THE BRITISH OXYGEN COMPANY LIMITED.

FOUNDED in 1886 as

BRIN'S OXYGEN COMPANY, LTD.

OXYGEN

— FOR —

MEDICAL AND LANTERN PURPOSES.

GENERAL PRICE LIST.

OXYGEN WORKS

— IN —

- LONDON.
- CARDIFF.
- BIRMINGHAM.
- MANCHESTER.
- SHEFFIELD.
- NEWCASTLE-ON-TYNE.
- GLASGOW.

(For Full Addresses see Inside)

APRIL 1912. (COPYRIGHT) Entered at Stationers Hall. No. 190

(Previous Lists Cancelled).

July, 1912. **TRADE ONLY.**

THE BRITISH OXYGEN COMPANY, LTD.

Trade Discounts on Current Lists (190, 145, 175, 198).

***Oxygen** and other Gases:—*

Terms by contract or other arrangement.

DESCRIPTION.	GENERAL PRICE LIST (190).		WELDING LIST (145).		CUTTING LIST (175).		C. GAS BLOW-PIPES (198).		TRADE DIS-COUNTS.
	PAGE.	FIGURE.	PAGE.	FIGURE.	PAGE.	FIGURE.	PAGE.	FIGURE.	per cent.
Cylinders	3	–	11	–	–	–	5	–	33⅓
do. covers	4	1	11	–	–	–	5	–	15
do. valves	9	3, 4	–	–	–	–	–	–	25
do. fittings	9, 10, 13	5, 9, 17	–	–	–	–	–	–	25
Valve Keys	10	6, 7, 8	–	–	–	–	4	6–7	25
F.A. Valves	11	10, 11	–	–	–	–	–	–	25
Pressure Gauges with flynuts	11	12	–	–	–	–	–	–	15
Regulators without pressure gauges	12	14	–	–	–	–	4	5	25
Regulators with one or two pressure gauges	12	15	9	2	22	16	–	–	20
Regulator, low pressure, without pressure gauge	13	16	–	–	–	–	–	–	20
Cylinder Stand—self-adjusting type only	15	21	–	–	–	–	–	–	15
Inhalers and all medical appliances	16–24	24–34	–	–	–	–	–	–	15
Lime-light apparatus	25–28	35–41	–	–	–	–	–	–	20
Oxy-coal gas Blowpipe and fittings	–	–	–	–	–	–	3–4	2–5	20
Fletcher's Oxy-coal gas Blowpipes	–	–	–	–	–	–	8	8–9	10
Universal Blowpipe	–	–	7	1	–	–	–	–	20
Hydraulic back pressure valve	–	–	10	4	–	--	–	–	20
Hand Universal Metal Cutters	–	–	–	–	6	1, 2	–	–	10
Metal Cutting Machines	–	–	–	–	8–19	3, 19	–	–	special
Petrol Metal Cutters	–	–	–	–	20	15	–	–	10
Canvas-covered Rubber Tubing	–	–	20–21	–	–	–	–	–	20
Best ⅜" Rubber tube	–	–	–	–	–	–	4	–	20
„ ¼" „ „	–	–	–	–	–	–	4	–	20
Armoured Asbestos-covered Rubber Tubing	–	–	–	–	23	–	–	–	10
Tinted Goggles	–	–	20–21	–	23	–	–	–	20

ADDRESSES
OF
THE BRITISH OXYGEN CO., LTD.

NOTICE.—It is requested that all communications be addressed to the Works of the Company which are most conveniently situated for the supply of oxygen.

LONDON S.W. WORKS AND **HEAD OFFICE:** Telephone: 4706 and 4707 VICTORIA. Telegraphic Address: "BRIN'S OXYGEN," LONDON.	ELVERTON STREET, WESTMINSTER.
LONDON S.E. WORKS: Telephone: Private Line from Westminster Works.	TUNNEL AVENUE, EAST GREENWICH.
CARDIFF WORKS: Telephone: No. 786. Telegraphic Address: "OXYGEN," CARDIFF.	EAST MOORS, CARDIFF.
BIRMINGHAM WORKS: Telephone: No. 87, EAST BIRMINGHAM. Telegraphic Address: "BARYTA," BIRMINGHAM.	SALTLEY WORKS, BIRMINGHAM.
MANCHESTER WORKS: Telephone: No. 2538, MANCHESTER. Telegraphic Address: "OXYGEN," MANCHESTER.	GREAT MARLBOROUGH STREET, MANCHESTER.
SHEFFIELD WORKS: Telephone: No. 2801, CENTRAL. Telegraphic Address: "OXYGEN," SHEFFIELD.	SAVILLE STREET, SHEFFIELD.
NEWCASTLE WORKS: Telephone: No. 3239, CENTRAL. Telegraphic Address: "OXYGEN," NEWCASTLE.	BOYD STREET, NEWCASTLE-UPON-TYNE.
GLASGOW WORKS: Telephones: QUEEN'S PARK, No. 901 and 210. Telegraphic Address: "OXYGEN," GLASGOW.	ROSEHILL WORKS POLMADIE, GLASGOW.

THE BRITISH OXYGEN CO., LD.

TERMS.

Customers who have not a credit account with the Company should remit cash with order, and deposit the value of the Cylinders or furnish references. The deposit will be refunded on return of the Cylinders to the Company's Works from which they were supplied, carriage paid and in good condition, less any rent charges which may have accrued (*see page* 3).

DELIVERY.

LONDON. Gas is delivered free (except under certain special large contracts) within five miles of Charing Cross in quantities of 20 feet and upwards; on smaller quantities Customers will be charged for carriage. The Company have arranged with Messrs. Carter, Paterson & Co. that all Cylinders delivered full by them will be collected empty *free of charge*. On Cylinders returned by other means than the above, carriage must be prepaid.

BIRMINGHAM. By special arrangement with Messrs. Pickford & Co., Cylinders which contain gas in quantities of over 5s. in value are delivered and collected free within two miles of Stephenson Place; on smaller quantities Customers will be charged for carriage.

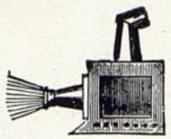
CARDIFF. - - -
MANCHESTER. - -
SHEFFIELD. - - -
NEWCASTLE-ON-TYNE.
GLASGOW. - - -

The Company do not pay carriage on Cylinders except by special arrangement.

RAILWAY RATES.

Oxygen Cylinders are conveyed by the Railway Companies by goods train at the same rate as mineral waters (Class 2), and in Cylinders up to 40 cubic feet capacity by passenger train at ordinary parcels rate. Returned empty Cylinders are conveyed at reduced rates by goods train, but the full parcels rate is charged on empty Cylinders returned by passenger train. Cylinders consigned by rail, whether passenger or goods, must be packed in cover or case as specified by the Railway Companies (*see page* 4).

THE BRITISH OXYGEN CO., LD.

REGISTERED  TRADE MARK.

General Price List.

COMPRESSED GASES.

OXYGEN.

	In the Company's Cylinders.	In Customer's own Cylinders.
Quantities of less than 20 cubic feet	4d. per cubic foot	3d. per cubic foot
Quantities of 20 cubic feet and less than 40 cubic feet	3d. ,, ,, ,,	2½d. ,, ,, ,,
Quantities of 40 cubic feet and upwards	2d. ,, ,, ,,	1½d. ,, ,, ,,

NITROGEN supplied at same prices as above.
HYDROGEN supplied at ½d. per cubic foot less than above prices.
COAL GAS ,, ,, ,, ,, ,,
NITROUS OXIDE—For Particulars see Special List.
CARBONIC ACID— ,, ,, ,, ,,
ACETYLENE— ,, ,, ,, ,,
LIQUID AIR— ,, ,, ,, ,,

Special Terms to the Trade and Large Consumers.

Trade Mark.—The Company beg to draw the attention of their Customers to the above registered Trade Mark. All Cylinders filled by the Company (whether their own or their Customers') are stamped with this Trade Mark. The stamp is a guarantee that the Cylinder has been tested and proved sound by the Company in accordance with their regulations.

Caution against Oxygen of Inferior Quality.—Customers requiring Oxygen for inhalation should be particularly careful to procure Oxygen which is abstracted from the atmosphere, and which consequently contains no corrosive or deleterious impurities.

SEAMLESS STEEL CYLINDERS.

* Cubic Contents in feet.	Approximate external diameter in inches.	Approximate length over all in inches, including valve.	Approximate weight in lbs. (empty).	Price of Cylinders with Valve.	Rent per week after first 14 days.
†6	4	14	10	26/6	
10	4	19	13	28/–	
12	4	23	15	29/6	1/3
15	4	27	18	31/–	
20	4	35	23	33/–	
40	5½	36	45	49/6	
60	5½	50	66	59/6	1/6
60	7	32	66	68/–	
80	7	41	88	79/–	2/–
100	7	49	110	93/–	2/6

* *All Cylinders are filled to a pressure of* 120 *atmospheres.*
† *This size of Cylinder cannot be hired.*

All Cylinders sold or employed by the Company are guaranteed to be made of steel complying with the British Government recommendations. They are made to the Company's own Specifications, and are regularly inspected during manufacture by one of the Company's Engineers. They are all annealed, valved, and tested hydraulically to a pressure of 1½ tons per square inch, in the Company's Works, before being filled with gas. The Company's methods of annealing, testing and filling Cylinders are in accordance with the British Government recommendations (*see page* 4).

Ordering of Cylinders.—Oxygen, Nitrogen, Hydrogen and Coal Gas are supplied in any of the above Cylinders, subject to the terms stated on page 1.

When ordering gas Customers are requested to state clearly the size of Cylinder required, also whether they require fittings, and if so to specify them.

All fittings are interchangeable, that is to say, they can be attached to any size of Cylinder valved with the standard type of valve for the gas which it contains (Figs. 3 and 4).

In ordering fittings it should be stated for what gas they are required.

For particulars and prices of Cylinder fittings and accessories see pages 9 to 15.

No Credit for Gas Returned.—No credit can be given for gas returned in Cylinders, as the valves of all Cylinders arriving at the Works are immediately opened and the contents (if any) blown off.

Rent.—Rent is charged after the first fortnight as per particulars above on all Cylinders lent out by the Company. In case a Customer having incurred a rent charge on a Cylinder decides to purchase the Cylinder, the Company may remit a portion or all of the rent charge according to circumstances. Customers who are frequent users of Oxygen will find it an economy to purchase their own Cylinders.

Delivery of Private Cylinders.—It will greatly facilitate prompt return of Customers' own Cylinders if they will advise the Company by post when they are sending Cylinders to be filled, quoting the Cylinder numbers. **A label bearing the Customer's name must be attached to each Cylinder, to identify it.**

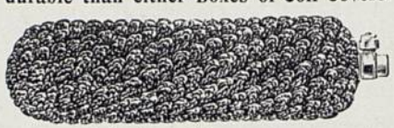
PRICES OF HEMP COVERS, WOODEN BOXES & COIR COVERS FOR TRANSPORT OF CYLINDERS BY RAIL.—*See page* 1.

Size of Cylinder. ...	6 ft.	10 ft.	12 ft.	15 ft.	20 ft.
Hemp Cover	3/6	4/-	4/6	5/-	5/6
Wooden Box	1/6	1/6	1/6	2/-	2/6
Coir Cover	1/6	1/6	1/6	2/	2/-

Size of Cylinder. ...	40 ft.	60 ft.	80 ft.	100 ft.
Hemp Cover	7/6	9/6	13/-	16/-
Wooden Box	3/-	—	—	—
Coir Cover	2/6	2/9	3/3	3/6

Private Owners of Cylinders are recommended to employ Hemp Covers, as they are neater and more durable than either Boxes or Coir Covers. ***(See Fig. 1.)***

Fig. 1.



Notice *re* Covers.—With the object of preventing inconvenience and delay, the Company supply covers under the following conditions:—

1. Customers ordering gas by rail in the Company's Cylinders will be debited with the value of the cover, and afterwards credited in full if it is returned carriage paid and in sound condition.

2. Customers sending in their own Cylinders to be filled, unprotected by any of the approved forms of covering, and with no instructions to cover, will have their Cylinders returned in new covers, with which they will be debited.

PROVING OF CYLINDERS.

Annealing. — In accordance with Government recommendations all Cylinders (before being subjected to the usual hydraulic test for the first time) must be annealed by the Company at one or other of their Works.

The annealing marks of the Company are as under:—

London Works. **Birmingham Works.** **Cardiff Works.** **Manchester Works.**

Sheffield Works. **Newcastle Works.** **Glasgow Works.**

The charges for annealing including re-test are as under:—

Cylinders up to and including 40 feet capacity 2/-

Ditto over ditto 3/-

The above charges will only be incurred *at intervals of four years*, when annealing will be repeated, the ordinary annual hydraulic test being considered sufficient in the interval.

Testing.—All Cylinders received at the Company's Works to be filled for the first time will, after annealing, be tested hydraulically to a pressure of 1½ tons per square inch and afterwards registered. No extra charge, however, is incurred for this. The Company re-test all Cylinders annually, for which a charge of **1**s. is made, a periodical re-test being necessary as much in the interest of the Customer as of the Company.

Stretch Apparatus.—All hydraulic testing of Cylinders is done by the Company in their Stretch indicating apparatus. This system was originally introduced by the Company. It was officially approved by the British Government's Cylinder Committee of 1896, and has

recently been added to the official Cylinder Regulations of Germany and other countries. Being an apparatus of general interest it is illustrated and described on the following page.

Test Marks.—The hydraulic test marks of the Company are as follows:—

London Works. **Birmingham Works.** **Cardiff Works.** **Manchester Works.**

Sheffield Works. **Newcastle Works.** **Glasgow Works.**

The Company's Works accept each others, anneal marks but not each others, test marks.

Numbering of Cylinders.—All the Company's Cylinders are numbered, and Customers' Cylinders coming in to one of their Works for the first time, unnumbered, to be filled, and with no instructions as to numbering will (after having been annealed and tested) be numbered and stamped by the Company in accordance with their own test books. This plan is adopted by the Company in order to retain a life record of each Cylinder passing through their hands.

Valves.—All the Company's Cylinders are fitted with valves to take standard connections (see Figs. 3 and 4). Special care and experience have been brought to bear on the construction and design of these valves, and the Company guarantee the quality of material and workmanship to be of the best. All valves are separately tested to a pressure of 1½ tons per square inch before they are fitted to Cylinders.

Valving of Cylinders.—A charge of **1**s. is made for fixing a valve in a Cylinder. (Except when this charge is covered by annealing charge.)

Distinctive Colours of Cylinders, Regulators and Gauges.—Oxygen is charged into Cylinders painted **Black** and Coal-gas (or Hydrogen) into Cylinders painted **Red**. Under no circumstances will Oxygen be put into a Red Cylinder or Coal-gas (or Hydrogen) into a Black one. The above distinctive colours have been adopted by the trade, and any Customer who should violate the rule by sending to one of the Company's Works a Red Cylinder having contained Oxygen, or a Black Cylinder having contained Coal-gas (or Hydrogen), will be held responsible for the consequences. Regulators, Gauges, and other Fittings are also distinguished in the same manner, those intended for Oxygen being painted Black, and those intended for Coal-gas (or Hydrogen) being painted Red. It is a dangerous practice to use the same Regulator or Gauge for both Oxygen and Coal-gas (or Hydrogen). Gauges should be returned periodically for adjustment and re-testing by the makers.

Nitrogen Cylinders are painted grey and fitted with right-hand valves.

Caution *re* use of Oil or Grease.—Customers are specially cautioned against using oil or any fatty matter on their fittings.

Left-hand Fittings for Coal-gas (or Hydrogen) Cylinders.—As an additional and almost absolute protection from accident through the inadvertent mixture of gases, the Company, many years ago, introduced left-hand screwed connections in the case of all Coal-gas (or Hydrogen) fittings. All the Company's own stock is fitted in this way, and the practice has been almost universally adopted in the trade. *The Company refuse to fill any Cylinders with Coal-gas (or Hydrogen) except such as are fitted with left-hand screwed connections.* When Coal-gas (or Hydrogen) Cylinders *having Oxygen Connections* are delivered at the Company's Works, the Customer will be communicated with and asked to give his authority to have the Cylinders fitted with left-hand connections. *If he declines to do so his Cylinders will be returned empty.* Customers who are willing to have their Cylinders altered in the above manner *must also send all their other Coal-gas (or Hydrogen) fittings to be similarly altered*, or they will be useless when the Cylinder is returned.

STRETCH TESTING APPARATUS FOR CYLINDERS.

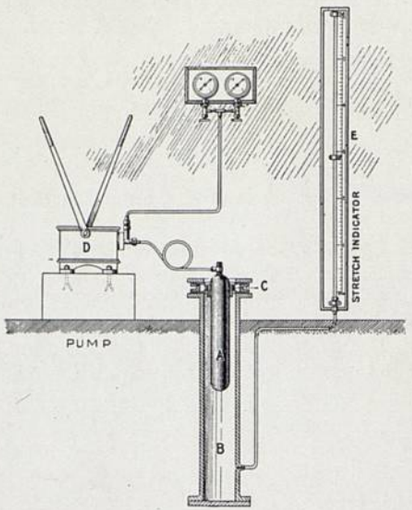


Fig. 2.

As supplied to the British and other Governments.

Prices on Application.

This apparatus consists of a cast-iron chamber **B**, in which the Cylinder **A** to be tested is suspended. **D**, an hydraulic pump employed for testing the Cylinder **A**. **E**, a gauge glass communicating with the bottom of chamber **B**; and **C**, an india-rubber joint ring, which is capable of closing and making a perfect joint round the shoulder of the Cylinder. The method of testing is as follows :—Both Cylinder **A** and chamber **B** are filled with water to the exclusion of all air, and a perfect joint is made round the neck of the Cylinder by inflating the india-rubber ring **C**, which can be instantaneously done by water pressure from the ordinary main supply. When the Cylinder is gradually subjected to the test pressure by means of the pump **D**, its expansion is measured by the displacement of water from the chamber **B**, and this displacement is indicated by the rise of the water level in the gauge glass, which continues until the maximum test pressure is obtained. The pressure is then released, and if no permanent stretch has been given to the metal, the water will return to its original level in the indicator. If, however, any permanent stretch has been caused this will not be the case, and the Cylinder would therefore be rejected as unfit for use.

The value of this apparatus is obvious. Its employment insures that a Cylinder is never strained beyond the "elastic limit" of its metal, and without this safeguard no hydraulic test is reliable.

HINTS TO USERS OF COMPRESSED GASES.

ORDERING GAS.

Order your Cylinders some days before they are required for use. State clearly the quantity and kind of gas or gases required.

State clearly what fittings, if any, are required.

PRIVATE CYLINDERS.

If you are a constant user of compressed gases you will find it cheaper and better to buy your own Cylinders and fittings, and send the former, when necessary, to your Agent, or to the Works of the Company in your district to be filled.

GAUGING CONTENTS OF CYLINDERS.

When Cylinders arrive from the Company's Works, gauge them, to see that they contain the full quantity of gas. Sometimes, in transit, valves are jarred, so as to start a slight leak of gas, which can generally be stopped by screwing down the valve spindle a little tighter.

For gauging Cylinders, use *separate* gauges for Oxygen and Coal-gas (or Hydrogen).

TESTING FOR LEAKAGE.

After gauging the Cylinder, or, if a Cylinder is not gauged, the moment it comes to hand, test the valve with *water*, by pouring a small quantity into the valve outlet. If *no bubbles show in the water* you can rest satisfied that all is gas-tight. Repeat this test *always* after using gas until the Cylinder is empty.

It is desirable also to test round the valve spindle *when the valve is open*, especially when coupled up to a regulator or fine adjustment valve, and if any leak is found, tighten down the gland nut round the valve spindle.

CYLINDER FITTINGS.

If you use your own fittings in connection with hired Cylinders, it is as well to try them on arrival of Cylinders to make sure that everything is accurate.

Never use fittings with taper screwed connections. They are unreliable, unmechanical, and most injurious to valves.

Never use keys of long leverage to close Cylinder valves. They give undue power, which is injurious to valve seats. If a valve leaks after the spindle is screwed up with an ordinary key it is often due to grit on the seat To remove this, open and close the valve sharply until the leak stops.

OIL CAUTION.

Avoid the use of oil or lubricant in any form, and keep all sockets and nipples and working parts dry and free from grit.

POSITION OF CYLINDERS.

If possible, always use the Cylinders in a vertical position. By so doing there is far less likelihood of moisture or grit that may be in a Cylinder getting blown into the valve or other passages. This is especially desirable in the case of Coal-gas.

RETURN OF EMPTY CYLINDERS.

Return hired Cylinders to the Company whenever they are done with and thus avoid paying rent on them. Also return all fittings which have been lent with the Cylinders, otherwise they will be charged for. A label bearing the Customer's name must always be attached to a Cylinder when it is returned to the Company's Works for purposes of identification.

RETURNED GAS.

The Company allow no credit for returned gas, as, in accordance with their regulations, Cylinders which have been used are always emptied before being re-filled. It is therefore well to note that gas returned is gas wasted. Oxygen never deteriorates by being kept in Cylinders.

STORING COAL-GAS IN CYLINDERS.

Avoid storing Coal-gas in Cylinders for any great length of time, as this gas gradually deteriorates. If gas has to be stored in a Cylinder for any length of time, it is better to use Hydrogen. Hydrogen never blackens limes, but twice the quantity of Hydrogen is required.

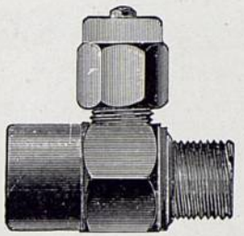
CLEANING COAL-GAS CYLINDERS.

Always save a little pressure in your Cylinder, and then either take it into the open air and blow it off with *valve downwards*, or return it to the Company to be treated in this way. By this means all residue will be driven out.

ILLUSTRATED PRICE LIST OF CYLINDER FITTINGS AND ACCESSORIES.

NOTE.—Valve Sockets and the Nipples of Fittings should be cleaned and freed from grit before being connected. The use of oil or grease of any kind for lubricating Valves, Gauges or other Fittings used with compressed Oxygen must be strictly avoided.

Fig. 3.—CYLINDER VALVE.
(No. 1 Type).



8s. 6d. each.

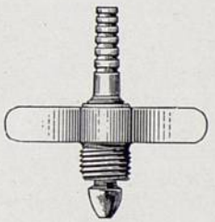
This is the Company's Standard type of Valve, and it is fitted to all Cylinders employed in the United Kingdom unless otherwise instructed.

Fig. 4.—CYLINDER VALVE
(No. 2 Type.)

8s. 6d. each.

This Valve has a side connection, otherwise it is the same as No. 1 Type. It is chiefly employed on Cylinders in the Company's Colonial Works and on Cylinders sent abroad.

Fig. 5.—NIPPLE AND UNION FOR CYLINDER VALVES.



2s. 3d. each.

This connection is sent out with hired Cylinders unless a Fine Adjustment Valve or Regulator is ordered. To connect with Cylinder Valve screw the Union into Valve Socket. Provided the Valve Socket is in good condition and freed from grit it is only necessary to tighten up the union by hand in order to make a perfectly gas-tight joint.

All kinds of Cylinder Valves and Special Fittings made to order.

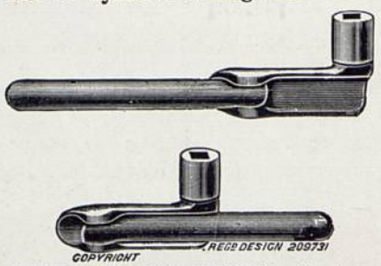


Fig. 6.—FOLDING LEVER KEY. (Steel throughout.)

1s. 6d. each, Black. 2s. 3d. each, Nickel-plated.

This key is principally sent out with hired Cylinders. When the lever is extended an increased power is obtained for opening the Valve. When closed an ordinary T handle is formed, thus giving reduced leverage for closing the Valve, thereby preventing injury to the Valve seating. The construction also prevents the Valve spindle being turned the wrong way in opening or closing the Valve.

Fig. 7.—VALVE KEY.

Wooden Handle (as shown) ... 2s. each.
All Steel (Black) ... ... 1s. 6d. each.

Fig. 8.—GLAND NUT SPANNER.

1s. each.

This Spanner is useful for tightening up the Gland Nut of Cylinder Valves when a leakage of gas is observable round the Valve Spindle. Cylinder owners and frequent users of Cylinders should possess one, but it is not supplied with hired Cylinders.

Fig. 9.—PLUG FOR CYLINDER VALVE SOCKET.

1s. each.

This Plug is useful to prevent injury to Valve Socket. It can be screwed in and out of the Valve Socket by means of the ordinary Valve Key. It is not supplied with hired Cylinders.

All kinds of Special Fittings made to order.

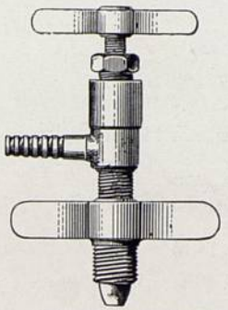


Fig. 10.—FINE ADJUSTMENT VALVE.

(LARGE PATTERN.)

7s. each.

Can be obtained on hire at the cost of 6d. per week.

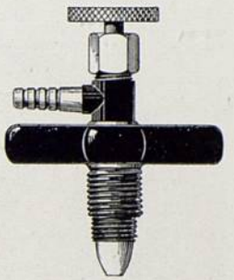


Fig. 11.—FINE ADJUSTMENT VALVE.

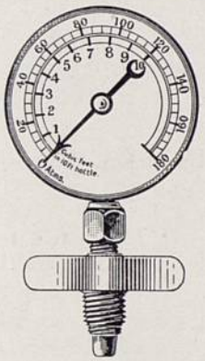
(SMALL PATTERN.)

6s. each.

These Valves are not Automatic Pressure Regulators, and consequently must not be used for Double Lantern work. They can only be employed as substitutes for the Nipple and Union connection, but for this purpose they are useful. They give a more delicate means of adjusting the flow of Gas from the Cylinder than the ordinary Cylinder Valve. After they are connected to the Cylinder Valve the latter may be left open and all subsequent regulation can be effected by the fine adjustment valve. Care must, however, be taken to see that no leakage of gas occurs either in the Socket or round the Spindle of the Cylinder Valve.

The Cylinder Valve should be closed as an additional precaution against leakage when the Cylinder is not in use.

Fig. 12.—GAS PRESSURE GAUGE.



4 ins. diameter, 30s. each.

3 ins. diameter, 25s. each.

These Pressure Gauges are useful to frequent users of Oxygen Cylinders, and particularly to Agents, as a means of ascertaining the quantity of gas in Cylinders. They are connected to Cylinders in the same way as the Nipple and Union, Fig. 5.

The Gauges, as illustrated, are specially marked in atmospheres and feet, and the cubic contents of any Cylinder may be readily calculated in the following manner:—

The figures on outer ring indicate pressure in atmospheres; 120 atmos. being the pressure to which all Cylinders are charged.

The figures on inner ring indicate the number of cubic feet of gas contained in a 10 ft. cylinder. To calculate the quantity of gas contained in any Cylinder, multiply the figure to which the needle points by the multiple of 10, thus, if the gauge is attached to a 40 ft. Cylinder, and the needle points to 6, then 6 × 4 = 24 ft. = quantity of gas in Cylinder.

Both types of Pressure Gauge are fitted with safety checks in the stem to prevent a sudden rush of gas into the gauge tube when the Cylinder Valve is opened.

Fig. 13.—LEAK TESTER.

NICKEL-PLATED.

2s. 6d. each.

TO USE THE TESTER. Press the conical rubber end into the outlet of the Cylinder Valve. If there is the slightest leakage of gas it will be at once indicated by bubbles passing through the water. If, on the other hand, there is no leakage, bubbles will not be perceptible.

The instrument is a handy substitute for the clumsy method of testing for leakage by pouring some water into the socket of the Valve. It is only about 4 inches long, and can be carried in the waistcoat pocket. The water is found to evaporate very slowly, and will only require renewal at long intervals of time.

N.B.—Oil must not be used in the Tester.

The Company not being makers of Pressure Gauges do not guarantee these articles in any respect. They are only supplied subject to the purchaser accepting all risk (if any) in respect of them.

REGULATORS.

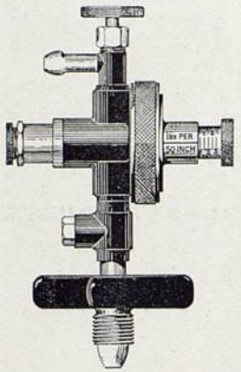


Fig. 14.—"ENDURANCE" AUTOMATIC REGULATOR.
(Patent.)

30s. each.

FITTED WITH HIGH PRESSURE GAUGE TO REGISTER THE CONTENTS OF CYLINDER,

15s. extra.

This Regulator is suitable for every class of work for which Oxygen is employed (except metal cutting—see special pamphlet on Metal Cutting). It automatically delivers gas from the Cylinder at any pressure to which it is set up to 30 lbs. per square inch. It is of substantial construction, and has been specially designed by the Company. It is manufactured by the Company, and is fitted with a gas expansion device which obviates ignition risks at the valve seat. It is specially recommended for all kinds of blowpipe work, and for injector lantern jets. The adjustable screwed socket on the side of the Regulator is graduated in lbs. per square inch, and the Regulator can be set by this means to any desired constant pressure, thus enabling the usual low pressure gauge to be dispensed with.

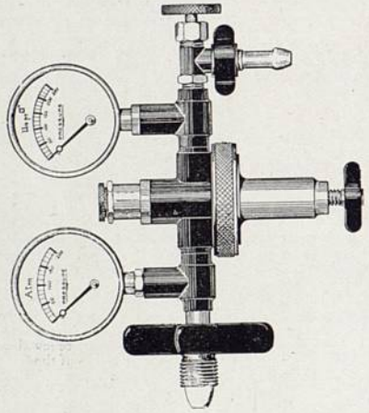


Fig. 15.—"ENDURANCE" HIGH PRESSURE AUTOMATIC REGULATOR.
(Patent.)

FITTED WITH HIGH AND LOW PRESSURE GAUGES,

63s. each.

This Regulator is similar to the one illustrated in Fig. 14, but is adjusted to pressure gauge by means of thumb screw to automatically deliver gas at any desired pressure up to 10 atmospheres. It is specially constructed for use in metal cutting and other purposes where comparatively high constant pressures are required.

All kinds of Special Fittings made to order.

REGULATORS—*continued.*

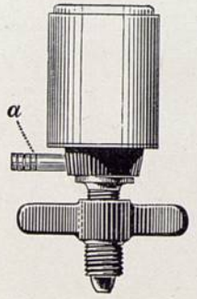


Fig. 16.—BEARD'S AUTOMATIC REGULATOR.

21s. each.

Can be obtained on hire at the cost of **1**s. per week.

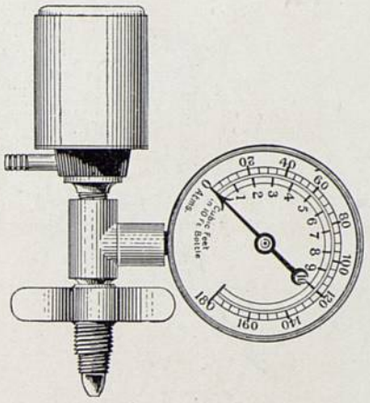


Fig. 17.—TEE PIECE (as shewn) TO COMBINE REGULATOR AND GAUGE.

6s. each.

Y PIECE for same purpose.

6s. each.

This regulator is extensively used in Lantern work. It reduces and automatically controls the pressure and flow of gas from the Cylinders, so that after the Cylinder Valve is opened the gas may be regulated by the taps on the Lime-light jet ; *a* is the delivery nozzle to which the rubber tubing to jet should be connected

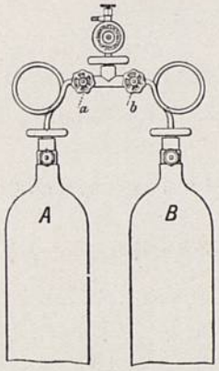


Fig. 18.—CONNECTOR BETWEEN REGULATOR AND TWO CYLINDERS.

Price, without Regulator, **30**s.

The principal object of a combined Regulator and high-pressure Gauge, as shewn in Figs. 15 and 17, is to guard against the Oxygen supply running short during use. Pressure Gauges permanently attached to Regulators are a fruitful source of trouble. They soon become inaccurate (particularly the small type so frequently employed) and being delicate in construction they are liable to injury in workshop handling. The Connector here illustrated is an excellent substitute for the pressure Gauge permanently attached to a Regulator. The Regulator is in communication with two Cylinders A and B, one of which can be shut off when the other is in use. Thus, if the valve of Cylinder A and the pipe valve *a* are open whilst the valve of Cylinder B and the pipe valve *b* are closed, Oxygen flows from Cylinder A through the Regulator until it begins to empty. The valves of Cylinder A are then closed and those of Cylinder B opened. Oxygen will then flow from Cylinder B whilst the empty A Cylinder can be removed and replaced by a full one. Thus, it will be readily seen that a continuous supply of Oxygen can be maintained by the employment of this Connector, and for prolonged use Regulators with this Connector will be found more convenient and reliable than those fitted with pressure Gauges. A separate pressure Gauge (Fig. 12)—preferably of the larger diameter—should be in the possession of all constant users of Cylinders, to enable them to check the contents of Cylinders when they arrive from the compressing factory.

All kinds of Special Fittings made to order.

CYLINDER STANDS.

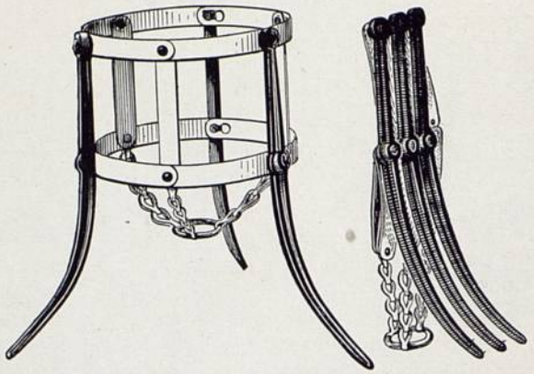


Fig. 19.—PORTABLE CYLINDER STAND.

Suitable only for 20 ft. Cylinders and under. **5**s. and **6**s. each.

In ordering, please state the capacity of Cylinder, and if fitted with Hemp Cover.

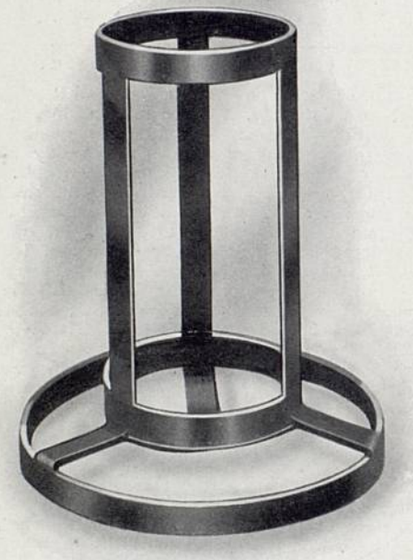


Fig. 20.—
CYLINDER STAND.

Suitable for 20 ft. Cylinders and upwards.

4 ins. to 6ins. dia., **8**s. each.

8 ins. dia., **10**s. each.

In ordering, please state the capacity of Cylinder, and if fitted with Hemp Cover.

All kinds of Special Fittings made to order.

CYLINDER STANDS—*continued.*

Fig. 21.—SELF-ADJUSTING CYLINDER STAND.

SUPPLIED IN TWO SIZES.

To take Cylinders up to 5½ inches diameter.

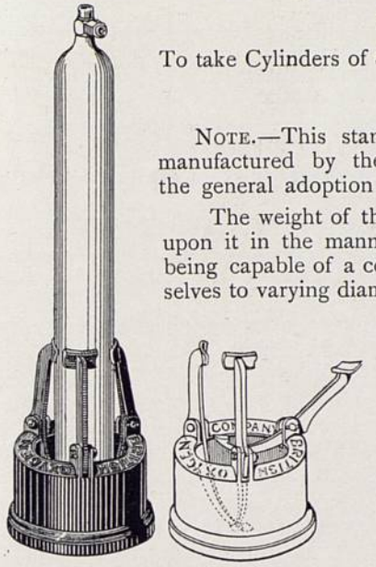
10s. each.

To take Cylinders of 5½ inches diameter and upwards, with covers.

12/6 each.

NOTE.—This stand is of a new registered design. It is manufactured by the Company and meets a want created by the general adoption of hemp covers.

The weight of the Cylinder is employed to close the jaws upon it in the manner indicated by the sketches, and the jaws, being capable of a considerable range of movement, adapt themselves to varying diameters of Cylinders.



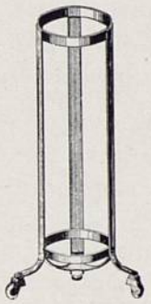


Fig. 22.—CYLINDER STAND ON ROLLERS.

Suitable for Hospitals, &c.

To take 4 inch diameter Cylinder without cover.

Price ... ... **17**s. **6**d.

To take 4 inch diameter Cylinder in cover or 5½ inch diameter Cylinder without cover.

Price ... ... **25**s.

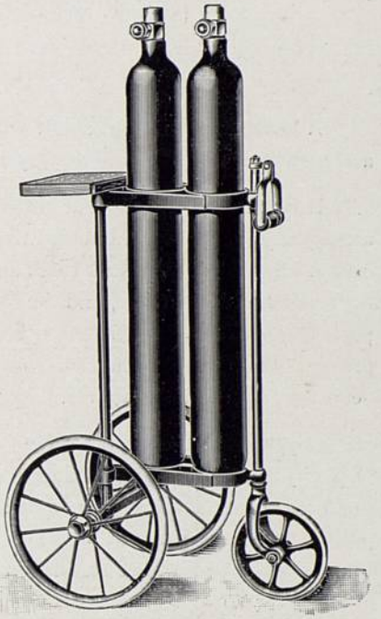


Fig. 23.—TROLLY STAND FOR ONE OR TWO CYLINDERS.

Suitable for Hospitals, &c.

To take 4 inch diameter Cylinders without covers.

Price ... ... **50**s.

To take 4 inch diameter Cylinders in covers or 5½ inch diameter Cylinders without covers.

Price ... ... **70**s.

All kinds of Special Fittings made to order.

MEDICAL.

NOTES ON THE MEDICAL USES OF OXYGEN.

Air contains about 79·1 per cent. Nitrogen and 20·9 per cent. Oxygen. [Carbonic Acid (·04 per cent.) and other minor constituents of air discovered in recent years, are here disregarded.]

Oxygen is the portion of the air necessary to support animal life. The average respiration of a healthy adult man in a temperate climate is as follows:—

30 cubic inches per inhalation.
480 „ „ „ minute.

EXHALED AIR CONTAINS:—

4·4 per cent. of Carbonic Acid.
16·5 „ „ of Oxygen.
79·1 „ „ of Nitrogen.

A healthy man inhales about 400 cubic feet of air per twenty-four hours, and consumes about 20 feet of Oxygen during that time.

It frequently happens that through the presence of noxious gases in the atmosphere, or through enfeebled respiration, the requisite proportion of Oxygen cannot be inhaled. In such cases an additional supply of this gas becomes a matter of vital importance, and the introduction by the Company of chemically pure Oxygen, compressed into cylinders so as to be readily transported, has provided the medical profession with a therapeutic agent of which they have not been slow to avail themselves.

Oxygen is of the utmost value for purposes of resuscitation after suffocation or asphyxia. In mines, chemical works, gas works, and other places where such cases are of frequent occurrence, cylinders of Oxygen are placed in accessible positions where they are available for immediate use when required (*see* page 21). Many lives have thus been saved by the prompt administration of the gas.

Oxygen inhalation is, however, not restricted to extreme cases of this description. Its value in cases where respiration is impaired through illness is now fully recognised by the medical profession, by whom it is largely prescribed.

Oxygen is also extensively prescribed for the treatment of wounds and sores and for many maladies not connected with the respiratory organs.

For General Hints to Cylinder Users, see pages 7 and 8.

SPECIAL REGULATIONS FOR SUPPLY OF OXYGEN FOR MEDICAL PURPOSES.

For prices and particulars of Oxygen and Cylinders, see Pages 2 and 3.

Oxygen is so generally recognised as valuable for medical purposes and for resuscitation in cases of "gassing," drowning, etc., that with a view to meeting the convenience of the medical profession, the Company have made arrangements to supply Oxygen for *Medical Purposes at all their Works at any hour of the day or night.*

Orders should distinctly state that the Oxygen is wanted for medical purposes, and the Company beg to draw attention to the following regulations which they have made with a view to conducting this branch of their business with extra dispatch :—

1.—When medical orders are received for Oxygen, unaccompanied by an order for inhaling apparatus, the Company will send with the Cylinder one gun-metal nipple and union (Fig. 5) to fit Cylinder valve, one valve key (Fig. 6), and a short length of indiarubber tubing (Fig. 24) with glass or ebonite mouthpiece, by means of which the gas can be inhaled direct from the Cylinder. The price of the indiarubber tubing and mouthpiece (which are not returnable) is **2/-** with glass mouthpiece, **2/6** with ebonite mouthpiece.

2.—When an inhaler is ordered, but type not specified, No. 1 or 2 type (Figs. 26 or 27) will be sent.

3.—Credit will be allowed in full for Cylinder, nipple, union and key, if returned in good condition within a fortnight, *but no credit can be given for inhalers or for indiarubber tubes and mouthpieces*, as the Company do not consider it right to send out a second time articles which may have been in close contact with cases of illness and disease.

4.—Unless otherwise instructed, Oxygen ordered for medical purposes by letter will be delivered in the usual way by road carrier (*see* page 1).

5.—In cases where Oxygen for inhalation is ordered by telegram, without special instructions as to delivery, it will be forwarded by special messenger direct, or by special messenger to catch first passenger train if wanted in the country.

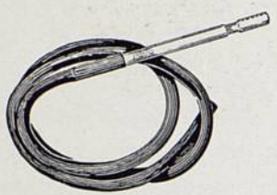
6.—As there are no ordinary means of delivery open to the Company from 1 p.m. on Saturday to 8.30 a.m. on Monday, and between 6 p.m. and 6 a.m. on all other days of the week and on public holidays, a supply of Oxygen can only be *ensured* at these times by sending for it to the Company's Works. An effort will be made to execute urgent orders received by telegram from medical men during these periods by employing cabs or special messengers *but no delivery can be guaranteed.*

7.—All extra expenses of special delivery will be charged to the Customer.

OXYGEN INHALING APPLIANCES.

N.B. No Inhaler under any circumstances can be sent out on hire.

Fig. 24.—INHALING TUBE.

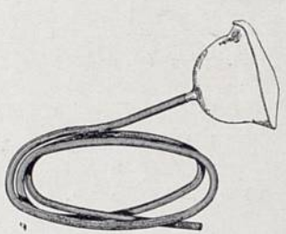


Glass Mouthpiece, with 3 feet of tubing ... ... **2**s. **0**d. each.
Ebonite do. ... **2**s. **6**d. ,,

This is the simplest form of Inhaling Apparatus, and is sent out with all Cylinders of Oxygen ordered for medical purposes. (See previous page.)

To Use.—Connect the indiarubber end of tube to grooved end of nipple and union (Fig. 5). Open the Cylinder Valve gently by means of the lever key (Fig. 6), tapping it with the wrist, and when the desired amount of Oxygen is flowing from the Cylinder, allow the patient to inhale through the mouthpiece. If a fine adjustment valve (Figs. 10 and 11) or a regulator (Figs. 14 or 16) is used on the Cylinder instead of the nipple and union, connect the tube to outlet of same and regulate as per instructions under each illustration. After inhalation make sure that the Cylinder Valve is closed. (See page 7.)

Fig. 25.—GLASS FACE-PIECE.



Covering Mouth and Nose, fitted with india-rubber tube, etc. ... ... **5**s. each.

This face-piece is sometimes preferred to the mouthpiece (Fig. 24), but it is only supplied to order.

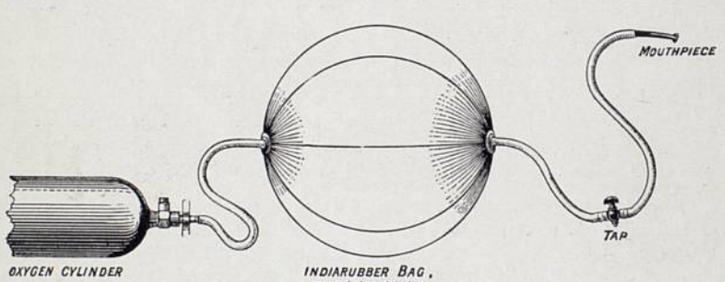


Fig. 26.—INHALER (No. 1 Type).

Price **7**s. **6**d.

OXYGEN INHALING APPLIANCES—*continued.*

N.B.—No Inhaler under any circumstances can be sent out on hire.

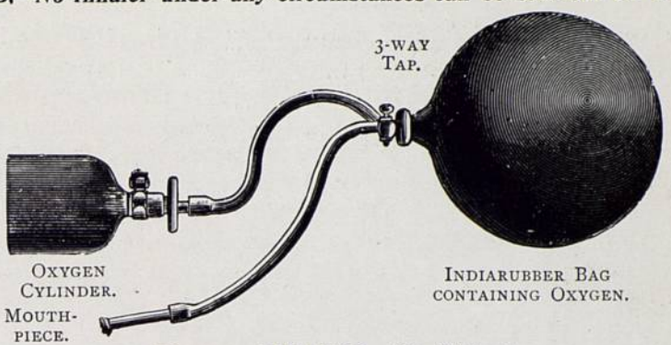


Fig. 27.—INHALER. (No. 2 Type.)

Price ... ... **13**s. **0**d.

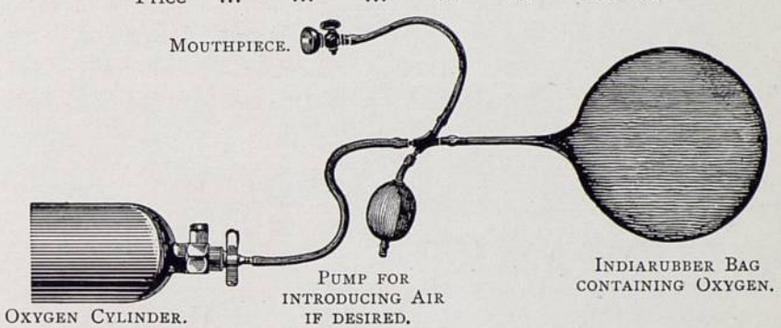


Fig. 28.—INHALER. (No. 3 Type.)

Price ... ... **26**s. **0**d.

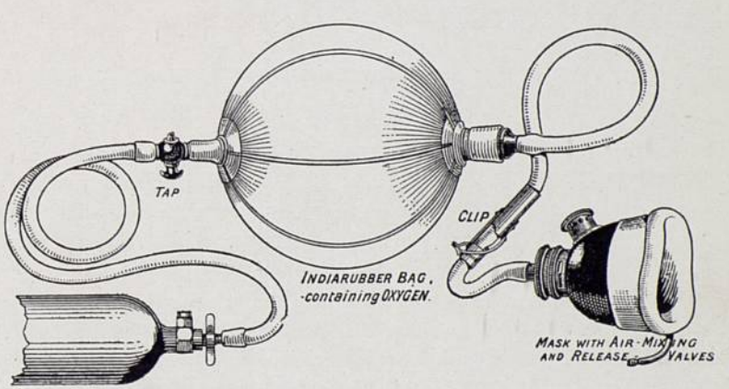


Fig. 29.—INHALER. (No. 4 Type.)

Price ... ... **37**s. **6**d.

OXYGEN INHALING APPLIANCES—*continued.*

N.B.—No Inhaler under any circumstances can be sent out on hire.

The four types of INHALER illustrated on pages 18 and 19 require no special description, as the illustrations are sufficiently clear. The object of the indiarubber bag in each case is merely to provide an intermediate vessel in which small quantities of Oxygen can be conveniently stored and measured. The bag in each case will store about 1 gallon of Oxygen (about one-sixth of a cubic foot) at a time. Type 1 cannot be removed from the Cylinder. Type 2 can be disconnected from the Cylinder when the bag is full, and small supplies of Oxygen can thus be carried to a patient's bed-side. This is sometimes an advantage. Types 3 and 4 are fitted with means for mixing air with the pure gas if desired, and Type 4 is provided with a Mask or Face-piece so as to cover both mouth and nose, expirations escaping through the release valve as shown.

N.B.—In all cases when filling the Inhaler bags care must be taken to admit Oxygen slowly, and not to overcharge them with gas. After filling always shut the Cylinder Valve before closing any tap on the Inhaling apparatus. For connecting the Inhalers to Oxygen Cylinders follow the instructions under Fig. 24, page 18.

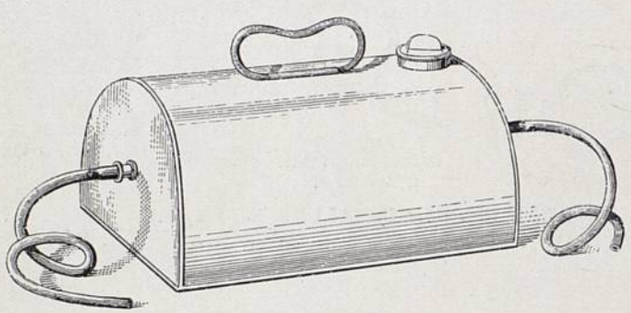


Fig. 30.—GAS WARMER.

Price ... ... **35**s.

The expansion of Oxygen as it issues from the Cylinder has a cooling effect on the gas, and in certain cases of sickness, particularly when the Oxygen is being inhaled rapidly, it is desirable to warm the gas. This can be done by employing a long supply indiarubber tube, which can be partially coiled in a vessel containing warm water.

Fig. 30 consists of a copper vessel containing warm water surrounding a coiled copper tube, designed to effect this purpose. It can be used with an Inhaler or an ordinary tube and mouthpiece, and it is a useful addition to Inhaling apparatus in Hospitals and other places where Oxygen is constantly employed.

For Movable Cylinder Stands, specially suitable for Hospital use, see Fig. 23, page 15.

LIFE-SAVING OXYGEN APPLIANCES.

A memorandum signed by the Chief Inspector of Factories, and issued from the Home Office in May, 1906, recommends that "a Cylinder of compressed Oxygen fitted with a piece of rubber gas-tubing and a mouthpiece should be kept in constant readiness" where cases of carbonic oxide poisoning or "gassing" are liable to occur.

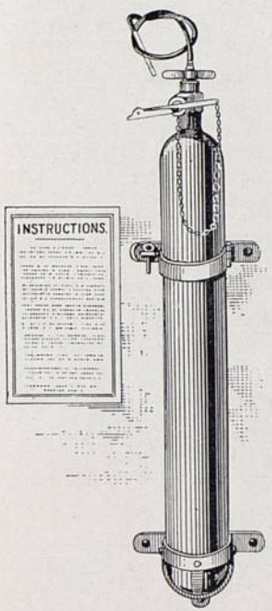


Fig. 31.—Cylinder in Wall Bracket.

Price complete, as shown, with Card of Instructions.

£**2 15**s.

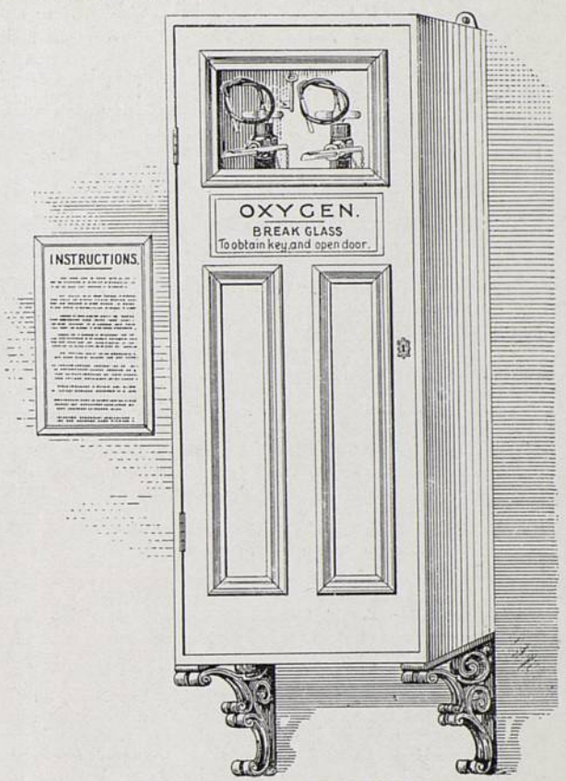


Fig. 32.—Cylinder Wall-Box.

Price complete, as shown, with Card of Instructions,

£**5 10**s.

Figs. 31 and 32 illustrate convenient methods of placing Oxygen Cylinders in Factories, Collieries, Chemical Works, Cement Works, Gas Works, and all places where cases of "gassing" are liable to occur amongst the workmen. In such cases it is of vital importance to have the position of Cylinders known and accessible to all. It is also of importance to have the methods of administering the gas as simple as possible. In Fig. 31 the equipment consists of a Cylinder containing 20 feet of Oxygen (the size generally recommended), a lever key (Fig. 6) fixed in position to open the valve, and attached to the Cylinder by chain, a nipple and union (Fig. 5) fixed in position with a tube and mouthpiece (Fig. 24) attached. The Cylinder has only to be removed from the wall bracket when required for use. In Fig. 32—which is specially recommended—there are two cylinders each containing 20 feet of Oxygen, and each equipped in the manner described above. These Cylinders are enclosed in a wooden wall-box, and the method of obtaining a Cylinder for use is clearly indicated by the printed instructions on the door. A duplicate or master key is provided with each box or set of boxes for the use of the Works Manager. The advantage of two Cylinders is obvious. The wall-box should never by any mischance be empty, for duplicating the equipment enables one Cylinder to be sent away for filling whilst the other remains available for use. *The above prices do not include Oxygen, which is charged for separately at usual rates.*

LIFE-SAVING OXYGEN APPLIANCES—*continued.*

A fine adjustment valve (Fig. 10) can be employed on the Cylinders if desired, and it is frequently recommended. The Company do not, however, advocate its use for this particular purpose. It involves the manipulation of two valves if the directions under Fig. 10 are followed, and it increases the liability to leakage when the Cylinder is out of use if they are not followed. When Oxygen has to be administered on the spur of the moment it is most desirable to avoid any vestige of complication about the Cylinder, and the ordinary Cylinder valve is so well constructed that no difficulty in controlling the flow of gas by means of this valve should be experienced if the instructions are properly followed.

Most large works possess their Ambulance Corps and Fire Brigades, and it is recommended that these should be regularly instructed in the use of Oxygen Cylinders and the administration of the gas. No ordinary workmen should, however, be debarred from using the gas in emergencies, and printed instructions (which are supplied by the Company) should be conspicuously displayed beside every wall-bracket or box containing Cylinders of Oxygen.

The following instructions are given by the Chief Inspector of Factories in the Memorandum of May, 1906, referred to above:

DANGER OF "GASSING."

The first symptoms produced by breathing the gas are giddiness, weakness in the legs, and palpitation of the heart.

If a man feels these symptoms he should at once move into fresh warm air, when in slight cases they will quickly disappear.

Exposure to cold should be avoided as it aggravates the symptoms.

A man should not walk home too soon after recovery, as muscular exertion after exposure to the gas is to be avoided.

If a man should be found insensible or seriously ill from the gas he should at once be removed into fresh warm air, and immediate information be sent to the oxygen administrator, a medical man being sent for at the same time.

No man should work alone on any work which would be likely to involve exposure to the gas. Should the nature of the work cause the man to enter a culvert or hole, he should have a rope tied securely round his waist, held at the other end by his mate standing outside.

USE OF THE OXYGEN CYLINDER.

The cylinder should be provided with a lever key, nipple and union, together with a rubber tube at the end of which is a mouthpiece. It is also advisable to have a small pressure gauge attached to the cylinder so that loss of oxygen may be observed and the cylinder kept in working order.*

Open the valve gradually by tapping the lever key (fully extended) with the wrist until the oxygen flows in a gentle stream from the mouthpiece in the patient's mouth, and allow the oxygen to be breathed until relief is obtained. The lips should not be closed round the mouthpiece, as it is important to allow free egress for surplus oxygen. The nostrils should be closed during inspiration or inflation of the lungs, and opened during expiration or deflation of the lungs, so that the oxygen may be inhaled as pure as possible through the mouth.

If the teeth are set, close the lips and one nostril. Let the conical end of the mouthpiece slightly enter the other nostril during inspiration and remove it for expiration.

ARTIFICIAL RESPIRATION.

Artificial respiration is sometimes necessary in addition to the oxygen inhalation if the oxygen does not appear to act quickly.

Place the patient on his back, slightly raising the shoulders with a folded coat; remove everything tight about the chest and neck; draw the tongue forward and maintain it in that position. Grasp the arms just above the elbows, and draw them steadily above the head, keeping them on the stretch for two seconds and then folding them and pressing them against the chest for the same length of time. Repeat these movements about 15 times a minute for at least half an hour, or until natural breathing has been initiated, when the oxygen inhalation alone will suffice.

After recovery oxygen inhalation at intervals should be continued as desired.

*A separate pressure gauge in the possession of the Works Manager, or other authorised person responsible for the Cylinders being adequately charged with Oxygen, is probably preferable. Cylinders after use should always be handed to this person whose duty it should be to gauge the Cylinders and decide whether they should be refilled with Oxygen or restored to their receptacle.—B.O. Co., Ltd.

LIFE-SAVING OXYGEN APPLIANCES—*continued.*

OXYGEN RESPIRATING APPARATUS FOR WORKING IN NOXIOUS OR IRRESPIRABLE GASES.

(Messrs. SIEBE, GORMAN & FLEUSS' PATENT.)

Price Complete, as shown, £22 15s. 0d.

Fig. 33.—Front View.

Fig. 34.—Back View.

In places where Oxygen Cylinders are required for purposes of resuscitation, an apparatus which supplies a man with factitious but perfectly respirable air, entirely independent of any communication with the outer atmosphere, is almost essential. It is one thing to resuscitate a victim to noxious gases by means of Oxygen, but it is quite another thing to rescue him for the purpose of doing so. No more frequent instances of humble heroism are recorded than those where workmen have lost their own lives by entering one of these death traps with the object of rescuing a comrade. The British Government recommend the use of Oxygen Respirators to enable workmen to penetrate noxious atmospheres, and some foreign Governments go so far as to prescribe their use in Collieries in the proportion of one for every twenty miners.

One or more Oxygen Respirators, **in addition to Oxygen Cylinders,** should always be available for use amongst workmen employed in Collieries, Chemical Works, Cement Works, Gas Works, and all places where cases of "gassing" are liable to occur. They should also be within easy access of men at work in drains, sewers, culverts, flues and wells. Every Fire Brigade and Salvage Corps should also be equipped with both Oxygen Respirators and Cylinders of Oxygen. Nowhere is suffocation of more frequent occurrence than at fires, and the value of the one apparatus as a means of rescue, and the other as a means of resuscitation after rescue, cannot be exaggerated.

N.B.—Only experienced men thoroughly conversant with the working of the Apparatus, and trained in its use, should be permitted to wear the Oxygen Respirator and enter dangerous places.

LIFE-SAVING OXYGEN APPLIANCES—*continued.*

The following particulars of the Oxygen Respirating Apparatus (Figs. 33 and 34) are furnished by the Makers :—

DESCRIPTION.

This patented apparatus is designed to supply the user with a factitious but perfectly respirable air entirely independent of any communication with the outer atmosphere for about two hours at a time. It has no air pipe or other connections with the base of operations, so that for exploring and rescue work in mines, etc., its scope of usefulness is practically unlimited, the wearer being perfectly safe in the most deadly gases and able to walk any distance and to explore the most intricate turnings of a mine with every freedom of action. The principle of the apparatus is that the wearer breathes the same air over and over again, the carbonic acid being absorbed from it after each expiration, and at the same time the requisite amount of oxygen restored to it, thus rendering it pure and fit to be again inhaled into the lungs.

It is entirely of British design and British Manufacture.

Its simplicity is remarkable. There is a complete absence of complications. It has fewer connections and consequently fewer joints to keep tight than any other apparatus manufactured.

The importance of these points, in view of the fact that apparatus of this class is mainly used by unskilled men, cannot be overrated.

Less training is needed with this apparatus than with others. Five minutes suffice in which to become conversant with the whole apparatus and its working, and a very little practice makes the wearer quite proficient in its use. A man can put the apparatus on himself without assistance and be ready for work in one minute from the order to "get ready." It is the most comfortable and most flexible apparatus on the market, and is the lightest of the type using compressed oxygen. The apparatus is fitted with an emergency valve which enables the wearer at any moment to supply additional Oxygen to the breathing bag direct from the cylinders, and the pressure gauge is fixed in front so that the wearer can at all times see the quantity of Oxygen available for use. The apparatus is arranged to automatically pass a constant supply of two litres of Oxygen per minute into the breathing bag, this quantity being the maximum required under all conditions of hard work. This is the method of supply approved and recommended by the Royal Commission on Mines (1907).

The mouth-piece allows the wearer free movement of his head, being connected to the breathing bag by strong flexible corrugated tubes. The inhaling and exhaling valves in the latest pattern are of mica, and being of the simplest design, do not stick or get out of order. The mouth-piece is attached by a small rubber band, which fits comfortably round the outside of the mouth, and buckles behind the head. The nose-clip is made comfortably to fit every nose and cannot slip off. Mica goggles are supplied to protect the eyes. In place of mouth-piece and nose-clip, a half-mask, covering nose and mouth, can be worn if preferred. A mask is also made which completely covers nose, mouth and eyes.

Heavy work can be done with less fatigue with this apparatus than with any other system in use, CO_2 in the breathing bag at the end of the period of exertion being present in an almost negligible quantity, the percentage of O being very high.

Caustic Soda is the absorbent used and can be obtained in any town. In the bag system employed the soda is so placed that the movement of the wearer when walking or at work automatically rubs off the carbonated surface of the soda, and thus constantly exposes a fresh surface for the absorption of carbonic acid. The bag is very easily emptied after use and a fresh supply of soda can be placed in it immediately, and the apparatus made ready for use again in two or three minutes.

NOTE.—The Company recommend the above apparatus as combining efficiency with comparative lightness and simplicity. There are, however, other types on the market and they will be pleased to furnish particulars of these on application.

LANTERN.

For prices and particulars of Oxygen, Coal-gas, Hydrogen and Cylinders, see pages 2 and 3.

USEFUL NOTES FOR LANTERNISTS.

The quantities of Oxygen and Coal-gas used with various forms of limelight jets working to their full efficiency and the candle powers produced are approximately as follows :—

Blow-through jet { 5 ft. of Oxygen per hour.
6 ft. of Coal-gas per hour.
Candle power 400—600.

This type of jet is now seldom used. It has been largely superseded by the injector-jet. Both types have the advantage of requiring only the Oxygen supply from a cylinder, Coal-gas being drawn from the ordinary house supply.

Injector-jet or ordinary mixed jet of medium power { 6 ft. of Oxygen per hour.
7 ft. of Coal-gas per hour.
Candle power 1,000—1,200.

The injector-jet is a mixed jet which as stated above can draw its Coal-gas from the ordinary house supply. For efficient working, however, the Oxygen must be delivered to the jet at a pressure of from 12 to 15 lbs. per square inch. *It is necessary, therefore, to employ a regulator on the Oxygen Cylinder set to deliver gas at this pressure, which is considerably higher than that required for ordinary blow-through or mixed jets.* Stronger india-rubber tubing must consequently be used between the regulator and this jet. Ordinary india-rubber tubing is sufficient for connecting the jet with Coal-gas supply.

Ordinary mixed jets without injector require both Oxygen and Coal-gas to be delivered from cylinders through regulators, as it is necessary for both gases to be supplied to the jets under equal pressure.

Injector-jet or ordinary mixed jet of high power { 10 ft. of Oxygen per hour.
12 ft. of Coal-gas per hour.
Candle power 1,600—2,000.

If Hydrogen is used instead of Coal-gas twice the quantity of Hydrogen is required, but the light obtained is slightly better.

REQUIREMENTS FOR A LANTERN ENTERTAINMENT.

It will save Lanternists much annoyance and expense if, before starting for an entertainment, they examine the following lists to make sure that the Gas Cylinder equipment is right, and nothing left behind :—

LANTERN FITTED WITH BLOW-THROUGH JET.

- Usual Lantern equipment.
- Cylinder of Oxygen.
- Oxygen Regulator.
- Valve Key.
- Gland Nut Spanner.
- Ample rubber tubing for both Oxygen and Coal-gas supply.
- Limes.

LANTERN FITTED WITH INJECTOR JET.

- Usual Lantern equipment.
- Cylinder of Oxygen.
- Special Oxygen Regulator.
- Valve Key.
- Gland Nut Spanner.
- Pressure rubber tubing for Oxygen.
- Ample ordinary rubber tubing for Coal-gas.
- Limes.

LANTERN FITTED WITH MIXED JET.

- Usual Lantern equipment.
- Cylinder of Oxygen.
- Cylinder of Coal-gas (or Hydrogen).
- Oxygen Regulator.
- Coal-gas Regulator.
- Valve Key.
- Gland Nut Spanner.
- Rubber tubing for both Oxygen and Coal-gas.
- Limes.

BLACKENING OF LIMES BY IMPURE COAL GAS.

Coal Gas, which has been compressed into Cylinders, is sometimes found to contain an impurity which, when the gas is used for lime-light, quickly blackens the lime and seriously reduces the amount of light obtainable. This impurity is a gaseous compound of iron, which is gradually formed by the action of a certain constituent of the gas upon the iron of the Cylinder. Coal-gas Cylinders which may cause trouble owing to the above reason will be treated by the Company in a special manner, which has been found in a large measure to remedy this defect, at a charge of 2s. to 3s. 6d. each, according to the size of the Cylinder.

No Lanternist's equipment is complete without pressure-gauges, and not only should Cylinders be gauged before starting for an entertainment to make sure that they contain sufficient gas, but all fittings should also be tried on the Cylinders to make certain that they fit and are in proper working order.

After gauging a Cylinder, and always after the valve has been opened, test for leakage with water in the valve socket.

For General Hints to Cylinder Users, see pages 7 and 8.

LIME-LIGHT APPARATUS.

Special Lime-light Apparatus made to order.

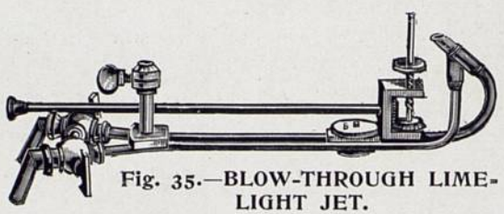


Fig. 35.—BLOW-THROUGH LIME-LIGHT JET.

15s.

Gases consumed { 5 ft. of Oxygen per hour.
6 ft. of Coal Gas ,,

Candle power 400–600.

Fig. 36.—MIXED JET, with Lever Cocks and Improved Mixing Chamber.

30s.

Gases consumed { 6 ft. of Oxygen per hour.
7 ft. of Coal Gas ,,

Candle power 1,000–1,200.

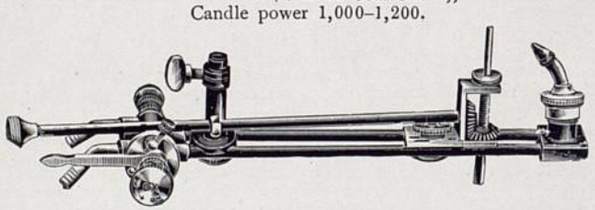


Fig. 37.—SPECIAL MIXED JET, with Double Valve cut off and Improved Mixing Chamber.

42s.

This Jet is capable of very delicate adjustment and rapid cut on or off of the gases.

Gases consumed { 6 ft. of Oxygen per hour.
7 ft. of Coal Gas ,,

Candle power 1,000–1,200.

LIME-LIGHT APPARATUS—*continued.*

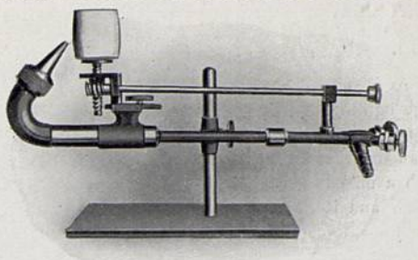


Fig. 38.—HIGH POWER MIXED JET.

30s.

Stand **2s. 6d.** extra.

Gases consumed { 10 ft. of Oxygen per hour.
12 ft. of Coal-gas ,,

Candle-power 1,600.

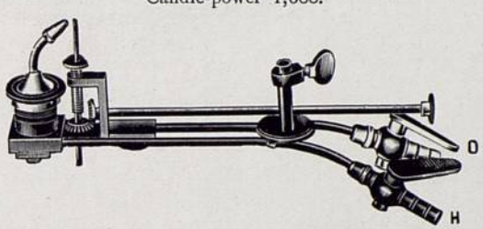


Fig. 39.—THE "INJECTOR" MIXED JET (Jackson's), **30s.**
HIGH-POWER DITTO FOR CINEMATOGRAPH, 37s. 6d.

This is a full power mixed or chamber jet which can be worked with compressed Oxygen from a Cylinder and Coal-gas taken direct from the town supply. In order to obtain the Oxygen supply at the requisite pressure from Cylinders it must either be taken direct from the Cylinder or from an ordinary fine adjustment valve (Fig. 10) or from an automatic regulator set to deliver at from 12 to 15 lbs. pressure. (The regulator shown in Fig. 14 is specially recommended for use with this jet.)

The jet shown consumes the same amount of both Oxygen and Coal-gas as the mixed jets illustrated in Figs. 36 and 37, and gives the same amount of light. It can, however, be constructed to give higher candle-powers if desired.

INSTRUCTIONS FOR USE.—Connect the Oxygen and Coal-gas supplies just as if working with a "blow-through" jet, using strong india-rubber tubing for the O supply, as this will have to stand considerably more pressure than is ordinarily required for a lime-light jet. Turn on the H supply and light the burner. It will be found that with the H tap fully open, more gas than is required will be supplied when the O is turned on. Regulate the gas supply and obtain the maximum lime-light in the ordinary way. After this the H tap will not require to be readjusted. To turn down the light simply turn off the O supply. It will then be found that a small H flame is left still burning, which is sufficient to keep the lime warm. To produce the light again simply turn on the O supply; the H supply will again be taken automatically from the mains. The simplicity of this adjustment is a great convenience in actual use.

Snapping, when turning off, is sometimes caused by a checked supply of Coal-gas. The supply passages for the Coal-gas should be large enough to pass to the jet at town's pressure the full quantity of gas which the jet consumes when working at full power. This applies also to the combination of two or three jets used for dissolving with ordinary dissolving taps. The H passages in some dissolving taps require opening out a little in order to satisfy this requirement. A better plan, however, is to connect the jets directly with the town's supply by means of a branch pipe or tee piece. The dissolving is then done wholly by the O supply.

Turning on the O too strongly does not cause passage of the O into the H main. The more the O is turned on the greater is the suction in the H pipe. The jet is therefore a "safety jet."

The chief advantage of the jet is briefly that it combines the efficiency of a mixed jet with the safety and economy of a "blow-through" jet. Compared with the ordinary mixed jet it soon saves its cost in compressed Coal-gas. Compared with the "blow-through" jet it gives twice the quantity of light with the same safety and cheapness.

LIME-LIGHT APPARATUS—*continued.*

Fig. 40.—LIME-LIGHT BOX.

£3. 0s. 0d.

This Lime-Light Box is suitable for ordinary stage lighting. It is strongly constructed, and fitted with a 6-inch plano-convex lens. It is fitted with a mixed jet similar to Fig. 36, and is supplied with gelatine films for colour effects.

This Lime-Light Box, complete with gelatine colours, can be obtained on hire at **5s.** per night.

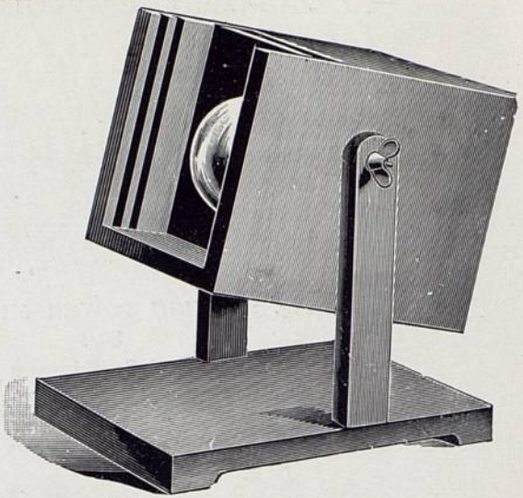


Fig. 41.—COMBINED REFLECTOR AND MIXED JET.

Complete as shewn,
£2. 8s. 3d.

Mixed Jet as illustrated (without connections),
£0 7s. 6d.

Reflector as illustrated (without connections),
£1 15s. 0d.

NOTE.—The above Reflector and Jet are admirably adapted for lighting large stages or for other purposes where a powerful projected light is required.

To obtain the best results about 10 ft. of each gas is required per hour.

These Lights were very successfully employed for lighting up the stages at Olympia and the Earl's Court Theatre, where flooding lights of great power had to be projected considerable distances.

This Reflector and Jet complete as shewn can be obtained on hire at **5s.** per night.

SUNDRIES.

SPECIAL ARMOURED ASBESTOS-COVERED RUBBER TUBING		**1s. 6d.** per foot.
SPECIAL RUBBER TUBING FOR INJECTOR JET		**9d.** and **1s. 3d.** per foot.
BEST RUBBER GAS TUBING		**6d.** ,,
FLEXIBLE METALLIC GAS TUBING		**8d.** ,,
PUSH-ON CONNECTIONS FOR DITTO		**8d.** each.
LIMES, best hard Nottingham, suitable for all the jets illustrated above, except No. 41	per box of 1 doz.	**2s. 6d.**
LIMES, best hard Nottingham, suitable for all the jets illustrated above, except No. 41	per box of six	**1s. 9d.**
LIMES, large size, specially made for No. 41	per box of nine	**3s. 3d.**
LIMES, special, for high-power mixed jet No. 38	per box of six	**2s. 6d.**

SPECIAL NOTICE.

THIS PRICE LIST only deals with matters specially relating to Medical and Lantern uses of Oxygen in Cylinders.

Industrial applications of Oxygen in Cylinders and many valuable appliances manufactured by the Company are described and illustrated in the three Special Pamphlets mentioned below, any of which will be forwarded on application to any of the Company's Works.

"The Welding of Metals by the Oxy-Acetylene Blow Pipe."

"Metal Cutting by Oxygen."

"The Oxy-Coal Gas System of Lead-Burning and Brazing."

(*For full List of Current Pamphlets and Circulars issued by the Company, see page* 32.)

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CURRENT SPECIAL PAMPHLETS AND CIRCULARS ISSUED BY THE COMPANY.

Illustrated General Price List (No. 190).

Illustrated Pamphlet on—

"The Welding of Metals by the Oxy-Acetylene Blow Pipe,"

with Photographs of work done.

Handbook on—

"Oxy-Acetylene Welding."

Illustrated Pamphlet on—

"Metal Cutting by Oxygen."

Illustrated Pamphlet on—

"The Oxy-Coal Gas System of Lead-Burning and Brazing."

Illustrated Pamphlet on—

"Apparatus for the Self-Intensive Liquefaction of Gases."

Illustrated Pamphlet on—

"The Commercial Production of Oxygen and Nitrogen."

Illustrated Pamphlet on—

"The Commercial Production of Hydrogen."

Circulars on—

"Carbonic Acid."

"Nitrous Oxide."

"Liquid Air."

"Quality of Oxygen."