/2"	21 3/4"	6 1/2"	6 1/2"	6	1 1/4"
38" x 25"	50"	18 1/2"	42 1/2"	61"	9"	22"	6 1/2"	6 1/2"	6	1 1/4"
40" x 27"	52"	19 1/2"	45 3/4"	65 1/4"	10"	24"	6 1/2"	6 1/2"	6	1 1/4"
42" x 28"	54"	20"	47 3/4"	67 3/4"	10 1/2"	25 1/4"	6 1/2"	6 1/2"	6	1 1/4"
45" x 30"	57"	21 1/2"	50 3/4"	71 3/4"	11 1/2"	27 3/4"	6 1/2"	6 1/2"	6	1 1/4"
48" x 32"	60"	22"	54"	76"	12 1/2"	29 1/2"	7"	6 1/2"	6	1 1/4"

Rectangular Sluices have short Spigot at Back.

Prices on application.

Dimensions of Single-faced Sluices (Rectangular).



NOTE.—Dimensions subject to alteration (designs being revised).

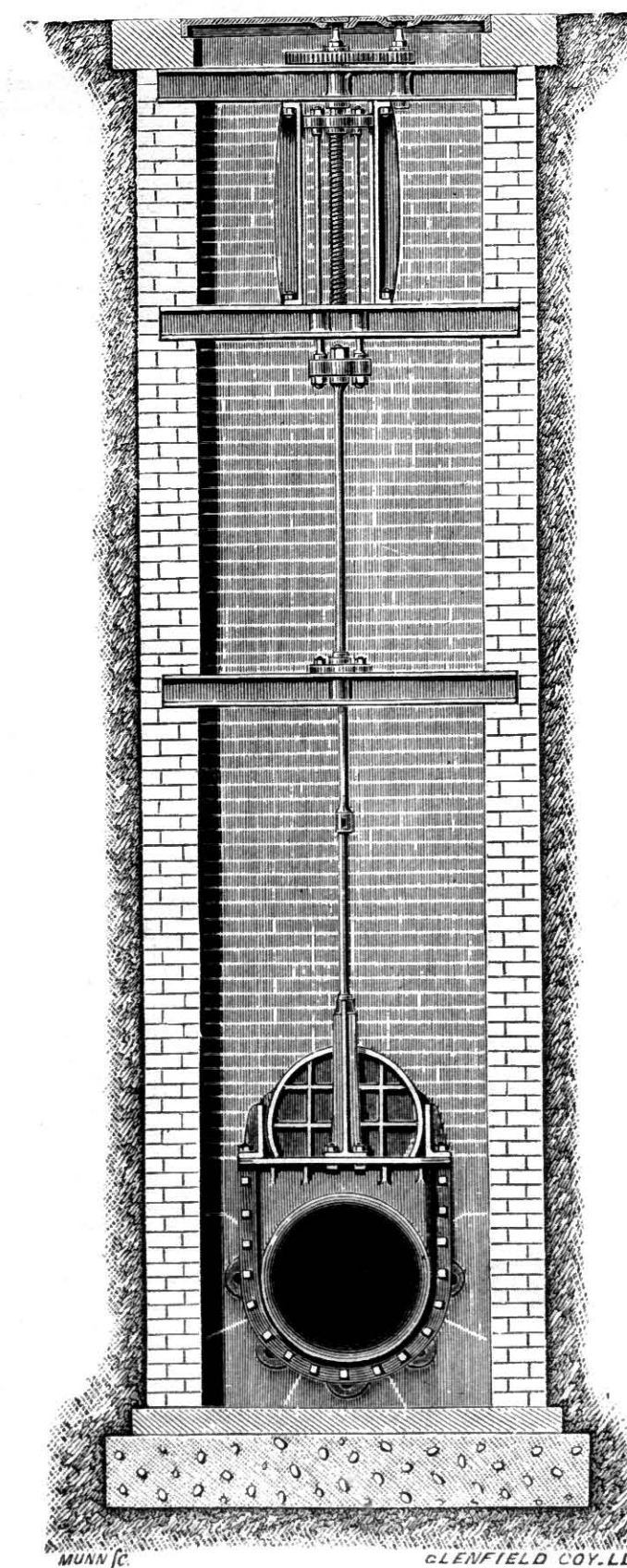
A Breadth.	B Height.	C	D	E	F	G	H	J	LEWIS BOLTS.	
									No.	Dia.
4" x 6"	11"	47"	115"	161"	31 1/2"	14"	33 1/2"	2"	4	1/2"
5" x 7"	12"	50"	133"	187"	41"	16 1/2"	4"	2 1/2"	4	1/2"
6" x 9"	13"	60"	166"	233"	55"	20"	4 1/2"	2 1/2"	4	1/2"
7" x 10"	14"	71"	184"	255"	63"	20 1/2"	4 1/2"	3 1/2"	4	1/2"
8" x 12"	15"	84"	211"	299"	74"	23"	4 1/2"	3 1/2"	4	1/2"
9" x 14"	16"	99"	247"	344"	86"	28 1/2"	4 1/2"	3 3/4"	4	1/2"
10" x 15"	17 1/2"	111"	266"	364"	99"	33"	4 1/2"	3 3/4"	6	1/2"
12" x 18"	19 1/2"	133"	311"	433"	122"	37"	4 1/2"	4"	6	1/2"
14" x 21"	21 1/2"	154"	366"	499"	155"	41"	5"	4 1/2"	6	1/2"
15" x 22"	24"	171"	401"	555"	177"	44"	5"	4 1/2"	6	1/2"
16" x 24"	25"	184"	424"	588"	199"	47"	5"	4 1/2"	8	1/2"
18" x 27"	28 1/2"	211"	499"	688"	233"	51"	5 1/2"	4 1/2"	8	1/2"
20" x 30"	31"	247"	555"	744"	255"	55"	5 1/2"	4 1/2"	8	1/2"
21" x 32"	32"	266"	588"	800"	277"	58"	5 1/2"	4 1/2"	8	1/2"
22" x 33"	33"	281"	622"	866"	300"	61"	5 1/2"	4 1/2"	8	1/2"
24" x 36"	36 1/2"	311"	700"	966"	333"	66"	6"	5 1/2"	8	1/2"
26" x 39"	39"	344"	777"	1055"	366"	71"	6"	5 1/2"	8	1/2"
27" x 40"	40"	366"	800"	1111"	388"	74"	6"	5 1/2"	8	1/2"
28" x 42"	41"	388"	866"	1199"	411"	77"	6 1/2"	6 1/2"	8	1/2"
30" x 45"	43"	411"	933"	1255"	433"	80"	6 1/2"	6 1/2"	8	1/2"
32" x 48"	45"	433"	1000"	1377"	455"	83"	6 1/2"	6 1/2"	8	1/2"
34" x 51"	47"	455"	1055"	1488"	477"	86"	6 1/2"	6 1/2"	8	1/2"
36" x 54"	47 1/2"	477"	1111"	1555"	500"	89"	6 1/2"	6 1/2"	8	1/2"
38" x 57"	50"	500"	1199"	1666"	522"	92"	6 1/2"	6 1/2"	8	1/2"
40" x 60"	52"	522"	1255"	1777"	544"	95"	6 1/2"	6 1/2"	8	1/2"
42" x 63"	54"	544"	1322"	1888"	566"	98"	6 1/2"	6 1/2"	8	1/2"
45" x 68"	57"	566"	1488"	2055"	611"	105"	6 1/2"	6 1/2"	8	1/2"
48" x 72"	60"	600"	1666"	2222"	666"	114"	7"	6 1/2"	8	1/2"

Rectangular Sluices have Short Spigot at Back.

Prices on application.

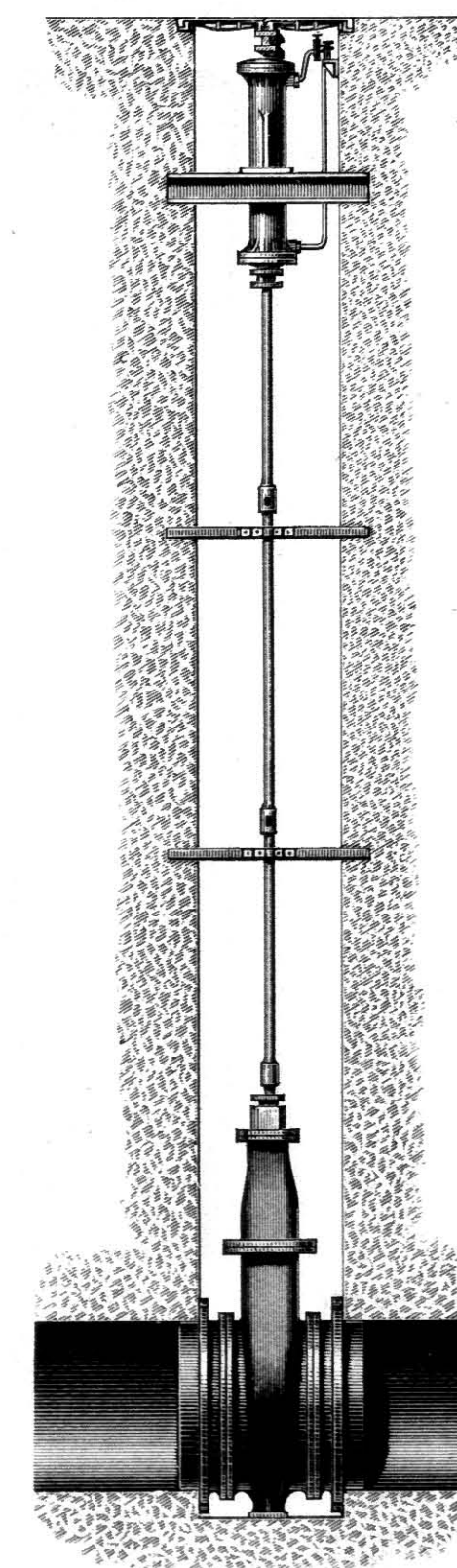
Double-faced Wall Sluices and Valves.

Fig. A 96.



WET WELL.

Fig. A 97.



DRY WELL.

These Sluices and Valves are tight against pressure from either side.

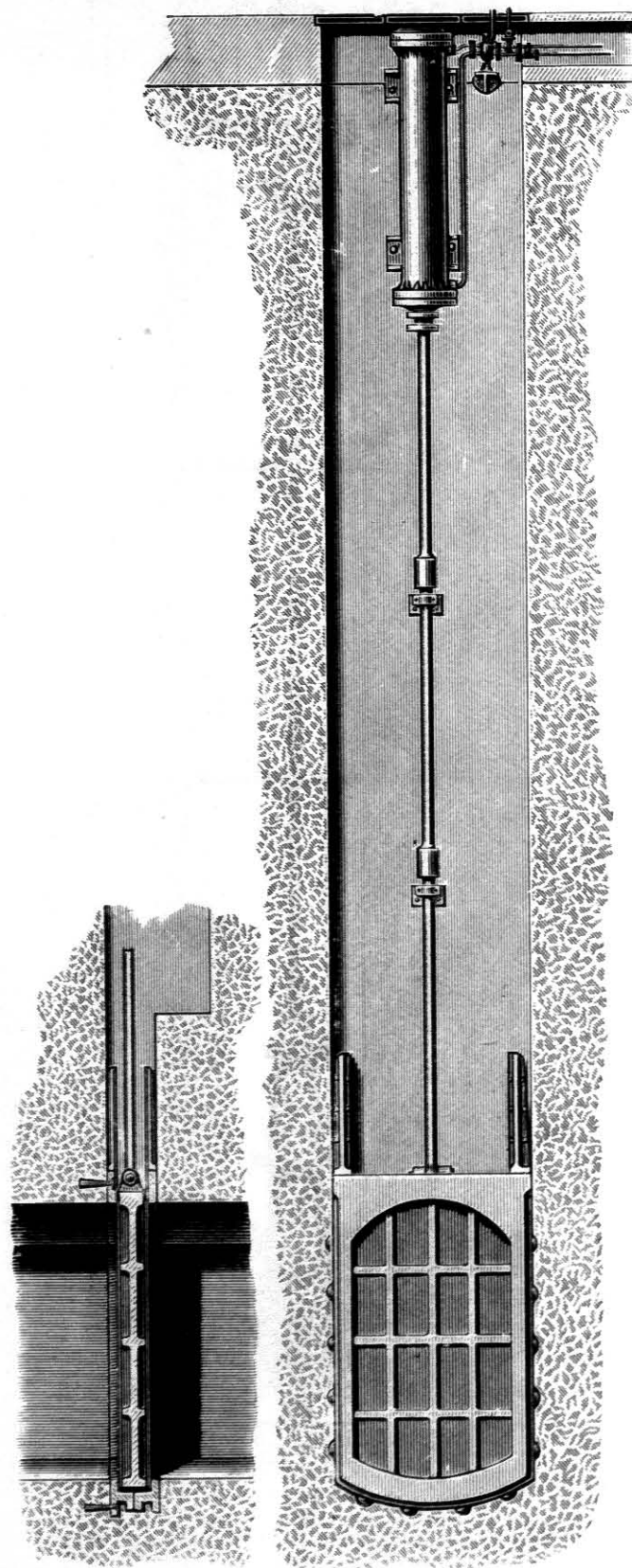
The Gearing may be either Screw or Hydraulic as shown.

Made in large sizes and suitable for Dock Works.

Prices on application.

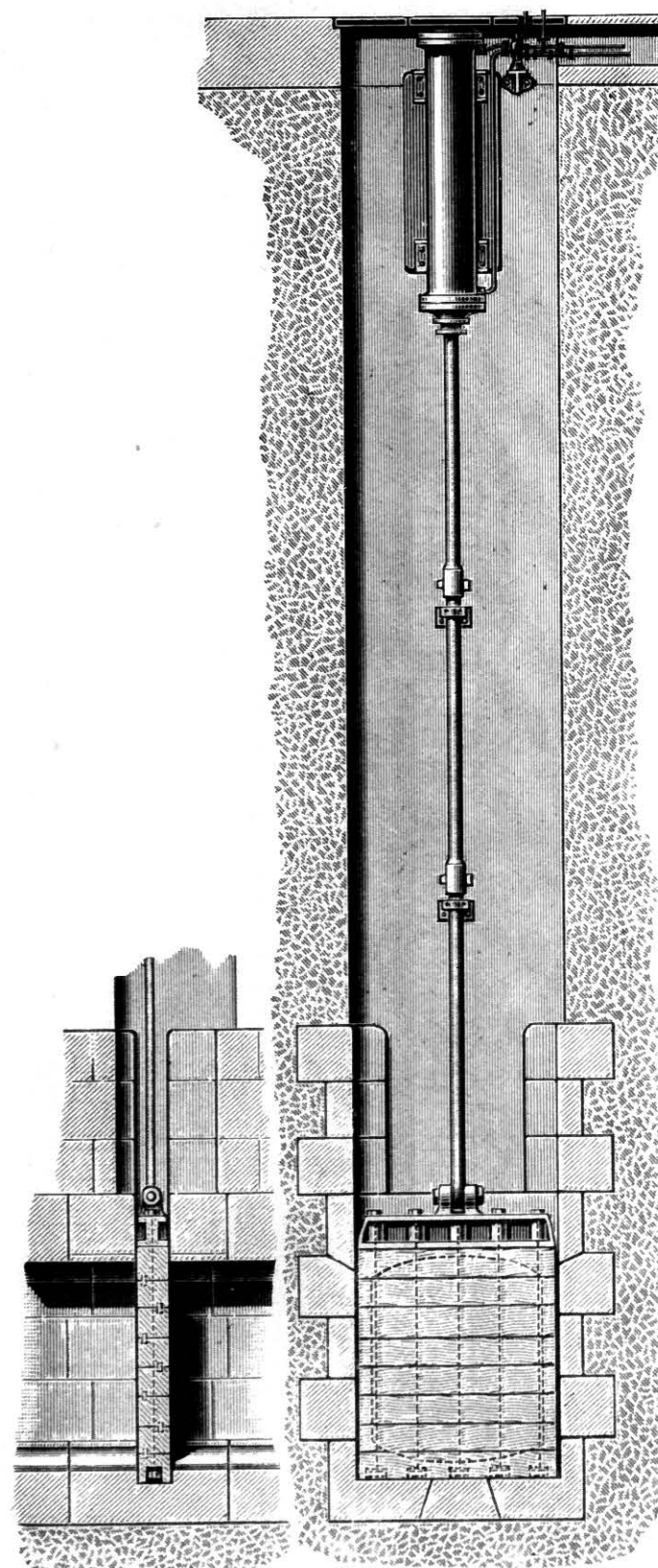
Dock Sluices, with Hydraulic Cylinder.

Fig. A 98.



CAST-IRON DOOR, WITH
GUN-METAL FACES
ON EACH SIDE.

Fig. A 99.

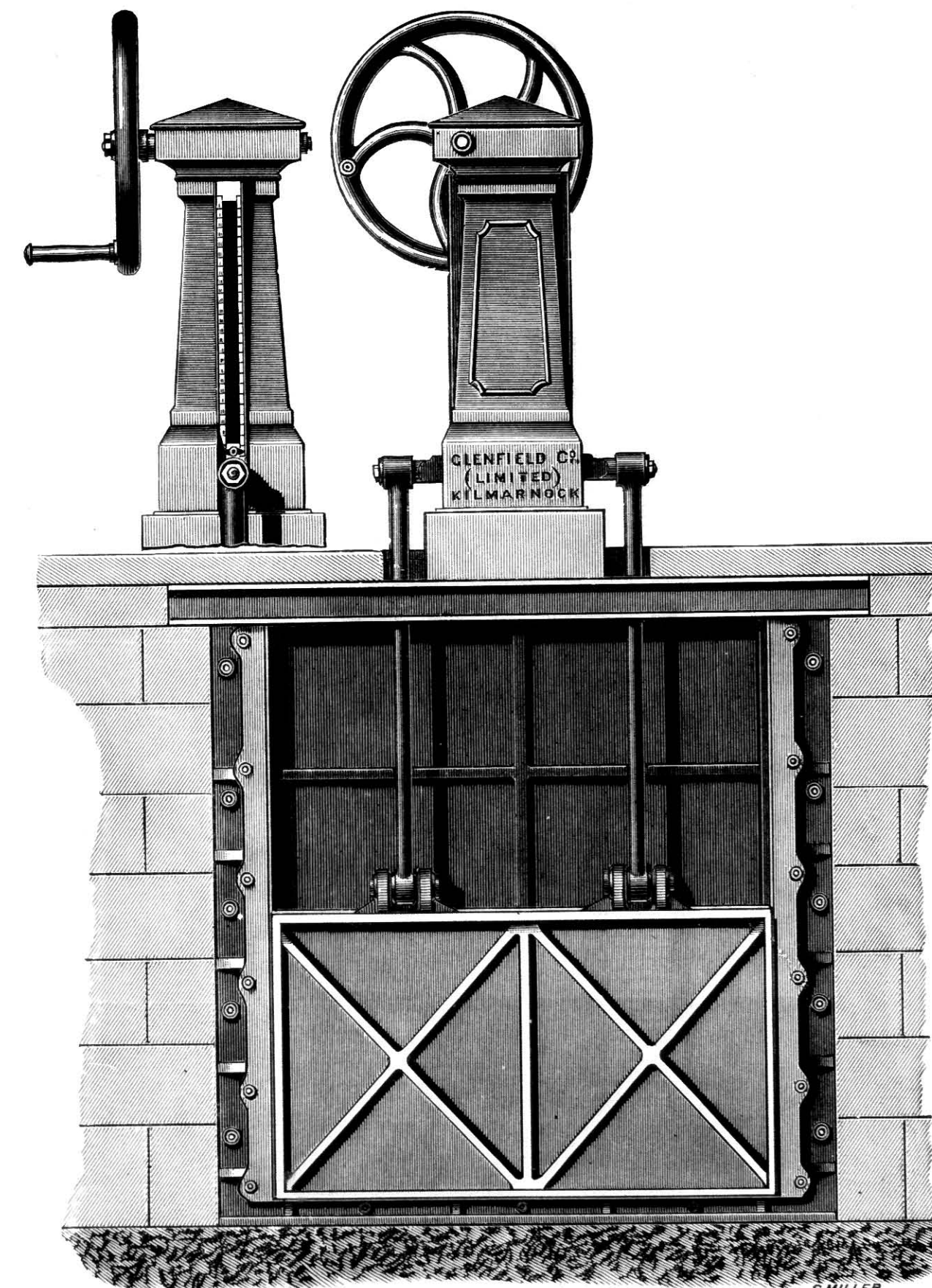


DOOR OF TEAK OR GREEN-HEART,
WORKING ON DRESSED
GRANITE FACE.

Prices on application.

Single-faced Sluice, with Headstock.

Fig. A 100.



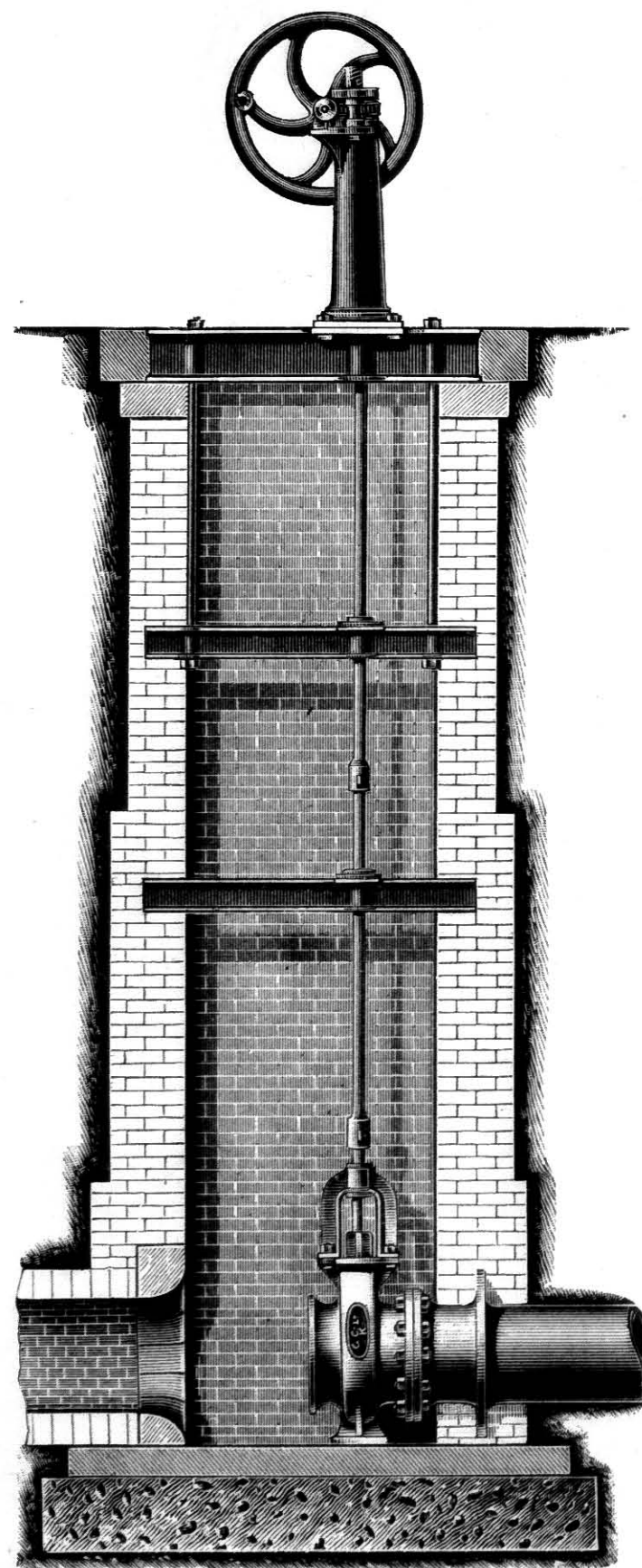
The above Sluice can be made to suit any size of opening.
The Headstock is Worm Geared and has Indicator at side.

For Dimensions, etc., see pages 25, 26, 27, and 28.

Prices furnished on receipt of particulars giving Size, Depth of Water, etc.

Double-faced Sluice Valve (Open Top), With Worm and Screw Headstock.

Fig. A 102.

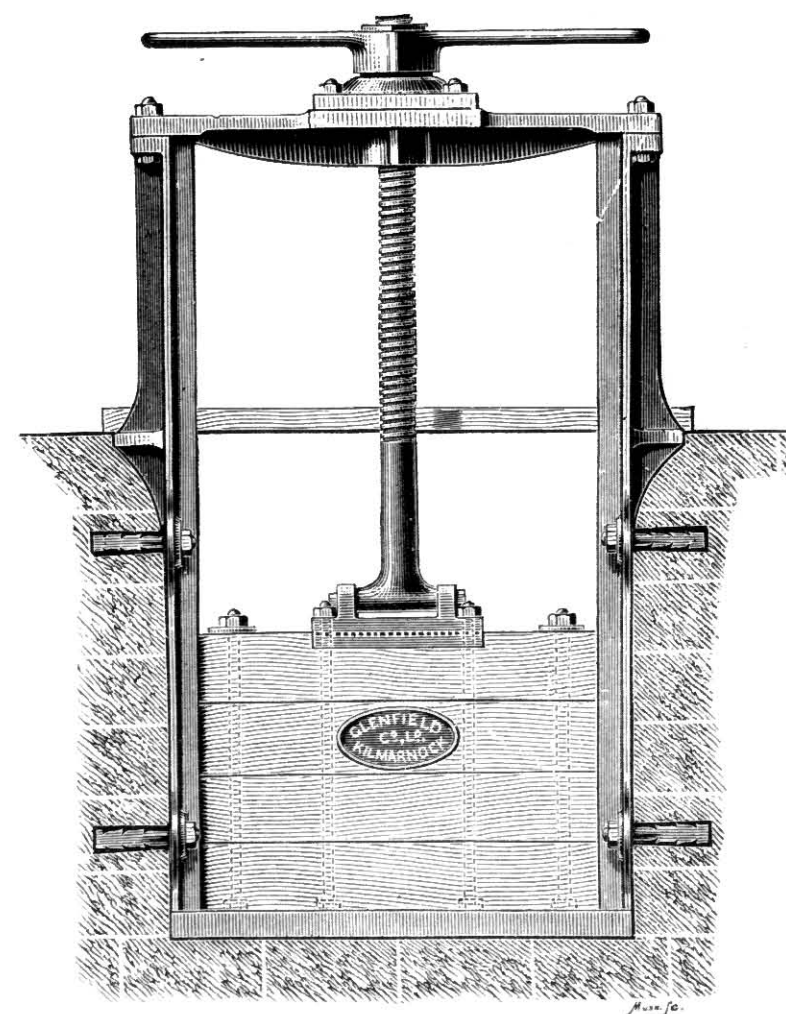


The Sluice Valve is tight against pressure from either side.
The Headstock can be substituted by Hydraulic Cylinder if desired.

Prices on application.

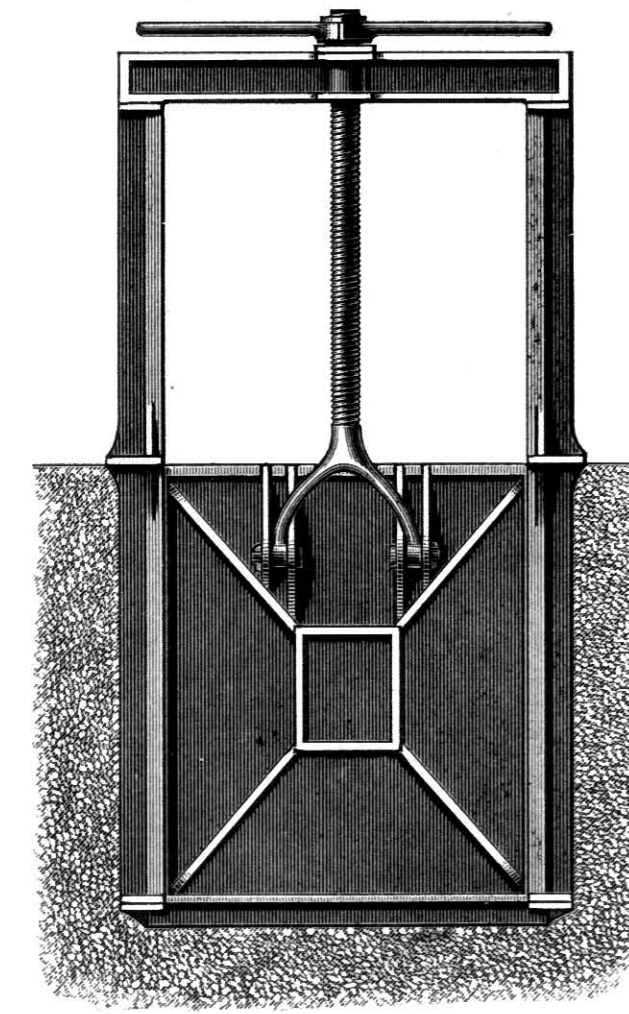
Reservoir or Open Channel Sluices.

Fig. A 105.



WOOD DOOR.

Fig. A 106.



IRON DOOR.

The Screw is of wrought iron working in gun-metal Nut.
These Sluices can be made of any size.

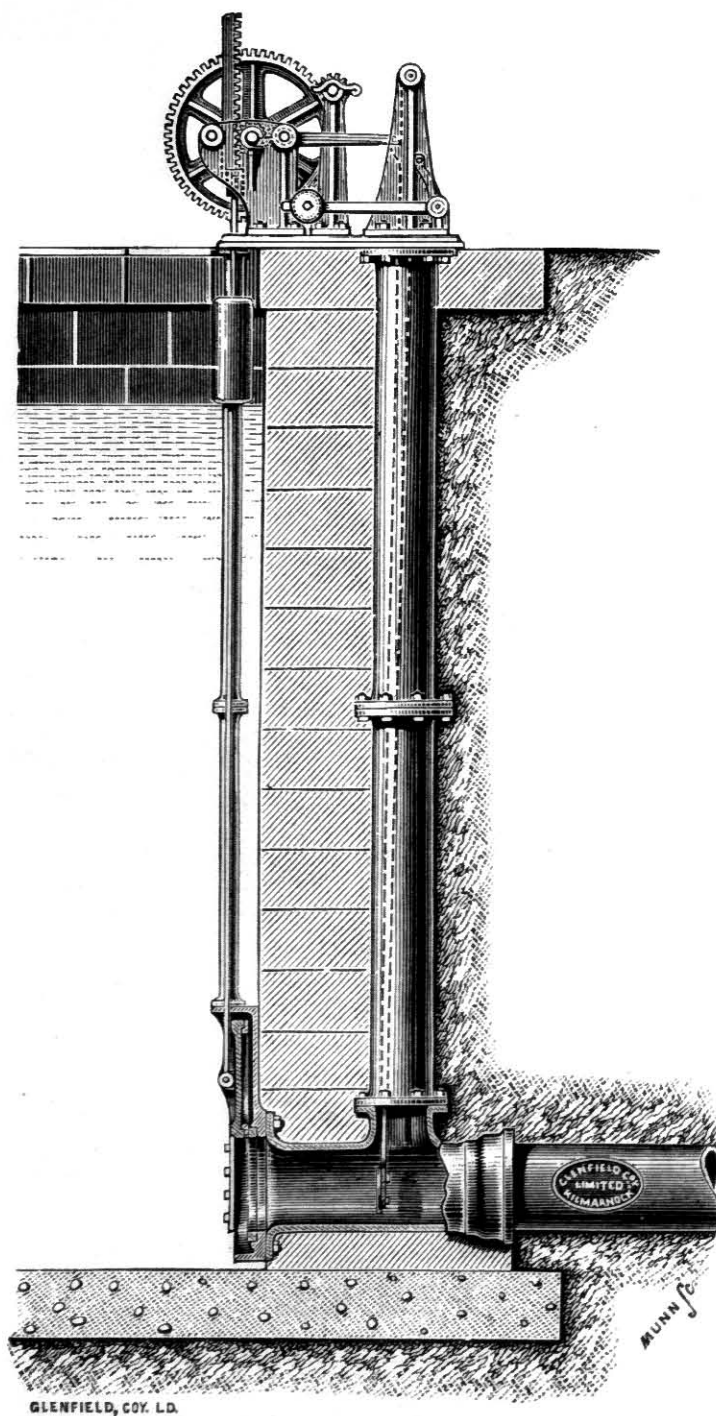
PRICES.

Width.	Depth.	Price, A 105, Wood Door.	Price, A 106, Iron Door.	Width.	Depth.	Price, A 105, Wood Door.	Price, A 106, Iron Door.
2' 0"	1' 6"			3' 0"	3' 0"		
2' 0"	2' 0"			3' 0"	5' 0"		
2' 0"	4' 0"			4' 0"	3' 6"		
2' 6"	2' 6"			4' 0"	4' 0"		
2' 6"	4' 0"			4' 0"	6' 0"		
3' 0"	2' 6"			5' 0"	5' 0"		

Self-closing Sluice,

For fixing in Reservoir or Break-pressure Tank.

Fig. A 108.



When velocity of current in Pipe exceeds a certain limit owing to a burst, the Sluice closes automatically and prevents damage by flooding.

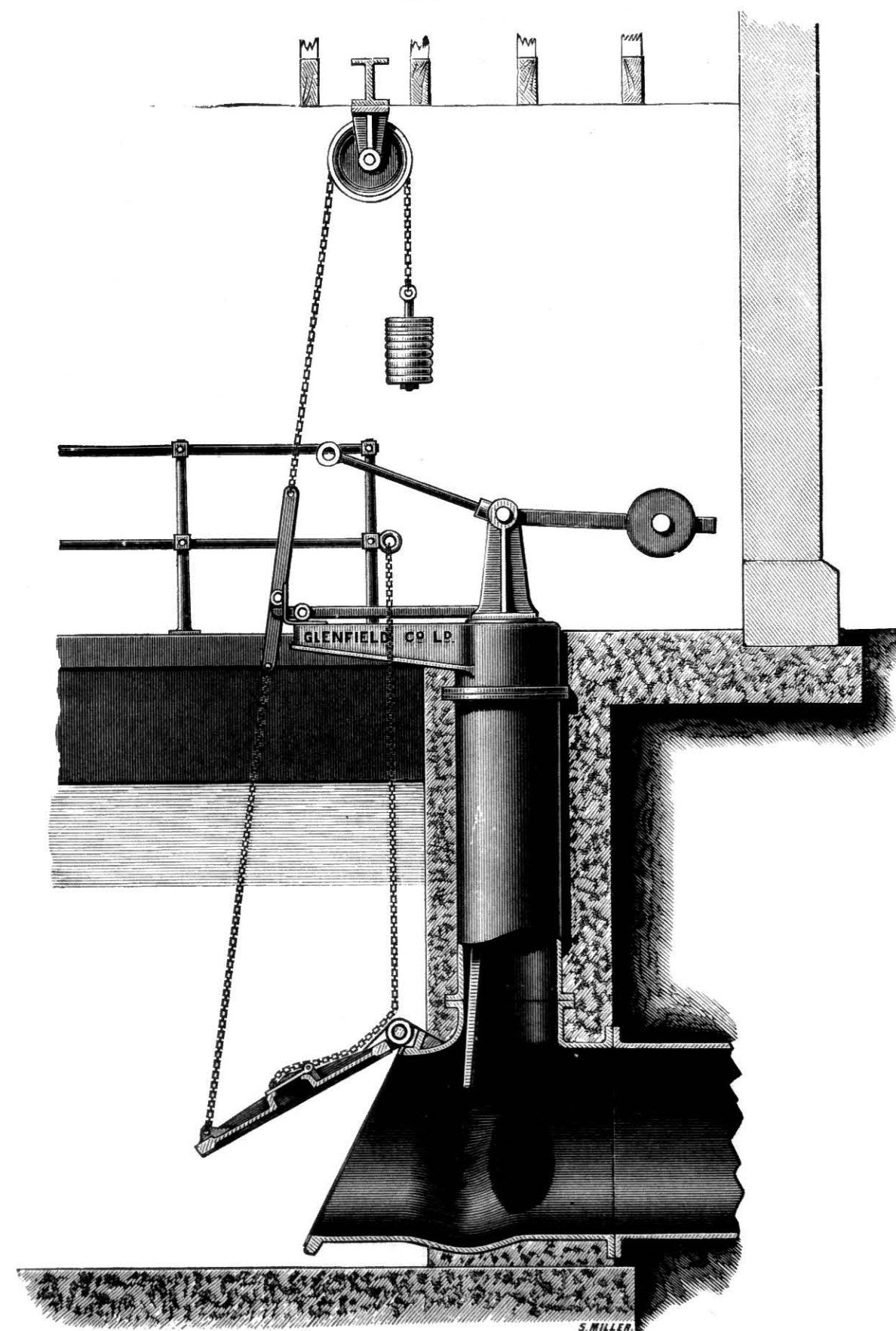
NOTE.—This form of Geared Sluice (without automatic gear) is suitable for quick-shutting Sluice for Measuring Cistern.

Prices on application.

Self-closing Valve,

For fixing in Reservoir, Aqueduct, or Break-pressure Tank.

Fig. A 110.



Made for Bradford, Belfast, Edinburgh, etc.

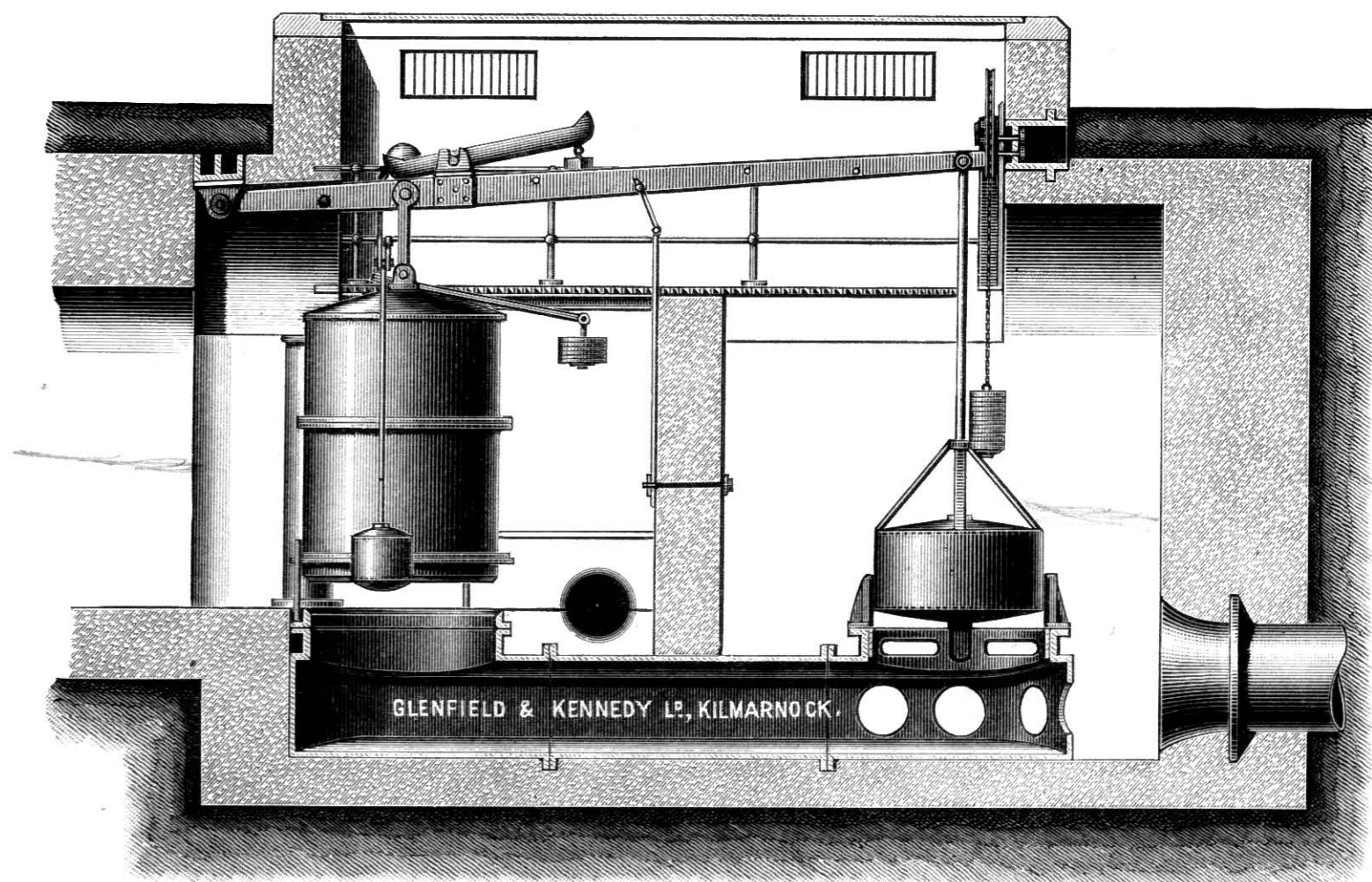
When velocity of current in Pipe exceeds a certain limit owing to a burst, the Flap (being balanced) closes automatically and prevents damage by flooding. The small Flap in centre is for re-charging the Main when burst Pipe is made good.

Prices on application.

Self-closing Valve,

For fixing at end of Aqueducts and beginning of Syphons, or Supply Pipes.

Fig. A 109.



Made for Manchester (Thirlmere Works).

When a burst occurs in Main Pipe, the abnormal draw-off causes Float to drop, thus closing Main Valve (shutting off supply automatically).

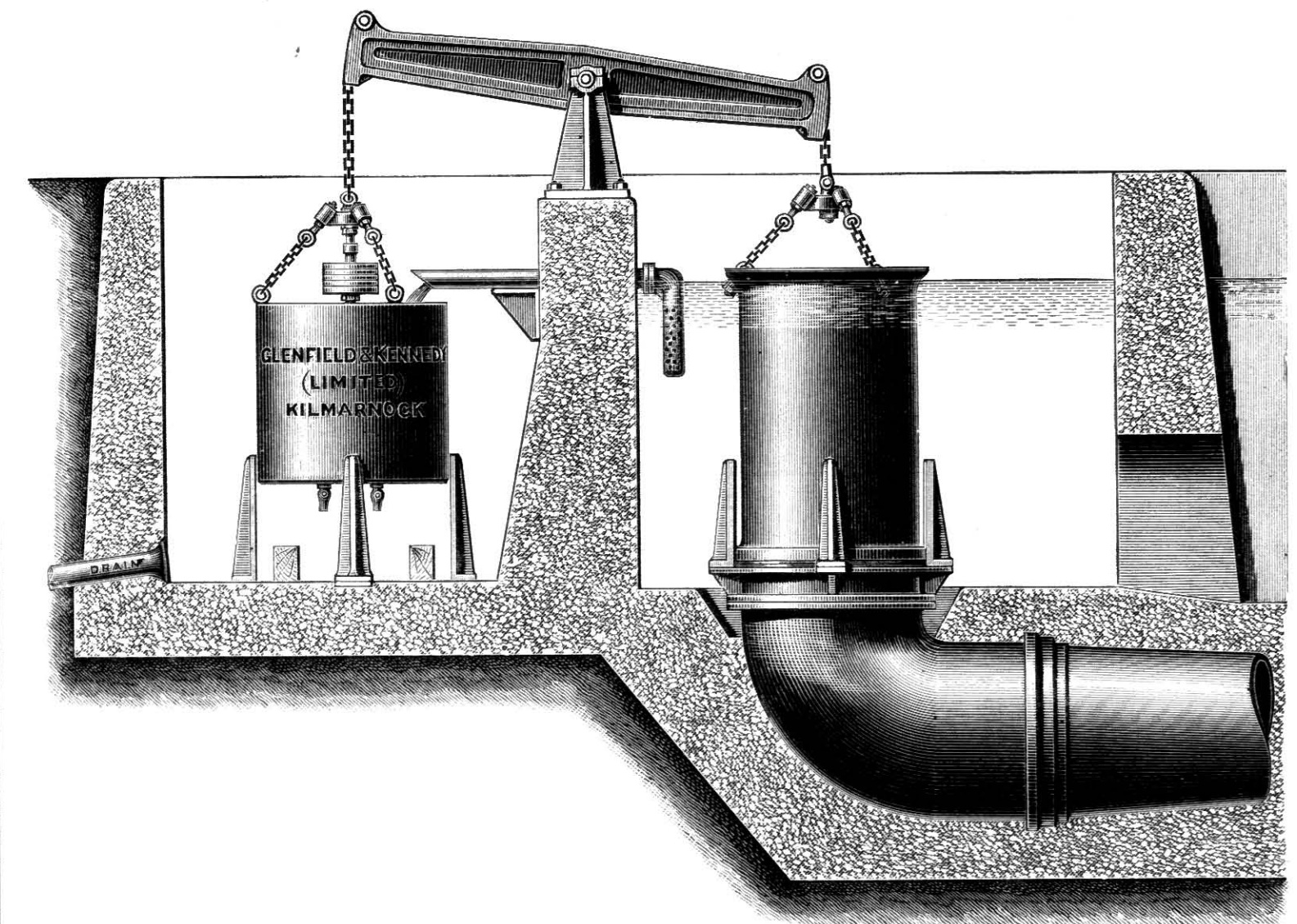
In the event of Aqueduct being temporarily emptied for any purpose, the Main Valve closes, but when Aqueduct is filled small inner Valve is opened by the two side Floats, thus charging the Main Pipe.

When Main is charged the Main Valve also opens automatically.

Prices on application.

Automatic Overflow or Storm Water Discharge.

Fig. A 136.



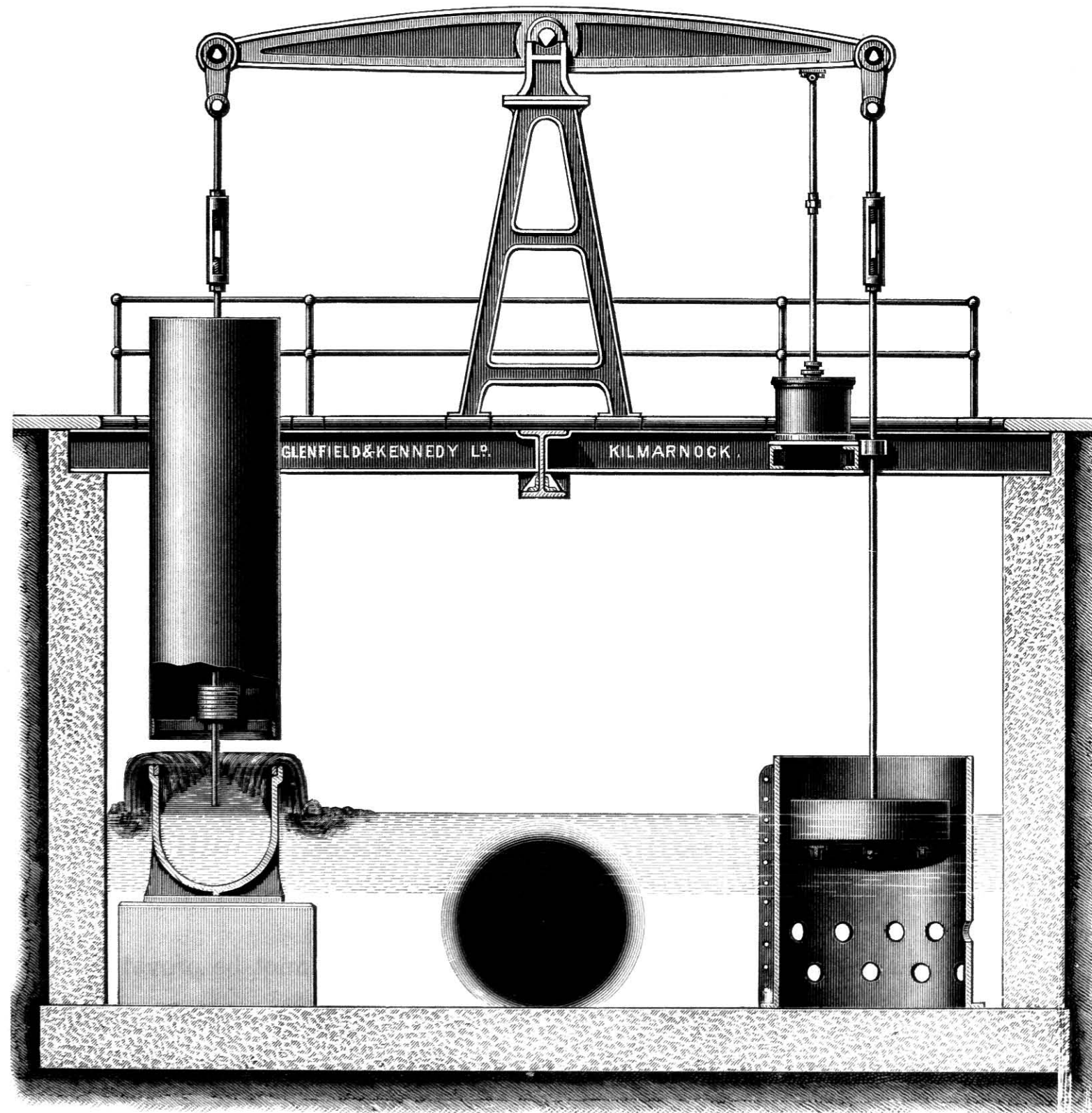
In situations where the ordinary Waste or Overflow Weir cannot be provided large enough to discharge flood water, this Valve arrangement is employed. It opens and closes entirely automatically and does not require the attention of watchman. Its action is steadied by means of a cataract piston in Balance Cylinder.

In use at Arbroath Water Works, Kinlochleven Hydraulic Power Works, etc.

Prices on application.

Regulating Valve.

Fig. A 111.

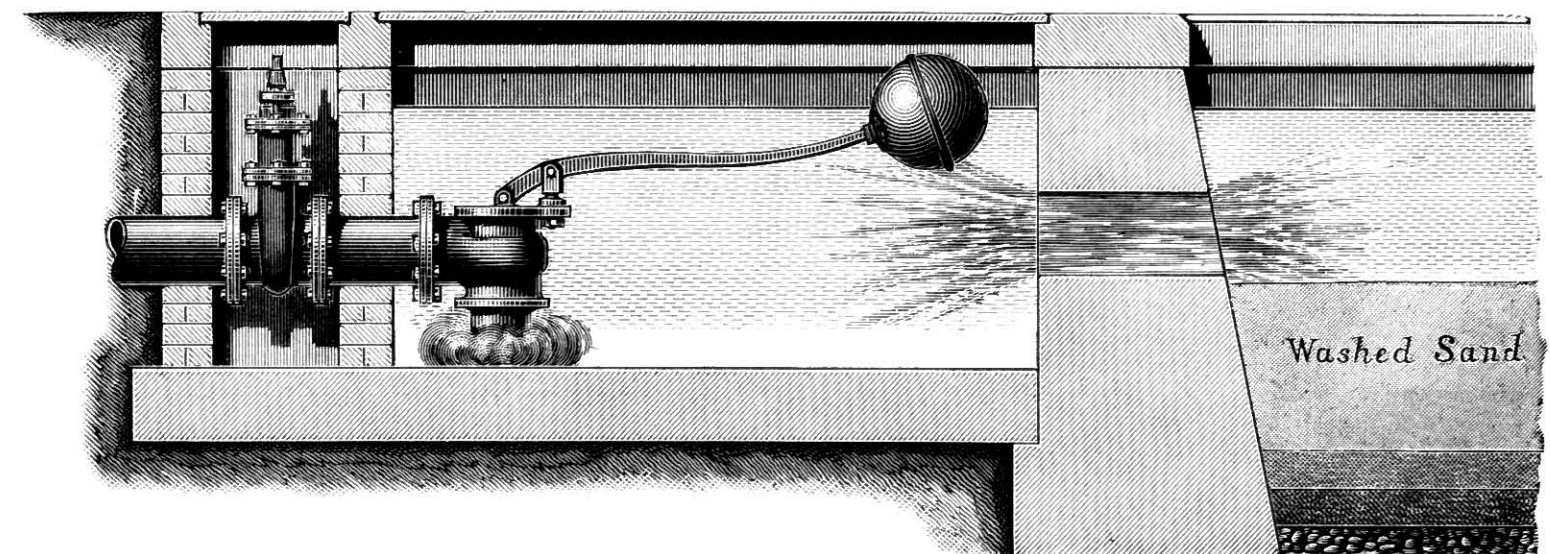


Made for Newcastle Water Works, etc.

Prices on application.

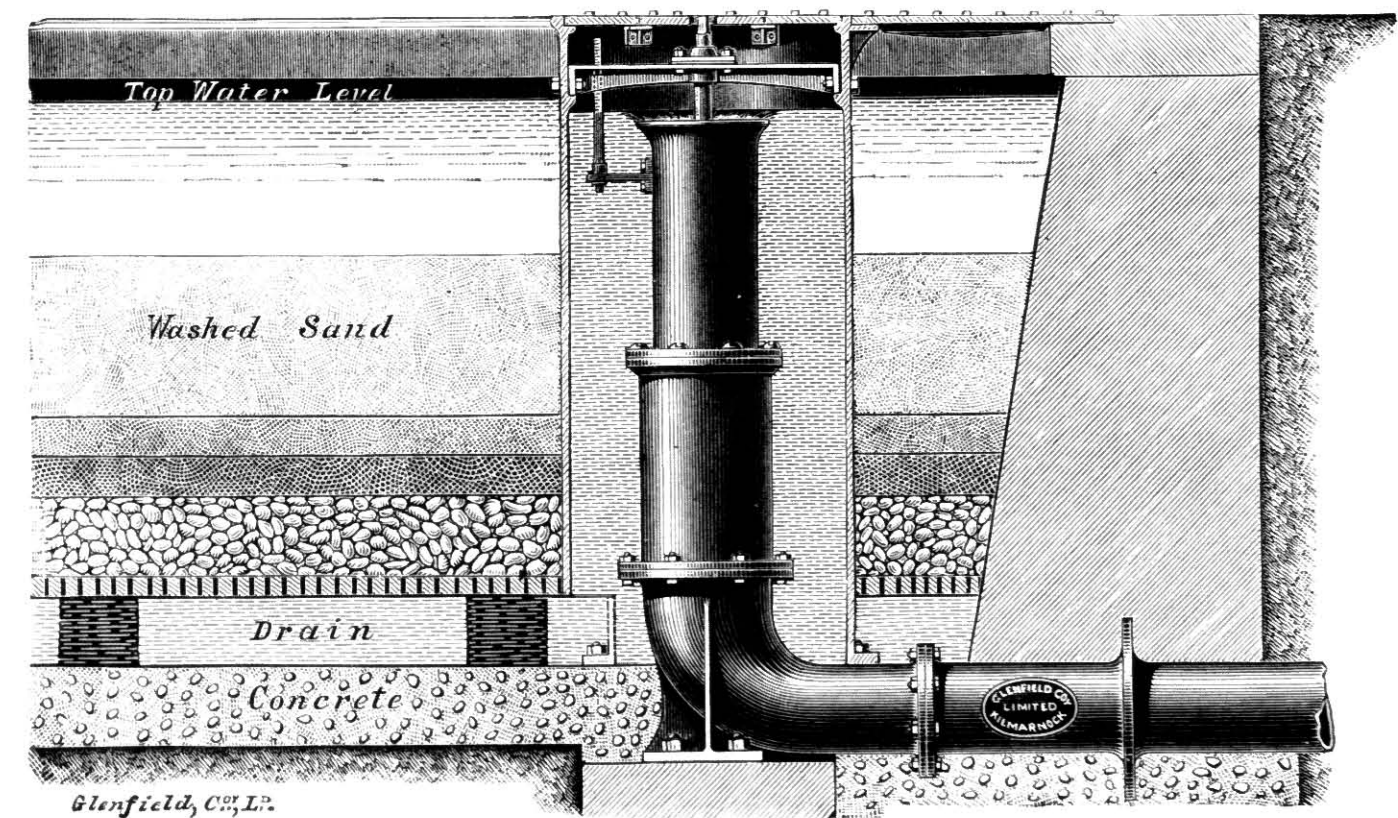
Inlet Arrangement at Filters.

Fig. A 112.



Adjustable Filter Outlet, with Gauging Arrangement.

Fig. A 114.



In Cast-Iron Cylinder.

By means of the Central Screw the difference in level (and, consequently, the head on the sand) between Inlet and Outlet can be varied at pleasure, while the Gauge Rod gives means of calculating the volume of the clear water discharge.

The movable Cylinder is of gun-metal, fixed Cylinder is lined with brass and has rolling packing.

The following Sizes have been made :—

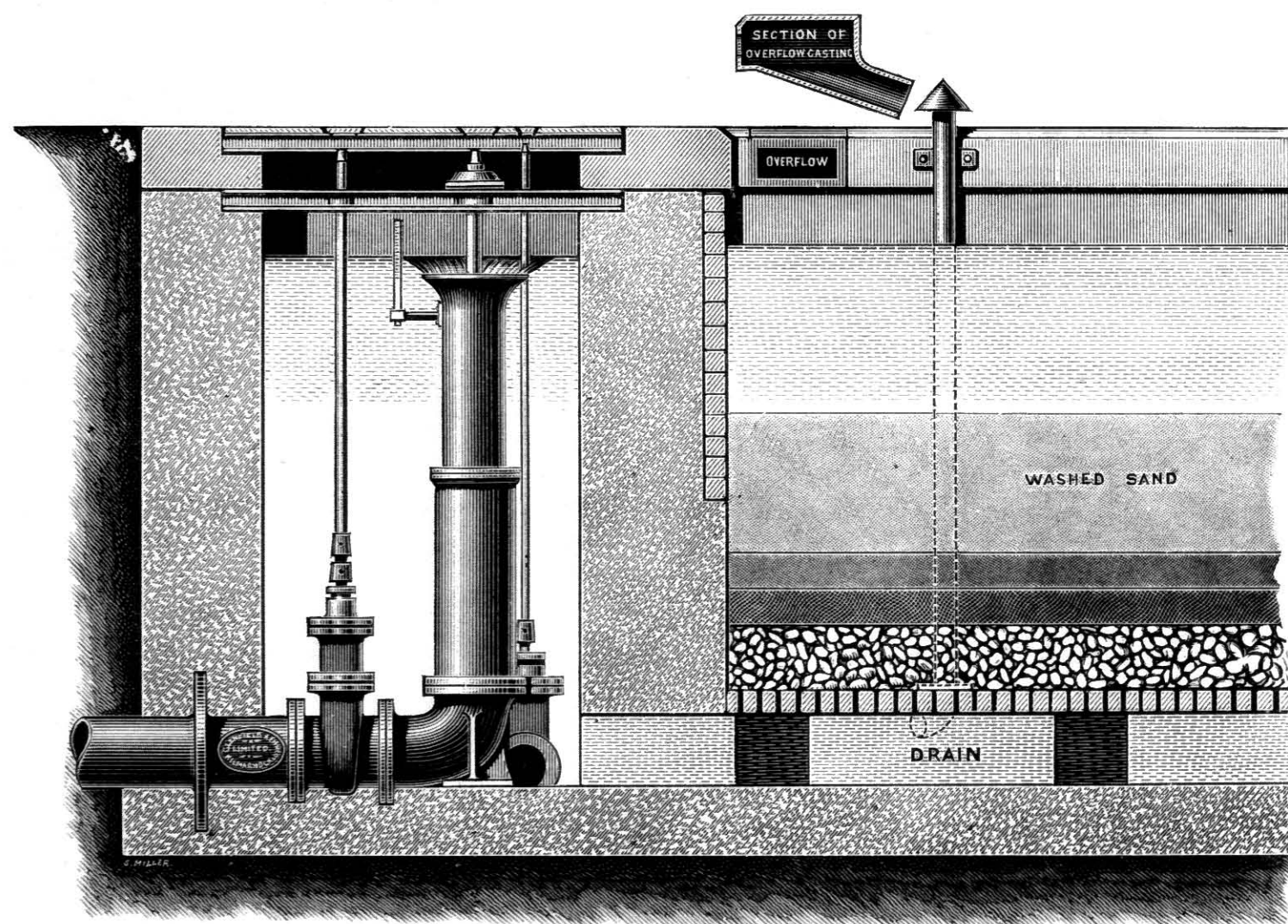
Gun-metal Cylinder, ..	4½"	5½"	7"	8"	9"	9"	10"	12"	15"	18"	24"	dia.
Outlet Pipe, ..	3"	4"	6"	7"	8"	9"	10"	12"	15"	18"	24"	„

Prices on application.

Adjustable Filter Outlet.

With Gauging Arrangement.

Fig. A 115.



The above is very similar to Filter Outlet shown on page 39, except that the Apparatus is placed in concrete Well instead of cast-iron Cylinder.

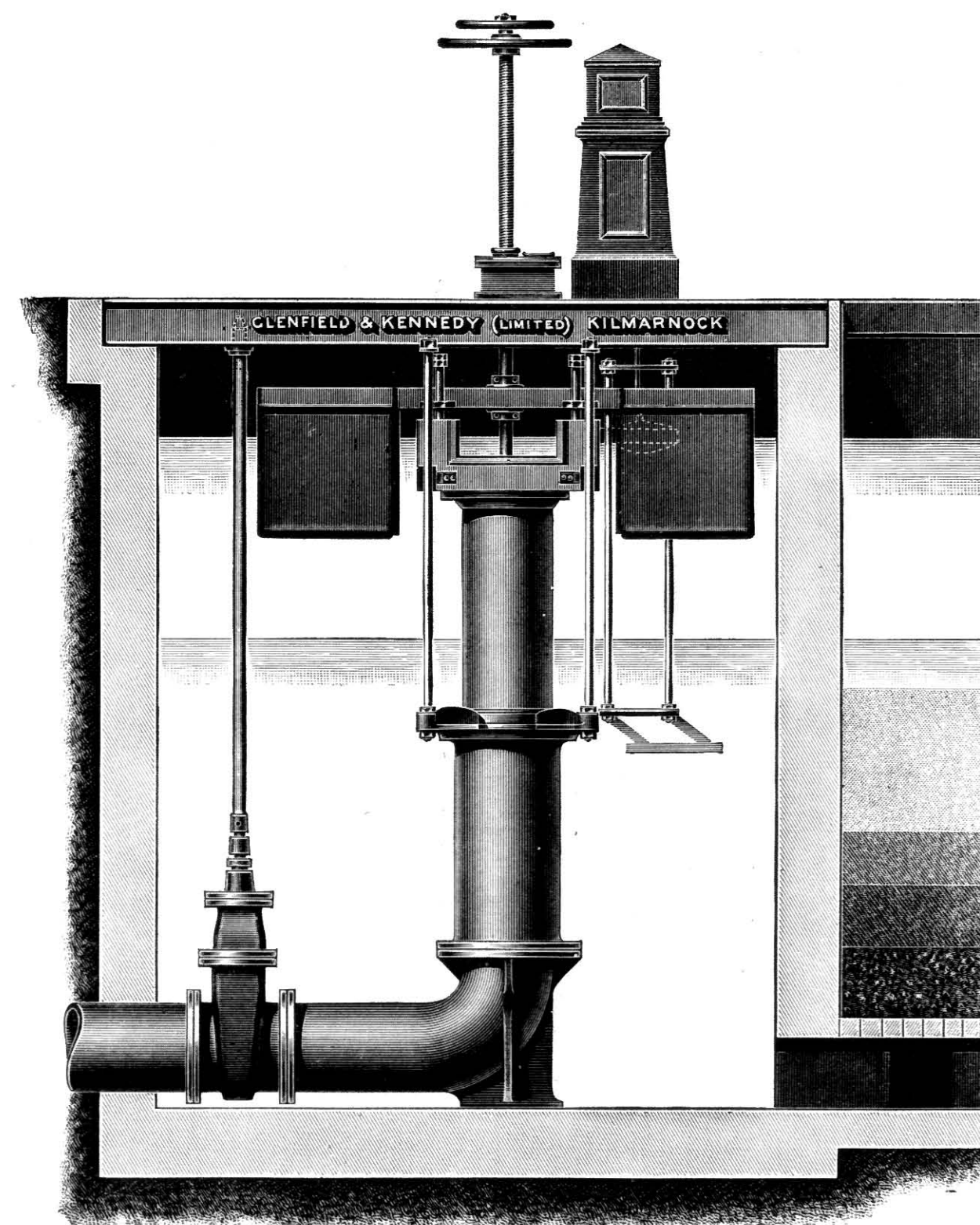
The small Sluice Valve is for scouring.

The larger Valve is for controlling discharge from Filter, and can be supplied or not as desired.

Prices on application.

Glenfield-Jones Filter Outlet Regulator.

Fig. A 118.

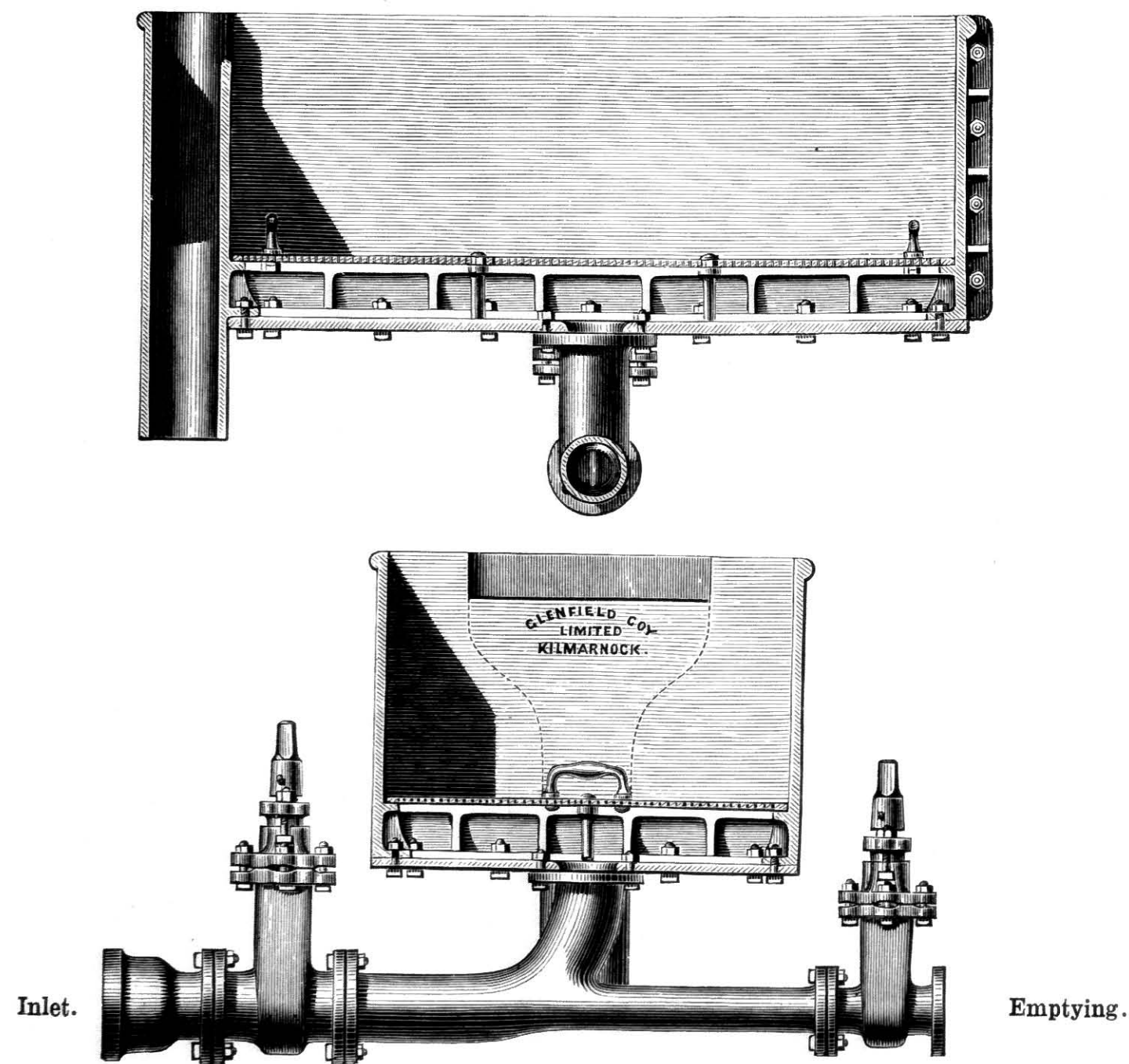


Telescopic Tube is carried by Floats, allowing it to rise and fall with the variation of the water level. The Box has notches or weirs for measuring the water discharged. The Weir Box is raised or lowered by Screw and small Hand Wheel, so as to increase or diminish the overflow at pleasure. An Index is fitted to side of Pillar showing the depth or quantity of water flowing over Weir. The large Wheel is for raising the whole arrangement and to act as a stopper at the desired limit of low draw-off. Thus the Outlet automatically adjusts itself to the condition of the Filter Bed, as, when the sand becomes partially clogged, the water level in Outlet Well will fall and thus increase the working head on Filter till permissible maximum is reached. A Recording Apparatus as shewn can be fixed, if desired, giving a record of the depth flowing over Weir.

Prices furnished on receipt of particulars giving Size of Outlet Pipe, Depth of Water in Well, etc.

Sand Washing Machine.

Fig. A 120.



To wash foul sand from the Filters thoroughly clean, only a few feet head of water is necessary. The supply should be ample. All the pressure needed is just to keep the particles of sand from lying on the Perforated Plate. The waste water is carried off by Overflow Pipe at end.

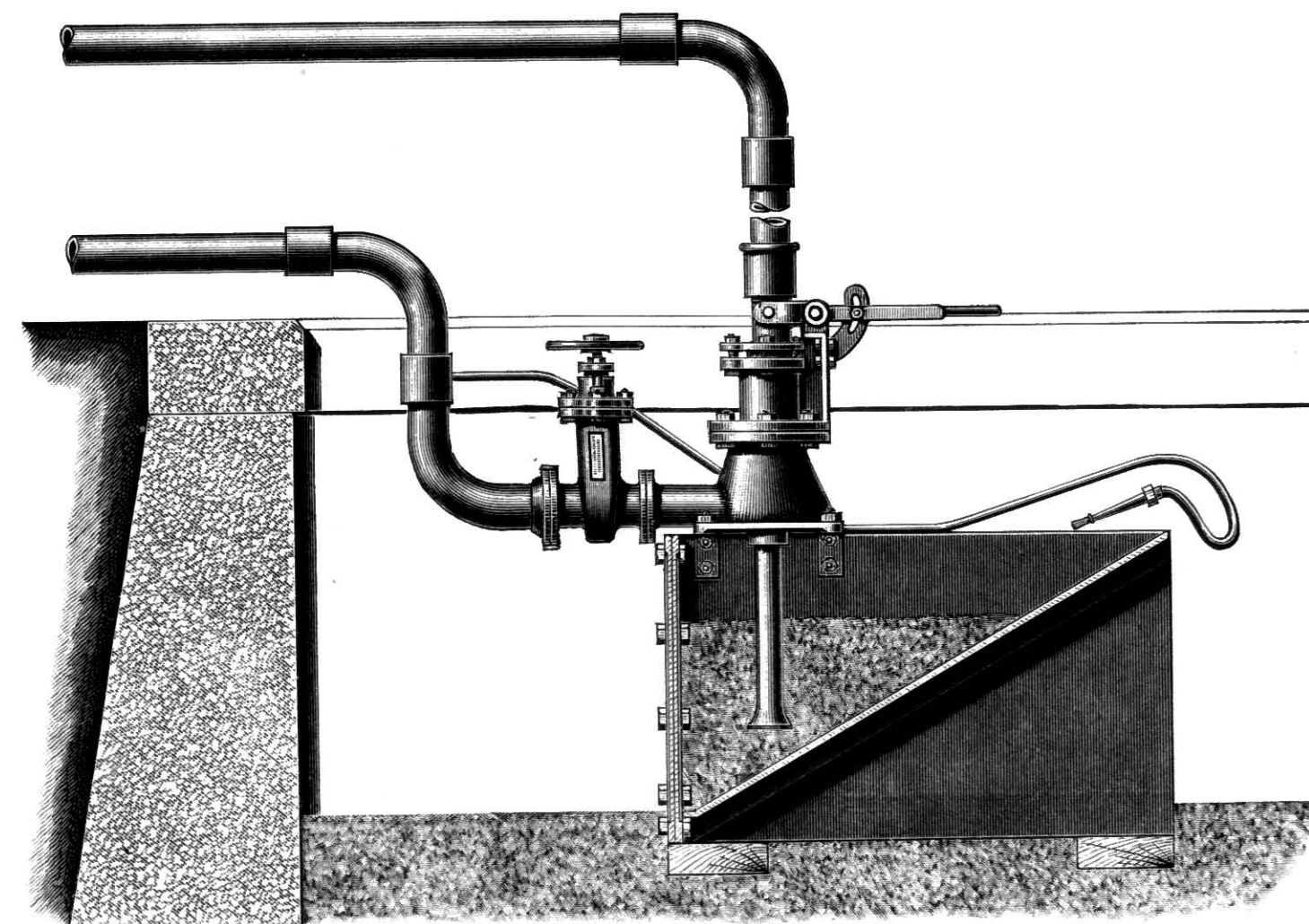
Patterns have been made for undernoted Sizes :—

Approximate quantity of Sand washed per hour. Tons. Prices.			Approximate quantity of Sand washed per hour. Tons. Prices.		
8' x 4' x 3' 6" deep.	5.0		5' x 4' x 2' 11 3/8" deep.	2.8	
6' x 4' x 4' "	4.4		6' x 3' x 2' 6" "	2.0	
6' x 4' x 3' "	3.4		4' 6" x 2' 6" x 1' 10" "	1.0	
6' x 4' x 2' 6" "	2.8				

NOTE.—1" wrought-iron Bars placed close together are sometimes used instead of Perforated Plate.

Hydraulic Ejector, For Sand Washers.

Fig. A 122.



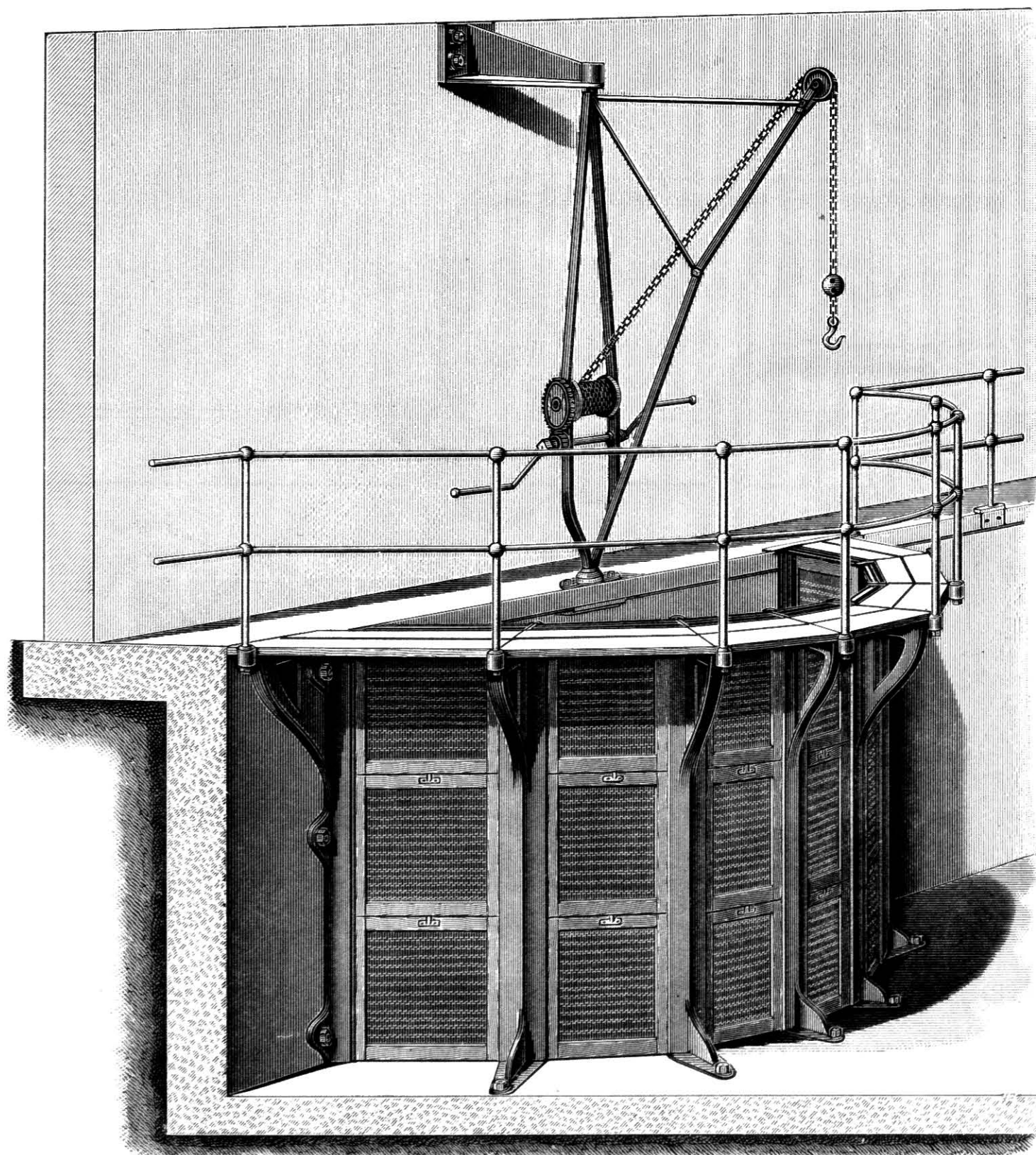
The Box with sloped bottom is placed in Filter Bed and the dirty sand shovelled into it. Being subjected to action of Jet from small Hose, the sand and water are raised by Ejector and thrown up to ground level at side of Filter.

In use at Birmingham Water Works, etc.

Prices on application.

Screening Well, with Removable Screens.

Fig. A 101.



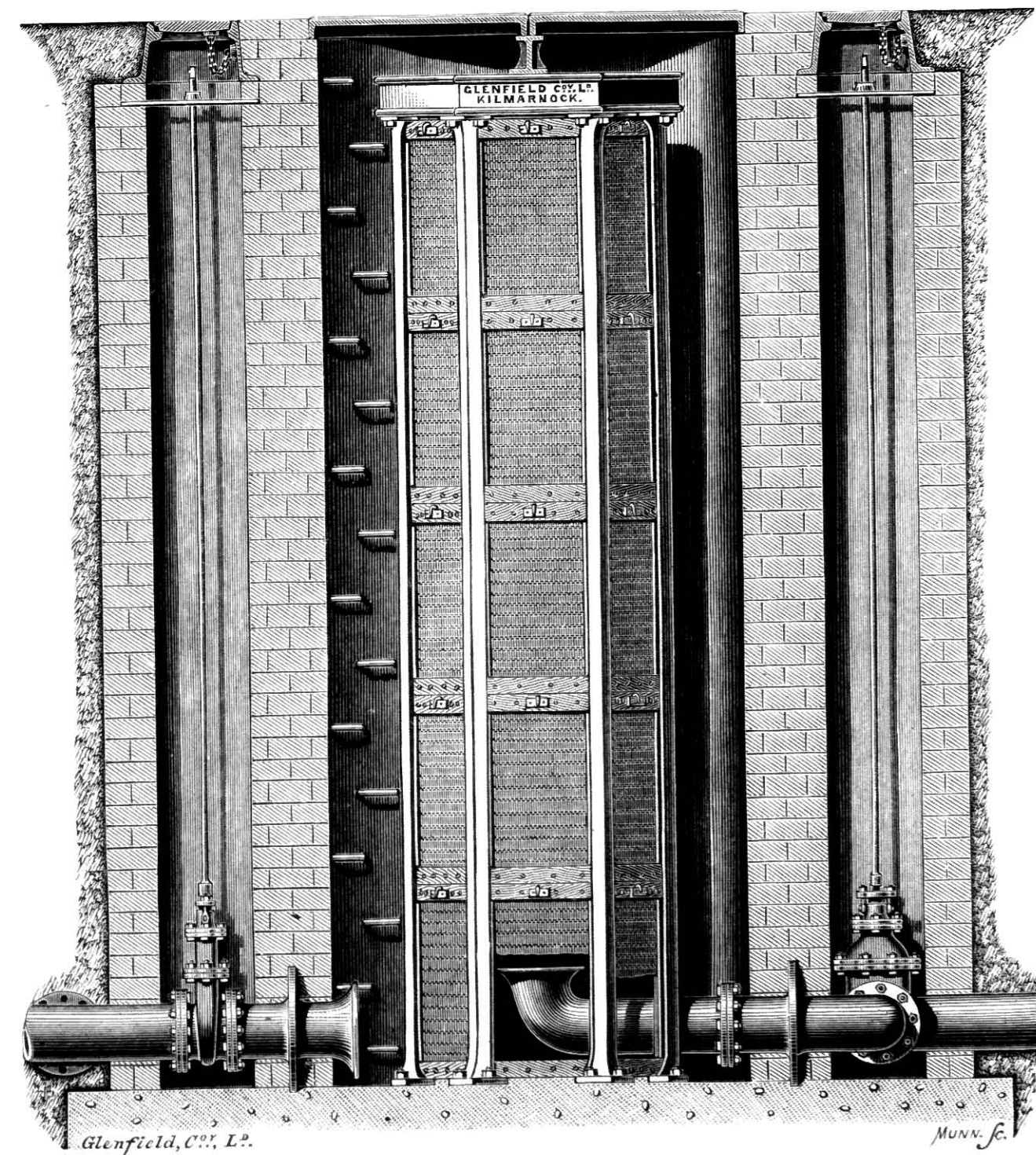
The Screens are in duplicate, there being double grooves in Standards to receive them.

Prices on application.

Screening Well, with Removable Screens.

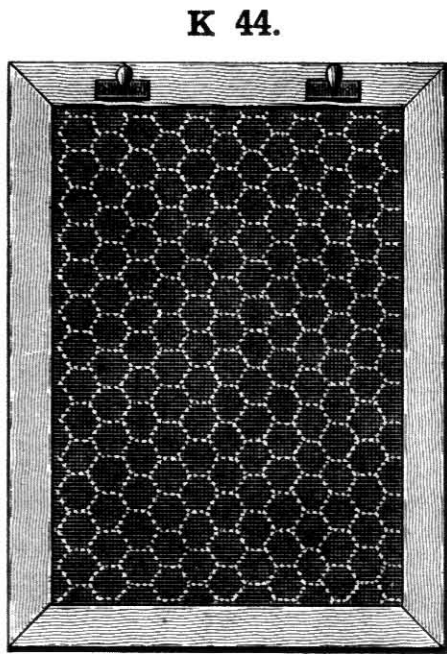
With By-pass Pipes and Valves.

Fig. K 100.

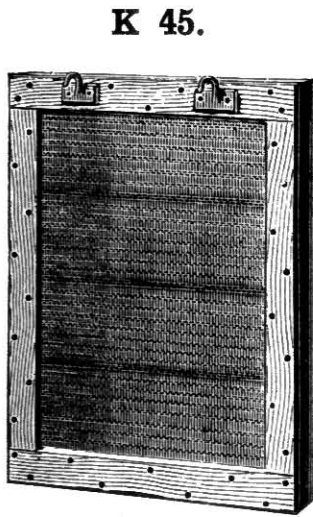


For particulars of Wire Cloth, see pages 47 and 48.

Screens,
With Copper Wire bound in Timber Frames.



K 44.

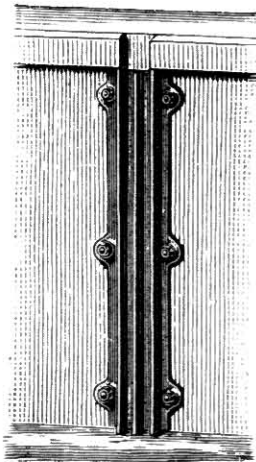


K 45.

PRICES OF K 45.

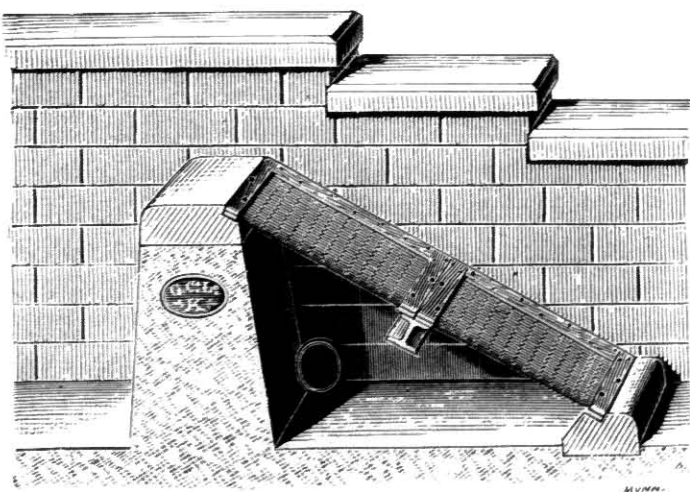
Outside Sizes.		Price.
Width.	Depth.	
2' 6"	3' 0"	
3' 0"	3' 0"	
3' 3"	3' 3"	
3' 3"	3' 6"	
3' 6"	3' 6"	
3' 6"	3' 9"	
4' 0"	4' 0"	
4' 0"	4' 6"	
4' 6"	4' 6"	
4' 6"	5' 0"	

GUIDES
FOR SCREENS.
K 61.

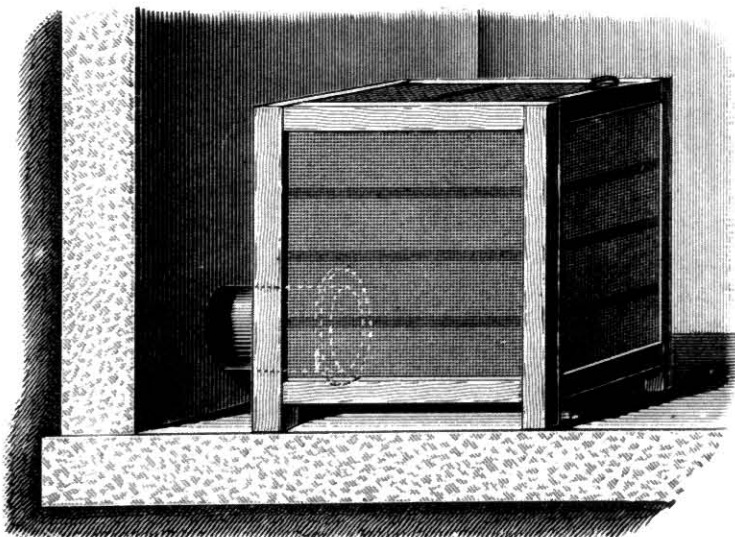


The Screens are usually arranged in duplicate, so that one can be cleaned while the other is in use. K 44 has octagonal mesh behind to support the wire cloth. K 45 is made with gun-metal bars to support the wire cloth.

ARRANGEMENT OF SCREENS AT INTAKE.
K 106.



BOX SCREEN.
K 107.




The water is passed over the Sloping Screen (K 106), which is thus self-cleansing. The screened water passes into Pipe. This arrangement is good where plenty of water is available.

Prices on application.

Table of Deliveries of Water through Wire Cloth Strainers.


TABLE No. I.

EXPERIMENTS ON DELIVERY OF WATER THROUGH COPPER WIRE CLOTH STRAINERS, ORDINARY SQUARE MESH, THUS 																				
1. Spaces per Lineal In.	2. Spaces per Sq. In.	3. Thickness of Wire. W. G. Decimals.		4. Width of One Space. Decimal Ins.	5. Area of One Space. Decimal Sq. Ins.	6. Area of Water- way in Sq. Ins. Per Sup. Ft.	7. Weight per Sup. Ft. Oz.	8. Approx. Price per Sup. Ft.	9. Equal to Price Per Lb.	Delivery in Gallons per Minute under the following Heads.										
		No.	Ins.							Head of Water in Ins. Equal to Lbs. per Sup. Ft. in Wire Cloth.	$\frac{1}{4}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{2}$	2	3	4		
4	16	16	.065	.185 x .185	.034225	79	10.57				310	374	442	514						
8	64	22	.028	.097 x .097	.009409	86	8.375				195	280	374							
10	100	25	.020	.08 x .08	.0064	92	7.0				408	442	478	514						
13	169	22	.028	.048 x .048	.002304	58	6.0				250	280	310	408						
16	256	26	.018	.044 x .044	.001936	72	5.4				222	310	408							
20	400	29	.013	.037 x .037	.001369	79	4.8				195	236	280	374						
30	900	31	.010	.023 x .023	.000529	70	4.18				195	280	342	374	408					
40	1,600	31½	.0095	.015 x .015	.000225	55	4.18				144	182	222	250	342	442				
50	2,500	32	.009	.011 x .011	.000121	43	4.5				121	169	222	280	342					
60	3,600	33½	.0075	.0091 x .0091	.000082	43	3.8				62	78	99	121	169	195	280	382		
80	6,400	34½	.006	.0065 x .0065	.00004225	39	2.9				62	78	132	169	222	280	374			
100	10,000	36	.0042	.0058 x .0058	.00003364	48	2.0				43	62	78	99	144	195	280	*		
120	14,400	42	.0038	.0045 x .0045	.00002025	42	2.0				28	43	62	78	99	121	195			

The size of the piece of Copper Wire Cloth exposed to the water was exactly 12" x 12" in all cases. * Washed after each observation.

Table of Deliveries of Water through Wire Cloth Strainers.

TABLE No. II.

EXPERIMENTS ON DELIVERY OF WATER THROUGH COPPER WIRE CLOTH STRAINERS,
LONG WIRES LYING PARALLEL, WITH RIBBON MESH, THUS 

1.	2.		3.	4.	5.	6.	7.	Delivery in Gallons per Minute under the following Heads.								
	Thickness of Wire.							Head of Water in } Ins.	1	1½	2	3	4			
	W.G. Decimals.	No.												¾	½	¾
Spaces per Lineal In.			Decimal Ins.	Area of Waterway in Sq. Ins.	Weight per Sup. Ft.	Approx. Price per Sup. Ft.	Equal to Price per Lb.	Equal to } Lbs. per Sup. Ft. on Wire Cloth.								
6	12	.109	.058	30	40				144	169	195	222	280	342	408	
8	15	.072	.053	45	38				169	222	280	342				
10	15	.072	.028	25	36				99	121	144	169	195	222	280	342
12	17	.058	.025	33	30				144	169	222	250	280	310		
14	18	.049	.0224	34	27				121	169	208	250	280	342		
16	19	.042	.0205	35	20				121	169	195	222	280	342		
18	20	.035	.0205	40	18				99	121	144	195	222	250	310	374
20	21	.032	.019	39	15				110	144	195	222	310	342		
24	21	.032	.0095	25	16				78	99	121	144	182	250	310	

The size of the piece of Copper Cloth exposed to the water was exactly 12" x 12" in all cases.

Harvey's Patent Straining or Filtering Apparatus for Water Mains.

Fig. K 102.

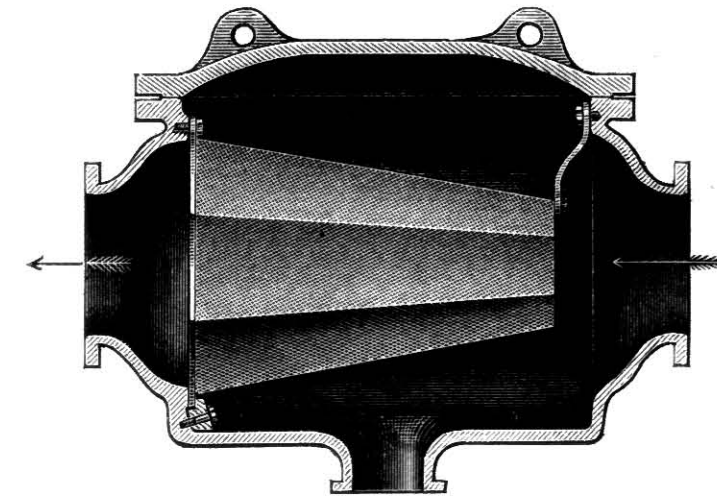


Fig. K. 103.

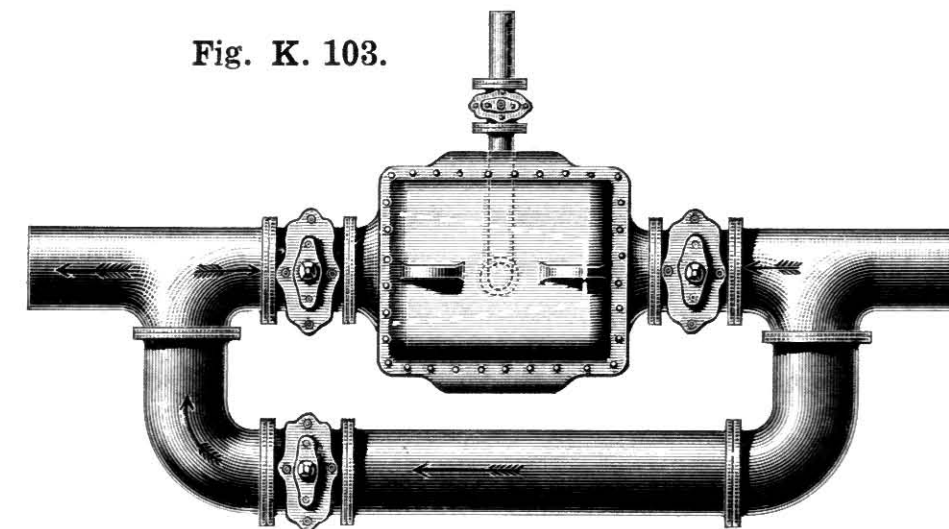
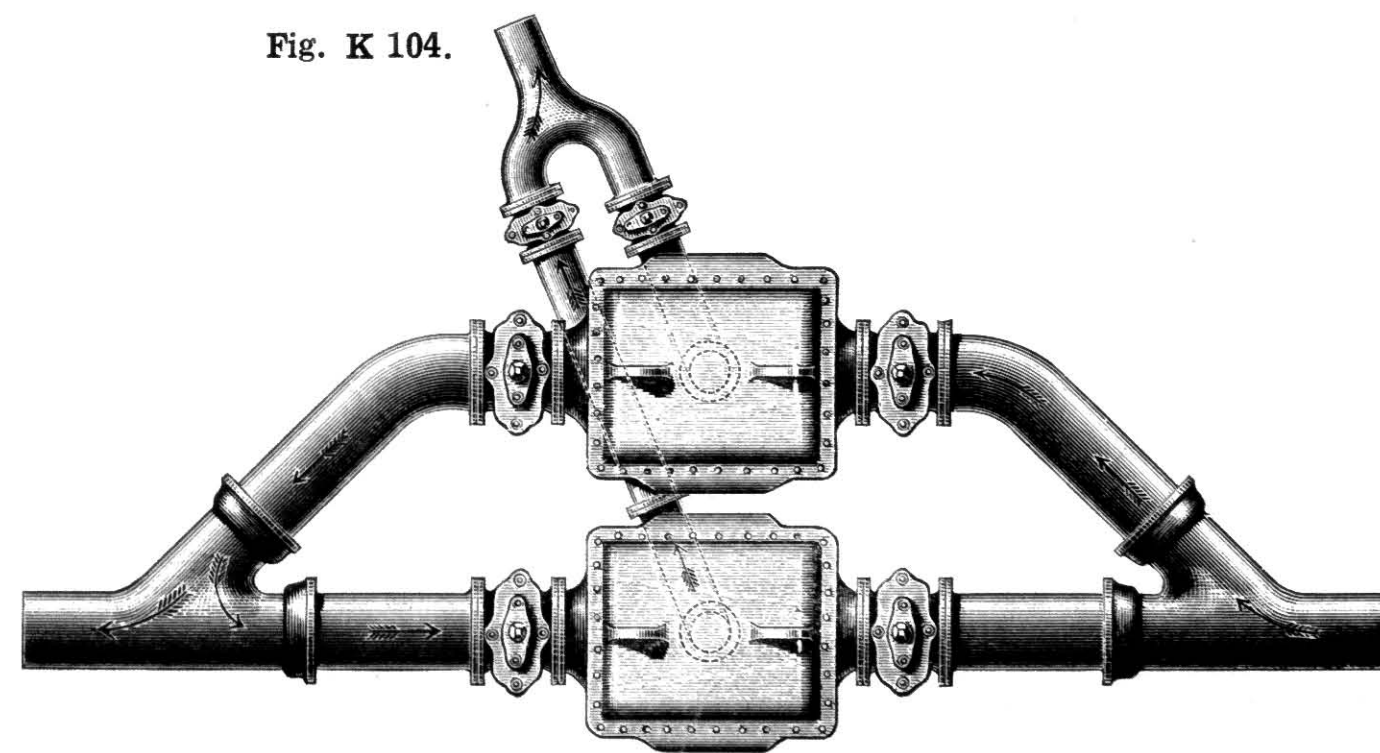


Fig. K 104.



For description see next page.

Harvey's Patent Straining or Filtering Apparatus for Water Mains.

This apparatus consists of a cast-iron Box fitted internally with a skeleton framework of gun metal, covered all over (except on the outlet end) with either perforated sheet copper or copper wire gauze, and forming a Strainer of large superficial area and of any required degree of fineness. This Strainer is securely pinned to the inside of Box, over the mouth of the outlet to the water main. The Box or Chamber, besides having the necessary inlet and outlet branches provided on the ends, has also a scour or cleaning branch provided on bottom as shown by the vertical section in Fig. K 102, p. 49.

The Strainers are usually fitted into the main in pairs, one being in the main and one in a by-pass, and both fitted with stop valves on the inlet and outlet branches, as also valves on the scour pipes, as shown in plan by Fig. K 104, p. 49. By this arrangement one of the Strainers may be cleaned without disturbing the main supply through the other Strainer. The cleansing of a Strainer is done by closing the inlet valve of the Strainer to be cleaned and opening its scour valve, when part of the water which has passed the open Strainer will go back through the outlet valve of the closed Strainer and away to the drain by the scour pipe, thus reversing the flow of water in the closed Strainer and effectually washing it out.

A single Strainer may also be arranged to be self-cleansing by being placed in the main and having a by-pass formed round it, as shown by Fig. K 103, p. 49. In this arrangement the by-pass valve is kept closed during the time the water is passing down the main. For cleansing this Strainer the inlet valve is closed and the by-pass valve and scour valve opened, when part of the water passing will go as before, backwards through the Strainer and wash it out through the scour valve.

We would recommend, however, that wherever possible the arrangement as shown by Fig. K 104, p. 49, should be adopted, as in this type nothing but strained water is passed down the main, whereas in Fig. K 103, p. 49, arrangement, during the time the Strainer is being cleaned, the water which is passing down the main is unstrained.

This Strainer is less costly than the straining arrangements usually adopted. It is simple in construction, cannot get out of order, and can be easily examined by taking off the cover of the straining chamber.

Prices on application.

Intake Gratings.

Fig. A 138.

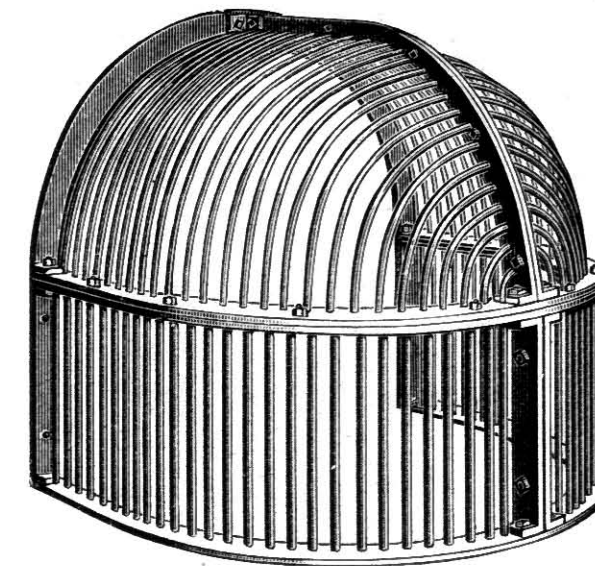
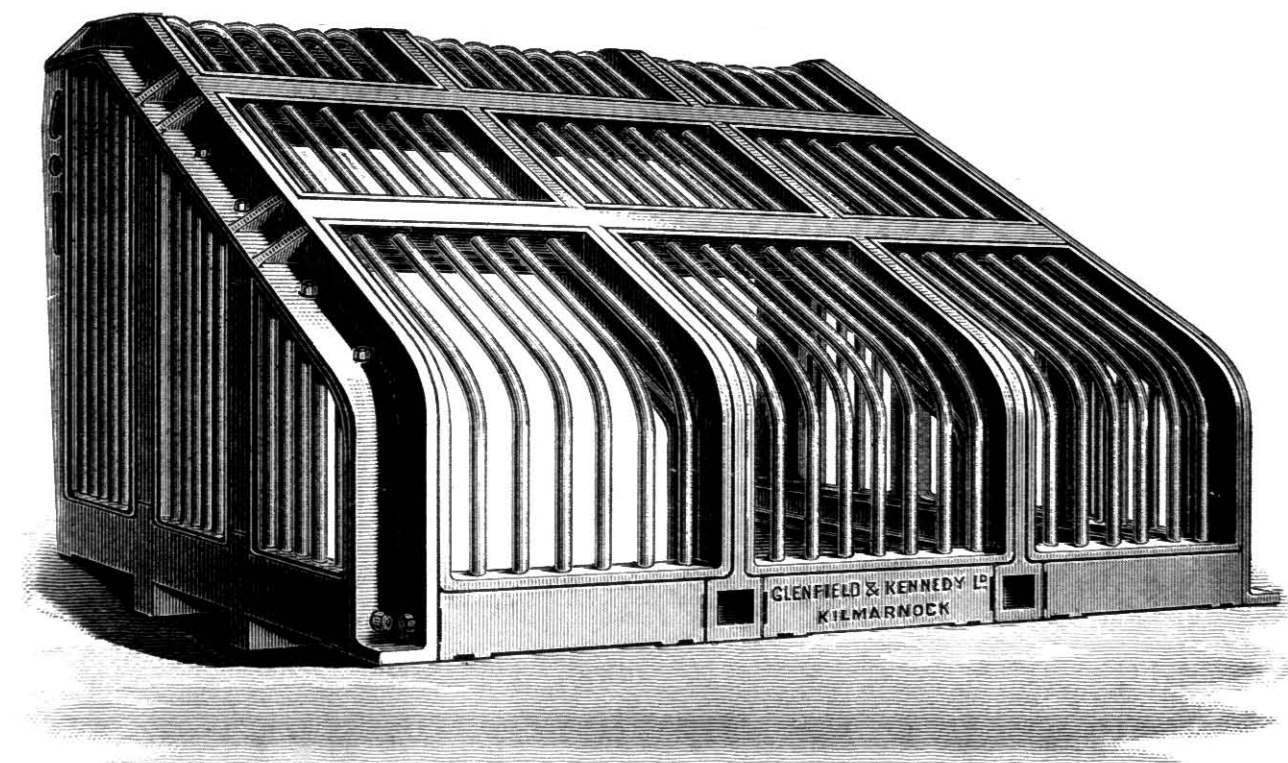


Fig. A 139.



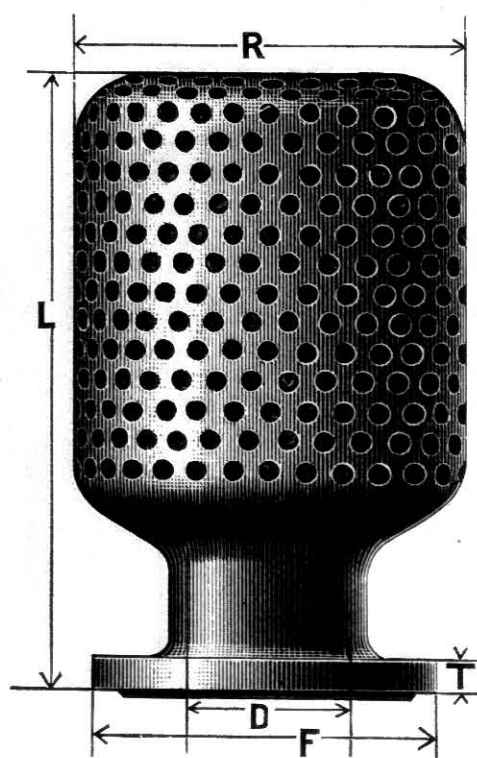
The size and form are designed to suit circumstances.

Prices on application.

DIMENSIONS AND PRICES OF

Cast-Iron Rose-pieces or Strainers.

Fig. A 125.



Dia. of Pipe. D	Dia. of Flange. F	Thick-ness of Flange. T	No. of Bolts in Flange.	Dia. of Bolt Circle.	Outside Dia. of Rose. R	Total Length of Rose. L	PERFORATIONS.		Price.
							Size of Hole.	No. of Holes.	
1½"	5¼"	⅝"	4	½"	3⅞"	5¼"	1½"	18	
2"	6"	¾"	4	⅝"	4½"	6"	1½"	33	
2½"	6½"	¾"	4	⅝"	5"	6¼"	1½"	50	
3"	7¼"	¾"	4	⅝"	5¾"	7½"	1½"	80	
4"	8½"	7⁄8"	4	⅝"	7"	8½"	¾"	64	
5"	10"	7⁄8"	8	⅝"	8¼"	9⅝"	¾"	90	
6"	11"	7⁄8"	8	⅝"	9¼"	11"	¾"	132	
7"	12"	1"	8	⅝"	10¼"	13"	7⁄8"	132	2-14
8"	13¼"	1"	8	⅝"	11½"	13⅜"	7⁄8"	168	14
9"	14½"	1"	8	⅝"	12¾"	15"	1"	168	
10"	16"	1"	8	¾"	14"	17"	1"	216	
12"	18"	1⅝"	12	¾"	16"	19½"	1"	300	
14"	20¾"	1¼"	12	7⁄8"	18½"	23"	1⅝"	384	
15"	21¾"	1¼"	12	7⁄8"	19½"	23"	1⅝"	384	
18"	25¼"	1⅝"	12	7⁄8"	23"	26¼"	1⅝"	532	

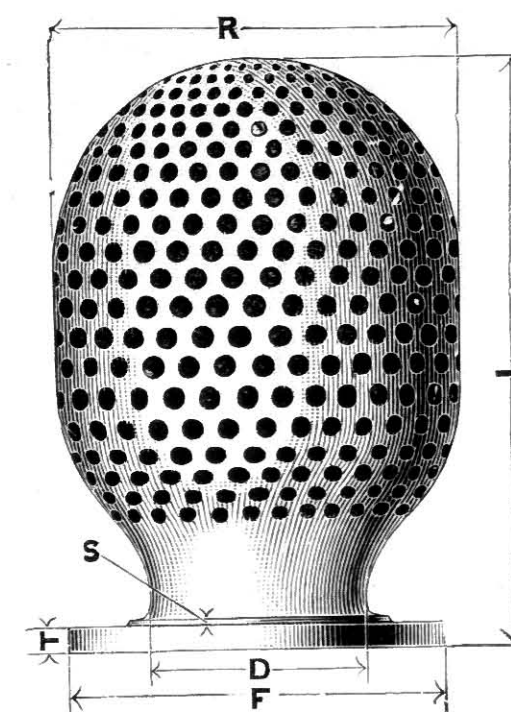
Flanges faced.

DIMENSIONS AND PRICES OF

Copper Rose-pieces or Strainers.

With Brass Flanges.

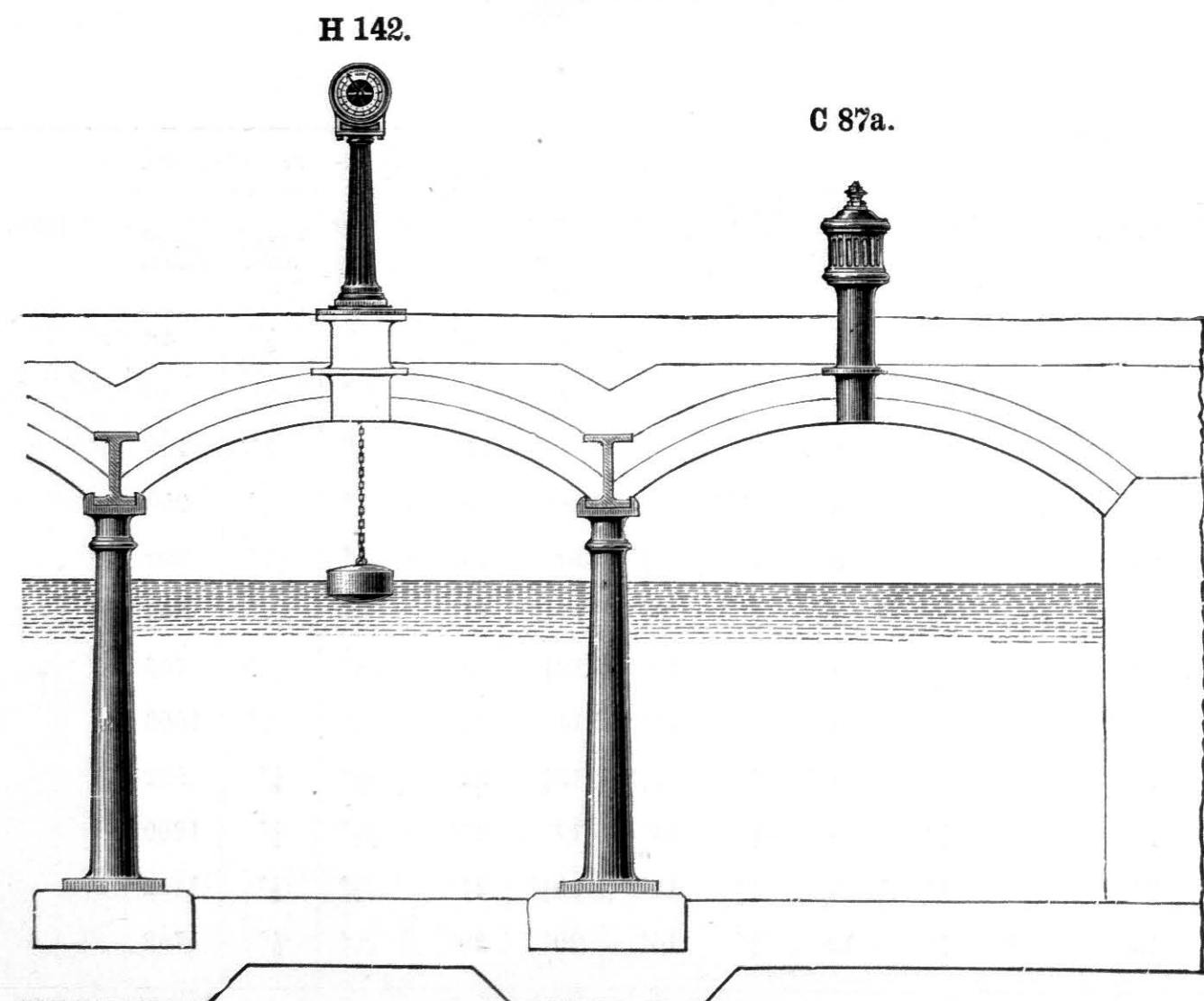
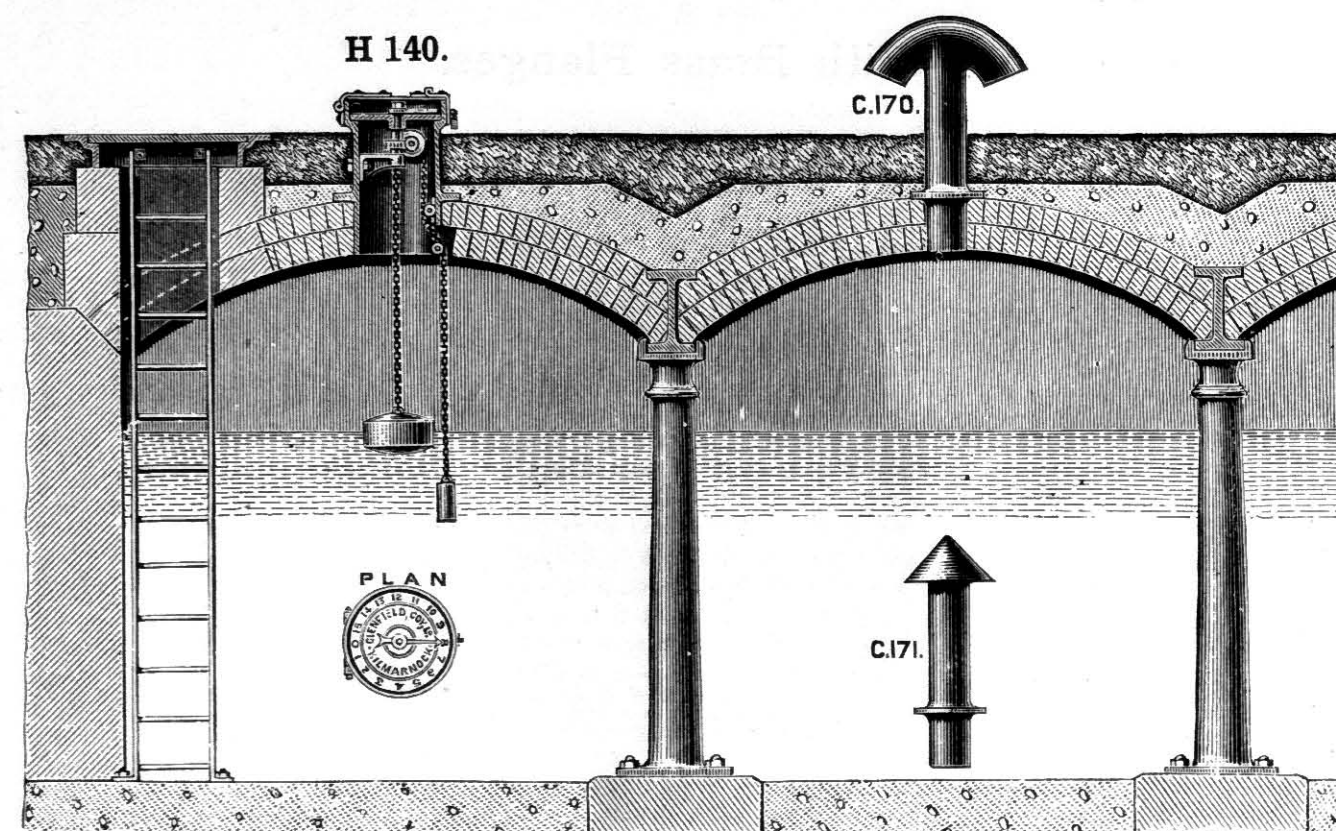
Fig. A 126.



Dia. of Pipe. D	Dia. of Flange. F	Thick-ness of Flange. T	Extra Thick-ness of Neck of Flange. S	No. of Bolts in Flange.	Dia. of Bolt Circle.	Outside Dia. of Rose. R	Total Length of Rose. L	Thick-ness of Copper in Rose.	PERFORATIONS.		Price.
									Size of Hole.	No. of Holes.	
1½"	5¼"	⅝"	1⁄8"	4	½"	3⅞"	5"	1⁄8"	⅜"	48	
2"	6"	¾"	1⁄8"	4	⅝"	4½"	6"	1⁄8"	⅜"	86	
3"	7¼"	7⁄16"	1⁄8"	4	⅝"	5¼"	7½"	1⁄8"	⅜"	192	
4"	8½"	1⁄2"	1⁄8"	4	⅝"	7"	8½"	1⁄8"	7⁄16"	250	
5"	10"	5⁄8"	3⁄16"	8	⅝"	8¼"	10"	1⁄8"	7⁄16"	392	
6"	11"	5⁄8"	3⁄16"	8	⅝"	9¼"	11½"	1⁄8"	7⁄16"	564	
7"	12"	11⁄16"	3⁄16"	8	⅝"	10¼"	12¾"	3⁄32"	7⁄16"	768	
8"	13¼"	11⁄16"	3⁄16"	8	⅝"	11½"	14"	3⁄32"	7⁄16"	1003	
9"	14½"	¾"	1⁄4"	8	⅝"	12¾"	15¾"	3⁄32"	1⁄2"	972	
10"	16"	13⁄16"	1⁄4"	8	¾"	14"	17"	3⁄32"	1⁄2"	1200	
11"	17"	13⁄16"	1⁄4"	8	¾"	15"	18½"	3⁄32"	1⁄2"	1452	
12"	18"	13⁄16"	1⁄4"	12	¾"	16"	20"	3⁄32"	1⁄2"	1702	

Flanges turned all over and Bolt Holes drilled.

Water Level Indicators, Ventilators, Columns, etc., For Covered Service Reservoir.



For Details see pages 55 and 57.

Water Level Indicators.

Fig. H 143.



Fig. H 141.

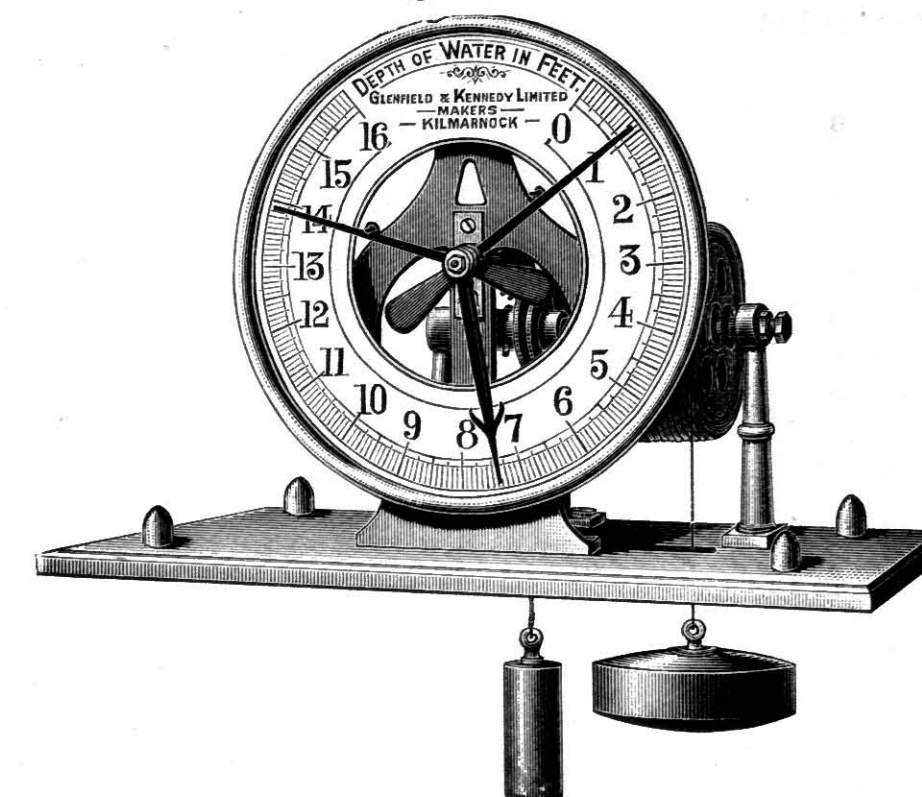


Fig. H 142.

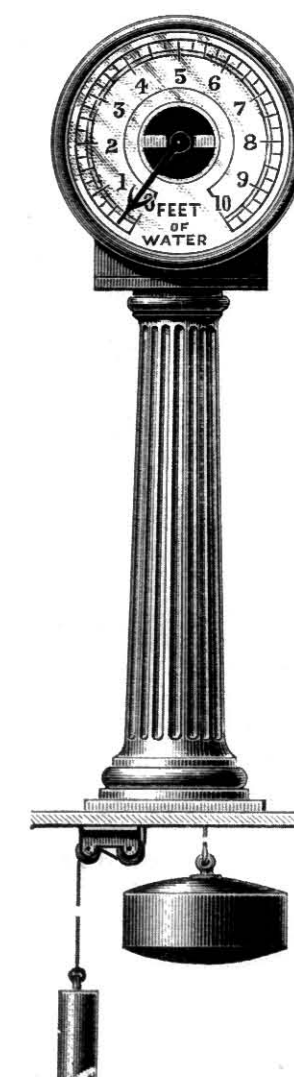
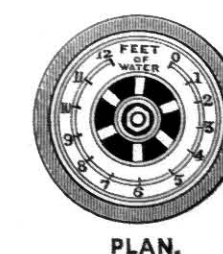
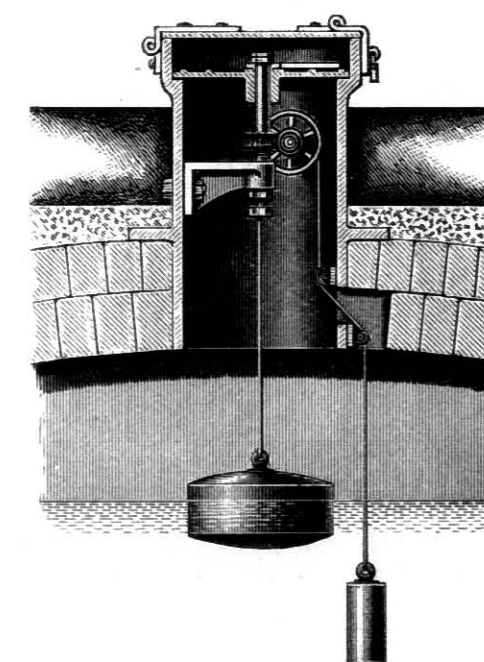


Fig. H 140.



Prices.

H 140—For top of Covered Reservoir or Tank, with locked iron Cover, . . .	each.
H 141—With Maximum and Minimum Pointers and mahogany and glass Cover Case for placing inside House or Water Tower, . . .	"
H 142—For top of Reservoir or Tank, with Dial and glass Cover, . . .	"
H 143—Cast Iron Indicator Plate with figures and divisions raised and painted, @	per foot.

Water Level Indicators.

Fig. H 145.

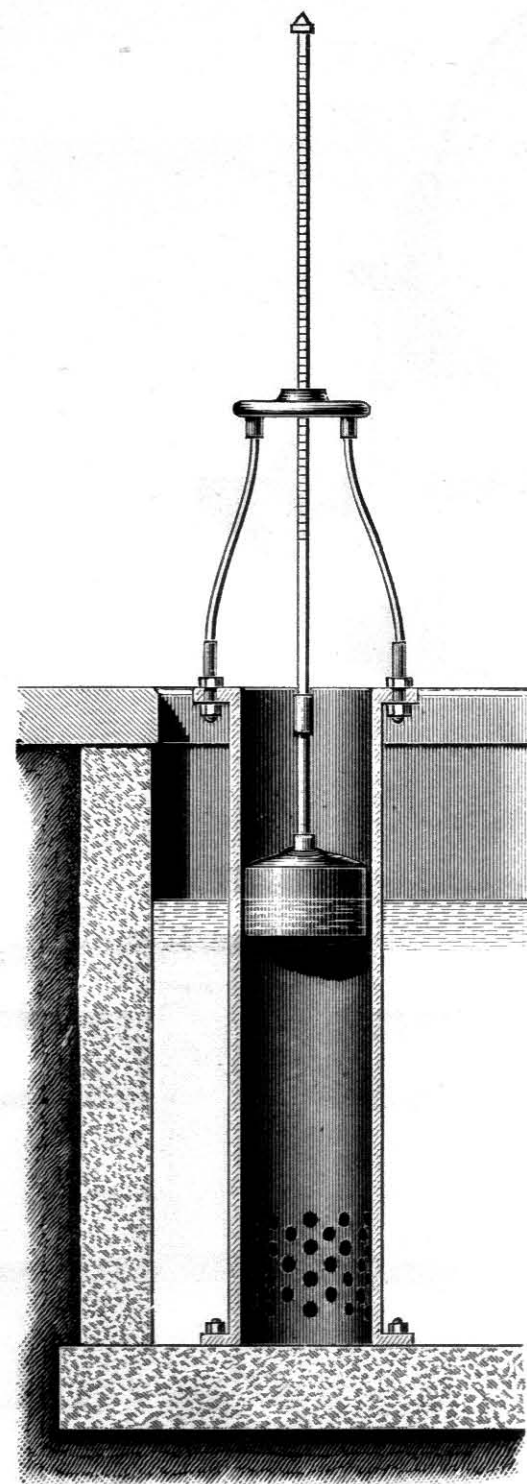
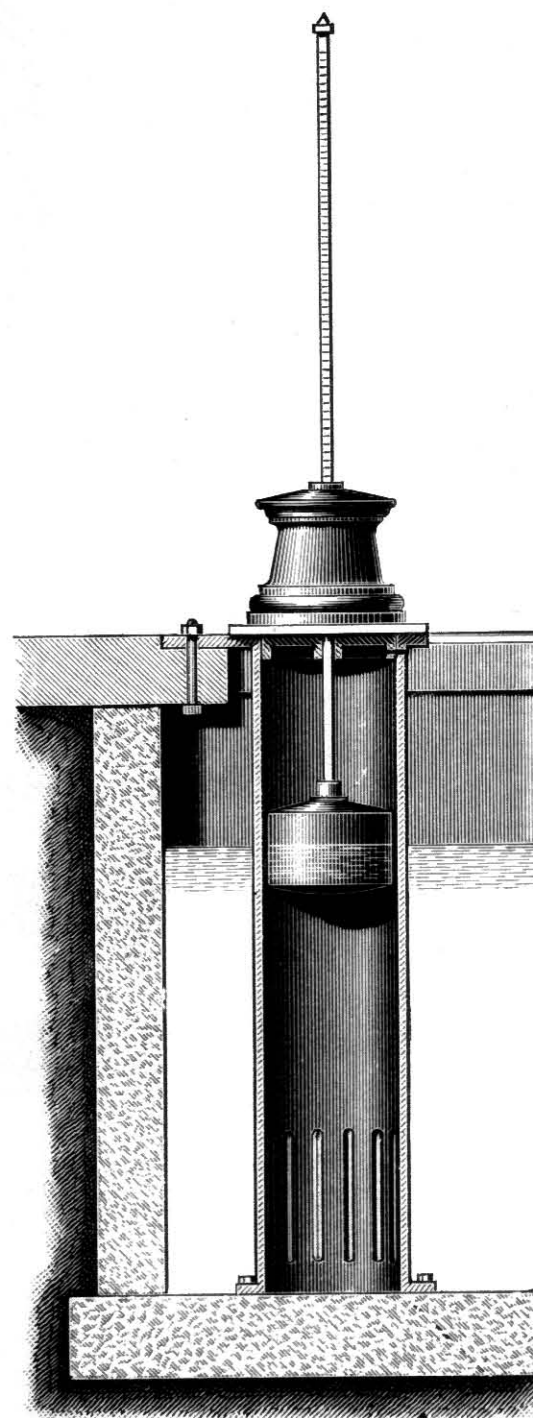


Fig. H 146.



PRICES.

Depth of Water.	Fig. H 145.	Fig. H 146.
5'	each.	each.
7'	"	"
10'	"	"
12'	"	"

Prices for other Depths on application.

Reservoir Ventilators.

Fig. C 87a.

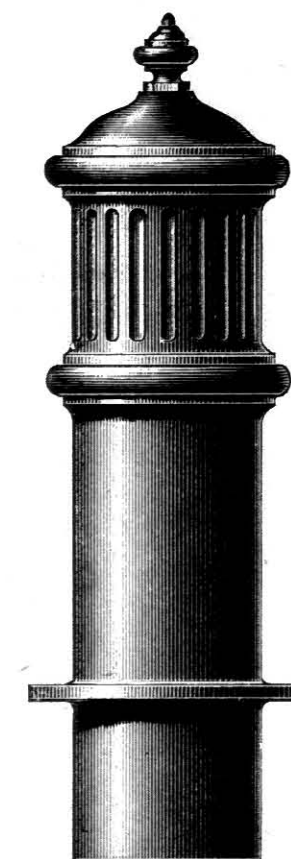


Fig. C 87.

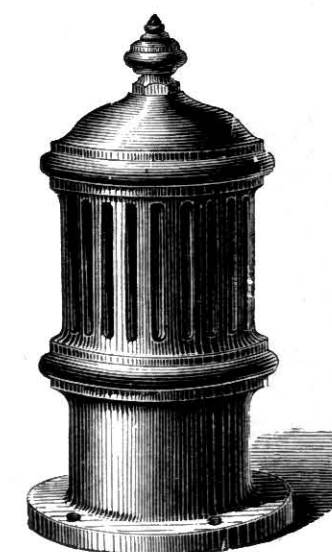


Fig. C 170.

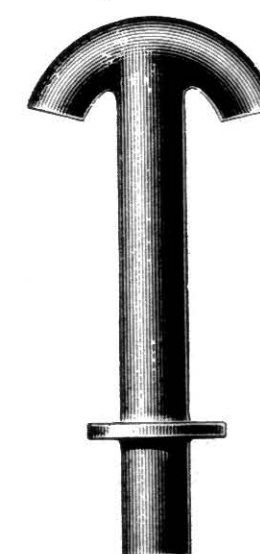
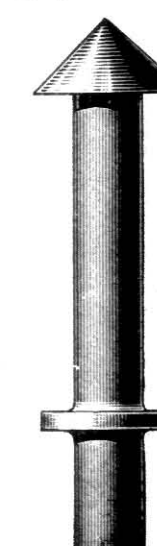


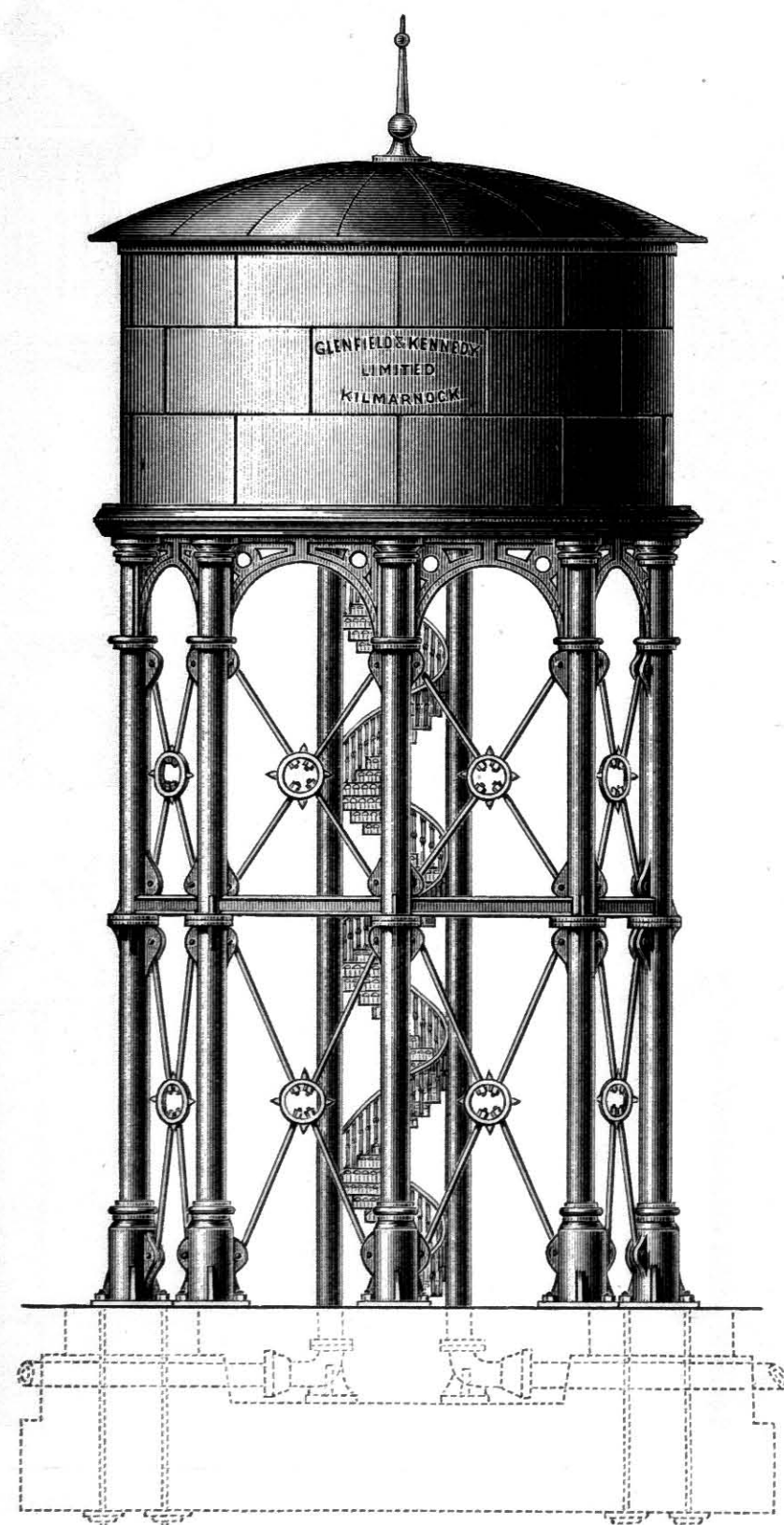
Fig. C 171.



Dia.	PRICES.				LENGTH OVER ALL.			
	Fig. C 87.	Fig. C 87a.	Fig. C 170.	Fig. C 171.	Fig. C 87.	Fig. C 87a.	Fig. C 170.	Fig. C 171.
2"					0' 10"	2' 5"	2' 4"	2' 4"
3"					0' 11"	2' 9 1/2"	2' 7 1/2"	2' 7 1/2"
4"					1' 2 1/2"	3' 1"	2' 11"	2' 11"
5"					1' 5"	3' 4 1/2"	3' 5 1/2"	3' 5 1/2"
6"					1' 7"	3' 9"	4' 0"	4' 0"
7"					1' 11"	4' 3"	4' 4"	4' 4"
8"					2' 2"	4' 10 1/2"	4' 8"	4' 8"
9"					2' 4 1/2"	5' 5 1/2"	5' 3"	5' 3"

Wrought Iron Tank on Columns.

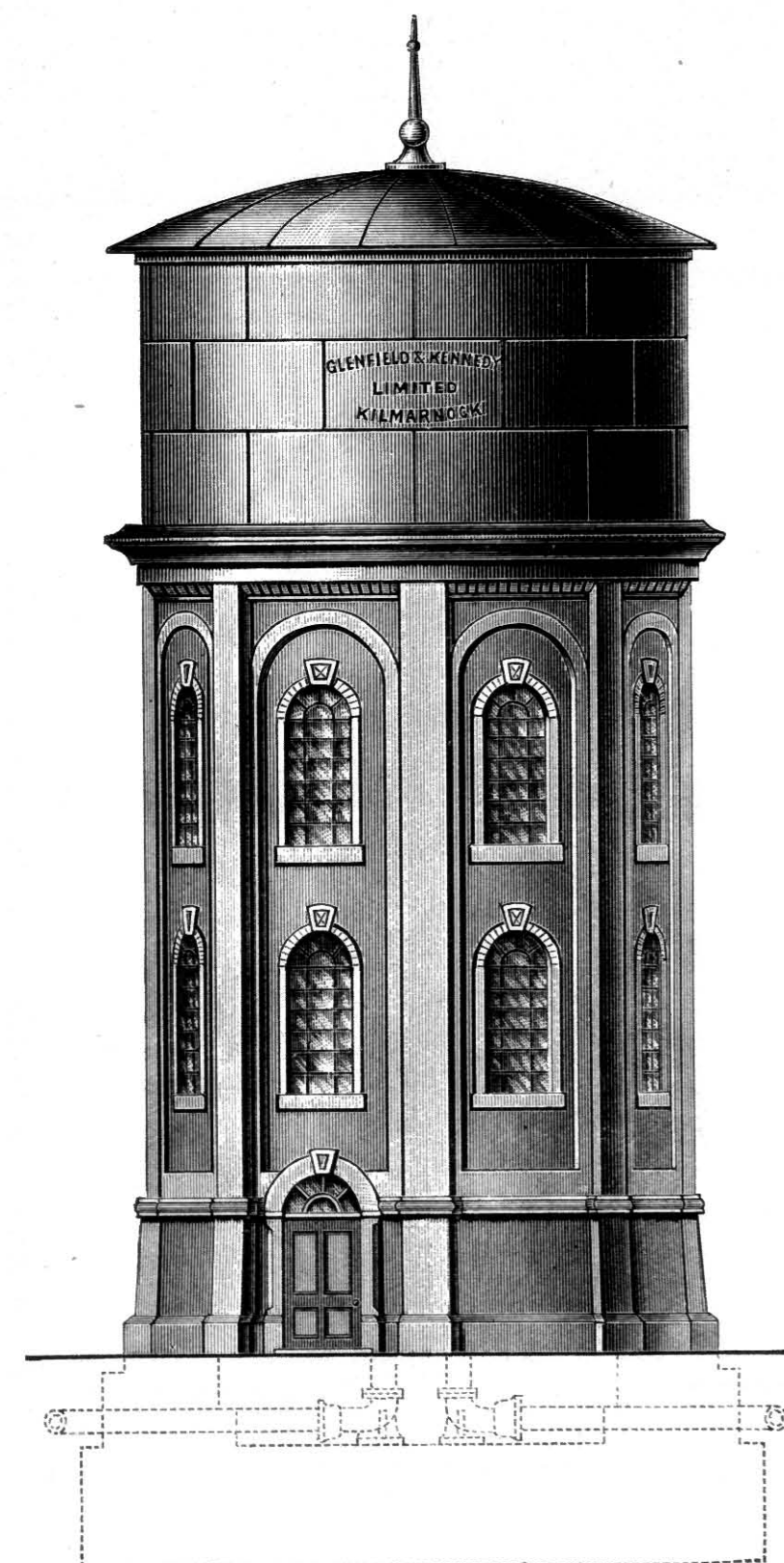
Fig. A 130.



Capacity in Gallons.	Size of Tank.	Height from Ground Line to Bottom of Tank.	Tank with Pipes and Ladders.	Roof only.	Columns and Girders.
50,000	32' dia. × 10' deep	40'	Prices on application.		
20,000	18' dia. × $\left\{ \begin{array}{l} 12' \text{ sides} \\ 14' \text{ centre spherical bottom} \end{array} \right\}$	40'			

Wrought Iron Tank on Masonry Tower.

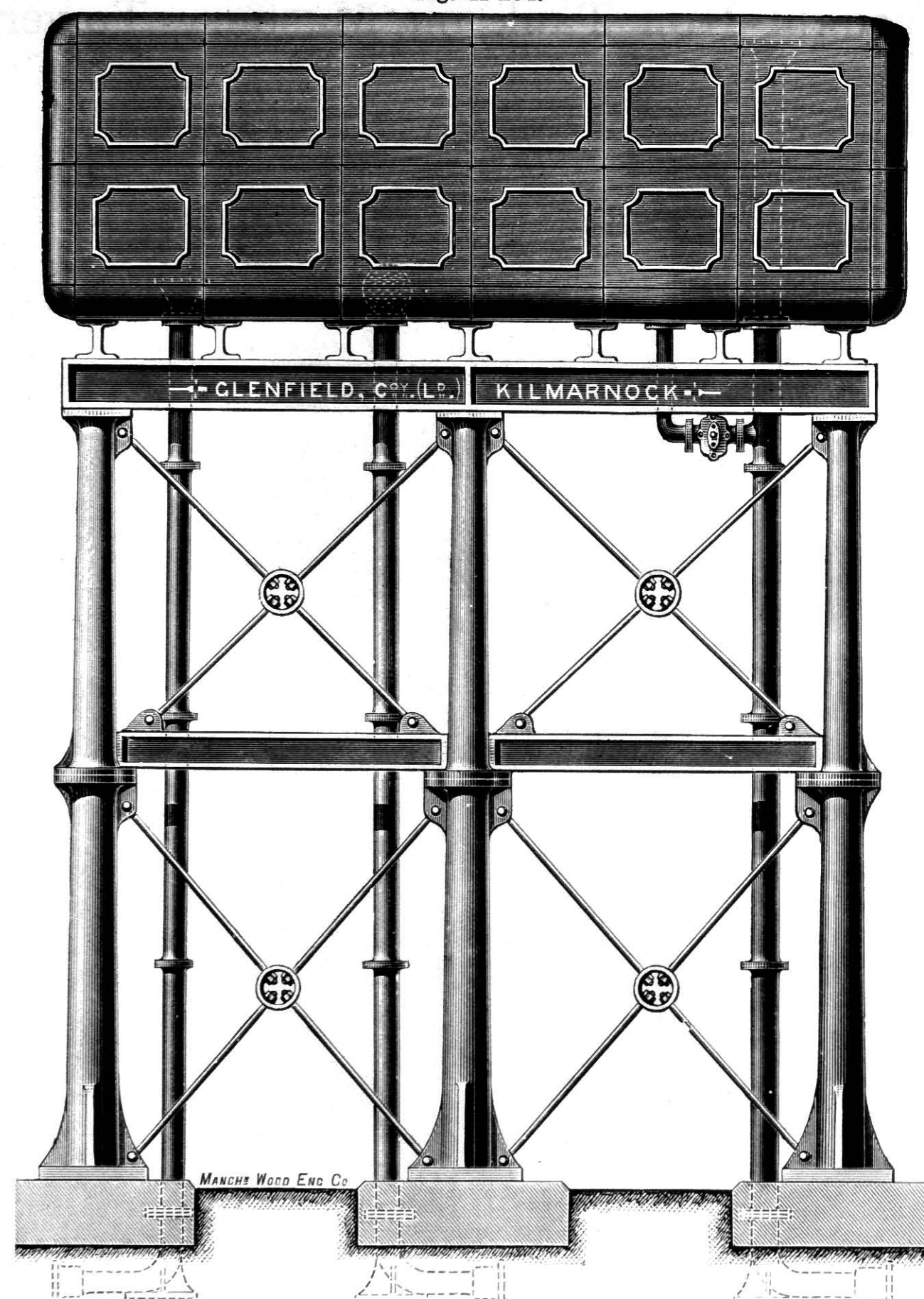
Fig. A 131.



Prices on application.

Cast Iron Tank on Columns.

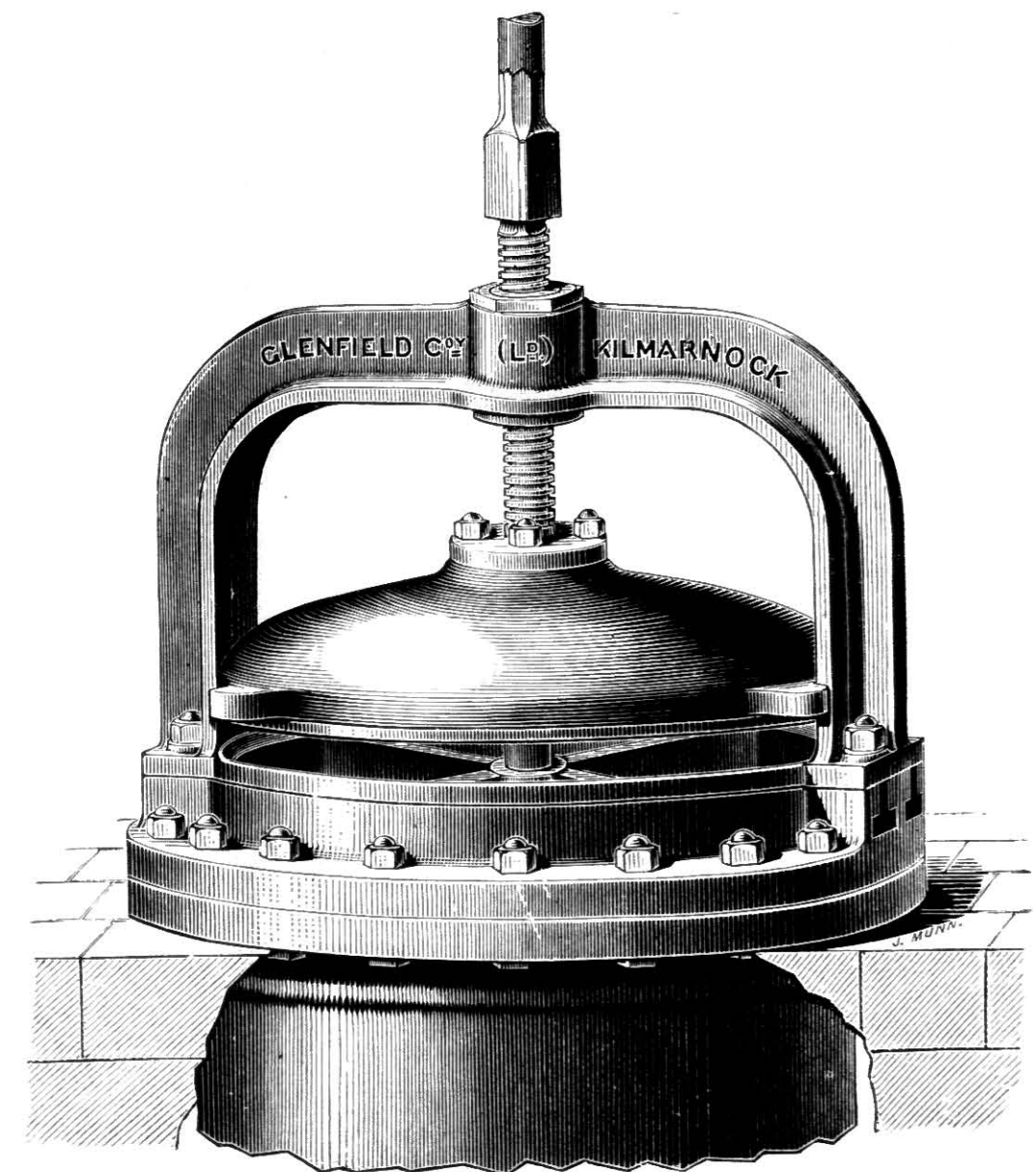
Fig. A 134.



Capacity in Gallons.	Size of Tank.	Height from Ground Line to Bottom of Tank.	Including Ladder, Columns, Girders, Pipes, &c.
10,000	21' x 17' x 5'	25'	Prices on application.
10,000	21' x 17' x 5'	50'	
25,000	21' x 21' x 9'	25'	
25,000	21' x 21' x 9'	50'	
50,000	33' x 29' x 9'	25'	
50,000	33' x 29' x 9'	50'	

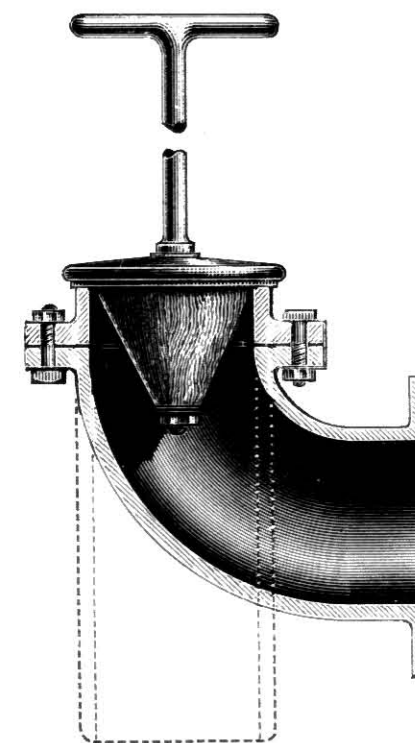
Flat Outlet Valve.

No. 1.



Sludge Valve.

Nos. 26 and 26a.



Nos. 26 and 26a.—Sludge Valve.

The Flat Outlet Valve, No. 1, has gun-metal faces ground perfectly water-tight. The Spigot-piece is built into floor of Dam. It is worked from top of embankment wall by rod passing through Guide on top.

PRICES.

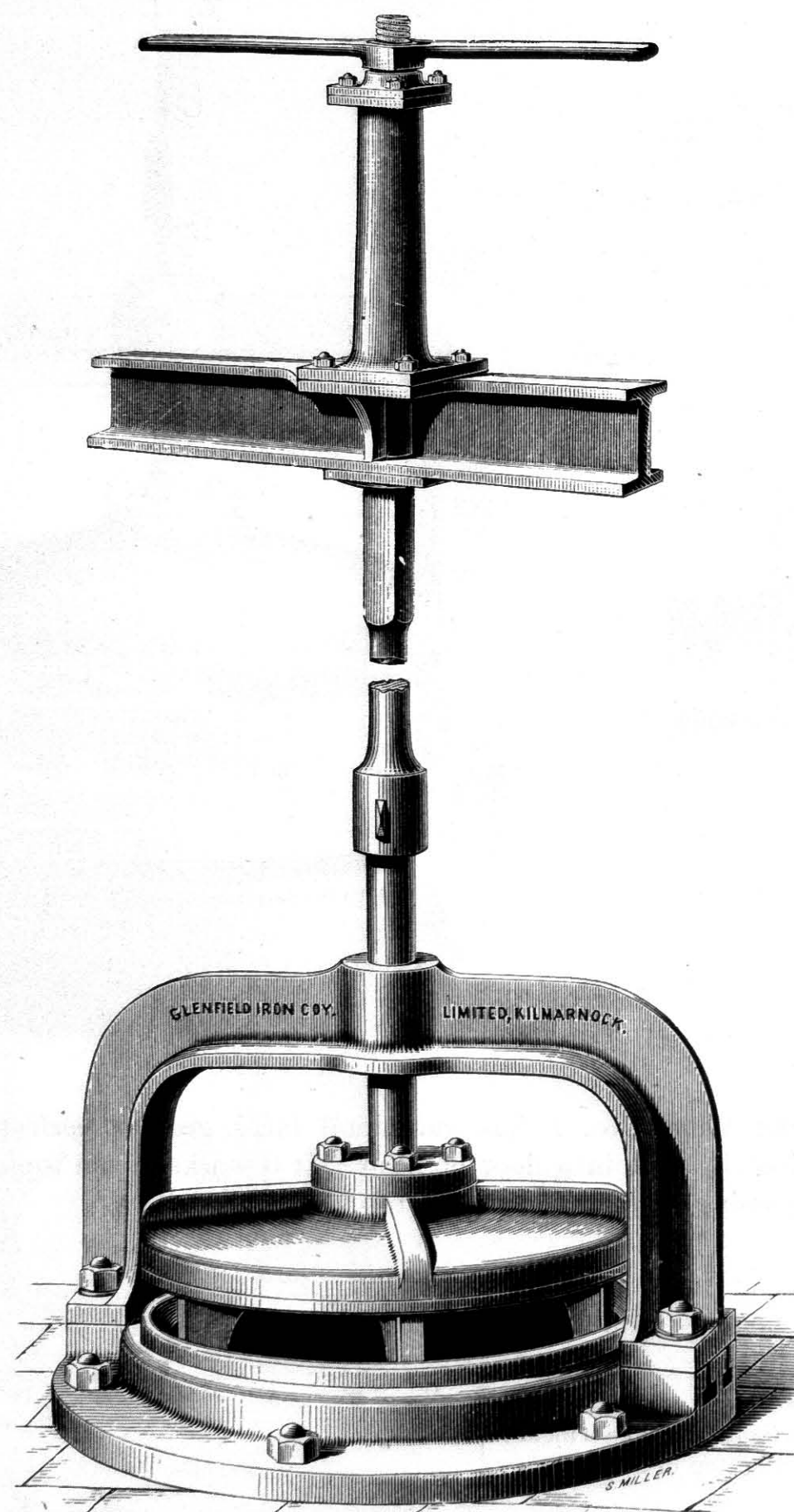
No. 1.—Flat Outlet Valve, with Screw and Nut of gun metal, with ordinary Spigot-piece bolted on included, but <i>not</i> including Socket End on top of Screw, ..	4"	6"	8"	10"	12"	16"	20"	24"	each.	
								3"		4"	6"	8"

No. 26.—Sludge Valve with Double Flanged Bend, each.

No. 26a.—Sludge Valve with Flanged and Spigot-piece, as shown by dotted lines, "

Flat Outlet Valve.

No. 2.



PRICES.

Flat Outlet Valve, No. 2, with gun metal Spindle and gun metal Bush in brig—Socket End on top of Rod included—left for welding, Lewis Bolts <i>not</i> included, ..	4"	6"	8"	10"	12"	16"	20"	24"	each.
Extra to above Prices if with cast iron Pillar, gun metal Nut, and wrought iron Screw, cast iron Beam <i>not</i> included, ..	..	..	..	..	..	..	..	..	..

This Valve has gun-metal faces ground perfectly water-tight. It is worked from top of embankment by Screwed Rod working in gun-metal Nut in Pillar, as shown. The Valve is fastened to floor of Reservoir or Tank by Lewis Bolts.

SECTION B.

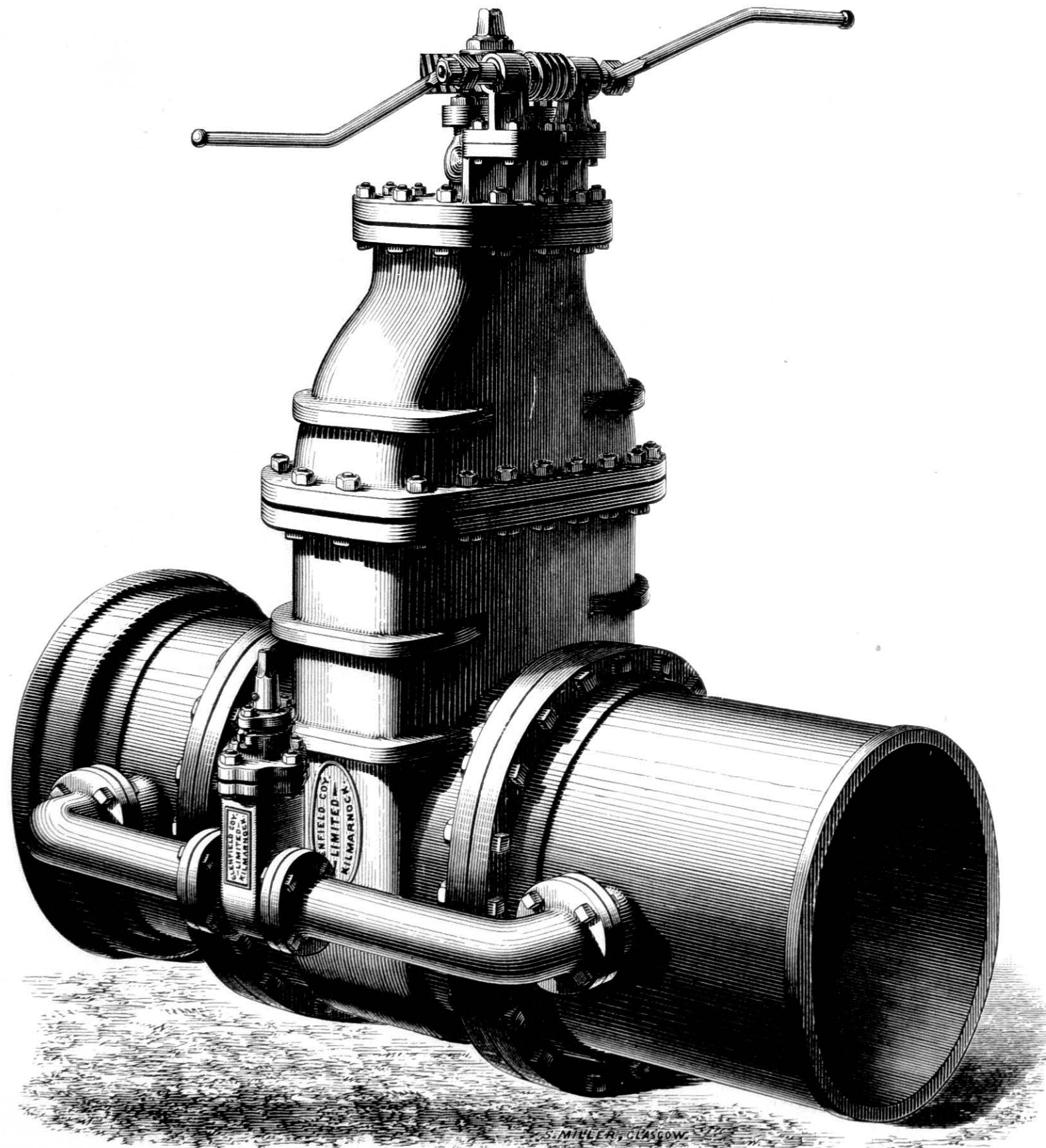
SLUICE VALVES, AIR VALVES,
BALL VALVES, RELIEF VALVES,
ETC.

The designs are subject to alteration and amendment, and, while corrections in Catalogue are made from time to time, Glenfield & Kennedy Ltd. do not guarantee that goods supplied will be exactly as shewn.

Sluice Valves for Large Mains,

With Worm Wheel Gearing, and By-pass Arrangement.

Fig. A 150.



Over One Hundred Sluice Valves, $31\frac{1}{2}$ " (800 millimetres) dia., of this pattern have been supplied to Rio de Janeiro and other Water Works, all tested to a pressure of 300 lbs. per sq. in.

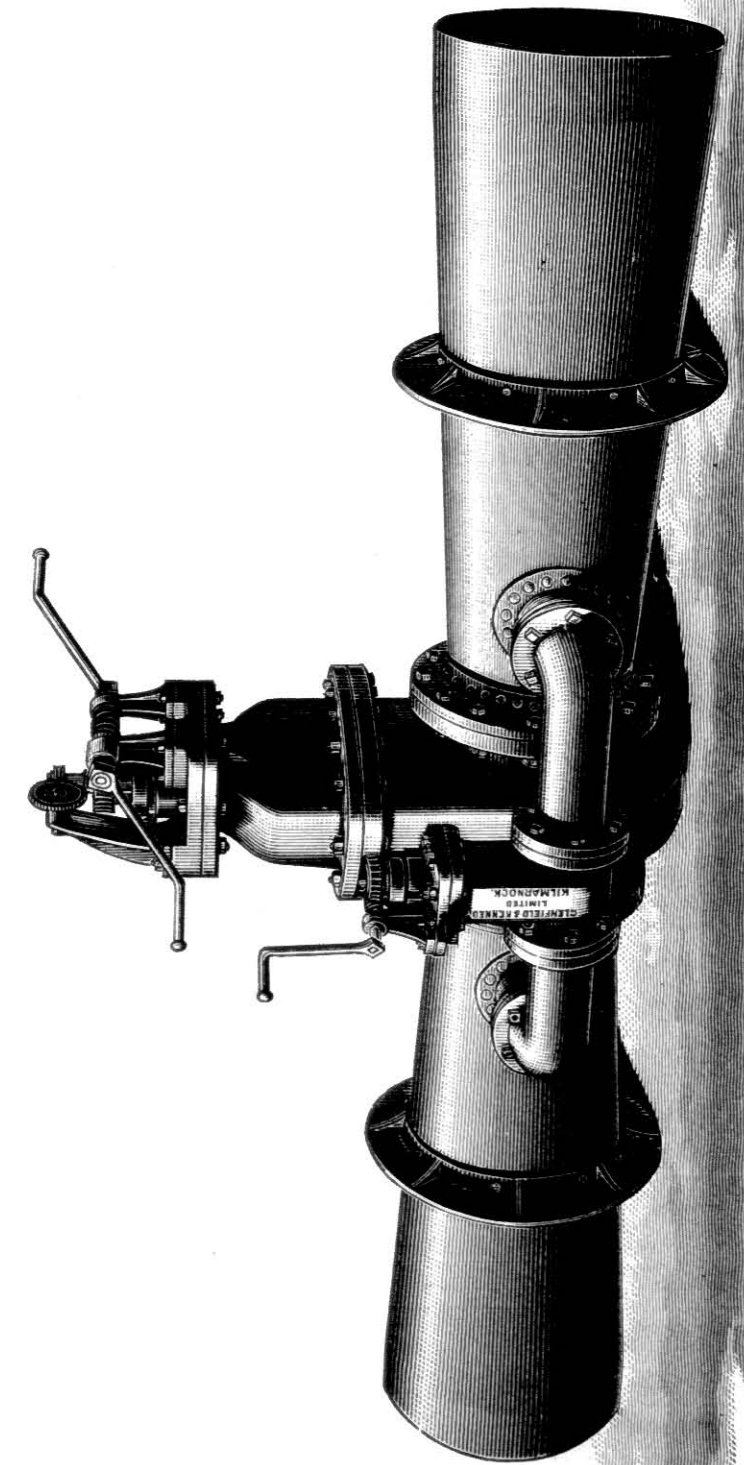
The By-pass is for the purpose of relieving the pressure before opening the large Valve.

For Prices of By-passes see page 5, and for Prices of Worm Gearing see page 22.

Sluice Valve for Large Mains,

With Worm Wheel Gearing, By-pass, and Indicator.

Fig. A 149.

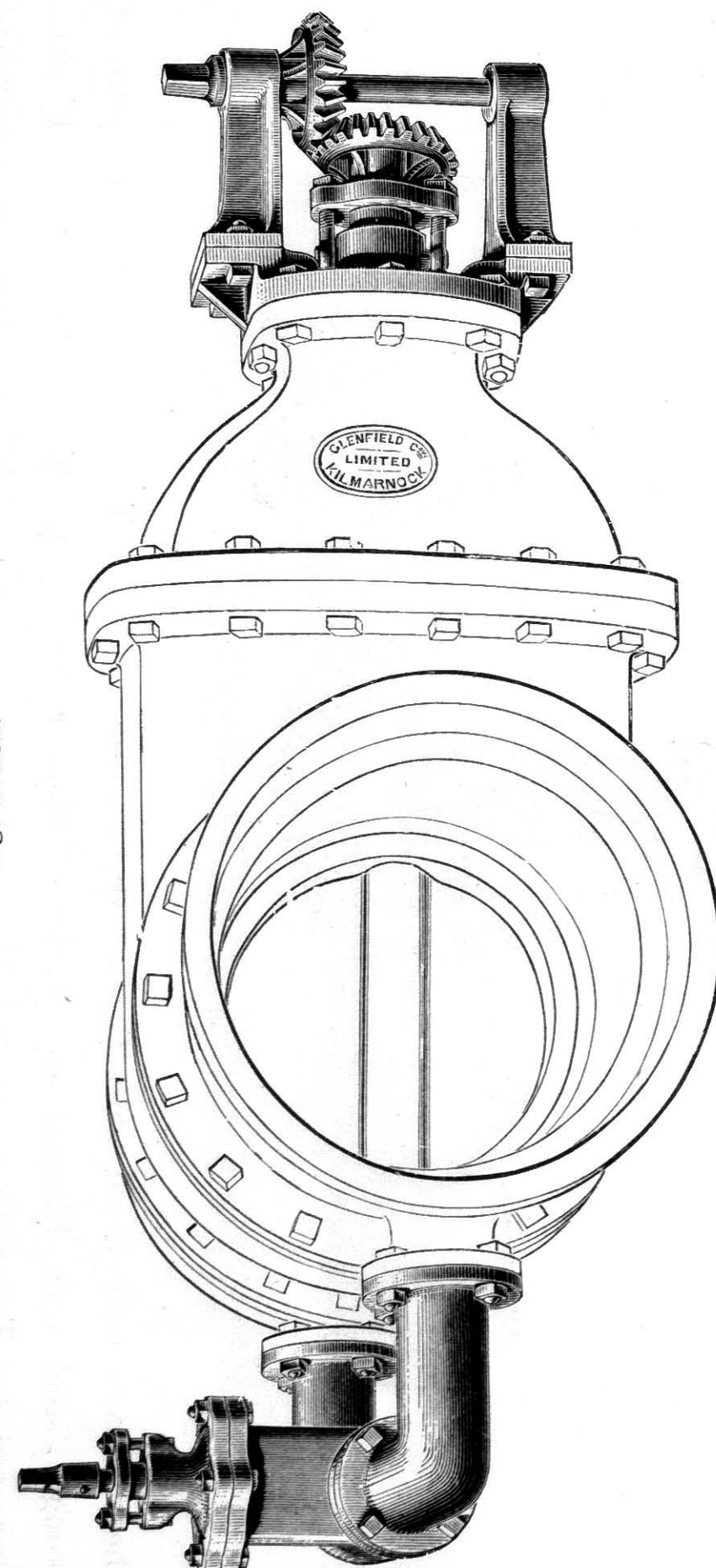


These Valves were fitted with Patent Anti-friction Rollers. The Connecting Pipes were of wrought steel with Flanges and Puddle Collars rivetted on. The Valves were 21" dia., connected by Taper Pipes to 30" Main. A large number of these Valves were supplied for Coolgardie Water Works, Western Australia.

Prices on application.

Sluice Valve, with Bevel Gearing and By-pass.

Fig. A 151.



NOTE.—When desirable the By-pass can be brought round the upper part of the Main Valve, so that both Main Valve and By-pass can be worked from the same Surface Box.

For Prices of By-passes see page 5, and for Prices of Bevel Gearing see page 23.

By-passes for Sluice Valves.

By-passes, consisting of two gun metal Bends and gun metal Stop Valve or Cock, are sometimes fitted to Valves of small diameter—in cases where the By-pass is large enough to supply a new district. It also gives an effective means of sounding a district for waste. Prices on application.

By-passes can also be fitted to large Sluice Valves in the manner shown in Fig. A 153; but *it is preferable* to have the By-pass Branches on the Spigot and Socket Connecting Pipes as shown, page 2 of this Section, as the length of the Valve has to be increased and entails alterations of patterns.

PRICE LIST.

Spigot and Socket Connecting Pieces, with Branches for By-pass, two double-flanged Bends, Sluice Valve and Bolts and Joints complete (including Bolts for bolting Connecting Pieces to large Valve), as illustrated, pages 2 and 4, Section B.

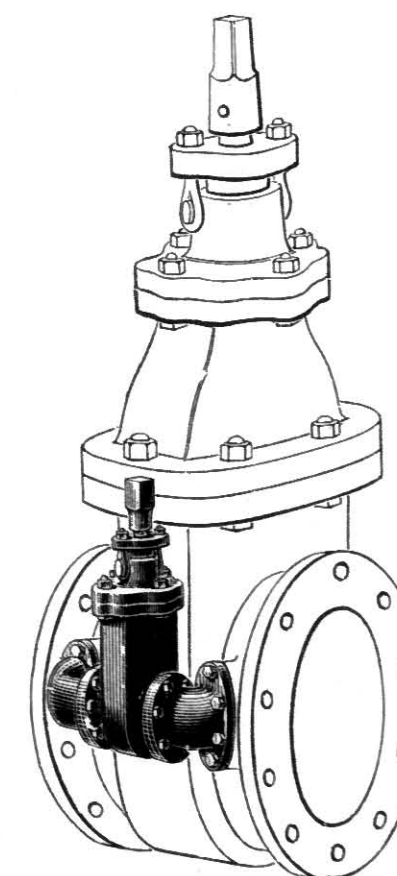
Dia. of Main Pipe, ..	12"	15"	18"	21"	24"
Dia. of By-pass, ..	2"	2½"	3"	3½"	4"
Prices,					

Prices of larger Sizes on application.

Fig. A 152.



Fig. A 153.



Double-slided Horizontal Stop Valves.

(Sometimes placed Vertically and fitted with Spur Gearing.)

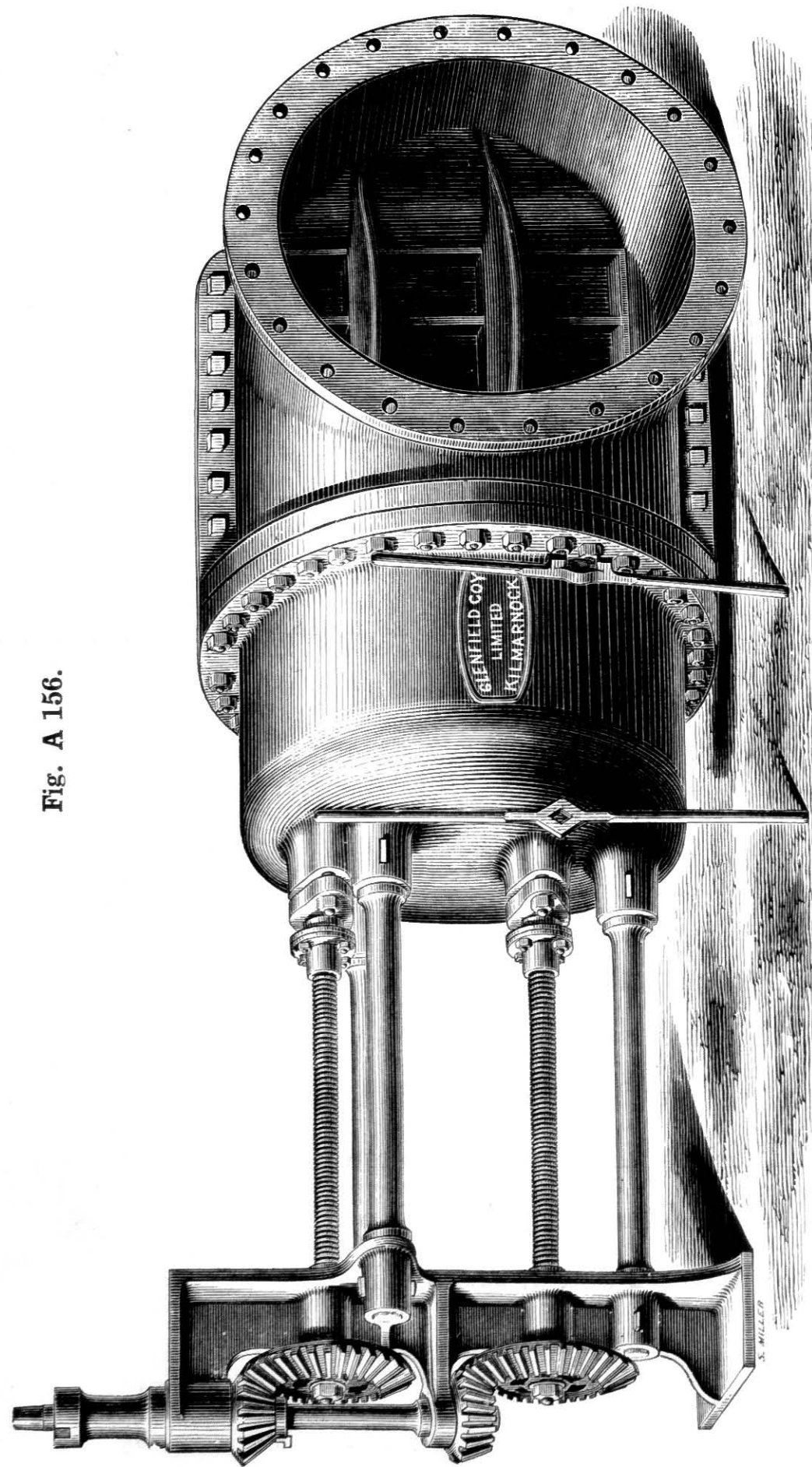


Fig. A 156.

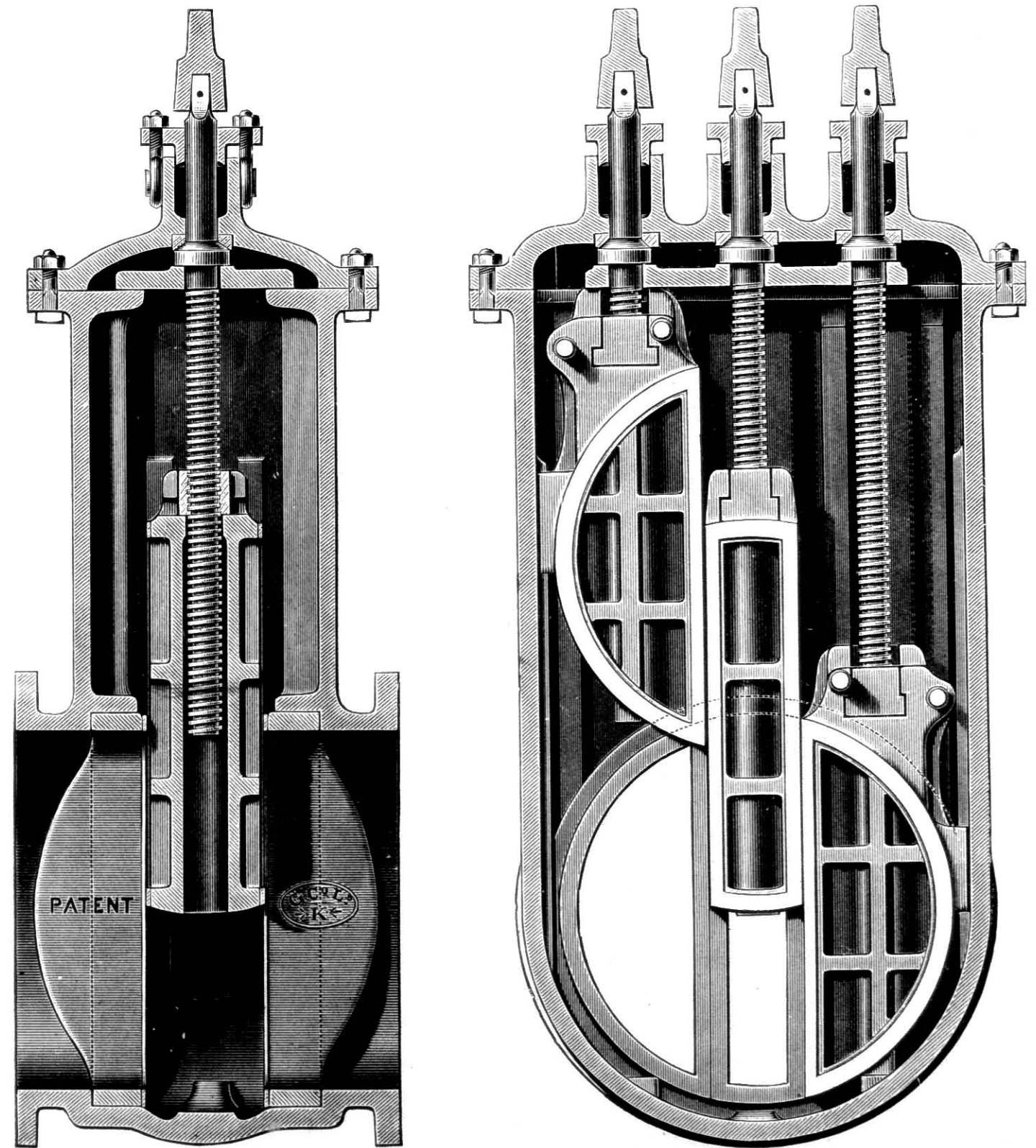
These Double-slided Stop Valves are particularly well suited for heavy pressures in pipes of large diameter. The arrangement of the two slides, wrought by bevel gearing, enables the operator to first open the small slide, which, relieving the pressure to a great extent, facilitates the opening of the larger slide. The Valve is strong and substantially made. The stuffing gland and screw tubes being of gun metal, and the various working parts being bushed with the same material, the Valve is not liable to get stiff and unworkable. The faces, which are double, are also of gun metal, and are securely fastened to slide blocks by screwed brass pins. Each Valve is thoroughly tested under pressure and perfectly water-tight. Patterns have been made for the following sizes, viz. :—18", 20", 24", 27", 30", 36", 40", 42", and 48" dia.

Prices on application.

Patent Sluice Valve,

With two or more Doors, for Large Mains under High Pressures.

Fig. A 158.



SUPPLIED TO BOMBAY, BUENOS AYRES, ETC.

- (a)—The body of Sluice Valve is in one casting with internal strengthening ribs, making a much stronger Valve than when two Castings are bolted together. The ring-piece dividing the water-way into two or more openings, being inserted in the manner shown, is free from the initial strains inseparable from Valves which have the dividing webs cast in them.
- (b)—The Doors have each independent screw spindles. They are arranged with locking snugs, so that the small Door *must* be opened first and closed last.
- (c)—The Valves can be furnished with Bevel Gearing to open when Valve lying on side, if desired.

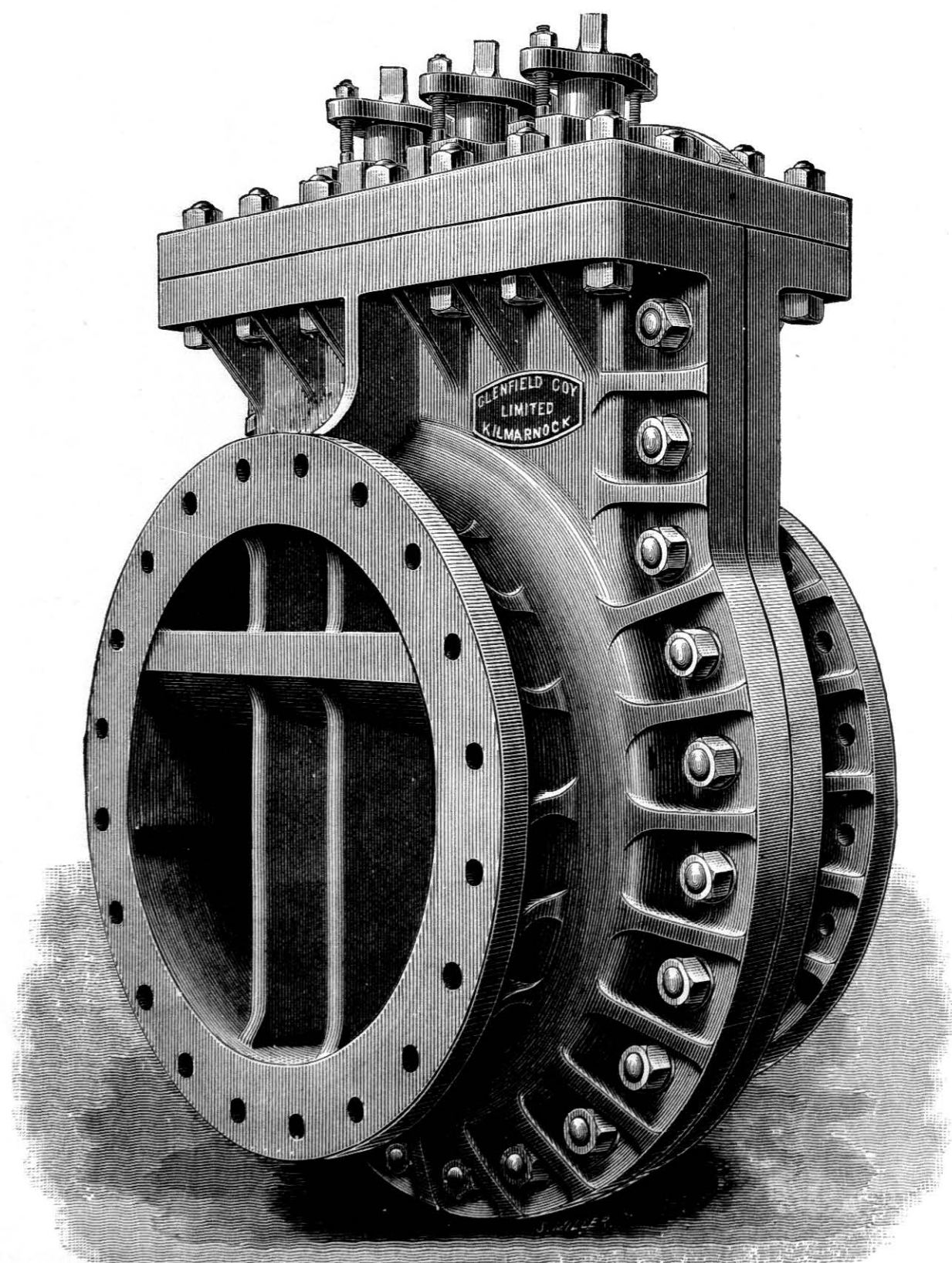
Prices on application.

Sluice Valve,

With three Doors, for Large Mains under High Pressures.

BODY BOLTED TOGETHER IN HALVES.

Fig. A 159.



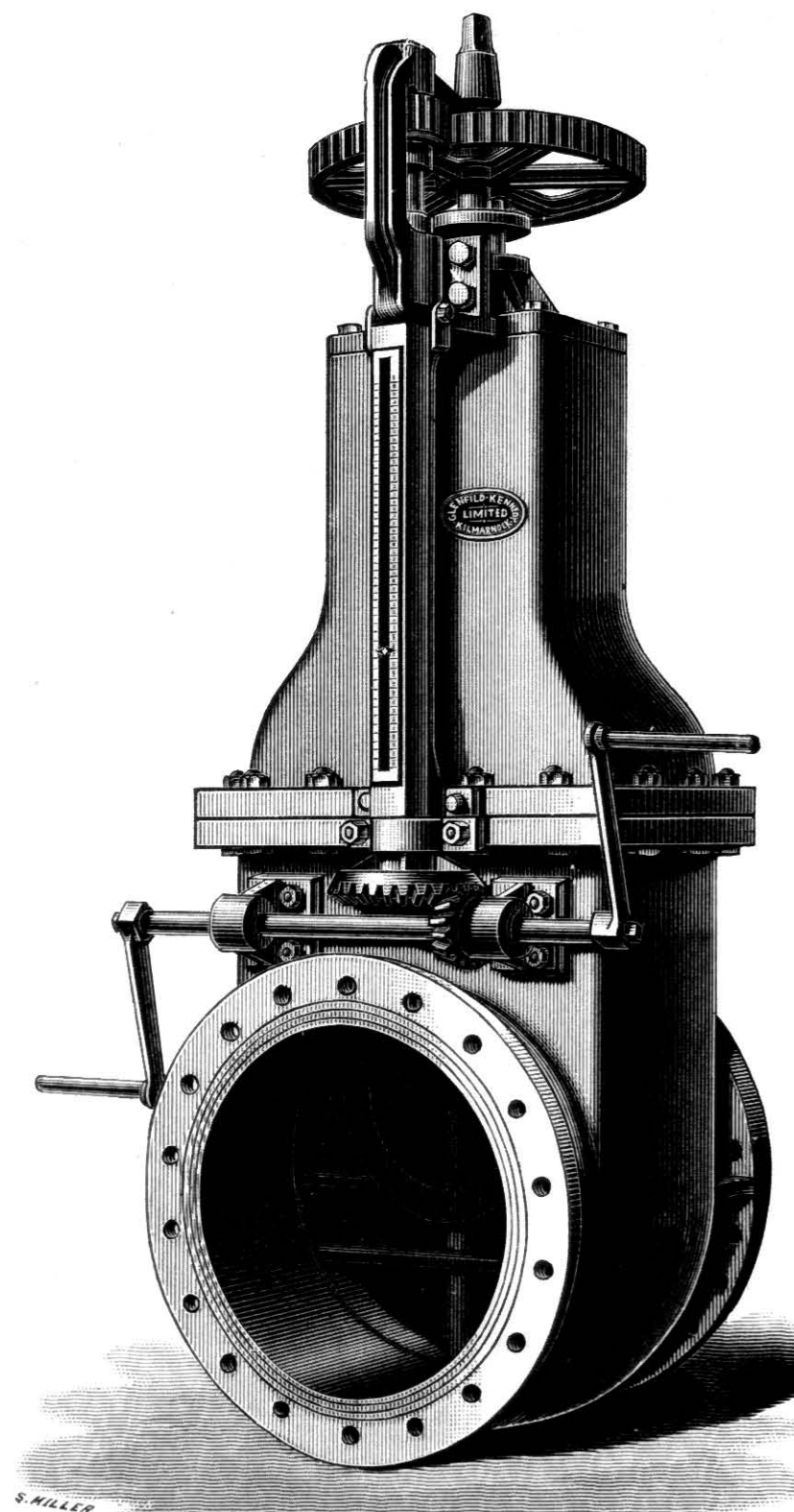
SUPPLIED TO LIVERPOOL WATER WORKS (VYRNWY SUPPLY).

Can be made with two Doors, if desired, and can be furnished with Bevel Gearing to open when Valve lying on side, if desired.

Prices on application.

Sluice Valve and By-pass Valve Combined.

Fig. A 160.



SUPPLIED TO BIRMINGHAM (ELAN VALLEY) WATER WORKS.

In the above type the By-pass Valve is placed inside the large Door and thus saves external pipes, which take up room that cannot at times well be spared.

The small Door is opened first and closed last. The small Door rises into compartment on top of large Door, so that when both Doors are open the water-way is the clear and unobstructed full diameter of the pipe.

Fitted with Indicator to show how far Valve may be open or closed.

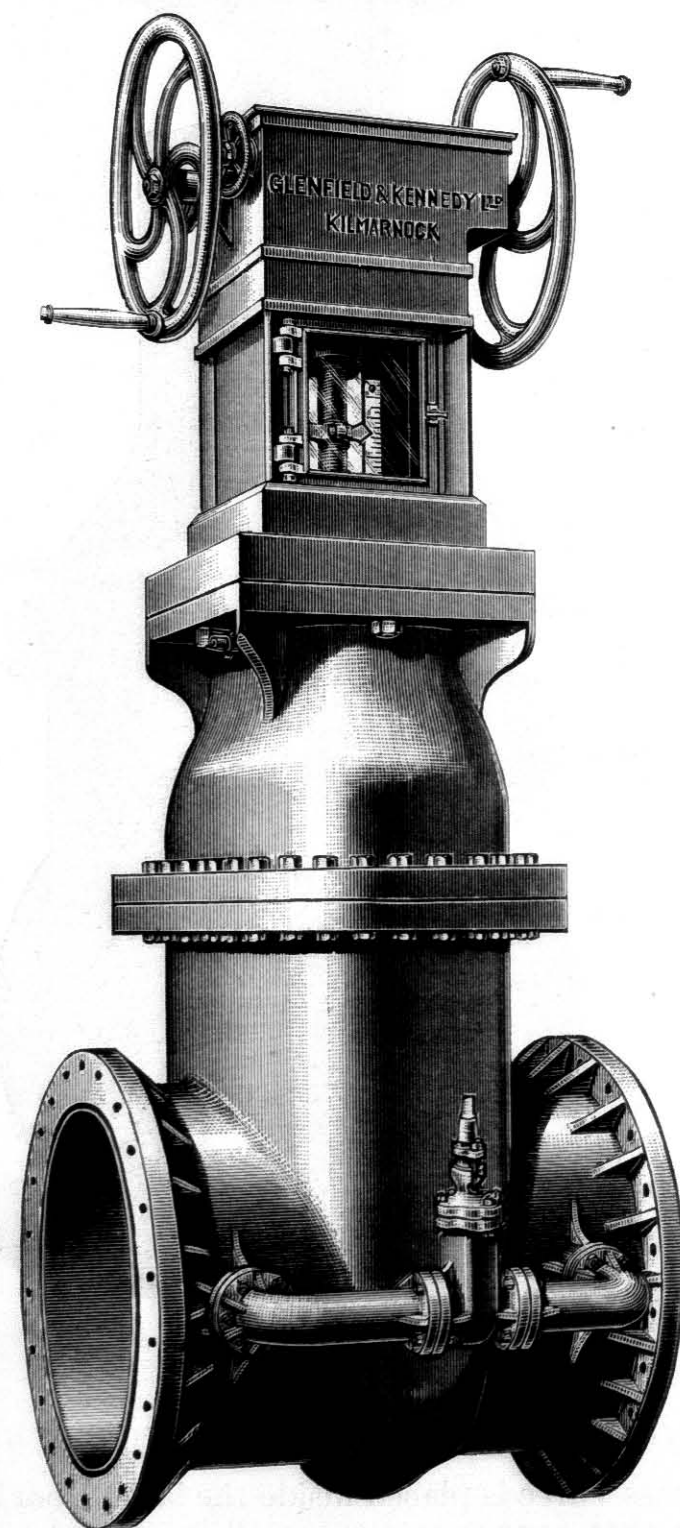
These Valves can be fitted either with or without the Gearing and Indicator shown.

Prices on application.

Sluice Valves (of large size),

Fitted with Headstock, Indicator Gear and By-pass.

Fig. A 164.



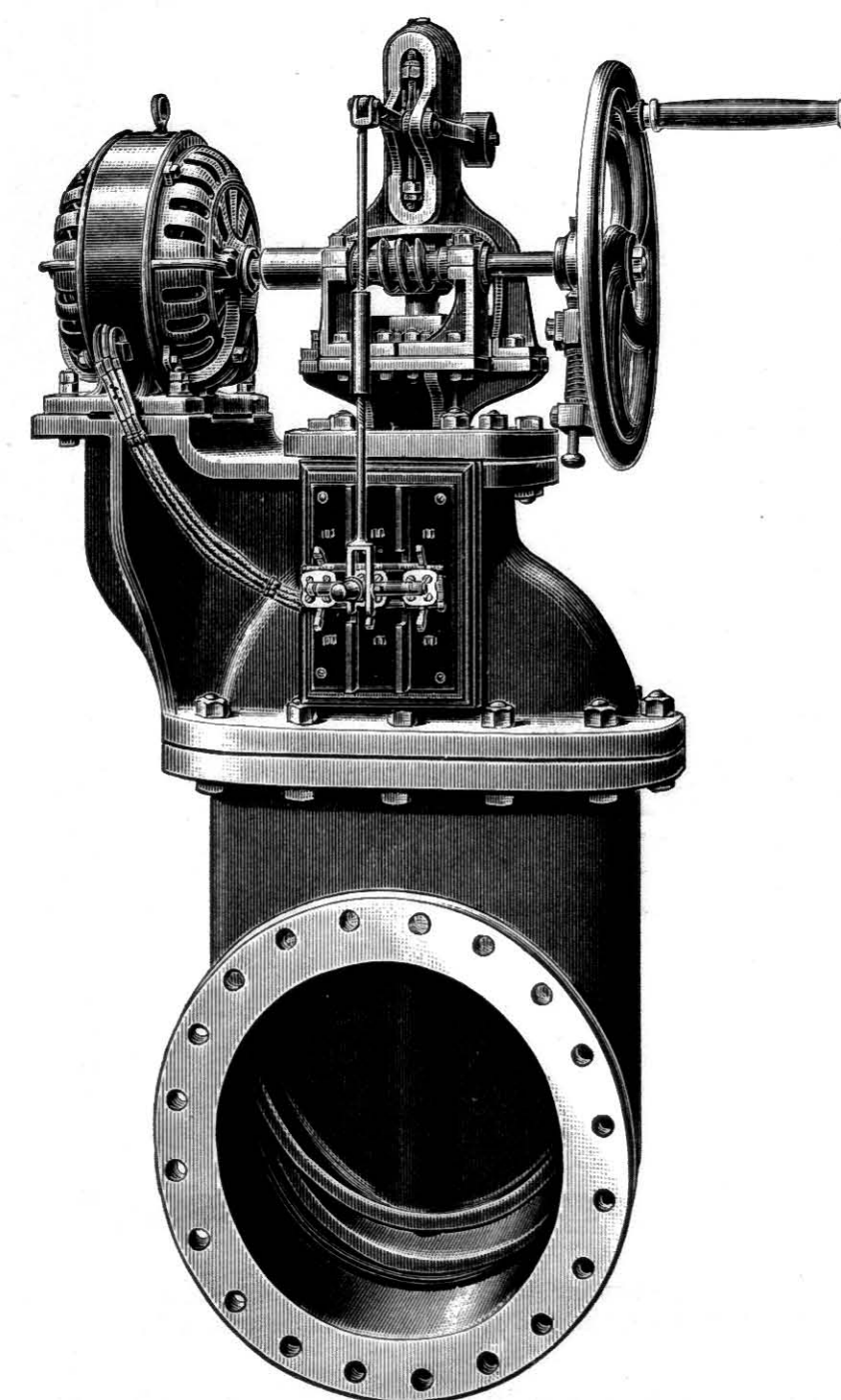
SUPPLIED TO MANCHESTER WATER WORKS.

Prices on application.

Sluice Valve operated by Electric Motor.

Also made suitable for operating by hand.

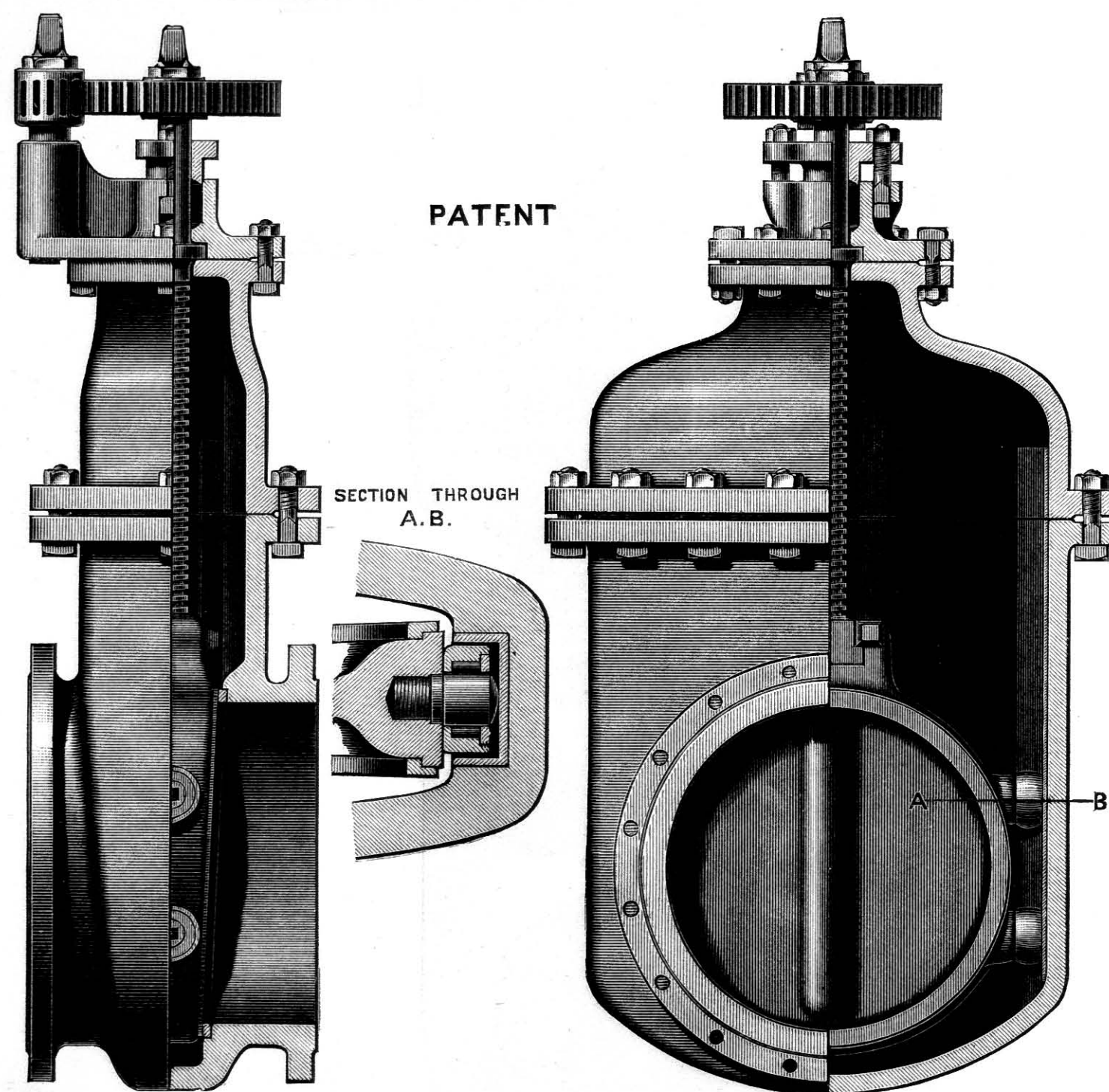
Fig. A 165.



Prices on application.

Sluice Valve, with Anti-friction Rollers.

Fig. A 162.



This type of Valve has been supplied to Edinburgh, Belfast, Bradford, Colombo (Ceylon), Coolgardie (Western Australia), Buenos Ayres, East London Water Co., etc.

The object of the Anti-friction Rollers is to render the Valve much more easily opened or closed than an ordinary Sluice Valve. In opening the Valve under pressure, the Valve Key is first placed on the Spindle of Pinion. Whenever the Door has been raised clear of the tapered face and is bearing on the Anti-friction Rollers (about two turns of Key on pinion spindle effects this), the Key is transferred to spindle at centre of Spur Wheel and the Valve can then be opened or closed in the ordinary way in much less time and by exerting less power than in the case of a Sluice Valve of ordinary construction.

The Rollers are of hard gun metal, and bear on hard gun metal both on their inner and outer surfaces. The recesses for the gun metal in Valve Body are machined by a tool specially designed for the purpose.

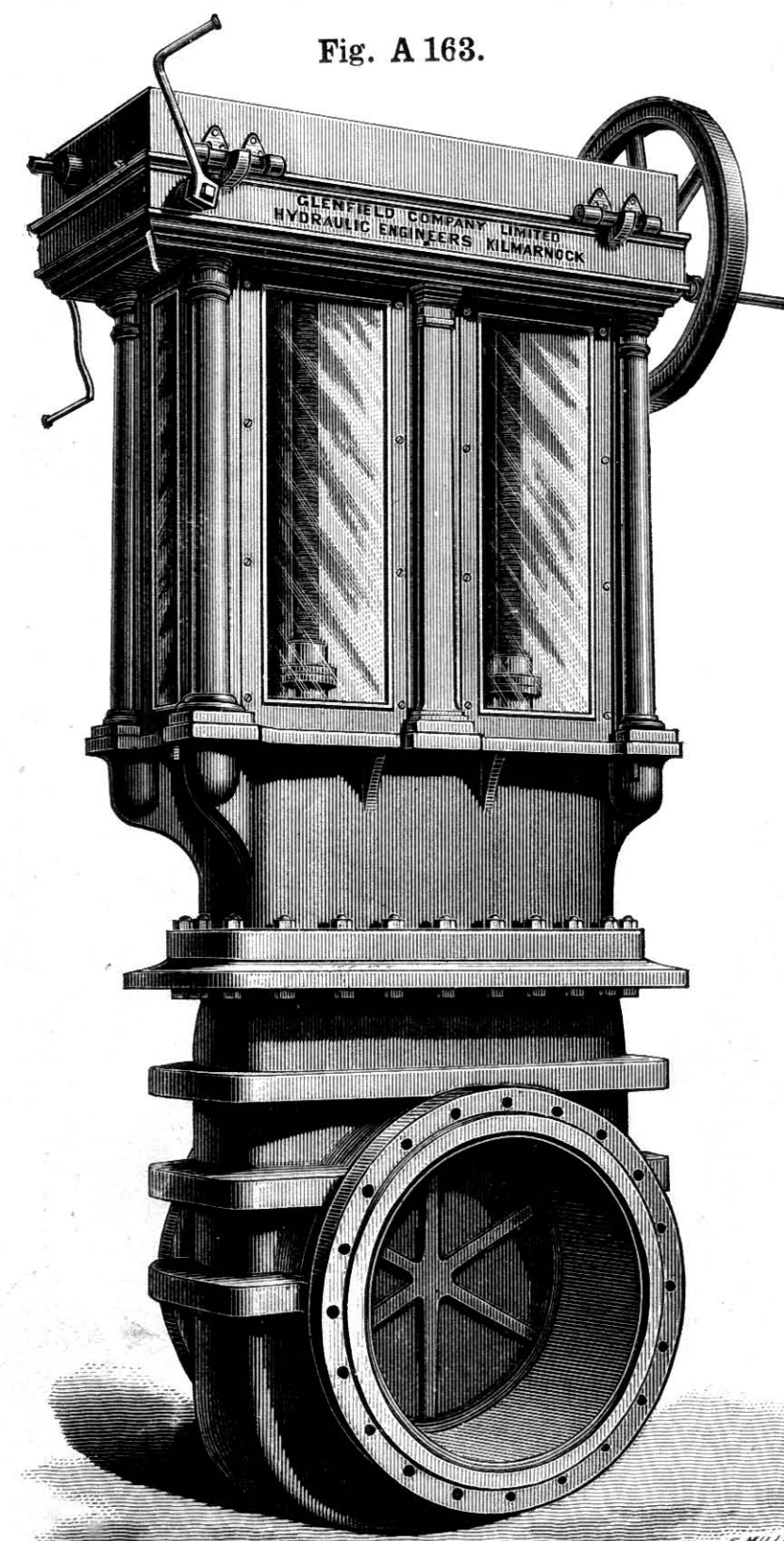
Patterns have been made for the following sizes, viz. : 10", 12", 14", 15", 18", 20", 21", 22", 24", 27", 30", and 36" dia.

Prices on application.

Sluice Valve,

With Patent Anti-friction Rollers and Headstock, for Heavy Pressures.

Fig. A 163.



SUPPLIED TO BRADFORD WATER WORKS.

The illustration is from a photograph of a 36" Valve which was tested to 500 lbs. per sq. in.

These Valves are designed to work under heavy pressures, the guides on Door being fitted with hard bronze live rollers, same as described on preceding page.

The Headstock is of an ornamental character, having plate glass panels. The Gearing is a combination of worm and bevel, with clutch, so that either can be used. The worm gear being used to lift the Door a short distance, and the bevel gear raising it the remaining portion at a quicker rate.

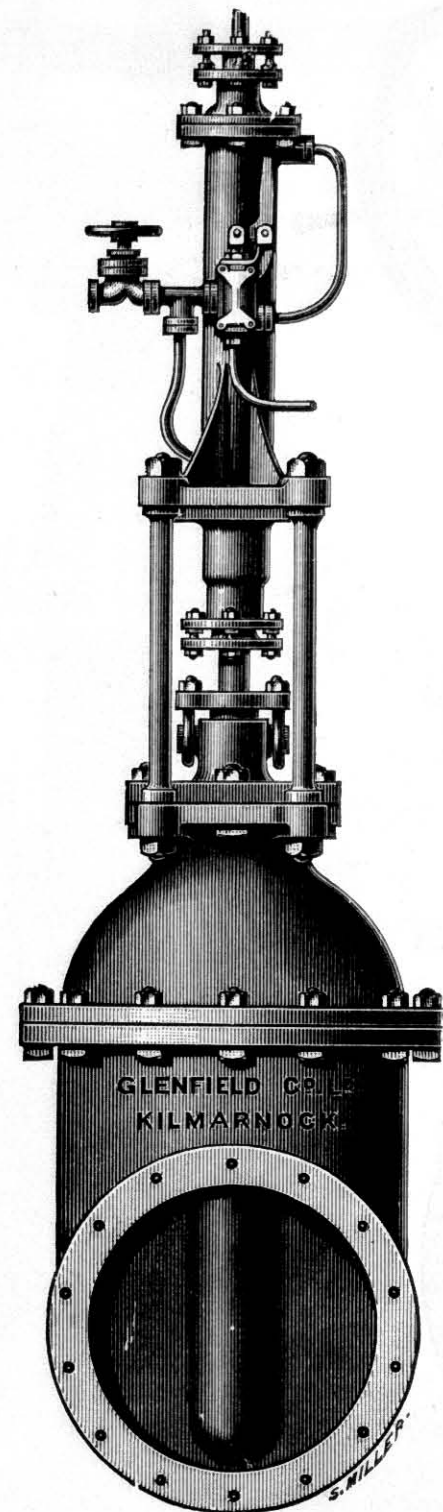
The Collars on lifting screws are fitted with ball bearings.

Prices on application.

Sluice Valves, with Hydraulic Cylinders.

Operated by Hydraulic Pressure.

Fig. A 166.



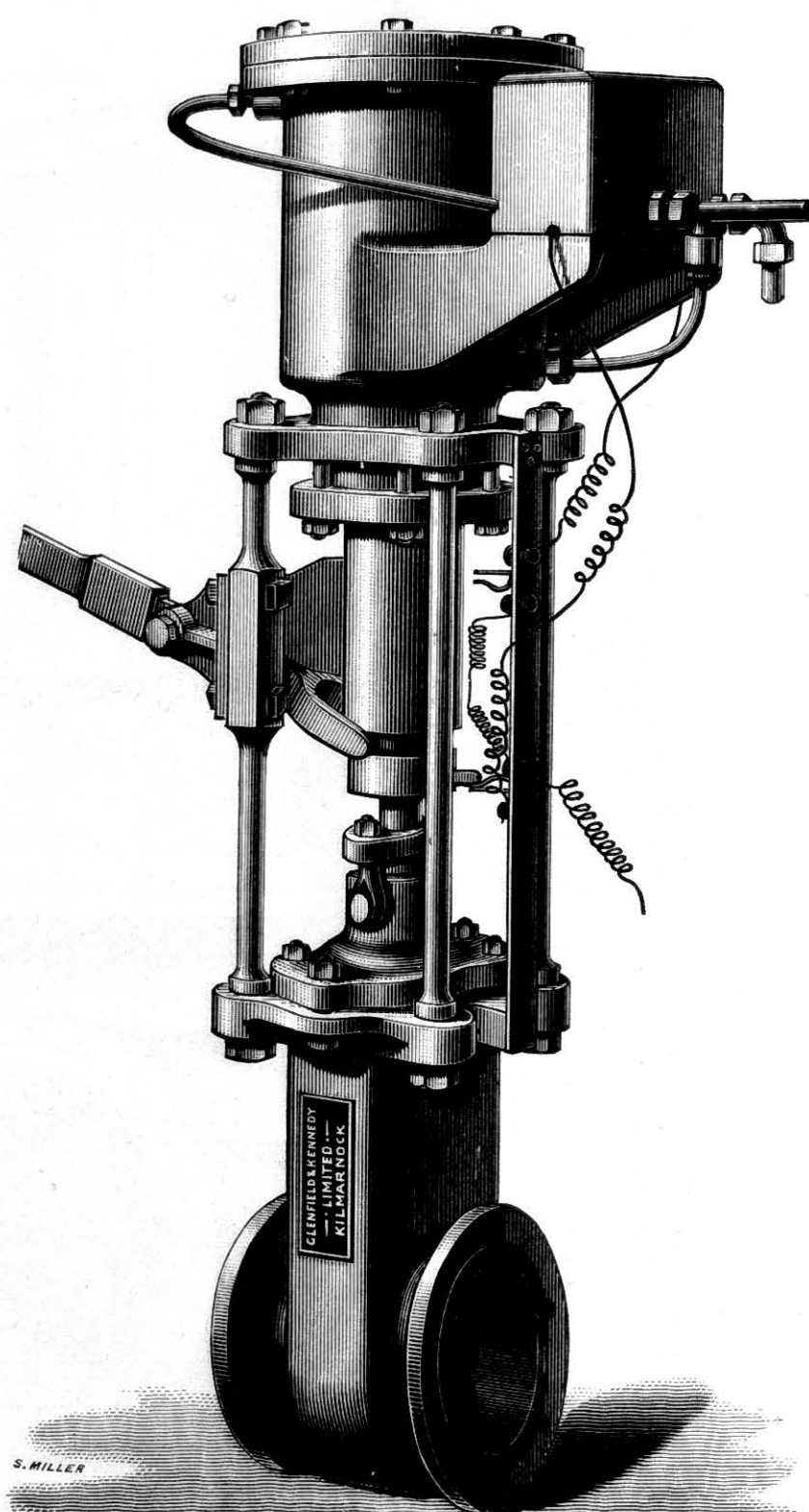
The Cylinder, as shown above, is made of a diameter to suit a working pressure of 700 lbs. per sq. in., but can be made of a greater or less diameter to suit any pressure.

The Piston Rod is shown continued up through top cover, so as to show how far Valve is open or closed. This can be dispensed with if preferred.

The Valve which controls the motion of the Piston is worked by a Lever Bar from above.

Operated by Electric Gear.

Fig. A 168.



The Sluice Valve illustrated is fitted with Hydraulic Cylinder which is operated by Electric current, which may be from an adjacent Electric Station or from a Battery. When pressure is off, the Valve can be opened or closed by Lever Handle.

Prices on application.

Headstocks for Sluice Valves.

Fig. A 41.

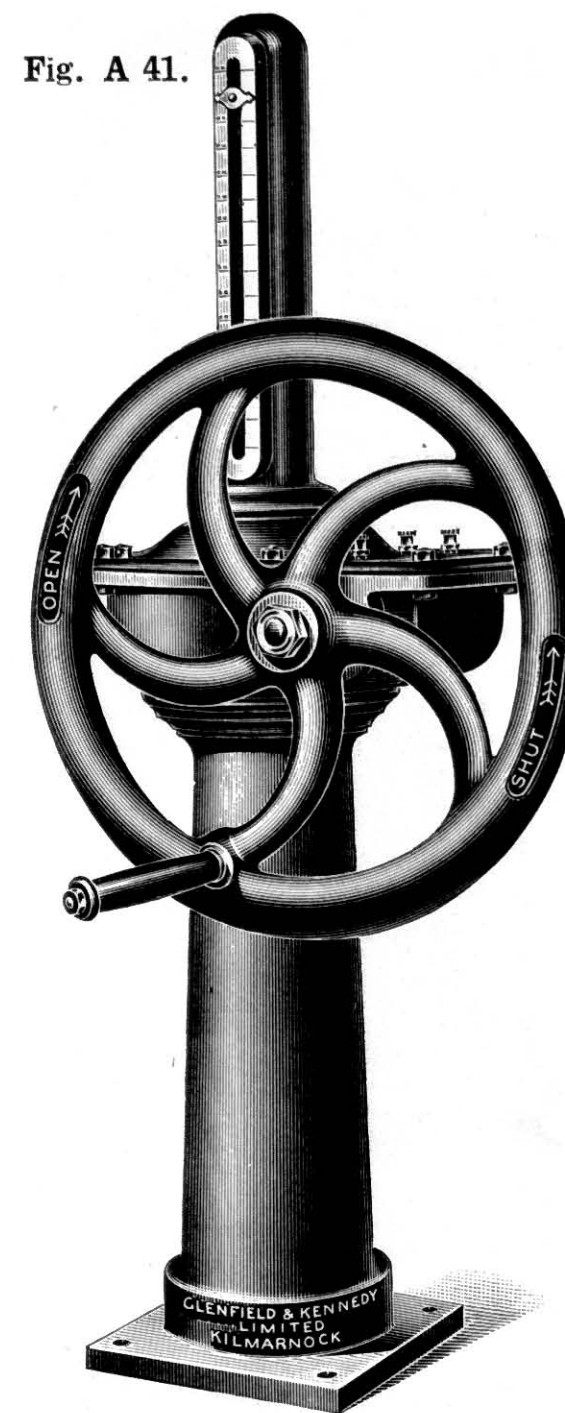
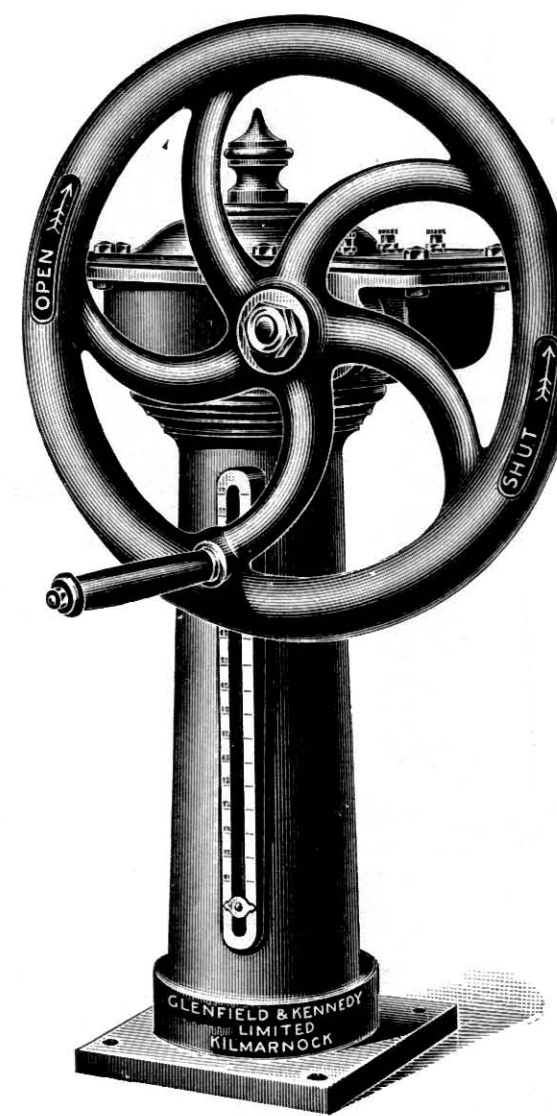


Fig. A 45.



These Worm Wheel Headstocks are suitable for large Valves, or Valves under high pressure. The Column in A 45 has slot with brass face and forms an Index to show how far Valve door is open. The Sluice Valve underneath has the ordinary screwed Spindle, the strain on Valve Rod being *torsional*. The screwed Spindle in A 41 is protected by Hood, which has slot with brass face. The Spindle is readily examined, cleaned, and oiled. The Spindle in the Sluice Valve underneath is plain, and slides in the Stuffing Box. The strain on Valve Rod is in *tension*.

Column, Hood with Index, cast steel Worm Wheel and Worm, Fly Wheel with Handle, Journals all bushed with gun metal, including iron screw Spindle projecting at bottom of Headstock and prepared for going on to Valve Rod, or left for welding.

PRICES.

SIZE OF VALVE,	12"	18"	24"	30"	36"	
A 41,	-					each.
A 45,	-					"

Headstocks for Sluice Valves.

Fig. A 43.

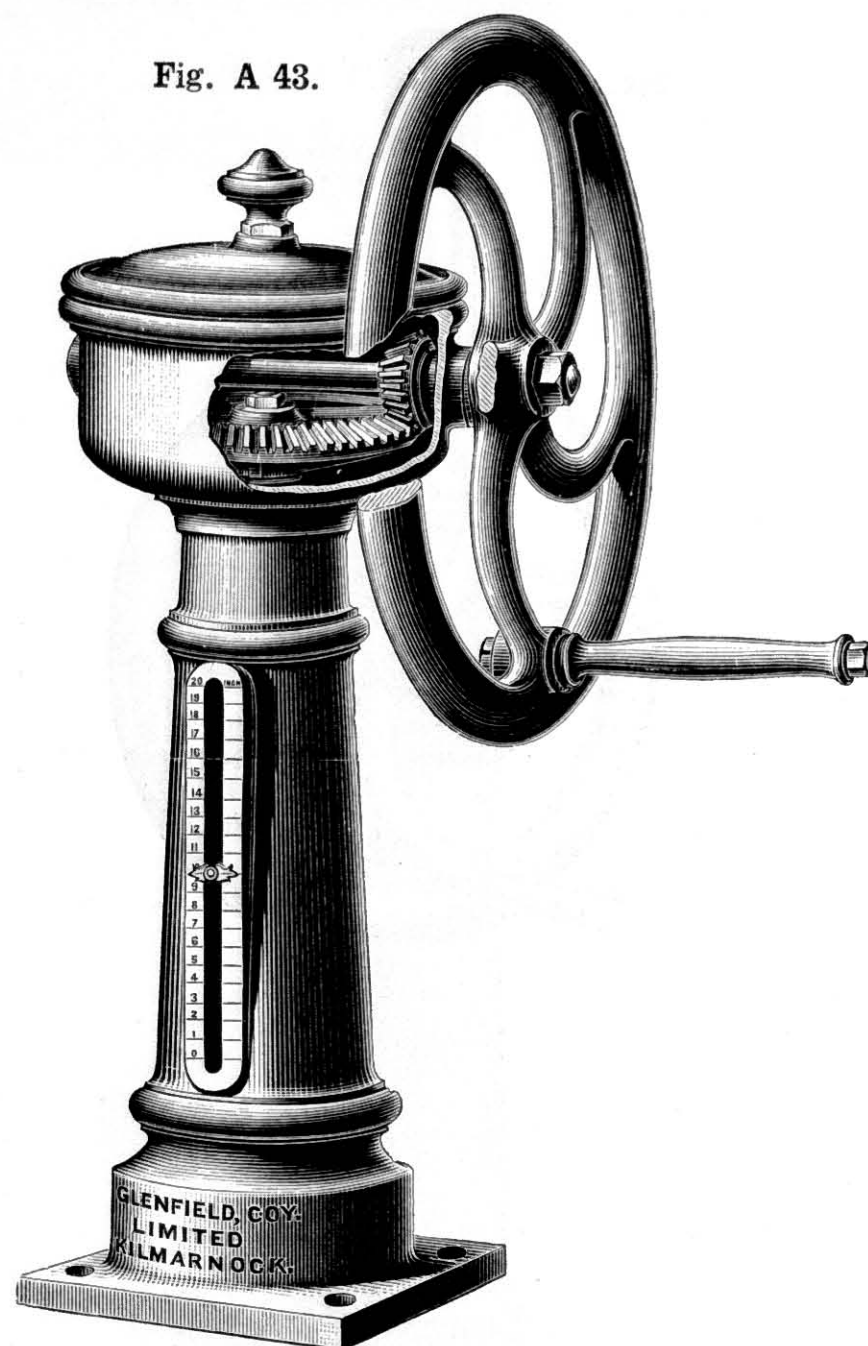
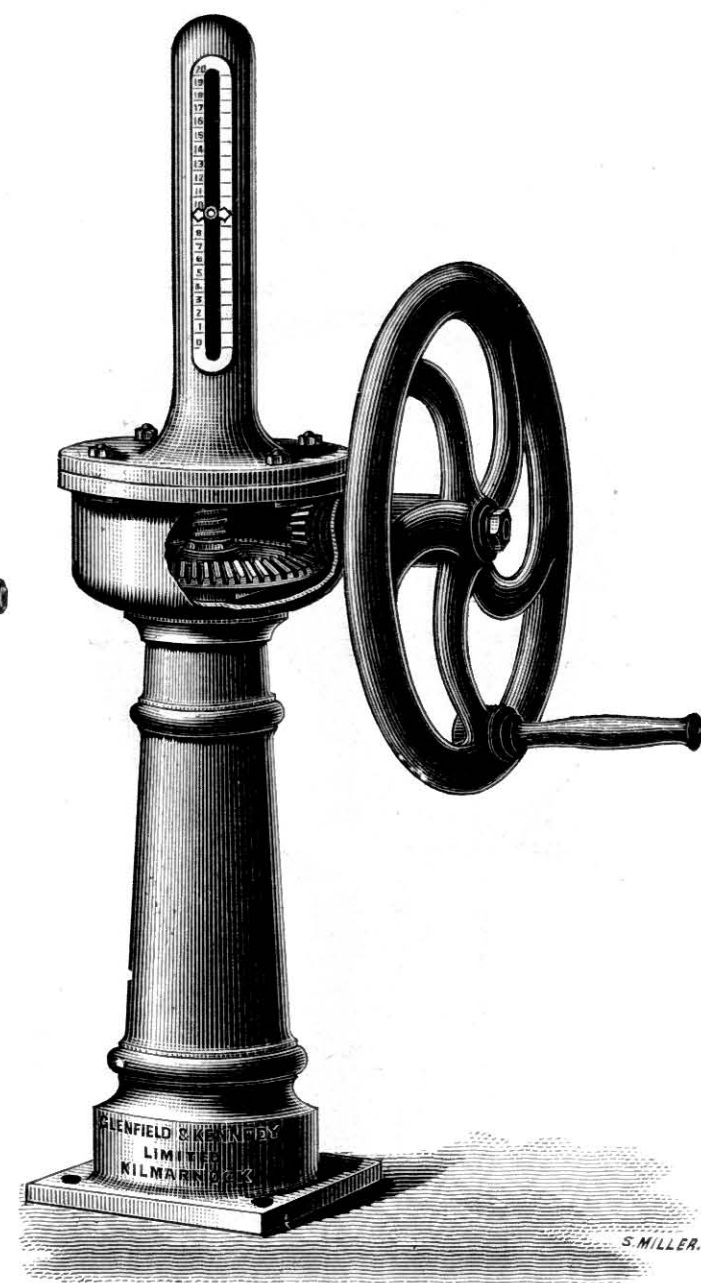


Fig. A 44.



The Bevel Wheel Headstock (A 43) is geared in the ratio of about 3 to 1. The Column has a slot with brass face, and forms an Index to show how far Valve Door is open. The Sluice Valve underneath has the ordinary screwed Spindle, the strain on Valve Rod being *torsional*.

The Headstock (A 44) is similar to A 43, but is arranged for the Valve Spindle to rise up through, and has Indicator on Hood, which protects Valve Spindle. The Spindle in the Valve underneath is plain, and slides in the Stuffing Box. The strain on Valve Rod is in *tension*.

A 43—Column with Cover, cast iron bevel Wheel and cast steel Pinion, Fly Wheel with Handle, Journals all bushed with gun metal, and including iron Spindle projecting at bottom of Headstock, with end prepared for going on to Valve Rod, or left for welding.

A 44—Column with Cover, cast iron bevel Wheel and cast steel Pinion, Fly Wheel with Handle, Journals all bushed with gun metal, and including iron screwed Spindle (working in gun metal Nut) projecting at bottom of Headstock, with end prepared for going on to Valve Rod, or left for welding.

PRICES.

SIZE OF VALVE,	12"	18"	24"	30"	36"
A 43,	-	-	-	-	-
A 44,	-	-	-	-	-

each.

,,

Headstocks for Sluice Valves.

Fig. A 52.

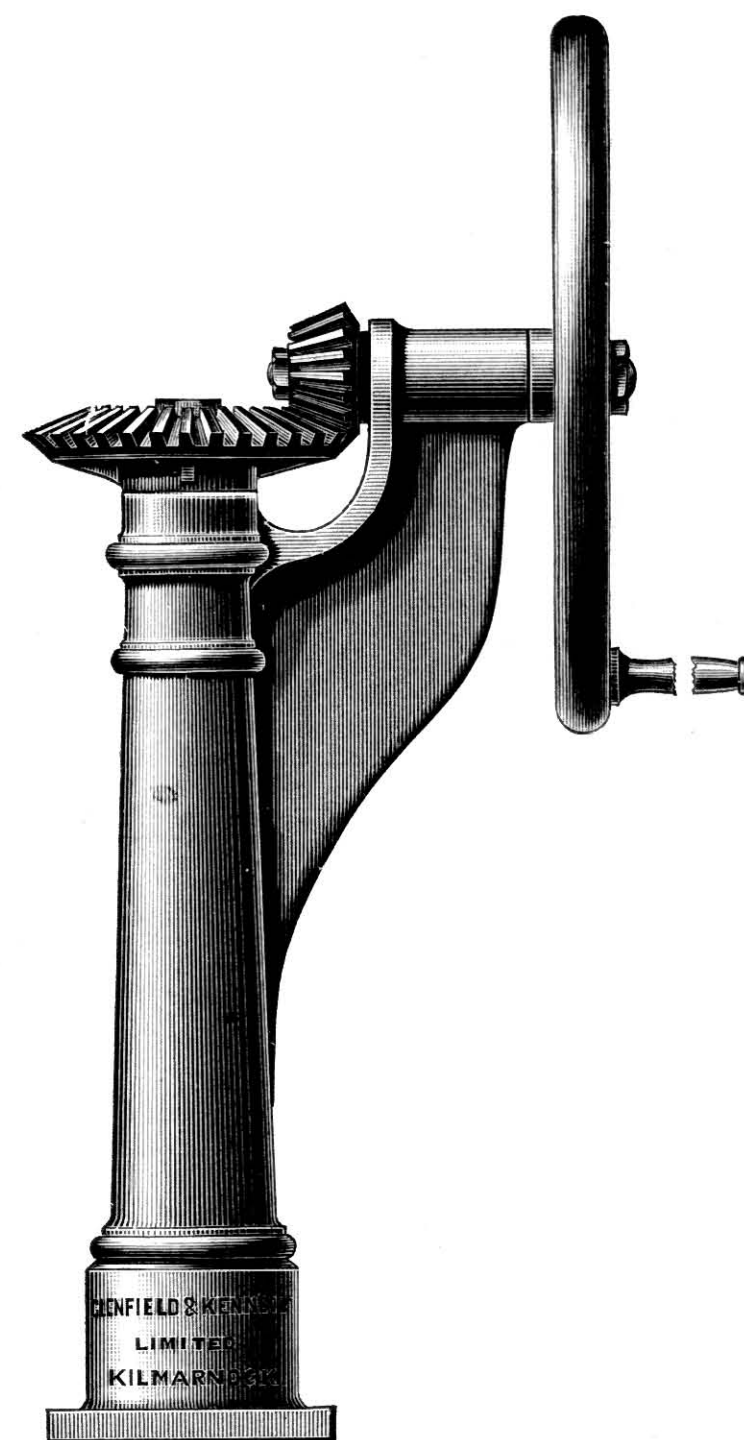
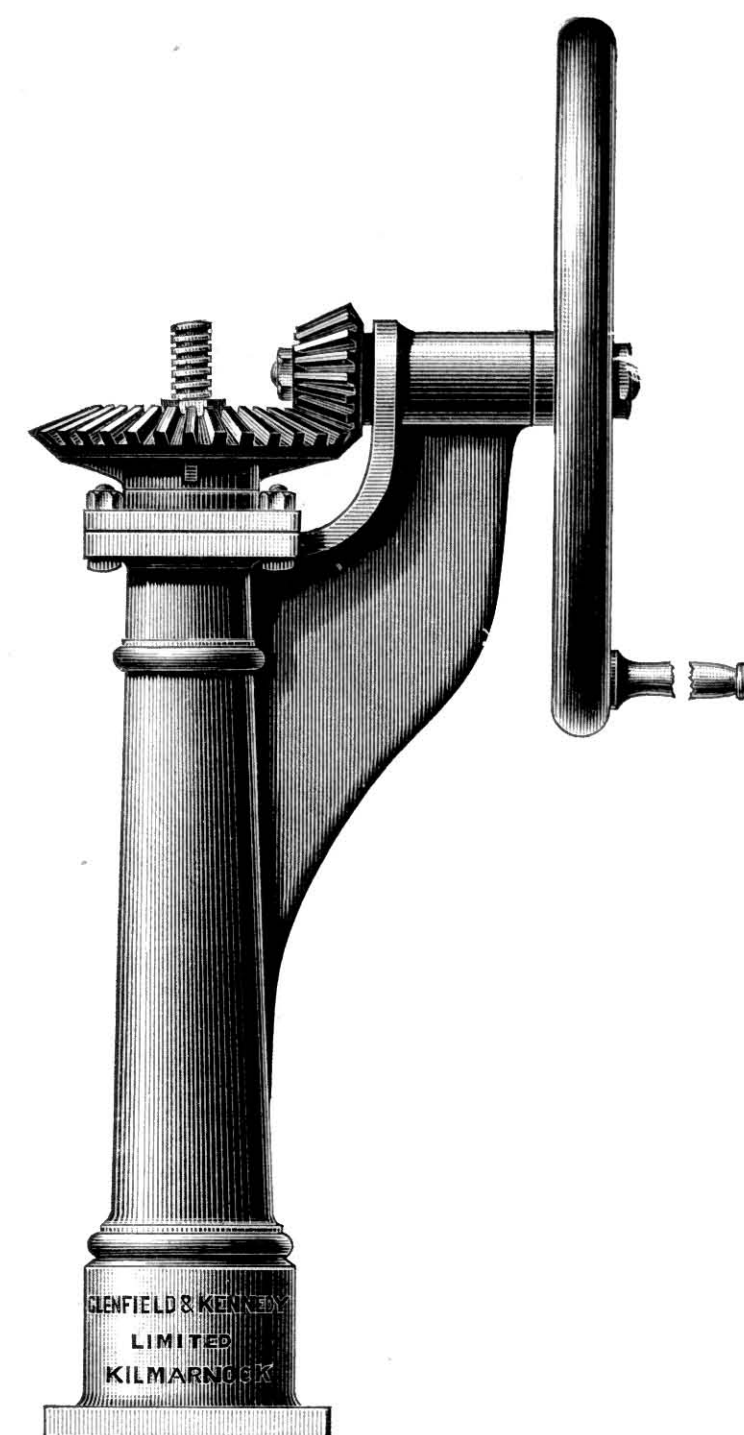


Fig. A 53.



The above illustrations show Headstocks having the Bevel Wheels uncovered.

With A 52 the Sluice Valve underneath has the ordinary screwed Spindle, the strain on Valve Rod being *torsional*.

With A 53 the Spindle in the Sluice Valve is plain and slides in the Stuffing Box. The screwed Spindle rises up through Nut at top and shows how far Valve is open or closed.

A 52—Column with cast iron bevel Wheel and cast steel Pinion, Fly Wheel with Handle, Journal bushed with gun metal, and including iron Spindle projecting at bottom of Headstock, with end prepared for going on to Valve Rod, or left for welding.

A 53—Column with cast iron bevel Wheel and cast steel Pinion, Fly Wheel with Handle, Journal bushed with gun metal, and including iron screwed Spindle (working in gun metal Nut) projecting at bottom of Headstock, with end prepared for going on to Valve Rod, or left for welding.

PRICES.

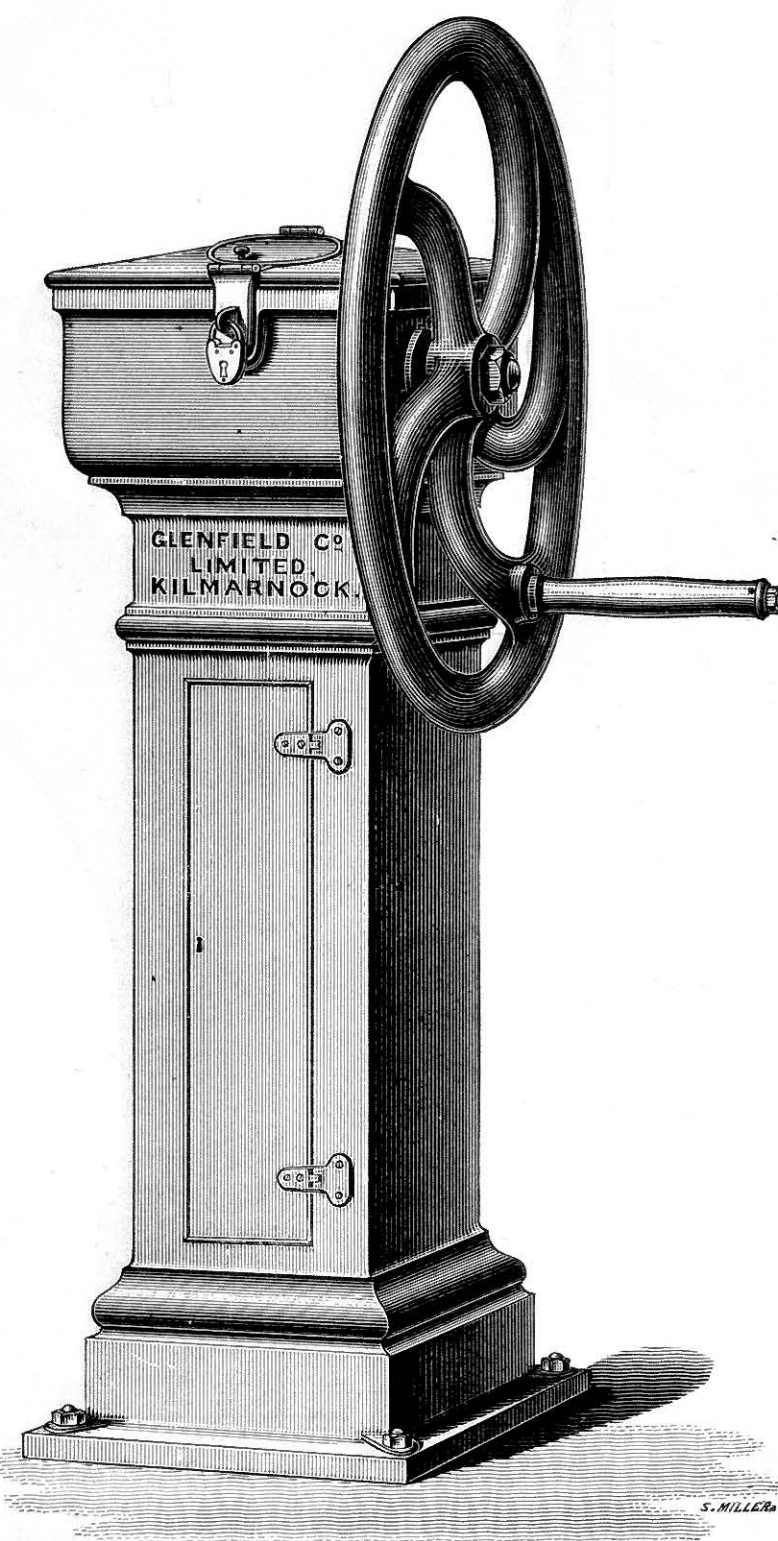
SIZE OF VALVE,	12"	18"	24"	30"	36"
A 52,	-	-	-	-	-
A 53,	-	-	-	-	-

each.

,,

Headstock for Sluice Valves.

Fig. A 46.



This Worm Gear Headstock is suitable for large Valves or Valves under heavy pressure, the rods being in *tension*.

The Screw is of wrought iron, Nut of gun metal, Worm and Wheel of cast steel. An Index is fixed inside at top showing how far Valve is open, a small lid being provided in cover for facility in reading the Index.

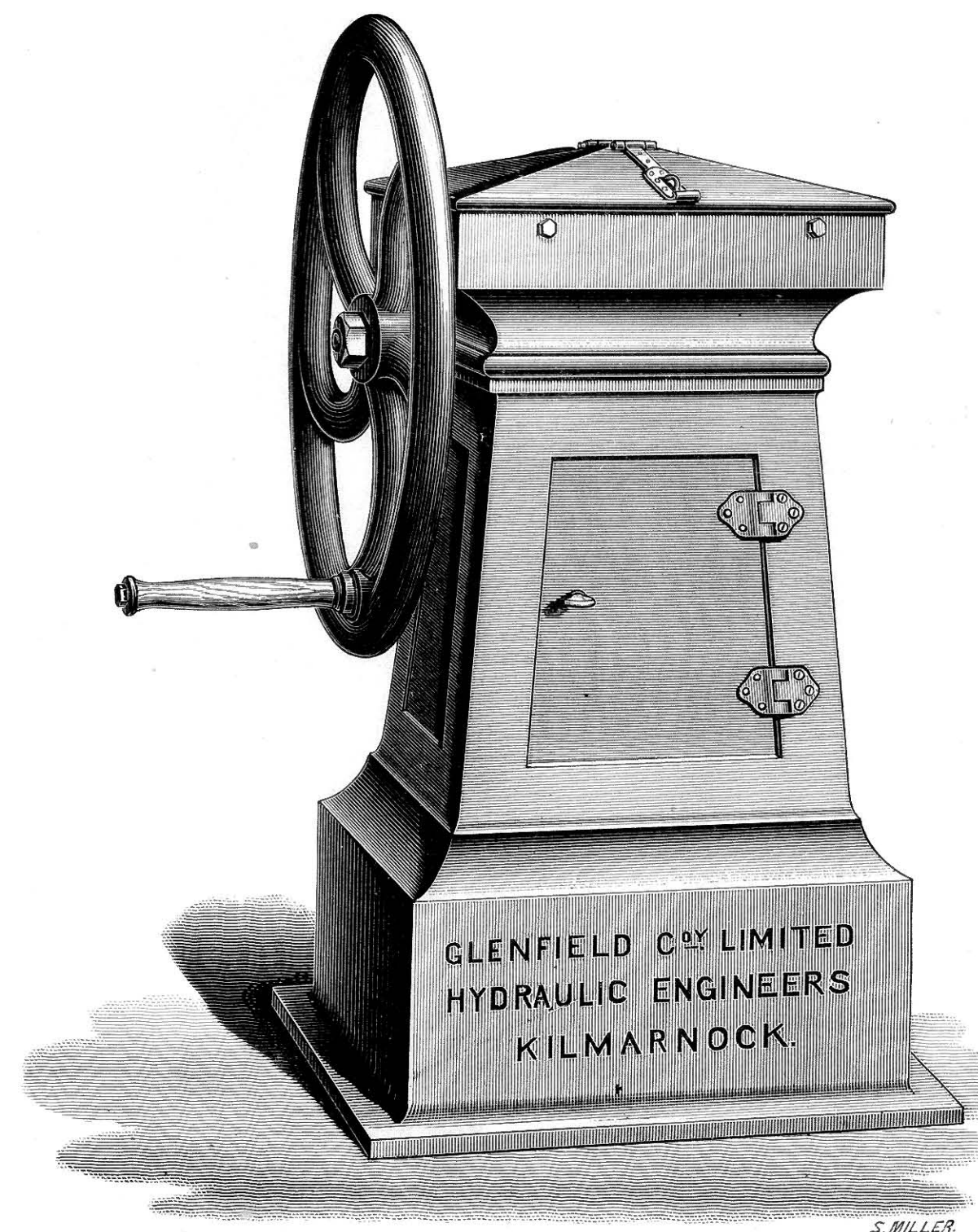
Side Door (with lock) is provided for oiling Screw, etc.

Forked Rod of malleable cast iron is provided, which carries the gun metal nut at top. The lower end has socket prepared for Valve Rod.

Prices on application.

Headstock for Sluice Valves.

Fig. A 47.

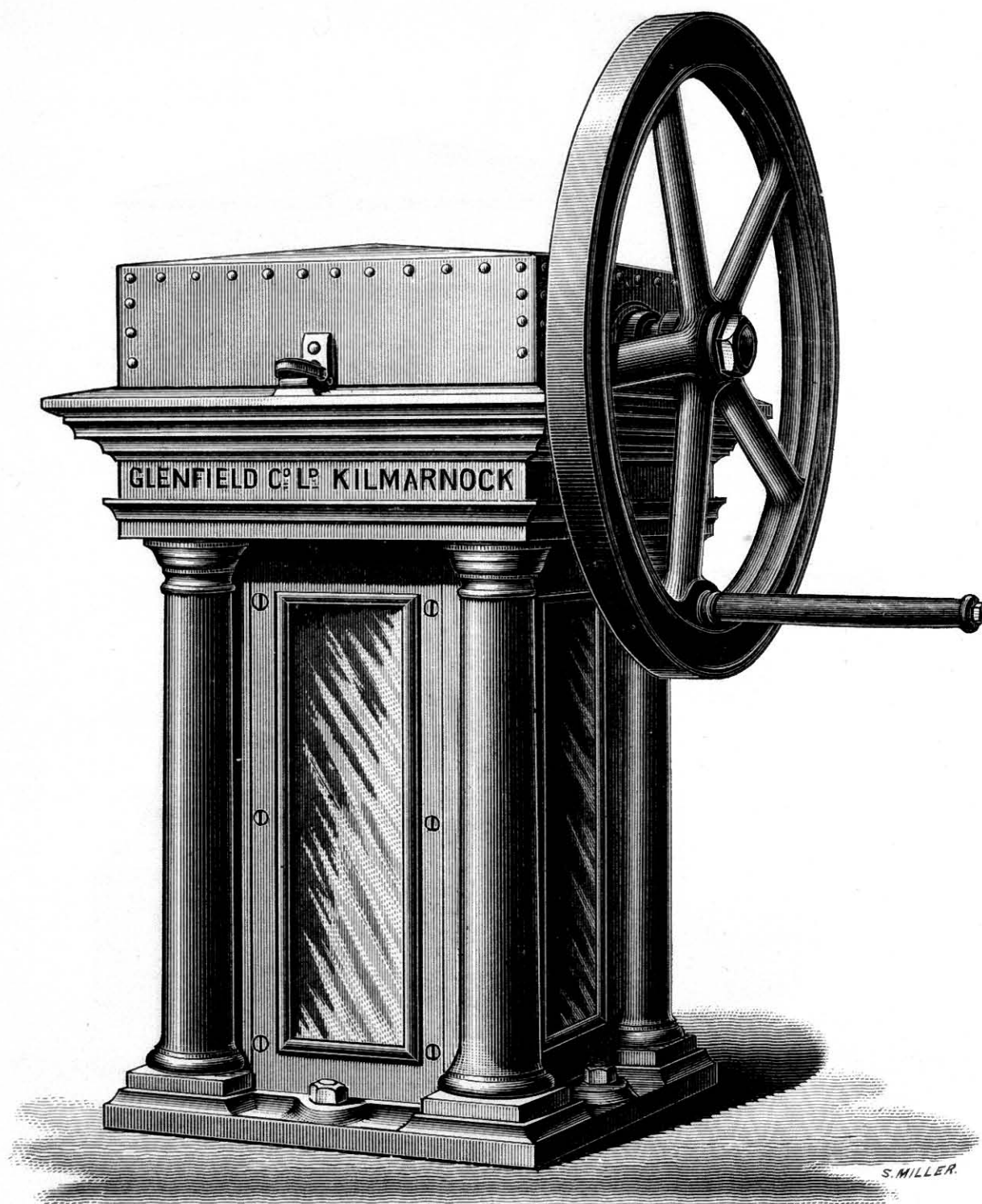


Worm Gear Headstock for large Valves, with Gearing similar to that described for Headstock on page 18, the body being of a more massive design. Complete, with Index, etc.

Prices on application.

Headstock for Sluice Valves.

Fig. A 48.



Bevel Gear Headstock for large Valves, with plate-glass panels all round (one being hinged). An index is fixed inside at top, with small Door on Cover. This Headstock can be arranged with Screw and Fork, or Nut in Wheel, as desired.

Prices on application.

Headstocks for Sluice Valves.

Fig. A 42.

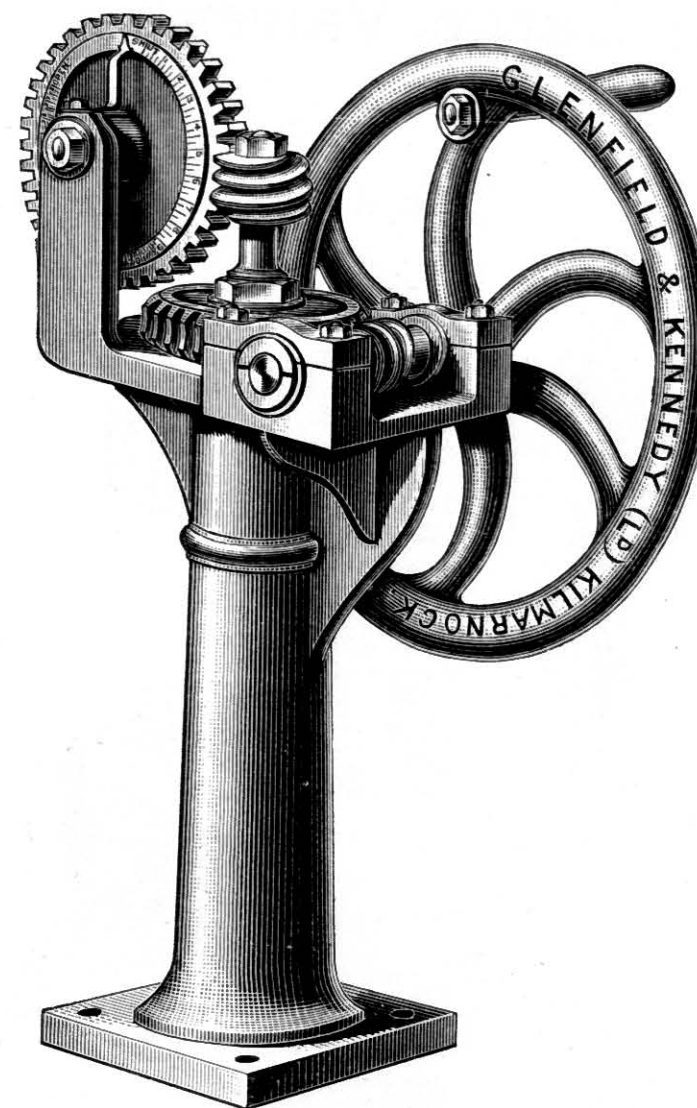


Fig. A 49.

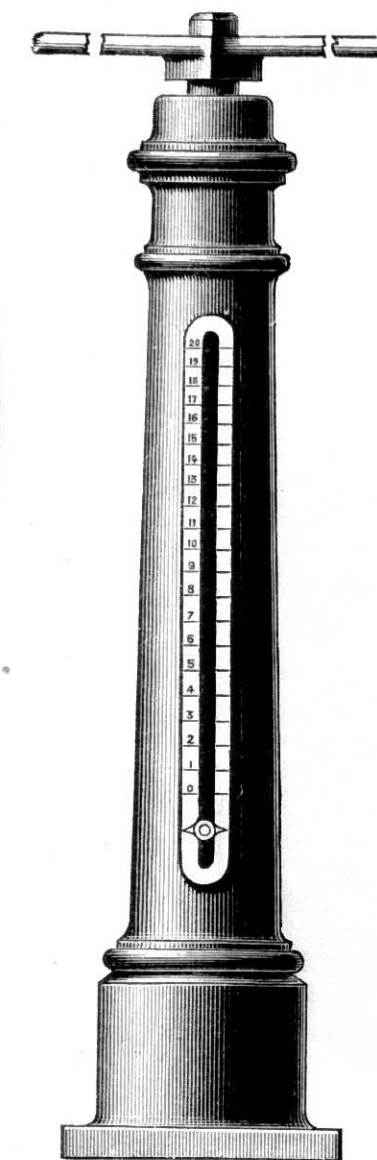
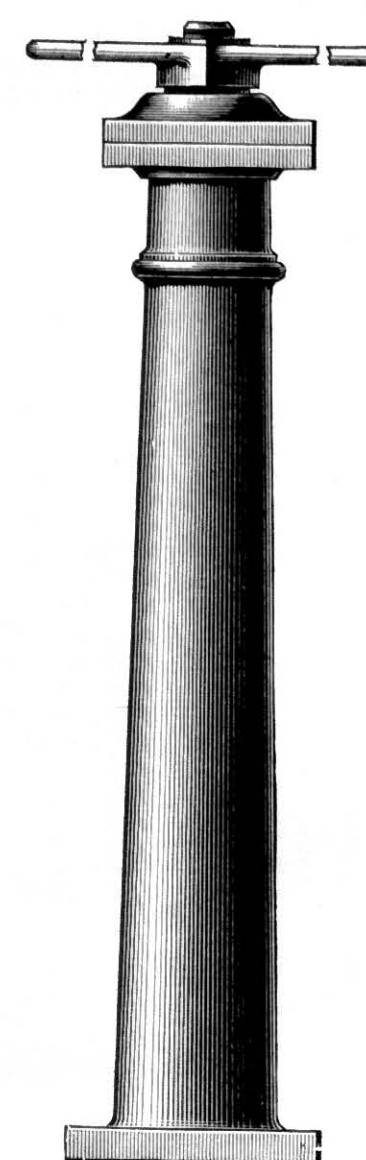


Fig. A 50.



PRICES.

A 42—Worm Wheel Headstock, suitable for large Valves, or Valves under high pressure. The Index is formed by a brass-faced wheel driven by small worm. The Sluice Valve underneath has ordinary screwed Spindle. The strain on Valve Rod is *torsional*.

Column, with cast steel Worm Wheel and Worm, Fly Wheel with Handle, Journals all bushed with gun metal, including iron screw Spindle projecting at bottom of Headstock and prepared for going on to Valve Rod, or left for welding.

SIZE OF VALVE,	12"	18"	24"	30"	36"
A 42, - - -					

each.

A 49—Guide Pillar for Valve Rod, with Cross-handle on top, and having Indicator Slot, with gun metal Index Plate, Nut, and Pointer on side of Pillar to show how far Valve is open.

To suit Valves up to 9" 10" to 15" 16" to 24" dia.

each.

A 50—Screw Pillar, with gun metal Nut, with Cross-handle. The Screw rises through the Nut and shows how far Valve is open.

To suit Valves up to 7" 8" to 12" 13" to 18" 20" to 24" dia.

each.

Prices include Rod projecting a foot or so under Sole of Pillar and left for welding up to Valve Rod.

Gearing for Working Large Valves.

Fig. A 176.

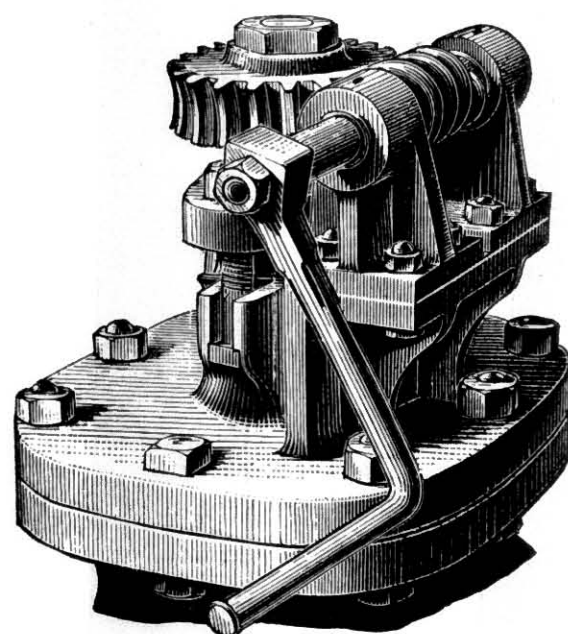
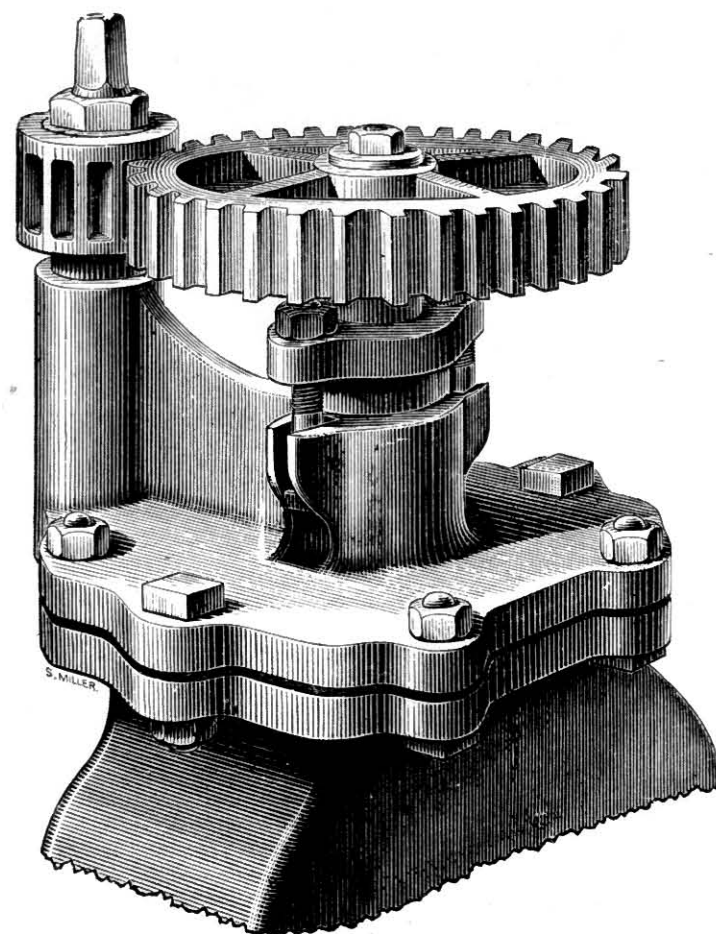


Fig. A 177.



PRICES.

	SIZE OF VALVE, 16"	18"	20"	22"	24"	30"	36"	42"
A 176 Worm Wheel Gearing, with Bracket cast on Stuffing Box, and Gland bushed with gun metal,								
A 177 Spur Wheel Gearing,								

NOTE.—The above Prices are all extra to Prices of Sluice Valves.

Gearing for Working Large Valves, & Indicator Gear.

Fig. A 178.

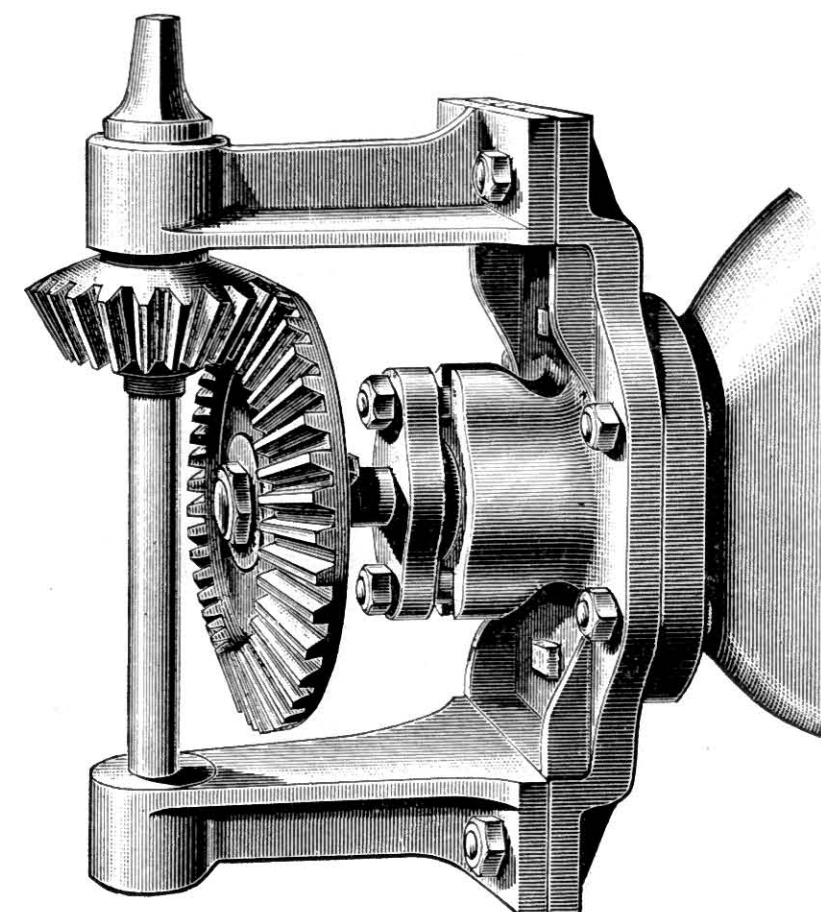


Fig. A 179.

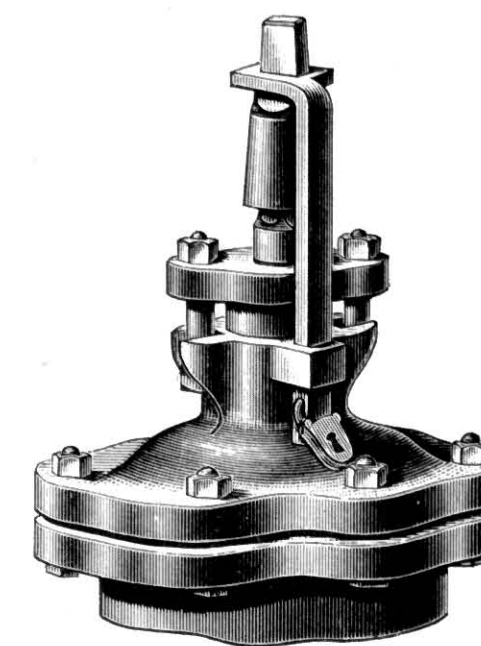


Fig. A 180.

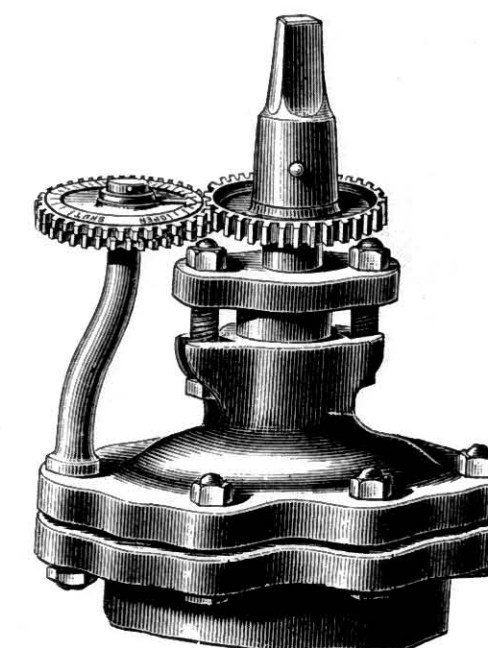
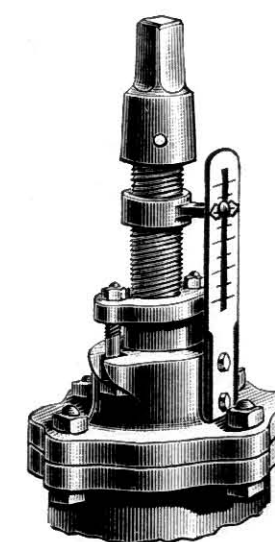


Fig. A 181.



PRICES.

	SIZE OF VALVE,								16"	18"	20"	22"	24"	30"	36"	42"	
A 178—Bevel Wheel Gearing to open Valve when lying on its side,																	
A 179—Locking Arrangement for Sluice Valves, ..																	
	SIZE OF VALVE,								3"	4"	5"	6"	7"	8"	9"	10"	12"
A 180—Indicator Gear (Differential Wheels)—visible from above,																	
A 181—Indicator Gear (Fine Screw and Pointer)—visible from side,																	

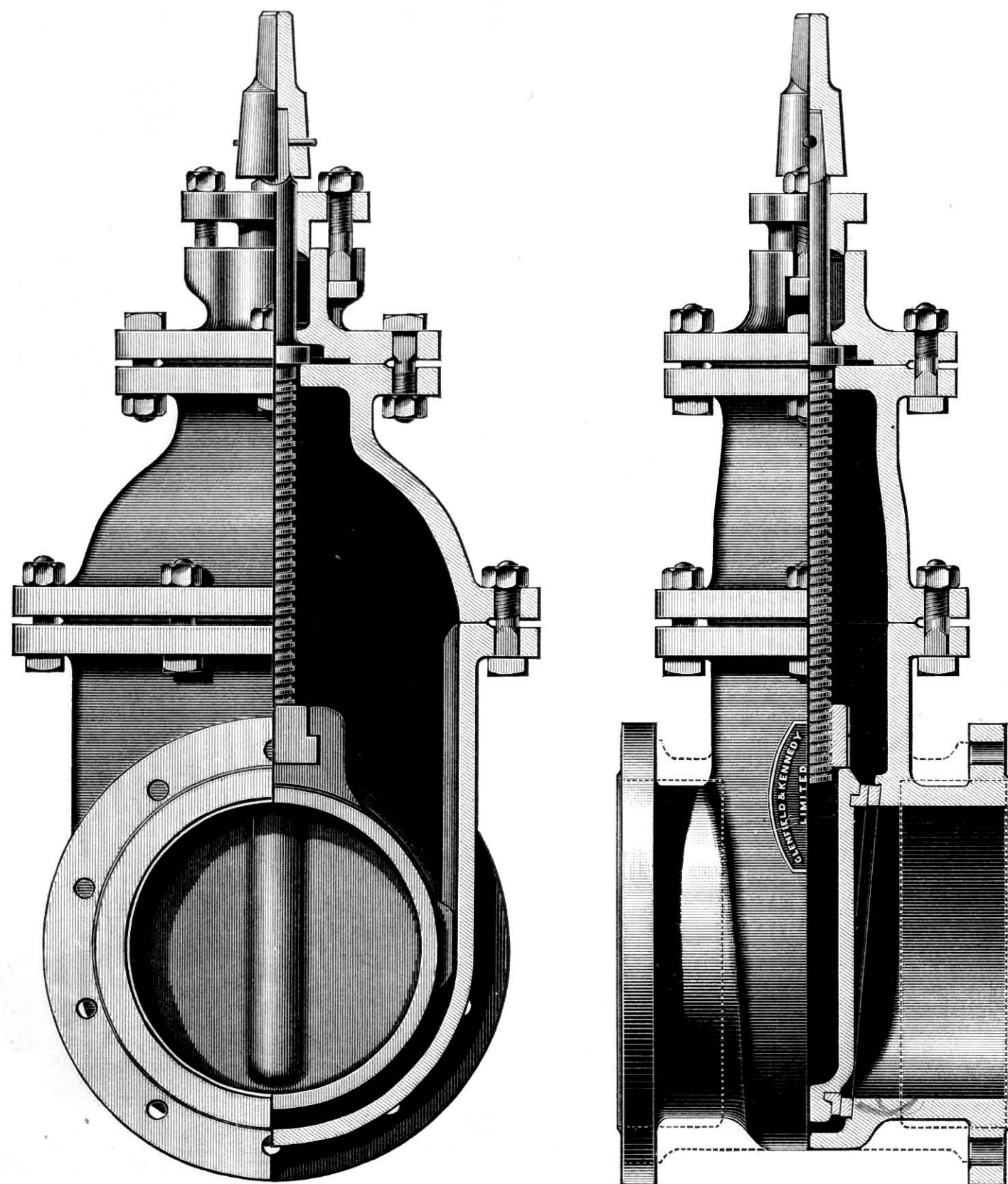
Indicators for larger sizes of Sluice Valves, prices on application.

To suit Valves 1½" to 4" 5" to 12" dia.

NOTE.—The above Prices are all extra to Prices of Sluice Valves.

Sluice Valve.

Fig. A 1.



Valves of 9" dia. and upwards are made of this type.


The dotted lines show a Double Socket Valve.

When ordering state whether to be Double Flanged or Double Socket.

All Valves coated with Dr. Angus Smith's Patent Composition.

For Dimensions see pages 27 and 28 of this Section.

For Particulars of Sluice Valves for Exhaust Steam see Section B (Steam).

Unless otherwise instructed, all Sluice Valves for Water are made to open 

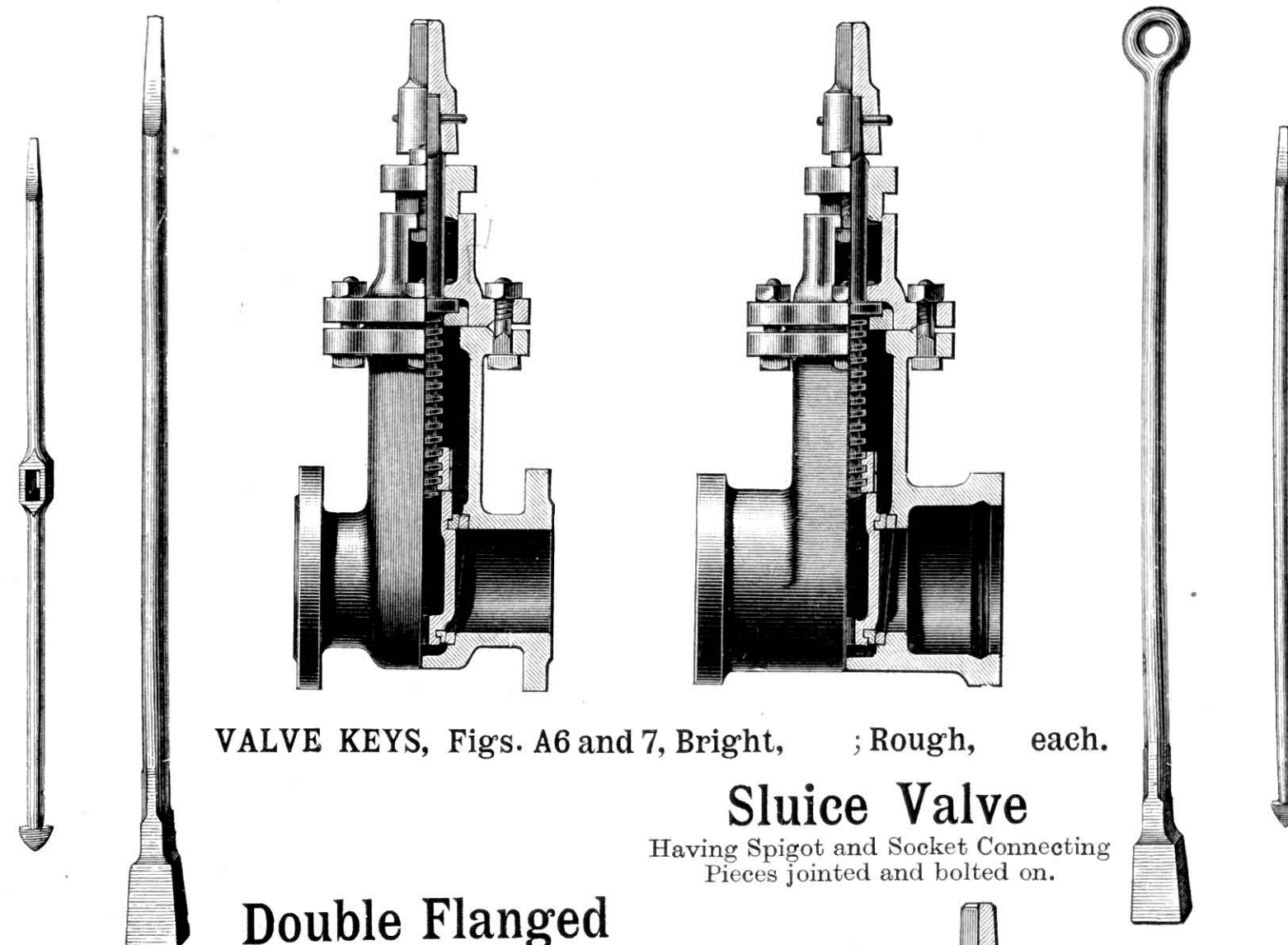
Double Flanged Sluice Valve. Double Socket Sluice Valve.

Fig. A 6.

Fig. A 2.

Fig. A 3.

Fig. A 7.



VALVE KEYS, Figs. A6 and 7, Bright, ; Rough, each.

Sluice Valve

Having Spigot and Socket Connecting Pieces jointed and bolted on.

Double Flanged Sluice Valve

With Hand Wheel.

Fig. A 5.

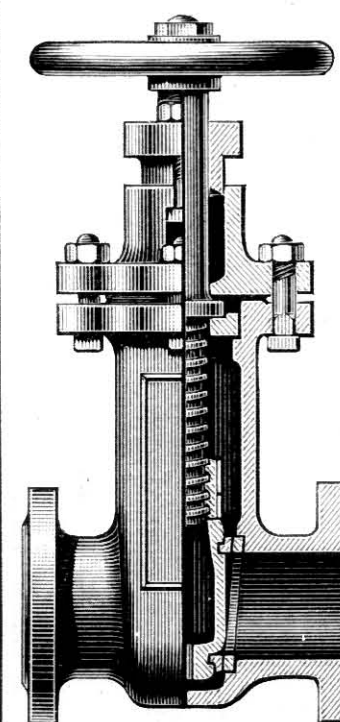
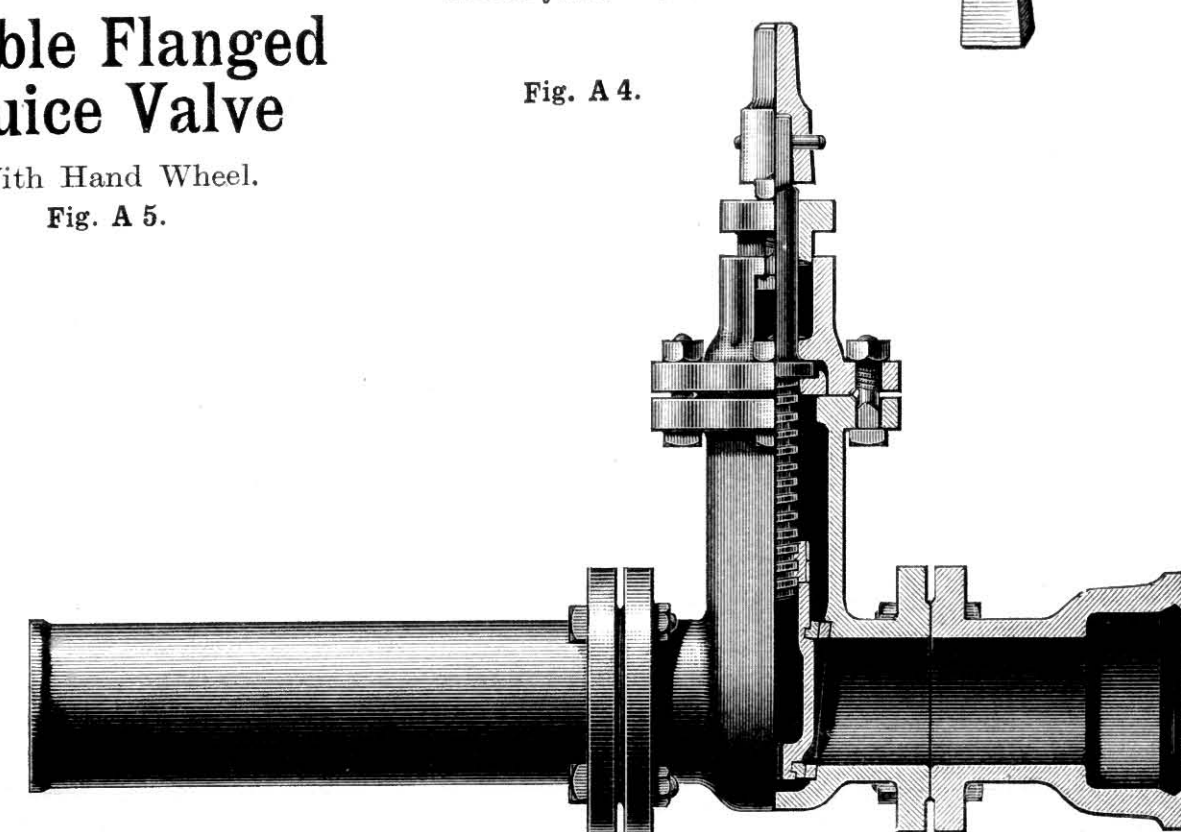


Fig. A 4.




Valves of 8" dia. and under are made of these types.

All Valves tested to a head of 600 feet of water before being sent out.

For Dimensions see pages 27 and 28 of this Section.

For Dimensions of Spigot and Socket Ends see page 30 of Section D.

Unless otherwise instructed, all Sluice Valves for Water are made to open thus 

Sluice Valves.

These Sluice Valves are of the best construction and workmanship. The materials used in their construction are of first-class quality, both as regards cast iron, wrought iron, and gun metal. The Spindles are of special forged bronze. The Valves are all double-faced, both faces being accurately machined or hand-scraped to a bearing and proved. All parts of Water Valves are then tested to a pressure of 600, and Gas and Sewage Valves to 50 ft. head of water. When specially ordered, these Valves can be strengthened to stand 1000 ft., or still higher pressures. A 1 represents the end and side views, half section, half elevation, of a Flanged Valve of 9" dia. and above; the dotted lines show the same as a Double Socket Valve. A 2, A 3, A 4, and A 5 show Valves under 9" dia.

SLUICE VALVE PRICE LIST.

Size. Inches.	Figs. A 1, 2, or 3, with Screw of forged bronze, Nut and 4 Faces of gun metal. Flanged or Socket.	Figs. A 1, 2, or 3, with Screw of wrought iron, Nut and 4 Faces of gun metal. Flanged or Socket.	Figs. A 1, 2, or 3, Gas or Sewage Valves, Screw of wrought iron, Nut and Faces of cast iron. Flanged or Socket.	Fig. A 4, Spigot and Socket Ends, jointed on any of the preceding. Extra.	Oval Rim. Hand Wheel fitted on top of Spindle of any of the preceding. Not polished. Extra.
1½					
2					
2½					
3					
3½					
4					
4½					
5					
5½					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
18					
20					
21					
22					
24					

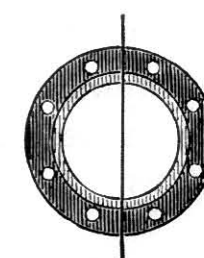
Larger Sizes, 25", 26", 27", 28", 30", 31½", 33", 36", 40", 42", 45", 48", 54", 57", 60", 66", 72", 75", and 84", by special quotation.

For Dimensions of Spigot and Socket Ends, see Section D.

Dimensions of Sluice Valves.

Size of Valve.		Diameter of Flanges.	Diameter of Bolt Circle.	Length over Flanges.	Thickness of Flange.	Bolts in Flange.	Diameter of Bolts.	Height from centre of Pipe to top of Cap on Spindle.
Centimetres.	Inches.	Inches.	Inches.	Inches.	Inches.	Number.	Inches.	Inches.
3·8	1½	5¼	3¾	7½	5⁄8	4	½	13¾
5	2	6	4½	8½	¾	4	5⁄8	17¾
6·3	2½	6½	5	9½	¾	4	5⁄8	18¾
7·7	3	7¼	5¾	9¾	¾	4	5⁄8	20¼
8·3	3¼	7¾	6	9¾	¾	4	5⁄8	20¾
9	3½	8	6½	9¾	¾	4	5⁄8	21½
10·1	4	8½	7	9¾	7⁄8	4	5⁄8	22¾
11·4	4½	9	7½	9¾	7⁄8	8	5⁄8	23¾
12·7	5	10	8¼	10	7⁄8	8	5⁄8	25
14	5½	11	9¼	10¾	7⁄8	8	5⁄8	25½
15·2	6	11	9¼	10¾	7⁄8	8	5⁄8	26¼
17·8	7	12	10¼	11¼	1	8	5⁄8	28¾
20·3	8	13¼	11¼	11½	1	8	5⁄8	31¾
23	9	14½	12¾	13¾	1	8	5⁄8	33¼
25·5	10	16	14	15	1	8	3⁄4	35½
28	11	17	15	16	1½	8	3⁄4	37¾
30·5	12	18	16	16	1½	12	3⁄4	38¾
33	13	19¼	17¼	17	1½	12	3⁄4	41½
35·5	14	20¾	18½	17½	1½	12	7⁄8	42¾
38·1	15	21¾	19½	17½	1½	12	7⁄8	44½
40·6	16	22¾	20½	18½	1½	12	7⁄8	46
45·8	18	25¼	23	19½	1½	12	7⁄8	50
51	20	27¾	25¼	20¾	1½	16	7⁄8	53
53·5	21	29	26½	21½	1½	16	7⁄8	54¾
56	22	30	27½	22	1½	16	1	58½
61	24	32½	29¾	22	1½	16	1	61½
63·6	25	33½	30¾	22	1½	16	1	63½
66·2	26	34¾	32	22	1½	20	1	66½
68·8	27	36	33¼	23½	1½	20	1	68½
71·3	28	37¾	34¾	25	1½	20	1½	69¾
76·5	30	39¾	36¾	27	1½	20	1½	73
80	31½	41¼	38½	27½	1½	20	1½	75½
84	33	43¼	40	28	1½	20	1½	79½
91·6	36	46¼	43	29	1½	24	1½	84½
96·6	38	48¼	45	29½	1½	24	1½	88½
101·6	40	50¼	47	30	2	24	1½	91½
106·8	42	52½	49¼	30½	2	28	1½	95¾
114·4	45	55½	52¼	32	2	28	1½	100¾
122	48	58½	55¼	32	2½	28	1½	105½

In all cases the vertical line passes between holes thus



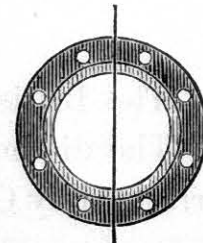
NOTE.—The British Standard only extends to 24" Pipes. The dimensions given for larger sizes have been arranged by GLENFIELD & KENNEDY LIMITED.

The Length over Flanges in above Table refer to Water Valves only. Gas, Cyanide and Exhaust Valves are all made specially short over Flanges.

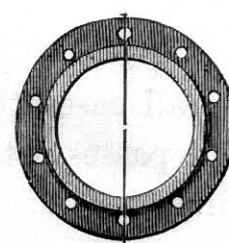
Dimensions of Sluice Valves.

Size of Valve.		Diameter of Flanges.	Diameter of Bolt Circle.	Length over Flanges.	Thickness of Flange.	Bolts in Flange.	Diameter of Bolts.	Height from centre of Pipe to top of Cap on Spindle.
Centimetres.	Inches.	Inches.	Inches.	Inches.	Inches.	Number.	Inches.	Inches.
3.8	1½	5¼	3⅞	7⅞	¾	4	½	13⅞
5	2	6	4¾	8½	¾	4	½	17¾
6.3	2½	6½	5⅞	9¼	¾	4	9/16	18¾
7.7	3	7	5¾	9⅜	1⅜	4	9/16	20¼
8.3	3¼	7⅜	6	9⅜	1⅜	4	9/16	20¾
9	3½	7¾	6¼	9⅜	1⅜	4	9/16	21½
10.1	4	8½	6¾	9⅝	7/8	4	9/16	22¾
11.4	4½	9¼	7½	9⅞	7/8	4	5/8	23⅜
12.7	5	9¾	8	10	7/8	6	5/8	25
14	5½	11	9¼	10¾	7/8	6	5/8	25½
15.2	6	11	9¼	10¾	7/8	6	5/8	26¼
17.8	7	12½	10½	11¼	1	6	5/8	28⅜
20.3	8	13⅜	11½	11⅝	1	6	¾	31⅝
23	9	15	12¾	13⅝	1	8	¾	33¼
25.5	10	16	13¾	15	1⅛	8	¾	35½
28	11	17½	15	16	1⅛	8	¾	37⅜
30.5	12	18½	16	16	1⅛	10	¾	38¾
33	13	20	17½	17	1¼	10	7/8	41⅝
35.5	14	20¾	18⅜	17⅝	1¼	10	7/8	42¾
38.1	15	21¾	19¼	17½	1¼	12	7/8	44½
40.6	16	23⅜	21	18½	1⅝	12	7/8	46
45.8	18	25	22¼	19⅝	1⅝	12	7/8	50
51	20	27½	25⅛	20¾	1½	14	1	53
53.5	21	28¾	26¼	21¼	1⅝	14	1	54¾
56	22	30¼	27½	22	1¾	14	1	58½
61	24	32	29⅝	22	1¾	16	1	61⅝
63.6	25	33	30⅝	24	1¾	16	1	63½
66.2	26	34	31½	22	1¾	16	1	66½
68.8	27	36	33¼	23½	1¾	18	1	68⅝
71.3	28	37¼	34¼	25	1¾	18	1⅛	69¾
76.5	30	39⅝	36½	27	1¾	18	1⅛	73
80	31½	41¼	38⅞	32¼	1⅞	20	1¼	75½
84	33	42¾	39½	32	1⅞	20	1¼	79⅝
91.6	36	45½	42⅝	29	1⅞	20	1¼	84⅝
101.6	40	49½	46¼	32	2	22	1¼	91⅝
106.8	42	52⅞	48⅝	30½	2	22	1¼	95⅝
122	48	58½	54¾	32	2¼	28	1¼	105⅝

For all sizes of Sluice Valves up to and including 11", the vertical line passes between the holes thus



For all sizes including 12" and upwards, the vertical line passes through two holes thus



This Table gives particulars of Flanges as used up to about the end of 1905.

The Length over Flanges in above Table refer to Water Valves only. Gas, Cyanide and Exhaust Valves are all made specially short over Flanges.

Hand Wheel, Oval Rim. Hand Wheel, Square Rim.

Fig. A 188.

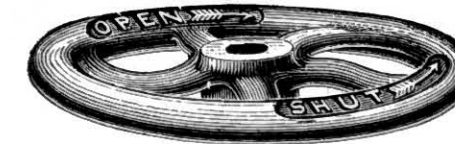
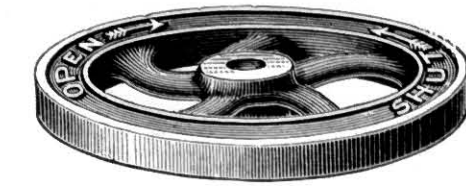


Fig. A 189.



Spindle Bushed Gland Bushed.

for Repacking under Pressure.

Fig. A 191.

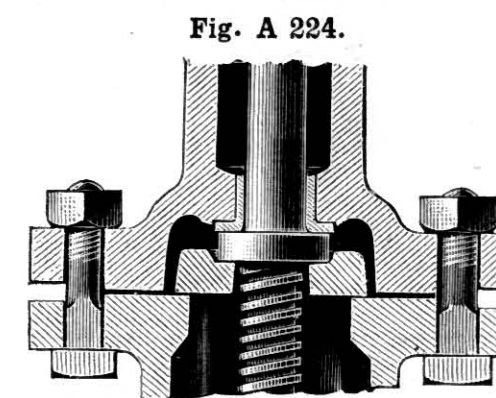
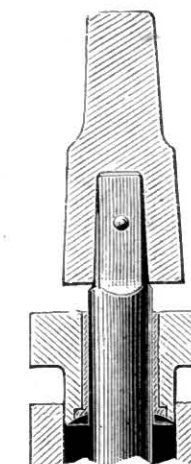
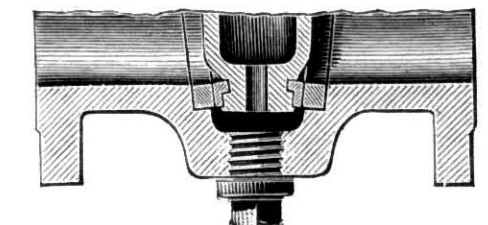


Fig. A 224.



Plug Scour.

Fig. A 194.



EXTRA TO PRICES OF SLUICE VALVES.

A 191—Gland bushed with gun metal,	2" to 7" inclusive,	
	8" to 10" ..	
	12" to 18" ..	
	20" to 24" ..	
A 194—Brass Plug in bottom of Valve,	2" to 6" ..	
	7" to 9" ..	
	10" to 12" ..	
A 224—Gun metal Bush in bottom of Stuffing Box, allowing Valve to be packed while under pressure,	2" to 5" ..	
	6" to 7" ..	
	8" to 9" ..	
	10" to 12" ..	

Bolts and India Rubber Joint for Sluice Valves—

2"	2½"	3"	4"	5"	6"	7"	8"	9"	Valve. per Set.
10"	12"	14"	15"	16"	18"	20"	22"	24"	Valve. per Set.

Patent Cyanide Valves.

Fig. A 196

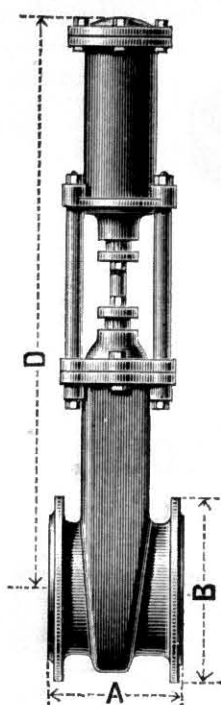


Fig. A 197.

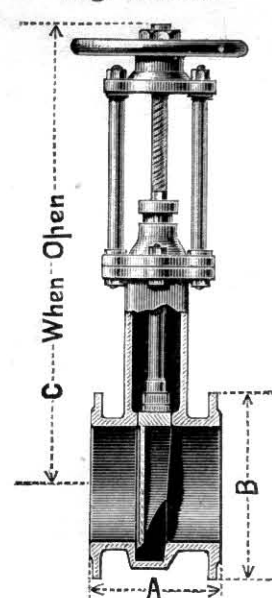


Fig. A 198.

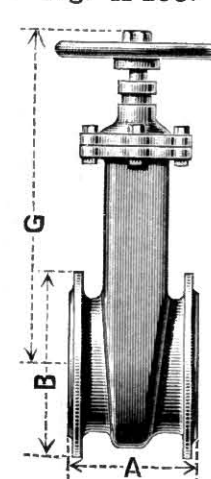
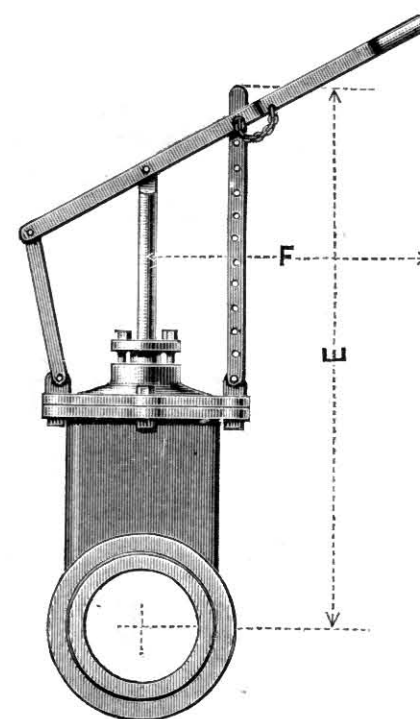


Fig. A 199.



Size of Valve.	A	B	C	D	E	F	G
1"	5"	5"	9 $\frac{3}{4}$ "	..	10"	10"	9 $\frac{3}{4}$ "
2"	5 $\frac{3}{4}$ "	6"	1' 2"	..	1' 3"	12"	12"
3"	6 $\frac{1}{2}$ "	7 $\frac{1}{4}$ "	1' 9"	2' 1 $\frac{1}{4}$ "	1' 9"	1' 2"	1' 2 $\frac{1}{4}$ "
4"	6 $\frac{3}{4}$ "	8 $\frac{1}{2}$ "	2' 0 $\frac{1}{2}$ "	2' 5 $\frac{1}{2}$ "	1' 11 $\frac{1}{2}$ "	1' 4"	1' 3 $\frac{3}{4}$ "
5"	7 $\frac{1}{2}$ "	10"	2' 4 $\frac{1}{2}$ "	2' 9"	2' 2 $\frac{3}{4}$ "	1' 6"	1' 6"
6"	8 $\frac{1}{4}$ "	11"	2' 8 $\frac{1}{4}$ "	3' 0"	2' 5 $\frac{3}{4}$ "	1' 7 $\frac{3}{4}$ "	1' 8 $\frac{3}{4}$ "
7"	9"	12"	3' 1 $\frac{1}{4}$ "	3' 3 $\frac{3}{8}$ "	2' 10"	1' 9"	1' 10 $\frac{3}{4}$ "
8"	9 $\frac{1}{2}$ "	13 $\frac{1}{4}$ "	3' 5 $\frac{1}{4}$ "	3' 8 $\frac{1}{4}$ "	3' 1 $\frac{7}{8}$ "	1' 11"	2' 1 $\frac{1}{4}$ "
9"	10"	14 $\frac{1}{2}$ "	3' 9 $\frac{1}{4}$ "	3' 11"	3' 4 $\frac{2}{8}$ "	1' 11 $\frac{1}{2}$ "	2' 3 $\frac{1}{2}$ "
10"	10 $\frac{3}{4}$ "	16"	4' 1 $\frac{3}{4}$ "	4' 1 $\frac{1}{4}$ "	3' 8 $\frac{3}{8}$ "	2' 0 $\frac{1}{4}$ "	2' 5"
12"	12"	18"	4' 10 $\frac{3}{4}$ "	4' 8 $\frac{1}{2}$ "	4' 3 $\frac{5}{16}$ "	2' 1 $\frac{1}{4}$ "	2' 9 $\frac{3}{4}$ "
14"	13"	20 $\frac{3}{4}$ "	5' 6 $\frac{1}{4}$ "	5' 4 $\frac{5}{8}$ "	4' 7"	2' 3"	3' 1 $\frac{1}{2}$ "
15"	13 $\frac{1}{4}$ "	21 $\frac{3}{4}$ "	5' 10"	5' 6 $\frac{3}{8}$"	..	..	3' 3 $\frac{3}{4}$ "
16"	13 $\frac{3}{4}$ "	22 $\frac{3}{4}$ "	6' 1"	5' 8 $\frac{1}{2}$"	..	..	3' 5 $\frac{1}{4}$ "
18"	14"	25 $\frac{1}{4}$ "	6' 8 $\frac{1}{4}$ "	6' 2"	..	..	3' 8 $\frac{1}{4}$ "
20"	14 $\frac{1}{2}$ "	27 $\frac{3}{4}$ "	7' 3 $\frac{3}{4}$ "	6' 7 $\frac{3}{4}$"	..	..	3' 11"
21"	15 $\frac{1}{2}$ "	29"	7' 8"	6' 10"	..	..	4' 2"
22"	15 $\frac{3}{4}$ "	30"	7' 10"	7' 0 $\frac{3}{4}$"	..	..	4' 4 $\frac{1}{2}$ "
24"	16"	32 $\frac{1}{2}$ "	8' 3 $\frac{1}{2}$ "	7' 8"	..	..	4' 8"

Body, Cover, Wedge, Gland, Nut, and Faces of Cast Iron. Pins and Spindle of Wrot. Iron. Wyper and Lever of Malleable Cast Iron.

Flanges faced on strip, but left undrilled. If ordered drilled, and no particulars sent, will be made to British Standard, Table 1.

Every Valve carefully tested on Water Pressure before leaving Works.

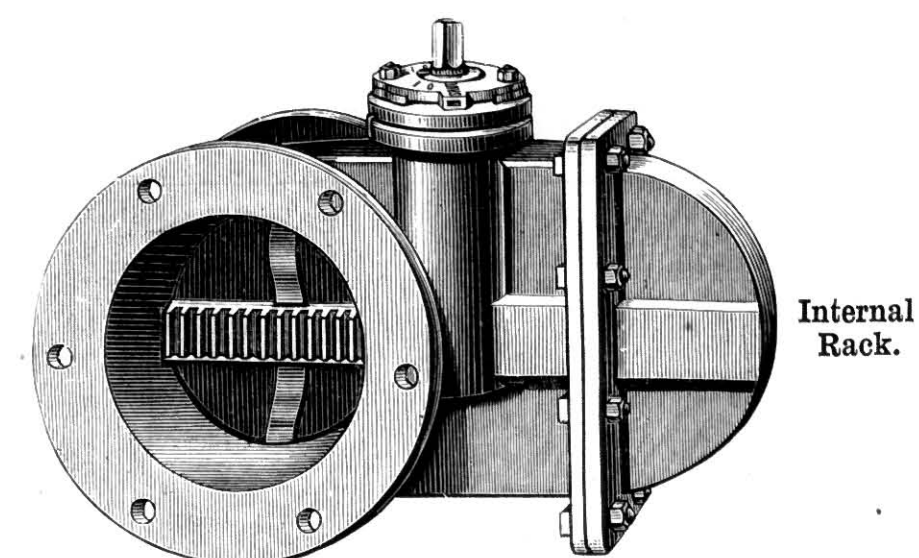
Both Types of Valves (Single or Double Faced) are made with Inside Screw, Outside Screw, Lever Handle, or Cylinder for Air or Water Pressure.

Prices on application.

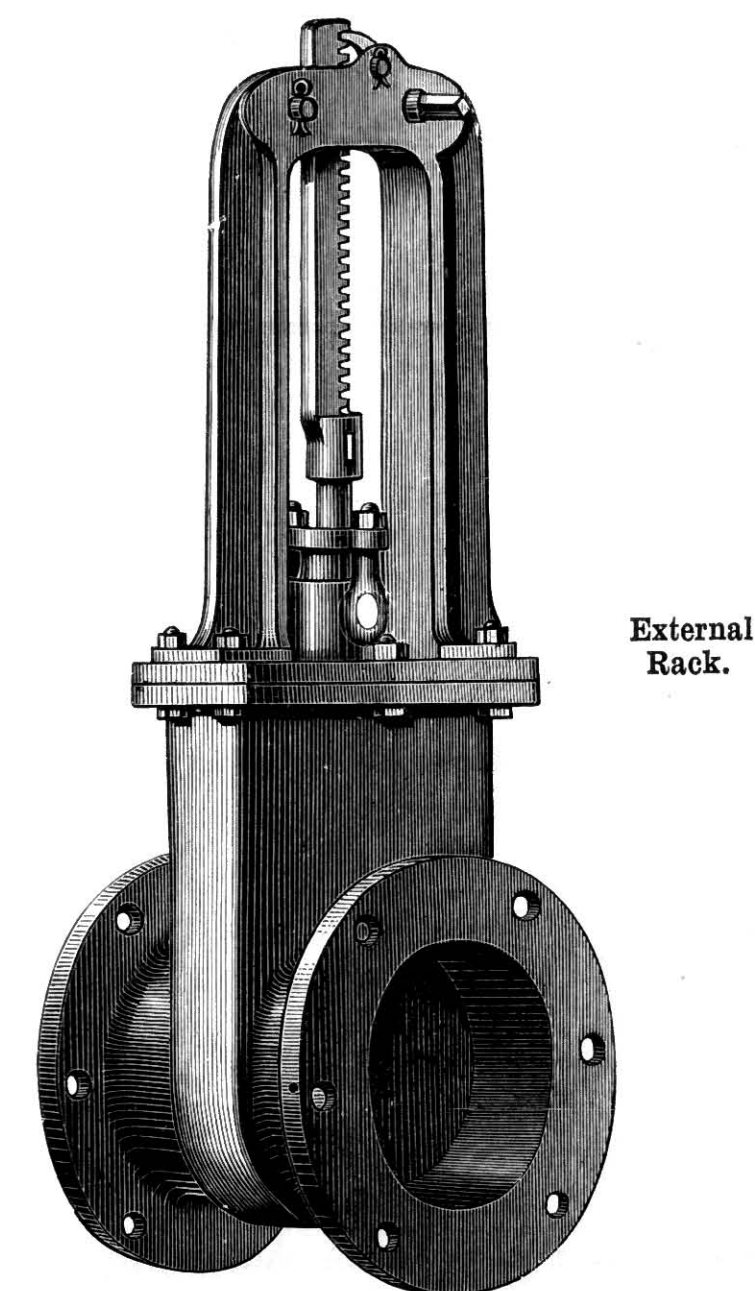
Improved Rack and Pinion Gas Valves.

BODY CAST IN ONE PIECE.

A 17.



A 18.



For Dimensions, etc., see next page.

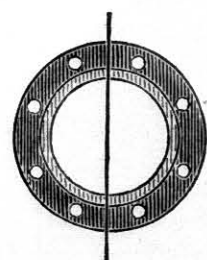
Price List and Dimensions of Rack and Pinion Gas Valves.

Size of Valve.		Price, Flanged Ends Internal Rack.	Price, Flanged Ends External Rack.	Spigot and Socket Ends bolted and jointed on.	Dia. of Flanges.	Dia. of Bolt Circle.	Length over Flanges.	Bolts in Flanges.	Dia. of Bolts.
Mm.	Inches.	A 17.	A 18	Per Pair.	Inches.	Inches.	Inches.	Number.	Inches.
50	2				6	4½	8½	4	⅝
63	2½				6½	5	9½	4	⅝
77	3				7¼	5½	10¼	4	⅝
100	4				8½	7	11½	4	⅝
127	5				10	8½	11½	4	⅝
152	6				11	9¼	11¾	4	⅝
178	7				12	10¼	11¾	4	⅝
200	8				13¼	11½	12¼	4	⅝
230	9				14½	12¾	13½	4	⅝
255	10				16	14	13¾	8	¾
305	12				18	16	16	8	¾
355	14				20¾	18½	16	8	7⁄8
380	15				21¾	19½	17	8	7⁄8
406	16				22¾	20½	18	8	7⁄8
458	18				25¼	23	18	8	7⁄8
510	20				27¾	25¼	20	8	7⁄8
535	21				29	26½	20	8	7⁄8
560	22				30	27½	20	8	1
610	24				32½	29¾	20	8	1
662	26		..	..	34¾	32	20	12	1
688	27		..	..	36	33¼	20	12	1
765	30		..	..	39¾	36¾	22	12	1½
916	36		..	..	46¼	43	23	12	1½
1220	48		..	..	58½	55¼	31	16	1½

British Standard Flanges, but with fewer bolts, to suit low pressure.

All tested to 30 lbs. per sq. in.

In all cases the vertical line passes between holes thus



NOTE.—The British Standard only extends to 24" Pipes. The dimensions given for larger sizes have been arranged by GLENFIELD & KENNEDY LIMITED.

By vertical line is meant a line parallel with vertical spindle.

Cast Iron Ground Plug Cocks.

Fig. A 11.

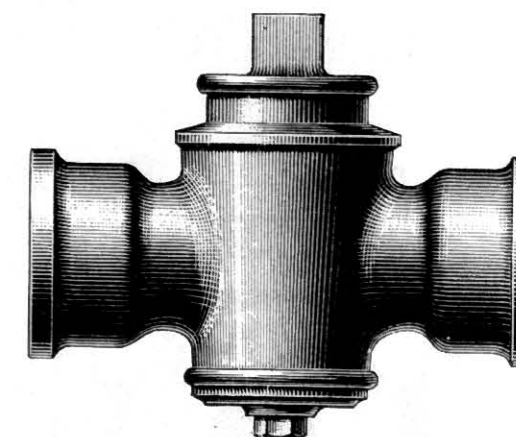


Fig. A 12.

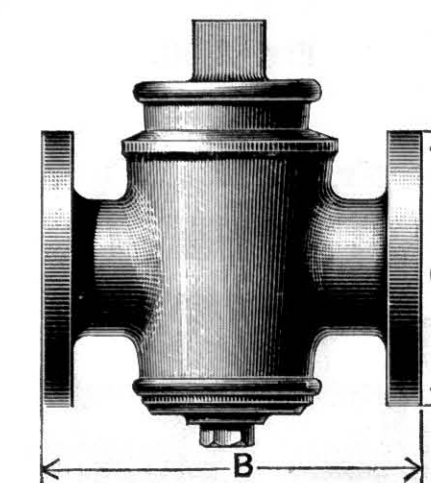


Fig. A 15.

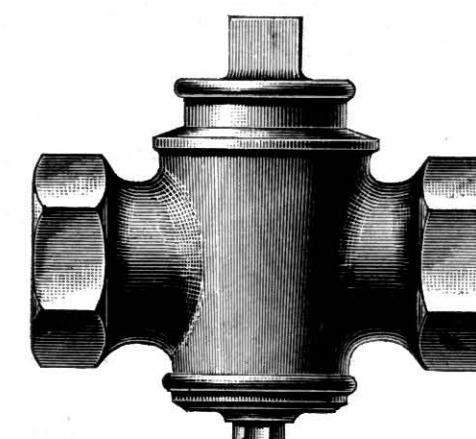
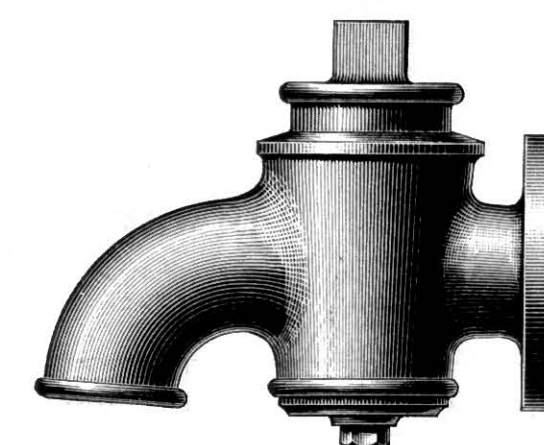


Fig. A 13.



Size.	B	C	PRICES.				Extra if Fitted with Brass Plug.
			A 11.	A 12.	A 13.	A 15.	
Inches.	Inches.	Inches.	Each.	Each.	Each.	Each.	Each.
1	4½	4½					
1¼	5	4¾					
1½	5½	5¼	....	....	....	....	....
2	6½	6					
2½	8	6½					
3	9	7¼	....	....	....	....	....
3½	10¼	8					
4	11½	8½					
4½	12	9	....	....	....	....	....
5	12½	10					
6	14	11					

Flanges of A 13 same as for A 12.

Flanges left undrilled unless otherwise instructed.

Cast Iron Ground Plug Cocks.

Fig. A 10.

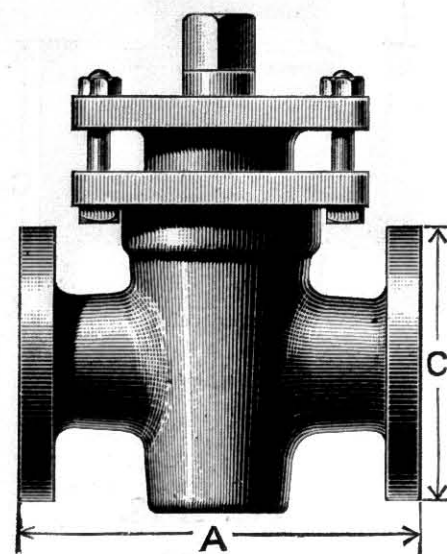
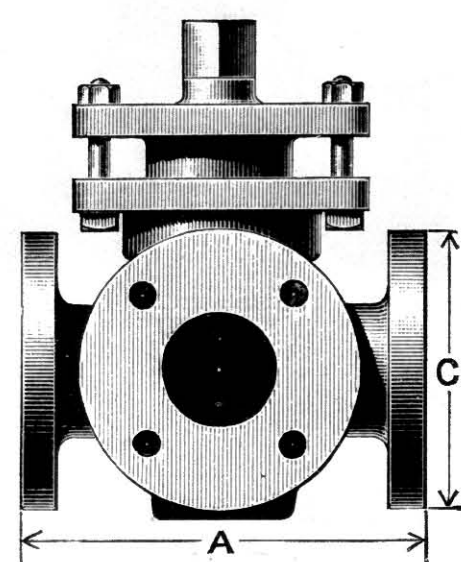


Fig. A 14.



DIMENSIONS AND PRICES.

Fig. A 10.

Size.	A	C	Price.
Inches.	Inches.	Inches.	Each.
1	4 $\frac{3}{4}$	4 $\frac{1}{2}$	
1 $\frac{1}{4}$	5 $\frac{1}{2}$	4 $\frac{3}{4}$	
1 $\frac{1}{2}$	6	5 $\frac{1}{4}$	
2	7 $\frac{1}{2}$	6	
2 $\frac{1}{2}$	9	6 $\frac{1}{2}$	
3	10	7 $\frac{1}{4}$	
3 $\frac{1}{2}$	11	8	
4	12	8 $\frac{1}{2}$	
4 $\frac{1}{2}$	12 $\frac{1}{2}$	9	
5	12 $\frac{3}{4}$	10	
6	14	11	

Fig. A 14.

Size.	A	C	Price.
Inches.	Inches.	Inches.	Each.
1	5 $\frac{1}{2}$	4 $\frac{1}{2}$	
1 $\frac{1}{4}$	6	4 $\frac{3}{4}$	
1 $\frac{1}{2}$	7	5 $\frac{1}{4}$	
2	8 $\frac{3}{4}$	6	
2 $\frac{1}{2}$	9 $\frac{1}{2}$	6 $\frac{1}{2}$	
3	11	7 $\frac{1}{4}$	
3 $\frac{1}{2}$	12	8	
4	13 $\frac{1}{2}$	8 $\frac{1}{2}$	
4 $\frac{1}{2}$	14	9	
5	15	10	
6	18	11	

Flanges left undrilled unless otherwise instructed.

Air Valves.

Fig. H 7, Section.

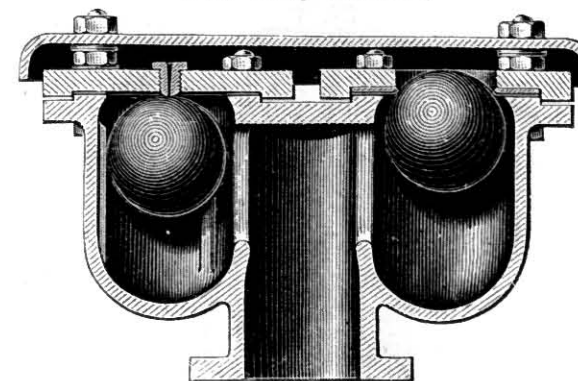


Fig. H 7, Outside View.

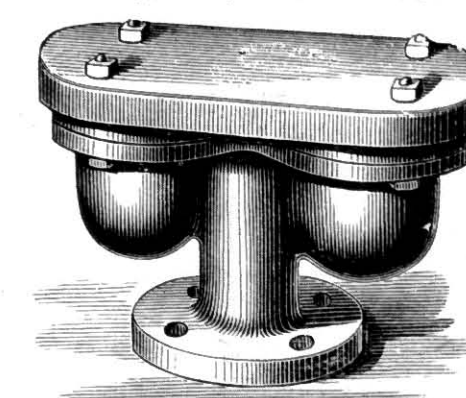


Fig. H 4.



Fig. H 7, Large.

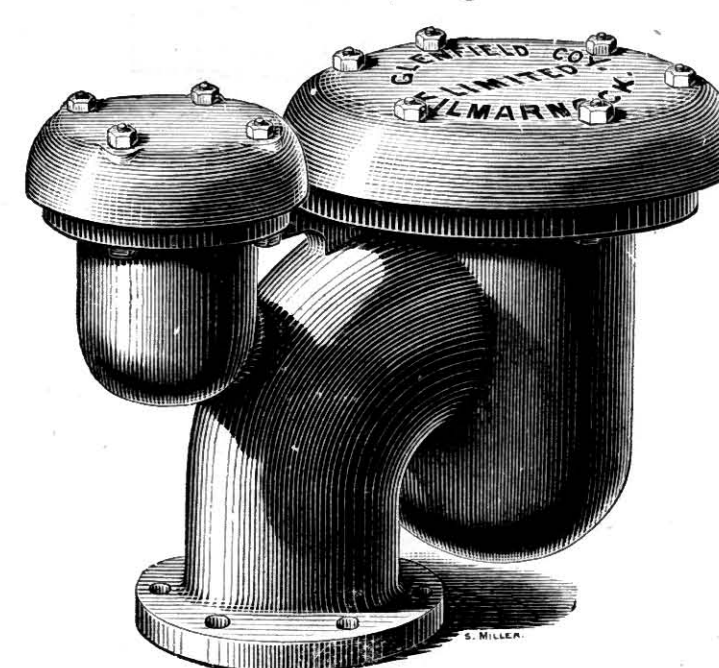
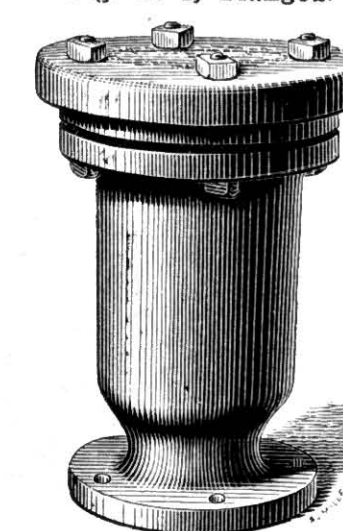


Fig. H 4a.



Fig. H 4, Flanged.



Air Valves of the Ball type work on the following principle:—

The Ball must float in water, and, as the air discharges through the small orifice, the water rises and lifts the Ball, which closes the orifice, thus preventing escape of water. As air accumulates in the body of Valve the water level sinks, and, when the water leaves the Ball altogether, the latter drops down by its own weight, thus opening the orifice to discharge air and closing again as the water rises.

It follows, therefore, that high pressures require a large diameter of Ball. The pressures under which the Balls discharge air are as follow (the pressure depending on diameter of orifice employed):—

Dia. of Ball,	2 $\frac{1}{2}$ "	3"	3 $\frac{1}{2}$ "	3 $\frac{3}{8}$ "	5"	5 $\frac{1}{2}$ "
Lbs. per Sq. In.,	20-90	40-150	55-220	70-250	180-280	200-300

These are not calculated results but are from actual experiment. The Air Valves are tested under air pressure in an apparatus got up for the purpose. Working pressures should always be stated when ordering.

For Particulars, see page 37.

Air Valves.

Fig. H 5.

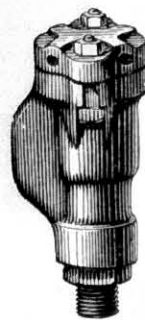


Fig. H 21.

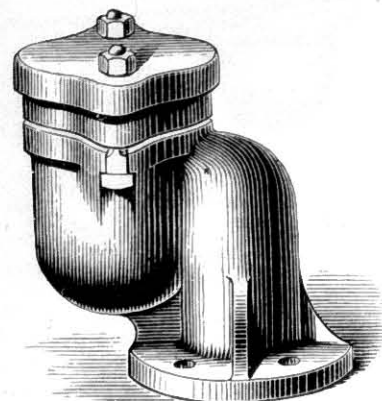


Fig. H 23.

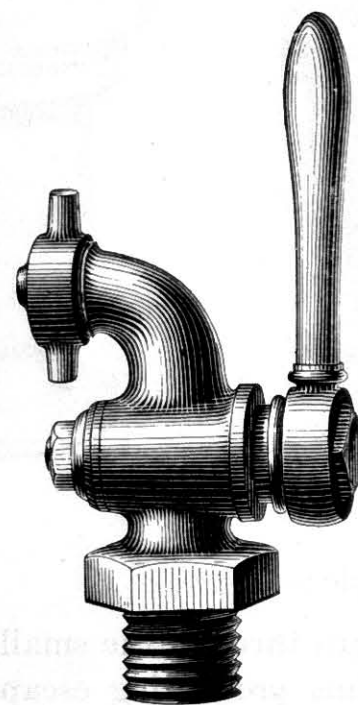


Fig. H 22.

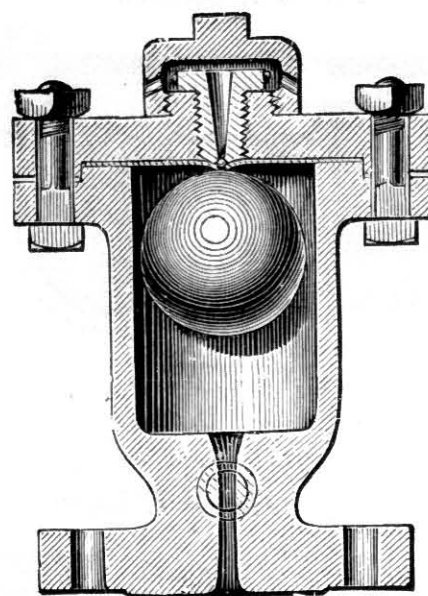
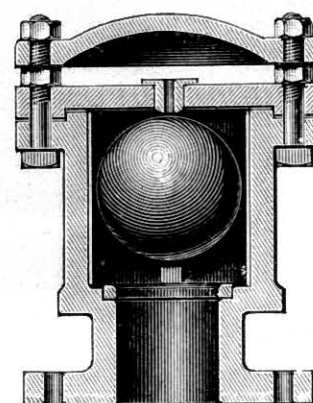


Fig. H 31.



NOTES.

H 5 and H 21 are used only for discharging air when filling pipes.

H 22 has Ground Cock (gun metal Key working in gun metal bush) to permit of ball being examined without shutting off water in main.

H 23 is screwed into Blind Flange on branch on main (or direct into main). The Cap has a small orifice, say a thirty-second part of an inch in diameter, and is kept constantly discharging. It can be furnished with Caps having orifice of various diameters.

H 31 is a Double-acting Air Valve for discharging air under pressure and preventing air from entering the main should the pressure in latter fall below that of the atmosphere.

The Balls are of Rubber or Vulcanite, to suit the Pressures, are of special manufacture, made in our own works. Each Ball carefully tested by being subjected for some days to high pressure in a closed vessel.

For Particulars, see page 37.

Price List of Air Valves.

H 7—DOUBLE AIR VALVES—

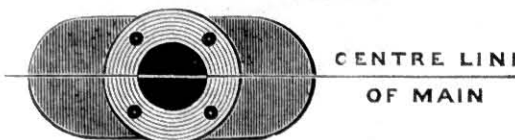
NOTE.—The Chamber with small orifice discharges air under pressure.

The large orifice is for discharging large volumes of air when filling pipes.

Inlet Branch,	1½"	2"	2½"	3"	4"	6"	8"	10"	12"	dia.
Inlet Flange,	5¼"	8"	8"	8"	8½"	11"	13¼"	16"	18"	"
Diameter of Bolt Circle, ..	3¾"	6½"	6½"	6½"	7"	9¼"	11½"	14"	16"	"
No. and Size of Bolts, ..	4-½"	4-½"	4-½"	4-½"	4-½"	8-½"	8-½"	8-¾"	12-¾"	"
Price,										each.

These sizes are made type H 7 large.

Centre line of Air Valve is always between two holes



These Double Air Valves have frequently a Sluice Valve directly underneath the branch, having bevel gearing, so that it can be opened or closed from same surface box as covers the air valve, as shown by Fig. H 42 on next page. The Air Valve is also sometimes made with a side branch to which Sluice Valve is bolted (standing vertically).

H 4 {Screwed } Single Air Valves to discharge air under pressure—
{Flanged }

H 4a—With Stop Cock to allow of Air Valve being repaired without shutting water off main—

Ball,	2½"	3"	3½"	3¾"	5½"	dia.
Working pressure not exceeding	20-90	40-150	55-220	70-250	200-300	lbs. per sq. in.
Gun metal Nipple, if made screwed (gas thread),	¾"	1"	1"	1"	1"	usual dia.
Flange, if made flanged,	5¼"	8"	8"	8"	8"	dia.
Price,						each.

H 5—Nipple Screwed—¾" gas thread (for small pipes), to allow volumes of air to escape when filling pipes—

Ball, 1½" dia. Price, each.

H 21—Large orifice to allow large volumes of air to escape when filling pipes—

Inlet,	2"	3"	4"	dia.
Ball,	3"	3½"	5"	"
Flange,	8"	8"	8½"	"
Diameter of Bolt Circle, ..	6½"	6½"	7"	"
No. and Size of Bolts, ..	4-½"	4-½"	4-½"	"
Price,				each.

H 22—With gun metal Ground Stop Cock—

Ball, 3½" dia. ; Flange, 8" dia. ; Inlet, 1" x ¾"; Price, each.
Ball, 5" .. ; Flange, 8" .. ; Inlet, 1" x ¾"; Price, .. (extra heavy).

H 23—HEAVY GUN METAL AIR COCKS—

Screwed ¾" gas, with Cap on Nose having small aperture, with brass Spanner ; Price, each.

H 31—DOUBLE-ACTING AIR VALVE for Syphons—

Inlet,	¾"	1½"	2"	2½"	4"	dia.
Flange,	1" (gas thread)	5¼"	8"	8"	8½"	"
Price,						each.

NOTE.—It will be observed that Air Valves 2" to 3" dia. have flange 8" dia. (4 holes at 6½" centres), which is the ordinary size Ball Hydrant template.

Air Valves.

Fig. H 40.

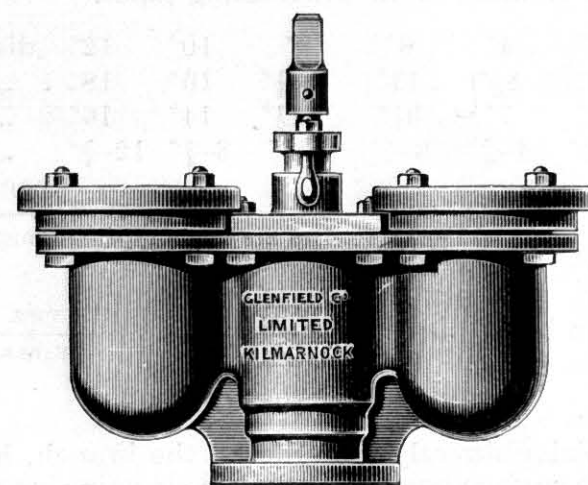


Fig. H 41.

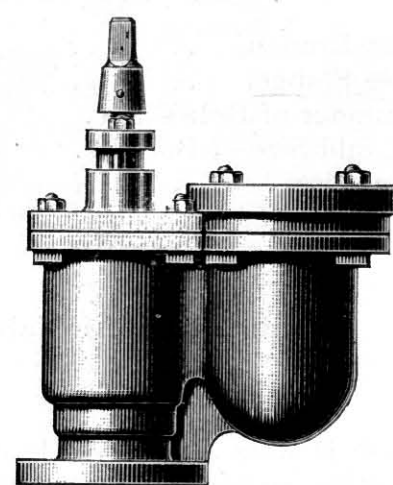
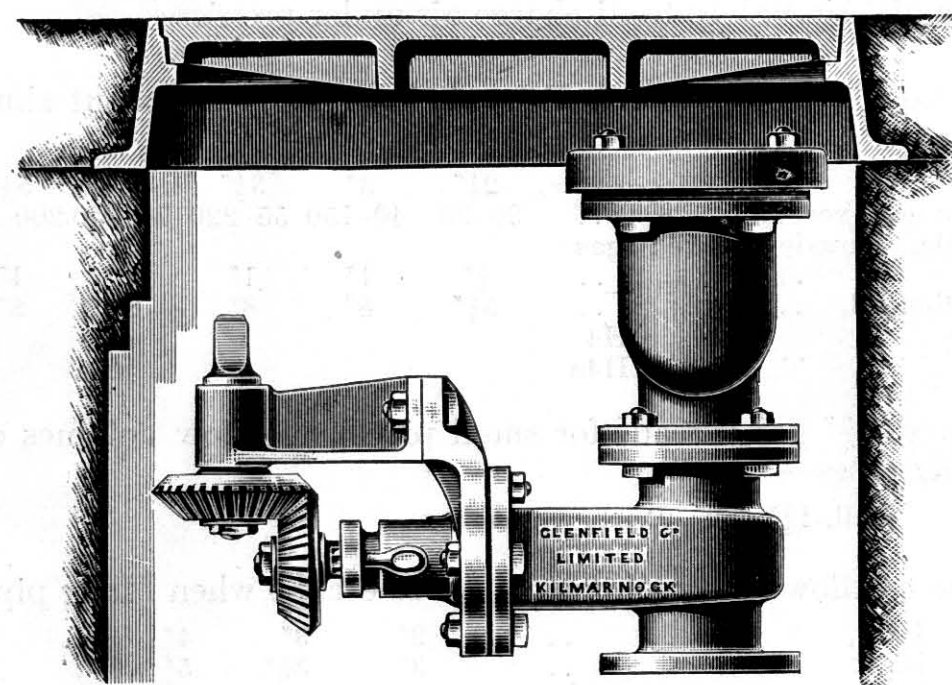


Fig. H 42.

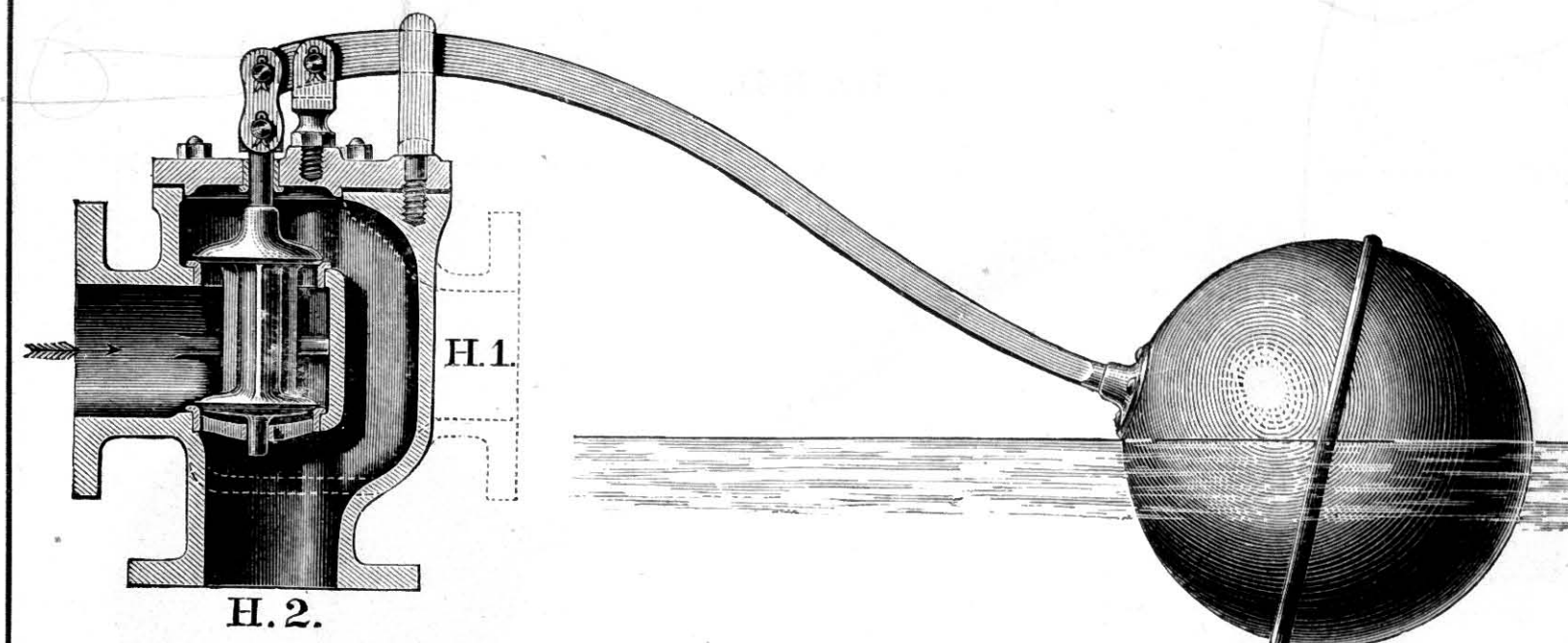


PRICES.

	2"	3"	4"	6"	8"	
H 40—Double Air Valve with Screw-down Valve Combined, to allow of Air Valve being repaired without shutting water off main, ..						each.
H 41—Single Air Valve with Screw-down Valve Combined, having large orifice for discharging large volumes of air when filling pipes, ..						"
H 42—Double Air Valve with Sluice Valve underneath, worked by bevel gearing, ..						"
Surface Box for H 42, ..	B249	B109	B92	B95	B18	"

Equilibrium Ball Valves.

Figs. H 1 and H 2.



Body and Cover are of cast iron, Valve, Valve Seats, Guide Bush, and Links are gun metal, Lever is strong forged wrought iron, Float Ball is copper and tinned. Each Valve tested to 600 feet head.

The Valve being double beat, a small variation of level gives a large discharge from Valve.

The Lever can be placed at right angles to what is shown above if desired. H 1 (Straight) is made with Lever at right angle.

NOTE.—Fig. H 45, page 40, is the type most commonly used.

PRICES.

H 1 (Straight) and H 2 (Angled).

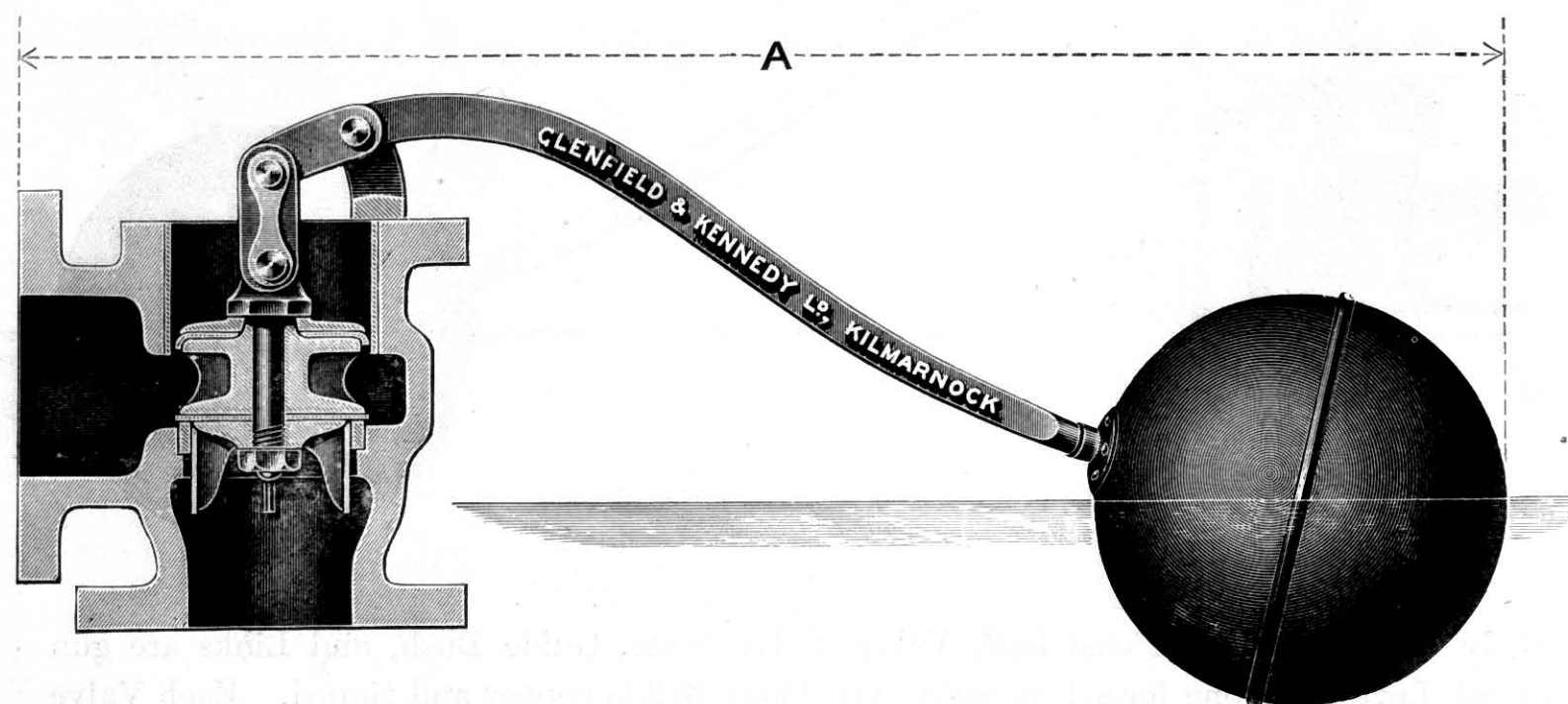
1½"	2"	2½"	3"	4"	5"	6"	7"	8"	
									each.

Flanges to British Standard, Table I., and drilled to that standard unless otherwise instructed.

Also larger sizes.

Patent Equilibrium Ball Valve.

Fig. H 45.



H 45—Patent Equilibrium Ball Valve, specially suitable for high pressures.

Size of Valve, -	1½"	2"	2½"	3"	4"	5"	6"	7"	8"
Overall length A, -	4' 2½"	4' 10¼"	5' 2"	5' 7½"	6' 2½"	6' 6½"	7' 4"	8' 1½"	8' 8½"
Diameter of Ball, -	9"	10"	10"	12"	14"	16"	18"	20"	20"
Price, -	80/-								each

Also larger sizes.

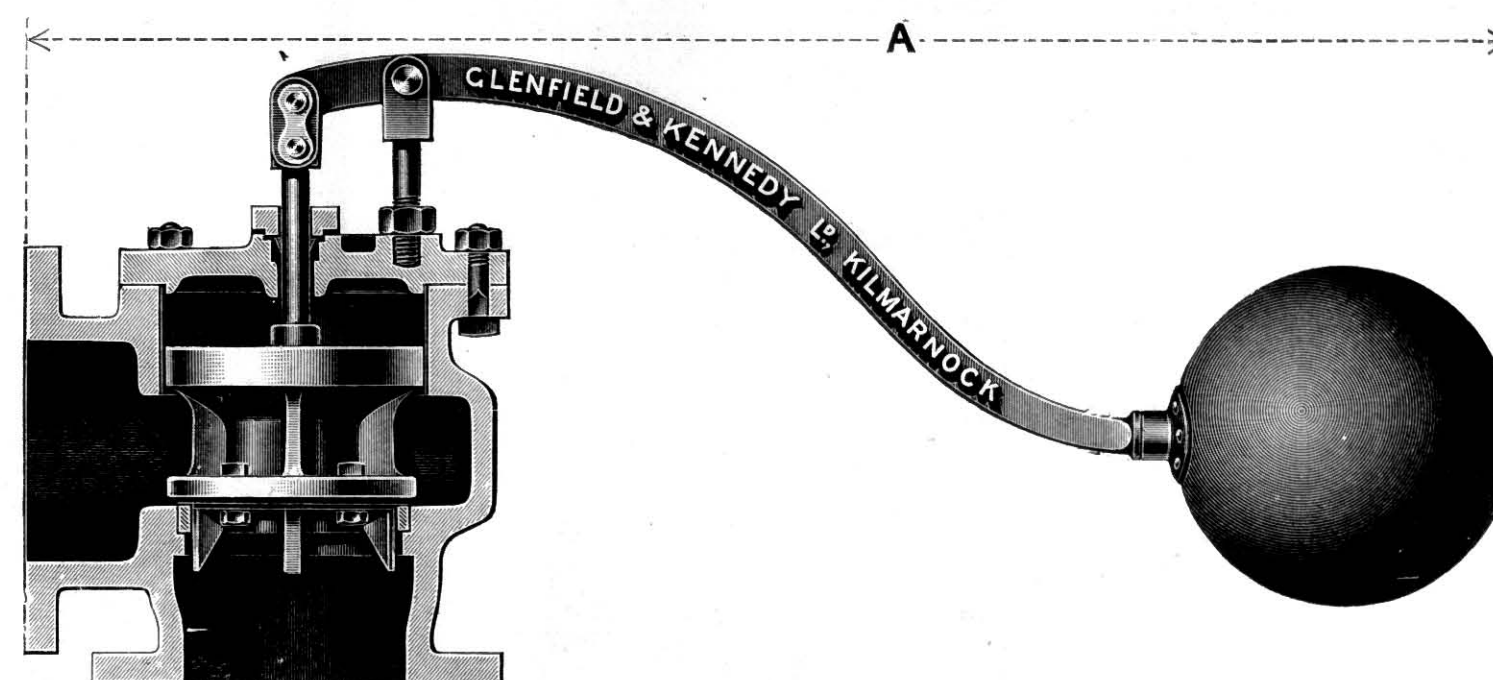
This type of Valve is the one almost universally used.

The above dimensions refer to Valves working under ordinary pressures, and can be modified to suit special cases.

Flanges to British Standard, Table I., and drilled to that standard unless otherwise instructed.

Patent Ball Valve.

Fig. H 48.



In this type the main valve is not fixed to the float lever, but is opened and closed by the water pressure acting alternately on the bottom or top side of piston by an amount depending on the position of the float which controls a passage from the top side of piston. This passage is not shown in the illustration.

This Valve should not be used for a pressure of less than 20 lbs. per square inch when the full discharge of pipe is desired.

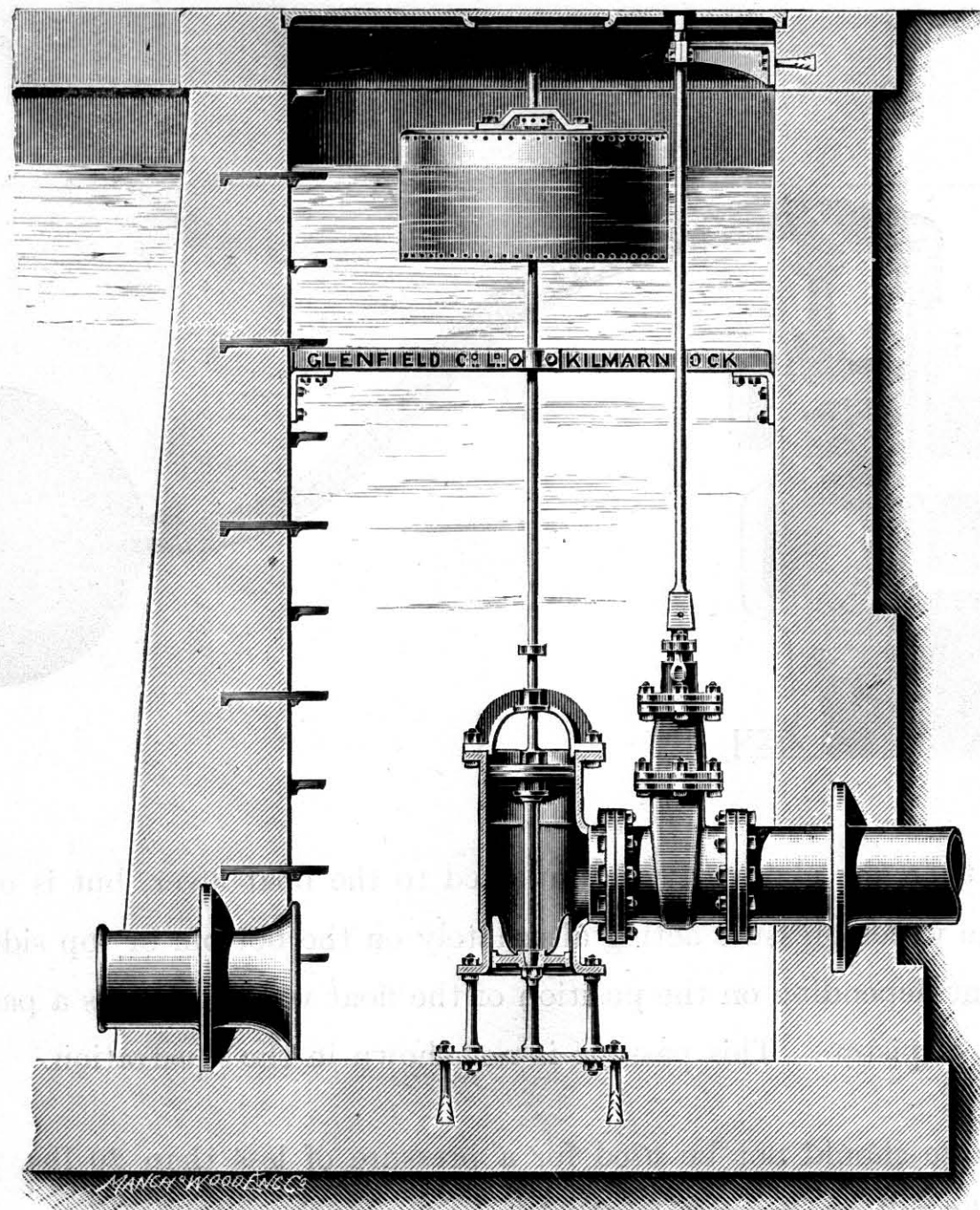
NOTE.—This Valve is (irrespective of pressure) specially suitable in cases where there is little room to spare. It is often placed in a small chamber connected to filter beds or clear water tanks.

Prices on application.

Equilibrium Ball Valve.

For Filters or Clear Water Tanks.

Fig. H 50.



Equilibrium Ball Valve with Guide for Rod, Valve and Piston of gun metal, or with gun metal Faces, top part brass lined, Float of galvanized iron, with Adjusting Screw and gun metal Nut, including Sluice Valve, Spindle, and Guide Bracket, Chamber Cover, Step Irons, and two Wall Pipes, all as shown.

PRICES.

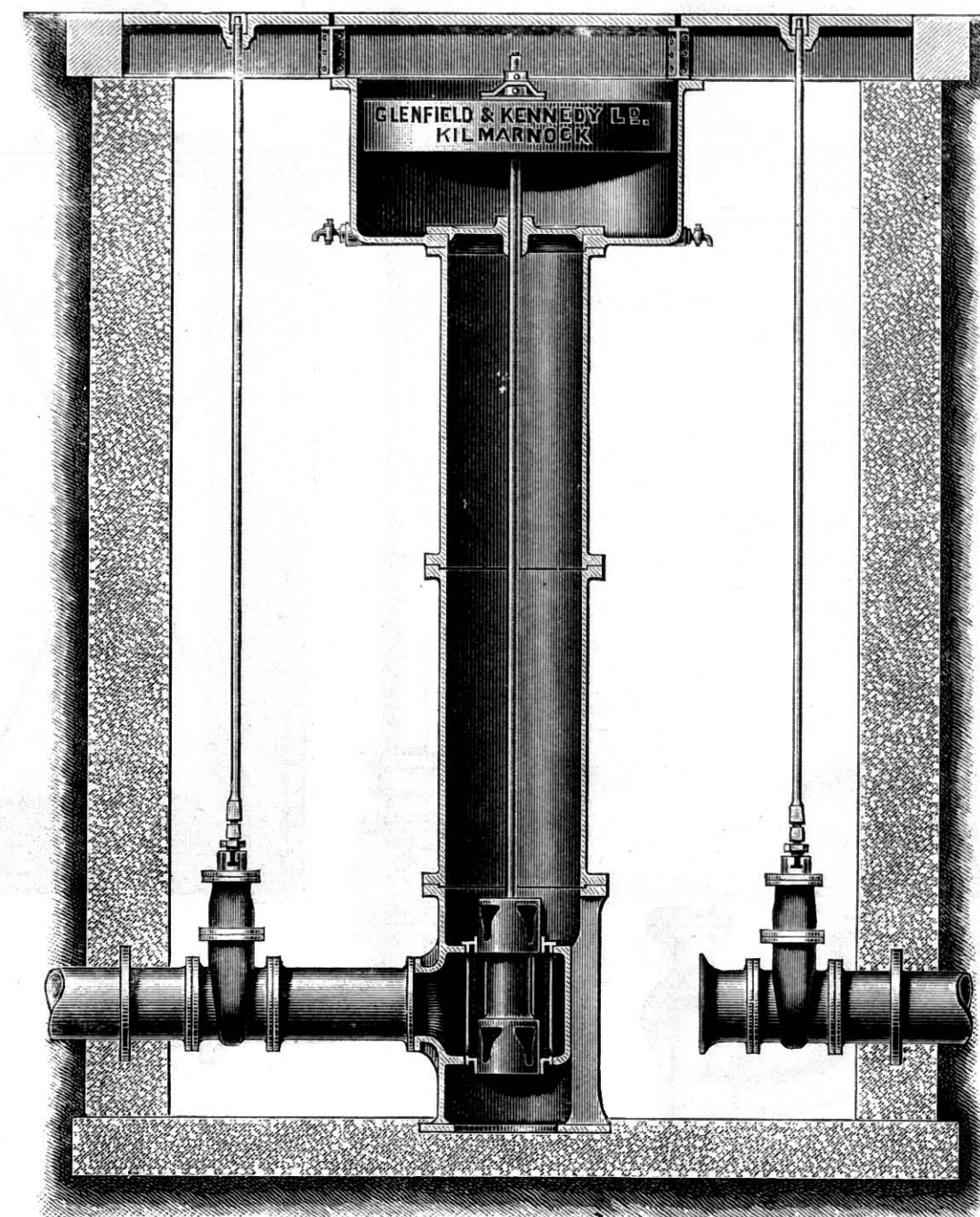
Pipes and Valve, ..	12"	15"	18"	24"	dia.
Well,	5' 0"	5' 6"	6' 0"	7' 0"	"
Well,	10' 0"	12' 0"	14' 0"	18' 0"	depth.
Float,	3' x 1' 6"	3' 3" x 1' 9"	3' 6" x 1' 9"	4' x 2'	dia. and depth.
Bellmouth, ..	3' 0"	3' 0"	3' 0"	3' 0"	long.
Price,	each complete.				

NOTE.—This type of Ball Valve is not made to be absolutely water-tight.

Equilibrium Ball Valve.

For Filters or Clear Water Tanks.

Fig. H 51.



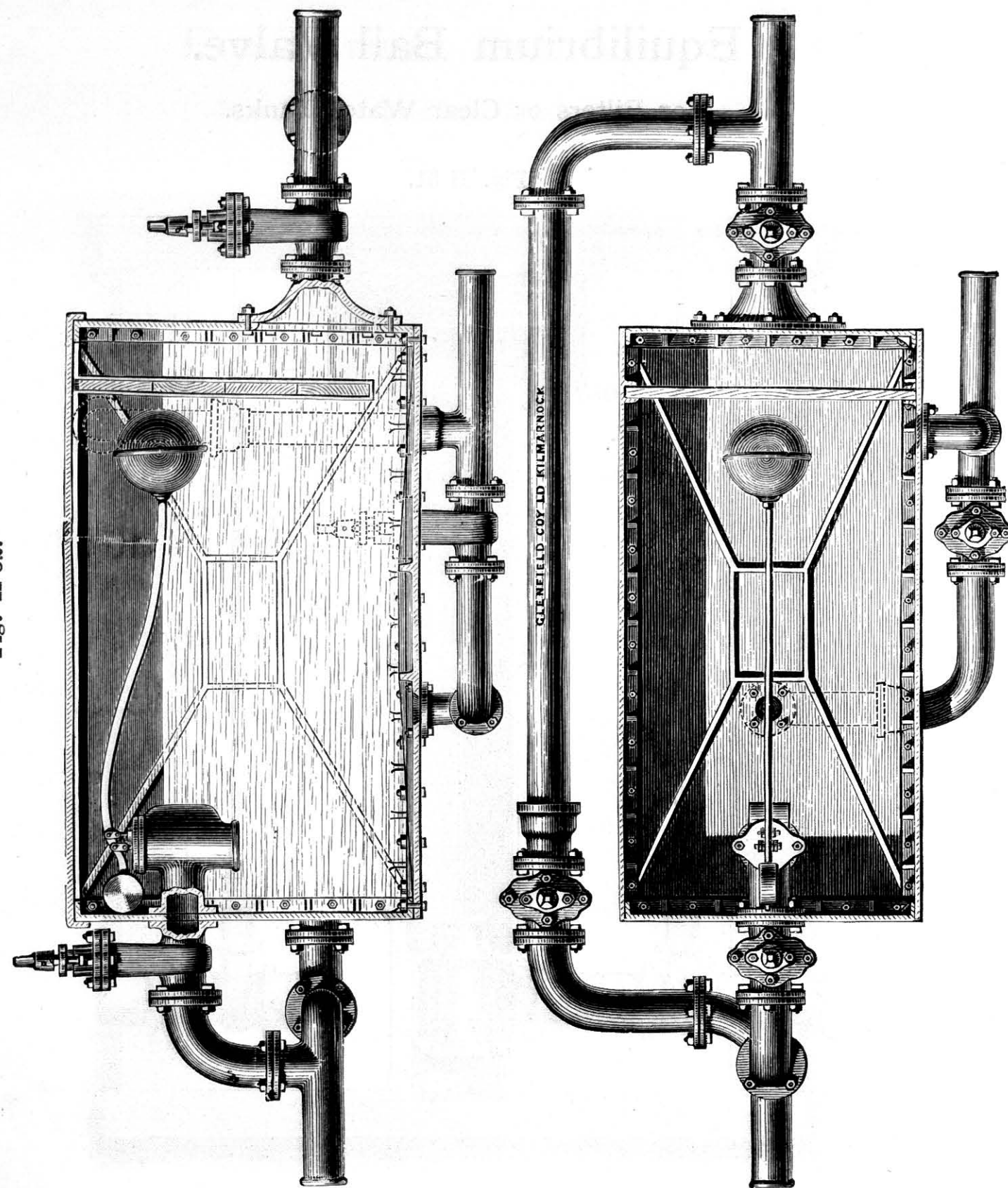
Equilibrium Ball Valve, enclosed in cast iron Standard or Pipe, having Float Chamber at top, with Cocks for steadying rise and fall of Float. Valve and Valve Seats of gun metal. Adjusting Screw and gun metal Nut at top of Float.

NOTE.—This type of Ball Valve is not made to be absolutely watertight.

Prices on application.

Pressure Reducing Apparatus.

Fig. H 52.



This Apparatus can be supplied either with or without the By-pass Arrangement. The tank can be cleaned at any time by emptying it from the bottom by the pipe and valve placed there for the purpose. In the event of the Ball Valve becoming clogged by foreign matter, causing leakage to a slight extent, the overflow water is carried into the emptying pipe by the bend fixed at top. The wood partition at end next outlet is to prevent the back rush of air from the lower main agitating the water in tank.

PRICES.

Size of Ball Valve.		Size of Tank.		Without By-pass.	By-pass and Valve extra.
2½"	..	5' x 2' 0" x 3' 6" deep	..	..	..
3"	..	5' x 2' 0" x 3' 6"	..	..	..
4"	..	5' x 2' 6" x 3' 6"	..	..	..
6"	..	7' x 3' 6" x 4' 0"	..	..	..
9"	..	10' x 4' 6" x 5' 0"	..	..	..
12"	..	12' x 5' 0" x 5' 6"	..	..	..

When Tank is of Brick or Concrete, Fittings are designed to suit.

Improved Pressure Reducing Valves.

Fig. H 57.

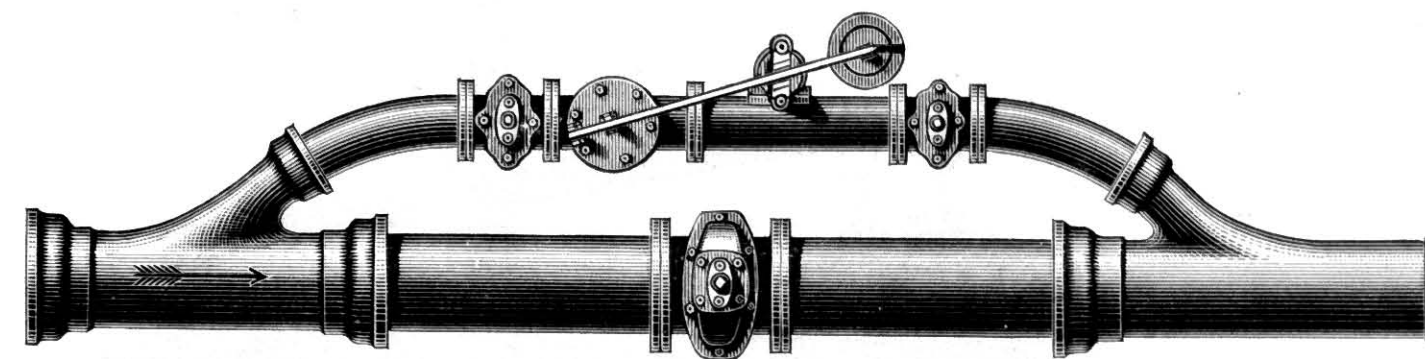


Illustration shows Reducing Valve placed on By-pass on Main.

Several types of Pressure Reducing Valves are made. The selection of type depends on the circumstances of each individual case. The Valve is usually in Equilibrium, and closes when the pressure on the outlet side attains the point to which the Valve is set to work at, re-opening whenever the outlet pressure falls below that point. The outlet pressure is thus practically constant and independent of varying pressures on the inlet. *In some cases it is sufficient if the Valve acts simply as a regulator and does not necessarily require to shut off the water dead tight. In others it is required that the water be shut off absolutely when the pressure attains a given point.* In all cases the pressure on outlet can be raised or lowered at pleasure by adding or taking off weights.

The Valves are "cushioned" in action to prevent concussion.

When the full head is required, as in cases of fire, etc., they can be quickly put out of action.

The Valves have given satisfaction in constant use for years, and the various types are the subject of Letters Patent.

In ordering, please state maximum inlet pressure and what range of pressures on outlet is desired.

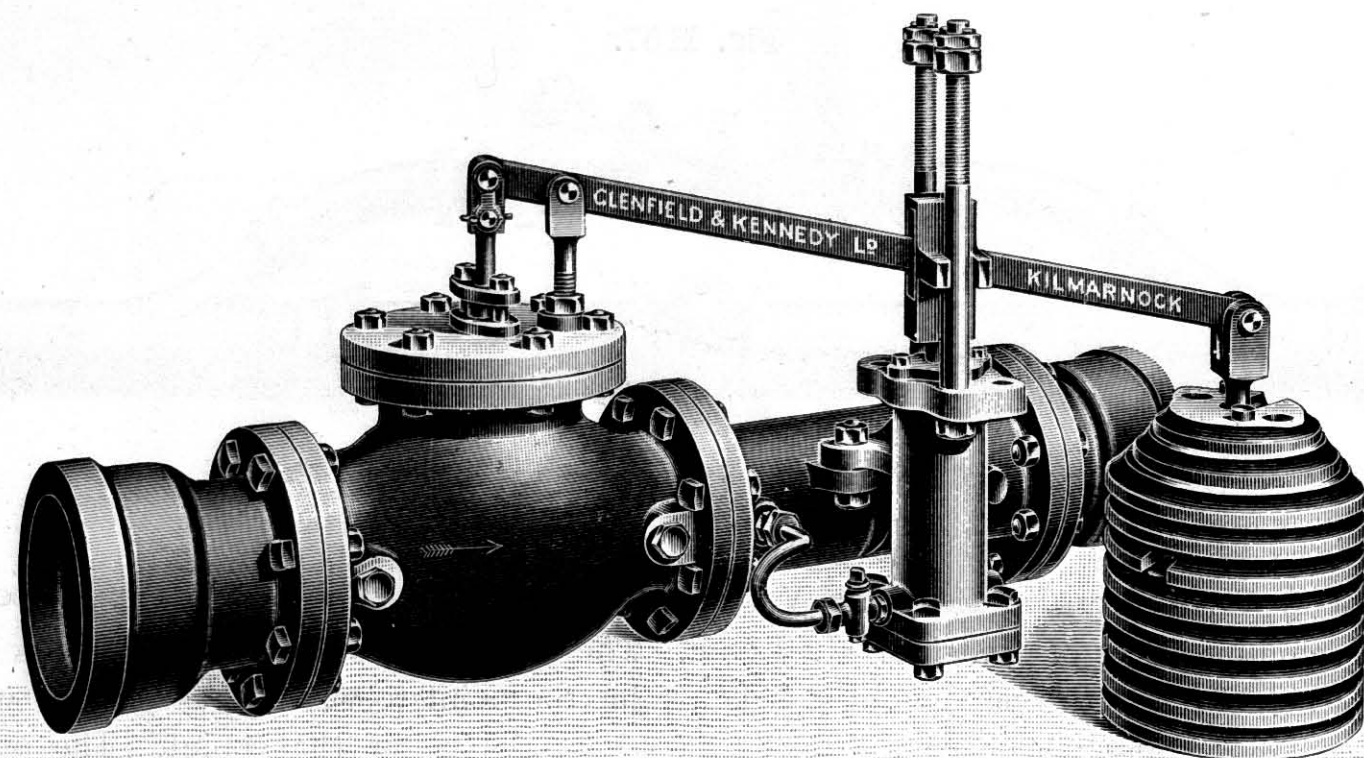
With Spigot and Socket Connection—no By-pass—for Prices, see Figs. H 56 and H 59, pages 46 and 47.

Small Sizes, ½", ¾", 1", and 1½"—entirely of gun metal—for Prices, see Fig. F 67, Section G.

By-pass Pipes and Valves, if required—Prices on application.

Patent Pressure Reducing Valve.

Fig. H 56.



When the pressure on the outlet rises above the pressure at which the Valve is set to work, the Valve closes and re-opens again when the pressure falls below that point.

The pressure on outlet may be increased by adding or diminished by taking off weights.

With this Valve the water is shut off absolutely tight.

In the event of fire, full pressure is obtained by closing Tap fixed at bottom of Cylinder, which empties Cylinder by a small side passage and allows weighted Lever to drop to bottom position.

When ordering, please state maximum inlet pressure and what pressure is desired on outlet.

NOTE.—It is important to check Cock at bottom of Cylinder so that Weights may rise and fall slowly.

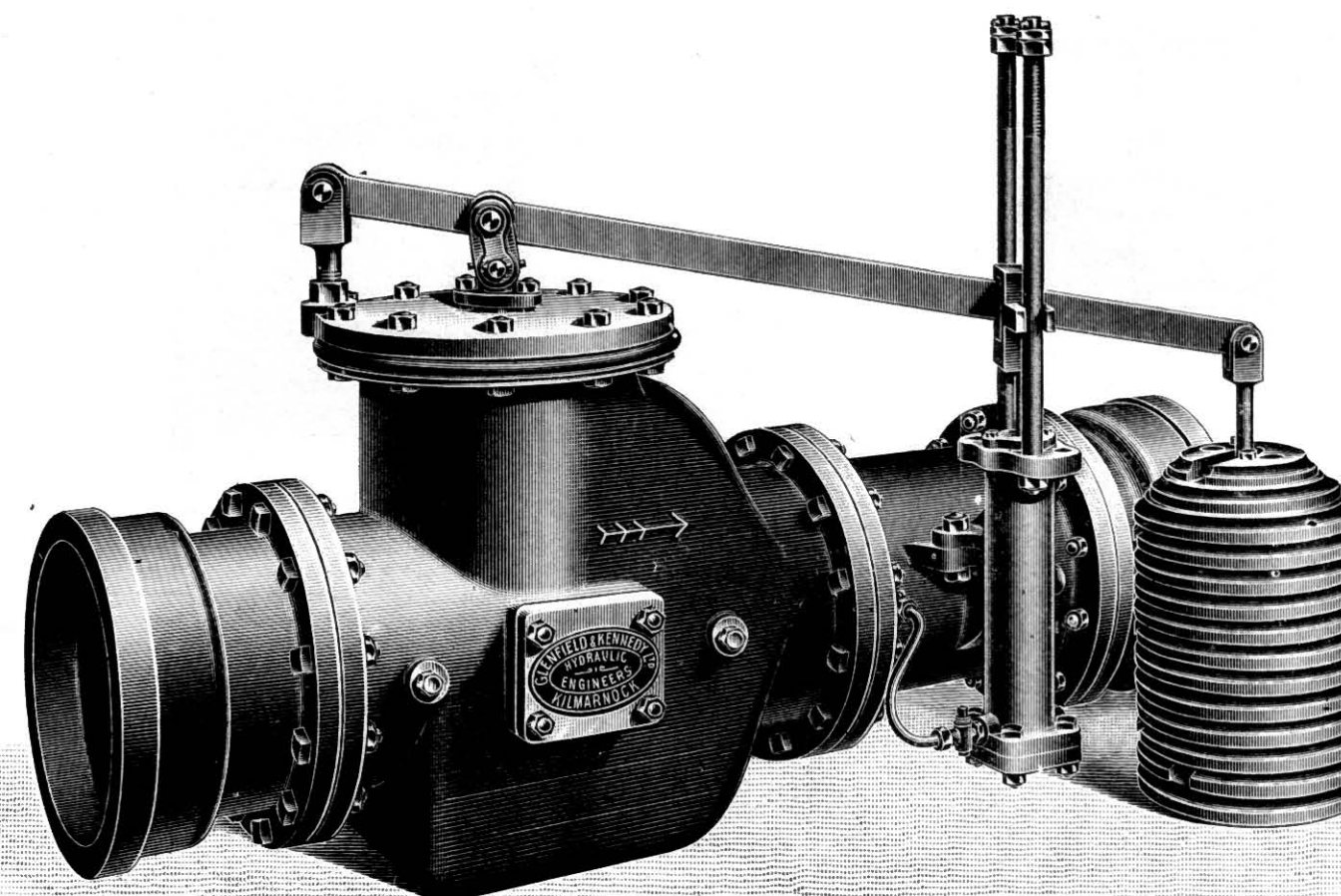
INCLUDING SPIGOT AND SOCKET CONNECTING PIECES BOLTED AND JOINTED ON.

Prices on application.

Patent Pressure Reducing Valve.

With Outside Lever and Weights.

Fig. H 59.



The Valve is in Equilibrium, and closes when the pressure on the outlet side attains the point to which the Valve is set to work at, re-opening whenever the outlet pressure falls below that point. The outlet pressure is thus practically constant and independent of varying pressures on the inlet.

In the Valve illustrated above, the Cylinder and Piston (which form a Cataract) are fixed on the side of the Connecting Piece and act through a weighted Lever. There is no drip or waste.

Full pressure is obtained, in the event of fire, by simply closing Tap fixed at bottom of Cylinder, which empties Cylinder by a small side passage and allows weighted Lever to drop to bottom position.

The outlet pressure can be increased by adding and reduced by taking off weights.

When ordering, please state maximum inlet pressure and what pressure is desired on outlet.

NOTE.—It is important to check Cock at bottom of Cylinder so that Weights may rise and fall slowly.

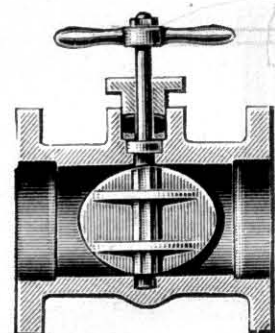
PRICES.

INCLUDING CONNECTING PIECES.

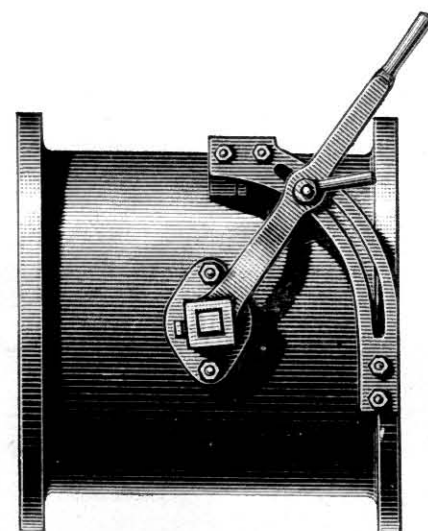
1½"	2"	2½"	3"	4"	5"	6"	7"	8"	9"	10"	12"	15"
												each.

Throttle Valves.

HAND.
Fig. H 61.



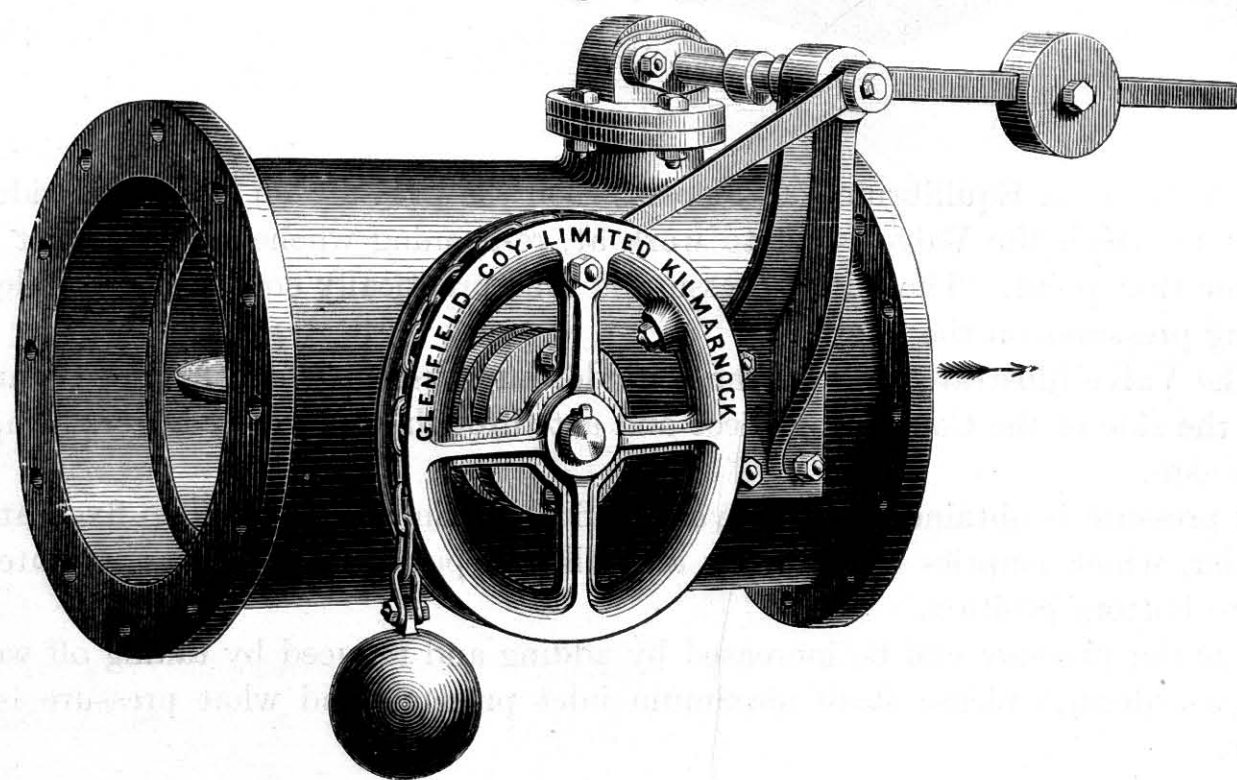
LEVER AND QUADRANT.
Fig. H 62.



PRICES.

- | | | |
|--|------------------------------|-------|
| H 61—Body and Door of cast iron,
Spindle of wrought iron,
Double Flanged Ends, | 2" 3" 4" 5" 6" 7" 8" 10" 12" | each. |
| H 62—Throttle Valve, with Lever and Quadrant
to fix Door in any desired position. | Prices on application. | |

SELF-ACTING.
Fig. H 63.



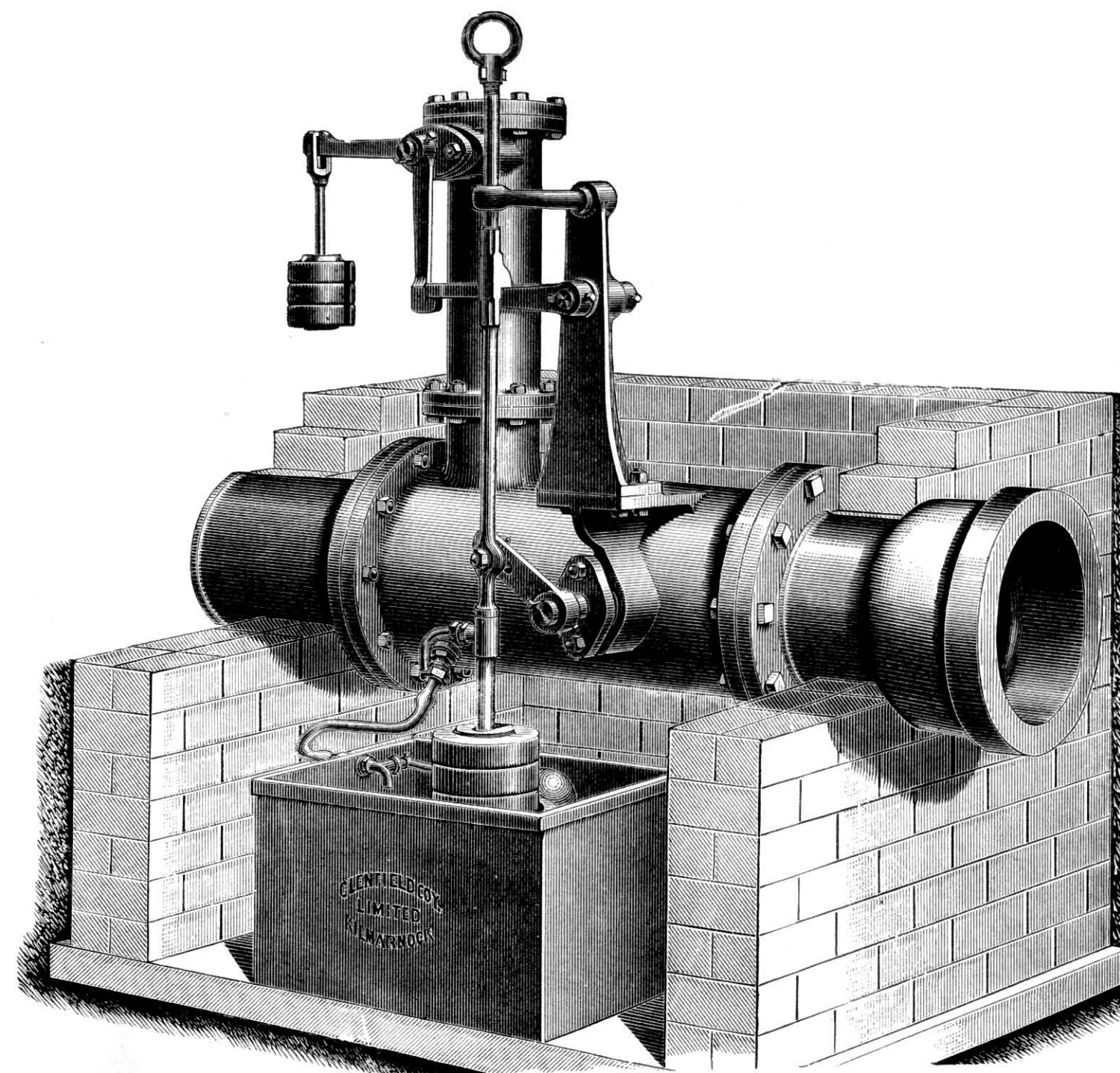
When the velocity of current exceeds a certain limit, a disc, which is held by a lever and projects into the water-way, is thrown back, thus releasing wheel and weight, and closing the Throttle Valve. The Valve is re-set by hand. This type of Self-acting Throttle Valve is suitable only for placing on the inlet of the pipe, and where quick closing will do no damage.

This type of Valve should not be used above 12" diameter.

Prices on application.

Self-Acting Throttle Valve.

Fig. H 64.

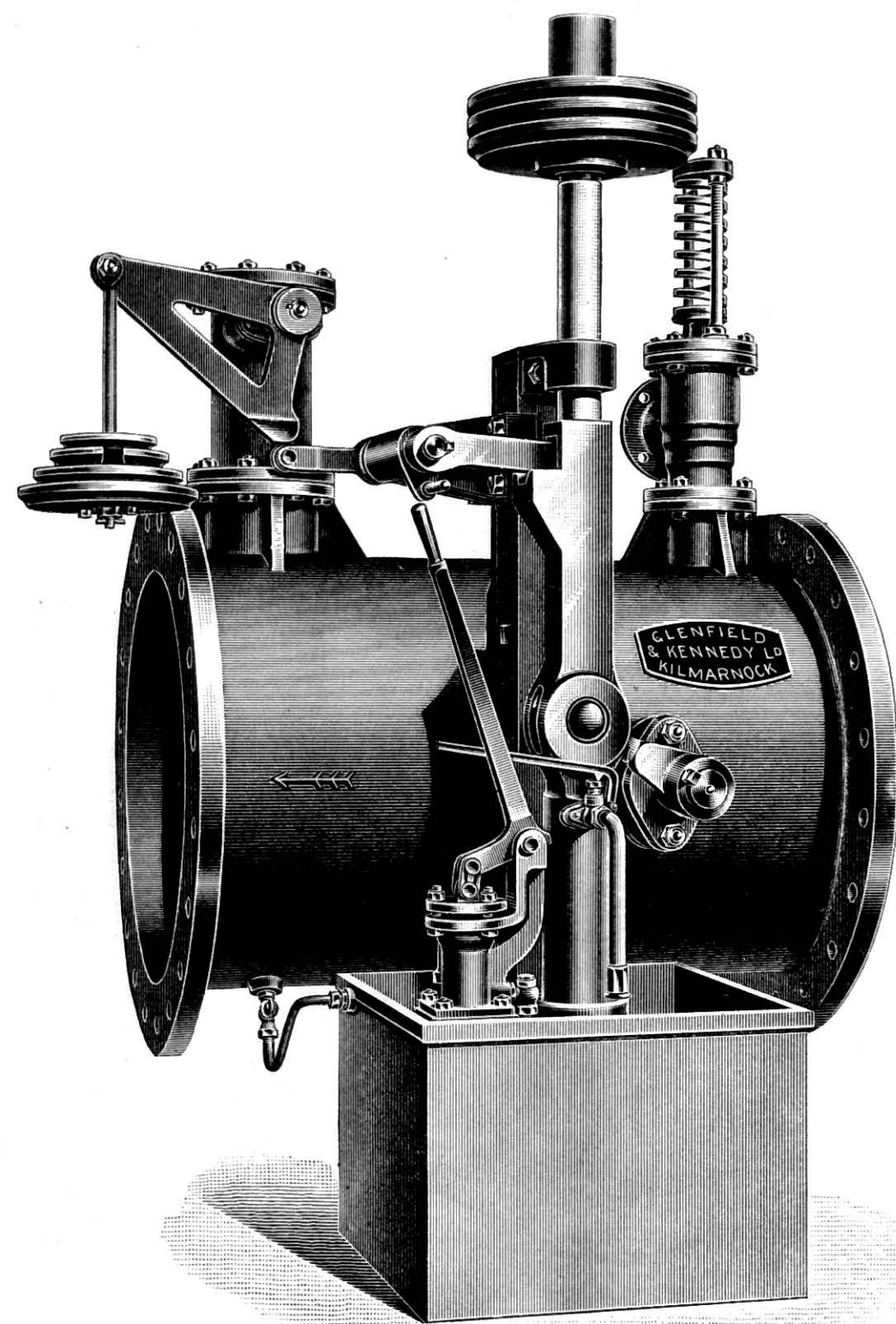


This Valve shuts off the water gradually in the event of a fracture occurring on the line of main. It is shown arranged to be re-set by hand from the surface of the road. The levers, etc., are so arranged that the pulling up of the Vertical rod by hand re-sets the levers and puts the Valve in readiness for action. All working parts are bushed with gun metal. Suitable for pipes up to and including 8" diameter.

Prices on application.

Self-Acting Throttle Valve.

Fig. H 80.

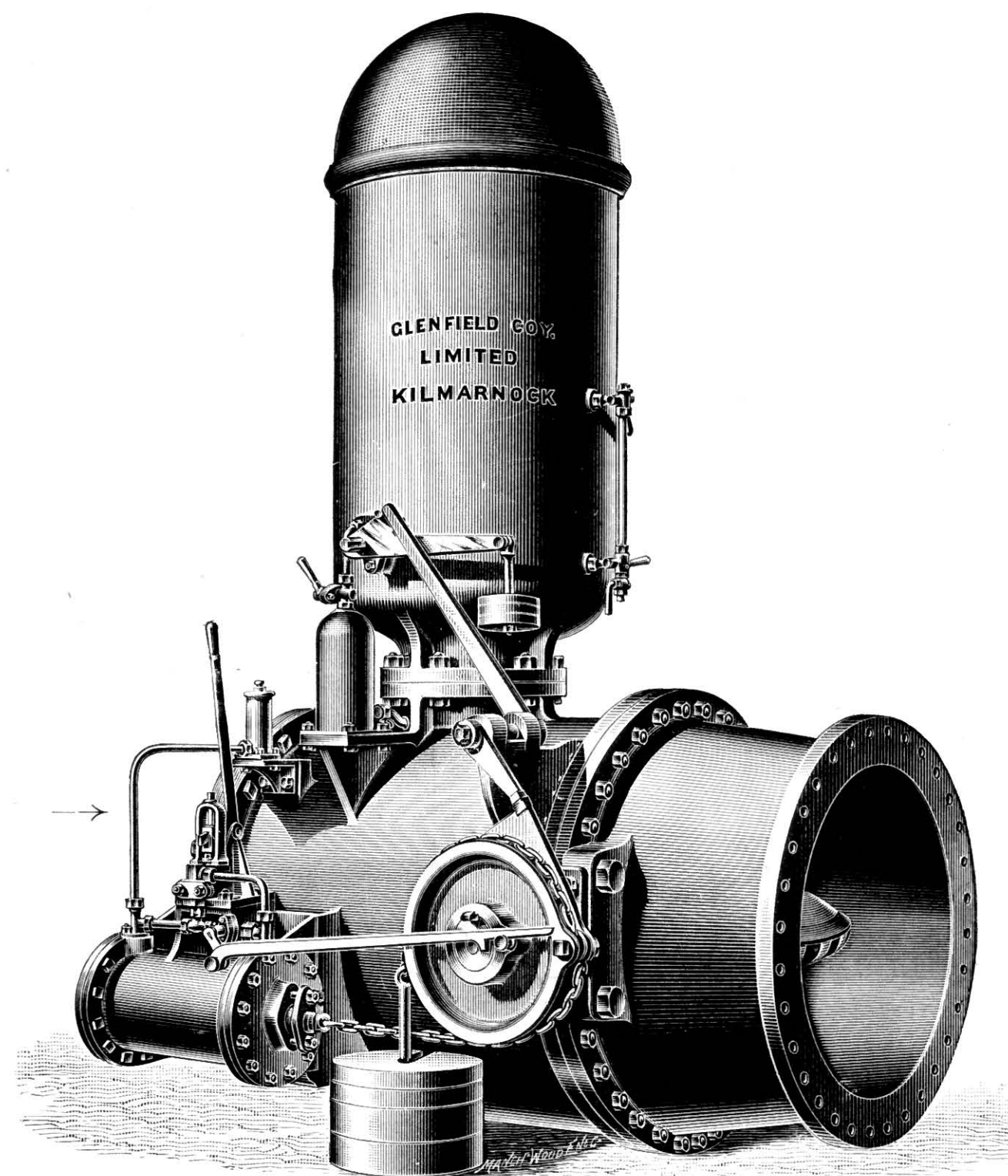


This Valve is similar in principle to that described on previous page, but is provided with Hand Pump for re-setting the levers and putting the Valve in readiness for action. All working parts are bushed with gun metal. Patterns have been made up to 40" diameter.

Prices on application.

Self-Acting Throttle Valve.

Fig. H 65.



This Valve is re-set by means of hand pump. Cataract Cylinder is placed horizontal. Air vessel has means of charging it with air, and is provided with gauge cocks and glass. These Valves were made for Manchester Corporation Thirlmere Supply.

Prices on application.

Self-Acting Throttle Valves or Self-Closing Valves.

PATENT.

Fig. H 67.

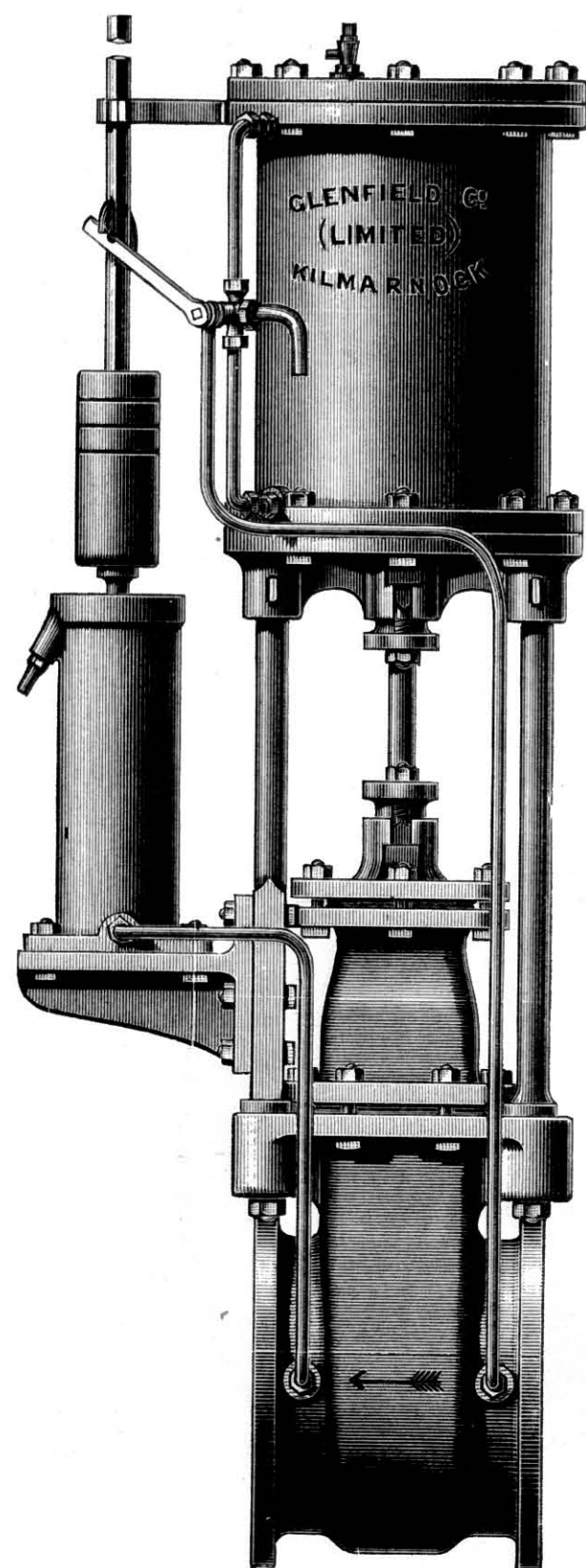
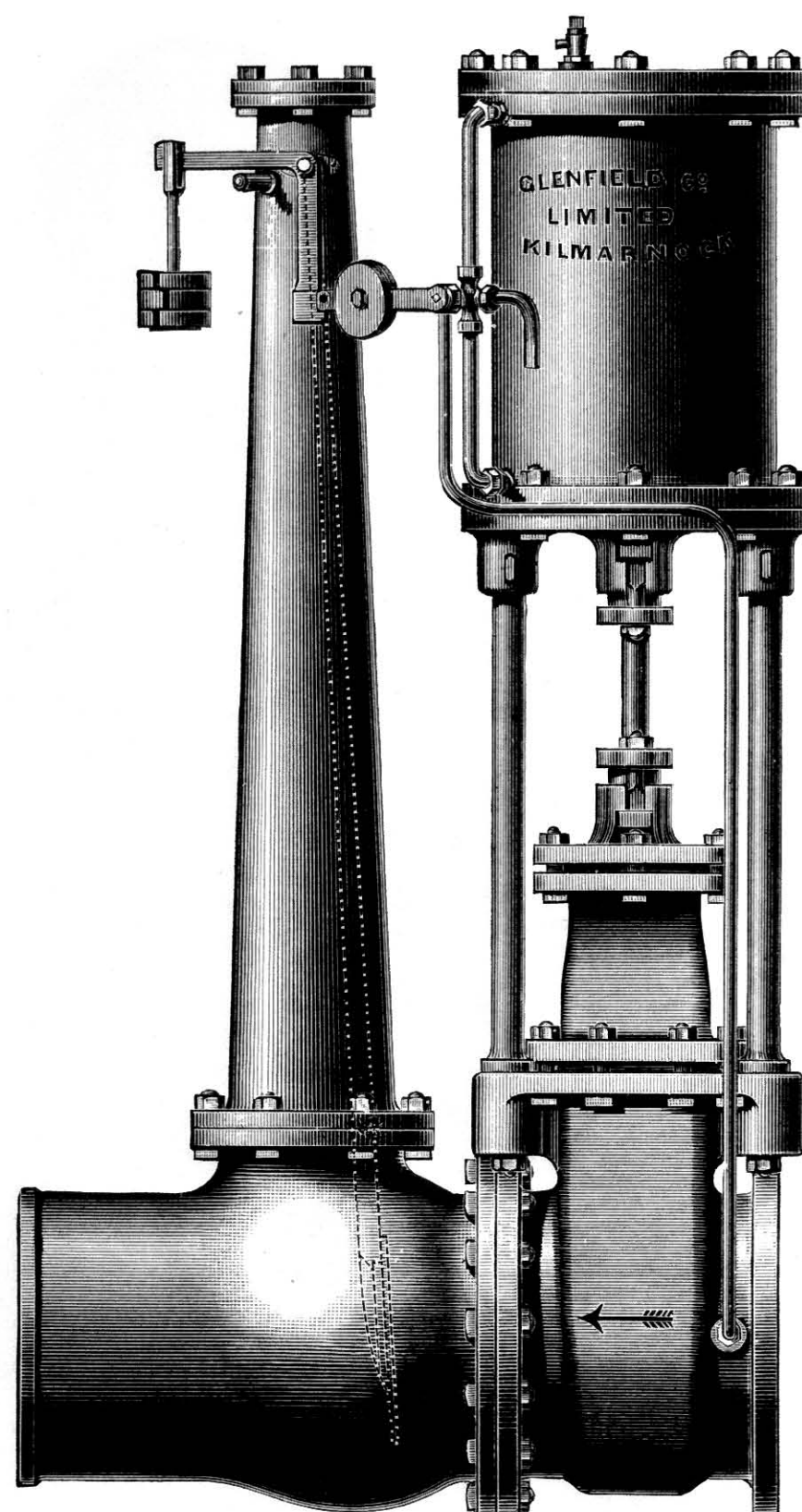


Fig. H 68.



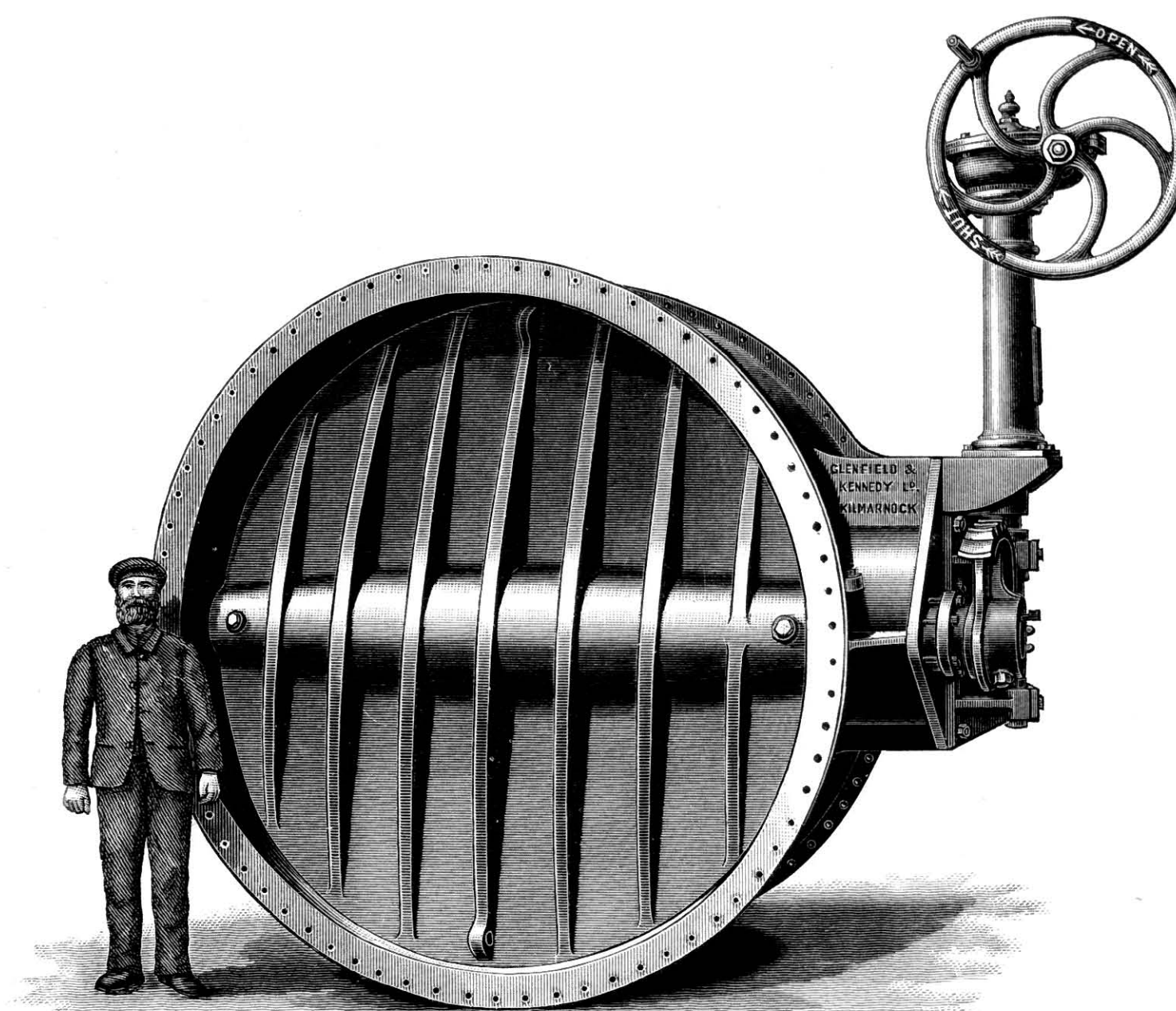
The Sluice Valves have Parallel Faces, with Patent Anti-friction Rollers of gun metal. When pressure in main is reduced (due to a burst), the Loaded Auxiliary Piston in H 67 reverses Four-way Cock, thus putting pressure on upper side of Piston in Hydraulic Cylinder, causing the Valve to close.

In the case of H 68, the Four-way Cock is reversed by the extra velocity of current in Main Pipe acting on Disc in the water-way.

Prices on application.

Throttle Regulating Valve.

Fig. H 82.



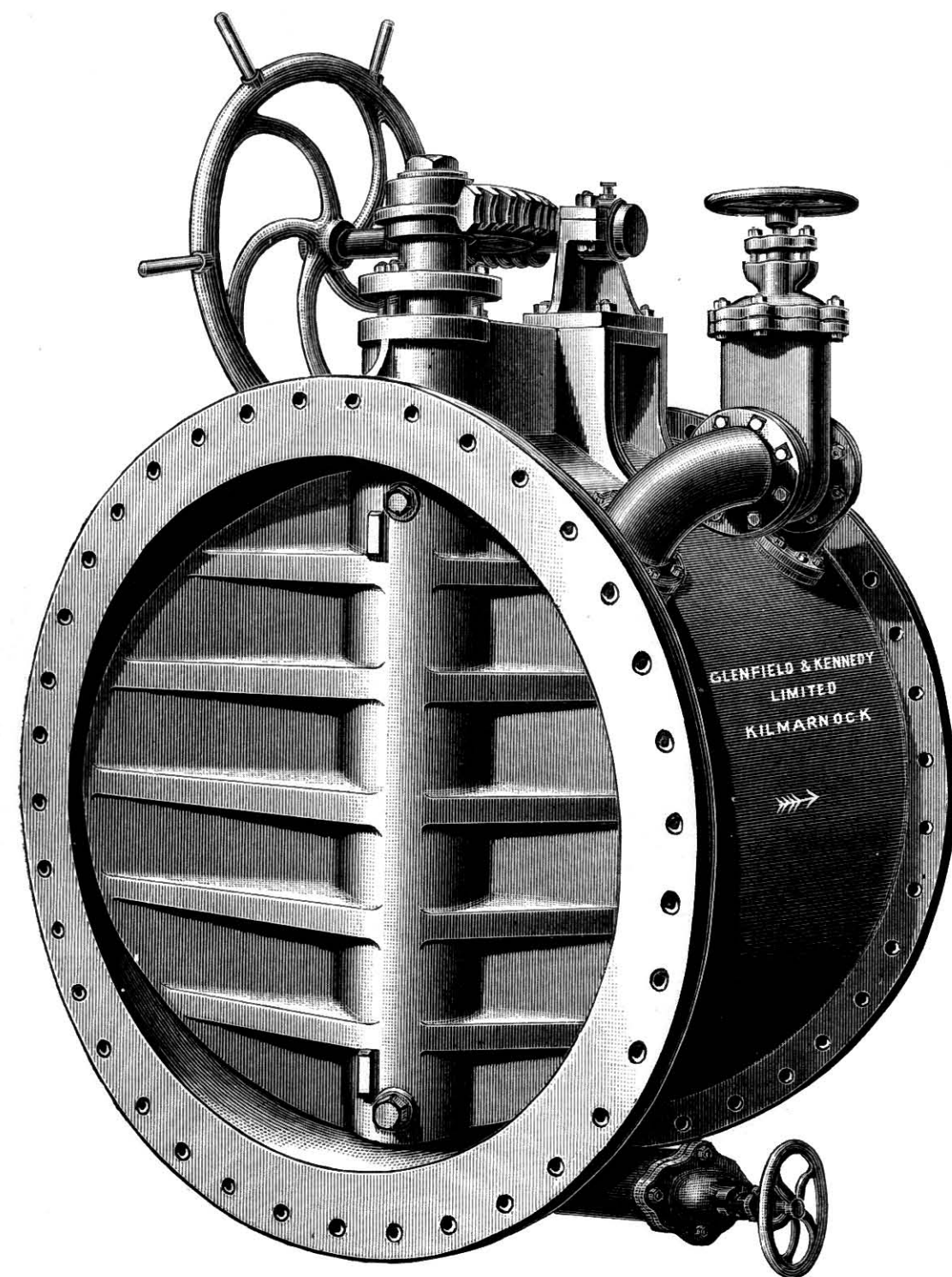
Used on Power Pipe Lines for controlling flow quickly. By-pass supplied if required.

These Valves have been made up to 8 feet diameter.

Prices on application.

Throttle Regulating Valve.

Fig. H. 84.



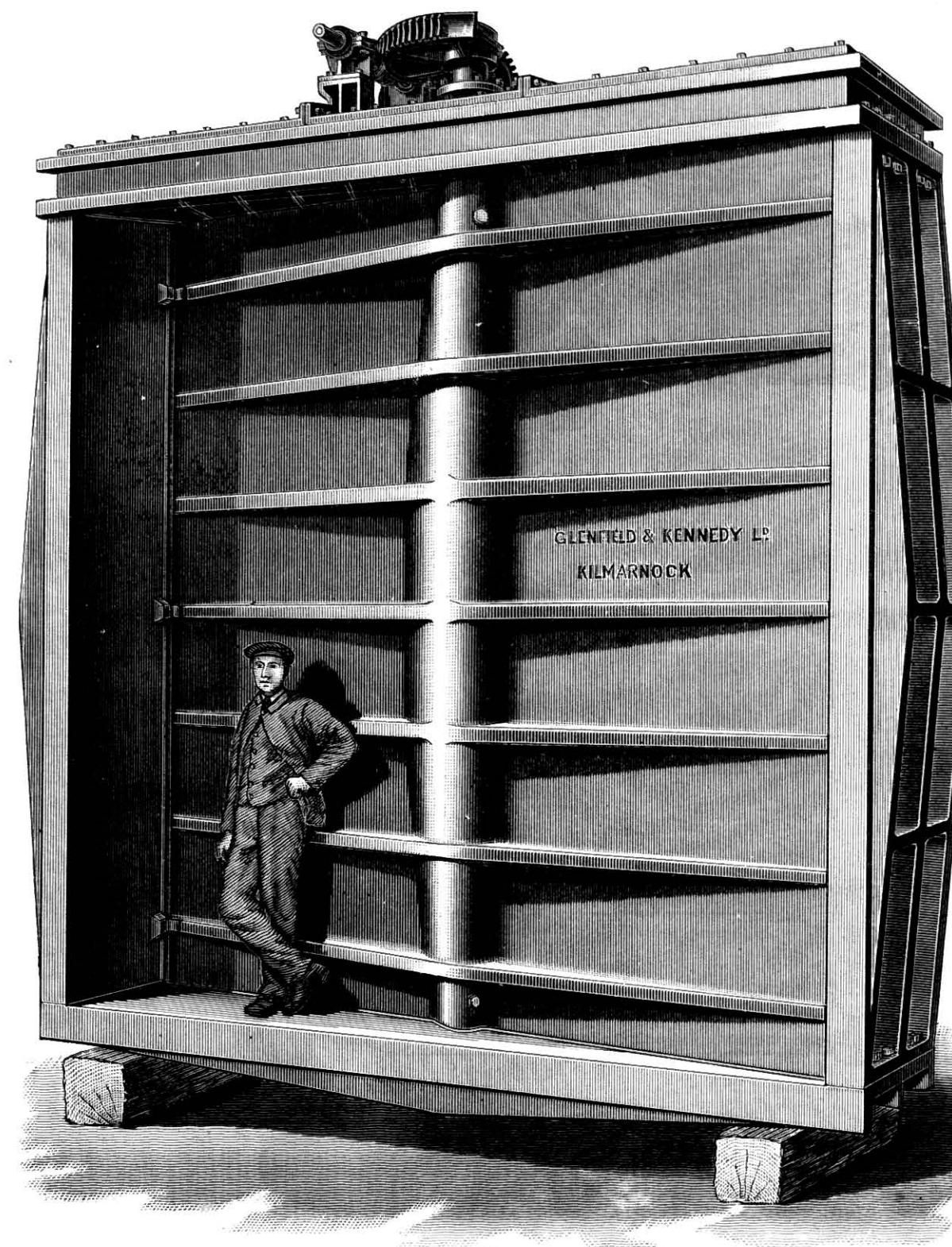
Used on Power Pipe Lines, etc., for controlling flow quickly.

The above illustration shows Valve fitted with Worm Gearing, By-pass, and Draining Valve, but can be supplied without these if desired.

Prices on application.

Throttle Regulating Valve.

Fig. H 86.



Used on Power Pipe Lines for controlling flow quickly. These Valves have been made up to 12 feet square.

Prices on application.

Concussion Relief Valves.

Fig. H 19.

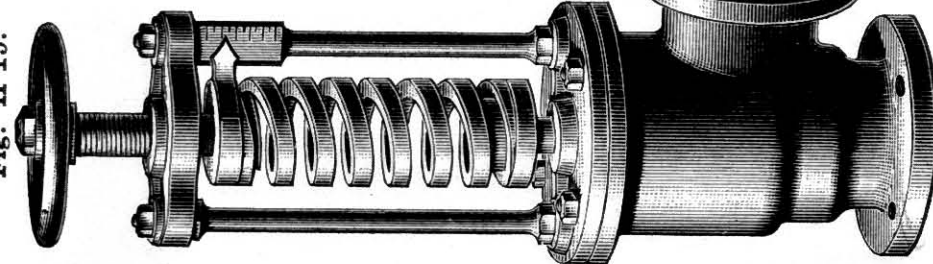


Fig. H 12.

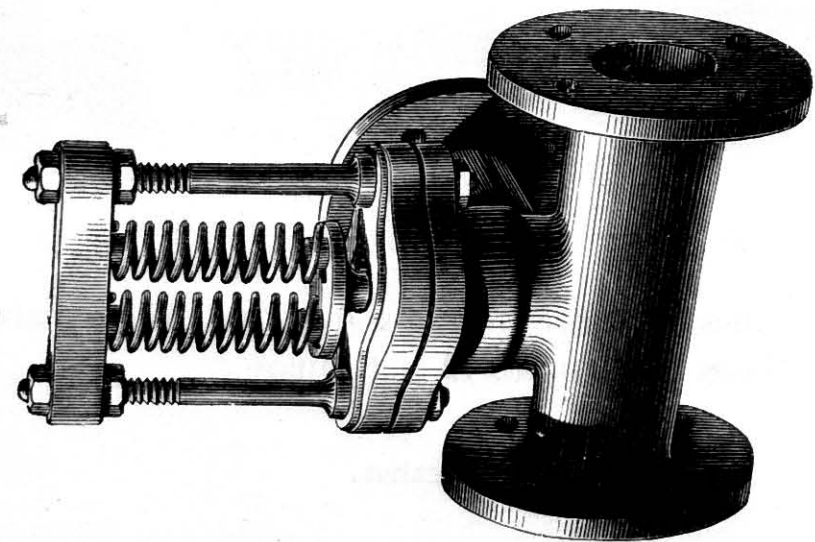
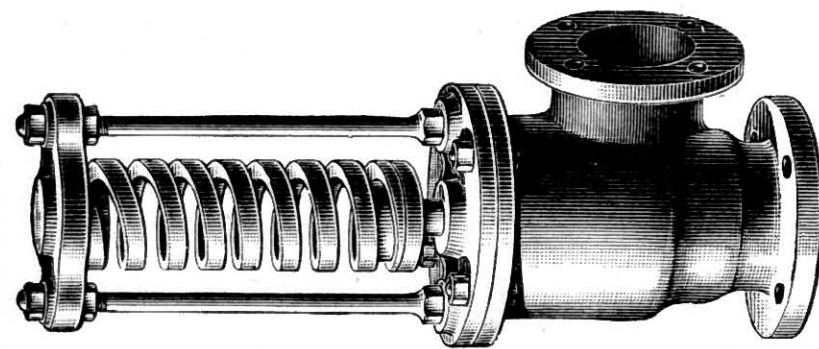
Fig. H 20.
with Spring.

Fig. H 27

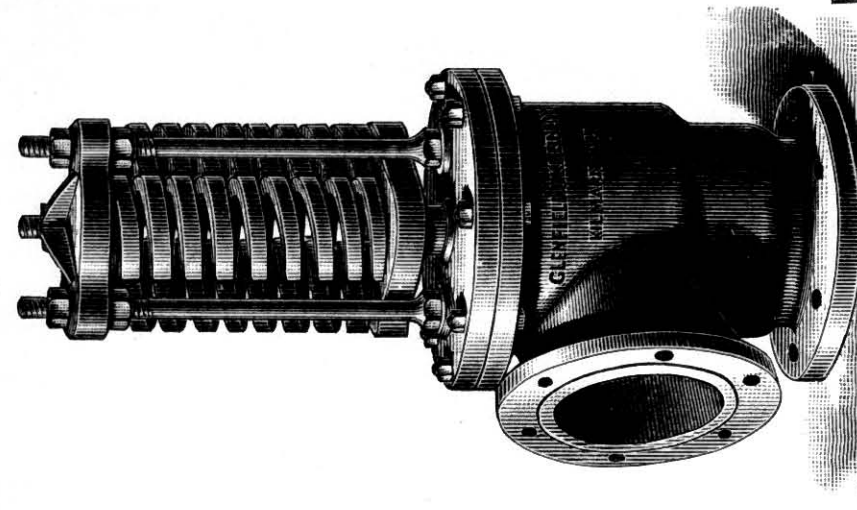
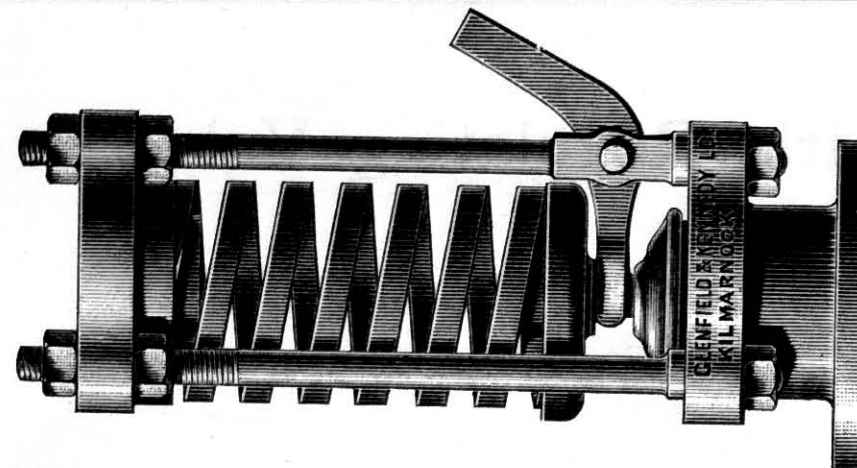


Fig. H 28.



1 1/2"	2"	2 1/2"	3"	4"	5"	6"	8"	10"	12"

H 12—Single Beat Relief Valve, having branch same diameter as main, with Spring, Adjusting Screw and Index to set Valve to any desired pressure, for pressures up to 100 lbs. per sq. in., with Spring, for pressures up to 100 lbs. per sq. in.,
 H 20—Do.
 H 27—Do.
 H 28—Do.

Please state maximum pressure when ordering, as it depends on the pressure whether the Valves are furnished with one, two, or more Springs.

When used for water, Flanges are to British Standard, Table I., and drilled to that standard unless otherwise instructed. When used for steam, the diameters of Flanges are in accordance with Table II., and are left undrilled. If desired drilled, this would be done in accordance with the particulars given on page 4 of Section B (Steam), unless otherwise instructed.

Concussion Relief Valves.

Fig. H 20.

With Lever.

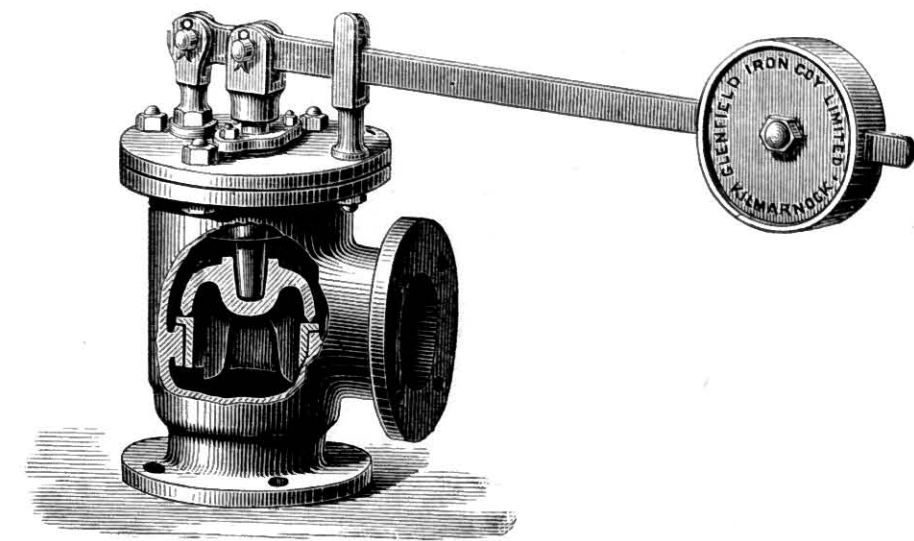
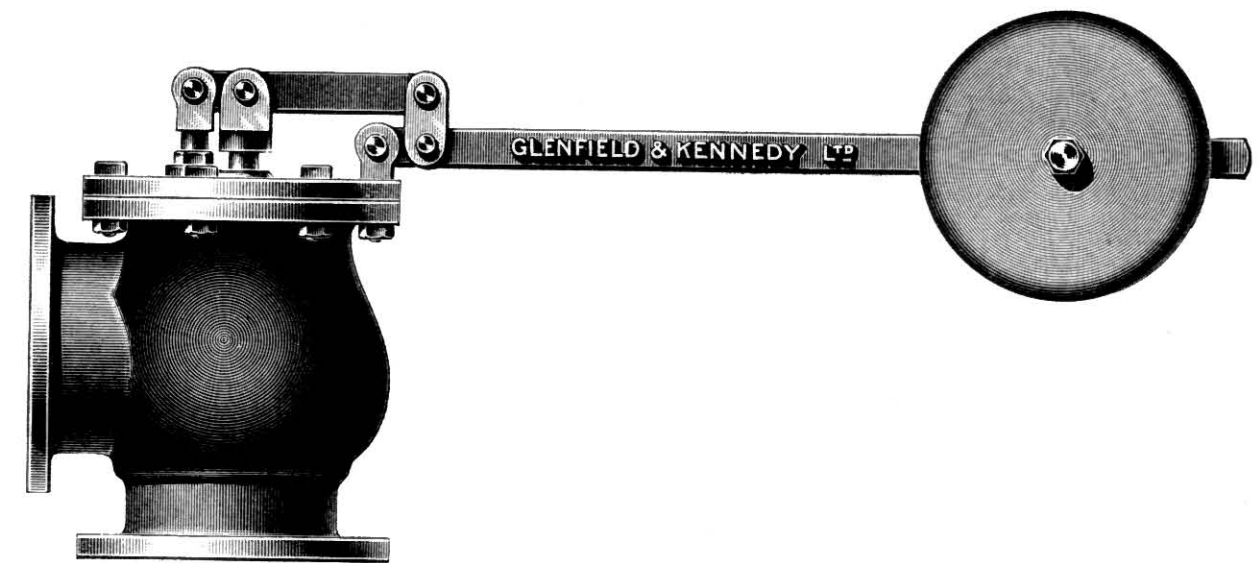


Fig. H 29.



PRICES.

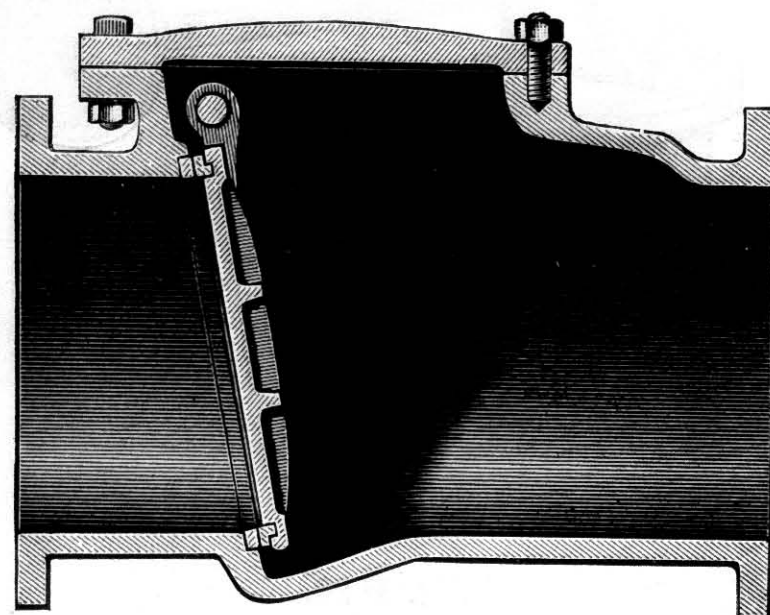
H 20—Single Beat Relief Valve, with Lever and Weight, { 1 1/2" 2" 2 1/2" 3" 4" 5" 6" each.
 H 29—Single Beat Compound Lever Relief Valve for high pressures, with Weight. } Prices on application.

Please state maximum pressure when ordering.

When used for water, Flanges are to British Standard, Table I., and drilled to that standard unless otherwise instructed. When used for steam, the diameters of Flanges are in accordance with Table II., and are left undrilled. If desired drilled, this would be done in accordance with the particulars given on page 4, Section B (Steam), unless otherwise instructed.

Retaining or Reflux Valves.

Figs. M1 and M2.



PRICES.

M 1—Faces and bushes of gun metal, faces scraped to a true bearing.

1½"	2"	2½"	3"	4"	5"	6"	7"	8"	9"	10"	12"	14"	15"	16"	18"	20"	22"	24"
each.																		

For low pressures a Light type of Valve can be supplied up to and including 12" diameter.

M 2—Faces of cast iron, with leather face on malleable flap.

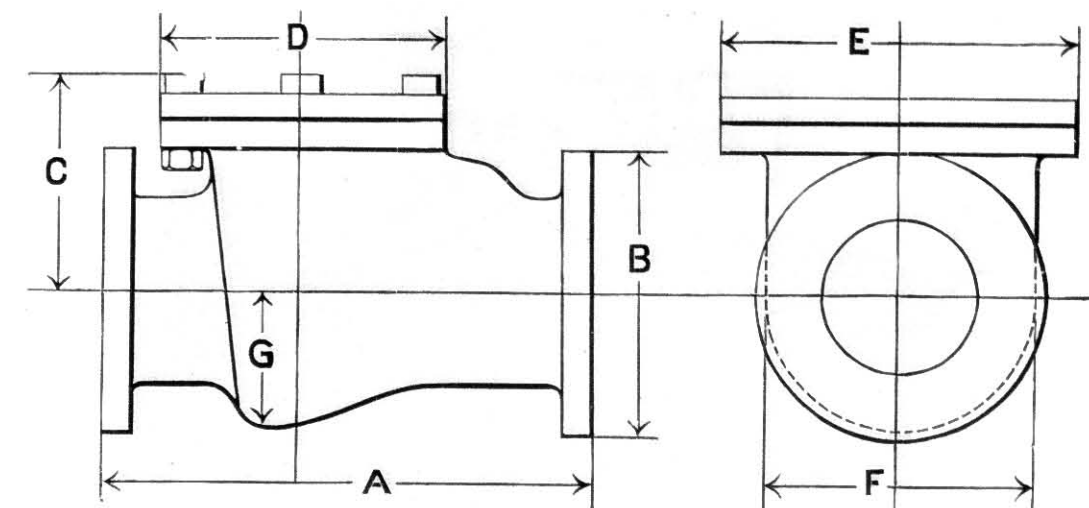
1½"	2"	2½"	3"	4"	5"	6"	7"	8"	9"	10"	12"	14"	15"	16"	18"	20"	22"	24"
each.																		

For low pressures a Light type of Valve can be supplied up to and including 12" diameter.

Spigot and Socket Ends jointed and bolted on.

1½"	2"	2½"	3"	4"	5"	6"	7"	8"	9"	10"	12"	14"	16"	18"	20"	22"	24"	
																		extra.

Dimensions of Reflux Valves.



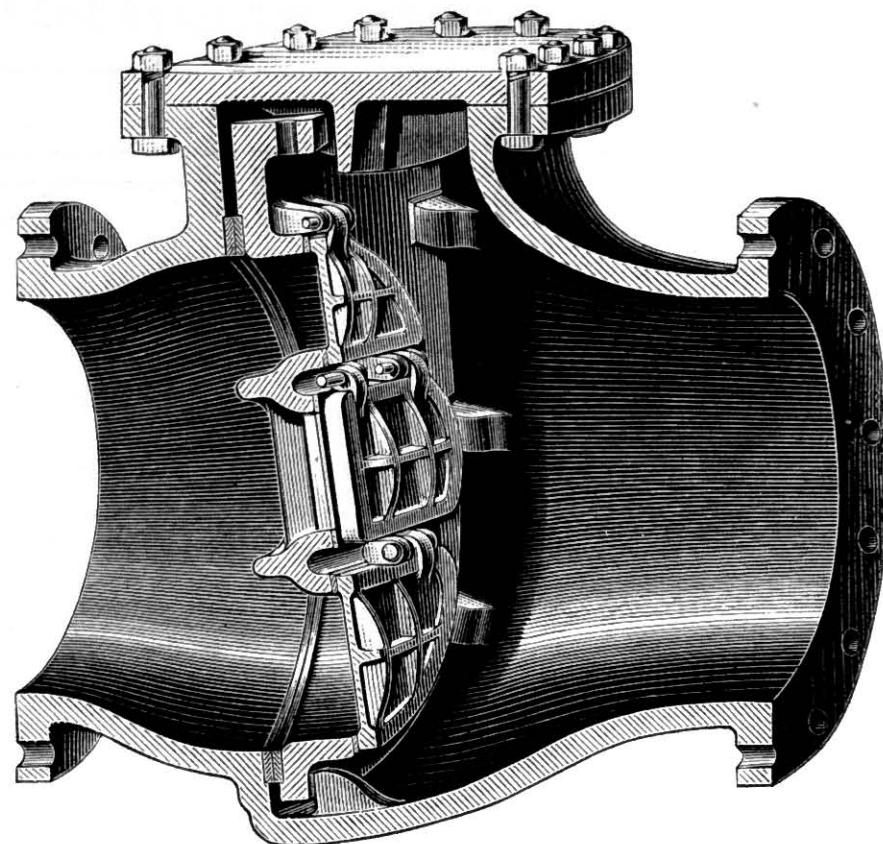
Size.	A Heavy and Light Types.	B Heavy and Light Types.	C	D	E	F	G
2"	9"	6"	4½"	6½"	7½"	4½"	2½"
2½"	9½"	6½"	4½"	6½"	7½"	4½"	2½"
3"	11¼"	7¼"	5½"	8"	9"	5½"	2½"
4"	14½"	8½"	6½"	9½"	11½"	7½"	3½"
5"	15"	10"	7½"	9½"	11½"	8½"	4½"
6"	16½"	11"	8½"	9½"	13½"	9½"	4½"
7"	18"	12"	8½"	10"	14½"	10½"	5½"
8"	19½"	13½"	10"	11½"	16½"	12"	6"
9"	21"	14½"	11"	11½"	17½"	13½"	6½"
10"	23"	16"	11½"	12½"	19½"	14½"	7½"
12"	27"	18"	13½"	12½"	22"	17½"	8½"
14"	32"	20½"	16½"	14"	26"	21½"	10½"
15"	32"	21½"	16½"	14½"	26"	21½"	10½"
16"	35"	22½"	18"	14½"	27½"	22½"	11½"
18"	42"	25½"	21½"	15"	30"	25½"	12½"
20"	42"	27½"	22"	20"	31½"	26½"	14½"
21"	44"	29"	22"	18"	36"	29"	15"
22"	46"	30"	23"	19"	38"	31½"	15½"
24"	50"	32½"	30"	17½"	38½"	33½"	16½"

The Flanges of both types are to British Standard, Table I., and are drilled to that standard unless otherwise instructed.

The dimensions of the Light type, viz. : C, D, E, F, and G are approximately as given in above Table.

Retaining or Reflux Valves.

Fig. M 4.

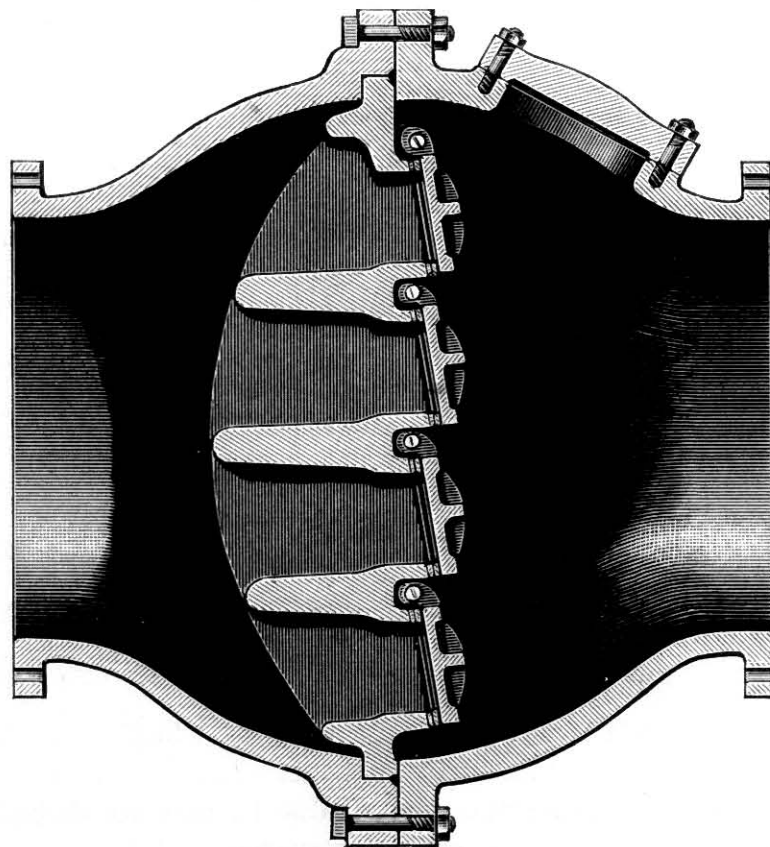


The above Valve is so arranged that the part which carries the doors can be lifted clear out of the valve body for repairs, or to allow the passage of a scraping machine.

Some sizes have Frame (on which small doors are hung) fixed by Stud. In that case the main Frame is not removable through top opening.

Prices on application.

Fig. M 5.



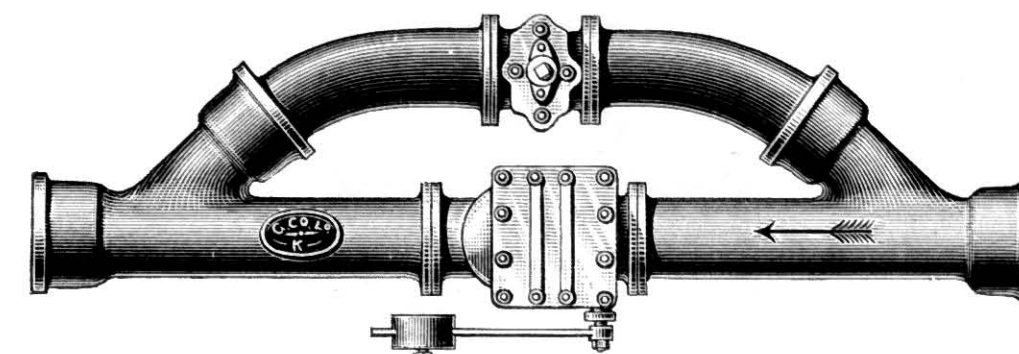
The above Valve has manhole door to give admittance to clean or repair.

Patterns have been made up to 42" dia.

Prices on application.

Loaded Reflux Valve, with By-pass.

Fig. H 74.

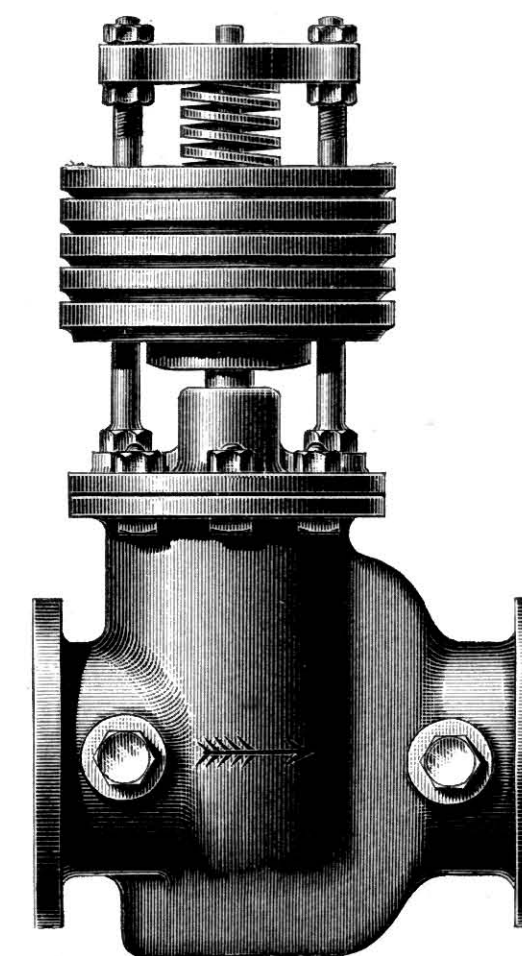


The object of this arrangement is to load Pumping Main so as to supply a high district, while the By-pass can be used at night (or during repairs to Pumping Engines) to supply from Service Reservoir. A second Reflux Valve, opening in the opposite direction, can be substituted for Sluice Valve on By-pass.

Prices on application.

Loaded Equilibrium Valve.

Fig. H 76.



Loaded Equilibrium Valve for the purpose of keeping a head on Pumping Main for pumping to high districts.

The surplus water passes through the Valve to Service Reservoir.

This Valve may be provided with lever outside and Cataract Cylinder at end, or with Cataract Cylinder above (without lever) depending on circumstances of pressure, length of main, etc.

Prices on application.

Back-pressure Retaining Valve or Check Valve.

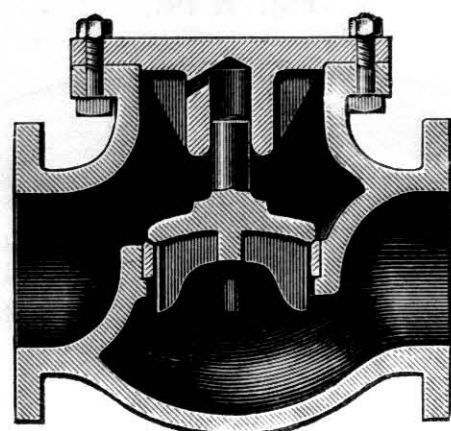
Fig. H 6.

CAST IRON BODY.

PRICES.

1½" 2" 2½" 3" 3½" 4" 4½" 5"

each.



GUN METAL VALVE AND SEAT.

PRICES.

6" 7" 8" 9" 10" 11" 12"

each.

Check or Foot Valves for Vertical Pipes.

Fig. H 34.

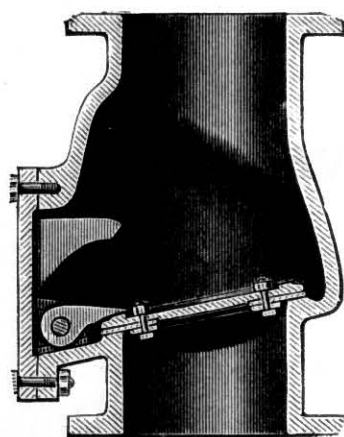


Fig. H 35.

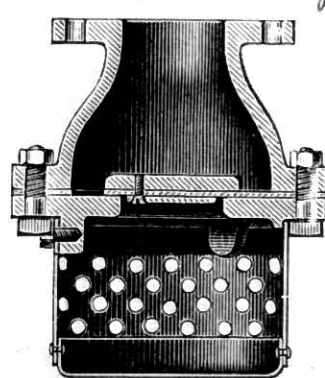


Fig. H 36.

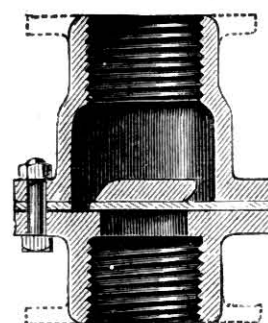


Fig. H 38.

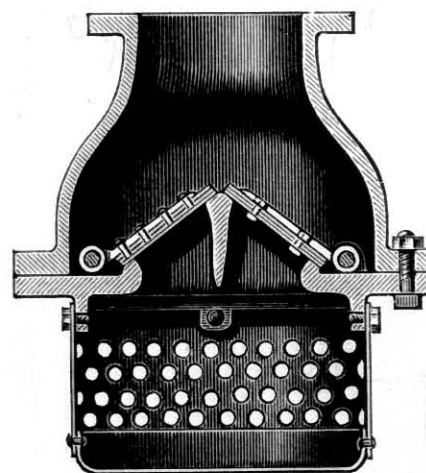
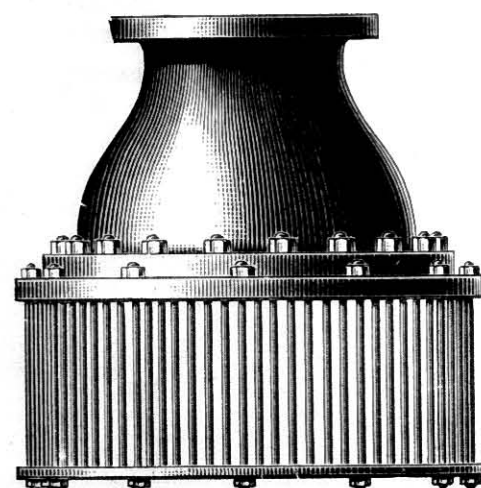


Fig. H 39.



PRICES.

1½" 2" 2½" 3" 4" 5" 6" 7" 8" 9" 10" 12"

each.

H 34—Foot Valve, ..
Strainer Piece for bolting
to inlet of Foot Valve
H 34,

H 35—Foot Valve & Strainer
Combined,

H 36—Foot Valve,

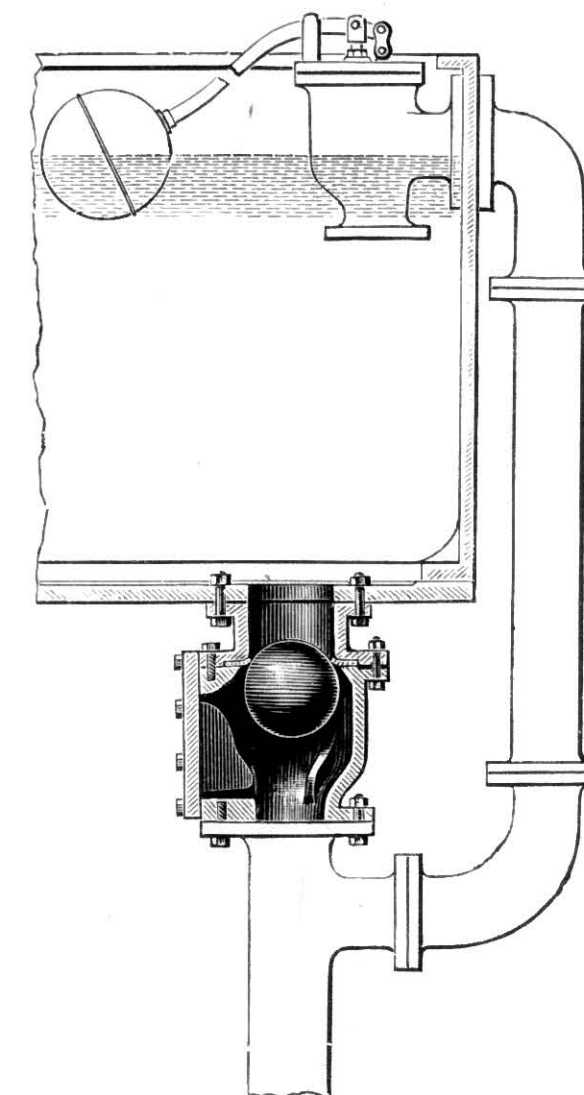
H 38 (Foot Valve and Strainer Combined, can be supplied either with cast iron Doors on cast iron Seat, leather-faced Doors on cast iron Seat, or gun metal Doors on gun metal Seat.) Prices on application.

For Prices of Spigot and Socket Connecting Pieces, see page 26 of this Section.

NOTE.—The Strainers for large sizes are of wrought iron with parallel bars as shown by H 39.

Ball Check Valve.

Fig. H 72.



The object of the Ball Check Valve is to allow water to flow from the tank, but to prevent water to flow up into it except through the Ball Valve at top. A tank on an elevation can thus be filled at night when pressure in town mains is high, and give a supply during the day when pressure in mains is low. It is also suitable for a pumping supply.

Prices on application.

SECTION C.

BALL HYDRANTS, SPINDLE HYDRANTS,
FIRE COCKS, NAME PLATES FOR
HYDRANTS, ETC., AND
STREET WATERING STANDPOSTS.

The designs are subject to alteration and amendment, and, while corrections in Catalogue are made from time to time, Glenfield & Kennedy Ltd. do not guarantee that goods supplied will be exactly as shewn.

Fire Hydrants.

Fig. C 2.

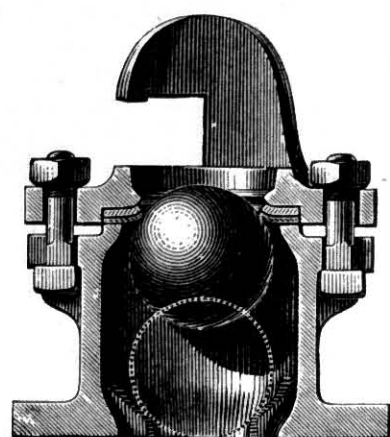


Fig. C 2 on Branch.

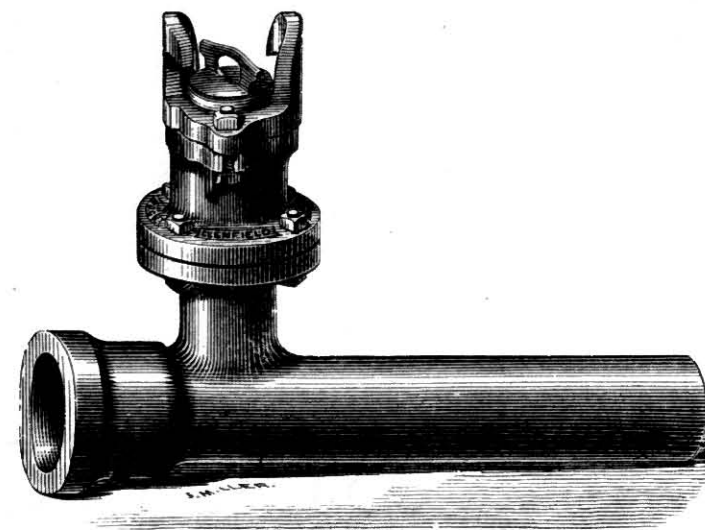


Fig. C 120.

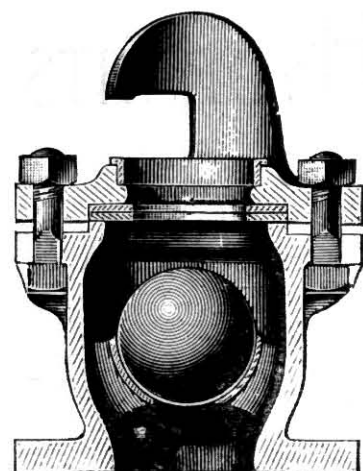


Fig. H 8.

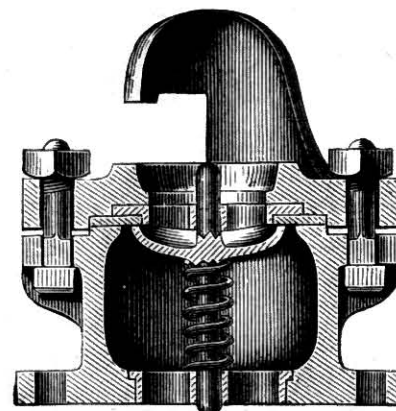
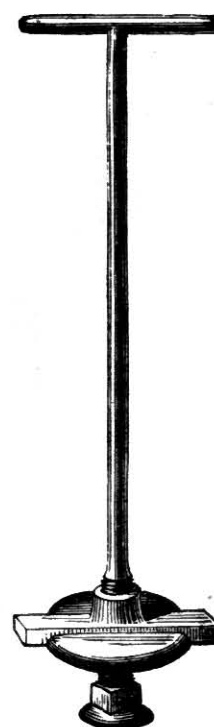


Fig. C 4½.



PRICES.

C 2	—Ball Hydrant, {with Cap, ordinary size, Ball 3" dia. (Bateman & Moore's Patent),	each.
C 4½	—Scouring Key for Ball Hydrants, {3" outlet, Ball 3½" dia.,	"
C 120	—Ball Hydrant, with Rest for Ball, {ordinary size, Ball 3" dia.,	"
H 8	—Spring Hydrant, ordinary size, seldom used,	"

All tested to 600 feet head of water.

NOTE.—Ball Hydrants C 2 and C 120, ordinary size and large size, Flange 8" dia., 4 holes for ½" bolts at 6½" centres.

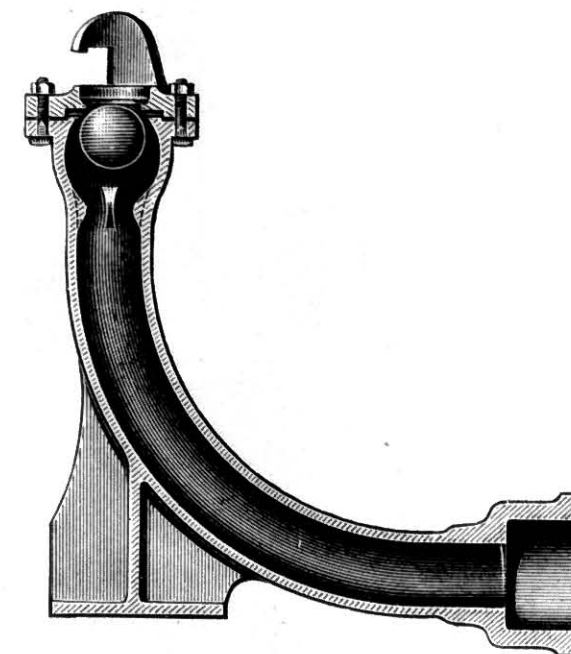
Width between Hooks, ordinary size 4½", large size 4¾".

MISCELLANEOUS PRICES.

Vulcanite Ball for Hydrant, 3" dia.,	each.
Leather Washer for Ball Hydrant, ordinary size,	"
Rubber do. do. do.	"
Set of Bolts and Rubber Joint for attaching Hydrant to Branch-piece,	per Set.

Fire Hydrants.

Fig. C 20.



Ball Hydrant, Fig. C 2, see page 2, Sec. C.
Standpipe, Fig. C 5, see page 2, Sec. E.
Surface Box, Fig. B 6, see page 8, Sec. D.

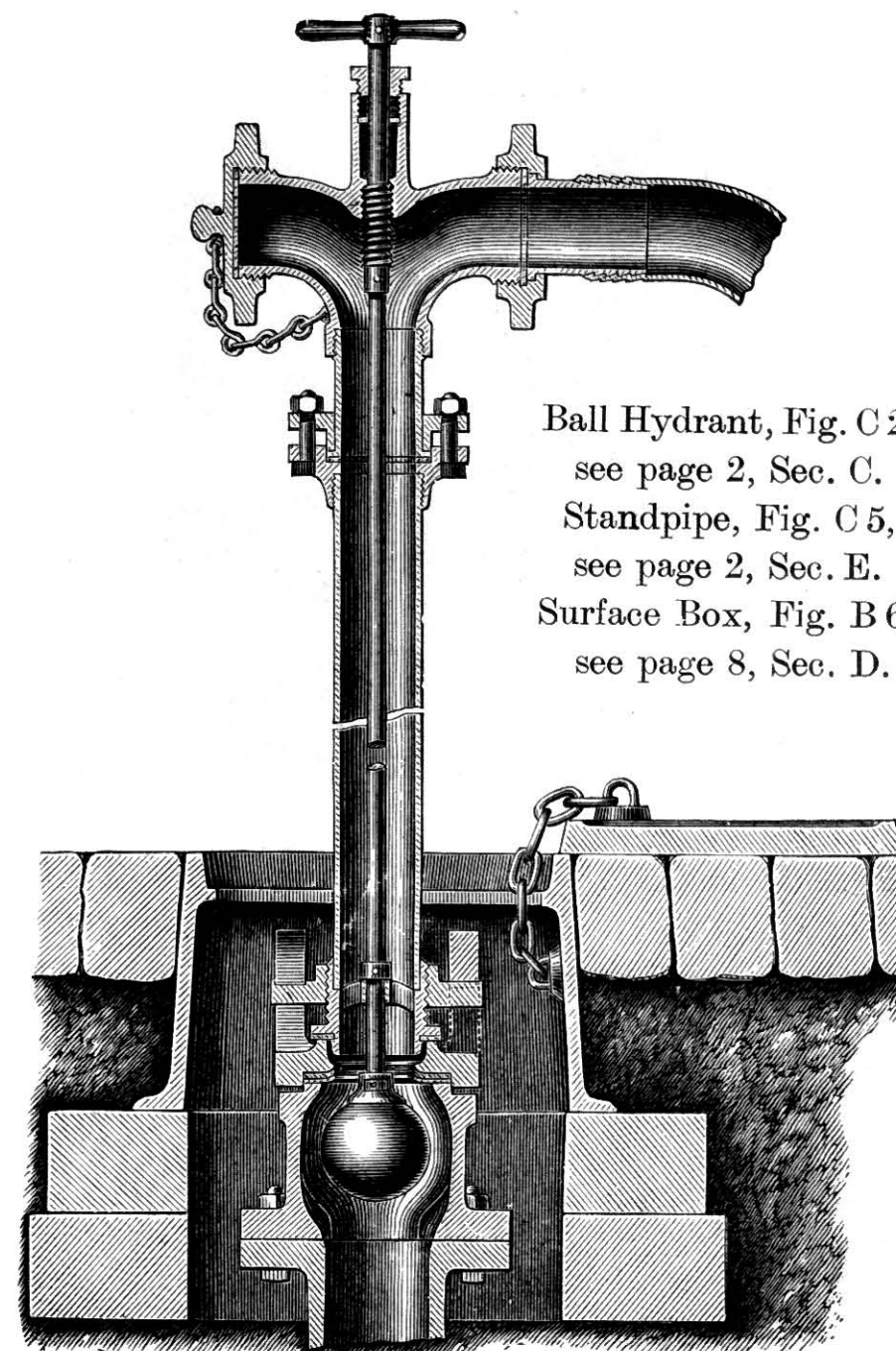


Fig. C 104.

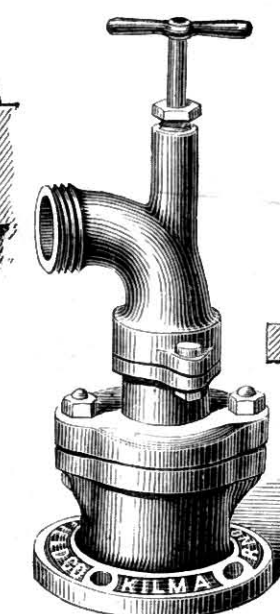
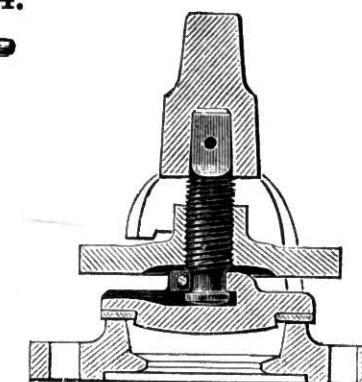


Fig. C 114.



PRICES.

C 20	—Ball Hydrant, with Socket Elbow, {for 2", 2½" or 3" pipes,	each.
	{for 4" pipes,	"
C 104	—Do. and short Single Outlet Standpipe Combined,	"
C 114	—Screw-down Valve to close Hydrant, so as to prevent admission of air or gases when water is turned off, or to prevent leakage till convenient to repair a defective Ball,	"

All tested to 600 feet head of water.

Fire Cocks.

Fig. C 1.

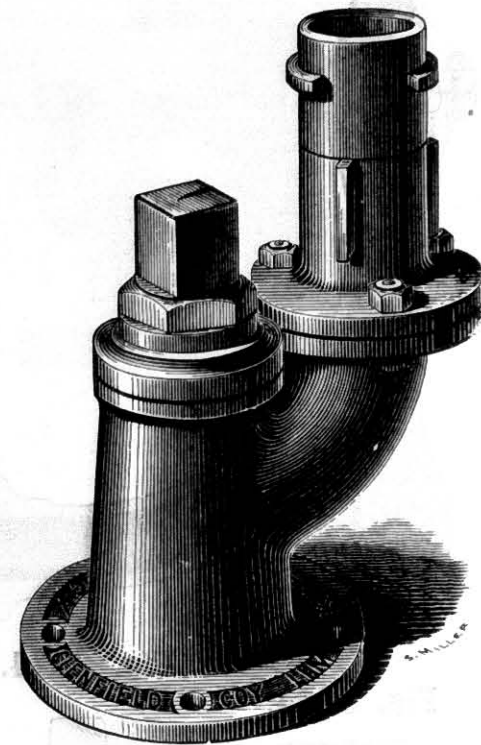
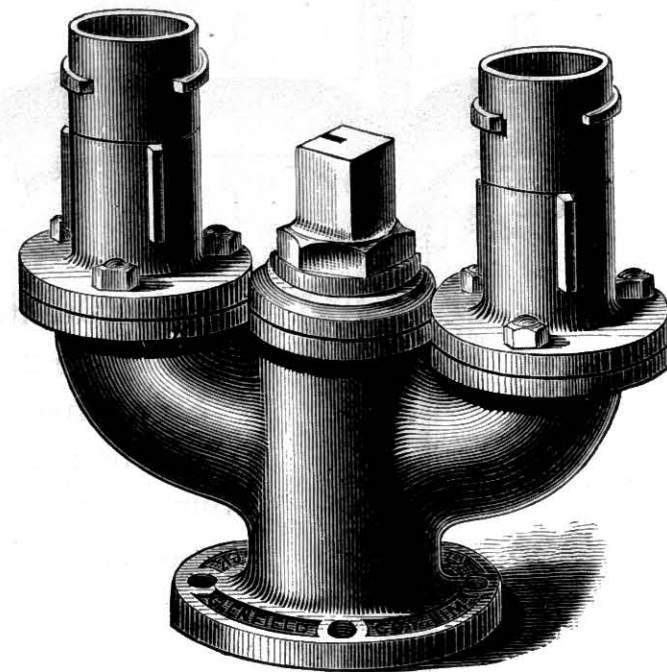
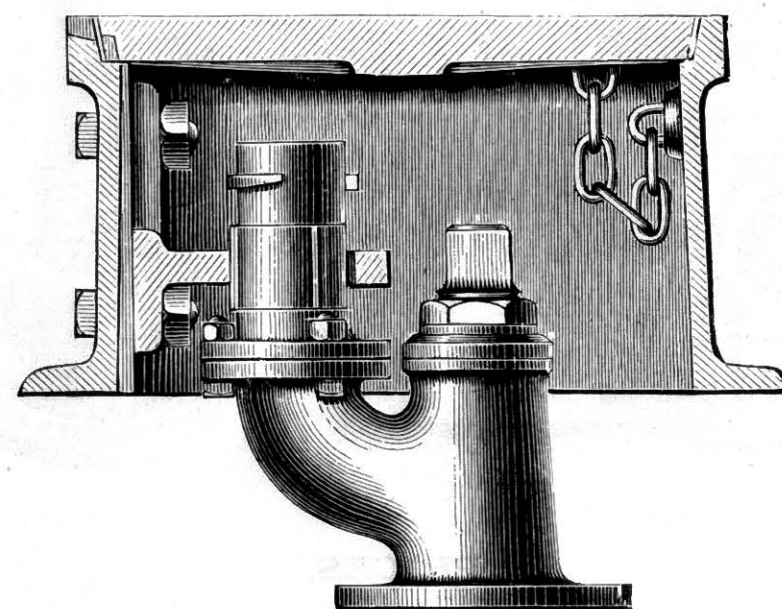


Fig. C 1 (Double Outlet).



Figs. C 1 and B 7.



PRICES.

C 1	2" gun metal Fire Cock, flange 7" dia.,	each.
	2" do. flange 8" dia.,	"
	2" double outlet gun metal Fire Cock, flange 8" dia.,	"

All tested to 600 feet head of water.

Fire Hydrants.

Fig. C 109.

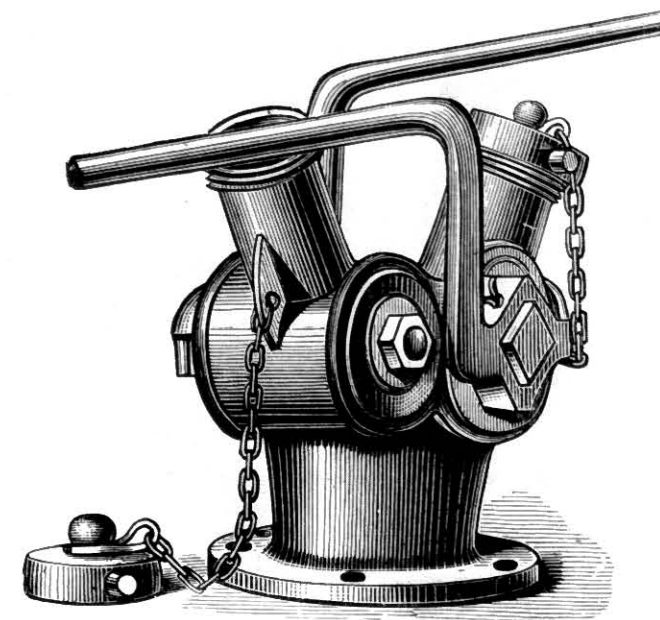


Fig. C 110.

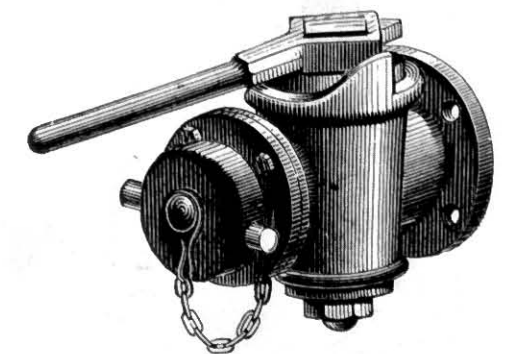


Fig. C 4—SPINDLE HYDRANT.

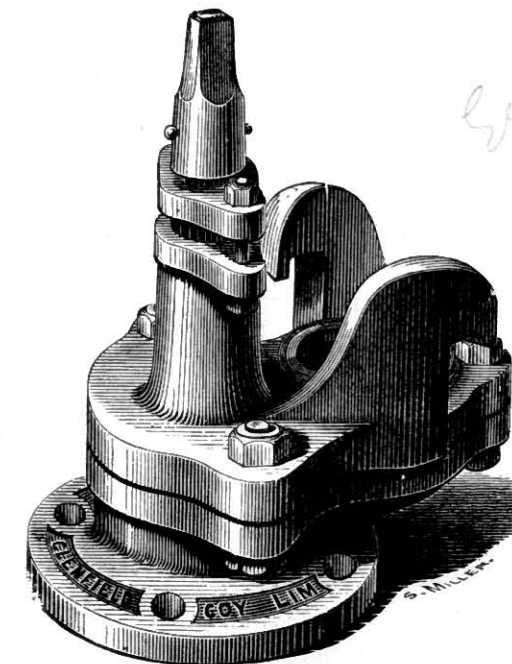
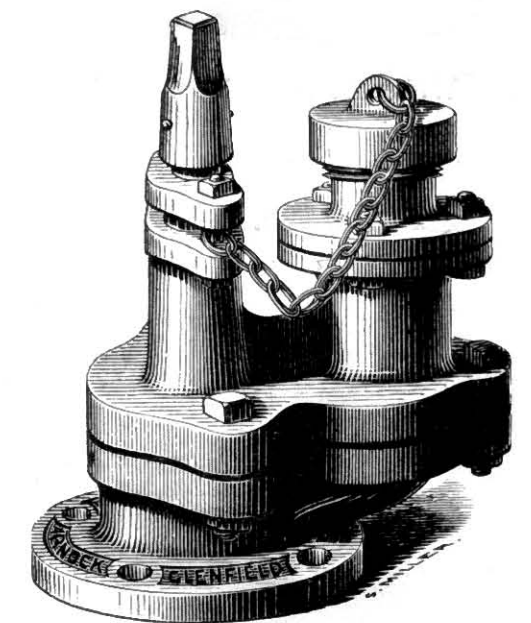


Fig. C 24—SPINDLE HYDRANT.



The Spindle, Nut, Valve, Valve Seat, and Seating of Outlet of this Hydrant are of gun metal.
Distance between Hooks, 1½" Hydrant 2¾", 2¼"
and 2½" Hydrants 4¼", 3" Hydrant 4¾".

In addition to the Spindle, etc., being gun metal, as mentioned for C 4 Hydrant, the Outlet-piece of this Hydrant is gun metal, and can be screwed to suit any Brigade thread. The Cap is a loose cast iron one, but can be supplied screwed, either in cast iron or gun metal.

PRICES.

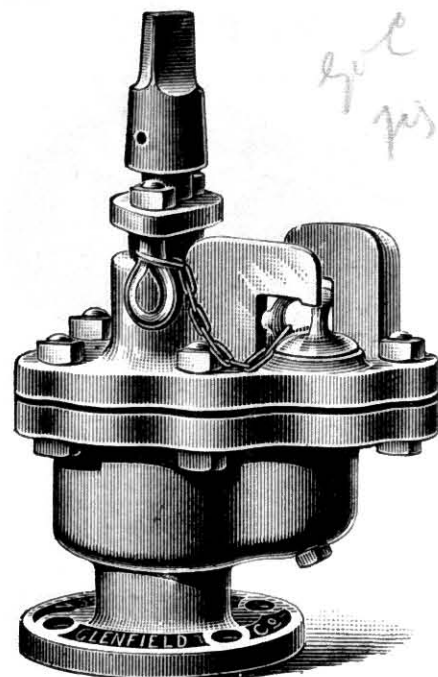
	Dia. of Inlet, 1½"	2¼"	2½"	3"	
C 4—Spindle Hydrant, with Lugs and chained cast iron loose Cap,..	each.
C 24—Do., Screwed Outlet and chained cast iron loose Cap,	"
C 109—Double Outlet Hydrant, all gun metal, with wrought iron Handles; Inlet 3½" bore, Outlets 2½" bore, with two Screwed gun metal Caps,	"
C 110—2½" Hydrant with cast iron Body, gun metal Plug, Outlet-piece, and Screwed Cap, and with wrought iron Handle,	"

All tested to 600 feet head of water.

NOTE.—Flange of 1½" Spindle Hydrant 6½" dia., 4 holes at 5½" centres.
Do. 2¼", 2½", and 3" Spindle Hydrants 8" dia., 4 holes at 6½" centres.

Fire Hydrants.

Fig. C 28.



Width between Hooks $4\frac{1}{4}$ ".

Fig. C 29.

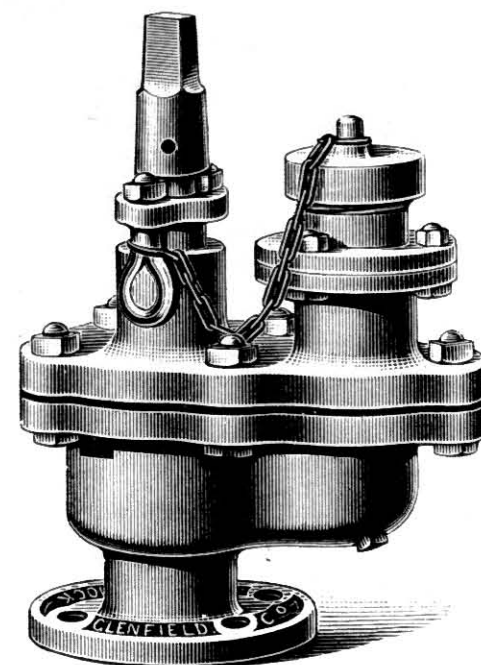


Fig. C 136.

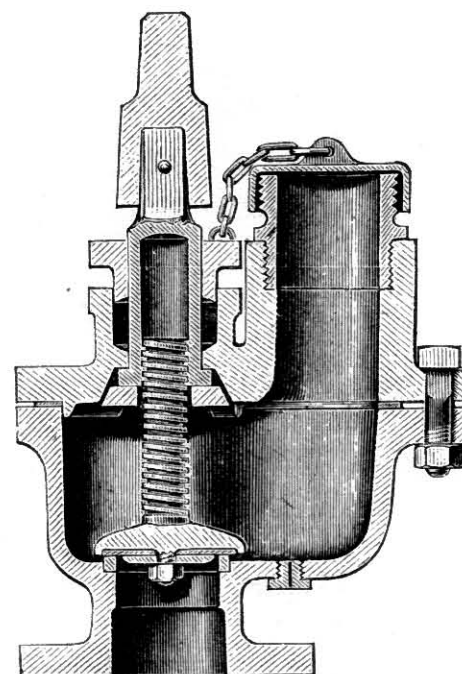
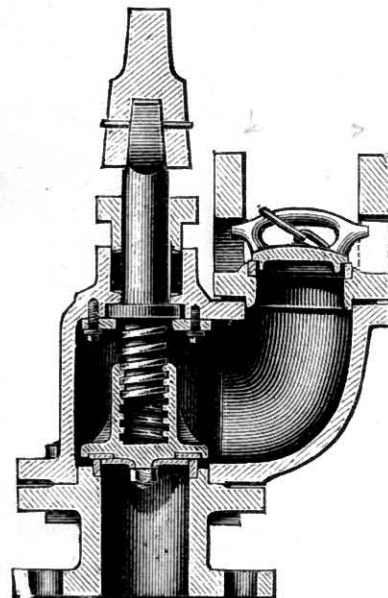


Fig. C 135.



Width between Hooks $4\frac{1}{4}$ ".

PRICES.

$2\frac{1}{2}$ " 3"

C 28—	Spindle Hydrant, with Lugs and with chained cast iron loose Cap, ..	each.
C 29—	Do. with gun metal Screwed Outlet and chained cast iron loose Cap, ..	"
C 135—	Do. with Lugs and chained cast iron loose Cap, Outlet Seating of gun metal, hollow Valve, ..	"
C 136—	Do. with gun metal Screwed Outlet and chained cast iron loose Cap, hollow Spindle, ..	"

All tested to 600 feet head of water.

NOTE.—Flange of $2\frac{1}{2}$ " and 3" Spindle Hydrants as above, 8" dia., 4 holes at $6\frac{1}{2}$ " centres.

Fire Hydrants.

Fig. C 22.

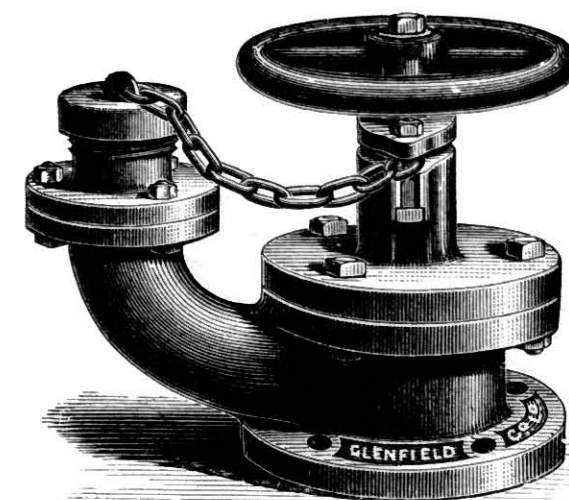


Fig. C 137.

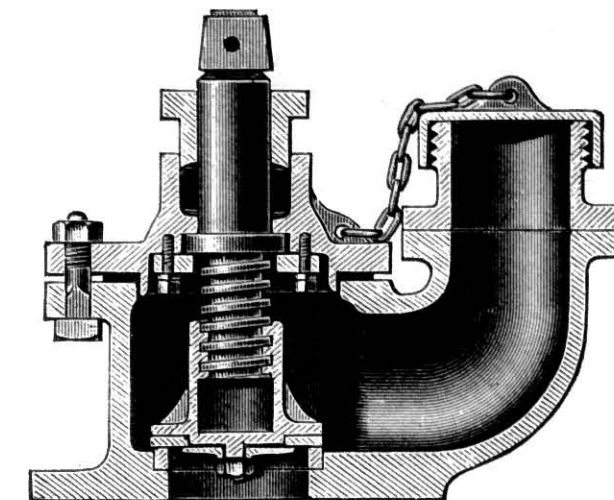
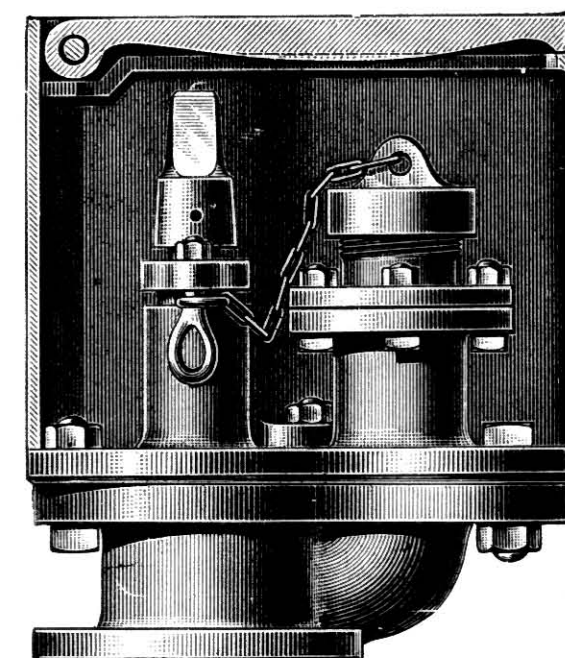
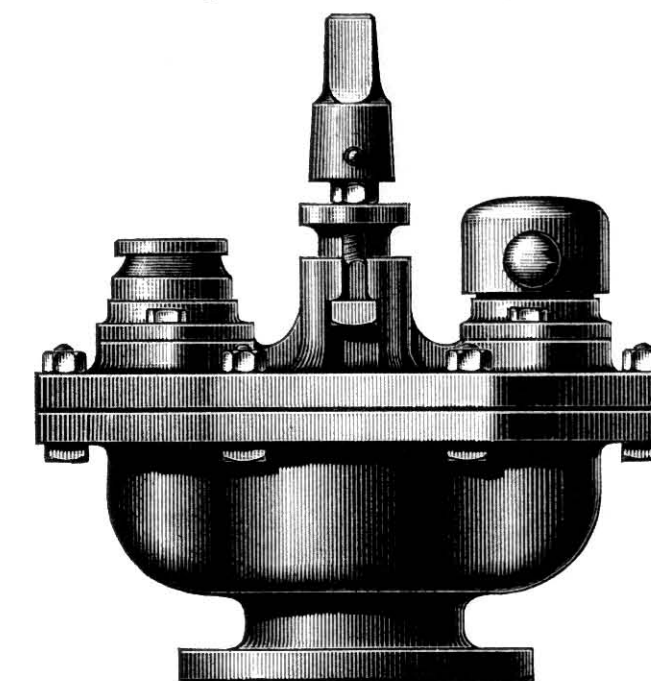


Fig. C 111.



Figs. C 138 and C 139.



PRICES.

$2\frac{1}{4}$ " $2\frac{1}{2}$ " 3"

C 22—	Wheel Hydrant, or Mill Cock, with gun metal Screwed Outlet and chained cast iron loose Cap, ..	each.
C 111—	Spindle Hydrant and Surface Box Combined, ..	"
C 137—	Do. with gun metal Screwed Outlet and chained cast iron loose Cap, hollow Valve, specially suitable for shallow mains, ..	"
C 138—	Double-outlet Spindle Hydrant, with 5" Inlet, one 5" and one $2\frac{1}{2}$ " Outlets, ..	"
C 139—	Do. with 5" Inlet and two $2\frac{1}{2}$ " Outlets, ..	"

The Outlets can be screwed to suit any Brigade gauge or be made suitable for connection to Instantaneous Coupling, if desired.

All tested to 600 feet head of water.

NOTE.—Flanges of $2\frac{1}{4}$ ", $2\frac{1}{2}$ ", and 3" Hydrants as above, 8" dia., 4 holes at $6\frac{1}{2}$ " centres.

Fire Hydrants.

Fig. C 140.

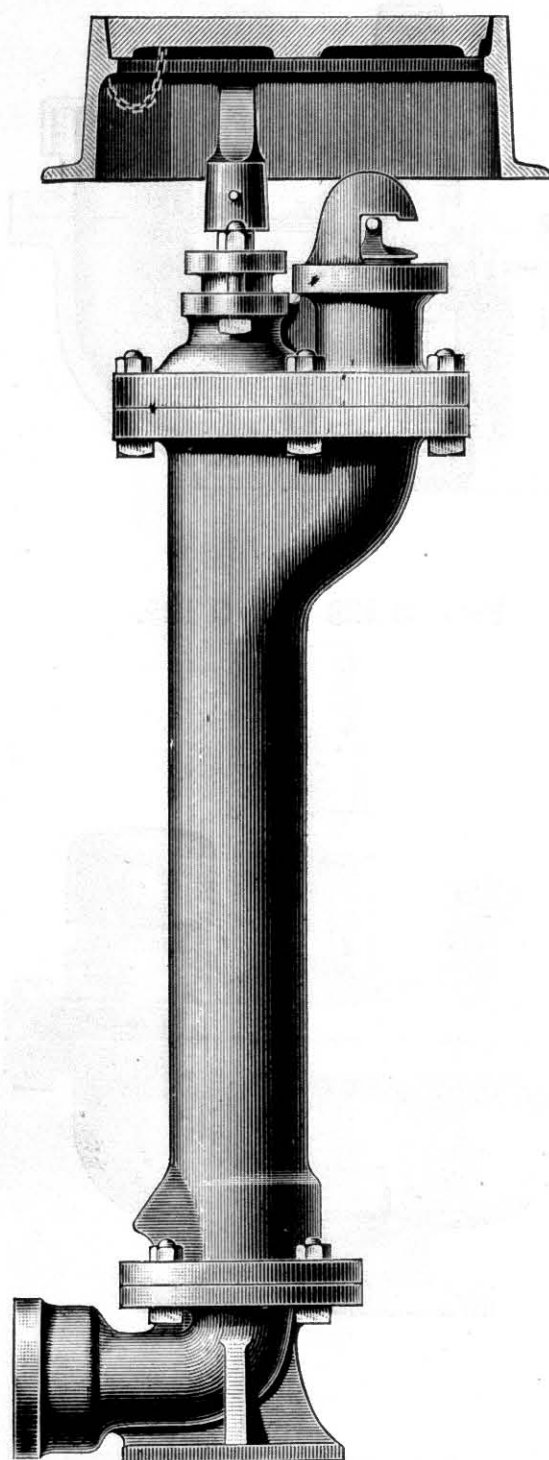


Fig. C 106.

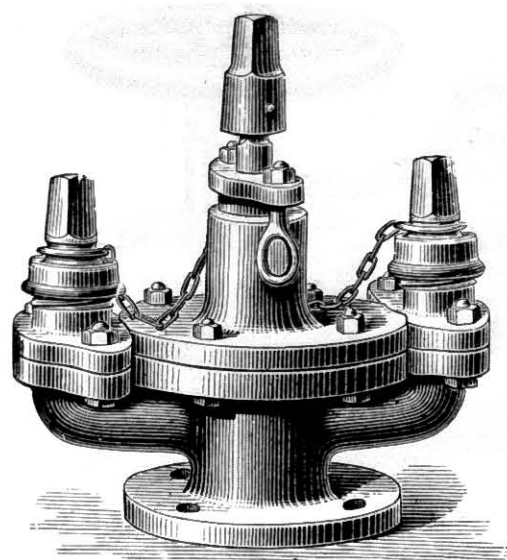
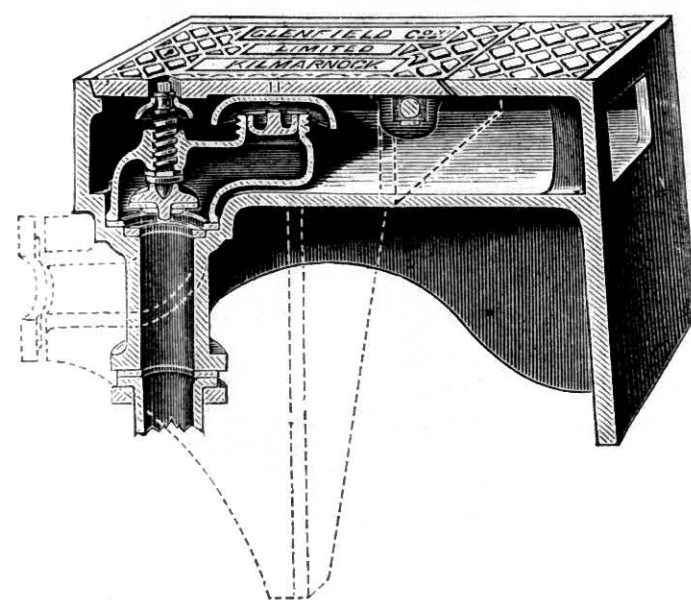


Fig. C 112.



PRICES.

C 106—Double-outlet Spindle Hydrant, 2½" Inlet and two 1½" Outlets,	2½"	each.
	1½" 2½" 3¼" 4"	
C 112—Flushing Box for placing at edge of pavement for flush- ing gutters, also used as Fire Hydrant, ..	1½"	"
Watering Box, as shown by dotted lines on C 112, ..	1½"	"
C 140—Spindle Hydrant (anti-freezing), with Lugs and chained cast iron loose Cap, not including Surface Box, ..	2½"	"

All tested to 600 feet head of water.

NOTE.—Flange of 2½" Hydrant C 106, 8" dia., 4 holes at 6½" centres.

Fire Hydrants.

Fig. C 23.

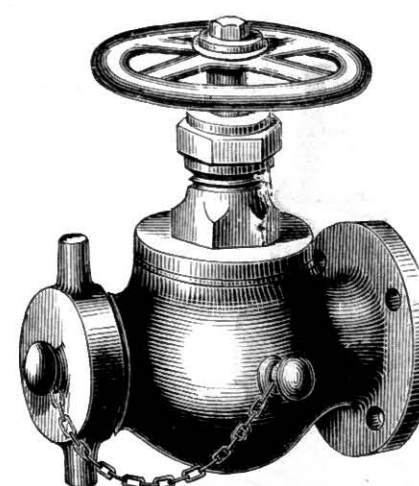


Fig. C 58.

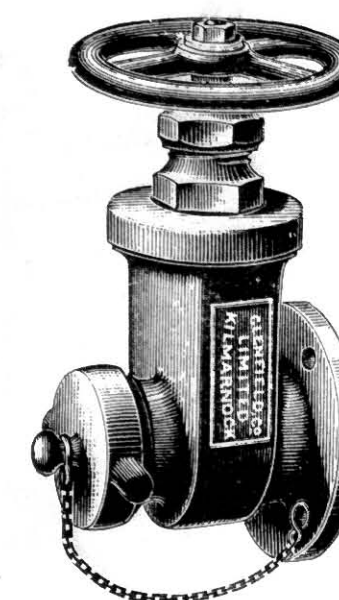


Fig. C 143.

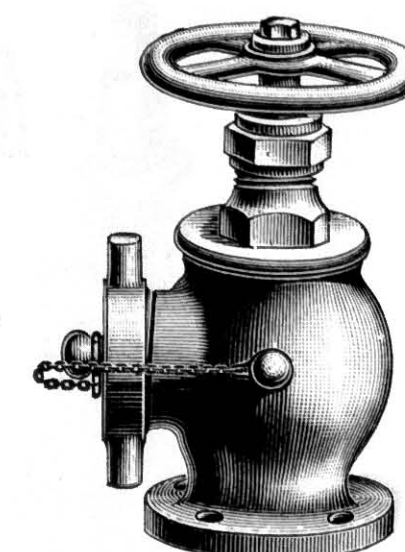


Fig. C 151.

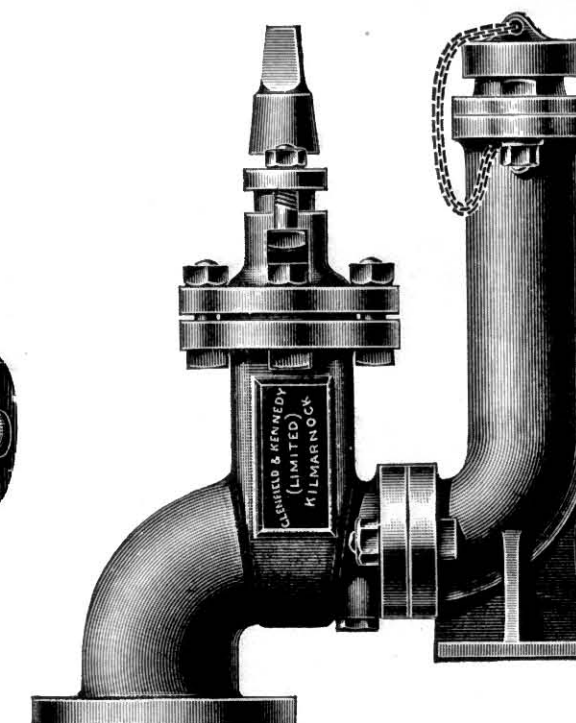


Fig. C 145.

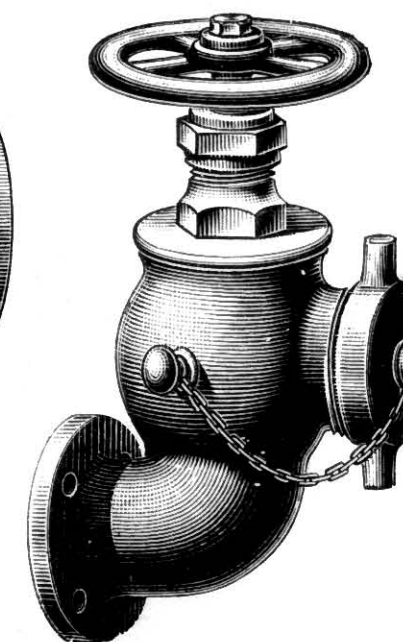
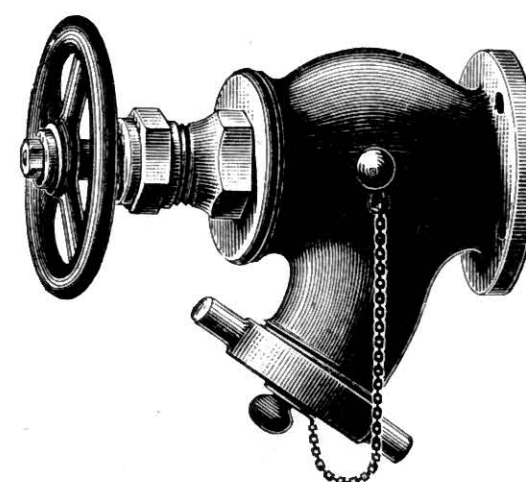


Fig. C 144.



PRICES.

	1½"	2"	2½"	
C 23—Globe Barrel Hydrant, { gun metal, Painted, }				each.
or Mill Cock, { Body, Cover, and Gland of cast iron, }				"
				Outlet and working parts of gun metal, }
C 58—Gun Metal Mill Cock (Sluice Valve type),				"
C 143 and C 144—Globe Barrel { right-angled, gun metal, Painted, }				"
Hydrant, or Mill Cock, { do. Body, Cover, and Gland of cast }				"
				iron, Outlet and working parts of gun metal, }
C 145—Globe Barrel Hydrant, or Mill Cock, Inlet at bottom, gun metal, Painted,				"
All tested to 600 feet head of water.				
NOTE.—Flange of Mill Cocks 1½"—5¼" dia., 4 holes at 3⅞" centres.				
Do. 2"—6" dia., 4 holes at 4½" centres.				
Do. 2½"—6½" dia., 4 holes at 5" centres.				

C 151—Sluice Valve Hydrant, with gun metal Screwed Outlet, self-acting Emptying Valve and Chained cast iron loose Cap, 4" inlet, 3" valve, each; 3" inlet, 3" valve, 1½" each.

NOTE.—4" inlet, flange 8½" diam., 4 holes at 7" centres.
3" " " 7¼" " 4 " 5¾" "

Fire Hydrants (Sluice Valve Type).

Fig. C 35.

Fig. C 105.

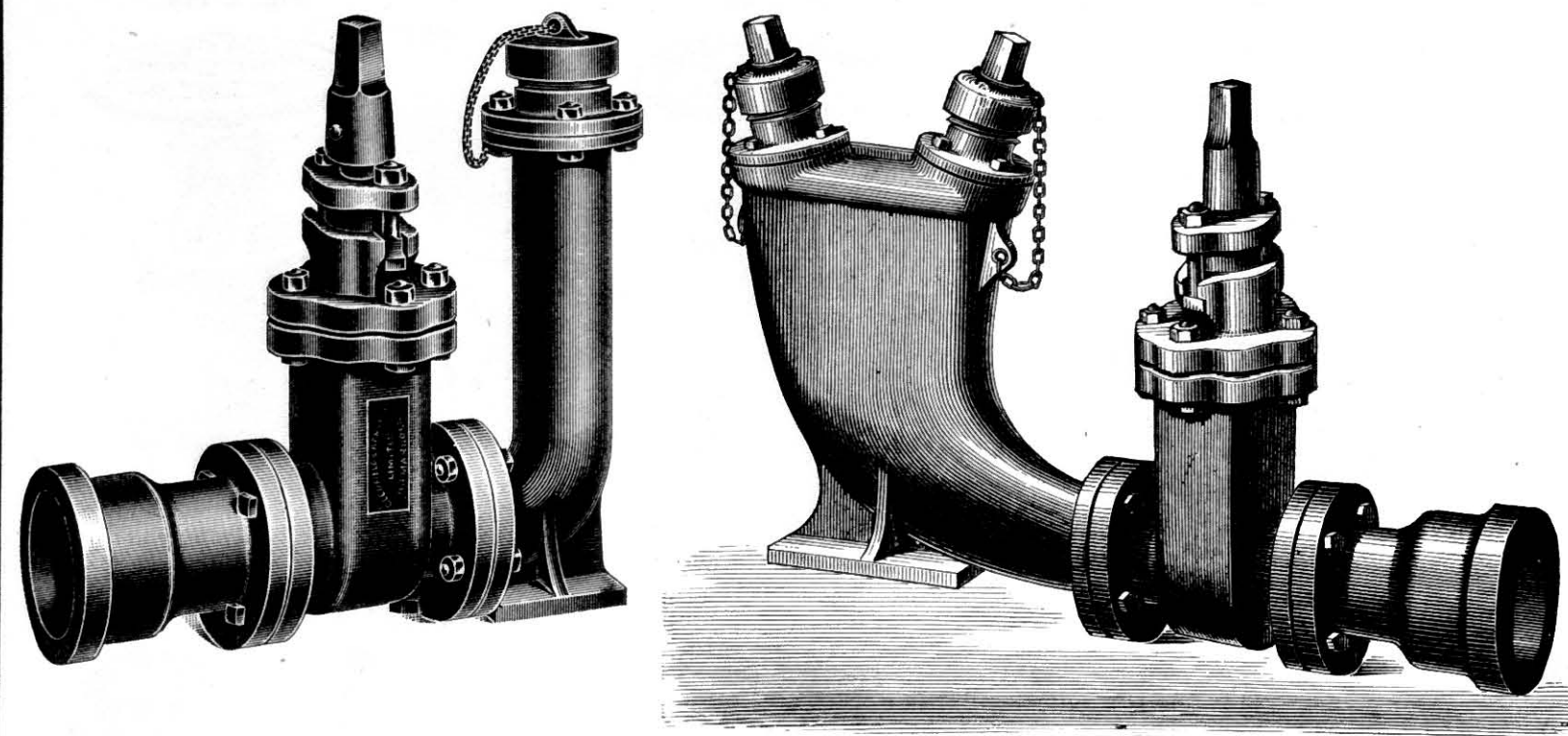
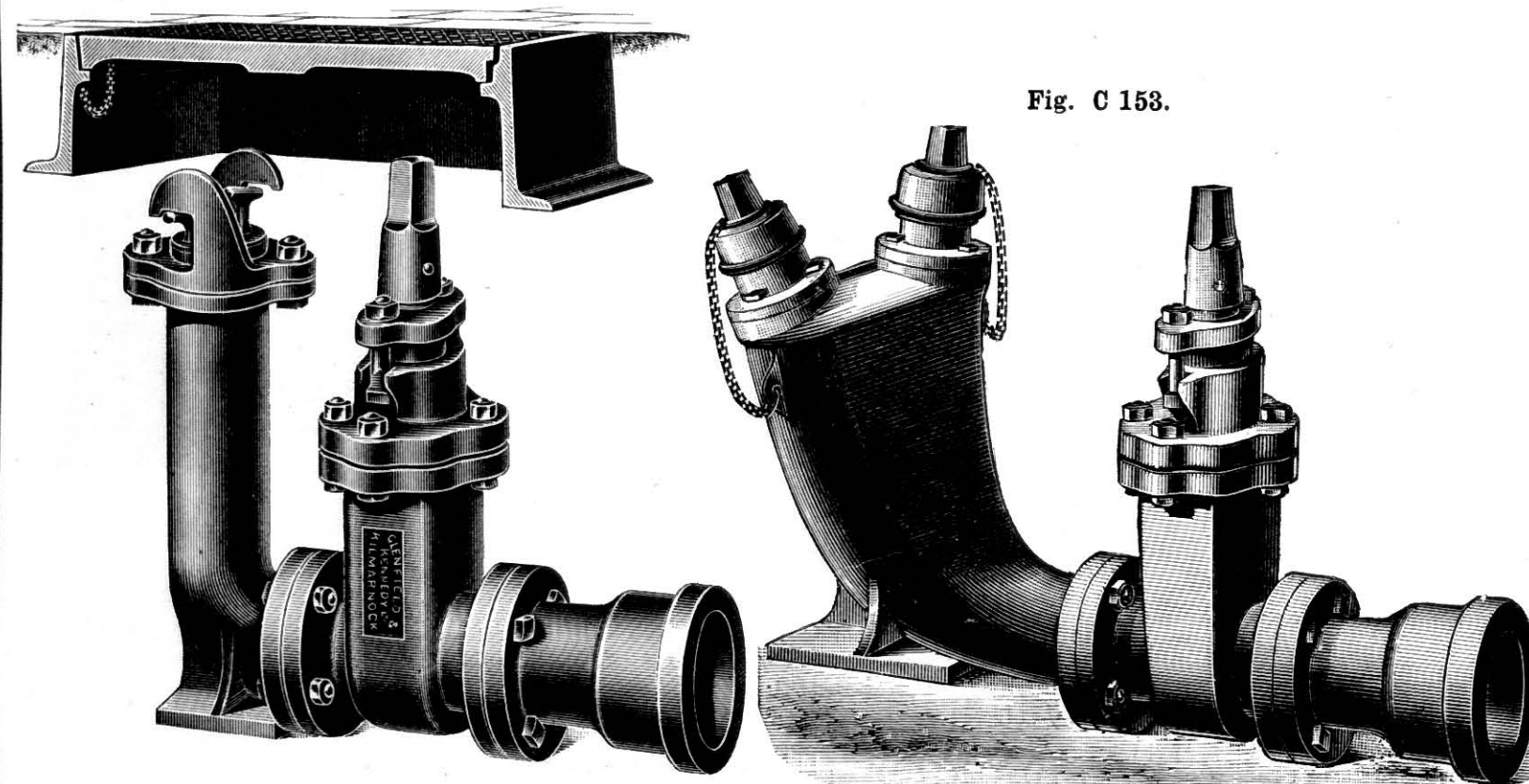


Fig. C 150.

Fig. C 153.



PRICES.

2" 2½" 3" 4" 5"

- | | |
|--|-------|
| C 35—Sluice Valve Hydrant, with gun metal Screwed Outlet, self-acting Emptying Valve, and chained cast iron loose Cap, .. | each. |
| C 105—Sluice Valve Hydrant, with Double Outlet Bend, gun metal Screwed Outlets, self-acting Emptying Valve, and chained cast iron Screwed Caps, .. | " |
| C 150—Sluice Valve Hydrant, with Lugs, otherwise as C 35, not including Surface Box (see B 28, Section D), .. | " |
| C 153—Similar to C 105, but Outlets at right angles to supply pipe, .. | " |

All tested to 600 feet head of water.

Fire Hydrants.

Fig. C 57.

Fig. C 113.

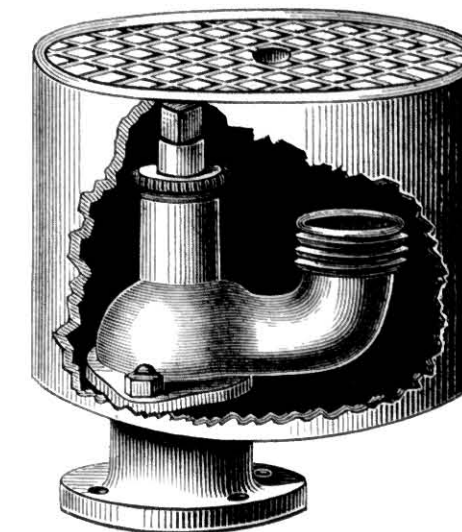
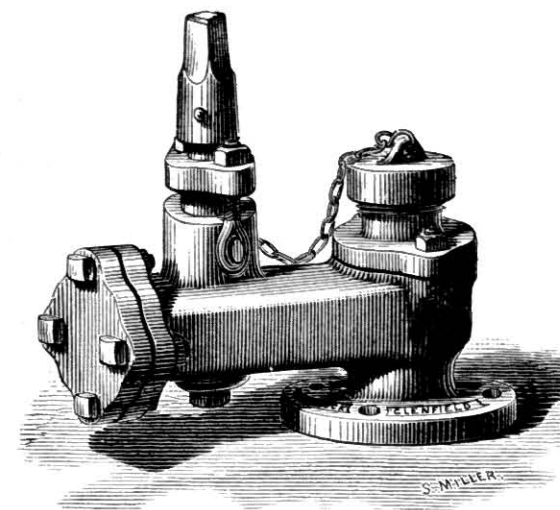


Fig. C 108.

Fig. C 25.

Fig. C 26.

Fig. C 26a.

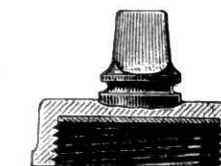
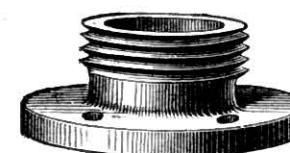
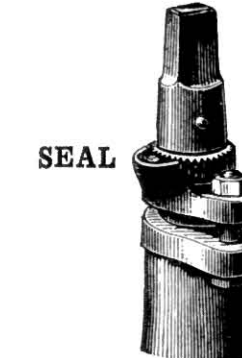
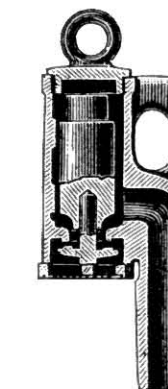
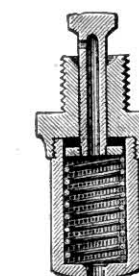
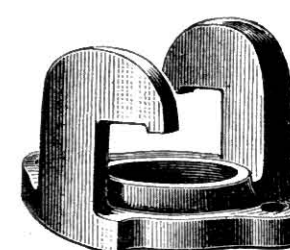


Fig. C 116.

Fig. C 107.

Fig. C 117.

Fig. C 118.



PRICES.

- | | |
|--|-------|
| C 25—Cast Iron loose Cap to suit Hydrants with Lugs, | each. |
| C 26—Cap for Hydrants, Screwed, cast iron, ; gun metal, | " |
| C 26a—Do. cast iron, Unscrewed, | " |
| C 57—Rack and Pinion, or Clearway Hydrant, 2½" dia., Flange 8" dia., 4 holes at 6½" centres, (The Rack, Pinion, Door, and Outlet are of gun metal.) | " |
| C 107—Self-acting Spring Emptying Valve for Hydrants, etc., | " |
| C 108—Gun Metal Screwed Outlet-piece for Hydrants, | " |
| C 113—Small Fire Hydrant, or Garden Watering Box, with ¾" Valve, 1¼", 1½", each. | " |
| C 116—Outlet part of Ball Hydrant with Lugs, | " |
| C 117—Baker's Patent Emptying Valve for Hydrants, etc., | " |
| C 118—Sealing Arrangement for Spindle Hydrants (when supplied along with Hydrants), Do. for Sluice Valves at each and upwards depending on size of Valves. | " |

Hydrants tested to 600 feet head of water.

Deliveries of Hydrants.

The Ball Hydrant, ordinary size, delivers through a Standpipe at the rate of about 250 gallons per minute, with a sustained head of 30' in supply pipe. By "sustained" head is meant that this head would be shown by a pressure gauge placed on the supply pipe *when Hydrant is delivering*. The static head on the Hydrant may of course greatly exceed that pressure when closed, as the pressure in the main when Hydrant is open depends on the diameter and length of the main.

Spindle Hydrants and Valve Hydrants deliver at about the same rate as above—some give a larger delivery, depending on the diameter of the Hydrant and the character of the water-way. Unobstructed water-ways give of course the best delivery. Information as to deliveries of the various forms of Hydrants may be had on application.

It takes a sustained pressure of about 85' behind a delivery nozzle $\frac{3}{4}$ " dia. to throw a jet about 70' high, using about 80 gallons per minute.

Where the supply is likely to be intermittent, it is best to use Spindle or Valve Hydrants, as when mains are empty the ball in Ball Hydrant drops, and sewer gas may find its way into the mains. Ball Hydrants should not be used where the pressure is under 30' head. The Branch from main to Hydrant should never be less than $2\frac{1}{2}$ " dia.—better to be 3" dia.—even if *main* is only 2" dia.

Every Hydrant is carefully tested to 600 feet head of water.

Name Plates for Hydrants and Sluice Valves.

Fig. C 51.

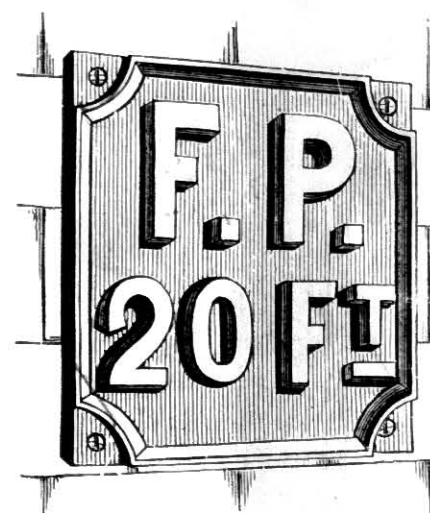


Fig. C 52.

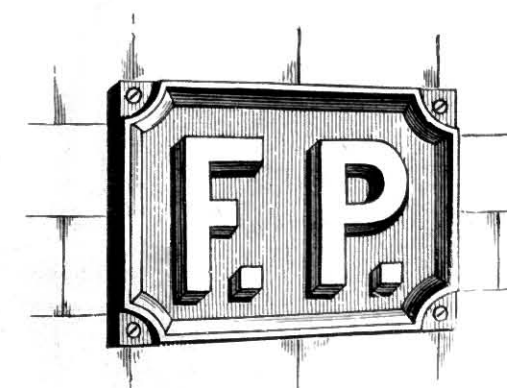


Fig. C 59.

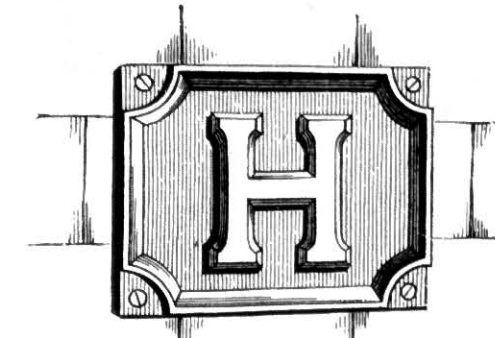


Fig. C 67.

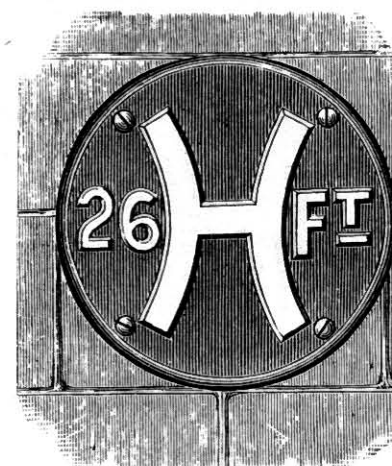


Fig. C 68.

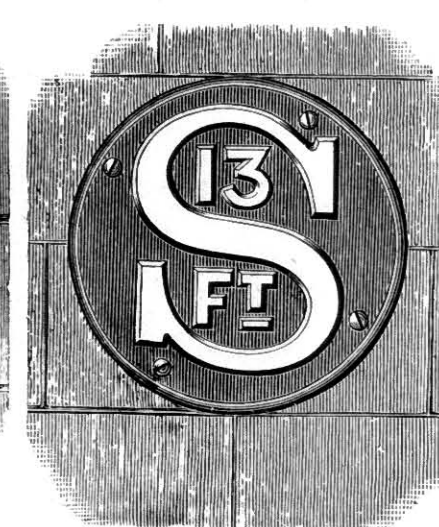


Fig. C 130.

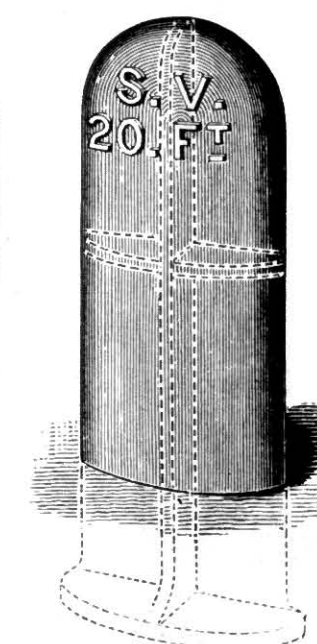
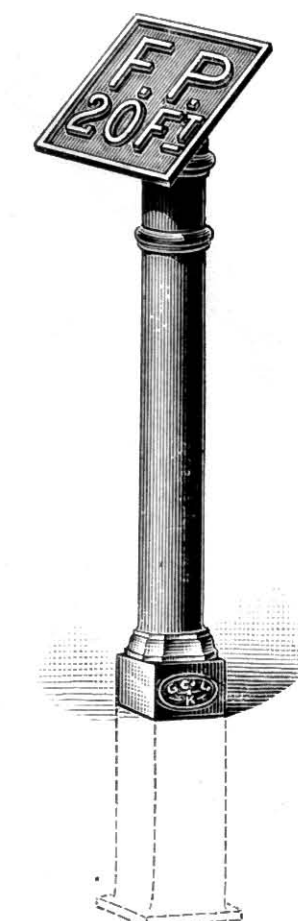


Fig. C 131.



PRICES.

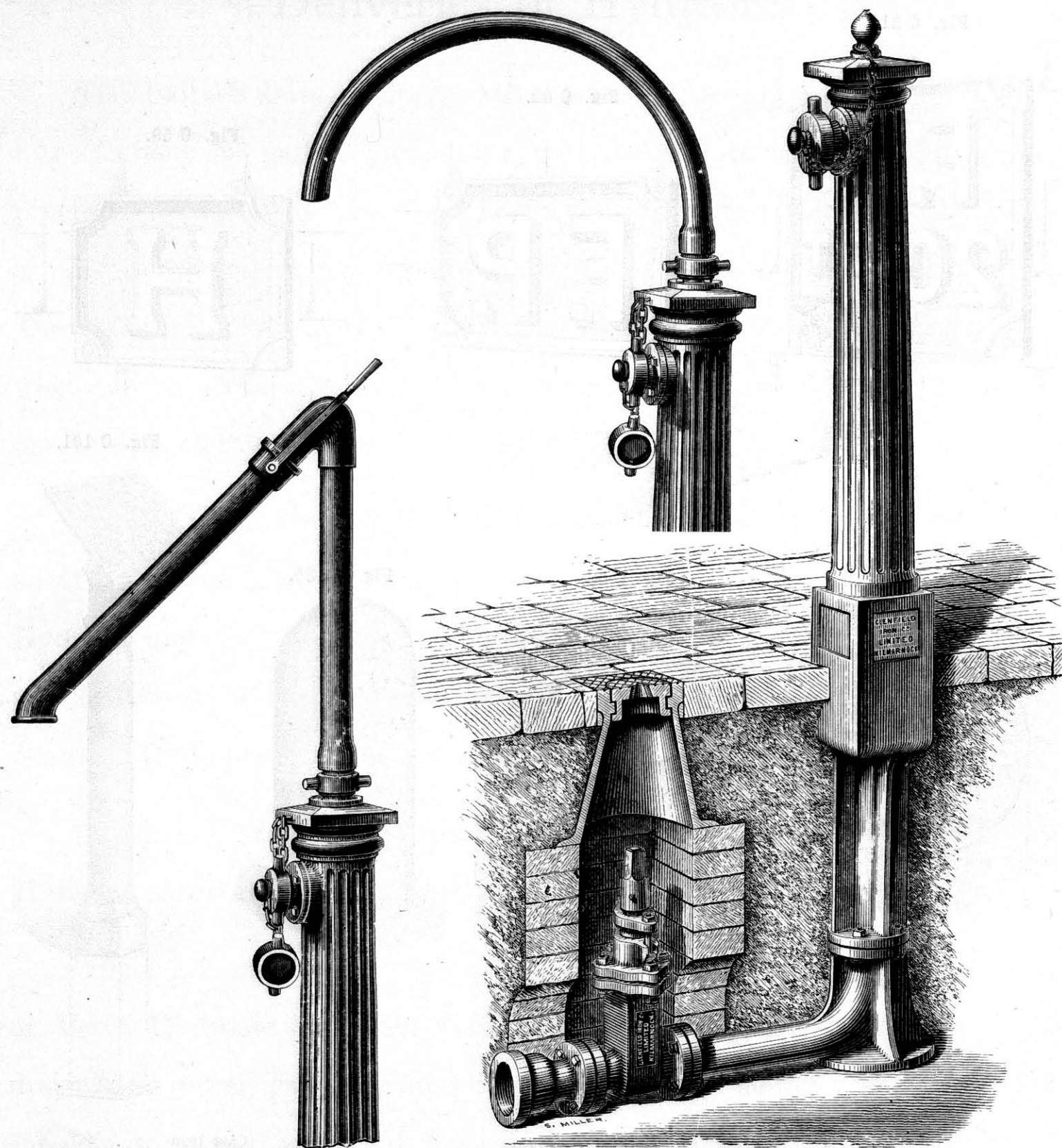
					Cast Iron Painted.	Enamelled.	
C 51	Name Plate for Hydrants (F.P.—Fire Plug), with "Ft." marked,	$9\frac{3}{4}" \times 9\frac{3}{4}"$	..	each.			
C 52	Do. (do.), plain,	$9" \times 6"$	..	..	
C 59	Do. (H—Hydrant), plain,	$9" \times 6"$	..	..	
C 67	Do. (do.), with "Ft." marked,	$9\frac{3}{4}"$ dia.,	..	..	
C 68	Name Plate for Valves (S—Sluice Cock), with "Ft." marked,	$9\frac{3}{4}"$ dia.,	..	..	
C 130	Curved Standard Name Plate,	..	..	..	..	..	..
C 131	Pillar do.	..	..	..	..	..	..

These Name Plates are usually painted white ground, black letters.

Street Standpost.

Fig. 2 B, with Bend.

Fig. 2 B.

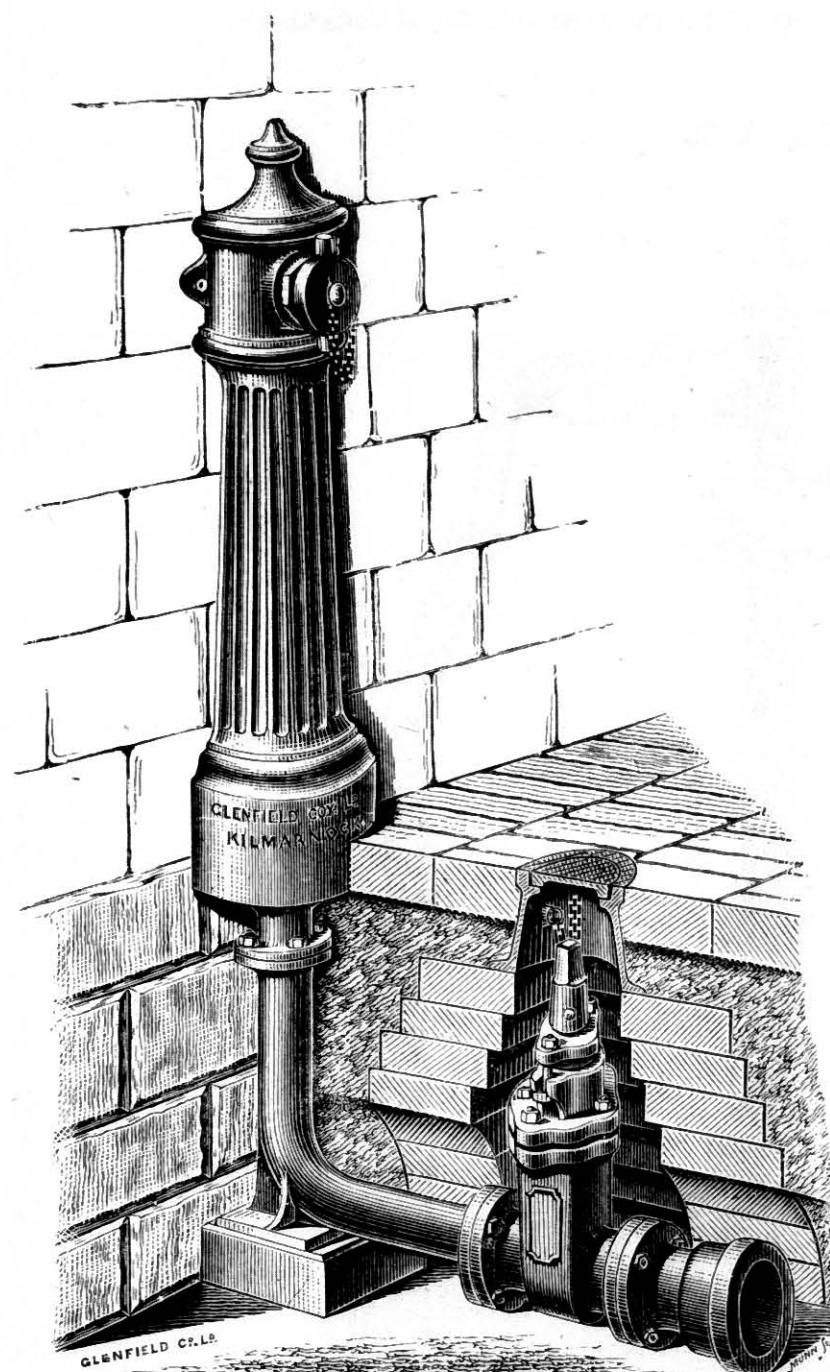


PRICES.

- | | | |
|--------------------------------|--|-------|
| 2 B—Street Watering Standpost, | with Bottom Elbow, but without Sluice Valve, etc., with one gun metal Outlet and chained cast iron Screwed Cap, as above, but with two gun metal Outlets (one on top and one on side), and cast iron Caps, | each. |
| | with one Outlet, but including 2½" Sluice Valve, with Socket-piece on Inlet, having Surface Box and self-emptying Valve, | " |
| | Wrought Iron Bend, with Half-coupling for filling Water Cart, 3' out, extra to each, | " |
| | Upright Pipe on Standpost, with Half-coupling and acute Bend at top, | " |
| | Delivery-piece, with detachable Shackle, for carrying with Water Cart, | " |
- The Outlet can be screwed to any Brigade Thread. Height from ground line to apex, 4 feet 9 inches.

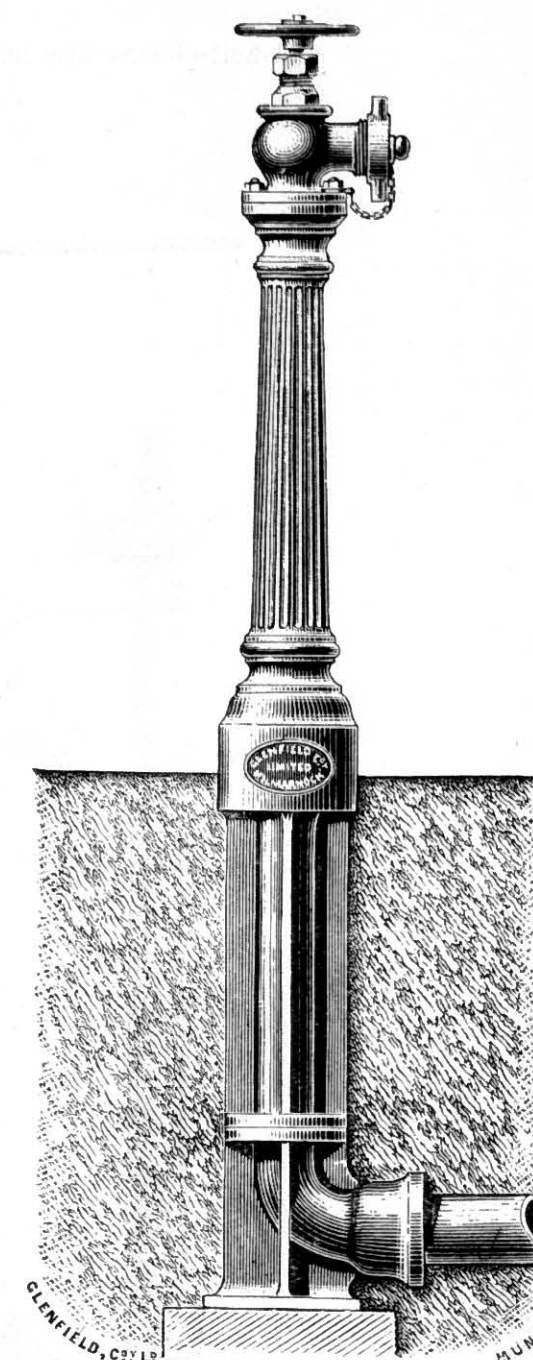
Wall Standpost.

Fig. L 25.



Pillar Hydrant.

Fig. L 28.



PRICES.

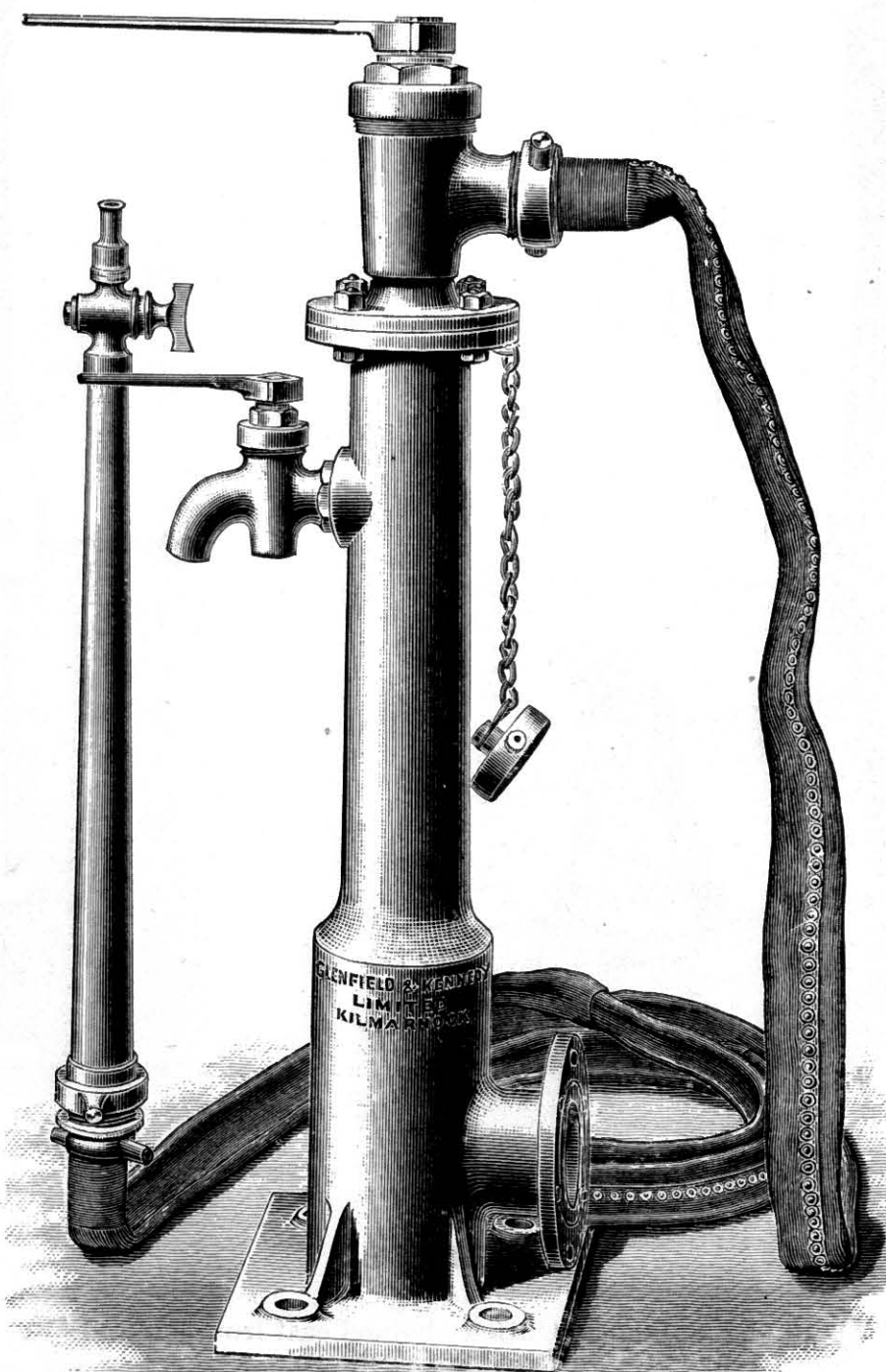
- | | |
|--|-------|
| L 25—Wall Standpost, with one gun metal Outlet, chained cast iron Screwed Cap, and having 2½" Sluice Valve and Surface Box as shown, | each. |
| Extra if provided with Self-emptying Valve, | " |
| If Baker's Patent do. | " |
| Height from ground line to apex, 3 feet 2½ inches. | |
| L 28—Pillar Hydrant—2½" gun metal Screw-down Hydrant on top of Pillar—with chained gun metal Screwed Cap, | " |
| Height from ground line to top of wheel, 3 feet 7½ inches. | |

Pillar Hydrant,

With Hose Connections and Draw-off Tap.

(A Self-closing Tap may be substituted for the Draw-off Tap if desired.)

Fig. L 30.



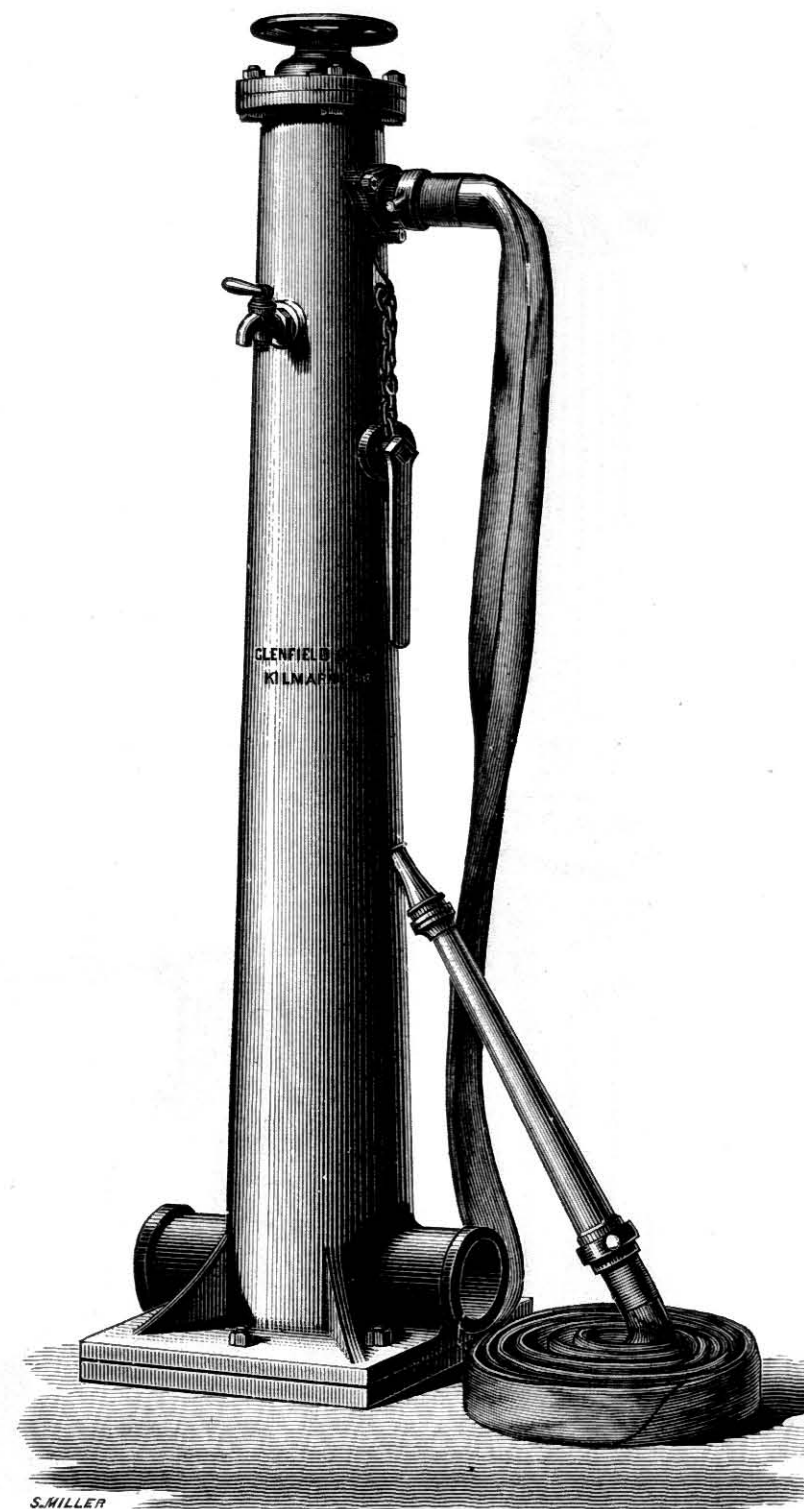
L 30—Pillar Hydrant, complete as shown, except Hosepipe and Couplings. The Hydrant and Draw-off Cock are gun metal, Handpipe of copper, with gun metal Ends, Cock and Nozzle, each.

Height from ground line to top of key, 36½ inches. Height of ground line from base, 12 inches.

Pillar Standpost.

With Hose Connections and Draw-off Tap

Fig. L 36.



Street Standpost.

Fig. L 38.



PRICES.

L 36—Pillar Standpost (mean dia. 8½") complete, as shown, except Hosepipe and Couplings; the Draw-off Tap is of gun metal, Handpipe of copper, with gun metal Ends and Nozzle, each.

Height from ground line to top of wheel, 4 ft. 10 inches. Height of ground line from base, 2 feet.

L 38—Street Watering Standpost with one gun metal Outlet, chained cast iron Screwed Cap, cast iron Bend at bottom and internal wrought iron Pipe, without Draw-off Tap, each.

Extra if fitted with ¾" Draw-off Tap, "

Height from ground line to top of wheel, 4 ft. 1½ inches.

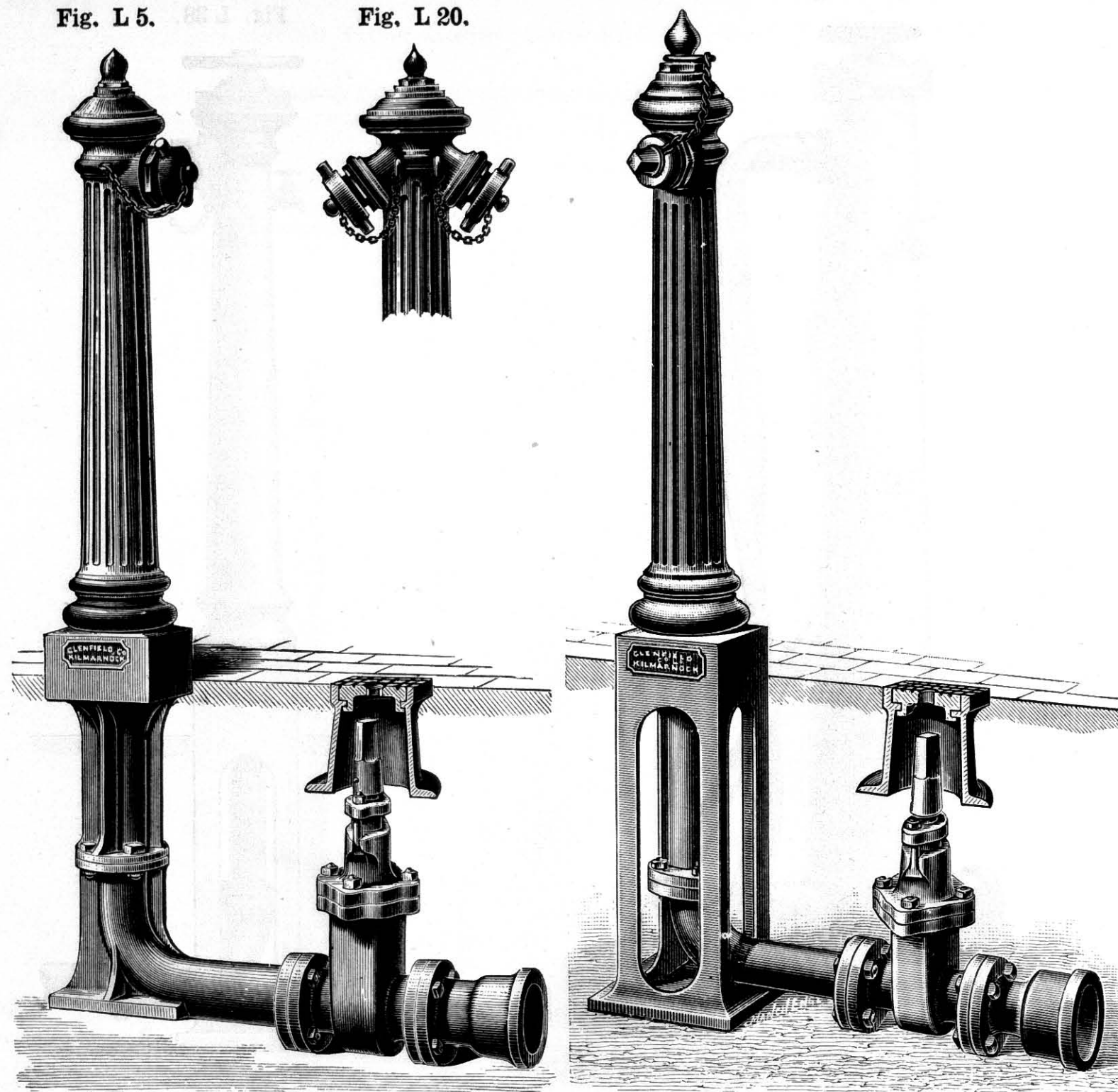
NOTE.—A Self-closing Tap may be substituted for the Draw-off Tap, if desired.

Street Standposts.

Fig. L 6.

Fig. L 5.

Fig. L 20.



PRICES.

L 5—Street Watering Standpost, with one Outlet (which may be on side or top), with chained cast iron Screwed Cap, and having 2½" Sluice Valve and Surface Box as shown,	each.
L 6—Street Watering Standpost, all as above, but having internal wrought iron Pipe,	"
L 20 { Street Watering Standpost, similar to L 5, but having two bent Outlets as shown and cast iron Screwed Caps,	"
Street Watering Standpost, similar to L 5, with two straight Outlets and cast iron Screwed Caps,	"
Height from ground line to apex, 3 feet 9 inches.	
Extra to either of above if provided with Self-emptying Valve,	"
If Baker's Patent do.	"

Street Standposts.

Fig. L 7.

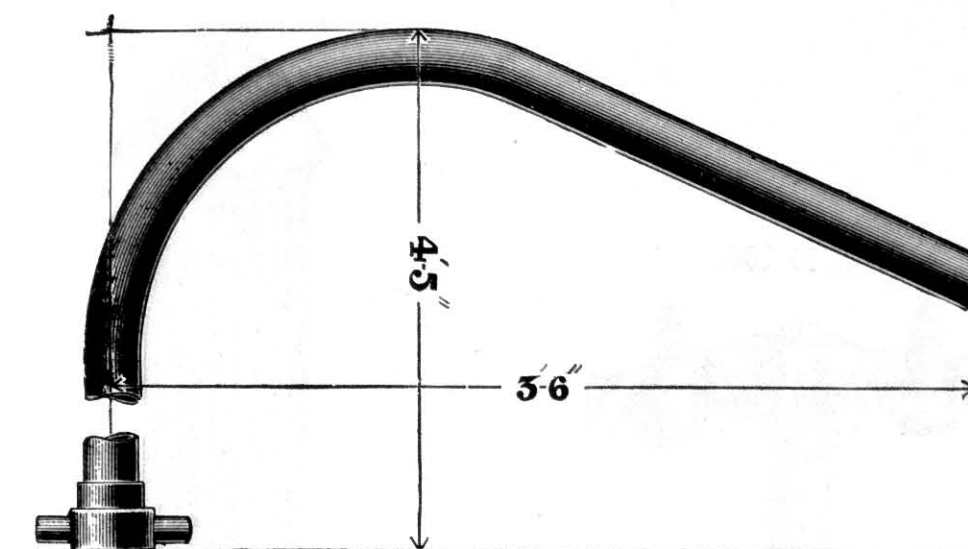
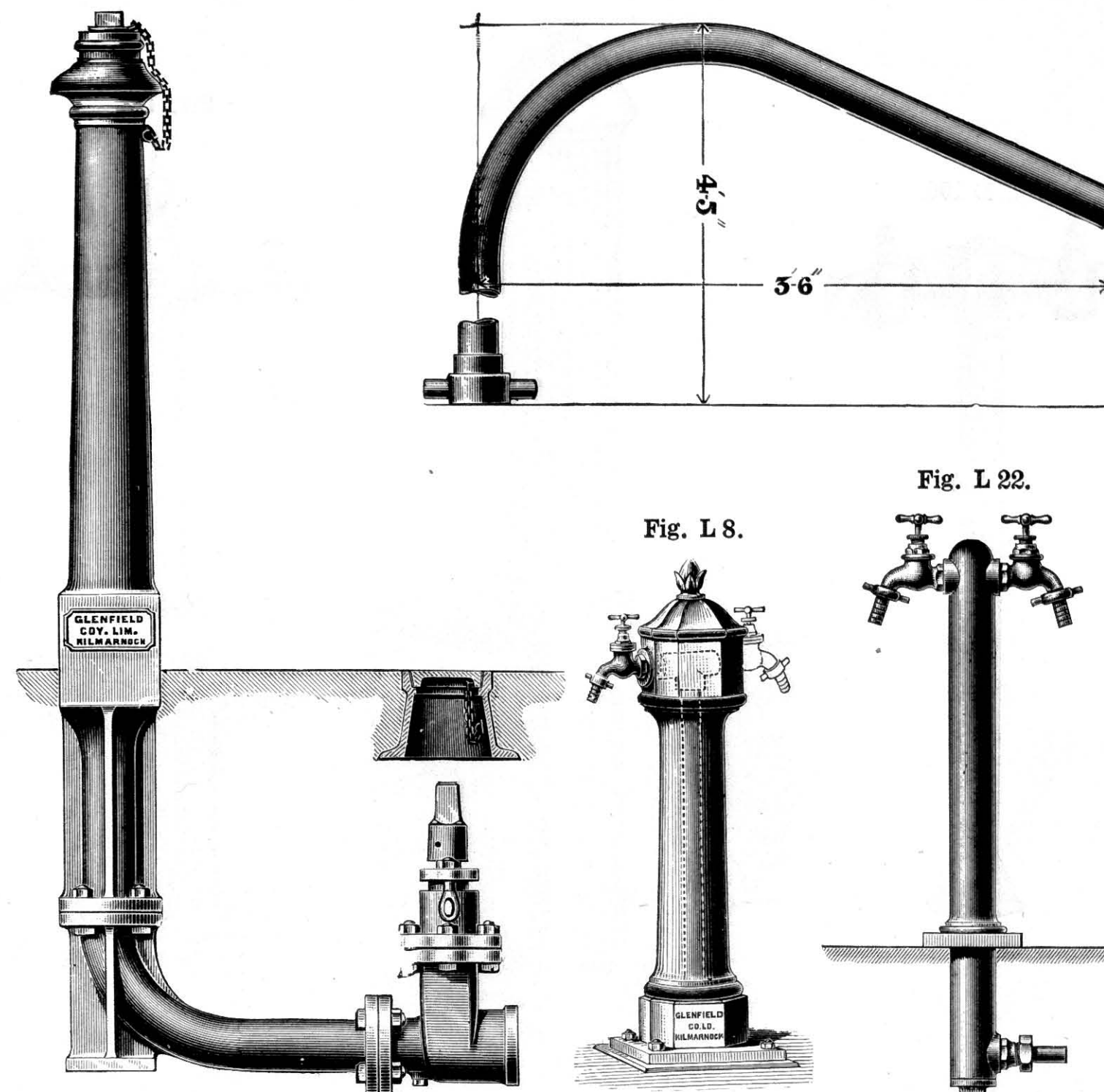


Fig. L 22.

Fig. L 8.



PRICES.

L 7—Street Watering Standpost, with one Outlet (which may be on side or top), with chained cast iron Screwed Cap, and having 2½" Sluice Valve and Surface Box as shown,	each.
Height from ground line to apex, 3 feet.	
Wrought Iron Bend, with Half-coupling for filling Water Carts,	"
L 8—Garden Watering Post, with internal wrought iron pipe, having ¾" Screw-down Tap, with Half-union for Hose,	one Outlet, ; two Outlets, "
L 22—Garden Watering Post, having ¾" Screw-down Tap, with Half-union for Hose,	one Outlet, ; two Outlets, "
Height from ground line to apex, 2 feet 6 inches.	

Street Standposts.

Fig. L 2.

Fig. D 100.

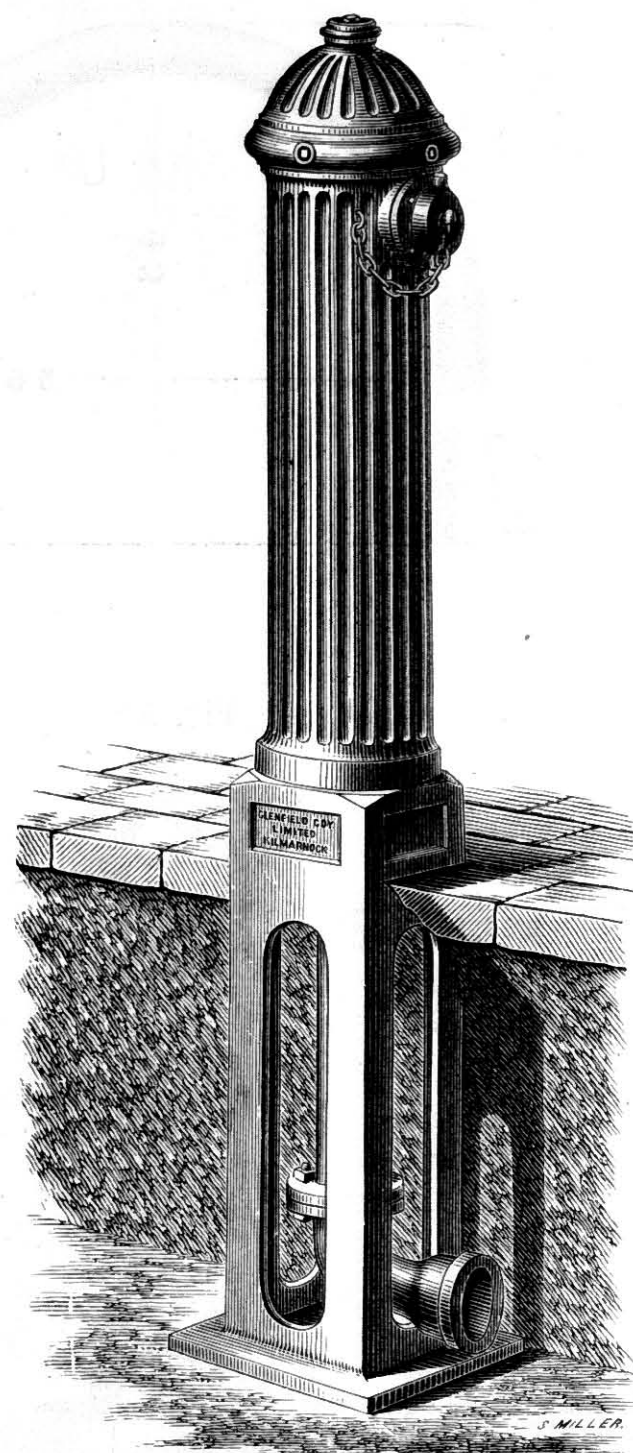
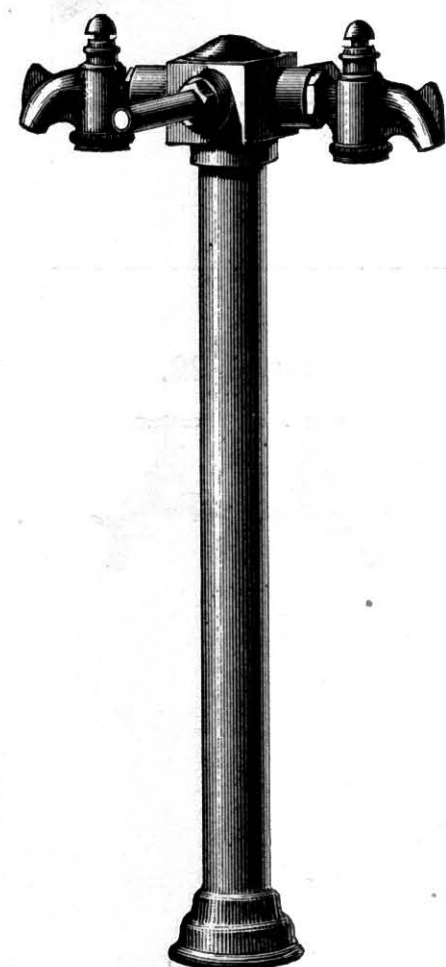
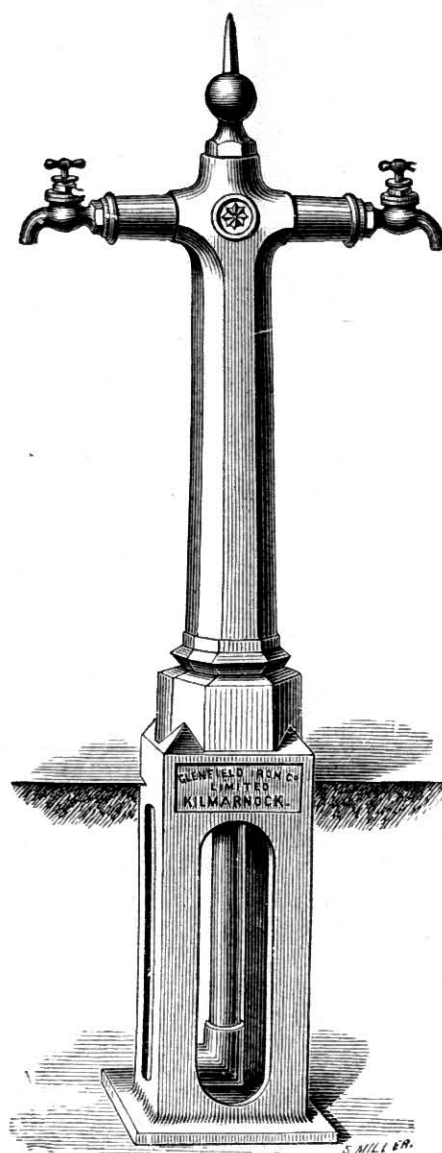


Fig. L 3.



PRICES.

- D 100—Portable Standpipe for using on Hydrants, with two $\frac{3}{4}$ " Self-closing Taps, with Snug for hanging buckets, suitable for temporary supplies, such as Army Camps, etc., each.

Stem is of wrought iron, Bottom and Turning Arms of gun metal.

Height from bottom to centre of outlet, 2 feet 6 inches.

- L 2—Street Watering Standpost, 9 $\frac{1}{2}$ " dia., having Valve in top, with one gun metal Outlet and chained cast iron Screwed Cap, with cast iron Bend at bottom for connection to main, "

NOTE.—When specially ordered, this Standpost can be fitted with an Index to register the number of times the Standpost has been used for filling Water Carts.

Height from ground line to apex, 4 feet 6 inches.

- L 3—Standpost, with two 1" Screw-down Nose Cocks on Arms, wrought iron Knee at bottom for connection to 1 $\frac{1}{2}$ " wrought iron Pipe, each.

Height from ground to centre of arms, 3 ft.

Street Standposts.

Fig. L 9.

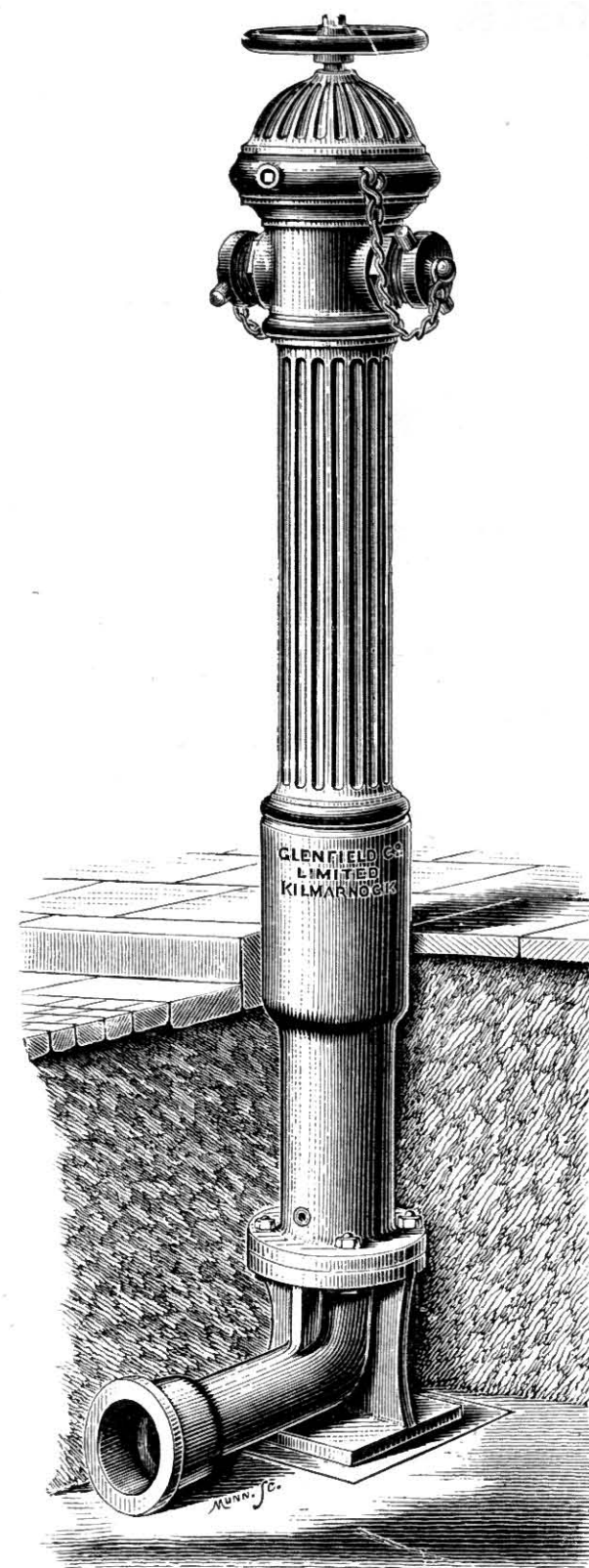


Fig. L 40.

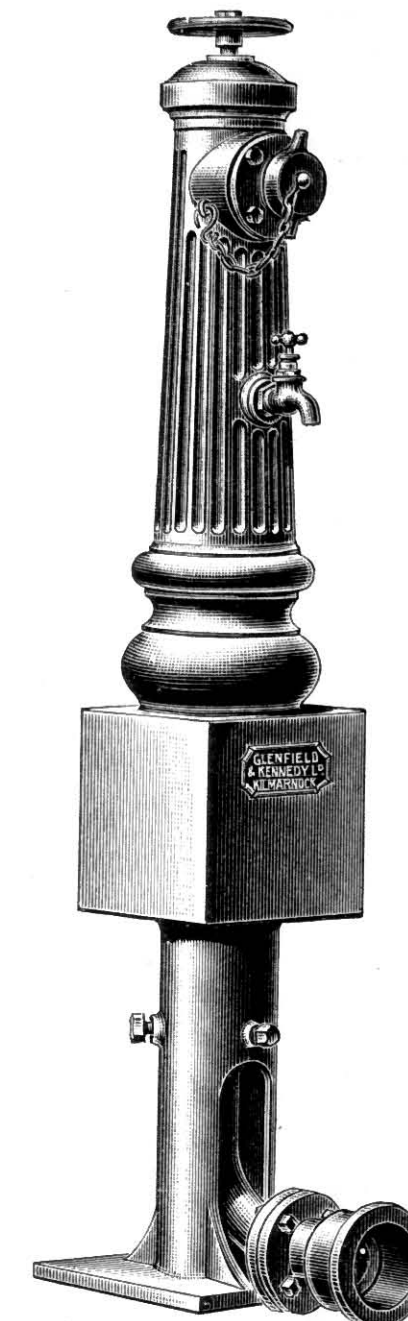


Fig. L 10.



PRICES.

- L 9—Anti-freezing Street Watering Standpost with bottom Elbow, gun metal Outlet and chained cast iron Screwed Cap, Square at top for Key, one Outlet, ; two Outlets, each.
- Cast Iron Hand Wheel, extra, "
- L 10—Street Watering Standpost, as above, but having Patent Self-closing Non-concussive Fountain Tap, one Outlet, ; two Outlets, "
- L 40—Street Watering Standpost with gun metal Outlet and chained cast iron Screwed Cap, without Draw-off Tap, "
- Extra if fitted with Draw-off Tap, "

NOTE.—When Tap in use L 10 Post is not Anti-freezing.

Height from ground line to apex, L 9 and L 10, 4 feet 4 $\frac{1}{2}$ inches ; L 40, 3 feet 9 inches.

Street Standposts.

Fig. L 11.

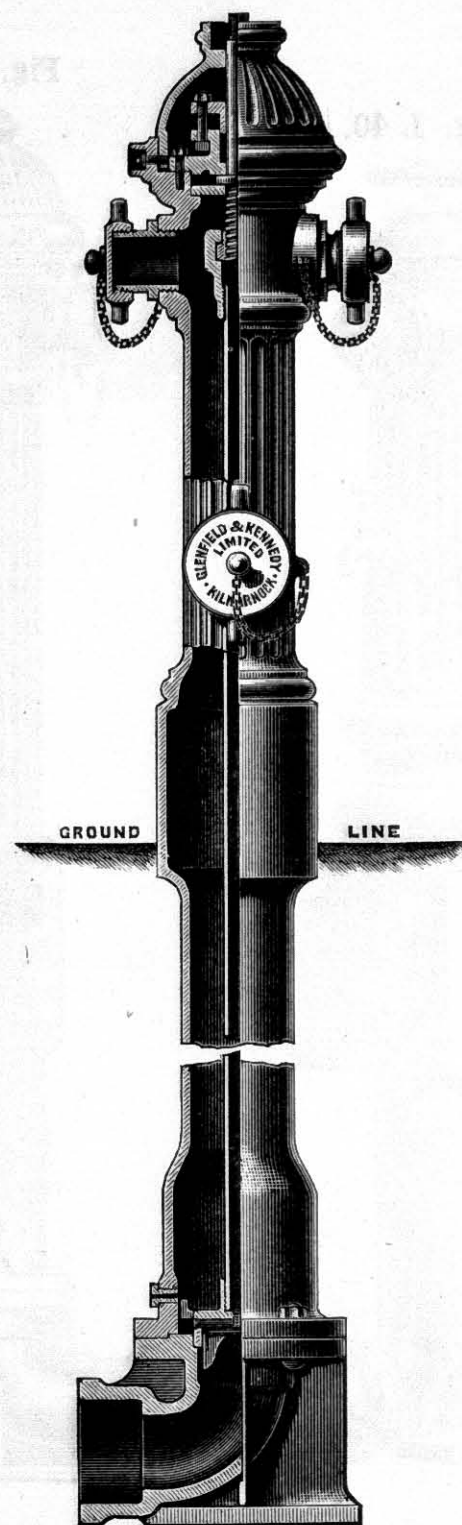
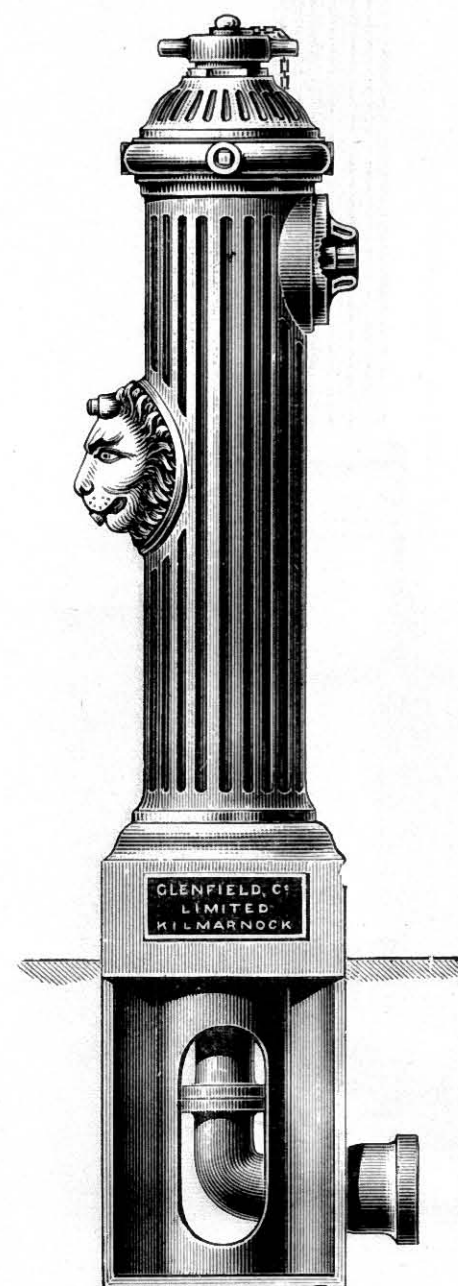


Fig. L 12.



PRICES.

L 11—Anti-freezing Street Watering Standpost, with 3" bottom Elbow, three gun metal Outlets, and chained cast iron Screwed Caps, with Square at top for Key, each.

L 12—Street Watering Standpost, 9" dia., with bottom Elbow, gun metal Outlet on top and chained cast iron Screwed Cap, Valve in top, and having Patent Self-closing Non-concussive Fountain Tap, ,

If without Fountain Tap, ,

Height from ground line to apex, L 11, 3 feet 8½ inches; L 12, 4 feet.

Street Standposts and Fountains Combined.

Fig. L 13.

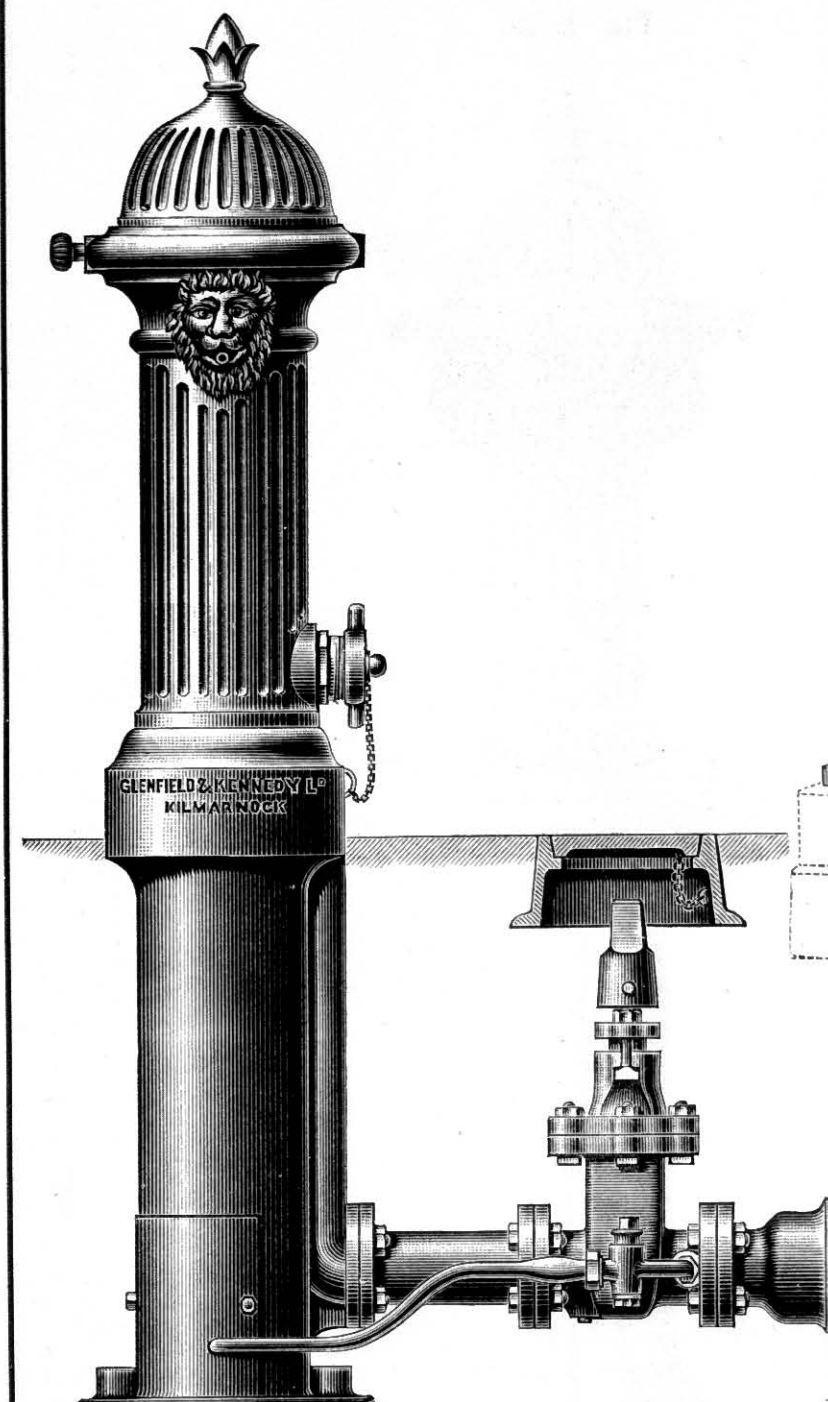
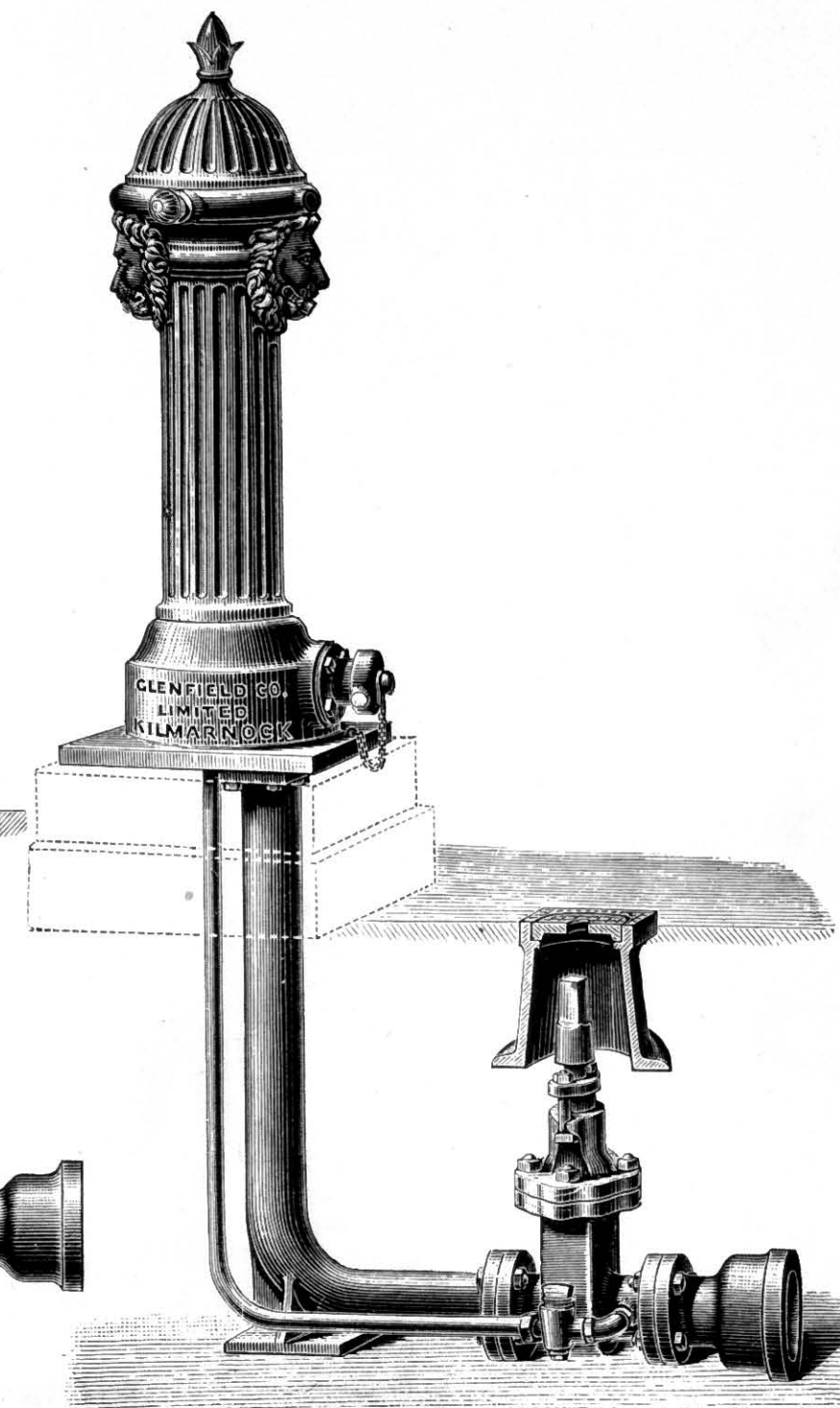


Fig. L 14.



PRICES.

L 13—Anti-freezing Fountain and Standpost Combined, with Sluice Valve and Surface Box, and having separate connection to Fountain with Stop Cock, .. . each.

Height from ground line to apex, 3 feet 6½ inches.

L 14—Fountain and Standpost Combined, with 2½" Sluice Valve and Surface Box, and having separate connection to Fountain with Stop Cock, .. . single Outlet, ; double Outlet, ,

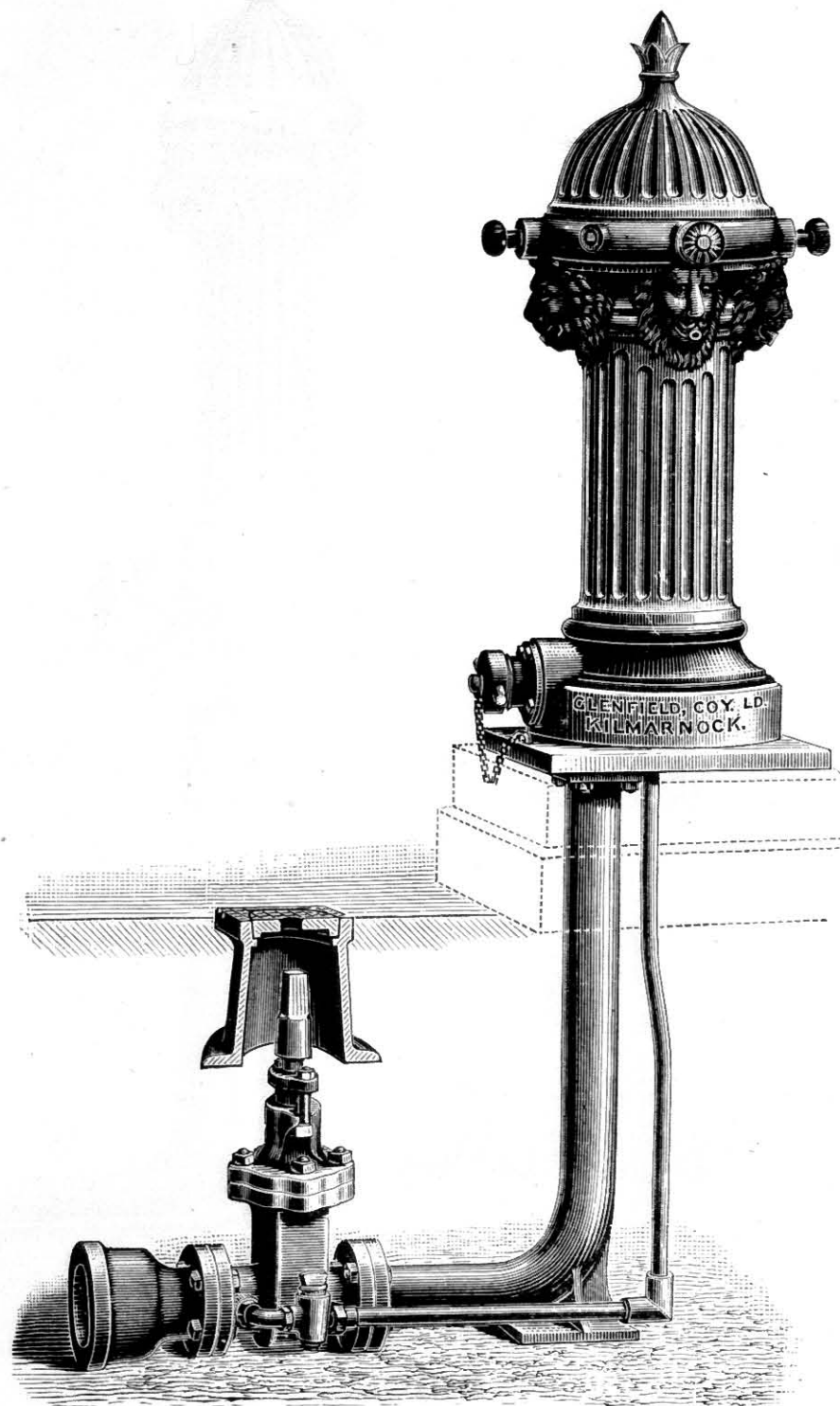
Height from bottom flange to apex, 3 feet 8 inches.

NOTE.—These Fountains are fitted with Kennedy's Patent (gun metal) Self-closing Taps, with Pulley, Chain, and Weight.

When required to work under a pressure exceeding 200 feet head, please state this when ordering.

Street Standpost and Fountain Combined.

Fig. L 15.



PRICE.

L 15—Four-outlet Fountain and Standpost Combined, with 2½" Sluice Valve and Surface Box, and having separate connection to Fountain Taps with Stop Cock, each.

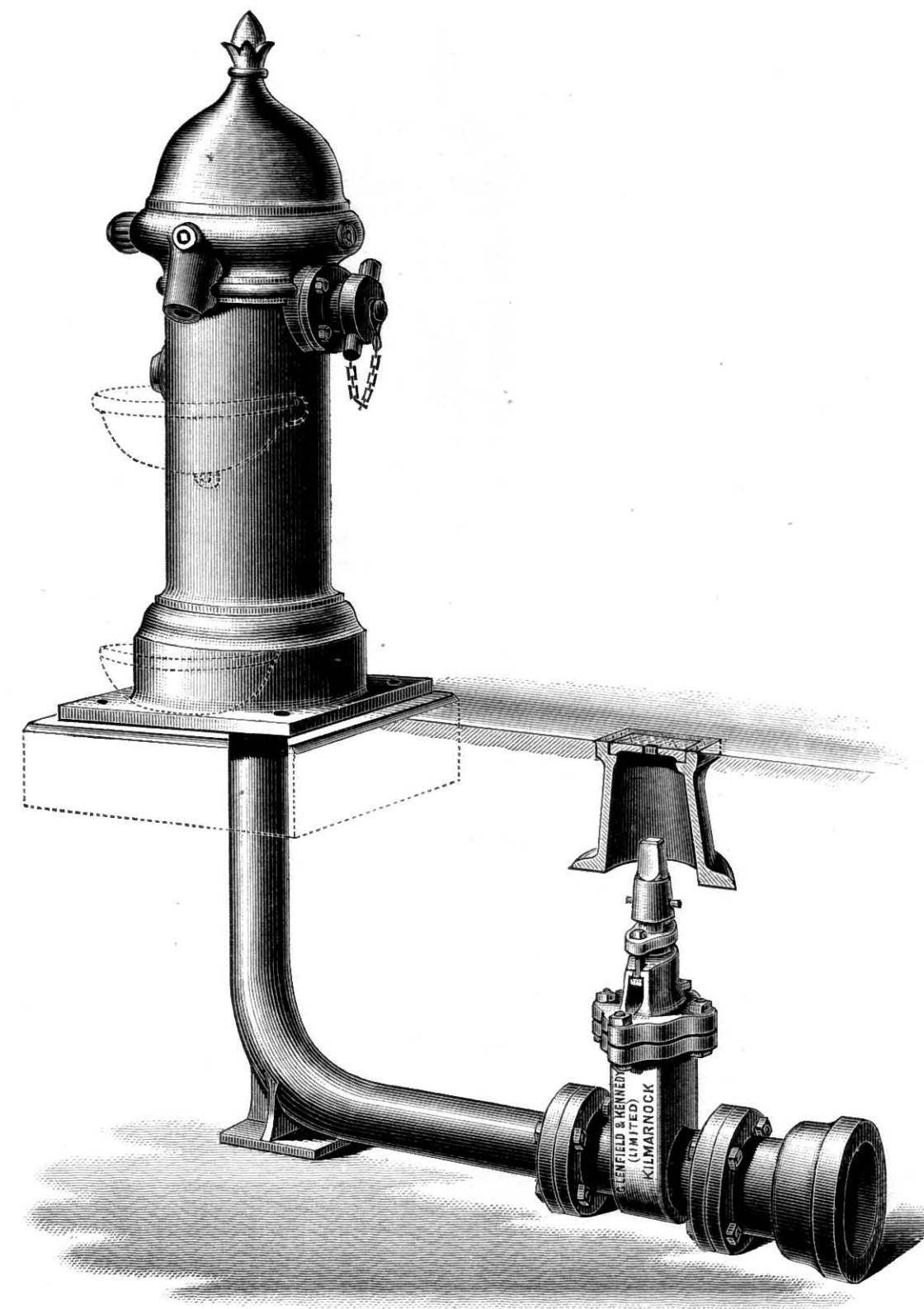
This Fountain is fitted with Kennedy's Patent (gun metal) Self-closing Tap, with Pulley, Chain, and Weight.

Height from bottom flange to apex, 3 feet 11½ inches.

NOTE.—When the Fountains are required to work under a pressure exceeding 200 feet head, please state this when ordering.

Kennedy's Patent Self-closing Fountain.

Fig. L 19.



PRICES.

L 19	{	Standpost and Fountain Combined, Valve on side, with 2½" Sluice Valve and Surface Box, <i>without</i> Basins,	each.
		Standpost and Fountain Combined, Valve on side, with 2½" Sluice Valve and Surface Box, <i>with</i> Basins, as shown by dotted lines, and galvanized Cup and Chain,	

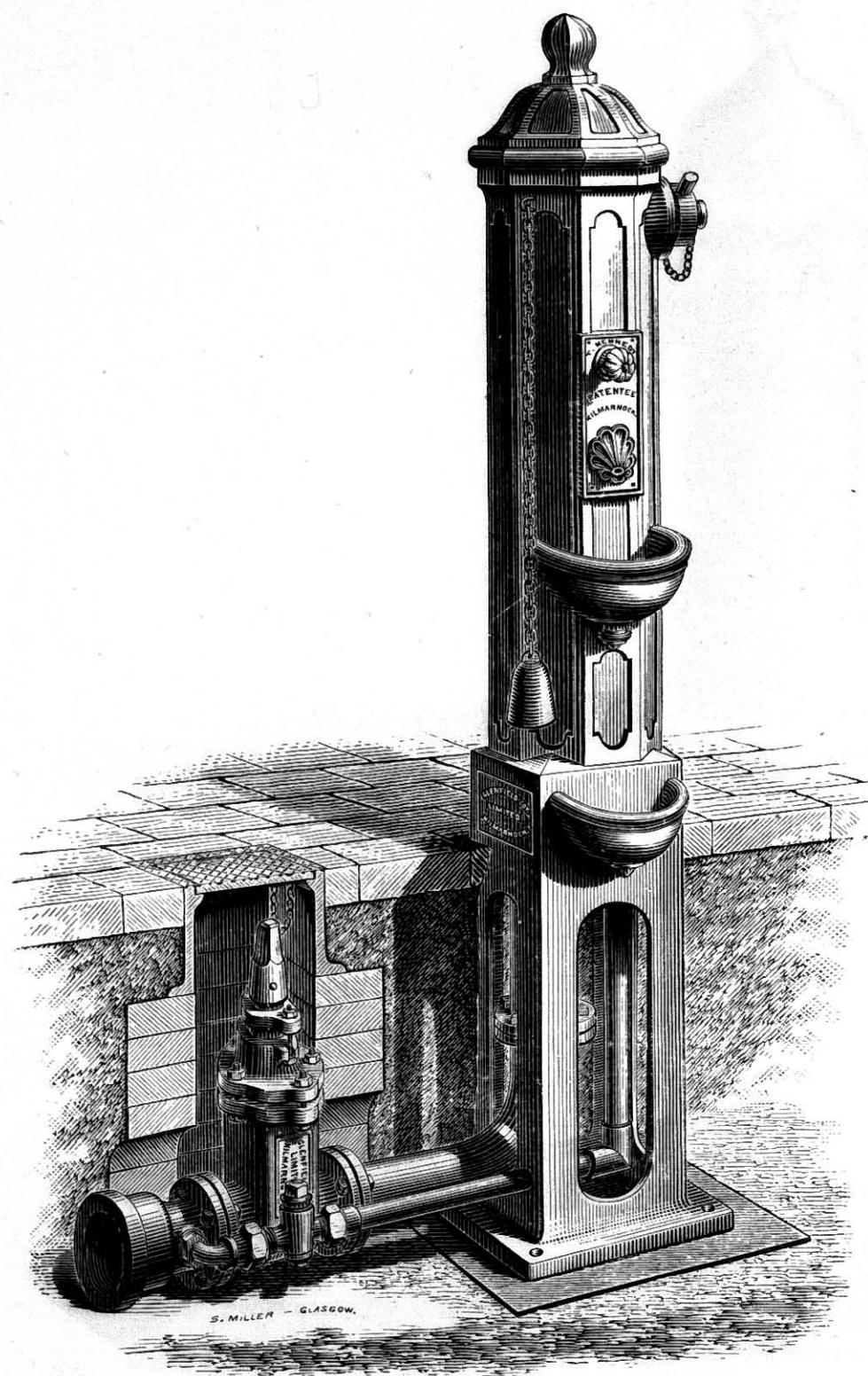
Height from ground line to apex, 3 feet 6½ inches.

This Fountain is fitted with Kennedy's Patent (gun metal) Self-closing Tap, with Pulley, Chain and Weight.

NOTE.—When Fountains are required to work under a pressure exceeding 200 feet head, please state this when ordering.

Street Standpost and Fountain Combined.

Fig. L 1.



PRICES.

L 1—Street Watering Standpost and Fountain Combined, with galvanized Cup and Chain, chained cast iron Screwed Cap, and having $2\frac{1}{2}$ " Sluice Valve and Surface Box. A Self-emptying Valve is fixed in Outlet of Sluice Valve to prevent damage by frost, each.

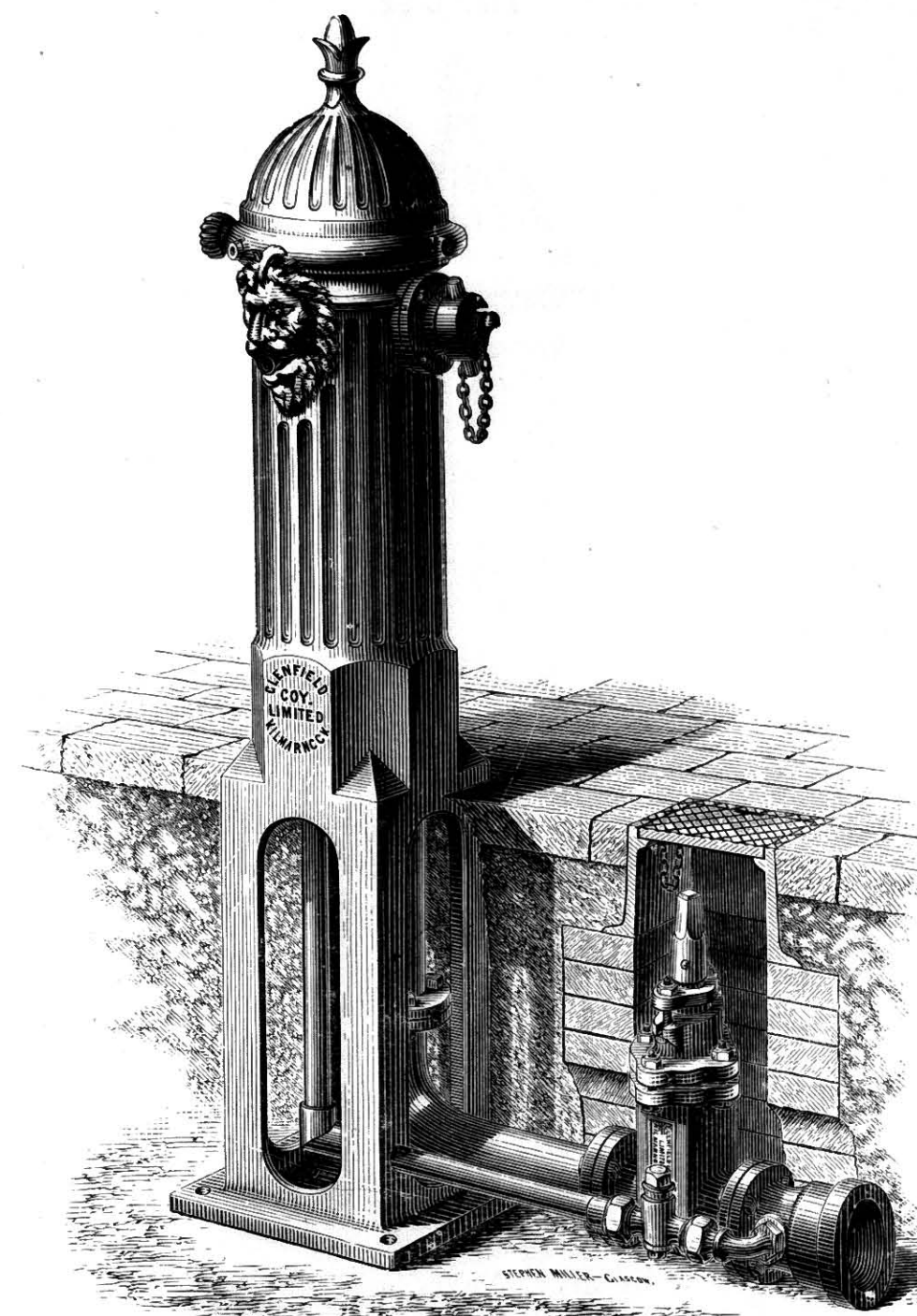
If without Fountain Tap, "

Height from ground line to apex, 5 feet.

NOTE.—When Fountains are required to work under a pressure exceeding 200 feet head, please state this when ordering.

Street Standpost and Pillar Fountain Combined.

Fig. L 4.



PRICE.

L 4—Street Watering Standpost and Pillar Fountain Combined, with chained cast iron Screwed Cap, and having $2\frac{1}{2}$ " Sluice Valve and Surface Box. The Fountain is $\frac{3}{4}$ " Kennedy's Patent Self-closing, with Pulley, Chain, and Weight. A Self-emptying Valve is fixed in Outlet of Sluice Valve to prevent damage by frost, each.

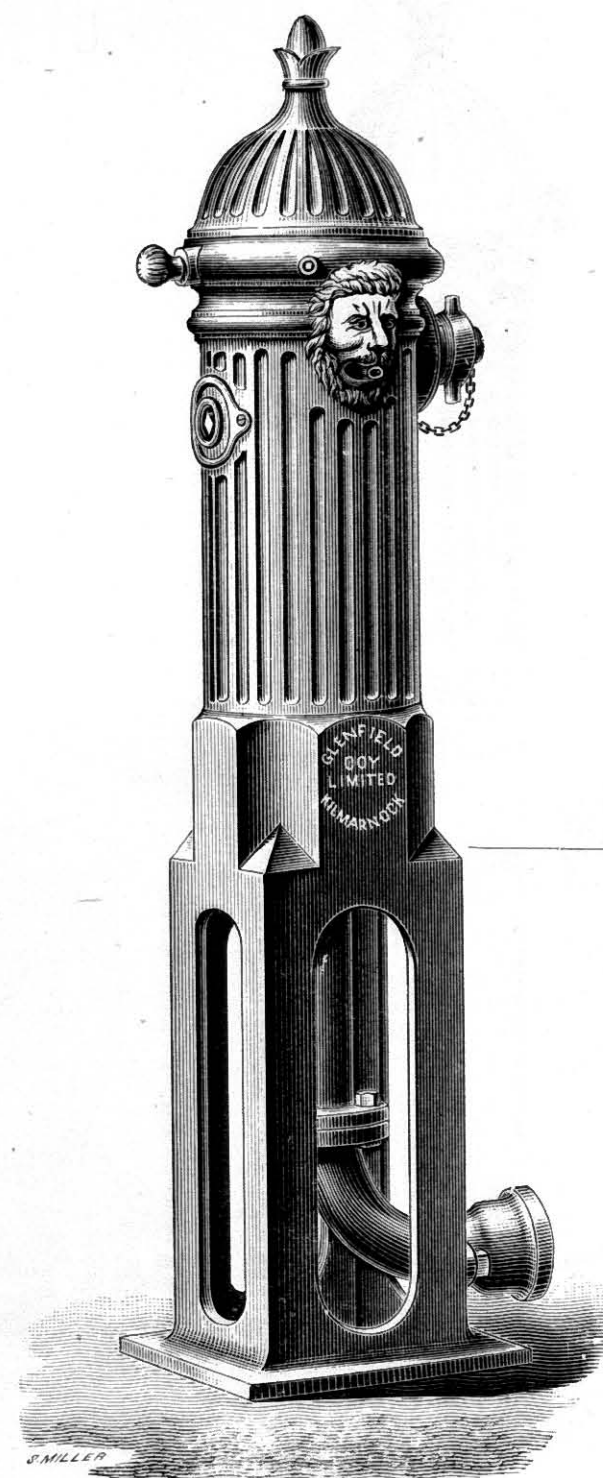
Extra if two Fountain Taps, "

Height from ground line to apex, 3 feet 9 inches.

NOTE.—When the Fountains are required to work under a pressure exceeding 200 feet head, please state this when ordering.

Street Standpost and Pillar Fountain Combined.

Fig. L 32.



Ground Line.

PRICE.

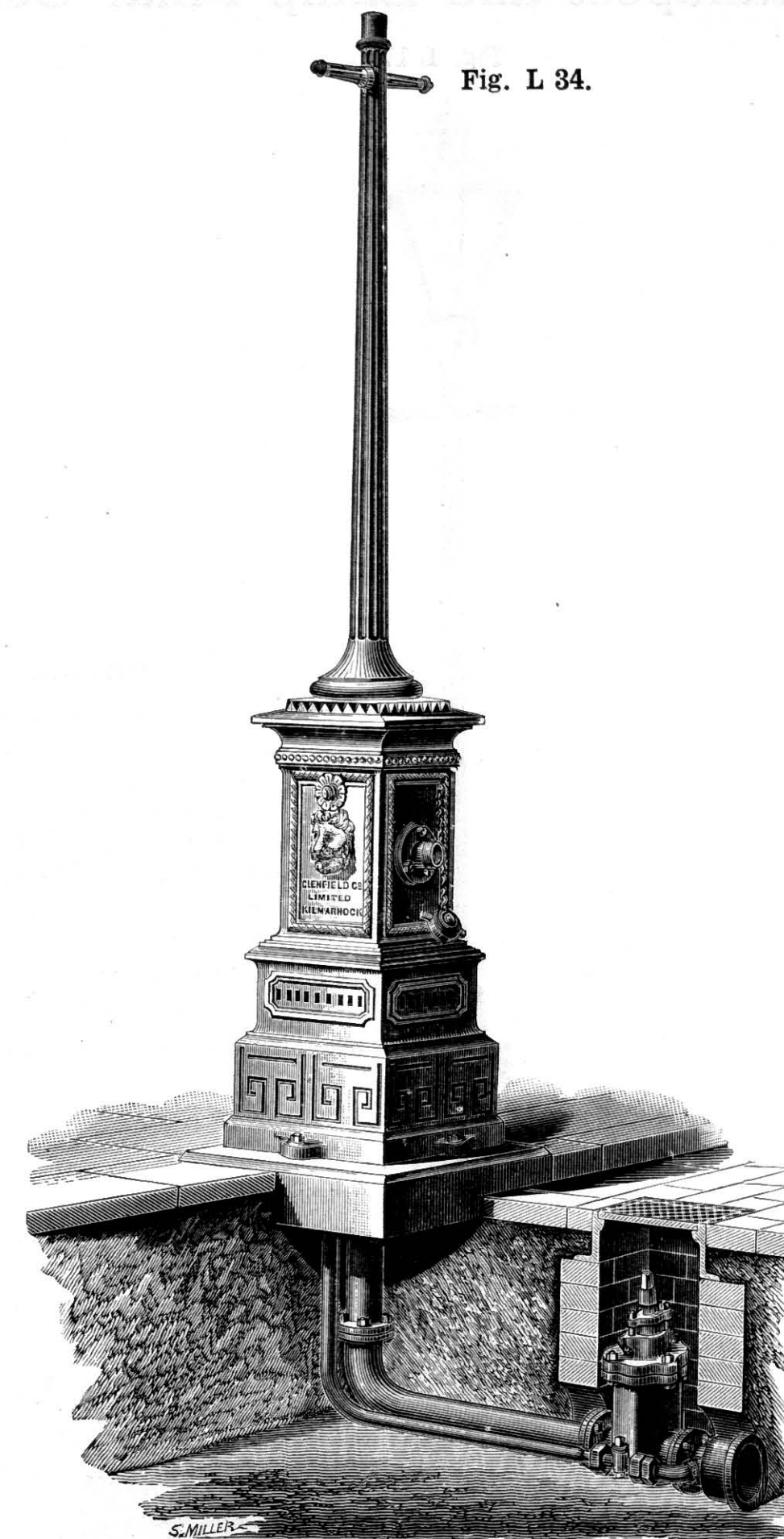
L 32—Street Watering Standpost and Pillar Fountain Combined, 11 $\frac{3}{4}$ " dia., with bottom Elbow, gun metal Outlet at side, with chained cast iron Screwed Cap, Valve in top, each.

Height from ground line to apex, 3 feet 9 inches.

NOTE.—When Fountains are required to work under a pressure exceeding 200 feet head, please state this when ordering.

Street Standpost and Pillar Fountain Combined.

Fig. L 34.

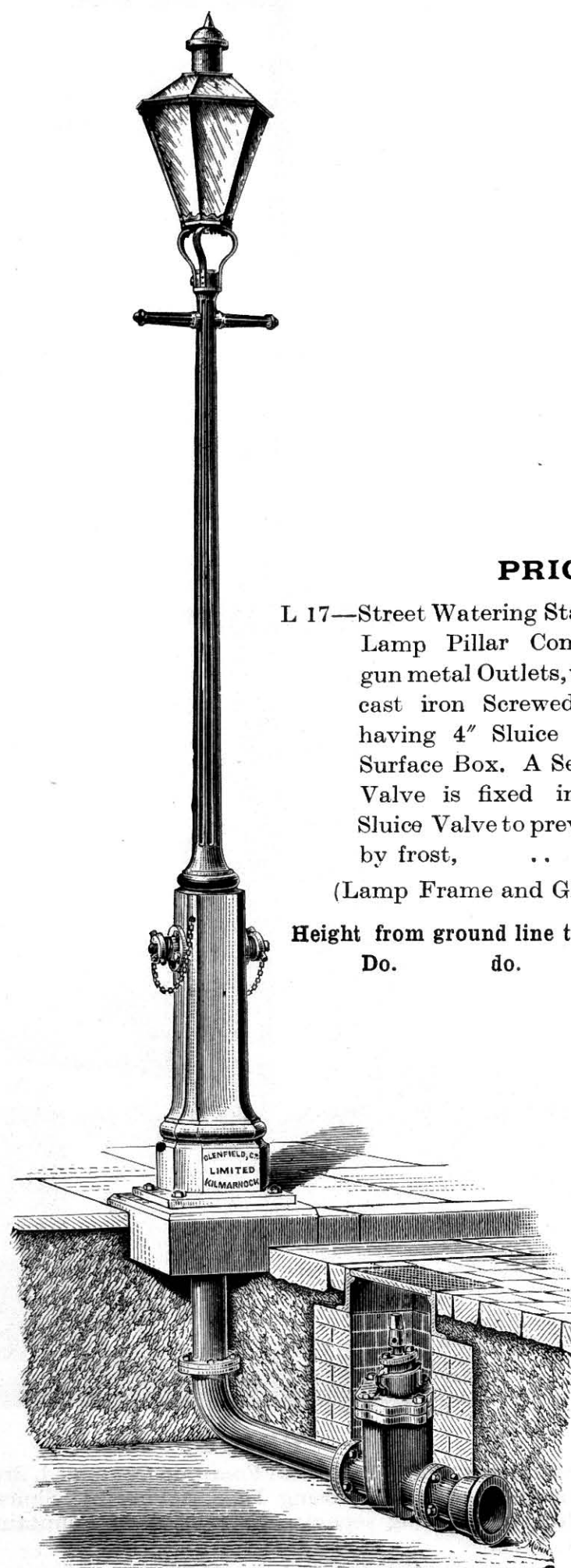


PRICE.

L 34—Street Watering Standpost, Lamp Pillar and Fountain Combined, fitted with two Patent Non-concussive Self-closing Taps, having 2 $\frac{1}{4}$ " Sluice Valve and Surface Box, and having separate connection to Fountain Taps with Stop Cock, each.
Height from ground line to outlet, 2 feet 7 inches. Height from ground line to top of pillar, 10 feet.

Street Standpost and Lamp Pillar Combined.

Fig. L 17.



PRICE.

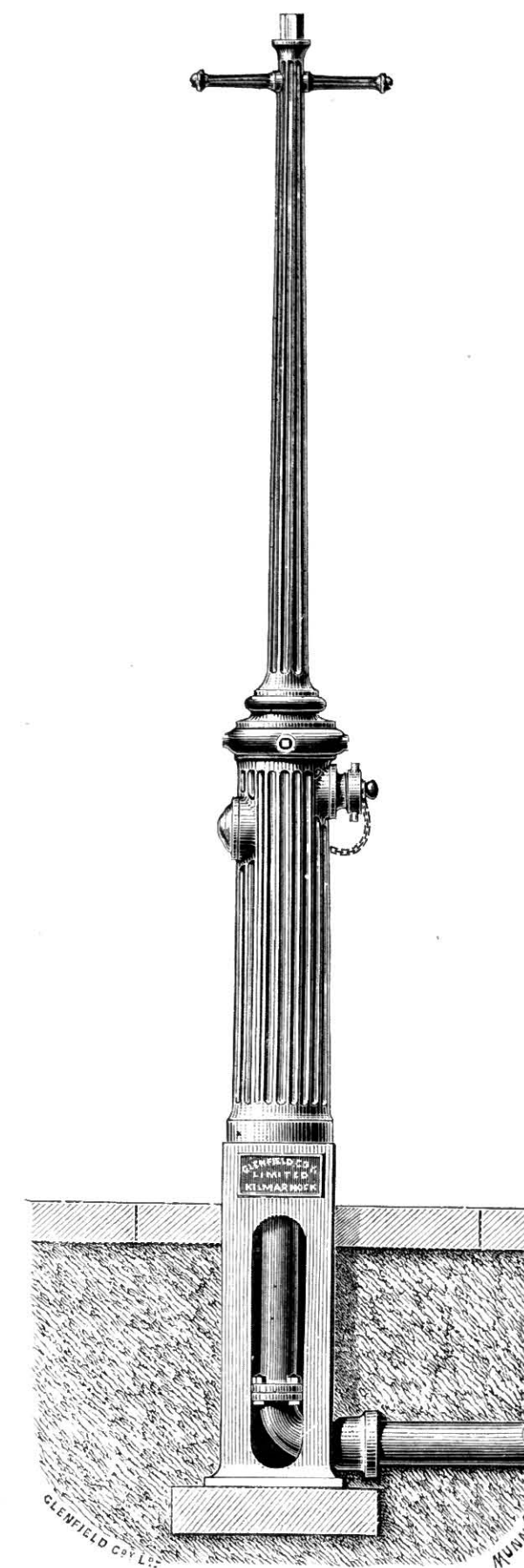
L 17—Street Watering Standpost and Lamp Pillar Combined, two gun metal Outlets, with chained cast iron Screwed Caps and having 4" Sluice Valve and Surface Box. A Self-emptying Valve is fixed in Outlet of Sluice Valve to prevent damage by frost, each.

(Lamp Frame and Glass not included.)

Height from ground line to outlet, 2 feet 10 inches.
Do. do. top of pillar, 10 feet.

Street Standpost and Lamp Pillar Combined.

Fig. L 18.



PRICE.

L 18—Street Watering Standpost and Lamp Pillar Combined, one gun metal Outlet, with chained cast iron Screwed Cap, and having Screw-down Valve in Pillar to be worked by a Key, including internal Pipe and Bend at bottom, } each.

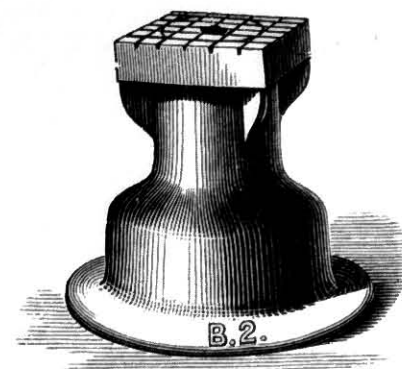
Height from ground line to outlet, 3 feet 6 inches. Height from ground line to apex, 10 feet.

SECTION D.

SURFACE BOXES TO SUIT SLUICE VALVES, AIR VALVES, AND HYDRANTS; SPECIAL CASTINGS, ETC.

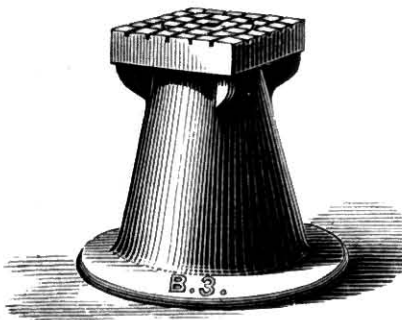
The designs are subject to alteration and amendment, and, while corrections in Catalogue are made from time to time, Glenfield & Kennedy Ltd. do not guarantee that goods supplied will be exactly as shewn.

Surface Boxes for Sluice Valves.



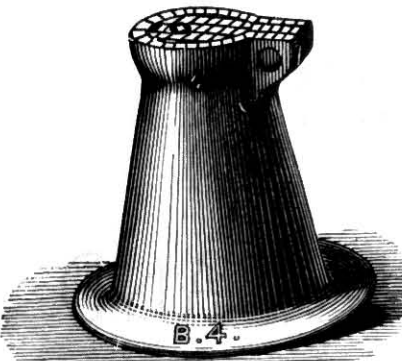
		Clear Opening.	Size inside at bottom.	Depth.	Remarks.	Price Each.
B 2—	For Sluice Valves,	3½" dia.	9" dia.	12"	Curved body, bayonet joint locking lid.	
B 123—	Do.	3¼" dia.	9½" dia.	11¾"	do.	
B 165—	Do.	3½" dia.	8¼" dia.	12¼"	Curved body, hinged lid.	

For size of Valve Key across corners, see foot of page.



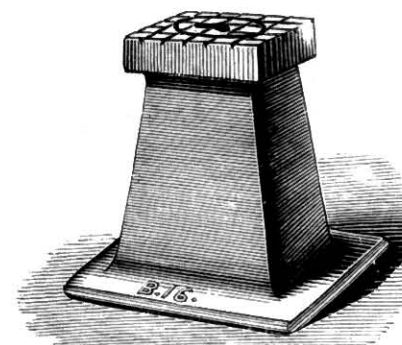
B 3—	For Sluice Valves,	3¼" dia.	9" dia.	12"	Tapered body, bayonet joint locking lid.	
B 164—	Do.	4½" dia.	8" dia.	9"	do.	
B 265—	Do.	3½" dia.	7" dia.	12"	do.	
B 231—	Do.	3½" dia.	9" dia.	11½"	Tapered body, chained lid.	
B 289—	Do.	3¼" dia.	8½" dia.	11½"	Tapered body, round top, chained lid.	

For size of Valve Key across corners, see foot of page.



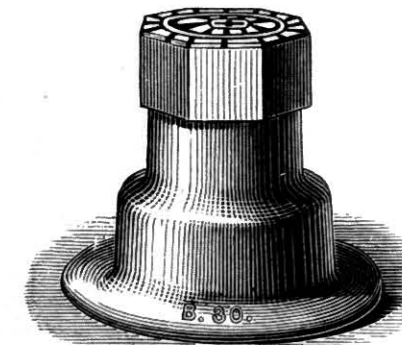
B 4—	For Sluice Valves,	4" dia.	9" dia.	12"	Tapered body, hinged and locked.	
B 58—	Do.	6½" dia.	7¼" dia.	8½"	do.	
B 126—	Do.	6" dia.	8" dia.	12"	do.	
B 209—	Do.	7¼" dia.	7¼" dia.	8½"	Hinged lid.	

For size of Valve Key across corners, see foot of page.



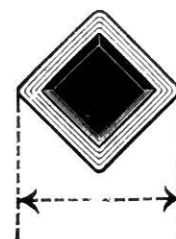
B 16—	For Sluice Valves,	3½" dia.	7¼" sq.	9"	Tapered body, hinged lid.	
		3¼" dia.	7¼" sq.	12"	Tapered body, chained lid.	
		3½" dia.	6½" sq.	9"	do.	
B 181—	Do.	6½" x 5½"	7¼" x 6¼"	6"	do.	
B 180—	Do.	5½" x 4½"	8" x 7"	10"	do.	
B 183—	Do.	5½" x 3"	6½" x 4½"	6"	do.	
B 168—	Do.	3½" sq.	7" sq.	8"	do.	
B 182—	For Small Valves,	4½" x 2½"	6½" x 4½"	9"	do.	
B 223—	For Sluice Valves,	4" dia.	6½" sq.	9"	do.	
B 224—	Do.	6½" dia.	8½" sq.	9"	do.	
B 225—	Do.	4" sq.	5½" sq.	6"	Hinged lid.	
B 226—	Do.	6½" sq.	8½" sq.	9"	Tapered body, chained lid.	
B 227—	Do.	10½" sq.	12½" sq.	9"	do.	

For size of Valve Key across corners, see foot of page.



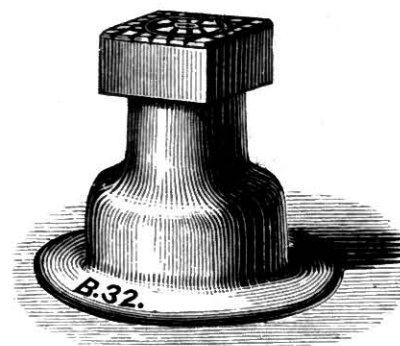
B 30—	For Sluice Valves,	4½" dia.	8½" dia.	12"	Curved body, octagonal top.	
B 31—	Do.	3½" dia.	9" dia.	8"	do.	
		3¼" dia.	9" dia.	12"	do.	

Size of Valve Key across corners, { up to 12" Valves inclusive, 3½"
13" to 22" do. 3¼"
24" and up do. 4¼"



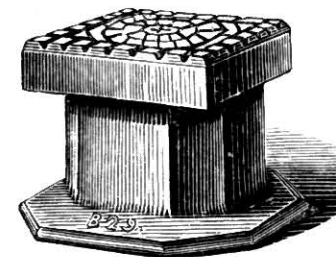
All coated with Dr. Angus Smith's Patent Composition.

Surface Boxes for Sluice Valves and Stop Cocks.

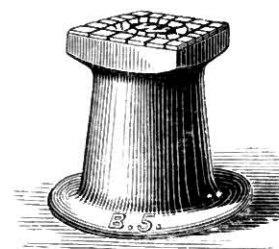


		Clear Opening.	Size inside at bottom.	Depth.	Remarks.	Price Each.
B 32—	For Sluice Valves,	3½" dia.	8¼" dia.	16"	Curved body, deep square top, bayonet joint locking lid.	
				12"	do.	
				8"	do.	
B 190—	For Stop Cocks,	2½" dia.	7¼" dia.	12"	do.	
B 193—	For Sluice Valves,	3½" dia.	7" dia.	12"	Hinged lid.	
B 244—	Do.	3¼" dia.	7" dia.	12½"	Curved body, hinged lid.	
B 269—	For Stop Cocks,	2½" dia.	8" dia.	18"	Light, with openings at foot, chained lid.	
B 298—	For Sluice Valves,	3½" dia.	15¼" dia.	16"	Chained lid.	

For size of Valve Key across corners, see foot of page 2.

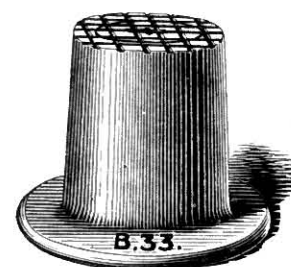


B 29—	For Large Valves } also suits Ball Hydrant	7" x 5½"	8½" x 7"	9¼"	Square top, octagon body.	
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B 5 {	For Small Valves,	3¼" dia.	6½" dia.	9"	Tapered body, chained lid.	
	Do. or Stop Cocks,	3¼" dia.	5½" dia.	6"	do.	
B 250—	Do.	4½" dia.	4½" dia.	9"	Chained lid, heavy.	
B 270—	Do.	3¼" dia.	5" sq.	8"	Tapered body, chained lid.	
B 310—	Do.	3½" dia.	4½" dia.	10"	do.	

For size of Valve Key across corners, see foot of page 2.



B 33—	For Small Valves,	3½" dia.	7" dia.	9"	Tapered body, chained lid.	
B 53—	Do.	3½" dia.	7" dia.	9"	do.	
B 127—	Do. or Stop Cocks,	4" dia.	5½" dia.	5"	do.	
B 142—	Do.	4½" dia.	6½" dia.	9"	do.	

For size of Valve Key across corners, see foot of page 2.



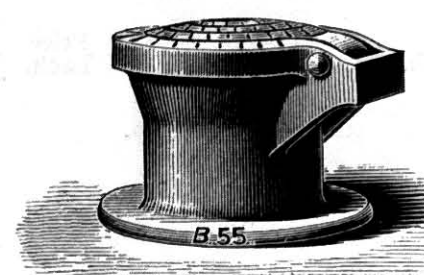
B 37—	For Small Valves } or Stop Cocks,	3¼" dia.	6" dia.	8"	Tapered body, chained lid.	
B 54—	Do.	3¼" dia.	6½" dia.	8"	do.	
B 57—	For Large Valves,	6" dia.	8½" dia.	9"	do.	
				10"	do.	
				14"	do.	
				18"	do.	
				22"	do.	
B 195—	For Large Valves,	5" dia.	5½" dia.	7"	do.	
B 246—	For Small Valves,	3½" dia.	4½" dia.	8"	do.	

For size of Valve Key across corners, see foot of page 2.

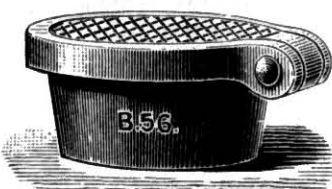
All coated with Dr. Angus Smith's Patent Composition.

Surface Boxes for Sluice Valves and Stop Cocks

(Continued).

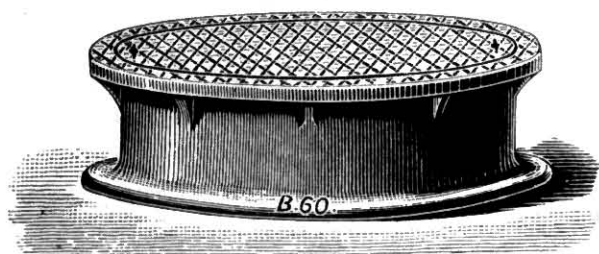


	Clear Opening.	Size inside at bottom.	Depth.	Remarks.	Price each.
B 55—For Small Valves or Stop Cocks	4" dia.	5" dia.	6"	Hinged lid.	
B 118—Do.	4" dia.	4½" dia.	6"	Hinged lid, square bottom flange.	
B 199—For Large Valves,	8½" dia.	9½" dia.	11"	do.	
B 220—Do.	7½" dia.	7½" dia.	8½"	Hinged and locked.	
B 233—Do.	6½" dia.	9½" dia.	9"	Hinged lid.	
B 290—Do.	4½" dia.	4½" dia.	8"	Chained lid.	

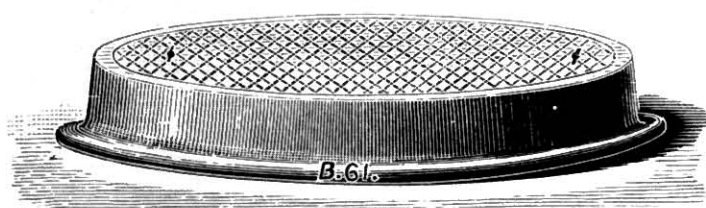


B 56—For Small Valves, or Stop Cocks,	6" dia.	5½" dia.	4"	Hinged lid.	
B 59—For Valves—for putting into Flagstone,	7" dia.	7" dia.	3½"	Chained lid.	

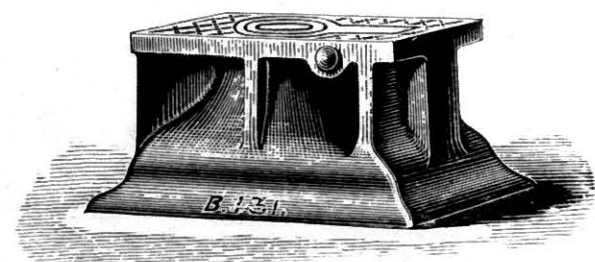
For size of Valve Key across corners, see foot of page 2.



B 60—Heavy Manhole for Valve Chamber,	26" dia.	26" dia.	10½"	
B 104—Do.	36" dia.	36" dia.	12"	
B 178—Do.	30" dia.	30" dia.	12"	



B 61—Heavy Manhole for Chamber,	43" dia.	46" dia.	7"	
B 167—Do.	19" dia.	20½" dia.	12¼"	{ Square bottom } flange.
B 176—Do.	16" dia.	18" dia.	14"	
B 236—Do.	18" dia.	18" dia.	4"	
B 255—Do.	36" dia.	38½" dia.	6"	

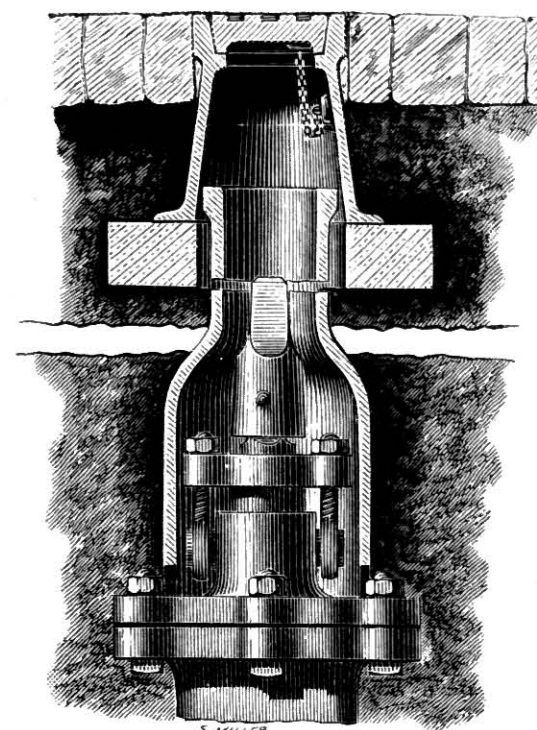


B 98—For Valves,	3¼" dia.	10" x 7"	6"	Brighton pattern.
B 100—Do.	3½" dia.	8½" x 5½"	6"	{ Brighton pattern, } malleable cast lid.
B 131—For Footpaths,	2½" dia.	6½" x 3½"	1½"	Brighton pattern.
B 132—For Valves,	3¼" dia.	8½" x 6½"	9"	do.

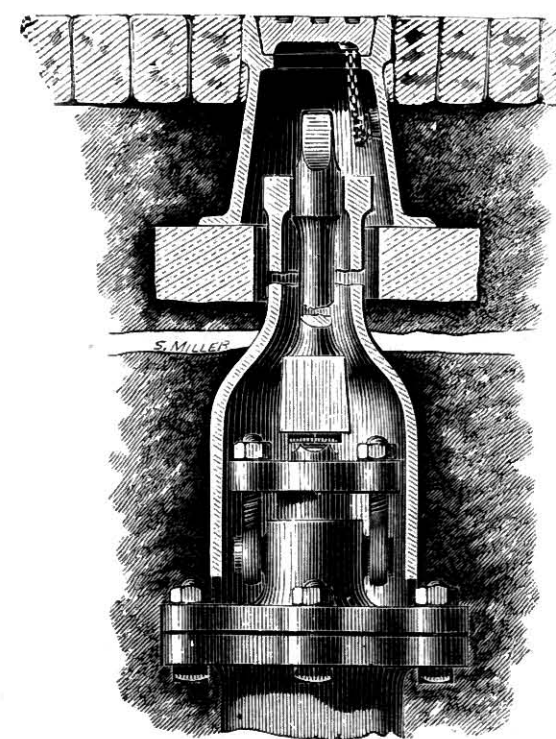
For size of Valve Key across corners, see foot of page 2.

All coated with Dr. Angus Smith's Patent Composition.

Surface Boxes, etc., for Sluice Valves.



	Depth from surface to top of Pipe.	Size of Valve.	Price of Tube.	Price of Surface Box. B 5.
B 40—Protecting Tube and Surface Box.	36"	{ 2" to 6" 7" to 12"		
Do.	42"	{ 2" to 6" 7" to 12" 13" to 18"		
Do.	48"	{ 2" to 6" 7" to 12" 13" to 18"		



	Depth from surface to top of Pipe.	Size of Valve.	Price of Tube.	Price of Spindle.	Price of Surface Box. B 5.
B 41—Protecting Tube, Lengthening Spindle, and Surface Box.	36"	{ 2" to 6" 7" to 12"			
Do.	42"	{ 2" to 6" 7" to 12" 13" to 18"			
Do.	48"	{ 2" to 6" 7" to 12" 13" to 18"			

All coated with Dr. Angus Smith's Patent Composition.

Mr. Fraser
COPY.

From H. Davenport.

28th Nov. 1923.

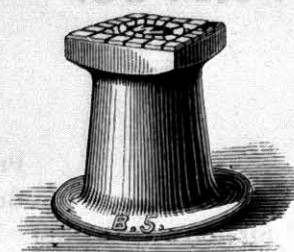
2 B 139

W.T. Ward, M.I.M.E.

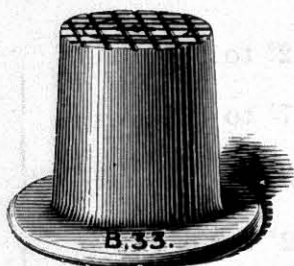
LLANDUDNO U.D.C.

They have Glenfield & Kennedy hydrant and Sluice Valve Boxes etc. here and have been using B6 approx. 19 x 12, 16 x 9 on top, 9 $\frac{1}{2}$ " deep ~~weighing~~ about 60 lbs. also B100 and B 300, but in each case are being troubled by boxes, and particularly lids, being broken by traffic.

Surface Boxes for Stop Cocks.



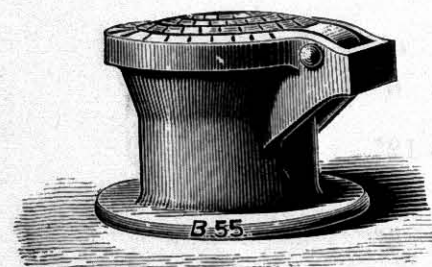
		Clear Opening.	Size inside at bottom.	Depth.	Remarks.	Price Each.
B 5—For Roadways,		3 $\frac{3}{4}$ " dia.	6 $\frac{1}{2}$ " dia.	9"	Tapered body, chained lid.	
B 52—	Do.	3 $\frac{3}{4}$ " dia.	5 $\frac{1}{2}$ " dia.	6"	do	
B 52—	Do.	3" dia.	4 $\frac{1}{2}$ " dia.	9"	do.	



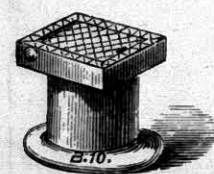
B 33—For Roadways,		3 $\frac{3}{8}$ " dia.	7" dia.	9"	Tapered body, chained lid.	
B 53—	Do.	3 $\frac{1}{2}$ " dia.	7" dia.	9"	do.	
B 127—	Do.	4" dia.	5 $\frac{3}{8}$ " dia.	5"	do.	
B 142—	Do.	4 $\frac{3}{4}$ " dia.	6 $\frac{1}{4}$ " dia.	9"	do.	
B 125—For Footpaths,		3 $\frac{3}{4}$ " dia.	4 $\frac{3}{8}$ " dia.	5"	do.	
B 128—	Do.	3 $\frac{3}{4}$ " dia.	5" dia.	4"	do.	
B 291—For Roadways,		8" x 6"	8 $\frac{3}{4}$ " x 6 $\frac{3}{4}$ "	9"	do.	



B 37—For Roadways,		3 $\frac{3}{4}$ " dia.	6" dia.	8"	Tapered body, chained lid.	
B 51—	Do.	3" dia.	4" dia.	10"	do.	
B 54—	Do.	3 $\frac{3}{4}$ " dia.	6 $\frac{1}{4}$ " dia.	8"	do.	



B 55—For Roadways,		4" dia.	5" dia.	6"	Hinged lid.	
B 118—	Do.	4" dia.	4 $\frac{1}{2}$ " dia.	6"	do. {square bottom flange.}	

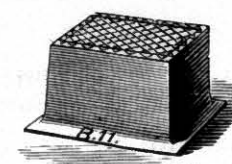


B 10—For Footpaths,		3 $\frac{1}{2}$ " dia.	3 $\frac{1}{2}$ " dia.	5"	Hinged lid, square top.	
B 73—	Do.	6 $\frac{1}{4}$ " sq.	6 $\frac{1}{4}$ " sq.	5"	Hinged and locked.	
B 160—	Do.	4 $\frac{1}{2}$ " x 4"	4 $\frac{1}{2}$ " sq.	7 $\frac{1}{2}$ "	Hinged lid, square body.	
B 161—	Do.	5" x 4 $\frac{1}{2}$ "	5" sq.	8"	do.	
B 257—	Do.	4 $\frac{1}{8}$ " dia.	6 $\frac{1}{8}$ " dia.	4 $\frac{3}{8}$ "	Tapered body, chained lid.	

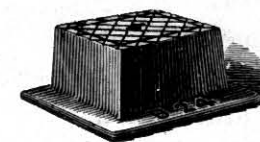
All coated with Dr. Angus Smith's Patent Composition.

Surface Boxes for Stop Cocks

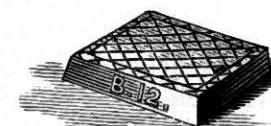
(Continued.)



		Clear Opening.	Size inside at bottom.	Depth.	Remarks.	Price Each.
B 11—For Footpaths		4 $\frac{7}{8}$ " sq.	5 $\frac{3}{8}$ " sq.	4"	Chained lid.	
B 71—	Do.	4 $\frac{3}{8}$ " x 4"	5 $\frac{3}{8}$ " sq.	3"	Hinged lid.	
B 112—	Do.	4 $\frac{1}{4}$ " x 3"	5 $\frac{1}{4}$ " sq.	6"	do.	
B 235—	Do.	4 $\frac{3}{8}$ " dia.	5 $\frac{1}{2}$ " sq.	3"	Chained lid.	
B 235—	Do.	3 $\frac{1}{2}$ " x 3 $\frac{1}{4}$ "	4 $\frac{1}{2}$ " x 4"	4"	Hinged lid.	



B 24—For Footpaths,		4 $\frac{1}{2}$ " sq.	6 $\frac{1}{4}$ " sq.	4"	Locked lid.	
B 133—For Roadways,		4 $\frac{1}{2}$ " x 3 $\frac{3}{4}$ "	6 $\frac{1}{4}$ " sq.	4"	Hinged lid.	
B 138—	Do.	6 $\frac{1}{8}$ " x 4"	8 $\frac{3}{8}$ " x 6 $\frac{1}{8}$ "	9"	Chained lid.	
B 158—	Do.	5 $\frac{1}{2}$ " x 4"	8" x 5 $\frac{1}{2}$ "	6"	Hinged and locked.	
B 163—For Footpaths,		3 $\frac{3}{8}$ " sq.	5 $\frac{1}{2}$ " sq.	8"	Chained lid.	
B 170—	Do.	4 $\frac{1}{6}$ " x 3"	5 $\frac{1}{2}$ " x 3 $\frac{1}{2}$ "	3"	Hinged lid.	
B 171—	Do.	4" sq.	5 $\frac{3}{8}$ " x 4 $\frac{3}{8}$ "	3"	do.	
B 201—	Do.	6 $\frac{1}{2}$ " x 5 $\frac{1}{8}$ "	7 $\frac{3}{4}$ " x 5 $\frac{5}{8}$ "	4"	do.	
B 217—For Roadways,		3 $\frac{3}{8}$ " sq.	5 $\frac{1}{4}$ " x 5 $\frac{3}{8}$ "	6"	Chained lid.	
B 218—For Footpaths,		6 $\frac{3}{4}$ " x 4 $\frac{1}{4}$ "	7 $\frac{3}{4}$ " dia.	8 $\frac{3}{4}$ "	Hinged lid.	
B 261—	Do.	4 $\frac{3}{8}$ " x 3 $\frac{3}{4}$ "	6 $\frac{3}{8}$ " x 5 $\frac{3}{8}$ "	2 $\frac{1}{4}$ "	do.	
B 261—	Do.	4 $\frac{3}{8}$ " x 4 $\frac{3}{4}$ "	6 $\frac{1}{2}$ " x 6 $\frac{1}{2}$ "	4 $\frac{1}{2}$ "	do.	
B 280—For Roadways,		5" x 4"	8 $\frac{3}{8}$ " x 6 $\frac{1}{8}$ "	9"	do.	



B 12—For Flagstones,		4 $\frac{7}{8}$ " sq.	5 $\frac{1}{4}$ " sq.	1 $\frac{1}{4}$ "	Chained lid.	
B 124—	Do.	4 $\frac{1}{2}$ " x 3 $\frac{3}{4}$ "	5 $\frac{1}{2}$ " sq.	1 $\frac{3}{4}$ "	Hinged and locked.	
B 130—	Do.	3 $\frac{1}{2}$ " x 2 $\frac{3}{4}$ "	4 $\frac{1}{2}$ " sq.	1 $\frac{3}{4}$ "	do.	
B 262—	Do.	4 $\frac{1}{4}$ " x 4 $\frac{1}{4}$ "	6 $\frac{1}{8}$ " x 6 $\frac{1}{8}$ "	3"	Hinged lid.	



B 25—For Flagstones,		4 $\frac{3}{4}$ " sq.	5 $\frac{1}{4}$ " sq.	3"	Chained lid.	
B 56—	Do.	6" dia.	5 $\frac{1}{4}$ " dia.	4"	Hinged lid.	
B 72—	Do.	4 $\frac{3}{4}$ " sq.	6" x 5 $\frac{1}{4}$ "	4"	do.	
B 122—	Do.	4 $\frac{3}{8}$ " x 3 $\frac{1}{4}$ "	5 $\frac{1}{2}$ " x 3 $\frac{3}{8}$ "	3 $\frac{3}{8}$ "	do.	
B 155—	Do.	3 $\frac{1}{4}$ " dia.	4 $\frac{1}{4}$ " dia.	6"	Chained lid.	
B 169—	Do.	7 $\frac{3}{8}$ " x 6 $\frac{5}{8}$ "	8 $\frac{1}{2}$ " sq.	4"	Bayonet joint locking lid.	
B 206—	Do.	6" sq.	6" sq.	8 $\frac{1}{2}$ "	Hinged and locked.	
B 285—	Do.	3" dia.	3 $\frac{3}{8}$ " dia.	3"	Chained lid.	
B 285—	Do.	3" dia.	3 $\frac{3}{8}$ " dia.	3"	do.	

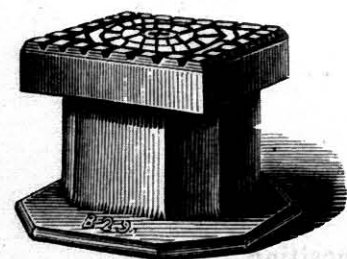
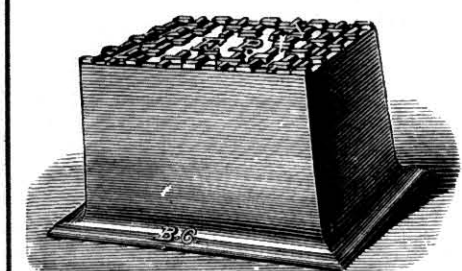
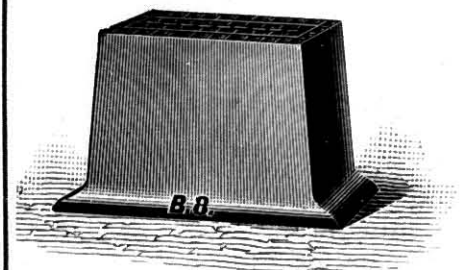


B 26—Malleable Cast Key for Boxes with locked covers,

All coated with Dr. Angus Smith's Patent Composition.

Surface Boxes for Hydrants.

For Ball Hydrants.



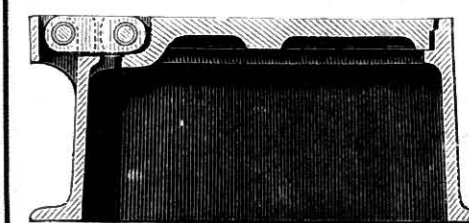
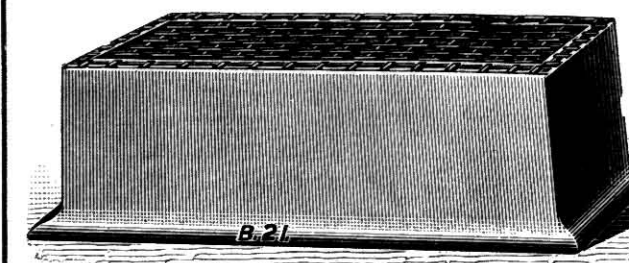
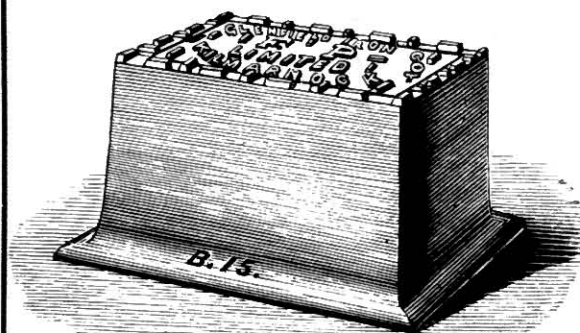
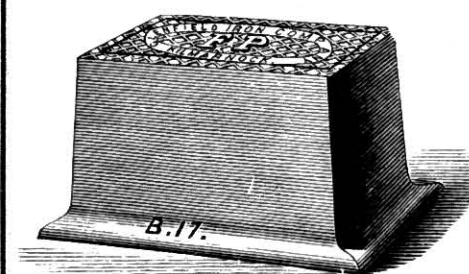
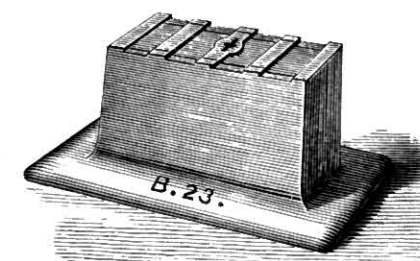
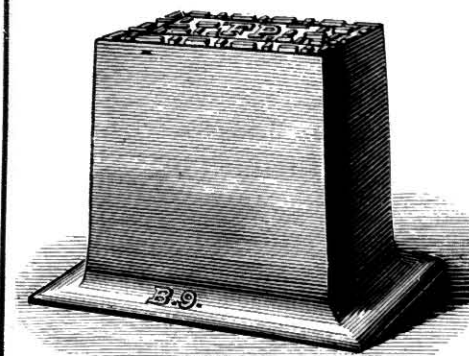
	Clear Opening.	Size inside at bottom.	Depth.	Remarks.	Price Each.
B 8	For Roadways,	7" x 5"	9" x 7"	8"	Chained lid.
		7 1/4" x 5"	9" x 7"	8"	With lock.
		7 1/4" x 5"	10 3/4" x 7 1/2"	8"	Hinged lid.
		7 1/4" x 5"	10 3/4" x 7 1/2"	8"	Hinged and locked.
	Shallow—for Footpaths,	7" x 5"	8 1/2" x 6 1/2"	4"	Chained lid.
B 133	For small Hydrant,	6 1/2" x 4"	8 5/8" x 6 1/8"	9"	do.
B 143	For Roadways,	7 1/2" x 7 1/2"	9 1/2" x 9 1/2"	9"	do.
B 172	Do.	6 1/4" x 5 1/2"	8 1/2" x 6"	8"	Hinged lid.
B 175	Do.	7 1/4" x 5 1/4"	9 1/4" x 7 1/4"	8"	Chained lid and locked.
B 202	For Footpaths,	8" x 6"	11 3/8" x 8 1/4"	7"	Hinged and locked.
B 207	Do.	6 3/4" sq.	8" sq.	9"	Chained lid.
B 245	For Roadways,	7 1/2" x 5 1/2"	9 1/2" x 7 1/2"	7 1/2"	do.
B 256	Do.	8 5/8" x 5 1/2"	10" x 7 1/8"	7 5/8"	Oval, with chained lid.
B 266	For Footpaths,	7" x 5"	8 7/8" x 6 3/4"	10"	Chained lid, light.
B 286	For Roadways,	7 1/4" x 6 1/2"	10" x 8"	8"	Hinged lid.
B 288	Do.	6 7/8" x 4 3/4"	8 7/8" x 6 3/4"	10"	Chained lid.
B 6	For Roadways,	8 7/8" x 6 7/8"	11" x 9"	8 1/2"	Chained lid.
			11" x 9"	8 1/2"	With lock.
			12 1/4" x 9"	8 1/2"	Hinged lid.
			12 1/4" x 9"	8 1/2"	Hinged and locked.
B 74	Shallow—for Footpaths,	8" x 6"	9 3/4" x 7 3/4"	5"	Chained lid.
B 75	For Roadways,	8" x 6"	10" x 8"	7 1/2"	do.
B 135	Do.	7 1/2" x 7 1/2"	8 5/8" x 8 5/8"	9"	do.
B 136	Do.	7 3/4" x 7 3/4"	9 1/2" x 9 1/2"	9"	do.
B 187	Shallow—for Footpaths,	9" sq.	11" sq.	4 1/2"	do.
B 189	For Roadways,	9" x 7"	12 3/8" x 9"	8 1/2"	Hinged lid.
B 191	Do.	6" sq.	8" sq.	10"	Chained lid.
B 214	Do.	8 3/4" x 3 7/8"	11 3/4" x 8 1/4"	6"	do.
B 229	Do.	9 1/8" x 7 1/8"	11" x 9"	8"	do.
B 259	Do.	9" x 9"	12 1/2" x 12 1/2"	9"	Chained lid, heavy.

B 29—For Roadways, 7" x 5 3/4" 8 1/8" x 7" 9 1/4" Square top, octagon body.

All coated with Dr. Angus Smith's Patent Composition.

Surface Boxes for Hydrants.

For Spindle Hydrants.

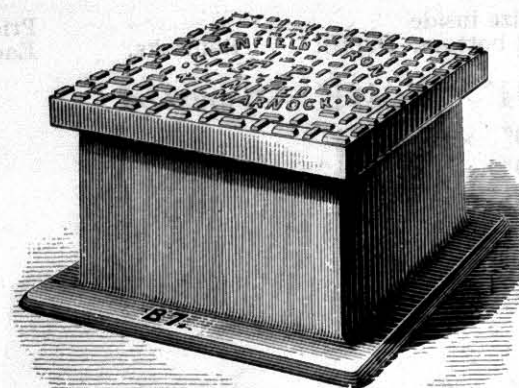


	Clear Opening.	Size inside at bottom.	Depth.	Remarks.	Price Each.
B 9	For C 4, C 28, C 135, C 140,	9 1/4" x 5 1/2"	11 1/4" x 7 3/4"	12 1/4"	Chained lid.
B 75	Do.	8" x 6"	10" x 8"	7 1/2"	do.
B 99	Do.	6 1/2" x 4 3/4"	9" x 8 1/2"	10 3/4"	do.
B 141	Do.	7" x 4"	8 1/2" x 5 5/8"	6 5/8"	do.
B 23	Shallow, for C 4, C 28, C 135, C 140,	7 1/2" x 4 1/2"	9" x 6"	6"	Locked. Used in some places but rather confined.
B 210	Deep do.	6 1/2" x 3 3/4"	8" x 5 1/2"	9"	do.
B 210	Shallow do.	7 3/8" x 4 3/8"	9 1/2" x 6 1/2"	6"	Chained lid.
B 17	For C 4, C 24, C 28, C 29, C 135, C 136, C 137, C 140,	10 1/8" x 6 1/4"	12 5/8" x 8 3/4"	8"	Chained lid.
B 103	Do.	9 1/2" x 6 1/4"	12 5/8" x 8 3/4"	8"	Hinged and locked.
B 129	Shallow, Do.	10 3/4" x 6 3/4"	13 3/8" x 8 1/2"	7 1/4"	Hinged lid.
B 173	Do.	10 3/4" x 6 3/4"	12 1/4" x 8 1/4"	4 1/2"	Chained lid.
B 173	Do.	10 3/8" x 7"	12 1/4" x 8 1/4"	7 1/8"	Hinged lid.
B 15	For C 4, C 24, C 28, C 29, C 135, C 136, C 137, C 140, C 57, ..	11 1/4" x 8 1/2"	14" x 10 1/2"	9"	Chained lid.
B 77	Do.	9 1/2" x 7"	13 1/2" x 9 1/2"	7 3/4"	Hinged lid, heavy.
B 78	Do.	11 7/8" x 9"	11 1/2" x 9"	6 1/2"	Hinged lid.
B 79	Do.	11 3/8" x 10 3/8"	13 1/4" x 13 1/4"	7"	Hinged lid, heavy.
B 144	Do.	11" x 9"	13 3/8" x 11 1/2"	7 5/8"	Chained lid.
B 188	Do.	12" sq.	14 1/4" sq.	7"	do.
B 21	For C 22,	18 1/2" x 12 1/2"	20" x 14"	7 1/4"	Chained lid.
B 179	Do.	16" x 8 1/2"	18 1/2" x 9 3/4"	4"	Hinged lid.
B 194	Do.	19" x 13"	20 1/2" x 14 1/2"	6"	Chained lid, light.
B 197	Do.	18 5/8" x 13 5/8"	20 5/8" x 15 5/8"	10"	do. heavy.
B 232	Do.	16 3/4" x 12 3/4"	20 1/4" x 16 1/4"	9"	Chained lid. Locked lid.
B 139	For Spindle Hydrants C 4, C 28, C 29, C 135, C 136, C 137; also, Valve Hydrants C 35 and C 150,	16" x 11"	18" x 13"	9"	Hinged lid.
B 177	For 2 1/2", C 35, C 150,	15" x 6 5/8"	16 3/4" x 9"	8 1/2"	do.
B 242	.. ..	12" x 9"	14 1/4" x 11 3/4"	6 1/2"	do.

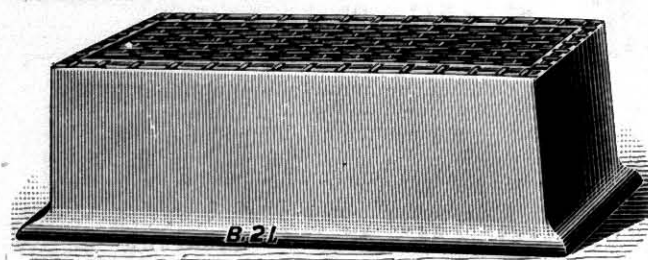
All coated with Dr. Angus Smith's Patent Composition.

Surface Boxes for Hydrants.

For Fire Cocks.

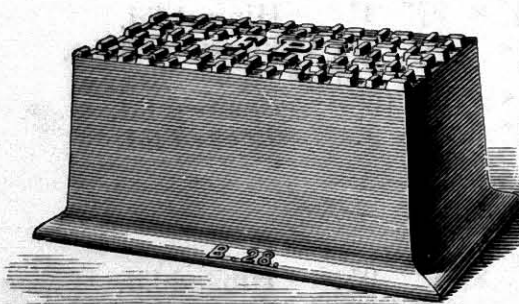


		Clear Opening.	Size inside at bottom.	Depth.	Remarks.	Price Each.
B 7	Ordinary, for C1,				Chained lid.	
	Heavy, do.	13 $\frac{5}{8}$ "	11" 14" x 11 $\frac{1}{4}$ "	9"	do.	
	Do. do.				Hinged lid.	
B 162	For Footpaths,	10 $\frac{1}{4}$ "	9" 10 $\frac{1}{4}$ " sq.	16"	do.	
B 166	Heavy, ..	11 $\frac{3}{4}$ "	9" 12 $\frac{1}{2}$ " x 9 $\frac{3}{4}$ "	8 $\frac{1}{2}$ "	Chained lid.	
					Lid with	
B 219	Do. ..	10 $\frac{1}{2}$ " sq.	10 $\frac{1}{2}$ " sq.	9 $\frac{3}{4}$ "	ventilating openings.	



		Clear Opening.	Size inside at bottom.	Depth.	Remarks.	Price Each.
B 21	For C 1 Double Outlet, C 106,	17 $\frac{1}{4}$ " x 12 $\frac{1}{4}$ "	20" x 14"	7 $\frac{1}{4}$ "	Hinged and locked.	
B 36	For C 109, ..	28 $\frac{3}{4}$ " x 12"	32 $\frac{1}{2}$ " x 14 $\frac{1}{2}$ "	6"	Hinged lid.	
		30" x 12"	32 $\frac{1}{2}$ " x 14 $\frac{1}{2}$ "	6"	Chained lid.	
B 88	Do. ..	27" x 15"	27 $\frac{3}{4}$ " x 15 $\frac{3}{4}$ "	9 $\frac{3}{4}$ "	Hinged lid.	
B 107	For C 1 Double Outlet, C 106,	16 $\frac{3}{4}$ " x 10 $\frac{1}{2}$ "	17 $\frac{1}{2}$ " x 11 $\frac{1}{4}$ "	5 $\frac{1}{2}$ "	Chained lid.	
B 179	Do.	16" x 8 $\frac{1}{2}$ "	18 $\frac{1}{2}$ " x 9 $\frac{1}{4}$ "	4"	Hinged lid.	
B 194	Do.	19" x 13"	20 $\frac{1}{2}$ " x 14 $\frac{1}{2}$ "	6"	Chained lid, light.	
					do. heavy.	
B 197	Do.	18 $\frac{5}{8}$ " x 13 $\frac{5}{8}$ "	20 $\frac{5}{8}$ " x 15 $\frac{5}{8}$ "	10"	Chained lid.	

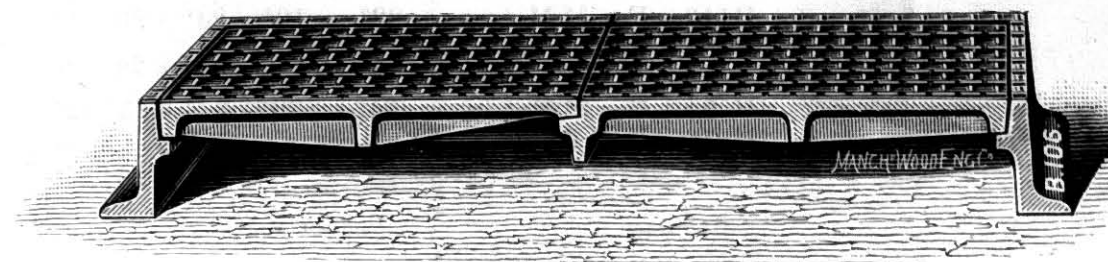
For Sluice Valve Hydrants.



		Clear Opening.	Size inside at bottom.	Depth.	Remarks.	Price Each.
B 28	For C35 and C150,	13 $\frac{5}{8}$ " x 6 $\frac{5}{8}$ "	16" x 9" 8 $\frac{1}{2}$ "		Chained lid.	
B 36	For C105, ..	30" x 12"	32 $\frac{1}{2}$ " x 14 $\frac{1}{2}$ "	6"	do.	
B 80	For C35 and C150,	14 $\frac{1}{4}$ " x 9"	16 $\frac{1}{2}$ " x 10"	4"	Hinged lid.	
B 82	Do.	15" x 9"	15" x 9"	4"	Chained lid.	
B 83	Do.	15 $\frac{1}{8}$ " x 10"	17" x 12"	6"	do.	
B 89	For C153, ..	30" x 20"	32" x 22"	6"	do.	
B105	For C35 and C150,	14 $\frac{1}{8}$ " x 8 $\frac{1}{4}$ "	16 $\frac{5}{8}$ " x 10"	5"	do.	
B114	Do.	16 $\frac{3}{4}$ " x 9 $\frac{3}{4}$ "	19" x 12"	8 $\frac{3}{4}$ "	do.	
B147	Do.	15" x 8 $\frac{1}{2}$ "	17" x 10 $\frac{1}{2}$ "	4 $\frac{1}{2}$ "	do.	
B148	Do.	26 $\frac{1}{2}$ " x 9"	28" x 10 $\frac{3}{4}$ "	4 $\frac{1}{4}$ "	do.	
B154	Do.	16 $\frac{1}{4}$ " x 7 $\frac{1}{4}$ "	18" x 8 $\frac{1}{4}$ "	7"	Hinged lid.	
B185	Do.	13 $\frac{1}{2}$ " x 10"	16 $\frac{1}{2}$ " x 12"	6 $\frac{3}{4}$ "	Hinged and locked.	

All coated with Dr. Angus Smith's Patent Composition.

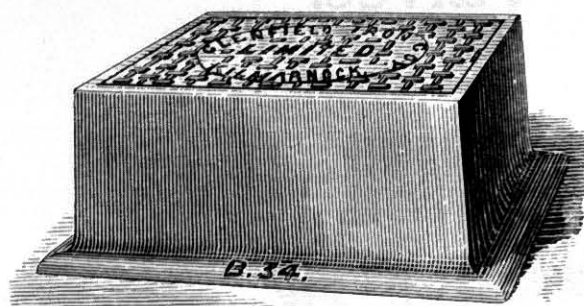
Surface Boxes for Air Valves.



		Clear Opening.	Size inside at bottom.	Depth.	Remarks.	Price Each.
B 106	For 12" Double Air Valve, H 7,	40" x 27"	43" x 29"	6 $\frac{1}{4}$ "	Lid in 2 pieces.	
B 93	For 10" do.	36" x 24"	36" x 24"	6"	do.	
B 90	For 8" do.	34 $\frac{1}{2}$ " x 23"	37" x 25"	6 $\frac{1}{2}$ "	do.	
B 109	For 6" do.	32" x 18"	34" x 20"	6 $\frac{1}{2}$ "	Chained lid.	
B 212	For 6" do.	30" x 18"	30" x 18"	4"	Chained lid, oblong body, no bottom flange.	
B 89	For 6" do.	30" x 20"	32" x 22"	6"	Chained lid.	
B 184	For 4" do.	23 $\frac{3}{4}$ " x 12 $\frac{1}{2}$ "	25" x 14"	9"	do.	
B 20	For 4" do.	23 $\frac{1}{2}$ " x 12 $\frac{5}{8}$ "	25" x 14"	5 $\frac{3}{8}$ "	do.	
B 198	For 4" do.	23 $\frac{1}{8}$ " x 12 $\frac{1}{8}$ "	24 $\frac{5}{8}$ " x 13 $\frac{5}{8}$ "	6"	do.	
B 13	For 4" do.	22 $\frac{1}{2}$ " x 14 $\frac{1}{2}$ "	25 $\frac{1}{2}$ " x 17 $\frac{1}{4}$ "	10"	do.	
B 14	For 2" do.	15" x 13"	16" x 14"	4"	do.	
		14 $\frac{1}{4}$ " x 13"	17" x 14"	4"	Locked lid.	
B 85	For 2" do.	19" x 14 $\frac{1}{4}$ "	21 $\frac{1}{4}$ " x 16 $\frac{1}{2}$ "	7"	Chained lid.	
B 120	For H 4, 5 $\frac{1}{2}$ " Ball, Light,	13" x 13"	14 $\frac{1}{4}$ " x 14 $\frac{1}{4}$ "	5 $\frac{1}{4}$ "	do.	
B 81	For H 4, 5 $\frac{1}{2}$ " Ball, Heavy,	14 $\frac{3}{8}$ " x 14 $\frac{3}{8}$ "	18" x 18"	9"	do.	
B 22	For H 4, 3 $\frac{7}{8}$ " Ball, Light,	10 $\frac{3}{8}$ " x 10 $\frac{3}{8}$ "	11 $\frac{1}{2}$ " x 11 $\frac{1}{2}$ "	4 $\frac{1}{4}$ "	do.	
B 79	For H 4, 3 $\frac{7}{8}$ " Ball, Heavy,	11 $\frac{3}{8}$ " x 10 $\frac{3}{8}$ "	13 $\frac{1}{4}$ " x 13 $\frac{1}{4}$ "	7"	Hinged lid.	
B 134	For H 4, 2 $\frac{1}{2}$ " Ball,	7" x 7"	8 $\frac{1}{8}$ " x 8 $\frac{1}{8}$ "	4"	Chained lid.	
B 8	For H 5, Shallow,	7" x 5"	8 $\frac{1}{2}$ " x 6 $\frac{1}{2}$ "	4"	do.	
B 120	For H 21, 3" and 4" Inlet,	13" x 13"	14 $\frac{1}{4}$ " x 14 $\frac{1}{4}$ "	5 $\frac{1}{4}$ "	do.	
B 22	For H 21, 2" Inlet,	10 $\frac{3}{8}$ " x 10 $\frac{3}{8}$ "	11 $\frac{1}{2}$ " x 11 $\frac{1}{2}$ "	4 $\frac{1}{4}$ "	do.	
B 78	For H 22, ..	11" x 9"	11 $\frac{1}{2}$ " x 9"	6 $\frac{1}{2}$ "	Hinged lid.	
	For H 23, Air Cock, ..	..	..	..	..
B 134	For 3" Air Valve, H 31,	7" x 7"	8 $\frac{7}{8}$ " x 8 $\frac{7}{8}$ "	4"	Chained lid.	
B 22	For 1 $\frac{1}{2}$ ", 2", and 2 $\frac{1}{2}$ " Air Valve, H 31, ..	10 $\frac{3}{8}$ " x 10 $\frac{3}{8}$ "	11 $\frac{1}{2}$ " x 11 $\frac{1}{2}$ "	4 $\frac{1}{4}$ "	do.	
B 7	For 4" Air Valve, H 31,	13 $\frac{5}{8}$ " x 11"	14" x 11 $\frac{1}{4}$ "	9"	do.	
					do.	
B 109	For 6" Air Valve, H 40,	32" x 18"	34" x 20"	6 $\frac{1}{2}$ "	Perforated lid.	
B 36	For 4" do.	30" x 12"	32 $\frac{1}{2}$ " x 14 $\frac{1}{2}$ "	6"	Chained lid.	
					With lock, ventilating	
B 284	For 4" do.	30" x 15"	33" x 18"	22"	opening in centre of lid, with cast iron dirt pan.	
B 198	For 3" do.	23 $\frac{1}{8}$ " x 12 $\frac{1}{8}$ "	24 $\frac{5}{8}$ " x 13 $\frac{5}{8}$ "	6"	Chained lid.	
	For 2" do.	..	..	..	..

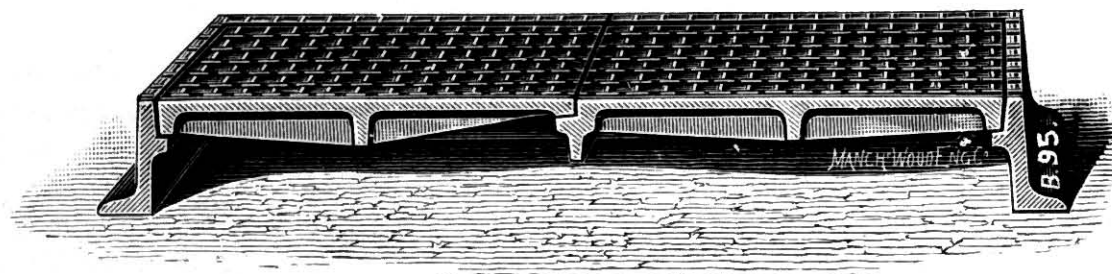
All coated with Dr. Angus Smith's Patent Composition.

Surface Boxes for Meters.



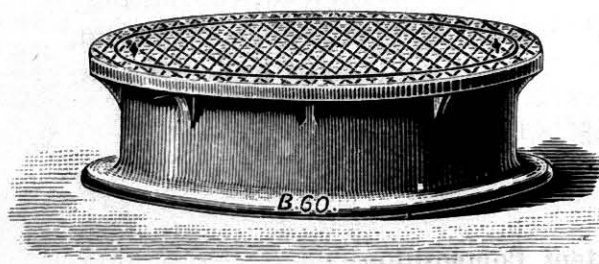
	Clear Opening.	Size inside at bottom.	Depth.	Remarks.	Price Each.
B 34—For $\frac{1}{4}$ ", $\frac{3}{8}$ " and $\frac{1}{2}$ " Meters,	$15\frac{3}{4}" \times 15\frac{3}{4}"$	$18" \times 18"$	$8\frac{1}{4}"$	Chained lid.	
B 113—For $\frac{3}{4}$ " Meters,	$22" \times 18"$	$24" \times 20"$	$6\frac{1}{8}"$	do.	
B 87—For 1" and $1\frac{1}{2}"$ Meters,	$24" \times 24"$	$24" \times 24"$	6"	do.	
B 91—For 2" Meters,	$34" \times 30"$	$37" \times 33"$	12"	do.	
B 18—For 3" and 4" Meters,	$48" \times 36"$	$50" \times 38"$	5"	Lid in 3 parts.	

Cast Iron Chamber Covers.



	Clear Opening.	Size inside at bottom.	Depth.	Remarks.	Price Each.
B 239—15" x 5 $\frac{3}{4}$ "	$15" \times 5\frac{3}{4}"$	$15" \times 5\frac{3}{4}"$	$3\frac{1}{4}"$	Hinged lid.	
B 205—19" sq.	19" sq.	19" sq.	10"	Chained lid.	
B 238—20" x 20"	$25\frac{1}{4}" \times 24\frac{1}{4}"$	$26" \times 14"$	12"	Hinged lid.	
B 240—22 $\frac{1}{2}" \times 10\frac{1}{2}"$	$26" \times 14"$	$23\frac{1}{4}" \times 17\frac{1}{4}"$	6"	Chained lid.	
B 263—22 $\frac{1}{2}" \times 16\frac{1}{2}"$	$26" \times 16"$	$26" \times 16"$	$2\frac{1}{2}"$	Ventilating or solid lid, 2 lifting rings.	
B 251—24" x 14"	$26" \times 20"$	$26" \times 20"$	$7\frac{1}{4}"$	Chained lid.	
B 252—24" x 18"	24" sq.	24" sq.	$7\frac{1}{4}"$	do.	
B 292—24" sq.	$32\frac{3}{8}" \times 32\frac{3}{8}"$	$33\frac{1}{2}" \times 27\frac{1}{8}"$	9"	Small lid in cover.	
B 116—30" x 30"	$36" \times 36"$	$34\frac{1}{2}" \times 34\frac{1}{2}"$	6"	Chained lid.	
B 221—31 $\frac{5}{8}" \times 25\frac{1}{8}"$	$36" \times 36"$	$36" \times 36"$	8"	Lid in 3 pieces.	
B 153—33" x 33"	$34\frac{1}{2}" \times 34\frac{1}{2}"$	$36\frac{1}{2}" \times 32"$	8"	Hinged lid.	
B 196—33 $\frac{3}{4}"$ sq.	$36" \times 24"$	$38" \times 38"$	$3\frac{1}{2}"$	Lid in 2 pieces, no bottom flange.	
B 115—34 $\frac{1}{2}" \times 30\frac{1}{2}"$	$37\frac{1}{2}" \times 25"$	$39\frac{1}{2}" \times 27\frac{1}{2}"$	12"	Lid in 2 pieces.	
B 93—36" x 24"	$44" \times 32"$	$48" \times 16"$	6"	do.	
B 156—36" x 36"	$50\frac{3}{8}" \times 35"$	$50" \times 38"$	6"	do.	
B 19—36 $\frac{1}{4}" \times 23\frac{3}{4}"$	$52\frac{1}{2}" \times 27\frac{1}{2}"$	$63" \times 50"$	$3\frac{3}{4}"$	Lock bolts on each side.	
B 94—37" x 25 $\frac{1}{2}"$	$63" \times 37\frac{1}{2}"$	$69" \times 24"$	$7\frac{1}{2}"$	Hinged lid.	
B 110—42" x 30"	$63" \times 37\frac{1}{2}"$		$5\frac{1}{4}"$	Lid in 3 pieces.	
B 95—46" x 14"			$5\frac{1}{4}"$	Lid in 2 pieces.	
B 159—48" x 33"			$5\frac{1}{4}"$	Lid in 3 pieces.	
B 18—48" x 36"			7"	do.	
B 151—51" x 26"			7"	Lid in 2 pieces.	
B 117—61" x 48"			7"	Lid in 3 pieces.	
B 111—61 $\frac{1}{4}" \times 35\frac{3}{4}"$			7"	do.	
B 42—66" x 21"			7"	do.	

Circular Chamber Covers.

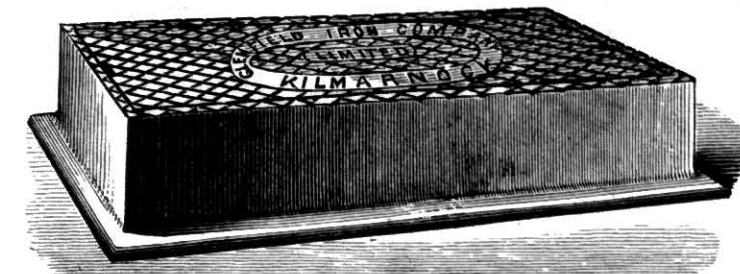


	Clear Opening.	Size inside at bottom.	Depth.	Price Each.
B 176—16" dia.	18" dia.	14"		
B 167—19" dia.	20 $\frac{1}{8}"$ dia.	12 $\frac{1}{4}"$		
B 60—26" dia.	26" dia.	10 $\frac{1}{4}"$		
B 178—30" dia.	30" dia.	12"		
B 104—36" dia.	36" dia.	12"		
B 61—43" dia.	46" dia.	7"		

All coated with Dr. Angus Smith's Patent Composition.

Surface Boxes for General Purposes.

Not Included in foregoing pages of Section D.



	Clear Opening.	Size inside at bottom.	Depth.	Remarks.	Price Each.
B 22—10 $\frac{1}{8}" \times 9\frac{1}{4}"$	$11\frac{1}{2}" \times 11\frac{1}{2}"$	$4\frac{1}{4}"$		Hinged lid.	
B 27—22" x 16"	$24" \times 18"$	$5\frac{1}{4}"$		Chained lid.	
	$25\frac{1}{8}" \times 18"$	$5\frac{1}{4}"$		Hinged lid.	
B 35 { $27\frac{3}{4}" \times 21\frac{3}{4}"$ $26\frac{1}{2}" \times 21\frac{3}{4}"$	$30" \times 24"$	$6\frac{1}{4}"$		Chained lid.	
	$30" \times 24"$	$6\frac{1}{4}"$		Hinged lid.	
B 38—24 $\frac{1}{4}" \times 23\frac{3}{4}"$	$26" \times 25\frac{3}{8}"$	4"		Chained lid.	
B 84—16" x 9"	$18" \times 10"$	4"		Hinged lid.	
B 86—17" x 16"	$19" \times 18"$	$6\frac{1}{2}"$		do.	
B 92—34 $\frac{1}{4}" \times 18\frac{1}{4}"$	$37" \times 21"$	7"		Chained lid.	
B 102—15" x 5 $\frac{3}{4}"$	$15" \times 5\frac{3}{4}"$	$3\frac{1}{4}"$		Hinged lid.	
B 108—20" x 16"	$22" \times 18"$	$8\frac{1}{4}"$		Chained lid.	
B 119—13 $\frac{1}{4}" \times 10"$	$16\frac{1}{2}" \times 12"$	$6\frac{3}{4}"$		Hinged lid.	
B 121—15 $\frac{7}{8}" \times 9"$	$17\frac{3}{4}" \times 11"$	9"		Hinged lid, oval.	
B 140—17 $\frac{3}{4}" \times 12\frac{3}{4}"$	$20" \times 15"$	10"		Chained lid.	
B 145—22 $\frac{1}{2}" \times 11\frac{1}{2}"$	$26\frac{3}{4}" \times 14\frac{1}{4}"$	5"		Hinged lid.	
B 146—25" x 22 $\frac{1}{2}"$	$26" \times 23"$	6"		do.	
B 149—27" x 20"	$29\frac{1}{4}" \times 22\frac{1}{4}"$	6"		Chained lid.	
B 150—14 $\frac{1}{8}" \times 14\frac{1}{8}"$	$16" \times 16"$	4"		do.	
B 152—30" x 23"	$30" \times 23"$	$8\frac{1}{4}"$		Lid in 3 pieces.	
B 186—20" x 18"	$22\frac{1}{2}" \times 19\frac{1}{2}"$	4"		Hinged and locked.	
B 192—16" x 10 $\frac{1}{4}"$	$18" \times 12"$	6"		Chained lid.	
B 203—22 $\frac{1}{2}" \times 13"$	$25\frac{1}{2}" \times 16"$	10"		do.	
B 204—26" sq.	26" sq.	6"		do.	
B 213—60" x 21"	$61\frac{1}{2}" \times 22\frac{1}{2}"$	$4\frac{1}{2}"$		Lid in 2 pieces.	
B 215—4 $\frac{3}{4}"$ sq.	$7\frac{3}{8}"$ sq.	$10\frac{1}{2}"$		Top, body, and bottom flange square.	
B 216—27" x 24"	$27" \times 24"$	6"		2 lifting rings in lid.	
B 222—14 $\frac{1}{2}" \times 5"$	$16" \times 6\frac{1}{2}"$	$3\frac{1}{2}"$		Hinged and locked.	
B 228—23" x 18"	$24" \times 19"$	$7\frac{3}{8}"$		do.	
B 230—12" sq.	16" sq.	9"		Chained lid.	
B 234—22 $\frac{1}{4}"$ sq.	$23\frac{1}{2}"$ sq.	4"		do.	
B 237—10 $\frac{5}{8}" \times 4\frac{5}{8}"$	$15" \times 9"$	6"		do.	
B 241—30" x 14"	$32" \times 16"$	5"		Chained lid, with small ventilating chamber at one end.	
B 243—14" x 12"	$16\frac{1}{2}" \times 14\frac{1}{2}"$	9"		Chained lid, with small lid in centre.	
B 248—20" x 9"	$21\frac{1}{2}" \times 10\frac{1}{2}"$	6"		Chained lid.	
B 249—24" x 18"	$25\frac{3}{4}" \times 19\frac{3}{4}"$	6"		do.	
B 253—26" x 15"	$28" \times 17"$	$\left\{ \begin{array}{l} 8" \\ 10" \end{array} \right.$		Hinged and locking bolt.	
				do.	

All coated with Dr. Angus Smith's Patent Composition.

Surface Boxes for General Purposes

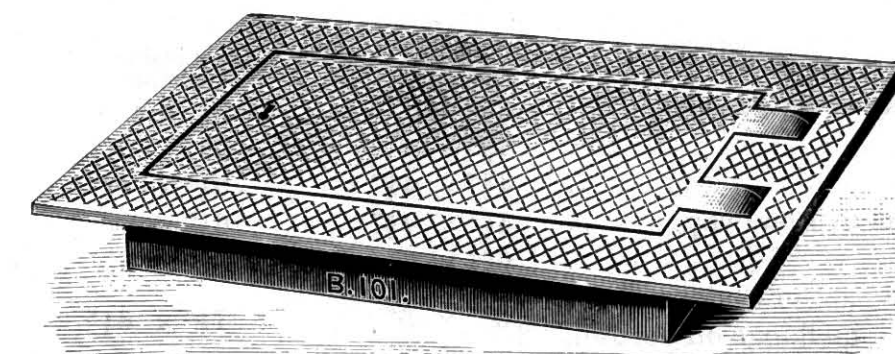
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Clear Opening.	Size inside at bottom.	Depth.	Remarks.	Price Each.
B 254—20" sq.	20" sq.	4"	Chained lid.	
B 258—27 $\frac{3}{4}$ " × 12 $\frac{3}{4}$ "	29 $\frac{1}{4}$ " × 14 $\frac{1}{2}$ "	4"	do.	
B 260—24" × 24"	25 $\frac{1}{4}$ " × 24"	4 $\frac{1}{4}$ "	Hinged and locked.	
B 264—24" sq.	24" sq.	15"	Half of lid ventilating.	
B 268—18" × 13"	20 $\frac{3}{4}$ " × 15 $\frac{3}{4}$ "	10 $\frac{1}{4}$ "	Chained lid.	
B 272—22" sq.	23" sq.	9"	do.	
B 273—16" sq.	17 $\frac{1}{2}$ " sq.	6 $\frac{1}{2}$ "	do.	
B 274—28 $\frac{3}{4}$ " × 18 $\frac{3}{4}$ "	31 $\frac{1}{4}$ " × 21 $\frac{1}{4}$ "	9"	do.	
B 275—26 $\frac{3}{4}$ " × 15 $\frac{3}{4}$ "	28 $\frac{3}{8}$ " × 17 $\frac{3}{8}$ "	5"	do.	
B 276—15" × 13"	16 $\frac{1}{2}$ " × 14 $\frac{1}{2}$ "	6"	do.	
B 277—25 $\frac{1}{4}$ " × 12 $\frac{3}{4}$ "	27 $\frac{3}{8}$ " × 14 $\frac{5}{8}$ "	6 $\frac{1}{2}$ "	do.	
B 278—32 $\frac{3}{4}$ " × 20 $\frac{3}{4}$ "	34 $\frac{3}{8}$ " × 22 $\frac{5}{8}$ "	4 $\frac{1}{2}$ "	Hinged and locked.	
B 279—20" × 9"	22" × 11"	4"	Chained lid.	
B 281—30" × 21"	30" × 21"	6"	With lock and safety stay.	
B 282—36" × 24"	36" × 24"	6"	do.	
B 283—27" × 24"	29 $\frac{3}{4}$ " × 26"	4"	Hinged and locked.	
B 287—16 $\frac{1}{2}$ " sq.	18 $\frac{3}{8}$ " sq.	6"	Chained lid.	
B 293—12" × 7"	14 $\frac{1}{2}$ " × 9 $\frac{1}{2}$ "	4 $\frac{3}{8}$ "	Lid in 2 pieces, heavy.	
B 294—24" × 18"	24" × 18"	6"	Hinged lid.	
B 295—12 $\frac{1}{4}$ " × 6 $\frac{1}{4}$ "	15" × 8"	6"	Hinged and locked.	
B 296—11 $\frac{1}{4}$ " × 7 $\frac{3}{8}$ "	14" × 9 $\frac{1}{2}$ "	8"	Hinged lid.	
B 297—50" × 13 $\frac{1}{2}$ "	53" × 16 $\frac{1}{2}$ "	5"	Light.	
B 299—15" sq.	16 $\frac{3}{4}$ " sq.	4"	Chained lid.	
B 300—11 $\frac{1}{2}$ " × 7 $\frac{3}{4}$ "	14 $\frac{3}{8}$ " × 10"	6"	Heavy hinged lid, with small malleable cast hinged lid in centre.	
B 301—7" × 7"	7 $\frac{5}{8}$ " sq.	3 $\frac{1}{2}$ "	Chained lid.	
B 302—32" × 18"	34" × 20"	12"	Chained lid, in 2 pieces.	
B 303—9" sq.	13" sq.	12"	do.	
B 305—8" × 10"	10" × 12"	8 $\frac{1}{2}$ "	do.	
B 306—12 $\frac{3}{4}$ " sq.	14 $\frac{1}{4}$ " sq.	5 $\frac{1}{4}$ "	Hinged and locked with wrought-iron galvanized tray.	
B 307—8" × 6"	10" × 8"	8 $\frac{1}{2}$ "	Chained lid.	
B 308—10 $\frac{1}{2}$ " × 7 $\frac{3}{8}$ "	12 $\frac{3}{8}$ " × 8"	4 $\frac{1}{2}$ "	Hinged lid.	
B 309—5" × 4 $\frac{1}{4}$ "	6" × 6"	3 $\frac{1}{2}$ "	do.	
B 311—34" × 24"	37 $\frac{1}{4}$ " × 25 $\frac{1}{2}$ "	4"	Hinged and locked.	
B 312—14" × 10"	16" × 12"	6 $\frac{3}{4}$ "	Light, hinged and locked.	
B 313—do.	do.	do.	Heavy, do. do.	
B 314—5" dia.	6 $\frac{1}{4}$ " dia.	12"	Light, chained lid.	
B 315—5" dia.	7" dia.	12"	Heavy, do.	
B 316—30" × 12"	33" × 15"	6"	Light, hinged and locked.	
B 317—do.	do.	do.	Heavy, hinged.	
B 319—16" × 12"	17 $\frac{1}{2}$ " × 13 $\frac{1}{2}$ "	4"	Chained lid.	
B 320—13 $\frac{1}{4}$ " sq.	14 $\frac{3}{4}$ " sq.	3 $\frac{1}{8}$ "	Loose lid.	
B 321—16" × 12"	18" × 14"	6"	Chained lid.	
B 322—18" dia.	19 $\frac{1}{2}$ " dia.	7"	Chained and locking lid and W.I. lifting ring.	
B 323—25 $\frac{1}{2}$ " × 19"	26 $\frac{3}{4}$ " × 20 $\frac{1}{4}$ "	3"	Hinged and locked lid.	
B 324—15" × 9"	17 $\frac{3}{4}$ " × 11 $\frac{3}{4}$ "	8"	Chained lid.	
B 325—7 $\frac{1}{4}$ " × 4"	10" × 6 $\frac{1}{2}$ "	8"	do.	
B 326—19" × 16"	21 $\frac{1}{2}$ " × 18 $\frac{1}{2}$ "	6"	Locked lid, light.	
B 327—9 $\frac{3}{4}$ " sq.	12" sq.	6"	Chained lid, heavy.	
B 328—19" × 16"	21 $\frac{1}{4}$ " × 18 $\frac{1}{4}$ "	6"	do.	
B 329—10 $\frac{1}{4}$ " × 6 $\frac{3}{4}$ "	11 $\frac{5}{8}$ " × 8 $\frac{3}{8}$ "	12"	do.	

Surface Boxes for General Purposes

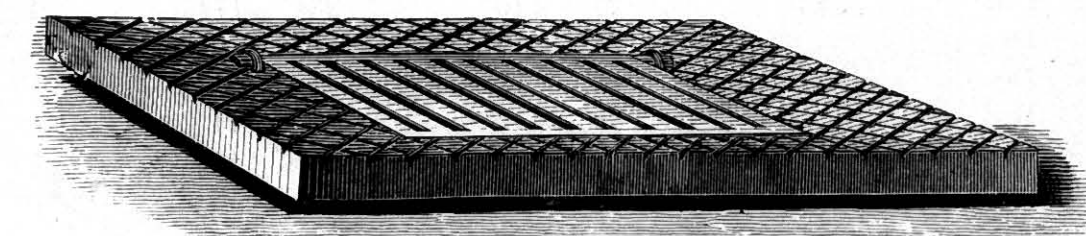
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Clear Opening.	Size inside at bottom.	Depth.	Remarks.	Price Each.
B 330—2 $\frac{1}{2}$ " dia.	3 $\frac{3}{4}$ " dia.	6 $\frac{1}{2}$ "	Chained lid, flange in centre.	
B 331—7 $\frac{1}{8}$ " × 4 $\frac{1}{8}$ "	8 $\frac{3}{4}$ " × 6 $\frac{3}{4}$ "	8"	do. with gunmetal lock.	
B 332—21" sq.	21" sq.	6"	Hinged lid, locking bolt and padlock, ventilator on lid.	
B 333—30" × 20"	32 $\frac{5}{8}$ " × 21 $\frac{5}{8}$ "	4"	Hinged and locked lid.	
B 335—8 $\frac{3}{4}$ " × 3 $\frac{1}{2}$ "	9 $\frac{1}{2}$ " × 5 $\frac{1}{2}$ "	6 $\frac{1}{2}$ "	Chained lid.	
B 336—9" × 7"	11 $\frac{1}{2}$ " × 9 $\frac{1}{2}$ "	8 $\frac{1}{2}$ "	do.	
B 337—36" × 20"	38 $\frac{3}{4}$ " × 22 $\frac{3}{4}$ "	7"	Lid in 2 pieces.	
B 338—22 $\frac{1}{4}$ " × 12 $\frac{1}{2}$ "	24" × 14 $\frac{1}{4}$ "	8"	Chained lid.	
B 339—9 $\frac{1}{4}$ " × 5 $\frac{1}{2}$ "	12" × 8 $\frac{1}{4}$ "	6"	do.	
B 340—13 $\frac{1}{8}$ " sq.	15" sq.	10"	do.	
B 341—18 $\frac{1}{2}$ " × 10"	22 $\frac{1}{2}$ " × 12 $\frac{1}{2}$ "	6"	Hinged and locked lid.	
B 342—5" × 5"	6 $\frac{5}{8}$ " × 6 $\frac{5}{8}$ "	6"	Chained lid.	
B 343—43 $\frac{1}{4}$ " × 24"	43 $\frac{1}{4}$ " × 24"	4"	Lid in 2 pieces, hinged.	



Clear Opening.	Size inside at bottom.	Depth.	Remarks.	Price Each.
B 76—8 $\frac{1}{2}$ " × 6 $\frac{1}{2}$ "	9 $\frac{1}{4}$ " × 7 $\frac{1}{4}$ "	4"	Chained lid.	
B 101—20" × 20"	20" × 20"	3 $\frac{1}{2}$ "	Hinged lid.	
B 247—36" × 36"	36" × 36"	5"	do.	
B 318—24" × 18"	24" × 18"	3 $\frac{1}{4}$ "	do.	

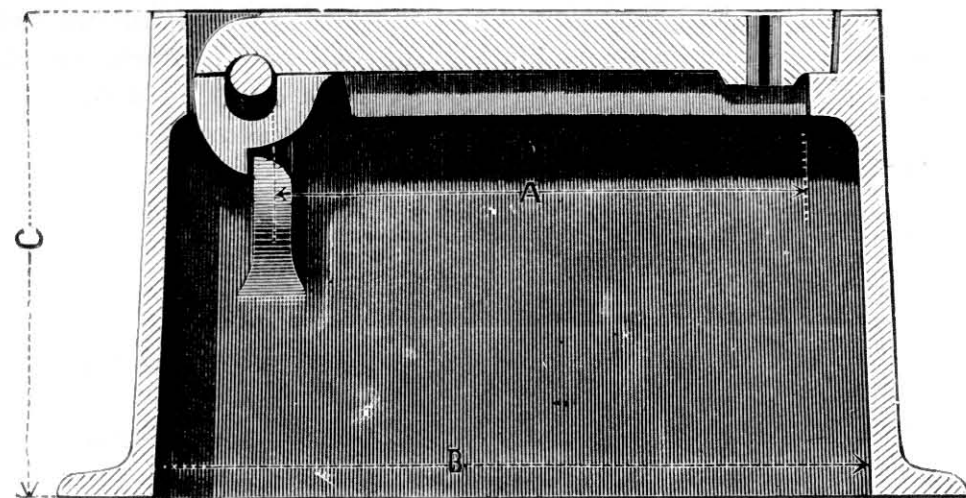
Flat Grating, with Frame.



	Overall.	Grating.	Price Each.
B 39	18" × 17 $\frac{1}{2}$ "	8" × 7 $\frac{1}{2}$ "	
	27" × 27"	14" × 14"	

All coated with Dr. Angus Smith's Patent Composition.

Surface Boxes, With Brown's Patent Self-Locking Lids.



		Clear Opening.	Size inside at bottom.	Depth.	Price Each
B 10P—For Stop Cocks in Pavements, ..		3½" dia.	3½" dia.	5"	
B 11P—Do. ..		4½" × 4"	5½" × 5½"	3"	
B 211P—Do. ..		4¾" × 4¼"	5½" × 4¾"	3¾"	
B 24P—For Stop Cocks in Roadway, ..		4¾" × 4½"	6½" × 6¼"	4"	
B 23P—Do. ..		6¾" × 3½"	9¾" × 5¾"	6¼"	
B 224P—Do. or Sluice Valves, no flange on bottom, }		5" × 5"	7½" × 6½"	6"	
B 171P—Do. ..		5½" × 5½"	7" × 7"	3"	
B 8P—For Ball Hydrants, ..		7¾" × 5"	10½" × 6¾"	8"	
B 6P—Do. ..		9¼" × 6¾"	12¾" × 9"	8¾"	
B 22P—For Air Valve H 4, ..		10" × 10"	12¾" × 11½"	4"	
B 15P—For Spindle Hydrants C 24, C 28, etc.,		11¾" × 8½"	15" × 10½"	9"	
B 147P—Do. ..		15" × 8½"	17¾" × 10"	4½"	
B 82P—For Valve Hydrants C 35 and 150,		14" × 10"	16¾" × 11¾"	4"	
B 84P—For General Purposes, ..		15" × 12"	17¾" × 13¾"	4"	
B 14P—For 2" Double Air Valve, ..		17" × 13"	19¾" × 14¾"	4"	
B 200P—For General Purposes, ..		18" × 12"	20½" × 13¼"	4"	
B 27P—Do. ..		20" × 15"	22¾" × 16¾"	4"	
B 227P—Do. ..		21" × 16"	23¾" × 17¾"	4"	
B 304P—Do. ..		15" × 12"	16¾" × 13½"	3¼"	
B 334P—Do. ..		12" × 12"	14¾" × 15¼"	10"	
B 344P—Do. ..		18" × 12"	21½" × 14¾"	10"	
B 345P—Do. ..		15" × 12"	18½" × 14¾"	10"	
B 346P—Do. ..		10" × 10"	13½" × 12½"	10"	

Any of GLENFIELD & KENNEDY'S Square or Rectangular Surface Boxes can be made with BROWN'S Patent Self-locking Lids.

The Lock is very simple.

To open the Lid, lift it bodily with the Key, and turn it backwards.

All coated with Dr. Angus Smith's Patent Composition.

Surface Boxes

(Norton's Patent).

The illustrations show some types of these Surface Boxes. They are fitted with a special lid, having a loose hinge pin fitted into recesses in the box, the recesses being fitted with white metal blocks, forming a non-corrodible bearing for hinge, thus preventing rusting up, and so fitted that they cannot be removed without suitable tools and until the lids are fully opened. There are no bolts or nuts and the blocks are interchangeable.

Broken or dangerous lids can be removed and new ones fixed in a few minutes without disturbing the frame or roadway.

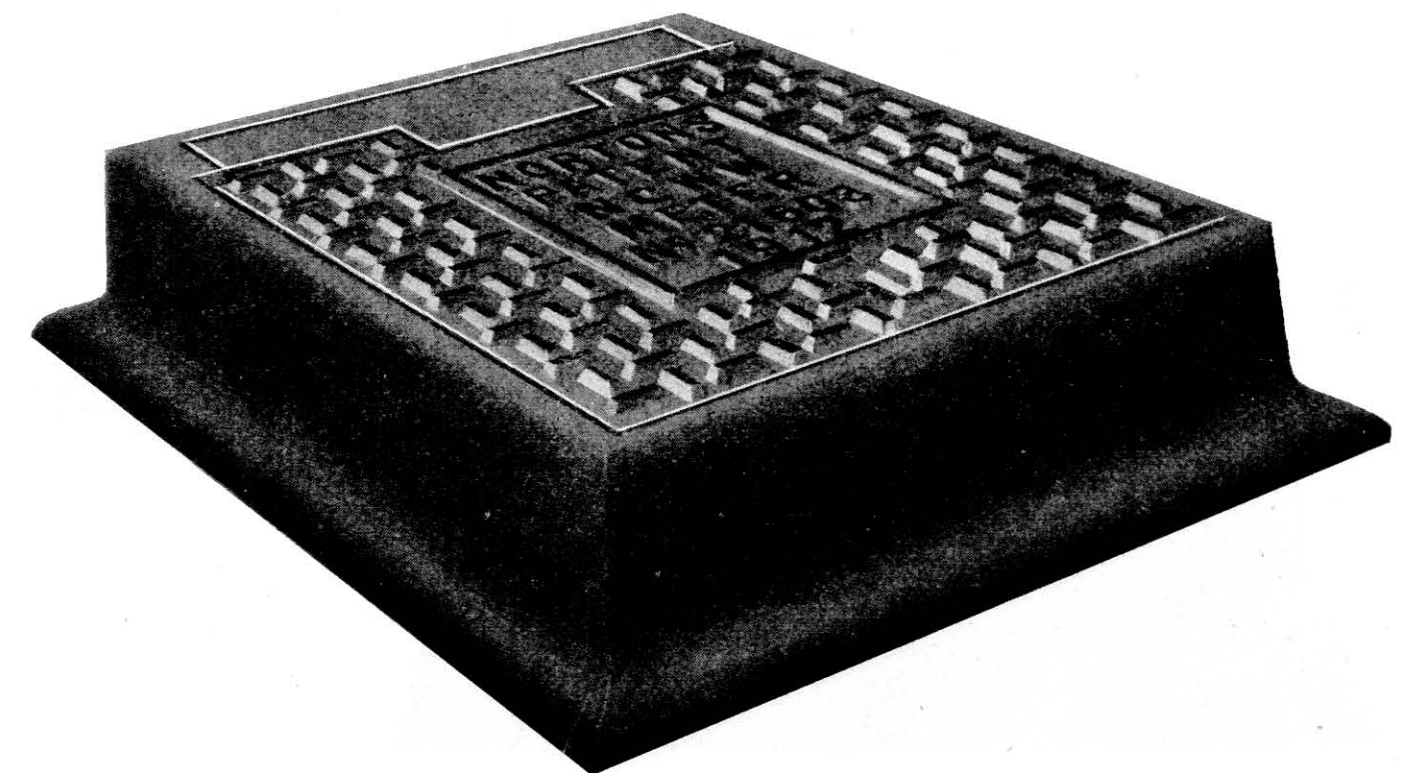
Surface Boxes fitted with Double Hinge, Non-Rocking Lids have brackets cast in frame for supporting these Lids, and when open the Lids lie flat on the surface of the roadway.

For extraordinarily heavy traffic, Steel or Malleable Iron Lids can be fixed to the frames.

Meter Surface Box.

With Double or Single Link Lid, Lock Bolt and Dust Proof Tray inside.

Fig. B 400 N.



For particulars see page 19.

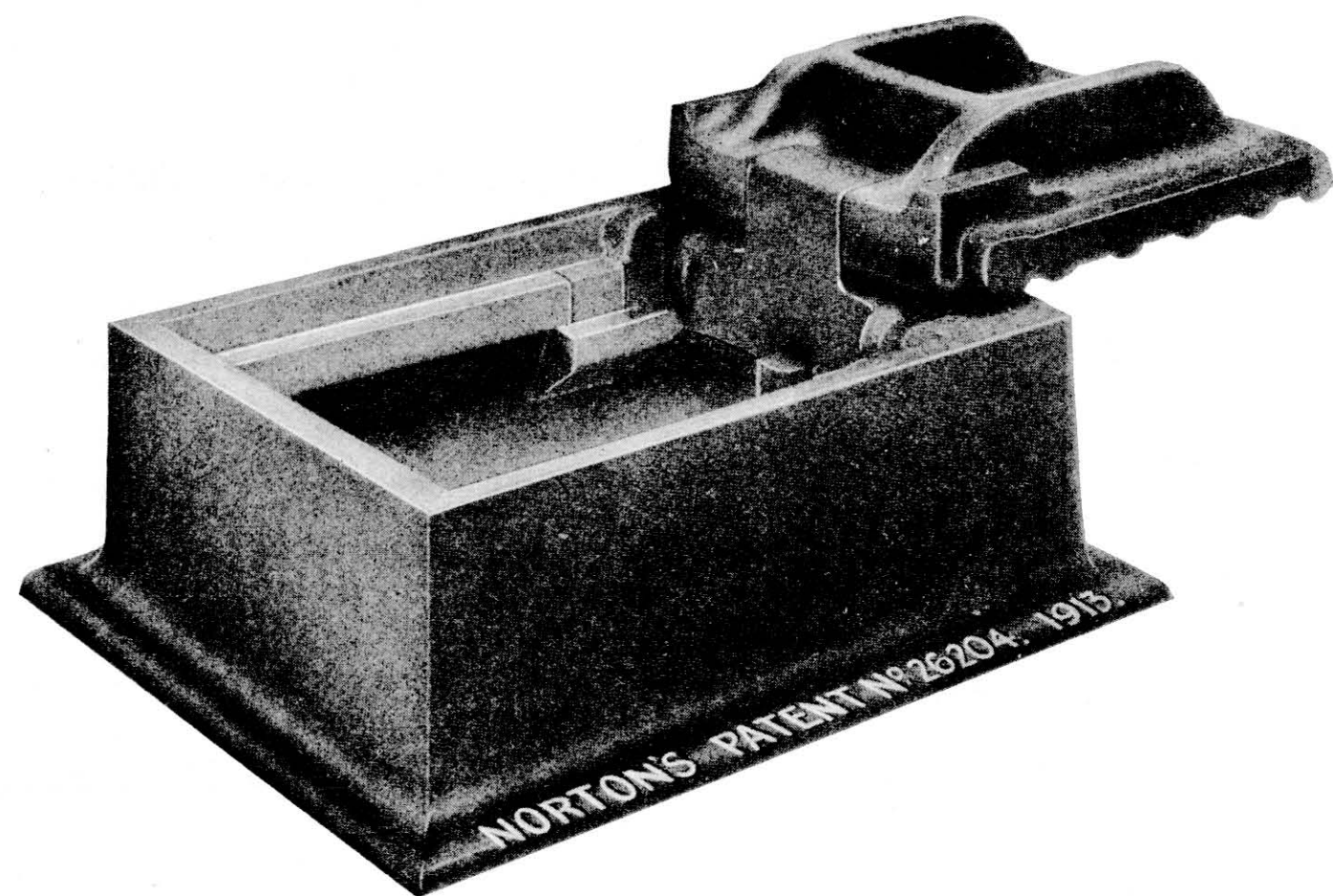
Surface Boxes

(Norton's Patent)—continued.

Heavy Pattern Hydrant Surface Box.

With Double or Single Link Lid.

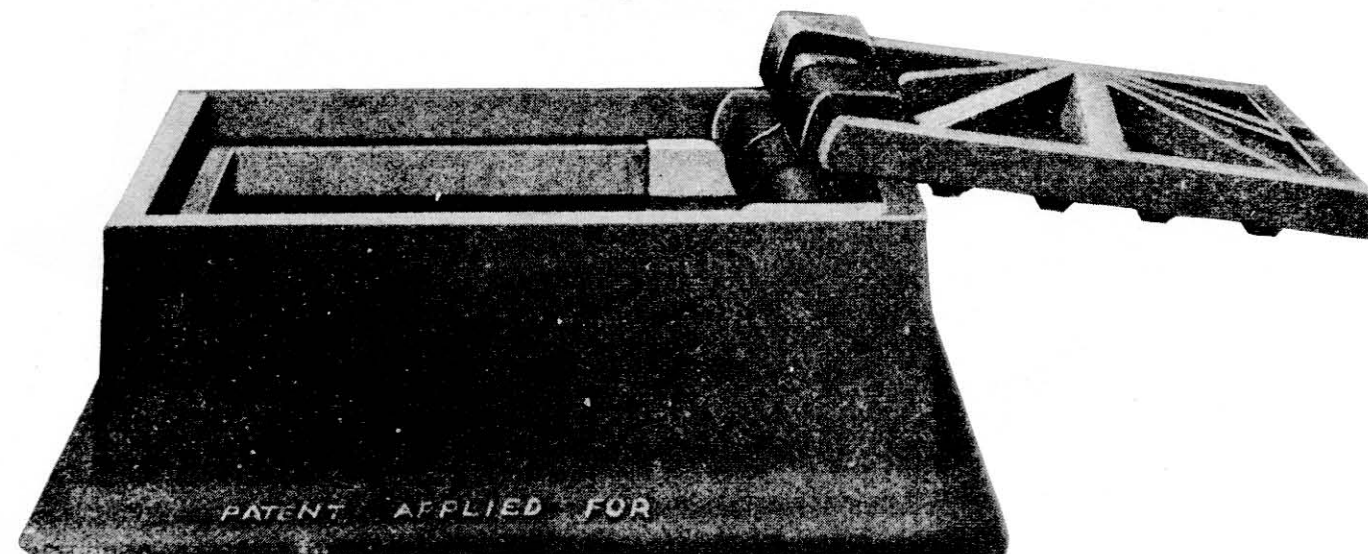
Fig. B 402 N.



Hydrant or Valve Surface Box.

With Double or Single Link Lid.

Fig. B 404 N.



For particulars see page 19.

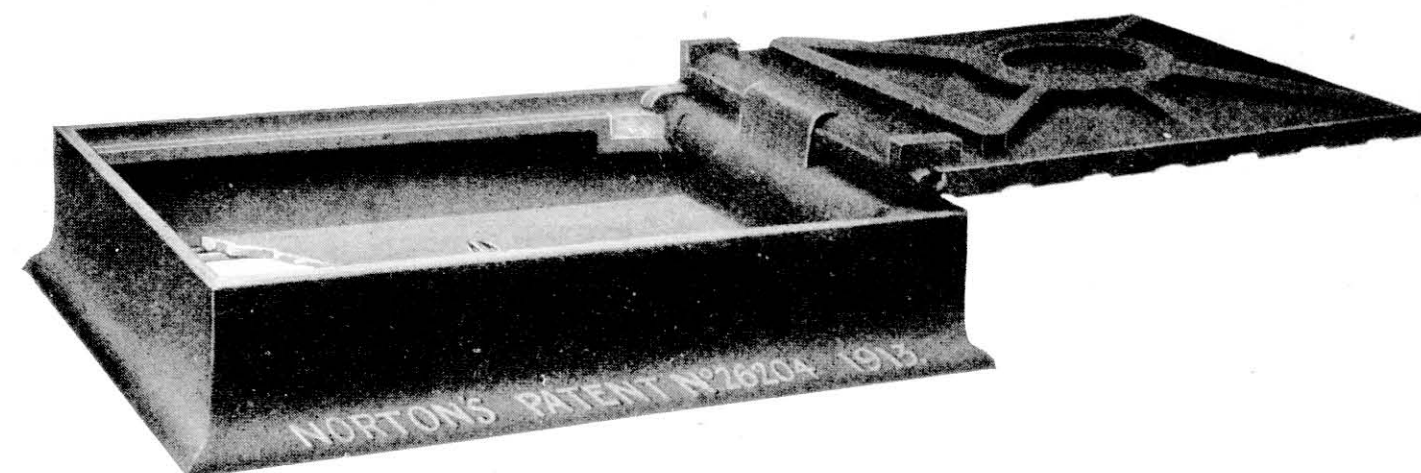
Surface Boxes

(Norton's Patent)—continued.

Double Link Intercepting Chamber or Meter Surface Box.

With Inner Air or Dust-proof Seal Plate and Stud Locking Bolt.

Fig. B 406 N.

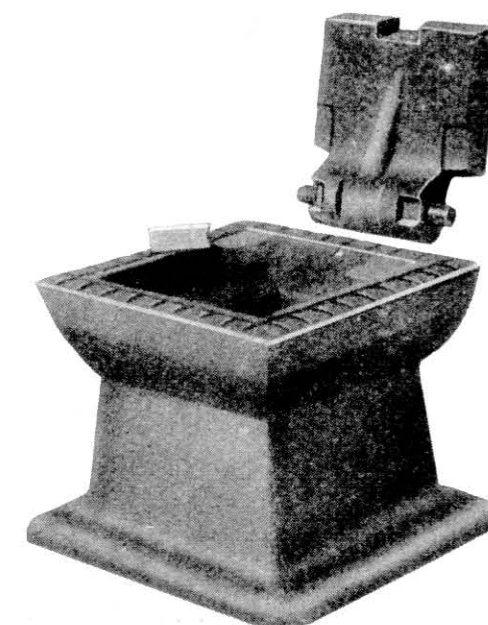
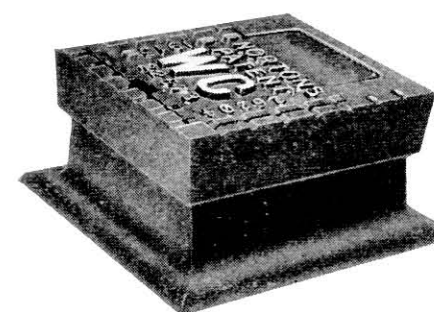


Stop Cock and Valve Surface Boxes.

Fig. B 412 N.

Fig. B 410 N.

Fig. B 408 N.



	Clear Opening.	Over Flange.	Depth.
B 400N	24" x 18"	31 1/2" x 24 1/2"	5 3/4"
B 402N	12" x 9"	19 3/4" x 15 1/2"	6 1/2" (Heavy)
B 404N	12" x 9"	19 3/4" x 15 1/2"	6 1/2" (Light)
B 406N	18" x 15"	27" x 21 1/2"	5 3/4"
B 408N	4" x 3 1/4"	7 1/2" x 7"	3 1/2"
B 410N	4" x 3 1/4"	8 1/2" x 8 1/2"	6 1/2"
B 412N	6" x 5 1/2"	12" x 12"	6 1/2"

Prices on application.

Special Castings.

STANDARD List of Tee Pieces (Figs. C 30 and C 31) and Crosses (Fig. C 75)

Fig. C 30.

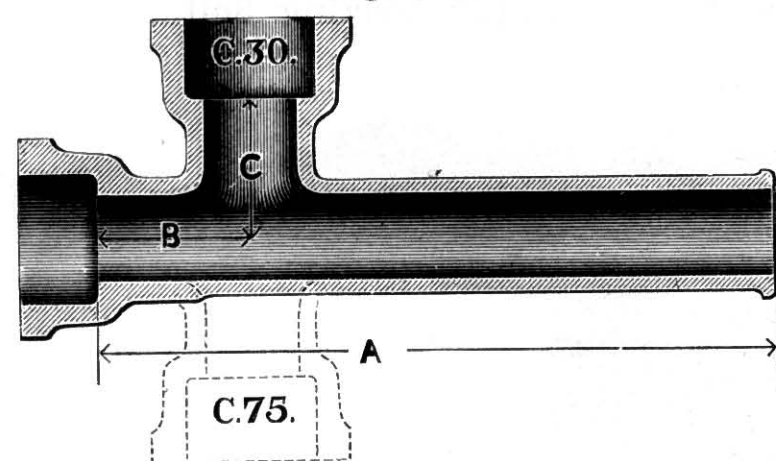
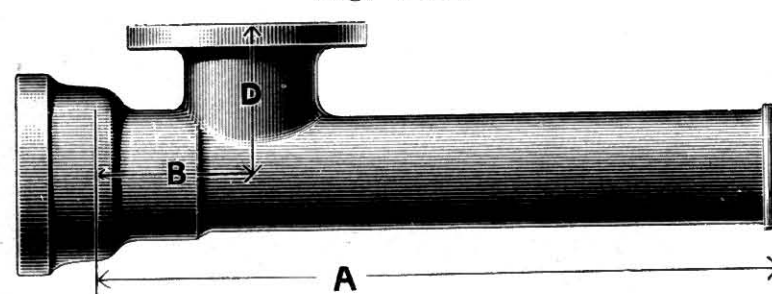


Fig. C 31.



INTERNAL DIA. OF		DIMENSIONS.				PRICES.	
Pipe.	Branch.	A	B	C	D	Figs. C 30 and C 31. Each.	Fig. C 75. Each.
1½"	× 1½"	1' 9½"	2¾"	2¾"	4½"		
2"	× 1½"	2' 3"	3¾"	3¾"	5"		
2"	× 2"	2' 3"	3¾"	3¾"	5"		
2½"	× 1½"	2' 3"	4¾"	4¾"	6"		
2½"	× 2"	2' 3"	4¾"	4¾"	6"		
2½"	× 2½"	2' 3"	4¾"	4¾"	6"		
3"	× 1½"	2' 3"	4¾"	4¾"	6½"		
3"	× 2"	2' 3"	4¾"	4¾"	6½"		
3"	× 2½"	2' 3"	4¾"	4¾"	7"		
3"	× 3"	2' 3"	4¾"	4¾"	7"		
4"	× 1½"	2' 3"	5"	5"	8"		
4"	× 2"	2' 3"	5"	5"	8"		
4"	× 2½"	2' 3"	5"	5"	8"		
4"	× 3"	2' 3"	5"	5"	8"		
4"	× 4"	2' 3"	5"	5"	8"		
5"	× 1½"	2' 6"	5"	5"	8"		
5"	× 2"	2' 6"	5"	5"	8"		
5"	× 2½"	2' 6"	5"	5"	8"		
5"	× 3"	2' 6"	5"	5"	8"		
5"	× 4"	2' 6"	6"	6"	8"		
5"	× 5"	2' 6"	6"	6"	8"		

All tested before leaving Works.

All Castings coated with Dr. Angus Smith's Patent Composition.

Special Castings.

STANDARD List of Tee Pieces (Figs. C 30 and C 31) and Crosses (Fig. C 75)—
(Continued).

Fig. C 30.

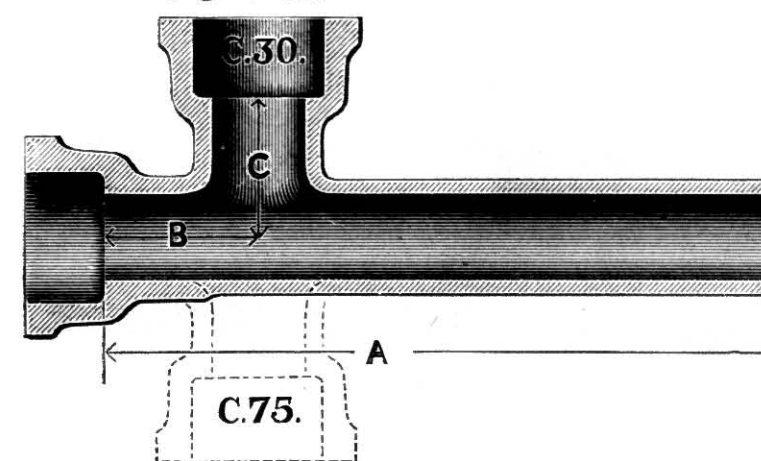
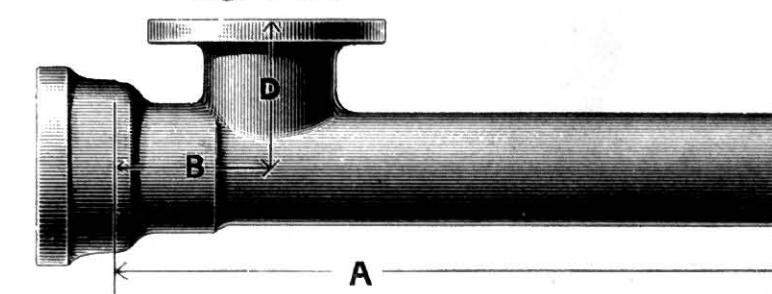


Fig. C 31.



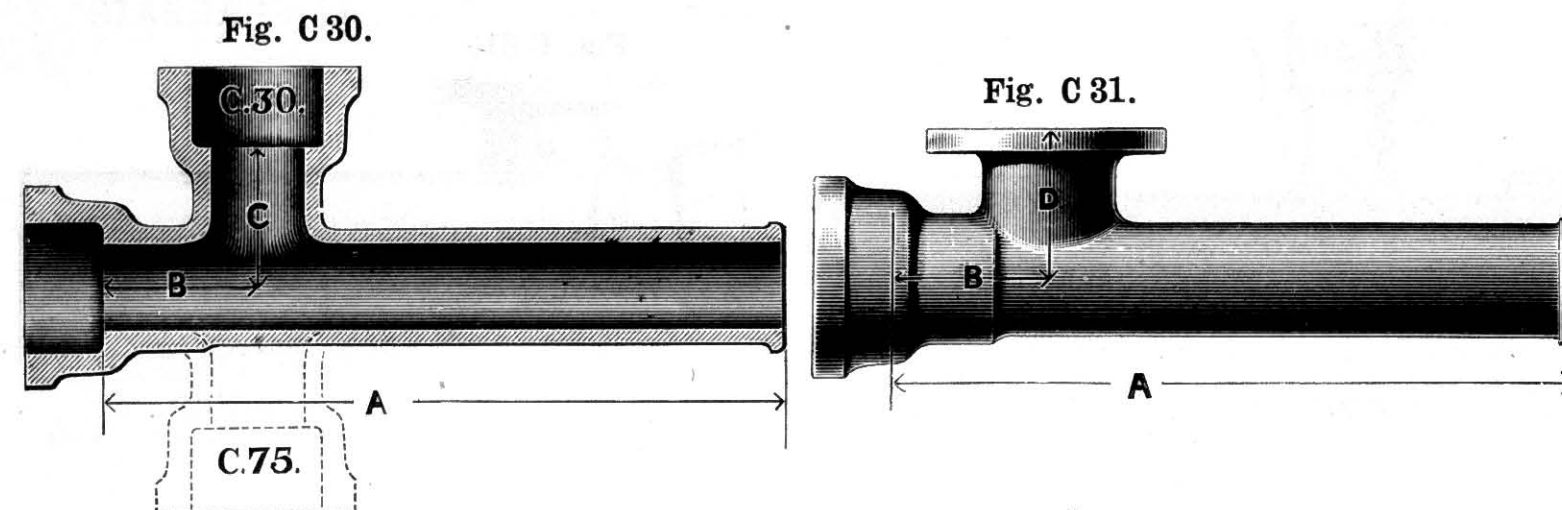
INTERNAL DIA. OF		DIMENSIONS.				PRICES.	
Pipe.	Branch.	A	B	C	D	Figs. C 30 and C 31. Each.	Fig. C 75. Each.
6"	× 1½"	2' 6"	6"	6"	9"		
6"	× 2"	2' 6"	6"	6"	9"		
6"	× 2½"	2' 6"	6"	6"	9"		
6"	× 3"	2' 6"	6"	6"	9"		
6"	× 4"	2' 6"	7"	7"	9"		
6"	× 5"	2' 6"	7"	7"	9"		
6"	× 6"	2' 6"	7"	7"	9"		
7"	× 2"	2' 9"	7"	7"	9"		
7"	× 2½"	2' 9"	7"	7"	9"		
7"	× 3"	2' 9"	7"	7"	9"		
7"	× 4"	2' 9"	7"	7"	9"		
7"	× 5"	2' 9"	7"	7"	9"		
7"	× 6"	2' 9"	7"	7"	9"		
7"	× 7"	2' 9"	7"	7"	9"		
8"	× 2½"	2' 9"	8"	8"	9"		
8"	× 3"	2' 9"	8"	8"	9"		
8"	× 4"	2' 9"	8"	8"	9"		
8"	× 5"	2' 9"	8"	8"	9"		
8"	× 6"	2' 9"	8"	8"	9"		
8"	× 7"	2' 9"	8"	8"	9"		
8"	× 8"	2' 9"	8"	8"	9"		
9"	× 3"	3' 0"	9"	9"	9½"		
9"	× 4"	3' 0"	9"	9"	9½"		
9"	× 5"	3' 0"	9"	9"	9½"		
9"	× 6"	3' 0"	9"	9"	9½"		
9"	× 7"	3' 0"	9"	9"	10"		
9"	× 8"	3' 0"	9"	9"	10"		
9"	× 9"	3' 0"	9"	9"	10"		

All tested before leaving Works.

All Castings coated with Dr. Angus Smith's Patent Composition.

Special Castings.

STANDARD List of Tee Pieces (Figs. C 30 and C 31) and Crosses (Fig. C 75)—
(Continued).



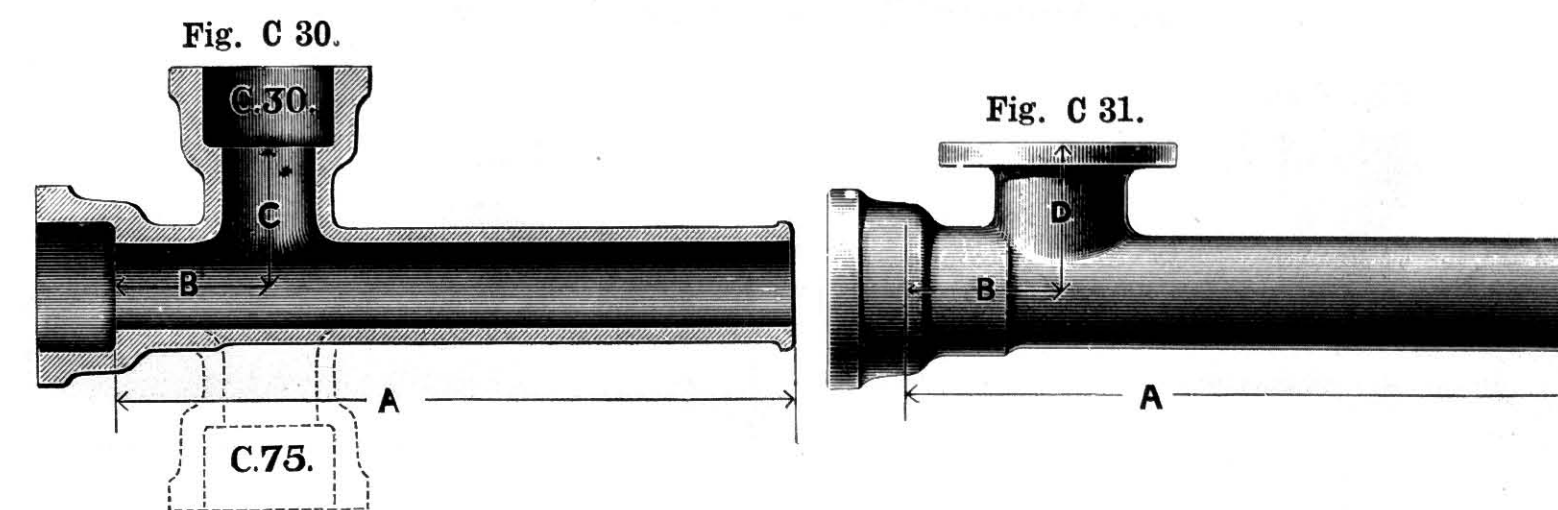
INTERNAL DIA. OF		DIMENSIONS.				PRICES.	
Pipe.	Branch.	A	B	C	D	Figs. C 30 and C 31. Each.	Fig. C 75. Each.
10" × 3"		3' 0"	9"	9"	10"		
10" × 4"		3' 0"	9"	9"	10"		
10" × 5"	...	3' 0"	9"	9"	10"	...	...
10" × 6"		3' 0"	9"	9"	10"		
10" × 7"		3' 0"	9"	9"	10"		
10" × 8"	...	3' 0"	9"	9"	10"	...	...
10" × 9"		3' 0"	9"	9"	10"		
10" × 10"		3' 0"	9"	9"	10"		
11" × 3"	...	3' 0"	9"	9"	10"	...	...
11" × 6"		3' 0"	9"	9"	10"		
11" × 9"		3' 0"	9"	9"	10"		
11" × 11"	...	3' 0"	9"	9"	10"	...	...
12" × 3"		3' 0"	10"	10"	11"		
12" × 4"		3' 0"	10"	10"	11"		
12" × 6"	...	3' 0"	10"	10"	11"	...	...
12" × 8"		3' 0"	10"	10"	11"		
12" × 9"		3' 0"	10"	10"	11"		
12" × 10"	...	3' 0"	10"	10"	11"	...	...
12" × 12"		3' 0"	10"	10"	11"		
13" × 4"		3' 3"	10"	10"	11½"		
13" × 6"	...	3' 3"	10"	10"	11½"	...	...
13" × 9"		3' 3"	10"	10"	11½"		
14" × 6"		3' 3"	11"	11"	12"		
14" × 9"	...	3' 3"	11"	11"	12"	...	...
14" × 12"		3' 3"	11"	11"	12"		
14" × 14"		3' 3"	11"	11"	12"		

All tested before leaving Works.

All Castings coated with Dr. Angus Smith's Patent Composition.

Special Castings.

STANDARD List of Tee Pieces (Figs. C 30 and C 31) and Crosses (Fig. C 75)—
(Continued).



INTERNAL DIA. OF		DIMENSIONS.				PRICES.	
Pipe.	Branch.	A	B	C	D	Figs. C 30 and C 31. Each.	Fig. C 75. Each.
15" × 6"		3' 3"	11"	11"	1' 1"		
15" × 9"		3' 3"	11"	11"	1' 1"		
15" × 12"	...	3' 3"	11"	11"	1' 1"	...	...
15" × 15"		3' 3"	11"	11"	1' 1"		
16" × 6"		3' 6"	12"	12"	1' 2"		
16" × 9"	...	3' 6"	12"	12"	1' 2"	...	...
16" × 12"		3' 6"	12"	12"	1' 2"		
16" × 16"		3' 6"	12"	12"	1' 2"		
18" × 9"	...	3' 9"	1' 1"	1' 1"	1' 2½"	...	...
18" × 12"		3' 9"	1' 1"	1' 1"	1' 2½"		
18" × 15"		3' 9"	1' 1"	1' 1"	1' 2½"		
18" × 18"	...	3' 9"	1' 1"	1' 1"	1' 2½"	...	...
20" × 12"		4' 0"	1' 3"	1' 3"	1' 5"		
20" × 15"		4' 0"	1' 3"	1' 3"	1' 5"		
20" × 18"	...	4' 0"	1' 3"	1' 3"	1' 5"	...	...
20" × 20"		4' 0"	1' 3"	1' 3"	1' 5"		
21" × 12"		4' 0"	1' 3"	1' 3"	1' 6"		
21" × 18"	...	4' 0"	1' 3"	1' 3"	1' 6"	...	...
21" × 21"		4' 0"	1' 3"	1' 3"	1' 6"		
22" × 12"		4' 3"	1' 4"	1' 4"	1' 7"		
22" × 18"	...	4' 3"	1' 4"	1' 4"	1' 7"	...	...
22" × 22"		4' 3"	1' 4"	1' 4"	1' 7"		
24" × 12"		4' 6"	1' 6"	1' 6"	1' 9"		
24" × 18"	...	4' 6"	1' 6"	1' 6"	1' 9"	...	...
24" × 24"		4' 6"	1' 6"	1' 6"	1' 9"		

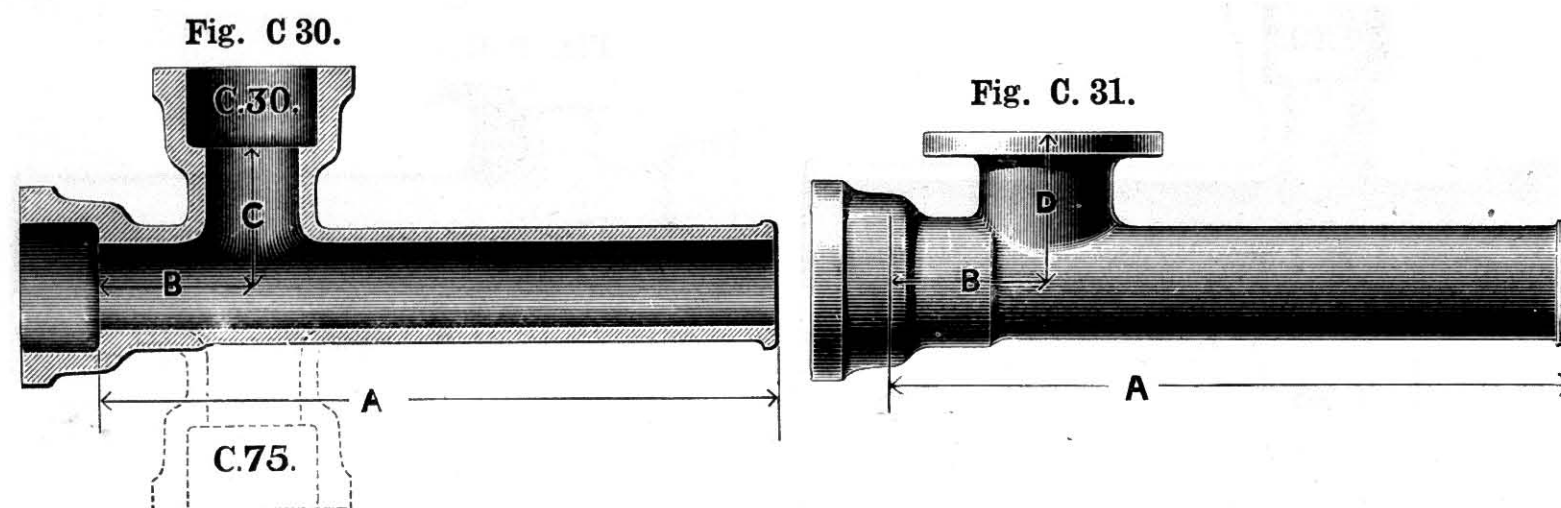
All tested before leaving Works.

All Castings coated with Dr. Angus Smith's Patent Composition.

Special Castings.

MISCELLANEOUS List of Tee Pieces (Figs. C 30 and C 31) and Crosses (Fig. C 75).

For Standard List see pages 20 to 23.



INTERNAL DIA. OF		DIMENSIONS.				PRICES.	
Pipe.	Branch.	A	B	C	D	Figs. C 30 and C 31. Each.	Fig. C 75. Each.
2" × 2"		3' 0"	1' 0"	8½"	7¼"		
3" × 2"		3' 0"	1' 0"	9"	7¾"		
3" × 3"		3' 0"	1' 0"	9"	7¾"		
4" × 2"		3' 0"	1' 0"	9½"	8"		
4" × 3"		3' 0"	1' 0"	9½"	8"		
4" × 4"		3' 0"	1' 0"	9½"	8"		
5" × 3"		3' 0"	1' 0"	10"	8"		
5" × 4"		3' 0"	1' 0"	10"	8"		
6" × 3"		4' 0"	1' 6"	10½"	9"		
6" × 4"		4' 0"	1' 6"	10½"	9"		
6" × 6"		4' 0"	1' 6"	11"	9"		
7" × 4"		4' 0"	1' 6"	11"	9"		
7" × 6"		4' 0"	1' 6"	11"	9"		
8" × 4"		4' 0"	1' 6"	11¾"	9"		
8" × 6"		4' 0"	1' 6"	1' 0"	9"		
8" × 8"		4' 0"	1' 6"	1' 0½"	9"		
9" × 3"		4' 0"	1' 6"	1' 0½"	9½"		
9" × 4"		4' 0"	1' 6"	1' 0½"	9½"		
9" × 6"		4' 0"	1' 6"	1' 0¾"	10"		
9" × 9"		4' 0"	1' 6"	1' 1"	10"		

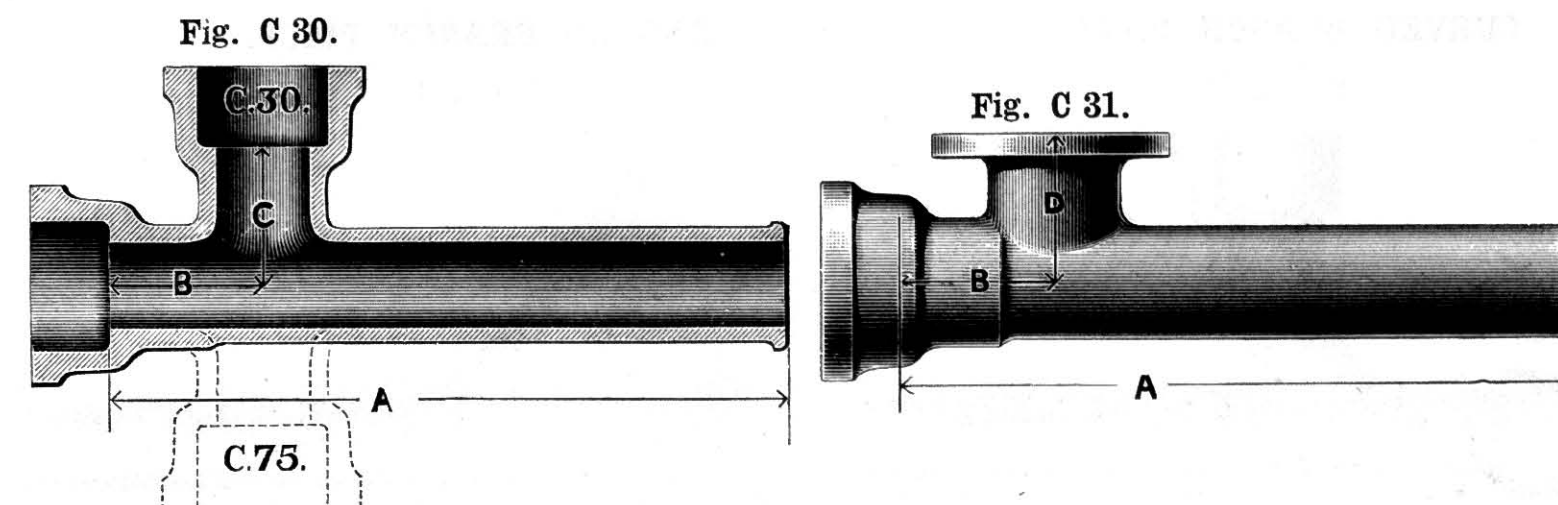
NOTE.—These are all as used by Glasgow Corporation Water Works, and are ⅛" smaller in bore than the nominal size.

All tested before leaving Works.

All Castings coated with Dr. Angus Smith's Patent Composition.

Special Castings.

MISCELLANEOUS List of Tee Pieces (Figs. C 30 and C 31) and Crosses (Fig. C 75)
(Continued). For Standard List see pages 20 to 23.



INTERNAL DIA. OF		DIMENSIONS.				PRICES.	
Pipe.	Branch.	A	B	C	D	Figs. C 30 and C 31. Each.	Fig. C 75. Each.
10" × 4"		4' 0"	1' 6"	1' 1"	10"		
10" × 6"		4' 0"	1' 6"	1' 1"	10"		
10" × 10"		4' 0"	1' 6"	1' 1½"	10"		
12" × 4"		4' 0"	1' 6"	1' 1½"	11"		
12" × 6"		4' 0"	1' 6"	1' 2"	11"		
12" × 9"		4' 0"	1' 6"	1' 2"	11"		
12" × 12"		4' 0"	1' 6"	1' 2"	11"		
13" × 4"		4' 0"	1' 6"	1' 2"	11½"		
13" × 6"		4' 0"	1' 6"	1' 2½"	11½"		
14" × 9"		4' 0"	1' 6"	1' 3"	1' 0"		
14" × 14"		4' 0"	1' 6"	1' 3"	1' 0"		
15" × 6"		4' 0"	1' 6"	1' 3"	1' 1"		
15" × 9"		4' 0"	1' 6"	1' 4"	1' 1"		
15" × 12"		4' 0"	1' 6"	1' 4"	1' 1"		
15" × 15"		4' 0"	1' 9"	1' 6"	1' 1"		
18" × 9"		4' 6"	1' 9"	1' 6"	1' 2½"		
18" × 12"		4' 6"	1' 9"	1' 7"	1' 2½"		
18" × 15"		4' 6"	2' 0"	1' 7½"	1' 2½"		
18" × 18"		4' 6"	2' 0"	1' 7½"	1' 2½"		
24" × 12"		5' 0"	2' 0"	1' 10"	1' 9"		
24" × 18"		5' 0"	2' 0"	1' 10"	1' 9"		
24" × 24"		5' 0"	2' 0"	1' 10"	1' 9"		

NOTE.—These are all as used by Glasgow Corporation Water Works, and are ¼" smaller in bore than the nominal size.

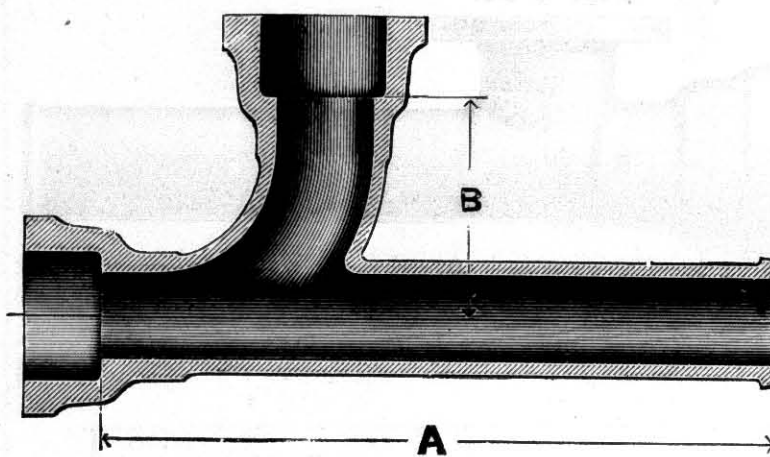
All tested before leaving Works.

All Castings coated with Dr. Angus Smith's Patent Composition.

Special Castings. STANDARD LIST.

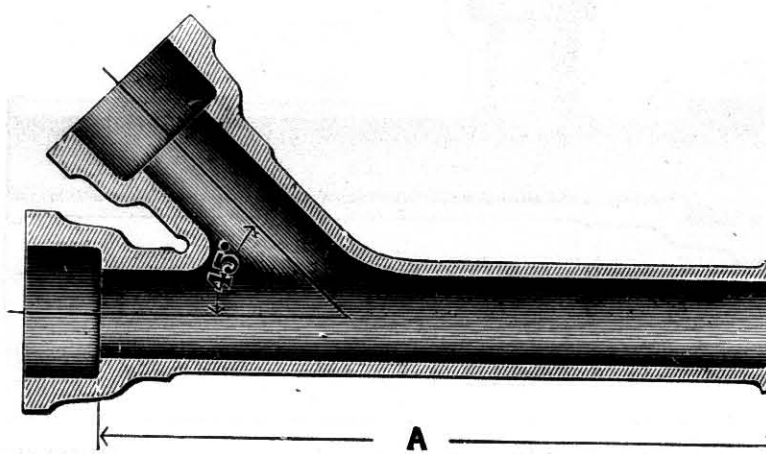
CURVED BRANCH PIECE.

Fig. C 71.



ANGLED BRANCH PIECE.

Fig. C 72.



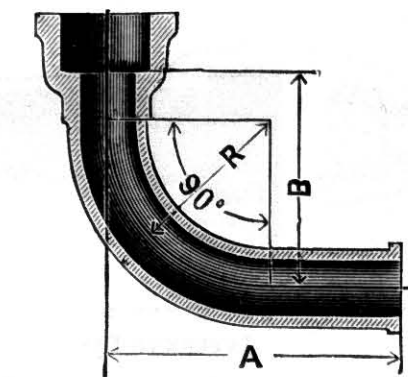
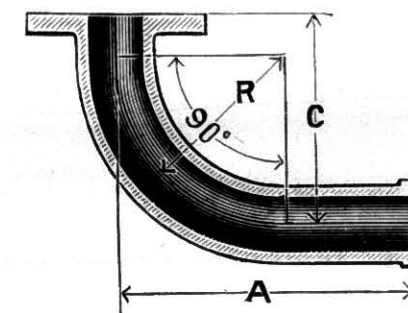
INTERNAL DIA. OF		DIMENSIONS.		PRICES.	
Pipe.	Branch.	A	B	Fig. C 71. Each.	Fig. C 72. Each.
1½"	× 1½"	1' 9½"	8"		
2"	× 2"	2' 3"	9"		
2½"	× 2½"	2' 3"	9"		
3"	× 3"	2' 3"	10"		
4"	× 4"	2' 3"	10"		
5"	× 5"	2' 6"	11"		
6"	× 6"	2' 6"	11"		
7"	× 7"	2' 9"	12"		
8"	× 8"	2' 9"	1' 1"		
10"	× 10"	3' 0"	1' 2"		
12"	× 12"	3' 0"	1' 4"		
15"	× 15"	3' 3"	1' 6"		
18"	× 18"	3' 9"	1' 8"		

All tested before leaving Works.

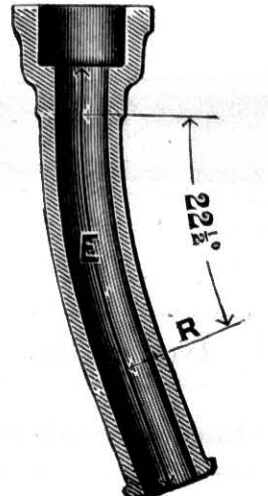
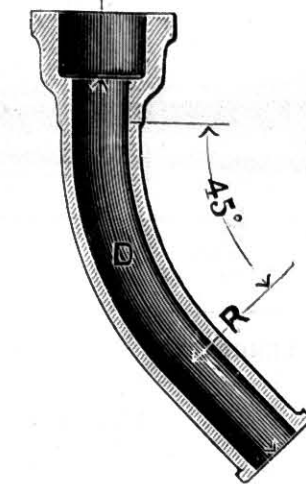
All Castings coated with Dr. Angus Smith's Patent Composition.

Special Castings. STANDARD List of Bends.

C 33.—Quarter Bends.—C 34.



Eighth Bend.—C 78. Sixteenth Bend.—C 160.



Internal Dia.	DIMENSIONS.								PRICES.			
	Quarter Bends.				Eighth Bends.		Sixteenth Bends.		Fig. C 33. Each.	Fig. C 34. Each.	Fig. C 78. Each.	Fig. C 160. Each.
	A	B	C	Radius.	D	Radius.	E	Radius.				
1½"	13"	7½"	7½"	5"	18½"	10"	18½"	20"				
2"	14½"	9½"	9½"	6½"	21¼"	13"	21¼"	26"				
2½"	15"	10"	10"	7"	22"	14"	22"	28"				
3"	17"	11"	11"	8"	24½"	16"	24½"	32"				
4"	18"	12"	12"	9"	26¼"	18"	26¼"	36"				
5"	18"	12½"	12½"	9"	26¾"	18"	26¾"	36"				
6"	20"	13½"	13½"	10"	29¼"	20"	29¼"	40"				
7"	21"	14½"	14½"	11"	30¾"	22"	30¾"	44"				
8"	22"	16"	16"	12"	32¼"	24"	32¼"	48"				
9"	23"	16"	16"	12"	33¾"	24"	33¾"	48"				
10"	23"	16"	16"	12"	33¾"	24"	33¾"	48"				
11"	23"	16"	16"	12"	33¾"	24"	33¾"	48"				
12"	24"	16"	16"	12"	34¾"	24"	34¾"	48"				
14"	26"	18½"	18½"	14"	38½"	28"	38½"	56"				
15"	27"	18½"	18½"	14"	39½"	28"	39½"	56"				
16"	29"	20½"	20½"	16"	42¾"	32"	42¾"	64"				
18"	31"	22½"	22½"	18"	45¾"	36"	45¾"	72"				
20"	34"	25"	25"	20"	50½"	40"	50½"	80"				
21"	34"	25"	25"	20"	50½"	40"	50½"	80"				
22"	38"	29"	29"	24"	56¾"	48"	56¾"	96"				
24"	39"	29"	29"	24"	57¾"	48"	57¾"	96"				

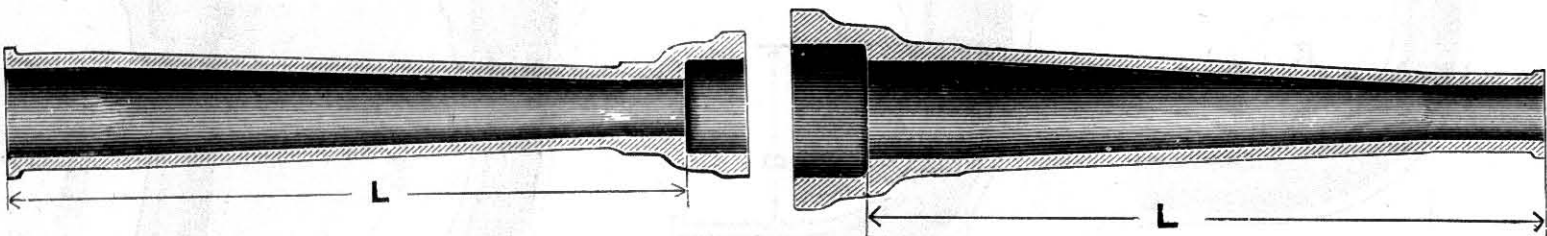
All tested before leaving Works.

All Castings coated with Dr. Angus Smith's Patent Composition.

Special Castings.
STANDARD List of Taper Pipes.

Fig. C 79.

Fig. C 79a.



INTERNAL DIA.		LENGTH. L	PRICES.		INTERNAL DIA.		LENGTH. L	PRICES.	
Large end.	Small end.		Fig. C 79. Each.	Fig. C 79a. Each.	Large end.	Small end.		Fig. C 79. Each.	Fig. C 79a. Each.
2"	to 1½"	2' 6"			7"	to 4"	3' 0"		
2½"	to 1½"	2' 6"			7"	to 5"	3' 0"		
2½"	to 2"	2' 6"	...	...	7"	to 6"	3' 0"	...	...
3"	to 1½"	3' 0"			8"	to 3"	3' 0"		
3"	to 2"	3' 0"			8"	to 4"	3' 0"		
3"	to 2½"	3' 0"	...	...	8"	to 5"	3' 0"	...	...
4"	to 2"	3' 0"			8"	to 6"	3' 0"		
4"	to 2½"	3' 0"			8"	to 7"	3' 0"		
4"	to 3"	3' 0"	...	...	9"	to 4"	3' 0"	...	...
5"	to 2"	3' 0"			9"	to 5"	3' 0"		
5"	to 2½"	3' 0"			9"	to 6"	3' 0"		
5"	to 3"	3' 0"	...	...	9"	to 7"	3' 0"	...	...
5"	to 4"	3' 0"			9"	to 8"	3' 0"		
6"	to 2"	3' 0"			10"	to 6"	3' 6"		
6"	to 3"	3' 0"	...	...	10"	to 7"	3' 6"	...	...
6"	to 4"	3' 0"			10"	to 8"	3' 6"		
6"	to 5"	3' 0"			10"	to 9"	3' 6"		
7"	to 3"	3' 0"							

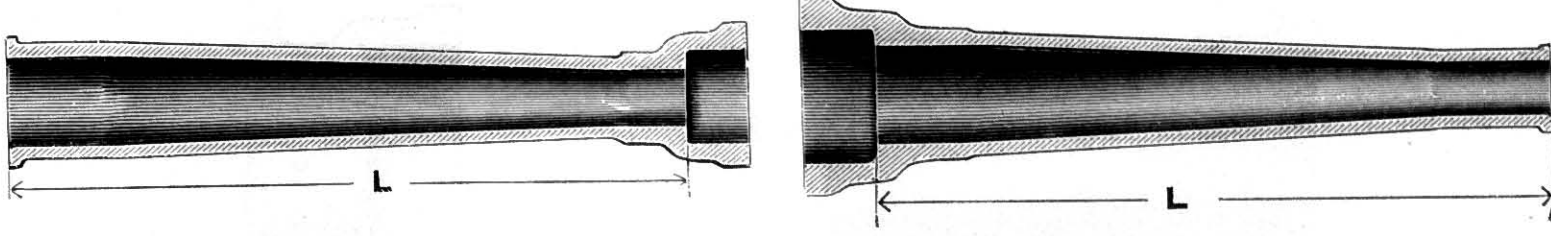
All tested before leaving Works.

All Castings coated with Dr. Angus Smith's Patent Composition.

Special Castings.
STANDARD List of Taper Pipes (Continued).

Fig. C 79.

Fig. C 79a.



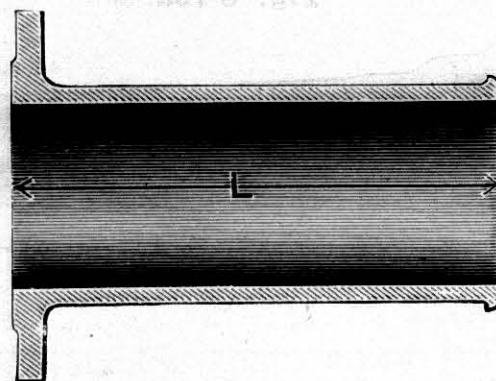
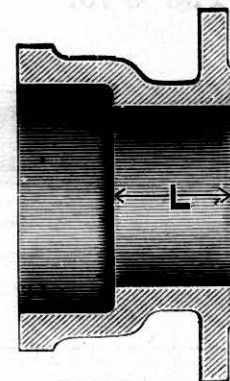
INTERNAL DIA.		LENGTH. L	PRICES.		INTERNAL DIA.		LENGTH. L	PRICES.	
Large end.	Small end.		Fig. C 79. Each.	Fig. C 79a. Each.	Large end.	Small end.		Fig. C 79. Each.	Fig. C 79a. Each.
12"	to 6"	4' 0"			18"	to 16"	4' 0"		
12"	to 8"	4' 0"			20"	to 12"	4' 0"		
12"	to 9"	4' 0"	...	...	20"	to 14"	4' 0"	...	...
12"	to 10"	4' 0"			20"	to 16"	4' 0"		
14"	to 8"	4' 0"			20"	to 18"	4' 0"		
14"	to 9"	4' 0"	...	...	21"	to 12"	4' 0"	...	...
14"	to 10"	4' 0"			21"	to 14"	4' 0"		
14"	to 12"	4' 0"			21"	to 16"	4' 0"		
15"	to 9"	4' 0"	...	...	21"	to 18"	4' 0"	...	...
15"	to 10"	4' 0"			22"	to 14"	4' 0"		
15"	to 12"	4' 0"			22"	to 16"	4' 0"		
16"	to 10"	4' 0"	...	...	22"	to 18"	4' 0"	...	...
16"	to 12"	4' 0"			22"	to 20"	4' 0"		
16"	to 14"	4' 0"			24"	to 16"	4' 0"		
18"	to 10"	4' 0"	...	...	24"	to 18"	4' 0"	...	...
18"	to 12"	4' 0"			24"	to 20"	4' 0"		
18"	to 14"	4' 0"			24"	to 22"	4' 0"		

All tested before leaving Works.

All Castings coated with Dr. Angus Smith's Patent Composition.

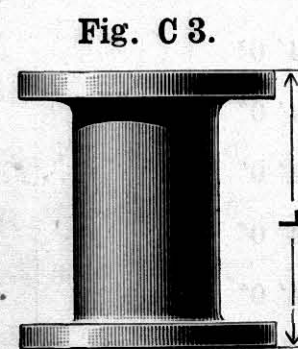
Special Castings.

STANDARD List.

Flange and Spigot Piece.
Fig. C 80.Flange and Socket Piece.
Fig. C 81.

Dia.	LENGTH.		Dia.	LENGTH.	
	Fig. C 80.	Fig. C 81.		Fig. C 80.	Fig. C 81.
1½"	14½"	2¾"	10"	18"	5½"
2"	16¾"	2¾"	11"	18½"	6"
2½"	16¾"	3¼"	12"	18½"	6"
3"	17"	4¼"	13"	18¾"	6¼"
3½"	17"	4¼"	14"	18¾"	6½"
4"	17"	4¼"	15"	19"	6¾"
4½"	17"	4¼"	16"	19"	6¾"
5"	17"	4¼"	18"	20"	7½"
6"	17"	4¾"	20"	20"	8"
7"	18"	4½"	21"	21"	8¼"
8"	18"	5"	22"	21"	8¼"
9"	18"	5¼"	24"	21"	8½"

Lengthening Pieces.



LENGTH. L	PRICES.	
	2½" Bore. Each.	3" Bore. Each.
3"		
6"		
8"
10"		
12"		
14"
16"		
18"		
21"		

All tested before leaving Works.

All Castings coated with Dr. Angus Smith's Patent Composition.

Special Castings.

STANDARD List.

Collars, Plugs, and Caps.

Fig. C 32.

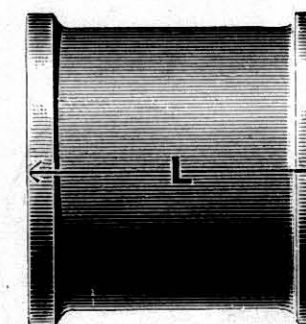


Fig. C 55.

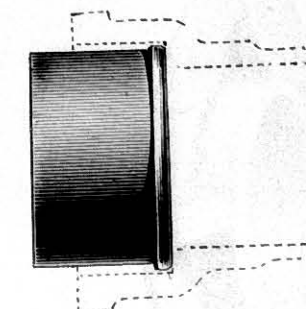
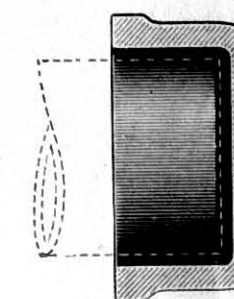


Fig. C 56.



To suit Pipes of under- noted Dia.	LENGTH OF COLLAR C 32. L	PRICES.			To suit Pipes of under- noted Dia.	LENGTH OF COLLAR C 32. L	PRICES.		
		Fig. C 32. Each.	Fig. C 55. Each.	Fig. C 56. Each.			Fig. C 32. Each.	Fig. C 55. Each.	Fig. C 56. Each.
1½"	6½"				13"	14"			
2"	8"				14"	16"			
2½"	8"	....	....	....	15"	16"	....	....	....
3"	8"				16"	16"			
3½"	8"				18"	16"			
4"	8"	....	....	....	20"	16"	....	....	....
4½"	9"				21"	16"			
5"	9"				22"	16"			
6"	9"	....	....	....	24"	18"	....	....	....
7"	9"				27"	18"			
8"	10"				30"	18"			
9"	10"	....	....	....	33"	18"	....	....	....
10"	12"				36"	18"			
11"	12"				42"	18"			
12"	14"				48"	18"			

All Specials are tested where practicable before leaving Works.

All Castings coated with Dr. Angus Smith's Patent Composition.

Special Castings.

Puddle Collars and Bellmouthed Pipes.

Fig. C 86.

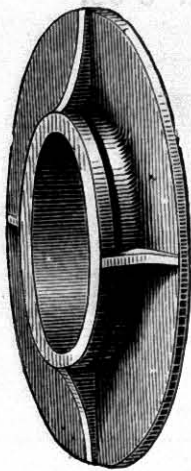


Fig. C 86a.

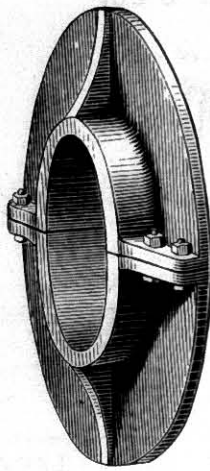
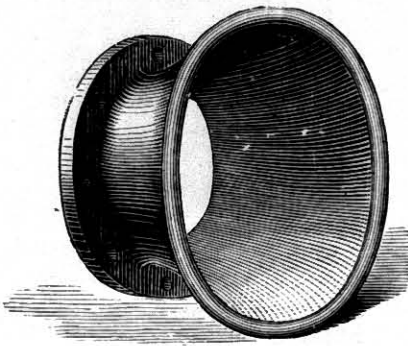


Fig. C 84.



To suit Pipes of undernoted Dia.	PRICES.			To suit Pipes of undernoted Dia.	PRICES.		
	Fig. C 86. Each.	Fig. C 86a. Each.	Fig. C 84. Each.		Fig. C 86. Each.	Fig. C 86a. Each.	Fig. C 84. Each.
6"				21"			
7"				22"			
8"	24" . . .	. . .	. . .	. . .
9"				27"			
10"				30"			
12"	33" . . .	. . .	. . .	. . .
14"				36"			
15"				40"			
16"	42" . . .	. . .	. . .	. . .
18"				48"			
20"				..			

All Specials are tested where practicable before leaving Works.

All Castings coated with Dr. Angus Smith's Patent Composition.

Special Castings.

Clips and Collars.

Fig. C 85.

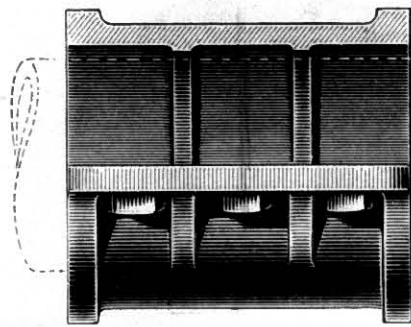


Fig. C 85a.

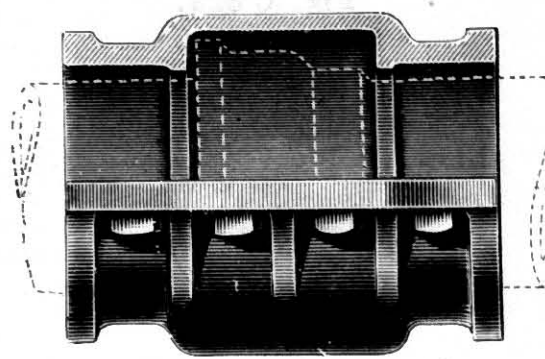
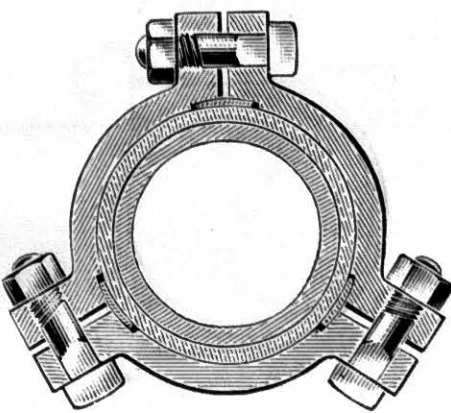


Fig. H 15.



To suit Pipes of undernoted Dia.	PRICES.		To suit Pipes of undernoted Dia.	PRICES.	
	Fig. C 85. Each.	Fig. C 85a. Each.		Fig. C 85. Each.	Fig. C 85a. Each.
6"			21"		
7"			22"		
8"	24" . . . .	. . . .	. . . .
9"			27"		
10"			30"		
12"	31½" . . . .	. . . .	. . . .
14"			33"		
15"			36"		
16"	40" . . . .	. . . .	. . . .
18"			42"		
20"			48"		

C 85 and C 85a are for repairing burst or split Pipes.

Prices include Bolts and Joint Complete—Flanges planed.

H 15 is used for making up Pipes which have been cut out, such as in Pipe Scraping operation, etc.

For Prices see Section J.

All Specials are tested where practicable before leaving Works.

All Castings coated with Dr. Angus Smith's Patent Composition.

Special Castings.

Saddles.

Fig. C 82.

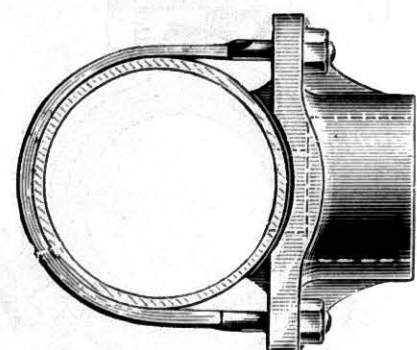


Fig. C 82a.

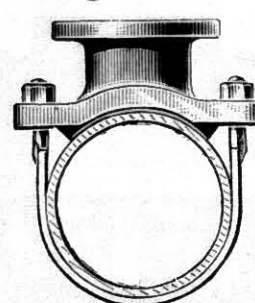
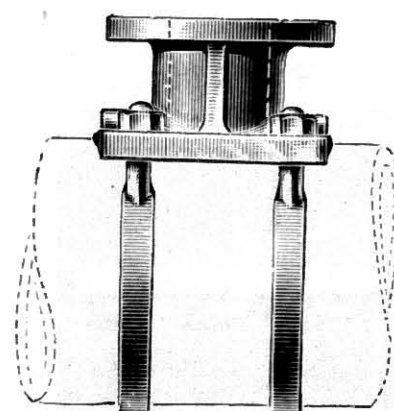


Fig. C 82a.



INTERNAL DIA.		PRICES.		INTERNAL DIA.		PRICES.	
Main.	Branch.	Fig. C 82. Each.	Fig. C 82a. Each.	Main.	Branch.	Fig. C 82. Each.	Fig. C 82a. Each.
4"	1½"			10"	6"		
4"	2"			12"	4"		
5"	2"	...	...	12"	6"	...	...
5"	2½"			12"	8"		
6"	2"			14"	6"		
6"	3"	...	...	14"	9"	...	...
7"	2"			15"	6"		
7"	3"			15"	9"		
7"	4"	...	...	16"	6"	...	...
8"	3"			16"	9"		
8"	4"			18"	9"		
8"	5"	...	...	18"	12"	...	...
9"	3"			20"	12"		
9"	4"			20"	15"		
9"	6"	...	...	24"	12"	...	...
10"	4"			24"	15"		

NOTE.—The smaller sizes are made with single Strap, the larger sizes with double Strap.
In those sizes that require it, the Straps are made jointed.

All Specials are tested where practicable before leaving Works.

All Castings coated with Dr. Angus Smith's Patent Composition.

Special Castings.

Miscellaneous Special Pipes.

Figs. C 73 and C 74.

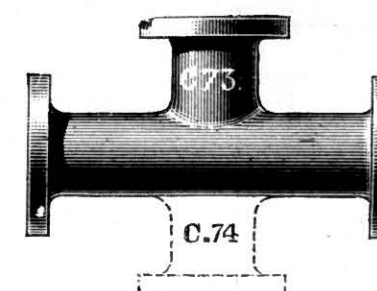


Fig. C 76.

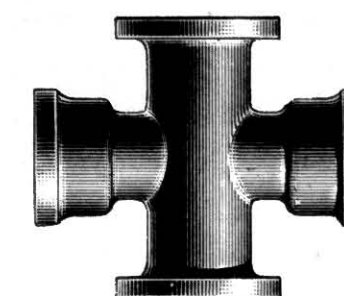


Fig. C 77.

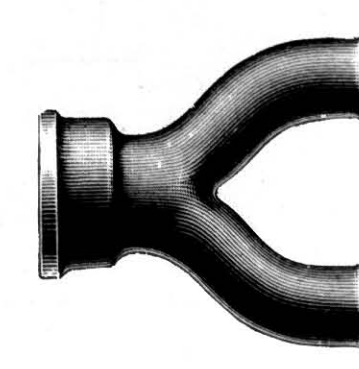


Fig. H 13.

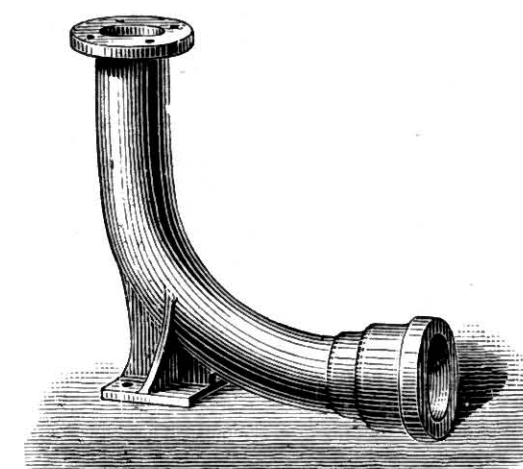


Fig. H 78.

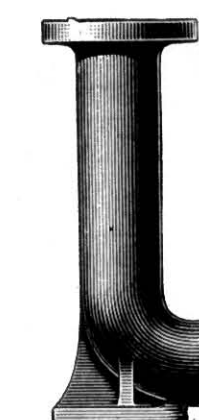


Fig. H 14.

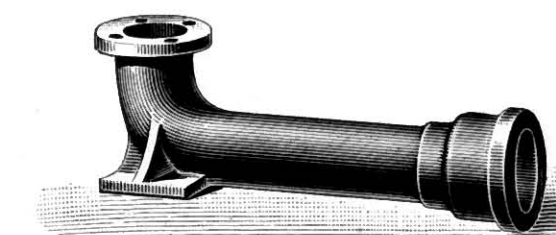


Fig. C 161.



Fig. C 162.

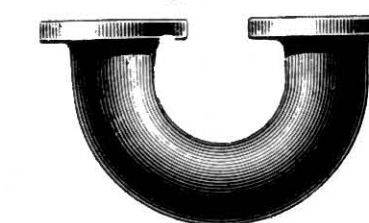
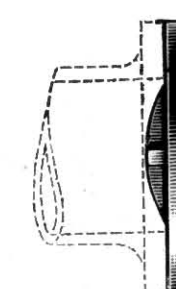


Fig. C 167.



PRICES.

	2½"	3"	4"	5"	6"	7"	8"	
Bend H 13 ..								each.
Bend H 14 ..								"
Bend H 78 ..								"

Larger Sizes.
Prices on application.

Blank Flange, Fig. C 167, machined and including Bolts and Joint.

3"	4"	5"	6"	7"	8"	9"	10"	11"	12"
each.									

Larger Sizes. Prices on application.

All Specials are tested where practicable before leaving Works.

All Castings coated with Dr. Angus Smith's Patent Composition.

Short Bends and Tees of Cast Iron.

(British Standard. Table IV.)

FOR ALL PRESSURES UP TO 325 LBS. PER SQ. IN.

Fig. C 200.

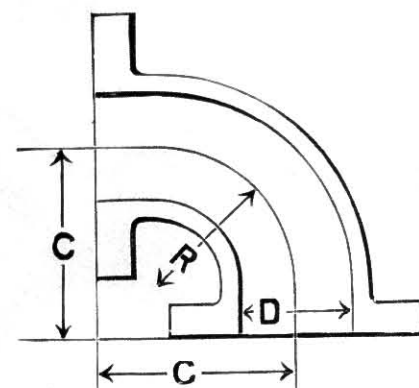
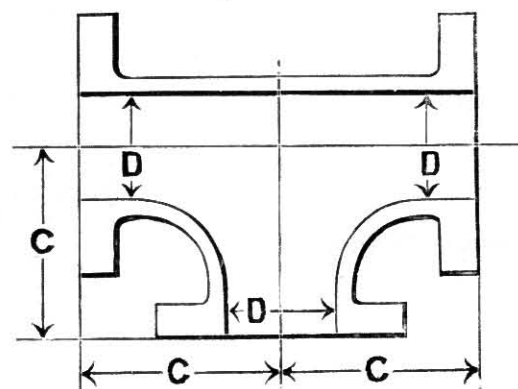


Fig. C 201.



These Sketches are merely for the purpose of identifying the dimensions given in the Table and are not to Scale.

D	$\frac{C}{D+3''}$	R	D	$\frac{C}{D+3''}$	R
Internal Dia. of Pipe.	Centre to Flange Face.	Radius of Centre-line of Bend.	Internal Dia. of Pipe.	Centre to Flange Face.	Radius of Centre-line of Bend.
$\frac{1}{2}''$	$3\frac{1}{2}''$	$2\frac{1}{2}''$	9"	12"	9"
$\frac{3}{4}''$	$3\frac{3}{4}''$	$2\frac{3}{4}''$	10"	13"	10"
1"	4"	$2\frac{3}{4}''$	*11"	14"	$10\frac{3}{4}''$
$1\frac{1}{4}''$	$4\frac{1}{4}''$	3"	12"	15"	$11\frac{3}{4}''$
$1\frac{1}{2}''$	$4\frac{1}{2}''$	3"	*13"	16"	$12\frac{1}{2}''$
* $1\frac{3}{4}''$	$4\frac{3}{4}''$	$3\frac{1}{4}''$	14"	17"	$13\frac{1}{2}''$
2"	5"	$3\frac{1}{4}''$	15"	18"	$14\frac{1}{4}''$
$2\frac{1}{2}''$	$5\frac{1}{2}''$	$3\frac{3}{4}''$	16"	19"	$15\frac{1}{4}''$
3"	6"	4"	*17"	20"	16"
$3\frac{1}{2}''$	$6\frac{1}{2}''$	$4\frac{1}{2}''$	18"	21"	17"
4"	7"	$4\frac{3}{4}''$	*19"	22"	$17\frac{3}{4}''$
* $4\frac{1}{2}''$	$7\frac{1}{2}''$	$5\frac{1}{4}''$	20"	23"	$18\frac{1}{4}''$
5"	8"	$5\frac{1}{2}''$	21"	24"	$19\frac{1}{2}''$
6"	9"	$6\frac{1}{2}''$	*22"	25"	$20\frac{1}{2}''$
7"	10"	$7\frac{1}{4}''$	*23"	26"	$21\frac{1}{4}''$
8"	11"	$8\frac{1}{4}''$	24"	27"	$22\frac{1}{4}''$

* The Committee suggest that, for general use, these sizes be dispensed with.

Prices on application.

All Castings coated with Dr. Angus Smith's Patent Composition.

Expansion Joints for Water.

Fig. C 101.

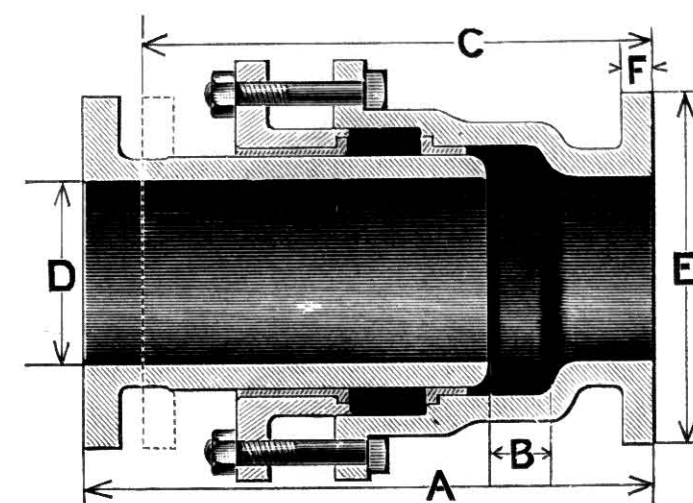
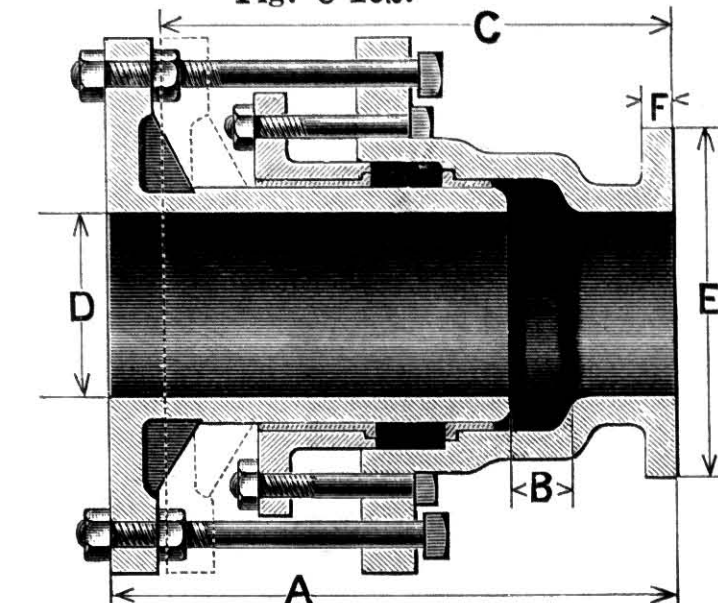


Fig. C 102.



PRICES.

	2"	$2\frac{1}{2}''$	3"	4"	5"	6"	7"	8"	9"	10"	12"	14"	16"	18"	20"	22"	24" internal dia.
C101																	each.
C102																	"

C 101 and C 102 have Gland Bush and Neck Bush of gun metal as shown; are often used in Steam Pipes. Spigot and Socket Connecting Pieces bolted and jointed on if desired. Flanges drilled to British Standard, Table I., unless otherwise instructed.

Fig. C 83.



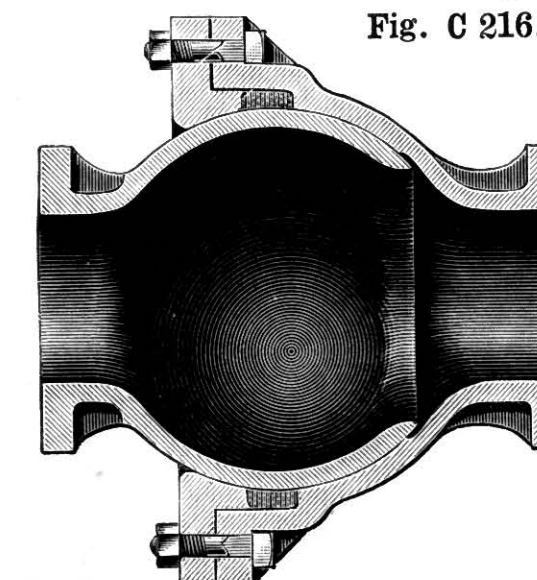
PRICES.

	2"	$2\frac{1}{2}''$	3"	4"	5"	6"	7"	8"	9"	10"	12"	14"	16"	18"	20"	22"	24" internal dia.
																	each.

Forster's Patent gives elasticity to the mains laid in ground liable to subsidence or across iron bridges liable to vibration.

Ball and Socket Joint.

Fig. C 216.



The Balls and Sockets are accurately machined by a special Ball Rest.

Prices.

	3"	4"	5"	6"	7"	8"	9"	10"	11"	12"

Larger Sizes.

Prices on application.

Flanges drilled to British Standard, Table I., unless otherwise instructed. All Specials are tested where practicable before leaving Works. All Castings coated with Dr. Angus Smith's Patent Composition.

Reservoir Ventilators.

Fig. C 87.

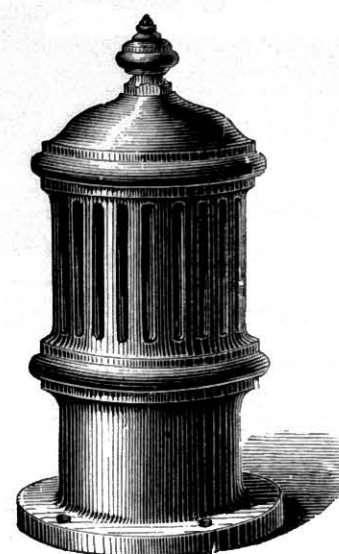


Fig. C 87a.

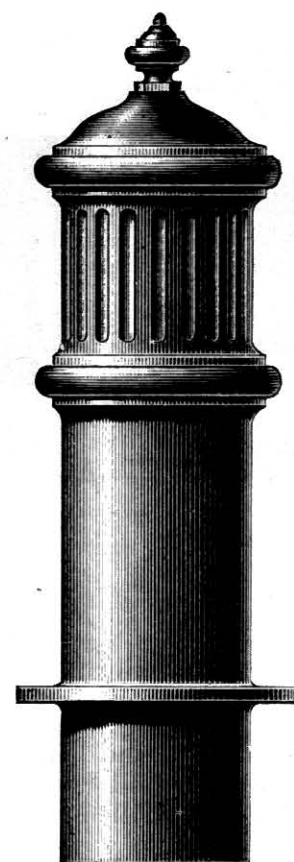


Fig. C 170.

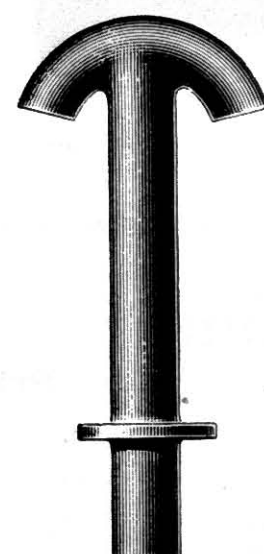
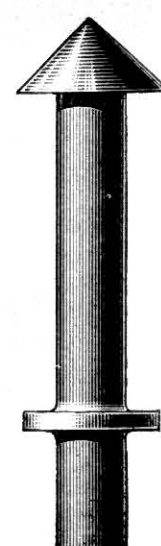


Fig. C 171.



Dia.	PRICES.				LENGTH OVER ALL.			
	Fig. C 87.	Fig. C 87a.	Fig. C 170.	Fig. C 171.	Fig. C 87.	Fig. C 87a.	Fig. C 170.	Fig. C 171.
2"					0' 10"	2' 5"	2' 4"	2' 4"
3"					0' 11"	2' 9½"	2' 7½"	2' 7½"
4"					1' 2½"	3' 1"	2' 11"	2' 11"
5"					1' 5"	3' 4½"	3' 5½"	3' 5½"
6"					1' 7"	3' 9"	4' 0"	4' 0"
7"					1' 11"	4' 3"	4' 4"	4' 4"
8"					2' 2"	4' 10½"	4' 8"	4' 8"
9"					2' 4½"	5' 5½"	5' 3"	5' 3"

Dirt Boxes.

Fig. H 24, large type.

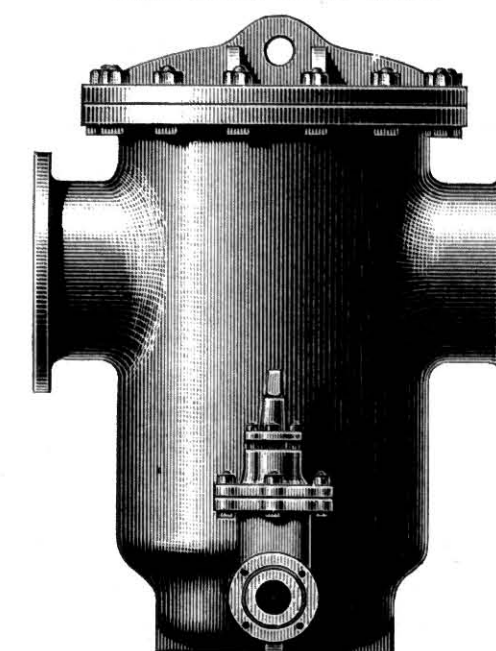


Fig. H 24.

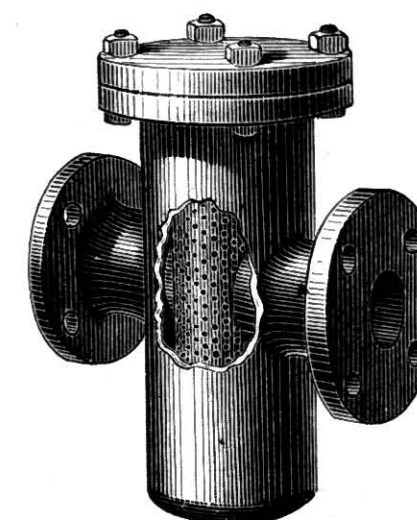
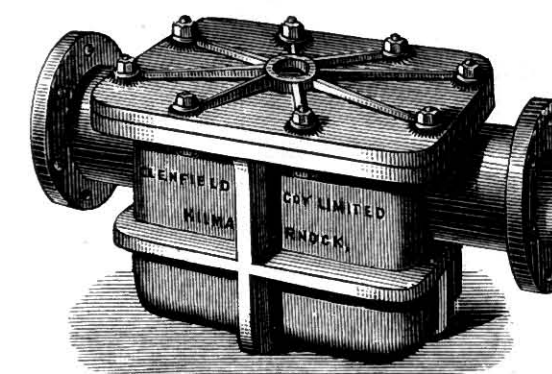


Fig. H 25.



PRICES.

H 24—Dirt Box, suitable for fixing on Inlet of Water Meters or for Supply Mains—

1½" 2" 3" 4" 5" 6" 8" 10" 12" 15" 18" 20" 24"

For List of Prices, see p. 6, Meter Section, and subject to discount applicable to that Section.

each.

These Dirt Boxes have perforated Copper Strainers. The Strainers may be of galvanized iron if desired. The larger sizes, 12" and upwards, are furnished with a Scour Branch and Sluice Valve.

H 25—Dirt Box, or Fish Valve, is furnished with Copper Wire Screen or Screens—

Prices on application.

All Castings coated with Dr. Angus Smith's Patent Composition.

Spigot and Socket Cast Iron Water Pipes.

Cast in Dry Sand, vertically, Socket down, and Tested at the Foundry to the respective pressures named.

Internal Dia.	TESTED TO A WATER PRESSURE OF—											
	400 Vertical Feet.			500 Vertical Feet.			600 Vertical Feet.			700 Vertical Feet.		
	Thick-ness.	Normal Weight of each Pipe.		Thick-ness.	Normal Weight of each Pipe.		Thick-ness.	Normal Weight of each Pipe.		Thick-ness.	Normal Weight of each Pipe.	
Inches.	Inches.	Cwts.	qrs.	lbs.	Inches.	Cwts.	qrs.	lbs.	Inches.	Cwts.	qrs.	lbs.
3	.368	1	0	10	.375	1	0	14	.400	1	0	23
4	.375	1	1	24	.397	1	2	6	.420	1	2	16
5	.405	1	3	22	.428	2	0	9	.451	2	0	22
6	.437	2	2	0	.459	2	2	14	.481	2	3	0
7	.450	3	0	0	.473	3	0	18	.496	3	1	8
8	.460	3	2	0	.485	3	2	21	.510	3	3	14
9	.480	4	0	7	.506	4	1	3	.532	4	2	0
10	.500	4	2	7	.527	4	3	7	.555	5	0	7
12	.560	6	1	0	.594	6	2	14	.627	7	0	0
14	.625	8	0	0	.660	8	1	24	.695	8	3	21
15	.637	11	2	2	.676	12	0	27	.715	13	0	2
16	.650	12	2	0	.693	13	1	9	.736	14	0	20
18	.687	14	3	8	.733	15	3	8	.777	16	2	0
20	.725	17	1	24	.777	18	2	22	.829	19	3	13
21	.740	18	1	23	.793	19	3	3	.846	21	0	13
22	.755	19	2	0	.809	20	3	16	.863	22	1	10
24	.787	22	1	0	.842	24	0	8	.897	25	2	16
25	.802	23	3	5	.859	25	2	0	.916	27	0	24
26	.817	25	0	0	.876	26	3	20	.935	28	3	7
27	.832	26	3	0	.894	28	2	14	.956	30	2	0
28	.847	28	0	0	.912	30	0	21	.975	32	1	0
30	.875	31	0	0	.950	34	0	0	1.025	36	2	0
32	.915	34	1	16	.993	37	0	26	1.072	40	0	14
33	.935	36	1	0	1.015	39	1	0	1.095	43	0	0
36	1.000	42	1	0	1.100	46	2	0	1.200	50	2	0
39	1.125	51	1	20	1.250	57	1	5	1.375	63	1	3
42	1.125	55	1	0	1.250	61	2	0	1.375	68	0	0
48	1.250	70	1	0	1.400	79	0	0	1.550	88	0	0

3" to 14" dia. inclusive, 9' long, plus the Socket ; 15" dia. and up, 12' long, plus the Socket.

12" and 14" dia. can also be cast in lengths of 12' by special agreement ; Weights in proportion.

Coated with Dr. Angus Smith's Patent Composition.

Spigot and Socket Cast Iron Water Pipes.

Cast in Green Sand on the slope, and tested at the Foundry, the lighter weights to 300 feet of water pressure, and the heavier weights to greater pressure.

Inside Dia.	Length of Pipe, exclusive of Socket.	Average Weight of Pipe, Spigot and Socket Joints.			Inside Dia.	Length of Pipe, exclusive of Socket.	Average Weight of Pipe, Spigot and Socket Joints.		
Inches.	Feet.	Cwts.	qrs.	lbs.	Inches.	Feet.	Cwts.	qrs.	lbs.
1	6	0	0	22	3 1/8	9	1	0	20
1 1/4	6	0	0	26	3 1/2	9	1	0	14
1 1/2	6	0	1	4	4	9	1	1	14
1 3/4	6	0	1	17	4	9	1	1	18
2	6	0	1	8	4	9	1	1	24
2	6	0	1	14	4	9	1	2	0
2	6	0	1	20	4	9	1	2	7
2	6	0	2	0	4 1/4	9	1	2	7
2	6	0	2	4	4 1/2	9	1	2	18
2	6	0	2	8	5	9	1	3	14
2 1/2	6	0	2	0	5	9	2	0	0
2 1/2	6	0	2	14	5	9	2	0	14
2 1/2	9	0	3	7	5 5/16	9	2	1	14
2 1/2	9	0	3	14	5 1/2	9	2	1	0
2 1/2	9	0	3	22	6	9	2	1	14
3	9	0	3	14	6	9	2	2	0
3	9	0	3	21	6	9	2	2	24
3	9	1	0	0	6	9	3	0	0
3	9	1	0	7	7	9	2	3	10
3	9	1	0	14	7	9	3	0	14
3	9	1	0	18	7	9	3	1	0
3	9	1	1	0	8	9	3	1	14
3 1/8	9	0	3	21	8	9	3	1	24
3 1/8	9	1	0	0	8	9	3	2	0
3 1/8	9	1	0	14	..	..	..	..	..

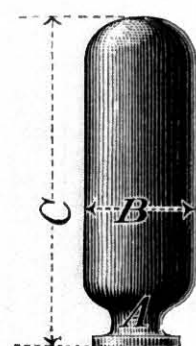
The above Straight Pipes can also be supplied with Turned and Bored Joints at a weight of 2 to 7 lbs. per length extra, according to dia.

Coated with Dr. Angus Smith's Patent Composition.

Air Vessels.

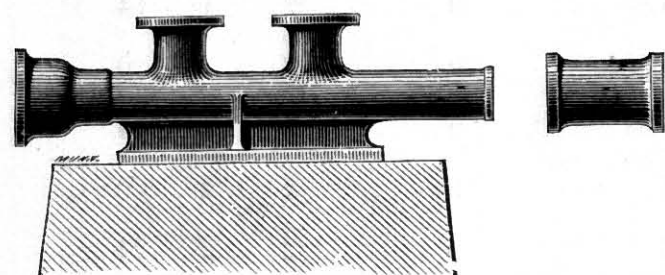
For Hydraulic Hoists and other purposes.

AIR VESSEL, including two gun metal Cocks screwed into side near lower end, for recharging same.



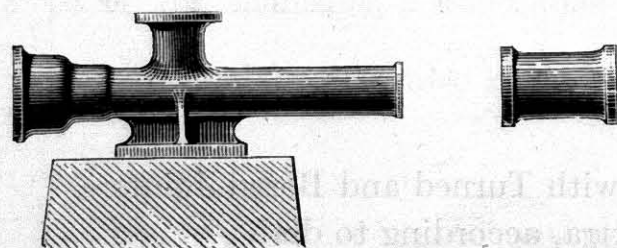
Inlet A,	..	..	1½"	2"	2½"	3"	4"	5"	6"	dia.
Body B,	..	..	6"	8"	9"	10"	12"	14"	16"	internal dia.
C,	..	..	36"	42"	48"	54"	60"	66"	72"	long.
Price,	..	..								each.

DOUBLE BRANCH PIECE, with Duckfoot Bracket, the two Branches having Flanges faced. Including Bolts and Joints and Collar.



Main Pipe and Branches :	1½"	2"	2½"	3"	4"	5"	6"	dia.
Price, ..								each.

SINGLE BRANCH PIECE, with Duckfoot Bracket, Flange faced. Including Bolts and Joint and Collar.



Main Pipe and Branch :	1½"	2"	2½"	3"	4"	5"	6"	dia.
Price, ..								each.

SECTION E.

FIRE EXTINGUISHING APPARATUS

CONSISTING OF

HYDRANT STANDPIPES,

HOSE COUPLINGS, HOSE REELS,

ETC., ETC.

The designs are subject to alteration and amendment, and, while corrections in Catalogue are made from time to time, Glenfield & Kennedy Ltd. do not guarantee that goods supplied will be exactly as shewn.

Fire Extinguishing Apparatus.

Hydrant Standpipes.

Fig. C 5.

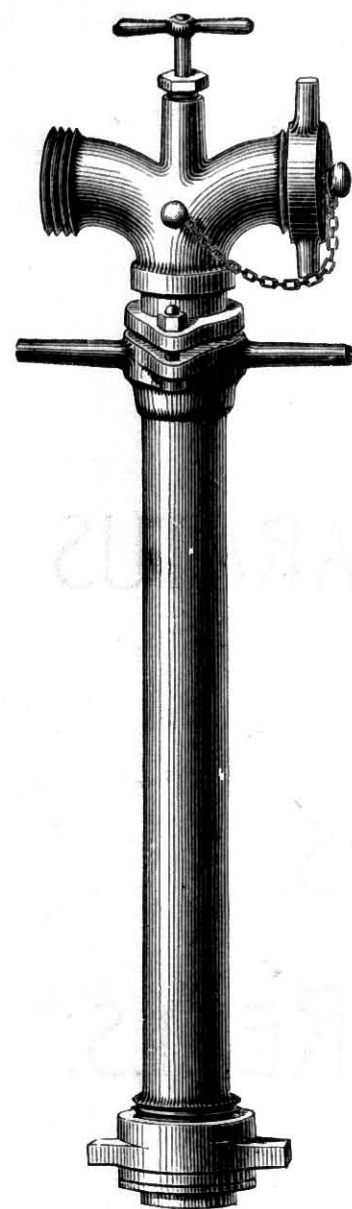


Fig. C 5½.

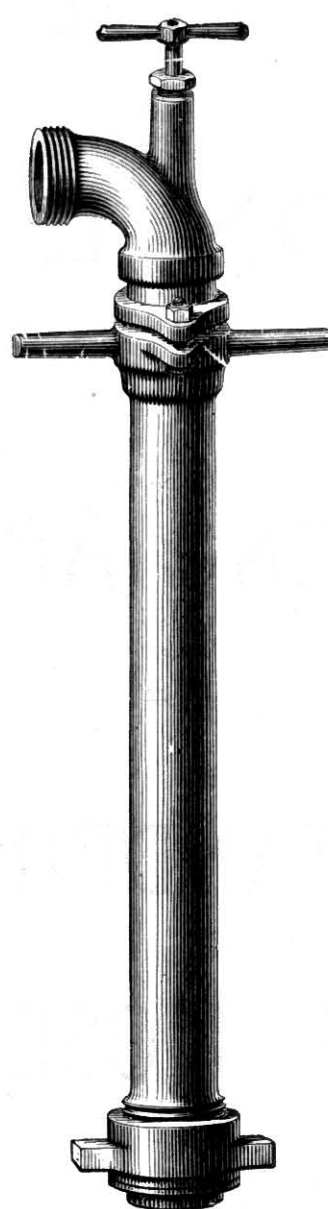


Fig. C 6.

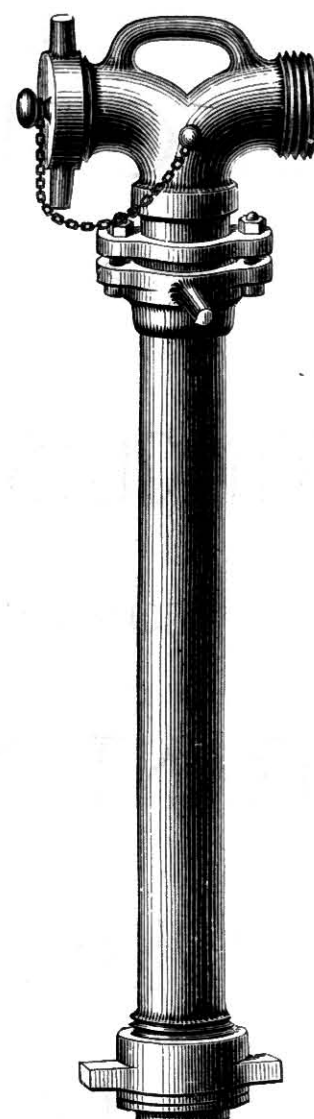
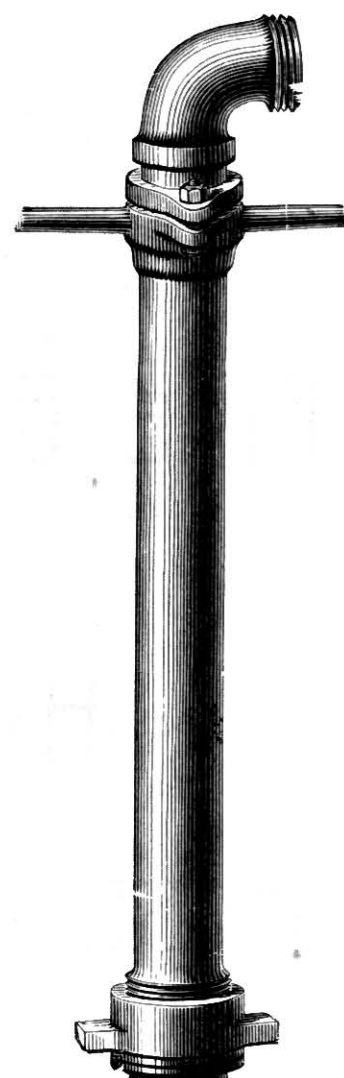


Fig. C 11.



These Standpipes have strong seamless copper stem, the bottom and ends being gun metal screwed and sweated to the copper. The ends can be screwed to suit any Brigade thread. Distance from bottom to centre of Outlet = 30 inches. Extra lengths, per inch.

PRICES.

		Morris' Patent.
C 5 —To suit Ball Hydrants, Double Outlet, with Swivel and one chained gun metal Screwed Cap,	each.	each.
C 5½—To suit Ball Hydrants, Single Outlet, with Swivel (no Cap on Single Outlet Standpipes),	"	"
C 6 —To suit Spindle Hydrants C 4, C 28, etc., Double Outlet, with Swivel and one chained gun metal Screwed Cap,	"	"
C 11 —To suit Spindle Hydrants C 4, C 28, etc., Single Outlet, with Swivel, no Cap,	"	"

Fire Extinguishing Apparatus.

Hydrant Standpipes.

Fig. C 12.

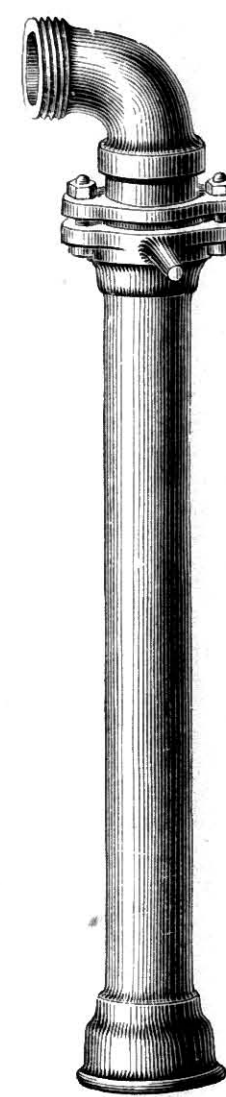


Fig. C 13.

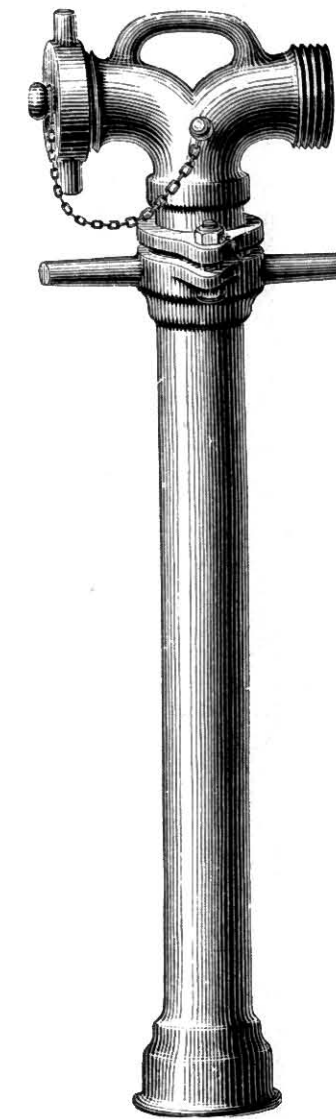


Fig. C 16.

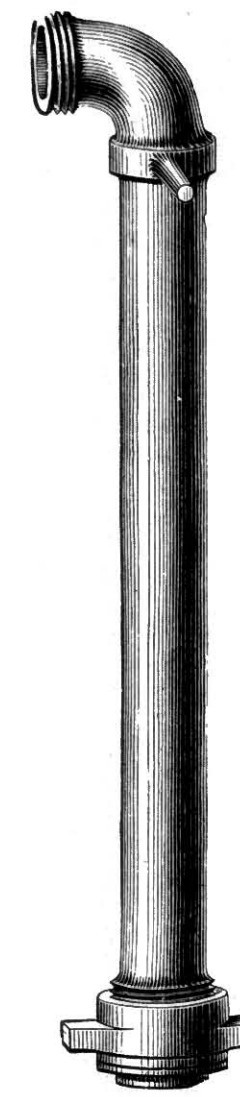
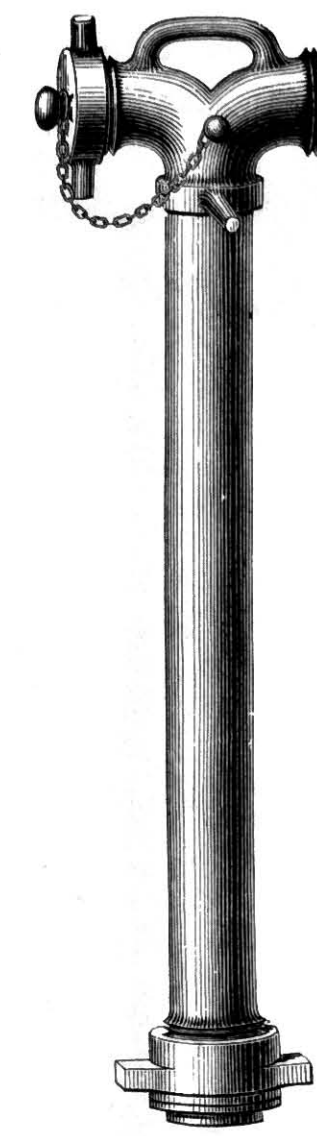


Fig. C 17.



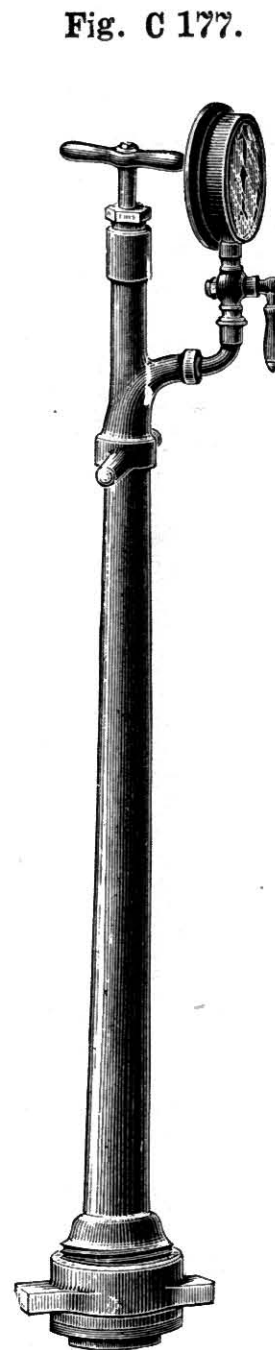
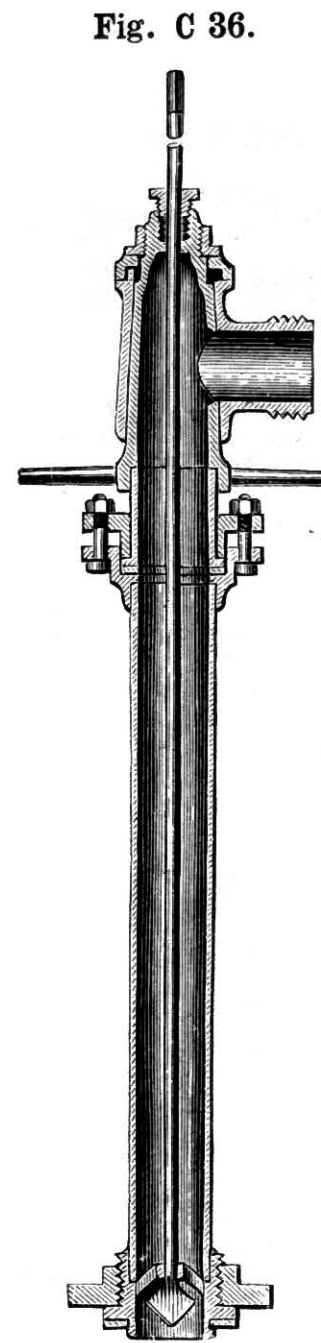
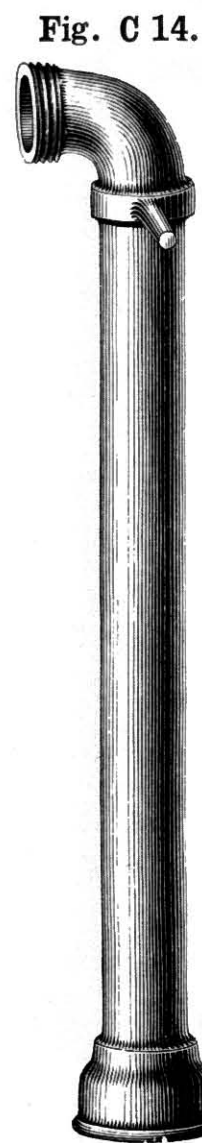
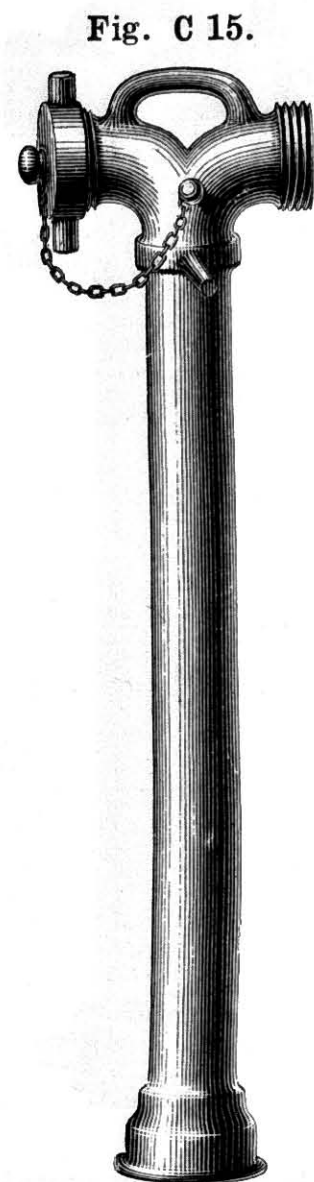
These Standpipes have strong seamless copper stem, the bottom and ends being gun metal screwed and sweated to the copper. The ends can be screwed to suit any Brigade thread. Distance from bottom to centre of Outlet, 30 inches. Extra lengths, per inch.

PRICES.

C 12—To suit Hydrants C 1, C 24, C 29, etc., Single Outlet, with Swivel, no Cap,	each.
C 13—To suit Hydrants C 1, C 24, C 29, C 22, C 57, or C 35, Double Outlet, with Swivel and one gun metal chained Cap,	"
C 16—To suit Spindle Hydrants C 4 and C 28, Single Outlet, without Swivel, no Cap,	"
C 17—To suit Spindle Hydrants C 4 and C 28, Double Outlet, without Swivel, with one gun metal chained Cap,	"

Fire Extinguishing Apparatus.

Hydrant Standpipes.



These Standpipes have strong seamless copper stem, the bottom and ends being gun metal screwed and sweated to the copper. The ends can be screwed to suit any Brigade thread. Distance from bottom to centre of Outlet, 30 inches. Extra lengths, per inch.

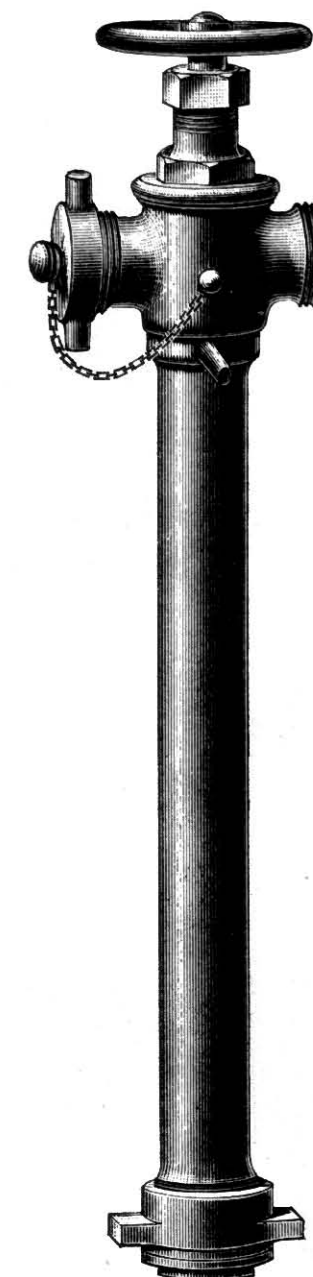
PRICES.

C 14—To suit Hydrants C 1, C 24, C 29, etc., Single Outlet, without Swivel, no Cap, ..	each.
C 15—To suit Hydrants C 1, C 24, C 29, etc., Double Outlet, without Swivel, with one chained gun metal screwed Cap, ..	..
C 36—With Drill for boring out Frozen Hydrants, with Swivel and Ground Plug Arrangement on top, ..	..
Do. do. without Swivel, ..	..
C 177—Light Standpipe to suit Ball Hydrants, for taking pressures, with Gauge Cock but not including Pressure Gauge, ..	..

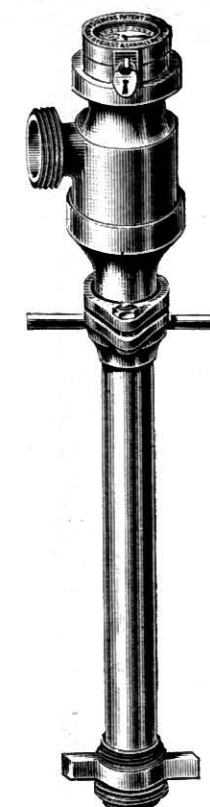
Fire Extinguishing Apparatus.

Hydrant Standpipes.

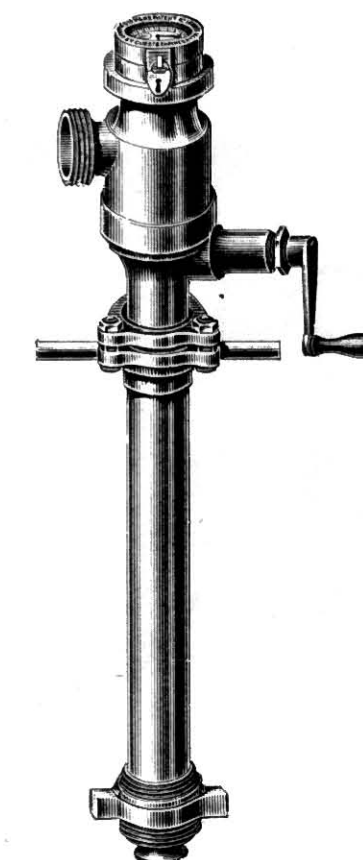
Fig. C 178.



Meter Standpipe.
Fig. C 218.



Meter Standpipe.
Fig. C 219.



PRICES.

C 178—Double-outlet Standpipe, without Swivel, to suit Hydrants C 4, C 28, and C 135, with one chained gun metal Screwed Cap, valve in top, Bottom and Ends of gun metal, and cast iron Hand Wheel. Distance from bottom to centre of Outlet, 30 inches, ..	each.
C 218—Standpipe Meter, suitable for Screw-down Hydrants— Size of Meter—1½" 2" 2" full bore. 2½" full bore.	each. ft.
Extra length over 18" of Tube in Standpipe,	
C 219—Standpipe Meter, suitable for Ball Hydrants— Size of Meter—1½" 2" 2" full bore. 2½" full bore.	each. ft.
Extra length over 18" of Tube in Standpipe,	

Fire Extinguishing Apparatus.

Cap and Union for Pressure Gauge.

Fig. C 175.

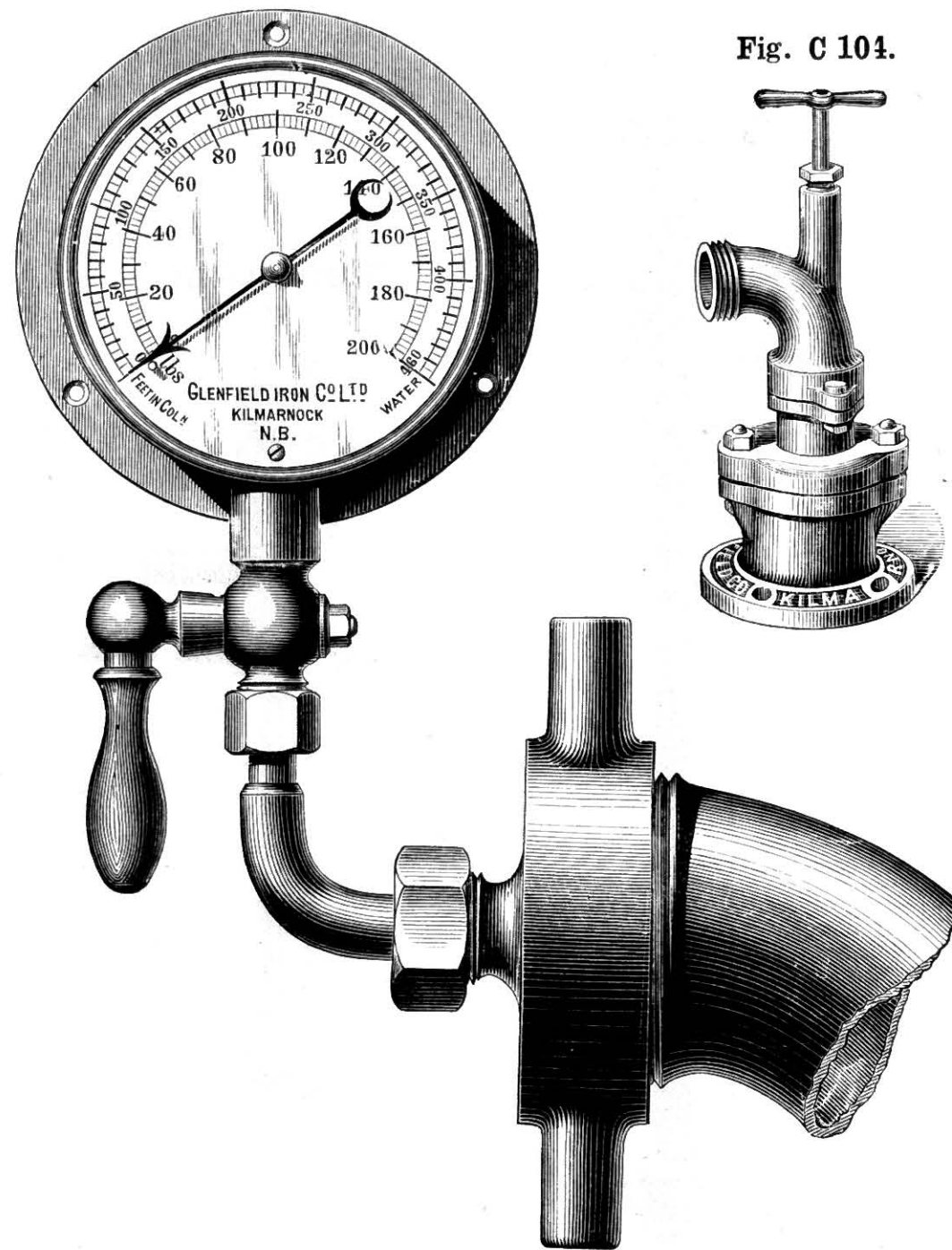


Fig. C 104.

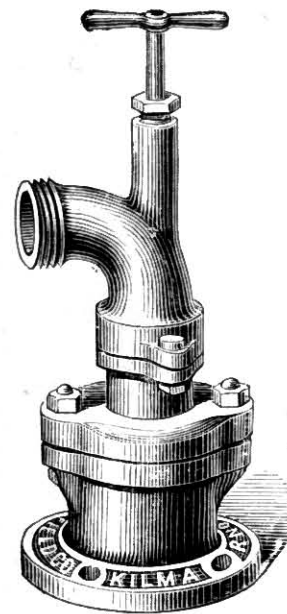
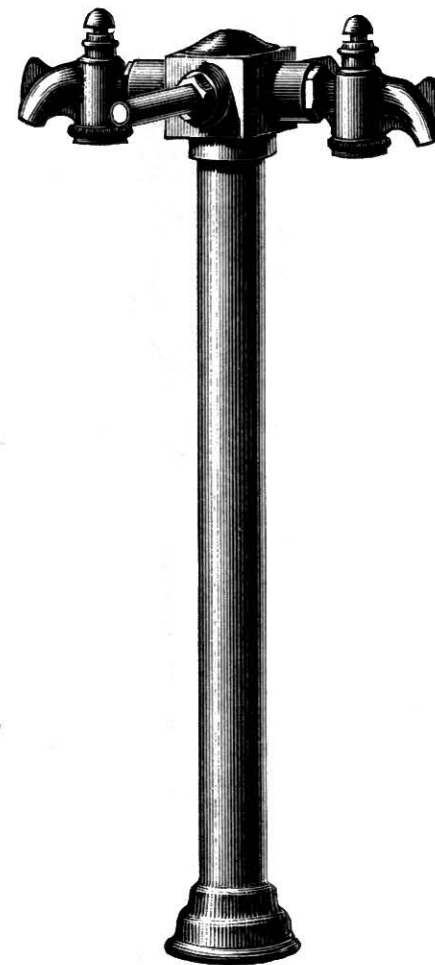


Fig. D 100.



PRICES.

- C 104—Ball Hydrant and Short Single Outlet Standpipe Combined, each.
 C 175—Cap and Bent Union for attaching to Standpipe, for taking pressures, *not* including Pressure Gauge,
 D 100—Portable Standpipe for using on Hydrants, with two $\frac{3}{4}$ " Self-closing Taps, with Snug for hanging buckets, suitable for temporary supplies, such as for Army Camps, etc. Stem is of wrought iron, Bottom and Turning Arms of gun metal,

PRESSURE GAUGES.

Specially made and accurately graduated in Feet in Column of Water and Lbs. per sq. in. from Mercurial Column.

4" 5" 6" 7" 8" dia.

- Pressure Gauge, with { Cock and Union, each.
 { Maximum Pointer, extra,
 { Open Dial, extra,

Larger Sizes made.

When ordering, please state what pressure the Gauge is wanted to be graduated up to.

Fire Extinguishing Apparatus.

Fig. C 18a.

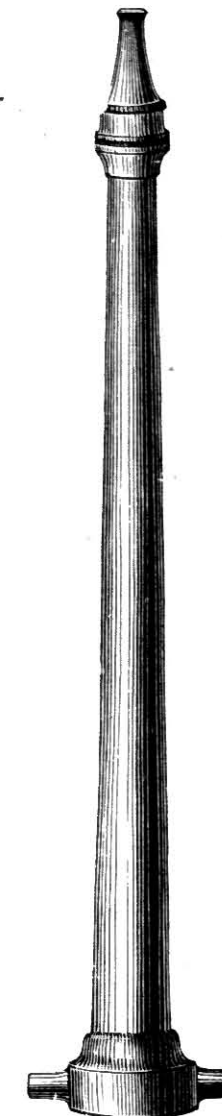


Fig. C 37.

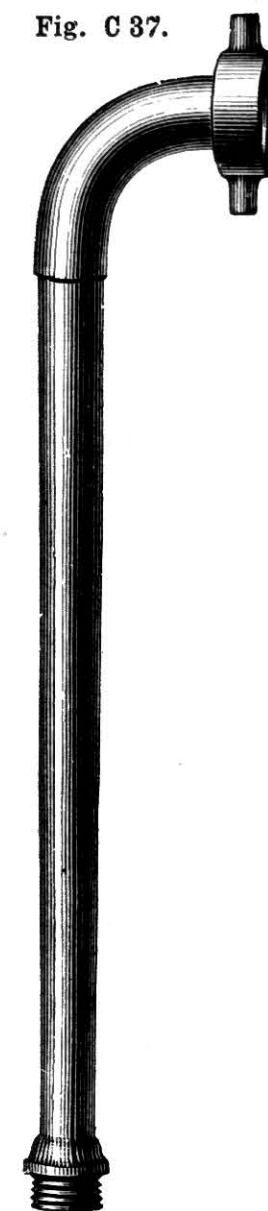


Fig. C 173.

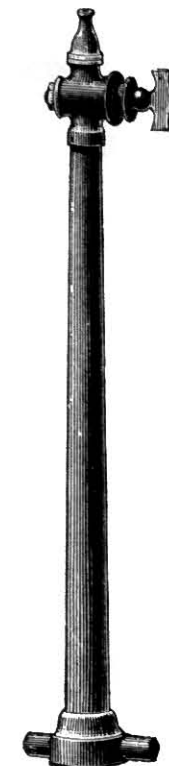


Fig. C 49.



Fig. C 39.



Fig. C 39a.



Fig. C 18.

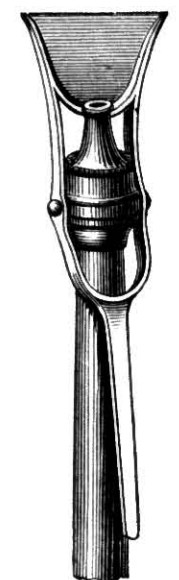


Fig. C 39b.

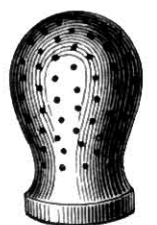


Fig. C 9.



Fig. C 179.



The Body of Handpipe is of seamless copper tube, tapered, the gun metal Ends being screwed and sweated on.

PRICES.

- C 9—Coupling Wrench, { Black, each.
 { Bright,
 C 10—Handpipe, gun metal Ends—
 Without Nozzle, $2\frac{1}{2}$ " to $1\frac{1}{2}$ " dia., 24" long, each. Without Nozzle, 2" to $1\frac{1}{2}$ " dia., 16" long, ..
 Do. $2\frac{1}{2}$ " to $1\frac{1}{2}$ " .. 20" .. Do. $1\frac{1}{2}$ " to 1" .. 16" ..
 Do. $2\frac{1}{4}$ " to $1\frac{1}{2}$ " .. 24" .. Do. $1\frac{1}{4}$ " to $\frac{3}{4}$ " .. 12" ..
 Do. 2" to $1\frac{1}{2}$ " .. 20" .. With small Nozzle, 1" to $\frac{3}{8}$ " .. 12" ..
 C 18 —Spreader to attach to any Nozzle, large, .. ; small, ..
 .. $\frac{3}{8}$ " $\frac{1}{2}$ " $\frac{5}{8}$ " $\frac{3}{4}$ " $\frac{7}{8}$ " 1" $1\frac{1}{4}$ " $1\frac{1}{2}$ " dia. of orifice.
 C 18a—Nozzles, gun metal, { London Fire Brigade Pattern, each.
 { small,
 C 37 —Swivel Bend and Handpipe Combined, for attaching to Standpipes for watering streets,
 C 39 —Rose to attach to Handpipes, $1\frac{1}{2}$ " ; 2" ; $2\frac{1}{2}$ " ; 3" ..
 C 39a—Elbow for Jet, to fit on end of Branch Pipe,
 C 39b—Globe Spreader, for do.
 .. $\frac{1}{2}$ " $\frac{5}{8}$ " $\frac{3}{4}$ " $\frac{7}{8}$ " 1" dia.
 C 49 —Patent Barbour Nozzle and Adjustable Spreader Combined, each.
 C 173 { Handpipe, with Cock } $2\frac{1}{2}$ " to $1\frac{1}{2}$ " x 24" long,
 { and Nozzle, } small, for garden use, for hose, .. $\frac{1}{2}$ " dia., .. ; $\frac{3}{4}$ " dia., .. 1" dia., ..
 C 179 —Coupling Wrench and Spanner Combined, { Black,
 { Bright,

Fire Extinguishing Apparatus.

Fig. C 50.



Fig. C 53.

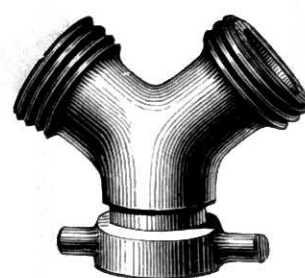


Fig. C 54.



Fig. C 7.

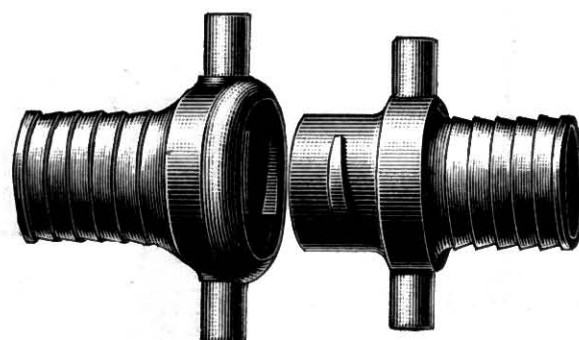


Fig. C 8.

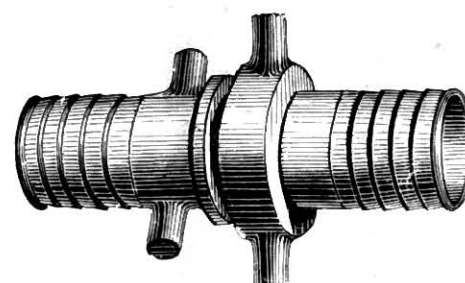


Fig. C 38.

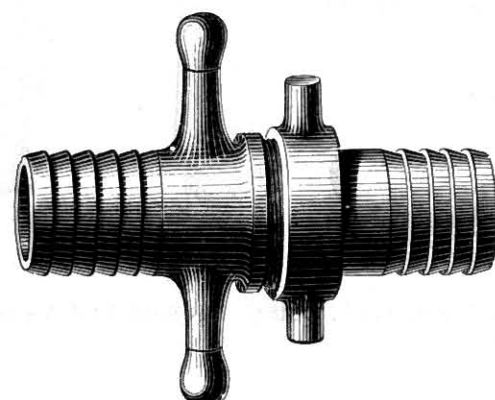
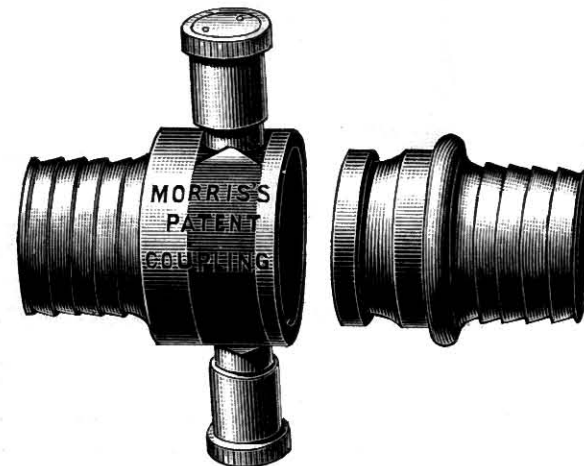


Fig. C 19.



PRICES.

HOSE COUPLINGS.

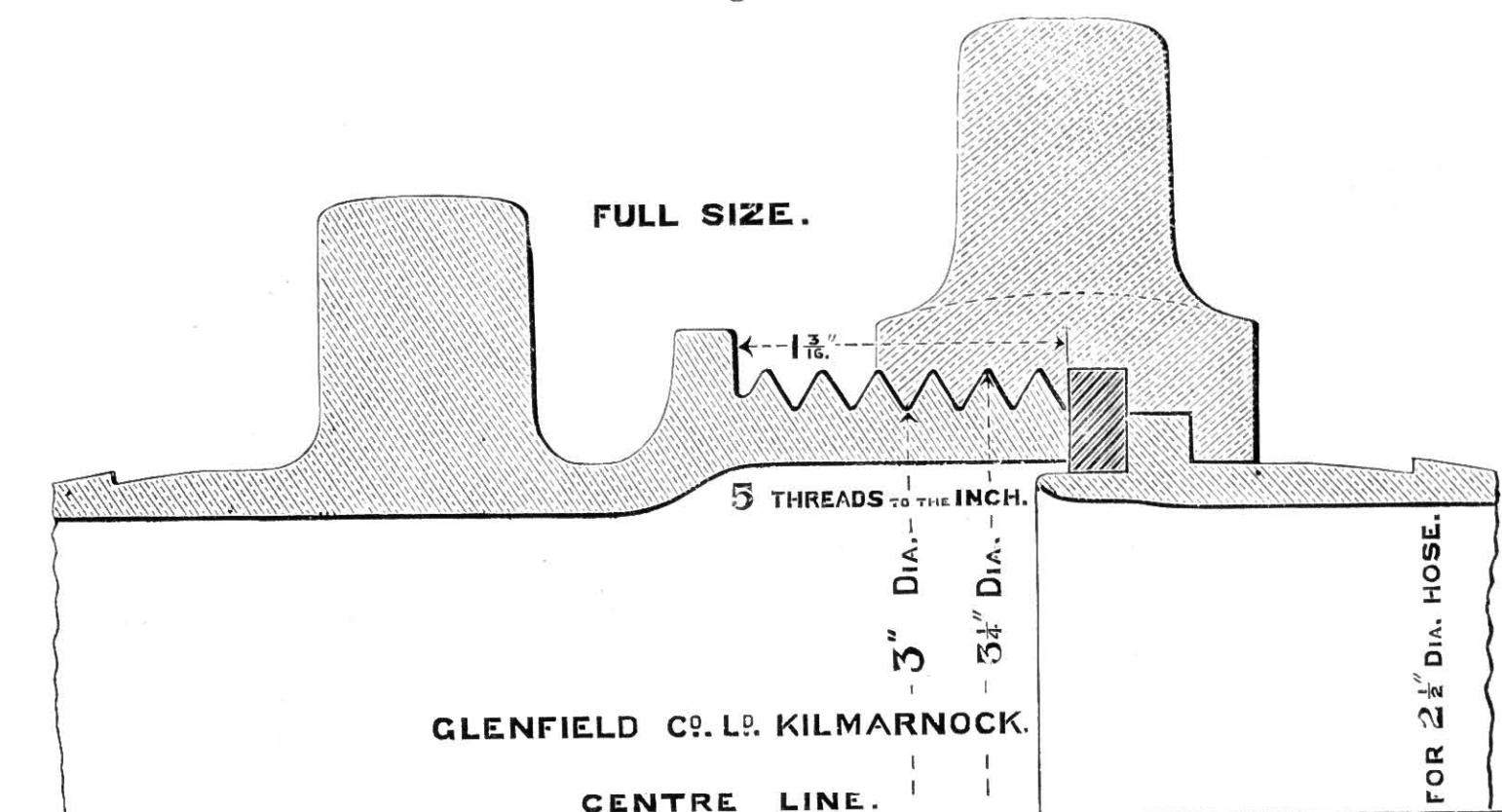
	1/2"	5/8"	3/4"	7/8"	1"	1 1/4"	1 1/2"	1 3/4"	2"	2 1/4"	2 1/2"	2 3/4"	3"	
C 7—Bayonet Joint, { gun metal, Finished, ..														per
C 8—Screwed, { or Aluminium, ..														pair.
C 19—Morris' Patent Instantaneous Couplings, ..														"
C 38—Tozer's Patent Swivel Hose Couplings, ..														"
Attaching Couplings to Hose with Copper Wire, Soldered, @														pair.
C 50—Diminishing or Connecting-piece, ..														each.
C 53—Dividing Branch-piece, ..														"
Do. Morris' Patent, ..													2 1/2"	"
C 54—Collecting Branch-piece, ..														"
Do. Morris' Patent, ..													2 1/4"	"

Fire Extinguishing Apparatus.

Standard London Fire Brigade Threads.

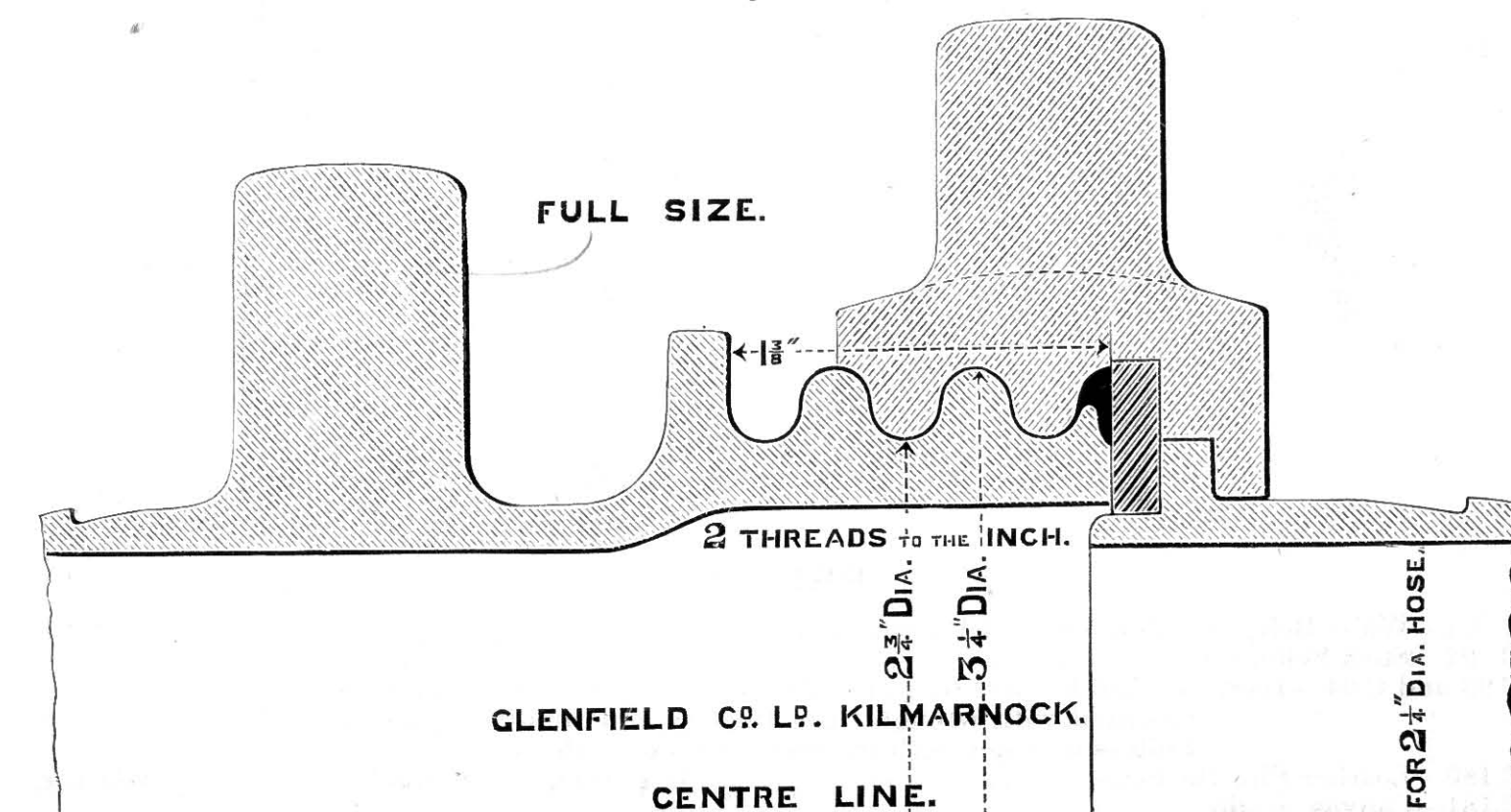
Old V Thread.

Fig. C 220.



New Round Thread.

Fig. C 221.



Fire Extinguishing Apparatus.

Fig. C 91.



Fig. C 93.

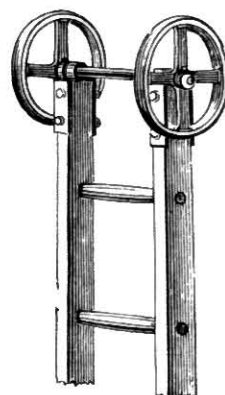


Fig. C 94.

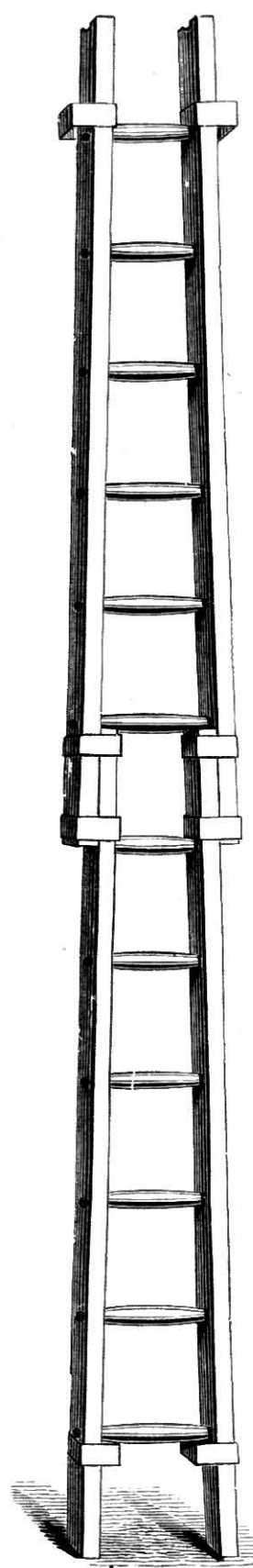


Fig. C 92.

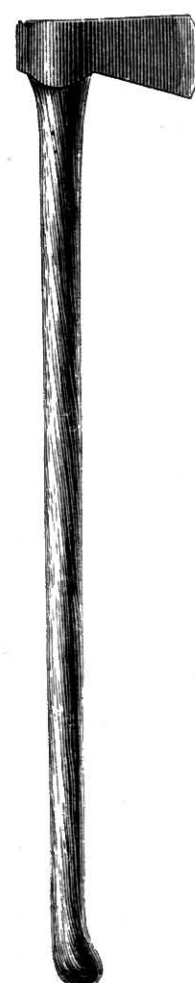
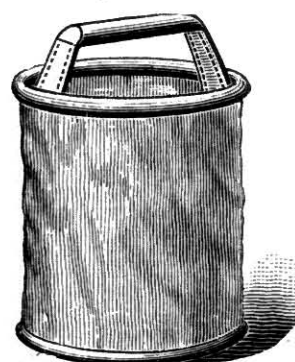


Fig. C 180.



Fig. C 181.



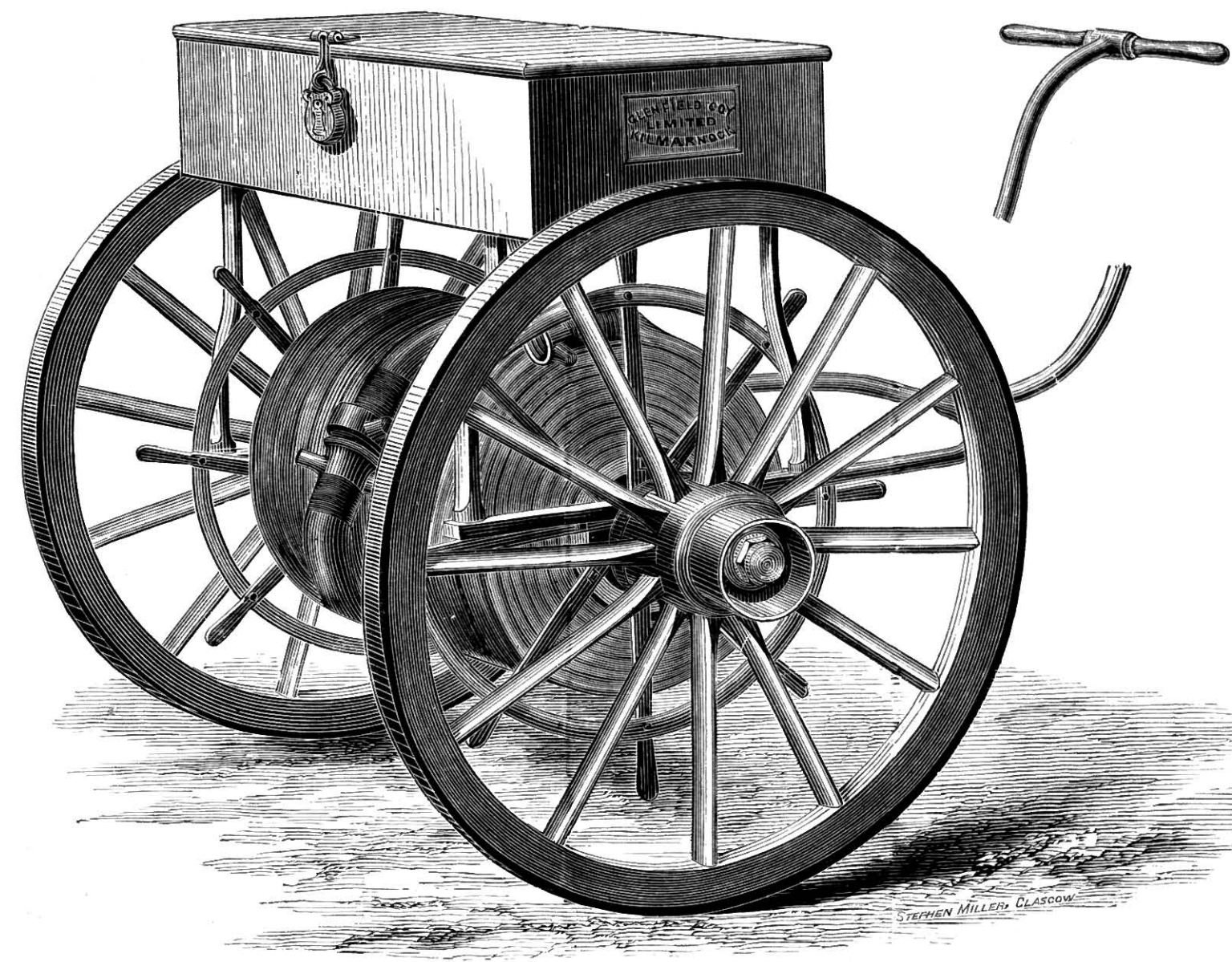
PRICES.

C 91—Waist Belt, with Hatchet and Wrench as shown,	.. .. .	each.
C 92—Steel Felling Axe,	.. .. .	"
C 93 and C 94—Telescope Ladder in three parts, 20' long, red pine Sides, oak Treads, mounted with wrought iron Buckles and Binding Bolts, with Pulleys on top length for running up on wall,	.. .. .	"
C 180—Leather Fire Bucket,	.. .. . large size, ; small size,	per doz.
C 181—Canvas do.	.. .. .	"

Fire Extinguishing Apparatus.

Hose Reel.

Fig. C 98.



PRICE.

C 98—Hose Reel on Wheels and Axle, with Tool Box Complete, to hold 450 to 500 yards 2½" Canvas Hose, or about 120 yards 2½" Leather Hose,	each.
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Fire Extinguishing Apparatus.

Hose Carriage.

Fig. C 182.



Hose Reels.

Fig. C 183.

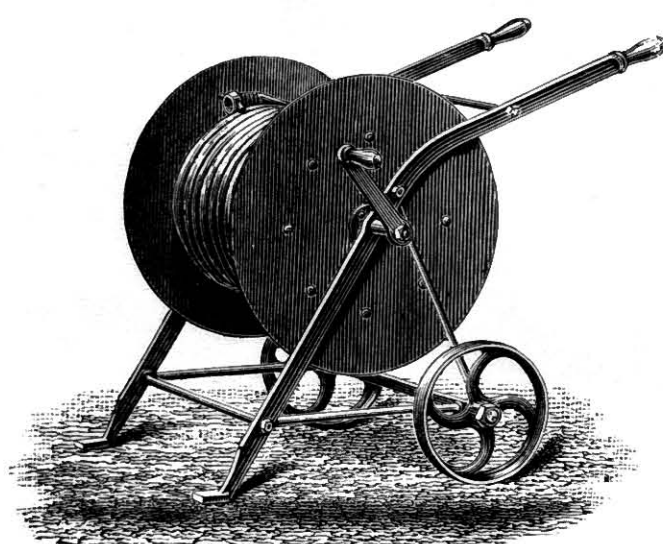
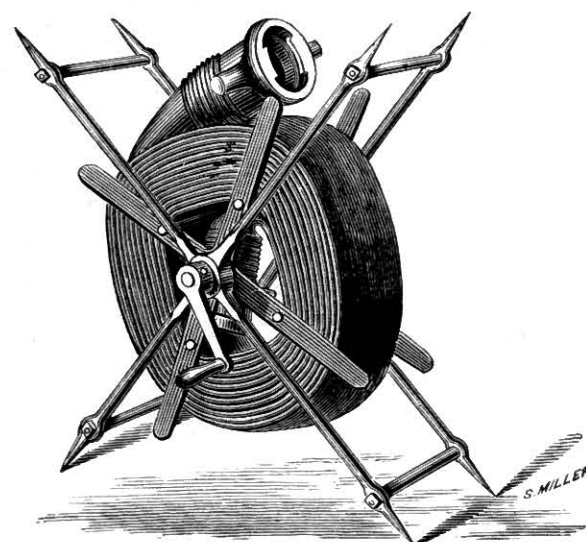


Fig. C 97.



PRICES.

C 97—Hand Hose Reel, to hold	20 yards Canvas Hose,	each.
	30 yards do.	"
C 182—Hose Carriage, with	mounted on Springs, to contain 400 yards 2½" Canvas Hose, or about 200 yards 2½" Leather Hose, Wheels 3' 6" dia.,	"
Tool Box,	smaller size, to contain 230 yards 2½" Canvas Hose, or about 80 yards 2½" Leather Hose, Wheels 3' dia.,	"
C 183—Small Hose Reel on Wheels, to contain 100 yards 2½" Canvas Hose, or about 40 yards 2½" Leather Hose, .. .. .	.. .. .	"

Fire Extinguishing Apparatus.

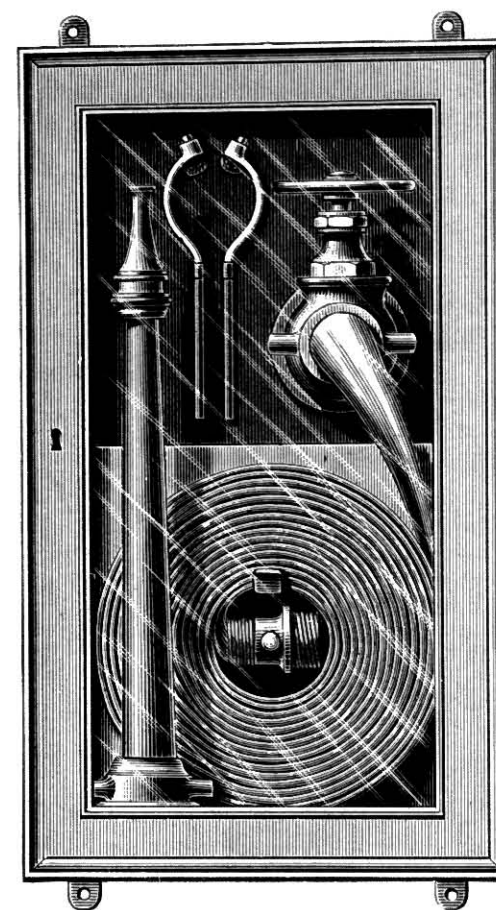
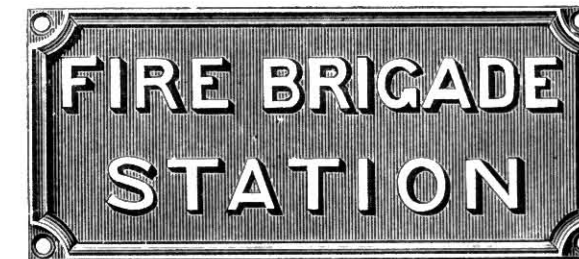
CASE WITH GLASS FRONT,
TO CONTAIN HOSE, Etc.
Fig. C 188.HOSE BRACKET.
Fig. C 189.

Fig. C 192.



NAME PLATES.

Fig. C 193.



PRICES.

C 188—Wood Case to contain Hose, etc., with Door having glass front (spring catch),	each.
Cast Iron Case do. do. (do. do.)	"
C 189—Cast Iron Hose Bracket,	"
C 190—Swivel Hose Bracket to contain 100 feet 2½" Canvas Hose,	"
C 192 and C 193—Cast Iron Name Plate { "Fire Hose Station,"	"
{ "Fire Brigade Station,"	"

FIRE HOSE.

Best and strongest make of hand-woven Linen Hose, made from best selected materials,	¾" 1" 1½" 1½" 1½" 2" 2½" 2½" 2½" 3" internal dia.
Extra if tanned or burnetized,	Prices on application.
Best Rubber-lined hand-woven Linen Hose,	Do.
Best heavy copper rivetted Leather Hose, made from selected butts,	Do.

50 feet to 80 feet is a convenient length for Linen Hose, 30 to 50 feet for Leather or Rubber-lined Hose.

NOTE.—Linen Hose must be carefully dried after being used to prevent mildew.

For Prices of Couplings, etc., see page 8 of this Section.

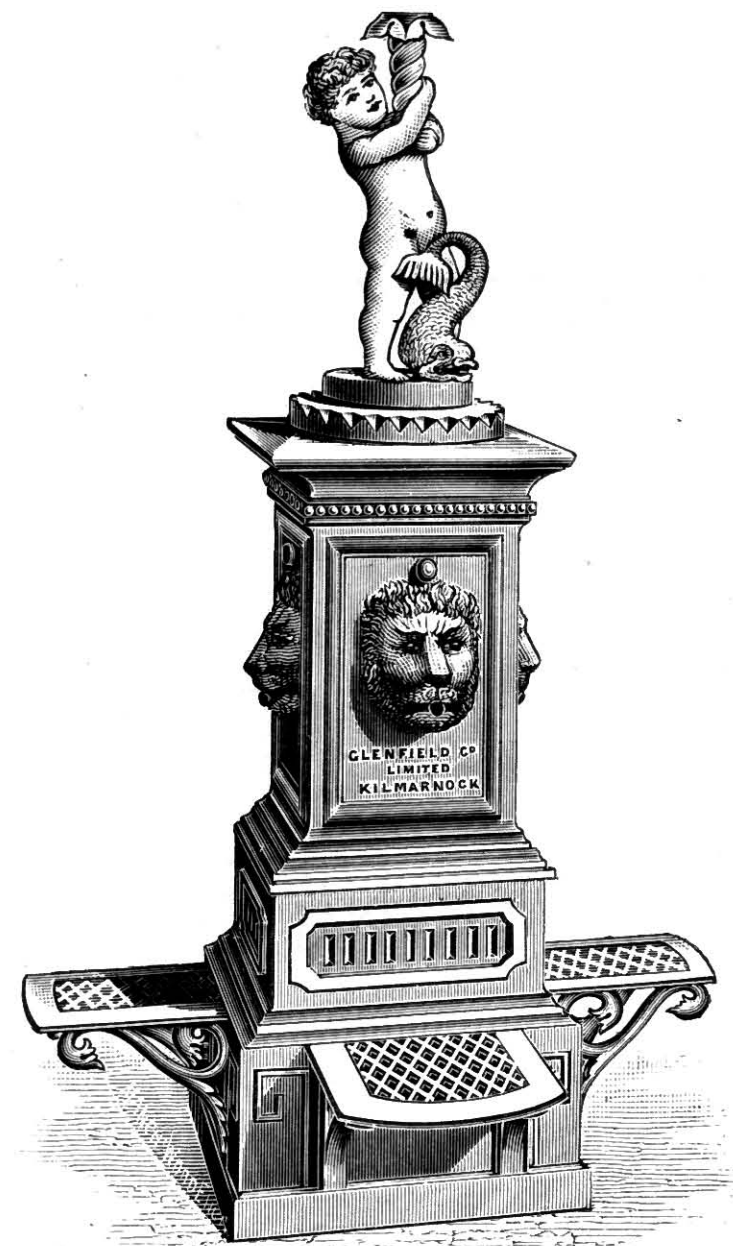
SECTION F.

DRINKING FOUNTAINS AND STREET WATERING STANDPOSTS.

The designs are subject to alteration and amendment, and, while corrections in Catalogue are made from time to time, Glenfield & Kennedy Ltd. do not guarantee that goods supplied will be exactly as shewn.

Self-closing Fountain.

Fig. D 31.



PRICE.

D 31—Four-tap Fountain, fitted with Patent Non-concussive Self-closing Taps, with Figure on top,	each.
If without Figure on top,	„

Height from ground level to top of Figure, 5 feet 9 inches.

Kennedy's Patent Self-closing Fountains.

Fig. D 1.

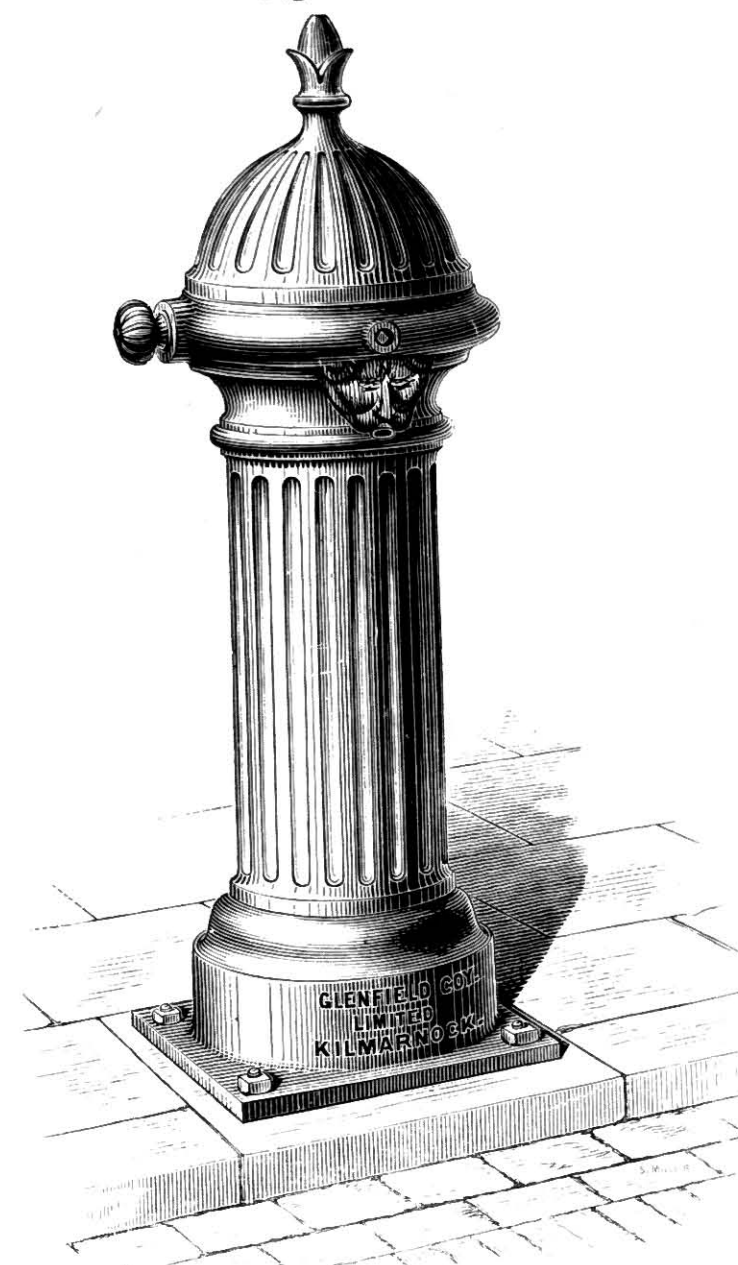
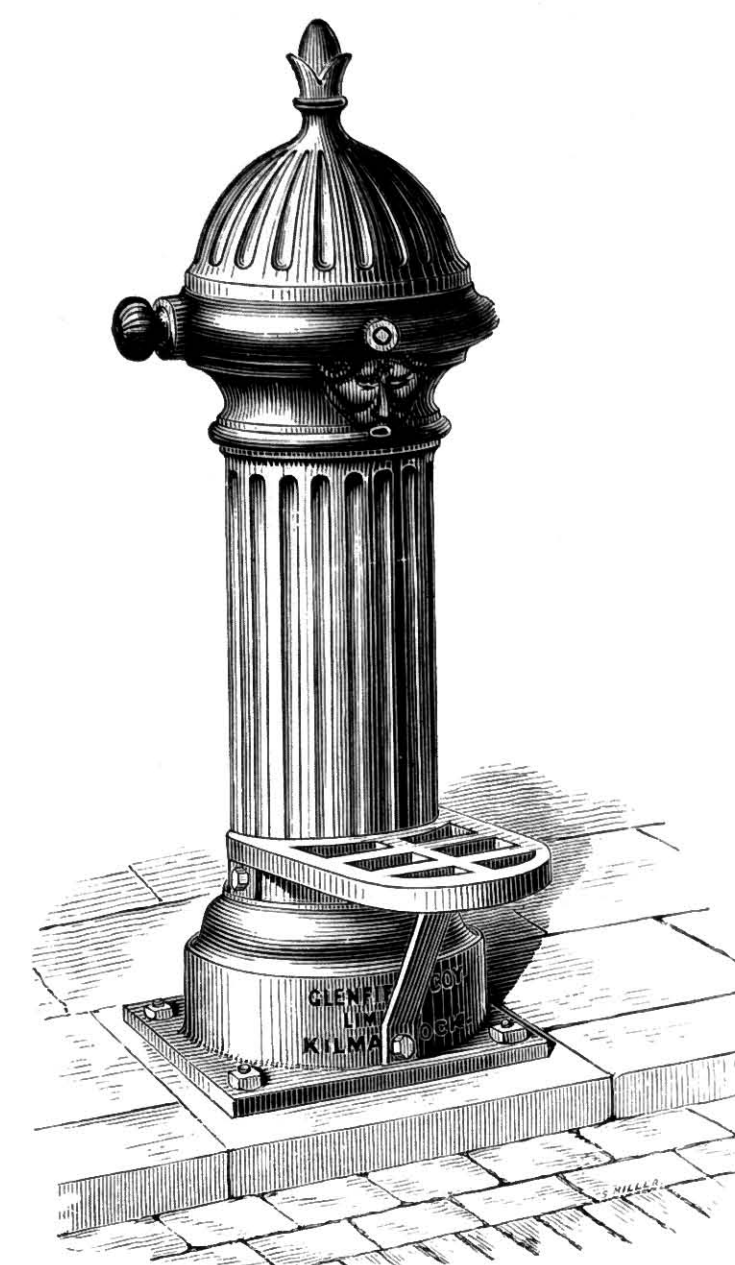


Fig. D 21.



PRICES.

D 1—Pillar Fountain,	ordinary sized inside Tap,	Column, 8½" dia.,	each.
		Column, 7" dia.,	„
	one large sized inside Tap, for low pressures,	.. .. .	„
D 21—Do.	with Bracket for Buckets, ordinary sized inside Tap,	Column, 8½" dia.,	„
		Column, 7" dia.,	„
	Galvanized Cup and Chain, extra, .. .. .	.. .. .	„

These Fountains are fitted with Kennedy's Patent (gun metal) Self-closing Taps, with Pulley, Chain, and Weight.

The Handles are of malleable cast iron bushed with gun metal.

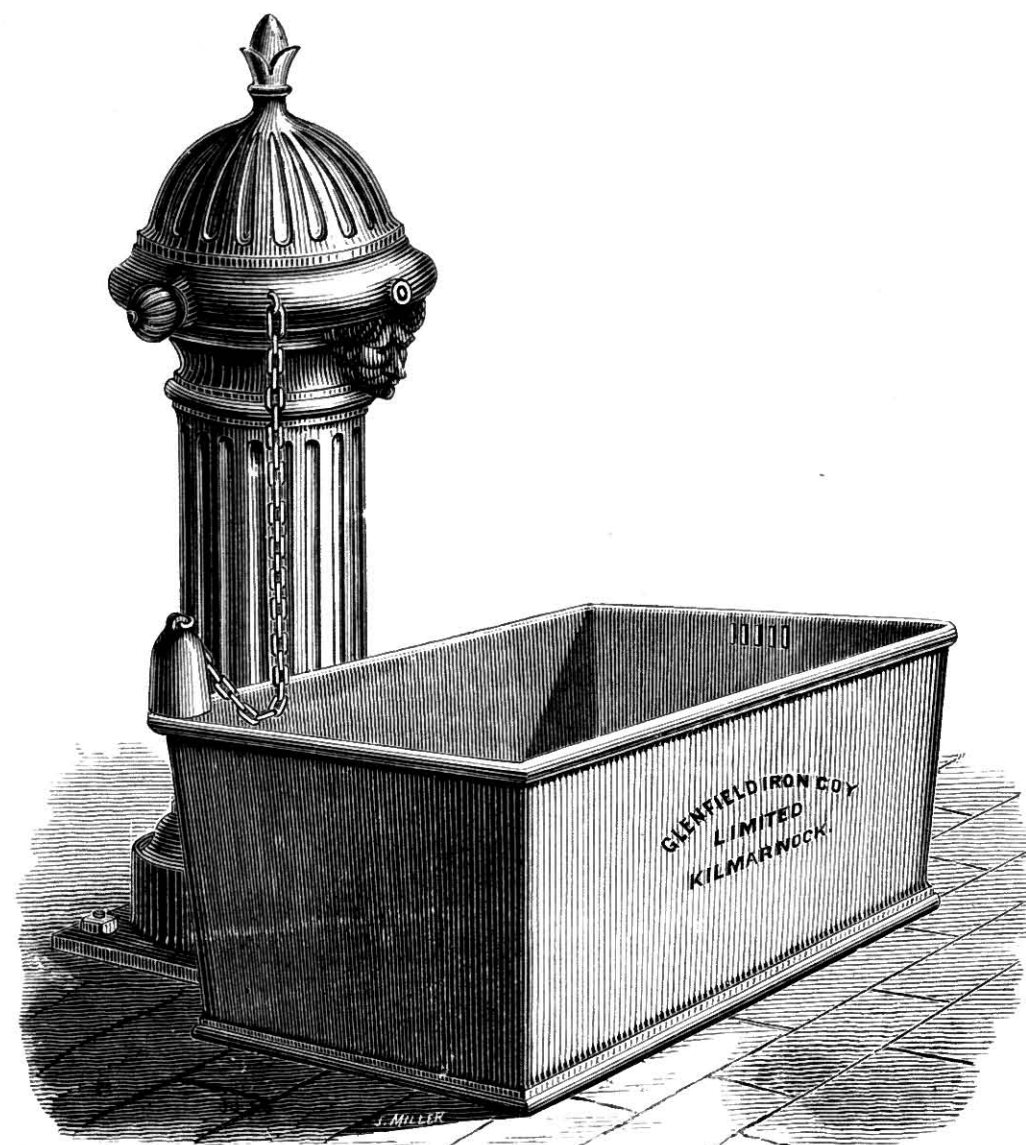
Keys are not supplied unless specially ordered.

Height from ground line to apex, 3 feet 6½ inches.

NOTE.—When Fountains are required to work under a pressure exceeding 200 feet head, please state this when ordering.

Kennedy's Patent Self-closing Fountains.

Fig. D 23.



PRICE.

D 23—Pillar Fountain, with Cattle Trough and Cup and Chain, each.

This Fountain is fitted with Kennedy's Patent (gun metal) Self-closing Tap, with Pulley, Chain, and Weight.

The Handle is of malleable cast iron bushed with gun metal.

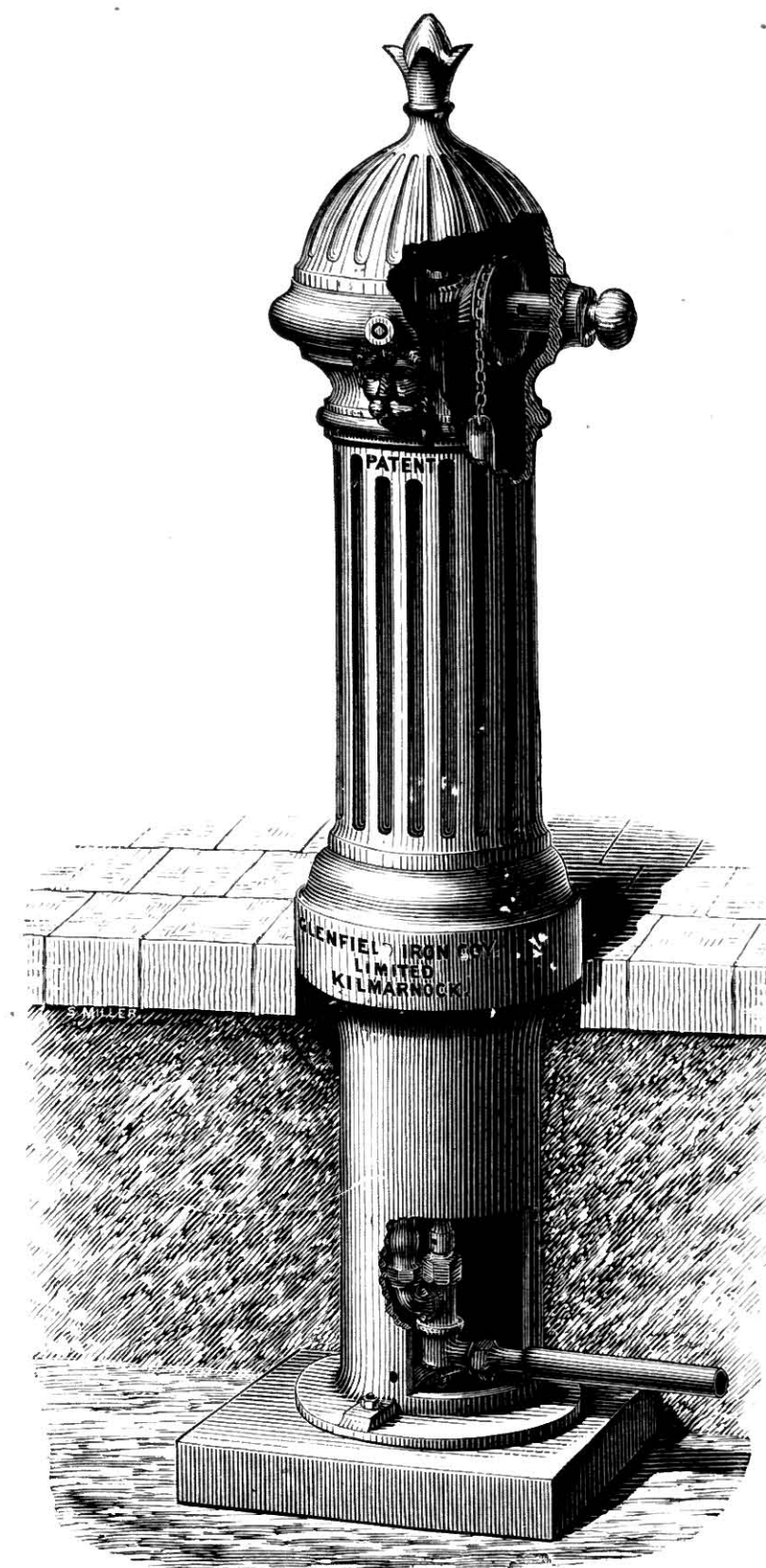
Keys are not supplied unless specially ordered.

Height from ground line to apex, 3 feet 6½ inches.

NOTE.—When the Fountains are required to work under a pressure exceeding 200 feet head, please state this when ordering.

Kennedy's Patent Self-closing Anti-Freezing Pillar Fountain.

Fig. D 1 F.



For Description and Prices see next page.

Kennedy's Patent Self-closing Anti-freezing Pillar Fountain.

DESCRIPTION.

This Fountain has been specially designed to overcome the objection of the Fountains freezing in winter. The Tap is placed about 2 feet underground. The Self-closing Valve is same as in ordinary Pillar Fountain D 1, but placed vertical instead of horizontal. On top of Spindle there is a skewed bevel Quadrant actuated by handle, pulley, chain, and weight in the usual manner. The Fountain is furnished with a Patent Self-acting Emptying Valve at bottom of outlet pipe. A small rod from this valve is provided, being led up inside pillar, and by its means the Self-emptying Valve can be prevented from acting during the summer months, thus saving water.

If at any time it is found necessary to replace the Rubber Seating or Roller in the Tap, this can be done in a few minutes by taking off the top Cover of Fountain and taking out the centre rod with screw and valve on end. In the event of a Tap getting choked through foreign matter lodging in the Valve, the whole Tap can be taken out, examined, and cleaned (a special Key being required for this) without requiring to open the ground.

There is no heavy stone Base required for Foundation, as in the case of the ordinary Pillar Fountain.

Another type of Self-closing Pillar Fountain is made with Pillar similar to D 1 F in appearance but having Lever Arrangement in head as D 34, page 7, and the Tap also placed 2 feet underground.

PRICES.

With ordinary sized Tap,	each.
With large Tap for low pressures,	"
Special Key for taking out Tap for examination,	"
Galvanized Cup and Chain, extra,	"

Height from ground line to apex, 3 feet 6 inches.

For situations where the frost is severe the Tap may be placed deeper in the ground, and has been made with Tap 4 feet 9 inches underground for Newfoundland, etc.

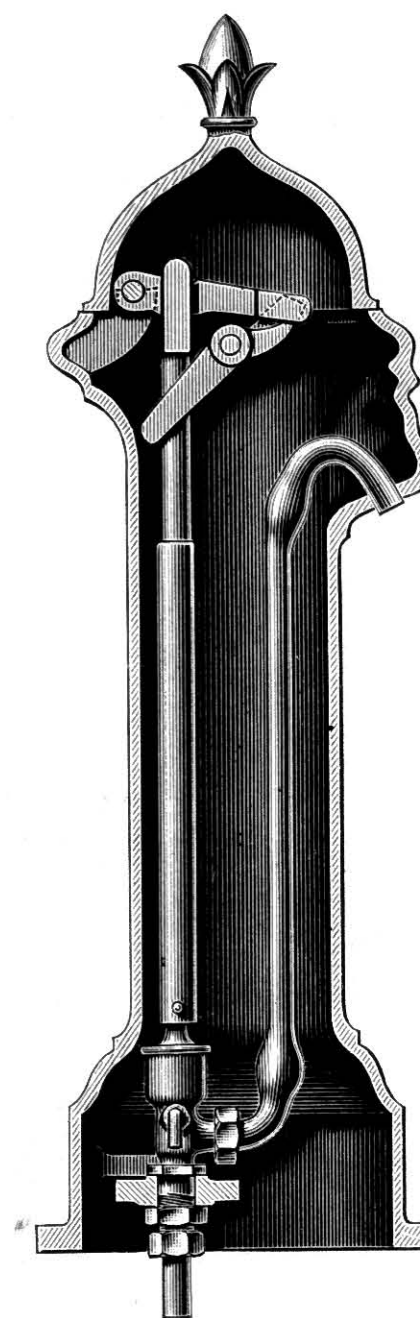
If desired deeper than usual, please state depth when ordering.

NOTE.—When Fountains are required to work under a pressure exceeding 200 feet head, please state this when ordering.

Self-closing Pillar Fountains.

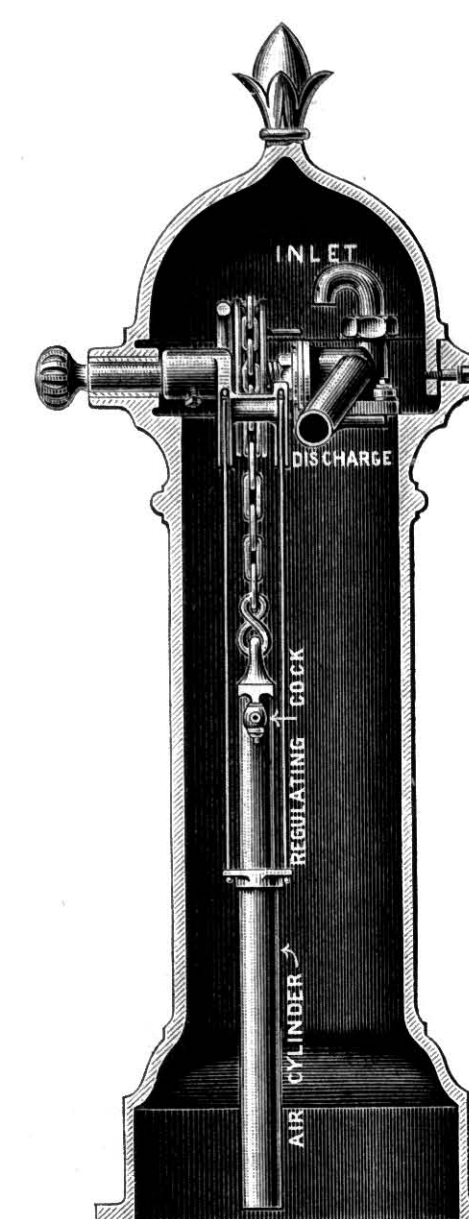
SEMI-ANTI-FREEZING.

Fig. D 34.



PATENT QUANTITY SUPPLYING.

Fig. D 36.



PRICES.

D 34—Semi-anti-freezing Pillar Fountain, with Tap placed at bottom of casing. When the Fountain is closed the valve automatically empties the delivery pipe. Suitable where the frost is not severe or of long duration, each.

D 36—Patent Quantity Supplying Fountain to discharge a given quantity of water and then close automatically even should the handle be held open,

When the Fountain is opened the air cylinder is pulled up, and, while the air is being gradually expelled from same, the Fountain gives a supply of water.

Sufficient water is supplied at each operation to fill a bucket.

By setting the small regulating cock the duration of discharge can be altered as desired. This Fountain can also be fitted with a Coin-in-Slot Arrangement so as to give a certain quantity of water, and then close automatically when this quantity has been discharged.

Height from ground line to apex, 3 feet 6½ inches.

NOTE.—When the Fountains are required to work under a pressure exceeding 200 feet head, please state this when ordering.

Kennedy's Patent Self-closing Fountains.

Fig. D 42.

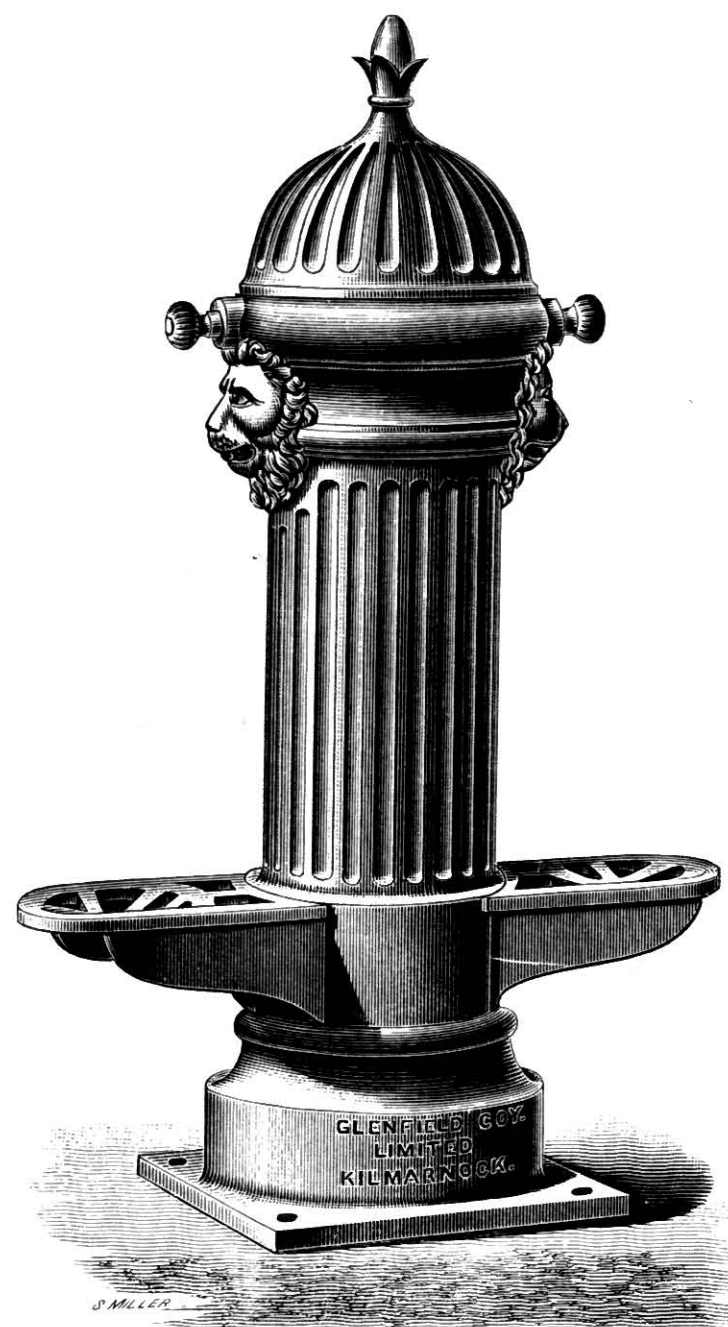


Fig. D 41.



PRICES.

D 41—Pillar Fountain, with two Taps (ordinary sized Taps), each.

Height from ground line to apex, 3 feet 6½ inches.

D 42—Pillar Fountain, with two Taps, with Brackets for Buckets, or to suit "Chatties" (for India), "

Height from ground line to apex, 4 feet 8 inches.

Galvanized Cup and Chain, extra, "

These Fountains are fitted with Kennedy's Patent (gun metal) Self-closing Taps, with Pulley, Chain, and Weight.

The Handles are of malleable cast iron bushed with gun metal.

Keys are not supplied unless specially ordered.

NOTE.—When the Fountains are required to work under a pressure exceeding 200 feet head, please state this when ordering.

Kennedy's Patent Self-closing Fountains.

Fig. D 46.

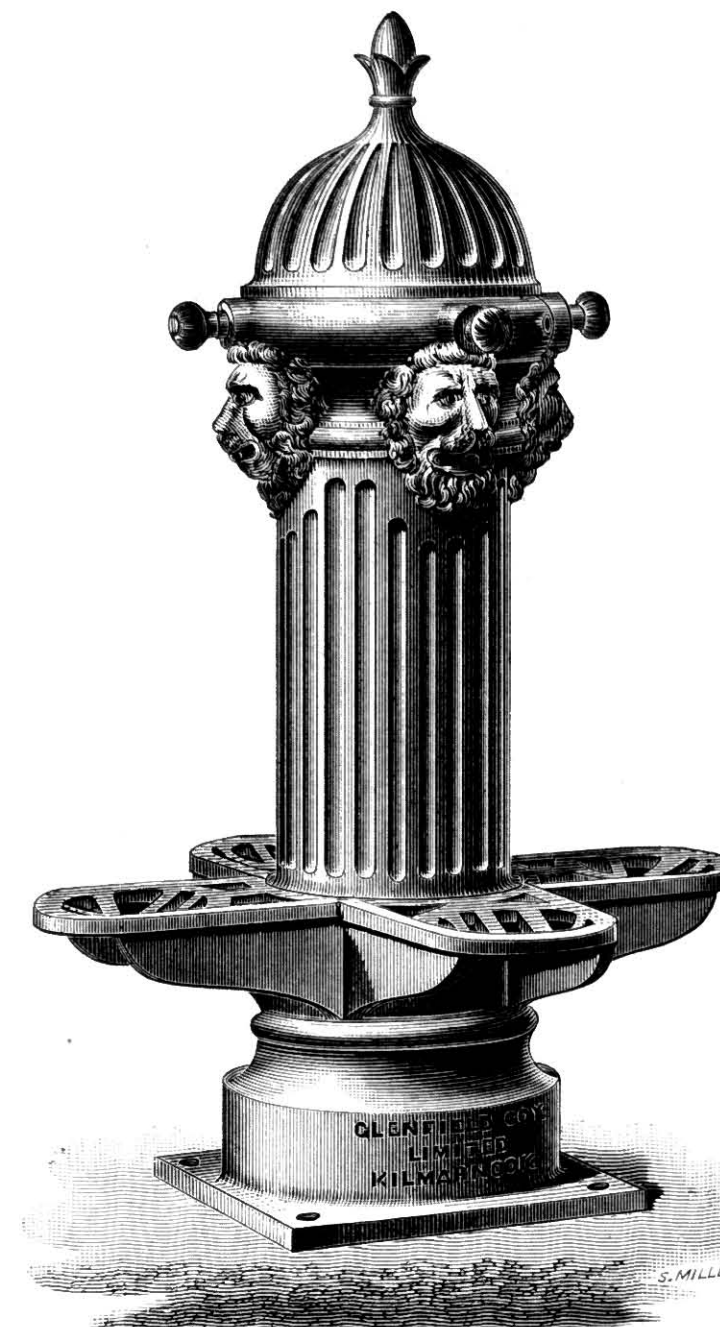
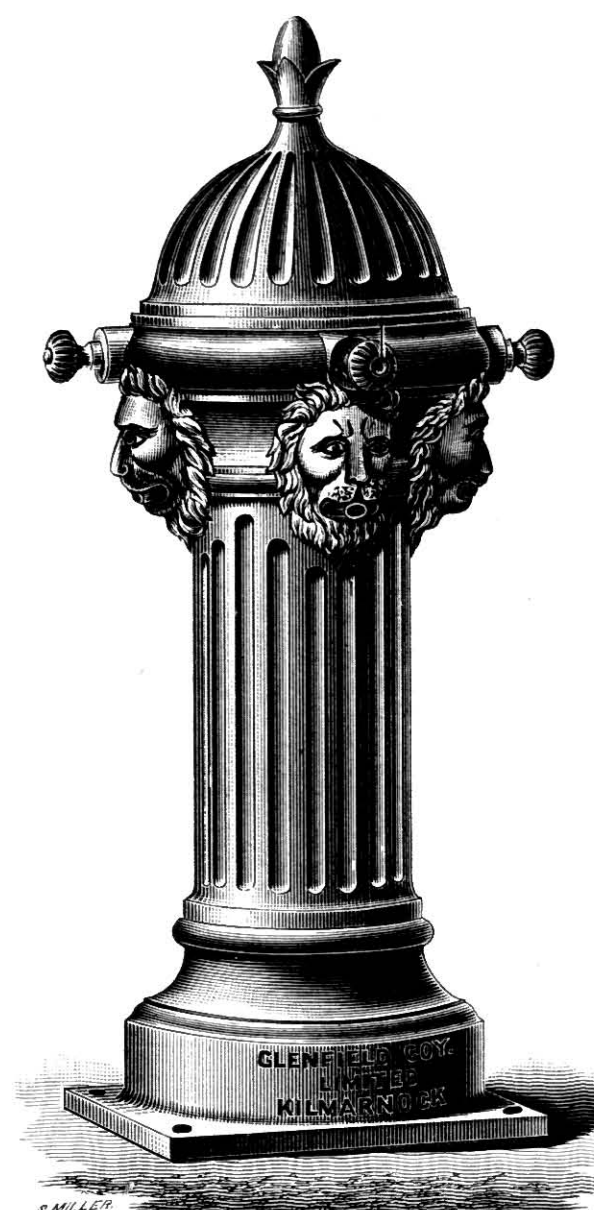


Fig. D 45.



PRICES.

D 45—Pillar Fountain, with four Taps, each.

Height from ground line to apex, 4 feet.

D 46—Pillar Fountain, with four Taps, with Brackets for Buckets, or to suit "Chatties" (for India), "

Height from ground line to apex, 4 feet 8 inches.

Galvanized Cup and Chain, extra, "

These Fountains are fitted with Kennedy's Patent (gun metal) Self-closing Taps, with Pulley, Chain, and Weight.

The Handles are of malleable cast iron bushed with gun metal.

Keys are not supplied unless specially ordered.

NOTE.—When the Fountains are required to work under a pressure exceeding 200 feet head, please state this when ordering.

Kennedy's Patent Self-closing Fountains.

Fig. D 18.

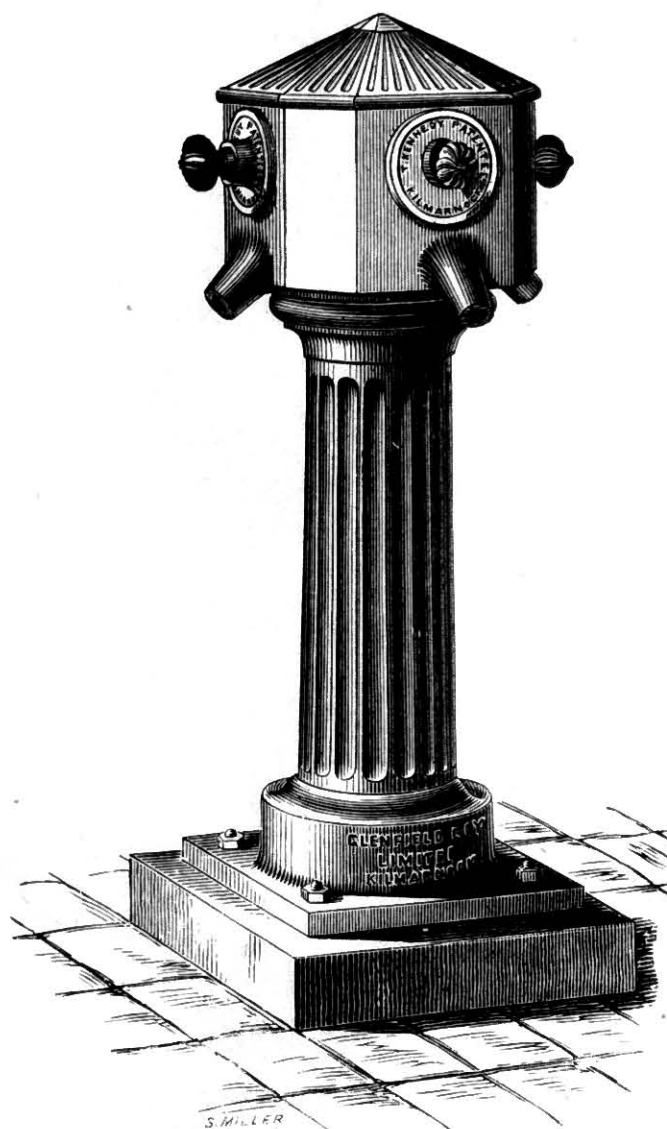
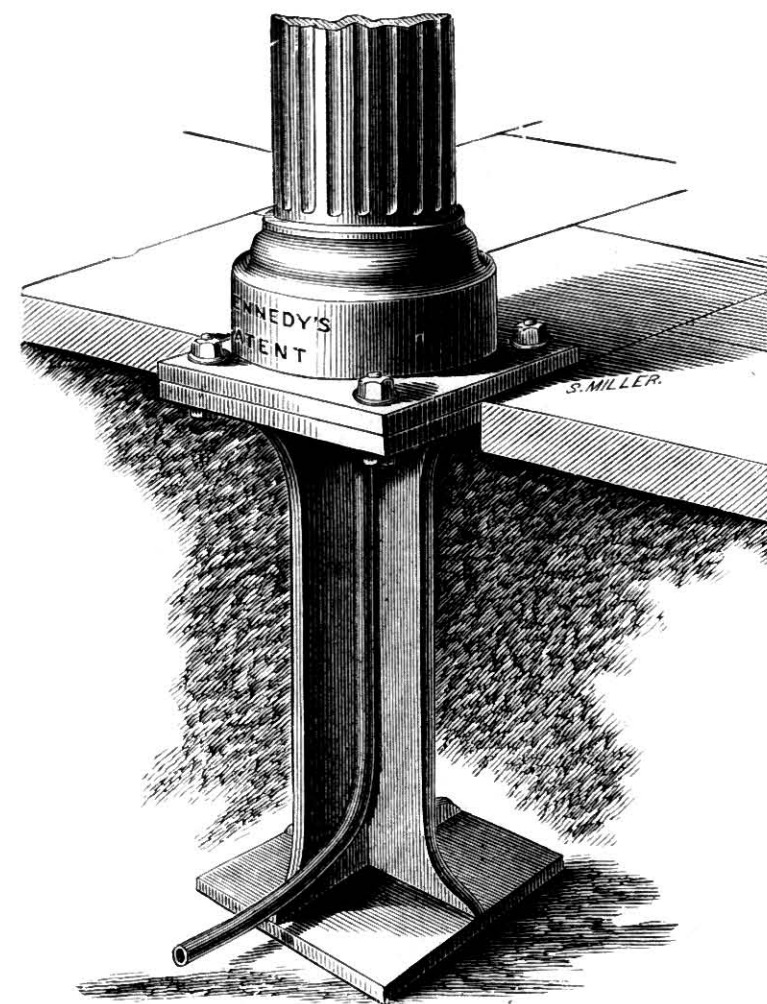


Fig. D 24.



PRICES.

D 18—Four-outlet Fountain, each.

D 24—Cast Iron Base for Pillar Fountains, with 4 Bolts, 18" high, ; 22" high, ..

Galvanized Cup and Chain, extra, "

This Fountain is fitted with Kennedy's Patent (gun metal) Self-closing Tap.

The Handles are of malleable cast iron bushed with gun metal.

Keys are not supplied unless specially ordered.

Height from bottom flange to apex, 3 feet 3½ inches.

NOTE.—When the Fountains are required to work under a pressure exceeding 200 feet head, please state this when ordering.

Kennedy's Patent Self-closing Fountains.

Fig. G 1.

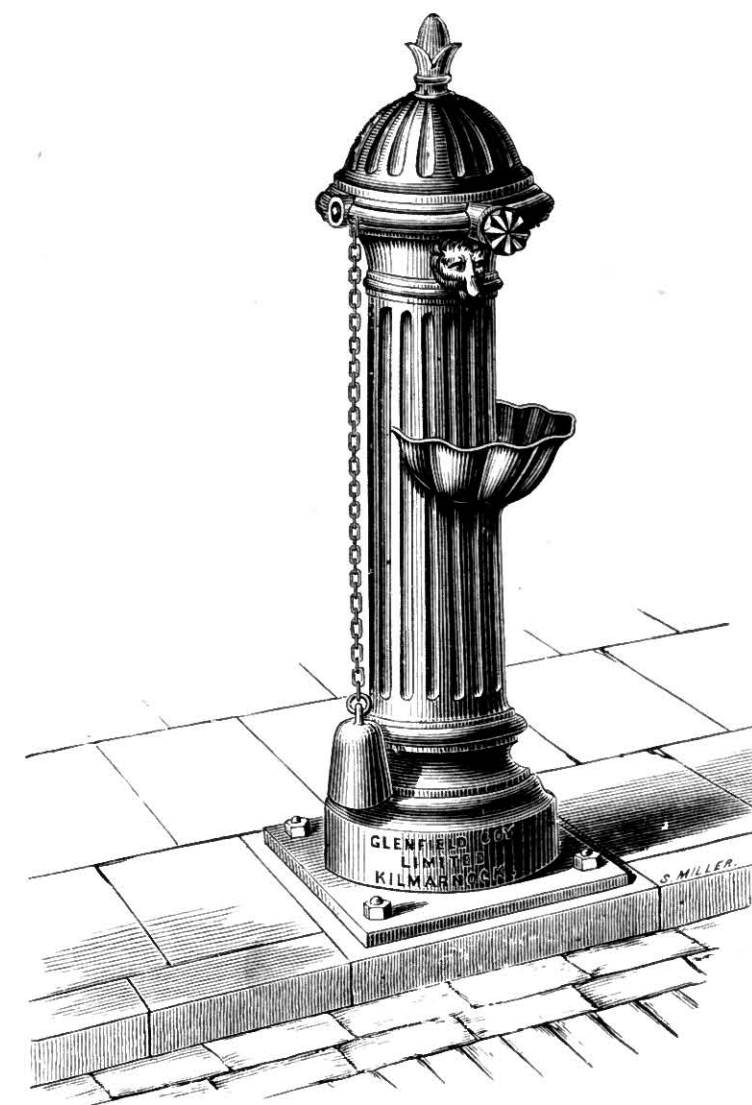
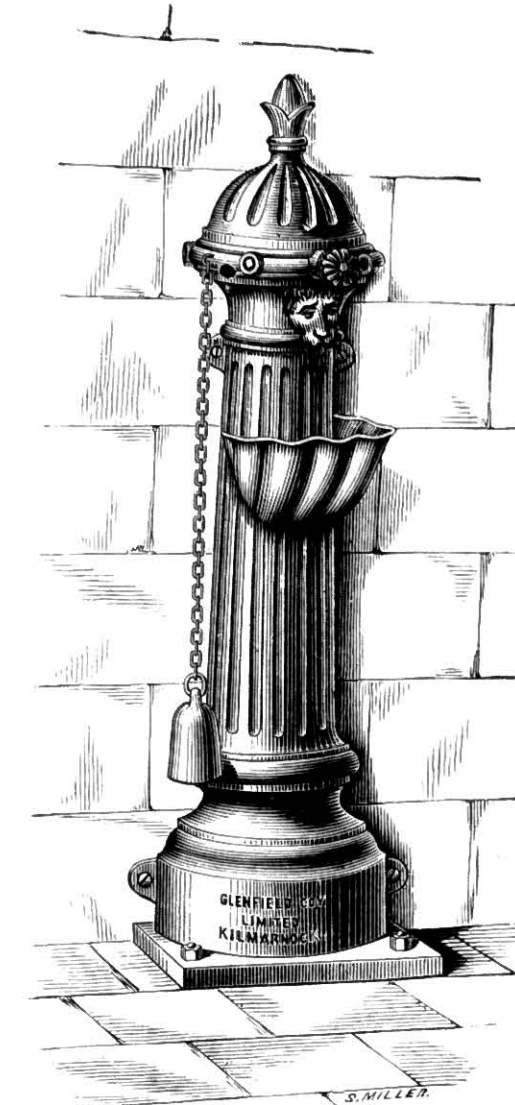


Fig. D 20.



PRICES.

D 20—Fountain, with Basin and chained Cup, for fixing against wall, each.

G 1—	Do.	do.	{	Single Outlet,	.. ..	..
				do. and Dog Basin,	.. ..	..
				Double Outlet,	.. ..	..
				do. and Dog Basins,	.. ..	..

These Fountains are fitted with Kennedy's Patent (gun metal) Self-closing Taps.

The Handles are of malleable cast iron bushed with gun metal.

Keys are not supplied unless specially ordered.

Height from ground line to apex, 3 feet 11 inches.

NOTE.—When Fountains are required to work under a pressure exceeding 200 feet head, please state this when ordering.

Fountain and Lamp Pillar Combined.

Fig. D 23a.

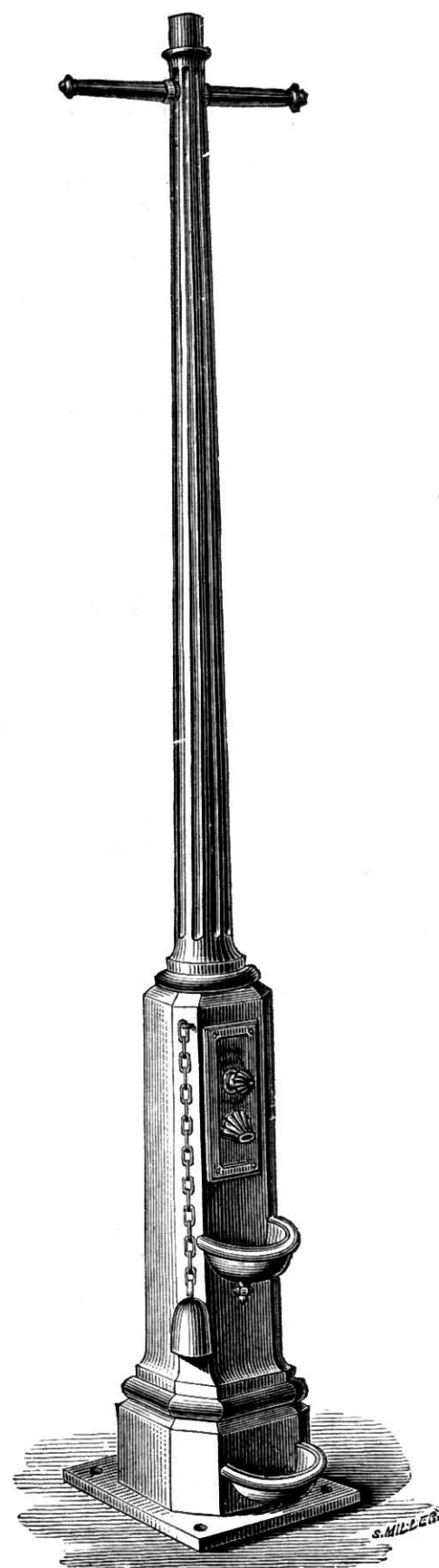
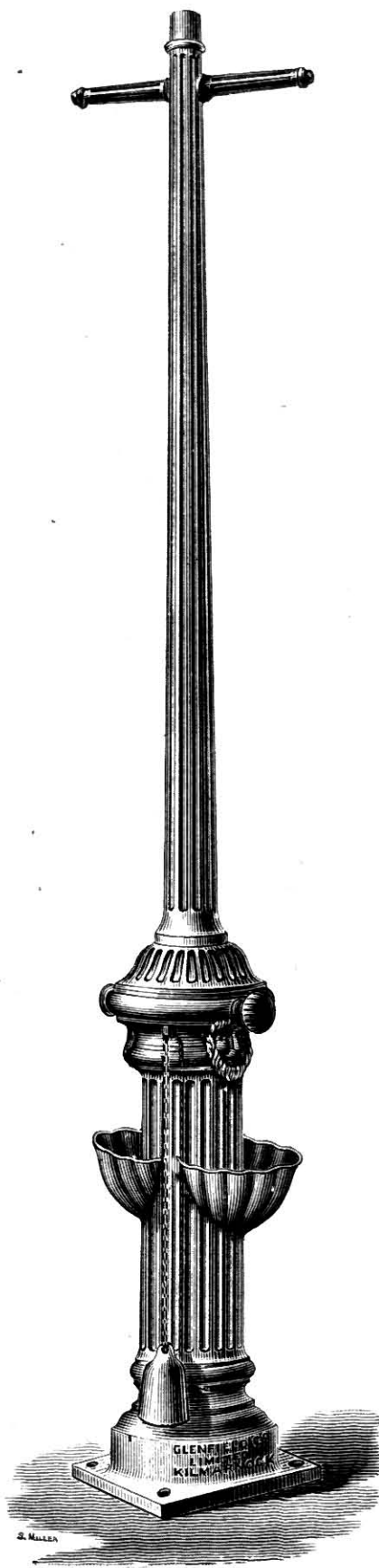


Fig. D 95.



PRICES.

D 23a—Lamp Pillar and Fountain Combined, with galvanized Cup and Chain and Dogs' Basin, each.
 D 95 — Do. Double Outlet, with two galvanized Cups and Chains, „

These Fountains are fitted with Kennedy's Patent (gun metal) Self-closing Taps.

Keys are not supplied unless specially ordered.

Height from ground line to top of Pillar, 10 feet.

NOTE.—When the Fountains are required to work under a pressure exceeding 200 feet head, please state this when ordering.

Self-closing Fountains.

Fig. D 97.

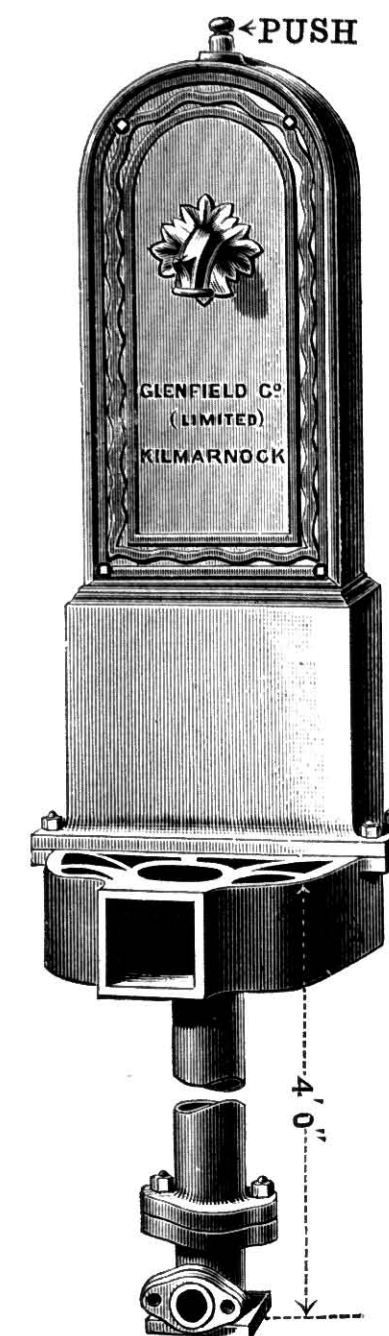


Fig. D 26.



PRICES.

D 26—Fountain on independent Base, fitted with Kennedy's Patent Self-closing Tap, each.

(Outside dimensions, 3' x 1' x 6" deep.)

D 97—Anti-freezing Fountain, with Box Grating, Push Knob on top, „

NOTE.—When the Fountains are required to work under a pressure exceeding 200 feet head, please state this when ordering.

Kennedy's Patent Self-closing Fountains.

Fig. D 98.

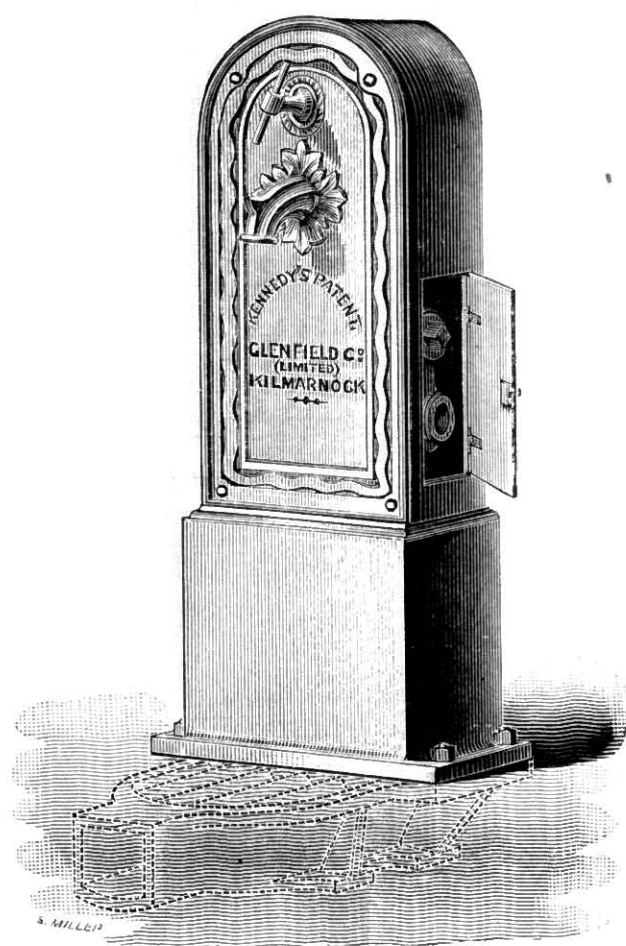


Fig. D 24a.



PRICES.

D 24a—Wall Fountain, as made for Madras Water Works, etc., etc.,	$\left\{ \begin{array}{l} \frac{3}{4}'' \\ 1'' \end{array} \right.$	each.
D 98 —Fountain and Hydrant Combined, locked Door on side,	.. ..	..
Cast Iron Grating, as shown by dotted lines, extra,	.. ..	..

These Fountains are fitted with Kennedy's Patent (gun metal) Self-closing Taps, with Pulley, Chain, and Weight.

NOTE.—When the Fountains are required to work under a pressure exceeding 200 feet head, please state this when ordering.

Kennedy's Patent Self-closing Wall Fountains.

Fig. D 2.

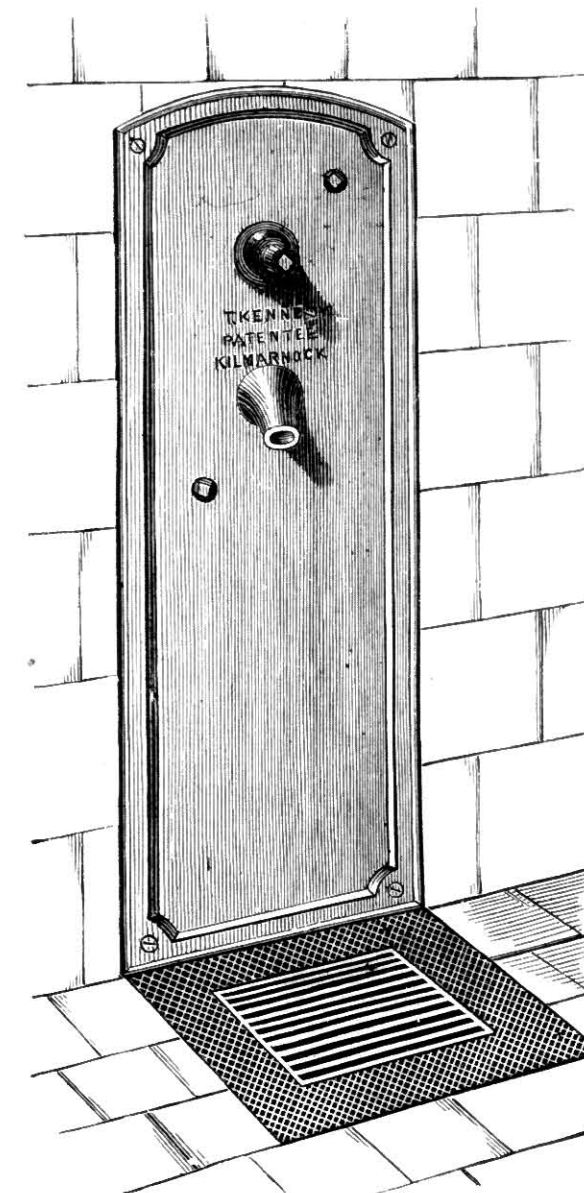


Fig. D 11.



These Fountains can have either Knob or Tapered Handles, or, if preferred, can be made suitable for opening with Portable Key.

PRICES.

D 2—Plate Wall Fountain (exclusive of Cesspool Grating),	.. ..	each.
D 11—Flush Handle Plate Wall Fountain,	$\left\{ \begin{array}{l} \frac{3}{4}'' \\ 1'' \end{array} \right.$	.. ..

These Fountains are fitted with Kennedy's Patent (gun metal) Self-closing Taps, with Pulley, Chain, and Weight.

Keys are not supplied unless specially ordered.

NOTE.—When the Fountains are required to work under a pressure exceeding 200 feet head, please state this when ordering.

Kennedy's Patent Self-closing Wall Fountains.

Fig. D 4 F.

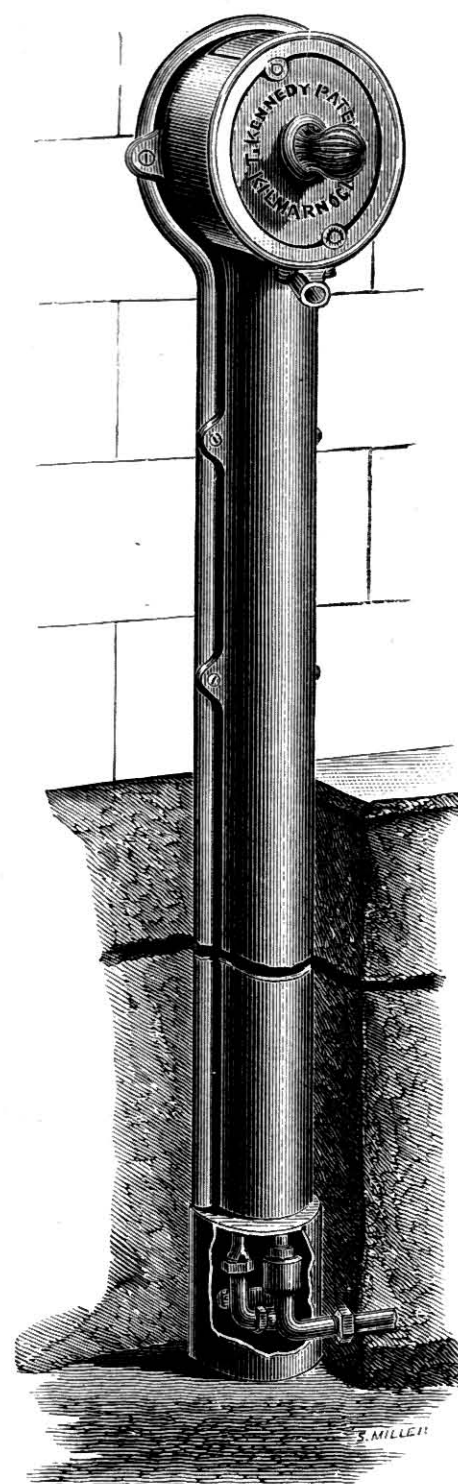
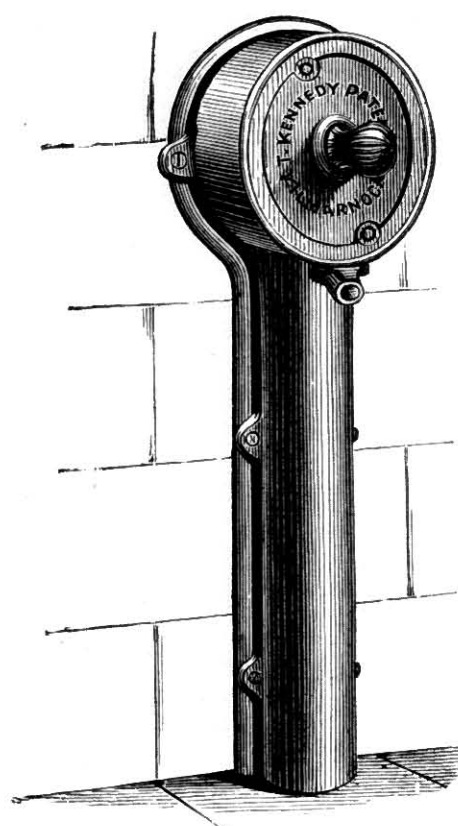


Fig. D 4.



These Fountains can have either Knob or Tapered Handles, or, if preferred,
can be made suitable for opening with Portable Key.

PRICES.

D 4	{ Casing Wall Fountain,	.. .. .	each.
	Do.	with addition of Stop Tap and Lead Pipe, .. .. .	..
D 4 F	—Anti-freezing Wall Fountain,	.. .. .	..

When ordering, please state pressure under which Fountain D 4 F is required to work.

These Fountains are fitted with Kennedy's Patent (gun metal) Self-closing Taps.

Keys are not supplied unless specially ordered.

NOTE.—When Fountains are required to work under a pressure exceeding 200 feet head,
please state this when ordering.

Kennedy's Patent Self-closing Wall Fountains.

Fig. D 104.

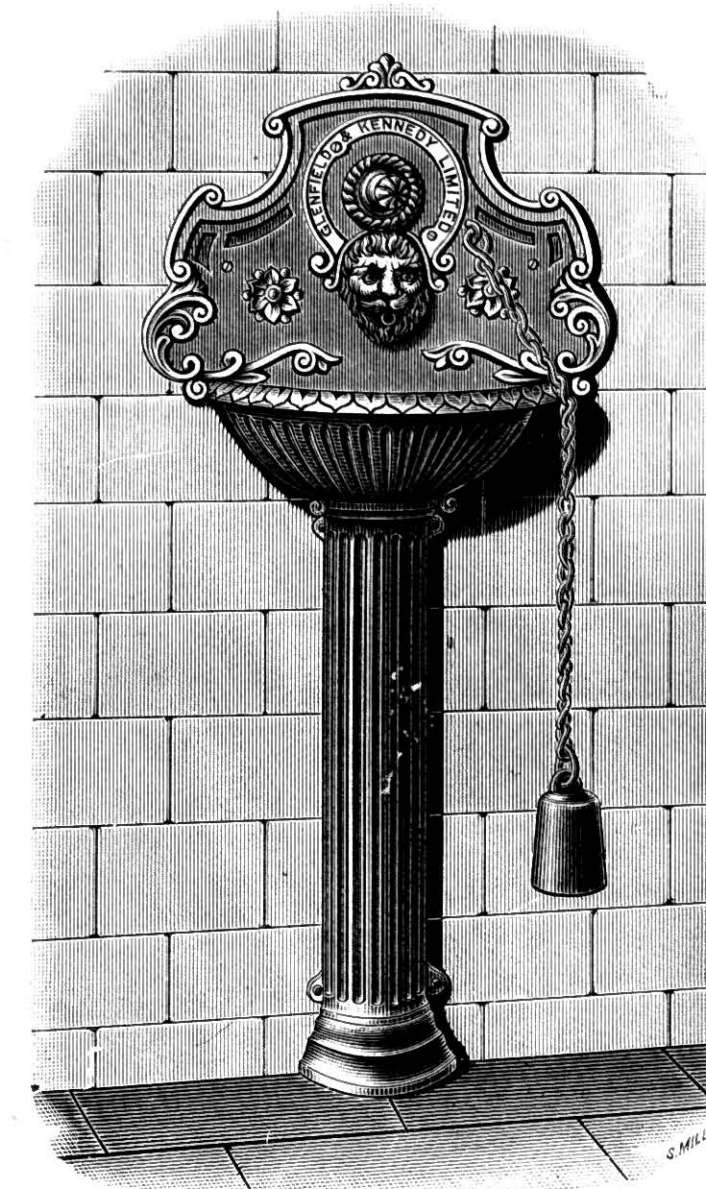


Fig. D 17.



These Fountains can have either Knob or Tapered Handles, or, if preferred,
can be made suitable for opening with Portable Key.

PRICES.

D 17	—Fountain to fix on Wall, with galvanized Cup and Chain,	.. .. .	each.
D 104	—Do.	do. .. .. .	..

These Fountains are fitted with Kennedy's Patent (gun metal) Self-closing Taps.

Keys are not supplied unless specially ordered.

NOTE.—When Fountains are required to work under a pressure exceeding 200 feet head,
please state this when ordering.

Kennedy's Patent Self-closing Wall Fountains.

Fig. D 3.

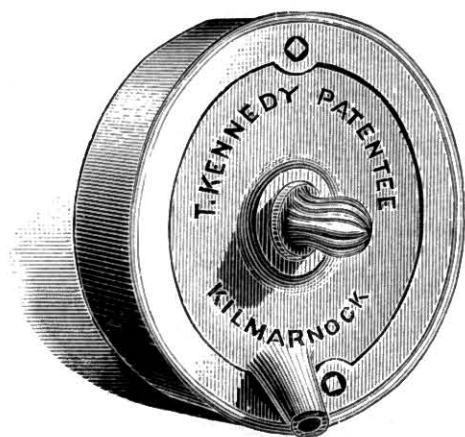


Fig. D 8.

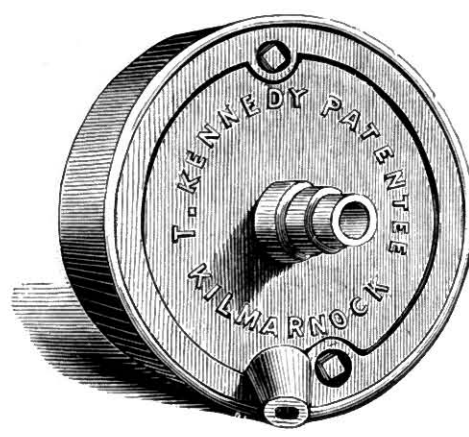


Fig. D 9.

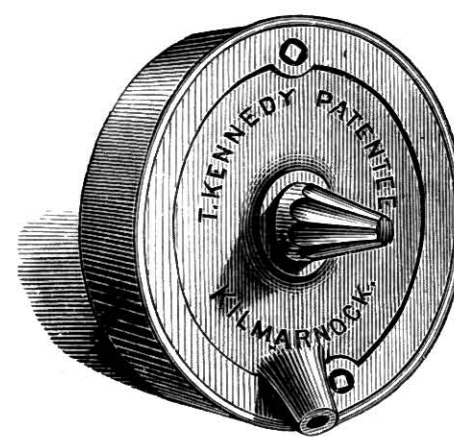


Fig. D 5.



Fig. D 19.

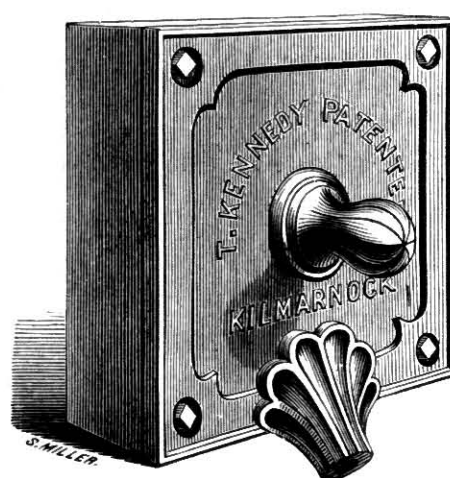
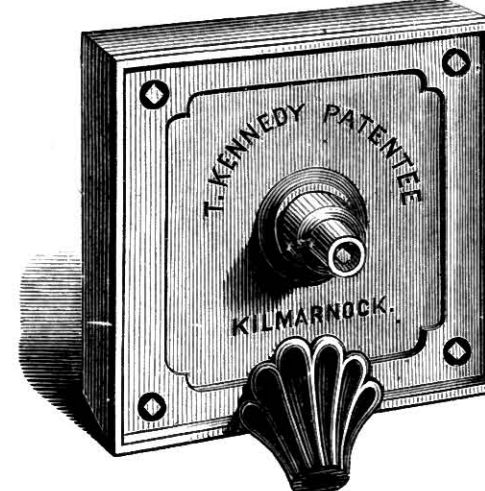


Fig. D 19a.



These Fountains can have either Knob or Tapered Handles, or, if preferred, can be made suitable for opening with Portable Key.

PRICES.

D 3	—Circular Wall Fountain, Knob Handle,	..	..	..	..	$\frac{1}{2}$ "	; $\frac{3}{4}$ "	; 1"	each.
D 5	—Oblong Wall Fountain,	..	..	..	..	..	..	..	"
D 8	—Circular Wall Fountain, Key Handle,	..	..	..	..	$\frac{1}{2}$ "	; $\frac{3}{4}$ "	; 1"	"
D 9	—Do. Tapered Handle,	..	..	..	..	..	..	..	"
D 19	—Square Wall Fountain, Knob Handle,	..	..	..	..	..	..	..	"
D 19a	—Do. Key Handle,	..	..	..	..	$\frac{1}{2}$ "	; $\frac{3}{4}$ "	..	"
D 19b	—Do. Tapered Handle,	..	..	..	..	..	..	..	"
D 19c	—Do. with Inlet and Outlet at back,	..	..	..	..	..	..	$\frac{3}{4}$ "	"

These Fountains are fitted with Kennedy's Patent (gun metal) Self-closing Taps.

Keys are not supplied unless specially ordered.

NOTE.—When Fountains are required to work under a pressure exceeding 200 feet head, please state this when ordering.

Continuous-flow Fountains, etc.

Fig. D 102.

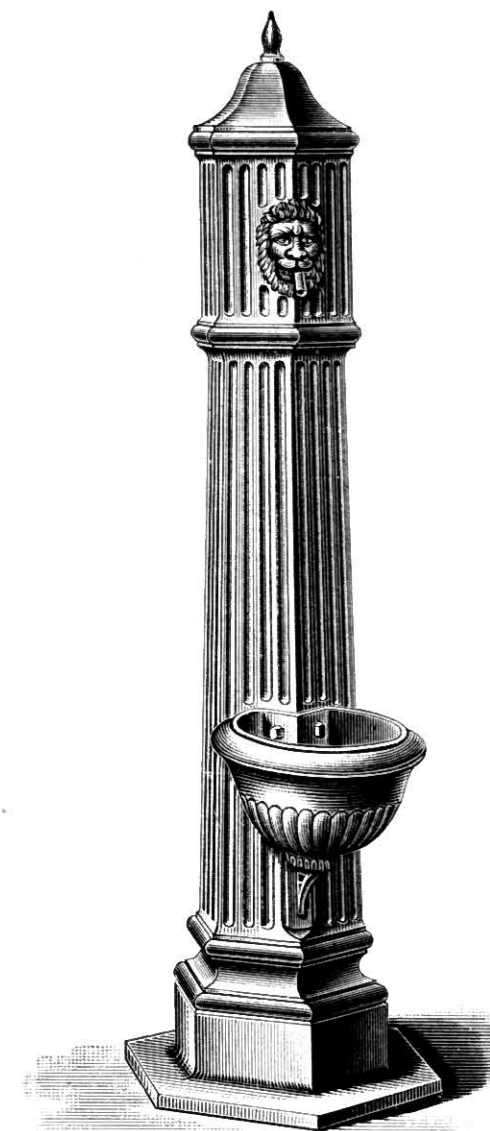


Fig. D 103.

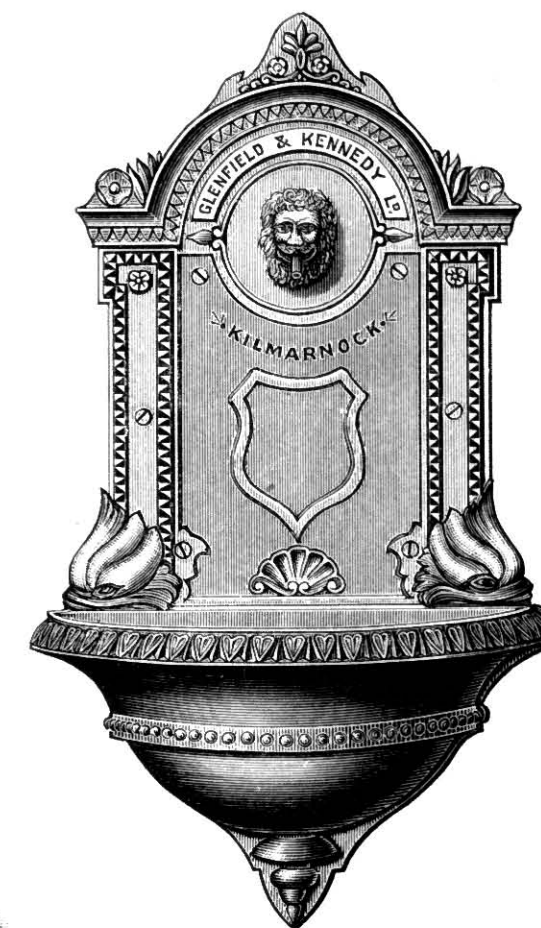


Fig. D 106.



PRICES.

D 102—Continuous-flow Pillar Fountain,	{ with one Outlet and Basin,	each.
	{ with two Outlets and Basins,	"

Height from ground line to apex, 5 feet 2 inches.

D 103—Continuous-flow Wall Fountain, with Basin,	"
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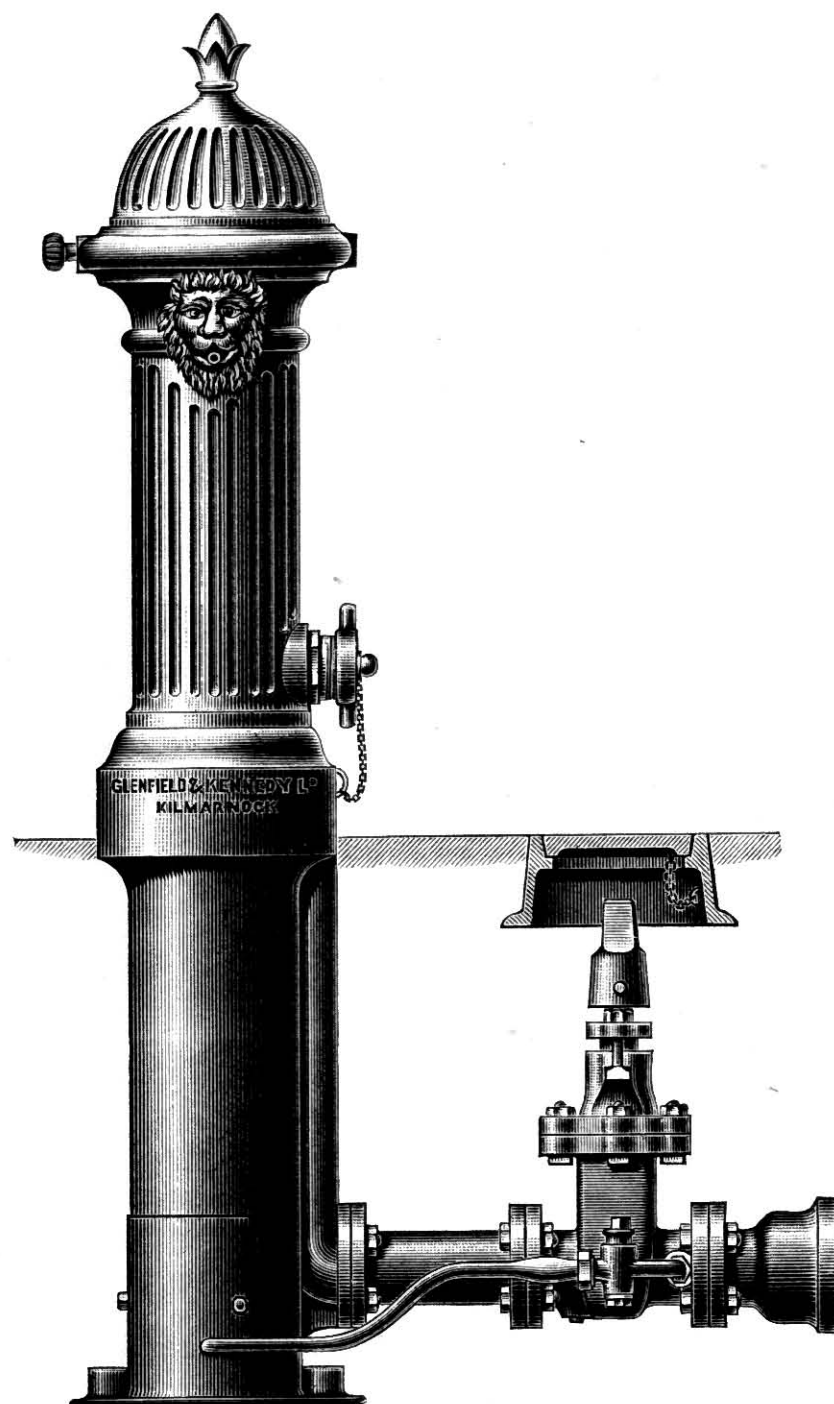
Galvanized Cup and Chain, extra,	"
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Height over all from bottom to top, 4 feet 6 $\frac{1}{2}$ inches.

D 106—Harkess' Jet D'eau Hygienic Fountain—Price on Application.	
--	--

Street Standpost and Anti-Freezing Fountain Combined.

Fig. L 13.



PRICE.

- L 13—Standpost and Anti-freezing Fountain Combined, with Sluice Valve and Surface Box, and having separate connection to Fountain with Stop Cock, .. } each.
Galvanized Cup and Chain, extra, "

Height from ground line to apex, 3 feet 6½ inches.

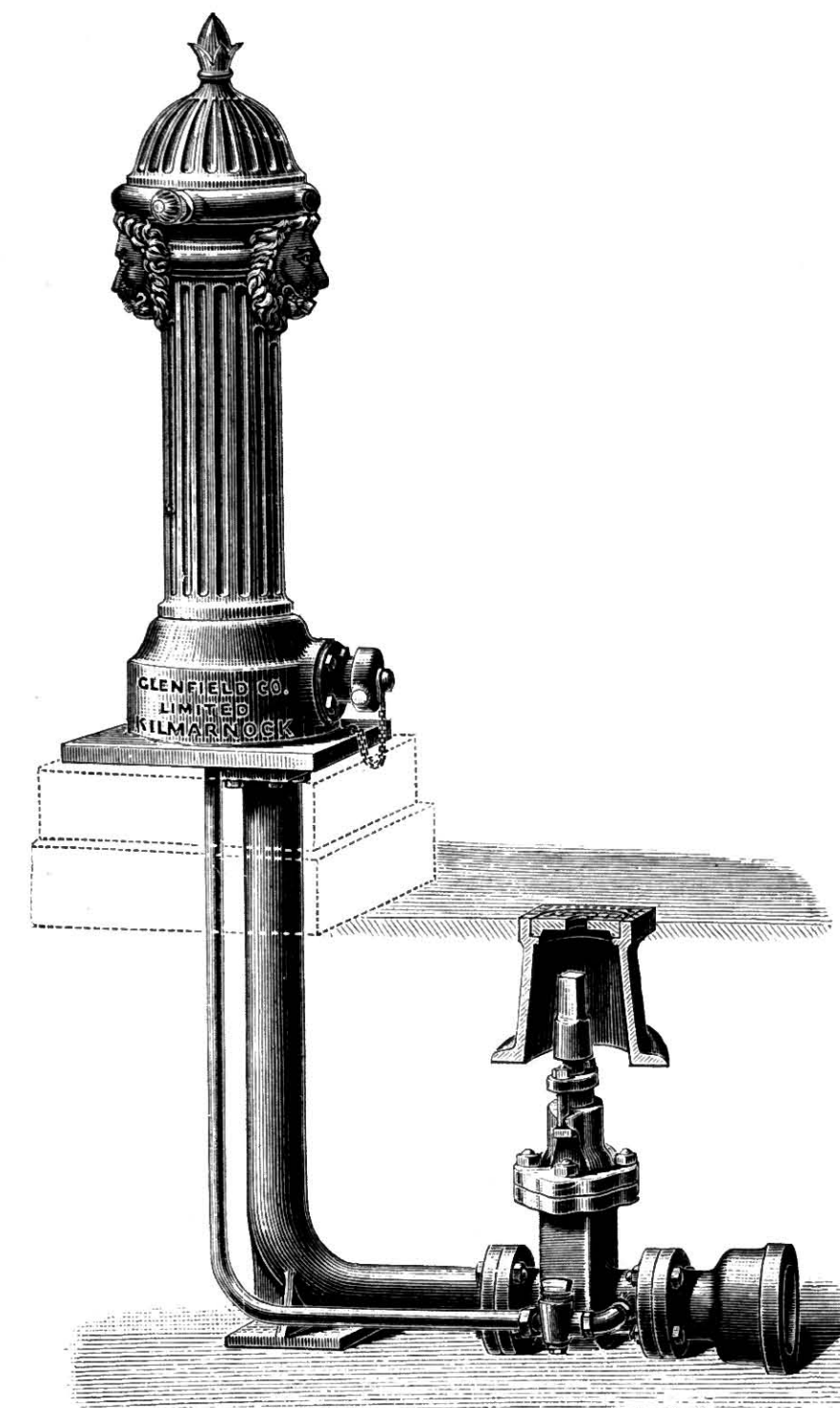
This Fountain is fitted with Kennedy's Patent (gun metal) Self-closing Tap, with Pulley, Chain, and Weight.

The Handle is of malleable cast iron bushed with gun metal.

NOTE.—When Fountains are required to work under a pressure exceeding 200 feet head, please state this when ordering.

Kennedy's Patent Self-closing Fountain.

Fig. L 14.



PRICE.

- L 14—Fountain and Standpost Combined, with 2½" Sluice Valve and Surface Box, and having separate connection to Fountain with Stop Cock, .. } single Outlet, ; double Outlet, each.
Galvanized Cup and Chain, extra, "

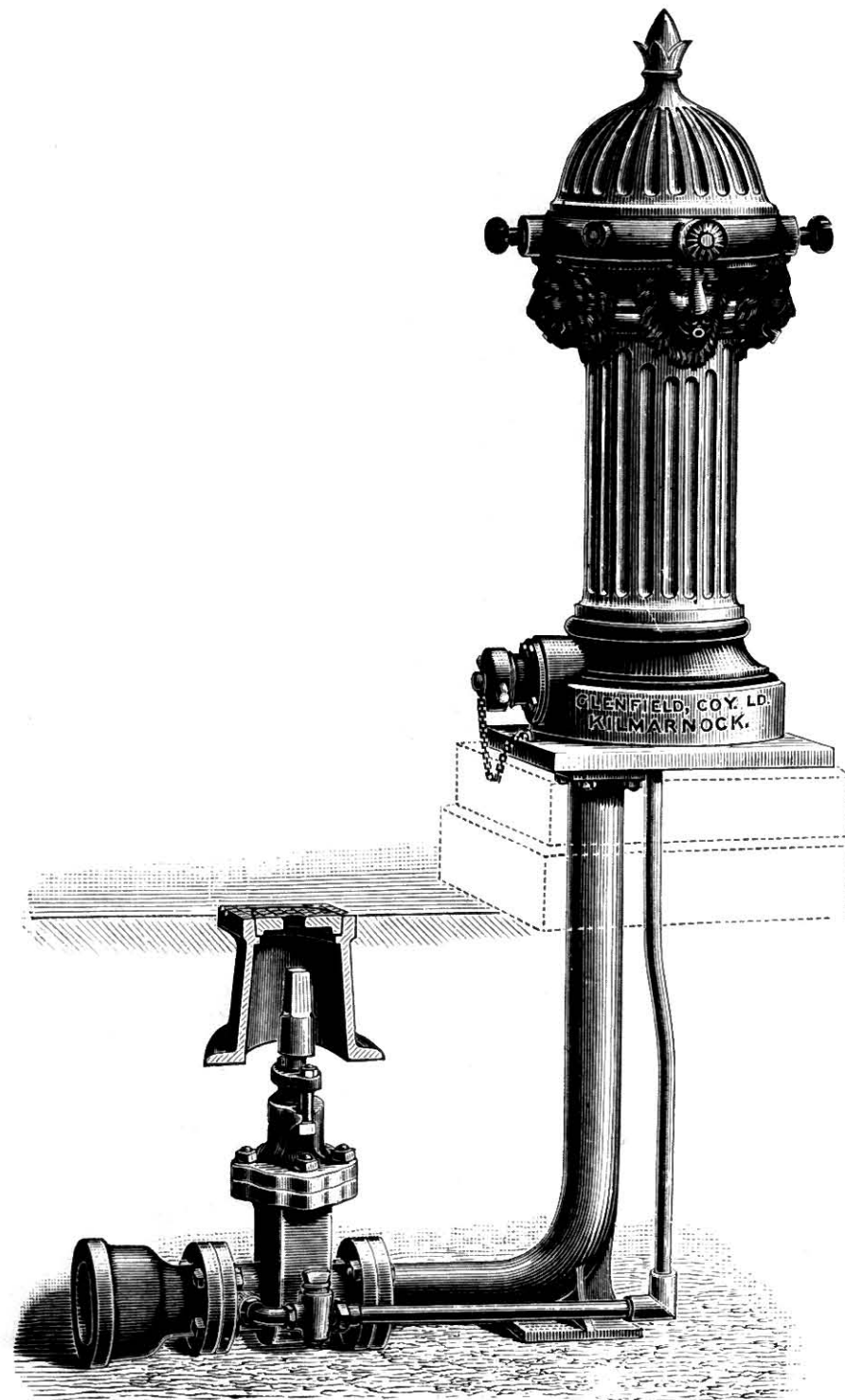
Height from bottom flange to apex, 3 feet 8 inches.

This Fountain is fitted with Kennedy's Patent (gun metal) Self-closing Tap, with Pulley, Chain, and Weight.

NOTE.—When Fountains are required to work under a pressure exceeding 200 feet head, please state this when ordering.

Kennedy's Patent Self-closing Fountain.

Fig. L 15.



PRICE.

- L 15—Four-outlet Fountain and Standpost Combined, with 2½" Sluice Valve and Surface Box, and having separate connection to Fountain Taps with Stop Cock, } each.
 Galvanized Cup and Chain, extra, ,

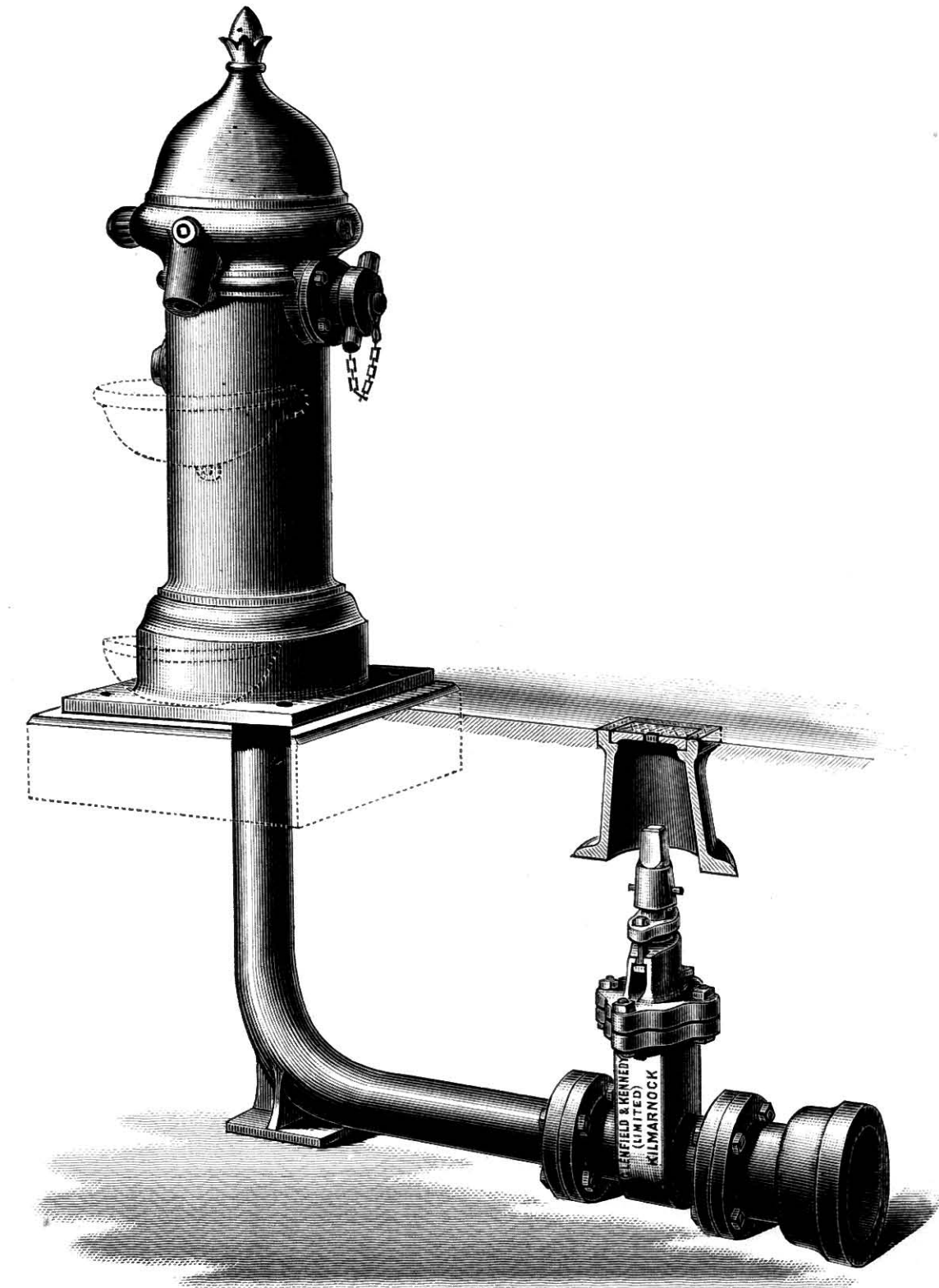
This Fountain is fitted with Kennedy's Patent (gun metal) Self-closing Tap, with Pulley, Chain, and Weight.

Height from bottom flange to apex, 4 feet.

NOTE.—When Fountains are required to work under a pressure exceeding 200 feet head, please state this when ordering.

Kennedy's Patent Self-closing Fountain.

Fig. L 19.



PRICES.

- Standpost and Fountain Combined, Valve on side, with 2½" Sluice Valve and Surface Box, *without* Basins, each.
 L 19—Standpost and Fountain Combined, Valve on side, with 2½" Sluice Valve and Surface Box, *with* Basins, as shown by dotted lines, and galvanized Cup and Chain, ,

Height from ground line to apex, 3 feet 6½ inches.

This Fountain is fitted with Kennedy's Patent (gun metal) Self-closing Tap, with Pulley, Chain, and Weight.

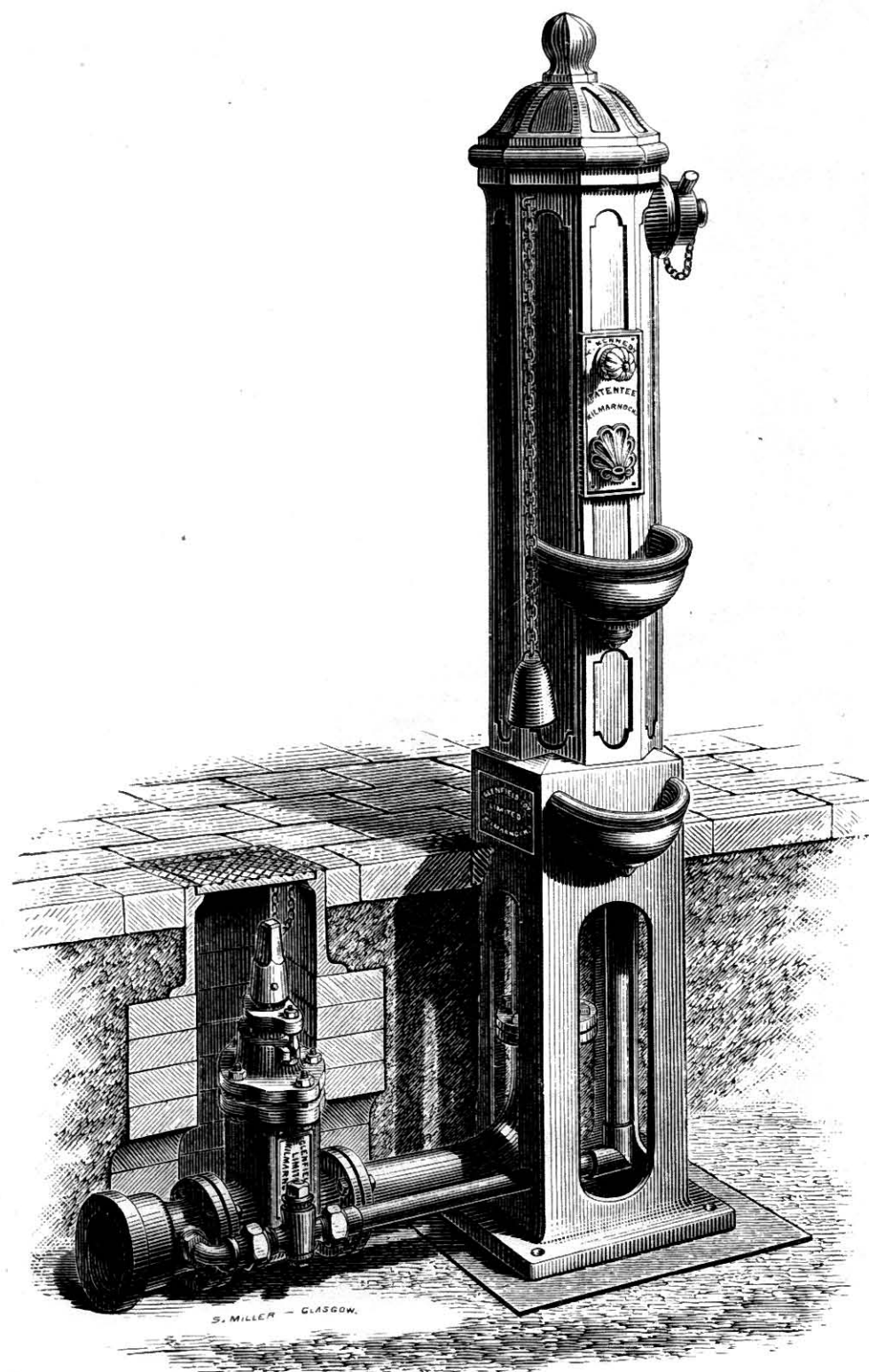
The Handle is of malleable cast iron bushed with gun metal.

Keys are not supplied unless specially ordered.

NOTE.—When Fountains are required to work under a pressure exceeding 200 feet head, please state this when ordering.

Street Standpost and Fountain Combined.

Fig. L 1.



PRICES.

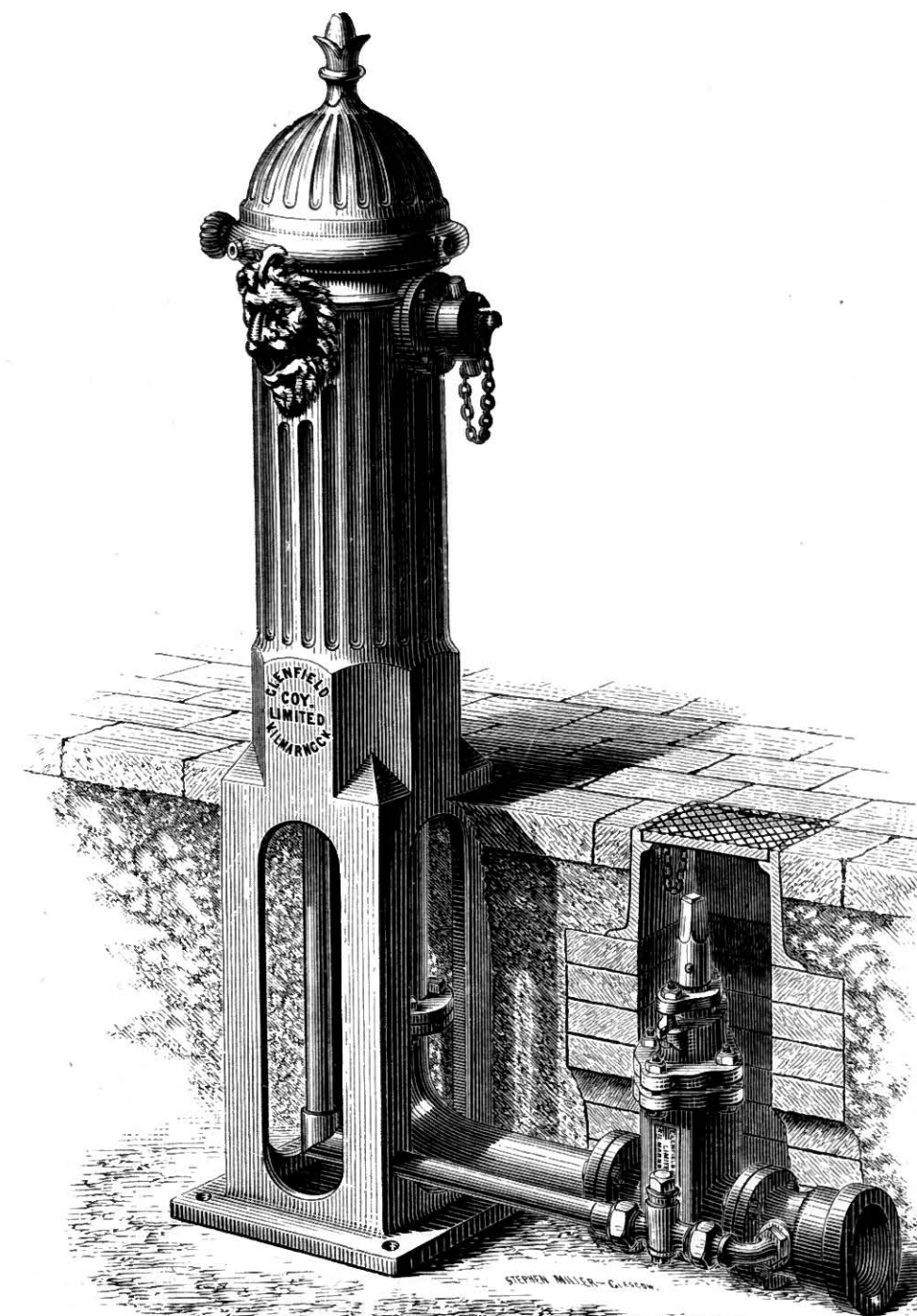
- L 1—Street Watering Standpost and Fountain Combined, with galvanized Cup and Chain, chained cast iron Screwed Cap, and having $2\frac{1}{2}$ " Sluice Valve and Surface Box. A Self-emptying Valve is fixed in Outlet of Sluice Valve to prevent damage by frost, each.
- If without Fountain Tap, "

Height from ground line to apex, 5 feet.

NOTE.—When Fountains are required to work under a pressure exceeding 200 feet head, please state this when ordering.

Street Standpost and Pillar Fountain Combined.

Fig. L 4.



PRICE.

- L 4—Street Watering Standpost and Pillar Fountain Combined, with chained cast iron Screwed Cap, and having $2\frac{1}{2}$ " Sluice Valve and Surface Box. The Fountain is $\frac{3}{4}$ " Kennedy's Patent Self-closing, with Pulley, Chain, and Weight. A Self-emptying Valve is fixed in Outlet of Sluice Valve to prevent damage by frost, each.
- Extra if two Fountain Taps, "

Height from ground line to apex, 3 feet 9 inches.

NOTE.—When Fountains are required to work under a pressure exceeding 200 feet head, please state this when ordering.

Street Standposts and Pillar Fountains Combined.

Fig. L 32.

**PRICES.**

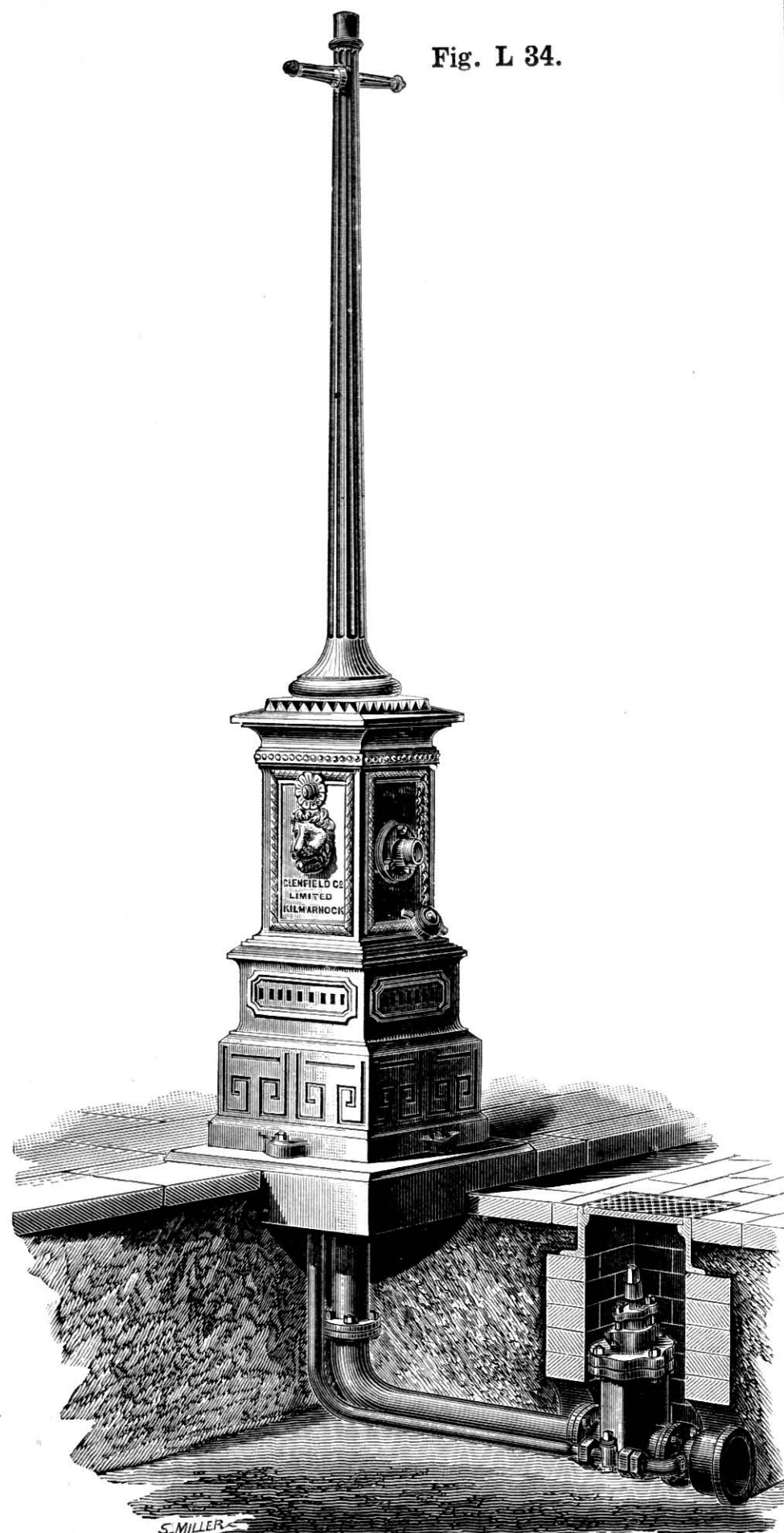
L 32—Street Watering Standpost and Pillar Fountain Combined, 11 $\frac{3}{8}$ " dia., with bottom Elbow, gun metal Outlet at side, with chained cast iron Screwed Cap, Valve in top, each.

Height from ground line to apex, 3 feet 9 inches.

L 34—Street Watering Standpost, Lamp Pillar and Fountain Combined, fitted with two Patent Non-concussive Self-closing Taps, having 2 $\frac{1}{2}$ " Sluice Valve and Surface Box, and having separate connection to Fountain Taps with Stop Cock, each.

Height from ground line to top of pillar, 10 feet.

Fig. L 34.



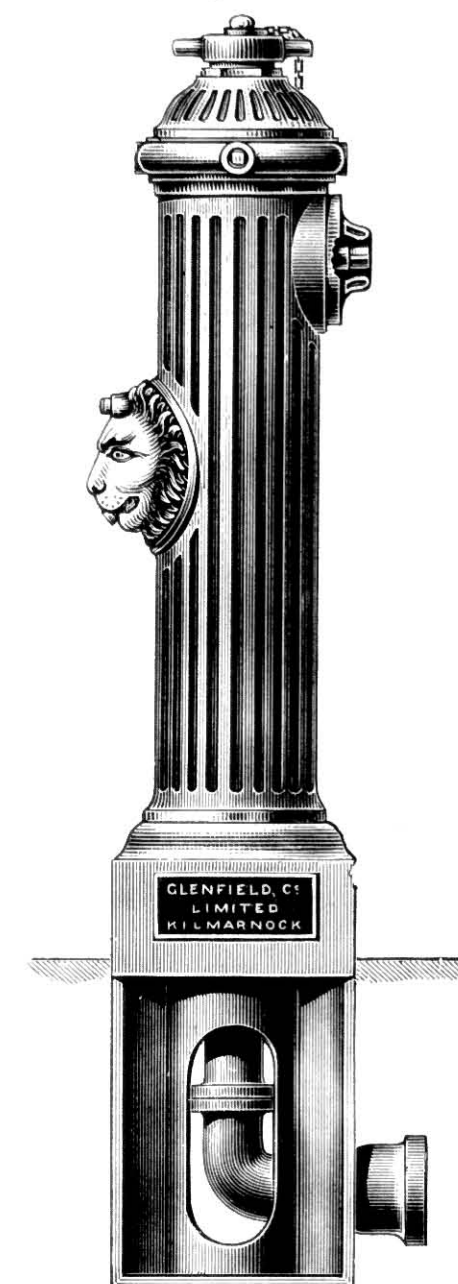
Street Standposts and Pillar Fountains Combined.

Fitted with Patent Non-concussive Self-closing Taps.

Fig. L 10.



Fig. L 12.

**PRICES.**

L 10—Street Watering Standpost, with Bottom Elbow, gun metal Outlet, and chained cast iron Screwed Cap, with square at top for Key, and having Patent Non-concussive Self-closing Fountain Tap, one Outlet, ; two Outlets, each.

Height from ground line to apex, 4 feet 4 $\frac{1}{2}$ inches.

NOTE.—When Tap in use L 10 Post is not Anti-freezing.

L 12—Street Watering Standpost and Fountain Combined, with bottom Elbow, gun metal Outlet on top, and chained cast iron Screwed Cap, Valve in top, and having Patent Non-concussive Self-closing Fountain Tap, ,

If without Fountain Tap, ,

Height from ground line to apex, 4 feet.

Pillar Fountains.

Fig. D 50.

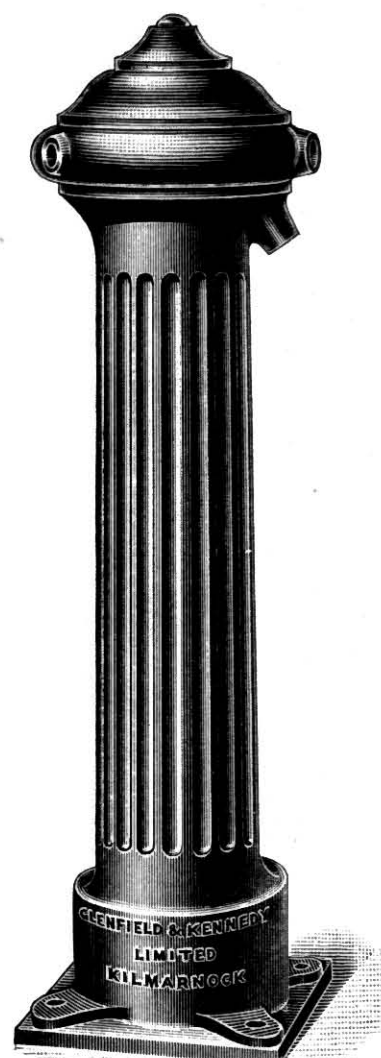
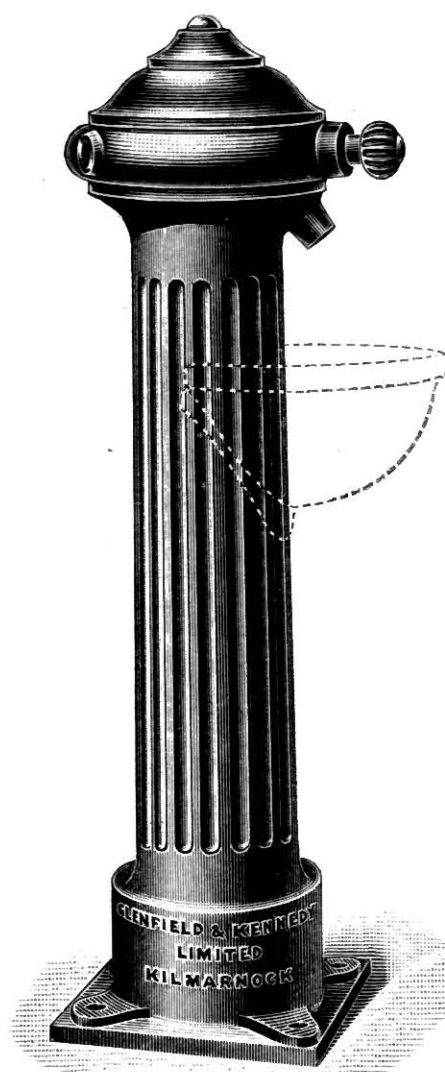


Fig. D 50a.



PRICES.

D 50	Single-outlet Fountain, fitted with Non-concussive Self-closing Tap, and having Push Knob on side,	each.
	Single-outlet Fountain, fitted with Non-concussive Self-closing Tap, and having Push Knob on side, with Basin and Cup and Chain, ..	„
D 50a	Single-outlet Fountain, fitted with Kennedy's Patent Self-closing Tap, ..	„
	Single-outlet Fountain, fitted with Kennedy's Patent Self-closing Tap, with Basin and Cup and Chain,	„

Height from ground line to apex, 3 feet 2½ inches.

Pillar Fountains,

Fitted with Patent Non-concussive Self-closing Taps.

Fig. D 60.

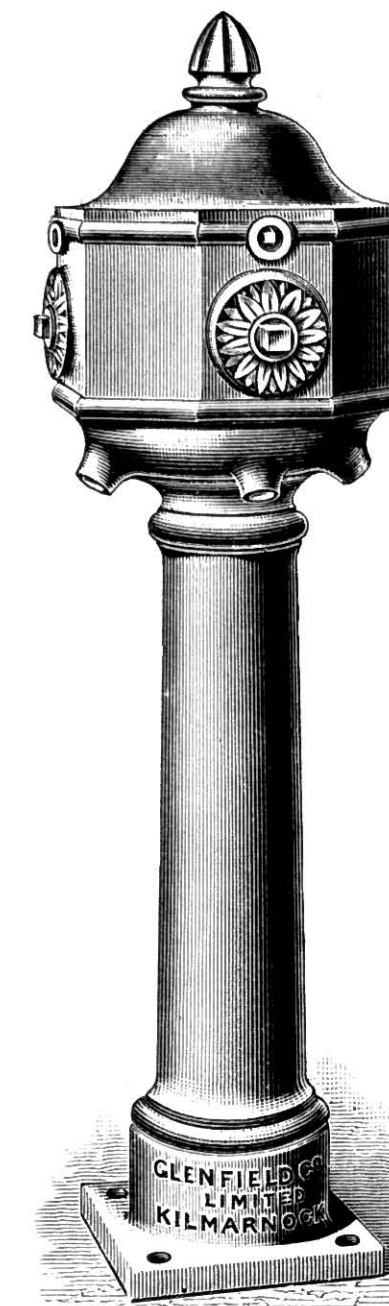
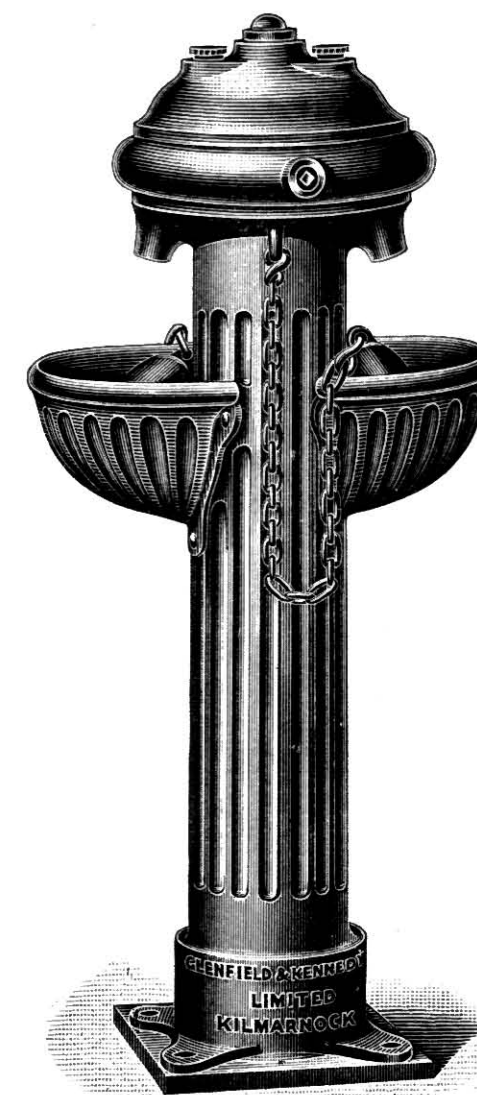


Fig. D 54.



PRICES.

D 54—Double-outlet Fountain,	with Basins and Cups and Chains, ..	each.
	Push Knobs on top, without Basins and Cups and Chains, ..	„

Height from ground line to apex, 3 feet 2½ inches.

D 60—Four-outlet Fountain, Push Knobs on side,	„
--	---

Height from ground line to apex, 3 feet 11½ inches.

Wall Fountains,

Fitted with Patent Non-concussive Self-closing Taps.

Fig. D 70.

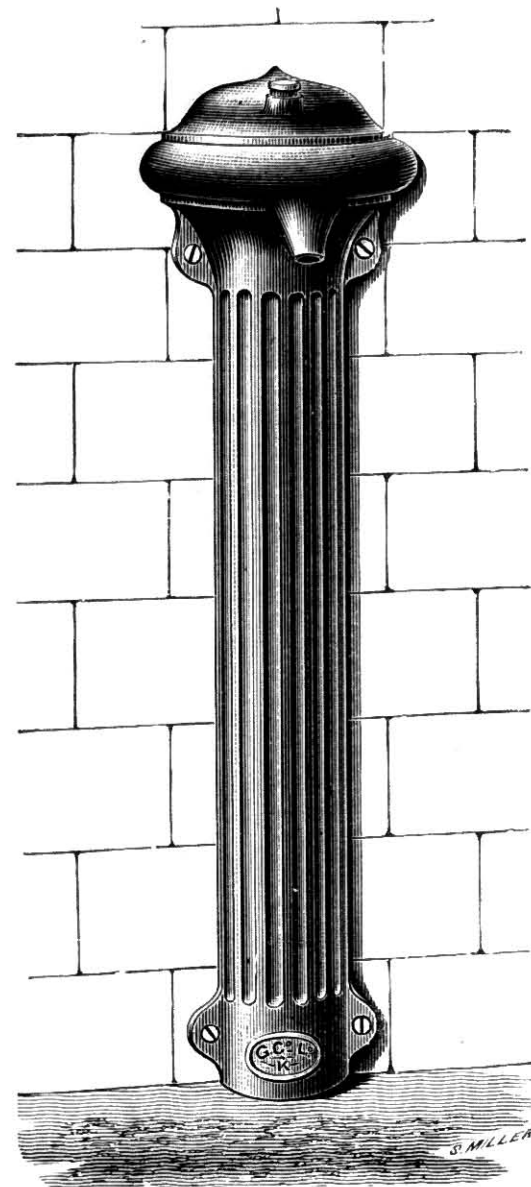


Fig. D 76.



Fig. D 73.

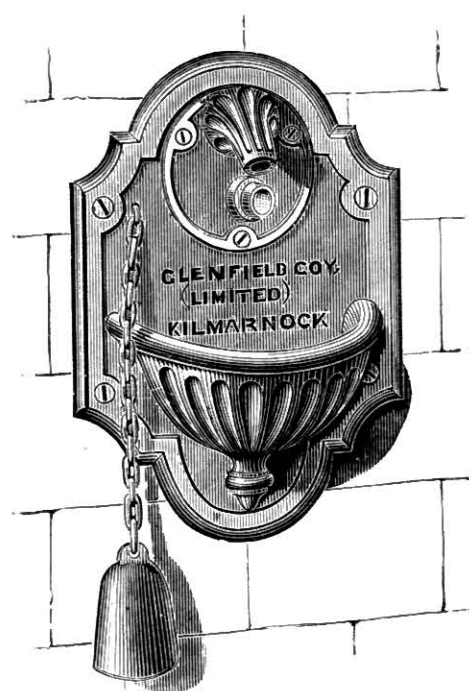


Fig. D 78.



PRICES.

D 70—	Wall Fountain, with Casing, Push Knob on side,	.. .. .	each.
D 73—	Do. with Basin and Cup and Chain, Push Knob in front under Outlet,	.. .. .	..
D 76—	Do. Push Knob on top,	.. .. . 1/2", 1"	..
D 78—	Do. do. in front above Outlet,	.. .. .	..

Wall Fountains,

Fitted with Patent Non-concussive Self-closing Taps.

Fig. D 25.

With Basin.



Without Basin.



Fig. D 86.

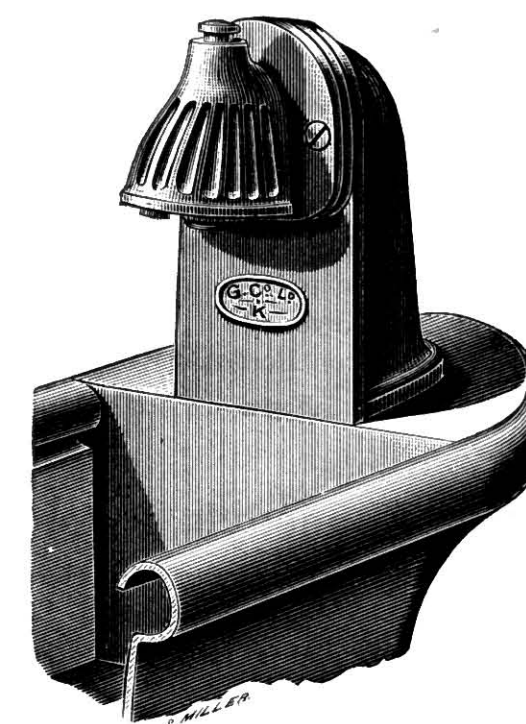
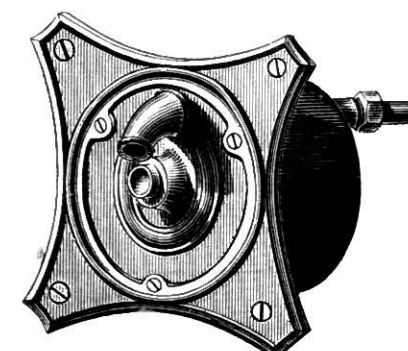


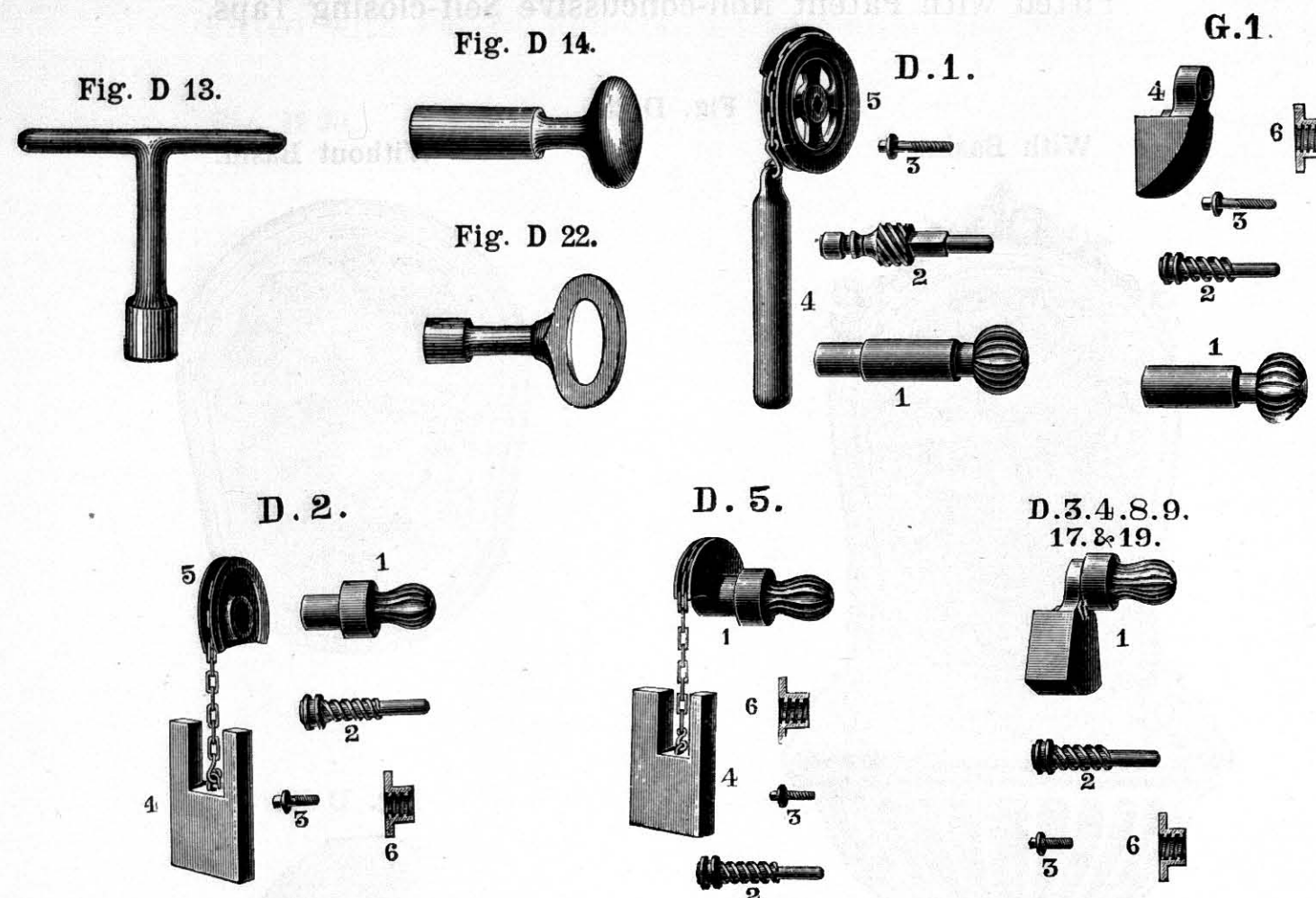
Fig. D 84.



PRICES.

D 25—	Wall Fountain (Lion's Head), Push Knob in front above Outlet	{ with Basin and Cup and Chain, ..	each.
		{ without Basin, ..	..
D 84—	Do. Push Knob in front under Outlet, all gun metal, suitable for inserting into Granite Fountain,	.. .. .	..
D 86—	Fountain set on end of Cattle Trough, including Standard Brackets,	.. .. .	..
	Galvanized Cup and Chain (extra), if required,	.. .. .	..

Keys and Miscellaneous Fittings for Fountains.



PRICES.

D 13—Steel Cross Key for removing front of Fountains,	..	..	..	..	⌘ dozen.
D 14—Wrought Iron Portable Knob Keys, case-hardened,	..	..	..	..	..
D 22 { Brass Portable Keys,	..	..	..	..	..
{ Malleable Cast Iron Portable Keys,..	..	..	..	..	..

Keys are not supplied unless specially ordered.

Fittings for Kennedy's Patent Fountains, Finished, ready for use.

No.	Description.	D 1.	G 1.	D 2.	D 5.	D 3, 4, 8, 9, 17 and 19.
1	Handle,					each.
2	Gun Metal Screw and Valve, .. .. .					..
3	Brass Bolt for fixing Top or Door of Fountain,					..
4	Cast Iron Weight and Chain, .. .. .					..
5	Do. Pulley,.. .. .					..
6	Gun Metal Nut for Screw, .. .. .					..

SECTION G.

SCREW-DOWN BIB AND STOP TAPS, GROUND TAPS, FERRULES, COUPLINGS, WASTE PLUGS, ETC., ETC.

The designs are subject to alteration and amendment, and, while corrections in Catalogue are made from time to time, Glenfield & Kennedy Ltd. do not guarantee that goods supplied will be exactly as shewn.

Screw-down Bib Taps.

Fig. E 1.

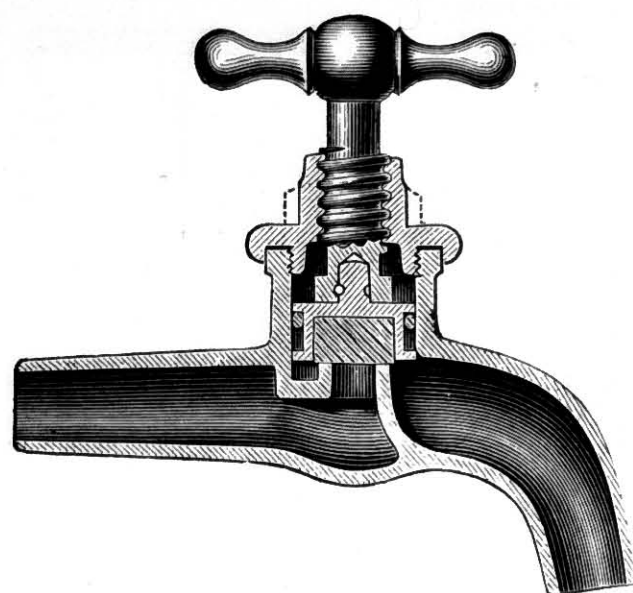


Fig. E 21.

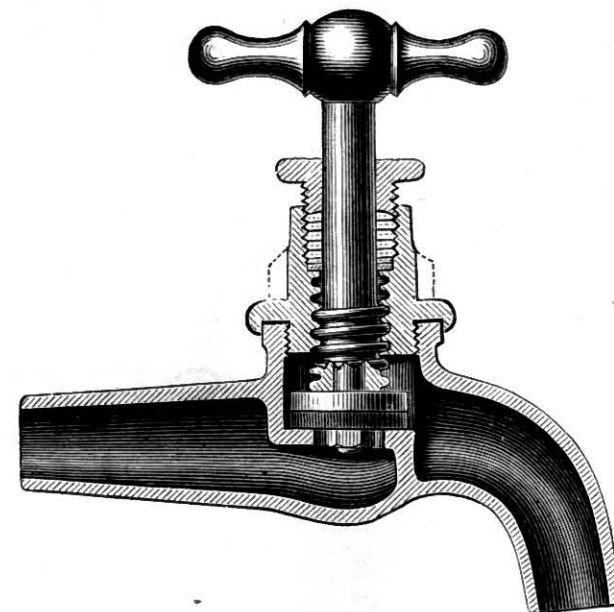
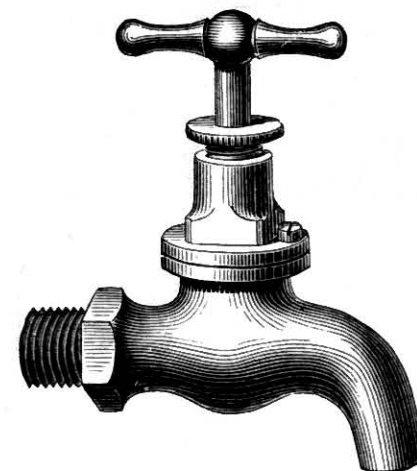


Fig. E 2.



Fig. E 22.



PRICES.

E 1—Kennedy's Patent Bib Tap, Plain End,	.. 3 doz.
E 2—Do. do. Male Screwed End,	..
E 21—Bib Tap, Plain End, with Stuffing Box,	..
E 22—Bib Tap, Male Screwed End, with Stuffing Box,	..

$\frac{3}{8}$ "	$\frac{1}{2}$ "	$\frac{5}{8}$ "	$\frac{3}{4}$ "	1"	1 $\frac{1}{4}$ "	1 $\frac{1}{2}$ "

All Taps carefully tested to a pressure of 250 lbs. per sq. in.

Screw-down Bib Taps.

Fig. E 3.

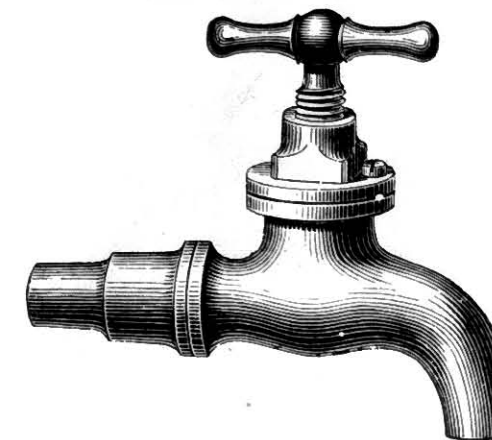


Fig. E 23.

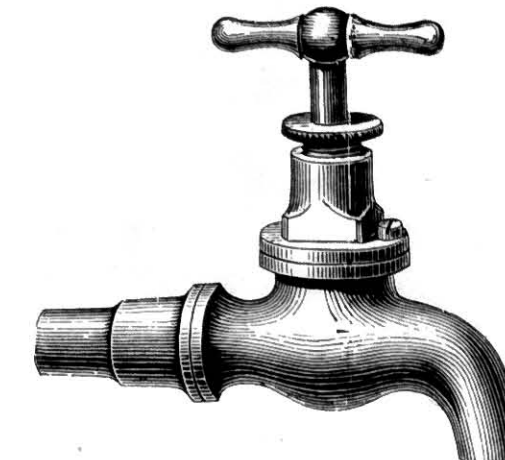


Fig. E 24.

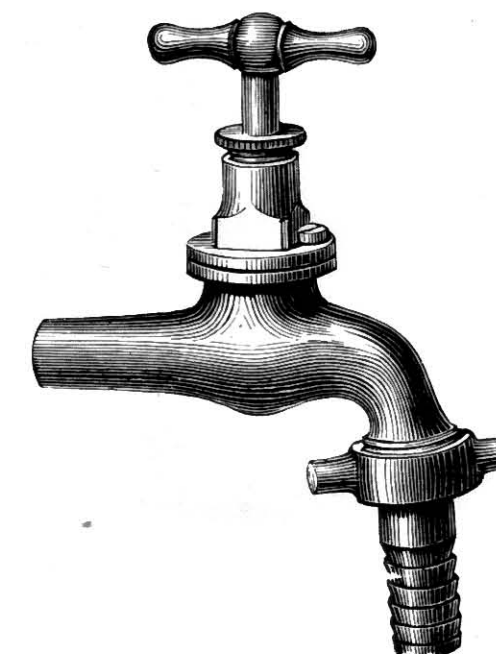
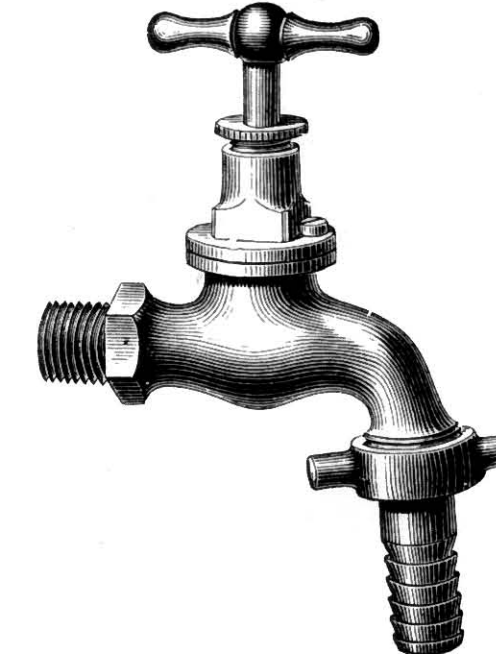


Fig. E 25.



PRICES.

E 3—Kennedy's Patent Bib Tap, with Screwed Boss,	3 doz.
E 23—Bib Tap, Stuffing, with Screwed Boss,	..
E 24—Bib Tap, Plain End, Stuffing, Half-coupling on Nose for Hosepipe,	..
E 25—Bib Tap, Screwed End, Stuffing, Half-coupling on Nose for Hosepipe,	..

$\frac{3}{8}$ "	$\frac{1}{2}$ "	$\frac{5}{8}$ "	$\frac{3}{4}$ "	1"	1 $\frac{1}{4}$ "	1 $\frac{1}{2}$ "

All Taps carefully tested to a pressure of 250 lbs. per sq. in.

Screw-down Bib Taps and Bosses.

Fig. E 53.

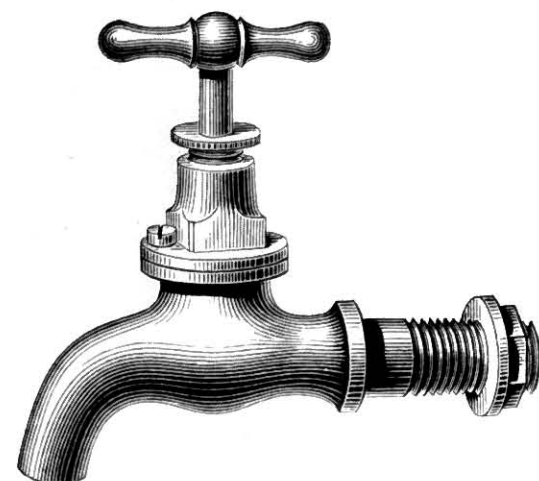


Fig. E 60.

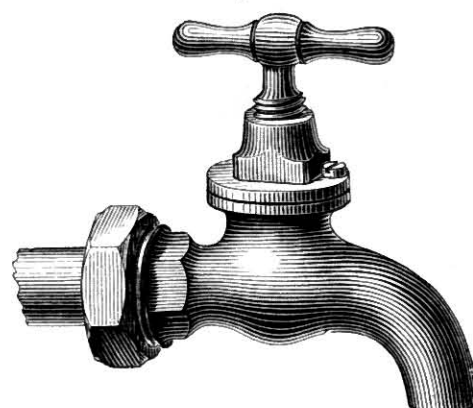


Fig. E 61.

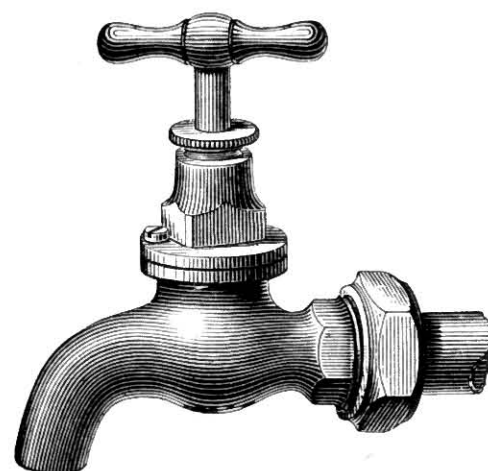


Fig. E 66.

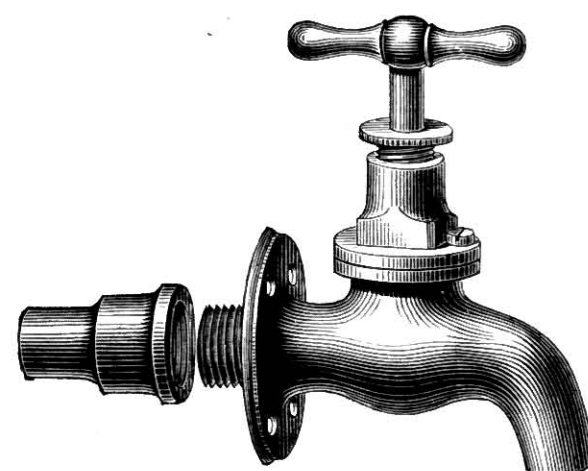


Fig. E 64.

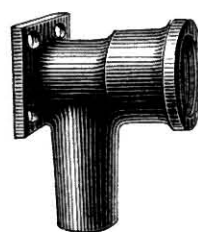
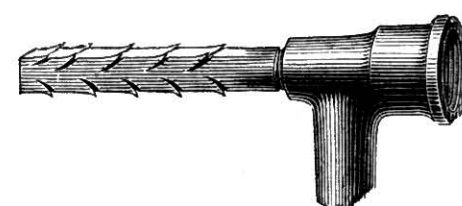


Fig. E 65.



PRICES.

- E 53—Range Cock, or Nose Cock, with Screwed Tail and Jam Nut, doz.
 E 60—Bib Tap, Kennedy's Patent, with Compression Coupling for jointing Lead Pipes without Solder,
 E 61—Bib Tap, Stuffing, with Compression Coupling for jointing Lead Pipes without Solder,
 E 64—Kneed Boss for fixing Cocks with Screwed End on Wall,
 E 65—Kneed Boss for fixing Cocks with Screwed End on Wall, with Lewis Bolt,
 E 66—Screw-down Bib Tap, Stuffing, with Flange and Boss,

$\frac{3}{8}$ "	$\frac{1}{2}$ "	$\frac{5}{8}$ "	$\frac{3}{4}$ "	1"	1 $\frac{1}{4}$ "	1 $\frac{1}{2}$ "

All Taps carefully tested to a pressure of 250 lbs. per sq. in.

Screw-down Stop Taps.

Fig. E 49.

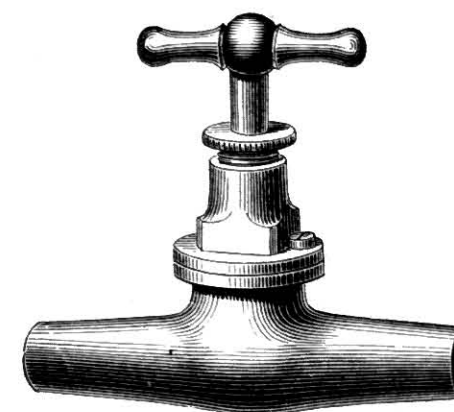


Fig. E 50.

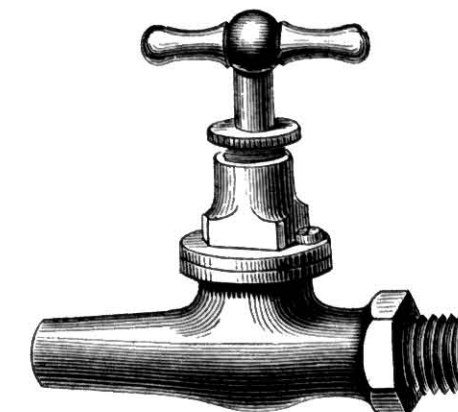


Fig. E 51.

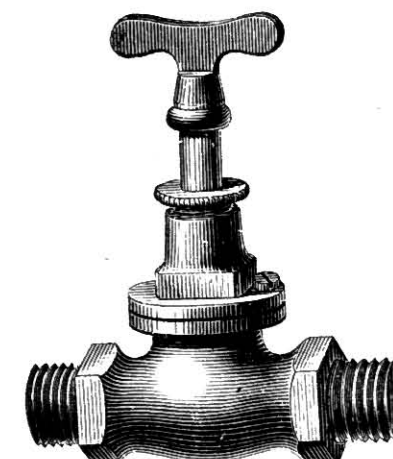
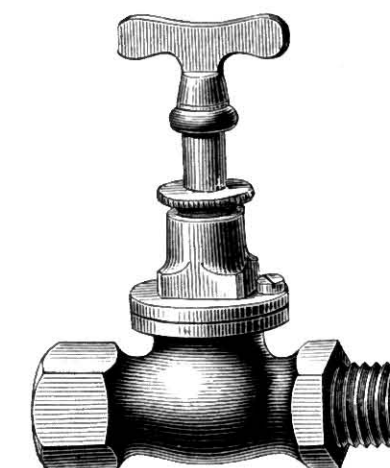


Fig. E 54.



PRICES.

- E 49—Screw-down Stop Tap, { Plain Ends, Rough, .. doz.
 { Ground Union one end, Rough, } ..
 E 50—Screw-down Stop Tap, { Rough,
 { Plain one end, Male with long Screw and Jam Nut, } ..
 { Screw other end Rough, } ..
 E 51—Screw-down Stop Tap, { Rough,
 { Male Screwed Ends, } ..
 E 54—Screw-down Stop Tap, Male Screw one end, Female other end, Rough, .. }

$\frac{3}{8}$ "	$\frac{1}{2}$ "	$\frac{5}{8}$ "	$\frac{3}{4}$ "	1"	1 $\frac{1}{4}$ "	1 $\frac{1}{2}$ "	2"

All Taps carefully tested to a pressure of 250 lbs. per sq. in.

Screw-down Stop Taps.

Fig. E 55.

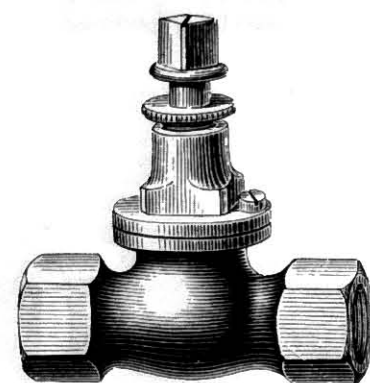


Fig. E 52.

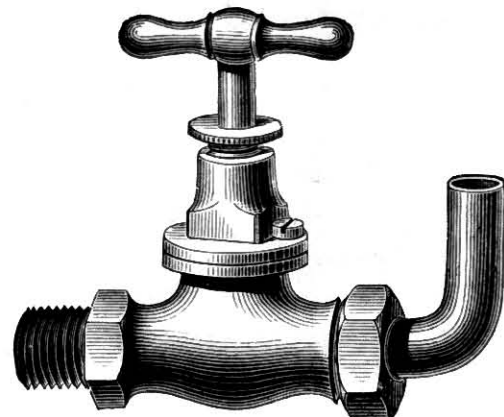


Fig. E 58.

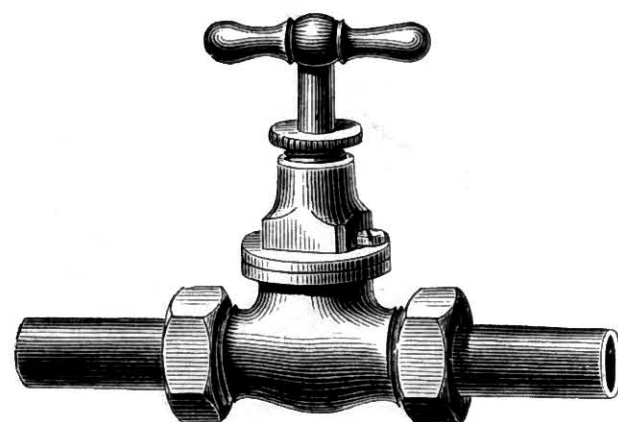
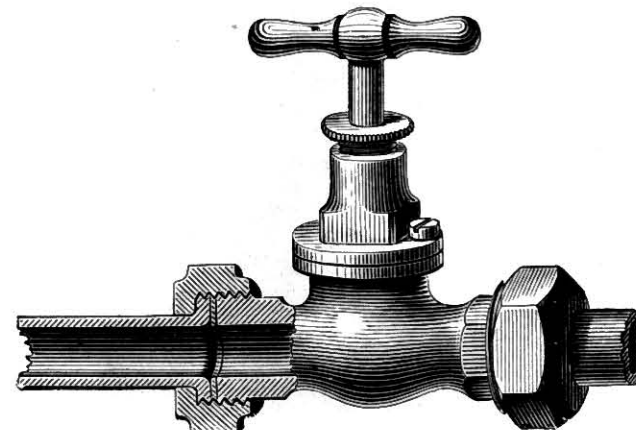


Fig. E 62.



PRICES.

- E 52—Screw-down Stop Tap, Male one end,
Bent Union other end, Rough, .. doz.
- E 55—Screw-down Stop Tap, Female Ends,
Square Head, Rough, "
- Cross Head, extra, "
- E 58—Screw-down Stop Tap, Ground Unions
both ends, Rough, "
- E 62—Screw-down Stop Tap, Compression
Couplings both ends for jointing
Lead Pipes without Solder, Rough, ..

$\frac{3}{8}$ "	$\frac{1}{2}$ "	$\frac{5}{8}$ "	$\frac{3}{4}$ "	1"	1 $\frac{1}{4}$ "	1 $\frac{1}{2}$ "	2"

All Taps carefully tested to a pressure of 250 lbs. per sq. in.

Screw-down Stop Taps.

Fig. E 47.

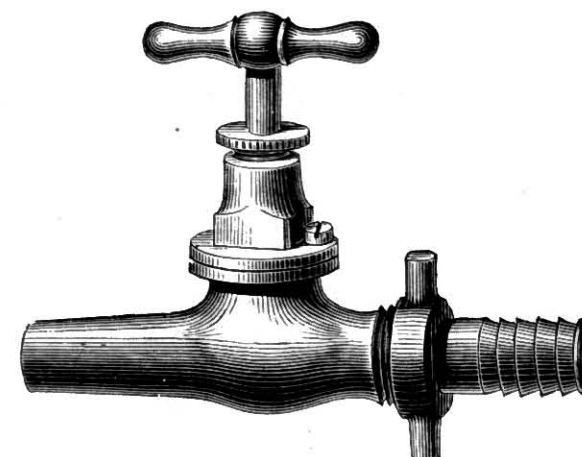


Fig. E 120.

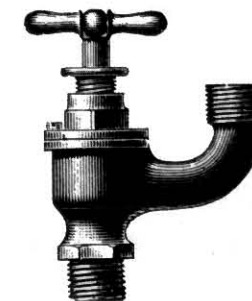


Fig. E 48.

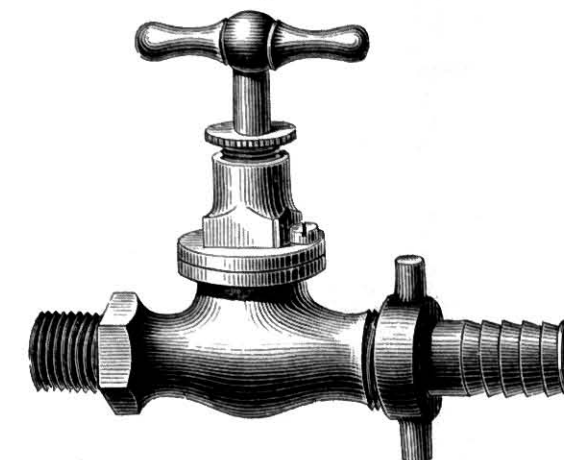


Fig. E 38.

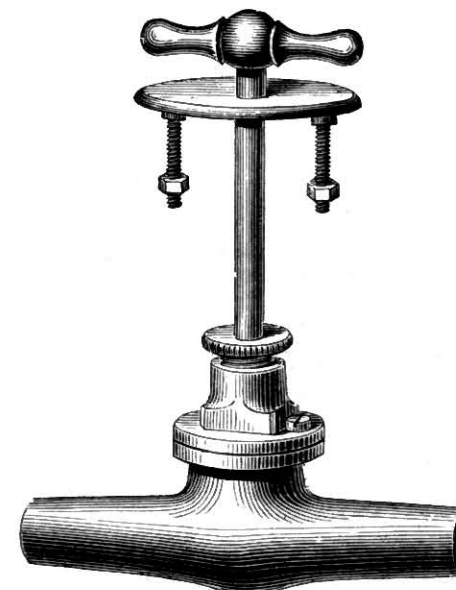


Fig. E 57.

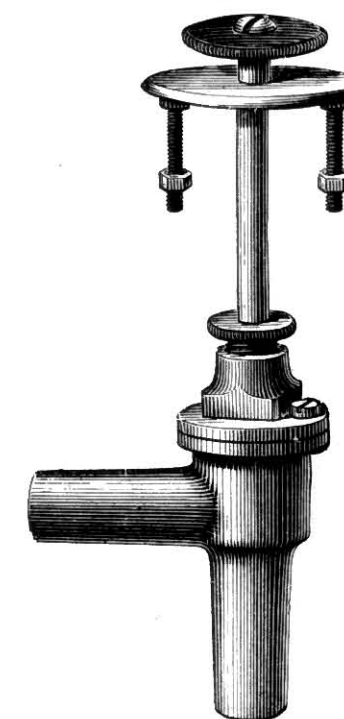
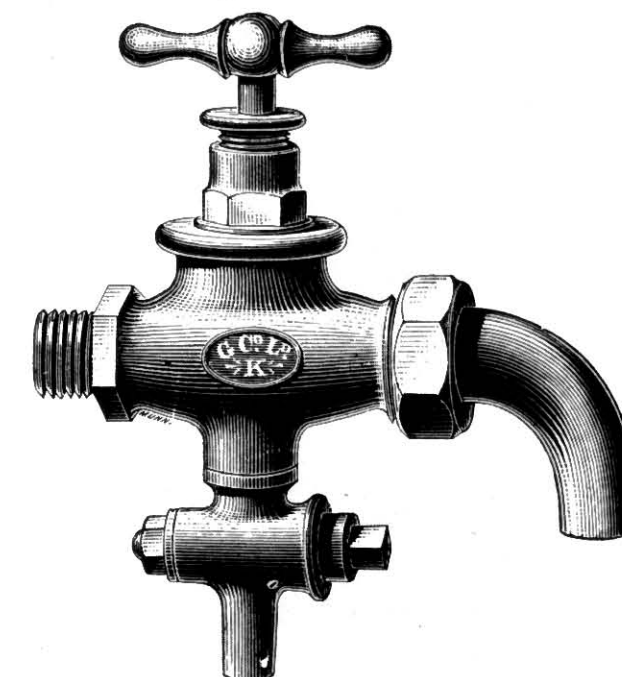


Fig. E 26.



PRICES.

- E 26—Meter Test Cock, for the purpose of
running water through Meter to
test if Rolling Packing is good, .. doz.
- E 38—Wash Basin Tap, with Plate and Bolts,
Plain Ends, Rough, "
- China Discs. extra, "
- E 47—Screw-down Stop Tap, Plain one end,
Hose Union other end, Rough, "
- E 48—Screw-down Stop Tap, Male Screw one
end, Hose Union other end, Rough, "
- E 57—Right-angled Wash Basin Tap, with
Plate and Bolts, Plain Ends, Rough, "
- E 120—Screw-down Hose Cock for Garden
Watering or other purposes, "

$\frac{3}{8}$ "	$\frac{1}{2}$ "	$\frac{5}{8}$ "	$\frac{3}{4}$ "	1"	1 $\frac{1}{4}$ "	1 $\frac{1}{2}$ "	2"

All Taps carefully tested to a pressure of 250 lbs. per sq. in.

Screw-down Ferrule and Stop Taps.

Fig. E 56.

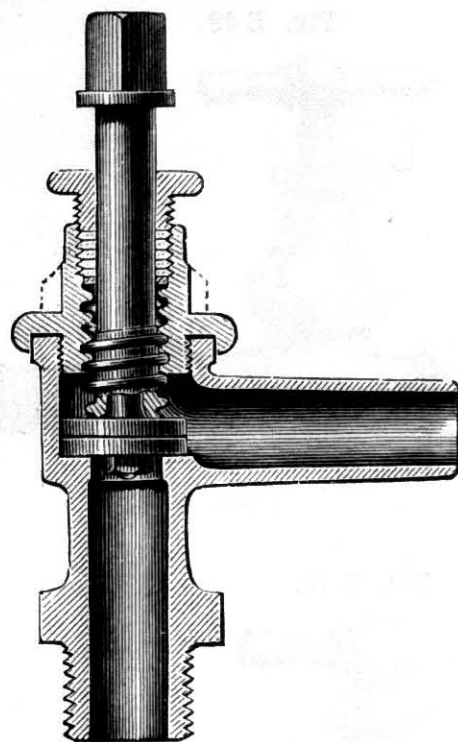


Fig. E 105.

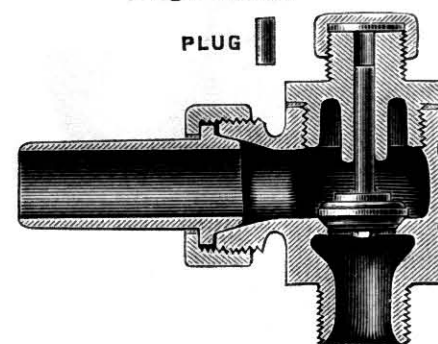


Fig. E 59.

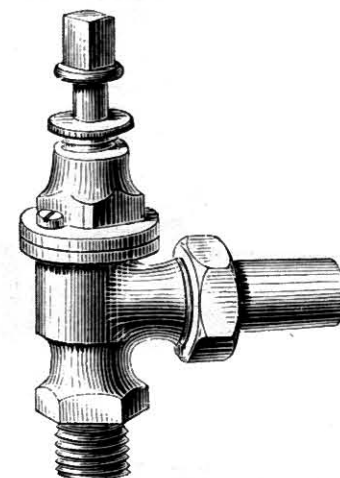


Fig. E 69.

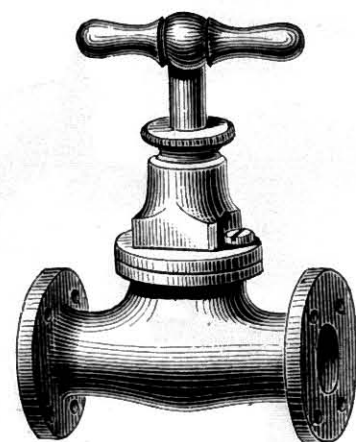
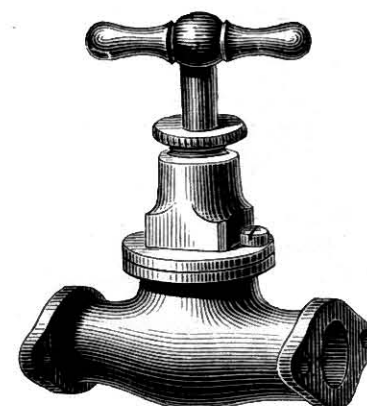


Fig. E 115.



Fig. E 70.



PRICES.

	$\frac{3}{8}$ "	$\frac{1}{2}$ "	$\frac{5}{8}$ "	$\frac{3}{4}$ "	1"	1 $\frac{1}{4}$ "	1 $\frac{1}{2}$ "
E 56—Screw-down Ferrule Tap							
Plain End, Rough, ..							
Screwed End on ..							
Outlet, Rough, ..							
with Ground Union ..							
Plain, Rough, ..							
with Ground Union ..							
Screwed, Rough, ..							
E 59—Do. ..							
with Compression ..							
Coupling for jointing ..							
to Lead Pipe ..							
without Solder, ..							
Rough, ..							
E 69—Screw-down Stop Tap, with Circular Flanges, ..							
Rough, ..							
E 70—Screw-down Stop Tap, with Oval Flanges, Rough, ..							
E 105—Hack's Ferrule, ..							
E 115—Cast Iron Cover for Ferrule Taps, ..							

All Taps carefully tested to a pressure of 250 lbs. per sq. in.

Lavatory Taps, etc.

Fig. E 7.

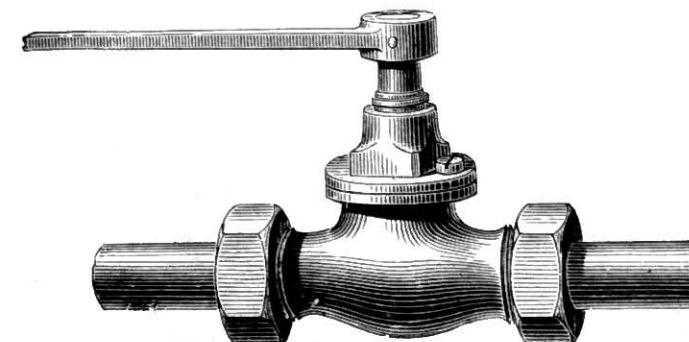


Fig. E 32.

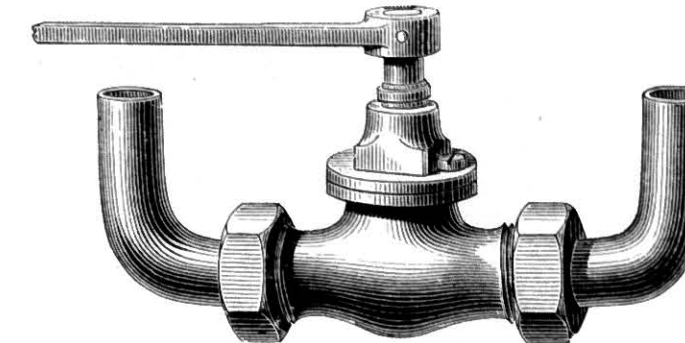
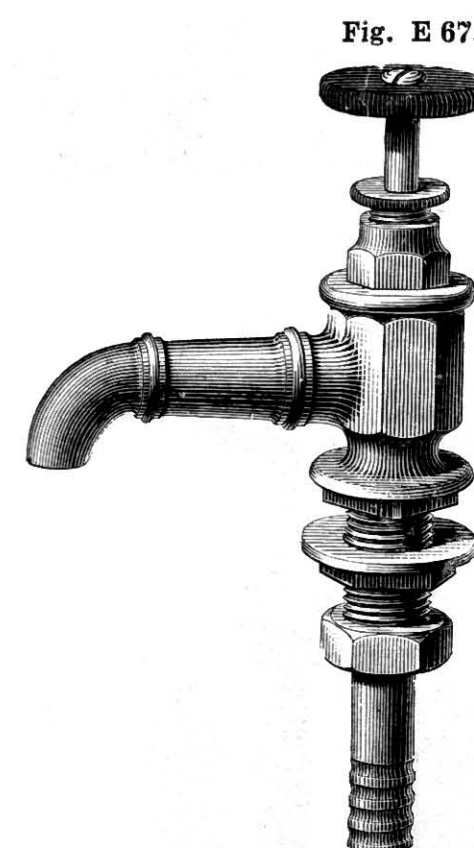


Fig. E 68.



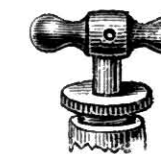
E 80.



E 83.



E 81.



E 84.



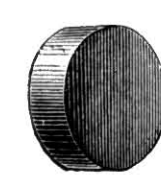
E 82.



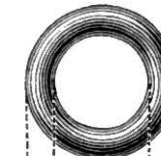
E 85.



E 33.



E 34.



PRICES.

	$\frac{3}{8}$ "	$\frac{1}{2}$ "	$\frac{5}{8}$ "	$\frac{3}{4}$ "	1"	1 $\frac{1}{4}$ "	1 $\frac{1}{2}$ "
E 7—Water Closet Tap, with Straight Unions, ..							
Rough, ..							
E 32—Water Closet Tap, with Bent Unions, Rough, ..							
Vulcanized India Rubber Discs or Plugs for ..							
Taps, ..							
E 33—Leather Washers or Discs for Cocks with ..							
Leather Valves, having small Hole in ..							
Centre, ..							
E 34—Vulcanized India Rubber Rolling Rings, ..							
E 67—Right-angled Bath or Lavatory Cock, Polished,* ..							
E 68—Straight do. do. *							

* Can be had Silver-plated if desired.

Taps can be furnished with heads of the varieties shown, E 80 to E 85, or to special design.

E 83 and E 85 are charged a little extra.

All Taps carefully tested to a pressure of 250 lbs. per sq. in.

Screw-down Sluice Valve Stop Taps.

Fig. E 100.

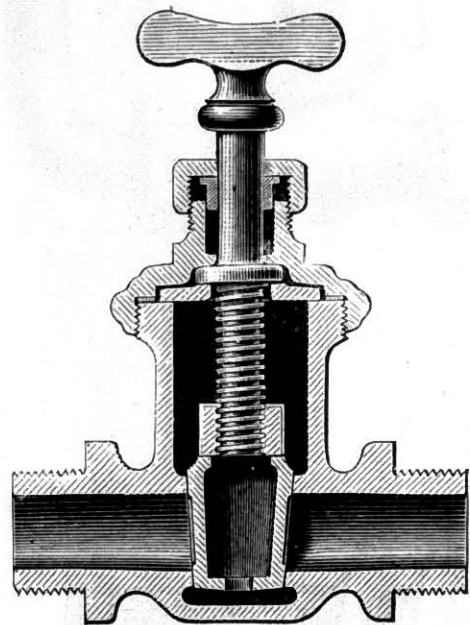


Fig. E 101.

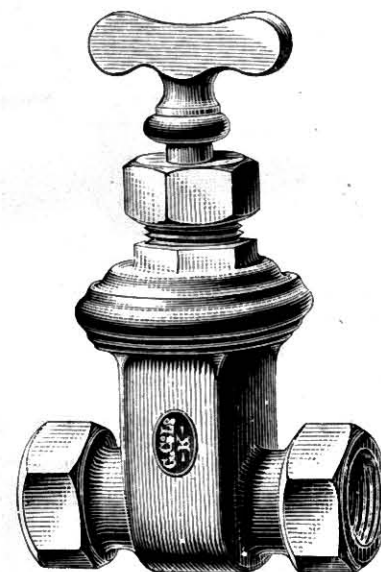
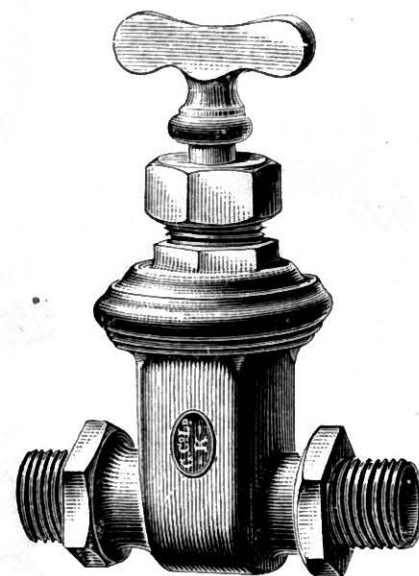


Fig. E 102.

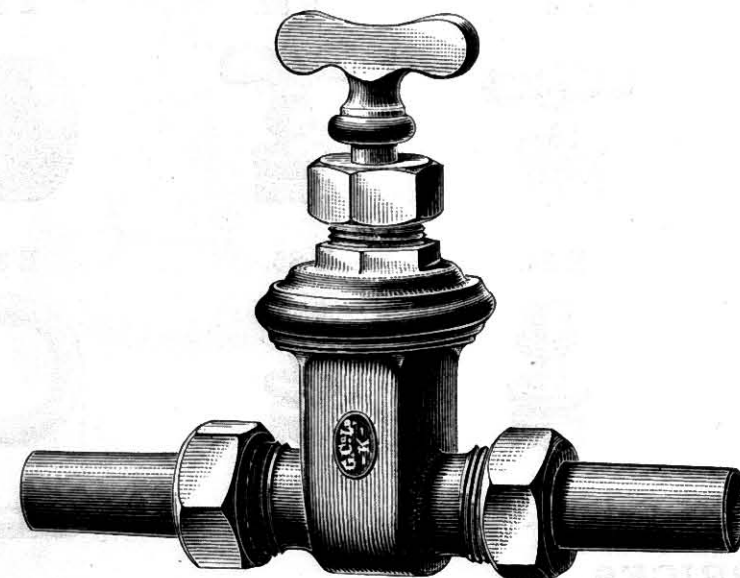
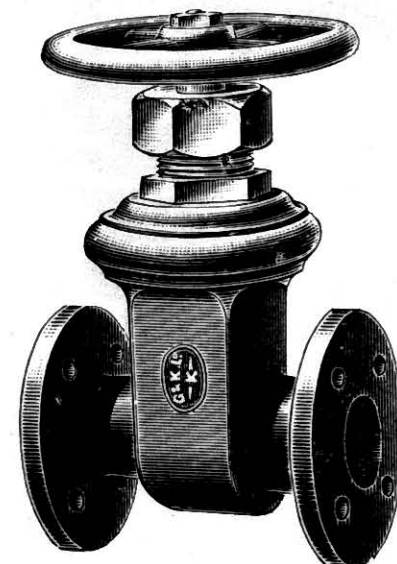


Fig. E 103.



PRICES.

E 100—Screw-down Sluice Valve Stop Taps, Male Screwed Ends,	
E 101—Screw-down Sluice Valve Stop Taps, Female Screwed Ends,	
E 102—Screw-down Sluice Valve Stop Taps, Ground Union both ends,	
E 103—Do. do., Flanged Ends,	

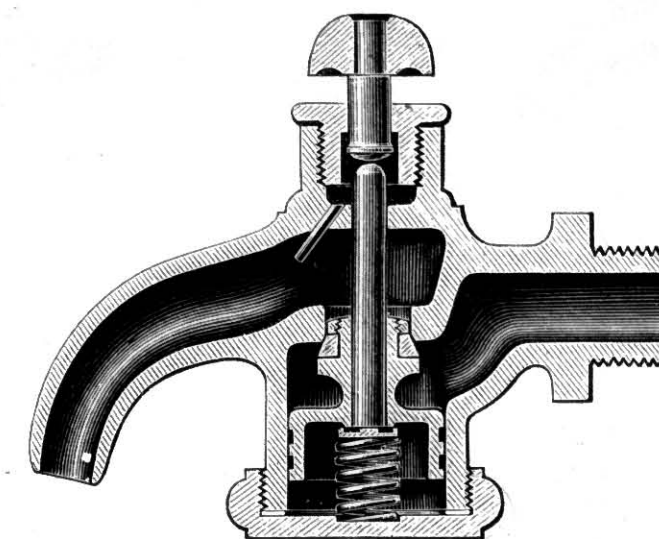
$\frac{1}{2}$ " $\frac{3}{4}$ " 1" 1 $\frac{1}{4}$ " 1 $\frac{1}{2}$ " 2"

Prices on application.

All Taps carefully tested to a pressure of 250 lbs. per sq. in.

Patent Non-concussive Self-closing Tap.

Fig. E 63a.



The special features of this Tap are—

- (1) Easily opened ;
- (2) Absolutely non-concussive ;
- (3) Full waterway ;
- (4) Simple ;
- (5) Durable.

When the Button is pressed the small centre Valve opens first, then the Main Valve opens, and the Tap discharges full bore. The Spring underneath is simply to carry weight of valve spindle and overcome friction.

PRICES.

E 63a—Patent Non-concussive Self-closing Tap, as illustrated,	3"	1"	5"	3"	1"	1 $\frac{1}{4}$ "	1 $\frac{1}{2}$ "
E 63b—With Flange and Boss,							
E 63c—With Flange and Jam Nut and Union,							
E 63d—Stop Cock, with Coupling Tail on each end,							
E 63e—Stop Cock, with Male Ends,							
E 63f—Stop Cock, with Plain Ends for Lead,							

All tested to 250 lbs. per sq. in.

Patent Non-concussive Self-closing Taps.

Fig. E 71.

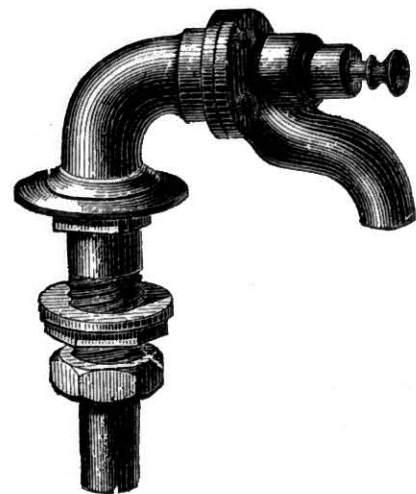


Fig. E 71a.

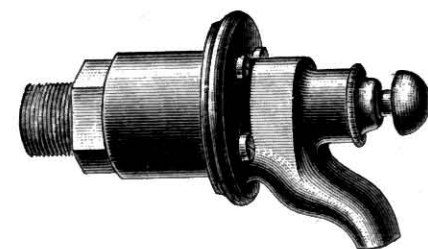


Fig. E 107.

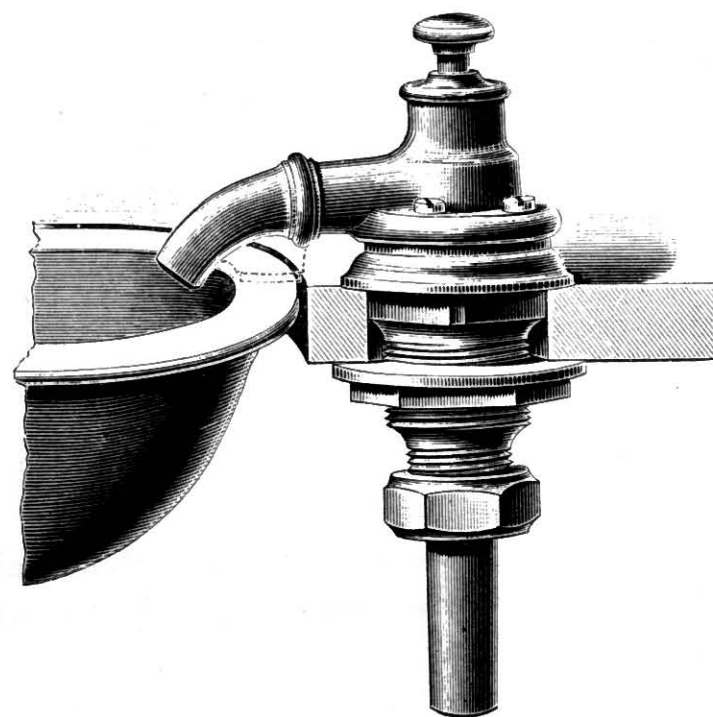
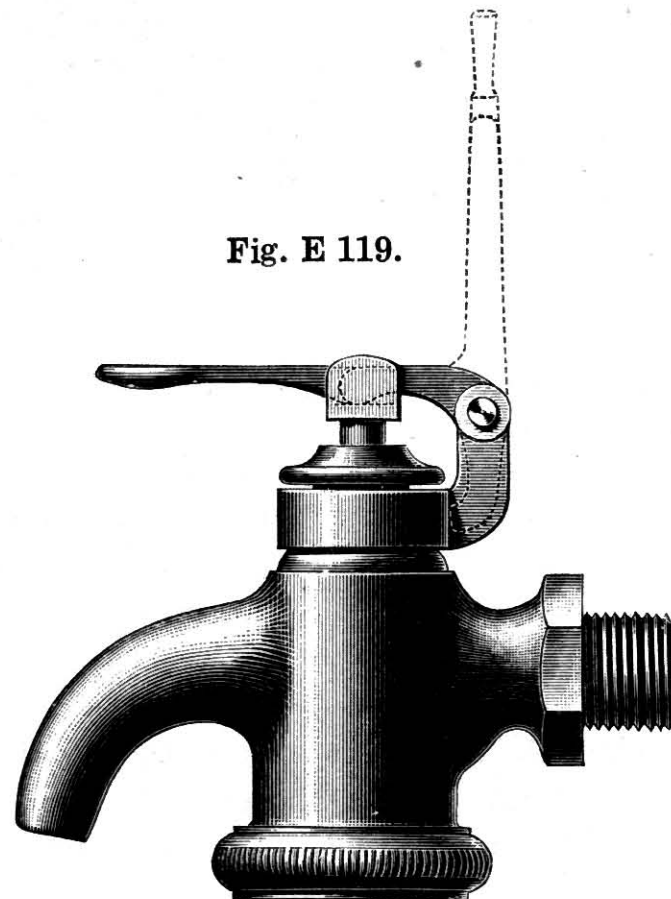


Fig. E 119.



PRICES.

	$\frac{3}{8}$ "	$\frac{1}{2}$ "	$\frac{5}{8}$ "	$\frac{3}{4}$ "	1"	1 $\frac{1}{4}$ "	1 $\frac{1}{2}$ "
E 71 —Patent Self-closing Bath or Lavatory Cock, Polished, 3 doz.							
E 71a—Patent Self-closing Bath or Lavatory Cock, Polished,							
{ with Straight Screwed End, ,,							
{ with Lever-handle, ,,							
{ with Union and Jam Nut, ,,							
E 107 —Patent Self-closing Bath or Lavatory Cock, Polished, "							
E 119 —Patent Non-concussive Self-closing Cock, with Lever-handle,.. .. . "							

All Taps carefully tested to a pressure of 250 lbs. per sq. in.

Self-closing Taps.

Fig. E 72.

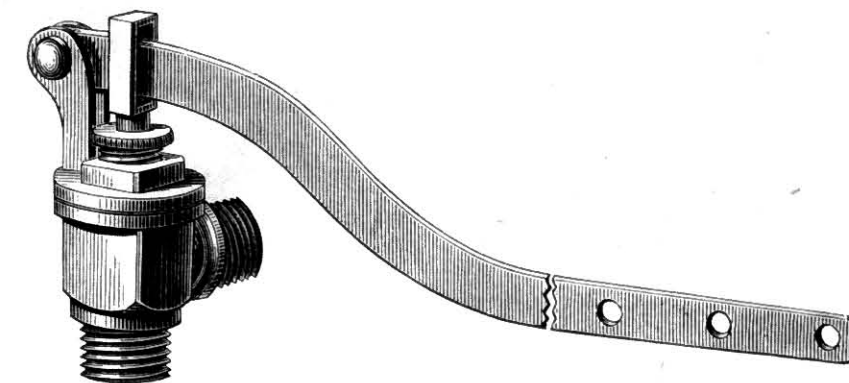


Fig. E 30.

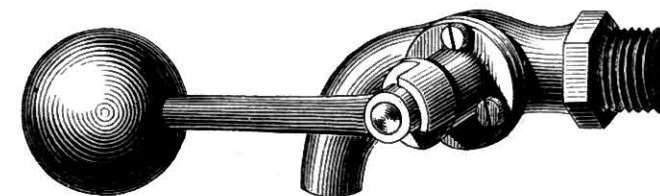
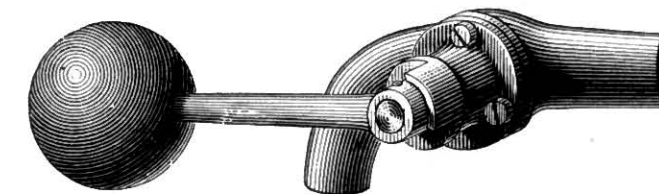


Fig. E 31.



PRICES.

	$\frac{3}{8}$ "	$\frac{1}{2}$ "	$\frac{5}{8}$ "	$\frac{3}{4}$ "	1"	$1\frac{1}{4}$ "	$1\frac{1}{2}$ "
E 30—Self-closing Bib Tap, Screwed End, $\frac{3}{4}$ doz.							
E 31—Do. Plain do. „							
E 72—Self-closing Cock, with Lever and Weight, „							

All Taps carefully tested to a pressure of 250 lbs. per sq. in.

Kennedy's Patent Ball Taps.

Fig. E 5.

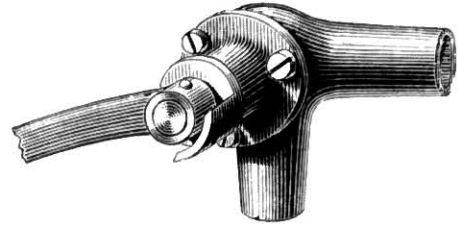


Fig. E 43.

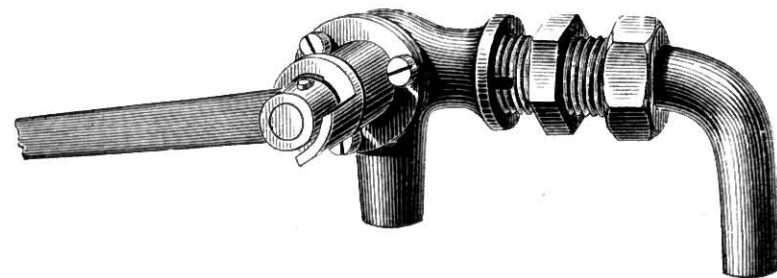


Fig. E 6.

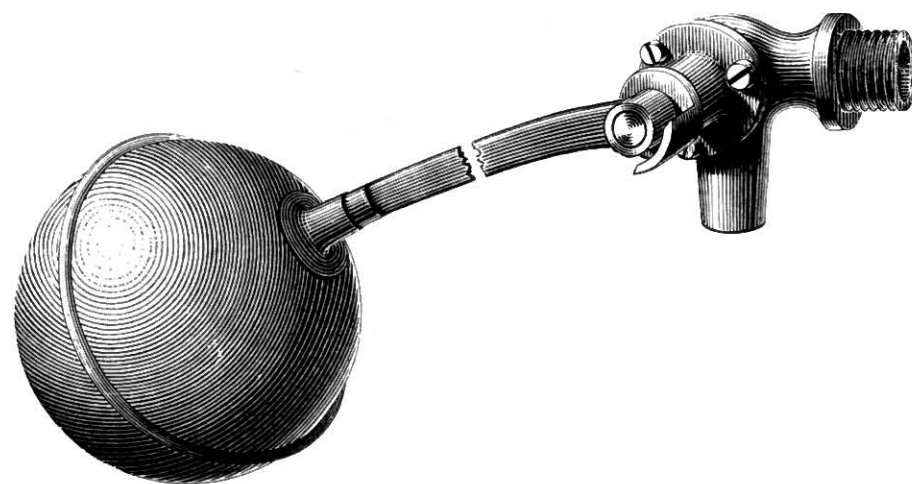


Fig. E 5, with Lugs.

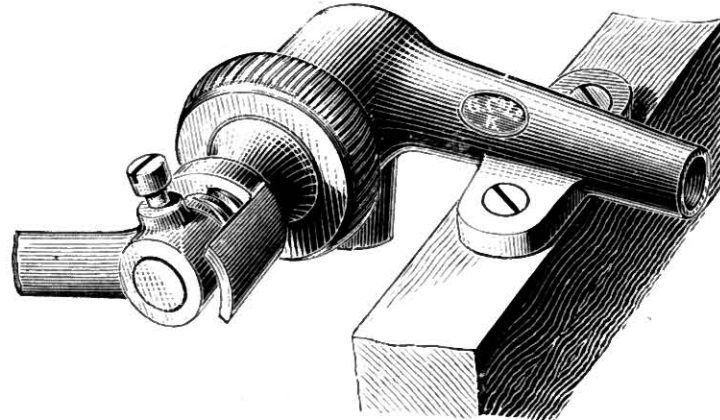
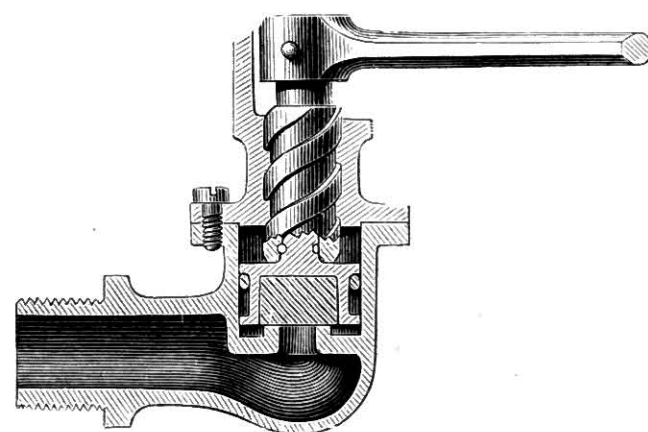


Fig. E 6 (Section).



PRICES.

	3"	1"	5"	3"	1"	1 1/4"	1 1/2"
E 5—Kennedy's Patent Ball Cock, { Plain End, doz.							
E 6—Do. { with Lugs, "							
E 43—Do. { Screwed End, "							
Tinned Copper Ball Shell, Jointed and with Screwed Socket to suit above Ball Cocks, extra, "							

	Dia.	4"	4 1/2"	5"	6"	7"	8"	9"	10"	12"
Tinned Copper Ball Shells, doz.										
Do. Jointed and with Screwed Socket, "										

All Taps carefully tested to a pressure of 250 lbs. per sq. in.

Patent Ball Taps.

Fig. E 45.

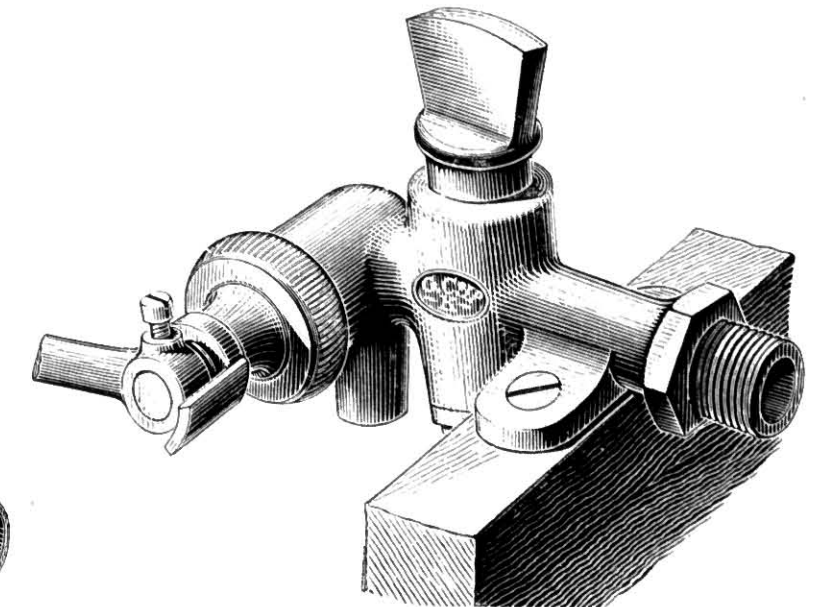


Fig. E 44.

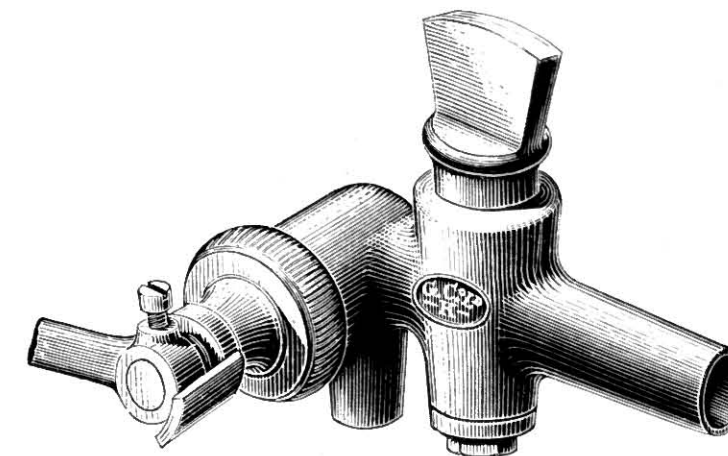


Fig. E 106.

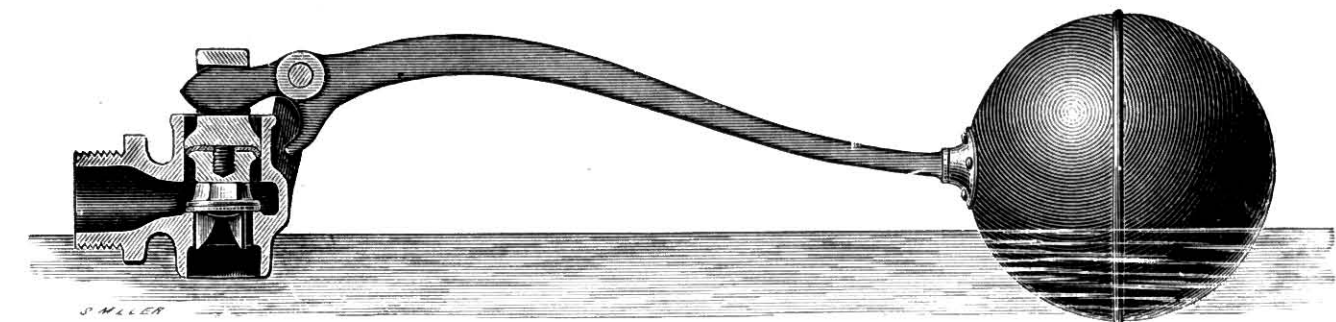
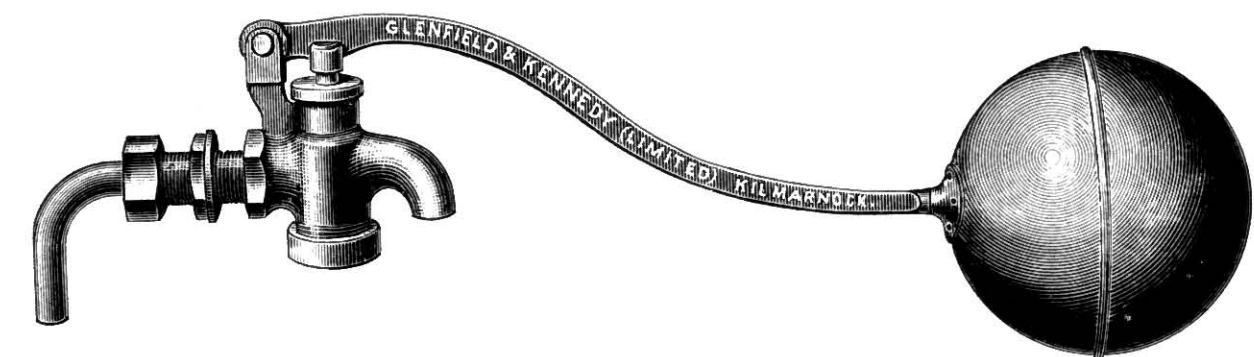


Fig. E 104.



PRICES.

	3"	1"	5"	3"	1"	1 1/4"	1 1/2"
E 44—Kennedy's Patent Ball Cock and Stop Cock Combined, Plain End, no Lugs, doz.							
E 45—Kennedy's Patent Ball Cock and Stop Cock Combined, with Screwed End and Lugs, "							
E 104—Patent Silent Ball Cock—Price on application.							
E 106—Patent Equilibrium Ball Cock, specially suitable for high pressures, "							

For Prices of Copper Balls see previous page.

All Taps carefully tested to a pressure of 250 lbs. per sq. in.

Ground Stop Cocks.

Fig. F 2.

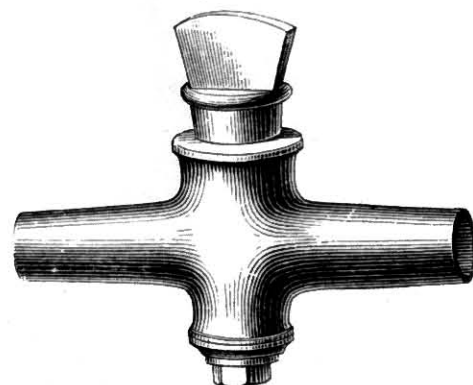


Fig. F 11.

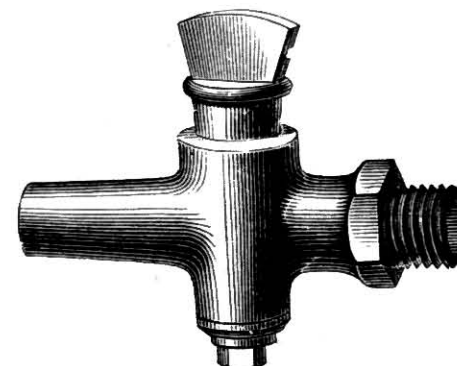


Fig. F 13.

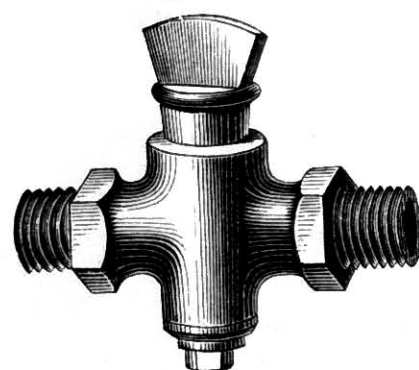


Fig. F 14.

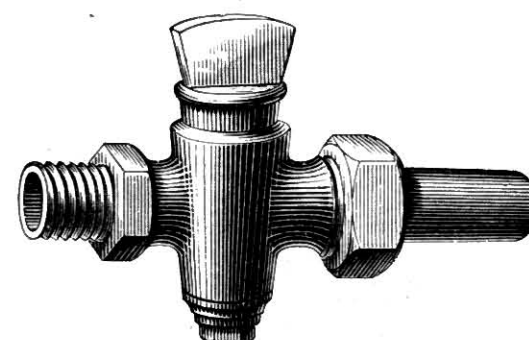


Fig. F 32.

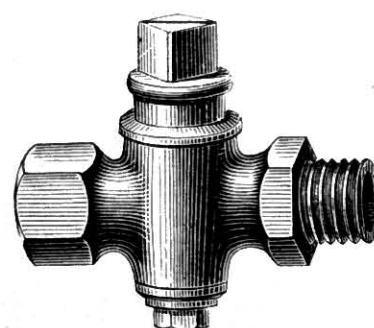
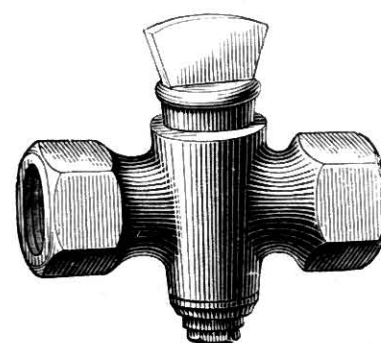


Fig. F 15.



PRICES.

	3/8"	1/2"	5/8"	3/4"	1"	1 1/4"	1 1/2"	2"
F 2—Ordinary Ground Stop Cock,	Plain Ends, .. .. .	.. .. .	.. .. .	.. .. .	.. .. .	.. .. .	.. .. .	.. .. .
	(Frost Cock), .. .. .	.. .. .	.. .. .	.. .. .	.. .. .	.. .. .	.. .. .	.. .. .
	with Union on one end, .. .. .	.. .. .	.. .. .	.. .. .	.. .. .	.. .. .	.. .. .	.. .. .
	Plain Ends, with Full Bore round Waterway, .. .. .	.. .. .	.. .. .	.. .. .	.. .. .	.. .. .	.. .. .	.. .. .
	with gun metal Solid Keys, .. .. .	.. .. .	.. .. .	.. .. .	.. .. .	.. .. .	.. .. .	.. .. .
F 11—Ground Stop Cock,	Plain one end, Male Screw other end, .. .. .	.. .. .	.. .. .	.. .. .	.. .. .	.. .. .	.. .. .	.. .. .
	Plain End, Female Screw other end, .. .. .	.. .. .	.. .. .	.. .. .	.. .. .	.. .. .	.. .. .	.. .. .
F 13— Do.	Male Screwed Ends .. .. .	.. .. .	.. .. .	.. .. .	.. .. .	.. .. .	.. .. .	.. .. .
	Male Screw one end, other end with Union for Lead Pipe, .. .. .	.. .. .	.. .. .	.. .. .	.. .. .	.. .. .	.. .. .	.. .. .
F 14— Do.	with Union both ends. .. .. .	.. .. .	.. .. .	.. .. .	.. .. .	.. .. .	.. .. .	.. .. .
F 15— Do.	Female Screwed Ends .. .. .	.. .. .	.. .. .	.. .. .	.. .. .	.. .. .	.. .. .	.. .. .
F 32— Do.	Male Screw one end, Female Screw other end, .. .. .	.. .. .	.. .. .	.. .. .	.. .. .	.. .. .	.. .. .	.. .. .

All Taps carefully tested to a pressure of 250 lbs. per sq. in.

Ground Ferrule Cocks.

Fig. F 16.

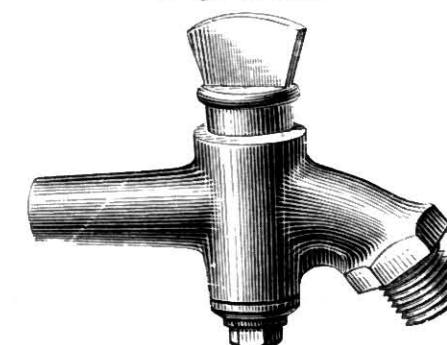


Fig. F 17.

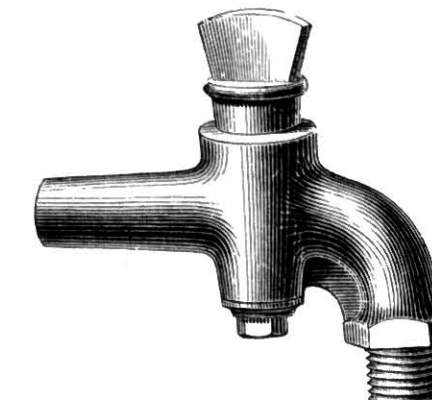


Fig. F 40.

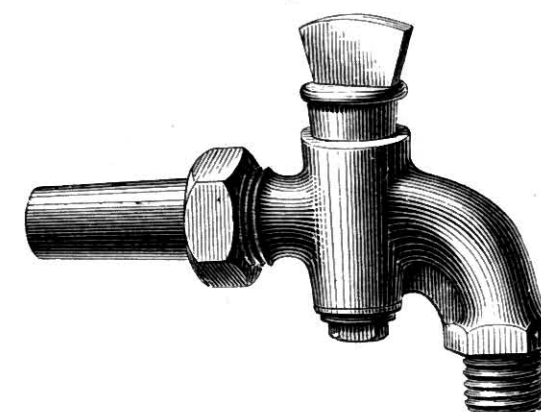


Fig. F 41.

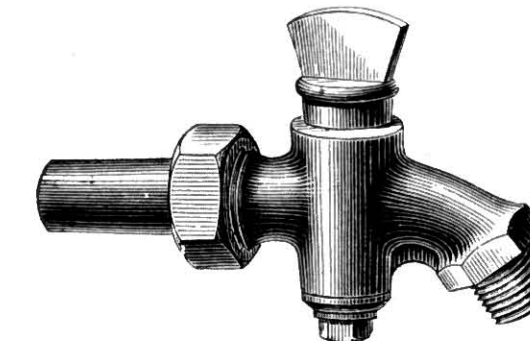


Fig. F 42.

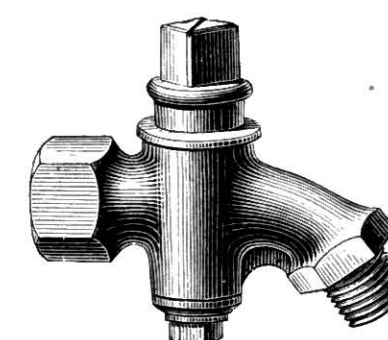
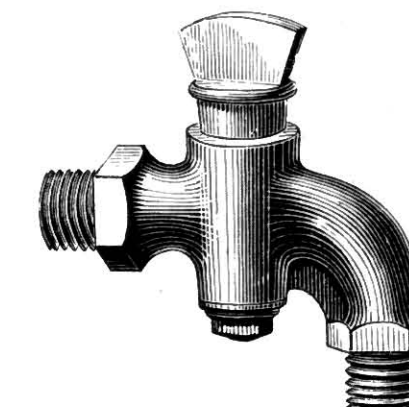


Fig. F 43.



PRICES.

	3/8"	1/2"	5/8"	3/4"	1"	1 1/4"	1 1/2"	2"
F 16—Ground Ferrule Cock, Angled, .. .. .	.. .. .	.. .. .	.. .. .	.. .. .	.. .. .	.. .. .	.. .. .	.. .. .
F 17— Do. Ordinary, .. .. .	.. .. .	.. .. .	.. .. .	.. .. .	.. .. .	.. .. .	.. .. .	.. .. .
	Do. do. { with Union for Lead Pipe, .. .. .	.. .. .	.. .. .	.. .. .	.. .. .	.. .. .	.. .. .	.. .. .
F 40— { Do. do. { with Full Bore round waterway, .. .. .	.. .. .	.. .. .	.. .. .	.. .. .	.. .. .	.. .. .	.. .. .	.. .. .
	Do. do. { (Frost Cock) .. .. .	.. .. .	.. .. .	.. .. .	.. .. .	.. .. .	.. .. .	.. .. .
F 41— Do. Angled, with Union for Lead Pipe, .. .. .	.. .. .	.. .. .	.. .. .	.. .. .	.. .. .	.. .. .	.. .. .	.. .. .
F 42— Do. Male and Female Screwed Ends, .. .. .	.. .. .	.. .. .	.. .. .	.. .. .	.. .. .	.. .. .	.. .. .	.. .. .
F 43— Do. Male Screwed Ends, .. .. .	.. .. .	.. .. .	.. .. .	.. .. .	.. .. .	.. .. .	.. .. .	.. .. .

All Taps carefully tested to a pressure of 250 lbs. per sq. in.

Ground Stop Cocks—Close Bottom.

Fig. F 4.

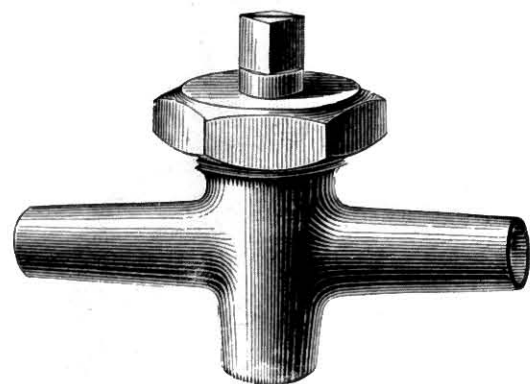


Fig. F 18.

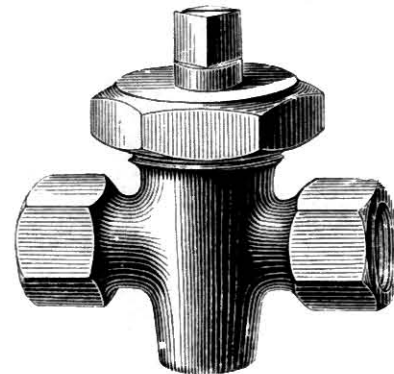


Fig. F 19.

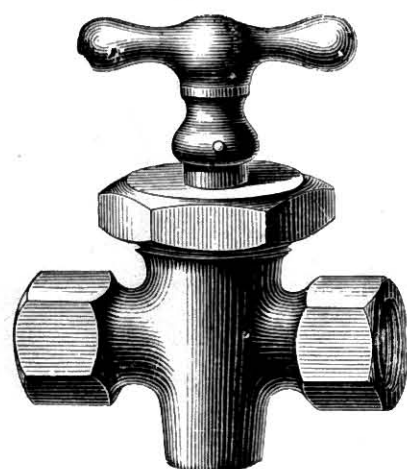


Fig. F 20.

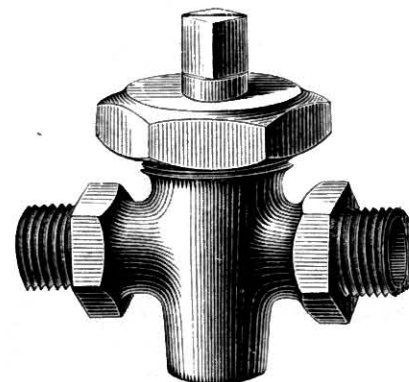


Fig. F 21.

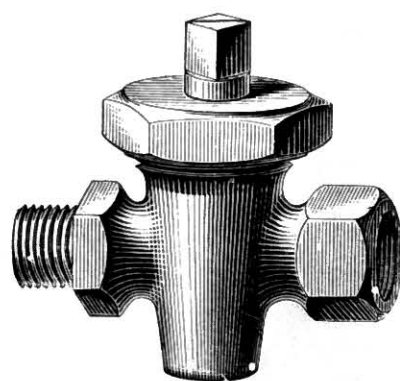


Fig. F 70.

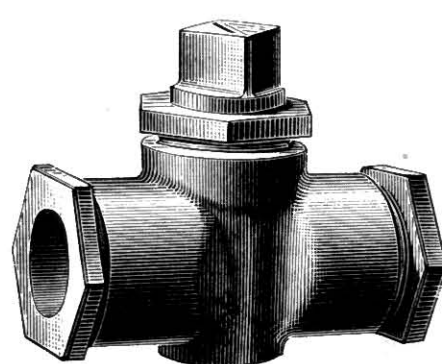
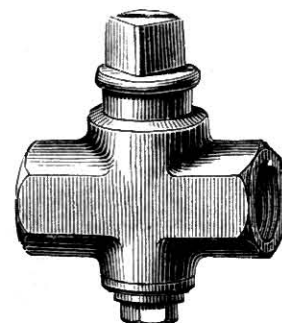


Fig. F 33.



PRICES.

		$\frac{3}{8}$ "	$\frac{1}{2}$ "	$\frac{5}{8}$ "	$\frac{3}{4}$ "	1"	$1\frac{1}{4}$ "	$1\frac{1}{2}$ "	2"
F 4	Ground Stop Cock, Close Bottom, Plain Ends, .. doz								
	Do. do. do. with gun metal Key and Stuffing Gland with Bolts, ..								
F 18	Ground Stop Cock, Close Bottom, Female Screwed Ends, ..								
F 19	Ground Stop Cock, Close Bottom, Female Screwed Ends, with Cross-handle, ..								
F 20	Ground Stop Cock, Close Bottom, Male Screwed Ends, ..								
F 21	Ground Stop Cock, Close Bottom, Male Screw one end, Female other end, ..								
F 33	Ground Stop Cock, Ordinary Bottom, strong, Female Ends, ..								
F 70	Ground Stop Cock, Close Bottom, for jointing to Lead Pipe without solder, extra heavy, ..								

All Taps carefully tested to a pressure of 250 lbs. per sq. in.

Ground Cocks.

Fig. F 24.

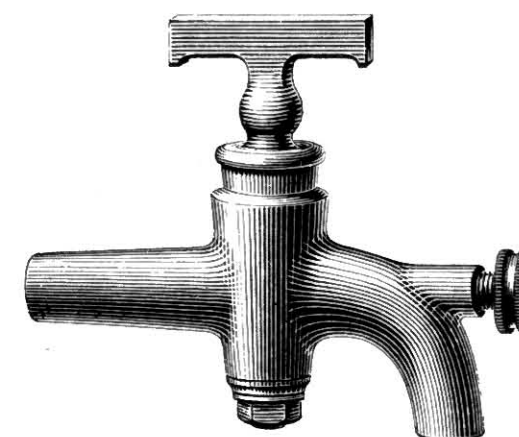


Fig. F 25.

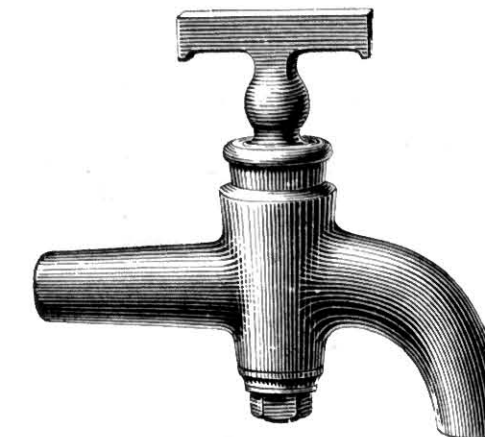


Fig. F 26.

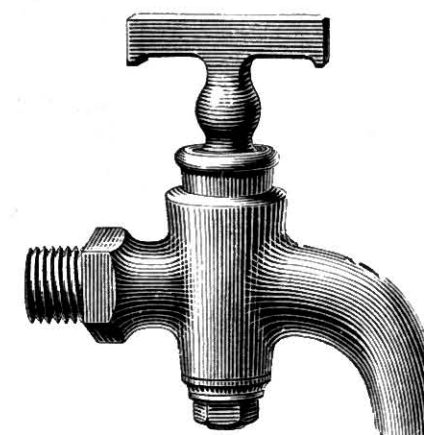
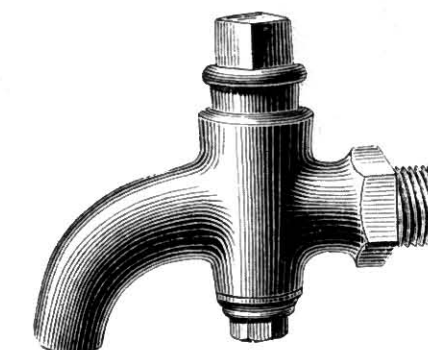


Fig. F 27.



PRICES.

		$\frac{3}{8}$ "	$\frac{1}{2}$ "	$\frac{5}{8}$ "	$\frac{3}{4}$ "	1"	$1\frac{1}{4}$ "	$1\frac{1}{2}$ "	2"
F 24	Ground Bib Cock with Cleansing Screw, Rough, .. doz								
F 25	Do. Ordinary, Rough, ..								
F 26	Do. Male Screwed End, Rough, ..								
F 27	Do. do. Square Head, Rough, ..								

All Taps carefully tested to a pressure of 250 lbs. per sq. in.

Ground Stop Cocks.

Fig. F 51.

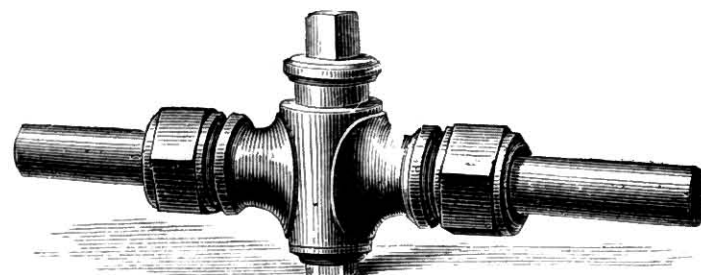


Fig. F 52.

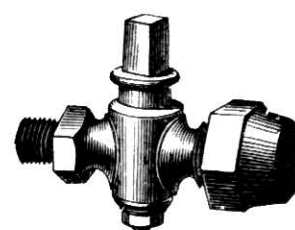


Fig. F 55.

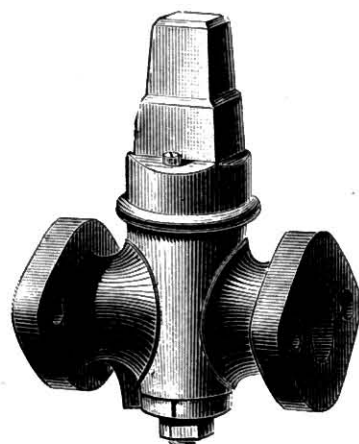


Fig. F 56.

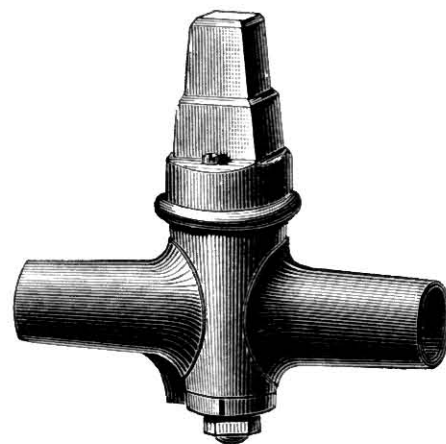
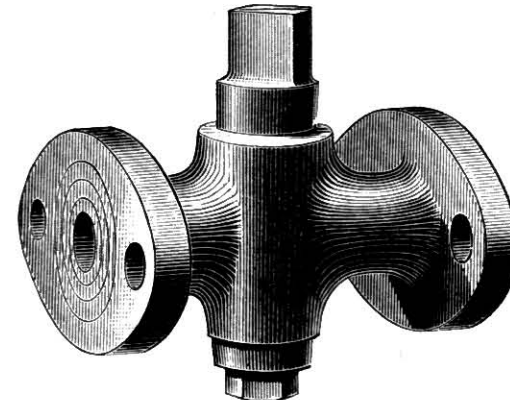


Fig. F 72.



PRICES.

	$\frac{1}{2}$ "	$\frac{5}{8}$ "	$\frac{3}{4}$ "	1"	1 $\frac{1}{4}$ "	1 $\frac{1}{2}$ "
F 51—Heavy Ground Stop Cock, with two Unions for Lead Pipe, Rough,						
F 52—Heavy Ground Stop Cock, one Male End, other end with Tapered Compression Coupling for jointing Lead Pipe without Solder, Rough,						
F 55—Double Flanged Stop Cock, cast iron Head,						
F 56—Stop Cock, Plain Ends, do.						
F 72—Double Flanged Stop Cock, Square Head,						

All Taps carefully tested to a pressure of 250 lbs. per sq. in.

Ground Stop Cocks and Gauge Cocks.

Fig. F 53.

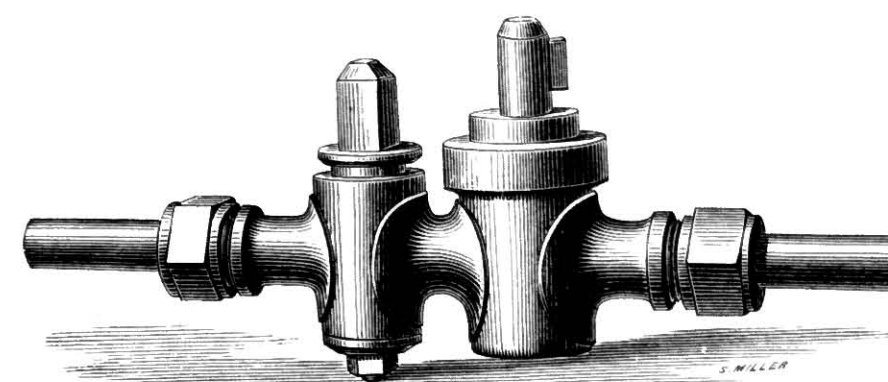


Fig. F 54.

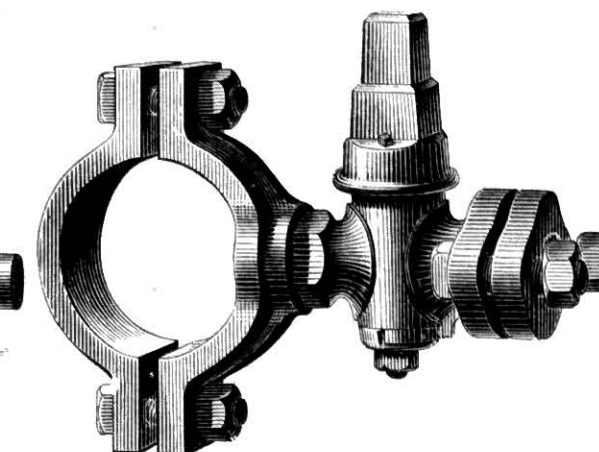


Fig. F 53a.

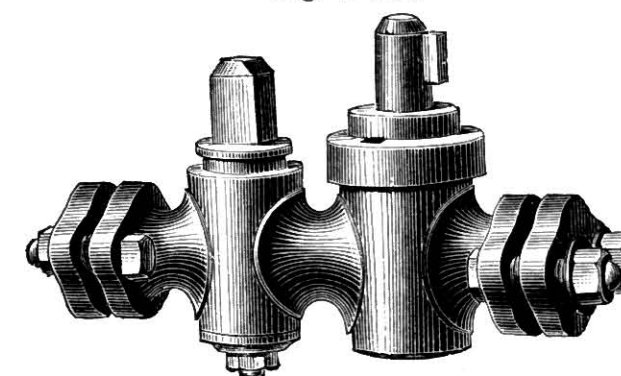


Fig. E 111.

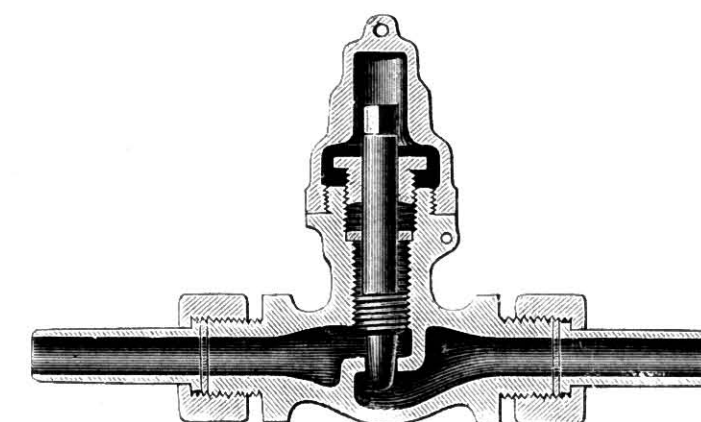
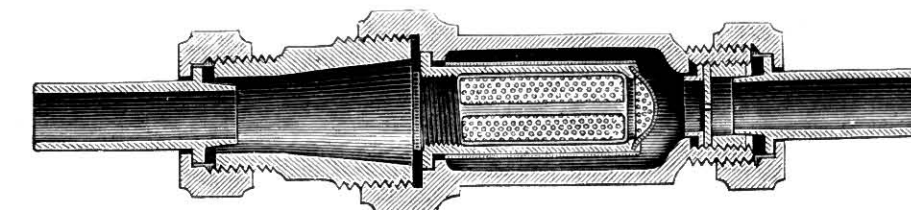


Fig. E 46.



PRICES.

	$\frac{1}{4}$ "	$\frac{3}{8}$ "	$\frac{1}{2}$ "	$\frac{5}{8}$ "	$\frac{3}{4}$ "	1"	1 $\frac{1}{4}$ "	1 $\frac{1}{2}$ "
E 46—"Meter Cock" or Filter, with small orifice in Disc to give a certain discharge,								
E 111—Gauge Cock, with screwed protecting Cover. Spindle is set by Key to give a certain discharge, ..								
F 53 { Heavy Double Ground Stop or Gauge Cock, with two Unions,								
NOTE.—One Plug has restricted orifice with perforated protection.								
Do. but with Plain Ends, no Unions, ..								
F 53a—Do. with loose Flanges								
F 54 { Heavy Ground Stop Cock, one Male End, other end with Flange and Bolts, with cast iron Cap, ..								
Heavy Ground Stop Cock, Double Flanged, ..								
NOTE.—Saddles not included above. Prices for Saddles of brass, wrought iron, or malleable cast iron furnished on application.								

All carefully tested to a pressure of 250 lbs. per sq. in.

Check Valves for High Steam Pressures.

Fig. G 22.

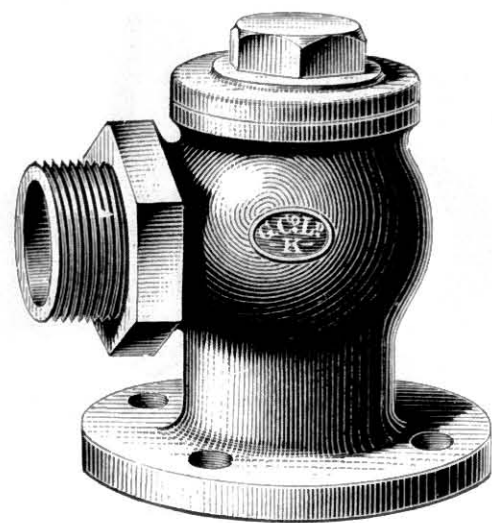


Fig. G 23a.



Fig. G 23.

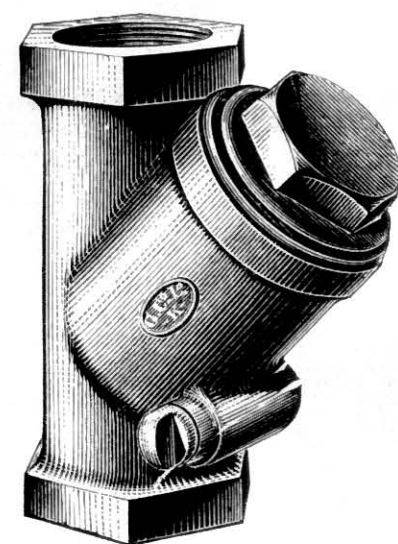
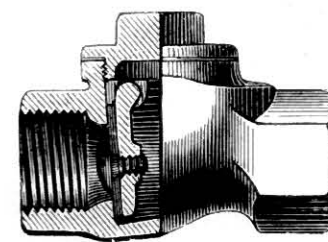


Fig. F 36.



PRICES.

ALL OF BEST HARD GUN METAL.

F 36—Back Pressure Retaining Valve (Flap), Female Screwed Ends,	doz.
G 22—Check Valve, Right Angle,	”
G 23—Straight Check Valve, Female Screwed Ends,	”
G 23a—Do. Flanged Ends,	”

$\frac{1}{2}$ "	$\frac{3}{4}$ "	1"	1 $\frac{1}{4}$ "	1 $\frac{1}{2}$ "	2"	2 $\frac{1}{2}$ "

All carefully tested to a pressure of 250 lbs. per sq. in.

Flanges in accordance with British Standard, Table II., and drilled to that standard unless otherwise instructed.

Gun Metal Steam Check Valves.

Fig. F 37.

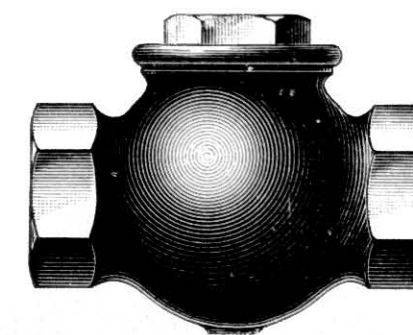


Fig. F 38.

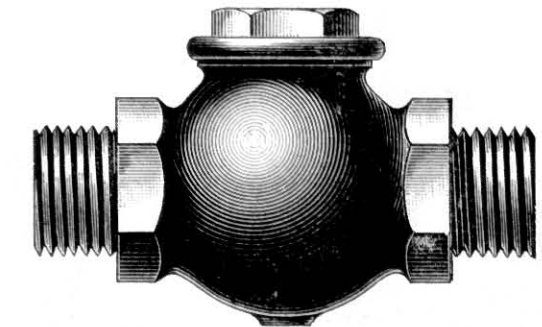


Fig. F 35.

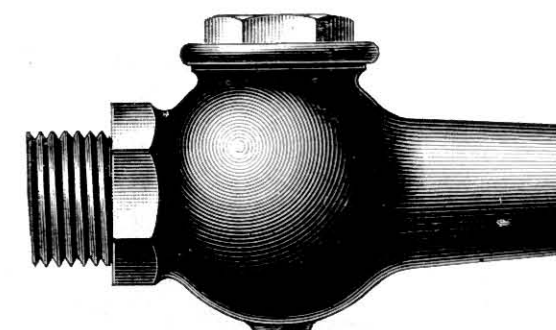
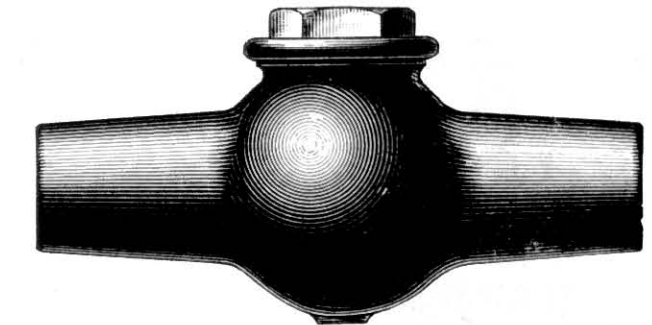


Fig. F 6.



PRICES.

Size of Valve,	$\frac{1}{2}$ "	$\frac{5}{8}$ "	$\frac{3}{4}$ "	1"	1 $\frac{1}{4}$ "	1 $\frac{1}{2}$ "
F 6—Back-pressure Retaining Valve, Plain Ends,						
F 35—Back-pressure Retaining Valve, one Plain and one Screwed End,						
F 37—Back-pressure Retaining Valve, Female Screwed Ends,						
F 38—Back-pressure Retaining Valve, Male Screwed Ends,						

All carefully tested to a pressure of 250 lbs. per sq. in.

Gun Metal Stop Valves.

Fig. G 16.

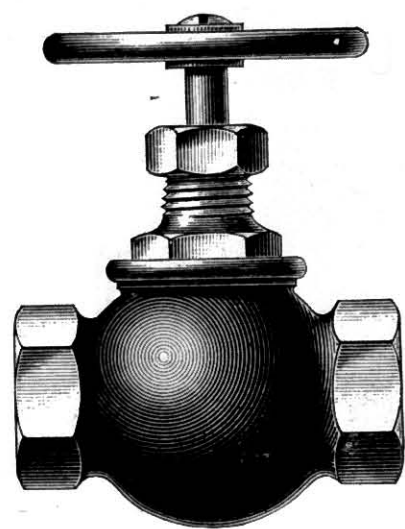


Fig. G 16a.



Fig. G 17.

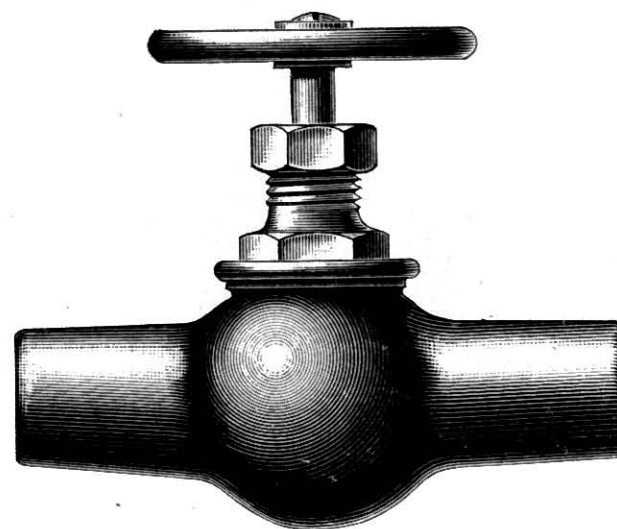


Fig. G 17a.

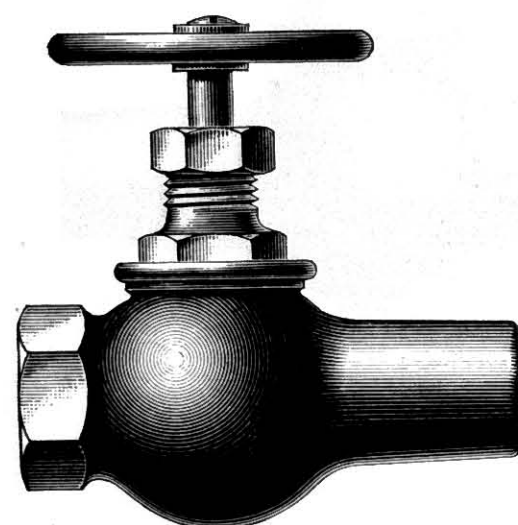


Fig. G 20.

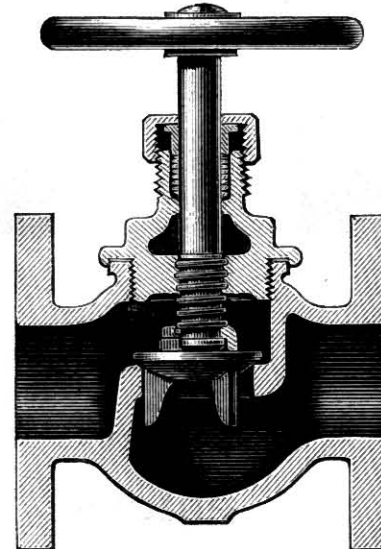
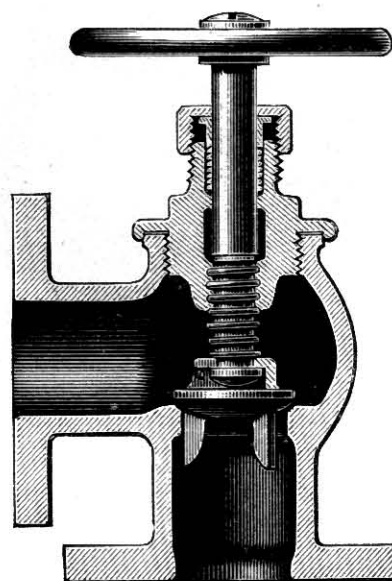


Fig. G. 16b.



PRICES.

G 16 or 16a—Gun Metal Screw-down Stop Valve, with Ground Faces, Female Screwed Ends—

G 17—	Do.	do.	Plain Ends—
G 17a—	Do.	do.	Female one end, Plain other end—
	$\frac{1}{4}$ "	$\frac{3}{8}$ "	$\frac{1}{2}$ "
	$\frac{5}{8}$ "	$\frac{3}{4}$ "	1"
	$1\frac{1}{4}$ "	$1\frac{1}{2}$ "	$1\frac{3}{4}$ "
	2 "		

G 16b or 20—Gun Metal Screw-down Stop Valve, with Ground Faces, Flanged Ends—

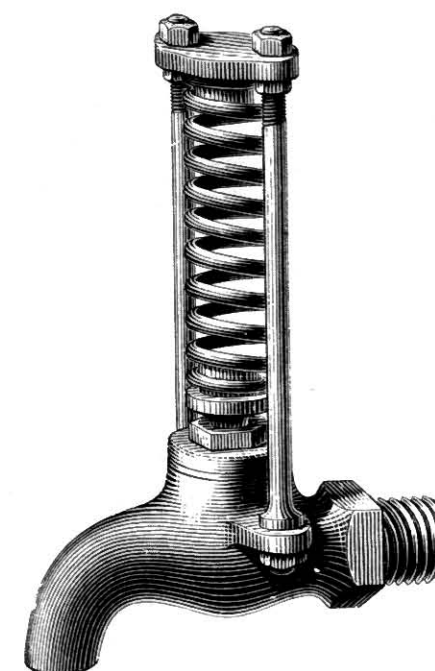
$\frac{1}{2}$ "	$\frac{5}{8}$ "	$\frac{3}{4}$ "	1"	$1\frac{1}{4}$ "	$1\frac{1}{2}$ "	$1\frac{3}{4}$ "	2"
-----------------	-----------------	-----------------	----	------------------	------------------	------------------	----

NOTE.—These Stop Valves may be Stop and Back Pressure Combined, if so ordered.

The ordinary pattern of above Valves are all carefully tested to 250 lbs. and heavier pattern to 350 lbs. per sq. inch water pressure.

Gunmetal Concussion Relief Valves, etc.

Fig. F 8.



Double Spring.

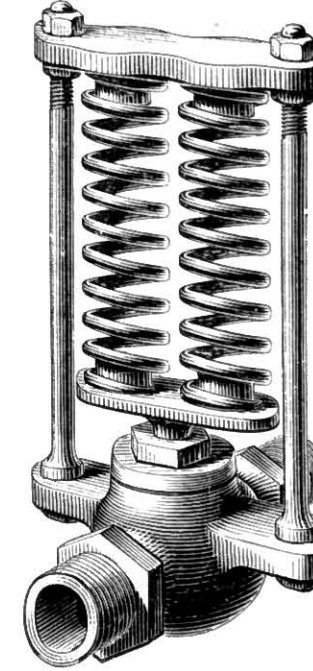


Fig. F 9.

Single Spring.

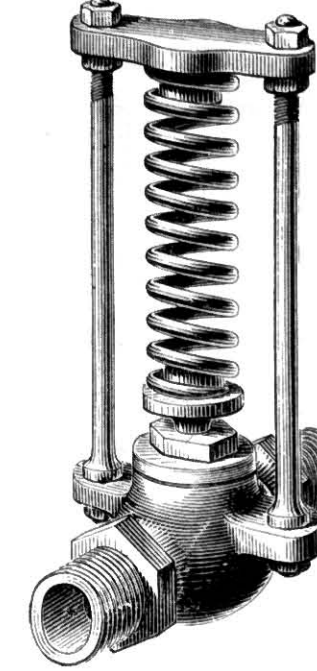


Fig. F 58.

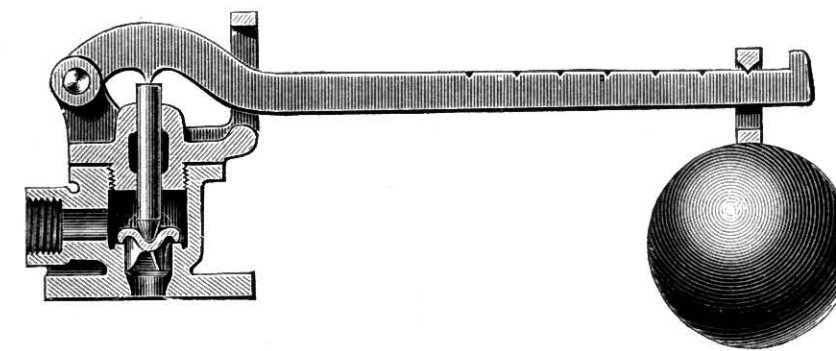
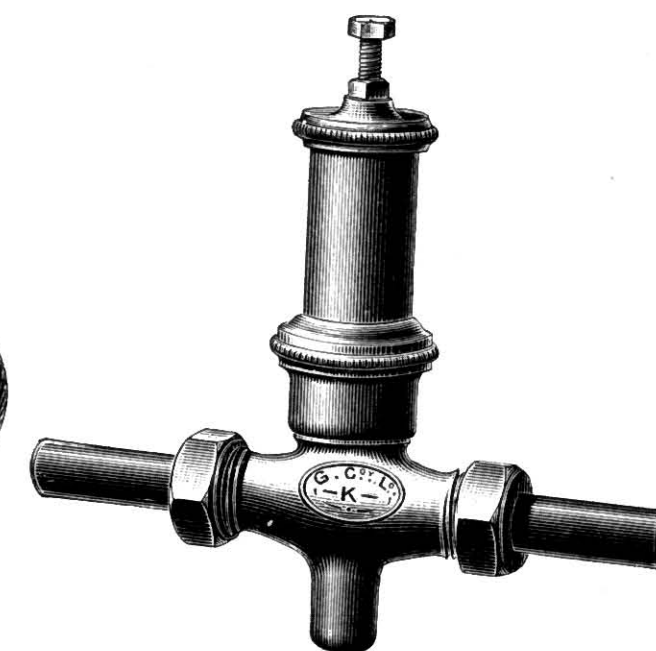


Fig. F 67.



PRICES.

F 8—Concussion Relief Bib Valve, Male End, with Single Spring,	..	..	each
F 9—Concussion Relief Stop Valve, Male End, with Single Spring,	..	..	"
F 58—Do. with Lever and Weight,	..	..	"
F 67—Patent Pressure Reducing Valve, pressure on Outlet variable by means of Screw on top, ..	..	..	"

NOTE.—F 8 or F 9 may be supplied with one or two Springs, depending on pressure under which they are to work.

All carefully tested to a pressure of 250 lbs. per sq. in.

$\frac{1}{2}$ "	$\frac{3}{4}$ "	1"	$1\frac{1}{2}$ "

Keys, etc., for Taps.

Fig. F 50.

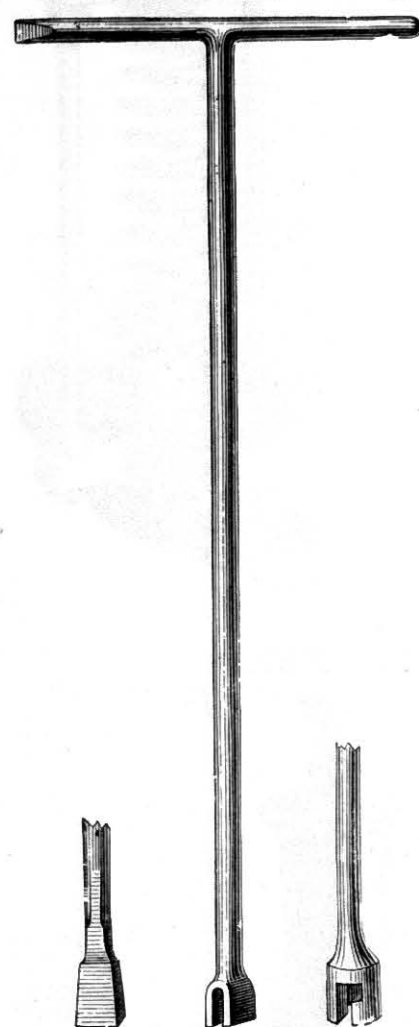


Fig. F 30.

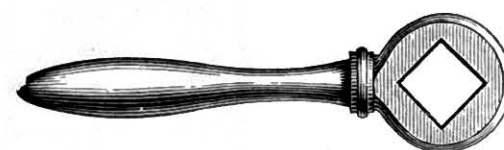


Fig. F 31.

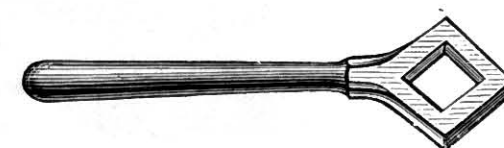


Fig. F 59.



Fig. F 60.



Fig. F 64.

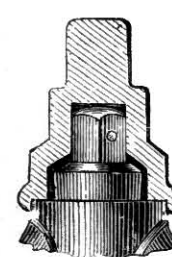


Fig. F 61.



Fig. F 62.



Fig. F 63.



PRICES.

For $\frac{1}{2}$ " $\frac{3}{4}$ " 1" $1\frac{1}{4}$ " Cocks.

F 30 or F 31—Handles or Spanners for Cocks {brass, finished, .. P doz.
 wrought iron, black, ..

F 50—Wrought Iron Key, with Cross-handle, for Stop Cocks, each.

F 59 and 60—These show varieties of Hand Wheels on Cocks or Stop Valves.

F 61, 62, 63, and 64—These show varieties of Tops on Ground Stop Cocks.

Ferrule Connections.

Fig. E 9.

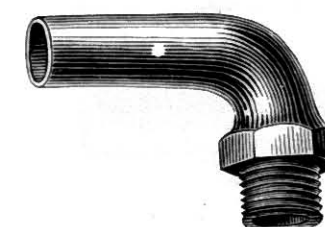


Fig. E 10.

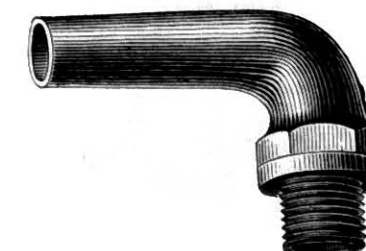


Fig. E 11.

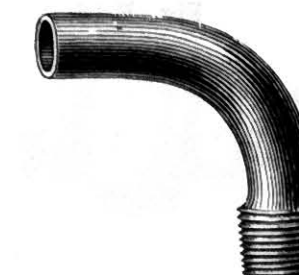


Fig. E 12.

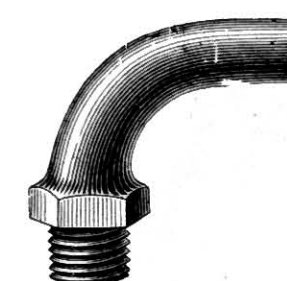


Fig. E 13.

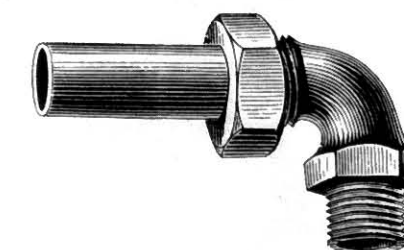


Fig. E 14.



Fig. E 15.

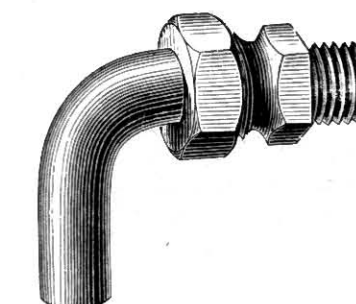


Fig. E 16.

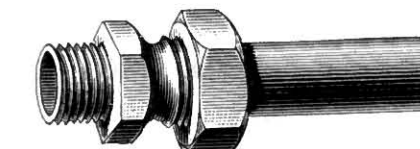
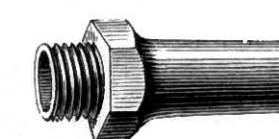


Fig. E 17.



PRICES.

	$\frac{3}{8}$ "	$\frac{1}{2}$ "	$\frac{5}{8}$ "	$\frac{3}{4}$ "	1"	$1\frac{1}{4}$ "	$1\frac{1}{2}$ "	$1\frac{3}{4}$ "	2"
E 9—Bent Ferrule, for Lead Pipe Connection, .. P doz.									
E 10— Do. do. extra heavy, ..									
E 11— Do. do. long bend, ..									
E 12— Do. do. do. ..									
E 13— Do. with Ground Union for Lead Pipe connection, heavy,									
E 14—Straight Ferrule, for Iron Pipe connections, ..									
E 15—Bent Ferrule, with Ground Union for Lead Pipe connection,									
E 16—Straight Ferrule, with Ground Union for Lead Pipe connection, heavy,									
E 17—Straight Ferrule, for Lead Pipe connection, ..									

All carefully tested to a pressure of 250 lbs. per sq. in.

Ferrule Connections.

Fig. E 18.

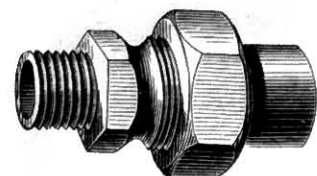


Fig. E 19.

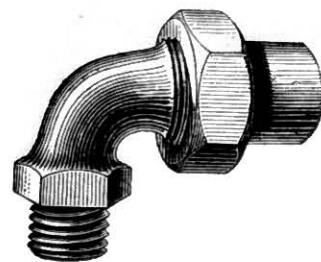


Fig. E 20.

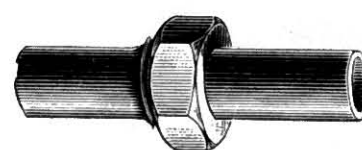


Fig. E 35.

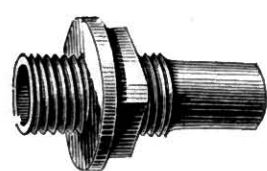


Fig. E 36.



Fig. E 37.

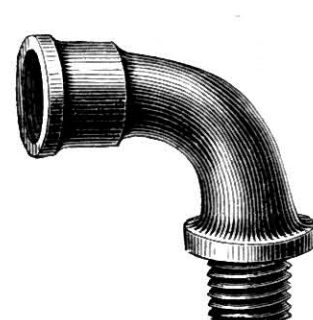


Fig. E 39.

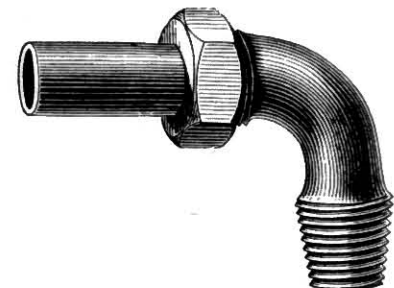


Fig. E 40.

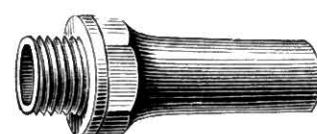
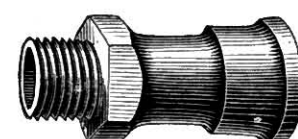


Fig. E 41.



PRICES.

	$\frac{3}{8}$ "	$\frac{1}{2}$ "	$\frac{5}{8}$ "	$\frac{3}{4}$ "	1"	1 $\frac{1}{4}$ "	1 $\frac{1}{2}$ "	1 $\frac{3}{4}$ "	2"
E 18—Straight Ferrule { with Ground Union for Iron Pipe connection, doz.									
E 19—Bent Ferrule { Female both ends, extra heavy, "									
E 20—Ground Union Coupling for Lead Pipes, "									
E 35—Straight Ferrule, with loose Jam Nut, "									
E 36—Bent Ferrule, for Iron Pipe connection, Male, "									
E 37—Do. do. Male "									
E 39—Bent Ferrule, with Ground Union for Lead Pipe connection, "									
E 40—Straight Ferrule, for Lead Pipe, heavy, "									
E 41—Do. for Iron Pipe, "									

All carefully tested to a pressure of 250 lbs. per sq. in.

Ferrule Connections.

Fig. E 91.

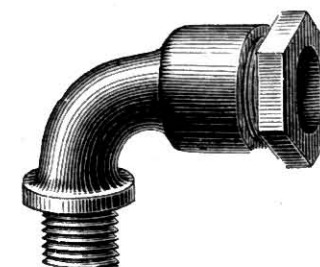


Fig. E 92.

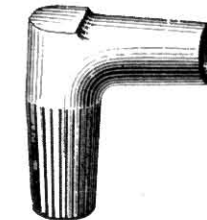


Fig. E 93.

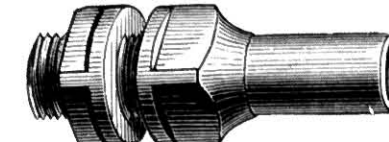


Fig. E 94.

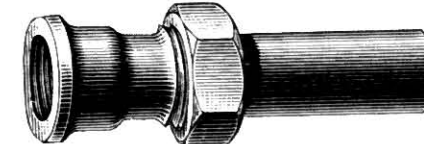


Fig. C 66.

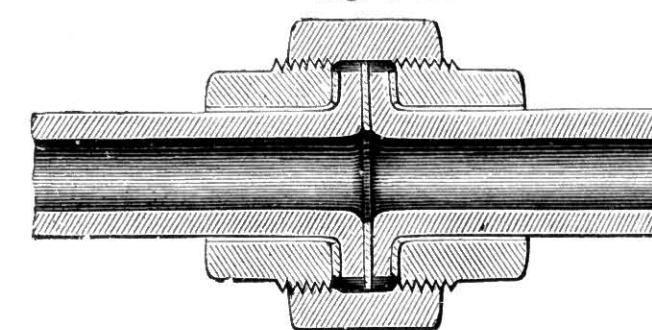


Fig. C 69.

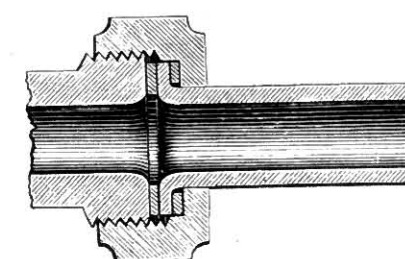
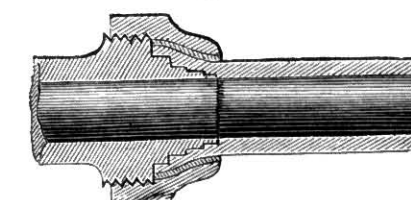


Fig. C 70.



PRICES.

	$\frac{3}{8}$ "	$\frac{1}{2}$ "	$\frac{5}{8}$ "	$\frac{3}{4}$ "	1"	1 $\frac{1}{4}$ "	1 $\frac{1}{2}$ "	1 $\frac{3}{4}$ "	2"
C 66 { Gun Metal Coupling, for jointing Lead Pipes without Solder, doz.									
Do. do. tapered form like C 70, "									
Jam Nuts—extra to Prices of Ferrules, "									
C 69 { These show the manner of jointing Lead Pipes, without the use of Solder, to Cocks or Ferrules.									
E 91—Bent Ferrule, for screwing into Main, for jointing Lead Pipe without Solder, "									
E 92—Bent Ferrule, for driving into Main, "									
E 93—Straight Ferrule or Union, with Jam Nut, "									
E 94 { Straight Ferrule Ground Union, for con- necting Lead and Iron Pipes, "									
Bent do do. "									

All carefully tested to a pressure of 250 lbs. per sq. in.

Ferrule Connections.

Fig. C 40.



Fig. C 41.



Fig. C 42.



Fig. C 43.



Fig. C 44.



Fig. C 45.



PRICES.

[illegible]

Ferrule Connections, Etc.

Fig. C 46.



Fig. C 47.



Fig. C 48.

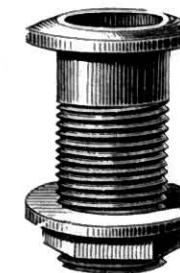


Fig. C 60.



Fig. C 61.



Fig. C 62.



Fig. C 63.



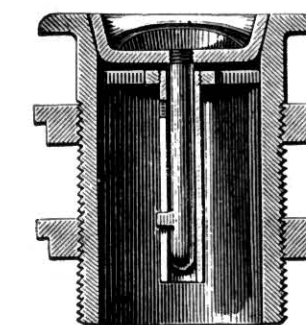
Fig. C 64.



Fig. C 65.



Fig. C 90.



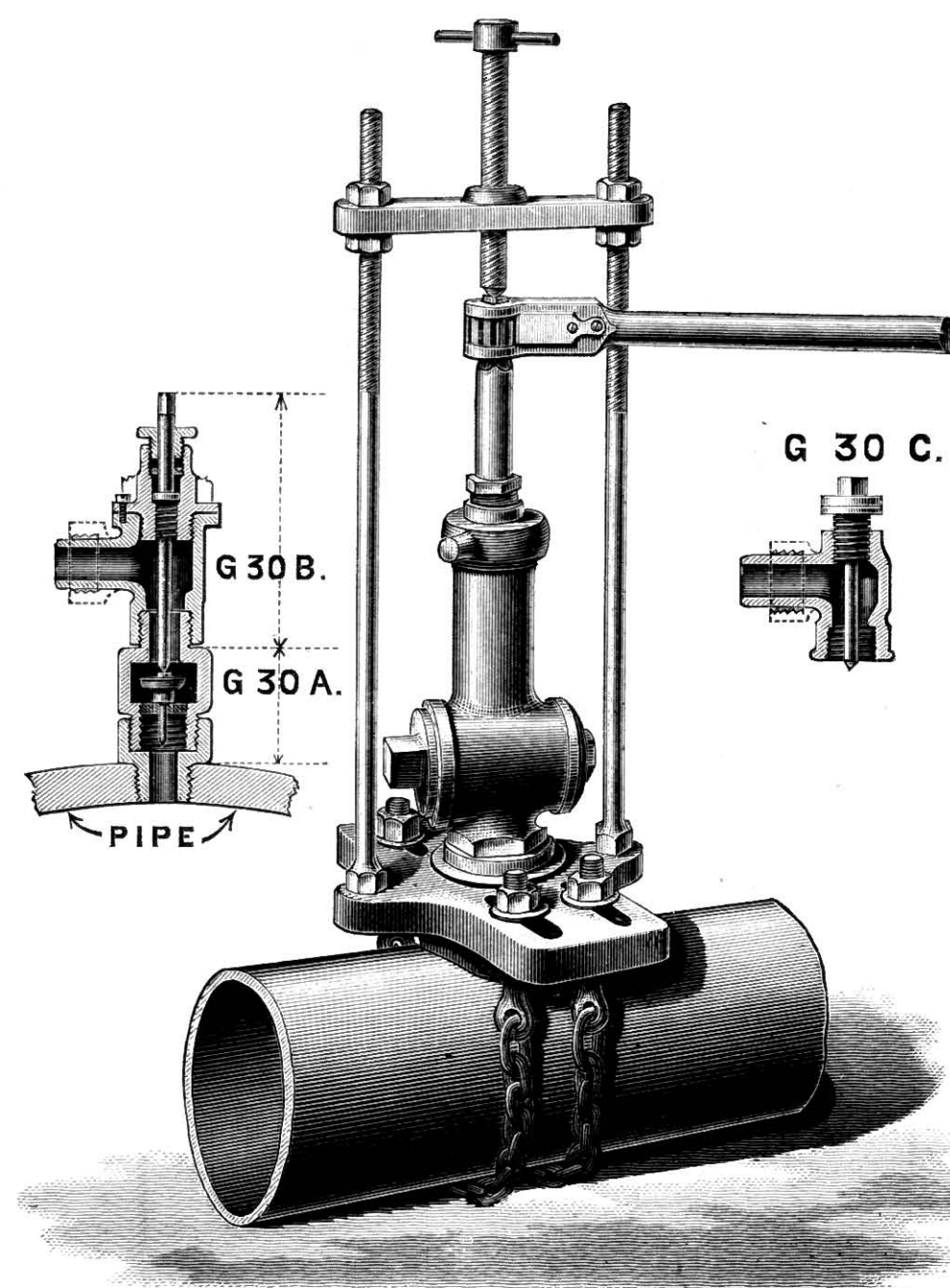
PRICES.

[illegible]

Apparatus for

Drilling and Tapping Mains and Inserting Ferrules, etc.,
without requiring to turn off the Water.

Fig. G. 30.



PRICES.

	To tap	$\frac{1}{2}$ "	$\frac{3}{4}$ "	1"	$1\frac{1}{4}$ "
G 30 { Bracket, with Chain, Bolts, four Saddles, Vertical Cock, and Ratchet Brace without Drill and Tap, but with Spindle and Sockets,	each				
Drill to suit above,	"				
Tap do.	"				
G 30 A—Ferrule, with small Internal Valve,	"				
G 30 B—Ferrule Cock, to screw on top of Ferrule G 30 A, with Plain End,	"				
Ferrule Cap—can be used instead of Ferrule Cock in cases where Cock is not required, with Plain End,	"				
G 30 C { Ferrule Cap, with Ground Union,	"				

NOTE.—The $1\frac{1}{4}$ " size can tap all the lower sizes, provided Drills and Taps are supplied.

For Instructions see next page.

Instructions for Working

Boring and Tapping Apparatus for Pipes under Pressure.

Select the Saddle to suit the size of pipe in which the Ferrule is to be inserted, and place it over the point where it is desired to insert the Ferrule, putting joint between pipe and saddle.

Secure the large Plate with Cock attached, by means of the chain round pipe, and open Cock full.

Remove cover of Cock, and insert the proper size of Drill into end of spindle, and secure it by cotter.

Drop the Spindle, with Drill attached, into Cock and replace cover.

Put on Ratchet brace and start drilling in the usual way.

After Drill has penetrated the pipe, pull the spindle hard up against the cover of Cock, and then close Cock.

Remove cover of Cock, and having withdrawn spindle, remove Drill and insert the Tap in its place, and secure with cotter as before.

Drop the Spindle with Tap into Cock, put on cover, open Cock, and proceed to tap the hole in the usual way.

Having unscrewed the Tap, pull the spindle hard up against the cover of Cock, and then close Cock.

Remove cover of Cock, and having withdrawn spindle, remove Tap and insert the small socket (with springs inside) in its place, and secure with cotter as before.

Insert the top end of Ferrule into socket and drop it into Cock, allowing the bottom to rest on plug of Cock.

Replace the cover and open Cock full.

Screw the Ferrule into main, taking care that the screw enters correctly.

The water pressure in main will then close Valve inside Ferrule.

The spindle should then be withdrawn and the Bracket carefully removed.

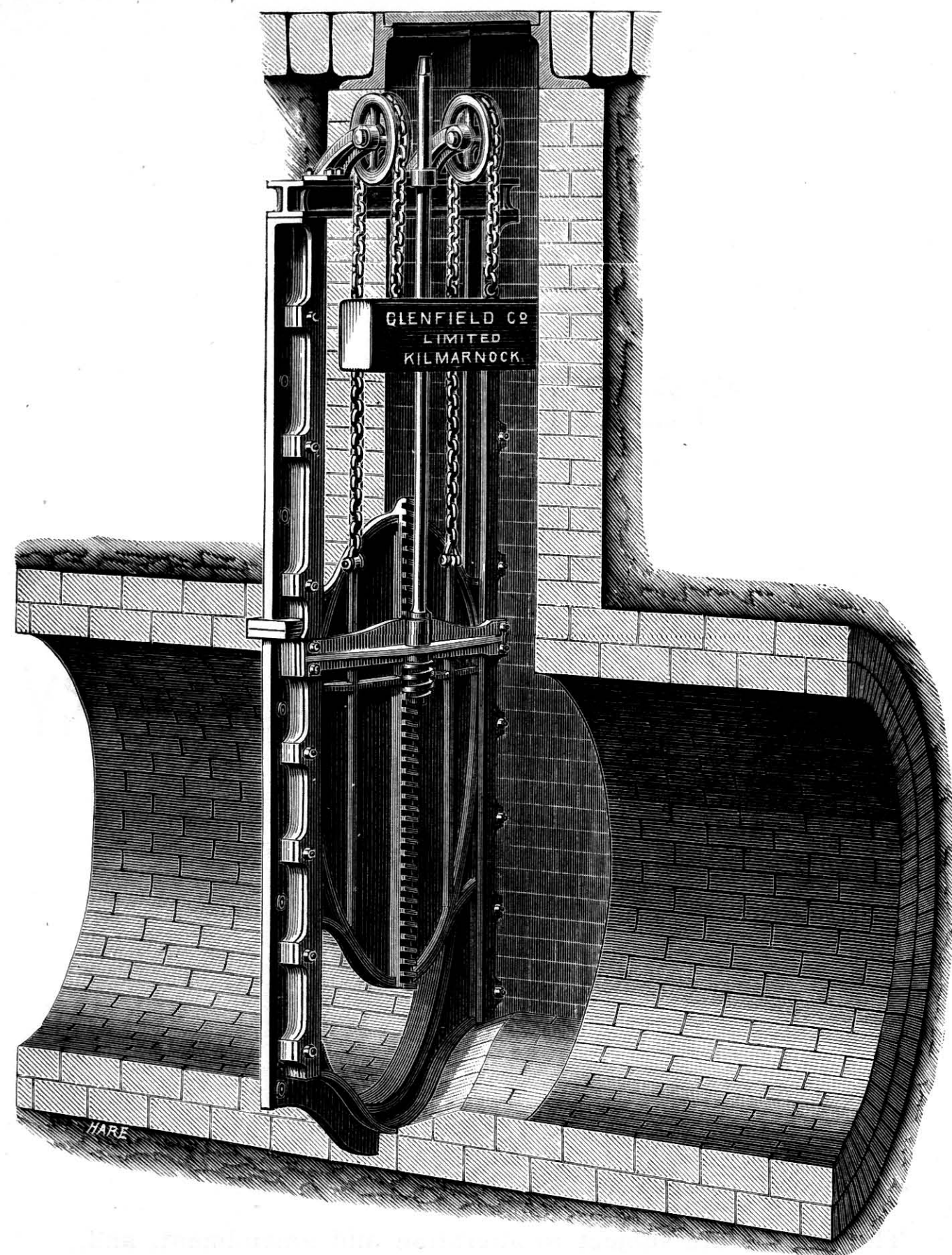
Screw on the Ferrule Cock, and having made the necessary pipe connection, the valve can be opened in the usual way.

SECTION H.

SEWERAGE AND SANITARY FITTINGS.

The designs are subject to alteration and amendment, and, while corrections in Catalogue are made from time to time, Glenfield & Kennedy Ltd. do not guarantee that goods supplied will be exactly as shewn.

Penstocks. No. 1.



PRICES.

CHAMBER COVER NOT INCLUDED IN PRICE.

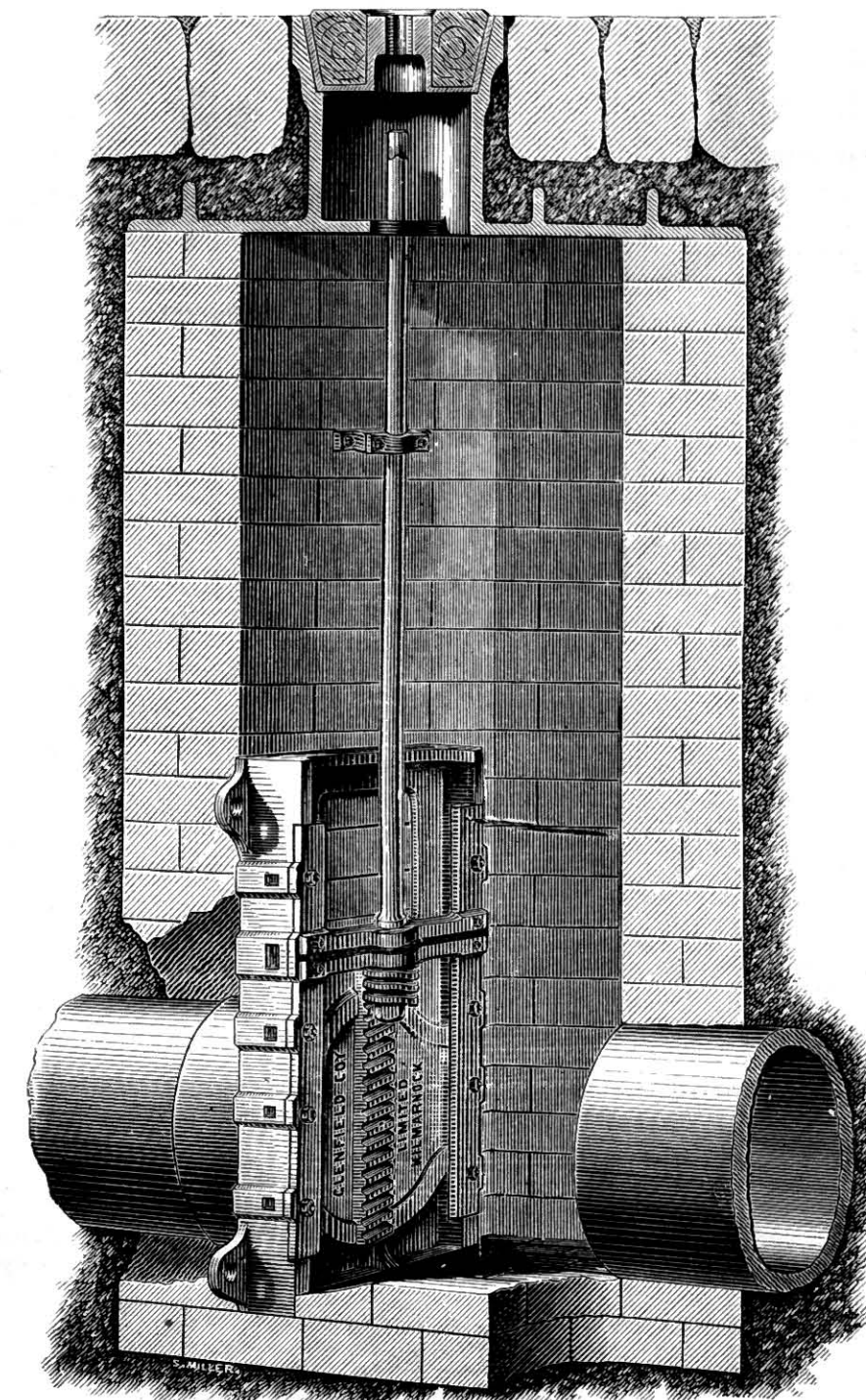
No. 1.—Penstock for Egg-shaped Sewer—Bearing at Worm bushed with gun metal.			
2' 0" × 1' 4", Without Balance Weight,	each.	3' 9" × 2' 6", With Balance Weight,	each.
2' 6" × 1' 8", Do.	do.	4' 0" × 2' 8", Do.	do.
3' 0" × 2' 0", With	do.	5' 0" × 3' 4", Do.	do.
3' 6" × 2' 4", Do.	do.		

Also 6' × 4', 7' × 4' 8", 8' × 5' 4", 9' × 6', 10' × 6' 8".

When required, these Penstocks can be made with gun metal Faces.
Adjustable Wedge Blocks can be supplied, if required, at a slight extra cost.

Penstocks.

No. 3.



PRICES.

CHAMBER COVER NOT INCLUDED IN PRICE.

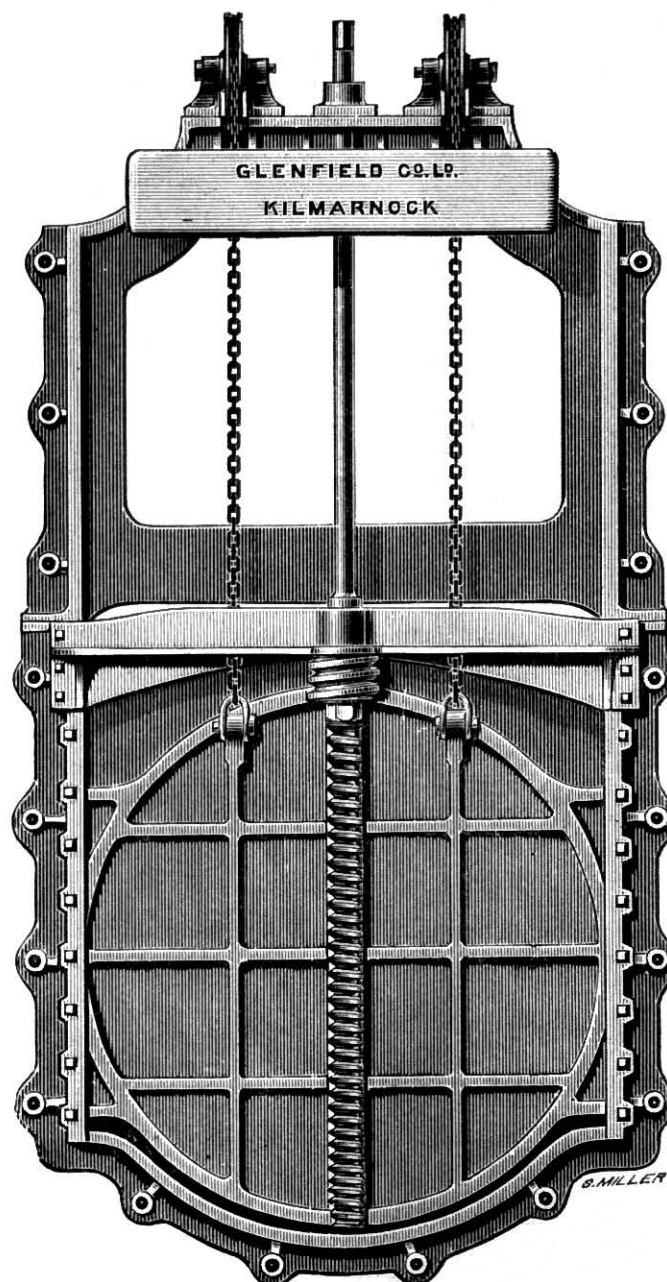
No. 3—Circular Penstock—Bearing at Worm bushed with gun metal.

6", ..	..	each.	18", ..	..	each.
8", ..	..	"	21", ..	..	"
9", ..	..	"	24", ..	..	"
12", ..	..	"	27", ..	..	"
15", ..	..	"	30", ..	..	"
16", ..	..	"	36", ..	..	"

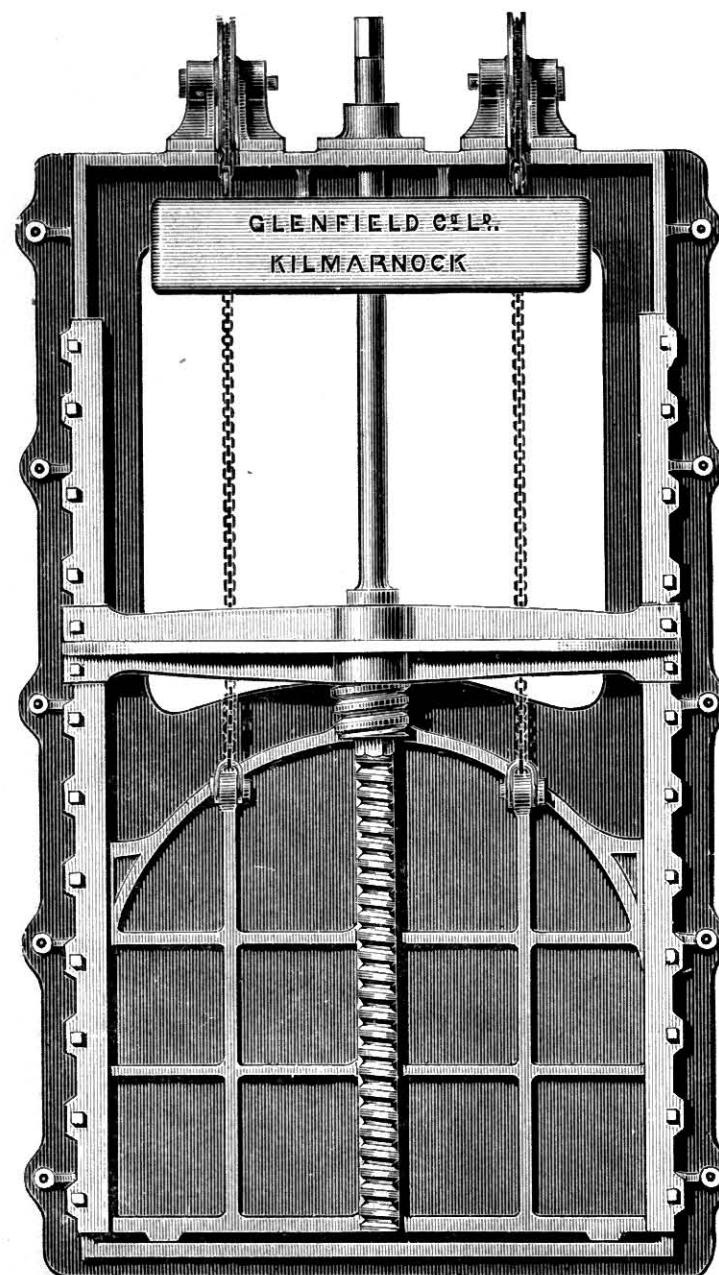
When required, these Penstocks can be made with gun metal Faces.

Penstocks.

No. 140.



No. 142.



PRICES.

No. 140—Circular Penstock—Bearing at Worm bushed with gun metal.

24" dia., Without Balance Weight,	each.	36" dia., Without Balance Weight,	each.
27" dia., Do.	"	40" dia., With do.	"
30" dia., Do.	"	42" dia., Do. do.	"

Also Larger Sizes.

No. 142—D-shaped Penstock—Bearing at Worm bushed with gun metal.

24" x 24", Without Balance Weight,	each.	30" x 30", Without Balance Weight,	each.
27" x 27", Do.	"	36" x 36", Do.	"

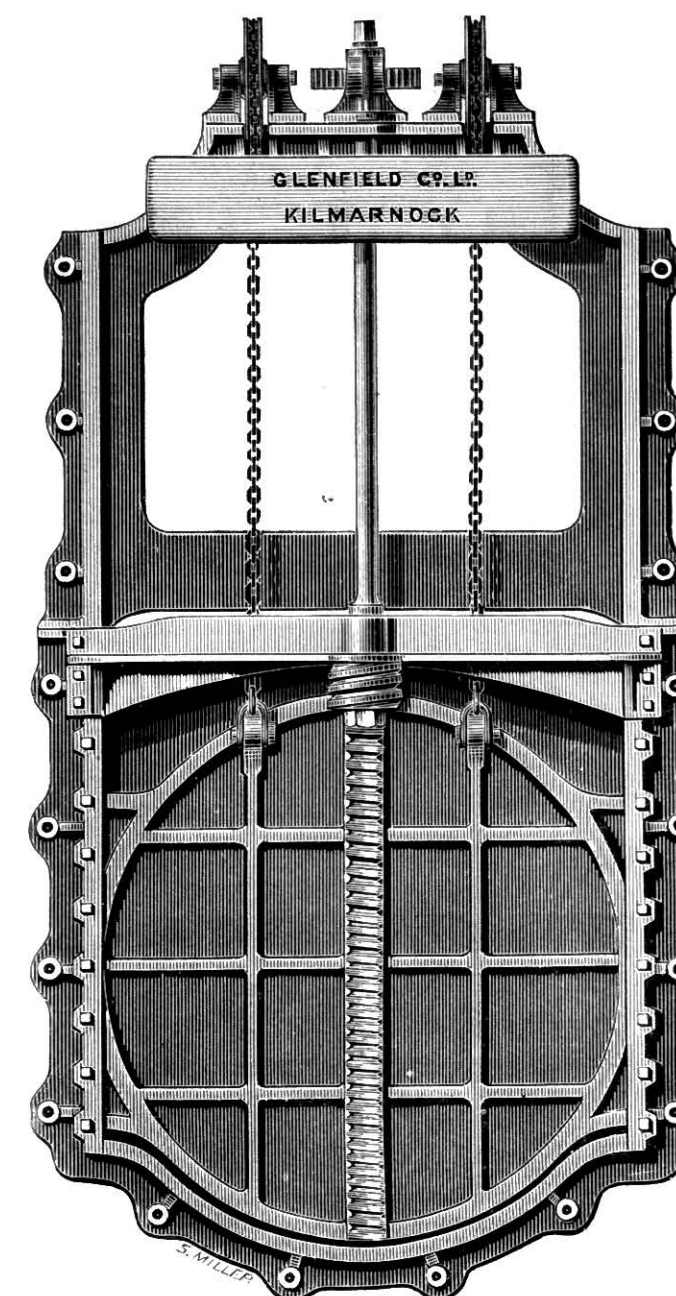
Also Larger Sizes, having Balance Weights.

When required, these Penstocks can be made with gun metal Faces.

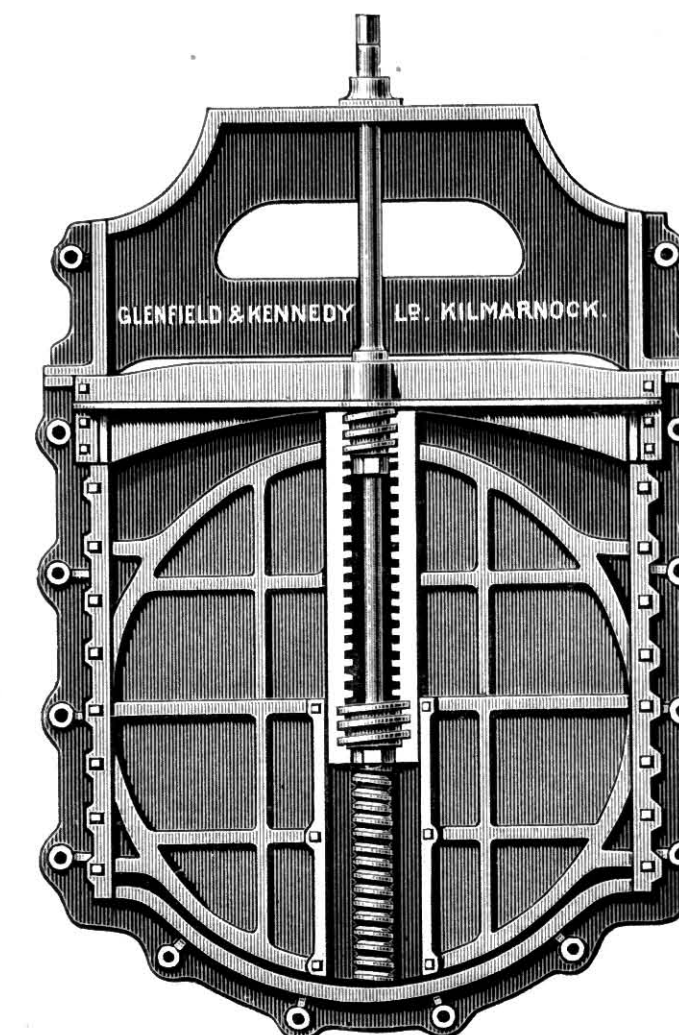
Adjustable Wedge Blocks can be supplied, if required, at a slight extra cost.

Penstocks.

No. 144.



No. 146.



PRICES.

No. 144—Large Circular Penstock, with Balance Weight—Bearing at Worm bushed with gun metal.

48" dia., With Spur Wheel Gearing,	..	..	..	each.
54" dia., Do.	..	..	..	"
60" dia., Do.	..	..	..	"
72" dia., Do.	..	..	..	"
84" dia., Do.	..	..	..	"

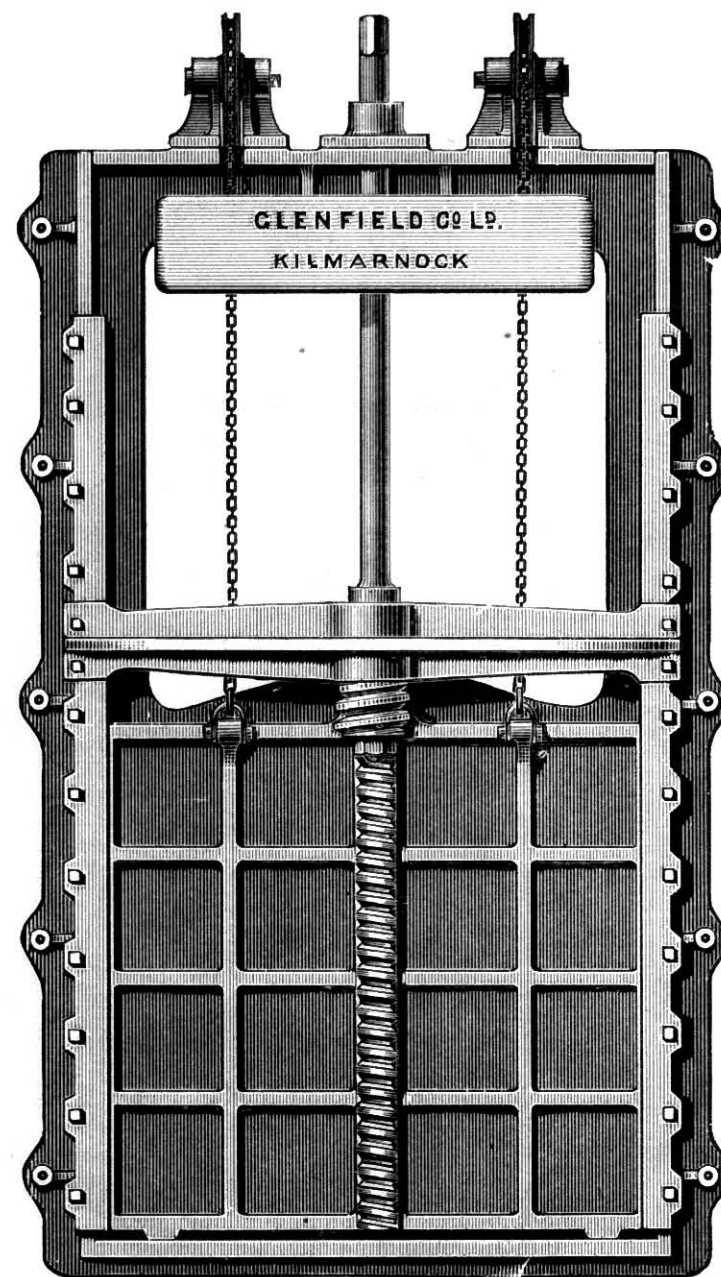
No. 146—Penstock, with Double Door—for shallow Sewers—Bearing at Worm bushed with gun metal.

When required, these Penstocks can be made with gun metal Faces.

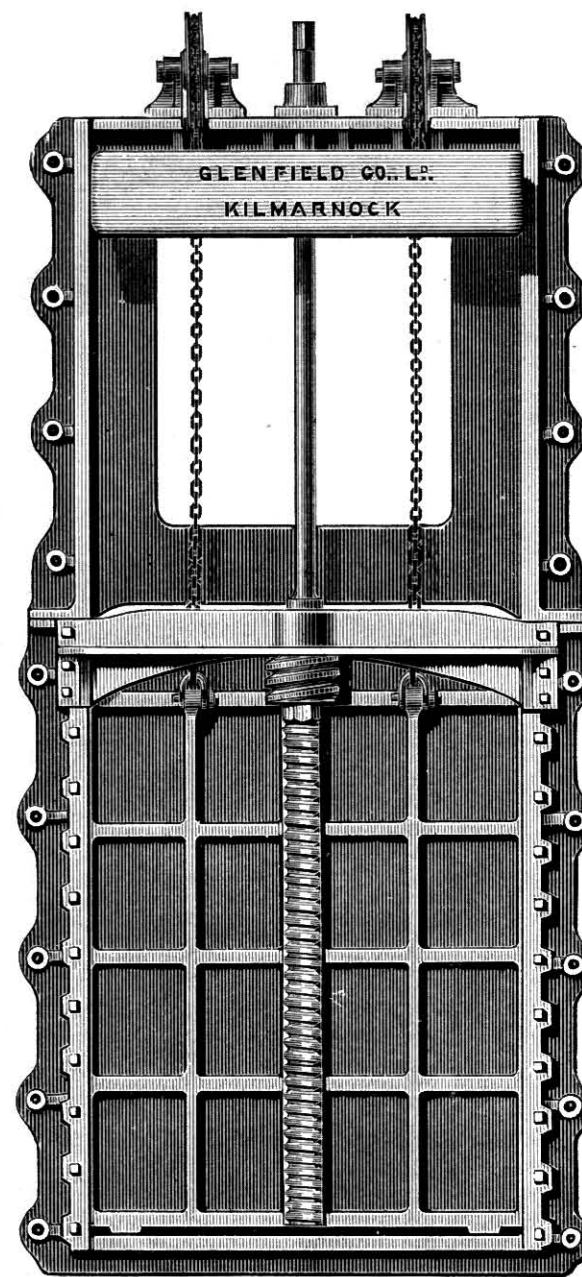
Adjustable Wedge Blocks can be supplied, if required, at a slight extra cost.

Penstocks.

No. 148.



No. 150.



PRICES.

No. 148—Square Penstock—Bearing at Worm bushed with gun metal.

18" sq., Without Balance Weight, ..	each.	27" sq., Without Balance Weight, ..	each.
21" sq., Do. ..	..	30" sq., With do. ..	..
24" sq., Do. ..	..	36" sq., Do. do. ..	..

Also Larger Sizes.

No. 150—Rectangular Penstock—Bearing at Worm bushed with gun metal.

Breadth.	Depth.		Breadth.	Depth.		
18"	24"	Without Balance Weight, ..	each.	30"	42"	With Balance Weight, ..
24"	30"	Do. ..	..	42"	54"	Do. ..

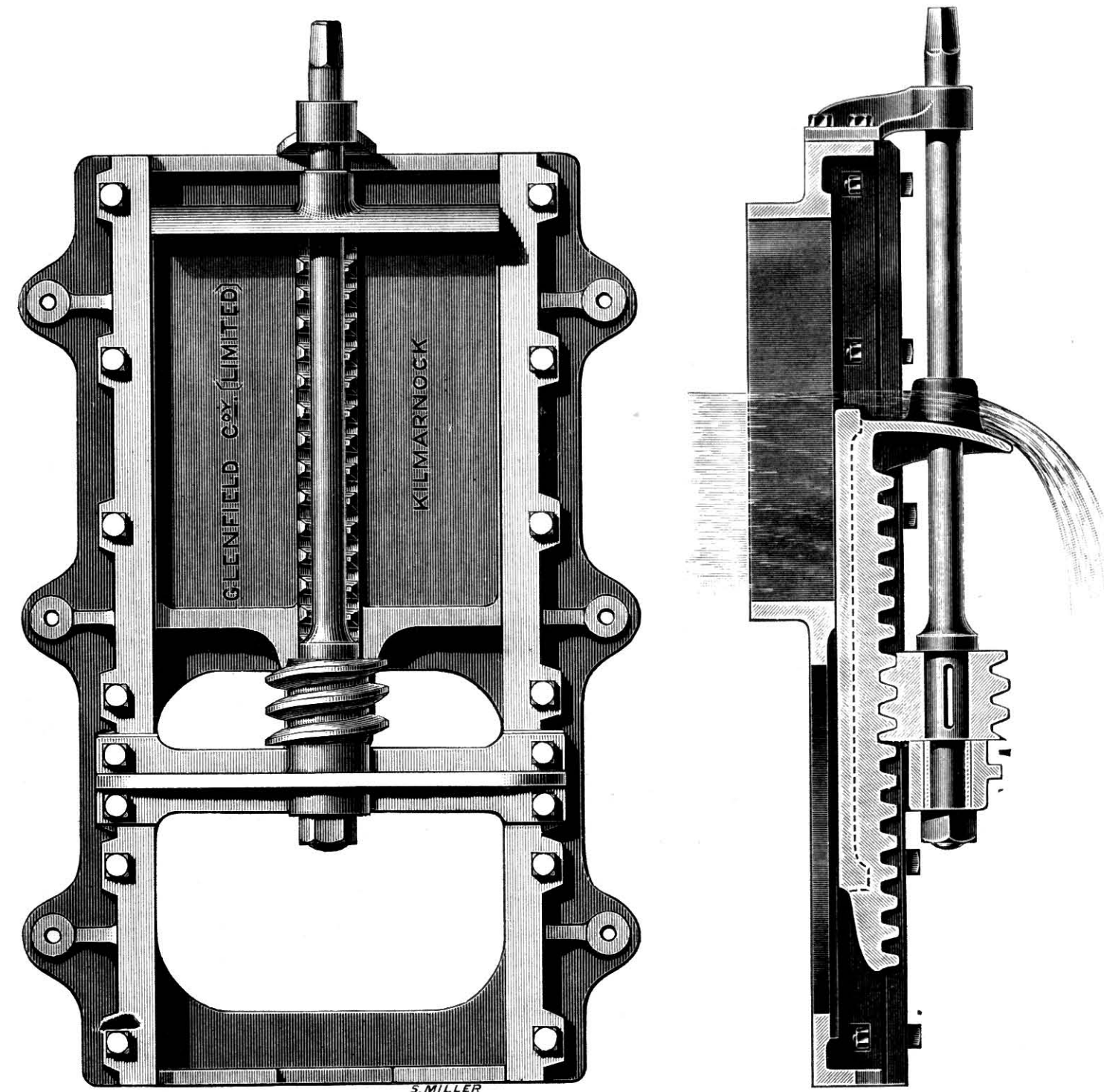
Also Larger Sizes.

When required, these Penstocks can be made with gun metal Faces.

Adjustable Wedge Blocks can be supplied, if required, at a slight extra cost.

Penstocks.

No. 3 A.



PRICES.

No. 3 A—Penstock to open downwards—Bearing at Worm bushed with gun metal.

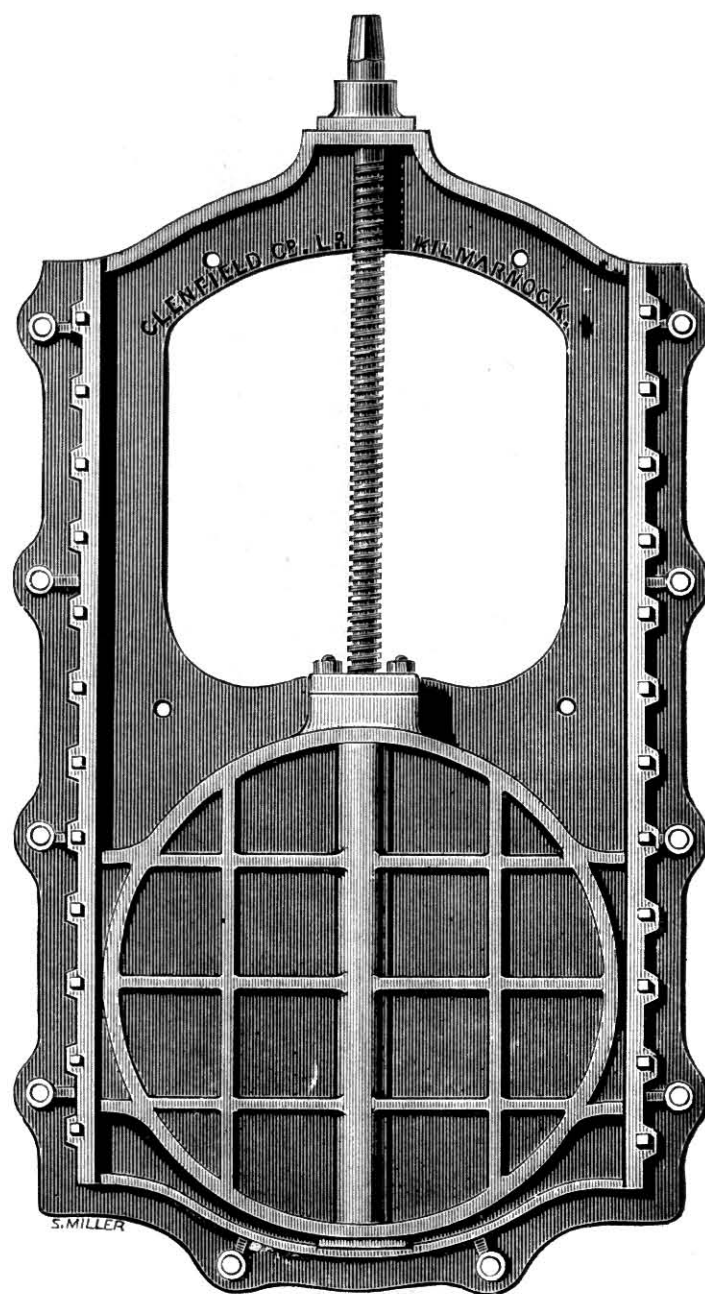
Breadth.	Depth.									each.
12"	20"	..	..	..	..	..	..	..	..	..
16"	24"	..	..	..	..	..	..	..	..	..
20"	30"	..	..	..	..	..	..	..	..	..
24"	36"	..	..	..	..	..	..	..	..	..

Also Larger Sizes.

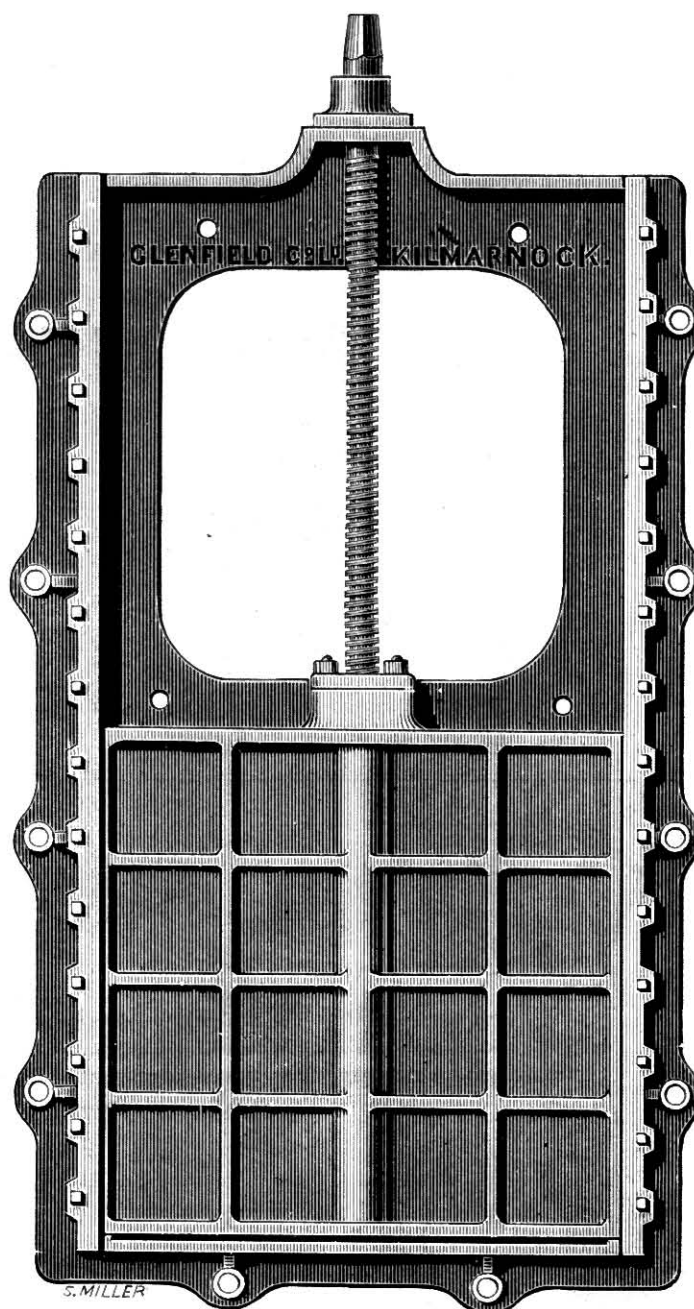
When required, these Penstocks can be made with gun metal Faces.

Penstocks.

No. 152.



No. 154.



PRICES.

No. 152—Circular Screw Penstock, with wrought iron Screw and gun metal Nut.

10"	12"	15"	16"	18"	21"	24"	27"	dia.
								each.

With Spur Wheel Gearing.

30"	32"	36"	42"	48"	54"	60"	dia.
							each.

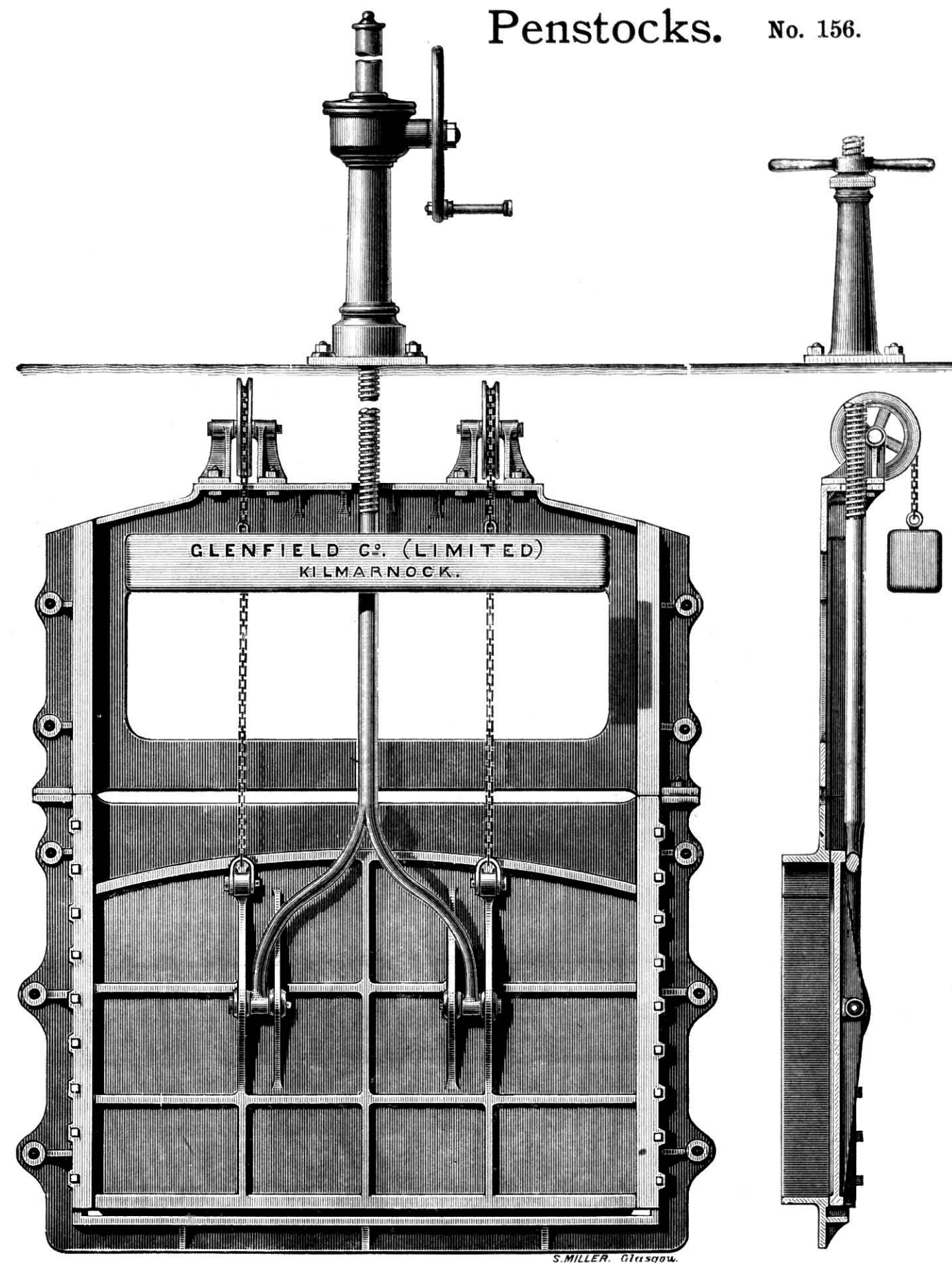
No. 154—Square Screw Penstock, with wrought iron Screw and gun metal Nut.

18"	21"	24"	27"	30"	36"	42"	48"	sq.
								each.

Also Larger Sizes.

When required, these Penstocks can be made with gun metal Faces.
Adjustable Wedge Blocks can be supplied, if required, at a slight extra cost.

Penstocks. No. 156.



PRICES.

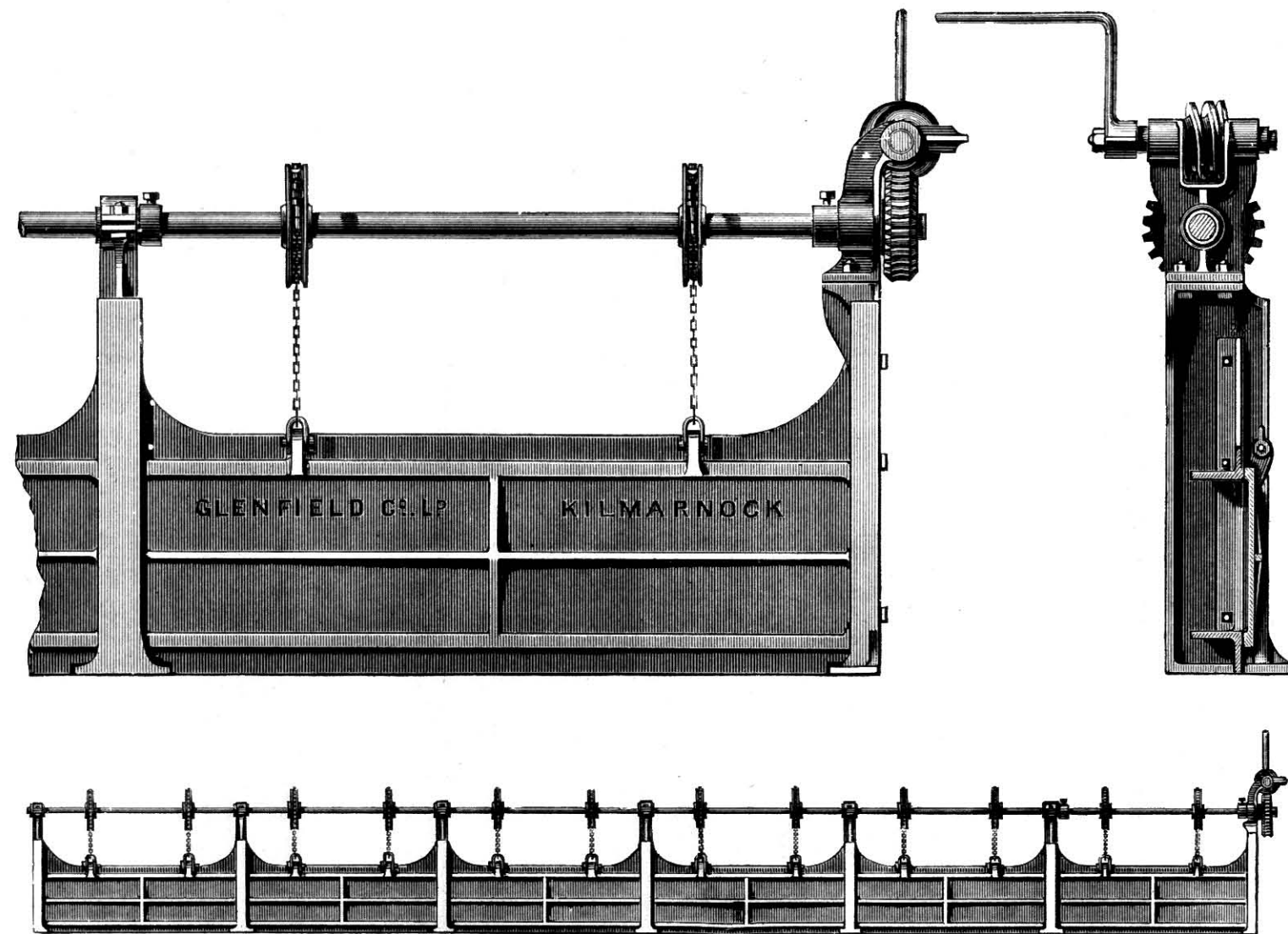
No. 156—Rectangular Penstock, curved Top, with Screw Gear and Balance Weight.			
Depth at	Each.	Depth at	Each.
Width. Centre.		Width. Centre.	
36" x 24", With Plain Headstock,		60" x 40", With Geared Headstock (Worm or Bevel),	
42" x 30", Do.		72" x 48", Do. (do. do.),	
48" x 36", Do.		84" x 54",	
		96" x 60",	

Length of Rod and Screw allowed for, 1' clear of Balance Weight Pulley.

When required, these Penstocks can be made with gun metal Faces.
Adjustable Wedge Blocks can be supplied, if required, at a slight extra cost.

Penstocks.

No. 158.



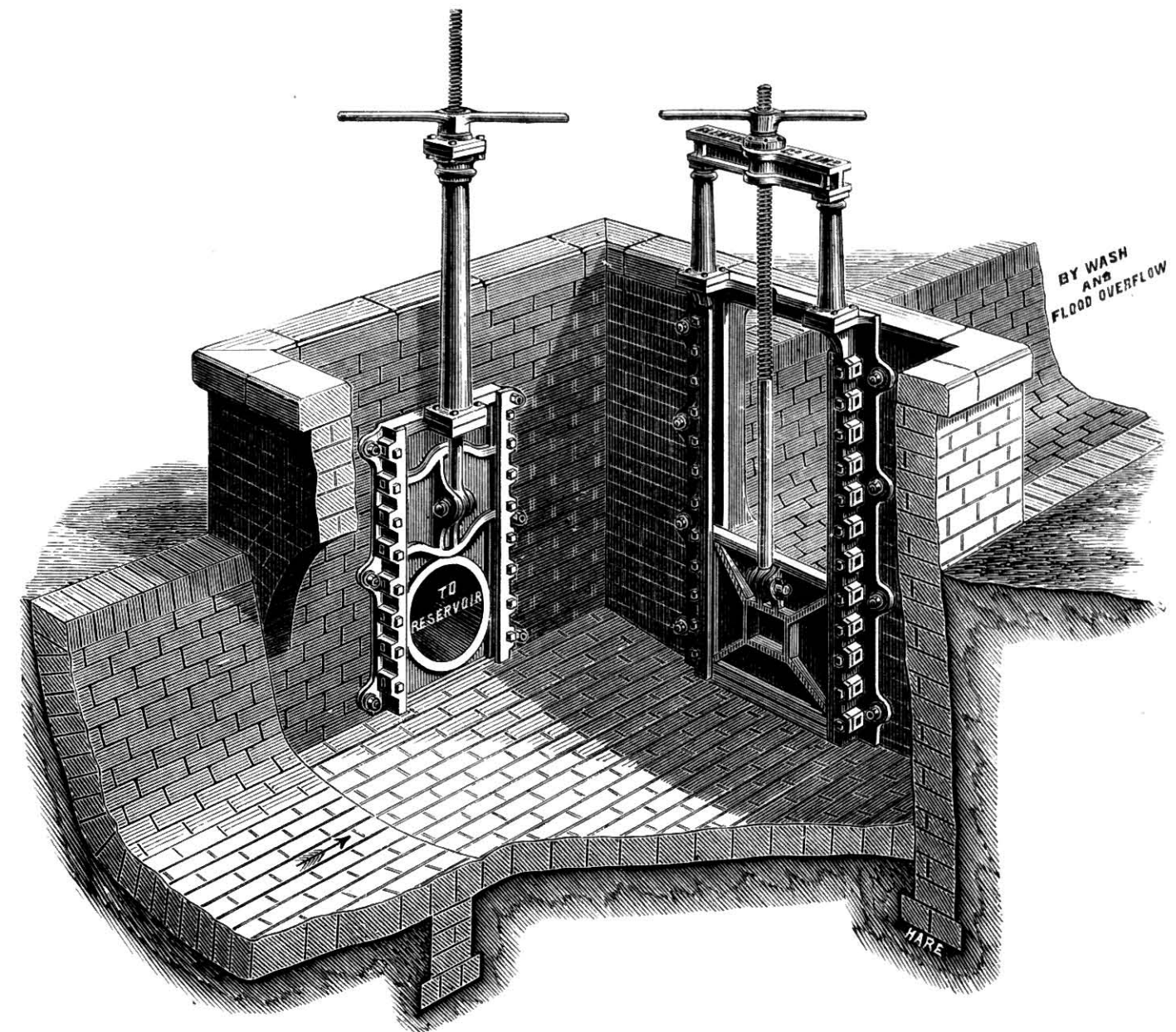
No. 158—Overflow Penstock—Bearing at Worm bushed with gun metal.

Prices on application.

When required, these Penstocks can be made with gun metal Faces.

Sluice Chamber.

No. 159.

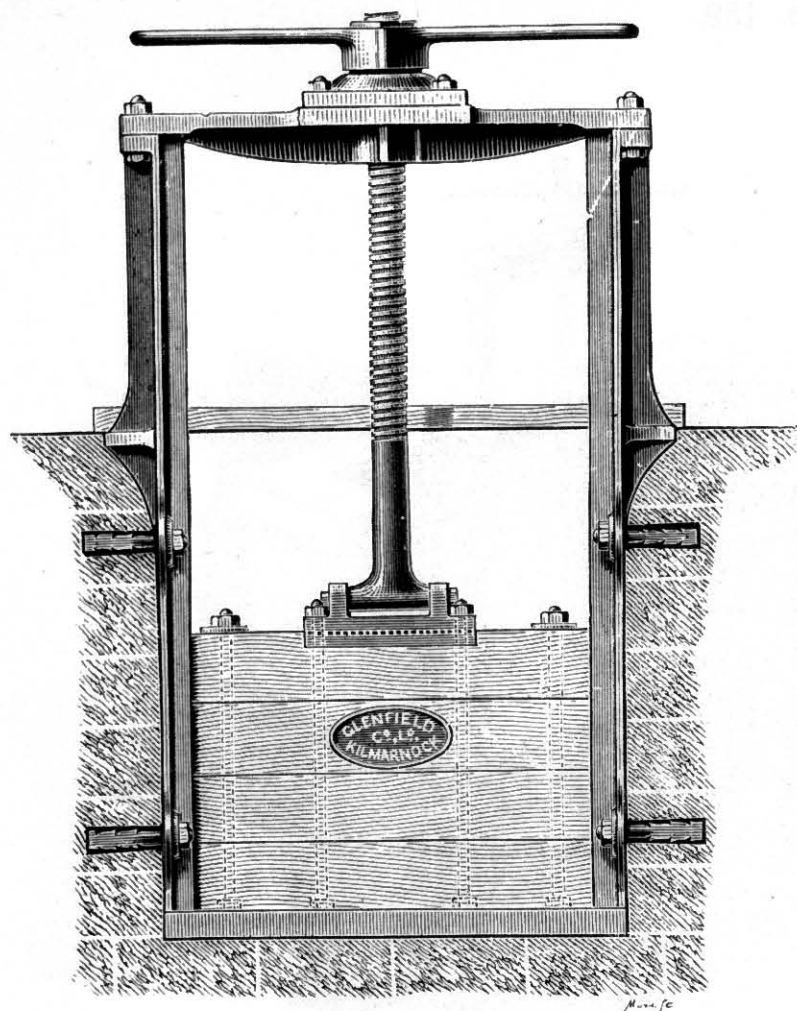


These Circular and Rectangular Sluices can be made of any size. The Slides and Doors of the Rectangular Sluices are faced in Lathe, and can be supplied lined with gun metal, if wished. The Circular Sluices can have gun metal Rings, if wished; or both can have cast iron Faces only, if desired. Lewis Bolts are supplied for fixing Sluices to masonry. The Rectangular Sluice is used as an Overflow or Scour, as required.

Prices on application.

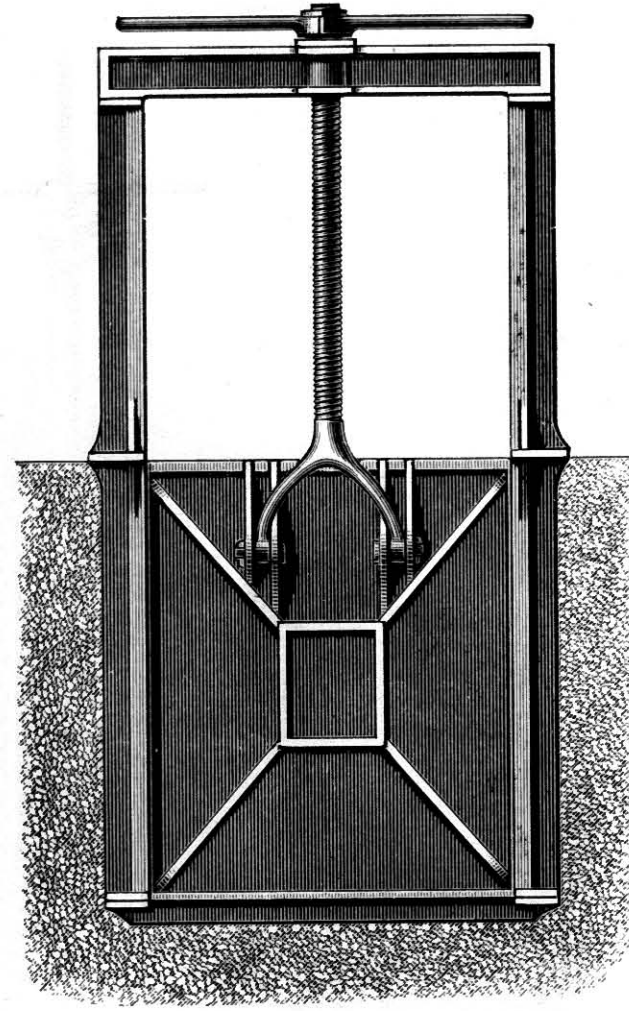
Reservoir or Open Channel Sluices.

No. 160.



Wood Door.

No. 161.



Iron Door.

The Screw is of wrought iron working in gun-metal Nut.
These Sluices can be made of any size.

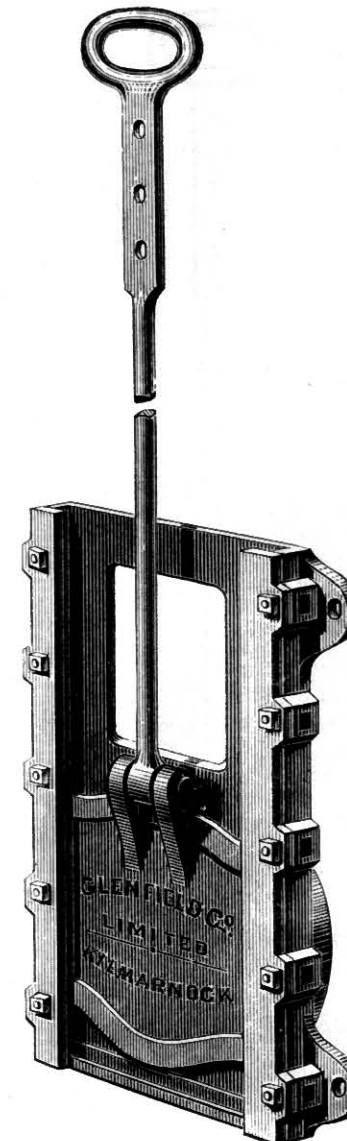
PRICES.

Width.	Depth.	Price, No. 160, Wood Door.	Price, No. 161, Iron Door.	Width.	Depth.	Price, No. 160, Wood Door.	Price, No. 161, Iron Door.
2' 0"	1' 6"			3' 0"	3' 0"		
2' 0"	2' 0"			3' 0"	5' 0"		
2' 0"	4' 0"			4' 0"	3' 6"		
2' 6"	2' 6"			4' 0"	4' 0"		
2' 6"	4' 0"			4' 0"	6' 0"		
3' 0"	2' 6"			5' 0"	5' 0"		

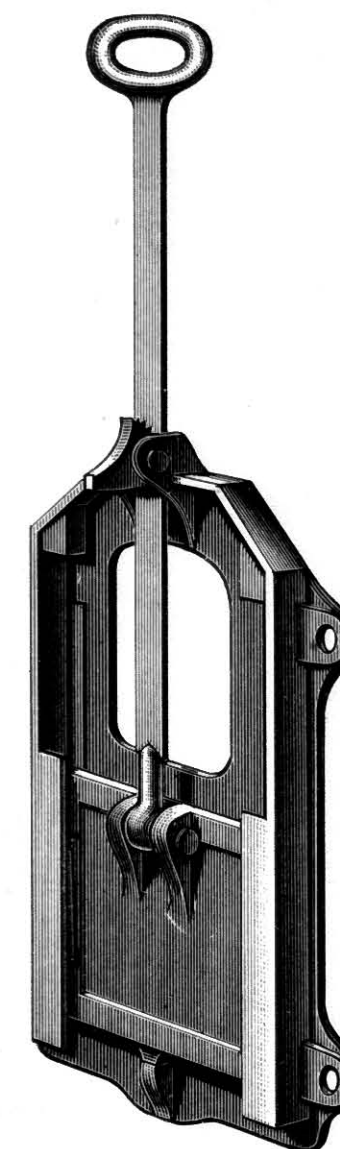
Gun Metal Faces, if required, charged extra.

Hand Flushing Valves.

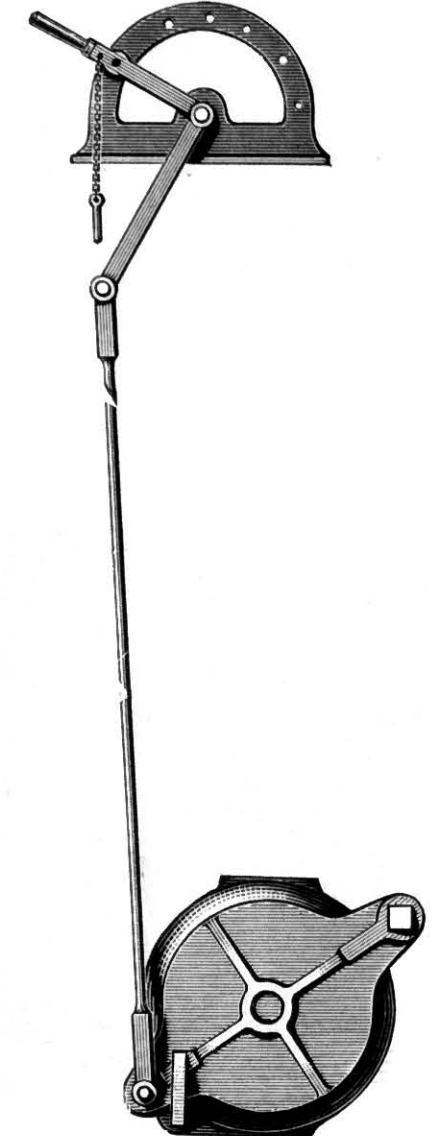
No. 6.



No. 20.



No. 8.



The Hand Flushing Sluice No. 20 is fitted with arrangement to hold up door at any desired position.
To lower the door, press the block with foot, thus releasing door.

PRICES.

With cast iron Faces.				With cast iron Faces.			
No. 6.	No. 20.			No. 6.	No. 20.		
4",		each.	12",				each.
6",		"	14",				"
8",		"	15",				"
9",		"	16",				"
10",		"	18",				"

When required, these Valves can be made with gun metal Faces.

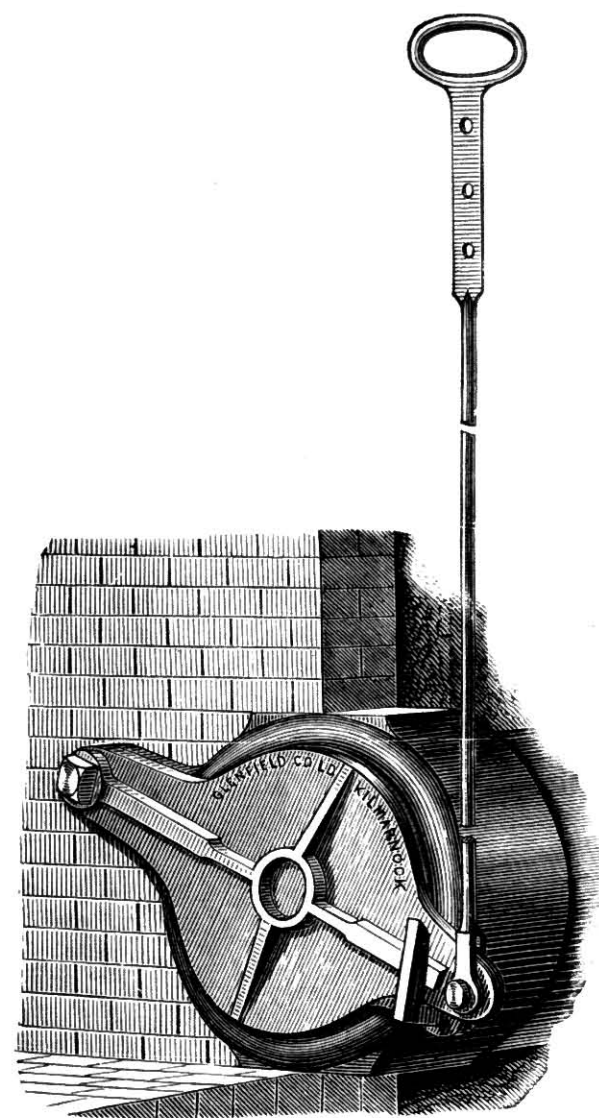
No. 8—Quick-opening Disc Flushing Valve.

Prices on application.

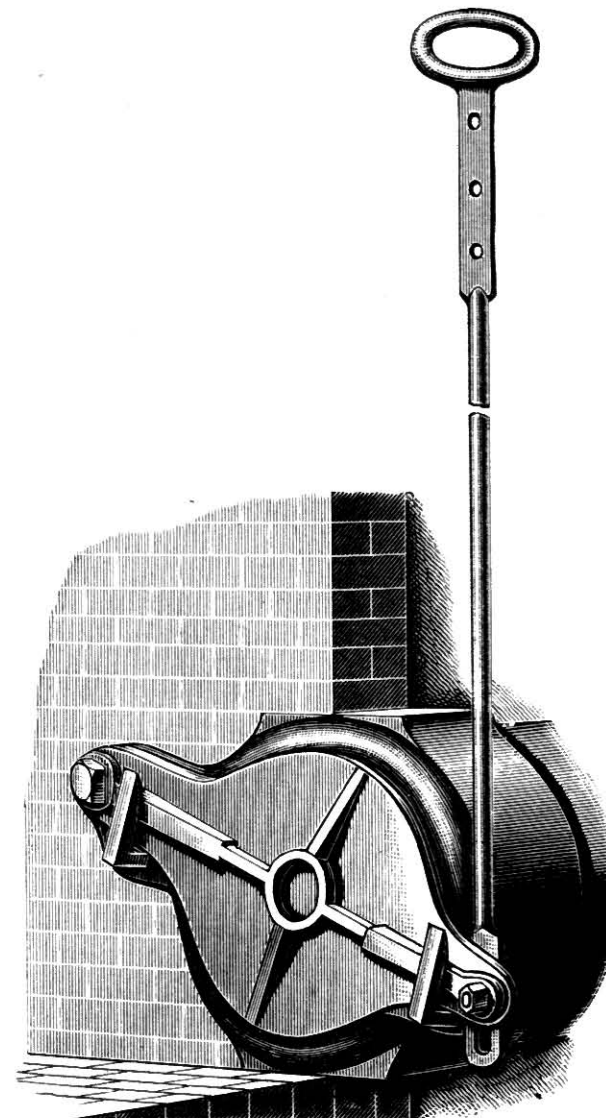
NOTE.—Hand Flushing Valves can be supplied with Spigot-piece cast on back, or with Spigot-piece bolted on and having Puddle Collar, at extra cost.

Hand Flushing Valves.

No. 7.



No. 22.



No. 22—With Double Wedge Snug and with Slot in Lifting Rod for ease in opening.
No. 22 is used in cases where it is essential that Door is kept wedged up to Face, or when pressure is tending to force Door from the Face.

PRICES.

With cast iron Faces.

No. 7. No. 22.

	No. 7.	No. 22.	each.
3"
4"
5"
6"
7"
8"
9"
10"
12"
14"
15"
16"
18"
21"
24"

With gun metal Faces and Hinge Pin.

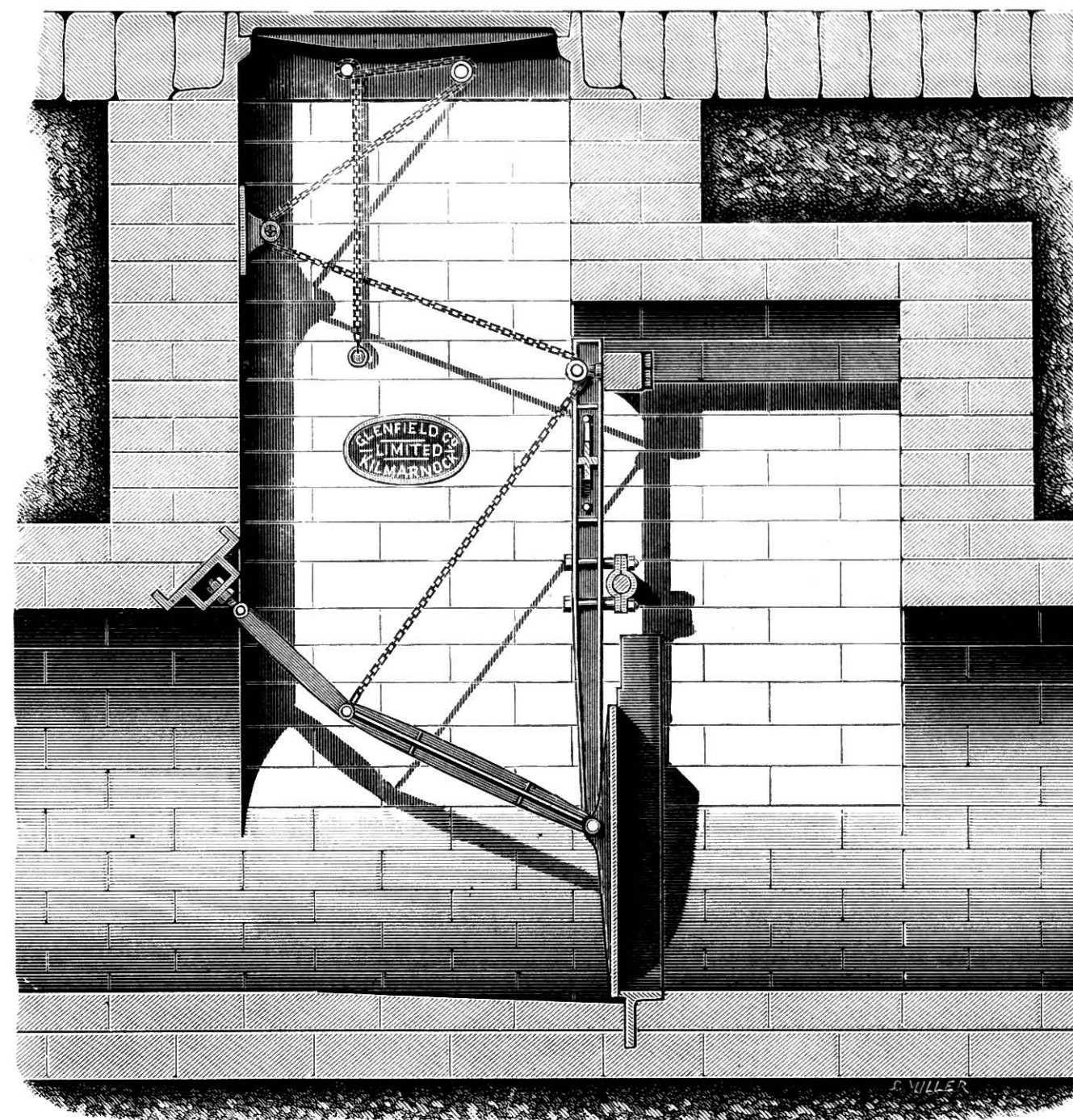
No. 7. No. 22.

	No. 7.	No. 22.	each.
3"
4"
5"
6"
7"
8"
9"
10"
12"
14"
15"
16"
18"
21"
24"

NOTE.—Hand Flushing Valves can be supplied with Spigot-piece cast on back, or with Spigot-piece bolted on and having Puddle Collar, at extra cost.

Flushing Valves.

No. 164.



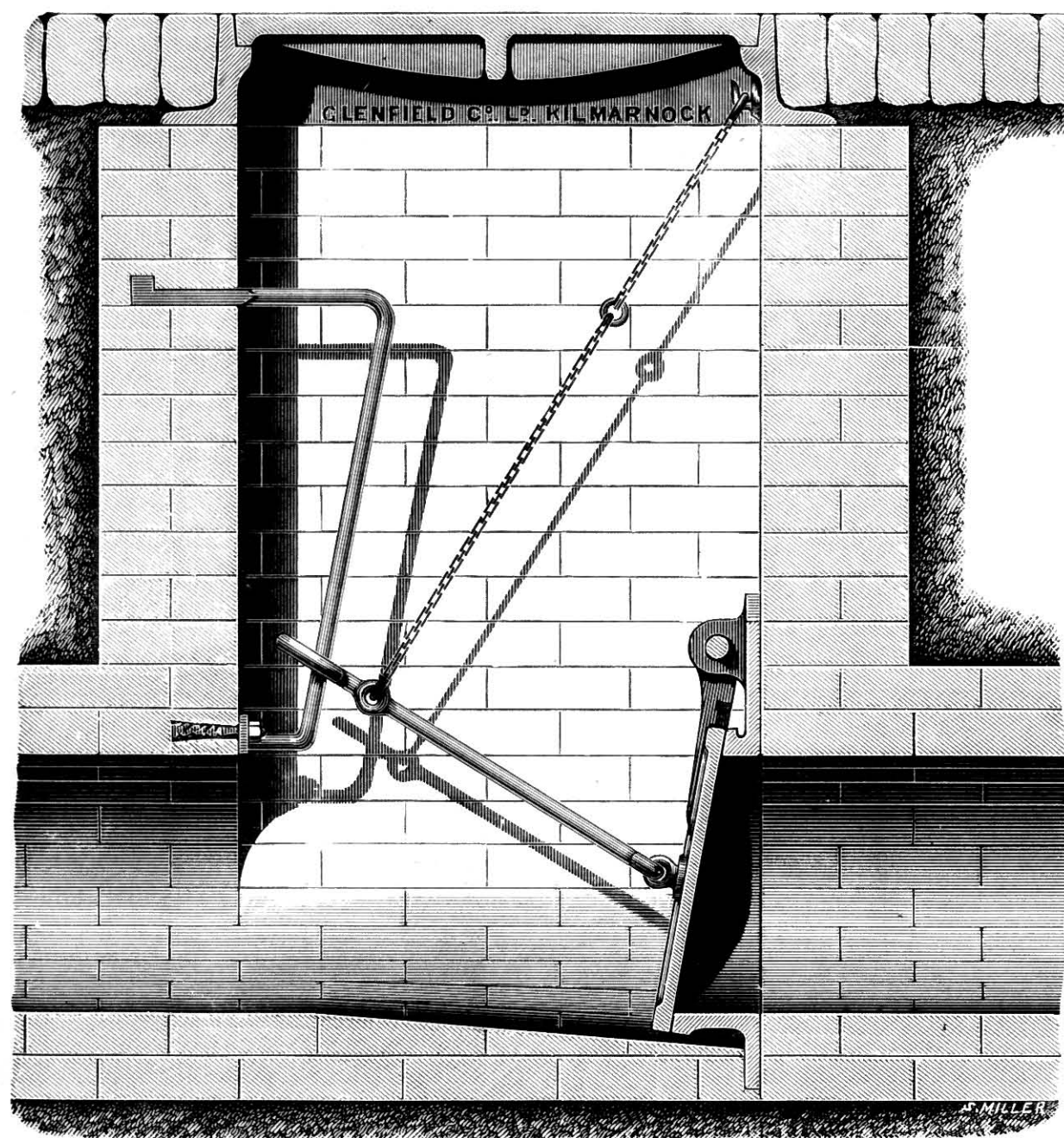
No. 164—Balanced Flushing Valve for Sewers.

24" dia., 3' x 2', 3' 3" x 2' 2", 3' 6" x 2' 4", 3' 9" x 2' 6", 5' 6" x 3' 8".

Prices on application.

Flushing Valves.

No. 166.



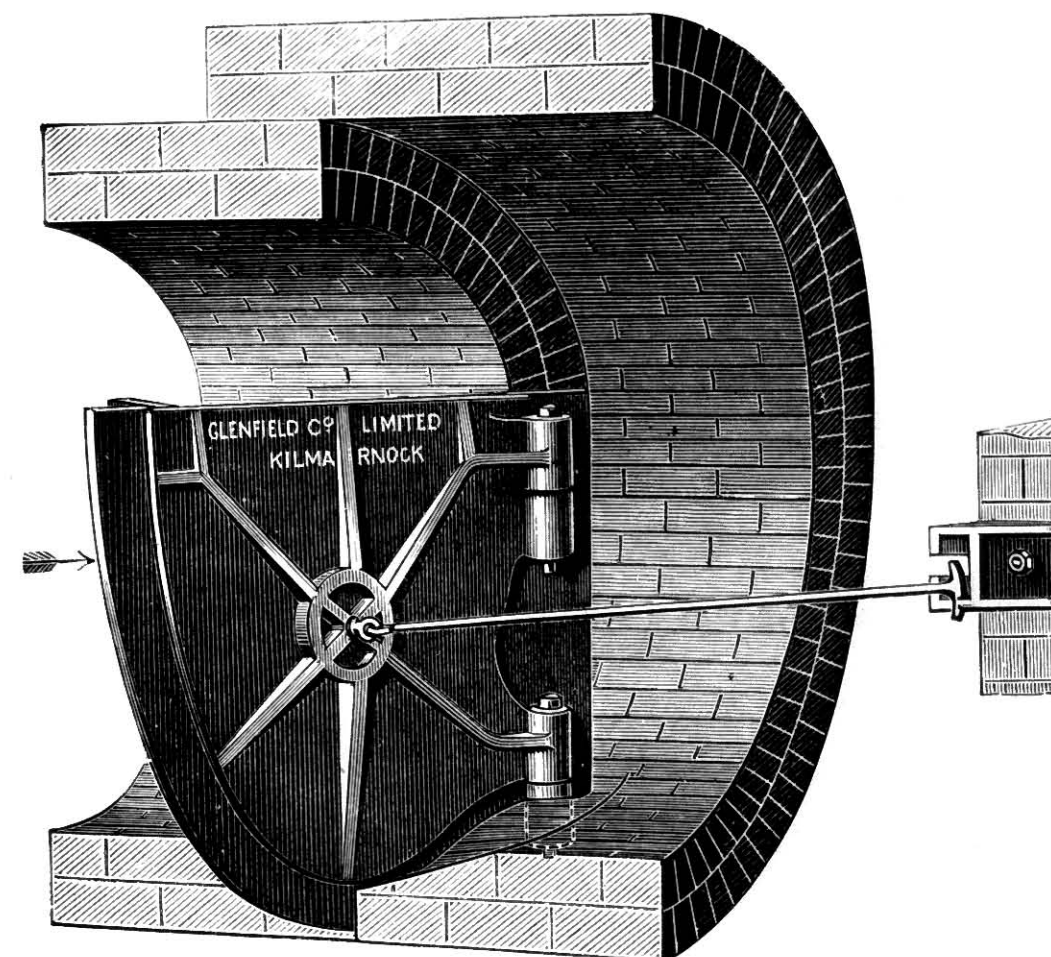
PRICES.

CHAMBER COVER NOT INCLUDED IN PRICE.

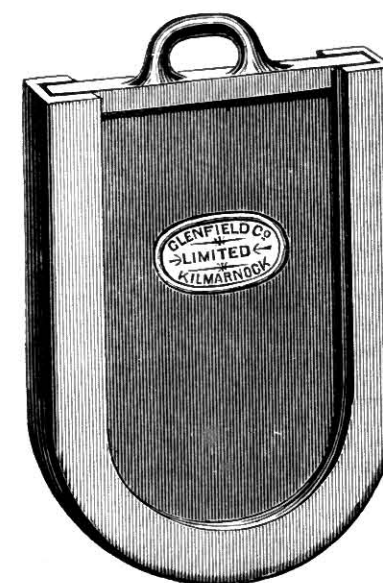
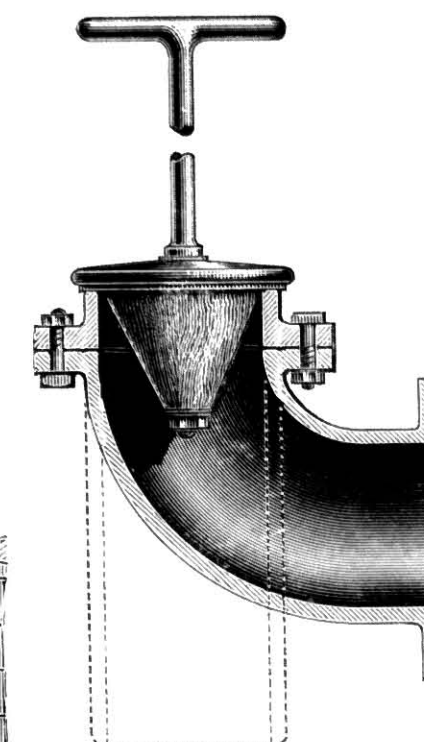
No. 166—Flushing Valve for Circular Sewers.

12"	18"	20"	24"	30"	dia.
					each.

Flushing Valves.

Flushing Gate.
No. 14.

No. 4.

Sludge Valve.
Nos. 26 and 26a.

Prices.

No. 26.—Sludge Valve with
Double Flanged Bend.

3" 4" 6" 8"

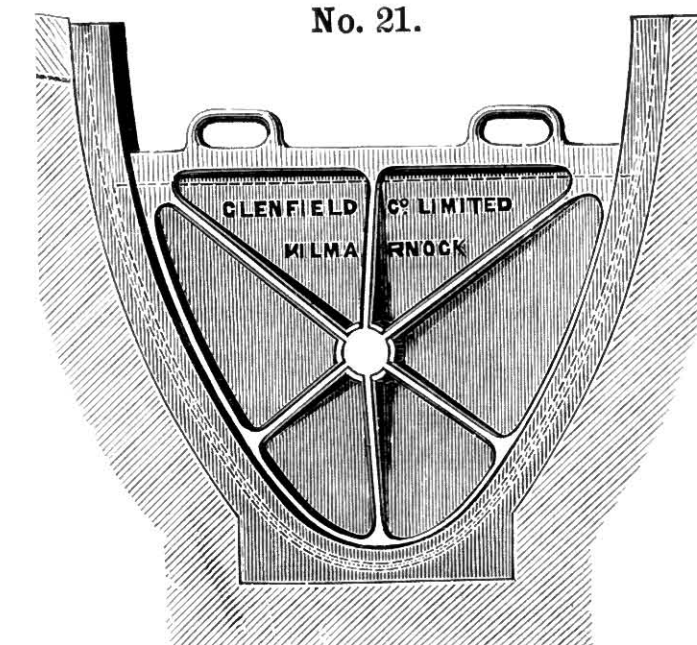
each.

No. 26a.—Sludge Valve with
Flanged and Spigot-piece, as
shown by dotted lines,

3" 4" 6" 8"

each.

No. 21.



PRICES.

No. 4—Hand Flushing Sluice, all cast iron.

Size of Door.		Price each.	Size of Door.		Price each.	Size of Door.		Price each.
Height.	Breadth.		Height.	Breadth.		Height.	Breadth.	
15"	10"	..	19 1/2"	13"	..	26"	18"	..
18"	12"	..	24"	16"	..	30"	20"	..

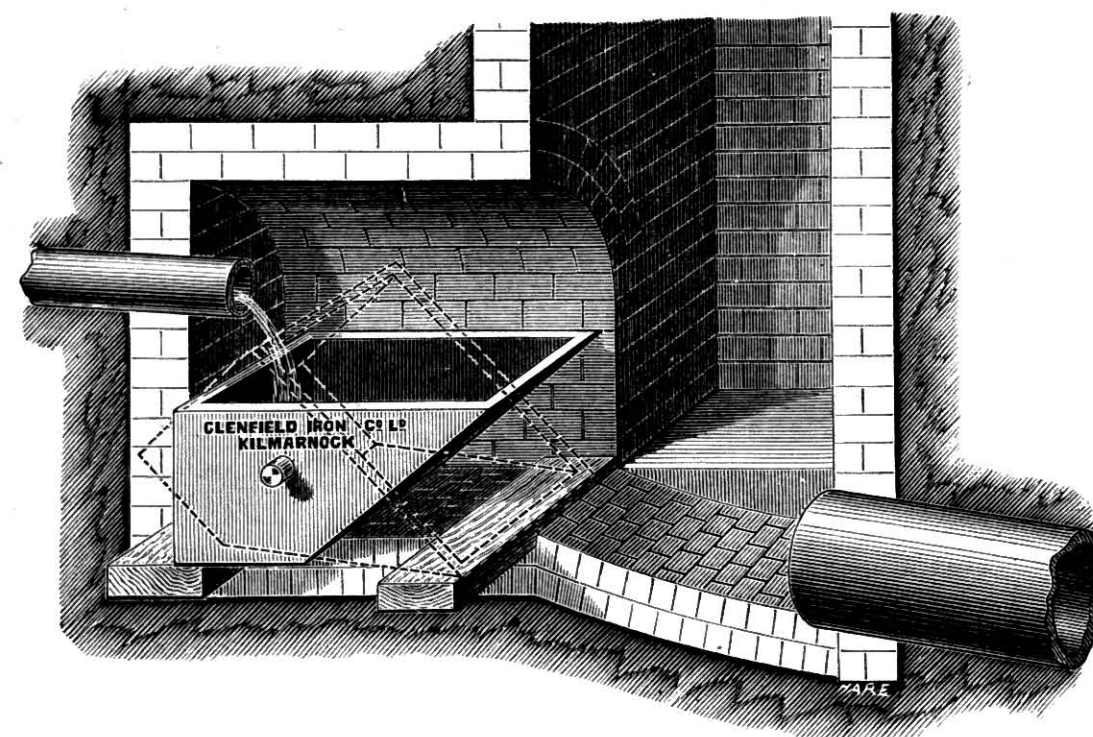
No. 14—Flushing Gate.

No. 21—Hand Flushing Stop, all cast iron.

Prices on application.

Tilting Flushing Box.

No. 27.

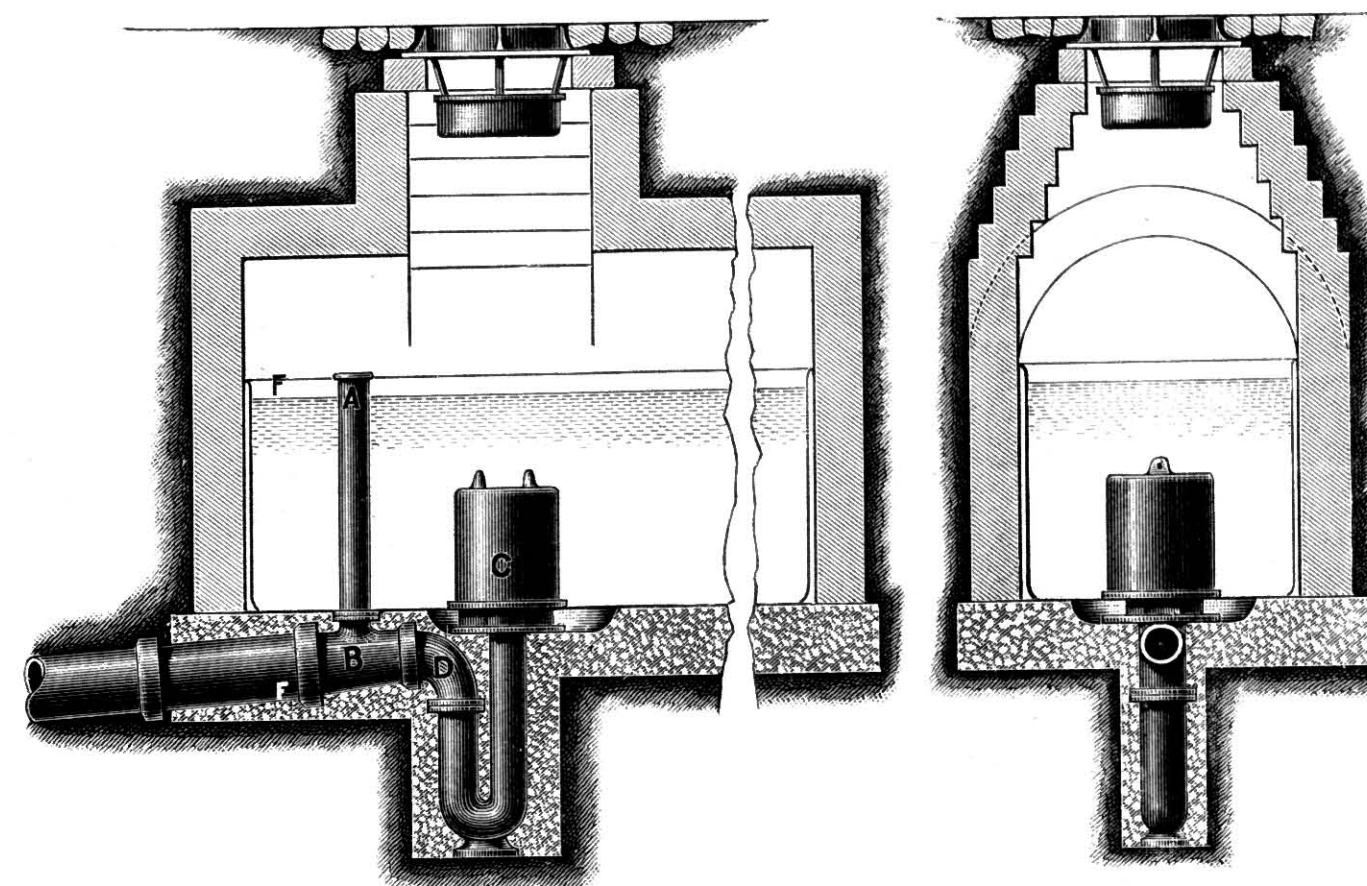


PRICES.

Contents. Gallons.	INSIDE SIZES.		Depth.	PRICES.	
	Length.	Breadth.		Cast Iron.	Wrought Iron, Galvanized.
5	22"	10"	11"	each.	each
10	26"	13"	13"	"	"
50	44"	22"	22"	"	"
100	56"	28"	28"	"	"
200	70"	35"	35"	"	"

Patent Automatic Flushing Syphon.

No. 296.



PRICES.

No.	Dia. of Syphon Outlet.	Depth of water drawn in— stock sizes.	Sizes usually recommended for flushing.	Syphon C D. Cast Iron. Painted.	Extra per foot depth of water in tank beyond stock sizes.	Taper Pipe B and Socket Vent A, extra if required.	Ventilated Manhole Cover 20" clear opening and black Dirt Box.
0	3"	3' 0"	4"				
1	4"	3' 0"	6"				
2	5"	3' 0"	6" to 9"				
3	6"	3' 0"	9" to 12"				
3a	7"	2' 6"	12" to 18"				
4	8"	2' 6"	18" to 21"				
5	9"	2' 6"	21" to 24"				
6	10"	2' 6"	24" to 30"				

The depths given are stock depths—any depth of water may be discharged.

When ordering, please give measurement from (F) water level in chamber to (F) invert of sewer to be flushed, and state diameter of sewer so that the proper Syphon may be supplied.

If the sewer is freely vented the vent pipe A on taper pipe B is not essential.

Where the gradient is very flat, larger size Syphons than given in above Table should be used.

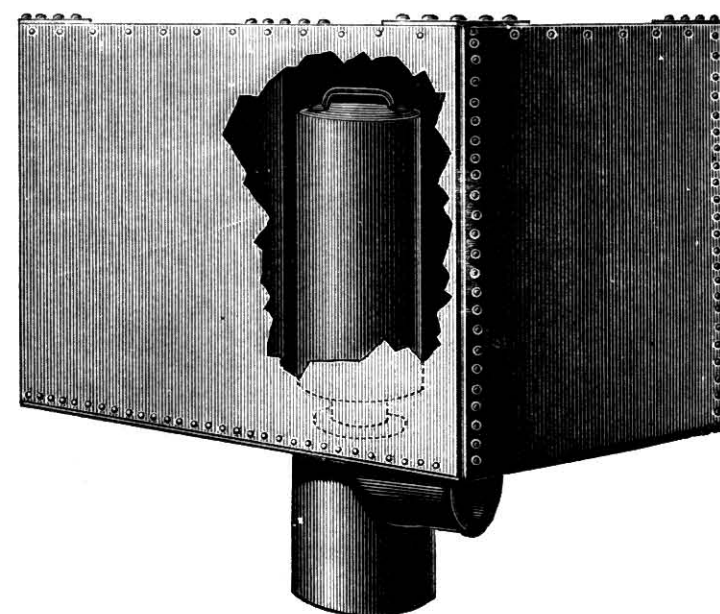
Patent Automatic Syphon Flushing Tanks.

No. 297.



For Waste Water.

No. 298.



For Clean Water.

PRICES.

No 297—Circular Flushing Tank, with Syphon—

Capacity.	In Cast Iron.		In Galvanized Iron.	In Glazed Ware.	Lid and Frame for Tank and Sunk Dish for receiving discharge of sinks. Extra.		each.
	Painted.				Painted.	Galvanized.	
15 gallons,		each.			
20 "		"			"
30 "		"			"
50 "		"			"
100 "		"			"

No. 298—Square Flushing Tank with Syphon Body and Syphon of galvanized wrought iron.

Trapping Box forming connection to fall pipe of cast iron—

Capacity,	10	15	20	25	30	40	50	gallons.
Capacity,	60	70	80	100	120	150	200	gallons.

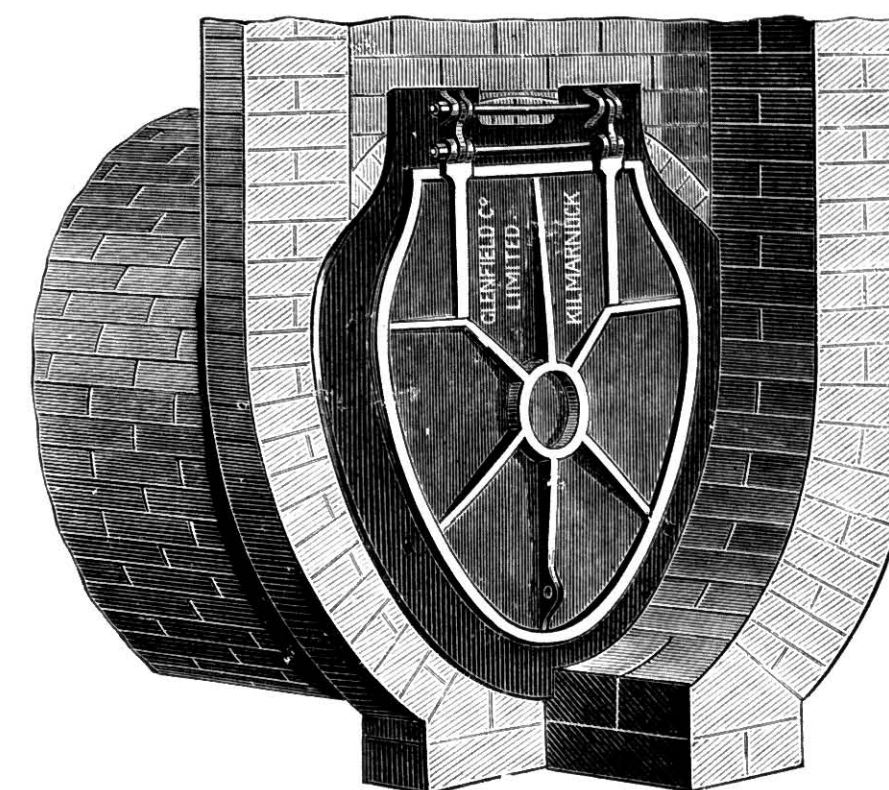
NOTE.—All flushing appliances used with other than clear water require periodical cleansing; if this cannot be secured they must ultimately fail in action. In fixing, there must be free ventilation at the syphon outlet. If the drain does not allow of this, by reason of a trap, etc., in its length, a vent must be provided.

If Flushing Tanks are very shallow, larger size Syphons should be used.

Flap Valves.

EGG-SHAPED FLAP IN CHAMBER, OR ON WALL.

No. 15.



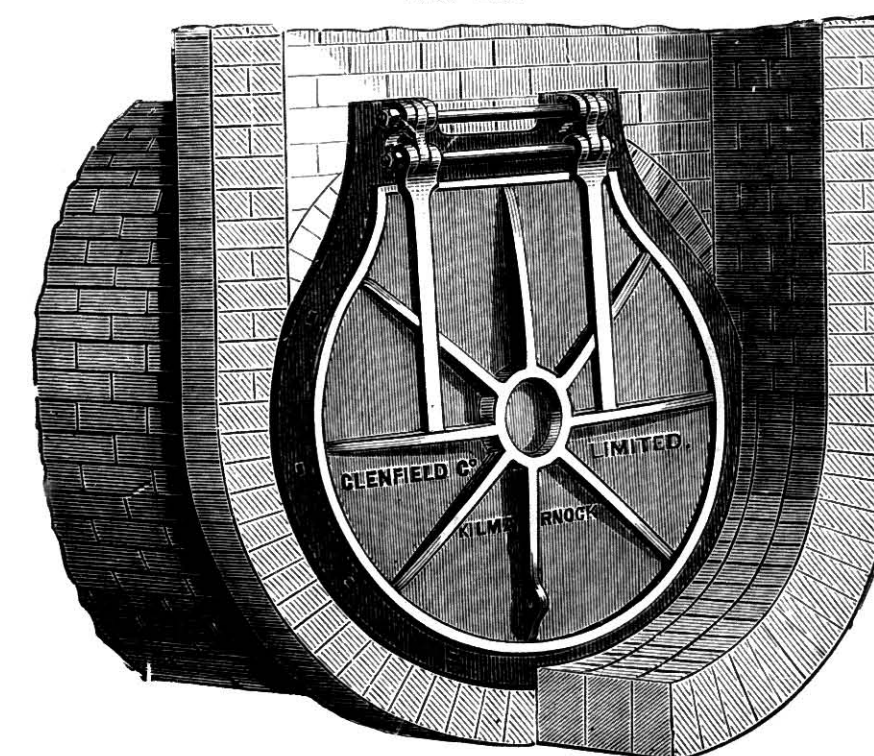
PRICES.

2' 0" x 1' 4" ..	each.	3' 0" x 2' 0" ..	each.	3' 9" x 2' 6" ..	each.	4' 6" x 3' 0" ..	each.
2' 6" x 1' 8" ..	..	3' 6" x 2' 4" ..	..	4' 0" x 2' 8" ..	..	5' 0" x 3' 4" ..	..

Also Larger Sizes.

CIRCULAR FLAP IN CHAMBER, OR ON WALL.

No. 18.



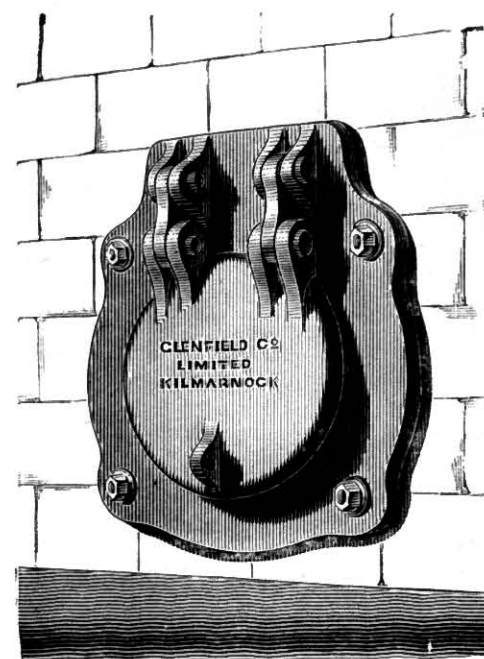
PRICES.

24"	27"	30"	36"	40"	42"	48"	54" dia.
							each.

Also Larger Sizes.

Flap Valves.

Heavy. No. 31.



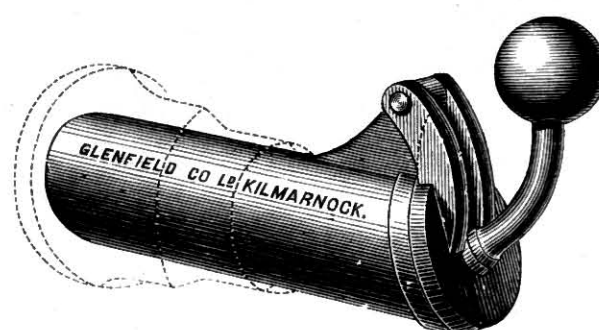
Light



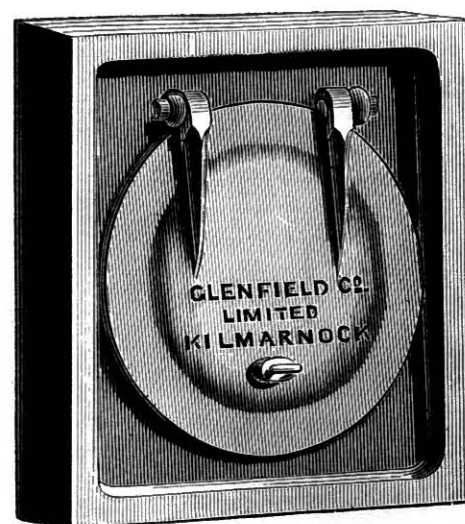
No. 32.



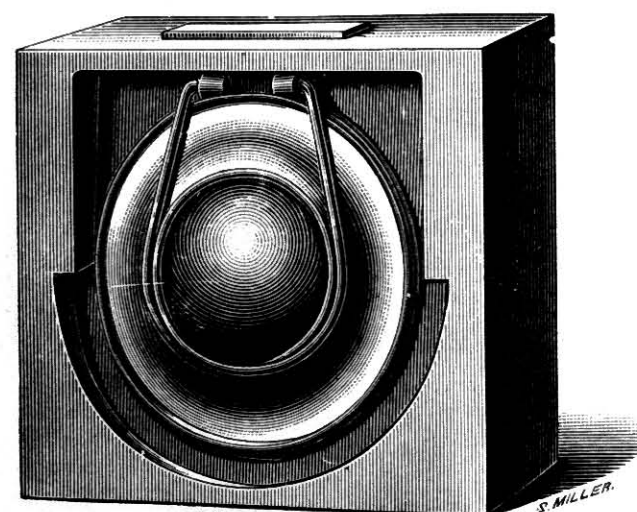
No. 40.



No. 32 A.



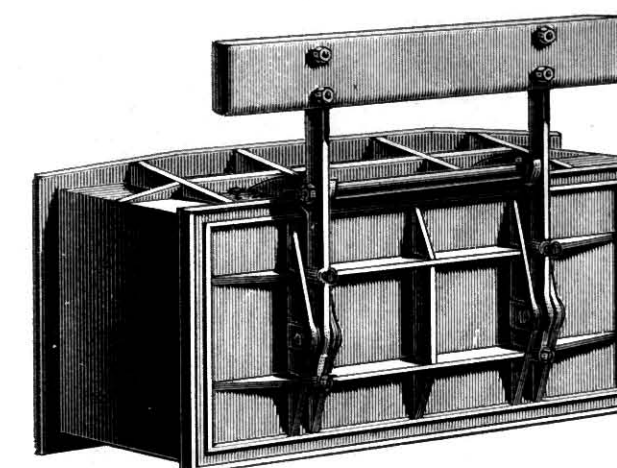
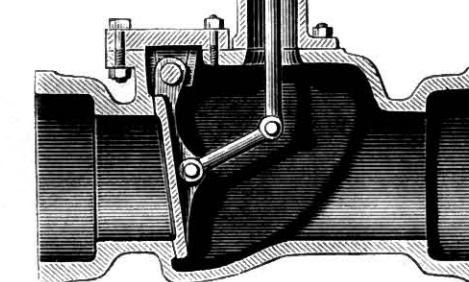
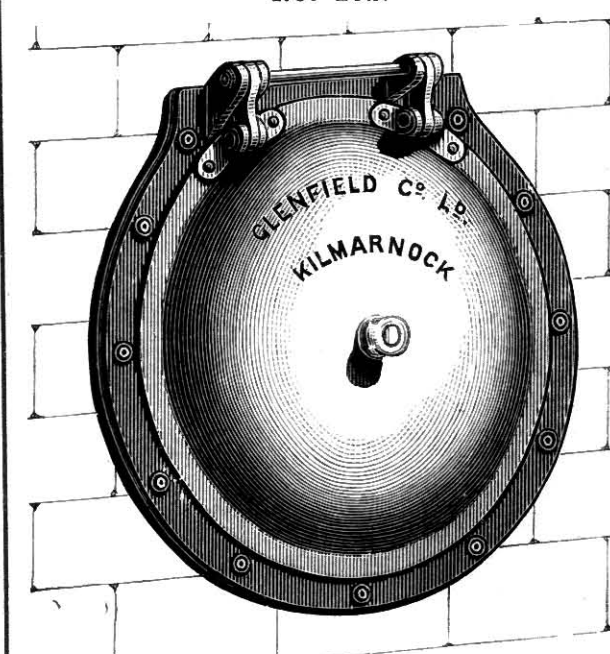
No. 33.



PRICES.

	4"	5"	6"	8"	9"	10"	12"	15"	18"	21"
No. 31—Double-hinged Wall Flap, Heavy, Faces machined, and with gun metal Hinge Pins, .. each										
No. 31—Single-hinged Wall Flap, Light, .. "										
No. 31—Single-hinged Wall Flap, Light, Galvanized, .. "										
No. 32—Stoneware, with Galvanized Flap, .. "										
No. 32A—Do. (Square Block), do. .. "										
No. 33—Do. (do.), Phosphor Bronze Flap, .. "										
No. 40—Weighted Flap Valve, .. "										

Flap Valves.

Balanced Valve,
With Adjustable Weight.
No. 38.Hand Flushing Valve,
With Tube, Handle, and Surface Box.
No. 170.Balanced Valve,
No. 39.Wall Flap Valve,
With Sensitive Galvanized Hollow Door.
No. 182.

PRICES.

No. 38—Balanced Valve—Hinges bushed with brass—
6" 8" 9" 12" 15" 18" dia.
each.

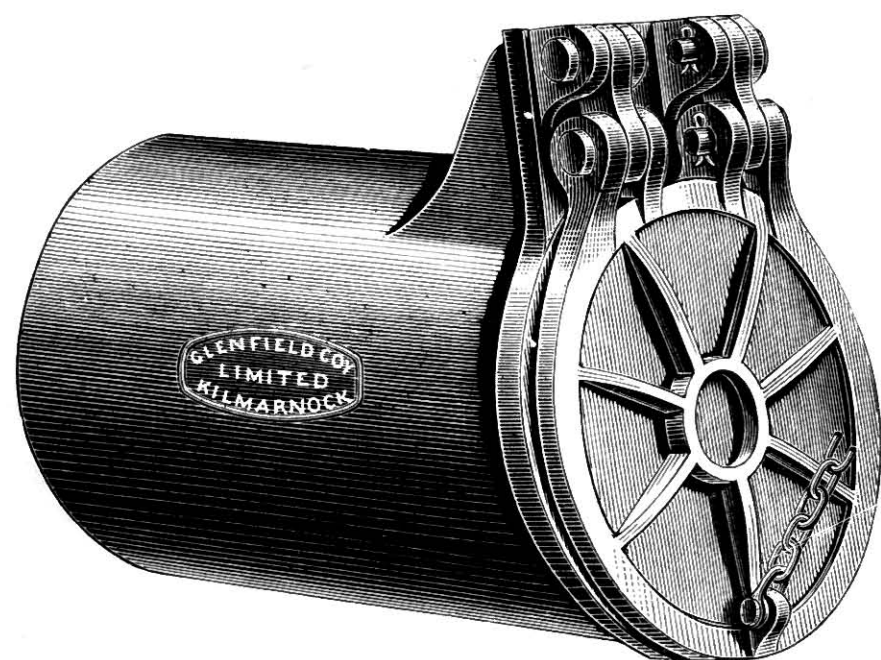
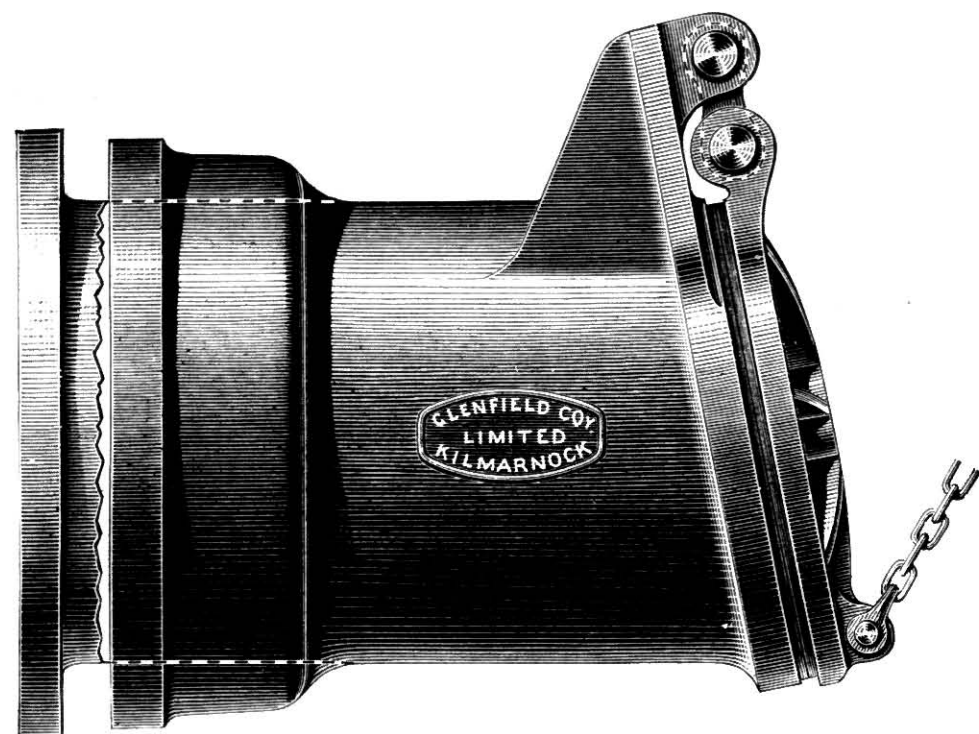
No. 39—Balanced Valve.

No. 170—Hand Flushing Valve—
6" 9" 12" 18" dia.
each.

No. 182—Wall Flap Valve.

Flap on End of Pipe, with Double Hinge.

No. 35.



PRICES.

With Cast Iron Faces.

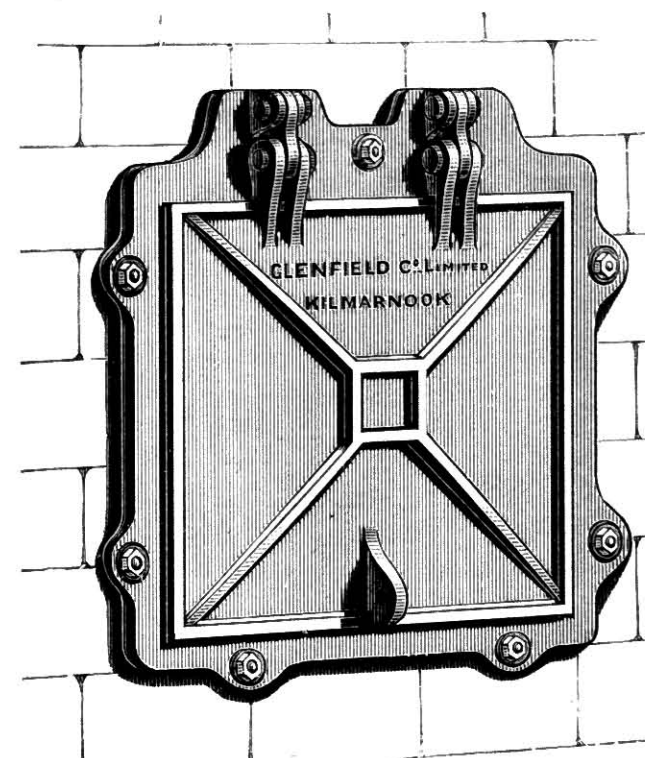
3",	..	..	each.	8",	..	..	each.	15",	..	..	each.
4",	..	..	"	9",	..	..	"	16",	..	..	"
5",	..	..	"	10",	..	..	"	18",	..	..	"
6",	..	..	"	12",	..	..	"	20",	..	..	"
7",	..	..	"	14",	..	..	"	24",	..	..	"

Chains and Hooks extra.

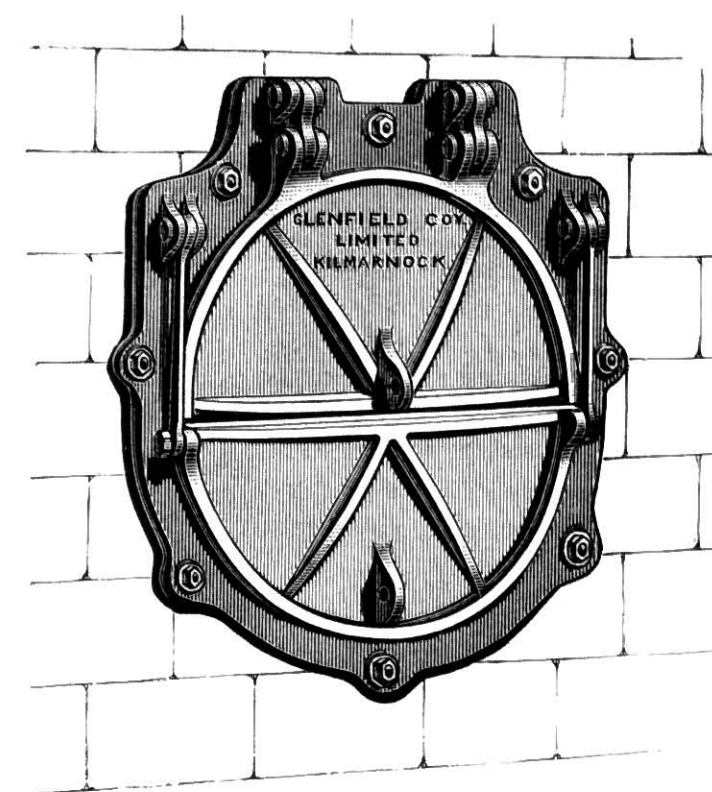
When required these Valves can be made with gun metal Faces and gun metal Hinge Bolts.

Flap Valves.

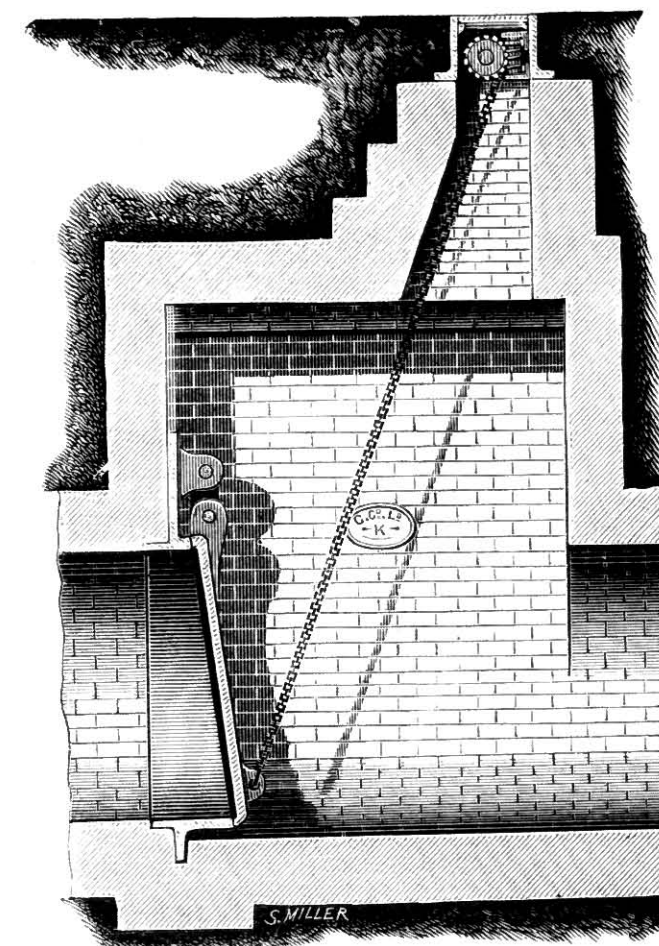
No. 184.



No. 186.



No. 188.



No. 184—Square Flap on Wall.

No. 186—Circular Double-doored Flap on Wall.

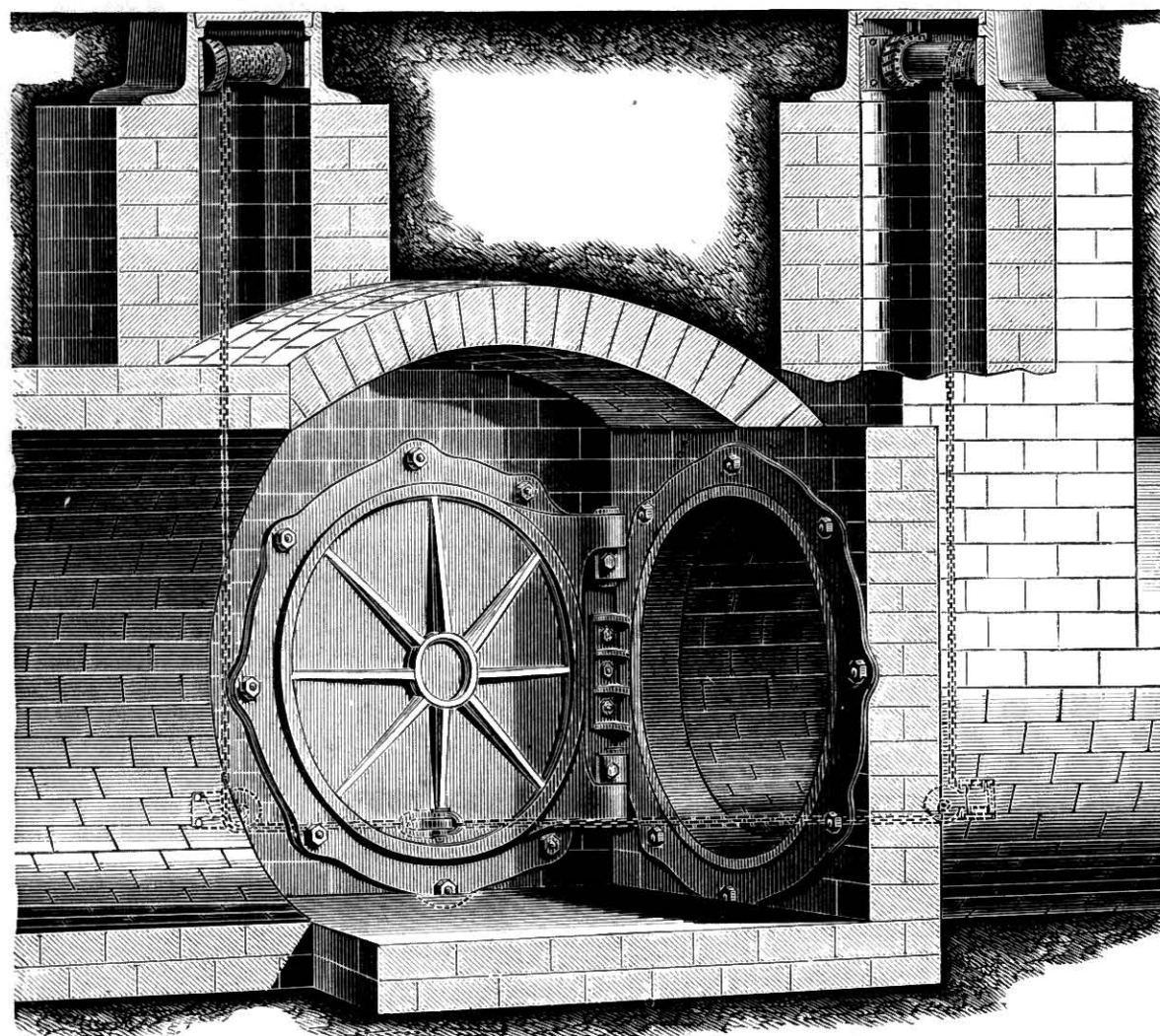
No. 188—Flap in Chamber, with Chain Barrel—Worm geared—in Surface Box.

Prices on application.

Two-way Flap Valves.

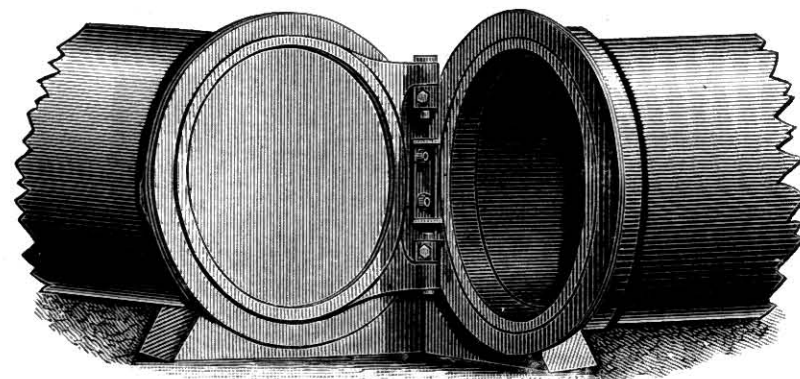
For Large Sewers.

No. 192.



For Drain Pipes.

No. 194.



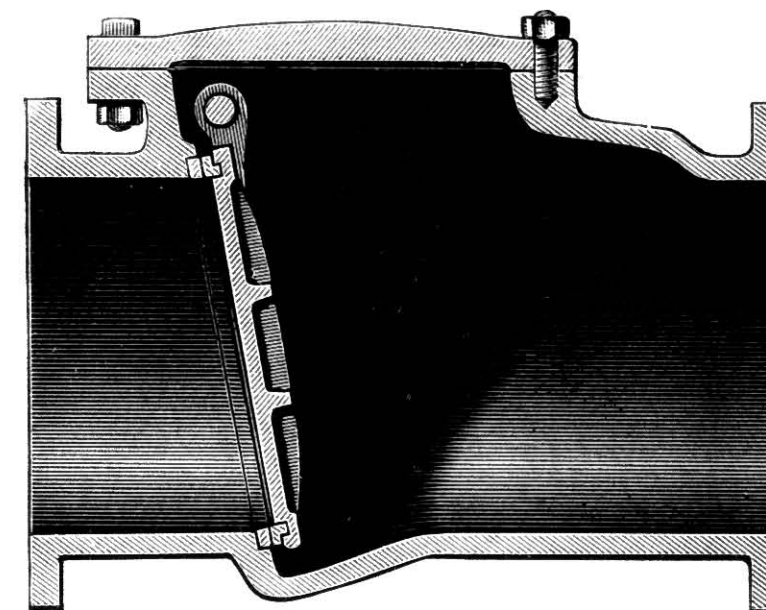
No. 192—Two-way Flap for Large Sewers, worked by Chain Barrels—Worm geared—in Surface Box.

No. 194—Two-way Flap for Drain Pipe.

Prices on application.

Retaining or Reflux Valves.

Nos. 43 and 44.



PRICES.

No. 43—Faces and bushes of gun metal, faces scraped to a true bearing.

1½"	2"	2½"	3"	4"	5"	6"	7"	8"	9"	10"	12"	14"	15"	16"	18"	20"	22"	24"	
<hr/>																			each.

For low pressures a Light type of Valve can be supplied up to and including 12" diar.

No. 44—Faces of cast iron, with leather face on malleable flap.

1½"	2"	2½"	3"	4"	5"	6"	7"	8"	9"	10"	12"	14"	15"	16"	18"	20"	22"	24"	
																			each.

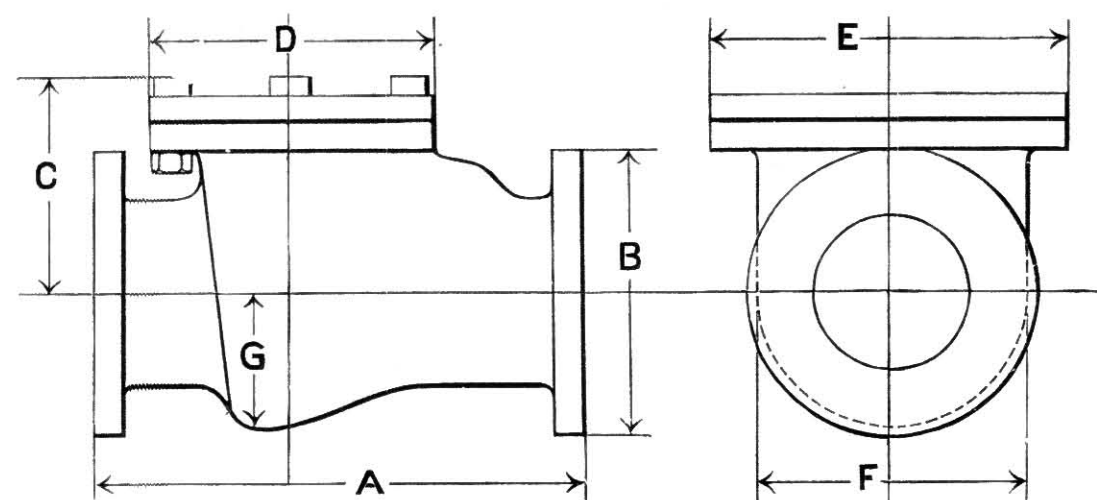
For low pressures a Light type of Valve can be supplied up to and including 12" diar.

Spigot and Socket Ends jointed and bolted on.

1½"	2"	2½"	3"	4"	5"	6"	7"	8"	9"	10"	12"	14"	16"	18"	20"	22"	24"
																	<i>extra.</i>

For Dimensions see next page.

Dimensions of Reflux Valves.



Size.	A Heavy and Light Types.	B Heavy and Light Types.	C	D	E	F	G
2"	9"	6"	4 $\frac{1}{4}$ "	6 $\frac{5}{8}$ "	7 $\frac{1}{8}$ "	4 $\frac{3}{8}$ "	2 $\frac{3}{16}$ "
2 $\frac{1}{2}$ "	9 $\frac{1}{2}$ "	6 $\frac{1}{2}$ "	4 $\frac{1}{2}$ "	6 $\frac{7}{8}$ "	7 $\frac{7}{8}$ "	4 $\frac{7}{8}$ "	2 $\frac{7}{16}$ "
3"	11 $\frac{3}{4}$ "	7 $\frac{1}{4}$ "	5 $\frac{1}{2}$ "	8"	9"	5 $\frac{3}{4}$ "	2 $\frac{7}{8}$ "
4"	14 $\frac{1}{2}$ "	8 $\frac{1}{2}$ "	6 $\frac{3}{4}$ "	9 $\frac{1}{8}$ "	11 $\frac{3}{8}$ "	7 $\frac{5}{8}$ "	3 $\frac{1}{16}$ "
5"	15"	10"	7 $\frac{5}{8}$ "	9 $\frac{1}{8}$ "	11 $\frac{7}{8}$ "	8 $\frac{1}{4}$ "	4 $\frac{1}{8}$ "
6"	16 $\frac{1}{2}$ "	11"	8 $\frac{1}{8}$ "	9 $\frac{5}{8}$ "	13 $\frac{1}{8}$ "	9 $\frac{1}{2}$ "	4 $\frac{3}{4}$ "
7"	18"	12"	8 $\frac{7}{8}$ "	10"	14 $\frac{5}{8}$ "	10 $\frac{3}{4}$ "	5 $\frac{3}{8}$ "
8"	19 $\frac{1}{2}$ "	13 $\frac{1}{4}$ "	10"	11 $\frac{5}{8}$ "	16 $\frac{3}{8}$ "	12"	6"
9"	21"	14 $\frac{1}{2}$ "	11"	11 $\frac{5}{8}$ "	17 $\frac{3}{8}$ "	13 $\frac{1}{8}$ "	6 $\frac{9}{16}$ "
10"	23"	16"	11 $\frac{3}{4}$ "	12 $\frac{1}{8}$ "	19 $\frac{1}{8}$ "	14 $\frac{7}{8}$ "	7 $\frac{7}{16}$ "
12"	27"	18"	13 $\frac{1}{8}$ "	12 $\frac{5}{8}$ "	22"	17 $\frac{1}{2}$ "	8 $\frac{3}{4}$ "
14"	32"	20 $\frac{3}{4}$ "	16 $\frac{1}{4}$ "	14"	26"	21 $\frac{1}{2}$ "	10 $\frac{1}{4}$ "
15"	32"	21 $\frac{3}{4}$ "	16 $\frac{1}{2}$ "	14 $\frac{1}{4}$ "	26"	21 $\frac{1}{4}$ "	10 $\frac{5}{8}$ "
16"	35"	22 $\frac{3}{4}$ "	18"	14 $\frac{1}{2}$ "	27 $\frac{1}{2}$ "	22 $\frac{3}{8}$ "	11 $\frac{1}{4}$ "
18"	42"	25 $\frac{1}{4}$ "	21 $\frac{1}{4}$ "	15"	30"	25 $\frac{3}{4}$ "	12 $\frac{5}{8}$ "
20"	42"	27 $\frac{3}{4}$ "	22"	20"	31 $\frac{3}{4}$ "	26 $\frac{1}{2}$ "	14 $\frac{1}{2}$ "
21"	44"	29"	22"	18"	36"	29"	15"
22"	46"	30"	23"	19"	38"	31 $\frac{1}{4}$ "	15 $\frac{5}{8}$ "
24"	50"	32 $\frac{1}{2}$ "	30"	17 $\frac{1}{4}$ "	38 $\frac{1}{2}$ "	33 $\frac{1}{2}$ "	16 $\frac{1}{2}$ "

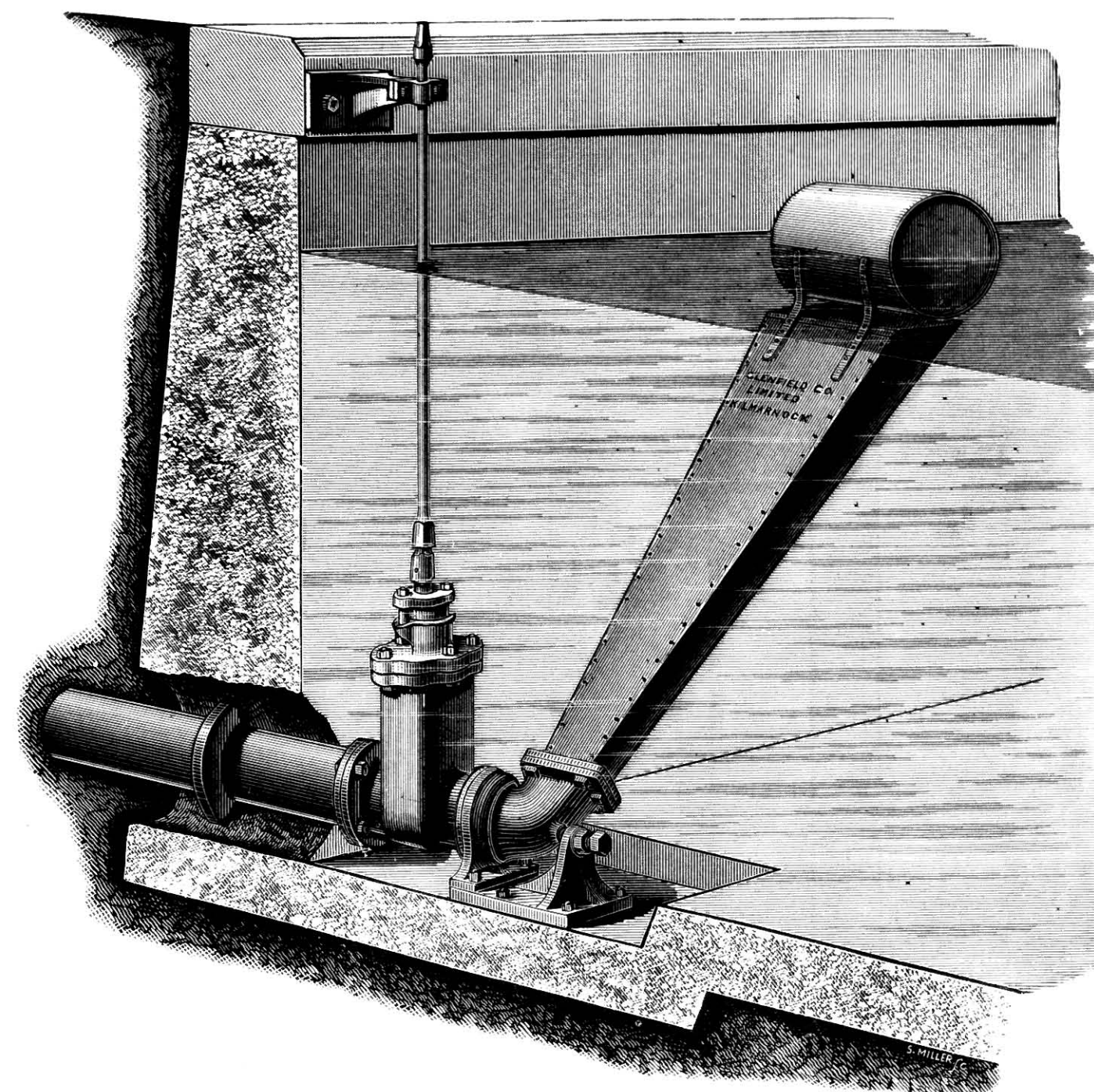
The Flanges of both types are to British Standard, Table I., and are drilled to that standard unless otherwise instructed.

For low pressures a Light type of Valve can be supplied up to and including 12" dia.

The dimensions of the Light type, viz. : C, D, E, F, and G are approximately as given in above Table.

Drainer for drawing off clear liquid from Settling Tanks.

No. 48.

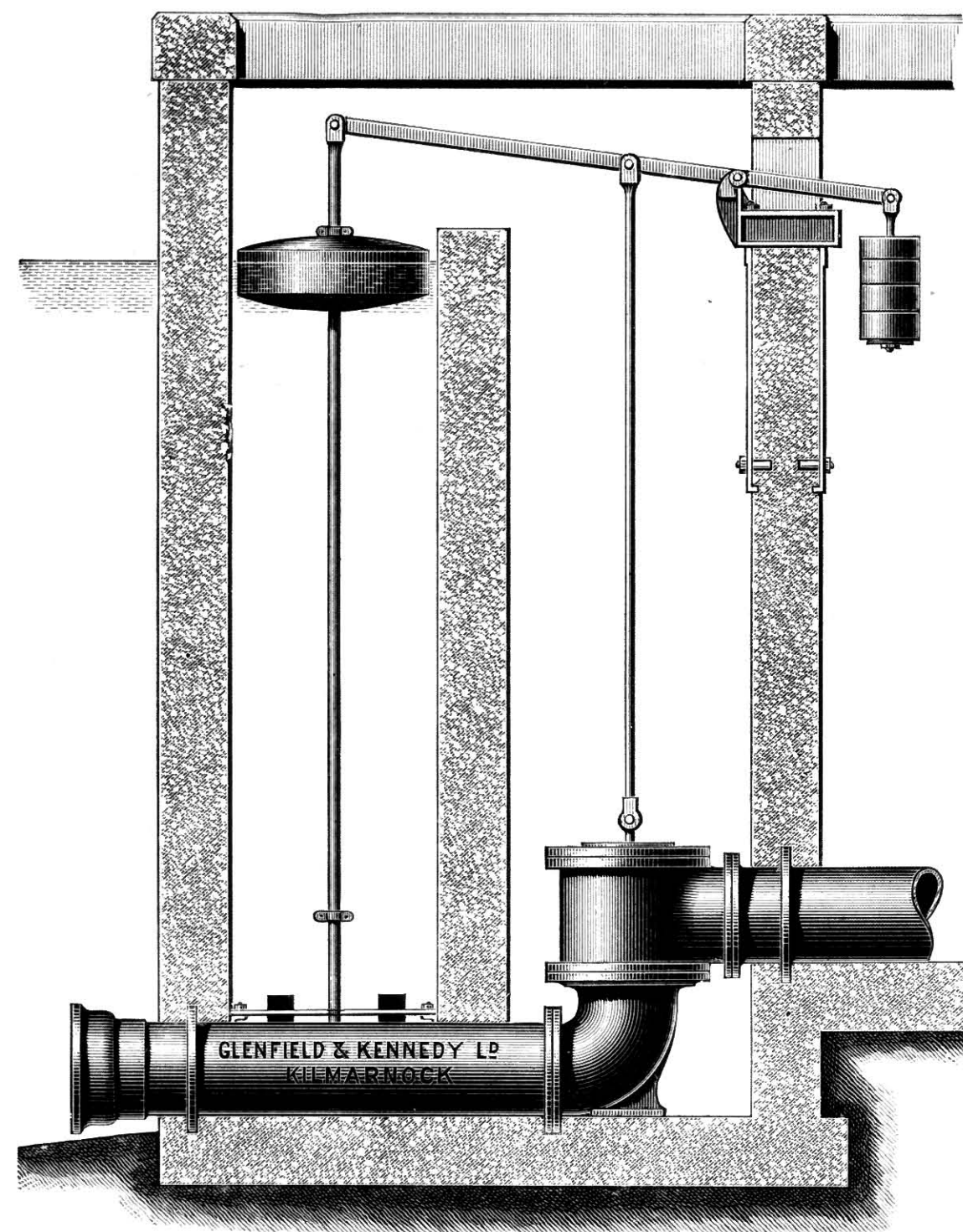


	Dia.	Depth of Water.—PRICES.			
		4 ft.	6 ft.	9 ft.	12 ft.
Sole Bracket, Swivel Bend, galvanized Arm and Float,	3				
	6				
	9				
	12				
Sluice Valve, with Lengthening Spindle, Guide Brackets, Bolts, and Joints (Valve has gun metal Faces and Nut and forged bronze Spindle),	3				
	6				
	9				
	12				
Wall Pipe, with Puddle Collar,	3				
	6				
	9				
	12				
		Length of Pipe.			
		3' 0"			
		3' 3"			
		3' 6"			
		3' 9"			
		Approximate delivery per hour { 3" 6" 9" 12" dia.			
		{ 3300 18,600 51,000 105,000 gallons.			

Also Larger Sizes. Patterns have been made up to 30" dia. If with Double Float Arrangement, at slightly extra cost. If required, a Wire Cloth Strainer is put on Inlet to prevent leaves, etc., from entering the Pipes, at slightly extra cost.

Automatic Tide Valve.

No. 290.



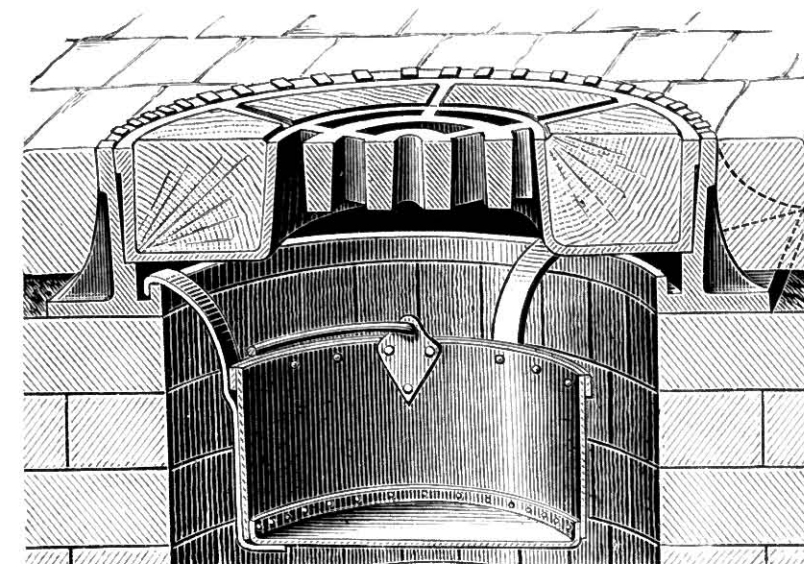
No. 290—Automatic Tide Valve to discharge sewage during ebb tide only.

Particulars and Prices on application.

Manhole Covers.

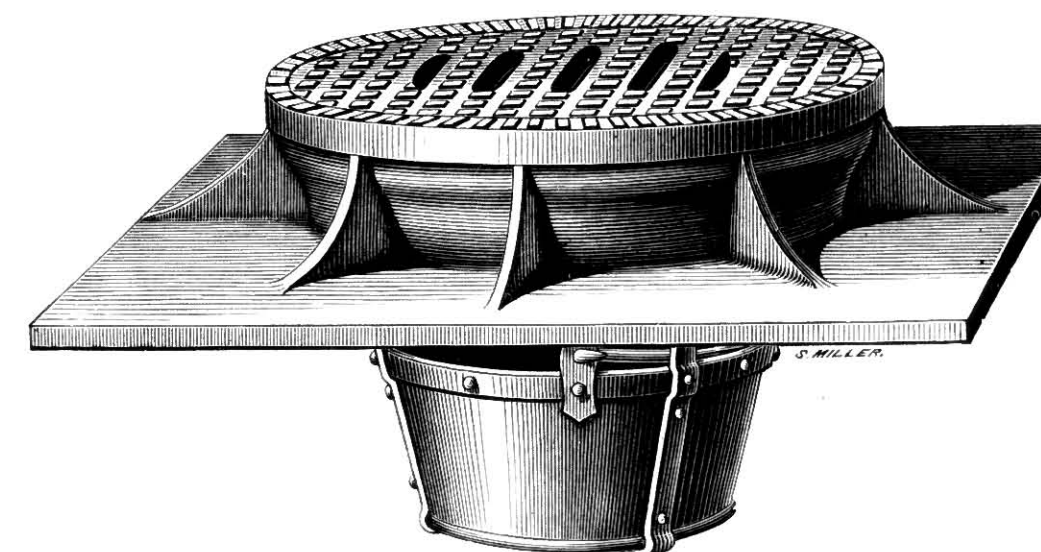
Circular.

No. 58—With Wood Blocks and Square Bottom Flange.



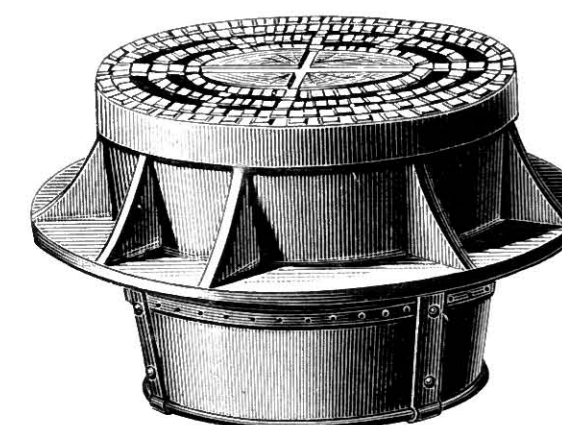
Clear Opening.	Depth.	Price. Each.	Strong Galvanized Wrought Iron Dirt Pan. Price. Extra. Each.
10" dia.	4"		
15" "	6"		
18" "	6"		
20" "	6"		
22" "	6"		
22" "	9"		
24" "	6"		
24" "	9"		

No. 60—With Square Bottom Flange.



Clear Opening.	Depth.	Price. Each.	Strong Galvanized Wrought Iron Dirt Pan. Price. Extra. Each.
18" dia.	6"		
18" "	7"		
18" "	9"		
20" "	6"		
20" "	9"		
21" "	6"		
22" "	6"		
22" "	9"		

No. 206—With Wood Blocks in centre and Circular Bottom Flange.

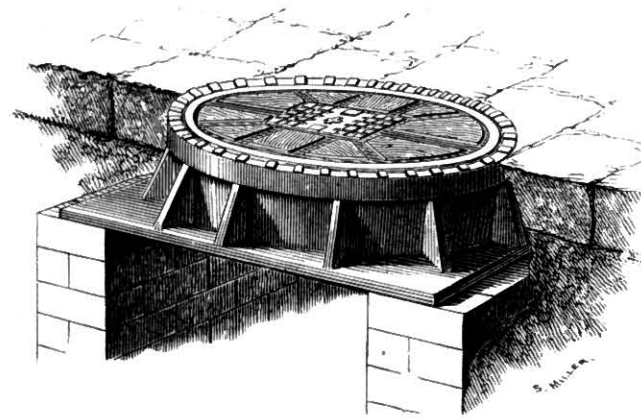


Clear Opening.	Depth.	Price. Each.	Strong Galvanized Wrought Iron Dirt Pan. Price. Extra. Each.
15" dia.	6"		
18" "	6"		
21" "	6"		
24" "	6"		

NOTE.—When not provided with Dirt Pan the Cover has no openings in Lid.

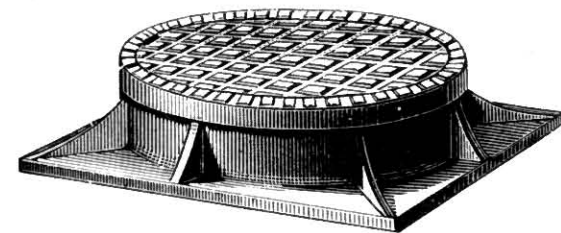
Manhole Covers.

Oval.



No. 208—With Wood Blocks.

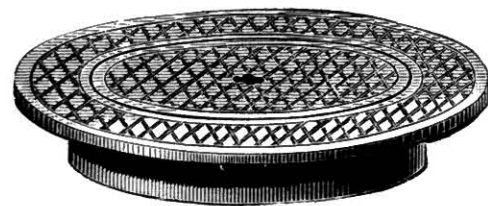
Clear Opening.	Depth.	Price. Each.	Strong Galvanized Wrought Iron Dirt Pan. Price. Extra. Each.
20" x 15"	6"		
20" x 15"	9"		
22" x 18"	6"		
22" x 18"	9"		



No. 210—Square Flange at bottom.

Clear Opening.	Depth.	Price. Each.
24" x 18"	3"	

Circular.



No. 212—With Flange on top.

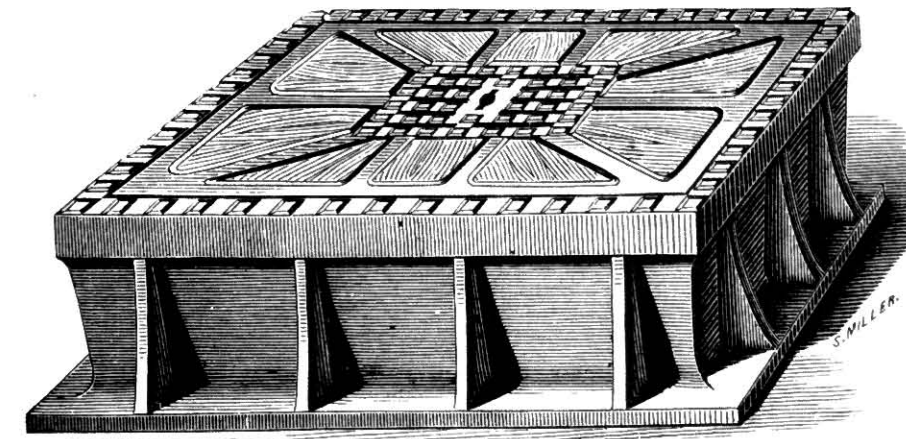
Clear Opening.	Depth.	Price. Each.
7" dia.	4"	
20" "	4"	

NOTE.—When not provided with Dirt Pan the Cover has no openings in Lid.

Manhole Covers.

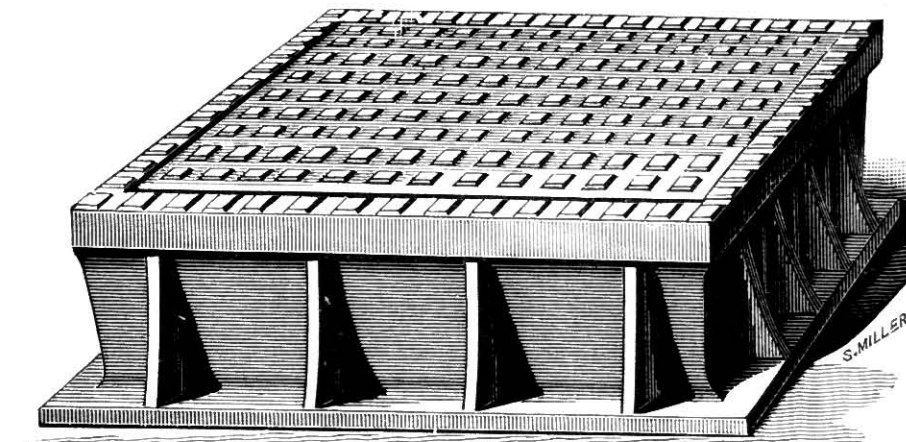
Square.

No. 64—With Wood Blocks.



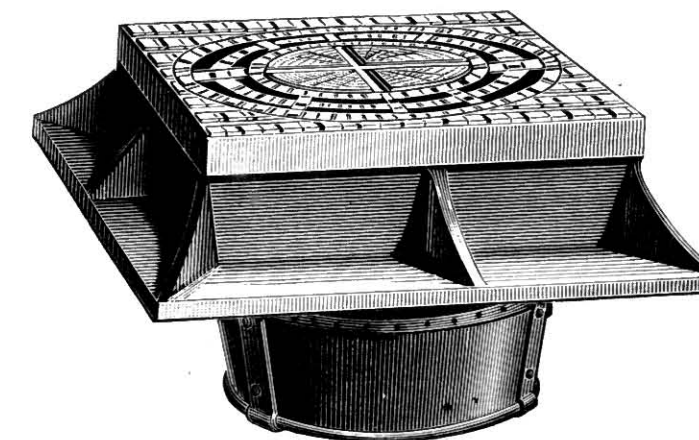
Clear Opening.	Depth.	Price. Each.	Strong Galvanized Wrought Iron Dirt Pan. Price. Extra. Each.
18" x 18"	6"		
20" x 20"	6"		
22" x 22"	6"		
22" x 22"	9"		

No. 214—With plain Lid.



Clear Opening.	Depth.	Price. Each.
18" x 18"	6"	
20" x 20"	6"	
22" x 22"	6"	
22" x 22"	9"	

No. 216—With Wood Blocks in centre.

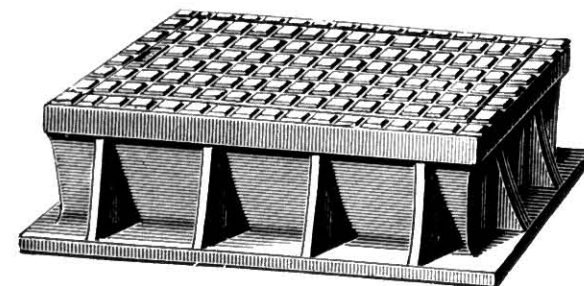


Clear Opening.	Depth.	Price. Each.	Strong Galvanized Wrought Iron Dirt Pan. Price. Extra. Each.
18" square	6"		
21" "	6"		
24" "	9"		

NOTE.—When not provided with Dirt Pan the Cover has no openings in Lid.

Manhole Covers.

Rectangular.

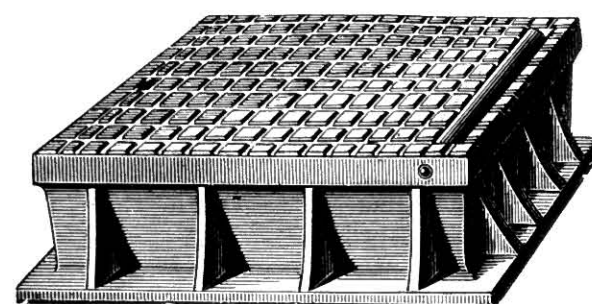


No. 218.

Clear Opening.	Depth.	Price. Each.
19" x 14"	7 1/4"	
22" x 20"	8"	
28" x 21 3/4"	6"	

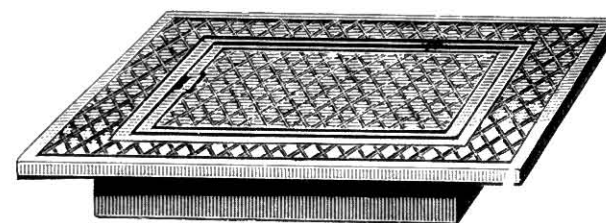
Square.

No. 220—With Hinged Lid.



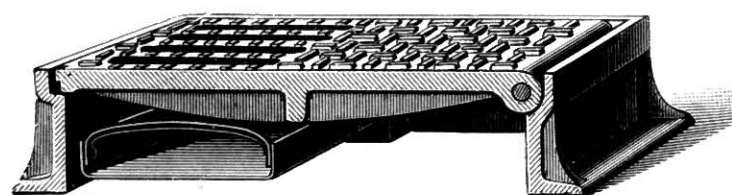
Clear Opening.	Depth.	Price. Each.
15" x 15"	3"	
18" x 18"	6"	
20" x 20"	4"	
20" x 20"	6"	
24" x 24"	6"	
30" x 24"	6"	

No. 222—With Square Flange on Top.



Square Opening	20" x 20"	3 1/4"
	24" x 24"	5"
Circular Opening	24" dia.	1 1/2"
Rectangular Opening	27" x 24"	4"

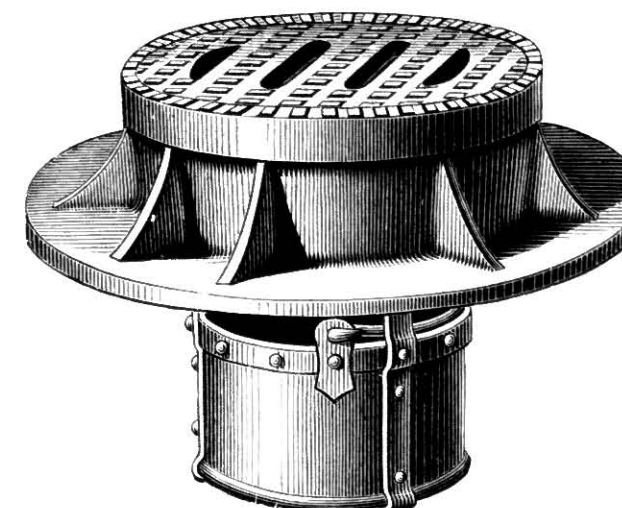
No. 224—Manhole Cover and Ventilator Combined, with Dirt Box.



21" x 18"	6"
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Lamphole Covers.

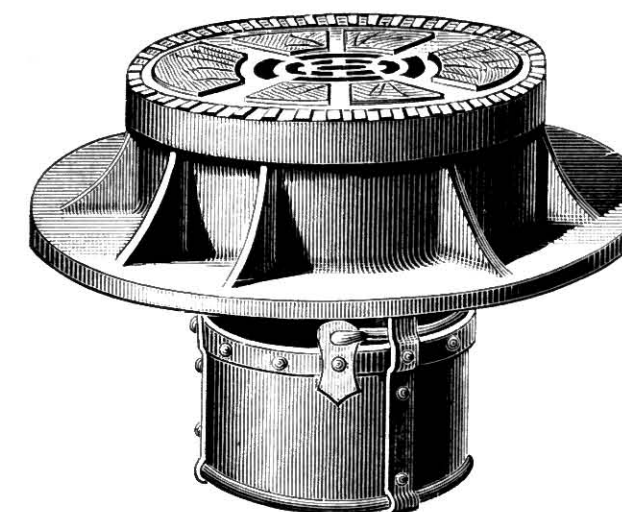
No. 61—Circular.



Clear Opening.	Depth.	Price. Each.
Square flange 8" dia.	5"	
Circular flange, 10" "	6 1/2"	
12" "	6 1/2"	
15" "	6 1/2"	

Galvanized Wrought Iron Dirt Pan. Price. Extra. Each.

No. 226—Circular, with Wood Blocks and Ventilating Openings.

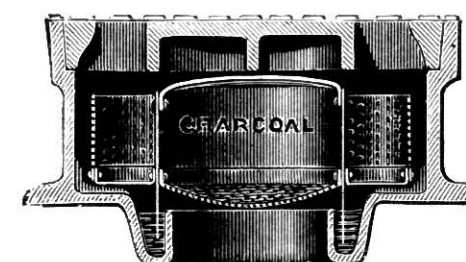


Clear Opening.	Depth.	Price. Each.
10" dia.	6"	
12" "	6"	
15" "	6"	

Galvanized Wrought Iron Dirt Pan. Price. Extra. Each.

With Charcoal Ventilator.

No. 228—Circular.

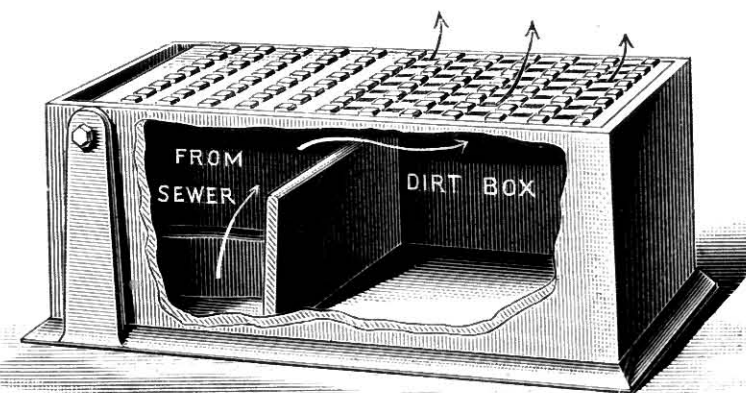


Clear Opening.	Depth.	Price. Each.
5" dia.	5 1/2"	
6" "	7"	
8" "	8 1/2"	

Galvanized Charcoal Basket. Price. Extra. Each.

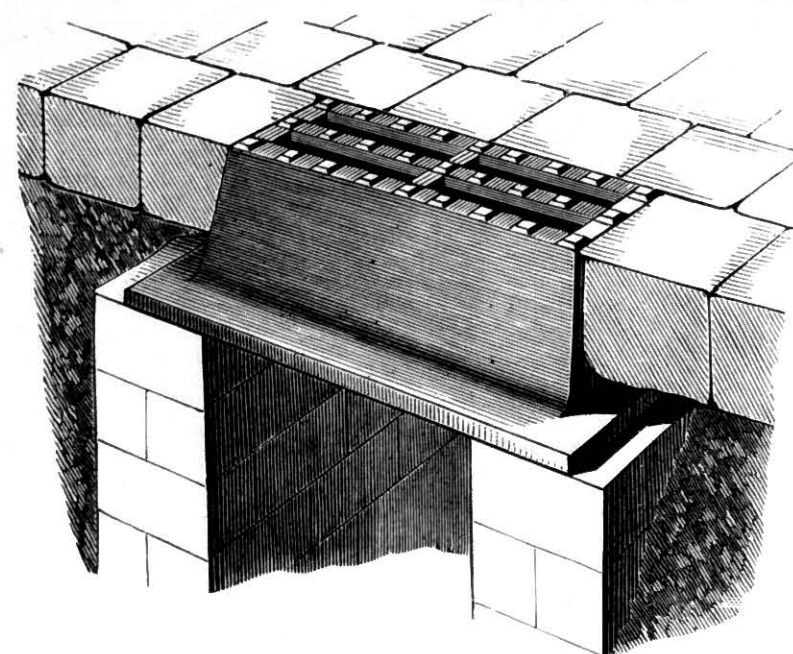
Ventilating Covers for Sewers.

No. 270—Rectangular, with Hinged Lid.



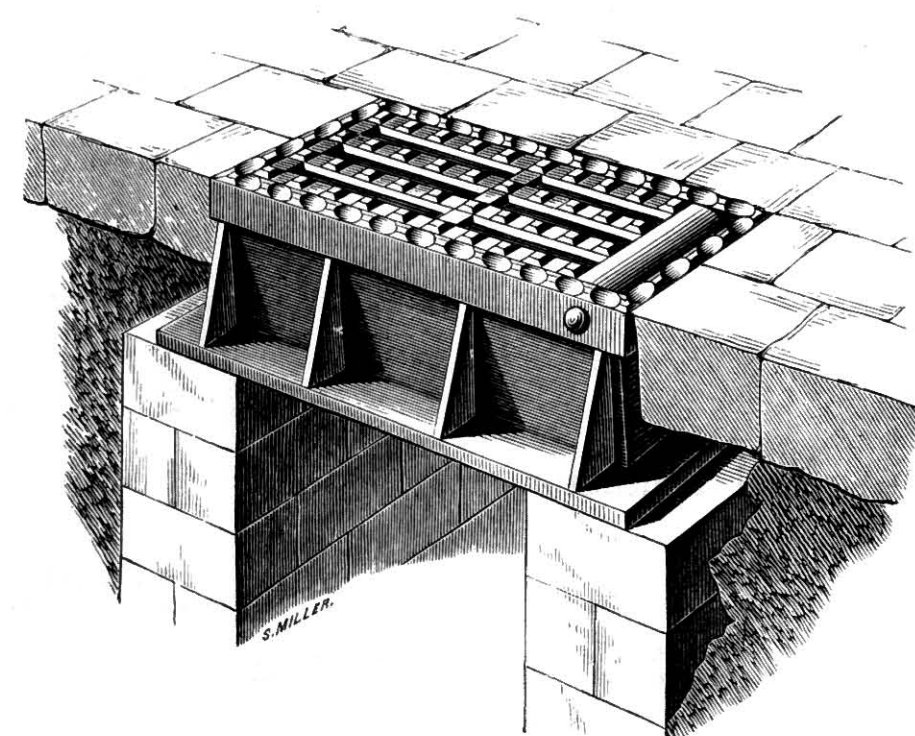
Outside at Top.	Depth.	Size of Ventilating Pipe.	Price. Each.
20 1/4" x 10 3/4"	9 1/2"	6"	
27 1/2" x 14"	11 1/2"	9"	
33" x 16"	16"	12"	

Ventilating Gratings.



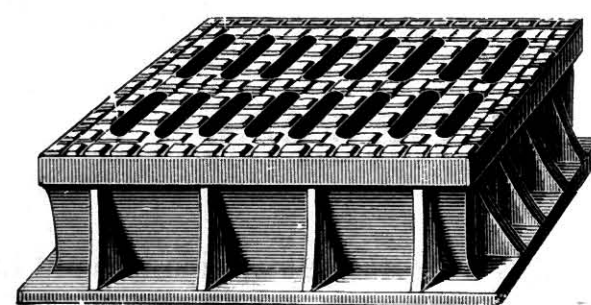
No. 67—With Solid Grating.

Outside at Top.	Depth.	Price. Each.
8" x 4"	6"	
9" x 9"	7"	
12" x 6"	6"	
12" x 12"	8"	
18" x 9"	9"	
24" x 12"	9"	



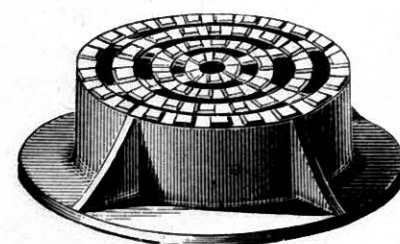
No. 68—With Hinged Lid.

Clear Opening.	Depth.	Price. Each.
9" x 9"	6"	
14" x 14"	9"	
16½" x 15"	9½"	
18¼" x 17¼"	9"	
20" x 18½"	10"	



No. 230—Square, with Chained Lid.

Clear Opening.	Depth.	Price. Each.
9" x 9"	6"	
17" x 17"	9¾"	
18" x 18"	6"	
20" x 20"	6"	
22" x 22"	6"	
23" x 23"	6"	

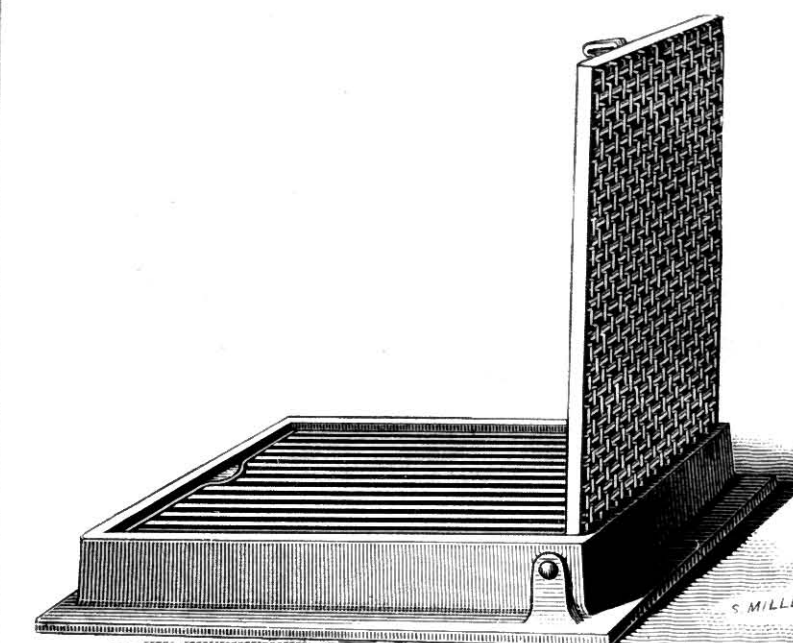


No. 232—Circular, with Solid Grating.

Outside at Top.	Depth.	Price. Each.
8½" dia.	9"	

Side Entrance Covers.

No. 70.



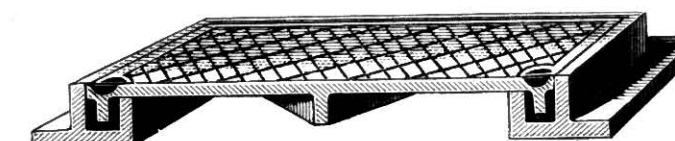
Clear Opening.	Depth.	Price. Each.	Extra for Wrought Iron Safety Grating to come up flush when door opened.	Extra for Locking Lid when closed.	Extra for Locking Lid in upright position automatically.
24" x 24"	6"				
30" x 30"	7"				
36" x 36"	5"				
36" x 36"	7½"				

The two following have Lid in 2 pieces.

60" x 36"	5"
72" x 36"	5"

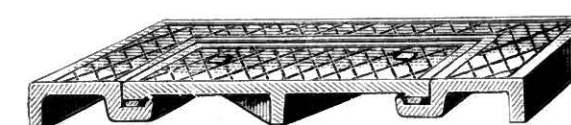
Air-tight Inspection Covers.

No. 236—For Sand Joint.



	Clear Opening.	Outside Size at top.	Depth.	Price. Each.
Heavy, ..	18" x 10½"	23" x 15½"	3"	
Light, {	16" x 14"	20½" x 18½"	2¾"	
	20" x 20"	24" x 24"	2½"	
	24" x 18"	28¾" x 22¾"	2½"	
Heavy, ..	24" x 24"	29½" x 29½"	3¼"	
Light, ..	36" x 24"	39" x 27"	2"	

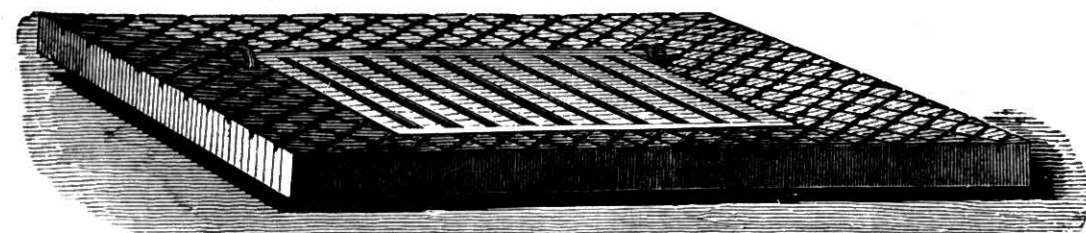
No. 238—Rubber Joint, Cover secured by Brass Screws.



Clear Opening.	Outside Size at Top.	Price. Each.
11" x 7"	18" x 14"	
12" x 12"	20" x 20"	
16" x 16"	24" x 24"	
20" x 20"	28" x 28"	

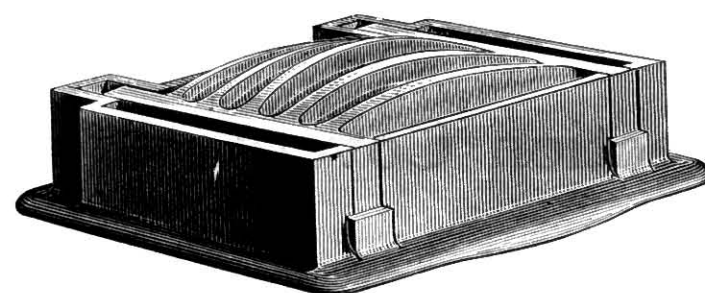
Cesspool and Gulley Gratings.

No. 74—Grating and Frame.



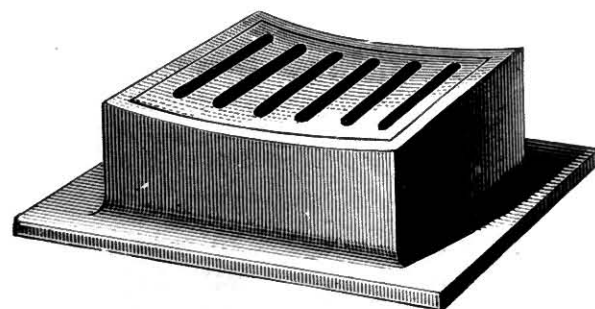
Over all.	Grate.	Price. Each.
18" x 17½"	8" x 7½"	
27" x 27"	14" x 14"	

No. 83—Gulley Grating, Hinged.



Size Inside at Top.	Depth.	Price. Each.
8" x 8"	6"	
12" x 12"	6"	
18" x 12"	6"	
15" x 15"	6"	
18" x 15"	6"	
20" x 16"	6"	

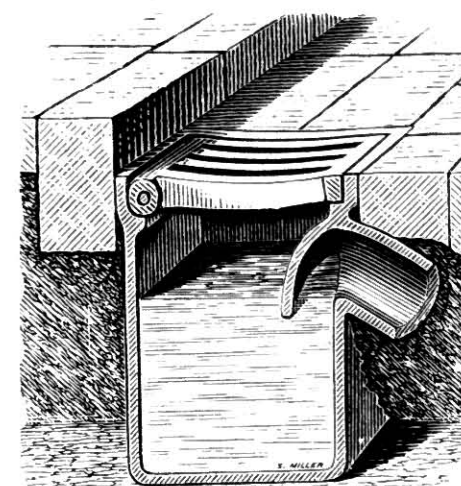
No. 242—Gulley Grating, with Loose Grating.



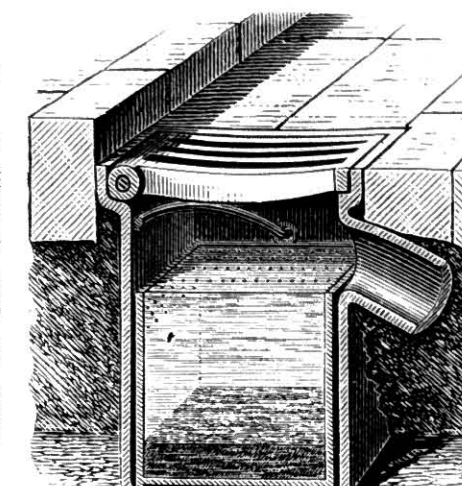
Size Inside at Top.	Depth.	Price. Each.
12" x 10½"	8½"	
16" x 10"	7½"	
15" x 14"	6"	
18" x 15"	6"	
20" x 16"	6"	

Gulley Grates.

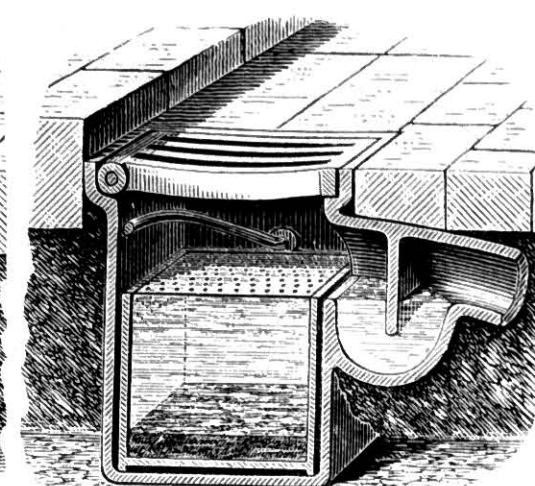
No. 91.



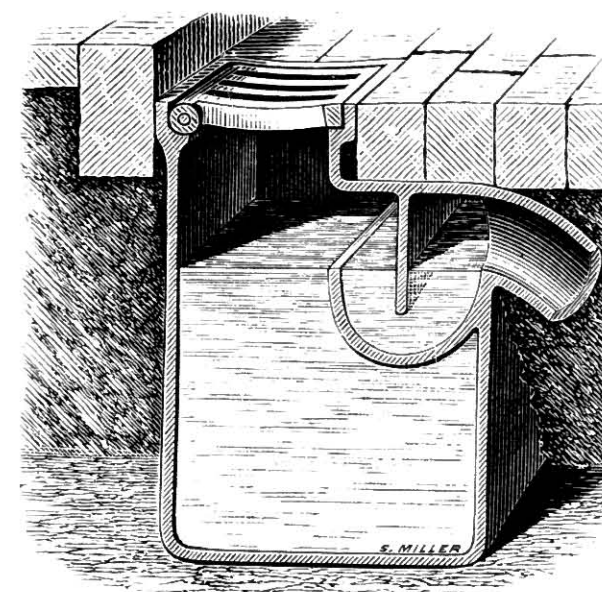
No. 92.



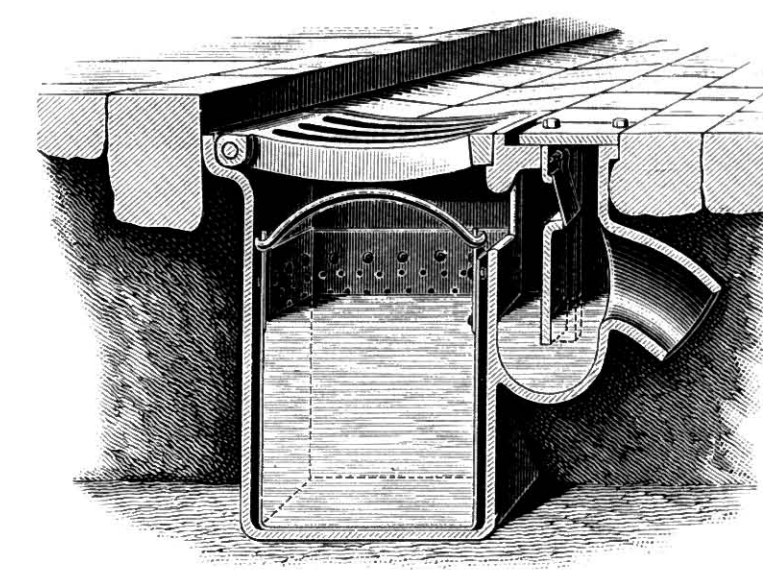
No. 93.



No. 94.



No. 95.

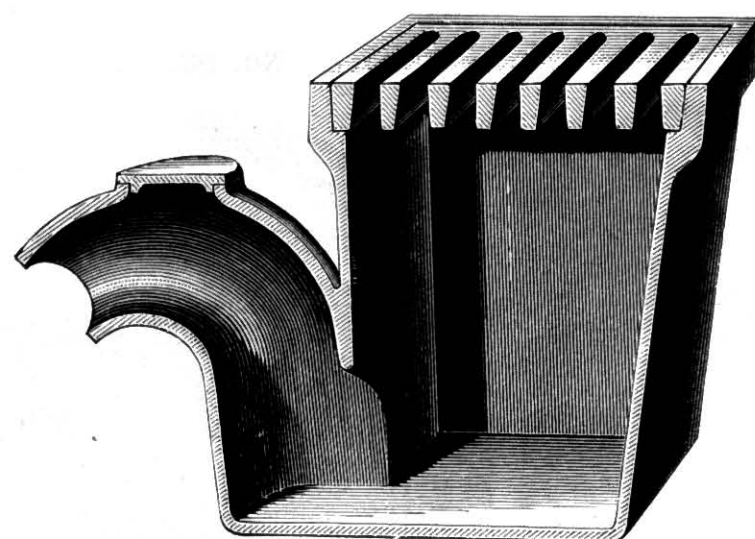


PRICES.

SIZES OUTSIDE AT TOP.

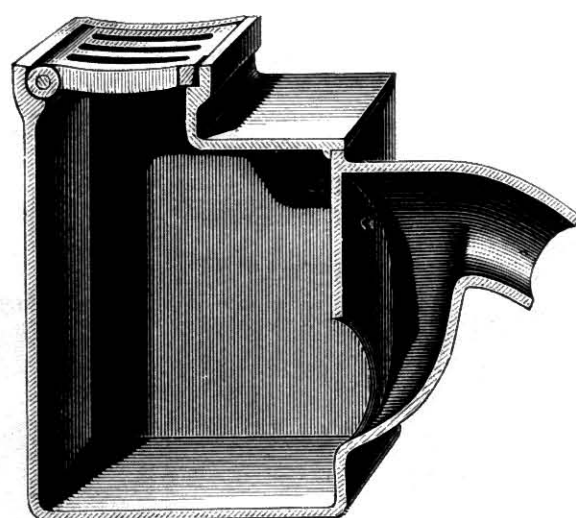
	Depth.	Depth.	Depth.	Depth.	Depth.	Depth.	Wrought Iron Galvanized Dirt Box Extra.
	8" x 6" x 14"	10" x 8" x 12"	14" x 12" x 14"	16" x 15" x 20"	18" x 12" x 14"	18" x 13" x 24"	
No. 91—							each.
No. 92—							each.
No. 93—							"
No. 94—				(18" deep),			"
No. 95—Gulley Trap, with light aluminium flap to admit fresh air into sewer, and to prevent sewer gases escaping from sewer, and including wrought iron galvanized Dirt Box,							
	Size Outside at Top.		Depth.				each.
	16" x 15"		20"				

Gulley Grates.



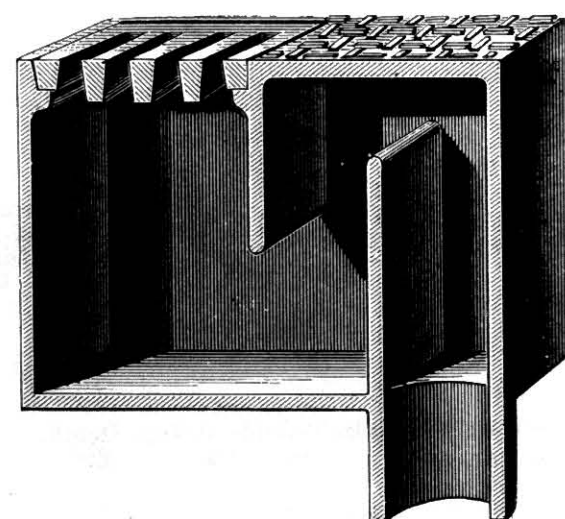
No. 246.
Trapped Gulley Grate.

Size Outside at Top.	Depth.	Price. Each.
$20\frac{3}{4}" \times 15\frac{3}{4}"$	$\times 20\frac{1}{2}"$	



No. 248.
Trapped Gulley Grate.

Size Outside at Top.	Depth.	Price. Each.
21½" × 13¼"	25"	

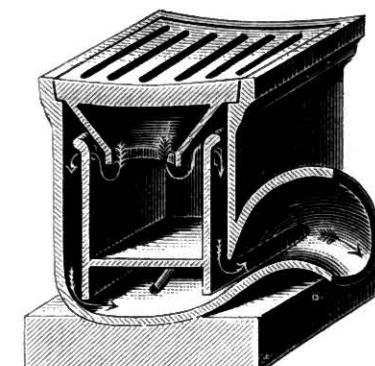


No. 250.
Lowe's Gulley Grate.
Trapped.

Size Outside at Top.	Depth.	Price. Each.
14" × 8" × 10"		
17" × 9" × 12"		
30" × 18" × 16"		

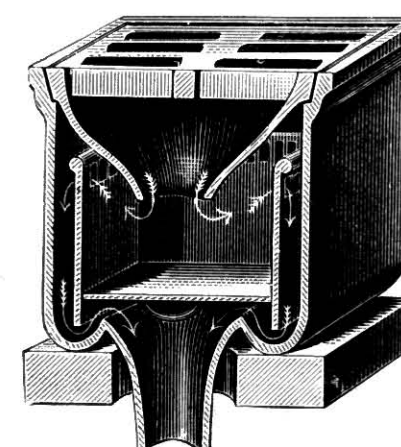
Gulley Grates.

No. 252—Double Trapped Gulley, with side outlet



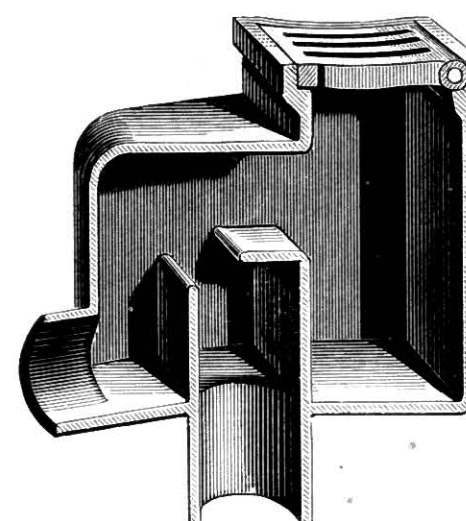
Size Outside at Top.	Price. Each.
20" x 15"	
18" x 12"	
16" x 12"	
14" x 10"	
12" x 8"	
10" x 7"	

No. 254—Double Trapped Gulley, with bottom outlet.



Sizes as above.

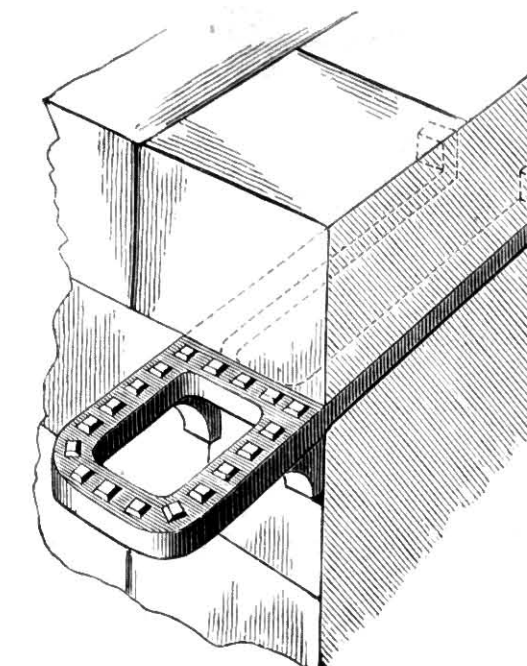
No. 256—Gulley, with ordinary discharge outlet, and with storm-water discharge outlet.



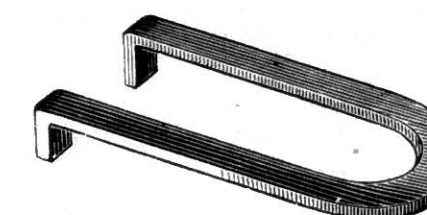
Size Outside at Top.	Price. Each.
16" x 14½"	

Foot Irons.

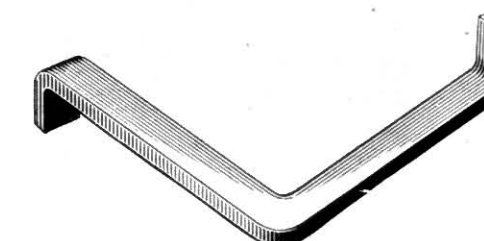
No. 87.



No. 88.



No. 89.

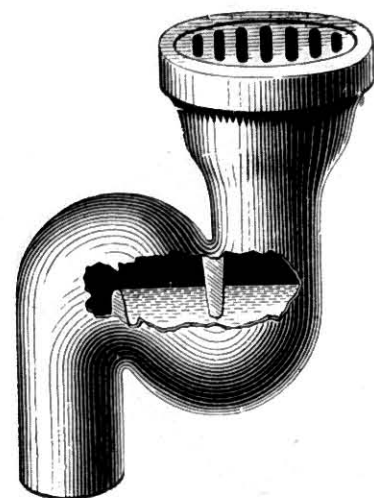


FOOT IRONS.

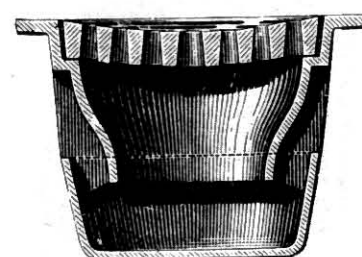
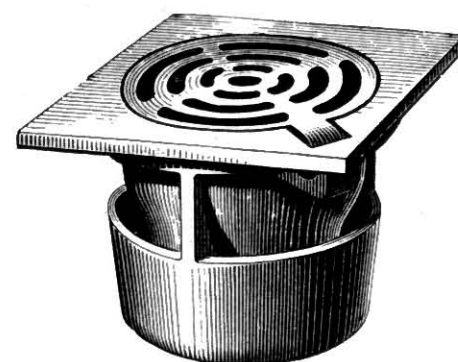
No. 87	{ Foot Iron, malleable cast iron,.. .. . each.
	Do. cast iron, "
No. 88—	Do. wrought iron, "
No. 89—	Do. angled, wrought iron, "

Trapped Gulleys.

No. 78.



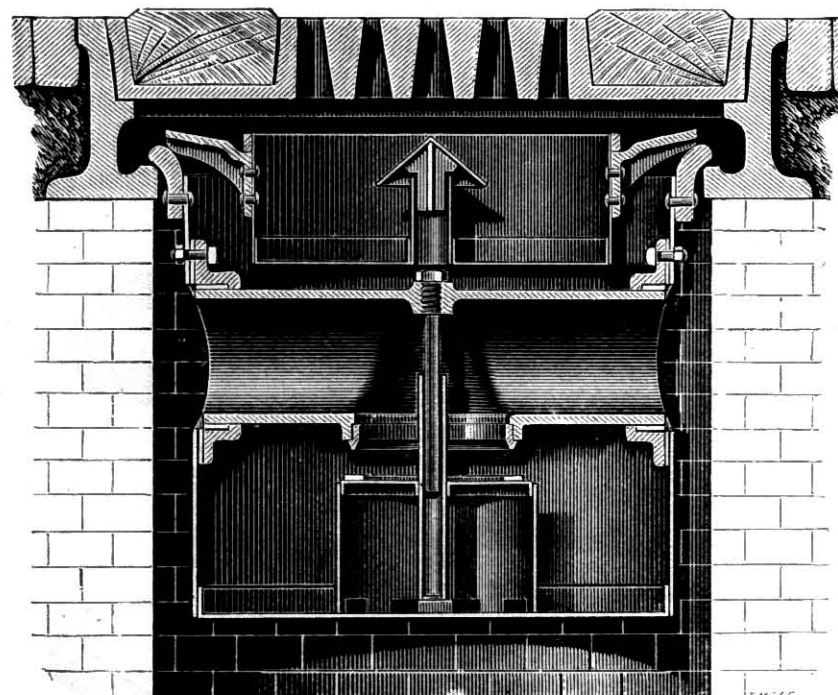
No. 79.



Self-closing Ventilator.

To keep Storm-water out of Sewers.

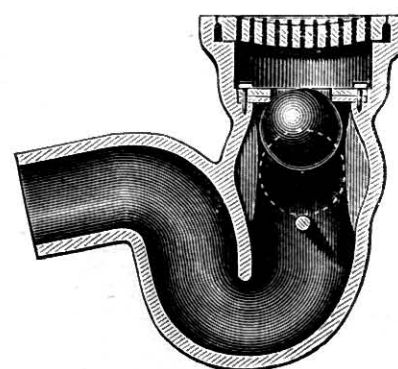
No. 258.



Flood Valve,

With Ball, to prevent back flooding.

No. 80.

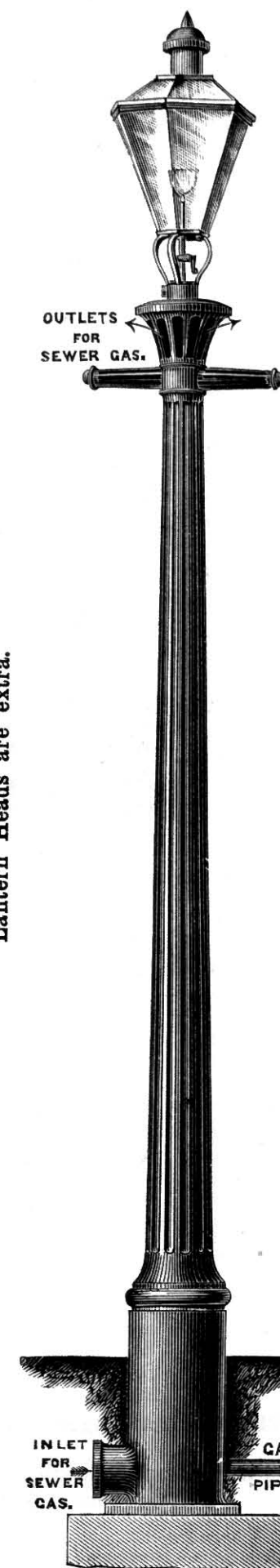


PRICES.

No. 78—Small Trap for leading into Pipe Drain,	2"	2½"	3"	each.				
No. 79—Round Sink Trap, Hinged Lid. ..	6"	7"	8"	9"	10"	11"	12"	"
No. 80—Valve, with Ball, to prevent back flooding.								
No. 258—Self-closing Ventilator to keep Storm-water out of Sewers.								

Ventilating Column and Lamp-post Combined.

No. 263.



Ventilating Column.

No. 262 b.



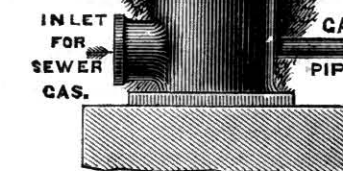
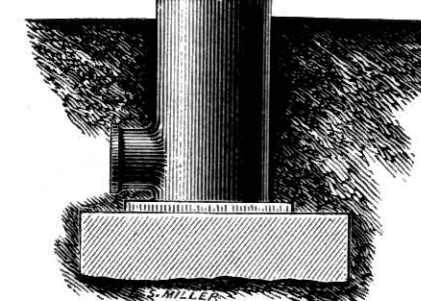
No. 262.



No. 262 a.



	30 feet	25 feet	20 feet	15 feet	10 feet	6 feet	2' 6"
No. 262 — Ventilating Column with Galvanized Wire Guard.	..	..	..	..	..	..	..
No. 262a — Do. with Cast Iron Cap	..	..	..	..	..	..	..
No. 262b — Do. with Zinc Coronet.	..	..	..	..	..	..	..
Total Height from ground level, ..	30	25	20	15	10	6	2' 6"
Size of Ventilating Tube, ..	inches.	inches.	inches.	inches.	inches.	inches.	inches.
Nos. 262, 262a, and 262b, ..	each.	each.	each.	each.	each.	each.	each.
Size of Ventilating Tube, ..	6	6	6	6	6	6	6
Nos. 262, 262a, and 262b, ..	each.	each.	each.	each.	each.	each.	each.
Depth underground, 2' 6".	..	..	..	..	..	..	..
No. 263—Ventilating Column and Lamp-post Combined.	..	..	..	..	..	..	..
Without Sole, ..	..	..	..	..	..	..	..
With Sole, ..	..	..	..	..	..	..	..
Lantern Heads are extra.	..	..	..	..	..	..	..

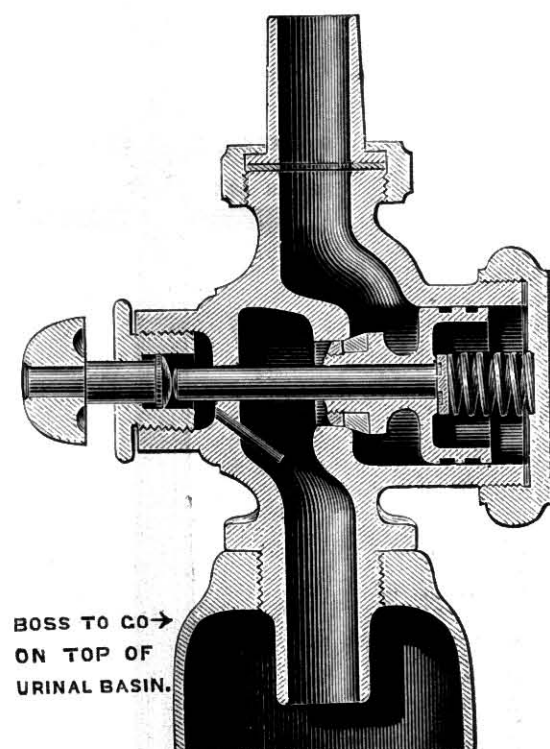


Urinal Taps.

Patent Non-concussive Self-closing Taps.

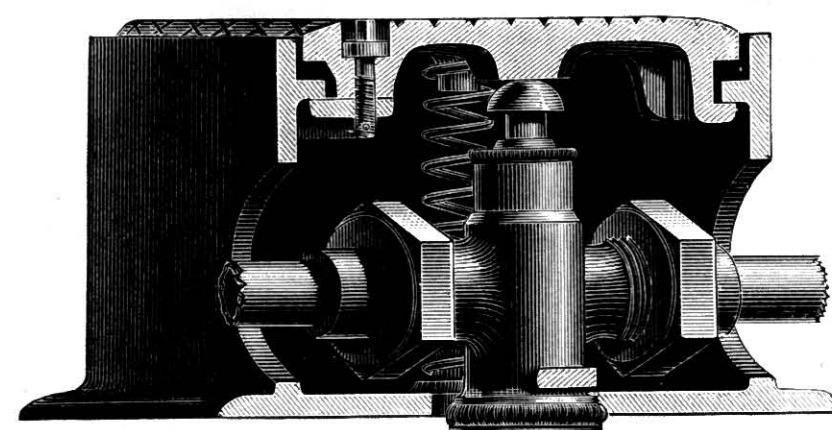
For fixing on Urinal and
pressing by hand.

No. 181.



For fixing in floor for foot tread.

No. 181 A.



The special features of these Taps are—

- Easily opened ;**
- Absolutely non-concussive ;**
- Full water-way ;**
- Simple ;**
- Durable.**

PRICES.

No. 181—Tap for fixing on Urinal and pressing by hand, with Union for lead Pipe; $\frac{1}{2}$ " dia., ... each.

This Tap is arranged so that it continues to discharge water for 20 seconds or so after button is released.

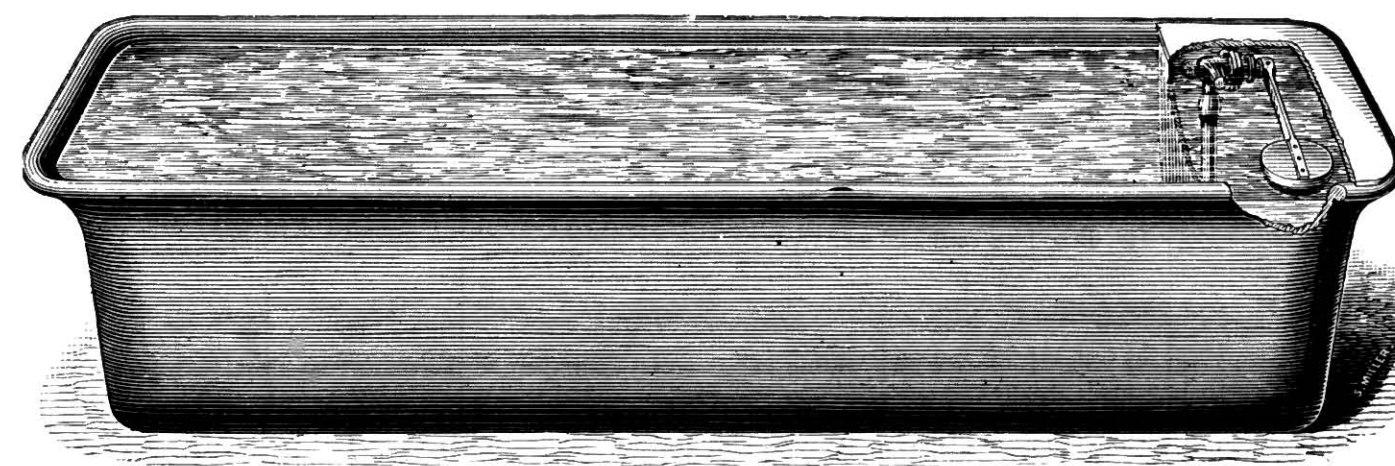
No. 181 A—Tap for fixing in floor for foot tread, including cast iron Box and Lid, with Springs, }
Complete; $\frac{1}{2}$ " dia., each.

Cattle Troughs.

No. 100.



No. 101.



For Dimensions see next page.

Cattle Troughs.

No. 102.



PRICES.

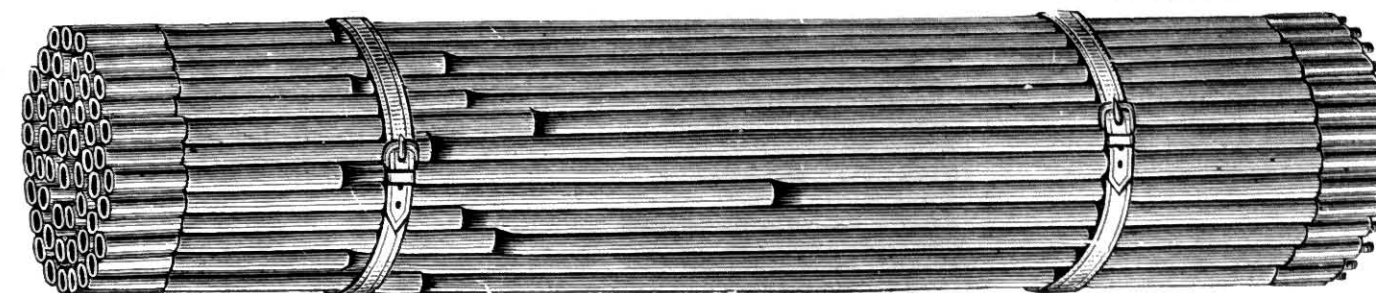
	Sizes.	Trough only.	Trough, with Valves.	Trough, with Base, without Valves.	Trough, with Base and with Valves.
No. 100	4' 0" × 2' 0" × 1' 2 1/4"				
	5' 8" × 2' 0" × 1' 2 1/4"				
No. 101	3' 3" × 1' 8" × 1' 2"				
	4' 3" × 1' 8" × 1' 2"				
	4' 9" × 1' 8" × 1' 2"				
	6' 3" × 1' 8" × 1' 2"				
	9' 3" × 1' 8" × 1' 2"				
	12' 1" × 1' 8" × 1' 2"				
No. 102	3' 3" × 1' 9" × 1' 2 1/2"				
	6' 3" × 1' 9" × 1' 2 1/2"				
	9' 3" × 1' 9" × 1' 2 1/2"				

The above are all outside dimensions.

All neatly painted.

Sewer Cleaning Apparatus.

No. 110.



No. 110—Cane Drain Rods, carefully selected, with strong Brass Screwed Ends.

30 feet. 50 feet. 80 feet. 100 feet.

In 3 feet lengths,
In 4 feet lengths,
In 5 feet lengths,
In 6 feet lengths,

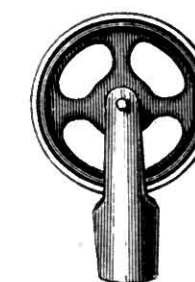
Sewer Cleaning Tools.



No. 111.

Double Spiral Screw, ..

Price.
Each.



No. 112 B.

Gun Metal Clearing Wheel. ..

Price.
Each.



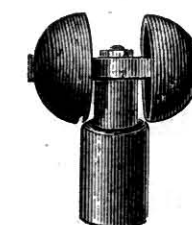
No. 112.

Clearing Wheel,



No. 113.

Spring Hook,



No. 112 A.

Universal Roller,



No. 113 A.

Wheel and Hooks,

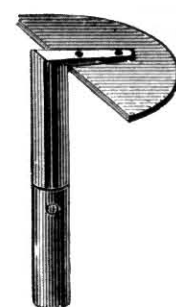
Sewer Cleaning Tools.



No. 114.

Price.
Each.

Jointed Scraper



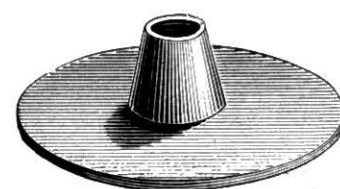
No. 114 A.

Plain Scraper,



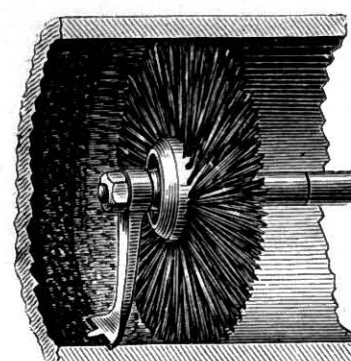
No. 115.

Clearing Ball,



No. 117—India Rubber Plunger.

3" 4" 5" 6" Sewer.
each.



No. 116—Brush and Scraper.

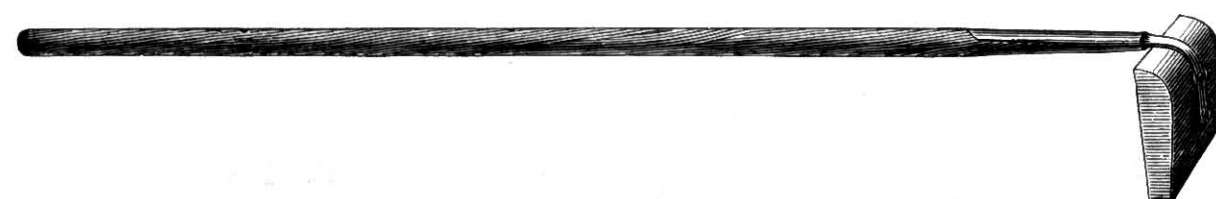
2" 3" 4" 6" 7" 8" 9" 12" 15" 18" Sewer.
each.



No. 120.

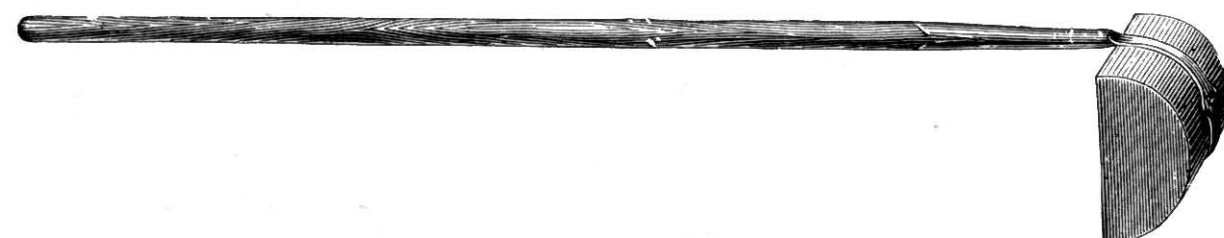
Price.
Each.

Rake, with Shaft,



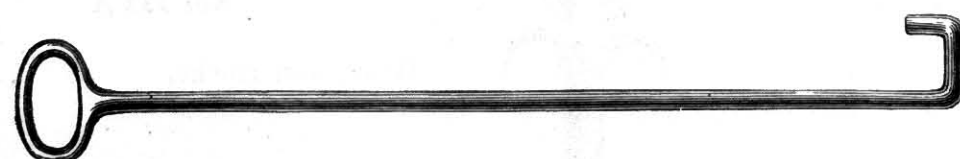
No. 121.

Gulley Cleaner,



No. 122.

Gulley Cleaner,



No. 123.

Wrought Iron Hook,

Light Cast Iron Pipes and Specials.

For Drainage Purposes.

Internal Dia.		Length of Pipe, exclusive of Socket.		Average Weight of Pipe, Spigot and Socket Joints.			Approximate Price per Ton, subject to fluctuation, and depending on quantity required.		
Inches.	Feet.	Cwts.	Qrs.	Lbs.	£	s.	d.		
1½	6	0	1	2					
2	6	0	1	14					
2½	6	0	2	0					
3	9	0	3	14					
3¼	9	1	0	0					
3½	9	1	0	14					
4	9	1	1	14					
4½	9	1	2	14					
5	9	1	3	14					
6	9	2	1	14					
7	9	2	3	14					
8	9	3	1	14					
9	9	4	0	0					
10	9	4	3	0					
12	9	5	3	21					

SPECIAL CASTINGS.

Such as BRANCH PIPES, BENDS, COLLARS, etc.,

At special rates per ton, depending on quantity, etc.

Can be coated with Dr. Angus Smith's Patent Composition at extra cost.

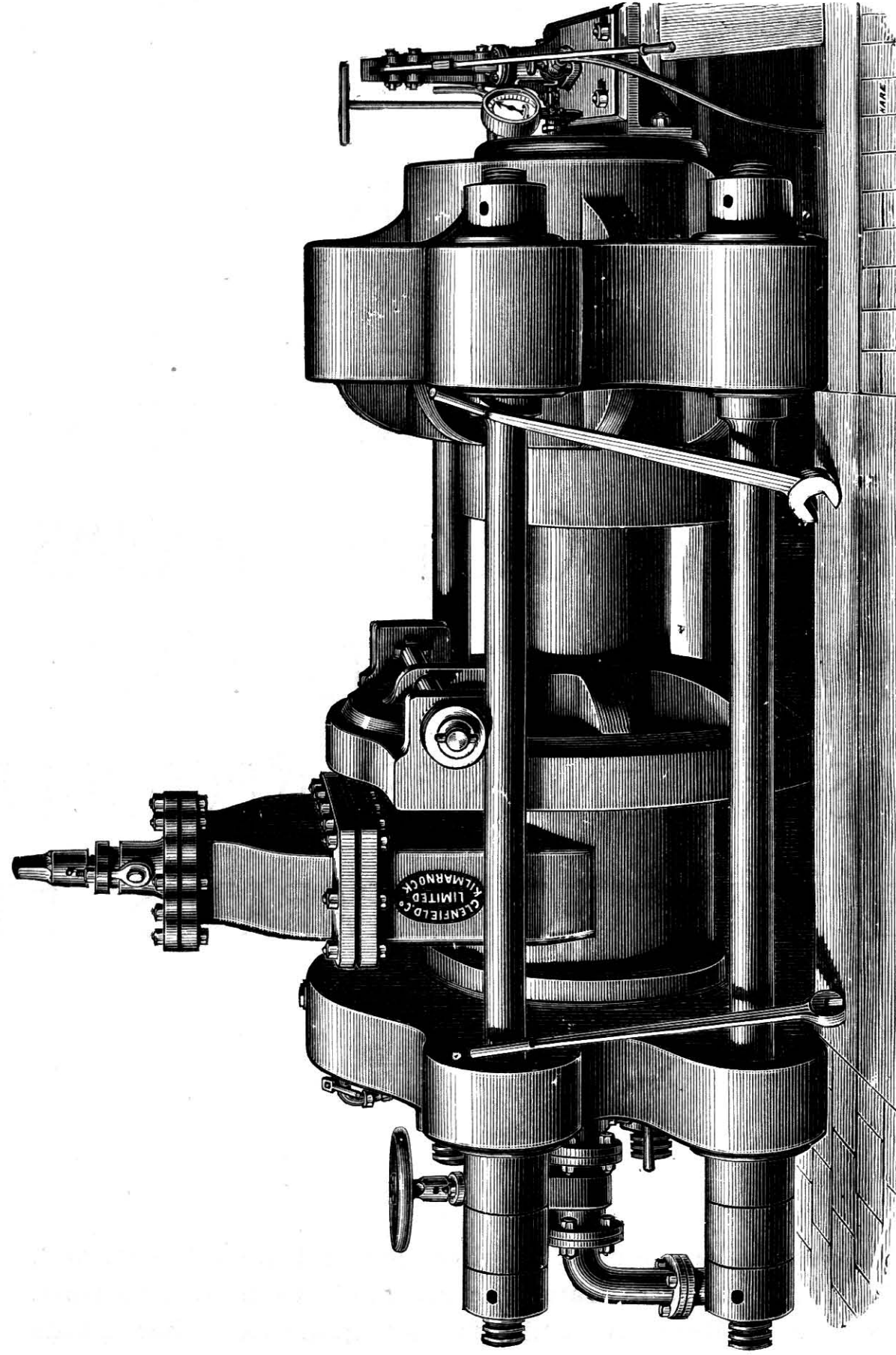
SECTION J.

PIPE TESTING APPARATUS,
PRESSURE GAUGES, ALARMS,
HYDRAULIC HOISTS, WATER
PRESSURE ENGINES, RECORDERS,
PIPE SCRAPING APPARATUS, ETC.

The designs are subject to alteration and amendment, and, while corrections in Catalogue are made from time to time, Glenfield & Kennedy Ltd. do not guarantee that goods supplied will be exactly as shewn.

Hydraulic Pipe Testing Machine.

Fig. H 160.

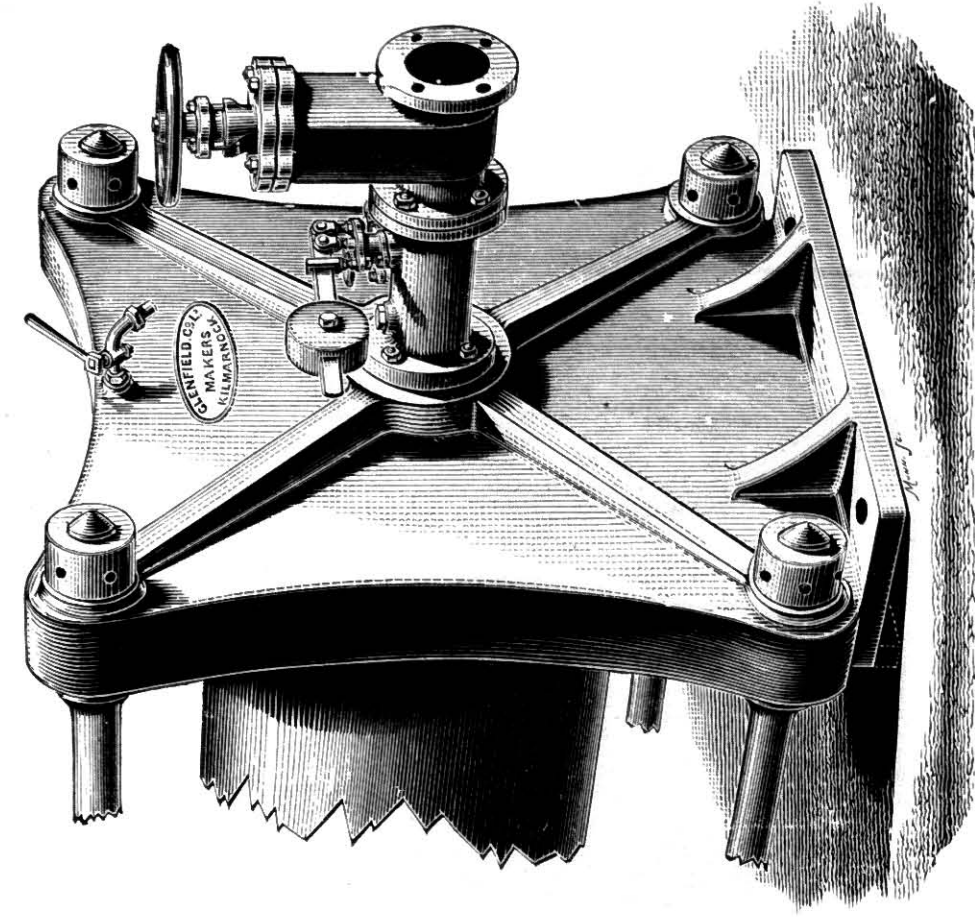
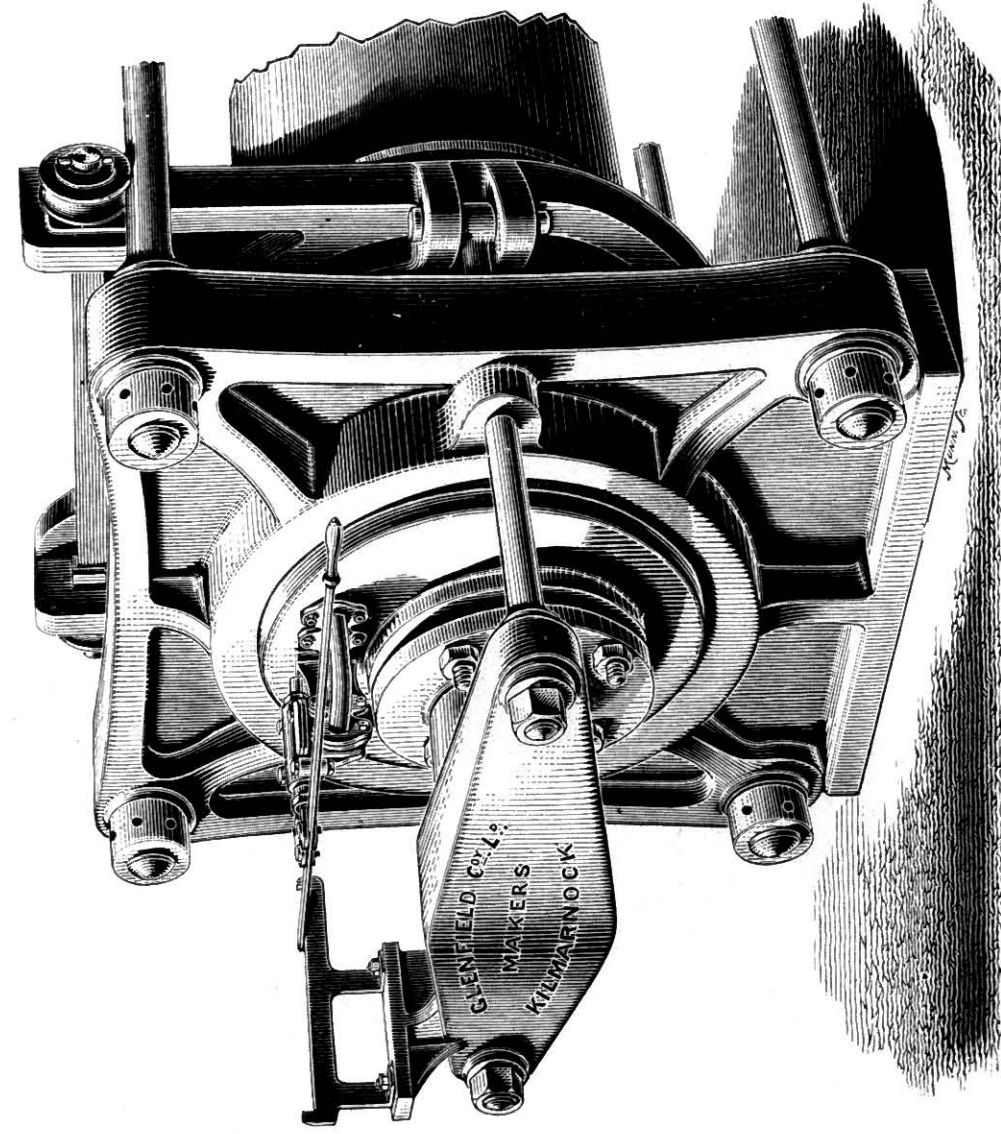


This Machine tests Pipes or Sluice Valves up to 48" internal dia. The Shifting Face Plate is forced up by Hydraulic Ram, the Cylinder for which is formed in Back Head of Machine, and is worked by Hand Pump. The Shifting Plate is drawn back, either by Hand Screw Gear or by Hydraulic Power, as may be preferred.

Prices on application.

Kennedy's Patent Hydraulic Pipe Testing Machine.

Fig. H 162.

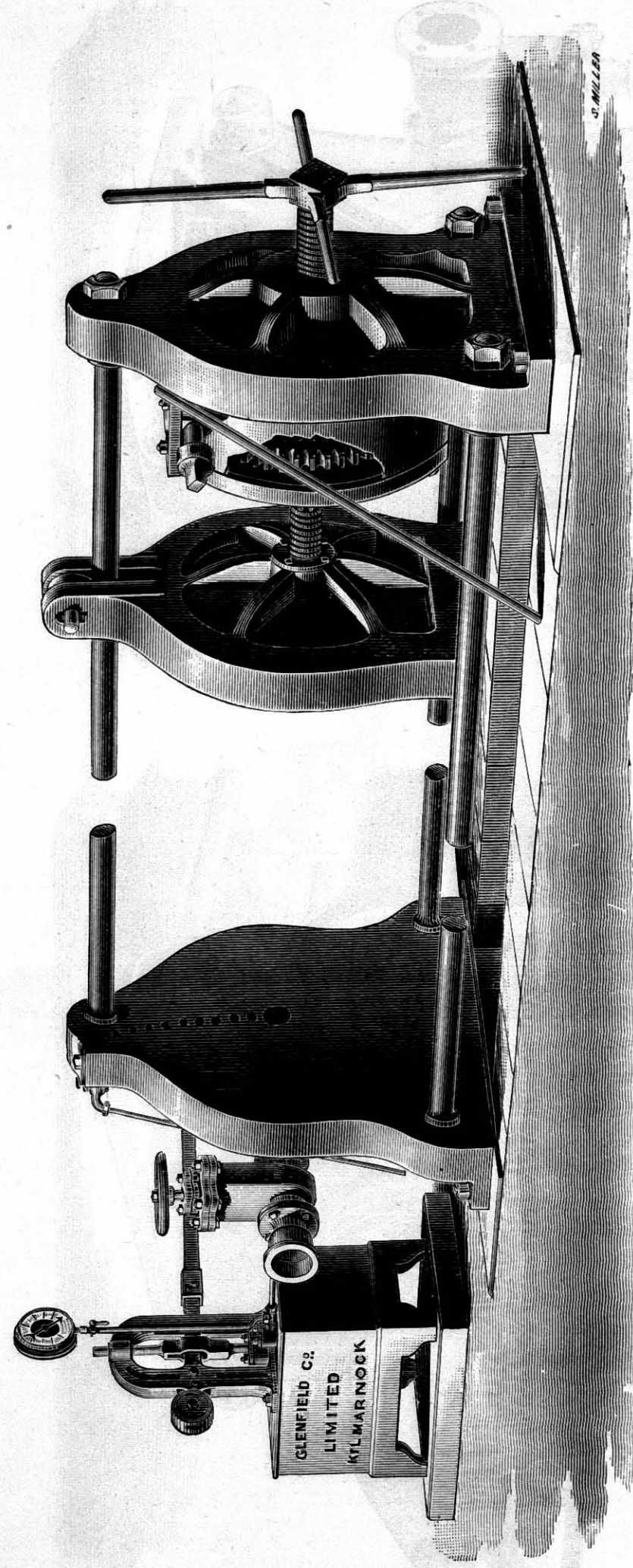


All the motions of the Machine are worked by Hydraulic pressure, say from an accumulator. All the labour necessary is simply that required to roll in the pipes. All the rest can be accomplished by a lad. After the pipe has been filled up with water (which may be at a low head), the necessary test pressure is put on by admitting a small quantity of the high pressure water (the pressure being controlled by small Safety Valve shown). The movable head of Machine is put up or drawn back simply by moving a Lever. Patterns have been made for Machines to take in pipes up to 48" dia.

Prices on application.

Pipe Testing Machine.

Fig. H 164.



This Machine tests Pipes up to and including 24" dia. It has powerful Single Screw, supplemented by Worm Gearing.

The Shifting Face Plate is quickly put up by Centre Screw, and then power applied by the Worm.

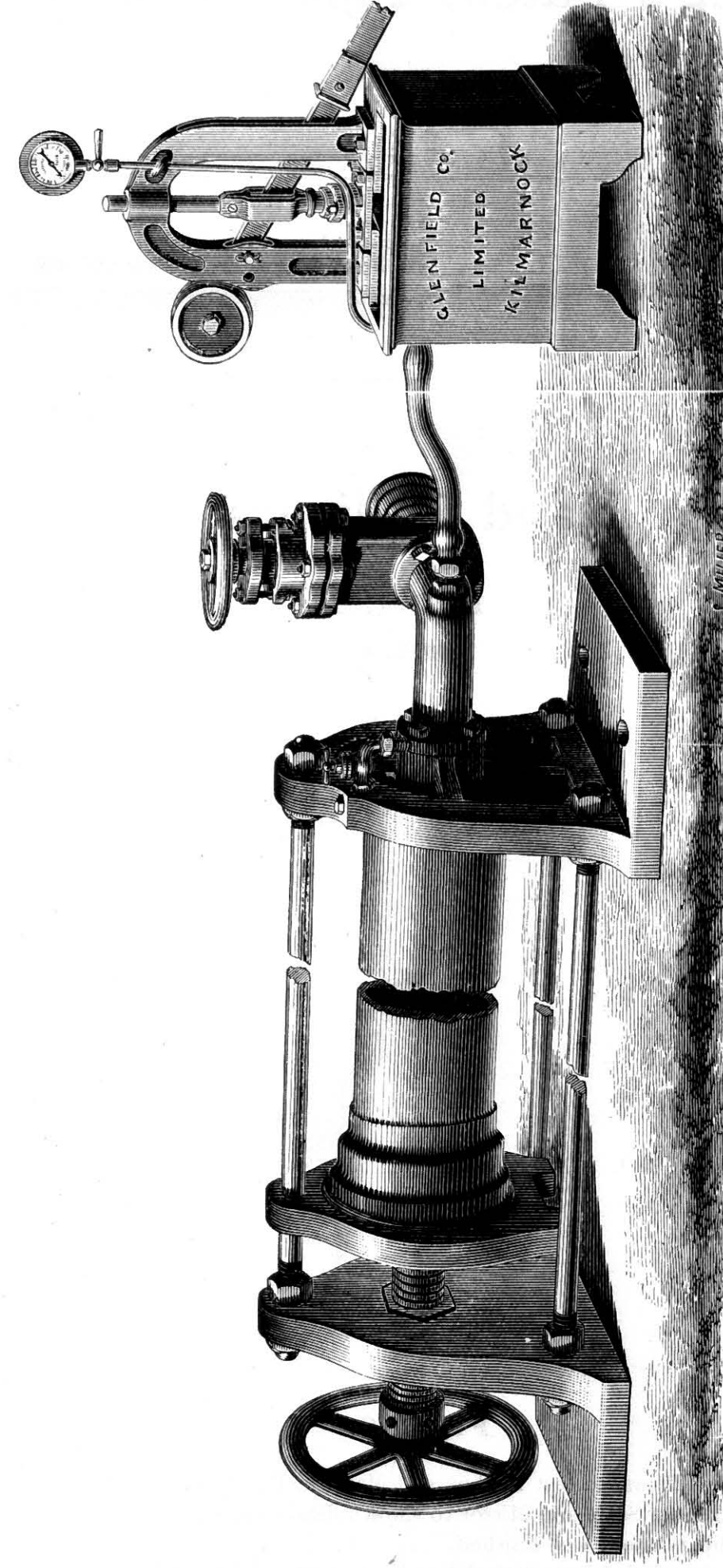
Complete with Pump, Pressure Gauge, Sluice Valve, Air Cock, etc.

Rests (adjustable), with inclined bars for rolling pipes into position, can be supplied if required.

Prices on application.

Pipe Testing Machine.

Fig. H 166.



This Machine tests Pipes up to and including 12" dia., or larger if required.

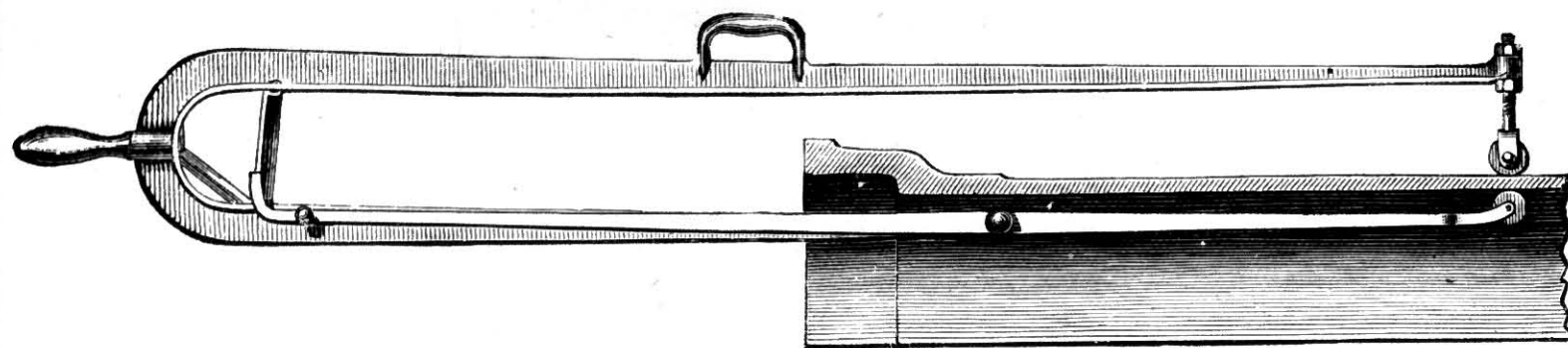
It has powerful Single Screw for forcing up Shifting Face Plate.

Complete with Pump, Pressure Gauge, Air Cock, etc.

Prices on application.

King's Patent Pipe Callipers.

Fig. H 170.



Hand Callipers.

Fig. H 171.

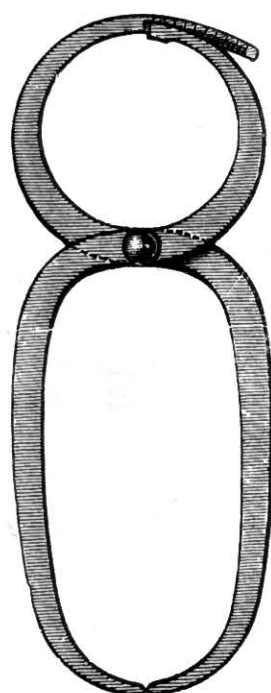


Fig. H 172.

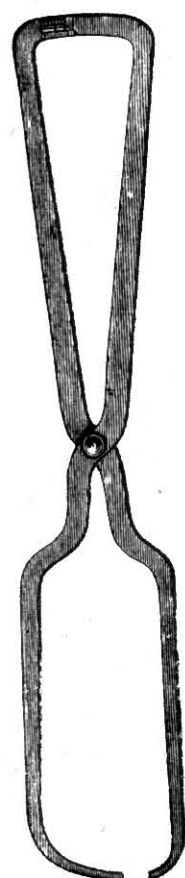
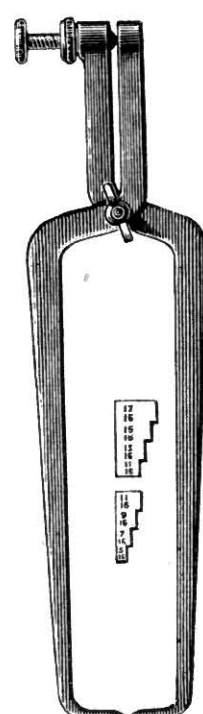


Fig. H 173.

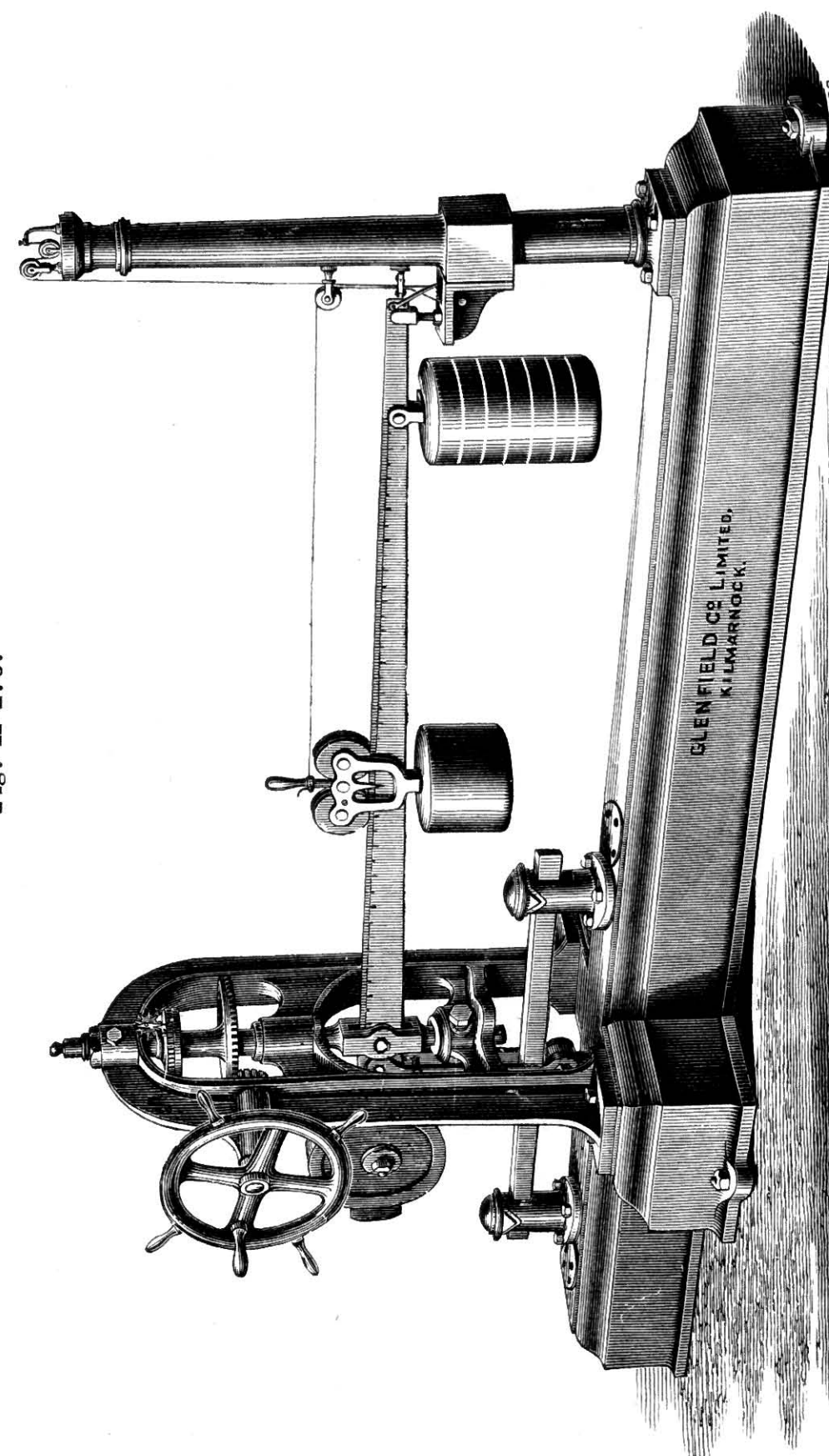


PRICES.

H 170—King's Patent Pipe Callipers, to test thickness of Metal in Pipes of 2" to 48" dia., with Engraved brass Scale and Mirror to show indications,	each.
H 171 or H 172—Hand Callipers, steel, well finished,	"
H 173—Hand Callipers, steel, well finished, with Adjusting Screw and brass Gauge Pieces instead of Scale,	"

Bar Testing Machine.

Fig. H 176.



These Machines have been supplied to the principal Pipe Foundries in Great Britain.

This Machine is arranged for testing the breaking strain of cast iron Bars $2'' \times 1''$, or $1''$ sq., at centres 3' or 4' apart. The Indicating Arrangement is Self-acting.

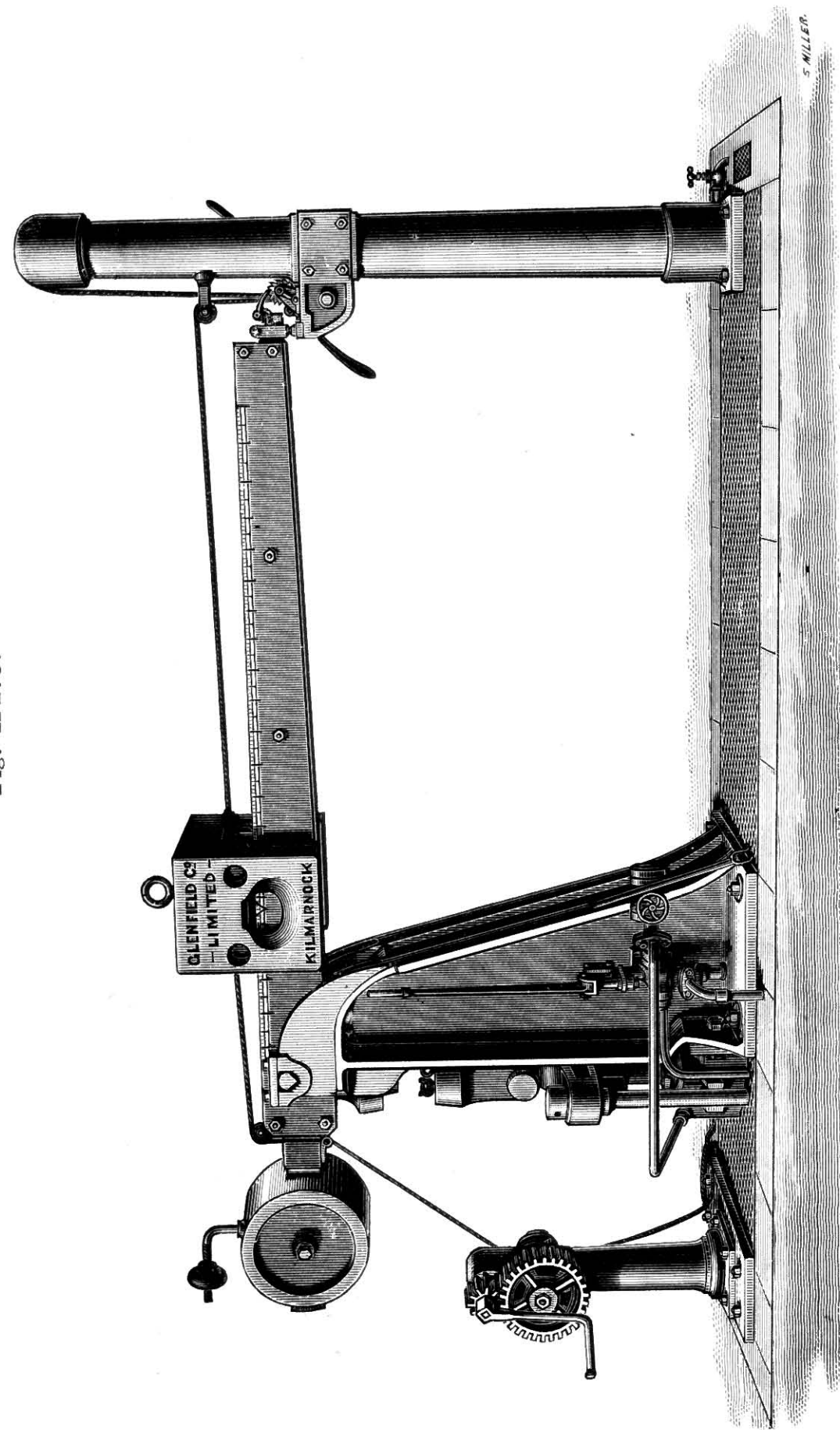
An Index gives the deflection of the bar to the third decimal. The Machine can also be readily adapted for testing the tensile strength of wrought iron or gun metal.

Prices on application.

Hydraulic Single Lever Tensile Testing Machine

For testing the tensile strength of cast iron, wrought iron, gun metal, etc.

Fig. H 178.



The above illustration shows a 15 ton Machine.

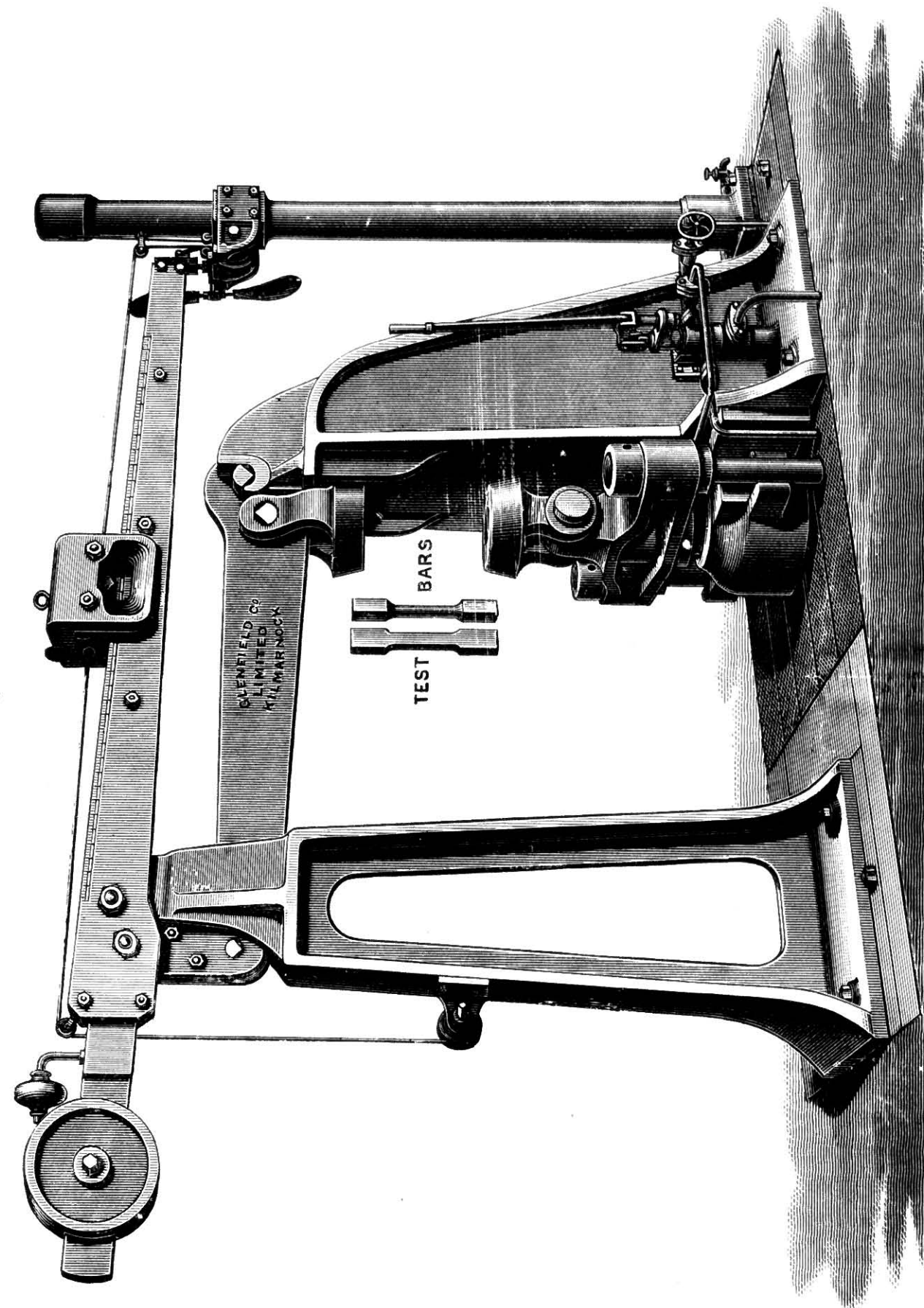
The Travelling Weight is moved along automatically by a weight within the end column and is pulled back to zero by means of the hand Winch shown. The weight in column is retarded by an oil cataract. In larger Machines the Travelling Weight is moved back by Hydraulic Gear. Stress is put upon the specimen by a Hydraulic Cylinder, the supply to which may be from an Accumulator.

Prices on application.

Hydraulic Compound Lever Tensile Testing Machine

For testing the tensile strength of cast iron, wrought iron, gun metal, etc.

Fig. H 180.



The above illustration shows a 30 ton Machine.

The above Machine is similar to that illustrated and described on preceding page, but has Double or Compound Lever instead of Single one.

While the test is being applied, the Weight travels automatically along the graduated Lever in sight of the operator, who stands with the Valve Lever in his hand.

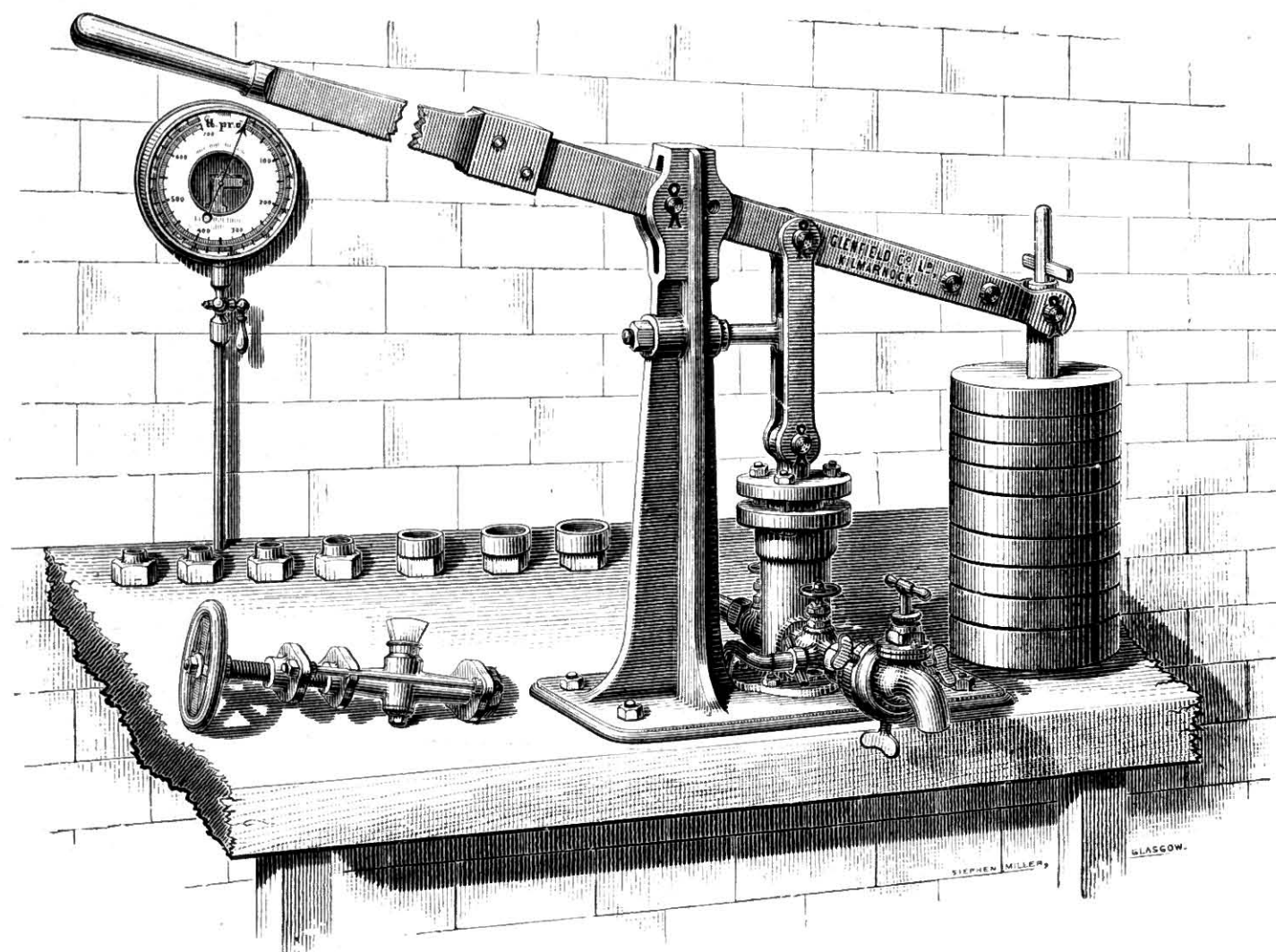
The Machine is compact (occupying little space), and can be furnished with a Test Weight which can be applied at any moment to test the accuracy of the centres.

A small hand Winch is shown on the Machine to pull the Weight back to zero. This may be done by Hydraulic power if desired.

Prices on application.

Tap Testing Machine.

Fig. H 183.



This Machine is in use in the principal Corporation Testing Departments.

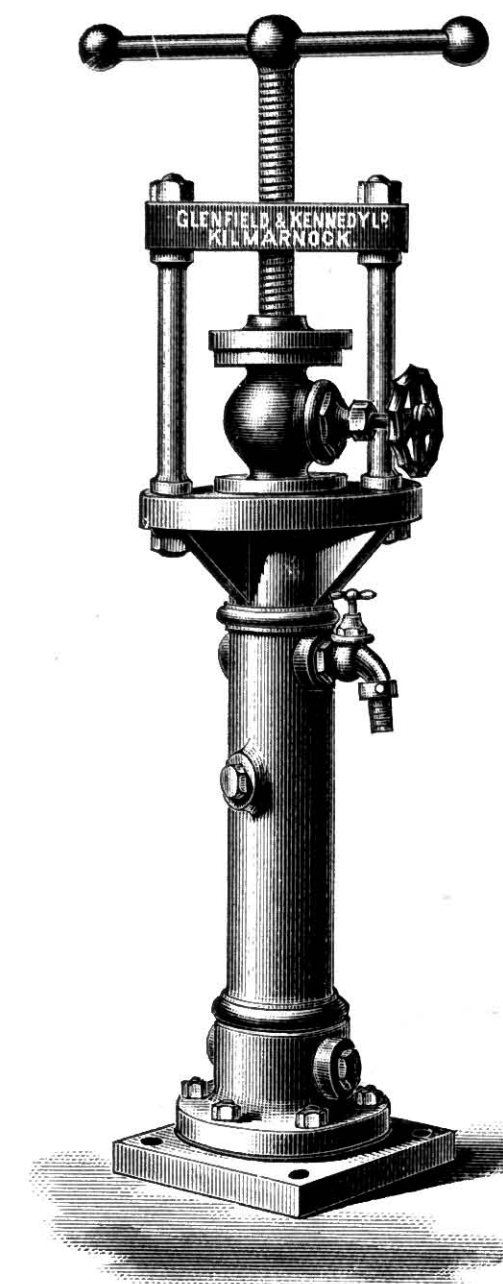
The Machine, as shown, is loaded to give a test pressure of 300 lbs. per sq. in., but it can be set to give any test pressure by taking off some of the weights. By pulling down the Lever the load rests on Plunger, and gives a supply of high pressure water for testing, the operation being repeated when Plunger goes to bottom of its stroke.

PRICE.

H 183—Tap Testing Machine, consisting of Hand Pressure Pump, with gun metal Couplers, Swivel Chucks, etc., for testing Bib Taps, and Gland and Coupling Rods for testing Stop Taps. Chucks, etc., supplied with Machine to test Taps up to 1½" dia. Complete with Stop Valves, Pressure Gauge, etc., each.

Pillar for testing Taps, Valves, etc.

Fig. H 184.



DESCRIPTION.

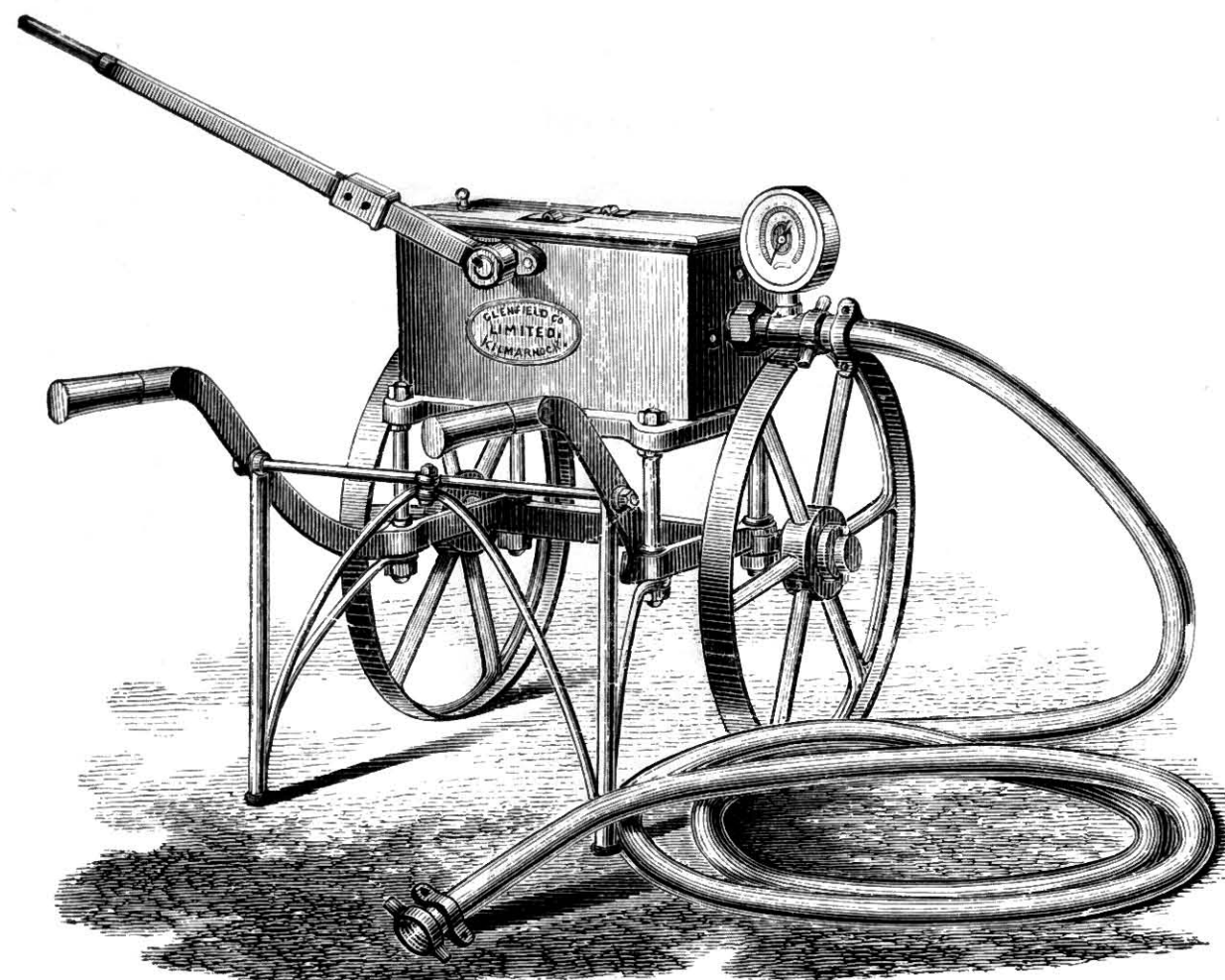
Water is admitted either by one of the Connections shown or by Pipe underneath through centre of Pillar. A Connection is, of course, made to a pump by means of which the test pressure is applied, say to 300 lbs. per sq. in. or more if required.

The flange on upper side of Valve being tested, is furnished with a small Air Cock (not shown). Tap on side of pillar is for Emptying purposes. Takes up to 1½" dia.

Prices on application.

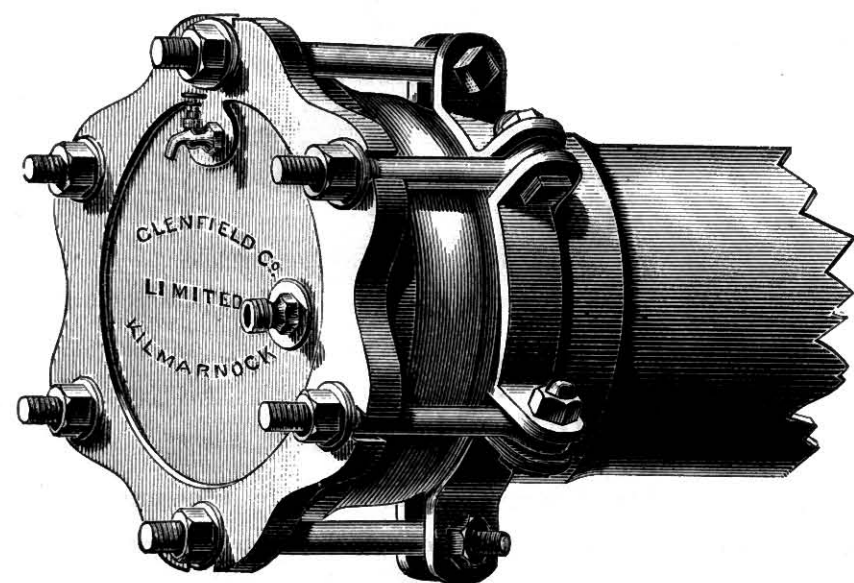
Test Pump on Barrow.

Fig. H 186.



Blank Flange, with Gland, Bolts, Ferrule, and Air Cock.

Fig. H 187.



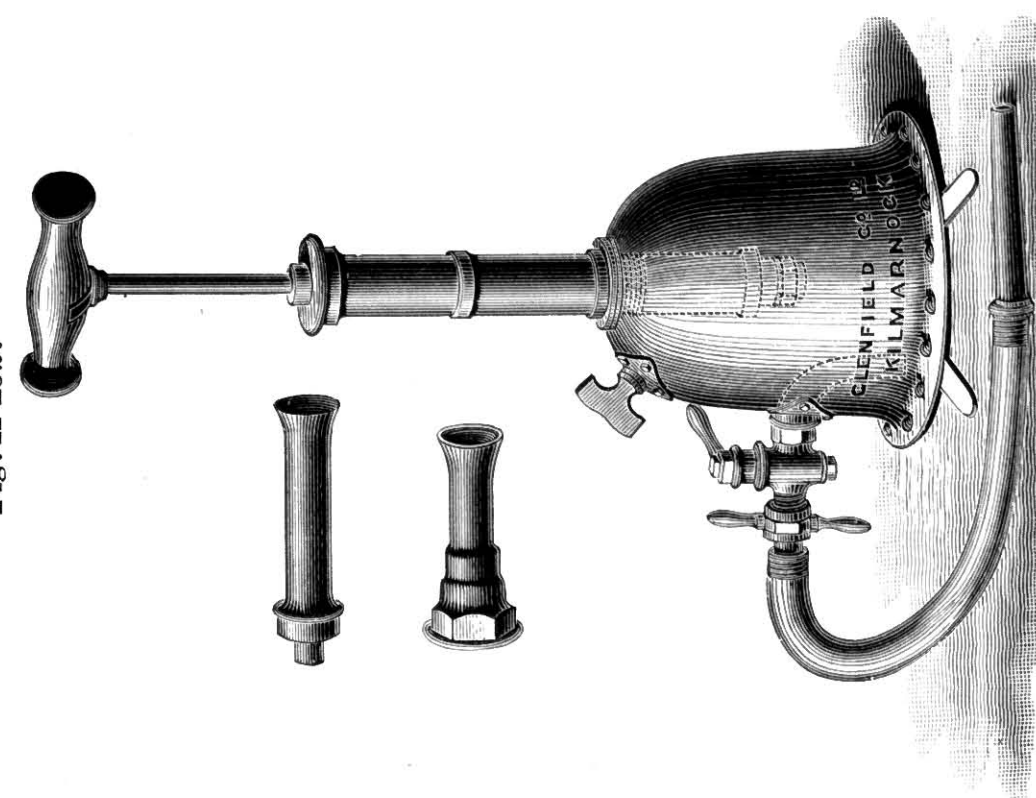
PRICES.

H 186—Test Pump on Barrow, consisting of wrought iron Barrow carrying gun metal Pump fixed inside cast iron Tank, with 20 feet $\frac{1}{2}$ -inch 4-ply strong rubber Hose, and Pressure Gauge, with Couplings, etc., Complete, each.
 Extra, if fitted with metallic Hose instead of rubber Hose,
 These Pumps are used for testing pipes when laid in trench, before being covered in. Blank Flanges for this purpose, with Gland, Bolts, Ferrule, and Air Cock Complete, to fit any size of pipe, can be supplied to order.

Prices on application.

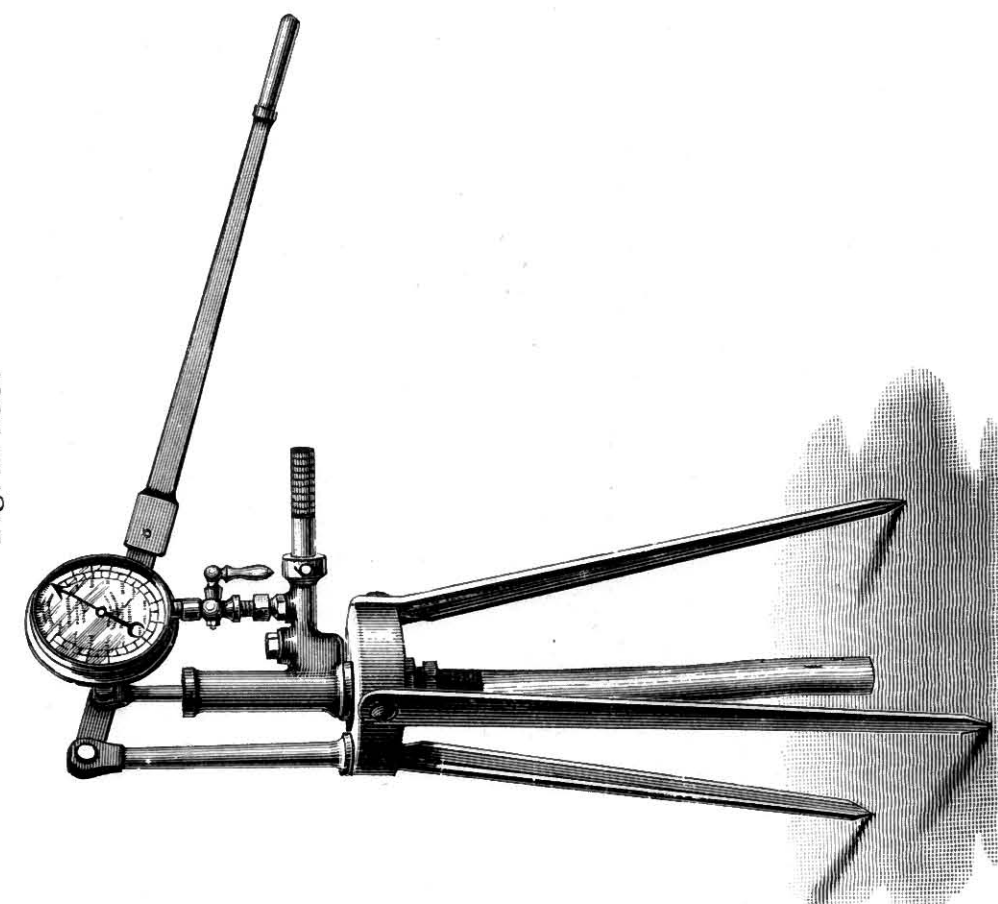
Plumbers' Force Pump, or Service Pump.

Fig. H 192.



Boiler Test Pump.

Fig. H 190.

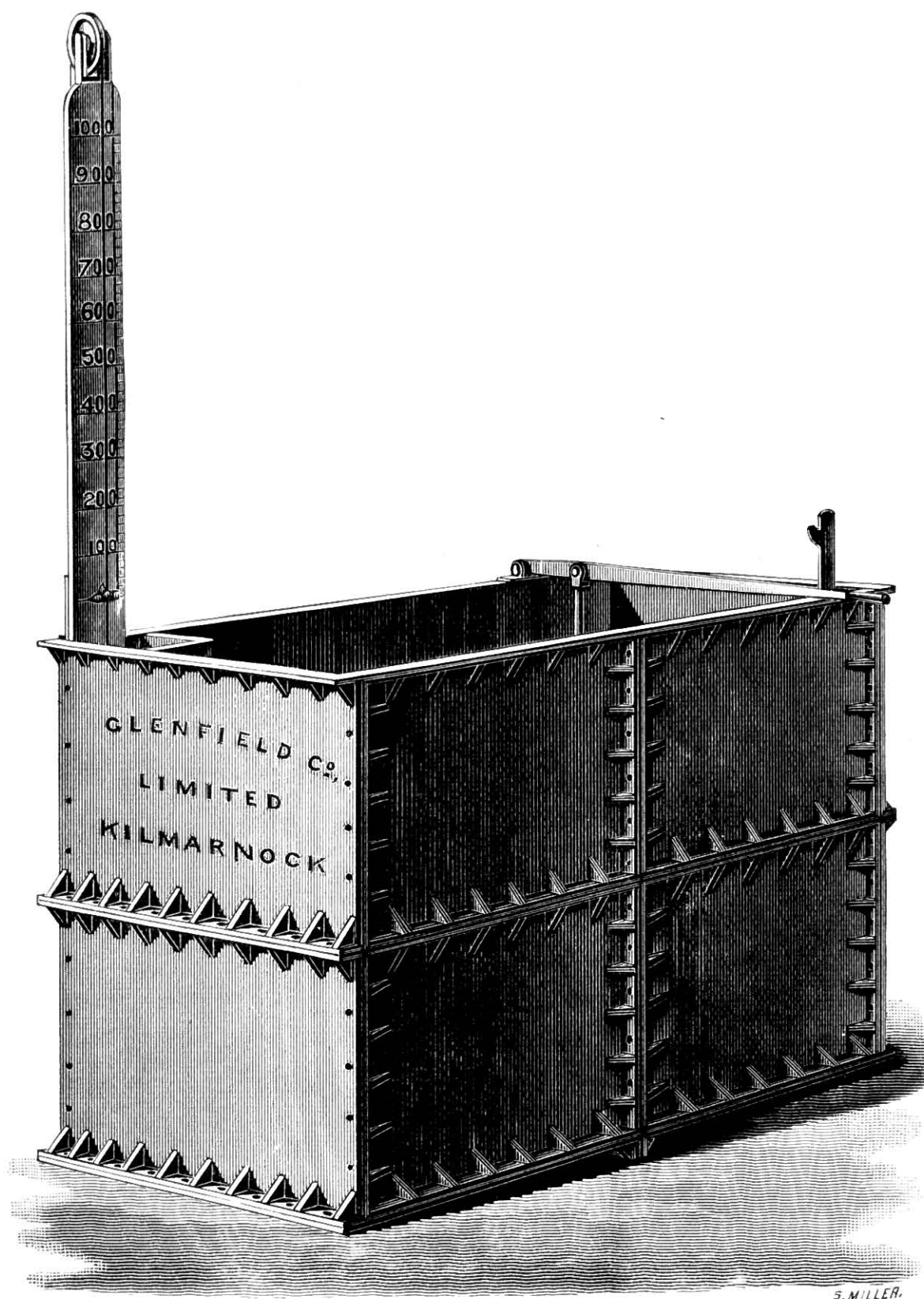


PRICES.

H 190—Boiler Test Pump (a useful little portable Pump which can be used for many purposes), Barrel, Valves, etc., of gun metal, Plunger $1\frac{1}{2}$ " dia. \times $2\frac{1}{2}$ " stroke; Complete, with 4" Pressure Gauge, as shown, each.
 H 192—Plumbers' Force Pump, or Service Pump, with short length of Hose and Connections shown,

Tank for Testing Meters.

Fig. H 195.

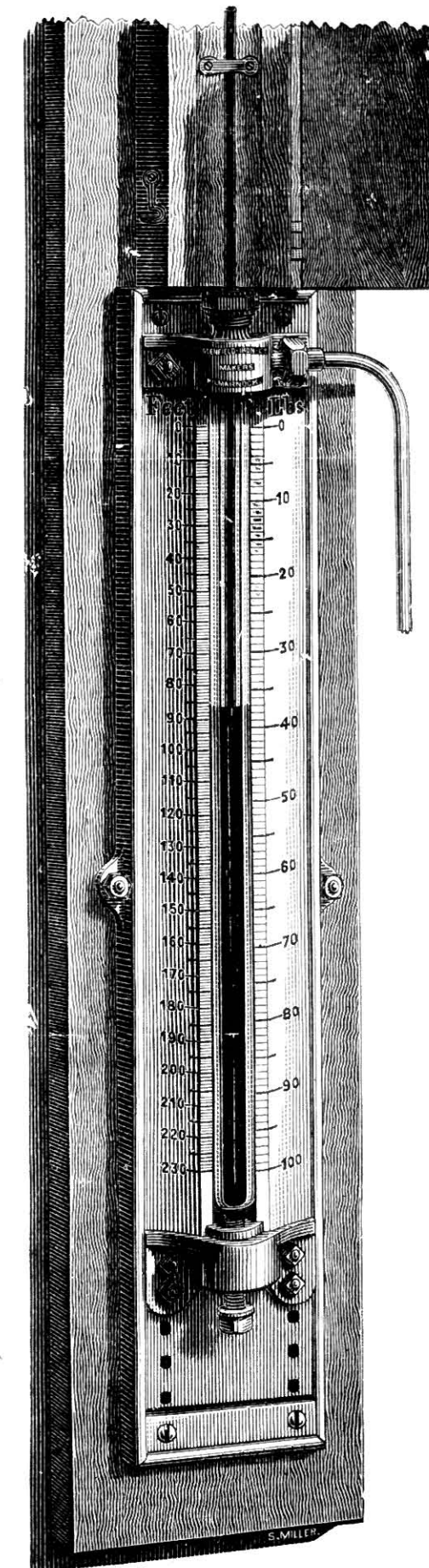


These Tanks can be supplied of any required capacity.
The Index is carefully graduated (in gallons, or cubic metres, or both).

Prices on application.

Mercurial Column Pressure Gauge.

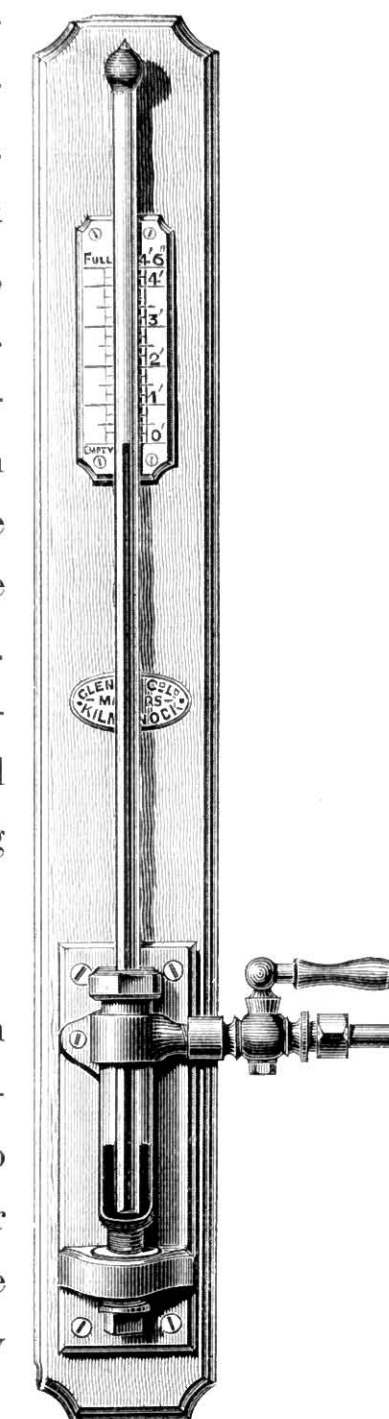
Fig. H 100.



H 100.—The small-bore upright Tube, as well as the Reservoir Tube, are of best flint glass. The pressure in feet of column of water is marked on the left, and pressure in lbs. per sq. in. on the right side. By measuring the height of mercury in the small glass column, the accuracy of the Gauge can be demonstrated at any time. When required for testing Pressure Gauges, a small gun metal Hand Pump is furnished along with the Mercurial Gauge.

H 102.—The small Column can be used for Testing purposes, or as an Indicator to show level of water in reservoir or overhead tank, which may be at a distance and connected by a pipe.

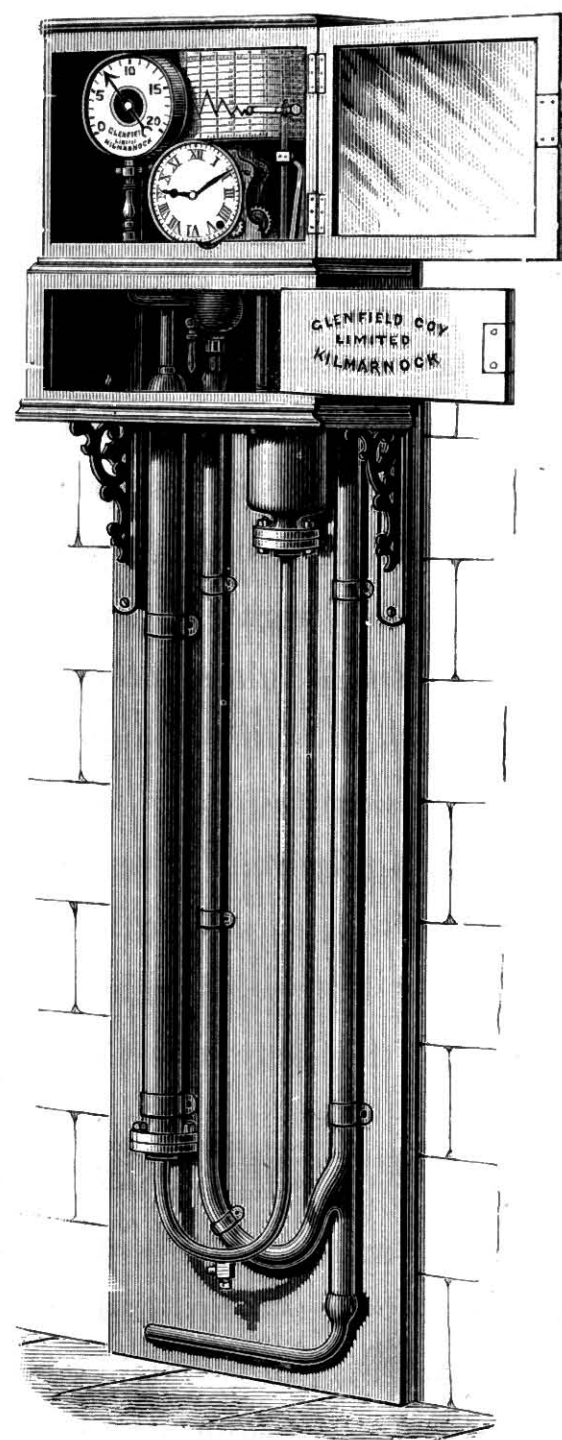
Fig. H 102.



Prices on application.

Mercurial Pressure Recorder.

Fig. H 105.



This Instrument records on a drum, driven by clock, the pressure in pipes or level of water in a reservoir or overhead tank, being connected thereto by a pipe. It is more suitable for low heads, say up to 40' or so, is extremely sensitive, and perfectly accurate. When head is greater, the column of mercury has to be correspondingly long, and in such case can only be accommodated where room is available.

Prices on application.

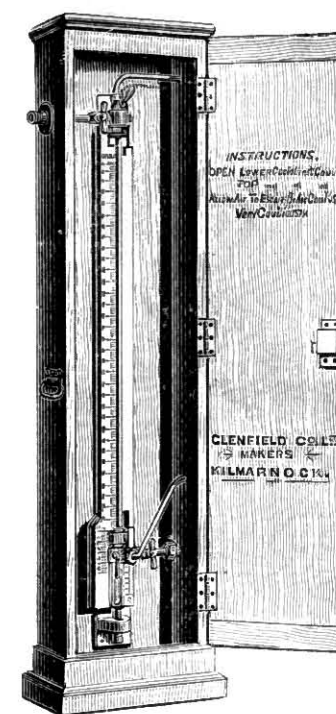
Difference Pressure Recorder.

Fig. H 108.



Mercurial Difference Pressure Gauge.

Fig. H 106.



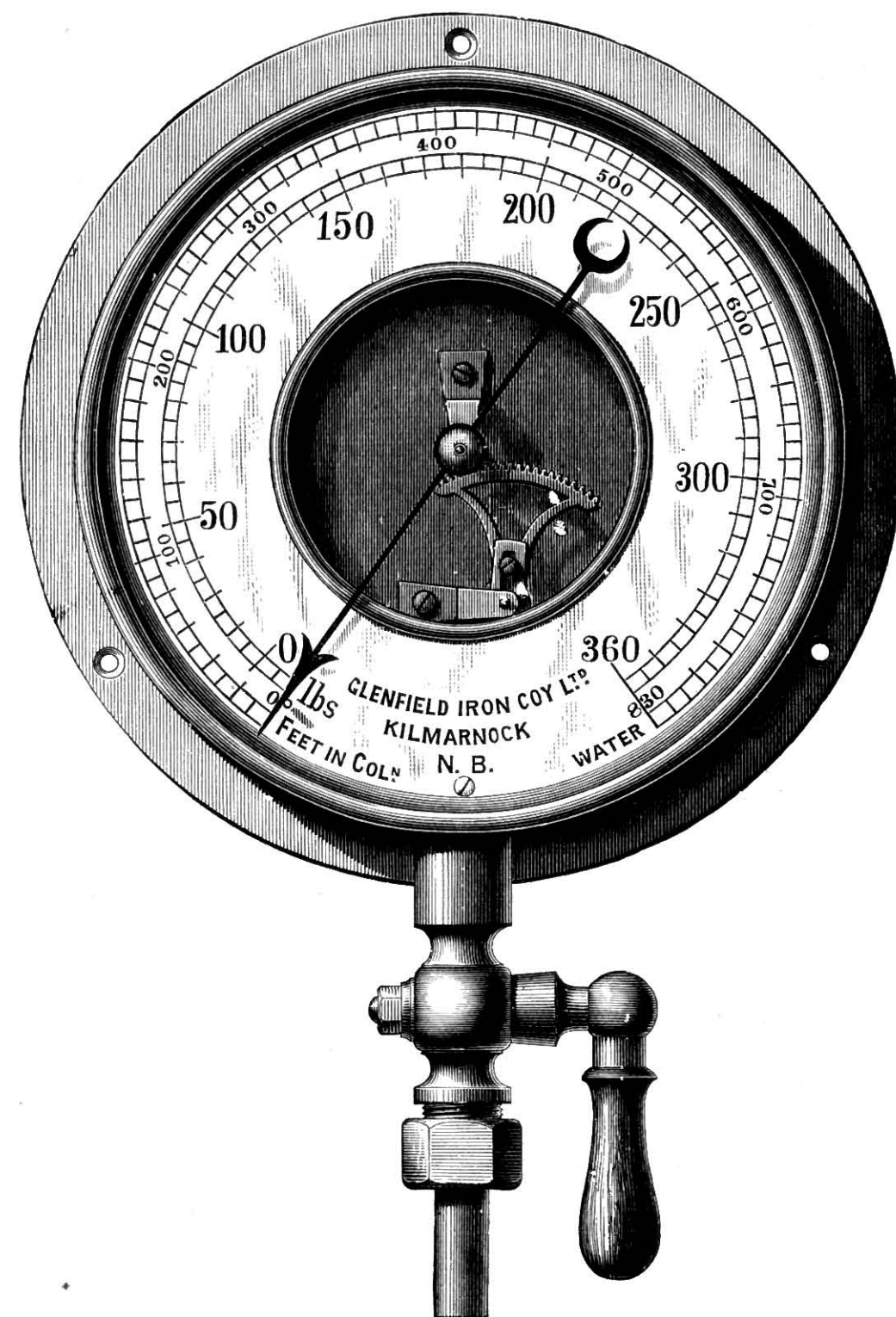
The smaller of the illustrations is an instrument for indicating, by means of a column of mercury, the *difference* of pressures between any two pipes or sources of supply, or by application by two different connections to the same pipe at different points shows at a glance the effect of any obstruction, throttling, or friction between the points.

The larger illustration indicates on a drum, driven by clock, the *difference* of pressures as above described, and has been applied for recording the readings of pressure from "Venturi" pipes or meters.

Prices on application.

Bourdon's Patent Pressure Gauge.

Fig. C 230.



These Pressure Gauges, which are our own make, are accurately graduated, the dials being marked directly from a Mercurial Column Standard, having a range of 360 lbs. per sq. in. The dials are marked in ft. in column of water and lbs. per sq. in. When required, the dials can be graduated in atmospheres and metres in column of water. Special Gauges, 15" or even larger dia., are made with fine graduations when specially ordered. Gauges having maximum or minimum pointer, and Electro-plated Gauges, are also furnished when specially ordered.

For Prices see next page.

When ordering, please state what pressure the Gauge is wanted to be graduated up to.

Pressure Gauges and Standpipes

For taking Pressures at Hydrants.

Cap and Union for Pressure Gauge.

Fig. C 175.

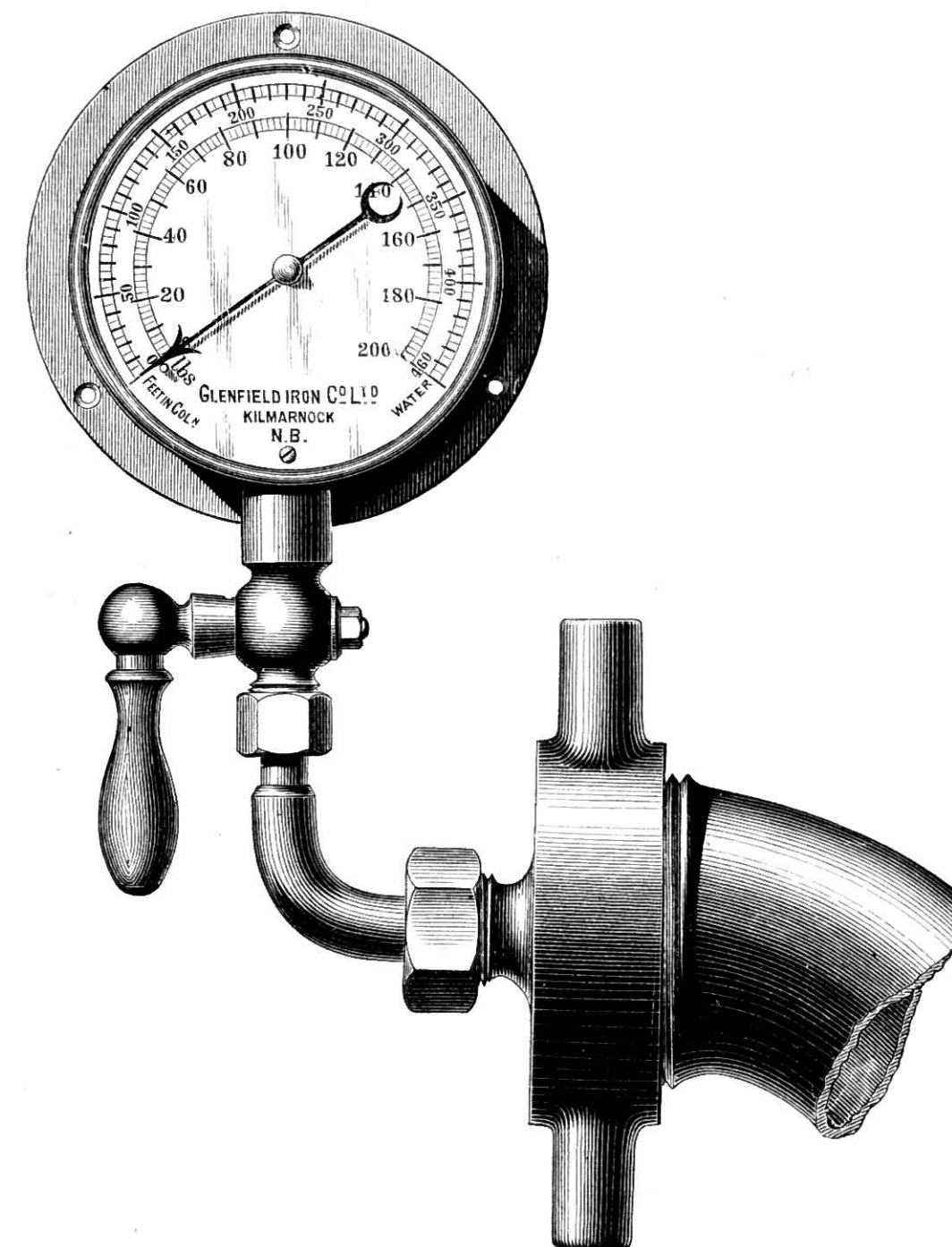
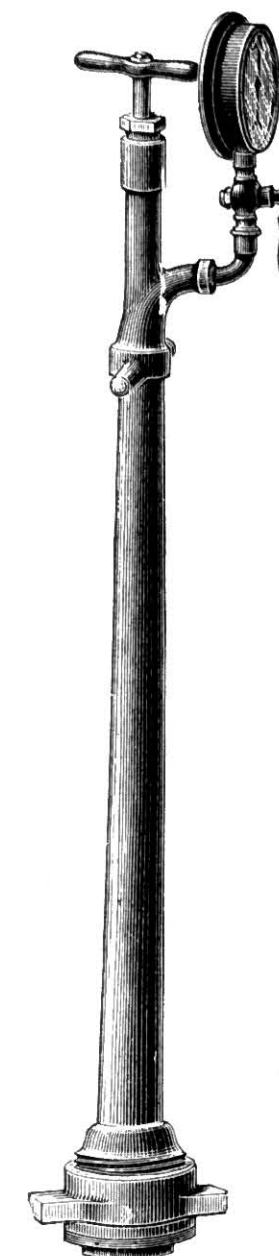


Fig. C 177.



PRICES.

C 175—Cap and Bent Union for attaching to Standpipe, for taking pressures, *not* including Pressure Gauge, each.
C 177—Light Standpipe to suit Ball Hydrants, for taking pressures, with Gauge Cock, but *not* including Pressure Gauge, ,,

PRESSURE GAUGES.

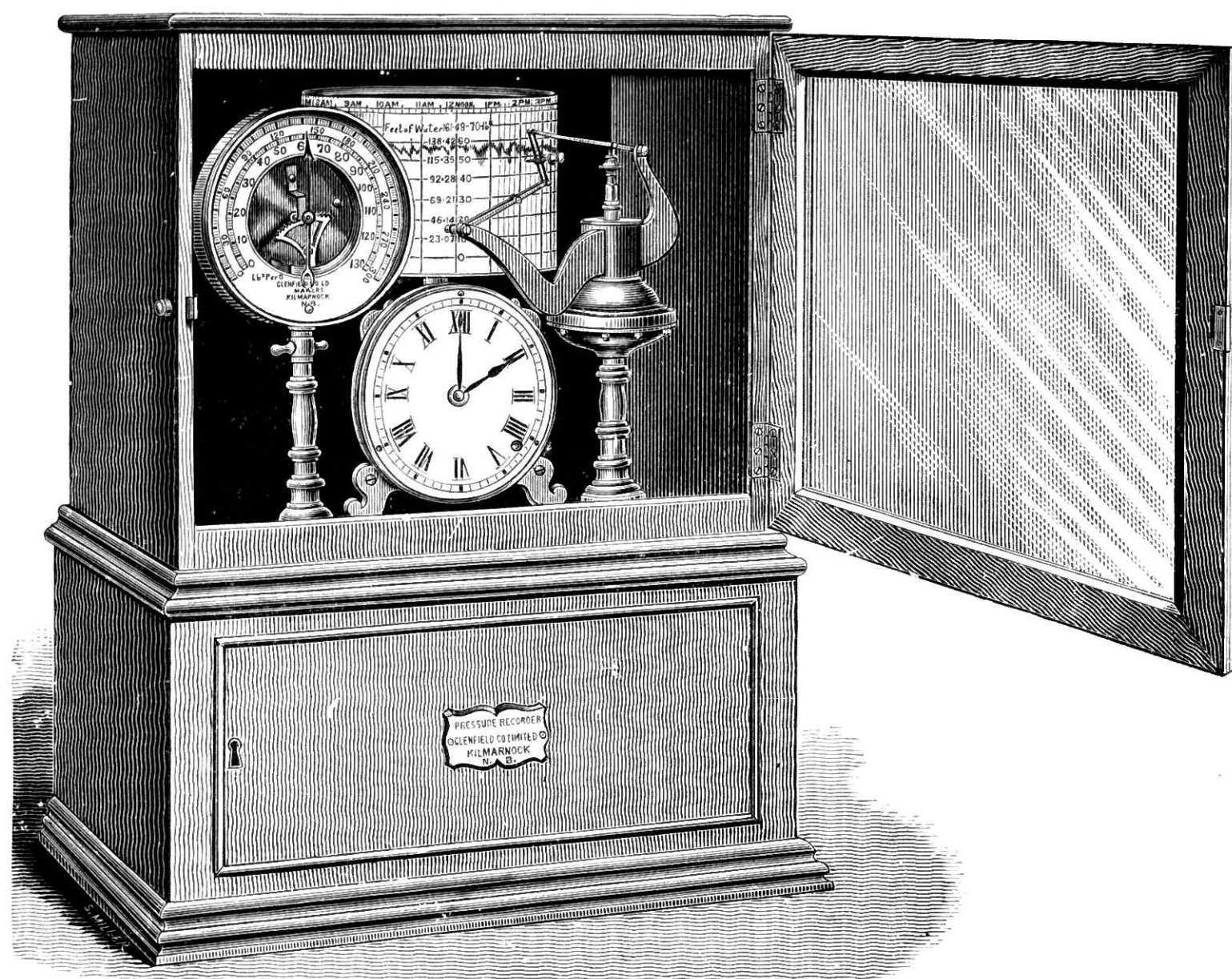
Specially made and accurately graduated in Ft. in column of water and Lbs. per sq. in. from Mercurial Column.

	4"	5"	6"	7"	8"	dia.
Pressure Gauge, with { Cock and Union, each.						
Maximum Pointer, extra						
Open Dial, extra						

When ordering, please state what pressure the Gauge is wanted to be graduated up to.

Pressure Recorder.

Fig. H 109.



This Instrument gives an accurate record of the pressure on Water Main Pipes, Steam Boilers, or Blast Main. The pressure on any given day, hour, or minute can be read at a glance by referring to the Diagram.

The Instrument consists of Inlet Cock, Pressure Gauge, and Clock with Drum, all mounted in a neat mahogany Case, with glass front and top.

The Drum revolves once in 24 hours or 7 days. The Instrument being extremely sensitive, records the slightest variation of pressure, thus indicating waste on District Mains where the pressure should be steady during the night. When a burst occurs, it shows the exact time the burst took place by the sudden reduction of pressure. The same Instrument can be supplied in connection with an Alarm Bell placed in the Watchman's house which rings immediately when a serious reduction of pressure occurs.

For recording the pressure on Blast Main of Blast Furnaces a neat Mercurial Column is substituted for the Pressure Gauge.

For Steam users, the Instrument serves as a check on the Pressure Gauges on the Boilers, and, in the event of any accident, keeps a faithful record of the pressure in the Boiler at the time of accident. In the case of Boilers working at different pressures, two Indicators can be placed to record on the same Drum.

PRICES.

Complete as shown	to give daily diagram,	each.
	with Clock having weights, and Case to stand on floor, to give one week's diagram,	

Diagram Papers extra.

Pressure Recorders.

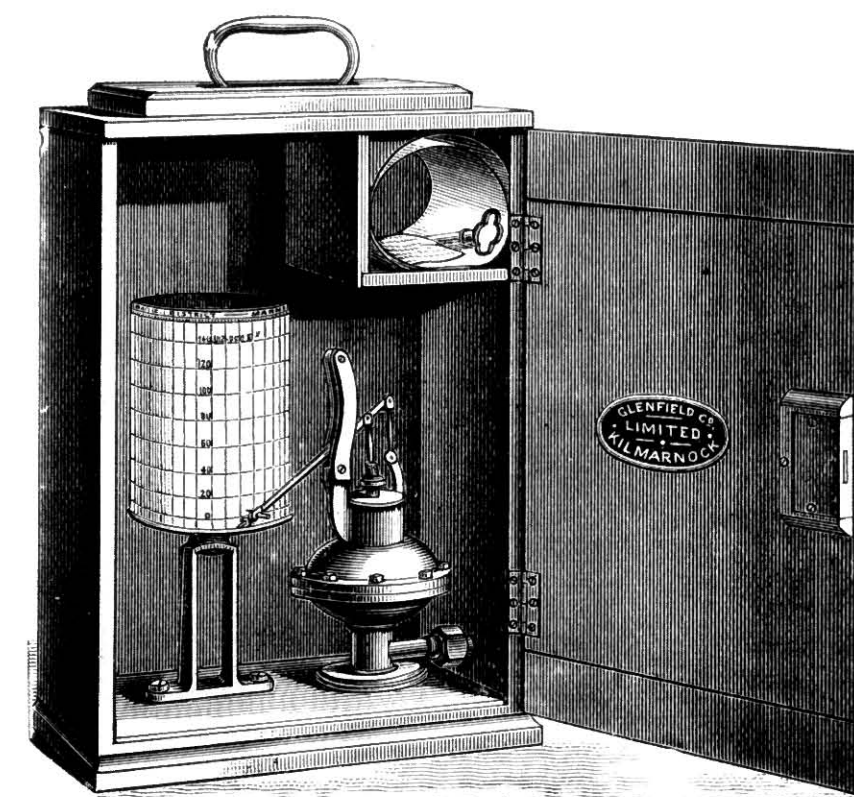
Pressure Recorder
In Cast Iron Case.

Fig. H 110.



Portable Pressure Recorder
With Drum.

Fig. H 114.



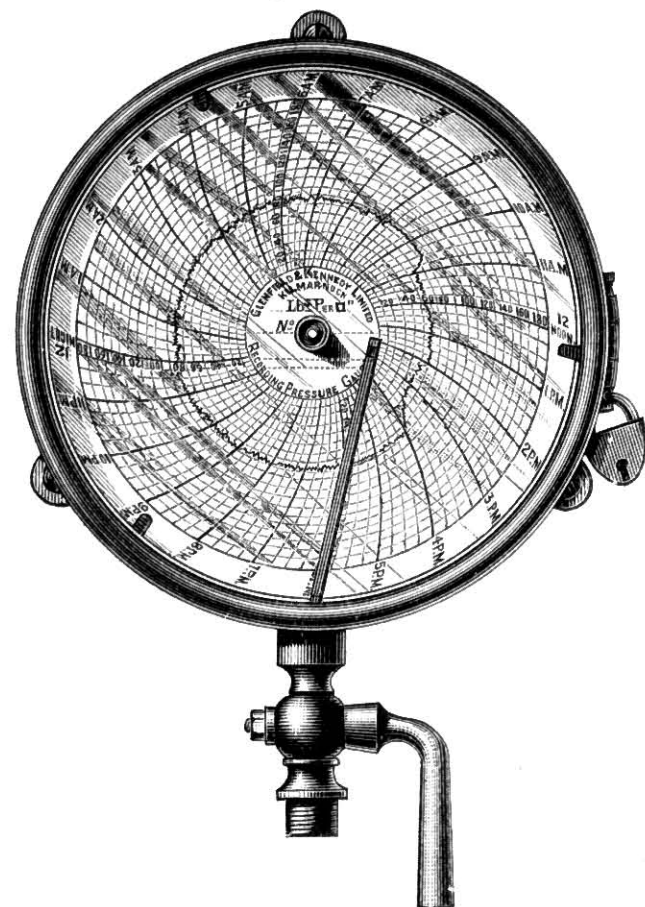
PRICES.

H 110—Pressure Recorder in cast iron Case, suitable for placing on street or for daily diagram,	each.
other exposed position, with Clock, Drum, and Pressure Gauge, for weekly .. .. .	..
H 114—Portable Pressure Recorder for daily diagram, with Clock inside of small vertical Drum, with 6' of Hose Pipe and Connection, in neat mahogany Case for carrying about. Handle is folded down and a night Lamp placed on top when taking Diagrams on the street during the night, .. .. .	..

Diagram Papers extra.

Pressure Recorders.

Fig. H 111.



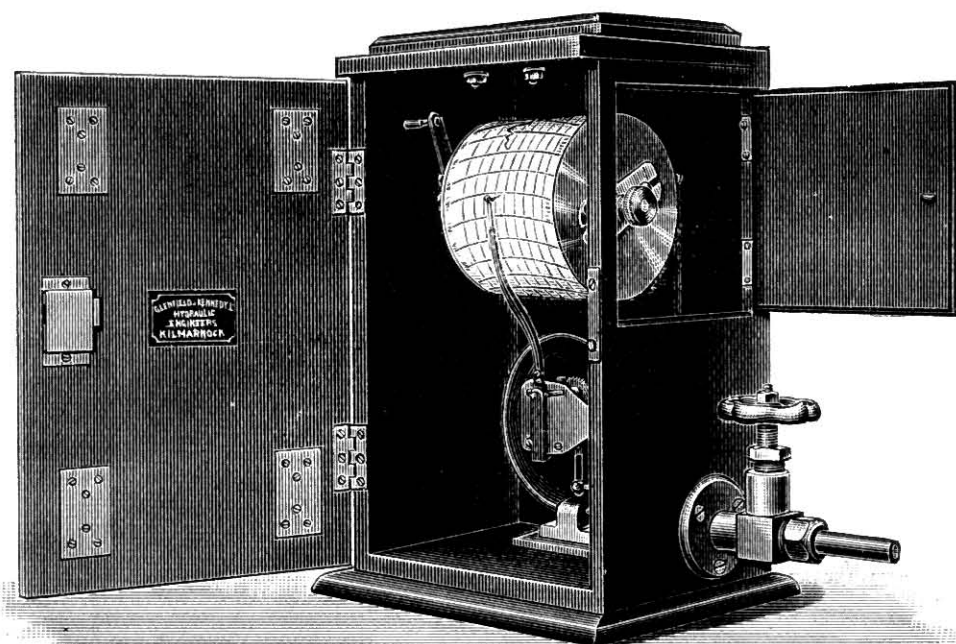
PRICES.

H 111—Portable Pressure Recorder, with brass casing which encloses a strong well-made clock and a flat disc. The disc carries the diagram and describes a complete revolution in 24 hours or 7 days. As the disc revolves, a pen actuated by the pressure marks on the diagram paper the exact pressure at any period.

For daily diagram, ... 1/5 each.

For weekly ,, .. ,,

Fig. H 113.



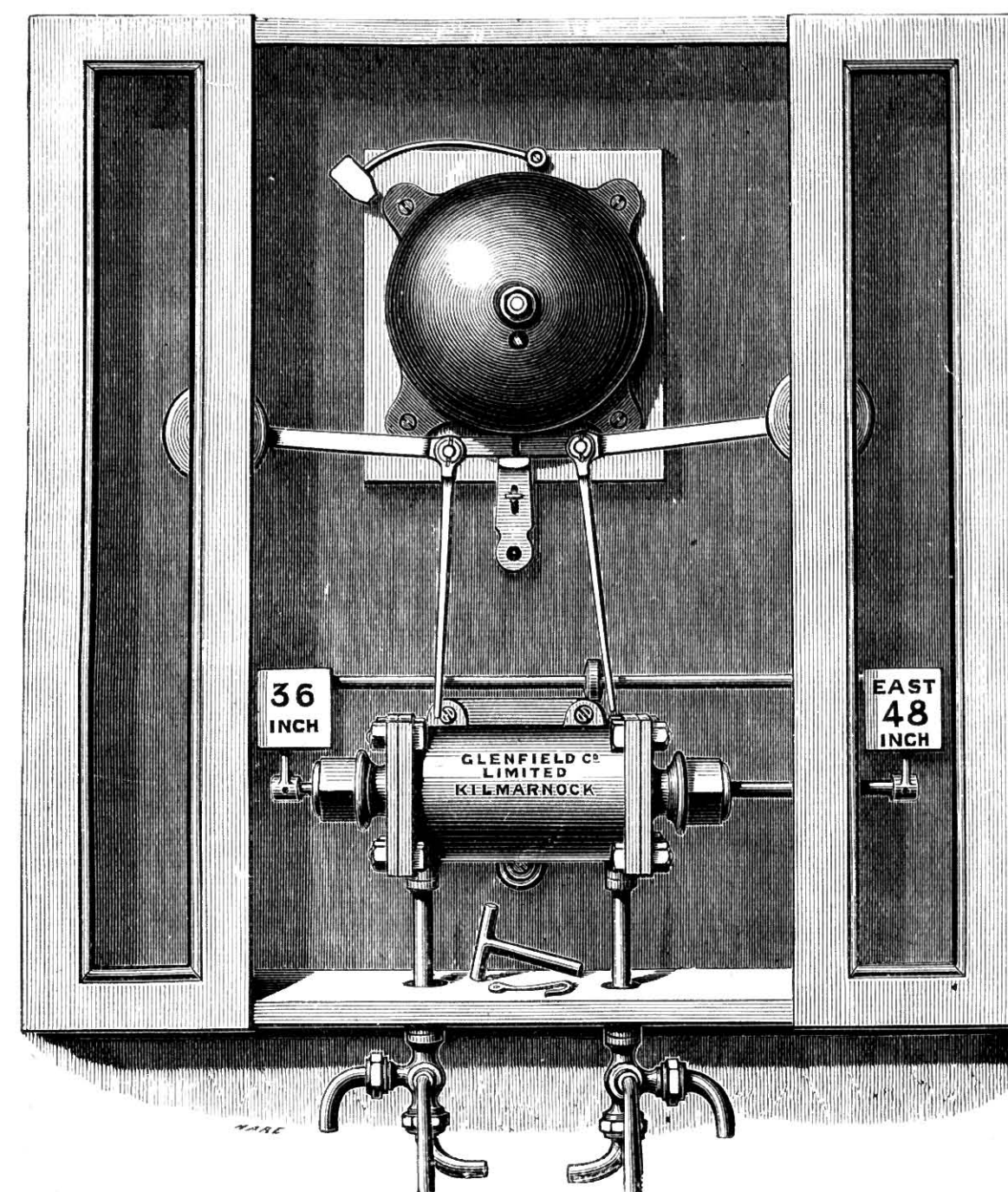
PRICE.

H 113—Portable Pressure Recorder for daily diagram, with clock inside of small horizontal drum, with 6' of Hose Pipe and Connection, in neat Mahogany Case for carrying about. Handle is folded down and a night lamp placed on top when taking diagrams on the street during the night, each.

Diagram Papers Extra.

Alarm for Detection of Burst on Water Main Pipes.

Fig. H 115.

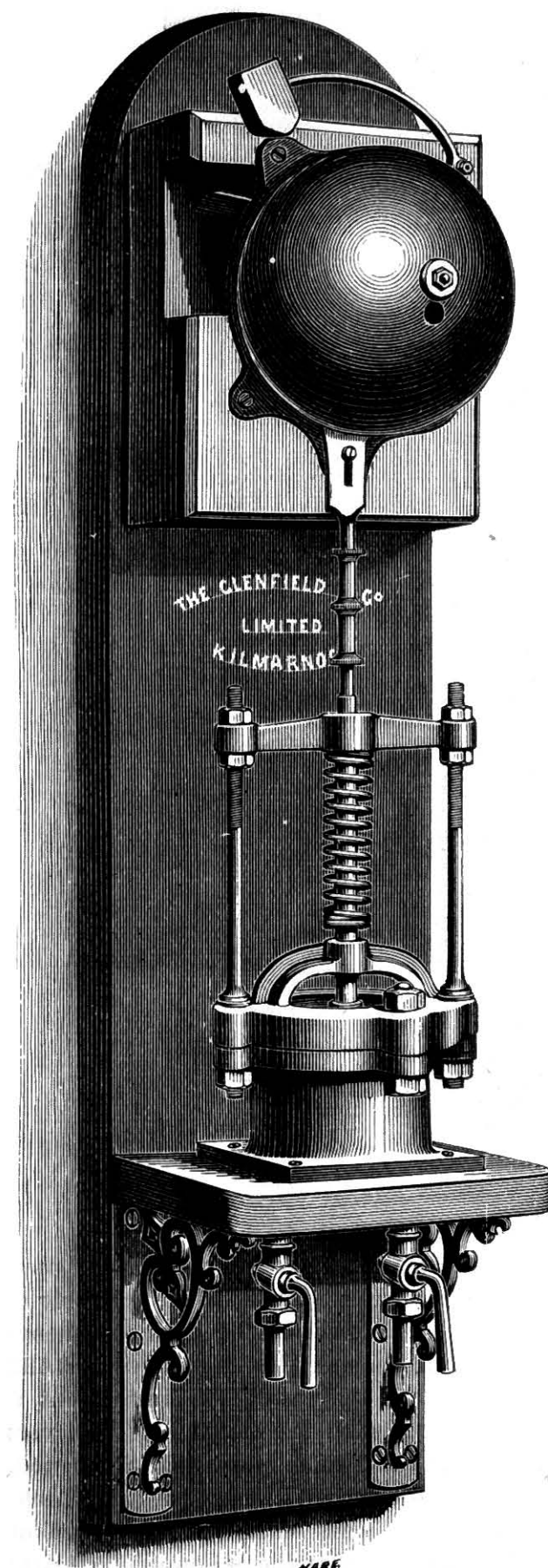


Service Pipes from two separate Mains under similar pressures are connected to the Cocks at bottom of case. The Cylinder is furnished with a Piston, which is balanced by the pressure from each Main on each side of piston. When one of the Main Pipes has burst, the piston is forced to one end of the Cylinder in consequence of the pressure in the burst Main having been relieved. A brass plate, having name of Main engraved, "EAST 48 INCH," is thus brought into view, and is seen through a glass panel in the case. The Instrument is covered in by mahogany folding-doors, locked, which have been taken off to show the Machine. The levers in connection with the Alarm Bell are actuated by the cam on rod over Cylinder, which moves with the piston, and sets the bell ringing, which continues for about three minutes. The Alarm being placed in the Watchman's house, he is wakened if asleep, and, as it is seen at a glance which Main has burst, he hastens to shut down the Valve to get Main repaired. The Cocks at bottom are three-way, so that the action of the Alarm can at any time be tested by experiment, by relieving the pressure on either side of the piston.

Prices on application.

Alarm for Detection of Burst on Water Main Pipes.

Fig. H 116.

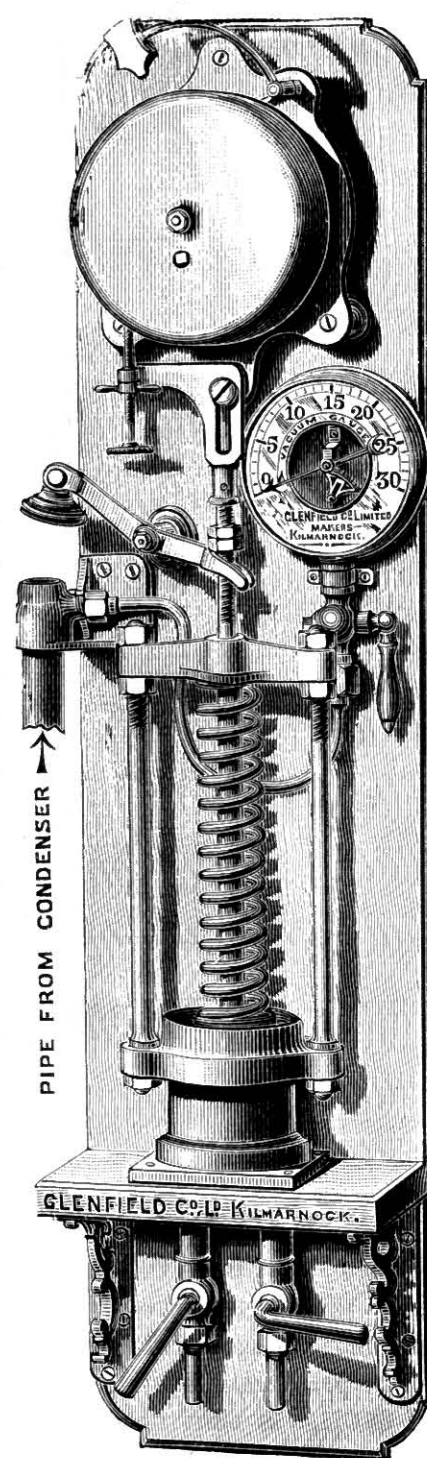


H 116—A Service Pipe from Main, $\frac{1}{2}$ " or $\frac{3}{4}$ " bore, is connected to one of the Cocks on bottom of cylinder. The pressure of water from Main raises a piston, which compresses the steel spiral spring and raises the lever in connection with the Alarm Bell. The Instrument is placed in the Watchman's house, the Bell being kept wound up. When the Main bursts, the pressure is at once relieved, and causes the fall of the piston, which, setting the Bell ringing, awakens the Watchman, who hastens to shut off the water at the Valve. The second Cock in bottom of cylinder is for the purpose of letting off air and for testing the action of the Alarm. When in use the Machine should be tested at least once a day.

H 117 shows a small Valve which is connected by a pipe to Condenser of Pumping Engines. When a burst occurs, the vacuum in Condenser is destroyed and engine slowed down automatically.

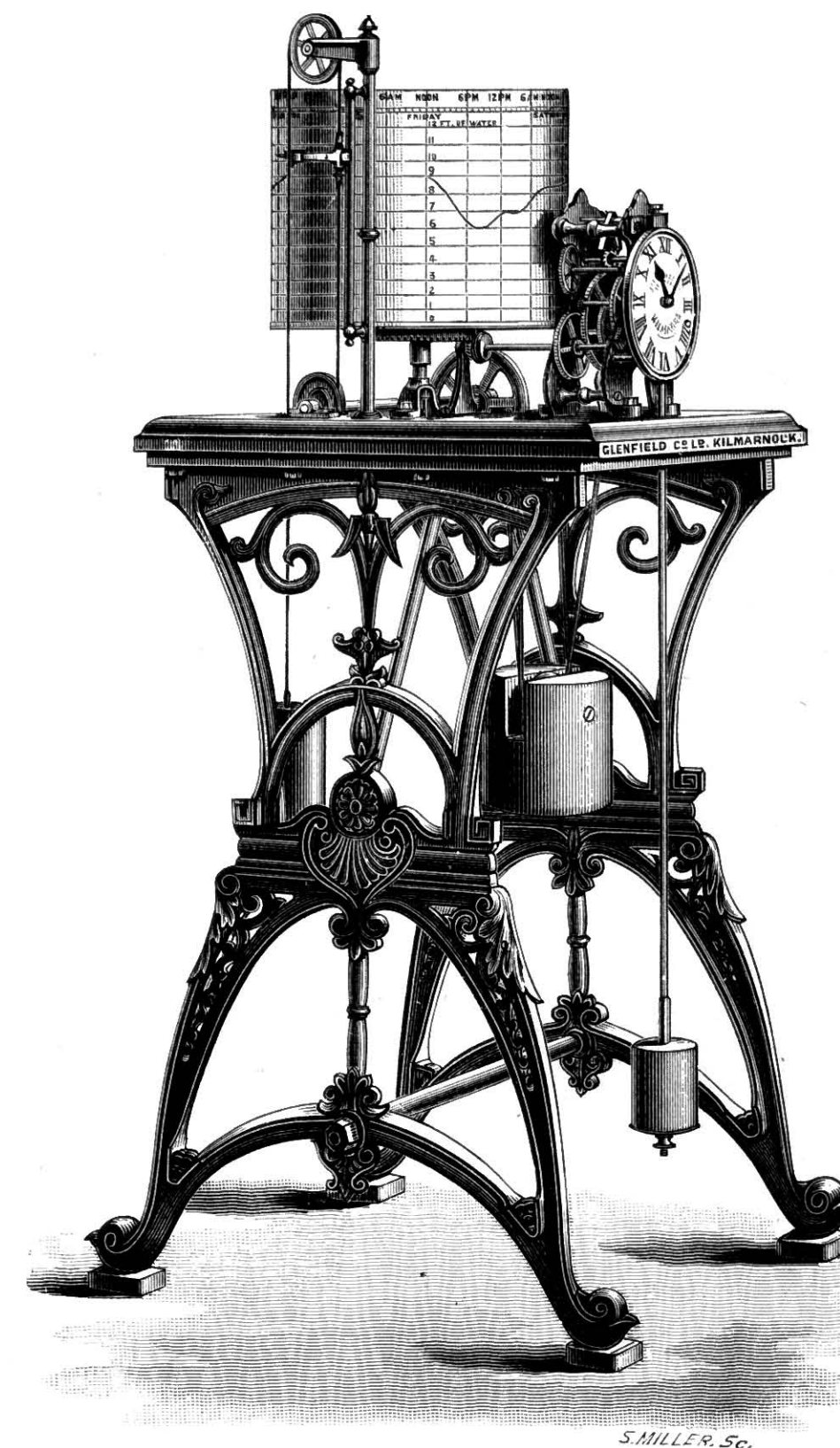
Prices on application.

Fig. H 117.



Water Level Recorder on Cast Iron Standards.

Fig. H 120.

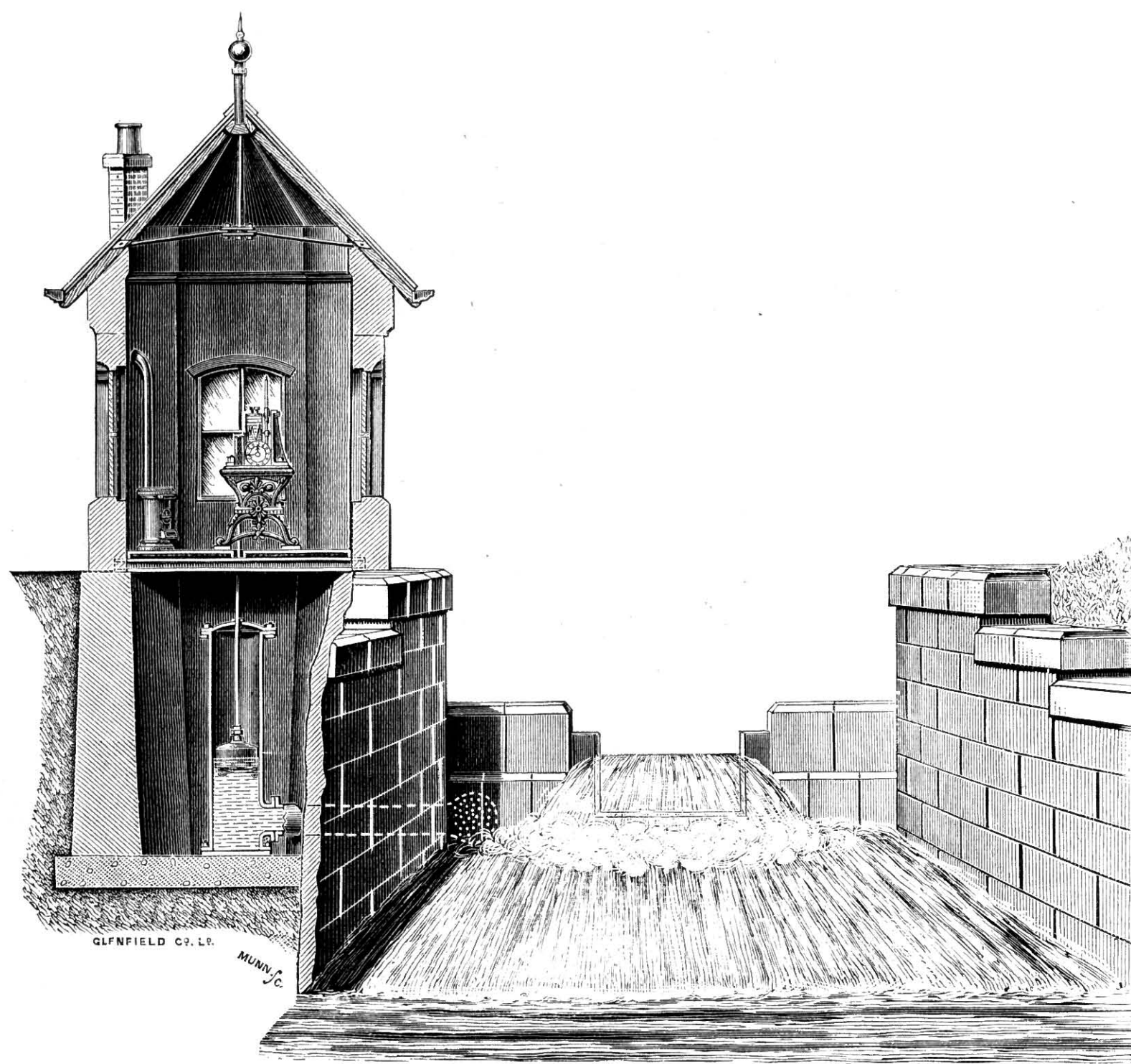


This Instrument records the level of water flowing over a weir, level of tide, or for any similar purpose. It is provided with strong 8-day Pendulum Clock. The motion of pen marking on Drum can be reduced in any suitable ratio required. Recorder may have Clock and Drum to give a monthly Diagram if desired. Instruments have been made with three Drums, a long paper unwinding from Drum No. 1 over Drum No. 2, and coiling on to Drum No. 3, the paper being changed once a month.

Prices on application.

Weir Gauge and Water Level Recorder.

Fig. H 121.

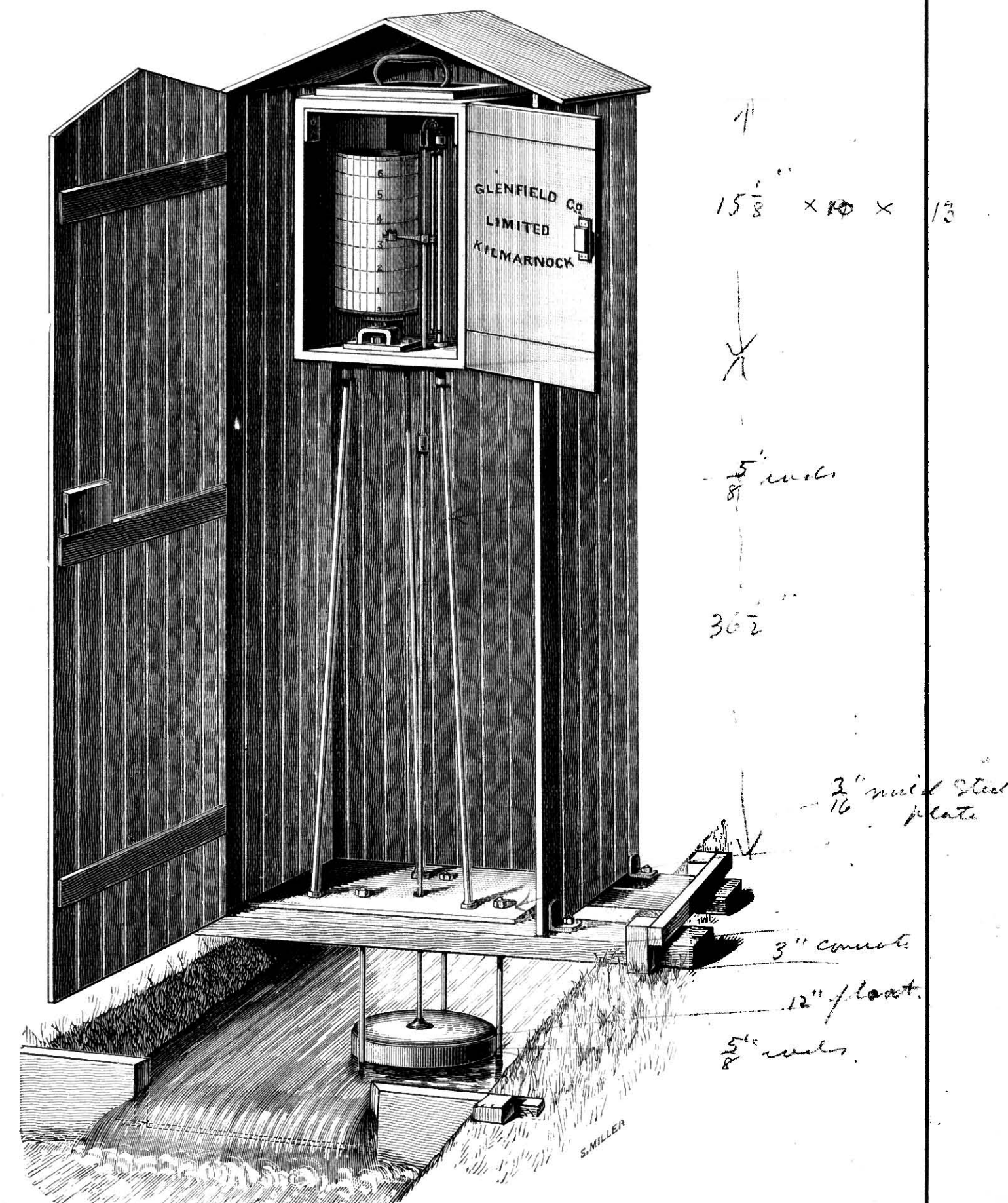


The above illustration shows the application of Recorder on previous page.

The Drum carrying Diagram is driven by a powerful Clock. The Diagram may be daily, or weekly, or arranged to do without changing papers for a month. The float is of copper. The work is of the best material and high-class finish.

Portable Water Level Recorder.

Fig. H 122.



The wood Hut shown for covering the Instrument can be supplied, if wished, at an extra cost.

PRICE.

Portable Water Level Recorder, with Clock (24-hour) inside Drum, with copper Float and Rod Complete. Drum enclosed in light mahogany Case with Handle. The Supports are detachable,

each.

Diagram Papers extra.

Hutchison's Patent Discharge Recorder.

Fig. H 124.



This Instrument records, by means of the cam and pen carriage, the *Rate of Discharge* on Drum (24-hour or 7-day) in gallons or cubic feet per minute over V notch, rectangular weir, or open channel of known dimensions. By simply taking the area of diagram, the total Discharge for any period can be ascertained much more quickly and more correctly than from a diagram giving the simple height flowing over weir. If it is desired to record height on same drum, a pen can be added to give this, as illustrated above.

For particulars see next page.

Prices on application.

Hutchison's Patent Discharge Recorder.

The great advantages of the Curve are—

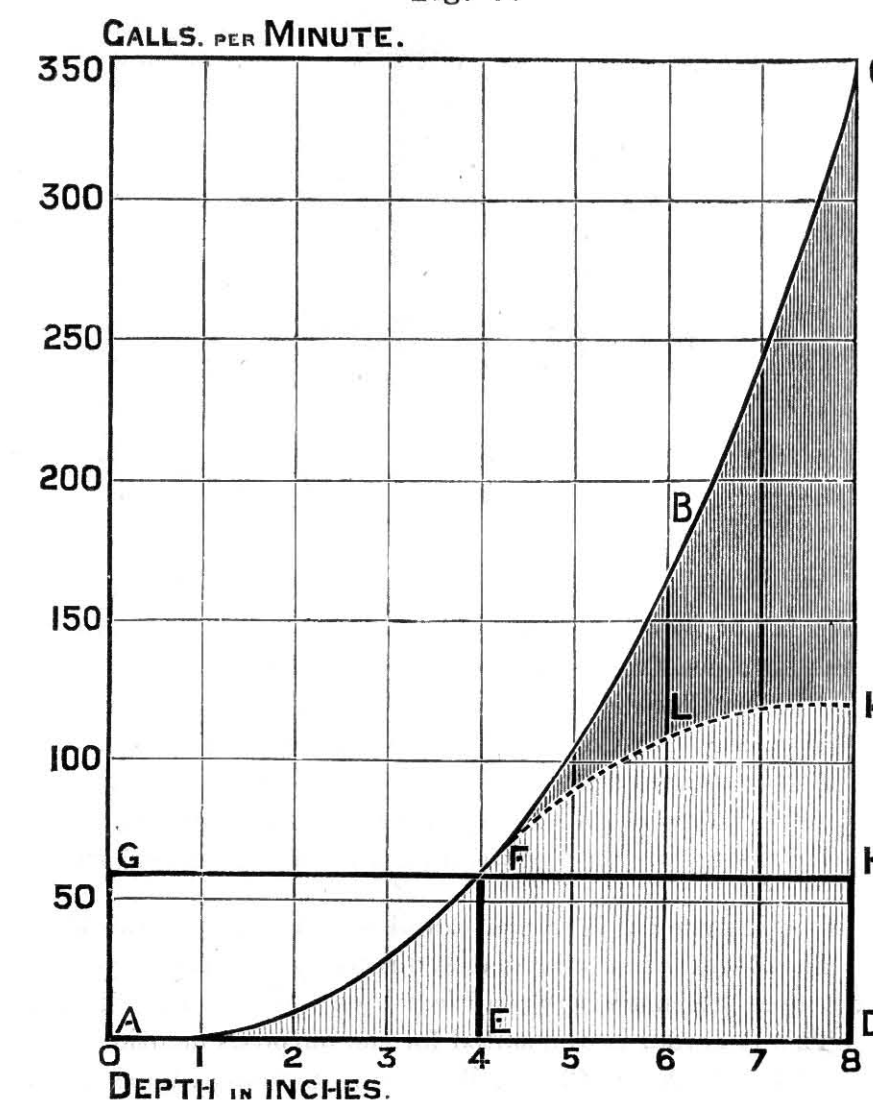
- (1) The Rate of Discharge at any given instant is got by scaling the corresponding ordinate, or at sight, if the diagram paper is ruled to scale:
- (2) The Discharge for any given period is got by taking the area of the corresponding figure by a planimeter or otherwise.

It should be noted that Curves drawn by machines which simply record the depth of the water over the sill cannot in general be integrated for Discharge, and before an accurate estimate of the Discharge can be formed from them, a "Rate of Discharge" Curve must be plotted, each ordinate involving a calculation of the form, $y = kx^n$.

Also, if, instead of making the said calculations, an estimate of the Discharge for the given period be made for the mean depth, in certain cases an error as great as 35 % may be got in the result, as shown in Fig. 3.

Let the Curve of depths over the notch for a given period be a straight line, the depth running from 0" to 8", then the Curve ABC will be the corresponding Curve of Rate of Discharge, and the total Discharge for the period will be proportional to Fig. ABCD. Now the average depth for the period is 4", and the corresponding Rate of Discharge is given by the ordinate EF and the total Discharge is proportional to Fig. AGHD. Hence is lost the Discharge corresponding to the area FBCKLF, which will be found to be over 35 % of correct Discharge.

Fig. 3.



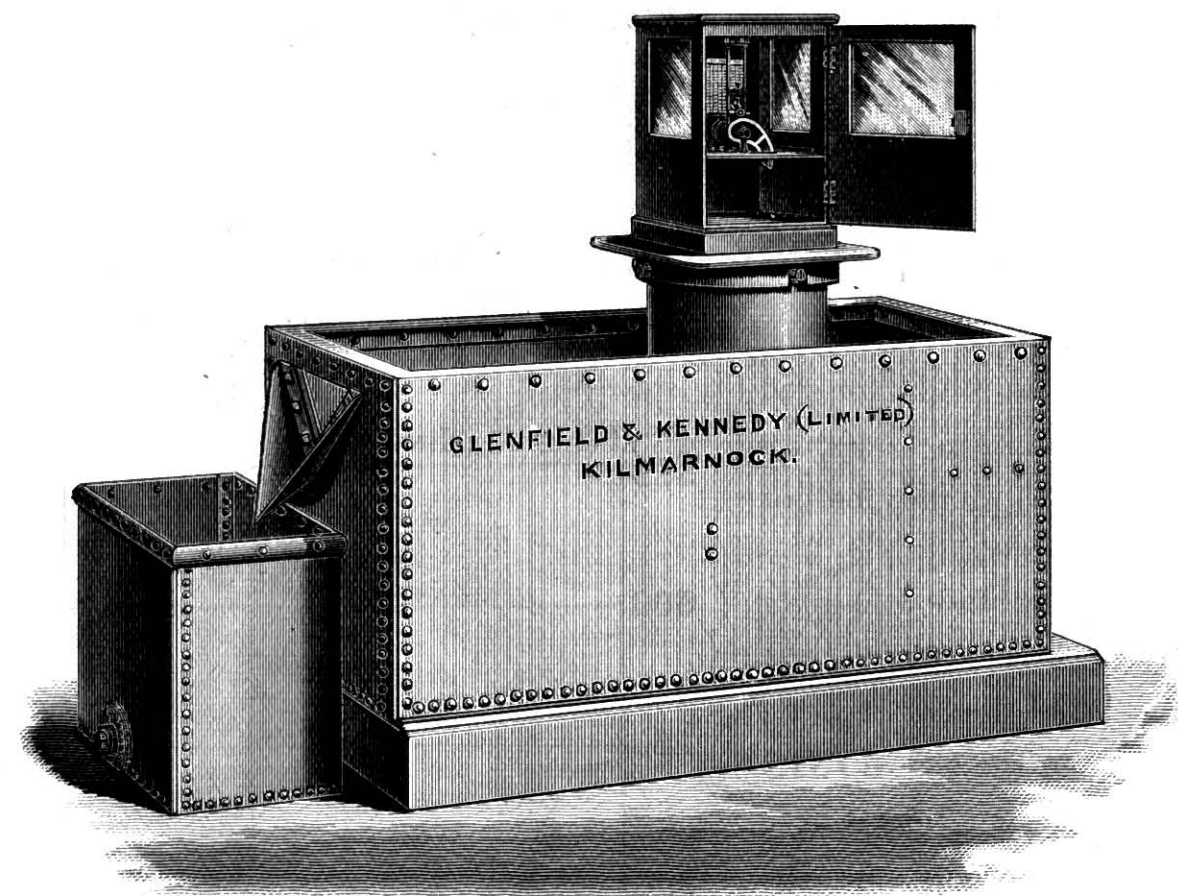
NOTE.—In ordering a Recorder, full particulars as to dimensions of notch or sill, state of water above sill, formula used, probable discharge, etc., should be given.

There is no limit to the Discharge which may be recorded by this Apparatus.

Hutchison Discharge Recorder and Measuring Tank.

For the measurement of Discharge from Air Pump, Boiler Feed, Flow over Weirs, etc.

Fig. H 125.



This Instrument records on Diagram by means of a Cam and Pen Carriage, which are actuated by the rise or fall of Copper Float, the *rate of flow* in gallons, pounds, or cubic feet, over V Notch, Rectangular Weir, Orifice, or open Channel of known dimensions.

A Lever Clock is placed inside of Drum, which is arranged to give daily or weekly Diagrams.

Provided with Copper Float and Phosphor Bronze Float Cord.

As the variations in the levels of float do not give equal quantities in the flow, the Cam is plotted from the curve of flow to give an equal scale on the Diagram.

By taking the area of diagram with a planimeter, the total quantity passed during any period can be ascertained.

The Instrument is compact, and is enclosed in a neat Mahogany and Glass Case, and takes up little space.

The Recorder may be placed directly over Tank, as shown in illustration, or may be placed at a distance and connection made between Float Pipe and Measuring Tank by means of a Pipe.

This Recorder is well suited for the purposes mentioned, and is a useful adjunct in Boiler House Installations, Electric Power Plants, Water and Sewerage Works, etc.

This type of Recorder can be made to register any desired rate of flow.

The Measuring Tank is of galvanized mild steel plates, and is provided with horizontal perforated and vertical plain baffle plates. The opening, which is fitted with brass lip, may be a V Notch, or Rectangular Weir, as preferred.

Prices furnished on receipt of particulars giving maximum and minimum quantities to be measured, also whether a daily or a weekly Diagram is desired.

Wheel Press Recorder.

Fig. H 154.

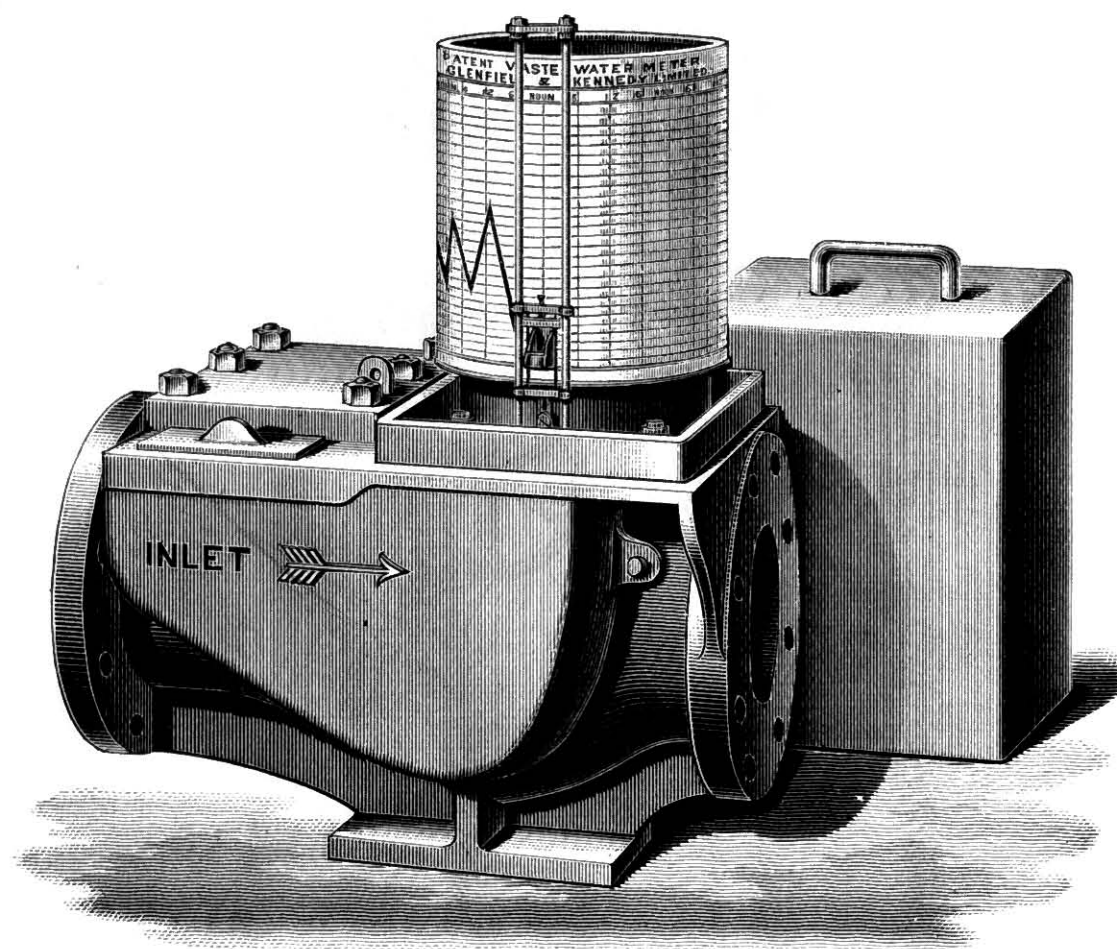


The above illustration shows an Instrument which records the power required to force waggon and other wheels on their axles. With Mahogany and Glass Case to cover the instrument.

Prices and particulars on application.

Patent Waste Water Meter.

Fig. H 208.



This Meter is principally used for the detection of waste.

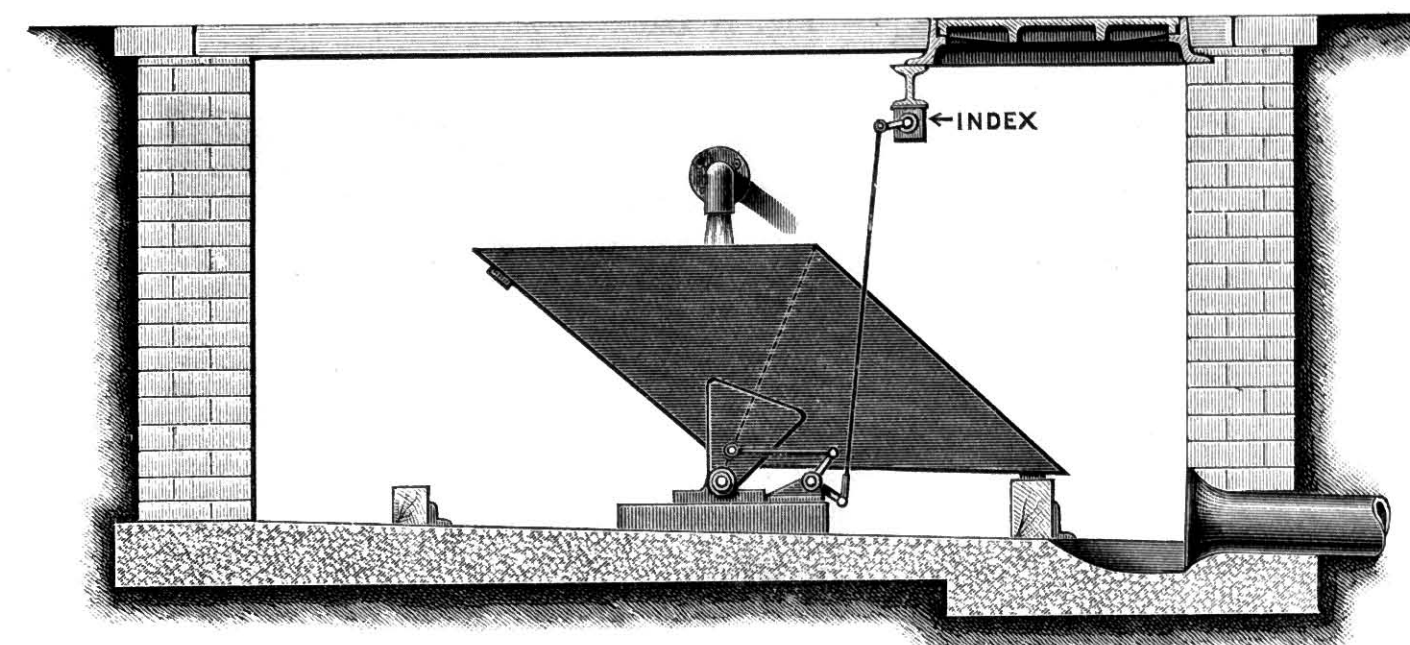
It gives a continuous record on a chart of the *rate of flow* in the pipe to which it is attached, and, if required, the total quantity over a given period is calculated from the mean rate obtained from the chart.

Size of Meter. Inches.	Maximum delivery per hour. Gallons.	Size of Meter. Inches.	Maximum delivery per hour. Gallons.
2	4,000	12	106,000
3	8,000	14	140,000
4	14,000	15	165,000
5	23,000	16	188,000
6	30,000	18	238,000
7	40,000	20	292,000
8	50,000	22	356,000
9	62,000	24	420,000
10	73,000		

Prices on application.

Tumbling Meter.

Fig. H 209.



Tumbling Meter, with Index to register the number of gallons discharged—

Capacity of each Compartment.	Delivery per Hour.
67 gallons.	20,000 gallons.
58.4 „	17,500 „
50 „	15,000 „
41.67 „	12,500 „
33.34 „	10,000 „
25 „	7,500 „
16.67 „	5,000 „
8.34 „	2,500 „
3.34 „	1,000 „
1.4 „	416.6 „

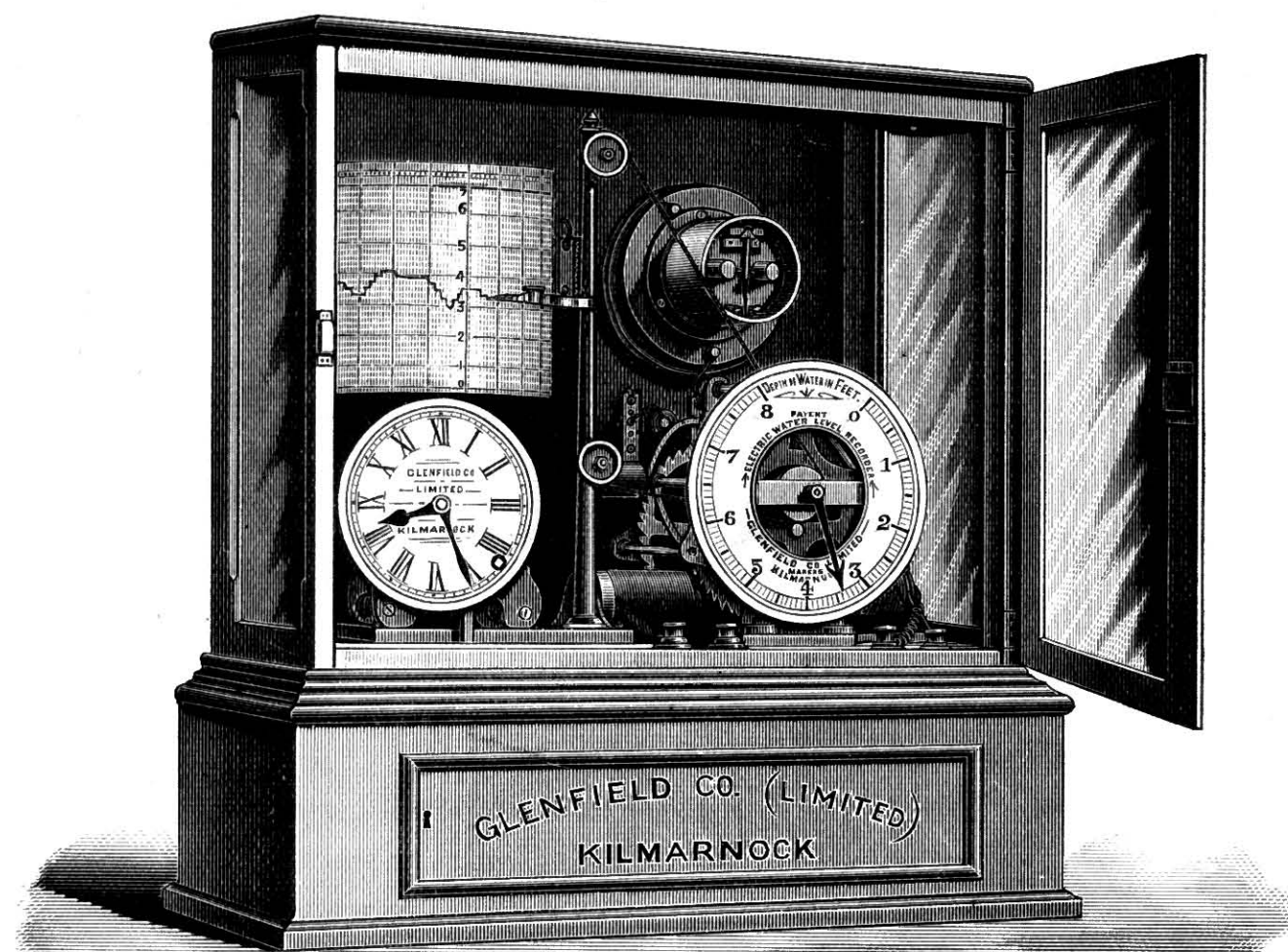
Used for measuring Drainage, etc., where great accuracy is not essential.

Prices on application.

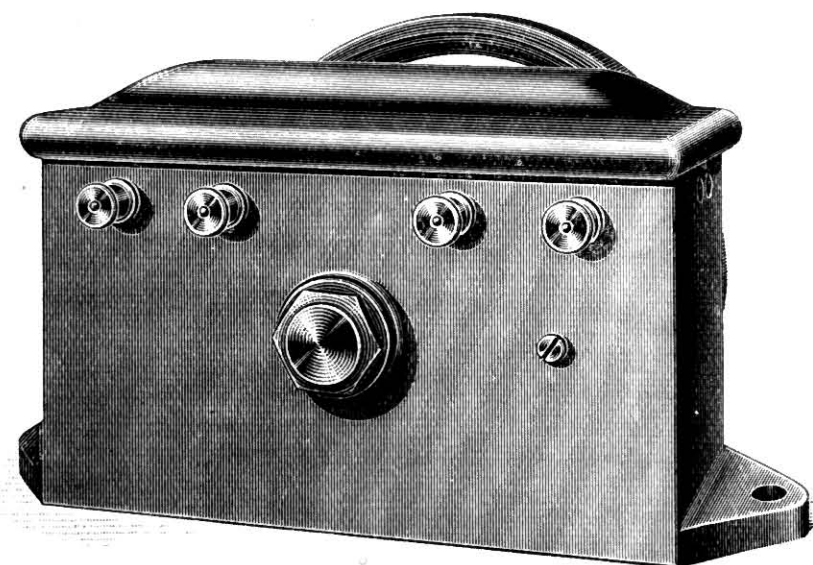
Patent Electric Water Level Indicator and Recorder.

Daily Receiving Instrument.

Fig. H 126.



Transmitting Instrument.



For particulars see next page.

Patent Electric Water Level Indicator and Recorder.

The illustrations on preceding page show—

Indicating and Recording Receiving Instrument for placing in office or engine house;
Transmitting Instrument for placing at reservoir.

RECEIVING INSTRUMENT.

The relay (shown fixed on back of case) operates (by battery in office) the Receiving Instrument with dial, and actuates the pen which marks the water level on diagram.

The Receiver can be arranged to take either *daily* or *weekly* diagrams.

That illustrated on the preceding page is a *daily* Receiver, the drum of which is rotated by a strong 30-hour spring Clock with dial showing the time.

On page 36 is shown a *weekly* Receiver, the drum of which is actuated by a strong 8-day pendulum Clock with time dial.

Receivers are generally fitted with both Indicating and Recording Apparatus. Either can, however, be supplied alone, and in that case the price per set is considerably reduced.

Where two or more Receivers are to be installed in one and the same office they can be arranged in *one* cover case. This reduces the cost per set, as only *one* Clock is necessary. On page 37 are shown *two* daily Receivers (Indicating and Recording) arranged in *one* cover case, with *one* Clock and *one* deep Drum to carry *two* diagrams, the one above the other on one and the same sheet. Two weekly Receivers can also be arranged in the same manner.

TRANSMITTING INSTRUMENT.

A battery of a few cells (depending on length of line wire) is placed at reservoir. This transmits a current every rise or fall of water in reservoir, in increments of $\frac{1}{4}$ " or any greater variation of level which is preferred, the contacts being made by means of the float.

The Transmitter is enclosed in an air and water tight cast iron case.

The whole Instruments are well finished, and Receiver is mounted in a neat mahogany and glass case.

All parts are strong, substantial, simple, easily got at, and not liable to derangement.

The whole can be fitted up and set to work by an ordinary skilled mechanic.

The same type of Transmitter is supplied for either Daily or Weekly Receiving Instruments.

Instruments are in use in

London, Rochester, Glasgow, Aberdeen, Perth, Gainsborough, Scarborough, Belfast, Great Marlow, Sutton (Surrey), Chatham, Birmingham, Nottingham, Newcastle-on-Tyne, Hull, Stockport, Whitehaven, Cromer, St. Helens, Basingstoke, Epsom, Sevenoaks, Okayama (Japan), Wellington (N.Z.), Maidenhead, Formosa (Japan), Epsom, Lurgan, Metropolitan Water Board, Hemel Hempstead, Bolton, Leeds, Swatow (China), Tonbridge, Lagos (Nigeria), Santos (Brazil), Harrogate, etc.

Repeat Orders have been supplied to

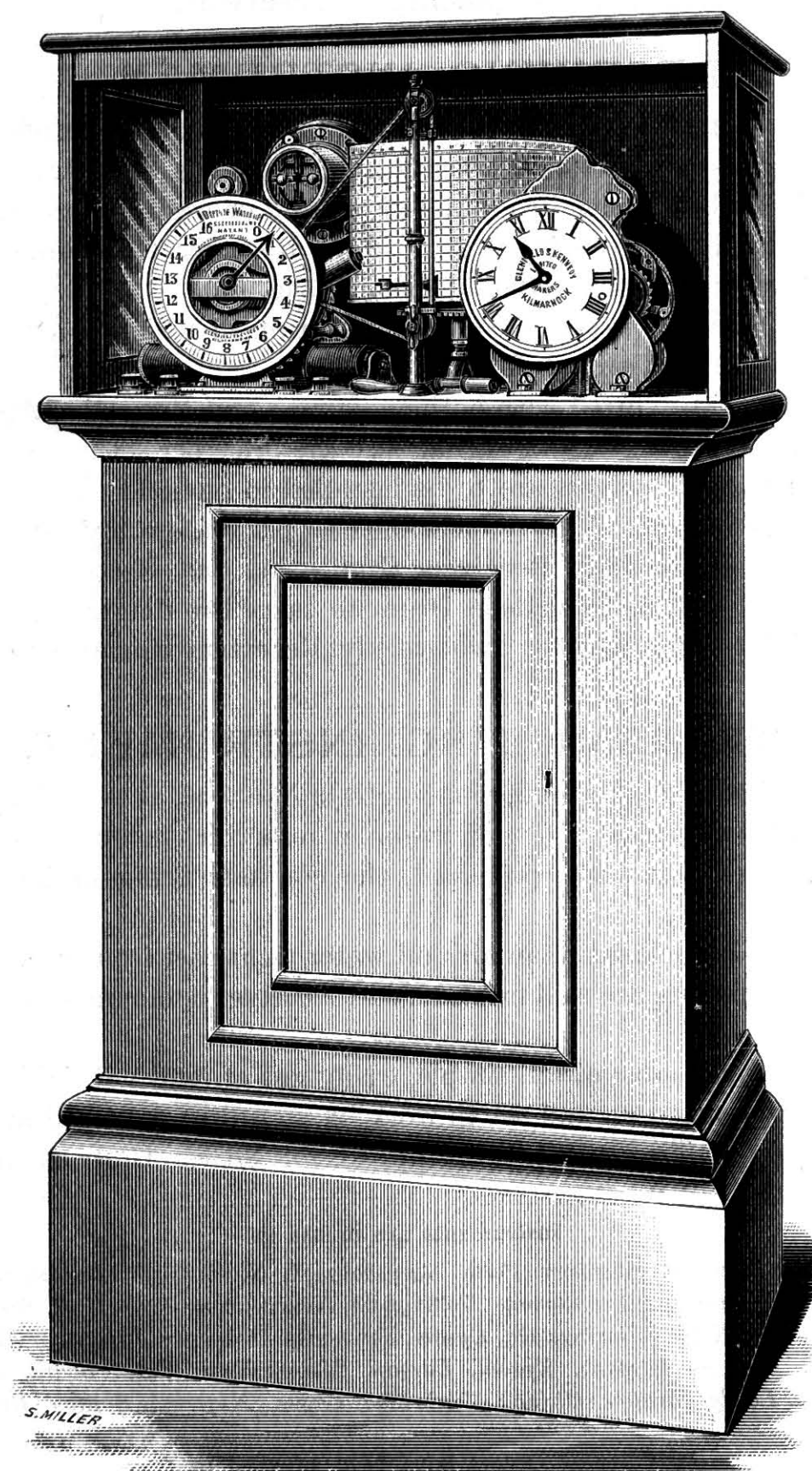
Glasgow, Perth, Belfast, Sutton (Surrey), Chatham, Newcastle-on-Tyne, Maidenhead, Formosa (Japan), Metropolitan Water Board, etc.

Prices on application.

Electric Water Level Indicator and Recorder.

Weekly Receiving Instrument.

Fig. H 127.

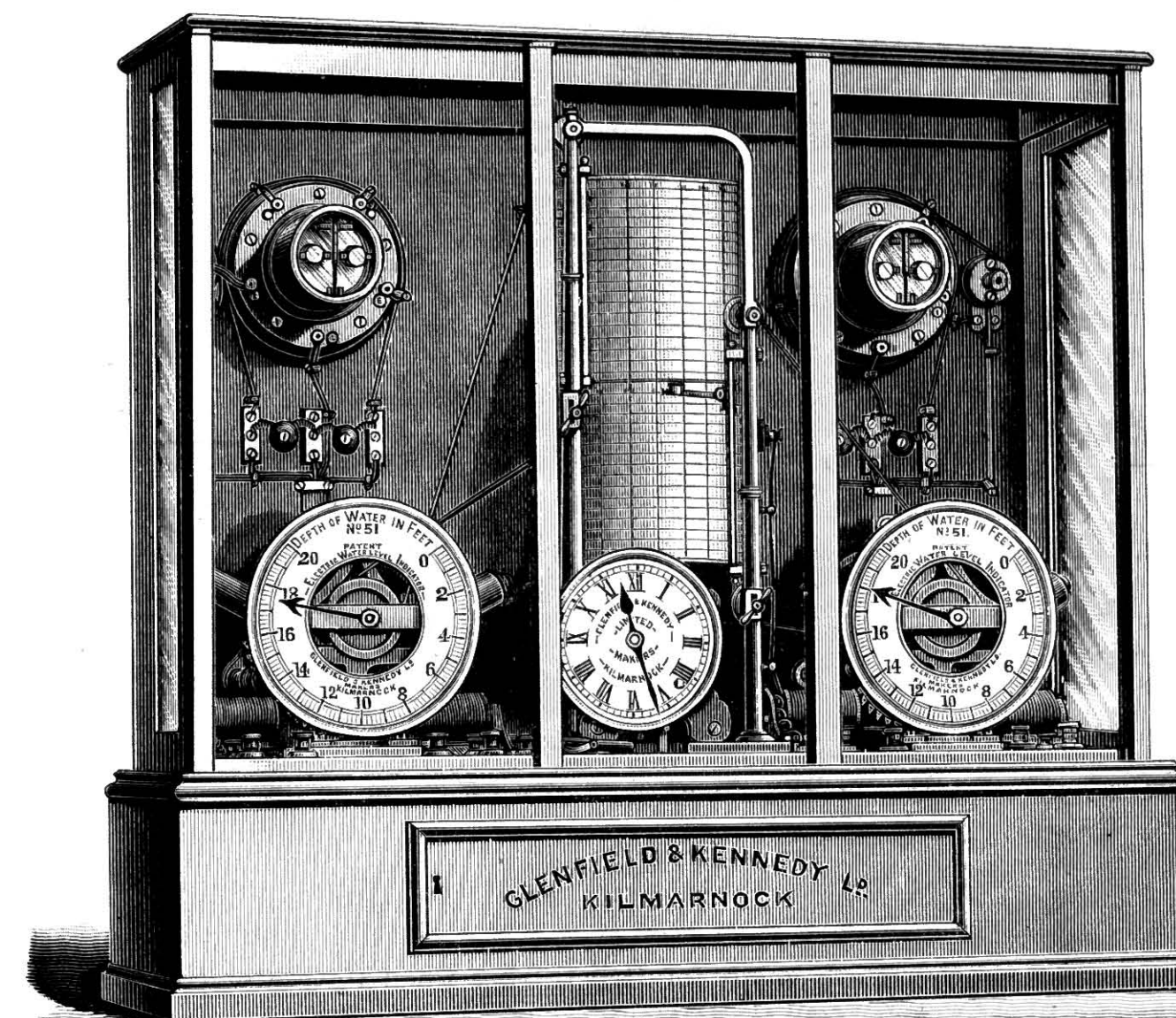


See page 35.

Electric Water Level Indicator and Recorder.

Two Daily Receiving Instruments in One Case.

Fig. H 128.

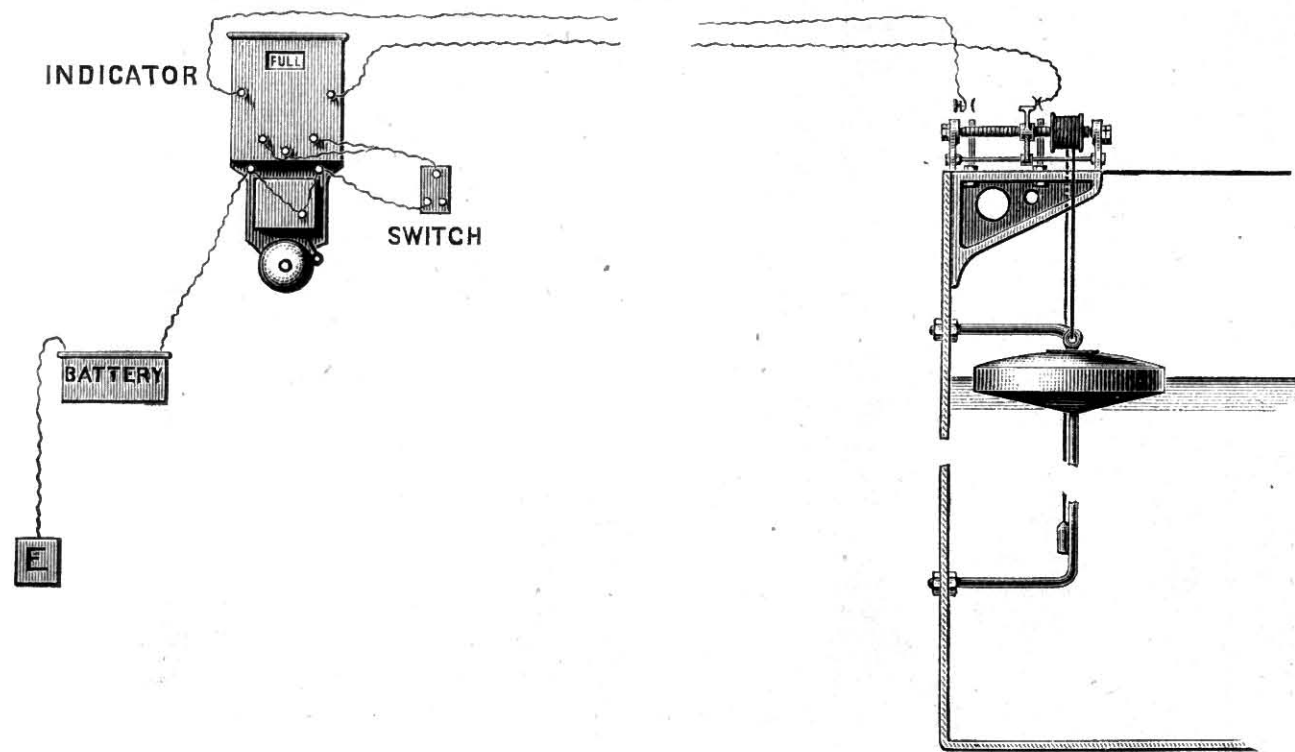


NOTE.—Recorders have also been made having four Weekly Receiving Instruments in one Case, with four Drums driven by one Clock.

See page 35.

Electric Alarm Bell Arrangement.

Fig. H 204.



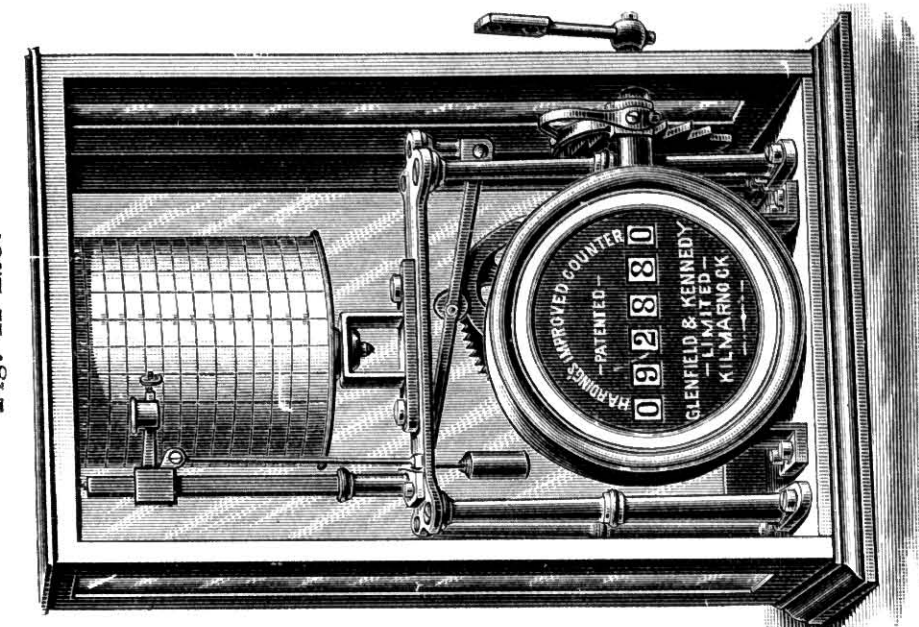
The above illustration shows Arrangement for Bell to ring when the water rises or falls to arranged depths.

When Bell is desired to ring at one depth only, the Apparatus is supplied without disc.

Prices on application.

Harding's Counter Engine Speed Recorder.

Fig. H 129.



This Recorder shows the number of Revolutions made during any hour of day or night.

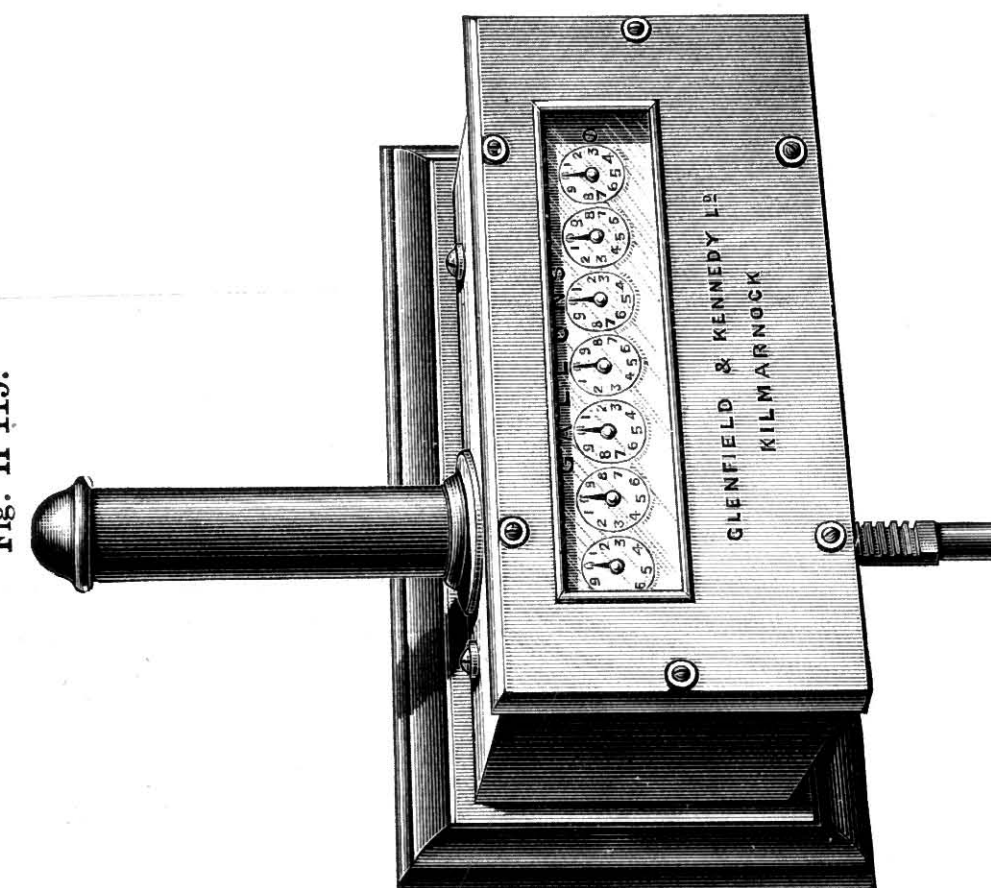
The Counter shows the aggregate.

PRICE.

H 129—Complete, with gearing carrying a pen which marks on a small drum revolving once in 24 hours, the whole mounted in a neat mahogany and glass case, each
Diagram Papers extra.

Pumping Engine Quantity Indicator.

Fig. H 119.



Indicator for putting on Pumping Engines of variable stroke to show quantity pumped.

Suitable for Cornish Pumping Engines, etc.

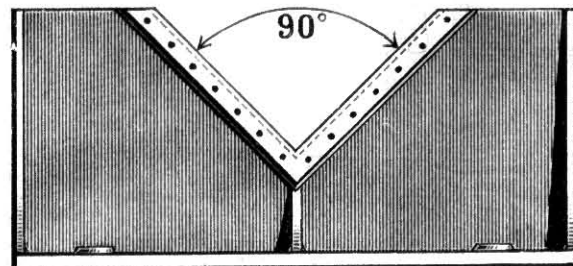
PRICE.

H 119—Complete as shown, each.
NOTE.—This is made double for indicating gallons pumped by a Duplex Pump with variable stroke.

Weir Gauges.

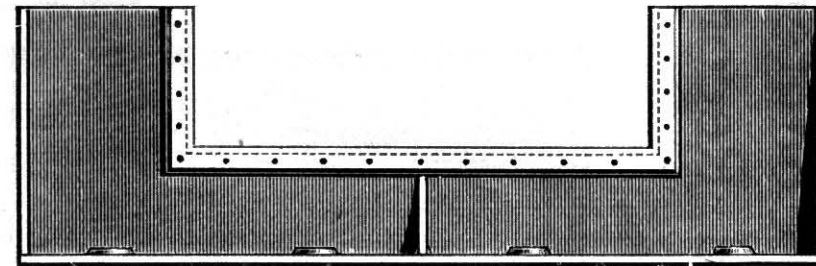
V Type.

Fig. H 97.



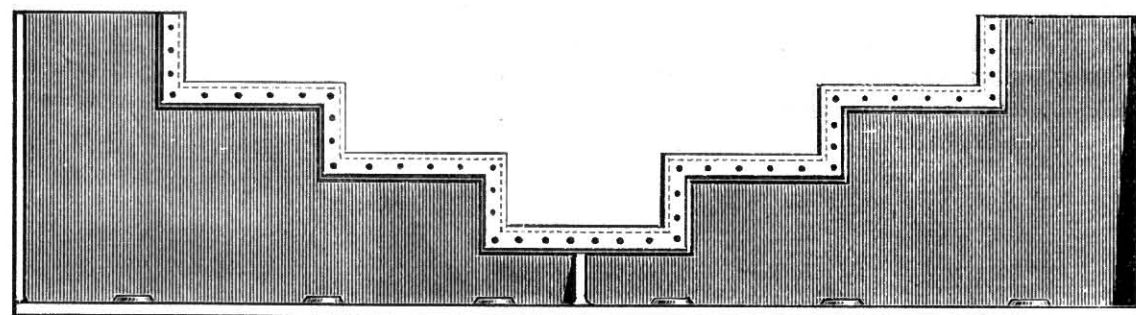
Rectangular Type.

Fig. H 98.



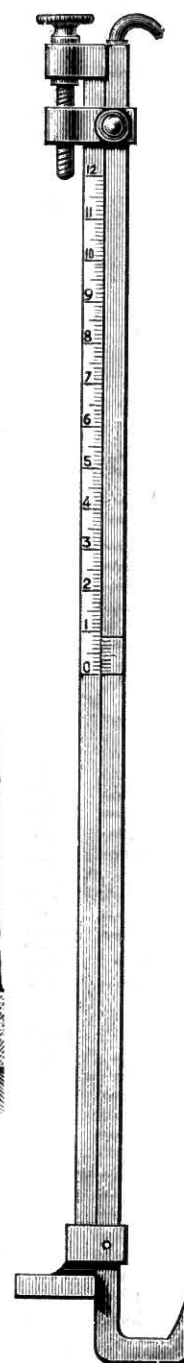
Step Type.

Fig. H 99.



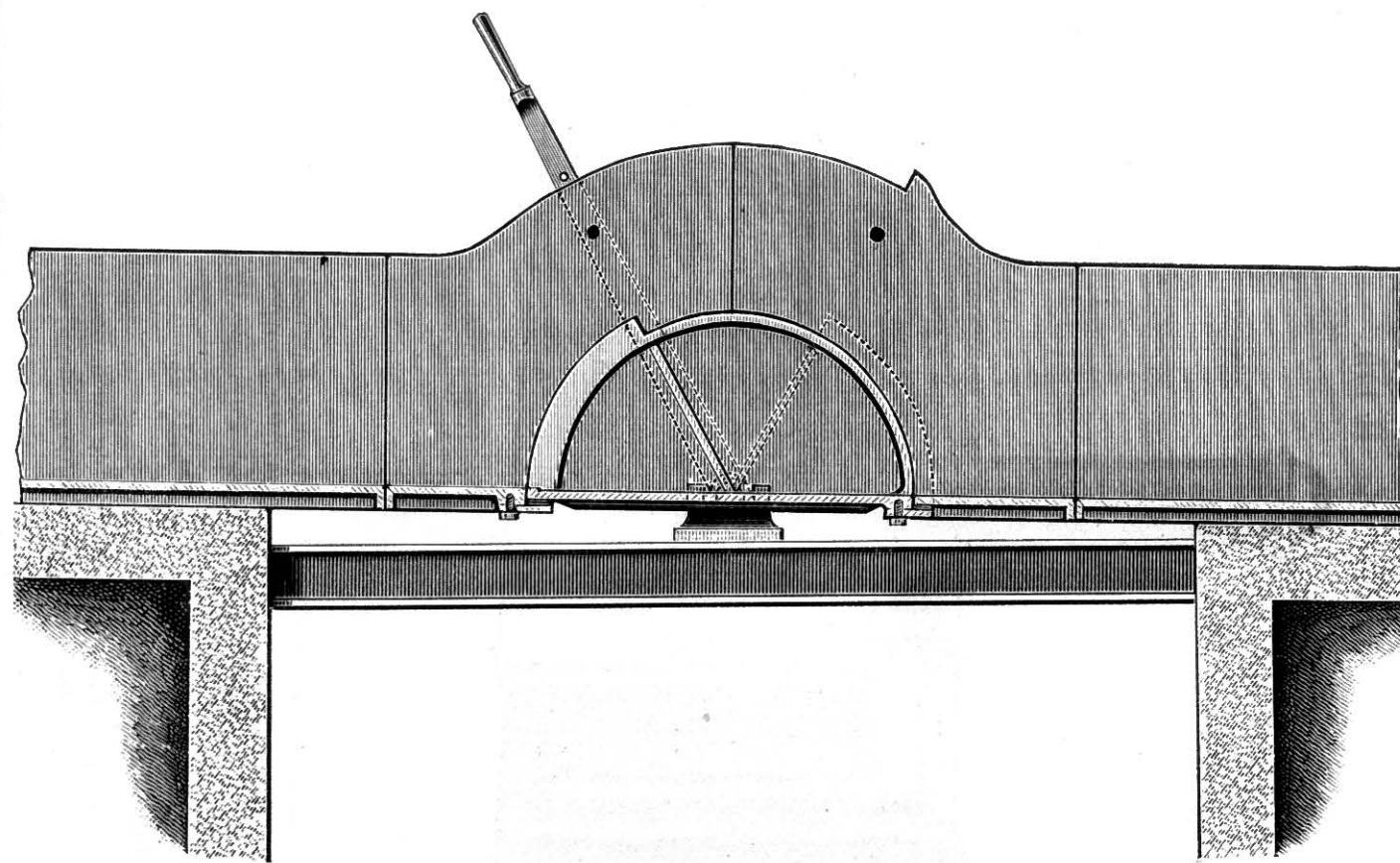
Hook Gauge.

Fig. H 90.



Tilting Weir for Measuring Chamber.

Fig. H 93.



According to Size and Quantity of Water to be Measured.

Prices on application.

Rain Gauges.

Fig. H 201.

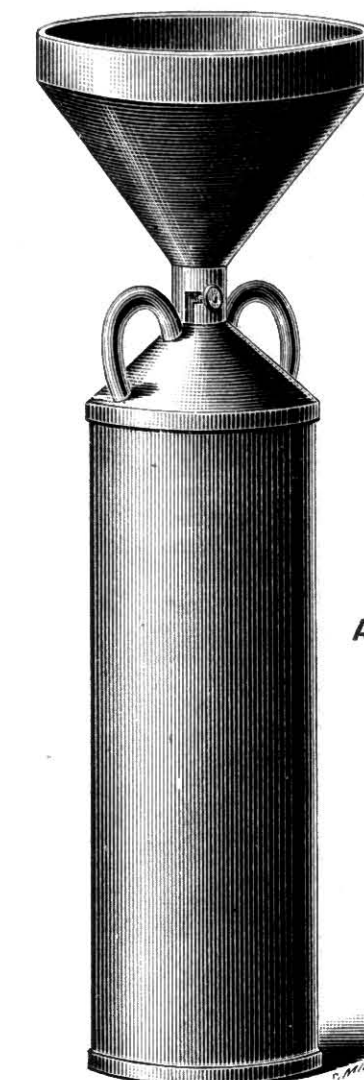
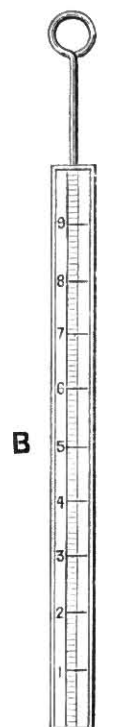
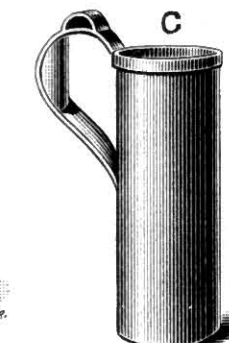


Fig. H 200.



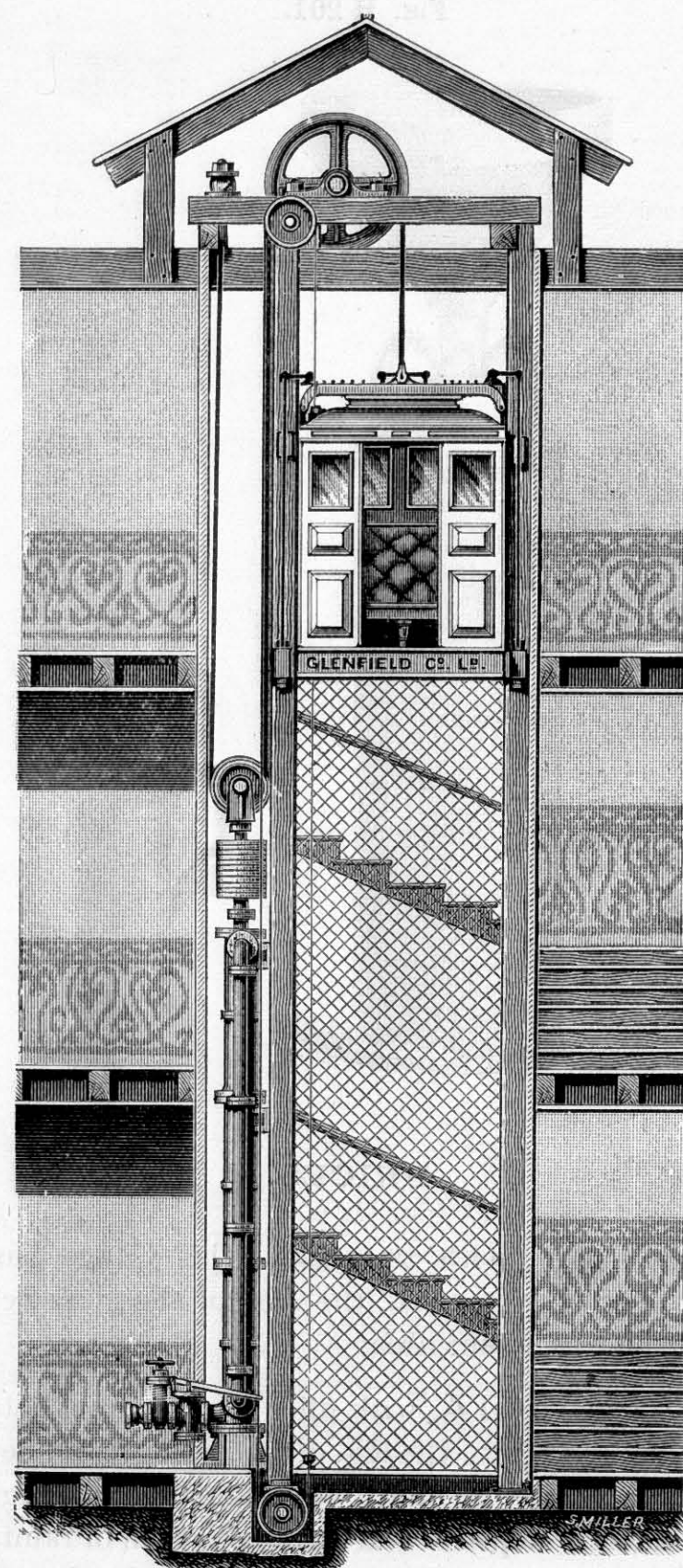
PRICES.

H 200—Small glass Rain Gauge, with zinc top. This Gauge has a catchment area of 10 sq. ins., the area of the glass being about half the catchment area, each

H 201—Large double-handled Vessel A, with filler top, giving a catchment area of 100 sq. ins., the dia. of Receiving Tank being equal to an area of 50 sq. ins. Graduated slate Gauging Dipper B shows 2" depth of water for each inch of rainfall, the wet line on Dipper indicating the depth of water. Small Measuring Vessel C, with Graduated slate Gauge D, has an area of 10 sq. ins., so that when water is poured from the Receiving Tank each inch of depth in the small Vessel C represents $\frac{1}{10}$ " of rainfall, thus giving a very accurate reading, each.

Hydraulic Passenger Hoist.

Fig. H 210.



Dia. and stroke of Ram are made to suit the water pressure available and height of Lift required. The Cage is fitted with an efficient and reliable Safety Gear, which immediately comes into action either owing to one of the lifting ropes breaking or stretching.

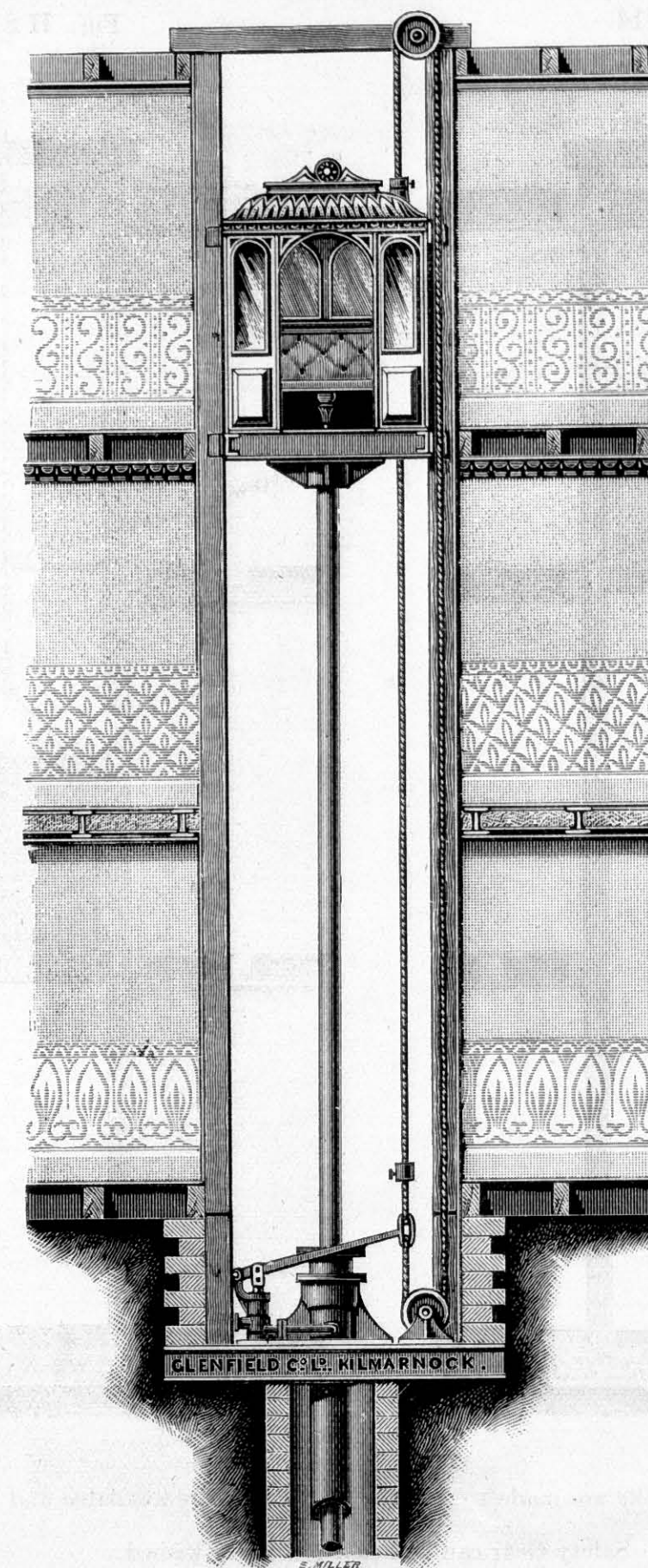
A Governor can be fitted, if desired, to stop Cage, if at any time the speed of travel is unduly increased from any cause.

NOTE.—Inverted Ram type may be substituted for Cylinder, depending on water pressure and other circumstances.

Prices on application.

Hydraulic Passenger Hoist.

Fig. H 212.



Dia. and stroke of Ram are made to suit the water pressure available and height of Lift required.

Prices on application.

Hydraulic Goods Hoists.

Fig. H 214.

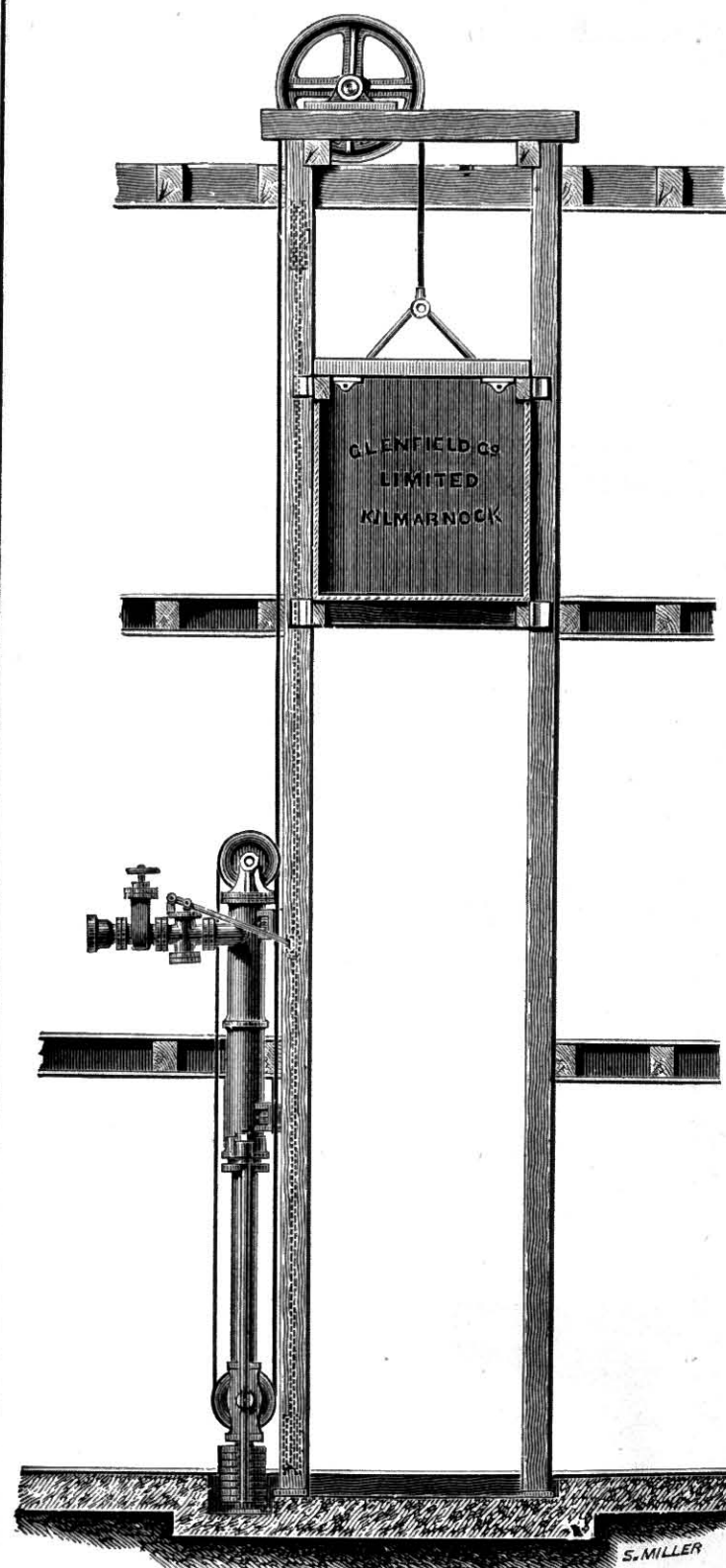
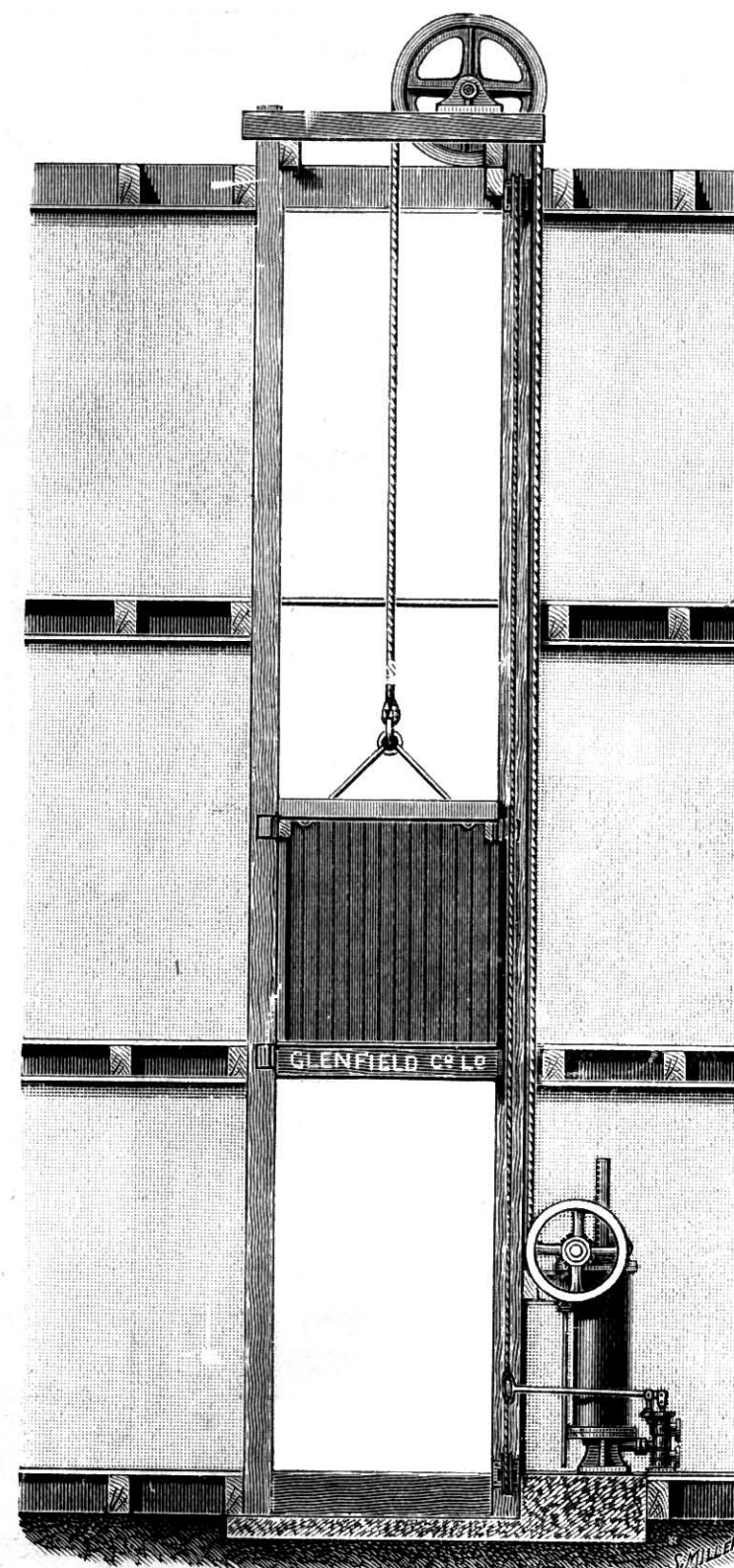


Fig. H 215.



Dia. of Ram and length of Stroke are made to suit the water pressure available and height of Lift required.

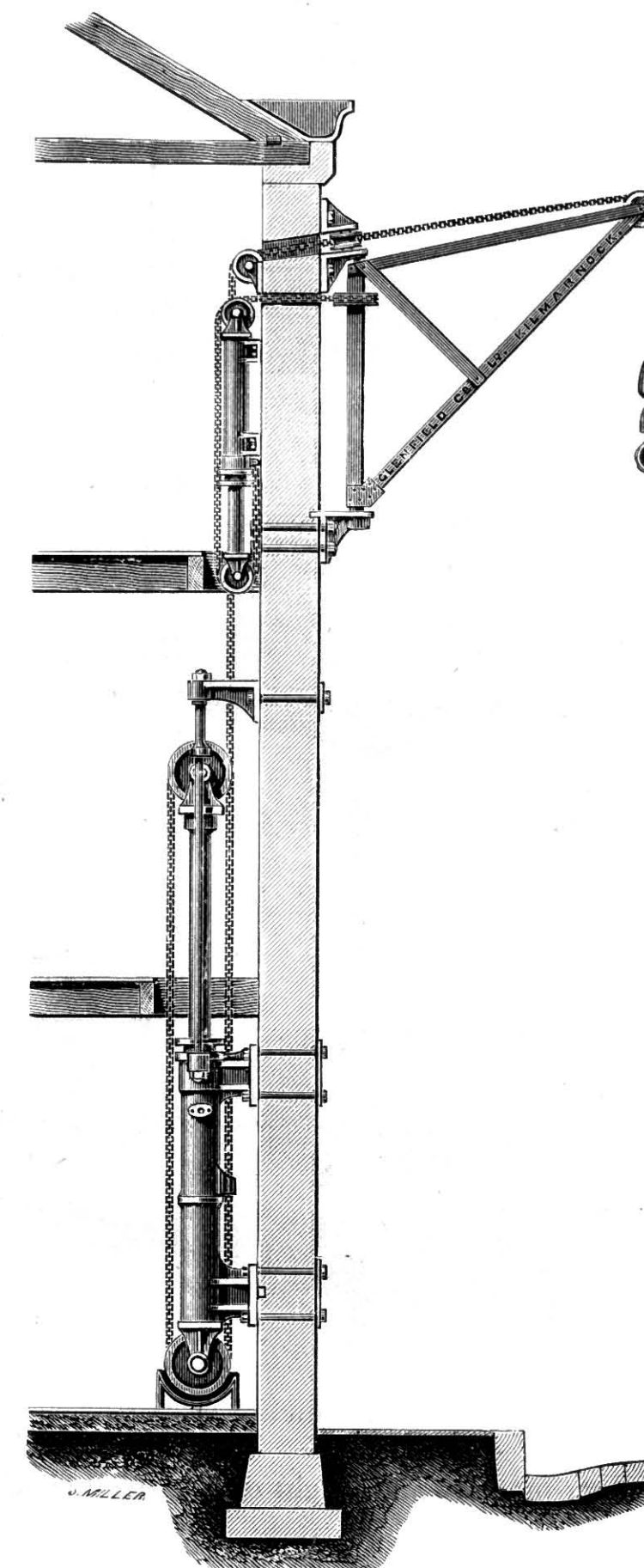
Safety Gear can be fitted to Cage if wished.

NOTE.—Cylinder type, as on page 42, may be substituted for Ram, depending on water pressure, room available and other circumstances.

Prices on application.

Hydraulic Warehouse Crane

Fig. H 218.

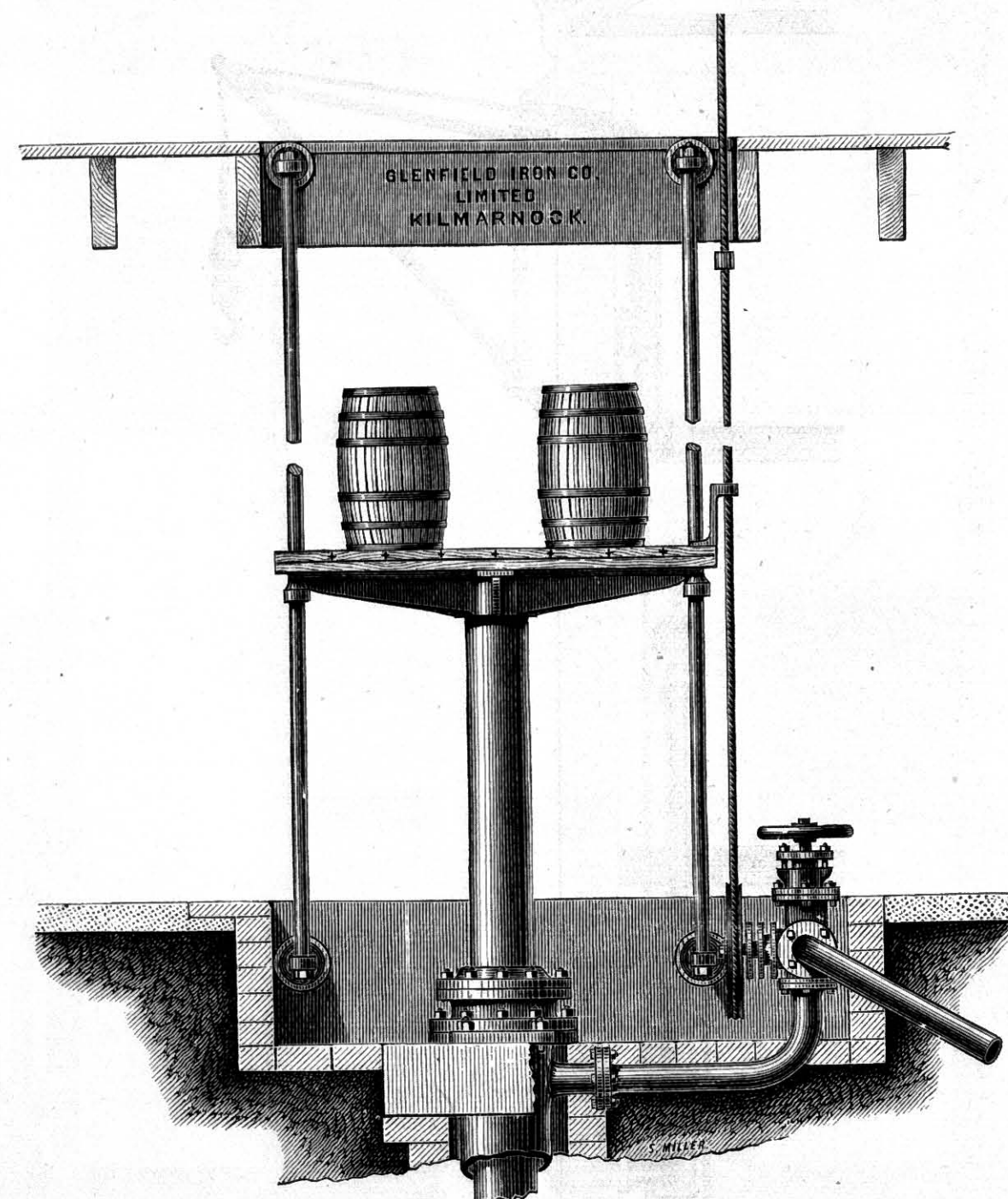


The Crane, or Jigger, may be with or without Slueing Gear, and Ram may be inverted, depending on circumstances. The Valves can be arranged to be worked from any floor.

Prices on application.

Hydraulic Platform Hoist.

Fig. H 220.

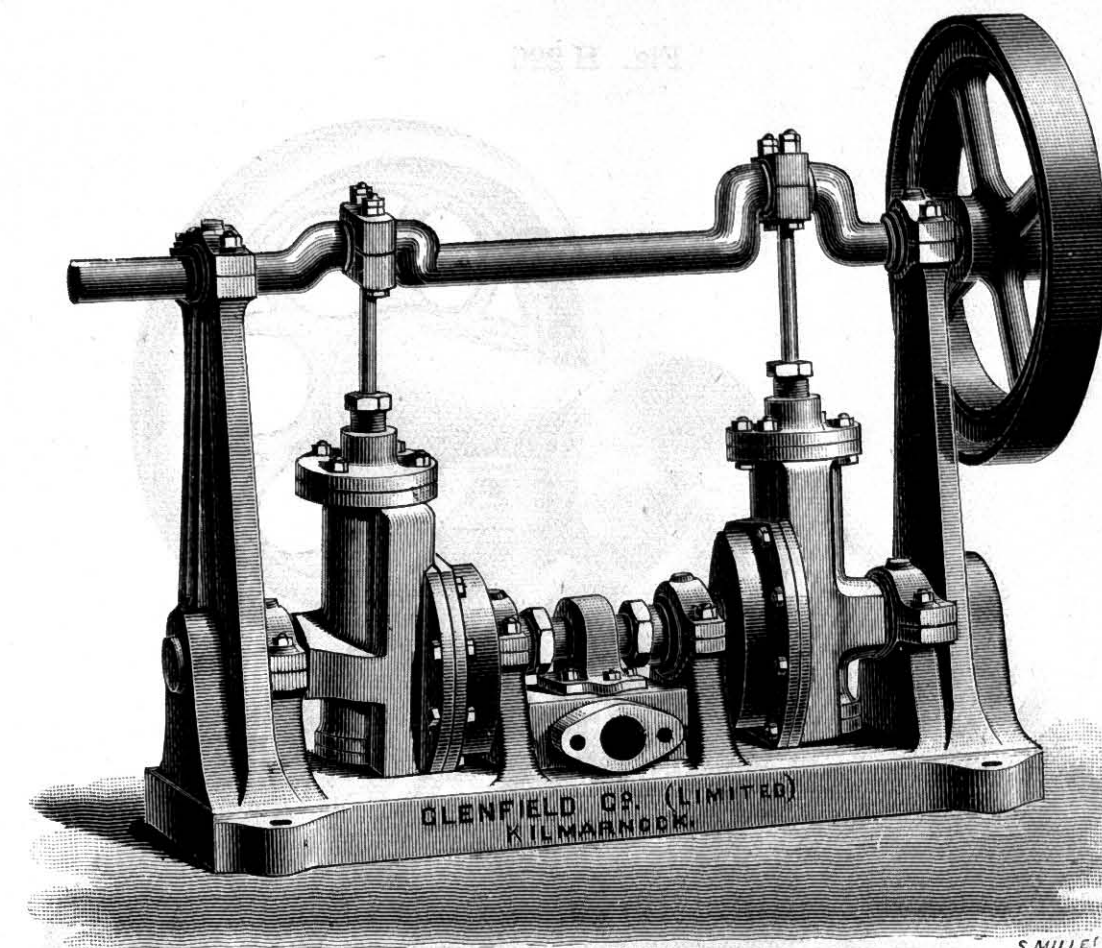


The dia. and length of Cylinder and Ram are proportioned to the available water pressure and height of Lift required.

Prices on application.

Patent Water Pressure Engine.

Fig. H 224.



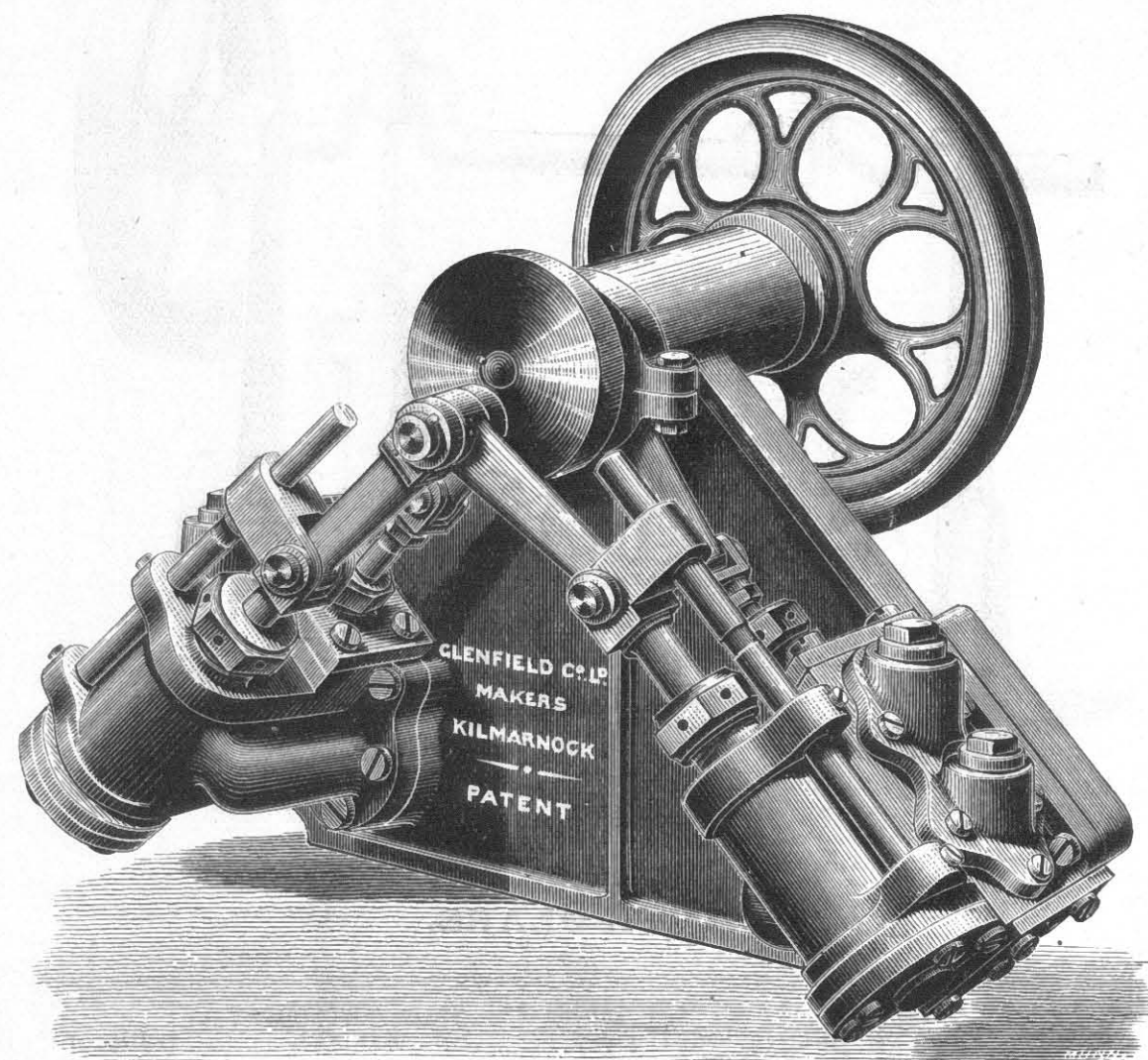
PARTICULARS.

Dia. of Cylinders.	Length of Stroke.	Water Pressure in Lbs.	Revols. per Minute.	Indicated Power in Foot Lbs.	Lifting Power of Cylinders per Stroke. Lbs.	SPACE OCCUPIED BY ENGINES.			Dia. of Supply Pipe.	Dia. of Discharge Pipe.
						Length.	Breadth.	Height.		
1½"	3"	50	60	5,301	176	20"	7"	14"	¾"	1"
2½"	5"	50	40	16,332	490	33"	12"	24"	1¼"	2½"
3½"	7"	50	35	39,286	962	46"	15"	32"	1½"	3"
4½"	9"	50	30	71,550	1,590	48"	16"	36"	2"	4"
5½"	11"	50	25	108,850	2,374	60"	24"	46"	3"	4½"

Prices on application.

Wilson's Water Pressure Engine or Hydraulic Motor.

Fig. H 226.



This Patent Double-cylinder Hydraulic Motor has been specially designed for small Powers, such as driving Dentist's machinery, Sewing Machines, etc. It runs quietly at a high speed, takes up small space, and is very powerful for its size. The Cylinders, Valves, etc., of the $1\frac{1}{4}$ " size are of best gun metal.

In the larger size the Cylinders are of cast iron lined with gun metal, the other working parts being also of gun metal.

PARTICULARS.

Cylinders $\left\{ \begin{array}{l} 1\frac{1}{4}" \text{ dia.} \times 1\frac{1}{2}" \text{ stroke.} \\ 3" \text{ dia.} \times 4" \text{ stroke.} \end{array} \right.$	Extreme dimensions $\left\{ \begin{array}{l} \text{length, } 14\frac{1}{2}" ; \text{ breadth, } 9\frac{3}{4}" ; \text{ height, } 11\frac{3}{4}" . \\ \text{length, } 3' ; \text{ breadth, } 12\frac{1}{2}" ; \text{ height, } 2' 3\frac{1}{8}" . \end{array} \right.$
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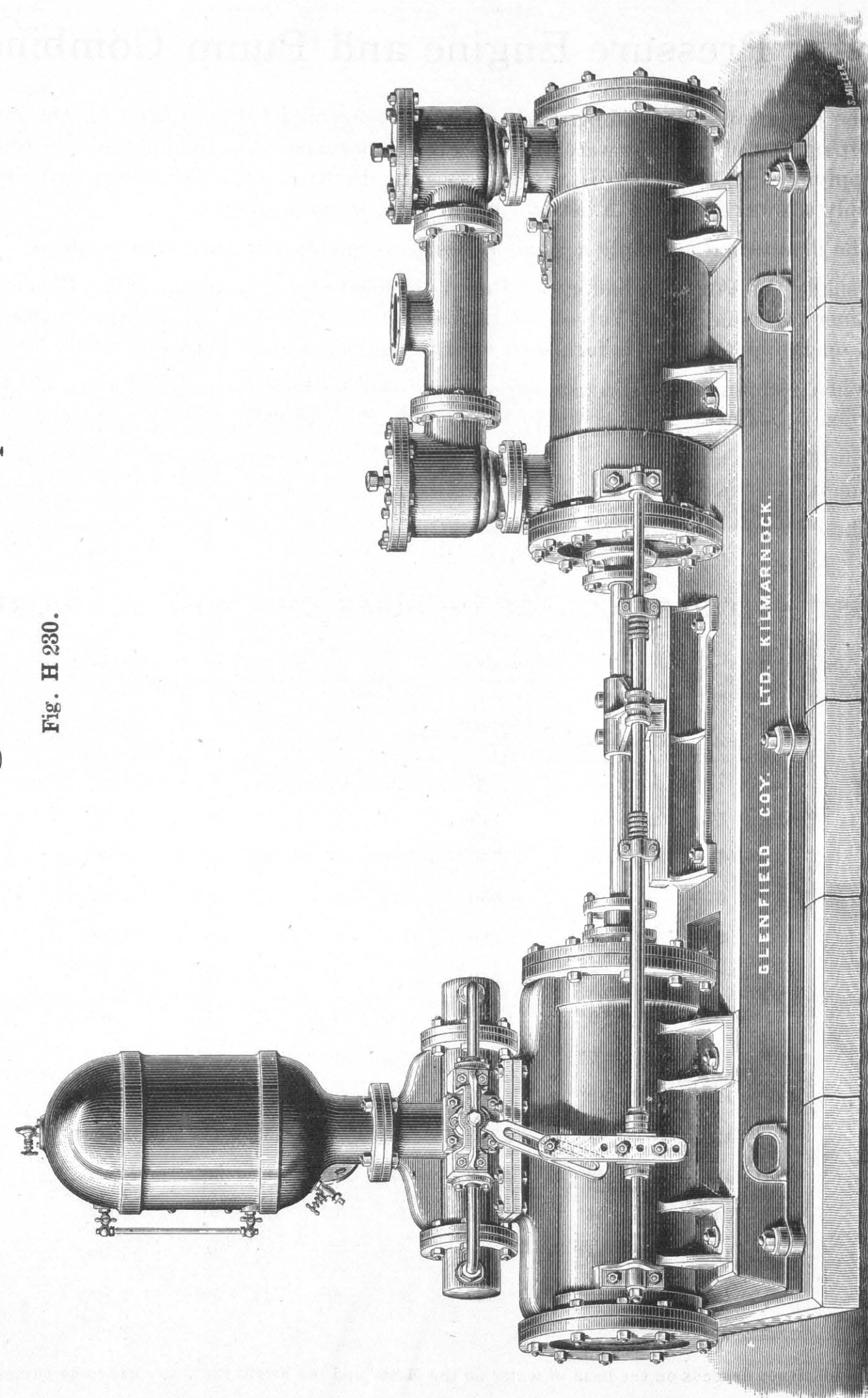
Larger Sizes made. Particulars on application.

PRICES.

Engine with $\left\{ \begin{array}{l} 1\frac{1}{4}" \text{ dia. Cylinders,} \\ 3" \text{ dia. Cylinders,} \end{array} \right.$	each.
Extra, if fitted with Index to show quantity of water used,	.. .. .	"

Water Pressure Engine and Pump Combined.

Fig. H 230.



For particulars see next page.

Water Pressure Engine and Pump Combined.

The power of water coming from ordinary reservoir level is utilized for the purpose of pumping part of the same water, or water from another source, to a high service reservoir for supplying high districts. In several cases the discharge from the Power Cylinder goes to supply a lower district. A list of some of those in use is given.

The illustration is simply a type, as design is modified to suit circumstances.

Usually the Power Cylinder and Pump are lined with gun metal. The Piston Valve and Liner for same, Pilot Valve and Liners of Pilot Cylinders are also gun metal. Air Vessel on Power Cylinder is furnished with Gauge Glass and Cocks if desired.

When pumping against considerable heights an Air Vessel is put on Pump, and Pumps are, when occasion requires, made of the Double Plunger type.

The Engines are frequently made in duplicate, each to do the full duty required, so that one is a "stand by."

These Pumps work quietly and efficiently, and require very slight attention.

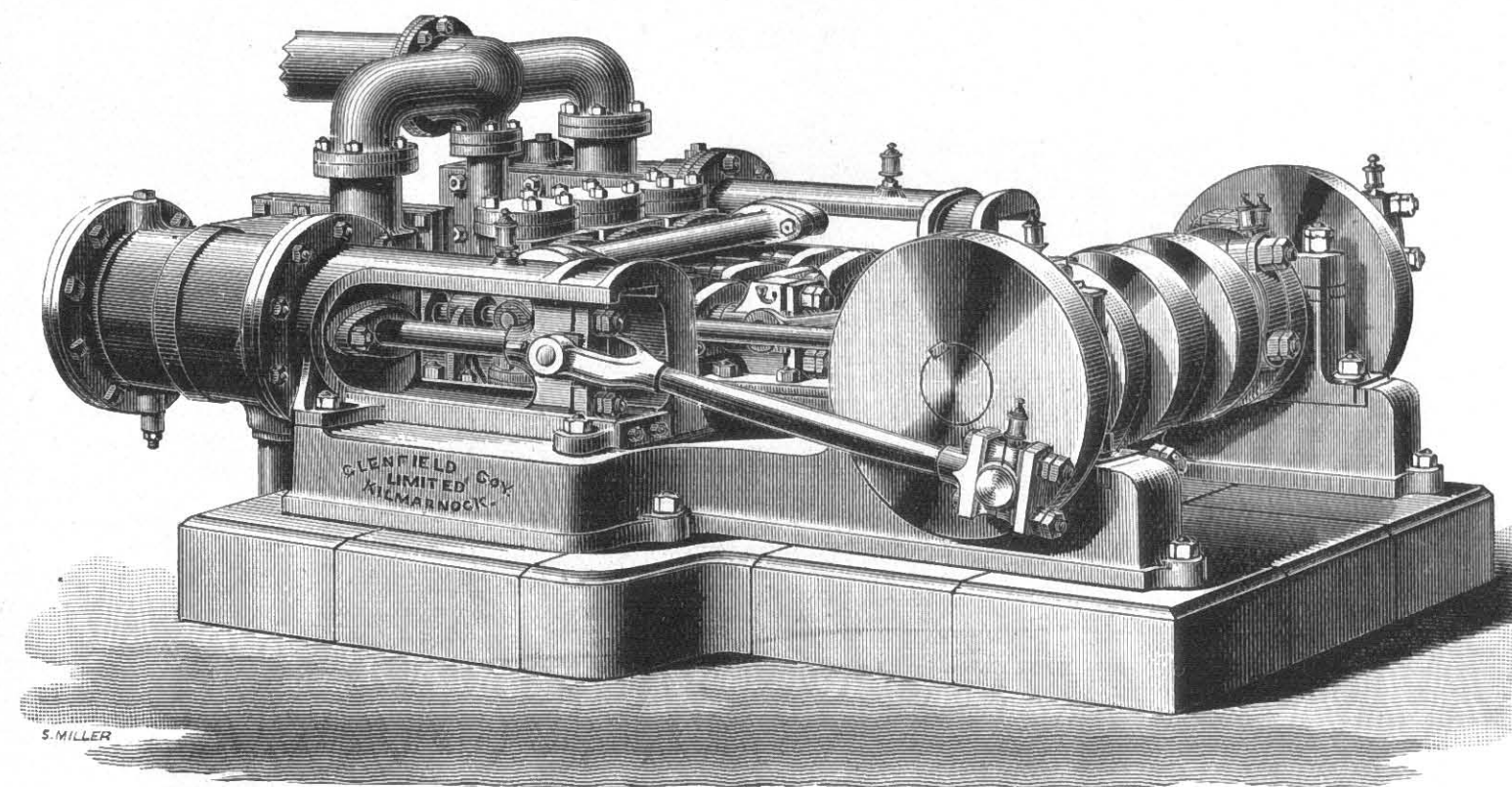
LIST AND PARTICULARS OF SOME OF THOSE AT WORK.

Size of Cylinder. Dia. × Stroke.	Size of Pump. Dia. × Stroke.	Approximate Delivery of Pump. Gallons per hour.	Size of Cylinder. Dia. × Stroke.	Size of Pump. Dia. × Stroke.	Approximate Delivery of Pump. Gallons per hour.
2½" × 7"	1⅜" × 7"	40	6½" × 18"	7½" × 18"	3,700
2½" × 7"	2½" × 7"	140	6⅝" × 18"	6" × 18"	2,000
2½" × 7"	4¾" × 7"	750	7¼" × 12"	4½" × 12"	1,080
3" × 9"	5" × 9"	1,080	7¼" × 12"	4⅝" × 12"	1,100
3⅛" × 9"	5" × 9"	1,080	7⅝" × 30"	11" × 30"	9,000
3½" × 7"	3" × 7"	300	8" × 12"	4⅜" × 12"	1,080
3½" × 9"	5" × 9"	1,080	8⅝" × 11"	2½" × 11"	260
3¾" × 7"	3" × 7"	300	8⅝" × 18"	6" × 18"	2,500
4½" × 12"	5¼" × 12"	1,200	13¼" × 15"	10½" × 15"	6,000
5¼" × 12"	6¾" × 12"	2,160	14" × 36"	5⅛" × 36"	2,500
5¼" × 12"	9¼" × 12"	4,100	17½" × 30"	18" × 30"	24,000
5¼" × 34"	15" × 34"	21,420	18" × 30"	9" × 30"	7,500
6¼" × 18"	8¾" × 18"	4,500	23" × 36"	9¼" × 36"	7,708
6½" × 12"	3" × 12"	420	24" × 30"	11¼" × 30"	9,300

The efficiency depends on the head of water on the Motor and the height the water has to be pumped.

Horizontal Three-throw Hydraulic Pumps.

Fig. H 232.



The above illustration shows Three-Throw Hydraulic Pumps.

Adapted for—

**Motor Water at a low pressure and raising
same to a high pressure;**

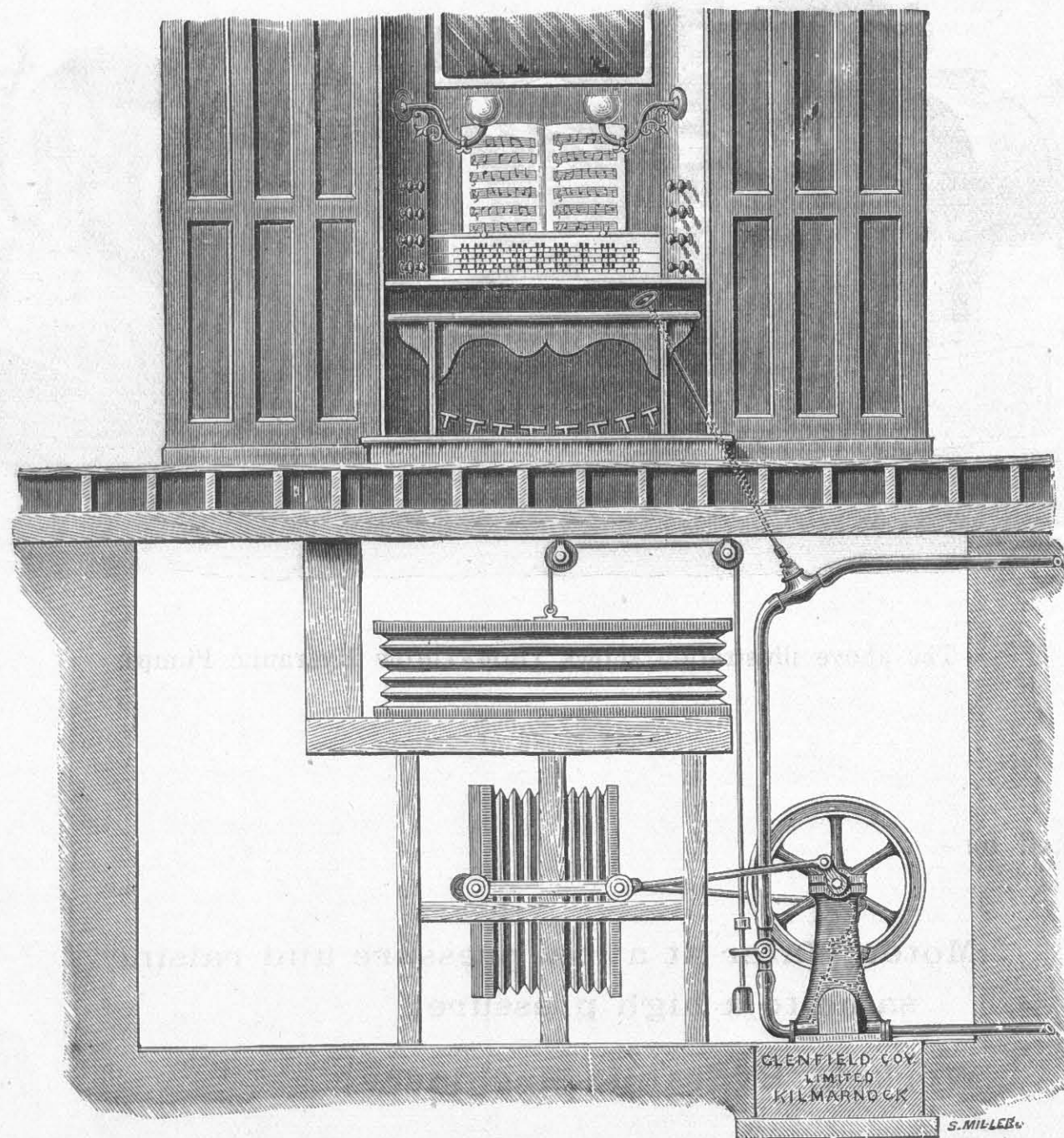
Working Hydraulic Machinery;

Pumping into Accumulator, etc.

Prices on application.

Patent Water Pressure Engine Driving Organ Bellows.

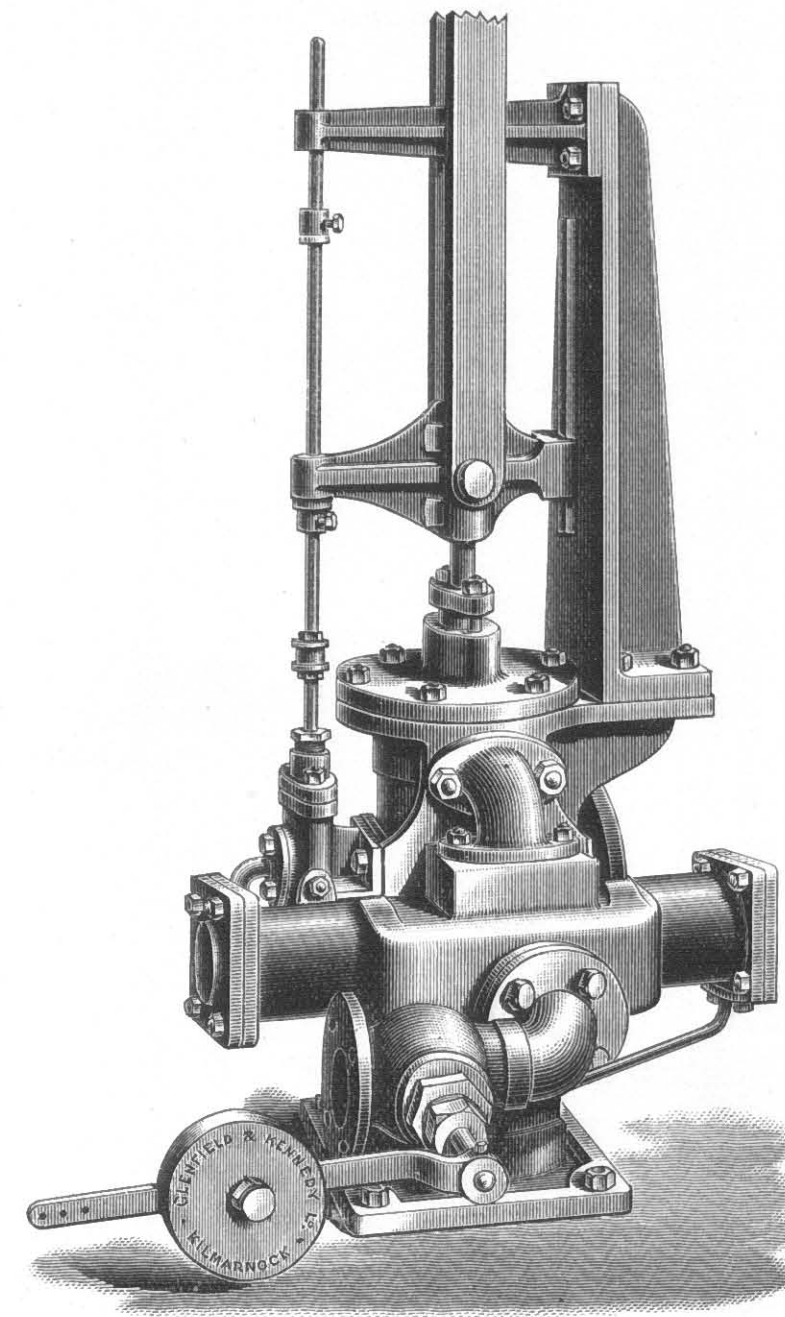
Fig. H 235.



Prices are given for Engines and Gearing on having particulars of requirements, water pressure, etc.

Hydraulic Organ Blowing Engine.

Fig. H 236.



This is a direct-acting Water Engine connected direct to Bellows or Feeder of Organ. A Rod from Feeder is connected to a Cock on Engine supply, which automatically regulates the speed of the Engine. The Engine is made with an arrangement to prevent a sudden reverse at ends of Stroke.

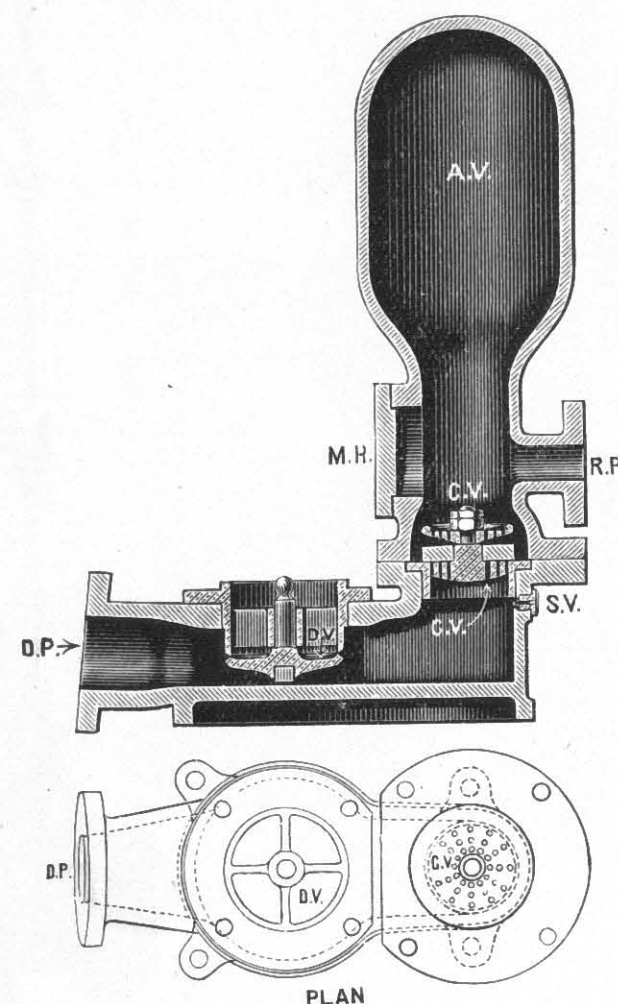
PRICES.

3" Cylinder × 10" Stroke,	..	..	..	..	..	..	..	each.
3½" Cylinder × 10" Stroke,	..	..	..	..	..	..	..	"
5" Cylinder × 10" Stroke,	..	..	..	..	..	..	..	"
Extra, if fitted with Rack and Index to show quantity of water used,								"

Hydraulic Rams

For raising Water with a small fall to a greater height.

Fig. H 244.



No.	Diameter of Drive Pipe.	Diameter of Rising Pipe.	Quantity raised 100 feet high in 24 hours according to fall. Gallons.	Price per Ram, with Air Vessel, Complete.
1	1" to 1½"	½" to ¾"	100 to 500	
2	1½" to 2"	1"	200 to 1,000	
3	2½" to 3"	1½" to 2"	500 to 3,000	
4	3½" to 4"	2"	800 to 5,000	
5	5" to 6"	2½"	1,200 to 9,000	
6	7" to 9"	3" to 4"	5,000 to 40,000	

For other particulars see next page.

Hydraulic Rams.

WE also make Compound Rams, by means of which an impure supply of water may be used for raising pure water.

There is no danger of the impure water mixing with the clean water.

Prices of Compound Rams on application.

In some cases the supply of power water may be insufficient to keep Ram working continuously.

For such cases we have designed and put into successful operation an automatic arrangement which stops the Ram when the supply of water runs short, and restarts it when sufficient water has accumulated in tank built for that purpose.

To enable us to determine the proper size of Ram to use we require the following particulars :—

Quantity of water at disposal, and Fall or Head ;

Quantity of water to be raised ;

Height and distance to which it has to be forced.

Cranes

For Supplying Locomotives with Water.

Fig. H 130.

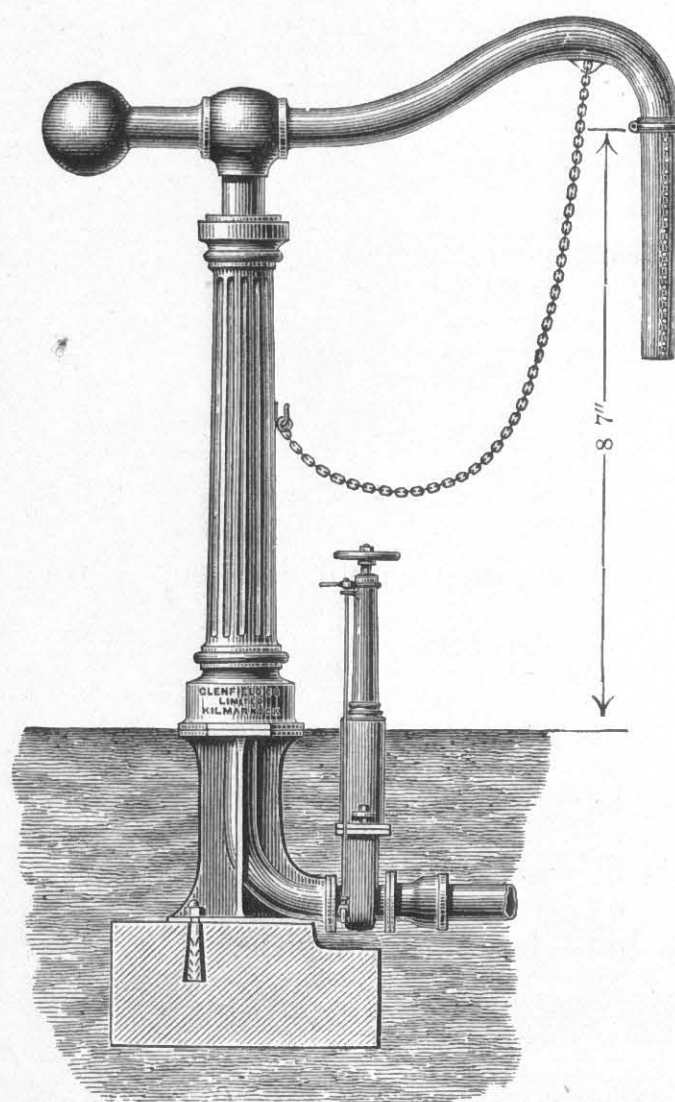
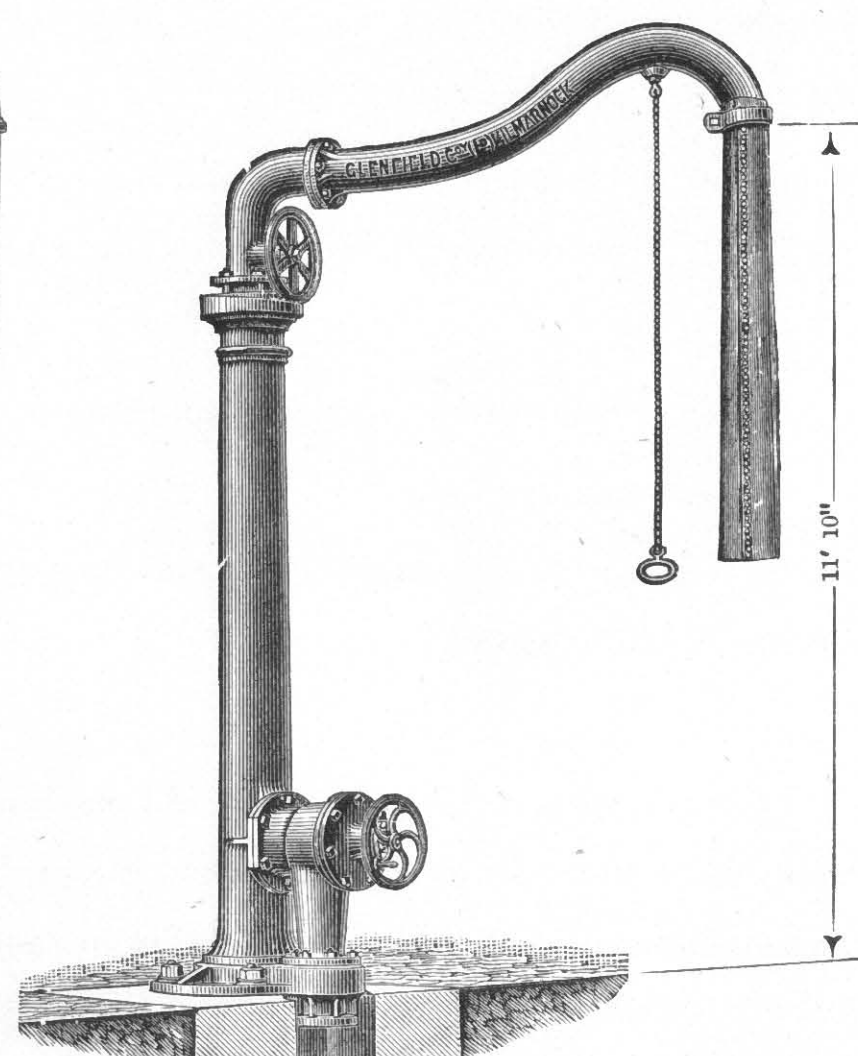


Fig. H 131.



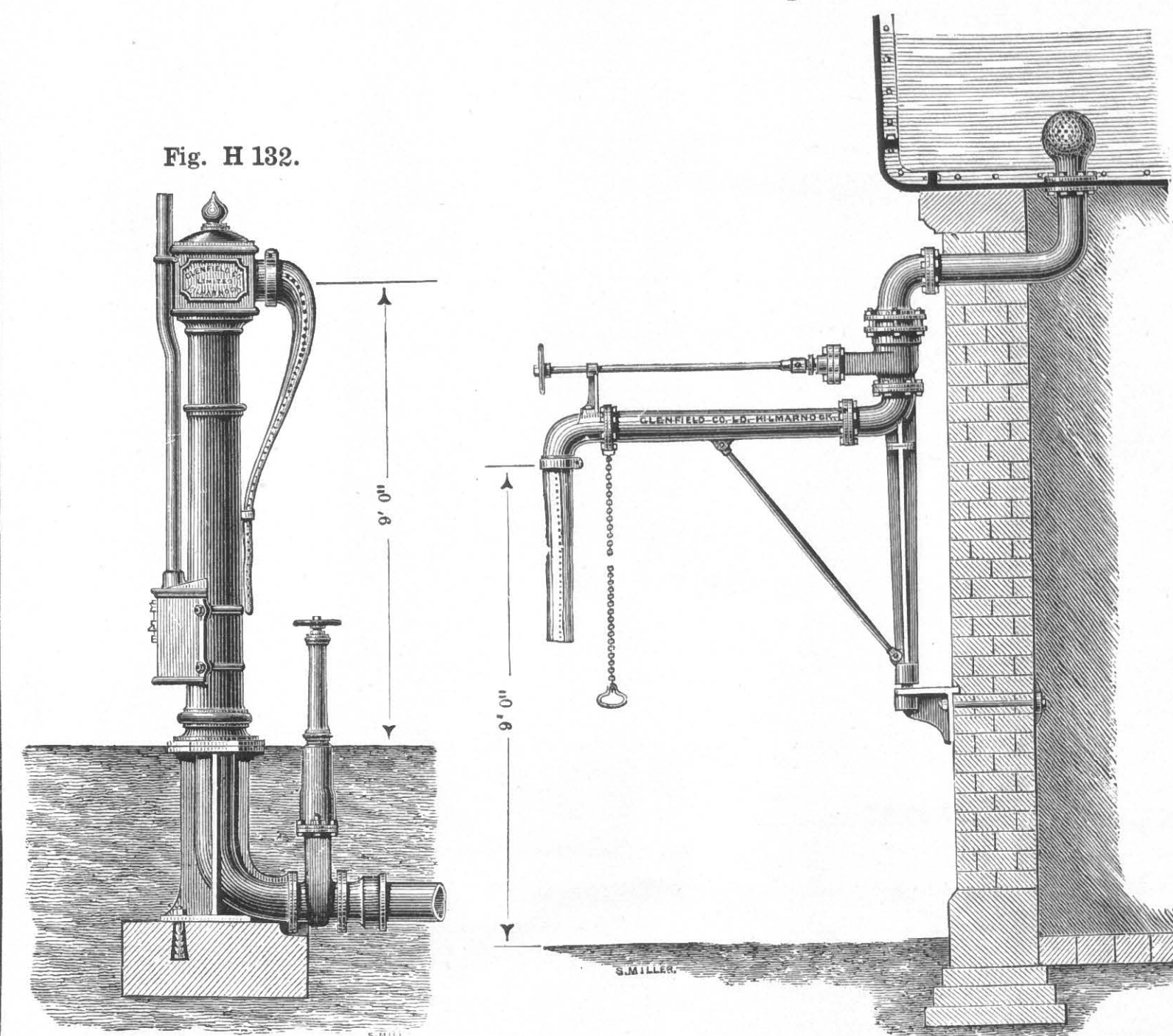
PRICES.

- H 130—Locomotive Crane (swivelling), with Sluice Valve, Delivery Hose, etc., Complete ; Inlet, 5" dia., each.
- H 131—Locomotive Crane (swivelling with Roller), with Stop Valve, Delivery Hose, etc., Complete ; Inlet, 6" dia., ,,

Cranes

For Supplying Locomotives with Water.

Fig. H 133.



PRICES.

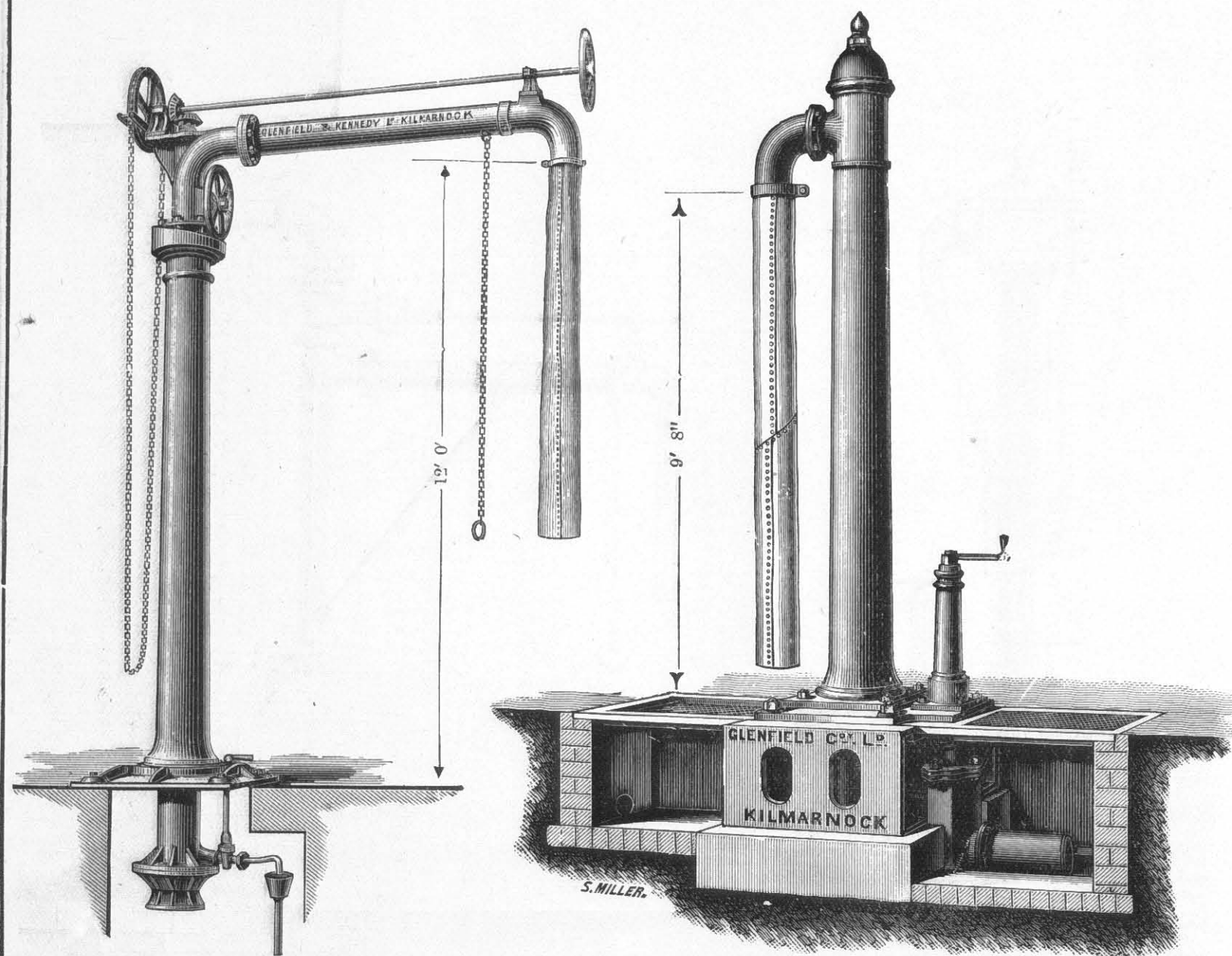
- H 132—Locomotive Crane, with Sluice Valve, Delivery Hose, Stove, etc., Complete ; Inlet, 8" dia., each.
- H 133—Locomotive Crane supported on wall, with Sluice Valve, two Bends and Rosepiece, Wall Bracket, Delivery Hose, etc., Complete ; Inlet, 6" dia., ,,

Cranes

For Supplying Locomotives with Water.

Fig. H 135.

Fig. H 134.



PRICES.

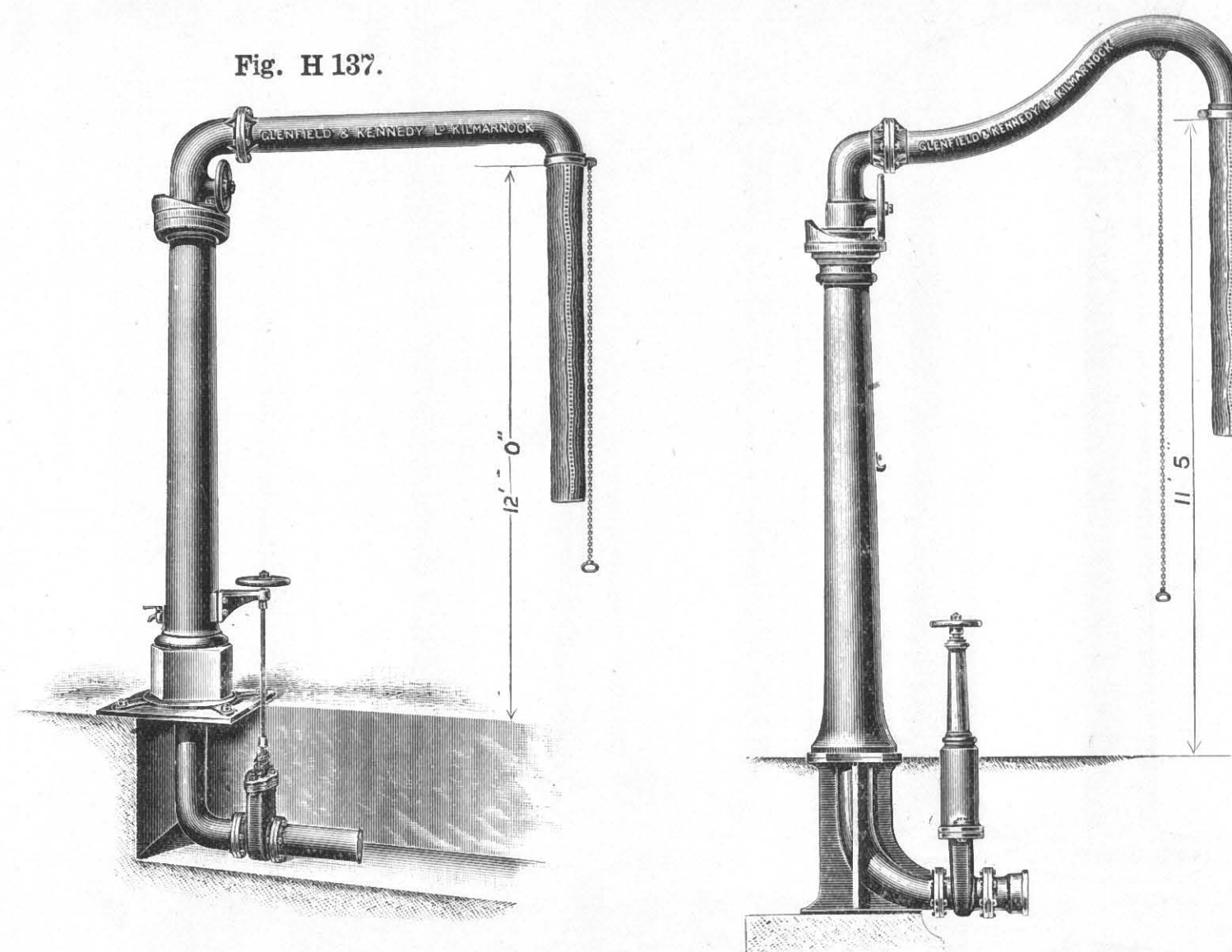
- H 134—Locomotive Crane, with Sluice Valve, Delivery Hose, etc.,
Complete ; Inlet, 8" dia., each.
- H 135—Locomotive Crane (swivelling with Roller), with Stop Valve,
Delivery Hose, etc., Complete ; Inlet, 6" dia., fitted with
small Emptying Cock to prevent damage by frost, ,,

Cranes

For Supplying Locomotives with Water.

Fig. H 139.

Fig. H 137.



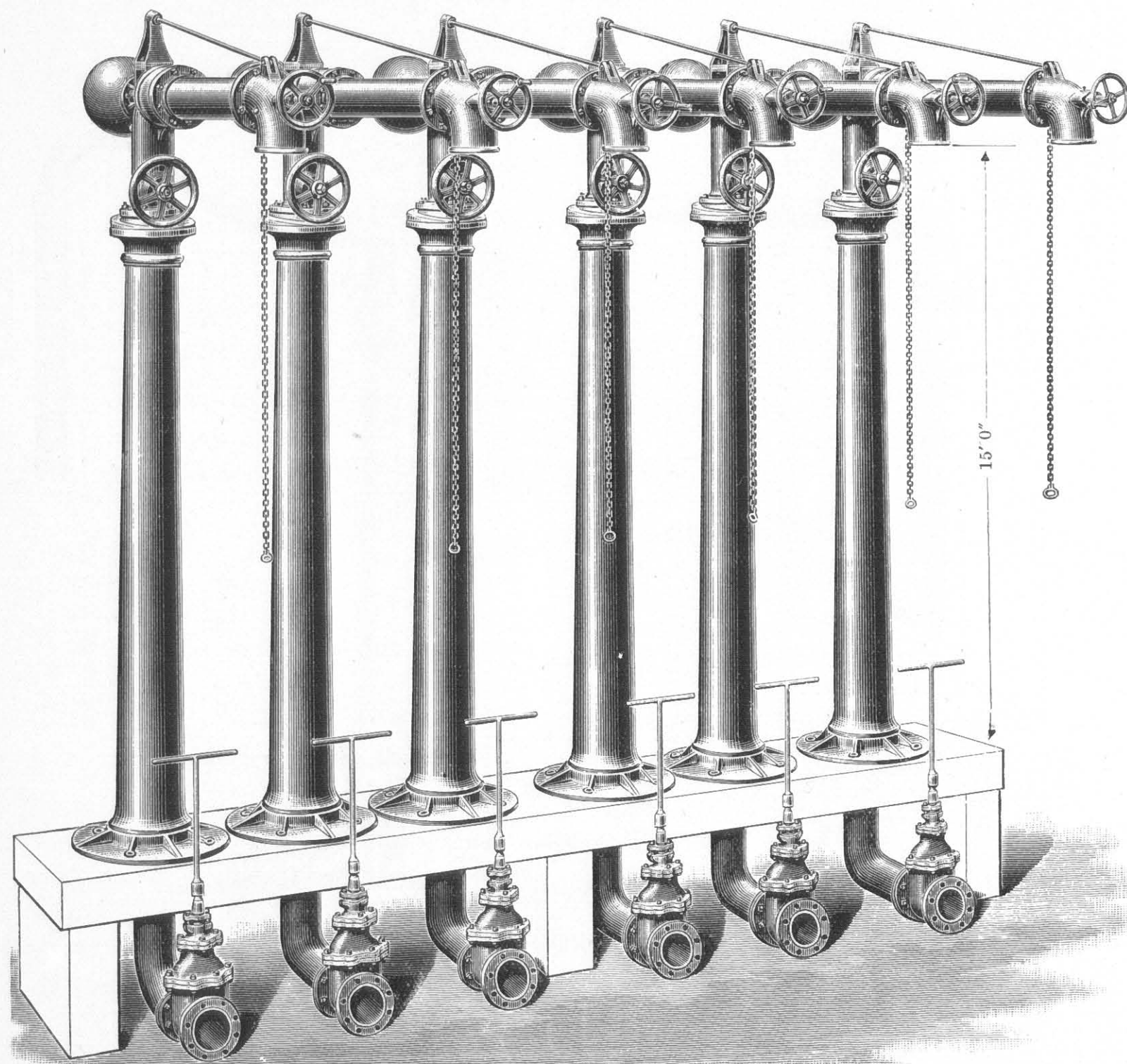
PRICES.

- H 137—Locomotive Crane (swivelling with roller), with Sluice Valve,
Delivery Hose, etc., Complete ; Inlet, 8" dia., each.
- H 139—Locomotive Crane (swivelling with roller), with Sluice Valve,
Delivery Hose, etc., Complete ; Inlet, 6" dia., ,,

Cranes

For Supplying Locomotives with Water.

Fig. H 136.



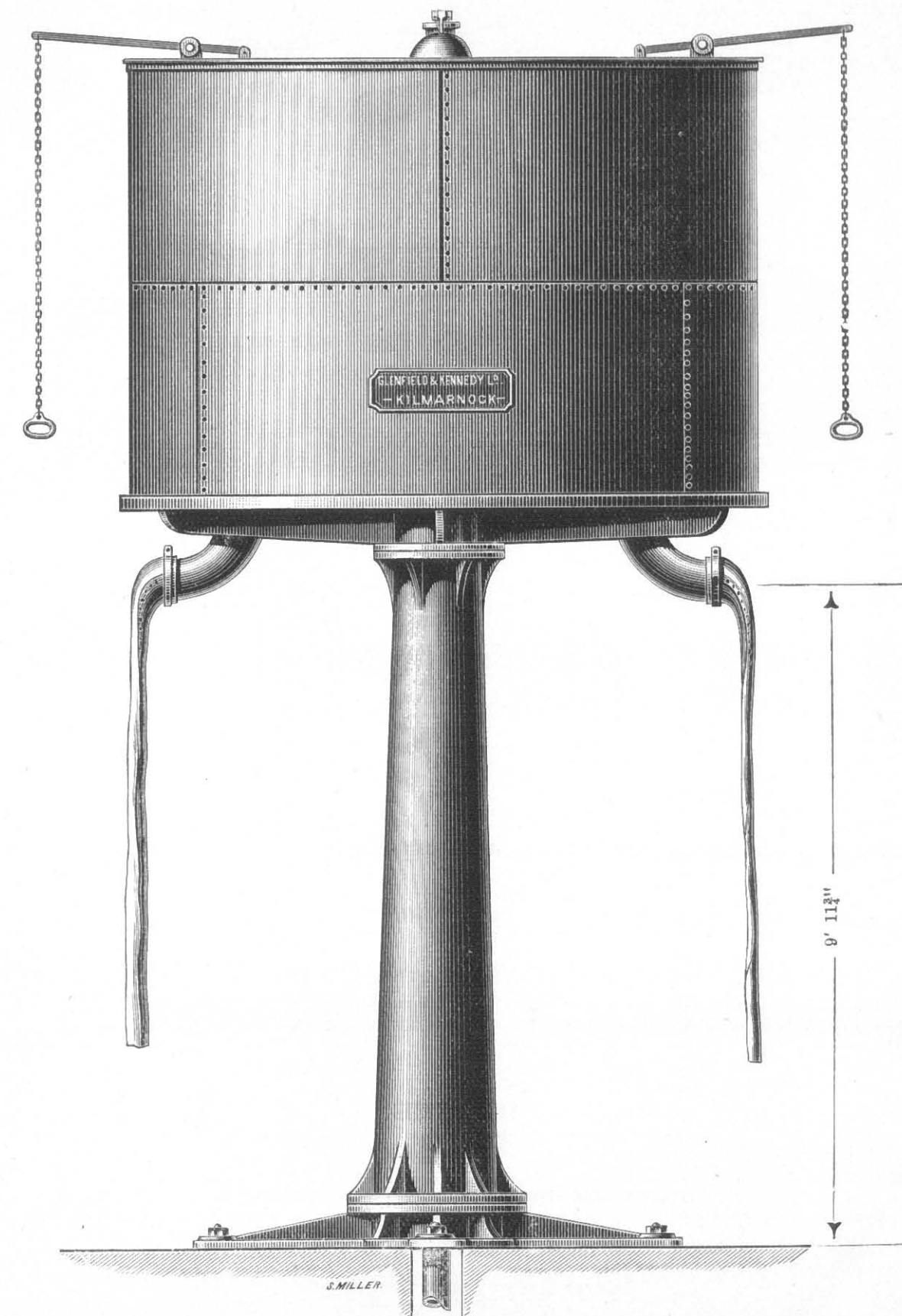
PRICE.

H 136—Locomotive Crane (swivelling with Roller), with Sluice Valve; Inlet, 9" dia.; complete as shown without Delivery Hose. Bend at bottom fitted with Duckfoot, Sluice Valve has small Emptying Cock to prevent damage by frost, each.

Wrought Iron Tank on Column

For Supplying Locomotives with Water.

Fig. H 138.



Wrought Iron Tank on Column, with Ball Valve on inlet, two outlet Valves, two Bends, and two lengths of leather Hose.

Prices on application.

Pipe Scraping Apparatus.

Fig. H 9.

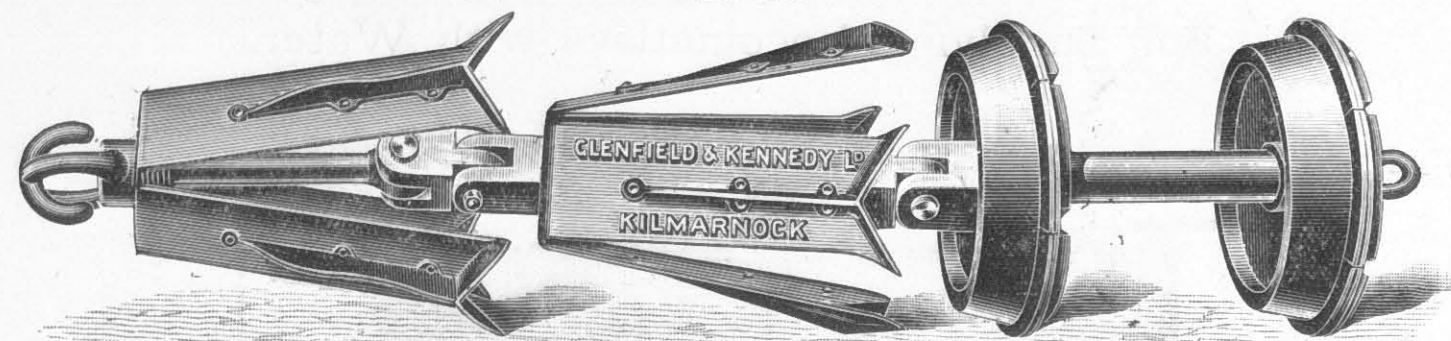


Fig. H 10.

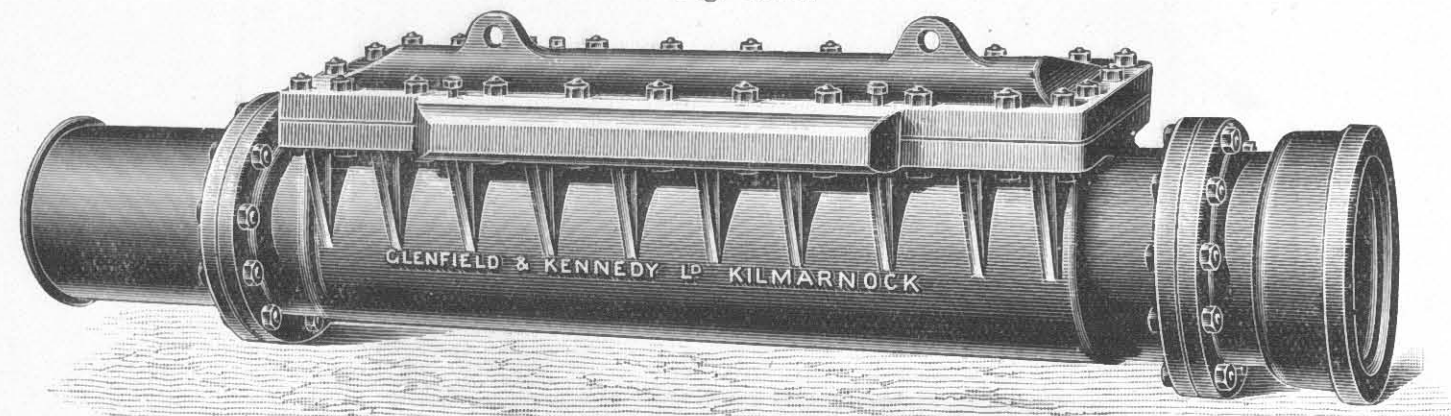


Fig. H 11.

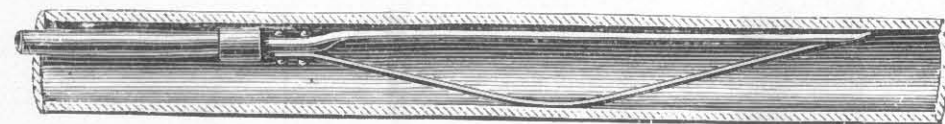


Fig. H 16.



Fig. H 250.

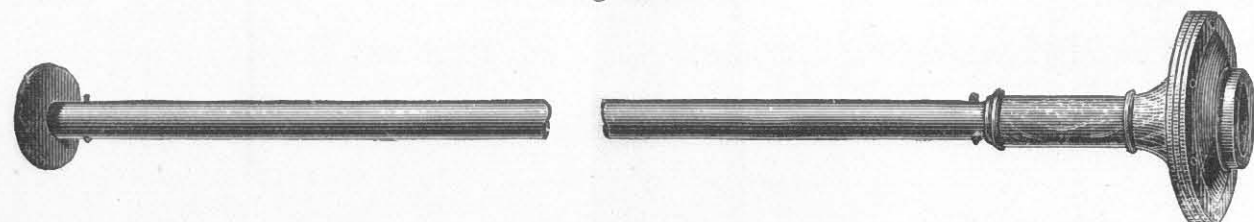
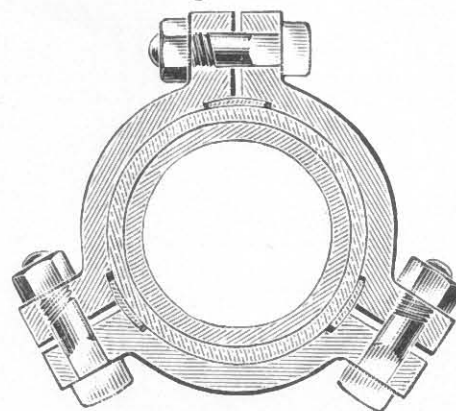


Fig. H 15.



PRICES.

H 9—Pipe Scraper, driven by pressure, .. 6" 7" 8" 9" 10" 12" 14" 16" 18" each.

Larger Sizes than 18 inch by special quotation.

H 10—Hatch Boxes, or Door Pipes, for inserting Scrapers into Mains, including Spigot and Socket Connections jointed and bolted on, .. 6" 7" 8" 9" 10" 12" 13" 14" "

Larger Sizes by special quotation.

H 11—Pipe Scraper, for working by hand, to suit 3/4" wrought iron pipe, .. 2" 2 1/2" 3" 4" 5" 6" "

H 15—Clip Joint, in 3 parts, with thick Rubber Bush, .. 2" 4" 5" 6" 7" 8" 9" 10" 12" 13" "

H 16—Stethoscope, for detecting passage of Scraper underground, .. " "

H 250—Water Waste Detector, with brass tube and sounding disc, to detect leakage in Main, any length up to 5 feet, .. " "

Reports and Full Particulars as to Working, etc., sent on application. (See next page.)

Appended is a list of some of the places where our apparatus has been used.

Summary of Cost of Scraping Water Mains.

Year.	Name of Place.	Dia. of Main.	Length of Main.	Cost.	Nature of obstructions removed, other than Corrosion.	Gain in Delivery after Scraping.
		Inches.	Miles. Yards.			Per cent.
1880	Bradford,	18	4 1100	£634	Stones, lead, crowbar, etc.,	55.6
1883	Whitehaven,	13	2 1056	516	Mussels, stones, and lead,	27.6
1885	Omagh,	11	3 1223	53	Lead and defective castings,	300
1887	Roubaix,	6	2 792	425	Calcareous matter.	
1890	Dumfries,	24	4 1162	113	Stones.	
1891	Lanark,	9	1 0	75	Lead, wood, and stones,	33.7
1892	Newport,	7	6 880	8		
1892	Burntisland,	5	0 75†	252	Lead, wood, and stones,	43
1894	Waterford,	8	3 1320	212	Broken pipe, rope,	40
1895	Cupar-Fife,	13	8 0	67	Broken pipe, rabbit,	52
1895	Merthyr-Tydvil,	7	3 880	318	About 400 stones,	30
1896		14	5 617	178	Broken pipe, lead, and stones,	82
		12	6 770	52	Bad joints, stones, etc.,	50
1897	Cumnock,	5	1 880	57	Pieces of pipe and stones,	30
	Alfreton,	6	0 912	78	Bad joints,	75
1898	Kirriemuir,	7	4 0	270	Lead and stones,	30
	Dunfermline,	6	6 0	300		
	Plymouth,	12	14 0			
		24	1 880			
1899	Tarapaca, South America, ..	5	56 0	714	Chisel 5 3/8" long x 1" broad, 1 piece metal 4" x 5" x 3/8",	27.28
		7			Stones and metal,	27
		9			30 tons of incrustation removed,	21.73
	Innerleithen,	6	0 1300	60	Stones and piece of wood 45" long x 1 1/2" dia.,	60
	Ennis, Co. Clare,	6	4 1/2 0		Stones, half-brick, and small piece lead,	56
		9	4 1/2 0		Stones, 36 lbs. lead, cast iron,	
1900	Pontypridd,	10	4 1/2 0	277	Piece of wood 4" x 1 1/2" x 19" long, gate hinge,	Gain of 100 feet head.
		12	3 0		Steel bar 3' 6" x 3/8" and a bolt 3/4" x 3",	
	Cockermouth,	15	7 1/2 0	470	Stones and about 3 tons corrosion,	99
	Mossel Bay, South Africa, ..	4 1/2	8 1170	785	Lead, yarn, and metal,	88
		5	12 0			
1902	Pelotas, Rio Grande do Sul Brazil,	12	9 830	450	Large stones, etc.,	44
	Cagliari (Sardinia),	15	7 1/2 0			50
		14	3 3/4 0			
1907	North Berwick,	6	13 0			50
		5	0 1400			
		12	1 0			
1908	Bolton,	10	0 500		Lead and clay.	
		9	1 880			39.6
	Largo (Fife),	5	1 1200			
1909	Kinross,	7	3 1300		Corrosion and stones.	
		4	0 1400			
1911	Clackmannanshire County Council,	6	3 1430	117	10 tons incrustation, 3 pieces cast iron 3" x 1 1/2" x 1/2", 2" x 1 1/2" x 1/2", 1 1/2" x 1 1/2" x 1 1/2", boot 11" long,	80
					About 10 tons incrustation.	41
1912	Cardiff,	24	9 0			36.5
1912	Grahamstown, South Africa, ..	10	7 1300	475		
1912		14	6 760			
1913	Ayr,	16	8 250			
1913	South Essex Water Co., ..	12	1 1126			(Equal to new pipe)
						42.85
1914	Workington,	13	4 1200			
		12				
	Irvine,	10	7 0			
		7				

† High-pressure Hydraulic Main.

In addition to the foregoing, Pipe Scraping has also been carried out at Kilmarnock, Thurso, Inverkeithing, Elgin, Nairn, Portmadoc, Aberdeen, Cowdenbeath, Kendal, Bredbury, Rothesay, Crewe, Whitby, Pietermaritzburg (South Africa), Forfar, Enniskillen, Maybole, Bombay (India), Huddersfield, Egremont, Exeter, Birstal, Denbigh, Halifax, Ulverston, Newport, Guisborough, Bingley, Bridge of Allan, Ballina, Lerwick, Moffat, Welshpool, Thirsk, Fermoy, Carlow, Hull, Dundee, Stirling, Scarborough, Tavistock, Oakham, Perth, East Stirlingshire Water Works, Whitechurch (Salop), etc., etc.

H 11.—HAND-SCRAPER.

Scraping by hand has been done in Paisley, St. Andrews, Neath, Golspie, Berwick, Muirkirk, Bishopton, Tobermory, Tighnabruach, etc., etc., and in every case has given greatly increased delivery of water.

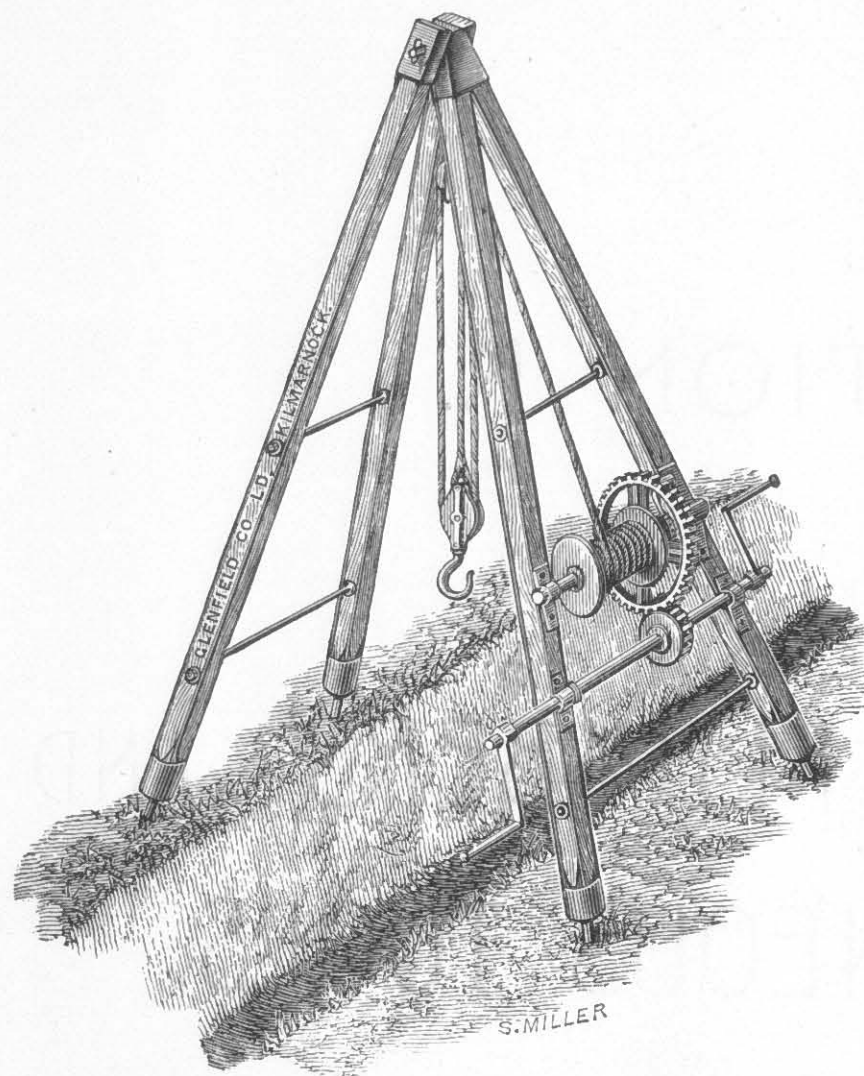
SECTION K.

PIPE-LAYING, PLUMBERS', AND MISCELLANEOUS TOOLS, ETC.

The designs are subject to alteration and amendment, and, while corrections in Catalogue are made from time to time, Glenfield & Kennedy Ltd. do not guarantee that goods supplied will be exactly as shewn.

Pipe-laying Tools.

K 90.



K 46.



PRICES.

K 46—Pulley Blocks (Moore's)—

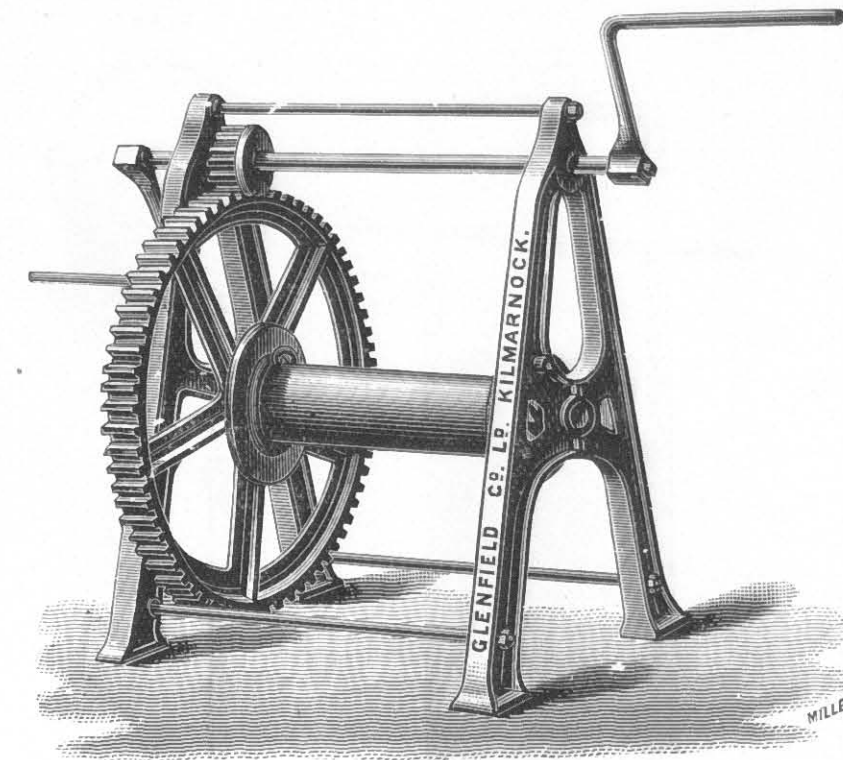
To Lift—	10	20	30	40	60	80	100	cwts.
								each.
Extra for Chain, including 1 Hook—								3 ft.

K 90—Sheer Legs and Winch, with Blocks, etc., Complete—

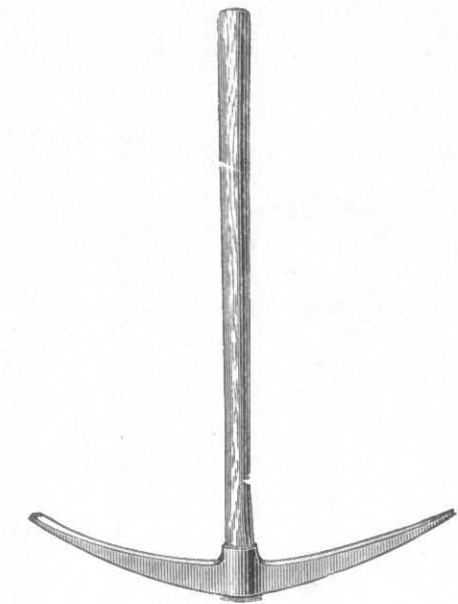
To Lift—	10	20	30	40	50	60	cwts.
							each.

Pipe-laying Tools.

K 92.



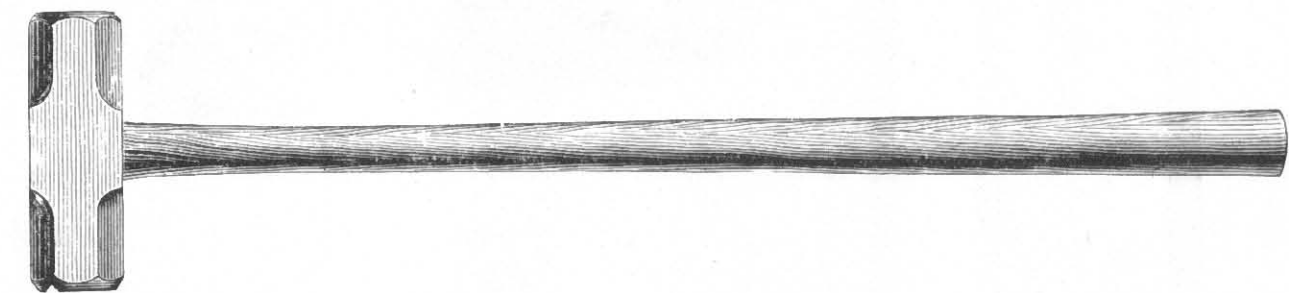
K 60.



K 62.



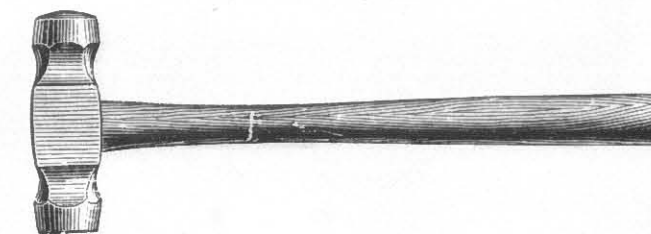
K 23.



K 64.



K 22.



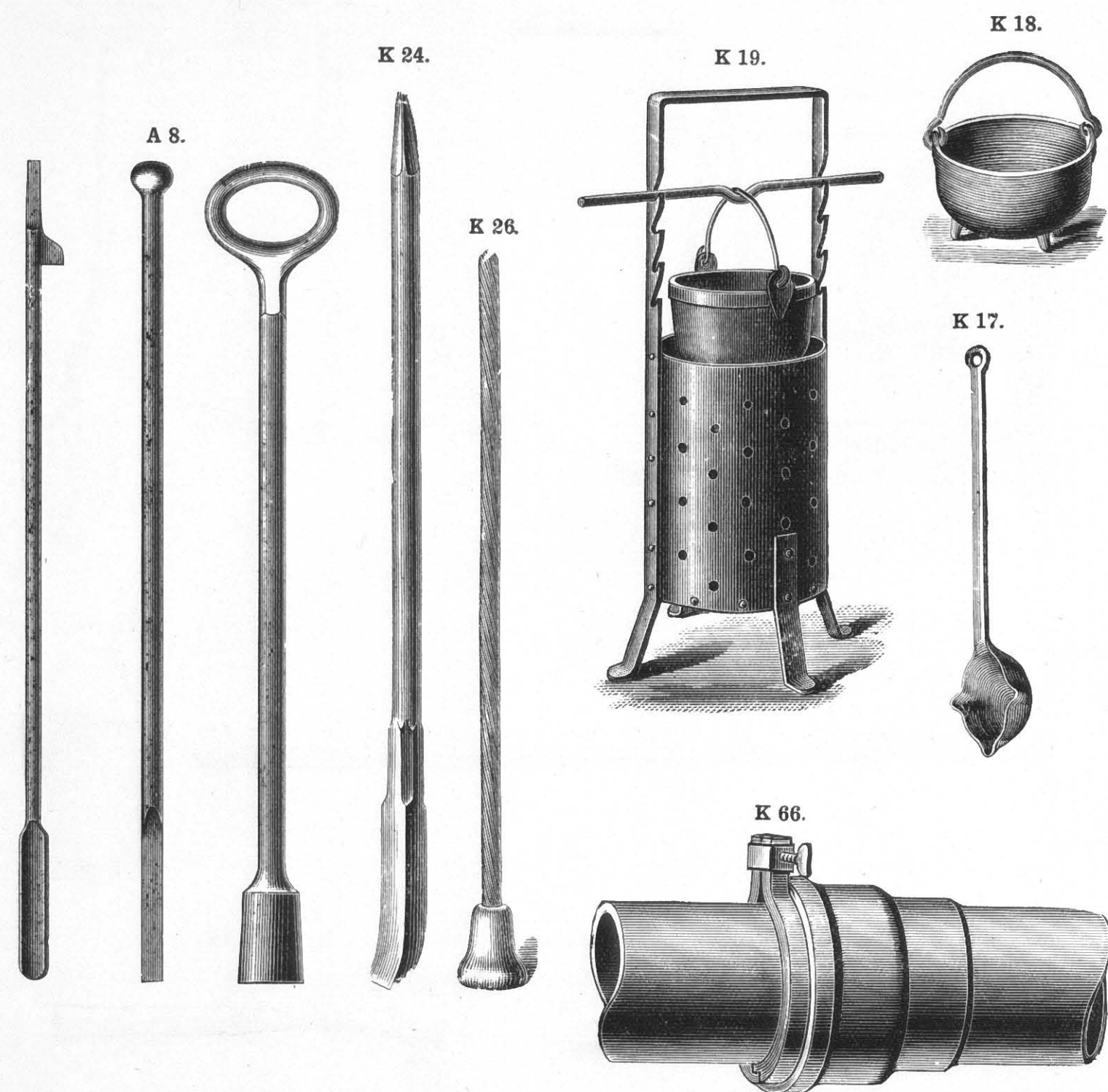
K 10.



PRICES.

K 10—Fitters' Hammer, ..	..	..	..	..	..	..	..	3 lb
K 22—Heavy Hand Hammer	..	..	..	..	..	..	..	"
K 23—Sledge Hammer	..	..	..	..	..	..	..	"
K 60—Pick, Shafted, ..	..	..	..	..	..	..	..	each.
K 62—Shovel, Shafted, ..	..	..	..	..	..	..	..	"
K 64—Galvanized Bucket, ..	..	..	..	..	..	..	..	"
K 92—Hoisting Crab to lift with two and three Sheave Blocks, ..	..	..	2	3	4	5	tons.	each.

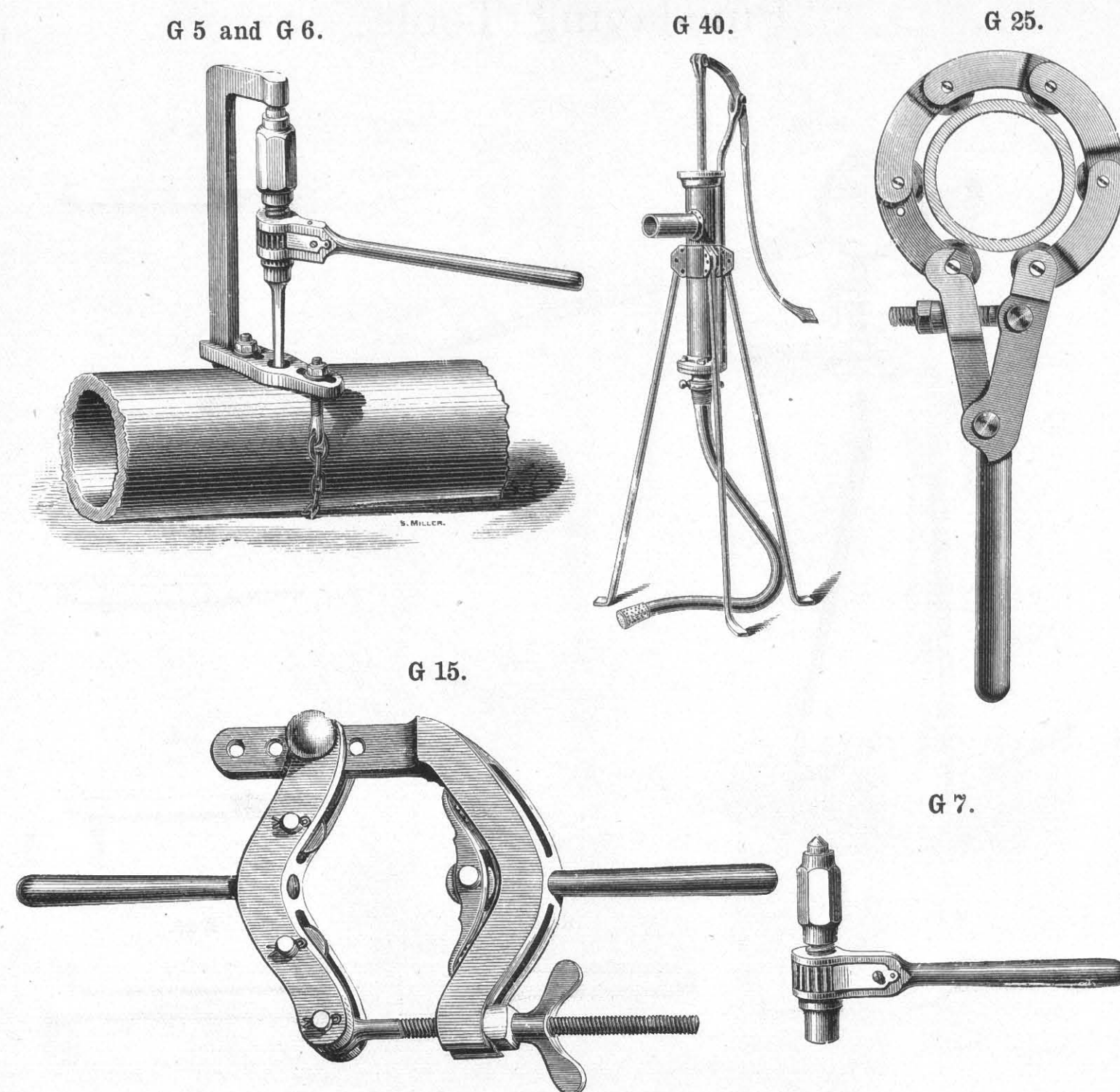
Pipe-laying Tools.



PRICES.

A 8—Set of three Valve Keys, Metropolitan Pattern	{ Rough, Polished,										3 s.				
K 17—Lead Ladle (of wrought iron)	3"	3½"	4"	4½"	5"	6"	7"	8"	9"	10"	each.				
K 18—Lead Pot,											3 lb.				
K 19—Choffer,											each.				
K 24—Crowbar, steel pointed,											"				
K 26—Pounder, or Rammer, with Shaft,											"				
K 66—Clips for running lead joints	2"	3"	4"	6"	8"	10"	12"	15"	18"	20"	22"	24"	30"	36"	"

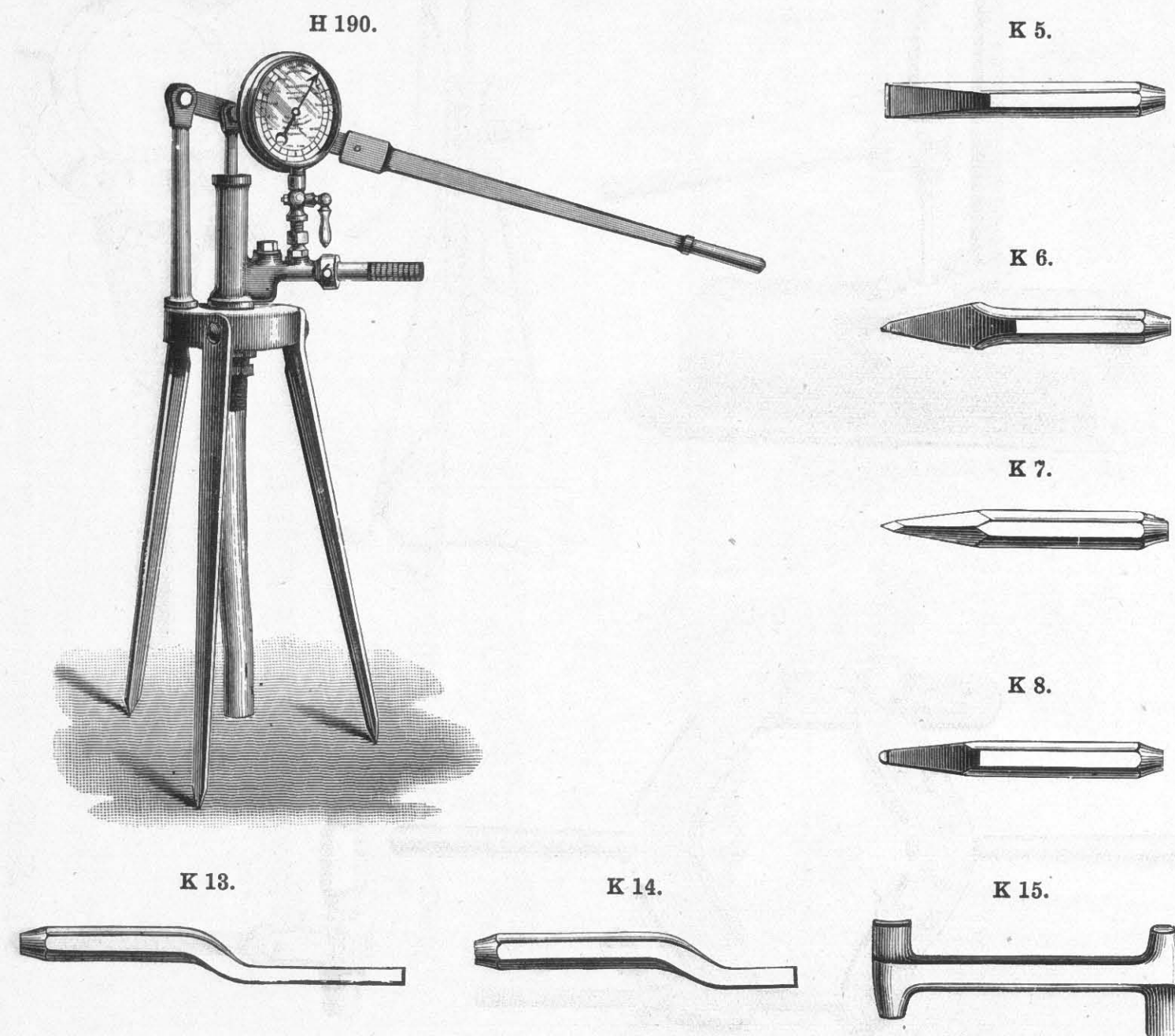
Pipe-laying Tools.



PRICES.

G 5 and G 6—Bracket or Cramp, with Chain Sling and Ratchet Brace for drilling pipes, including three Chain Slings and three Drills,										each.
										10" 12" 14" 16" 18" 20" 22" 24"
G 7—Ratchet Brace, .. .. .										..
G 25—Jones' Pipe Cutter, for cast iron pipes—										..
To Cut—2" to 3" 2" to 4" 2" to 5" 2" to 6" 2" to 7" 2" to 8" 5" to 6" 5" to 7" 5" to 8" 5" to 10" 5" to 11" 5" to 13" Pipes.										each.
Extra Cutters,										for 2" to 8", ; 5" to 13", ..
G 15—Cutter for cast iron pipes—										..
To Cut—2" to 4" 4" to 6" 5" to 8" 8" to 12" Pipes.										each.
Extra Cutters,										for 2" to 4", ; 4" to 6", ; 5" to 8", ; 8" to 12", ..
G 40—Hand Pump for pumping out trench, with brass Union for 2" Hose, but not including Hose, ..										..

Pipe-laying Tools.



PRICES.

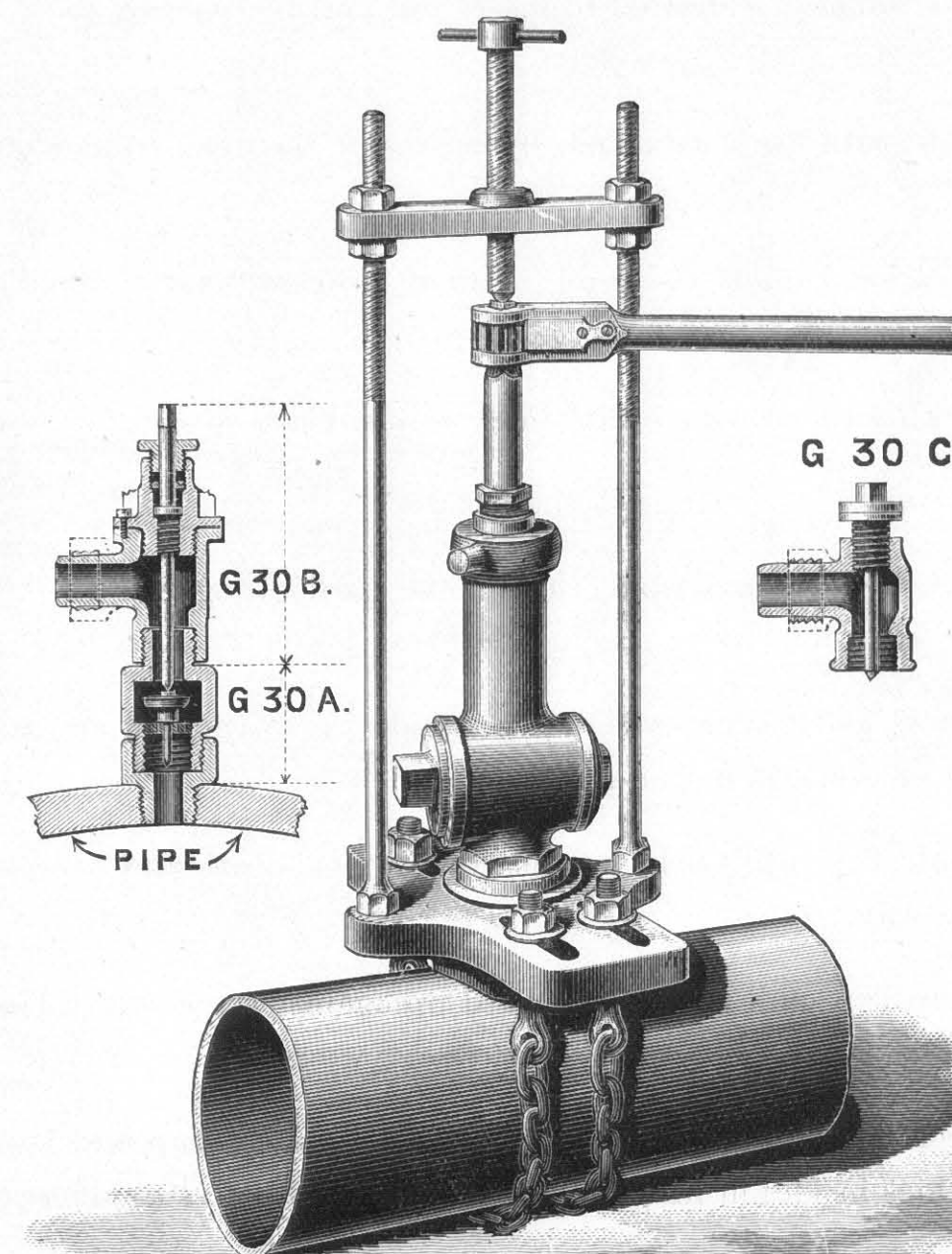
H 190—Test Pump (a useful little Portable Pump which can be used for many purposes), Barrel, Valves, etc., of gun metal, Plunger $1\frac{1}{2}$ " dia. \times $2\frac{1}{2}$ " stroke, Complete, with 4" Pressure Gauge, as shown, each.

K 5, K 6, K 7, K 8, K 13, K 14, and K 15—Chisels, Caulking Tools, and Staving Irons, steel, @ per lb.

Apparatus for

Drilling and Tapping Mains and Inserting Ferrules, etc., without requiring to turn off the Water.

Fig. G. 30.



PRICES.

		To tap	$\frac{1}{2}$ "	$\frac{3}{4}$ "	1"	$1\frac{1}{4}$ "
G 30	Bracket, with Chain, Bolts, four Saddles, Vertical Cock, and Ratchet Brace without Drill and Tap, but with Spindle and Sockets,	each				
	Drill to suit above,	"				
	Tap do.	"				
G 30 A	Ferrule, with small Internal Valve,	"				
G 30 B	Ferrule Cock, to screw on top of Ferrule G 30 A, with Plain End,	"				
G 30 C	Ferrule Cap—can be used instead of Ferrule Cock in cases where Cock is not required, with Plain End,	"				
	Ferrule Cap, with Ground Union,	"				

NOTE.—The $1\frac{1}{4}$ " size can tap all the lower sizes, provided Drills and Taps are supplied.

For Instructions see next page.

Instructions for Working

Boring and Tapping Apparatus for Pipes under Pressure.

Select the Saddle to suit the size of pipe in which the Ferrule is to be inserted, and place it over the point where it is desired to insert the Ferrule, putting joint between pipe and saddle.

Secure the large Plate with Cock attached, by means of the chain round pipe, and open Cock full.

Remove cover of Cock, and insert the proper size of Drill into end of spindle, and secure it by cotter.

Drop the Spindle, with Drill attached, into Cock and re-place cover.

Put on Ratchet brace and start drilling in the usual way.

After Drill has penetrated the pipe, pull the spindle hard up against the cover of Cock, and then close Cock.

Remove cover of Cock, and having withdrawn spindle, remove Drill and insert the Tap in its place, and secure with cotter as before.

Drop the Spindle with Tap into Cock, put on cover, open Cock, and proceed to tap the hole in the usual way.

Having unscrewed the Tap, pull the spindle hard up against the cover of Cock, and then close Cock.

Remove cover of Cock, and having withdrawn spindle, remove Tap and insert the small socket (with springs inside) in its place, and secure with cotter as before.

Insert the top end of Ferrule into socket and drop it into Cock, allowing the bottom to rest on plug of Cock.

Re-place the cover and open Cock full.

Screw the Ferrule into main, taking care that the screw enters correctly.

The water pressure in main will then close Valve inside Ferrule.

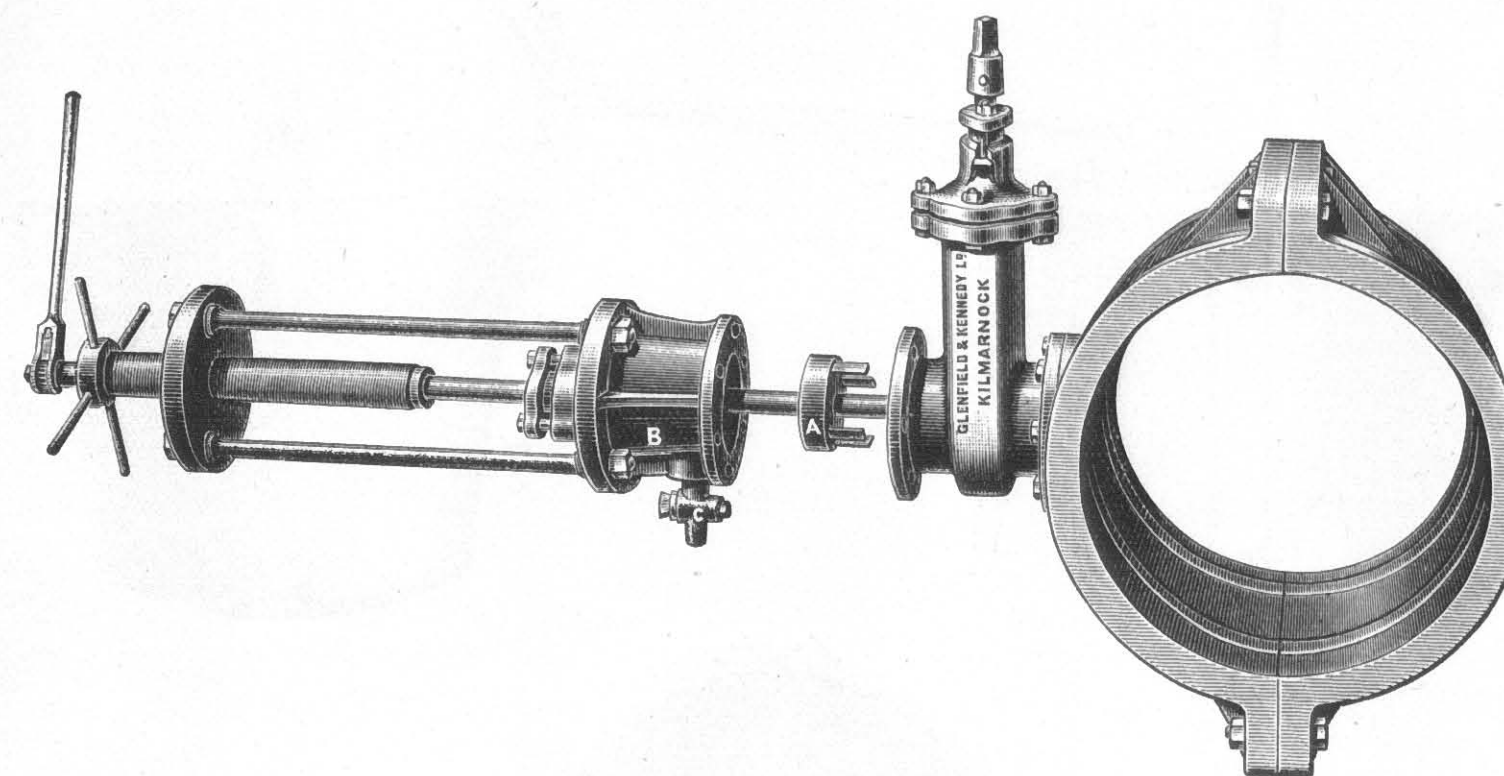
The spindle should then be withdrawn and the Bracket carefully removed.

Screw on the Ferrule Cock, and having made the necessary pipe connection, the valve can be opened in the usual way.

Apparatus for Making

Connection to Water Mains under Pressure.

Fig. G 33.



The Collar and Valve being permanent parts of the connection these are supplied to suit the size of Main and Branch required.

Having fixed the Collar and leaded and caulked up the ends in the usual manner, bolt the Valve to same as shown.

Open Sluice Valve full up.

Insert the Boring Head **A** and attach the Casing **B** to Valve.

After hole is bored or cut out, open Scour Cock **C** so as to clear out the borings.

The Boring Head is then withdrawn into Casing (a catch on central spindle pulling the disc cut out of pipe with it).

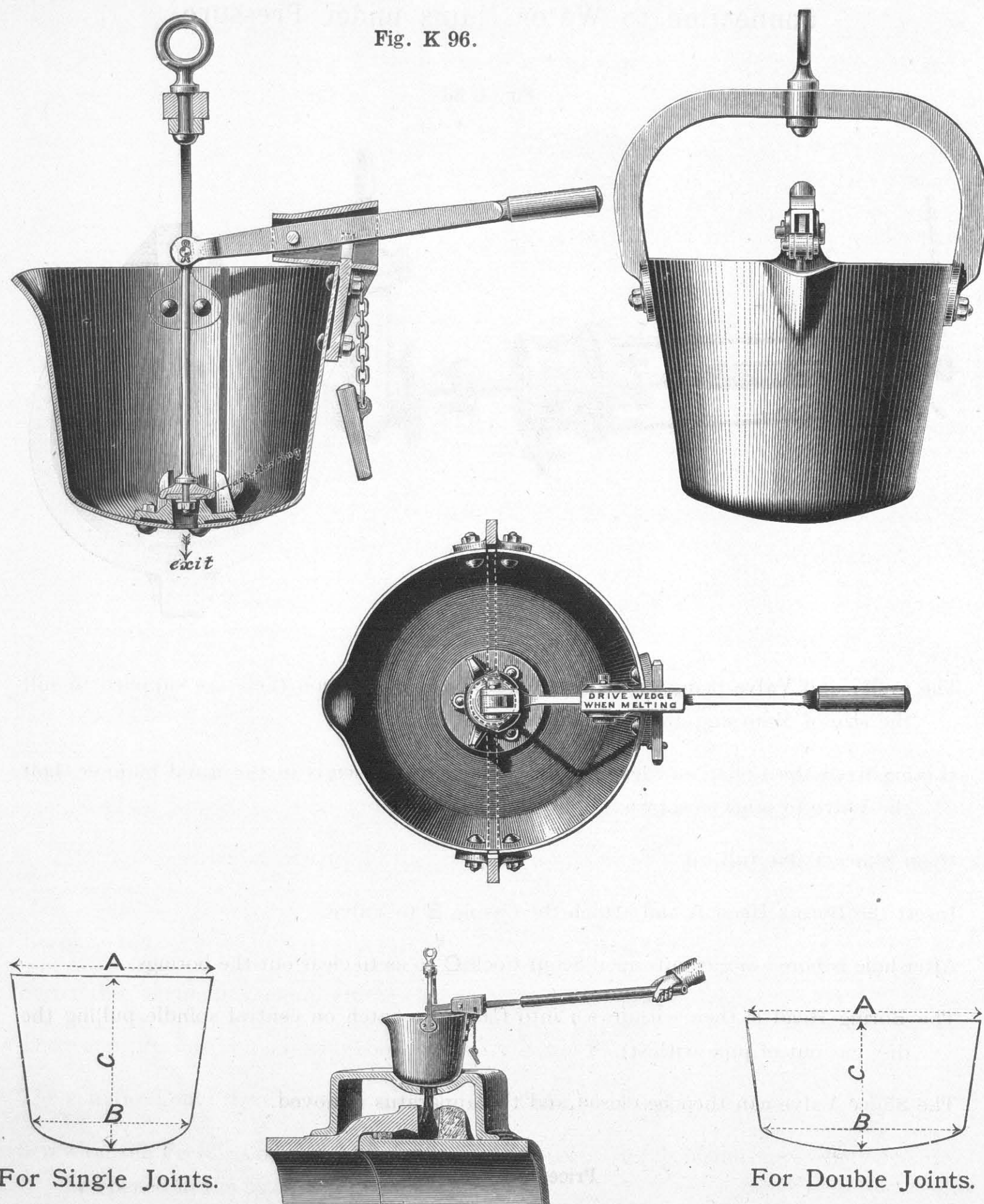
The Sluice Valve can then be closed and the apparatus removed.

Prices on application.

Nicholson's Patent Combined Melting Pot and Ladle.

For running lead Joints in cast iron Pipes.

Fig. K 96.



Nicholson's Patent Combined Melting Pot and Ladle.

For running lead Joints in cast iron Pipes.

LADLES.

SUITABLE FOR SINGLE AND DOUBLE PIPE JOINTS, MADE OUT OF A SOLID PLATE OF MILD STEEL.

LADLES FOR SINGLE JOINTS.					LADLES FOR DOUBLE JOINTS.				
To hold	A	B	C	PRICE.	To hold	A	B	C	PRICE.
Cwts.	Inches.	Inches.	Inches.	£ s. d.	Cwts.	Inches.	Inches.	Inches.	£ s. d.
$\frac{1}{4}$	$6\frac{3}{4}$	$5\frac{1}{2}$	$6\frac{1}{4}$		1	12	10	8	
$\frac{3}{4}$	$9\frac{5}{8}$	$7\frac{1}{2}$	$8\frac{1}{2}$		2	$15\frac{3}{4}$	$13\frac{3}{4}$	9	
1	$10\frac{1}{4}$	$7\frac{1}{2}$	11		$2\frac{1}{2}$	16	$13\frac{3}{4}$	$10\frac{1}{4}$	
$1\frac{1}{2}$	$12\frac{1}{2}$	10	10		3	$16\frac{3}{8}$	$13\frac{3}{4}$	$12\frac{1}{2}$	
2	13	10	12		4	$16\frac{7}{8}$	$13\frac{3}{4}$	$15\frac{1}{2}$	
$2\frac{1}{2}$	15	10	14		..	..	..	..
3	15	10	16		..	..	..	..

The Prices do not include stool for resting on pipes.
This may be made out of a piece of light channel iron dished to receive Ladle.

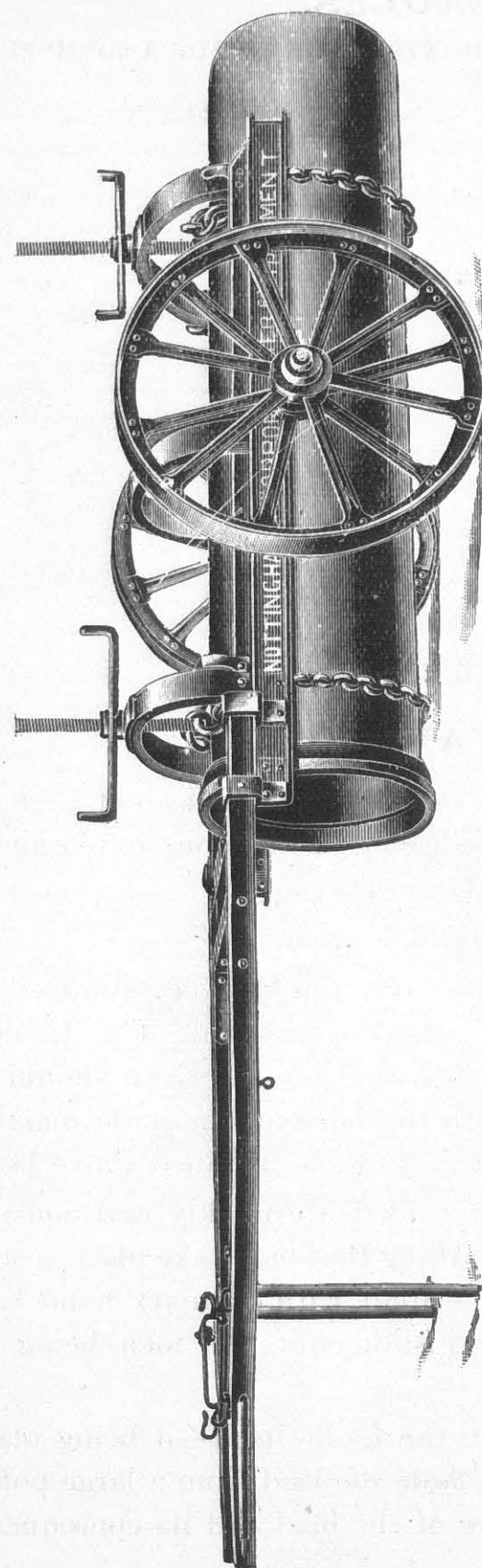
ADVANTAGES.

- Safety;** The operator can open the Valve by a piece of tube put on the handle. He thus stands quite clear. Dangerous explosions not unfrequently occur when running large pipe Joints.
- Soundness of Joints;** The soundness of the Joint is ensured—
1st.—No scum or dross can possibly be admitted, as only the clean fluid lead flows from the bottom. The Ladle should never be entirely emptied into the joints. Even should the Ladle be accidentally emptied to the bottom, the scum remains in the Ladle, as the Valve Seat projects some distance above bottom of Ladle.
2nd.—The Joint being filled up quickly and continuously in spite of any blowing or sparking that may take place, a solid joint is ensured, as when running a Joint with ordinary hand ladle it is not unfrequently filled by instalments, the men being afraid to fill it up right off.
- Fluidity of Lead;** As the lead is melted in the Ladle itself—it being placed over the fire—it is not necessary to ladle the lead from a large pot as is usually done. The high temperature of the lead and its consequent fluidity are thus ensured.

The Ladle for Double Joints is used for running Collars on two pipes with spigot ends (some pipe lines are Jointed in this manner). The Valves in the Double Ladle are arranged at a distance to suit the Joints to be run, and they may be run either separately or simultaneously, the Ladle itself being "dished" at bottom so as to rest on the Collar when running the Joints.

Thomson's Patent Pipe Cart.

Fig. K 99.



As used by Nottingham Corporation Water Department, Huddersfield Corporation Water Department,
Hereford Corporation Gas Department, etc.

The Frame and Bridges, which carry the lifting screws, are of channel iron.

Screws of special steel, lathe-turned, and Shafts of selected ash.

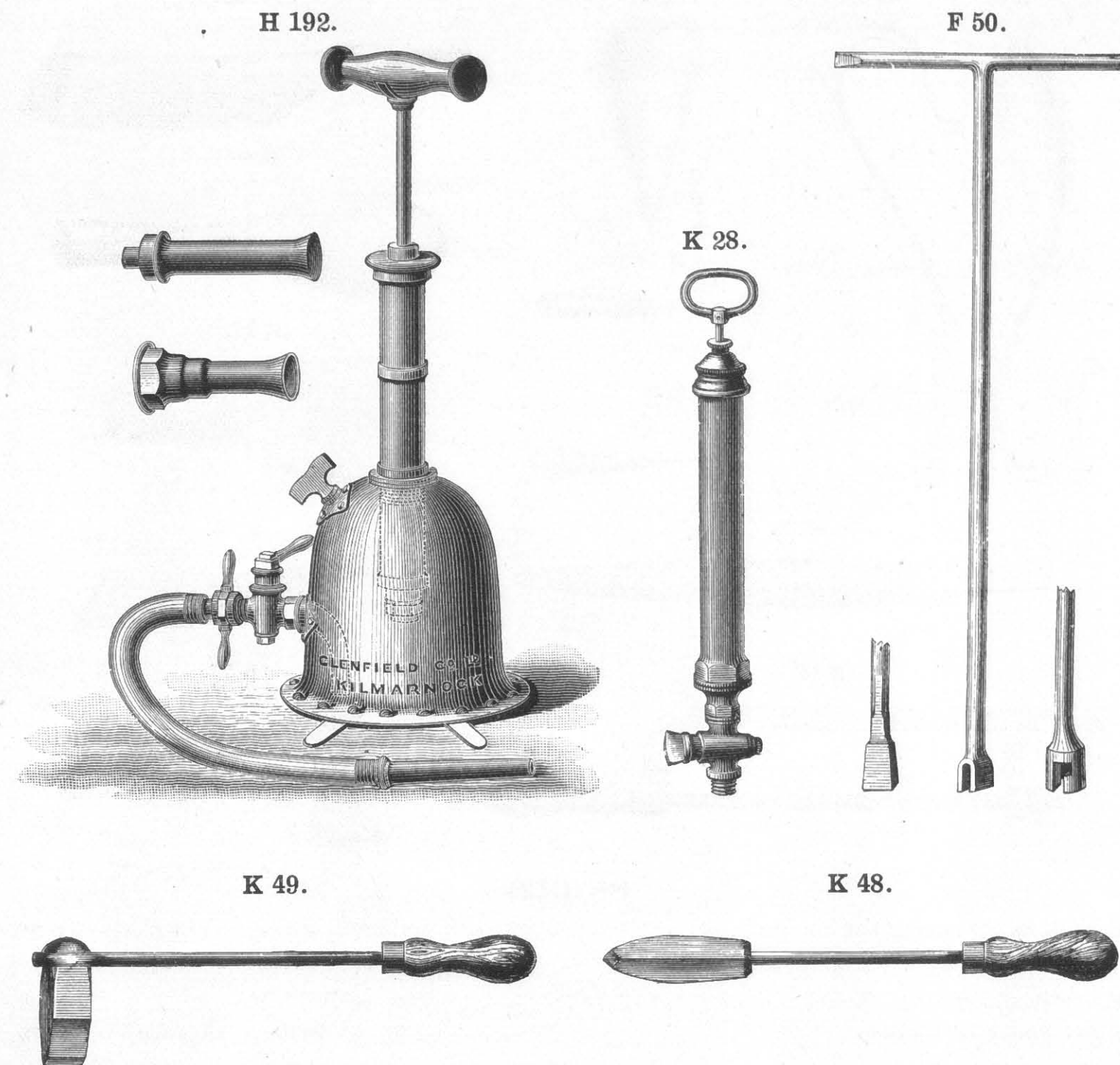
The Wheels are similar to those fitted on traction engines.

Only one man required to load and unload it.

To carry 15" to 30" Pipes weighing from 11 cwt. to 3 tons.

Prices on application.

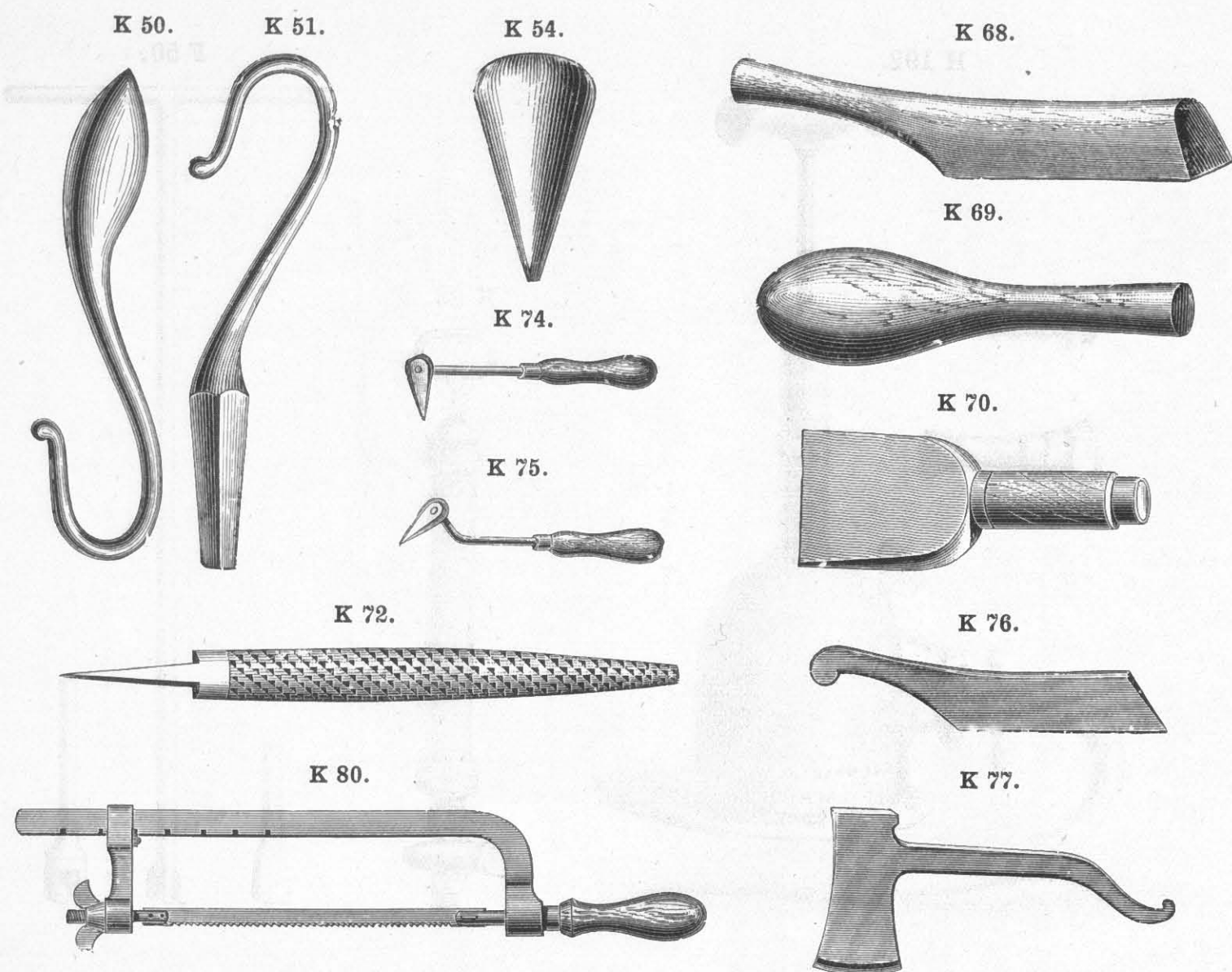
Plumbers' Tools.



PRICES.

F 50	—Wrought Iron Key with Cross Handle, for Stop Cocks,..	..	each.
H 192	—Plumbers' Force Pump, or Service Pump, with short length of Hose and Connections shown, .. .. .	..	..
K 28	—Air Pump for charging Syphon, with Cock, .. .. .	..	..
K 48	} Soldering Bolts, .. .. .	..	3 lb.
K 49			

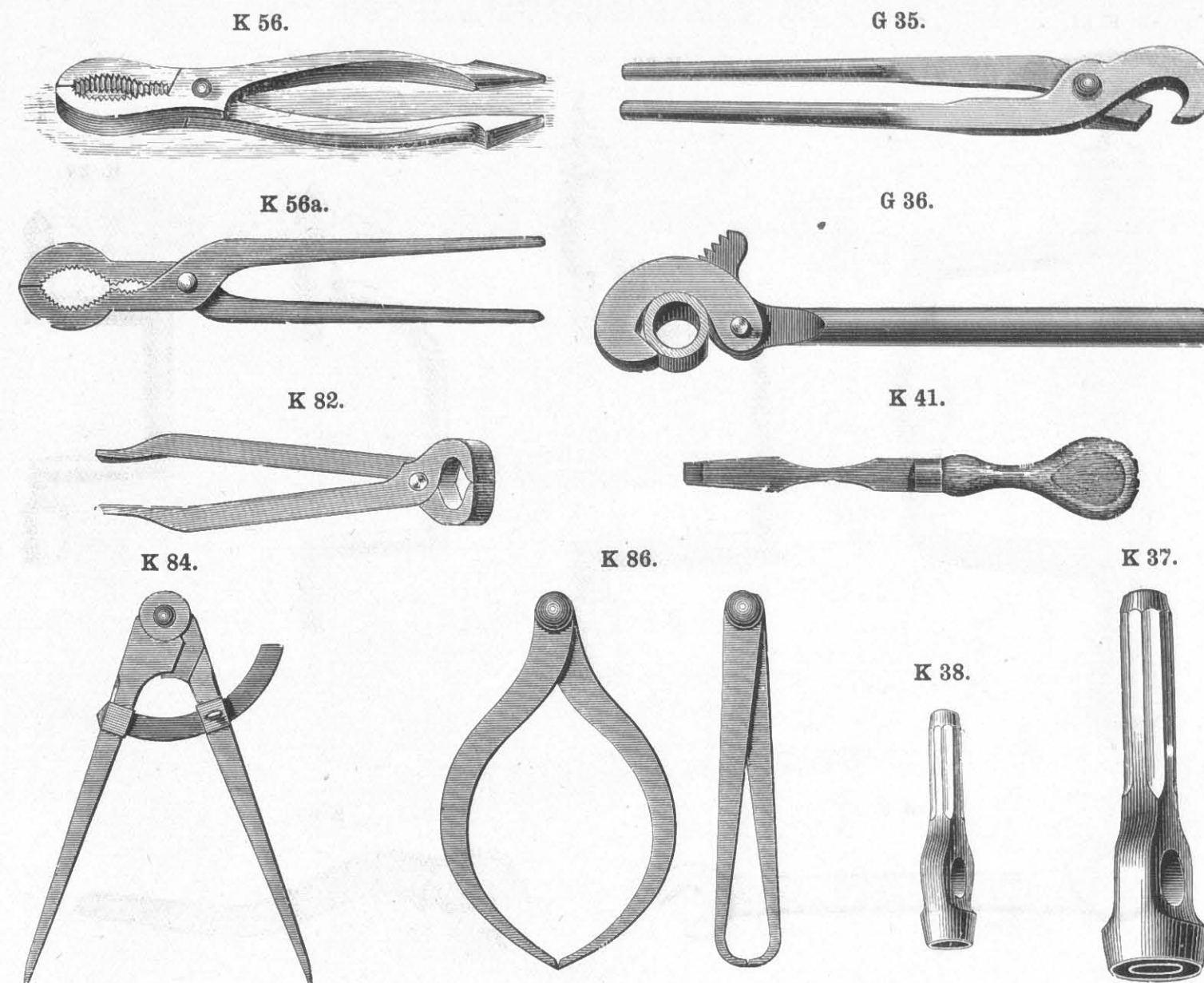
Plumbers' Tools.



PRICES.

K 50, K 51—Plumbers' Irons,	1" 1 1/4" 1 1/2" 2" 2 1/2" 3"	per lb.
K 54—Boxwood Cone,		each.
K 68—Plumbers' Dresser,	beech, per doz.; boxwood, per doz.	
K 69—Do. Maul,	do. ,, do.	
K 70—Do. Chase,	8" 9" 10" 12" 14"	
K 72—Do. Rasps,	Fine, Coarse,	
K 74, K 75—Shave Hooks, bent or straight, with heart shape or triangular Blades,		
K 76—Plumbers' Knife, iron handle,		
K 77—,, Cutting Knife, to order.	8" 10" 12" 14"	
K 80—Bow Saw and Frame for iron,		each.
Blades for do.		

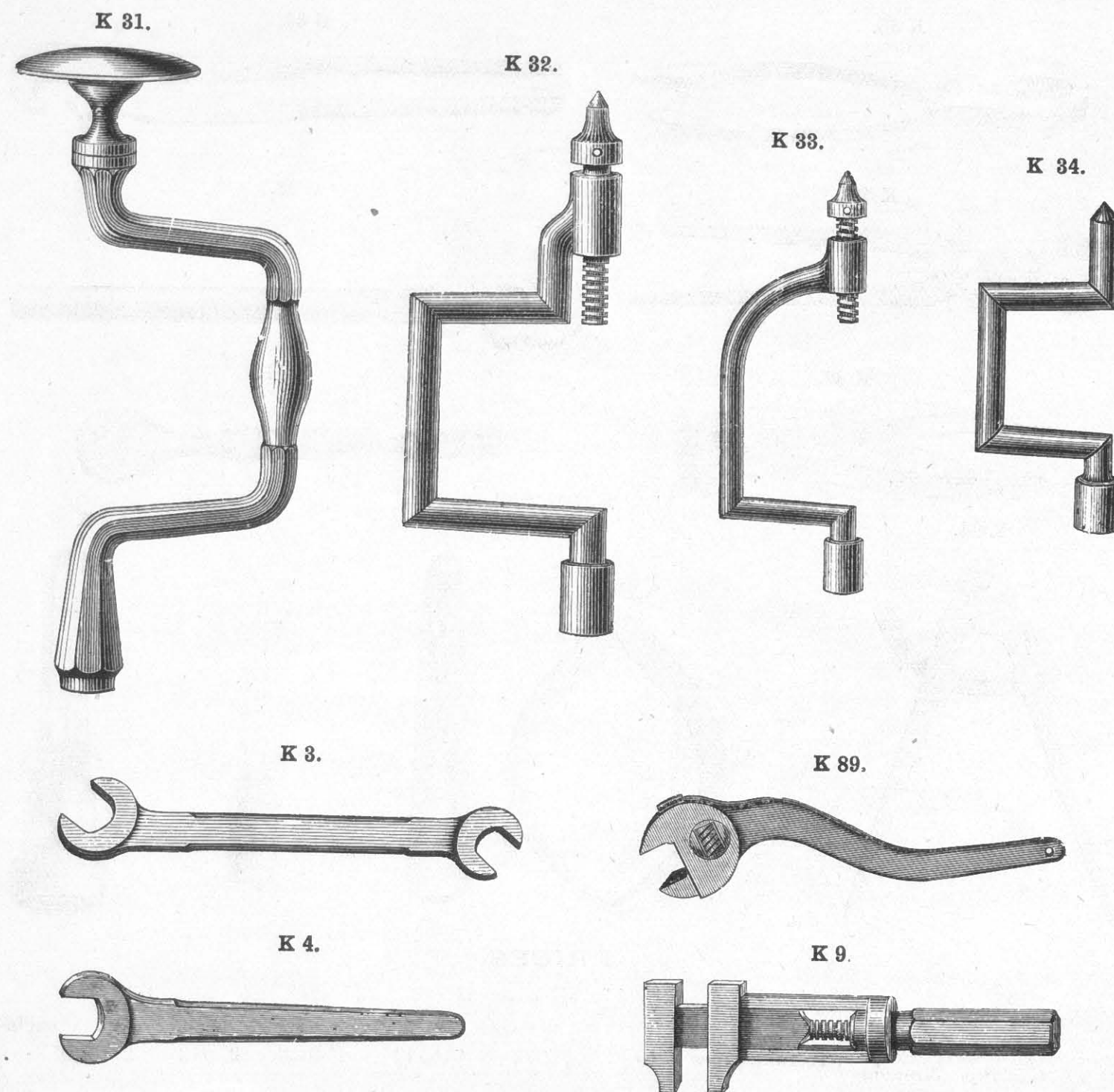
Plumbers' Tools.



PRICES.

G 35—Gas Pipe Tongs	1" 3/8" 1/2" 5/8" 3/4" 1" 1 1/4" 1 1/2" 1 3/4" 2" 2 1/4" 2 1/2" 2 3/4" 3" 3 1/2" 4"	each.
G 36—Gas Pipe Wrenches	To take pipes 1/8" to 1/2" 1/4" to 3/4" 1/2" to 1 1/4" 1" to 2" 2" to 3" 2" to 5"	
K 37—Double Washer Punch,		
K 38—Single do.		
K 41—Screw Driver,	4" 6" 8" 10" 12" 14" 16" 18"	
K 56—Gas Pliers, 2 holes,	7" 8" 9" 10" 12" 14"	per pair.
K 56a—Do. do. improved,		
K 82—Cutting Pincers,	5" 6" 7" 8" 9" 10" 12"	per doz.
K 84—Wing Compasses, To 5" 6" 7" 8" 9" 10" 11" 12" 14" 16" 18" 20" 22" 24"		
black,		
K 86—Callipers (outside or inside)	3" 3 1/2" 4" 4 1/2" 5" 5 1/2" 6" 7" 8" 9" 10" 12" 14" 16" 18" 20" 22" 24"	

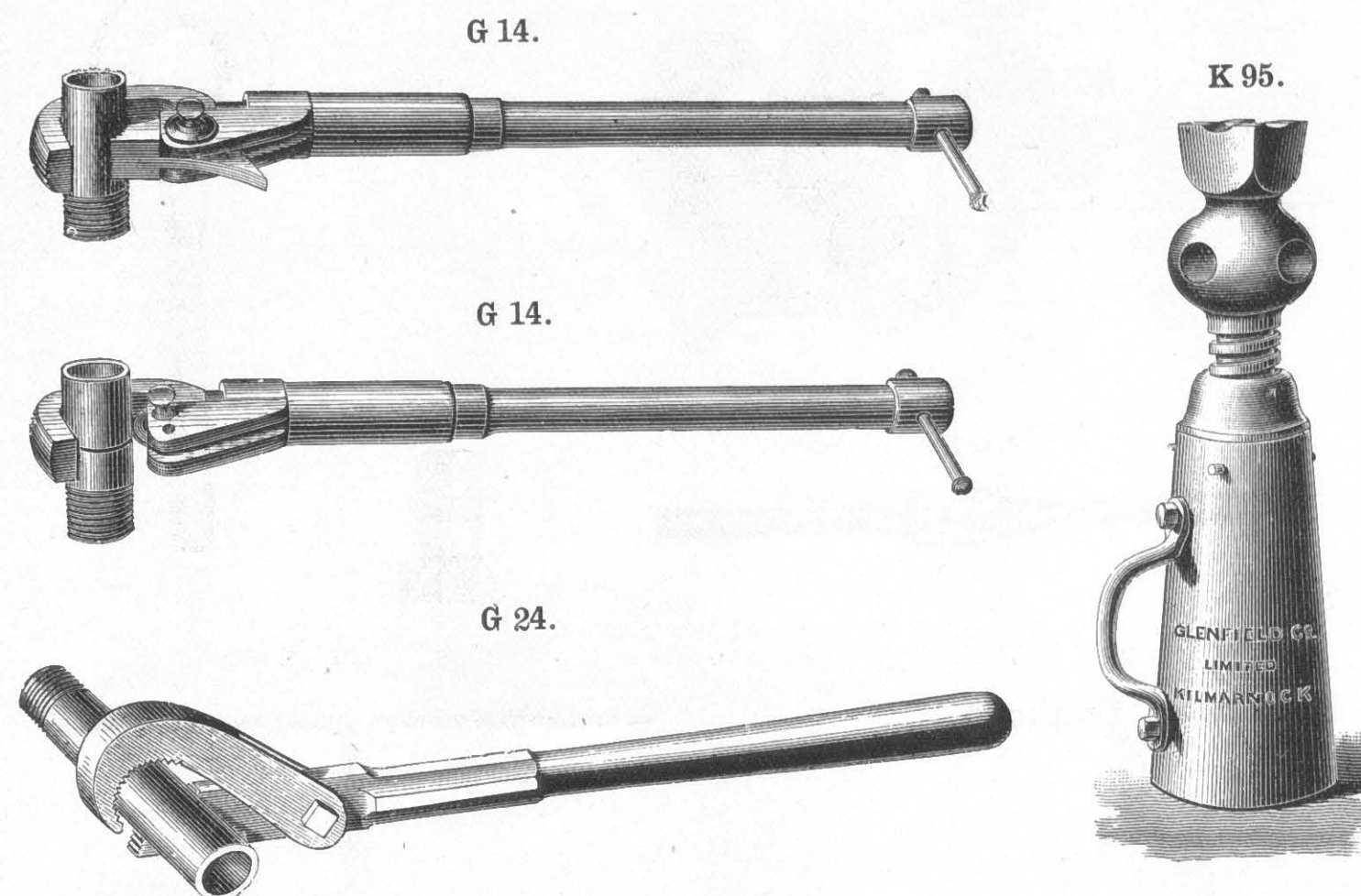
Miscellaneous Tools.



PRICES.

K 3—Screw Keys, or Spanners, malleable cast,	..	..	..	..	..	..	..	..	..	@	Ⓕ lb.
K 4—Do. do. forged, ..	..	..	..	..	..	..	..	..	..	@	"
K 9—Adjustable Spanner, or Wrench,	{ 8" 10" 12" 14" 16" 18"							each.		
K 31—Hand Brace, ..	..	..	..	..	..	..	..	..	..	..	"
K 32—Do. with Screw, ..	..	..	..	..	..	..	..	..	..	..	"
K 33—Do. do. ..	..	..	..	..	..	..	..	..	..	..	"
K 34—Plain Hand Brace, ..	..	..	..	..	..	..	..	..	..	..	"
K 80—Clyburn Spanner, all wrought iron {	4"	5"	6"	8"	10"	12"	15"	18"	21"	24"	26"	28"	30"	..

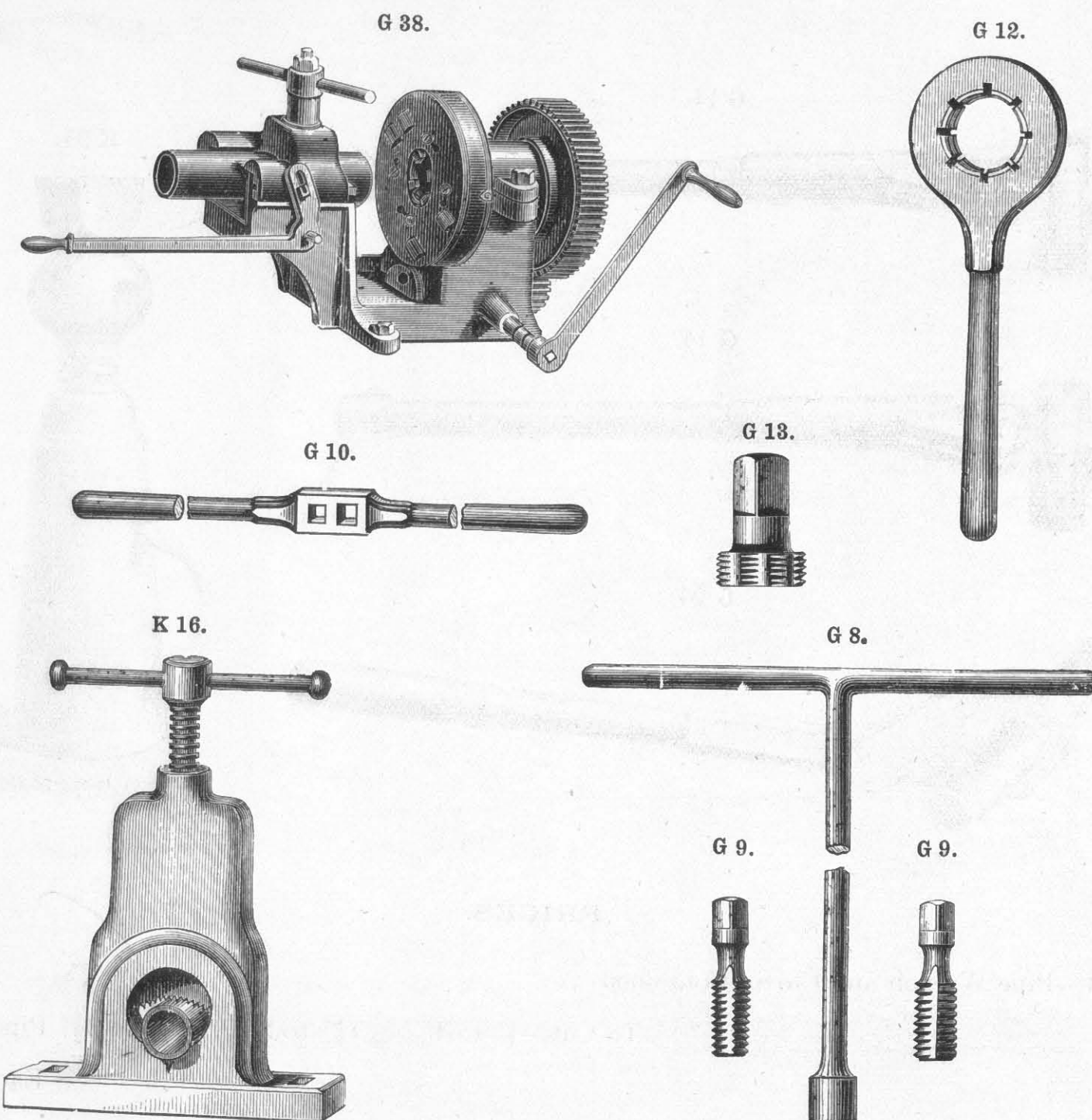
Miscellaneous Tools.



PRICES.

G 14—Pipe Wrench and Cutter Combined—										
To Cut— $\frac{1}{4}$ " to 1"										$1\frac{1}{4}$ " to 2"
										$2\frac{1}{4}$ " to $3\frac{1}{2}$ " Pipes.
										Each.
Extra Cutters,										"
G 24—Self-adjusting Pipe Wrench—										
$\frac{1}{4}$ " to $\frac{1}{2}$ "										$\frac{3}{4}$ " to $1\frac{1}{4}$ "
										$1\frac{1}{2}$ " to 2"
K 95—Screw Bottle Jack, with malleable cast iron Case—										
2	4	6	8	10	12	15	18	20	Tons.	
										Each.

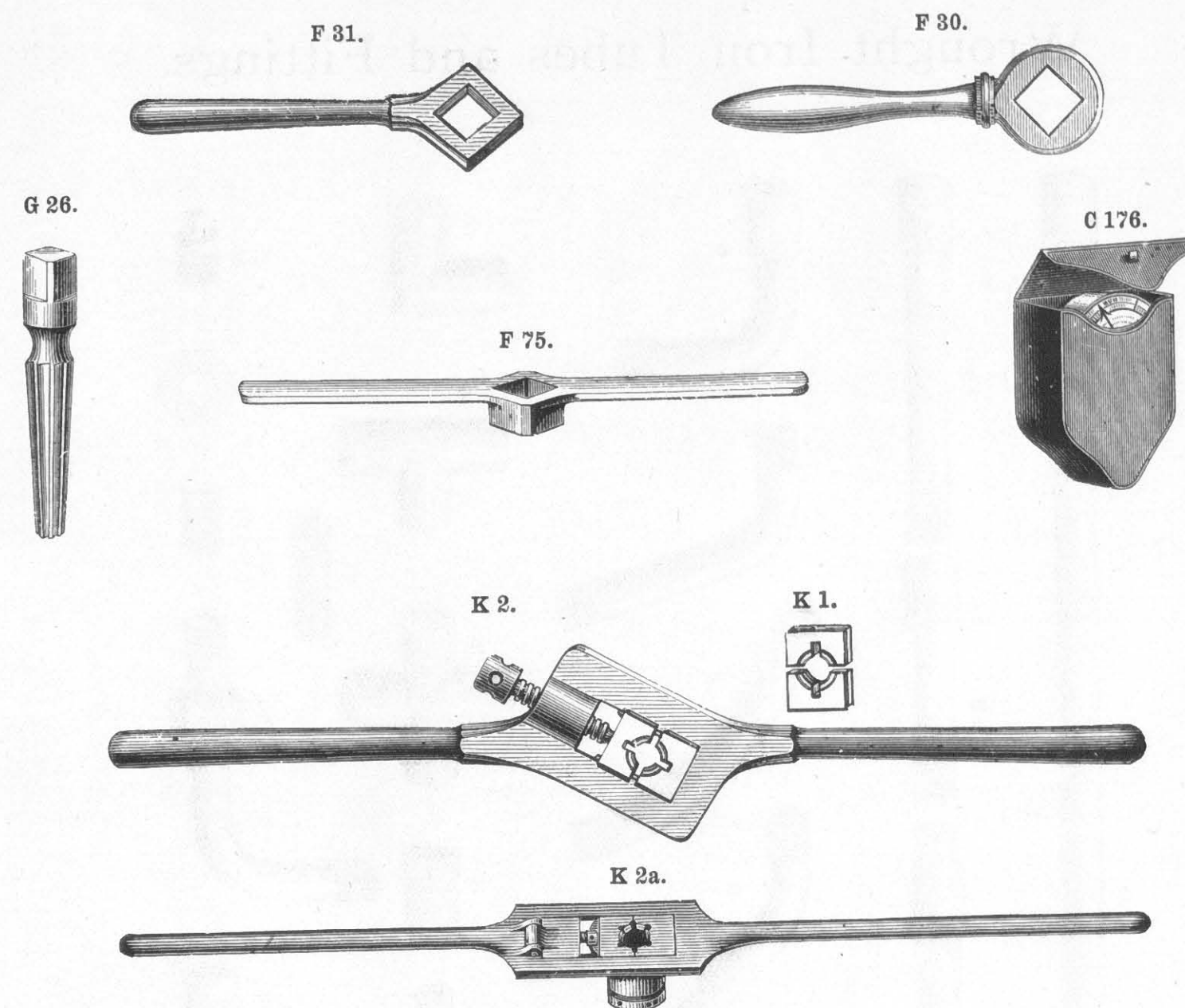
Miscellaneous Tools.



PRICES.

G 8—Long Key, with Cross Handle, to suit square heads of Taps, ..	..	..	..	..	..	each.
	$\frac{3}{8}$ "	$\frac{1}{2}$ "	$\frac{5}{8}$ "	$\frac{3}{4}$ "	1"	
G 9—Taps, best steel, carefully tempered, one each Plug and Taper,					$1\frac{1}{4}$ "	$1\frac{1}{2}$ "
G 10—Wrench to suit square heads of Taps, ..	..	..	..	..	..	pair.
G 12, G 13—Screw Plate and Tap, for repairing damaged couplings, made to suit any Screw Gauge, for Hose Couplings or Gas Threads, ..	..	..	..	..	..	each.
G 38—Hand-power Screwing Machine, with adjustable Dies, to screw,	$\frac{1}{4}$ ", $\frac{3}{8}$ ", $\frac{1}{2}$ ", $\frac{3}{4}$ ", and 1" wrought iron tubes ; 3 sets of Dies,	..	..	..	..	"
	1", $1\frac{1}{4}$ ", $1\frac{1}{2}$ ", $1\frac{3}{4}$ ", and 2" wrought iron tubes ; 1 set of Dies,	..	..	..	..	"
	$1\frac{1}{2}$ ", $1\frac{3}{4}$ ", 2", $2\frac{1}{4}$ ", $2\frac{1}{2}$ ", and 3" wrought iron tubes; 1 set of Dies,	"
	To take $\frac{1}{4}$ " to $1\frac{1}{4}$ "	$\frac{1}{4}$ " to 2"			$1\frac{1}{4}$ " to 3"	
K 16—Tube Vice,

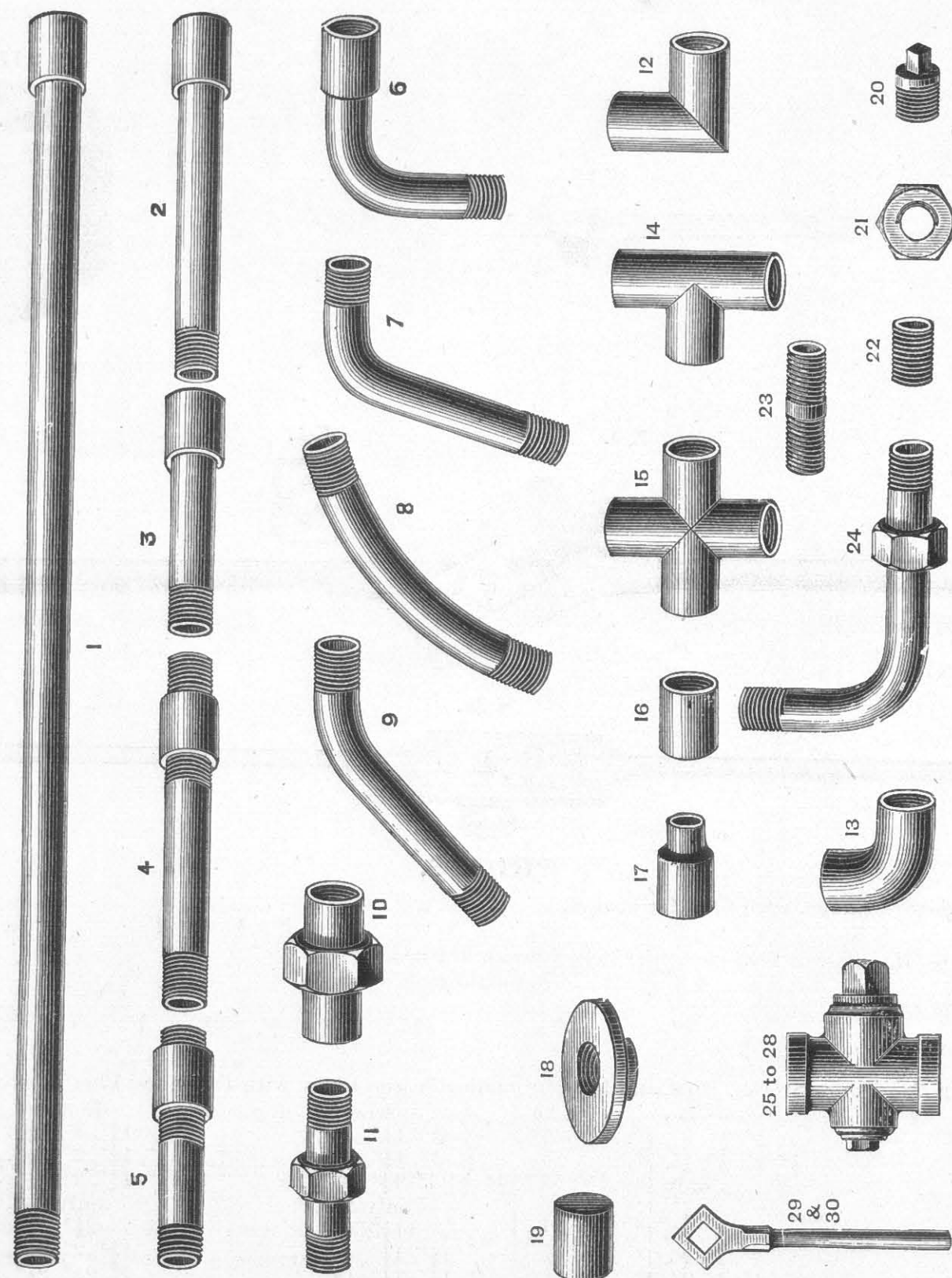
Miscellaneous Tools.



PRICES.

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Wrought Iron Tubes and Fittings.



For Particulars see next page.

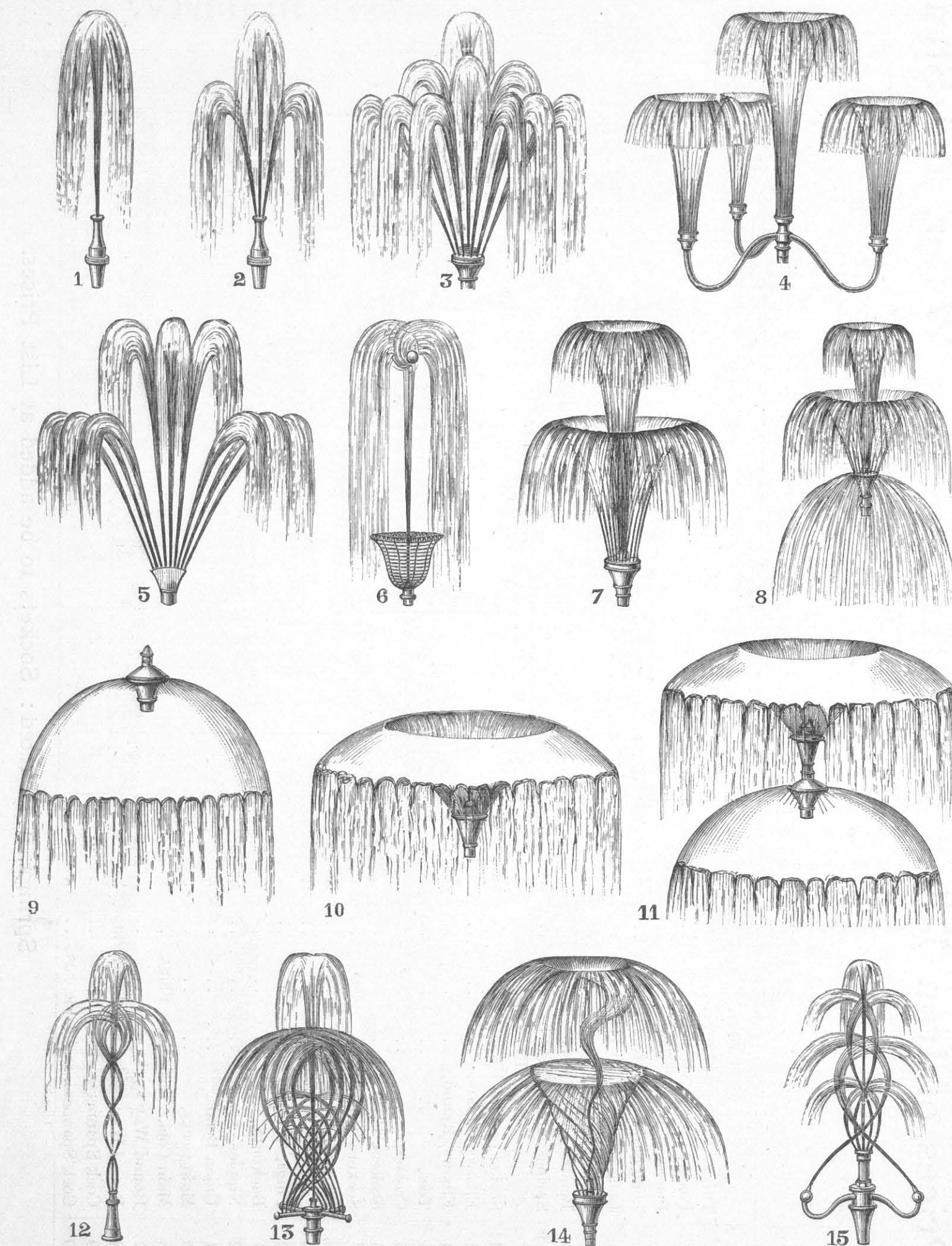
Prices of Iron Tubes and Fittings for Gas, Water, and Steam,
SHOWN ON PRECEDING PAGE.

2 H

No.	INTERNAL DIA. (NOMINAL), IN INCHES.														
	$\frac{1}{8}$ & $\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	$1\frac{3}{4}$	2	$2\frac{1}{4}$	$2\frac{1}{2}$	$2\frac{3}{4}$	3	$3\frac{1}{2}$	4
	TUBES.														
1	Tubes, 2' long and over, per ft.														
2	Pieces, 12" to $23\frac{1}{2}$ " long, each														
3	Pieces, 4" to $11\frac{1}{2}$ " long, "														
4	Long Screws, 12" to $23\frac{1}{2}$ " long, "														
5	Long Screws, 3" to $11\frac{1}{2}$ " long, "														
23	Barrel Nipples, "														
6	Bends, "														
7, 8, 9	Springs, not Socketed, "														
	FITTINGS.														
10, 11	Socket or Pipe Union, each														
12	Elbows, Square, "														
13	Elbows, Round, "														
14	Tees, "														
15	Crosses, "														
16	Sockets, Plain, "														
17	Sockets, Diminished, "														
18	Flanges, "														
19	Caps, "														
20	Plugs, "														
21	Backnuts, "														
22	Nipples, "														
24	Union Bends, "														
25	Main Cocks, "														
26	Main Cocks, with brass Plugs, "														
27	Round Way Cocks, "														
28	Round Way Cocks, with brass Plugs, "														
29	Cock Spanners, wrought, "														
30	Cock Spanners, malleable cast, "														

Sockets to be added at List Prices.

Ornamental Fountain Jets.



Prices on application.

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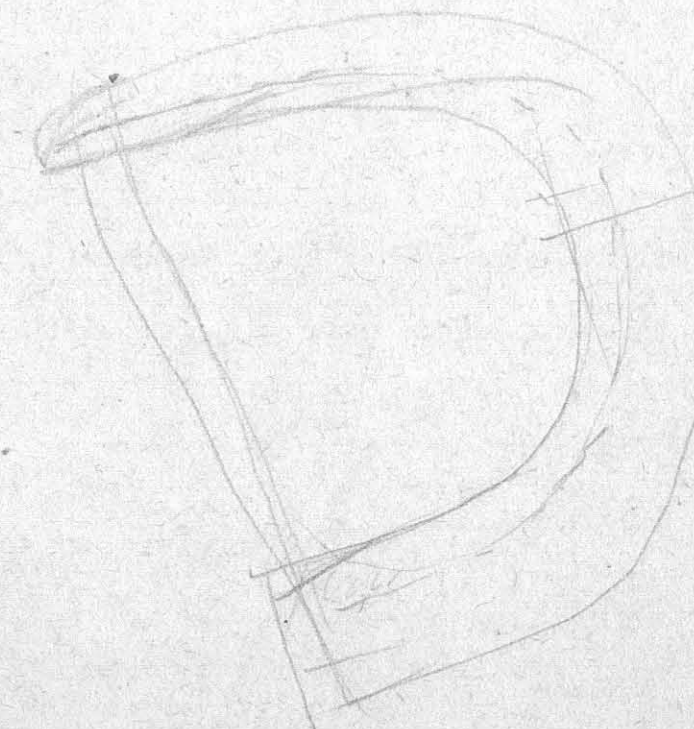
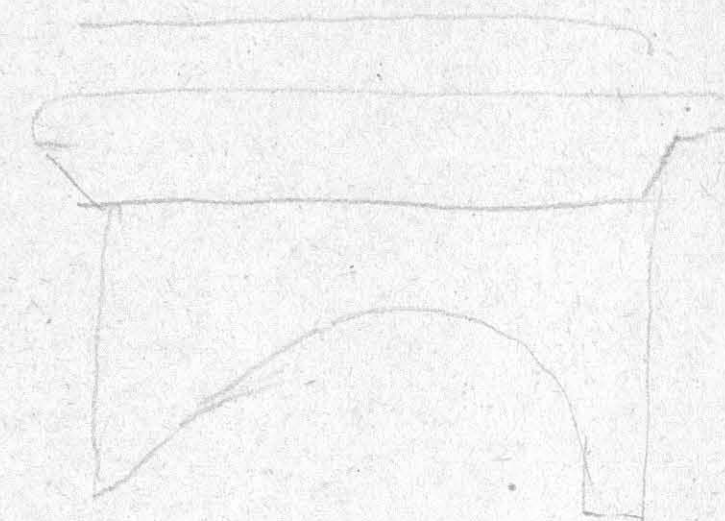
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The "GLENFIELD"
ROTARY
WATER METER

PATENTS No. 13440, 18905—1911.



MAKERS:
GLENFIELD & KENNEDY LIMITED,
KILMARNOCK, SCOTLAND.

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"GLENFIELD," KILMARNOCK.

TELEPHONES:
NO. 28 KILMARNOCK.

(NO 66 CENTRAL, GLASGOW.)
SPECIAL PRIVATE WIRE
FROM GLASGOW TO KILMARNOCK.

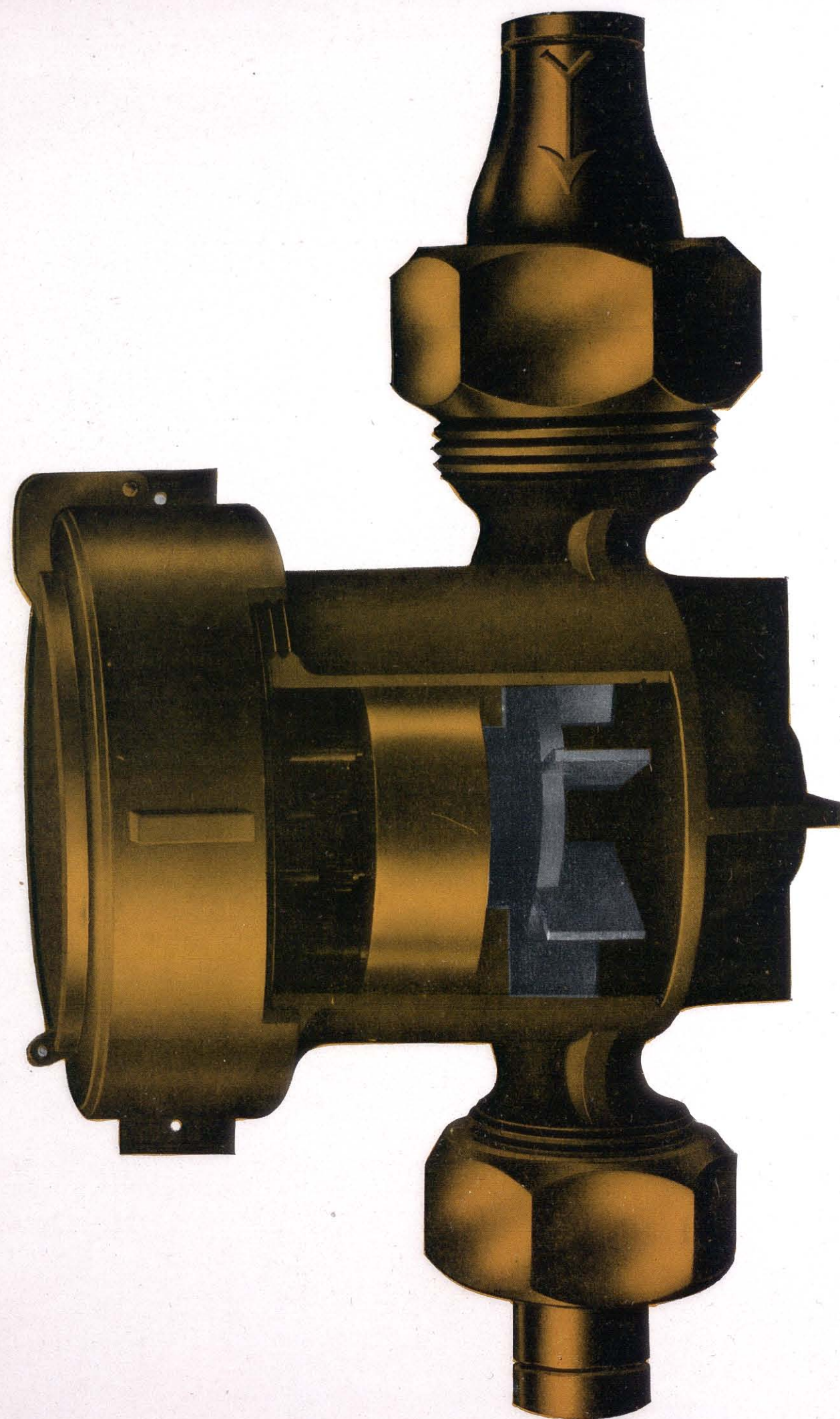
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39 VICTORIA STREET, WESTMINSTER, S.W.

TELEGRAPHIC ADDRESS:
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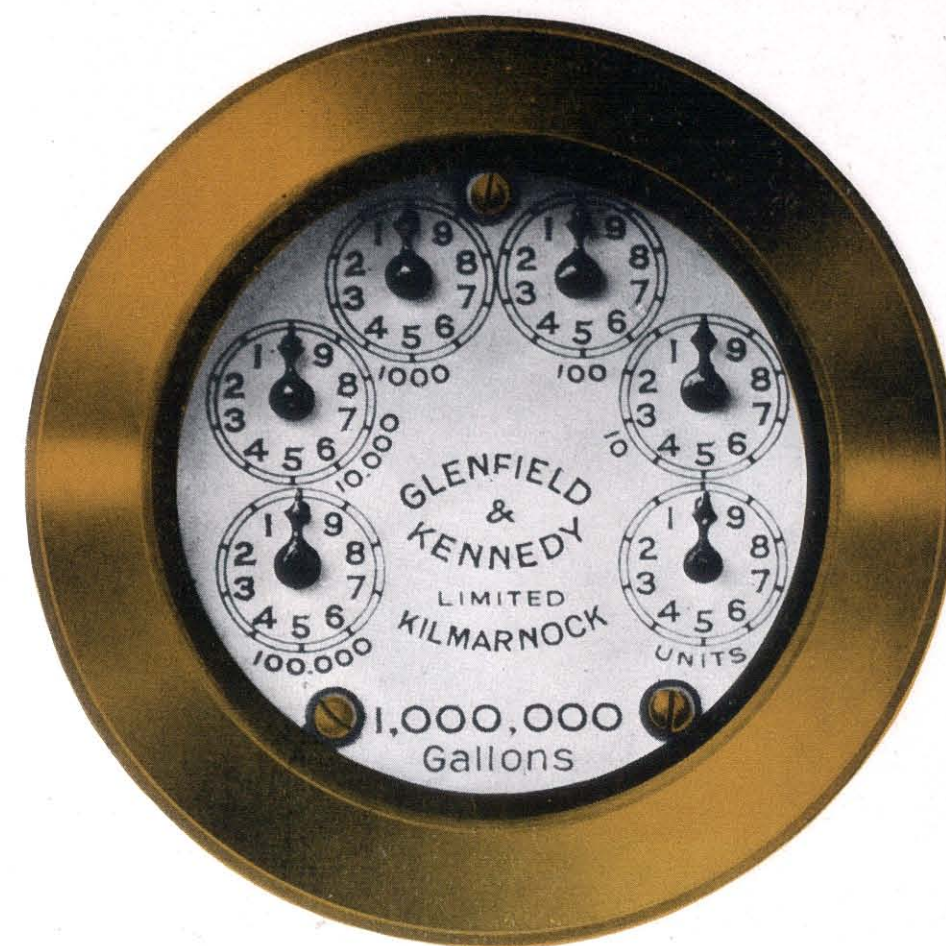
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The "Glenfield" Rotary Water Meter.

GLENFIELD & KENNEDY LIMITED, KILMARNOCK, SCOTLAND.



GLENFIELD & KENNEDY LIMITED, KILMARNOCK, SCOTLAND.



ACCURACY.—Although a good Positive Water Meter is the most accurate type, its cost frequently prohibits its use where water is comparatively cheap, and where *extreme* accuracy is not essential.

In these cases a Rotary Meter can be used, especially where the water is generally drawn off at full bore and then shut off.

SPACE AND WEIGHT.—Sometimes where space is limited it is impossible to find room for a Positive Meter, and if a portable Meter is required the weight of a Positive Meter is a great disadvantage.

To enable us to meet all conditions, we have put on the market a Rotary Meter, so that where Customers do not feel justified in going to the expense of our well-known Kennedy Meter, we can supply them with a Rotary Meter at a lower price.

The illustration on opposite page shews this Meter, for the manufacture of which we have installed special machinery, which will enable us to produce an excellent Meter at a low cost. The Body is of Brass, the Revolving Vane of Celluloid, and the Index Gearing of a Nickel Alloy.

Size of Meter.	Length over with Tailpieces.	Length over without Tailpieces.	Breadth.	Height.	Weight.
$\frac{1}{2}$ "	9"	$4\frac{5}{8}$ "	$3\frac{3}{4}$ "	$4\frac{1}{4}$ "	3 lbs. $14\frac{1}{2}$ ozs.
$\frac{3}{4}$ "	$10\frac{1}{4}$ "	$5\frac{1}{2}$ "	$4\frac{1}{8}$ "	$4\frac{3}{8}$ "	5 " $1\frac{1}{2}$ "
1"	11"	$6\frac{9}{16}$ "	$4\frac{3}{8}$ "	$4\frac{11}{16}$ "	6 " $8\frac{1}{2}$ "
$1\frac{1}{4}$ "	$12\frac{1}{4}$ "	$6\frac{9}{16}$ "	$4\frac{3}{8}$ "	$4\frac{11}{16}$ "	8 " 11 "
$1\frac{1}{2}$ "	$14\frac{1}{2}$ "	$7\frac{5}{8}$ "	$5\frac{1}{4}$ "	$5\frac{1}{2}$ "	12 " 9 "

(For particulars of Structural Details see next page.)

GLENFIELD & KENNEDY LIMITED, KILMARNOCK, SCOTLAND.

Section of The "Glenfield" Rotary Water Meter,

Showing Constructional Details.

