CATALOG No. 22
First Edition 1920

The Electro Importing Co.
233 Fulton Street
New York City

No Order For Less Than 50 Cents Accepted

BEFORE ORDERING PLEASE READ CAREFULLY.

IMPORTANT

All Previous Prices Are Withdrawn With This Issue

OUR GUARANTEE.—We guarantee every article listed in this Catalogue to be equal in every detail to the illustration and printed description, but as we are constantly improving and bettering our goods there may be slight changes from details as shown in cuts. We will replace free of charge any article or part thereof, in which there may be a mechanical defect of construction if same is returned prepaid to us within five days after receipt.

CABLE AND TELEGRAPH ADDRESS “ELDIPORT,” NEW YORK.
TELEPHONES 7777 and 7776 Cortland.

OUR TERMS.—Cash with order. We do not open accounts with private individuals, nor do we sell on the installment plan. Our low prices do not justify it.

Always allow sufficient money to cover postage. Weight of packages can be readily figured from the weights given in the catalogue descriptions. Knowing the weight and the parcel post zone in which your post office is located, measuring from New York, you can easily figure the amount of postage required from the parcel post rate table shown on page 8.

EXPRESS C. O. D. ORDERS for at least $5.00 or more will be accepted by us East of the Mississippi. We require a deposit of 25 per cent. of the amount purchased.

REMITTANCES should be made by N. Y. Draft, Post Office or Express Money Order by Registered Letter. Do not send money unregistered by regular mail.

U. S. STAMPS (new and in good condition) will be accepted instead of cash in amounts up to $3.00. Above this amount 5 per cent. to cover brokerage fee must be added to total.

SHIPPING DIRECTIONS should accompany each order; in their absence we will use our best judgment in making selection of routes.

WHEN ORDERING give catalogue number.

RETURN OF GOODS.—Occasionally an article does not work as you think it should, or it may become defective through mishandling in transportation. In that event don’t send the goods back without first writing us a letter stating just what is the trouble. Frequently we can advise you of a remedy by mail which often saves the wait necessarily incident to returning goods. If we can’t advise you how to remedy the trouble we will tell you how to return the goods. Never return goods without having marked on it your name and address and in the package a slip of paper with your name, address and order number. This insurance the maximum of speed possible in correcting an error or trouble. Always write why you are sending goods back for we can’t guess it, though it may seem very plain to you. Goods returned without our permission are returned at customer’s risk. We do not accept goods which are sent express or freight collect.

GOODS BY MAIL AND PARCEL POST. We are not responsible for goods lost or broken in the mails. For your own protection, order mail goods insured.

Fragile articles will be carefully packed and duly labeled by us, but as the Parcel Post does not guarantee their safe delivery we cannot be held responsible for breakage or lost shipments. For your own protection, order Parcel Post goods insured. The fee for this insurance for each package is:

3c. for $10 insurance 5c. for $25 Insurance 10c. for $50 Insurance

WE CARRY A COMPLETE STOCK of all the listed goods in our New York house, and in most cases ship the same day that order is received.

OUR ENGINEERING STAFF will cheerfully answer, free of charge, any and all technical questions pertaining to our goods, if a 2-cent stamp to cover postage is enclosed. If diagrams for connections are desired an additional charge of 10 cents will be made by our drafting department. Wireless Questions, “Hook ups,” etc., of bearing direct relation to our goods are returned at the rate of 25 cents each. Where special calculations or special information is desired, we will inform correspondent as to the cost of such work.

FOREIGN CUSTOMERS will please make remittance by International Money Order (procured at any Post Office), or otherwise by Bank Draft on New York. All banks sell these drafts. Note that the value must be in American dollars.

Pen Yan, N. Y.

Dear Sirs:

Received your information that I asked of you and thank you a thousand times for the same. I would not take $10.00 for the coil I received of you at $4.75. IT WILL JUMP AN INCH ON FOUR COLUMBIA DRY CELLS.

Yours respectfully,

CHAS. CARR.
The Electro Importing Co., N. Y., Mfrs.

TO WHOM IT MAY CONCERN.

WHEREAS, the Electro Importing Company is a manufacturing corporation, incorporated to do business in the State of New York, and

WHEREAS, Hugo Gernsback is the president thereof, now therefore, I, Hugo Gernsback of New York City, New York, being duly sworn, do say that:

WHEREAS, each and every testimonial published at the foot of each page of this catalog is unsolicited, that these testimonials have been received from bona fide customers, that their names and addresses are genuine as published, that the testimonials are unaltered and undestroyed, and,

WHEREAS, the testimonials as published have been taken at random from the testimonial files of the Electro Importing Company, and that they represent only a small percentage of the total number of these letters in the possession of the Company, now therefore:

It is agreed that the Electro Importing Company will pay the sum of $200.00 to anyone who will prove that the above facts are not true and correct as affirmed.

Hugo Gernsback

Dear Sirs:

Wichita Falls, Tex.

I wish to thank you for your prompt attention in sending out my wireless telegraph outfit; and wish to recommend your firm to any one who is interested in electric goods.

Yours truly,

A. L. JACKSON, JR.

The Electro Importing Co., N. Y., Mfrs.

Patents:

No. 988,456
April 4, 1911

No. 988,767
April 4, 1911

No. 1,016,138
Jan. 30, 1912

No. 1,033,095
July 23, 1912

No. 1,057,820
April 11, 1913

5 Patents Pending in Patent Office

Gentlemen—

Kenosha, Wis.

The instruments arrived a few days ago and after giving them a thorough test, I think I can justly say, that they are satisfactory in every respect.

Let me say to whom it may concern, that this statement is absolutely unsolicited on the part of the Electro Importing Co., being entirely voluntary on my part.

Yours respectfully,

SIDNEY DERBYSHIRE.
The Electro Importing Co., N. Y., Mfrs.

How to Figure Parcel Post Rates

With every article in our catalogue, we state the exact shipping weight of same. Having this weight, and knowing the zone in which your post office is located, measuring from New York, you will know the correct rate to charge the customer supplying to the goods you are ordering, in consulting the Parcel Post Table below.

U. S. Parcel Post

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Parcel Post Rates are computed according to weight of the parcel to be shipped and according to the distance between the shipping and delivery point. For this purpose, the U. S. is divided into 8 Zones, having different rates of postage applicable to each.

The table shows the amount of Postage by parcel post, according to the weight of the package and according to distance by zones.

If you don't know the Zone in which your post office is located measuring from New York, the Postmaster will tell you.

Parcels weighing 4 ounces or less are mailed at the rate of 1 cent for each ounce or fraction thereof, regardless of distance. Parcels weighing more than 4 ounces up to 16 ounces must be mailed as a full pound. If three or more packages in a single entry are less than 1 pound, the Postmaster will charge the difference, so that the few additional cents for C. O. D. fees can hardly be considered.

Where packages are accepted at Parcels Rates, (One cent for each two ounces up to eight ounces, over eight ounces, as other Parcel Post Matter.)

In some instances Express Rates are cheaper than Parcel Post Rates, consult the table:

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<th>Between NEW YORK</th>
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<td>San Francisco, Cal.</td>
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The weights given in our catalogue are the exact shipping weights; this means the apparatus or article packed and boxed ready for shipment. In some instances, as with speakers, etc., it is easily understood that the wrapping must be heavy so as to insure the safe arrival of the goods. In other instances a paper wrapping only is needed with some excelsior, which amounts to fractions of an ounce.

The Electro Importing Co., N. Y., Mfrs.

Or-Ders Are Recorded

Rec-Eived

And Recorded

Elco.

Our Sixteenth Year

A Few Facts That You Should Know About The E. I. Co.

W.e want you as a customer and would like to tell you a little about ourselves so you will know us better.

The Electro Importing Co. was organized in 1904, starting with a small office at 32 Park Place, New York, 16 feet square. At that time we were the first in America to sell solely experimental electric goods.

The first amateur wireless outfit in America was made and sold by us and on this account the writer has been called "The Father of Amateur Wireless."

The E. I. Co. grew rapidly because it gave everybody a square deal, and in 1905 we moved to larger quarters at 87 Warren Street, to improve manufacturing facilities.

Early in 1908 we again had outgrown our facilities and moved to 80-82-84-86 West Broadway, with six times as much floor space as before.

These, of years, we found inadequate, and in 1910, when conditions became intolerable, when every inch of floor, wall, and even ceiling space was at a premium, we moved to our 5-story building at No. 233 Fulton Street, which we now occupy from basement to roof.

Maybe you wonder how the E. I. Co. can offer its wonderful values—how it can afford to sell much cheaper than anyone else. Our policy has always been:

"America's Oldest Electrical Experimental and Radio Supply House"

The writer is also Publisher and Editor of the Electrical Experimenter, Science and invention, and Radio Amateur News, two magazines sold on every newspaper stand and too well known to need any introduction, a deal square business. We can bank on our reliability and our desire to do the square thing. Honestly always to the end the E. I. Co. always makes good.

Supplying experimenters for such a long period over the world with reliable E. I. is a price to meet these pocketbook, has built up a reputation which we cherish very highly and which we would not, by a single act, destroy or damage.

The Electro Importing Co.

San Francisco, Cal.

(over)
The Electro Importing Co., N. Y., Mfrs.

Parcel Post
(Continued)

If you send in an order calling for different items of our goods all to be packed and shipped together, in one package or box, it is understood that you will benefit a good deal on the transportation charges, as it will not take much more packing material for three or four small articles than for one. The saving which we can effect in all these cases is to your advantage as we will return to you in every case the over-payment of your transportation charges, if there is any.

Note.—Be very careful in figuring out the transportation charges for goods weighing, for instance, four ounces. If you order two items calling for four ounces each, this would make eight ounces shipping weight, but in reality you are required to pay for one pound, as the Parcel Post Law states that articles which exceed four ounces up to 16 ounces must be mailed as a full pound. The same holds true if one article weighs one pound and another four pounds and six ounces. This means that you would have to send in money enough to cover six pounds at the Parcel Post rate.

Parcel Post Service to Foreign Countries

Parcel Post Rates to PORTO RICO, CANAL ZONE (Isthmus of Panama), HAWAII, PHILIPPINE ISLANDS, TUTUILA (Pago-Pago) and other parts of SAMOA, in possession of the U. S. and GUAM (Ladrones Islands), are the same in DOMESTIC RATES for the "Eighth Zone."

Rates for CANADA, CUBA and MEXICO are 12 cents per lb. Limit of weight 16 lbs. or 6 oz.

Rates for Europe, including GREAT BRITAIN and IRELAND, most of the British possessions, also NEWFOUNDLAND, AUSTRALIA, etc., and all other countries to which the Parcel Post extends are 12 cents per lb. Limit of weight 30 lbs.

How to Return Goods to Us by Parcel Post

When you return goods by parcel post, put the letter you write in an envelope and paste or tie the envelope securely to the outside of the package. In addition to the postage you put on the package, put a 2-cent stamp on the envelope.

"Don't return goods without asking first our permission."

View of One of Our Five Stock Rooms

ENORMOUS STOCKS MAKE PROMPT SHIPMENTS POSSIBLE

The Electro Importing Co., N. Y., Mfrs.

Educational Institutions That Buy Our Goods

The following Educational Institutions have been supplied by us REGULARLY for years with our goods. The list which we give here is only a partial one; we have many hundred more institutions on our books, but lack of space prevents us from publishing same. We hardly need say that the names speak for themselves and no higher tribute to the quality of our goods and our excellent service which we give could be presented.—

Adrian Public School, Adrian, Mich.
Allegheny College, Meadville, Pa.
Aurora Public Schools, Aurora, Ill.
Board of Education, Dover Plains, N. J.
Baltimore Dept. of Education, Baltimore, Md.
Berlin School Dept., Berlin, N. H.
Billings Board of Education, Billings, Mont.
Bloomfield Theological Seminary, Bloomfield, N. J.
Board of Education, Hazen, So. Dak.
Board of Education, Neodesha, Kansas.
Brattleboro High School, Brattleboro, Vermont.
Brookville Board of Education, Brookville, Pa.
Brown University, Providence, R. I.
Carnegie Institute of Technology, Pittsburgh, Pa.
Cherokee...High School, Columbus, Kansas.
College of Emporia, Emporia, Kansas.
Columbia University, New York City.
Colt Memorial High School, Bristol, R. I.
Connecticut Agricultural College, Storrs, Conn.
Cornell University, Ithaca, N. Y.
Dakota Wesleyan University, Mitchell, S. Dak.
Darlington Public School, Darlington, S. C.
Dartmouth Medical College, Hanover, N. H.
Delaware College, Newark, Del.
Department of Education, New York City.
Dubuque German College and Seminary, Dubuque, Iowa.
Elder High School, Cincinnati, Ohio.
Ferris Independent School District, Ferris, Tex.
Findlay College, Findlay, Ohio.
Georgia School of Technology, Atlanta.
Gonzaga University, Spokane, Wash.
Grove City College, Grove City, Pa.
Heidelberg University, Tiffin, Ohio.
High School of Memphis, Memphis, Tenn.
Iowa State Teachers College, Cedar Falls, Iowa.
Lake Placid High School, Lake Placid, N. Y.
Massachusetts Agricultural College, Amherst, Mass.
Minden High School, Minden, Nebr.
Parson College, Fairfield, Iowa.
Princeton University, Princeton, N. J.
Rock Hill College, Effiectt City, Md.
School District No. 2, Brattleboro, Vt.
St. Edward's College, Austin, Tex.
St. Joseph School, San Jose, Cal.
St. Mary College, Dayton, Ohio.
St. Mary's Mission, O'Kanagan Co., Wash.
South Georgia College, Helena, Ga.
South Western Pennsylvania University, Allegheny, Pa.
State University of Iowa, Iowa City, Iowa.
Stevens High School, Clinton, N. H.
St. Mary's Mission, Mission, Wash.
University of Florida, Gainesville, Fla.
University of Illinois, Urbana, Ill.
University of Nebraska, Lincoln, Neb.
University of California, Berkeley, Cal.
University of Southern Mississippi, Hattiesburg, Miss.
Vassar College, Poughkeepsie, N. Y.
Yale University, New Haven, Conn.

Governments Departments that buy our goods:

U. S. Navy Supply Dept.
U. S. Signals Corps, Field Co.
U. S. Bureau of Standards, Washington, D. C.
U. S. Corps Artillery School, Fort Monroe, Va.

Gentlemen:—

I wish to thank you for your promptness in sending my goods. I received them within a week after I sent my order. I will recommend you to any experimenter and you may expect another order from me in the future.

MARTIN McDONIERT.
TREATISE ON WIRELESS TELEGRAPHY
By H. Gernsback
President ELECTRO IMPORTING CO.
Editor "EUROPEAN ELECTRICAL EXPERIMENTER"
Editor "RADIO AMATEUR NEWS"
Manager RADIO LEAGUE OF AMERICA

WIRELESS AND THE AMATEUR
A RETROSPECT

PART ONE

ON DECEMBER 13, 1912, the new wireless law went into effect. The average
wireless "friend" who had not followed the topic from its beginning, will not be
eased in the following facts.

The first talk of Wireless Legislation in the country started in 1908. The
writer in his Editorial in the November, 1908, issue of Modern Electrics pointed
out that a law was sure to be passed to protect the public against unfair
laws. Previous to this time there was no wireless law and the writer had
organized the "Wireless Association of America." This was done to bring all wireless
amateurs together and to protest against unfair laws. Previous to this time there was no wireless
bill made its appearance. No other electrical
amateurs, appeared in the January, 1910, issue of Modern Electrics.

A. Merritt, the New York Independent, the New York "World, the New York Times,
Boston Transcript, etc., all lauded and commended the writer's stand.

The next question huried at us is:-"How can I receive messages if I don't
know the codes?" If you are using a wireless telegram, no matter if it is in Chinese or English, "comes in" in
dots and dashes. When you have the telephone receivers to your ear and a
message comes in, you hear a series of dits and dahs. A long dit is a dash, a short dit is a dot. We sell a
100 code chart by means of which the user can learn the meaning of any
messages transmitted or received by such station, except to the person or persons
for whom the same may be directed, or their authorized agents or to another
person or persons to whom the same is to be delivered.

The Electro Importing Co., N. Y., Mfrs.

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The Electro Importing Co., N. Y., Mfrs.
The Electro Importing Co., N. Y., Mfrs.

Treatise on Wireless Telegraphy—(Continued)

from the same as through the regular telephone. (For further details on Wireless Telephony, see Lesson 18 of The Wireless Course.)

The question asked mostly by the layman is: "How far can I receive with such a telephone?" To this question you should ask him: "How far can you hear the whistle of the X & Y Cotton Mill?" No you wouldn't, 3rd, THE RADIO tone; 4th, THE PERIKON; 5th, ZINCITE; 6th, SILICON AND GALENA; 7th, IRRON PYRITES (FERRON); and 8th, CARBORUNDAERDAY. The reason for this is that the detector is the very heart of the wireless receiver; in other words, it is the instrument that captures the wireless energy and converts it into an electrical signal that can be amplified and used to operate the other components of the receiver.

The detector is an important component of a wireless receiver, as it is responsible for converting the weak electromagnetic signals received from the antenna into a stronger electrical signal that can be used to operate the other components of the receiver. The detector is often referred to as the "brain" of the wireless receiver, as it is the component that determines the sensitivity and selectivity of the receiver. The detector is typically a vacuum tube or a semiconductor diode, and it is designed to respond to a specific frequency range.

The detector is part of a larger system that includes the antenna, the aerial, the amplifier, and the transmitter. The antenna is responsible for receiving the wireless signal, while the aerial is responsible for transmitting the signal. The amplifier is responsible for increasing the strength of the signal, while the transmitter is responsible for converting the electrical signal back into a wireless signal that can be transmitted over long distances.

The detector is an essential component of a wireless receiver, as it is responsible for converting the weak electromagnetic signals received from the antenna into a stronger electrical signal that can be used to operate the other components of the receiver. The detector is often referred to as the "brain" of the wireless receiver, as it is the component that determines the sensitivity and selectivity of the receiver. The detector is typically a vacuum tube or a semiconductor diode, and it is designed to respond to a specific frequency range.
Treatise on Wireless Telegraphy—(Continued)

The Electro Importing Co., N. Y., Mfrs.

Dear Sirs,—

Michigan City, Ind.

[Address]

I am glad to say I received the goods which were in your 1,100 the order for. The qualities of the very best quality, I think the quality of which Brought in Messages I Never Heard Before, and all coming in very loud. Anyone wishing to buy a detector among my friends I will surely tell them of this one.

Yours truly,

ROY WREN.

THE WIRELESS ACT

"As it enacted by the Senate and House of Representatives of the United States of America, in Congress assembled: That a person, company, or corporation within the jurisdiction of the United States shall not use or operate any apparatus for radio communications as a means of commercial intercourse among the several States, or with foreign nations, or upon any vessel of the United States engaged in interstate or foreign commerce, or for the transmission of radiograms or signals to which the effect of which extends beyond the jurisdiction of the State or Territory in which the same are made, or where interference would be caused thereby, with the receipt of messages or signals from beyond the jurisdiction of the said State or Territory, except under and in accordance with a license, revocable for cause, in that behalf granted by the Secretary of Commerce and Labor upon application therefor, but nothing in this Act shall be construed to apply to the transmission and exchange of radiograms or signals between points situated in the same State; Provided, That the effect thereof shall not extend beyond the jurisdiction of the said State or interfere with the reception of radiograms or signals from beyond said jurisdiction.""

GENERAL RESTRICTIONS ON PRIVATE STATIONS

"Fifteenth. No private or commercial station not engaged in the transaction of bona fide commercial business by radio communication or in experimentation in connection with the development and manufacture of radio apparatus for commercial purposes shall use a transmitting wave length exceeding two hundred meters or a transformer input exceeding one kilowatt, except by special authority of the Secretary of Commerce and Labor contained in the license of the station; Provided, That the owner or operator of a station of the character mentioned in this regulation shall not be liable for a violation of the requirements of the third or fourth regulations to the penalties of one hundred dollars or twenty-five dollars, respectively, provided in this section unless the person maintaining or operating such station shall have been notified that the said transmitter has been found upon test conducted by the Government, to be so adjusted as to violate the said third and fourth regulations, and opportunity has been given to said owner or operator to adjust said transmitter in conformity with said regulations.

SPECIAL RESTRICTIONS IN THE VICINITIES OF GOVERNMENT STATIONS

"Sixteenth. No station of the character mentioned in regulation fifteen situated within five nautical miles of a naval or military station shall use a transmitting wave length exceeding two hundred meters or a transformer input exceeding one-half kilowatt.""

Let us explain in plain English just what this means: As you notice from the first paragraph, the part which we underlined, it is pointed out to you that the law does not concern you unless you send messages from one state into another. You therefore do not require a license as long as your messages do not reach over the border of your state and if you do not interfere with a station's business (in your state) which receives messages from another state. Of course, you want to know how you can tell what your transmitting range is. We will explain.

It has been proved by experience with spark coils, that in almost all cases a one-inch spark cannot possibly reach over eight miles. From this information the following table has resulted:

Wireless Telegraph or Telephone sending stations included.

Edward J. Cotterell

Treatise on Wireless Telegraphy—(Continued)

The Electro Importing Co., N. Y., Mfrs.

Some time ago I purchased one of your "Interstate" receiving outfits, and I wish to say that this outfit HAS FAR EXCEEDED MY EXPECTATIONS.

A friend of mine purchased a tuning coil (a $2.00 coil) from another firm in New York City. His coil is four inches thick and a little longer than the one on my outfit and yet I can tune the Navy Yard, the Herald, and several other stations, BETTER ON MINE THAN ON HIS.

"Interstate" is the word I WISH FOR THE MONEY that could be purchased.

Yours truly,

EDW. J. COTTERELL.

West Hoboken, N. J.

Gentlemen—

Some time ago I purchased one of your "Interstate" receiving outfits, and I wish to say that this outfit HAS FAR EXCEEDED MY EXPECTATIONS.

Yours truly,

EDW. J. COTTERELL.
TRANSMITTING DISTANCES OF SPARK COILS

<table>
<thead>
<tr>
<th>Spark Length</th>
<th>Transmission Distance</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-in.</td>
<td>3 miles</td>
</tr>
<tr>
<td>4-in.</td>
<td>12 miles</td>
</tr>
</tbody>
</table>

With open core transformers the spark length cannot be taken as a basis to figure transmission distance in watts. It has been found that for each five watts input into the primary, not more than one (1) mile can possibly be covered.

Thus our No. 8050 transformer coil in conjunction with our electrolytic inter·

rupter uses 5 amperes at 110 volts. 'l'hat is 550 Watts. Five goes into 550 just 110 times. The maximum distance that can be covered with the No. 8050 coil (unless you use more current) is 110 miles.

For closed core transformers we figure ten watts for each mile. Therefore, our No. 9281, 1 K.W. type transformer will at best not send over 50 miles, and our No. 9282, 1 K.W. type transformer will not send over 100 miles.

Knowing what the distance is, as the crow flies, from your locality to the nearest border of the next state, you can easily figure out what the maximum power is that you can use if you do not wish to take out a license. An example:

Suppose you live in the city of Columbus, Ohio. The nearest state line is Kentucky about 36 miles in a direct line from Columbus. If you do not wish to be licensed you can use any spark coil up to 10-inch spark, or a ½ K.W. close core transformer.

Suppose your home is in Austin, Texas. The nearest state line is Louisiana, a distance of 239 miles. Thus you could with permit use a 200 mile sending outfit. 

It is also pointed out that if you live within five miles of a Government wireless station you can not use more than 50 miles state border might be 100 miles or more distant.

To another state, as in New York City, you are required to take out a license for any size transmitter.

The license has not been created to muzzle you; it is the other way around.

Uncle Sam gives you a written order telling you that you can transmit a wireless message. What the license is free. It costs not a penny. All that is required of you is that you are familiar with the law and that you can transmit messages at a fair degree of speed.

The law does not prevent you from that you take an examination in person if you are located too far from the nearest radio inspector. All you have to do is to take an examination in person that you are conversant with the law and that you can transmit messages at a fair degree of speed.

In an interview with the "New York Times," W. D. Terrell, United States Customs House, said in discussing the new law:

"The law does not prevent you from that you take an examination in person if you are located too far from the nearest radio inspector. All you have to do is to take an examination in person that you are conversant with the law and that you can transmit messages at a fair degree of speed.

In the tuned outfits, we have in addition to the above enumerated apparatus:

- The Leyden jars, or condenser; 6th-The Helix, or oscillation transformer.
- The Leyden jars change the red spark obtained from a spark coil, into an intense violet spark, which is then fed into the radio transformer. By means of this transformer, the spark is converted into a stronger spark in the spark gap. The spark gap (the open space between the sending and receiving outfits, is the largest, set, and the smallest, set, and the smallest, set, as it is a great help to all who are interested in Telegraphy, and he will forward the necessary papers to you to be signed.

Radiosenders are located at the following points: (Address him at the Customs House):

- New York, N. Y.; Baltimore, Md.; Savannah, Ga.; New Orleans, La.; San Francisco; Cal.; Seattle, Wash.; Cleveland, Ohio, and Chicago, Ill. Also the Commissioner of Navigation, Department of Commerce and Labor, Wash., D. C.

In a letter to the "New York Times," W. D. Terrell, United States Radio Inspector, said in discussing the new law:

"The law does not prevent you from that you take an examination in person if you are located too far from the nearest radio inspector. All you have to do is to take an examination in person that you are conversant with the law and that you can transmit messages at a fair degree of speed.

In an interview with the "New York Times," W. D. Terrell, United States Radio Inspector, said in discussing the new law:

"The new law regulating wireless telegraphy will change the entire system of the inter-city and inter-state telegraph system, and it will be impossible to classify the various operators and amateurs on a basis which will fit the new system. All the apparatus will have to be replaced by the new system and to be in operation.

Only those stations are affected which are near enough to the coastal stations to offer interference or to interfere with the coastal stations.

"I have had many letters from the inter-state and inter-city telegraph operators expressing the hope that the new law will not be practiced and that the operators will be given a fair chance to work in the new system.

The amateur operators operate in every way possible to secure their license."
above. Now after the maximum "radiation" has been ascertained, the test block of the other apparatus. The ¼-inch coil and tubes purchased of you OVER A YEAR AND A HALF AGO STILL GIVE FINE DEMONSTRATIONS.

Yours respectfully,
O. BICKERDIKE.
Receiving Time by Wireless

(Reprinted from "The Electrical Experimenter")

The wisdom of furnishing vessels at sea with the correct time by wireless has been demonstrated time and again since the government began sending the signal over a few years ago. Since that time, too, many jewelers, railway officials and others on land who need the correct time have been taking the messages. The sending instruments used are extremely powerful, and any owner of a wireless receiving outfit within their range may get the time absolutely correct twice a day by properly tuning his receiving apparatus.

The stations that send out the reports, and the wave lengths used by each, are as follows:

radio Time Signals of the World

Washington, D. C. (NAA) 2,500 meters. Noon and 10 p.m. 75th Meridian S. T.
Great Lakes, Ill. (NAJ) 1,515 meters. Noon and 10 p.m. 50th Meridian S. T.
Key West, Fla. (NAB) 1,400 meters. Noon and 10 p.m. 75th Meridian S. T.
San Francisco, Cal. (NPG) 2,400 meters. Noon and 10 p.m. 120th Meridian S. T.
New Orleans, La. (NAT) 1,000 meters. Noon 75th Meridians S. T.
San Diego, Cal. (NPL) 2,400 meters. Noon 120th Meridians S. T.
San Diego, Cal. (NPL) 9,500 UD meters. Noon 120th Meridians S. T.
Eureka, Cal. (NPF) 2,000 meters. Noon 120th Meridians S. T.
Point Arguello, Cal. (NPK) 1,515 meters. Noon 120th Meridians S. T.
North Head, Wash. (NPC) 1,800 meters. Noon 120th Meridians S. T.
Darien, Canal Zone, Panama (NBA) 4,000 meters. 1 p.m. 75th Meridians S. T.

The above listed Naval Stations transmit "Time Signals" each day for a period of five minutes, starting exactly five minutes in advance of the above specified schedules. Every tick of a standard Naval Observatory clock is transmitted as a dot, omitting the 29th second of each minute; the last five seconds of each of the first four minutes; and finally the last ten seconds of the LAST minute. The 12 noon, 1 p.m. and 10 p.m. signal is sent as a dash.

Note—NAJ, NPL, NPK, NPW.—During that part of the season in which the DAYLIGHT SAVING LAW is in effect, the time signals mentioned above will be transmitted exactly one hour earlier than the above schedules of NAJ, NPL, NPK and NPW.

Foreign Stations

Darasena Norte, Argentine Republic (LIA) 800 meters. From 1:59'00" to 2:00'00" (Greenwich Mean Time). At 2:00'00" a dot lasting 0.25 second is transmitted.
Choshi, Japan (JCS) 400 meters. From 8:59'00" to 9:04'00" (Central Japanese Time) (155th East Meridian). At 9:04 a one second dash is sent.
Cape Town, South Africa (VNC) 600 meters. From 8:59'00" to 9:00'00" (Greenwich Mean Time). At 9:00'00" a second dash is sent.

The transmitting clock that mechanically sends out the signals is corrected very accurately shortly before noon, from the mean of three standard clocks, that are rated by star sights with a meridian transit instrument.

(We recommend for this Time receiving purpose, either our "Tuckerton" Receiving set or our type "Nasen" Receiving set.

The aerial for this purpose should be quite large and preferably have a height above the ground of not less than 75 to 100 feet. The aerial itself may be of the flat-top or slanting variety; and may be composed of 6 to 8 strands of our solid Antennium wire, each strand having a length of 80 to 100 feet, and for very long distances such as 1,000 miles or more, the aerial should be as high as possible, and probably 150 to 200 feet in length, or even more. The strands may be spaced 6 to 8 feet apart.)

*Meridian Standard Time.

Gentlemen—
I received order all O. K. The tuner was better than I had expected. The wire and ground clamp are also very good.

GEORGE CURTIS.
Our aim is not only to sell you electrical goods! We want to instruct you how to handle to the best advantage all the Wireless Apparatus; to tell you the how and why of the fascinating art of Wireless. This is the Reason for offering you our Fill:

Of course, we want you for a customer. You are interested in buying electrical and wireless apparatus. Why not be one of our regular patrons? We promise to give you the maximum of quality, plus service and to show you OUR appreciation, we are going to give you a profit sharing PREMIUM on every dollar you spend with us.

Read the following proposition. It means an absolutely unique opportunity.

Free Wireless Course Offer—(Continued)

CONDITONS:

On these pages you will find twenty "Wireless Course Certificates."

You must attach one of these certificates to each order for one dollar ($1.00) in Wireless Apparatus and send them to us. Thus you will receive one Wireless Course lesson. The value of each lesson is $1.00. If you send us twenty certificates, you will receive ten lessons. Of course, you can send us as many certificates as you want, but the cloth binder is only furnished with lesson No. 1.

We have just announced a new Wireless Course, and for the first time it is a "Transmitting Course," which you can study in the privacy of your own home. We have been receiving many letters asking for lessons on the subject of transmitting Wireless Apparatus, and we have therefore undertaken the preparation of a complete Transmitting Course.

This course contains complete transmitting sets and apparatus. It is understood that each lesson must amount to 20 cents, or ten lessons, if you order goods amounting to $2.00, but the cloth binder is only furnished with lesson No. 1.
Free Wireless Course Offer—(Continued)

—ABSOLUTELY NO DISCOUNT ALLOWED FROM ANY ORDER APPLYING TO THIS FREE WIRELESS COURSE. AND NO LESSONS WILL BE SENT ON ANY ORDER UNLESS THE CORRESPONDING COUPON IS ATTACHED.

It is needless to say that our Wireless Course is up-to-date and absolutely thorough, commencing with the most complete explanations on Electricity in General and Wireless, ending with chapters on scientific mathematics and complete history of Wireless.

Do not miss this splendid opportunity.

Send in your order and your Wireless Course Certificate TO-DAY.

READ contents of Wireless Course on back of coupons.

Contents of Lesson No. 11
AERIALS.
Antenna, Wiring, Insulators, Looped Aerial, Umbrella aerial, Lead-in, Bellini-Tosi Radiogoniometer, construction of aerials, etc.

Contents of Lesson No. 12
THE HOOK-UPS AND CONNECTIONS.
Study of the diagrams, Wireless telegraph symbols, close coupled systems, connected aerials, interrupters, shipboard stations, Fessenden station, Receiving sets, Loose-coupled sets, Marconi selective receiving set, etc.

Contents of Lesson No. 13
THE HOOK-UPS & CONNECTIONS.
Useful Information. Fessenden interference Preventer; Telefunken receiving set, Duplex Receiving set, The Collin system. The Lee De Forest system. Dielectric strengths of insulators, Notes on Cables, Equivalents, Bull and soldering wires, Electrical units.

Contents of Lesson No. 14
OPERATION OF THE INSTRUMENTS.
Wave-length. Wave-Meters, Tuning. Use of the different instruments, Wireless Insulators.

Contents of Lesson No. 15
LEARNING TO OPERATE THE CODES.
Operating the key, patent key, Morse code, Ciphoungraph. The different codes, cipher messages, Abbreviations, Government messages, commercial messages. The Wireless Law.

Contents of Lesson No. 16
COMMERCIAL SHIP AND LAND WIRELESS STATIONS.

Contents of Lesson No. 17
HIGH FREQUENCY CURRENTS.
Tesla experiments. Prof. Fessenden’s experiments. Tesla Transformer, Dulzin Transformer.

Contents of Lesson No. 18
THE WIRELESS TELEPHONE.
The principles, Collins system, Poulten’s system, etc.

Contents of Lesson No. 19
THE MATHEMATICS OF WIRELESS TELEGRAPHY.
Calculation of wave-lengths, Inductive calculation, Capacity calculation, Range of stations, Tables, Data, etc.

Contents of Lesson No. 20
THE HISTORY OF THE DEVELOPMENT OF WIRELESS TELEGRAPHY.
Steinheil, Edison, Marconi, Tesla, Hertz, Crookes, Hughes, Popoff, Marconi, etc., etc.

The “Interstate” Wireless Receiving Outfit

This is the outfit you have been looking for. IT IS NOT A TOY by any means, and while we do not claim to be a commercial set, we do claim that the amateur who owns one is enabled to do excellent work in all respects.

The very best instruments are used in the “Interstate.”

This set comprises:

Our No. 9860 Standard Tuning Coil, bare wire wound, with two patent sliders, hard rubber composition coil head and posts; our new improved GALENA DETECTOR of wonderful sensitiveness, ONE OF THE MOST SENSITIVE IN EXISTENCE; our No. 1024 75 ohm Watch Case Receiver and 2-foot cord; a good condenser, mounted in base, balanced to the right. The Looped Aerial, UMBRELLA aerial, 50 feet above ground, 50-75 feet long is required. For this you need 200 or 300 feet of our No. 1219 Antennium wire and 8 of our No. 1997 Insulators.

By using the No. 9871 Receiver the distance is increased from 20-25 per cent. Note over all of this set is 4½x5½ inches.

No. 1500 “Interstate” Wireless outfit, as described $7.00

Shipping weight 4 lbs.

NOTE—By using our No. 8477 loading coil in series with the tuning coil the wave length of this outfit is increased greatly, and time signals from the powerful Government stations can be plainly heard.

“Inter-Ocean” Wireless Receiving Outfit

The increasing popularity of loose coupled wireless receiving apparatus has caused us, as leaders in the manufacture of amateur wireless equipment to design an outfit which, at its price, is positively unequalled at the present time.

It consists of our latest model loose coupler No. 12902 with single slide, bare wire wound primary, with a secondary of silk covered wire. A switch handle is provided on the secondary to permit of the closest possible tuning adjustment, so important in long distance work. Signals can be perfectly received from stations using long wave lengths. For our No. 1550 Galena Detector which for sensitivity, convenience and permanence of adjustment is positively unsurpassed at the price. Our No. 10910 Jr. fixed condenser is also part of the outfit.

Size 10x12x6½ in. high.

No. 1550 “Inter-Ocean” Wireless Receiving Outfit, complete as described but no phones $15.00

Shipping weight 10 lbs.

PERMIT US TO LET YOU HAVE FREE, with our compliments when ordering any of our receiving apparatus, Lesson No. 1 “The Principles of Electricity” or Lesson No. 2 “The Receiving Apparatus” or Lesson No. 14 “The Operation of the Instruments” or Lesson No. 12 “The Hook-Ups and Connections” of our famous “WIRELESS COURSE.”

The Principle and Construction of Receiving apparatus are described in these lessons.

Just attach your free coupon to your order. For further information consult free Wireless Course Offer in this catalogue.
The “Trans-Pacific” Wireless Receiving Outfit

Just as its name implies so is the outfit. It is the outfit for long distance, truly great distances.

The No. 1555 Professional Loose Coupler, with a wave length of 4,000 meters, permits of its use for receiving all the commercial stations. The coupler itself is the simplest and most beautiful instrument of its kind we have ever developed. The detector has been on the market many years and its rotary sliding cup (patent applied for) and double micrometer and spring adjustment are really the same of detector simplicity and efficiency. It looks business and will give your station a commercial looking appearance.

No. 1555 “Trans-Pacific” Wireless Receiving Outfit, complete as described, no Phones $16.80

Shipping weight 15 lbs.

The “Electro” “Arlington (NAA) Baby Timer”

De Luxe Receiving Cabinet

Wave Lengths: Min. 200 Meters; Max. 1,200 Meters

The “Arlington Baby Timer” is without question the most compact, the smallest, as well as the most wonderful little time receiving cabinet on the market to-day.

Very fine selectivity is had both with condenser and tuning inducances. The tuning is sharp and accurate and you will be amazed at the clearness of the received signals. In this outfit a standard Auto Transformer type of tuning inducance is used. This type makes for great selectivity as practically no energy is lost in the transformation. This makes it in a sense more efficient than most loose couplers on the market to-day.

The “Arlington Baby Timer” is recommended for use with an oscillating vacuum detector for undamped waves if external connections are made as per diagram furnished with the cabinet.

It can of course be used with any detector and any good set of phones.

Size over all 8½x8x4 inches. Shipping weight 4 lbs.

No. 4433 “Electro” “Arlington (NAA) Baby Timer” as described $11.90

No. 1555 “Electro” “Arlington (NAA) Baby Timer” as described $22.00

No. 4444 “Electro” “Key-West (NAR)” Radio Outfit

De Luxe Receiving Cabinet

Wave Lengths: Min. 450 Meters; Max. 2,500 Meters

Our “Sayville (WSL)” outfit was originally planned for jewelers’ use. As can be readily understood, a jeweler’s outfit must be of commercial type, must be highly selective, and practically free from interference.

Time signals from such stations as Arlington (NAA) are received with the greatest ease over a range of 1,250 miles on a medium aerial having 310 meters. This is accomplished with any good crystal or vacuum detector. On larger aerials the receiving distance of course is increased.

In this outfit we use very efficient, closely coupled tuning inducances AND A SPECIAL VARIORIOMETER COIL placed at right angles to the tuning inducance. This construction is original with us and the entire arrangement of closely coupled inducances is more efficient than most loose couplers, as practically no energy is lost in transformation.

This outfit is highly selective especially on long wave lengths. It is an ideal jewelers’ set and the better, up-to-date amateur will be proud of this fine set. Poor binding posts for the phones are used in order that two sets may be attached to the outfit.

This highly efficient set stands unmatched in this country to-day. It is of generous proportions and represents a good deal more than what we ask you to pay for it. It looks business and will give your station a commercial looking appearance.

Size over all 12x10x6½ inches. Shipping weight 5 lbs.

No. 4455 “Electro” “Sayville (WSL)” Radio Outfit as described $28.00
The "Electro" "Nauen (POZ)" Radio Outfit

The "Electro" "Nauen (POZ)" Radio Outfit is designed for the most modern receiver. It is capable of receiving both undamped and damped wave stations. It has a minimum wave length of 150 meters and a maximum of 3,500 meters which covers practically the entire range of modern radio practice.

The "Electro" "Nauen (POZ)" Radio Outfit contains two sets of primary switches for controlling long wave reception for use in receiving continuous wave stations. In receiving long waves, a switch is thrown towards the right, and the secondary is placed well within the primary. The secondary

SPREADS BACK AND FORWARD

No. 4466

The "Electro" "Nauen (POZ)" Radio Outfit can be used with any kind of crystal or vacuum detector. It is necessary to connect an additional loading coil in the aerial circuit to receive long waves, as stations which employ undamped wave generators use wave lengths exceeding 4,000 meters. Two of our No. 8486 Tuning Coils can be connected in series and will work satisfactorily, in conjunction with the "Nauen" receiver for receiving wave lengths up to 6,000 meters, with a moderate size aerial. A suitable antenna for this kind of work should consist of a single wire 500 to 600 feet long and about 50 feet high. The switches of both the secondary and primary are manipulated until the incoming signals are heard at the maximum intensity.

By merely throwing in the coil in the circuit by connecting in switch No. 2 to the right, it is possible to receive continuous wave stations. It is necessary to connect an additional loading coil in the aerial circuit to receive long waves, as stations which employ undamped wave generators use wave lengths exceeding 4,000 meters. Two of our No. 8486 Tuning Coils can be connected in series and will work satisfactorily, in conjunction with the "Nauen" receiver for receiving wave lengths up to 6,000 meters, with a moderate size aerial. A suitable antenna for this kind of work should consist of a single wire 500 to 600 feet long and about 50 feet high. Under normal conditions, with the above aerial and a properly tuned oscillating Audion, there should be no trouble in receiving European stations such as Nauen and Ellwiesa with this wonderful outfit.

No. 7778 Galena, soft metal, set in the Detector-cup with HUGONIUM soft metal, and rotating, is furnished with No. 9701 Detector. Shipping weight 1 lb.

No. 9701 Detector as described but with a TESTED "RADICOT" crystal, the cost there is...

Ẹ $2.00

A piece of TESTED GALENA, set in the Detector-cup with HUGONIUM soft metal is furnished with No. 9700 Detector and a piece of TESTED HUGONIUM soft metal is furnished with No. 9701 Detector.

Shipping weight 4 oz.

No. 9700 shipping weight 1 lb.

Shipping weight 15 lbs.

No. 4477 "Electro" Nauen (POZ) Radio Outfit as described...

$45.00

The "Electro" Galena Detector...
THE "ELECTRO" RADIOCITE DETECTOR
WITH GOLD CATWHISKER

POSITIVELY THE MOST SENSITIVE CRYSTAL DETECTOR MADE

FEATURES
Gold Catwhisker
Bakelite Base
Non Jar Knob
Quadruple Adjusting Range
Long Distance Tested
Ultra-sensitive Crystal
1/2 in. Felt Sub-base
Adjustment Lock
Non Surface-leaking
Rotary Detector Cup

$4.50

CONSTRUCTION

BASE.—We use Bakelite % in. THICK the best insulator known to-day, as well as the most expensive.

QUADRUPLE ADJUSTING RANGE.— This is a very important feature. The long fine catwhisker wire is so light that it needs a very heavy knob to displace it. To deaden any jar or knock we employ a % IN. THICK SOFT FELT SUB-BASE (not shown in illustration). This makes the detector practically jar-proof.

RADIOCITE CRYSTAL THE MAIN FEATURE.—"A detector is no better than its crystal." We come out with this strong claim, supported by evidence from thousands of users:

Radiocite is the most sensitive crystal known to-day barring none. It is more sensitive than galena, zincite, or silicon.

ADJUSTMENT.—A heavy bronze casting, triple nickel plated WEIGHING 3/4 lb. carries a very heavy shaft on both sides of which are attached two hard rubber knobs 1½ in. in diameter. In the center of the shaft a very large, solid hard rubber standard which supports the heavy nickel plated brass spring. The spring holds the Radiocite crystal in place by a positive spring action.

A simple slot makes it possible to LOCK THE CATWHISKER by means of the cancel knob adjusting knob "A" WITHOUT DISTURBING THE CATCHWHISHER ADJUSTMENT IN ANY WAY WHATSOEVER. The knob "A" simply locks the central rotating shaft, without displacing the catwhisker as much as a milimeth of an inch.

Both Hands Rest on the Table while adjusting.

CATWHISHER.—We furnish two of these. One of 14 KARAT GOLD, impossible of oxidation, the other of phosphor bronze.

QUADRUPLE ADJUSTING RANGE.—This wonderful range is only to be found in the Radiocite Detector. It positively beats everything for quick and complete searching out of the most sensitive crystal spot.

Rotating the two large knobs, adjusts the catwhisker for best contacting pressure.

1. Pushing the knob from one side to the other (% in. movement allows for this) gives the catwhisker ample lateral motion.

2. The Rotating Detector Cup, rotated by means of the knurled insulating rings, brings the crystal to every point of the crystal under the catwhisker.

3. Sliding the Detector Cup backwards or forwards completes any possible adjusting that can be imagined.

Finally the detector can be screwed on the table with the crystal towards you or away from you. The adjusting is accomplished equally well either way.

Operates on any commercial radio station. These cells may be of very small size, such as a flashlight battery. A curious part of the improved Radiocite is that it does not sound at all like an electrolytic detector, but the sound coming in over the telephone receiver is exactly the same as that of a crystal detector.

The Radiocite can only be used with a 2,000-ohm headset or one with higher ohmage. Lower resistance than 2,000 ohms tend to shorten the life of the detector.

The Radiocite is only sold complete as shown. Radiocite exchange cartridges are only furnished to users of the instrument providing the original cartridge is returned to us either whole or broken.

Specifications: The Radiocite consists of a heavy insulated base on this is mounted a very large solid hard rubber standard, which supports the heavy nickel plated brass spring. The spring holds the Radiocite crystal in place by a positive spring action.

The Radiocite is only sold complete as shown. Radioson exchange cartridges are only furnished to users of the instrument providing the original cartridge is returned to us either whole or broken.

The Radioson cartridge under-rooms five different tests before it is finally sealed. You cannot change the adjusting without smashing the glass or by passing a high tension current through it.

It is necessary to use two dry cells (three volts) in connection with the detector. These cells may be of very small size, such as a flashlight battery. A curious part of the improved Radiocite is that it does not sound at all like an electrolytic detector, but the sound coming in over the telephone receiver is exactly the same as that of a crystal detector.

Let us send you free with our compliments lesson No. 10, "The Detectors," of our famous "WIRELESS COURSE" telling you all about "Detectors." Just attach coupon No. 10 to your order. For information see free Wireless Course offer in this catalogue.
The “Electro” Tuner

PATENTED FEB. 1, 1910

3300 METERS

The “Electro Tuner” which we present is undoubtedly one of the best examples of a high grade commercial tuner. We were the very first firm in the industry to produce this style, and there is no doubt whatever that this tuner is the most popular one we manufacture. The type described here, with its tenth style evolved, and we believe it is impossible to further improve on it. Our long years of experience vouch for superiority.

The wave length of the “Electro Tuner” with 100-foot flat top 4-wire aerial 100 feet high is 2469 meters. This tuner is perfectly adapted to receiving from undamped wave stations and if 3 or more of them are used in series on a fair sized aerial you can receive from the European stations perfectly. According to the latest researches it is BARE WIRE WOUND by our special process. The convolutions approach up to 1/100 inch and are wound with amazing precision, making the finest tuning possible.

There are over 300 convolutions of copper wire, and this tuner will tune as ground through your body by way or the slider is impossible. Each post is marked. W stands for the wire convolutions; S for slider.

Size of tuner over all, 15x7 inches, Shipping weight 5 lbs.

No. 5489 “Electro Tuner” double slide, as described.................. $5.50

The “Electro” Tuner, Jr.

PATENTED FEB. 1, 1910

While the “Electro” Tuner previously described may be used to “tune in” for the largest stations, we have had a large demand for a Double Slide tuner of a smaller design appropriate for our friends with our “Electro Tuner, Jr.”

CONSTRUCTION

TUBE — Non-Seamless — carefully doped and finished. They are wound with bare wire (the best way). The wire can’t move loose.

SLIDERS RODS — Solid Square rods highly nickel plated and polished. They are made and they do. On the rods are our wonderful patent sliders, one red and one black — an exclusive feature found only on our goods.

Sizes. 8 inches long, 3/4 inches high, 3/4 inches wide.

No. 9500 “Electro Tuner, Jr.” (double slide) as described............... $3.50

Shipping weight 2 lbs.

The “Electro” Loose Coupler

RECEIVING TUNING TRANSFORMER

Patented Feb. 1, 1910

While an ordinary tuning coil is admirably suited for ordinary work it is not a success where exceedingly fine tuning is required. In fact, even the best tuner cannot tune within 10 per cent. accuracy. Furthermore, now that so very many stations are working simultaneously, we must have an instrument which is capable of tuning to an exceedingly fine degree and be able to ABSOLUTELY tune out ANY unwanted station.

This Loose Coupler is an excellent instrument for this purpose.

No. 12062 Wood parts are of polished hard wood; metal nickel plated. The wire on the primary is bare wire wound after the latest process, ensuring high efficiency. The secondary is machine wound with green silk covered wire, as it would be quite impossible to wind the very fine wire otherwise.

The secondary, projecting from the right has a large hard rubber switch handle, which carries a nickel switch blade. This blade plays over 6 contact points, to vary the inductance. The secondary coil heads ARE OF HARD RUBBER COMPOSITION, the secondary slides freely on two beautifully nickel-plated brass rods. On the primary one of our patent sliders is provided as used on our other instruments. The secondary can be moved back and forth with the greatest possible ease and will not stick, or require two hands to move as is the case with even expensive makes. Our loose coupler is built to pick up wave lengths up to 10,000 meters and as the majority of commercial and government stations have only a wave length up to 600 meters, our instrument will be found to respond in practical cases.

Adjustment: When connections are made and detector is adjusted, move secondary up to the centre of primary, then adjust slider till signals come in loud; then move secondary back and forth, while moving the switch knob back and forth, till position is found where signals are loudest. Now the variable condenser is adjusted. Dimensions: Length of base 12 inches, width 6 inches, height over all 8 1/4 inches.

No. 12062 “Electro” Loose Coupler, as described........................... $7.00

Shipping weight 5 lbs.

The “Electro” Professional Loose Coupler

(RECEIVING TRANSFORMER)

Our professional loose coupler has been carefully balanced and the secondary and primary have been wound according to the latest researches in this art. The diameter as well as the amount and the size of the wire is highly important and the type which is present herewith is unique in effectiveness and we guarantee it to do anything and everything, even the most expensive loose coupler on the market to-day will do.

No. 14000

This coupler is made of hand rubbed, piano finished mahogany throughout. Primary winding is of bare copper wire wound by our special process and there is one of our well-known patented Hard Rubber Ball Sliders conveniently located on the side. This slider makes perfect contact on only one turn of wire at a time and never wears out the wire. The secondary wound with green silk
The "Electro" Professional Loose Coupler (Continued)

covered copper wire is calculated for long wave lengths and the crowning feature of it is the secondary switching arrangement attached to the secondary. There are 8 switch points to the rotary switch which takes the place of the secondary. The Bakelite plate is placed at a slight angle in respect to the apparatus; this Bakelite plate is hand buffed. The entire cabinet is made of highly polished mahogany, with switches, controls and binding posts and metal parts of brass, nickel-plated. The size is 9 x 12 x 1 1/2 in. and weight of this outfit, being only 2 lbs, especially recommends it for service under conditions where space is at a premium or where weight must be kept down.

No. 14000 Professional Loose Coupler

Shipping weight 19 lbs.

$13.00

The "Electro" Navy Type "3 in 1" Coupler—(Continued)

in the minimum of time, particularly when quick tuning is necessary. Thus the switch knob is used for switching in more or less secondary turns and for moving the secondary backward and forward all at the same time.

This Coupler most all of the outfits manufactured and we particularly recommend it for RECEIVING TIME SIGNALS as sent out by the various U. S. Government Station. The outfit may be used with any Type of detector and any phones but we particularly recommend the use of the No. 9300 Radion Detector and our No. 6666-3000 ohm Government Phones.

No. 11000 "Electro" Vario Selective Coupler

(no phones or detector)...

$8.50

Shipping weight 5 lbs.

The "Electro" Navy Type "3 in 1" Coupler

in the minimum of time, particularly when quick tuning is necessary. Thus the switch knob is used for switching in more or less secondary turns and for moving the secondary backward and forward all at the same time.
The "Electro" "Trans-Oceanic" Undamped Wave Loading Coil

15,000 METER COIL

There is a distinct need for an extra long wave loading coil for use in receiving the long distance undamped signals from such stations as we have now. The Armstrong, the Nauen, Germany, stations (call PCJ), transmit either of three waves, viz., 6,300, 9,400 while 12,600 meters, and 10,000 to 14,000 meter waves are quite common among the newer, longer range stations.

Such circuits as the Armstrong, which utilize vacuum tube oscillating relays, in order to pick up the signals from the long wave stations in all parts of the world. As an example, the Nauen, Germany, station (call PCJ), transmits either of these waves, viz., 6,300, 9,400 while 12,600 meters, and 10,000 to 14,000 meter waves are quite common among the newer, longer range stations.

These waves cannot be received otherwise than by using an extra long wave loading coil capable of tuning in 10,000 to 15,000 meter waves directly.

No. 4506

15,000 Meters

$3.50

The Electro Importing Co., N. Y., Mfrs.

The "Electro" Loading Coil

In order to receive messages from stations using very long wave lengths it becomes necessary to use a loading coil in order to increase the natural wave length of the ordinary tuning coil or loose coupler. The loading coil has a wave length of approximately 5,000 meters. If placed in series with the tuning coil on your receivers (as Nauen, Germany, or our "Interstate" coil), the receiving range is reduced to within ten meters. If placed in series with the Arlington Government station using 2,500 meter waves, the loading coil enables one to receive messages from almost any station, no matter what its wave length, up to 5,000 meters. The capacity of your outfit is increased enormously as the coupling is not necessary; therefore you can go to any radius.

No. 8047

Shipping weight 1 lb.

The "Electro" Junior Fixed Condenser

THE CONDENSER THAT IS COPIED BUT NEVER EQUALLED

The "Electro" Junior Fixed Condenser is the SMALLEST AND NEATEST wireless condenser ever placed before the public. It is entirely made of hard rubber composition and has such small capacities, size over 3 in. in diameter and 1 1/2 in. in height. The diameter of the hard rubber thumb handle is 1 1/4 in. in diameter. No. 8047 Electro Loading Coil, as described... $3.50

No. 10010

Shipping weight 4 oz.

The "Electro" Junior Fixed Condenser

The condenser that is copied but never equalled.

The Electro importers of the "Trans-Oceanic" long wave loading coil is 32 IN. HIGH. The "Electro" Junior Fixed Condenser is hard to beat. It is made in small fixed capacities and comes in a convenient size for any amateur, from 250 to 3,000 meters, exactly like every other one of its kind making them perfectly balanced and interchangeable.

Of course a very common use for the No. 10010 Junior Fixed Condenser is as a blocking condenser, and there is a very big need for connections is required. It is then simply connected in series with the circuit.

Another use for this condenser that its low price and size make particularly useful is in the many instances of the "Electro" Junior Fixed Condenser, as described...

No. 8047

Shipping weight 4 oz.
**The “Electro” Rotary Variable Condensers**

The rotary variable condensers we present here, have exclusive features which make them more valuable than others, yet our price is lower. Consider these three features alone and you will be convinced: **FIRST—THese CONDENSERS ARE THE ONLY ONES MADE WITH A TRANSPARENT CASE IN WHICH OIL CAN BE USED WITHOUT IT LEAKING.** In this way the condenser capacity can be increased FIVE TIMES and at the same time the condenser can be used on higher potentials than air insulated condensers. Next, this condenser is the only one now on the market provided with screw holes so it can be screwed down to a table or instrument board. **THIRD—THIS CONDENSER IS THE ONLY ONE NOW ON THE MARKET WITH CONNECTIONS AT THE BOTTOM as shown in the illustration.** This form of construction makes a better instrument and cleaner wiring for you. No longer is it necessary to run unsightly wires up to the top of your condenser, for our connections are only ½ in. above the table level. Cover is made of highly polished hard rubber composition with a large scale that is easily read. The handle is knurled and a very convenient size. The pointer is very rigid and clear and the handle has an exclusive feature permitting of it swinging all around in a complete arc or stopping at the maximum or minimum capacity. Plates are of a special metal alloy, properly spaced with separators milled to .0005 of an inch, and so supported that they cannot hear certain stations for the sole reason that their ground condenser is either too high or too low in capacity. For that reason this new style condenser was evolved for us and it has found the instant approval of thousands of wireless enthusiasts.

**The “Electro” Fixed Variable Condenser**

This is one of the greatest innovations ever originated by us. The case contains two fixed condensers of different capacities. If the switch lever is on point 1 the two condensers are in series; this is the lowest capacity available. If lever is moved to point 2, the smallest condenser is in circuit. On point 3 the large condenser is in circuit. Thus it will be seen that three distinct capacities are provided for in this condenser. It is a proven fact that different stations are heard with varying degrees of intensity, all depending on the capacity of the ground (blocking) condenser. Very few persons realize that they cannot hear certain stations for the sole reason that their ground condenser is either too high or too low in capacity. For that reason this new type condenser was evolved for us and it has found the instant approval of thousands of wireless enthusiasts.

**The “Electro” Fixed Variable Condenser**

The accompanying cut (actual size) shows our hard rubber ball bearing slider (patented Feb. 1, 1919). It is the acme of perfection and accuracy in efficiency, quietness and the slider ever placed on the market. All non-metallic. All sliders over the rod with astonishing ease. **NO MICROPHONIC CONTACTS** are possible with this slider (in the phonograph type) as the slider is pressed evenly on the tuning coil wire, while the phosphor bronze spring which makes contact with the rod, presses firmly on the ball, ensuring perfect contact at all times.

*Let us send you free with our compliments lesson No. 9 "The Receiving Apparatus" of our famous "WIRELESS COURSE" telling you all about "Potentialometers." Just attach coupon No. 9 to your order. For information see free Wireless Course offer in this catalogue.*

**The Electro Importing Co., N. Y., Mfrs.**
The “Electro” Professional Wave Meter

FOR WAVE LENGTHS FROM 180 TO 1,800 METERS

The up-to-date wireless amateur to-day wants more than a radio set for receiving or transmitting. He wants to know what he is sending and what he is receiving. Realizing therefore the need of the radio enthusiast for an easy to use measuring instrument we developed a wave meter in which time and money to perfecting one that would produce the maximum of simplicity with the simplest of instruments and with a maximum of accuracy even when in the hands of a mere novice.

Our Professional Wave Meter enables you to easily find out what wave length you are emitting and therefore to tune your station to 200 meters or less. The law goes further and says you must emit a wave with a decrement of 1/10 or less. Our wave meter enables you to so tune your station so that you will emit a wave form acceptable to the government.

In other words, our Professional Wave Meter enables you to read wave lengths of either receiving or sending stations, also to obtain capacities, interferences, and decrements, and then when you are through using your wave meter as such, JUST ADD A LOOSE COUPLER. TAKE OFF YOUR INDUCTANCE COIL AND YOU HAVE A FIRST CLASS RECEIVING OUTFIT.

WHAT IT CONSISTS OF

Our Professional Wave Meter consists of two standard and accurately wound inductance coils on a seasoned and polished mahogany form having two neat separable connectors conveniently mounted for connection to either coil. This form is also called the exploring coil. When not in use it sets on a handy peg on the polished mahogany base. For connections we supply a 5 ft. silk cord. The detector is our standard No. 9701 RADIOCITE DETECTOR whose sensitivity is so well known that it requires no further mention. The condenser is our accurate and never varying No. 9241 that is as near perfect as a condenser can be made. All are mounted on a beautiful hand rubbed piano finish mahogany base that will be an ornament to any station. The entire instrument rests on soft rubber feet for extra insulation. The directions that we supply are so complete as it is possible to make them and yet are so accurate that they require no expert or trained user to get perfect results with the instrument. For readings we supply an accurate plotted curve that is of course absolutely correct. Altogether every part is of very high grade and assembled by expert mechanics so it will last and always be accurate and reliable.

OPERATION

Do you want to find out what your emitted wave is? Simply bring the standard inductance near your sending helix or oscillation transformer. Move your condenser needle to the position where signals are loudest in the receiver. Note the reading on your condenser and look for that reading on your curve which immediately tells you the wave form you are using. This eliminates lengthy mathematics. To read the wave length of an incoming wave bring the exploring coil close to your tuning coil or loose coupler and follow the same procedure.

Accuracy is guaranteed within 5 per cent; sufficient for all commercial needs and surely for your purposes.

Remember we were not the first to produce a wave meter, but we are the last. The mistakes and experience of others can be avoided. Our wave meter will therefore assure you of the best at the lowest price.

By using our detector you will find it easy to use. We advise the use of any of our better grade wireless receivers, but any good wireless receiver will do excellent work. Receivers are not supplied with this wave meter. Tune your station up-to-date? If not, bring it up-to-date by getting our Professional Wave Meter at once.

No. 4488 "Electro" Professional Wave Meter, complete .................. $16.00

Size 7x14x8 in. Shipping weight 10 lbs.

Gentlemen,— Am just after receiving my Detector and Buzzzer and am very much pleased with both, especially the Detector.

ANDREW SCHMIDLAPP.

The Electro Importing Co., N. Y., Mfrs.

The "Electro" Radiotone

HIGH FREQUENCY SILENT TEST BUZZER

This instrument gives a wonderful high pitched MUSICAL NOTE in the receiver, impossible to obtain with the ordinary test buzzers. The RADIOTONE is built along entirely new lines; it is NOT an ordinary buzzer, reconstructed in some manner. The RADIOTONE has a single fine steel reed vibrating at a remarkably high speed, adjusted to its most efficient frequency at the factory. Hard silver contacts are used to make the instrument last practically forever. There is nothing to get out of order—for there are no set screws, no adjusting screws, which in themselves proclaim an instrument as unprefect.

Yes, the RADIOTONE IS SILENT. In fact, it is so silent that you must place your ear almost on top of it to hear that beautiful musical note. If you have to adjust your detector you appreciate just what this means. Nearly all test buzzers on the market to-day, scream so loud that you hear them 15 feet and more away.

How can you adjust a detector, when you hear TWO SOUNDS, one outside of the phone, the other inside of the phones? Nothing like this with the RADIOTONE. You hear the sound where it belongs—in the phones.

How do we do it? First the steel reed is so constructed that it cannot possibly create a loud sound in the air surrounding it. Then by accurately insulating the entire electrical unit, and by providing a heavy felt base for the instrument, all outside sound is done away with.

The casing is made of hard rubber composition, and there are three binding posts on the instrument. The RADIOTONE is small and takes up but very little room. Just the same, we wager you will give it a prominent location on your instrument table, because it really is an exceptionally beautiful instrument, one you will be proud to show to your most critical friends.

As already mentioned the RADIOTONE is equipped with an exceptionally heavy green felt sub-base. The RADIOTONE works best on a single dry cell. Two cells may be used, but we do not recommend this. The RADIOTONE can be operated continuously if desired, it will POSITIVELY NOT STICK.

RADIOTONE LEARNER'S OUTFIT

No instrument lends itself more readily to learning the telegraph codes than the RADIOTONE. An ordinary telegraph sounder outfit is worse than useless to learn the wireless codes because every time you depress the key a loud noise is heard. The RADIOTONE is heard but the first click. It does not resemble in the least the sounds heard in a set of phones when receiving a Radio message.
The Electro Importing Co., N. Y., Mfrs.

The "Electro" Radiotone—(Continued)

The RADIOTONE, however, lends itself admirably to this purpose. It gives an exact reproduction of a Radio message and you can readily learn the codes in less than thirty days with only a little persistent practicing.

Fig. 1 shows a real learner’s Radio Code Outfit consists of: You require first the RADIOTONE; second a dry cell; third, our No. 1024 Receiver (75 ohms); fourth, our No. 1118 Telegraph Key; fifth, our No. 1090 Condenser. A few extra receiver cords can be connected as shown by dotted lines, in case several of your friends are learning the code with you. Don’t forget: in all cases the condenser must be used.

If you wish comfort, order one of our headbands and an extra receiver, to keep the receiver out of your ears.

INTERCOMMUNICATING RADIOTONE OUTFIT

Fig. 2 shows another suggestion for a modern telegraph line, to practice telegraphy between two chums’ houses. The circuit will be noted but one metallic line wire is required. The return circuit may be the ground as indicated. Each station consists of one RADIOTONE, one or more dry cells (according to distance); one of our No. 1118 telegraph keys; our No. 10910 Junior Fixed Condenser; two No. 1924—75 ohm receivers (of course a single receiver may be used); one No. 672 8-foot receiver cord, and one headband. A call bell is not required as the phones will sing so loud that the tone may be heard ten feet away.

The "Electro" Radiotone, as described, complete. Size: 6 ½ x 3 x 2½ in. Shipping weight 1 lb. $1.50

The "Electro" CODOPHONE

Patents Pending

This instrument imitates LOUDLY and audibly Radio Signals. It is used in learning the Morse or Continuous Codes. It replaces the buzzer practice outfit, as well as the regular telegraph sounder outfit.

No. 1099

What this remarkable instrument is and does.

The "Electro" Codophone is positively the only instrument made that will imitate a 500 cycle note exactly as heard in a Wireless receiver, so closely and so wonderfully clear, that Radio operators gasp in astonishment when they first hear it. And you need no receivers over the ears to hear the imitation singing spark, which sounds for all the world like a high-pitched distant powerful Radio Station. No, the loud-talking receiver equipped with a horn, talks so loud that you can hear it from another room, and even if there is a lot of other noise.

THAT’S NOT ALL. By lengthening or tightening the receiver cap, a tone from the Carbon Ball Microphone changes to a whisper, while the Codophone changes to a higher and higher voice, which we furnish with every instrument.

FOR INTERCOMMUNICATION. Using two dry cells for each instrument, two Codophones when connected with one wire and return ground, can be used for intercommunication between two houses one-half mile apart. Any one station may call the other at any time, and if both are on the receiving end, the other can hear the message, or if both are on the sending end, one can talk to the other.

THAT’S NOT ALL. By lengthening or tightening the receiver cap, a tone from our "Electro" Codophone changes to a whisper, while the Codophone changes to a higher and higher voice, which we furnish with every instrument.

The "Electro" Codophone is the only instrument made that will imitate a 500 cycle note exactly as heard in a Wireless receiver, so closely and so wonderfully clear, that Radio operators gasp in astonishment when they first hear it. And you need no receivers over the ears to hear the imitation singing spark, which sounds for all the world like a high-pitched distant powerful Radio Station. No, the loud-talking receiver equipped with a horn, talks so loud that you can hear it from another room, and even if there is a lot of other noise.

THAT’S NOT ALL. By lengthening or tightening the receiver cap, a tone from our "Electro" Codophone changes to a whisper, while the Codophone changes to a higher and higher voice, which we furnish with every instrument.

The "Electro" Codophone is positively the only instrument made that will imitate a 500 cycle note exactly as heard in a Wireless receiver, so closely and so wonderfully clear, that Radio operators gasp in astonishment when they first hear it. And you need no receivers over the ears to hear the imitation singing spark, which sounds for all the world like a high-pitched distant powerful Radio Station. No, the loud-talking receiver equipped with a horn, talks so loud that you can hear it from another room, and even if there is a lot of other noise.

THAT’S NOT ALL. By lengthening or tightening the receiver cap, a tone from our "Electro" Codophone changes to a whisper, while the Codophone changes to a higher and higher voice, which we furnish with every instrument.

The "Electro" Codophone is positively the only instrument made that will imitate a 500 cycle note exactly as heard in a Wireless receiver, so closely and so wonderfully clear, that Radio operators gasp in astonishment when they first hear it. And you need no receivers over the ears to hear the imitation singing spark, which sounds for all the world like a high-pitched distant powerful Radio Station. No, the loud-talking receiver equipped with a horn, talks so loud that you can hear it from another room, and even if there is a lot of other noise.

THAT’S NOT ALL. By lengthening or tightening the receiver cap, a tone from our "Electro" Codophone changes to a whisper, while the Codophone changes to a higher and higher voice, which we furnish with every instrument.

The "Electro" Loud-Talker

We present herewith two little instruments for which we have had a long and persistent demand.

These outfits have been gotten up solely for the Experimenters and for this reason we are selling them "Knocked Down." In other words, the instruments come all ready for you to assemble; no parts, screws, nuts, washers, etc., are furnished. Complete directions how to assemble given with each set. With a pair of pliers and a screwdriver, the outfit can be readily put together in less than twenty minutes.

The most important point is that the telephone receiver spool comes already wound, and complete, and the Experiment will, therefore, not need to wind his own spool.

The outfit when assembled comprises a high-sensitivity CARBON BALL MICROPHONE with carbon diaphragm of exactly the same type as our "Detectophone." The "Back Plate" which holds the carbon balls has five cup-shaped polished depressions, each accommodating about twelve to fifteen of the special carbon balls furnished in a bottle.

The receiver is our No. 1024 style with the difference that no magnet is used in the same for the reason that the function of this instrument is electro magnetic, the same as our "Detectophone." The spool is wound with special enameled wire for five ohms, standard with our Detectophone.

The instrument works best on two dry cells, and particular attention is called to the fact that in order to work, the loud-talker requires a fairly heavy current and for that reason must be used for connecting the transmitter with the loud-talker. If this is not done, the voice will be weakened considerably. If no heavy wire is at hand, more batteries must be used to compensate.

With this instrument no switch is required; if one is through talking all that is necessary is to lay the transmitter face up, which automatically cuts out the current.

USES: This instrument can be used to transmit phonograph music from one room to another; used as a Detectophone, as a Radio Amplifier; as a telephone extension (by connecting the regular telephone receiver against the sensitive transmitter); as a "Howler" (Whistling Micro-telephone); and for Loud-Talker and Phonograph Microphone use.

No. 206 "Electro" Loud-Talker Oufit

No. 206 "Electro" Loud-Talker Oufit, same as above except that it is already assembled and tested at factory. Set complete. $2.75

Shipping weight 1 lb.

The Electro Importing Co., N. Y., Mfrs.
## The Electro "Government" Phones

### Highest Precision Phones Made in the United States

(Adopted by several Governments)

**CONSTRUCTION:**

<table>
<thead>
<tr>
<th>No.</th>
<th>Feature Description</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>6666</td>
<td>Magnets are wound with No. 42 B &amp; S. ENAMEL COPPER WIRE</td>
<td>3,000 Ohms</td>
</tr>
<tr>
<td>6667</td>
<td>Single receiver (no band or cord), 1,500 Ohms</td>
<td>Cord with two tips</td>
</tr>
</tbody>
</table>

- The magnets are wound with No. 42 B & S. ENAMEL COPPER WIRE. The magnets are a great deal more powerful than the best imported Swedish tungsten steel, which we guarantee. The magnetic power of this receiver is the highest of any and this accounts for the remarkable sensitivity and long distance receiving power of these wonderful phones.

- We lay particular stress on the magnets of this receiver and we guarantee that the magnets will not lose their strength for two years. We realize a wireless telephone receiver is not better than the strength of its magnets, hence we have extended all our energies towards producing something that can be relied upon, practically indefinitely.

- While this headgear is the lightest on the market to-day we have not sacrificed its efficiency, as may be easily ascertained when testing out the sets. Each receiver is wound to 1,500 ohms, giving 3,000 ohms per set.

- These phones as well as all our others are now equipped with our famous "Gernsback Patent" Common-Sense Headbands.

- Our Mr. H. Gernsback had been experimenting for years before this extraordinary simple as well as efficient headband was finally developed.

- Greatly annoyed by headbands that would not fit the head permanently, that would not hold the receivers tight to the head, that caught your hair, that were heavy and hurt your head, he developed the present band that has none of these faults.

### THE "ELECTRO" "JUNIOR" Wireless Phones

These phones are exactly the same as our No. 8070 described above except that instead of using No. 8071 double pole receivers, we furnish 2,000 ohm No. 1024 single pole receivers. While these are single pole receivers, they should be borne in mind that in connection with silicon or galena detectors, such phones will almost prove as sensitive as the No. 8070 kind. These phones are marvelously sensitive and will give a click when the two moistened tips are contacted with another piece of metal, — a test which very few high priced receivers will stand.

- These phones as well as all our others are now equipped with our famous "Gernsback Patent" Common-Sense Headbands.

- Until you have worn a "Gernsback Patent" Common-Sense Headband you don't know what phone comfort is.

### Shipping Weight:

- 1 lb. for No. 8070 (Patent Pending)
- 1 lb. for No. 8071 (double pole receivers)

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**The Electro Importing Co., N. Y., Mfrs.**

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**The "Electro" Amateur Wireless Phones**

We herewith present our amateur type wireless phones which are superior to anything as yet. These phones are wound to 1,000 ohms each receiver and are wound with No. 40 enamal copper wire, have double pole magnets, which are extremely powerful and made especially for wireless use.

These phones as well as all our others are now equipped with our famous "Gernsback Patent" Common-Sense Headbands.

- These receivers fit the head perfectly. The weight is 12 ounces. With this set we furnish a finely finished five-foot bifurcated green cord with nickel-plated tips.

<table>
<thead>
<tr>
<th>No.</th>
<th>Feature Description</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>8070</td>
<td>Two Thousand Ohm Phones, as described</td>
<td>$6.00</td>
</tr>
<tr>
<td>8071</td>
<td>Receiver only (1,000 Ohms), not wired with No. 8070</td>
<td>$2.45</td>
</tr>
<tr>
<td>8072</td>
<td>&quot;Gernsback Patent&quot; Double Headband (fits our No. 1024)</td>
<td>$1.40</td>
</tr>
<tr>
<td>8073</td>
<td>Five-foot bifurcated green cord, each</td>
<td>$0.75</td>
</tr>
</tbody>
</table>

**Shipping Weight:**

- 2 lbs. for No. 8070
- 1 lb. for No. 8071
- 1 lb. for No. 8072
- 4 oz. for No. 8073

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**THE "ELECTRO" "JUNIOR" Wireless Phones**

These phones consist of two receivers. "Gernsback Patent" swivel soft rubber padded headbands and five-foot bifurcated cords are furnished with this set.

- Shipping weight 2 lbs.

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**The Electro Importing Co., N. Y., Mfrs.**

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The "Electro" 1000 Ohm Single Pole Receiver

It isn't often that we can offer you so valuable a piece of apparatus at so little money. Here is a case in point.

Our No. 1024A is a carefully designed wireless receiver of the single pole type and one which with certain types of detectors such as the silicon, galena, carborundum, etc., will give excellent results. This is not a cheap telephone receiver, wound to a high resistance and then called a wireless receiver, but it was actually designed for the purpose we advertise.

To make you fully appreciate what this phone is, let us tell how it is made and you judge for yourself.

The shell is of polished hard rubber composition, light strong, and durable. The earpiece is of the same material and designed to be comfortable yet exclude external noises. Shell fits our regular headband. The magnet is a very fine special tungsten alloy magnet steel, very ingeniously shaped, it will retain its magnetism under all conditions, short of abuse.

The winding is a full tested 1890 OHMS IN NO. 40 B. & S. BLACK ENAMELED WIRE. It is wound on a specially soft Swedish iron core. Every receiver is tested for resistance and insulation. Diaphragms are of selected stock and hand sorted.

After reading this description do you doubt that we are proud of our No. 1024A Receiver? You will never regret buying one or a pair. Their sensitivity far excels many double pole receivers. Size 2¼ x 1¼ inches.

No. 1024A Receiver 1000 ohms as described. Price $1.75
Shipping weight 1 lb.

The "Electro" Double Pole Receiver

The double pole receiver No. 1030, which we illustrate here is of course more powerful than the No. 1024 type. The No. 1030 receiver is wound to 75 ohms and has two powerful magnets and double poles. This telephone receiver is suitable for all kinds of telephone work where a powerful double pole receiver is wanted and is also found of great use in wireless telegraphy where a low resistance receiver is desired.

Of course, it can be used in the same way as our No. 1024, but in all cases it will give better results just as you have a right to expect for it is double pole and stronger.

One of the uses of many of our customers have been putting it to is in the making of microphonic telephone and wireless amplifiers using it as a second step up from the transmitter used. In that case a high grade low resistance receiver is preferred and high grade receivers are the only kind we make. It can also be used as a second receiver for regular telephones in that way providing extra receiver for each ear. Try it once and you will always have it on your phone. It keeps outside noises and lets you hear on both ears as nature intended. Simply connect it in parallel to your present receiver using one of our single receiver cords.

No. 1030 75 Ohm Receiver, as described. Price $1.40
Shipping weight 1 lb.

When ordering any of our Phones, don't forget that we will gladly send you FREE with our compliments Lesson No. 5 "The Principles of Magnetism" or Lesson No. 9 "Receiving Apparatus" or Lesson No. 18 "The Wireless Telephone" of our famous "WIRELESS COURSE."

Everything worth knowing about Receivers is explained in these lessons. Just attach your free coupons to your order. For further information consult free Wireless Courses offer in this catalogue.

Gentlemen—

Saratoga Springs, N. Y.

I have just received your reply concerning the wire I wound on that Magnet generator and was exceedingly pleased to note your kindness in such a thing as this. I bought considerable goods from you and they were always satisfactory in both quality and price.

CHAS. M. COGAN.
Minerals and Crystals

When you buy a mineral or wireless crystal you are interested in only a very few things. First you want to know value. EVERY CRYSTAL SOLD BY US IS TESTED FOR SENSITIVITY. Don’t pay more for so-called “extra.” Note that we sell by weight wherever possible. When we say you get an ounce, we mean an ounce. This means a lot more than an ounce, and when you buy Bullfrog Minerals and Crystals from The Electro Importing Co., you buy the best tested goods that are found at the lowest possible prices. Your first order will convince you of our claims.

BORNITE

Used a great deal abroad. Can be used with a phosphor bronze contact wire, or with zincite. Marvelously sensitive. No. 2416. Borneite, per oz. $0.45 Shipping weight 2 oz.

ZINCITE

The aristocrat of all wireless minerals. Too well known to need any introduction. Undoubtedly the most sensitive of all crystals. GUARANTEED 100 PER CENT. PURE. No. 2417. Zincite, per oz. $1.75 Shipping weight 2 oz.

No. 2418. Zincite, 1/2 oz. $0.45 Shipping weight 1 oz.

SILICON

There are two kinds of this material: Silicon crystals and fused Silicon. The former, manufactured in this country, is absolutely up to the mark; the latter, imported, is the best kind that should be used. It comes in chunks and somewhat expensive. It is very hard and extremely brittle.

No. 9209. Silicon, per oz. $0.45 Shipping weight 2 oz.

No. 9209a. Silicon, 1/2 oz. $0.20 Shipping weight 1 oz.

IRON PYRITES

Our iron pyrites is an imported Spanish stock that may be used for years without deterioration. Very sensitive. No. 2505. Iron Pyrites (Ferron), extremely sensitive, per oz. $0.40 Shipping weight 1 oz.

MOLYBDENITE

This new substance is the only one discovered so far which does not get out of adjustment, when used in a sensitive Detector, and when placed near a sending gap. Most substitutes suffer a great deal from strong sending currents, but it is impossible to damage the adjustment of the Molydeneite Detector, and a heavy discharge does not affect it. By silvery pieces quite sensitive when distant stations are to be picked up.

No. 2504. Molydeneite, per oz. $0.45 Shipping weight 2 oz.

COPPER PYRITES

Very sensitive and very stable. Even sensitivity along whole surface. Not easily jarred out. Use phosphor bronze contact wire. GUARANTEED 100 PER CENT. PURE. No. 2417. Copper Pyrites, per oz. $0.45 Shipping weight 2 oz.

PEROXIDE OF LEAD

No. 2506. Peroxide of Lead, Co-pressed tablets, ca. $0.40 Shipping weight 2 oz.

MINERAL SETS

No. 2502. Zincite and Copper Pyrites (Perikon) per set. $0.95 Shipping weight per set 4 oz.

MINERAL ASSORTMENT

Consisting of generous pieces of each of the nine minerals and crystals shown on these pages. A perfect assortment for the wireless experimenter. No Radiocite supplied. No. 2536. Mineral Assortment (9 minerals). No Radiocite supplied, per set. $2.00 Shipping weight 1 lb.

CARBONBUND

Special assortment for experimenting with the Carbonbund Detector. Quite sensitive and very stable. Commercial companies for many years. No, 9105. Carbonbund, per oz. $0.40 Shipping weight 2 oz.

The most wonderful of all Wireless Crystals

RADIOCITE TESTED FOR SENSITIVITY

RadioCite is the most wonderful of all radio crystals. It is more sensitive than the best and far more sensitive than any other crystal or mineral. RadioCite is a specially selected grade of a rare crystal chemically treated. The mineral that looks like liquid gold. It has a highly, wonderfully polished surface giving it a perfectly burnished appearance. This crystal is now in use by several governments, and is conceded to be the most satisfactory of all. It is used with a medium stiff phosphor bronze spring, or with a stiff silver wire, about No. 20 B. & S. Gauge. One of the important features of RadioCite is that it does not jar out easily. Each crystal is tested out individually for sensitivity and guaranteed. RadioCite comes packaged separately in a box, wrapped, and full directions for use accompanying the same can be requested like any other crystal; it may be clamped between springs, but it is best to set it in Bichromous soft metal.

No. 2504. Generous piece of tested RADIOCITE. $0.60 Shipping weight 2 oz.

The one up-to-date mineral which every amateur must have.

The Wireless Code Chart

This code chart has been brought out by us pursuant to a large demand by our enthusiastic wireless friends, who like to have the three codes, the Morse, Continental and Naval, before their eyes when sending or receiving messages. This is truly a beautiful chart, being arranged in such a manner that a letter or figure can be “spotted” instantly without the eye searching for precious seconds. The dots and dashes are very heavy and large and can easily be read by the novice without effort. There are, in addition, a list of abbreviated 10 foot off. There are, in addition, a list of abbreviated and figures, such as used by Continental operators; also a chart of Morse abbreviations used by the fraternity.

The chart measures 8 x 11 inches and is printed on white cardboard. It will make a fine addition to any wireless station and it will make the latter look businesslike. Copies in black and white background only.

The latest feature of this article is that on the back we now have the International Morse Code and conventional wireless alphabet, also the list of abbreviations to be used in radio communication and as adopted by the International telegraphic Convention. Room is left also for a private code if desired.

No. 2501 Wireless Code Chart. By mail, extra $0.05. No. 2501

Cleveland, Ohio.

Gentlemen—

Your piece of radiocite received in excellent condition and am glad to inform you that it is without doubt the best mineral ever put on the market. It has a silicon or galena beat forty different ways and back again. I have tried it out on an indoor set consisting of a piece of bare copper wire 20 feet long, a gas pipe ground on a forty cent detector and a pair of 200 Ohm phones. This set worked used for the purpose of testing Radiocite and the results one would call "amazed me off my feet." I have not yet tried it on my big set but it works as good as it did on the small set—why, I’ll have “some” set.

Yours truly,

L. PLACEK
316 W. 84th St.
Cleveland, O.
The Electro Importing Co., N. Y., Mfrs.

The "Electro" Rotary Potentiometer

(NON-INDUCTIVE)  PATENTED FEB. 28th, 1911

There are several unique features incorporated in our instrument which above all takes up a minimum of space, being only 4 in. diameter, the thickness of the

main body being only ⅛ in.

We use in this instrument a high resistance carbon-graphite rod and the resistance of this instrument is approximately 360 ohms, as experience has taught us that for wireless use only about 1 ohm to 2 hundred ohms are generally used, we do not furnish extra

rods for this new instrument and 300 ohms cover all the wants of the operator and experimenter.

The most important part of the instrument is the rotor which is not straight on a long rod, as used in our old style movement. It will be realized that this is a great advantage, as the rotary movements for wireless use be very easy to remember the proper regulation current to give his detector and will

not have any of the above objections. We finally found that the movement which we use is the only one that meets our requirements, that has a great many excellent points making it highly desirable for aerials.

The instrument is made of molded hard rubber which makes it the most attractive of apparatus of this sort ever placed on the market. There is nothing to shrink or warp on this instrument and the construction is beyond criticism. The connection is positive. The instrument is always ready and there is nothing to wear out or to be replaced. The carbon-graphite rod is embedded in the hard rubber and it will not break even if the instrument should hard rubber. The diameter of the rubber thumb handle is 1 in. An ideal instrument to use with the Radiophon detector.

Size over all 4½ in.; weight four ounces. Connections are the same as for any potentiometer. Instrument is shipped ready for instant use.

No. 9255 "Electro" Potentiometer

Shipping weight 1 lb.

$2.75

The Electro Importing Co., N. Y., Mfrs.

No. 9255 "Electro" Potentiometer (patented)

Telephone Cords

5 FOOT GREEN COTTON BIFACED CORD. This cord is used on our No. 5270 telephones; with 2 nickel tips and 4 loop connections. (See illustration.)

No. 5075 Each

Shipping weight 2 oz.

$0.75

No. 9069 5 FOOT SILK BIFACED CORD, as used on our No. 5069 receivers:

Each

Shipping weight 2 oz.

$0.75

No. 4003 3 FOOT TELEPHONE CORD with 2 metal tips and 2 loop connections to No. 1024 Receiver.

Each

Shipping weight 2 oz.

$0.85

No. 4003 3 FOOT TELEPHONE CORD, with 4 metal tips, well finished throughout. (Shipping weight 2 oz.)

Each

$0.45

No. 4003 RECEIVER DIAPHRAGM (Ferrotone). Each

Shipping weight 1 oz.

$0.10

The "Electro" Ground Clamp

The most ingenious clamp ever invented. Invaluable to every wireless experimenter.

A wireless outfit is not better than its weakest part—he which is usually a poor set of all wireless trouble is due to a poor ground. Our new Ground Clamp is of course, not for telephone, bells, telegraph and lighting work; in fact, everywhere where a good ground on which YOU CAN DEPEND is desired.

It fits any gas or water pipe. A tinned lug is provided to attach wires. The clamp (9½ in. wide) is of pure copper with the lug in plated.

No. 10003 "Electro" Ground Clamp, as described.

Shipping weight 4 oz.

$0.20

The Electro Importing Co., N. Y., Mfrs.

No. 10003 "Electro" Ground Clamp.

No. 10003 "Electro" Ball Antenna Insulator

The "Electro" Ball Antenna Insulator

The size of this Insulator over all is 3¼ x 2¼ inches. Weight 7½ ounces. The insulator is made entirely of porcelain in one piece and has a triple coating of brown glaze. The insulating value is of the highest order and greater than similar insulators. It will hold 10,000 volts. All the grooves are undershod and this feature is responsible for the fact that the new insulator "sheds the water like a duck."

We recommend one insulator on each end of an aerial strand for receiving. For sending there should always be two of these insulators in tandem; this will afford sufficient insulation up to 10 K. W. transmitters.

No. 10007 "Electro" Ball Insulator, as described.

Shipping weight 1 lb.

$0.25

The Electro Importing Co., N. Y., Mfrs.

No. 10007 "Electro" Ball Antenna Insulator.
The "Electro" Antenna Switch

As illustration shows this is a three-pole double throw switch. As will be seen the throw to change the switch over is only about 1 inch, making it almost instantly. The two end blades are at an angle of 140 degrees. By referring to the diagram it will be seen that when the switch is thrown for receiving the primary of the coil is disconnected. If sodium is the sending key should be touched it will be impossible to damage the receiving instrument, as the coil and copper leads are pure copper.

This switch will stand the discharge of a 4-inch coil without jumping across. It can be used in connection with transformer up to 5 kW. All copper parts are very heavy.

The switch can be screwed down on any table or wall. If used in connection with transformer, height over all 6 inches, when lever is down; when lever is up, height is 5 inches.

No. 1161 measures 14x3x2 inches overall. Its carrying capacity is 100 amperes.

No. 1167 measures 17x3x2 inches overall. Its carrying capacity is 100 amperes.

DON'T USE ON AMPERE SWITCHES.

100 AMPERE

No. 1161

125 Volt Lighting Switch. Shipping weight 4 lbs. $6.00

600 Volt Lighting Switch. Shipping weight 7 lbs. $6.00

Ground Wire for Lighting Switches

(Approved by the Underwriters.)

This wire has a soft iron core while the outside is pure SOLID copper. The copper forms about one-third of the entire wire. Only one size carried, No. 4, which has 9 feet per lb.

No. 4004 Size 4 B. & S. soft copper end wire, per foot. $0.08

Shipping weight 2 lbs. for each 100 feet.

Galvanized Stranded Guy Wire

This wire is used as guy wire to secure the aerial mast. It is made of 6 No. 12 B. & S. wire twisted and is well galvanized to prevent rust. We do not recommend thinner wire, as it is not strong enough to withstand storms, etc. This wire is furnished in coils measuring 100 feet.

NOT LESS THAN 100 FEET SOLD.

No. 1526 Galvanized iron wire, per 100 feet. $0.55

Shipping weight, 3 lbs.

NOTE—Don't use a single solid wire for guying your mast.

Bamboo Spreaders

These bamboo rods are 8 ft. long and taper slightly from 1/4 and 1/2 in. at the butt. They are very strong and light. Must be sent by express unless cut in 2 ft. pieces.

No. 6237 Bamboo Pole, 8 ft. long, Price each. $0.70

Shipping weight 2 lbs.
The "Electro" Spark Gap

While our old style jump spark balls were well suited for short distances, for which purpose they were unmatched, the "Electro" Spark Gap is intended to do real hard work—even commercially for short distances.

The peculiar properties of a small spark gap make it particularly efficient for sending, especially when a sending condenser is used. Any size spark coil up to 6 inches can be used successfully. If a single small Jarvden jar is shuttled across the gap and its formation forms the spark coil, an intense blue mass of fire will crash across the gap with a roar—exactly as you hear it in the large commercial and government sets. If you never saw our Gap in operation, you will hardly realize its power. Besides, it may also be used as an ANCHOR GAP in the antennas, which is an automatic switch. The "Electro" Spark Gap has two rods 3-16 inches diameter, 2¼ inches gap while sending. Stands which are finely plated are mounted on heavy hard rubber composition base. Size of base, 7⅛ x 9½ inches. Size over all, 4⅞ inches long, 2⅞ inches high.

No. 2220 "Electro" Spark Gap, as described $1.00
Shipping weight 1 lb.

The "Electro" Rotary Spark Gap

The advantages of the rotary spark gap are too well known to require much comment. Sure it is, however, that the "Electro" Rotary Spark Gap has been designed in a modern high pitched spark that will increase your send distance at least 20 per cent. (and probably more) besides making your emitted signals more easily read. The motors are all standard rock motors that have been constructed for years, are well constructed, operated at high speed and are perfectly dependable under all conditions. The disk is of solid bakelite, 4⅜ inches in diameter and with 12 large zinc gap contacts that have been carefully turned and ground to size. The disc runs perfectly true. The parts are milled and very conveniently placed. The stationary electrode are of zinc and are held in place by use of pins and screw driver only. Owing to its high speed the "Electro" forms a beautiful spot. All contacts are renewable. The Rotary Spark Gap is especially valuable for use in connection with the early Tesla Transformers and high frequency outputs.

Size, base 7⅛ x 9 in.
No. 2352 "Electro" Rotary Spark Gap, with 110 volt Universal Motor working on D, C, & A.C. $18.00
Shipping weight 20 lbs.

The "Electro" Kick-Back Preventer

All transmitting sets in Wireless stations, employing commercial or private circuits for the source of energy, are required to properly protect the circuit against Kick-backs from the spark coil or transformer. To this end, the Fire Underwriters require that two, one-half microfarad, fixed condensers, be connected in series across the primary circuit, supplying the transformer or spark coil. The centre connection between the two condensers is to be grounded to a good ground connection, as diagram, or to a water pipe, on the street side of all meters, etc. The ground wire should be run on insulators, and be of the same size as the primary leads of the transmitting set. The proper capacity condenser has been developed by us, and very compact and efficient. It is made of heavy tin foil and a good dielectric; the enclosing case being of glass. The insulators are then sealed in a high grade sealing compound giving a superb insulation that will not leak. Get one of these condensers to-day, and have your sending protected according to the Underwriter’s rules, before you get into trouble.

Size, 3½ x 4⅞ inches. Shipping weight 8 lbs.
No. 1718 Kick-Back Preventer, as described. Price...

The "Electro" Telegraph Keys

There has long been a demand for a good, efficient, but cheap telegraph key and the one which we are now manufacturing complies with all demands that anyone could possibly make of a low price key. The parts are mounted on a solid hard rubber composition base, size 72½ x 1½ inches, ¾ inch thick. All metal parts are nickel plated and polished and the contact arrangement is simple but absolutely sure. A standard telegraph knob one inch in diameter in hard rubber composition is furnished. The No. 1118 Key has two of our standard binding posts, while the No. 1119 has three of them. This key works easily and there is nothing to interfere with proper sending. It will make a handsome addition to any instrument table.

No. 1118 Single Circuit "Electro" Telegraph Key composition base...
No. 1119 Double Circuit (More) "Electro" Telegraph Key composition base...
Shipping weight 1 lb.

The "Electro" Telegraph Key

These steel lever, standard telegraph keys are a radical departure from the old style metal keys and the amateur as well as the professional will find these keys far superior to anything that has been offered before. Our new lever is centered in the fact that instead of using a metal frame, which is so liable to make a short circuit the different parts, we use a ¾ in. insulated base. This not alone gives the instrument a classy appearance and enhances its value at the same time the insulation is a great deal and our keys to-day are without doubt the finest ever made on the market. We do not use a spiral spring to operate the key, but use a special kind of a tongue spring which works a great deal better and smoother than the old style spring. The lever is solid steel, nickel plated and highly polished as are all the metal parts on the key. There is absolutely no lateral motion and the trunnions cannot possibly get loose.

The contacts are pure silver. A generous hand of large binding posts are furnished. If you have once used this key you will never use another.

We only furnish one style of this key, namely, the one with top connection. No leg connections are furnished. The base size is 7½ x 2½ x 1⅞ inches. Shipping weight 1½ lbs.

No. 1117 Steel Lever Key with Insulated Base as described, Each...

When ordering one of our Spark Gaps, Telegraph, or Wireless Keys, please remember to send us your compliments. Lesson No. 5 "The Amateur Transmitting Sets and Apparatus" or Lesson No. 6 "Transmitting Sets for Student" or Lesson No. 7 famous "WIRELESS COURSE." More practical knowledge is contained in these lessons than in big books.

Just attach one or all coupons Nos. 5, 6, 7 or 15 to your order. For further information see Free Wireless Course offer in this catalogue.
The "Electro" Wireless Key

30 AMPERES CAPACITY

While our No. 1117 Key is well suited for coils up to 2 in. spark, a larger key must be used for the more powerful coils, from 3 to 12 in. spark length, also in connection with our No. 8050 transformer or coil

No. 1117

Our key will positively hold up even if 30 amperes are used for hours. A 110 V. direct or alternating lighting current supply. No resistance or condenser is used, except a key or switch to break the current in the usual manner. The vibrator of the coil must be screwed up tight. The key has been filled with the solution (formula furnished only with interrupter), and as soon as the key is depressed you will get the surprise of your life. Instead of a thin, meagre spark, as with batteries, you get a FIERCELY THICK. That is this key. Nothing for Wireless is unnecessary to mention. The spark obtained of a 1-inch coil, when used with the "SPARK PILLS THE GAP."

No. 9212 Wire Key with Insulated Base, as described

Shipping weight 2 lbs. $3.50

No. 9213 Upper Contact for above key

Shipping weight 2 oz. $0.30

No. 9214 Lower Contact for above key

Shipping weight 2 oz. $0.30

The "Electro" Adjustable High-Tension Condensers

For many years we sold these fine condensers with no adjustment, but of late a heavy demand for a high tension adjustable condenser has sprung up and we are therefore more than pleased to present to our condensers now with the adjustable feature.

The connections are made in such an ingenious manner that either one, two, three or all nine of the plates can be put in circuit, simply by sliding the contact rod into more or less contact bushings. The adjustment is quick, varis and easy, no switches or levers need be touched. The adjustable feature is of inestimable importance for wireless work, as no spark coil, transformer coil, or transformer can work to the highest efficiency without the right capacity, which can only be obtained by using a condenser with a variable capacity. No. 550 has 9 contact bushings. No. 521 has 10 contact bushings.

The construction is simple and durable, and sparking is absolutely prevented. The cases are solid quartered oak, highly finished. For dielectric we use imported French glass sheets of a special grade, 1/16 in. thick, free from salts and air bubbles. Instead of tinfoil we use metal plates. The No. 550 has 1440 sq. in. of active condenser surface. It can be used up to 5 k.W. Size over all is 11 3/4 x 14 x 2 3/8 in. Its maximum capacity is .005 microfarads.

No. 550 High Tension Adjustable Condenser, as described

Shipping weight 40 lbs. $5.60

No. 551 High Tension Adjustable Condenser, as described

Shipping weight 45 lbs. $7.70
The Gernsback Electrolytic Interrupter—(Continued)

Therefore, two 2-inch coils will give a 4-inch spark and so on. Ordinary vibrator spark coils can not of course be connected in series, as each vibrator opposes the other.

With the electrolytic interrupter a plurality of coils work as one, as the pulsations from the interrupter flowing through all the primaries (connected in series) magnetize and demagnetize the primaries at all times. The result, therefore, is that each coil acting in unison with the other (or others) will add its output to the other (or others). The longer spark is the result.

OPERATION

First fill the glass jar with the solution (to be obtained from any druggist) so that it stands 2½ inches from the top of jar. Put the cover on jar and pass the rod through the cover down in the tube. Be sure that its point rests on the bottom of tube. The weight is then attached to the rod as shown in diagram. Next connect the interrupter as shown in diagram. If the current is direct the positive pole of the current must be connected with the post marked + on interrupter. If the current is alternating it does not make any difference how the wires leading to interrupter are connected, since there is no positive or negative pole.

The Interrupter works on direct and alternating current.

A switch block with fuses should always be used with the interrupter. It is much better to blow out a fuse than to damage the coil or interrupter if the current should get too strong; or if the tube in the interrupter should accidentally become fractured, which would short circuit the line.

Every instrument is fully guaranteed to be all we claim for it. The factory to do the work is our own; and what we claim for it is our own. All work done is under our own supervision.

No. 5000 THE GERNSHACK INTERRUPTER, as described. Size 10½x5½x3½ in. Shipping weight 4 oz. $4.25

No. 5000a Metal rods for Gernsback Interrupter. Each. Shipping weight 4 oz. $0.25

No. 5000b Interrupter Tube. Shipping weight 4 oz. $0.65

No. 5000c Interrupter Jar, 4½x5½x5½ in. Shipping weight 3 lbs. Each. $0.55

The “Electro” ½ K. W. Transformer-Coil

(100 MILE WIRELESS COIL)

The average experimenter when buying a coil nowadays buys a cat in a bag. The coil is supplied entirely and if it should break down must be sent back to the factory. Neither does the owner know what is inside of the coil—he must take the maker’s word for it. Our new coil IS NOT SEALED IN, yet is better insulated than a sealed in coil. The new design has 4 BLOCK SECONDARIES (see illustration). These secondaries are wound with ENAMELED WIRE. This means, on account of getting 3 times as many ampere turns into a given space, that our secondaries are 3 times as efficient as other ones, and that they will not heat up even if run continuously. Range about 50 miles per K.W. unit on lowest secondary voltage about 3½ amperes. Secondary wound in best manner with finest insulation; cannot break down. Range about 50 miles per K.W. with sensitive detector at receiving stations.

This transformer is extremely efficient, reliable, and flexible in control. For 120 cycles frequency costs the same as for 60 cycles, below. For lower than 50 cycles frequency, add 10 per cent. to cost here given.

No. 9250 “Electro” ½ K.W. Transformer-Coil, as described. Size 6½ in. high by 8 in. long by 8½ in. wide. Shipping weight 32 lbs. $15.00

No. 9251 "Electro" ½ K.W. Transformer-Coil, as described. Size 6½ in. high by 8 in. long by 8½ in. wide. Shipping weight 32 lbs. $25.00

No. 9252 "Electro" 1 K.W. Transformer-Coil, as described. Size 6½ in. high by 10 in. long by 8½ in. wide. Shipping weight 65 lbs. $47.00

The Electro Importing Co., N. Y., Mfrs.

The “Electro” ½ K. W. Transformer Coil—(Continued)

are arranged in such a way that they cannot move and are always ½ inch apart. After connections are made the cover is screwed down, and this marvel of simplicity is always ready to be inspected and to be taken apart, when occasion arises, for new experiments, etc., etc.

Four top metal binding posts are provided, so that one secondary may be used at a time, both in series, both in parallel and for other important experiments.

By connecting in multiple, range is greatly increased.

As there is no vibrator or condenser to this coil, it must, of course, be used with our electrolytic interrupter by running it from 110 Volts Alternating current, or 110 Volts Direct current.

The spark obtained is 1 to 1½ inches long, but ½ inch thick. For wireless work it is the fat spark that counts, not the long, thin spark. You must radiate (tamperage) from your antenna, not tension (voltage).

The coil radiates energy in the form of a high-frequency magnetic field which moves on the wave of electricity in the air. A spark of any kind need not be used, especially if the radio set is not used at a time, both in series, both in parallel and for other important experiments.

The Electro Importing Co., N. Y., Mfrs.
The "Electro" "Bull-Dog" Spark Coils

The Electro Importing Co., N. Y., Mfrs.

This new "Bull Dog" type is the outcome of our 12 years' experience in this work, and for workmanship and appearance it stands unmatched. We departed from the old, cold looking box style and now enclose the primary, secondaries and condenser all in a fibre tube, enhancing the appearance a great deal and also making the coil far more compact and lighter at the same time.

A new French double spring vibrator with double adjustment is used now, giving extremely fast vibrations. The insulation is superb, internal sparking is impossible, as the greatest care is exercised to insulate all parts with the most expensive sealing compound. Our coils are especially constructed for use in wireless telegraphy, and we have devoted considerable labor and time in experimenting to produce something that we can recommend confidently to our customers. Our aim is to furnish a coil not easily injured, even by rough handling, and these coils may be subjected to considerable rough usage without injury. The usual form of Ruhmkorff coil we found was too delicate and easily put out of order, and we therefore do not manufacture same. All the good features of the Ruhmkorff are embodied in our coils, and we guarantee them to give a very powerful and "fat" spark impossible to obtain with any other coil.

Connect two short pieces of wire to the two top binding posts. Make a "spark gap" by leaving a small space between the wire points. If the coil is started a steady stream of sparks will flow between the points. It can be intensified by tightening the thumb screw on the vibrator of the coil. If the "spark gap" is about ¼ inch, a "fire ball" will be observed between the points. If the experiment is conducted on the best condenser, the spark will work without the trick. If the wires were copper the fire ball will be green; if of iron, reddish yellow; if of zinc, bluish. To lengthen the spark, attach a metal plate to the negative pole. The positive pole should have a sharp point. The lengthened spark will not be single; it will tend to branch out.

Another method to greatly lengthen the spark is as follows: Moisten the wood frame between the two wire points with your finger. The spark will at first be thin, but it will enlarge gradually as the moisture increases. This method lengthens a spark two or three times. A 1-inch spark coil will very often give 2 or 3 inches. The experiment is done as follows: Being two thin iron wires vertically in such a manner that they run parallel. With a little patience the spark will work without the trick. The spark will experiment the right distance to space the wires will be found. The spark will go up swiftly in ladder fashion. As soon as it touches a thin glass plate it will light up again. If a piece of cardboard is put between the spark gap it will be pierced. The bigger the coil the thicker the cardboard will turn out. Note the peculiar hole the spark has made, and compare it with the hole the needle has made. Explanation: The current comes from both sides.

If your friend smokes cigarettes you can play an amusing trick on him. Offer him some of your cigarette paper prepared as follows: Place a few balls of tissue paper on a match about 2 in. high; then wind the entire match with single thickness of cigarette paper. Take the other wire (which must be well insulated or you get a shock) and move it all over the surface of the cigarette paper. The paper will catch fire when the spark which you make will turn out. The idea is this: The paper will be pierced with numerous holes—too fine to be observed—and when your friend tries to light the cigarette and the rolled ft, he will waste a box of matches without being able to get as much as one puff. After trying three or four leaves you can hardly blame him

Experiments With Spark Coils

The "Electro" "Bull-Dog" Spark Coils—(Continued)

The Electro Importing Co., N. Y., Mfrs.

The secondary of all our coils are wound with enameled wire.

No. 4360 ¼ in. use 2 type R. E. cells, or 3 dry cells. Shipping weight 5 lbs.

No. 1087 ¼ in. use 2 type R. E. cells, or 4 dry cells. Shipping weight 5 lbs.

No. 1088 ½ in. use 3 type R. E. cells, or 5-6 dry cells. Shipping weight 5 lbs.

No. 4366 ½ in. use 3-4 type R. E. cells, or 6-7 dry cells. Shipping weight 5 lbs.

No. 1089 2 in. use 4 type R. E. cells, or 12 dry cells. Shipping weight 5 lbs.

PRICES

| No. 4360 ¼ in. coil, price | $4.00 |
| No. 1087 ¼ in. coil, price | $5.00 |
| No. 1088 ½ in. coil, price | $7.00 |
| No. 4366 ½ in. coil, price | $9.00 |
| No. 1089 2 in. coil, price | $12.00 |
| No. 1089 3 in. coil, price | $23.00 |
| No. 1091 4 in. coil, price | $36.00 |

Prices of larger coils on application.
Experiments With Spark Coils—(Continued)

If he commences to say a few things—or he may quit smoking cigarettes altogether. If an old incandescent bulb is connected with a spark coil, if the bulb is grounded, the bulb will emit a greenish light in the dark, as soon as the coil starts working. If one wire has a very fine point at one end and the other wire, a very peculiar and weird discharge will be observed. When the point is as little as possible, no spark will start through the spark. If your neighbors dog has the habit of walking around from any device to another device, a spark will come near that particular ash can again, even if it should be full of soup bones.

The Tesla Transformer is an apparatus which steps up the frequency of the spark coil. If one wire has a very fine point and is not too far away from the other wire, a spark will be obtained. There are hundreds of experiments and demonstrations that can be performed with this apparatus.

The “Electro” Tesla Transformer

(Patent Applied for)

We hardly need mention that the Tesla Transformer is one of the most marvellous pieces of apparatus ever invented and there are thousands of experiments and demonstrations that can be performed with this apparatus.

The “Electro” Tesla Transformer was the result of years of experiments and experiments with spark coils. We had to build dozens of different models before a perfect apparatus was produced. We do not hesitate to say that the price of this apparatus is the greatest bargain ever offered to the public.

The construction of this transformer has been simplified to such an extent that it is not only absolutely “ fool proof” but we guarantee that it will do anything a 1-inch coil can do, and will do it better.

The secondary is wound with the best high tension cable and the secondary with the best DOUBL-E-SCULPTED enamel wire.

The secondary is insulated by solid hard rubber brackets as shown in cut. It is also provided with two finished coil ends.

The “Electro” Tesla Transformer is an apparatus which steps up the frequency of the secondary of a spark coil, to many hundred times its original value. It is an incredibly high frequency that produces the wonderful phenomena you have seen performed on the stage by some clever electrician, all of which can be duplicated with one of our transformers.

The “Electro” Tesla Transformer can be operated in conjunction with the following apparatus: it is of no value without them:

First, a spark coil or transformer; second, a set of condensers; third, a spark gap. One of our 1-inch spark coils is sufficient to operate the transformer, but we would always recommend getting a 2-inch coil with our transformers; the results are to be had. Our 1/2 W. Tesla transformer in connection with our Electro-lytic interrupter is give still more wonderful effects, such as making jars or any other sending condenser of the RIGHT CAPACITY can be used in conjunction with a transformer. A single spark gap can be used, but it MUST BE UNDERSTOOD THAT THE TESLA TRANSFORMER CANNOT BE USED WITHOUT THE ABOVE MENTIONED ACCESSORIES.
The "Electro" Storage Batteries

Used on board of several U. S. battleships. Same style used in the Oldsmobile, Pullman and a number of other high-class automobiles for ignition and lighting.

<table>
<thead>
<tr>
<th>Type</th>
<th>Voltage</th>
<th>Capacity</th>
<th>Shipping Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. 555</td>
<td>6 V.</td>
<td>60 A. H.</td>
<td>7 lbs.</td>
</tr>
<tr>
<td>No. 1250</td>
<td>6 V.</td>
<td>120 A. H.</td>
<td>35 lbs.</td>
</tr>
<tr>
<td>No. 1251</td>
<td>6 V.</td>
<td>240 A. H.</td>
<td>88 lbs.</td>
</tr>
</tbody>
</table>

Any garage or power plant will recharge any battery for about 25 cents. If you have direct current, you can charge it yourself at a cost of 8 to 10 cents by using a bank of lamps to cut down the current. If you have 110 volts A. C., this battery can be charged through a bank of lamps and our No. 12500 rectifier shown elsewhere.

If you wish to know more about this wonderful BATTERY, send 2c. stamp and we will send you our "Treatise on Storage Batteries.

$15.00 Including War-Tax

Full Directions on Label

No. 555 $13.00
No. 1250 $15.00
No. 1259 $18.00
No. 1259 $24.00

THESE BATTERIES ARE SENT FULLY CHARGED

The Electro Importing Co., N. Y., Mfrs.

Type R. E. Storage Battery

We know that everyone having dry cells is dissatisfied because such batteries do not last for continuous work which is just as it should be. A man who works on the premises always regrets if his body wants storage batteries, but the price makes it prohibitive for him to buy them.

With these facts in mind we have constructed a battery that, despite of its unusually low price, is the best that money can buy.

For seven years we sold these batteries, but they were not well received and the sales did not amount to much. The demand for a sealed battery has been growing every year and we abandoned the open type in favor of the sealed type.

The plates, with our twelve years' experience in making them, are the same reliable ones as used in our No. 555 6 V. 60 A. H. battery. The same is true of the material used. We furnish these batteries without acid. It can be obtained from any drug store. To mix the acid proceed as follows: In a clean porcelain vessel pour five parts (by bulk) of distilled or rain water. Into this pour under constant stirring a part of chemically pure sulphuric acid (oil of vitriol) 60 degrees Beaune. If the solution has cooled, test it with a hydrometer such as our No. 1543. It should now read 1.260 degrees specific gravity. The electrolyte is then carefully poured into each cell through the opening by removing the porcelain vent stopper until it stands ½ inch over the top of plates. Batteries should then be charged as per directions. Commercial acid or hydron water should under no circumstances be used; it will spoil the battery in a few weeks. It is a good plan for owners to recharge their batteries once every two weeks, no matter if run down or not. This treatment will keep batteries in perfect shape and they will last much longer. When battery stands idle for over a month, first discharge same and recharge again.

Type R. E. should be charged with a steady current of two amperes for ten hours. It will then give twenty amperes in ten hours. Ten amperes for ten hours. It will run, for instance, a small motor, which takes one ampere, ten hours at a stretch. Battery of this type should be charged once a week. Batteries of this type must then be charged again, after which it will give the same output of ten amperes for ten hours. Only direct current can be used. Only direct current can be used. Only direct current can be used. Only direct current can be used.

If you have direct current on your premises you can charge the battery yourself. If you have alternating current it will be impossible to charge storage cells unless our "Electro" rectifier No. 12500 is used, which changes the alternating current to direct. If you have no current available, do not try to charge with dry cells. The dry cells will be spoiled by the first charging.

The charging voltage must always be higher than the voltage of the charged storage cell. A fully charged storage cell should not exceed 2.5 volts. When the charging current is taken off the voltage of the cell will drop at once to 2.2. This is correct. Cells from 2 to 4 inch need 5 cells of type R. E.

TESTING

The only reliable way to test a storage battery is by means of a low reading voltmeter. If the experimenter wants to know how far the battery is run down, the voltmeter readings should be taken when the battery is actually working. Other tests are of no value whatever. No value. The owner of a storage battery, whether it be his or his employer's, should test his battery every time he changes it. Never test an accumulator with an ammeter—that is, never connect the instrument directly across the battery. It is a "dead short circuit," and is not alone very harmful, but it will burn out the instrument. Never test an accumulator with an ammeter.
The Electro Importing Co., N. Y., Mfrs.

The "Electro" Batterymeter

The greatest problem to the user of storage batteries is "How strongly charged or discharged is my battery?" The question of overcharge if not too great is not serious, but letting a battery discharge too much is particularly useful on smaller electric plants such as are used on automobiles, launches, small houses, etc.

No. 1620 Electro Storage Battery Meter, scale 15-0-15 amperes...

The "Electro" Pocket Volt and Ammeters

These little instruments are without doubt the most compact and durable meters ever produced in this country. They are not alone extremely accurate, but they can be "dead beat," all metal construction. The finish is the finest - instance, the density of the electrolyte is found when the battery is fully charged to 1,250 sq. gr. Then when the readings is taken after the battery has been used, and it now shows a sp. gr. of 1.174, it means that only 46 per cent of the charge remains. This is readily ascertained by a glance at the table accompanying each instrument. Always bear in mind that voltmeter readings never tell the true condition of a battery. The operation of the Batterymeter is simple. The vent of the battery is removed, the nozzle of the meter placed in the electrolyte. As it is anhydrous and liquid enough is drawn up by suction in the glass tube to float the Batterymeter. The readings is then taken and the liquid replaced in the battery by applying pressure to the bulb and vent is replaced. The value of the Batterymeter is self-evident, and if you don't want to get caught with a completely discharged battery or seriously sulphated one, get a Batterymeter at once and see just how much juice is left in your storage battery. An invaluable instrument for the automobile, electrician, owner of isolated plant, etc.

No. 1543 Batterymeter, medium grade, length 10 in., hydrometer scale 15 to 25, Buméne and equivalent specific gravity. Complete with directions in a neat cardboard box, size 13x2x2x1/4 inch. Price...

Shipping weight 2 lbs.

The "Electro" Storage Battery Meters

This meter is so called because when properly connected to a storage battery circuit it will not only show the quantity of current passing through the circuit but also show whether the battery is charging or discharging. The normal position of the needle on this ammeter is in the centre and the needle going to the left indicates that the battery is discharging, while a deflection to the right indicates the battery is being charged.

The meter is for direct current only, 3/4 in. in diameter and 3 in. thick. It is made for switchboard mounting for which purpose 2 studs are provided, each having 2 nuts and washers for connections and fastening. All metal parts are brass highly polished. Only supplied in one scale, 0-15. The mechanism is of the permanent magnet type, serviceable, accurate and above all durable. This meter is particularly useful on smaller electric plants such as are used on automobiles, launches, small houses, etc.

No. 1620 Electro Storage Battery Meter, scale 15-0-15 amperes...

The "Electro"-Lytic Rectifier

The Electro-lytic Rectifier

For the past years we have been flooded with mail to supply a rectifier to change alternating current to direct. As is well known, alternating current cannot be used to charge storage batteries and for a great many other purposes also direct current only can be used.

Our rectifier works on any cycle alternating current up to 110 volts. It must be used in reverse when used with direct current and cannot be connected to the current supply without the resistance in series with it. The efficiency of the 4 jar rectifier is 85%, AND THERE IS NO LEAKAGE at all as is usually found in other rectifiers. The 4 jar rectifier furthermore USES BOTH SIDES OF THE CYCLE, which accounts for the high efficiency. Of course, a one jar set may be used successively, and EVEN ONE JAR ALONE rectifies alternating current to direct but the efficiency is only 50%. The greatest problem to the user of the Electro-lytic Rectifier is the correct choice of size, which is decided by the fact that the Electro-lytic Rectifier can be used for any purpose direct current only can be used.

However, for experiments using little current, the one jar type is very satisfactory. The 4 jar type passes as much as 5 amperes and can be used continuously (as for instance charging storage cells) with 2 1/2 amperes. The one and two jar types pass 1/2 of the above amperage. Our Electro-lytic Rectifiers come ready for use. All you have to do is to dissolve the salts in HOT water and fill in jars, and the rectifier is ready. The 4 jar type comes with a wooden tray (see illustration) which holds the jars. No tray is furnished if jars are bought separately. The covers are of heavy porcelain with polarity marks in plain sight. The base and aluminum plates are very substantial and the latter will last for months. New aluminum plates will not be sold separately, except to users of the rectifiers. When ordering new plates it is ABSOLUTELY REQUIRED that you give us number or date of purchase. OTHER PARTS ARE NOT SOLD. Directions and diagrams only furnished with rectifying set.

No. 12500 Four jar rectifier, as described, with tray...

Shipping weight 30 lbs.

No. 12501 One jar rectifier, as described...

Shipping weight 5 lbs.

No. 12502 Renewal aluminum or lead plates in each...

Shipping weight 1 lb.

No. 12503 Renewal salts (charge for one jar)...

Shipping weight 1 lb.

No. 12504 Glass jar for rectifier, size 4 1/8 x 5 1/2 in.

Shipping weight 4 lbs.

The "Electro 8-10" Dynamo

Wherever there is surplus power, be it gasoline engine, large electric motor, water-wheel, windmill, or direct current from the storage battery circuit, it will not only show the quantity of current passing through the circuit but also show whether the battery is charging or discharging. The normal position of the needle on this ammeter is in the centre and the needle going to the left indicates that the battery is discharging, while a deflection to the right indicates the battery is being charged.

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The Electro Importing Co., N. Y., Mfrs.

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Shipping weight 4 lbs.

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The Electro Importing Co., N. Y., Mfrs.

The “Electro 8-10” Dynamo—(Continued)

surface with small commutator for the comparatively heavy currents encountered on low voltage work. Case—Cast iron, cast from die moulded patterns, therefore no damaged casting are ever used. Windings—Shunt.

In designing this machine the very first consideration was for results. No endeavor was made to save copper, iron or workmanship. Instead, the only thought was that the money was spent in result producing labor and materials. No weak end brackets, no dents in the base plate, brush holders, but good honest to goodness solid stuff that shows the value. It’s a real bargain and one you will never regret investing in. This machine is semi-enclosed, practically dustproof, a radical departure in small dynamo building. Pulley, 1 inch diameter, V-grooved for round belt.

No. 810 “Electro” 8 Volt 10 Amperes Dynamo, as described $17.00

The “Electro” Rheostat-Regulator

PORCELAIN BASE

(PATENTED FEB. 1, 1910.)

This little current regulator makes a valuable addition to any wireless set where it is used to regulate the battery current.

With battery lamps it is very valuable, where it is used to prevent the lamps from burning out on account of too strong a current, etc.

In connection with small motors it will regulate the speed more accurately and more gradually than could be done by any other means. This feature makes it very desirable for Dentists, Doctors, and all those who need an effective regulator. In connection with cautionary devices for delicate apparatus, it is indispensable, as any degree of heat can be obtained, due to the very fine regulation.

One of its real values is in forming a very small field regulator for small motors and dynamos, giving in that way a voltage step type rheostate. It also makes an excellent automobile lamp dimmer where it can be used to cut down the glare yet not dim the present auto dimmers now in use.

Advantages over other rheostate: Gradual and accurate regulation of current; great current capacity; little heating; air-cooled; no concealed parts; impossible to get out of order. PORCELAIN BASE. CANNOT BURN NOBRE.

For electro-plating work it will find indispensable. A gradual increase of current is especially necessary for fine work.

The wire used in this regulator is the highest resistance wire. It will positively not rust, break nor bend, even under a constant load of 3 amperes. This is guaranteed in every instance. The grooves which holds the spiral is ( ) shaped (PATENTED), which makes it impossible for the coil to fall out or become dislocated or worn out. A large hard rubber handle (1 inch diameter) is provided, allowing rapid and smooth turning of switch blade. Doesn’t stay with the resistance wound on fibre that will smoke and smell as soon as current is turned on.

Resistance is 10 ohms. Maximum capacity, 3 amperes continually; size, 4 inches diameter, thickness of base 13/16 inch. No. 5000 Rheostat-Regulator (patented). Price $0.75

No. 5000 $0.75

Dear Sirs:—

Last year I ordered a number of things of you, among which was an “Electrolytic” Interrupter for my wireless station. I have used it every day all the while except during 1 month of the time. I found that it worked just as well after three months of non-use as it did when I got it. The “Telegraph Key” I received of you is a daddy, as is the Ball Bearing slider.

ASHLEY WILLIAMS.

No. 909 Student’s Chronic Plunge Battery

Shipping weight 4 oz.

No. 998 Carbon Rod with Binding Post, for above battery, each

Shipping weight 4 oz.

No. 997 Amalgamated Zinc Rod with Binding Post, for above, each

Shipping weight 4 oz.

The “Electro” X-Ray Tubes

These tubes, if worked by coil No. 4366 or No. 1039 will take sharp photographs of the human hand, contents of a purse, etc. The time required for exposure is shorter with the use of Barium-Platinum-Cyanide screens the skeleton of a hand will be readily seen by placing the screen between the eye and the object to be examined. The X-Ray tube should be immediately behind the object. This is a great pity that electrical experimenters do not give more attention to the study of X-Rays and radiography. There are few subjects more fascinating and none more fruitful of results. That the last words in Roentgen rays is not spoken is evident by the strides made in radiography in the last few years. Soon you have tried a few experiments you will say you have been exposed to X-Rays. This is only a suggestion. There are innumerable others available.

No. 1129 is the only tube in the U. S. able to work satisfactorily on a 1/4 in. coil. Our No. 9010 tube works very well on a 1/2 in. coil.

No. 9010 X-Ray tube, small size. Price $4.20

No. 1129 X-Ray tube, medium size. Price $6.65

No. 1129 X-Ray tube, large size. Price $9.50

Barium-Platinum-Cyanide Screen

These are intended to make the X-Rays visible to the naked eye. If an object is shown before the screen and in front of the X-Ray tube, the outlines will readily be seen projected on the screen. The beams of a hand, for instance, can be observed easily with the use of the Barium-Platinum-Cyanide screen. They represent the screen alone, which is mounted on a polished mahogany frame. To be used in the work only. Size 3 1/4 x 1/4.

No. 1254 Barium-Platinum-Cyanide Screen on frame Price each $3.00

No. 1284 Barium-Platinum-Cyanide Screen on frame Price each $7.00

Student’s Chronic Plunge Battery

Here is the first low priced, as well as foolproof chronic acid battery on the market. It is a little wonder, and for the small price we ask for it, it stands unremarked.

It is an ideal battery for electrical experiments. We furnish enough chronic salts for 4 charges. Full directions for operation and care of battery are included. Each battery tests 2 volts and 10 amperes when set up fresh. Not over 2 amperes should be drawn from battery continuously. By using six or eight of these batteries, a great many experiments can be performed. No solution can run out of this battery if upset by accident. This makes it an ideal portable battery, such as for operating a bicycle lamp, or any other portable lamp, where a powerful light is not required, for boy scouts’ field telegraph work, operating telegraph outfits, etc., etc.

Pipe over all is 1/2 inches.

No. 909 Student’s Chronic Plunge Battery

Shipping weight 4 oz.

No. 998 Carbon Rod with Binding Post, for above battery, each

Shipping weight 4 oz.

No. 997 Amalgamated Zinc Rod with Binding Post, for above, each

Shipping weight 4 oz.

The Electro Importing Co., N. Y., Mfrs.
"The Boy's Electric Toys"-(Continued)

cell, complete telegraph set, electric riveting machine, electric buzzer, dancing fishes, singing telephone, mysterious dancing man, electric jumping jack, magnetic and electric figures, rheostat, ernst pendulum, electric butterfly, thermo electric motor, visual telegraph, etc., etc.

This does not by any means exhaust the list, but a great many more apparatus can be built actually and effectually.

With the instruction book which we furnish, one hundred experiments that can be made with this outfit are listed, nearly all of those being illustrated with superb illustrations. We lay particular stress on the fact that no other materials, good quality and the most necessary to perform any of the one hundred experiments or to make any of the 25 outfits. Everything can be constructed and accomplished with this outfit, two hands, and a screw driver. Moreover, this is the only outfit on the market to-day in which there is included a complete chromic acid plaque, by which both children and everyone of the experiments can be performed. No other source of current is necessary.

Moreover, the outfit has complete wooden bases with drilled holes in their proper places so that all you have to do is to mount the various pieces by means of the machine screws furnished with the set.

The outfit contains 114 separate pieces of material and 24 pieces of finished articles ready to use at once.

Among the finished materials the following parts are included: Chromic salt for battery, lamp socket, bottle of mercury, core wire (two different lengths), a bottle of iron filings, three spoons of wire, carbons, a quantity of machine screws, flexible cord, two wood bases, glass plate, paraffine paper, binding posts, screw driver, etc., etc. The instruction book is so clear that anyone can make the apparatus without trouble, and besides a section of the instruction book is taken up with the fundamentals of electricity, so acquaint the layman with all important facts in electricity in a simple manner.

All instruments and all materials are well finished and tested before leaving the factory. We guarantee satisfaction.

We wish to emphasize the fact that anyone who goes through the various experiments with becomes proficient in electricity and will certainly acquire an electrical education which cannot be duplicated except by frequenting an electrical school for some months.

The size over all of the outfit is 14x9x2%.

Just a few things that can be made with "THE BOY'S ELECTRIC TOYS." We have not the space available to show all the other hundreds that can be made with this outfit and two hands.

The different parts of outfit No. 2002

---

No. 2002 "The Boy's Electric Toys" outfit as described...

Shipping weight 8 lbs.

$6.00
The E. I. Co. Chemical Laboratory

This outfit is not a toy, but a practical laboratory set, with all the chemicals, apparatus and reagents necessary to perform real work and to teach the beginner all the secrets of inorganic chemistry. With this outfit we give free a book containing a Treatise in Elementary Chemistry, useful data and recipes, and 100 instructive and amusing experiments.

DESCRIPTION OF THE OUTFIT:

The outfit consists of forty-four (44) Chemicals all C. P. (chemical pure) put up in appropriate wooden boxes, glass bottles, and hermetically closed jars. The acids are put up in glass bottles, with ground-in glass stoppers and there is a sufficient quantity of chemicals supplied (mostly one to two ounces) enough to make dozens of experiments with each. See list of Chemicals herewith.

A list of the 17 pieces of apparatus furnished with this outfit is printed also herewith.

The Instruction book is a real Chemistry Course for the Beginner. Some of the Contents are: Division of Matter, This is a Treatise on Elementary Chemistry and deals with the theory of the Elements, Molecules and Atoms, etc.

The following tables are furnished: Symbols and Atomic weights of the Elements; Measures of Weights, Volume, Capacity and Length; Per Cent. solutions; Conversion of Measure expressed in parts; Poisons and their antidotes; Technical chemical name of chemical substances; Formulas for Cleaning various substances, etc., etc.

Among the 100 Experiments are:

How to make chemical tricks; How to make invisible and magic inks; How to test flour; How to test soil; How to Make Chloring Gas and smoke (German War Gas); How to bleach cloth and flowers. How to produce Oxygen and Hydrogen; How to make chemical colors; How to test Acids and Alkalies; Production of Ammonium Nitrate; Chloride Making Sulphuric Acid; Testing Boric Acid; Formation of Zinc Oxide; Making Copper Chloride; Preparing Explosive Paper; Tin-plating by chemical action; Copper-plating; Electroplating; Fireproof Mixture; Producing Fireworks; Transparent Soap; Chemical Colors; How to Make Coal-Gas, and hundreds of interesting hints and formulas.

Chemical Laboratory

Continued

It contains the following 44 chemicals:

- Alum, \( \text{Al}_2(\text{SO}_4)_3 \)
- Sodium Acetate, \( \text{Na}_2\text{CO}_3 \)
- Selenium, \( \text{Se} \)
- Ammonium Carbonate, \( \text{NH}_4\text{CO}_3 \)
- Ammonium Chloride, \( \text{NH}_4\text{Cl} \)
- Ammonium Sulphate, \( \text{NH}_4\text{SO}_4 \)
- Nickel Chloride, \( \text{NiCl}_2 \)
- Folic Acid, \( \text{Fe} \)
- Zinc, \( \text{Zn} \)

The following apparatus are furnished:

- One Standard Washbottle
- One Alcohol Lamp
- One Copper Glass Measure
- One Erlenmeyer Flask
- One Glass Funnel
- One Delivery Tube
- Six Assorted Test-Tubes
- One Test-Tube Holder

Shipping weight 10 lbs.

Can be shipped by Express only.

Bunsen Burners

This useful appliance is mounted on iron base, with Stop to regulate the mixture of air. The Brass tip inside of tube can be adjusted to regulate the flow of gas. When used with ordinary illuminating gas gives intense heat.

Shipping weight 1 lb.

Glass Spirit Lamp

Invaluable to the experimenter. Used in a thousand different ways, to bend glass rods and tubing; to solder wire, etc. Uses wood alcohol. Size 2½x2 in.

Shipping weight 1 lb.

Bunsen Burner No. 1352

Shipping weight 1 lb.

Glass Spirit Lamp No. 1339

Shipping weight 1 lb.
Complete Wall Set Magneto Telephone
(Western Electric Type)

This is a complete commercial telephone station. The cabinet is of polished oak, piano finish, within which is contained the powerful magneto, the 300 Ohm polarized ringer, and induction coil. The magneto is exceptionally light and compact, being of the two bar type with brass gear transmission. The extra sensitive microphone, mouthpiece, and two gongs are mounted on the front of the cabinet, giving the entire instrument an exceptionally compact appearance of compactness and efficiency. Guaranteed to work over 20 miles. The telephone receiver is a double pole, one, and has a hard rubber button number of four, six and eight, being provided for connections. The instrument is one which we can offer with pride to our patrons at a ridiculously low price. It is unobtainable anywhere at a price below $15.00 and is an instrument unequaled in value for the price we ask. Size over all 11 x 10 x 8 in. Shipping weight, 15 lbs.

No. 26 Long Distance Telephone Set—One station... $7.00
Two stations
Shipping weight 35 lbs.
$13.00

Above wall sets have been bought from telephone exchanges who put in Central battery types. Slightly used but guaranteed to be in A1 working order.

Telimphone—Interior Telephones
(These Telephones are new.)

In our efforts to present something to our friends that could only fail to work by using a sledge hammer, the all-metal "Telimphone" were produced, made of pressed steel, beautifully oxidized. A short description of how these Telimphones are made may be of interest. The cases are of stamped steel, black baked enamel. The transmitter (the most important part of the phone) is of the carbon grain type with rigidly insulated carbon, rubber and fibre. It is as sensitive as that used on many a long distance phone. The receiver is of the metal shell type wound with a fine grade of magnet wire. It is remarkably sensitive. The bell is of the usual type but made as carefully as the rest of the phone. The ringing button is entirely concealed with the exception of the actual projecting stud.

Our illustration does the Phone little justice. You must see it to appreciate its value. Will work up to 4,000 feet, for 2 party lines only, 2 X 0. $2.00. Set of 4, $5.80. N. B. Two stations are required for two persons to communicate with each other. Any amount of these phones can be connected in one circuit.

No. 9204 Carbon Grain Transmitter, each...

Carbon Grain Transmitter

This is a special design of transmitter for long distance work. It may be used with satisfaction on wireless telephone sets where a heavy current is to be passed through it. This is a first-class instrument in many respects.

A telephone transmitter has only one function to perform and it either does that right or the most expensive telephone equipment is useless. Some applies especially where the transmitter is desired for experimental purposes. Our transmitter has a very low resistance and a high current capacity. It don't transmit that tinny sound as cheap transmitters do. Altogether a finely nickel-plated article at a very low price. Size over all 3 x 3 x 2. No. 6050 Carbon Grain Transmitter, each...

$1.25

Shipping weight 1 lb.

No. 9204 Complete "Telimphone," One Station...

$2.95

Shipping weight 3 lbs.

N. B. Two stations are required for two persons to communicate with each other. Any amount of these phones can be connected in one circuit.

Telephone Equipment

This is one of the most powerful magnetos ever manufactured, the price so low as to afford to put good stuff into them; equipped with transmission wheels all brass, crank handle furnished. This magneto gives alternating current only, it can be rewound so it will light up a number of six and ten volt lamps, all depending upon the thickness of the wire you wind on the armature. As we furnish these magnetos, they will give a powerful alternating current and you will not be able to stand the current when grasping hold of the terminals. This makes an ideal shocking machine. The magneto furnished with these generators are very powerful, each one being able to lift one pound easily.

No. 55 5-BAR MAGNETO GENERATOR as described. Price...
Shipping weight 25 lbs.

No. 23 2-BAR GENERATOR same as the above described except that it is of a smaller type. Price...
Shipping weight 10 lbs.

No. 33 3-BAR GENERATOR, same as described, above except that it has only 3 bars and is somewhat smaller. Price...
Shipping weight 10 lbs.

No. 44 4-BAR GENERATOR, same as No. 55 except that it has 4 bars, and is somewhat smaller. Price...
Shipping weight 15 lbs.

Western Electric Ringer Box

Complete with 2500 ohm polarized ringer bells in front of cabinet. The magneto furnished is of the two-bar type with brass gear transmission to drive it, and crank on the outside of the cabinet. The cabinet is of polished oak, piano finish. It is a regular style independent box containing 2500 ohms polarized ringer with bells on top outside of the box. Has also triple lightning arrestor. No. 16 Western Electric Ringer Box... $4.50

Shipping weight 15 lbs.

No. 17 Ringer Box, This is the same as No. 16, except no magneto is furnished. Also the box is somewhat smaller. Price...
Shipping weight 10 lbs.

No. 17 Ringer Box, size over all 6 x 7 x 5...

Price...
Shipping weight 10 lbs.

Telephone Equipment

The goods which we offer on these pages are all standard telephone apparatus. Every piece we are offering is equipment that for one reason or another was discontinued by the telephone companies. We have bought a large block of these goods and have a large quantity of every item on hand. Immediate shipment can be made on all of the goods in practically any quantity within reason. We guarantee every piece to be as represented, and we will refund the money if the goods are not exactly as claimed by us.
No. 1 TELEPHONE RELAY, 1500 ohms—has two silver-contact springs and is very sensitive. Can be used wherever a sensitive relay is needed. It is adjustable and can be used for a variety of purposes. Weight 2 lbs. Price $1.50

No. 2 STANDARD TELEPHONE Induction Coll, primary 1 ohm, secondary 55 ohms. Used wherever you need a good induction coil. Has primary and secondary and iron wire core; fiber wound with German silver wire. 1,500 resistance. Enclosed in iron. The resistance being about 1 lb. Quality such as used on enclosed in iron. The resistance being

No. 3 STANDARD RESISTANCE wound with German silver wire—1,500 ohms. Can be used as a choke or plain good induction coil. Has primary and secondary and iron wire core; fiber wound with German silver wire—1,500 resistance. Enclosed in iron. The resistance being about 1 lb. Quality such as used on

No. 4 HORSESHOE MAGNET, size 3½ wide x 5 inches high. Will lift about 1 lb. Quality such as used on magnetos, which means the best. Shipping weight, 2 lbs. Price $0.40

No. 5 STANDARD RESISTANCE COIL (Transformer). This is a standard small repeating coil and is used by all telephone companies. It has 4 different windings and eight contacts. Entirely enclosed in iron. The resistance being respectively 72 and 125 ohms, and 99 and 100 ohms. Can be used for wireless, for boosting signals, etc. Shipping weight, 2 lbs. Price $0.50

No. 6 3/4 M. F. CONDENSER. This is a standard telephone condenser and has ¼ microfarads. Condenser comes in neat metal casing. This condenser is used in connection with spark coils to absorb the vibrator spark. Invaluable for test buzzers to absorb spark and make the sound of the buzzer more steady. Is also used by every experimenter in connection with wireless where a fixed capacity is needed. Shipping weight, 1 lb. Price $0.65

No. 7 DOUBLE POLE BELL TELEPHONE RECEIVER—hard rubber casing with 4 ft. cord and tips. Standard 75 ohms—very powerful magnets. This receiver can be used in connection with any ordinary telephone work, and you will even find it sensitive enough for short distance wireless work. Shipping weight, 3 lbs. Price $0.80

No. 8 STANDARD TELEPHONE RECEIVER with Metal Bracket. This receiver is made by Stromberg Carlson Co., with genuine hard rubber handle and ear cup. A very good fool-proof as well as sensitive receiver. Shipping weight, 3 lbs. Price $0.75

No. 9 IMPEDANCE COIL. This is a very fine little transformer and is used extensively in connection with telephone work. It is in reality an A. C. transformer for which you would pay $5.00 if you had it made to order. Wind- ing a primary on top of secondary completes transformer. Secondary 2,000 ohms. Can be used successfully to boost wireless signals. Also in connection with audions, etc. Shipping weight, 2 lbs. Price $0.80

No. 10 MICROPHONE AND BRACKET. An A-1 sensitive microphone of the carbon grain type. Has hard rubber mouthpiece and enamel steel bracket, the instrument being 10 inches long. This microphone, in connection with our No. 7 or 8 Receiver, will constitute a complete telephone outfit, good to speak 50 miles or more, at a remarkably low price. Shipping weight, 5 lbs. Price $1.25

No. 11 REPEATING COIL (Transformer). A standard repeating coil used for telephonic work. The coil windings and eight contacts. Entirely enclosed in iron. The resistance being 2 lb. Price $0.20

No. 12 POLARIZED RINGER with Bells. The resistance of the two coils is 1300 ohms each. The armature is perfectly adjustable. Bell will work on any magnet. We also furnish blue print with ringer showing how a standard polarized relay can be made by anyone using only a few pieces of metal and screws. Shipping weight, 2 lbs. Price $1.50

No. 13 POLARIZED RINGER with Bells. This is the same kind of ringer as the No. 12, except that it is not adjustable and that the resistance is lower. First class in all respects. Blue print furnished with this to make polarized relay same as with No. 12. Solenoids on this ringer are worth more than the price we ask for the entire, ringer, and do not forget a powerful magnet that goes with it. Shipping weight, 2 lbs. Price $1.00

No. 14 HARMONIC RINGER. This ringer is also polarized and has a powerful magnet. It works on 66.6 cycles and any magnet will operate it if run at a certain speed. Resistance of each coil being 200 ohms. Can be converted into a polarized relay by substituting a very fine leaf spring instead of the heavy one furnished. Shipping weight, 4 lbs. Price $1.60

No. 15 RINGER without Bells—630 ohms. This also is a polarized ringer and has an adjustable armature. The adjustment is done by means of the top screw. With this instrument, too, we furnish a blue print showing how a polarized relay can be built. They are worth their weight in gold; the powerful magnet alone being worth more than the price we ask for the entire instrument. Shipping weight, 2 lbs. Price $0.80

No. 16 POLARIZED RINGER with Bells, resistance 990 ohms. This is the same instrument in all respects as No. 15 except that the magnet is not adjustable. Blue print how to make polarized relay furnished. Shipping weight, 2 lbs. Price $0.75

No. 17 RINGER WITH BELLS, 80 ohms. This is the same instrument in all respects as No. 15 except that the magnet is not adjustable. Blue print how to make polarized relay furnished. Shipping weight, 2 lbs. Price $0.75
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Contains information on how to make 30 different pieces of wireless sending apparatus from materials easily obtainable. Instructions and descriptions are big, simple, and easily understood.

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Design and Construction of Audion Amplifying Transformers

Radio and Audio Frequency Type

This latest and important book by Mr. Edward T. Jones, late Associate Editor of Radio News, will be of great interest to all radio amateurs throughout the land. The transformers shown in these books have never been described in print before, and have usually been considered a manufacturer's secret. Anyone who has several vacuum tubes cannot afford to do without this book because it will enable him to build the necessary amplifying transformers very readily.

Mr. Jones, the author, is a practical man, who is an experimenter himself and knows whereof he speaks. The book is printed on good paper and has an attractive cover in two colors. Paper bound. Size, 5 inches by 7 inches. Contains many illustrations, diagrams and working data necessary to build the transformers.

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Switches, Burglar Alarms and Miscellaneous Connections.

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A masterpiece. Just the book you need to tell you all about electricity and electrical facts in plain everyday language that you can understand. Explains every electrical device from a push button and bell to the biggest generator made. Worth it is worth in gold for the man who doesn't know enough about electricity, and to the experimenter it is still more valuable because of its many facts, tables, etc.

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the treatment is made as understandable and as
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time, incorporates a wealth of technique and in-
struction for the Radio Amateur—the Radio Oper-
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well as teachers and students of the subject in
general.

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The electro Importing Co., N. Y., Mrs.

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By E. W. SECOR, E. E.

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