CURT W. MEYER,

PHYSICAL & CHEMICAL APPARATUS,

FOR SCHOOL USE.

Office: No. 182 Broadway,

New York.

1881.

CURT W. MEYER'S

Illustrated and Descriptive Catalogue

OF

PHILOSOPHICAL AND CHEMICAL APPARATUS

FOR SCHOOL USE.

Electro Medical Instruments, Batteries,

OPTICAL GOODS, ETC.

ESTABLISHED 1866.

OFFICE: No. 182 BROADWAY.

NEW YORK.
1881.

THREE MEDALS AWARDED,

1870, 1877, 1880.

BRYANT W. DINSMORE, Steam Printer, 38 Cortlandt St., New York.

PREFACE.

The expensiveness of apparatus is sometimes urged as an obstacle to the introduction of science into schools. I hope it will be shown that this obstacle is not a real one. Leaving out of account the few larger experiments, which have contributed but little to our knowledge, it is manifest that the wise expenditure of a few dollars would enable any competent teacher to place the leading facts and principles of natural science completely at the command of his pupils; giving them thereby precious knowledge, and still more precious intellectual discipline, a discipline which invokes observation, reflection, prevision by the exercise of reason, and experimental verification.

And here, if I might venture to do so, I would urge upon the science teachers of our public and other schools that the immediate future of science as a factor in American education depends mainly upon them. I would respectfully submit to them whether it would not be a mistake to direct their attention at present to the collection of costly apparatus. Their principal function just now is to arouse a general love for scientific study. This is best done by the exhibition of the needful facts and principles with the simplest possible appliances, and by bringing their pupils into contact with actual experimental work.

The very time and thought spent in devising such simple instruments will give the teacher himself a grasp and mastery of his subject which he could not otherwise obtain; but it ought to be known by the principals of our schools that time is needed, not only for devising such instruments, but also for preparing the experiments to be made with them after they have been devised. No science teacher is fit to meet his class without this distinct and special preparation before every lesson. His experiments are part and parcel of

his language, and they ought to be as strict in logic, and as free from stammering as his spoken words. To make them so may imply an expenditure of time which few principals now contemplate, but it is a necessary expenditure, and they will act wisely in making provision for it.

To them, moreover, in words of friendly warning, I would say, make room for science by your own healthy and spontaneous action, and do not wait until it is forced upon you by revolutionary pressure from without. The condition of things now existing cannot continue. Its simple statement suffices to call down upon it the condemnation of every thoughtful mind

All doubts expressed as to the value of science teaching in schools, and all objections urged on the score of the expensiveness of apparatus, would, I considered be most practically met by showing what could be done, in the way of discipline and instruction, by experimental lessons involving the use of apparatus so simple and inexpensive as to be within everybody's reach.

Apparatus not of my own manufacture enumerated in this catalogue have been chosen according to my own judgment as possessing either important improvements or being of a superior construction and excellent workmanship. Every instrument is tried and perfectly adjusted previous to shipment.

The most delicate apparatus is handled in my establishment which may assure you of most careful handling of all apparatus intrusted to our care. They are securely packed, for which merely outlay charges are made.

Apparatus will be sold singly or in complete collections.

On goods ordered singly from the list, or on any complete collection of instruments in which no charges are made already for packing 5 per cent. is to be added to the amount of the bill for box and packing.

Goods to be shipped as freight. All orders should be accompanied by money order or draft on New York for the full amount of the bill and also please state by what route and lines to forward.

Goods to be shipped by Express Co. will be shipped C. O. D. if remittance of one-third payment is made with the order.

Goods to be mailed. Small orders should always be accompanied by the cash and sufficient amount added for stamps to prepay the mail.

I insure delivery or safe carriage of goods to any part of the United States or Canada for $2\frac{1}{2}$ per cent.

I will not be responsible for breakage after goods have left my establishment in proper condition securely packed.

Yours respectfully,

CURT W. MEYER,

Established 1866. 182 Broadway, New York.

CONTENTS.

No. 1.

Electrical Instruments,

DESCRIPTIVE.

I. Collection of Electrical Instruments

The only American manufacture designed to accompany

Prof. JOHN TYNDALL'S "LESSONS IN ELECTRICITY."

At the Royal Institution, 1875-76; Published by D. APPLETON & Co., New York.

Tyndall's Manual, "Lessons in Electricity," is an elementary guide-book for practical experiments and self-study, and highly recommended by competent judges as one of Professor Tyndall's most successful efforts to make science clear even to unscientific minds. It contains all the directions necessary for experimental study, which is after all the only real study of this branch of science. The apparatus prescribed is so simple and comparatively so inexpensive, that it will be found to be within the reach of all our schools and almost every student.

I am confident you will, upon due examination, approve of the (duplicate) price list from Tyndall's Manual, which please find appended to this circular.

Collection of Electrical Instruments.—The apparatus is highly spoken of by our press in general, and by all our educational and scientific periodicals. (See extracts below.) The *First Premium* has been awarded to it at the American Institute, N. Y., in 1877. Testimonials, expressing great delight and satisfaction as to the working of the apparatus, and their elegant design and finish, as well as simplified construction, are received daily—in fact, from wherever they have been placed. They are models of instruments, made of the best and most suitable materials; they are of great durability, elegantly finished, and their cost is limited to at least ⅓ of the general prices of apparatus.

The apparatus will be sold singly, for which please find prices on the list, and add 10 per cent. for packing.

Complete Collection of Instruments, (58 in number,) box and packing included, $65.00 net.

Tyndall's Manual, $1.00.

PRICE-LIST OF APPARATUS DESIGNED TO ACCOMPANY

TYNDALL'S "LESSONS IN ELECTRICITY."

1.	A horizontally supported rail, with wire cradle and silk ribbon for suspending excited rods and light bodies	$1 50
2.	A wooden balancing lath and support	75
3.	A delicate straw index on an insulating balancing point on stand	75
4.	Two sticks of sealing-wax	25
5.	Two sticks of gutta-percha	2 75
6.	Two small glass tubes	75
7.	One large tube	1 00
8.	One rubber of flannel	20
9.	One rubber of silk	1 00
10.	Box of amalgam	25
11.	Ebonite comb	35
12.	Foolscap paper	10
13.	Mahogany board	1 50
14.	Piece of india-rubber	25
15.	Watch-glass for Florentine experiment (with oil)	10
16.	Roughened glass tube	1 50
17.	Straw electroscope	1 50
18.	Dutch metal electroscope	1 25

Apparatus for Conduction, Insulation, and Induction.

19.	Long cylindrical conductor	4 00
20.	Cork and rod for insertion into glass tube	15
21.	Box containing fragments of paper for attraction	10
22.	Book of Dutch metal for attraction	25
23.	Long length of copper wire	10
24.	Silk thread for suspending copper wire	10
25.	Long straw index and stand	2 00
26.	Metal table on insulating stand	1 00
27.	A length of packthread	10
28.	A fox's brush	75
29.	A brass tube to fit over end of gutta-percha tube	35
30.	Two metal balls and insulated supports	2 50
31.	Electric Carrier	35
32.	Length of Chain	25

The Electrophorus.

33.	Circular metal plate, with ball and insulated handle attached; and sheet of vulcanized rubber	3 50

Illustration of the Action of Points.

34.	An electric machine	8 00
35.	A conical metal conductor	1 00

36.	Number of Needles	$ 10
37.	Reel of fine wire for connecting conductor with machine	15
38.	Point or wire fitting into prime conductor of machine for the action of electric wind on candle-flame	25
39.	Electric Mill	50
40.	Paper tassel and wire	25
41.	Book of silver leaf	75

The Leyden Jar.

42.	First form of Leyden jar	50
43.	An ordinary Leyden jar	2 00
44.	Bevis's plate	85
45.	Insulated discharger with metal knobs	75
46.	Two sheets of tin with silk holders	50
47.	Glass plate for ditto with silk holders	60
48.	Leyden jar with movable coatings	1 50

Ignition by Electric Spark, etc.

49.	Cottrell's Rubber	1 50
50.	An insulated brass ball	60
51.	An Argand burner and flexible tubing	2 00
52.	An iron spoon for igniting bisulphide of carbon, ether, etc.	15

Duration of Electric Spark.

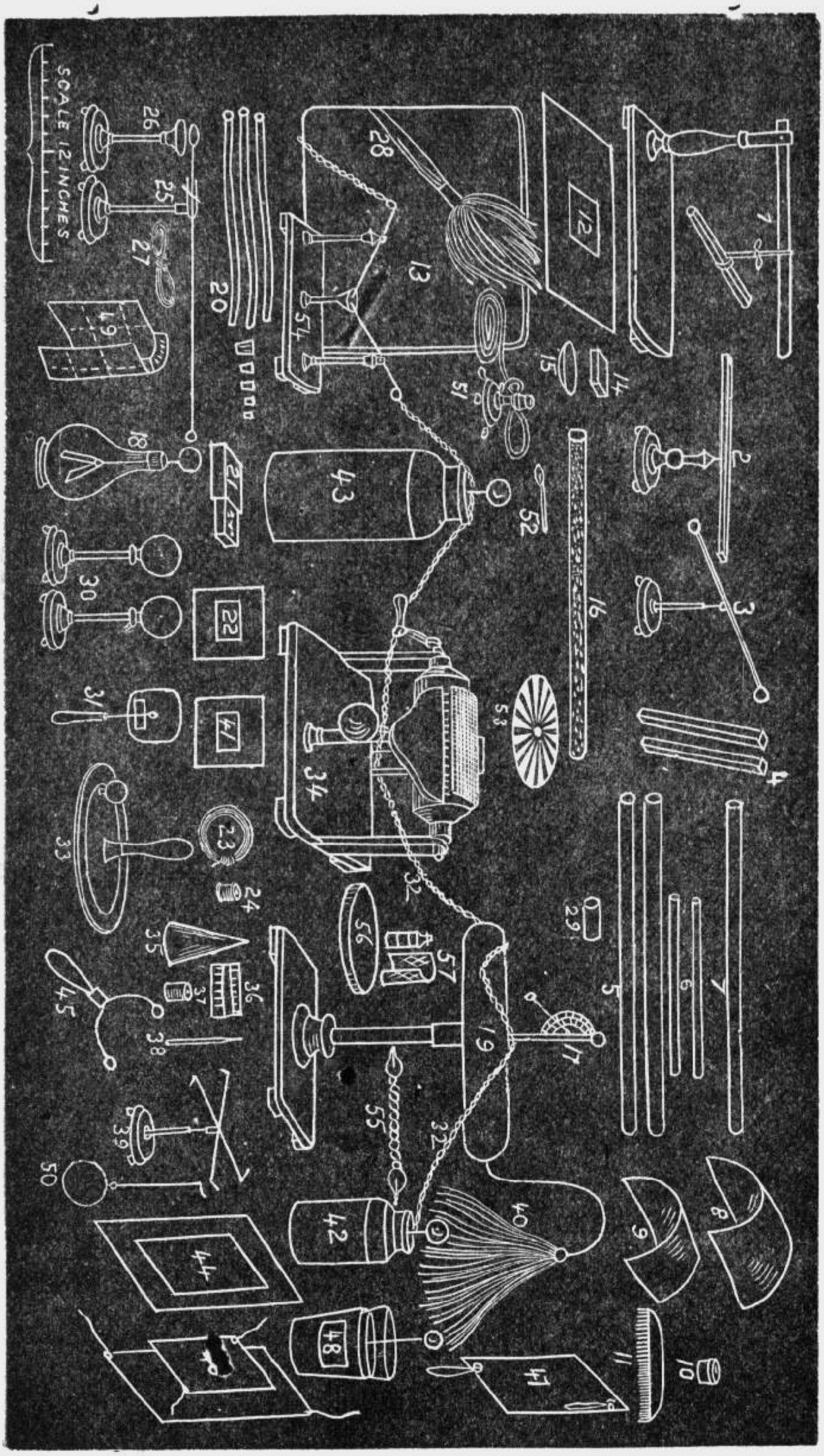
53.	A rotating disc with black and white sectors	1 25
54.	Spark apparatus for connection with Leyden jar	3 00
55.	Vacuum tube (electric light in vacuo)	2 00

Lichtenberg's Figures.

56.	A resin cake	75
57.	Bottle containing a mixture of flowers of sulphur and red lead; muslin gauze for dusting powder on resin surface	25
58.	Box and packing	5 00

The apparatus is supplied by CURT W. MEYER, 182 BROADWAY, NEW YORK. *Price of the whole collection, box included,* $65. *The instruments may be had singly or collectively.*

A smaller collection of neat apparatus, consisting of plate machine with 6 apparatus. See page 13.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EXTRACTS FROM THE PRESS.

"*New York Times*," April 2d. 1877.—Tyndall has selected the cheapest and most practical articles to use in his Lessons in Electricity. A price list of these useful apparatus is given in the appendix of the book. The apparatus is offered by CURT W. MEYER, N. Y., at these low rates.

"*New York Tribune*," Dec. 15th, 1877.—

"CHEAP ELECTRICAL APPARATUS."

The well-known work of Prof. Tyndall has been followed in this city. CURT W. MEYER has provided apparatus to execute each of the experiments Tyndall describes. The apparatus can be bought separately, the whole set costing $55. With such apparatus in his hands a student learns to think and operate for himself far more effectively than with costly, complicated machines, which he is rarely permitted to use. This new developed system has already been found of excellent service in the furtherance of intelligent educational work. The apparatus being neatly made, presents an attractive appearance and helps to interest the scholar in the care and management of the tools of science.

"*New Yorker Staatszeitung*," Dec. 16th, 1877.—Das leichtverständliche Werk "Lessons in Electricity," von Prof. Tyndall, wird sich sehr bald Jedem, der Interesse an diesem Zweige der Physik nimmt, als werthvoller Wegweiser empfehlen. Dieses Werk enthält im Anhang ein Verzeichniss von 58 Instrumenten, mit welchen sich alle angeführten Experimente machen lassen, und werden solche von der Firma CURT W. MEYER, N. Y., zu diesen niedrig angesetzten Preisen fabrizirt.

"*New York Evening Post*," Dec. 18th, 1877.—In accordance with Prof. Tyndall's suggestion, CURT W. MEYER, of this city, has devised a set of apparatus, including everything needed for the making of all the experiments described in Tyndall's "Lessons in Electricity." They are offered to schools singly or in complete set at an extremely low price. The complete set is sold for $55. At the prices fixed there is no profit to the manufacturer, but the schools and private classes which need the apparatus will get the benefit of the enterprise. We commend the matter to the attention of teachers in the belief that Mr. Meyer's undertaking will forward the cause of elementary scientific study.

"*Milwaukee Seebote*," Dec. 24th, 1877.—

"ELECTRICITÆT."

Wichtig für Schulen.

Laut Mittheilungen der *New Yorker Staatszeitung* wird von der Firma CURT W. MEYER, in New York, eine Sammlung von 58 electrischen Instrumenten für den niedrigen Preis von $55 angefertigt und verkauft. Für die Solidität des Unternehmens bürgt uns der vorzügliche Ruf, dessen sich als Fabrikant physikalischer Instrumente Herr CURT W. MEYER erfreut, und lenken wir gern die Aufmerksamkeit der Schulvorsteher auf dieses wichtige und liberale Unternehmen.

"*New England Journal of Education*," Boston, Nov. 22d, 1877.—We have carefully examined the cheap collection of electrical instruments manufactured by CURT W. MEYER, N. Y., and have never seen anything to compare with the 58 instruments for the low price of $55. For ordinary schools, these instruments include all that is necessary for a complete illustration of this department of natural philosophy.

Nov. 29th, 1877.—No more suitable present can be made by pupils to their school than a set of Prof. Tyndall's electric apparatus.

"*New York School Journal*," Dec. 8th, 1877, page 4.—

"VALUE OF NATURAL PHILOSOPHY AS A SCHOOL STUDY."

The apparatus of CURT W. MEYER have been carefully examined, and we have found them of beautiful design and excellent workmanship, and have never before seen anything more complete. We hope that this laudable enterprise will soon find deserved appreciation and support.

"*Educational Weekly*," Chicago, Jan. 3d, 1878, page 13.—

"A THOROUGH STUDY OF NATURAL PHILOSOPHY."

It is to be expected, that a large interest will be taken by all in favor of advancement of natural sciences, especially by all our schools not sufficiently provided with instruments, in the reasonable offer made by CURT W. MEYER, of New York. It is further desirable that such a laudable enterprise should soon find its deserved support. We ourselves heartily commend Mr. Meyer's undertaking to the special attention of teachers and students, in the belief that it will much forward the cause of elementary scientific study.

"*National Journal of Education*," Boston, Dec. 6th, 1877, page 257.—

"IMPORTANCE OF A THOROUGH STUDY OF NATURAL PHILOSOPHY."

In accordance with the above expressed desire, a New York firm, CURT W. MEYER, is now manufacturing cheap apparatus. All our institutions not provided as yet should at once attend to give support to such a highly laudable enterprise. A present support of this enterprise would encourage the manufacture of similar cheap collections to illustrate various other branches of physics, resulting in a remarkable interest taken within time by our whole population in the study of Natural Philosophy, beneficially to science and those dependent thereon.

"*Popular Science Monthly*," Feb., 1878, by Prof. E. L. YOUMANS.—

"MEYER'S ELECTRICAL APPARATUS FOR BEGINNERS."

A philosophical instrument maker of New York, Mr. CURT W. MEYER, having been applied to for various articles suitable for rudimentary experiments in electricity, conceived the idea of meeting this demand by preparing the complete set of instruments needed for the illustration of Prof. Tyndall's book. These he has manufactured and put up in cases for transportation, so that those who wish to enter upon such a course of experiments will be spared all trouble in selecting or making the instruments necessary for the purpose. The price is such that many boys will probably be unable to procure it, but there are not many schools that by a little effort could not get the apparatus for the use of their pupils. Electricity is admirably adapted on many accounts for introducing the young to the scientific study of natural objects and agents, and in furnishing them with the facilities and equipments for the work MR. MEYER has done them a very useful service.

"*Merchants' Journal*," New York, Oct. 6th, 1877.—

"PRACTICAL ELECTRICITY."

The idea acted upon by Mr. CURT W. MEYER, Nos. 182 & 184 Broadway, New York, of placing on exhibition a complete collection of electric instruments, designed to accompany Prof. John Tyndall's "Lessons in Electricity," is an excellent one, and will doubtless induce many students of that science to add to their knowledge by actual experiment. The price at which the apparatus is fixed, does not exceed a dollar a piece; the complete apparatus containing 58 various instruments and materials, costs $55.00.

"*Boston Journal of Chemistry*," Oct., 1878.—

"CHEAP ELECTRICAL APPARATUS."

Teachers who wish to illustrate the elements of electricity with their classes, but who can spend but a limited amount for apparatus, should get the cheap but excellent set advertised by Mr. C. W. MEYER, of New York, and also Professor Tyndall's *Lessons in Electricity*, as a practical guide to the use of it. The apparatus has been prepared cheap enough to be within the reach of every school; and the idea has been admirably carried out, for the apparatus is as good as it is simple and inexpensive.

2. The Students' Portable Electrical Machine & Apparatus

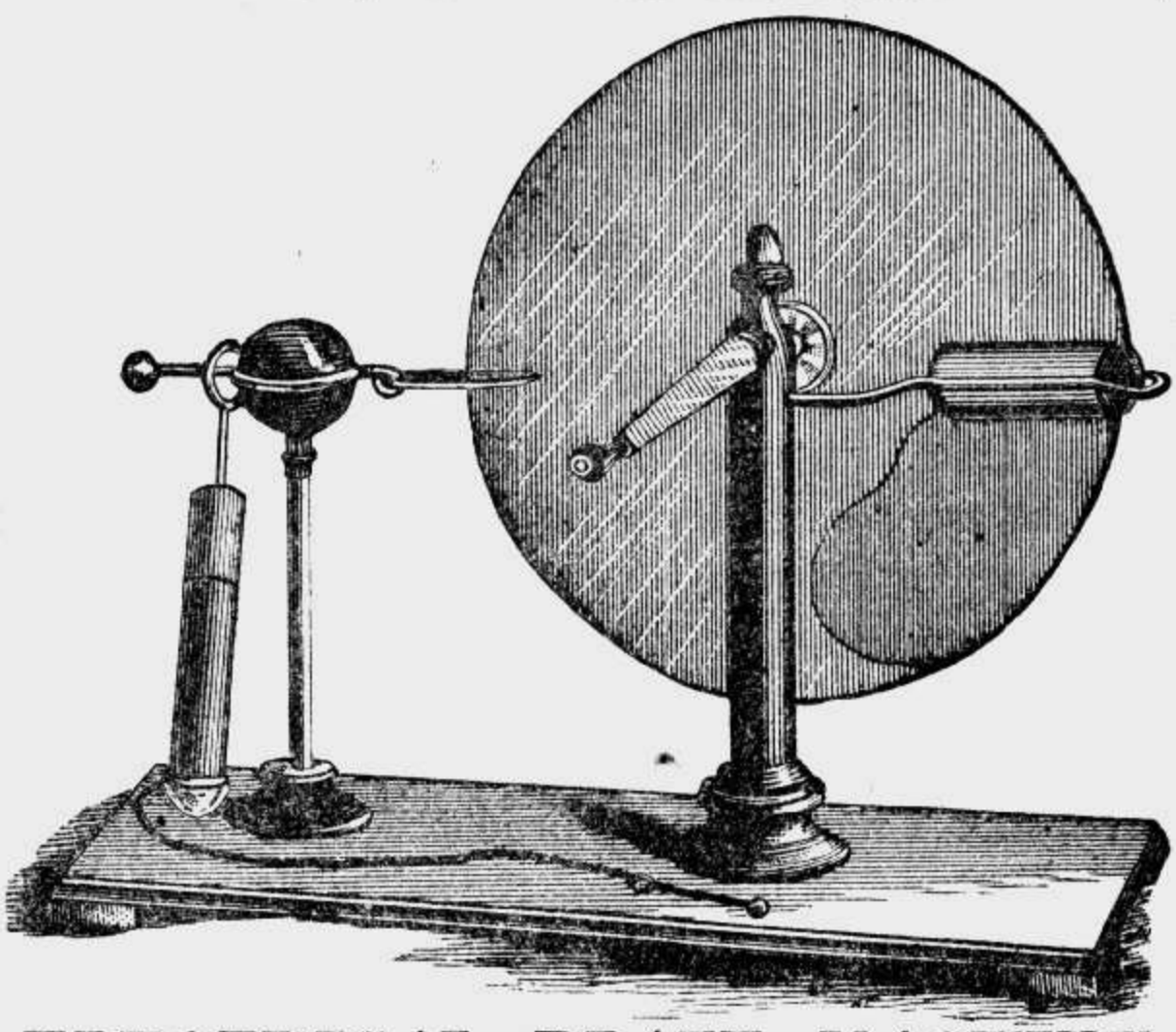
DESIGNED TO ACCOMPANY

Prof. Curt W. Meyer's

Elementary Guide in Electricity.

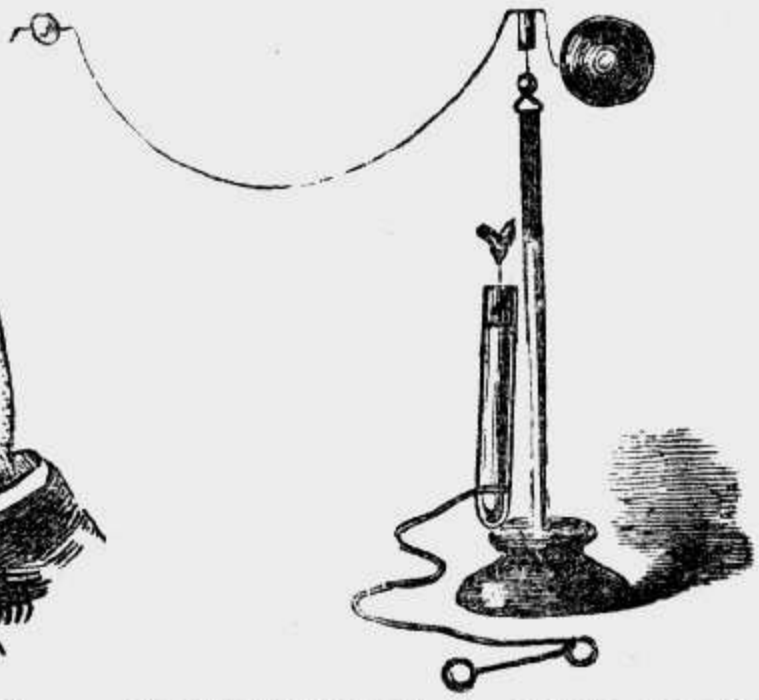
Price, complete, $15.00.

HIGHEST PREMIUM, awarded at the American Institute Exhibition, 1880.



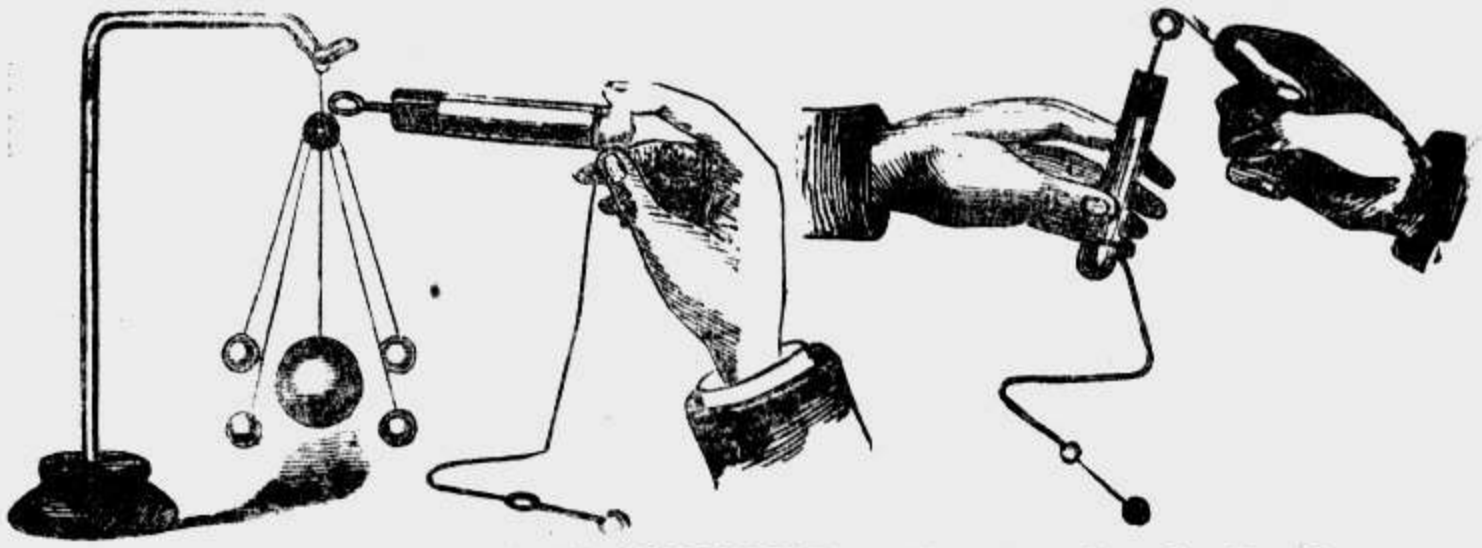
ELECTRICAL PLATE MACHINE.

HEAD OF MEDUSA,



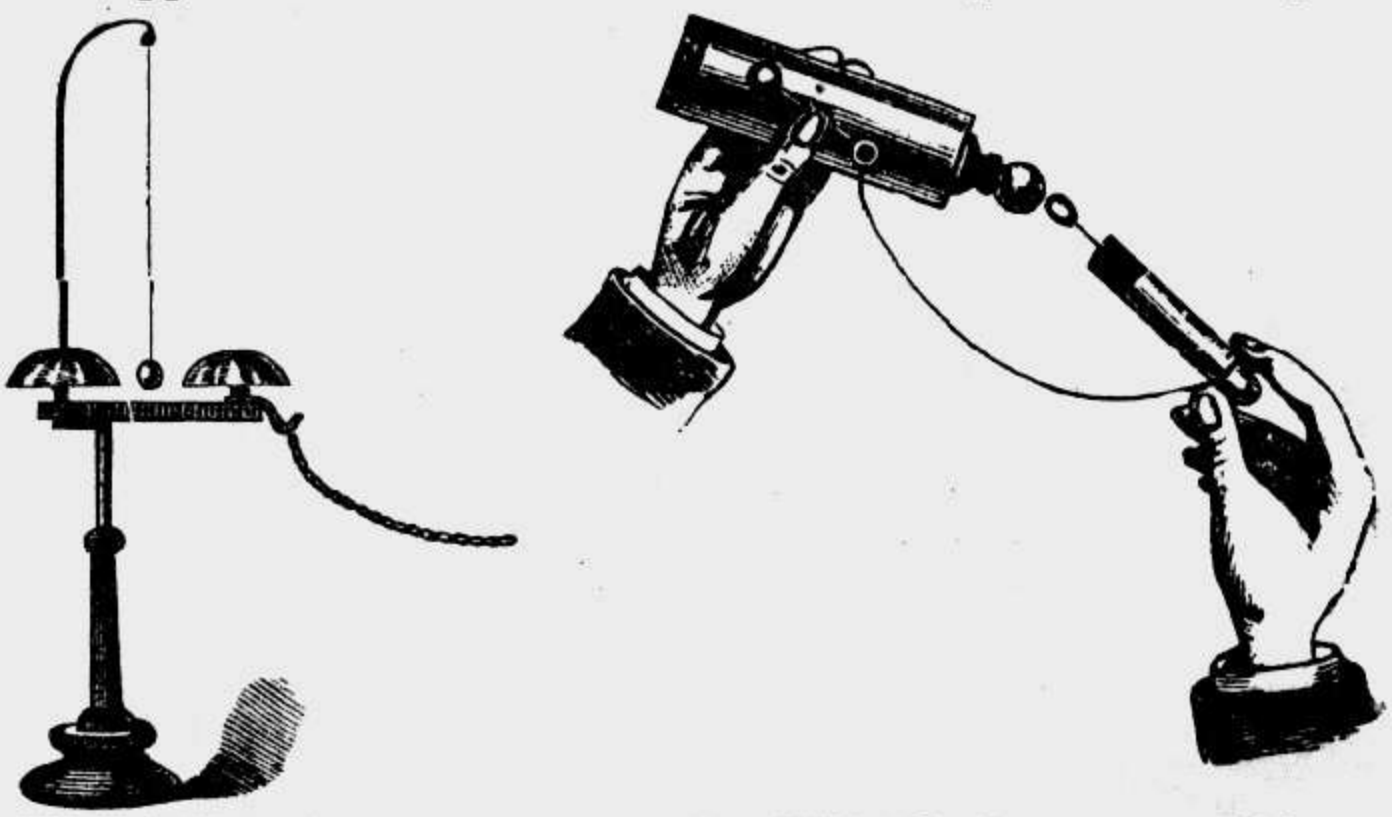
ELECTRICAL ORRERY.

These instruments now in reach of the philosopher and the student are a charming, ready, and effective means of developing this most subtle and interesting force; being one of the most instructive and amusing pieces of apparatus that can be affording endless amusement to young and old alike, and placed in the hands of the you g student of electrical science, forming an elegant addition to evening entertainments.



PITH BALL ELECTROMETER. Leyden Jar & Discharger.

The apparatus is elegant in design and made of only perfect and the most suitable materials. It will illustrate the heating power of electricity by igniting gas, ether, alcohol, firing electric cannon, etc. Will electrify any number of persons joining hands and will also illustrate most of the phenomena of electric attraction, repulsion and induction. A brilliant spark—1 inch—can be produced, showing the electric light in *vacuo*, and illustrating the principles of lightning. The apparatus will furnish the student ample means to per-



ELECTRICAL BELLS. ELECTRICAL CANNON.

form any known experiment of this most amusing science.

This complete set contains the following:

An electrical plate machine, with conductor, Leyden jar, discharger, set of bells on stand, pith ball electrometer on insulated stand, head of Medusa on insulated stand, electric cannon, electrical orrery on insulated stand, box of amalgam, chain, and manual in electricity with illustrations, all contained in neat wooden box. . . . . Price, $15.00.

Extra parts can be had at the following prices;

Glass or rubber plate to fit electrical machine .	$1.00
Vacuum tubes . . . $1.50, $2.00 and	3.00
Leyden jars	75
Sealing-wax, glass tube, flannel and silk . . .	1.00
Bottle with flower of sulphur and red lead mixed, muslin gauze	25
Lightning rod to fit stand; or Franklin's plate .	75
Hard rubber disk for Lichtenberg's figures . .	50
Manual, with illustrations	25

VALUABLE OPINIONS OF THE PRESS.

To repeat here all the articles which have appeared in most of our leading papers concerning the new Student's portable apparatus and electrical machine, would form a book in itself; therefore it will suffice to mention some of the papers with the respective dates on which the article appeared.

New York *Evening Post*, Dec. 15, 1879, Dec. 10, 1880.
New York Herald, Aug. 30, 1880.
New England Journal of Education, Aug. 26, and Dec. 9, 1880.
Brooklyn Eagle, Sept. 1, 1880.
The Churchman, Sept. 15, 1880.
New Yorker Belletristisches Journal, Sept. 10, 1880.
American Business Journal, Oct. 2, 1880.
New York Mercantile Review, Oct. 9, 1880.
Boston Journal of Chemistry, October and December, 1880.
Der Techniker, New York, Sept. 15, Nov. 15, 1880.
The Bulletin (Scientific Record), New York, Oct. 16, 1880.
New York School Journal, Oct. 16, Nov. 20, 1880.
National Journal of Education, Boston, Nov. 4, 1880.
Scientific American, New York, Nov. 6, Dec. 4, 1880.
Milwaukee Seebote, Nov. 16, 1880.
Milwaukee Herold, Nov. 17, 1880.
Toledo Chronicle, Toledo, Iowa, Nov. 18, 1880.
Frank Leslie's *Illustrated Weekly*, Dec. 18, 1880.
New York *Times*, Dec. 12, 1880.
New York *Tribune*, Dec. 12, 1880.
Popular Science Monthly, Jan. 1881.

3. CURT W. MEYER'S,

Late Improved

Holtz Electrical Influence Machines

Are Always in Operation at my Establishment.

The latest improvements which I have made on all my Holtz machines are manifold. They consist:

1. In correctness of construction, specially in the detailed parts of mechanism, respecting the principles of electrical science.

2. In the selection of the most suitable materials.

3. In the adoption of improved condensers.

4. In adding a most elegant design and excellent workmanship.

The highest premium has been awarded to my Holtz machines at the late Industrial Exhibition of the American Institute in New York, 1880, for unexceled perfectness as to the results obtained, and on account of the superiority in construction and elegancy in workmanship.

NOTE.—My large Holtz machine has been operated daily at the American Institute Exhibition from the 15th Sept. until the 27th Nov. within which time a few days only proved unsuccessful to operate the machine, on account of too unqualified a condition of the atmosphere. Within two and a half months, excepting the few days mentioned, the machine never has failed to exhibit its astonishing results. Sparks *eleven* inches in length were discharged in rapid succession; shorter, more condensed, sparks from 6 to 9 inches in length. intensified by a number of condensers, discharged with dazzling brightness, making a report as loud as that of a pistol. The variety of most striking experiments which I have performed there before the public will long be remembered by those who have seen them all.

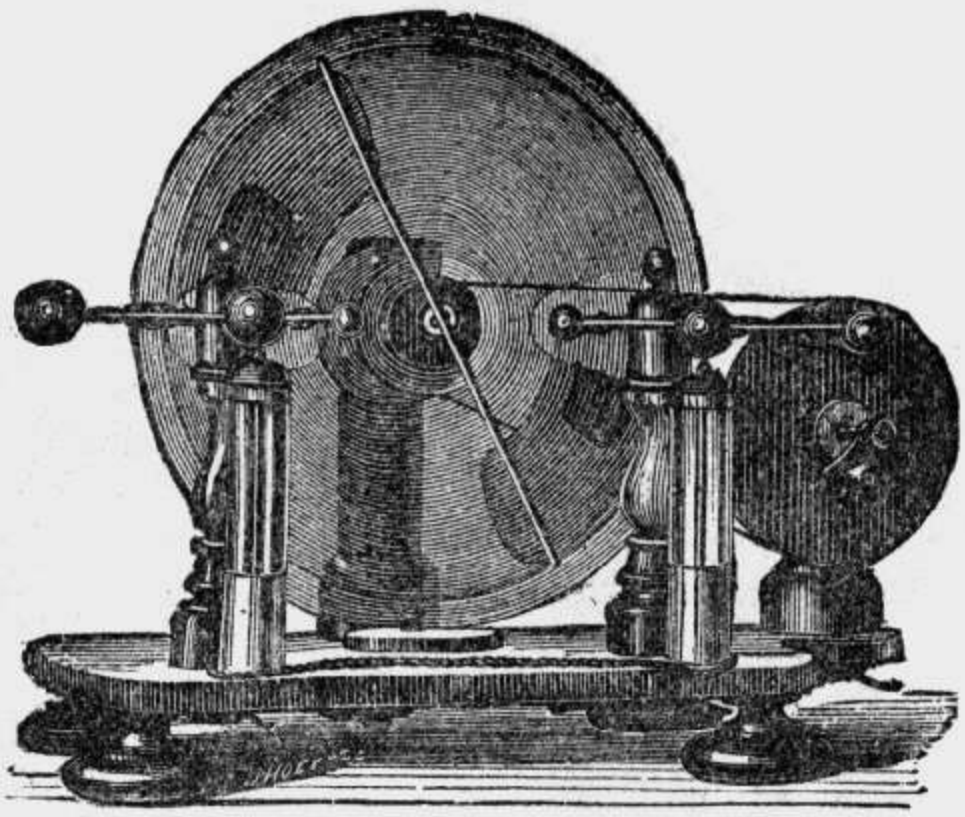
The machine is yet as good as ever, after all this strain, no harm done to it whatsoever.

This is the first trial which has been given to operating Holtz' machines continuously, and I have found the result more satisfactory than first expected.

The amount of ozone produced while the machine is operated was instantly noticed by all visitors who came within the area surrounding the machine. An area which covered not less than 36 feet square was charged with ozone.

Holtz Improved Electrical Machine

No. 1.



The above cut illustrates this machine. Additional modifications and improvements have been made lately, which, however, do not necessitate a change in the above illustration. This wonderful apparatus is of elegant design and the most improved electrical instrument ever invented. The sparks produced are brilliant, *seven inches* in length, discharging in rapid succession, thus enabling the operator to perform experiments which heretofore failed with even ten times more costly apparatus.

This invention is one of the greatest wonders of our age.

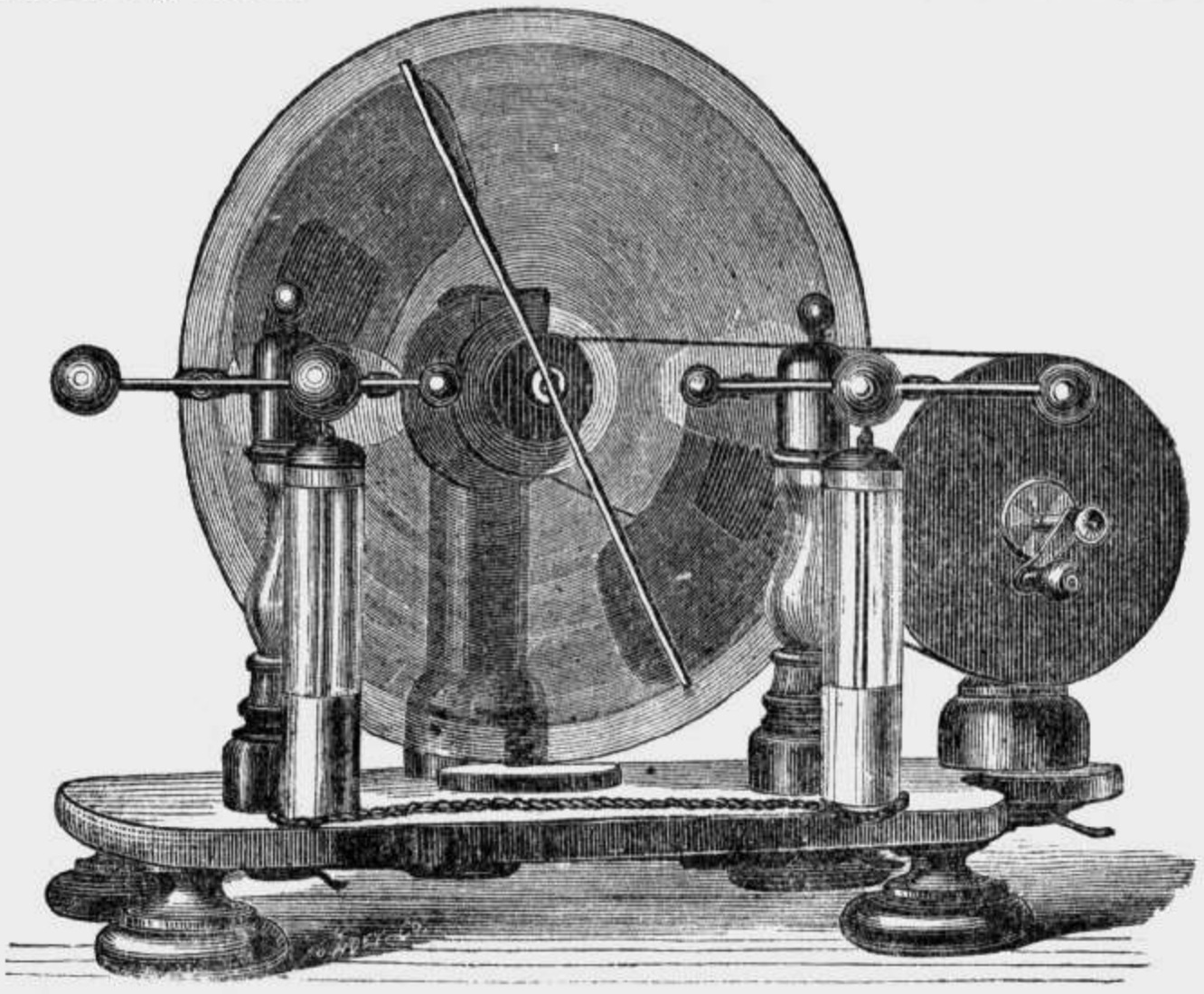
No school should be without it. Students are delighted when seeing the results obtained. The large demand made on these machines enables me to offer them with the latest additional improvements added, also with improved condensers highly finished, including chain rubber and catskin for . . . . . $25.00.

(See illustration on next page.)

This large size Holtz machine with a stationary plate 22 inches diameter productive of a vivid spark *eleven* inches in length, brilliantly intensified, with all the latest improvements complete, ... $75.00.

Holtz' Improved Electrical Machine

Astonishing Results. No. 2 **MINIATURE LIGHTNING**



Directions for setting up and operating the Holtz Machine.

1st. Be careful in unpacking every part of the apparatus. The large pillar with axle attached to receive the revolving glass plate is first to be screwed on to the base of the machine. (I ship the machine sometimes with axle pillar and cast iron stand with wheel remaining attached to the board, to avoid placing them wrong. The engraving will plainly indicate the location of each single part.)

2d. The stationary plate with its paper inductors is the second part to be placed in position and should temporarily be kept leaning against the pillar, resting with its centre hole on the axle. This plate is to be placed in one way only, therefore strictly observe that the paper inductors are exactly situated as shown in the illustration, that is: left side paper inductor pointing upward, right side inductor downward.

3d. Attach the revolving plate to the axle, therefore unscrew the nut and remove rubber ring and *one* paper washer. The revolving glass plate should rest between the two paper washers. Replace rubber ring and nut and have the glass plate well centred.

4th. Set the two conductors in front of the revolving plate with their pointed combs in a horizontal position. These combs must not touch the glass plate, but should be as near as possible. The last point of the comb on left and right should be near the edge of the revolving glass plate.

5th. The stationary plate is now to be brought into its proper position, and should be within $\frac{1}{8}$ inch distance from the revolving plate firmly attached. To do this, set the stationary plate into the slotted centre piece attached to the board and situated in front of the large pillar, then find all the necessary adjustments provided for and to be of service to bring this plate even with the revolving plate. The grooved excentrical rubber rings on each conductor's comb serve to hold the stationary plate in a centred position; they themselves are excentrical and will push the plate more left or right as may be required by giving them a turn. They also serve to move the plate nearer or off from the revolving plate. The slotted centre piece fastened on the base of the machine serves to elevate or lower the stationary plate.

6th. The sliding rods with balls attached on the conductors should be in a position as shown in the engraving, the two small balls opposite each other and the sliding rod in the same horizontal position as the comb.

7th. Attach the cross arm or double comb; slide its centre pin into the hole of the axle of the glass plate, and keep its points almost touching the glass plate. The combs should stand opposite the further ends of the paper inductors on the stationary plate.—*see engraving.*

8th. The Leyden jars or condensers have to be placed one in front of each conductor and by means of the brass hook and chain connected with the conductor. Hang the chain into the Leyden jar and the hook on the brass rod of the comb. The long chain serves to connect both outside metallic coatings of the jars with each other.

9th. Finally attach the iron stand with its wheel and handle on the right hand side of the board, so that the cord pulley of the glass plate is opposite the iron wheel and then fasten the cord to it. The iron stand is moveable in a slot to adjust the cord properly. The stand with its wheel can also be attached with its handle situated on the back of the machine, then use the other slot provided for in the machine base and have the iron wheel almost opposite the pulley of the glass plate. This improvement is made to allow the operator of the machine to stand behind it and give the students a full view of the operating machine.

10th. The revolving plates must always be turned toward the paper induction points and never from them.

11th. To charge the machine rub the vulcanite rubber briskly with the catskin (the latter may be warmed previous, to be perfectly dry), and after the rubber is excited hold it near one of the paper inductors on the back of the stationary plate, drawing it slowly away from them while the machine is being turned in the direction as above described, the machine at once will become charged.

12th. The machine should always be kept perfectly clean and free from dust and moisture, and also remember that the best effects can be produced in a dry room and under favorable conditions of the atmosphere (such as we have on a cold winter day).

13th. If the atmospheric conditions should be unfavorable a charge may yet be obtained by disconnecting the Leyden jars from the conductors, later when the machine is charged they may be connected again.

14th. To produce the "silent" or brush discharge, simply disconnect the chain from one jar to another.

P. S.—I have a great variety of extra fine *Condensers* for either machines, small and larger sizes. My new constructed *Lightning tubes* are also superb and will form one of the finest additions that can be made to these machines. A variety of *Geissler or Vacuum tubes* can be shown to great advantage, and need only to be held between the two poles. A proper selection made from *Tyndall's electrical apparatus* added to these machines will form an outfit in electrical science more complete and more satisfactory for the performance of a great variety of instructive and most amusing experiments than could be done heretofore with far more costly apparatus.

Caution.—All my improved Holtz machines bear a steel blue label with my name and address on the paper inductors of the stationary plate.

4. THE ELECTRIC LIGHTER.

ECONOMY!

The fluid can be prepared at trifling cost. 4,000 lights for five cents.

SAFETY!

No more fires caused by throwing half-lighted matches on the floor.

DIRECTIONS FOR USE.

Take off the lid *A* by pulling the three springs *B* which keep it fastened down; throw the contents of the bottle *C* into the glass reservoir *D*, and pour water up to the arrow embossed on the glass; then put the lid in its place again, taking care that the two wires of the ignitor *E* be well fitted in the two notches indented in the glass. The apparatus is now ready for use. Press on the knob *F* to the full extent of the

Cointepas' Patent. Curt W. Meyer, Sole Agent.

spring, and instantaneously the spiral of platinum wire *G* will be heated to incandescence, and will ignite the wick of the lamp *H*, which SHOULD NOT TOUCH the wire.

☞ *Instructions to be followed*—Never light a lucifer match with the ELECTRIC LIGHTER as phosphorus would damage the platinum wire.

When the composition is exhausted throw it away and renew it.

Each time the liquid is changed, it will be necessary to thoroughly cleanse the zinc with water. To do this, unscrew the knob *F* and the zinc will fall of itself between the two pieces of carbon. Replace it in like manner after washing.

The lamp *H*, when empty, should be replenished with alcohol or refined petroleum.

To Save trouble and Expense purchasers are advised to have the fluid prepared by a druggist, using the following recipe.

Recipe by Weight of 100 *parts*—Take 75 parts of cold water into which pour *very slowly* 20 parts of sulphuric acid; then 5 parts of Bichromate of Potash. Stir the whole, and pour into a large bottle for use when required. Special care should be taken not to use the liquid before it is cold. The quantity poured into the glass jar should not rise above the arrow embossed on the glass.

The Electric Lighter is FREE FROM ALL DANGER. The liquid is NOT INFLAMMABLE.

Price of the Electric Lighter, complete $3.50

No. 2.

Philosophical and Chemical APPARATUS.

IN

COLLECTIONS, ECONOMICALLY SELECTED FOR SCHOOL USE

1. List of Physical Apparatus

DESIGNED TO ACCOMPANY

PROF. BALFOUR STEWART'S PHYSIC PRIMER.

An admirable text book in physics as the above with the apparatus at command will enable the teacher to perform the most important physical experiments with certainty.

1 Tin pan with peas
2 Iron plate with four strings
3 Balance to carry 2 lbs. in each scale; beam 15 to 18 inches long
4 Piece of metal (200 grains weight)
5 Set of weights (600 grains to ½ grain)
6 2 lbs. mercury in bottle
7 Two pieces of glass two inches square
8 Two 4 lb. weights
9 Plumb line
10 Stoneware dish for mercury
11 Tube for showing level of water
12 Metal cylinder with two tubes and stoppers
13 Tube with movable bottom and cord
14 Water jar for tube
15 Indigo solution
16 Substance weighing 1000 grains same specific gravity as water
17 Hollow brass cylinder
18 Bucket to contain above
19 Apparatus for attaching the bucket to balance
20 Block to illustrate flotation
21 Air-pump, Tate's principle
22 Bell-jar receiver
23 Two India rubber balls
24 Jar with neck and flange
25 Two pieces of India rubber
26 Magdeburgh Hemispheres
27 Brass cock for hemispheres
28 Tube for barometer
29 Glass mortar for cistern
30 Funnel for filling barometer
31 Vibrating wire on support
32 Model thermometer
33 Centigrade thermometer
34 Bladder two-thirds filled with air
35 Flask for boiling water, and cork in duplicate.
36 Triangle and wire gauze to support flask
37 Pan to hold sulphuric acid in vacuo, and shallow vessel to hold water

38 Wires to show unequal power of iron and copper to conduct heat
39 Apparatus to show image of candle
40 Electric pendulum
41 Several pieces of elder pith
42 Electroscope
43 Holtz improved electric machine 14 inch plate
44 Box amalgam
45 Rod, half glass, half brass
46 Rod of glass, covered with red wax
47 Piece of silk
48 Piece of flannel
49 Brass ball with point on insulated stand
50 Leyden jar, pint size
51 Discharger
52 Galvanic battery, 4 cells, Grove's or Bunsen's
53 Length of fine platinum wire
54 Electro magnet
55 Knitting needle and thread
56 Apparatus for Oersted's experiment
57 Thirty feet of covered wire
58 Box and packing

Apparatus complete (58 in number), HOLTZ IMPROVED ELECTRICAL MACHINE included, price . . $110.00.

The above price is subject to change. Prices of single apparatus from the above list will be furnished upon application.

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2. List of Chemical Apparatus

DESIGNED TO ACCOMPANY

PROF. H. E. ROSCOE'S CHEMISTRY PRIMER.

The above Primer is a most succcessful effort to convey information in such a manner as to make it both intelligible and interesting to very young pupils, and so to discipline their minds as to incline them to more systematic after-studies. Simple experiments have been devised, leading up to the chief truths of chemistry.

1 Taper with wire holder
2 Glass tube containing a taper, with U tube for holding the caustic soda, and caoutchouc tubing to connect to the aspirator.
3 Pair of hand-scales with glass pans, and weights in oak box
4 A 2 oz. glass flask, iron tripod stand.
5 Bunsen's burner, with 1 yard of caoutchouc tubing.
6 A bell jar, capsule to contain the phosphorus.
7 Apparatus for decomposing water by electricity, with 2 collecting tubes and wire to suspend them
8 A 4 cell Grove's or Bunsen's battery in wooden tray, with wires.
9 Glass mortar and pestle, gas eprouvette.
10 Flask, etc., for generating hydrogen.
11 Stoneware pneumatic trough, with beehive shelf.
12 4 wide mouthed gas-collecting bottles, pint size.
13 3 stoneware gas trays.

14 A pint flask, wash bottle.
15 Two U shaped calcium chloride tubes, and hard glass tube to contain the copper oxide.
16 Two 8 oz. stoppered glass retorts.
17 A retort stand, with three rings, and clamp for test tubes, etc.
18 A 16 oz. porcelain evaporating dish.
19 A 4 oz. porcelain evaporating dish.
20 Two 3 inch glass funnels.
21 Filter papers.
22 A horse-shoe magnet and armature
23 A palette knife
24 A piece of iron wire gauze six inches square
25 Iron tray or sand bath
26 One dozen 5 inch test tubes and test tube holder
27 Test tube stand for 12 tubes
28 One blowpipe, two files (round and triangular)
29 Half a pound of glass tubing, selected
30 2 dozen spare corks
31 Box and packing

The apparatus complete. Price $47 00

The above price is subject to change. Prices of single apparatus from the above list will be furnished upon application.

3. List of Chemicals, Etc.

SELECTED TO ACCOMPANY

PROF. H. E. ROSCOE'S CHEMISTRY PRIMER.

1	Sulphuric acid	4 lbs	25	Potassium nitrate	4 oz
2	Nitric acid	3 lbs	26	Zinc	2 oz
3	Hydrochloric acid	2 lbs	27	Copper turnings	2 oz
4	Lime water	1 pint	28	Copper oxide	2 oz
5	Ammonia (solution)	4 oz	29	Copper sulphate	2 oz
6	Caustic potash	4 oz	30	Antimony	2 oz
7	Sodium carbonate	4 oz	31	Mercury	2 oz
8	Potassium chromate	4 oz	32	Lead acetate	2 oz
9	Potassium ferrocyanide	4 oz	33	Castor oil	2 oz
10	Silver nitrate	2 oz	34	Caustic soda (solid)	2 oz
11	Litmus	4 oz	35	Sodium carbonate anhydrous	1 oz
12	Indigo	4 oz	36	Phosphorus, yellow	1 oz
13	Calcium chloride	8 oz	37	" red	½ oz
14	Marble	8 oz	38	Tin oxide	½ oz
15	Iron filings	8 oz	39	Mercury oxide	½ oz
16	Lime	4 oz	40	Potassium	1 dram
17	Gypsum	4 oz	41	Sodium	1 dram
18	Clay	4 oz	42	Gold leaf	6 leaves
19	Bleaching powder	4 oz	43	Magnesium ribbon	½ yard
20	Manganese dioxide	1 lb	44	Litmus paper	1 book
21	Soda crystals	4 oz	45	Charcoal	1 piece
22	Alum	4 oz	46	Box and packing	
23	Sulphur roll	4 oz			
24	Sulphur flour	4 oz			

The above chemicals in box all properly labelled, price $31.50

The above price subject to change. Price of single chemicals furnished upon application.

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4. List of Specimens

SELECTED TO ACCOMPANY

PROF. H. E. ROSCOE'S CHEMISTRY PRIMER.

1 Aluminium
2 Tin
3 Lead
4 Silver
5 Bar iron
6 Cast iron
7 Steel
8 Galvanized iron
9 Iron ore
10 Iron oxide
11 Iron sulphate
12 Bronze
13 Brass
14 Clay
15 Tin stone
16 Galena
17 Zinc blende
18 White sand
19 Red sand
20 Flint
21 Quartz
22 Graphite
23 Rock salt
24 Sodium sulphate
25 Sodium nitrate
26 Bone ash
27 Limestone
28 Magnesium sulphate
29 Potassium carbonate
30 Potassium chlorate
31 White lead
32 Red lead
33 Litharge

The above thirty-three specimens, in pasteboard box, each specimen labelled, price $10.00

The above price subject to change. Price of single specimens furnished upon application.

[From the *Scientific American*, Dec. 4th 1880]

NEW BOOKS AND PUBLICATIONS.

ELECTRICITY. By Prof. Curt W. Meyer, New York. 25 cents.

An elementary guide book of practical experiments, prepared to accompany the student's portable electrical machine and apparatus sold by Mr. Meyer. Mr. Meyer is doing good work in preparing for students and schools, at relatively small cost, sets of apparatus for practical experiments in physics and chemistry. The series of experiments described in this pamphlet are such as any bright boy or girl might try and in so doing gain a real knowledge of the fundamental principles of electrical science.

5. CURT W. MEYER'S
Philosophical & Chemical Apparatus.

SET No. 1.

Pneumatics.

Air Pump	$15 00
Bell Jar	1 50
Bladder Cup	2 50
Hand Glass	1 00

Centre of Gravity.

Leaning Tower	2 50

Hydrostatics.

Hydrometer	1 00
Hydrometer Jar	75
Siphon	75

Heat.

Spirit Lamp	75
Ball and Ring (Expansion)	2 50
Thermometer for Liquids	75
Steam Engine Model	5 00
Glass Tubing, various sizes	50

Acoustics.

Violoncello Bow	2 00
Diapason	8 00
Screw Press	5 00
Vibrating Plate,	2 50

Optics.

1 Pair of Lenses	2 00
Concave Mirror	2 00
Prism	2 00
Microscope	4 00
Kaleidoscope	50

Electricity.

Selection from Tyndall's Electric Instruments: Nos. 1, 2, 3, 4, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 17, 19, 20, 21, 22, 23, 24, 32, 34, 38, 40, 43, 45, 48,	26 80
Complete Set of Telegraphic Instruments and Battery	6 00
Horse-shoe Magnet and Armature	1 50
Magnetic Needle	75
Box and Packing	2 45

Net, $100 00

SET No. 2.

Pneumatics.

Air Pump	$20 00
Bell Jar	1 50
Bladder Cup	2 75
Hand Glass	1 00

Centre of Gravity.

Leaning Tower	2 50

Hydrostatics.

Hydrometer	1 00
Hydrometer Jar	75
Siphon	75
Barometer	8 00

Heat.

Spirit Lamp	1 00
Ball and Ring (Expansion)	2 75
Thermometer for Liquids	75
Steam Engine Model	8 00
Glass Bulb and Tube	75
Glass Tubing, various sizes	75

Acoustics.

Violoncello Bow	2 00
Diapason	8 00
Screw Press	5 00
Vibrating Plate	2 50

Optics.

Concave Mirror	2 25
Convex Mirror	2 25
1 Pair of Lenses	2 00
Prism	2 00
Telescope	4 00
Microscope	8 00
Kaleidoscope	75

Electricity.

Selection from Tyndall's Electric Instruments: Nos. 1, 2, 3, 4, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 17, 19, 20, 21, 22, 23, 24, 28, 32, 33, 38, 40, 43, 45, 48	20 55
Holtz's late Improved Electric Machine, complete,	25 00
Set of Telegraphic Instruments and Battery	6 00
Horse-shoe Magnet and	

Armature	1 50
Bar Magnet	75
Loadstone	75
Magnetic Needle	1 50
Box and Packing	2 95
Net,	**$150 00**

SET No. 3.

Pneumatics.

Air Pump	$20 00
Bell Jar	1 50
Bladder Cup	3 00
Magdeburgh Hemispheres	6 50
Hand Glass	1 00

Centre of Gravity.

Leaning Tower	2 50

Hydrostatics.

Hydrometer	1 00
Hydrometer Jar	75
Siphon	75
Barometer	6 00
Cartesian Devil	2 00

Heat.

Spirit Lamp	1 00
Ball and Ring (Expansion)	2 75
Thermometer for Liquids	
Thermometer 500° Fahrenheit	2 50
Glass Bulb and Tube	75
Steam Engine Model	8 00
Glass Tubing, various sizes	75

Acoustics.

Violoncello Bow	2 00
Diapason	8 00
Screw Press	5 00
Vibrating Plate	3 50

Optics.

Concave Mirror	2 25
Convex Mirror	2 25
1 Pair of Lenses	2 00
Prism	2 00
Telescope	4 00
Microscope	5 00
Kaleidoscope	75

Electricity.

Selection from Tyndall's Electric Iustruments. Nos. 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 28, 29, 32, 33, 38, 39, 40, 42, 43, 45, 48, 53, 55, 56, 57	31 30
Holtz's late Improved Electric Machine, complete	25 00
Bunsen's Battery, 2 quart size	4 00
Horse-shoe Magnet and Armature	1 50
Bar Magnet	1 00
Loadstone	75
Ruhmcorff's Coil (Induction)	8 00
Handles and Cords	1 25
Set of Telegraphic Instruments	6 00
Magnetic Needle	2 00

Chemistry.

Retort Stand	2 25
Florence Flasks	50
Retort	50
Test Tubes on Stand	1 50
Blowpipe	75
Various Acid Bottles	1 00
Measuring Glass	75
Funnels	75
Filtering Paper	50
Mortar and Pestle	1 75
Bunsen Burner	1 50
Scale	5 50
Box and Packing	3 70
Net,	**$200 00**

SET No. 4.

Mechanics.

Cohesion Plates	75
Adhesion Disk	75
Capillary Tubes	1 50
Collison Balls on Stand	5 00
Gyroscope	3
Wedge	1 50
Illustration of Pulleys.	12
Leaning Tower (Centre of Gravity)	2 50

Hydrostatics.

Hydrometer	1 00
Hydrometer Jar	75
Siphon	75
Barometer Tube	2 75
Quicksilver	2 25
Cartesian Devil	1 75
Hero's Fountain Flask.	1 25

Pneumatics.

Air Pump	30 00
2 Bell Jars, various sizes	3 50
Fountain in Vacuo	6 50
Magdeburgh Hemispheres	8 50
Bladder Cup	3 00
Hand Glass	1 00

Heat.

Spirit Lamp	1 00
Ball and Ring (Expansion)	2 75
Thermometer for Liquids	75
The mometer 500° Fahrenheit	2 50
Glass Bulb and Tube	75
Steam Engine Model	8 00
Glass Tubing, various sizes	75

Acoustics.

Violoncello Bow	2 00
Diapason	8 00
Screw Press	6 50
Vibrating Plate	3 50
Telephone see (Electricity)	....

Optics.

Concave Mirror	2 25
Convex Mirror	2 25
Set of Demonstration Lenses	5 00
Prism	3 00
Telescope	4 00
Microscope	9 00
Kaleidoscope	75

Electricity.

Tyndall's Electric Instruments, Complete Collection	55 00
Holtz's late Improved Electric Machine, Complete	25 00
Bunsen's Battery 2 qt. size	4 00
Horse-shoe Magnet and Armature	2 50
Bar Magnet	1 00
Loadstone	75
Ruhmcorff's Coil (Induction)	8 00
Handles and Cords	1 25
Electro Magnet	3 00
Set of Telegraphic Instruments	6 00
Magnetic Needle	2 00
Telephones, 1 Pair	8 00

Chemistry.

Retort Stand	2 25
Florence Flasks	50
Retort	50
Test Tubes on Stand	1 50
Blowpipe	75
Various Acid Bottles	1 00
Measuring Glass	75
Funnels	75
Filtering Paper	50
Mortar and Pestle	1 75
Bunsen Burner	1 50
Scale	5 50

Astronomy.

9 iuch Terrestrial Globe and Stand	8 00
Box and Packing	5 50

Net, $300 00

SET No. 5.

Mechanics.

Cohesion Plates	75
Adhesion Disk	75
Capillary Tubes	1 50
Capillary Plates	1 50
Dissected Cone	2 25
Set of Apparatus (Centre of Gravity	6 00
Pendulum	3 00
Collision Balls on Stand	5 00
Compound Levers	3 75
Gyroscope	3 00
Wedge	1 50
Illustration of Pulleys	16 00
Leaning Tower	2 50

Hydrostatics.

Equilibrium Tubes	3 00
Illustration of Buoyancy	7 50
Hydrometer	1 00
Hydrometer Jar	1 00
Set of Pumps	16 00
Siphon	75
Barometer Tube	2 75
Quicksilver	2 25
Cartesian Devil	1 75
Hero's Fountain Flask	1 25

Pneumatics,

Air Pump	36 00
2 Bell Jars, various sizes	3 50
Freezing Apparatus	3 00

Mercury Shower.....	2 00
Fountain in Vacuo....	6 50
Guinea and Feather Tube.....	6 50
Magdeburgh Hemispheres	8 50
Bladder Cup	
Hand Glass	1 00

Heat.

Spirit Lamp.....	1 00
Ball and Ring (Expansion)....	2 75
Thermometer for Liquids..	75
Thermometer 500° Fahrenheit	2 50
Glass Bulb and Tube..	75
Set of Reflectors and Iron Ball	10 00
Ingenhaus Conductometer.....	5 00
Glass Tubing, various sizes.....	75
Steam Engine Model..	12 00

Acoustics.

Violoncello Bow.....	2 00
Diapason	8 00
Bell in Vacuum	2 50
Savart's Wheel.....	6 00
Screw Press.....	6 50
Vibrating Plate	3 50
Telephone, see (Electricity)	....

Optics.

Concave Mirror,.....	2 25
Convex Mirror.....	2 25
Set of Demonstration Lenses.....	5 00
Prism.....	3 00
Telescope	10 00
Microscope.....	20 00
Spectroscope	18 00
Kaleidoscope	75
Model of the Eye....	5 50

Electricity.

Tyndall's Electric Instruments, Complete Collection.....	
Holtz's late Improved Electric Machine, complete	25 00
Set of Electric Bells on Stand.....	5 00
3 Bunsen Batteries, 2 qt. size.....	12 00
Horse-shoe Magnet and Armature	2 50
Bar Magnet.....	1 50
Loadstone.....	75
Ruhmcorff's Coil (Induction).....	8 00
Handles and Cords ..	1 25
Electro Magnet	3 00
Set of Telegraphic Instruments.....	6 00
Magnetic Needle.....	2 00
Telephones, 1 Pair....	8 00
Insulated Wire.....	1 50

Chemistry.

Retort Stand.....	2 25
Florence Flasks	75
Retort	75
Test Tubes on Stand..	1 50
Blowpipe	75
Various Acid Bottles..	1 00
Measuring Glass.....	1 00
Funnel.....	50
Filtering Paper	50
Mortar and Pestle.....	1 75
Bunsen's Burner.....	1 50
Scale	5 50

Astronomy.

9 inch Terrestrial Globe and Stand.....	8 00
Box and Packing.....	7 25

Net, $450 00

Any instrument in the above collections not required, may be left out, and any one desired substituted for it. Additional apparatus will be found in the ***fourth part*** of this catalogue.

No. 3.

Electro Medical Apparatus,

BATTERIES AND SUPPLY.

These Prices are Greatly Reduced.

The highest Premium has been awarded to Curt W. Meyer's Electro Magnetic Instruments for medical use, at the American Institute Exhibition of New York 1870 and 1880.

1. CURT W. MEYER'S,

ELECTRO MAGNETIC INSTRUMENTS

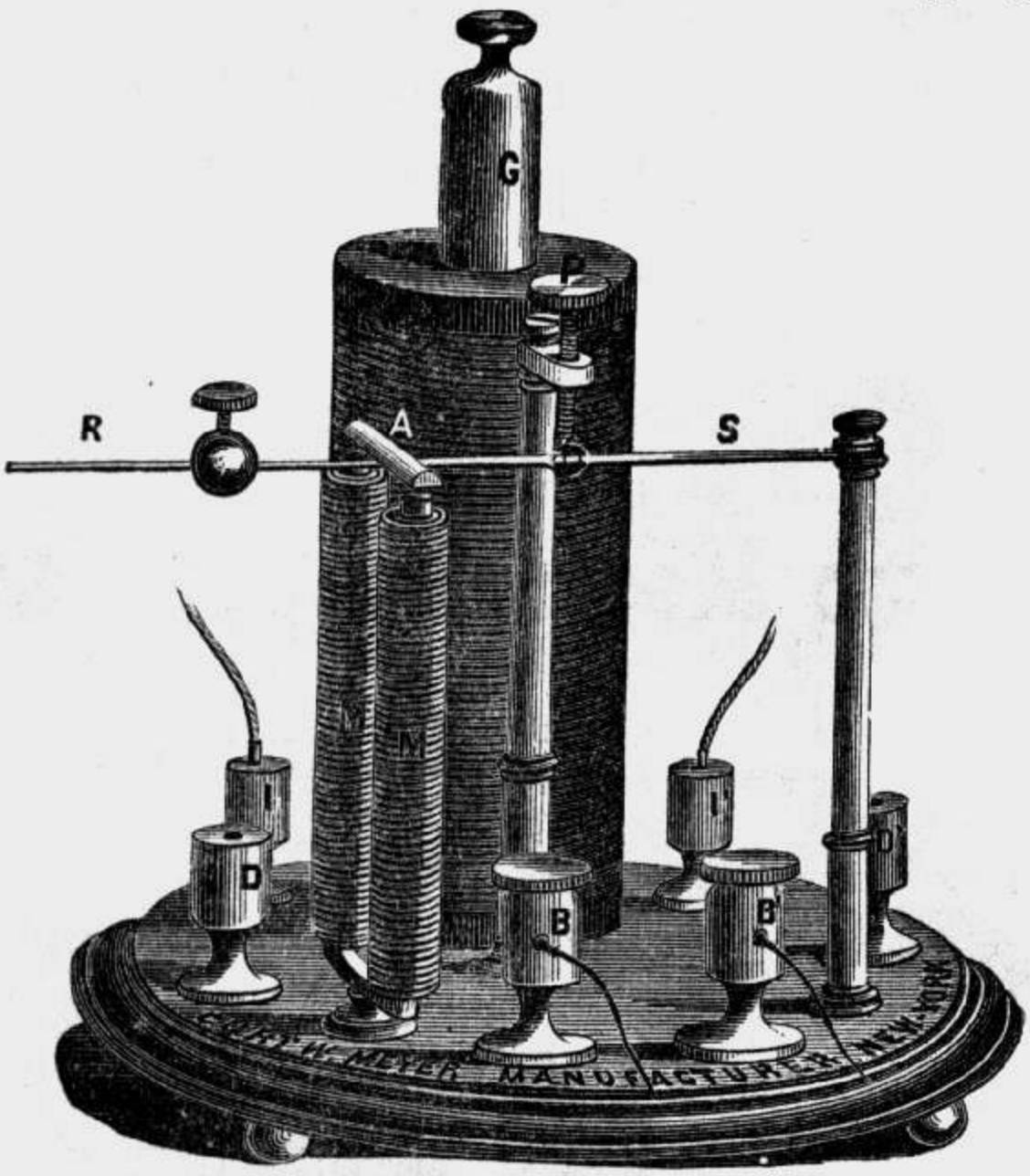
FOR PHYSICIANS AND FAMILY USE

These instruments are most suitable for physicians' use, but as the prices of such have been greatly reduced, they are now in reach of families and the patient himself. They are also much simplified in construction, which will render them easily handled. Directions are furnished with each instrument.

I have a variety of constructions partially my own, partially those of other manufacturers which I am specially dealing in. Those not of my own manufacture I have adopted according to my own judgment and can recommend them as possessing superior qualities to those of other manufacturers.

The Physicians' or Practitioners' Office Apparatus.

Including electric cords, set of electrodes and battery, $30.00



The above engraving illustrates this apparatus. It is a very neatly constructed and easily handled Faradaic machine. It is not liable to damage by acids or fumes from acids of the battery, being covered under a glass shade. The battery is entirely separate from the instrument. The current is powerful and can be minutely regulated in strength as well as in the number of vibrations per second. This model of an instrument has sufficiently proved its superiority over all other constructions, being now introduced since the last twelve years and no improvement has been required ever since.

The highest premium has repeatedly been awarded for continuance of superiority in construction and elegancy in workmanship.

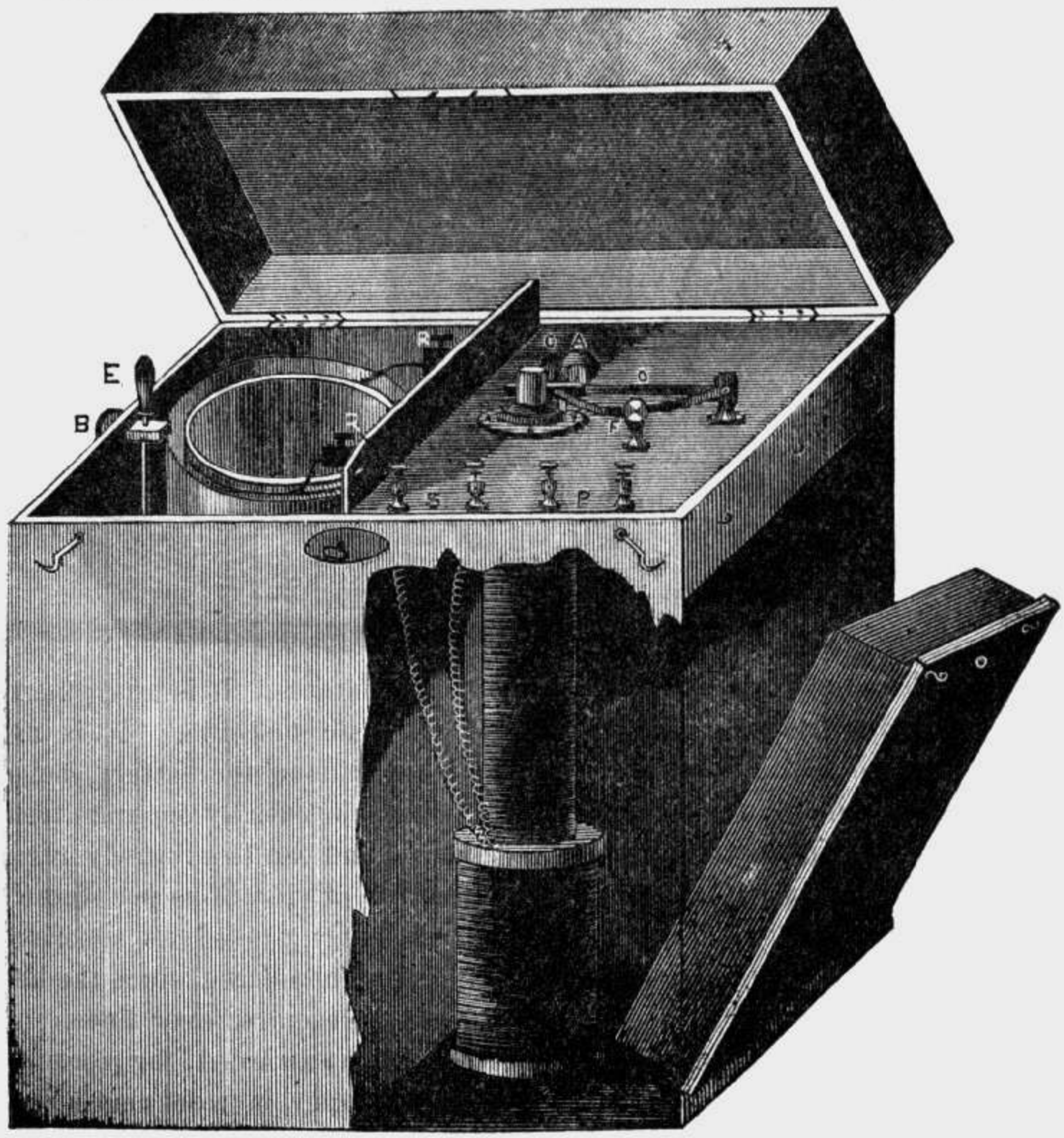
This is the only practical and durable apparatus for colleges or hospitals; it is ready for action at a moment's notice and action stopped in a second, no further attendance to the battery required. The battery remains charged for months, without refilling.

The apparatus is portable, powerful and simple in construction, no repairs are needed and all connections are brought to view to enable the student of electro therapeutics to fully understand the peculiar construction of his instrument.

Testimonials from all parts of this country expressing highly favorable opinions in regard to this apparatus are in my possession

The Stoehrer Improved Induction Apparatus.

In fine black walnut case, with full set of electrodes and cords, complete $40.00

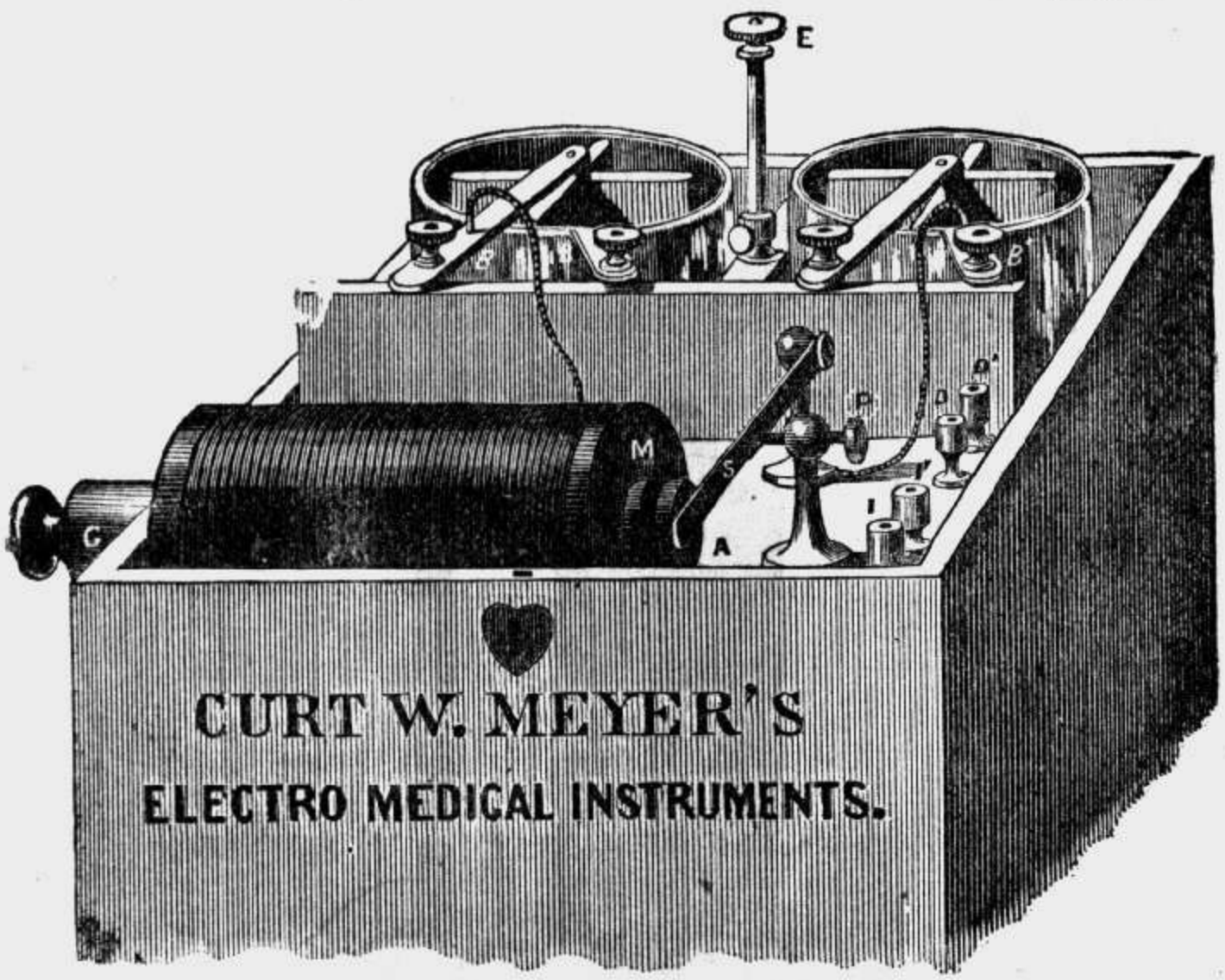


The above illustration, represents the apparatus in its former construction. A new battery system is now attached, while the rest of the apparatus remains the same.

This instrument is powerful enough for any purposes in medical treatment, and is equal practical for physicans and home use.

The Double Cell Electro Medical Instrument.

One of the most powerful portable apparatus for general use, including cords and electrodes $25.00



The illustration above represents this apparatus, in its former construction. It has also been improved since, as regards the battery and some slight mechanical alterations. The instrument in its present form, is perfect in every respect. A more practical and easily handled apparatus for family use, is not in existance, according to my knowledge.

The Single Cell Electro Magnetic Instrument.

In fine black walnut case, cords and electrodes included. $18.00

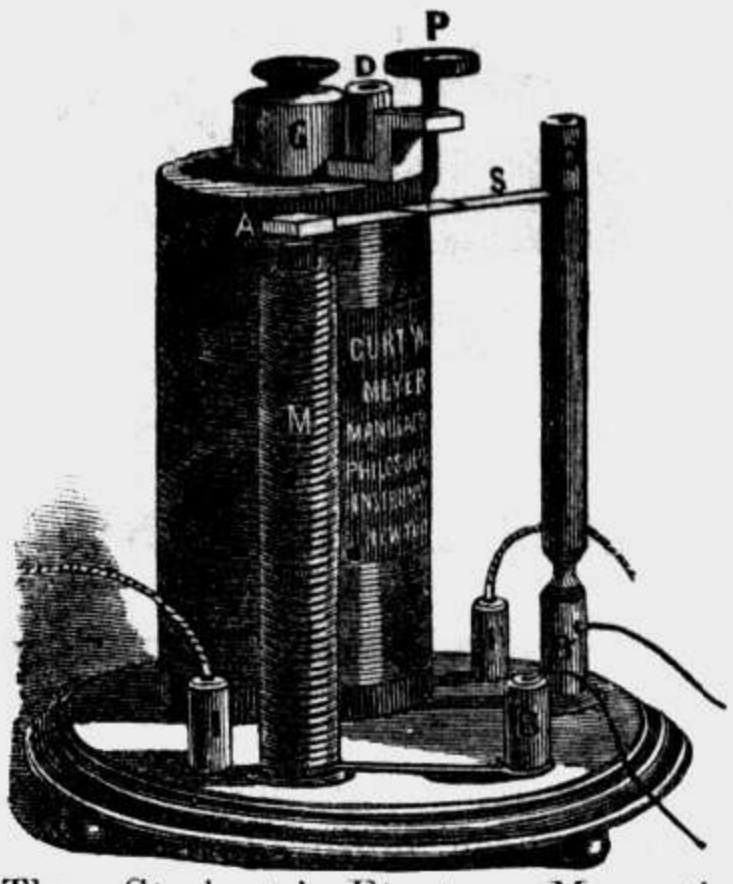
This instrument is similar to the former, with only one battery

of the improved form attached. The coil is also smaller, therefore the instrument is not quite as powerful, yet sufficient for home use in most cases. It is a cheap, reliable instrument for family use, among instruments of superior workmanship.

The Students' Electro Magnetic Instrument.

Including handles, cords and battery. $15.00

An instrument simplified in construction, and made on the same principle as the Physicians and Practitioner's Office Apparatus, but on a smaller scale. The battery of an improved form is entirely separate. The instrument is not liable to damage by surrounding fluids. The coil is covered under glass. The apparatus is neat, durable and powerful. See illustration below.



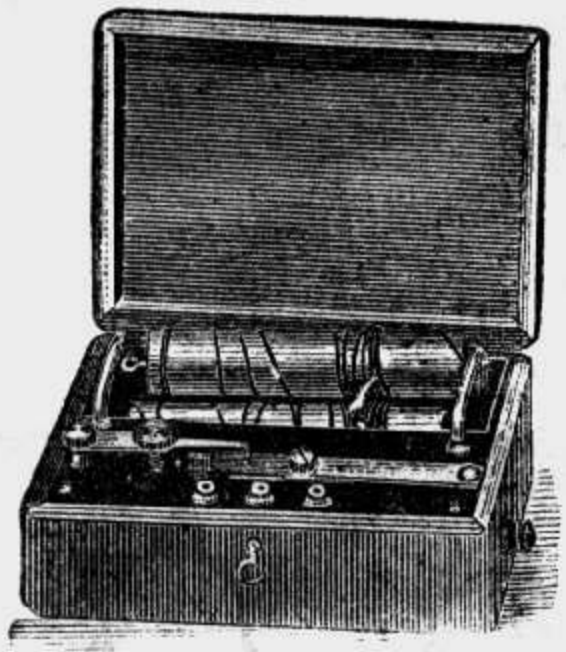
The Students' Electro Magnetic Instrument.

☞All the above mentioned instruments, furnish the primary and secondary or induced currents, both can be minutely graduated in strength.

2. Bossard's Patent Electro Magnetic APPARATUS FOR PHYSICIANS AND FAMILY USE.

Their construction is quite different from all other apparatus The improvement consists in conjoining the two poles of the electro-magnet, thus making a very sensitive current breaker, a weak current will suffice to operate these instruments. The workmanship is perfect, no strong acids required for the battery, the apparatus is reliable and does not need repairs.

No. 1



Bossard's Patent E. M. Instrument.

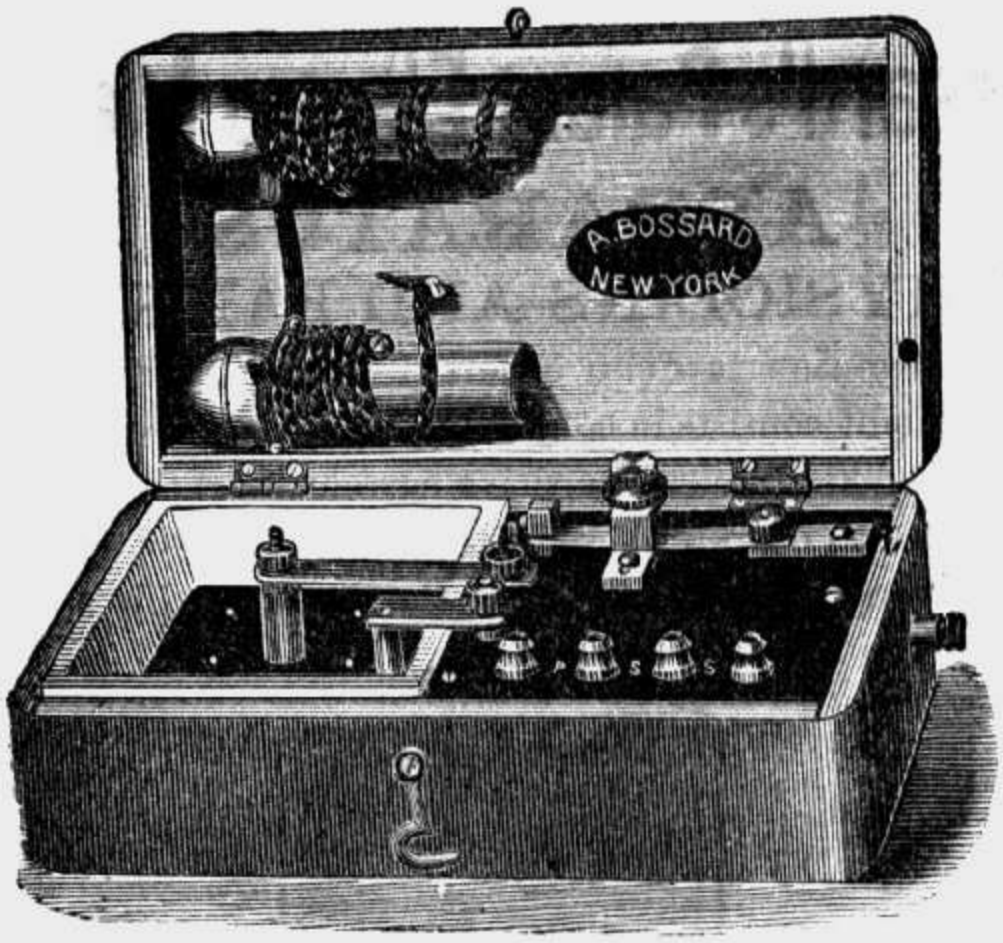
Bossard's Patent E. M. Apparatus, No. 1. Size of black walnut case, 4½x3x1⅝ inches, producing 3 currents. $8 00

Bossard's Patent E. M. Apparatus, No. 2. Size of black walnut case, 4½x3x1⅝ inches, producing 6 various currents 10 00

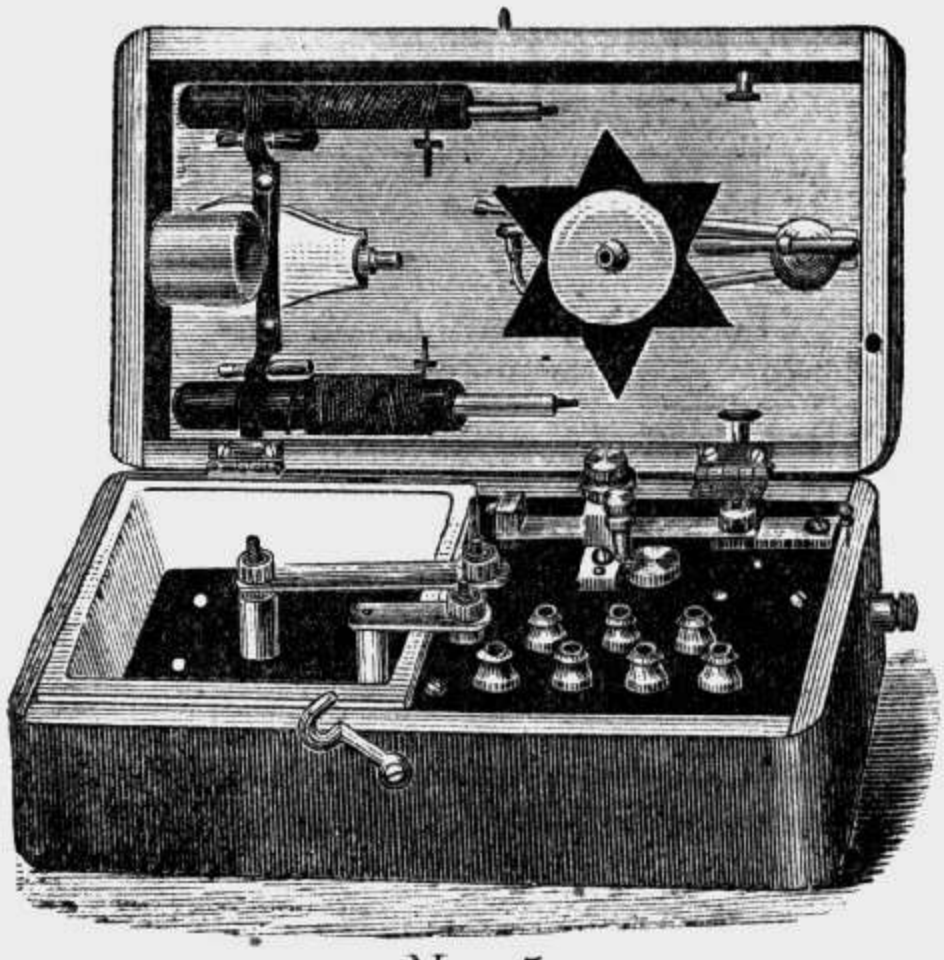
Bossard's Patent E. M. Apparatus, No. 3. Size of black walnut case, 7½x3x4 inches, producing 6 various currents 12 00

Bossard's Patent E. M. Apparatus, No. 4. Size of black walnut case, 7½x3x4 inches, producing 9 various currents, including a full set of electrodes, such as 2 Universal handles, sponge-holder, tongue plate, round disc and 2 small electrodes for single nerves. 18 00

Bossard's Patent E. M. Apparatus, No. 5. Size of black walnut case, 7½x3x4 inches, producing 22 various currents, including a complete set of electrodes, most all which are in use by physicians 32 00



No. 3.



No. 5.

The above instruments are furnished also in fine polished mahogany case, brass parts and electrodes nickel plated, for which the prices are the following: No. 1, $9; No. 2, $11; No. 3, $13.50 No. 4, $20; No. 5, in extra fine rosewood case, $36.

The apparatus is furnished with printed directions and indicator of the various currents.

Nos. 1 and 2 apparatus are pocket instruments.

3. Gaiffe's Improved Pocket Batteries.

AN ELECTRO MAGNETIC INSTRUMENT

FOR PHYSICIANS' AND FAMILY USE.

No. 1, powerful apparatus, ... $12 00
No. 2, second size, ... 10 00
No. 3, third size, ... 6 00

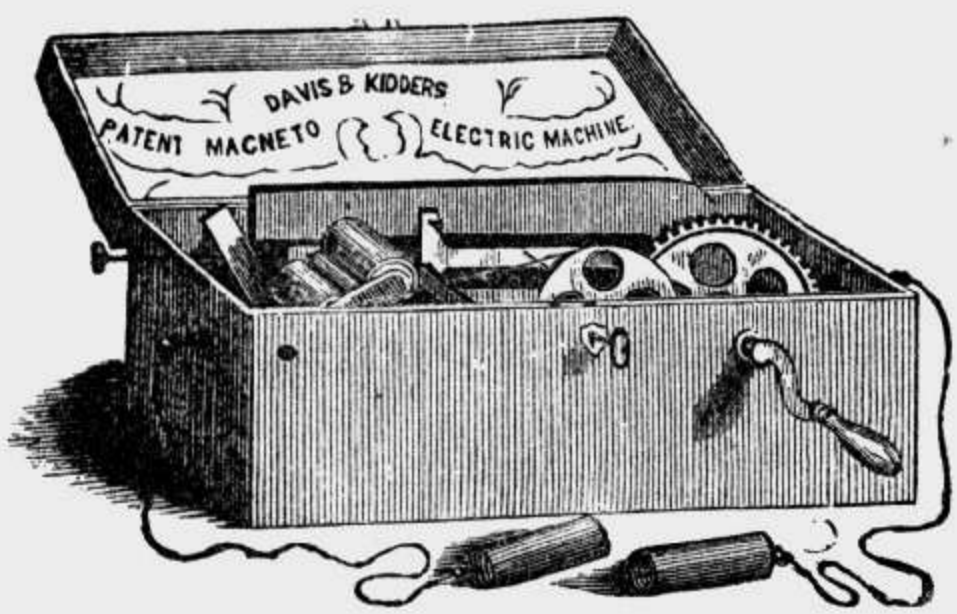
N. B.—The No. 3 Gaiffe Pocket Battery is the cheapest reliable apparatus which has ever been offered to the trade. It is complete, not as powerful as the larger sizes, but satisfactory in every respect. Should more power be required a cheap additional battery cell may be connected with it.

The Electro Magnetic or Faradaic Instruments thus range in price as follows: $6, 8, 9, 10, 11, 12, 13.50, 15, 18. 20, 25, 30, 32, 36, 40.

4. Magneto Electric Machines.

FOR MEDICAL TREATMENT

These machines require no battery, they are operated with a crank, (see engraving); they are substantially made and not easily put out of order.



Prices according to finish and power, $9, 10, 12, 15 and 18.

5. IMPROVED GALVANIC BATTERIES

FOR APPLICATION OF THE CONTINUOUS CURRENT.

12 CELL BATTERY, *Zinc and Copper* Plates, each of 3½ square inch surface, Hard Rubber Vessels, including Electrodes and Cords..... $24 00

12 CELL BATTERY, *Zinc and Carbon* Plates, same construction..... 28 00

12 CELL BATTERY, *Zinc and Copper,* with No. 2 Faradaic Instrument attached, in the same case, all complete..... 32 00

12 CELL BATTERY, *Zinc and Carbon,* with No. 2 Faradaic Instrument attached, in the same case, all complete..... 36 00

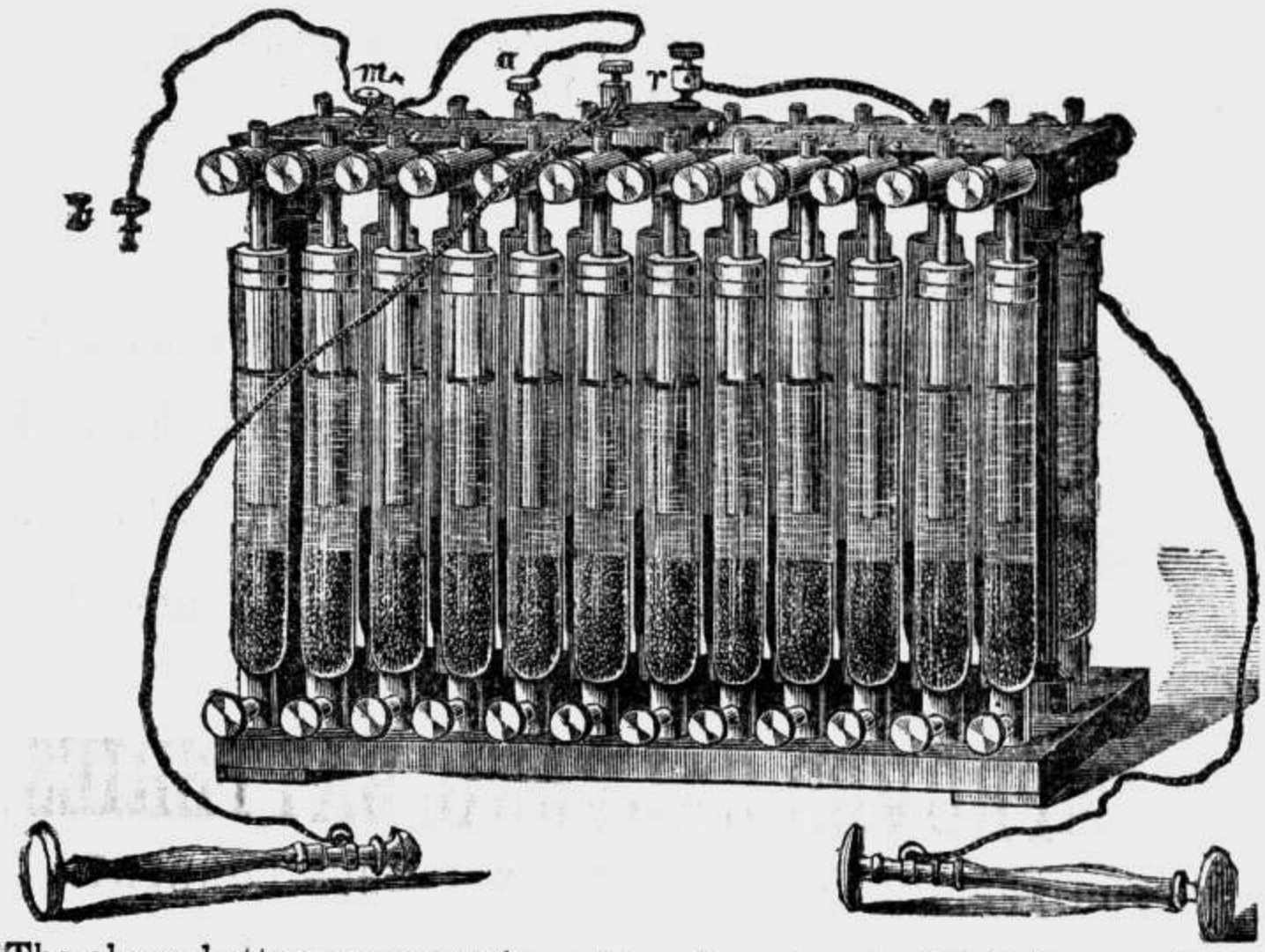
LARGER BATTERIES, *Zinc and Carbon,* with 20, 24, 30 and 36 Cells, with mechanism to bring battery at once in and out of action, (Stoehrer's principle,) including Cords, Electrodes and Current Reverser; per Element, or Cell.. 2 50

PORTABLE BATTERIES, CURT W. MEYER'S improved construction, a modification of Leclanche's Battery, (see engraving below); these batteries, including 1 pair of Universal Handles and Electrodes, Cords, Current Selector and Current Reverser, in Polished Mahogany Case, Nickel Plated, 12, 24 and 36 Cells, reduced to $40 $70 and..... 90 00

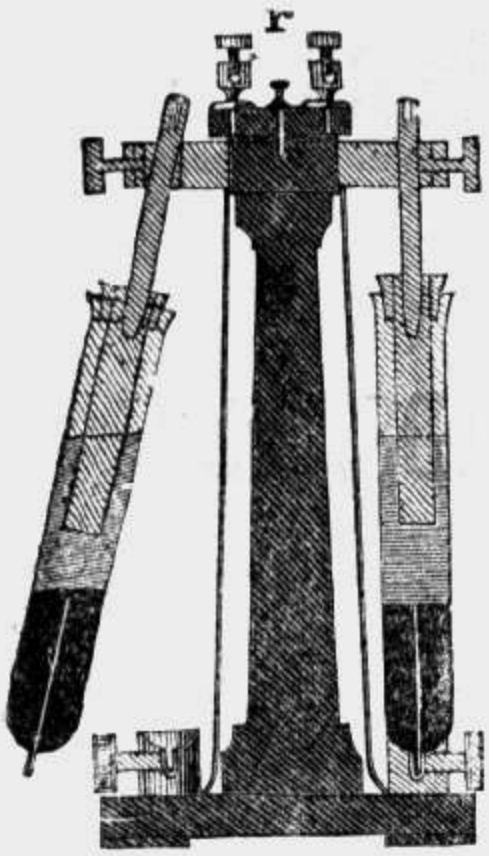
Directions furnished with each instrument.

CURT W. MEYER'S

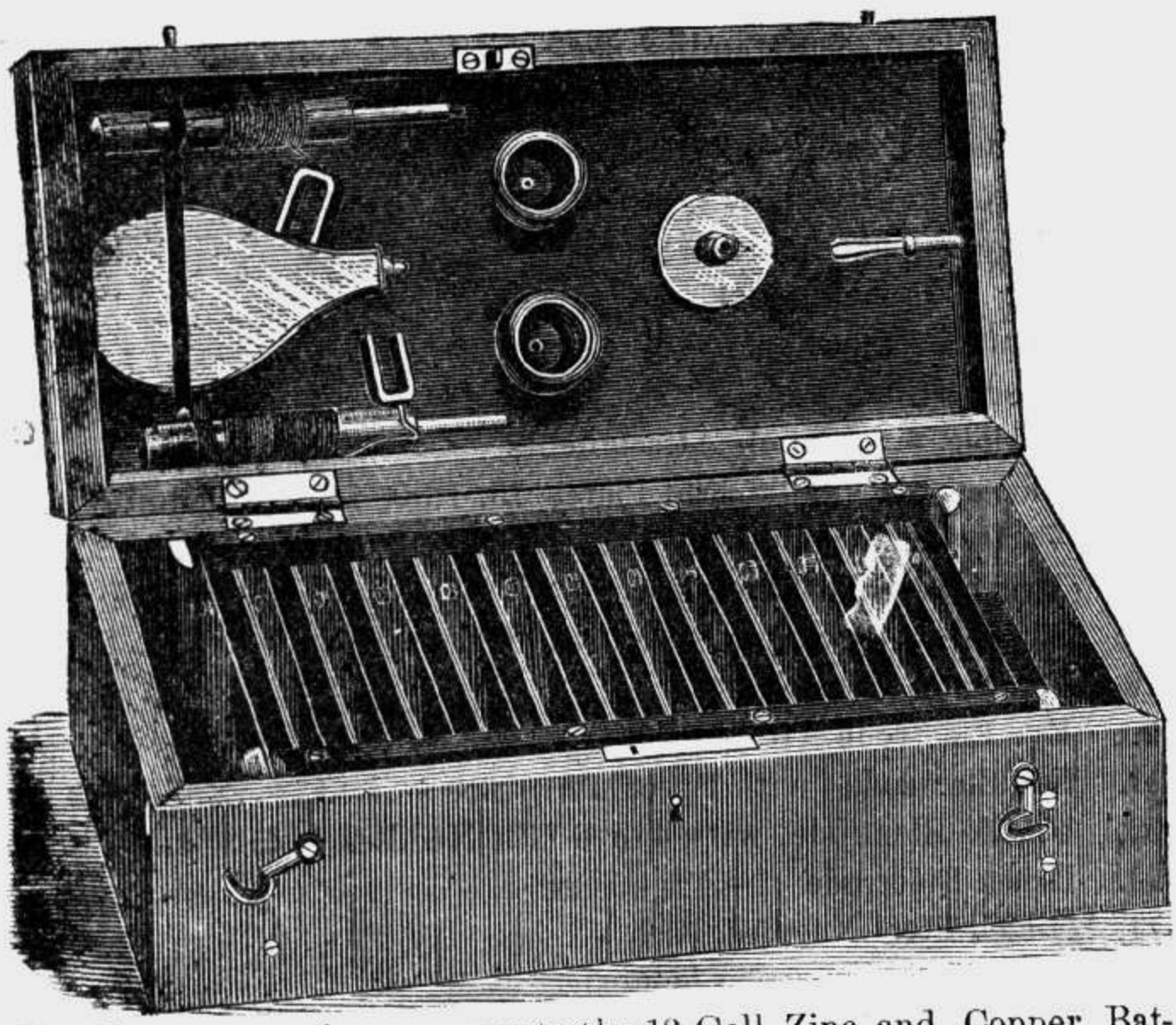
Improved Portable Galvanic Battery.



The above battery representing a 24 cell system, is fitted in a polished mahogany case.



This portable battery is by far the *cleanest* and *most durable* battery ever constructed. Spilling of the fluid is impossible, no acid required. The battery needs refilling only trice within a year, and is always ready for use. The workmanship is throughout perfect, all connections are soldered. 12, 24 and 36 cells, $40. 70. & 90. The engraving, a side view of the battery, illustrates how a cell is to be taken out.



The above engraving represents the 12 Cell Zinc and Copper Battery—a most perfect apparatus if small currents are required.

6. GALVANO-CAUTERY BATTERIES

Stoehrer's Principle, complete	$90
New portable battery, very powerful	75
Galvano-caustic Electrodes in case, complete . . .	75

7. GALVANOMETERS.

According to sensitiveness, . . . $4, 6, 8, 10, and 12

GALVANOSCOPE $10

8. ELECTRODES, CORDS, &C.

1.	Ordinary Handles....per pair - - - - -	$0 75
2.	Finer Finished Handles " - - - - - -	1 00
*3.	Small Sponge-holder " - - - - - -	1 50
*4.	Large " " - - - - - -	2 00
*5.	Largest " " - - - - - -	2 50
*6.	Large Sponge-electrode, each - - - - -	1 25
*7.	Universal Handle, with Cord, each - - - -	1 50
*8.	Large Universal Handles, per pair - - - -	3 00
*9.	Various Shaped Lengthening Rods, to fit Universal Handles, each - - - - - - - - -	50

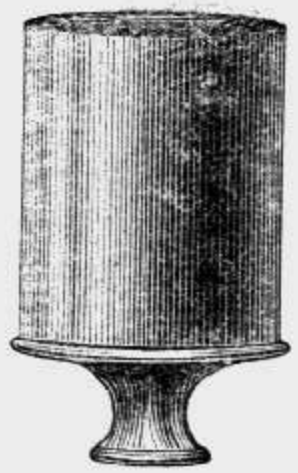
Various Shaped Electrodes to fit either Un. Handle or Length. Rod.

*10.	Single Sponge-holder - - - - - - - -	75
*11.	" Flannel-holder - - - - - -	60
*12.	Nasal Electrode - - - - - - - -	75
*13.	Tongue Plate - - - - - - - - -	75
*14.	Various Sizes Knob Attachments 30, 40, 50 and	75
*15.	Various Sizes Solid Flat Plates 75, 1.00, 1.25 1.50 and	1 75
*16.	Various Sizes Solid Convex Plates 75, 1.00, 1.25 1.50 and	1 75
17.	T Shaped Solid Electrode - - - - - -	1 75
*18.	Silver Electrode, for Strictures of Urethra - - -	2 75
*19.	Female Electrode - - - - - - - -	2 50
20.	Eye Electrode Attachment - - - - - - -	50
21.	Ear Electrode (with Speculum) - - - -	3 50
*22.	Needle Electrode, with 4 or 6 Gilt Needles, 6.00 and	8 00
*23.	Brush Electrode - - - - - - - -	1 00
24.	Gilded Steel Needles, each - - - - - - -	50
25.	" " " large size, each - - -	75
26.	Platina Needles, each - - - - - - -	1 75
27.	Silk insulated metallic cords, per pair each, 1½ yard	1 50
28.	" " copper wire cords " " 2 " -	2 75
29.	*Water Rheostate* for graduating the strength of the current, to be attached to one of the cords - - -	1 25

Those marked thus * are illustrated below.

Any other shape of Electrodes desirable, made to order.

No. 8.



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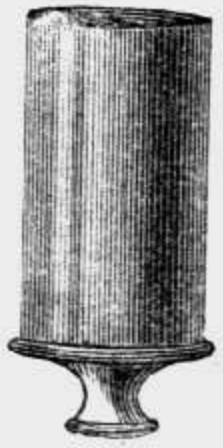


No. 4.

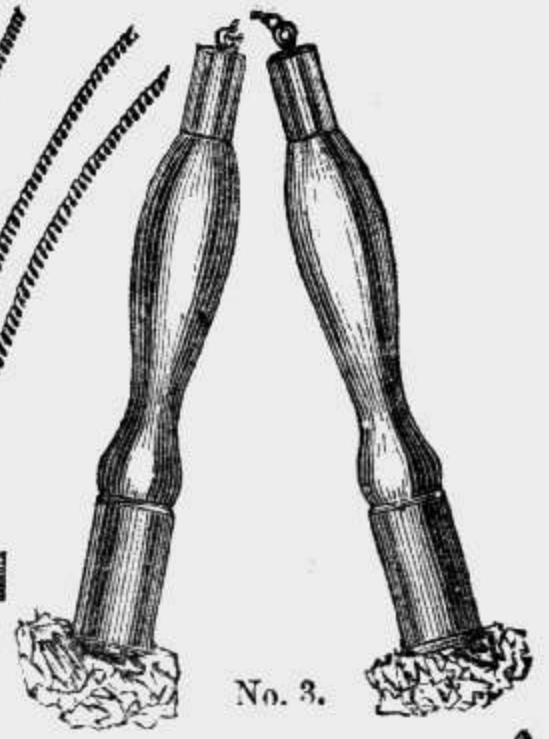
No. 15.

No. 15.

No. 28.

No. 16.

No. 22.



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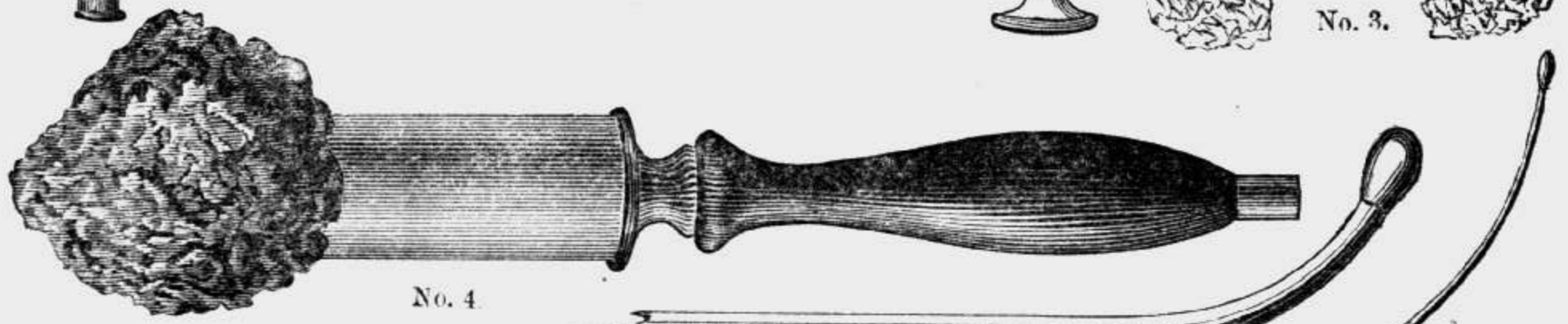
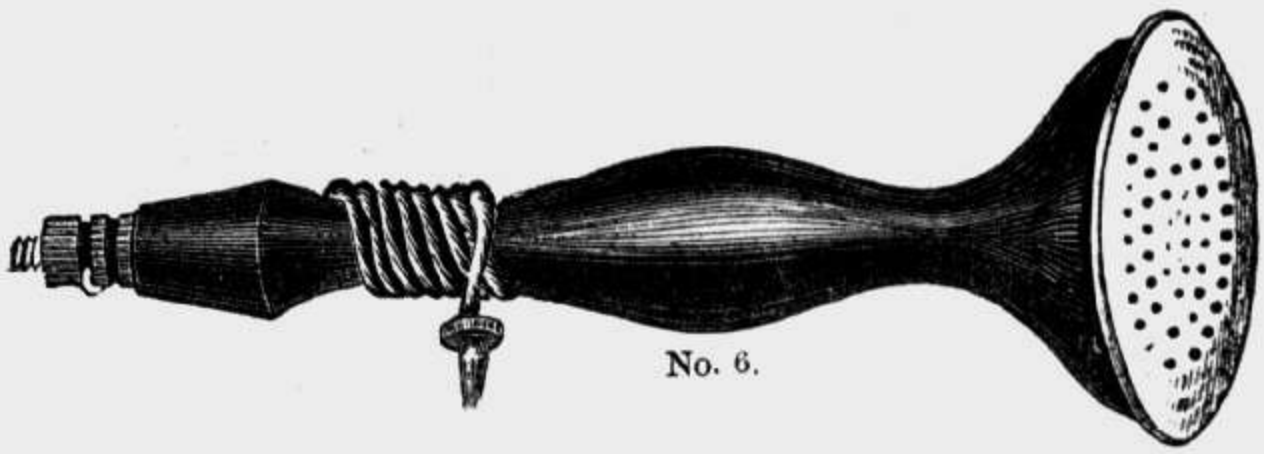


No. 4

No. 19

No. 18.



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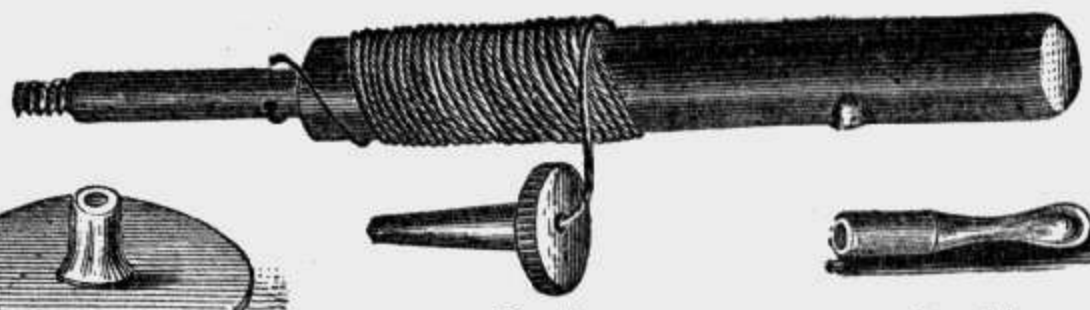

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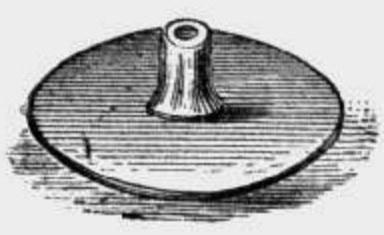

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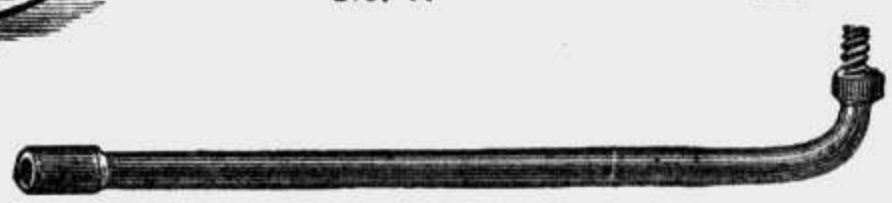
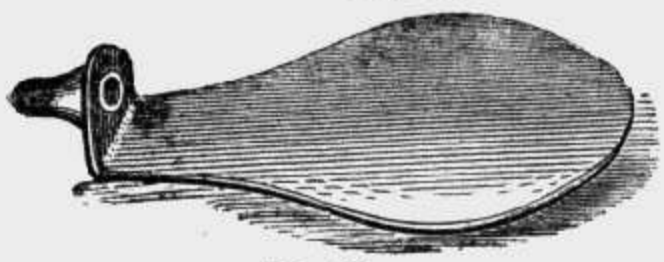


No. 9.

No. 14

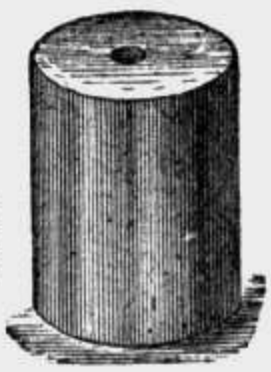
No. 9.

No. 12.



No. 13.

No. 10.



No. 11.

[From the *Evening Post*, New York, Dec. 21, 1880.]

A Practical and Inexpensive Gift.

"Now that the holiday season has come, many and various are the objects given to children, some adapted for use, others for amusement, but few for instruction. It is quite possible, however, to construct certain scientific objects by which a lad can not only be made happy in their possession, but which at the same time may become a prominent feature in his education. Professor Curt W. Meyer presents for the holiday season a very perfect set of electrical instruments, contained in a box not more than a foot square. It can be sold at the same cost as many a useless toy. This electrical machine answers perfectly for all class experiments." It can be bought at No. 182 Broadway, for $15.

No. 4.

MISCELLANEOUS.

PRICE LIST.

Apparatus for Mechanics.

Most of these Apparatus have to be made to order.

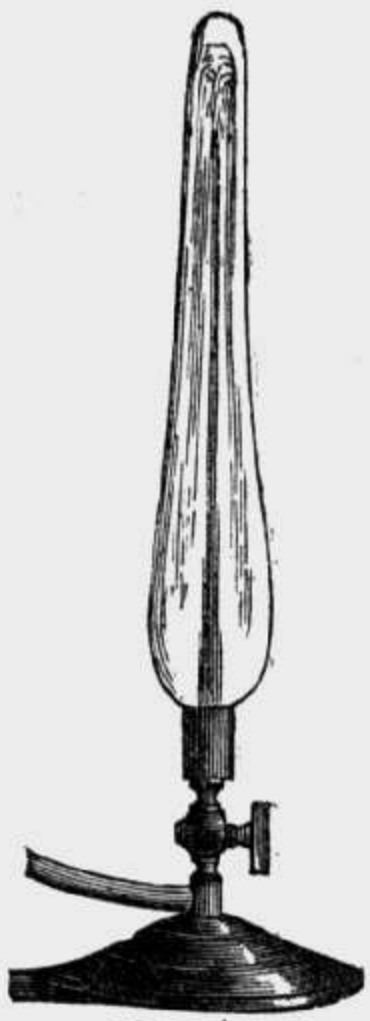
1	Endosmeter	$ 2 00	11	Screw in frame	$5 00
2	Inertia apparatus	1 75	12	Sets of solids	5 00
3	Illustration of momentum	$13 75	13	Centrifugal forces	12 00
4	Resultant motion	10 00	14	Atwoods falling machine	75 00 to 100 00
5	Cycloid frame	3 50	15	Apparatus, illustrating the principle of the reverbal balance	15 00
6	Whirling machine (with ring)	25 00	16	Models of crystals, eac	1 75
7	Whirling machine, with accessories	50 00	17	" " " (soli glass) 13 pieces in cas	25 00
8	Simple lever	1 50	18	Parallelogram of force	5 00
9	Inclined plane	6 00	19	Set of weights	5 00
10	Lever balance and steel-yard	7 00			

Apparatus for Hydraulics and Hydrostatics.

20	Equilibrium apparatus	$ 6 00	32	Universal hydrometers	2 00
21	Masson's apparatus	13 50	33	Specific gravity balance	15 00
22	Pressure of liquids	3 00	34	Diving bell	5 00
23	Archimedes principle	3 00	35	Siphons, glass and brass	75 cts to 1 50
24	Tantalus cup	2 00	36	Forcing pump, model	2 50
25	Archimedes screw	5 00	37	Lifting pump, model	2 50
26	Hero's fountain	10 00	38	Lifting and force-pump mounted	12 00
27	Barker's mill	12 00	39	Capillary tubes and pan	1 50
28	Hydrometer jars 75c to	2 00	40	Capillary plates and pan	2 00
29	Nicholson's hydrometer	2 50	41	Hydraulic press	12 00
30	Hydrometers, (lighter than water)	1 00	42	Barometers	6 to 12 00
31	Hydrometers, (heavier than water)	1 00	43	Aneroid Barometers	8to12 00

Apparatus for Pneumatics.

44 Air pumps fitted up on stand $15, 18, 20, 25, 30 and 36 00
45 Air pumps on tables, first-class workmanship $75 to $150 00
46 Bell jar receiver with sliding rod and ball attached $ 5 00
47 Bell jar receiver with metal cap aud stop cock, $ 4 00
48 Capped receivers according to size 1 50 to 4 00
49 Swelled receivers $2 to 5 00
50 Open receivers $1 50 to 4 00
51 Plain receivers 75cts to 3 50
52 Condensing pumps $6 50 to 12 00
53 Condensing chamber 10 00
54 Resistance fan 1 00
55 Bursting squares per doz. 2 50
56 Expansion apparatus $1 00
57 Bacchus illustration 2 25
58 Weight and buoyancy of air 9 00
59 Upward pressure apparatus 10 00
60 Bolt head apparatus 3 50
61 Barometer gauges $3 to 3 75
62 Rubber bags $2 to 3 50
63 Barometer apparatus 6 50
64 Mariotte's law apparatus 10 50



No. 71

65 Plate paradox 1 75
66 Revolving jet 2 50
67 Sliding rod 2 25
68 Air gun barrel 1 00
69 Rubber hose to fit air pump 3 00
70 Bell in vacuo 3 00
71 Fountain in vacuo $6 50 to 8 50

Apparatus for Heat.

72*a* Alcohol lamps, 75c to $ 1 50
(See chemical apparatus)
72*b* Bunsen Burners 75 to $3 50
See Chemical Apparatus.
73 Berzelius' lamp 4 50
74 Tripod (iron) for Bunsen burner 75
75 Oxyhydrogen blow pipes 12 00
76 Ordinary blow pipes 25cts to 75
77 Fire syringe $ 2 00

No. 72. *b*.

78 Ball and ring on stand 3 50
79 " " " with handles 1 75
80 Bar and gauge 1 75
81 Pyrometer 5 00
82 Compound bar 1 25
83 Apparatus for maximum density of water 8 00
84 Air-thermometer 75c to 2 50
85 Fluid thermometer 75
86 Water hammer 75
87 Franklin's palm glass 75
88 Maximum and minimum thermometer, self registering $3 50 to 5 00
89 Comparative thermometers, Fahr. and Cent. or Fahr. and Reaum. 1 75
90 Differential thermometer 4 00
91 Thermometer 500°Fahr. 2 50
92 Thermo-multiplier 25 to 40 00
93 Wire gauze 50
94 Conductometer $2 to 5 00
95 T bar for conductivity $2 50
96 Parabolic reflectors, including: stand with regulator, iron ball with adjustment, phosphorus cup, etc. $10 to 25 00
97 Leslie's cubes 2 50
98 Radiator 7 00
99 Specific heat apparatus $1 75 to 10 00
100 Apparatus to illustrate the evaporation of volatile liquids in a vacuum, etc. 13 00
101 Gay Lussac's apparatus $10 to 30 00
102 Apparatus for liquefying gas 50 00
103 Illustration of low pressure steam engine 5 00
104 Candle bombs per doz 50
105 Steam engine models $4, 5, 8, 12, 18, to 36 00

Acoustical Apparatus.

106 Sonometer $16 to $27 00
107 Violoncello bow $2 to 2 50
108 Support for vibrating plate 2 50
109 Screw press for vibrating plate 6 50
110 Circular or square brass plate for vibration $2 50 to 4 00
111 Triangular or polygonal brass plate 4 50
112 Circular or square glass plates $2 75 to 3 50
113 Kaleidophones $3 50, 8, 15, and 18 00
114 Diapasons (tuning forks) small 2 00
115 Diapason, large size, mounted on resonant case $7 to 8 00
116 Duplicate diapason, to vibrate by influence $8 50
117*a* Combination of diapasons, on separate resonant cases, sounding either the perfect chord or diatonic scale, each 7 00
117*b* Bell in vacuo see Pneumatics.
118 Roger's apparatus to show the intermittence of sonorous flames 12 00
119 Model organ pipes, set 12 00
120 Siren (ordinary) 25 00
121 Double Siren of Helmholtz 230 00
122 Grand Siren of Seebeck 375 00
123 Savarts' Wheel 6 00
124 Hopkins' tube on stand 8 00
125 Savarts' Bell and Resonator 20 00

Apparatus or materials not mentioned in the above list will be furnished at lowest possible prices.

Optical Instruments and Goods.

126	Plane mirror with handle	$1 00 to	1 50
127*a*	Spherical concave mirrors	2 00 to	4 00
127*b*	" convex "	2 00 to	4 00
128	Crooke's radiometers or light motors	7 00 and	9 50
129	Cylindrical mirrors	2 50 to	5 00
130	Multiplying "	2 00 to	2 50
131	Kaleidoscopes 35 50 75 cents upward	to	3 00
132	Glass prisms 50, 75, 1.25,	2 00 to	3 00
133	Mounted prisms on stand		4 00
134	Prisms of crown and flint glass		7 00
135	Achromatic prisms on stand		18 00
136	Nichols' prisms	5 00 to	16 00
137	1 Pair of lenses	1 00 to	3 00
138	1 Set of six lenses	5 00 to	8 00
139	Achromatic lenses, set		10 00
140	Tourmaline polariscope		8 00
141	Models of the eye 5 50, 12.00 and		20 00
142	Pocket magnifiers from 50 upward	to	2 50
143	Watchmaker loupes " 50 "	to	1 50
144	Engraver " 1 50 "	to	5 00
145	Pocket microscopes " 1 00 "	to	2 50
146	Linen provers " 50 "	to	1 50
147	Magnifying charms " 35 "	to	1 00
148	Reading glasses, round or square frame, with handle	75 to	5 00
149	Coddington lenses	$1 75 to	4 00
150	Botanical loupes	1 50 to	4 00
151	Tripod magnifier	75 to	1 25
152	Microscope in box (with accesories) for boys		3 00
153	" " " " " second size		4 50
154	" " " on cast iron stand		4 00
155	" " " larger size		5 00
156	" " " for students		8 00
157	" " " French, with rack motion		12 00
158	" " " " large size (for school use)		20 00
159	The student's microscope		22 00
160	The large student's microscope		25 00
161	The school microscope, large		36 00
162	The professional Microscope		50 00
163	The physician's microscope		75 00
164	Universal microscope		100 00
165	Microscopic objects (ordinary) per doz.		2 50
166	" " better quality per doz.		3 50
167	" " Bourgogne's finest preparations, each 1 00	to 1	75
168	" object covers per doz.		35
169	" " slides " "		1 00
170	Telescopes ordinary	75 to	1 25
171	Telescopes achromatic $3.00, 4.00, 4.75, 5.50,	6 50 to	10 00
172	Telescopes on stand for school use		12 00
173	Telescopes for excursionists, with case and leather straps 8., 9.50, 11., 15., 18., 22	to	36 00

174 Astronomical telescopes $60, 85 and $150 00
175 Opera glasses, black morocco covering, achromatic 4., 4.50, 5., 6., 7., 8 to 12 00
176 " " fine black morocco finish, better quality, 6., 8., 10., 12., 15 to 17 50
177 " " fancy finish, morocco leather, better quality, 12., 15., 18., 21 to 25 00
178 " " white or colored pearl, extra finish, 10., 12.50, 14., 16., 18., 25 to 30 00
179 Field and marine glasses, ordinary, 9., 12., 13.75, 15., 18 to 25 00
180 " " " " better quality, 12., 15., 18., 23., 26 to 30 00
181 " " " extra finish and quality, 25., 36 to 48 00

☞On orders given in the above line of goods, please indicate the number and price of the article. The lower prices under a certain number, indicate smaller size, but not inferior quality of goods.

☞No Telescope, Opera, Field or Marine Glass will be delivered from my establishment without such having proved to possess the required qualities,—they are personally selected by me.

Spectacles and Eye-Glasses.

A fine assortment of goods in this line always on hand. Any desired style of frame made to order. For proper selection of numbers of focus, see appendix at back of book.

Steel Spectacles.

182 Ordinary quality, 50 and 0 75
183 Better quality, $1 and 1 25
184 First quality, $1 50 and 2 00
185 Hook sides, first quality $2 and 2 50
186 Frameless $2 to 3 00

Silver Spectacles.

187 Fine coin, first quality $2 to 3 00

Gold Spectacles.

188 10 karat, first quality, $6, 7. and 8 00
189 12 karat, first quality, $7, 8, and 9 00
190 14 karat, first quality, $8, 9 50 and 11 00
191 18 karat, first quality, $10 50, 12, and 14 00

Brazilian Pebbles fitted to above Spectacles, will make an extra charge of $3 00

Steel Eye-Glasses.

192 Ordinary quality, 75, $1 and 1 25
193 Better quality, $1 25, 1 50 and 1 75
194 First quality, $2, 2 50 and 3 00

Frameless Eye-Glasses.

195 Ordinary $1 75
196 Extra fine $2 and 2 50

Rubber Eye-Glasses.

197 Ordinary 50 and 75
198 Second quality $1 and 1 25
199 Extra fine $1 50 and 1 75

Shell Eye-Glasses.

200 Second quality $1 50 and 2 00
201 Extra fine $2 25 and 2 50

Gold Eye-Glasses.

202 10 karat, first quality $6 00
203 12 karat, first quality $7, 8 and 9 00
204 14 karat, first quality $8, 10 and 12 00

The above gold frames are the most substantial ones. They are neatly made and elegantly finished, and vary in price according to weight.

Brazilian Pebbles fitted to above eye-glasses, extra charge $3.

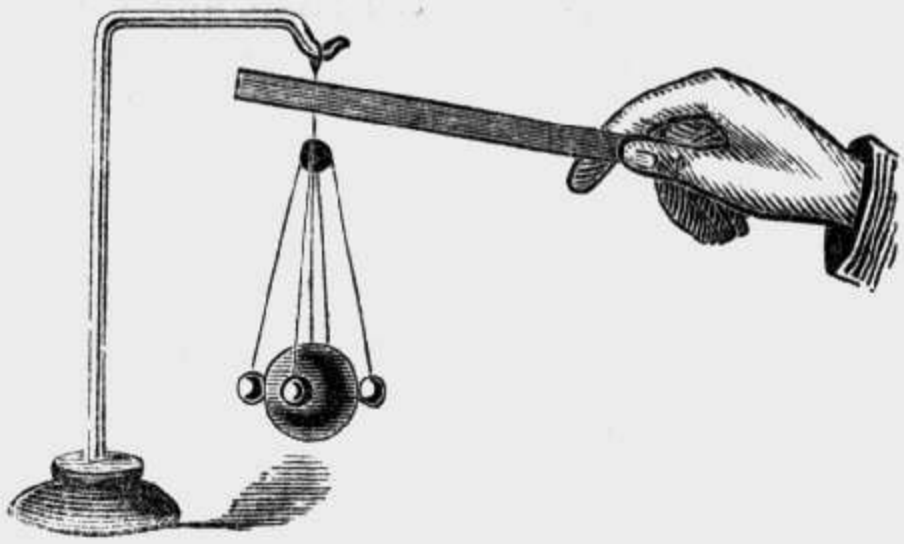
205	Stereoscopes		$1 50, 2, 2 50 and $4 00
206	Stereoscopic views, each, from 15 cts upward to		1 00
207	Spectroscopes		$34, 45, 55, 75 and 85 00
208	Pocket spectroscopes or hand spectroscopes		$16, 18, and 20 00
209	Magic lanterns, ordinary		$5, 10 and 15 00
210	" " better quality		$25, 30, 35 and 45 00
211	Stereopticans, oxy-hydrogen, from		$150 to 500 00
212	" oxy-calcium, from		$100 to 160 00
213	Dissolving view apparatus		$50, 60, 70 and 80 00
214	Magic lantern slides per set of 12, from		$2 50 to 9 00
215	Slides for spectrum analysis	each	$2 50 to 3 00
216	" astronomical	"	$1 50
217	" geological	"	$1 50
218	" natural phenomena	"	$2 to 2 50
219	" historical	"	$1 50
220	" chromotropes	"	$3 to 6 00
221	" plain		$1 00

Electrical, Magnetic and Galvanic Apparatus and Supply.

222	Friction cylinder, plain	$1 50
223	" mounted with, axle	$3 00
224	Friction glass plate, 8,12 and 15 inches	$1, 5 and 8 00
225	" rubber " 8, 12 and 15 inches	$1, 3 50 and 7 00
226	Electrophorus	$3 50
227	Electric frictional machines	$8, 15, 25, 50 and 75 00
228	Curt W. Meyer's Holtz machines	$25, 30, 75 and 85 00

Larger size Holtz machines made to order.

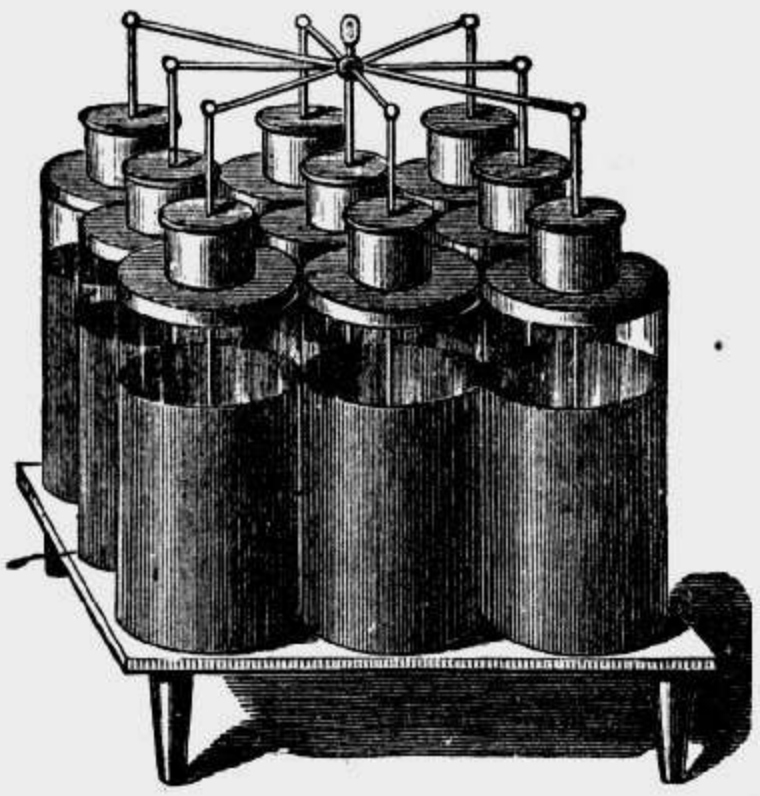
229	Insulated conductors	$4, 8 and 14 00
230	Insulating stools	$4, 5 and 6 00
231	Pith ball electrometer and stand	75 cents and 1 50



No. 231

232	Quadrant electrometer and stand	$2 00
233	" " to fit conductor	$1 50
234	Gold leaf "	$125 to 4 00
235	Electrical flier to fit conductor	50
236	do on stand	$1 00
237	Electrical orrery on stand	$1 50
238	Head of hair	$1 50
239	Electrical bells on stand	$1 50, 2 50, 3 75, 5 and 8 00
240	" " to fit conductor	$1 50, 3 and 4 00
241	Pith ball dancing apparatus	$1 50 and 2 50

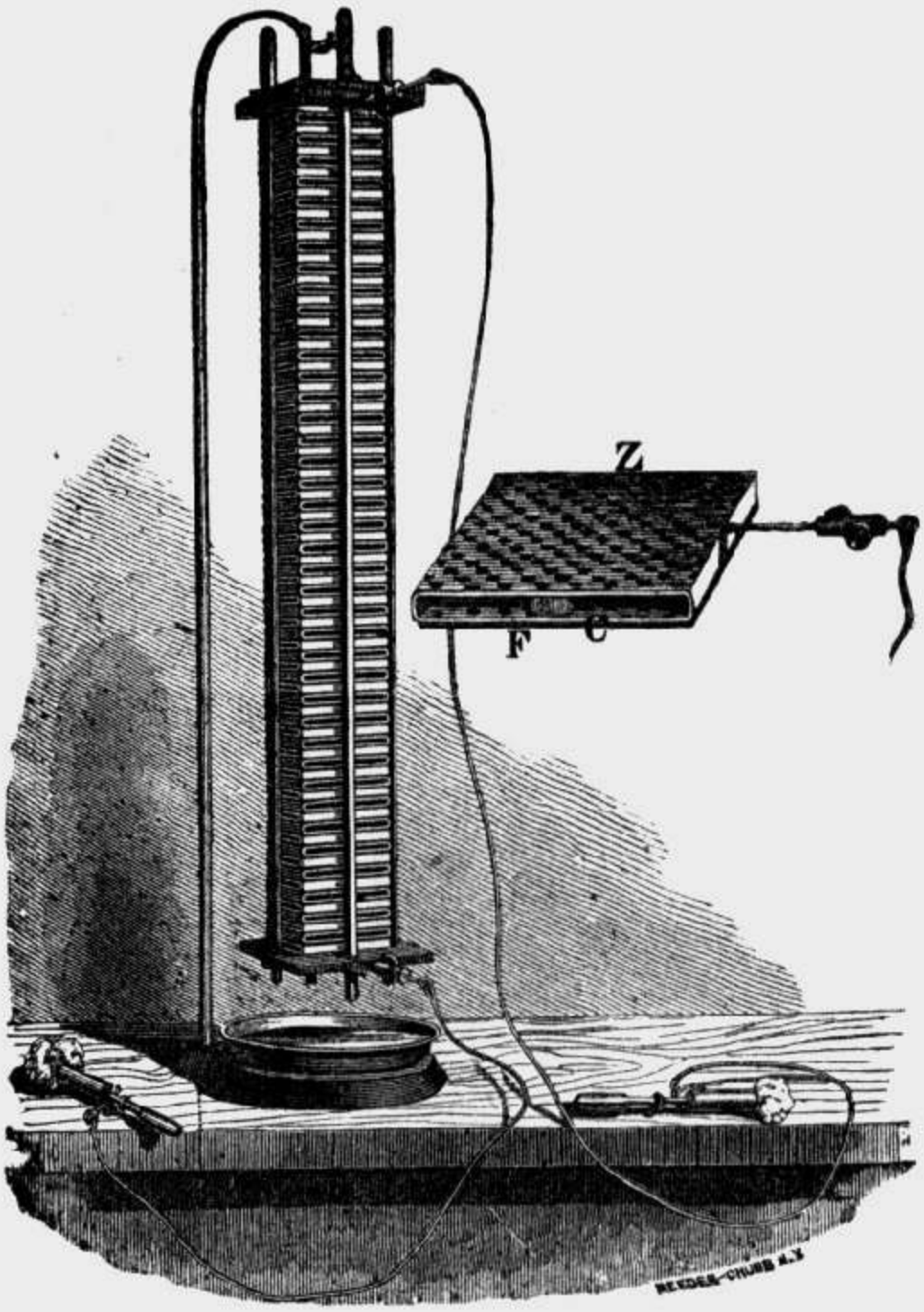
242	Pith balls, various sizes, per dozen	25 cts and 50
243	Dancing image plates to fit conductor	$1 50
244	" " " on stand	$5 00
245	Dancing images of pith	75
246	Electric spoon for ether or alcohol	25 cts and 75
247	Electric cannon	$1 50 and 2 50
248	Electrical thunder house	$8 and 10 00
249	Spiral or lightning tubes	75 cents to $3 00
250	Platinum foil lightning tubes, large size	$5 00
251	Lightning or luminous plates	$1 50 to 8 00
252	Apparatus to illustrate Lichtenberg's figures	75 cents to 1 50
253	Bevis's plates	85
254	Lightning plates, small	$1 00
255	Leyden jars with movable coatings	$1 50
256	Leyden jars	75 cents, 1, 1 50, 2, 3 4 00
257	Electrical or Leyden battery of 4 jars	$6 00
258	" " " of 6 "	$9 00
259	" " " of 9 "	$13 50



No. 259

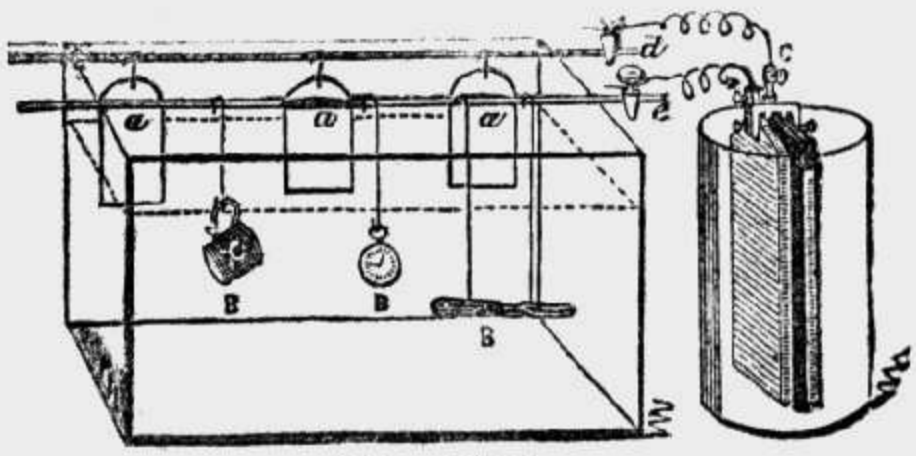
260	Dischargers, small size 75 cents, plain $1 50, larger size, $2 50, jointed 3 50	
261	Universal discharger	$3 00
262	" " large size	$10 00
263	Aurora tube	$6 50 and 8 00
264	Geissler or vacuum tubes, a great variety, each 1.50, 1.75, 2, $2 50, 3, 4, 5, 6, 8 and 10 00	

265	Natural lodestones	50 cts and 75
266	Bar-magnets	50, 75, 1 and 1 50
267	Horse-shoe magnets with armature, 20, 30, 45, 65, 85, 1 25 $1 50, 2 and 2 50	
268	Magnetic needles or compasses, ordinary, 35, 50, 75, 1, 1 50 $1 75, 2, 3 and 4 00	
269	" " on stand	$1 50, 2 75 and 3 00
270	Magneto-electric machines	$9, 10, 12, 15 and 18 00
271	Pocket compasses, elegantly finished,	$2 75, 4, 6 and 8 00
272	Voltaic piles, for medical use,	$20, 35 and 45 00
273	Voltaic piles, for school use,	$15, 25 and 35 00



No. 272

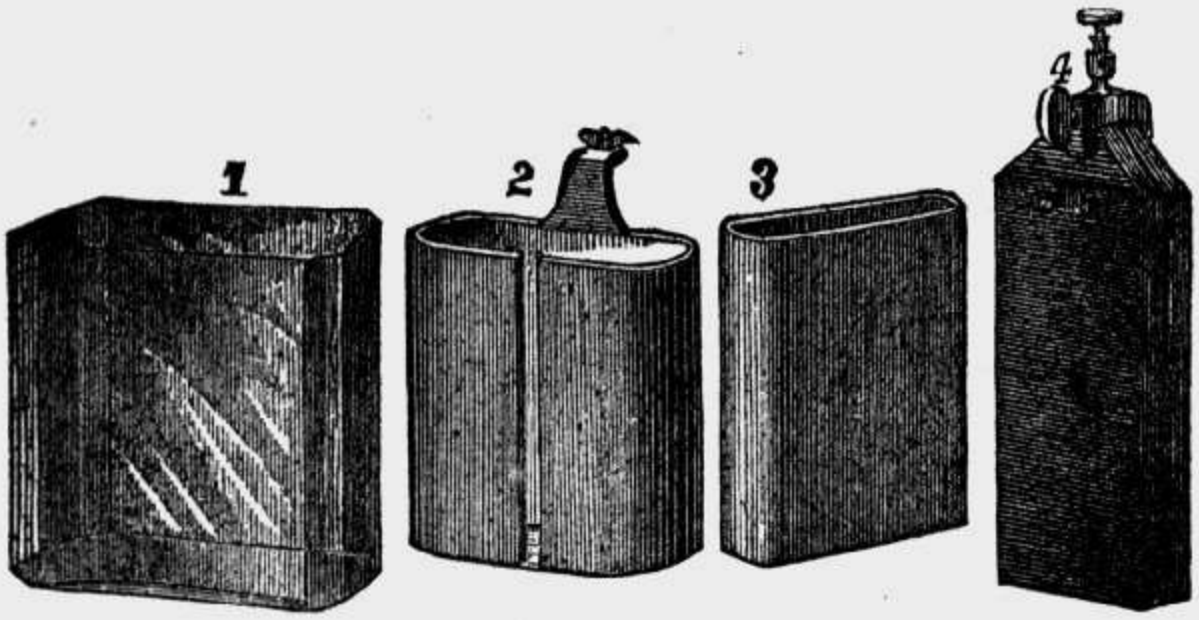
274 **Daniell ' battery**, per cell..... ....$2 25
275 **Smee's battery**, per cell,.....$2 75, 3 50, 4 50 and 6 00



No. 275.

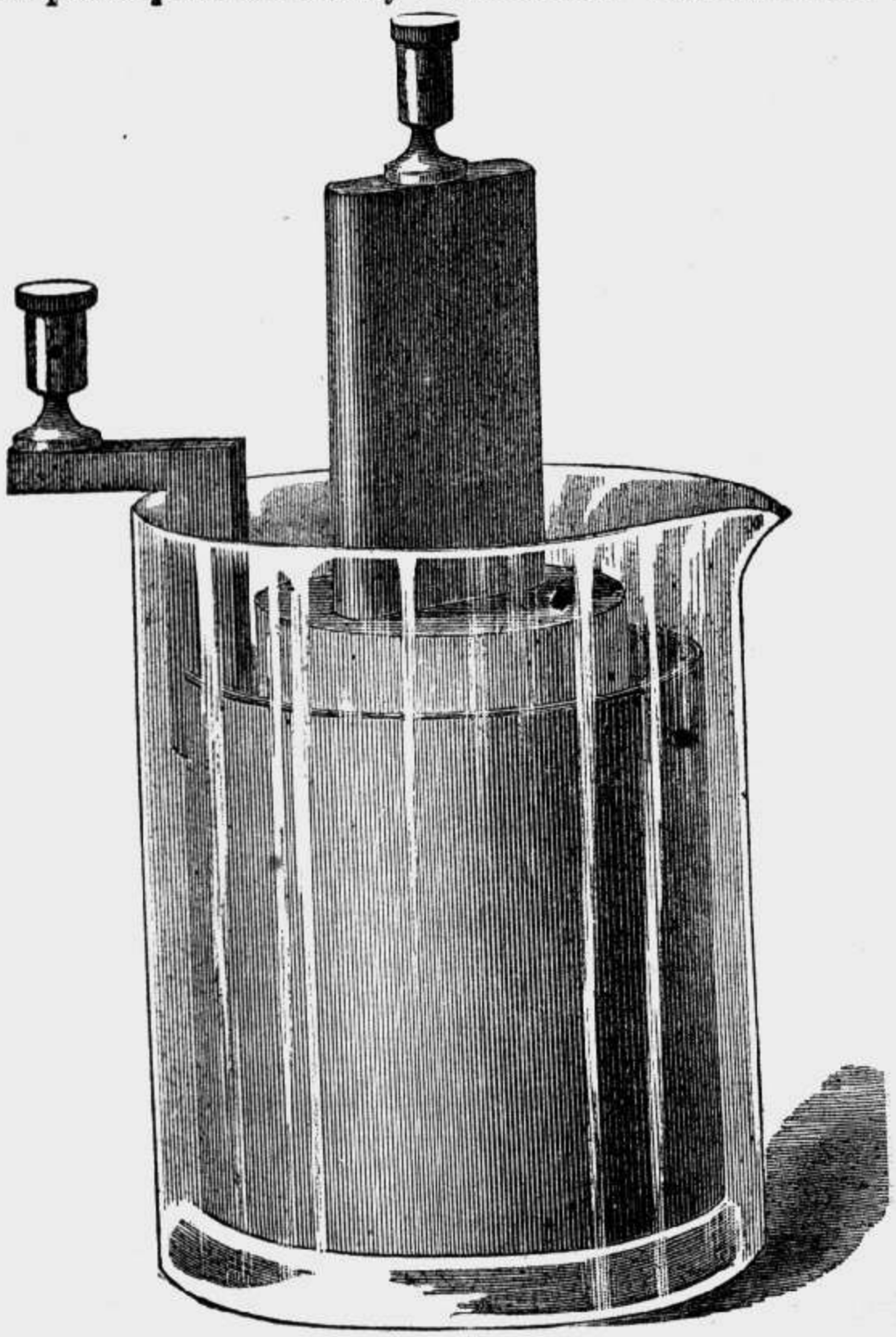
Most suitable for electro plating purposes.

276 *a* **Carbon-zinc**, or Bunsen's battery, various patterns, C. H. and V. W. improved cell, $5 and 6 00
276 *b* **Ordinary Bunsen** cell, $1 25, 2 25, 3 50, 4 and 5 50

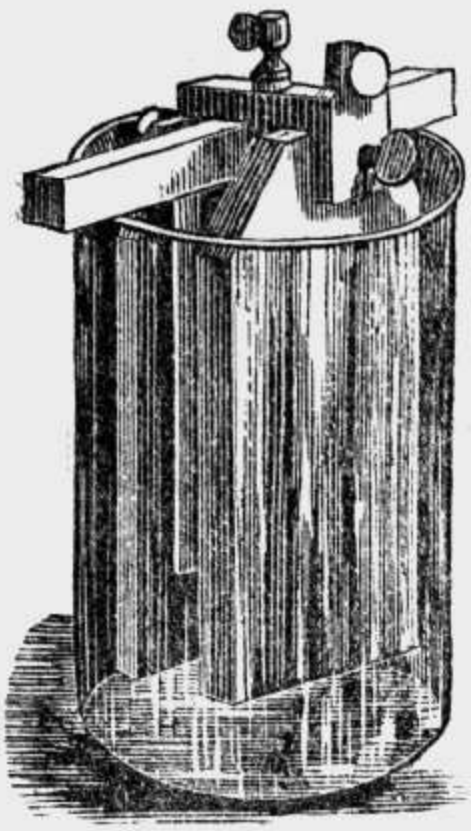


No. 276 *a*

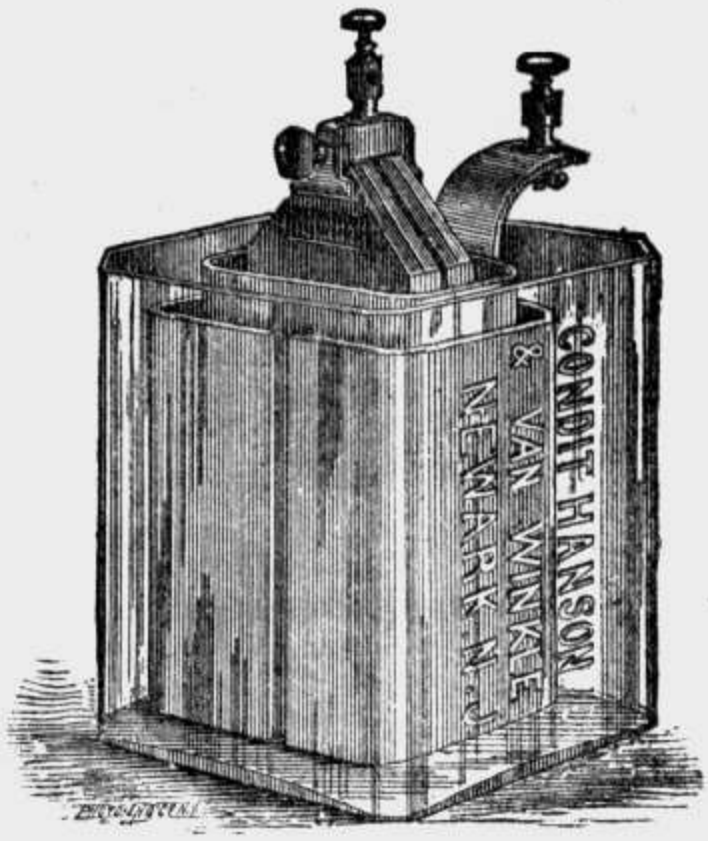
276 *c* Improved Bunsen battery $4 00



No. 276. *c.*

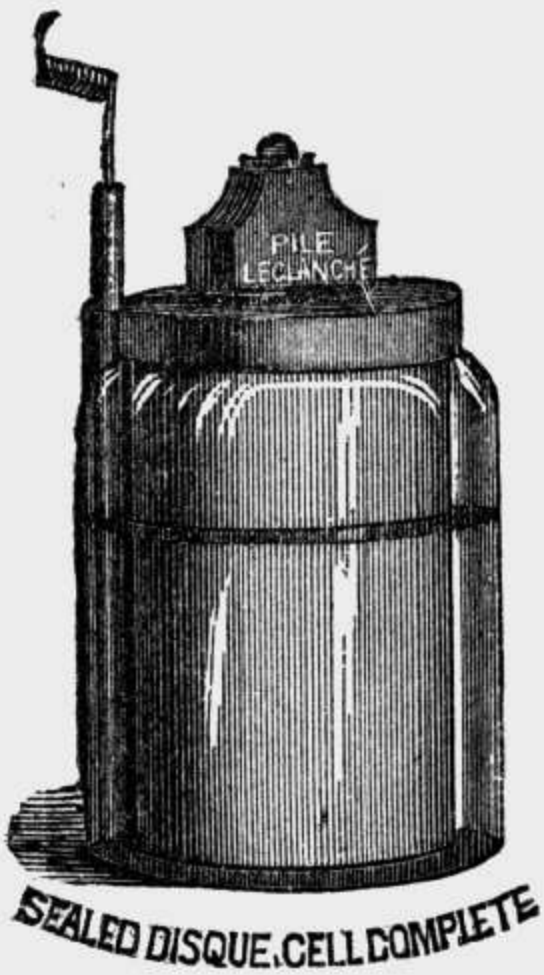


No. 275.

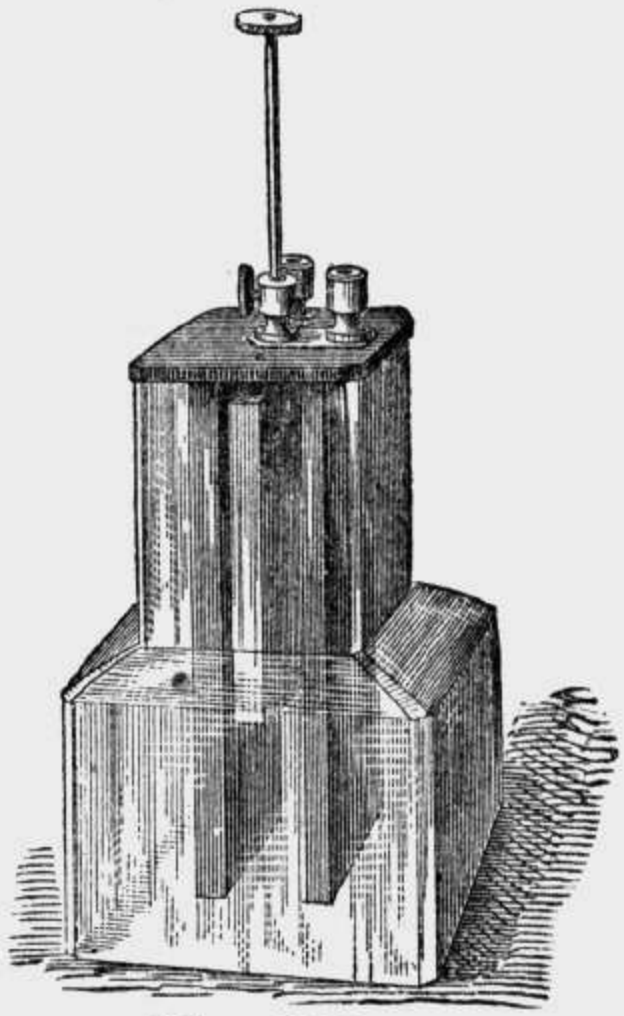


No. 276. *a.*

277 Grove's battery, per cell.....$2 50 and 4 00
278 Leclanche's battery, per cell.....$2 50, 3 25 and 4 00



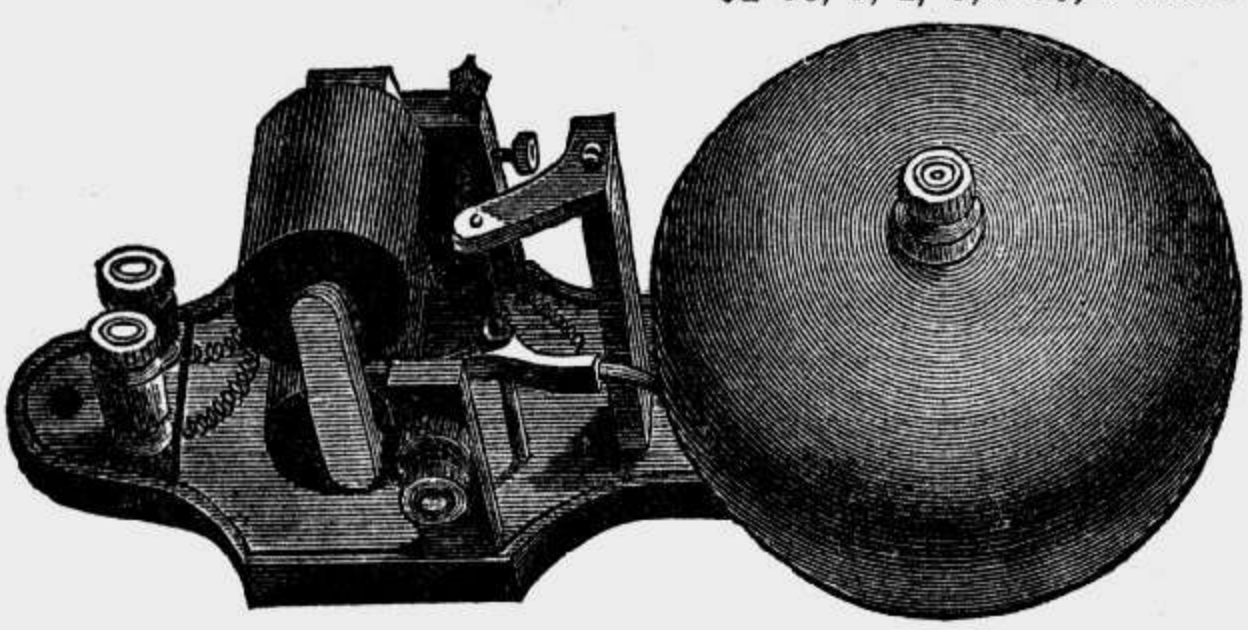
No. 278.



No. 279.

279 Grenet battery, various shapes and sizes, also called bichromate of potash battery,
$2 25, 2 50, 3, 4 25, 4 50, 5 50, 6 50 and 12 00
280 Galvanometers. See Medical Apparatus, page 40.
$4, 6,8, 10 and 12 00

281 **Electric lighters** $3 50
282 **Electric lamps** $8, 12, 15 and 25 00
283 **Carbon points for electric light, per pair** 25, 35 and 50 cents.
284 **Doebereiner's platinum sponge lamps (hydrogen lamp)** $3, 5 and 8 00
285 **Water decomposing apparatus** $3 and 5 00
286 **Decomposing and recomposing water apparatus** $10 00
287 **Contracting helix** $3 75
288 **Electro motors** $8, 12, 15 and 25 00
The $12, 15 and 25 motors have attachments for revolving Geissler tubes.
289 **Helix for magnetizing** $2, 2 50 and 3 00
290 **Helix and ring armature** $3 50, 4 and 5 00
291 **Electro magnets** $1, 1 50, 2, 3 and 4 00
292 **Set of telegraphic instruments complete, sounder, key and battery** $6 00
293 **Set of telegraphic instruments complete, superior constructions, without battery,** $8, 10 and 12 50
294 **Electric bells, iron frame and wooden box bells,** $2 50, 3, 4, 5, 6 50, 8 and 9 00



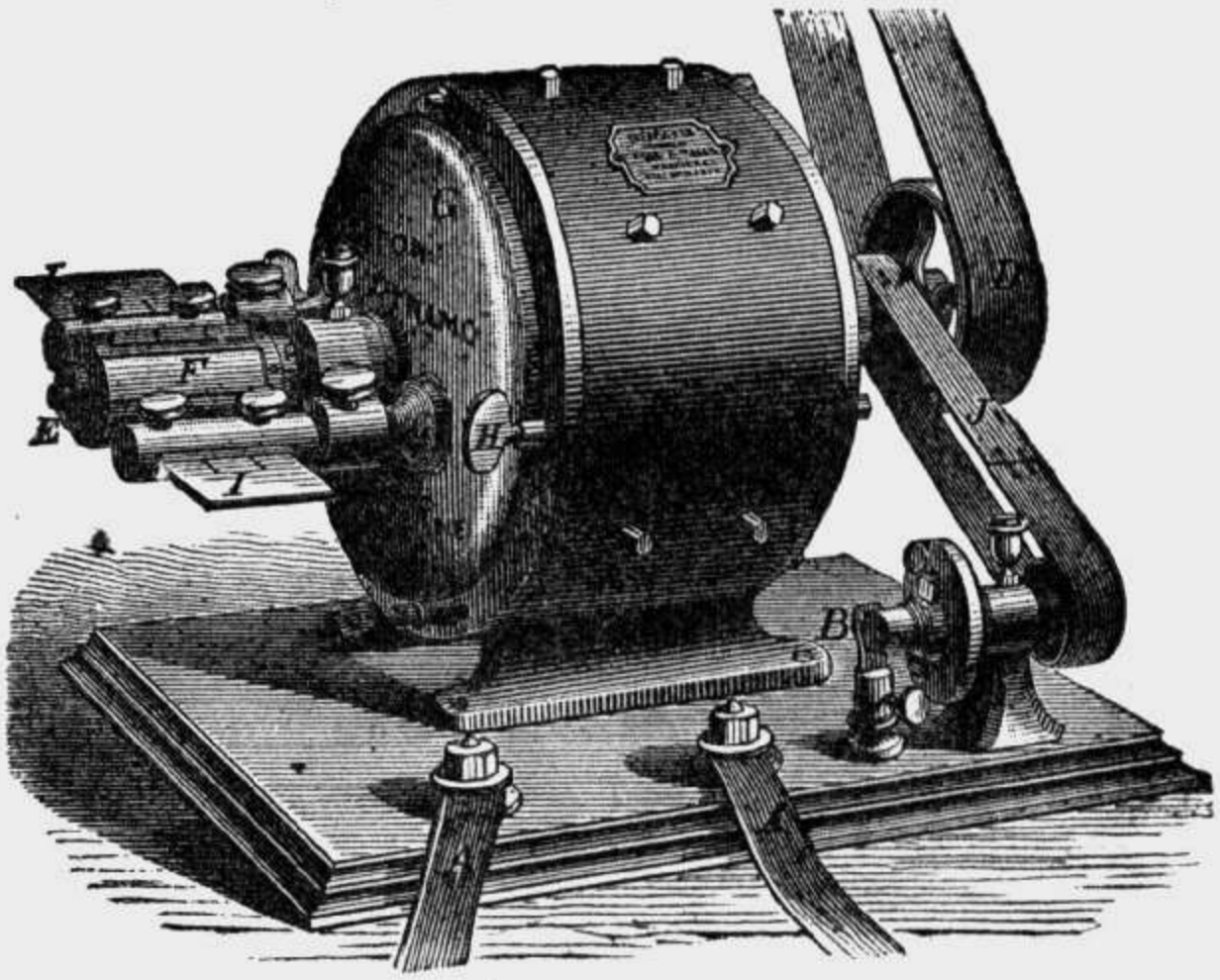
No. 294

295 **Rheostates ; according to number of units, from 0 : 100, 10 : 500, 100 . 1000,** $45, 60 and 75 00
296 **Electro magnetic instruments, with upright coils, very powerful, including battery,** $15 and 25 00
297 **Pocket induction apparatus** $6, 8, 10 and 12 00
298 **Ruhmkorff's induction coils, with condenser and automatic break, giving 1-16 inch spark** $6 50

"	1/8	"	..... 8 00
"	3-16	"	..... 10 00
"	1/4	"	..... 12 00
"	3/8	"	..... 15 00
"	1/2	"	..... 22 00
"	5/8	"	..... 28 00
"	3/4	"	..... 35 00
"	7/8	"	..... 40 00
"	1	"	..... 45 00
"	1 1/2	"	..... 60 00
"	2	inches "	..... 75 to 100 00
"	3	" "	..... 125 to 140 00
"	4	" "	..... 150 to 200 00

299 Dynamo electric machines, most improved form. Weston's paten

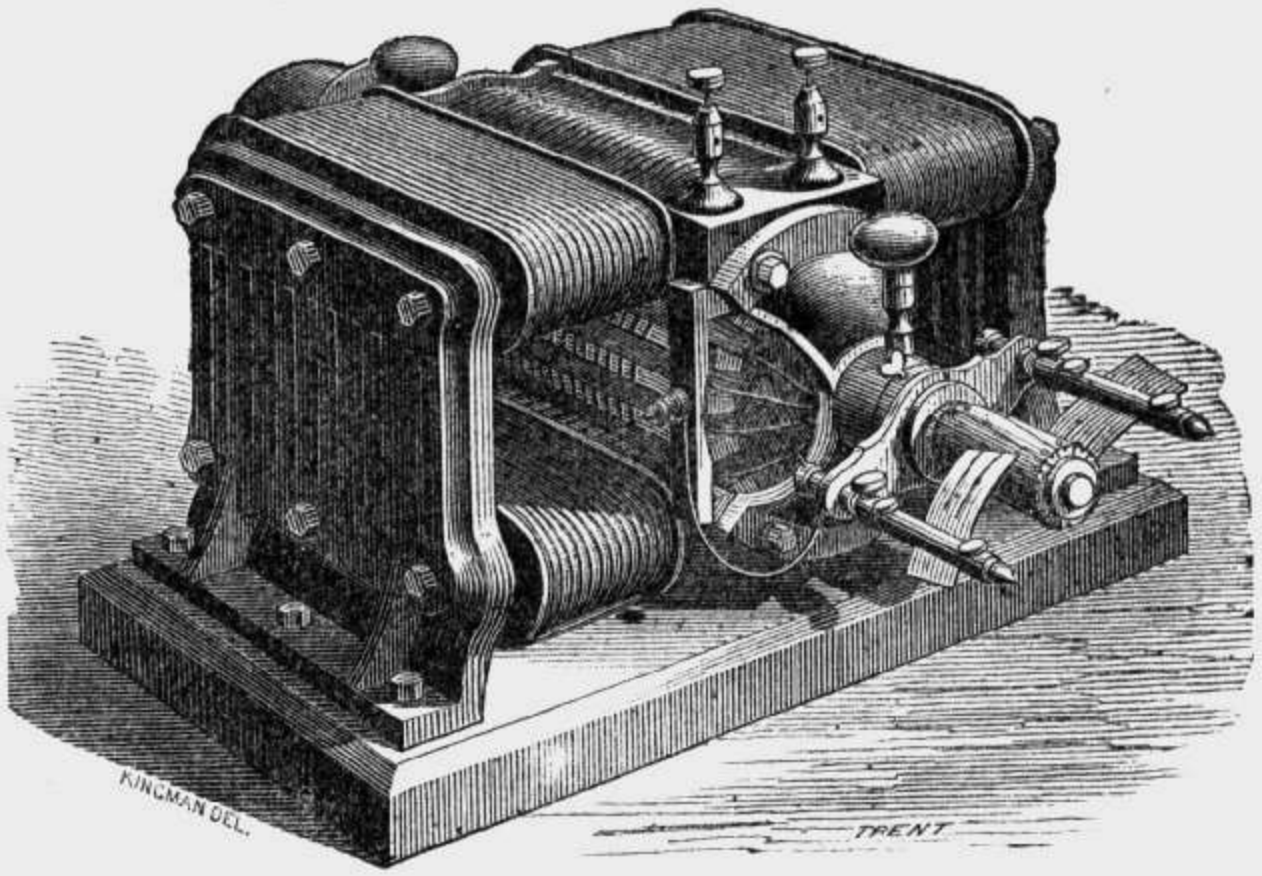
for electro-plating and electro-typing, small size	$150 00
2d size, requiring 1-6 horse power	200 00
3d size, requiring ½ horse power	350 00
4th size, requiring 2 horse power	500 00
5th size, requiring 4 horse power	800 00



No. 299

300 Dynamo electric machines for electric light (latest improvement.

No. 1,	1 light,	$250 00	No. 4	1, 2 or 3 lights,	$600 00
No. 1½,	1 light,	350 00	No. 5	5 lights	1000 00
No. 2	1 light,	450 00	No. 6	10 lights	1400 00
No. 2½	2 lights,	450 00	No. 8	20 lights	2000 00
No. 3	1 light	600 00			



No. 300

301 Electric lamps, each $60 00

INSTRUMENT AND BATTERY MATERIALS.

302 Screw cups, single and double, to fit bases, 15, 20, 25, 30 and 35
303 Wire connecting clamps, single and double, 20, 25 and 30
304 Large size screw binding posts 25, 30, 35 and 40
305 Table binding posts, single 25, double 40
306 Carbon clamps 20, 25 and 30
307 Daniel battery zinc clamp 20 and 25
308 Carbon battery zinc connections 20, 25 and 30
309 Carbon plates for Bunsen batteries from 20 cents upward to 2 50
Cut to order any size, to 12 inches square.
310 Carbon pencils for electriclight, ¼ inch square, 10 to 12 inches long, 20
311 Rolled zinc cylinders for Bunsen batteries 60, 75 and $1 25
312 Rolled zinc plates for Smee's batteries 35, 45, 55 and 80
313 Heavy zincs, cylinder shape $2 50
314 Battery jars 35, 40, 50, 60, 75, 85, $1, $1 50
315 Porous cells 15, 20, 30, 35 and 40
316 Battery fluid, ready prepared, (bichromate of potash fluid) pint 20, quart, 35
317 Platinum wire and foil per dwt. 60
318 Tin foil, finest, per oz. 10
319 " ordinary, per sheet, 3 feet long 10
320 Magnesium ribbon, one foot 6 cents, per oz. $4 50
321 Bichromate of potash 30
322 Bisulphate of mercury, per oz. 25
323 Blue vitriol, package 10
324 Insulated copper wire,
No. 16, 18, 20 22, 26, 30, 32, 34, 36, 38,
cotton covered, per pound,
$0.60, $0.65, $ 70, $ 80, 120, 165, 200
325 Silk covered "
1 60, 1 75, 1 85, 2 00, 2 40, 3 40, 4 00, 4 75, 8 00, 14 00
The above prices for quantities not less than one pound.
Small quantities, 25 per cent. additional.
326 Electric cord, plain, per yard, 15 and 25
327 " " silk insulated per yard, 30, 40 and 50

Chemical Apparatus and Supply.

328 Test tube stands for 12 or 18 tubes $1 50 and 2 00
329 Carbonic acid apparatus $1 00 and 2 50
330 Iron tripod stands $75, 1 50 and 2 00
331 Retort stands iron, with 2, 3 and 4 rings $1, 1 25, 1 50 and 2 50
332 Fluid or glass thermometers $75, 1 00 and 1 25
333 Chemical thermometers Fahr. or Cels. $1 50, 2, 2 50 and 3 00
334 Tin back thermometers $35, 45, 65, 75 and 1 00
335 Copper case thermometers $1 25, 1 75 and 2 50
336 Medical or fever thermometers plain in case $2 50
337 " " " self registering, pat. twist in case $3 50
338 Hydrogen lamps $3, 4, 6 00 and 8 00
339 Platinum sponges, each 75
340 Hydrometers for light and heavy liquids 75 and 1 00
341 Spirit Hydrometers, plain $1 00
342 U. S. Custom House alcoholometer with thermometer $2 50
343 Twaddel's (hydrometers) 75

344 Urinometers with test glass, in case 85
345 Arsenic apparatus $3 00
346 Barometer tubes, closed at one end $1 00 and 1 25
347 Gasometers $25, 35 and 50 00
348 Hydrogen generators $6, 8, 10 and 25 00
349 Alcohol lamps $.50, 75, 1 00 and 1 50
350 Bunsen burners $.75, 1, 1 25 upwards to 4 00
351 Hand scales $2, 2 50 and 3 00
352 Prescription scales $5, 5 50, 7, 10, 12, 15, 18 and 25 00
353 Analytical balances $50, 90 and 110 00
354 Weights in sets $.50, 65, 75, 1 25, 2 75, 5, 7 and 12 00
355 Test tubes of best and well annealed glass

inches,	3	4	5	6	7	8	9
per doz.	.25	35,	40,	50,	60,	85,	$1 25

356 Funnels each .15, 20, 30, 40, 50 and 75
357 Funnel tubes or safety tubes .25, 35 and 50
358 Funnel tubes with one or 2 bulbs .35, 50, 60 and 75
359 U tubes .20, 25. 35, 45 and 75
360 Chloride of calcium tubes .20, 30 and 50
361 Prince Ruperts drops per doz. .50 to 1 00
362 Candle bombs per doz. 50
363 Cartesian imps each .25 to 50
364 Pneumatic troughs $8, 10 and 12 00
365 Set of cork borers $1 75 and 2 50
366 Brass blowpipes, ordinary 25, 35, 50 and 75
367 Blowpipes, fine quality $1 25, 2 50 2 75
368 Blowpipe (oxy hydrogen). See Heat.
369 Pulse glasses. See Heat.
370 Wash bottle fittings 15 and 25
371 Woulfe's bottles 75 and $1 00
372 Siphons 50, 75 and 1 25
373 " with suction tube 60, 75 and 1 75
374 Glass stop cock with tube $1 00 to 2 00
375 Retorts plain, glass 25. 35, 50 and 80
376 " tubulated 40, 45, 65 and 90
377 Glass blowpipes 35
378 Burettes, graduated $1 50, 1 75, 2 00, 3 00
379 Pipettes " 25, 35, 50, 75 and 1 00
380 Hydrometer jars with lip 35, 50, 75, $1, 1 25 and 1 75
381 " " graduated 75, $1, 1 25 and 1 75
382 Ounce graduates or measures 35, 45,65,85,1 25 and 1 60
383 Florence or chemical flasks 25, 30, 35, 40, 50, 60, 75 and 1 00
384 Crucibles, porcelain 15, 30, 60 and 75
385 " Hessian in nest of four 25
386 " platinum, per dwt. 60
387 Filtering paper, 100 sheet packages, 35, 50, 75 and 1 00
388 Crucible tongs 75, 1 25 and 2 50
389 Evaporating dishes, porcelain, 20, 35, 45, 65, 85 and 1 00
390 Mortar and pestle, porcelain, $1, 1 25, 1 50 and 1 75
391 " " glass 50, 75, $1 and 1 25
392 " " agate $2 25, 3, 4 and 5 00
393 Rubber tubing, flexible, per foot, 12, 15, 18, 25 and 30
394 Rubber stoppers per doz. 12 cents to 75
395 Sheet rubber, flexible, per sqnare foot 35 and 50

396 Rubber cement in tin box 40
397 Gas bags, spherical, 1, 2, 3 & 4 gall. $2 25, 2 75, 3 50 and 4 00
398 Gas bags, square, with stop cock,
18x24, 20x30, 24x30, 30x40,
$10, 11 50, 12 50, 16 00
399 Gas bags, square, 30x40, canvas covered $23 00
400 Acid bottles 15, 20, 25, 30, 35 and 50
401 Arsenic tubes 10
402 Beaker glasses in nest of three, 2 to 4 oz. 38
403 " " " five, 1 to 8 oz. 75
404 " " " six, 2 to 16 oz. $1 25
405 Globe receivers, tubulated 65, 75 and 90
406 Receivers, see Pneumatics.
407 Litre bottles 75, $1, 1 25 and 1 50
408 Specific gravity bottles $1 50, 2 25, 2 50 and 2 75
409 Glass tubing, heavy glass, per pound 75
410 " " thin glass " (extra fine) 1 25
411 " " for electrical purposes, per pound 2 00
412 Stirring rods, set of six 25
413 Glass rod, white or colored, per pound 1 00

Astronomical Instruments.

414 *Terrestrial Globes*, plain, on stand, inches 3, 4, 6, 9, 12, 20,
$1 50, 3, 4, 9, 15, 45
415 *Terrestrial Globes*, with meridian, on iron stand inches
3, 4, 6, 9, 12, 20
$2 50, 3 50, 5, 12, 18, 50
416 *Terrestrial Globes*, complete, with horizon, meridian and hour circle, on stand, inches 6, 9, 12, 20
$10, 16, 25, 65

The 9, 12 and 20 inch globes have also quadrant attached.

417 *Terrestrial Globes* complete, most elegantly finished, 20 inches dia. $75, 80 and 175 00

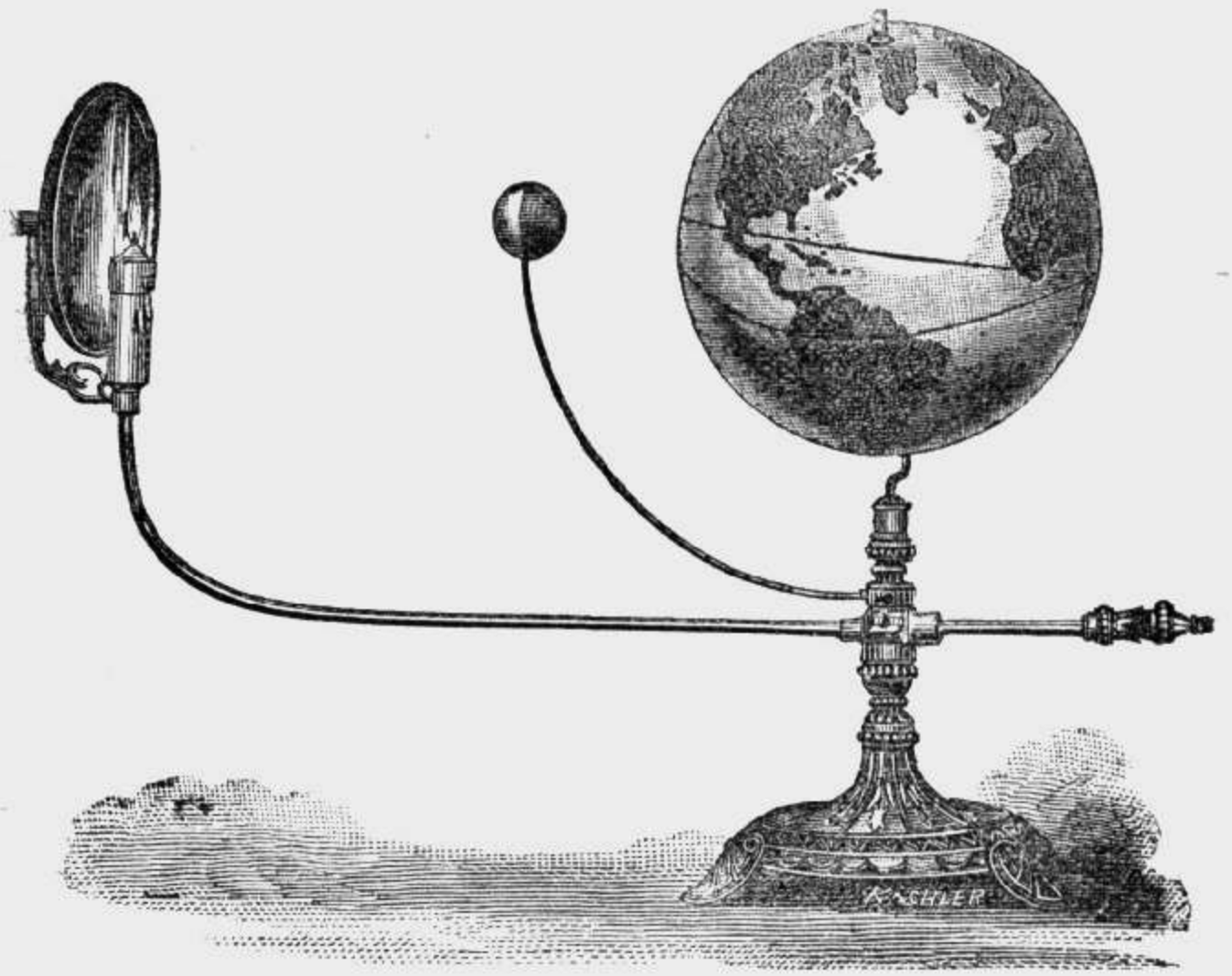
No. 416

418 *Celestial Globes*, plain, on iron stand, inches 9, 12, 20,
$9, 15, 45
419 *Celestial Globes*, with meridan, on iron stand, inches, 9, 12, 20
$12, 18, 50

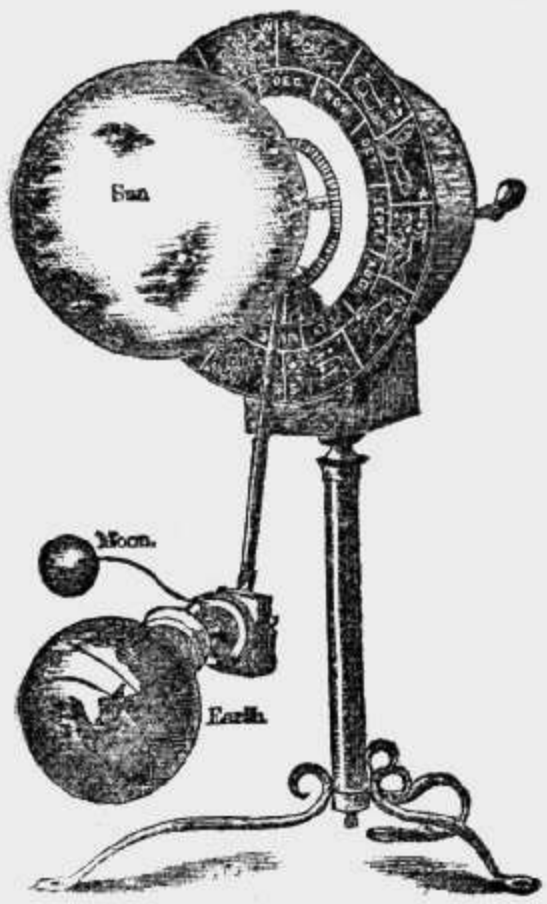
420 *Celestial Globes*, with horizon, meridian, hour circle and quadrant on stand, inches 9, 12, 20 $16, 25, 65 00

421 *Celestial Globes*, more elegantly finished, 20 inches, $75, $80 and 175 00

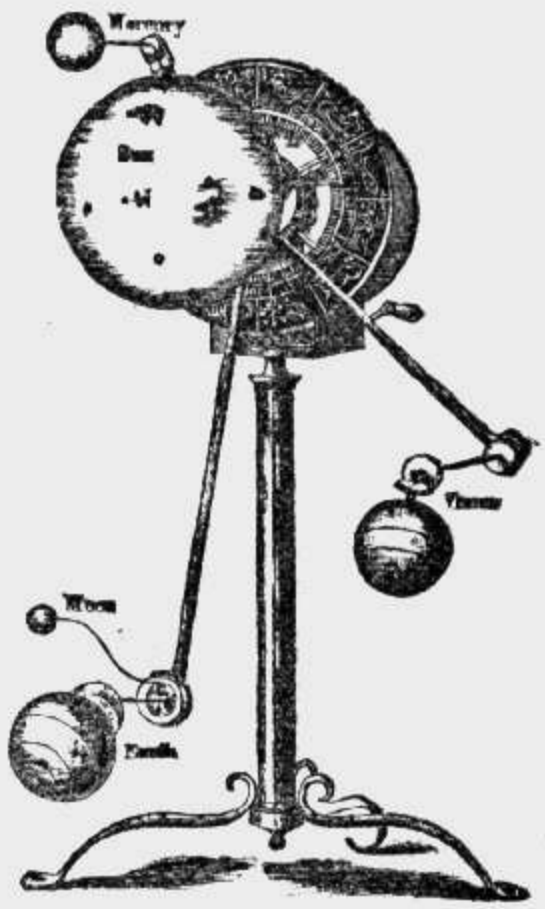
422 *Slated Globes*, inches, 4, 6, 9, 12, 16, 20
$2, $4, $8, $12, $25, $45



No. 423 *b*



No. 426



No. 427

423 *a Lunar Tellurian*, on iron stand, with 6 inch globe of the earth, 1⅓ inch globe of the moon, earth's orbit, 36 inches dia. $20 00
423 *b Tellurian Globe* on bronzed stand $12 00
424 *Automatic Tellurian* or *astronomical clock* $40 00
425 *The Stellar Tellurian*, with Jackson's mathematical geography, manual for the instrument, Celestial Hemispheres, and key. 18 inches dia. $50 00
36 " " $80 00
426 *Lunatellus*, moved with rotary gear, almanac accompanying it $20 00
427 *Heliotellus* moved with rotary gear, almanac added $32 50
428 *Movable planisphere* of the heavens, painted $3 00
429 " " " " natural $3 00
430 *Small movable planisphere* 5½ inches (square) 30
431 *Telescopes*, see optical instruments and goods, $60, 85 & 150 00

Mathematical and Surveying Instruments.

432 *French instruments*, made of brass, in neat cases, according to the number of pieces $75, 100, 125, 150, 175, 225, 250, 300, 350, 375, 450, 500, 575, 700, 7.50 8 00
433 *French instruments*, german silver, in cases $5.00, 5.75, 7.50, 8.00, 9.75, 11.00, 12.00, 18.50, 24.00, 30 36 00
434 *French instruments* on card board, brass $0.50, 60, 70, 85 1 00
435 *French instruments* on card board, german silver $1.50 and 1 85

French instruments, singly, brass

436 Dividers $0.30, 40, and 50
437 Proportional dividers in case $ 2 50
438 Drawing pen $0.25, 30 and 35
439 Dotting wheel 1 00

French instruments, singly, german silver

440 Dividers 75
441 Proportional dividers plain and with rackmovement in case $3.50 and 6 00
442 Proportional dividers with rackmovement, divided for lines, circles, solids and planes in case 8 00
443 Beam compasses, with pen and pencil points in box 7 50
444 Pocket dividers, with folding pen, pencil and needle points 7 25

German instruments, in german silver highly finished, steel points.

445 Dividers with handle 1 10
446 Compasses with pen, pencil and needle points 3 00
447 " with fixed needle and pen points 2 25
448 " with fixed needle and pencil points 2 25
449 Dividers, according to size, 4, 5 and 6 inch 90c, 1 00 and 1 10
450 Hair-spring dividers 1 90

451	Compasses, with 3 and 4 attachments	$3 00 and	4 00
452	Pocket dividers, with sheath		2 50
453	Pocket compasses, with folding points		7 00
454	Triangular compasses		4 00
455	Half dividers		2 75
456	Proportional dividers	$8.00, 9.00 and	10 00
457	Bow pen, with spring, adjusting screw and pencil point	$2 25 and	2 85
458	Beam compasses, with pen and pencil points, in case		9 00
459	Drawing pens	60c 70 and	80
460	Drawing pens, with joint	90c 1 00 and	1 25
461	Hatching pens	$1 75 and	2 50
462	Railroad pen		2 75
463	Steel spring dividers		1 25
464	" " bow pen, with needle point		1 75
465	" " " pencil " " "		1 75
466	*German instruments* in morocco cases, according to number of pieces	$3 50, 4 50, 5 50, 6 50, 8 00,	11 00
467	*German instruments*, in polished cases with lock and tray	$10, 12, 15, and	20 00
468	" " extra fine quality, in pocket morocco cases, $9, 12, 15, 18 and		20 00
469	" " " " " in polished cases with lock and tray, $12, 15, 18, 22, and		32 00
	English instruments, singly, german silver, high finish, with double joint		
470	Dividers		2 50
471	Hair-spring dividers		3 50
472	Compasses	$11 and	16 00
473	Bow pen, $3 50 Bow pencil		3 50
474	Bow pen, with needle point $4 00 Bow pencil, with needle point		4 00
475	Proportional dividers		7 50
476	Tubular compasses, with sliding bar and needle points		18 00
477	Drawing pens	$1 35, 1 50 and	1 75
478	Drawing pens, with joint	1 50, 1 75 and	2 00
479	Railroad pen		4 50
480	Tracer $1 00 Pricker		1 50
	Swiss instruments, singly, german silver, finest English steel, with pivot joints		
481	Dividers	$2 00 and	2 75
482	Hair-spring dividers	$3 00 and	3 50
483	Compasses with attachments	$4 50, 5 00, 6 00, 7 50 and	9 50
484	Steel spring dividers, with german silver handle		1 70
485	" " bow pen " " " " and needle point		2 50
486	" " bow pencil " " " " and needle point		2 50
	Swiss instruments, in cases		
487	Morocco case, containing divider, compasses with attachments and drawing pen		10 50
488	Polished rosewood cases, with outfit	$25, 28, 30 32, 45 and	50 00
489	Planimeter		35 00
490	Pantographs for reducing or enlarging drawings, etc.	$3 50, 6, 18, 25 and	30 00
491	Protracters, circular on bristol board		40
492	" semi-circular, horn	40c, 50, 60, 75, $1 and	1 25
493	" circular "	$1 50, 1 75 and	2 00

494	" square "	50c and	1 00
495	" " boxwood		75
496	" " ivory	$1 75 and	2 50
497	" " " larger sizes	$5, 7, and	12 00
498	" semi-circular, brass	25c, 35, 60 and	75
499	" " german silver	75c, 1 00 and	1 50
500	Boxwood scales, flat 6, 12 and 24 inch	35c, 50 and	2 00
501	" " beveled both sides,	24 inch	2 50
502	" " triangular 6, 12,	18 and 24 inch $1 50, 2, 3, and 5 00	
503	Scale rules 12 inches	12c, 25, 50	75
504	T squares, ordinary	35c, 40, 50, 60, 70 and	85
505	" with shifting head	80c, 90, 1 00, 1 20, 1 40 and	1 60
506	" better quality	75c, 85, 1 00, 1 25, 1 50 and	1 75
507	" " " with shifting head	$1 25, 1 40, 1 50, 1 60, 1 75 and	2 00
508	" finest "	$1 20, 1 50, 1 75, 2 00 2 50 and	3 25
509	" " " with shifting head	$2 20, 2 50, 2 75, 3 00, 3 50 and	4 25
510	Triangles 30x60° and 45° ordinary	15c, 20, 25, 30, 40 and	50
511	" " " " better qnality	25c, 40, 50, 60 and	75
512	" " " " finest "	60c, 70, 80, 1, 1 25	1 75
513	" " " " german silver	$2 50, 2 75, 3 00, 3 50, 4 00 and	5 00
514	Curves, wood ordinary	each 15c to	45
515	" " better quality	each 30c to	60
516	" horn	60c, 75, 85, and	1 00
517	Curves and triangles, in hard rubber, from	35c small size, upward to	2 25
518	Indian ink, per cake 25c, 30, 40, 50, 60, 75, 1 25, 150, 2, and		4 00
519	China ink cups	6c, 10, 15, 25 and	30
520	Paper stumps, assorted per doz.		50
521	Chamois " " " "		1 50
522	Crayon holders	10, 15, 25, 40 and	60
523	Rubber in cakes	5c, 10, 15 to	50
524	Sponge rubbers	10c, 15, 25, 60 and	1 75
525	Drawing paper tacks, per doz.	20c, 25, 35, 50, 60, 80 and	1 00
526	Horn centres $\frac{1}{2}$ ince dia.		15
527	" " $\frac{3}{4}$ " " with german silver ream		50
528	Geometrical bodies, made of wire silvered,	sets of 12 pieces, in box	5 00

SURVEYORS' COMPASSES.

529	5 inch Vernier compass with sights, 2 levels, ball and socket cover, complete in mahogany case with lock, key and strap, (also Jacob staff mountings).	$45 00
530	6 inch Vernier compass, same as above	50 00
531	5 inch compass without vernier, in walnut case, rest same as above	30 00
532	6 inch compass, same as above	35 00
533	Tripod to fit compass, extra	5 00
534	Out-keeper for compass, extra	2 50
535	Achromatic telescope with cross hairs and attachment to fit any of the above	10 00

LEVELS.

536 Farmers' levels with telescope in case, with tripod $35 to $75 00

537 " " without telescope, but with sights in case $10 to 25 00

538 Surveyors' and builders' levels in case complete with tripod $50 to 100 00

539 18 inch engineers' Dumpey level with achromatic telescope, the latter with rack movement and sun shade, parallel screws, mahogany tripod, all complete in mahogany case with plumb-bob, magnifier, etc. 125 00

540 18 inch engineers' Y level, complete in case as above 125 00

THEODOLITES.

541 Mining theodolite, with 2 inch needle, vernier, 3½ inch long achromatic telescope with cross hairs and level attached, gratuated arc with vernier, parallel screws, and mahogany tripod, complete in mahogany case with plumb-bob, magnifier, etc. $100 00

542 English theodolite, 6 inch circle, two telescopes, levels, graduated silver circles, tangents, best London make, in mahogany case complete, with magnifier, plumb-bob, screw driver, etc., including mahogany tripod, $200 to $300 00

TRANSITS.

543 Demi transit, 4¼ inch needle, achromatic telescope 10⅓ inches long with cross hairs, two levels on plates, parallel screws, divided to ½ degrees, in case complete with tripod $75 00

544 Same as above, but additional spirit level on telescope and tangent movement and clamp to telescope, also tangent to plates $110 00

545 Mining transit with 3½ inch needle, verticle circle 3¼ inch in dia., achromatic telescope with cross hairs and rack movement, light constructed otherwise similar to the Surveyors' Transit, in walnut case, complete, with mahogany tripod (most suitable for mining or railroad use) $125 00

546 Surveyors' transit, 5 inch needle, verticle circle 4¾ inch dia., achromatic telescope, level, clamp and tangent to telescope, clamp and tangent to upper and lower plates divided to ½ degrees, two verniers reading to minutes; in walnut case, complete, with strong mahogany tripod $150 00

547 Engineers' transit, 5 inch compass needle, achromatic telescope, level, clamp and tangent to upper and lower plates, parallel screws, shifting centre tripod head, divided to ½ degrees, with two covered verniers reading to minutes, strong mahogany tripod; in mahogany case, complete, including plum-bob, magnifier, screw driver, etc. $180 00

548 Engineers' transit, same as above, and additional verticle circle and clamp and tangent movement to telescope $200 00

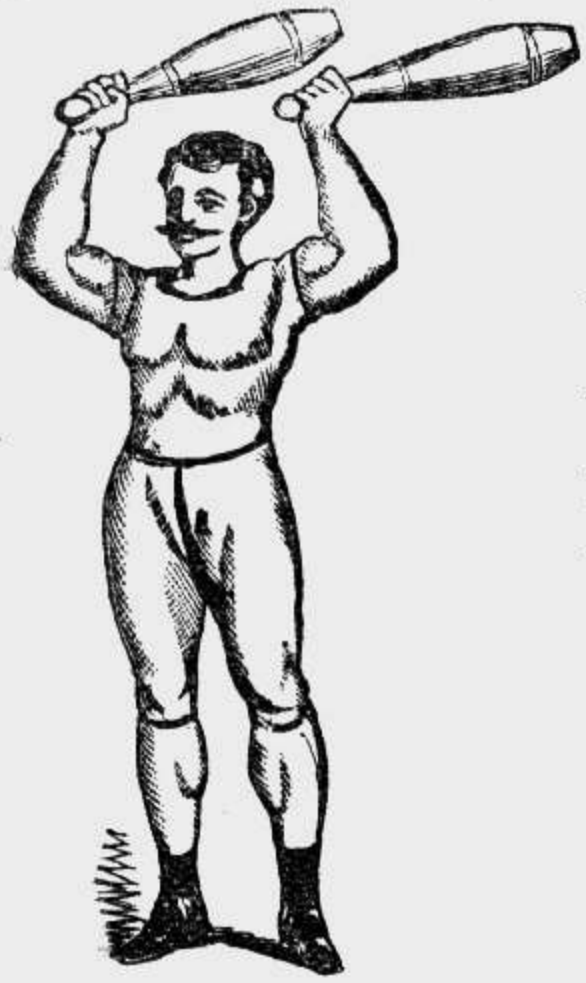
549 Engineers' transit, same as 547, divided to ⅓ degrees and reading by vernier to 20 seconds $215 00

CHAINS, TAPES, &C.

550 N. Y. Levelling Rod, made of seasoned satin wood, with tangent and clamp $15 00
551 Plum-bob, brass with steel point and screw top $1 50 & 2 00
552 Surveyors' chains, No. 12, iron wire, 2 pole $1.50; 4 pole, $3 00
553 " " No. 9, " " 2 " $2.00; 4 " $3 50
554 " " No. 8, " " 2 " $2.75; 4 " $4 50
555 " " No. 7, " " 2 " $3.75; 4 " $5 50
556 " " No. 12, steel wire, links and ring brazed; 2 pole $5 50; 4 pole, $10 00
557 Marking pins, No. 8 steel wire, 11 in a set, 1 50
558 " " No. 7 and 9 iron wire $0 50 and $0 75
559 Metallic tape measures in tenths or twelfths of foot leather cases, 33 feet $2 25
560 same as above 50 feet 3 00
561 " " 66 feet 3 50
562 " " 75 feet 3 75
563 " " 100 feet 4 75
564 Metallic steel tapes, otherwise same as above, 3 feet, $1 75
6 feet $2 50; 33 feet $6; 50 feet $8 25; 66 feet $11; 75 feet $12 50; 100 feet $16 00

Apparatus and Materials for Calisthenic Exercises.

565 Indian clubs of any size, per pair $1 00 and 1 50
566 Flying trapeze any size, each $1 00 and 1 25
567 " rings " " per pair $1 00 and 1 25
568 Dumb bells, of any weight, per lb. 05



Maple wood Dumb Bells, Wands, &c., &c., for calisthenic exercises, especially made for schools and gymnasiums. On orders of larger quantities a reduction will be made.

Books.

569	Manual of telegraphy—*Smith*	$ 30
570	Elementary guide in Electricity—*Curt W. Meyer*	25
571	Lessons in Electricity—*Tyndall*	1 00
572	Induction coils—*Dyer*	60
573	Galvanism—*Sir W. Snow Harris*	60
574	Questions on Magnetism—*McGregor*	60
575	Physics Primer—*Balfour Stewart*	50
576	Chemistry Primer—*H. E. Roscoe*	50
577	Notes on Electrical Phenomena—*Tyndall*	75
578	Electro-Metallurgy—*Napier*	3 00
579	" " —*Watt*	80
580	Electricity—*Sir W. Snow Harris*	60
581	Cipher Letter and Telegraph Code—*Larrabee*	1 00
582	Electro-Metallurgy—*Gore*	2 50
583	Electro-Therapeutics—*Hamilton*	2 00
584	Frictional Electricity—*Sir W. Snow Harris*	7 00
585	Examination of Telegraph Apparatus, etc.—*Morse*	3 00
586	Electrical Measurement—*Kohlrausch*	2 50
587	Chemical Physics—*Pynchon*	3 00
588	Electro-Magnetic Telegraph, etc.—*Turnbull*	3 00
589	Electricity, its Theory, Sources, etc.—*Sprague*	3 00
590	Electricity and Magnetism—*Jenkin*	1 50
591	Electricity in its relation to practical medicine—*Meyer*	4 50
592	Electricity and the Electric Telegraph—*Prescott*	5 00
593	Electricity and Magnetism—*Maxwell*	10 00
594	Galvanoplastic Manipulations—*Roesler*	6 00
595	The Galvanometer and its Uses—*Haskins*	1 25
596	Manual of Electricity—*Ferguson*	1 75
597	" " " —*Noad*	12 00
598	Magnetism—*Noad*	1 40
599	Magnetism—*Harris*	1 80
600	Medical Electricity—*Althaus*	6 00
601	" " —*Beard & Rockwell*	6 25
602	Natural Philosophy—*Ganot*	3 00
603	New Theory of Terrestrial Magnetism—*Metcalf*	2 00
604	Manual for the use of Globes—*Schedler*	25
605	Manual for calisthenic exercises	25

THE END.

Important Statement Regarding the Adoption of Spectacles and Eye-Glasses.

I have always paid the most careful attention to optics within the past twenty years and specially to the treatment of the defective and afflicted eye-sight. The proper selection of glasses, as regards quality and number of focus required, is no easy task, and it should be born in mind that by far most of these goods are handled in our present days by mere dealers in optical goods. There is no law which could prevent dealers from doing so, yet it should be considered by those in need of glasses or by those otherwise afflicted with their sight, that they need some better advise.

Remember, that the eye is the most delicate organ of our human structure. Even the slightest defect once noticed should be attended to immediately, to avoid a prolonged strain upon the sight. Strain will weaken the sight, therefore it is a great mistake to avoid wearing glasses as long as possible for fear that they have to be worn continuously. If there is anything in existence that will improve the power of our sight without the least strain upon it, it will certainly act beneficially. There is no glass which would be of any service to the normal eye-sight, except a combination of glasses, such as telescopes, opera glasses, etc., but the latter cause a painful strain upon the optic nerves, while they enlargen the observed object, or bring them out clearer and nearer.

Usually persons do not discover that their sight begins to fail until late when in an advanced condition of weakness. This can be avoided by comparison with the sight of other persons and should never be neglected. It may either be in examining a distant object, or fine reading matter close by, that weakness will be detected.

This the only cause why those, who avoid wearing glasses until they have to, have finally to begin with an extremely strong number to be of any benefit to them. Too often it is the case that even than a strong glass gives but little satisfaction. The sight has become weak; that means, the optic nerves have been but little exercised and no glass can improve such a condition of the eye at once.

Those afflicted with their sight will do well to answer the following questions, which will sufficiently guide me to properly understand their particular cases. I may not always be able to furnish a glass to be of any service, if learned from the statements made, but may see that the sight needs other treatment.

☞ *To be answered by those only who have worn glasses previously for reading, and who have no difficulties to see distant objects distinctly.*

1. State since when glasses have been worn.
2. About how many times have you changed glases for stronger ones?
3. When glasses first obtained, could you then manage to read still without glasses in the day time?

4. How far from the eye do you now hold an ordinary newspaper to see fine print distinctly with your present glasses?

5. Do you find difficulties in reading with these glasses at night by either gas or lamp light?

6. How far from the eye do you hold fine print as above at night to see it distinctly with your present glasses?

7. State your age and nature of business, if engaged in any.

8. State whether the new glass is mostly desired for reading or general work

9. If the glass be intended for work, state nature of such work.

10. If you can spare the old glasses or even a broken part of it enclose it in an envelope addressed to me.

11. Otherwise enclose the smallest type print which you are still able to read without glasses.

12. Does your sight fail already in some degree looking at distant objects?

In answering the above, merely state number of questions to which add your reply.

☞ *To be answered by those only who already have worn glasses to distinguish objects at a distance, and who are able to read fine print without glasses, even should such be somewhat troublesome.*

13. Can you still recognize without using glasses, a person known to you at a distance 20 yards off? if not.

14. How near has such a person to come to be recognized?

15. What are the difficulties with your present glasses, if any, state, do you have a desire to see more distinctly or do your present glasses diminish in size objects at a distance, when the glasses are close fitted to your eyes? or is there a mist around you?

16. Do you wish a glass for outdoor use or for your work?

17. If intended for your work state nature of your business or such work particular.

18. Can you manage to read without using glasses, ordinary newspaper print for about an hour?

19. State in inches how far from the eye you hold such ordinary newspaper print to read it conveniently, without using glasses and enclose such print.

20. Also answer the questions Nos. 1, 2 and 10.

In answering the above merely state number of question to which add your reply.

☞ *To be answered by those only who have never before worn glasses and now find difficulties in reading fine print especially at night, but whose sight is perfect when looking at distant objects.*

21. Answer the questions Nos. 7, 8, 9 and 12.

22 Enclose in envelope the smallest size type print which you are able to read at night.

23. Do you have difficulties in reading by day light?

24. Does the sun light or its brightness reflected much interfere with your sight, or do you prefer a bright day light when reading?

25. How long ago is it that you discovered a weakness in your eye after reading.

26. How long time can you still read before such weakness is setting in, especially at night time?

27. If your sight be very weak already, state whether you are still able to read any large size print, enclose such print, but it should be just the smallest type you can read.

28. How far from the eye are you obliged to hold the paper to read it most distinctly?

In answering the above, merely state number of question to which add your reply.

☞ *To be answered by those only who have never before worn glasses and now find difficulties in seeing distant objects distinctly, while their sight is still powerful enough to read ordinary print.*

29. State since when you discovered that objects at a distance do not appear as distinct as previous.

30. Also answer the questions Nos. 13, 14, 16, 17, 18 and 19.

In answering the above, merely state number of question to which add your reply.

THERE ARE OTHER COMPLICATED CASES WHICH CANNOT BE TREATED WITHOUT PERSONAL CONSULTATION.

RULES.

Give your order for Spectacles or Eye-glasses as follows:

Answer the questions as above described, for proper selection of your glasses. Indicate the number and price from this catalogue for style of frame which is to be fitted to your glasses. See catalogue page 47.

The spectacles or eye-glasses so ordered are all fitted with first quality glasses. All orders in this line of goods should be accompanied by not less than $1.50, for which I deliver a pair of good finished steel spectacles or eye-glasses fitted with first quality glasses, or will return the money if no glasses can be fitted. The goods will be sent by mail for which enclose 6 cents in postage to prepay the mail. Any cheaper quality of goods are not fitted with first quality glasses, such will not be delivered.

Brazilian Pebbles. Should such be wanted instead of glasses add $3.00 to any frame selected on page 47 of this catalogue.

Brazilian Pebbles have the great advantage, being a very hard crystal, not to be easily scratched on their high polished surface. They are also preferable to be worn by any one with easily inflamed or very sensitive eyes.

[*From the Journal of Commerce, New York Dec.* 21, 1880.]

ELECTRICITY.—Now that so much attention is being paid to all branches of the science of electricity, students generally will be glad to know that by purchasing Professor Meyer's students' electrical machine, which is offered by Professor Curt W. Meyer, No. 182 Broadway, at a very low price, they can readily perform all the ordinary class experiments. It is designed to accompany Professor Meyer's "Elementary Guide in Electricity." This has become a standard work in our leading schools, and when combined with the electrical machine, cannot fail to afford valuable information in reference to this most subtile force of whose full powers we after all know so little.

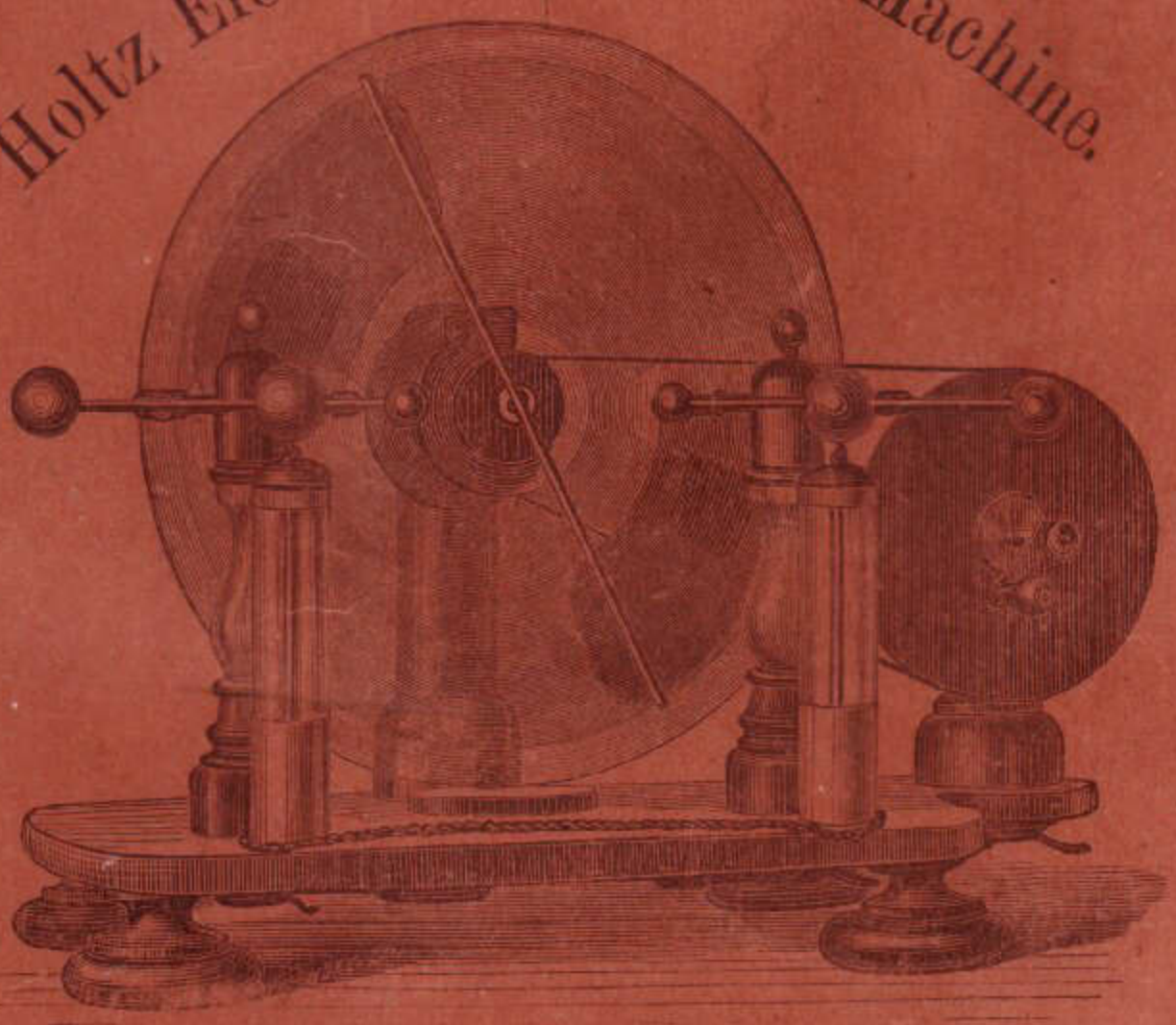
[*From the New York Times, Dec.* 14*th*, 1880.]

HOLIDAY SCIENTIFIC GIFTS.

HANDSOME, PRACTICAL, AND INEXPENSIVE ELECTRICAL MACHINES FOR CHRISTMAS.

That some scientific teaching takes place in public and private schools is quite evident from the numerous class-books published. It is very unfortunate that children acquire little information in regard to the imponderable agents from the want of experimental instruction. Alone by itself, electricity, or optics, or pneumatics, become to them mere abstractions. There is many a man to-day who has secured what is called a liberal education who, when he has given him a telegraphic message, would be no more able to explain the broad principles of electricity or the nature and properties of the magnet than would a Bushman. Now that the holiday season has come, many and various are the objects given to children, some adapted for use, others for amusement, but few for instruction. It is quite possible, however, to construct certain scientific objects by which a lad can not only be made happy in their possession, but which at the same time may become a prominent feature in his education. Professor Curt. W. Meyer, of No. 182 Broadway, presents for the holiday season a very perfect set of electrical instruments. In a convenient box may be found a compact electrical plate machine, perfectly capable of generating electricity, with electrical orrery, cannon, bells, ball, electrometer, Leyden jar, head of Medusa, and a Geissler, or vacuum tube, with other apparatus. Now, all these various objects are contained in a box not more than a foot square, and can be sold at the same cost as many a useless toy. This electrical machine answers perfectly for all class experiments. The philosophical instrument maker of to-day is not required to turn out ponderous machines for purposes of public instruction. A class is much more impressed when science is taught them by means of simple instruments. This robs science of half its mystery. All the wonderful progress electricity, magnetism, and optics have made is due to the adoption of the plainest, the most inexpensive, machines. Professor Meyer, by his inventions, has endeavored to present to parents and teachers apparatus explanatory of science which can be sold at low cost. His great desire then is to arouse a general love of scientific study, and as it is quite certain that all the needful facts and principles may be produced with simple appliances, young people and even old ones can then be brought into contact with actual experimental demonstrations.

Holtz Electrical Influence Machine.



MEDALS AWARDED

1870, 1877, 1880.