

CATALOGUE
OF
Maps, Apparatus, Charts,
REFERENCE-BOOKS, &c.,
ADAPTED TO GRAMMAR AND COMMON SCHOOLS,
FOR SALE AT THE
EDUCATIONAL DEPOSITORY,
TO THE
PUBLIC SCHOOLS IN UPPER CANADA



TORONTO:
PRINTED FOR THE DEPARTMENT OF PUBLIC INSTRUCTION FOR UPPER CANADA.
BY LOVELL AND GIBSON, YONGE STREET.

1883.

PREFATORY NOTE.

IN this catalogue are given the net prices at which the books and school requisites enumerated therein may be obtained by the Public Educational Institutions of Upper Canada, from the Depository in connection with the Department. In each case, cash must accompany the order sent.

Text-books must be paid for at the full catalogue price. This branch of the Depository will be discontinued as soon as the present stock is exhausted. Books will, however, be *specially* procured for parties at a distance, who may send for them. Colleges and private schools will be supplied with any of the articles mentioned in the catalogue at the prices stated. Local Superintendents and Teachers will also be supplied on the same terms with such educational works as relate to the duties of their profession.

DEPARTMENTAL NOTICES.

PRE-PAYMENT OF POSTAGE ON BOOKS.

According to the new Postage Law, the postage on all books, printed circulars, &c., sent through the post, *must be pre-paid by the sender*, at the rate of one cent per ounce. Local Superintendents and teachers ordering books from the Educational Depository, will therefore please send such an additional sum for the payment of this postage, at the rate specified, and the Customs duty on copyright books, as may be necessary.

PUBLIC LIBRARY BOOKS, SCHOOL MAPS,

APPARATUS AND PRIZE BOOKS.

The Chief Superintendent will add *one hundred per cent.* to any sum or sums, *not less than five dollars*, transmitted to the Department by Municipal and School Corporations, on behalf of Grammar and Common Schools; and forward Public Library Books, Prize Books, Maps, Apparatus, Charts, and Diagrams, to the value of the amount thus augmented, upon receiving a list of the articles required. In all cases it will be necessary for any person acting on behalf of the Municipal or Trustee Corporation, to enclose or present a written authority to do so, verified by the corporate seal of the Corporation. A selection of Maps, Apparatus, Library and Prize Books, &c., to be sent, can always be made by the Department, when so desired.

✍ Catalogues and Forms of Application furnished to School authorities on their application.

FORM OF APPLICATION FOR PUBLIC LIBRARY BOOKS, MAPS,
APPARATUS, SCHOOL PRIZE BOOKS, &c.

[Insert Post Office Address here.]

SIR,—The [Trustees, or Board of Trustees, if in Towns, &c.] of the School being anxious to provide [Maps, Library Books, or Prize Books, &c.] for the Public Schools in the [Section, Town, or Village, &c.] hereby make application for the, &c., enumerated in the accompanying list, in terms of the Departmental Notice relating to for Public Schools. The selected are *bona fide* for the; and the CORPORATION HEREBY PLEDGES ITSELF not to give or dispose of them, nor permit them to be given or disposed of, to the teacher or to any private party, OR FOR ANY PRIVATE PURPOSE WHATSOEVER, but to apply them solely to the purposes above specified in the Schools of the, in terms of the Departmental Regulations granting one hundred per cent. on the present remittance. The parcel is to be sent to the Station of the Railway, addressed to

IN TESTIMONY WHEREOF, the Corporation above-named, hereto affixes its corporate seal to this application, by the hand of,* this day of, 186--.

Amount remitted, \$.....

Trustees must sign their own names.	} Corporate seal to be placed here.
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To the Chief Superintendent of Education, Toronto.

NOTE.—Before the trustees can be supplied, it will be necessary for them to have filled up, signed and sealed WITH A PROPER CORPORATE SEAL, as directed, a copy of the foregoing Form of Application. On its receipt at the Education Office, the *one hundred per cent.* will be added to the remittance, and the order, so far as the stock in the Depository will permit made up and despatched. Should the Trustees have no proper corporate seal, the Department will, on the receipt of \$2 additional, have one engraved and sent with the articles ordered.

* * If Library and Prize Books be ordered, in addition to Maps and Apparatus, it will BE NECESSARY FOR THE TRUSTEES TO SEND NOT LESS THAN *five dollars additional* for each class of books, &c., with the proper forms of application for each class.


☞ The *one hundred per cent.* will not be allowed on any sum less than *five dollars.* Text books cannot be furnished on the terms mentioned above: they must be paid for in full, at the net catalogue prices.

* The Trustees of the Section; Chairman and Secretary of the Board of City Town, or Village Trustees; Warden, Mayor, or Reeve.

ASSORTED PRIZE BOOKS IN PACKAGES,

Selected by the Department, for Grammar or Common Schools, from the Catalogue, in assorted packages, as follows :

Package	No. 1.	Books and Cards,	5cts. to 70cts each.....	\$10
"	No. 2.	Ditto ditto	5cts. to \$1.00 each.....	\$16
"	No. 3.	Ditto ditto	5cts. to \$1.25 each.....	\$20
"	No. 4.	Ditto ditto	10cts. to \$1.50 each.....	\$26
"	No. 5.	Ditto ditto	10cts. to \$1.75 each.....	\$30
"	No. 6.	Ditto ditto	10cts. to \$2.00 each.....	\$36
"	No. 7.	Ditto ditto	15cts. to \$2.25 each.....	\$40
"	No. 8.	Ditto ditto	15cts. to \$2.50 each.....	\$46
"	No. 9.	Ditto ditto	15cts. to \$2.75 each.....	\$50
"	No. 10.	Ditto ditto	20cts. to \$3.00 each.....	\$56
"	No. 11.	Ditto ditto	20cts. to \$3.25 each.....	\$60
"	No. 12.	Ditto ditto	20cts. to \$3.50 each.....	\$66
"	No. 13.	Ditto ditto	25cts. to \$3.75 each.....	\$70
"	No. 14.	Ditto ditto	55cts. to \$4.00 each.....	\$76
"	No. 15.	Ditto ditto	25cts. to \$4.25 each.....	\$80
"	No. 16.	Ditto ditto	30cts. to \$4.50 each.....	\$86
"	No. 17.	Ditto ditto	30cts. to \$4.75 each.....	\$90
"	No. 18.	Ditto ditto	30cts. to \$5.00 each.....	\$96
"	No. 19.	Ditto ditto	35cts. to \$5.25 each.....	\$100
"	No. 20.	Ditto ditto	35cts. to \$5.50 each.....	\$120

 *Special Prizes*, in handsomely bound books, singly at from \$1.05 to \$5.50. In sets of from two to six volumes of Standard Literature, at from \$3.00 to \$10.00 per set.

. Trustees are requested to send in their orders for prizes at as early a date as possible, so as to ensure the due despatch of their parcels in time for the examinations, and thus prevent disappointment.

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CATALOGUE.

PART I.—MAPS AND APPARATUS.

I.—IRISH NATIONAL MAPS.

Mounted on Canvas and Rollers, Coloured and Varnished.

1. Modern Geography.

*The World on a Globular Projection	\$3 50	*America.....	3 00
Do do do Outline.....	3 50	England.....	3 00
Do Mercator's Projection		Ireland.....	3 00
Outline.....	4 50	Scotland.....	3 00
*Eastern Hemisphere, singly.....	2 00	*The British Islands.....	3 00
*Western Hemisphere, singly.....	2 00	British Isles (Geological)....	3 50
*Europe.....	3 00	*United States.....	3 00
*Asia.....	3 00	Pacific Ocean.....	3 00
*Africa.....	3 00	Australia.....	3 00

2. Ancient and Scripture Geography.

Ancient or Scripture World.....	\$3 00	Palestine, comprising Canaan,	
Orbis Veteribus Notus.....	3 00	Land of Promise, the Holy	
Terra Sancta, combining the		Land and Plan of Jerusalem,	3 00
Geography of the Old and		Italia Antiqua.....	3 00
New Testaments.....	1 75	Græcia Antiqua.....	3 00
Asia Minor or Antiqua.....	1 75		

II.—CANADA SCHOOL ROOM MAPS.†

Mounted on Canvas and Rollers, Coloured and Varnished.

Europe.....	2 38	America.....	2 38
Asia.....	2 38	Palestine (in course of prepara-	
Africa.....	2 38	tion).....	2 38

III. MAP OF BRITISH NORTH AMERICA.

British North America, including Upper and Lower Canada, Nova Scotia, New Brunswick, Prince Edward Island, Newfoundland, British Columbia, Vancouver, &c.....	6 00
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IV.—MAPS OF UPPER CANADA.

Maclear's Map of Upper Canada.....	2 50	Tremaine's Map of U. O.....	
Smith's do do.....		Tackabury's do do.....	

* These maps have been revised under the direction of the Educational Department, and published in Toronto expressly for the Public Schools in Upper Canada.

† These maps have been chiefly constructed, under the direction of the Educational Department. They are intended to supply a want, long felt by Canadian teachers, of Maps adapted to this country.

V.—W. & K. JOHNSTON'S MAPS.**1. Large Modern Maps.**

Commercial Chart of the World on Mercator's projection .. \$12 00	Central Europe..... \$2 38
The World, (Mercator's)..... 2 38	France 2 38
Do (Physical)..... 2 38	Italy..... 2 38
General Europe..... 8 00	India 2 38
Geological Europe ... 15 00	Spain and Portugal 2 38
Physical do 2 38	The United States 11 00

2. Small School Maps.

The Eastern Hemisphere.... 1 38	England..... 1 38
The Western Hemisphere... 1 38	Ireland 1 38
Europe 1 38	Scotland..... 1 38
Asia 1 38	Palestine 1 38
Africa..... 1 38	Illustrations of Geographical Terms..... 1 50
America..... 1 38	
United States and Canada... 1 38	

3. Large Classical Maps.

Orbis Veteribus Notus..... 2 38	Italia Antiqua 2 38
Orbis Romanus 2 38	Asia Minor Antiqua..... 2 38
Græcia Antiqua 2 38	

VI.—W. & R. CHAMBERS' MAPS.

Cloth, Rollers, Coloured and Varnished.

The World..... 4 00	America (South) 3 00
Europe 3 00	England 3 00
Asia 3 00	Ireland..... 3 00
Africa..... 3 00	Scotland..... 3 00
America (North)..... 3 00	Palestine 3 00

VII.—LONDON CHRISTIAN KNOWLEDGE SOCIETY'S MAPS.

Canvas, Rollers, Coloured and Varnished.

1. Modern Geography.

The World (outline)..... 1 75	South America 2 00
Europe..... 3 00	England and Wales 3 50
Asia 3 00	Do do 1 50
North America..... 2 00	Scotland..... 1 50

2. Ancient and Scripture Geography.

The Assyrian and other Em- pires 1 50	Syria, New Testament 2 00
Syria, Old Testament 2 00	The Land of Promise..... 0 88

VIII.—VARTY'S MAPS.

Mounted on Canvass and Rollers, Coloured and Varnished.

The World, Globular... 2 25	Asia, Outline..... 1 00
The World, Physical 6 00	Africa, do 1 00
The World, Outline..... 1 75	America, do 1 00
Europe, Physical 3 75	America, Full 1 25
Europe, Outline 1 75	India 1 25

2. Combination Maps.

(One each full and outline, mounted together.)

Europe !.....	\$2 00	England	\$2 00
Asia	2 00	Ireland	2 00
Africa	2 00	Scotland.....	2 00
America.....	2 00		

3. Scripture Maps.

Roman Empire.....	1 50	Palestine	2 50
Acts of the Apostles.....	1 75	Land of Canaan	1 50

IX.—WHYTE'S MAPS.

(Scottish School Book Association.)

Cloth, Rollers, Coloured and Varnished.

Central and Southern Europe	3 75	North America	1 50
General Europe	1 50	South America	1 50
Asia	1 50	Hindustan	1 50
Africa.....	1 50		

X.—NELSON'S MAPS.

Cloth, Rollers, Coloured and Varnished.

Eastern Hemisphere.....	3 00	Ireland.....	3 00
Western Hemisphere.....	3 00	Scotland.....	3 00
British Islands, in connection		Palestine	3 00
with the continent of Europe	3 00	Lands of the Bible.....	3 00
England	3 00		

XI.—DAY & SONS' MAPS.

Orthographic Projection of the		World of the Antipodes	6 00
World.....	6 00	American Sub-marine Chart.	1 10

XII.—PHILLIPS' SCHOOL ROOM MAPS.

Cloth, Rollers, Outline Coloured, and Varnished.

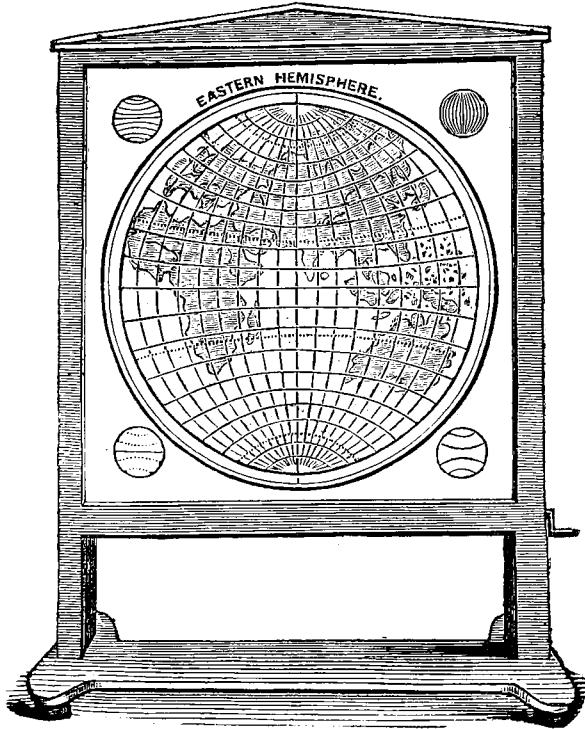
The World in Hemispheres..	3 25	Australia	3 00
Do (Physical)....	3 00	England	3 00
Do (Mercator's) ..	4 00	Ireland	3 00
Europe	3 00	Scotland.....	3 00
Asia	3 00	British Isles.....	4 00
Africa	3 00	Do Physical	4 00
North America	3 00	Do Geological.....	6 00
South America.....	3 00		

XIII.—PELTON'S OUTLINE MAPS.

Canvas, Rollers, and Varnished.

Eastern Hemisphere.....	5 00	United States	3 50
Western Hemisphere.....	5 00	The entire series with a Key.	20 00
Two Hemispheres, with Key.	10 00	Extra Keys to Hemispheres,	
Europe.....	3 50	each	0 50
Asia	3 50	Ditto to Continents, each ...	0 50
South America and Africa ..	3 50		

II.—CANADIAN ROTARY MAP STANDS AND CASES.



CANADIAN ROTARY MAP STAND.

1. Canadian Rotary Map Stand—National Series.—No. I.

The Stand is mounted on castors, and contains nine Coloured Maps on a continuous web of cloth, which revolves vertically, over rollers, by turning the handle at the side, so that the maps are exhibited in rotation. An outside cover of oak paper contains the following List of the Maps:—

United States.	Australia.	Orbis Veteribus Notus.
Europe.	Pacific Ocean.	Græcia Antiqua.
Asia.	Scripture World.	Italia Antiqua.

The Maps measure 5 feet 5 inches by 4 feet four inches. The Stand is 6 feet 10 inches high by 6 feet broad, with Blackboard behind for arithmetic or diagrams. It can be taken to pieces, packed, and sent with safety to any part of the country. Price \$35 00.

The price of separate maps are \$3 and \$3 50.

2. National Series—No. II.

(This is mounted in the same style as No. I.)

List of the Maps.

Eastern Hemisphere.	England.	Asia Minor.
Western Hemisphere.	Ireland.	Terra Sancta.
America.	Scotland.	
Africa.	Palestine.	

The Maps measure 5 feet 6 inches by 4 feet 4 inches, the stand is 8 feet 4 inches by 4 feet 8 inches broad. Price \$38, or for the two stands \$72.

3. Large Rotary Map Stand—Canada Series.—No. I.

(Ten Maps, Mounted same as the National Series.)

List of the Maps.

Eastern Hemisphere.	Africa.	Physical Europe.
Western Hemisphere.	America.	Canaan and Palestine.
Europe.	British Isles.	
Asia.	Orbis Veteribus Notus.	

The Maps measure 4 feet 2 inches by 3 feet 6 inches, the stand is 6 feet 9 inches high by 4 feet 8 inches broad. Price \$36. Single maps \$2 38 each.

4. Large Rotary Map Stand—Canada Series.—No. II.

(Nine Maps, Mounted same as the preceding.)

List of the Maps.

France.	Italy.	Orbis Romanus.
Spain.	India.	Italia Antiqua.
Central Europe.	Mercator's World.	Græcia Antiqua.

The Maps measure 4 feet 2 inches by 3 feet 6 inches, the stand is 6 feet 9 inches high by 4 feet 8 inches broad. Price \$32, or for the two stands \$67.

5. Small Rotary Map Stand—Johnston's Series.—No. I.

List of the Maps.

Eastern Hemisphere.	Africa.	Scotland.
Western Hemisphere.	America.	Canaan and Palestine.
Europe.	England.	
Asia.	Ireland.	

The Maps measure 2 feet 9 inches by 2 feet 3 inches, the stand is 6 feet high by 3 feet 2 inches broad. Price \$25.

6. Set of Large Maps in Case—Canada Series.—No. I.

The Case for hanging on a Wall contains 10 Coloured Maps on Cloth and Rollers, and is so constructed that any Map can be drawn down as required, and pulled up again by the cords at the side.

List of the Maps.

Eastern Hemisphere.	Africa.	Physical Europe.
Western Hemisphere.	America.	Canaan and Palestine.
Europe.	British Isles.	
Asia.	Orbis Veteribus Notus.	

The Maps measure 4 feet 2 inches by 4 feet 6 inches. The case is 4 feet 8 inches long by 1 foot 9 inches high; and as it is only 4 inches thick, it projects very little from the wall. It can be packed and sent with safety to any part of the country. Price \$26.

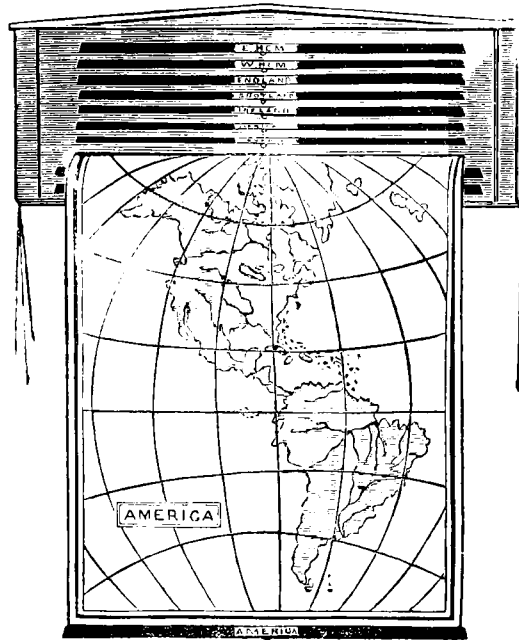
7. Set of Large Maps in Case—Canada Series—No. II.

(Nine Maps, Mounted same as Case No. I.)

List of the Maps.

Franco.	Italy.	Orbis Romanus.
Spain.	India.	Italia Antiqua.
Central Europe.	Mercator's World.	Græcia Antiqua.

The Maps measure 4 feet 2 inches by 3 feet 6 inches. The case is 4 feet 8 inches long by 1 foot 9 inches high. Price \$22.



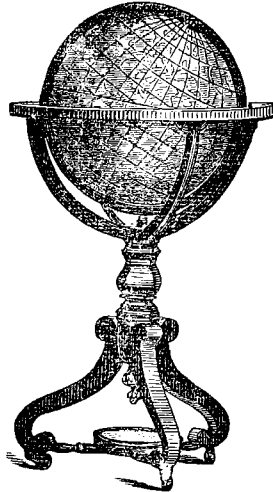
MAPS IN CASE.

8. Set of Small Maps in Case—Johnstons' Series.—No. I.

List of the Maps.

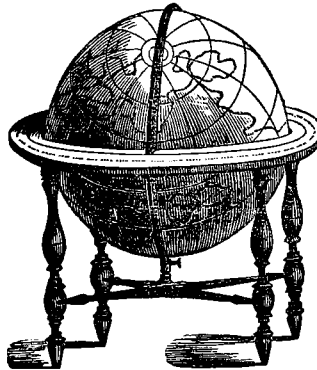
Eastern Hemisphere.	Africa.	Scotland.
Western Hemisphere.	America.	Palestine.
Europe.	England.	
Asia.	Ireland.	

Size of the Maps, 33 by 27 inches. Size of the case, 3 feet 8 inches by 1 foot 6 inches. Price \$16. Singly \$1 38.



I. Globe with High Stand.

12 inch Globes, high stand, with compass and quadrant.....	\$18.00
“ “ “ “ “ “ per pair....	85. 00
18 inch Globe, high stand, with compass and quadrant.....	46. 00
“ “ “ “ “ “ per pair....	90. 00
18 inch Blackboard drawing Globe, with box	£ 21.00



GLOBE, LOW STAND, FIG. 2.

* Constructed in Toronto, under the supervision of the Department.

IV.—ATLASES.

Bohn's Library Classical Atlas, cloth	\$1 60
Blackwood's Atlas of Modern Geography, wrappers	0 20
Dower's " " boards	0 75
Groombridge's Atlas, wrappers	0 20
Geographical and Physical Atlas, limp, <i>juv</i>	1 00
Hughes' Hand Atlas for Bible Readers, limp	0 50
" Bible Maps, coloured, limp	1 75
" " plain, paper covers	0 75
Johnston's Elementary Atlas, cloth	\$1 12 and 1 50
" General "	2 50
" Physical "	2 50
" " of Natural Phenomena	16 50
" Astronomical "	2 50
" Classical "	2 50
Kirkwood's School Atlas	0 37
Long's Classical Atlas	2 50
Milner and Peterman's Descriptive Atlas	6 75
" " Physical "	3 00
Philips' First School Atlas, plain	0 12
" " " col'd	0 25
" Atlas Modern Geography	0 25
" " for Beginners	0 60
" Introductory School Atlas	1 20
" Students Atlas	0 85
" Select "	1 60
" Comprehensive Atlas	2 30
" Cabinet "	2 30
" Physical "	
" School Classical "	1 10
Reid's Modern Atlas	1 00
" Introductory Atlas	0 50
Vogel's Physical Atlas	1 25
Whyte's Selected "	0 75
" New General	1 25

V.—PHYSICAL GEOGRAPHY, ETHNOLOGY,
AND METEOROLOGY.

Guyot's Mural Map of the World	\$7 50
" " " North America	6 50
" " " South America	6 50
" " " Geographical Elements	6 50

This is a series of colored Maps, projected on a large scale, for the Recitation Room, consisting of the Map of the World, North and South America, exhibiting the physical phenomena of the Globe, &c.

Smith's principal Mountains of the World	1 50
" " Rivers "	1 50
Christian Knowledge Society principal Rivers of the World	1 50
" " " Physical Geography in six sheets.	
Size, 44 by 45 in., mounted	1 50
Ditto, Two Sheets. Size, 22 by 30 in., mounted	0 50
Reynolds' Chart of Physical Geography, size about five feet square. Mounted	3 75
Ditto, Twelve Diagrams of Physical Geography. Enclosed in a cloth portfolio	2 70

Reynolds' View of Nature, in ascending regions. Size 25 in. by 24 in., mounted	\$1 50
Ditto, in a paper portfolio	1 05
Ditto, cloth and lettered	1 85

VI.—ETHNOGRAPHY.

Reynolds' Ethnographical Map of the World. Size, 3 feet by 2 feet; mounted	1 22
Reynolds' Diagrams of the Human Species—Fifty full length Figures, with descriptive letter press. Size 5 feet by 3 feet 2. Mounted	2 25
Ditto, In paper portfolio, <i>jr.</i>	40
Latham's Ethnology of the British Colonies. pp. 264. 16mo. Eng. Edi., <i>juv.</i>	0 90
Ditto British Islands	0 90
Ditto Europe	0 90
Ditto Man and his Migrations	0 90
Ditto Varieties of Man	4 00

VII.—METEOROLOGY.

I. BAROMETERS.

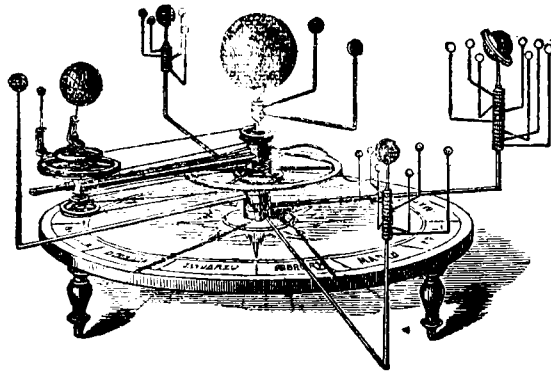
Standard Barometer, mahogany frame	\$72 00
Mercurial Barometer, mahogany frame	38 00
Wheel Barometer, \$8 50 to	20 00
Bourdon's Barometer	55 00
Pediment Barometer, \$4 00 to	20 00

II. THERMOMETERS.

Self Registering Maximum Thermometer, walnut frame	9 00
Minimum Thermometer, walnut frame	9 00
Minimum Thermometer, 9 inches	2 00
Hygrometer, Wet and Dry Bulb Thermometer, mahogany frame ..	18 00
8-inch Lane wood Thermometer	0 38
8-inch Boxwood Thermometer, double scales from 85 cents to ..	-0 95
10-inch do do do do \$1 00 to	1 15
12-inch do do do do 1 15 to	1 30
Rain Gauge, of japanned tin, with measuring glass	5 00

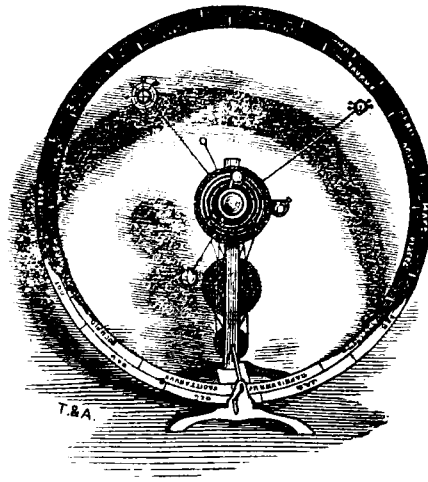
III. BOOKS AND CHARTS.

General Instructions for making the Meteorological Observations at the Senior County Grammar Schools	0 75
Daily Register Book, containing printed forms, and adapted for the complete observations of one year.	3 00
Monthly and Annual Abstract Book, do do	3 00
Blank Books for Extraordinary Records	0 75
Four Tables, for Barometer, Rain Gauge, &c., and synopsis, reprinted from the instructions on sheets, 3 cents each, cards 10 cents each	
Drew's Practical Meteorology	1 15
Muller's Physics and Meteorology, with 538 engravings on wood, and 2 coloured plates	2 75
Brocklesby's Elements of Meteorology	0 60
Chamber's Meteorology	0 20



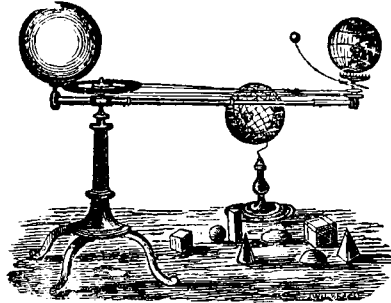
ORRERY OR PLANETARIUM. FIG. 2.

Canadian School Planetarium. Price, High Stand, \$16. Low Stand. (Fig. 2.) \$12 50.



SWAIN'S PLANETARIUM. FIG. 3.

Swain's Planetarium. (Fig. 3.) Price \$16.50, and \$54.



TELLURIAN, &C. FIG. 4.

The TELLURIAN * for illustrating the various phenomena resulting from the relations of the Sun, Moon and Earth to each other. Price, \$8 00 and \$12 00.

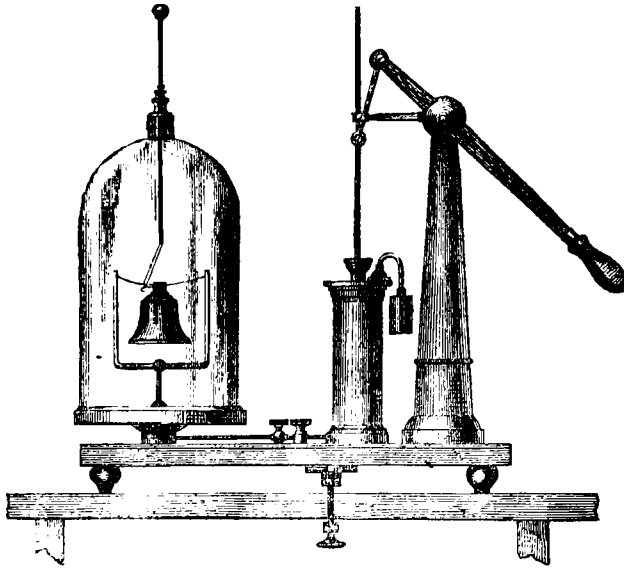
The Lunarian for illustrating the phases of the moon and centre of gravity. Price 75 cts.

Mattison's Astronomical Maps, or Celestial Charts. Size of Maps 3 feet by 3½ feet, Mounted and colored. Per set of 16, with Key.....	\$16 00
Mattison's Astronomical Maps. mounted on canvass, rollers and colored, with Key.....	20 00
Varty's Astronomical Diagrams. Size, 4 feet 9 inches by 3 feet 6 inches; mounted	4 25
Drew's Astronomy, 12 Diagrams; mounted	24 00
Darton's Illustrative Astronomy; mounted.....	2 00
Reynold's Astronomical Diagrams; mounted	3 75
Reynold's Twelve Astronomical Diagrams; in a portfolio.....	2 50
Reynold's Atlas of Astronomy. Ten quarto plates, folded in half, in wrapper	0 25
Reynold's Pictorial and Descriptive Atlas of Astronomy; in wrapper. Eng. Edi., jr.....	0 40
Johnston's School Atlas of Astronomy, edited by J. R. Hind....	2 50
Hinds' Astronomical Vocabulary, (a text book).....	0 30
Christian Knowledge Society's Astronomical Figures; Atlas form.....	1 50

* The Brass geared Tellurian, manufactured under the direction of the Educational Department, is made to revolve by a set of brass wheels, and is not so liable to get out of order as the instrument with the cord. (See Fig. 4.)

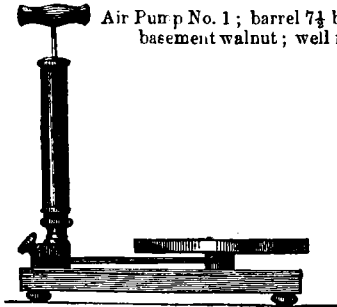
PART II.—NATURAL PHILOSOPHY, &c.

I.—PNEUMATICS.

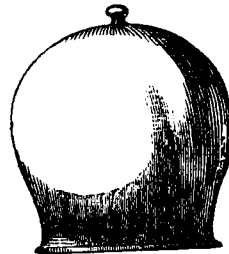


AIR PUMP, FIG. 1.

Air Pump No. 1; barrel $7\frac{1}{4}$ by 2 inches; plate 8 inches; basement walnut; well finished. Without bell glass \$22 00



AIR PUMP, FIG. 2.



BELL GLASS, FIG. 3.

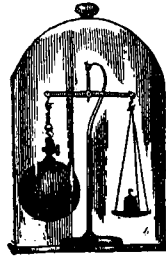
Air Pump No. 2; barrel 7 by $1\frac{1}{4}$ inches; walnut basement; plate 6 inches. Without Bell Glass.....\$12 50
 Tate's Double Action Air Pump; length of barrel 16 inches; bore $1\frac{1}{4}$ inches; stroke 8 inches..... 18 00
 Swelled Bell Glasses. Fig. 3, from one to eight gallons; various prices.
 Swelled Open Top Bell Glasses, from one to four gallons; various prices.

Bell Glasses, with screw caps to receive a stop-cock, &c., see fig. 1 (also suitable for collecting gases), from one to four gallons; various prices.



HEMISPHERE CUPS, FIG. 4.

Hemispherical Cups, No. 4; with stop-cock, handles, and stand ..	\$6 00
Stand, Lever, and Fulcrum, used with hemispherical cup for weighing a column of air	5 40
Freezing Apparatus, bell glass, pan for acid, improved silvered water cup and stand	4 80



AIR BALANCE, FIG. 5.

Apparatus illustrating the weight and buoyancy of air, gas, &c. fig. 5; 3 inch glass globe, stop-cock, stand steel beam, with grain and ounce weights, scale pans, and counterpoise. Price, without

Bell Glass	\$7 25
Revolving Jet, for condensed air fountain	1 20
Double Revolving Jet, revolves in opposite directions	2 20
Bell for vacuo, with stand ..	\$1 40 and 1 45
Brass Plate and Wood Cylinder; illustrating the porosity of wood, pressure of air, &c.	1 10
Lock for striking flint and steel in vacuum	2 20
Barometer in vacuo (Fig. 6); bell glass, 33 inches high, tube, cup, and cap	3 60
Artificial Fountain (Fig. 7), or fountain in vacuo, with stopcock and jet, stand, &c., 20 inches	\$4 60
Guinea and Feather Apparatus, with tall conical receiver, sliding rod plate, drop tables, &c.: 3 feet, \$8.40; 4 feet	12 00
Guinea and Feather Apparatus; two falls, ground brass plate and stuffing box; extra hook for use with the Bell, &c.	4 50

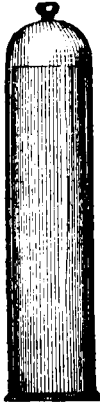


FIG. 6.



FIG. 7.

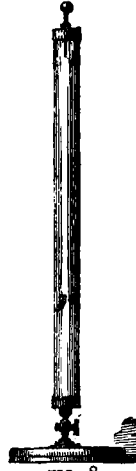
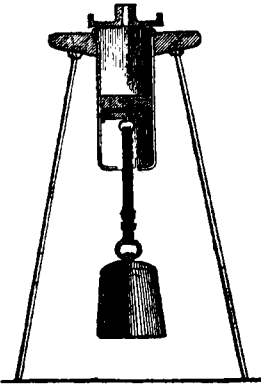


FIG. 8.

Guinea and Feather Tube (fig. 8); improved, capped at each end, with stopcock and stand (also fitted for Aurora Tube for electricity); 2½ feet, \$4.80; 3 feet \$7 50
 Mercury Tunnel, for showing the porosity of wood, pressure of air, &c 0 35



UPWARD PRESSURE APPARATUS, FIG. 9.

Upward Pressure Apparatus (Fig. 9); glass bell; brass cap, with India rubber bag, to which weights are attached; tripod stand and strap \$5 40
 Bursting Squares; for expansion or pressure; per doz 1 80
 Wire Guard for Bursting Squares 0 60
 Sliding Rod, with packing screw, regulating screws, hook and pin-cers, &c 1 60

Sliding Rod, with packing screw.....	\$1 20
Cartesian Bottle Imp, with a glass jar, 12 inches by 3 inches, on foot, with caoutchouc, 6 inches square.....	\$3.25 and 1 10
Jar, with foot 15 inches high, 2 inches diameter, with light glass flask to swim in the jar, to illustrate specific gravity.....	0 60
Bacchus Experiment; a pair of narrow bottles connected by a tube, to show the transfer of liquids from one vessel to another	0 40
Bacchus Experiment, with Brass caps, &c.....	1 80
Fire Syringe, or Pneumatic Tinder Box, for igniting tinder by compressed air	0 90
Magic Bottle, from which water will flow through the bottom when the stopper is removed	0 90
Perforated Tin Bottle, to show the upward pressure of the air.....	0 60
India Rubber Spherical Bags, for expansion; various prices.	
Japanned Tin Oiler	0 45
Barometer Tube, 31 inches long, with small funnel for performing the Torricellian experiment	0 50
Brass Stopcocks, Connecters, &c.; various prices.	

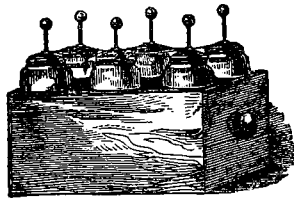
II.—ELECTRICITY.

Electrical Machine; plate 30 inches; prime conductor 36 by 5 inches, with double and separable sets of points, draw tube and ball; negative conductor 5 inches; basement 5½ feet by 3 feet, of mahogany; shaft 44 inches from floor; insulated crank; in every respect well finished.....	\$105 00
Electrical Machine; plate 12 inches; prime conductor 12 by 3 inches; base like the foregoing.....	18 00



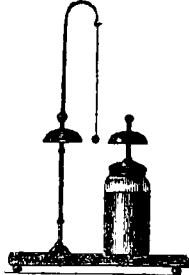
LUMINOUS LEYDEN JAR. FIG. 1.

Diamond or Luminous Jars (Fig. 3); the spots are perforated to show the points on both sides; two and four quarts\$3 75



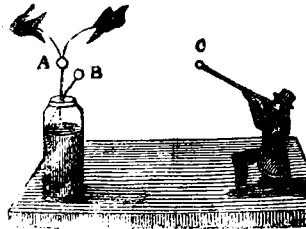
ELECTRIC BATTERIES. FIG. 2.

Electric Batteries (Fig. 2); neatly cased; four 1 quart jars, \$7.25;
 six 1 quart jars, \$9.60; four 2 quart jars.....\$12.00
 Leyden Jar, improved form, with moveable coatings..... 3.00



LEYDEN JAR AND BELLS. FIG. 3.

Leyden Jar (Fig. 3), with bells and stand \$6.00
 Dancing Image Plates, on insulating and adjusting stand, No. 38... 7.25
 Stand for Illuminating Eggs..... 1.80
 Dancing Images, of pith, painted; per pair..... 0.60



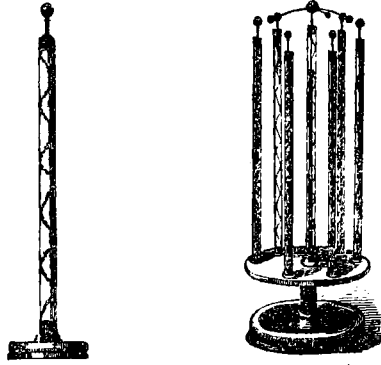
ELECTRIC SPORTSMAN AND BIRDS. FIG. 4.

Electric Sportsman and Birds; used with electrometer jar. 90 cts. and \$1.25
 Electric Birds; per dozen, 90 cts. and 1.25



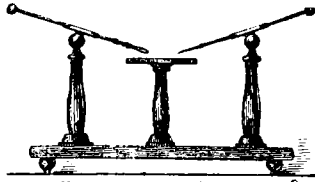
INSULATING STAND FIG

Insulating Stand (Fig. 5), with jar and electrometers \$4.80



SPIRAL SPOTTED TUBES. FIGS. 6 AND 7.

Spiral Spotted Tube and Stand; No. 6, two feet, \$3; three feet...	\$3 60
Set of Six Spiral Inside Spotted Tubes; with centre insulated pillar, and revolving discharger mounted on mahogany stand; with two feet tubes, No. 7	24 00
Insulating Stool; mahogany, 8 inch, swelled legs; neatly finished..	4 40
Insulating Stool; polished wooden top; 13 inches by 11 inches; four massive glass legs	1 60
Electric Seasons Machines, or Tellurian; mounted on insulated stand	3 80
Electrical Orrery, for showing the revolution of the moon round the earth, and of the earth and moon round the sun.....	1 25
Electrical Inclined Plane.....	3 60



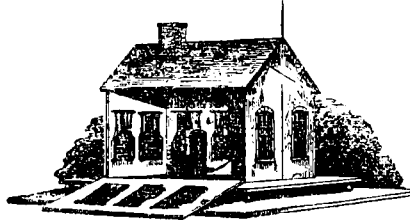
UNIVERSAL DISCHARGER. FIG. 8.

Universal Discharger (Fig. 8); large insulated table, swelled pillars with universal joints, sliding rod with balls, &c. \$6 50



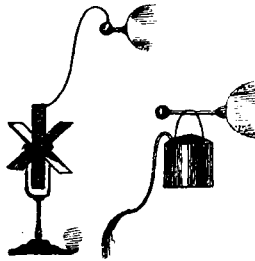
ELECTRICAL DISCHARGER. FIG. 9

Plain Discharger; large glass handle, \$1.25 to	\$3 00
Jointed Discharger (Fig. 9); large handle, best form	4 25
Electric Swing and Image, \$1.25 and	2 40



THUNDER HOUSE. FIG. 10.

Thunder House (Fig. 10); illustrating the lightning rod: the house is held together by magnets, and is blown down by the discharge of a gas pistol within; complete.....	\$6 00
Thunder House, for showing the effects of a stroke of lightning ...	1 00
Electrical Pistol, for exploding the oxyhydrogen gas.....	1 20
Electrical Gas Pistol; plain	0 60
Electrical Swan and Basin	1 20
Electrical Swan	0 45
Artificial Spider, for attraction and repulsion	0 60
Amalgam, per box, 30 cts. and	0 60
Stout rod of Sealing Wax, 12 inches long	0 60
Roll of Tin Foil	0 20
Dutch Gold, per book	0 10
Gutta Percha Insulating Stands, about 5 inches high, with needle tips	0 25
Gutta Percha Insulating Stands, about 5 inches high, with flat circular table tops.....	0 25



WATER BUCKET. FIG. 11.

Water Bucket, to show electrified water.....	\$0 80
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III.—MAGNETISM & ELECTRO-MAGNETISM.

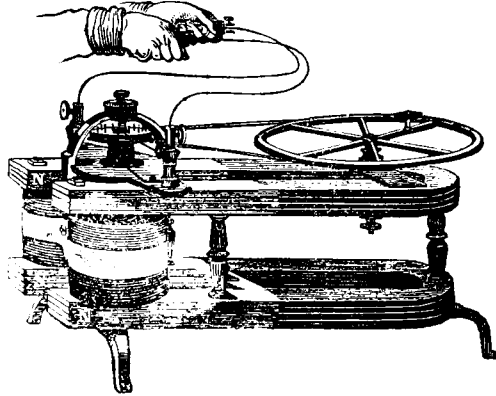


FIG. 1.

Magneto Electric Machine. No. 1.....\$30 00
 " " " in box, from \$9.00 to 15 50

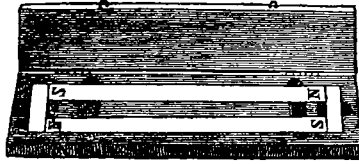


FIG. 2.

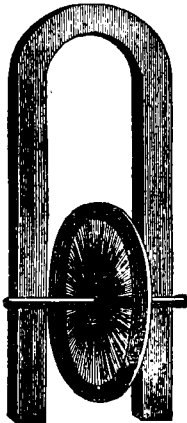


FIG. 3.

Wightman's Improved Box of Magnetic Apparatus. Fig. No. 2.....\$6 00
 U Magnets from 25 cts. to 1 60
 Set of two Bar Magnets, with Armatures in a box; 60 cents and 0 90
 Natural Loadstone, or Magnetic Iron Ore; specimen in box; 30 cents and 0 45

U Magnets (Fig. No. 3) from 20 cents to... 2 50
 Wheel Armatures for ditto. No. 4 0 60



FIG. NO. 5.

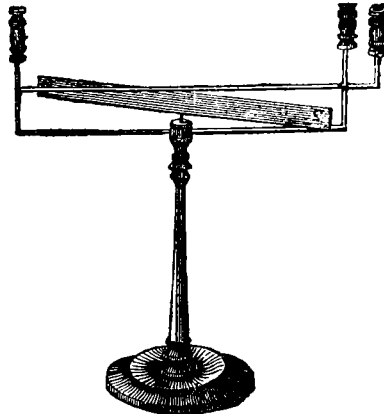


FIG. NO. 6.

Dipping Needle ; brass stand, No. 5	\$1 25
Oersted's Electro-Magnetic Experiment, for showing deflection of a Magnetic Needle, No. 6, from \$2 00 to.....	3 60

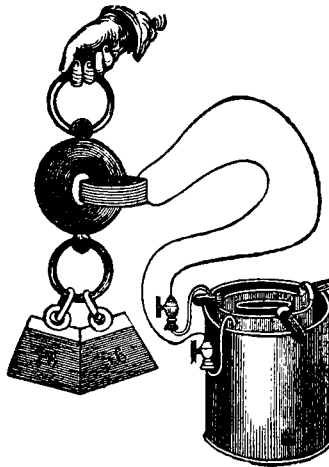


FIG. NO. 7.

Electro-magnet and Keeper, a single coil (fig. 7), without battery ; will carry 112lbs	\$3 00
" " smaller size.....	1 50

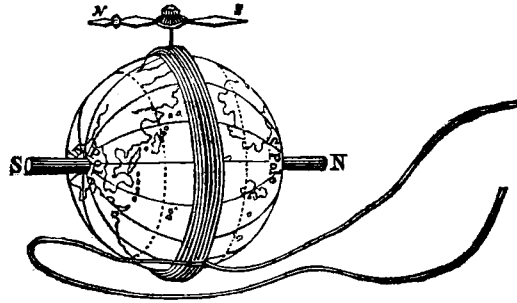


FIG. NO. 8.

Globe and Coil with Magnets and Dipping Needle. No. 8..... \$4 80
 Apparatus for showing the Decomposition of Water, by means of the
 current from the Magneto-Electric Machine..... 4 20

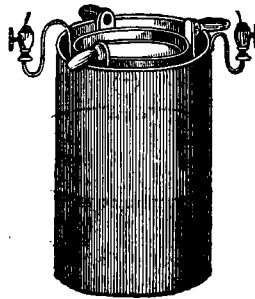


FIG. NO. 9.

Sulphate of Copper Battery, No. 9; this Battery is charged
 with a solution of Sulphate of Copper, (blue vitriol,) by which
 the power of the Battery is sustained..... \$6 50



FIG. NO. 10.

Grove's Battery, No. 10, with Platinum Plates,
 amalgamated Zinc Cylinders, Porous Cups,
 and Glass Jars, used with strong Nitric and
 dilute Sulphuric Acids. 4 series in a Box... 8 75

Smee's Battery; Set of six in a Mahogany tray 10 80

Daniell's Battery; Set of six pints in a Mahog-
 any Tray..... 10 80

Zinc Plates for Smee's Battery, each..... 0 25

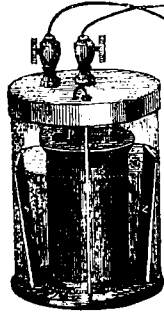


FIG. NO. 12.

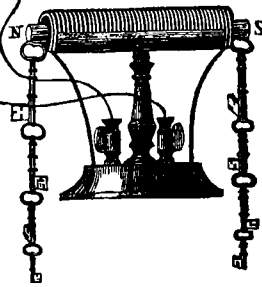


FIG. NO. 11.

Helix and Bar; on stand. No. 11.....	\$2 50
and.....	3 50
Smee's Battery; per pair. No. 12.....	1 80
and.....	2 40

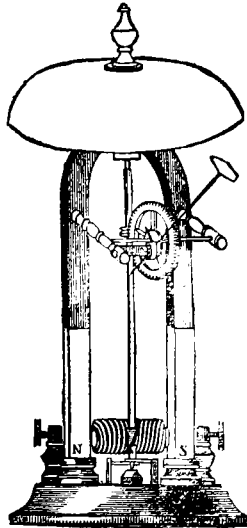


FIG. NO. 13.

Horizontal Revolving Armature Bell Engine. No. 13.....	\$12 00
Revolving Electro Magnet.....	26 00

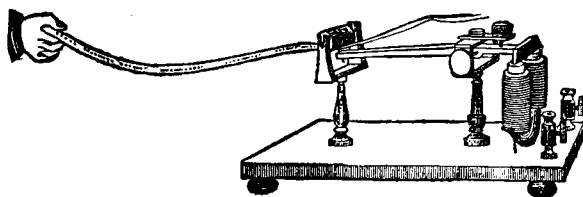


FIG. NO. 14.

Model of American Telegraph, with Spool and Paper. No. 14.....	\$ 6 00
Morse's Telegraph, with clock work, reel, alarm, and brake.....	} 45 00
Signal Key for operating do.....	
Paper reel and paper.....	
Large English Telegraph Model, with table of signs, and a 6 inch needle, for use at lectures.....	\$5 40 and 3 60
A Reverser for use with the electric telegraph model, and other galvanic experiments.....	5 40
Double Beam Axial Engine.....	20 00
Magnetic Toys—ships, fish, swan, &c., in boxes, with magnets, various prices.	

IV.—CHEMISTRY.

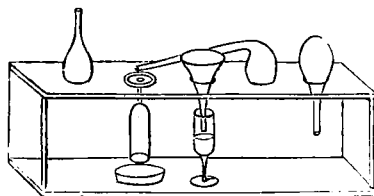


FIG. 1.

I. Chemical Apparatus, &c.

Griffin's Schoolmaster's Laboratory [Publishers No. 2128.] An organized Collection of Chemical Apparatus, sufficient for a course of Elementary Lessons, or for the performance of Chemical analysis. The number of articles in this collection is about 270. Price, neatly packed in a box by publishers, and sold unopened	\$ 60 00
Griffin's Schoolmaster's Laboratory [Publishers No. 2129.] For the same objects, but a more expensive collection. This set extends to about 400 articles, including complete sets of Portable Furnaces. Price, packed in a box by publishers, and sold unopened	100 00
Griffin's Apparatus for Johnston's Agricultural Chemistry [Publishers No. 1725.] For the performance of the experiments requisite to demonstrate the chemical facts contained in Professor Johnston's Catechism of Agricultural Chemistry and Geology. Price, packed in a box by publishers, with Text Book, Eng. Edi.....	00

Griffin's Apparatus for Stockhart's Chemistry. A collection of apparatus for performing the elementary experiments described in Stockhart's <i>Principles of Chemistry</i> . Price, packed in a box by publishers, and sold unopened, with Text Book		\$4 75
Griffin's Chemical Laboratories. —Chemical Laboratories, in Portable Cabinets, containing apparatus and preparations for a course of elementary experiments, selected and arranged by John J. Griffin, F.C.S., to accompany "Griffin's Chemical Recreations."		
Cabinet No. 0, in black pine box, containing most essential articles, with Chemical Recreations; packed by publishers, and sold unopened		3 00
Cabinet No. 1, in mahogany box, containing nearly 40 articles; packed by publishers, and sold unopened		4 50
Cabinet No. 2, in mahogany box, containing nearly 60 articles; packed by publishers, and sold unopened		8 00
Cabinet No. 3, in mahogany box, containing nearly 80 articles; packed by publishers, and sold unopened		10 00
Cabinet No. 4, in mahogany box, containing nearly 100 articles; packed by publishers, and sold unopened		12 50
Cabinet No. 5, in mahogany box, containing nearly 120 articles; packed by publishers, and sold unopened		15 00
Griffin's Atomic Symbols ; consisting of Coloured Cubes, about two inches square, intended to represent Chemical Atoms or Volumes. They can be easily grouped so as to illustrate the Atomic Constitution of Compounds, &c. Price per dozen, any colour		1 25
1. Oxygen, <i>White</i> .	5. Arsenic, <i>Green</i> .	
2. Hydrogen, <i>Pale Blue</i> .	6. Carbon, <i>Black</i> .	
3. Selenium, <i>Pale Brown</i> .	7. Heavy Metal, <i>Blue</i> .	
4. Phosphorus, <i>Flesh-Red</i> .		
Statham's Chemical Cabinets , similar to the foregoing. (Negretti and Zambra's):—		
Cabinet No. 1, in mahogany box, contains upwards of 60 chemical reagents, &c.; packed by publishers, and sold unopened		5 50
Cabinet No. 2, in mahogany box, contains upwards of 60 chemical reagents, &c., superior; packed by publishers, and sold unopened		8 00
Cabinet No. 3, in mahogany box, contains upwards of 70 chemical reagents, &c., superior; packed by publishers, and sold unopened		11 00
Cabinet No. 4, in mahogany box, contains upwards of 79 chemical reagents, &c., superior; packed by publishers, and sold unopened		16 00
Cabinet No. 5, in mahogany box, contains upwards of 79 chemical reagents, &c., for qualitative analysis; packed by publishers, and sold unopened		44 00
Statham's Agricultural Test Chests , for the qualitative analysis of soils, manures, &c.		
Cabinet No. 1, in pine box, with nearly 100 reagents: sold unopened		16 00
Do No. 2, do do do larger and better "		27 00
Do No. 3, do do do do do "		44 00

Universal Portable Furnaces, refractory fire clay, bound with iron; English manufacture.....	\$11 00
Evaporating Furnace with handle.....	0 75
Combustion Furnace, as improved by Stenhouse.....	1 25
Hydrogen Balloons, of gold beater's skin, from.....	1 00
Pneumatic Cisterns of copper and tin, various prices.	
Plain and Tubulated Retorts, from a gill to two quarts, from 40 cts. to	1 50
Hydrogen Gas Generator, with gas jets, &c.	4 80
Superior Gas Bags, India rubber cloth, with brass connector, from	2 00
Small Copper Cannister, Screw and Hose, for making hydrogen; very useful for charging Compound Blowpipes, and filling Balloons	2 40
Brass Hydrogen Bubble Pipe.....	0 90
Alcohol Blast Lamp, of copper; useful in bending Glass Tubes, heating Platina Crucibles, and other purposes where an intense heat is required	2 50
Glass Blower's Lamp, Danger's pattern	1 10
Blowpipe Apparatus, in a box.....	5 00
Funnel Holders, with moveable arm, from.....	0 30
Vertical Support and Retort Holder, with rod, loaded foot, and nut	1 00

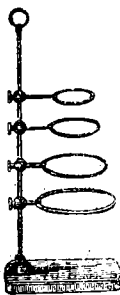


FIG. 2.

Lamp Stand, with four bows and binding screws, No. 2 \$2 40



FIG. 3.

Test Tubes, with stand; 1 dozen assorted, No. 3 \$2 40
 Round Tin Plate Stills, one gallon..... 4 00
 Chemical Balance, with weights 0 90 || Chemical Labels, in book form, 10 cts. to..... | 0 35 |
| Glass Tubing, Combustion Tubes, Connecting Tubes, Gas Bottles, Syphons, Pipettes, Alcalimeters, Glass Funnels, Porcelain Funnels, Boiling Flasks, Test Tubes, Evaporating Basins, Stopcocks, &c., &c., including all the glassware required in the Laboratory, at various prices. | |

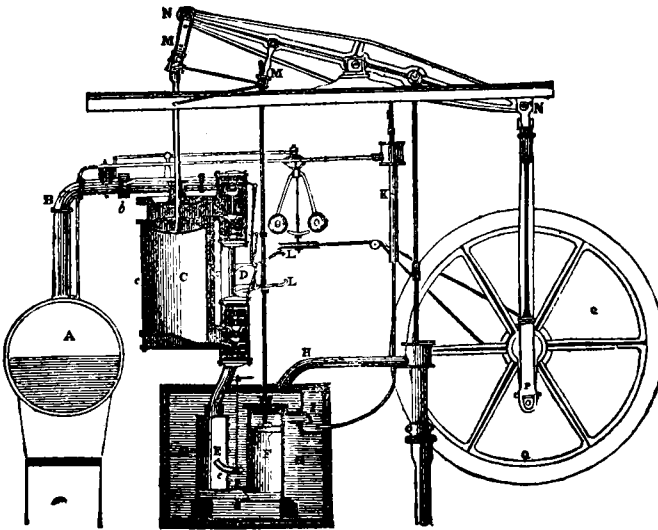
2. Charts and Books.

Youman's Chart of Chemistry. —Containing about one thousand Diagrams, in sixteen different colours. The illustrations refer to—1. Simple bodies; 2. Binary compounds; 3. Salts; 4. Minerals; 5. Organic compounds; on cloth and varnished. Size, 4 feet 9 inches wide, by 3 feet 6 inches deep, with Class Book		\$5 00
Youman's Class Book of Chemistry , in which the Principles of Science are familiarly explained and applied to the Arts, Agriculture, Physiology, Dietetics, Ventilation, and the most important Phenomena of Nature. 12mo., pp. 340		0 63
Youman's Chemical Atlas , with thirteen coloured plates, constructed from the Chart. 4to., pp. 105		1 60
Foster's Chart of the Organic Elements , beautifully coloured, mounted on rollers, with Text Book. Am. Edi., <i>hb</i>		3 75
Foster's First Principles of Chemistry , illustrated by a series of the most recently discovered and brilliant experiments known to the Science. Adapted specially for classes. 12mo., Sheep, Am. Edi., <i>hb</i>		0 50
Galloway's Chemical Plates , constructed for the Department of Science and Art, London, comprising:		
1. Table of elements, mounted on rollers, and varnished. Size, 4 feet 3 by 3 feet.		
2. List of Basic substances,		
3. List of Acid substances,		
4. General formula of the more important Salts.		
} Mounted on one canvas and rollers, and varnished. Size, 2 ft. 3 by 3 ft. 3.		
Price for the set, mounted, &c.,		3 00
Brand's Table of Chemical Equivalents, Weights, Measures, etc. In five sheets. Eng. Edi., <i>jwp</i> . Price per packet		0 73
Rose's Chemical Tables , 8vo., cloth, pp. 69, Am. Edi., <i>lbc</i>		0 6
Stockhart's Principles of Chemistry , illustrated by simple experiments; by Dr. Julius Adolph Stockhardt. Translated by C. H. Pierce, M.D., and edited by Professors Pierce and Horsford, of Harvard University; pp. xix. 681, Eng. or Am. Edi., <i>jb. hgb</i>		1 00
Stockhart's Chemical Field Lectures for Agriculturists , 12mo., Eng. Edi., <i>hgb</i>		1 05
Will's Qualitative Analysis		1 25
Wood's Chemical Manipulation		0 95
Johnston's Catechism of Agricultural Chemistry and Geology. —By Professor James F. W. Johnston, M.D.; with an Introduction by John P. Norton, A.M., and an Appendix compiled by James W. Dawson, Esq., A.M., late Superintendent of Education, Nova Scotia, Principal of McGill College, Montreal. 24mo., pp. 78 boards		0 20
Do do English Edition. 24mo., pp. 63, cloth stitched		0 20
Johnston's Elements of Agricultural Chemistry and Geology. —By Professor James F. W. Johnston, A.M. Eng. Edi., <i>ubs</i> . 12mo., pp. 337		0 97
Do do American Edition, 12mo		0 80
Phillip's Metallurgy. —A practical treatise on the Chemistry of the Metals		2 50

V.—HEAT.

Pyrometer ; this consists of an iron bar and plate gauge, to show that metals expand in all directions when heated	1 20
Model Thermometer ; to illustrate the expansion of liquids by heat; 16 ounce flask, with 36 inch tube, scale printed on white wood, 30 inches long, comprehending 100°, from 60° to 100° Fahrenheit	1 00
Pair Planished Reflectors ; 13 inch, in cases which serve for stands, iron ball and stand	8 10
Brass Reflectors , true parabolic, on stands, with iron ball, new and convenient arrangement for adjusting the foci, per pair	10 80
Concave Reflectors , silvered copper, burnished, 6 inches diameter, with rod, foot and thumb screws	1 50
Pulse Glass , consisting of a tube with two bulbs, large size, for showing the ebullition of spirits in vacuo, on applying the heat of the hand; mounted on a stained wooden support	1 25
Conductometer for showing the capacity of different metals to conduct heat by the firing of phosphorus, from \$1.10 to	2 20

VI.—STEAM.



1. Models.

Wightman's Sectional Model of Watt's Low-Pressure Steam Engine and Boiler, with furnace. Beam 16 inches	\$38 00
Miniature Steam Engine, High-Pressure, of Brass	13 00

Revolving Steam Jet, of Brass, complete in itself; illustrates Hero's Steam Engine.	\$1 70
Wollaston's Illustration of Low-Pressure Steam Engine.	0 90
A Sectional Model of the Steam Engine; by which the motions of the several parts, its internal structure, and the high and low-pressure principles, can be easily explained, Price in a box. . .	11 50

VII. CHARTS AND BOOKS.

Mabrun's Mechanical Diagrams. French Lithographs, beautifully colored and shaded; prepared for and approved by the Department of Science and Art, London viz:—Locomotive Steam Engine and Stationary Steam Engine. Size of each Diagram 5 feet 3 inches by 4 feet. Mounted on rollers and varnished.—Price each.	4 50
Reynolds' Mechanical Diagrams. Size of each Diagram is 3 feet by 2 feet, coloured. Singly \$1.50 each; on rollers, varnished \$1.88 each, per set, viz: Condensing Steam Engine, Locomotive Engine, High Pressure Engine, Marine Engines, Oscillating,	
Reynolds' Steam Engines. Historical and Descriptive account of the Steam Engine. Enclosed in a portfolio, cloth <i>jr.</i> Price for the two.	2 10
Reynolds' Steam Engine and Boiler. Showing clearly the working parts of each; on a sheet, coloured, and folded in wrapper, with Popular Description.	0 80
Reynolds' Section of a Steam Frigate, On the Paddle-Wheel principle, showing the internal arrangements, with a view of the most improved form of Marine Engine. Drawn by A. W. Morant, C. E. Same size as the preceding print, to which it is designed as a companion. In wrapper.	0 20
Bournes' Steam Engine, A Catechism of the Steam Engine, A. E.	0 65
Lardner's Steam Engine, With numerous Engravings. A. E.	1 15
Steam and Steam Engine. Paper.	0 10

VIII. MECHANICS.

Mechanical Powers. mahogany frame, with four sets brass pulleys, with silk cord, two sets brass weights, simple and compound levers, wheel and axle, screw and lever with nut, screw as an inclined plane, wedge in sections, inclined plane with arc and binding screw, carriage, ship's capstan, &c. complete, No. 1. \$30 00	
Mechanical Powers. do do three do (as above). Price in Box with Directions.	17 00
Mechanical Powers, containing the lever, wheel and axle, a series of pulleys, the inclined plane, wedge, screw, with examples of the Parallelogram of forces, centre of gravity, friction, collision of elastic bodies—Compound Lever. (Height of the frame, 2 feet 6 inches; width 2 feet 3 inches).	28 50
A Smaller Set, omitting the Parallelogram of Forces and Collisions of Elastic Bodies (height of the frame, 2 feet 1 inch; width, 1 foot 11½ inches).	14 25
A Commoner Set (height of the frame, 2 feet; width, 19 inches). .	7 25
A Train of Spur wheels, mounted on a mahogany stand, with weights. Price in a box.	6 00

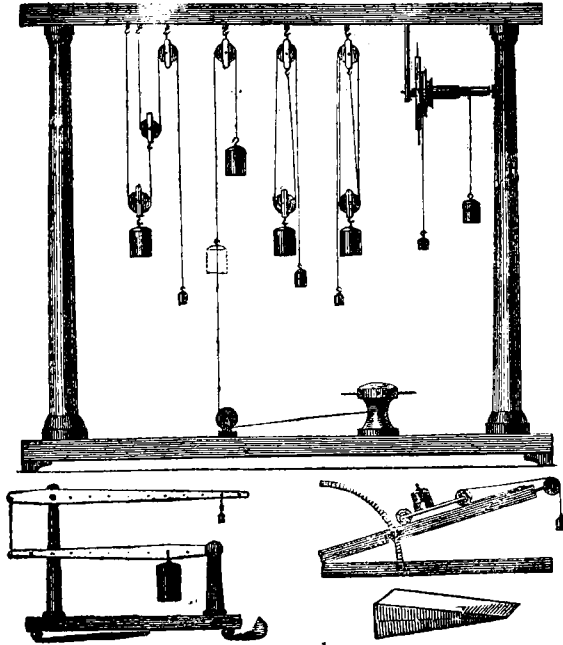


FIG. NO. 1.

- A double Inclined Plane, with an Application of the Composition and Resolution of Forces. In a box..... \$2 75
 Bent Lever, convertible into a Toggle Joint Press with weights, and description. Price..... 1 50

Inertia Apparatus, (a card being projected by the spring and leaving the ball upon the pillar.) Fig. 2..... 0 60

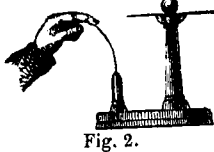


Fig. 2.

Centre of Gravity Apparatus, viz,
 1, 2, 3, blocks of various figures, with centres of gravity, and suspension; 4, two balls on rod, with centre of gravity; 5, Leaning Tower of Pisa, with two centres of gravity; 6, loaded

wheel on stand, with centre of gravity and magnitude; 7, mechanical paradox, a double cone *appears to roll up hill*; 8, horseman, balanced on two points. This set also includes a brass plumb, cord and handle, for supporting the various articles on centre of gravity. Price of set..... 8 75

The Brachystochrone, or line of swift descent; six feet in length made of mahogany, with two ivory balls. The curved path is that of a cycloid, and when two balls are released from the top of the inclined plane and the cycloidal curve at the same time, the latter will reach the bottom first, although the path in which it rolls is the longest..... 10 00

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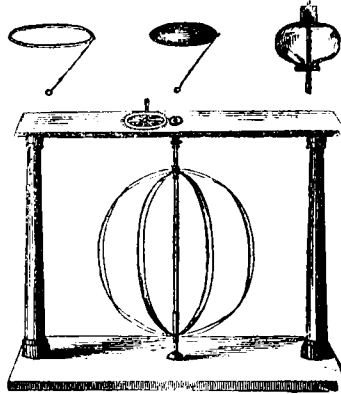
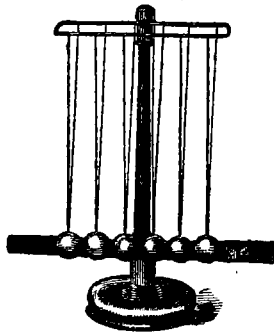


FIG. NO. 3.

- Centrifugal Machine**, mahogany frame, with brass geared wheels, with eight illustrations of central and centrifugal forces, of the cause of bodies revolving on their smallest diameter, of the flattening of the poles, &c., No. 3 9 75
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COLLISION BALLS. FIG. 4.

- Collision Balls**, the same with six $1\frac{1}{2}$ inch lignum vitæ balls, (fig. 4) 3 50

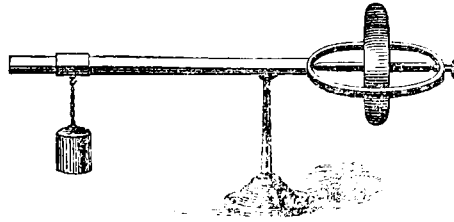


FIG. NO. 5.

Gyratoire.—(No. 5) An oblate spheroid, or wheel, is suspended in a frame, balanced on a point, on which it revolves freely; give the wheel a rapid motion, the frame, if horizontal, becomes immovable; incline it slightly, and it takes a slow, regular motion; illustrating the precession of the equinoxes.....\$ 8.50

Holbrook's Lane's Mechanical Paradox, somewhat similar to the above, \$2.50, \$3.50 and..... 5 00

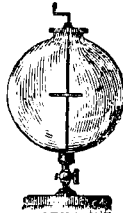


FIG. NO. 6.

Illustration of La Place's Theory. (No. 6.) This instrument is a glass globe, with cap; a shaft, with metal button and crank, stop cock and stand..... 7 25

Screw.—Apparatus for illustrating the principle of the action of the screw; size of the screw 6 inches long, 3 inches diameter, with square bottomed thread, mounted on a spindle with a handle. 1 25

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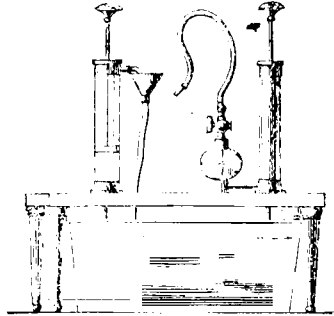


FIG. NO. 1.

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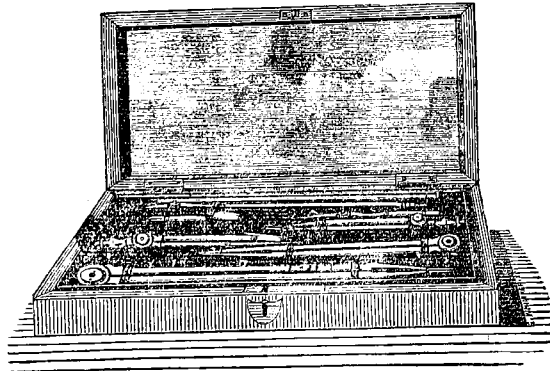
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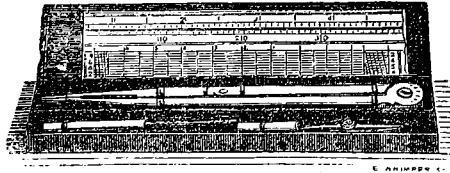
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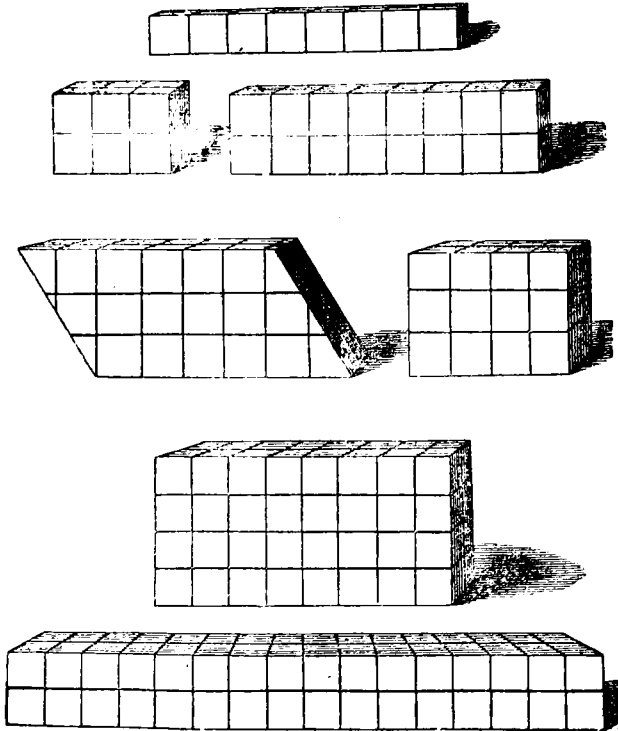
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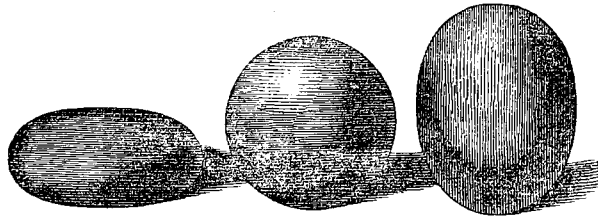
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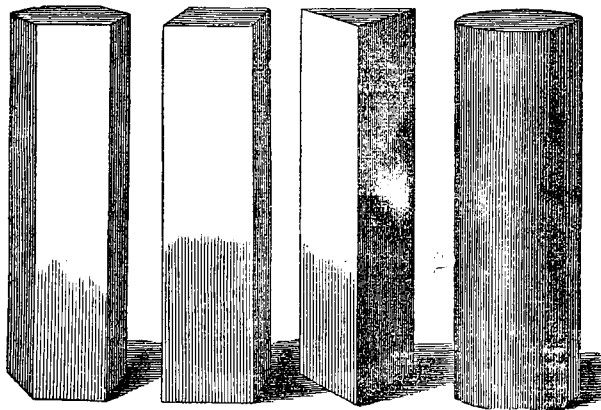
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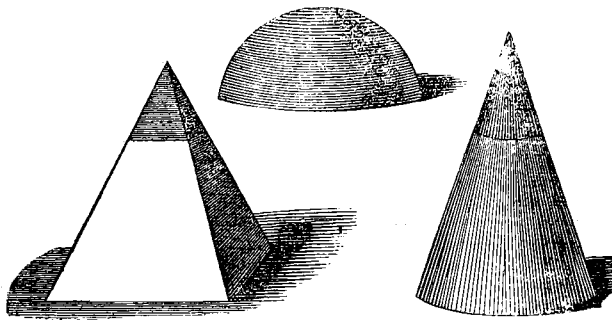


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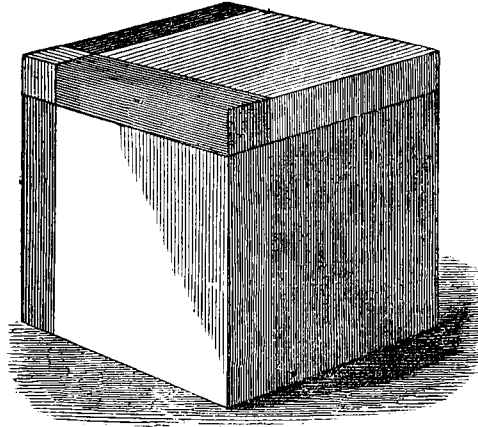
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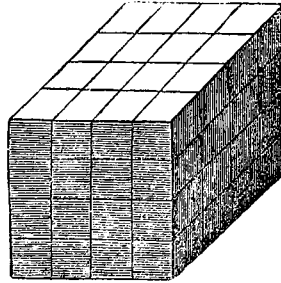
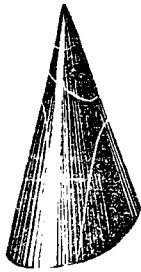
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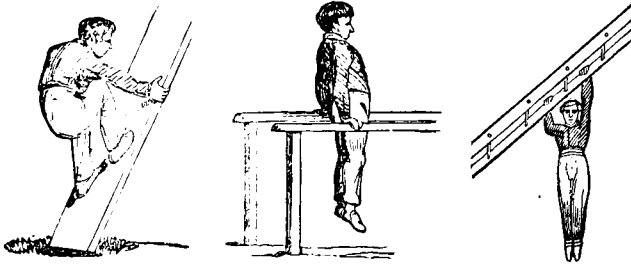
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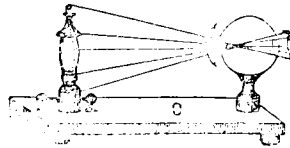
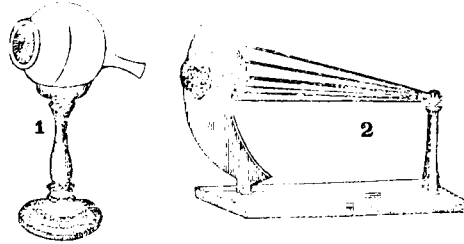


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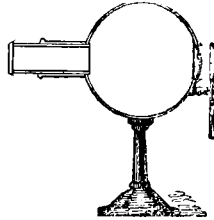
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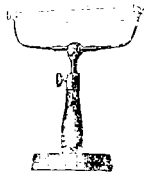
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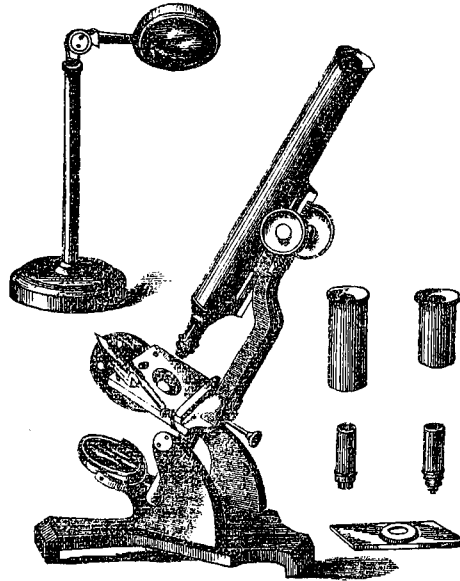


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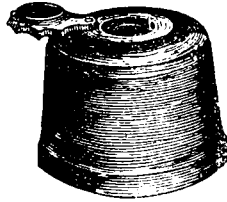
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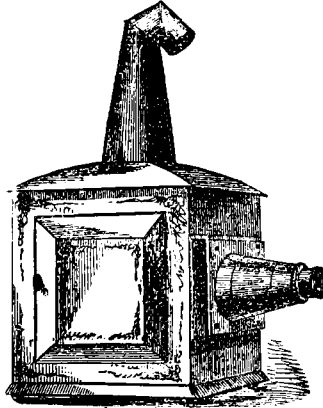


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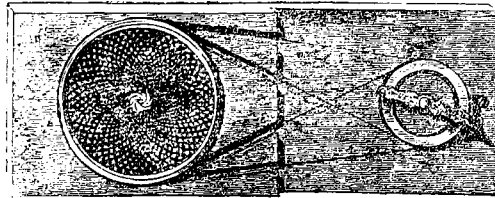


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