

A BOOK OF ELECTRICAL PRODUCTS



VOLTAMP ELECTRIC MFG. CO.
BALTIMORE MD. U.S.A.

VOLTAMP MOTOR—Type AS—with Switch

Little
"Dickie"



\$1.35
Prepaid

The type AS is a little wonder. While the smallest model that we make, it is, nevertheless, a perfect little machine, capable of running from six to eight ordinary toys or small models on a single dry battery.

It has all our patented features, heavy BEARINGS, and is supplied with a STARTING SWITCH for turning the current on and off without disconnecting the cells. Has V-grooved removable PULLEY. Finished in black enamel with nicked trimmings. $1\frac{1}{2}$ to 3 Volts. 1 Ampere. Speed 2000 R. P. M. In neat packing box. Size of base $3\frac{3}{4}$ x 3 inches, $3\frac{3}{4}$ inches high. Weight 1 lb.

List No. 1305, Type AS Motor.....Price \$1.25. Prepaid, \$1.35

VOLTAMP MOTOR—Type A.



1485



1482



1334

An excellent model for the beginner and does the same work as the AS. It has no Starting Switch and the Bearings are not quite as heavy, but in other respects it is identical.

The PULLEY is removable, so that a FAN may be attached.

Finished in black enamel with nicked trimmings. $1\frac{1}{2}$ to 3 Volts. 1 Ampere. Speed 2000 R. P. M. In neat packing box. Size of base $3\frac{3}{4}$ x 3 inches, $3\frac{3}{4}$ inches high. Weight 1 lb.

List No. 1304, Type A Motor.....Price \$1.00. Prepaid, \$1.15

List No. For Types A, AS, B, BS and BRS Motors Prepaid

1334 Brushes, per pair, prepaid, 10 cts.; 3 sets.....\$.25

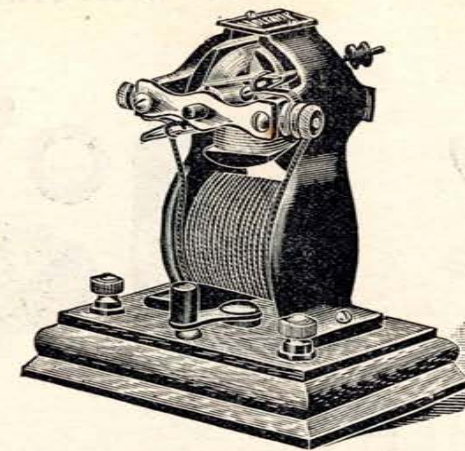
1485 Brush Holders, per pair, prepaid, 10 cts.; 3 sets.....\$.25

1482 Commutator.....\$.25

A copy of "MOTOR HINTS" is sent with each Motor

VOLTAMP MOTOR—Type BS with Switch

"Jim
Dandy"



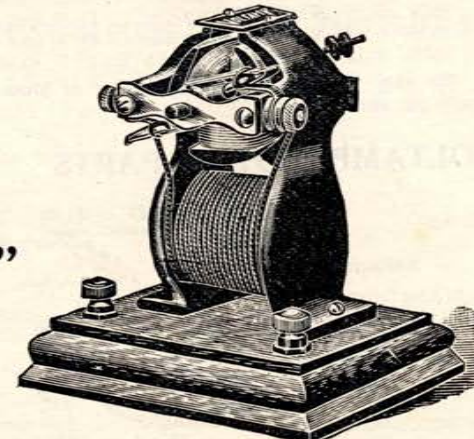
\$1.90
Prepaid

This little Motor is the most practical for its size ever produced, affording excellent power for running toys, mechanical models and small window displays. It will work from six to twelve pieces at one time. The FIELD and ARMATURE are soft gray-iron casting, well covered with wire to give an abundance of magnetism. The BEARINGS are long and heavy, and have oil holes reaching to the shaft. The V-grooved PULLEY is removable, being fastened to the shaft by a small set screw. Finished in black enamel with nicked trimmings, and mounted on a polished wood base with binding posts and a STARTING SWITCH for turning the current on and off without disconnecting the cells. Operates on one or two dry cells. $1\frac{1}{2}$ to 3 Volts. 1 Ampere. Speed 2500 R. P. M. Size $3\frac{3}{4}$ x $3\frac{3}{4}$ inches high. Weight $1\frac{1}{4}$ lbs.

List No. 1302, Type BS Motor.....Price \$1.75. Prepaid, \$1.90

VOLTAMP MOTOR—Type B "The Hummer"

The
"Hummer"



\$1.65
Prepaid

Similar to the model BS in every detail, except that it has no Starting Switch and the Bearings are not quite as heavy. It has the same power and will do the identical work of the Model BS.

Operates on one or two dry cells. $1\frac{1}{2}$ to 3 Volts. 1 Ampere. Speed 2500 R. P. M. Size $3\frac{3}{4}$ x $3\frac{3}{4}$ inches high. Weight $1\frac{1}{4}$ lbs.

List No. 1301, Type B Motor.....Price \$1.50. Prepaid, \$1.65

A copy of "MOTOR HINTS" is sent with each Motor

VOLTAMP MOTORS WITH FANS



MOTOR AND FAN

List No.

2075	AS Motor, with 4 in. Fan.....	Prepaid Price
2076	BS Motor, with 4 in. Fan.....	\$1.60
2077	C Motor, with 5 in. Fan.....	2.00
2078	E Motor, with 6 in. Fan.....	3.50
		5.50

MOTOR, FAN, WIRE AND BATTERY

List No.

2079	AS Motor, 4 in. Fan, Wire and 1 Battery, weight packed 4 1/4 lbs.....	Not prepaid Price
2080	BS Motor, 4 in. Fan, Wire and 1 Battery, weight packed 4 1/2 lbs.....	\$1.75
2081	C Motor, 5 in. Fan, Wire and 2 Batteries, weight packed 8 lbs.....	2.10
2082	E Motor, 6 in. Fan, Wire and 3 Batteries, weight packed 11 lbs.....	3.65
		5.60

VOLTAMP FANS

Give More Breeze than Any Other Fan of Equal Size
"It's All in the Bend"

List No.

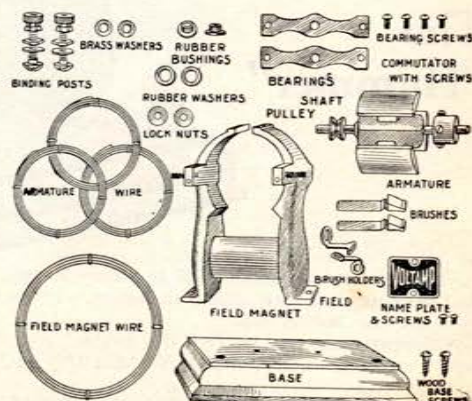
1674	4 in. Nickered Fan for A, AS, B, BS, BRS Motors. \$	Prepaid
1675	5 in. Nickered Fan for C, D, E and F Motors.....	25
1676	6 in. Nickered Fan for C, D, E and F Motors.....	.35
1677	8 in. Nickered Fan for D, E, F, G and H Motors..	.50
		.75

Be sure to give the name or type of Motor on which the Fans will be used.

VOLTAMP MOTOR PARTS

For Assembling

For those who want to assemble a Motor we pack the parts of the Models B and BS, all ready to wind and connect. Explicit directions are given so that any boy can readily produce the working machine as illustrated on the previous pages. Weight 1 1/4 lbs.



List No.

	Price	Prepaid
1303	Type B Parts....	\$1.25
1506	Type BS Parts...	\$1.40
		1.65

A copy of "MOTOR HINTS" is sent with each Motor

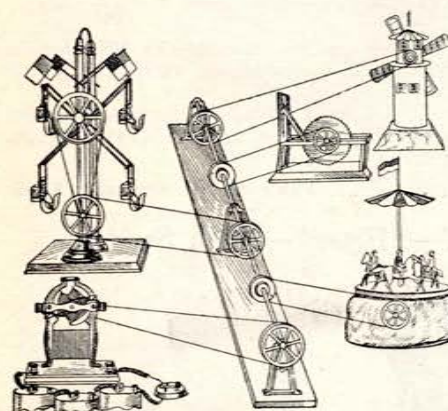
"MOTOR HINTS FOR BEGINNERS"

A Primer on Electricity

Postpaid 10 Cents



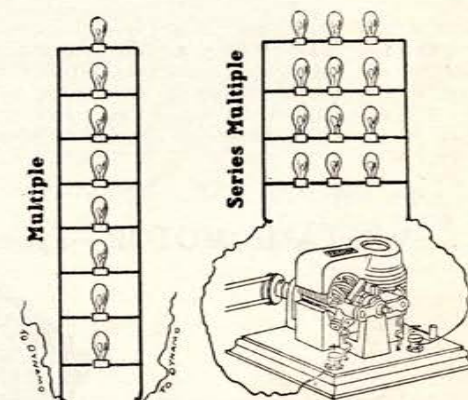
From beginning to end every page contains valuable information on the use and care of Motors and Dynamos—how they are made—how to connect cells to the best advantage—how to operate a miniature machine shop, mechanical toys, shaftings, models, etc.; Motor Hints, Dynamo Hints, Battery Hints, Electroplating Hints and many interesting experiments. Also contains an Electrical Dictionary, giving in simple language clear explanations of the Electrical words and terms in common use. Sound and instructive from cover to cover.



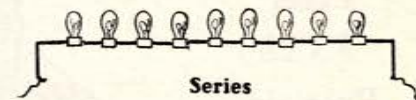
MOTOR WITH THREE CELLS



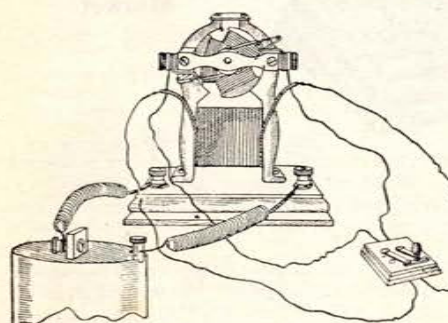
ELECTRO MAGNETS



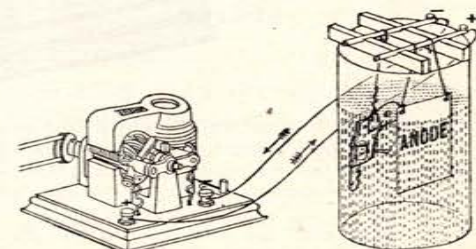
TO LIGHT ELECTRIC LAMPS



Series



To Reverse the Direction of a Motor



HOW TO ELECTROPLATE

Illustrations from "MOTOR HINTS"

Given free of charge with each VOLTAMP Motor and Dynamo

VOLTAMP MOTOR—Type BRS—"Crack-a-Jack"

THE
"CRACK-A-JACK"



RUNS
IN
EITHER

D
I
R
E
C
T
I
O
N

In every way an ideal motor, having the same general qualities of the BS, and, in addition, provided with a perfect REVERSING SWITCH, by means of which the Motor can be run in either direction or brought to a full stop.

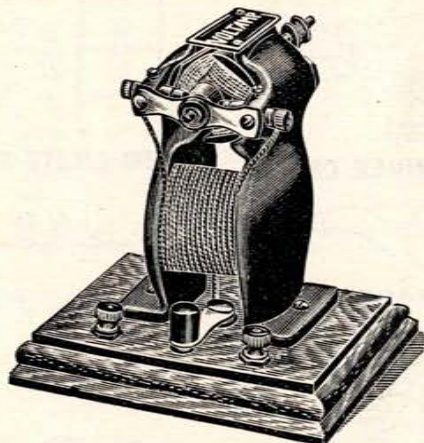
Operates splendidly on one or two dry cells. $1\frac{1}{2}$ to 3 Volts. 1 Ampere. Speed 2500 R. P. M. Mounted on a polished wood base. Occupies a space $5\frac{5}{8} \times 4\frac{1}{4} \times 3\frac{3}{4}$ in. high. Weight $1\frac{3}{4}$ lbs.

"It's a Crack-a-Jack."

List No. 1505, Type BRS Motor.....Price \$2.00. Prepaid, \$2.15

VOLTAMP MOTOR—Type C—"Flyer"—With Switch

The
"Flyer"
\$3.25
Prepaid



Most
Powerful Motor
for the
Price on the
Market

A thoroughly practical Motor, giving good service in numerous advertising schemes now before the public. Operates Mutoscopes, Window Displays, Model Machinery, Countershafts to which are belted a number of Mechanical Toys, etc. Its speed on two or three dry batteries is remarkable, and for this reason it has become a favorite as a FAN Motor, using a five-inch Fan Blade.

Provided with an extra-long ARMATURE, wide and heavy FIELD, both of soft gray iron, and carefully wound for speed and power. Compressed round-woven wire gauze BRUSHES, with spiral tension springs. Has a STARTING SWITCH for turning the current on and off.

Finished in gloss-black enamel with nicked parts. Size of base $4\frac{1}{2} \times 3\frac{1}{2}$ in., $4\frac{3}{4}$ in. high. Weight in box $2\frac{1}{2}$ lbs. 3 Volts. $1\frac{1}{2}$ Amperes. 2000 R. P. M. About $1/40$ H. P.

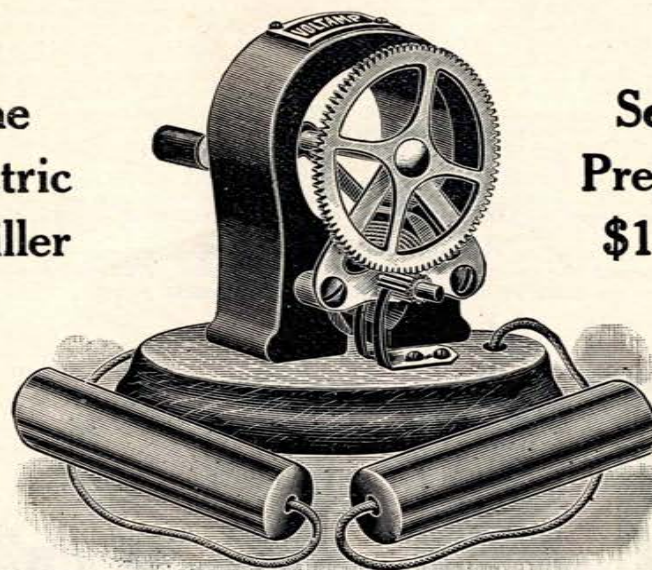
List No. 1306, Type C Motor.....Price \$3.00

A copy of "MOTOR HINTS" is sent with each Motor

VOLTAMP MAGNETO MACHINE

The
Electric
Thriller

Sent
Prepaid
\$1.10



Well built throughout and powerful. Produces electricity without batteries by simply turning the crank, giving a delightful current. Excellent for Medical treatment, and also affords much amusement for entertaining small audiences. Very instructive.

It is beautifully finished in gloss-black enamel with nicked parts, and is mounted on a polished hardwood base $3\frac{3}{4}$ in. diameter.

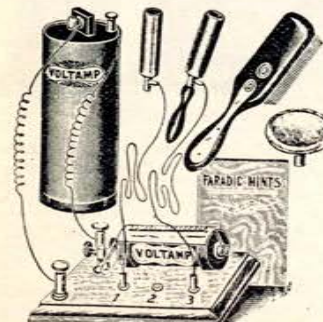
List No. 1380 Magneto Machine.....Price \$1.00

List No. 1694 Extra Brush Contact Springs, with screws, each, Prepaid, \$.15, 2 for .25

A copy of "MOTOR HINTS" is sent with each Magneto

FAMILY MEDICAL COIL OUTFIT

Relieves Aches and Pains.



Just the thing to convince you of the value of Medical Electricity. An occasional application will act as a mild tonic, keeping the body refreshed. Purifies the skin. With the Hair Brush will relieve Headaches, Neuralgia, Diseases and other troubles of the Scalp. Physicians use it in their practice and advise their patients to do so.

The outfit is complete with No. 1382 Medical Coil, a pair of Silk Cords, a pair of Metal Handles, a Wood Handle, a Sponge, an Electrical Hair Brush, a Dry Battery, and a copy of "Faradic Hints," containing instructions and treatments. Weight packed 4 lbs.

List No. 1756, Family Medical Coil Outfit....Price \$2.50

MODEL ATTACHMENT TOYS

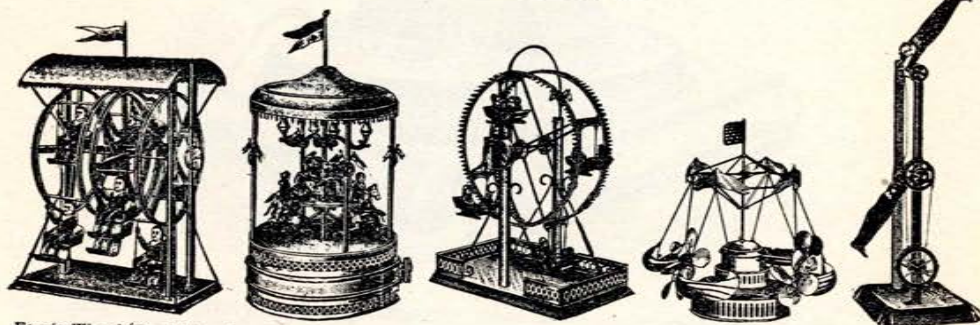
The following model toys and machines are remarkably clever reproductions, well made and correct in mechanical detail. Each one is supplied with a pulley and can be belted with a light cotton string direct to one of our motors; where several are used they should be belted to a countershaft (see page 12) and this to the motor, as illustrated in "Motor Hints." Many of the models listed are not illustrated, and only a general idea can be gotten from the description. All are handsomely finished in bright, natural-color enamels.

Note.—These models are all imported, and, though selected from samples, the manufacturer is at liberty to change the style, shape and finish in order to improve them. For this reason it frequently happens that we must supply models differing somewhat from the illustrations and dimensions.

Our stock of these goods is very large, yet occasionally the supply of certain patterns is exhausted; it takes from four to six months to obtain them from abroad, and in order to avoid delay in filling orders we take the liberty of substituting other models of equal or better value.

We pack with care for the mails, but cannot be responsible for any damage in transit. We advise shipment by express, especially the larger models, or where several are ordered.

Dimensions are given in inches; height x length x width.



Ferris Wheel (Double) Race Horses (Double Carousel) Ferris Wheel (Single) Airship (3 Carriers) Acrobat (Double)

Style	H.	L.	W.	Price	Post.
Funny Acrobat, Single.....	10	4 3/4	3	\$.30	\$.05
Funny Acrobat, Double.....	12	4 1/2	3	.40	.10
Carousel, Single, 3 Horses.....	9 1/2	4 1/4	4 1/4	.25	.08
Carousel, Single, 3 Horses.....	9 1/2	4 1/4	4 1/4	.25	.08
Carousel, Double, 5 Horses.....	11 1/2	6 1/2	6 1/2	.50	.15
Carousel, Double, Musical.....	15	7 1/2	7 1/2	.85	.20
Carousel, Double, Musical.....	15	7 1/2	7 1/2	1.00	.20
Ferris Wheel, Single, 3 Carriers.....	16	9	9	1.25	.25
Ferris Wheel, Double, 6 Carriers.....	11	6	3	.65	.10
Ferris Wheel, Single, 6 Carriers, Large.....	11 1/2	7 1/2	3 1/4	.85	.15
Ferris Wheel, Double, 6 Carriers, Musical.....	15	6 1/2	6	1.25	.20
	17	8	7	1.50	.25

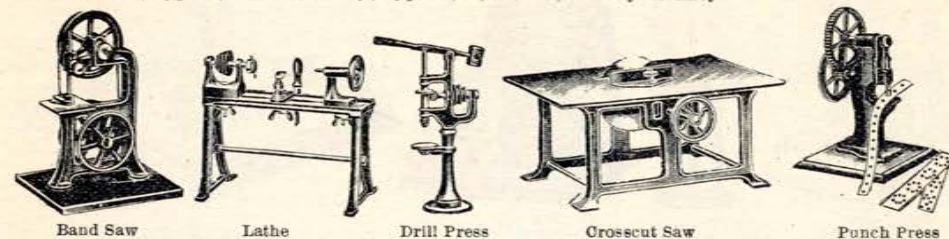


Carousel (Single) Acrobat (Single) Carousel (Single) Drummer Clown Ferris Wheel (Single) Wind Mill

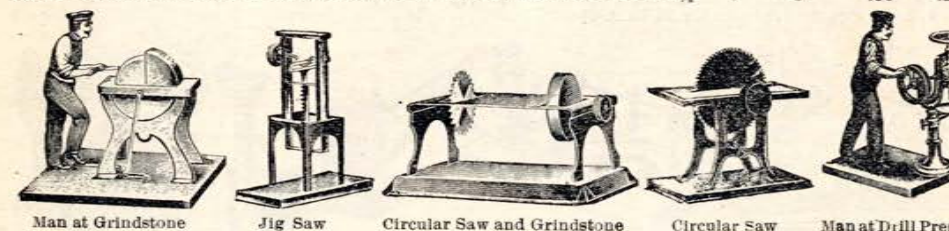
Style	H.	L.	W.	Price	Post.
Windmill.....	7 1/2	4	4	\$.25	\$.05
Windmill.....	7 1/2	4 1/4	4 1/4	.35	.08
Windmill and House.....	9 1/2	5 1/2	4	.50	.10
Windmill and Water Tower.....	11 1/2	7	5 1/2	.85	.15
Windmill and Elevator.....	9 1/2	10	5 1/2	.85	.15
Windmill, House and Log Saw.....	10 1/2	9 1/4	4 3/4	.85	.22
Air Ship, 3 Carriers.....	10	5 1/2	5 1/2	.50	.10
Air Ship, 3 Carriers.....	12	8	8	.65	.10
Air Ship, 4 Carriers.....	15	10 1/2	10 1/2	1.00	.15
Air Ship, 4 Carriers.....	17	12	12	1.35	.25
Air Ship, 6 Carriers.....	11	8	8	.85	.20

MODEL MACHINERY, TOYS, ETC.

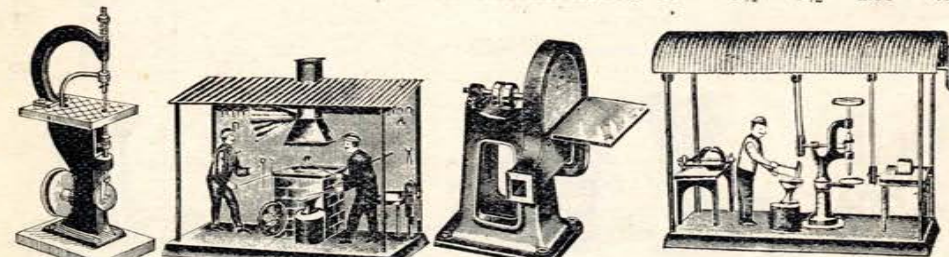
These are excellent pieces, the machine models being strong enough to do light work. Any number can be used to make up Machine-Shop Equipments, according to the capacity of the Countershaft and Motor. Type AS or A will easily pull four to six; type BRS, BS or B, six to twelve; type C, ten to twenty; type D, E, F or J, twenty to fifty.



Style	H.	L.	W.	Price	Post.
Man at Drill Press.....	4 1/4	4 3/4	3 1/4	\$.25	\$.05
Man at Circular Saw.....	4 1/4	4 3/4	3 1/4	.25	.05
Man at Grindstone.....	4 1/4	4 3/4	3 1/4	.25	.05
Man at Anvil.....	4 1/4	4 3/4	3 1/4	.25	.05
Man at Tumbling Barrel.....	6	6 3/4	4 3/4	.30	.10
Jig Saw.....	6 1/2	4	3	.25	.05
Punch Press.....	5	3 1/4	3 1/4	.35	.08
Circular Saw and Grindstone.....	3 1/2	5 1/4	3 1/2	.35	.05
Drill Press.....	4 1/2	2 1/2	2 1/2	.55	.08
Band Saw.....	5	4 1/4	2 1/4	.65	.12
Lathe.....	4 1/4	5	3	.85	.15

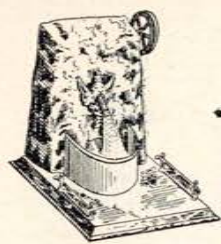


Machine Models, for light work.	H.	L.	W.	Price	Post.
Emery and Buffing Wheel, No. 1629 (see page 15).....	4	3 3/4	2 3/4	\$.50	\$.05
Emery and Buffing Wheel, No. 1629 (see page 15).....	4 3/4	4 1/4	2 3/4	.85	.10
Punch Press, Geared.....	4 1/4	3 1/4	3 1/4	.65	.12
Punch Press.....	5 1/2	5	3	.85	.20
Drill Press.....	5 3/4	4	1 3/4	1.50	.12
Circular Saw, Small.....	2 3/4	4 1/2	3 1/4	1.00	.12
Circular Saw, Large.....	3 1/2	5 1/2	4 1/2	1.65	.18
Jig Saw.....	5 3/4	2 3/4	2	2.00	.20
Band Saw.....	8	5 3/4	4 1/2	2.50	.45



Machine Models, for light work	H.	L.	W.	Price	Post.
Sand-Paper Wheel.....	5	4 1/2	3 1/2	\$1.90	\$.25
Milling Machine, Vertical (not illustrated).....	6	6 1/4	3 1/4	3.50	.25
Milling Machine, Horizontal (not illustrated).....	6 1/2	6 1/4	3 1/4	4.00	.25
Lathe.....	5 1/4	5 1/4	4	2.00	.20
Lathe (not illustrated).....	5 1/2	8	4	3.50	.35
Pile Flattener Drive (not illustrated).....	7 3/4	3 1/2	3 1/2	3.50	.35
Grindstone, enclosed.....	4	3 1/2	2 1/4	.50	.08
Blacksmith's Shop, Men at work.....	8	7	6 1/2	1.15	.18
Machine Shop, Men at work.....	8 1/2	9	4 1/2	1.00	.18
Machine Shop, Men at work.....	5 1/2	9	6 1/2	1.15	.22

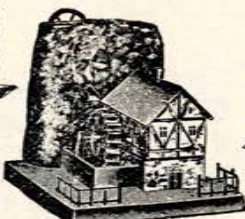
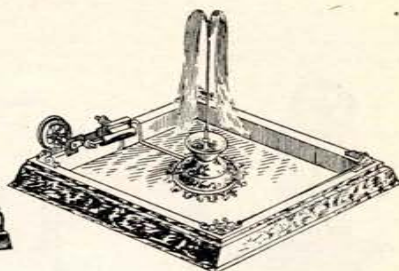
MODEL ATTACHMENT TOYS



Park Spring



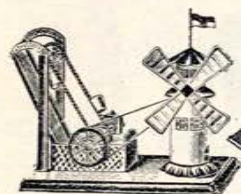
Fountain (Round)

Olde Mille and
Water Wheel

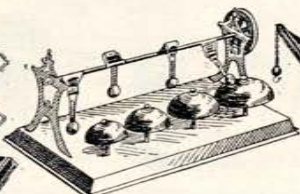
Square Fountain

Style

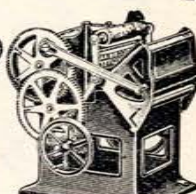
	H.	L.	W.	Price	Post.
Olde Mille, Sand Carrier and Water Tower.....	12	8	7	\$1.25	\$.18
Olde Mille, Water Wheel and Log Saw.....	9	9	8 1/4	1.65	.20
Ye Olde Mille, Rustic (by express only).....	9	9	9	1.75	.20
Ye Olde "Light House by the Sea," Rustic (by express only).....	9	14	13	3.00	Exp.
Hydrant Pump, pumps water (not illustrated).....	11	13	12	3.00	Exp.
Park Spring, with real Water Pump.....	6	3	3	.50	.08
Fountain, Round, throws a 12-inch spray.....	6	5 1/2	5 1/2	.65	.08
Fountain, Round, throws a 15-inch spray.....	4 3/4	4 3/4	4 3/4	.60	.08
Street Pump, with handle and trough, pumps water.....	8 1/2	3 1/2	3 1/2	.80	.08
Fountain, square, throws a 12-inch spray.....	8	7 1/2	8 1/2	1.50	.20
Fountain, square, throws an 18-inch spray.....	3	8 1/2	8 1/2	1.00	.18
	3	11	11	1.50	.25



Sand Elevator and Wind Mill



Chimes

Hoisting
CraneStreet
Pump

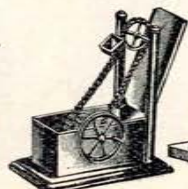
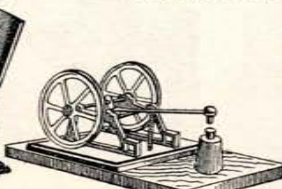
Printing Press

Style

	H.	L.	W.	Price	Post.
Sand Elevator or Water Carrier, substantial.....	6 1/4	6 3/4	4 1/2	\$.85	\$.15
Sand Elevator or Water Carrier and Windmill.....	9 1/2	10	5 1/2	.85	.15
Chimes, 4 Gongs.....	4	4	6 3/4	.35	.05
Chimes, 4 Gongs, superior.....	3	7	3	.50	.08
Teddy Bear, musical.....	3	5 3/4	3	.65	.10
Hoisting Crane.....	8 1/2	4 1/2	4 1/2	.75	.15
Trip Hammer.....	3	5 1/4	5 1/4	.50	.08
Passenger Elevator (not illustrated).....	11	5	3 1/2	.65	.08
Pile Driver (not illustrated).....	10 1/4	5 3/4	3 3/4	1.00	.20
Concrete Mixer Machine (not illustrated).....	6 1/4	7	5 3/4	1.00	.15
Printing Press, with set of type.....	6	5 3/4	5 1/4	4.15	.30



Fiddler Clown

Sand Elevator or
Water Carrier

Triphammer



Fan



Street Pump

Style

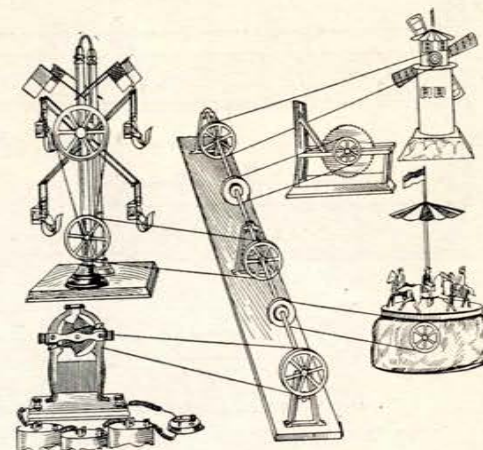
	H.	L.	W.	Price	Post.
Fan—Buzz Fan—also called "Electric Fan," with Pulley.....	7 1/2	3 1/2	2 3/4	\$.35	\$.05
Fiddler Clown, Musical, Dressed Figure.....	9	6	4	1.00	.15
Drummer Clown, Musical, Dressed Figure.....	9 3/4	5	3 1/4	.65	.12
Scissors Grinder, Dressed Figure.....	7	6	3	.50	.06
Blacksmith, Dressed Figure.....	7	6	3	.50	.06
Wood Sawyer, Dressed Figure.....	7	6	3	.50	.06
Butcher, Dressed Figure.....	8	6	3 1/2	.65	.08
Laundress, Dressed Figure.....	8	6	3 1/2	.65	.08
Blacksmith, Dressed Figure.....	8	6	3 1/2	.65	.08

TOY AND MODEL MACHINE OUTFIT

Complete with Motors and Shafts

The following outfits of Toys and Models have been carefully selected to combine nicely and prove a source of entertainment and instruction both for children and grown-ups. Any change can be made or entirely different outfits can be arranged from the lists on the previous pages to suit individual taste and ideas.

The Battery Cases supplied are described on page 34. These are fitted with proper switches, but, when preferred, the BATTERY RHEOSTAT may be substituted at an extra cost of 65 cents. The latter is extremely handy for controlling speed and for shutting off the current.

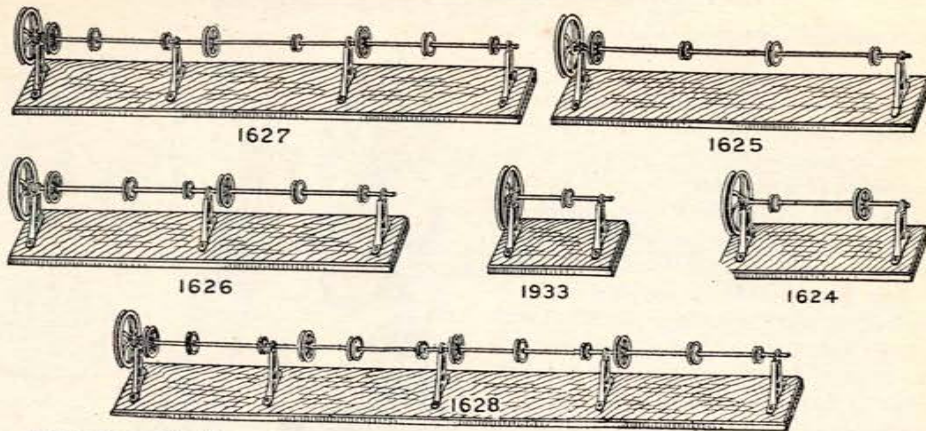


List No.

Price

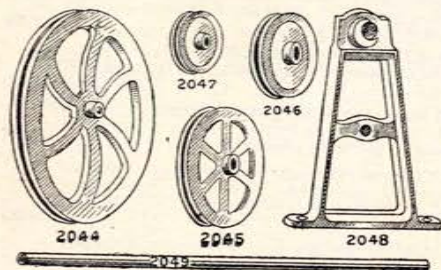
1655 Outfit—Funny Acrobat, Carousel, Chimes, 3-Pulley Shaft, 1 Battery, Wire and AS Motor. Weight packed, about 6 lbs.....	\$2.35
1656 Outfit—Carousel, Airship, Chimes, Funny Acrobat, Man at Tumbling Barrel, 5-Pulley Shaft, 2 Batteries, Wire and BS Motor. Weight packed, about 9 lbs.....	4.00
1657 Outfit—Chimes, Park Spring, Sand Elevator, Acrobats, Carousel, 5-Pulley Shaft, 2 Batteries, Wire and BS Motor. Weight packed, about 11 lbs.....	5.50
1658 Outfit—Windmill and House, Carousel, Chimes, Fountain, Ferris Wheel, Acrobats, Passenger Elevator, 7-Pulley Shaft, Case of 3 Batteries, Wire and BS Motor. Weight packed, about 15 lbs.....	7.00
1659 Outfit—Windmill and Water Tower, Sand Elevator, Airship, Carousel, Ferris Wheel, Round Fountain, 7-Pulley Shaft, Case of 3 Batteries, Wire and "C" Motor. Weight packed, about 18 lbs.....	8.50
1660 Outfit—Windmill, House and Log Saw, Sand Elevator, Upright Fountain, Chimes, Race Horses, Airship, Ferris Wheel, Acrobats, 9-Pulley Shaft, Case of 4 Batteries, Wire and "C" Motor. Weight packed, about 22 lbs.....	10.00
1661 Outfit—Race Horses, Ferris Wheel, Airship, Chimes, Musical Teddy Bear, Musical Clown, Acrobats, Park Spring, Windmill and Sand Elevator, Passenger Elevator, 13-Pulley Shaft, Case of 4 Batteries, Wire and "C" Motor. Weight packed, about 27 lbs.....	12.25
1662 Outfit—Musical Ferris Wheel, Airship, Musical Race Horses, Acrobats, Chimes, Musical Drum Clown, Musical Violinist Clown, Musical Teddy Bear, Round Park Fountain, Ye Olde Mill, 13-Pulley Shaft, Case of 4 Batteries, Wire and "D" Motor. Weight packed, about 35 lbs.....	15.50
1663 Outfit—Man at Drill Press, Man at Saw, Man at Anvil, 3-Pulley Shaft, 1 Battery, Wire and AS Motor. Weight packed, about 6 lbs.....	2.35
1664 Outfit—Machine Shop, Men at Work, 1 Battery, Wire and AS Motor. Weight packed, about 5 lbs.....	2.35
1665 Outfit—Blacksmith Shop, Man at Work, 1 Battery, Wire and AS Motor. Weight packed, about 5 lbs.....	2.35
1666 Outfit—Jigsaw, Blacksmith, Triphammer, Knife-Sharpener, Circular Saw and Grindstone, 5-Pulley Shaft, 2 Batteries, Wire and BS Motor. Weight packed, about 9 lbs.....	4.00
1667 Outfit—Lathe, Drill Press, Bandsaw, Emery Wheel and Buffer, Punch Press, 5-Pulley Shaft, 2 Batteries, Wire and BS Motor. Weight packed, about 11 lbs.....	5.50
1668 Outfit—Emery Wheel and Buffer, Punch Press, Circular Saw, Bandsaw, Machine Shop, Lathe, 7-Pulley Shaft, Case of 3 Batteries, Wire and BS Motor. Weight packed, about 15 lbs.....	7.75
1669 Outfit—Machine Shop, Blacksmith Shop, Punch Press, Circular Saw, Emery Wheel and Buffer, Bandsaw, Lathe, Triphammer, 9-Pulley Shaft, Case of 4 Batteries, Wire and "C" Motor. Weight packed, about 20 lbs.....	11.00
1670 Outfit—Model Machine Shop. Lathe, Bandsaw, Punch Press, Emery Wheel and Buffer, Sandpaper Wheel, Drill Press, 7-Pulley Shaft, Case of 4 Batteries, Wire and "C" Motor. Weight packed, about 25 lbs.....	14.75
1671 Outfit—Model Machine Shop. Lathe, Sandpaper Wheel, Bandsaw, Jigsaw, Circular Saw, Punch Press, Emery Wheel and Buffer, 9-Pulley Shaft, Case of 4 Batteries, Wire and "D" Motor. Weight packed, about 35 lbs.....	17.25

COUNTERSHAFTS



With these Shafts models can be operated at any desired speed and can be arranged over any space. Very useful in Machine Shops, Model and Window Displays, Christmas Gardens, etc. Pulleys are V-grooved and can be operated with cotton or thin twine for belts. For diameters of pulleys see parts below.

List No.	Style	Length	Price	Post-age	List No.	Style	Length	Price	Post-age
1933	2 Pulleys	4 in.	\$.25	\$.07	1626	7 Pulleys	14 in.	\$.70	\$.18
1624	3 Pulleys	5½ in.	.35	.09	1627	9 Pulleys	19 in.	.90	.23
1625	5 Pulleys	9½ in.	.50	.12	1628	13 Pulleys	25 in.	1.25	.27

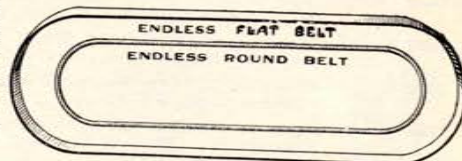


Shafting, Pulleys, Hangers, Etc.

List No.	Diam.	Size	Prepaid Each	Prepaid Price
2044	2¼ in.	No. 29	10 cts.	3 for \$.25
2045	1¼ in.	No. 29	10 cts.	4 for .25
2046	¾ in.	No. 29	10 cts.	5 for .25
2047	¾ in.	No. 29	10 cts.	6 for .25
2048	Hangers, ht. 2 in.		10 cts.	3 for .25
2049	Shafting, No. 29 Drill Gauge,		15 cts. per ft., 2 ft.	.25

LEATHER BELTS—Endless

For use with Motors and Dynamos. Not intended for Motors smaller than type D, and cannot be used with the above counter shafts. Length is the measurement over all. Belting, any length, per foot, prepaid: Flat, ¾ in., 12 cts.; 1 in., 15 cts. Round, ¾ in. or ¼ in., 5 cts.; 5/16 in., 6 cts.



ENDLESS FLAT BELTS

Width	Lgth.	Prepaid	Width	Lgth.	Prepaid	Diam.	Lgth.	Prepaid	Lgth.	Prepaid
¾ in.	4 ft.	\$.45	1 in.	4 ft.	\$.65	1/8 in.	4 ft.	\$.20	5 ft.	\$.25
¾ in.	5 ft.	.60	1 in.	5 ft.	.80	¼ in.	4 ft.	.25	6 ft.	.35
¾ in.	6 ft.	.75	1 in.	6 ft.	1.00	5/16 in.	4 ft.	.30	6 ft.	.40

ENDLESS ROUND BELTS

Patents Granted this Company November 27, 1906; January 1, 1907; January 29, 1907.

Patents Pending.

Trade-Mark Registered.

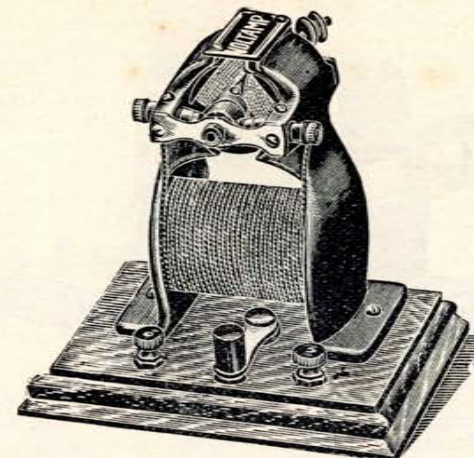


January 29, 1907.

VOLTAMP MOTOR—Type E—"Whizzer"

The
"Whizzer"

Prepaid
\$5.00



This Motor is constructed on lines similar to our Model C, but is much larger and heavier. It operates beautifully on four to six volts of battery with a low consumption of current. The BRUSHES are of the compressed round woven-wire pattern of phosphor-bronze; the BEARINGS are wide and heavy, with large OIL CUPS, insuring good service on continuous runs.

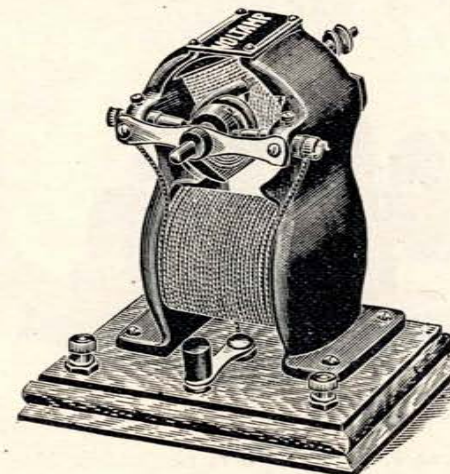
It is prettily finished in gloss-black enamel, and all parts are nicked. Mounted on a base 4½x3½ in. Height 4¾ in. Weight 3 lbs. Weight packed 3½ lbs. 4 Volts. 1¼ Amperes. 1800 R. P. M. About 1/20 H. P.

List No. 1308, Type E Motor.....Price \$4.50

VOLTAMP MOTOR—Type F—"Flasher"

The
"Flasher"

Prepaid
\$6.00



For extraordinary power in a compact space this size is highly recommended. It is patterned like Types C and E, but is much larger and heavier, with consequent stronger power. The BEARINGS are wide and are supplied with large OIL CUPS. The BRUSHES are compressed round woven wire, held to good contact on the COMMUTATOR by enclosed springs and adjusted by end screws. Will wear a lifetime.

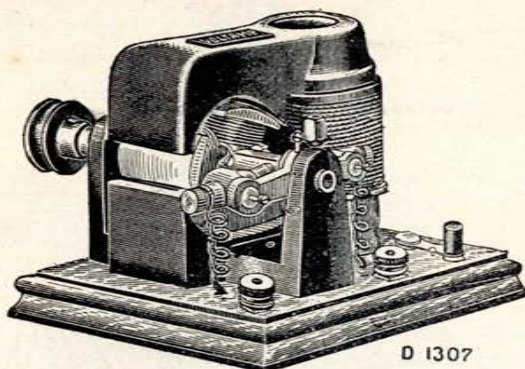
It is beautifully finished in gloss-black enamel. All parts are nicked. Base 5¼x4 in. Height 5¼ in. Weight 5 lbs. Weight packed 6 lbs. 6 Volts. 1½ Amperes. 1600 R. P. M. About 1/16 H. P.

List No. 1309, Type F Motor.....Price \$5.50

A copy of "MOTOR HINTS" is sent with each Motor

VOLTAMP MOTOR—Type D—"Whirler"

For Hard
Service the
"Whirler"
Can't be
Beat



\$4.25
Prepaid

The Type D is a strictly high-grade Motor, thoroughly well made, modeled after a popular large machine in general use.

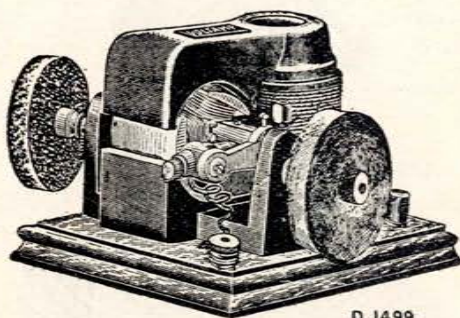
The FIELD pieces and ARMATURE are of purest soft gray iron. The FIELD MAGNET CORE is soft steel. The BEARINGS are long and heavy. Small OIL CUPS supply oil to the shaft through the Bearings. The new design ROCKER-ARM BRUSH HOLDER is movable, permitting proper adjustment of the BRUSHES and change of speed. Has V-grooved removable PULLEY.

On three or four dry cells it develops wonderful speed and power, especially well adapted for window displays requiring considerable power in a limited space.

In practical use in jewelry shops and homes operating small Circular Saws, Emery and Buffing Wheels and light-running Sewing Machines. Very economical to run.

Finished in Black Enamel and all parts Nickeled. Mounted on a base $5\frac{1}{4} \times 4$ in. Height $3\frac{1}{4}$ in. Weight $3\frac{1}{4}$ lbs. 4 Volts. $1\frac{1}{4}$ Amperes. 1800 R. P. M. About $1\frac{1}{25}$ H. P.

List No. 1307, Type D Motor, weight packed $3\frac{1}{2}$ lbs. Price \$4.00



List No.

	Price	Prepaid Price
1499 Type D, Extra Long Shaft, with Emery and Buffing Wheels.....	\$4.70	\$5.00
1680 Type D, Extra Long Shaft, with Emery Wheel and Circular Saw..	4.95	5.20
1507 Type D, Extra Long Shaft only.....	4.25	4.50
1635 Circular Saw, $1\frac{1}{4}$ in. diameter, with Set Screw Bushing.....	.35	
1681 Circular Saw, $2\frac{1}{4}$ in. diameter, with Set Screw Bushing.....	.50	
1636 Emery Wheel, 2 in. diameter, with Set Screw Bushing.....	.35	
1682 Emery Wheel, 3 in. diameter, with Set Screw Bushing.....	.50	
1613 Buffing Wheel, 2 in. diameter, Canton Flannel.....each, \$.15, 2 for	.25
1614 Buffing Wheel, 2 in. diameter, Felt.....each,	.15, 2 for	.25
1654 $\frac{1}{8}$ in. Endless Leather Belt, 4 ft.....		.20

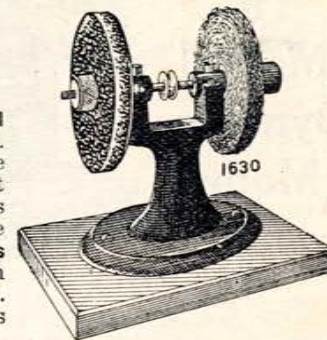
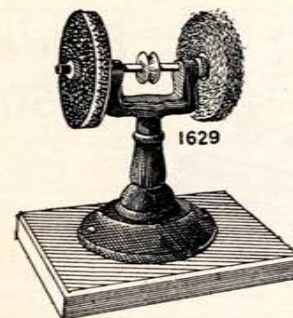
A copy of "MOTOR HINTS" is sent with each Motor

MACHINERY MODELS

The demand for a superior line of machinery models has induced us to manufacture a few of these miniatures. Those shown here are exact reproductions of the machines used in our shops, with each detail carefully worked out. Each piece is turned and trued from solid steel casting. They are well built, strong and durable, and will do real work.

EMERY AND
BUFFING WHEEL
STANDS

Emery and Buffing Wheel Stands are great favorites. The Emery Wheels are true and of the very best make. The Buff Wheels are of superior felt. These Emery and Buffing Stands will sharpen and polish knives and small tools. Either of our small motors will pull them.



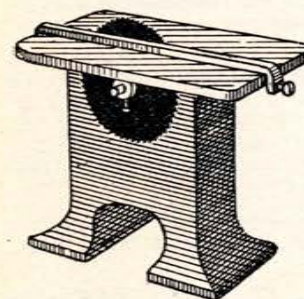
List No.

	Price	Prepaid
1629 Emery and Buffing Wheel Stand, complete, small, $2\frac{3}{8} \times 3\frac{3}{4} \times 4$ in..	\$.50	\$.55
1630 Emery and Buffing Wheel Stand, complete, large, $2\frac{3}{8} \times 4\frac{1}{2} \times 4\frac{3}{4}$ in..	.85	.95
1615 Emery Wheel only, 2 in., for No. 1630...Prepaid, each 25 cts., 5 for		1.00
1616 Emery Wheel only, $1\frac{3}{4}$ in., for No. 1629...Prepaid, each 25 cts., 5 for		1.00
1613 Buff Wheel only, 2 in., Canton Flannel...Prepaid, each 10 cts., 3 for		.25
1614 Buff Wheel only, 2 in., Felt.....Prepaid, each 10 cts., 3 for		.25

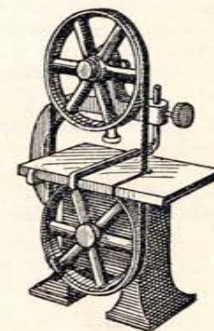
CIRCULAR SAW, BAND
SAW, PUNCH PRESS

No. 1631 Circular or Cross-cut Saw is fitted with $1\frac{3}{4}$ in. Circular Saw and will cut light materials up to $\frac{1}{4}$ in. thick. Has 1 in. grooved Pulley and adjustable guide.

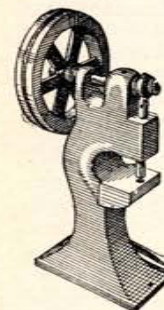
No. 1632 Band Saw is a perfect model, having adjustable top wheel, saw and table guides. The Band Saw is of the very best spring blade steel and will do nice work; 1 in. grooved pulley.



1631



1632

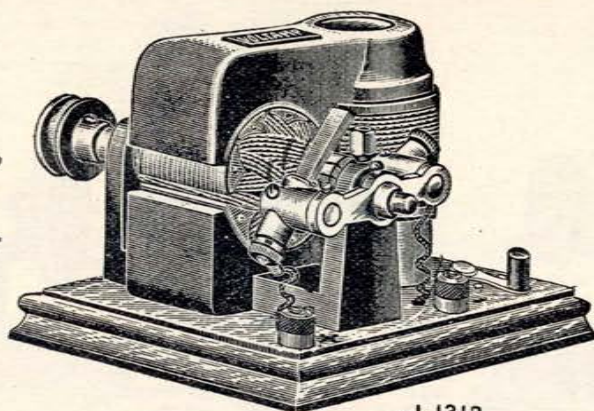


1634

No. 1634 Punch Press is patterned after the well-known Ferracut machines and is strongly built. Will punch thin material nicely. Fitted with trip which must be pressed down to punch or stamp the material.

List No.	Use Type C, D, E or F Motor	Price	Prepaid
1631	Circular Saw, size $2\frac{1}{4} \times 3\frac{1}{2} \times 4$ in.....	\$1.75	\$2.00
1632	Band Saw, size $2\frac{1}{4} \times 4 \times 6$ in.....	3.75	4.00
1634	Punch Press, size $2\frac{1}{2} \times 3 \times 5\frac{5}{8}$ in.....	2.50	2.75
1617	Circular Saw only, diam. $1\frac{3}{4}$ in. for No. 1631, each.....		.35
1618	Band Saw only for No. 1632, each.....		.50

VOLTAMP DYNAMO-MOTOR—Type J

The
"Marvel"
Dynamo-
MotorPrice
\$5.50

J 1312

Pronounced by all who have used it a real marvel. An ideal machine for the amateur electrician and experimenter. In general use in schools for demonstrations in dynamics. A wonderful achievement in miniature models, outclassing in efficiency all similar machines of equal size. Over 2000 sold in one year.

As a DYNAMO its output at full speed, 3000 R. P. M., is about 40 watts, actual meter measurements. SHUNT WOUND. At 2400 R. P. M. it will light from 8 to 12 4-volt to 6-volt miniature lamps; at 2600 R. P. M. it will light eight 8-volt lamps. It will run small motors, explode gas, decompose water, charge Storage Batteries and assist in many experiments that are interesting and helpful to the beginner and experimenter. Does excellent electroplating.

A feature of the Machine is our ROCKER-ARM BRUSH HOLDER, which allows the proper adjustment of the Brushes and permits variation of voltage. By swinging the yoke any voltage can be obtained, ranging, at 3000 R. P. M., from 6 Volts $1\frac{1}{2}$ Amperes to 14 Volts 3 Amperes; at 2200 R. P. M., 5 Volts 1 Ampere to 8 Volts $1\frac{1}{2}$ Amperes; at 2000 R. P. M., 6 Volts 1 Ampere to 4 Volts $\frac{3}{4}$ Ampere. It is this one feature that has made the "MARVEL" so universally popular.

Operated as a Motor on five or six Dry Batteries or three or four Fuller Cells or on 6 Volts or 8 Volts of Storage Battery it gives great power and speed. About 2000 R. P. M. About $\frac{1}{20}$ H. P.

The FIELD is casting of soft gray iron and very heavy. The ARMATURE is of the laminated, tunnel drum pattern, eight sections, with fibre insulation on the outside and shellaced gauze insulation running through the section tunnels to protect the windings. It is wound with double-covered SILK wire. Both the FIELD and ARMATURE are heavily varnished and baked to protect them against short circuit and moisture. The COMMUTATOR is 8-section, of heavy Copper tubing, and has ample carrying capacity. The BRUSHES are of best quality Phosphor-Bronze Strips held firmly by solid Brush Holders. The BEARINGS are brass, extra long and heavy, with large OIL CUPS. The PULLEY is 1 in. diameter, V-grooved for 5-16-in. round belt.

Finished in gloss-black enamel and nicked parts. Mounted on a polished wood base $4\frac{3}{4} \times 5\frac{1}{2}$ in. Height 4 in. Weight $5\frac{1}{2}$ lbs. Weight packed $7\frac{1}{2}$ lbs.

Note: The "MARVEL" is sold in finished state only. For separate parts see page 24.

List No. 1312, Type J Dynamo Motor.....Price \$5.50

A copy of "MOTOR HINTS" is sent with each Dynamo

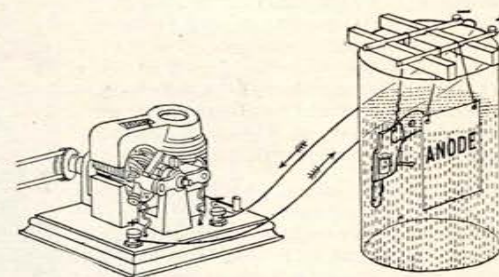
ELECTROPLATING

Of all the many experiments in Electricity, Electroplating is one of the most interesting and profitable. It is really a beautiful art, not difficult, and, with a little practice, anyone can soon produce excellent results. It offers an excellent opportunity to boys for earning "pin money" after school hours. Many men are now making a business of Electroplating, having been drawn into it originally as amateurs in experimental work.

The illustration (taken from "MOTOR HINTS") shows the method of connecting up the "MARVEL" Dynamo, which should be belted to some mechanical power shaft, water motor, gas or steam engine. For larger outfits the Type L is preferred.

Batteries are frequently used by beginners instead of Dynamos. Use 4 Volts Storage Battery or two cells (4 Volts) Fuller Battery.

An excellent treatise, "Handbook of Electroplating," sent prepaid 50 cts.



ELECTROPLATING MATERIALS

Strictly high-grade concentrated solutions, chemicals, polishing and other necessities for experimental and practical electroplating. Solutions are to be added to clear, soft water before using. Articles not listed will be quoted on application. Solutions are put up in glass bottles and must be sent by Express.

For light buffing and polishing with wheels not over 3 inches the Emery Wheel and Buffing Stand No. 1630, page 15, answers all purposes. The Stand No. 2450, illustrated here, is for larger wheels and heavier work. It has a solid frame, 6 in. high, $\frac{3}{8}$ in. spindle, 8 in. long, with taper screw-threaded ends, and will take wheels $\frac{3}{4}$ in. thick. Pulley is $1\frac{1}{8}$ in. diameter, grooved for $\frac{1}{4}$ in. round belt.

List No.	Price	List No.	Prepaid
1601 Copper Solution, per pint.....	\$.35	1602 Copper Anode, $2\frac{3}{4} \times 5\frac{1}{2} \times \frac{3}{16}$ in..	\$.35
1603 Brass Solution, per pint.....	.35	1604 Brass Anode, $2\frac{3}{4} \times 5\frac{1}{2} \times \frac{3}{16}$ in..	.35
2451 Nickel Solution, per pint.....	.35	1606 Nickel Anode, $2 \times 3\frac{1}{2} \times \frac{3}{16}$ in..	.35
1607 Silver Solution, per $\frac{1}{2}$ pint...	1.00	1608 Silver Anode, $1\frac{1}{2} \times 2\frac{1}{2} \times \frac{3}{16}$ in..	.75
1609 Gold Solution, per $\frac{1}{4}$ pint....	2.00	1610 Gold Anode, 24k., $\frac{3}{4} \times .013$	2.50

List No.	Price	Post.
2450 Buffing and Polishing Stand, weight packed 3 lbs.....	\$1.50	\$.45
1605 Nickel Salts, Concentrated, per lb.....	.35	.16

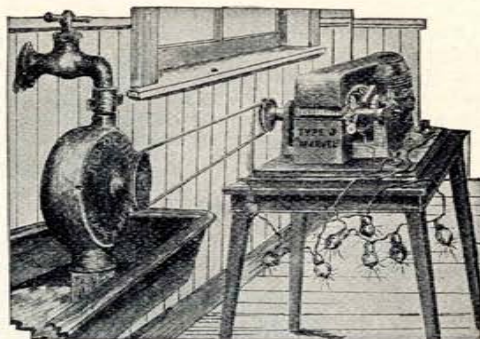
POLISHING MATERIALS

List No.	Price	Post.
1611 Vienna Lime Finish, in 2-lb. air-tight cans.....	\$.35	\$.32
1612 Rouge Polish, Jewelers' Fine XXG.....	.35	.06
2452 Rouge Polish, Special GS, for Gold and Silver work.....	.50	.16
2453 Rouge Polish, Medium GX, for general work.....	.35	.12
2454 Rouge Polish, Rough SXX, for heavy work.....	.40	.28
2455 Tripoli Polish, Best X, for general work.....	.25	.16
2456 Buff Wheels, Muslin, $1\frac{1}{2}$ in. diameter.....	.15	.02
2457 Buff Wheels, Muslin, 3 in. diameter.....	.25	.03
2458 Buff Wheels, Muslin, 6 in. diameter.....	.35	.06
2459 Buff Wheels, Canton Flannel, 6 in. diameter.....	.40	.06
2460 Felt Wheels, Spanish, Solid, 3 in. diameter.....	.25	.02
2461 Felt Wheels, Spanish, Solid, 6 in. diameter.....	.75	.06

THE "RED DEVIL" WATER MOTOR

Recognized by experts as the greatest little WATER MOTOR made, and the many thousands in use demonstrate its complete success. The construction of the wheel is known as the "Double Reacting Bucket," a type that develops 86% of the total power of the water delivered to it—more power than any other style will produce.

The primary object in offering this machine is in connection with our Dynamos and Generators as a suitable power drive, but it is useful in many other ways where a good water pressure is always at hand. The 6 in. Water Motor on 90 lbs. pressure, properly belted to our type J or K Dynamo, will drive it about 2000 R. P. M. generating sufficient current to light from four to eight 4 to 6-Volt Lamps. The cardinal points of efficiency is the construction of the bucket and wheel, which are **cast in one piece**. Each bucket is placed at just the proper angle to get the full and even impact, and is so shaped that it cannot hold or retain any water after its force is spent. The housing is large, so that the water instantly gets away without in any manner interfering with the force of the wheel.

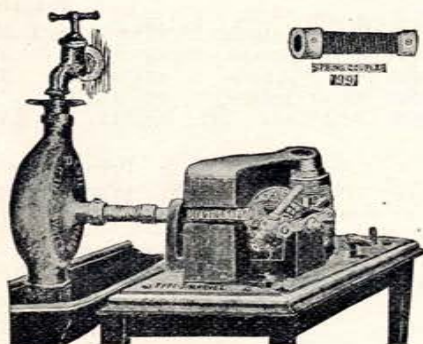


Horse-Power (H. P.) of 6 in. RED DEVIL MOTORS on 2 in. Supply Pipe
On Other Sizes of Pipes in Proportion

Head	Pressure	H.P.	Head	Pressure	H.P.	Head	Pressure	H.P.	Head	Pressure	H.P.
80 ft.	35 lbs.	.44	115 ft.	50 lbs.	.75	160 ft.	70 lbs.	1.25	210 ft.	90 lbs.	1.80
90 ft.	40 lbs.	.52	140 ft.	60 lbs.	.99	190 ft.	80 lbs.	1.50	230 ft.	100 lbs.	2.10

Furnished for $\frac{1}{2}$ in. standard faucet, unless otherwise specified. The coupling is of the swivel type, which allows the motor shaft to be placed at any desired angle. Be sure to specify whether V-grooved or flat-face pulley is wanted.

NOTE.—For driving a Dynamo or Generator the 6 in. size should be used, fitted with V-grooved pulley for $\frac{5}{16}$ in. round belt.



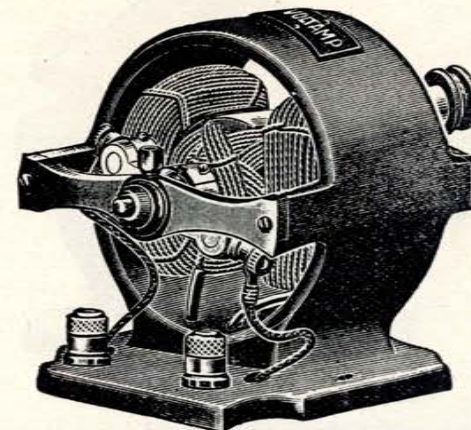
Well made throughout. Bearings are of special phosphor-bronze. Couplings are of brass and the shafts of steel. Normal free speed, 6 n. size, about 3000 R. P. M. Normal working speed about 2000 R. P. M. No lost motion. No vibration. Cannot leak. Finished in red enamel. Weight of 6 in. size 7 lbs. Weight packed 12 lbs.

NOTE.—With the WATER MOTOR attached to a $\frac{1}{2}$ in. supply under 55 lbs. pressure, and the "MARVEL"—type J—Dynamo, direct coupled to it by the Spring Coupler No. 1991, or belted to it, using a 2 in. pulley on each, the Dynamo will average about 2100 R. P. M. and will light six to eight 4-Volt or four to six 6-Volt Lamps.

List No.		Price
2420	6 in. Water Motor, 2 in. V-grooved pulley.....	\$5.00
2421	6 in. Water Motor, 2 in. flat-face pulley.....	5.00
2422	6 in. Water Motor, 2 in. flanged pulley.....	5.00
2423	$\frac{5}{16}$ in. Endless Round Belt, 5 ft.....	.35
2424	$\frac{3}{4}$ in. Endless Flat Belt, 5 ft.....	.60
1991	Spring Coupler, for direct coupling of Shafts, size of shaft holes $\frac{5}{16}$ and $\frac{1}{4}$ in.....	Prepaid, .75

Spring Couplers with other sizes of shaft holes made to order.

VOLTAMP GENERATOR—Type K



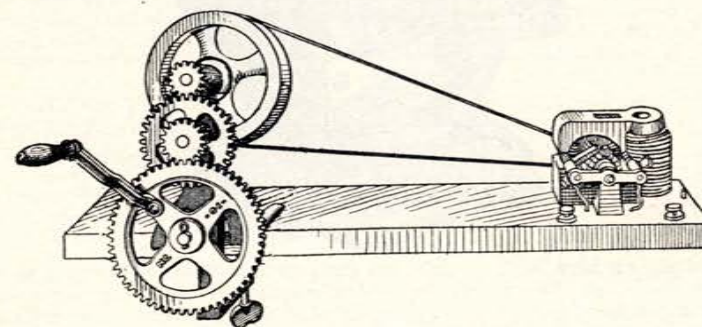
The Type K Generator-Dynamo is an efficient and practical machine of the bipolar pattern. It is particularly useful in laboratories where a small amount of direct current is required. In use in many schools for demonstrations and for experimental work. It is very desirable for operating Miniature Motors and Railways, for Sparking Gas or Gasoline Engines, charging Storage Batteries and for supplying current in an electroplating tank up to five gallons capacity. At full speed it will light from 12 to 15 6-volt 2-C. P. lamps. The Type K can also be used as a Motor. With 8 Volts of battery it will give good power and speed.

It is similar in general design and construction to the Type G Motor, with the exception of the ARMATURE and the BRUSHES. The ARMATURE is made from soft steel laminations and is 8-section tunnel drum type. The BRUSHES are of spring phosphor-bronze strips. The PULLEY is 1 in. diameter, V-grooved, but a flat-faced will be supplied when preferred. Output at 1800 R. P. M., $6\frac{1}{2}$ Volts, $6\frac{1}{2}$ Amperes, 40 Watts; at 2200 R. P. M., $7\frac{1}{2}$ Volts, $7\frac{1}{2}$ Amperes, 50 Watts. Occupies a space $4\frac{1}{2} \times 4\frac{1}{2} \times 5$ in. high. Weight $8\frac{1}{2}$ lbs. Weight packed 10 lbs.

List No. 1313, Type K Generator-Dynamo.....Price \$8.00

A copy of "MOTOR HINTS" is sent with each Generator

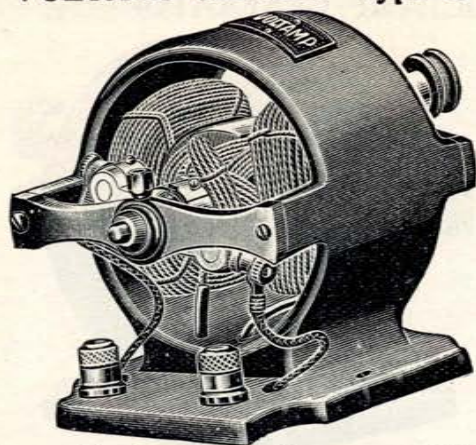
GEARED DRIVE HAND-POWER MACHINE



Extremely useful for demonstrating small Dynamo-Generators for Schools, Lectures, Exhibitions, as well as for practical work. The VOLTAMP DRIVE is compound geared, carefully adjusted to give the greatest speed with the least exertion. Can be clamped or screwed to any table and belted to the Dynamo. Complete with Belt.

List No.		Price
1920	Hand-Power Machine only, weight packed 12 lbs.....	\$3.50
1950	"MARVEL" Dynamo and Hand-Power Machine complete, wt. pkd. 17 lbs.....	9.00
2017	Type K Dynamo and Hand-Power Machine complete, wt. pkd. 24 lbs.....	11.50

VOLTAMP MOTOR—Type G

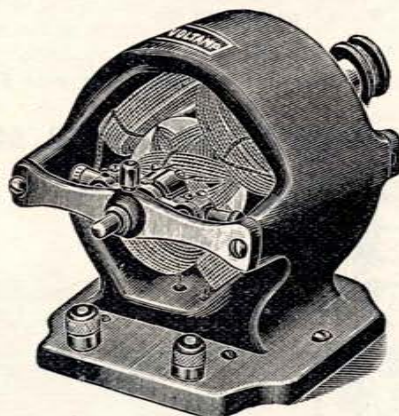


This Motor closely resembles the pattern of heavy power Motors of proved efficiency in practical use. An excellent Motor for running light Sewing Machines, Small Lathes and other light machinery. Neat in design and built with care. FIELD POLES and FRAME are cast in one solid piece. The FIELD COILS are form wound of double covered wire, taped and dipped in insulating varnish. The ARMATURE is soft gray casting, six-section tunnel drum pattern. The COMMUTATOR is heavy tubular copper, 6-section. The BRUSHES are of round compressed woven wire. Has adjustable ROCKER-ARM BRUSH HOLDER. One-inch V-grooved (or flat-face) PULLEY.

Finished in gloss-black enamel with nicked trimmings. Base measurements $4\frac{1}{2} \times 4\frac{3}{8}$ in. Height 5 in. Weight $8\frac{1}{4}$ lbs. Shipping weight 10 lbs. Operates on 6 Volts, 2 Amperes, 1800 R. P. M. About 1/15 H. P.

List No. 1310, Type G Motor.....Price \$8.00

VOLTAMP 4-POLE MOTOR—Type H



The model shown here is the 4-pole, an entirely new idea in Battery Motors. It is constructed on the same lines as the large 4-pole machines used for power purposes in factories, and gives great power on a low consumption of current. The BEARINGS are liberally designed and provided with ample OIL WELLS to insure cool running. It is fitted with our improved ROCKER-ARM BRUSH HOLDER and compressed woven-wire BRUSHES. All of the features that go to make the large machines of commerce efficient are retained. For Lathes and light Sewing Machines and similar light-running machinery. One-inch V-grooved (or flat-face) PULLEY.

Finished in gloss-black enamel with nicked parts, and is sure to please. Size of base $4\frac{1}{2} \times 4\frac{3}{8}$ in. Height 5 in. Weight $9\frac{1}{4}$ lbs. Shipping weight 12 lbs. It operates on 6 to 8 Volts at 2 Amperes. 1/12 H. P. 2000 R. P. M.

List No. 1311, Type H Motor.....Price \$10.00

VOLTAMP TRANSFORMER—For 110-Volt Alternating Current

Provides low-voltage current for operating MINIATURE MOTORS, ELECTRIC RAILWAYS, CHRISTMAS TREE, DECORATIVE AND OTHER MINIATURE LIGHTS, BELLS, BUZZERS, ANNUNCIATORS, BURGLAR ALARMS, RUHM-KORFF AND SIMILAR TYPES OF INDUCTION COILS, GASLIGHTING SYSTEMS, GAS OR GASOLINE ENGINE IGNITION, and for numerous other purposes where a low-voltage Battery Current is commonly used.

Where the 110-volt, 60-cycle Alternating current is available the VOLTAMP TRANSFORMER offers the cheapest and best means for providing low-voltage current suitable for almost all purposes where Battery current is ordinarily used. The entire apparatus is enclosed in a steel case, filled with insulating material, and is absolutely fireproof. and it will last a lifetime.

The distinct advantage of the VOLTAMP TRANSFORMER—type ZR—over all others is the Voltage Selecting Switch mounted on the top, by means of which any voltage may be selected, or the voltage may be increased or lowered at will, without the necessity of making or changing connections at the terminal posts. This feature has been added so that children may make free use of the current without the slightest risk of harm. The SELECTING SWITCH on type ZR offers either 4, 8, 14 or 24 volts. At the same time the terminals on the side can be used without in the least interfering with the Selecting Switch, thus affording current supply for two or more circuits of the same or different voltages. The type Z has terminal posts only, offering the same voltages as the type ZR.

NOTE.—The type ZR TRANSFORMER was designed especially for operating VOLTAMP MOTORS and RAILWAYS and for lighting Christmas Tree, Decorative and other Miniature Lamps. It is well to bear in mind that small battery Motors, Railways, Bells and similar electrical apparatus usually require on the Alternating-Current circuit about twice the voltage that would be used on battery or Direct-Current circuit.

Finished in black enamel, with nicked parts. Complete with separable Attachment Plug and long Reinforced (N. C.) Cord, ready to attach to lamp socket. Wt. pkd. 18 lbs. Price \$9.00

List No. 2417 VOLTAMP TRANSFORMER, type ZR.....\$9.00
2418 VOLTAMP TRANSFORMER, type Z.....7.50

VOLTAMP TRANSFORMER—Type Y

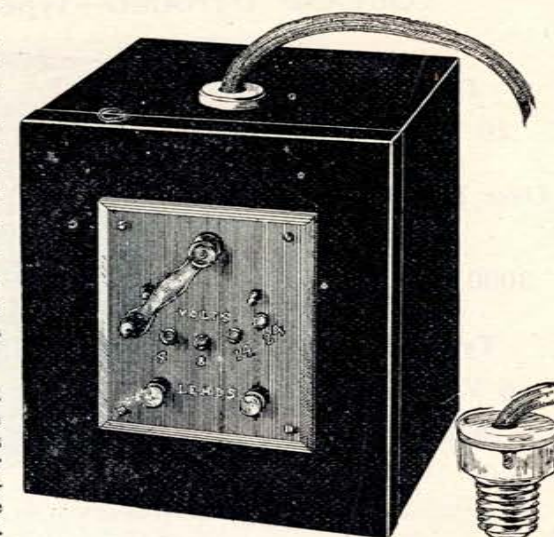
Same in detail as the type ZR, but of larger capacity, and is intended for heavier work. The SELECTING SWITCH and terminals offer either 4, 8, 14, 24, 30, 40 or 50 volts. Type Y has terminal posts only, offering the same voltages as the type YR.

List No. 2425 VOLTAMP TRANSFORMER, type YR.....\$12.00
2426 VOLTAMP TRANSFORMER, type Y.....10.50

ALTERNATING CURRENT RECTIFIER

For converting the Alternating Current into Direct Current. To be used in connection with a Transformer or lamps to regulate the flow of current. Two wires, T, are leads to the Transformer or lamp circuit, and the wires, L, carry the Direct Current to the work.

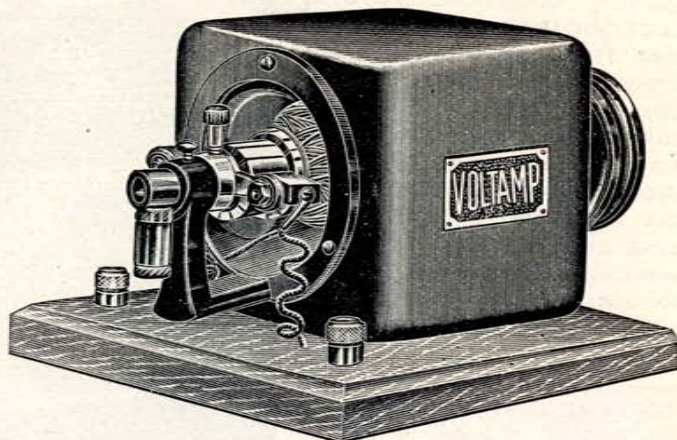
List No.	Description	Price	Postage
2419	Rectifier complete, weight packed 15 lbs.....	\$1.50	
2065	Renewal Electrodes, per set.....	1.00	\$.15
2066	Rectifier Salts, per package.....	.15	.10



VOLTAMP DYNAMO—Type L—The "Wizard"

Type L
20 V—6 A
Over 100 Watts
at
3000 R. P. M.

Type LP
6 V—13 A
\$15.00



The "WIZARD" is the latest successful VOLTAMP Dynamo and is intended for the various purposes of gas or gasoline engine ignition, charging storage batteries and electroplating; to provide currents for running miniature motors, railways and similar electrical models, for lighting low-voltage incandescent lamps and for experimental work.

The FIELD is bi-polar, semi-enclosed, of soft gray-iron casting in one piece, so that there is no break in the magnetic circuit. The ARMATURE is of the laminated, tunnel drum pattern, twelve sections, $2\frac{1}{4}$ in. diameter and $1\frac{1}{2}$ in. long, with fibre insulation on the outer ends and varnished gauze insulation running the section tunnels to protect the windings. Both FIELD and ARMATURE are heavily varnished and then baked to protect them against short circuit and moisture. The COMMUTATOR is 12-section, 1 in. diameter and $\frac{7}{8}$ in. long, of heavy copper tubing, to afford large carrying capacity. The BRUSHES are of the composite type—carbon and copper—held to good contact by the tension springs in the BRUSH HOLDERS. The BEARINGS are of bronze, extra long and heavy, with large wick-fed OIL CUPS fitted with screw caps. The PULLEY is 2 in. diameter, V-grooved for $\frac{3}{16}$ in. round belt. A flat-face Pulley furnished when preferred.

Finished in enamel, with nicked parts. Mounted on a polished wood base. Occupies a space 9x7x5 in. Weight 14 lbs. Weight packed 20 lbs.

List No.	Price
2411 Type L Dynamo, 20 Volts, 6 Amperes.....	\$15.00
2412 Extra Brushes.....	.40

VOLTAMP DYNAMO—Type LP

6 Volts, 13 Amperes. Identical with Type L with exception of the windings. Especially made for Electroplating purposes, but can be used for all work where a low voltage and high amperage is required.

List No.	Price
2413 Type LP Dynamo, 6 Volts, 13 Amperes.....	\$15.00

FRICION PULLEYS

For use with Dynamos, Generators. Cast Flanges and Double Thick Belt Pulleys. State size of shaft with order.

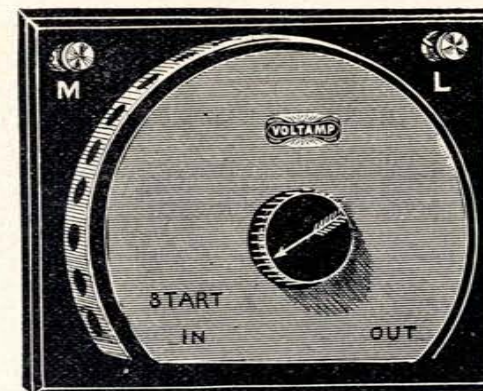


List No.	Price	Post.	List No.	Price	Post.
2462 $2\frac{1}{2}$ in. Pulley....	\$1.50	\$.10	2465 4 in. Pulley....	\$2.00	\$.24
2463 3 in. Pulley....	1.50	.12	2466 $4\frac{1}{2}$ in. Pulley....	2.25	.30
2464 $3\frac{1}{2}$ in. Pulley....	1.75	.16			

For BELT PULLEYS see page 24

VOLTAMP CONTROLLER-RHEOSTAT

Mounted on Slate Base



A RHEOSTAT THAT WILL CONTROL CURRENT AND NOT BURN OUT

The success of our NISIL Resistance Wire is best illustrated in this Controller-Rheostat. Can be used on the 110-V. A. C. or D. C. circuit without danger to itself or to the operator. Controls a battery of cells as easily as 110-V circuit. Mounted on Slate Base and air cooled.

Regulates speed of small Motors, Miniature Railways, and controls the brilliancy of incandescent lamps up to 110 volts, gradually and evenly. Useful to the surgeon in Cautery work, as any degree of heat can be gotten; also in controlling Surgeons' and Dentists' Headlights. Fills a great want in small Electroplating outfits, giving that gradual increase in current which is absolutely necessary when doing fine work. Size 2x7x9 in. Weight, $3\frac{1}{4}$ lbs. Weight packed, 5 lbs.

Note.—To run the VOLTAMP Miniature Railways, connect M to one side of current, L to one side of track; then connect the other side of current to other side of track. When the Arrow on the knob points to "START," the full resistance is in circuit; at "OUT" the resistance is entirely cut out.

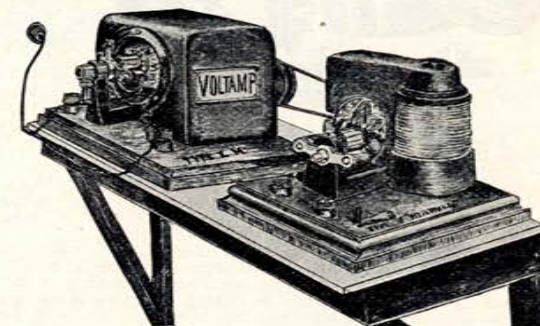
List No. 2447—VOLTAMP CONTROLLER-RHEOSTAT.....Price \$7.00

VOLTAMP MOTOR—Type LM

For 110-Volt D. C. Circuit Only

Using the same Field frame as the type L, but wound for power purposes only on the 110-Volt Direct Current Circuit. The ARMATURE, like the type L, has 12 sections, $2\frac{1}{4}$ in. diameter, but is 2 in. long. The COMMUTATOR is $1\frac{1}{4}$ in. diam. and 1 in. long, and has 24 segments; 2 in. V-grooved PULLEY. A flat-face Pulley furnished when preferred. Speed 4000 R. P. M. About $\frac{1}{10}$ H. P.

NOTE.—The type LM Motor, direct coupled by the Spring Coupler No. 1991 to the "MARVEL"—type J—Dynamo, or belted to it, using either V-grooved or flat-face Pulleys of equal diameters, will run the latter at full speed 3000 R. P. M.



List No.	Price
2414 Type LM Motor, for 110-Volt D. C. Circuit only.....	\$17.50
2415 Type LM Armature, wound and complete with Commutator.....	4.75
2416 Type LM Commutator only, 24 segments.....	1.50
2412 Extra Brushes.....	.40

All other parts are interchangeable with parts of types L and LP. See pages 24, 25.

MOTOR, DYNAMO AND MAGNETO PARTS

The following list comprises parts of our regular MOTORS, DYNAMOS, MAGNETO, etc. Parts of other machines or experimental work are special and will be made to order upon receipt of drawings and definite specifications and after our estimated price has been given and accepted. All dimensions are given in inches or fractions thereof, or are designated by the U. S. Standard Sheet Gauge, B. & S. Standard Wire Gauge and B. & S. Twist Drill Gauge numbers.

ARMATURES SHAFTS AND PULLEYS

"Solid" ARMATURES are castings made from pure soft gray iron, in one piece, turned and trued on the shaft. "Laminated" ARMATURES are made of discs of soft charcoal iron sheet, assembled and turned on the shaft. Types A, AS, B, BS, BRS, C, D, E and F Armatures are 3 pole, solid; "Magnet" ARMATURE is 2 pole, solid; types G and H are 6 section tunnel drum, solid; types J and K are 8 section tunnel drum, laminated; type L is 12 section, tunnel drum, laminated. "Unwound" ARMATURES are supplied with Shaft only and are turned and trued ready for winding. "Complete" Armatures are supplied with Shaft and Commutator and are wound ready for use. Face dimension is the length. Shafts are of best steel and have turned ends. Change of Shaft length, 10 cts. extra. Change of Shaft hole in Armature, 15 cts. extra. Prices are prepaid.

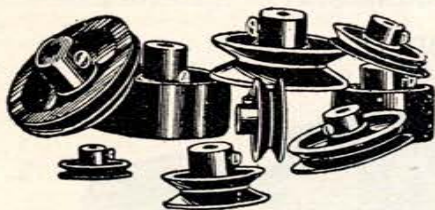
ARMATURES					SHAFTS			PULLEYS		
Type	Diameter	Face	Unw'd	Comp.	O. D.	Length	Price	Diam.	Face	Price
A, AS, B	1 3/16 in.	13/16 in.	\$.30	\$.60	No. 29	2 7/16 in.	\$.10	1 1/4 in.	1 1/4 in.	\$.10
BS, BRS	1 3/16 in.	13/16 in.	.30	.60	No. 29	2 7/16 in.	.10	1 1/4 in.	1 1/4 in.	.10
C, E	1 3/16 in.	1 5/16 in.	.45	.85	No. 29	3 3/8 in.	.10	1 1/2 in.	1 1/2 in.	.15
D	1 3/16 in.	1 1/2 in.	.65	1.15	No. 18	3 3/8 in.	.15	1 1/2 in.	1 1/2 in.	.15
F	1 15/16 in.	1 3/4 in.	.75	1.40	No. 18	3 3/8 in.	.15	1 3/4 in.	5/16 in.	.20
G, H	1 15/16 in.	1 3/4 in.	1.00	2.00	1/4 in.	6 1/2 in.	.20	1 in.	7/16 in.	.25
J	1 3/4 in.	1 1/2 in.	1.25	2.50	1/4 in.	6 in.	.20	1 in.	7/16 in.	.25
K	1 23/32 in.	1 1/2 in.	1.25	2.50	1/4 in.	6 1/2 in.	.20	1 in.	7/16 in.	.25
L	2 1/4 in.	1 1/2 in.	1.60	3.50	5/16 in.	9 in.	.25	2 1/4 in.	5/8 in.	.65
LM	2 1/4 in.	1 1/2 in.	2.00	4.75	5/16 in.	9 in.	.25	2 1/4 in.	5/8 in.	.65
Magnet	1 1/16 in.	1 1/16 in.	.30	.60	No. 29	2 1/4 in.	.10			

List No. 2053 Armature Discs, used on type J, diameter 1 1/4 in., 8 slots 3/8 in. round, 1/4 in. shaft hole, enough to make an armature 1 in. long (longer lengths at same rate).....Prepaid, \$.40

List No. 2054 Armature Discs, used on type L, diameter 2 1/4 in., 12 slots 13/32 in. round, 5/16 in. shaft hole, enough to make an armature 1 in. long (longer lengths at same rate).....Prepaid, \$.50



BELT PULLEYS



Flat face or V grooved. Supplied with set screw. Shaft hole 1/4 in. Any change in size of hole, extra 10 cts.

List No.	Diam.	Face	Pre-paid	List No.	Diam.	Face	Pre-paid
1637	1 in.	7/16 in.	\$.25	1640	2 1/2 in.	5/8 in.	\$.65
1638	1 1/2 in.	1 1/2 in.	.40	1641	3 in.	5/8 in.	.75
1639	2 in.	1 1/2 in.	.50				

The following are V grooved unless otherwise specified. Face 3/4 in., shaft hole 1/4 in.; change of shaft hole, extra 10 cts.

Diam.	Price	Postage	Diam.	Price	Postage
3 1/2 in.	\$.75	\$.10	5 in.	\$1.00	\$.25
4 in.	.85	.15	5 1/2 in.	1.15	.30
4 1/2 in.	.95	.20	6 in.	1.25	.35

The following are Flat Face only. Face 1 1/2 in., shaft hole 5/16 in.; change of shaft hole, extra 10 cts.

Diam.	Price	Post.	Diam.	Price	Post.	Diam.	Price	Post.
3 1/2 in.	\$.75	\$.18	4 1/2 in.	\$.95	\$.26	5 1/2 in.	\$1.15	\$.35
4 in.	.85	.22	5 in.	1.00	.30	6 in.	1.25	.40

COMMUTATORS A to F, inclusive, have their segments forced into the insulating body. A VOLTAMP patented process. The G, H, J, K and L have their segments firmly secured by deep-seated screws into the central insulating body. The back ends of all segments are turned up and have slots, to which the armature wires are to be soldered. Types A to F can be had with screws for attaching the wires if preferred. Face dimension is the length. Prices are prepaid.

VOLTAMP BRUSHES are made of phosphor bronze spring sheet or wire gauze. Types A, AS, B, BS, BRS are flat strip, 3/16 inch wide; type J is three-ply flat strip, 1/4 inch wide; all others are woven wire gauze, rolled, compressed and die-formed to proper size. Types K and L are rectangular, size 3/16x1/2x1/2 in. Magnet Brush is forked. Prices are, per pair, prepaid.

BRUSH HOLDERS for types A, AS, B, BS and BRS are angular, width 3/16 inch. Type J is solid with spring slot to hold the brushes; types K and L are rectangular, inside dimensions 3/16x1/2x1/2 in., 1-32 in. wall; types C, D, E, F, G and H are tubular. Tubular and rectangular brush holders have spiral springs to hold the brush to good contact. All parts are nicked. Prices are, per pair, prepaid.

No packages sold less than 25 cents

MOTOR, DYNAMO AND MAGNETO PARTS

COMMUTATORS					BRUSHES			BRUSH HOLDERS		
Type	Style	Diam.	Face	Hole	Price	O.D.	Length	Price	I.D.	O.D.
A, AS, B	3 sect.	7/16 in.	7/16 in.	No. 29	\$.25		1 1/2 in.	\$.10		7/16 in.
BS, BRS	3 sect.	7/16 in.	7/16 in.	No. 29	.25		1 1/2 in.	.10		7/16 in.
C	3 sect.	7/16 in.	1/2 in.	No. 29	.25	3/16 in.	5/16 in.	.20	3/16 1/4 in.	3/4 in.
D	3 sect.	7/16 in.	7/16 in.	No. 18	.25	3/16 in.	5/16 in.	.20	3/16 1/4 in.	3/4 in.
E	3 sect.	7/16 in.	7/16 in.	No. 29	.25	3/16 in.	5/16 in.	.20	3/16 1/4 in.	3/4 in.
F	3 sect.	3/8 in.	3/8 in.	No. 18	.35	1/4 in.	7/16 in.	.30	1/4 5/16	11/16 in.
G, H	6 sect.	3/8 in.	11/16 in.	1/4 in.	.60	1/4 in.	7/16 in.	.30	1/4 5/16	11/16 in.
J	8 sect.	3/8 in.	11/16 in.	1/4 in.	.60	(See note P. 24)	1 in.	.20	(See note P. 24)	.50
K	8 sect.	3/8 in.	11/16 in.	1/4 in.	.60	(See note P. 24)	1 in.	.20	(See note P. 24)	.50
L	12 sect.	1 in.	1/2 in.	5/16 in.	1.00	(See note P. 24)	1 in.	.20	(See note P. 24)	.50
LM	24 sect.	1 in.	1/2 in.	5/16 in.	1.50	(See note P. 24)	1 in.	.20	(See note P. 24)	.50
Magnet						7/16 in.	1 1/2 in.	.20		

BEARINGS for types A, AS, B, BS, C, E and F are the Cross Bars over the Armature holes, with holes in the center to take the Shafts. The bearing holes of types BS, C, E and F are reinforced by Bushings (dimensions given under Bearings); BEARINGS for types D, G, J and K are extra long tubular Bushings, running through the pedestals and cross bars and through the YOKES or ROCKER-ARMS. The I. D. of all BEARINGS is identical with hole of same type COMMUTATOR. All parts nicked. Prices are per pair prepaid, complete with necessary screws.

ROCKER-ARMS are used on types D, G, H, J, K and L. Made to swing over the Bearings and have Arms to carry the Brush Holders. Prices are for single pieces prepaid.

CROSS BARS AND BEARINGS					ROCKER-ARMS				
CROSS BARS			BEARINGS		YOKES		ARMS		
Type	Thk.	Width	Lgth.	O.D. Lgth.	Price	Thk.	Width	Lgth.	O.D.
A, AS, B	3/32	5/16	1 7/16	1/4	9/32	\$.25			
BS, BRS	3/32	5/16	1 7/16	1/4	9/32	.35			
C, E	3/32	5/16	1 7/16	1/4	9/32	.40			
D	1/4	9/16	2 5/8	3/4	9/16	.20	5/32	9/16	1 1/2
F	1/4	9/16	2 5/8	3/4	9/16	.50			
G, H	7/16	7/8	7/16	7/8	7/16	.30	5/32	5/8	2 1/4
J	7/16	7/8	7/16	7/8	7/16	.30	5/32	5/8	2 1/4
K	7/16	7/8	7/16	7/8	7/16	.30	5/32	5/8	2 1/4
L	1/2	1 1/4	1 1/4	1 1/4	1 1/4	.40			
Magnet	1/16	1 1/2	1 1/2	1 1/2	1 1/2	.40			

FIELD FRAMES are machined, drilled and enameled, ready for winding. Dimensions of Magnet Pole only is given. Figures in column "length" show distance between the sides of the solid one-piece Fields and between upper and lower Fields of the two-piece type. For diameter of Armature bore add 3/32 inch (about) to diameter of same type Armature. (See above.) Figures in column "space" are the diameters of the winding space. Other dimensions are given in the description of the finished machines. No directions are furnished for winding. Prices are prepaid except where weights are given.

WIRES. Sizes and lengths same as used on respective finished machines. Armature Wires for J and Magnet are Double-Covered Silk. All other Wires are Double-Covered Cotton. Form-wound Fields for type G, price per set of two, \$1.00; for type H, per set of four, \$1.10; for type K, per set of two, \$1.25; for type L, per set of two, \$1.50; for type LM, per set of two, \$2.75. In price list of Field wires below, types G, H, K and L are for wire only—not wound. Prices of Wires are prepaid.

WOOD BASES. For sizes see various motor descriptions. "Drilled" Bases have holes and slots ready for use. "Plain" are without holes or slots. Prices are per pair prepaid.

BINDING POSTS. Length refers to central screw. Furnished in shorter sizes, or up to 1 1/4 inches, at same price. Prices are per pair prepaid.

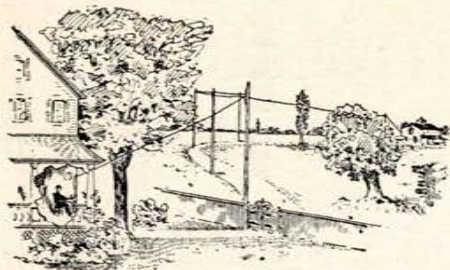
OIL CUPS. Type L is tubular, with cap, for wick feed. All others are hexagonal, open cups. Prices are per pair prepaid.

FIELD FRAMES				WIRES				WOOD BASES		BINDING POSTS		OIL CUPS	
Type	Diam.	Lgth.	Spa. Wt.	Price	Field	Arma.	Plain	Drill'd	Lgh.	Diam.	Price	Diam.	Price
A, AS	7/16	7/16	1 1/2	\$.50	\$.25	\$.15	\$.15	\$.25		in.		in.	
B, BS, BRS	3/4	1 3/16	1 1/2	.55	.25	.15	.15	.25		5/16	.10		
C	3/4	1 1/4	1 1/2	.75	.30	.15	.20	.35		3/8	.12		
D	3/4	1 1/4	1 1/2	1.75	.30	.20	.25	.40		3/8	.12	7/32	\$.12
E	3/4	1 1/4	1 1/2	1.25	.40	.15	.20	.35		3/8	.12		
F	3/4	1 1/4	1 1/2	2.00	.60	.25	.30	.50		3/8	.15		
G	1 1/8	2 1/2	3 1/2	4.00	.65	.25				3/8	.15	9/32	.15
H	1 1/8	2 1/2	3 1/2	4.50	.65	.25				3/8	.15	9/32	.15
J	1 1/8	2 1/2	3 1/2	2.25	.45	.35	.30	.50		3/8	.15	9/32	.15
K	1 1/8	2 1/2	3 1/2	4.00	.80	.30				3/8	.15	9/32	.15
L	1 1/8	2 1/2	3 1/2	5.50	1.25	.60	.40	.60		3/8	.15	1/2	.50
LM	1 1/8	2 1/2	3 1/2	5.50	2.25	1.35	.40	.60		3/8	.15	1/2	.50
Magnet				.50		.25	.15	.20					

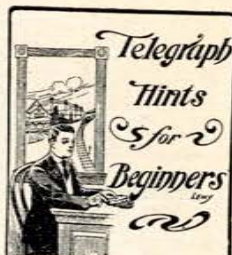
No packages sold less than 25 Cents

"TELEGRAPH HINTS FOR BEGINNERS"

Postpaid 15 Cents



LEARN
TELEGRAPHY
"It's Easy"

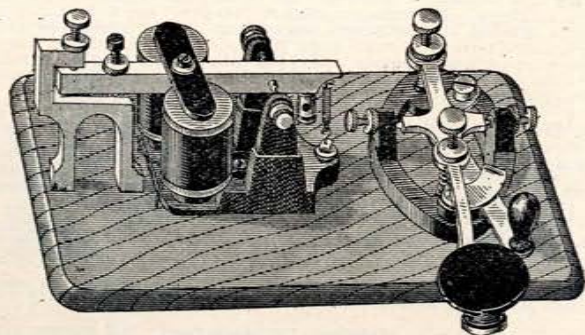


To learn Telegraphy is easy with this little book of hints to guide you. It is chock full of solid information, all told in the simplest style. In fact, it omits style and gets down to actual working suggestions at once.

Over 5000 sold in a short period tells a big story, and some of the comments of those who have used the book give a reason. One of our friends writes: "Your headline, 'Learn Telegraphy—It's Easy,' hits my case, for after only two weeks with your outfit and 'Telegraph Hints' I am communicating over the wire with a professional, and he calls me a wonder." Price 15 cents postpaid.

Sent free with every Voltamp Telegraph Instrument.

VOLTAMP TELEGRAPH INSTRUMENT

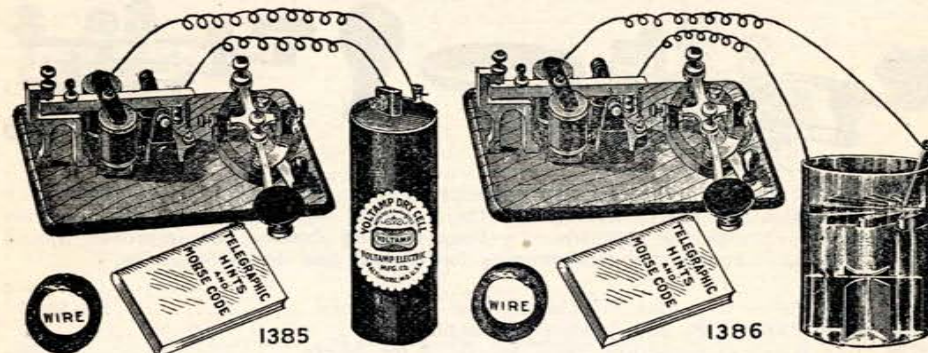


Voltamp Telegraph Instruments are used today by thousands of operators and are giving entire satisfaction. While we do not claim them to be the equal of the very high priced, they are nevertheless superior to the ordinary learners' instruments. It has a Giant Sounder, loud, clear and distinct, and a Solid Steel Lever Key, both set in solid Yoke and Trunnion castings—not in stamped frames. The Magnets are wound regularly and the Thumb Nut adjustments permit easy and positive locked adjustment. Hardened Platinsil Contacts only are used. Can be operated on short lines or on distances up to 10 miles.

Finished in Lacquered Brass and Enamel, neatly decorated and mounted on highly polished sounding board. Size 4½x7 in. Weight 1¾ lbs.

List No. 1397 5 Ohms, for lines up to 500 feet.....Price \$1.50. Prepaid, \$1.75
List No. 1398 20 Ohms, for lines up to 10 miles.....Price 1.75. Prepaid, 2.00

VOLTAMP TELEGRAPH SETS—Beginners' Outfits



The VOLTAMP Outfits are especially adapted to the needs of the beginner in Telegraphy and for operating short telegraph lines. At a small expense the student can set up an outfit exactly as illustrated and learn the code during leisure hours. After this, with a companion, put up a short line between two rooms or two homes, set up two outfits as shown in "Telegraph Hints," and the sending and receiving of messages can be practiced and quickly acquired.

The Outfits include the celebrated VOLTAMP TELEGRAPH INSTRUMENTS, a description of which is given on the opposite page, and "Telegraph Hints for Beginners," a book that has taught thousands and will instruct any boy or girl of average intelligence.

List No.	Price
1385 Outfit. No. 1397 Telegraph Instrument, 50 ft. No. 18 Bell Wire, one Dry Battery and a copy of "Telegraph Hints," with the Morse Code....	\$1.85
1386 Outfit. Same as No. 1385, with Gravity Battery instead of Dry Battery....	2.35
Two Sets No. 1385, for two operators.....	3.60
Two Sets No. 1386, for two operators.....	4.60

Any of the above outfits supplied with No. 1398 Instrument in place of No. 1397, for distances up to 10 miles, add 25 cents for each instrument.

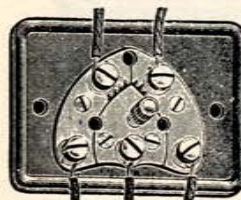
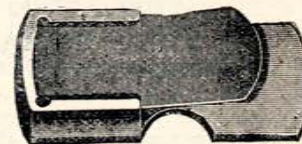
For student's practice the outfits with Dry Batteries answer all purposes. For Telegraph Lines over 50 feet the Gravity Battery is preferable. Full description, etc., given on page 36.

An outfit affords lots of entertainment and useful instruction.

SNAPPER SOUNDER

Imitates exactly the Telegraph Instrument. Makes a loud, sharp "click." Persons familiar with the Morse Alphabet can communicate with each other over a considerable distance.

List No. 1417.....Prepaid, each 10 cts., 3 for \$.25



LIGHTNING ARRESTER

Combination Peg Cut-Out, Lightning Arrester and Ground Wire Switch. Excellent for all short lines.

List No.	Prepaid
1544 Lightning Arrester.....	\$.55
1545 Extra Pegs, each.....	.10

For Heavy Outdoor Lines see Galvanized-Iron Wire on Page 90.

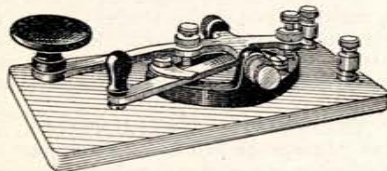
TELEGRAPH INSTRUMENTS, ETC.

STEEL LEVER KEYS



The Steel Lever Keys are preferred because they are lighter to the touch than brass, and constant use will not change their shape. Nicked Lever. Composition Rubber Knobs, Thumb Nut Adjustments, Brass-finished Frames and Improved Spring Holder. Beautiful and perfect instruments for use on fine desks or tables.

List No.		Prepaid
1399	Steel Lever Key, with top binding post connections.....	\$1.10
1400	Steel Lever Key, with bottom connections.....	.95
2020	Key Knob, Composition, diam. 1 1/4 in., 3 for 25 cts.....	.10
1765	Lever Knobs, Composition, 6 for 25 cts.....	.05



VOLTAMP TELEGRAPH KEY

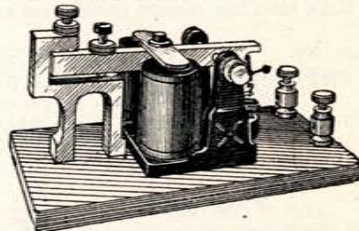
Well made. Solid Steel Lever Key and Thumb Nut adjustments. Hardened Platinil Contacts. Polished Wood Base.

List No.	Prepaid
1541	Mounted Telegraph Key.....\$.75

VOLTAMP TELEGRAPH SOUNDER

The very best made. Gives loud, clear and distinct sound. Beautifully finished in Brass and Enamel. Mounted on Polished Wood Base.

List No.	Prepaid
1542	Mounted Telegraph Sounder.....\$1.25



MECHANICAL TELEGRAPH KEY

For learning or teaching the Morse Alphabet by sound. Works exactly like the regular Telegraph Instrument, but requires no battery. Gives loud and clear "click." Finished in Enamel and Brass.

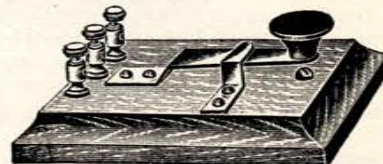
List No.	Prepaid
1543	Mechanical Telegraph Key.....\$1.00

A copy of "Telegraph Hints" with each of the above instruments.

STRAP SIGNAL KEYS

On neatly finished Wood Bases. Nos. 1924 and 1925 have two binding posts; No. 1926 has three.

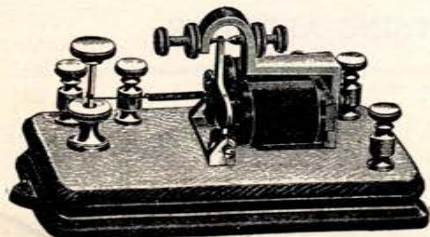
List No.	Prepaid
1924	Open Circuit, with 2 Binding Posts..\$.30
1925	Closed Circuit, with 2 Binding Posts.. .30
1926	Double Circuit, with 3 Binding Posts.. .35



VOLTAMP PONY RELAY

Has one-piece Armature and Lever. Well made and finely finished. Lacquered Brass parts. No. 1997 for lines up to 10 miles; No. 2099 for lines up to 50 miles.

List No.	Price	Postage
1996	Relay, 5 Ohms.....\$1.95	\$.25
1997	Relay, 20 Ohms..... 2.15	.25
2099	Relay, 75 Ohms..... 2.40	.25



VOLTAMP WIRELESS OUTFIT

The following outfit No. 2292 meets all the requirements of the beginner. We have supplied a number of them to students who have attained remarkable results. Designed for local distance work up to 1/4 mile. The outfit includes one each Transmitting and Receiving Set.

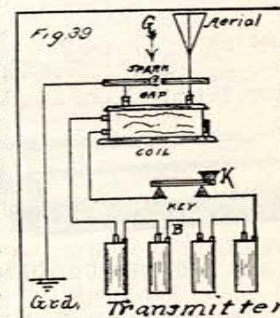
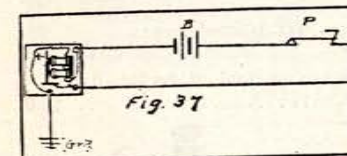
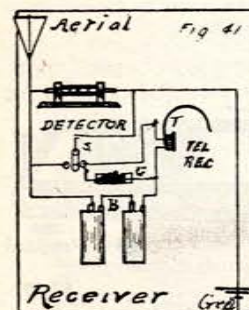
List No.	Price
2292	Wireless Telegraph Outfit.—No. 1737, 3/4 in. Induction Coil, No. 2250 Zinc Spark Gap, No. 1399 Key, No. 2254 Detector, No. 2264 Buzzer Test Outfit, No. 1423 Receiver, 3 ft. Cords, 2-point Switch, 2 Dry Cells.....\$11.00
2293	Wireless Telegraph Outfit.—For long distance up to 300 miles, with a 30-foot Aerial. No. 2263, 1 in. Induction Coil, No. 2251 Zinc Spark Gap with Helix, No. 1399 Key, No. 2257 Tuning Coil, No. 2259 Adjustable Condenser, No. 2264 Buzzer Test Outfit, No. 2261 Receiver and Cords, No. 2295 Silicon Detector and a 2-point Switch..... 30.00

Directions for Using

VOLTAMP WIRELESS TELEGRAPH OUTFIT

Connect up to the Induction Coil as shown in Fig. 39. The Battery and the Key are connected in series with the primary of the coil. The Spark Gap is connected across the secondary terminals. From one side of the Spark Gap a wire leads to the ground. The other side is connected to the aerial. By pressing Key K the current flows through the coil, causing the spark to jump across the gap at G.

Connect the Receiving Instruments as shown in Fig. 41. The Detector is connected to the Battery, B, with the Receiver, T, in series. The 2-point Switch, S, is



to short-circuit the Detector when sending, to prevent any damage to the detector. When the Switch, S, is on the left-hand point the Detector is short-circuited and the Battery is cut out; when on the right-hand point the Detector is ready for use. A Condenser, C, in multiple with the receiver increases the working range of the set.

To adjust the Detector after it is connected it is essential to have a Voltamp Buzzer Outfit, wired as shown in Fig. 37. By pressing on the Push, P, the Buzzer will sound, and when the Receiver is held to the ear a buzzing will be heard as soon as the Detector is properly adjusted. By altering the pressure on the granules in the glass tube with the thumb screws at the ends the proper position will be readily found.

STANDARD TUNED CIRCUIT WIRELESS DIAGRAMS

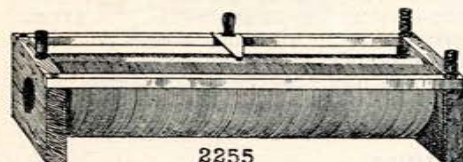
The following series of drawings show the practical science involved in Wireless Telegraphy. Each set of drawings is complete in itself and contains all the necessary data, with valuable side notes on operation and construction. With these drawings the amateur can successfully construct apparatus equal in efficiency to that in use at the Government stations:

Series	Postpaid
Series "A." Ten drawings of the latest Tuned Circuit Systems. Four Transmitting and Six Receiving Diagrams.....	\$.40
Series "B." Four diagrams of Wireless Telephone Circuits.....	.15
Series "C." Twelve drawings, with full details for construction of over thirty types of Tuned Circuit Apparatus. Companion set to Series "A".....	.75
Series "D." Twelve drawings, with complete details for construction of four sizes of Induction Coils for Tuned Circuit Transmitters. Most recent methods of coil makers.....	.75
Series "E." Six drawings, giving complete design of Transformer to reduce 110 volts A. C. to 10, 20, 30 and 40 volts, 60 cycles. Of value to every electrical experimenter.....	.40
Series "F." Ten drawings, giving complete details of a 2 K. W. Step-Up Transformer, to be used on 110-volt, 60 or 133-cycle A. C. Tuned Circuit Wireless Stations.....	.75
Series "G." Four recent drawings of Tuned Circuit Systems, with valuable notes on operation and testing of instruments.....	.15
Series "H." Ten blueprints, giving formula and data for calculating the wave length, frequency, capacity and inductance of Tuned Circuit Systems, with examples....	.50

VOLTAMP WIRELESS TELEGRAPH INSTRUMENTS

The instruments shown here are intended chiefly to assist the experimenter in the demonstration of the principles involved in Wireless Telegraphy. Made according to approved and successful designs, and will be found thoroughly reliable, highly sensitive and efficient.

For valuable information on this intensely interesting subject, given in simple language and fully illustrated, write to us for a copy of "The A B C of Wireless Telegraphy." Sent prepaid for \$1.00.



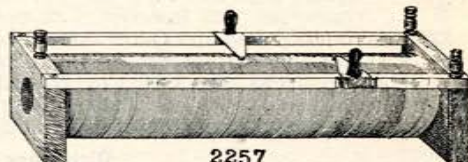
2255

POTENTIOMETER

Especially adapted for use with the Electrolytic Detectors. Made with resistance wire.

List

No.	Size	12x3x3 3/4 in.	Price	Post.
2255	Potentiometer, 300 ohms.	\$3.00	\$.40	



2257

TUNING COIL

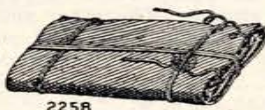
The best for experimental stations. Made for long-distance work. Used with adjustable Condenser, it has a range from 200 to 1500 meter wave lengths.

List

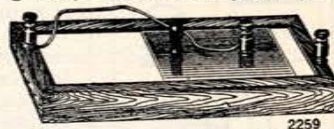
No.	Size	12x3x3 3/4 in.	Price	Post.
2257	Tuning Coil, Double Slide.	\$3.00	\$.40	



2253



2258



2259

List No. 2253 LEYDEN CONDENSERS. Efficient and will not give off brush discharges. Two tubes. \$1.00

2258 VOLTAMP FIXED CONDENSER. A valued assistant on all receiving outfits. Carefully made by a new process. For 3/4 in. spark or less. Capacity .002 Microfarads. .65

2266 Fixed Condenser, for 1 in. spark or less. Capacity .004 Microfarads. .75

2259 VOLTAMP ADJUSTABLE CONDENSER. A favorite instrument with many successful experimenters. Maximum capacity .005 Microfarads. Size 9x4x1 1/4 in. 1.60

VOLTAMP SPECIAL DETECTOR

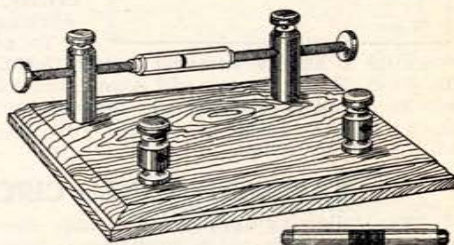
Made by a new process. This Detector will be found excellent for all local work. Every experimenter should have it. One extra glass tube, with material included. Size 4 1/2 x 3 1/4 x 2 1/4 in.

List No. Prepaid

2254 Voltamp Special Detector. \$1.25

2297 Extra Detector Material, per bottle. .25

2298 Extra Glass Tubes, 10 cts. each, 3 for. .25



2254

IMPROVED SILICON DETECTOR

By arrangement with the owners of the Silicon Patents we offer the Improved Silicon Detector, heretofore used only by the Government. We recommend this type for all long-distance work as the most sensitive Detector on the market. It will increase the efficiency of any outfit from 50 to 500%.

List No.

Prepaid

2295 Silicon Detector. \$10.00

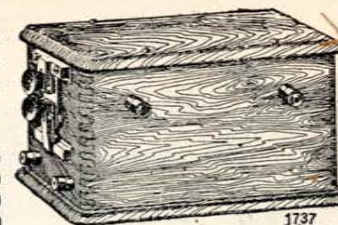


VOLTAMP WIRELESS INDUCTION COILS

Give a thick, heavy spark. Designed for Wireless Telegraphy, these coils will be found vastly superior to the ordinary coils used for automobile or X-ray work. Size 7 1/2 x 4 1/4 x 1 1/2 in. Weight packed 6 lbs.

List No.

No.	Wireless Coil, 3/4 in. spark.	Price
1737	Wireless Coil, 3/4 in. spark.	\$5.50
2263	Wireless Coil, 1 in. spark.	7.50
2294	Wireless Coil, 1 1/2 in. spark.	10.00



1737

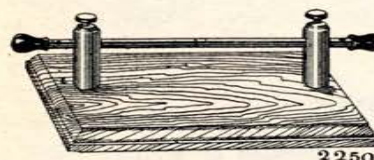
VOLTAMP ZINC SPARK GAP

Excellent for use with all transmitting outfits. Due to a peculiar property of Zinc, this gap gives a pure white spark, very desirable in this work. Size 4 1/2 x 3 1/4 x 2 1/4 in.

List No.

Prepaid

2250 Voltamp Zinc Spark Gap. \$1.00



2250

VOLTAMP SPARK GAP—with Sending Helix

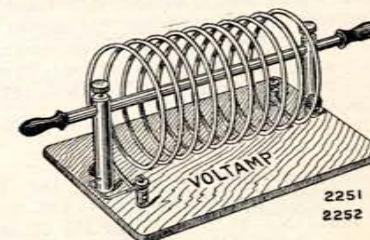
A combination of the above Zinc gap and suitable inductance. One of the best instruments made. Size 7 x 4 1/2 x 4 in.

List No.

Prepaid

2251 Zinc Spark Gap, with Sending Inductance Helix, 3 1/2 in. diameter. \$2.50

2252 Zinc Spark Gap, with Sending Inductance Helix, 5 in. diameter, size 9 x 5 1/4 x 5 3/4 in. 3.50



2251

2252

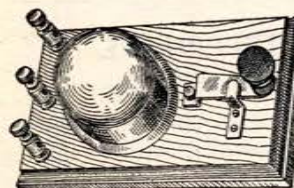
VOLTAMP BUZZER TESTING OUTFIT

Used to adjust and maintain the Detectors in sensitive condition. Size 5 1/2 x 3 1/2 x 2 1/4 in.

List No.

Prepaid

2264 Buzzer Testing Outfit. \$1.25



2264

VOLTAMP WIRELESS RECEIVERS

Especially wound for Wireless work with a new method Copper Wire—not German Silver. Extremely sensitive and highly efficient.

List No.

Prepaid

2260 Single Receiver, with Headband and Cords, about 200 ohms. \$3.50

2256 Single Receiver, with Headband and Cords, about 1,200 ohms. 5.00

2261 Double Receiver, with Headband and Cords, about 1,000 ohms. 8.00

2262 Double Receiver, with Headband and Cords, about 2,000 ohms. 10.00

For other Receivers see page 33.

List No.

Prepaid

2074 "GOLD" DIAPHRAGM. The latest device for increasing the range of any Receiver from 30% to 50%. Only .0055 in. thick. Diameter 2 in. Fits all our Receivers. \$.50



2260

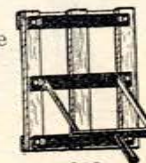
2261

2262

List No.

Price

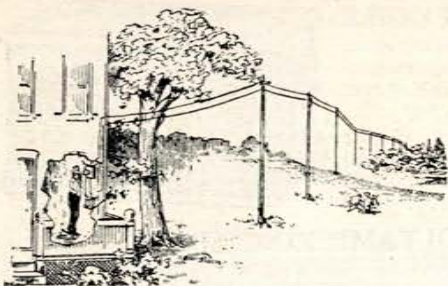
2296 HIGH POTENTIAL AERIAL SWITCH. Double Pole, Double Throw. Designed for Wireless Telegraph service. The metal parts and connecting terminals are mounted on hard rubber plates, backed by a polished hardwood frame. A sure protection against lightning. Size of base 10 1/2 x 14 in. Weight 3 lbs. \$3.50



2296

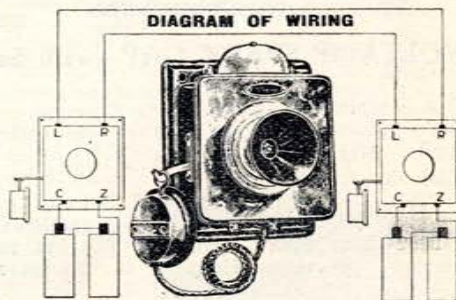
TELEPHONES

The Telephone is conceded to be the most useful invention of modern times, and, considering the low cost of installation, no home, hotel, apartment, office, store or factory should be without them. They will save many needless steps going from the living-room to the kitchen, from the house to the stable, from the store to the warehouse, or from the office to the factory. As easy to install as an electric bell and gives no trouble.



MIDGET TELEPHONES

A neat, compact, well-finished and reliable Telephone for interior or exterior lines up to 500 feet long. Fitted with Long-Distance Transmitter, Watchcase Receiver, enclosed Vibrating Bell and Nicked Push Button. Designed for two on a line only. Put up as in diagram, using No. 18 Bell Wire. Finished in Cabinet Oak.



List No.	Price
1418 Midget Telephones, per pair, weight packed 5 1/4 lbs.	\$5.00
1483 No. 18 Bell Wire, 155 ft to lb., per lb.	.35

VOLTAMP STANDARD TELEPHONE

The Leader of All Short-Distance Telephone Lines

This type of Telephone has been in use in our office and factories for years and gives no trouble. Has permanent magnets in the Receiver, Induction Coil, latest Bell type Transmitter, enclosed Vibrating Bell and Nicked Push Button. Put up as shown in the above diagram, using No. 18 Bell Wire. Finished in Cabinet Oak.

List No. 1419	VOLTAMP Standard Telephones, per pair, weight packed 8 lbs.	Price \$7.50
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VOLTAMP
"JUNIOR" TELEPHONES

EASY TO INSTALL

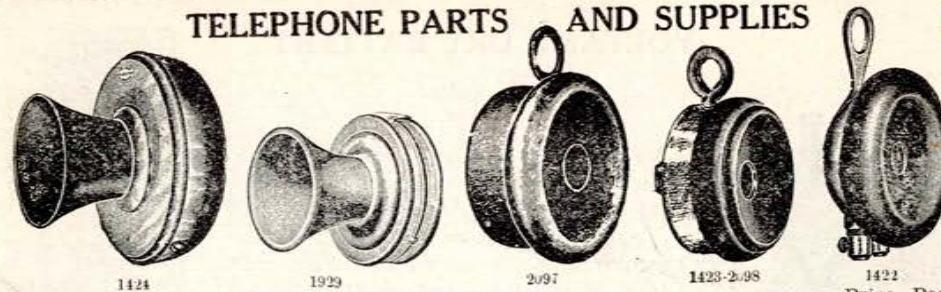
Not Toys, but Good Working Phones

Give excellent service up to 500 feet. Nothing to get out of order. Transmitter, Receiver, Buzzer and, in fact, the entire Phone is strictly high grade. Oak Cases. Outfit is complete with 100 ft. of wire, staples and 4 dry cells. Connect as in illustration.



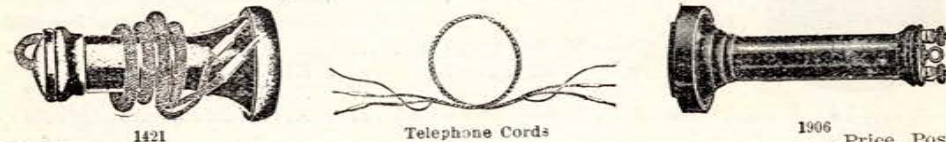
List No.	Price
1583 Junior Telephones, per pair, with 100 ft. wire and 4 dry cells, wt. pkd. 12 lbs.	\$5.00
1986 Junior Telephones, only, per pair, wt. pkd. 4 lbs.	4.00

TELEPHONE PARTS AND SUPPLIES



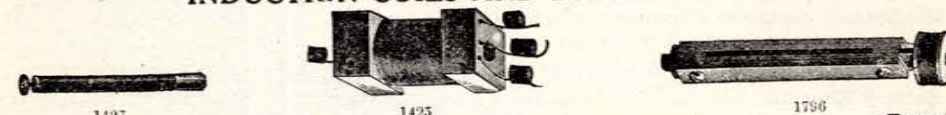
List No.	Price	Post.
1929 TRANSMITTER	Original Long-Distance type. Clear and defined in articulation. Can be placed on outside of case.	\$1.00 .08
1424 TRANSMITTER	Long-Distance Bell type. Articulates distinctly and plainly without variation.	1.25 .15
1422 RECEIVER	Single-Pole Watch Case. Resistance 75 ohms. Adjustment is positive and cannot change.	.55 .08
1423 RECEIVER	Double-Pole Watch Case. Resistance 75 ohms. Talks clearly and distinctly. Metal case.	.85 .08
2097 RECEIVER	"Solid" Double-Pole Watch Case. Resistance 85 ohms. Has permanent adjustment. Interior binding posts.	.90 .10
2098 RECEIVER	Double-Pole Watch Case. Metal Back. Resistance 75 ohms. A very good instrument, used on our No. 1583 Telephones. Metal case. With cord attached.	.65 .08

For Operator's Head-Band Receivers, see page 31.



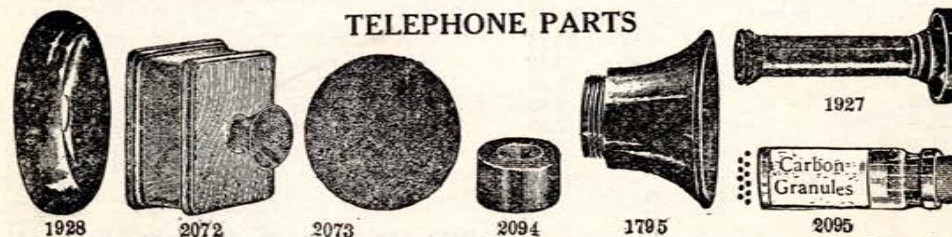
List No.	Price	Post.
1421 POSTLESS RECEIVER, Bipolar.	Resistance 85 ohms. Gives complete satisfaction. Supplied with cords.	\$1.00 .15
1906 STANDARD RECEIVER, Bipolar.	Resistance 85 ohms. No cords supplied.	1.00 .18
2083 TELEPHONE CORDS, 2 feet, Red and Black Cotton Cover.	Prepaid	.20
2084 TELEPHONE CORDS, 3 feet, Green Silk Cover.	Prepaid	.35
2085 TELEPHONE CORDS, 5 feet, Green Silk Cover.	Prepaid	.45
2096 TELEPHONE CORDS, 6 feet, Green Silk Cover, for Operator's Double Head Band.	Prepaid	.55

INDUCTION COILS AND BAR MAGNETS



List No.	Price	Post.
1427 TELEPHONE COIL, Resistance 75 ohms.	Prepaid	.55
1425 TELEPHONE COIL, Resistance 150 ohms.		.70
1708 TELEPHONE COIL, Resistance 250 ohms.		.90
1709 TELEPHONE COIL, Resistance 75 ohms. Best Magnet Steel.		.60
1796 COMPOUND BAR MAGNET, Resistance 75 ohms. Best Magnet Steel. Plated end.		.20
1427 BAR MAGNET, Permanent type. Best Steel. Plated end.		.30
2071 RESISTANCE SPOOL for No. 1427, wound 75 ohms.		

TELEPHONE PARTS



List No.	Price	Post.
2072 Transmitter Case only, with Mouth Piece. Same as used on our No. 1583 Telephones. Size 4 1/4 x 4 1/4 x 3 1/4 inches.	\$.75	\$.10
1928 Receiver Cap only.	.15	.03
1795 Mouth Piece.	.15	.03
2073 Ferrottype Transmitter and Receiver Diaphragm, diameter 2 inches.	\$.10	\$.02
2074 Gold Diaphragm, diam. 2 in.	.50	.02
1927 Receiver Shell.	.30	.08
2094 Carbon Cup for Transmitter	.15	.02
2095 Carbon for Transmitter.	.15	.02

VOLTAMP DRY BATTERY

1½ Volts.



Style X

The Voltamp Dry Cell is the result of extensive experimentation on the part of eminent electrical engineers, and is pronounced by the trade the most efficient and durable Dry Battery ever produced. It has a high voltage with a low internal resistance and excellent lasting qualities. Will stand up equal to any dry battery on the market on all open circuit work, bells, telephones, alarms, etc., and for lighting miniature lamps, running miniature motors and similar work.

Styles V and U are made with flat Fibre tops, on which the binding posts are mounted, making them convenient for many purposes where space is limited.



Styles U-V

List No.		Price	Prepaid
1314	Style X, size 2½x6 in.	\$.25	\$.59
1314	Style X only, per full dozen.	2.65	
1508	Style V, size 2x4½ in.	.25	.43
1509	Style U, size 1½x4 in.	.25	.36

SETS OF DRY CELLS IN CASES

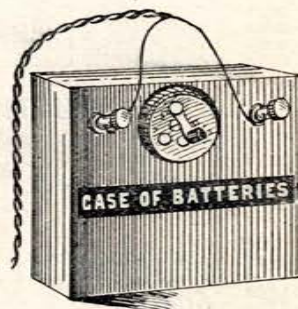
With Selecting Switches or Battery Rheostats

No Acids, No Mess

Dry and Clean

For Operating Miniature Motors, Railways, Lamps, Window Displays, etc.

Each case contains a number of Dry Cells connected ready for use, with a switch for selecting the desired number of cells and two binding posts to take the leading wires. A Battery Rheostat (see page 38) in place of a switch offers a capable means of controlling the current. It will prevent "burning out" of small lamps and will control the speed of miniature motors.



With Battery Rheostats

With Switches							With Battery Rheostats		Price
List No.	Cells	Speeds	Volts	Price	List No.				
1315	3	1	4½	\$1.15	1746	Case No. 1315, with Rheostat.			\$1.80
1316	4	2	3 & 6	1.40	1747	Case No. 1316, with Rheostat.			2.00
1317	6	2	4½ & 9	1.90	1748	Case No. 1317, with Rheostat.			2.50
1318	8	2	6 & 12	2.40	1749	Case No. 1318, with Rheostat.			3.00
1581	10	3	4½, 9 & 15	2.80	1582	Case No. 1581, with Rheostat.			3.40
1319	12	3	6, 12 & 18	3.25	1750	Case No. 1319, with Rheostat.			3.85

Weights Packed—Nos. 1315 or 1746, 19 lbs.; Nos. 1316 or 1747, 12 lbs.; Nos. 1317 or 1748, 20 lbs.; Nos. 1318 or 1749, 24 lbs.; Nos. 1581 or 1582, 27 lbs.; Nos. 1319 or 1750, 31 lbs.

POLARITY INDICATOR



When connected in circuit with a battery instantly indicates the positive and negative poles. Fits the vest pocket. Neat, durable and reliable.

List No. 1488, Polarity Indicator, for Batteries only.....Prepaid, \$.90

VOLTAMP STORAGE BATTERY

For Running Miniature Railways, Small Electric Motors, Miniature Incandescent Lamps, etc.



Clean, Convenient, Powerful, Reliable and Economical. Can be recharged from a Small Dynamo or on Direct Lighting Current.

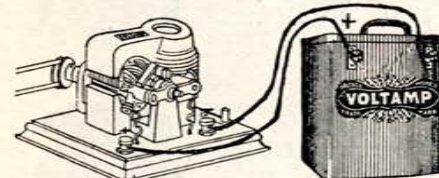
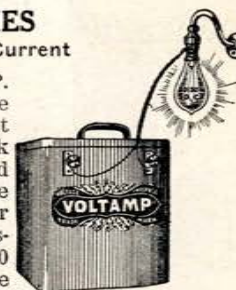
The 4-Volt 10-Hour will burn a set of eight 3½ or 4 Volt Lamps in multiple for 4 hours; the 4-Volt 25-Hour will do the same work for 10 to 12 hours. The 6-Volt 25-Hour will run a VOLTAMP Trolley or Interurban Car, Mining or Suburban Engine or a No. 2220 Locomotive for 25 hours. For other Locomotives the 8-Volt 25-Hour or 10-Volt 25-Hour will run from 25 to 30 hours.

List						List					
No.	Volts	Hours	Size	Wt. Pk.	Price	No.	Volts	Hours	Size	Wt. Pk.	Price
1321	4	10	5x5x7	12 lbs.	\$3.50	1325	6	25	9½x5 x7	32 lbs.	\$8.25
1322	6	10	7x5x7	16 lbs.	4.75	1326	2	50	7½x5½x8¾	24 lbs.	5.75
1323	2	25	4x5x8	12 lbs.	3.75	1327	4	50	13 x5½x8¾	42 lbs.	11.75
1324	4	25	7x5x7	25 lbs.	5.75	1335	6	50	18 x5½x8¾	60 lbs.	17.50
List No.											
2060	Glass Jar for 10-hour Storage Battery.....									Price	Post.
2061	Glass Jar for 25-hour Storage Battery.....									.25	.10
										.35	.15

CHARGING STORAGE BATTERIES

From the Direct (not Alternating) Lighting Current

Insert a charging plug in a lamp socket and screw a 50 C. P. lamp in the plug. Find the negative and positive ends of the cord by placing them on a wet piece of red litmus paper about one-quarter inch apart. The negative wire makes a blue mark and must be connected to the negative post of the battery, marked —. The other wire is positive and must be connected to the positive post of the battery, marked +. For charging the larger batteries use as many lamps connected in "parallel" as are necessary to get the normal charging rate of the battery. With a 50 C. P. lamp, taking 1½ amperes, the "6-25" battery will be charged in 15 hours. The battery is fully charged when the liquid

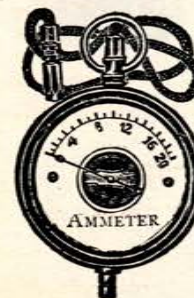


"gases" and has a "milky" or "boiling" appearance. Do not allow a battery to remain discharged longer than two weeks. Either recharge it or throw out the electrolyte and wash clean.

The liquid or "Electrolyte" in Storage Batteries is made by pouring one part (by volume) of Sulphuric Acid into four parts of distilled or rain water.

List No.		Prepaid
1846	Charging Plug (see No. 1846 on page 70).....	\$.65
1761	50 C. P. 110-Volt Lamp.....	.75
1762	100 C. P. 110-Volt Lamp.....	1.50

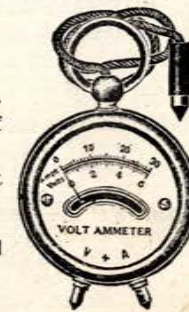
VOLTAMP POCKET METERS



About the size of a watch and as carefully made. Scale of Ammeter 0 to 30 Amperes. Scale of Volt-Ammeter 0 to 6 Volts, 0 to 30 Amperes.

Each one complete with flexible cord and neat leather pocket case.

List No.		Prepaid
1540	Pocket Ammeter.....	\$2.50
1381	Volt-Ammeter.....	4.75



VOLTAMP FULLER BATTERY

For Closed Circuit Work



1329

2 Volts. This Battery has proven very satisfactory for operating Small Motors, Miniature Lamps, Electric Railways, Telephones and for all work where a constant current is required, such as Electroplating, etc. They are easy to set up and will stand several months without attention. When exhausted they can be quickly recharged at home at small cost. Weight 12 lbs. Weight packed 20 lbs.

A series of three cells will operate a Trolley Car and a set of five will run a Locomotive 30 to 50 hours, or two cells will light eight 4-Volt 1 C. P. Lamps 10 to 12 hours on a charge. No mercury supplied with Battery.



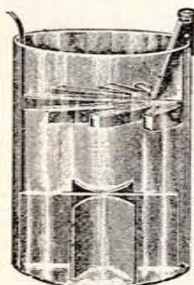
1328

List No.	Renewal Parts	Price	List No.	Renewal Parts	Price	Post.
1328	Fuller Battery, 6x8 complete, CHROMOTASH and Directions.....	\$1.50	1908	CHROMOTASH.....	\$.25	\$.16
	Fuller Battery, 6x8 per six, weight packed about 100 lbs.....	8.00	1910	Porous Cup.....	.20	.10
1329	Heavy Daniell Zincs.....	\$.35	1912	Cover.....	.10	.02
1909	Glass Jar, 6x8 in.....	.25				
1911	Fuller Carbon.....	.45				
1331	Mercury, Filtered, per oz., prepaid, 12 cts.; 4 ozs., prepaid, 45 cts.					

"CROWFOOT" GRAVITY BATTERY

For Closed Circuit Work. 1 Volt.

For Telegraph Line work these Batteries are best because of their constancy of current. Not recommended for Lamp or Motor work. A full description and directions are given in "Telegraph Hints."



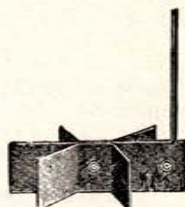
List No.	Price
1401	Gravity Battery, 6x8 complete, wt. pkd. about 16 lbs..... \$.75
	Gravity Battery, 6x8, per six, wt. pkd. about 80 lbs..... 4.00

Renewal Parts

List No.	Price
1401	Blue Stone, per lb. (post. 18 cts.)... .15
1402	Coppers, each (post. 3 cts.)..... .12
1404	Zincs, 3 lbs., heavy..... .35
1913	Glass Jars..... .25

VOLTAMP CARBON BATTERY

1½ Volts. Excellent for all Open Circuit work, Bells, Burglar Alarms, Door Trips, etc. Not suitable for Miniature Lamp, Motor or Railway work. When exhausted it can be quickly renewed to its full strength by thoroughly washing the carbon cylinder in warm water and then returning it to the jar in a fresh solution of Sal Ammoniac. Use only Amalgamated Pure Zinc Rods. Weight 3½ lbs. Weight packed 6 lbs.



1403



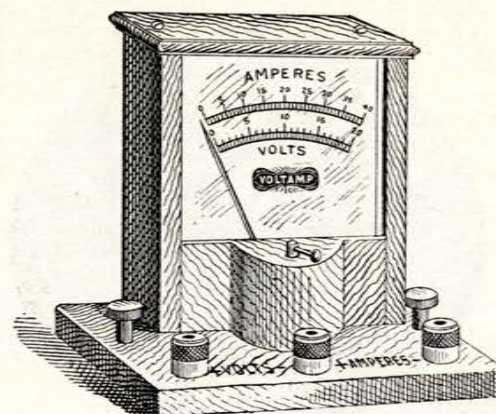
1404



1428

List No.	Price	Postage
1428	Carbon Cylinder Battery, complete (by Express only).....	\$.30
Renewal Parts		
1429	Pure Zinc Rods, Amalgamated, each.....	.05 \$.03
	Pure Zinc Rods, Amalgamated, per six.....	.25 .15
1430	Sal Ammoniac, 99% pure, per charge.....	.05 .04
1931	Sal Ammoniac, 99% pure, per lb.....	.15 .16
	Sal Ammoniac, 99% pure, per 25 lbs., per lb.....	.12
1914	Glass Jar only.....	.12
1915	Carbon Cylinder only.....	.15

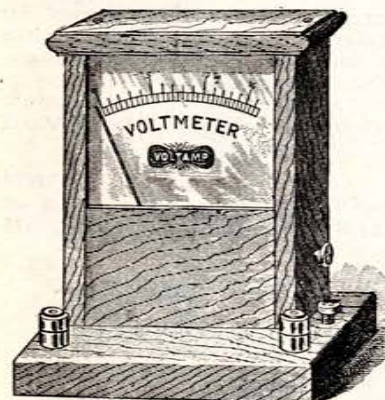
VOLTAMP VOLT-AMMETER



Every beginner and student in Electricity should know what current he is using, and his Meters should read true. Voltamp Meters are surprisingly accurate. These instruments are intended for measuring the Voltage and the Amperage of currents, and each instrument is adjusted to standardized apparatus.

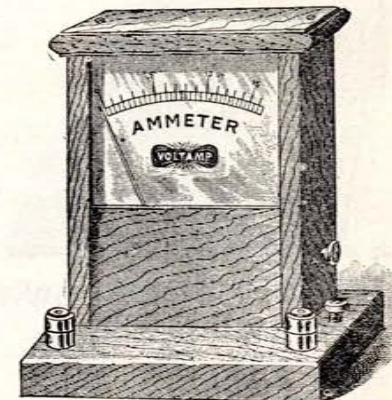
They are well made throughout, especial attention being paid to the magnets, which are of the very best steel for such work. The axle points are carefully tempered, insuring good wear. With very little care Voltamp Meters will last many years and will register accurately for all practical purposes.

VOLTMETER



Scale, 0 to 16 Volts.

AMMETER



Scale, 0 to 16 Amperes.

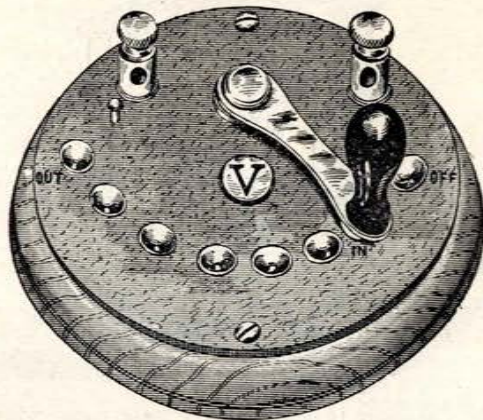
Volt-Ammeters are usually preferred, as they offer both measurements in one case and have larger reading scales. 0 to 20 Volts and 0 to 40 Amperes. For Voltmeter use posts 1 and 2; post 1 is positive and post 2 negative. For Ammeter use posts 2 and 3; post 2 is positive and post 3 is negative.

Note.—A Voltmeter only should be used for testing Storage Batteries. When taking Ampere readings of Storage Batteries heavy wires should be used and contact must be of short duration.

List No.	Prepaid
1359	Volt-Ammeter, Base 3½x6 in., Height 6 in., Weight packed 1½ lbs..... \$3.50
1378	Voltmeter, Base 3½x6 in., Height 6 in., Weight packed 1½ lbs..... 1.85
1379	Ammeter, Base 3½x6 in., Height 6 in., Weight packed 1½ lbs..... 1.85

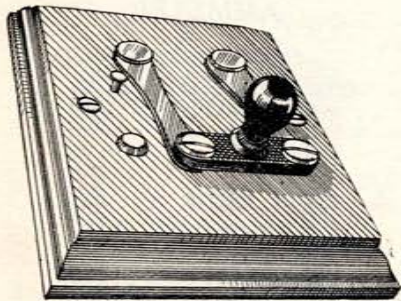
A copy of "MOTOR HINTS" is sent with each Meter

VOLTAMP BATTERY RHEOSTAT



Very useful for controlling the speed of small Motors and Miniature Railways; also for regulating the brilliancy of small Battery Lamps, thereby obviating the danger of burning out. About 5 ohms resistance is interposed in the series of eight points. Neatly finished wood base with nickeled parts. Size $3\frac{1}{4}$ in. diameter.

List No. 1332, Battery Rheostat.....Prepaid, \$.75



VOLTAMP REVERSING SWITCH

Used in connection with a battery current for reversing the polarity. With a Reversing Switch in the circuit a Motor can be run in either direction at will without changing the belt.

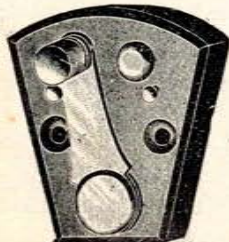
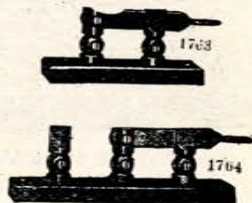
Convenient and practical. Has Nickeled Levers and Points, and mounted on either Polished Wood or Hard Rubber Base, $3\frac{1}{4} \times 3\frac{1}{2}$ in.

List No. Prepaid
1333 Reversing Switch, Wood Base.....\$.40
1504 Reversing Switch, Hard Rubber Base. .75

BATTERY SWITCHES

Best for Gas or Gasoline Engines. A good Switch for other purposes. Fibre Bases, with heavy Copper Knife Switch Contacts.

List No. Prepaid.
1763 Single Throw, $5/16 \times 1 \times 2\frac{3}{4}$ in.....\$.25
1764 Double Throw, $5/16 \times 1 \times 4$ in......35



KEYSTONE SWITCHES

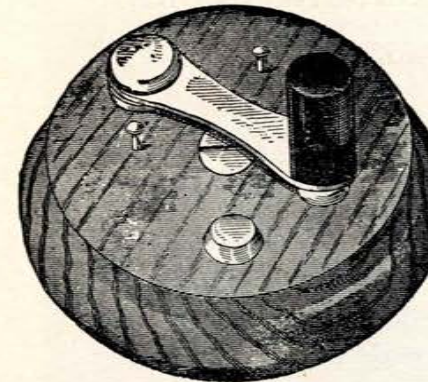
Polished Hard Rubber Bases and Nickeled Parts

List No. Prepaid
1533 1 point.....\$.35
1534 2 points......40
1535 3 points......45

Switches of any style not listed made to order.

VOLTAMP WOOD BASE SWITCHES

Nickeled Levers and Points. Polished Wood Bases. In Ash, Oak, Maple, Stained Cherry and Stained Walnut.



Actual Size, 1-2-3-4-5 Point.

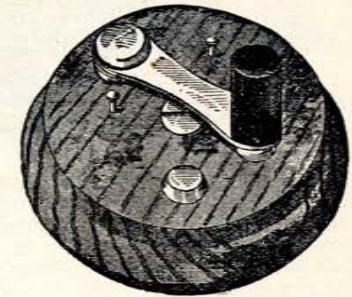
VOLTAMP WOOD BASE SWITCHES

Midget Size

List No.	Points.	Diam.	Each.	Doz.
1464	1 point.	$1\frac{1}{8}$ in.	Prepaid. \$.10	\$1.00
1465	2 point.	$1\frac{1}{8}$ in.	Prepaid. .12	1.25

HARD RUBBER BASES

For Round Switches with HARD RUBBER BASES add 50 cts. to each price up to and including 4 points, and 75 cts. for 5 points and over.



Actual Size—Midget.

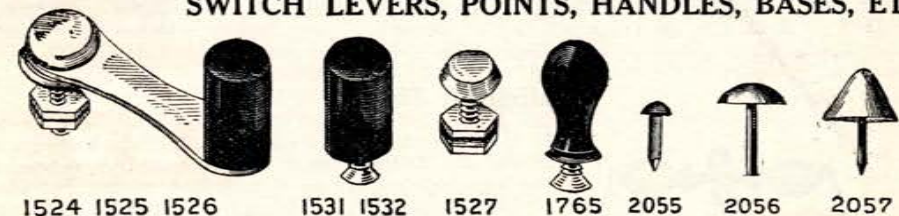
RECTANGULAR WOOD BASE SWITCHES

List No.	Points.	Size.	Each.	Dozen.
1516	1 point.	$1\frac{1}{2} \times 2$ in.	Prepaid. \$.10	\$1.00
1517	2 point.	$1\frac{1}{2} \times 2$ in.	.12	1.25
1518	1 point.	$1\frac{1}{2} \times 2\frac{1}{2}$ in.	.10	1.00
1519	2 point.	$1\frac{1}{2} \times 2\frac{1}{2}$ in.	.12	1.25

RECTANGULAR HARD RUBBER BASE SWITCHES

List No.	Points.	Size.	Each	Prepaid
1520	1 point.	$1\frac{1}{2} \times 2$ in.		\$.60
1521	2 point.	$1\frac{1}{2} \times 2$ in.		.65
1522	1 point.	$1\frac{1}{2} \times 2\frac{1}{2}$ in.		.70
1523	2 point.	$1\frac{1}{2} \times 2\frac{1}{2}$ in.		.75

SWITCH LEVERS, POINTS, HANDLES, BASES, ETC.

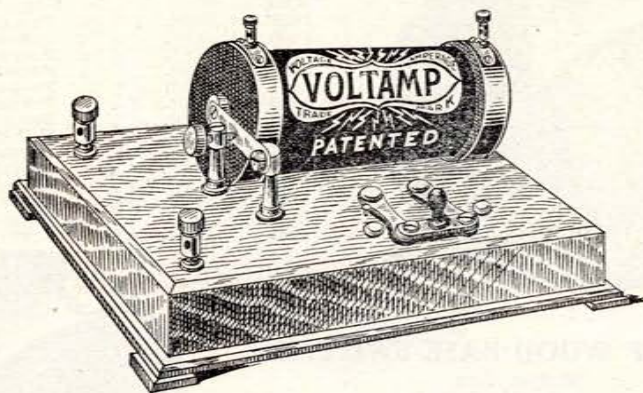


List No.	Description	Each.	Dozen.
1524	Small Lever, $\frac{3}{8} \times 1\frac{1}{2}$ in., used on No. 1464, with Post, Washer and 2 Nuts.	Prepaid. \$.05	\$.50
1525	Medium Lever, $7/16 \times 1\frac{1}{2}$ in., used on No. 1452, with Post, Washer and 2 Nuts	.06	.60
1526	Large Lever, $15/32 \times 1\frac{1}{2}$ in., used on No. 1332, with Post, Washer and 2 Nuts	.08	.85
1527	Contact Points, $5/16 \times \frac{3}{8}$ in.	.03	.25
1528	Polished Round Wood Base, $1\frac{7}{8}$ in. diameter.	.05	.50
1529	Polished Round Wood Base, $2\frac{3}{8}$ in. diameter.	.05	.55
1530	Polished Round Wood Base, $3\frac{3}{8}$ in. diameter.	.07	.75
1531	Lever Handles, with 4-36 Screws, small, $5/16 \times 7/16$ in., 4 for.		.10
1532	Lever Handles, with 6-32 Screws, large, $\frac{3}{8} \times 7/16$ in., 4 for.		.10
1765	Lever Handles, with 8-32 Screws, used on No. 1332, $7/16 \times \frac{3}{4}$ in., 3 for.		.10

No. 2055, per 25, 6 cts.; No. 2056, per 25, 10 cts.; No. 2057, per 25, 12 cts.
No orders accepted for less than 25 cts. Not less than 12 at dozen price.

VOLTAMP RUHKORFF INDUCTION COILS

HIGH TENSION SPARK COILS

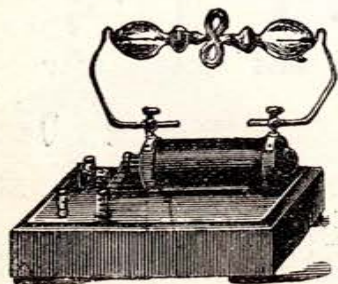


Used in mines for blasting; in manufacturing to ignite gas, gas or gasoline engines; for the production of ozone, to obtain high-frequency and X-Ray currents and for charging Leyden Jars; in wireless telegraphy for the production of Herzian waves. In experimental work their use in connection with Geissler Tubes is the most important and startling, showing the wonderful power of the high-tension coil in vacuum and in rarified gas.

The Coils listed below are our own make, superior in every way, each one fully measuring up to its rated output. Mounted on polished wood case stands, containing the Condensers, complete with perfect Vibrators, Platinum Contacts, Binding Posts for attaching battery and Binding Posts from which the secondary current is taken. No. 1406 has a Switch for turning the current on and off; all others are fitted with Pole-Changing Switch for changing the direction of the current flow and for turning the current on and off. A pair of loop end wires is supplied for experimental work. Voltages given below can be increased 50 per cent. without injury to the coils. Higher voltage gives longer spark.

List No.	Spark	Battery	Will Light	Weight	Wt. Pkd.	Prepaid
1406	1/4 in.	3 Volts.	4 Burners.	14 ozs.	18 ozs.	\$3.00
1407	1/4 in.	4 Volts.	5 Burners.	18 ozs.	28 ozs.	4.00
1408	3/8 in.	5 Volts.	6 Burners.	25 ozs.	35 ozs.	5.50
1409	1/2 in.	6 Volts.	9 Burners.	35 ozs.	50 ozs.	7.50
1410	3/4 in.	8 Volts.	15 Burners.	4 1/4 lbs.	7 lbs.	12.00
1411	1 in.	10 Volts.	18 Burners.	6 1/2 lbs.	10 lbs.	15.00

GEISSLER TUBES

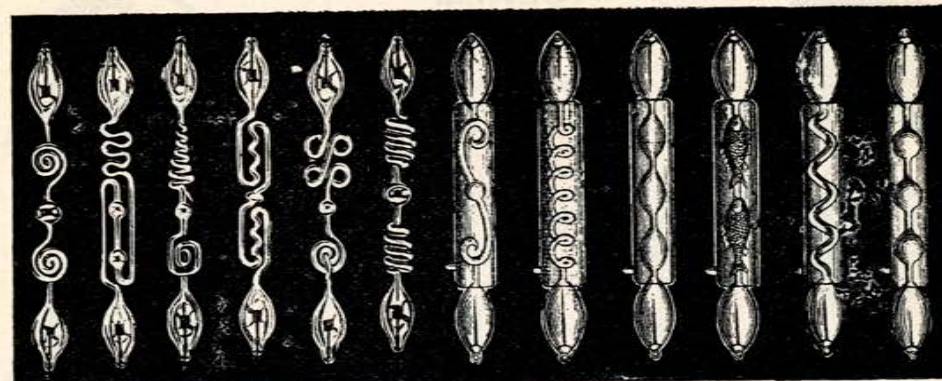


The Geissler Tube in Action

To fully appreciate the beautiful effects produced with a GEISSLER TUBE it must be seen in action, especially if the experiments are in a darkened room. The color effects are wonderful and beyond description. The tubes are made in many different patterns of special glass containing fluorescent salts, and are filled with various gases as the air is forced from them. The more expensive tubes are filled with fluorescent liquids of various colors to further enhance their brilliancy. When the terminals are connected with a high-tension current the tube becomes brilliantly luminant.

GEISSLER TUBES can be used with any of our Ruhmkorff or Jump Spark Coils; the longer the spark, naturally the higher the tension of the current, with a consequent higher brilliancy in the tube.

GEISSLER TUBES



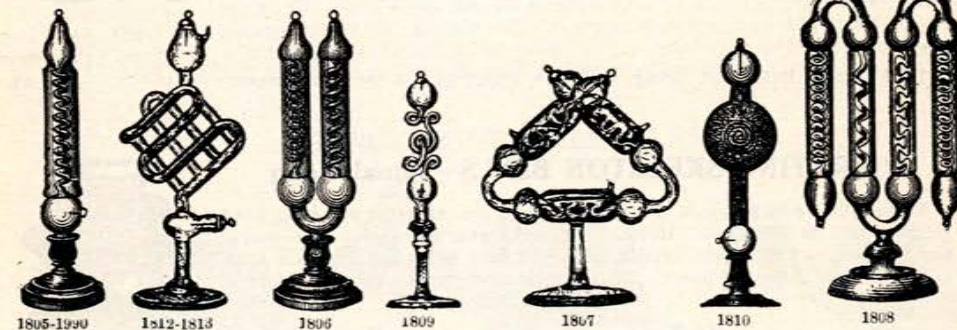
PLAIN

FLUORESCENT

We are direct importers of Geissler Tubes and keep a large assortment in stock. Each is carefully examined and tested and **guaranteed perfect when shipped**. There are several cheaper qualities to be had, but we do not list them, as they are altogether unreliable.

The lengths of Geissler Tubes will vary slightly and the sizes given are approximate. Remember the prices are for prepaid packages.

List No.	Length	Style	Prepaid	List No.	Length	Style	Prepaid
1797	4 in.	Plain	\$.45	1801	4 1/2 in.	Fluorescent	\$.65
1798	6 in.	Plain	.65	1802	6 in.	Fluorescent	1.00
1799	7 1/2 in.	Plain	.85	1803	7 1/2 in.	Fluorescent	1.25
1800	9 1/2 in.	Plain	1.00	1804	10 1/2 in.	Fluorescent	1.50

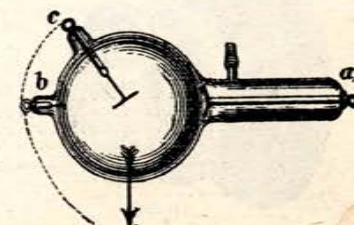


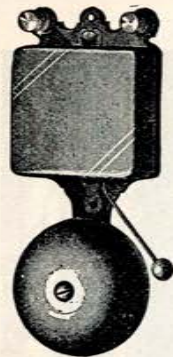
List No.	Length	Plain	Prepaid	List No.	Length	Fluorescent	Prepaid
1805	7 in.	Single Tube	\$1.25	1990	7 in.	Single Tube	\$1.50
1809	7 in.	Twist Tube	1.25	1806	7 in.	Two Tubes	2.00
1811	7 in.	Longitudinal	1.25	1807	7 in.	Three Tubes	2.75
1812	7 in.	Criss Cross	2.00	1808	7 in.	Four Tubes	3.25
1813	10 in.	Criss Cross	3.00	1810	7 in.	Bulb Tube	2.00

X-RAY TUBES

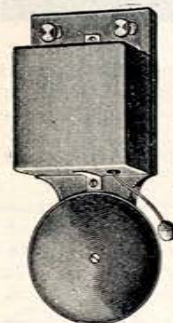
For experimental work in connection with our Jump Spark or Ruhmkorff Coils, to show the wonderful power of the Röntgen or X-Rays. The Cathode Mirror is in the long end (a), while the two Anodes are opposite (b, c). The X-Rays come in the direction pointed by the arrow.

List No.	Price	Postage
2247 X-Ray Tube, diam. 1 1/4 in....	\$2.75	\$.15
2248 X-Ray Tube, diam. 2 in....	3.50	.20
2249 X-Ray Tube, diam. 4 in....	5.00	.25





1436-7-8



1439

VOLTAMP ELECTRIC CALL BELLS

VOLTAMP BELLS and BUZZERS are carefully made and possess many distinct superior features. The Armature is pivoted and has lock-nut adjustment, absolutely securing the tension when set. All magnet cores have copper centers in the ends to keep the armature from sticking. The binding posts and all other parts cannot work loose. They can be adjusted for one battery or more. Finished in enamel and polished nickeled parts.

The Round Form Bell has all its working parts concealed and protected. Neat, compact and most reliable.

List No.		Price	Postage
1436	2½ in. Iron Box Bell..	\$.30	\$.14
1437	3 in. Iron Box Bell..	.35	.15
1438	4 in. Iron Box Bell..	.45	.18
1439	2½ in. Wood Box Bell..	.45	.14
1440	3 in. Wood Box Bell..	.50	.15
1441	4 in. Wood Box Bell..	.60	.18
1442	2½ in. Iron Box Buzz..	.30	.10
1757	1½ in. Pocket Buzzer, Nickeled.....	.35	.03
1451	No. 1757 on Pol. Base..	.45	.05
1590	3 in. Round Form Bell..	.50	.18

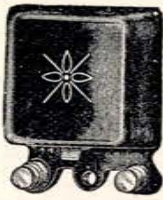


1590



1757

1451



1442

List No.

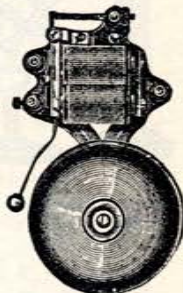
1672 Pony Bell, 1-in. Gong, full size 1½x3 in. A perfect ringer.....\$.90

Prepaid

VIBRATING SKELETON BELLS—Signal Gong

Unexcelled for Schools, Factories and Fire Alarms where a loud ringing bell is required. Reliable, Simple and Durable. The working parts are well made, easily adjusted and held fast by lock nuts which cannot become loose. Will operate on two or more batteries.

List No.	Wt. Pkd.	Price	Postage
1587	2½ in. Gong, 1½ lbs.....	\$.90	\$.26
1445	4 in. Gong, 2 lbs.....	1.20	.32
1446	5 in. Gong, 3½ lbs.....	1.45	.55
1447	6 in. Gong, 4 lbs.....	1.65	.64
1448	8 in. Gong, 8 lbs.....	2.60	

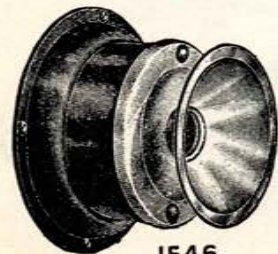


1587

THE ELECTRIC WHISTLE

The new Call Signal. Has loud, clear, musical sound that penetrates and can be heard at longer distance than the usual bell.

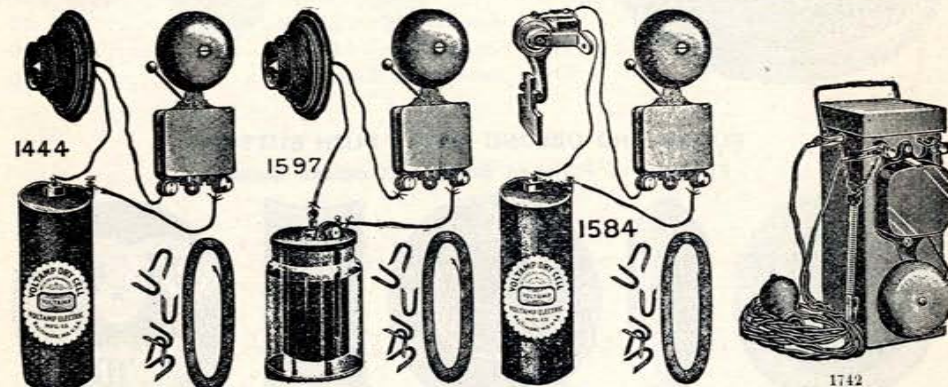
List No. 1546 Electric Whistle..... Prepaid, \$1.00



1546

VOLTAMP CALL-BELL OUTFITS

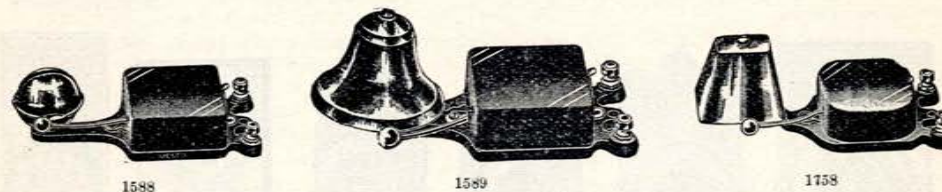
These equipments have been in use so long and with such complete satisfaction that they require no introductory words. Other combinations can be made, using any Bell, Push or Battery, or more wire can be added at the prices given with each on the different pages. Each of the outfits illustrated contains 50 ft. No. 18 Annunciator Wire and enough staples for putting it up. Outfit No. 1584 placed on a door jamb will sound an alarm when the door is opened, but the bell will not ring after the door has passed the trip or when the door is closing.



List No.

List No.		Wt. Pkd.	Price
1444	Outfit as illustrated, with one No. 1314 Dry Battery.....	3½ lbs.	\$.80
1595	Same at Outfit No. 1444, with Metal Push No. 1468 or 1897..	3½ lbs.	.90
1596	Same as Outfit No. 1444, with No. 1590 Bell.....	3¾ lbs.	1.00
1597	Outfit as illustrated, with one No. 1428 Carbon Battery.....	6½ lbs.	.90
1584	Outfit as illustrated, with No. 1701 Trip.....	3½ lbs.	.90
1742	Portable Bell Outfit, with 12 ft. Double Cord and Pear Push..	3½ lbs.	1.25

FANCY GONG CALL-BELLS



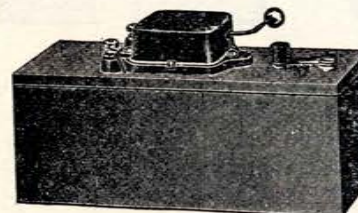
List No.

List No.		Price	Postage
1588	1½ in. Sleigh Bell, Iron Box.....	\$.55	\$.14
1589	2¾ in. Tea Bell, Iron Box.....	.55	.14
1758	1½x2 in. Rectangular Bell, Iron Box.....	.55	.14

ELECTRIC WINDOW-TAPPER

A good method of attracting attention to an object or to a window display. The tapper is placed so that the ball of the clapper just touches the glass. A dry battery is contained in the wood case, and when the switch is turned on a continuous tapping follows that will last until the switch is turned off. Weight 3½ lbs.

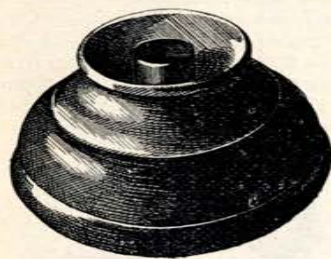
List No. 1697.....Price \$1.10



1697

VOLTAMP PUSH BUTTONS

Wood Push Buttons

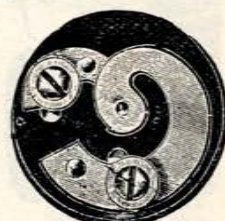
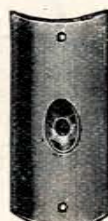
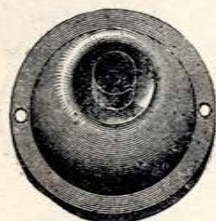


Artistically shaped and finely finished in Walnut, Oak, Cherry, Mahogany and Birch.

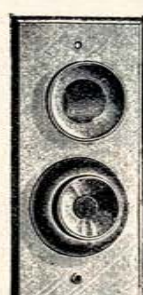
List No.	Diam.	Prepaid
1466	Standard Size, 2 1/8 in., each.....	\$.10
1467	Small Size, 1 3/4 in., each.....	.10
1792	Knobs, per four.....	.10

ROUND AND OBLONG METAL PUSH BUTTONS

Finished in Polished Brass or Oxidized Copper



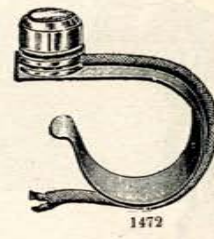
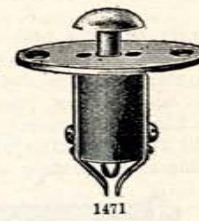
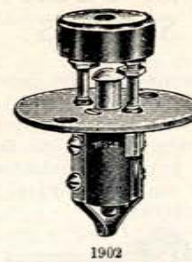
List No.		Prepaid
1468	2 1/2 in. Round—Smooth Brass.....	\$.15
1897	2 1/2 in. Round—Fancy.....	.15
1898	1 3/4 x 3 in. Curved for 1 1/4 in. Bead, Cast Brass.....	.35
1899	1 3/4 x 3 in. Curved for 1 1/4 in. Bead, Cast Brass.....	.35
1794	Fibre Push Button Backs, with screws.....	.07
1793	Push Button Springs, per pair.....	.05
1792	Knobs, per four.....	.10



List No.		Prepaid	List No.		Prepaid
1469	2 x 4 in. Smooth.....	\$.30	1503	2 x 4 in. Oval.....	.30
2018	1 3/4 x 4 in. Smooth.....	.30	1900	2 x 4 in. Oval Fancy....	.30
1502	2 x 4 in. Ornamental.....	.30	1901	2 5/8 x 5 3/4 in. Polished Cast..	.65
1904	1 3/4 x 4 in. Ornamental.....	.30		Brass, with Mouthpiece....	

Any of the Above in Polished Nickel-Plated Finish, 25 Cents Extra

VOLTAMP PUSH BUTTONS



List No.		Prepaid
1470	Desk Push, Nickeled.....	\$.20
1495	Pear Push.....	.20
1471	Floor Push, Nickeled.....	.30
1472	Table Clamp Push, Nickeled.....	.35
1902	Combination Foot Push; can be used as Foot Push or in connection with Nos. 1470-1472.....	.35
2068	Top Contact Plug only of No. 1902.....	.10
1903	6 ft. Silk Two-Conductor Cord, for use with any of the above.....	.25
	Extra Cord, per ft.....	.05

ANNUNCIATORS AND OUTFITS

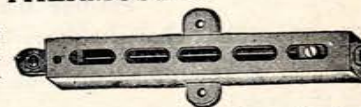
These outfits are easy to install. Very useful in stores, factories or private residences for calling help. Annunciators are well made and give no trouble. Outfits are complete.



List No.		Weight Packed Price
1992	Two Drop Annunciator .. 3 1/2 lbs.	\$1.90
1993	Four Drop Annunciator .. 7 lbs.	2.55
List No. 1994	Outfit—Two Drop Annunciator, two Dry Batteries, two Wood Push Buttons, 150 ft. of Bell Wire and sufficient staples to put up.....	12 lbs. 2.90
List No. 1995	Outfit—Four Drop Annunciator, two Dry Batteries, four Wood Push Buttons, 150 ft. of Bell Wire and sufficient staples to put up.....	17 lbs. 3.65

AUTOMATIC FIRE ALARM THERMOSTAT

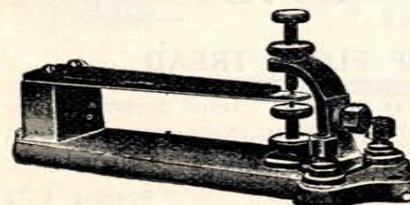
Makes electrical contact on rising temperature, and will ring bell or other signal at any distance. Useful in Hothouses, Incubators, etc., where a uniform temperature is required.



List No. 1707	Automatic Fire-Alarm Thermostat.....	Prepaid, \$.50
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ADJUSTABLE THERMOSTAT

Adjustable to any desired temperature and can be connected in circuit with an electric bell or other signal. For use in hothouses, incubators and for fire alarm in similar places. Size 1 3/16 x 4 in.



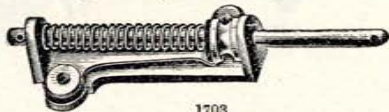
List No.		Prepaid
1343	Adjustable Fire Alarm Thermostat.....	\$1.50

BURGLAR ALARM DOOR AND WINDOW SPRINGS

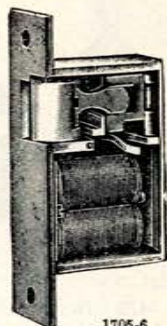


1701

Instantly ring the bell on opening the door or raising the window. No. 1701 **Door Trip** is used on store doors to announce the entrance of a customer. Rings only as door passes the trip. No. 1703 **Door Pull Circuit Closer**, connected with a mechanical door pull, will ring the Electric and Mechanical Bells at same time or separately as arranged.



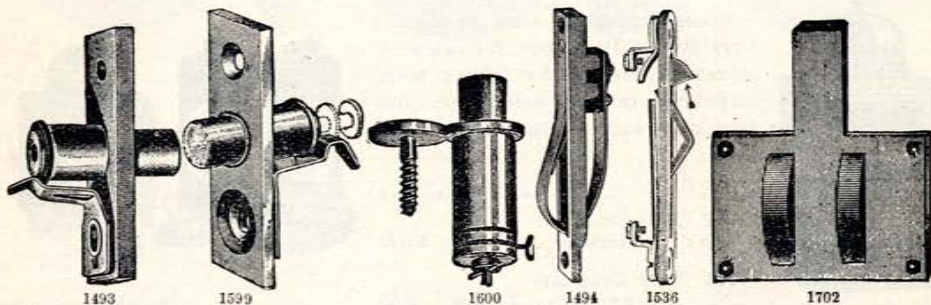
1703



1705-6

Electric Door Openers are simple in construction and positive in their action. Press the button and the armature will instantly release the Locking device. Operates on two dry batteries. Finished Cast Brass Plate.

List No.	Prepaid
1701 Door Trip.....	\$.28
1703 Circuit Closing Door Pull.....	.25
1705 Electric Door Opener, Mortise Door.....	2.40
1706 Electric Door Opener, Rim Door.....	2.65



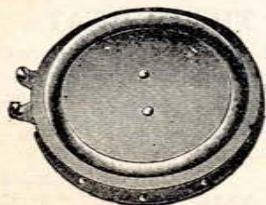
List No.	Prepaid	List No.	Prepaid
1600 Door Spring, Open Circuit..	\$.15	1494 Window Spring, Single....	\$.18
1493 Door Spring, Open Circuit..	.18	1536 Window Spring, Single....	.25
1599 Door Spring, Closed Circuit .18		1702 Window Spring, Double....	.28

VOLTAMP BURGLAR ALARM TRAP

Positive and Reliable

The illustration shows the trap balanced by the spring stretched in hall or entrance way to be protected. The slightest movement of the string, or if the string is broken, will complete the circuit and ring the bell.

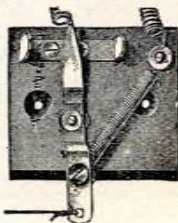
List No. 1598 Burglar Alarm Trap.....Prepaid, \$.25



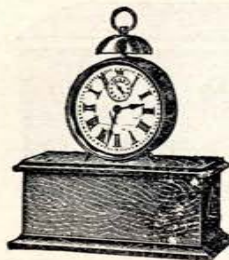
VOLTAMP FLOOR TREAD

Placed under a mat, rug or carpet. Least pressure of the foot will close the circuit. Useful in stores when attendant is drawn to another room.

List No. 1987 Floor Tread.....Prepaid, \$.75



VOLTAMP ELECTRIC ALARM CLOCKS

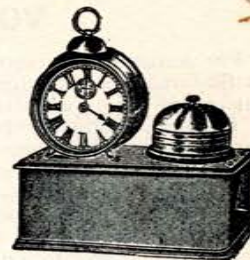


1743

These outfits are a sure cure for oversleeping, as the electric bell will ring until the switch is turned off or the attachment is disconnected, which means "get up." The clock is wound and set at the desired waking hour, the switch is turned on, and the electric bell will ring as soon as the time indicated by the alarm hand is reached.

Outfits Nos. 1743 and 1700 are ready for instant use. Each one is mounted on a polished wood base, containing one dry battery. No. 1743 has the Electric Bell attached on the back (not shown in the illustration). No. 1700 has the Round form bell as shown. No. 1489 is arranged so that the clock movement will throw an electric bell in circuit, which will ring until the switch is turned off. The switch and bell can be placed near the bed and the clock may remain on the table or elsewhere.

List No.	Wt. Pkd.	Price
1743 Electric Alarm Clock Outfit, complete.....	5½ lbs.	\$2.25
1700 Electric Alarm Clock Outfit, complete.....	5½ lbs.	2.50
1489 Electric Alarm Clock only, postage 32 cts....	2 lbs.	1.25

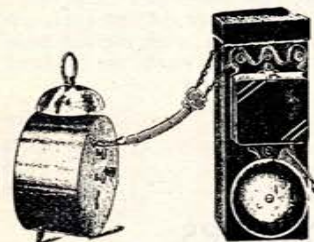


1700



1489

Outfit No. 1450. Alarm Clock, with Attachment, Bell and Battery. Wind the clock alarm and attach the chain clasp to the key. When the alarm goes off the key will twist the two chains and close the electric bell circuit. No. 1449 is the Electric Alarm Attachment, with Bell and Battery, without an alarm clock. Any ordinary alarm clock can be used. Very handy for temporary or permanent use for dining-room, office or sickroom. A chain clasp alarm clock attachment is also supplied.



1450

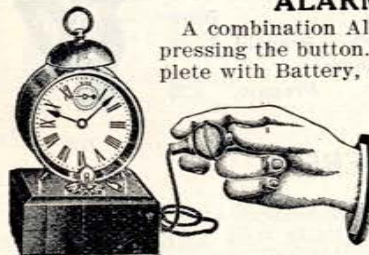


1699

List No.	Wt. Pkd.	Price
1450 Electric Alarm Attachment and Clock.....	5½ lbs.	\$1.75
1449 Electric Alarm Attachment only.....	3½ lbs.	.90
1699 Spring and Clasp, with Chains.....	Prepaid, each,	.25

ALARM CLOCK AND ELECTRIC LIGHT

A combination Alarm Clock and Flash Lamp. Provides a good light on pressing the button. Good timepiece. Neatly finished polished case. Complete with Battery, Cord and Push Button. Weight packed 5 lbs.



List No.	Price
1778 Alarm Clock and Electric Light Complete.....	\$2.50
1779 Same as No. 1778, without Cord and Push Button.....	2.00
1780 Renewal Battery (postage 15 cts.).....	.35

\$1.00 ELECTRIC GAS LIGHTER



A Perfect Substitute for Matches

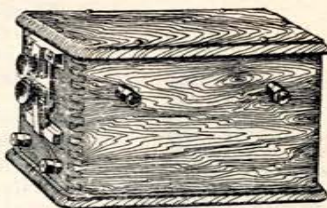
List No.	Price	Postage
1916 Gas Lighter, complete.....	\$1.00	\$.14
1917 Renewal Battery for No. 1916.....	.30	.12



VOLTAMP JUMP SPARK COILS

For Automobiles, Launches, Gas or Gasoline, Marine or Stationary Engine Ignition; also for Wireless Telegraphy and for illuminating Geissler Tubes, etc.

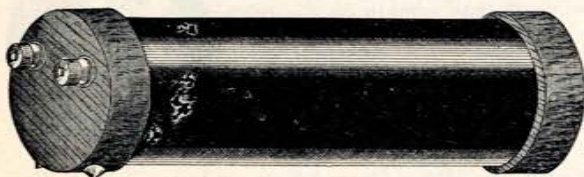
These Coils are carefully wound, are completely encased in insulating material and consume a minimum amount of current owing to their perfect adjustment. The vibrator is of simple construction, gives very rapid vibrations, can be adjusted while running and has set screws for permanent tension. About $\frac{3}{4}$ in. spark. Runs on 4 Volts, 3 to 6 dry cells. Weight 6 lbs.



List No.	Spark	Size	Price
1737	Jump Spark Coil, $\frac{3}{4}$ in.,	7x4x4 $\frac{1}{2}$ in.	\$5.50
2263	Jump Spark Coil, 1 in.,	7x4x4 $\frac{1}{2}$ in.	7.50

VOLTAMP SPARK COILS

For Gas Lighting, Gas and Gasoline Engine Ignition, etc.



magnetized more quickly than others and with a smaller amount of current. It produces a fat, thick flame, and an explosion is sure. Finished ends, with strong Binding Posts and neatly covered. Not intended for Induction work, such as Medical, Geissler Tube or Wireless.

List No.	Price
1412 8x2 $\frac{1}{2}$ in., weight 3 $\frac{1}{4}$ lbs.	\$1.25
1413 10x2 $\frac{1}{2}$ in., weight 3 $\frac{3}{4}$ lbs.	1.75
1414 12x2 $\frac{1}{2}$ in., weight 4 $\frac{1}{2}$ lbs.	2.25

ELECTRIC GAS LIGHTING BURNERS

Used with a primary Spark Coil, such as No. 1412 and battery. Simply turn the gas, then pull the little chain and it lights. Well made and durable. Do not easily get out of order.



1740

List No.	Price
1491 Gas Lighting Burners, each....	Prepaid, \$.75
1740 Advance Automatic Burners, each.....	Prepaid, 3.00



1491

ELECTRIC FLASHERS

A decided novelty in connection with battery lamps. Makes them flash automatically from 10 to 15 times per minute. Can be adjusted for any lamps up to 10 Volts. Size 1 $\frac{1}{2}$ x6 in.



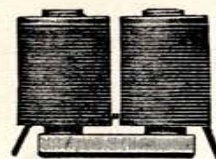
List No.	Prepaid
1341 Electric Flasher for battery lamps only.....	\$.75

Supplied for use on 110-volt circuits, flashing about 20 times per minute. Size 1 $\frac{1}{2}$ x6 in.

List No.	Prepaid
1342 Electric Flasher for 110-volt A. C. or D. C. Circuit.....	\$1.00

ELECTRO MAGNETS

For Bells, Small Apparatus, Telegraph and Other Experimental Work



1415



1547



1549



1921

In list of sizes on this page the diameter or width in inches is given first, then the length, and lastly the breadth.

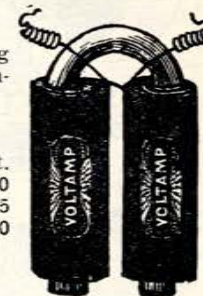
List No.	Ohms	Size	Prepaid	List No.	Ohms	Size	Prepaid
1415	5	15/16x1 $\frac{3}{4}$ x2 $\frac{1}{8}$	\$.55	1921	5	$\frac{7}{8}$ x1 13/16x2	\$.45
1416	20	15/16x1 $\frac{3}{4}$ x2 $\frac{1}{8}$.75	1547	2 $\frac{1}{2}$	15/16x1 $\frac{1}{2}$.25
1922	40	15/16x1 $\frac{3}{4}$ x2 $\frac{1}{8}$	1.00	1548	10	15/16x1 $\frac{1}{2}$.35
1923	50	15/16x1 $\frac{3}{4}$ x2 $\frac{1}{8}$	1.25	1549	Bare	15/16x1 $\frac{1}{2}$.10

No. 1549 Spools, unwound, 3 for 25 cents, prepaid.

LIFTING MAGNETS

For practical as well as experimental work; also for Magnetizing Permanent Magnets. Can be used on any battery. Size shows diameter and length of each spool in inches.

List No.	Size	Will Lift	With	Wt.	Wt. Pkd.	Price	Post.
2070	1 $\frac{1}{2}$ x2 $\frac{3}{4}$	About 15 lbs.	3 V.	1 lb.	1 $\frac{1}{4}$ lbs.	\$1.00	\$.20
2025	1 $\frac{3}{4}$ x3 $\frac{1}{4}$	30 lbs.	4 V.	2 lbs.	2 $\frac{1}{4}$ lbs.	1.50	.35
2026	2 $\frac{1}{4}$ x3 $\frac{3}{4}$	60 lbs.	8 V.	3 $\frac{3}{4}$ lbs.	4 lbs.	2.50	.60
2027	2 $\frac{3}{4}$ x4 $\frac{3}{4}$	90 lbs.	10 V.	8 $\frac{1}{2}$ lbs.	9 lbs.	4.50	
2028	3 $\frac{3}{4}$ x5 $\frac{3}{4}$	125 lbs.	14 V.	15 lbs.	16 lbs.	7.50	



PERMANENT MAGNETS

Horseshoe Type

Our own make of best-grade English Magnet Steel. Do not lose their magnetism. We do not list the cheap variety of Horseshoe Magnets, as they will not retain their magnetism for any length of time.



List No.	Size	Prepaid	List No.	Size	Prepaid
1550	2 in.	\$.12	1552	6 in.	\$.60
1678	3 in.	.20	1553	8 in.	1.00
1551	4 in.	.30	1679	12 in.	2.50

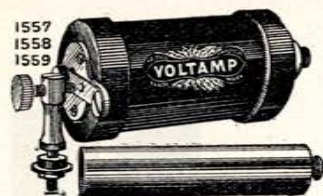
SOLID IRON MAGNET CORES

Made from Imported, Pure, Soft Norway Iron Rod

For Diameters (D) not listed, take prices of next larger diameter. Lengths (L) in between those listed, take prices of next longer length of same diameter. For longer lengths than listed, take proportionate prices. Larger diameters than listed quoted on application. Dimensions are given in inches. Prices are prepaid.

D L Price	D L Price	D L Price	D L Price	D L Price	D L Price	D L Price	D L Price	D L Price
$\frac{1}{4}$ x3, \$.15	$\frac{1}{4}$ x4, \$.15	$\frac{1}{4}$ x5, \$.15	$\frac{3}{8}$ x4, \$.20	$\frac{3}{8}$ x5, \$.20	$\frac{3}{8}$ x6, \$.25	7/16 x5, \$.25	7/16 x6, \$.35	
$\frac{1}{2}$ x5, .25	$\frac{1}{2}$ x6, .30	$\frac{1}{2}$ x8, .35	$\frac{3}{4}$ x6, .40	$\frac{3}{4}$ x8, .50	$\frac{3}{4}$ x10, .60	$\frac{7}{8}$ x7, .55	$\frac{7}{8}$ x10, .75	

For Iron Wire Magnet Cores see next page



1744 1745

INDUCTION COILS—Medical

Primary, Secondary and Combined Currents

Complete with Vibrator and Sheath

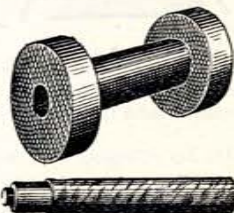
For Windings see list below

List No.	Size		Prepaid
1557	1½ x 2¾ in.	Primary and one Secondary.....	\$.75
1558	1½ x 3 in.	Primary and one Secondary.....	1.00
1559	1½ x 3 in.	Primary and two Secondaries.....	1.25
1565	1½ x 3 in.	Primary and three Secondaries.....	1.50
1744	Extra Sheath, to fit No. 1557, Nicked Brass...		.15
1745	Extra Sheath, to fit Nos. 1558, 1559 and 1585...		.15

INDUCTION COIL PARTS

SPOOLS AND WIRE

List No.		Prepaid
1563	Spool, Magnet and Sheath, as used on No. 1557.....	\$.30
1564	Spool, Magnet and Sheath, as used on No. 1558.....	.30
1565	Spool, Magnet and Sheath, as used on No. 1559.....	.35
1619	Spool, Magnet and Sheath, as used on No. 1585.....	.35
1569	Magnet Wire, sufficient Nos. 22 and 30 for Coil No. 1557.....	.35
1570	Magnet Wire, sufficient Nos. 22 and 30 for Coil No. 1558.....	.50
1571	Magnet Wire, sufficient Nos. 22, 28, 33 for Coil No. 1559.....	.75
1620	Magnet Wire, sufficient Nos. 22, 28, 33, 36 for Coil No. 1585.....	1.00



INDUCTION COIL VIBRATORS

CURRENT INTERRUPTERS

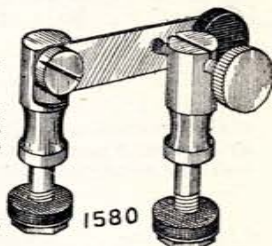
Complete parts, ready to attach to Coil or Battery Plate.

List No.		Prepaid
1579	"BANJO" Vibrator.....	\$.35
1580	POST Vibrator.....	.35

INDUCTION COILS—ELECTRO-MAGNET—and Parts

For Solenoid and other Experiments, see "MOTOR HINTS."

List No.		Prepaid
1554	Spool, Magnet and 4 Layers No. 24 Wire, ready for use.....	\$.35
1555	Spool, Magnet and 6 Layers No. 24 Wire, ready for use.....	.50
1556	Spool, Magnet and 8 Layers No. 22 Wire, ready for use.....	.75
1560	Spool and Magnet only, as used on No. 1554.....	.20
1561	Spool and Magnet only, as used on No. 1555.....	.20
1562	Spool and Magnet only, as used on No. 1556.....	.35
1566	Magnet Wire, sufficient No. 24, as used on Coil No. 1554.....	.25
1567	Magnet Wire, sufficient No. 24, as used on Coil No. 1555.....	.30
1568	Magnet Wire, sufficient No. 22, as used on Coil No. 1556.....	.40



IRON WIRE MAGNET CORES

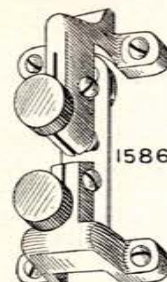
Made from Imported, Pure, Soft Norway Iron Wire
Straight Lengths, carefully bundled. Diameters (D) not listed, take prices of next larger diameter. Lengths (L) in between those listed, take prices of next longer length of same diameter. For longer lengths than listed, take proportionate prices. Larger diameters than listed quoted on application. B & S Wire Gauge No. 22; other sizes are special. Dimensions are given in inches. Prices are prepaid.

D	L	Price	D	L	Price	D	L	Price	D	L	Price	D	L	Price	D	L	Price	D	L	Price	D	L	Price
¼	x3	\$.15	¼	x4	\$.15	¼	x5	\$.15	¾	x4	\$.20	¾	x5	\$.25	¾	x6	\$.30	1½	x5	\$.30	1½	x6	\$.35
¾	x6	\$.40	¾	x7	\$.45	¾	x8	\$.50	¾	x6	\$.45	¾	x8	\$.60	¾	x10	\$.80	1x6	\$.50	1x8	\$.60	1x6	\$.50

The following are sent by mail where postage rates are given; where weights (Wt.) are shown, packages are too heavy for the mails and must be sent by express:

D	L	Price	Post	D	L	Price	Post	D	L	Price	Post	D	L	Price	Post
1	x10	\$.50	\$.25	1	x11	\$.60	\$.28	1	x12	\$.70	\$.30	1½	x10	\$.60	\$.28
1½	x11	.70	.30	1½	x12	.80	.35	1½	x14	.90	.40	1½	x16	1.00	.50
1½	x10	.75	.30	1½	x11	.80	.35	1½	x12	.90	.40	1½	x14	1.10	.50
1½	x16	1.25	.60	1½	x12	1.25	.55	1½	x14	1.40	.60	1½	x12	1.40	.60

D	L	Weight	Price	D	L	Weight	Price	D	L	Weight	Price	D	L	Weight	Price
1½	x16	4½ lbs.	\$1.35	1½	x18	5 lbs.	\$1.50	1½	x14	4½ lbs.	\$1.35	1½	x18	5½ lbs.	\$1.65
1½	x16	6 lbs.	1.75	1½	x20	7½ lbs.	2.15	1½	x16	8½ lbs.	2.60	1½	x20	10½ lbs.	3.00
1½	x24	12½ lbs.	3.65	1½	x18	10 lbs.	2.90	1½	x22	12½ lbs.	3.60	1½	x24	13½ lbs.	3.75
2	x18	11 lbs.	3.25	2	x20	12 lbs.	3.50	2	x24	14½ lbs.	3.90	2½	x20	14½ lbs.	3.95
2½	x24	17 lbs.	4.65	2½	x20	17½ lbs.	4.75	2½	x22	19 lbs.	5.15	2½	x26	23 lbs.	6.00



1586

VIBRATORS

For Jump Spark and Other High-Tension Coils

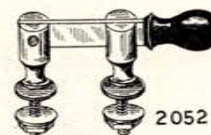
Thoroughly balanced. The Vibrator can be set to any desired tension and locked so that it will not change. Hard Iridio-Platinum Contacts.

List No.		Prepaid
1586	Vibrator complete, Lacquered Brass.....	\$1.25

REVERSING SWITCH PARTS

For mounting on Spark or Induction Coils, Medical Batteries and other electrical apparatus. Nicked parts.

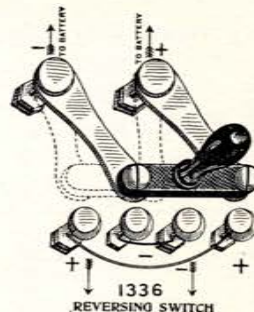
List No.		Prepaid
1336	Reversing Switch Parts, 1½ in. levers.....	\$.35
1337	Reversing Switch Parts, 1¾ in. levers.....	.35



2052

KNIFE SWITCH PARTS

List No.		Prepaid
2052	Knife Switch Parts.....	\$.25



REVERSING SWITCH

MICA SHEET

Carefully selected for electrical use. In pieces 1½ to 3 in. wide and 4½ to 7 in. long.

List No.		Prepaid
1947	Package, small size.....	\$.25
1948	Package, medium size.....	.50
1949	Package, large size.....	.75
	Assorted, per lb.....	2.00



EMPIRE CLOTH AND TAPE

An Electrical Insulating material used extensively in coil winding, splicing and for other high-tension work. Will withstand 7500 volts to each layer without puncturing.

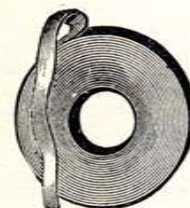
List No.		Price	Postage
2283	Empire Cloth, per sq. yd.....	\$1.60	\$.10
2284	Empire Tape, Bias, ¾ in. wide, per roll 72 yds.....	1.00	.18
2285	Empire Tape, Bias, ¾ in. wide, per roll 12 yds.....	.25	.04



INSULATING TAPE

Standard Approved Quality

List No.		Price	Postage
1481	½ lb. Roll, Good Black.....	\$.25	\$.08
1943	½ lb. Roll, Superior Black.....	.35	.08



1481-1493

Hardens quickly in open air. An absolute necessity for perfect insulation. By express only.

List No.		Price
1945	Micalac, Black, ½ pint.....	\$.25
1946	Shellac Liquid, Brown, ½ pint.....	.25



INSULATING LACQUER

Acid and Moisture Proof

VOLTAMP INSULATING COMPOUND

A Wax Compound for filling Coil Boxes, Transformers and similar apparatus. Melting point about 220° F. Will not crack, soften or lose its insulating properties in any weather.

List No.		Price	Postage
2282	Insulating Compound, 1 lb.....	\$.25	\$.18
	Insulating Compound, 3½ lbs.....	.75	.64
	Insulating Compound, 5 lbs. and over, 20 cts. per lb., sent by express.		



COPPER MAGNET WIRES



Highest Standard pure Copper Wire of uniform diameter, evenly and closely wound. Single or Double Covered with Cotton or Silk. Small lots are put up on pressed paper spools. Prices are net as per list below. No packages sold less than 25 cents.

On sizes No. 22 and finer, in lots of 2 lbs. and over, discount 15%; 4 lbs. and over, discount 25%. Packages of ¼ lb. and less are prepaid; for packages over ¼ lb. add postage at the rate of 16 cents per pound.

B & S Gauge No.	COTTON				COTTON				SILK				SILK			
	Single Covered				Double Covered				Single Covered				Double Covered			
	1oz. ¼ lb.	¼ lb.	½ lb.	1lb.	1oz. ¼ lb.	¼ lb.	½ lb.	1lb.	1oz. ¼ lb.	¼ lb.	½ lb.	1lb.	1oz. ¼ lb.	¼ lb.	½ lb.	1lb.
10 (to 15, inclusive)				.36				.38					.28	.50	.92	
16				.38				.40					.28	.52	.94	
17				.40				.42					.30	.53	.96	
18				.40				.44					.30	.55	.98	
19				.40				.46					.32	.55	1.00	
20	.25	.35	.58		.25	.35	.64		.30	.52	.88		.33	.58	1.00	
21	.25	.37	.60		.25	.38	.70		.32	.53	.90		.34	.60	1.02	
22	.25	.40	.62		.25	.42	.74		.33	.55	.92		.35	.62	1.06	
23	.25	.42	.65		.25	.44	.78		.34	.58	.96		.36	.64	1.12	
24	.27	.43	.68		.27	.48	.84		.35	.62	1.02		.38	.68	1.22	
25	.28	.45	.73		.30	.53	.92		.40	.65	1.10		.42	.75	1.36	
26	.30	.48	.80		.32	.57	1.00		.42	.70	1.20		.47	.82	1.50	
27	.30	.50	.86		.35	.60	1.10		.47	.80	1.30		.50	.90	1.66	
28	.32	.57	.92		.38	.66	1.20		.50	.82	1.38		.55	1.00	1.84	
29	.35	.65	.98		.40	.71	1.30		.55	.86	1.48		.60	1.18	2.12	
30	.38	.68	1.02		.44	.78	1.42		.58	.92	1.60		.65	1.40	2.56	
31	.40	.70	1.12		.46	.85	1.54		.60	1.00	1.76		.70	1.65	3.08	
32	.44	.75	1.24		.48	.90	1.64		.68	1.15	1.98		.75	1.85	3.40	
33	.48	.80	1.41		.55	1.10	1.88		.70	1.25	2.24		.80	2.20	4.00	
34	.52	.85	1.64		.63	1.18	2.20		.78	1.40	2.54		.90	2.55	4.60	
35	.55	.90	1.86		.68	1.25	2.50		.85	1.60	2.88		.95	2.75	5.00	
36	.60	1.00	2.12		.75	1.40	3.00		.95	1.85	3.40		1.10	3.60	5.60	
37	.65	1.15	2.40		.80	1.50	3.30		1.05	2.00	3.70		1.25	4.00	7.40	
38	.70	1.25	2.70		.85	1.60	3.60		1.15	2.20	4.00		1.35	4.40	8.00	
39	.75	1.40	3.00		.90	1.70	3.90		1.25	2.40	4.30		1.50	4.75	9.00	
40	.80	1.50	3.30		.95	1.80	4.20		1.35	2.60	4.60		1.60	5.00	10.00	

BARE COPPER WIRE. Take Single Cotton Magnet Wire List and deduct 20 per cent. Add postage, 16 cts. per pound. No packages sold less than 25 cts.

ENAMELED COPPER MAGNET WIRES. Especially desirable in the finer gauges for coils requiring a larger number of turns than can be obtained with cotton or silk covered wire. Comparing No. 36 Enameled Wire with No. 36 Single Silk-Covered Wire, about 60 per cent. more turns can be wound in same space. Requires careful winding. Prices are the same as for Single Silk-Covered Copper Magnet Wire.



ANNUNCIATOR, BELL AND OFFICE WIRE

List No.	Price Post.
1483 No. 18 Annunciator (Bell) Wire, per 1 lb., about 155 ft.	.35 .18
No. 18 Annunciator (Bell) Wire, per ½ lb., about 75 ft.	.18 .10
1998 No. 18 Office Wire, per 1 lb., about 95 ft.	.40 .18

WIRE STAPLES

List No.	Price Post.
1486 Wire Staples, ¼ x ¾ inch, Coppered, per box	\$.10 \$.05
Wire Staples, ¼ x ¾ inch, Coppered, per 1 lb.	.15 .18
Wire Staples, ¼ x ¾ inch, Coppered, per 5 lbs.	.60



GAS LIGHTING WIRE

List No.	Triple Insulation	Prepaid
1999 No. 22 Gas Lighting Wire, 100 ft.	\$.55	
No. 22 Gas Lighting Wire, 50 ft.	.30	

RUBBER COVERED WIRE

List No.	Price	Price
2086 No. 12, 100 ft.	\$1.50	\$14.25
2087 No. 14, 100 ft.	1.25	12.00

RESISTANCE WIRES

BARE GERMAN SILVER WIRE. Extensively used for Resistances; 18 per cent. German Silver has approximately 18.3 times the resistance of copper; 30 per cent. German Silver has approximately 28 times the resistance of copper. In the list below the carrying capacities in amperes are rated at a temperature rise of 100° F. Put up in packages of 100 feet, 50 feet and 25 feet. Prices are prepaid. For 200 ft. and over, discount 20%.

18% BARE GERMAN SILVER						30% BARE GERMAN SILVER					
B & S Gauge	Resist'ce	Current	100 ft. Carrying	Price List		B & S Gauge	Resist'ce	Current	100 ft. Carrying	Price List	
No.	Ohms	Capacity*	25 ft.	50 ft.	100 ft.	No.	Ohms	Capacity*	25 ft.	50 ft.	100 ft.
16	7.31	6.6	.35	.60	1.00	16	11.23	5.28	.50	.85	1.50
18	11.64	4.7	.30	.50	.85	18	17.86	3.76	.40	.70	1.25
20	18.50	3.3	.25	.42	.75	20	28.39	2.64	.40	.65	1.15
22	29.41	2.3	.25	.40	.70	22	45.13	1.84	.38	.60	1.05
23	37.10	1.95	.25	.40	.70	23	56.93	1.56	.38	.60	1.00
25	58.99	1.39	.25	.38	.65	25	90.51	1.11	.35	.55	.95
27	93.86	1.00	.25	.38	.65	27	144.40	.80	.35	.55	.90
29	149.10	.73		.35	.60	29	228.70	.58	.30	.50	.85
31	237.10	.49		.35	.55	31	363.80	.39	.30	.50	.85
33	377.10	.35		.30	.50	33	578.60	.28	.30	.45	.75
35	599.70	.25		.30	.50	35	920.10	.20	.30	.45	.75

* Amperes.

* Amperes.

ENAMELED GERMAN SILVER WIRE. 18 per cent. Far superior to cotton and silk covered wires in every respect. For prices, use same list as 30% GERMAN SILVER WIRE above.

For Electrical measuring instruments and where constant heats are to be withstood the following wires are preferred. These wires are used in the make up of VOLTAMP Rheostats, Transformers, Current Regulators and other apparatus, and have stood the severest tests. In packages of 100 feet, 50 feet and 25 feet. Prices are prepaid.

NISIL. This wire is superior to all other Resistance wires, especially where exposed to circulation of air, because of its high resistance, carrying capacity, accuracy and permanency. It will not deteriorate from use and is absolutely non-corrosive. Prices prepaid.

B & S Resist'ce Current						B & S Resist'ce Current					
Gauge	100 ft. Carrying	Price List				Gauge	100 ft. Carrying	Price List			
No.	Ohms	Capacity*	25 ft.	50 ft.	100 ft.	No.	Ohms	Capacity*	25 ft.	50 ft.	100 ft.
20	29.50	7.00	.45	.75	1.35	32	467.25	1.55	.30	.50	.85
22	46.35	5.10	.40	.70	1.25	33	587.06	1.43	.30	.50	.85
24	73.80	3.75	.38	.60	1.05	34	745.90	1.30	.30	.45	.75
26	115.40	2.50	.35	.60	1.00	36	1180.60	1.20	.30	.45	.75
28	185.60	2.00	.35	.55	.95	38	1870.75	1.05	.35	.50	.85
30	295.15	1.70	.35	.55	.90	40	3010.00	.90	.35	.55	.90

* Amperes.

* Amperes.

ADGERSIL, No. 23. Used on VOLTAMP RHEOSTATS. Resistance, 185 ohms per 100 feet. Carrying capacity, 1.4 A. Prepaid: 100 feet, \$1.00; 50 feet, 55 cts.; 25 feet, 30 cts.

CLISIL, No. 25. Resistance, 164 ohms per 100 feet. Carrying capacity, 1.3 A. Prepaid: 100 feet, 50 cts.; 50 feet, 30 cts.

FERSIL, No. 25. Resistance, 36 ohms per 100 feet. Carrying capacity, 1.5 A. Prepaid: 100 feet, 25 cts.



FIRE AND WATERPROOF WIRE

List No.	Price	Price
2002 No. 12, per 100 ft.	\$1.25	1000 ft., \$12.00
2003 No. 14, per 100 ft.	1.00	1000 ft., \$9.50



RUBBER-COVERED FIXTURE WIRE

List No.	Price Post.	Price Post.
2000 No. 18, 160 ft.	\$.75 \$.18	50 ft., \$.40 \$.10
2001 No. 20, 100 ft.	.75 .18	50 ft., .40 .10



List No.	Price Post.	Price Post.
2006 Cotton Covered No. 18 New Code, per foot	\$.03	\$.01
2007 Silk Covered No. 18 New Code, per foot	.04	.01
2008 Cotton Covered No. 20 Old Code, per foot	.02 ½	.01
2009 Silk Covered No. 20 Old Code, per foot	.03	.01

List No.	REINFORCED PORTABLE CORD	Price Post.
2010 Cotton Covered No. 18 Old Code, per foot	\$.04	\$.02
2011 Silk Covered No. 18 Old Code, per foot	.05	.02



FLEXIBLE CONDUCTOR CORDS

For Medical Battery and General Experimental Work

List No.	Silk covered	Prepaid	
1511 Voltamp Special	Per yard	\$.10	3 yards, \$.25
1512 Double Silk Covered	Per yard	.12	3 yards, .30
2012 Without Tinsel, Stranded Copper	Per yard	.07	4 yards, .25
2013 Two Conductor	Per yard	.15	2 yards, .25

IRIDIO-PLATINUM WIRE AND SHEET

10% IRIDIO-PLATINUM. The only satisfactory material for electrical contacts in Medical Batteries, Induction and Spark Coils, Telephones and similar apparatus. Will not corrode by arcing or exposure. For high-tension Jump Spark and Wipe Spark Coils we recommend only our high-grade, flint-hard 25% Iridio-Platinum wire. Used on all VOLTAMP Ruhmkorff and High-Tension Spark Coils. The cost of this material is based on percentage of Iridium, a rare and costly metal. Prices subject to change without notice. Prices are prepaid by regular mail at purchaser's risk; by registered mail, 8 cts. extra. B. & S. Wire Gauge. U. S. Standard Sheet Gauge.

IRIDIO-PLATINUM WIRE

No. 10%	No. 25%	No. 10%	No. 10%	No. 10%
12, per in., \$5.00	12, per in., \$6.00	20, per in., \$1.10	30, per ft., \$1.50	30, six in., \$.35
14, per in., 3.50	14, per in., 4.35	22, per in., .75	32, per ft., 1.00	32, six in., .60
15, per in., 2.50	15, per in., 3.20	24, per in., .50	34, per ft., .75	34, six in., .45
18, per in., 1.50	18, per in., 2.10	28, per ft., 2.00	36, per ft., .60	36, six in., .35

10% IRIDIO-PLATINUM SHEET—No. 35 (.008) Thick

Prepaid	Prepaid
Per square inch.....\$6.00	Per $\frac{3}{16}$ inch x $\frac{3}{16}$ inch square.....\$.50
Per $\frac{1}{8}$ inch Disc, round......15	Per $\frac{1}{4}$ inch x $\frac{1}{4}$ inch square......75
Per $\frac{1}{8}$ inch x $\frac{1}{8}$ inch square......25	Platinum Foil, thickness .001 per sq. in.. 1.00

WOLLASTON WIRE

For Wireless Work

PLATINUM WIRE

Diam.	Prepaid	Prepaid	Diam.	Prepaid	Prepaid
.0001 Per 3 inches, \$1.00	Per foot, \$3.50	.0001 Per 6 inches, \$.45	Per foot, \$.75		
.0002 Per 3 inches, .75	Per foot, 2.75	.0002 Per 6 inches, .35	Per foot, .60		

VIBRATOR CONTACTS—PLATINUM

For Induction and High-Tension Spark Coils and Other Electrical Apparatus

List No.	Diam.	Length	Length	Diam.	Prepaid
2275	Disc $\frac{1}{8}$ inch	and Point $\frac{1}{8}$ inch	X No. 15, 10% Iridio Platinum.....		.35
2276	Rivet $\frac{1}{8}$ inch x $\frac{1}{16}$ inch, and Point $\frac{1}{8}$ inch	X No. 15, 10% Iridio Platinum.....			.50
2277	Rivet $\frac{1}{8}$ inch x $\frac{1}{16}$ inch, and Point $\frac{1}{8}$ inch	X No. 15, 25% Iridio Platinum.....			.75
2278	Rivet $\frac{3}{16}$ inch x $\frac{1}{16}$ inch, and Point $\frac{1}{8}$ inch	X No. 14, 25% Iridio Platinum.....			1.25
2279	Rivet $\frac{1}{4}$ inch x $\frac{1}{16}$ inch, and Point $\frac{1}{8}$ inch	X No. 12, 25% Iridio Platinum.....			1.75

VIBRATOR CONTACTS—PLATINSIL

An excellent substitute for Platinum on Medical and other Induction coils and Electrical apparatus using 3 to 4 volts of Battery.

List No.	Diam.	Length	Diam.	Prepaid
2280	$\frac{1}{8}$ inch Disc and $\frac{1}{8}$ inch Point	No. 15.....		.15
2281	$\frac{1}{8}$ inch Rivet and $\frac{1}{8}$ inch Point	No. 15.....		.25

SILVER WIRE AND SHEET—.999 Fine

SILVER WIRE

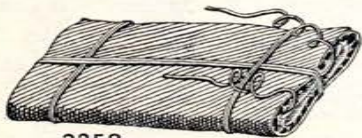
No. 16, per foot, Prepaid \$.75	No. 28, per foot, Prepaid \$.40	No. 21, per sq. in., Prepaid \$.50
No. 22, per foot, Prepaid .55	No. 33, per foot, Prepaid .25	No. 27, per sq. in., Prepaid .35

SILVER SHEET

SPARK COIL CONDENSERS

With Terminals Fully Tested

List No.	Spark	Prepaid	List No.	Spark	Prepaid
2288	For $\frac{1}{4}$ in. or less	\$.35	2258	For $\frac{3}{4}$ in. or less	\$.65
2265	For $\frac{1}{2}$ in. or less	.50	2266	For 1 in. or less	.75



2258

TIN FOIL

Standard Quality and Weight

Used in VOLTAMP Condensers

List No.	Prepaid	Price	Post.
2267	2x48 in., 8 strips \$.25	Full lb. \$.60	.16
2268	3x48 in., 6 strips .25	Full lb. .55	.16
2269	4x48 in., 4 strips .25	Full lb. .50	.16
2270	6x48 in., 3 strips .25	Full lb. .40	.16

No orders accepted less than 25 cts.

INSULATING PAPER

Strong, Paraffined, Non-Porous

List No.	Prepaid
2271	2x48 in., 8 strips... \$.15
2272	3x48 in., 6 strips... .15
2273	4x48 in., 4 strips... .12
2274	6x48 in., 3 strips... .12

VOLTAMP SOLDERING TORCH

Slips Into the Vest Pocket. Always Ready for Any Emergency

A perfectly simple and practical torch that quickly does the work of soldering joints and light brazing. Burns either Gasoline, Benzine or Wood Alcohol. Adjustable blowpipe for broad or pointed flame. Hard Rubber mouthpiece. Can also be used as a candle when working in dark places. The Tank is 5 in. high and $\frac{3}{4}$ in. in diameter. Made of brass and heavily nicked. Will not leak. A useful article in every workshop, laboratory or work kit.

Saves Its Cost in a Short Time

List No.	Prepaid
1473	Voltamp Pocket Soldering Torch...\$.50

SOLDERING OUTFIT



SOLDERING COPPERS

List No.	Price	Postage
1930	$\frac{1}{2}$ lb. Soldering Copper.....\$.30	\$.08
1936	$\frac{3}{4}$ lb. Soldering Copper.....	.40 .12
1940	Handles, each.....	.05 .03
1937	1 lb. Soldering Copper.....	.50 .16
1938	2 lbs. Soldering Copper.....	.85 .32
1939	Bunsen Burner, with Regulator.....	.50 .15

VOLTAMP SOLDERING PASTE

Contains no acid and is non-corrosive. Flows freely and makes a perfect joint.

List No	Price
1476	$\frac{1}{4}$ lb. Tin.....Prepaid, \$.25
2051	1 lb. Tin.....Prepaid, .90

SOLDERING SALTS

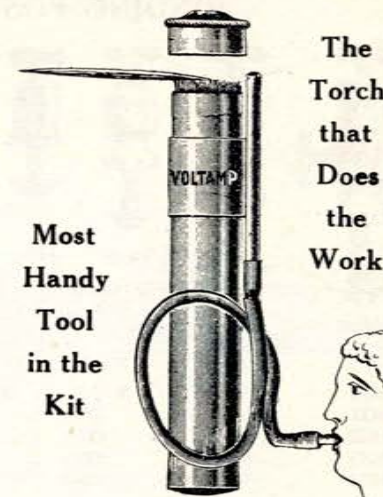
An excellent combination, far superior to acids. No gaseous odor when heated.

List No.	Price
1942	$\frac{1}{4}$ lb. Tin.....Prepaid, \$.20
2067	1 lb. Tin.....Prepaid, .70

WIRE SOLDER



List No.	Price	Postage
1474	$\frac{1}{2}$ lb. Best.....\$.18	\$.08
1475	1 lb. Best.....	.35 .16
1941	Best Bar Solder, 1 lb.....	.35 .16



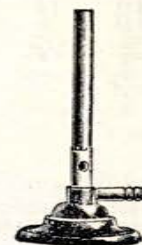
Most Handy Tool in the Kit

The Torch that Does the Work

Half Size

Complete with Soldering Iron, Steel Scraper, Wire Solder, Soldering Paste, Rosin contained in a neat box.

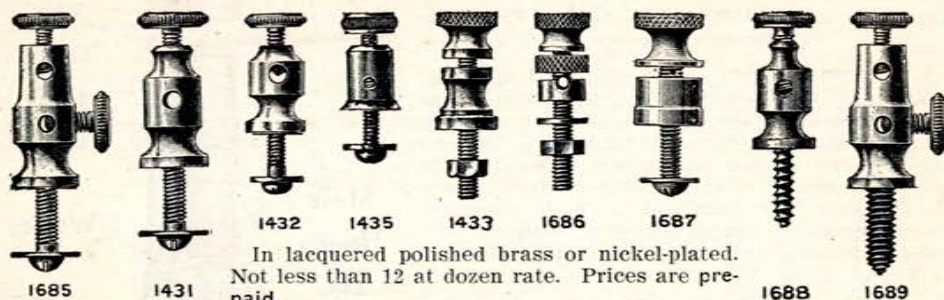
List No.	Prepaid
1935	Soldering Outfit.....\$1.00



1939



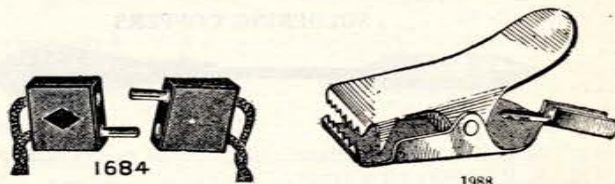
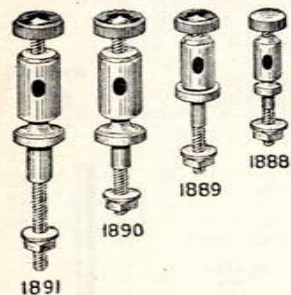
BINDING POSTS AND CONNECTORS



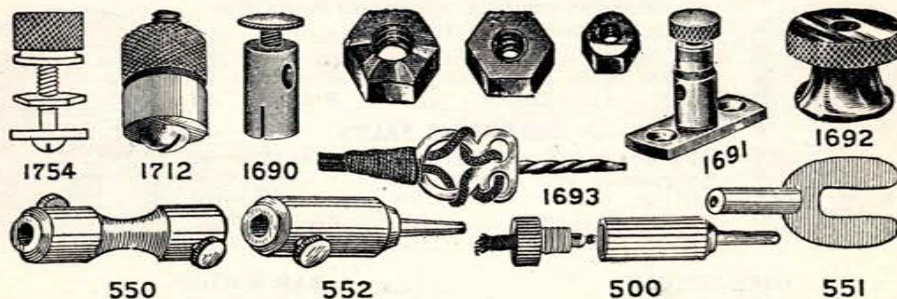
In lacquered polished brass or nickel-plated. Not less than 12 at dozen rate. Prices are pre-paid.

List No.	Height	Each	Dozen	List No.	Height	Each	Dozen
1685	1 3/8 in.	\$.12	\$1.35	1686	5/8 in.	\$.08	\$.90
1431	1 in.	.09	1.00	1687	7/8 in.	.12	1.35
1432	3/4 in.	.07	.75	1688	3/4 in.	.08	.90
1435	1 1/2 in.	.05	.55	1689	1 3/8 in.	.12	1.35
1433	3/4 in.	.08	.95				

Binding Posts Nos. 1888, 1889, 1890 and 1891 are one piece, superior in every way. Cuts are one-half actual size. Nickel-plated. Connector No. 1684 is convenient where connections are made and broken frequently. Hard Fibre and cannot break. Testing Clips No. 1988 are excellent for quick connection with insulated or bare wire. Have cup end for attaching cord.



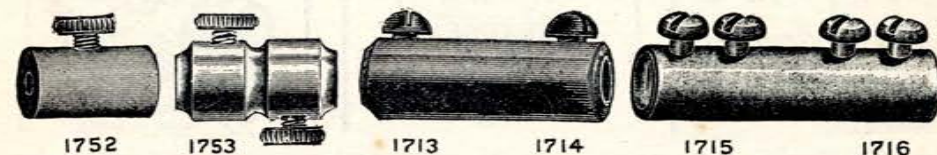
List No.	Prepaid	Dozen	List No.	Prepaid	Dozen
1888	Binding Post, each...	\$.08 \$.90	1891	Binding Post, each...	\$.20 \$2.00
1889	Binding Post, each...	.10 1.00	1684	Connectors, each...	.30
1890	Binding Post, each...	.15 1.65	1988	Test Clips, per pair...	.20



List No.	Each	Doz.	List No.	Each	Doz.
1754	Carbon Connector for Dry Battery.....	\$.04 \$.45	1691	Coil Head Binding Posts, per pair.....	\$.18 \$1.25
1712	Heavy Binding Post...	.08 .90	550	Connectors.....	.12 .90
1690	Zinc Connector for Dry Battery.....	.03 .35	551	Terminals.....	.12 1.25
1693	"Watch Key" Cord Tips, per pair.....	.10	552	Connectors.....	.10 1.10
			500	Cord Tips, per pair....	.10
			1692	Thumb Nuts, see next page	

BINDING POSTS AND CONNECTORS

Hexagonal Nuts				Milled Thumb Nuts			
Thread	Diam.	Dozen	100	Thread	Diam.	Each	Doz.
2-48	5/32 in.	\$.10	\$.75	8-32	5/16 in.	\$.02	\$.20
4-36	5/32 in.	.10	.75	4-36	1/2 in.	.05	.55
6-32	11/32 in.	.12	.85	6-32	1/2 in.	.05	.55
8-32	11/32 in.	.12	.85	8-32	1/2 in.	.05	.55
10-32	3/4 in.	.15	1.00	8-32	1/2 in.	.05	.55
14-20	1/2 in.	.20	1.25	10-32	5/8 in.	.05	.55



List No.	Size of Wire	Each	Doz.	List No.	Size of Wire	Each	Doz.
1752	For No. 16 and Smaller.	\$.07	\$.80	1714	For No. 10 and Smaller.	\$.07	\$.75
1753	For No. 12 and Smaller.	.13	1.40	1715	For No. 6 and Smaller.	.08	.90
1713	For No. 14 and Smaller.	.05	.55	1716	For No. 4 and Smaller.	.10	1.10

BATTERY CONNECTORS

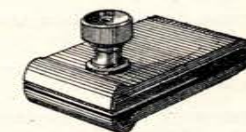
Flexible Cords



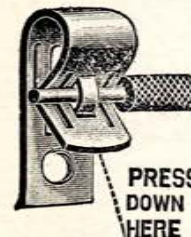
Convenient for connecting up battery cells, easy to apply and contact is certain.

List No.	Prepaid
1718	Battery Connectors, 4 for.....\$.12
1719	Battery Connectors, per dozen......30

TEST CONNECTORS



SPRING BINDING POSTS



Make quick and sure connection.

Will not jar loose.

List No.	Prepaid
1695	Spring Binding Posts, per pair.....\$.10
1696	Spring Binding Posts, per dozen......55

Will hold wires securely, even if of different sizes. Thumb Screw Binding Post.

List No.	Prepaid
1717	Test Connectors, each....\$.10
1698	Test Connectors, dozen... 1.10

"ABSOLUTE" BATTERY CONNECTORS



The best and surest connector. Grip firmly and cannot be shaken loose by vibration. Squeeze the springs together, slip between post and nut, tighten the nut.

List No.	Prepaid
1755	Battery Connectors, per pair.....\$.20

SELECT BOOKS FOR THE STUDENT IN ELECTRICITY



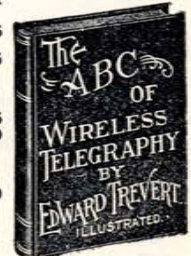
MOTOR HINTS has a warm spot in the heart of every beginner in the study of Electricity. Full of timely suggestions in puzzling situations. A coupon with each book entitles the owner to 10 cts. in trade when purchasing any VOLTAMP Motor or Dynamo.	Prepaid	.10
TELEGRAPH HINTS will teach anyone how to telegraph. It's easy with this little book to show you. A coupon with each book entitles the owner to 15 cts. in trade when purchasing any VOLTAMP Telegraph Instrument of the value of \$1.50 or over.		.15
FARADIC HINTS contain explicit instructions for treatment at home of nearly all ailments and diseases that can be cured or relieved by electricity. It is well to remember that electricity in medicine does all that drugs can do and leaves no lurking poison remaining behind in the system. This book tells you plainly how to use it. A coupon with each book entitles the owner to 15 cts. in trade when purchasing any VOLTAMP Medical Battery or accessory of the value of \$1.50 or over.		.15
Vest-Pocket Electrical Dictionary. Contains nearly 5000 words, terms and phrases used in the Electrical profession, giving their definitions in most lucid and comprehensive manner. Convenient size for carrying in the vest pocket—224 pages, illustrated. Cloth.		.25
		.50
A B C of Electricity. Endorsed by Thos. A. Edison. Gives the principles of Electric Science in simple language, free from technical terms. Cloth, illustrated.		.50
Induction Coils: How to Make and Use. Contains complete directions and diagrams for making medical and intensity coils, with numerous interesting experiments.		.50
Electric Bell Pitting and Gas Lighting. Teaches you how to wire a building for Electric Bells, Electric Burglar Alarms, Electric Gas Lighting. Cloth, illustrated.		.50
Practical Handbook of Electroplating. The very best book for amateurs on this interesting subject. Gives practical directions for all kinds of Electroplating. Cloth, illustrated.		.50
Questions and Answers About Electricity. Especially for the student and amateur, explaining the theory of electricity and magnetism. Cloth, illustrated.		.50
The Gas Engine: How to Make and Use It. A practical work on the Gas Engine, fully illustrated with working drawings. Well worth its price. Cloth.		.75
Electric Motor Construction for Amateurs. The very book for those who intend to build their own Motors. Complete directions and drawings for making an Electric Motor to run a Sewing Machine or Small Lathe, and for making an Electric Battery that will furnish the current to run the Motor. Cloth, illustrated.		1.00
New Experimental Electricity: Revised. Contains 20 Chapters—204 pages and 100 illustrations. Practical information on every important electrical subject. A superb book. Cloth, illustrated.		1.00
How to Build a D. C. 1-K-W. or a 1-H-P. Motor. Recently published and in big demand. The author, Prof. A. E. Watson, has contributed many useful works on electricity, but this is probably his best effort. Fully illustrated, with easy working drawings. Cloth.		1.00
Storage Batteries: Their Theory, Construction and Use. A practical treatise on the construction, installation and maintenance of Storage Batteries. Fully illustrated with working drawings and diagrams. Cloth.		1.50
Electricians' Handy-Book. The best compilation of electrical information ever made. Extracts from the works of leading authors and professors dealing with every electrical field. Told in simple language. Cloth, illustrated.		2.50

PRACTICAL ILLUSTRATED BOOKS—With Working Drawings

10 Cents Each, Postpaid

No. 1 How to Make a Dynamo.	No. 15 How to Make a Toy Motor.
No. 2 How to Make a Telephone.	No. 16 How to Make an Electric Bell.
No. 3 How to Make an Electric Motor.	No. 17 How to Make a Telegraph Instrument.
No. 4 How to Make a Storage Battery.	No. 18 How to Wind Armatures.
No. 5 How to Make a Wimshurst Electric Machine.	No. 19 How to Wind Field Magnets.
No. 6 How to Make a Magneto Machine.	No. 20 How to Make an Ammeter.
No. 7 How to Make a Medical Induction Coil.	No. 21 How to Make a Thermostat.
No. 8 How to Make a Pocket Accumulator.	No. 22 Motor Rotation.
No. 9 How to Make a Plunge Battery.	No. 23 How to Make an Electric Soldering Iron.
No. 10 How to Make a Voltmeter.	No. 24 How to Make an Electric Heater.
No. 11 How to Make a Galvanometer.	No. 25 How to Make an Electric Furnace.
No. 12 How to Make a Hand Dynamo.	No. 26 How to Make a Hand-Feed Arc Lamp.
No. 13 How to Make a Talking Machine.	No. 27 How to Make a Jump-Spark Coil.
No. 14 How to Make a 1/4-H-P. Dynamo or Motor.	No. 28 How to Make a Rheostat.

How to Make a Condenser and a Leyden Jar. With full working drawings, paper.	Prepaid	\$.25
How to Make a Transformer. With full working drawings, paper.		.25
How to Make Electric Batteries at Home. Explicit directions for making Electric Batteries—Primary and Storage, Wet and Dry, with diagrams and illustrations. Paper.		.25
		.50
Electrical Instrument Making (200 pages). Complete and practical instructions for making all electrical instruments. How to test, etc. Best book published for the price. Cloth, illustrated.		.50
The New Everybody's Handbook of Electricity. All about Electric Bells, Lamps, Batteries, Dynamos, Motors, etc. A Glossary of Electrical terms. Also descriptions of the latest electrical inventions. Cloth, illustrated.		.50
Dynamos and Electric Motors: All About Them. Replete with good information on these absorbing topics. Practical and concise instructions for building Dynamos and Motors. Just the book for the practical amateur. Cloth, illustrated.	Prepaid	.50
Something About X-Rays for Everybody. Meets the popular demand for plain information regarding this wonderful scientific discovery. Intended for the lay reader and entirely devoid of technical language. Cloth, illustrated.		.50
The A B C of Wireless Telegraphy. Tells in simple language the theory, principles, descriptions of the different apparatus used, history, latest improvements and methods of operating. Full instructions for making the various parts of the apparatus, with many diagrams to make the test easy. Cloth, illustrated.		1.00
The Telephone: How to Make and Use. A reliable and thoroughly practical work on this great invention. Complete with working drawings. Cloth.		1.00
Wireless Telegraphy and Telephony Popularly Explained. With a Special Article by Nikola Tesla.		1.00
Lessons in Telegraphy. Replete with important information.		1.00



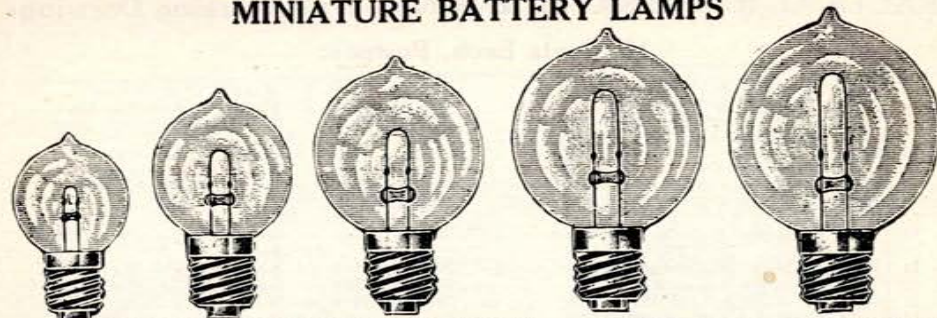
MODEL SERIES ELECTRICAL BOOKS

Price, each, 25 Cents; Postage, 3 Cents.

The following list comprises a choice collection of English books, highly recommended for the thorough manner in which the various subjects are handled and illustrated. Complete with working drawings. Paper Cover:

The Study of Electricity for Beginners	Schneider
Electric Batteries: How to Make and Use Them	Marshall
Modern Primary Batteries	Schneider
Dry Batteries: How to Make and Use Them	Schneider
Small Accumulators: How to Make, Charge and Use Them	Marshall
Small Dynamos: How to Make, Test and Repair Them	Powell
Induction Coils: How to Make and Use Them	Stoye
Experimenting with Induction Coils	Norrie
Electric Bells and Alarms, Construction and Installation	Powell
Electric Bells, Annunciators and Alarms: How to Install Them	Schneider
Electric Gas Igniting Apparatus: How to Install	Norrie
Telephones and Microphones: How to Make and Use Them	Marshall
WIRELESS Telegraph Outfits: How to Make and Use up to 100 Miles	Harrison
Small Electrical Measuring Instruments, Meters, Bridges, etc.	Marshall
Electric Lighting for Amateurs	Marshall
Alternating Currents Simply Explained	Marshall
Simple Electrical Working Models: How to Make and Use Them	Schneider
Electrical Circuits and Diagrams, Illustrated and Explained, Part I	Schneider
Electrical Circuits and Diagrams, Illustrated and Explained, Part II	Schneider
Simple Scientific Experiments: How to Make and Perform	De Ratti
WIRELESS Telephone Construction, with 43 Illustrations	Harrison

MINIATURE BATTERY LAMPS



VOLTAMP MINIATURE BATTERY LAMPS are skillfully made, are efficient and economical and have a superior finish. Each lamp is carefully tested before it is shipped. Lamps can be had at slightly lower prices, but they fail in quality.

All Miniature Battery Lamps listed have Miniature Edison Screw Bases, $\frac{3}{8}$ in. diameter, and will fit any of the Receptacles and Sockets shown on page 61. Consumption of current averages from .2 Ampere for the smaller sizes to .5 Ampere for the largest. Can be used on Dry Batteries, Fuller or Storage Cells. Dry Batteries give $1\frac{1}{2}$ volts each, and three cells in series will light one to eight 4-volt Lamps connected in multiple; Fuller and Storage cells offer 2 volts each, so that two cells of each in series will light one to eight 4-volt Lamps connected in multiple. Battery Lamps can be used on Dynamos of suitable low voltage. For further information on Batteries see pages 34, 35 and 36. For wiring see "MOTOR HINTS."

List No.	Volts	C. P.	Each	Doz.	List No.	Volts	C. P.	Each	Doz.
1344	$3\frac{1}{2}$	1	\$.25	\$2.75	1347	8	3	\$.30	\$3.00
1345	4	1	.25	2.75	1348	10	6	.30	3.00
1346	6	2	.25	2.75	1738	14	8	.35	3.25

Lamps colored Red, Blue, Green, Yellow, Purple or Frosted, extra, each, 5 cts.; per dozen, 50 cts. Prices are Prepaid. Not less than 6 Lamps sold at dozen rate.

PEAR SHAPE LAMPS

In Clear Glass or Colored

The above description applies to these lamps.

List No.	Volts	C. P.
2402	4	1
2403	6	2
2404	8	3
2405	10	6
2406	14	8

Prepaid, each, 30 cts.
Prepaid, dozen, \$3.25.
Not less than 6 at dozen rate.

TIPLESS LAMPS

Especially adapted for Surgeons' uses and for Flashlights. High grade and do not throw shadow.

List No.	Volts	C. P.	Prepaid
1721	4	1	\$.45
1722	6	2	.50



LENS FRONT LAMPS

For Flashlights. The lens in the front increases the brilliancy. $3\frac{1}{2}$ Volts. 1 C. P.



List No. 1723..Prepaid, \$.20.

TUNGSTEN—METAL FILAMENT LAMPS—OSRAM

Best, Most Practical and Economical

The greatest achievement in incandescent lamps. Give three times the light for the same current and longer life. Average consumption of current .2 Ampere. The color is daylight white. Miniature Edison Screw Base only.

List No.	Volts	C. P.	Prepaid
2245	$1\frac{1}{2}$	1 C. P. on 1 Dry Battery, 1 C. P. on 1-Cell Storage Battery	\$.35
2246	$2\frac{1}{2}$	1 C. P. on 2 Dry Batteries, 3 C. P. on 2-Cell Storage Battery	.40
2400	$3\frac{1}{2}$	2 C. P. on 3 Dry Batteries, 4 C. P. on 2-Cell Storage Battery	.45
2401	$5\frac{1}{2}$	3 C. P. on 4 Dry Batteries, 6 C. P. on 3-Cell Storage Battery	.50



VOLTAMP TIPLESS MIRROR REFLECTOR LAMPS

Especially for VOLTAMP MINIATURE RAILWAYS, Headlights, Flashlights, etc.

An ideal lamp for Railway Headlights. The opaque reflector back throws the rays a considerable space. Improves any Flashlight 50%.



List No.	Prepaid	List No.	Prepaid
2407 4-Volt Reflector Lamp	\$.35	2409 8-Volt Reflector Lamp	\$.40
2408 6-Volt Reflector Lamp	.35	2410 12-Volt Reflector Lamp	.40

MINIATURE SOCKETS AND RECEPTACLES

For Miniature Edison Screw Base Lamps Only



List No.	Prepaid	Prepaid
1349 Porcelain Receptacle	Each \$.06	Doz. \$.65
1724 Brass Receptacle	.22	2.20
1351 Porcelain Socket, white, for Battery Lamps	.10	1.00
2034 Porcelain Socket, green, for Battery or Series Lamps	.12	1.25
1353 Christmas Tree Pin Socket	.07	.75
1932 Pull Socket with Chain	.50	5.50

MINIATURE ELECTRIC ARC LIGHTS

For the illumination of Shop Window and other displays, Christmas Gardens, Railway Stations, etc., the Miniature Arc Lamps are really novel. The Milk White Globes give a beautiful daylight, white, lustrous light, very similar in effect to the real Arc. From six to eight lamps in multiple can be operated on three Dry Batteries, two Fuller Cells or 4-Volt Dynamo; about eight lamps in multiple on a 4-Volt Storage Battery; eight lamps in series on 110-Volt Street-Lighting Circuit.

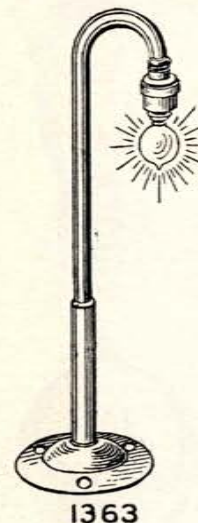
Polished Base Stands, about $10\frac{1}{2}$ in. high, with lamps, wired and complete.



Exact Size of Arc Lamp

For Battery Current

List No.	4-VOLT LAMPS	Prepaid
1363	Miniature Arc Lights	\$1.00
1364	Miniature Arc Lights, per eight	7.50
1365	Extra Lamp, Milk White, each	.35
1720	Extra Lamp, Clear Glass, each	.30



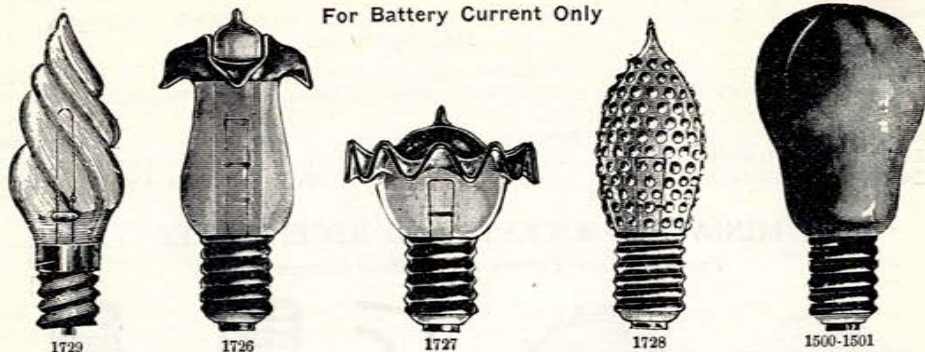
1363

For 110-Volt A. C. or D. C.

List No.	14-VOLT LAMPS	Prepaid
1366	Miniature Arc Lights	\$1.00
1367	Miniature Arc Lights, per eight	7.50
1368	Extra Lamp, Milk White	.35
2015	Extra Lamp, Clear Glass	.35

DECORATIVE BATTERY LAMPS

For Battery Current Only



Furnished only in 4 Volts and with Miniature Edison Screw Bases. Nos. 1726 and 1727 have beautifully tinted scalloped shades. No. 1728 is deep pickle-green colored glass. No. 1729 can be had in clear or colored glass. Prices are prepaid.

List No.	4 Volts	Each	Doz.	List No.	4 Volts	Each	Doz.
1726	Long Tulip and Shade..	.40	\$4.50	1728	"Pickle" Bulb, green....	.35	\$4.00
1727	Short Tulip and Shade..	.40	4.50	1729	"Flame" Bulb, clear or colored.....	.35	4.00

Not Less than 12 Lamps Sold at Dozen Rate

DECORATIVE FRUIT AND FLOWER LAMPS

For Battery Current and in Series on Lighting Current

Fruit and Flower Lamps are altogether unique and novel. The bulbs are clever imitations of different fruits, flowers and berries in their natural tints. Rich and brilliant effects for Table and Christmas Tree decoration. Furnished in 4 Volts only for battery current. Where the street-lighting circuit is to be had these lamps make a handsome display at a very low cost. Use eight in series on the 110-Volt to 115-Volt, sixteen in series on the 220-Volt to 230-Volt circuit, and as many multiples of eight or sixteen as desired. Prices are prepaid.



1500 1501

For Battery Current Only

List No.	Each	Doz.
1500	Fruit and Flower Lamps, 4 Volts..	.35 \$4.00

For A. C. or D. C. Circuit

List No.	Each	Doz.
1501	Fruit and Flower Lamps, 14 Volts..	.40 \$4.25

Not Less than 12 Lamps Sold at Dozen Rate

14-VOLT SERIES LAMPS

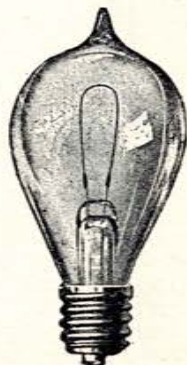
For 110-Volt A. C. or D. C.

To be used eight in series and as many multiples of eight as required on the Street-Lighting Circuits, 100 to 115 Volts. Use sixteen in series on 220-Volt circuit. Furnished in clear glass or colored with Miniature Edison Screw Bases only. Prices are prepaid.

List No.	Each	Doz.
1369	14 Volts, 8 C. P., Clear Glass.....	.30 \$3.25
1732	14 Volts, 8 C. P., Colored.....	.35 \$3.75



1500-1501



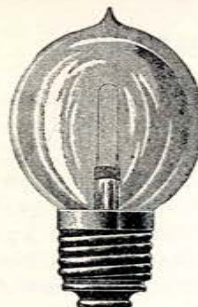
ONE-WATT BATTERY LAMPS

Standard Edison Base Only

Very popular because of their high efficiency, brilliant illuminating power and low current consumption. Diameter of Base 1 in. Price, Prepaid, each, 40 cents; per dozen, \$4.50. For Sockets and Receptacles see page 69.

List No.	Volts	C. P.	List No.	Volts	C. P.
1355	4	4	1496	12	8
1356	6	6	1497	14	8
1357	8	8	1498	16	8
1358	10	8			

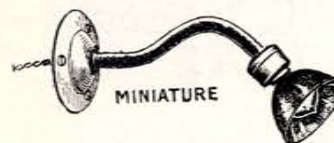
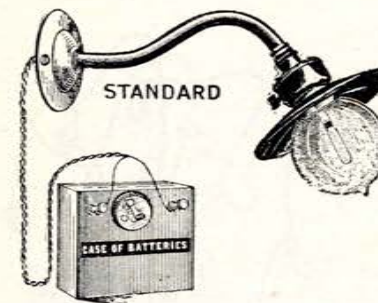
Any of the Above in Any Color, Extra 5 Cents Each



Half Size

BATTERY LAMP OUTFITS

Fill a real want as NIGHT LAMPS, when dressing, in bed and sickrooms, closets, cellars, stables or any place where an occasional light is needed. A turn of the switch, which can be placed anywhere, and you have a light. Dry Batteries last a good while, depending on use; Storage Batteries last longer and give a brighter light. Standard Edison Base, 4-Volt, 4 C. P. Lamps and Sockets, or Miniature Edison Base 4-Volt, 1 C. P. Lamps and Sockets. Complete with Bracket, Switch, 25 ft. of Wire and Battery. Case No. 2468 gives twice the life of No. 2467. Case No. 2470 gives three times the life of No. 2469.



List No.	Standard Base	Wt. Pkd.	Price	Miniature Base	No.	Price
2467	With case of 3 Dry Batteries.....	12 lbs.	\$2.40	2472		\$2.25
2468	With case of 6 Dry Batteries.....	20 lbs.	3.15	2473		3.00
2469	With 4-Volt 10-Hour Storage Battery....	22 lbs.	4.75	2474		4.60
2470	With 4-Volt 25-Hour Storage Battery.....	25 lbs.	7.00	2475		6.85
2471	Bracket and Lamp only (postage 8 cts.).....		1.25	2476		1.10

EMERGENCY LAMP

Can be attached to an incandescent lamp socket and used with 110-Volt Lamp. When preferred it will be fitted with connector ends instead of attachment plug, and with 4-Volt to 14-Volt Lamp to use on Storage or Dry Batteries. Complete with 10 ft. Cord.

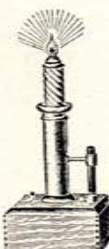


List No.	Price	Post.
2478	Emergency Lamp, 110 Volts.....	\$1.25 \$.12
2477	Emergency Lamp, 4 to 14 Volts.....	1.25 \$.12

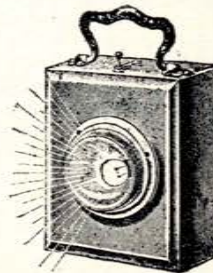
ELECTRIC CANDLE AND HOUSE LAMPS

Very handy. Give sufficient light to illuminate an entire room. Elegant designs. Nickered and polished parts. Finely finished cases.

List No.	Price	Postage
1781	Electric Candle, complete....	\$2.50 \$.40
1396	House Lamp, complete.....	2.25 .30
1780	Renewal Battery.....	.35 .15



1781



1396



DECORATIVE LAMP OUTFITS

Always an effective and magnificent display for any interior decoration, Christmas Trees, Banquet Tables, etc. Easy to put up and absolutely safe.

The **Battery Outfit** consists of a long festoon of silk-covered flexible cord with eight diverging ends, to which are attached eight porcelain sockets, eight lamps, clear and assorted colors, ready to attach to the case of 3 Dry Batteries with Switch. Compact and Portable and Economical. A string of 8 lamps can be operated with 3 Dry Batteries, 2 Fuller Cells or a 4-Volt Storage Battery.

An extra lamp is furnished with each 8-light string.

With Lamps of Assorted Colors

List No.		Wt. Pkd.	Price
1387	8-Light Outfit.....	15 lbs.	\$4.00
1477	16-Light Outfit.....	25 lbs.	7.75
1478	24-Light Outfit.....	40 lbs.	11.25
1479	32-Light Outfit.....	50 lbs.	14.50
1480	8-Light String and Lamps only.....		3.25

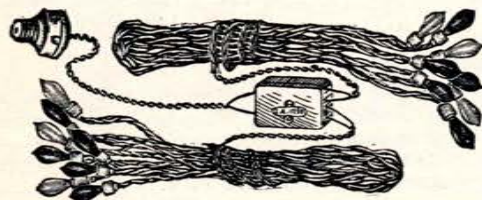
With Fruit and Flower Lamps

List No.		Wt. Pkd.	Price
1370	8-Light Outfit.....	15 lbs.	\$4.25
1371	16-Light Outfit.....	25 lbs.	8.25
1372	24-Light Outfit.....	40 lbs.	12.00
1373	32-Light Outfit.....	50 lbs.	15.50
1490	8-Light String only.....		1.25

Nos. 1480 and 1490 are prepaid.



DECORATIVE LAMP OUTFITS



For 110-Volt A. C. or D. C.

Where the Street-Lighting Circuit is available these outfits are a splendid means of decoration. Each 8-light outfit consists of a festoon of a long Silk-Covered Flexible Cord (National Code) with eight diverging ends, to which are attached eight porcelain Sockets; eight

Lamps, Clear and Assorted Colors, with Attachment Plug ready to attach to the lamp socket. For 16 or more lights the strings are connected in multiples of eight ready for immediate service. An extra lamp is furnished with each 8-light string. 32-light outfits are too heavy for the mails.

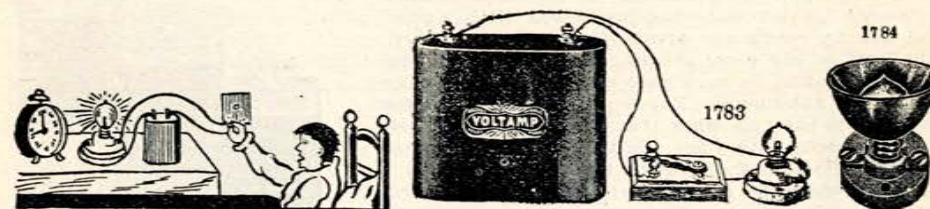
With Lamps of Assorted Colors

List No.		Price	Postage
2090	8-Light Outfit, 9 Lamps.....	\$4.00	.20
2091	16-Light Outfit, 18 Lamps.....	6.75	.40
2092	24-Light Outfit, 27 Lamps.....	9.50	.60
2093	32-Light Outfit, 36 Lamps.....	12.00	

With Fruit and Flower Lamps

1374	8-Light Outfit, 9 Lamps.....	\$4.75	.25
1375	16-Light Outfit, 18 Lamps.....	8.25	.50
1376	24-Light Outfit, 27 Lamps.....	11.75	.60
1377	32-Light Outfit, 36 Lamps.....	15.00	

ELECTRIC LIGHT OUTFIT

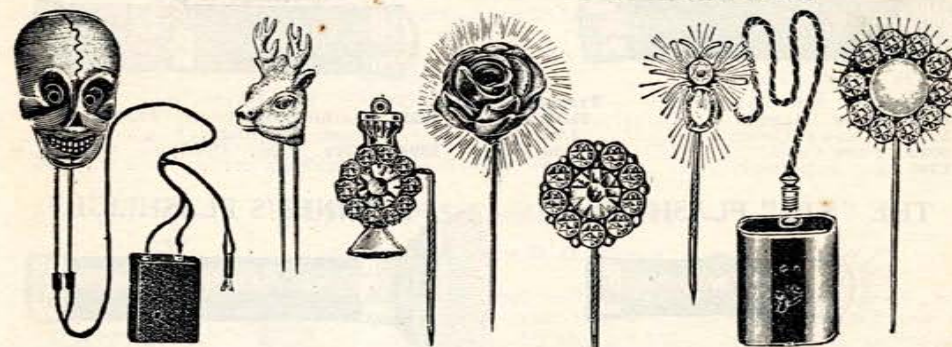


Very attractive to beginners in Electricity and for children generally. Can be used as a night light, as in illustration; in dark closets and similar places where a ready light is appreciated. Complete with Lamp, Receptacle, Switch and Wire. Silvered Mirror Reflectors, extra 10 cents.

List No.

List No.		Prepaid
1783	Electric Light Outfit.....	\$.75
1345	Extra Lamp, 4 Volts, Clear Glass.....	.25
	Extra Lamp, 4 Volts, Any Color.....	.30
1360	Electric-Light Outfit, with Reflector.....	.85
1784	Silvered Mirror Reflector, each.....	.10
1790	Extra Battery.....	.35

ELECTRIC SCARF AND BUTTON-HOLE PINS



Made and finished in superior style and durable workmanship. Jewel and Rose Pins are clusters of brilliant stones of various colors, fitted with cord and screw plug, as in illustration, and can be used with any Flashlight case listed in this book. Ivory-Head Pins have cords that clamp under the binding posts of the battery. Unique, Sparkling, Beautiful.

List No.

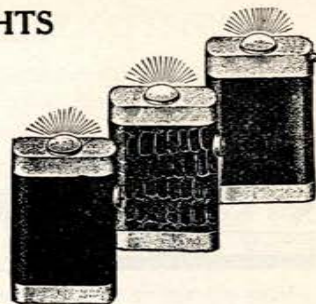
List No.		Prepaid
1785	Jewel Pin Outfit: Battery and Case, Lamp Cord, Plug and one of the following Pins: Jewel, Cluster, Spider, Lantern, Horseshoe or Crescent.....	\$1.15
1786	Rose Pin Outfit: Battery and Case, Lamp, Cord and Plug.....	1.15
1361	Jewel or Rose Pin, with Lamp, Cord and Plug only—no battery and case..	.75
1791	Lamp, with Cord and Plug only, for any of the above Pins.....	.35
1391	Extra Battery for any of the above outfits.....	.30
1787	Ivory-Head Pin Outfit: Battery, Cord, Plugs and any of the following Pins: Skull, Elk Head, Owl Head, Dog Head, Cat Head, Wolf Head or Horse Head.....	1.50
1362	Ivory-Head Pin, with Lamp, Cord and Plugs only—no battery.....	1.10
2033	Lamp, with Cord and Plugs only, for any Ivory-Head Pin.....	.40
1790	Extra Battery for Ivory-Head Pin.....	.35

For Battery Illustrations see page 66

VOLTAMP FLASHLIGHTS

The Pocket Flashlight is one of the most popular of modern conveniences, and justly, too. It is a practical and an ever-ready article that will give a brilliant light on the mere pressing of a button. Useful about the house, in dark places, cellars, in camp or around the automobile. Takes up little space in the pocket or in the grip when traveling. Various styles, each complete with Case, Battery, Lamp, Reflector and Bull's-Eye Lens. Nickeled trimmings.

NOTE.—OSRAM LAMPS will be furnished with any of the Flashlights. These lamps give more light and are great battery savers. Extra charge, 25 cents.



VEST-POCKET FLASHLIGHTS



1390

List No.	Size 1x2 3/4 x 3 3/4 in.	Prepaid
1492	Paper Cover.....	.65
1389	Cloth Cover, Voltamp "Special".....	.75
1391	Extra Battery.....	.30
1733	Alligator Cover, Voltamp "Choice".....	.85
1390	No. 1733, with Constant Attachment.....	1.00
1723	Extra Lamp.....	.25
2479	"Baby" Flashlight, 1x2x3 3/4 in.....	.90
2480	Extra Battery for No. 2479.....	.25



2479

TUBULAR FLASHLIGHTS



List No.	Size 1 1/2 x 8 1/2 in.	Prepaid
1734	Paper Cover.....	\$1.10
1393	Alligator Cover.....	1.25
2022	Fibre Case.....	1.50
1395	Extra Battery.....	.42



List No.	Size 1 1/2 x 8 1/2 in.	Prepaid
1735	Leatherette Cover, Constant and Flashing.....	\$1.85
1394	Fibre Case, Constant and Flashing.....	2.35

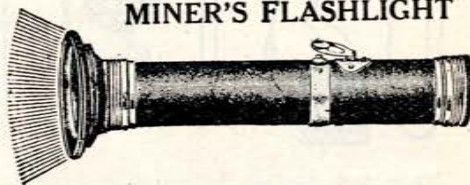
THE "KID" FLASHLIGHT



Very popular because of its small size and light weight. Has Osram Lamp. Takes Two-Cell Battery. Size 1 1/2 x 6 in.

List No.	Prepaid
1621	Alligator Cover.....\$1.10
1622	Fibre Case.....1.45
1623	Extra Battery (Post. 8c.).... .30

MINER'S FLASHLIGHT



Has powerful Reflector and Constant or Flashing Attachment. Size 1 1/2 x 9 in., Lens 2 1/2 in.

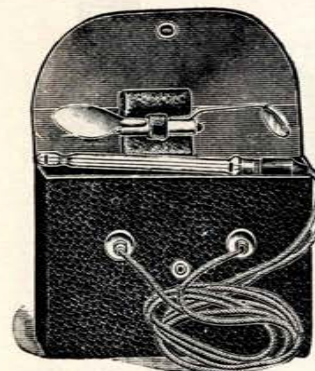
List No.	Prepaid
1736	Miners' Flashlight.....\$2.95
1395	Extra Battery......42

Batteries Used With Flashlights, Scarf Pins, Candles, Clocks, etc.



List No.	Size	Used with	Price	Postage
1391	7/8 x 2 3/8 x 2 3/8 in.	Nos. 1492, 1389, 1733, 1390	.25	.05
1790	7/8 x 2 3/8 x 2 3/8 in.	No. 1783 and Jewel Scarf Pins	.30	.05
1780	1 1/4 x 3 1/8 x 3 3/8 in.	Nos. 1778, 1779, 1781	.35	.15
1395	1 1/4 x 8 in.	Nos. 1393, 1394, 1734, 1735, 1736	.30	.12
1623	1 1/4 x 5 in.	Nos. 1621, 1622	.30	.08
2480	3/4 x 1 1/8 x 2 1/2 in.	No. 2479	.20	.05

SURGEON'S LAMPS AND OUTFITS



1769

A physician or dentist frequently requires a lamp for exploring the mouth, throat, nose, teeth, etc., and the No. 1769 outfit proves very handy. The case is small enough to fit into the coat pocket. It contains a superior mouth lamp with a lens front, made in one piece entirely of glass so that it can be readily antiseptized after each operation. Also has an adjustable Reflecting Mirror and Tongue Depressor, both heavily nickel-plated. A pair of 5 ft. Silk Conducting Cords with lamp socket and an excellent Service Battery complete the outfit, which is contained in a splendid leatherette-covered case.

No. 1768 Lamp has attached Cords with a plug end that will fit any Flashlight. Very convenient. 4 Volts.



1768



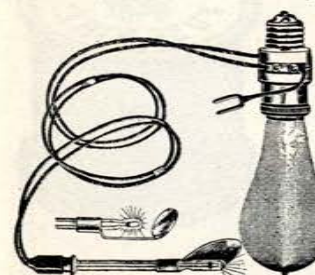
1766—ASEPTIC MOUTH LAMPS—1767

Supplied with all VOLTAMP outfits. Made in one piece with lens fronts and can be freely antiseptized in ordinary solutions. Will fit any Flashlight case. 4 Volts.

List No.	Prepaid
1769	Mouth Lamp Outfit, complete.....\$4.50
1766	Mouth Lamp only, superior.....1.00
1767	Mouth Lamp, imported......50
1768	Mouth Lamp and Attached Cords......65
1780	Renewal Battery, price 35 cts., postage 15 cts.

SURGEON'S LAMP OUTFIT

For Use on A. C. or D. C. Circuit



1770

An exceedingly convenient outfit where the street current is to be had. Screw it into a lamp socket and it is ready. Can be used on 110 or 220-volt alternating or direct current with the proper lamp in series. (See page 70.) Consists of an attachment plug, an 8-candle-power standard-size lamp, a superior Mouth Lamp with adjustable Reflecting Mirror and Tongue Depressor attachment, and a pair of 5 ft. Silk Conducting Cords with lamp socket.

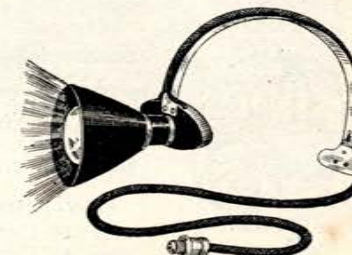
List No.	Prepaid
1770	Series Lamp Outfit, complete.....\$3.50

SURGEON'S HEAD LAMP

For Use on 110-Volt A. C. or D. C. Circuit

With large Tipless Lamp and Reflector. Throws a clear, bright light. Complete with 6 ft. Cords and Attachment Plug.

List No.	Prepaid
401	Surgeon's Head Lamp.....\$3.75



401

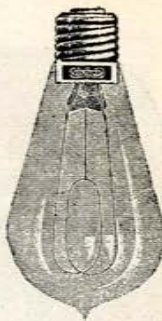
INCANDESCENT LAMPS

Standard Edison Base Only

Extra High Quality Carbon Filament Lamps—Efficient and Economical. Have stood the test of years in our own shops. 110-Volt Lamps can be used on 105 to 115-Volt Circuits, and the 220-Volt on 210 to 230-Volt Circuits, either A. C. or D. C. Frosted or Colored Lamps, 5 cts. each extra.

TUNGSTEN LAMPS, owing to their high operating temperature, emit a brilliant pure white light, much resembling clear daylight. They save over 60% in current consumption, compared with the ordinary carbon filament lamps. For 110-Volt Circuit only.

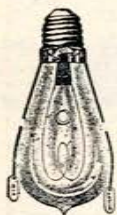
Note.—All lamps are fully tested and carefully packed, and we cannot be responsible for any breakage in transit.



CARBON FILAMENT LAMPS

TUNGSTEN LAMPS

110 Volts				220 Volts				110 Volts			
List No.	C.P.	Price	Post.	List No.	C.P.	Price	Post.	List No.	C.P.	Watts	Price Post.
2428	8	\$.20	\$.08	2434	8	\$.25	\$.08	2440	20	25	\$.85 \$.08
2429	16	.20	.08	2435	16	.25	.08	2441	32	40	1.10 .10
2430	24	.25	.08	2436	24	.30	.08	2442	48	60	1.40 .15
2431	32	.35	.10	2437	32	.40	.10	2443	80	100	1.75 .20
2432	50	.65	.15	2438	50	.75	.15				
2433	100	1.00	.25	2439	100	1.00	.25				



TURN DOWN LAMP

110 VOLTS

An excellent lamp for bedrooms, hallways, stores, offices and other places where a small light is mostly required. Turns down like gas light and uses less than one-fourth the current of the ordinary lamp. Edison Standard Base only.

List No. 2444—Turn-Down Lamp.....Price \$.65 Postage \$.08

TESTED FUSE WIRE

Safe Carrying Capacity, Amperes	Best Length for Use	Fusing Current for Same	Price Per Foot	Safe Carrying Capacity, Amperes	Best Length for Use	Fusing Current for Same	Price Per Foot
1/4	1 in.	3/4 Amp.	\$.01	15	2 1/4 in.	24 Amp.	\$.02 1/2
3/4	1 in.	2 1/4 Amp.	.01	20	2 1/2 in.	30 Amp.	.03
1	1 in.	5 Amp.	.01	25	2 3/4 in.	37 Amp.	.04
2	1 1/4 in.	10 Amp.	.01 1/2	30	3 in.	43 Amp.	.05
5	2 in.	12 Amp.	.01 1/2	35	3 in.	49 Amp.	.05
6	2 1/2 in.	17 Amp.	.01 3/4	50	3 in.	69 Amp.	.08

No packages less than 25 cts.



DESK FANS

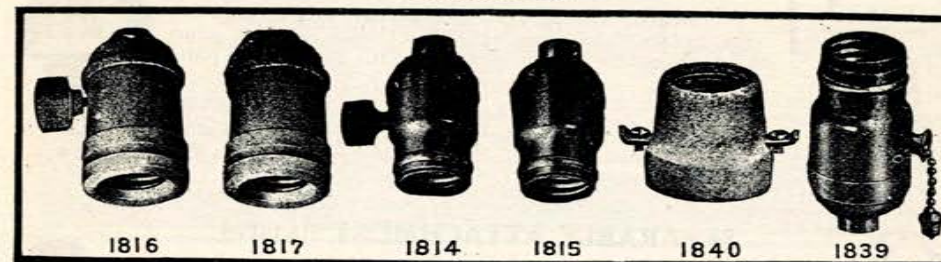
Standard Makes. Adjustable. Efficient, Durable, Economical

List No.	Direct Current	Price	List No.	Direct Current	Price
1951	110 Volts, 12 in....	\$13.50	1953	110 Volts, 16 in....	\$15.50
1952	220 Volts, 12 in....	14.50	1954	220 Volts, 16 in....	16.50
2445	110 Volts, OSCILLATING, 12 in.....	17.00			
110-V. Alternating Current			110-V. Alternating Current		
1955	60 Cycles, 12 in....	\$15.00	1957	130 Cycles, 12 in....	\$15.00
1959	60 Cycles, 16 in....	17.50	1961	130 Cycles, 16 in....	17.50
2446	110 Volts, OSCILLATING, 65 or 130 Cycles, 12 in.....	19.00			

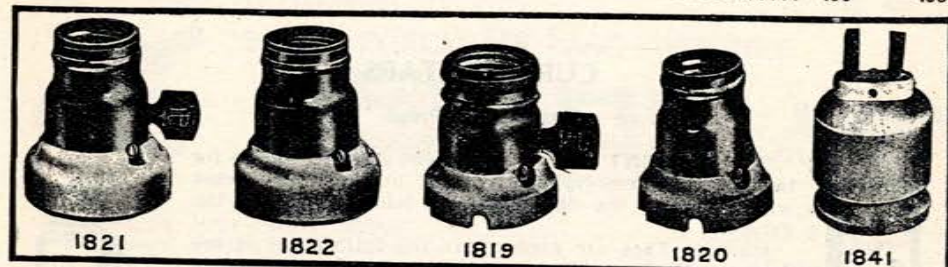


STANDARD LIGHTING SUPPLIES

Note.—All standard Supplies listed are for Standard Edison Screw Base only. Diameter 1 in.

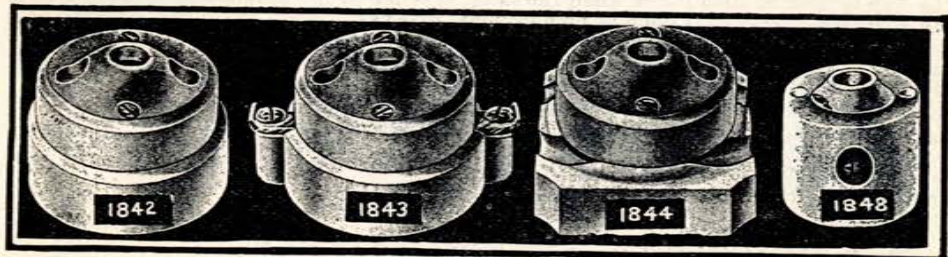


List No.	Price	Postage
1816 Key Socket, Porcelain Shell.....	.20	\$.05
1817 Keyless Socket, Porcelain Shell.....	.19	.05
1814 Key Socket, Brass Shell.....	.20	.03
1815 Keyless Socket, Brass Shell.....	.19	.03
1818 Socket Bushings, per dozen.....	.10	.03
1840 Porcelain Cleat Socket, superior.....	.10	.05
1840 Porcelain Cleat Socket, superior, per dozen.....	1.00	.50
1839 Chain Pull Socket, Brass.....	.50	.05



WALL SOCKETS have Porcelain Bases and Brass Shells. Slotted bases are for open wire work and solid bases are for concealed work.

List No.	Price	Postage
1821 With Key, Solid Base.....	\$.30	\$.05
1822 Keyless, Solid Base.....	.29	.05
1819 With Key, Slotted Base.....	.30	.05
1820 Keyless, Slotted Base.....	.29	.05
1841 Weatherproof Socket, Porcelain.....	.18	.05
1841 Weatherproof Socket, Porcelain, per dozen.....	2.00	.50



The ROSETTES shown are the most popular make. They have a positive locking arrangement, so that the cap will not come loose. Porcelain. Safe carrying capacity. Compact and neat.

List No.	Price	Postage
1842 Rosette, Round, for concealed work.....	\$.12	\$.05
1843 Rosette, Round, for cleat (open) work.....	.12	.05
1844 Rosette, Square, for molding work.....	.12	.05
1848 Ceiling Button, Porcelain, each 5 cts.; postage 3 cts.; per doz...	.50	.30



ATTACHMENT PLUGS

For tapping and carrying the current from an electric-light fixture to a drop light, fan, motor or any other device requiring current to operate it. Simple and safe.

List No.	Price	Postage
1823 Attachment Plug, Porcelain Cap.	\$.15	\$.03
1824 Attachment Plug, Brass Cap.	.15	.03



SEPARABLE ATTACHMENT PLUGS

These Plugs are a decided improvement over the solid styles shown above. The Caps are separable from the plugs, permitting removal of the latter without twisting the cords. No. 1989 is useful for extending a flexible cord line. Caps of both styles are interchangeable with all plugs. No. 1825 is porcelain.

List No.	Price	Postage
1825 Separable Attachment Plug	\$.25	\$.05
1989 Extension Plug, Composition	.50	.05



CURRENT TAPS

Attachment Plugs

The **CURRENT TAP** is an efficient and safe means for tapping the street-lighting current at the lamp socket without losing the light from the lamp already in the fixture.

Multiple Taps are used where the full output of the A. C. or D. C. circuit is required. For running power motors, fans, drop lights, emergency lamps and similar devices. Up to 250 Volts.

Series Taps are used on the A. C. circuit for operating motors, fans and similar devices, wound for the A. C. circuit; also for lighting lamps of 4 Volts to 14 Volts. Used on the D. C. circuit, the current thus obtained can be used for running low-voltage motors, fans and similar electrical apparatus; also in Electro-Medical work and for charging **Storage Batteries**. (See page 35.) If

the Tap is used at such times when the lamp is required for illuminating purposes, the work is done at no additional expense.

With a lamp in series on the 110-volt or 220-volt circuit, the tapped current is reduced to any voltage from 4 Volts to 14 Volts. When using the **Series Tap** be sure to insert a lamp offering sufficient current flow for the work in hand. The limit of current flow in Amperes, using carbon filament lamps (not Tungsten), is as follows:

Lamps of	8 C. P.	16 C. P.	24 C. P.	32 C. P.	50 C. P.	100 C. P.
On 110-volt circuit.....	1/4 A.	1/2 A.	3/4 A.	1 A.	1 1/2 A.	3 A.
On 220-volt circuit.....	1/8 A.	1/4 A.	3/8 A.	1/2 A.	3/4 A.	1 1/2 A.

For lighting 4-volt lamps use an 8 C. P. lamp in the Series Tap.

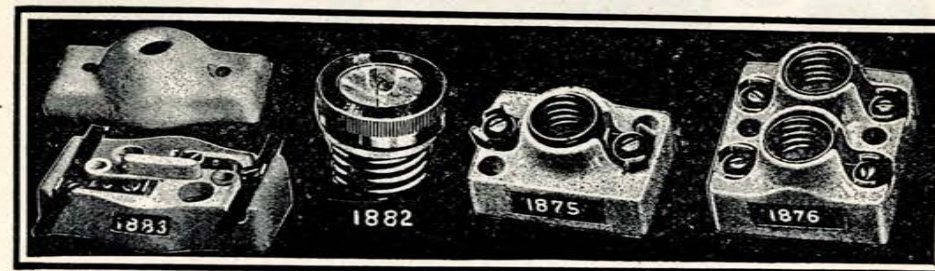
The **VETTER SERIES TAP** is in one piece, with porcelain body and brass top. The **SEPARABLE TAPS** are all porcelain and have removable caps that can be replaced by any other attachment cap when the TAP is no longer needed. Standard Edison Base only.

List No.	Prepaid	List No.	Prepaid
1846 Vetter Series Tap	\$.65	1845 Edison Solid Multiple Tap	\$.50
1829 Edison Separable Series Tap	.55	1830 Edison Separable Mul. Tap	.55

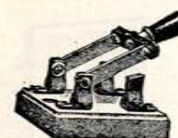
For 110-volt and 220-volt Lamps see page 68.



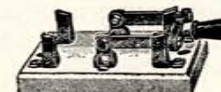
STANDARD LIGHTING SUPPLIES



List No.	Price	Postage
1883 Porcelain Cleat Rosettes	\$.15	\$.05
1882 Fuse Plugs, 3 Amperes to 30 Amperes, each	.06	.02
1877 Triple Pole Main	.32	.18
1878 D. P. Single or Double Cross Over	.25	.18
1875 Edison Plug Cut Out, S. P. Main	.15	.08
1876 Edison Plug Cut Out, D. P. Main	.22	.15
1879 S. Branch D. P. two-wire	.25	.18
1880 D. Branch D. P. two-wire	.45	.28
1881 D. Branch D. P. three-wire	.75	.33



D. P. S. T.



D. P. D. T.

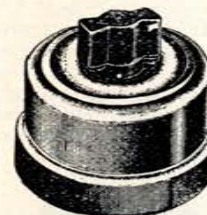


S. P. D. T.



S. P. S. T.

List No.	15 Amperes	Price	Postage
1884 Single Pole, Single Throw		\$.25	\$.06
1885 Single Pole, Double Throw		.35	.08
1886 Double Pole, Single Throw		.35	.10
1887 Double Pole, Double Throw		.45	.12



STANDARD SNAP SWITCHES

Plain Face

List No.	250 Volts	Price	Postage
1826 5 Amperes, Single Pole		\$.25	\$.05
1827 10 Amperes, Single Pole		.35	.06
1828 10 Amperes, Double Pole		.50	.08

Indicating Face

List No.	250 Volts	Price	Postage
1831 5 Amperes, Single Pole		\$.25	\$.05
1832 10 Amperes, Single Pole		.35	.06
1833 10 Amperes, Double Pole		.50	.08



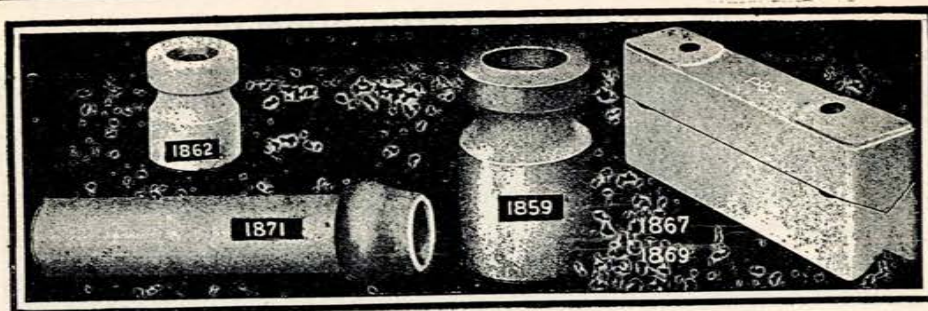
PENDANT SWITCHES

To be suspended with flexible cord where it is inconvenient to use a Switch. The circuit is closed by pushing one button and opened by pressing the other. On any circuit up to 250 Volts. Polished Brass.



List No.	Price	Postage
1849 Perkins, 5 Amperes	\$.35	\$.05
1850 Perkins, 10 Amperes	.50	.06
1683 P. & S., 5 Amperes	.35	.05
1673 P. & S., 10 Amperes	.50	.06





PORCELAIN KNOBS

List No.	Size	Pairs	Price	Post.
1859 Large, 1	x1 1/2 in.	Per 12	\$.15	\$.19
1860 Large, 1	x1 1/2 in.	Per 50	.50	
1861 Large, 1	x1 1/2 in.	Per 100	.90	
1862 Small, 1/2	x 3/4 in.	Per 12	.12	.06
1863 Small, 1/2	x 3/4 in.	Per 50	.40	.19
1864 Small, 1/2	x 3/4 in.	Per 100	.75	.42
1865 Leather-Head Nails		Per 50	.10	.05
1866 Leather Heads only		Per 50	.05	.02

PORCELAIN CLEATS

List No.	Size	Pairs	Price	Post.
1867 Standard 2 Wire		Per 12	\$.18	\$.20
1868 Standard 2 Wire		Per 100	1.00	
1869 Standard 3 Wire		Per 12	.18	.22
1870 Standard 3 Wire		Per 100	1.00	

PORCELAIN TUBES

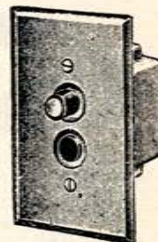
1871 3 in. x 5/16 in. hole	Per 12	\$.18	\$.15
1873 3 in. x 5/16 in. hole	Per 100	.70	.28
1872 6 in. x 3/8 in. hole	Per 12	.30	
1874 6 in. x 3/8 in. hole	Per 100	1.50	

STANDARD LIGHTING SUPPLIES

FLUSH PUSH-BUTTON SWITCHES

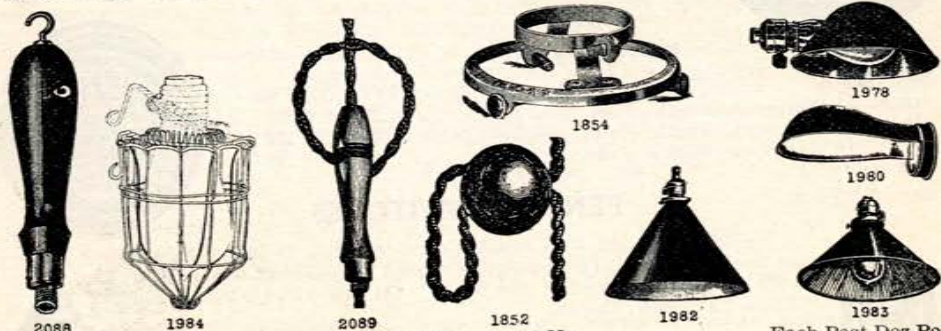
High grade and thoroughly reliable. The mechanism cannot easily get out of order. Furnished complete with Nicked Face Plate.

List No.	Price	Postage
1834 Single Pole	\$1.00	\$.12
1835 Double Pole	1.25	.12
1836 Three Point	1.25	.12
1837 Four Point	2.00	.12
1838 Iron Boxes for above	.25	.05



METAL SHADES, REFLECTORS, ETC.

VOLTAMP Metal Shades and Reflectors are well made and enameled. Colors are green outside and white inside. Strong, durable and neat. No. 1984 Lamp Guards are the best on the market. Require no shade holder. Do not obstruct the light. No. 2088 Socket Handle, for 1/2 in. socket, screws into the socket, the lamp cord passing through the central hole. No. 2089 Socket Handle, for 1/2 in. socket, takes any size cord and can be adjusted to any height. No. 1854 and 1855 Shade Holders are standard fixtures, brass finish. In nickel finish add 5 cents each, or 30 cents in dozen lots.



List No.	Price	Post	List No.	Each	Post	Doz	Post
1978 Parabola Shade, polished, 7 in.	\$.60	\$.05	1854 Shade Holder, 2 1/4 in.	\$.05	\$.02	\$.50	\$.15
1979 Parabola Shade, frosted, 7 in.	.50	.05	1855 Shade Holder, 3 1/4 in.	.07	.02	.75	.15
1980 Half Shade, metal	.25	.03	1984 Wire Lamp Guards	.20	.03	2.25	.35
1981 Half Shade, green glass	.40	.15	2088 Socket Handle only	.15	.03	1.50	.25
1982 Cone Shade, metal, 10 in.	.25	.08	2089 Socket Handle only	.12	.03	1.25	.25
1983 Cone Shade, glass, 7 in.	.50	.15	1852 Cord Adjusters, prepaid	.05			.50

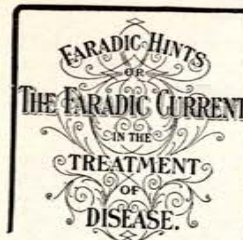
Not less than 12 sold at dozen rate.

"FARADIC HINTS"

Postpaid 15 Cents

A book of instruction in the use of electricity for the home treatment of disease, aches, pains, etc. Told in simple language that anyone can understand. Full of useful hints for physician or patient. A splendid course in electro-medical treatments, telling how the current should be applied in each case.

NOTE.—A coupon with each book entitles the owner to 15 cents in trade when purchasing any VOLTAMP Medical Battery or accessory of the value of \$1.50 or over.

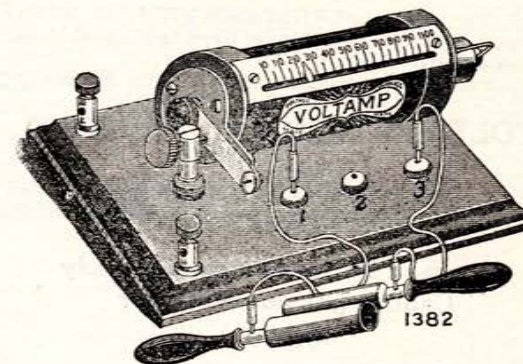


VOLTAMP MEDICAL INDUCTION COILS

Just the Thing to Convince You of the Great Value of Electricity in Medicine
A Safe Remedy for Most All Aches and Pains. Electricity Is Life

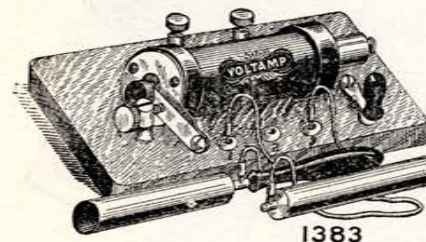
The coil used on this outfit is exactly the same as those used on our high-grade medical batteries. It gives three distinct currents—Primary, Secondary and Combined—nicely controlled by a slide sheath. A calibrated scale and index show the strength of current taken.

All parts are finely nickel-plated, and it is mounted on a full polished cherry base, size 5 1/4 x 3 1/2 x 2 in. Sent complete with one pair of Silk Cords, two Metal Hand Electrodes, two Ebonized Electrode Handles and a copy of "Faradic Hints," a book of instructions and treatments. Operates with one dry or wet cell.



List No.

1382 Medical Induction Coil.....\$1.75



A beautifully finished and very powerful Coil, similar to the No. 1382, but without the indicating scale. Provides three currents—Primary, Secondary and Combined—with a slide Sheath Controller. Has a switch for turning the current on and off. A pair of Silk Cords; two Metal Hand Electrodes, one Ebonized Electrode Handle and a copy of "Faradic Hints" go with it. Operates on one dry or wet cell. Size 5 1/4 x 3 1/2 x 1 1/4 in.

List No.

1383 Medical Induction Coil.....\$1.50

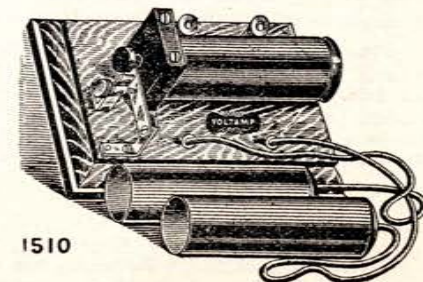
Any of the Hair Brushes and Electrodes listed on succeeding pages can be used with the above coils.

HOUSEHOLD MEDICAL COIL

Nicely made, strong and compact, this coil gives a splendid current and the slide sheath controls it from mild to strong. Operates on one dry or wet cell. Size 4 1/2 x 3 1/4 x 1 1/4 in.

List No.

1510 Household Medical Coil.....\$.90



VOLTAMP MEDICAL BATTERIES

In the treatment of diseases, aches and pains with the electric current it is highly essential that only an effective and well-made battery be used. The mere fact that an instrument "buzzes" or "makes a noise" is no evidence of its efficiency. Many of the instruments now before the public are flimsy productions, totally worthless as an aid to health, with only one point of recommendation—their low price.

The distinctive features of the VOLTAMP MEDICAL BATTERIES are the winding of the Coil and the smooth control of the currents. VOLTAMP Coils are scientifically wound with heavily insulated wires over a reinforced magnet center (patented). The great care taken in this work and the precision of the accompanying vibrator together produce the quality of currents that are positive in their action and prove the valued medium in Electro-Medical treatments.

The method of controlling the currents, whether by sheath over the magnet or by the Fuld Regulator, the instantaneous and unflinching response of the switches, the substantial character of the various parts, the convenient and compact form, the beautifully finished hardwood cases and many other points of superiority are unsurpassed by any of the higher-priced instruments on the market.

The makers of VOLTAMP MEDICAL BATTERIES for nearly 30 years have manufactured the highest-grade Electro-Medical Apparatus, recognized as standards by the medical profession.

Patents granted January 10, 1899; February 21, 1899; June 27, 1899; July 2, 1901.

VOLTAMP MEDICAL BATTERY

No. 6

"MAJESTIC"

Compact, Portable, Always Ready
Cannot get out of Order

\$5.00

The MAJESTIC is the leader of all low-price, high-grade Medical Batteries, and its compact form and convenient arrangement instantly commend it to the doctor or his patient for home use or when traveling. It cannot get out of order and there is nothing to spill or leak. Always dry, clean and neat, and of such simplicity that a child may give or take the current without the slightest risk or harm.

The induction coil furnishes three different currents—Primary (weak), Secondary (medium) and Combined Primary and Secondary (strong). All are smoothly controlled by a slide sheath, which increases the strength as it is drawn outward from a very mild to a very strong current.

The case is of selected cherry wood, with rounded corners and molded top, handsomely finished, and has a carrying handle of nicked brass. Beneath the hinged plate the base forms a compartment for the following accessories: Two Metal Hand Electrodes, two Ebonized Electrode Handles, two Sponge Electrodes, two Silk Conducting Cords, a Metal Foot Plate and a copy of our complete instruction book, "Faradic Hints." Size of case $8\frac{1}{2} \times 5\frac{1}{2} \times 5$ in. Weight 6 lbs.

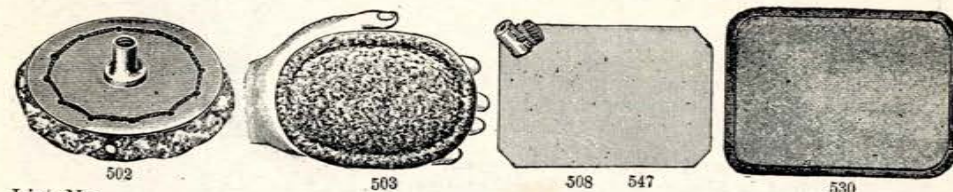


List No.	Price
1892 Medical Battery No. 6.....	\$5.00

Thousands of these Batteries are in daily use for relieving and curing pains and aches and for general HOME Treatments.

MEDICAL BATTERY ELECTRODES

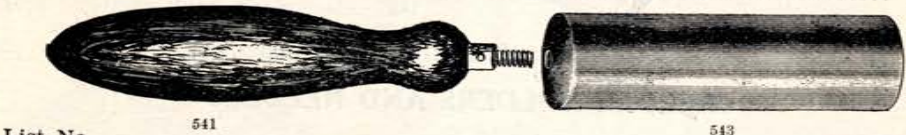
VOLTAMP MEDICAL BATTERY ELECTRODES are made according to designs approved by the leading specialists, and are in use by the foremost electro-therapists and hospitals in the United States.



List No.	Prepaid
502 Sponge Electrode, best flat sponge, per pair.....	\$.50
503 Hand Sponge, with strap, insulated with soft rubber, faced with fine sponge or spongio piline, for general application with the hand.....	.75
508 Metal Foot Plate, for applying current to feet. Large size $4 \times 7\frac{3}{4}$ in.....	.35
547 Metal Foot Plate, small size $3\frac{3}{4} \times 6\frac{3}{4}$ in.....	.25
530 Felt-Covered Pad Electrodes, for application of the current to the body. Insulated with soft rubber and faced with best quality of Jaeger felt.	
Size A, $3\frac{3}{4} \times 2\frac{3}{4}$ in.....	\$.50
Size B, $4 \times 3\frac{1}{2}$ in.....	.60
Size C, $5\frac{1}{2} \times 3\frac{3}{4}$ in.....	.75
Size D, 7×5 in.....	.90



List No.	Prepaid
528 Silk Conducting Cords, 3 ft. lengths, per pair.....	\$.35
585 Silk Conducting Cords, 5 ft. lengths, per pair.....	.50
586 Silk Conducting Cords, 8 ft. lengths, per pair.....	.65
500 Separable Cord Tips, per pair.....	.10
576 Ebonized Wood Electrode Handle, with Interrupter or Current Breaker, with Universal Connectors to take any make of cords, length $6\frac{1}{2}$ in....	.75
575 Ebonized Wood Electrode Handle, without Interrupter.....	.50



List No.	Prepaid
541 Ebonized Wood Handle, each 15 cts., per pair.....	\$.25
543 Metal Handles, Nickel-plated, per pair.....	.25
501 Wood and Metal Handles, per pair, each.....	.50



List No.	Prepaid
516 Metallic Wire Brush, stiff.....	.40
540 Metallic Brush, soft tinsel.....	.40
521 Erb Electrode, sponge-covered ball end.....	.25



List No.	Prepaid
523 Laryngeal Electrode, metal ball and insulated stem, length 7 in.....	\$.50
525 Laryngeal Electrode, sponge-covered metal ball, with insulated stem.....	.55
524 Laryngeal Electrode, sponge-covered metal disc, with insulated stem.....	.75

VOLTAMP ELECTROLYSIS OUTFIT

A Safe and Permanent Remedy for the Removal of Superfluous Hair, Warts, Moles, Birthmarks and Other Facial Blemishes

The persistent growth of hair on the face is the cause of untold annoyance and discomfort to many, especially to ladies. Numerous chemical preparations are often tried, but their effect is only temporary and the hair or blemish always returns.

Electrolysis is the only Sure and Permanent Remedy. The Treatment is Simple and Anyone Can Use it. Absolutely Painless and Leaves no Scar.



The outfit is carefully designed for self-treatment at home. The battery contains six VOLTAMP cells, type U, any number of which or all can be used at one time. These cells are reliable, and with ordinary care and use will last from six to twelve months. The accessories are all in full view, each one having a metal clasp receptacle on the top plate. They include one Needle Holder, two Steel Needles, a pair of Epilating Forceps, a Self-Holding Lens, a Massage Roller, a pair of Silk Conducting Cords, a Sponge Electrode, two Ebonized Electrode Handles and a copy of "Faradic Hints," giving full instructions for Electrolysis treatments.

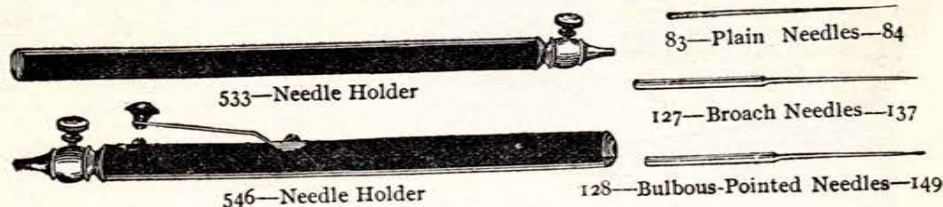
The Battery can also be used for Medical and Massage treatments where the galvanic current is desired.

The case is of cabinet-finished cherry, size 11 1/4 x 5 1/2 x 4 inches, and has a polished nicked brass carrying handle. Weight 6 lbs.



List No.	Price
1487 Electrolysis Outfit, complete	\$10.00
1509 Renewal Cells (postage each, 11 cts.)	Each, .25

NEEDLE HOLDERS AND NEEDLES



NOTE.—Platinum Needles are always to be preferred, as they will not corrode or rust under any conditions.

List No.	Prepaid
546 Needle Holder, with Set Screw and Interrupter	\$1.00
533 Needle Holder, with Set Screw, without Interrupter	.75
83 Steel Needles, Plain, each 5 cts., per dozen	.50
127 Steel Broach Needles, each 5 cts., per dozen	.50
128 Steel Needles, Bulbous Pointed (Hayes), each 10 cts., per dozen	1.00
84 Iridio-Platinum Needles, Plain, each	.40
137 Iridio-Platinum Broach Needles, each	.50
149 Iridio-Platinum, Bulbous Pointed, each	.50

MASSAGE ROLLERS

The art of Massage has been gradually developed until now, in connection with the mild Faradic current, it is a valued resource in modern medical treatment. Voltamp Massage Rollers are in constant use by the foremost professional masseurs, who pronounce them superior for the treatment of Headache, Neuralgia, Rheumatism, Sore Muscles, etc. Wrinkles, crowfeet, pale and hollow cheeks can be successfully treated and be replaced by soft, clear and smooth skin. They bring back the rosy glow of health to faded cheeks. Any battery listed in the book can be used with Voltamp Rollers.



IDEAL MASSAGE ROLLER FLEXIBLE



The only Massage Roller that shapes itself to the lines of the neck, throat, arms or other portions of the body. It consists of a series of 15 spiral-spring flexible rollers, 1/4 in. diameter, each working on its own axis. The spring tension is balanced throughout and the roller gives equally over the surface to which it is applied.

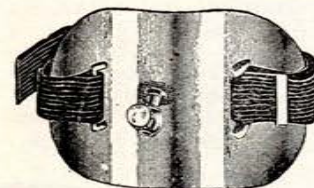
It is the only ideal roller for the masseur, because it answers every call made upon it, massaging equally well all parts of the body, arms, neck, throat, face and scalp.

List No.	Prepaid
225 Ideal Massage Roller	\$3.00



List No.	Prepaid
549 Metal Massage Roller, nickel-plated	.50
574 Felt-Covered Carbon Massage Roller	.50

WRIST, NECK AND HEAD BAND ELECTRODE

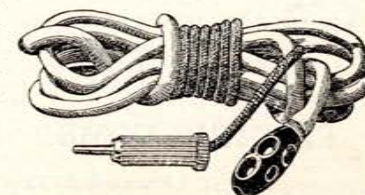


Of especial advantage in self-treatment and in the removal of superfluous hair or other dermatological work, as it leaves both hands free. Perfect, uninterrupted contact assured. The silk webbing strap is long enough to go around the head, neck or wrist, and the flat clasp holds the electrode in the proper position. A piece of moist felt or cotton gauze is placed between it and the skin.

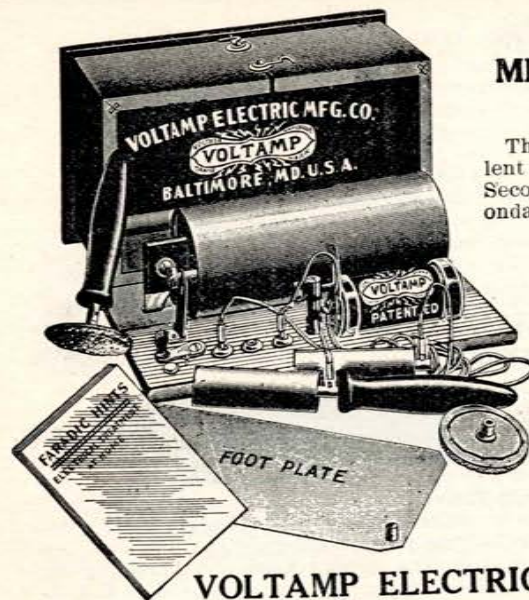
List No.	Prepaid
544 Wrist, Neck or Head Band Electrode	\$.75

EINHORN STOMACH OR GASTRIC ELECTRODE

For applying the current within the stomach or rectum. The electrode is inclosed in a small perforated hard-rubber olive, so that it does not come in direct contact with the mucous surfaces. It is attached to a flexible conducting cord about three feet long, covered with pure soft-rubber tubing.



List No.	Prepaid
518 Einhorn Stomach or Gastric Electrode	\$2.00



HOUSEHOLD MEDICAL BATTERY No. 24

A POPULAR DESIGN

The HOUSEHOLD Battery has an excellent coil, offering three currents—Primary, Secondary, and Combined Primary and Secondary—all controlled by a slide sheath.

The case is of genuine Cherry or Oak, handsomely finished, and has a compartment in the top for the following accessories: Two Sponge Electrodes, two Silk Conducting Cords, two Metal Hand Electrodes, two Ebonized Electrode Handles, a Metal Foot Plate and a copy of "Faradic Hints," a very clear, easy-to-read book of instructions and treatments. Size $9 \times 5 \frac{1}{2} \times 5$ in. Weight $5 \frac{1}{4}$ lbs.

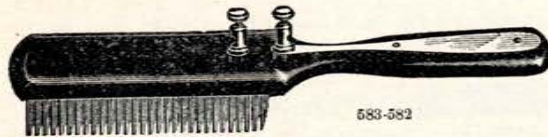
List No. Price
1339 Household Battery No. 24. \$4.00

VOLTAMP ELECTRIC HAIR BRUSHES

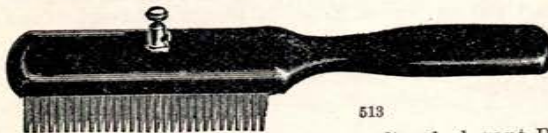
A TONIC FOR THE SCALP AND HAIR

Falling hair, dandruff, baldness and various other troubles of the scalp, and even the little pains that are frequently called neuralgia, are, in a general sense, due to a sluggish condition of the tiny blood vessels that supply the roots of the hair. Such troubles are often ascribed to the presence of germs, and a cure is promised in the application of liquid washes. Nothing can be farther from the truth, as germs play a very small part in the majority of cases, while liquid washes are often injurious and, as remedies, prove complete failures.

All successful scalp treatment must be directed toward a stimulation of the nerves in the scalp, for which there is nothing so perfectly adapted as the Faradic Current, and the VOLTAMP Electric Brushes and Combs are the best and safest means of applying it. The application is very simple and the sensation is delightful.



583-582



513



554

No. 582 is an exceptionally good and elegant Brush, having fine wire bristles closely set. An "electric shampoo" with this Brush is a grand treat.

	Prepaid
List No.	\$1.00
583 Electric Hair Brush, large, 2 binding posts.....	.75
513 Electric Hair Brush, large, 1 binding post.....	.55
554 Electric Hair Brush, small, 2 binding sockets.....	1.50
582 Electric Hair Brush, large, of fine wire bristles, 2 binding posts.....	

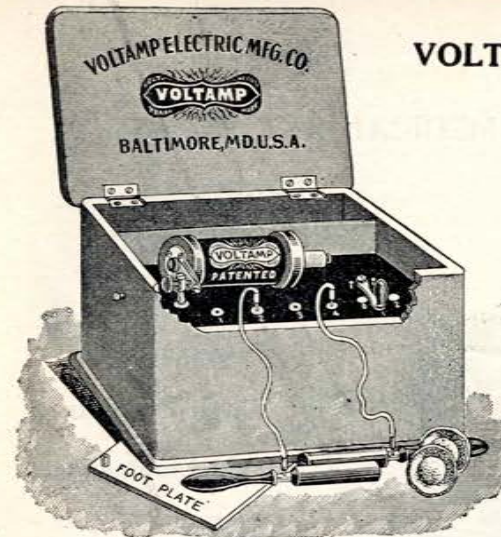
ELECTRIC COMB

List No. 584.....Prepaid, \$1.00



VOLTAMP MEDICAL BATTERY No. 9

Single Cell, \$4.00



MEDICAL BATTERY

No. 15

Double Cell, \$6.50

The No. 9 is an excellent low-price instrument, offering three currents, controlled by a slide sheath. Its construction is extremely simple, so that nothing can get out of order, and the life of the cell is considerable. Supplied with a pair each Silk Conducting Cords, Metal Hand Electrodes, two Ebonized Electrode Handles, a Sponge Electrode, a Metal Foot Plate and a copy of "Faradic Hints." The case is of antique oak. Size $8 \frac{3}{4} \times 5 \times 5 \frac{1}{4}$ in. Weight 5 lbs.

List No. Price
1894 Medical Battery No. 9.....\$4.00

VOLTAMP MEDICAL BATTERY No. 15

The No. 15 is identical in appearance with the above, but has two cells, and the Coil carries an extra High-Tension Winding, which affords a more powerful current. A full set of Electrodes, the same as supplied with the No. 6 outfit. Size of oak case $8 \frac{3}{4} \times 6 \frac{3}{4} \times 5 \frac{1}{4}$ in. Weight $7 \frac{3}{4}$ lbs.

List No. Price
1896 Medical Battery No. 15.....\$6.50

VOLTAMP MEDICAL BATTERY No. 8

"THE GRAND OLD DOCTOR"
\$3.50

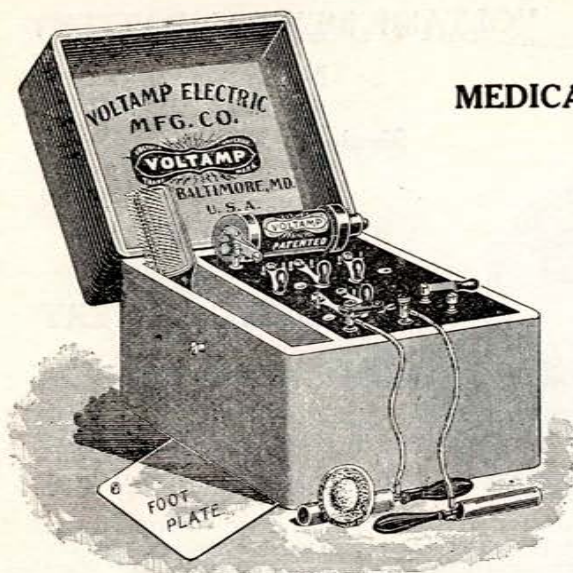
Convenient for Satchel or Suit Case

Very smallest in size and price, but as neat, as durable and as reliable as any of the larger styles. Has the usual three-current coil and sheath controller.

Put up in a cabinet-finished cherry case. Size $8 \times 3 \frac{3}{4} \times 5$ in. Weight $4 \frac{3}{4}$ lbs. The Electrodes that go with it are two Silk Conducting Cords, two Metal Hand Electrodes, two Ebonized Electrode Handles, a Sponge Electrode, a Metal Foot Plate and a copy of "Faradic Hints."

List No. Price
1893 Medical Battery No. 8...\$3.50





VOLTAMP MEDICAL BATTERY No. 10

"CROWN"

Two Cells
Powerful Coils
Three Currents
Pole Changer
\$7.50

This outfit is furnished with two cells and a high-tension coil, making it the most powerful Electro-Medical Battery on the market for the price. It is capable of delivering the Faradic Current sufficiently strong for almost every possible requirement.

The induction coil furnishes three currents, all differing in the degree of intensity, in sensation and purpose, and the slide-sheath controller varies these currents from the weakest to one of extreme power.

Mounted on the plate with the coil is a Selecting Switch for one or two cells, a Coil Selecting Switch, a Pole-Changing Switch for changing the polarity of the current without removing the electrodes from the patient, two Binding Posts to take the Conducting Cords, and a Battery Switch for throwing the current on or off. All parts are handsomely finished and nickel-plated. The case is of heavy oak, highly polished, with dovetailed and rounded corners, and is supplied with a leather-strap handle. Size 8x8x5 3/4 in. Weight 9 lbs.

The accessories included with the outfit include two Silk Conducting Cords, two Metal Hand Electrodes, two Ebonized Electrode Handles, two Sponge Electrodes, a Metal Foot Plate, a copy of "Faradic Hints" and a Metallic Hair Brush for treating the scalp and hair.

List No. 1895 Medical Battery No. 10.....\$7.50

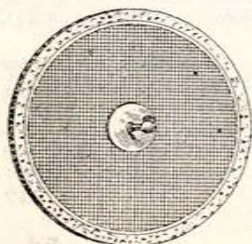
Efficiency combined with VOLTAMP quality make this unquestionably the most durable Battery on the market.

ELECTRODES

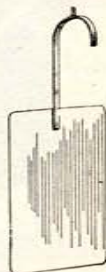
List No. Prepaid

146 PAD ELECTRODE. A metal cloth back faced with spongio piline for application of the current over large space. Diameter 8 in.....\$1.50

175 BATH PLATE ELECTRODES. For electric baths. Hang over the edge of the tub and then connect with the battery. Also used singly, applying the current to the parts of the body not submerged with a hand sponge or other electrode. Per pair, prepaid, \$3.00; one only... 1.65



146



175

For Other Electrodes see Following Pages

FULD CURRENT REGULATOR

Patented January 10, 1899



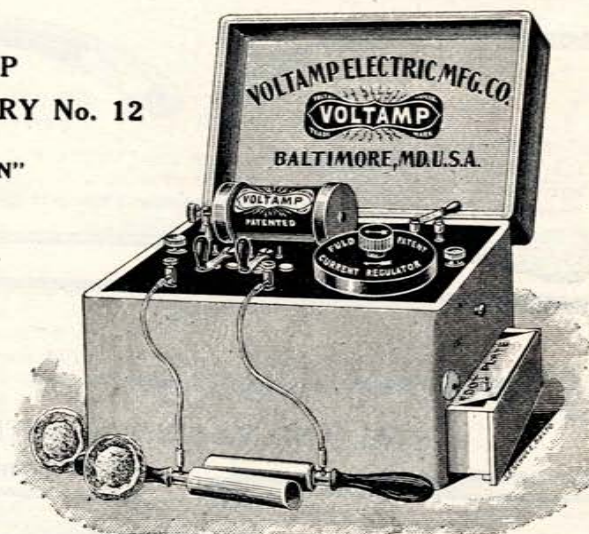
Very useful in Medical work for controlling and graduating the Faradic current with minuteness and accuracy. With it in the circuit a shock is impossible. Equal in efficiency to any similar rheostat or current regulator manufactured, no matter what the price.

Mounted ready for use. Connect the two upper binding posts PP and NN to the battery; the lower binding posts P and N take the conducting cords.

List No. 1384 Fuld Current Regulator.....\$2.00

VOLTAMP MEDICAL BATTERY No. 12 'CHAMPION'

With the
Fuld Current
Regulator
\$10.00



A thoroughly high-grade instrument, suitable for the practicing physician or for self-treatment. The Coil is made up of a Primary and two Secondaries, one of which is an extra High-Tension winding. Six distinct currents can be had, suitable for all Faradic treatments.

The distinct advantage of this Battery over all others lies in the method of controlling the current by the Fuld Current Regulator. With this remarkable instrument in the circuit the current can be regulated from the mildest to the very strongest and a shock is impossible. It is fitted with two dry cells and switches for selecting the coils and throwing the current on or off.

The case is of cherry, size 9 1/4 x 6 1/4 x 7 3/4 in., with rounded corners and molded top, all magnificently polished. Has a substantial carrying strap. All parts are handsomely nickel-plated. Weight 9 1/2 lbs.

The outfit includes two Silk Conducting Cords, two Metal Hand Electrodes, two Sponge Electrodes, two Ebonized Electrode Handles, a Metal Foot Plate and a copy of "Faradic Hints," a book full of useful information.

List No. 2021 Medical Battery No. 12.....\$10.00

VOLTAMP MEDICAL BATTERY No. 11

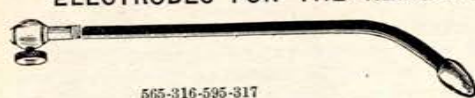
Single Cell

The No. 11 is similar to the No. 12 above, except that it has only one cell and the coil is not quite so large. A splendid outfit where only one cell is needed. Size 9 1/4 x 5 1/2 x 7 1/4 in. Weight 7 lbs.

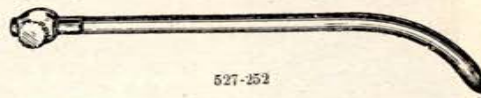
List No. 1340 Medical Battery No. 11.....\$8.00

MEDICAL BATTERY ELECTRODES

ELECTRODES FOR THE REMOVAL OF URETHRAL STRICTURE, ETC.



565-316-595-317



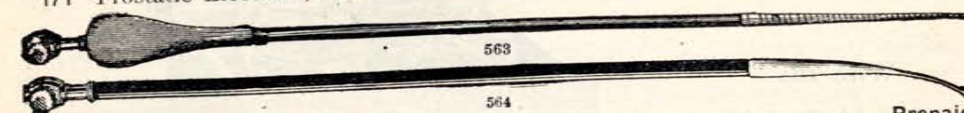
527-252

- | | | |
|----------|---|---------|
| List No. | | Prepaid |
| 565 | Olive, with insulated curved stem, any size, length 9 in..... | \$.50 |
| 316 | Set of six No. 565, all sizes, in a neat case..... | 3.50 |
| 595 | Olive, with insulated straight stem, any size, length 9 in..... | .50 |
| 317 | Set of six No. 595, all sizes, in a neat case..... | 3.50 |
| 527 | Metallic Sound, nickel-plated, three sizes, $\frac{1}{8}$, $\frac{3}{16}$, $\frac{1}{4}$ in. diameter, each.... | .50 |
| 333 | Metallic Sound, nickel-plated, per set of three sizes..... | 1.40 |
| 252 | Metallic Sound, copper, three sizes, $\frac{1}{8}$, $\frac{3}{16}$, $\frac{1}{4}$ in. diameter, each..... | .75 |



75-325

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|----------|--|---------|
| List No. | | Prepaid |
| 75 | Olive, with spiral flexible stem, any size, length 9 in..... | \$.50 |
| 325 | Set of six No. 75, all sizes, in a neat case..... | 3.50 |
| 171 | Prostatic Electrode, for treatment of the Prostatic Gland..... | 3.00 |



563

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| List No. | | Prepaid |
| 563 | Spiral Flexible Intra-uterine Electrode, insulated stem, 9 in..... | \$1.50 |
| 564 | Inflexible Intra-uterine Electrode, insulated, length 9 in..... | 1.00 |

RECTAL AND VAGINAL ELECTRODES.



537-573

- | | | |
|----------|--|---------|
| List No. | | Prepaid |
| 537 | Rectal Electrode, nickel-plated olive, insulated stem, length $4\frac{3}{4}$ in..... | \$.75 |
| 232 | Rectal Electrode, copper olive, insulated stem, length $4\frac{3}{4}$ in..... | 1.00 |
| 538 | Rectal Electrode, all metal, nickel-plated, length 4 in..... | .50 |
| 573 | Rectal Electrode, all metal, copper, length 4 in..... | .60 |



557-558-593-594

- | | | |
|----------|--|---------|
| List No. | | Prepaid |
| 557 | Rectal Electrode, nickel-plated, $\frac{7}{16}$ in. olive, insulated stem..... | \$1.25 |
| 593 | Rectal Electrode, copper, $\frac{7}{16}$ in. olive, insulated stem..... | 1.50 |
| 558 | Vaginal Electrode, nickel-plated, $\frac{3}{4}$ in. olive, insulated stem..... | 1.25 |
| 594 | Vaginal Electrode, copper, $\frac{3}{4}$ in. olive, insulated stem..... | 1.50 |
| 572 | Syringe Electrode, Rectal or Vaginal, nickel-plated olive..... | 2.50 |
| 266 | Syringe Electrode, Rectal or Vaginal, copper olive..... | 2.75 |

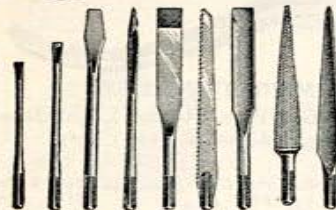
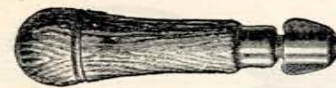


569-243-244

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|----------|--|---------|
| List No. | | Prepaid |
| 569 | Vaginal Electrode, all metal, nickel-plated, length 6 in..... | \$.60 |
| 243 | Vaginal Electrode, all metal, copper, length 6 in..... | .75 |
| 244 | Vaginal Electrode, all metal, zinc, length 6 in..... | 1.00 |
| 568 | Vaginal Electrode, nickel-plated olive, insulated stem, length 6 in..... | 1.50 |
| 591 | Vaginal Electrode, copper olive, insulated stem, length 6 in..... | 1.75 |

TOOLS AND SUPPLIES

HOLLOW HANDLE TOOL SETS

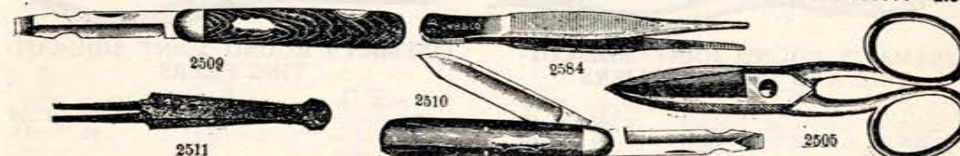


2507



2506

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|----------|---|---------|
| List No. | | Prepaid |
| 2506 | Hollow-Handle Tool Set, standard size, 6 inches..... | \$.75 |
| 2507 | Hollow-Handle Tool Set, standard size, $7\frac{1}{4}$ inches..... | 1.00 |



2509

2584

2510

2505

- | | | |
|----------|--|---------|
| List No. | | Prepaid |
| 2509 | Electricians' Combination Knife and Screw Driver, one blade..... | \$.55 |
| 2510 | Electricians' Combination Knife and Screw Driver, two blades..... | .80 |
| 2505 | Electricians' Scissors for cutting and stripping wire, heavy and nicked..... | .60 |
| 2511 | Tweezers, small size..... | .15 |
| 2584 | Tweezers, large size, nicked..... | .25 |

"NO-TWIST" SCREW DRIVERS

- | List No. | Length | Price | Post. | List No. | Length | Price | Post. | List No. | Length | Price | Post. |
|----------|-----------|--------|--------|----------|-----------|--------|--------|----------|------------|--------|--------|
| 2585 | 2 in..... | \$.18 | \$.03 | 2514 | 6 in..... | \$.25 | \$.06 | 2516 | 10 in..... | \$.35 | \$.10 |
| 2513 | 4 in..... | .20 | .04 | 2515 | 8 in..... | .30 | .08 | 2517 | 12 in..... | .40 | .12 |



RATCHET SCREW DRIVER

Right and Left Hand, and Rigid

- | List No. | Length | Price | Post. | List No. | Length | Price | Post. |
|----------|-----------|--------|--------|----------|-----------|--------|--------|
| 2586 | 2 in..... | \$.35 | \$.03 | 2520 | 6 in..... | \$.65 | \$.10 |
| 2518 | 3 in..... | .45 | .05 | 2521 | 8 in..... | .75 | .12 |
| 2519 | 5 in..... | .55 | .08 | | | | |

SPIRAL RATCHET SCREW DRIVER

Light Weight. Right and Left Hand, and Rigid. Three Bits

- | List No. | | Price | Post. |
|----------|----------------------------------|--------|--------|
| 2567 | Spiral Ratchet Screw Driver..... | \$1.00 | \$.10 |



Heavy Weight. Right and Left Hand, and Rigid. Three Bits

- | List No. | | Price | Post. |
|----------|----------------------------------|--------|--------|
| 2588 | Spiral Ratchet Screw Driver..... | \$1.25 | \$.20 |

AUTOMATIC DRILL

- | List No. | | Price | Post. |
|----------|--|--------|--------|
| 2589 | Automatic Drill, with $\frac{1}{16}$, $\frac{5}{64}$ and $\frac{3}{32}$ Drill Points..... | \$.75 | \$.06 |



- | List No. | | Price | Post. |
|----------|---|--------|--------|
| 2590 | Automatic Drill, with 8 Drill Points, $\frac{1}{16}$ to $\frac{11}{64}$ in..... | \$1.10 | \$.10 |
| 2591 | Extra Drill Points, per set of 8, $\frac{1}{16}$ to $\frac{11}{64}$ in..... | .60 | .03 |

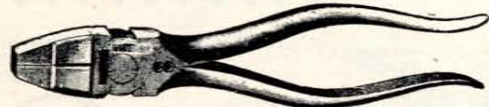
TOOLS AND SUPPLIES



COMBINATION PLIERS

Flat Nose, Gas Pipe, Side-Cutting, Button Pliers, with Reamer and Screw-Driver

List No.		Price	Post.
2532	6 in., Polished Head....	\$.45	\$.06
2534	8 in., Polished Head....	.65	.12



COMBINATION PLIERS

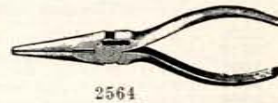
Flat Nose, Gas Pipe, Round Edge, Side-Cutting and Round Nose Pliers

List No.		Price	Post.
2566	5 1/2 in., Polished Head....	\$.60	\$.06
2592	5 1/2 in., Full Polished....	.70	.06



LINEMAN'S ROUND JOINT SIDE-CUTTING AND SPLICING PLIERS

List No.		Price	Post.
2536	6 in., Polished Head....	\$.65	\$.08
2538	8 in., Polished Head....	.95	.15



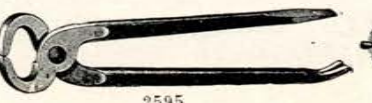
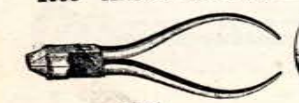
List No.		Price	Post.
2547	END-CUTTING NIPPERS, 5 1/2 in., polished head....	\$.65	\$.06
2544	COMBINATION SLIP-JOINT PLIERS, 6 in., full polished....	.45	.08
2545	COMBINATION SLIP-JOINT PLIERS, 8 in., full polished....	.55	.15
2564	LONG CHAIN NOSE SIDE-CUTTING PLIERS, 5 1/2 in., polished head....	.75	.06



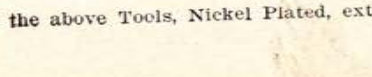
List No.		Price	Post.
2569	FLAT-NOSE PLIERS, 3 1/2 in., polished jaws....	\$.30	\$.03
2570	FLAT-NOSE PLIERS, 5 in., polished jaws....	.40	.05
2571	ROUND-NOSE PLIERS, 3 1/2 in., polished jaws....	.30	.03
2572	ROUND-NOSE PLIERS, 5 in., polished jaws....	.40	.05
2573	DIAGONAL-CUTTING PLIERS, 6 in., polished head....	.85	.08



List No.		Price	Post.
2567	FLAT-NOSE PLIERS, 5 in., polished jaws....	\$.40	.05
2540	BURNER PLIERS, 4 in., full polished....	.35	.08
2541	BURNER PLIERS, 6 in., full polished....	.35	.08
2542	GAS PLIERS, 8 in., full polished....	.40	.12
2553	HAND VISE, 3/16-in. hole through the handle, 5 1/2 in., full nicked....	1.50	.10

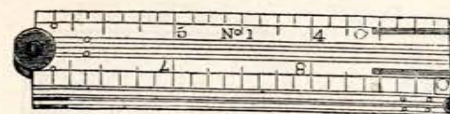


List No.		Price	Post.
2594	FLAT-NOSE, SIDE-CUTTING PLIERS, 5 in., polished head....	\$.45	\$.06
2595	HOUSEHOLD PLIERS, 6 in., polished head....	.35	.06
2553	HAND VISE, 3/16-in. hole through the handle, 5 1/2 in., full polished....	.50	.10

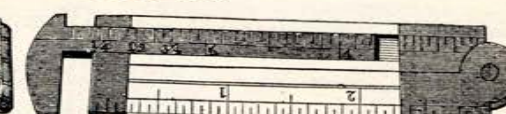


Any of the above Tools, Nickel Plated, extra 25 cts.

TOOLS AND SUPPLIES



2620 to 2623

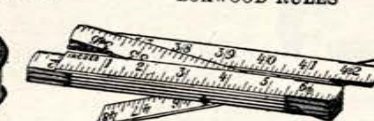


BOXWOOD RULES

2618-2619

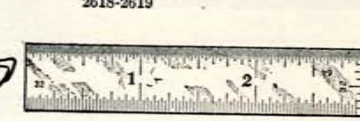


2624



2628

2712-ZIGZAG

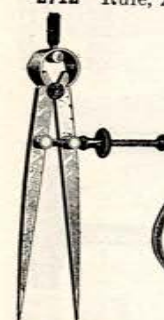


2616

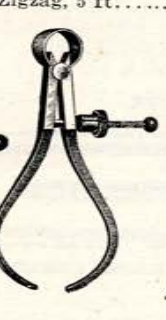
FLAT STEEL

2617

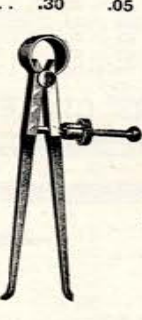
List No.		Price	Post.
2620	Rule, Plain, 12 in.....	\$.10	\$.03
2621	Rule, Plain, 24 in.....	.15	.05
2622	Rule, Brass Bound, 12 in.....	.25	.03
2623	Rule, Brass Bound, 24 in.....	.35	.05
2618	Rule, Caliper End, 12 in.....	.25	.02
2619	Rule, Caliper End, 24 in.....	.35	.04
2712	Rule, Zigzag, 5 ft.....	.30	.05



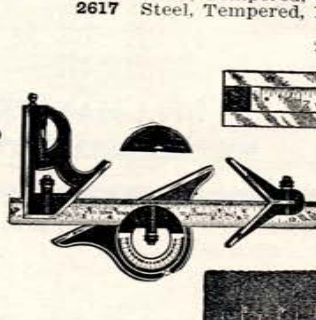
2672



2673



2674



2636 to 2641



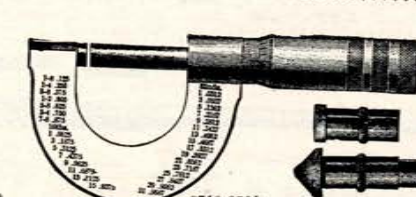
2624-2630

List No.		Price	Post.
2672	Spring Dividers, 5 in.....	\$.80	\$.05
2673	Spring Outside Calipers, 5 in.....	.80	.05
2674	Spring Inside Calipers, 5 in.....	.80	.05

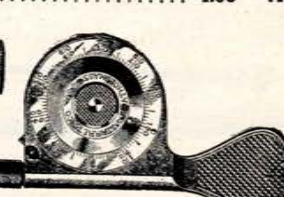
List No.		Price	Post.
2636	Combination Square, with Miter Head, 9 in. scale.....	1.25	.18
2637	Combination Square, with Miter Head, 12 in. scale.....	1.50	.24
2638	Combination Square, with Miter and Center Heads, 9 in. scale.....	1.75	.24
2639	Combination Square, with Miter and Center Heads, 12 in. scale.....	2.00	.30
2641	Combination Square, with Miter and Center Heads, Protractor and Levels, 9 in. scale.....	3.75	.35
	Combination Square, with Miter and Center Heads, Protractor and Levels, 12 in. scale.....	4.00	.40



2708-2709

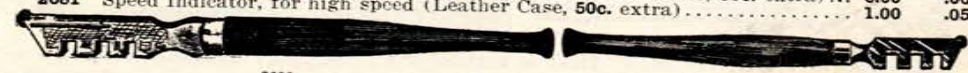


2710-2711



2681

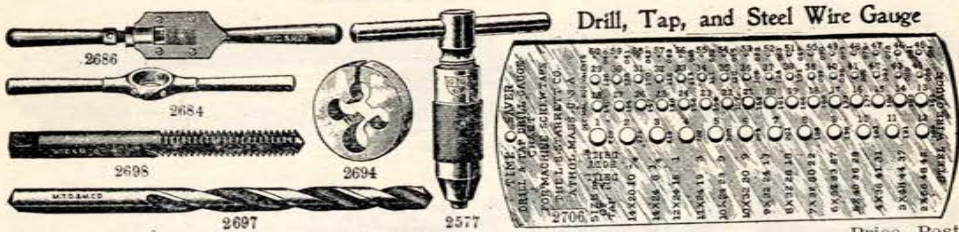
List No.		Price	Post.
2708	B. & S. American Standard Wire Gauge, sizes 0 to 36, about 3 1/4 in. diam.....	\$2.50	\$.03
2709	U. S. Standard Gauge for Sheet and Plate, sizes 0 to 36, about 3 1/4 in. diam.....	2.50	.03
2710	Micrometer, measures by thousandths up to 1 in. (Leather Case, 50c. extra)....	5.00	.06
2711	Micrometer, with Lock Nut and Ratchet Stop (Leather Case, 50c. extra)....	6.00	.06
2681	Speed Indicator, for high speed (Leather Case, 50c. extra)....	1.00	.05



2682

List No.		Price	Post.
2682	Glass Cutter, Wood Handle....	\$.18	\$.03
2683	Glass Cutter, Metal Handle....	\$.12	\$.03

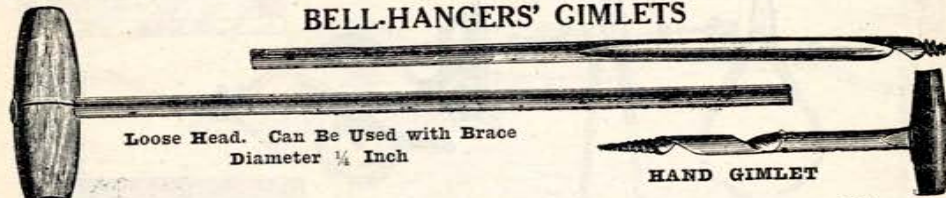
TOOLS AND SUPPLIES



List No.	Price	Post.	List No.	Price	Post.
2686 Tap Wrench, for 1/4 in. and smaller.....	\$1.60	\$.08	2684 Die Holder, 5 in., for 5/16 in. Dies.....	\$.45	\$.05
2687 Tap Wrench, for 1/4 to 3/8 in.	2.90	.15	2685 Die Holder, 6 in., for 13/16 in. Dies.....	.75	.08
2577 Drill and Tap Wrench.....	.65	.05	2706 Drill, Tap, Steel Wire Gauge, Standard Thread up to 1/4 in., each.....	1.75	.03
2694 Dies, for Machine Screws, 5/16 in. diam., any Standard Thread up to 1/4 in., each.....			Standard Thread up to 1/4 in., each.....	.35	.01
2692 Dies, for Machine Screws, 1/16 in. diam., any Standard Thread up to 1/4 in., each.....			Standard Thread up to 1/4 in., each.....	.30	.01
2698 Taps, for Machine Screws, any Standard Thread up to 1/4 in., each.....					
2697 Drills, Twist-Drill Gauge or Stubbs Steel Wire Gauge, prices prepaid:					

Numbers	Length	Each	Dozen	Numbers	Length	Each	Dozen
1 to 5	4 in.	\$.17	\$1.75	36 to 40	2 7/16 in.	\$.09	\$1.00
6 to 10	3 3/4 in.	.16	1.70	41 to 45	2 1/4 in.	.08	.85
11 to 15	3 1/2 in.	.15	1.60	46 to 50	2 1/16 in.	.07	.75
16 to 20	3 1/4 in.	.15	1.55	51 to 60	1 3/4 in.	.07	.75
21 to 25	3 1/2 in.	.13	1.40	61 to 70	1 1/2 in.	.06	.65
26 to 30	2 15/16 in.	.12	1.30	71 to 75	1 5/16 to 1 1/16 in.	.07	.75
31 to 35	2 5/8 in.	.11	1.15	76 to 80	1 to 3/4 in.	.07	.75

BELL-HANGERS' GIMLETS



List No.	Price	Post.	List No.	Price	Post.
2529 Bell-Hangers' Gimlet, 12 in.....	\$.55	\$.10	2699 Hand Gimlet, 1/4 in.....	\$.12	\$.03
2596 Bell-Hangers' Gimlet, 24 in.....	.75	.15	2598 Hand Gimlet, 3/16 in.....	.12	.03
2597 Bell-Hangers' Gimlet, 36 in.....	.90	.20	2599 Hand Gimlet, 1/2 in.....	.12	.03



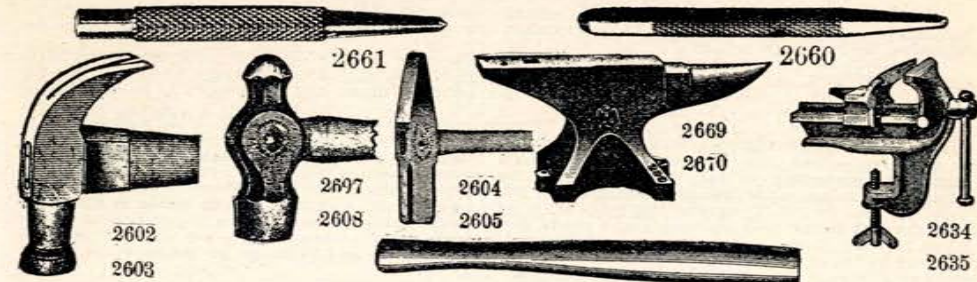
List No.	Price	Post.	List No.	Price	Post.
2652 Ratchet Brace, 10-in. sweep.....	\$.75	\$.30	2675 Hand Drill, small size.....	\$1.50	\$.30
2653 Ratchet Brace, 10-in. sweep, Best.....	1.50	.30	2676 Hand Drill, large size.....	2.25	.50
2677 Breast Drill, large size (not illustrated).....				2.75	.60

List No.	Price	Post.	List No.	Price	Post.
2655 Expansive Bit, bores 1/2 to 1 1/2 in. holes.....	\$.95	\$.08	2659 Rose-Head Countersink Bit.....	\$.12	\$.03
2656 Expansive Bit, bores 3/8 to 3 in. holes.....	1.25	.12	2693 Gimlet Bit, 1/8 in.....	.12	.03
2690 Screw-Driver Bit.....	.12	.03	2704 Gimlet Bit, 1/4 in.....	.12	.03
2705 Reamer Bit.....	.12	.03	2700 Cold Chisel, 1/4 in. face.....	.10	.05
			2701 Cold Chisel, 1/2 in. face.....	.20	.08
			2702 Cold Chisel, 3/4 in. face.....	.30	.12

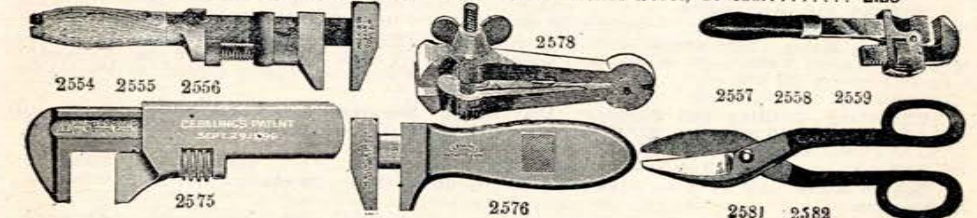


2689—PATENT AUGUR BITS—Sizes in Inches—2688—SOCKET FIRMER CHISELS									
Diam.	3/16	1/4	5/16	3/8	1/2	5/8	3/4	1	1 1/4
Price..	\$.20	.20	.25	.35	.40	.45	.50	.55	
Post...	.03	.03	.04	.05	.06	.07	.08	.09	
Width..	1/4	3/8	1/2	5/8	3/4	1	1 1/4	1 1/2	
Price..	\$.25	.25	.30	.35	.35	.40	.45	.55	
Post...	.08	.08	.09	.09	.10	.12	.17	.18	

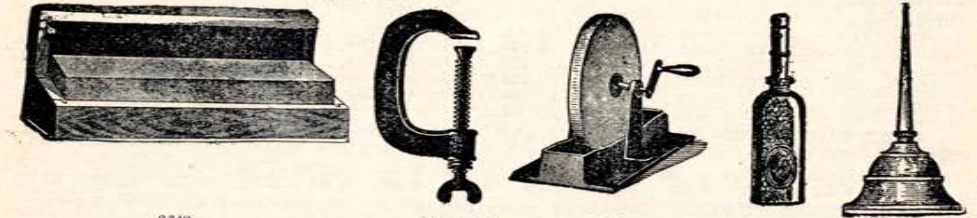
TOOLS AND SUPPLIES.



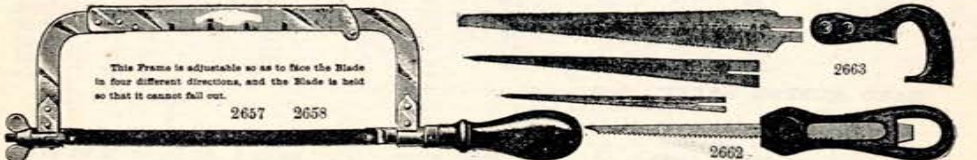
List No.	Price	Post.	List No.	Price	Post.
2602 Nail Hammer, Solid Steel.....	\$.65	\$.35	2660 Nail Set, Knurled Steel.....	\$.12	\$.03
2603 Nail Hammer, Cast Steel.....	.50	.35	2661 Center Punch, Knurled Steel.....	.12	.03
2604 Riveting Hammer, 8 oz.....	.35	.15	2633 Bench Vise, Iron, 1 1/4 lbs.....	.45	.25
2605 Riveting Hammer, 12 oz.....	.45	.20	2634 Bench Vise, Steel, 2 1/4 lbs.....	.75	.40
2607 Machinist's Hammer, 8 oz.....	.60	.20	2635 Bench Vise, Steel, 4 1/2 lbs.....	1.25	
2608 Machinist's Hammer, 12 oz.....	.65	.25	2669 Anvil Steel, 5 lbs.....	1.75	
2609 Machinist's Hammer, 16 oz.....	.70	.30	2670 Anvil Steel, 15 lbs.....	2.25	



List No.	Price	Post.	List No.	Price	Post.
2554 Monkey Wrench, 6 in.....	\$.40	\$.12	2557 Stillson Wrench, 6 in.....	\$.75	\$.12
2555 Monkey Wrench, 8 in.....	.45	.20	2558 Stillson Wrench, 8 in.....	.85	.20
2556 Monkey Wrench, 12 in.....	.65	.50	2559 Stillson Wrench, 14 in.....	1.15	
2575 Bicycle Wrench, Polished, 4 in.....	.25	.05	2581 Tinner's Snips, cast steel.....	.40	.20
2576 Pocket Wrench, Nicked, 4 in.....	.40	.05	2582 Tinner's Snips, solid steel.....	1.00	.30
2578 Hand Vise, Forged Steel, 4 1/2 in.....	.75	.15			



List No.	Price	Post.	List No.	Price	Post.
2501 Oil Can, Pocket Size.....	\$.10	\$.02	2642 Grindstone, 6-in. Wheel, 5 1/2 lbs.....	\$.90	\$.35
2502 Oil Can, 1 oz.....	.10	.03	2643 Oilstone, 7 in. (Best).....	.85	.35
2503 Oil Can, 2 oz.....	.15	.05	2679 Clamps, Iron, 3 in.....	.10	.10
2504 Mach. Oil, Best, 4-oz. Bottle.....	.15	.05	2680 Clamps, Steel, 5 in.....	.40	.25



List No.	Price	Post.	List No.	Price	Post.
2657 Hack-Saw Frame, Adjustable to 12 in.....	\$.75	\$.24	2662 Key-Hole Saw.....	\$.25	\$.05
2658 Hack-Saw Blades, 12 in., each.....	.10	.02	2663 Nest of Saws, Key-Hole, Compass and Pruning.....	.90	.20
Hack-Saw Blades, 12 in., doz.....	1.00	.10			

EMERY CLOTH, Sheets 9x11 in., Coarse, Medium or Fine, per sheet..... Prepaid, 5 cts.
 EMERY PAPER, Sheets, 9x11 in., Coarse, Medium or Fine, per sheet..... Prepaid, 4 cts.
 EMERY FLOUR, Very Fine, for Grinding and Polishing, 1/4 lb..... Prepaid, 15 cts.
 SAND PAPER, Sheets 9x11 in., Coarse, Medium or Fine, per sheet..... Prepaid, 3 cts.

RAW MATERIALS

All materials listed are standard quality, regularly carried in the supply department of our shops. These can be ordered cut to any size, shape and design at the special rates for Machine Work given below.

Dimensions are given in inches, or by U. S. Standard Sheet Gauge, B. & S. Standard Wire Gauge or B. & S. (or Starrett's) Twist-Drill Gauge Numbers. Abbreviations used are: In. for inch; thick. for thickness; ft. for foot; sq. for square; diam. for diameter; I. D. for inside diameter; O. D. for outside diameter.

Prices are per foot or square foot. Fractional parts will be supplied at special rates given under each material. The extra charge is compulsory for the reason that it requires as much time and labor to prepare 1 inch as 1 foot. No orders will be accepted for any one material amounting to less than 25 cents, to which postage must be added proportionally when postage rates or weights are given. Example: A piece of $\frac{3}{16}$ in. Fibre, size 6x8 inches, equals 48 sq. in., or $\frac{1}{4}$ sq. ft.; the price is $\frac{1}{4}$ of 50 cents, or 17 cents. As no order is filled for less than 25 cents, this amount and 8 cents for postage must be sent. Again, a piece of $\frac{3}{16}$ in. Hard Rubber Sheet, 6x8 inches, equals 48 sq. in., or $\frac{1}{4}$ sq. ft. (less than $\frac{1}{4}$ sq. ft.). The price is $\frac{1}{4}$ of \$2.50, or 83 cents, to which add 25% extra, 21 cents, and postage, 10 cents; total, \$1.14. Packages over 4 lbs. will be sent by Express.

MACHINE WORK

The following charges are extra and are based on materials listed hereunder, except Steel Sheet and Rods, on which all extra charges for machine work are doubled. Odd shapes and designs and special work will be priced on receipt of drawings and specifications.

Circles. Take material prices of square of diameter and the following extras: Diameters up to 3 inches, 25 cts.; up to 6 inches, 50 cts.; up to 14 inches, \$1.00.

Squares and Rectangles. Cut to accurate dimensions and with trued edges. Lengths up to 3 inches, 25 cts.; up to 6 inches, 50 cts.; up to 14 inches, \$1.00.

Drilling Holes. Flat Stock. Holes up to $\frac{1}{4}$ inch diameter, 5 cts. each, 35 cts. per dozen; $\frac{1}{2}$ up to $\frac{1}{2}$ inch, 7 cts. each, 60 cts. per dozen; $\frac{3}{4}$ up to 1 inch, 10 cts. each, 85 cts. per dozen; 1 up to 2 inches, 20 cts. each. **Round Rods.** End holes not over 2 inches deep, double prices of same sizes in Flat Stock.

Threading—Drilling and Tapping. Flat Stock. Standard Screw Threads only. Up to $\frac{1}{4}$ inch diameter, 10 cts. each, \$1.00 per dozen; $\frac{1}{2}$ up to $\frac{1}{2}$ inch, 15 cts. each, \$1.50 per dozen; $\frac{3}{4}$ up to 1 inch, 20 cts. each. **Round Stock.** End holes, above sizes, not over $\frac{3}{4}$ inch deep, add 50% to above prices; $\frac{3}{4}$ up to 2 inches, add 100%.

Square Holes. Up to $\frac{1}{2}$ inch, 15 cts. each; $\frac{1}{2}$ up to 1 inch, 20 cts. each; 1 up to 2 inches, 30 cts. each.

Rod Ends. Ends of rods cut true and centered, or ends rounded, up to $\frac{1}{2}$ inch, each, 10 cts.; $\frac{1}{2}$ up to 1 inch, each, 15 cts.; 1 inch up to 2 inches, each, 20 cts.

Plating. Nickel, Brass, Copper, Silver and Gold Plating, Polishing and Lacquering of metal pieces and other similar work will be quoted on application.

HARD FIBRE SHEET. Size of full sheets about 33x42 inches. Well seasoned and dry. Cut to any dimensions. On lots less than 4 lbs., add postage at the rate of 16 cents per lb. For pieces less than $\frac{1}{2}$ sq. ft. of $\frac{1}{16}$ in. and thinner, add 50%; balance, 30%. Over $\frac{1}{2}$ sq. ft., discount 10%.

Thick-	Wt.	Price.	Thick-	Wt.	Price.	Thick-	Wt.	Price.	Thick-	Wt.	Price.
ness	sq. ft.		ness	sq. ft.		ness	sq. ft.		ness	sq. ft.	
$\frac{1}{16}$ in.	$\frac{1}{4}$ lb.	\$.25	$\frac{1}{32}$ in.	$\frac{1}{8}$ lb.	\$.45	$\frac{3}{16}$ in.	$\frac{1}{4}$ lb.	\$.90	$\frac{1}{2}$ in.	$\frac{1}{2}$ lb.	\$1.75
$\frac{1}{8}$ in.	$\frac{1}{2}$ lb.	.25	$\frac{1}{16}$ in.	$\frac{1}{4}$ lb.	.50	$\frac{1}{8}$ in.	$\frac{1}{2}$ lb.	1.05	$\frac{3}{8}$ in.	$\frac{3}{4}$ lb.	2.10
$\frac{1}{4}$ in.	$\frac{1}{2}$ lb.	.30	$\frac{1}{8}$ in.	$\frac{1}{4}$ lb.	.55	$\frac{1}{4}$ in.	$\frac{1}{2}$ lb.	1.25	$\frac{1}{2}$ in.	$\frac{3}{4}$ lb.	2.50
$\frac{3}{8}$ in.	$\frac{1}{2}$ lb.	.35	$\frac{1}{4}$ in.	$\frac{1}{2}$ lb.	.60	$\frac{3}{8}$ in.	$\frac{1}{2}$ lb.	1.55	$\frac{1}{2}$ in.	$\frac{1}{2}$ lb.	2.90
$\frac{1}{2}$ in.	$\frac{1}{2}$ lb.	.40	$\frac{1}{2}$ in.	$\frac{1}{2}$ lb.	.75						

HARD FIBRE ROD—Round. Cut to any length. Prices are per foot prepaid. Less than $\frac{1}{2}$ foot, add 40%; over $\frac{1}{2}$ foot, discount 10%.

Diameter.	Price.	Diameter.	Price.	Diameter.	Price.	Diameter.	Price.
$\frac{1}{16}$ in.	\$.18	$\frac{1}{8}$ in.	\$.25	$\frac{3}{16}$ in.	\$.35	$\frac{1}{2}$ in.	\$.45
$\frac{5}{16}$ in.	\$.20	$\frac{3}{8}$ in.	\$.30	$\frac{7}{16}$ in.	\$.45	$\frac{1}{2}$ in.	\$.55
$\frac{9}{16}$ in.	\$.25	$\frac{1}{2}$ in.	\$.35	$\frac{5}{8}$ in.	\$.55	$\frac{3}{4}$ in.	\$.65
$\frac{11}{16}$ in.	\$.30	$\frac{3}{4}$ in.	\$.40	$\frac{7}{8}$ in.	\$.75	1 in.	\$.85
$\frac{13}{16}$ in.	\$.35	1 in.	\$.50	1 1/8 in.	\$.75	1 1/4 in.	\$.90

HARD FIBRE TUBING. Especially recommended for High-Tension Coils. Cut to any length. Prices are per foot prepaid. For less than $\frac{1}{2}$ ft., add 40%; over $\frac{1}{2}$ ft., discount 10%.

I. D.	Wall	Price	I. D.	Wall	Price	I. D.	Wall	Price	I. D.	Wall	Price
$\frac{1}{8}$ in.	$\frac{1}{32}$ in.	\$.25	$\frac{1}{2}$ in.	$\frac{1}{16}$ in.	\$.24	$\frac{15}{16}$ in.	$\frac{1}{8}$ in.	\$.50	1 1/8 in.	$\frac{3}{16}$ in.	\$.90
$\frac{3}{16}$ in.	$\frac{1}{32}$ in.	.25	$\frac{5}{8}$ in.	$\frac{1}{16}$ in.	.30	1 in.	$\frac{1}{16}$ in.	.45	1 1/2 in.	$\frac{1}{8}$ in.	.95
$\frac{1}{4}$ in.	$\frac{1}{16}$ in.	.25	$\frac{3}{4}$ in.	$\frac{1}{16}$ in.	.26	1 1/8 in.	$\frac{1}{8}$ in.	.55	1 3/4 in.	$\frac{1}{8}$ in.	1.05
$\frac{5}{8}$ in.	$\frac{1}{16}$ in.	.20	1 in.	$\frac{1}{16}$ in.	.36	1 1/4 in.	$\frac{1}{8}$ in.	.60	1 7/8 in.	$\frac{1}{8}$ in.	1.20
$\frac{3}{4}$ in.	$\frac{1}{16}$ in.	.20	1 1/8 in.	$\frac{1}{16}$ in.	.36	1 3/4 in.	$\frac{1}{8}$ in.	.60	2 in.	$\frac{1}{8}$ in.	1.35
$\frac{7}{8}$ in.	$\frac{1}{16}$ in.	.20	1 3/4 in.	$\frac{1}{16}$ in.	.36	2 in.	$\frac{1}{8}$ in.	.70	2 1/4 in.	$\frac{1}{8}$ in.	1.50
1 in.	$\frac{1}{16}$ in.	.20	2 in.	$\frac{1}{16}$ in.	.40	2 1/4 in.	$\frac{1}{8}$ in.	.75	2 3/4 in.	$\frac{1}{8}$ in.	1.60
1 1/8 in.	$\frac{1}{16}$ in.	.22	2 1/4 in.	$\frac{1}{16}$ in.	.40	3 in.	$\frac{1}{8}$ in.	.85	3 1/4 in.	$\frac{1}{8}$ in.	2.00
1 1/4 in.	$\frac{1}{16}$ in.	.22	3 in.	$\frac{1}{16}$ in.	.45	3 1/4 in.	$\frac{1}{8}$ in.	.75	3 3/4 in.	$\frac{1}{8}$ in.	2.25

HARD RUBBER SHEET. Best grade polished. Cut to any dimensions. Prices and postages are per sq. ft. For pieces less than $\frac{1}{2}$ sq. ft. of $\frac{1}{8}$ in. and thinner, add 50%; balance, 25%. Over $\frac{1}{2}$ sq. ft., discount 10%.

Thick.	Price.	Thick.	Price.	Thick.	Price.	Thick.	Price.
$\frac{1}{16}$ in.	\$.70	$\frac{1}{8}$ in.	\$1.40	$\frac{3}{16}$ in.	\$3.10	$\frac{1}{2}$ in.	\$5.10
$\frac{1}{4}$ in.	.70	$\frac{5}{16}$ in.	1.65	$\frac{3}{8}$ in.	3.60	$\frac{1}{2}$ in.	5.80
$\frac{3}{8}$ in.	.08	$\frac{1}{2}$ in.	2.50	$\frac{5}{8}$ in.	4.20	$\frac{3}{4}$ in.	6.85
$\frac{1}{2}$ in.	1.00	1 in.	2.50	1 1/2 in.	4.20	2 in.	6.85

HARD RUBBER ROD—Round. Polished. Cut to any length. Prices are per foot prepaid. For less than $\frac{1}{2}$ foot, add 40%; over $\frac{1}{2}$ foot, discount 10%.

Diameter.	Price.	Diameter.	Price.	Diameter.	Price.	Diameter.	Price.
$\frac{1}{16}$ in.	\$.15	$\frac{1}{8}$ in.	\$.20	$\frac{3}{16}$ in.	\$.36	$\frac{1}{2}$ in.	\$.78
$\frac{5}{16}$ in.	\$.20	$\frac{3}{8}$ in.	\$.24	$\frac{7}{16}$ in.	\$.48	$\frac{1}{2}$ in.	\$.60
$\frac{9}{16}$ in.	\$.24	$\frac{1}{2}$ in.	\$.30	$\frac{5}{8}$ in.	\$.78	$\frac{3}{4}$ in.	\$.90
$\frac{11}{16}$ in.	\$.24	$\frac{3}{4}$ in.	\$.36	$\frac{7}{8}$ in.	\$.90	1 in.	1.14
$\frac{13}{16}$ in.	\$.24	1 in.	\$.48	1 1/8 in.	1.24	1 1/4 in.	1.72
$\frac{15}{16}$ in.	\$.24	1 1/8 in.	\$.60	1 3/4 in.	1.48	2 in.	1.96

Note.—To avoid delays and unnecessary correspondence, read carefully the top of this page. No orders taken for less than 25 cts., to which postage must be added proportionally, where rates or weights are given.

RAW MATERIALS

HARD RUBBER TUBING. Polished. Cut to any length up to 24 inches. Prices are per foot prepaid. Less than $\frac{1}{2}$ foot, add 50%; over $\frac{1}{2}$ foot, discount 10%.

I. D.	O. D.	Price	I. D.	O. D.	Price	I. D.	O. D.	Price	I. D.	O. D.	Price
$\frac{1}{16}$ in.	$\frac{1}{8}$ in.	\$.15	$\frac{1}{8}$ in.	$\frac{3}{16}$ in.	\$.42	$\frac{3}{16}$ in.	$\frac{1}{4}$ in.	\$.30	$\frac{1}{2}$ in.	$\frac{5}{8}$ in.	\$.48
$\frac{3}{32}$ in.	$\frac{1}{4}$ in.	.18	$\frac{1}{4}$ in.	$\frac{1}{2}$ in.	.20	$\frac{1}{2}$ in.	$\frac{3}{4}$ in.	.30	$\frac{3}{4}$ in.	1 in.	.48
$\frac{1}{8}$ in.	$\frac{1}{2}$ in.	.25	$\frac{3}{8}$ in.	$\frac{1}{2}$ in.	.24	$\frac{1}{2}$ in.	$\frac{3}{4}$ in.	.35	$\frac{3}{4}$ in.	1 in.	.60
$\frac{3}{16}$ in.	$\frac{1}{2}$ in.	.30	$\frac{1}{2}$ in.	$\frac{3}{4}$ in.	.28	$\frac{1}{2}$ in.	$\frac{3}{4}$ in.	.45	1 in.	1 1/4 in.	.64

SOFT RUBBER SHEET. P. G. Black. Good quality. Thickness $\frac{3}{32}$ inch. Per sq. ft., prepaid, 50 cts. For pieces less than $\frac{1}{2}$ sq. ft., add 50%; over $\frac{1}{2}$ sq. ft., discount 10%.

SOFT RUBBER TUBING. Best quality. The $\frac{3}{8}$ x $\frac{3}{8}$ inch and $1\frac{1}{2}$ x $\frac{3}{8}$ inch are high-grade tubing for gas, water or compressed-air work, and will stand good pressure. The $\frac{3}{8}$ x $\frac{1}{2}$ inch is gas hose for ordinary pressure. The $\frac{1}{2}$ x $\frac{3}{16}$ inch and $\frac{3}{16}$ x $\frac{1}{2}$ inch are black pure gum tubing. Prices are prepaid, except for $\frac{3}{8}$ x $\frac{1}{2}$ inch; postage, 32 cts. per foot. For 25 ft. and over, discount on all 20%.

I. D.	O. D.	10 Ft.	I. D.	O. D.	1 Ft.	3 Ft.	I. D.	O. D.	3 Ft.	6 Ft.	I. D.	O. D.	1 Ft.
$\frac{1}{32}$ in.	$\frac{3}{32}$ in.	\$.20	$\frac{1}{8}$ in.	$\frac{1}{4}$ in.	P. G. \$1.0	\$.25	$\frac{1}{8}$ in.	$\frac{1}{4}$ in.	\$.15	\$.25	$\frac{3}{8}$ in.	$\frac{1}{2}$ in.	\$.25
$\frac{1}{16}$ in.	$\frac{1}{8}$ in.	.25	$\frac{3}{16}$ in.	$\frac{1}{4}$ in.	P. G. .15	.40	$\frac{1}{2}$ in.	$\frac{3}{4}$ in.	.20	.35	$\frac{3}{4}$ in.	1 in.	.70

BRASS SHEET. Cut to any dimensions. Stock sizes about 14 inches wide and 8 feet long. Prices and postages are per sq. ft. For pieces less than $\frac{1}{2}$ sq. ft. of $\frac{1}{16}$ inch and thinner add 50%; balance, 30%; over $\frac{1}{2}$ sq. ft., discount 10%.

Thick.	Width	Price	Post.	Thick.	Width	Price	Post.	Thick.	Width	Price	Post.	Thick.	Width	Price	Post.
$\frac{1}{16}$ in.	$\frac{1}{2}$ in.	\$.10	\$.02	$\frac{1}{32}$ in.	2 in.	\$.25	\$.06	$\frac{1}{16}$ in.	1 in.	\$.25	\$.06	$\frac{1}{8}$ in.	$\frac{1}{2}$ in.	\$.25	\$.06
$\frac{1}{8}$ in.	1 1/4 in.	.15	.03	$\frac{1}{16}$ in.	3 3/4 in.	.35	.08	$\frac{1}{8}$ in.	2 in.	.35	.10	$\frac{1}{4}$ in.	1 in.	.35	.10
$\frac{1}{4}$ in.	2 in.	.18	.04	$\frac{1}{8}$ in.	$\frac{1}{2}$ in.	.10	.02	$\frac{1}{4}$ in.	3 in.	.50	.15	$\frac{3}{8}$ in.	1 1/4 in.	.40	.12
$\frac{3}{8}$ in.	$\frac{1}{2}$ in.	.12	.03	$\frac{1}{4}$ in.	$\frac{3}{4}$ in.	.10	.02	$\frac{1}{2}$ in.	$\frac{1}{2}$ in.	.15	.03	$\frac{1}{2}$ in.	3 3/4 in.	.85	.32
$\frac{1}{2}$ in.	$\frac{3}{4}$ in.	.15	.03	$\frac{1}{2}$ in.	$\frac{1}{2}$ in.	.12	.02	$\frac{3}{4}$ in.	$\frac{1}{2}$ in.	.20	.04	$\frac{3}{4}$ in.	1 in.	.40	.14
$\frac{3}{4}$ in.	1 in.	.18	.03	$\frac{3}{4}$ in.	$\frac{1}{2}$ in.	.15	.03	$\frac{3}{4}$ in.	$\frac{1}{2}$ in.	.20	.04	$\frac{1}{2}$ in.	$\frac{1}{2}$ in.	.35	.10
				$\frac{3}{4}$ in.	1 in.	.30	.08	$\frac{1}{2}$ in.	3 1/2 in.	1.25	.50				

BRASS SHEET—FLAT STRIPS. Cut to any length. Prices and postages are per foot. Less than $\frac{1}{2}$ ft., add 50%; over $\frac{1}{2}$ ft., discount 10%.

Th'k	Width	Price	Post	Th'k	Width	Price	Post	Th'k	Width	Price	Post	Th'k	Width	Price	Post
$\frac{1}{16}$ in.	$\frac{1}{2}$ in.	\$.10	\$.02	$\frac{1}{32}$ in.	2 in.	\$.25	\$.06	$\frac{1}{16}$ in.	1 in.	\$.25	\$.06	$\frac{1}{8}$ in.	$\frac{1}{2}$ in.	\$.25	\$.06
$\frac{1}{8}$ in.	1 1/4 in.	.15	.03	$\frac{1}{16}$ in.	3 3/4 in.	.35	.08	$\frac{1}{8}$ in.	2 in.	.35	.10	$\frac{1}{4}$ in.	1 in.	.35	.10
$\frac{1}{4}$ in.	2 in.	.18	.04	$\frac{1}{8}$ in.	$\frac{1}{2}$ in.	.10	.02	$\frac{1}{4}$ in.	3 in.	.50	.15	$\frac{3}{8}$ in.	1 1/4 in.	.40	.12
$\frac{3}{8}$ in.	$\frac{1}{2}$ in.	.12	.03	$\frac{1}{4}$ in.	$\frac{3}{4}$ in.	.10	.02	$\frac{1}{2}$ in.	$\frac{1}{2}$ in.	.15	.03	$\frac{1}{2}$ in.	3 3/4 in.	.85	.32
$\frac{1}{2}$ in.	$\frac{3}{4}$ in.	.15	.03	$\frac{1}{2}$ in.	$\frac{1}{2}$ in.	.12	.02	$\frac{3}{4}$ in.	$\frac{1}{2}$ in.	.20	.04	$\frac{3}{4}$ in.	1 in.	.40	.14
$\frac{3}{4}$ in.	1 in.	.18	.03	$\frac{3}{4}$ in.	$\frac{1}{2}$ in.	.15	.03	$\frac{3}{4}$ in.	$\frac{1}{2}$ in.	.20	.04	$\frac{1}{2}$ in.	$\frac{1}{2}$ in.	.35	.10
				$\frac{3}{4}$ in.	1 in.	.30	.08	$\frac{1}{2}$ in.	3 1/2 in.	1.25	.50				

BRASS ROD—Round. Cut to any length. On diameters $\frac{3}{8}$ in. and smaller prices are prepaid; for pieces less than $\frac{1}{2}$ ft., add 50%. On diameters $\frac{1}{2}$ in. and larger prices and postages are per foot; on pieces less than $\frac{1}{2}$ ft. add 30%; over $\frac{1}{2}$ ft., discount 10%. No packages less than 25 cts.

Diameter.	$\frac{3}{32}$ in.	$\frac{1}{8}$ in.	$\frac{5}{32}$ in.	$\frac{11}{64}$ in.	$\frac{3}{16}$ in.	$\frac{13}{64}$ in.	$\frac{7}{32}$ in.	$\frac{1}{4}$ in.	$\frac{9}{32}$ in.	$\frac{5}{16}$ in.	$\frac{11}{32}$ in.	$\frac{3}{8}$ in.
Prepaid...	\$.05	\$.06	\$.06	\$.10	\$.10	\$.14	\$.12	\$.14	\$.16	\$.18	\$.24	\$.30
Diam....	$\frac{13}{32}$ in.	$\frac{7}{16}$ in.	$\frac{1}{2}$ in.	$\frac{9}{16}$ in.	$\frac{5}{8}$ in.	$\frac{3}{4}$ in.	$\frac{7}{8}$ in.	$\frac{13}{16}$ in.	1 in.	1 $\frac{1}{8}$ in.	1 $\frac{1}{4}$ in.	1 $\frac{3}{8}$ in.
Price...	\$.30	\$.26	\$.30	\$.36	\$.48	\$.60	\$.80	\$.96	\$1.12	\$1.28	\$1.56	\$1.90
Post....	.08	.10	.14	.18	.22	.30	.40	.45	.56	.64	.80	1.00
												1.32

RAW MATERIALS

COPPER SHEET. Cut to any dimension. Prices and postages are per sq. ft. For pieces less than 1/2 sq. ft. add 40%; over 1 1/2 sq. ft., discount 10%.

Thick	Price	Thick	Price	Thick	Price	Thick	Price	Thick	Price
No. 28....	\$.48	1/16 in....	\$.60	1/32 in....	\$.60	1/16 in....	\$.30	1/16 in....	\$1.50
	\$.10		\$.16		\$.30		\$.30		\$.60

COPPER ROD—Round. Cut to any length. Prices and postages are per ft. On diameters 3/8 in. and smaller, for less than 1/2 ft. add 50%; on diameters 7/16 in. and larger, for less than 1/2 ft., add 30%; on diameters 3/8 in. and larger, over 1 1/2 ft., discount 10%.

Diameter	1/8 in.	7/32 in.	1/4 in.	5/16 in.	3/8 in.	7/16 in.	1/2 in.	3/4 in.	7/8 in.	1 in.
Price....	\$.08	\$.15	\$.18	\$.22	\$.28	\$.40	\$.50	\$.80	\$1.20	\$1.50
Postage.	.02	.03	.04	.06	.10	.14	.18	.36	.54	.64

COPPER TUBING—Seamless. Cut to any length. Prices and postages are per ft. Less than 1/2 ft., add 50%; over 1 1/2 ft., discount 10%.

Inside Diameter	3/16 in.	1/4 in.	5/16 in.	3/8 in.	7/16 in.	1/2 in.	3/4 in.	1 in.
Outside Diameter	1/4 in.	5/16 in.	3/8 in.	7/16 in.	1/2 in.	3/4 in.	1 in.	1 1/4 in.
Price.....	\$.20	\$.25	\$.40	\$.45	\$.60	\$.85		
Postage.....	.03	.03	.07	.08	.12	.25		

COPPER WIRE CLOTH. For round or square motor and dynamo brushes. Cut to any dimensions. By "mesh" is meant the number of holes to 1 inch across. Prices are per sq. ft. For less than 1/2 sq. ft. add 25%; over 1 1/2 sq. ft. discount 10%.

16-Mesh, No. 26 Copper Wire....\$.65 60-Mesh, No. 37 Copper Wire....\$.75

PHOSPHOR BRONZE STRIPS. The very best for flat motor and dynamo brushes and Vibrators. Cut to any length. Prices are per ft. prepaid. For less than 1/2 ft., add 50%; over 1 1/2 ft., discount 10%.

Thick	Width	Price	Thick	Width	Price
No. 34, 1/32 in.	1/8 in.	\$.18	No. 28, 1/16 in.	1/4 in.	\$.15
No. 34, 1/16 in.	1/8 in.	.15	No. 28, 1/32 in.	1/4 in.	.18

GERMAN SILVER SHEET. Cut to any dimensions. Prices are per sq. ft. prepaid. For less than 1/2 sq. ft. add 50%; over 1 1/2 sq. ft., discount 10%.

No. 36, prepaid..\$.35 No. 30, prepaid..\$.45 No. 27, prepaid..\$.50 No. 24, prepaid..\$.55

GERMAN SILVER ROD. Cut to any length. Diameter 3/8 in., per ft., 50 cts., postage 10 cts.; less than 1/2 ft., add 50%.

IRON SHEET. Tagger's Iron, Black Plate, Ferrotyp. Clean Soft Iron Sheet, for Transformers and other Electrical purposes. Sheets, 20x28 inches. Cut to any dimensions. U. S. Standard Sheet Gauge. Add postage at rate of 16 cts. per lb. on packages of 4 lbs. or less. No. 36, weight 1 lb. per sheet, price 20 cts.; No. 30, weight 2 1/4 lbs. per sheet, price 20 cts. For Transformers—Pieces not smaller than 1 1/2x4 in., extra 7 cts. per sheet; not smaller than 2x7 inches, extra 5 cts. per sheet.

IRON RODS. Best Soft Norway. Cut to any length. Prices and postages are per foot. For less than 1/2 ft., add 50%; over 1 1/2 ft., discount 20%.

Diam.	3/16 in.	1/4 in.	5/16 in.	3/8 in.	7/16 in.	1/2 in.	3/4 in.	7/8 in.	1 in.
Price....	\$.12	\$.15	\$.18	\$.20	\$.22	\$.24	\$.25	\$.30	\$.40
Post....	.02	.04	.06	.08	.10	.13	.18	.28	.48

IRON WIRE. Best Soft Norway. For induction coils. Prices and postages are per 100 ft. in coils. For 200 ft., discount 10%; 300 ft., 15%; 400 ft. and over, 20%.

See also Soft Iron Wire Cores, page 50.

Diameter	No. 26	No. 24	No. 23	No. 22	No. 20	No. 18	No. 14
Price.....	\$.12	\$.12	\$.20	\$.20	\$.22	\$.25	\$.28
Postage.....	.02	.02	.03	.05	.06	.10	.16

IRON WIRE—GALVANIZED. For Telegraph and Telephone Lines. No. 12, 100 ft., 40 cts.; 250 ft., 90 cts.; 500 ft., \$1.50; 1000 ft., \$2.50. By express only.

MAGNET STEEL. Highest Grade English. Rectangular and Round. Cut to any length. Prices and postages are per ft. For less than 1/2 ft., add 50%; over 1 1/2 ft., discount 10%.

Size	Price Post.	Size	Price Post.	Size	Price Post.	Size	Price Post.
1/16x1 1/2	\$.60	1/8x1 1/2	\$.55	1/4x1 1/2	\$.50	3/8x1 1/2	\$.40
1/8x1 1/2	.25	1/4x1 1/2	.40	3/8x1 1/2	.65	1/2x1 1/2	.80

STEEL SHEET. Bessemer Strips. Cut to any length. Prices and postages are per ft. For less than 1/2 ft., add 50%; over 1 1/2 ft., discount 20%. No packages less than 25 cts.

Size	Price Post.	Size	Price Post.	Size	Price Post.
1/16x8 1/2	\$.15	1/32x3 3/16	\$.25	3/32x1 1/16	\$.20
1/32x1 1/16	.10	1/16x1 1/16	.07	1/8x5 3/8	.40
1/16x1 1/16	.15	1/32x3 3/16	.30		
1/32x2 3/8	.20	1/16x4	.35		

STEEL RODS. Cold-Rolled Machine Steel. Round. For shafting and Axles. Cut to any length. Prices and postages are per foot. For less than 1/2 ft., add 50%; over 1 1/2 ft., discount 20%.

Diam.	3/8 in.	1/2 in.	5/8 in.	3/4 in.	7/8 in.	1 in.	1 1/4 in.	1 1/2 in.	1 3/4 in.	2 in.
Price....	\$.10	\$.10	\$.12	\$.12	\$.15	\$.15	\$.18	\$.18	\$.25	\$.30
Postage.	.02	.02	.02	.03	.04	.06	.08	.10	.12	.18

Note.—To avoid delays and unnecessary correspondence, read carefully the top of page 88. No orders taken for less than 25 cts., to which postage must be added proportionally where rates or weights are given.

RAW MATERIALS

STEEL RODS, STUBBS—Round. Best quality for fine small tools, drills and taps. Cut to any length. Prices and postages are per ft. For less than 1/2 ft., add 50%; over 1 1/2 ft., discount 10%.

Diameter	1/16 in.	3/32 in.	1/8 in.	5/32 in.	3/16 in.	1/4 in.	5/16 in.	3/8 in.	7/16 in.	1/2 in.	5/8 in.
Price.....	\$.10	\$.10	\$.15	\$.15	\$.20	\$.20	\$.25	\$.30	\$.35	\$.50	\$.85
Postage.....	.02	.02	.02	.02	.03	.03	.04	.06	.08	.10	.13

Also sizes Nos. 1 to 60 in Twist Drill Gauge. Price, each, 10 cts. per ft.; postage, 2 cts.

STEEL SHEET. Jessop's. For Tools. Cut to any dimensions. Prices and postages are per sq. ft. For pieces less than 1/2 sq. ft., add 50%; over 1 1/2 sq. ft., discount 10%.

Thick	Price Post.	Thick	Price Post.	Thick	Price Post.
1/32 in.	\$.60	1/16 in.	\$.22	1/16 in.	\$1.10
				3/32 in.	\$1.75

STEEL RODS. Jessop's. Round. For Tools. Cut to any length. Prices and postages are per ft. For less than 1/2 ft., add 50%; over 1 1/2 ft., discount, 20%. Fractional parts over 4 lbs. (postage over 64 cts.) are sent Express collect.

Diam.	Price Post.	Diam.	Price Post.	Diam.	Price Post.
1/8 in.	\$.12	1/2 in.	\$.35	1 1/4 in.	\$1.45
3/16 in.	.15	5/16 in.	.40	1 1/2 in.	.90
1/4 in.	.18	3/4 in.	.45	1 3/4 in.	2.00
5/16 in.	.20	7/8 in.	.60	2 in.	2.65
3/8 in.	.22	1 in.	.85	2 1/2 in.	3.25
7/16 in.	.25	1 1/4 in.	1.00		5.00

STEEL RODS. Jessop's. Octagonal. For tools. Cut to any length. Prices and postages are per ft. For less than 1/2 ft., add 50%; over 1 1/2 ft., discount 20%.

Diam.	Price Post.	Diam.	Price Post.	Diam.	Price Post.
3/8 in.	\$.25	1/2 in.	\$.40	3/4 in.	\$.75
	.08		.16		.28

STEEL RODS. Jessop's. Square and Rectangular. For Tools. 5/16x3/16 in. and 3/8x3/8 in. are Self-Hardening. Cut to any length. Prices and postages are per ft. For less than 1/2 ft., add 50%; over 1 1/2 ft., discount 20%. Fractional parts over 4 lbs. (postage over 64 cts.) are sent Express collect.

Size	Price Post.	Size	Price Post.	Size	Price Post.
1/4x1/4 in.	\$.20	1/2x1/2 in.	\$.40	3/4x3/4 in.	\$.45
5/16x5/16 in.	.40	3/8x3/8 in.	.50	1/2x1 in.	.75
3/8x3/8 in.	.55	1/2x1 in.	.24	3/4x1 1/4 in.	1.00
7/16x7/16 in.	.30	1/2x1 in.	.40		.44

STEEL WIRE. PIANO WIRE. Spring Wire. Cut to any length. Prices are per 25 ft. prepaid. For 50 ft., discount 10%; for 100 ft., discount 15%. B. & S. Standard Wire Gauge.

Prepaid....\$.15 \$.15 \$.18 \$.18 \$.20 \$.20 \$.22 \$.22 \$.25 \$.25

ZINC SHEET. Cut to any dimensions. Prices and postages are per sq. ft. For pieces less than 1/2 sq. ft., add 40%; over 1 1/2 sq. ft., discount 10%.

Thickness	1/16 in.	3/32 in.	1/8 in.	5/16 in.	3/8 in.
Price.....	\$.35	\$.50	\$.75	\$1.00	\$1.50
Weight (postage 16 cts. lb.)	1 1/8 lbs.	2 1/2 lbs.	3 3/4 lbs.	5 lbs.	7 1/2 lbs.

ZINC RODS. Cut to any length. Prices are per ft. prepaid. For less than 1/2 ft., add 50%; over 1 1/2 ft., discount 10%.

Diam. 1/16 in.—prepaid \$.15 Diam. 3/8 in.—prepaid \$.18

ALUMINUM SHEET. Cut to any dimensions. Prices are per sq. ft. prepaid. For less than 1/2 sq. ft., add 50%; over 1 1/2 sq. ft., discount 10%.

Thickness 1/16 in.—prepaid \$1.10 Thickness 3/32 in.—prepaid \$1.70

ALUMINUM RODS. Cut to any length. Prices are per ft. prepaid. For less than 1/2 ft., add 50%; over 1 1/2 ft., discount 10%.

Diam. 3/16 in. \$.18 Diam. 1/2 in. \$.18 Diam. 1/4 in. \$.20 Diam. 5/16 in. \$.25 Diam. 3/8 in. \$.30

ALUMINUM WIRE. Cut to any length. Prices are per 25 ft. prepaid. For 50 ft., discount 15%; for 100 ft., discount 20%. B. & S. Standard Wire Gauge.

No. 22 prepaid, \$.20 No. 20, \$.20 No. 18, \$.20 No. 16, \$.22 No. 15, \$.25

NICKEL SHEET. Cut to any dimensions. Thickness, 3/64 in. Per sq. ft., price \$7.25; postage, 40 cts. For 1/2 sq. ft. or less, 7 cts. per sq. in. prepaid.

LEAD SHEET. Cut to any dimensions. Thickness 1/16 in. Per sq. ft., price 75 cts.; postage, 64 cts. For less than 1/2 sq. ft. at rate of 1 cent per sq. in.; postage, 1/2 cent.

BLOCK TIN SHEET. Cut to any dimensions. Thickness 1/8 in., per sq. ft., price \$2.50; postage, \$9 cts. For less than 1/2 sq. ft., at rate of 4 cts. per sq. inch prepaid.

ASBESTOS SHEET. Cut to any dimensions. Size of sheets, 40x40 in. Prices and postages are per sq. ft. For less than 1/2 sheet, add 50%.

Thick	Price Post.	Thick	Price Post.	Thick	Price Post.
1/32 in.	\$.08	1/16 in.	\$.15	3/32 in.	\$.22
	.05		.09		.12
				1/2 in.	\$.30

Note.—To avoid delays and unnecessary correspondence, read carefully the top of page 88. No orders taken for less than 25 cts., to which postage must be added proportionally where rates or weights are given.

THE PARAGON FOUNTAIN PEN



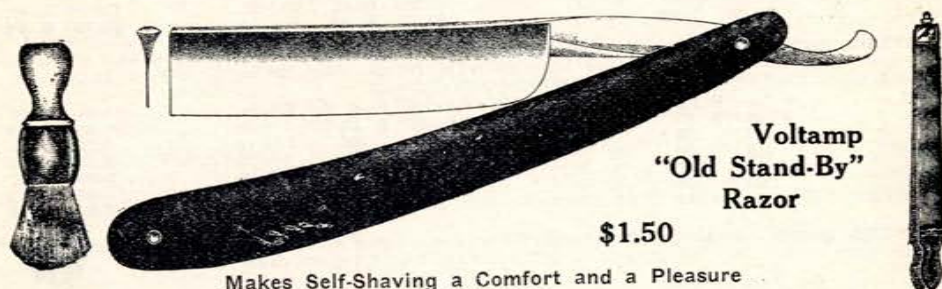
CLEAN

FILLS ITSELF

SIMPLE

Fitted with 14 Kt. Gold Pen. Self-Filling, or the filler may be discarded and the barrel used for holding the ink. Will not leak or drip.

List No. 2841 Paragon Fountain Pen.....Prepaid, \$1.50



**Voltamp
"Old Stand-By"
Razor**

\$1.50

Makes Self-Shaving a Comfort and a Pleasure
Full Hollow Ground. For Youths and Men

- | | | |
|----------|---|---------|
| List No. | | Prepaid |
| 2810 | "Old Stand-by" Razor, 5/8 in. Blade, Rubber Handle..... | \$1.50 |
| 2812 | "Old Stand-by" Razor, set of 7 in a handsome case, a razor marked for each day of the week..... | 10.00 |
| 2813 | "Old Stand-by" Razor Strop, Horse Hide and Canvas..... | 1.00 |
| 2814 | "Old Stand-by" Shaving Brush, Rubberset..... | .75 |

THE FLAMING POCKET LIGHTER

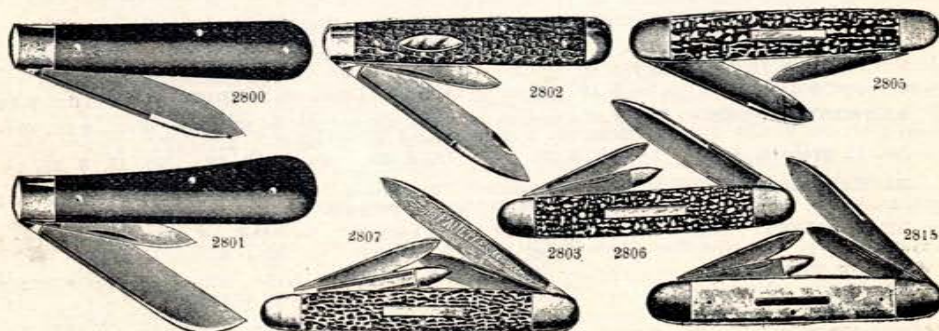
Will Light in the Wind

A Boon to Smokers Lights Itself

The most convenient and practical lighter on the market. Just a little deodorized wood alcohol once in a while does the work. Will light anything that will burn.

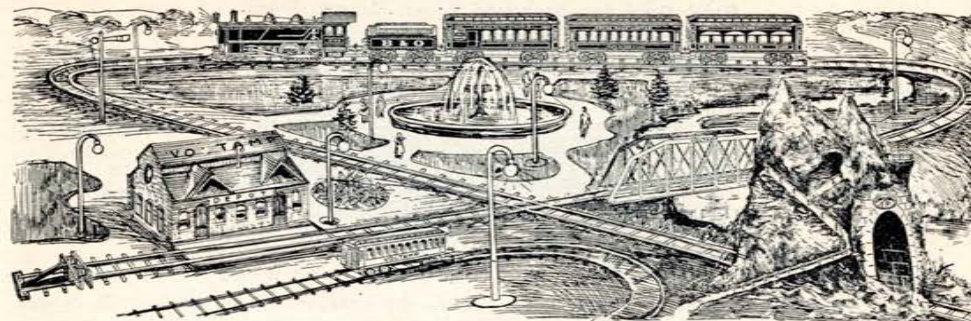
- | | | |
|----------|-----------------------------|---------|
| List No. | | Prepaid |
| 2856 | Flaming Pocket Lighter..... | .50 |
| 2857 | Renewal Filament..... | .30 |

POCKET KNIVES—"Old Stand-By" Brand



- | List No. | Style | Blades | Handle | Pre-paid | List No. | Style | Blades | Handle | Pre-paid |
|----------|--------------------|--------|--------|----------|----------|--------------------|--------|--------|----------|
| 2800 | Boys' Jack Knife, | One | Coco | \$.25 | 2803 | Bolster-End Knife, | Three | Stag | \$.75 |
| 2801 | Boys' Jack Knife, | Two | Coco | .35 | 2806 | Bolster-End Knife, | Three | Ivory | 1.00 |
| 2802 | Bolster-End Knife, | Two | Stag | .65 | 2807 | Bolster-End Knife, | Four | Stag | 1.25 |
| 2805 | Bolster-End Knife, | Two | Stag | .65 | 2815 | Bolster-End Knife, | Four | Ivory | 1.50 |

VOLTAMP ELECTRIC RAILWAYS



It is with especial pleasure and a pardonable pride that we present this line, and, although before the public only three years, we unhesitatingly claim for VOLTAMP ELECTRIC RAILWAYS the foremost place in their field, with numerous complimentary letters in our possession to heartily attest the claim. The truest reason for this fortunate situation is the fact that we started out right, supplying models that not only supported our claims of superiority, but which established an admirer—a living testimonial—with every purchaser.

Our latest models possess further advantages, foremost among which are the addition of an Electric Headlight, the new type of motor and the change in the winding. The Motor, designed for railways exclusively, is of the solid field form to avoid breaking of the magnetic circuit. This feature, together with the new style of winding, results in a remarkably low consumption of current. All the VOLTAMP patented features are retained—Solid Commutator, which is unbreakable, and Removable Brushes, which can be quickly changed without disturbing the mechanism.

The VOLTAMP CONTROLLER-REVERSER, used on all our Railways for changing the direction of the motor, is positive in its action, sending the car forward or backward or bringing it to a full stop. It is the only Controller-Reverser ever devised that is absolutely dustproof, oilproof and foolproof.

The VOLTAMP AUTOMATIC COUPLERS have delighted all because of their simplicity and perfect action. A train of separated cars can be instantly coupled, just like the real cars in a railroad yard, and they stay coupled.

Always an important factor to the intending purchaser of an Electric Railway is the current supply. The new windings of the various motors used in VOLTAMP Railways permit the use of either Battery current or Street-Lighting current at a very small cost. In the following pages, with each style of railway, the consumption of current is given accurately according to meter measurements.

THERE IS NO "TROUBLE DEPT" WITH VOLTAMP RAILWAYS

The VOLTAMP RELAY REVERSER is acknowledged the greatest novelty ever shown in connection with miniature railways. By means of this little attachment the direction of any Electrical Motor, Motor Car, Engine or Locomotive can be changed without stopping or even touching it, making it go forward or backward or brought to a full stop at the will of the operator, who can take his position anywhere at a point distant from the track or close by. Patent pending.



The Switch



AUTOMATIC COUPLER



PATENT APPLIED FOR

2149

THIRD RAIL SYSTEMS

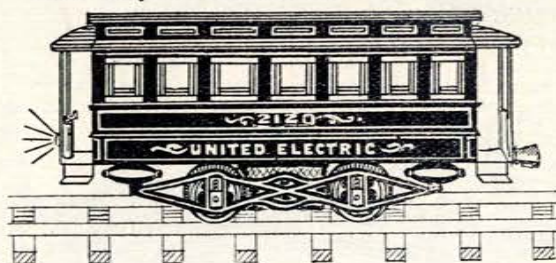
NOTE.—Occasionally a correspondent asks why we do not make Railways of the "Third Rail" system. Our answer: We aim to avoid trouble, and such a system is apt to create it. The chief objection is the track, which must be prepared by the manufacturer in sections, having the trolley or third rail completely insulated from the other two. These sections may test out perfectly in the shop, but when the interested and inexperienced purchaser puts them together there is one chance that he will disarrange the insulators, thereby causing trouble.



VOLTAMP TROLLEY—Single Truck

Built Only for Standard 2-Inch Gauge Track

6 Volts
¾ Ampere
Battery or
Street
Current



Electric
Headlight
Price
\$4.50

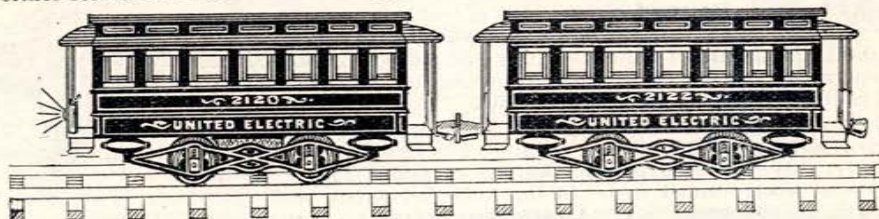
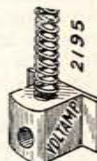
The Miniature Trolley Car closely resembles the modern street railway in design, and runs equally well on Battery or Street Current.

The **Body**, as on all our Railways, is made of Bessemer Steel Sheet. The sides are paneled and the windows framed by rolled grooves to make them rigid and strong. VOLTAMP cars will stand a lot of abuse and still retain their shape. Artistically finished in maroon and white, with neat gold lettering and stripes.

The **MOTOR** is entirely concealed from view, suspended over the forward axle. The drive consists of a steel pinion and three brass gears, all of which are cut from thick flat sheet to insure long wear. The solid Commutator is unbreakable (patented). The Brushes are the famous VOLTAMP type (patented), which can be quickly removed and replaced by the mere use of a thumb and finger.

The **Trucks** have turned steel wheels, brass finished, mounted on perfectly trued steel axles. The latter rest in flanged bronze bearings, set in the finished boxes of the truck frame, and have spiral tension springs to take up any possible unevenness in the tracks. This arrangement prevents "derailing." VOLTAMP cars will not "jump the track."

Specifications.—6 Volts, ¾ Ampere. Speed about 150 feet per minute. Length over all 12 in., width 3½ in., height 5¼ in., weight 2¾ lbs. Has seven windows on each side, long side seats, Electric Headlight and rear coupler to carry Trailer. Takes any curve of 14-in. radius or over, and will run nicely on 4 or 5 Dry Cells. Fitted with our celebrated **Controller-Reverser** to run it either forward or backward or bring it to a full stop.



2120—TROLLEY

2122—TRAILER

TROLLEY TRAILER CAR, Single Truck, No. 2122, is the same in every respect as the Electric Trolley, but has no Motor or Controller-Reverser. Automatic Couplers.

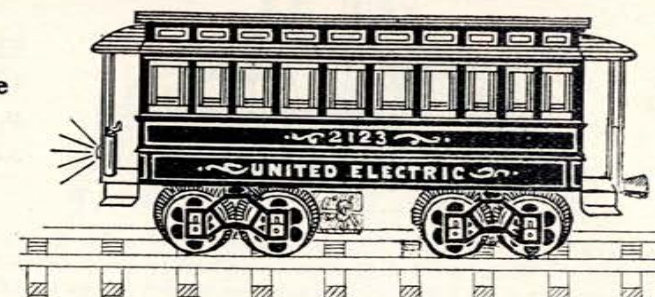
List No.		Price
2120	Single-Truck TROLLEY, weight packed 4¼ lbs.	\$4.50
2121	Single-Truck TROLLEY, with 9 ft. Steel Track, Ties, Connector; weight packed 5½ lbs.	4.85
2122	Single-Truck TROLLEY TRAILER, weight packed 3 lbs.	2.00
2192	Extra Brushes, per set of 3, prepaid, 15 cts.; 2 sets, prepaid.	.25
2408	Extra Reflector Lamp for Headlight, 6 Volts, prepaid.	.35
2226	Equipment.—No. 2120 Trolley, No. 2150 9-ft. Coppered Steel Track and Ties (3-ft. Circular Track), No. 2154 Connector, No. 1316 Battery of 4 Dry Cells in case with Switch; weight packed about 25 lbs.	6.00
2227	Equipment.—No. 2120 Trolley, No. 2122 Trailer, No. 2151 18-ft. Coppered Steel Track and Ties (6-ft. Circular Track or 8-ft. Oval), No. 2154 Track and Battery Connector, No. 2164 Bridge, No. 1317 Battery of 6 Dry Cells in case with Switch; length of train 25 in.; weight packed about 30 lbs.	9.25

NOTE.—No. 2120 Trolley, fitted with a Relay Reverser, extra charge \$2.50

VOLTAMP TROLLEY—Double Truck

Built Only for Standard 2-Inch Gauge Track

6 Volts
¾ Ampere
Battery
or Street
Current



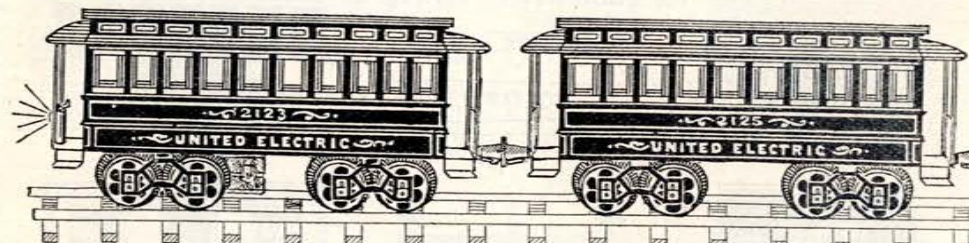
Electric
Headlight
Price
\$6.00

The Double-Truck Trolley is a splendid reproduction of the larger cars used in the big cities. The trucks are carefully balanced and centrally bolted to the platform. The **Motor** is coupled to both axles of the forward truck by a set of four heavy brass gears and a steel pinion, an arrangement by which both axles are driven equally, insuring a steady and powerful pull on level grade or hill. This car will haul one or more Trailers over a 7 per cent. grade at good speed, using only 6 to 8 Volts of Battery or Street Current.

The **Body** is made similar to the single-truck Trolley, with a neat finish in maroon and white, gold stripes and lettering.

The addition of an **Electric Headlight** to all VOLTAMP railways lends a decided realistic effect. The lamp is made especially for headlight purposes, and has a reflector back which throws the rays over considerable space.

Specifications.—6 to 8 Volts, ¾ Ampere. Speed about 175 feet per minute. Length 14½ in., width 3½ in., height 5¼ in., weight 3¼ lbs. Has 10 windows on each side, two long seats, Electric Headlight and rear coupler to carry Trailers. Will take any curve of 15-in. radius and over. **Controller-Reverser.**



2123—TROLLEY

2125—TRAILER

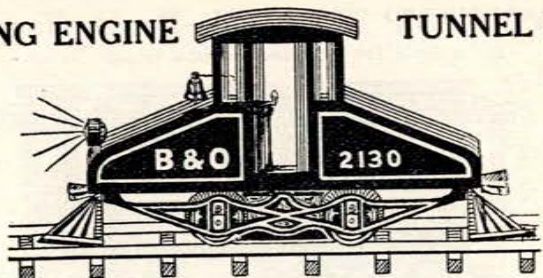
TROLLEY TRAILER CAR, Double Truck, No. 2125, is identical with the No. 2123 Trolley, but has no Motor or Controller-Reverser. Automatic Couplers.

List No.		Price
2123	Double-Truck Trolley, weight packed 4¾ lbs.	\$6.00
2124	Double-Truck TROLLEY, with 9 ft. Steel Track, Ties, Connector; weight packed 6 lbs.	6.35
2125	Double-Truck TROLLEY TRAILER, weight packed 3½ lbs.	2.50
2192	Extra Brushes, per set of 3, prepaid, 15 cts.; 2 sets, prepaid.	.25
2408	Extra Reflector Lamp for Headlight, 6 Volts, prepaid.	.35
2228	Equipment.—No. 2123 Trolley, No. 2150 9-ft. Coppered Steel Track and Ties (6-ft. Circle), No. 2154 Connector, No. 1316 Battery of 4 Dry Cells in case with Switch; weight packed about 25 lbs.	7.35
2229	Equipment.—No. 2123 Trolley, No. 2125 Trailer, No. 2159 or No. 2163 Track and Ties, No. 2154 Connector, No. 2164 Bridge, No. 1317 Battery of 6 Dry Cells and Switch; length of train 30 in.; weight packed about 35 lbs.	11.50

NOTE.—No. 2123 Trolley, fitted with a **Relay-Reverser**, extra charge \$2.50. The value of this attachment is instantly appreciated. The switch may be placed any distance away from the track, yet the car will be sent forward or backward as the operator wills. Works perfectly on Battery or Direct Lighting current

MINING ENGINE TUNNEL MOTOR

6 Volts
¾ Ampere
Battery or
Street
Current



Electric
Headlight
Price
\$4.50

This is the boy's delight, and not without reason. It is more than a mere toy—a model—and will lead the young mind to think over and study the fundamental problems of railroading, at the same time affording boundless pleasure because of its realistic appearance and remarkable work. Coupled to a train of three or more cars, it proves an attraction for children that surpasses all other amusement.

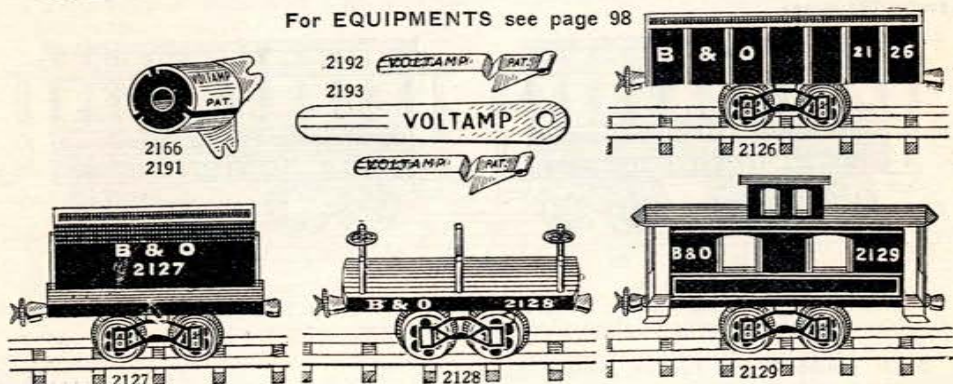
The Motor arrangements are similar to the Single-Truck Trolley. Like the latter, it is triple-gearred, has excellent pull, sufficient to haul with ease the four freight cars shown below on even or 7 per cent. hill grade. A Controller-Reverser is placed conveniently in the cab, and a slight movement of the lever will send the engine forward or backward, start or stop it. Finished in steel-blue color, with gold lettering and stripes.

Specifications.—6 to 8 Volts, ¾ Ampere. Speed about 150 feet per minute. Length over all 10½ in., width 3½ in., height 5½ in., weight 3 lbs. Has Electric Headlight and Swinging Bell, and carries Cowcatcher on both ends, with couplers to haul Trailers.

List No.	Built Only for Standard 2-Inch Gauge Track	Price
2130	MINING ENGINE, Single Truck; weight packed about 4¼ lbs.	\$4.50
2131	MINING ENGINE, Single Truck, with 9 ft. Track, Ties and Connector; weight packed about 5½ lbs.	4.85
2408	Extra Lamp for Headlight, 6 Volts.	.35

NOTE.—No. 2130 Mining Engine, fitted with a Relay Reverser, extra charge \$2.50.

For EQUIPMENTS see page 98



List No.	Style	Length	Width	Height	Price	Postage
2126	GONDOLA CAR	8½ in.	3 in.	3½ in.	\$1.00	.25
2127	DUMP CAR	7½ in.	3¼ in.	4¼ in.	1.00	.25
2128	FLAT CAR	8½ in.	3 in.	4 in.	1.00	.25
2129	CABOOSE	9¾ in.	3¼ in.	6¼ in.	1.75	.35

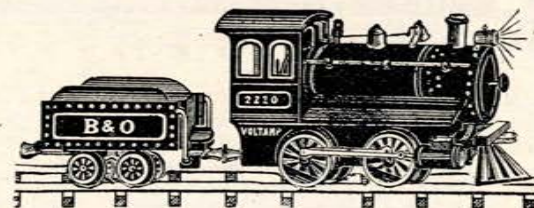
Prepaid

List No.	Style	Price
2166	Commutator for Trolleys, Mining Engines, Suburban and Interurban Motor Cars.	\$.25
2191	Commutator for all Locomotives.	.30
2192	Brushes for Trolleys, Mining Engines, Suburban and Interurban Motor Cars, set of 3, prepaid, 15 cts.; 2 sets.	.25
2193	Brushes for Locomotives using Battery Current, set of 3, prepaid, 15 cts.; 2 sets.	.25
2358	Brushes for Locomotives using Street Current, set of 3.	.25

VOLTAMP ELECTRIC LOCOMOTIVE—Single Truck

Built Only for Standard 2-Inch Gauge Track

6 to 8 Volts
¾ Ampere
Battery or
Street Current

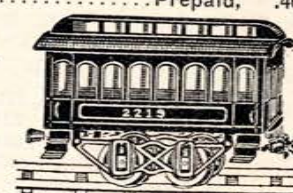


Electric
Headlight
Price
\$10.00

In the line of Electric novelties the name "VOLTAMP" has long and justly stood as a synonym for distinct excellence of design, superior construction and real value. This is especially so of our No. 2220, a new model, designed in response to a demand for a Locomotive and Tender of small size. In detail it is identical with the larger types described in succeeding pages, running equally well on Battery or Street-Lighting Current. For EQUIPMENTS see next page.

Specifications.—No. 2220 Locomotive and Tender. Length 17½ in.; Locomotive only, length 10¼ in.; width 3½ in., height 5½ in. Counterbalanced Drive Wheels, diameter front 1¾ in., flange 2 in. Stroke of Piston ¾ in. Current 6 to 8 Volts, ¾ Ampere. Speed about 150 ft. per minute. Operates on any curve with a radius of 15 in. or over. Tender only, length 7 in., width 3¼ in., height 3½ in. Finish, steel-blue enamel, with gold lettering and stripes. Electric Headlight.

List No.	SINGLE TRUCK.	Price
2220	Locomotive and Tender, weight packed 7 lbs.	\$10.00
2354	No. 2220 Locomotive only, weight packed 5¾ lbs.	9.00
2355	Tender only, weight packed 1¼ lbs. (postage 20 cts.)	1.00
2358	Extra Brushes, per set of 3.	Prepaid, .25
2408	Extra Lamp for Headlight, 6 Volts.	Prepaid, .35
2409	Extra Lamp for Headlight, 8 Volts.	Prepaid, .40

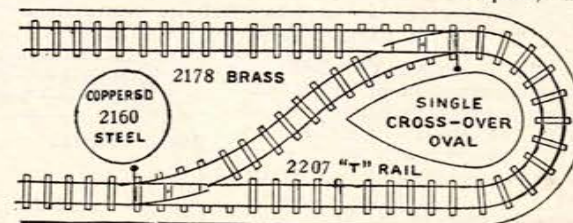


"They Couple
and Stay Coupled"

List No.	Style	Price
2218	Combination Baggage Car, length 10 in., width 3¼ in., height 5½ in., weight packed 2¼ lbs. (by mail 35 cts.)	\$1.65
2219	Passenger Car, length 10 in., width 3¼ in., height 5½ in., weight packed 2¼ lbs. (by mail 35 cts.)	1.50
2149	AUTOMATIC COUPLERS. "They Couple and Stay Coupled." Per set, Prepaid.	.25

Single Cross-Over Oval

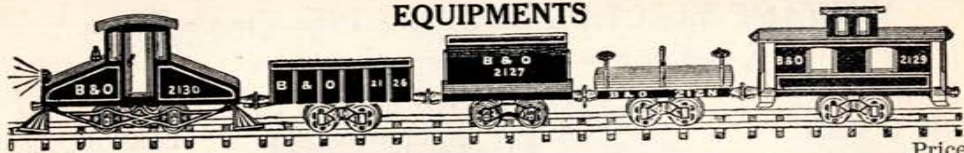
A very neat Track and gives no trouble. A "Bumper" at one or both ends improves its appearance considerably. Package contains two Right or Left-Hand Switches and Connector, with sufficient Track and Ties to complete an oval about 40x90 in.



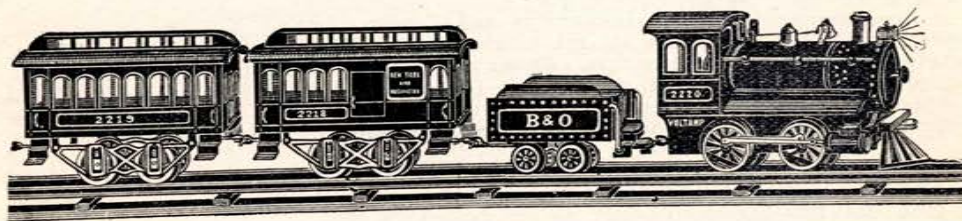
List No.	Style	Price	Post.
2160	SINGLE CROSS-OVER OVAL, Coppered Steel Track.	\$2.25	\$.60
2178	SINGLE CROSS-OVER OVAL, Brass Track.	2.75	.60
2207	SINGLE CROSS-OVER OVAL, Brass "T" Rail (2 pkgs.)	5.50	.90

For Other Track Designs see pages 110 and 111

EQUIPMENTS



- List No. Price
- 2231 Equipment.—No. 2130 Mining Engine, No. 2150 Track and Ties, No. 2154 Battery and Track Connector, No. 1316 Battery of 4 Dry Cells in case with Switch; weight packed about 25 lbs. \$6.00
- 2232 Equipment.—No. 2130 Mining Engine, No. 2126 Gondola, No. 2129 Caboose, No. 2151 18-ft. Track and Ties, No. 2154 Connector, No. 2164 Bridge, No. 1317 Battery of 6 Dry Cells in case with Switch; length of train 33 in.; weight packed about 30 lbs. 10.00
- 2233 Equipment.—No. 2130 Mining Engine, No. 2126 Gondola, No. 2128 Flat Car, No. 2127 Dump Car, No. 2129 Caboose, No. 2159 or 2163 Track and Ties, No. 2154 Connector, No. 2164 Bridge, No. 1318 Battery of 8 Dry Cells in case with Switch; length of train 50 in.; weight packed about 40 lbs. 12.50



Locomotive No. 2220—Equipment No. 2359

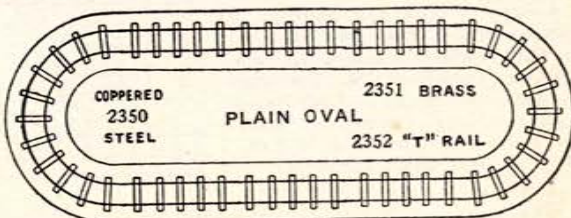
This handsome equipment includes our new model Single-Truck Locomotive and Tender, a Combination Baggage and a Passenger Car. The outfit is built on the same lines as are all our deservedly popular Locomotives and Cars illustrated and described on further pages. Every detail is perfectly carried out, and the general appearance is so natural that they hold the enchanted attention of all, young and old.

- List No. Price
- 2359 Equipment.—No. 2220 Locomotive and Tender, No. 2218 Combination Baggage Car, No. 2219 Passenger Car, No. 2150 9-ft. Double Steel Track and Ties, No. 2154 Track and Battery Connector, No. 1316 Battery of 4 Dry Cells in case with Switch; length of train 36 in., weight packed about 25 lbs. 14.75
- 2360 Equipment.—No. 2220 Engine and Tender, No. 2218 Combination Baggage Car, No. 2219 Passenger Car, No. 2159 or 2163 Track and Ties, No. 2154 Connector, No. 2164 Bridge, No. 2169 Ticket Office, No. 1317 Battery of 6 Dry Cells in case with Switch; length of train 36 in., weight packed about 30 lbs. 17.50
- 2361 Equipment.—No. 2220 Engine and Tender, No. 2126 Gondola Car, No. 2127 Dump Car, No. 2128 Flat Car, No. 2129 Caboose, No. 2159 or 2163 Track and Ties, No. 2154 Connector, No. 2164 Bridge, No. 2167 Station, No. 1317 Battery of 6 Dry Cells in case with Switch; length of train 50 in., weight packed about 40 lbs. 19.00

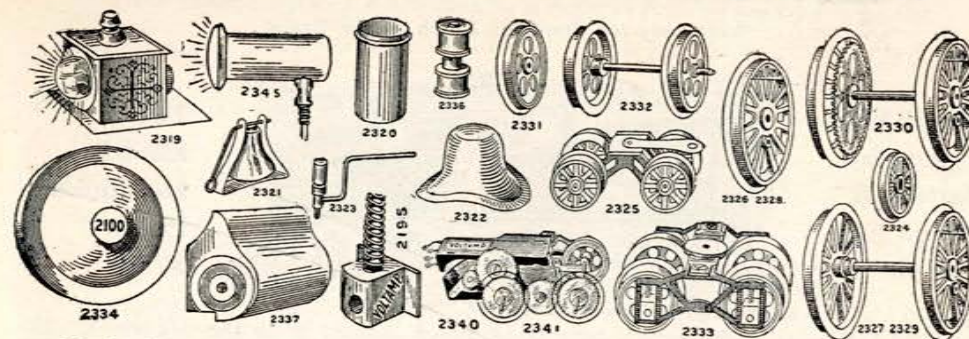
PLAIN OVAL TRACKS

Full description of Track materials is given on pages 108 and 109. The PLAIN OVALS and CIRCLES are easily laid. Each package contains sufficient Track and Ties for a roadbed about 40 in. wide and 90 in. long. For other TRACK DESIGNS see pages 110 and 111.

- List No. Price Postage
- 2350 PLAIN OVAL, Coppered Steel Track. \$1.05 .50
- 2351 PLAIN OVAL, Brass Track. 1.80 .50
- 2352 PLAIN OVAL, Brass "T" Rail. 3.00 .50

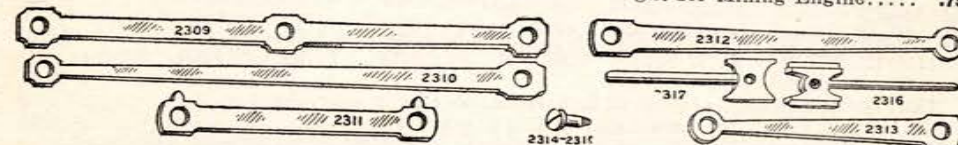


TROLLEY, MOTOR CAR AND LOCOMOTIVE PARTS



For description and sizes of various parts see the complete Railways. All parts finished ready for use. Be sure to state Voltage of Lamps when ordering Headlights.

- | List No. | For Locomotives | Prepaid | List No. | For Locomotives | Prepaid | |
|----------|--|---------|------------------------------------|--|---------|--|
| 2318 | Headlight, Dummy..... | \$.50 | 2389 | Air Tanks, per pair..... | \$.20 | |
| 2319 | Headlight, Electric..... | 1.00 | 2397 | Steam Chests, per pair..... | .25 | |
| 2320 | Smokestack..... | .12 | For Trolleys and Other Cars | | | |
| 2321 | Bell, with Trestle..... | .25 | 2331 | Wheel used on all Cars..... | .15 | |
| 2322 | Steam and Sand Domes, pair..... | .30 | 2332 | Two No. 2331 on Axle..... | .30 | |
| 2323 | Steam Whistle..... | .15 | 2333 | Bearing Journals, set of 4..... | .25 | |
| 2324 | Pilot Wheels, pair on Axle..... | .30 | 2334 | Truck complete, for all Cars..... | .85 | |
| 2325 | Pilot Truck, complete..... | .75 | 2342 | Truck Frame only, for all Cars..... | .25 | |
| 2326 | Drive Wheels, brass-finished steel..... | .30 | 2343 | No. 2342, with Bearing Boxes..... | .50 | |
| 2327 | Drive Wheels, 2 No. 2326 on Axle..... | .60 | 2338 | Motor and Gears for Single Trucks..... | 2.25 | |
| 2328 | Drive Wheels, solid brass..... | .50 | 2339 | Motor and Gears for Double Trucks..... | 3.00 | |
| 2329 | Drive Wheels, 2 No. 2328 on Axle..... | 1.00 | 2340 | No. 2338, with Truck and Wheels..... | 3.00 | |
| 2330 | No. 2329 Drive Wheels, with No. 2301 Gear..... | 1.35 | 2341 | No. 2339, with Truck and Wheels..... | 3.75 | |
| 2334 | Boiler Head and Front Plate..... | .20 | 2345 | Headlight, Electric..... | 1.00 | |
| 2335 | Front Plate only..... | .10 | 2348 | Headlight, Trolley and Interurban..... | .60 | |
| 2336 | Air Brake Pump..... | .15 | 2349 | Headlight for Mining Engine..... | .75 | |



- | List No. | For Locomotives | Prepaid | List No. | For Locomotives | Prepaid |
|----------|--|---------|----------|--|---------|
| 2309 | Connecting Rods, 6-Wheel Drives, pair..... | \$.50 | 2317 | Cross-Head Slides, for all 4-Wheel Drives, pair..... | \$.35 |
| 2310 | Piston Rods, 6-Wheel Drives, pair..... | .40 | 2289 | Set, 2 each 2311, 2312, 2317, with Screws..... | 1.00 |
| 2316 | Cross-Head Slides, 6-Wheel Drives, pair..... | .50 | 2344 | Set, 2 each 2311, 2313, 2317, with Screws..... | 1.00 |
| 2353 | Set, 2 each 2309, 2310, 2316, with Screws..... | 1.60 | 2314 | Shoulder Screws for Connecting Rods, 1/2 doz..... | .25 |
| 2311 | Connecting Rods, 4-Wheel Drives..... | .30 | 2315 | Shoulder Screws and Bushing for joining Rods to Wheels, pair.... | .15 |
| 2312 | Piston Drive Rods, Double Truck..... | .30 | | | |
| 2313 | Piston Drive Rods, Single Truck..... | .35 | | | |

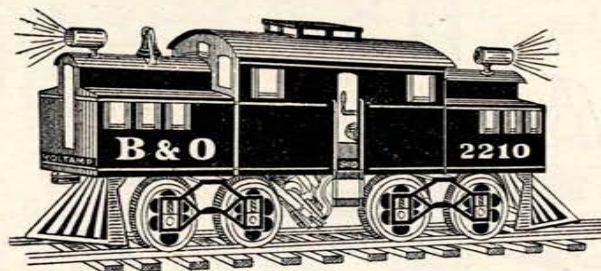


- | List No. | Teeth | O. D. | Face | Hole | Prepaid |
|----------|--------------------------------------|-------|-------------|----------|--------------------|
| 2300 | Gear Wheel..... | 90 | 1 15/16 in. | 3/8 in. | \$.30 |
| 2301 | Gear Wheel, Hub Center..... | 50 | 1 15/16 in. | 1/16 in. | .35 |
| 2302 | Gear Wheel..... | 52 | 1 1/4 in. | 3/8 in. | .20 |
| 2303 | Gear Wheel, Hub Center..... | 52 | 1 1/4 in. | 1/16 in. | .25 |
| 2304 | Gear Wheel { Compounding..... | 52 | 1 1/4 in. | 1/16 in. | No. 29 or } .35 |
| 2305 | Gear Wheel { With Pinion Center..... | 19 | 1 15/16 in. | 1/8 in. | No. 18 } .25 |
| 2306 | Gear Wheel, Hub Center..... | 28 | 1 1/4 in. | 3/8 in. | No. 29 } .25 |
| 2307 | Gear Wheel, Brass..... | 19 | 1 15/16 in. | 1/8 in. | No. 29 } .15 |
| 2299 | Gear Wheel, Steel..... | 19 | 1 15/16 in. | 1/8 in. | No. 29 or 18 } .15 |
| 2308 | Pinion, Steel..... | 9 | 1/4 in. | 3/16 in. | No. 30 } .10 |

ELECTRIC SUBURBAN ENGINE—Double Truck

Built Only for Standard 2-Inch Gauge Track

8 to 10 Volts
¾ Ampere
Battery or
Street
Current



Two
Electric
Headlights
Price
\$7.50

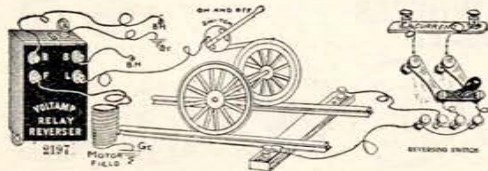
The handsome model shown here is patterned directly after the engines in successful operation by the B. & O. R. R. through the long tunnels under the streets of Baltimore and by the N. Y. C. & H. R. R. R. on its suburban lines. It is pronounced a perfect miniature by railroad engineers and is universally praised by all purchasers. The Motor is compound geared to both axles of the forward truck, using a set of five heavy gears. Built to stand hard use and strong enough to haul any six of our Double-Truck Passenger or Freight Cars or ten of the Single-Truck patterns, using only 8 Volts, Battery or Street current.

The Body is ribbed and all openings are framed—precautions that will prevent dents and bends should the car have a fall. Finished in steel-blue color, with gold lettering and stripes.

Specifications.—8 to 10 Volts, ¾ Ampere. Speed, with 6 Dry Cells, 200 ft. per minute. Length over all 13½ in., width 3¾ in., height 6½ in., weight 4 lbs. Takes any radius of 15 in. and over. Has Swinging Bell and Cowcatcher on each end, with Couplers for coupling trailer cars. Is supplied with two Electric Headlights, which take their current from the tracks. Complete with Controller-Reverser.

List No.		Price
2210	ELECTRIC SUBURBAN ENGINE, weight packed 6 lbs.	\$7.50
2211	ELECTRIC SUBURBAN ENGINE, with RELAY REVERSER, weight packed 6 lbs.	10.00
2192	Extra Brushes, per set of 3, prepaid, 15 cts.; 2 sets, prepaid.	.25
2408	Extra Lamp for Headlight, 6 Volts, prepaid.	.35
2234	Equipment.—No. 2210 Suburban Engine, No. 2159 or 2163 Track and Ties, No. 2154 Connector, No. 2164 Bridge, No. 1317 Battery of 6 Dry Cells in case with Switch; weight packed about 30 lbs.	10.50
2235	Equipment.—No. 2210 Suburban Engine, No. 2109 Flat Car, No. 2112 Coal Hopper, No. 2110 Caboose, No. 2159 or No. 2163 Track and Ties, No. 2154 Connector, No. 2164 Bridge, No. 1318 Battery of 8 Dry Cells in case with Switch; length of train 53 in., weight packed about 55 lbs.	16.75

VOLTAMP RELAY REVERSER



The Greatest Novelty Ever Shown on Miniature Railways. Positive in its Action. Perfectly Made. Platinum Contacts.

Can be attached to any Miniature Trolley, Motor Car or Locomotive, and works equally well on Battery or 110-Volt Direct current, but not on the Alternating current. The RELAY is carried on the engine or car, while the REVERSING SWITCH is placed wherever the operator may elect. Connect as in illustration; run two wires from "B" "B" to the Brush Holders "BH," another wire from "F" to one end of the Field wire, and another from "L" to the wheel Contact Brush. "G" is then grounded to frame of the engine "Gr."

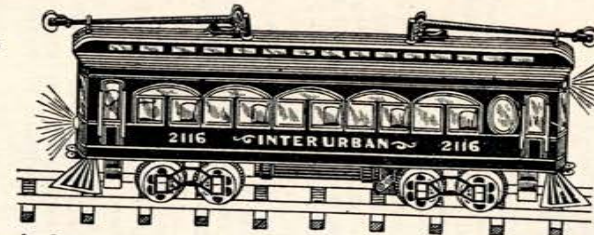
NOTE.—When the Relay Reverser is in circuit the Controller Reverser is arranged for make and break, and acts as an "on and off" switch.

List No.	Prepaid
2197	VOLTAMP RELAY REVERSER, complete.....\$2.50

VOLTAMP INTERURBAN RAILWAY—Double Truck

Built Only for Standard 2-Inch Gauge Track

6 to 8 Volts
¾ Ampere
Battery or
Street
Current



Electric
Headlights
Price
\$9.00

A sumptuously beautiful car that baffles description and which must be seen to be appreciated. Complete in appointments. Has Pullman framed windows of clear glass (unbreakable celluloid), Electric Headlight and Electric Dangerlight. Aisle Seats. The trolley poles are not arranged for overhead current feed unless so ordered. Where care is taken in building the roadbed, and the trolley poles with the overhead wires are rigidly set up, this railway presents a decided realistic appearance, especially if the track is made to pass through a parked oval.



The Motor and gear drive are similar to those described under the Double-Truck Trolley, giving equal power. Finished in olive green, with gold lettering and stripes.

A RELAY REVERSER added to this car vastly enhances its work. This little attachment makes a decided hit, as the onlooker cannot tell how the direction of the car is reversed unless told. Remember, the operator may take his position at a distant point or close by—it does not matter.

Specifications.—6 to 8 Volts, ¾ Ampere. Speed 200 ft. per minute. Length over all 13½ in., width 3½ in., height 6½ in., weight 4½ lbs. Has Glass Windows and aisle seats; Cowcatcher on each end, with couplers to take on trailer cars; Electric Headlight and Dangerlight, which take their current supply from the tracks; also a Controller-Reverser to send it in either direction and to start or stop it. Any style of track may be used of 15 in. radius or over.



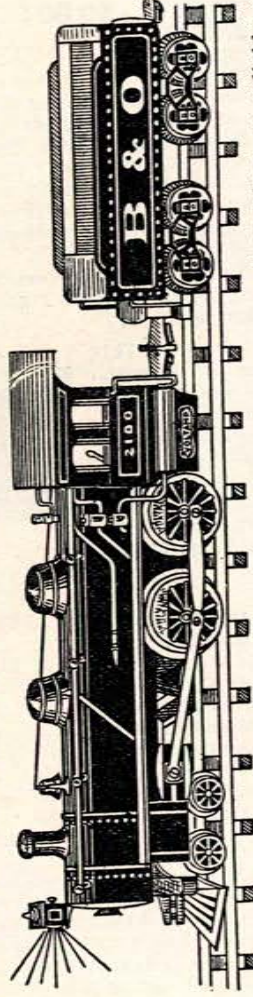
List No.		Price
2116	INTERURBAN ELECTRIC RAILWAY, Double Truck, weight pkd. 7 lbs.	\$9.00
2117	INTERURBAN ELECTRIC RAILWAY, with RELAY REVERSER, weight packed 7 lbs.	11.50
2192	Extra Brushes, per set of 3, prepaid, 15 cts.; 2 sets, prepaid.	.25
2408	Extra Reflector Lamp for Headlight, Clear Glass, 6 Volts, prepaid.	.35
2427	Extra Reflector Lamp for Dangerlight, Red, 6 Volts, prepaid.	.35
2119	Trolley Pole for overhead feed or as dummy (postage 5 cts.)	.75
2230	Equipment.—No. 2116 Interurban Railway Car, No. 2159 or No. 2163 Track and Ties, No. 2154 Connector, No. 2164 Bridge, No. 2169 Station, No. 1317 Battery of 6 Dry Cells in case with Switch; length of train 18½ in., weight packed about 35 lbs.	12.50

SOURCE OF CURRENT SUPPLY

For intermittent work—periods of short duration—the Cases of VOLTAMP Dry Cells give excellent service and are the most popular method. 1½ Volts per cell. Where continuous or long runs are made the Fuller Batteries are recommended. A series of 3 Fuller Batteries (each 2 Volts) will run a Trolley, and a set of 5 or 6 will run a Locomotive from 30 to 50 hours. Quickly recharged at home at small cost. VOLTAMP Storage Batteries are the most convenient and economical, especially where the Direct Street Current is to be had. 6-Volt sizes for Trolleys and Mining Engine; 8-Volt sizes (2 to 4-Volt in series) for Suburban, Interurban and small Locomotives; and 12-Volt sizes (2 to 6-Volt in series) for the larger Locomotives and long runs. The 25-hour Storage Batteries give more than three times the life of the 10-hour. Full descriptions of all Batteries on pages 34, 35 and 36.

All VOLTAMP Railways can be operated on the street lighting or house current, either Alternating or Direct, and where this supply is to be had the cost of running is practically nothing. For Alternating-Current Transformers see page 21; for Direct-Current Controllers see page 23.

No. 2100—VOLTAMP LOCOMOTIVE AND TENDER—Four-Wheel Drive



VOLTAMP Locomotives require no laudatory remarks by us. They have proven themselves so reliable and have given such universal satisfaction that they warrant our challenge to the world to produce their equal in design, detail, workmanship, finish and durability. The simplicity of the mechanism has been brought to a point so fine that we do not know how we could improve them. Particular attention is directed to the **Truck Frame**, which is combined with the Motor Field in one piece (patent pending). This not only assures a rigid mechanism, but keeps the magnetic lines unbroken, resulting in greater power and lower current consumption. Another important improvement, exclusively VOLTAMP, is the method of attaching the forward or Pilot truck to the frame. This has always been a giant stumbling-block in the construction of miniature Locomotives, for it is that, more than any other feature, which causes "derailing." On a VOLTAMP Locomotive the Pilot Truck is appended by a toggle lever and pivoted so that it **must hug the track**. No matter in what position the engine is—running on straight track or rounding a curve, on level road or climbing grade—it cannot "jump the track."

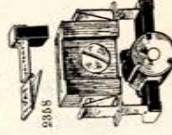
A faithful reproduction of the modern Express Locomotive used on all trunk lines. The Motor occupies a position midway between and over the axles of the drive wheels, to which it is attached by a series of five heavy cut gears and steel pinion. Wound for use on either Battery Current, 110-Volt Alternating or Direct Current, or 220-Volt Direct Current. The Brushes are composite carbon and copper. No sparking. No heating. Nothing to get out of order, and the only attention required is a drop of good oil or vaseline now and then on the bearings and gears.

All VOLTAMP Locomotives carry the following fixtures: **Electric Headlight**, Smokestack, Bell, Steam and Sand Domes, Whistle, Footboard, Hand Rails, Cowcatcher with Coupler (except No. 2202), Rear End Coupler to take on Trailers. A **Controller-Reverser** is placed in the cab, with a "throttle" lever to start and stop the engine or to send it forward and backward.

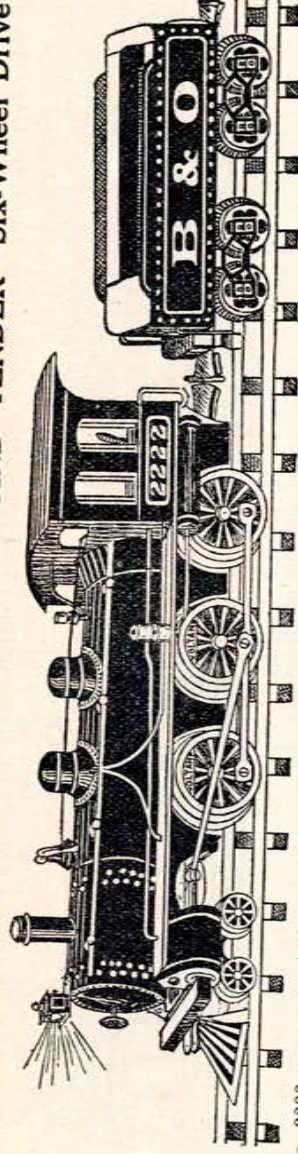
Specifications.—No. 2100 Locomotive and Tender, length 25 in. Locomotive, length 15 in., width 4 in., height 6 in. Counterbalanced Drive Wheels, diameter front $2\frac{1}{4}$ in., flange $2\frac{1}{2}$ in. Pilot Wheels, diameter front $1\frac{1}{16}$ in., flange $1\frac{1}{16}$ in. Drive Wheel base 4 in. Stroke of Piston $1\frac{1}{2}$ in. Current 8 to 10 Volts, $\frac{3}{4}$ Ampere. Speed about 200 ft. per minute. Operates on any curve having a radius of 15 in. or over. Tender, length $10\frac{1}{2}$ in., width $3\frac{3}{4}$ in., height $4\frac{3}{4}$ in. Finished in steel blue, with gold lettering and stripes, nicked and brass finished parts. **Built Only for Standard 2-Inch Gauge Track.**

List No.

2100	LOCOMOTIVE and TENDER, weight packed about 25 lbs.	Price
2132	No. 2100, with RELAY REVERSER, weight packed about 25 lbs.	\$15.00
2101	No. 2100 Locomotive only, weight packed about 20 lbs.	17.50
2102	TENDER only, weight packed about 3 lbs.	13.00
2358	Extra Brushes, per set of 3.	2.00
2409	Extra Lamp for Headlight, 8 Volts.	Prepaid, .25
		Prepaid, .40



No. 2222—VOLTAMP LOCOMOTIVE AND TENDER—Six-Wheel Drive



In our No. 2222 we present the pioneer Miniature Six-Wheel Drive Locomotive, the ideal engine, the Mecca of miniature railway construction. It is patterned directly after the famous "Royal Blue Limited," and although it made its first appearance only two years ago, as might naturally be expected it created as big a sensation as the original at the last World's Fair. Its graceful lines, of perfect equipment, handsome finish and the excellence of its mechanical and electrical construction have attracted the attention of railroad experts, and by those who have examined it carefully it is admitted to be the most perfect model ever shown.

Specifications.—No. 2222 Locomotive and Tender, length $27\frac{1}{2}$ in. Locomotive, length $17\frac{1}{2}$ in., width 4 in., height $6\frac{3}{4}$ in. Counterbalanced Brass Drive Wheels, diameter front $2\frac{1}{4}$ in., flange $2\frac{1}{4}$ in. Pilot Wheels, diameter front $1\frac{1}{16}$ in., flange $1\frac{1}{16}$ in. Drive Wheel base $6\frac{1}{2}$ in. Stroke of Piston $1\frac{1}{4}$ in. Takes any curve of 20-in. radius or over. Current 12 to 14 Volts, 1 Ampere. Speed 200 ft. per minute. Tender, length $10\frac{1}{2}$ in., width $3\frac{3}{4}$ in., height $4\frac{3}{4}$ in. Electric Headlight, Air Pumps and Tank. **Built Only for Standard 2-Inch Gauge Track.**

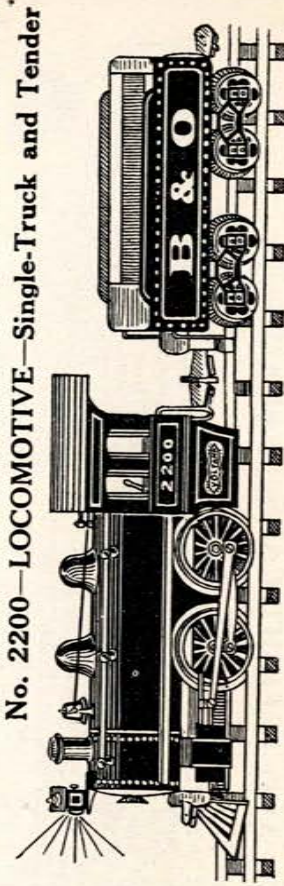
List No.

2222	LOCOMOTIVE and TENDER, Double Truck, weight packed about 30 lbs.	Price
2223	No. 2222, with RELAY REVERSER, weight packed about 30 lbs.	\$22.50
2358	Extra Brushes, per set of 3.	25.00
2410	Extra Lamp for Headlight, 12 Volts.	Prepaid, .25
		Prepaid, .40

Except that it has no forward truck, the No. 2200 is the same as the No. 2100 on previous page. All working parts and specifications correspond except length, $12\frac{1}{2}$ in. Locomotive and Tender $22\frac{1}{2}$ in.

List No.

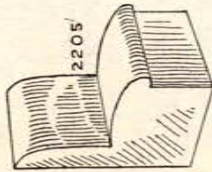
2200	LOCOMOTIVE and TENDER, weight packed about 20 lbs.	Price
2204	No. 2200, with RELAY REVERSER, weight packed about 20 lbs.	\$12.00
2201	No. 2200 Locomotive only, weight packed about 15 lbs.	14.50
2358	Extra Brushes, set of 3.	10.00
2409	Extra Lamp, 8 Volts.	Prepaid, .25
		Prepaid, .40



No. 2200—LOCOMOTIVE—Single-Truck and Tender

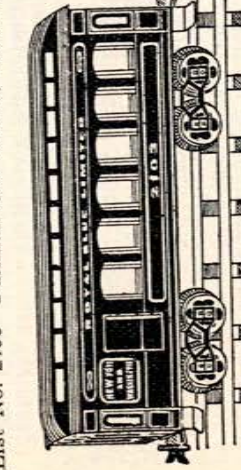
VOLTAMP PASSENGER AND FREIGHT CARS—Double Truck

These Passenger and Freight Cars are a complete revelation to all. No tin is used in VOLTAMP Cars. The bodies are made of Bessemer Steel sheet, all sides are ribbed and all openings are framed. This process stiffens them wonderfully and it requires hard knocks to spoil their shape. Passenger Cars are "vestibuled," and all carry **Automatic Couplers** that couple and stay coupled. The wheels are turned to exact size from **Steel** castings, and are brass finished. All hubs are bushed with **Fibre**, completely insulating them from the Steel Axles, thus avoiding all danger of short-circuiting the tracks. Handsomely finished in enamel and gold. Nos. 2103, 2104 and 2106, length 15 in., width 3½ in., height 6 in. Nos. 2105 and 2107, length 18 in., width 3½ in., height 6 in. All Freight Cars are 13½ in. long and 3½ in. wide; the height is given with each car. Finished in appropriate enamel colors.

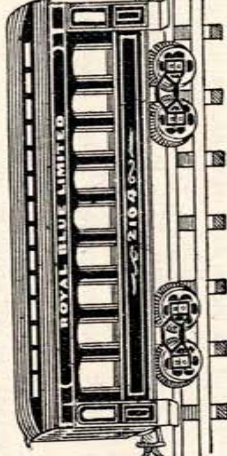


List No. 2205
List No. 2196

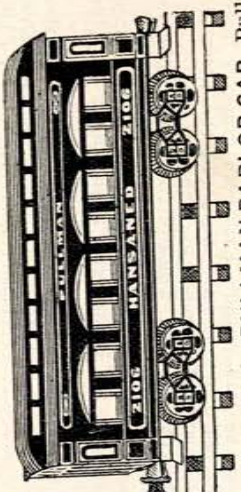
Passenger Car Seats, per 6, prepaid, 35 cts.; per 12 prepaid, \$.60
Pullman Car Chairs, Revolving, per 6, prepaid, 50 cts.; per 12, prepaid, \$.90



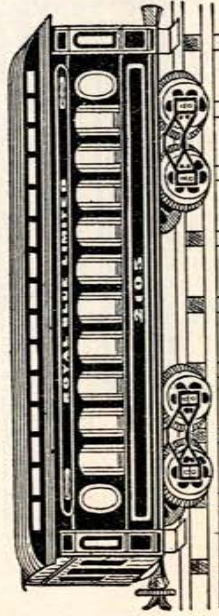
No. 2103 COMBINATION CAR. Has baggage-room, sliding doors and aisle seats. Price \$2.50, postage \$.50.



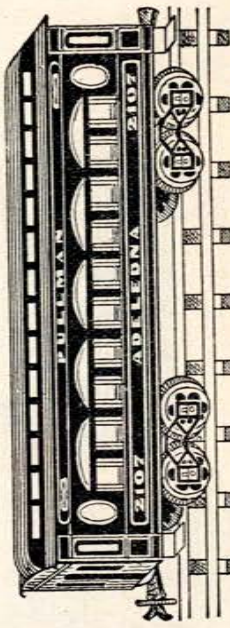
No. 2104 PASSENGER COACH. Has aisle seats. Vestibuled platform. Price \$2.50, postage \$.50.



No. 2106 PULLMAN PARLOR CAR. Pullman-shaped windows and revolving chairs. Price \$2.50, postage \$.50.

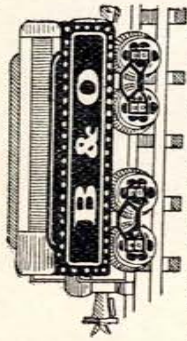


No. 2105 PASSENGER COACH—GRAND. Elegantly finished. Has aisle seats. Weight packed 4½ lbs. Price \$3.50.

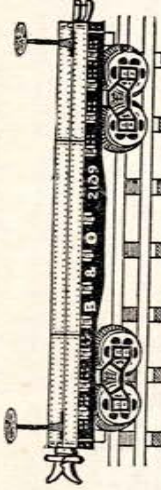


No. 2107 PULLMAN PARLOR CAR—DE LUXE. Pullman windows and revolving chairs. Wt. pkd. 4½ lbs. Price \$3.50.

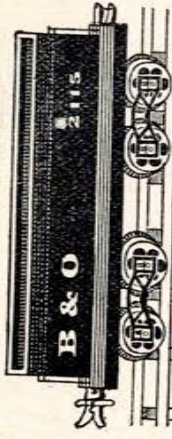
VOLTAMP FREIGHT TRAILERS—Double Truck



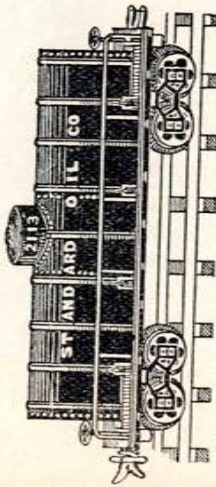
No. 2102 TENDER. Double Truck. Used with all Locomotives. Length 10½ in., width 3¾ in., height 4¾ in. Price \$2.00, postage \$.45.



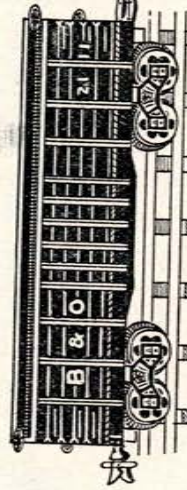
No. 2109 FLAT CAR. For carrying lumber, stone and similar material. Has 2 Brake Wheels. Height 4 in. Price \$1.50, postage \$.40.



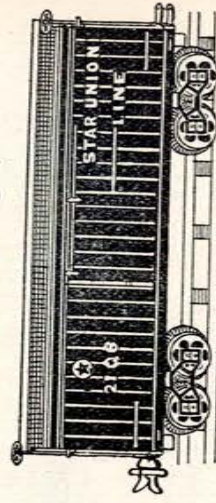
No. 2115 DUMP CAR. Will carry sand or gravel. Has tilting body, with snap latch. Height 4½ in. Price \$2.00, postage \$.45.



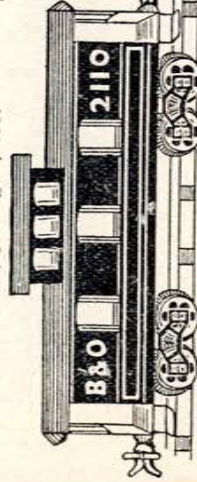
No. 2113 OIL TANK CAR. Will carry water and does not leak. Opening at top. Height 5¾ in. Price \$2.50, postage \$.50.



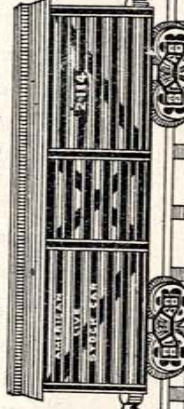
No. 2111 GONDOLA CAR. Open Freight for stone, coal or similar heavy stuff. 2 Brakes. Height 4½ in. Price \$1.75, postage \$.50.



No. 2108 BOX CAR. With sliding doors. Roomy inside. For general freight. Height 5¾ in. Price \$2.25, postage \$.50.



No. 2110 CABOOSE. Five windows on each side and 3 lookout windows above the roof. Height 6 in. Price \$2.25, postage \$.50.



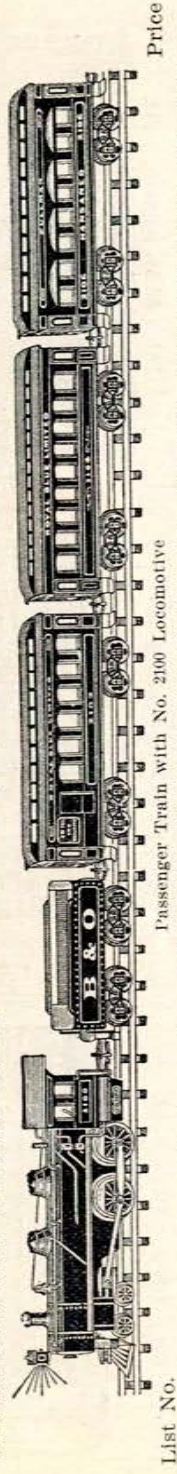
No. 2114 LIVE-STOCK or CATTLE CAR. With sliding doors and slat slides. 2 Brakes. Height 5¾ in. Price \$2.50, postage \$.50.



No. 2112 COAL HOPPER CAR. For carrying coal. Has drop doors for unloading. Height 5¾ in. Price \$2.50, postage \$.50.

PASSENGER AND FREIGHT EQUIPMENTS

The following are a few of the equipments we have often suggested and which have given pleasure and satisfaction. These, of course, may be varied to suit the individual fancy, or may be disregarded entirely and a selection made from the general list of cars. The Single-Truck Cars on previous pages can also be used, and will make neat and inexpensive trains. The equipments below, supplied with Coppered Steel Track, may be changed to Brass or "T" Rail, when the difference in the catalog price must be added to the price of the outfit. See pages 108, 109, 110 and 111.

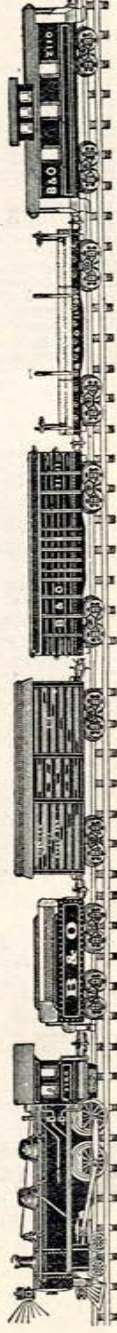


List No.

Passenger Train with No. 2100 Locomotive

Price

- 2238 **Equipment.**—No. 2100 Locomotive and Tender, No. 2103 Combination Car, No. 2104 Passenger Coach, No. 2106 Pullman Car, No. 2159 or 2163 Track and Ties, No. 2154 Connector, No. 2164 Bridge, No. 1318 Battery of 8 Dry Cells in case with Switch; length of train 70 in., weight packed for shipment about 70 lbs.....\$24.50
- 2239 **Equipment.**—No. 2100 Locomotive and Tender, No. 2103 Combination Car, No. 2105 Passenger Coach—Grand, No. 2107 Pullman Car—De Luxe, No. 2159 or 2163 Track and Ties, No. 2154 Connector, No. 2164 Bridge, No. 1318 Battery of 8 Dry Cells in case with Switch; length of train 76 in., weight packed about 70 lbs..... 27.00



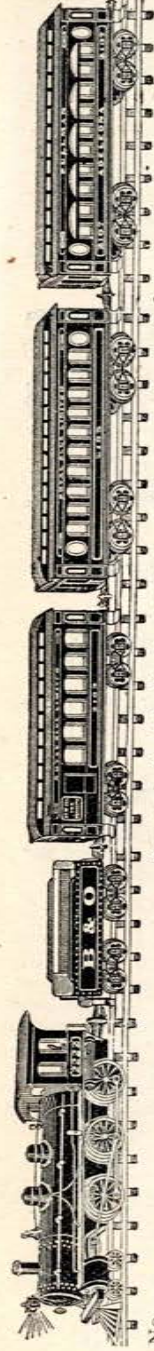
List No.

Freight Train with No. 2100 Locomotive

Price

- 2240 **Equipment.**—No. 2100 Locomotive and Tender, No. 2114 Live-Stock Car, No. 2111 Gondola Car, No. 2109 Flat Car, No. 2110 Caboose, No. 2159 or 2163 Track and Ties, No. 2154 Connector, No. 2164 Bridge, No. 1581 Battery of 10 Dry Cells in case with Switch; length of train 79 in., weight packed for shipment about 75 lbs.....\$26.25
- 2241 **Equipment.**—No. 2100 Locomotive and Tender, No. 2108 Box Car, No. 2112 Coal Hopper, No. 2113 Oil Tank Car, No. 2115 Dump Car, No. 2110 Caboose, No. 2159 or 2163 Track and Ties, No. 2154 Connector, No. 2164 Bridge, No. 2170 Two Signals, No. 2167 Station, No. 1581 Battery of 10 Dry Cells in case with Switch; length of train 82 in., weight packed for shipment about 80 lbs..... 32.00
- 2242 **Equipment.**—No. 2100 Locomotive and Tender, No. 2103 Combination Car, No. 2104 Passenger Coach, No. 2106 Pullman Car, No. 2108 Box Car, No. 2113 Oil Tank Car, No. 2109 Flat Car, No. 2110 Caboose, No. 2161 Double Cross-Over Oval Track, No. 2154 Connector, No. 2164 Bridge, No. 2167 Station, No. 2170 Two Signals, No. 1320 Battery of 12 Dry Cells in case with Switch; length of train 124 in., weight packed for shipment about 100 lbs..... 38.00

NOTE.—For any of the above equipments supplied with No. 2222 Locomotive instead of No. 2100, add extra charge \$7.50; with No. 2200 instead of No. 2100, deduct \$3.50. Any Locomotive in the equipments on this page supplied with the RELAY REVERSE, add extra charge \$2.50.

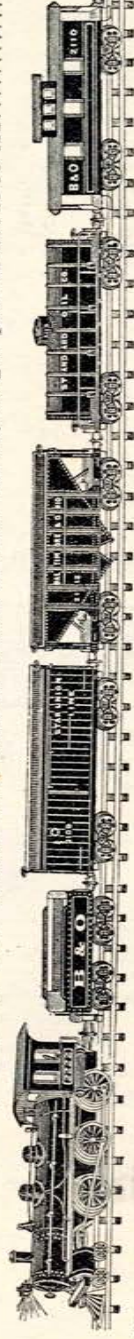


List No.

Passenger Train with No. 2222 Locomotive

Price

- 2243 **Equipment.**—No. 2222 Locomotive and Tender, No. 2103 Combination Car, No. 2104 Passenger Coach, No. 2106 Pullman Car, No. 2105 Passenger Coach—Grand, No. 2107 Pullman Car—De Luxe, No. 2188 "T" Rail Double Cross-Over Oval, No. 2185 "T" Rail Track and Battery Connector, No. 2189 "T" Rail Bridge, No. 2167 Station, No. 2170 Two Signals, No. 1320 Battery of 12 Dry Cells in case with Switch; length of train 108 in., weight packed about 90 lbs.....\$49.00



List No.

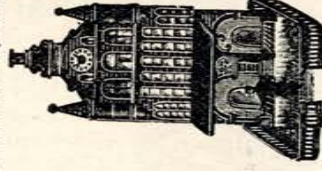
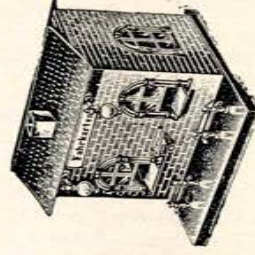
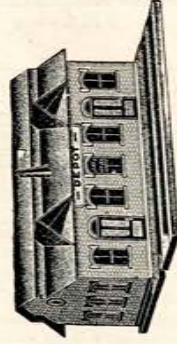
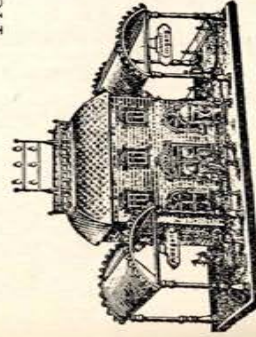
Freight Train with No. 2222 Locomotive

Price

- 2244 **Equipment.**—No. 2222 Locomotive and Tender, No. 2103 Combination Car, No. 2105 Passenger Coach—Grand, No. 2107 Pullman Car—De Luxe, No. 2109 Box Car, No. 2112 Coal Hopper, No. 2113 Oil Tank Car, No. 2114 Live-Stock Car, No. 2110 Caboose, No. 2188 "T" Rail Double Cross-Over Oval, No. 2189 Bridge, No. 2167 Station, No. 2170 Two Signals, No. 1320 Battery of 12 Dry Cells in case with Switch; length of train 134 in., weight packed about 100 lbs.....\$55.50

STATIONS, TICKET OFFICES, TUNNELS

Prettily decorated metal pieces, which give the "road" a strikingly realistic effect.



2390

2167

2391-2

2168

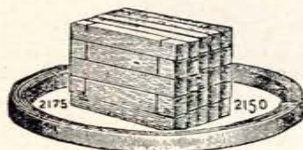
2169

List No.	Price	Post.
2390 Station.....	\$2.25	\$.35
2167 Station.....	1.50	.25
2391 Tunnel.....	1.00	.20

List No.	Ticket Office.....
2168	
2169	Tower Station.....
2392	Tunnel, Rustic.....

Price	Post.
\$1.25	\$.25
1.00	.20
2.00	.30

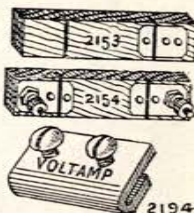
VOLTAMP TRACK AND CONNECTORS



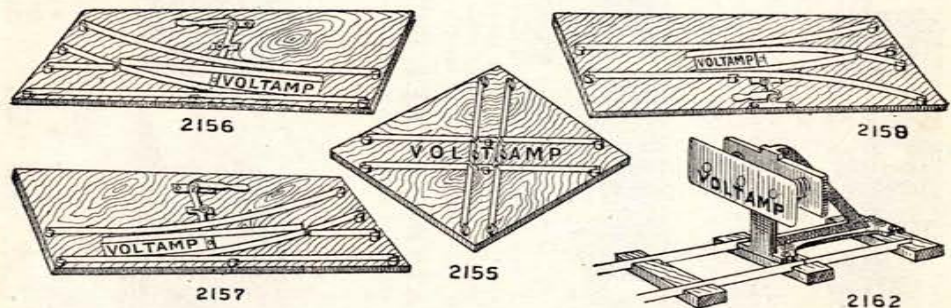
BRASS Track is superior, especially on long roadbeds; offering less resistance to the flow of current than steel, thus giving a larger supply to the Motor, making it pull better and stronger.

Note.—All Tracks listed in this Catalog are arranged for Standard 2-in. gauge Railways only.

List No.		Price	Post.
2150	9 Feet Double Steel Track and 24 Ties.....	\$.35	\$.18
2151	18 Feet Double Steel Track and 48 Ties.....	.70	.35
2175	9 Feet Double Brass Track and 24 Ties.....	.60	.18
2176	18 Feet Double Brass Track and 48 Ties.....	1.20	.35
2152	Extra Ties, 2-in. gauge, per 24.....	.20	.08
2153	Single Track Connector, each.....	.05	.01
2154	Double Track and Battery Connector, each.....	.10	.02
2194	"Fish-Plate" Track Connector, each.....	.05	.01



SWITCHES, CROSSINGS, BUMPERS, TROLLEY POLES

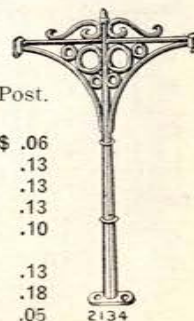


VOLTAMP Switches and Crossings differ entirely from all other makes. They cannot get out of order. Brass Track is used throughout, resting in permanent brass posts. The Switches have accurate and positive lever throw, and when "set" will remain "locked" until "lifted" by the switchman. Trolley Poles 2118 and 2134 can be used to hold overhead wires, or as dummies to ornament the track. Supplied with brass "grips," which keep the wire taut and in line. Neatly finished and enameled.

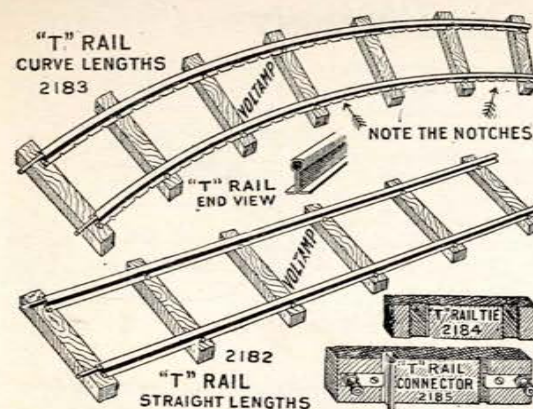
TROLLEY-WIRE POLES

Height 11¼ in., Arm 3½ in.

List No.		Price	Post.
2155	Crossing, center-piece in "Figure 8" and Cross-Over Tracks, 6x6 in.....	\$.35	\$.06
2156	Right-Hand Track Switch, 6x11 in.....	.75	.13
2157	Left-Hand Track Switch, 6x11 in.....	.75	.13
2158	"Y" Track Switch, 6x11 in.....	.75	.13
2162	Track Bumper, 3x3¼x3 in.....	.35	.10
2118	Trolley-Wire Pole—Single Arm—11¼ in. high, Arm 3½ in.....	.30	.13
2134	Trolley-Wire Pole—Double Arm—each 3½ in.....	.50	.18
2346	Trolley Wire, No. 14 Brass, per 25 ft.....	.25	.05



VOLTAMP "T" RAIL TRACK AND SWITCHES



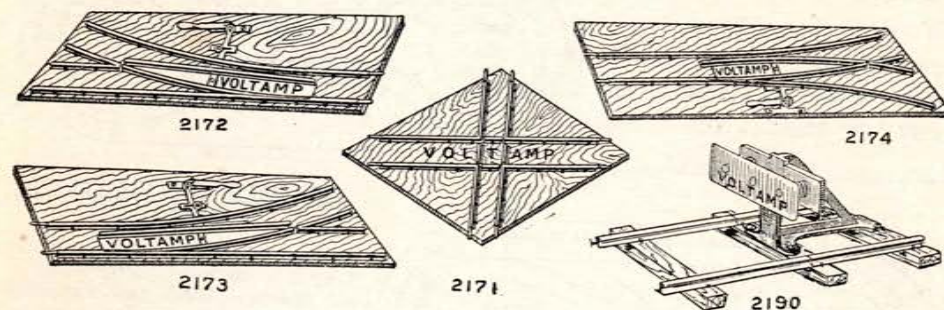
"T" RAIL is beyond question the ideal track for the amateur engineer for the same reason that it is preferred by the professional. With its perfect travel is assured. No Sparking. No Waste of Current. Smaller Consumption of Current, and absolutely smooth riding. VOLTAMP "T" RAILS are drawn brass, 2 ft. long, 5/16 in. high, with the rail top slightly flattened (1/32 in.), offering a good, broad, rolling surface to the wheels; a brass pin at one end of each rail fits snugly into the open end of the next, making firm connection and contact.

VOLTAMP CURVE "T" RAILS are sent out in straight lengths, notched on one side, and can be curved to any radius with the fingers, the notched side forming the inner line of the curve, as in the illustration.

The TIES are cut for Standard 2-in. gauge, with grooves to receive and hold the rail base snugly. It is best to tack the track at every other tie, using a round-head escutcheon pin, and placing it so that the head will rest over the edge of the rail base. No. 2185 CONNECTOR is used where the final joint is made in the tracks, and has two binding posts to receive the wires from the batteries or other source of current.

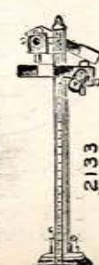
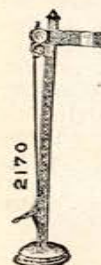


List No.		Price	Post.
2181	Brass "T" Rails and Ties, package contains 8 Curve and 4 Straight lengths, 36 Ties and No. 2185 Connector; sufficient for 12 ft. of double track.....	\$1.50	\$.30
2182	Brass "T" Rail, 2 Straight lengths, 2 ft. each, and 6 Ties.....	.25	.06
2183	Brass "T" Rail, 2 Curve lengths, 2 ft. each, and 6 Ties.....	.25	.06
2184	Ties for Brass "T" Rail, per 24.....	.20	.08
2185	Track and Battery Connector for "T" Rail.....	.10	.02
2347	"Look-Out" Sign Stand for Railroad Crossing.....	.30	.12



"T"-RAIL SWITCHES, CROSSING, BUMPER, SIGNALS

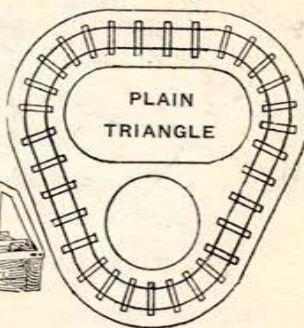
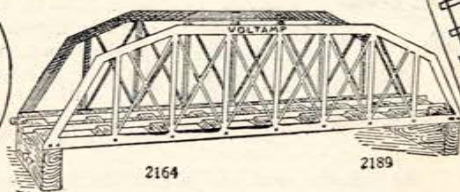
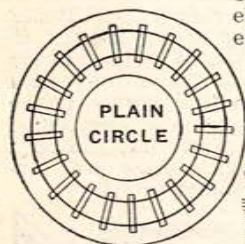
List No.		Price	Post.
2171	Crossing for "T" Rail, center-piece in "Figure 8" and Cross-Over Tracks, 6x6 in.....	\$.50	\$.06
2172	Right-Hand Switch for "T" Rail, 6x11 in.....	1.25	.13
2173	Left-Hand Switch for "T" Rail, 6x11 in.....	1.25	.13
2174	"Y" Track Switch for "T" Rail, 6x11 in.....	1.25	.13
2190	Track Bumper, Brass "T" Rail, 3x3¼x3 in.....	.35	.10
2170	Signals, Single Arm.....	.30	.05
2133	Signals, Double Arm.....	.50	.08



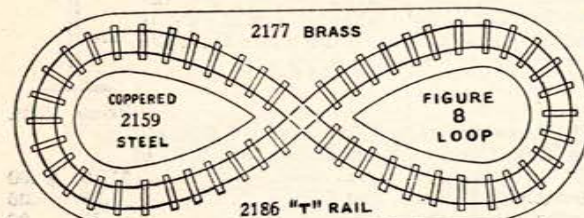
POPULAR TRACK DESIGNS

The Track Designs shown here are the most popular. They are easy to lay and give no trouble when properly connected. Furnished in Coppered Steel or Brass Ribbon Track and in Brass "T" Rail. Each package contains sufficient material—Track, Ties and Connectors—to complete a roadbed measuring 40 in. wide and 7½ ft. long.

For the PLAIN CIRCLES and TRIANGLES use List Nos. 2150, 2151, 2175, 2176 or 2181 on pages 108 and 109. The addition of a Bridge, a Tunnel, a Station, Signals, Trolley Poles or other pieces, shown elsewhere, will greatly enhance the effect



List No.		Price	Post.
2164	Bridge for Steel or Brass Tracks.....	\$.75	\$.25
2189	Bridge for Brass "T" Rails.....	.75	.25

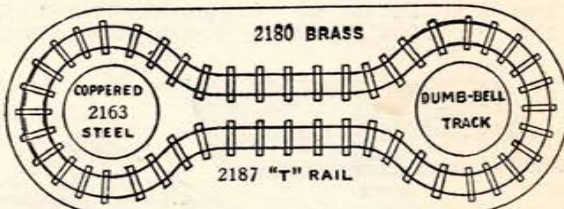


"FIGURE 8" LOOP

List No.		Price	Post.
2159	Steel.....	\$1.05	\$.45
2177	Brass.....	1.55	.45
2186	"T" Rail....	3.00	.45

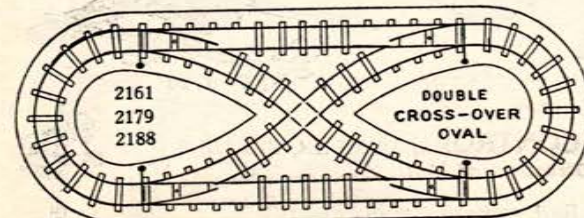
"DUMB-BELL" TRACK

List No.		Price	Post.
2163	Steel.....	\$1.05	\$.50
2180	Brass.....	1.80	.50
2187	"T" Rail....	3.00	.50



DOUBLE CROSS-OVER OVAL

The DOUBLE CROSS-OVER OVAL is the most picturesque of all tracks. With the switches open a train of cars can be crossed from one side to the other, describing the figure 8, and, when closed, it will run over the outside oval. No. 2188 makes "the road of perfect travel."



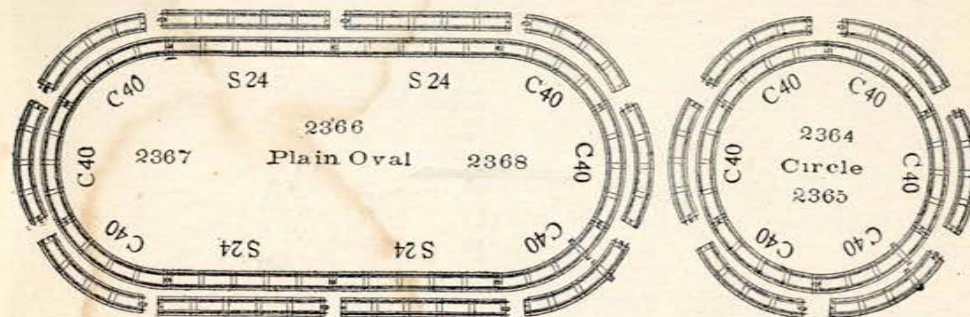
List No.		Price
2161	Double Cross-Over Oval, Coppered Steel Track, weight packed 9 lbs.....	\$4.30
2179	Double Cross-Over Oval, Brass Track, weight packed 9 lbs.....	5.00
2188	Double Cross-Over Oval, Brass "T" Rail, weight packed 9 lbs.....	8.00

For Other TRACK DESIGNS see pages 97 and 98

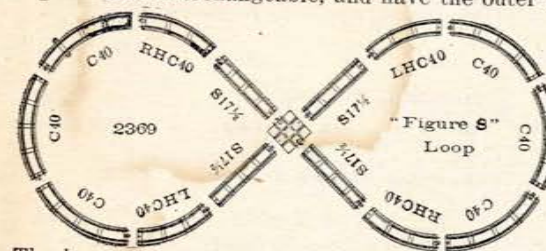
VOLTAMP SECTION TRACK

Ready for Immediate Use in 5 Minutes

No Trouble. Quickly put together and easily taken apart. Can be used year after year. Always remains flat as the floor beneath it. No "hiking" of the track after the train has passed.

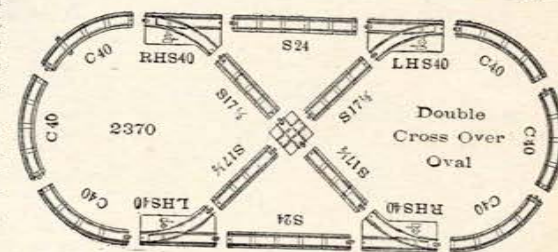


Built on strong light wood bases, with brass "T" Rail and Ties. All curves are regular and interchangeable, and have the outer rail slightly raised—a feature as necessary in miniature railroading as on standard roadbeds—to permit the train to run at high speed.



The inner illustrations of the Plain Oval and Circle show the track put together and latched, ready for the train. Each complete track has one section supplied with binding posts to take the current wires.

The Ovals, "Figure 8" and Double Cross-Over Tracks can be converted into plain Circles or Ovals when desired, and may be made longer by adding extra straight sections, S-17½ or S-24.



SECTION TRACKS

Complete					Extra Sections			
List No.	Style	Size	Weight, Pkd.	Price	List No.	Style	Size	Price Post
2364	Circle	30 in. diam.	3 lbs.	\$1.75	2371	C 30	3 x21 in.	\$.45 \$.10
2365	Circle	40 in. diam.	4 lbs.	2.50	2372	C 40	3 x20½ in.	.45 .10
2366	Oval	30x54 in.	5 lbs.	2.50	2373	S 24	3 x24½ in.	.40 .12
2367	Oval	40x64 in.	7 lbs.	3.25	2374	S 17½	3 x17½ in.	.35 .08
2368	Oval	40x88 in.	10 lbs.	4.00	2375	RHC 40	3 x15½ in.	.40 .08
2369	"Fig. 8"	40x96 in.	15 lbs.	5.75	2376	LHC 40	3 x15½ in.	.40 .08
2370	Double Cross-Over Oval	40x96 in.	18 lbs.	10.50	2377	Crossing	6 x 6 in.	.50 .10
					2378	RHS 40	7½ x16 in.	1.50 .18
					2379	LHS 40	7½ x16 in.	1.50 .18

VOLTAMP CONTROLLER-REVERSERS

For Changing the Direction of Motor Cars or Locomotives. Connect the two opposite Binding Posts with the Brush Holders, one Binding Post to the Wheel Contact Brush and the other to the end of the Field Wire.

List No.		Prepaid
2198	VOLTAMP CONTROLLER-REVERSER, Locomotive style.....	\$.50
2199	VOLTAMP CONTROLLER-REVERSER, Trolley style.....	.50



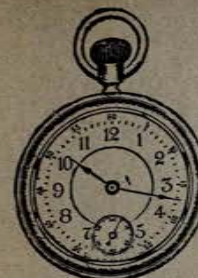
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THE "FAITHFUL" WATCH

Most Reliable and the Handsomest Low-Priced Stem-Winding and Stem-Setting Watch Ever Offered

Heavy Beveled Crystal Double-Sunk Dial
Polished Nickel Finish



List No.	Description	Prepaid
2850	The "Faithful" Watch, Boys' size, 1 7/8 in.	\$1.00
2851	The "Faithful" Watch, Ladies' size, 1 1/2 in.	1.25

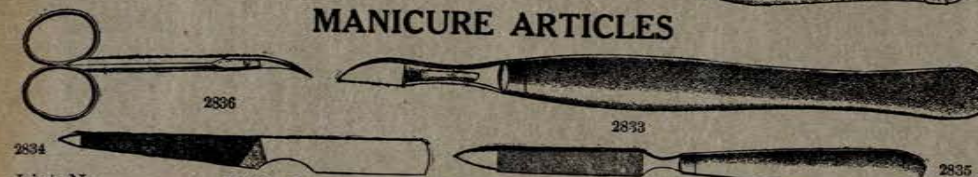
THE FAULTLESS NAIL CLIP

For Cutting, Cleaning and Filing A Perfect Treasure
for Clipping Hang-Nails

List No. 2832 The Faultless Nail Clip.....Prepaid, \$.25



MANICURE ARTICLES



List No.	Description	Prepaid
2836	Nail Scissors, Professional size, 4 in.	\$.60
2833	Cuticle Knife, Professional, White Handle, 5 in.	.50
2834	Nail File, Professional, Flexible Steel, 5 in.	.50
2835	Nail File, Professional, White Handle, 5 1/2 in.	.50
2837	Nail Polisher, Professional (not illustrated), 4 in.	.50

"OLD STAND-BY" SCISSORS



List No.	Description	Prepaid
2826	Solid Steel Scissors, 4 in.	\$.35
2827	Solid Steel Scissors, 5 1/2 in.	.50
2828	Solid Steel Scissors, 7 in.	.65
2829	Solid Steel Scissors, 9 in.	1.00

1000-SHOT AIR RIFLE

Hammerless Repeater Good Sights Accurate Shooter
Shoots Air-Rifle Shot and Darts Only

List No.	Description	Price	Post.
2847	1000-Shot Air Rifle, 35 in.	\$1.65	\$.50
2848	Air-Rifle Shot, 58 to ounce, package.	.10	.05
2849	Air-Rifle Darts, Assorted Colors, per dozen.	.35	.10

ROLLER AND ICE SKATES

Latest Models Best Makes



All Roller Skates extend to fit all sizes from 8 1/4 to 11 1/2 in. Weight, Plain Bearing, about 4 lbs.; Ball Bearing, 4 1/4 lbs. Give length of shoe in inches when ordering Ice Skates. Boys', 8 1/2 to 12 in.; Girls' sizes, 8 to 10 1/2 in. Weight about 3 1/2 lbs.

List No.	ROLLER SKATES	Price	List No.	ICE SKATES	Price
2852	Boys' Plain Bearing.....	\$1.50	2843	Boys' Good Quality.....	\$2.00
2853	Boys' Ball Bearing.....	3.00	2844	Boys' High-Grade Hockey...	3.00
2854	Girls' Plain Bearing.....	1.50	2845	Girls' Good Quality.....	2.00
2855	Girls' Ball Bearing.....	3.00	2846	Girls' High-Grade Hockey...	3.00