

Palmer, E. (Firm)  
TC- 113020

PALMER'S  
NEW  
CATALOGUE



PALMER'S  
NEW CATALOGUE,

WITH

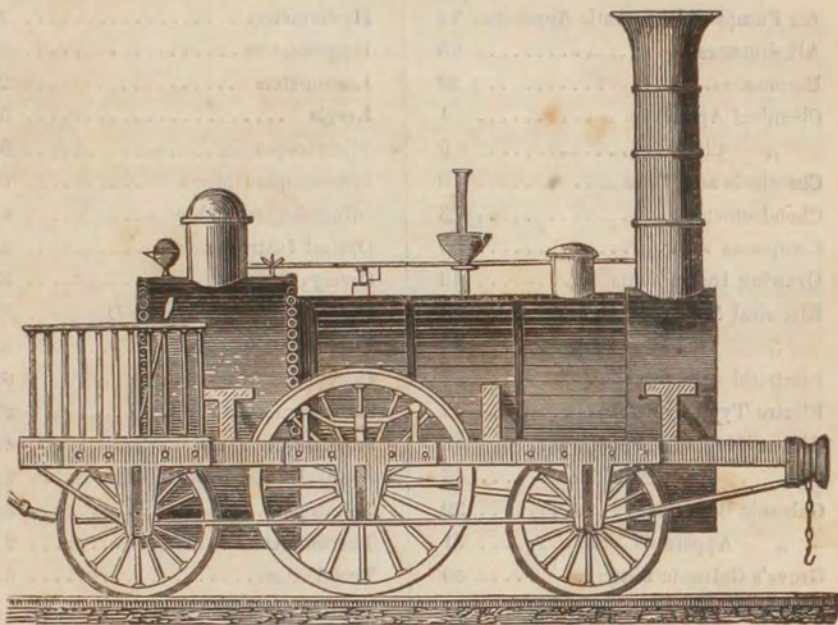
THREE HUNDRED ENGRAVINGS OF APPARATUS,

ILLUSTRATIVE OF

CHEMISTRY, PNEUMATICS, FRICTIONAL & VOLTAIC ELECTRICITY,  
ELECTRO MAGNETISM, OPTICS, &c. &c.

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WORKING MODELS OF STEAM ENGINES AND ALL KINDS  
OF MACHINERY MADE TO DRAWINGS.

LABORATORIES FITTED UP ON A LARGE OR SMALL SCALE.

---

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1840.

Entered at Stationers' Hall.

# NEW CATALOGUE

## CONTENTS.

|                                 | Page |                                   | Page |
|---------------------------------|------|-----------------------------------|------|
| Air Pumps & Pneumatic Apparatus | 24   | Hydrometers                       | 23   |
| Alkalimeters                    | 23   | Hygrometers                       | 23   |
| Barometers                      | 20   | Lactometers                       | 23   |
| Chemical Apparatus              | 1    | Levels                            | 50   |
| "    Chests                     | 9    | Microscopes                       | 58   |
| Chemicals and Tests             | 18   | Microscopic Objects               | 62   |
| Chondrometers                   | 23   | Mineralogical Cabinets            | 64   |
| Compasses                       | 50   | Optical Instruments               | 53   |
| Drawing Instruments             | 48   | Orrerys                           | 53   |
| Electrical Machines, Cylinder   | 29   | Polariscopes and Selenite Designs | 62   |
| "    "    Plate                 | 30   | Pluveometers                      | 23   |
| Electrical Apparatus            | 31   | Pneumatic Filters                 | 65   |
| Electro-Type Apparatus          | 43   | Saccharometers                    | 23   |
| Electro-Magnetic Apparatus      | 43   | Smee's Galvanic Batteries         | 40   |
| "    "    Machines              | 46   | Spectacles and Reading Glasses    | 53   |
| Galvanic Batteries              | 39   | Telescopes                        | 56   |
| "    Apparatus                  | 41   | Thermometers                      | 21   |
| Grove's Galvanic Batteries      | 40   | Theodolites                       | 51   |
| Globes                          | 52   | Toxicological Chests              | 15   |

## ADDRESS.

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E. PALMER, having at considerable expense and trouble completed a new Catalogue, with 300 engravings of Chemical, Philosophical, and Optical Instruments, begs to submit it to his Friends and the Public, trusting, that as the drawings have been made from the instruments themselves, it will be found of great assistance to those residing in the country, or abroad, who may favor him with their orders: at the same time he begs to return his grateful acknowledgments to those who have hitherto favored his establishment with their support; also to the Professors of Chemistry and Natural Philosophy, not only for their individual assistance, but for their kind recommendations; and he trusts, that by continuing to manufacture every article of the best workmanship, and on moderate terms, suitable for the Lecture Table or private investigations, to merit a continuance of their patronage.

The instruments being made upon the premises, enables him, in many instances to simplify their construction, in order to suit, not only the scientific, but likewise the mere tyro in science.

To Schoolmasters and those engaged in the education of youth he begs to submit his Catalogue, and to solicit a continuation of their favors.

Parents and guardians of youth, who feel desirous of promoting a taste for Chemistry and Natural Philosophy in the minds of the young, from seeing with what rapid strides those sciences are now advancing, and how necessary their acquaintance is to all, being so extensively employed in the arts and manufactures, will find nothing promote their wishes nor their children's pleasure more, than in selecting for their young friends an assortment of apparatus, whereby they may be able to follow up practically those experiments which they have seen at lectures, and read in the different introductory works to science.

All that is necessary for this purpose may now be had for a very trifling cost, as an instance of which, E. P. begs to refer to pages 16 and 17, containing lists of different amounts, suitable for all ages.

It is with pleasure E. P. calls attention to many new and important discoveries recently made, particularly Mr. Spencer's, of the Electro-Type, or art of copying medals, engraved copper-plates, &c., thereby affording an opportunity for obtaining fac-simile impressions of scarce and valuable medals, and of multiplying copper-plates for printing, or giving the possessor an opportunity to obtain a beautiful copper-plate in relief, a thing that heretofore could not possibly have been done.

Also the new, powerful, and simple Galvanic Battery, invented by Alfred Smee, Esq. The pleasure derived from experimenting with the Galvanic Battery has, before the introduction of this, been destroyed, either by its being soon out of action, or when the sustaining batteries have been used, by giving great trouble; but with this we possess a battery of immense and continuous power without the least trouble, neither requiring bladders or porous pots, nor emitting fumes either dangerous or disagreeable.

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N.B.—Laboratories fitted up on a large or small scale in Town or Country. Working Models of Steam Engines, all kind of Machinery, and every description of Chemical and Philosophical Apparatus made to drawings.

Country and Foreign Orders, enclosing a remittance, or order for payment in London, promptly attended to.

Half price only can be allowed for returned packages, deducting all expense of carriage, and no allowance made for breakage, the greatest care being taken in packing.

Fig.

Fig.

# APPARATUS.

## CHEMISTRY.

|                                                                                                                                      | £. | s. | d. |
|--------------------------------------------------------------------------------------------------------------------------------------|----|----|----|
| Adapters, glass, for Retorts, from.....                                                                                              | 0  | 2  | 0  |
| Air Jars, cut, per nest of six ... ..                                                                                                | 0  | 8  | 6  |
| Ditto .... larger .....                                                                                                              | 0  | 10 | 0  |
| Ditto, bell-shaped, for collecting the gases, each from                                                                              | 0  | 1  | 0  |
| Ditto....ditto....with ground stoppers, for defla-<br>grating 2s. 6d., 3s. 3d., 4s., and upwards.                                    |    |    |    |
| Ditto....ditto....mounted, with brass cap, for the re-<br>ception of air-cocks and other apparatus, each,<br>pint 4s., . . quart 5s. |    |    |    |
| Ditto....ditto....graduated, from .....                                                                                              | 0  | 3  | 6  |

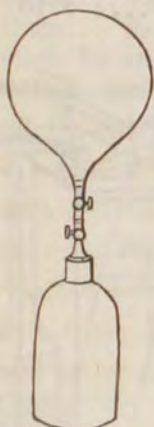


Fig. 1.

Air Jar, bell shaped, mounted with brass cap, two stop-cocks, connecting piece, ferule and bladder, for the reception of gases, from 14s.



Fig. 2.

Alembics, glass, 1/4-pint to two quarts, from 5s. to 20s.  
Ditto, earthen, from 3s.

Alkalimeters, each..... 0 6 0

Bar, compound, consisting of two metals riveted together, for shewing the *unequal* expansion of metals by heat, on stand ..... 0 16 0

Bars of Copper, Zinc, and Iron for precipitating metals from solutions, from 3d. each.

Bladders, with ferrules .....from 2s. to 0 3 0

Ditto, with stop-cocks .....from 5s. to 0 6 6

Blowpipes. common, each .....6d. and 0 1 0

Blowpipe, Wollaston's, arranged in three pieces, to enclose in each other for the pocket 5s. 6d. Fig. 3.

Fig. 3.

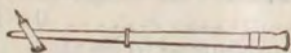
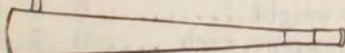


Fig. 4.



Blowpipe, Black's 2s. 6d. Fig. 4.

Blowpipe, Bergman's Improved, with Condensor and extra Jet 5s. Fig. 5.

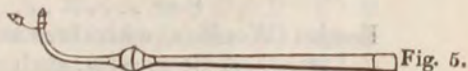


Fig. 5.

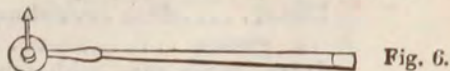


Fig. 6.

Blowpipe, Pepy's, with moveable Jet-pipe, that it may be placed at any angle the operator pleases 5s. 6d. Fig. 6.

Blowpipes, Gurney's Oxy-Hydrogen ..... from 30s. to 2 2 0  
 Ditto, Palmer's ditto ..... 1 1 0

This instrument is so constructed that the gases mix in a gauze chamber, and to remedy the danger which may arise from the pressure being taken off one reservoir and not the other, a valve is placed in each opening to the chamber.

The above, with Lime-Burner, &c. See page 6. Fig. 26.



Fig. 7.

Blowpipe, self-acting  
 Spirit, for bending  
 glass tubes, Tin,  
 6s.



Fig. 8.

Blowpipe, self-acting, in  
 brass, with sliding  
 Lamp £1. 10s.

Blowpipe, self-acting, with boiler and stand ..... 0 15 0

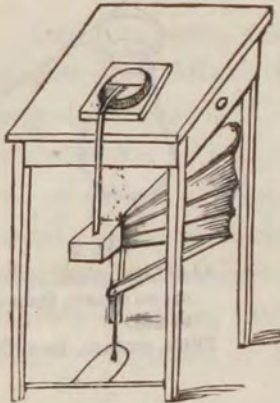


Fig. 9.

Blowpipe, Glassblower's  
 Table, with double bel-  
 lows, jets, lamp, and  
 stand, complete, from  
 £4. 4s. to £6. 6s.

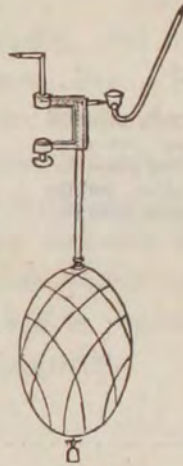


Fig. 10.

Blowpipe (Dangers)  
 from £2. 2s. to  
 £5. 5s.

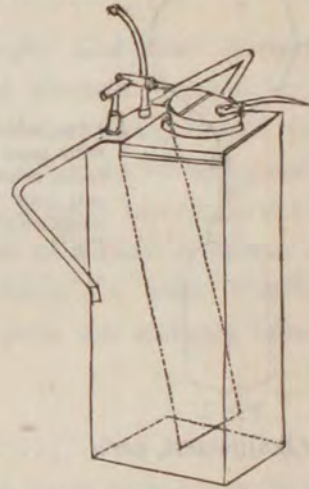


Fig. 11.

Blowpipe, Tilley's Hydraulic,  
 very superior £2. 2s.

Blowpipe, Tilley's Hydraulic, common ..... £1. 1s. to 1 5 0  
 Ditto .. Hemming's Safety Jet, for the mixed gases... 0 9 6  
 Ditto .. Lamp, and Tray ..... 0 5 0  
 Bottles, capped, for acids and volatile substances, each,—  
 1-oz. .... 0 2 0  
 2-oz. .... 0 2 6  
 4-oz. .... 0 3 6  
 8-oz. .... 0 4 6  
 Bottles (Woulfe's) with three necks, each, pints 2s. 6d. qts. 0 3 6  
 Ditto, specific gravity, each ..... 0 1 6  
 Ditto ..... ditto ..... stoppered, and graduated to 1000  
 grains ..... 0 5 0  
 Ditto, in tin case, with counterpoise weight ..... 0 8 6  
 Boxes of Mineral Fragments for the Blowpipe, each .... 0 2 0  
 Brass Tobacco-pipe, for blowing gas bubbles ..... 0 2 6  
 Ditto, Caps, with stop-cock screw for cementing on jars,  
 &c., from ..... 0 1 0

Bottles, best flint glass, well stoppered,—

|                            | Narrow mouth. |             | Wide mouth. |             |
|----------------------------|---------------|-------------|-------------|-------------|
| $\frac{1}{2}$ -oz. & 1-oz. | 6d. each,     | 5s. p. doz. | 6d. each,   | 5s. p. doz. |
| 2-oz.                      | 8d. "         | 7s. "       | 9d. "       | 8s. "       |
| 3-oz.                      | 9d. "         | 8s. "       | 10d. "      | 9s. "       |
| 4-oz.                      | 9d. "         | 8s. 6d. "   | 10d. "      | 9s. 6d. "   |
| 6-oz.                      | 10d. "        | 9s. 6d. "   | 11d. "      | 10s. 6d. "  |
| 8-oz.                      | 1s. "         | 10s. 6d. "  | 1s. 2d. "   | 12s. "      |
| 16-oz.                     | 1s. 4d. "     | 15s. "      | 1s. 6d. "   | 16s. "      |
| Quarts                     | 2s. "         | 21s. "      | 2s. 3d. "   | 24s. "      |
| 3-Pints                    | 2s. 6d. "     | 28s. "      | 3s. "       | 33s. "      |

|                                                       |      |     |        |
|-------------------------------------------------------|------|-----|--------|
| Candle Bombs, per dozen                               | 0    | 0   | 4      |
| Caoutchouc, in sheets, each                           | 0    | 1   | 0      |
| Ditto... tubing, per foot, 1s. 6d., 2s., and upwards. |      |     |        |
| Ditto... Varnish, per oz.                             | 0    | 0   | 4      |
| Ditto... Bags, for gas                                | 15s. | and | 1 10 0 |
| Cement, for attaching glass to brass, per lb.         | 0    | 2   | 0      |
| Chauffers, each                                       | 0    | 7   | 0      |



Fig. 12.

Chauffers, with cover and pipe for increasing the heat, forming a very useful Table Furnace, as described in Reid's Chemistry 12s.

|                                                                                        |                                 |   |   |   |
|----------------------------------------------------------------------------------------|---------------------------------|---|---|---|
| Connecting Pieces, brass, for uniting stop-cocks and other apparatus, each             | 10d. &                          | 0 | 1 | 0 |
| Ditto... square ditto                                                                  |                                 | 0 | 1 | 6 |
| Ditto... Angle Pieces                                                                  |                                 | 0 | 1 | 6 |
| Ditto... T Pieces                                                                      |                                 | 0 | 2 | 6 |
| Ditto... Ferrules, for bladders, small 10d.... large                                   |                                 | 0 | 1 | 8 |
| Keys, for square connecting pieces, enabling the operator to obtain a very tight joint |                                 | 0 | 2 | 0 |
| Copper Basins, 1s. 9d., 2s. 3d., 3s., and upwards.                                     |                                 |   |   |   |
| Ditto Sand Baths 2s., 3s., 5s., and upwards.                                           |                                 |   |   |   |
| Crucibles, cast-iron, each                                                             | 6d. to                          | 0 | 3 | 0 |
| Ditto... Hessian and English, in nests                                                 | 3d. to                          | 0 | 1 | 0 |
| Ditto... Tongs, various                                                                | 1s. 6d., 2s., 2s. 6d., 3s., and | 0 | 4 | 6 |
| Cubic-inch Tubes, graduated into 10ths and 100dths, each                               |                                 | 0 | 4 | 0 |
| Ditto... ditto... stoppered                                                            |                                 | 0 | 5 | 0 |
| Cuff's Scale of Chemical Equivalents, varnished                                        |                                 | 0 | 6 | 6 |
| Cryophorus, or Frost Bearer, Dr. Wollaston's                                           |                                 | 0 | 4 | 0 |

|                                                                           |         |         |           |
|---------------------------------------------------------------------------|---------|---------|-----------|
| Decimal Weights, from 1000 grains to the 10th of a grain, in mahogany box | 1       | 10      | 0         |
| Dishes, glass                                                             | 1s. 6d. | 2s. 6d. | and 0 3 6 |

Ditto, Evaporating, of real Wedgwood ware, not liable to crack or stain,—

|                          |   |   |   |
|--------------------------|---|---|---|
| 2-inches over, each..... | 0 | 0 | 4 |
| 3   "   "   ".....       | 0 | 0 | 6 |
| 4   "   "   ".....       | 0 | 0 | 9 |
| 5   "   "   ".....       | 0 | 1 | 0 |
| 6   "   "   ".....       | 0 | 1 | 4 |
| 7   "   "   ".....       | 0 | 1 | 8 |
| 8   "   "   ".....       | 0 | 2 | 0 |
| 9   "   "   ".....       | 0 | 2 | 6 |
| 10   "   "   ".....      | 0 | 3 | 0 |
| 11   "   "   ".....      | 0 | 3 | 9 |
| 12   "   "   ".....      | 0 | 4 | 6 |

And up to 24-inches over, price according to size.

Ditto, Platinum, from 7s. upwards.

Dropping Tubes, 4d. and 6d. each.

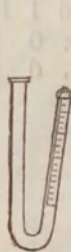


Fig. 13.



Fig. 14.



Fig. 15.

Fig. 13. Eudiometers, Ure's 8s. 6d.

Fig. 14. Eudiometers, Hope's 10s. 6d.

Fig. 15. Eudiometers, Volta's 12s.

|                                                                        |   |   |   |
|------------------------------------------------------------------------|---|---|---|
| Etnas, tin, for boiling water quickly, $\frac{1}{2}$ -pints, each..... | 0 | 2 | 0 |
| Pints .....                                                            | 0 | 2 | 6 |

|                                                          |         |   |   |    |
|----------------------------------------------------------|---------|---|---|----|
| Filtering Paper.....                                     | per lb. | 0 | 1 | 4  |
| Ditto..... thin, per quire .....                         |         | 0 | 1 | 6  |
| Fire Clay .....                                          | per lb. | 0 | 0 | 3  |
| Flasks, $\frac{1}{4}$ -pint .....                        |         | 0 | 0 | 5  |
| "   "   " .....                                          |         | 0 | 0 | 9  |
| "   Pint .....                                           |         | 0 | 0 | 10 |
| "   Quart .....                                          |         | 0 | 1 | 3  |
| "   with bent tubes for generating gases, (see fig. 48.) |         |   |   |    |
| from 5s. to                                              |         | 0 | 8 | 6  |



Fig. 16.  
Furnace, Aikin's  
Blast, from 10s. 6d.



Fig. 17.  
Furnace, Universal,  
from 15s.



Fig. 18.  
Furnace, French 25s.  
to £1. 10s.



Fig. 19.  
Furnace, Knight's  
£4. 10s.



Fig. 20.  
Furnace, Round Iron,  
very useful £3. 3s.

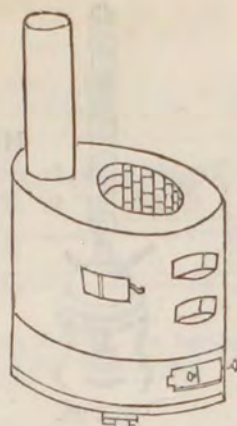


Fig. 21.  
Furnace, Dr. Black's,  
£4. 15s.

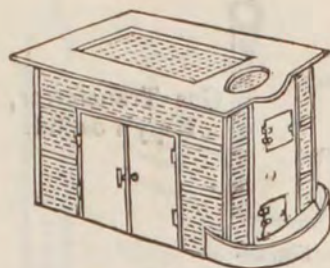


Fig. 22.  
Furnace, on Professor Brande's  
Principle, made to order, price  
according to size.

*Furnace Stoves, for experimental purposes, made to order.*

|                                                                                                            |                           |   |   |   |
|------------------------------------------------------------------------------------------------------------|---------------------------|---|---|---|
| Funnels, glass .....                                                                                       | 6d., 9d., 1s. 1s. 6d. and | 0 | 2 | 6 |
| Ditto, with long necks, for introducing substances and liquids into retorts, &c. without soiling the neck, | 4d., 6d., and             | 0 | 1 | 0 |

|                                                         |   |   |   |
|---------------------------------------------------------|---|---|---|
| Gauge, for showing the expansion of metals by heat .... | 0 | 5 | 0 |
|---------------------------------------------------------|---|---|---|

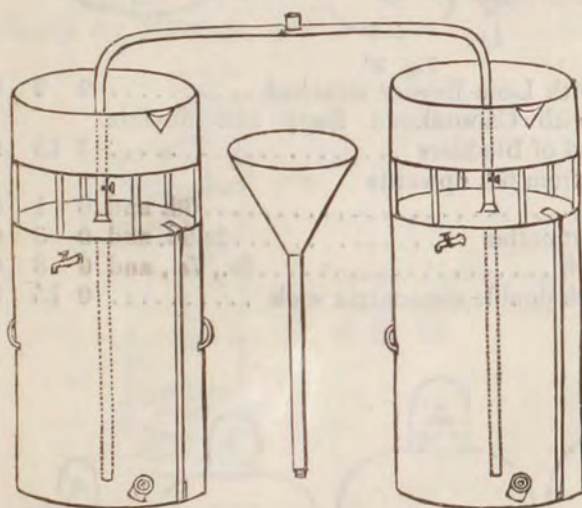
|                                                          |   |   |   |
|----------------------------------------------------------|---|---|---|
| Glass and Enamel Rods, for stirring solutions, from .... | 0 | 0 | 3 |
|----------------------------------------------------------|---|---|---|

|                    |                          |   |   |   |
|--------------------|--------------------------|---|---|---|
| Glass Tubing ..... | per lb. 2s. 4d., 3s. 6d. | 0 | 5 | 0 |
|--------------------|--------------------------|---|---|---|

Do. Tubes, bent, and made to order.

|                                       |   |   |   |
|---------------------------------------|---|---|---|
| Do. Syringe, for washing filters..... | 0 | 1 | 6 |
|---------------------------------------|---|---|---|

Gas Holders, Pepy's Improved, which, with the addition of a jet, forms a convenient Hydraulic Blowpipe, 30s, 42s., 52s. 6d., 63s. and upwards.



Pair of large  
Pepy's Copper  
Gas-holders, suit-  
able for lecturers,  
£12. 12s.

Fig. 23.

|                                                                                  |    |    |   |
|----------------------------------------------------------------------------------|----|----|---|
| The above, with Palmer's Oxy. Hydrogen Jet, Lime Burner, &c. very complete ..... | 14 | 14 | 0 |
|----------------------------------------------------------------------------------|----|----|---|



Fig. 24.

Gas Transferrer,  
Pepy's 5s. 6d.



Fig. 25.

High Pressure Boiler  
and Stand, with Ba-  
rometer Tube, Ther-  
mometer, & Lamp,  
complete £3. 3s.

|                                                                                                                                                          |   |    |   |
|----------------------------------------------------------------------------------------------------------------------------------------------------------|---|----|---|
| Hydrometers, from .....                                                                                                                                  | 0 | 7  | 0 |
| Iron Tube Apparatus, for making Potassium .....                                                                                                          | 1 | 5  | 0 |
| Iron Wire, small, for combustion in Oxygen Gas                                                                                                           |   |    |   |
| Jet, horizontal revolving, for exhibiting Philosophical Fire-<br>Works with Hydrogen Gas.....                                                            | 0 | 7  | 0 |
| Ditto, Palmer's Oxy-Hydrogen, on stand, for burning the<br>mixed Gases with perfect safety, with recent Im-<br>provements, (see Blowpipes, page 2) ..... | 1 | 1  | 0 |
| Ditto, ditto, with Bladders, Stopcocks, &c. ....                                                                                                         | 1 | 12 | 0 |

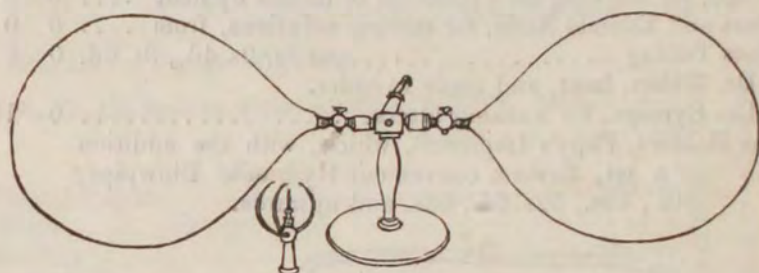


Fig. 26.

|                                                                                    |               |    |   |
|------------------------------------------------------------------------------------|---------------|----|---|
| Ditto, ditto, with Lime-Burner attached .....                                      | 2             | 2  | 0 |
| Ditto, ditto, with Caoutchouc Bags and flexible<br>Tubes instead of Bladders ..... | 3             | 13 | 6 |
| Ladles, small iron, from 6d. upwards                                               |               |    |   |
| Ditto, Deflagrating .....                                                          | 6d. and       | 0  | 1 |
| Ditto, with air-tight collar .....                                                 | 2s. 6d. and   | 0  | 3 |
| Lamps, Argand, each .....                                                          | 6s., 7s., and | 0  | 8 |
| Ditto, ditto, with double concentric wick .....                                    | 0             | 15 | 0 |

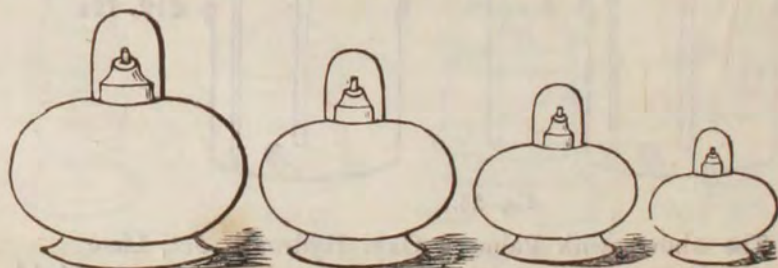


Fig. 27.

|                          |               |   |   |   |
|--------------------------|---------------|---|---|---|
| Lamp, Glass Spirit ..... | 2s., 3s., 4s. | 0 | 5 | 0 |
|--------------------------|---------------|---|---|---|

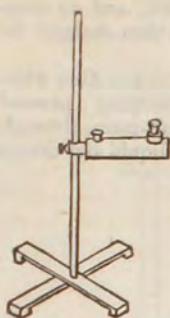


Fig. 28.  
Lamps, Berzelius's  
portable Blowpipe  
10s.  
Ditto, with brass  
Lamp 15s.

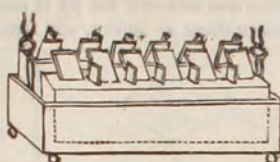


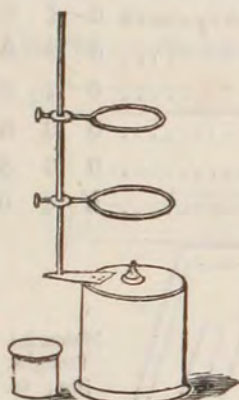
Fig. 29.  
Lamp, Cooper's, for heating  
Tubes 21s. and 35s.



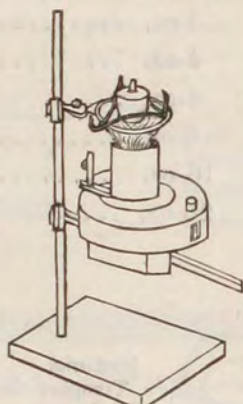
Fig. 30.  
Lamp, Davy's Safety  
10s. 6d.



Fig. 31.  
Lamp, Farraday's, with  
four wicks, as recom-  
mended in his chemi-  
cal manipulations, 15s.



Lamp, brass  
Spirit, with  
two sliding  
rings, form-  
ing a conven-  
ient stand  
for watch  
glasses, small  
evaporating  
dishes, &c.  
7s. Fig. 32.



Spirit Lamps, with  
concentric wick  
and double cur-  
rent of air, on  
Professor Rose's  
principle, moun-  
ted on a stand,  
18s. Fig. 33.  
Ditto ditto, on tri-  
pod stand, 12s.

Fig. 32.

Fig. 33.

Lamps for Blowpipe, with Tray ..... 0 5 0



Fig. 34.

Lamps, Hydrogen,  
very superior 30s.  
& £2. 2s.



Fig. 35.

#### DIRECTIONS FOR USE.

Remove the top A, to which the inside glass B, containing a coil of Zinc C, is attached, fill the outside glass G, half or two-thirds full of Diluted Sulphuric Acid (made by mixing one part of Oil of Vitrol with eight or nine parts of Water), replace the top A, raise the lid D, observing that the Platina E is opposite the jet F,

allow it to remain up about a minute, when, IF EFFERVESCING, and no spontaneous flame produced, apply a light and then close the lid; it is then charged for use.

When the liquid remains in the inside glass, and in contact with the Zinc without effervescing, it has lost its power, and the Apparatus wants recharging; proceed thus,—first, carefully remove the Platina and unscrew the jet or mouth-piece, through which pass a fine needle to clear it, replace them as before, add fresh liquid and charge as above directed.



Fig. 36.

Marsh's Apparatus for the detection of arsenic  
7s. 6d. and 10s. 6d.

|                                              |   |   |   |
|----------------------------------------------|---|---|---|
| Measure Glasses, 2-oz. and minim, each ..... | 0 | 1 | 6 |
| 3-oz. ....                                   | 0 | 1 | 9 |
| 4-oz. ....                                   | 0 | 2 | 0 |
| 6-oz. ....                                   | 0 | 2 | 3 |
| 8-oz. ....                                   | 0 | 2 | 6 |
| 16-oz. ....                                  | 0 | 3 | 6 |
| 20-oz. ....                                  | 0 | 4 | 0 |

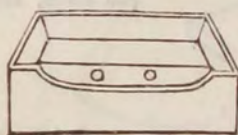


Fig. 37.

Mercurial  
Troughs, ma-  
hogany, 6s.  
Fig. 37.

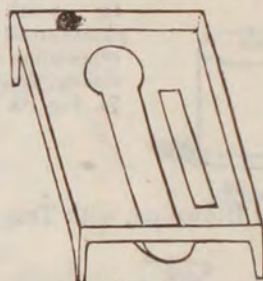
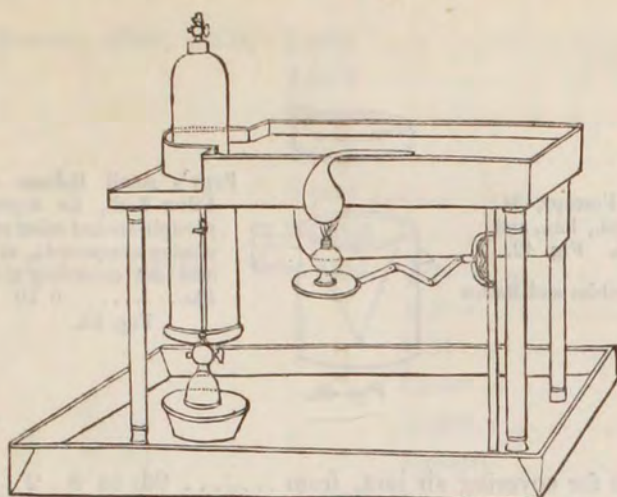


Fig. 38.

Mercurial  
Troughs,  
iron, 6s.  
10s. 6d. &  
21s.  
Fig. 38.

Models of Crystals in wood, to facilitate the study of

|                                                                                              |                                |    |   |   |
|----------------------------------------------------------------------------------------------|--------------------------------|----|---|---|
| Crystallography, per set .....                                                               | 0                              | 7  | 6 |   |
| Ditto ditto, in glass, per set ..                                                            | 0                              | 18 | 0 |   |
| Ditto ditto, consisting of 15 secondary forms, each<br>enclosing its primitive nucleus ..... | 2                              | 10 | 0 |   |
| Mortars, agate, from .....                                                                   | 5s. to                         | 2  | 2 | 0 |
| Ditto, composition, No. 0000 .....                                                           | 0                              | 1  | 3 |   |
| 000 .....                                                                                    | 0                              | 1  | 6 |   |
| 00 .....                                                                                     | 0                              | 2  | 0 |   |
| 0 .....                                                                                      | 0                              | 2  | 3 |   |
| 1 .....                                                                                      | 0                              | 2  | 6 |   |
| 2 .....                                                                                      | 0                              | 3  | 0 |   |
| Ditto, glass, each.....                                                                      | 2s. 2s. 6d., 3s. 6d., 5s., and | 0  | 6 | 0 |



Mercurial  
Troughs, iron,  
very superior,  
with Pepy's  
Gasometer at-  
tached. £9.9s.  
Fig. 39.

Fig. 39.

|                                               |   |    |   |
|-----------------------------------------------|---|----|---|
| Mortars, Iron, from .....                     | 0 | 2  | 6 |
| Ditto Steel, crushing with pestles, each..... | 0 | 14 | 0 |
| Muffles, earthenware, from .....              | 0 | 0  | 9 |

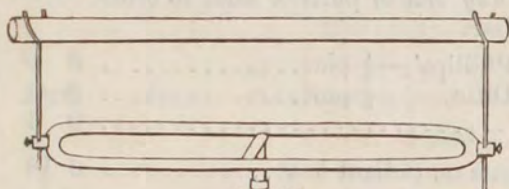


Fig. 40.

Palmer's Gas Lamp for  
heating tubes, which  
screws on to a com-  
mon gas pillar, 18s.

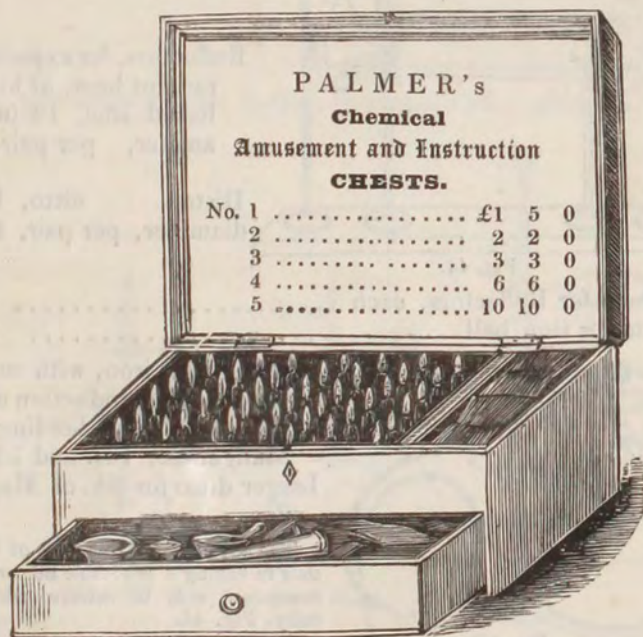
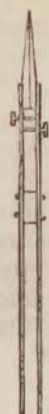


Fig. 41.

Platinum Spoons for the blowpipe, each 1s.6d., 3s.6d.  
8s. and 0 10 6



Platinum Forceps, 3s.,  
5s. 6d., 8s., 12s., and  
upwards. Fig. 42.

Ditto Crucibles and Basins



Fig. 43.

Pepy's small Balneo, or  
Filter-Bath, for drying  
precipitates and other ex-  
plosive compounds, at a  
heat not exceeding  $212^{\circ}$   
Far. .... 0 10 0

Fig. 43.

Fig. 42.

|                                                               |        |   |    |   |
|---------------------------------------------------------------|--------|---|----|---|
| Plates of Glass for covering air jars, from .....             | 6d. to | 0 | 2  | 6 |
| Pneumatic Troughs for collecting the gases, various sizes,    |        |   |    |   |
| small .....                                                   |        | 0 | 4  | 6 |
| 2nd size .....                                                |        | 0 | 10 | 6 |
| 3rd size .....                                                |        | 0 | 16 | 0 |
| <i>Pneumatic Troughs of any size or pattern made to order</i> |        |   |    |   |
| <i>in Copper, Tin, or Zinc.</i>                               |        |   |    |   |
| Precipitating Glasses, Phillips',— $\frac{1}{4}$ -pint.....   |        | 0 | 0  | 9 |
| Ditto ditto, Ditto, $\frac{1}{2}$ -pint.....                  |        | 0 | 1  | 0 |
| Pulse Tubes, each .....                                       |        | 0 | 1  | 3 |
| Reflectors, for experiments on radiant heat.....              |        | 0 | 18 | 0 |

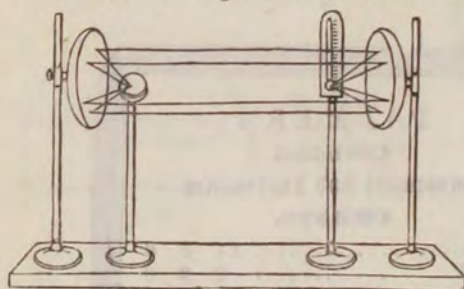


Fig. 44.

Reflectors, for experiments on  
radiant heat, of highly po-  
lished zinc, 12 inches di-  
ameter, per pair, £2. 2s.

Ditto ditto, 15 inches  
diameter, per pair, £3. 3s.

|                                   |   |   |   |
|-----------------------------------|---|---|---|
| Stands for Reflectors, each ..... | 0 | 5 | 0 |
| Ditto for iron ball.....          | 0 | 6 | 0 |

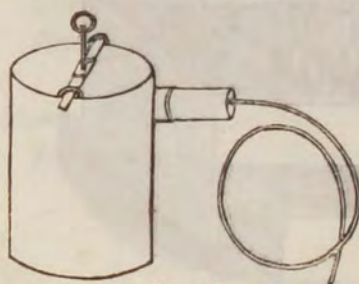


Fig. 45.

Retorts, cast iron, with connecting  
tube for the production of oxygen  
gas, capable of holding 11lb. of  
Manganese, 10s. and 15s.  
Larger ditto for 31b. of Manganese,  
21s.

The advantage of this form of bottle con-  
sists in having a moveable lid, whereby the  
manganese may be removed without diffi-  
culty. Fig. 45.

|                                                         |   |   |    |
|---------------------------------------------------------|---|---|----|
| Retorts, earthen, from .....                            | 0 | 0 | 10 |
| Ditto, porcelain, tubulated,— $\frac{1}{2}$ -pint ..... | 0 | 2 | 6  |
| Ditto ditto, Pint .....                                 | 0 | 3 | 6  |

|                                                                                       |                                              |   |   |    |
|---------------------------------------------------------------------------------------|----------------------------------------------|---|---|----|
| Retorts, glass, plain,— $\frac{1}{4}$ -pint .....                                     |                                              | 0 | 0 | 8  |
| $\frac{1}{2}$ -pint .....                                                             |                                              | 0 | 0 | 10 |
| Pint.....                                                                             |                                              | 0 | 1 | 0  |
| Quart .....                                                                           |                                              | 0 | 2 | 0  |
| 3-pint .....                                                                          |                                              | 0 | 2 | 6  |
| 2-quart .....                                                                         |                                              | 0 | 3 | 0  |
| Ditto                                                                                 | ditto, tubulated,— $\frac{1}{4}$ -pint ..... | 0 | 1 | 4  |
|                                                                                       | $\frac{1}{2}$ -pint .....                    | 0 | 1 | 8  |
|                                                                                       | Pint.....                                    | 0 | 2 | 0  |
|                                                                                       | Quart .....                                  | 0 | 3 | 9  |
|                                                                                       | 3-pint .....                                 | 0 | 4 | 9  |
|                                                                                       | 2-quart .....                                | 0 | 5 | 3  |
| Receivers, glass, plain,— $\frac{1}{4}$ -pint.....                                    |                                              | 0 | 0 | 9  |
| $\frac{1}{2}$ -pint .....                                                             |                                              | 0 | 0 | 10 |
| Pint .....                                                                            |                                              | 0 | 1 | 4  |
| Quart.....                                                                            |                                              | 0 | 1 | 9  |
| 3-pint.....                                                                           |                                              | 0 | 2 | 6  |
| 2-quart .....                                                                         |                                              | 0 | 3 | 6  |
| Ditto                                                                                 | ditto, tubulated,— $\frac{1}{4}$ -pint ..... | 0 | 1 | 2  |
|                                                                                       | $\frac{1}{2}$ -pint .....                    | 0 | 1 | 3  |
|                                                                                       | Pint.....                                    | 0 | 1 | 6  |
|                                                                                       | Quart .....                                  | 0 | 2 | 6  |
|                                                                                       | 3-pint .....                                 | 0 | 3 | 9  |
|                                                                                       | 2-quart .....                                | 0 | 4 | 3  |
| Ditto, Quilled,— $\frac{1}{4}$ -pint, 1s.6d.; $\frac{1}{2}$ -pint, 1s.9d.; pint ..... |                                              | 0 | 2 | 6  |



Fig. 46.

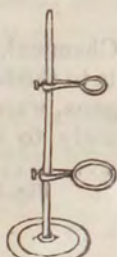


Fig. 47.

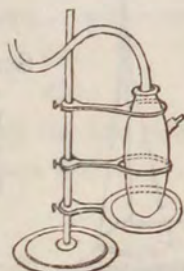


Fig. 48.

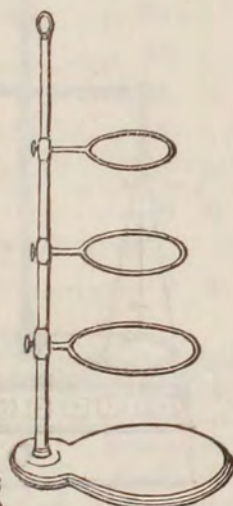


Fig. 49.

|                                                        |  |   |    |   |
|--------------------------------------------------------|--|---|----|---|
| Retort Stands, small, with 2 sliding brass rings,      |  |   |    |   |
| Fig. 46. ....                                          |  | 0 | 4  | 6 |
| Small brass ditto, with 2 sliding rings, Fig. 47. .... |  | 0 | 8  | 0 |
| Third size ditto, with 3 sliding rings, Fig. 48. ....  |  | 0 | 14 | 0 |
| Large ditto ditto, Fig. 50. ....                       |  | 1 | 1  | 0 |
| Plain iron Retort Stands, with 3 sliding rings,        |  |   |    |   |
| Fig. 49 .....                                          |  | 0 | 7  | 6 |
| Ditto ditto, japanned .....                            |  | 0 | 10 | 0 |

Retort Stands large, brass, with fountain Argand Lamp,  
three sliding rings, &c. very complete ..... 1 16 0

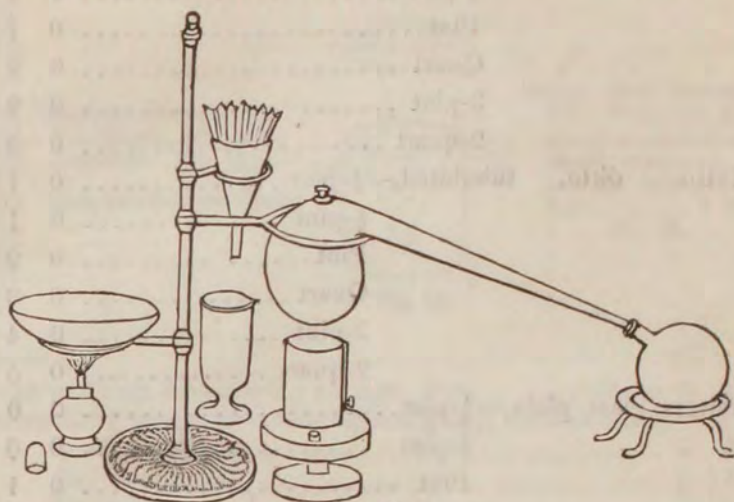


Fig. 50.

Retort Stand large, brass, with tubulated retort, receiver,  
stand for ditto, and Argand Lamp (Fig. 50 ) ... 1 12 0  
Ditto, smaller ditto, with retort, &c. .... 1 5 0  
Ditto, iron ditto, instead of brass ..... 1 0 0  
Scales, Chemical, common, in oak boxes..... 0 3 6  
Ditto, ditto, better, in mahogany box..... 0 7 0  
Ditto, ditto, with box end beams and brass pans.... 0 15 0  
Ditto, ditto, with glass pans..... 0 18 0  
Ditto, ditto, standard grain, in French polished ma-  
hogany box, with box end beams and glass pans.. 2 2 0

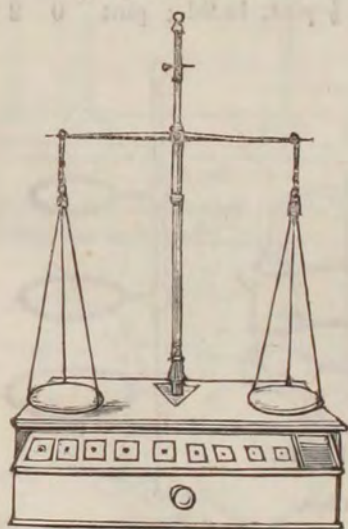


Fig. 51.

Scales, Chemical, with decimal  
weights to the tenth of a grain,  
brass pans, warranted to weigh  
accurately to the tenth of a  
grain ..... 3 3 0

Fig. 51.

Very delicate Balances, for assaying, or accurate ana-  
lytical chemistry, in mahogany lanterns and glass  
sides ..... £8. 8s. to 16 16 0

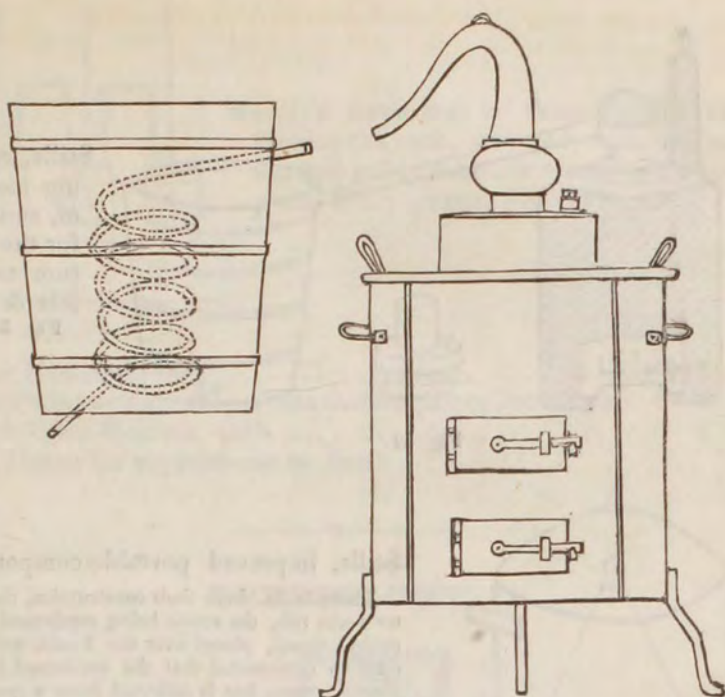
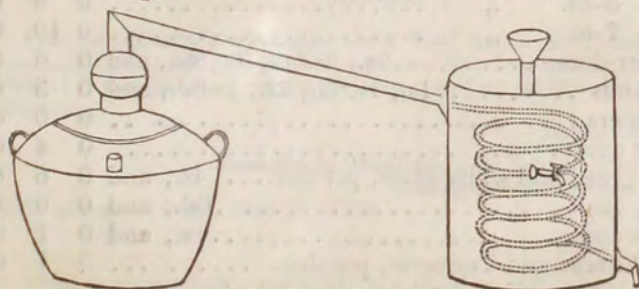


Fig. 52.

Stills, copper, portable, best make, with pewter worm, tub, iron frame and furnace, complete,—

|                                                  |    |       |   |                 |    |    |   |
|--------------------------------------------------|----|-------|---|-----------------|----|----|---|
| 2-gallon .....                                   | 5  | 5     | 0 | 10-gallon ..... | 13 | 13 | 0 |
| 3 „ .....                                        | 6  | 6     | 0 | 12 „ .....      | 15 | 15 | 0 |
| 4 „ .....                                        | 7  | 7     | 0 | 15 „ .....      | 18 | 18 | 0 |
| 5 „ .....                                        | 8  | 8     | 0 | 18 „ .....      | 22 | 0  | 0 |
| 6 „ .....                                        | 9  | 9     | 0 | 20 „ .....      | 24 | 0  | 0 |
| 7 „ .....                                        | 10 | 10    | 0 | 25 „ .....      | 30 | 0  | 0 |
| 8 „ .....                                        | 11 | 11    | 0 | 30 „ .....      | 35 | 0  | 0 |
| 20-gallon Still, for brick-work, with cock ..... |    |       |   | 27              | 0  | 0  |   |
| 25-gallon ditto                                  |    | ditto |   | 34              | 0  | 0  |   |
| 30-gallon ditto                                  |    | ditto |   | 40              | 0  | 0  |   |

Stills, 1-gallon, copper, with tin tub and pewter worm complete, for a common fire ..... 2 2 0



Stills, 1-gallon tin, complete, common, 21s. best make, £1.5s. Fig. 53  
Ditto, 2-gallon £1. 16s.

Fig. 53.

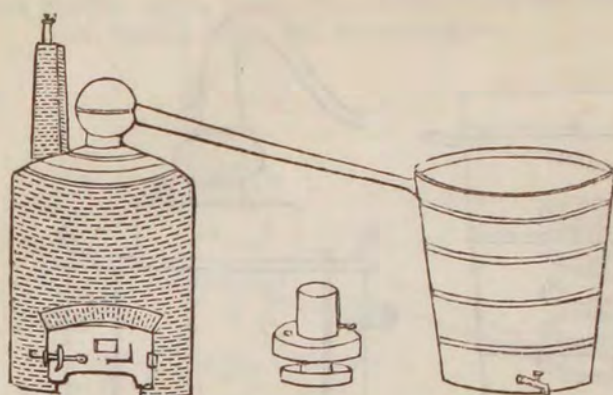


Fig. 54.

Stills, working models of, suitable for the lecture table, 30s. & 42s.  
Fig. 54.

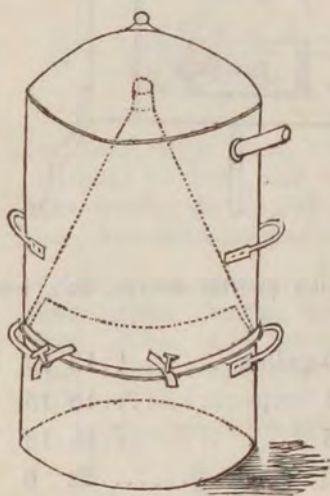


Fig. 55.

### Stills, improved portable compound.

These Stills, from their construction, require no worm tub, the steam being condensed on a conical vessel, placed over the liquid, and the cone so constructed that the condensed liquid cannot return, but is collected from a spout at the side, in the usual manner.

The lower part, with the addition of the cover, forms a convenient pan for decoctions, &c. &c.

|                    |   |   |   |
|--------------------|---|---|---|
| Gallon . . . . .   | 4 | 4 | 0 |
| 2-Gallon . . . . . | 5 | 5 | 0 |

|                                                               |   |    |   |
|---------------------------------------------------------------|---|----|---|
| Spatulas, steel, of various sizes, from . . . . .             | 0 | 1  | 0 |
| Ditto, platinum, from . . . . .                               | 0 | 12 | 0 |
| Stopcocks, brass, best make . . . . .                         | 0 | 3  | 0 |
| Syphons, glass . . . . .                                      | 0 | 2  | 6 |
| Ditto, pewter and copper, with stopcock, from . . . . .       | 0 | 7  | 0 |
| Test Glasses, 1½-oz, per doz. . . . .                         | 0 | 7  | 0 |
| 3-oz. „ . . . .                                               | 0 | 8  | 0 |
| 5-oz. „ . . . .                                               | 0 | 9  | 0 |
| 7-oz. „ . . . .                                               | 0 | 10 | 0 |
| Test Tubes, per dozen . . . . . 2s., 2s.6d., 3s., 4s., and    | 0 | 6  | 0 |
| Test Tube Stands . . . . . 1s., 1s.6d., 2s., 2s.6d., and      | 0 | 3  | 6 |
| Ditto Holders . . . . .                                       | 0 | 0  | 6 |
| Test Jars, per doz. . . . .                                   | 0 | 4  | 0 |
| Tube Flasks, green and white glass, per doz. . . . . 4s., and | 0 | 6  | 0 |
| Tube Retorts, each . . . . . 6d., and                         | 0 | 0  | 8 |
| Tubes, Wedgwood . . . . . 1s., and                            | 0 | 1  | 6 |
| Test Papers, Litmus and Turmeric, per doz. . . . .            | 0 | 1  | 0 |
| Thermometers, Chemical and others, (see list of)              |   |    |   |

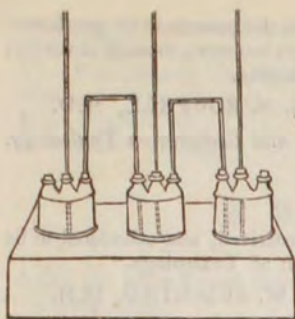


Fig. 56.

Woulfe's Apparatus of three Bottles with three necks each, mounted, with conducting and safety tubes, in a mahogany tray, pints, 16s. ; quarts, 20s. Fig. 56.

|                                                                    |   |   |   |
|--------------------------------------------------------------------|---|---|---|
| Water Hammers, each .....                                          | 0 | 4 | 0 |
| Welter's Safety Tubes to prevent the bursting of Retorts, &c. .... | 0 | 2 | 0 |
| Watch Glass Holders, each .....                                    | 0 | 0 | 6 |
| Wire Gauze for experiments on flame                                |   |   |   |

---

## TOXICOLOGY.



### PALMER'S TOXICOLOGICAL CHEST.

Containing, in stoppered bottles, all the most approved Tests for the detection of Poisons, and a complete set of Apparatus for performing the necessary Experiments, with directions, price Three Guineas; or on a smaller scale, in deal box, price Two Guineas.

### TESTIMONIALS.

3, Hinde Street, 10th November, 1836.

I have examined the Chest of preparations and implements for Toxicological investigations, arranged and sold by Mr. E. Palmer, of 103, Newgate Street; and I have no hesitation in recommending it as well calculated for its purposes, both to the student and practitioner.

ANTHONY TODD THOMSON,  
*Professor of Medical Jurisprudence, University of London.*

I have examined a Toxicological Chest, fitted up by Mr. Palmer, of Newgate Street, and think it well adapted for the purpose intended, namely, that of enabling students and practitioners to detect Poisons. A Chest of this kind has long been a desideratum.

JONN. PEREIRA,  
*Lecturer on Chemistry at the London Hospital, and at the Aldersgate Street School of Medicine.*

151, Aldersgate Street, Nov. 12, 1836.

I have examined the Toxicological Chest, fitted up and arranged by Mr. Palmer, 103, Newgate Street, and I have no hesitation in expressing my approval of it, and

my opinion that the Tests contained in it ought to be in the possession of gentlemen practising in the country, who may be called upon, at any moment, to analyse various matters, and report upon cases of real or suspected poisoning.

G. N. ROUPELL, M.D.

*Physician to St. Bartholomew's, and Lecturer on Toxicology.*

13, Welbeck Street, Nov. 10, 1836.

The Toxicological Chest of Mr. Palmer is well contrived, and calculated to be of essential service both to the medical jurist and student of Toxicology.

W. CUMMING, M.D.

*Lecturer on Forensic Medicine at the Aldersgate Street School.*

Oct. 18, 1836.

have examined a Toxicological Chest, prepared by Mr. Palmer, 103, Newgate Street, and am of opinion it affords information and means for detecting the exhibition of Poisons by Tests, which the improvements in Science at the present time render it highly important for medical men in general to possess, but especially those in remote parts of the kingdom, and Army Surgeons on foreign stations.

L. LEESE, M.D.

*Surgeon to the Hon. East India Company.*

Coleman Street, Dec. 6, 1836.

SIR,

38, Finsbury Square, Nov. 15, 1836.

The necessity for a compendious collection of pure Tests and convenient Apparatus, for the detection of Poisons, must be universally admitted; and such a collection the neat package which you submitted to my examination seems to afford. The chemical re-agents are, I believe, well prepared, and in perfect accordance with the present advanced state of Toxicological science. The various pieces of Apparatus, constructed in a clever and compendious manner, appear to be quite sufficient for all the investigations which belong to this department of Chemistry. I cannot therefore too strongly recommend it to the notice of the medical professors, and to every individual who may be required to undertake any inquiry in this branch of medical jurisprudence.

I remain, SIR, very faithfully yours,

GEORGE BIRKBECK.

To Mr. Edward Palmer.

## PARTICULARS

OF A

## Set of Chemical Apparatus,

TO THE

AMOUNT of FIVE POUNDS.

Nest of Crucibles.

An Iron Retort Stand, with three sliding rings for the support of Apparatus.

A Chemical Argand Lamp.

Three Glass Retorts, and a Glass Receiver

A Glass Funnel, and Filtering Paper.

A Flat and Round Bottom Flask.

A Glass Bottle, with ground tube, for generating the gases.

Three Evaporating Basins.

A large japanned Pneumatic Trough.

A Glass Bell Air Jar, with wire and ladle, for deflagrating.

Ditto, with brass cap.

A Bladder, mounted with brass Air Cock, and Jet Pipe.

An Iron Retort and Conducting Tube, for making Oxygen Gas from Manganese in a common grate.

Two Cylindrical Air Jars.

A Glass Graduated Measure.

A Dropping Tube, and six Test Tubes.

Two Test Glasses.

Glass Tubing and Blowpipe.

A Three-neck Woulfe's Bottle.

A Porcelain Mortar and Pestle.

72 1926-28 Bk. 10 593 1-15-10 Charles Wood

A Box of Weights and Scales.  
A Glass Spirit Lamp.  
Two Precipitating Glasses.  
Platinum Wire and Foil.  
Glass Syphon  
Watch Glass Holder.

Test Tube Holder.  
Two Glass Plates for Air Jars.  
Bent Glass Funnel.  
Self-acting Spirit Blowpipe, for bending  
Glass Tubes.

### A MORE EXTENSIVE SET, TEN POUNDS.

A full size brass Retort Stand, with three  
sliding rings.  
A Chemical Argand Lamp.  
Three Glass Retorts and a Receiver, one  
tubulated.  
Two Glass Funnels, and half a Quire of  
Filtering Paper.  
A Round and Flat Bottom Flask.  
A Gas Bottle, with bent tube.  
A Deflagrating Glass Bell Air Jar,  
mounted, with wire and ladle.  
A Bell Air Jar, mounted, with brass screw  
cap, and two brass air cocks, connecting  
screw, and mounted bladder.  
An Iron Retort and Flexible Conducting  
Tube, for making Oxygen Gas from  
Manganese.  
A Japanned Pneumatic Trough.  
A set of Cylindrical Air Jars.  
An assortment of Glass Tubes.  
A four-ounce Graduated Glass Measure.  
Two Test Glasses.

A Long Dropping Tube.  
Four Evaporating Dishes.  
A Porcelain Mortar and Pestle.  
A Glass Spirit Lamp.  
Two Glass Evaporating Dishes.  
Two Precipitating Jars.  
A Bergman's Blowpipe.  
Pepy's Water Bath, for drying filters.  
Two Stirring Rods.  
Twelve Test Tubes, and mahogany stand.  
Ure's Eudiometer.  
Pint Woulfe's Apparatus, in mahogany  
tray, with bent tubes, complete.  
Table Furnace.  
Self-acting Spirit Blowpipe, for bending  
glass tubes.  
Bent Glass Funnel.  
Mercurial Trough.  
Glass Plates, for covering Air Jars.  
Specific Gravity Bottle, in tin case, with  
counterpoise weight, and directions.  
Box of Scales and Weights.

### A YET MORE EXTENSIVE SET, TWENTY POUNDS.

A very complete portable Iron Furnace,  
lined with fire brick.  
Pepy's improved Gas-Holder, which, with  
the addition of a Jet, forms a very con-  
venient Hydraulic Blowpipe.  
Daniel's Sustaining Battery of twelve 1lb.  
pots. in mahogany tray  
One-gallon Tin Still, with worm and tub  
complete.  
An Argand Spirit Lamp and Stand, on  
Professor Rose's principle.  
A Glass Alembic.  
Palmer's Oxyhydrogen Blowpipe, com-  
plete.  
Three Nests Crucibles.  
Pair of Grain Scales, with box-end beams,  
in mahogany box, and Weights.  
A full size Brass Retort Stand, with three  
sliding rings.  
A Chemical Argand Lamp.  
Three Glass Retorts and a Receiver, one  
tubulated.  
Two Glass Funnels, and half a quire of  
Filtering Paper.  
A round and flat bottom Flask.  
A Deflagrating Glass Bell Air Jar, mount-  
ed, with sliding collar and ladle.  
A Bell Air Jar, mounted with brass screw  
Cap, and two brass Air-Cocks, connect-  
ing-screw, and mounted bladder.

A Gas Bottle, with curved tube.  
An Iron Retort, and flexible Conducting-  
Tube, for making Oxygen Gas from  
Manganese.  
A Japanned Pneumatic Trough.  
A set of Cylindrical Air Jars.  
An assortment of Glass Tubes.  
A four-ounce graduated Glass Measure.  
Two Test Glasses.  
A long Dropping Tube.  
Four Evaporating Dishes.  
A Porcelain Mortar and Pestle.  
A Glass Spirit Lamp.  
Two Glass Evaporating Dishes.  
Two Precipitating Jars.  
Bergman's Blowpipe.  
Pepy's Water Bath, for drying filters.  
Two Stirring Rods.  
Twelve Test Tubes, and mahogany stand.  
Ure's Eudiometer.  
Pint Woulfe's Apparatus, in mahogany  
tray, with bent tubes, complete.  
Table Furnace.  
Self-acting Spirit Blowpipe, for bending  
glass tubes.  
Bent Glass Funnel.  
Mercurial Trough.  
Three Glass Plates for covering Air Jars.  
Specific Gravity Bottle, in tin case, with  
counterpoise weight, and directions.

## CHEMICALS.

|                           |                 |                                |          |
|---------------------------|-----------------|--------------------------------|----------|
| Acid, Acetic .....        | 0 2 oz.         | Antimony, Nitro Muriate, Sol.  | 0 2 oz.  |
| " strong .....            | 1 6 "           | Oxides .....                   | 1 0 "    |
| Arsenious .....           | 0 2 "           | Phosphate .....                | 0 8 "    |
| Arsenic .....             | 1 0 "           | Sulphuret .....                | 0 8 lb.  |
| Benzoic .....             | 3 0 "           | Tartrate and Potash            | 0 6 oz.  |
| Boracic .....             | 1 0 "           | Archil .....                   | 0 2 "    |
| Camphoric .....           |                 | Arsenic .....                  | 0 6 "    |
| Chloric .....             |                 | Sulphurets .....               | 0 4 "    |
| Chromic .....             | 5 0 "           | Baryta .....                   | 2 6 "    |
| Chloro Chromic .....      | 5 0 "           | Baryta Crystals .....          | 3 0 "    |
| Citric .....              | 1 0 "           | Acetate .....                  | 1 0 "    |
| Fluo Silicic .....        | 0 6 "           | Carbonate .....                | 0 4 "    |
| Gallic .....              | 12 0 "          | " Native .....                 | 0 4 lb.  |
| Hydriodic Sol .....       | 1 6 "           | Chlorate .....                 | oz.      |
| Malic .....               |                 | Muriate .....                  | 0 6 "    |
| Muriatic, common .....    | 0 3 lb.         | Nitrate .....                  | 0 6 "    |
| " pure .....              | 0 2 oz.         | Oxalate .....                  | 0 8 "    |
| Molybdic .....            | 12 0 "          | Phosphate .....                | 0 8 "    |
| Nitrous .....             | 1 0 lb.         | Sulphate .....                 | 0 4 "    |
| Nitric .....              | 1 4 "           | Barytic Water .....            | 0 6 "    |
| " pure .....              | 0 4 oz.         | Bismuth .....                  | 0 3 "    |
| Nitro Muriatic .....      | 0 4 "           | Oxide .....                    | 1 0 "    |
| Oxalic, common .....      | 0 3 "           | Nitrate .....                  | 1 6 "    |
| " pure .....              | 0 6 "           | Nitrate, Solution .....        | 0 6 "    |
| Phosphoric, Sol .....     | 1 3 "           | Borax .....                    | 0 2 "    |
| " Glacial, pure           | 15 0 "          | Boron .....                    | gn.      |
| Prussic .....             | 1 6 "           | Bromine .....                  | 7 6 oz.  |
| Pyroligneous .....        |                 | Cadmium .....                  | 2 0 dm.  |
| Succinic .....            | 9 0 "           | Oxides .....                   |          |
| Sulphuric, common .....   | 0 3 lb.         | Calcium, Chloride, Fused ..... | 1 0 oz.  |
| " pure .....              | 0 2 oz.         | Sulphuret .....                | 0 4 "    |
| Tartaric, common .....    | 0 3 "           | Carbon, Sulphuret .....        | 3 0 "    |
| " pure .....              | 0 6 "           | Charcoal, Animal .....         | 0 6 "    |
| Tungstic .....            |                 | Boxwood .....                  | 0 6 "    |
| Alcohol .....             | imp. pint 3 0 " | Chromium .....                 | 0 2 gr.  |
| pure .....                | 5 0 "           | Oxides .....                   | 1 0 oz.  |
| Alloys, various .....     |                 | Oxalate and Potash .....       |          |
| Æther, Acetic .....       | 1 0 oz.         | Copper, Granulated .....       | 3 0 lb.  |
| Pyroligneous, Imp. pt.    | 2 0 "           | Acetate .....                  | 1 0 oz.  |
| Sulphuric .....           | 0 6 oz.         | Carbonate .....                | 1 0 "    |
| " Rectified .....         | 0 8 "           | Foil .....                     | 0 3 "    |
| Nitric .....              | 1 6 "           | Leaf .....                     | 0 2 bk.  |
| Aluminum .....            |                 | Muriate .....                  | 1 6 oz.  |
| Alumina .....             | 1 6 "           | Nitrate .....                  | 0 3 "    |
| Acetate, Sol .....        | 0 4 "           | Oxides .....                   | 1 6 "    |
| Muriate, Solution .....   | 0 4 "           | Sulphate, common .....         | 1 0 lb.  |
| Nitrate, Solution .....   | 0 4 "           | " pure .....                   | 0 3 oz.  |
| and Potash Sulphate ..... | 0 2 "           | Sulphuret .....                | 0 6 "    |
| Sulphate, Solution .....  | 0 4 "           | Turnings .....                 | 3 0 lb.  |
| Amber .....               | 0 6 "           | Cobalt, common .....           | 10 0 oz. |
| Ammonia, Solution .....   | 0 2 "           | Acetate, Solution .....        | 1 3 oz.  |
| Strong .....              | 0 3 "           | Carbonate .....                | 10 0 "   |
| Strongest .....           | 0 6 "           | Muriate, Solution .....        | 1 3 "    |
| Carbonate, pure .....     | 0 3 "           | Oxide, common .....            | 8 0 "    |
| Fluàte .....              | 1 0 "           | " pure .....                   |          |
| Hydro Sulph. Sol .....    | 0 6 "           | Creosote .....                 |          |
| Muriate .....             | 0 2 "           | Fluor, Spar .....              | 0 4 lb.  |
| " pure .....              | 0 6 "           | Flux, black .....              | 0 6 oz.  |
| Nitrate .....             | 5 4 lb.         | white .....                    | 0 6 "    |
| Oxalate .....             | 1 0 oz.         | Galls .....                    | 0 2 "    |
| Phosphate .....           | 0 8 "           | Tincture .....                 | 0 3 oz.  |
| Prussiate .....           | 1 0 "           | Gold Chloride, Solution .....  | 5 0 "    |
| Sulphate .....            | 0 3 "           | Leaf .....                     | 1 9 bk.  |
| Succinate .....           |                 | Iodine .....                   | 1 6 oz.  |
| Antimony .....            | 0 3 "           | Iodide Iron .....              | 2 6 "    |
| Glass .....               | 0 3 "           | Lead .....                     | 3 0 "    |

|                     |       |       |                         |    |        |
|---------------------|-------|-------|-------------------------|----|--------|
| Iodide, Mercury     | 3     | 0 oz. | Morphia                 | 30 | 0 oz.  |
| " Sulphur           | 3     | 0 "   | " Acetate               | 24 | 0 "    |
| Iridium, Native     |       |       | " Muriate               | 25 | 0 "    |
| Iron                |       |       | " Sulphate              | 28 | 0 "    |
| " Acetate           | 0     | 4 "   | Naptha                  |    |        |
| " Carbonate         | 1     | 0 lb. | " Rectified             | 2  | 0 "    |
| " Chromate          | 0     | "     | Nickel, common          | 0  | 3 "    |
| " Filings           | 1     | 0 "   | " Carbonate             | 2  | 0 "    |
| " Muriate           | 0     | 6 oz. | " Muriate               | 1  | 0 "    |
| " Nitrate, Solution | 0     | 3 "   | " Oxide                 |    |        |
| " Oxides            | 0     | 6 "   | " Sulphate              | 1  | 0 "    |
| " Prussiate         | 1     | 0 "   | Osmium                  |    |        |
| " Sulphate          | 0     | 2 "   | " Oxide                 |    |        |
| " Sulphuret         | 0     | 8 lb. | Phosphorus              | 2  | 0 "    |
| " Turnings          | 0     | 6 "   | Palladium               |    |        |
| Lead                |       |       | " Oxide                 |    |        |
| " Acetate           | 0     | 2 "   | Platinum Ammon, Muriate | 25 | 0 "    |
| " Bin Acetate, pure | 0     | 4 "   | " Balls for Hydrogen    |    |        |
| " Carbonate         | 0     | 4 "   | Lamps                   | 1  | 0 ea.  |
| " Chromate          | 0     | 6 "   | " Polychrest            |    |        |
| " Granulated        | 1     | 6 lb. | ditto                   | 2  | 0 "    |
| " Muriate           | 0     | 6 oz. | " Chloride              |    |        |
| " Nitrate           | 0     | 6 oz. | " Native                |    |        |
| " Oxalate           | 0     | 6 "   | " Sponge                | 30 | 0 oz.  |
| " Oxides            | 0     | 3 "   | " Pure                  | 30 | 0 "    |
| " Phosphate         | 0     | 6 "   | Potassium               | 0  | 1½ gr. |
| " Red               | 0     | 3 lb. | Potash, fused           | 0  | 6 oz.  |
| " Tartrate          | 0     | 8 oz. | " pure                  | 2  | 6 "    |
| Lime                |       |       | " Acetate               | 1  | 0 "    |
| " Carbonate         | 0     | 1 "   | " Arsenate              | 0  | 4 "    |
| " Chloride          | 0     | 8 lb. | " Carbonate, common     | 1  | 0 lb.  |
| " Fluuate           | 0     | 4 "   | " pure                  | 0  | 6 oz.  |
| " Hydrosulphuret    | 1     | 0 oz. | " Bi Carbonate          | 0  | 4 "    |
| " Muriate, Crystals | 0     | 2 "   | " Chlorate              | 0  | 9 "    |
| " Fused             | 0     | 8 "   | " Per Chlorate          | 5  | 0 "    |
| " Oxalate           | 0     | 6 "   | " Chromate              | 0  | 6 "    |
| " Prussiate         | 1     | 0 "   | " Bi Chromate           | 0  | 6 "    |
| " Phosphate         | 0     | 3 "   | " Fluo Silicate         | 1  | 0 "    |
| " Phosphuret        | 3     | 6 "   | " Hydriodate            | 2  | 0 "    |
| " Sulphuret         | 0     | 6 "   | " Muriate               | 0  | 6 "    |
| Litmus              | 0     | 6 "   | " Nitrate, pure         | 0  | 3 "    |
| " Tincture          | 0     | 3 "   | " Oxalate               | 0  | 6 "    |
| Lycopodium          | 0     | 6 "   | " Prussiate             | 0  | 4 "    |
| Magnesia            |       |       | " pure                  | 0  | 6 "    |
| " Carbonate         | 0     | 4 "   | " Silicate              | 1  | 0 "    |
| " Muriate           | 0     | 4 "   | " Sulphate              | 0  | 3 "    |
| " Nitrate           | 0     | 6 "   | " Bi Sulphate           | 0  | 3 "    |
| " Oxalate           | 0     | 8 "   | " Tartrate              | 0  | 3 "    |
| " Sulphate          | 0     | 1 "   | " Bi Tartrate           | 0  | 2 "    |
| Manganese           |       |       | " Crude                 |    |        |
| " Carbonate         | 0     | 3 gr. | Rhodium                 |    |        |
| " Muriate           | 1     | 0 "   | " Oxide                 |    |        |
| " Oxalate           | 1     | 0 "   | Selenium                | 0  | 4 gr.  |
| " Oxides, pure      |       |       | Silex                   | 1  | 0 oz.  |
| " black             | 0     | 3 lb. | Sodium                  | 0  | 1½ gr. |
| " grain             | 0     | 3 "   | Soda                    |    |        |
| " Sulphate          | 1     | 0 oz. | " Arsenate              | 0  | 4 oz.  |
| Mercury             |       |       | " Benzoate              | 3  | 6 "    |
| " Acetate           | 2     | 6 "   | " Carbonate             | 0  | 3 "    |
| " Chloride          | 0     | 6 "   | " Bi Carbonate          | 0  | 3 "    |
| " Bi Chloride       | 0     | 6 "   | " Muriate               | 0  | 4 "    |
| " Nitrate           | 0     | 6 "   | " Nitrate               | 0  | 6 "    |
| " Oxides            | 1     | 0 "   | " Oxalate               | 0  | 6 "    |
| " Prussiate         | 2 & 3 | 0 "   | " Phosphate             | 0  | 6 "    |
| " Sulphate          | 1     | 0 "   | " Sulphate, pure        | 0  | 2 "    |
| " Sulphuret         | 0     | 6 "   | " Tartrate and Potash   | 0  | 4 "    |
| Molybdenum          |       |       | Strontia                | 3  | 0 "    |

|                          |         |                           |         |
|--------------------------|---------|---------------------------|---------|
| Strontia, Crystals ..... | 4 0 oz. | Tin Granulated .....      | 0 4 oz. |
| Acetate .....            | 1 0 "   | Muriate .....             | 1 0 "   |
| Carbonate, pure .....    | 0 8 "   | Nitrate .....             | 1 0 "   |
| Muriate .....            | 1 0 "   | Oxides .....              | 1 6 "   |
| Nitrate .....            | 0 4 "   | Titanium .....            |         |
| Oxalate .....            | 0 8 "   | Oxide .....               |         |
| Sulphate, pure .....     | 0 8 "   | Test Papers, Litmus ..... | 0 1sht. |
| Water .....              | 0 6 "   | Red .....                 | 0 1 "   |
| Silver, Acetate .....    | 8 0 "   | Turmeric .....            | 0 1 "   |
| Chloride .....           | 5 0 "   | Tungsten .....            |         |
| Cyanide .....            | 6 6 "   | Oxide .....               |         |
| Leaf .....               | 1 6 bk. | Zinc .....                | 1 lb.   |
| Nitrate .....            | 5 6 oz. | Acetate .....             | 1 6 oz. |
| " fused .....            | 5 6 "   | Carbonate .....           | 0 6 "   |
| Phosphate .....          | 5 0 "   | Zinc Foil .....           | 0 3 "   |
| Sulphate .....           | 5 6 "   | Granulated .....          | 0 6 lb. |
| Sulphur Chloride .....   | 4 0 "   | Malleable Sheet .....     |         |
| Roll .....               | 0 4 lb. | Oxide .....               | 0 6 oz. |
| Sublimed .....           | 0 6 "   | Sulphate .....            | 0 3 "   |
| Tin .....                | 0 3 oz. | Wire .....                | 1 0 "   |
| Foil .....               | 0 3 "   |                           |         |

N.B.—Some of the above Chemical Preparations varying continually in price, E. P. cannot pledge himself to be confined at all times to the Catalogue quotation, but will, in such cases, charge as low as possible.

## BAROMETERS, THERMOMETERS, HYDROMETERS, SACCHAROMETERS, &c.



Fig. 58.  
Best Wheel Barometer with Thermometer & Spirit Level, plain mounted, £3. 3s. to £5. 5s.



Fig. 59.  
Best Wheel Barometer with screw Hygrometer, rosewood inlaid with pearl, and German silver fittings, very elegant, £7. 7s.

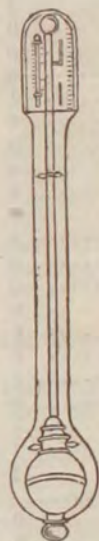


Fig. 60.  
Upright Barometer with Thermometer, plain, £3. 3s. to £5. 5s.



Fig. 61.  
Upright Barometer, rosewood inlaid with pearl, £7. 7s.



Marine Barometers, common, £3. 3s.  
Ditto ditto, on the best principle, with Thermometer, &c. £4. 10s.

Fig. 62.

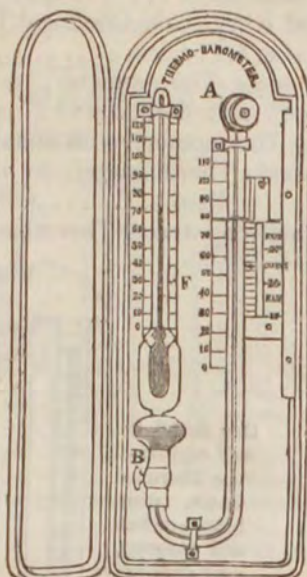


Fig. 63.

The Portable Thermo-Barometer, with the latest improvements, 8 inches in length, applicable for sea & mountainous purposes, £3. 3s.

#### *DIRECTIONS FOR USING THE PORTABLE THERMO-BAROMETER.*

Having placed it in an upright position, unscrew the small head at top of right-hand tube A, as far as possible, and turn the stopcock B; the mercury will then be observed to fall, and should be allowed to remain a short period of time to settle at the correct temperature. When about to make an observation, place the arrow on the Barometer scale to the surface of the mercury in the right-hand tube, and observe the temperature by the Thermometer; then place the point of the vernier in the same degree on the Barometer tube as the mercury stands in the Thermometer, which will indicate the weight of atmospheric pressure precisely the same as any other Barometer.

To make the instrument portable, gently incline it downwards, and when in that position, turn the stopcock off and screw the brass head at A, until it feels sufficiently firm.

### **THERMOMETERS.**

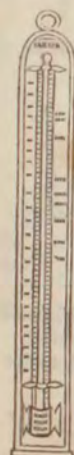


Fig. 64.

Plain Boxwood Thermometer, 4s. 6d.  
3-inch Ivory-scale ditto, in morocco case, for the pocket, 7s.

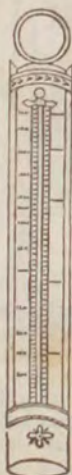


Fig. 65.

8-inch Ivory-scale Thermometer, in ornamental japanned case, 7s.

|                                                                              |   |    |   |
|------------------------------------------------------------------------------|---|----|---|
| 9-inch ivory-scale Thermometer, on ebony, with German silver mountings ..... | 0 | 14 | 0 |
| 10-inch jointed ivory-scale Chemical Thermometer, in morocco case .....      | 1 | 4  | 0 |
| 8-inch metal-scale Thermometer, in japanned case, for Brewing, &c. &c. ....  | 0 | 8  | 6 |
| Large Brewing Thermometer with metal scale, in copper case                   | 0 | 15 | 0 |
| 4-inch metal-scale Thermometer, in morocco case .....                        | 0 | 10 | 0 |
| 6-inch ditto ditto .....                                                     | 0 | 14 | 0 |
| Day & Night self-registering Thermometer, with boxwood scale, 15s.           |   |    |   |

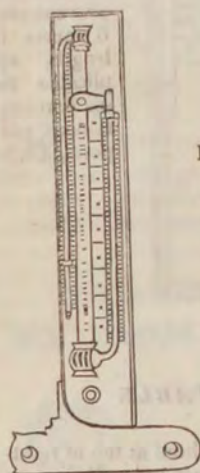


Fig. 66.

Day & Night  
self-register-  
ing Thermo-  
meter, with  
brass bracket  
and magnet,  
very superior  
£1. 1s.

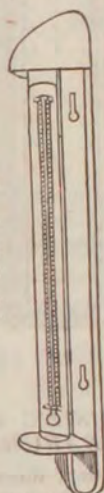


Fig. 67.

10-inch ivory-  
scale Thermo-  
meter, with  
copper roof,  
£1. 4s.

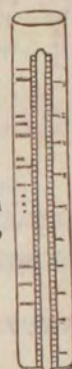


Fig. 68.

Oval Thermo-  
meters, for  
portability, in  
boxwood,  
9s. 6d.  
Ditto ditto,  
ivory, 12s.

|                                                                                     |   |    |   |
|-------------------------------------------------------------------------------------|---|----|---|
| 8-inch ivory-scale Window Thermometer, with mahogany frame and glass cylinder ..... | 0 | 15 | 0 |
|-------------------------------------------------------------------------------------|---|----|---|

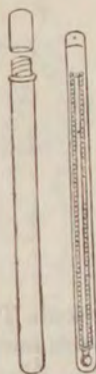


Fig. 69.

Small ivory-  
scale Thermo-  
meter, in Ger-  
man silver  
case, for the  
pocket, 15s.

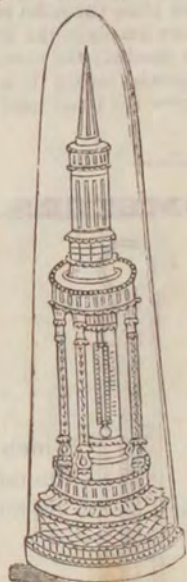


Fig. 70.

Carved ivory pedes-  
tal Thermometer,  
under glass shade,  
for drawing-room,  
£3. 3s.  
Ditto ditto, small  
£1. 10s.

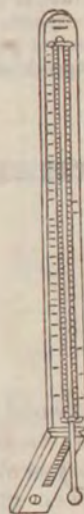


Fig. 71.

Plain boxwood  
Chemical  
Thermometer,  
with jointed  
scale, to 600  
Fahrenheit, 15s



Fig. 72.

Differential  
Thermometer  
12s.

|                                                        |   |    |   |
|--------------------------------------------------------|---|----|---|
| Plain boxwood Chemical Thermometer, with jointed scale |   |    |   |
| to 300 Fahrenheit .....                                | 0 | 12 | 0 |
| Spirit Thermometer, for low temperatures .....         | 0 | 15 | 0 |

## HYDROMETERS, SACCHAROMETERS, &c.

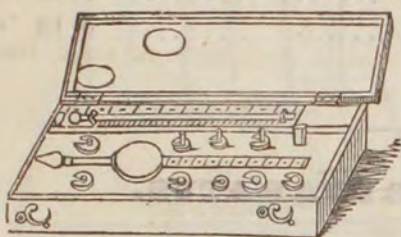


Fig. 73.  
Sykes's improved metal Hydrometers,  
as used by the Board of Excise, in  
mahogany case, £4. 4s.

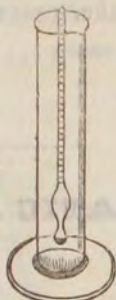


Fig. 74.  
Glass Hydrometers in tin  
cases, 7s. 6d.  
and 12s.

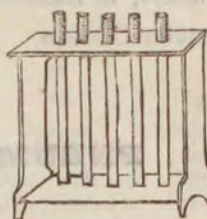


Fig. 75.  
Lactometers for  
ascertaining the  
relative value  
of Milk, per set,  
14s.



Fig. 76.  
Alkalimeters,  
as described by  
Dr. Faraday, 6s.

|                                                                                    |   |    |   |
|------------------------------------------------------------------------------------|---|----|---|
| Glass Hydrometers in mahogany cases, with Thermometer                              | 0 | 18 | 0 |
| Ditto ditto, improved, with ivory rule and sliding scale .....                     | 2 | 2  | 0 |
| Ditto ditto, with Saccharometer scale attached, and Thermometer .....              | 1 | 10 | 0 |
| Twaddle's Hydrometer, in sets, complete .....                                      | 3 | 3  | 0 |
| Beaume's Hydrometer for saline solutions .....                                     | 1 | 0  | 0 |
| Glass Saccharometers for ascertaining the strength of Worts, &c. in tin case ..... | 0 | 7  | 6 |



Fig. 77.  
Chondrometers for weighing Corn,  
£2. 2s.

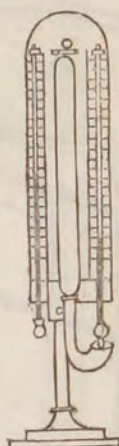


Fig. 78.  
Mason's Hygrometer,  
for indicating both the  
temperature dryness, and  
humidity of the Air,  
£2. 10s.

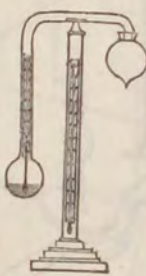


Fig. 79  
Daniel's Dewpoint  
Hygrometer,  
£2. 5s.

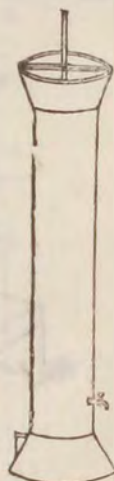


Fig. 80.  
Pluviometer,  
or Rain  
Gauge, tin  
japanned,  
with float &  
divided rod.  
£1. 10s.

|                                                                                                                                                 |          |    |   |
|-------------------------------------------------------------------------------------------------------------------------------------------------|----------|----|---|
| Hydrometrical Beads, from.....                                                                                                                  | 7s. to 1 | 10 | 0 |
| Acitometers in tin case .....                                                                                                                   | 0        | 18 |   |
| Ditto, with Beaume's scale.....                                                                                                                 | 1        | 1  | 0 |
| Hydrometers for ascertaining the quantity of corrosive<br>sublimate in solutions as used by the Anti-Dry-Rot<br>Company, in leather cases ..... | 0        | 15 | 0 |
| Urinometers, in leather cases .....                                                                                                             | 0        | 10 | 6 |
| Hydrometer Glasses                                                                                                                              |          |    |   |

### PNEUMATIC APPARATUS.



Fig. 81.

Small single-  
barrel Air  
Pump with  
Receiver,  
21s., 25s., &  
30s.

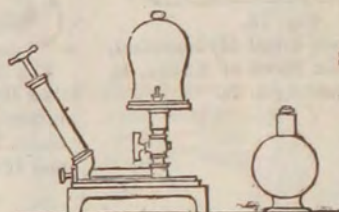


Fig. 82.

Small single-  
sloping-barrel  
Air Pump &  
Receiver, with  
Fountain,  
£2. 5s.

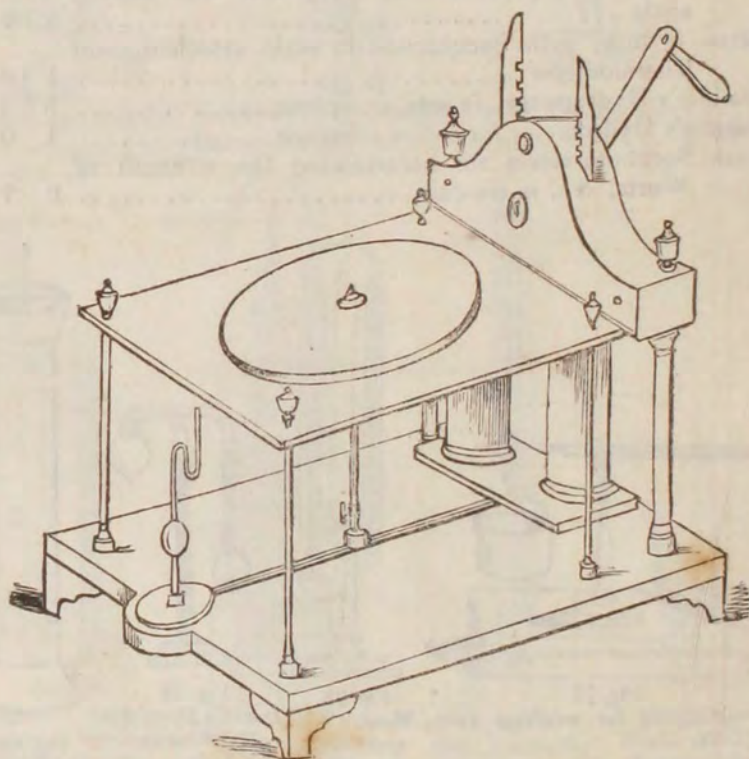


Fig. 83.

Large size double-barrelled Air Pump, with raised plate, £12. 12s.

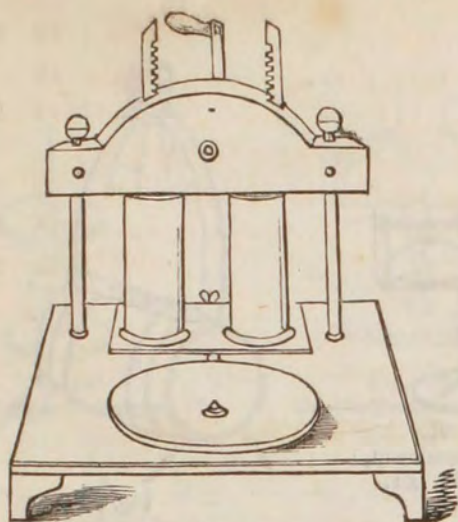


Fig. 84.  
Double-Barrelled Air Pump, £3. 10s.  
£4. 14s. 6d. & £7. 7s.

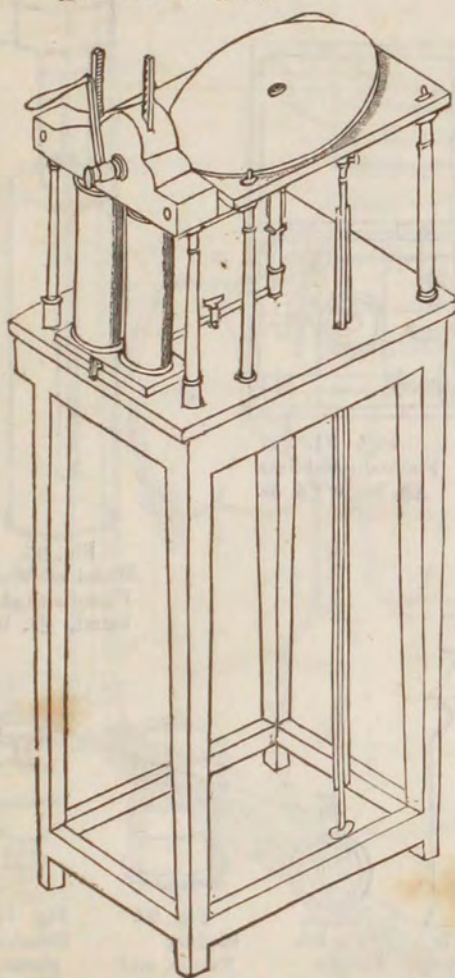


Fig. 85.  
Large-size Double-barrelled Air Pump on stage  
stool, with Barometer Gauge, £19.



Fig. 86.  
Ground Brass  
Plate with col-  
lar of leather &  
sliding wire,  
12s. & 15s.



Fig. 87.  
Pocket Con-  
densers for  
instantane-  
ous light,  
3s. 6d.

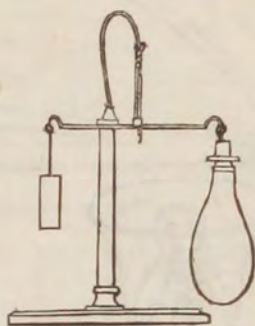


Fig. 88.  
Copper Bottle, beam & stand  
£2. 15s.

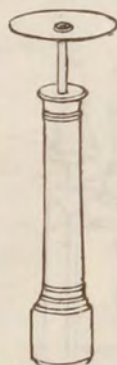


Fig. 89.  
Syringe & lead  
Weight, 12s.

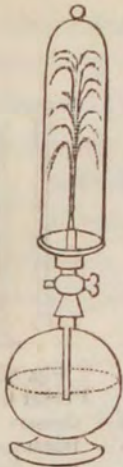


Fig. 90.  
Fountain in Vacuo,  
best make, 15s.



Fig. 91.  
Bell Experiment,  
best make, £1.

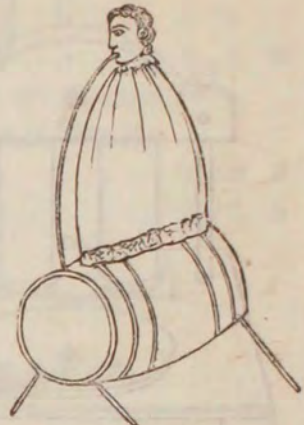


Fig. 92.  
Bacchus Experiment,  
£1. 8s.



Fig. 93.  
Tantalus's Cup, 10s.

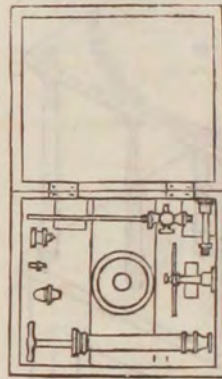


Fig. 94.  
Fountain and Jets,  
£3. 3s. to £5. 5s.

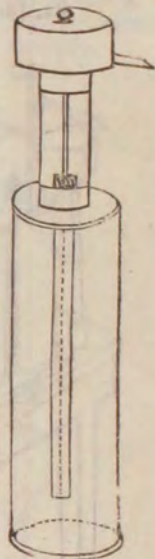


Fig. 95.  
Model of Water  
Pump with glass  
barrel, £1. 10s.

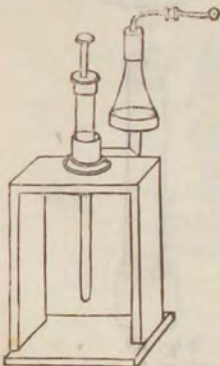


Fig. 96.  
Model of Forcing Pump  
on mahogany stand,  
£2. 15s.

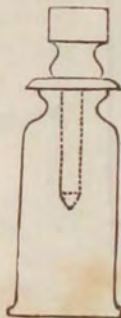


Fig. 97.  
Filtering Cup,  
6s. 6d.



Fig. 98.  
Lung's  
Glass, 6s.



Fig. 99.  
Bladder  
Frame, and  
lead weights,  
7s. 6d.



Fig. 100.  
Hemis-  
pheres,  
15s. 18s.  
30s.



Fig. 101.  
Single Transferer, 16s.

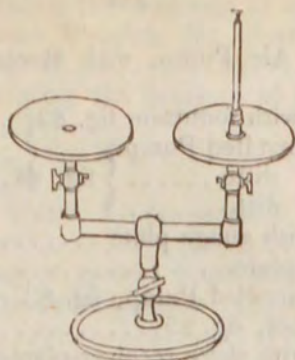


Fig. 102.  
Double Transferer, £2. 2s.



Fig. 103.  
Guinea and Feather Apparatus,  
with 2 falls, 16s.

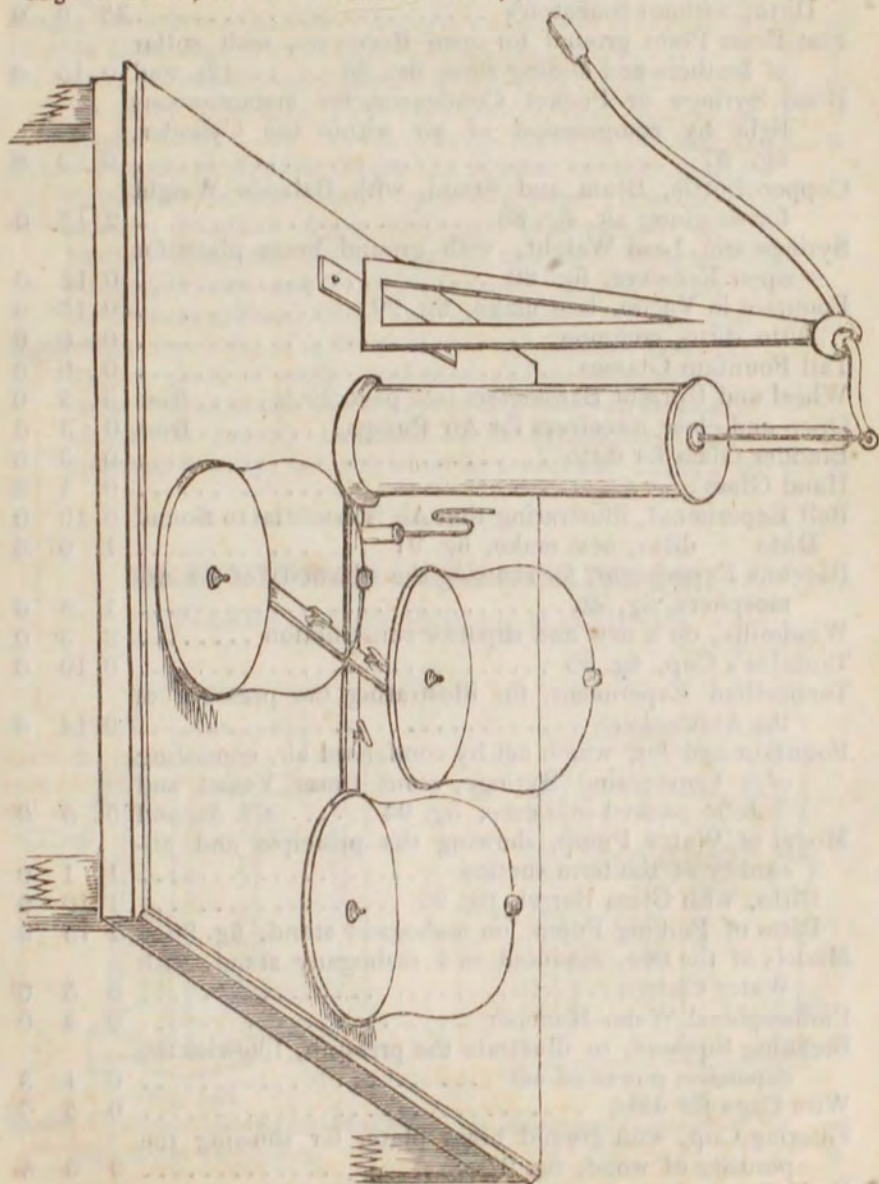


Fig. 104.  
Leslie's Pump for making Ice in any climate, with three Receiver Plates each,  
13 inches diameter, £60.

|                                                                                                                                                |               |    |    |   |
|------------------------------------------------------------------------------------------------------------------------------------------------|---------------|----|----|---|
| Small Single-barrel Air Pump, with Receiver, fig. 81,                                                                                          | 21s. 25s. and | 1  | 10 | 0 |
| Ditto ditto, with fountain, fig. 82. ....                                                                                                      |               | 2  | 5  | 0 |
| Small-size Double-barrelled Pump } fig. 84. ....                                                                                               |               | 3  | 10 | 0 |
| Second-size ditto ditto ..... }                                                                                                                |               | 4  | 14 | 6 |
| Third-size ditto ditto ..... }                                                                                                                 |               | 7  | 7  | 0 |
| Ditto ditto, with guage-plate .....                                                                                                            |               | 8  | 8  | 0 |
| Ditto, with raised plate .....                                                                                                                 |               | 9  | 9  | 0 |
| Large-size Double-barrelled Pump, fig. 83 .....                                                                                                |               | 12 | 12 | 0 |
| Ditto, on stage stool, fig. 85.....                                                                                                            |               | 19 | 0  | 0 |
| Leslie's Ice Pump, with three receiver-plates, fig. 104 ..                                                                                     |               | 60 | 0  | 0 |
| Extra large Double-barrelled Pump, with Smeaton's, for accurate exhaustion .....                                                               |               | 60 | 0  | 0 |
| Ditto, without Smeaton's .....                                                                                                                 |               | 35 | 0  | 0 |
| Flat Brass Plate ground for open Receivers, with collar of leathers and sliding wire, fig. 86 .....                                            | 12s. and      | 0  | 15 | 0 |
| Brass Syringe or Pocket Condensor, for instantaneous light by compression of air within the Cylinder, fig. 87.....                             |               | 0  | 3  | 6 |
| Copper Bottle, Beam and Stand, with Balance Weight for weighing air, fig. 88 .....                                                             |               | 2  | 15 | 0 |
| Syringe and Lead Weight, with ground brass plate for open Receiver, fig. 89 .....                                                              |               | 0  | 12 | 0 |
| Fountain in Vacuo, best make, fig. 90.....                                                                                                     |               | 0  | 15 | 0 |
| Ditto ditto, common .....                                                                                                                      |               | 0  | 6  | 6 |
| Tall Fountain Glasses .....                                                                                                                    |               | 0  | 6  | 0 |
| Wheel and Upright Barometers (see page 20.).....                                                                                               | from          | 3  | 3  | 0 |
| Open and close Receivers for Air Pumps.....                                                                                                    | from          | 0  | 3  | 6 |
| Bladder Glass for ditto .....                                                                                                                  |               | 0  | 3  | 6 |
| Hand Glass .....                                                                                                                               |               | 0  | 1  | 6 |
| Bell Experiment, illustrating that Air is essential to Sound                                                                                   |               | 0  | 10 | 0 |
| Ditto ditto, best make, fig. 91 .....                                                                                                          |               | 1  | 0  | 0 |
| Bacchus Experiment, for showing the Elasticity of the Atmosphere, fig. 92.....                                                                 |               | 1  | 8  | 0 |
| Windmills, on a new and superior construction .....                                                                                            |               | 3  | 3  | 0 |
| Tantalus's Cup, fig. 93 .....                                                                                                                  |               | 0  | 10 | 0 |
| Torricellian Experiment, for illustrating the pressure of the Atmosphere .....                                                                 |               | 0  | 14 | 0 |
| Fountain and Jet, which act by condensed air, consisting of a Condensing Syringe, stout brass Vessel and Jets, packed in a case, fig. 94 ..... | £3. 3s. and   | 5  | 5  | 0 |
| Model of Water Pump, showing the principle and absurdity of the term suction .....                                                             |               | 1  | 1  | 0 |
| Ditto, with Glass Barrel, fig. 95 .....                                                                                                        |               | 1  | 10 | 0 |
| Ditto of Forcing Pump, on mahogany stand, fig. 96..                                                                                            |               | 2  | 15 | 0 |
| Models of the two, mounted on a mahogany stand, with Water Cistern .....                                                                       |               | 5  | 5  | 0 |
| Philosophical Water Hammer .....                                                                                                               |               | 0  | 4  | 0 |
| Breaking Squares, to illustrate the pressure, likewise the expansive power of air .....                                                        |               | 0  | 1  | 3 |
| Wire Cage for ditto .....                                                                                                                      |               | 0  | 5  | 0 |
| Filtering Cup, with ground brass plate, for showing the porosity of wood, fig. 97 .....                                                        |               | 0  | 6  | 6 |
| Fruit Stand, for supporting shrivelled fruit, under receiver of Air Pump .....                                                                 |               | 0  | 4  | 6 |

|                                                                                                                                                                                                                                                                                                            |              |    |    |   |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|----|----|---|
| Lung's Glass, for illustrating the elasticity of air, fig. 98,                                                                                                                                                                                                                                             | 0            | 6  | 0  |   |
| Bladder Frame and Lead Weights, for illustrating the elasticity of Air, fig. 99.....                                                                                                                                                                                                                       | 0            | 7  | 6  |   |
| Hemispheres, for illustrating the pressure of the Atmosphere, small.....                                                                                                                                                                                                                                   | } fig. 100   | 0  | 15 | 0 |
| Second size .....                                                                                                                                                                                                                                                                                          |              | 0  | 18 | 0 |
| Third size .....                                                                                                                                                                                                                                                                                           |              | 1  | 10 | 0 |
| Apparatus for Freezing Water by evaporation, under an exhausted Receiver .....                                                                                                                                                                                                                             | 0            | 12 | 0  |   |
| Foul Air Pipe, consisting of ground brass plate for open Receiver, Bent Tube and Stopcock .....                                                                                                                                                                                                            | 0            | 16 | 0  |   |
| Exhausting Syringes .....                                                                                                                                                                                                                                                                                  | 0            | 7  | 0  |   |
| Condensing ditto.....                                                                                                                                                                                                                                                                                      | 0            | 7  | 0  |   |
| Ditto ditto, both in one instrument .....                                                                                                                                                                                                                                                                  | 0            | 10 | 6  |   |
| Large ditto .....                                                                                                                                                                                                                                                                                          | 1            | 1  | 0  |   |
| Single Transferer, fig. 101.....                                                                                                                                                                                                                                                                           | 0            | 16 | 0  |   |
| Double ditto, fig. 102 .....                                                                                                                                                                                                                                                                               | 2            | 2  | 0  |   |
| Guinea and Feather Apparatus, 3 falls.....                                                                                                                                                                                                                                                                 | 1            | 4  | 0  |   |
| Ditto ditto, 2 falls, fig. 103 .....                                                                                                                                                                                                                                                                       | 0            | 16 | 0  |   |
| Glass for ditto .....                                                                                                                                                                                                                                                                                      | 10s. 6d. and | 0  | 12 | 0 |
| Set of Pneumatic Apparatus, packed in case, consisting of sloping barrel Air Pump, open and close glass Receivers, Fountain Apparatus, pair of Hemispheres, Sliding Wire and Collar, Syringe and Lead Weight, Bladder Frame and Weight, Filter Cup and Glass for Mercury, Hand Glass and Fruit-stand ..... | 6            | 6  | 0  |   |
| Apparatus consisting of a Brass Stand and Balance Beam, with a piece of cork suspended at one end and a brass weight at the other, illustrating that two bodies which are exactly balanced in an Atmosphere of common density, are not when in a vacuum .....                                              | 0            | 8  | 0  |   |

## FRictional Electricity.

### CYLINDER ELECTRICAL MACHINES.

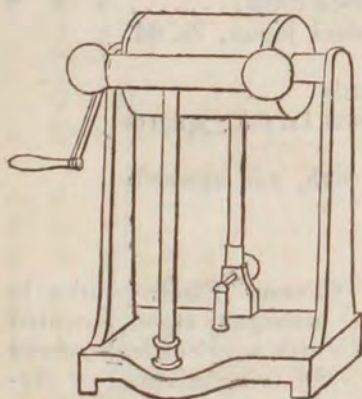


Fig. 105.

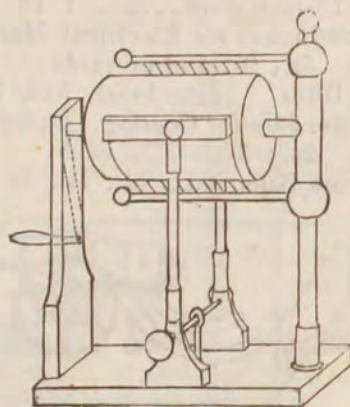


Fig. 106.

Small Cylinder Electrical Machine, on mahogany stand, with brass conductor .....

1 10 0

|                                                                                                                     |       |                |   |   |    |   |
|---------------------------------------------------------------------------------------------------------------------|-------|----------------|---|---|----|---|
| Second size ditto                                                                                                   | ditto | fig. 105 ..... | } | 2 | 2  | 0 |
| Third size ditto                                                                                                    | ditto |                |   | 3 | 10 | 0 |
| Fourth size ditto                                                                                                   | ditto |                |   | 4 | 10 | 0 |
| Fifth size ditto                                                                                                    | ditto |                |   | 6 | 6  | 0 |
| Sixth size ditto                                                                                                    | ditto |                |   | 8 | 0  | 0 |
| Palmer's Improved Cylinder Electrical Machines, with<br>double cushions, fig. 106.. £5. 5s., £10. 10s., and 18 18 0 |       |                |   |   |    |   |

By the construction of these Machines a great increase is obtained in the quantity of Electricity, and the Instrument rendered far more compact and elegant.

\* \* \* *Larger Cylindrical Electrical Machines of either kind made to order.*

### PLATE ELECTRICAL MACHINES.

9-inch Plate Machine..... 3 3 0

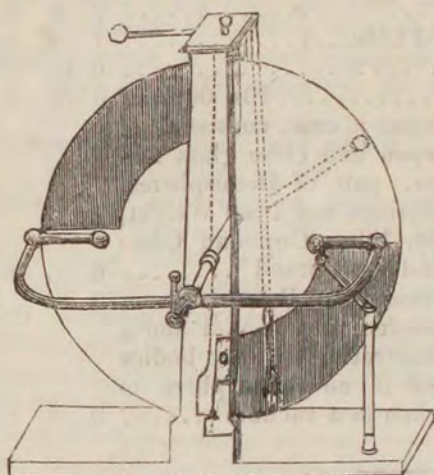


Fig. 107.

12-inch Plate Machine with  
Electrometer attached to  
stand for regulating the  
intensity of the shock  
when used for medical  
purposes, fig. 107, £4. 10s.  
18-inch ditto ditto, £7. 10s.  
24-inch ditto ditto, £12.

Glass Plates for Electrical Machines, 9 inches diameter,  
each 0 18 0

12-inch ditto ..... 1 1 0 | 18-inch ditto ..... 2 10 0

15-inch ditto ..... 1 15 0 | 24-inch ditto ..... 4 4 0

Conductors for Electrical Machines, black japan, 3s. 6d.

5s., 9s. and upwards

Ditto ditto brass, from 7s. upwards

Glass Jars for Coating,  $\frac{1}{2}$ -pints 1s.; pints 1s. 6d.; quarts

2s.; 3-pints 3s. each

Brass Balls, 6d., 9d., 1s., 1s. 6d, 2s. each, and upwards

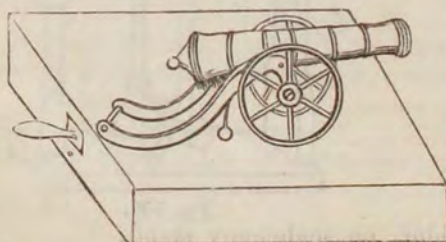


Fig. 108.

Cannon Electrophorus in  
mahogany stand, mounted  
with an electrical cannon  
for firing mixtures of Hy-  
drogen and Atmospheric  
Air. £2. 10.

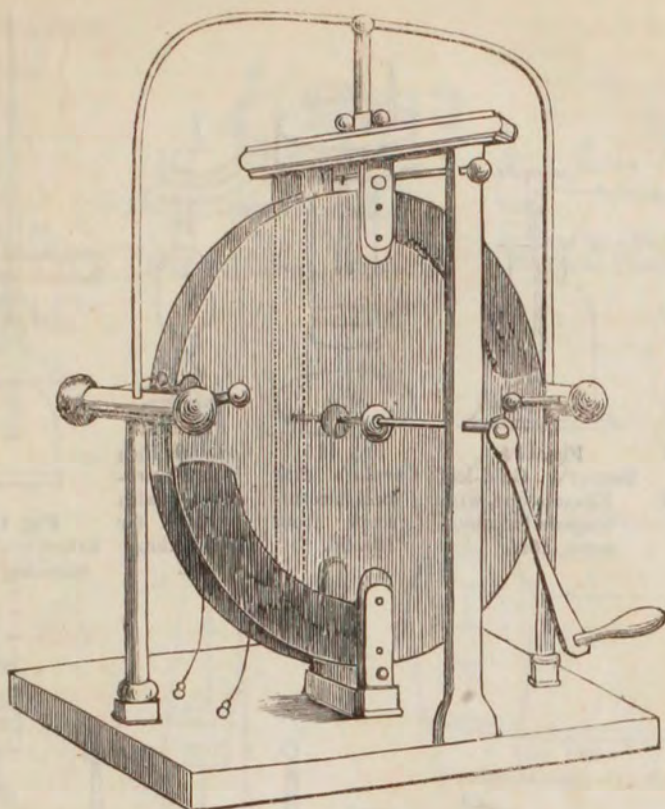


Fig. 109.

Double 18-inch Plate Electrical Machine, a very splendid and powerful instrument, on Woodward's principle, fig. 109 ..... 14 14 0

The whole of the above Electrical Machines may be had packed in deal or mahogany cases, with Medical or other Apparatus.

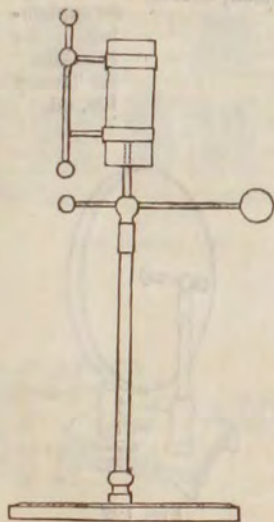


Fig. 110.  
Harris's Unit Jar Electrometer, £1. 15s.

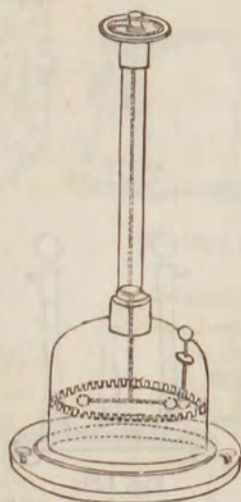


Fig. 111.  
Coulomb's Torsion Electrometer, £2. 10s.

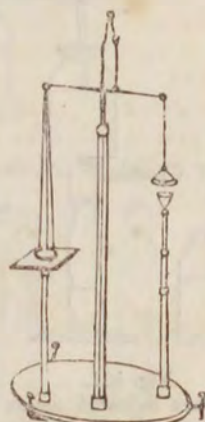


Fig. 112.  
Harris's Balance Beam Electrometer, £4. 4s.



Fig. 113.  
Henley's  
Quadrant  
Electro-  
meter,  
7s. 6d.

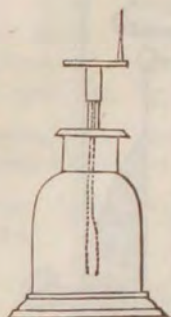


Fig. 114.  
Benet's Gold-leaf  
Electroscope, with  
Singer's Improve-  
ment, 16s.



Fig. 115  
Cavallo's Pith  
Ball Electro-  
scope from  
10s. 6d.



Fig. 116.  
Cavallo's Pith  
Ball Electro-  
scope, with  
stopcock for  
exhaustion,  
£1. 5s.



Fig. 117.  
Saussure's Elec-  
trometer, £1. 5s.

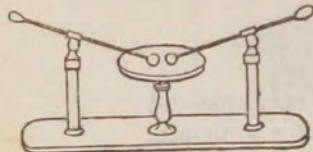


Fig. 118.  
Henley's Universal Discharger, with Press  
and Table, £1. 10s.

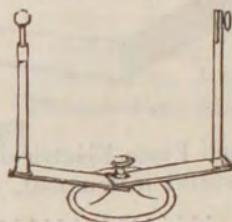


Fig. 119.  
Jointed Insulated For-  
ceps, on stand, £1.10s.



Fig. 120.  
Two Jars  
mounted,  
for explain-  
ing the  
Franklin-  
ian Theory  
10s. 6d.

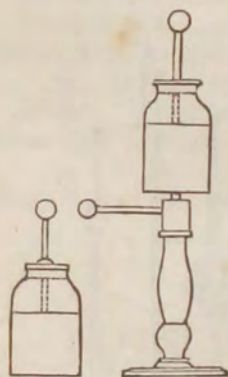


Fig. 121.  
Two Jars mounted for ex-  
plaining the Franklinian  
Theory, with insulated  
stand, &c. 18s.

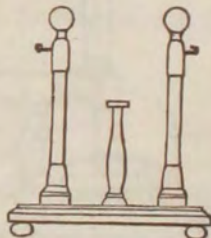


Fig. 122.  
Apparatus for the igni-  
tion of Phosphorus,  
£1. 1s.

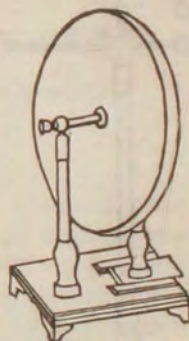


Fig. 123.  
Improved Electrical Con-  
denser, £2. 5s.

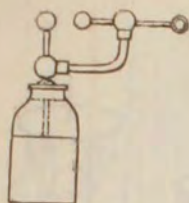


Fig. 124.  
Medical Jars mounted  
with Lanes's  
discharging Elec-  
trometer, from  
10s. 6d.

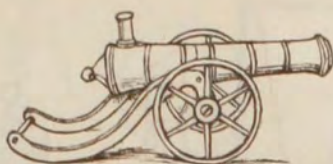


Fig. 125.  
Electrical Cannon, 12s and 18s.

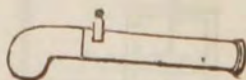


Fig. 126.  
Electrical Pistol, 6s.

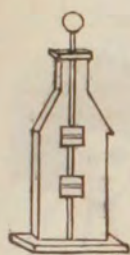


Fig. 127.  
Thunder  
House, 7s. 6d.



Fig. 128.  
Obelisk, 7s.

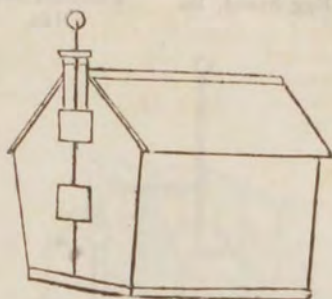


Fig. 129.  
Powder House, £1. 1s.



Fig. 130.  
Fire House, 16s.



Fig. 131.  
Electrical Sportsman, £1. 5s.

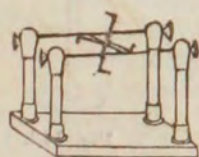


Fig. 132.  
Inclined Plane, £1. 1s.

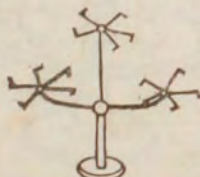


Fig. 133.  
Electrical Whirls.  
8s. 6d.



Fig. 134.  
Magic Picture in  
frame, 7s. 6d.

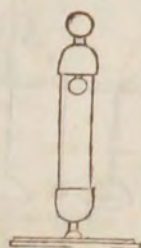


Fig. 135.  
Luminous Con-  
ductor on stand.  
£1. 1s.

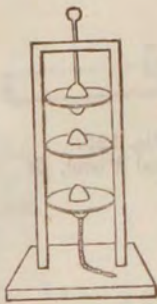


Fig. 136.  
Egg Stand, 9s.

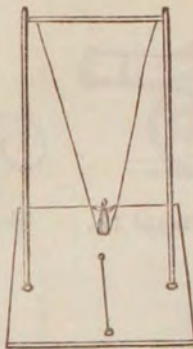


Fig. 137.  
Electrical Swing,  
14s.



Fig. 138.  
Electrical  
Flask,  
6s. 6d.



Fig. 139.  
Diamond Spotted  
Jars, 8s. 6d.  
and 15s.  
Ditto ditto, very  
large, £2. 10s.



Fig. 140.  
Image Plates,  
9s. and 12s.

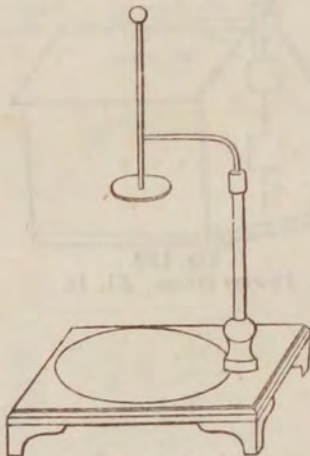


Fig. 141.  
Image Plates, with insulated glass  
support for the upper plate, 15s.



Fig. 142.  
Pith Ball  
Stand, with  
ball & Wire  
8s. 6d.



Fig. 143.  
Carved Head with  
Hair, 7s.



Fig. 144.  
Insulated Stools, 10s. 6d.  
15s. ; and upwards.

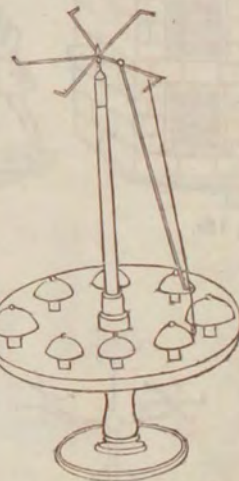


Fig. 146.  
Gamut of Bells, £1. 16.

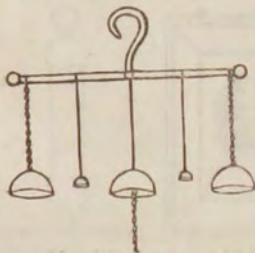


Fig. 145.  
Set of Three Bells, 7s. 6d.



Fig. 147.  
Bucket & Sy-  
phon, 5s. 6d.



Fig. 148.  
Revolving  
Spiral on  
Stand,  
10s. 6d.



Fig. 149.  
Hand  
Spiral,  
5s. 6d.



Fig. 150.  
Set of Five Spirals  
on mahogany pe-  
destal, plain  
Tubes, £1. 10s.  
Ditto ditto, with  
double tubes of  
various colours,  
£2. 2s.



Fig. 151.  
Electrical Star, from  
4s. 6d.

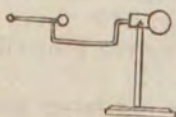


Fig. 152.  
Electrical Orrery,  
7s. 6d.



Fig. 153.  
Luminous Words in Frame, on  
coloured glass, 12s.



Fig. 154.  
Painted  
Glass  
Plane, on  
stand, 13s.



Fig. 155.  
Electrical Swan, 2s.



Fig. 156.  
Jointed  
Dischar-  
gers, 8s.,  
10s., 12s.  
each.

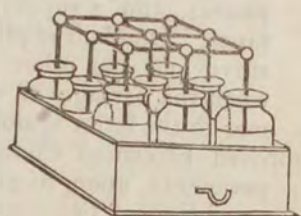


Fig. 157.  
Electrical Batteries, £2. 10s. to  
£10. 10s.

|                                                                                                                                                                                                                                   |   |    |   |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|----|---|
| Cuthbertson's Discharging Electrometer .....                                                                                                                                                                                      | 2 | 2  | 0 |
| Harris's Unit Jar Electrometer, with graduated slider, for charging other Leyden jars, or Batteries, with known proportions of electricity, fig. 110 .....                                                                        | 1 | 15 | 0 |
| Harris's Balance Beam Electrometer, for estimating in grain weights the attractive power exerted between two oppositely electrified surfaces, such as the outer and inner coatings of a Leyden jar or battery, &c. fig. 112 ..... | 4 | 4  | 0 |
| Coulomb's Torsion Electrometer, for measuring with great accuracy small quantities of electricity, fig. 111 .....                                                                                                                 | 2 | 10 | 0 |
| Lane's Discharging Electrometer, for regulating the charge of a Leyden jar .....                                                                                                                                                  | 0 | 7  | 0 |
| Henley's Quadrant Electrometer, with graduated arc, for experiments with accumulated electricity, fig. 113..                                                                                                                      | 0 | 7  | 6 |
| Bennet's Gold-leaf Electroscope, with Singer's improvement, whereby the instrument is better insulated. It is used for detecting minute quantities of electricity, fig. 114 .....                                                 | 0 | 16 | 0 |
| Cavallo's Pith Ball Electroscope, fig. 115 .....                                                                                                                                                                                  | 0 | 10 | 6 |
| This instrument is not so delicate as the Gold-leaf Electroscope, but is very serviceable for likewise detecting small quantities of electricity.                                                                                 |   |    |   |
| Ditto ditto, with stopcock for exhaustion, fig. 116 .....                                                                                                                                                                         | 1 | 5  | 0 |

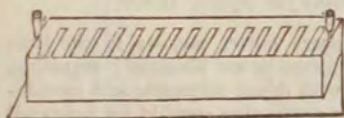
|                                                                                                                                                                                                                                                                                                                                                                                                                                   |            |    |   |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|----|---|
| Haüy's Needle Electroscope, for ascertaining the electrical state of mineral substances.....                                                                                                                                                                                                                                                                                                                                      | 0          | 8  | 0 |
| Saussure's Electroscope, for experiments on atmospheric electricity, fig. 117.....                                                                                                                                                                                                                                                                                                                                                | 1          | 5  | 0 |
| Henley's Universal Discharger, with press and table, for deflagrating the metals by electricity or submitting bodies to electric shocks, fig. 118.....                                                                                                                                                                                                                                                                            | 1          | 10 | 0 |
| Ditto ditto, with charcoal forceps, &c. adapted for frictional or voltaic electricity, fig. 162.....                                                                                                                                                                                                                                                                                                                              | 2          | 2  | 0 |
| Jointed Insulated Forceps on stand, forming a convenient support for wire, &c. through which it is required to pass an electric charge, fig. 119 .....                                                                                                                                                                                                                                                                            | 1          | 10 | 0 |
| Two jars mounted, for explaining the Franklinian Theory, fig. 120 .....                                                                                                                                                                                                                                                                                                                                                           | 0          | 10 | 6 |
| Ditto ditto, superior, with insulated stand, ball and wire, fig. 121 .....                                                                                                                                                                                                                                                                                                                                                        | 0          | 18 | 0 |
| Apparatus for the ignition of Phosphorus, consisting of two insulated brass balls with a cavity in the centre of each for the reception of a small piece of phosphorus, and a support between the two for a lighted taper. One ball is placed in connexion with the positive and the other with the negative conductor, when the passage of the electric fluid from the former to the latter ignites the phosphorus, fig. 122.... | 1          | 1  | 0 |
| Improved Electrical Condensor and Apparatus, for experiments upon disguised or paralysed electricity, consisting of two circular metallic plates, 12 inches diameter, insulated by glass supports, one of which is made to slide in order that they may be brought near or made to recede from each other. A binding screw is attached to each plate to connect with a pith ball or gold-leaf electroscope, fig. 123.....         | 2          | 5  | 0 |
| Glass Jars mounted with moveable metallic coatings, to show that the charge is not in the coatings, as those with which it is charged may be removed and others put in their place while the glass retains the electricity .....                                                                                                                                                                                                  | 0          | 14 | 0 |
| Adams's combined Apparatus, consisting of ball and wire, pointed wire, exhausting syringe, luminous conductor, exhausted flask, two Leyden jars and insulating pillar. This apparatus is made to shift in a variety of ways, that a number of amusing and instructive experiments may be performed with them .....                                                                                                                | 3          | 3  | 0 |
| Medical jars mounted with Lane's Discharging Electrometer, to regulate the intensity of shock given to a patient, fig. 124 .....                                                                                                                                                                                                                                                                                                  | from 0     | 10 | 6 |
| Medical Electrical Directors with insulated handles, for passing a shock through any particular part of the body.....                                                                                                                                                                                                                                                                                                             | each 0     | 3  | 6 |
| Volta's Electrophorus for obtaining the electric spark, forming a useful appendage to the Laboratory..                                                                                                                                                                                                                                                                                                                            | from 0     | 12 | 0 |
| Electrical Cannons for firing a mixture of hydrogen and atmospheric air by a spark from the prime conductor, fig. 125 .....                                                                                                                                                                                                                                                                                                       | 12s. and 0 | 18 | 0 |

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |               |   |    |   |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|---|----|---|
| Electrical Pistol, for the same experiment, fig. 126                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | ....          | 0 | 6  | 0 |
| Electrical Powder Cannon, for firing gunpowder by passing the charge from a Leyden jar                                                                                                                                                                                                                                                                                                                                                                                                                                                         | .....from     | 0 | 5  | 6 |
| Thunder House, for explaining the use and necessity of lightning conductors, fig. 127                                                                                                                                                                                                                                                                                                                                                                                                                                                          | .....         | 0 | 7  | 6 |
| Obelisk, for explaining the use of lightning conductors, fig. 128                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | .....         | 0 | 7  | 0 |
| Powder House, for showing the necessity of a continuous conductor, as in this experiment the circuit is broken in the centre of a cup holding gunpowder, which becomes ignited and blows open the house, fig. 129                                                                                                                                                                                                                                                                                                                              | ..            | 1 | 1  | 0 |
| Fire House for igniting by the electric discharge from a Leyden jar, tow saturated with resin, spirit, æther, or any other combustible material, fig. 130                                                                                                                                                                                                                                                                                                                                                                                      | .....         | 0 | 16 | 0 |
| Electrical Sportsman. This amusing experiment consists of a Leyden jar and a figure carved to represent a sportsman in the act of shooting; two wires are inserted in the jar, and at the end of one some carved pith birds, while the other is brought a short distance from the point of the gun. A chain from the prime conductor is connected with the wire communicating with the lower part of the jar, and as soon as the machine is put in action the birds rise, but fall as if shot immediately that the jar is discharged, fig. 131 |               | 1 | 5  | 0 |
| Electrical inclined plane, formed of two wires stretched from four insulated pillars, with an electrical fly or whirl across, fig. 132                                                                                                                                                                                                                                                                                                                                                                                                         | .....         | 1 | 1  | 0 |
| Electrical Fly or Whirl for showing the revolution of cross wires by the dispersion of electricity from points                                                                                                                                                                                                                                                                                                                                                                                                                                 | .....         | 0 | 3  | 6 |
| Three ditto ditto, on one stand, fig. 133                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | .....         | 0 | 8  | 6 |
| Magic Picture in frame, for giving slight shocks. It consists of a flat piece of glass coated on each side with tin foil the same as a Leyden jar, fig. 134                                                                                                                                                                                                                                                                                                                                                                                    | .....         | 0 | 7  | 6 |
| Luminous Conductors with valve for exhaustion, to show the passage of electric light through a partial vacuum                                                                                                                                                                                                                                                                                                                                                                                                                                  | ..... from    | 0 | 10 | 6 |
| Ditto ditto, on stand, fig. 135                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | .....         | 1 | 1  | 0 |
| Egg stand for passing the charge of a Leyden jar through eggs, oranges, &c. whereby they become luminous in a darkened room, fig. 136                                                                                                                                                                                                                                                                                                                                                                                                          | .....         | 0 | 9  | 0 |
| Electrical Swing for showing the repulsion of bodies similarly electrified, fig. 137                                                                                                                                                                                                                                                                                                                                                                                                                                                           | .....         | 0 | 14 | 0 |
| Electrical Flask with brass cap and valve for exhaustion, to imitate the aurora borealis, fig. 138                                                                                                                                                                                                                                                                                                                                                                                                                                             | .....         | 0 | 6  | 6 |
| Diamond Spotted Jars. These jars are mounted with tin foil cut in diamond-shape, showing a beautiful light when discharged in a darkened room, fig. 138,                                                                                                                                                                                                                                                                                                                                                                                       |               |   |    |   |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 8s.6d. and    | 0 | 15 | 0 |
| Ditto ditto, very large                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | .....         | 2 | 10 | 0 |
| Image Plates with brass stand and hook to connect with prime conductor for pith figures, illustrating in an amusing manner electrical attraction and repulsion, fig. 139                                                                                                                                                                                                                                                                                                                                                                       | ..... 9s. and | 0 | 12 | 0 |

|                                                                                                                                                                                                                                                                                    |   |    |   |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|----|---|
| Inage Plates, with insulated glass support for the upper plate, the connexion being made by a chain from prime conductor, whereby the figures are removed from the attractive influence of the cylinder, fig. 141 .....                                                            | 0 | 15 | 0 |
| Dancing Figures made from the pith of elder, plain, 1s., jointed 2s. and .....                                                                                                                                                                                                     | 0 | 3  | 0 |
| Pith Ball Stand. This experiment forms another illustration of electrical attraction and repulsion .....                                                                                                                                                                           | 0 | 5  | 6 |
| Pith Ball Stand with ball and wire, the connection being made by a chain from the prime conductor, fig. 142 .....                                                                                                                                                                  | 0 | 1  | 6 |
| Pith Balls ..... per dozen, 1s., and .....                                                                                                                                                                                                                                         | 0 | 1  | 6 |
| Carved Head with Hair, for illustrating the principle that bodies similarly electrified repel each other, fig. 143..                                                                                                                                                               | 0 | 7  | 0 |
| Insulated Stools for medical and other purposes where it is required to insulate a body from the ground, fig. 144, 10s. 6d., 15s. and upwards                                                                                                                                      |   |    |   |
| Set of Five Bells on stand, four being insulated and the other in connection with the ground, whereby the clappers which are suspended between the two become continually attracted from one to the other ..                                                                       | 0 | 18 | 0 |
| Set of Three Ditto on brass beam, to suspend from the conductor. The action of these are the same as the preceding, the centre bell being in connection with the ground by a chain, fig. 145 .....                                                                                 | 0 | 7  | 6 |
| Gamut of Bells. This experiment consists of eight bells arranged on a mahogany stand, with an electrical fly or whirl, carrying a single clapper, which in its revolutions strikes alternately each of the bells, fig. 146 ... ..                                                  | 1 | 16 | 0 |
| Spider Jar. This experiment consists of a Leyden Jar on stand, with ball and wire, between which and the knob of the jar is suspended a spider, carved from pith of elder, which is continually attracted and repelled from one ball to the other till the jar is discharged ..... | 0 | 8  | 6 |
| Bucket and Syphon to suspend from the prime conductor. In this experiment the water, which previously to being electrified only falls in drops, then runs in a stream, and in a darkened room appears luminous, fig. 147 .....                                                     | 0 | 5  | 6 |
| Revolving Spiral on stand, having an electrical fly or whirl which revolves by the dispersion of electricity from the points, presenting a very beautiful appearance in a darkened room, fig. 148....                                                                              | 0 | 10 | 6 |
| Hand Spiral, consisting of two glass tubes with brass caps, the interior one being covered in a spiral form with spangles of tin foil, showing, when presented to an excited conductor, a continuous stream of electrical light, fig. 149.....                                     | 0 | 5  | 6 |
| Set of Five Spirals on mahogany pedestal, with insulated revolving balls in the centre, which in their revolution communicate electricity to each of the spirals, producing a beautiful succession of spiral lines of light, fig. 150 .....                                        | 1 | 10 | 0 |

|                                                                                                                                                                                                           |                        |    |   |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|----|---|
| Set of Five Spirals, very superior, with double tubes of various colours .....                                                                                                                            | 2                      | 2  | 0 |
| Dome and Spirals. This is another experiment for illustrating in a pleasing manner the passage of the electric fluid, the dome, in addition to the spirals, being covered with spangles of tin foil ..... | from 2                 | 2  | 0 |
| Star formed of spangles of tin foil, on a flat glass, fig. 151 .....                                                                                                                                      | from 0                 | 4  | 6 |
| Bird formed of spangles of tin foil, on a flat glass ..                                                                                                                                                   | from 0                 | 4  | 6 |
| Electrical Orrery, representing the motions of the sun, earth, and moon, fig. 152 .....                                                                                                                   | from 0                 | 7  | 6 |
| Luminous Words in frame, on coloured glass, fig. 153 ..                                                                                                                                                   | 0                      | 12 | 0 |
| Painted Glass Plane on stand, in different colours, with devices of tin foil for showing the electric light, fig. 154 .....                                                                               | 0                      | 13 | 0 |
| Electrical Swan, by placing which upon the surface of a basin of electrified water, it may be attracted to any part by presenting the finger to it, fig. 155 .....                                        | 0                      | 2  | 0 |
| Electrical Spider, by electrifying which and presenting a ball it will be attracted, but upon presenting a point it will be repelled .....                                                                | 0                      | 1  | 0 |
| Jointed Dischargers, with insulated glass handles, for discharging electrical jars, batteries, &c. fig. 156, 8s., 10s., and .....                                                                         | 0                      | 12 | 0 |
| Small Discharging Rods, not jointed .....                                                                                                                                                                 | 0                      | 5  | 0 |
| Leyden Jars, 3s. 6d., 4s. 6d., 5s. 6d., 7s. and upwards .....                                                                                                                                             |                        |    |   |
| Electrical Batteries, fig. 157 .....                                                                                                                                                                      | from £2. 10s. to 10    | 10 | 0 |
| Electrical Cylinders, 2s. 6d., 3s. 6d., 4s. 6d., 6s. and upwards .....                                                                                                                                    |                        |    |   |
| Glass Handles .....                                                                                                                                                                                       | 1s. 3d., 1s. 6d. and 0 | 2  | 0 |
| — Legs .....                                                                                                                                                                                              | 1s. 6d., 2s. 0d. and 0 | 2  | 6 |
| Amalgam .....                                                                                                                                                                                             | per box 0              | 1  | 0 |
| Brass Chain .....                                                                                                                                                                                         | per yard 0             | 0  | 6 |

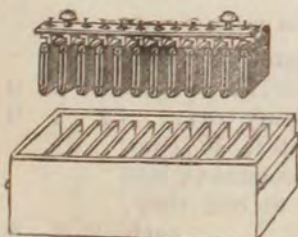
### **VOLTAIC and THERMO-ELECTRICITY.**



Cruikshank's Batteries, in mahogany troughs, for medical purposes

Fig. 158.

|                                  |   |    |   |
|----------------------------------|---|----|---|
| 25 pair of Plates, 2½-inch ..... | 1 | 1  | 0 |
| 50 Ditto ditto, 2½-inch .....    | 1 | 15 | 0 |
| 200 Ditto ditto, 2½-inch .....   | 5 | 10 | 0 |
| 50 Ditto ditto, 3-inch .....     | 2 | 10 | 0 |
| 25 Ditto ditto, 4-inch .....     | 2 | 8  | 0 |

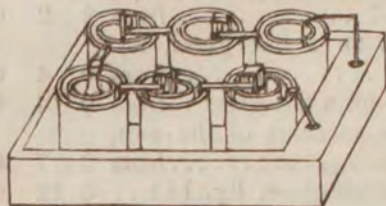


Dr. Wollaston's Battery of twelve pair of 4-inch plates, in porcelain troughs, £2. 2s.

Fig. 159.

Grove's Platinum Batteries excited with dilute muriatic acid in connection with the zinc, and strong nitric acid in connection with the platinum

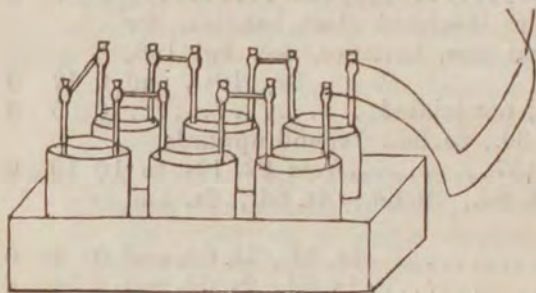
Six small Pots, with porous cells, in mahogany tray.... 1 15 0



Six larger Pots, with porous cells, in mahogany tray, £2. 10s.

Fig. 160.

Modification of Professor Daniels's Sustaining Battery, consisting of a cylinder of zinc and copper separated from each other by bladder, brown paper, or porous earthenware, and excited by a solution of salt and water in contact with the zinc, and a solution of sulphate of copper in the other cell. Price for single pots.....5s., 7s., and 0 15 0



Battery, containing six  $\frac{1}{2}$ -lb. pots of the above, in mahogany tray, which in decomposing water will give off a cubic inch of the mixed gases per minute, £1. 10s.

Fig. 161.

Battery, containing twelve 1-lb. pots, in mahogany tray 4 4 0  
Ditto, with six 8-lb. pots, ditto ..... 5 5 0

### SMEE'S CHEMICO-MECHANICAL VOLTAIC BATTERIES,

*Described in the Philosophical Magazine for April, 1840.*

The great superiority of this Battery over every other, consists in the little trouble required to put them in action, and the immense power obtained; requiring, likewise, no bladders or porous pots, being excited with dilute sulphuric acid containing one part acid to seven of water, and the action continuing steadily for hours till the acid is saturated.

They have nothing obnoxious or disagreeable during their action, hydrogen only being evolved. One cell, with a piece of platinized silver two inches square immersed in a tumbler of dilute acid, supported, with an electro-magnet, upwards of three hundred weight.

Its calorific effects are immense; six  $\frac{1}{2}$ -lb. pots readily melting iron wire and showing a most brilliant light when placed in connection with an electro-magnetic machine.

They may be had in a variety of forms and sizes as under:—

Smee's Battery, with twenty-five 4-inch plates of plated copper, on Cruikshank's plan ..... 3 3 0  
Six  $\frac{1}{2}$ -lb. Pots with plated copper, in mahogany tray.... 2 2 0  
Smee's Tumbler Batteries, with silver plates, so constructed that they may be immersed in common glass tumblers, and any number connected at one time,  
each 0 7 6

|                                                                            |                                                                                                                                    |      |   |   |    |   |
|----------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------|------|---|---|----|---|
| A series of six of the above mounted in pots and mahogany tray.....        |                                                                                                                                    |      |   | 2 | 10 | 0 |
| Ditto                                                                      | ditto, with 6 small pots and round zincs ....                                                                                      |      |   | 2 | 2  | 0 |
| Ditto                                                                      | ditto, larger .....                                                                                                                | from | 3 | 3 | 0  |   |
| Ditto                                                                      | ditto, in Wollaston's troughs of 12 cells with double zincs, and the silver plates presenting a surface of 252 square inches ..... |      |   | 5 | 5  | 0 |
| <i>Batteries fitted up with pots of all sizes and any number to order.</i> |                                                                                                                                    |      |   |   |    |   |

|                                                                                                                  |   |   |   |
|------------------------------------------------------------------------------------------------------------------|---|---|---|
| Insulated Stand, for exhibiting the combustion of charcoal, fusing of wire, &c., with the Galvanic Battery ..... | 1 | 1 | 0 |
|------------------------------------------------------------------------------------------------------------------|---|---|---|

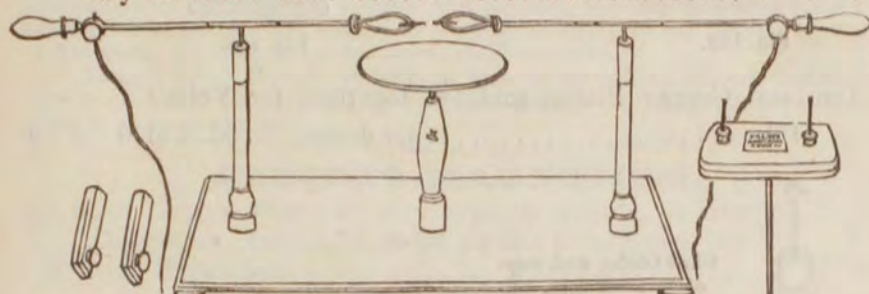


Fig. 162.

|                                                                                                                                                                                |  |  |  |   |    |   |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|--|---|----|---|
| Insulated Stand, very superior, with Henley's Universal Discharger and Press, two pair of forceps, &c., applicable both for Voltaic and Frictional Electricity, fig. 162 ..... |  |  |  | 2 | 2  | 0 |
| Apparatus for the Decomposition of Water, small .....                                                                                                                          |  |  |  | 0 | 5  | 0 |
| Large Ditto.....                                                                                                                                                               |  |  |  | 0 | 18 | 0 |
| Ditto ditto, with graduated tube .....                                                                                                                                         |  |  |  | 1 | 4  | 0 |
| Small double Decomposition Apparatus, having separate tubes for collecting the oxygen and hydrogen gases..                                                                     |  |  |  | 0 | 7  | 0 |



Fig. 163.

Large double Decomposition Apparatus, suitable for lecture tables or private experiments, £1. 1s.

|                                                                                                          |   |    |   |
|----------------------------------------------------------------------------------------------------------|---|----|---|
| Large double Decomposition Apparatus, with tubes graduated into tenths and hundredths of a cubic inch .. | 1 | 10 | 0 |
|----------------------------------------------------------------------------------------------------------|---|----|---|

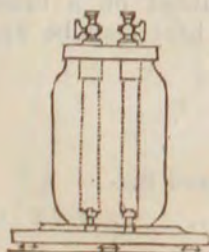


Fig. 164.

Large double Decomposition Apparatus, very superior, for collecting the separate gases, consisting of a glass vessel to be filled with acidulated water, and the tubes being furnished with stopcocks, any quantity of gas may be collected of either kind, without the necessity of continually filling the tubes, £3. 3s.

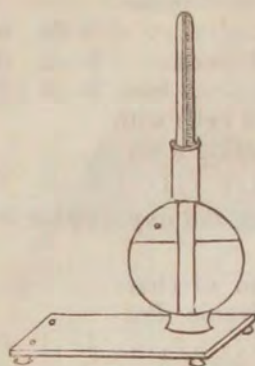


Fig. 165.

Bachhoffner's Voltameter, for measuring the exact quantity of gas which has passed in a given interval, the tube being accurately graduated into tenths and hundredths of a cubic inch, £1. 1s.



Fig. 166.

V Tube, for the decomposition of neutral salts, from 5s. to £1. 1s.

Zinc and Copper Plates, soldered together, for Volta's Pile.....per dozen, 3s. 6d. and 0 5 0

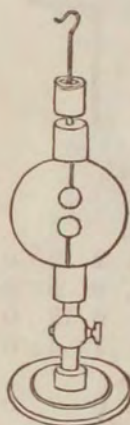


Fig. 167.

Glass Globe, with stop-cock, brass caps, collar of leathers, sliding forceps and balls, for showing electrical light in vacuo, and for the decomposition of compound gaseous fluids by the ignition of charcoal points with the voltaic battery, £1. 15s.

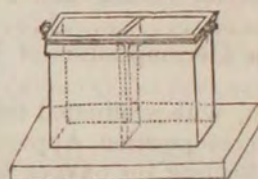


Fig. 168.

Farraday's Apparatus, for exhibiting Electro-chemical Decompositions, consisting of a glass trough divided by the insertion of a temporary diaphragm £1. 10s.

Chains composed of different metals, to show their relative conducting powers as regards voltaic electricity

Gold, Silver, and Copper Leaf, for combustion, &c.

Platinum Foil and Wire of all thickness

Sulphate of Copper for sustaining batteries, 1s. per lb.

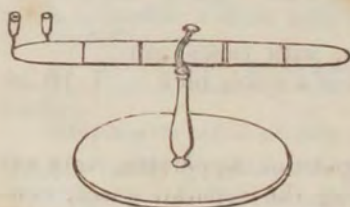


Fig. 169.

Compound Bars of Bismuth and Antimony, mounted on a brass stand, so that heat may be applied, 14s.

Battery of Six small Compound Bars of Copper and Bismuth ..... 0 5 0

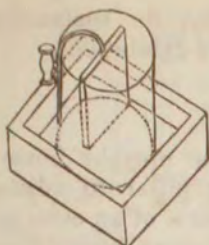


Fig. 170.

**ELECTRO-TYPE APPARATUS**, for procuring, by galvanic action, perfect fac similes of engraved copper-plates, however elaborate; also correct copies of medals, and all kind of metallic ornaments, 5s., 7s. 6d., 10s. 6d. and upwards

The Apparatus consists of a trough for holding a solution of sulphate of copper, and an inner vessel for the acid and water. The medal to be copied should first be moulded in fusible metal, and a wire attached to the mould to connect with the binding screw. A piece of zinc, amalgamated by washing it with a little dilute sulphuric acid and rubbing the surface with mercury, is then suspended in the acid by another copper wire and attached to the binding screw; which, after the lapse of a few hours, will produce a perfect fac-simile of the medal.

To copy copper plates for printing, as they cannot be moulded, a reverse must first be taken from the plate and this reversed again, which will produce an exact copy of the original plate.

### **ELECTRO-MAGNETISM.**

Covered Copper Wire, of very superior quality, in long lengths, 3s., 4s., 5s., 6s. & 8s. per lb., according to size

Ørsted's Experiment ..... 0 5 6

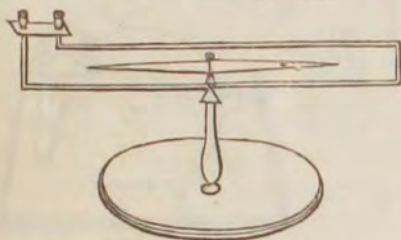


Fig. 171.

Ørsted's Experiment, so constructed that a current of electricity may be sent either above, below, or round the magnet, 10s. 6d.

Soft iron Induced Magnets, consisting of a bar of soft iron bent in the shape of a horse shoe, and covered with insulated copper wire, forming, whilst in connection with the galvanic battery, a powerful electro-magnet,

7s., 14s., 21s. and 1 10 0

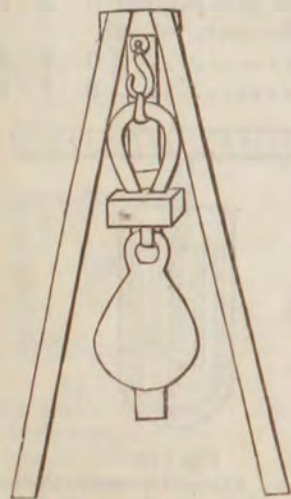
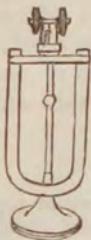


Fig 172.

Soft iron Induced Magnets, with tripod stand and weight, from 15s.

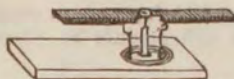
Soft iron Induced Magnets, on a very large scale, for sustaining immense weights, particularly calculated for exhibitions.



Ritchie's Experiment, consisting of an upright horse-shoe magnet on stand, with sliding pillar to adjust the mercury cup, exhibiting the rotation of an electro-magnet between the poles of a permanent horse shoe magnet, £1. 1s.

Fig. 173.

Palmer's Experiment, exhibiting the rotation between the poles of a soft iron horse shoe . . . . . 0 14 0



Electro Mag-  
netic Needle,  
very delicately  
balanced, with  
agate cap,  
10s. 6d.



Terrestrial Ro-  
tating Mag-  
net, 8s. 6d.  
Ditto ditto,  
with agate cap,  
10s. 6d.

Fig. 174.

Fig. 175.

Barlow's Rotating Magnet . . . . . 0 10 6

Palmer's Arrangement, for exhibiting both in one instru-  
ment, mounted on agate cap . . . . . 0 12 6

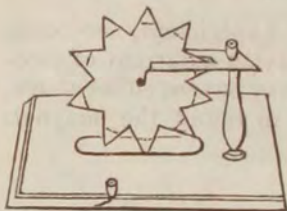


Fig. 176.

Barlow's Spur Wheel, 8s. 6d.

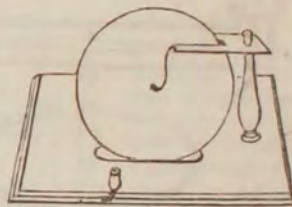


Fig. 177.

Sturgeon's Rotating Disc,  
8s. 6d.

Sturgeon's Apparatus, for opening and shutting battery  
circuit in electro-magnetic machines, best make, with  
levelling screws . . . . . 1 10 0

Mobile Wire Frame, for rotating on the pole of a magnet 0 5 0

Farraday's Needle, for rotating round the pole of a  
magnet . . . . . 0 7 6

Marsh's Vibrating Wire . . . . . 0 7 0

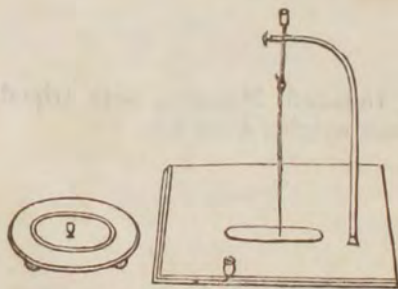


Fig. 178.

Palmer's Arrangement, for exhibiting both  
in one instrument, 10s. 6d.

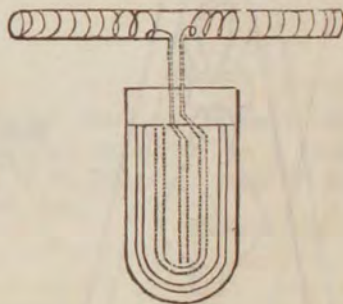


Fig. 179.

Ampere's Electro-Dynamic Cylin-  
der, with De la Rive's floating  
battery, 5s. 6d.



Fig. 180.

Apparatus exhibiting a Coil of Copper Wire rotating between the poles of a magnet, 14s. Ditto ditto, larger, with two rotating armatures, £1. 10s.

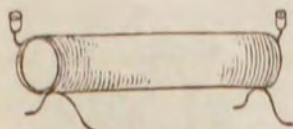


Fig. 181.

Helical Coils, for magnetizing needles, 5s.

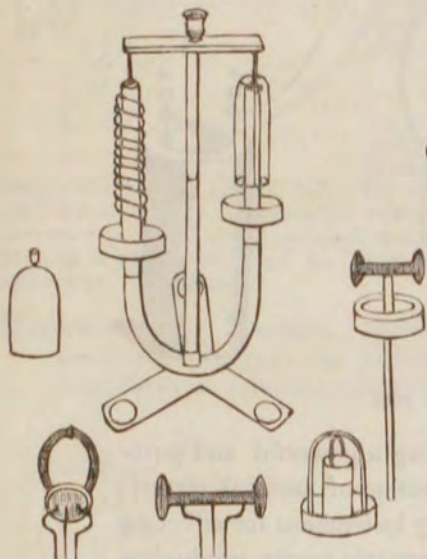


Fig. 182.

Compound Electro-magnetic Apparatus, consisting of a vertical cylindrical horse-shoe magnet, on brass foot, with leveling screws, sliding pillar, and agate cap, two rotating armatures, rotating coil, Ampere's bucket, mobile wire frame, helical coil, and rotating cylinder, £3. 3s.

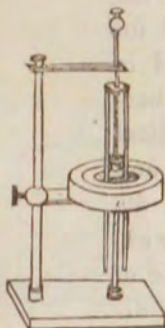


Fig. 183.

Apparatus for exhibiting the rotation of a magnet round a conducting wire, on agate cap, 25s.

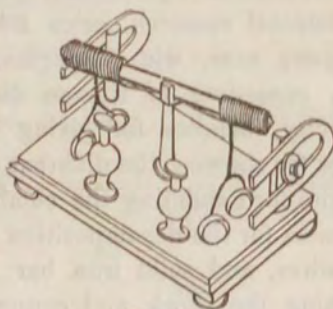


Fig. 184.

Vibrating Electro-Magnet, 24s.



Fig. 185.

Dr. Bird's Inversor, for reversing the currents in electro-magnetic experiments, 18s.



Fig. 186.

Bachhoffner's Electrepter, for reversing the currents in electro-magnetic experiments, 18s.

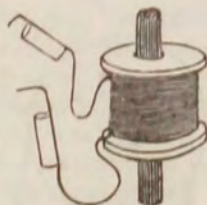


Fig. 187.

Primary Coils, with handles for giving shocks, 15s. and 21s.

Ampere's Apparatus, for exhibiting the rotation of a bat-  
tery round a magnet ..... 0 6

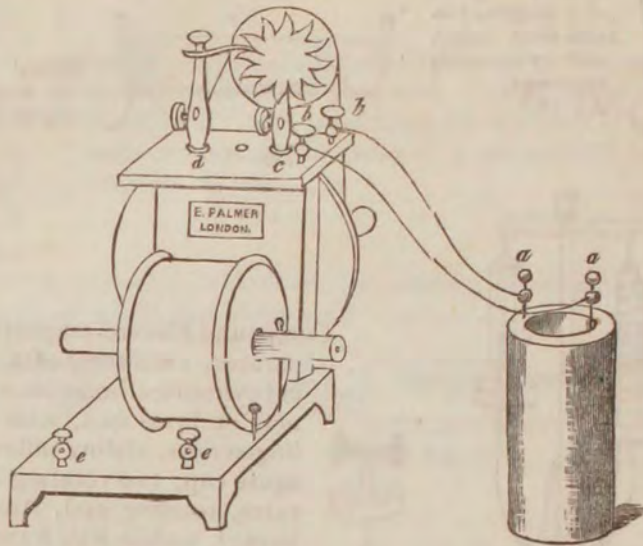


Fig. 188.

Electro-magnetic Machine, forming a powerful and portable apparatus for the application of medical electricity; also a highly interesting instrument for effecting decompositions by electro-magnetic power, producing brilliant combustion of the various metals with the different colored lights, and admirably adapted for experimental research, price £4. 4s.; or packed in mahogany case, with apparatus, exclusive of batteries, consisting of sponge directors for medical electricity, handles for giving shocks, wheels and springs for showing the different coloured lights, file and wire for exhibiting the combustion of iron wire, apparatus for the decomposition of water, bundle of iron wires, and solid iron bar for increasing or diminishing the shock and connecting wires for the battery ..... 6 6 0

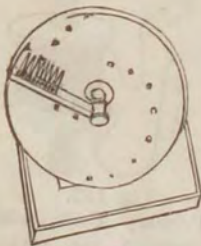


Fig. 189.

Sturgeon's Semi-spiral Disc, for connecting with an electro-magnetic machine, to exhibit the combustion of different metals. This apparatus consists of a circular metallic disc studded with two semi-spiral sets of eight different metals, having likewise rotating springs striking alternately, in their revolution, the corresponding metal, £3. 3s.

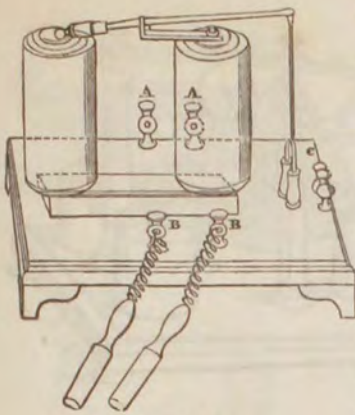


Fig. 190.

Consisting of two upright magnets, with a primary and secondary coil, over which is fixed a brass beam, having at one end an iron ball, and at the other a fork of stout copper wire, dipping into the two cups opposite the binding screws, C.C., battery connection being made at A.A., and the fork dipping into the mercury cups at C.C.; the upright iron bars become strongly magnetic, attracting the iron ball, thereby throwing the fork out of the mercury, and breaking battery connection.

The iron bars having then lost their magnetism, the fork falls again into the cups, renewing and continuing the former action. For administering medical electricity, the connection must be made as above, and the directors fas-

tened to the binding screws, B.B. For showing the combustion of iron wire and other metals, remove the wire which connects the two binding screws, C.C., into the mercury cups, and insert in one binding screw a rough file, in the other a piece of fine iron or other wire; draw the latter up and down the former, and a beautiful combustion will be shown.

**Magneto-electric Machine**, consisting of a compound horse-shoe magnet on mahogany stand, with two armatures for exhibiting quantity and intensity effects 10 10 0

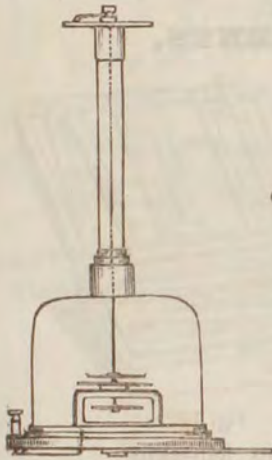


Fig. 191.

Galvanometer, with astatic needles, index, torsion key, moveable coil, and levelling screws, very delicately balanced, £3. 10s.



Fig. 192.

Bachhoffner's Galvanoscope, with astatic needles, on mahogany stand, under glass shade, £1. 1s.

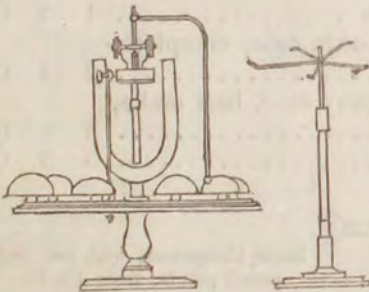


Fig. 193.

**Gamut of Bells**, on mahogany stand, with Ritchie's experiment rotating in the centre, carrying in its revolution a single clapper, which strikes alternately one of the bells. This experiment has likewise an electrical whirl to adapt it to the electrical machine, £3. 3s.

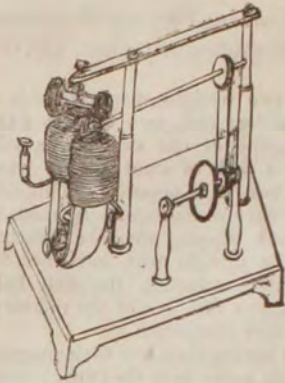


Fig. 194.

Model of Saw Mill driven by electro-magnetism, consisting of a powerful electro-magnet on stand, with rotating armature, driving in its revolution, by means of cog wheels, a circular saw, £3. 3s.

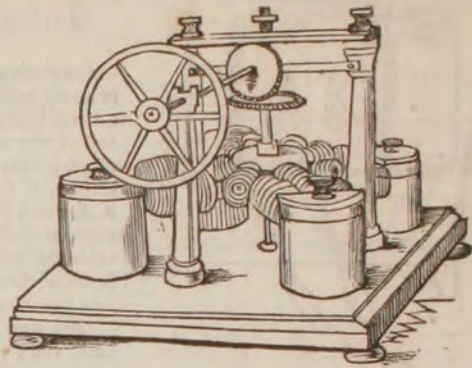


Fig. 195.

Electro-magnetic Engines, from 5 to 20 guineas.

An assortment of Electro-magnetic Apparatus, packed in mahogany case, to illustrate the first principles of the science . . . . . 2 2 0

Ditto ditto, with larger assortment . . . . . 5 5 0

### DRAWING INSTRUMENTS.



Fig. 196.



Fig. 197.

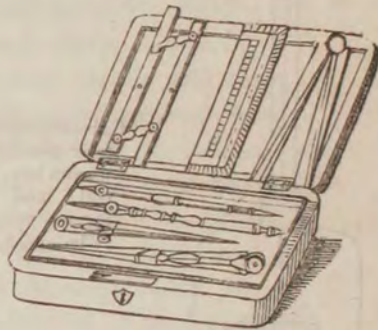


Fig. 198.

|                                                                               |         |   |    |   |
|-------------------------------------------------------------------------------|---------|---|----|---|
| No. 1, Small Set of Drawing Instruments in fish-skin case, fig. 196 . . . . . | 7s. and | 0 | 10 | 0 |
| „ 2, Ditto, with larger assortment . . . . .                                  |         | 0 | 16 | 0 |
| „ 3, Ditto, with ivory sector scale . . . . .                                 |         | 1 | 5  | 0 |
| „ 4, Largest and best Set, in fish-skin case, complete, fig. 197 . . . . .    |         | 2 | 2  | 0 |
| „ 5, Very complete Set, in mahogany case, best make, fig. 198 . . . . .       |         | 3 | 3  | 0 |
| „ Best Long Set, with extras . . . . .                                        |         | 5 | 5  | 0 |

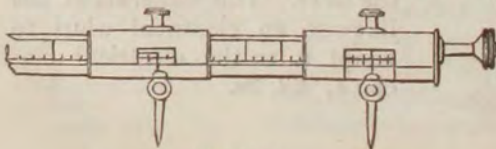
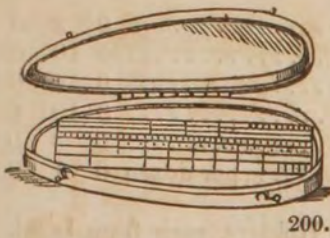
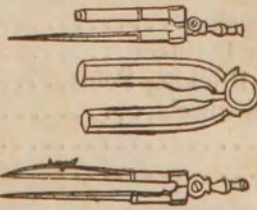


Fig. 199.

Beam Compasses, with pen and pencil points, from £2. 2s.



200.



Turn-in Compasses  
with bow handles,  
scale, and case,  
brass, £1. 10s.

Ditto ditto, in white  
metal, £1. 13s.

Ditto ditto, with  
lengthening bars,  
£2. 10s.

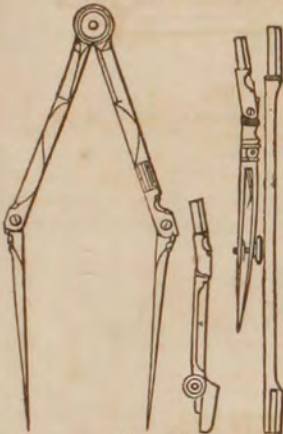


Fig. 201.

Sector-jointed,  
double-jointed  
Compasses,  
with shifting  
leg, lengthen-  
ing bar, pen &  
pencil points,  
£1. 1s.



Fig. 202.

Tube Compasses,  
with case and  
scale, £2.



Fig. 203.

Proportional Compasses, with adjustment,  
in case, £1. 13s.

Ditto ditto, in white metal, £2. 5s.

|                                  |   |    |   |
|----------------------------------|---|----|---|
| Bow Pens .....                   | 0 | 5  | 0 |
| Ditto, with 2 extra joints ..... | 0 | 10 | 6 |



Fig. 204. Double-jointed Bow  
Pen, with sliding  
pen and point, in  
case, 18s. fig. 204,  
Bow Pencils, with  
two extra joints,  
10s. 6d. fig. 205.



Fig. 206.  
Spring Di-  
viders, 6s. 6d.



Fig. 207  
Spring  
Pens, 6s. 6d.

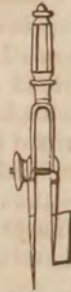
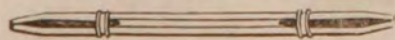


Fig. 208.  
Spring  
Pencils,  
6s. 6d.



Figs. 209, 210.  
Drawing Pens,  
best make, fig.  
209, 5s. 6d.  
Road Pen, best  
make, 16s. fig.  
210.

|                                       |           |    |     |
|---------------------------------------|-----------|----|-----|
| Drawing Pens, common.....             | 0         | 2  | 0   |
| Sector-jointed Hair Dividers .....    | 0         | 10 | 6   |
| Needle Holder, or Pricking Point..... | 0         | 4  | 6   |
| Dotting Point with wheels.....        | 0         | 10 | 6   |
| Centre Pieces .....                   | 0         | 3  | 0   |
| Drawing Pins .....                    | per dozen | 0  | 1 9 |



Crayon Holders, each from 1s.6d.

Fig. 211.

|                                                    |      |   |   |   |
|----------------------------------------------------|------|---|---|---|
| Parallel Rules .....                               | from | 0 | 2 | 6 |
| Protractors. Ivory & Ebony Triangles. Ship Curves. |      |   |   |   |
| Plotting Marquois and Gunter's Scales.             |      |   |   |   |

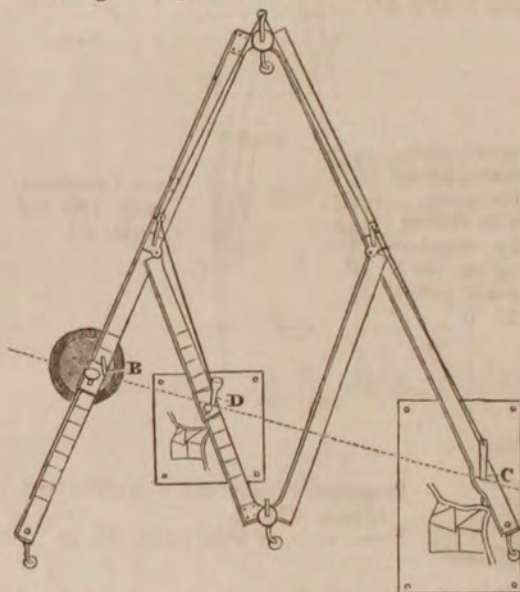
Two-foot best brass  
Pentagraph, in case,  
£6. 6s., fig. 212.

Fig. 212.

Gunter's Measuring Chains.

Pocket Measuring Tapes, 5s., 7s. 6d., 12s., and 15s.

**LEVELS, COMPASSES, &c.**

|                                                         |                         |   |      |
|---------------------------------------------------------|-------------------------|---|------|
| Portable Levelling Instrument, with Telescope & Compass | 8                       | 8 | 0    |
| 14-inch Troughton's Level .....                         | 11                      | 0 | 0    |
| Ditto, with Tripod Staff.....                           | 12                      | 0 | 0    |
| 20-inch Troughton's Level .....                         | 13                      | 0 | 0    |
| Ditto, with Tripod Staff.....                           | 14                      | 0 | 0    |
| 20-inch Y Levels, with Telescope .....                  | 16                      | 0 | 0    |
| Dumpy Level, without legs or compass .....              | 12                      | 0 | 0    |
| 14-inch Dumpy Level, with legs and compass...           | 15                      | 0 | 0    |
| Common Spirit Levels .....                              | 3s., 4s., 5s., 6s., and | 0 | 10 0 |

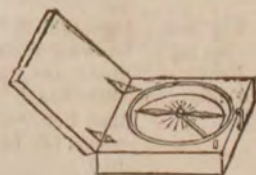
Square Wood Pocket Compasses, 3s. 6d.,  
4s. 6d., and 5s. 6d.

Fig. 213.

|                                        |               |   |    |   |
|----------------------------------------|---------------|---|----|---|
| Round Brass Pocket Compasses .....     | 5s., 6s., and | 0 | 7  | 0 |
| Brass Cone Compass, in wood case ..... |               | 0 | 14 | 0 |
| Brass Box Compass, in gimballs .....   |               | 1 | 0  | 0 |



Fig. 214.

Gilt Pocket Com-  
passes, in leather  
cases, 8s. 6d.,  
10s. 6d., & 12s.



Fig. 215.

Magnetic Needle  
and Stand, 3s. 6d.

### THEODOLITES.

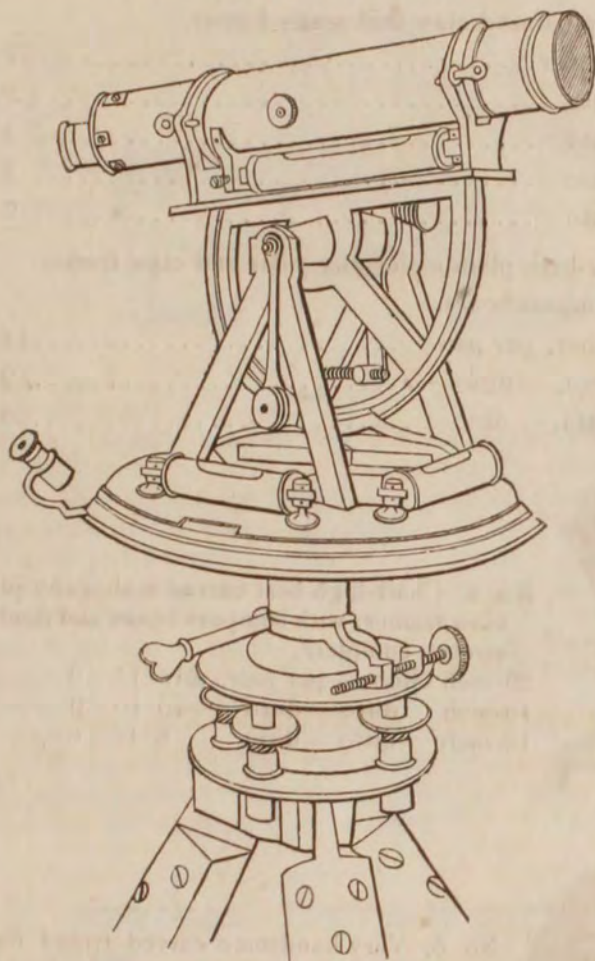


Fig. 216.

|                                                                                  |    |   |   |
|----------------------------------------------------------------------------------|----|---|---|
| 7-inch best Theodolite, with two Telescopes .....                                | 42 | 0 | 0 |
| 6-inch ditto, with one Telescope .....                                           | 28 | 0 | 0 |
| Ditto ditto, on the most improved plan, with two<br>Telescopes .....             | 36 | 0 | 0 |
| 5-inch plain Theodolite .....                                                    | 18 | 0 | 0 |
| Ditto, best construction, with tangent screw motion di-<br>vided on silver ..... | 24 | 0 | 0 |
| Common Theodolite .....                                                          | 9  | 9 | 0 |

AGENT FOR NEWTON &amp; Co.'s

**TERRESTRIAL and CELESTIAL GLOBES.**

Fig. 217.

No. 1,  
20-inch Globes, per pair, on black stained wood  
frames, particularly applicable for schools, £10.  
Ditto, on neat mahogany frames, for table use, £11.  
15-inch ditto, £6 6 0 and £6 16 6  
12-inch ditto, 4 4 0 and 4 14 6  
9-inch ditto, 2 12 6 and 3 3 0

No. 2, Low pillar and claw mahogany frames.

|                        |        |
|------------------------|--------|
| 15-inch, per pair..... | 7 17 6 |
| 12-inch ditto .....    | 5 10 0 |
| 9-inch ditto .....     | 3 13 6 |
| 6-inch ditto .....     | 2 12 6 |
| 3-inch ditto .....     | 2 2 0  |

No. 3, Chair-high plain mahogany pillar and claw frames,  
with compass boxes.

|                                |         |
|--------------------------------|---------|
| 20-inch Globes, per pair ..... | 14 14 0 |
| 15-inch ditto, ditto .....     | 9 9 0   |
| 12-inch ditto, ditto .....     | 6 6 0   |



Fig. 218.

No. 4, Chair-high best carved mahogany pillar and  
claw frames, with compass boxes and double hour  
circles, complete.

|                                    |
|------------------------------------|
| 20-inch Globes, per pair, £15 15 0 |
| 15-inch ditto ditto 10 10 0        |
| 12-inch ditto ditto 6 16 6         |



Fig. 219.

No. 5, Very handsome carved tripod frames, of  
best Spanish mahogany, with double hour  
circles and compass boxes, complete.

|                                    |
|------------------------------------|
| 20-inch Globes, per pair, £18 18 0 |
| 15-inch ditto ditto 12 12 0        |
| 12-inch ditto ditto 7 10 0         |



Globes, on neat mahogany pedestals.

|              |   |    |   |               |   |   |   |
|--------------|---|----|---|---------------|---|---|---|
| 9-inch ..... | 1 | 1  | 0 | 4½-inch ..... | 0 | 9 | 0 |
| 6-inch ..... | 0 | 12 | 0 | 3-inch .....  | 0 | 6 | 0 |

Globes, on rosewood pedestals.

|               |   |    |   |              |   |   |   |
|---------------|---|----|---|--------------|---|---|---|
| 6-inch .....  | 0 | 13 | 6 | 3-inch ..... | 0 | 7 | 0 |
| 4½-inch ..... | 0 | 10 | 0 | 2-inch ..... | 0 | 4 | 0 |

Fig. 220.

Globes, of all sizes, mounted in superior frames, to order.

## ORRERYS.

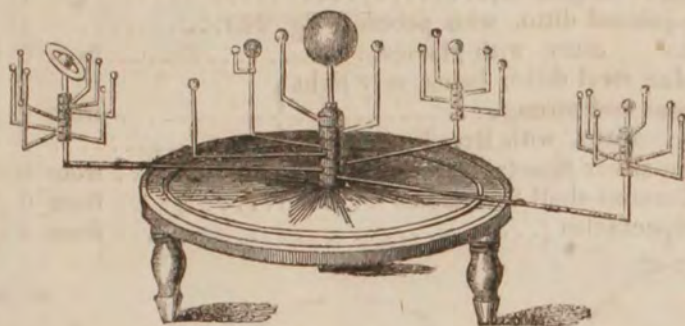


Fig. 221.

|                                                                                                                                                                                                                                                                |                   |    |    |   |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|----|----|---|
| Manual Planetariums, showing the Planets and their Satellites .....                                                                                                                                                                                            | from £1. 10s. to  | 5  | 5  | 0 |
| Tellurians, showing the obliquity of the axis of the Earth, the motion of the Earth and Moon, and the Planets Mercury and Venus.....                                                                                                                           | from £3. 3s. to   | 6  | 6  | 0 |
| Complete Orrerys, showing all the Planets and their Satellites, with the diurnal and annual motion of the earth, also the motion of the moon and the inferior planets, set in motion by a winch handle ..                                                      | from £10. 10s. to | 21 | 0  | 0 |
| A very superior complete Orrery, representing the diurnal and annual motion of the Earth, the motion of all the Planets, and showing the Sun revolving on its axis. The whole mounted in a globe frame, 21 inches in diameter, and actuated by clockwork ..... |                   | 52 | 10 | 0 |

## OPTICAL INSTRUMENTS.



Gold Spectacles .....

|      |   |   |   |
|------|---|---|---|
| from | 1 | 5 | 0 |
|------|---|---|---|



Fig. 223.



Fig. 224

|                                                                                   |        |    |   |
|-----------------------------------------------------------------------------------|--------|----|---|
| Best single-jointed Gold Spectacles, with picked Brazil pebbles, fig. 223.....    | 3      | 10 | 0 |
| Ditto double ditto, fig. 224 .....                                                | 4      | 0  | 0 |
| Best double-jointed Silver Spectacles, with picked Brazil pebbles, fig. 224 ..... | 1      | 10 | 0 |
| Ditto, with glasses.....                                                          | 1      | 0  | 0 |
| Single-jointed ditto, with pebbles, fig. 223.....                                 | 1      | 5  | 0 |
| Ditto ditto, with glasses.....                                                    | from 0 | 15 | 0 |
| Best blue steel ditto, being very light wear and strong.....                      | from 0 | 10 | 0 |
| Ditto ditto, with Brazil pebbles..                                                | 1      | 0  | 0 |
| German-silver Spectacles .....                                                    | from 0 | 7  | 0 |
| Best Tortoise-shell Spectacles .....                                              | from 0 | 9  | 0 |
| Steel Spectacles .....                                                            | from 0 | 2  | 6 |



Fig. 225.  
French pattern solid  
blue steel Specta-  
cles, 18s.



Fig. 226.  
Eye Preservers,  
mounted with the new  
neutral tint glass, from  
25s.



Fig. 227.  
Spectacles adapted  
for reading and  
public speaking,  
particularly suit-  
able for Clergy-  
men, &c. from 12s



Fig. 228.

Wiregauze Eye  
Preservers for  
railroads, &c.  
from 3s. 6d.

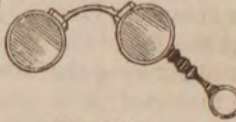


Fig. 229.

Gold folding hand  
Spectacles, to sus-  
pend round the  
neck, from  
£2. 12s. 6d. to  
£5. 5s.



Fig. 230.



Fig. 231.

Gold and pearl folding Hand Spectacles, figs. 230 & 231,  
from £3. 3s. to 6 6 0  
Gold and tortoiseshell ditto, figs. 230 and 231, from  
£2. 10s. to 5 5 0

|                                                                            |                  |   |    |   |
|----------------------------------------------------------------------------|------------------|---|----|---|
| Silver folding Hand Spectacles, fig. 229....                               | from 18s. to     | 1 | 5  | 0 |
| Silver and pearl folding Hand Spectacles, figs. 230 & 231,                 | from £1. 10s. to | 2 | 10 | 0 |
| Silver and tortoiseshell folding Hand Spectacles, figs. 230 and 231.....   | from £1. 1s. to  | 2 | 2  | 0 |
| Gilt folding Hand Spectacles, with gold mountings and double springs ..... |                  | 2 | 10 | 0 |
| Ditto, with pebbles.....                                                   |                  | 3 | 0  | 0 |
| Silver folding Hand Spectacles, with double springs ....                   |                  | 1 | 10 | 0 |
| Ditto, with pebbles .....                                                  |                  | 2 | 0  | 0 |



Gold single Eye Glasses, in great variety, from 18s. to £3. 3s.

Figs. 232, 233, 234.

|                                 |                 |   |    |   |
|---------------------------------|-----------------|---|----|---|
| Silver ditto .....              | from 5s. 6d. to | 0 | 12 | 0 |
| Tortoiseshell Eye Glasses ..... | from            | 0 | 4  | 6 |
| Horn ditto .....                |                 | 0 | 2  | 0 |



Fig. 235.



Fig. 236.

Reading and Burning Glasses, in a variety of mountings, from 2s. to £2. 10s.



Fig. 237.



Fig. 238.



Fig. 239.

|                                                                         |      |   |    |   |
|-------------------------------------------------------------------------|------|---|----|---|
| Opera Glasses, in a variety of mountings, figs. 237, 238, and 239 ..... |      |   |    |   |
| Convex and Concave Mirrors.....                                         | from | 0 | 18 | 0 |



Fig. 240.

Wollaston's Camera Lucida, for drawing objects in true perspective, in case for the pocket, £1. 10s.

Amici's Camera Lucida ..... 2 8 0



Fig. 241.

Portable Camera  
Obscura, 4s. 6d.,  
10s. 6d., to £3.3s.



Fig. 242.

Portable Field Ca-  
meras, £3. 3s.

Glass Prisms, 4s., 5s., and upwards

### PERSPECTIVES and TELESCOPES.



Figs. 243,



244,



245.

Perspectives, with 1 draw, fig. 243, 1s. 6d.  
Ditto, 2 ditto, fig. 244, 2s. 6d.  
Ditto, 3 ditto, fig. 245, 3s. 6d.  
Ditto, 2 ditto, and co-  
vered ends..... 5s. 0d.

Common Telescope, with 2 draws ..... from 0 12 0

### MILITARY TELESCOPES.



Fig. 246.

17 inches long when open, with 6 draws, and closes to  
4 inches ..... 1 10 0  
24-inch ditto ditto, and closes to 5 inches..... 2 2 0

### MAHOGANY-FRAME ACHROMATIC TELESCOPES.



Fig. 247.

18 inches long when open, with 2 draws, and closes to  
8 inches ..... 0 18 0  
20-inch ditto ditto..... 1 1 0  
28-inch ditto ditto, closes to 11 inches ..... 1 10 0  
17-inch ditto, with 3 draws, closes to 5½ inches ..... 1 10 0



Fig. 248.

24-inch Achromatic Telescope, with 3 draws, closes  
to 7½ inches..... 1 16 0  
30-inch ditto, with 4 draws ..... 2 10 0  
42-inch ditto, with 4 ditto ..... 4 4 0

### ACHROMATIC SHIP AND PILOT TELESCOPES.



Fig. 249.

Day or Night Achromatic Pilot Telescope, with 1, 2, or  
3 draws..... from 18s. to 3 3 0

|                                                                                               |   |   |   |
|-----------------------------------------------------------------------------------------------|---|---|---|
| Day or Night Achromatic Pilot Telescope, with shade tube, best make .....                     | 3 | 3 | 0 |
| Day or Night Achromatic Ship Telescope, with 1 draw and shade tube, best make, fig. 249 ..... | 3 | 3 | 0 |

## WALKING-STICK TELESCOPES.



Fig. 250.

|                                              |   |    |   |
|----------------------------------------------|---|----|---|
| 12-inch, 1 draw .....                        | 1 | 10 | 0 |
| Ditto, 2 ditto .....                         | 1 | 15 | 0 |
| Ditto, 3 ditto .....                         | 2 | 2  | 0 |
| 18-inch, 1 ditto .....                       | 1 | 15 | 0 |
| Ditto, 2 ditto .....                         | 2 | 2  | 0 |
| 24-inch, 1 ditto .....                       | 2 | 2  | 0 |
| Ditto, 2 ditto .....                         | 2 | 5  | 0 |
| Ditto, with compass .....                    | 2 | 10 | 0 |
| 18-inch containing various instruments ..... | 6 | 6  | 0 |

## VERY SUPERIOR TELESCOPES,

Adapted for either Astronomical or other purposes.

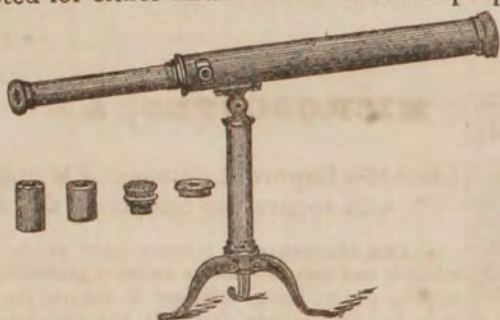
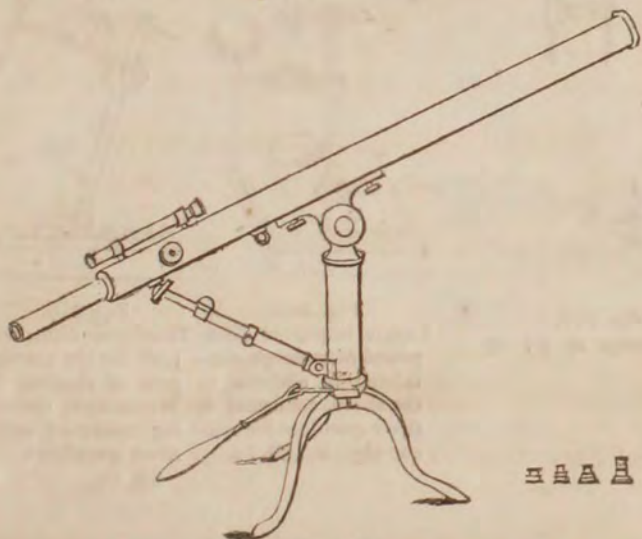
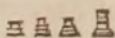


Fig. 251.

|                                                       |    |    |   |
|-------------------------------------------------------|----|----|---|
| 18 inches long, with rack and pinion, on stand, ..... | 8  | 8  | 0 |
| 30-inch ditto .....                                   | 12 | 12 | 0 |
| Ditto, with vertical rack .....                       | 14 | 14 | 0 |
| Ditto, with vertical and horizontal rack .....        | 21 | 0  | 0 |
| 42-inch, with rack and pinion .....                   | 30 | 0  | 0 |
| Ditto, with vertical rack .....                       | 32 | 0  | 0 |

42-inch,  
with vertical  
and horizon-  
tal rack, £36.

**REFLECTING TELESCOPES.**

|                                                                                                                               |     |    |   |
|-------------------------------------------------------------------------------------------------------------------------------|-----|----|---|
| One-foot Gregorian Reflecting Telescope on stand, packed<br>in mahogany case, speculum $2\frac{1}{2}$ inches diameter . . . . | 6   | 6  | 0 |
| One-foot and a half ditto, speculum 3 inches diameter . .                                                                     | 11  | 11 | 0 |
| Two-feet ditto, speculum 4 inches diameter . . . . .                                                                          | 16  | 16 | 0 |
| Ditto ditto, with rack-work motion . . . . .                                                                                  | 25  | 4  | 0 |
| Three-feet ditto, with speculum 5 inches diameter, and<br>rack-work motion . . . . .                                          | 42  | 0  | 0 |
| Ditto ditto, with speculum 6 inches diameter, on<br>tripod stand, and rack-work motion . . . . .                              | 68  | 5  | 0 |
| Four-feet ditto ditto, with speculum 7 inches diameter                                                                        | 105 | 0  | 0 |
| Seven-feet Newtonian Telescope, with speculum 6 inches<br>diameter . . . . .                                                  | 105 | 0  | 0 |
| Ditto ditto, with speculum, 7 inches diameter . . .                                                                           | 126 | 0  | 0 |
| Nine-feet ditto, with speculum 9 inches diameter . . . .                                                                      | 210 | 0  | 0 |



Fig. 253.

**MICROSCOPES, &c.**

Gould's Improved Compound Microscope, in case,  
with apparatus, complete, £1. 15s.

This Microscope is recommended to the naturalist, mineralogist, and botanist, for its extreme portability and high magnifying power, being sufficient to discover the most minute animalculæ, seed vessels, &c. It has also the uses of the single, compound, opaque, and aquatic Microscopes.

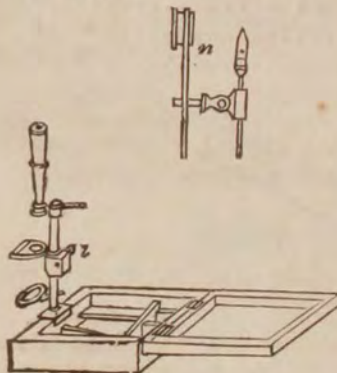


Fig. 254.

Gould's Microscope as set up  
for use.

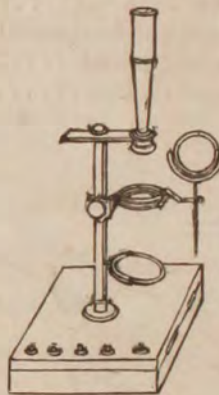


Fig. 255.

Larger improved Com-  
pound Microscope, con-  
taining in addition to  
the above, condenser &  
silver speculum for opa-  
que objects, £3. 3s.

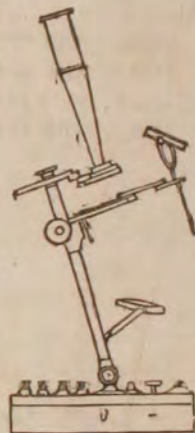


Fig. 256.

Third-size ditto, with  
joint for the conveni-  
ence of slanting the  
Microscope, contain-  
ing condenser and 2  
silver speculums,  
£5. 5s.

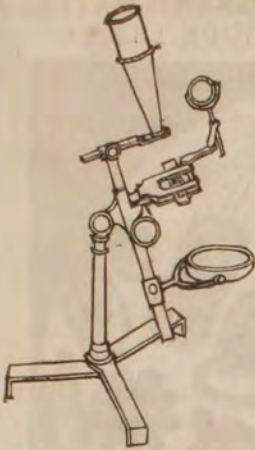


Fig. 257.



Fig. 258.

Pillar Microscope, fig. 257, with folding tripod foot, for the convenience of packing; containing Dr. Wollaston's doublet, in addition to the other powers, apparatus, &c. in neat mahogany case, fig. 258. £10. 10s.

Extra-large very superior Microscope, with tangent screw for very delicate adjustment, moveable stage, 2 condensers, frog plate, Dr. Wollaston's doublet, 2 silver speculums, plain and achromatic lenses, a variety of transparent and opaque objects, apparatus, &c.; the whole packed in a neat mahogany cabinet, price .. 35 0 0  
Dissecting Microscopes, very superior.....from 10 10 0



Fig. 259.

Small Microscopes with glass body, in case, 7s. 6d.



Fig. 260.

Gardener's Microscope, in case, 7s. 6d.

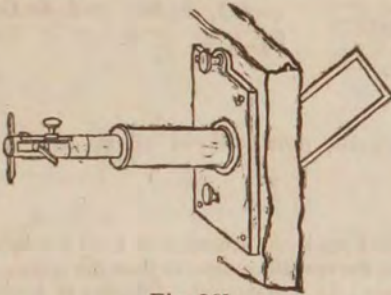


Fig. 261.

Solar Microscopes, from £6.6s. to £40.

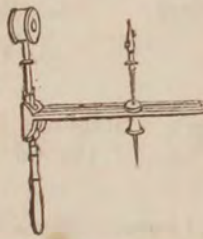


Fig. 262.

Flower Microscopes, 7s. 6d. and 10s. 6d.

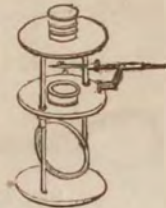


Fig. 263.

Botanical Microscopes, with three powers, 16s.



Fig. 264.

Cloth Microscopes for ascertaining the number of threads in a given space of linen cloth, in case, 2s. 6d.



Fig. 265. Cloth Microscopes, to fold for waistcoat pocket, 4s. 6d.

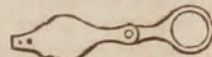


Fig. 266. Magnifying Lenses for the pocket, from 2s.



Fig. 267.

Magnifying Lenses, with 3 powers, which may be used separately or together, from 5s.

APPEARANCE OF A DROP OF STAGNANT WATER, AS  
SEEN THROUGH THE STANHOPE LENS.



Fig. 268.



Fig. 269.

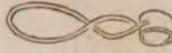


Fig. 270.

Stanhope Lenses, in white  
metal, 3s.6d. and 4s.6d.,  
fig. 269, 270.



Fig. 271.

Stanhope Lenses, mounted in silver, 6s. and  
10s. 6d.

This useful and ingenious Microscopic Lens is the invention of Lord Stanhope; both ends are ground convex, the one next the eye rather more so than the other. It has many advantages over the common Lens: for instance, the difficulty of holding the hand steady to the focus, and the loss of light and small field attendant on viewing with a high magnifying power are here obviated; for, the length of the Cylinder being the exact focus, the object has only to be placed upon the end that is ground less convex, or to be brought in contact with it, when the advantage of great magnifying power will be obtained, with a field of nearly five inches—equal to many of the Compound Microscopes.

The portability of this Instrument, its low price, and the facility with which it can be used, must recommend it strongly to all who use Microscopic Lenses. With it may be viewed the animalcules in water, mites in cheese, eels in paste and vinegar, the perspiration, human hair, farina and leaves of flowers, the hairs of animals, the down of moths, &c.: and, if a single drop of the crystallization of salts be spread lightly over the end of the Lens, and viewed without delay, the formation of the crystals will be beautifully apparent.

Best Silver Stanhope and Coddington Lens, in case . . . . 1 8 0  
Coddington's Spherical Lens, mounted in German silver,  
for the pocket, particularly adapted for viewing mine-  
rals, opaque and transparent objects . . . . . 0 9 0



Fig. 272.

Coddington's Spherical Lens, in silver, 16s.

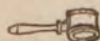


Fig. 273.

Small magnifying Glasses, 2s. and 2s. 6d.

*Palmer's Improved Portable Oxy-Hydrogen Apparatus and Microscope with prepared objects, complete.*

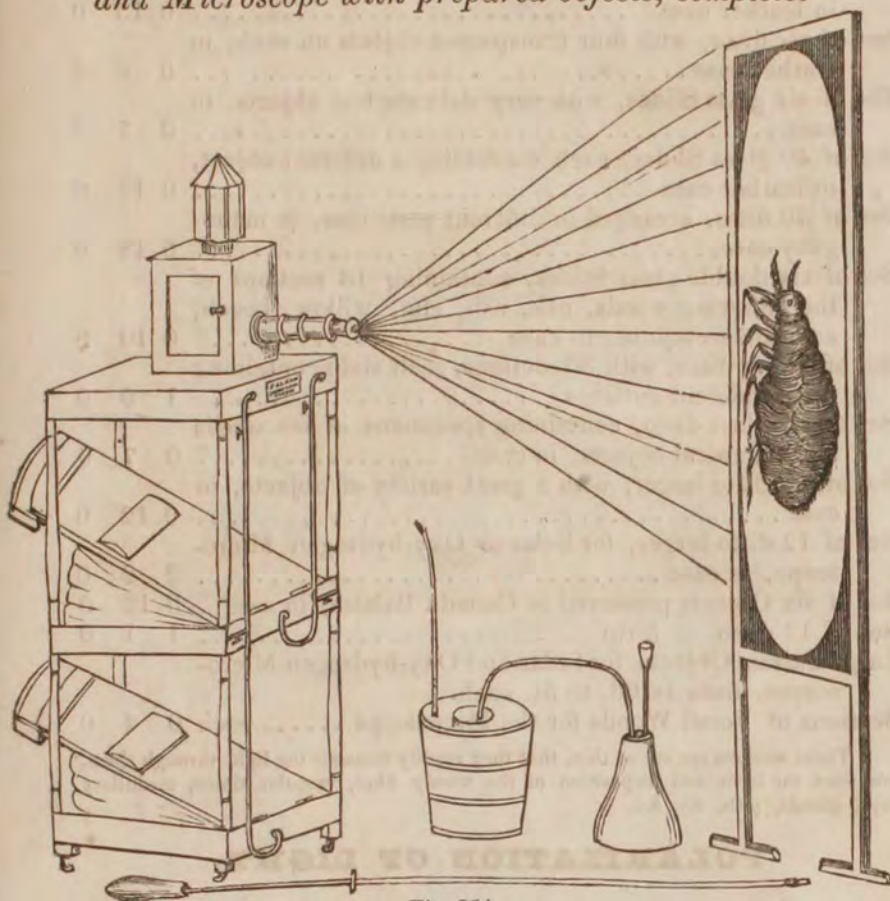


Fig. 274.

The Microscope is capable of showing various objects, magnified on a medium of from ten thousand to two million times, price £35.; or, without the Microscope, £20. Fig. 274.

*E. PALMER begs to submit the following splendid Apparatus to the attention of Lecturers, Schoolmasters, and Scientific Gentlemen, as by far the most portable and convenient Apparatus of the kind hitherto invented.*

As an Appurtenance to the Laboratory, it will be found exceedingly useful, not only for the production of intense heat and light, but also for many of the manipulations in Pneumatic Chemistry, which usually require expensive Apparatus, large quantities of water, and much room.

To the scientific Lecturer it is an Apparatus of great value, as it enables him to exhibit to an audience many very interesting and beautiful phenomena connected with the various Sciences; and also to illuminate diagrams for the illustration of Lectures on Astronomy and Natural History. All danger being obviated by the Gases being kept in separate vessels, which, when charged, contain Hydrogen enough to last half an hour, and Oxygen enough to last one hour, and by simply turning a cock, the Hydrogen vessel may be replenished.

Oxy-hydrogen Microscopes, fitted up on a larger scale, from £60. to £100.

Turned Cylinders, of very superior hard lime, prepared for the Microscope, 9s. per dozen.

### OBJECTS FOR MICROSCOPES.

|                                                                                                                                               |   |    |   |
|-----------------------------------------------------------------------------------------------------------------------------------------------|---|----|---|
| Set of nine ivory Slides, with four opaque objects on each, in leather case .....                                                             | 0 | 15 | 0 |
| Set of six ditto, with four transparent objects on each, in leather case .....                                                                | 0 | 8  | 6 |
| Set of six glass Slides, with very delicate test objects, in case .....                                                                       | 0 | 7  | 0 |
| Set of 40 glass Slides, each containing a different object, in leather case .....                                                             | 0 | 10 | 6 |
| Set of 50 ditto, arranged in different partitions, in mahogany case .....                                                                     | 0 | 18 | 0 |
| Set of six double glass Slides, containing 18 sections of the following woods, oak, ash, elm, willow, beech, and horse-chesnut, in case ..... | 0 | 10 | 6 |
| Set of twelve ditto, with 36 sections, each slide containing three different cuttings .....                                                   | 1 | 0  | 0 |
| Set of six glass ditto, containing specimens of sea-weeds and botanical objects, in case .....                                                | 0 | 7  | 0 |
| Set of six ditto larger, with a great variety of objects, in case .....                                                                       | 0 | 12 | 0 |
| Set of 12 ditto larger, for Solar or Oxy-hydrogen Microscope, in case .....                                                                   | 2 | 2  | 0 |
| Set of six Objects preserved in Canada Balsam, in case ..                                                                                     | 0 | 12 | 0 |
| Set of 12 ditto ditto .....                                                                                                                   | 1 | 1  | 0 |
| Large Balsam Objects, for Solar and Oxy-hydrogen Microscopes, from 1s. 6d. to 5s. each.                                                       |   |    |   |
| Sections of Fossil Woods for the Microscope .....                                                                                             | 0 | 4  | 0 |

These sections are cut so thin, that they readily transmit the light through them, and show the form and disposition of the woody fibre, vascular tissue, medullary rays, glands, pith, &c. &c.

### POLARIZATION OF LIGHT.

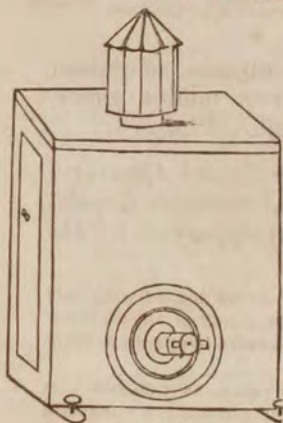


Fig. 275.

Apparatus to show the beautiful and extraordinary phenomena of Polarized Light, upon an opaque or semi-transparent screen, consisting of brass work with condensing lenses, and a polariscope, with tourmalines and series of different crystalline polished plates in ivory slides. By the light obtained in the combustion of lime with oxy-hydrogen gas, may be exhibited on a screen the splendid coloured rings, &c., £9.

|                                                         |   |    |   |
|---------------------------------------------------------|---|----|---|
| Polariscope, in rosewood .....                          | 2 | 10 | 0 |
| Polarizing Eye Pieces .....                             | 0 | 5  | 0 |
| Double Image Prisms, of calcarious spar and glass ..... | 0 | 10 | 0 |



Fig. 276.



Fig. 277.



Fig. 278.



Fig. 279.



Fig. 280.



Fig. 281.

Six Unannealed Glasses, for showing the tints of polarized light, figs. 276—7—8—9—80—1 ..... 1 1 0  
Selenite Designs



Fig. 282.



Fig. 283.



Fig. 284.



Fig. 285.



Fig. 286.



Fig. 287.



Fig. 288.

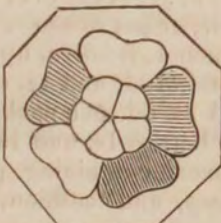


Fig. 289.



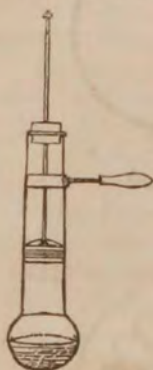
Fig. 290.

|                                                     |   |    |   |
|-----------------------------------------------------|---|----|---|
| Six-pointed Star, fig. 282 .....                    | 0 | 8  | 0 |
| Shamrock with motto, Erin-go-bragh, fig. 283 .....  | 0 | 14 | 0 |
| Superposing Stars, 16 rays, fig. 284.....           | 0 | 14 | 0 |
| The Flower Forget-me-not with motto, fig. 285 ..... | 0 | 14 | 0 |
| Tulip, fig. 286.....                                | 0 | 14 | 0 |
| Thistle with motto, Dinna Forget, fig. 287 .....    | 0 | 14 | 0 |

|                                                                             |                 |    |     |
|-----------------------------------------------------------------------------|-----------------|----|-----|
| Selenite Slide for exhibiting the Newtonian colored rings,<br>fig 288 ..... | 0               | 10 | 0   |
| Rosette, fig. 289 .....                                                     | 0               | 14 | 0   |
| Selenite Wedges, fig. 290 .....                                             | 0               | 7  | 6   |
| Pansy with motto, Heart's-ease .....                                        | 1               | 0  | 0   |
| Crosses and Discs of various colors, for superposing, each                  | 0               | 10 | 0   |
| Selenite Windows .....                                                      | from £3. 3s. to | 40 | 0 0 |

### MISCELLANEOUS APPARATUS.

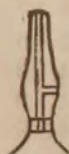
|                                              |   |   |   |
|----------------------------------------------|---|---|---|
| Apparatus to show the Bude Light, from ..... | 3 | 3 | 0 |
|----------------------------------------------|---|---|---|



Wollaston's Apparatus to illustrate the principle of the Condensing Steam Engine, 7s. 6d.

Fig. 291.

|                                                                                                             |                   |    |    |   |
|-------------------------------------------------------------------------------------------------------------|-------------------|----|----|---|
| Models of Locomotive, Condensing, and High Pressure<br>Steam Engines .....                                  | from £10. 10s. to | 50 | 0  | 0 |
| Cabinet, containing 144 carefully selected Mineralogical<br>Specimens, arranged according to Phillips ..... |                   | 2  | 2  | 0 |
| Ditto ditto, with 192 larger specimens.....                                                                 |                   | 4  | 4  | 0 |
| Ditto ditto, with 336 specimens .....                                                                       |                   | 14 | 14 | 0 |
| Cabinet, with collections of Geological Strata, from ....                                                   |                   | 2  | 2  | 0 |
| Selected Minerals named for blowpipe, or other ex-<br>periments, in cases of 60 and 80 each, 12s. and       |                   | 0  | 15 | 0 |
| Larkin's set of Geometrical Solids, consisting of 32<br>figures, in boxes each .....                        |                   | 0  | 7  | 6 |
| Binding Screws for Voltaic Batteries, 1s. 6d. per pair, or<br>per dozen .....                               |                   | 0  | 15 | 0 |
| Ditto ditto, 2s. 6d. per pair, or per dozen .....                                                           |                   | 1  | 4  | 0 |
| Magnets, single and compound, from 1s. upwards                                                              |                   |    |    |   |
| Porous earthenware pots, 6d. 10d. and 1s. each                                                              |                   |    |    |   |
| Photogenic Paper, 1s. and 2s. 6d. per packet                                                                |                   |    |    |   |
| Fixing Liquid for ditto, in bottles 1s. and 1s. 6d. each                                                    |                   |    |    |   |
| Photogenic Drawing Boxes, containing paper, fixing<br>liquid, sponge, glasses, and cushion, 7s. 6d. and     |                   | 1  | 1  | 0 |



Reid's mouth-piece for inhaling the nitrous oxide or Laughing Gas, 2s. 6d.

Fig. 292.

# BATTERIES AND APPARATUS

FOR

## *ELECTRO-METALLURGY.*

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### *Chemico-Mechanical Batteries.*

Single Voltaic Batteries, from 7s. 6d. upwards.

Battery, consisting of Six 2lb. Pots, in Tray, particularly adapted for the Electro-Metallurgist, £5. 5s.

Batteries, mounted in Wollaston's Troughs, as recommended by Mr. Smee, for Electro-Gilding, £5. 5s. and £6. 10s.

LARGER BATTERIES MADE TO ORDER.

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*Small Single-Cell Apparatus for Medals, 5s. 7s. 6d. and 10s. 6d. each.*

Apparatus with Battery, by which fac-similes of a number of Medals may be taken at the same time, 30s.

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