



MANFIELD NO. 38

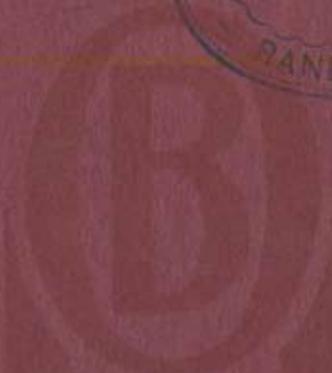
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The Ohio Brass Co.
Manfield Ohio U.S.A.

Porcelain
Insulators

TRAMWAY WORKSHOPS
21 MAR 1922
RANDVICK



Chief Electrical Engineer.
61 Hunter Street.

Catalog No. 18—1921

1 MAR 1922



Trade Mark
Registered U. S. Pat. Office
Principal Foreign Countries

High Tension Insulators ✓
Trolley Line Materials ✓
Rail Bonds and Tools ✓
Third Rail Insulators
Car Equipment Specialties

The Ohio Brass Company
Mansfield, Ohio, U. S. A.

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The Ohio Brass Company
Mansfield, Ohio, U. S. A.

Por-
celain
Insula-
tors



Main Office and Works at Mansfield, Ohio

C. S. WALLACE & COY. PTY. LTD.
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MELBOURNE

The Ohio Brass Company

Mansfield, Ohio, U. S. A.

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Sales Agents in Principal Foreign Countries



High Tension Insulator Factory at Barberton, Ohio



REMARKS TO CUSTOMERS

1st—Liability

When cases of damage to goods in transit are reported to us, we will gladly cooperate with our customers in having claims adjusted. However, as we use the utmost care in packing, we cannot be held responsible for such damage.

2nd—How to Order

It will enable us to ship orders more promptly and with less liability of error if the catalog number and the name in full of each article are stated; also whether shipments should be made by express, freight or parcel post, and if a particular route is preferred, same should be specified.

3rd—Telegraphing

The code words distributed throughout this Catalog, designating the various articles listed, may be used in connection with the "A. B. C. Code, Fifth Edition," "Lieber's Standard," "Western Union" or our own private Telegraphic Code.

4th—Returning Goods

Goods should not be returned without first communicating with us to obtain our approval and the correct shipping directions; at the time such shipment is made, proper notification of it should be forwarded to us, with a memorandum of all the material sent.

5th—Prices

All prices are subject to change without notice. Where quotations have been made by letter or through salesmen, reference to same should be made in the order.

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Accounts are payable thirty days from date of invoice, unless subject to special terms; those overdue are liable to sight draft.

7th—Remittances

Remit by draft, money order, registered letter or express money order.

8th—Financial Standing

If you are not positive that your financial standing is known and acceptable to us, please accompany your first order with good references, or authority to draw with bill of lading, or to express C. O. D. When shipment is to be made with sight draft attached to bill of lading or by express C. O. D., sufficient funds should be sent to cover the transportation charges both ways.

**O-B High Tension Insulators
and
Suspension Insulator Hardware**

**Described and listed in the
section immediately following.**



O-B HIGH TENSION PORCELAIN INSULATORS

THE economic importance of the insulator on a transmission line is too often overlooked until after the system is put in operation. Although the cost of the insulators is only a small portion of the total investment, a single failure may interrupt service and affect the earnings of the entire system.

There are many systems where the loss from a few interruptions only, will amount to more than the cost of the insulators on the entire line.

Most transmission companies recognize this, and the O-B Co. has spent much time and money in investigating operating conditions, so that improvements could be made in the insulators to give the best possible returns for the cost. Not only have designs been improved, but also manufacturing methods; while at the same time a most careful inspection and means of testing have been adopted with a view of eliminating line trouble just as far as possible. Inspection is carried on at the various stages by a corps of carefully trained men, the inspection being particularly rigid on the ware as it comes from the kilns.

After the ware has been inspected on delivery from the kilns, it undergoes the electrical tests. On all pin type designs, the tests are so run, that the parts and the assembled insulator receive a super-spark stress. This test is carried on for at least two minutes, and weeds out material that a test at just below flashing voltage could never get. This test will in no way damage good material, but if manufacturing conditions are not properly developed, will result in prohibitive losses.

The electrical characteristics of the apparatus are such as to combine to a large extent the advantages of normal frequency, oscillator and the impact method. This effect is obtained by properly balanced characteristics in the testing apparatus.

In the case of many O-B designs, including all types of suspension insulators, additional routine electrical tests are provided to measure and eliminate any pieces having the least possible leakage through the material. The greater part of the slightly porous material can not be detected or eliminated by a normal or high frequency test, but may be detected and eliminated by these additional tests. Systematic work in the manufacturing processes enables us to produce insulators which show exceedingly small losses on our electrical tests, although they are the most severe in practice.

Assembly

In general, the assembly of multipart insulators has not been given the attention it deserves. This, as well as the design, is of the utmost importance, for if not properly carried out many of the insulators are sure to crack after several years service necessitating a reinsulation of the system.



O-B HIGH TENSION PORCELAIN INSULATORS

Continued

Line trouble which has been attributed to electrical disturbances is in many cases actually due to insulators which have cracked. Trouble from this source has been even greater than that from porous material. This cracking is due largely to stresses set up through uneven temperature in the insulator, aggravated in some instances by stress due to cement expansion or by the internal stress in the material itself, caused by improper cooling. Much can be done to eliminate this through a good body composition and proper cooling, in the kilns, but it is recognized that the maximum stress developed when the insulator is suddenly cooled, as in a shower of rain, may be sufficient to destroy an otherwise perfect part.

Under operating conditions, the porcelain in an insulator, even in cases where there is no metal or cement present, is likely to work under a very narrow margin of safety for the maximum stress set up where one side of the insulator is hot and the other side cool.

The larger the insulator the more difficult it becomes to keep the stress down and there are many cases in practice where large, heavy insulators have failed from cracking in much less time than smaller, lighter insulators. It is a fairly easy matter to relieve stress in the insulator, providing mechanical reliability is sacrificed. This, however, is not possible in a modern line as the hazard is entirely too great.

Fortunately, a method has been developed which not only provides an elastic joint and thereby keeps down dangerous stresses, but furthermore this joint is such that the mechanical reliability is greatly increased. To secure this result, a coated sanded surface is provided on the porcelain, the bearing coming on the tips of the sand grains. These sand grains having a very much reduced area as compared to the porcelain body to which they are attached, take up practically all of the distortion, thereby relieving the main body from serious stress.

This improvement is the most important of any which has been applied to insulators within recent years and is worth all the time and expense required for its development, as it greatly increases the life or reliability of the insulator.

Up to the present time, this has been the only practical way developed of reducing the stresses which tend to crack an insulator under operating conditions, and at the same time which does not sacrifice the very essential mechanical reliability.



O-B HIGH TENSION PORCELAIN INSULATORS

Continued

Suspension Insulators

Suspension insulators are assembled under conditions of temperature and humidity such that the hydration of the cement is very complete. The bonding of the metal to the porcelain being accomplished at a high temperature tends to prevent undue stress in the porcelain on hot days, as the difference between the operating temperature and the assembly temperature is very small compared to what it would be if the assembly had been carried on at normal or low temperature.

Owing to the greater expansion rate of the metal over the porcelain, the assembly at higher temperature tends to place the porcelain in compression at normal working temperatures. This condition is particularly favorable, as porcelain is many times stronger in compression than in tension or shear.

To assemble properly at high temperature requires a very complete equipment, otherwise the results are doubtful and likely to be unsatisfactory.

Rating

When requesting recommendations for insulator service, give accurate information regarding maximum working voltage, climatic conditions, geographic location, length of line, size of conductor, and amount of power on the system.

An insulator which might be entirely suitable for one locality may be entirely too small for another locality, as fogs, salt deposits, prevalence of heavy rains or thunder storms might cause too many interruptions to service through the spilling of the insulator.

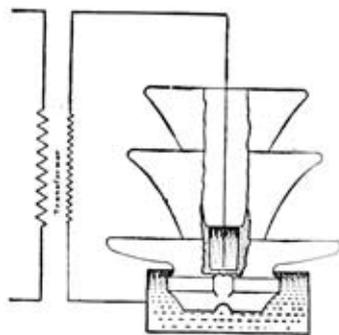


Figure 1

Commercial Insulator Tests

In Fig. 1 is shown the method of testing an assembled insulator; Fig. 2, that of testing a part; Fig. 3, that of testing a wall bushing. There are, of course, many pieces which do not come directly under these classes, but the tests are so applied as to be effective in weeding out material which might break down under service conditions.



O-B HIGH TENSION PORCELAIN INSULATORS

Continued

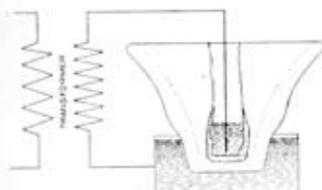


Figure 2

With but very few exceptions, all pieces are tested to at least a flashover stress for two minutes. The O-B testing equipment is very complete, including transformers which will give 400 K. V. to ground, oscillators and high voltage leakage or megger equipment.

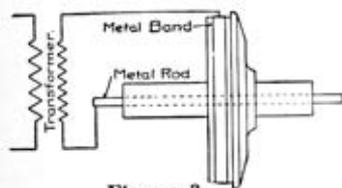


Figure 3

Leakage Distance

The leakage distance as given in the list for each insulator is obtained by measuring the insulator or drawing as indicated by the line D shown in Fig. 5 on the following page.

As the surface resistance varies directly as the length of the path and inversely as the width, it is evident that the length of leakage path alone does not represent the surface resistance of an insulator, for the width of the path varies with the diameter, and is only uniform throughout the length in the case of a tube or cylinder.

An insulator which has apparently a very small length of leakage path may be much more effective in preventing surface leakage than one having a much greater length of leakage path, if the design is such as to properly distribute the material, so as to keep surface stress down to a minimum.

As the distribution of material is very important in giving an insulator a high surface resistance, O-B methods of manufacture are developed along lines which insure proper shape in the parts.

Arcing Distances of Insulators

The voltage value necessary to cause an Insulator to arc from the tie wire to the pin can be closely approximated by measuring the Insulator or a drawing as indicated in Figs. 4 or 5 and referring to the Standard Spark Gap table given on the next page. Actual tests will give slightly different results according to conditions, but by following out this scheme, fairly conservative estimates may be made upon the arcing voltage.

In Fig. 4 the sum of distances (A or D) + B + C gives the dry arcing distance, A or D being used depending upon which gives the shortest distance between the conductor and the lower edge of the top shell. In Fig. 5 the sum of A + B + C gives the arcing distance wet with the precipitation at 45 degrees with the vertical.



O-B HIGH TENSION PORCELAIN INSULATORS

Continued

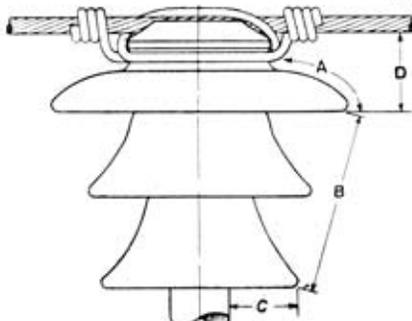


Figure 4

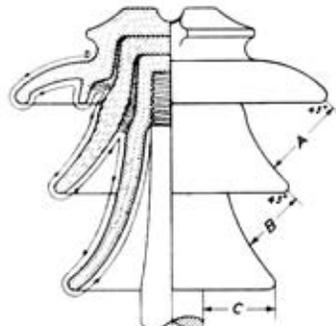


Figure 5

Standard Insulator Threads

The standard threading for both pins and pin holes is four threads per inch.

Standard diameters are 1 inch for standard pin hole and 1 $\frac{3}{8}$ inches for large pin hole. These dimensions are the extreme diameters at top of pin and at small end of pin hole.

Standard taper for pins and pin holes is $\frac{1}{16}$ inch increase in diameter per inch of length.

Glazes

The color of an Insulator is a matter of taste. Brown glaze has been almost universally adopted as standard, because of the fact that it is less conspicuous than other colors.

We can furnish a slate colored glaze when desired but in all cases we will furnish brown glaze unless otherwise specified.

A. I. E. E. Standard Spark Gap

The following table indicates the sparking distances, in effective volts, between sharp needle points in air, adopted as standard by the A. I. E. E.

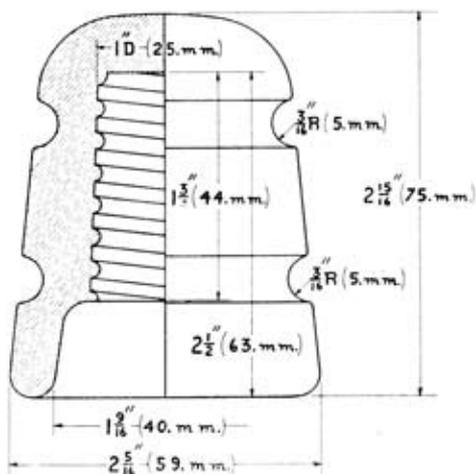
Kilovolts	Inches	Millimeters	Kilovolts	Inches	Millimeters	Kilovolts	Inches	Millimeters
5	0.225	5.72	50	3.55	90.17	140	13.95	354.33
10	0.47	11.94	60	4.65	118.11	150	15.00	381.00
15	0.725	18.42	70	5.85	148.59	170	17.80	452.12
20	1.00	25.40	80	7.10	180.34	200	20.50	520.70
25	1.30	33.02	90	8.35	212.09	250	25.60	650.24
30	1.625	41.28	100	9.60	243.84	300	31.00	787.40
35	2.00	50.80	110	10.75	273.05	350	36.10	916.94
40	2.45	62.23	120	11.85	300.99	400	41.20	1046.48
45	2.95	74.93	130	12.95	328.93	...	.....	.....

A spark gap with needle points whose distance apart is accurately adjustable is kept on the high voltage leads of our testing set as a continual check on the accuracy of the measurements as made with the volt-meter on the primary circuit.



O-B PORCELAIN INSULATOR

Pony—Double Groove



No. 9400

Size of Pin Hole.....	(25 mm.)	1 inch
Approximate Net Weight per 100.....	(25 Kg.)	56 lbs.

Domestic Shipping Data

Approximate Weight Packed, per 100.....	(29 Kg.)	63 lbs.
Approximate Number in Package.....		500

Export Shipping Data

Approximate Weight Packed, per 100.....	(Kg.)	lbs.
Approximate Number in Package.....		
Approximate Volume of Package.....	(cu. M.)	cu. ft.

Code Word
Buskin.

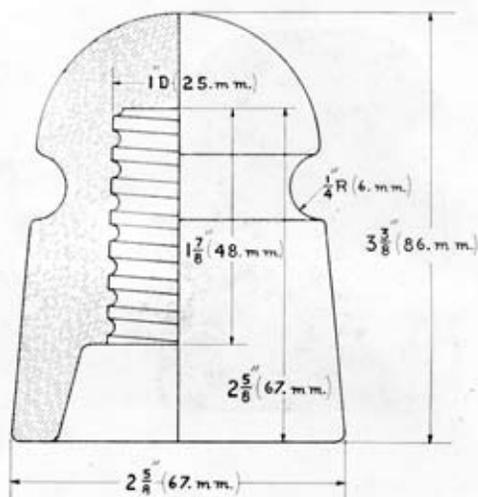
No. 9400—Double Groove Insulator for Telephone Wire.....\$200 00

List per 1000



O-B PORCELAIN INSULATOR

Pony—Large Size



No. 10565

Size of Pin Hole.....	(25 mm.)	1 inch
Approximate Net Weight per 100.....	(37 Kg.)	81 lbs.
Domestic Shipping Data		
Approximate Weight Packed, per 100.....	(42 Kg.)	92 lbs.
Approximate Number in Package.....		400
Export Shipping Data		
Approximate Weight Packed, per 100.....	(Kg.)	lbs.
Approximate Number in Package.....		
Approximate Volume of Package.....	(cu. M.)	cu. ft.

Code Word
Fondling.

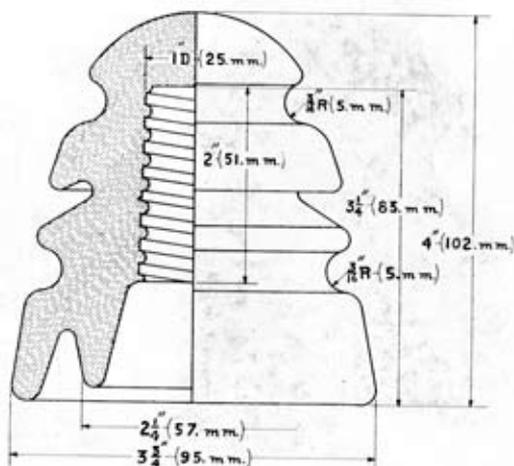
No.
10565—Large Size Insulator for Telephone Wire.....

List per 1000
\$200 00



O-B PORCELAIN INSULATOR

Transposition



No. 10747

Size of Pin Hole.....	(25 mm.)	1 inch
Approximate Net Weight per 100.....	(70 Kg.)	155 lbs.

Domestic Shipping Data

Approximate Weight Packed, per 100.....	(79 Kg.)	175 lbs.
Approximate Number in Package.....		180

Export Shipping Data

Approximate Weight Packed, per 100.....	(Kg.)	lbs.
Approximate Number in Package.....		
Approximate Volume of Package.....	(cu. M.)	cu. ft.

Code Word
Heroner.

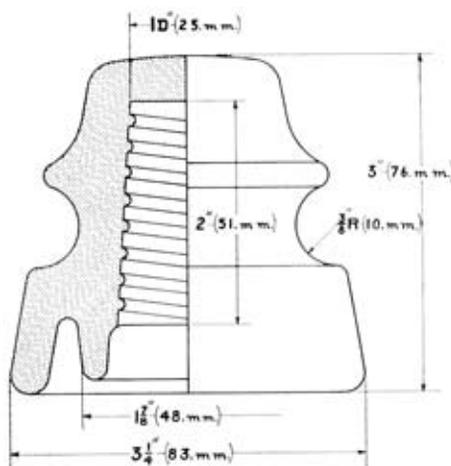
No. 10747—Transposition Insulator for Telephone Wires.....\$600 00

List per 1000



O-B PORCELAIN INSULATOR

Deep Groove—Double Petticoat—4,000 Volts



No. 10387

Leakage Surface.....	(89 mm.)	3 $\frac{1}{2}$ inches
Arcing Distance, Wet.....	(19 mm.)	$\frac{3}{4}$ inch
Size of Pin Hole.....	(25 mm.)	1 inch
Approximate Net Weight per 100.....	(39 Kg.)	86 lbs.

Domestic Shipping Data

Approximate Weight Packed, per 100.....	(45 Kg.)	100 lbs.
Approximate Number in Package.....		300

Export Shipping Data

Approximate Weight Packed, per 100.....	(Kg.)	lbs.
Approximate Number in Package.....		
Approximate Volume of Package.....	(cu. M.)	cu. ft.

Code Word
Buller.

No.
10387—Deep Groove, Double Petticoat Insulator..... \$340 00

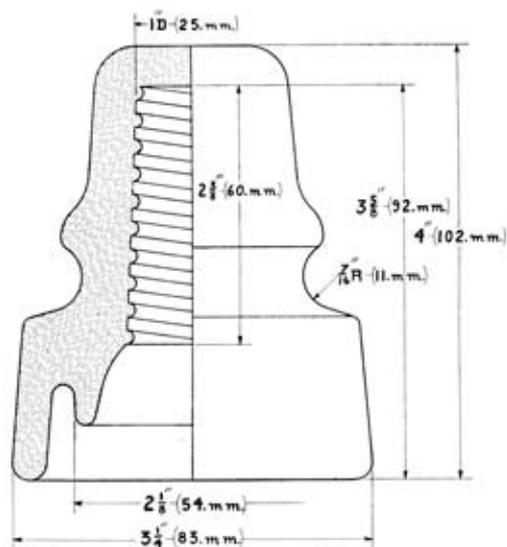
List per 1000

See "Rating," page 10.



O-B PORCELAIN INSULATOR

Deep Groove—Double Petticoat—4,000 Volts



No. 9990

Leakage Surface.....	(95 mm.)	3 3/4 inches
Arcing Distance, Wet.....	(19 mm.)	3/4 inch
Size of Pin Hole.....	(25 mm.)	1 inch
Approximate Net Weight per 100.....	(52 Kg.)	115 lbs.

Domestic Shipping Data

Approximate Weight Packed, per 100.....	(60 Kg.)	132 lbs.
Approximate Number in Package.....		225

Export Shipping Data

Approximate Weight Packed, per 100.....	(Kg.)	lbs.
Approximate Number in Package.....		
Approximate Volume of Package.....	(cu. M.)	cu. ft.

Code Word
Bustler.

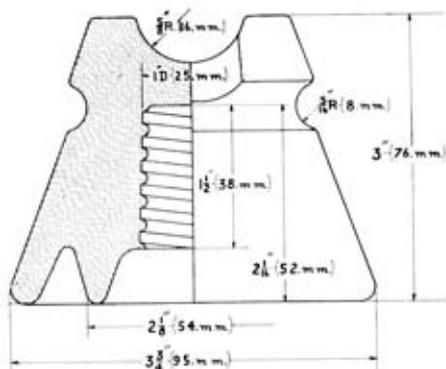
No. 9990—Deep Groove, Double Petticoat Insulator.....\$400 00

List per 1000

See "Rating," page 10.

**O-B PORCELAIN INSULATOR**

6,600 Volts



No. 9404

Leakage Surface.....	(127 mm.)	5 inches
Arcing Distance, Wet.....	(32 mm.)	1 1/4 inches
Size of Pin Hole.....	(25 mm.)	1 inch
Approximate Net Weight per 100.....	(50 Kg.)	111 lbs.

Domestic Shipping Data

Approximate Weight Packed, per 100.....	(59 Kg.)	130 lbs.
Approximate Number in Package.....		225

Export Shipping Data

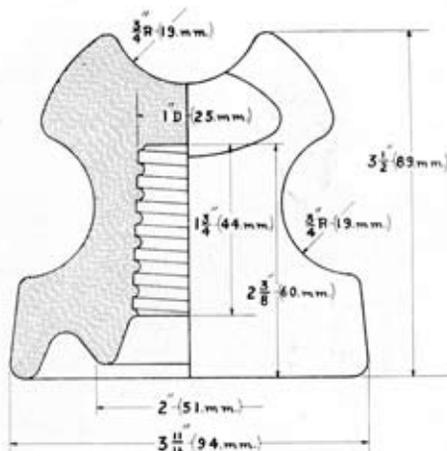
Approximate Weight Packed, per 100.....	(Kg.)	lbs.
Approximate Number in Package.....		
Approximate Volume of Package.....	(cu. M.)	cu. ft.

Code Word
Callus.

No. 9404—Insulator, General Rating 6,600 Volts.....\$180 00

For additional designs with same general rating, see page 58.

See "Rating," page 10.

**O-B PORCELAIN INSULATOR****6,600 Volts****No. 9953**

Leakage Surface.....	(95 mm.)	3 $\frac{3}{4}$ inches
Arcing Distance, Wet.....	(32 mm.)	1 $\frac{1}{4}$ inches
Size of Pin Hole.....	(25 mm.)	1 inch
Approximate Net Weight per 100.....	(71 Kg.)	156 lbs.

Domestic Shipping Data

Approximate Weight Packed, per 100.....	(80 Kg.)	176 lbs.
Approximate Number in Package.....		200

Export Shipping Data

Approximate Weight Packed, per 100.....	(Kg.)	lbs.
Approximate Number in Package.....		
Approximate Volume of Package.....	(cu. M.)	cu. ft.

Code Word
Calotype.No.
9953—Insulator, General Rating 6,600 Volts.....\$600 00

Last per 1000

For additional designs with same general rating, see page 58.

See "Rating," page 10.

**O-B PORCELAIN INSULATOR**

6,600 Volts



No. 12847

Leakage Surface	(133 mm.)	5 1/4 inches
Arcing Distance, Wet	(32 mm.)	1 1/4 inches
Size of Pin Hole	(25 mm.)	1 inch
Approximate Net Weight per 100	(60 Kg.)	133 lbs.

Domestic Shipping Data

Approximate Weight Packed, per 100	(70 Kg.)	155 lbs.
Approximate Number in Package		200

Export Shipping Data

Approximate Weight Packed, per 100	(Kg.)	lbs.
Approximate Number in Package		
Approximate Volume of Package	(cu. M.)	cu. ft.

Code Word
*Pinnacle.*No.
12847—Insulator, General Rating 6,600 Volts.....\$480 00

List per 1000

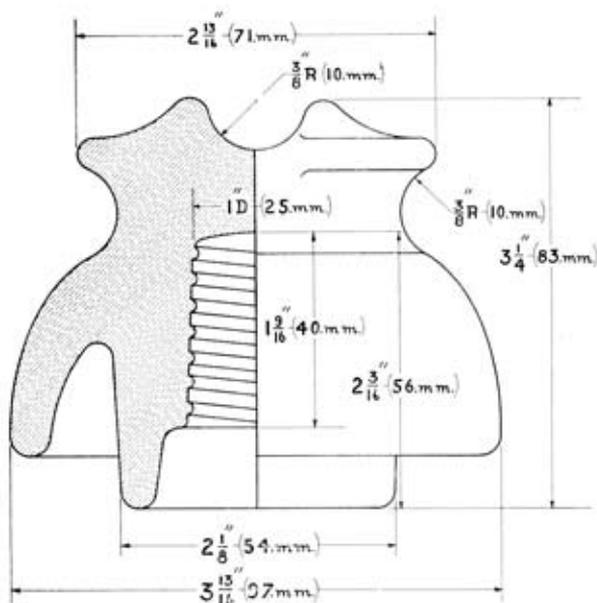
For additional designs with same general rating, see page 58.

See "Rating," page 10.



O-B PORCELAIN INSULATOR

6,600 Volts



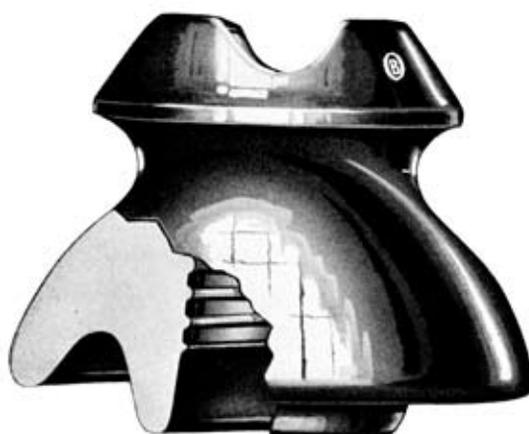
No. 12847

See description and list on the opposite page.



O-B PORCELAIN INSULATOR

6,600 Volts



No. 10636

Test Voltage.....		40,000
Leakage Surface.....	(121 mm.)	4 ³ / ₄ inches
Arcing Distance, Wet.....	(35 mm.)	1 ³ / ₈ inches
Size of Pin Hole.....	(35 mm.)	1 ³ / ₈ inches
Minimum Length Pin.....	(102 mm.)	4 inches
Approximate Net Weight per 100.....	(81 Kg.)	178 lbs.

Domestic Shipping Data

Approximate Weight Packed, per 100.....	(93 Kg.)	206 lbs.
Approximate Number in Package.....		140

Export Shipping Data

Approximate Weight Packed, per 100.....	(Kg.)	lbs.
Approximate Number in Package.....		
Approximate Volume of Package.....	(cu. M.)	cu. ft.

Code Word
Herring.

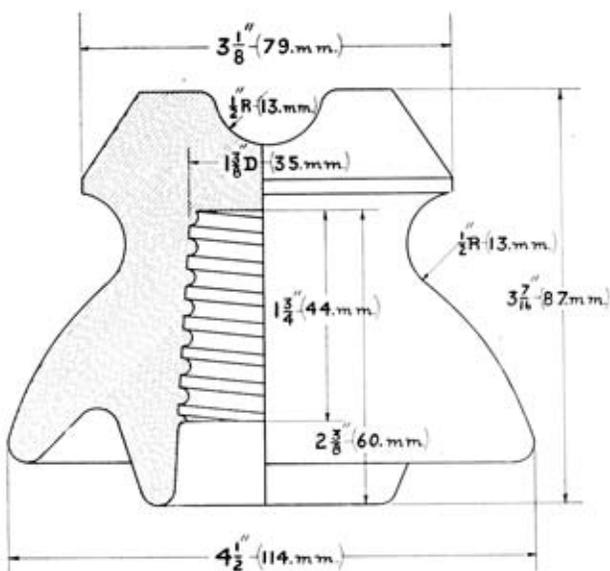
No. 10636—Insulator, General Rating 6,600 Volts.....\$700 00

For additional designs with same general rating, see page 58.

See "Rating," page 10.

**O-B PORCELAIN INSULATOR**

6,600 Volts



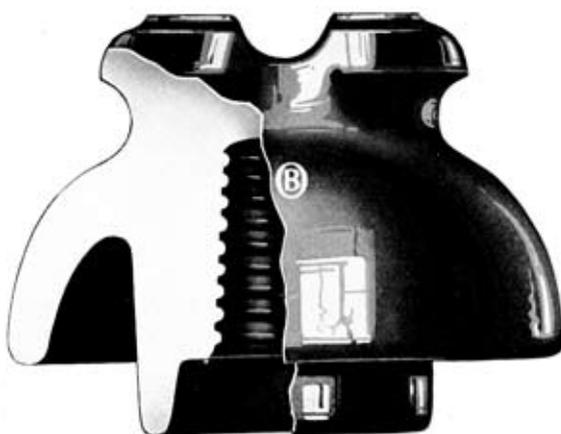
No. 10636

See description and list on the opposite page.



O-B PORCELAIN INSULATOR

11,000 Volts



No. 12848

Test Voltage.....		45,000
Leakage Surface.....	(159 mm.)	6 $\frac{1}{4}$ inches
Arcing Distance, Wet.....	(44 mm.)	1 $\frac{3}{4}$ inches
Size of Pin Hole.....	(25 mm.)	1 inch
Minimum Length Pin.....	(102 mm.)	4 inches
Approximate Net Weight per 100.....	(91 Kg.)	200 lbs.

Domestic Shipping Data

Approximate Weight Packed, per 100.....	(109 Kg.)	240 lbs.
Approximate Number in Package.....		100

Export Shipping Data

Approximate Weight Packed, per 100.....	(Kg.)	lbs
Approximate Number in Package.....		
Approximate Volume of Package.....	(cu. M.)	cu. ft.

Code Word
Pinniped.

No.
12848—Insulator, General Rating 11,000 Volts.....

List per 100
\$80 00

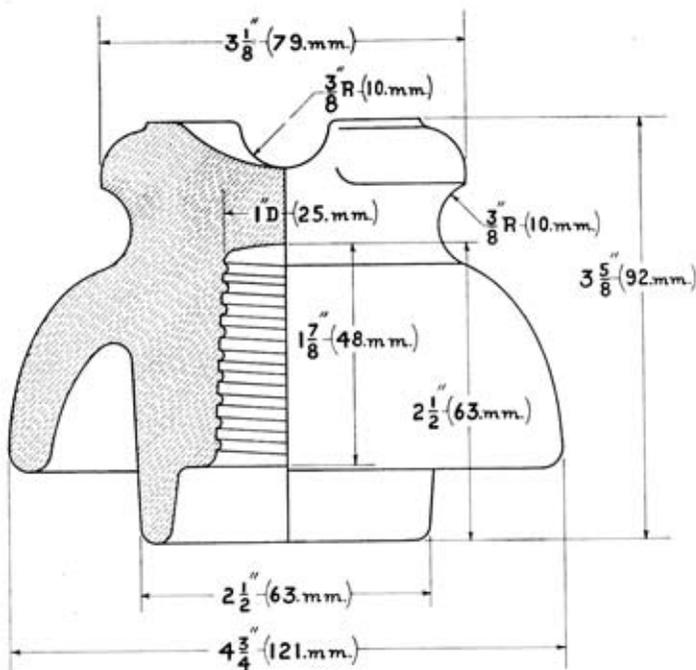
For additional designs with same general rating, see page 58.

See "Rating," page 10.



O-B PORCELAIN INSULATOR

11,000 Volts



No. 12848

See description and list on the opposite page.



O-B PORCELAIN INSULATOR

11,000 Volts



Nos. 9890-11913—For Cable

Test Voltage.....		40,000
Leakage Surface..... (108 mm.)		4 1/4 inches
Arcing Distance, Wet..... (38 mm.)		1 1/2 inches
Minimum Length Pin..... (102 mm.)		4 inches
Approximate Net Weight per 100..... (127 Kg.)		281 lbs.
Domestic Shipping Data		
Approximate Weight Packed, per 100..... (145 Kg.)		320 lbs.
Approximate Number in Package.....		100
Export Shipping Data		
Approximate Weight Packed, per 100..... (Kg.)		lbs.
Approximate Number in Package.....		
Approximate Volume of Package..... (cu. M.)		cu. ft.

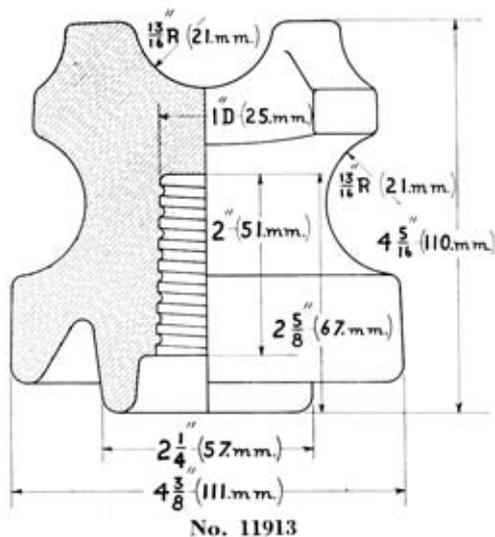
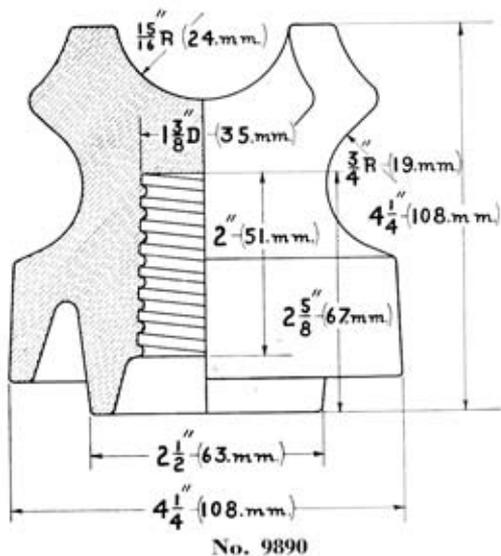
Code Word	No.	List per 100
<i>Camber.</i>	9890—Insulator, General Rating 11,000 Volts, 1 1/4-inch pin hole....	\$100 00
<i>Monkfish.</i>	11913— “ “ “ 11,000 “ 1 “ “ “	100 00

For additional designs with same general rating, see page 58.

See "Rating," page 10

O-B PORCELAIN INSULATOR

11,000 Volts



See description and list on the opposite page.

**O-B PORCELAIN INSULATOR**

13,000 Volts



No. 10044

Test Voltage.....		50,000
Leakage Surface.....	(203 mm.)	8 inches
Arcing Distance, Wet.....	(41 mm.)	1½ inches
Size of Pin Hole.....	(25 mm.)	1 inch
Minimum Length Pin.....	(102 mm.)	4 inches
Approximate Net Weight per 100.....	(97 Kg.)	213 lbs.

Domestic Shipping Data

Approximate Weight Packed, per 100.....	(111 Kg.)	244 lbs.
Approximate Number in Package.....		125

Export Shipping Data

Approximate Weight Packed, per 100.....	(Kg.)	lbs.
Approximate Number in Package.....		
Approximate Volume of Package.....	(cu. M.)	cu. ft.

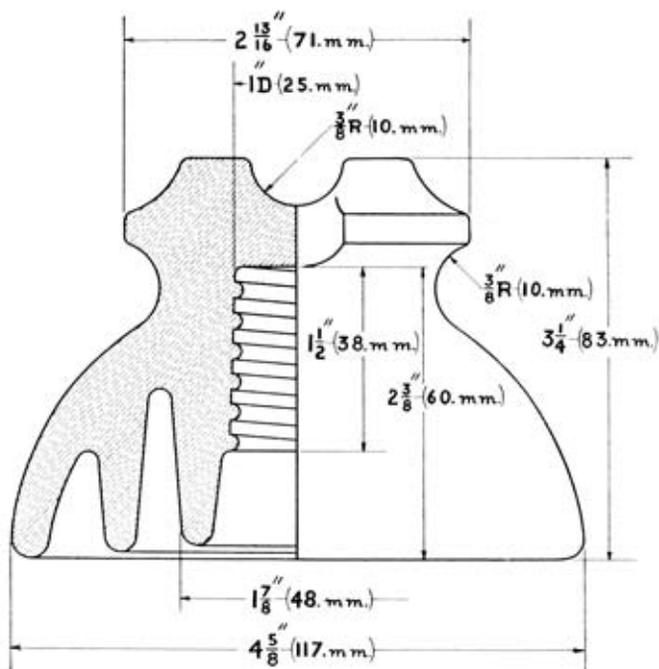
Code Word	No.	List per 100
Footman.	10044—Insulator, General Rating 13,000 Volts.....	\$86 00

See "Rating," page 10.



O-B PORCELAIN INSULATOR

13,000 Volts



No. 10044

See description and list on the opposite page.



O-B PORCELAIN INSULATOR

17,000 Volts



Nos. 12849-12850

Test Voltage.....		60,000
Leakage Surface.....	(235 mm.)	9 $\frac{1}{4}$ inches
Arcing Distance, Wet.....	(57 mm.)	2 $\frac{1}{4}$ inches
Minimum Length Pin.....	(102 mm.)	4 inches
Approximate Net Weight per 100.....	(153 Kg.)	338 lbs.

Domestic Shipping Data

Approximate Weight Packed, per 100.....	(170 Kg.)	375 lbs.
Approximate Number in Package.....		75

Export Shipping Data

Approximate Weight Packed, per 100.....	(Kg.)	lbs.
Approximate Number in Package.....		
Approximate Volume of Package.....	(cu. M.)	cu. ft.

Code Word
Pinweed.
Pioneer.

No.		List per 100
12849—Insulator, General Rating 17,000 Volts, 1 -inch pin hole..		\$140 00
12850— “ “ “ “ 17,000 “ 1 $\frac{1}{4}$ “ “ “ ..		140 00

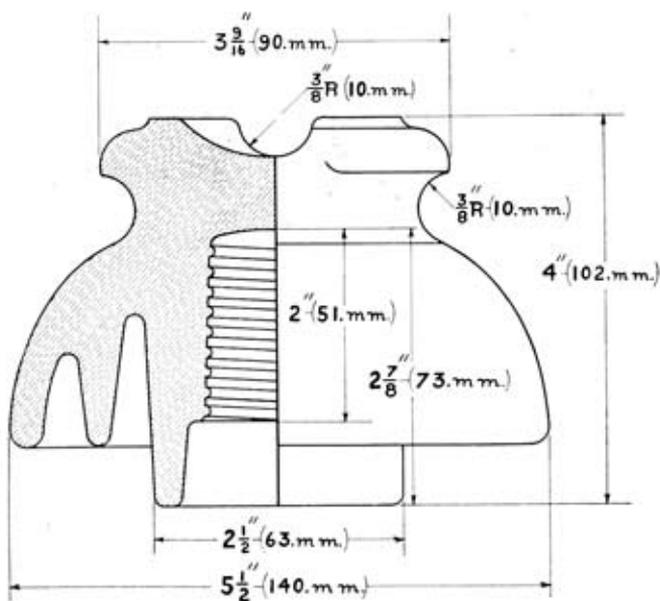
For additional designs with same general rating, see page 58.

See "Rating," page 10.



O-B PORCELAIN INSULATOR

17,000 Volts



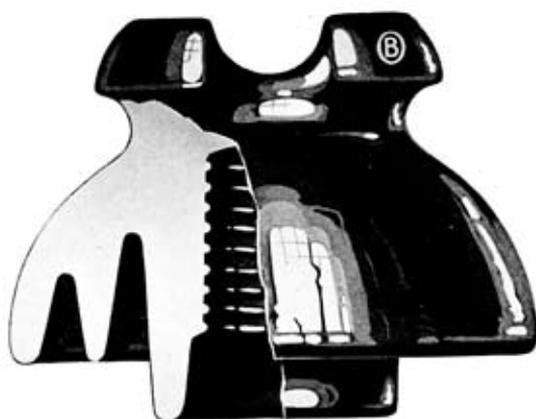
Nos. 12349-12350

See description and list on the opposite page.



O-B PORCELAIN INSULATOR

17,000 Volts



No. 25237

Test Voltage.....		60,000
Leakage Surface.....	(235 mm.)	9 $\frac{1}{4}$ inches
Arcing Distance, Wet.....	(57 mm.)	2 $\frac{1}{4}$ inches
Size of Pin Hole.....	(35 mm.)	1 $\frac{3}{8}$ inches
Minimum Length Pin.....	(102 mm.)	4 inches
Approximate Net Weight per 100.....	(159 Kg.)	350 lbs.

Domestic Shipping Data

Approximate Weight Packed, per 100.....	(188 Kg.)	415 lbs.
Approximate Number in Package.....		75

Export Shipping Data

Approximate Weight Packed, per 100.....	(Kg.)	lbs.
Approximate Number in Package.....		
Approximate Volume of Package.....	(cu. M.)	cu. ft.

Code Word
Rattinet.

No. 25237—Insulator, General Rating 17,000 Volts.....\$140 00

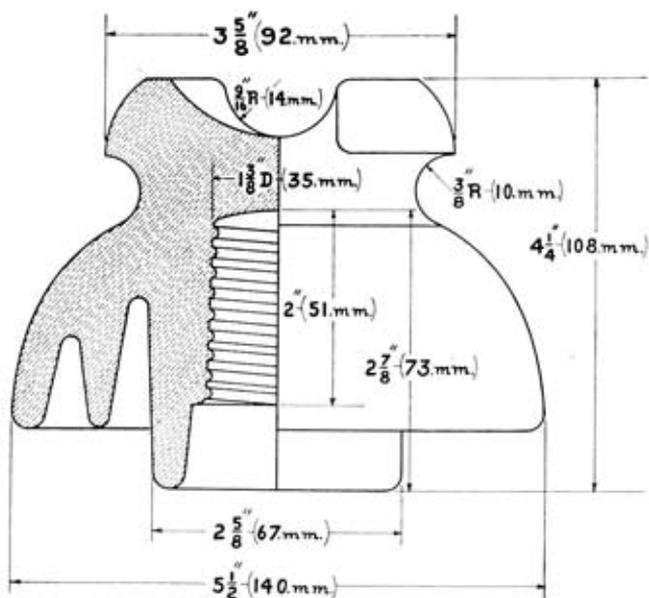
List per 100

For additional designs with same general rating, see page 58.

See "Rating," page 10.

**O-B PORCELAIN INSULATOR**

17,000 Volts



No. 25237

See description and list on the opposite page.



O-B PORCELAIN INSULATOR

23,000 Volts



Nos. 12851-12852

Test Voltage.....		60,000
Leakage Surface.....	(299 mm.)	11 ³ / ₄ inches
Arcing Distance, Wet.....	(73 mm.)	2 ⁷ / ₈ inches
Minimum Length Pin.....	(127 mm.)	5 inches
Approximate Net Weight per 100.....	(227 Kg.)	500 lbs.

Domestic Shipping Data

Approximate Weight Packed, per 100.....	(272 Kg.)	600 lbs.
Approximate Number in Package.....		40

Export Shipping Data

Approximate Weight Packed, per 100.....	(358 Kg.)	789 lbs.
Approximate Number in Package.....		40
Approximate Volume of Package.....	(.255 cu. M.)	9 cu. ft.

Code Word
Piously.
Pipette.

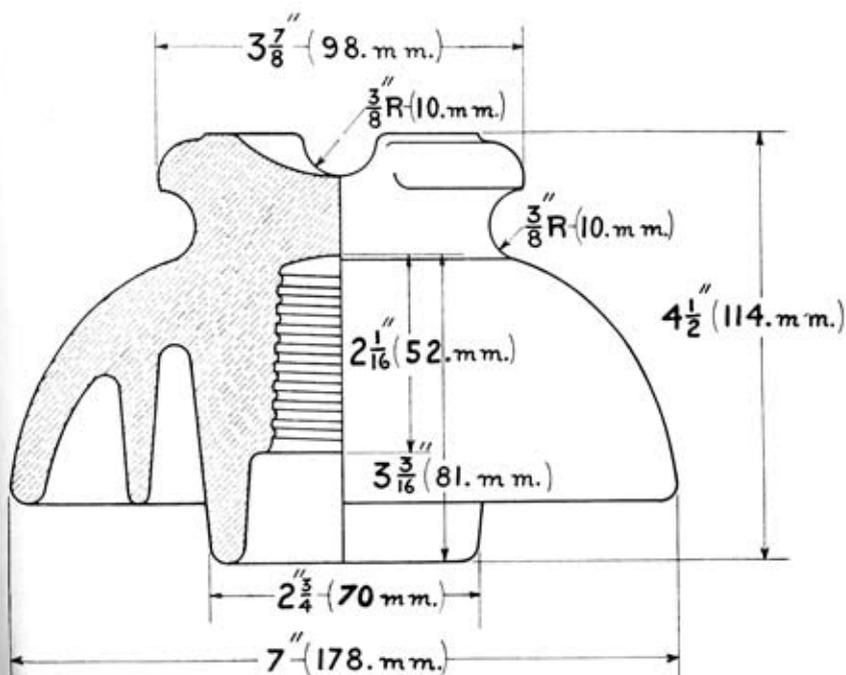
No.		List per 100
12851—Insulator, General Rating 23,000 Volts, 1 -inch pin hole.		\$180 00
12852— “ “ “ 23,000 “ 1 ¹ / ₂ “ “ “		.. 180 00

For additional designs with same general rating, see pages 58-59.

See "Rating," page 10.

**O-B PORCELAIN INSULATOR**

23,000 Volts



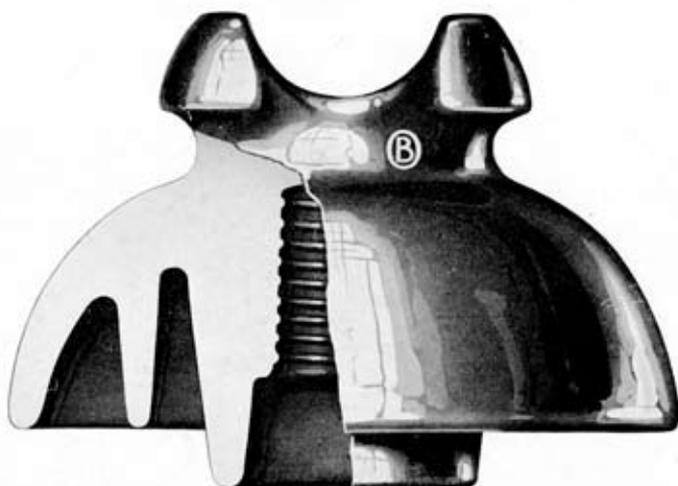
Nos. 12851-12852

See description and list on the opposite page.



O-B PORCELAIN INSULATOR

23,000 Volts



No. 25118

Test Voltage.....		60,000
Leakage Surface.....	(299 mm.)	11 ³ / ₈ inches
Arcing Distance, Wet.....	(73 mm.)	2 ⁷ / ₈ inches
Size of Pin Hole.....	(35 mm.)	1 ³ / ₈ inches
Minimum Length Pin.....	(127 mm.)	5 inches
Approximate Net Weight per 100.....	(218 Kg.)	480 lbs.
Domestic Shipping Data		
Approximate Weight Packed, per 100.....	(272 Kg.)	600 lbs.
Approximate Number in Package.....		40
Export Shipping Data		
Approximate Weight Packed, per 100.....	(Kg.)	lbs.
Approximate Number in Package.....		
Approximate Volume of Package.....	(cu. M.)	cu. ft.

Code Word
Rattle.

No. 25118—Insulator, General Rating 23,000 Volts.....\$180 00

List per 100

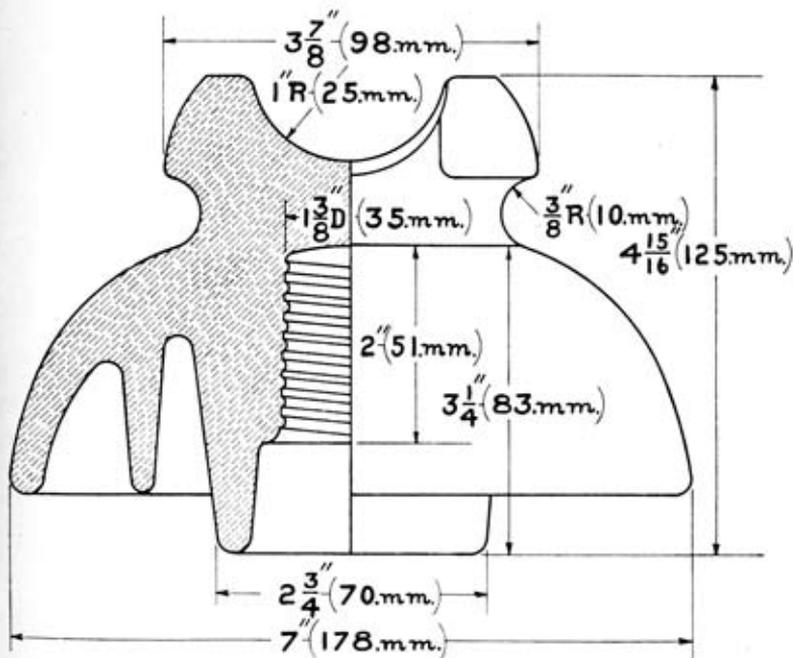
For additional designs with same general rating, see pages 58-59.

See "Rating," page 10.



O-B PORCELAIN INSULATOR

23,000 Volts



No. 25118

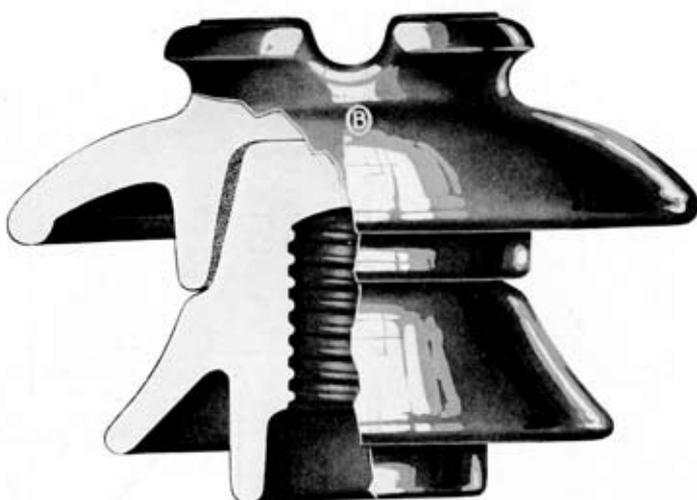
See description and list on the opposite page.



O-B PORCELAIN INSULATOR

Patented

27,000 Volts



No. 12546

Test Voltage.....		100,000
Leakage Surface.....	(302 mm.)	11 ⁷ / ₈ inches
Arcing Distance, Wet.....	(111 mm.)	4 ³ / ₈ inches
Size of Pin Hole.....	(35 mm.)	1 ³ / ₈ inches
Minimum Length Pin.....	(153 mm.)	6 inches
Approximate Net Weight per 100.....	(281 Kg.)	620 lbs.
Domestic Shipping Data		
Approximate Weight Packed, per 100.....	(340 Kg.)	750 lbs.
Approximate Number in Package.....		6
Export Shipping Data		
Approximate Weight Packed, per 100.....	(394 Kg.)	868 lbs.
Approximate Number in Package.....		6
Approximate Volume of Package.....	(.057 cu. M.)	2 cu. ft.

Code Word
Overlap.

No. 12546—Insulator, General Rating 27,000 Volts.....\$330 00
List per 100

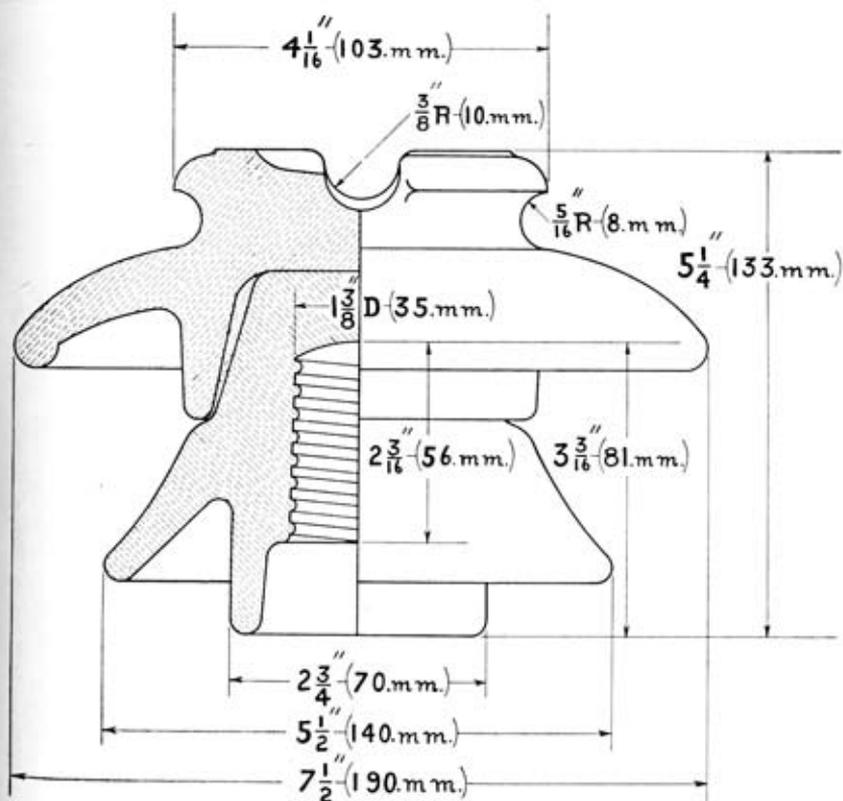
For additional designs with same general rating, see page 59.

See "Rating," page 10.

**O-B PORCELAIN INSULATOR**

Patented

27,000 Volts



No. 12516

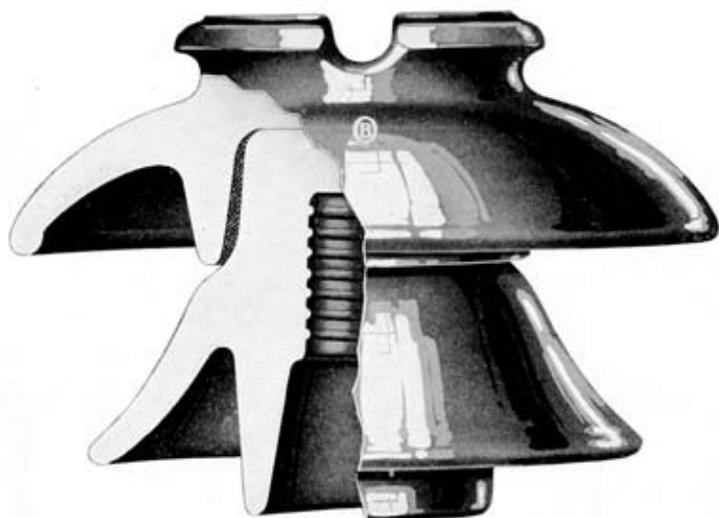
See description and list on the opposite page.



O-B PORCELAIN INSULATOR

Patented

35,000 Volts



No. 11622

Test Voltage.....		125,000
Leakage Surface.....	(432 mm.)	17 inches
Arcing Distance, Wet.....	(146 mm.)	5 $\frac{3}{4}$ inches
Size of Pin Hole.....	(35 mm.)	1 $\frac{3}{8}$ inches
Apnimum Length Pin.....	(152 mm.)	6 inches
Miproximate Net Weight per 100.....	(423 Kg.)	935 lbs.

Domestic Shipping Data

Approximate Weight Packed, per 100.....	(528 Kg.)	1165 lbs.
Approximate Number in Package.....		6

Export Shipping Data

Approximate Weight Packed, per 100.....	(612 Kg.)	1350 lbs.
Approximate Number in Package.....		6
Approximate Volume of Package.....	(.074 cu. M.)	2.6 cu. ft.

Code Word
Monolith.

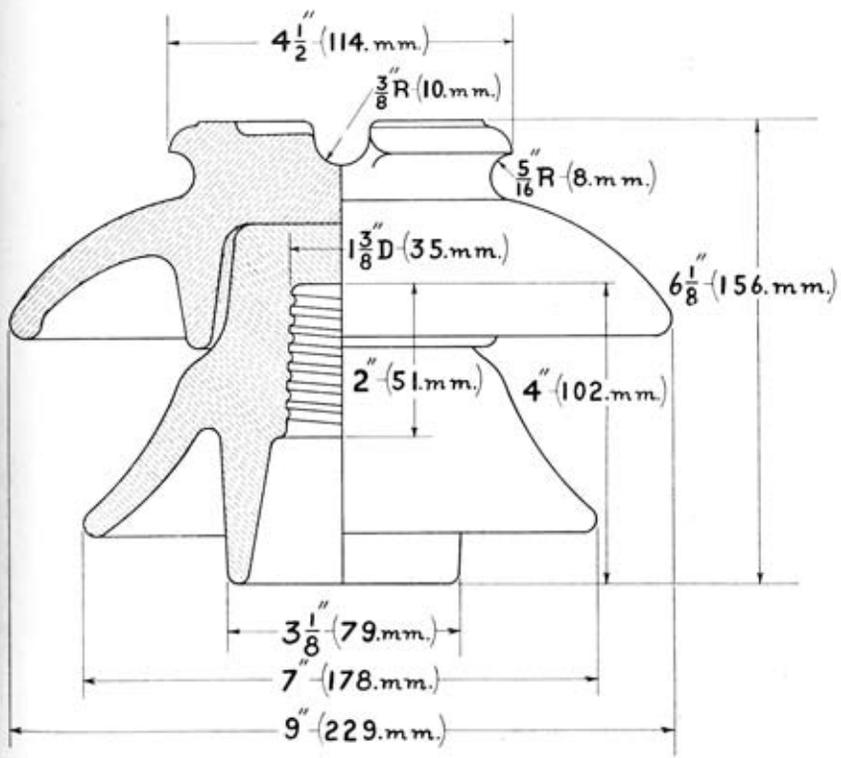
No. 11622—Insulator, General Rating 35,000 Volts..... List per 100 \$400 00

For additional designs with same general rating, see pages 59-60.

See "Rating," page 10.

O-B PORCELAIN INSULATOR

Patented
35,000 Volts



No. 11622

See description and list on the opposite page.



O-B PORCELAIN INSULATOR

Patented

45,000 Volts



No. 11623

Test Voltage.....		145,000
Leakage Surface.....	(540 mm.)	21 $\frac{1}{4}$ inches
Arcing Distance, Wet.....	(178 mm.)	7 inches
Size of Pin Hole.....	(35 mm.)	1 $\frac{3}{8}$ inches
Minimum Length Pin.....	(191 mm.)	7 $\frac{1}{2}$ inches
Approximate Net Weight per 100.....	(508 Kg.)	1120 lbs.

Domestic Shipping Data

Approximate Weight Packed, per 100.....	(680 Kg.)	1500 lbs.
Approximate Number in Package.....		6

Export Shipping Data

Approximate Weight Packed, per 100.....	(760 Kg.)	1675 lbs.
Approximate Number in Package.....		6
Approximate Volume of Package.....	(.116 cu. M.)	4.1 cu. ft.

Code Word
Monomial.

No. 11623—Insulator, General Rating 45,000 Volts.....\$500 00

List per 100

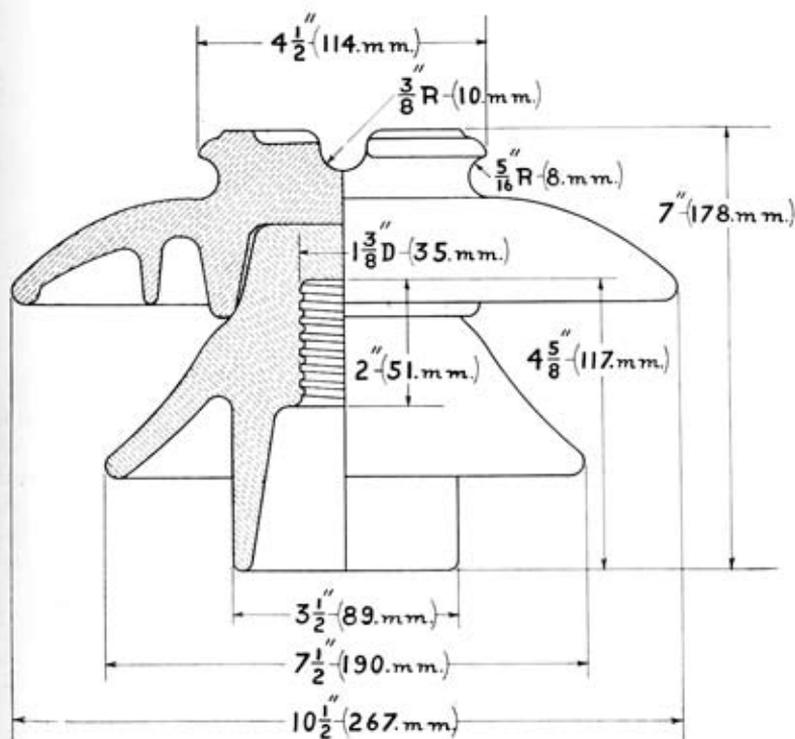
For additional designs with same general rating, see pages 60-61.

See "Rating," page 10.

**O-B PORCELAIN INSULATOR**

Patented

45,000 Volts



No. 11623

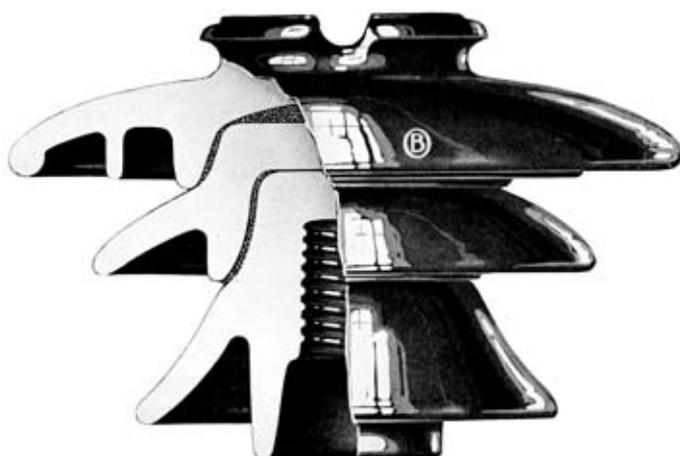
See description and list on the opposite page.



O-B PORCELAIN INSULATOR

Patented

45,000 Volts



No. 25264

Test Voltage.....		155,000
Leakage Surface.....	(584 mm.)	23 inches
Arcing Distance, Wet.....	(156 mm.)	6 $\frac{1}{8}$ inches
Size of Pin Hole.....	(35 mm.)	1 $\frac{3}{8}$ inches
Minimum Length Pin.....	(152 mm.)	6 inches
Approximate Net Weight per 100.....	(680 Kg.)	1500 lbs.

Domestic Shipping Data

Approximate Weight Packed, per 100.....	(815 Kg.)	1800 lbs.
Approximate Number in Package.....		3

Export Shipping Data

Approximate Weight Packed, per 100.....	(925 Kg.)	2040 lbs.
Approximate Number in Package.....		3
Approximate Volume of Package.....	(.074 cu. M.)	2.6 cu. ft.

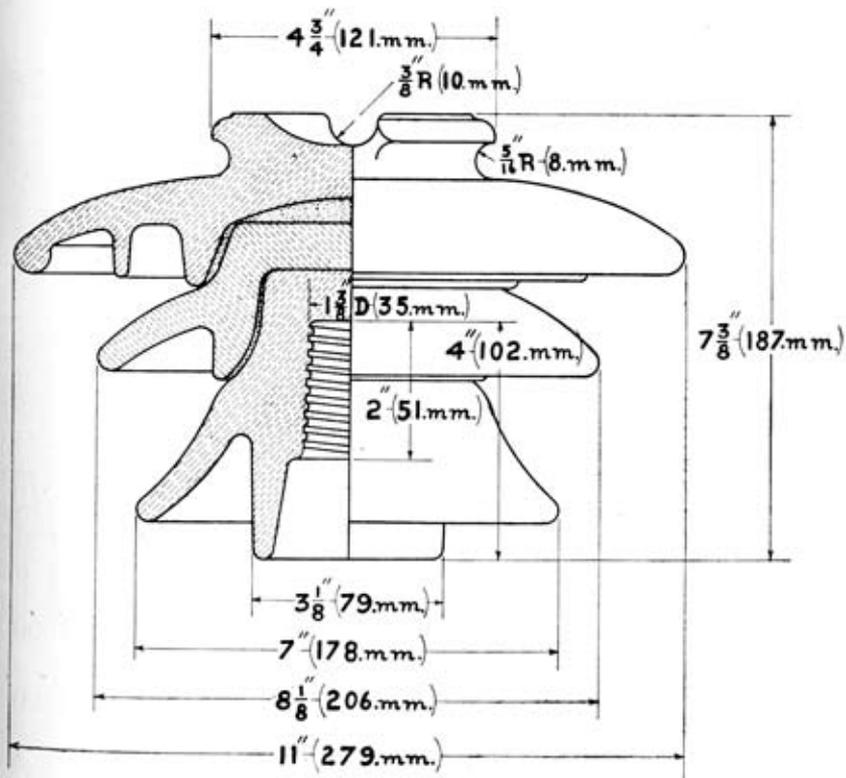
Code Word	No.	List per 100
<i>Rattlebox.</i>	25264—Insulator, General Rating 45,000 Volts.....	\$780 00

For additional designs with same general rating, see pages 60-61.

See "Rating," page 10.

O-B PORCELAIN INSULATOR

Patented
45,000 Volts



No. 25264

See description and list on the opposite page.

O-B PORCELAIN INSULATOR

Patented

55,000 Volts



No. 12855

Test Voltage.....		175,000
Leakage Surface.....	(654 mm.)	25 $\frac{3}{4}$ inches
Arcing Distance, Wet.....	(209 mm.)	8 $\frac{1}{4}$ inches
Size of Pin Hole.....	(35 mm.)	1 $\frac{3}{8}$ inches
Minimum Length Pin.....	(229 mm.)	9 inches
Approximate Net Weight per 100.....	(726 Kg.)	1600 lbs.

Domestic Shipping Data

Approximate Weight Packed, per 100.....	(1270 Kg.)	2800 lbs.
Approximate Number in Package.....		3

Export Shipping Data

Approximate Weight Packed, per 100.....	(1360 Kg.)	3000 lbs.
Approximate Number in Package.....		3
Approximate Volume of Package.....	(.096 cu. M.)	3.4 cu. ft.

Code Word
Piquant.

No. 12855—Insulator, General Rating 55,000 Volts.....

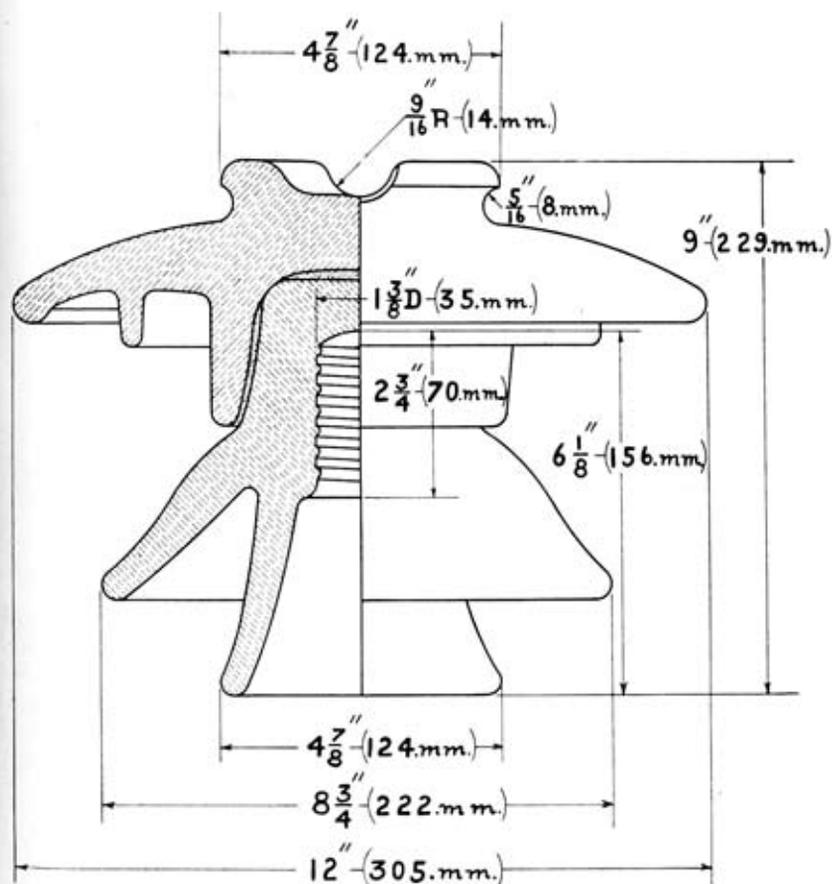
List per 100
\$920 00

See "Rating," page 10.

O-B PORCELAIN INSULATOR

Patented

55,000 Volts



No. 12855

See description and list on the opposite page.

O-B PORCELAIN INSULATOR

Patented
 55,000 Volts



No. 10638

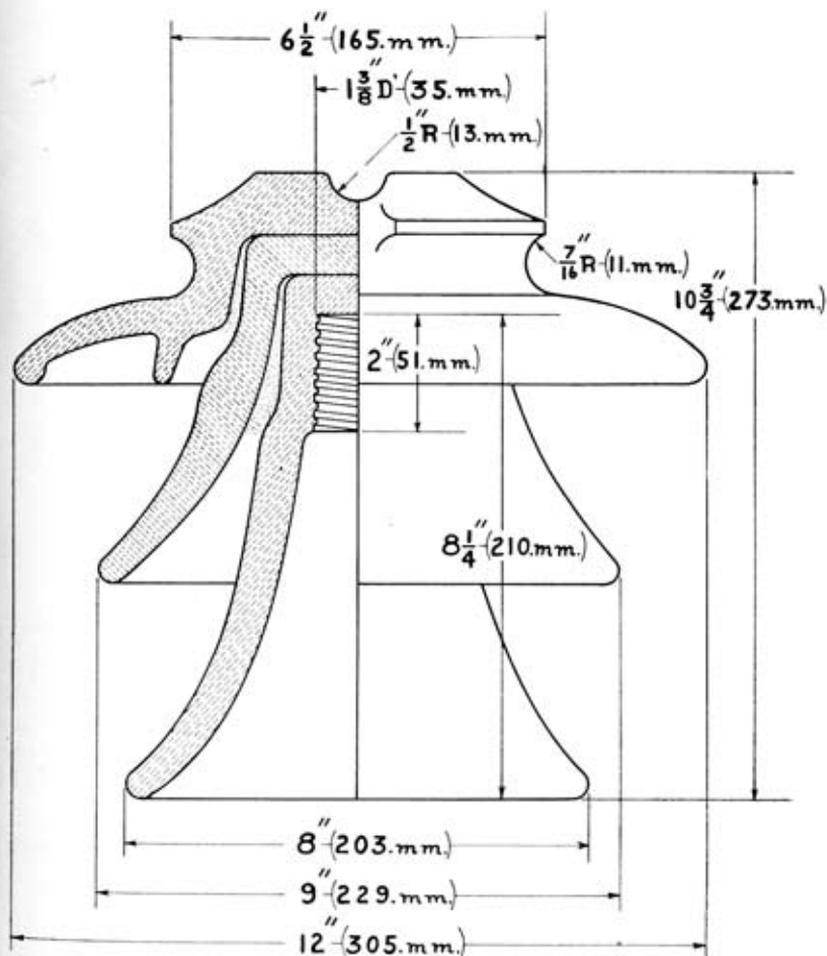
Test Voltage.....		175,000
Leakage Surface.....	(788 mm.)	31 inches
Arcing Distance, Wet.....	(216 mm.)	8 ¹ / ₂ inches
Size of Pin Hole.....	(35 mm.)	1 ³ / ₈ inches
Minimum Length Pin.....	(305 mm.)	12 inches
Approximate Net Weight per 100.....	(1026 Kg.)	2267 lbs.
Domestic Shipping Data		
Approximate Weight Packed, per 100.....	(1590 Kg.)	3500 lbs.
Approximate Number in Package.....		3
Export Shipping Data		
Approximate Weight Packed, per 100.....	(Kg.)	lbs.
Approximate Number in Package.....		
Approximate Volume of Package.....	(cu. M.)	cu. ft.

Code Word *Hessian.* No. 10638—Insulator, General Rating 55,000 Volts.....
 List per 100 \$1140 00

See "Rating," page 10.

**O-B PORCELAIN INSULATOR**

Patented
55,000 Volts

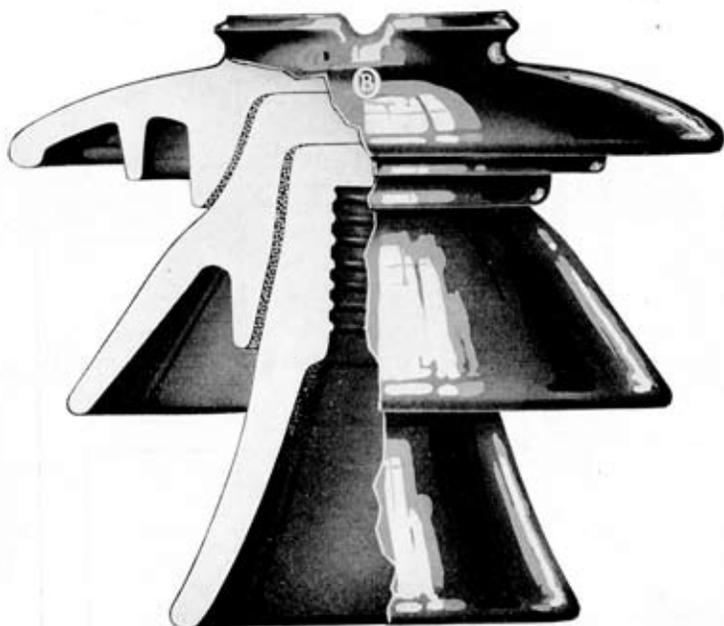


No. 10638

See description and list on the opposite page.

O-B PORCELAIN INSULATOR

Patented
66,000 Volts



No. 12552

Test Voltage.....		190,000
Leakage Surface.....	(870 mm.)	34 $\frac{1}{4}$ inches
Arcing Distance, Wet.....	(241 mm.)	9 $\frac{1}{2}$ inches
Size of Pin Hole.....	(35 mm.)	1 $\frac{3}{8}$ inches
Minimum Length Pin.....	(292 mm.)	11 $\frac{1}{2}$ inches
Approximate Net Weight per 100.....	(1450 Kg.)	3200 lbs.

Domestic Shipping Data

Approximate Weight Packed, per 100.....	(2050 Kg.)	4330 lbs.
Approximate Number in Package.....		3

Export Shipping Data

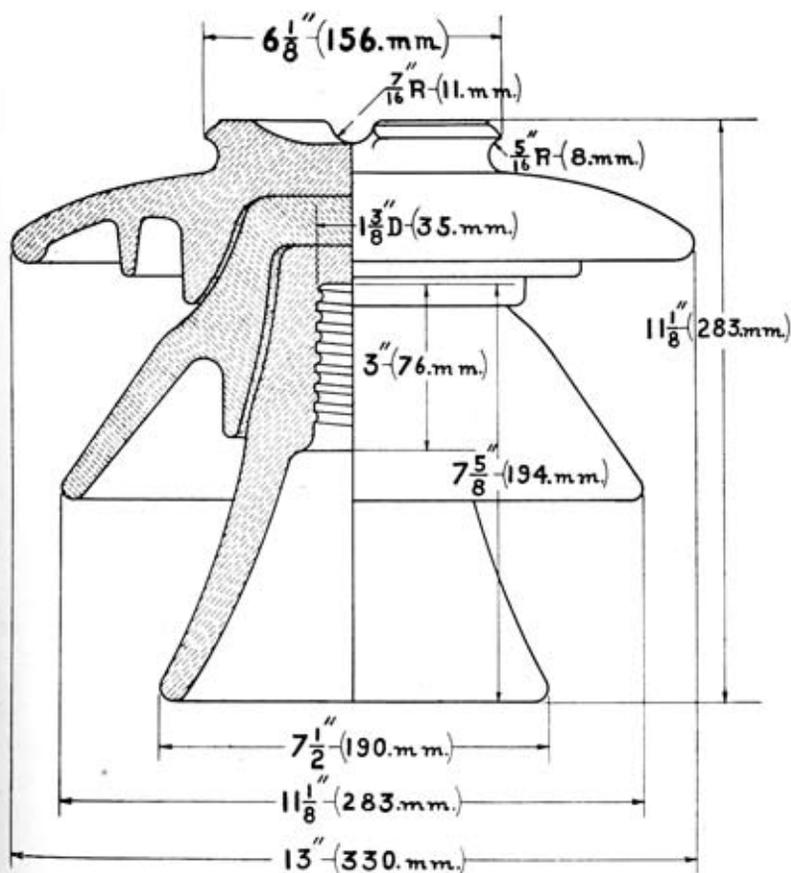
Approximate Weight Packed, per 100.....	(2042 Kg.)	4500 lbs.
Approximate Number in Package.....		4
Approximate Volume of Package.....	(.144 cu. M.)	5.1 cu. ft.

Code Word
Overtone.

No. 12552—Insulator, General Rating 66,000 Volts.....\$1400 00
List per 100
For additional designs with same general rating, see page 61.
See "Rating," page 10.

**O-B PORCELAIN INSULATOR**

Patented
66,000 Volts



No. 12552

See description and list on the opposite page.



O-B PORCELAIN INSULATOR

Patented
70,000 Volts



No. 10748

Test Voltage.....		195,000
Leakage Surface.....	(1029 mm.)	40½ inches
Arcing Distance, Wet.....	(254 mm.)	10 inches
Size of Pin Hole.....	(35 mm.)	1⅓ inches
Minimum Length Pin.....	(305 mm.)	12 inches
Approximate Net Weight per 100.....	(1497 Kg.)	3300 lbs.

Domestic Shipping Data

Approximate Weight Packed, per 100.....	(2120 Kg.)	4670 lbs.
Approximate Number in Package.....		3

Export Shipping Data

Approximate Weight Packed, per 100.....	(Kg.)	lbs.
Approximate Number in Package.....		
Approximate Volume of Package.....	(cu. M.)	cu. ft.

Code Word
Hever.

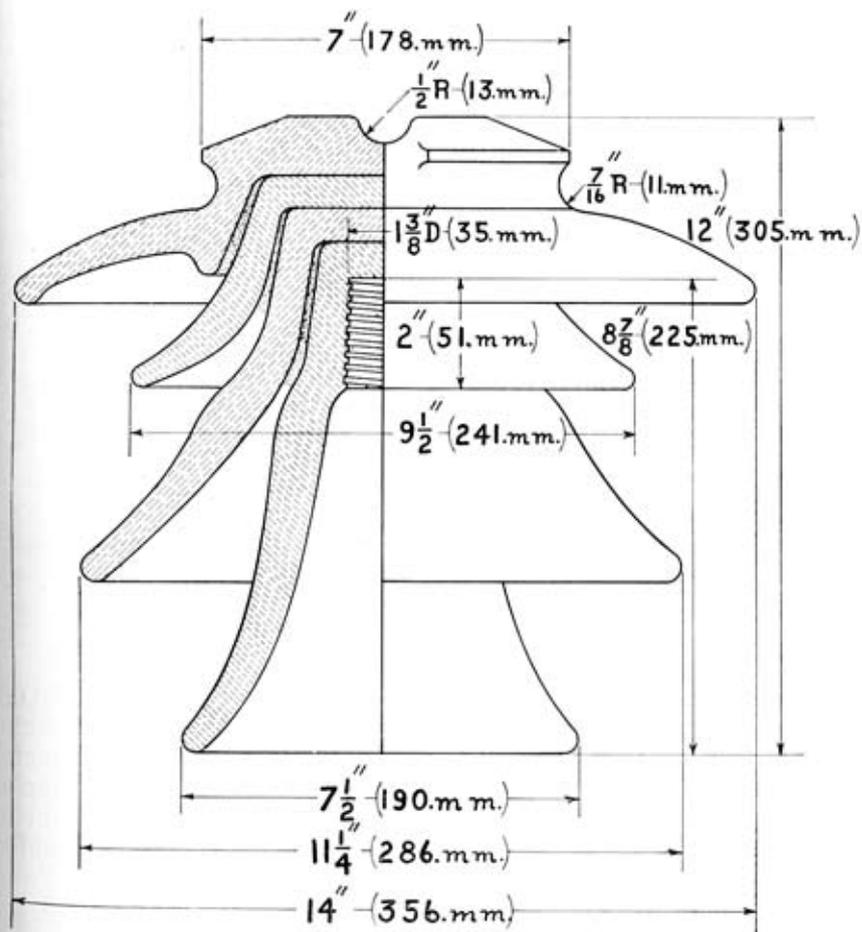
No.
10748—Insulator, General Rating 70,000 Volts..... \$1800 00

List per 100

See "Rating," page 10.

O-B PORCELAIN INSULATOR

Patented
70,000 Volts

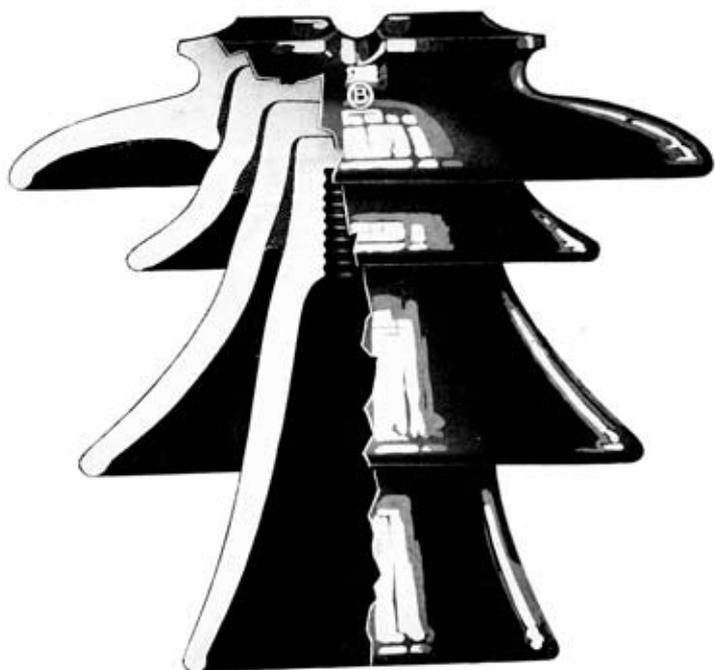


No. 10748

See description and list on the opposite page.

O-B PORCELAIN INSULATOR

Patented
80,000 Volts



No. 10577

Test Voltage		200,000
Leakage Surface	(1214 mm.)	47 ³ / ₄ inches
Arcing Distance, Wet	(295 mm.)	11 ⁵ / ₈ inches
Size of Pin Hole	(41 mm.)	1 ⁵ / ₈ inches
Minimum Length Pin	(356 mm.)	14 inches
Approximate Net Weight per 100	(1883 Kg.)	4150 lbs.

Domestic Shipping Data

Approximate Weight Packed, per 100	(2720 Kg.)	6000 lbs.
Approximate Number in Package		3

Export Shipping Data

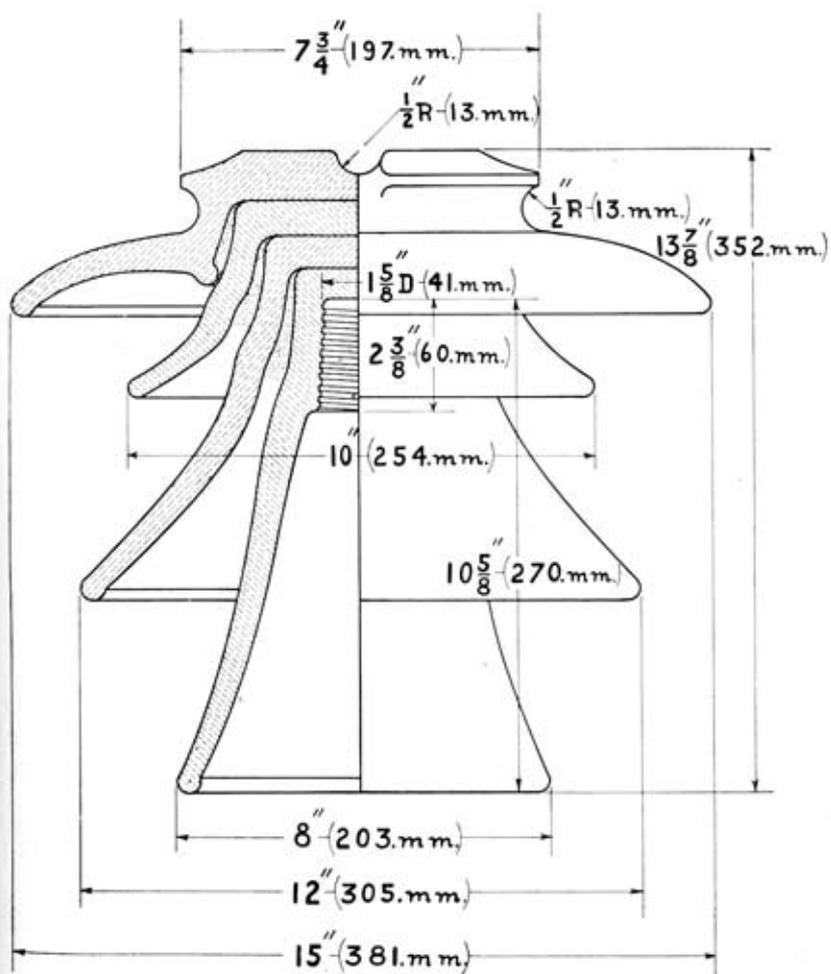
Approximate Weight Packed, per 100	(Kg.)	lbs.
Approximate Number in Package		
Approximate Volume of Package	(cu. M.)	cu. ft.

Code Word	No.		
Founder.	10577—Insulator, General Rating 80,000 Volts		List per 100 \$2800 00

See "Rating," page 10.

O-B PORCELAIN INSULATOR

Patented
80,000 Volts



No. 10577

See description and list on the opposite page.

O-B PORCELAIN INSULATOR

Patented
88,000 Volts



No. 13221

Test Voltage.....		250,000
Leakage Surface.....	(1256 mm.)	49 $\frac{1}{4}$ inches
Arcing Distance, Wet.....	(321 mm.)	12 $\frac{5}{8}$ inches
Size of Pin Hole.....	(51 mm.)	2 inches
Minimum Length Pin.....	(381 mm.)	15 inches
Approximate Net Weight per 100.....	(2904 Kg.)	6400 lbs.

Domestic Shipping Data

Approximate Weight Packed, per 100.....	(3697 Kg.)	8150 lbs.
Approximate Number in Package.....		3

Export Shipping Data

Approximate Weight Packed, per 100.....	(3697 Kg.)	8150 lbs.
Approximate Number in Package.....		3
Approximate Volume of Package.....	(.255 cu. M.)	9 cu. ft.

Code Word
Raccoon.

No.
13221—Insulator, General Rating 88,000 Volts

List per 100
\$3300 00

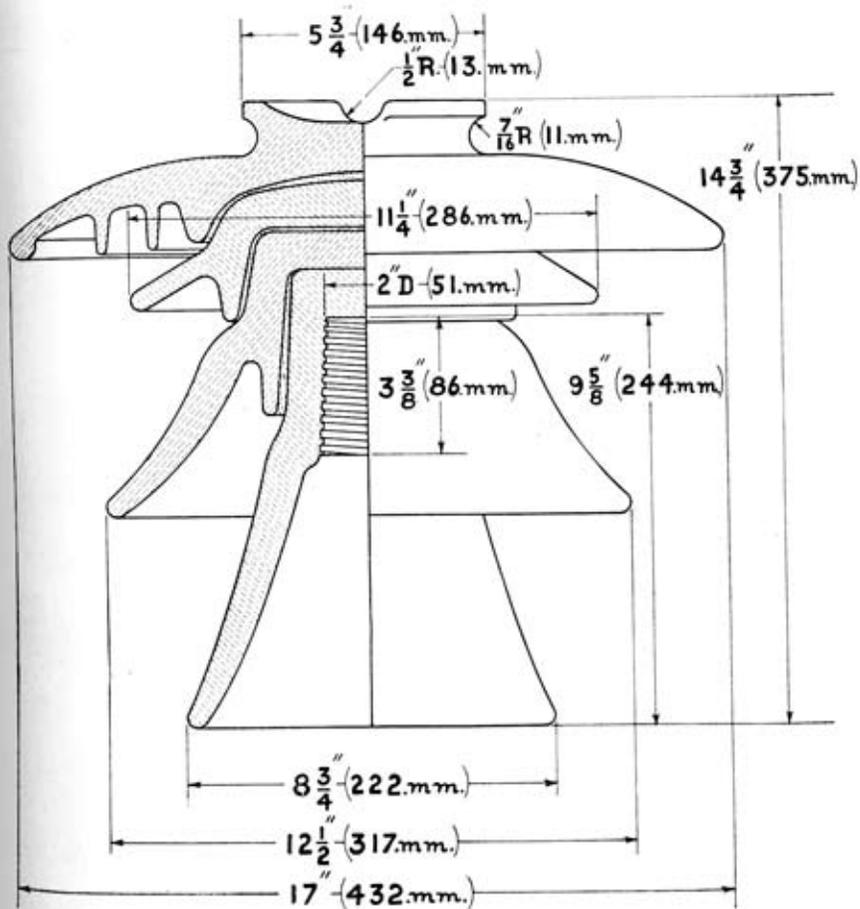
See "Rating," page 10.



O-B PORCELAIN INSULATOR

Patented

88,000 Volts



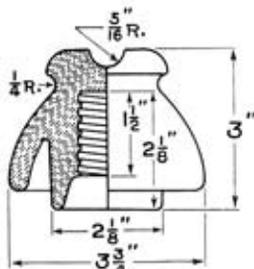
No. 13221

See description and list on the opposite page.



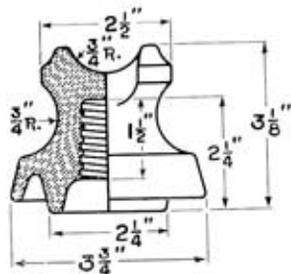
O-B PORCELAIN INSULATORS

Patented



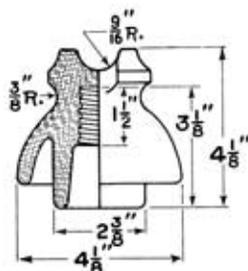
No. 9403-6.600 Volts

Diameter Pin Hole 1 inch
 Net weight per 100 125 pounds
 For later designs, see pages 18-23.



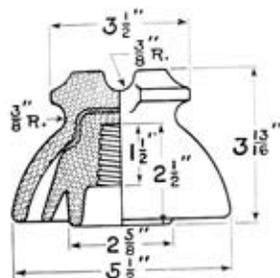
No. 10041-6.600 Volts

Diameter Pin Hole 1 inch
 Net weight per 100 106 pounds
 For later designs, see pages 18-23.



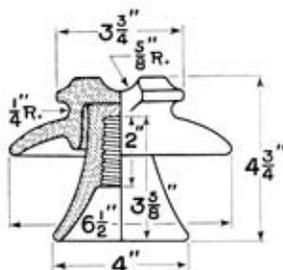
No. 9406-11.000 Volts

Diameter Pin Hole 1 inch
 Net weight per 100 181 pounds
 For later designs, see pages 24-27.



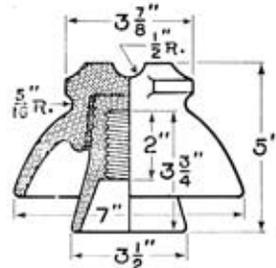
Nos. 9939-9937-17.000 Volts

Diameter Pin Hole, No. 9939 1 inch
 " " " No. 9937 1 1/4 inches
 Net weight per 100 328 pounds
 For later designs, see pages 30-33.



No. 9408-17.000 Volts

Diameter Pin Hole 1 inch
 Net weight per 100 360 pounds
 For later designs, see pages 30-33.



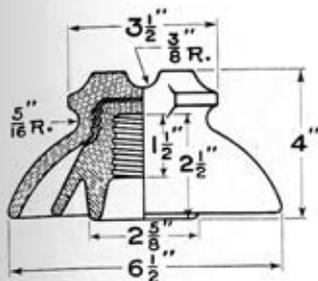
Nos. 11029-11914-23.000 Volts

Diameter Pin Hole, No. 11914 1 inch
 " " " No. 11029 1 1/4 inches
 Net weight per 100 452 pounds
 For later designs, see pages 34-37.



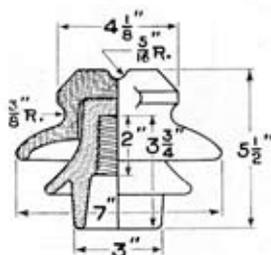
O-B PORCELAIN INSULATORS

Patented



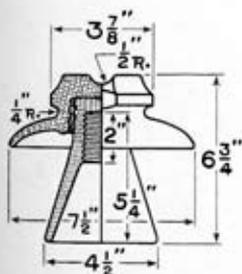
No. 9420-23,000 Volts

Diameter Pin Hole 1 1/4 inches
 Net weight per 100 390 pounds
 For later designs, see pages 34-37.



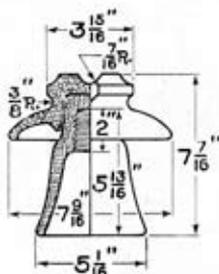
No. 10637-25,000 Volts

Diameter Pin Hole 1 1/4 inches
 Net weight per 100 500 pounds
 For later designs, see pages 38-39.



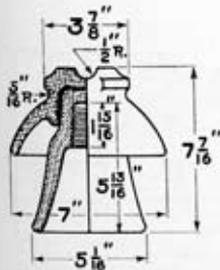
No. 9410-27,000 Volts

Diameter Pin Hole 1 1/4 inches
 Net weight per 100 467 pounds
 For later designs, see pages 38-39.



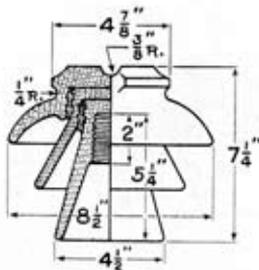
No. 12547-27,000 Volts

Diameter Pin Hole 1 1/4 inches
 Net weight per 100 625 pounds
 For later designs, see pages 38-39.



No. 12853-27,000 Volts

Diameter Pin Hole 1 1/4 inches
 Net weight per 100 630 pounds
 For later designs, see pages 38-39.



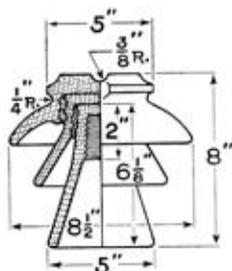
No. 9413-35,000 Volts

Diameter Pin Hole 1 1/4 inches
 Net weight per 100 848 pounds
 For later designs, see pages 40-41.



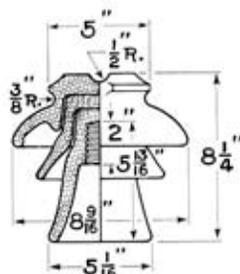
O-B PORCELAIN INSULATORS

Patented



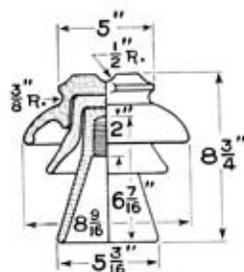
No. 9894-35,000 Volts

Diameter Pin Hole..... $1\frac{1}{4}$ inches
 Net weight per 100.....958 pounds
 For later designs, see pages 40-41.



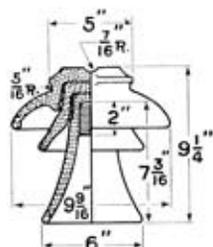
No. 12548-35,000 Volts

Diameter Pin Hole..... $1\frac{1}{4}$ inches
 Net weight per 100.....995 pounds
 For later designs, see pages 40-41.



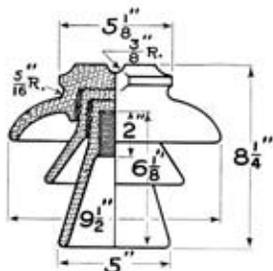
No. 12549-35,000 Volts

Diameter Pin Hole..... $1\frac{1}{4}$ inches
 Net weight per 100.....950 pounds
 For later designs, see pages 40-41.



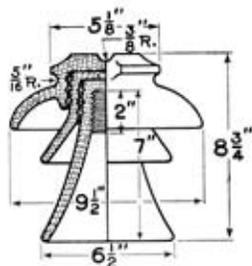
No. 12550-45,000 Volts

Diameter Pin Hole..... $1\frac{1}{4}$ inches
 Net weight per 100.....1125 pounds
 For later designs, see pages 42-45.



No. 9416-45,000 Volts

Diameter Pin Hole..... $1\frac{1}{4}$ inches
 Net weight per 100.....1050 pounds
 For later designs, see pages 42-45.



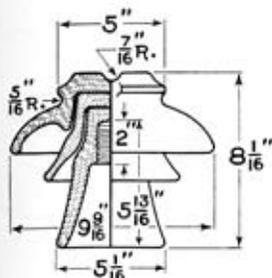
No. 9417-45,000 Volts

Diameter Pin Hole..... $1\frac{1}{4}$ inches
 Net weight per 100.....1140 pounds
 For later designs, see pages 42-45.



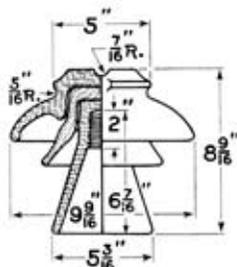
O-B PORCELAIN INSULATORS

Patented



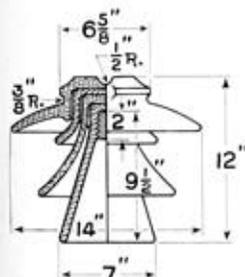
No. 12854-15,000 Volts

Diameter Pin Hole.....1 3/4 inches
 Net weight per 100.....1100 pounds
 For later designs, see pages 42-45.



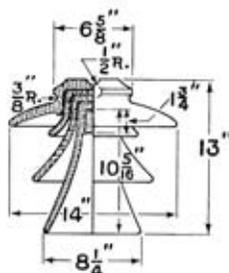
No. 12551-15,000 Volts

Diameter Pin Hole.....1 3/4 inches
 Net weight per 100.....1050 pounds
 For later designs, see pages 42-45.



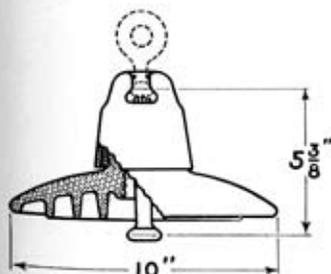
No. 9418-60,000 Volts

Diameter Pin Hole.....1 3/4 inches
 Net weight per 100.....2936 pounds
 For later designs, see pages 50-51.



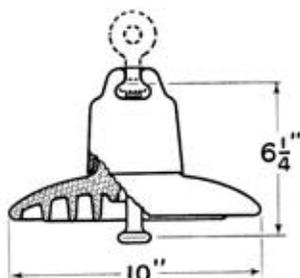
No. 10639-66,000 Volts

Diameter Pin Hole.....1 3/4 inches
 Net weight per 100.....3100 pounds
 For later designs, see pages 50-51.



No. 10566

Suspension Units
 Net weight per 100.....860 pounds
 For later designs, see pages 65-75.



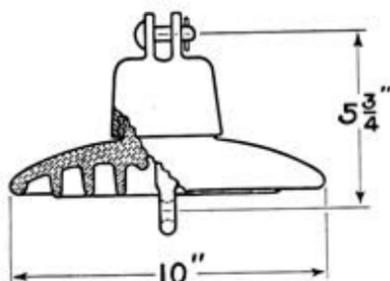
No. 10567

Suspension Strain Unit
 Net weight per 100.....1040 pounds
 For later designs, see pages 65-75.



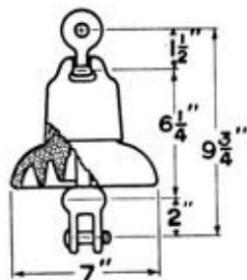
O-B PORCELAIN INSULATORS

Patented



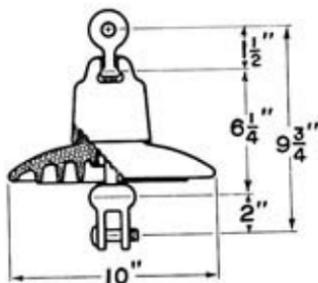
No. 11936

Net weight per 100.....860 pounds
For later designs, see pages 65-75.



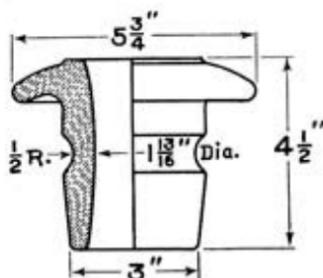
No. 10955-11,000 Volts

Net weight per 100.....1050 pounds
For later designs, see page 77.



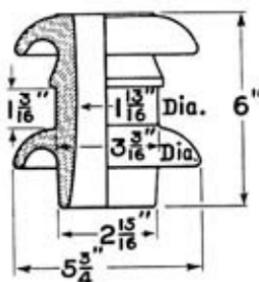
No. 10956-11,000 Volts

Net weight per 100.....1250 pounds
For later designs, see page 77.



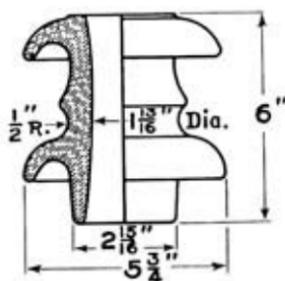
No. 9997-5,000 Volts

Net weight per 100.....300 pounds



No. 9898-10,000 Volts

Net weight per 100.....410 pounds



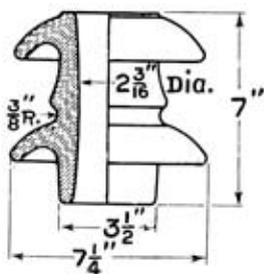
No. 9897-10,000 Volts

Net weight per 100.....410 pounds



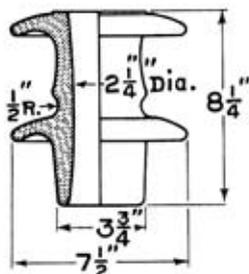
O-B PORCELAIN INSULATORS

Patented



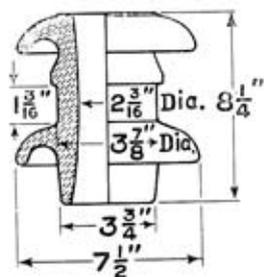
No. 9899-15,000 Volts

weight per 100.....750 pounds



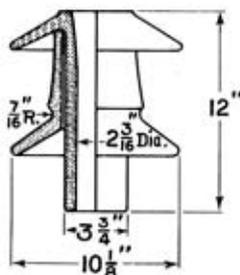
No. 9486-20,000 Volts

Net weight per 100.....800 pounds



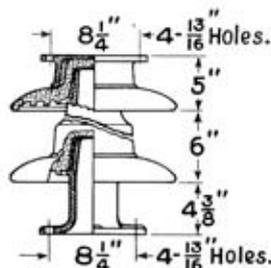
No. 10257-20,000 Volts

weight per 100.....825 pounds



No. 9900-35,000 Volts

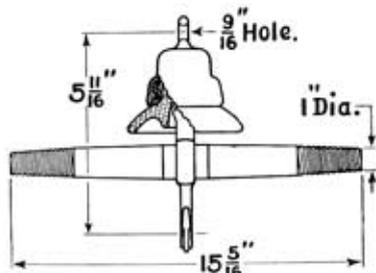
Net weight per 100.....2100 pounds



Type B, Form 2 Pillar Insulators

	Number Units	Net Weight Each
3	3	105
4	4	140
5	5	175
6	6	210
7	7	245

for later designs, see pages 105-107.



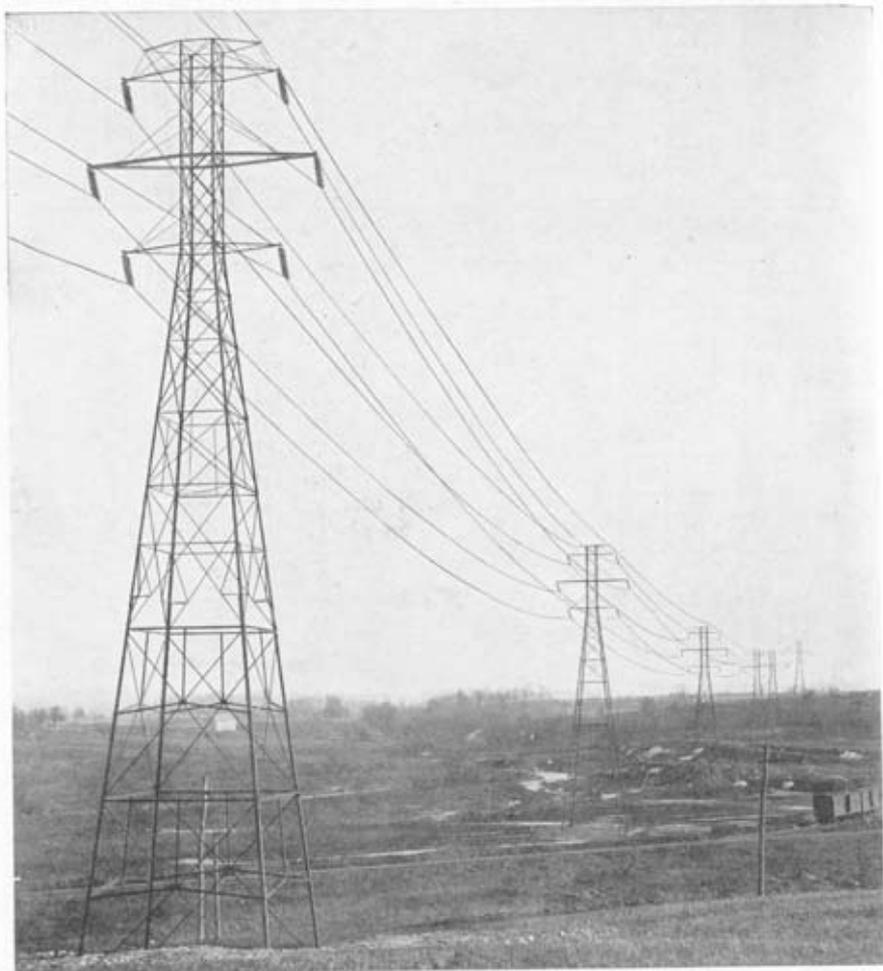
No. 11642-11,000 Volts

Net weight per 100.....400 pounds

For later designs, see page 171.



O-B SUSPENSION INSULATORS IN SERVICE



O-B Suspension Type Insulators installed on the Wheeling-Canton transmission line of the Ohio Power Company.



O-B SUSPENSION PORCELAIN INSULATORS



O-B Suspension Insulators—10 Units No. 25622 with Suspension Clamp No. 11549—flashing at nearly 500,000 volts. Were it desirable, this flash-over point could be increased materially by increasing the spacing between the individual units.

The arc is well away from the Insulator—a mark of design efficiency.



O-B SUSPENSION PORCELAIN INSULATORS

Patented

General Description

THE O-B Suspension Insulator contains many refinements not found in other insulators of this type. It consists of a one-piece porcelain disc with concentric circular ribs or petticoats on the under surface, a galvanized malleable iron cap casting which is securely cemented to the projecting head of the porcelain disc, and a galvanized steel center pin cemented in a pin hole which extends well into the head of the porcelain disc.

In this design, as in all O-B high-efficiency design Insulators, the electrical and mechanical characteristics are properly balanced. There is maximum insulation, reliability and mechanical strength for the length and weight of the Insulator.

The Insulator may consist of one or of several Units, the number depending upon line voltage, local conditions and the factor of safety or reliability desired by the user. If, when the line is erected, a future increase in voltage is contemplated, it is particularly advantageous to install Suspension Insulators as additional Units can be added at any time.

Each insulator Unit is an exact duplicate of the others of the same type.

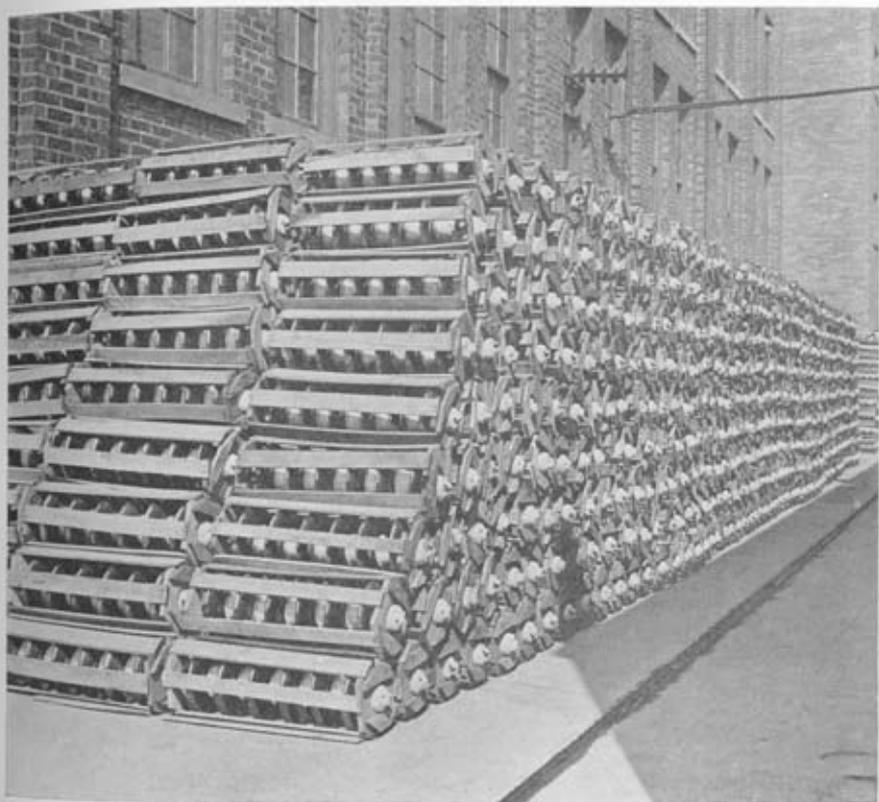
On both Type A and Type B Insulators, an efficient and convenient connection between Units is made by the patented ball and socket joint. This is the most satisfactory connection yet devised and is used by all manufacturers in Canada and Europe where O-B patents do not protect it. It will probably be adopted as standard within the next few years.

The Type B unit is a later development of the ball and socket insulator that permits a close spacing between Units. It can always be placed at top or bottom of a string of older design ball and socket insulators by filing the ball slightly.

Type D Insulators have the clevis connection between Units, and in this way differ from Type B Insulators. No. 25621 is made of the same porcelain Unit as No. 25620; likewise No. 25623 is similar to No. 25622.

See listing on the following pages.

CRATING OF O-B SUSPENSION TYPE INSULATORS



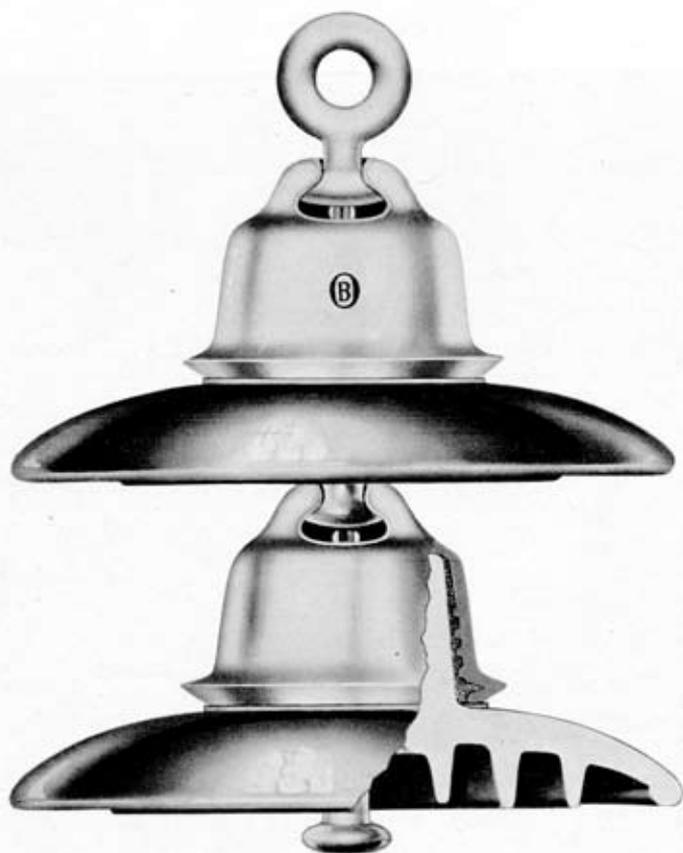
THE open crating of O-B Suspension Type Insulators as illustrated above, reduces the shipping weight and is a big convenience in erecting the line.

Insulators crated in this manner at the factory can be installed on the tower and the crates knocked off afterwards. Any chance of injuring the porcelain is minimized.



O-B SUSPENSION PORCELAIN INSULATOR

Type B, Form 1—Patented



Two Units, No. 25620, connected; lower Unit shown in part section

CAP castings are malleable iron, center pins steel, both galvanized.

Code Word	No.	List per 100
Ringneck.	25620—Type B, Form 1, Suspension Insulator, single unit.....	\$600 00

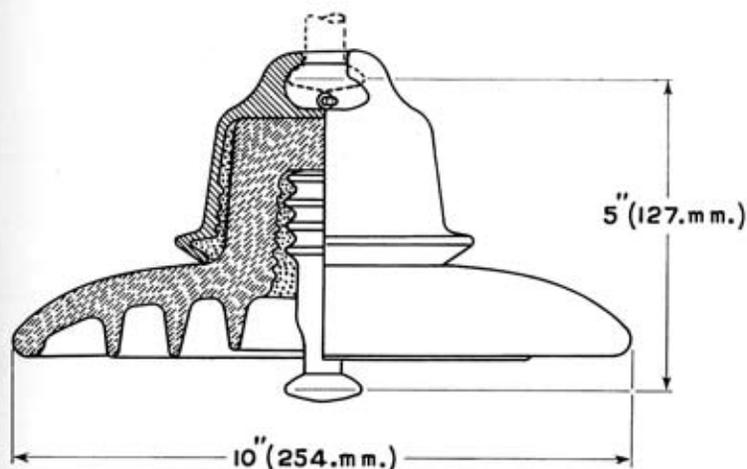
Note: Insulator Hardware is not interchangeable between Type B and Type A Suspension Insulators. See pages 172 to 195 for listing of Insulator Hardware.

See general description on page 66.

This Disc can also be supplied with Clevis Connection; see pages 70 and 71.

O-B SUSPENSION PORCELAIN INSULATOR

Type B, Form 1—Patented



Suspension Insulator No. 25620

The drawing is primarily to show dimensions and is not intended to be accurate in construction details.

Number of Units	Length of complete Insulator		Net Weight complete Insulator		Weight Packed for Domestic shipment, Complete Insulator	
	Inches	Millimeters	Pounds	Kilograms	Pounds	Kilograms
1	5	127	10	4.5	18	8.2
2	10	254	20	9.1	28	12.7
3	15	381	30	13.6	38	17.2
4	20	508	40	18.1	48	21.8
5	25	635	50	22.6	59	26.7
6	30	762	59	26.8	69	31.3
7	35	889	69	31.3	80	36.2
8	40	1016	79	35.8	90	40.8
9	45	1143	89	40.3	99	44.4
10	50	1270	99	44.9	110	50.0

For export shipment these insulator units are regularly packed 8 in a case as described below.

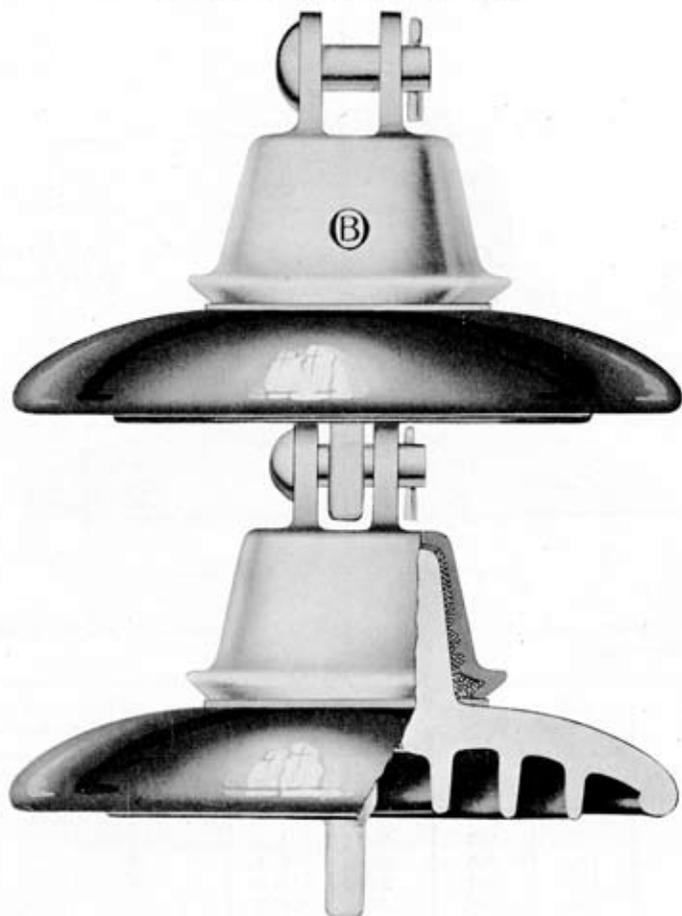
Number Units	DIMENSION OF CASE		Gross Weight per Case	
	Inches	Millimeters	Pounds	Kilograms
8	12 x 12 x 44½	305 x 305 x 1130	97	44

See listing on the opposite page.



O-B SUSPENSION PORCELAIN INSULATOR

Type D, Form 2—Patented



Two Units, No. 25621, connected; lower Unit shown in part section

THIS type of Insulator can be supplied when conditions demand, though the clevis connection lacks the distinctive advantages of the ball and socket connection used on Types A and B Insulators.

Cap castings are malleable iron, center pins steel, both galvanized.

Code Word
Ringworm.

No. 25621—Type D, Form 2, Suspension Insulator, single unit. . . . \$600 00

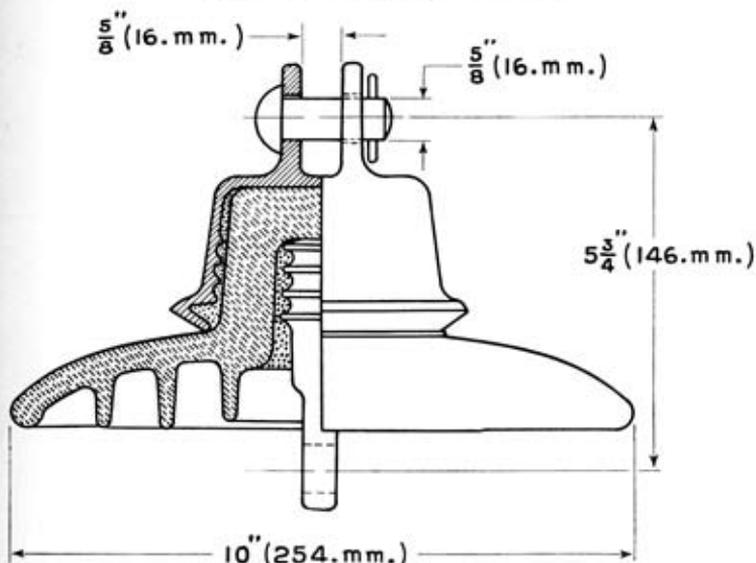
See pages 172 to 195 for listing of Insulator Hardware.

See general description on page 66.

This Disc can also be supplied with Ball and Socket Connection; see pages 68 and 69.

O-B SUSPENSION PORCELAIN INSULATOR

Type D, Form 2—Patented



Suspension Insulator No. 25621

This drawing is primarily to show dimensions and is not intended to be accurate in construction details.

Number of Units	Length of complete Insulator		Net Weight complete Insulator		Weight Packed for Domestic shipment, Complete Insulator	
	Inches	Millimeters	Pounds	Kilograms	Pounds	Kilograms
1	$5\frac{3}{4}$	146	9	4.1	13	5.9
2	$11\frac{1}{4}$	292	18	8.2	24	10.9
3	$17\frac{1}{4}$	438	27	12.3	33	15.0
4	23	584	36	16.3	45	20.4
5	$28\frac{3}{4}$	730	45	20.4	53	24.0
6	$34\frac{1}{2}$	876	54	24.5	65	29.5
7	$40\frac{1}{4}$	1022	63	28.6	74	33.6
8	46	1168	72	32.6	83	37.6
9	$51\frac{3}{4}$	1314	81	36.7	93	42.1
10	$57\frac{1}{2}$	1461	90	40.7	102	46.3

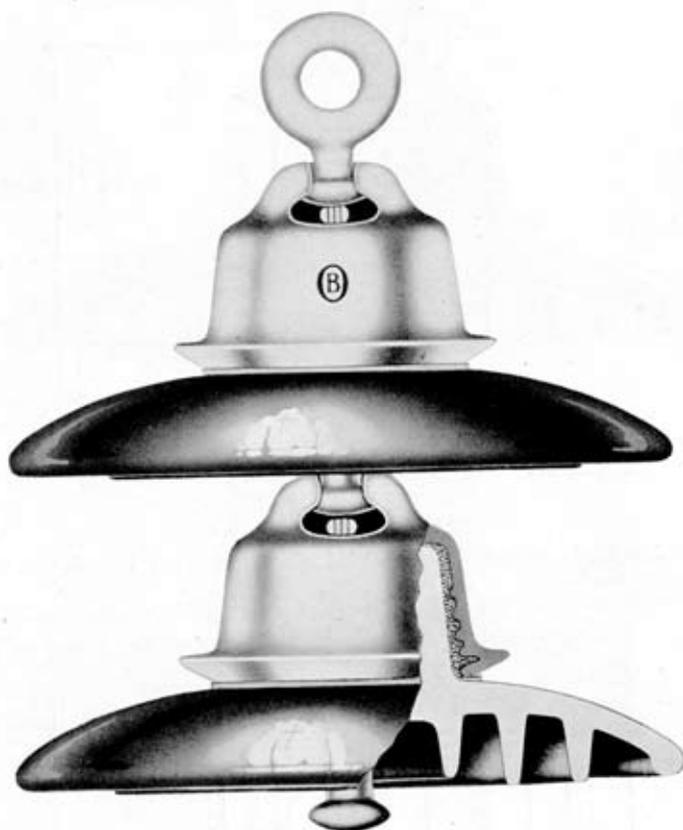
For export shipment these insulator units are regularly packed 8 in a case as described below.

Number Units	DIMENSION OF CASE		Gross Weight per Case	
	Inches	Millimeters	Pounds	Kilograms
8	12 x 12 x $44\frac{1}{2}$	305 x 305 x 1130	90	41

See listing on the opposite page.

O-B SUSPENSION PORCELAIN INSULATOR

Type B, Form 2—Patented



Two Units, No. 25622, connected; lower Unit shown in part section

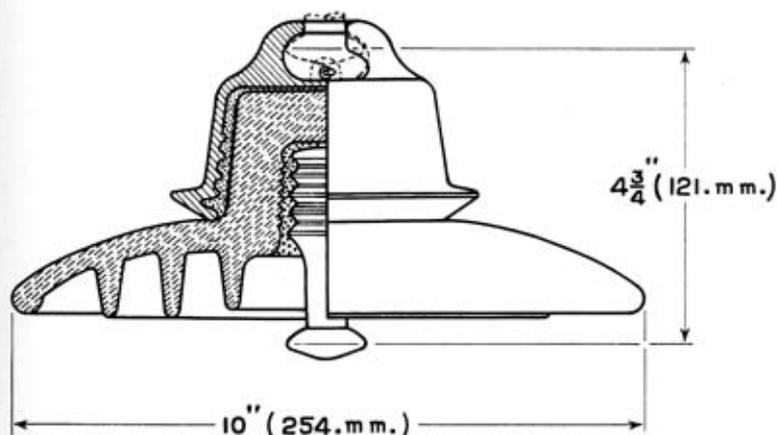
CAP castings are malleable iron, center pins steel, both galvanized.

Code Word No. List per 100
Ringtail. 25622—Type B, Form 2, Suspension Insulator, single unit. . . . \$600 00

Note: Insulator Hardware is not interchangeable between Type B and Type A Suspension Insulators. See pages 172 to 195 for listing of Insulator Hardware.

See general description on page 66.

This Disc can also be supplied with Clevis Connection; see pages 74 and 75.

**O-B SUSPENSION PORCELAIN INSULATOR****Type B, Form 2—Patented****Suspension Insulator No. 25622**

The drawing is primarily to show dimensions and is not intended to be accurate in construction details.

Number of Units	Length of complete Insulator		Net Weight complete Insulator		Weight Packed for Domestic shipment, Complete Insulator	
	Inches	Millimeters	Pounds	Kilograms	Pounds	Kilograms
1	4 $\frac{3}{4}$	121	9	4.1	18	8.2
2	9 $\frac{1}{2}$	242	18	8.2	26	11.8
3	14 $\frac{1}{4}$	362	27	12.3	36	16.3
4	19	483	36	16.3	45	20.4
5	23 $\frac{1}{2}$	603	46	20.8	55	24.9
6	28 $\frac{1}{2}$	724	55	24.9	65	29.5
7	33 $\frac{1}{4}$	845	64	29.0	74	33.6
8	38	965	73	33.1	84	38.0
9	42 $\frac{1}{2}$	1086	82	37.2	94	42.5
10	47 $\frac{1}{2}$	1207	91	41.2	103	46.6

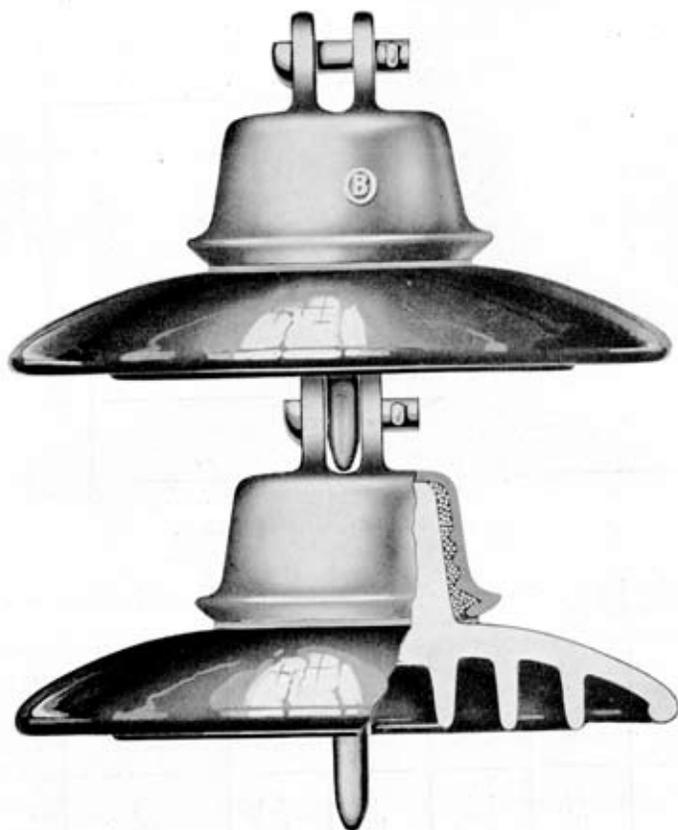
For export shipment these insulator units are regularly packed 8 in a case as described below.

Number Units	DIMENSION OF CASE		Gross Weight per Case	
	Inches	Millimeters	Pounds	Kilograms
8	12 x 12 x 42 $\frac{1}{2}$	305 x 305 x 1080	93	42

See listing on the opposite page

O-B SUSPENSION PORCELAIN INSULATOR

Type D, Form 3—Patented



Two Units, No. 25623, connected; lower Unit shown in part section

THIS clevis type unit embodies all the latest refinements of design. Dimensions of metal parts and spacing between units are in accordance with the standards adopted by the insulator manufacturers. Cap castings are malleable iron, center pins steel, both galvanized.

Code Word
Riotous.

No.
25623—Type D, Form 3, Suspension Insulator, single unit
See pages 172 to 195 for listing of Insulator Hardware.

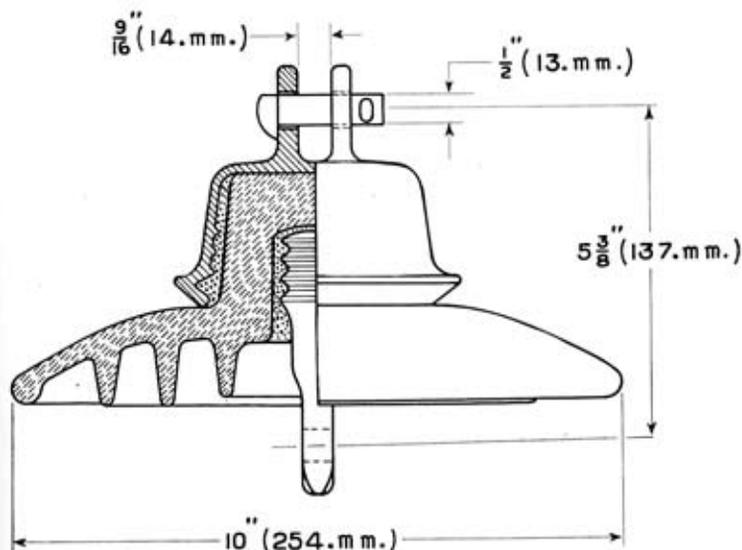
List per 100
\$600 00

See general description on page 66

This Disc can also be supplied with Ball and Socket Connection; see pages 72 and 73.

O-B SUSPENSION PORCELAIN INSULATOR

Type D, Form 3—Patented



Suspension Insulator No. 25623

The drawing is primarily to show dimensions and is not intended to be accurate in construction details.

Number of Units	Length of complete Insulator		Net Weight complete Insulator		Weight Packed for Domestic shipment. Complete Insulator	
	Inches	Millimeters	Pounds	Kilograms	Pounds	Kilograms
1	5 ³ / ₈	137	9	4.1	18	8.2
2	10 ¹ / ₄	273	18	8.2	26	11.8
3	16 ¹ / ₂	410	27	12.3	36	16.3
4	21 ¹ / ₂	546	36	16.3	45	20.4
5	26 ³ / ₈	683	46	20.8	55	24.9
6	32 ¹ / ₄	819	55	24.9	65	29.5
7	37 ³ / ₈	956	64	29.0	74	33.6
8	43	1092	73	33.1	84	38.0
9	48 ³ / ₈	1229	82	37.2	94	42.5
10	53 ¹ / ₂	1365	91	41.2	103	46.6

For export shipment these insulator units are regularly packed 8 in a case as described below.

Number Units	DIMENSION OF CASE		Gross Weight per Case	
	Inches	Millimeters	Pounds	Kilograms
8	12 x 12 x 42 ¹ / ₂	305 x 305 x 1080	93	42

See listing on the opposite page.



O-B SUSPENSION PORCELAIN INSULATOR

Type A, Form 3—Patented



Two Units, No. 11033; lower Unit shown in section

CAN be attached to support by means of fittings listed on pages 188 to 191 or by a regular hexagon or square head $\frac{3}{8}$ -inch machine bolt.

Cap castings are malleable iron, center pins forged steel, both galvanized.

Test Voltage.....		75,000
Ultimate Strength.....	(3,630 Kg.)	8,000 lbs.
Diameter of Insulator.....	(178 mm.)	7 inches
Height of Insulator†.....	(146 mm.)	5 $\frac{3}{4}$ inches
Approximate Net Weight, per 100.....	(336 Kg.)	740 lbs.
Approximate Weight Packed, per 100.....	(437 Kg.)	965 lbs.
Approximate Number in Package.....		6

Code Word
Knoller.

No. 11033—Insulator, General Rating 11,000 Volts, single unit.....\$546 00

List per 100

See "Rating," page 10.

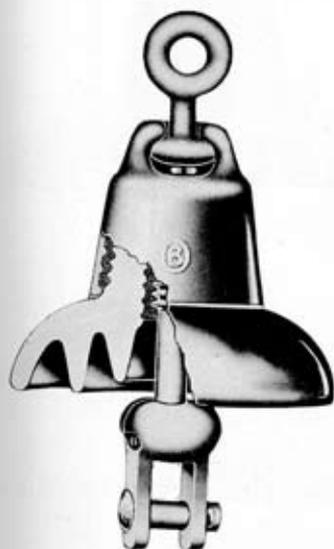
†Height is measured from center of ball on pin to center of socket in cap.

See pages 172 to 195 for listing of Insulator Hardware.



O-B SUSPENSION PORCELAIN INSULATORS

Patented



Insulator Unit No. 11033, page 76
Suspension Eye No. 11106, page 133
Socket Clevis No. 10753, page 190



Insulator Unit No. 25620, page 68
Suspension Eye No. 11547, page 133
Socket Clevis No. 11545, page 190

SUGGESTED arrangement for strain construction using standard suspension insulator units and standard hardware.

O-B SUSPENSION PORCELAIN INSULATORS

Type C, Form 1—Strain—Patented



No. 11034



No. 11937

Cap castings are malleable iron, center pins forged steel, both galvanized.

CATALOG NUMBERS	11034		11937	
Test Voltage.....		75,000		85,000
Ultimate Strength.....	(3,630 Kg.)	8,000 lbs.	(3,630 Kg.)	8,000 lbs.
Diameter of Insulator.....	178 mm.)	7 ins.	(254 mm.)	10 ins.
Height of Insulator†.....	168 mm.)	6½ "	(168 mm.)	6½ "
Diameter of Eyes.....	25 mm.)	1 "	(25 mm.)	1 "
Approximate Net Weight, per 100.....	(329 Kg.)	725 lbs.	(397 Kg.)	875 lbs.
Approximate Weight Packed, per 100.....	(437 Kg.)	965 "	(499 Kg.)	1,100 "
Approximate Number in Package.....		6		6

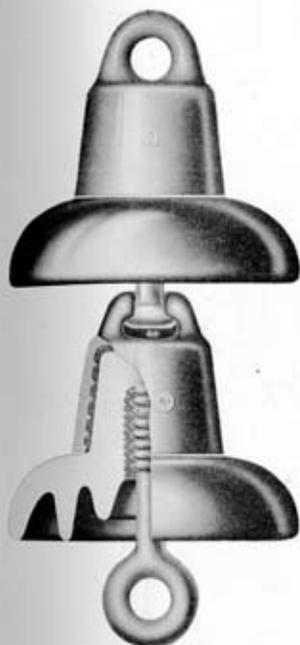
Code Word No. List per 100
 Inquire. 11034—Insulator, 7 inches diameter, General Rating 11,000 Volts \$550 00
 Monureid. 11937— " 10 " " " " 11,000 " 720 00

See "Rating," page 10.

†Height is measured from center to center of eyes.

O-B SUSPENSION PORCELAIN INSULATORS

Patented
Type CA—Strain



No. 11938



No. 11939

Cap castings are malleable iron, center pins forged steel, both galvanized.

CATALOG NUMBERS	11938	11939
Test Voltage, per single unit.....	75,000	85,000
Ultimate Strength.....	(3,630 Kg.) 8,000 lbs.	(3,630 Kg.) 8,000 lbs.
Diameter of Insulator.....	178 mm.) 7 ins.	(254 mm.) 10 ins.
Height, center to center of Eyes... (	311 mm.) 12½ "	(302 mm.) 11¾ "
Diameter of Eyes.....	25 mm.) 1 "	(25 mm.) 1 "
Approximate Net Weight, per 100. (	658 Kg.) 1,450 lbs.	(771 Kg.) 1,700 lbs.
Approximate Weight Packed, per 100. (	875 Kg.) 1,930 "	(998 Kg.) 2,200 "
Approximate Number in Package.....	3	3

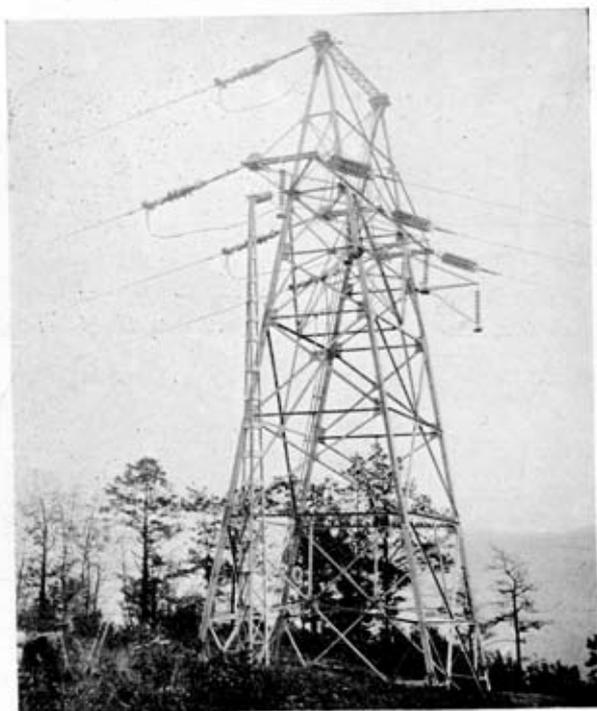
Code Word	No.	List per 100
Moonbeam.	11938—Insulator, two units, 7 inches diameter, General Rating 22,000 Volts.....	\$1280 00
Mooned.	11939—Insulator, two units, 10 inches diameter, General Rating 22,000 Volts.....	1430 00

See "Rating," page 10.

Above Insulators can be furnished with any desired number of units.



O-B PORCELAIN STRAIN INSULATORS For Extraordinary Conditions



IN the above illustration is shown O-B special Strain Insulator No. 13430 installed on a river span which, as far as records show, is the longest in the world. The Insulators operate at 150,000 volts and a normal mechanical working load of approximately 19,000 lbs. at 80° F. Many Insulators of this type are now in use in long span and river crossing work where heavy stresses and high voltage are involved.

These Insulators combine both reliability and efficiency, affording a most satisfactory solution for otherwise difficult problems. From the weight standpoint, the Insulators are extremely efficient. This makes for ease of handling and minimizes the cost of installation.

In the following pages are listed five different sizes covering a wide range of conditions but other sizes and combinations can be supplied promptly to meet the demands of the individual installation.

Special fittings can be supplied.

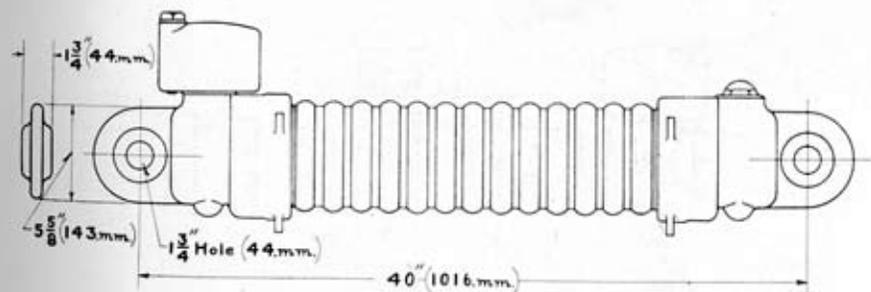
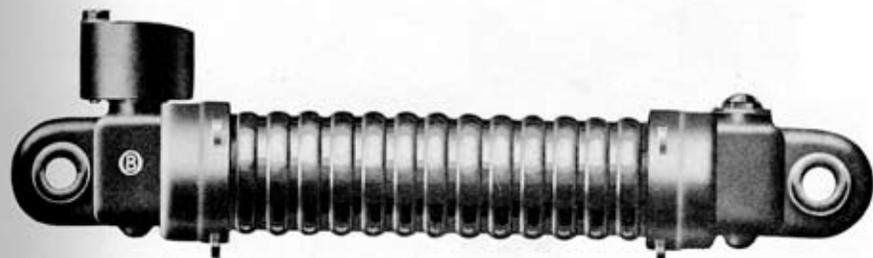
Recently developed facilities make possible the manufacture of cap and pin type insulators for heavy strains such as encountered in radio work or transmission lines having long spans, heavy conductor or conductor worked under heavy stress.



O-B PORCELAIN STRAIN INSULATOR

Patented

Wood Core—22,000 Volts



Working Load.....	(8,150 Kg.)	18,000 lbs.
Net Weight, each.....	(58 Kg.)	127 lbs.
Weight, Packed, each.....	(102 Kg.)	225 lbs.

Code Word
Raucity.

No. 25068—Strain Insulator, General Rating 22,000 Volts. List Each \$172 00

See "Rating," page 10.

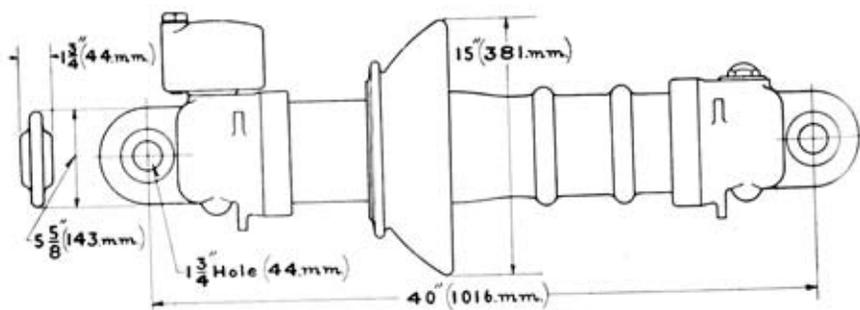
See general description on page 80.



O-B PORCELAIN STRAIN INSULATOR

Patented

Wood Core—44,000 Volts



Working Load	(8,150 Kg.)	18,000 lbs.
Net Weight, each	(66 Kg.)	145 lbs.
Weight, Packed, each	(122 Kg.)	270 lbs.

Code Word
Ravage.

No.

13427—Strain Insulator, General Rating 44,000 Volts.

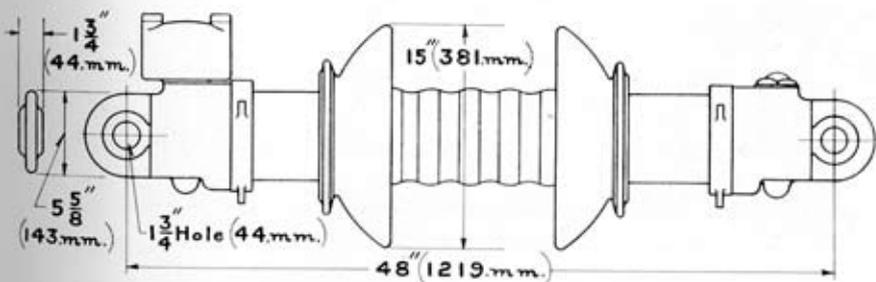
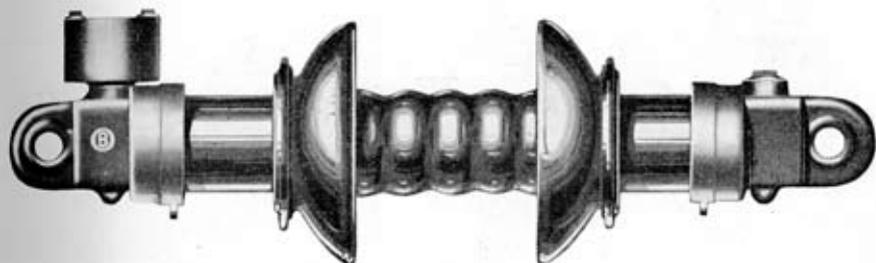
See "Rating," page 10.
See general description on page 80.

List Each
\$214 00

O-B PORCELAIN STRAIN INSULATOR

Patented

Wood Core—66,000 Volts



Working Load	(11,330 Kg.)	25,000 lbs.
Net Weight, each	(109 Kg.)	240 lbs.
Weight, Packed, each	(136 Kg.)	300 lbs.

Code Word
Ravelin.

No. 13428—Strain Insulator, General Rating 66,000 Volts. List Each \$300 00

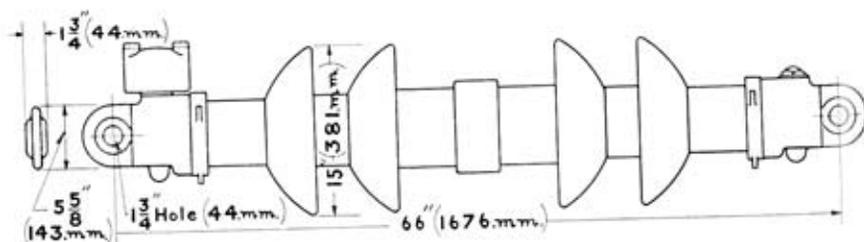
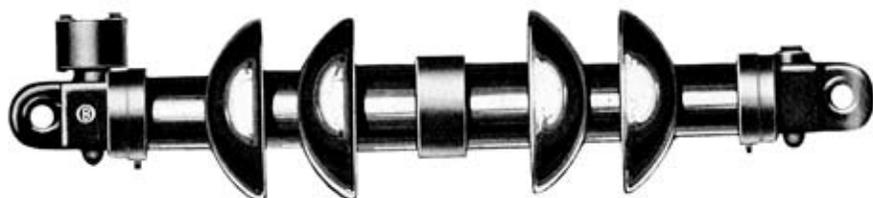
See "Rating," page 10.
See general description on page 80.



O-B PORCELAIN STRAIN INSULATOR

Patented

Wood Core—125,000 Volts



Working Load	(11,330 Kg.)	25,000 lbs.
Net Weight, each	(136 Kg.)	300 lbs.
Weight, Packed, each	(181 Kg.)	400 lbs.

Code Word
Ravehook.

No.

13429—Strain Insulator, General Rating 125,000 Volts

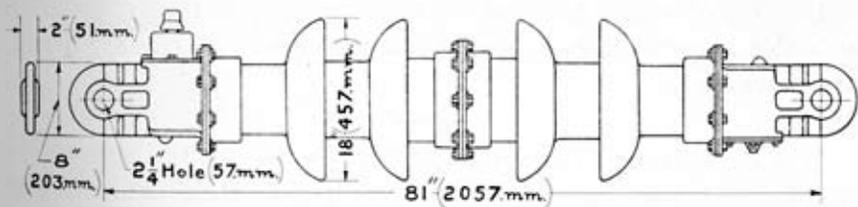
List Each
\$120 00

See "Rating," page 10.
See general description on page 80.

O-B PORCELAIN STRAIN INSULATOR

Patented

Wood Core—150,000 Volts



This insulator is shown in the picture on page 80, installed in a long river span of a transmission line.

Working Load	(18,125 Kg.)	40,000 lbs.
Net Weight, each	(261 Kg.)	575 lbs.
Weight, Packed, each	(329 Kg.)	725 lbs.

Code Word
Ravine.

No. 13430—Strain Insulator, General Rating 150,000 Volts List Each \$1232 00

See "Rating," page 10.
See general description on page 80.



O-B PORCELAIN LINK STRAIN INSULATOR

11,000 Volts

General Description

INSULATOR, No. 11940, is a modification of the original link insulator and has the following advantages over other link type strain and suspension insulators.

The straight hole readily permits threading of the insulator with conductor for dead ending, or fittings for coupling up. The shape of the Insulator permits drainage of water, obviating danger from cracking under certain freezing conditions sometimes found in practice and which may mean an appreciable loss where insulators are used in large quantities.

The contour of the flange keeps down stress set up in operation and minimizes cracking which may occur in time with link insulators.

While this insulator embodies distinctive advantages over other link type insulators care should be exercised where heavy loads are to be carried. There is a tendency to assume that all link type insulators are excessively strong because they place the dielectric in compression. Practice shows, however, that the material fails in time along shear lines under loads producing what might appear to be a comparatively low working stress for the material in compression.

Where heavy loads are to be carried the Cap and Pin Types shown on pages 68-79 are to be preferred.

O-B PORCELAIN LINK STRAIN INSULATOR

11,000 Volts

Continued



Front View



Rear View

This insulator can be installed with fittings listed on page 94.

Test Voltage.....		70,000
Maximum Working Load.....	(1,135 Kg.)	2,500 lbs.
Ultimate Strength.....	(3,630 Kg.)	8,000 lbs.
Diameter of Insulator.....	(197 mm.)	7 ³ / ₄ inches
Diameter of Holes for Strand.....	(17 mm.)	1 ¹ / ₂ inch
Approximate Net Weight, per 100.....	(181 Kg.)	400 lbs.
Approximate Weight Packed, per 100.....	(256 Kg.)	565 lbs.
Approximate Number in Barrel.....		30

Code Word
Moonery.

No. 11940—Link Strain Insulator, General Rating 11,000 Volts.....\$420 00

See "Rating," page 10.

See general description on the opposite page.



O-B PORCELAIN STRAIN INSULATOR

Patent Applied For
Type XH—2,500 Volts



No. 25009

A RUGGED Insulator for guy wires and dead ends. Has long leakage path and is made of high tension porcelain (wet-ware). Insulators of this type are more rugged and furnish more insulation for the investment than insulators of the multi-fin type.

Rounded corners permit rough handling without breakage.

Strands are interlocked so they cannot become separated should Insulator be broken.

Holes for strand are straight making installation easy.

Ultimate strength (tested with high strength steel strand) over 15,000 pounds (6,800 Kilograms).

Approximate Net Weight, per 100	(79.5 Kg.)	175 lbs.
Approximate Weight Packed, per 100	(84.0 Kg.)	185 lbs.
Approximate Number in Package		240

Code Word
Ratter.

No. 25009—Type XH Insulator, General Rating 2,500 Volts \$51 00

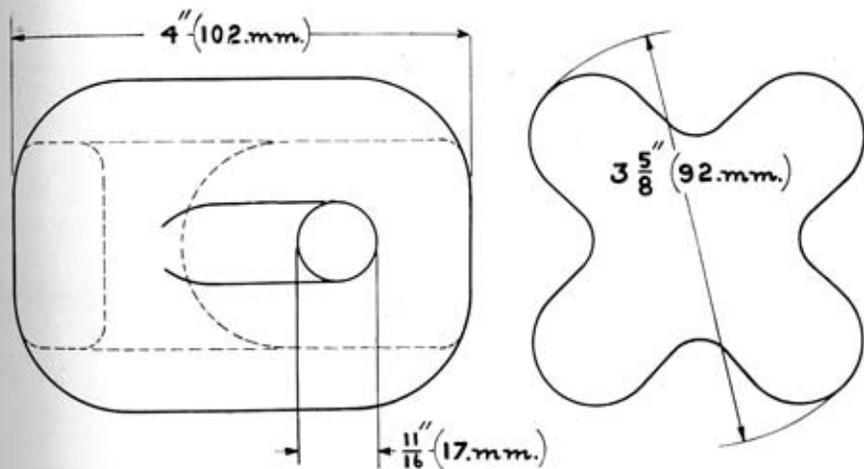
See "Rating," page 10.



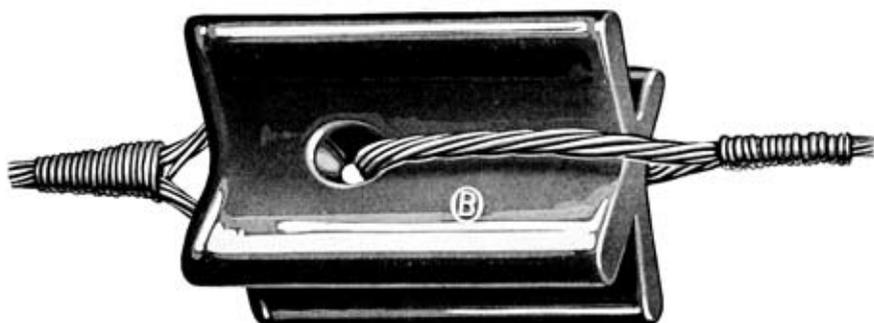
O-B PORCELAIN STRAIN INSULATOR

Patent Applied For

Type XI—2,500 Volts



No. 25009

**O-B PORCELAIN STRAIN INSULATOR****Patented****Type X—1,500-3,000-6,600 Volts**

USED for insulating guy wires and dead-ending. Has long leakage path and is made of high tension porcelain having high mechanical strength.

Strands are interlocked so that they cannot become separated should insulator be broken.

Holes for strand are straight making installation easy.

Approximate Shipping Data

Catalog Numbers	Net Weight, per 100		Weight, packed for Domestic Shipment, per 100		Number in Domestic Package
	Pounds	Kilograms	Pounds	Kilograms	
12458	113	51	123	56	260
13431	138	63	178	81	260
11629	200	91	250	113	100
11630	335	152	410	186	50

Code Word	No.	List per 100
<i>Outsee.</i>	12458—Type X Insulator, General Rating 1,500 Volts.	\$41 00
<i>Rawhead.</i>	13431—“ “ “ “ “ 1,500 “	43 00
<i>Moonfish.</i>	11629—“ “ “ “ “ 3,000 “	88 00
<i>Moonrise.</i>	11630—“ “ “ “ “ 6,600 “	129 00

For the higher voltages it is sometimes advisable to use two or more small insulators in series instead of one large insulator. See pages 94 and 95.

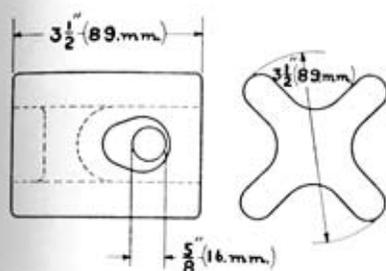
See “Rating,” page 10.



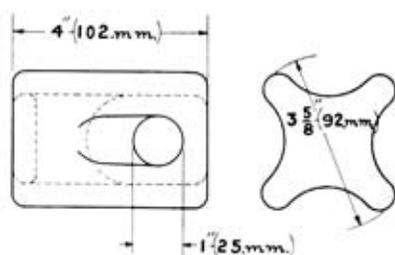
O-B PORCELAIN STRAIN INSULATOR

Patented

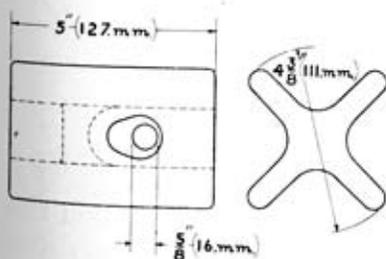
Type X—1,500-3,000-6,600 Volts



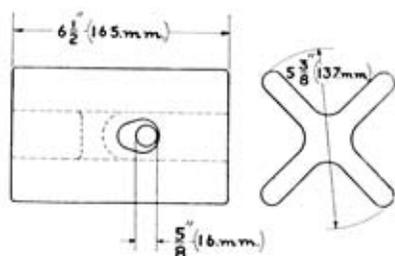
No. 12458



No. 13431



No. 11629



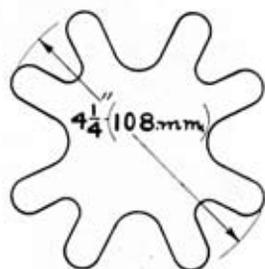
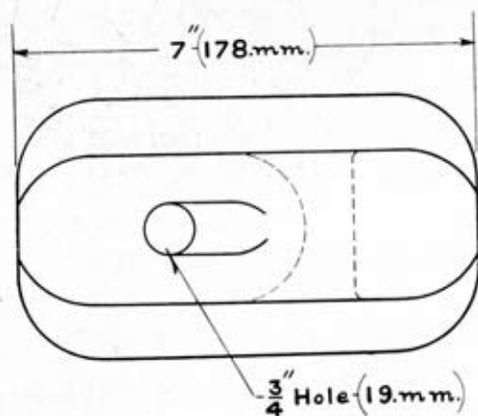
No. 11630

See description and list on the opposite page.



O-B PORCELAIN STRAIN INSULATOR

Multi-Fin—6,600 Volts



No. 25314

A STURDY design particularly suited to catenary construction and steam road electrification. Ultimate strength is in excess of 20,000 lbs. (9,070 Kilograms).

Approximate Net Weight, per 100	(204 Kg.)	450 lbs.
Approximate Weight Packed, per 100	(222 Kg.)	490 lbs.
Approximate Number in Package		70

Code Word
Rawbone.

No.
25314—Multi-Fin Insulator, General Rating 6,600 Volts

List per 100
\$128 00

See "Rating," page 10.



PORCELAIN STRAIN INSULATORS



Nos. 11927-11929



Nos. 10341-10343

MADE of "Dry Ware" Porcelain. Used for insulating guys and stays.

Code Word	No.	Approximate Ultimate Strength, Pounds	Diameter, Inches	Length, Inches	Diameter Grooves, Inches	Approximate Weight per 100 in Pounds		List per 100
						Net	Packed	
<i>Monarcho.</i>	11927	10,000	2 $\frac{5}{16}$	2 $\frac{9}{16}$	4 4 4 4 4 4	63	72	\$18 00
<i>Monastic.</i>	11928	12,000	2 $\frac{3}{4}$	3 $\frac{1}{4}$		113	125	28 00
<i>Monaxial.</i>	11929	15,000	3 $\frac{1}{4}$	5		300	340	48 00
<i>Calamus.</i>	10341*	10,000	2 $\frac{1}{2}$	3		88	95	12 00
<i>Calcify.</i>	10342*	12,000	2 $\frac{1}{2}$	3 $\frac{1}{2}$		140	150	15 00
<i>Calcine.</i>	10343*	15,000	3 $\frac{1}{4}$	5 $\frac{1}{2}$		275	300	30 00

*Nos. 10341, 10342 and 10343 are known by trade numbers 502, 504 and 506, respectively.



TYPE X INSULATOR FITTINGS

Patented



Nos. 12841-12843



Nos. 12841-12843-12845



No. 13400

USED for installing Type X and XH Insulators, except No. 11630, listed on pages 88-91; also with Link Strain Insulator, pages 86-87.

Use of fittings, with single Insulator or with several in series, gives a positive connection and permits easy renewal of damaged Insulators.

Bolts are provided with lead sleeve for bearing on porcelain.

Ultimate strength for the $\frac{5}{16}$ -inch bolts is 8,000 pounds (3,630 Kilograms); for the $\frac{3}{8}$ -inch bolt, 11,000 pounds (4,990 Kilograms). Larger bolts can be furnished to meet special conditions.

Strength of castings is greater than that of bolts.

Bolts are forged steel; castings, malleable iron, all sherardized.

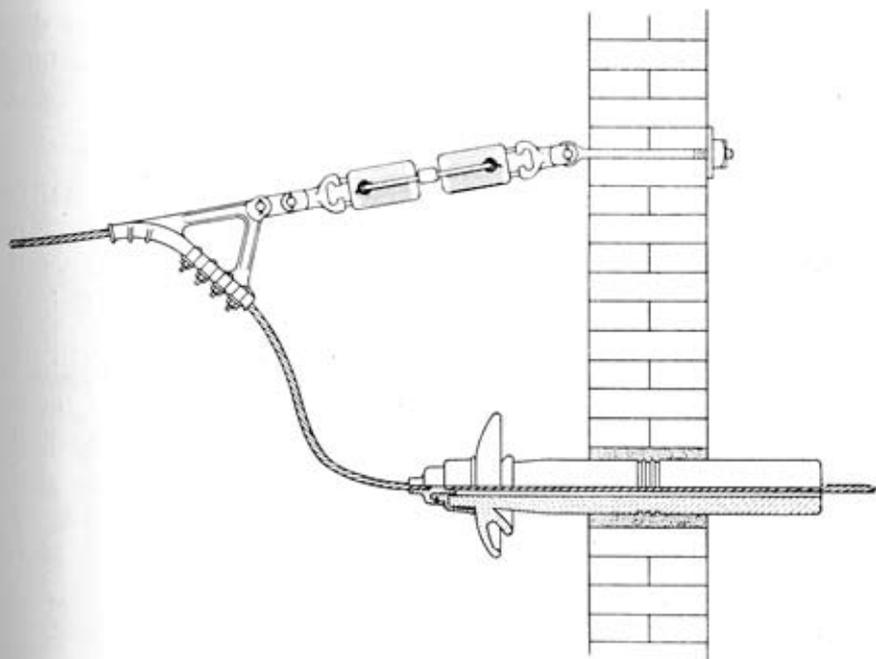
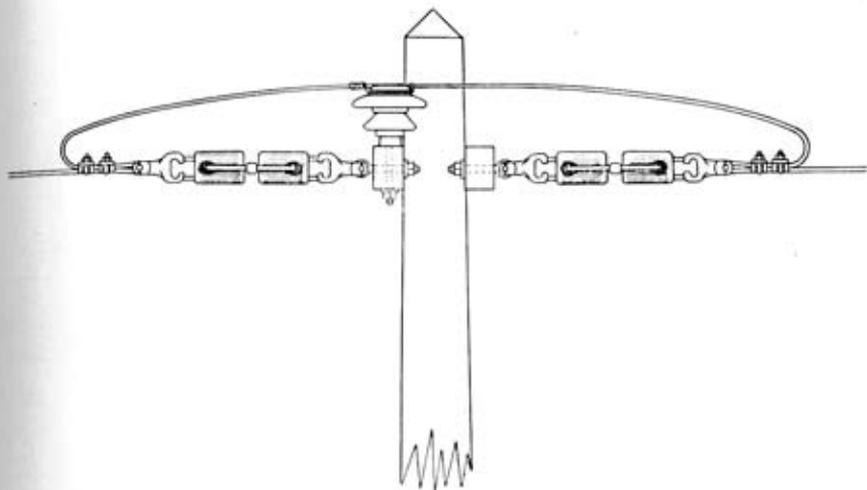
Opening in clevis is $\frac{13}{16}$ inch; diameter clevis bolt, $\frac{1}{2}$ inch.

Eye in Nos. 12843 and 12844 is $1\frac{1}{2} \times 1\frac{1}{4}$ inch.

Code Word	No.		List per 100
<i>Pirate.</i>	12841—End Bolt	$\frac{5}{16}$ inch Diameter, with Clevis	\$192 00
<i>Pirogue.</i>	12842—“ “	$\frac{3}{8}$ “ “ “ “	248 00
<i>Piscary.</i>	12843—“ “	$\frac{3}{8}$ “ “ “ “ Eye	146 00
<i>Piscinal.</i>	12844—“ “	$\frac{3}{8}$ “ “ “ “	202 00
<i>Pistol.</i>	12845—Intermediate Bolt,	$\frac{5}{16}$ inch Diameter, with Casting	206 00
<i>Pitcher.</i>	12846—“ “	$\frac{3}{8}$ “ “ “ “	206 00
<i>Rawhide.</i>	13400—Tool for Type X Insulator Fittings		762 00

End bolts can be furnished with sockets for holding any size cable.
Other fittings can be furnished for special conditions.

TYPE X INSULATOR FITTINGS



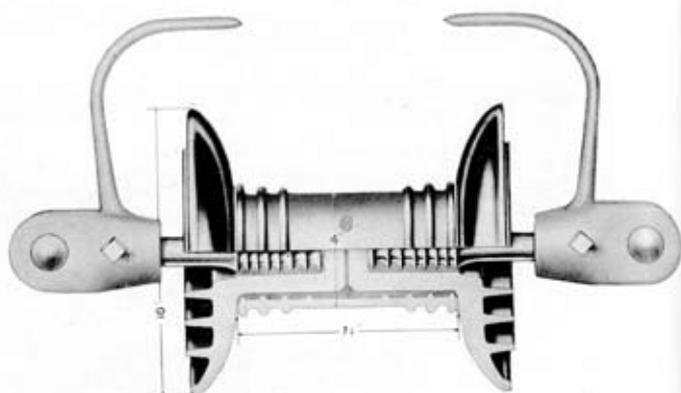
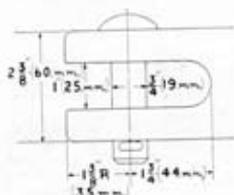
Showing methods of dead-ending lines



O-B PORCELAIN STRAIN INSULATOR

Patented

30,000 Volts



No. 11689

END castings are provided with discharge horns which cut down the time lag for excessive surges and increase the factor of safety of the Insulator.

All metal parts are galvanized.

Test Voltage.....		110,000
Maximum Working Load.....	(2,265 Kg.)	5,000 lbs.
Ultimate Strength.....	(9,100 Kg.)	20,000 lbs.
Opening in Clevis.....	(25 mm.)	1 inch
Diameter of Clevis Bolt.....	(19 mm.)	3/4 inch
Distance between centers of Clevis Bolts ...	(495 mm.)	19 1/2 inches
Approximate Net Weight, per 100.....	(1,860 Kg.)	4,100 lbs.
Approximate Weight Packed, per 100.....	(2,265 Kg.)	5,000 lbs.
Approximate Number in Crate.....		4

Code Word

No.

Moonseed.

11689—Strain Insulator, General Rating 30,000 Volts.....

List Each

\$44 00

Insulators of this type with greatly improved characteristics can be furnished owing to developments in manufacturing facilities. Attention should be called if ordering for radio work as Insulators are assembled specially.

See "Rating," page 10.

**O-B PORCELAIN BUS BAR INSULATORS**

Type A, Form 1—Patented



No. 10948



No. 10951

THE clamp which holds the bus bar in place is attached to a ring so that it can be rotated, making a secure clamp for a bar of any width not exceeding 4 (102 mm.) inches. It will clamp either round or rectangular bars and with the bolts as regularly furnished, will take any bar not over 3 (76 mm.) inches high. Higher bars may be used by employing longer clamping bolts.

All castings are malleable iron, galvanized, except top strap, which is bronze.

Code Word	No.	No. of Units	General Rating Indoor Service	Test Voltage per Unit Unassembled	Height Overall	Net Weight, Each	List Each
<i>Intercur.</i>	10948	1	13,000	75,000	7½ in. (191 mm.)	14 lbs. (6.3 Kg.)	\$12 00
<i>Interdash.</i>	10949	1	17,000	85,000	7½ in. (191 mm.)	16 lbs. (7.3 Kg.)	13 00
<i>Interdome.</i>	10950	2	33,000	75,000	12¼ in. (327 mm.)	22 lbs. (10.0 Kg.)	23 00
<i>Interesse.</i>	10951	2	44,000	85,000	12¼ in. (327 mm.)	27 lbs. (12.2 Kg.)	24 00

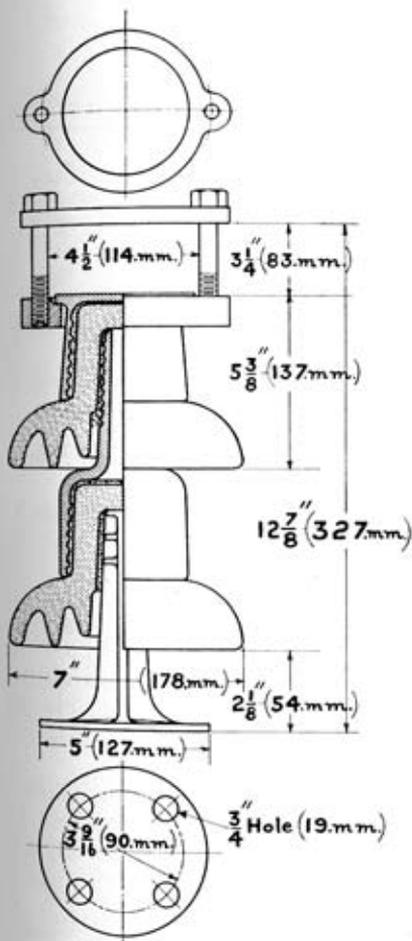
The cap and base castings of all Insulators listed on pages 98, 100 and 105 are interchangeable.

See "Rating," page 10.

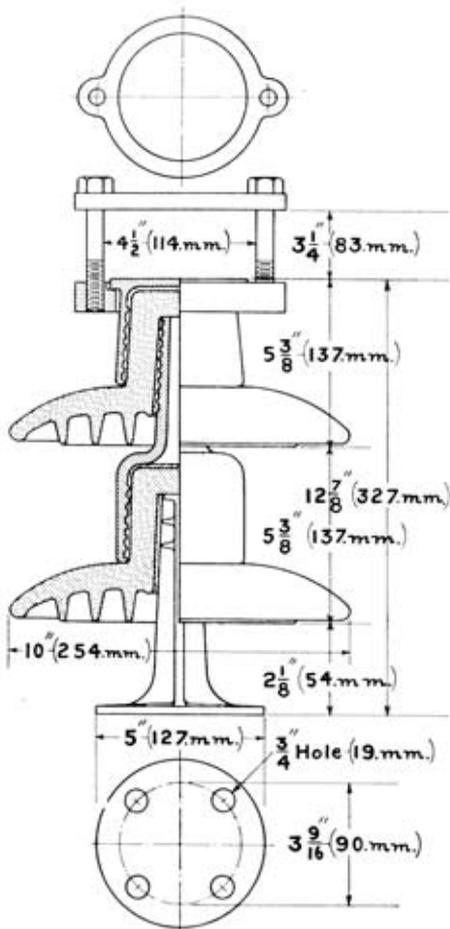


O-B PORCELAIN BUS BAR INSULATORS

Type A, Form 1—Patented



No. 10950



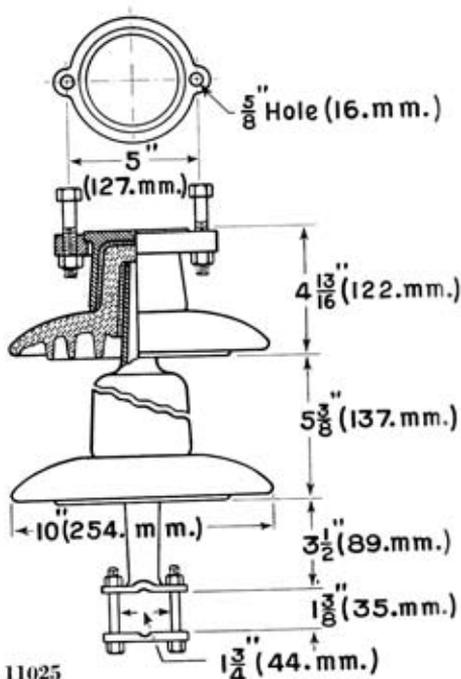
No. 10951

See diagrams of Bus Bar connections on pages 102 and 103.

See description and list on the opposite page.

**O-B PORCELAIN BUS BAR INSULATORS**

Type B, Form 1—Patented



No. 11025

INTENDED for suspending bus bars, the adjustable ring cap being attached to the overhead structure by two bolts passing through the ring casting. This allows Insulator to be rotated about its vertical axis before bolts are finally tightened so that bus bar clamp will hold bus bar centrally. Bolts in cap casting are $\frac{3}{8}$ x 5 inches, but the length can be varied according to requirements.

Bronze bus bar clamp, with $\frac{3}{8}$ x 2 $\frac{1}{2}$ -inch bolts as ordinarily furnished, will grip a pipe of 1 $\frac{3}{4}$ inches outside diameter or a flat bus bar 1 $\frac{1}{4}$ inches wide and 1 $\frac{3}{8}$ inches high; higher bars may be used by substituting longer bolts. All other castings are malleable iron, galvanized.

See also other designs on the following pages.

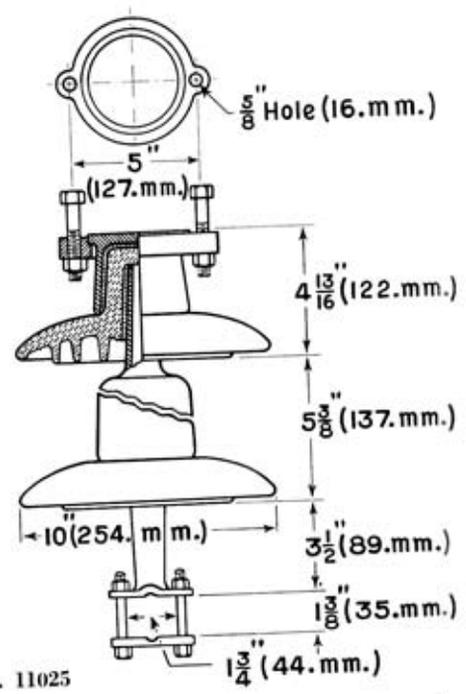
Code Word	No.	No. of Units	General Indoor Rating	Height Overall	Net Weight, Each	List Each
<i>Licking.</i>	11368	3	75,000	19 $\frac{1}{8}$ in. (484 mm.)	43 lbs. (19.5 Kg.)	\$36 00
<i>Interhyal.</i>	11025	4	90,000	24 $\frac{1}{8}$ in. (621 mm.)	57 lbs. (25.8 Kg.)	46 00
<i>Lictor.</i>	11369	5	110,000	29 $\frac{1}{8}$ in. (757 mm.)	71 lbs. (32.2 Kg.)	64 00
<i>Liefsome.</i>	11370	6	135,000	35 $\frac{1}{8}$ in. (894 mm.)	85 lbs. (38.6 Kg.)	80 00
<i>Lifeboat.</i>	11371	7	150,000	40 $\frac{1}{8}$ in. (1030 mm.)	99 lbs. (45.0 Kg.)	97 00

Each section of above Insulators is tested at 85,000 volts before being assembled. The cap and base castings of all Insulators listed on pages 98, 100 and 105 are interchangeable.

See "Rating," page 10.

O-B PORCELAIN BUS BAR INSULATORS

Type B, Form 1—Patented



INTENDED for suspending bus bars, the adjustable ring cap being attached to the overhead structure by two bolts passing through the ring casting. This allows Insulator to be rotated about its vertical axis before bolts are finally tightened so that bus bar clamp will hold bus bar centrally. Bolts in cap casting are $\frac{5}{8}$ "x5 inches, but the length can be varied according to requirements.

Bronze bus bar clamp, with $\frac{3}{8}$ "x2 $\frac{1}{2}$ "-inch bolts as ordinarily furnished, will grip a pipe of 1 $\frac{3}{4}$ " inches outside diameter or a flat bus bar 1 $\frac{1}{2}$ " inches wide and 1 $\frac{1}{8}$ " inches high; higher bars may be used by substituting longer bolts. All other castings are malleable iron, galvanized. See also other designs on the following pages.

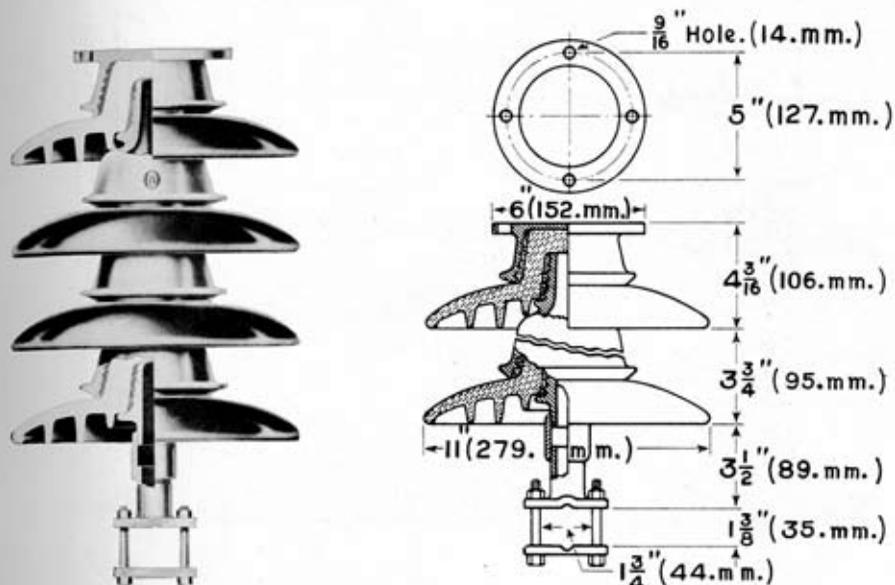
Code Word	No.	No. of Units	General Indoor Rating	Height Overall	Net Weight, Each	List Each
<i>Licking.</i>	11368	3	75,000	19 $\frac{1}{8}$ " in. (484 mm.)	43 lbs. (19.5 Kg.)	\$36 00
<i>Interhyal.</i>	11025	4	90,000	24 $\frac{1}{8}$ " in. (621 mm.)	57 lbs. (25.8 Kg.)	46 00
<i>Lictor.</i>	11369	5	110,000	29 $\frac{1}{8}$ " in. (757 mm.)	71 lbs. (32.2 Kg.)	64 00
<i>Liefsome.</i>	11370	6	135,000	35 $\frac{1}{8}$ " in. (894 mm.)	85 lbs. (38.6 Kg.)	80 00
<i>Lifboat.</i>	11371	7	150,000	40 $\frac{1}{8}$ " in. (1030 mm.)	99 lbs. (45.0 Kg.)	97 00

Each section of above Insulators is tested at 85,000 volts before being assembled. The cap and base castings of all Insulators listed on pages 98, 100 and 105 are interchangeable. See "Rating," page 10.



O-B PORCELAIN BUS BAR INSULATORS

Type B, Form 2—Patented



No. 12860

USED for supporting high tension bus bars suspended from above.

Bus Bar clamp is bronze and is held in place by $\frac{3}{8}$ x $2\frac{1}{2}$ -inch bolts. It will grip a pipe $1\frac{1}{4}$ inches outside diameter or a flat bus bar $1\frac{1}{4}$ inches wide and $1\frac{3}{8}$ inches high. Higher bars may be held by using longer bolts.

All other castings are malleable iron galvanized.

Clamp is attached to lower unit through a threaded coupling as shown. This permits clamp to be rotated for alignment.

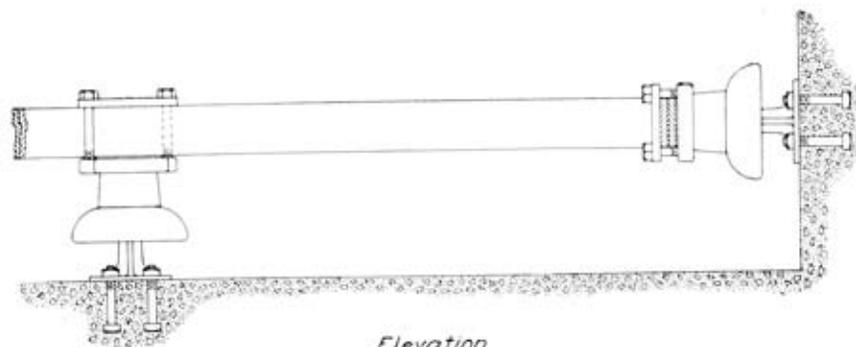
Code Word	No.	No. of Units	General Indoor Rating	Height Overall	Net Weight, Each	List Each
Plaque.	12859	3	75,000	$15\frac{3}{16}$ in. (386 mm.)	40 lbs. (18.1 Kg.)	\$38 00
Plaided.	12860	4	90,000	$18\frac{1}{2}$ in. (481 mm.)	51 lbs. (23.1 Kg.)	52 00
Planary.	12861	5	110,000	$22\frac{1}{2}$ in. (576 mm.)	62 lbs. (28.1 Kg.)	67 00
Planking.	12862	6	135,000	$26\frac{1}{8}$ in. (672 mm.)	74 lbs. (33.5 Kg.)	84 00
Plantage.	12863	7	150,000	$30\frac{3}{8}$ in. (767 mm.)	85 lbs. (38.5 Kg.)	104 00

Each section of above Insulators is tested at 95,000 volts before being assembled. The cap and base castings of all Insulators listed on pages 101 and 106 are interchangeable.

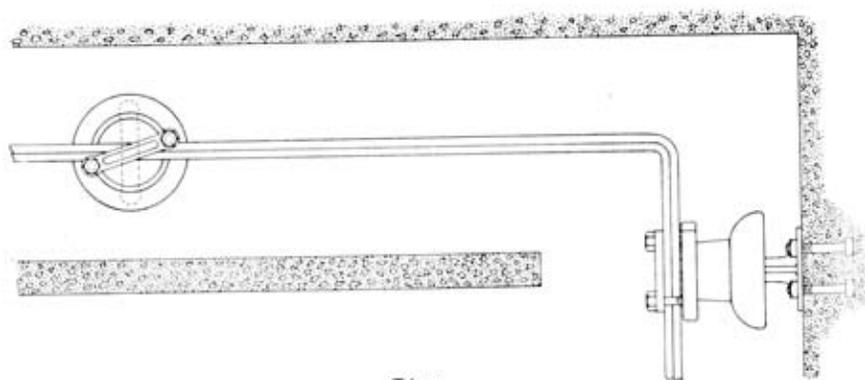
See "Rating," page 10.



LOW VOLTAGE BUS BAR INSTALLATION



Elevation



Plan

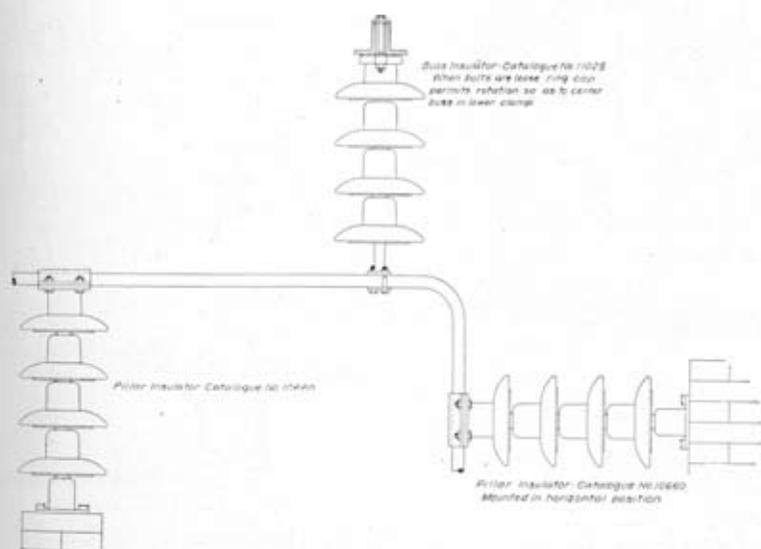
O-B Bus Bar Insulator No. 10948 is used

Bus bar is held tightly against rigid cap of insulator, which affords ample strength to resist magnetic pull in case of short circuit with large bus bars.

Revolving ring permits bus bar to be attached to insulator in any desired position. Clamping device accommodates a wide range of sizes of both rectangular and circular bus bars.



HIGH VOLTAGE BUS BAR INSTALLATION

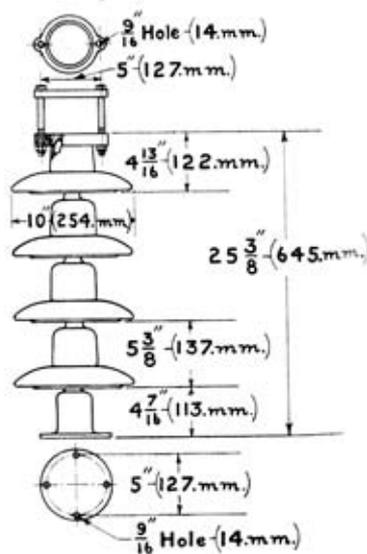
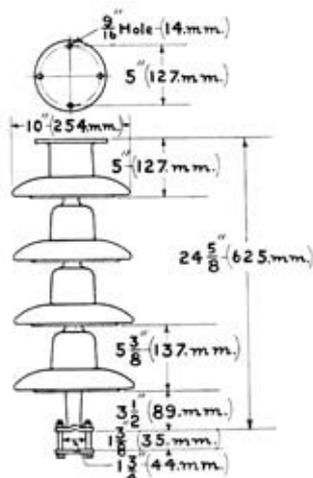
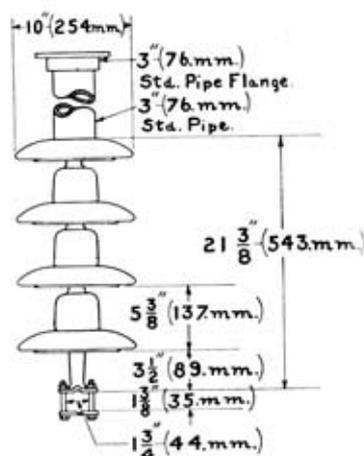
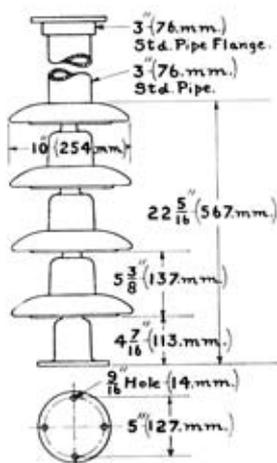


Flanges of cap and base castings of insulator No. 10660 have same drilling, which makes it possible to mount the insulator in any desired position.

Insulator No. 10660 may be furnished with Revolving Ring described on preceding page, if desired.



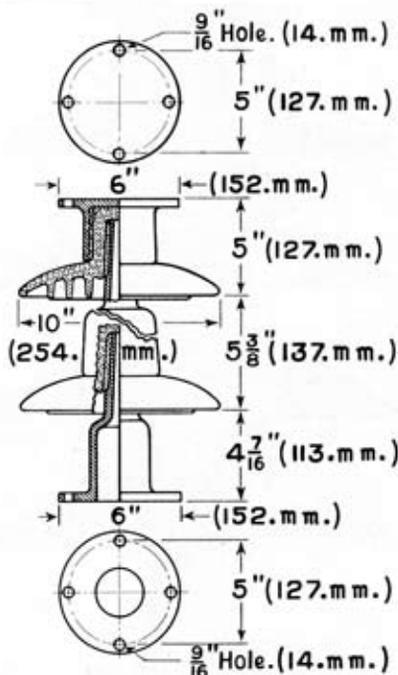
O-B PORCELAIN BUS BAR INSULATORS



THE above diagrams show various combinations of fittings which readily suggest themselves for use with the Type B, Form 1, Pillar and Bus Bar Insulators listed on pages 100 and 105.

O-B PORCELAIN PILLAR INSULATOR

Type B, Form I—Patented
Outdoor and Indoor Service



No. 10660

IN TENDED for insulating high voltage bus bars, switches, etc. They are suitable for mounting supported from below or suspended from above or may be mounted horizontally by bolting to a wall.

In assembling, the bolt holes in the cap and base are kept in the same relative position. The Insulators are assembled before shipment and packed one in a crate. All castings are malleable iron, galvanized.

See also other designs on the following pages.

Code Word	No.	No. of Units	General Rating		Approximate Height Overall	Net Weight, Each	List Each
			Outdoor	Indoor			
<i>Knurly.</i>	11366	3	60,000	75,000	20 ³ / ₁₆ in. (513 mm.)	40 lbs. (18.1 Kg.)	\$36 00
<i>Hohern.</i>	10660	4	75,000	90,000	25 ³ / ₁₆ in. (649 mm.)	50 lbs. (22.7 Kg.)	50 00
<i>Hodman.</i>	10661	5	90,000	110,000	30 ¹ / ₁₆ in. (786 mm.)	60 lbs. (27.2 Kg.)	64 00
<i>Holcad.</i>	10662	6	110,000	135,000	36 ³ / ₁₆ in. (922 mm.)	70 lbs. (31.8 Kg.)	80 00
<i>Kummel.</i>	11367	7	135,000	150,000	41 ¹ / ₁₆ in. (1059 mm.)	80 lbs. (36.3 Kg.)	97 00

Each section is tested at 85,000 volts before being assembled.

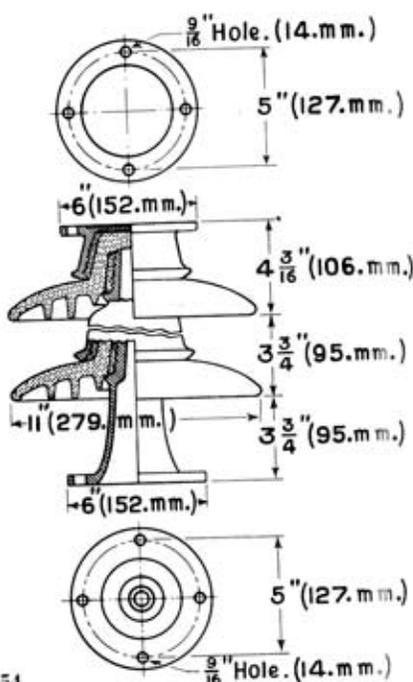
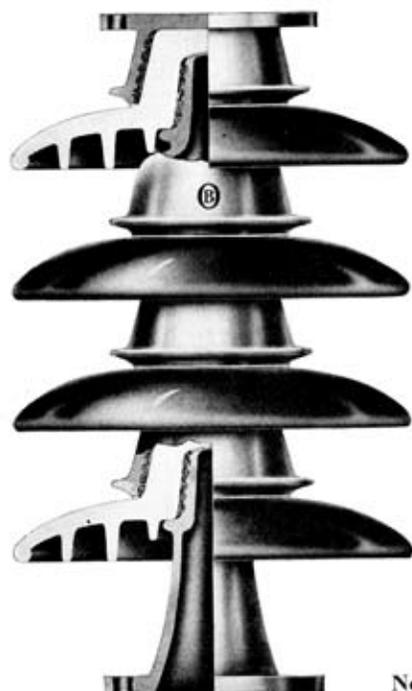
The cap and base castings of all Insulators listed on pages 98, 100 and 105 are interchangeable.

See "Rating," page 10.



O-B PORCELAIN PILLAR INSULATOR

Type B, Form 3—Patented
Outdoor and Indoor Service



No. 12454

USED for insulating high voltage bus bars, switches, etc. They are suitable for mounting supported from below or suspended from above or horizontally by bolting to a wall.

In assembling, bolt holes in cap and base are kept in same relative position.

Assembled before shipment and packed one per crate. All castings are malleable iron, galvanized.

Code Word	No.	No. of Units	General Rating		Approximate Height Overall	Net Weight, Each	List Each
			Outdoor	Indoor			
<i>Placid.</i>	12857	1	.....	17,000	7 1/2 in. (202 mm.)	18 lbs. (8.2 Kg.)	813 00
<i>Plagal.</i>	12858	2	.....	44,000	11 1/8 in. (297 mm.)	29 lbs. (13.1 Kg.)	26 00
<i>Outswell.</i>	12453	3	60,000	75,000	15 1/2 in. (392 mm.)	40 lbs. (18.1 Kg.)	38 00
<i>Outwall.</i>	12454	4	75,000	90,000	19 3/8 in. (487 mm.)	51 lbs. (23.1 Kg.)	52 00
<i>Outwear.</i>	12455	5	90,000	110,000	22 1/2 in. (583 mm.)	62 lbs. (28.1 Kg.)	66 00
<i>Outwit.</i>	12456	6	110,000	135,000	26 1/2 in. (678 mm.)	74 lbs. (33.6 Kg.)	84 00
<i>Oration.</i>	12457	7	135,000	150,000	30 7/8 in. (773 mm.)	85 lbs. (38.6 Kg.)	104 00

Each section of above Insulators is tested at 95,000 volts before being assembled. The cap and base castings of all Insulators listed on pages 101 and 106 are interchangeable.

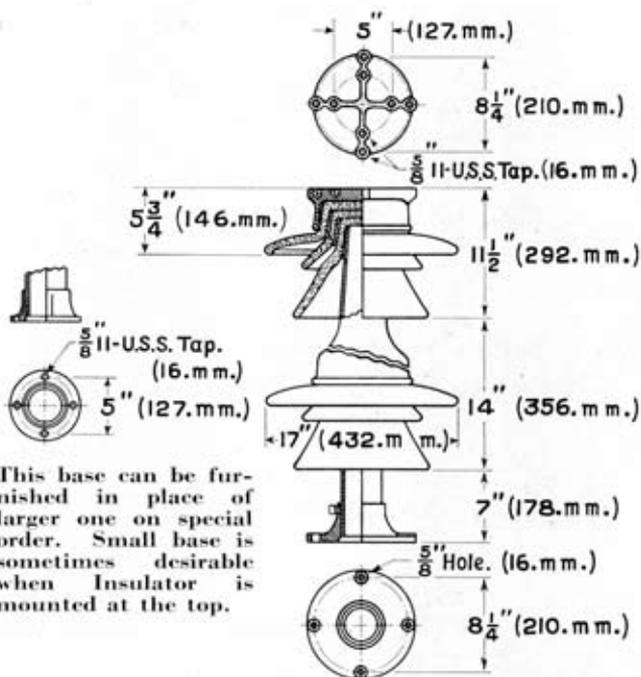
See "Rating," page 10.



O-B PORCELAIN PILLAR INSULATOR

Type B, Form 4—Patented

Outdoor and Indoor Service



This base can be furnished in place of larger one on special order. Small base is sometimes desirable when Insulator is mounted at the top.

No. 13222

ESPECIALLY adapted for heavy duty switch and bus work. Mechanical ultimate strength is 60,000 inch-pounds around the base. Top casting has two sets of holes spaced on 8 1/4 and 5-inch circles. Base has slight vertical adjustment where needed. Pin type insulators used embody all the latest refinements. Assembled before shipping and packed one per crate. All parts and the assembled elements given rigid factory tests before shipment. Metal parts are galvanized.

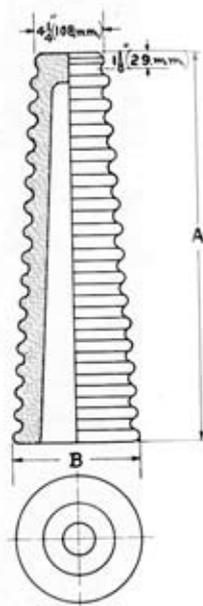
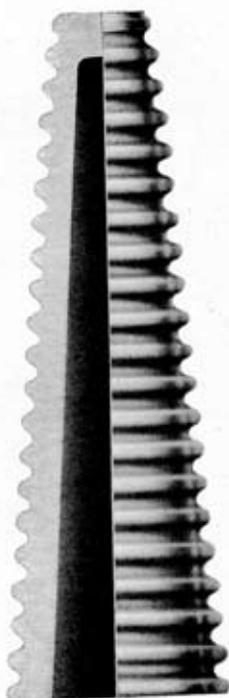
Code Word	No.	No. of Units	General Rating	Approximate Height, Overall	Net Weight, Each	List Each
<i>Rissoid.</i>	13709	2	120,000	32 1/2 in. (826 mm.)	137 lbs. (62.2 Kg.)	\$ 72 00
<i>Racemic.</i>	13222	3	165,000	46 1/2 " (1181 mm.)	200 " (90.9 Kg.)	106 00
<i>Ritratto.</i>	13710	4	220,000	60 1/2 " (1537 mm.)	263 " (119.5 Kg.)	140 00

See "Rating," page 10.



O-B PORCELAIN POST INSULATOR

One Piece—For Indoor Service



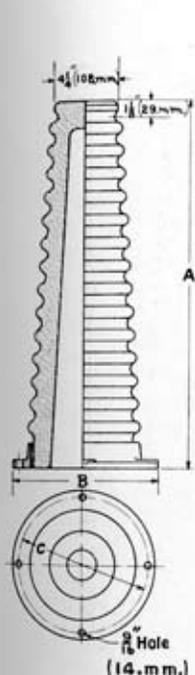
SIMILAR to Insulators listed on opposite page, but without base casting. Made of one piece of porcelain and intended for supporting high tension switches, etc., in stations.

Code Word	No.	General Rating	Net Weight, Each		Inches		Millimeters		List Each
			Pounds	Kilo-grams	A	B	A	B	
<i>Pitiful.</i>	12866	22,000	22	10.0	12	7	305	178	\$ 32 00
<i>Pitying.</i>	12868	44,000	35	15.9	18	7	457	178	42 00
<i>Placeful.</i>	12870	66,000	45	20.4	24	8	610	203	52 00
<i>Placid.</i>	12872	88,000	64	29.0	30	10	762	254	62 00
<i>Placket.</i>	12874	120,000	77	34.9	36	10	914	254	72 00
<i>Ritual.</i>	13712	150,000	92	41.7	41	11 1/2	1041	289	126 00
<i>Rivalry.</i>	13713	220,000	137	62.0	51	13	1295	330	156 00

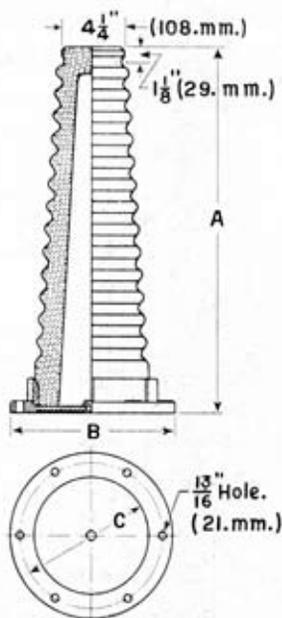
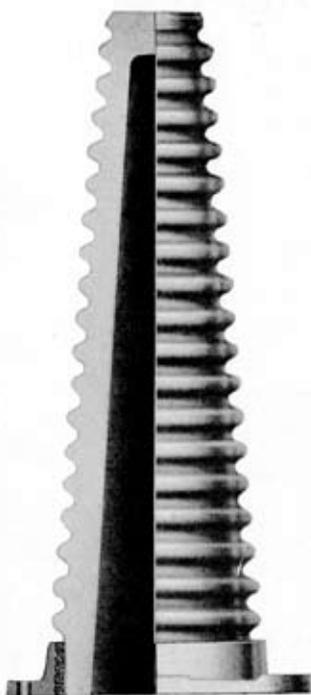
See "Rating," page 10

O-B PORCELAIN POST INSULATOR

One Piece—For Indoor Service



Nos. 12865-12873



Nos. 13714-13715

MADE of one piece of porcelain and intended for supporting high tension switches, etc., in stations.

Can be supported from below or suspended from above or mounted horizontally by bolting to a wall.

Base casting is malleable iron, galvanized.

Code Word	No.	General Rating	Net Weight, Each		Inches			Millimeters			List Each
			Pounds	Kilo-grams	A	B	C	A	B	C	
<i>Pitfall.</i>	12865	22,000	30	13.6	12	9 1/4	8	305	235	203	\$ 37 00
<i>Pitter.</i>	12867	44,000	43	19.5	18	9 1/4	8	457	235	203	47 00
<i>Placard.</i>	12869	66,000	57	25.8	24	10 1/4	9	610	260	229	60 00
<i>Placer.</i>	12871	88,000	79	35.8	30	12 1/4	11	762	311	279	70 00
<i>Placiturn.</i>	12873	120,000	92	41.7	36	12 1/4	11	914	311	279	82 00
<i>Rivulet.</i>	13714	150,000	126	57.1	41 1/2	15 1/2	13 1/2	1057	394	343	140 00
<i>Roadster.</i>	13715	220,000	189	85.6	51 1/2	17	15	1311	432	381	170 00

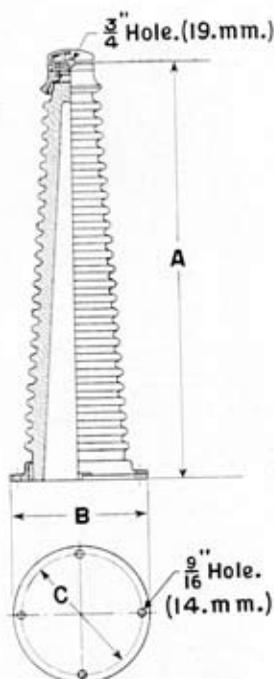
See "Rating," page 10.



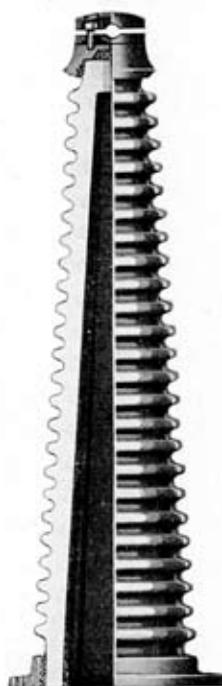
O-B PORCELAIN POST INSULATOR

For Indoor Service

120,000 Volts



Nos. 13716-13224



Nos. 13720-13721

This Post Insulator is furnished as shown with special fittings for bus bar work.

Cap casting can be cemented on so as to throw line of the bus at any desired angle with the drillings in the base. Information on this point is requested with order.

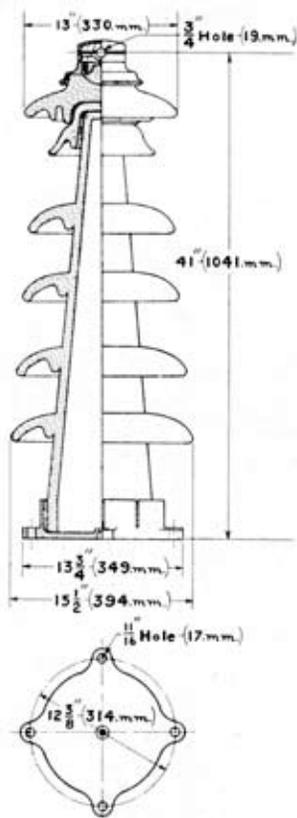
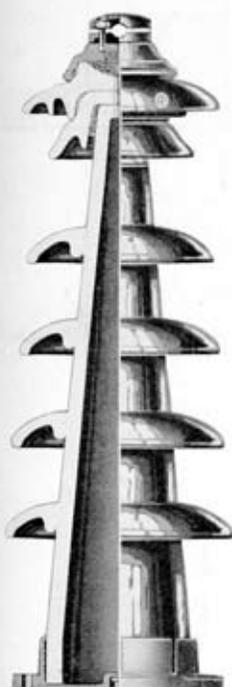
Code Word	No.	General Rating	Net Weight, Each		Inches			Millimeters			List Each
			Pounds	Kilo-grams	A	B	C	A	B	C	
<i>Roaring.</i>	13716	22,000	36	16.3	13 $\frac{1}{2}$	9 $\frac{1}{2}$	8	349	235	203	\$ 45 00
<i>Robber.</i>	13717	44,000	49	22.2	19 $\frac{1}{2}$	9 $\frac{1}{2}$	8	502	235	203	55 00
<i>Robinet.</i>	13718	66,000	63	28.6	25 $\frac{1}{2}$	10 $\frac{1}{2}$	9	654	260	229	68 00
<i>Rocket.</i>	13719	88,000	85	38.5	31 $\frac{1}{2}$	12 $\frac{1}{2}$	11	806	311	279	78 00
<i>Racial.</i>	13224	120,000	98	44.4	37 $\frac{1}{2}$	12 $\frac{1}{2}$	11	959	311	279	90 00
<i>Rockweed.</i>	13720	150,000	132	59.8	42	15 $\frac{1}{2}$	13 $\frac{1}{2}$	1067	394	343	148 00
<i>Rockrose.</i>	13721	220,000	195	88.5	52	17	15	1321	432	381	178 00

These Insulators can be furnished with special size hole in cap.
See "Rating," page 10.

O-B PORCELAIN POST INSULATOR

For Outdoor Service

120,000 Volts



THIS Post Insulator is furnished with special fittings for bus bar work.

Cap casting can be cemented on so as to throw line of the bus at any desired angle with the drillings in the base. Information is requested with order on this point.

Net weight, 150 pounds (68 Kilograms) each.

Code Word
Rachitic.

No.	List Each
13223—Post Insulator, Complete with Fittings, General Rating 120,000 Volts, Outdoor Service.....	\$170 00

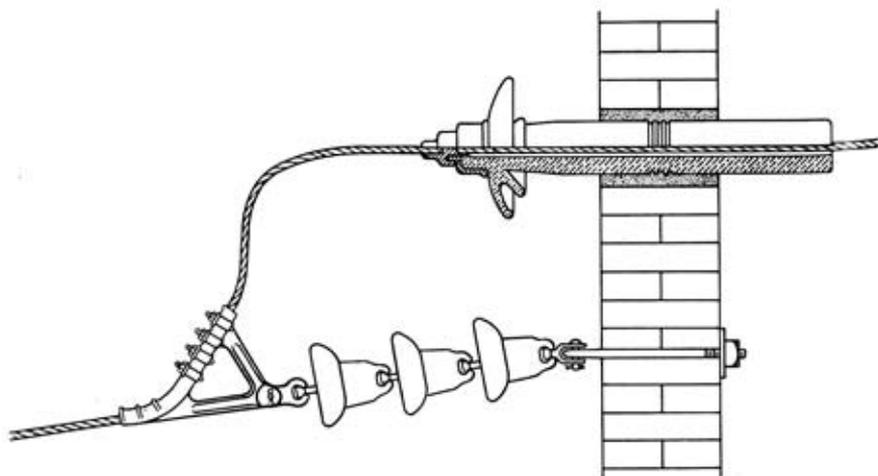
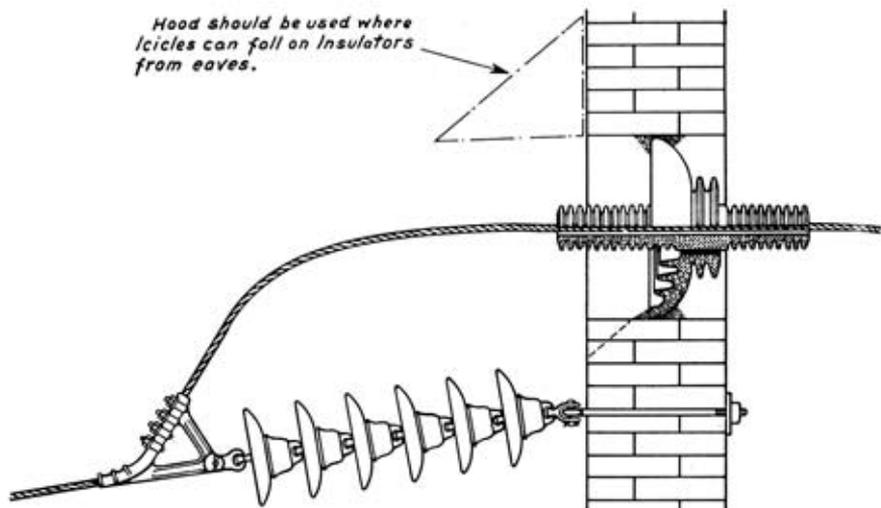
Insulator can be furnished with special size hole in cap.

See "Rating," page 10.



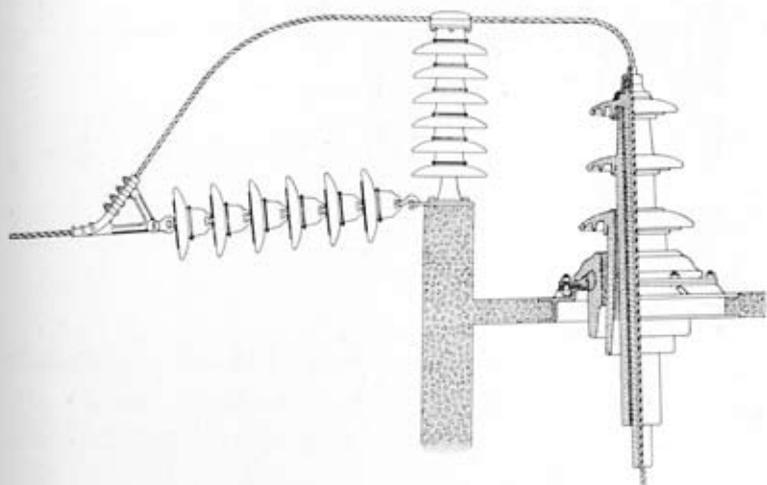
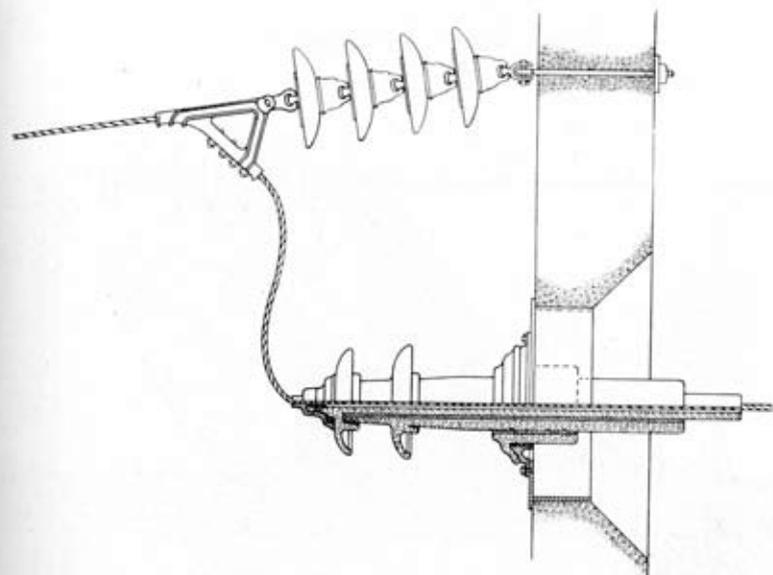
WALL ENTRANCE INSTALLATIONS

*Hood should be used where
icicles can fall on Insulators
from eaves.*



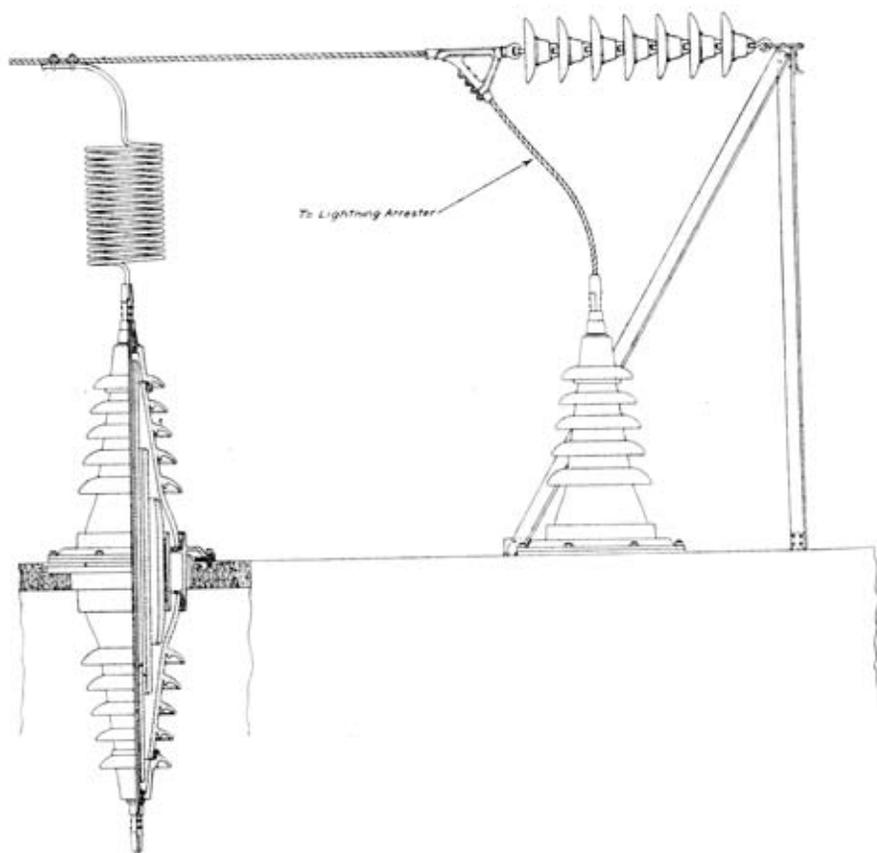
Where there is danger of icicles falling from eaves of roof, a protecting hood should be installed above the insulator.

WALL AND ROOF ENTRANCE INSTALLATIONS



A tarred felt gasket inserted between the flange casting of the bushing and roof insert flange cemented in the roof makes a water-tight joint.

ROOF ENTRANCE INSTALLATION

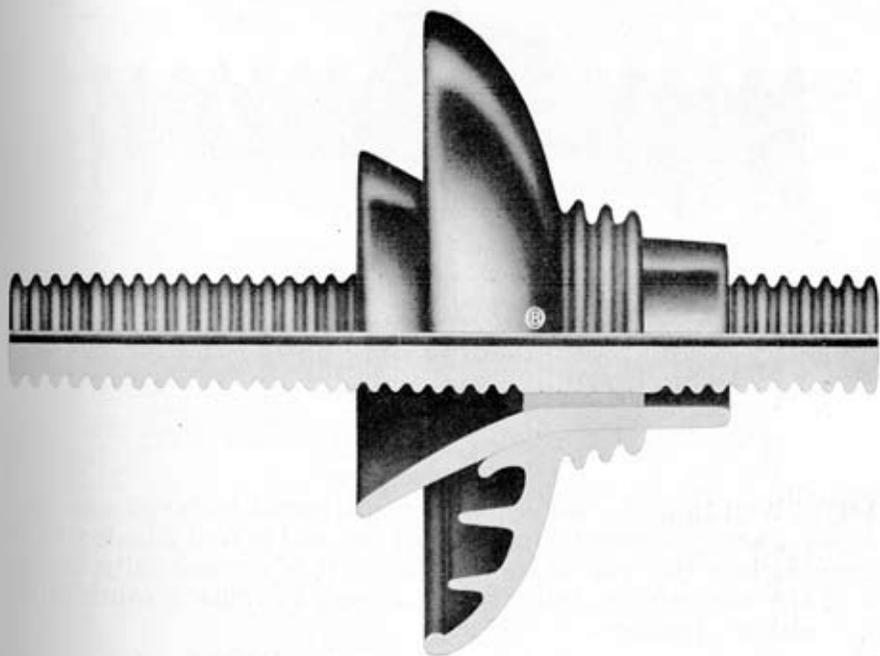


A tarred felt gasket inserted between the flange casting of bushing and roof insert flange cemented in roof makes a water-tight joint.



O-B PORCELAIN WALL INSULATORS

Extra Large Sizes



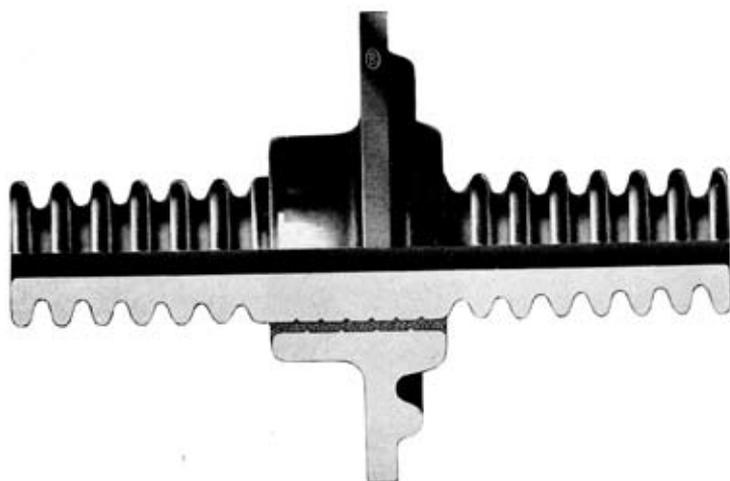
THE illustration is of one of the many large size Wall Insulators that we are prepared to furnish. These Insulators can be built with flanges up to 30 inches (762 mm.) in diameter to suit any conditions.

A part of O-B service is the free advice of experienced Engineers who will gladly aid in solving any difficult problems. You can take advantage of this service without obligating yourself in any way.



O-B PORCELAIN WALL INSULATOR

Type A, Form 1, 20,000—60,000 Volts



Square Flange

THIS Wall Insulator consists of a square porcelain flange cemented on a heavy corrugated porcelain tube, and is well adapted to be cemented into the wall of the building. It is exceptionally strong, all of the corrugations being heavy enough to resist a considerable blow without fracture.

In order to make the installation of these Wall Insulators complete, a small shed or housing should be built over each insulator where it is cemented into the wall to afford additional protection and help maintain dry surfaces in wet weather.

Code Word	No.	General Rating	Leakage Surface	Net Weight, Each	List Each
<i>Fraught.</i>	10045	20,000	19 $\frac{1}{4}$ in. (501 mm.)	32 lbs. (14.5 Kg.)	\$42 00
<i>Fraying.</i>	10046	40,000	24 $\frac{1}{4}$ " (616 mm.)	36 " (16.3 Kg.)	60 00
<i>Freckle.</i>	10047	60,000	26 $\frac{1}{4}$ " (673 mm.)	38 " (17.2 Kg.)	64 00

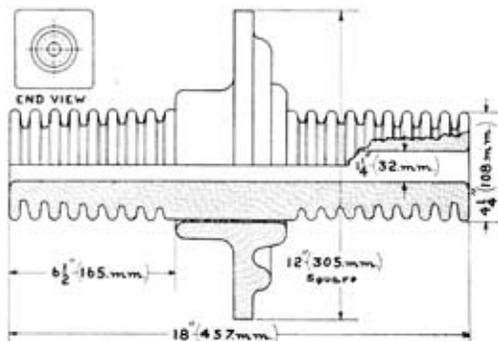
For larger sizes, see page 115.

See Wall and Roof Entrance Schemes on pages 112-114.

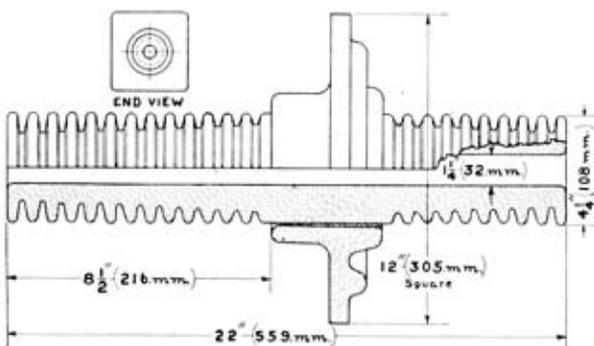
See "Rating," page 10.

**O-B PORCELAIN WALL INSULATOR**

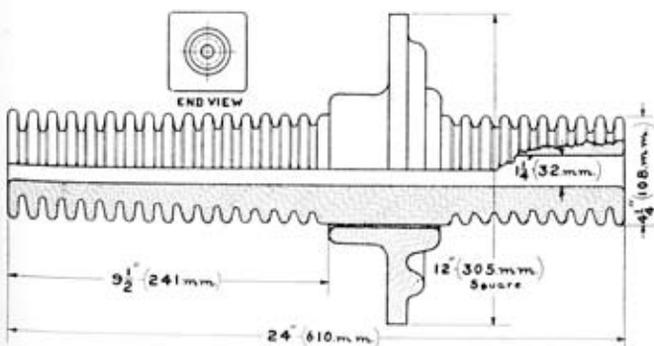
Type A, Form 1, 20,000—60,000 Volts



No. 10045



No. 10046

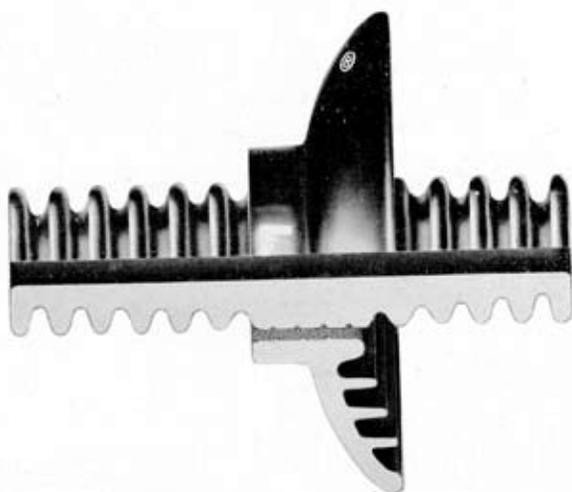


No. 10047

See description and list on the opposite page.

O-B PORCELAIN WALL INSULATOR

Type B, Form 1, 30,000—60,000 Volts



THIS Insulator consists of a corrugated porcelain disc cemented on a heavy corrugated porcelain tube, and differs from the Type "A," Form 1, Wall Insulator listed on the preceding page, in that the outer flange is circular instead of square. These insulators are equipped with shorter corrugated tubes than are used on the Type "A," Form 1, Insulators, because the circular flange in this case has more leakage surface than the square flange. These insulators may be cemented in the wall or in a small housing built on the side of the wall. In any case the corrugated surface of flange should face towards the outside.

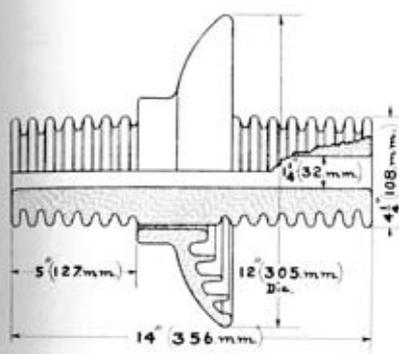
Code Word	No.	General Rating	Leakage Surface	Net Weight, Each	List Each
<i>Freedman.</i>	10048	30,000	19 in. (483 mm.)	22 lbs. (10.0 Kg.)	\$30 00
<i>Freedom.</i>	10049	50,000	21 " (533 mm.)	24 " (10.9 Kg.)	34 00
<i>Freezer.</i>	10050	60,000	30 " (762 mm.)	29 " (13.1 Kg.)	54 00

For larger sizes, see page 115.
See Wall and Roof Entrance Schemes on pages 112-114.
See "Rating," page 10.

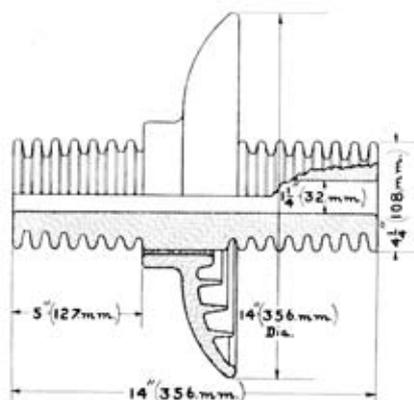


O-B PORCELAIN WALL INSULATOR

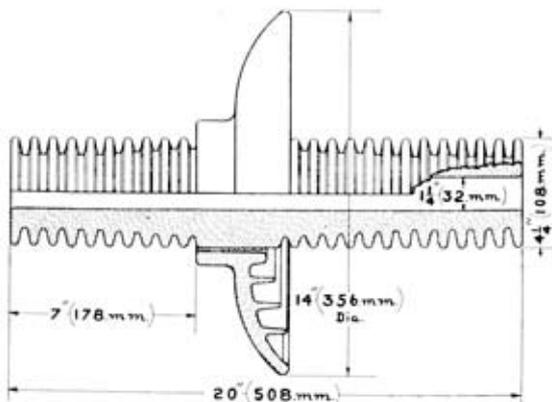
Type B, Form 1, 30,000—60,000 Volts



No. 10048



No. 10049



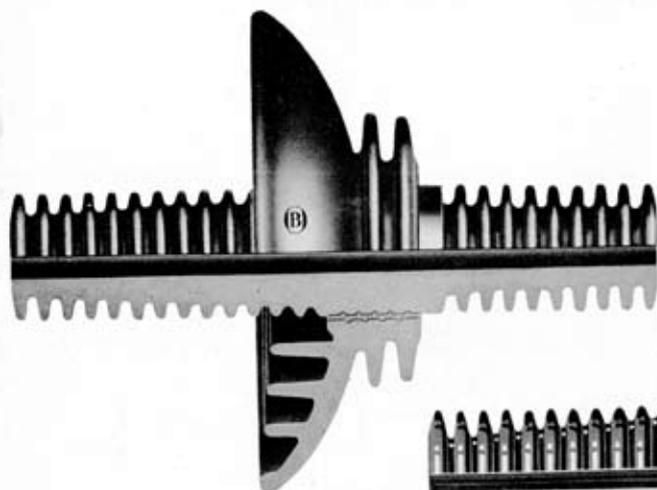
No. 10050

See description and list on the opposite page.

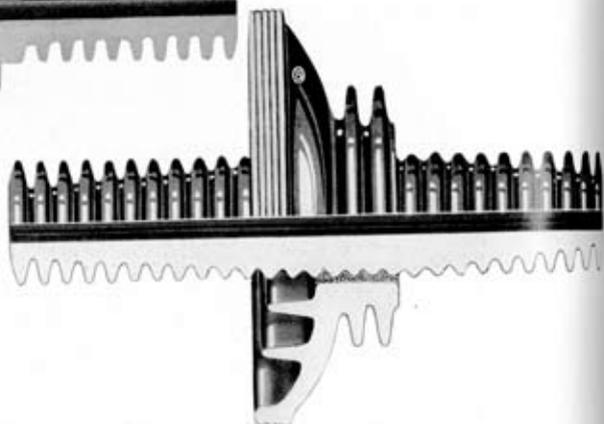


O-B PORCELAIN WALL INSULATOR

Type B, Form 3—70,000 Volts



No. 10563



No. 25424

CONSISTS of a corrugated porcelain flange cemented on a heavy corrugated porcelain tube. May be cemented in the wall or in a small housing built on the side of the wall. In any case the corrugated surface of flange should face towards the outside.

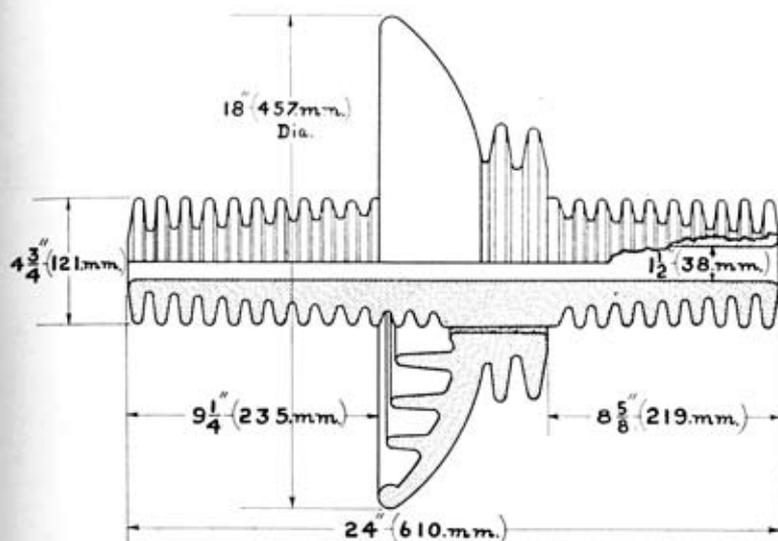
No. 25424 has outside edge of flange unglazed and corrugated to facilitate cementing into wall.

Code Word	No.	General Rating	Leakage Surface	Net Weight, Each	List Each
<i>Frenetic.</i>	10563	70,000	44 in. (1118 mm.)	65 lbs. (29.5 Kg.)	\$74 00
<i>Rockwood.</i>	25424	70,000	34 " (864 mm.)	55 " (25.0 Kg.)	74 00

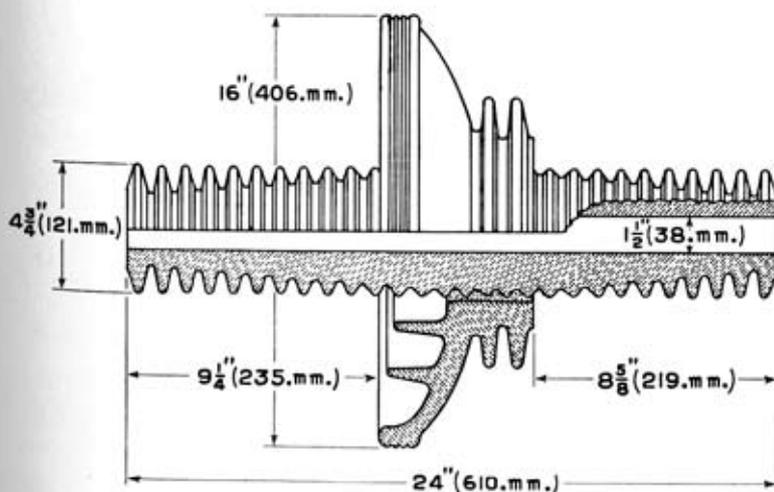
For larger sizes, see page 115.
See Wall and Roof Entrance Schemes on pages 112-114.
See "Rating," page 10.

O-B PORCELAIN WALL INSULATOR

Type B, Form 3—70,000 Volts



No. 10563



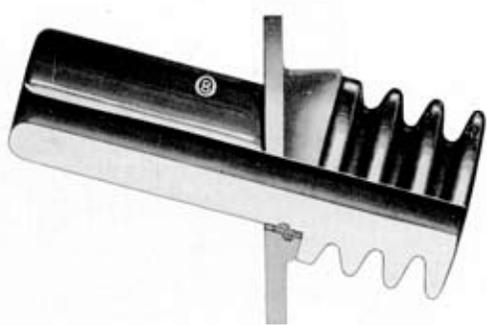
No. 25424

See description and list on the opposite page.

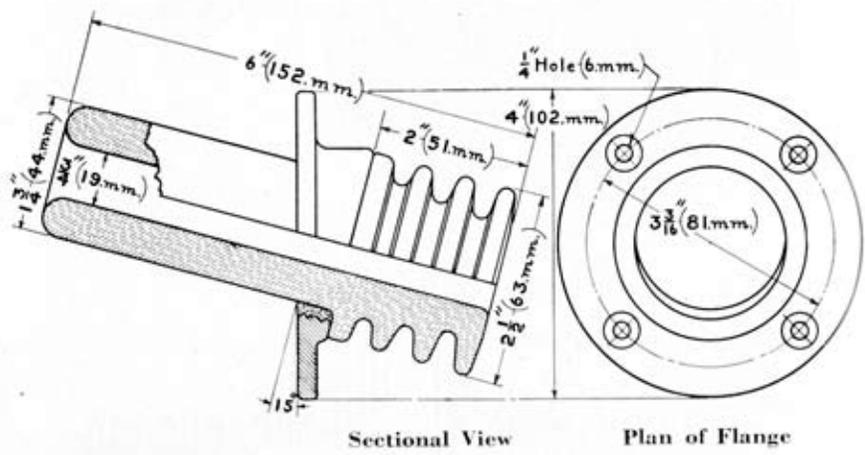


O-B LOW VOLTAGE OUTLET BUSHING

2300-6600 Volts



No. 13225



Sectional View

Plan of Flange

ESPECIALLY adapted for primary meter house outlets, etc. Bushing is furnished complete with flange as shown.

Can be furnished in special lengths, either end or both.

Flange is grey iron, galvanized.

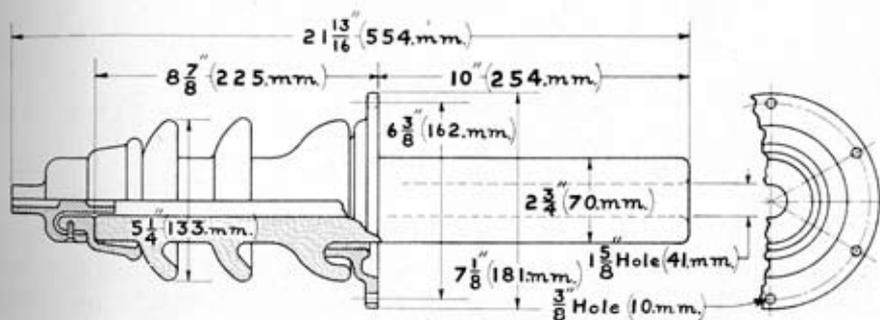
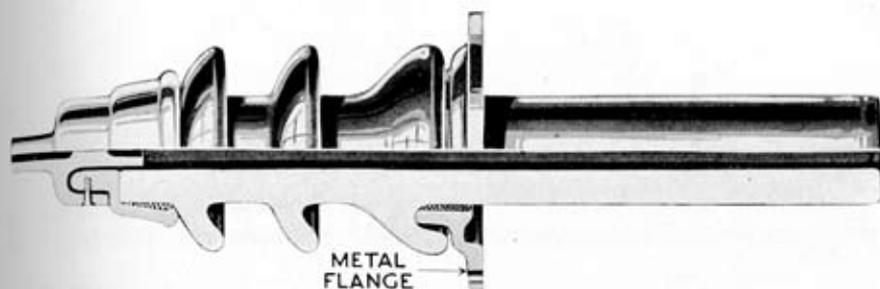
Code Word
Raciness.

No. 13225—Outlet Bushing List Each \$5 00



O-B PORCELAIN WALL OR ROOF INSULATOR

6,600 Volts



No. 12875

CAN be used in either horizontal or vertical position when exposed to the weather.

No. 12875 is equipped with iron cap and bronze terminal as shown; No. 12876 is without either cap or terminal.

Holes drilled in top and bottom of bronze terminal are $\frac{1}{2}$ inch (12.7 mm.) in diameter. Both are tinned for soldering.

Net weight No. 12875, 18 pounds (8.2 Kilograms); No. 12876, 12 pounds (5.4 Kilograms).

All iron parts are galvanized.

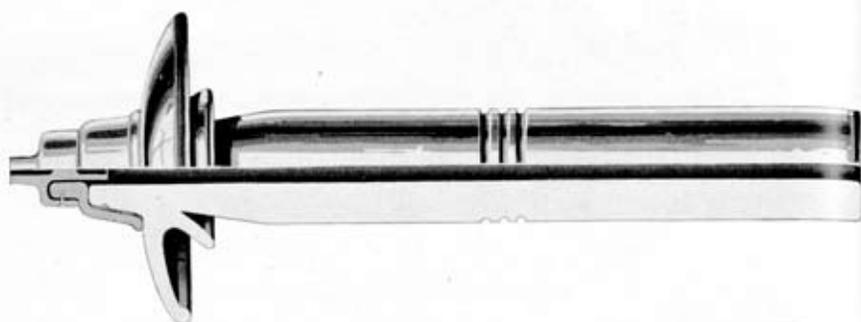
Code Word	No.	List Each
Plantule.	12875—Insulator, General Rating 6,600 Volts, with Cap.....	\$32 00
Plaque.	12876— " " " " 6,600 " without Cap.....	26 00

See Wall and Roof Entrance Schemes on pages 112-114.
See "Rating," page 10.



O-B PORCELAIN WALL OR ROOF INSULATOR

11,000 Volts



No. 10649

THIS Insulator can be used in either a horizontal or vertical position when exposed to the weather and with the rated voltage applied. Maximum efficiency is obtained by combining low weight and long striking distance.

Insulator No. 10649 is equipped with an iron cap and a bronze terminal as shown in the illustration. No. 10650 is furnished without either cap or terminal.

Holes drilled in top and bottom of bronze terminal are $\frac{1}{2}$ inch (12.7 mm.) in diameter; both are tinned for soldering.

Net weight, No. 10649, 38 pounds (17.2 Kilograms); No. 10650, 32 pounds (14.5 Kilograms).

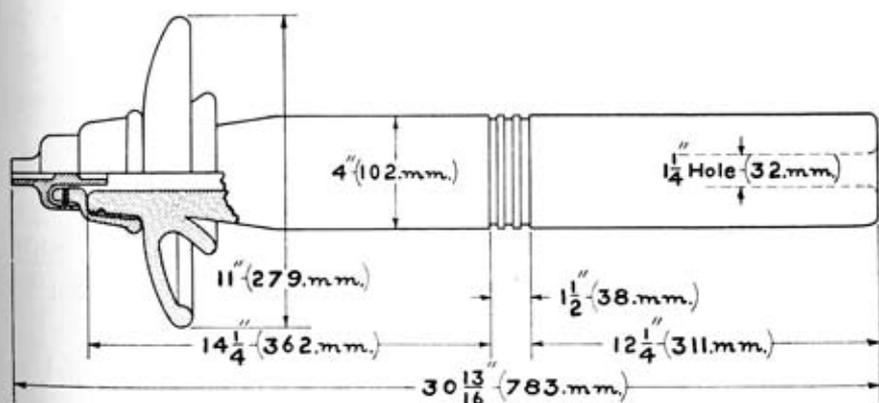
All iron parts are galvanized.

Code Word	No.	List Each
<i>Hickway.</i>	10649—Insulator, General Rating 11,000 Volts, with Cap.....	\$70 00
<i>Hiding.</i>	10650— " " " 11,000 " without Cap.....	54 00

See Wall and Roof Entrance Schemes on pages 112-114.
See "Rating," page 10.

O-B PORCELAIN WALL OR ROOF INSULATOR

11,000 Volts

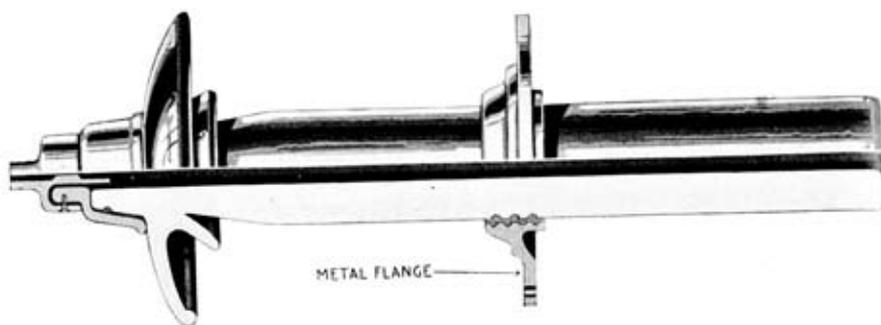


No. 10649

See description and list on the opposite page.

O-B PORCELAIN WALL OR ROOF INSULATOR

11,000 Volts



No. 12877

SAME design as shown on page 124, but equipped with metal flange for use in mounting in wall or roof.

Can be exposed to the weather in either the horizontal or vertical position.

If desired, Wall Insert Flange No. 13723 or No. 13226 may be built into wall or roof during construction and Insulator installed later by simply bolting it in place.

No. 12877 is equipped with iron cap and bronze terminal as shown, while No. 12878 is without either cap or terminal. Holes drilled in top and bottom of bronze terminal are $\frac{1}{2}$ inch (12.7 mm.) in diameter; both are tinned for soldering.

Net weight, each, No. 12877, 53 pounds (24.0 Kilograms); No. 12878, 47 pounds (21.3 Kilograms).

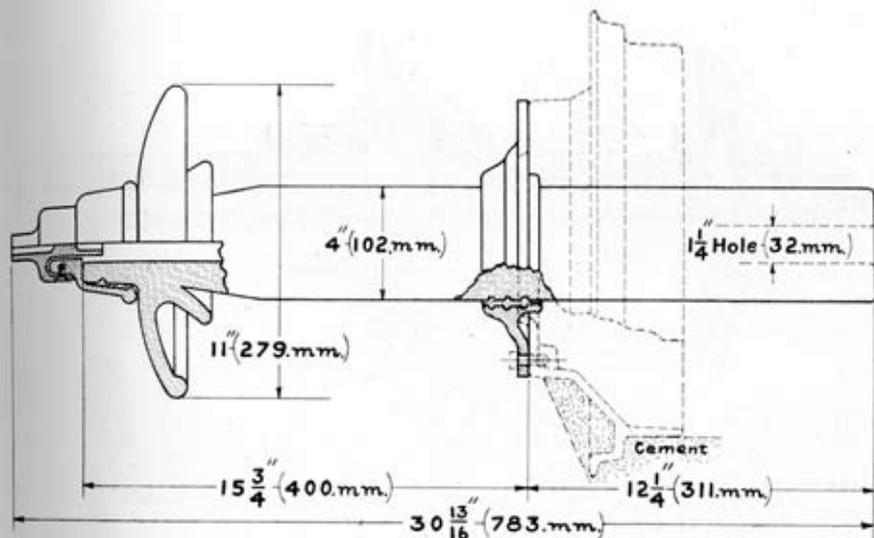
All iron parts on Insulator are galvanized.

Code Word	No.	List Each
<i>Plashoot.</i>	12877—Insulator, General Rating 11,000 Volts, with Cap.....	\$74 00
<i>Plasma.</i>	12878— " " " " 11,000 " without Cap.....	64 00
<i>Rodmont.</i>	13723—Wall Insert Flange for Thin Wall or Roof.....	23 00
<i>Racket.</i>	13226— " " " " Thick " " " ".....	26 00

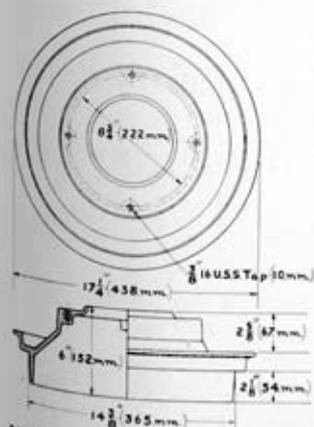
See Wall and Roof Entrance Schemes on pages 112-114.
See "Rating," page 10.

O-B PORCELAIN WALL OR ROOF INSULATOR

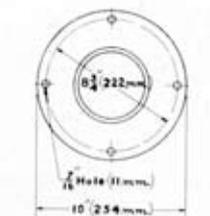
11,000 Volts



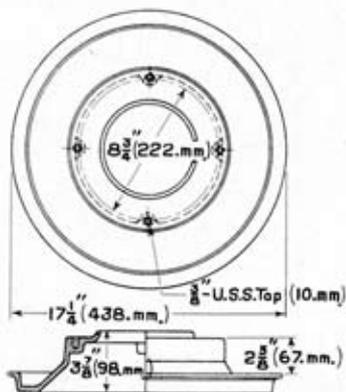
No. 12877—Wall Insert Flange No. 13226 Shown by Dotted Lines



No. 13226—Wall Insert Flange for Thick Wall or Roof



Plan of Metal Flange Furnished Cemented to Insulator

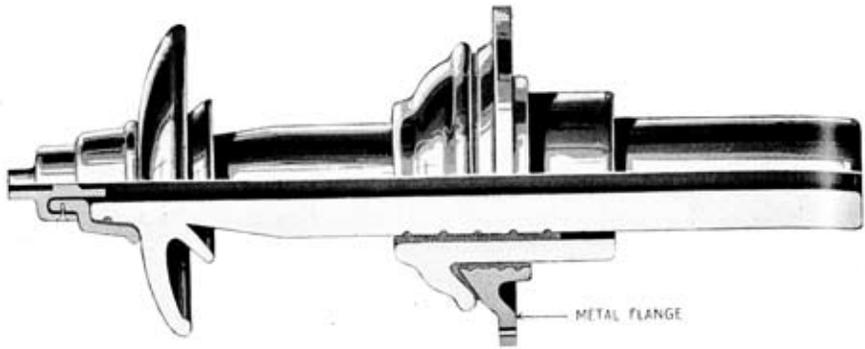


No. 13723—Wall Insert Flange for Thin Wall or Roof

See description and list on the opposite page.

O-B PORCELAIN WALL OR ROOF INSULATOR

22,000 to 33,000 Volts



No. 10651

THIS Insulator is designed to be exposed to the weather in either a horizontal or vertical position.

If desired, Wall Insert Flange No. 13724 or No. 13227 may be built into wall or roof during construction and Insulator installed later by simply bolting it in place.

Insulator No. 10651 is equipped with iron cap and bronze terminal as shown in the illustration; No. 10652 is furnished without either cap or terminal.

Holes drilled in top and bottom of bronze terminal are $\frac{1}{4}$ inch (12.7 mm.) in diameter; both are tinned for soldering.

Net weight, each, No. 10651, 58 pounds (26.3 Kilograms); No. 10652, 46 pounds (20.8 Kilograms).

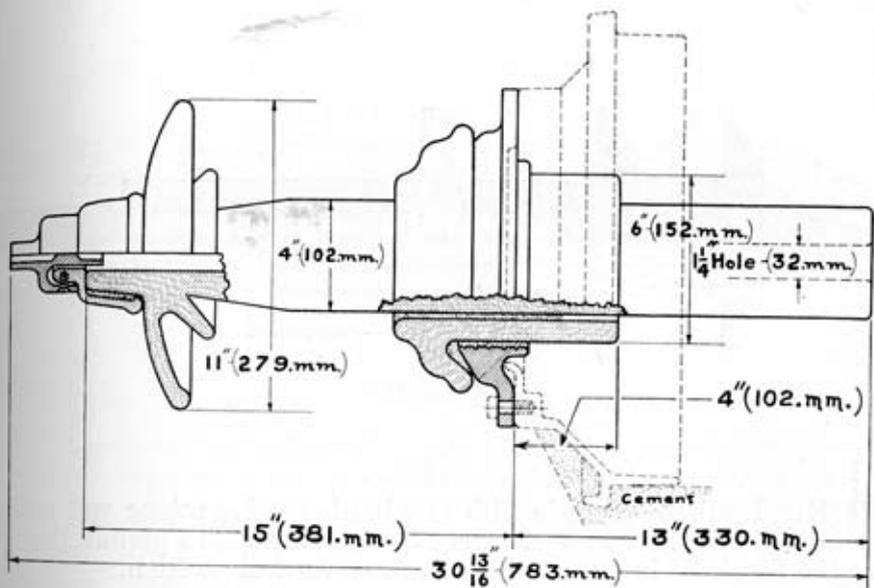
All iron parts on Insulator are galvanized.

Code Word	No.	List Each
<i>Hilarity.</i>	10651—Insulator, General Rating 22,000-33,000 Volts, with Cap.	\$90 00
<i>Hilltop.</i>	10652— " " " " 22,000-33,000 " without Cap	74 00
<i>Roebuck.</i>	13724—Wall Insert Flange for Thin Wall or Roof	26 00
<i>Raddle.</i>	13227— " " " " Thick " "	29 00

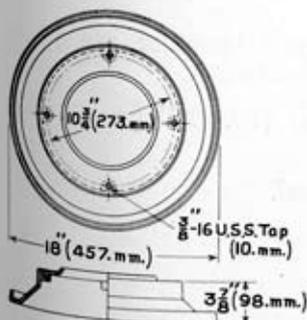
See Wall and Roof Entrance Schemes on pages 112-114.
See "Rating," page 10.

O-B PORCELAIN WALL OR ROOF INSULATOR

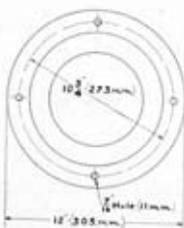
22,000 to 33,000 Volts



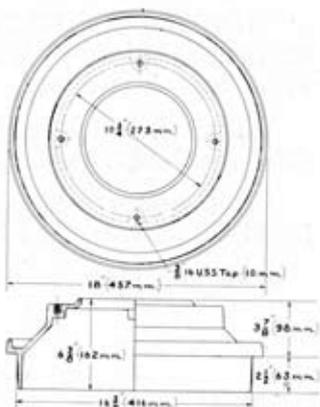
No. 10651—Wall Insert Flange No. 13227 Shown by Dotted Lines



No. 13721
Wall Insert Flange
For Thin Wall or Roof



Plan of Metal Flange
Furnished Cemented
to Insulator



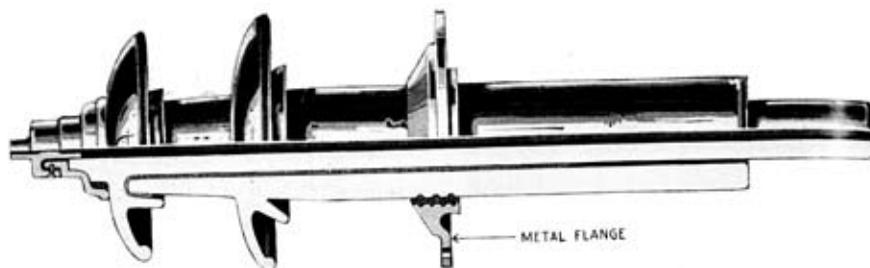
No. 13227
Wall Insert Flange
For Thick Wall or Roof

See description and list on the opposite page.



O-B PORCELAIN WALL OR ROOF INSULATOR

44,000 Volts



No. 10653

THIS Insulator is made with two heads to give a long wet arcing distance, the factor of safety being sufficient to permit the use of the Insulator in either a horizontal or vertical position.

If desired, Wall Insert Flange No. 13724 or No. 13227 may be built into wall or roof during construction and Insulator installed later by simply bolting it in place.

Insulator No. 10653 is equipped with an iron cap and a bronze terminal as shown in the illustration; No. 10654 is furnished without either cap or terminal.

Holes drilled in top and bottom of bronze terminal are $\frac{1}{2}$ inch (12.7 mm.) in diameter; both are tinned for soldering.

Net weight, each, No. 10653, 90 pounds (40.8 Kilograms); No. 10654, 80 pounds (36.3 Kilograms).

All iron parts on Insulator are galvanized.

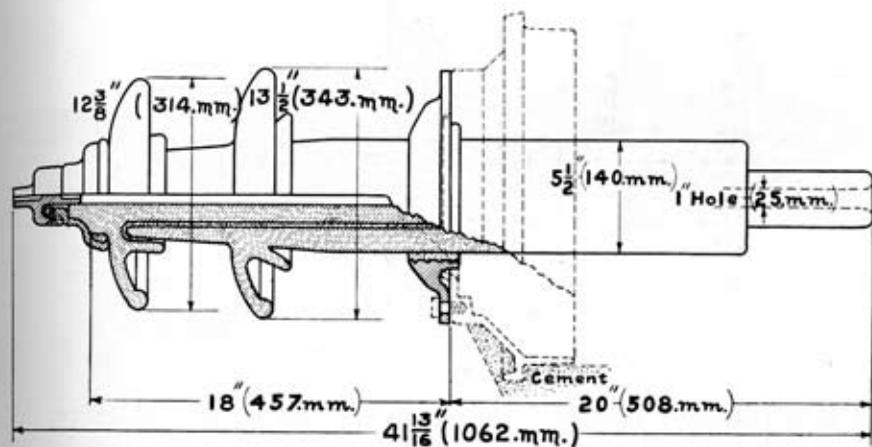
Code Word	No.	List Each
<i>Hinder.</i>	10653—Insulator, General Rating 44,000 Volts, with Cap.	\$120 00
<i>Histrionic.</i>	10654— " " " " 44,000 " without Cap.	110 00
<i>Roebuck.</i>	13724—Wall Insert Flange for Thin Wall or Roof	26 00
<i>Raddle.</i>	13227— " " " " Thick " " " "	29 00

See Wall and Roof Entrance Schemes on pages 112-114.
See "Rating," page 10.

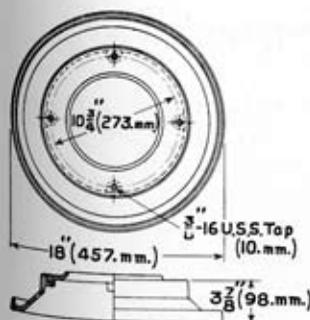


O-B PORCELAIN WALL OR ROOF INSULATOR

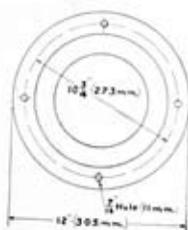
44,000 Volts



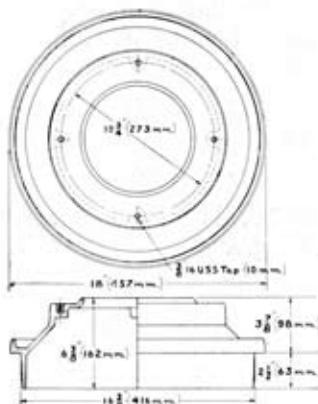
No. 10653—Wall Insert Flange No. 13227 Shown by Dotted Lines



No. 13724
Wall Insert Flange
For Thin Wall or Roof



Plan of Metal Flange
Furnished Cemented
to Insulator



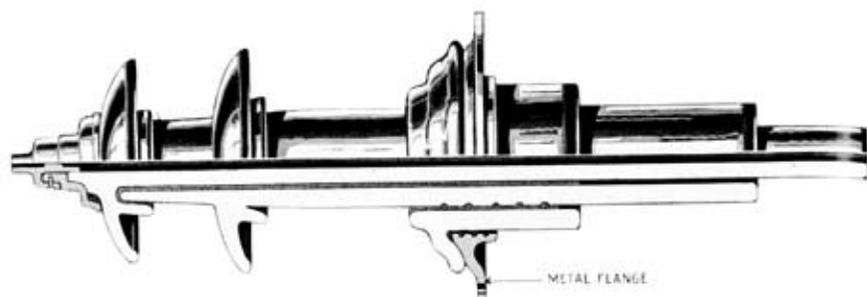
No. 13227
Wall Insert Flange
For Thick Wall or Roof

See description and list on the opposite page.



O-B PORCELAIN WALL OR ROOF INSULATORS

55,000-66,000 Volts



Nos. 10655 and 10657

THIS Insulator may be operated in either a horizontal or vertical position when exposed to the weather.

If desired, Wall Insert Flange No. 13697 or No. 13698 may be built into wall or roof during construction and Insulator installed later by simply bolting it in place.

Insulators Nos. 10655 and 10657 are equipped with an iron cap and a bronze terminal as shown; Nos. 10656 and 10658 are furnished without either cap or terminal.

Holes drilled in top and bottom of bronze terminal are $\frac{1}{8}$ inch (12.7 mm.) in diameter; both are tinned for soldering.

Net weight, each, No. 10655, 135 pounds (61.2 Kilograms); No. 10656, 115 pounds (52.2 Kilograms); No. 10657, 145 pounds (65.7 Kilograms); No. 10658, 120 pounds (54.4 Kilograms).

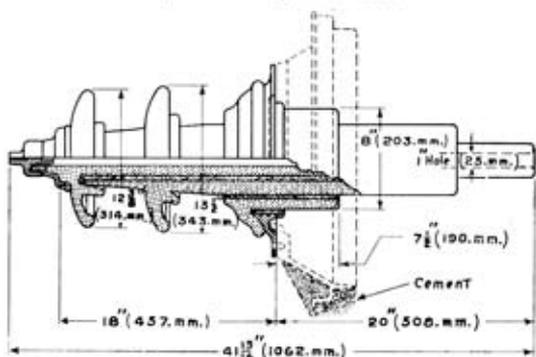
All iron parts on Insulator are galvanized.

Code Word	No.		List Each
<i>Histrion.</i>	10655—	Insulator, General Rating 55,000 Volts, with Cap.	\$160 00
<i>Hitter.</i>	10656—	" " " 55,000 " without Cap.	148 00
<i>Hobblor.</i>	10657—	" " " 66,000 " with Cap.	184 00
<i>Hobnail.</i>	10658—	" " " 66,000 " without Cap.	174 00
<i>Romaic.</i>	13697—	Wall Insert Flange for Thin Wall or Roof	42 00
<i>Romance.</i>	13698—	" " " " " Thick " " "	45 00

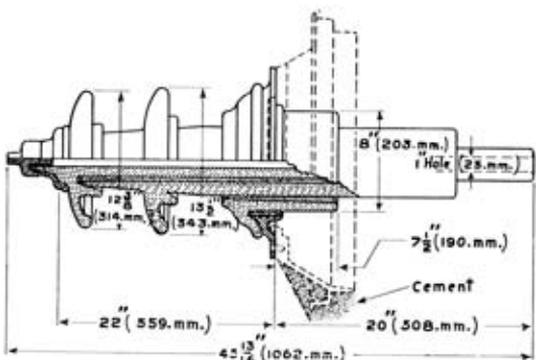
See Wall and Roof Entrance Schemes on pages 112-114.
See "Rating," page 10.

O-B PORCELAIN WALL OR ROOF INSULATOR

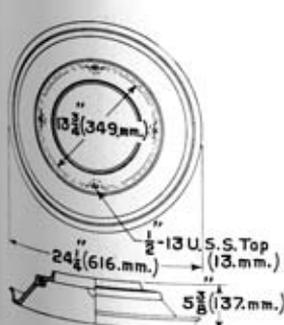
55,000 to 66,000 Volts



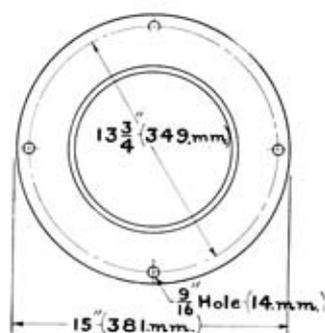
No. 10655—Wall Insert Flange No. 13698 Shown by Dotted Lines



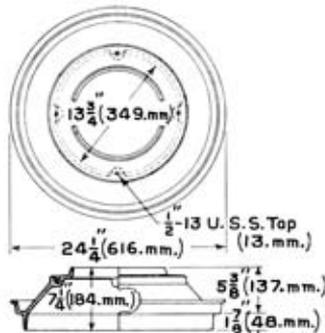
No. 10657—Wall Insert Flange No. 13698 Shown by Dotted Lines



No. 13697
Wall Insert Flange
For Thin Wall or Roof



Plan of Metal Flange
Furnished Cemented
to Insulator



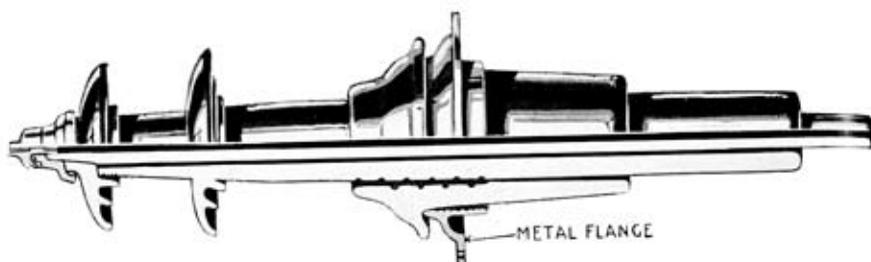
No. 13698
Wall Insert Flange
For Thick Wall or Roof

See description and list on the opposite page.



O-B PORCELAIN WALL OR ROOF INSULATOR

77,000 Volts



No. 12807

MAY be operated in either the horizontal or vertical position when exposed to the weather.

If desired, Wall Insert Flange No. 13699 or No. 13500 may be built into wall or roof during construction and Insulator installed later by simply bolting it in place.

No. 12807 is furnished with an iron cap and bronze terminal; No. 12808 is without either cap or terminal.

Holes in top and bottom of bronze terminal are $\frac{1}{2}$ inch (12.7 mm.) in diameter; both are tinned for soldering.

Net weight, No. 12807, 200 pounds (90.6 Kilograms); No. 12808, 175 pounds (79.3 Kilograms).

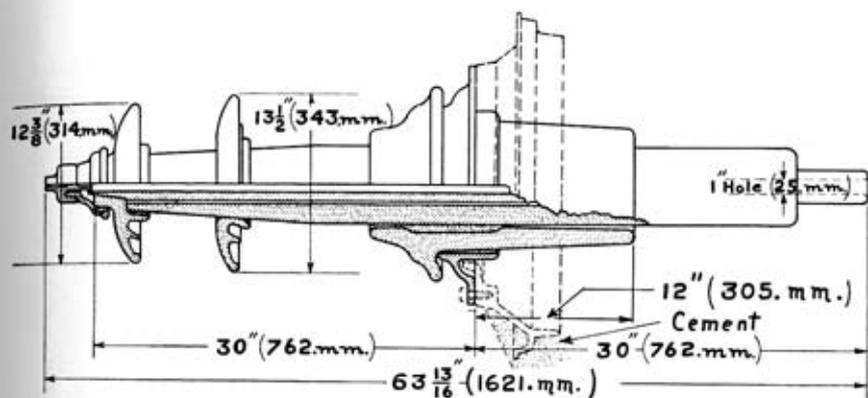
All iron parts are galvanized.

Code Word	No.	List Each
<i>Plasmin.</i>	12807—Insulator, General Rating 77,000 Volts, with Cap.	\$308 00
<i>Plaster.</i>	12808— " " " 77,000 " without Cap.	296 00
<i>Romeite.</i>	13699—Wall Insert Flange for Thin Wall or Roof	53 00
<i>Reality.</i>	13500— " " " Thick " " "	56 00

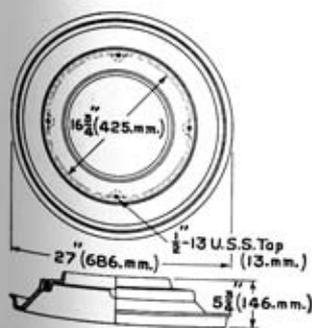
See Wall and Roof Entrance Schemes on pages 112-114.
See "Rating," page 10.

O-B PORCELAIN WALL OR ROOF INSULATOR

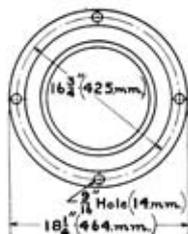
77,000 Volts



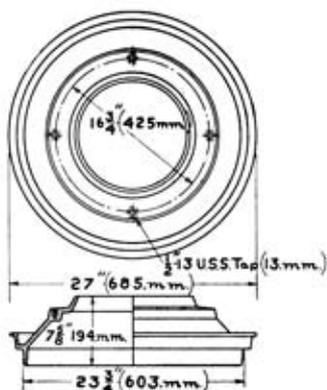
No. 12807—Wall Insert Flange No. 13500 Shown by Dotted Lines



No. 13699
Wall Insert Flange
For Thin Wall or Roof



Plan of Metal Flange
Furnished Cemented
to Insulator



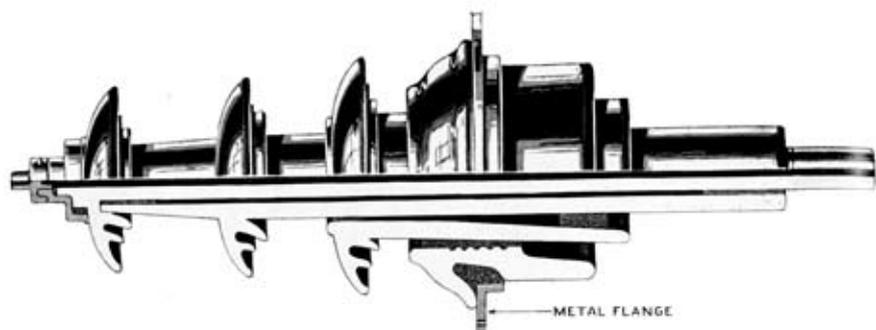
No. 13500
Wall Insert Flange
For Thick Wall or Roof

See description and list on the opposite page.



O-B PORCELAIN WALL OR ROOF INSULATOR

88,000 Volts



No. 10981

THIS Insulator may be exposed to the weather in either a horizontal or vertical position, but in ordering, it is necessary that the kind of service should be specified since, when the Insulator is used as a Roof Entrance, the cement between the outer porcelain cylinders is filled in at the top to eliminate water pockets, while, for Wall Entrance service, it is left as shown in the cut in order to increase the leakage surface.

If desired, Wall Insert Flange No. 13229 may be built into wall or roof during construction and Insulator installed later by simply bolting it in place.

Insulator No. 10981 is equipped with an iron cap and bronze terminal as shown; No. 10982 is furnished without either cap or terminal.

Holes drilled in top and bottom of bronze terminal are $\frac{1}{2}$ inch (12.7 mm.) in diameter; both are tinned for soldering.

Net weight, each, No. 10981, 255 pounds (115.5 Kilograms); No. 10982, 230 pounds (104.3 Kilograms).

All iron parts on Insulator are galvanized.

Code Word	No.	List Each
<i>Inracinate.</i>	10981—Insulator, General Rating 88,000 Volts, with Cap.....	\$414 00
<i>Insalutary.</i>	10982— " " " 88,000 " without Cap.....	400 00
<i>Radical.</i>	13229—Wall Insert Flange for Insulators Nos. 10981-10982.....	33 00

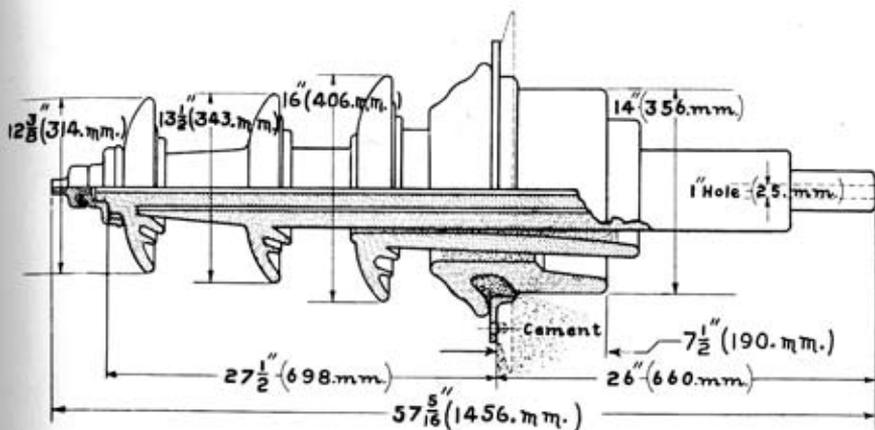
Note: Orders must specify whether Insulators are to be used in horizontal or vertical position.

See Wall and Roof Entrance Schemes on pages 112-114.

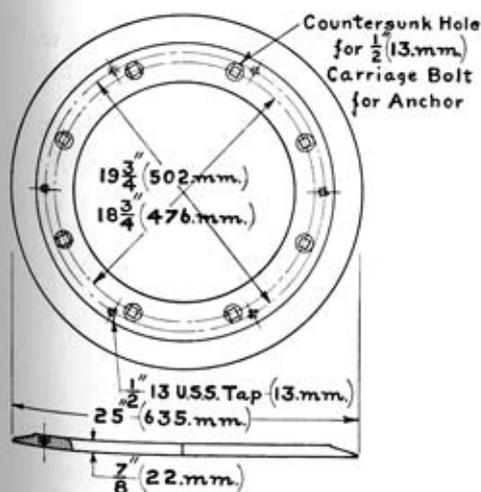
See "Rating," page 10.

O-B PORCELAIN WALL OR ROOF INSULATOR

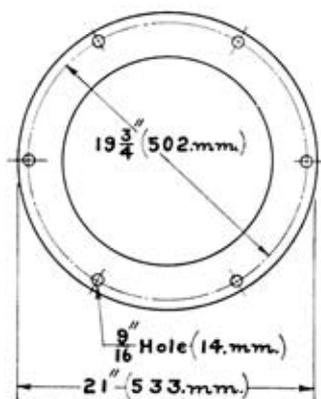
88,000 Volts



No. 10981—Wall Insert Flange No. 13229 Shown by Dotted Lines



No. 13229—Wall Insert Flange



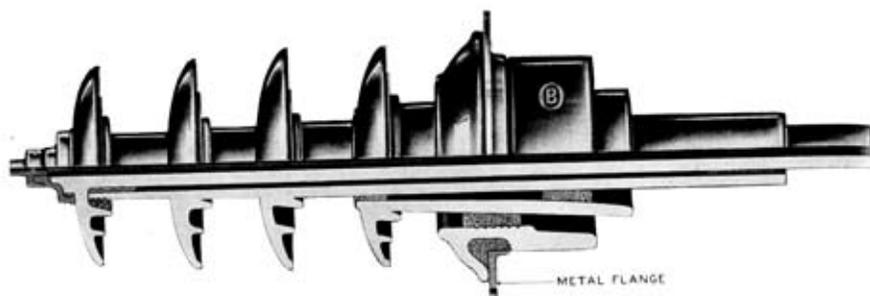
Plan of Metal Flange
Furnished Cemented to
Insulator

See description and list on the opposite page.



O-B PORCELAIN WALL OR ROOF INSULATOR

110,000 Volts



No. 10983

THIS Insulator may be exposed to the weather in either a horizontal or vertical position, but in ordering, it is necessary that the kind of service should be specified since, when the Insulator is used as a Roof Entrance, the cement between the outer porcelain cylinders is filled in at the top to eliminate water pockets, while, for Wall Entrance service, it is left as shown in the cut in order to increase the leakage surface.

If desired, Wall Insert Flange No. 13229 may be built into wall or roof during construction and Insulator installed later by simply bolting it in place.

Insulator No. 10983 is equipped with an iron cap and bronze terminal as shown; No. 10984 is furnished without either cap or terminal.

Holes drilled in top and bottom of bronze terminal are $\frac{1}{2}$ inch (12.7 mm.) in diameter; both are tinned for soldering.

Net weight, each, No. 10983, 294 pounds (133.3 Kilograms); No. 10984, 264 pounds (119.6 Kilograms).

All iron parts on Insulator are galvanized.

Code Word	No.	List Each
<i>Insanable.</i>	10983—Insulator, General Rating 110,000 Volts, with Cap.....	\$546 00
<i>Insaniate.</i>	10984— " " " 110,000 " without Cap....	534 00
<i>Radical.</i>	13229—Wall Insert Flange for Insulators Nos. 10983-10984.....	33 00

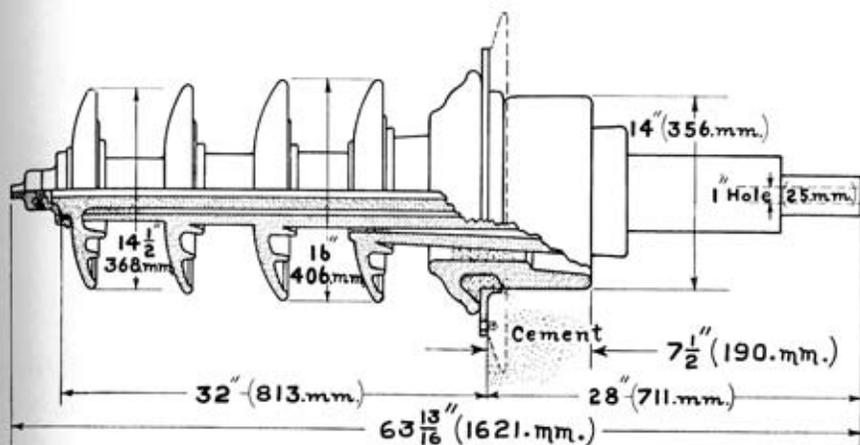
Note: Orders must specify whether Insulators are to be used in horizontal or vertical position.

See Wall and Roof Entrance Schemes on pages 112-114.

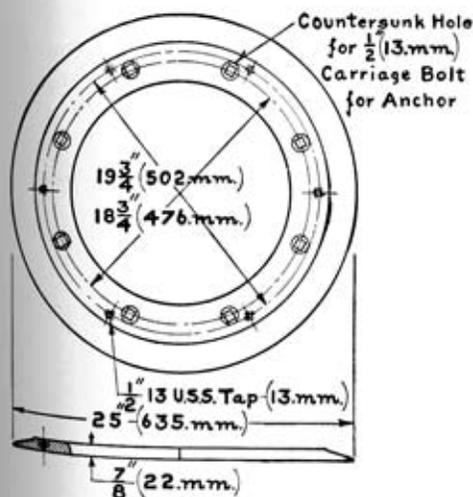
See "Rating," page 10.

O-B PORCELAIN WALL OR ROOF INSULATOR

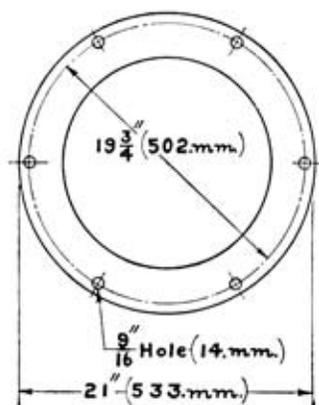
110,000 Volts



No. 10983—Wall Insert Flange No. 13229 Shown by Dotted Lines



No. 13229—Wall Insert Flange



Plan of Metal Flange
Furnished Cemented to
Insulator

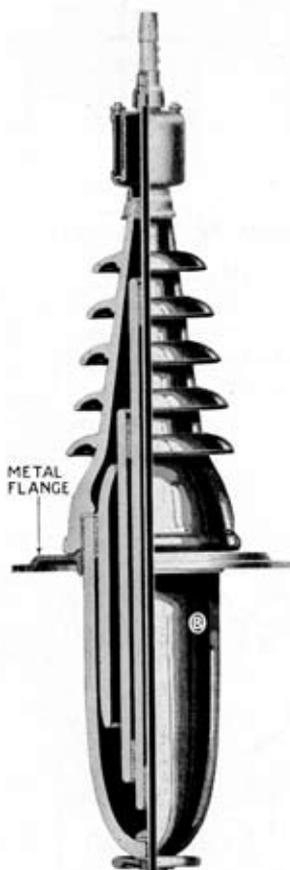
See description and list on the opposite page.



O-B PORCELAIN INSULATOR

For Switches and Transformers

120,000 Volts



No. 25298

DESIGNED for switch or transformer use, either indoor or outdoor service.

Must be filled with transformer oil or insulating compound. A reservoir is provided on upper end to allow for expansion of the insulating medium.

Connection through the insulator is made by a seamless brass tube.

Net weight, each, without oil or compound filling, 425 pounds (192.5 Kilograms).

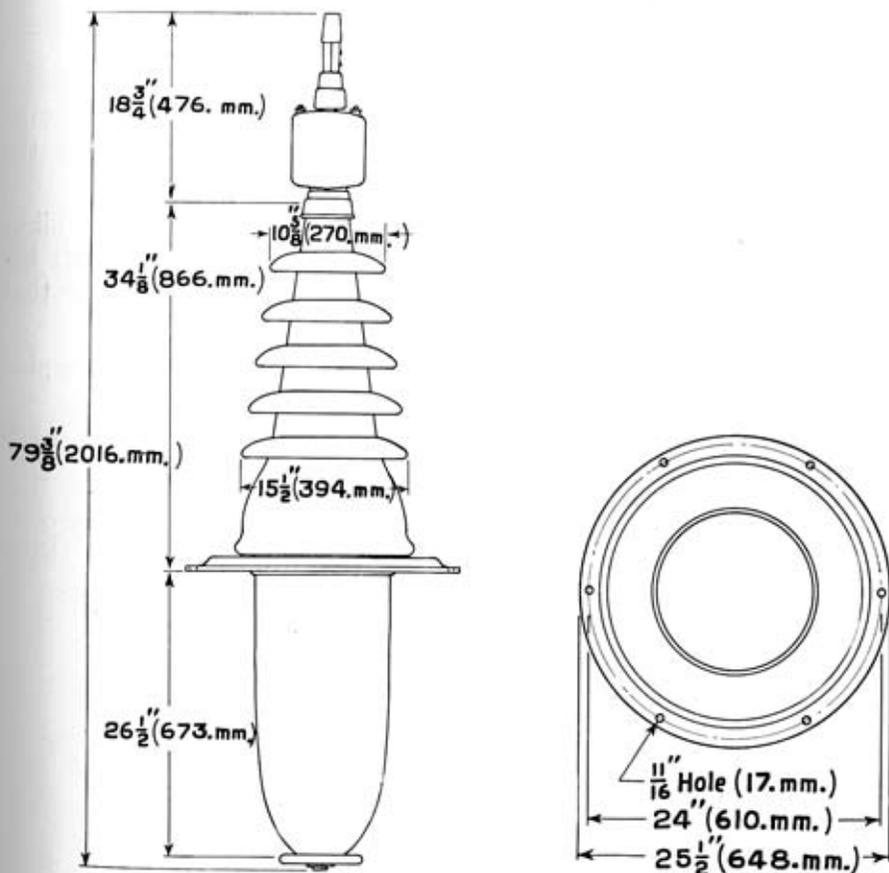
Code Word	No.	List Each
<i>Roncador.</i>	25298—Insulator, General Rating 120,000 Volts.....	\$600 00

See "Rating," page 10.

O-B PORCELAIN INSULATOR

For Switches and Transformers

120,000 Volts



No. 25298

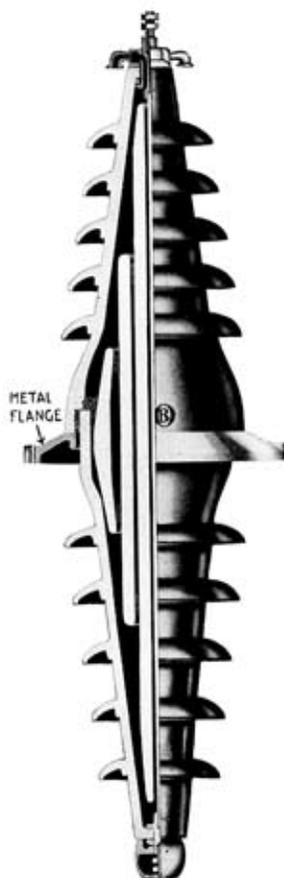
Plan of Metal Flange
Furnished Cemented
to Insulator

See description and list on the opposite page.



O-B PORCELAIN ROOF INSULATOR

110,000 Volts



No. 12879

DESIGNED to be operated in the vertical position when exposed to the weather.

Must be filled with transformer oil or insulating compound, an attachment being provided at the upper end for that purpose.

May be easily drained by loosening lower connection.

Connection through the insulator is made by a 4-0 copper cable.

Net weight, each, without oil or compound filling, 425 pounds (192.5 Kilograms).

All iron parts are galvanized.

Code Word
Plastron.

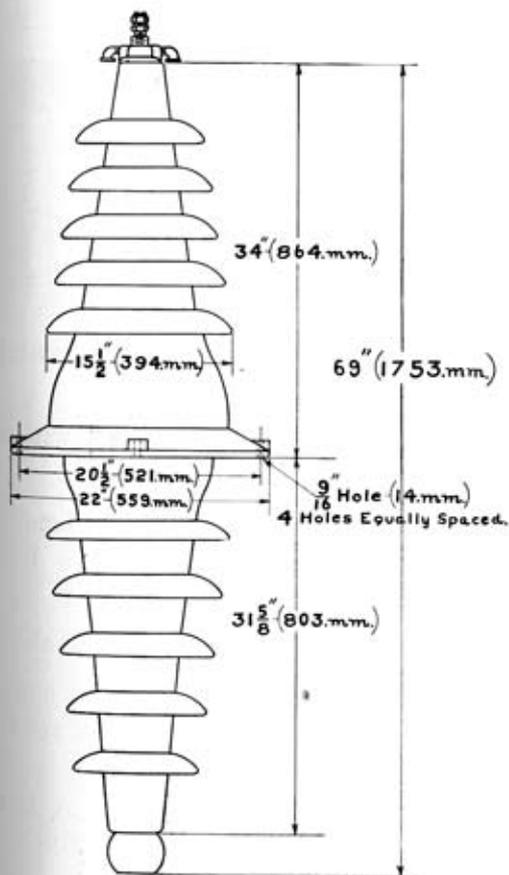
No.
12879—Insulator, General Rating 110,000 Volts.....

List Each
\$670 00

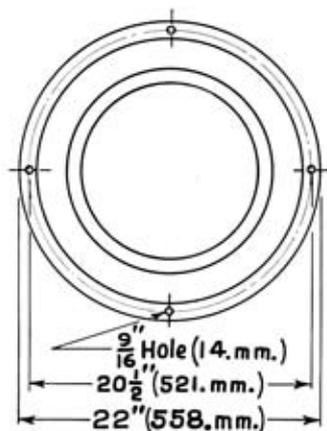
See Wall and Roof Entrance Schemes on pages 112-114.
See "Rating," page 10.

O-B PORCELAIN INSULATOR

110,000 Volts

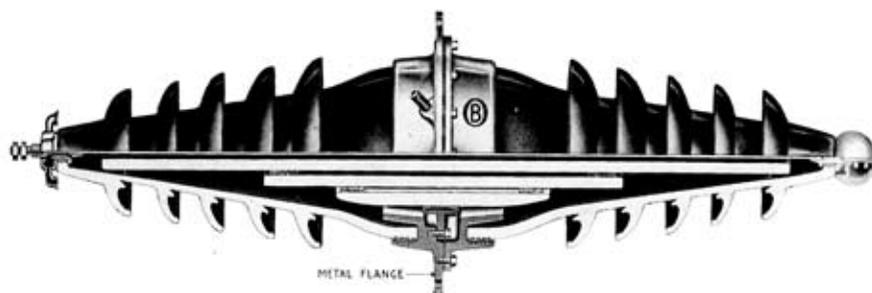


No. 12879



Plan of Flange Furnished
Cemented to Insulator

See description and list on the opposite page.

**O-B PORCELAIN WALL INSULATOR****120,000 Volts****No. 12590**

THIS Insulator may be exposed to the weather in a horizontal position.

No. 12590 is provided with a circular flange and No. 13395 with a square flange for mounting Insulator on wall.

Both ends of Insulator are provided with $\frac{3}{4}$ -inch removable studs and two $\frac{3}{4}$ -inch brass hex nuts for attaching suitable sockets for terminal connections.

Connection through the Insulator is made by a 4-0 copper cable.

Insulator must be filled with transformer oil or insulating compound, an attachment being provided for that purpose on the metal flange.

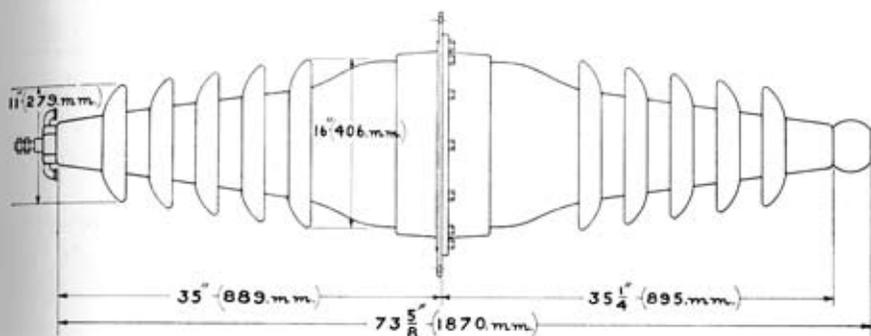
Net weight, each, without oil or compound filling, No. 12590, 480 pounds (217.4 Kilograms); No. 13395, 505 pounds (229 Kilograms).

Code Word	No.	List Each
<i>Plateau.</i>	12590—Insulator, General Rating 120,000 Volts, with Circular Flange.....	\$670 00
<i>Razorbill.</i>	13395—Insulator, General Rating 120,000 Volts, with Square Flange.....	670 00

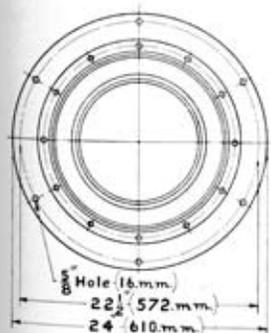
See Wall and Roof Entrance Schemes on pages 112-114.
See "Rating," page 10.

O-B PORCELAIN WALL INSULATOR

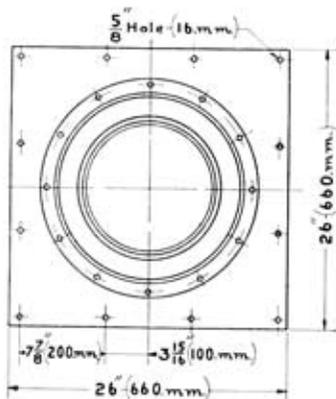
120,000 Volts



Nos. 12590-13395



Flange of No. 12590



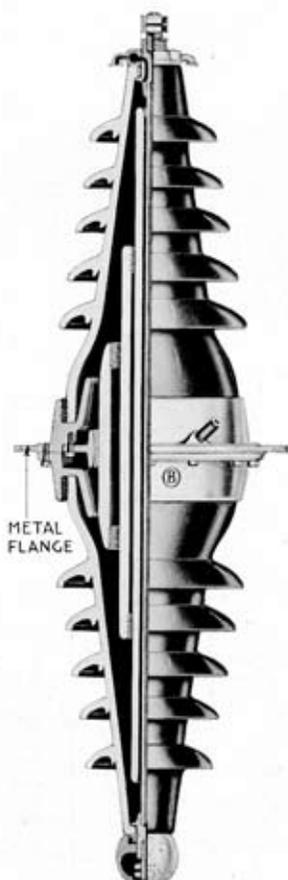
Flange of No. 13395

See description and list on the opposite page.



O-B PORCELAIN WALL OR ROOF INSULATOR

120,000 Volts



No. 12589

THIS Insulator may be exposed to the weather in either a vertical or horizontal position without change.

No. 12589 is provided with a circular flange and No. 13396 with a square flange for mounting Insulator on wall or roof.

Both ends of Insulator are provided with removable bronze terminals and two $\frac{3}{4}$ -inch brass hex nuts for attaching suitable terminal connections.

Connection through the Insulator is made by a 4-0 copper cable.

Insulator must be filled with transformer oil or insulating compound, an attachment being provided for that purpose at the upper end.

Net weight, each, without oil or compound filling, No. 12589, 525 pounds (238.0 Kilograms); No. 13396, 550 pounds (249.2 Kilograms).

Code Word
Platinum.

No.
12589—Insulator, General Rating 120,000 Volts, with Circular Flange.

Reacher.

13396—Insulator, General Rating 120,000 Volts, with Square Flange.

List Each

\$762 00

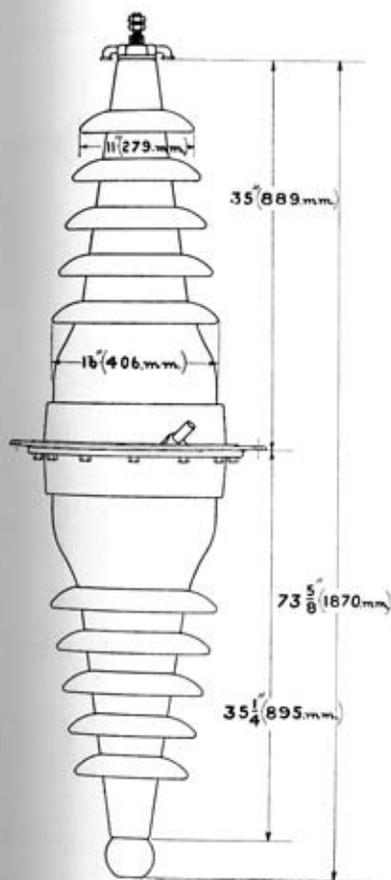
762 00

See Wall and Roof Entrance Schemes on pages 112-114.
See "Rating," page 10.

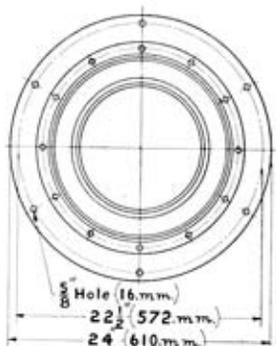


O-B PORCELAIN WALL OR ROOF INSULATOR

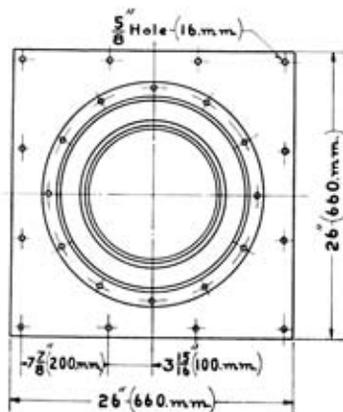
120,000 Volts



Nos. 12589-13396



Flange of No. 12589



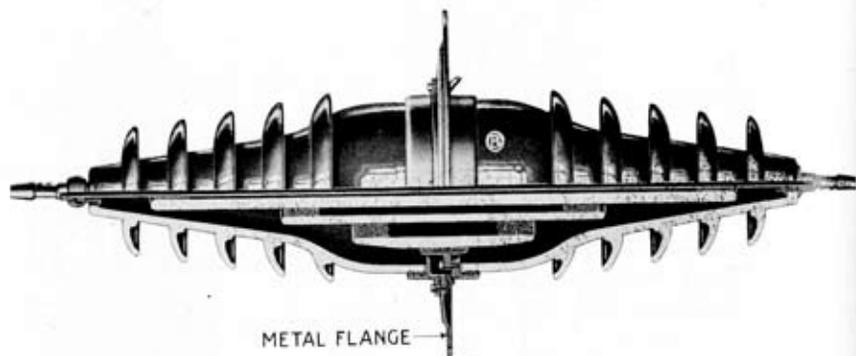
Flange of No. 13396

See description and list on the opposite page.



O-B PORCELAIN WALL INSULATOR

150,000 Volts



No. 25128

THIS Insulator may be exposed to the weather in a horizontal position.

Both ends of Insulator are provided with removable bronze terminals having holes $1\frac{1}{16}$ inches (27 mm.) in diameter, $2\frac{1}{4}$ inches (57 mm.) deep; tinned for soldering.

Connection through the Insulator is made by seamless brass tubing.

Insulator must be filled with transformer oil or insulating compound, an attachment being provided for that purpose on the metal flange.

Net weight, each, without oil or compound filling, 1000 pounds (453.0 Kiograms).

Code Word
Reactive.

No. 25128—Insulator, General Rating 150,000 Volts.

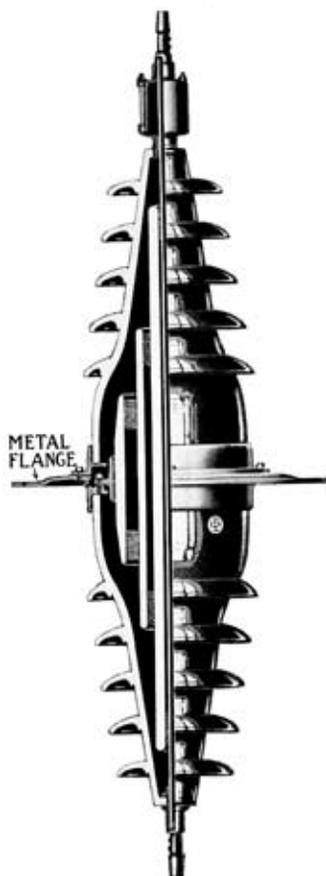
List Each
\$2170 00

See Wall and Roof Entrance Schemes on pages 112-114.
See "Rating," page 10.



O-B PORCELAIN ROOF INSULATOR

150,000 Volts



No. 11911

THIS Insulator may be exposed to the weather in a vertical position.

Both ends of Insulator are provided with removable bronze terminals having holes $1\frac{1}{8}$ inches (27 mm.) in diameter, $2\frac{1}{4}$ inches (57 mm.) deep; tinned for soldering.

Connection through Insulator is made by seamless brass tubing.

Insulator must be filled with transformer oil or insulating compound poured through an opening provided at the top.

Net weight, each, without oil or compound filling, 1025 pounds (464.5 Kilograms).

Code Word
Mootman.

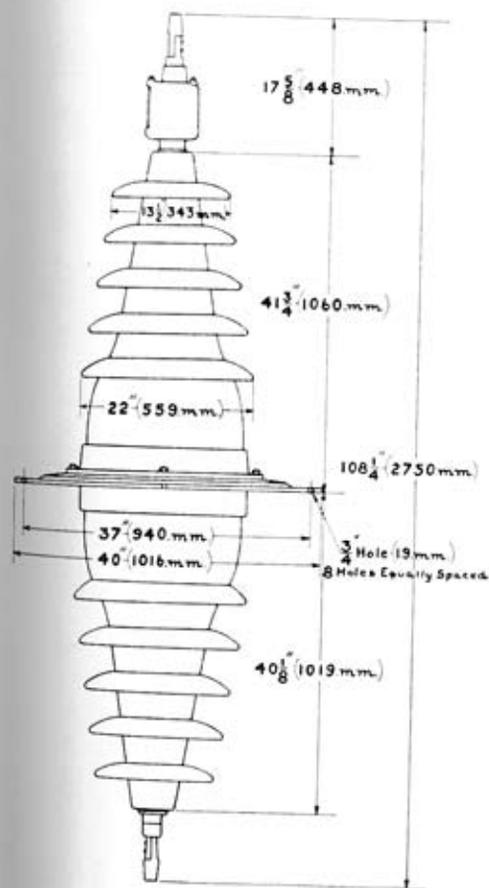
No.
11911—Insulator, General Rating 150,000 Volts.

List Each
\$2170 00

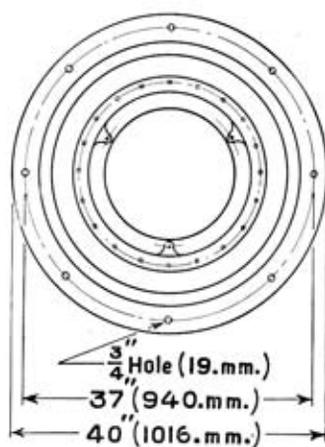
See Wall and Roof Entrance Schemes on pages 112-114.
See "Rating," page 10.

O-B PORCELAIN ROOF INSULATOR

150,000 Volts



No. 11911



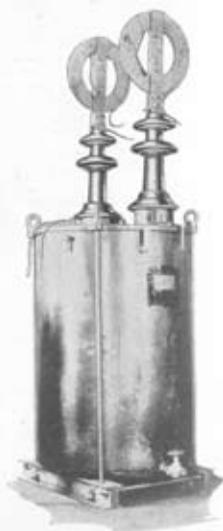
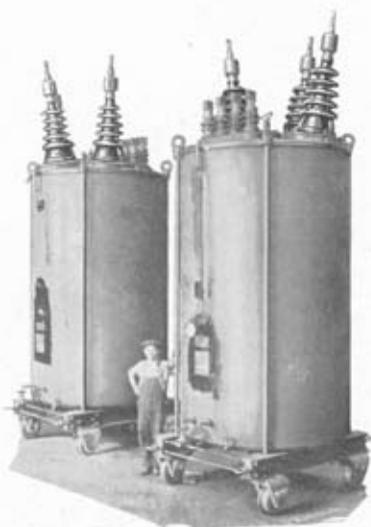
Plan of Flange Furnished
Cemented to Insulator

See description and list on the opposite page.



O-B PORCELAIN INSULATORS

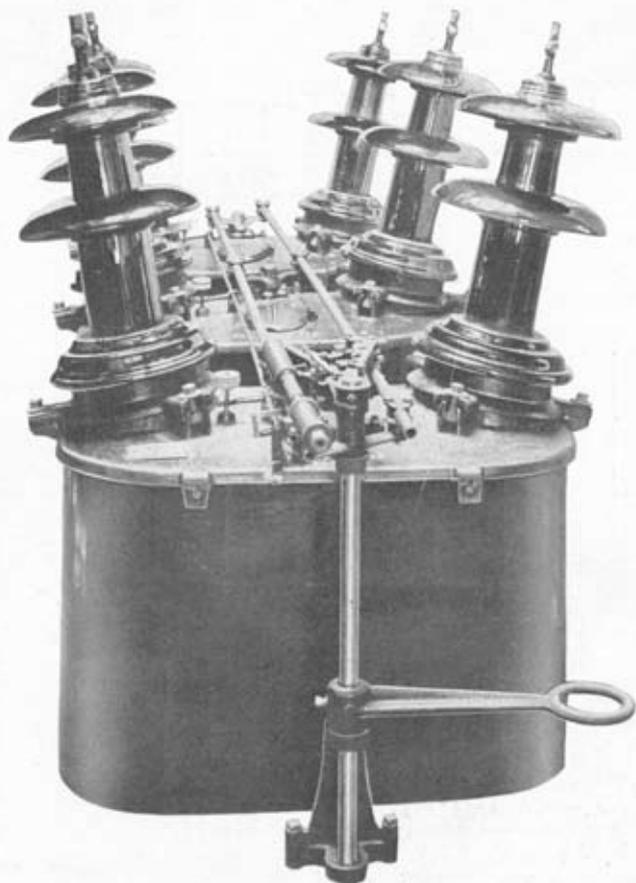
For Switches and Transformers



THESE three large transformers are equipped with O-B Insulators. O-B Insulators are particularly popular for station use due to their reliability and to the number of designs available.

O-B PORCELAIN INSULATORS

For Switches and Transformers



SPECIAL designs can be furnished to suit any high tension switches or transformers.

The illustration shows oil switch equipped with O-B Insulators.

The necessary Insulators can usually be supplied when it is desired to change old transformers, equipped for indoor service, to outdoor stations.

Let us know your needs.

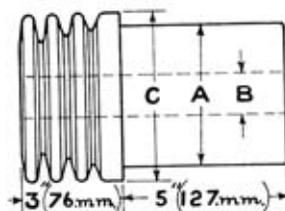


O-B PORCELAIN BUSHINGS

High Tension—Form 1

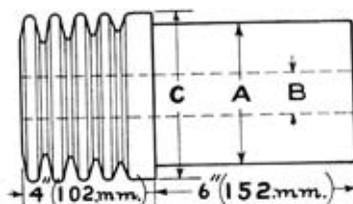


Nos. 10880-10886
Brown Glaze



Nos. 10887-10893
Brown Glaze

Code Word	No.	Inches			Millimeters			Test Voltage	List Each
		A	B	C	A	B	C		
<i>Insapory.</i>	10880	3½	1¼	4	89	32	102	30,000	\$ 3 30
<i>Insatiably.</i>	10881	3½	2	4	89	51	102	30,000	3 30
<i>Insatiety.</i>	10882	4¼	1¼	5	108	32	127	30,000	4 03
<i>Inscience.</i>	10883	4¼	2	5	108	51	127	30,000	4 03
<i>Inscient.</i>	10884	5	3	5½	127	76	140	30,000	4 46
<i>Inconce.</i>	10885	5	1¼	5	127	32	140	30,000	4 46
<i>Inscriber.</i>	10886	5	2	5½	127	51	140	30,000	4 46



Code Word	No.	Inches			Millimeters			Test Voltage	List Each
		A	B	C	A	B	C		
<i>Inscroll.</i>	10887	3½	1¼	4	89	32	102	40,000	\$4 10
<i>Insculp.</i>	10888	3½	2	4	89	51	102	40,000	4 10
<i>Insecable.</i>	10889	4¼	1¼	5	108	32	127	40,000	5 00
<i>Insecta.</i>	10890	4¼	2	5	108	51	127	40,000	5 00
<i>Insectator.</i>	10891	5	3	5½	127	76	140	40,000	5 54
<i>Insected.</i>	10892	5	1¼	5½	127	32	140	40,000	5 54
<i>Insectile.</i>	10893	5	2	5½	127	51	140	40,000	5 54

Note—Above bushings are regularly furnished brown glazed.

The actual working voltage, thickness of wall, floor, etc., and whether for indoor or outdoor service, should be specified on all orders or inquiries.



O-B PORCELAIN BUSHINGS

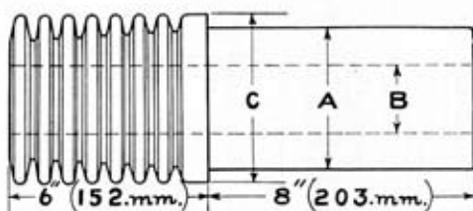
High Tension—Form I



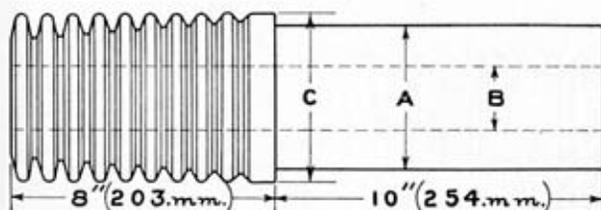
Nos. 10894-10900
Brown Glaze



Nos. 10901-10906
Brown Glaze



Code Word	No.	Inches			Millimeters			Test Voltage	List Each
		A	B	C	A	B	C		
<i>Insensate.</i>	10894	3½	1¼	4	89	32	102	55,000	\$6 10
<i>Inservient.</i>	10895	3½	2	4	89	51	102	55,000	6 10
<i>Insession.</i>	10896	4¼	1¼	5	108	32	127	55,000	7 44
<i>Insector.</i>	10897	4¼	2	5	108	51	127	55,000	7 44
<i>Inshaded.</i>	10898	5	3	5½	127	76	140	55,000	8 24
<i>Inshare.</i>	10899	5	1½	5½	127	32	140	55,000	8 24
<i>Inshrine.</i>	10900	5	2	5½	127	51	140	55,000	8 24



Code Word	No.	Inches			Millimeters			Test Voltage	List Each
		A	B	C	A	B	C		
<i>Insignia.</i>	10901	3½	1¼	4	89	32	102	70,000	\$ 8 50
<i>Insinew.</i>	10902	4¼	1¼	5	108	32	127	70,000	10 37
<i>Insinuator.</i>	10903	4¼	2	5	108	51	127	70,000	10 37
<i>Insition.</i>	10904	5	1¼	5½	127	32	140	70,000	11 48
<i>Insnarer.</i>	10905	5	2	5½	127	51	140	70,000	11 48
<i>Insnarl.</i>	10906	5	3	5½	127	76	140	70,000	11 48

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The actual working voltage, thickness of wall, floor, etc., and whether for indoor or outdoor service, should be specified on all orders or inquiries.



O-B PORCELAIN BUSHINGS

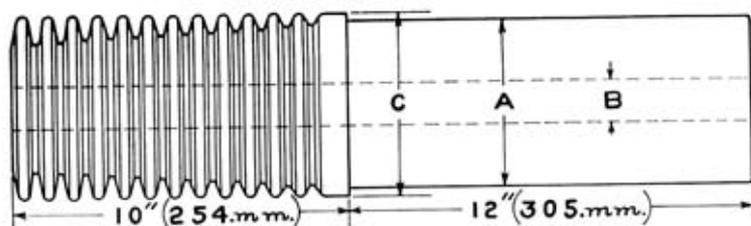
High Tension—Form 1



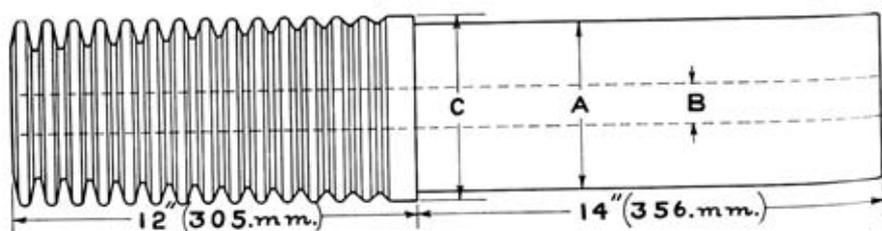
Nos. 10907-10910
Brown Glaze



Nos. 10911-10913
Brown Glaze



Code Word	No.	Inches			Millimeters			Test Voltage	List Each
		A	B	C	A	B	C		
<i>Inspere.</i>	10907	4 $\frac{1}{4}$	1 $\frac{1}{4}$	5	108	32	127	85,000	\$13 79
<i>Inspere.</i>	10908	5	1 $\frac{1}{4}$	5 $\frac{1}{2}$	127	32	140	85,000	15 26
<i>Inspirator.</i>	10909	5	2	5 $\frac{1}{2}$	127	51	140	85,000	15 26
<i>Inspirer.</i>	10910	5	3	5 $\frac{1}{2}$	127	76	140	85,000	15 26



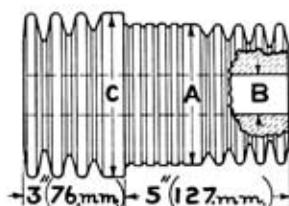
Code Word	No.	Inches			Millimeters			Test Voltage	List Each
		A	B	C	A	B	C		
<i>Inspirit.</i>	10911	4 $\frac{1}{4}$	1 $\frac{1}{4}$	5	108	32	127	100,000	\$17 69
<i>Instancy.</i>	10912	5	1 $\frac{1}{4}$	5 $\frac{1}{2}$	127	32	140	100,000	19 58
<i>Instaure.</i>	10913	5	2	5 $\frac{1}{2}$	127	51	140	100,000	19 58

Note—Above bushings are regularly furnished brown glazed.
The actual working voltage, thickness of wall, floor, etc., and whether for indoor or outdoor service, should be specified on all orders or inquiries.

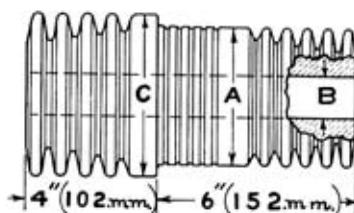


O-B PORCELAIN BUSHINGS

High Tension—Form 2

Nos. 10914-10920
Brown GlazeNos. 10921-10927
Brown Glaze

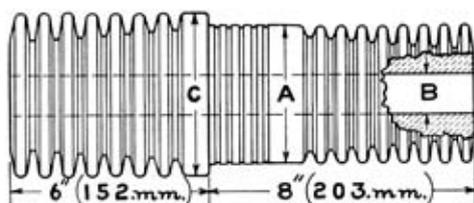
Code Word	No.	Inches			Millimeters			Test Voltage	List Each
		A	B	C	A	B	C		
<i>Insteep.</i>	10914	3½	1¼	4	89	32	102	30,000	\$ 3 30
<i>Instigator.</i>	10915	3½	2	4	89	51	102	30,000	3 30
<i>Instill.</i>	10916	4¼	1¼	5	108	32	127	30,000	4 03
<i>Instiller.</i>	10917	4¼	2	5	108	51	127	30,000	4 03
<i>Institutor.</i>	10918	5	3	5½	127	76	140	30,000	4 46
<i>Insuetude.</i>	10919	5	1¼	5½	127	32	140	30,000	4 46
<i>Insular.</i>	10920	5	2	5½	127	51	140	30,000	4 46



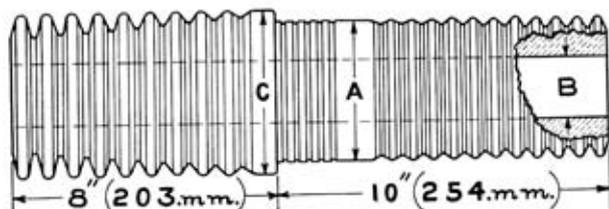
Code Word	No.	Inches			Millimeters			Test Voltage	List Each
		A	B	C	A	B	C		
<i>Insulary.</i>	10921	3½	1¼	4	89	32	102	40,000	\$ 4 10
<i>Insulous.</i>	10922	3½	2	4	89	51	102	40,000	4 10
<i>Insulsity.</i>	10923	4¼	1¼	5	108	32	127	40,000	5 00
<i>Insulter.</i>	10924	4¼	2	5	108	51	127	40,000	5 00
<i>Insune.</i>	10925	5	3	5½	127	76	140	40,000	5 54
<i>Insurable.</i>	10926	5	1¼	5½	127	32	140	40,000	5 54
<i>Insurancer.</i>	10927	5	2	5½	127	51	140	40,000	5 54

Note—Above bushings are regularly furnished brown glazed.

The actual working voltage, thickness of wall, floor, etc., and whether for indoor or outdoor service, should be specified on all orders or inquiries.

**O-B PORCELAIN BUSHINGS****High Tension—Form 2**Nos. 10928-10934
Brown GlazeNos. 10935-10940
Brown Glaze

Code Word	No.	Inches			Millimeters			Test Voltage	List Each
		A	B	C	A	B	C		
<i>Insurant.</i>	10928	3½	1¼	4	89	32	102	55,000	\$ 6 10
<i>Insurgent.</i>	10929	3½	2	4	89	51	102	55,000	6 10
<i>Intaglio.</i>	10930	4¼	1¼	5	108	32	127	55,000	7 44
<i>Integral.</i>	10931	4¼	2	5	108	51	127	55,000	7 44
<i>Integrally.</i>	10932	5	3	5½	127	76	140	55,000	8 24
<i>Integrator.</i>	10933	5	1¼	5½	127	32	140	55,000	8 24
<i>Integrate.</i>	10934	5	2	5½	127	51	140	55,000	8 24



Code Word	No.	Inches			Millimeters			Test Voltage	List Each
		A	B	C	A	B	C		
<i>Integer.</i>	10935	3½	1¼	4	89	32	102	70,000	\$ 8 50
<i>Invader.</i>	10936	4¼	1¼	5	108	32	127	70,000	10 37
<i>Invariant.</i>	10937	4¼	2	5	108	51	127	70,000	10 37
<i>Invasion.</i>	10938	5	1¼	5½	127	32	140	70,000	11 48
<i>Integrator.</i>	10939	5	2	5½	127	51	140	70,000	11 48
<i>Intermerate.</i>	10940	5	3	5½	127	76	140	70,000	11 48

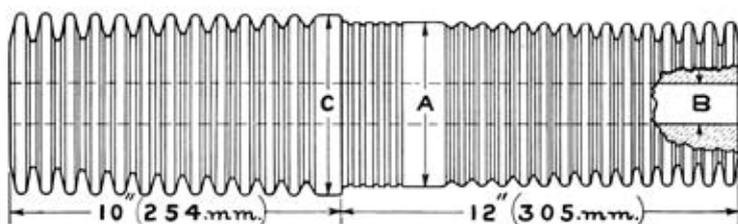
Note—Above bushings are regularly furnished brown glazed.

The actual working voltage, thickness of wall, floor, etc., and whether for indoor or outdoor service, should be specified on all orders or inquiries.

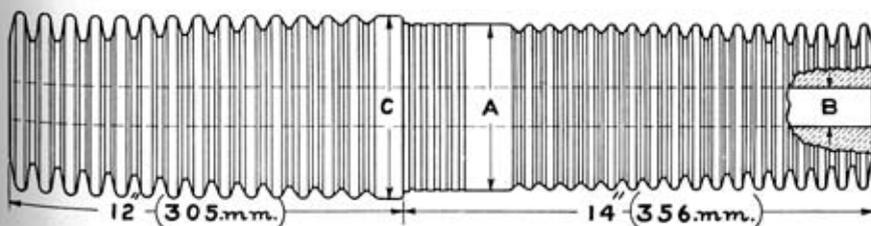


O-B PORCELAIN BUSHINGS

High Tension—Form 2

Nos. 10911-10914
Brown GlazeNos. 10945-10947
Brown Glaze

Code Word	No.	Inches			Millimeters			Test Voltage	List Each
		A	B	C	A	B	C		
<i>Intenable.</i>	10941	4 $\frac{1}{4}$	1 $\frac{1}{4}$	5	108	32	127	85,000	\$13 79
<i>Intendant.</i>	10942	5	1 $\frac{1}{4}$	5 $\frac{1}{2}$	127	32	140	85,000	15 26
<i>Intender.</i>	10943	5	2	5 $\frac{1}{2}$	127	51	140	85,000	15 26
<i>Intenible.</i>	10944	5	3	5 $\frac{1}{2}$	127	76	140	85,000	15 26



Code Word	No.	Inches			Millimeters			Test Voltage	List Each
		A	B	C	A	B	C		
<i>Intensate.</i>	10945	4 $\frac{1}{4}$	1 $\frac{1}{4}$	5	108	32	127	100,000	\$17 69
<i>Interaulic.</i>	10946	5	1 $\frac{1}{4}$	5 $\frac{1}{2}$	127	32	140	100,000	19 58
<i>Interal.</i>	10947	5	2	5 $\frac{1}{2}$	127	51	140	100,000	19 58

Note—Above bushings are regularly furnished brown glazed.
The actual working voltage, thickness of wall, floor, etc., and whether for indoor or outdoor service, should be specified on all orders or inquiries.

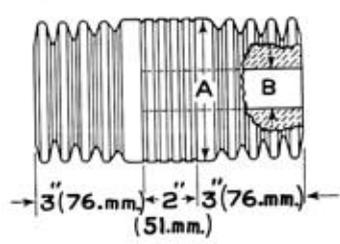


O-B PORCELAIN BUSHINGS

High Tension—Form 5

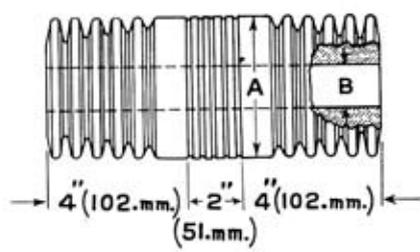


Nos. 13726-13732
Brown Glaze



Nos. 13733-13739
Brown Glaze

Code Word	No.	Inches		Millimeters		Test Voltage	List Each
		A	B	A	B		
<i>Rookery.</i>	13726	3 $\frac{1}{2}$	1 $\frac{1}{4}$	89	32	30,000	\$ 2 97
<i>Roomer.</i>	13727	3 $\frac{1}{2}$	2	89	51	30,000	2 97
<i>Roomful.</i>	13728	4 $\frac{1}{4}$	1 $\frac{1}{4}$	108	32	30,000	3 47
<i>Roomless.</i>	13729	4 $\frac{1}{4}$	2	108	51	30,000	3 47
<i>Roommate.</i>	13730	5	3	127	76	30,000	4 03
<i>Rooster.</i>	13731	5	1 $\frac{1}{4}$	127	32	30,000	4 03
<i>Rootless.</i>	13732	5	2	127	51	30,000	4 03



Code Word	No.	Inches		Millimeters		Test Voltage	List Each
		A	B	A	B		
<i>Roration.</i>	13733	3 $\frac{1}{2}$	1 $\frac{1}{4}$	89	32	40,000	\$ 3 69
<i>Rorqual.</i>	13734	3 $\frac{1}{2}$	2	89	51	40,000	3 69
<i>Rorulent.</i>	13735	4 $\frac{1}{4}$	1 $\frac{1}{4}$	108	32	40,000	4 31
<i>Rosary.</i>	13736	4 $\frac{1}{4}$	2	108	51	40,000	4 31
<i>Rosebud.</i>	13737	5	3	127	76	40,000	5 00
<i>Rosebush.</i>	13738	5	1 $\frac{1}{4}$	127	32	40,000	5 00
<i>Rosemary.</i>	13739	5	2	127	51	40,000	5 00

Note—Above bushings are regularly furnished brown glazed.

The actual working voltage, thickness of wall, floor, etc., and whether for indoor or outdoor service, should be specified on all orders or inquiries.

O-B PORCELAIN BUSHINGS

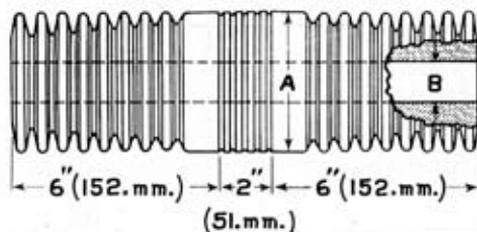
High Tension—Form 5



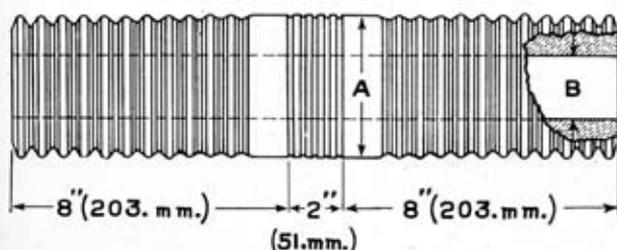
Nos. 13740-13746
Brown Glaze



Nos. 13747-13752
Brown Glaze



Code Word	No.	Inches		Millimeters		Test Voltage	List Each
		A	B	A	B		
<i>Roseroot.</i>	13740	3½	1½	89	32	55,000	\$ 5 49
<i>Rosewood.</i>	13741	3½	2	89	51	55,000	5 49
<i>Roseworm.</i>	13742	4¼	1½	108	32	55,000	6 41
<i>Rosland.</i>	13743	4¼	2	108	51	55,000	6 41
<i>Rostrum.</i>	13744	5	3	127	76	55,000	7 44
<i>Roving.</i>	13745	5	1½	127	32	55,000	7 44
<i>Rowlock.</i>	13746	5	2	127	51	55,000	7 44



Code Word	No.	Inches		Millimeters		Test Voltage	List Each
		A	B	A	B		
<i>Rowport.</i>	13747	3½	1½	89	32	70,000	\$ 7 65
<i>Royalism.</i>	13748	4¼	1½	108	32	70,000	8 93
<i>Royally.</i>	13749	4¼	2	108	51	70,000	8 93
<i>Roytelet.</i>	13750	5	1½	127	32	70,000	10 37
<i>Rubadub.</i>	13751	5	2	127	51	70,000	10 37
<i>Rubrical.</i>	13752	5	3	127	76	70,000	10 37

Note—Above bushings are regularly furnished brown glazed.
The actual working voltage, thickness of wall, floor, etc., and whether for indoor or outdoor service, should be specified on all orders or inquiries.



O-B PORCELAIN BUSHINGS

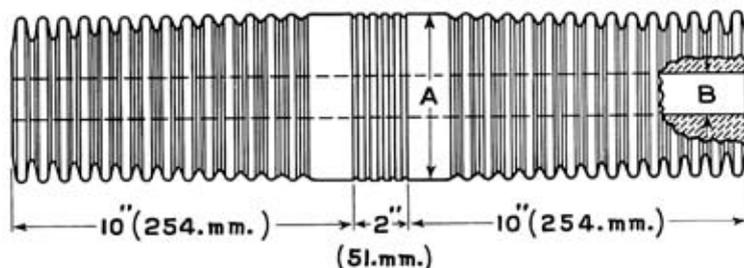
High Tension—Form 5



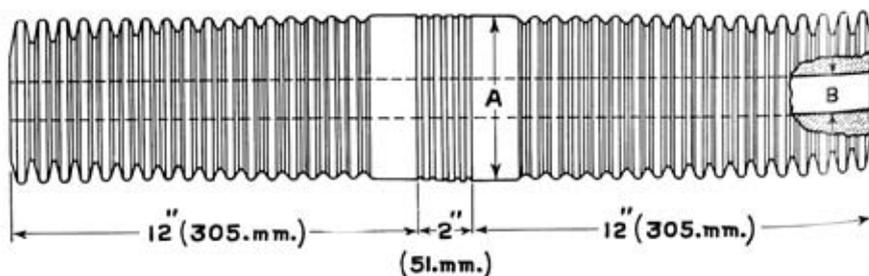
Nos. 13753-13756
Brown Glaze



Nos. 13757-13759
Brown Glaze



Code Word	No.	Inches		Millimeters		Test Voltage	List Each
		A	B	A	B		
<i>Rubstone.</i>	13753	4 $\frac{1}{4}$	1 $\frac{1}{4}$	108	32	85,000	\$11 87
<i>Rubytail.</i>	13754	5	1 $\frac{1}{4}$	127	32	85,000	13 79
<i>Rubywood.</i>	13755	5	2	127	51	85,000	13 79
<i>Ruching.</i>	13756	5	3	127	76	85,000	13 79



Code Word	No.	Inches		Millimeters		Test Voltage	List Each
		A	B	A	B		
<i>Ructation.</i>	13757	4 $\frac{1}{4}$	1 $\frac{1}{4}$	108	32	100,000	\$15 23
<i>Rudder.</i>	13758	5	1 $\frac{1}{4}$	127	32	100,000	17 69
<i>Rudiment.</i>	13759	5	2	127	51	100,000	17 69

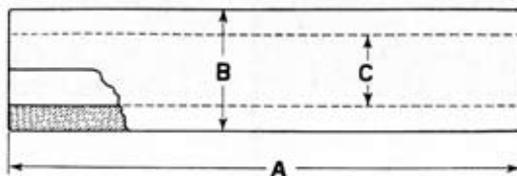
Note—Above bushings are regularly furnished brown glazed.
The actual working voltage, thickness of wall, floor, etc., and whether for indoor or outdoor service, should be specified on all orders or inquiries.

O-B PORCELAIN TUBES

High Tension—Form 6



Nos. 13760-13786
Brown Glaze



Code Word	No.	Inches			Millimeters			Test Voltage	List Each
		A	B	C	A	B	C		
<i>Rueful.</i>	13760	4	2	1	102	51	25	10,000	\$1 34
<i>Ruffian.</i>	13761	6	2	1	152	51	25	20,000	1 74
<i>Searover.</i>	13762	8	2	1	203	51	25	30,000	2 21
<i>Ruffler.</i>	13763	10	2	1	254	51	25	40,000	2 75
<i>Rugging.</i>	13764	12	2	1	305	51	25	50,000	3 42
<i>Rugosa.</i>	13765	14	2	1	356	51	25	55,000	4 09
<i>Rugosity.</i>	13766	16	2	1	406	51	25	60,000	4 89
<i>Seashore.</i>	13767	18	2	1	457	51	25	70,000	5 70
<i>Rumbler.</i>	13768	20	2	1	508	51	25	75,000	6 63
<i>Ruminate.</i>	13769	4	2 $\frac{1}{2}$	1 $\frac{1}{2}$	102	63	38	10,000	1 48
<i>Ruminator.</i>	13770	6	2 $\frac{1}{2}$	1 $\frac{1}{2}$	152	63	38	20,000	1 92
<i>Rummage.</i>	13771	8	2 $\frac{1}{2}$	1 $\frac{1}{2}$	203	63	38	30,000	2 44
<i>Rumorous.</i>	13772	10	2 $\frac{1}{2}$	1 $\frac{1}{2}$	254	63	38	40,000	3 03
<i>Rumpled.</i>	13773	12	2 $\frac{1}{2}$	1 $\frac{1}{2}$	305	63	38	50,000	3 77
<i>Rumseller.</i>	13774	14	2 $\frac{1}{2}$	1 $\frac{1}{2}$	356	63	38	55,000	4 51
<i>Runagate.</i>	13775	16	2 $\frac{1}{2}$	1 $\frac{1}{2}$	406	63	38	60,000	5 40
<i>Runaway.</i>	13776	18	2 $\frac{1}{2}$	1 $\frac{1}{2}$	457	63	38	70,000	6 29
<i>Rundlet.</i>	13777	20	2 $\frac{1}{2}$	1 $\frac{1}{2}$	508	63	38	75,000	7 33
<i>Runghead.</i>	13778	4	3	2	102	76	51	10,000	1 64
<i>Runlet.</i>	13779	6	3	2	152	76	51	20,000	2 13
<i>Runner.</i>	13780	8	3	2	203	76	51	30,000	2 71
<i>Rupicola.</i>	13781	10	3	2	254	76	51	40,000	3 36
<i>Ruralism.</i>	13782	12	3	2	305	76	51	50,000	4 18
<i>Rurality.</i>	13783	14	3	2	356	76	51	55,000	5 00
<i>Ruricolist.</i>	13784	16	3	2	406	76	51	60,000	5 99
<i>Rurigenous.</i>	13785	18	3	2	457	76	51	70,000	6 97
<i>Rushlight.</i>	13786	20	3	2	508	76	51	75,000	8 12

Note—Above bushings are regularly furnished brown glazed.

The actual working voltage, thickness of wall, floor, etc., and whether for indoor or outdoor service, should be specified on all orders or inquiries.

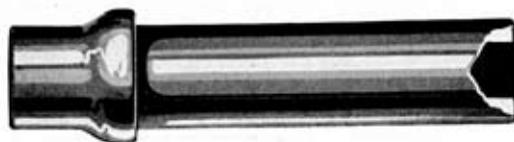


O-B PORCELAIN TUBES

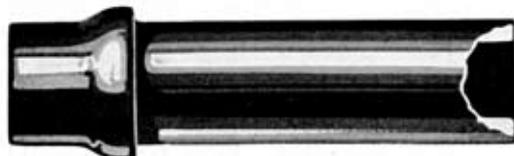
High Tension—Form 3



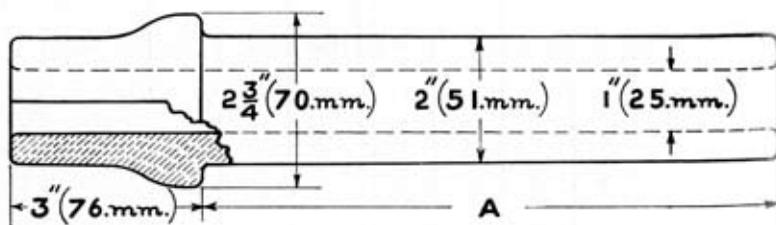
Nos. 12880-12895—Brown Glaze



Nos. 12881-12896—Brown Glaze



Nos. 12882-12897—Brown Glaze



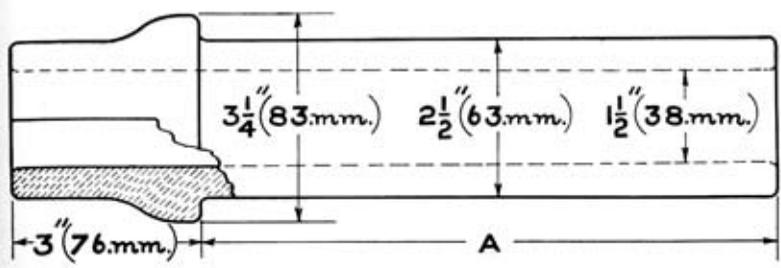
Code Word	No.	A—Length Under Head		Test Voltage	List Each
		Inches	Millimeters		
<i>Platonic.</i>	12880	3	76	20,000	\$2 03
<i>Playful.</i>	12883	5	127	30,000	2 57
<i>Pleaser.</i>	12886	7	178	40,000	3 20
<i>Pledge.</i>	12889	9	229	50,000	3 98
<i>Pleurisy.</i>	12892	11	279	55,000	4 78
<i>Plodder.</i>	12895	13	330	60,000	5 69

Note—Above bushings are regularly furnished brown glazed.

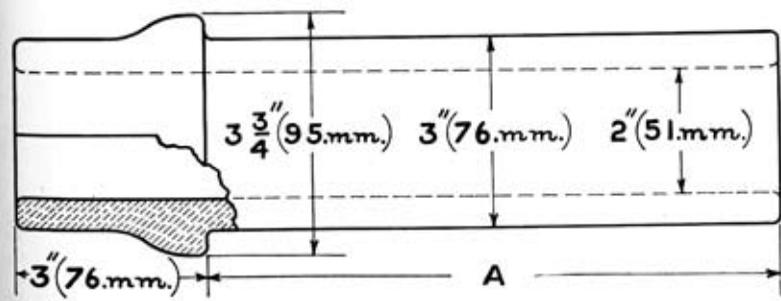
The actual working voltage, thickness of wall, floor, etc., and whether for indoor or outdoor service, should be specified on all orders or inquiries.

O-B PORCELAIN TUBES

High Tension—Form 3



Code Word	No.	A-Length Under Head		Test Voltage	List Each
		Inches	Millimeters		
<i>Playbill.</i>	12881	3	76	20,000	\$2 24
<i>Playgoer.</i>	12884	5	127	30,000	2 84
<i>Plebeian.</i>	12887	7	178	40,000	3 53
<i>Plenary.</i>	12890	9	229	50,000	4 39
<i>Pliant.</i>	12893	11	279	55,000	5 25
<i>Plotful.</i>	12896	13	330	60,000	6 28



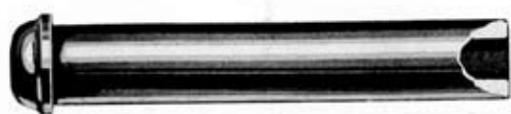
Code Word	No.	A-Length Under Head		Test Voltage	List Each
		Inches	Millimeters		
<i>Playday.</i>	12882	3	76	20,000	\$2 47
<i>Playsome.</i>	12885	5	127	30,000	3 14
<i>Plectile.</i>	12888	7	178	40,000	3 90
<i>Pleonasm.</i>	12891	9	229	50,000	4 85
<i>Plight.</i>	12894	11	279	55,000	5 80
<i>Plough.</i>	12897	13	330	60,000	6 94

Note—Above bushings are regularly furnished brown glazed.
 The actual working voltage, thickness of wall, floor, etc., and whether for indoor or outdoor service, should be specified on all orders or inquiries.

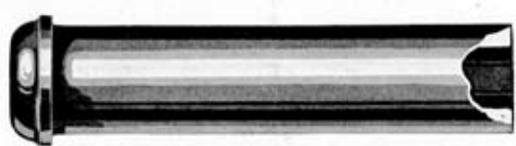


O-B PORCELAIN TUBES

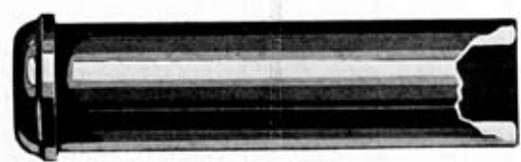
High Tension—Form 4



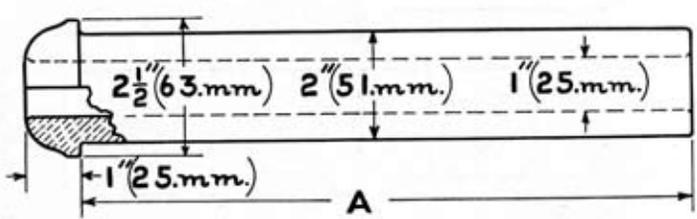
Nos. 12898-12921—Brown Glaze



Nos. 12899-12922—Brown Glaze



Nos. 12902-12923—Brown Glaze



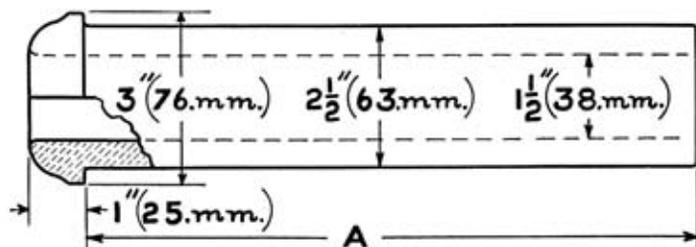
Code Word	No.	A—Length Under Head		Test Voltage	List Each
		Inches	Millimeters		
<i>Plowable.</i>	12898	3	76	10,000	\$1 48
<i>Plucky.</i>	12900	5	127	20,000	1 92
<i>Plumbago.</i>	12903	7	178	30,000	2 44
<i>Plunkel.</i>	12906	9	229	40,000	3 03
<i>Plurisy.</i>	12909	11	279	50,000	3 77
<i>Poachard.</i>	12912	13	330	55,000	4 51
<i>Podagra.</i>	12915	15	381	60,000	5 40
<i>Poetical.</i>	12918	17	432	70,000	6 29
<i>Poignant.</i>	12921	19	483	75,000	7 33

Note—Above bushings are regularly furnished brown glazed.
 The actual working voltage, thickness of wall, floor, etc., and whether for indoor or outdoor service, should be specified on all orders or inquiries.

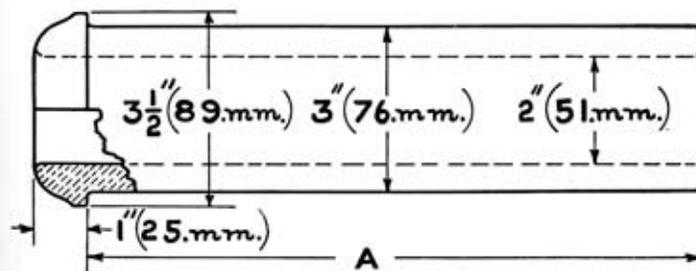


O-B PORCELAIN TUBES

High Tension—Form 4



Code Word	No.	A—Length Under Head		Test Voltage	List Each
		Inches	Millimeters		
<i>Plowgang.</i>	12899	3	76	10,000	\$1 64
<i>Plugging.</i>	12901	5	127	20,000	2 13
<i>Plumelet.</i>	12904	7	178	30,000	2 71
<i>Plunder.</i>	12907	9	229	40,000	3 36
<i>Plutocrat.</i>	12910	11	279	50,000	4 18
<i>Poachy.</i>	12913	13	330	55,000	5 00
<i>Podesta.</i>	12916	15	381	60,000	5 99
<i>Poetry.</i>	12919	17	432	70,000	6 97
<i>Pointal.</i>	12922	19	483	75,000	8 12

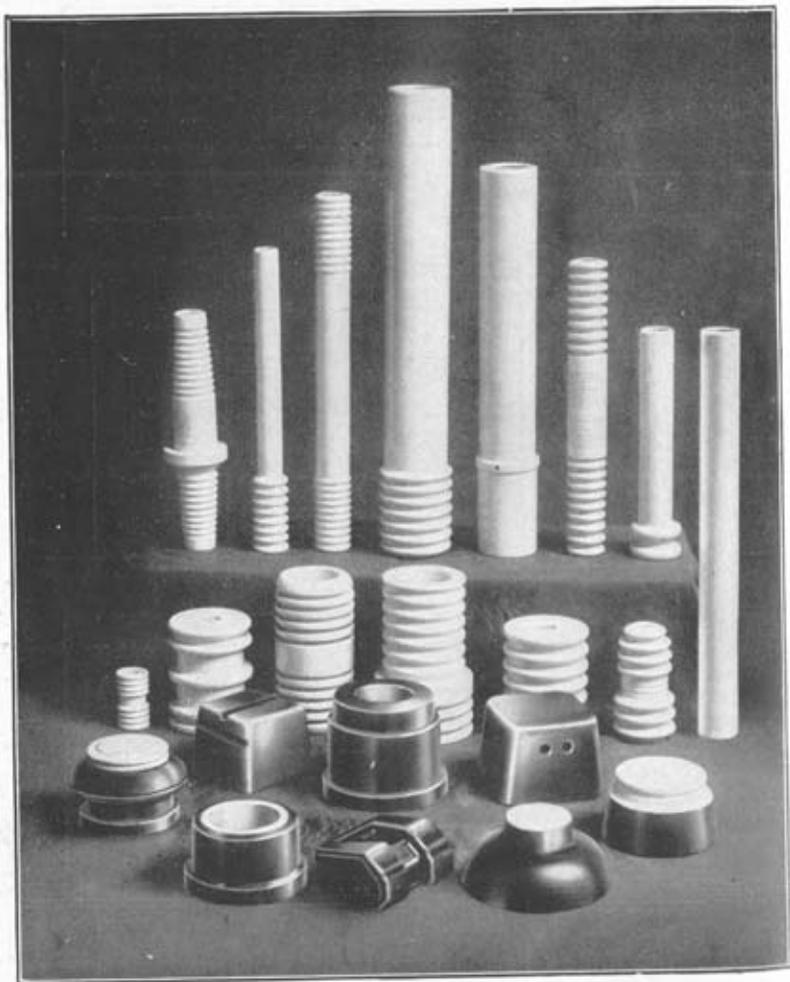


Code Word	No.	A—Length Under Head		Test Voltage	List Each
		Inches	Millimeters		
<i>Plumage.</i>	12902	5	127	20,000	\$2 34
<i>Plumper.</i>	12905	7	178	30,000	2 97
<i>Plural.</i>	12908	9	229	40,000	3 69
<i>Pluvial.</i>	12911	11	279	50,000	4 59
<i>Pocket.</i>	12914	13	330	55,000	5 49
<i>Poematic.</i>	12917	15	381	60,000	6 57
<i>Poetship.</i>	12920	17	432	70,000	7 65
<i>Poison.</i>	12923	19	483	75,000	8 91

Note—Above bushings are regularly furnished brown glazed.
The actual working voltage, thickness of wall, floor, etc., and whether for indoor or outdoor service, should be specified on all orders or inquiries.



SPECIAL O-B PORCELAINS

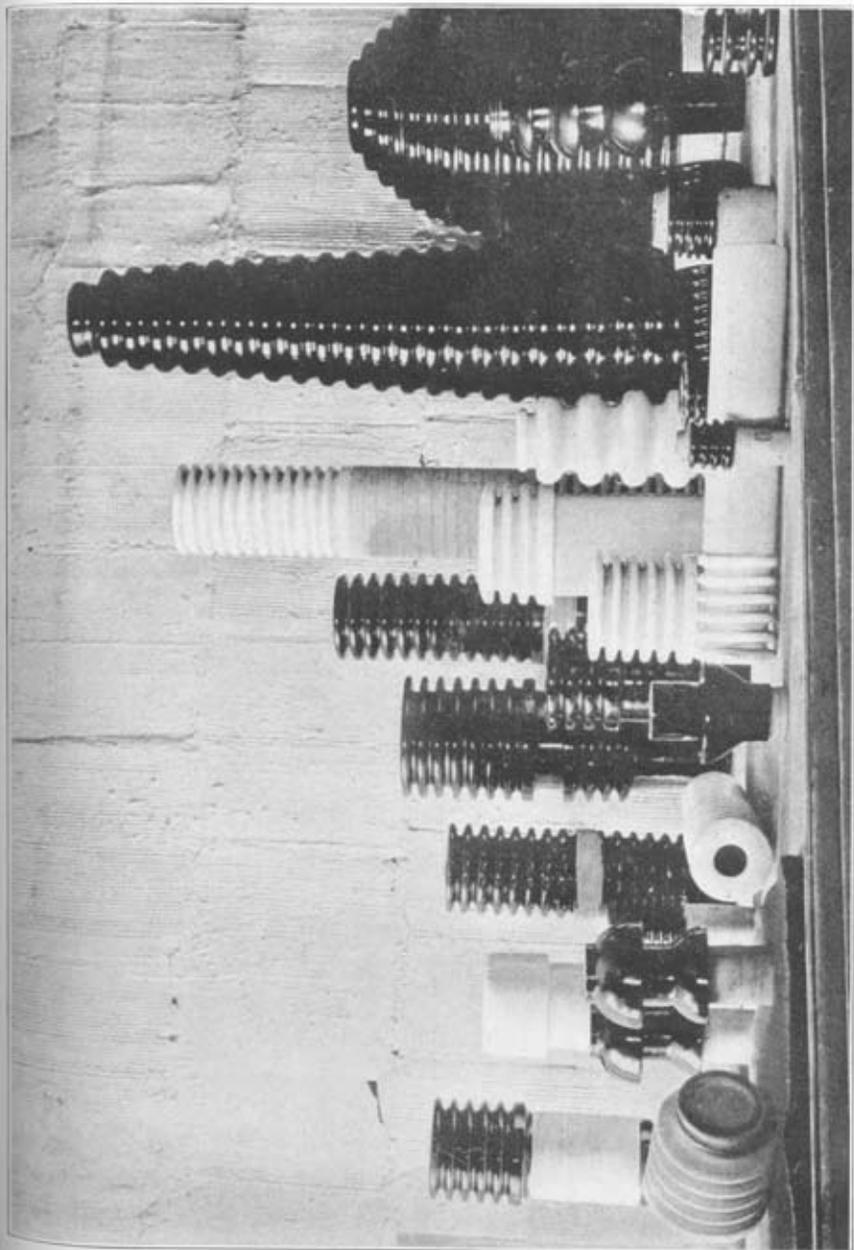


THE above group of high tension Porcelain Tubes, Bushings and Third Rail Insulator Blocks illustrates, in a general way, our wide facilities for manufacturing special porcelain.

Tubes can be made any commercial length and diameter required.

Length, working voltage and method of mounting the Tube should always be stated on all orders or inquiries.

SPECIAL O-B PORCELAINS

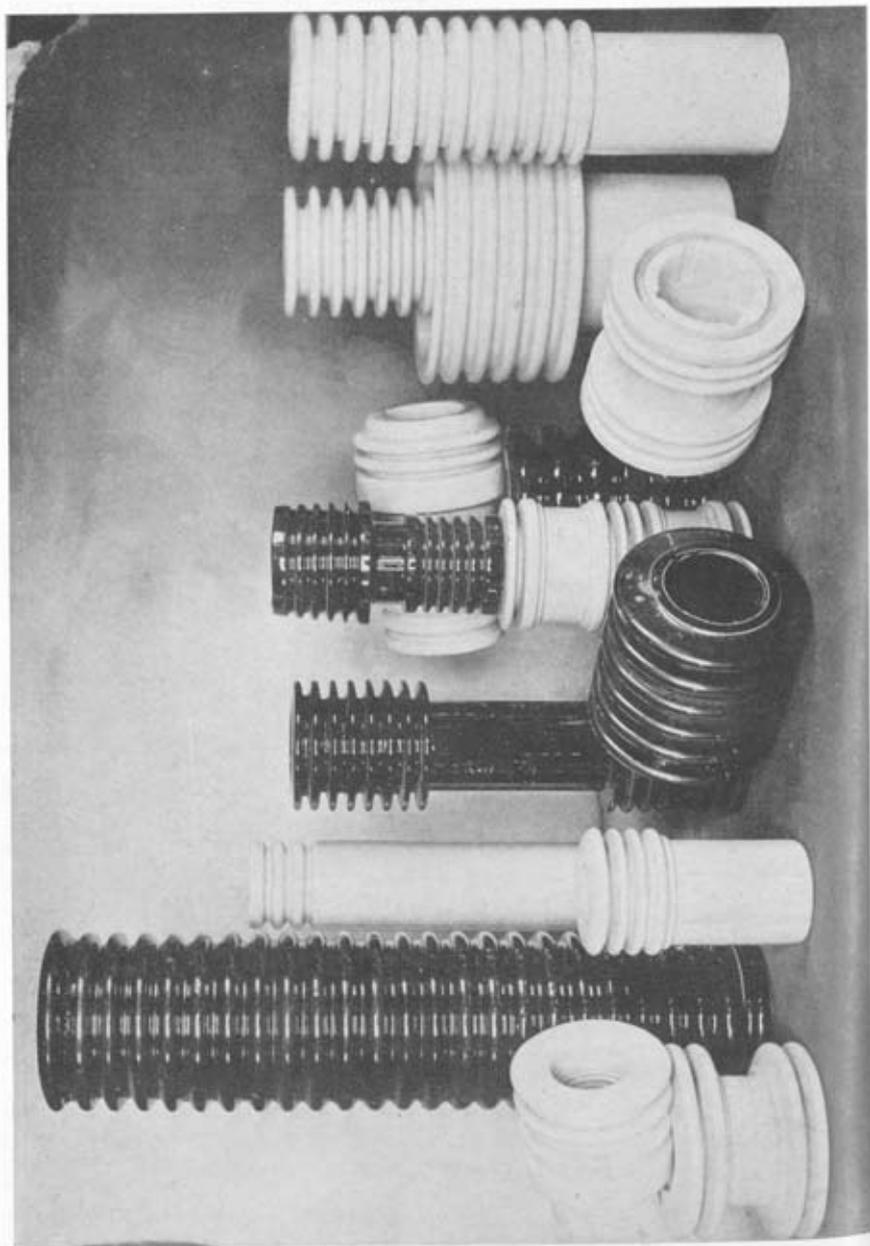


Pole
Hard-
ware
Miscellaneous

Tro
M



SPECIAL O-B PORCELAIN BUSHINGS



INSULATED ARC LAMP HANGER

Form 2—11,000 Volts



No. 25226—Both Arms Insulated.
One Porcelain Spool Sectioned to
show Construction



No. 25545—One Arm Insulated.
Other Grounded

A NEW Arc Lamp Hanger embodying a number of modern and desirable features.

High tension porcelain is used for insulating members, including the spools in arm for supporting conductors.

No. 25226 has porcelain spools in each arm.

No. 25545 has one arm entirely of metal with a prong that pierces and grounds the conductor. This grounded feature is intended to eliminate as much as possible breakage of conductor and danger from electrolytic action. The other spool insulator is sufficient to carry the voltage across the lamp.

Insulators are furnished with small clamp to prevent slipping of conductor through insulated arm.

Diameter porcelain, $5\frac{1}{2}$ inches (140 mm). Diameter hole in cap, $1\frac{1}{4}$ inches (29 mm). Distance between center of conductors at arms, 8 inches (203 mm).

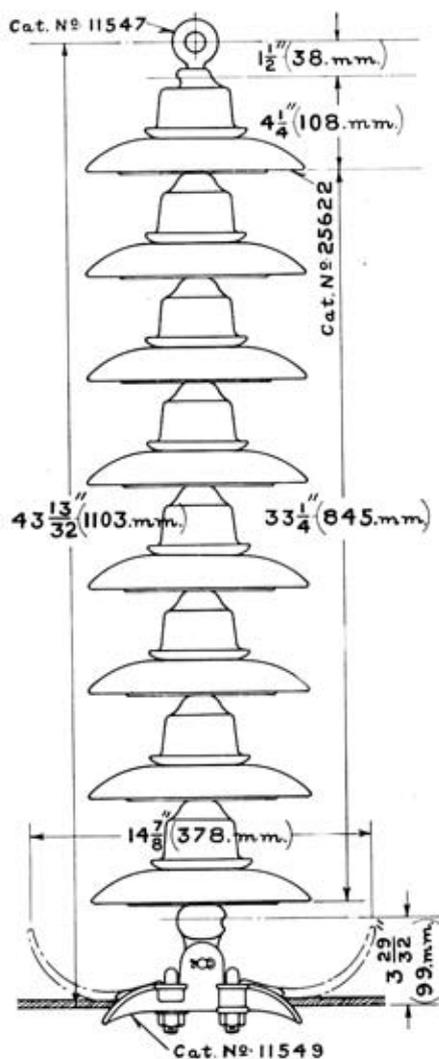
Code Word
Realness.
Russel.

No.		List per 100
25226	—Arc Lamp Hanger, Both Arms Insulated	\$600 00
25545	— " " " One Arm Grounded	650 00

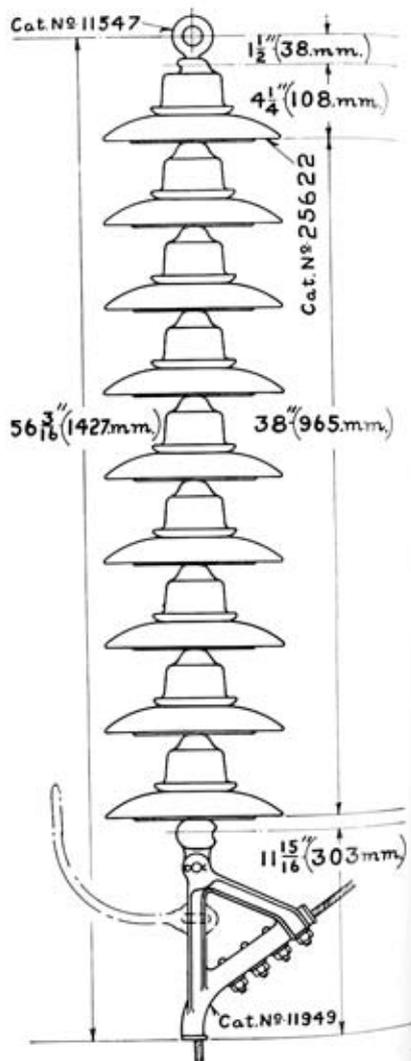
For additional design, see page 63.



O-B SUSPENSION INSULATORS INSTALLED



Suspension Insulator
with Suspension Clamp

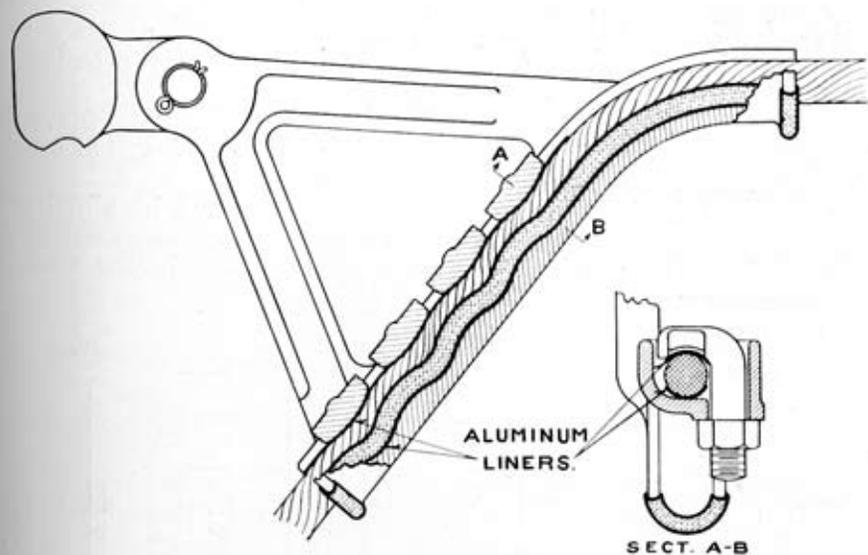
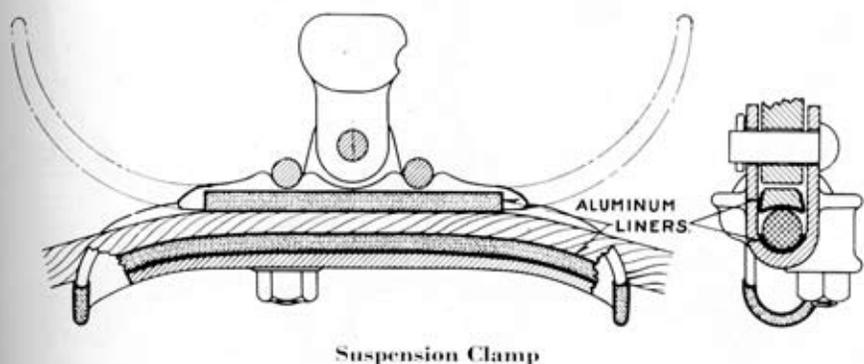


Strain or Dead-End Insulator
with Strain Clamp

On the right is shown a string of Insulators with Strain Clamp. In practice these usually are installed horizontally.

O-B Suspension Insulator Hardware is listed on the pages following.

O-B SUSPENSION WIRE CLAMPS

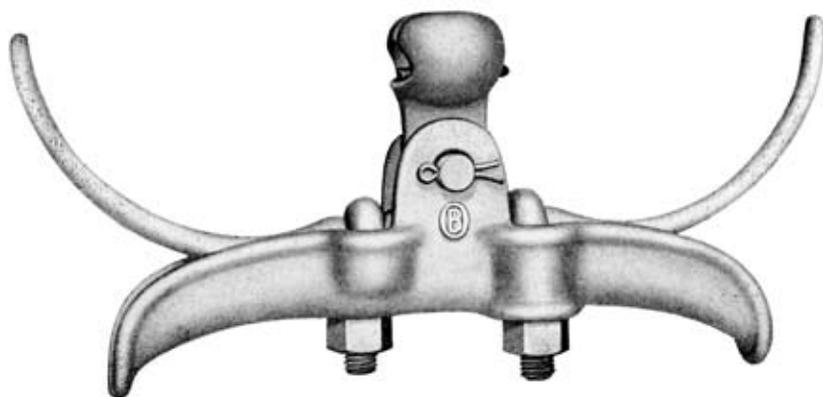


Above cuts illustrate the use of aluminum liners in Suspension Clamps. These liners are usually furnished with the conductor but can be installed in the Clamps prior to shipment, thereby eliminating work in the field.



SUSPENSION WIRE CLAMP

Type B, Form 1—Patented



FOR attachment direct to ball pin of suspension insulators. For method of installing, see pages 172 and 173.

Furnished with discharge horns or plain clamping piece. Discharge horns are desirable under certain conditions, as they cut down the time lag for excessive surges and increase the factor of safety of the insulators.

Swivel connection between body of Clamp and socket prevents severe bending strains on center pin of insulator which would otherwise be caused should the transmission wire break.

Sizes of cable given in table below are for copper; with aluminum cable, allowance should be made for an aluminum protecting sleeve about $\frac{1}{16}$ inch (1.6 mm.) thick to encircle the cable in the Clamp.

Castings are malleable iron, galvanized.

With Discharge Horns

Code Word	No.	Diameter Copper Cable		Insulators Used With	Weight Packed Per 100	List Per 100
		Min.	Max.			
<i>Moraliam.</i>	11548	$\frac{3}{8}$ in. (4.8mm.)	$\frac{1}{2}$ in. (14.3mm.)	Type A	504 lbs. (228 Kg.)	\$398 00
<i>Morality.</i>	11549	$\frac{3}{8}$ in. (4.8mm.)	$\frac{1}{2}$ in. (14.3mm.)	Type B	504 lbs. (228 Kg.)	398 00
<i>Moralize.</i>	11550	$\frac{1}{2}$ in. (7.9mm.)	$\frac{3}{4}$ in. (17.5mm.)	Type A	607 lbs. (275 Kg.)	428 00
<i>Moration.</i>	11551	$\frac{1}{2}$ in. (7.9mm.)	$\frac{3}{4}$ in. (17.5mm.)	Type B	607 lbs. (275 Kg.)	428 00
<i>Morbid.</i>	11643	$\frac{1}{2}$ in. (15.9mm.)	1 in. (25.4mm.)	Type A	840 lbs. (380 Kg.)	708 00
<i>Morbose.</i>	11644	$\frac{1}{2}$ in. (15.9mm.)	1 in. (25.4mm.)	Type B	840 lbs. (380 Kg.)	708 00

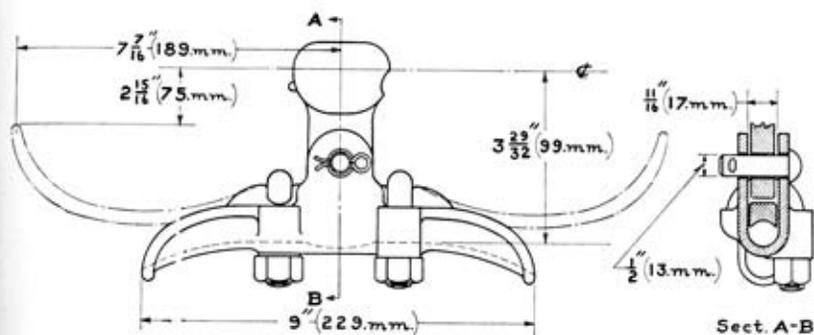
Without Discharge Horns

<i>Interpel.</i>	10879	$\frac{3}{8}$ in. (4.8mm.)	$\frac{1}{2}$ in. (14.3mm.)	Type A	417 lbs. (189 Kg.)	324 00
<i>Mopboard.</i>	11538	$\frac{3}{8}$ in. (4.8mm.)	$\frac{1}{2}$ in. (14.3mm.)	Type B	417 lbs. (189 Kg.)	324 00
<i>Mopful.</i>	11539	$\frac{1}{2}$ in. (7.9mm.)	$\frac{3}{4}$ in. (17.5mm.)	Type A	524 lbs. (237 Kg.)	396 00
<i>Moraine.</i>	11540	$\frac{1}{2}$ in. (7.9mm.)	$\frac{3}{4}$ in. (17.5mm.)	Type B	524 lbs. (237 Kg.)	396 00
<i>Russia.</i>	13707	$\frac{1}{2}$ in. (15.9mm.)	1 in. (25.4mm.)	Type A	743 lbs. (337 Kg.)	668 00
<i>Rustic.</i>	13708	$\frac{1}{2}$ in. (15.9mm.)	1 in. (25.4mm.)	Type B	743 lbs. (337 Kg.)	668 00

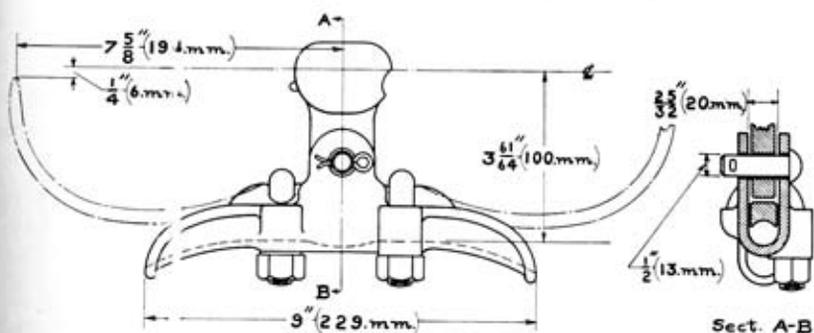
Clamps cannot be interchanged between Type A and Type B Insulators. Clamps for special conditions can be furnished on application.

SUSPENSION WIRE CLAMP

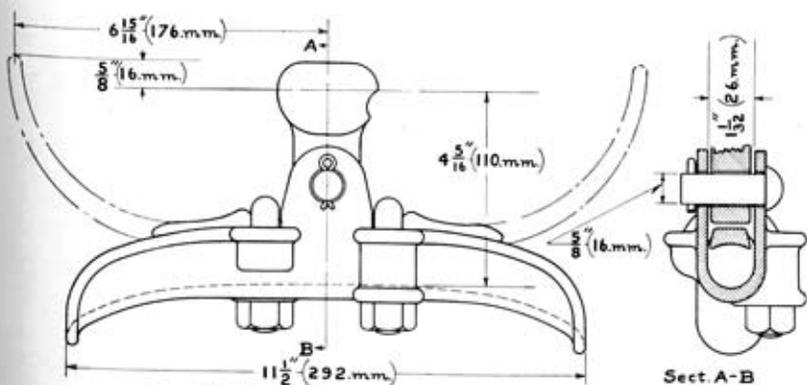
Type B, Form I—Patented



Nos. 11548-11549—With Discharge Horns
Nos. 10879-11538—With Plain Clamping Piece



Nos. 11550-11551—With Discharge Horns
Nos. 11539-11540—With Plain Clamping Piece



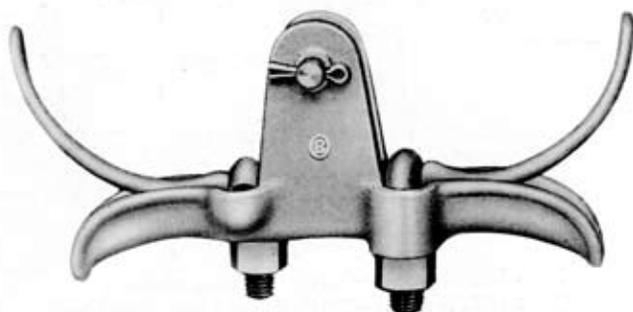
Nos. 11643-11644—With Discharge Horns
Nos. 13707-13708—With Plain Clamping Piece



SUSPENSION WIRE CLAMP

Type F, Form 1—Patented

For Clevis Type Insulators



No. 11944—With Discharge Horns

USED for supporting high tension transmission wires and is attached directly to our Type D and other makes of suspension insulators having an eye pin.

Furnished with discharge horns or with plain clamping piece. Discharge horns are desirable under certain conditions as they cut down the time lag for excessive surges and increase the factor of safety of the insulator. See illustration on page 172.

Can be used with conductors $\frac{3}{16}$ to $\frac{5}{8}$ inch (4.8 to 15.9 mm.) in diameter; when aluminum cable is used, an aluminum protecting sleeve about $\frac{1}{16}$ inch (1.6 mm.) thick should completely encircle cable in clamp and diameter should be measured over sleeves. See page 173.

No. 11944—Weight packed, per 100, is 385 pounds (174.5 Kilograms).

No. 11552—Weight packed, per 100, is 330 pounds (149.6 Kilograms).

Made of malleable iron, galvanized.

Code Word
Moreen.
Mordant.

No.		List per 100
11944	—Clamp for Type D Insulator, with Horn Clamping Piece.	\$378 00
11552	— " " " " " Plain	300 00

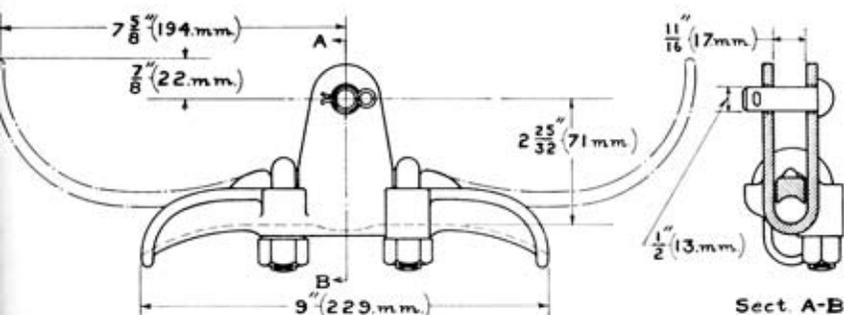
Clamps for special conditions can be furnished on application.



SUSPENSION WIRE CLAMP

Type F, Form 1—Patented

For Clevis Type Insulators



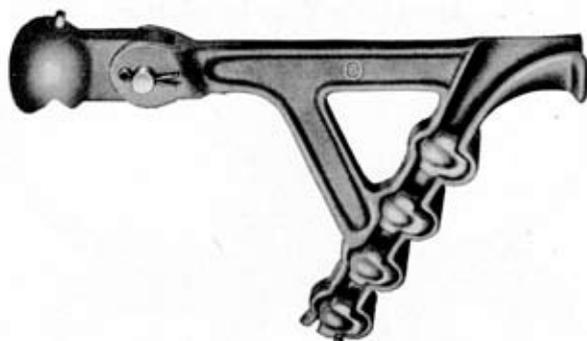
No. 11944—With Horn Clamping Piece

No. 11552—With Plain Clamping Piece



SUSPENSION STRAIN WIRE CLAMP

Type E, Form 1—Patented



Nos. 11041-11541—Without Discharge Horn

FOR use with high tension transmission wire. No loose parts need be handled in installing as hook bolts which grip wire can be loosened and turned out of way while wire is being seated in groove.

Furnished as shown above or with a discharge horn (see drawing on opposite page), which is desirable under certain conditions, as it cuts down the time lag for excessive surges and increases the factor of safety of the insulator. For method of installing, see page 172.

Can be used with conductors from $\frac{3}{16}$ to $\frac{1}{2}$ inch (4.8 to 12.7 mm.) diameter; when aluminum cable is used, an aluminum protecting sleeve about $\frac{1}{16}$ inch (1.6 mm.) thick should encircle cable in Clamp and diameter should be measured over sleeve. See page 173.

Numbers 10755 and 11947 are without socket eye and are for use with clevis type insulators.

Castings are malleable iron, galvanized.

Without Discharge Horn

Code Word	No.	No. Socket Eye Used	Insulators Used With	Weight Packed Per 100		List Per 100
				Pounds	Kilograms	
<i>Interplay.</i>	11041	10757	Type A	646	293	\$610 00
<i>Morelle.</i>	11541	11544	Type B	646	293	610 00
<i>Homotype.</i>	10755	.....	Type D	540	245	500 00

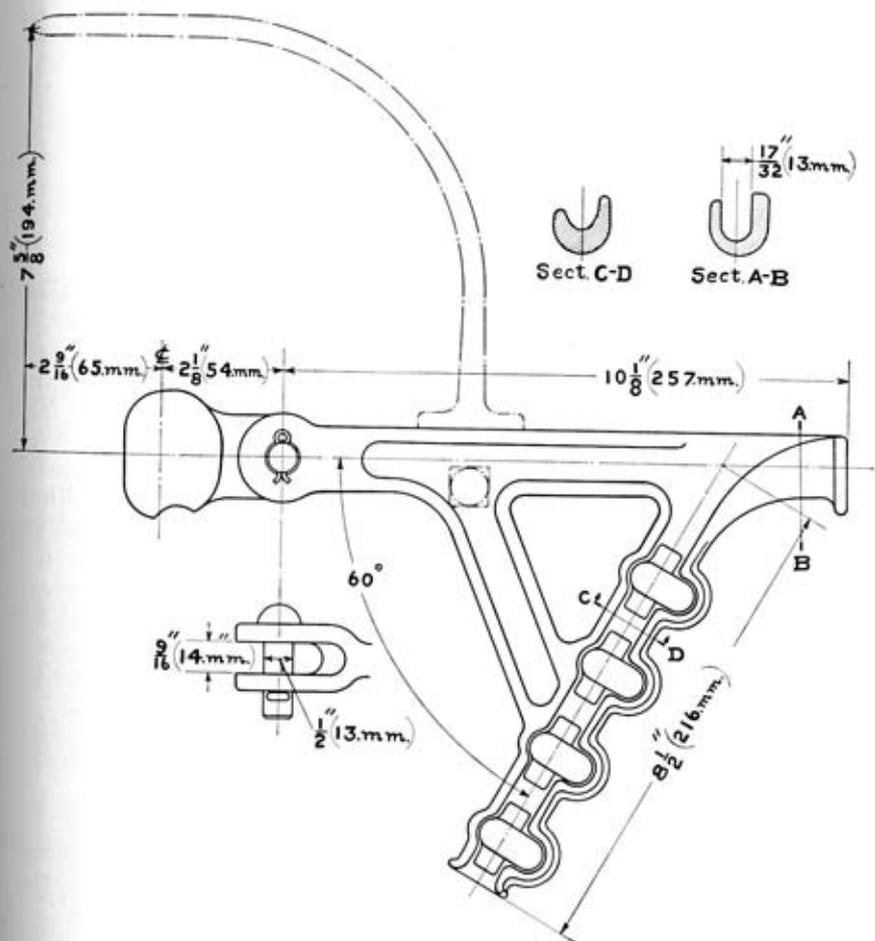
With Discharge Horn

<i>Morgay.</i>	11945	10757	Type A	786	356	726 00
<i>Morian.</i>	11946	11544	Type B	786	356	726 00
<i>Moribund.</i>	11947	.....	Type D	680	308	616 00

Clamps cannot be interchanged between Type A and Type B Insulators. Clamps for special conditions can be furnished on application.

SUSPENSION STRAIN WIRE CLAMP

Type E, Form 1—Patented



Nos. 11041-11541—Without Discharge Horn

Nos. 11945-11946—With Discharge Horn

See description and list on the opposite page.

**SUSPENSION STRAIN WIRE CLAMP**

Type E, Form 2—Patented



Nos. 11035-11512—Without Discharge Horn

DIFFERS from Form 1 Clamp listed on preceding pages in size of wire groove and position of hook bolts with respect to body.

Furnished as shown above or with a discharge horn (see drawing on opposite page), which is desirable under certain conditions, as it cuts down the time lag for excessive surges and increases the factor of safety of the insulator. For method of installing, see page 172.

Has the advantage of great ease in installing where a protecting sleeve is used around conductor, as lower sleeve can be installed in Clamp by bending ends back over ends of groove before wire is inserted.

No loose parts need be handled in installing as hook bolts can be turned back out of the way while wire is being seated in groove.

Can be used with conductors from $\frac{5}{16}$ to $\frac{11}{16}$ inch (7.9 to 17.5 mm.) diameter; when aluminum cable is used, an aluminum protecting sleeve about $\frac{1}{16}$ inch (1.6 mm.) thick should encircle cable in Clamp and diameter should be measured over sleeve. See page 173.

Numbers 11040 and 11950 are without socket eye and are for use with clevis type insulators.

Castings are malleable iron, galvanized.

Without Discharge Horn

Code Word	No.	No. Socket Eye Used	Insulators Used With	Weight Packed per 100		List Per 100
				Pounds	Kilograms	
<i>Interplead.</i>	11035	10757	Type A	697	316	\$670 00
<i>Morinda.</i>	11542	11544	Type B	697	316	670 00
<i>Interpone.</i>	11040	.....	Type D	591	268	560 00

With Discharge Horn

<i>Mormon.</i>	11948	10757	Type A	837	380	800 00
<i>Mornward.</i>	11949	11544	Type B	837	380	800 00
<i>Morocco.</i>	11950	.....	Type D	751	340	690 00

Clamps cannot be interchanged between Type A and Type B Insulators.
Clamps for special conditions can be furnished on application.



SUSPENSION STRAIN WIRE CLAMP

Type E, Form 3—Patented



Nos. 11327-11543—Without Discharge Horn

OF same general design as Form 2 Clamp listed on preceding pages but is heavier and has longer radius curve in wire seat.

Furnished as shown above or with a discharge horn (see drawing on opposite page), which is desirable under certain conditions, as it cuts down the time lag for excessive surges and increases the factor of safety of the insulator. For method of installing, see page 172.

No loose parts need be handled in installing as hook bolts which grip wire can be turned back out of the way while wire is being seated in groove.

Can be used with conductors from $\frac{3}{8}$ to $\frac{3}{4}$ inch (9.5 to 19.0 mm.) diameter; when aluminum cable is used, an aluminum protecting sleeve about $\frac{1}{16}$ inch (1.6 mm.) thick should encircle cable in Clamp and diameter should be measured over sleeve. See page 173.

Lower sleeve can be installed in Clamp by bending ends back over ends of groove before wire is inserted.

Numbers 11328 and 11953 are without socket eye and are intended for use with clevis type insulators.

Castings are malleable iron, galvanized.

Without Discharge Horn

Code Word	No.	No. Socket Eye Used	Insulators Used With	Weight Packed per 100		List Per 100
				Pounds	Kilograms	
<i>Labarum.</i>	11327	10757	Type A	859	390	\$800 00
<i>Morone.</i>	11543	11544	Type B	859	390	800 00
<i>Labefy.</i>	11328	.....	Type D	753	342	690 00

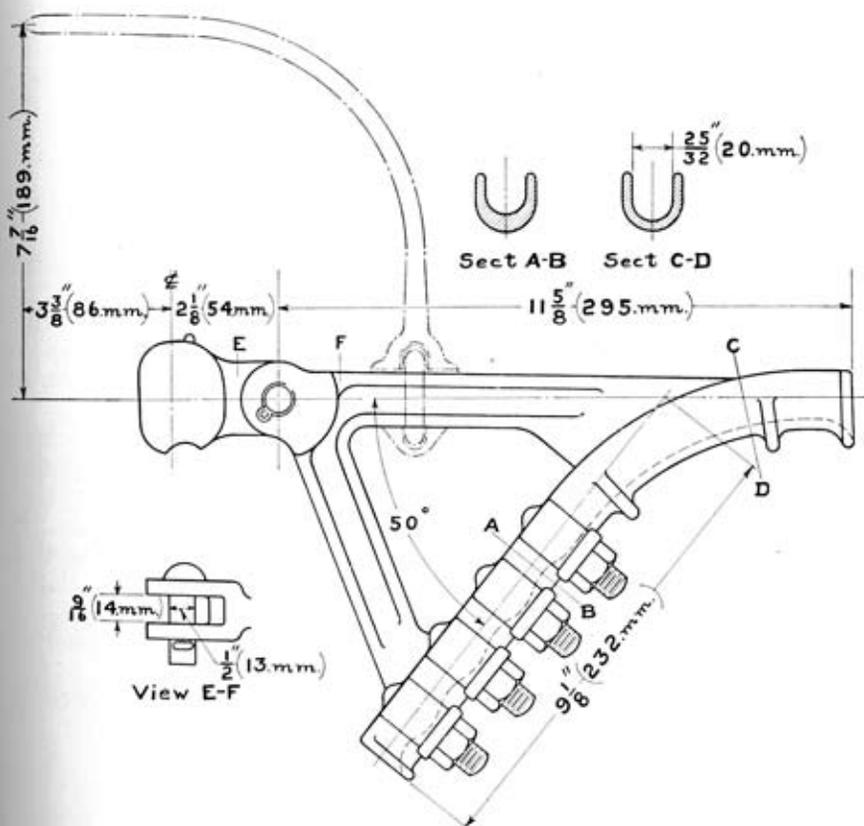
With Discharge Horn

<i>Morrow.</i>	11951	10757	Type A	999	453	930 00
<i>Morsel.</i>	11952	11544	Type B	999	453	930 00
<i>Morsure.</i>	11953	.....	Type D	893	405	818 00

Clamps cannot be interchanged between Type A and Type B Insulators.
Clamps for special conditions can be furnished on application.

SUSPENSION STRAIN WIRE CLAMP

Type E, Form 3—Patented



Nos. 11327-11543—Without Discharge Horn

Nos. 11951-11952—With Discharge Horn

See description and list on the opposite page.

**SUSPENSION STRAIN WIRE CLAMP**

Type E, Form 5—Patented



Nos. 12924-12925—Without Discharge Horn

HAS an unusually large wire seat for extra size cables sometimes encountered, particularly in aluminum.

Furnished as shown above or with a discharge horn (see drawing on opposite page), which is desirable under certain conditions, as it cuts down the time lag for excessive surges and increases the factor of safety of the insulator. For method of installing, see page 172.

No loose parts need be handled in installing, as hook bolts which hold cable can be turned back out of the way while wire is being seated in groove.

Can be used with conductors $\frac{3}{8}$ to $1\frac{1}{8}$ inches (15.9 to 28.6 mm.) in diameter; when aluminum cable is used, an aluminum protecting sleeve about $\frac{1}{16}$ inch (1.6 mm.) thick should encircle cable in clamp and diameter should be measured over sleeve. See page 173.

Lower sleeve can be installed in clamp by bending ends back over ends of groove in clamp before cable is inserted.

Numbers 12926 and 12929 are without socket eye and are for use with clevis type insulators.

Castings are malleable iron, galvanized.

Without Discharge Horn

Code Word	No.	No. Socket Eye Used	Insulators Used With	Weight Packed per 100		List Per 100
				Pounds	Kilograms	
<i>Pokebag.</i>	12924	10757	Type A	934	424	886 00
<i>Pokerish.</i>	12925	11544	Type B	934	424	886 00
<i>Polarity.</i>	12926	.....	Type D	823	373	774 00

With Discharge Horn

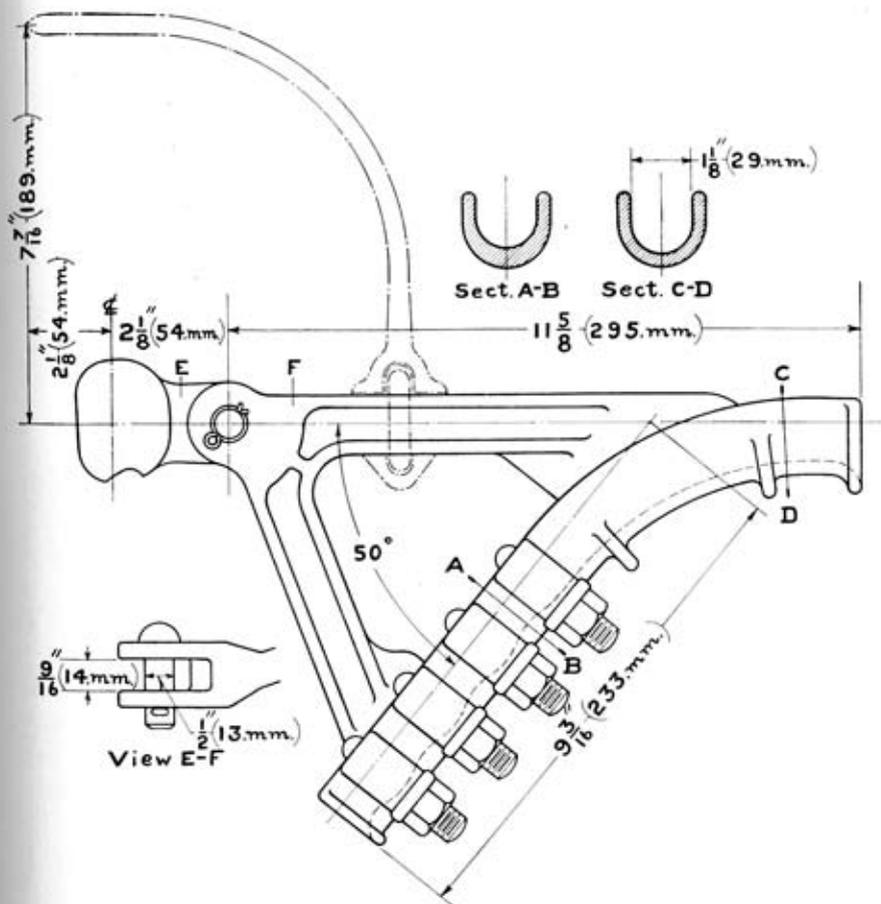
<i>Polarize.</i>	12927	10757	Type A	1074	488	1074 00
<i>Poldway.</i>	12928	11544	Type B	1074	488	1074 00
<i>Polemic.</i>	12929	.....	Type D	963	436	964 00

Clamps cannot be interchanged between Type A and Type B Insulators. Clamps for special conditions can be furnished on application.



SUSPENSION STRAIN WIRE CLAMP

Type E, Form 5—Patented



Nos. 12921-12925—Without Discharge Horn

Nos. 12927-12928—With Discharge Horn

See description and list on the opposite page.

**SUSPENSION STRAIN WIRE CLAMP****Type E, Form 4—Patented****For Ball-and-Socket or Clevis Type Insulators**

MUCH heavier than Type E Clamps listed on preceding pages and intended for use where strain is particularly heavy.

It is frequently used for copper-clad and steel conductors on long spans.

Wire groove is provided with rounded ribs giving great holding power even when a protecting sleeve is used around the conductor.

To be used with $\frac{7}{16}$ to $\frac{5}{8}$ inch (11.1 to 15.9 mm.) diameter conductors; when protecting sleeve is used around conductor, diameter should be measured over the sleeve. See page 173.

Regularly furnished without socket for attachment directly to clevis of strain yoke shown on pages 193-195. If, however, it is desired to use Clamp with a single string of insulators, Ball Socket Eye for either Type A or Type B Insulator can be furnished.

Weight, packed, 1,155 pounds (524 Kg.) per 100.

Code Word
Mortify.

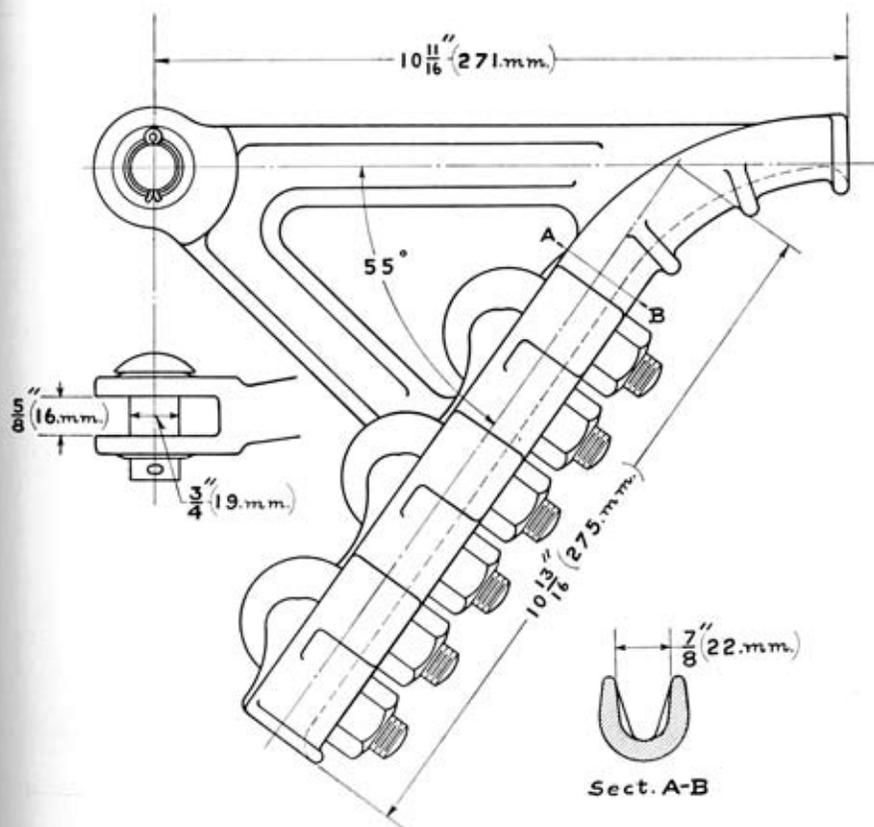
No. 11645—Clamp, Cast Steel, Galvanized..... \$984 00

List per 100

Clamps for special conditions can be furnished on application.

SUSPENSION STRAIN WIRE CLAMP

Type E, Form 4—Patented

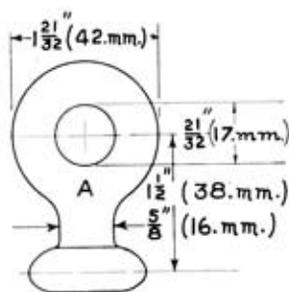


No. 11645

See description and list on the opposite page.



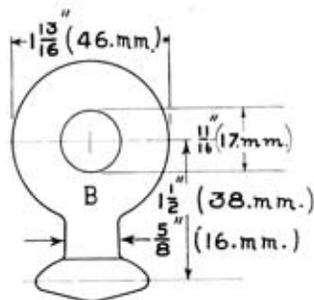
SUSPENSION EYE



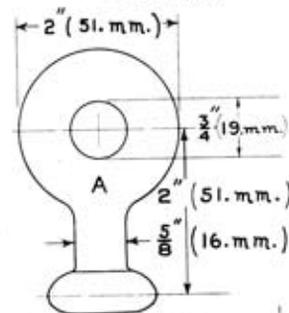
No. 11106



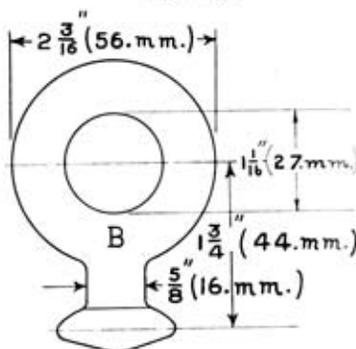
No. 10594



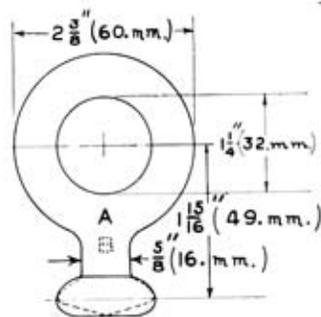
No. 11517



No. 10594



No. 12939



Nos. 12938-13199

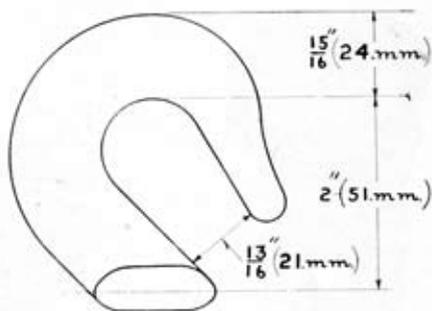
USED for attaching Suspension Insulators to towers. Made of drop forged steel, galvanized.

Code Word	No.	Insulators Used With	Weight Packed per 100		List Per 100
			Pounds	Kilograms	
<i>Incavaco.</i>	11106	Type A	44	20.0	\$60 00
<i>Handcuff.</i>	10594	Type A	63	28.5	66 00
<i>Polestar.</i>	12938	Type A	65	29.5	98 00
<i>Motacil.</i>	11517	Type B	49	22.2	64 00
<i>Polite.</i>	12939	Type B	55	25.0	64 00
<i>Readable.</i>	13499	Type B	65	29.5	98 00

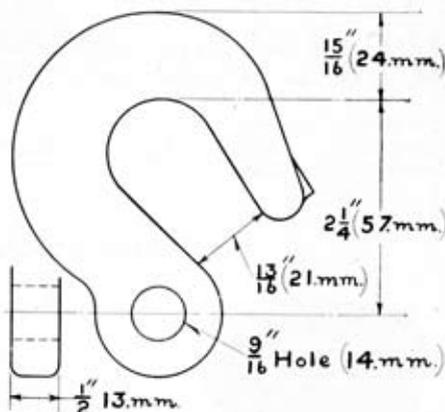
Fittings cannot be interchanged between Type A and Type B Insulators.

Special fittings for use with all types of Suspension Insulators can be furnished on application.

SUSPENSION HOOK



Nos. 10756-11546-13394



No. 13393

THESE Hooks are used for attaching Suspension Insulators to towers. The opening of the Hook is closed by the insulator cap, thus preventing unhooking after installation. Galvanized finish.

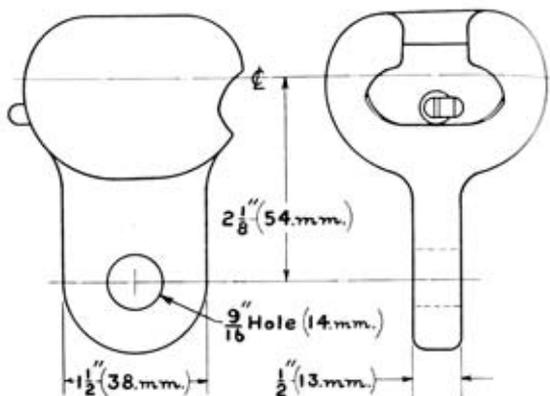
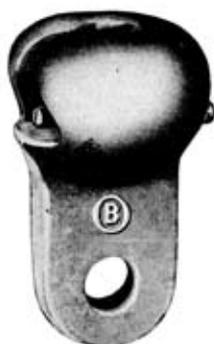
Code Word	No.	Material	Insulators Used With	Weight Packed per 100		List Per 100
				Pounds	Kilograms	
<i>Hornel.</i>	10756	Malleable Iron	Type A	94	42.5	\$ 82 00
<i>Mossback.</i>	11546	Malleable Iron	Type B	94	42.5	82 00
<i>Reading.</i>	13394	Forged Steel	Type B	105	47.5	108 00
<i>Readmit.</i>	13393	Malleable Iron	Type D	114	51.6	82 00

Fittings cannot be interchanged between Type A and Type B Insulators.

Special fittings for use with all types of Suspension Insulators can be furnished on application.



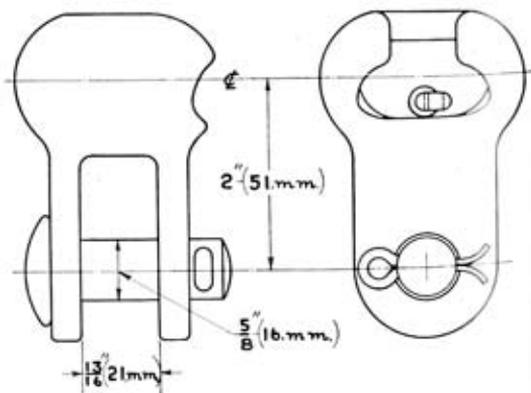
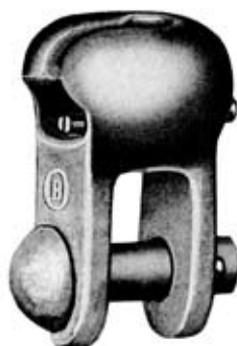
BALL SOCKET EYE



FOR use with Type E Strain Clamps and any other clamp having a clevis. Weight, packed, 111 pounds (50.4 Kg.) per 100.

Code Word	No.	List per 100
Hopbine.	10757—Socket Eye, Malleable Iron, Galv., for Type A Insulators	\$110 00
Moschatel.	11544— " " " " " " B " "	110 00

BALL SOCKET CLEVIS

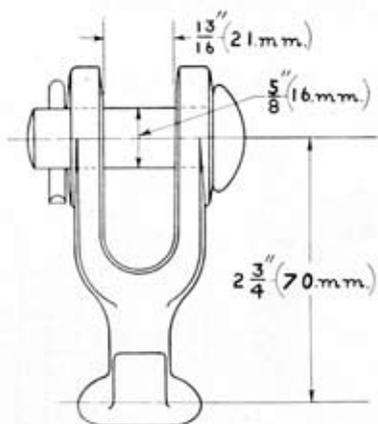


CAN be used for attaching any clamp having an eye to the ball center pin of Suspension Insulators. Cotter pins are brass. The weight, packed, is 145 pounds (65.8 Kg.) per 100.

Code Word	No.	List per 100
Horation.	10758—Socket Clevis, Malleable Iron, Galv., for Type A Insulators	\$134 00
Moslem.	11545— " " " " " " B " "	134 00

Fittings cannot be interchanged between Type A and Type B Insulators. Special fittings for use with all types of Suspension Insulators can be furnished on application.

SUSPENSION CLEVIS



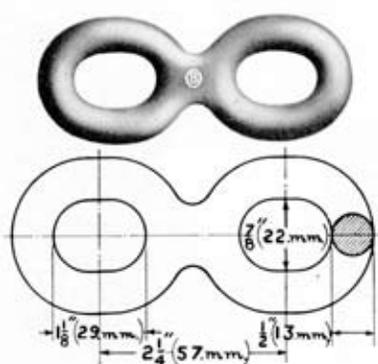
USED for attaching Suspension Insulators to towers in place of hook or eye listed on preceding page, where clevis is more suited to conditions. Weight, packed, 115 pounds (52.2 Kg.) per 100.

Code Word	No.	List per 100
Pollen.	12336—Clevis, Mall. Iron, Galv., for Type A Insulators.	\$102 00
Pollute.	12337— " Cast Steel, " " " B " "	102 00

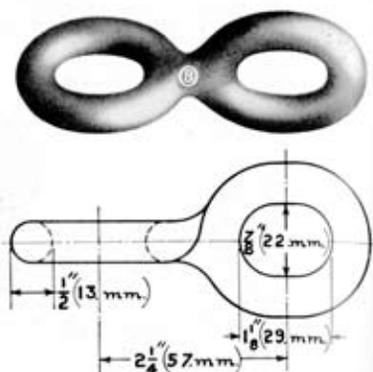
Fittings cannot be interchanged between Type A and Type B Insulators.



STRAIN LINKS



No. 13230

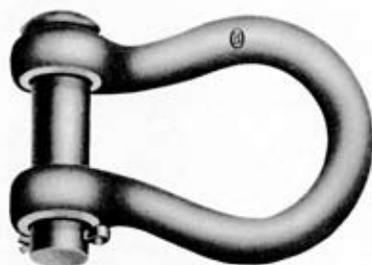


No. 13231

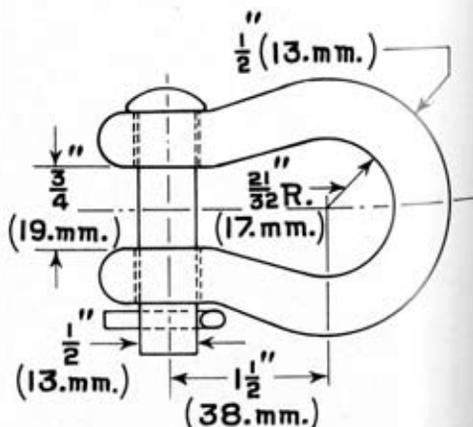
USED for attaching Suspension Insulators to towers, strain yokes, etc. Made in one piece of drop forged steel.

Code Word	No.	List per 100
<i>Rattail.</i>	13230—Straight Strain Link, Galvanized	\$ 88 00
<i>Rattan.</i>	13231—Twisted " " "	100 00

STRAIN CLEVIS



No. 13722



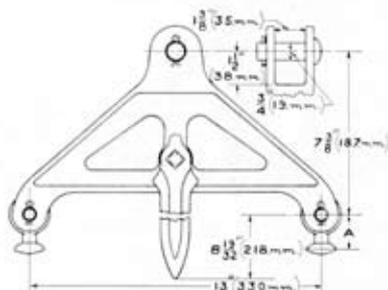
CAN be used with strain insulators listed on pages 78-79 or with any clevis type insulators for dead ending small size conductors where strains are not excessive.

Made of drop forged steel, galvanized.

Code Word	No.	List per 100
<i>Rusticity.</i>	13722—Strain Clevis, Galvanized	\$110 00

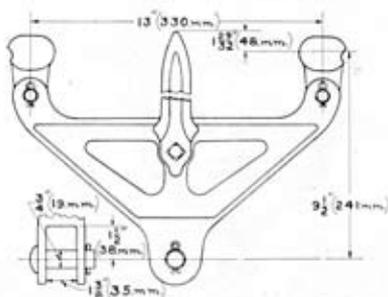
INSULATOR STRAIN YOKE

Form 2—Patented



Nos. 12932-12933

For Dimension "A", see page 188



Nos. 12934-12935

SERVES the same purpose as the Form 1 Yoke listed on the following pages and differs from it in having flexible connections which give greater flexibility.

Suspension Eyes are used on Upper Yoke while Ball Socket Eyes are used on Lower Yoke for attaching insulators.

Castings are malleable iron. All parts galvanized.

Code Word	No.	List per 100
Polyneme.	12932—Upper Yoke, for Type A Insulators.....	\$1040 00
Polymia.	12933— " " " " B "	1040 00
Polytomy.	12934—Lower " " " " A "	1040 00
Polytype.	12935— " " " " B "	1040 00



INSULATOR STRAIN YOKE

Form 1—Patented



Nos. 11685-6, 11687-8



Nos. 12930-1, 11687-8

FOR particularly heavy strains at dead ends, etc., or for double construction at railway crossings, two strings of Suspension Insulators may be connected in multiple by means of these yokes which are provided with discharge horns.

Hook, eye and clevis are interchangeable.

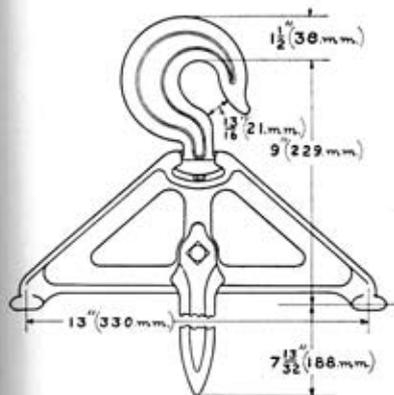
Castings malleable iron. All parts galvanized.

Code Word	No.	List per 100
<i>Mortling.</i>	11685—Upper Yoke, with Hook, for Type A Insulators.....	\$930 00
<i>Mortpay.</i>	11686— " " " " " " B "	930 00
<i>Polygon.</i>	12930— " " " " Eye, " " A "	920 00
<i>Ploygram.</i>	12931— " " " " " " B "	920 00
<i>Mosaic.</i>	11687—Lower " " Clevis, " " A "	931 00
<i>Mosaism.</i>	11688— " " " " " " B "	930 00

Upper Yokes can be furnished with clevis if desired.

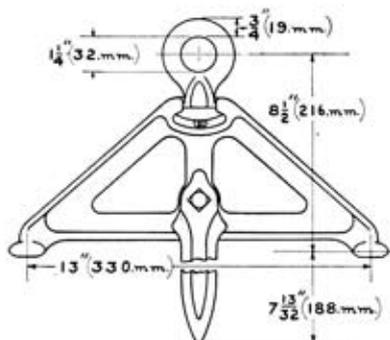
INSULATOR STRAIN YOKE

Form 1—Patented



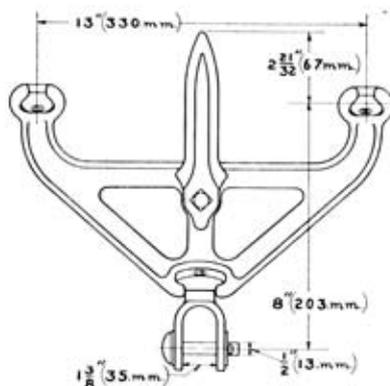
Nos. 11685-11686

Hook can be rotated 90°
from position shown



Nos. 12930-12931

Eye can be rotated 90°
from position shown



Nos. 11687-11688

Clevis can be rotated 90°
from position shown

See description and list on the opposite page.

**O-B High Tension
Insulators
and
Suspension
Insulator Hardware**

**Described and Listed in the
section preceding**

Pole Line Hardware
and
Miscellaneous
Materials

Described and Listed in the
section immediately
following

Pole
Line
Hardware
Miscellaneous
Materials

Troubleshooting
Materials



GLASS INSULATORS



No. 2614
Pony,
Double Petticoat,
Deep Groove



No. 2615
Standard Pony



No. 4430
Pony, Double
Groove



No. 7628
Transposition,
Double Petticoat



No. 1233
Double Petticoat,
Deep Groove



No. 1232
Double Petticoat,
Extra Large Groove



Nos. 1231-4328
Top Groove

Code Word	No.	For Size Wire	Diameter Insulator Inches	Height Insulator Inches	Diameter Groove Inches	Approx. Weight packed per 1000	No. in Standard Package	List per 1000
<i>Buoyancy.</i>	2614	No. 4 B. & S.	2 $\frac{3}{4}$	3 $\frac{1}{2}$	$\frac{7}{16}$	950 lbs.	275	\$96 00
<i>Burden.</i>	2615	Telephone	2 $\frac{1}{4}$	3 $\frac{1}{2}$	$\frac{1}{4}$	750 "	350	71 00
<i>Burdock.</i>	4430	"	2	3 $\frac{1}{2}$	$\frac{1}{4}$	760 "	340	71 00
<i>Bureau.</i>	7628	"	3 $\frac{1}{2}$	4 $\frac{1}{4}$	$\frac{5}{16}$	1700 "	125	194 00
<i>Burglar.</i>	1233	No. 0 B. & S.	3 $\frac{1}{4}$	4	$\frac{3}{8}$	1450 "	175	126 00
<i>Burgonet.</i>	1232	" 4-0 "	3 $\frac{1}{4}$	3 $\frac{1}{2}$	$\frac{1}{2}$	1375 "	165	126 00
<i>Burrower.</i>	1231	1 $\frac{1}{2}$ " & Smaller	3 $\frac{1}{2}$	4 $\frac{1}{2}$	1 $\frac{1}{2}$	2100 "	110	194 00
<i>Bushment.</i>	4328	2" "	3 $\frac{1}{2}$	4 $\frac{1}{2}$	2	2100 "	110	194 00



PIERCE FORGED STEEL PINS

With Separable Thimbles



On Wooden Arm



Detail of Thimble



Nos. 15001-15015



Nos. 15030-15033



On Steel Arm

THESE pins are made of a solid steel forging fitted with a separable thimble.

Thimble should be cemented into insulator at factory and screwed onto pin after latter is installed. A cork disc in top of thimble acts as a cushion and relieves porcelain of strain caused by expansion of the pin due to temperature change.

All parts of pin are galvanized.

Saddle listed below gives a firm seat for pins on round cross arms and helps prevent splitting of the arm. Made of pressed steel, galvanized.

Centering washers are used on lower end of pins to center them in holes bored for wood pins. Made of pressed steel, galvanized.

Cross Arm Saddles

Code Word	No.	Width Cross Arm	Size Pin Hole	Weight per 100	List per 100
<i>Saccharine.</i>	15001	3½ in.	¾ in.	62 lbs.	\$5 50
<i>Saccharum.</i>	15002	3½ "	" "	68 "	5 75
<i>Sacchalmin.</i>	15003	3¾ "	" "	74 "	6 00
<i>Saccular.</i>	15004	4 "	" "	80 "	6 30
<i>Sacerdotol.</i>	15005	5 "	" "	100 "	7 70
<i>Sackage.</i>	15011	3½ "	1 "	62 "	5 50
<i>Sackbut.</i>	15012	3½ "	1 "	68 "	5 75
<i>Sackcloth.</i>	15013	3¾ "	1 "	74 "	6 00
<i>Sacrament.</i>	15014	4 "	1 "	80 "	6 30
<i>Sacrifice.</i>	15015	5 "	1 "	100 "	7 70

Centering Washers

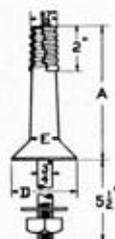
Code Word	No.	Fits Hole Diameter	Size Pin Hole	Weight per 100	List per 100
<i>Sacrilege.</i>	15030	1½ in.	¾ in.	12 lbs.	\$1 60
<i>Sadden.</i>	15031	1½ "	1 "	12 "	1 60
<i>Saddleback.</i>	15032	1½ "	¾ "	13 "	1 70
<i>Saddlebags.</i>	15033	1½ "	1 "	13 "	1 70

For listing of pins, see following pages.

**PIERCE FORGED STEEL PINS**

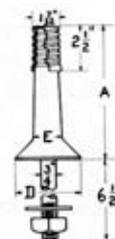
With Separable Thimbles

For Wooden Cross-Arms

1,500-pound Series for Insulators with 1-inch Pin Hole

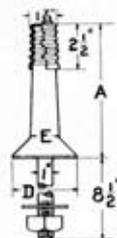
Nos. 15102-15116

Code Word	No.	Dimensions in Inches			Net Weight per 100 in Lbs.	List per 100
		A	D	E		
<i>Sallow.</i>	15102	3 1/2	2 1/4	0.94	217	\$26 50
<i>Salmon.</i>	15104	4	2 1/4	0.98	231	28 00
<i>Salon.</i>	15106	4 1/2	2 1/4	1.02	246	29 50
<i>Salpicon.</i>	15108	5	2 1/4	1.05	261	31 00
<i>Sallation.</i>	15110	5 1/2	2 1/4	1.08	278	32 75
<i>Saltbush.</i>	15112	6	2 1/4	1.12	297	34 75
<i>Saltecellar.</i>	15114	7	3	1.15	388	44 25
<i>Salting.</i>	15116	8	3	1.22	435	49 25

1,500-pound Series for Insulators with 1 3/8-inch Pin Hole

Nos. 15118-15144

<i>Sallless.</i>	15118	4	2 1/2	1.16	285	\$32 90
<i>Salt peter.</i>	15120	5	2 1/2	1.20	318	36 15
<i>Saltwort.</i>	15122	5 1/2	2 1/2	1.22	334	37 05
<i>Salute.</i>	15124	6	2 1/2	1.23	351	39 05
<i>Saluter.</i>	15126	7	3	1.26	417	48 00
<i>Salvage.</i>	15128	8	3	1.30	445	51 40
<i>Samaritan.</i>	15130	9	3	1.33	515	56 05
<i>Sameness.</i>	15132	10	3	1.36	568	60 90
<i>Samphire.</i>	15134	11	3 1/2	1.38	652	67 90
<i>Sanbenito.</i>	15136	12	3 1/2	1.41	699	71 65
<i>Sanctify.</i>	15138	13	3 1/2	1.44	746	74 65
<i>Sanctuary.</i>	15140	14	3 1/2	1.48	824	81 00
<i>Sandal.</i>	15142	15	3 1/2	1.51	877	85 25
<i>Sandfish.</i>	15144	16	3 1/2	1.58	932	89 80

3,000-pound Series for Insulators with 1 3/8-inch Pin Hole

Nos. 15146-15172

<i>Sandglass.</i>	15146	4	2 1/2	1.26	425	\$42 40
<i>Sandman.</i>	15148	5	2 1/2	1.30	462	47 00
<i>Sandpiper.</i>	15150	5 1/2	2 1/2	1.35	503	51 25
<i>Sandwich.</i>	15152	6	2 1/2	1.37	525	53 50
<i>Sanity.</i>	15154	7	3	1.41	577	58 75
<i>Sapling.</i>	15156	8	3	1.47	626	63 75
<i>Sarcel.</i>	15158	9	3	1.53	678	69 00
<i>Sardine.</i>	15160	10	3	1.57	734	75 50
<i>Sarce.</i>	15162	11	3 1/2	1.63	864	85 00
<i>Sassafras.</i>	15164	12	3 1/2	1.68	927	90 00
<i>Satisfy.</i>	15166	13	3 1/2	1.74	999	95 75
<i>Saturn.</i>	15168	14	3 1/2	1.80	1102	104 00
<i>Saucer.</i>	15170	15	3 1/2	1.86	1184	110 60
<i>Saunter.</i>	15172	16	3 1/2	1.92	1271	119 75

Pins can also be furnished in 4,500-pound Series for insulators with pin holes 1 1/2 inches and larger.

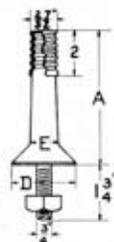
For description, see page 199.

PIERCE FORGED STEEL PINS

With Separable Thimbles

For Steel Cross-Arms

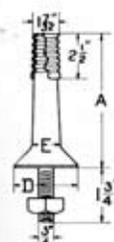
1,500-pound Series for Insulators with 1-inch Pin Hole



Nos. 15101-15115

Code Word	No.	Dimensions in Inches			Net Weight per 100 in lbs.	List per 100
		A	D	E		
<i>Savage.</i>	15101	3 1/2	2 1/4	0.94	158	\$22 50
<i>Savor.</i>	15103	4	2 1/4	0.98	173	24 00
<i>Savory.</i>	15105	4 1/2	2 1/4	1.02	188	25 50
<i>Saxon.</i>	15107	5	2 1/4	1.05	202	27 00
<i>Scalp.</i>	15109	5 1/2	2 1/4	1.08	220	28 75
<i>Scalper.</i>	15111	6	2 1/4	1.12	239	30 75
<i>Scaly.</i>	15113	7	3	1.15	330	40 25
<i>Scamp.</i>	15115	8	3	1.22	376	45 25

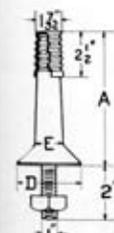
1,500-pound Series for Insulators with 1 3/8-inch Pin Hole



Nos. 15117-15143

<i>Scandal.</i>	15117	4	2 1/2	1.17	215	\$28 25
<i>Scant.</i>	15119	5	2 1/2	1.20	247	31 50
<i>Scaphoid.</i>	15121	5 1/2	2 1/2	1.22	263	32 40
<i>Scapula.</i>	15123	6	2 1/2	1.23	280	34 40
<i>Scarcecrow.</i>	15125	7	3	1.26	346	43 35
<i>Scarlet.</i>	15127	8	3	1.30	394	46 75
<i>Scary.</i>	15129	9	3	1.33	444	51 40
<i>Scathless.</i>	15131	10	3	1.36	496	56 25
<i>Scaup.</i>	15133	11	3 1/2	1.40	582	63 25
<i>Scent.</i>	15135	12	3 1/2	1.43	628	67 00
<i>Scentful.</i>	15137	13	3 1/2	1.46	675	70 00
<i>Schilling.</i>	15139	14	3 3/4	1.50	753	76 35
<i>Scholar.</i>	15141	15	3 3/4	1.53	805	80 60
<i>Schooldame.</i>	15143	16	3 3/4	1.56	861	85 15

3,000-pound Series for Insulators with 1 3/8-inch Pin Hole



Nos. 15145-15171

<i>Schoolmate.</i>	15145	4	2 1/2	1.25	263	\$32 40
<i>Schooner.</i>	15147	5	2 1/2	1.30	300	37 00
<i>Schottische.</i>	15149	5 1/2	2 1/2	1.33	340	41 25
<i>Sciatio.</i>	15151	6	2 1/2	1.35	363	43 50
<i>Scion.</i>	15153	7	3	1.41	415	48 75
<i>Scoffer.</i>	15155	8	3	1.47	464	53 75
<i>Scholder.</i>	15157	9	3	1.53	516	59 00
<i>Scomber.</i>	15159	10	3	1.59	572	65 50
<i>Scorner.</i>	15161	11	3 1/2	1.65	702	75 00
<i>Scorpion.</i>	15163	12	3 1/2	1.70	765	80 00
<i>Scoundrel.</i>	15165	13	3 1/2	1.76	837	85 75
<i>Scourger.</i>	15167	14	3 3/4	1.82	940	94 00
<i>Scowl.</i>	15169	15	3 3/4	1.88	1022	100 60
<i>Scrapenny.</i>	15171	16	3 3/4	1.94	1110	109 75

Pins can also be furnished in 4,500-pound Series for insulators with pin holes 1 1/2 inches and larger.

For description, see page 199.



LEE TYPE INSULATOR PINS

Separable Top—Patented



CONSIST of only base casting, thimble casting and stud bolt with nut and washer—stud bolt passing through base casting and threading into thimble. Thimbles are interchangeable on these Pins and the Pole Top Pins listed on page 204.

Thimbles may be cemented into insulators at factory, and castings mounted on poles and insulators installed at any time. This relieves customer of annoyance of cementing pins into insulators and, at same time, permits of safe shipment, which is not possible with one-piece pins cemented into the insulators.

Regularly furnished with plain finished base, sherardized thimble and galvanized bolt. Can be furnished on special order with galvanized or japanned base or with plain finished bolts, nuts and washers.

Pins can be furnished with special length bolts to fit any size cross arm.

See opposite page for listing.



LEE TYPE INSULATOR PINS

Separable Top—Patented—Continued

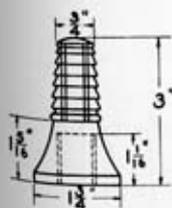
For Wood Cross-Arms

Code Word	No.	Dimensions in Inches			Net Weight per 100 in Lbs.	List per 100
		A	B	D		
<i>Shackle.</i>	13694	5½	2½	3 Round	228	\$ 49 00
<i>Laniate.</i>	11325	6½	3½	3 "	252	52 00
<i>Motation.</i>	11954	7	4	3 "	300	57 00
<i>Pilfer.</i>	12941	7	4	3¾ "	344	61 00
<i>Piling.</i>	12943	8½	5	3 "	324	63 00
<i>Pillage.</i>	12944	8½	5	3¾ "	350	66 00
<i>Shadeless.</i>	13696	9	6	3 "	366	68 00
<i>Interlard.</i>	11005	9	6	3¾ "	392	71 00
<i>Pimelic.</i>	12948	10	7	3 "	420	76 00
<i>Pimento.</i>	12949	10	7	3¾ "	445	78 00
<i>Pindaric.</i>	12952	11	8	3¾ "	490	83 00
<i>Pineal.</i>	12953	11	8	4¾ "	552	86 00
<i>Lanier.</i>	11326	13	10	3¾ "	590	95 00
<i>Pingle.</i>	12955	13	10	4¾ "	640	102 00
<i>Intermarry.</i>	11008	14	11	4¾ "	725	110 00

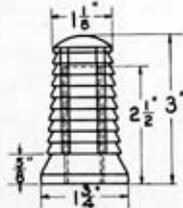
For Metal Cross-Arms

<i>Shadow.</i>	13695	5½	2½	3 Round	220	\$ 44 00
<i>Outprize.</i>	12459	6½	3½	3 "	245	46 00
<i>Outrage.</i>	12460	7½	4½	3 "	292	52 00
<i>Pillwort.</i>	12946	8½	5½	3 "	314	55 00
<i>Outright.</i>	12461	9	6	3 "	356	60 00
<i>Pinaster.</i>	12951	10	7	3 "	410	67 00
<i>Pinesap.</i>	12954	11	8	4 Oval	530	73 00
<i>Outrun.</i>	12462	13	10	4½ "	620	87 00
<i>Outsail.</i>	12463	14	11	4¾ "	700	100 00

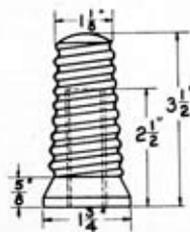
Thimbles for Lee Type Pins



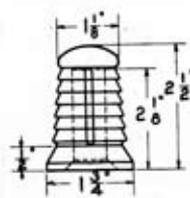
No. 01



No. 03



No. 04



No. 016

All pins listed above are regularly furnished with Thimble No. 03. Other thimbles can be supplied on special order. Approximate net weight per 100, 100 pounds.

**POLE TOP PIN**

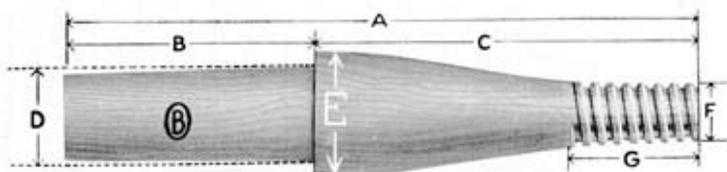
With Separable Top



CONSISTS of two malleable iron castings fastened together by a threaded stud screwing into both. Thimbles may be cemented into insulators at factory, castings mounted on poles and insulators installed at any time.

A lead washer insures a tight joint between thimble and pin. Thimbles are interchangeable with Lee Pins. Pins are regularly plain; galvanized on special order. Thimbles galvanized.

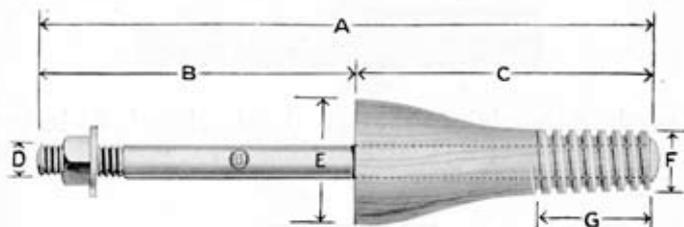
Code Word	No.	Length overall	Distance between Hole Centers	Height above Top Hole	Diameter of Pin Top	Diameter of Bolt Holes	List per 100
<i>Furrier.</i>	9883	16 $\frac{1}{4}$ in.	5 in.	11 in.	1 $\frac{1}{2}$ in.	$\frac{1}{16}$ in.	\$143 00
<i>Furrow.</i>	9884	20 $\frac{1}{4}$ "	6 "	14 "	1 $\frac{1}{2}$ "	$\frac{1}{16}$ "	185 00

WOOD PINS

LOCUST PINS are furnished plain. Oak Pin No. 1248 is painted. Pins impregnated with insulating compound are furnished when desired. Special sizes not listed can be furnished.

Code Word	No.	Stock	Dimensions in Inches							List per 100
			A	B	C	D	E	F	G	
<i>Cantata.</i>	2639	Locust	8	4	4	1 $\frac{1}{4}$	1 $\frac{1}{4}$	1	2	\$ 4 50
<i>Canticle.</i>	1248	Oak	9	4 $\frac{1}{2}$	4 $\frac{1}{2}$	1 $\frac{1}{2}$	1 $\frac{1}{4}$	1	2 $\frac{1}{2}$	3 10
<i>Cantlet.</i>	1249	Locust	9	4 $\frac{1}{2}$	4 $\frac{1}{2}$	1 $\frac{1}{2}$	1 $\frac{1}{4}$	1	2 $\frac{1}{2}$	7 70
<i>Pigeeced.</i>	9512	Locust	10 $\frac{1}{2}$	4 $\frac{1}{2}$	6 $\frac{1}{2}$	1 $\frac{1}{2}$	2	1 $\frac{1}{2}$	2 $\frac{1}{2}$	11 70
<i>Captain.</i>	7863	Locust	11 $\frac{1}{2}$	4 $\frac{1}{2}$	7 $\frac{1}{2}$	1 $\frac{1}{2}$	2	1 $\frac{1}{2}$	2 $\frac{1}{2}$	12 80
<i>Pikelet.</i>	12996	Locust	13	5	8	2	2	1 $\frac{1}{2}$	2 $\frac{1}{2}$	29 00
<i>Pilaster.</i>	12997	Locust	15	5	10	2	2	1 $\frac{1}{2}$	2 $\frac{1}{2}$	34 00
<i>Pilchard.</i>	12998	Locust	17	5	12	2	2	1 $\frac{1}{2}$	2 $\frac{1}{2}$	36 00

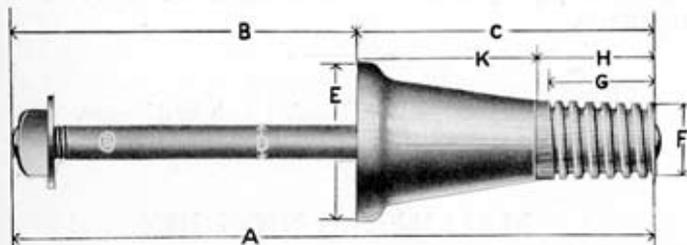
STEEL PINS With All Wood Top



Wood top is paraffined. Metal parts are sherardized.

Code Word	No.	Dimensions in Inches							List per 100
		A	B	C	D	E	F	G	
<i>Canaster.</i>	9488	6	1	5		2 1/4	1	2	\$27 50
<i>Candify.</i>	9489	9	5	4		1 1/2	1	2	33 00
<i>Cannon.</i>	9493	10 3/4	5 1/4	5		2 1/4	1	2	40 00
<i>Pileated.</i>	12940	6	1	5		2 1/4	1 1/2	2	36 00
<i>Kirkman.</i>	10805	9 1/4	5 1/4	4		2 1/4	1 1/2	2	44 00
<i>Canonist.</i>	9495	10 3/4	5 1/4	5		2 1/4	1	2	44 50
<i>Kitchen.</i>	11357	11 3/4	5 1/4	6		2 1/4	1	2	48 40
<i>Haggle.</i>	9497	13	6	7		2 1/4	1 1/2	2	55 00
<i>Halfness.</i>	9499	14	6	8		2 3/4	1 1/2	2	64 00
<i>Hallage.</i>	9501	15	6	9		3	1 1/2	2	69 00

With Porcelain Base

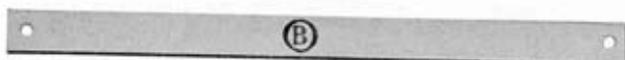


Threaded wood portion is paraffined. Metal parts are sherardized. Base is porcelain.

Code Word	No.	Dimensions in Inches									List per 100
		A	B	C	D	E	F	G	H	K	
<i>Endurant.</i>	10481	6	1	5		2 1/2	1	1 1/2	2	3	\$40 00
<i>Engross.</i>	10484	10 3/4	5 1/4	5		2 1/2	1	1 1/2	2	3	48 00
<i>Killing.</i>	10806	10 3/4	5 1/4	5		2 1/2	1 1/2	2	2 1/2	3	57 00
<i>Knabble.</i>	11358	11 3/4	5 1/4	6		4	1 1/2	2	2 1/2	3 1/2	70 50
<i>Halved.</i>	10589	13	6	7		3	1 1/2	2	2 1/2	3 1/2	74 50
<i>Hamster.</i>	10591	15	6	9		3 1/2	1 1/2	2	3	5	103 00



CROSS ARM BRACES



THE sizes listed below are regularly furnished with a hole at each end, $\frac{7}{16}$ inch and $\frac{9}{16}$ inch in diameter, respectively. They can be supplied with special sizes of holes to order.

Code Word	No.						List per 100
<i>Catacomb.</i>	2632	—	Length, overall 20 inches,	1	$\times \frac{3}{8}$ -inch Iron,	Galvanized.....	\$20 50
<i>Cataract.</i>	2633	—	" " 24 "	1 $\frac{1}{4}$	$\times \frac{1}{2}$ " " "	.....	30 40
<i>Catagory.</i>	2635	—	" " 26 "	1 $\frac{1}{4}$	$\times \frac{1}{2}$ " " "	.....	32 60
<i>Catfish.</i>	4454	—	" " 28 "	1 $\frac{1}{4}$	$\times \frac{1}{2}$ " " "	.....	35 00

WOOD CROSS ARM SUPPORTS

For Iron Poles



USED for attaching standard size wood cross arms to iron poles. The cross arms are secured to the supports by the two $\frac{1}{2}$ -inch bolts shown, which pass through them and clamp them in place by means of a nut and washer on their outer ends. These supports are made of malleable iron, japanned.

Code Word	No.						List per 100
<i>Combater.</i>	2641	—	Single Support for 4-inch Pole	(4 $\frac{1}{2}$	inches outside diameter) ..	\$352 00	
<i>Combing.</i>	2643	—	" " " 5 "	(5 $\frac{3}{8}$	" " " ") ..	352 00	
<i>Combust.</i>	2644	—	" " " 6 "	(6 $\frac{1}{2}$	" " " ") ..	385 00	

In ordering Cross Arm Supports observe that the Pole diameters as listed are "Pipe Measurements."



LAG SCREWS



Code Word	No.	Size	Material	List per 100
<i>Cerebral.</i>	7655	x2 inches	Galvanized	\$5 20
<i>Ceremony.</i>	7656	x2½	"	5 60
<i>Chafer.</i>	4416	x3	"	6 00
<i>Chagrin.</i>	4417	x4	"	7 00
<i>Chaise.</i>	4418	x3	"	7 20
<i>Chalky.</i>	4419	x4	"	8 50
<i>Champion.</i>	7657	x2½	"	8 00
<i>Chanter.</i>	4421	x3	"	8 40
<i>Chapel.</i>	7658	x3½	"	9 00
<i>Chaperon.</i>	4422	x4	"	9 60
<i>Chapter.</i>	4423	x5	"	11 00
<i>Chariot.</i>	4424	x6	"	12 40

Standard sizes not listed above furnished to order.

CROSS ARM BOLTS

With Square Heads and Nuts



Code Word	No.	Size	Material	Threading	List per 100
<i>Mohen.</i>	11955	x10 inches	Galvanized	with 4-inch	\$23 00
<i>Mothered.</i>	11956	x11	"	4 " "	24 00
<i>Motherly.</i>	11957	x12	"	4 " "	25 40
<i>Motility.</i>	11958	x14	"	6 " "	29 00

Standard sizes not listed above furnished to order.

COMMON CARRIAGE BOLTS



THE length of thread on Carriage Bolts is approximately three times the diameter of the bolts.

Code Word	No.	Size	Material	List per 100
<i>Clouding.</i>	4439	x4 inches	Galvanized	\$5 60
<i>Clover.</i>	4440	x5	"	6 20
<i>Clubbed.</i>	4445	x4	"	10 00
<i>Clucking.</i>	4446	x5	"	13 50

Standard sizes not listed above furnished to order.



POSITIVE LOCK WASHERS

Galvanized



Code Word	No.	Diameter of Bolt	Size of Steel		List per 1000
			Width	Thickness	
<i>Cogitate.</i>	9541	$\frac{1}{2}$ inch	$\frac{3}{16}$ inch	$\frac{1}{8}$ inch	\$10 70
<i>Cohesion.</i>	5035	"	"	"	14 70
<i>Sagenite.</i>	13682	"	"	$\frac{1}{16}$ "	14 00
<i>Coinage.</i>	5036	"	"	"	16 70
<i>Coiner.</i>	5037	"	"	"	19 00
<i>Coldish.</i>	5039	"	$\frac{1}{8}$ "	"	32 50
<i>Collapse.</i>	5040	1 "	"	"	40 00
<i>Motley.</i>	11683	$1\frac{1}{4}$ "	"	"	47 35

ROUND IRON WASHERS



Code Word	No.	Outside Diameter	*To Fit Cross Arm Bolt	Finish	List per 1000
<i>Colonize.</i>	4408	$1\frac{1}{2}$ inches	$\frac{1}{2}$ inch	Galvanized	\$11 40
<i>Colossus.</i>	4410	$1\frac{3}{4}$ "	"	"	22 50

*Note:—No. 4408 will fit $\frac{3}{4}$ -inch common carriage bolts and No. 4410 will fit $\frac{1}{2}$ -inch common carriage bolts. Standard sizes not listed above furnished to order.

SQUARE IRON WASHERS



Code Word	No.	Size in Inches	To Fit Bolt	Finish	List per 1000
<i>Coifier.</i>	9551	$2 \times 2 \times \frac{1}{4}$	$\frac{3}{8}$ -inch	Galvanized	\$25 00
<i>Coercion.</i>	7672	$2\frac{1}{4} \times 2\frac{1}{4} \times \frac{1}{8}$	"	"	42 00

Standard sizes not listed above furnished to order.



GALVANIZED STEEL WIRE STRAND



Regular Grade—Single Galvanized

Code Word	No.	7 Wires	Diameter in Inches	Weight in Pounds per 100 Feet	Approximate Breaking Strain in Pounds	List per 100 Feet
<i>Craggy.</i>	1190	No. 15	$\frac{1}{4}$	13	2300	\$1 75
<i>Cranium.</i>	1191	No. 12	$\frac{5}{16}$	22	3800	2 50
<i>Crater.</i>	1192	No. 11	$\frac{3}{8}$	30	5000	3 50
<i>Create.</i>	2572	No. 10	$\frac{7}{16}$	40	6500	4 50
<i>Credence.</i>	2573	No. 8	$\frac{1}{2}$	52	8500	5 50

Regular Grade—Extra Galvanized

Code Word	No.	7 Wires	Diameter in Inches	Weight in Pounds per 100 Feet	Approximate Breaking Strain in Pounds	List per 100 Feet
<i>Crescent.</i>	7807	No. 15	$\frac{1}{4}$	13	2300	\$1 75
<i>Cribbage.</i>	7808	No. 12	$\frac{5}{16}$	22	3800	2 50
<i>Crimson.</i>	7809	No. 11	$\frac{3}{8}$	30	5000	3 50
<i>Cringe.</i>	7810	No. 10	$\frac{7}{16}$	40	6500	4 50
<i>Critical.</i>	7811	No. 8	$\frac{1}{2}$	52	8500	5 50

Siemens-Martin—Extra Galvanized

Code Word	No.	7 Wires	Diameter in Inches	Weight in Pounds per 100 Feet	Approximate Breaking Strain in Pounds	List per 100 Feet
<i>Crochet.</i>	10280	No. 15	$\frac{1}{4}$	13	3050	\$1 70
<i>Crowned.</i>	10281	No. 12	$\frac{5}{16}$	22	4860	2 50
<i>Cruelly.</i>	10282	No. 11	$\frac{3}{8}$	30	6800	3 25
<i>Cruiser.</i>	10283	No. 10	$\frac{7}{16}$	40	9000	4 30
<i>Crusade.</i>	10284	No. 8	$\frac{1}{2}$	52	11000	5 25

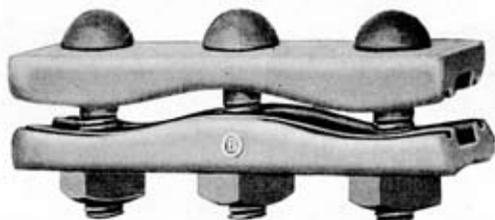
High Strength—Extra Galvanized

Code Word	No.	7 Wires	Diameter in Inches	Weight in Pounds per 100 Feet	Approximate Breaking Strain in Pounds	List per 100 Feet
<i>Isothermal.</i>	10285	No. 15	$\frac{1}{4}$	13	5100	\$2 25
<i>Isothere.</i>	10286	No. 12	$\frac{5}{16}$	22	8100	3 20
<i>Isotherm.</i>	10287	No. 11	$\frac{3}{8}$	30	11500	4 40
<i>Isotonic.</i>	10288	No. 10	$\frac{7}{16}$	40	15000	6 00
<i>Isotropic.</i>	10289	No. 8	$\frac{1}{2}$	52	18000	7 25

For additional data see tables in back of book.



SCHAPER GUY WIRE CLAMP



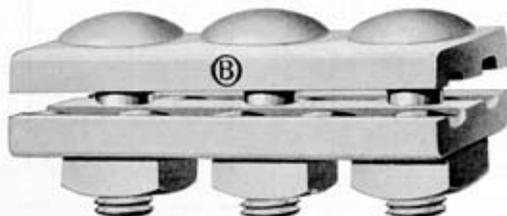
OF a heavy design of forged steel, and stronger than the ordinary type of three-bolt clamp as the wave form of groove for the wire gives greater resistance against slipping than a flat groove. It is intended for use on high strength cables in heavy guy work, catenary construction, etc. Length, 5½ inches.

Code Word
Herbage.

No. 10716—Clamp, Galvanized, for ¾, ⅞ and 1-inch Strand \$94 00

List per 100

GUY WIRE CLAMP



Made of Rolled Steel, Galvanized.

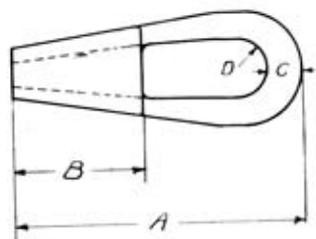
Code Word
*Conquest.
Conserve.
Piazza.*

No.		List per 100
3205	—Two Bolt Clamp for ¼ to ½-inch Strand, Length 3 in.	\$32 00
3206	—Three " " " ½ to ¾ " " " 4 "	43 00
12799	— " " " ½ to ¾ " " " 6 "	51 00

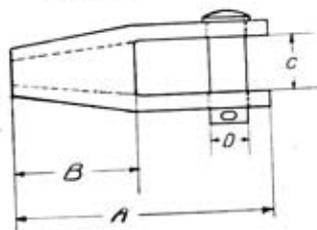
WIRE ROPE SOCKETS



Socket With Eye



Socket With Clevis



USED on ends of wire rope or strand for dead ending, etc. Strand is inserted in tapered hole—wires spread out and solder poured in. Sockets are drop forged in one piece from high strength steel.

With Eye

Code Word	No.	Size Strand in Inches	Dimensions in Inches				List per 100
			A	B	C	D	
<i>Rancid.</i>	13245	1/4	3 3/8	1 5/8	1 5/8	1 1/2	\$ 116 70
<i>Randan.</i>	13246	5/16	3 5/8	1 8/8	1 5/8	1 1/2	126 40
<i>Ranger.</i>	13247	3/8	4 1/8	2	1 5/8	1 1/2	146 00
<i>Rangle.</i>	13248	7/16	4 3/8	2	1 5/8	1 1/2	155 50
<i>Rankly.</i>	13249	1/2	5 1/8	2 1/4	1 5/8	1 1/2	194 40
<i>Ransack.</i>	13250	5/8	5 3/4	2 1/2	1 5/8	1 1/2	214 00
<i>Rantism.</i>	13251	3/4	6 1/8	2 3/8	1 5/8	1 1/2	262 75
<i>Rapacity.</i>	13252	7/8	7	3	1 5/8	1 1/2	350 00
<i>Raphany.</i>	13253	1	8	3 1/2	1 5/8	1 1/2	486 00
<i>Rapine.</i>	13254	1 1/8	9 1/4	4	1 5/8	1 1/2	681 00
<i>Rappel.</i>	13255	1 1/4	11 1/2	5	1 5/8	1 1/2	1167 00
<i>Rapport.</i>	13256	1 1/2	13	5 1/2	1 5/8	1 1/2	1750 00

With Clevis

<i>Rapture.</i>	13257	3/8	3 7/16	1 5/8	1 5/8	1 1/2	165 20
<i>Rarebit</i>	13258	5/16	3 7/16	1 5/8	1 5/8	1 1/2	175 00
<i>Rascal.</i>	13259	3/8	4 1/8	2	1 5/8	1 1/2	234 00
<i>Rasher.</i>	13260	7/16	4 3/8	2	1 5/8	1 1/2	243 00
<i>Rashful.</i>	13261	1/2	5 1/8	2 1/4	1 5/8	1 1/2	311 00
<i>Rasores.</i>	13262	5/8	5 3/4	2 1/2	1 5/8	1 1/2	311 00
<i>Ratofia.</i>	13263	3/4	6	2 3/8	1 5/8	1 1/2	409 00
<i>Ratfish.</i>	13264	7/8	6 7/8	3	1 5/8	1 1/2	525 00
<i>Rattler.</i>	13265	1	7 3/8	3 1/2	1 5/8	1 1/2	662 00
<i>Rathripe.</i>	13266	1 1/8	9 1/4	4	1 5/8	1 1/2	876 00
<i>Ration.</i>	13267	1 1/4	11 1/2	5	1 5/8	1 1/2	1555 00
<i>Ratlins.</i>	13268	1 1/2	13	5 1/2	1 5/8	1 1/2	2235 00

GENUINE CROSBY CLIP

Drop Forged Body



Code Word	No.	Description	List per 100
	13232	Crosby Clip, Galvanized, for 1-inch Strand	\$ 35 00
Ramify.	13233	" " " " 1 1/8-inch Strand	35 00
Ramline.	13234	" " " " 1 1/4-inch Strand	40 00
Rammel.	13235	" " " " 1 1/2-inch Strand	45 00
Ramoon.	13236	" " " " 1 3/4-inch Strand	45 00
Rampart.	13237	" " " " 2-inch Strand	55 00
Rampion.	13238	" " " " 2 1/4-inch Strand	65 00
Rampire.	13239	" " " " 2 1/2-inch Strand	75 00
Rampler.	13240	" " " " 3-inch Strand	85 00
Ramrod.	13241	" " " " 3 1/2-inch Strand	95 00
Ramson.	13242	" " " " 4-inch Strand	110 00
Ramsted.	13243	" " " " 4 1/2-inch Strand	125 00
Ramulus.	13244	" " " " 5-inch Strand	150 00

WIRE ROPE CLIP

Malleable Iron Body



Code Word	No.	Description	List per 100
	10267	Clip, Galvanized, for 3/16 and 1/2-inch Strand	\$ 14 40
Console.	10573	" " " " 3/8-inch Strand	16 80
Constant.	10268	" " " " 1/2-inch Strand	19 50
Contuse.	10575	" " " " 3/4-inch Strand	22 60
Foliage.	10269	" " " " 1-inch Strand	28 80
Follower.			



WEDGE GRIP



WIRE is held firmly by two wedges, although it may be released by a few blows on outer end of wedges.

Opening in clevis, $\frac{1}{16}$ inch; diameter clevis bolt, $\frac{5}{8}$ inch.

Will take 0 to 4-0 Round or Grooved Wire or $\frac{5}{16}$ to $\frac{1}{2}$ -inch strand.

Code Word	No.	List per 100
Pickback.	12634—Wedge Grip, Malleable Iron, Sherardized.....	\$92 00

MECHANICAL FEEDER WIRE STRAIN CLAMP



EACH half has spiral grooves corresponding to the arrangement of the cable strands, giving great holding power.

Hole in eye is $\frac{9}{16}$ inch in diameter. Thickness of eye, $\frac{3}{8}$ inch. Length of jaws, $3\frac{1}{2}$ inches.

Clamp with lower half of bronze is particularly suited for use under certain conditions with alternating current.

Malleable Iron, Sherardized

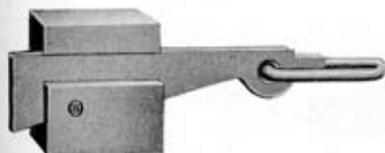
Code Word	No.	List per 100
Fluster.	10571—Clamp for No. 2-0 Solid to 400,000 C. M. Stranded Cable.	\$ 91 50
Fluted.	10572— " " 500,000 to 1,000,000 C. M. Stranded Cable....	132 00

Bottom Half Bronze—Top Malleable Iron, Sherardized

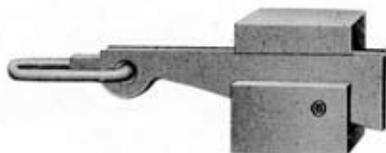
Reaper.	13309—Clamp for No. 2-0 Solid to 400,000 C. M. Stranded Cable .	115 00
Rearmost.	13310— " " 500,000 to 1,000,000 C. M. Stranded Cable....	150 00



TROLLEY WIRE WEDGE CLAMP



No. 8125—Right Hand



No. 13706—Left Hand

THIS Clamp secures a very powerful grip on the wire, as the greater the strain, the greater is the gripping effect of the Clamp. Grip can be released only by striking the small end of the wedge with a hammer. Fits all sizes and styles of Trolley Wire. Eye, $\frac{3}{8}$ inch.

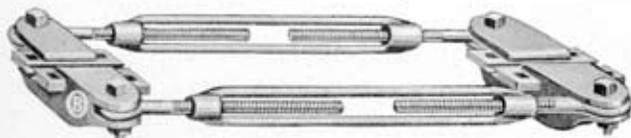
Code Word	No.	List Each
<i>Embargo.</i>	8125—Wedge Clamp, Right Hand, Japanned.....	\$7 20
<i>Sagittal.</i>	13706— " " Left " "	7 20

HAVEN'S WIRE ECCENTRIC



Code Word	No.	List Each
<i>Emerald.</i>	5328—For No. 8 B. & S. and smaller diameters of Wire.....	\$4 00
<i>Emigrate.</i>	1799— " $\frac{1}{2}$ inch " " " "	5 50

TROLLEY WIRE TIGHTENER



USED in splicing trolley wires. Length, center to center of clamps, maximum, $30\frac{3}{4}$ inches; minimum, $18\frac{3}{4}$ inches. The $\frac{3}{8}$ -inch turnbuckles are sherardized and are set $6\frac{1}{2}$ inches apart to provide ample clearance for splicing.

Code Word	No.	List Each
<i>Elderly.</i>	S126—Tightener for 0 to 4-0 Round, Grooved and Fig. 8 Wires..	\$16 00



STEEL WIRE STRAND THIMBLE



FURNISHED with ends open for inserting in eyes of anchor rods, etc. When installed, ends are easily closed.

Code Word	No.						List per 100
<i>Convoy.</i>	4219	—	Thimble for	$\frac{3}{16}$ to $\frac{1}{4}$ -inch	Strand, Galvanized	.....	\$15 70
<i>Cooler.</i>	7812	—	"	"	"	"	17 90
<i>Copier.</i>	4220	—	"	"	"	"	20 20
<i>Copious.</i>	4221	—	"	"	"	"	22 40

ANCHOR OR GUY RODS

Conform to A. E. R. A. Specifications

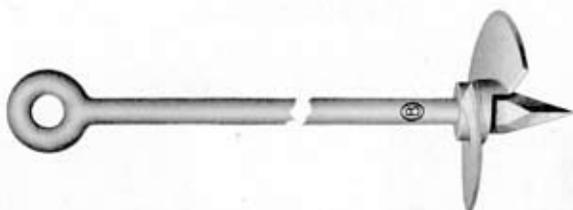


THESE Rods are furnished complete with nut and square iron washer. No. 7566 has 4x4x $\frac{1}{2}$ -inch washer; all others have 3x3x $\frac{3}{16}$ -inch washers.

Code Word	No.						List per 100
<i>Comedy.</i>	4223	—	Anchor Rod,	$\frac{3}{8}$ inch x 6 feet,	Galvanized	.....	\$132 00
<i>Comfort.</i>	4225	—	"	"	"	"	165 00
<i>Commix.</i>	4227	—	"	"	"	"	185 00
<i>Communal.</i>	4229	—	"	"	"	"	244 00
<i>Comparer.</i>	7566	—	"	"	"	"	516 00



SCREW GUY ANCHOR



CONSISTS of a guy rod with drop forged collar, having an oval shoulder. A dropped forged screw plate fits oval collar and is held in place by means of a pointed screw cap.

Hot dip galvanized.

Code Word	No.	Diameter Screw, Inches	Diameter Shaft, Inches	Length Overall, Inches	Net Weight Each, Pounds	List Each
<i>Saddle.</i>	13798	6	$\frac{3}{4}$	66	10	\$1 75
<i>Saddlebow.</i>	13799	8	1	66	18	3 20
<i>Sadiron.</i>	13800	10	$1\frac{1}{4}$	66	31	4 96

HARPOON GUY ANCHOR



Anchor Closed



Anchor Open

THIS Anchor consists of an iron rod 5 feet long and 1 inch square with four wings at the lower end. It is installed by driving the rod its full length into the ground with a sledge hammer, no digging being necessary.

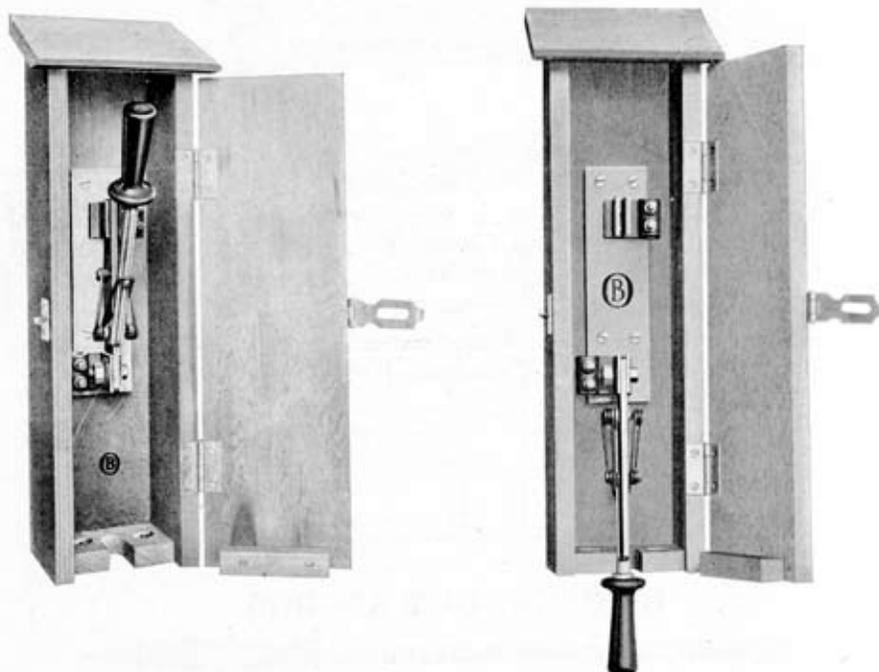
The guy wire is then attached to the ring in the end of the rod, and as the guy is tightened the wings of the Anchor will spread and set the Anchor.

Code Word	No.	List Each
<i>Crackle.</i>	10456—Harpoon Guy Anchor, Black Enamel Finish.....	\$4 75
<i>Craftily.</i>	10457— " " " Electro Galvanized.....	5 55
<i>Printer.</i>	13068— " " " Hot Dip Galvanized.....	7 50



LINE SECTION SWITCH

For 110-750 Volts



SWITCH is Quick Break type, single pole, mounted on slate base and enclosed in a cypress wood box with hinged door which may be closed and fastened when switch is open or closed.

Insulated handle only, projects below bottom of box when switch is open, thus preventing inexperienced persons from coming into contact with live parts.

Front connections, not fused.

Code Word	No.	Capacity, Amperes	Size of Connections in Inches	Height of Box, Inches	List Each
<i>Knacker.</i>	11359	100	1/2"	23	\$ 9 80
<i>Knapsack.</i>	11360	200	3/4"	23	11 20
<i>Knovery.</i>	11361	300	1"	23	13 00
<i>Knicker.</i>	11362	400	1 1/4"	23	14 80
<i>Knightly.</i>	11363	600	1 1/2"	25 1/2	21 00
<i>Knitback.</i>	11364	800	1 3/4"	28	28 80
<i>Knitter.</i>	11365	1,000	2"	28	33 00

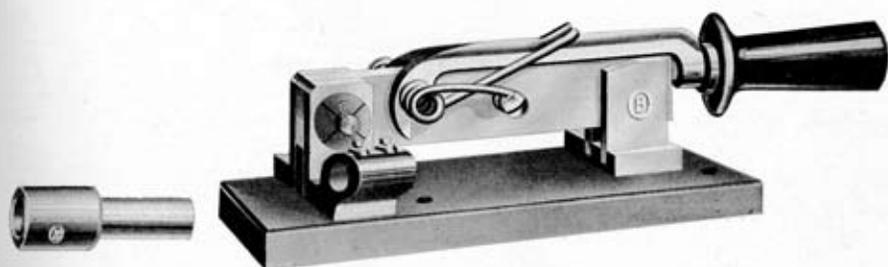
*Separable Terminals not regularly included; for listing see opposite page.



STANDARD QUICK BREAK SWITCHES

Patented

For Circuits of 110-600 Volts



Nos. 12444-12448

Nos. 7826-7832

ARE well adapted for railway and mine circuits where a quick, wide break is necessary.

Blades and jaws are of hard, cold rolled copper of ample cross-section for rated capacities. Flared handle protects hand.

Base is selected slate. Metal parts have plain finish.

Front connections.

Switches as listed are without separable terminals as shown in illustration. Terminals are furnished separately.

Single Pole—Without Separable Terminals

Code Word	No.		List Each
<i>Despend.</i>	7826—	100 Amperes, plain finish, not fused, $\frac{1}{2}$ -inch connections	\$ 6 80
<i>Despoil.</i>	7827—	200 " " " " " " " "	7 80
<i>Despot.</i>	7828—	300 " " " " " " " "	9 40
<i>Destine.</i>	7829—	400 " " " " " " " "	10 80
<i>Desume.</i>	7830—	600 " " " " " " " "	16 80
<i>Detent.</i>	7831—	800 " " " " " " " "	24 00
<i>Detract.</i>	7832—	1000 " " " " " " " "	28 00

Separable Terminals

Code Word	No.		List Each
<i>Picnic.</i>	12444—	Terminal, 100 amperes, $\frac{1}{2}$ -inch Cable Drilling	\$0 35
<i>Picotine.</i>	12445—	" 200 " " " "	35
<i>Pictural.</i>	12446—	" 300 and 400 amperes, $\frac{3}{4}$ -inch Cable Drilling	50
<i>Piculet.</i>	12447—	" 600 amperes, $1\frac{1}{4}$ -inch Cable Drilling	65
<i>Pieman.</i>	12448—	" 800 and 1000 amperes, $1\frac{1}{2}$ -inch Cable Drilling	1 80



LINE SECTION SWITCH

For Circuits of 1200 to 6600 Volts



SWITCH is mounted on porcelain insulators cemented to malleable iron base pins which are in turn bolted to channel iron base.

Channel iron is provided with two $\frac{7}{16}$ -inch holes, $15\frac{1}{2}$ inches apart for mounting on side of pole. If desired, black enameled slate base can be furnished.

Height overall with switch open, 22 inches; with switch closed, 13 inches. Blade is $\frac{1}{4} \times 1\frac{1}{2} \times 12$ inches and is provided with a $\frac{3}{4}$ -inch hole for disconnecting hook.

All iron parts are galvanized. Copper parts are bright dipped and lacquered.

Code Word
Mowing.

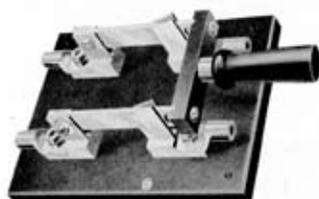
No.	List Each
11598—Switch complete, 300 amperes, not fused, $\frac{1}{2}$ -inch connections.	\$31 50

Above Switches can be furnished for higher voltages on order.



TYPE A KNIFE SWITCHES

110—600 Volts—Without Fuse Connections



ALL current carrying parts are pure hard drawn copper of generous proportions, base is high grade black Monson slate with oil finish. Lock washer under blade screw prevents loosening of joint between blade and cross bar.

Switch is approved and listed by the Underwriters National Electric Association under the rules and requirements of the National Board of Fire Underwriters.

Single Pole—Single Throw

Code Word	No.	Capacity in Amperes	Voltage	Diameter Cable Drilling Inches	Overall Dimensions Base, Inches	List Each
<i>Declinal.</i>	8451	30	110-250	.....	6½x2	\$ 1 90
<i>Decorum.</i>	8452	60	110-250	.....	8½x2	2 90
<i>Decoy.</i>	8454	100	110-250	.....	10½x2	5 50
<i>Dedicate.</i>	8456	200	110-250	.....	11½x3	8 30
<i>Defame.</i>	8458	400	110-250	.....	15 x4	18 80
<i>Default.</i>	8460	600	110-250	1	17½x4	25 60
<i>Defender.</i>	8511	30	250-600	.....	9½x2	2 80
<i>Deforce.</i>	8512	60	250-600	.....	9½x2	3 20
<i>Deftness.</i>	8514	100	250-600	.....	12½x3	5 20
<i>Delation.</i>	8516	200	250-600	.....	14½x4	9 00
<i>Demerit.</i>	8518	400	250-600	.....	17½x4	19 40
<i>Denizen.</i>	8520	600	250-600	1	19½x6½	25 00

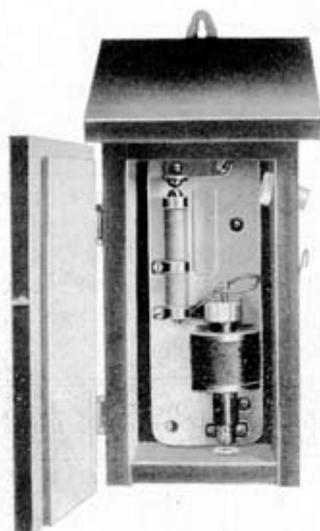
Double Pole—Single Throw

Code Word	No.	Capacity in Amperes	Voltage	Diameter Cable Drilling Inches	Overall Dimensions Base, Inches	List Each
<i>Denotate.</i>	8481	30	110-250	.....	6½x3½	\$ 2 90
<i>Deplore.</i>	8482	60	110-250	.....	8½x4½	4 20
<i>Depolish.</i>	8484	100	110-250	.....	10 x5	7 80
<i>Deponent.</i>	8486	200	110-250	.....	11½x6	12 20
<i>Deranger.</i>	8488	400	110-250	.....	16 x7	26 90
<i>Derelect.</i>	8490	600	110-250	1	17½x8	37 80
<i>Deride.</i>	8541	30	250-600	.....	9½x6	5 00
<i>Derision.</i>	8542	60	250-600	.....	9½x6	5 50
<i>Derogate.</i>	8544	100	250-600	.....	12½x7½	9 00
<i>Descend.</i>	8546	200	250-600	.....	14 x7½	17 00
<i>Desition.</i>	8548	400	250-600	.....	17½x9½	34 00
<i>Desolate.</i>	8550	600	250-600	1	19 x11½	44 50

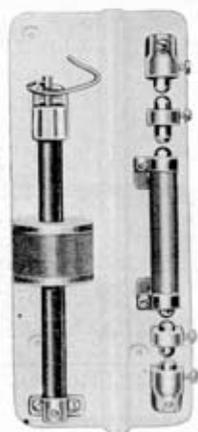
Switches can also be furnished in 800, 1000, 1200, 1500 and 2000 amperes capacity. Can be furnished with National Code Standard Fuse Holders if desired.



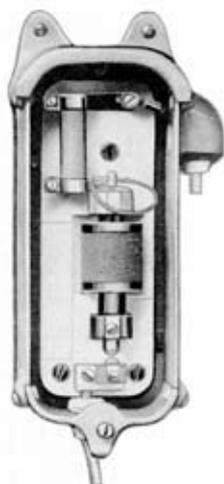
GARTON-DANIELS LIGHTNING ARRESTERS



Wood Covered
Pole Type



Station Type



Iron Covered
Pole Type

CONSIST of a resistance, one or more fixed air gaps and an air gap opened by the action of a magnet operated by the current flowing to ground, all connected in series.

Furnished in three styles—Station Type, Iron Covered Pole Type and Wood Covered Pole Type.

The Station Type has no cover and the metal parts are highly polished and lacquered.

The metal parts of Pole Arresters have a dipped finish.

The leads for the Pole Type are brought out of the box through porcelain bushings to provide ample insulation.

On direct current work, Arresters should be installed not less than five to the mile.



GARTON-DANIELS LIGHTNING ARRESTERS

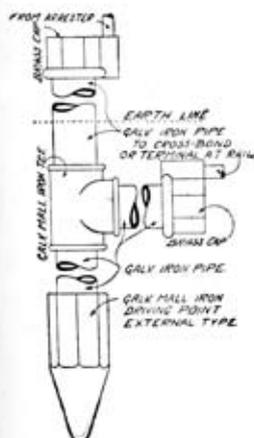
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For Lighting and Power Circuits—Direct or Alternating Current

Code Word	No.	Type	Voltage	Description	Dimensions in Inches	Net Weight in Lbs.	List Each
<i>Dotage.</i>	9724	DF	Up to 350	Station Type	8½x3x3	2¼	\$ 8 50
<i>Dowager.</i>	9725	DF	Up to 350	Iron Covered	12½x6x4	11¼	11 00
<i>Downtrod.</i>	9726	DF	Up to 350	Wood Covered	13½x7x6	6¼	9 50

For Railway Circuits—Direct Current

Code Word	No.	Type	Voltage	Description	Dimensions in Inches	Net Weight in Lbs.	List Each
<i>Downward.</i>	9727	EG	350 to 750	Station Type	9½x 3½x 3	4½	\$ 9 00
<i>Dramatic.</i>	9728	EG	350 to 750	Iron Covered	13½x 6½x 4½	13½	12 00
<i>Draper.</i>	9730	EG	350 to 750	Wood Covered	14½x 7 x 6½	8½	10 50
<i>Mucamide.</i>	11530	EH	750 to 1,300	Station Type	19½x 4 x 3½	11½	18 00
<i>Mucific.</i>	11532	EH	750 to 1,300	Wood Covered	25½x 8½x 7½	21½	20 00
<i>Pigeon.</i>	12969	EJ	1,500 to 1,800	Station Type	19½x 4 x 3½	11½	20 00
<i>Pigfoot.</i>	12970	EJ	1,500 to 1,800	Wood Covered	25½x 8½x 7½	21½	22 00
<i>Pigment.</i>	12971	EK	1,800 to 2,400	Station Type	49 x 8 x 17½	45	40 00
<i>Pignut.</i>	12972	EK	1,800 to 2,400	Wood Covered	49 x 13 x 15½	58	44 00



Nos. 13501-13502



No. 13503

Ground Fittings

Code Word	No.	List Each
<i>Reasoner.</i>	13501—Cap, Brass, ¾ inch, for No. 4 to 6 Solid Wire.....	\$0 45
<i>Reasur.</i>	13502— " " ¾ " " " 0 Cable.....	45
<i>Rebeller.</i>	13503—Point, Malleable Iron, ¾ inch.....	45



SOLDERING MATERIALS



No. 9732



No. 2850



Nos. 9784-9785



No. 1689



Nos. 5368-5369



Nos. 2989-9786

O-B CELERITY SOLDERING SALTS

THIS is a very satisfactory, quick-acting, non-corrosive salt, manufactured exclusively for us, and is heartily recommended.

Code Word	No.	List Each
<i>Encore.</i>	9732—Celerity Soldering Salts, 1-pound bottle.....	\$1 40

HIGHLAND SOLDERING PASTE

ABSOLUTELY free from acid or any ingredient injurious to insulation.

Code Word	No.	List per Box
<i>Endict.</i>	2850—Highland Soldering Paste, Two-ounce Box.....	\$0 35

SOLDER POTS

Code Word	No.	List Each
<i>Emperil.</i>	9784—Solder Pot, diameter 5 inches.....	\$1 50
<i>Emperor.</i>	9785— " " " 6 "	2 10

HALF-AND-HALF SOLDER

Code Word	No.	List per Pound
<i>Encamp.</i>	1689—Bar Solder.....	\$1 35
<i>Enchant.</i>	1691—Wire Solder No. 10 B. & S., 68 pounds per spool.....	1 40

POINTED SOLDERING COPPERS

Code Word	No.	List per Pair
<i>Empire.</i>	5368—Weight per pair, 2 pounds.....	\$2 70
<i>Empress.</i>	5369— " " " 4 "	4 30
<i>Emulate.</i>	5371—Wood Handles.....	15

SOLDER LADLES

Code Word	No.	List Each
<i>Emphasis.</i>	2989—Ladle, diameter of Bowl 3 inches.....	\$0 80
<i>Empatic.</i>	9786— " " " 4 "	1 00



GASOLINE BLOW TORCHES



No. 9783



No. 9781



No. 5373

NO. 9783 has a heavy steel tank fitted with an automatic brass pump inside the tank. A Solder Pot 5 inches in diameter may be used with this furnace. Height overall 12½ inches; diameter 8½ inches; net weight 9 pounds. Capacity five pints. Consumption ¾ pint per hour.

No. 9781 is especially adapted for heavy soldering, melting or brazing, having a burner protected by a wind shield makes it particularly suitable for outside work. Height overall 11¼ inches; diameter 4 inches; net weight 3½ pounds. Capacity one quart. Consumption 1¼ pints per hour.

No. 5373 is made of heavy seamless brass. Concave brass bottom. Attachment on burner for holding soldering iron. Height overall 10 inches; diameter 4 inches; net weight 3¼ pounds. Capacity one quart. Consumption ½ pint per hour.

Code Word	No.	List Each
<i>Empanel.</i>	9783—Hot Blast Furnace.....	\$24 80
<i>Eminent.</i>	9781—Turner Double Jet Blow Torch, polished brass.....	20 00
<i>Emissary.</i>	5373—Hot Blast Blow Torch.....	18 00



LAMP SOCKETS

250 Volts



No. 1591



No. 1588



No. 2879



No. 9573



No. 2876

Nos. 1591 and 1588 are packed 10 in a paper box.

Code Word	No.	List per 100
<i>Curfew.</i>	1591—Keyless Socket, Edison Base, $\frac{1}{4}$ -inch Cap.....	\$72 00
<i>Curtail.</i>	1588—Key " " " $\frac{1}{4}$ " "	80 00
<i>Cuticle.</i>	2879—Weatherproof Moulded Composition Socket, Edison Base..	46 00
<i>Cyclone.</i>	9573— " Porcelain Petticoat Socket, Edison Base.....	77 00
<i>Dabbler.</i>	2876— " " Socket, Edison Base.....	31 50

RECEPTACLE AND ROSETTES

250 Volts



No. 1603



No. 12964



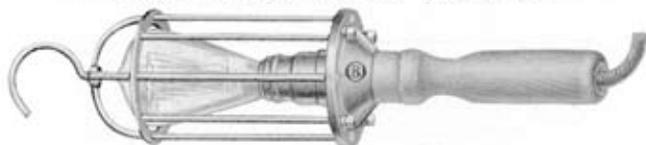
No. 12965



No. 12966

Code Word	No.	List per 100
<i>Daffodil.</i>	1603—Cleat Receptacle, Edison Base.....	\$34 00
<i>Pickrel.</i>	12964—Rosette, Cleat Type.....	22 00
<i>Picket.</i>	12965—Bryant Junior Rosette, Cleat Type.....	37 50
<i>Picklock.</i>	12966— " " " Concealed Type.....	37 50

PORTABLE LAMP GUARD



CONSISTS of a strong but light wire cage which is fastened to a wood handle by means of a bayonet-locking device.

Regularly furnished enameled and includes socket but no cord or lamp.

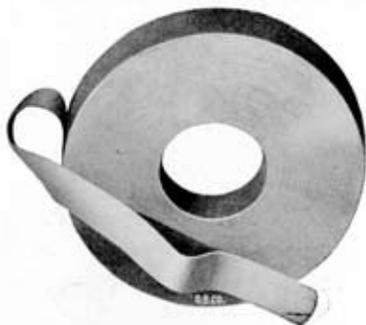
Code Word	No.	List per 100
<i>Dareful.</i>	9514—Lamp Guard with Edison Base Socket, without Lamp.....	\$460 00

LAMP CORD Cotton Covered



Code Word	No.	List per 1000 Feet
<i>Damask.</i>	9576—National Code Std. No. 14 B. & S. $\frac{1}{32}$ -in. Rubber Insulation..	\$127 00
<i>Dampen.</i>	9577— “ “ “ “ 16 “ $\frac{1}{32}$ “ “ “ ..	79 00
<i>Damson.</i>	9578— “ “ “ “ 18 “ $\frac{1}{32}$ “ “ “ ..	63 00

INSULATING TAPES

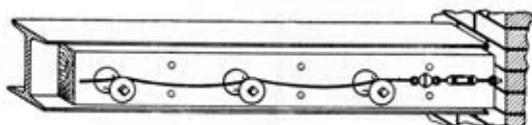


BUCKEYE Friction Tape is a special brand. It is a high grade product that can be recommended for all requirements.

Code Word	No.	List per Pound
<i>Duncheon.</i>	1686—Buckeye Friction, Black, $\frac{1}{4}$ inch wide	\$1 05
<i>Dutiful.</i>	2849—Manson “ “ $\frac{1}{4}$ “ “	1 70
<i>Earldom.</i>	7619—P. & B. Weatherproof, $\frac{1}{4}$ inch wide.....	1 45



PORCELAIN INSULATING KNOBS



Crane Trolley Construction Using Knob No. 13711



Nos. 10459-10460 No. 13711



Nos. 1169-7548



No. 4200



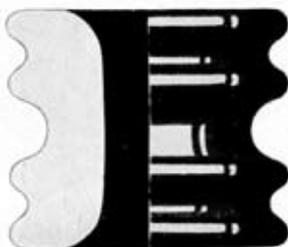
Nos. 2545-13681

Code Word	No.	Std. No.	Height Inches	Diam. Inches	Diam. Hole Inches	Diam. Groove Inches	Approx. Weight packed per 1000, in lbs.	No. in Standard Package	List per 1000
<i>Cabaret.</i>	10459	5½	1 9/16	1	1/4	5/16	80	5000	\$20 50
<i>Cabbage.</i>	10460	4½	1 1/8	1½	3/8	7/16	250	2000	39 50
<i>Sagacity.</i>	13711	51	3 1/4	2 1/4	1/2	2 1/2	600	500	160 00
<i>Cabinet.</i>	1169	24	1 3/4	2	7/16	5/8	400	1000	73 00
<i>Caboose.</i>	7548	*24	1 1/2	2	7/16	5/8	400	1000	49 00
<i>Cackle.</i>	4200	1	3 1/4	2 1/4	7/16	3/4	800	650	144 50
<i>Caddish.</i>	2545	† 0	2 1/4	3	7/16	1	1100	350	237 00
<i>Sagamore.</i>	13681	32	3	4 3/16	1 1/8	1 1/2	2500	130	400 00

*Similar to Standard No. 24 except 9/16-inch hole instead of 7/16 inch.

†Similar to Standard No. 0 except 7/16-inch hole instead of 1 1/4 inches.

PORCELAIN CABLE GUIDE INSULATOR



No. 13690

Height, 3 1/4 inches; diameter, 4 1/2 inches; diameter cable groove, 1 inch.

Weight per 100, 640 pounds.

Code Word	No.	List per 100
<i>Sagebrush.</i>	13690—Porcelain Cable Guide Insulator.....	\$48 80



UNINSULATED TURNBUCKLE

With Two Eyes



OPENINGS in eyes of $\frac{3}{8}$ -inch bolts are 1 inch in diameter and $1\frac{1}{4}$ inches in $\frac{3}{4}$ -inch bolt. Malleable iron body; drop forged eyes.

Code Word	No.				List per 100
<i>Bristle.</i>	2561—	Turnbuckle,	9-inch opening,	$\frac{3}{8}$ -inch Eye Bolts, Sherardized.	\$228 00
<i>Broach.</i>	7554—	"	12 "	" " " " " "	274 00
<i>Brocade.</i>	7556—	"	12 "	" " " " " "	320 00

UNINSULATED TURNBUCKLE

With Eye and Hook



OPENING in eye is 1 inch in diameter. Malleable iron body; drop forged eye and hook.

Code Word	No.				List per 100
<i>Brocket.</i>	2563—	Turnbuckle,	9-inch opening,	$\frac{3}{8}$ -inch Eye Bolts, Sherardized.	\$240 00
<i>Broiler.</i>	7558—	"	12 "	" " " " " "	280 00

INSULATED TURNBUCKLE

With Insulated Eye—750 Volts



ONE of the eyes of the Turnbuckle is insulated from the body by a heavy covering of Dirigo Insulation. Opening in uninsulated eye is 1 inch and in insulated eye $\frac{9}{16}$ inch in diameter. Malleable iron body; drop forged eyes.

Code Word	No.				List per 100
<i>Broiling.</i>	4206—	Turnbuckle,	6-inch opening,	$\frac{3}{8}$ -inch Eye Bolts, Sherardized	\$270 00
<i>Quinnat.</i>	13205—	"	12 "	" " " " " "	390 00



INSULATED TURNBUCKLE

With Brooklyn—750 Volts



MADE up of the Uninsulated Turnbuckle No. 2561, and the Single Brooklyn Strain Insulator No. 9995. Openings in eyes are 1 inch.

Code Word	No.	List per 100
<i>Broking.</i>	4198—Turnbuckle, 9-inch opening, $\frac{3}{4}$ -inch Eye Bolt, Sherardized...	\$380 00

INSULATED TURNBUCKLE

With Dirigo Spools No. 4201—750 Volts



Code Word	No.	List per 100
<i>Broncho.</i>	2570—Turnbuckle, 9-inch opening, $\frac{3}{4}$ -inch Forked Bolts, Sherardized	\$290 00
<i>Brooch.</i>	7562— " 12 " " " " " " "	310 00

INSULATED TURNBUCKLE

With Porcelain Spools No. 7548—750 Volts



Code Word	No.	List per 100
<i>Brother.</i>	2566—Turnbuckle, 9-inch opening, $\frac{3}{4}$ -inch Forked Bolts, Sherardized	\$220 00
<i>Browed.</i>	7564— " 12 " " " " " " "	240 00

**Pole Line Hardware
and
Miscellaneous
Materials**

**Described and Listed in the
section immediately
preceding.**

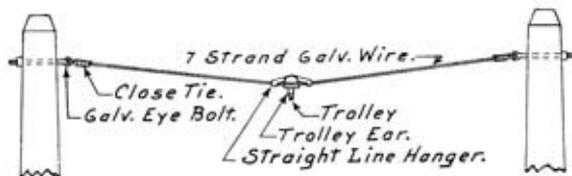
**Direct Suspension Line Materials
For Railways, Mines and In-
dustrial Haulage Systems**

**Described and Listed
in the section im-
mediately following.**

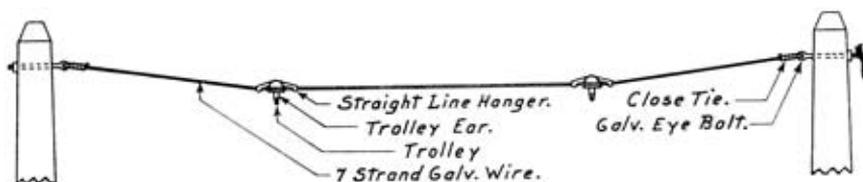


CROSS-SPAN CONSTRUCTION

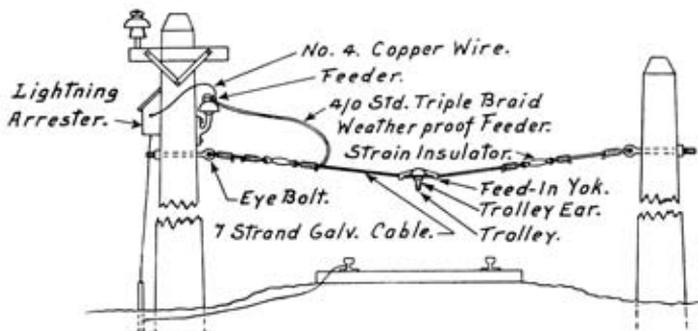
Tangent and Feed-In Spans



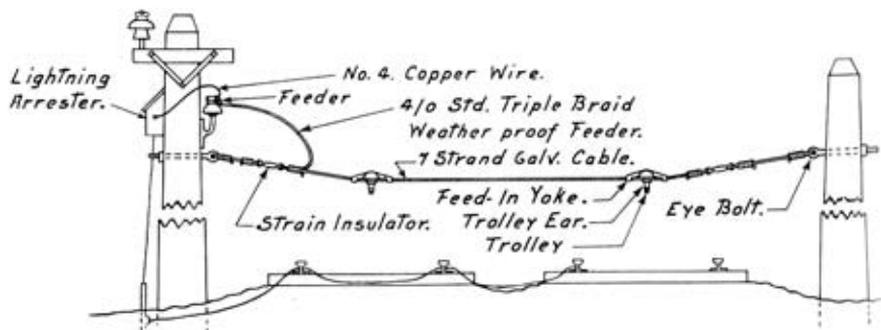
Tangent Span—Single Track



Tangent Span—Double Track



Feed-In Span—Single Track—Spaced 1000 Feet

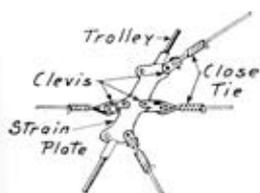


Feed-In Span—Double Track—Spaced 1000 Feet

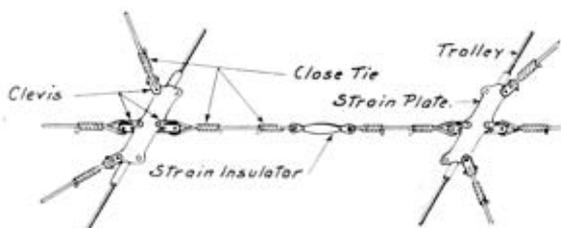


CROSS-SPAN CONSTRUCTION

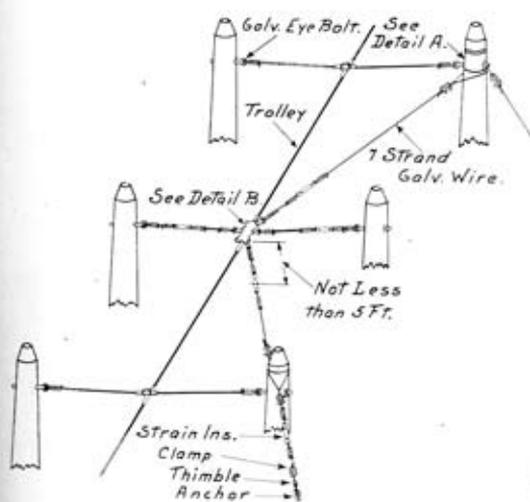
Anchor Spans—Spaced 1500 Feet



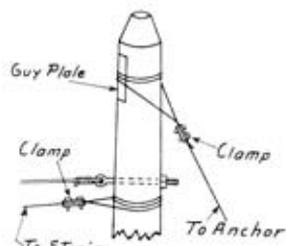
Detail B



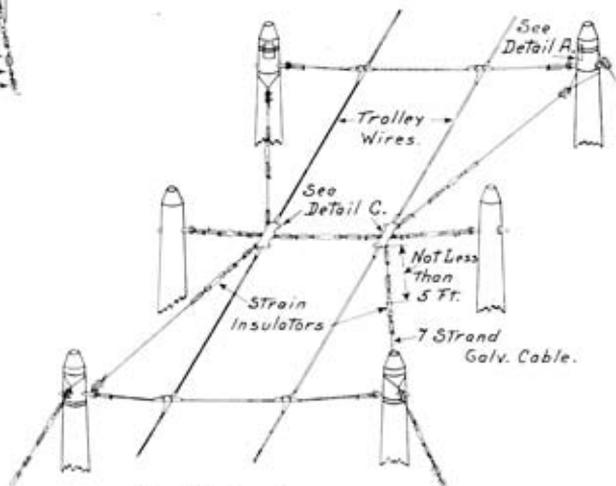
Detail C



Single Track



Detail A

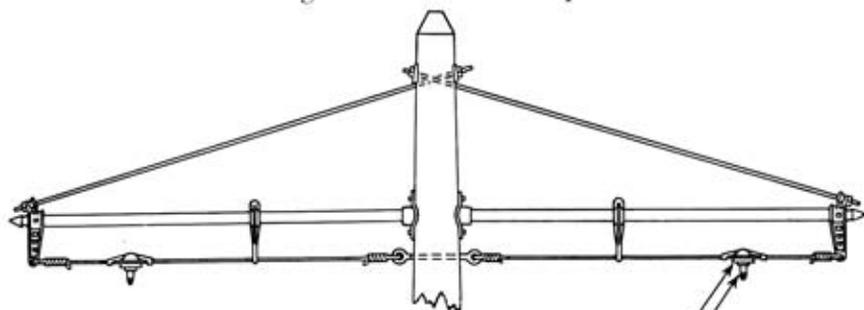


Double Track



POLE BRACKET CONSTRUCTION

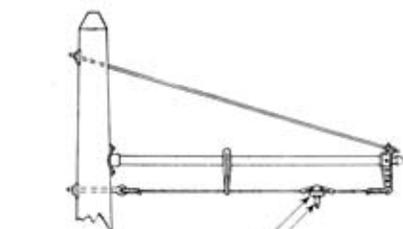
Tangent and Feed-In Spans



Straight Line Hanger.

Trolley Ear.

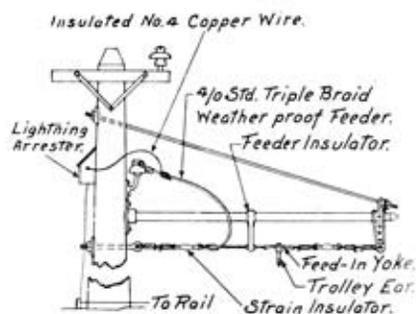
Tangent Span—Double Track



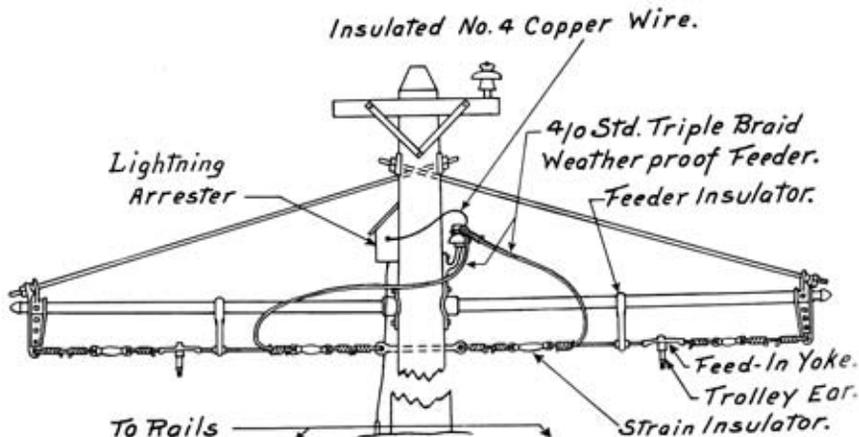
Straight Line Hanger.

Trolley Ear.

Tangent Span—Single Track



Feed-In Span—Single Track
Spaced 1000 Feet

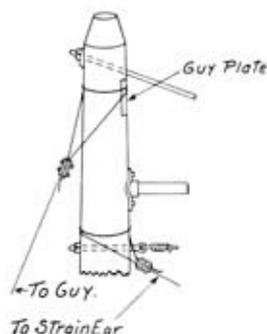


To Rails
Feed-In Span—Double Track—Spaced 1000 Feet

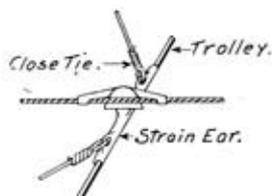


POLE BRACKET CONSTRUCTION

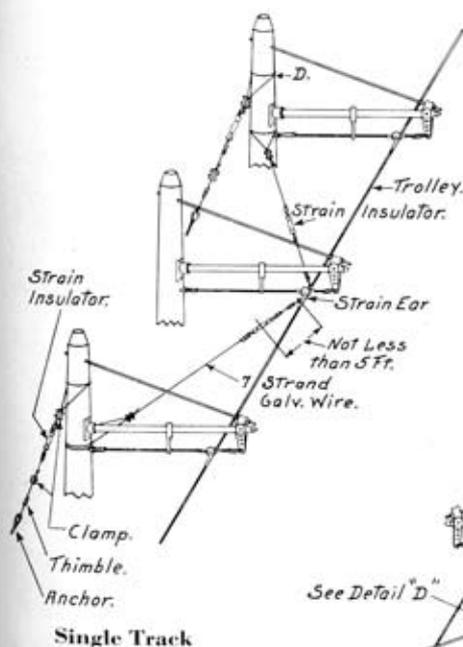
Anchor Spans—Spaced 1500 Feet



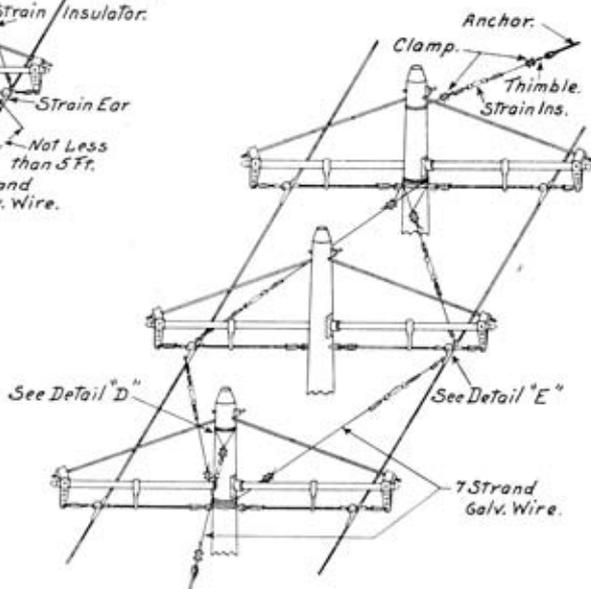
Detail D



Detail E



Single Track



Double Track

**OVERHEAD MATERIALS REQUIRED PER MILE****Direct Suspension—100-foot Pole Spacing—Wood Poles****A. E. R. A. Standard**

Note: Where A. E. R. A. Standard does not specify, the best present practice has been followed.

MATERIAL	Cross Span Suspension		Pole Bracket Suspension	
	Single Track	Double Track	Single Track	Double Track
Straight Line Hangers	44	88	48	96
Feed-In Yokes or Hangers	5	10	5	10
Flexible Pole Brackets			53	106
Galvanized Eye Bolts	106	106		
Pieces 7-Strand Galvanized Steel Strand Cross Span Wire 30-60 feet long	53	53		
Trolley Ears	49	98	49	98
Strain Plates	4	8		
Double Strain Ears			4	8
Strain Insulators	34	54	26	44
Feeder Insulators for Bracket Feed Strand			5	10
Trolley Wire Splicers	2	4	2	4
Trolley Wire	1 Mile	2 Miles	1 Mile	2 Miles
Feet 7-Strand Galvanized Steel Strand for Anchors, etc.	1160	2320	1160	2040
Rail Bonds—30-ft. Rail	352	704	352	704
Cross Bonds—500-ft. Spacing	10	20	10	20
Lightning Arresters	5	5	5	5
Feeder Wire	1 Mile	1 Mile	1 Mile	1 Mile
Pieces 4-0 Feeder Wire Connections 10-40 Feet Long	5	5	5	5
Feeder Line Insulators	53	53	53	53
Feet Feeder Insulator Ties—No. 6 Copper Wire	135	135	135	135
Guy Anchors	8	16	8	8
Feet Galvanized Iron Wire for Anchor Wrapping	48	96	48	64
Three Bolt Clamps	24	48	24	32
Steel Wire Strand Thimbles	8	16	8	8
Clevises for Strain Plates	16	32		

On curves, turnouts and line sections, the quantities of the following materials will be modified, depending upon local conditions:

Section Insulators.
Line Section Switches.
Frogs.
Single Curve Pull-Overs.

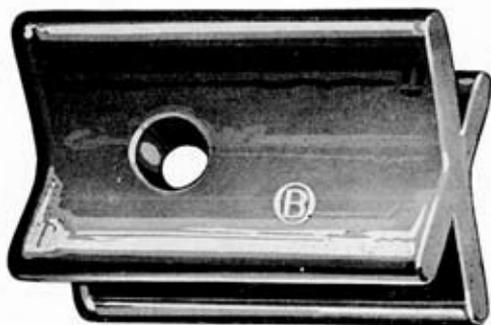
Double Curve Pull-Overs.
Curve Trolley Ears.
Strain Insulators.
Hangers.

See pages 236 and 238 for sketch of suggested construction on tangent.



PORCELAIN STRAIN INSULATORS

Conform to A. E. R. A. Specifications



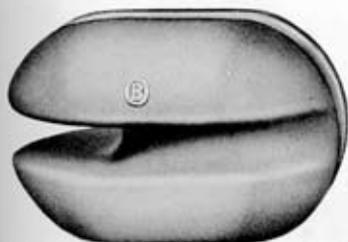
Type X—Patented

For listing, see pages 90 and 91, Insulator Section



Type XII—Patent Applied For

For listing, see pages 88 and 89 Insulator Section



Nos. 11927-11929



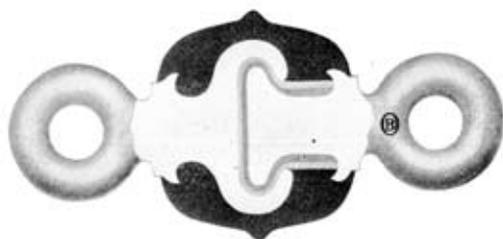
Nos. 10341-10343

For listing, see page 93, Insulator Section



O-B COMPOSITION STRAIN INSULATORS

750 Volts—Patented



THE various forms of O-B Composition Strain Insulators listed on this and the following page all have the same interior construction.

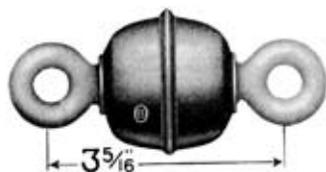
A malleable iron cup casting is compressed over the head of a second malleable iron casting. All metal parts sherardized.

Heavy sheet mica forms an effective insulation between these two castings. All strain is borne by the castings and intervening mica, Dirigo composition simply acting as a weatherproof covering.

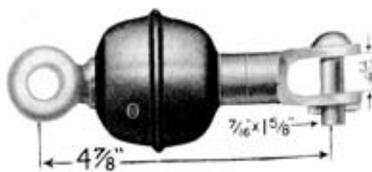
The composition is securely locked on by recessed flanges shown in sectional view.

Size of Insulator	Mechanical Routine Test	Average Ultimate Mechanical Strength	Routine Electrical Test	Average Ultimate Electrical Strength
2½ inch	3,000 lbs.	7,000 lbs.	7,000 Volts	14,000 Volts
2¼ inch	3,500 lbs.	9,000 lbs.	7,000 Volts	14,000 Volts

2½-Inch Diameter



No. 11526



No. 11647

Code Word
Modicum.
Mohair.

No. 11526—Insulator, 2½-inch diameter, *½-inch Eyes..... \$ 98 00
11647— " 2¼ " " *½ " Eye and Clevis..... 108 00

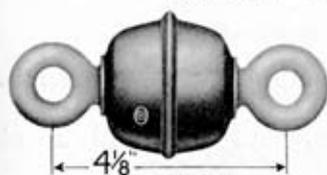
List per 100

*Eye will take a ½-inch bolt.

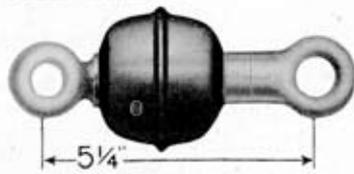


O-B COMPOSITION STRAIN INSULATORS

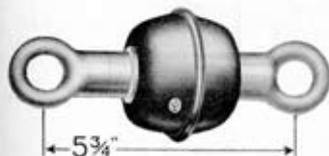
750 Volts—Patented—2 $\frac{1}{4}$ -Inch Diameter



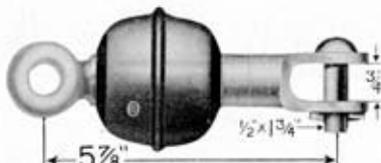
No. 11527



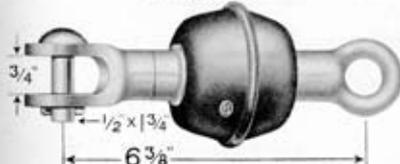
No. 11649



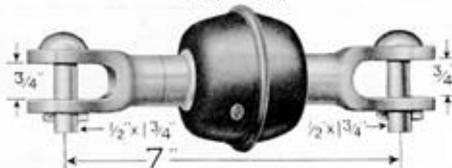
No. 11699



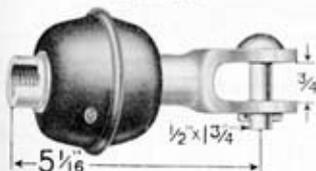
No. 11648



No. 11698



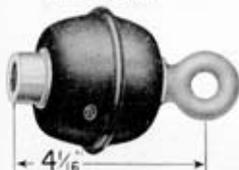
No. 11700



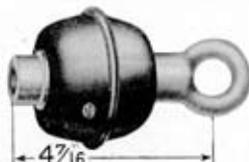
No. 11703



No. 11701



No. 11697



No. 11702

Code Word	No.	Description	Price
<i>Modular.</i>	11527	Insulator, 2 $\frac{1}{4}$ -inch diameter, *1-inch Eyes	\$144 00
<i>Moggan.</i>	11649	" " " " and $\frac{1}{2}$ -inch Eyes	154 00
<i>Molecule.</i>	11699	" " " " 1-inch Eyes	164 00
<i>Mohawk.</i>	11648	" " " " *1-inch Eye and Clevis	164 00
<i>Molehill.</i>	11698	" " " " Two Clevises	174 00
<i>Monadic.</i>	11700	" " " " *1-inch Tap and Clevis	170 00
<i>Molybdic.</i>	11703	" " " " *1-inch Stud	150 00
<i>Mollify.</i>	11701	" " " " " " " " Eye	144 00
<i>Monachal.</i>	11697	" " " " " " " " " "	154 00
<i>Monacid.</i>	11702	" " " " " " " " " "	154 00

*Eye will take a $\frac{1}{2}$ -inch bolt.

See general description on preceding page.

**WOOD STRAIN INSULATORS**

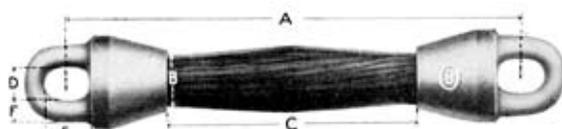
750—3,300 Volts

Conform to A. E. R. A. Specifications

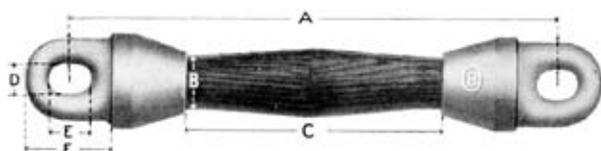
MADE of the best grade of hickory, impregnated with an insulating compound and varnished.

Sherardized, malleable iron caps are compressed firmly in place around ends of wood.

Size of Insulator in Inches.....	1	1½	1¾	1½
Routine Test in Pounds.....	4,000	5,000	6,000	7,500
Average Ultimate Strength in Pounds	7,500	8,000	11,500	15,000

With Regular Eyes

Code Word	No.	Voltage	Dimensions in Inches						List per 100
			A	B	C	D	E	F	
<i>Boaster.</i>	8574	750	9	1	5	1½ 1½	1½ 1½	1 1	\$ 75 00
<i>Boasting.</i>	8628	750	9½	1½	5	1½ 1½	1 1	1 1	85 00
<i>Bobbinet.</i>	10384	750	10½	1½	5	1½ 1½	1 1	1 1	160 00
<i>Heraud.</i>	10860	750	11½	1½	5	1½ 1½	1 1	1 1	180 00
<i>Bombast.</i>	8622	1,500	16	1	12	1½ 1½	1½ 1½	1 1	90 00
<i>Bonanza.</i>	9237	1,500	16½	1½	12	1½ 1½	1 1	1 1	105 00
<i>Boreas.</i>	10301	3,300	28½	1½	24	1½ 1½	1 1	1 1	145 00

With Long Eyes

Code Word	No.	Voltage	Dimensions in Inches						List per 100
			A	B	C	D	E	F	
<i>Bobolink.</i>	9974	750	9½	1	5	1 1	1½ 1½	1½ 1½	\$75 00
<i>Borneol.</i>	10472	750	11½	1½	5	1 1	1 1	2½ 2½	85 00

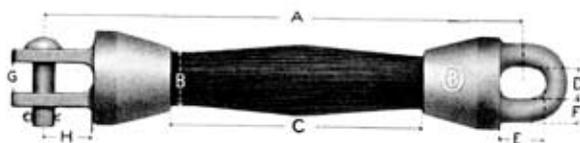
Insulators with eyes at right angles to each other furnished to order.



WOOD STRAIN INSULATORS

Continued

With Eye and Clevis

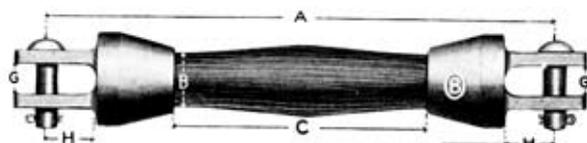


Clevis Bolt is $\frac{7}{16} \times 1\frac{1}{2}$ Inches

Code Word	No.	Voltage	Dimensions in Inches							List per 100	
			A	B	C	D	E	F	G		H
<i>Bodkin.</i>	9238	750	9 $\frac{1}{2}$	1	5	$\frac{11}{16}$	$\frac{13}{16}$	$\frac{7}{16}$	$\frac{3}{4}$	1	\$ 90 00
<i>Bollard.</i>	10295	750	10	1 $\frac{1}{4}$	5	$\frac{13}{16}$	1	$\frac{7}{16}$	$\frac{3}{4}$	1	100 00
<i>Bondage.</i>	10297	1,500	16 $\frac{1}{2}$	1	12	$\frac{11}{16}$	$\frac{15}{16}$	$\frac{7}{16}$	$\frac{3}{4}$	1	105 00
<i>Bonfire.</i>	10298	1,500	17	1 $\frac{1}{2}$	12	$\frac{13}{16}$	1	$\frac{7}{16}$	$\frac{3}{4}$	1	120 00

Insulators with eye and clevis in same plane furnished to order.

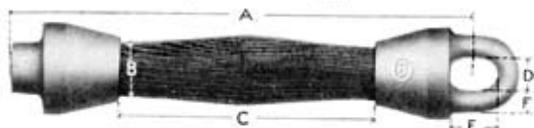
With Two Clevises



Clevis Bolt is $\frac{7}{16} \times 1\frac{1}{2}$ Inches

Code Word	No.	Voltage	Dimensions in Inches					List per 100
			A	B	C	G	H	
<i>Sahibah.</i>	13677	750	10	1	5	$\frac{3}{4}$	1	\$105 00
<i>Sailboat.</i>	13678	750	10 $\frac{1}{2}$	1 $\frac{1}{4}$	5	$\frac{3}{4}$	1	115 00

With Eye and Tapped Boss



Threaded End Casting is Tapped $\frac{3}{8}$ Inch, 11 Threads per Inch

Code Word	No.	Voltage	Dimensions in Inches						List per 100
			A	B	C	D	E	F	
<i>Bolster.</i>	8575	750	9	1	5	$\frac{11}{16}$	$\frac{13}{16}$	$\frac{7}{16}$	\$ 95 00
<i>Bombard.</i>	10296	750	9 $\frac{1}{2}$	1 $\frac{1}{4}$	5	$\frac{13}{16}$	1	$\frac{7}{16}$	105 00
<i>Boniform.</i>	10299	1,500	16 $\frac{1}{2}$	1	12	$\frac{11}{16}$	$\frac{15}{16}$	$\frac{7}{16}$	110 00
<i>Bootless.</i>	10300	1,500	16 $\frac{1}{2}$	1 $\frac{1}{4}$	12	$\frac{13}{16}$	1	$\frac{7}{16}$	125 00

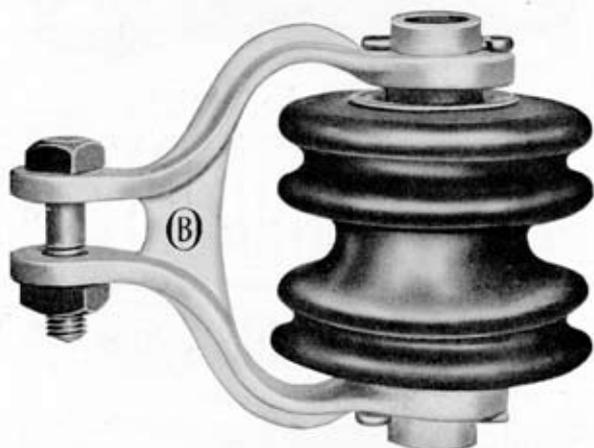
Insulators with two tapped bosses furnished to order.

See general description on preceding page.



PORCELAIN POLE STRAIN INSULATOR

1,500 Volts



No. 10392

USED at poles in 1,500 volt span construction, and can hang in any position and still afford ample insulation.

A broken porcelain can be quickly replaced by removing insulator pin, it being unnecessary to make up new strand joints.

In span work clevis can be attached directly to a $\frac{3}{4}$ -inch eye bolt fastened in pole.

Pole Casting and pin, japanned; bolt and cotter pin sherardized.

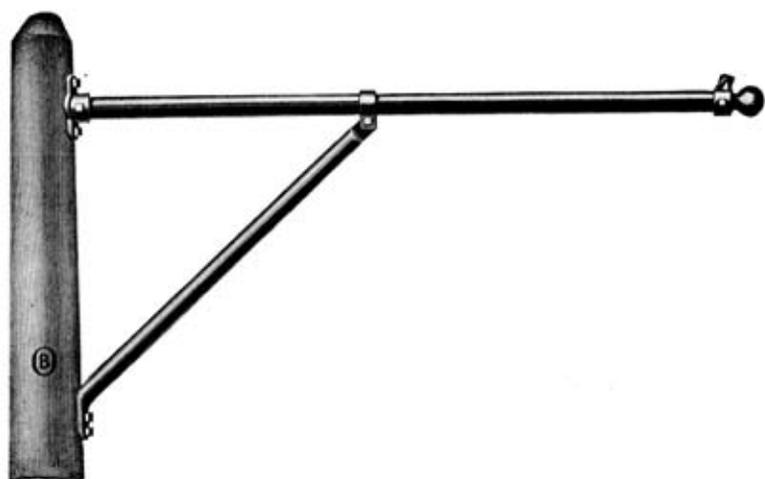
Diameter of Insulator.....	4 $\frac{1}{2}$ inches
Height of Insulator.....	4 $\frac{1}{4}$ "
Diameter of hole.....	1 $\frac{1}{2}$ "
Diameter at bottom of center groove.....	3 $\frac{1}{4}$ "
Width of center groove.....	1 "

Code Word
Alienage.
Alfa.

No.		List per 100
10392—Pole Strain Insulator, Complete, for 1,500 Volts.....		\$150 00
10391—Porcelain " only for 1,500 ".....		41 00

**RIGID POLE BRACKET**

Single Bracket, for Wood Poles—750 Volts



MADE of A Tubing only, horizontal arm being $1\frac{1}{2}$ inches, strut $1\frac{1}{4}$ inches.

Arm slips into pole casting and is held in place by a $\frac{3}{8}$ -inch machine bolt passing through casting and end of tubing.

Casting has a solid back which affords a bearing for end of arm and protects wood pole.

All castings are japanned.

Holes in pole castings and strut are for $\frac{1}{2}$ x4-inch lag screws but lags are not furnished unless specified.

Bracket lengths listed are actual lengths of horizontal tubing, but do not include projecting end casting.

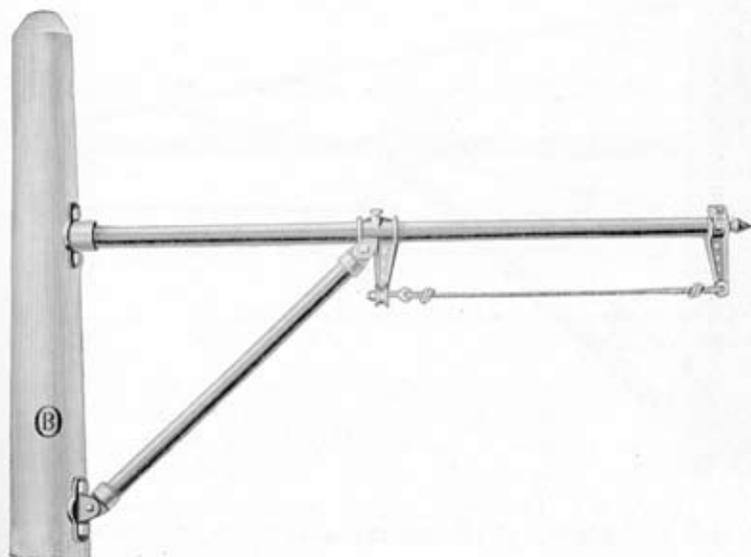
Code Word	No.	List per 100
<i>Sailcloth.</i>	13679—3-foot Arm, $1\frac{1}{2}$ -inch A Tubing.....	\$410 00
<i>Aback.</i>	10454—4 " " $1\frac{1}{2}$ " "	430 00
<i>Abaiser.</i>	10455—6 " " $1\frac{1}{2}$ " "	470 00

For listing of parts for above Brackets, see page 252.

FLEXIBLE POLE BRACKET

Single Bracket, for Wood Poles

Type A—Without Support Rod—750 Volts



MADE of either C Tubing or Pipe. Strut is threaded on both ends and is $1\frac{1}{4}$ inches and $1\frac{1}{2}$ inches respectively, for use with the $1\frac{1}{2}$ -inch and 2-inch arms.

Bracket arm is threaded into pole casting which has a solid back to give good bearing. Strand is $\frac{5}{16}$ inch, galvanized, and eye bolt is $\frac{1}{2} \times 6$ inches, galvanized.

Pole castings have holes for $\frac{1}{2} \times 4$ -inch lag screws but lags are not furnished unless specified. All castings malleable iron, japanned.

Bracket lengths listed are actual lengths of horizontal tubing, but do not include projecting end casting.

C Tubing

Code Word	No.		List per 100
<i>Abaist.</i>	3403—	9-foot Arm, $1\frac{1}{2}$ -inch C Tubing.....	\$ 950 00
<i>Abase.</i>	8787—10	" " $1\frac{1}{2}$ " "	1040 00
<i>Abash.</i>	3409—9	" " 2 " "	1150 00
<i>Abater.</i>	8789—10	" " 2 " "	1250 00

Pipe

<i>Invasive.</i>	10990—	9-foot Arm, $1\frac{1}{2}$ -inch Pipe.....	\$ 950 00
<i>Insected.</i>	10991—10	" " $1\frac{1}{2}$ " "	1040 00
<i>Inveigher.</i>	10992—9	" " 2 " "	1150 00
<i>Invenom.</i>	10993—10	" " 2 " "	1250 00

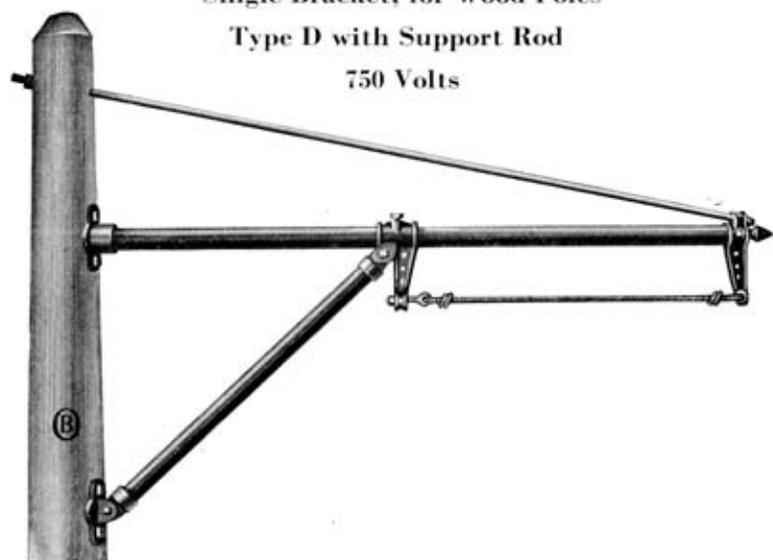
For listing of parts for above Brackets, see page 252.

**FLEXIBLE POLE BRACKET**

Single Bracket, for Wood Poles

Type D with Support Rod

750 Volts



MADE of either C Tubing or Pipe. Strut is threaded on both ends and is $1\frac{1}{4}$ inches and $1\frac{1}{2}$ inches respectively, for use with the $1\frac{1}{2}$ -inch and 2-inch arms.

Bracket arm is threaded into pole casting which has a solid back to give good bearing. Strand is $\frac{5}{16}$ inch, galvanized, and eye bolt is $\frac{1}{2} \times 6$ inches, galvanized.

Support rods as furnished with the $1\frac{1}{2}$ -inch and 2-inch arms have $\frac{7}{8}$ -inch and $\frac{1}{2}$ -inch U. S. S. rolled threads, respectively. Lengths of support rods are 10 feet, 6 inches and 11 feet, 6 inches, respectively, on the 9 and 10-foot Brackets. A beveled iron washer for use at pole is included with support rod.

Pole castings have holes for $\frac{1}{2} \times 4$ -inch lag screws but lags are not furnished unless specified. All castings malleable iron japanned.

Bracket lengths as listed are actual lengths of horizontal tubing, but do not include projecting end casting.

Code Word	No.	C Tubing	List per 100
<i>Abature.</i>	3493—	9-foot Arm, $1\frac{1}{2}$ -inch C Tubing	\$1100 00
<i>Abawed.</i>	5521—10	" " $1\frac{1}{2}$ " "	1190 00
<i>Abbatial.</i>	3499—9	" " 2 " "	1300 00
<i>Abbess.</i>	5529—10	" " 2 " "	1400 00
		Pipe	
<i>Inventful.</i>	10994—	9-foot Arm, $1\frac{1}{2}$ -inch Pipe	\$1100 00
<i>Investive.</i>	10995—10	" " $1\frac{1}{2}$ " "	1190 00
<i>Investure.</i>	10996—9	" " 2 " "	1300 00
<i>Invious.</i>	10997—10	" " 2 " "	1400 00

For listing of parts for above Brackets, see page 252.

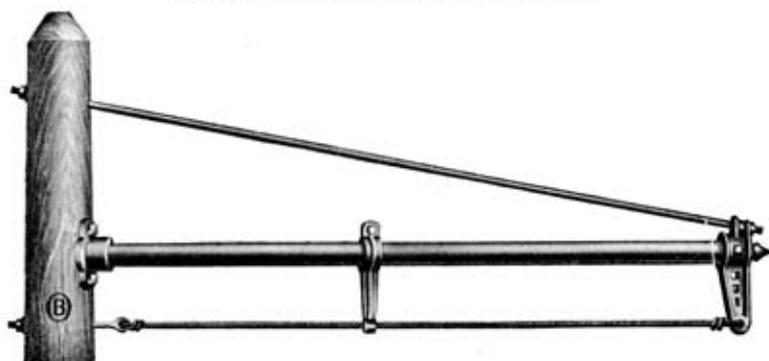


FLEXIBLE POLE BRACKET

Single Bracket, for Wood Poles

Type B—750 Volts

Conforms to A. E. R. A. Specifications



MADE with either A or C Tubing or Pipe arms. Arm bears against the solid back of the socket casting, being held in place by the tension of the support rod and strand. Strand is $\frac{1}{8}$ inch diameter, galvanized; eye bolt is $\frac{1}{2}$ x12 inches, galvanized. All castings are malleable iron, japanned.

Pole castings have holes for $\frac{1}{2}$ x4-inch lag screws but lags are not furnished unless specified.

Support rods, as furnished with the 1 $\frac{1}{2}$ -inch and 2-inch arms, have $\frac{7}{8}$ -inch and $\frac{1}{2}$ -inch U. S. S. rolled threads respectively. Lengths of support rods are 10 feet, 6 inches and 11 feet, 6 inches, respectively, on the 9 and 10-foot Brackets. A beveled iron washer for use at pole is included with support rod.

Bracket lengths as listed are actual lengths of horizontal tubing, but do not include projecting end casting.

Code Word	No.	C Tubing	List per 100
<i>Abbey.</i>	9062— 9-foot Arm,	1 $\frac{1}{2}$ -inch C Tubing	\$ 730 00
<i>Abdicat.</i>	9065—10 " "	1 $\frac{1}{2}$ " C "	800 00
<i>Abducent.</i>	9071— 9 " "	2 " C "	900 00
<i>Abductor.</i>	9074—10 " "	2 " C "	1000 00

Code Word	No.	A Tubing	List per 100
<i>Abbot.</i>	9063— 9-foot Arm,	1 $\frac{1}{2}$ -inch A Tubing	\$ 700 00
<i>Additive.</i>	9066—10 " "	1 $\frac{1}{2}$ " A "	770 00
<i>Abduct.</i>	9072— 9 " "	2 " A "	870 00
<i>Abeam.</i>	9075—10 " "	2 " A "	970 00

Code Word	No.	Pipe	List per 100
<i>Invirile.</i>	10998— 9-foot Arm,	1 $\frac{1}{2}$ -inch Pipe	\$ 730 00
<i>Invision.</i>	10999—10 " "	1 $\frac{1}{2}$ " " "	800 00
<i>Invider.</i>	11000— 9 " "	2 " " "	900 00
<i>Involucree.</i>	11001—10 " "	2 " " "	1000 00

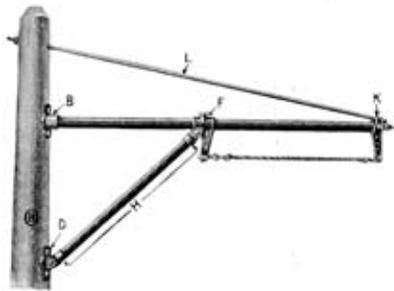
For listing of parts for above Brackets, see page 252.



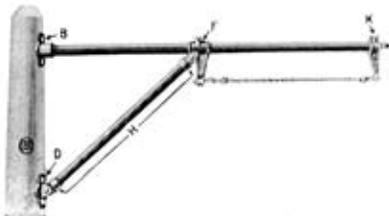
POLE BRACKET PARTS



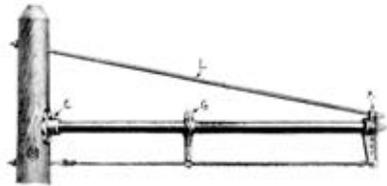
Rigid Bracket



Type D Bracket



Type A Bracket



Type B Bracket

CASTINGS are furnished complete with the necessary set screws or bolts. Bolts for attaching Strut End Castings are included with Inner Span Holder and Lower Pole Castings. Lag screws are not included with Pole Castings. All castings, malleable iron, japanned.

Support rods are furnished with nuts and beveled iron washer for pole end.

Code Word	No.	Part	List per 100
Marshall.	11807	A Upper Pole Casting for 1½-inch Arm, with Bolt.	\$ 60 00
Marshy.	11808	B " " " " 1½ " " Threaded.	70 00
Martin.	11809	B " " " " 2 " " " "	90 00
Martinet.	11810	C " " " " 1½ " " Not Threaded.	60 00
Martite.	11811	C " " " " 2 " " " "	80 00
Martlet.	11812	D Lower " " " " " "	50 00
Martyr.	11813	E Split Brace Casting for 1½-inch Arm.	40 00
Marvel.	11814	F Inner Span Holder Casting for 1½-inch Arm.	120 00
Masle.	11815	F " " " " 2 " " " "	150 00
Masher.	11816	G Guide " " 1½ " " " "	60 00
Maskery.	11817	G " " 2 " " " " "	70 00
Massage.	11818	H Strut End " " 1½ " " " "	60 00
Massicot.	11819	H " " " " 1½ " " " "	70 00
Masterly.	11820	J Ball End (Grey Iron) " " 1½ " " " "	60 00
Mastful.	11821	K Outer Span Holder " " 1½ " " " "	110 00
Mastiff.	11822	K " " " " 2 " " " "	130 00
Masting.	11823	L Support Rod, 7/16 inch x 10 feet 6 inches.	130 00
Matuco.	11824	L " " 1/8 " x 11 " 6 "	150 00
Matcher.	11825	L " " 1/8 " x 10 " 6 "	170 00
Matinal.	11826	L " " 1/8 " x 11 " 6 "	190 00

For listing of Eye Bolts see page 231.

**FEED-IN INSULATOR**

For Pole Brackets—Long Spacing
Conforms to A. E. R. A. Specifications



FOR use on pole bracket as insulated guide casting where feeder wire is carried through in place of ordinary strand.

Castings are same length as bracket castings so that tap is carried across in a straight horizontal line.

Only one bolt is used to hold the two castings together. Installed easily and quickly.

Insulation is split porcelain spool with hole 1 inch in diameter.

Distance center pipe to center porcelain spool: No. 12591, 6 $\frac{3}{4}$ inches; No. 12592, 7 $\frac{1}{4}$ inches.

Code Word	No.	List per 100
<i>Pexity.</i>	12591—Insulator, for 1 $\frac{1}{2}$ -inch Pipe (1 $\frac{3}{4}$ -inch outside diameter) . . .	\$125 00
<i>Phacoid.</i>	12592— " " 2 " " (2 $\frac{1}{4}$ " " " ") . . .	160 00

FEED-IN INSULATOR

For Pole Brackets—Short Spacing



IS shorter than the Insulator listed above and carries feeder wire closer to pole bracket arm. Insulation is porcelain with an opening 1 inch in diameter.

Distance center pipe to center spool: No. 4462, 2 $\frac{1}{4}$ inches; No. 4463, 2 $\frac{1}{2}$ inches.

Code Word	No.	List per 100
<i>Compart.</i>	4462—Insulator, for 1 $\frac{1}{2}$ -inch Pipe (1 $\frac{3}{4}$ -inch outside diameter)	\$80 00
<i>Compass.</i>	4463— " " 2 " " (2 $\frac{1}{2}$ " " " ")	90 00



TYPE A FEED-IN YOKE



MADE of bronze and fitted with a sherardized machine bolt and lock washer. Lips are tinned for soldering.

Will accommodate 2-0 to 4-0 B. & S. solid or stranded feeder wire.

Lower face of boss is machined so as to make a full contact with ear or clamp.

Hex head machine bolt is $\frac{3}{8}$ x $1\frac{1}{4}$.

Height $2\frac{1}{16}$ inches. Length $5\frac{3}{4}$ inches.

Code Word	No.	List per 100
<i>Bandbox.</i>	1037S—Feed-In Yoke, Bronze, $\frac{3}{8}$ -inch Stud.....	\$144 00
	Above can be furnished with $\frac{1}{2}$ -inch Stud.	

GROVER FEED-IN HANGER



SUITABLE for solid wire or cable not larger than $\frac{3}{8}$ -inch in diameter. Hex head machine bolt is $\frac{5}{8} \times 2\frac{3}{4}$.

Code Word	No.	List per 100
<i>Bandit.</i>	2417—Feed-In Hanger, Bronze, $\frac{3}{8}$ -inch Sherardized Stud.....	\$170 00
	Above can be furnished with $\frac{1}{2}$ -inch Stud.	

SYRACUSE YOKE



INTEENDED for use with wire or cable not greater than $\frac{9}{16}$ inch in diameter.

Lower surface, which bears against top of boss of ear, is $1\frac{3}{8}$ inches in diameter, providing a good contact between ear and yoke.

Bronze yoke has inside of end lugs tinned for soldering to wire if desired. Hex head machine bolt is $\frac{5}{8} \times 1\frac{3}{4}$.

Bronze Feed-In Yoke
Conforms to A. E. R. A. Specifications

Code Word	No.	List per 100
<i>Bandon.</i>	3197—Feed-In Yoke, Bronze, $\frac{3}{8}$ -inch Sherardized Stud.....	\$90 00

Malleable Iron Straight Line Suspension

<i>Alias.</i>	10407—Suspension Yoke, Malleable Iron, Sherardized, $\frac{3}{8}$ -inch Stud.	42 00
	Either of above can be furnished with $\frac{1}{2}$ -inch Stud.	



FEEDER WIRE INSULATORS

Dirigo Insulation—750 Volts



No. 8648



Nos. 8646 and 8297



No. 7627

CATALOG No. 8648, Side Bearing Insulator, Form 1, is adapted for use on corner construction, as the feeder wire is supported at the side of the Insulator, close to the cross arm, thus placing the strain on the insulator pin to the best advantage. It consists of a malleable iron shell into which is moulded Dirigo Insulation. Size of pin hole is 1 inch.

The Nos. 8646 and 8297 Top and Side Bearing Insulators, Form 1, are similar to the Side Bearing Insulator described above with the addition of a saddle on the top. The upright prongs, being of malleable iron, may be bent down over the feeder wire to secure it in place. Size of pin hole is 1 inch.

The No. 7627 Top and Side Bearing Insulator, Form 2, is made entirely of Dirigo Insulation, and is suitable for both straight line and corner suspension, the top groove being used for the former and the side groove for the latter. Size of pin hole is 1 inch.

Code Word	No.	List per 100
<i>Bractéal.</i>	8648—Side Bearing Insulator, Form 1, Sherardized, for Wire 1½ inches in diameter or less.....	\$140 00
<i>Bragger.</i>	8646—Top and Side Bearing Insulator, Form 1, Sherardized, for Wire 1 to 1½ inches in diameter.....	150 00
<i>Braiding.</i>	8297—Top and Side Bearing Insulator, Form 1, Sherardized, for Wire 1½ to 1¾ inches in diameter.....	190 00
<i>Brained.</i>	7627—Top and Side Bearing Insulator, Form 2, for Wire 1¼ inches in diameter or less.....	140 00

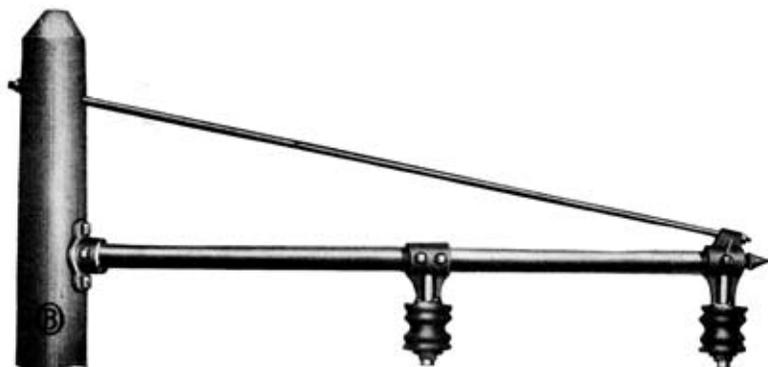


INSULATED POLE BRACKET

Patented

Type G—For Wood Poles

1,500 Volts



USED on 1,500 volt construction, ample insulation being provided by two Porcelain Sleeve Insulators, No. 10391, listed on page 246.

Trolley wire may be supported by Catenary Cross Span Trolley Steady, listed in the Catenary Section of this catalog, or a Syracuse Yoke, listed on page 255, suspension being attached to steel strand running between the two Sleeve Insulators.

Bracket arm is $1\frac{1}{2}$ -inch C Tubing or Iron Pipe; castings malleable iron; support rod, $\frac{3}{8}$ inch; support rod is 1 foot, 6 inches longer than arm.

Bracket arm fastened into pole casting by $\frac{3}{8}$ x3-inch square head machine bolt passing through both parts.

Pole casting drilled for $\frac{1}{2}$ x5-inch lag screws. Brackets are furnished complete as illustrated, except that lags are not furnished unless specified. All castings are malleable iron, japanned.

C Tubing

Code Word	No.		List per 100
<i>Albumen.</i>	10389—	9-foot Arm, $1\frac{1}{2}$ -inch C Tubing.....	\$1000 00
<i>Alcohol.</i>	10390—	10 " " $1\frac{1}{2}$ " "	1040 00

Pipe

<i>Involute.</i>	11158—	9-foot Arm, $1\frac{1}{2}$ -inch Pipe.....	\$1000 00
<i>Iodism.</i>	11159—	10 " " $1\frac{1}{2}$ " "	1040 00



TYPE A STRAIGHT LINE HANGER

1,500 Volts—Patented



A STURDY design using high voltage porcelain for the insulating member. Intended for 1,500-volt lines.

The porcelain is well protected from blows by the malleable iron shell which covers it completely.

Has long leakage path.

Outer shell and casting holding the stud are cemented securely to the porcelain.

The stud has a limited vertical movement in opposition to a heavy spring washer. This preserves a tight joint between the hanger and ear or clamp when the latter is aligned with the trolley wire.

The shell is malleable iron, sherardized.

Diameter of porcelain at bottom, $3\frac{1}{2}$ inches. Diameter of shell at bottom, $4\frac{1}{2}$ inches. Length over arms, $9\frac{3}{4}$ inches.

Code Word
Rebellion.

No.
13305—Hanger, $\frac{3}{4}$ -inch Stud.
Above can be furnished with $\frac{1}{2}$ -inch Stud.

List per 100
\$200 00



DIRIGO INSULATION



THE rain and the snow, the heat and the cold of nineteen years had attacked some of these O-B Hangers when the picture was taken. The rest had been installed for thirteen years. And the Superintendent of the mine said that they were still good for more.

This incident is particularly interesting because the hangers are the cap and cone type—the Dirigo Insulation is exposed to all the elements.

Such service as this has established the reputation of Dirigo Insulation.

Dirigo is long lived because it is a balanced composition.

It has electrical strength. It has mechanical strength. It resists heat. It resists weather.

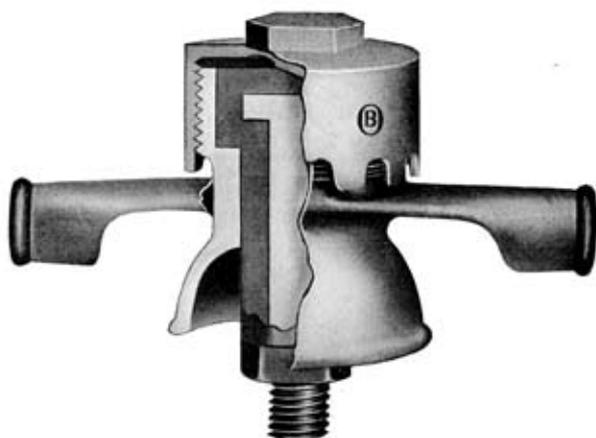
Each desirable quality is there in the right proportion—no one feature is emphasized to the detriment of another.

Dirigo Insulation is used in all O-B Hangers and Composition Strain Insulators.



TYPE D HANGERS

750 Volts



Sectional View of Type D Straight Line Hanger

ALL Type D Hangers listed on succeeding pages possess the following excellent features:

Insulated Bolt has two broad flat surfaces for application of wrench to attach ear or clamp.

Cap is provided with a hex for wrench and row of lugs around lower edge, one or two of which are intended to be turned under and lock cap securely in position and prevent bolt from working loose in service.

Leather washer between cap and head of bolt provides friction to prevent bolt from turning.

Threaded portion of body casting is $2\frac{1}{8}$ inches in diameter; bottom of skirt $2\frac{13}{16}$ inches in diameter, except in Form 2 which is $3\frac{3}{8}$ inches in diameter.

Head of Type D Insulated Bolt is $1\frac{1}{8}$ inches in diameter as against $1\frac{1}{16}$ inches for our Type M (West End) Bolt, hence presents a broader bearing surface.

See following pages for listing.



TYPE D-1 STRAIGHT LINE HANGERS

750 Volts



Well adapted for all ordinary service conditions.
Threaded portion of body is $2\frac{1}{8}$ inches in diameter.
Bottom of skirt is $2\frac{1}{8}$ inches in diameter.
Hanger includes Type D Bolt No. 2018.

Code Word	No.	List per 100
Abearing.	2022—Type D-1 Hanger, Mall. Iron, Sherardized, D Bolt, $\frac{1}{4}$ -inch Stud.	\$152 00
	Above can be furnished with $\frac{3}{8}$ -inch Stud.	

TYPE D-2 STRAIGHT LINE HANGERS

750 Volts



PREFERRED to D-1 Hanger where conditions are particularly severe. Body portion is heavier than D-1 and broader skirt affords increased protection to lower end of insulated bolt. Arms are reinforced by webs.

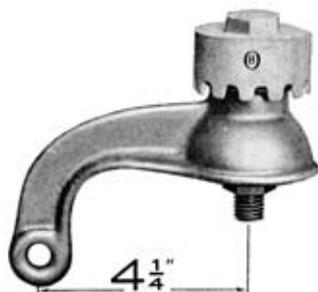
Threaded portion of body is $2\frac{1}{8}$ inches in diameter.
Bottom of skirt is $3\frac{3}{8}$ inches in diameter.
Hanger includes Type D Bolt No. 2018.

Code Word	No.	List per 100
Aberr.	10380—Type D-2 Hanger, Mall. Iron, Sherardized, D Bolt, $\frac{1}{4}$ -in. Stud.	\$152 00
	Above can be furnished with $\frac{3}{8}$ -inch Stud. For listing of Insulated Bolts, see page 265.	



TYPE D SINGLE AND DOUBLE CURVE HANGERS

750 Volts



No. 2045—Single Curve



No. 2048—Double Curve

AMPLE clearance is provided for all standard trolley wheels and harps.

Holes for span wire are $\frac{3}{8}$ inch in diameter.

Hangers include Type D Bolt No. 2018.

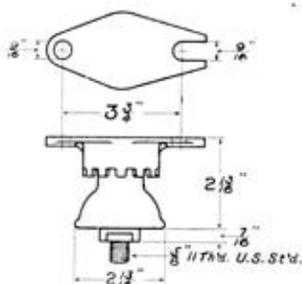
Code Word	No.	List per 100
<i>Abeyance.</i>	2045—Single Curve Hanger, Mall. Iron, Sherardized, $\frac{1}{2}$ -inch Stud	\$160 00
<i>Abiliment.</i>	2048—Double " " " " " " " " " "	176 00

Above can be furnished with $\frac{1}{2}$ -inch Stud.
For listing of Insulated Bolts, see page 265.



TYPE D BRIDGE HANGER

750 Volts



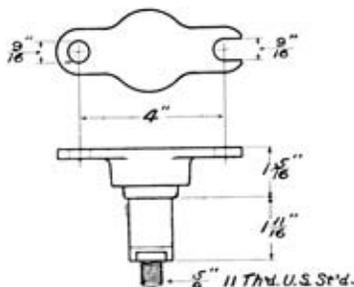
Hanger includes Type D Bolt No. 2018.

Code Word No. List per 100
Abloom. 2037—Bridge Hanger, Malleable Iron, Sherardized, $\frac{3}{8}$ -inch Stud \$170 00

Above can be furnished with $\frac{1}{2}$ -inch Stud.
 For listing of Insulated Bolts, see page 265.

TYPE D BARN HANGER

750 Volts



Hanger includes Type D Bolt No. 2018.

Code Word No. List per 100
Ablegate. 6480—Barn Hanger, Malleable Iron, Sherardized, $\frac{3}{8}$ -inch Stud \$102 00

Above can be furnished with $\frac{1}{2}$ -inch Stud
 For listing of Insulated Bolts, see page 265.



TYPE D SWIVELED POLE BRACKET HANGER

750 Volts



No. 8864—With Fibre Insulation

AN additional insulation is provided in Nos. 8864 and 8870 by means of a double fibre bushing placed inside the upper bracket arm sleeve. This adds to leakage distance and prevents forming of arc in case flying trolley bridges Hanger insulation.

Height from top of ear boss to bottom of pole bracket arm is $4\frac{1}{4}$ inches.

Diameter of skirt at bottom is $2\frac{1}{8}$ inches. Hanger body is supported by a $\frac{3}{8}$ x $3\frac{3}{4}$ -inch machine bolt. Bolts are fitted with leather washers.

Hanger includes Type D Bolt No. 2018.

Without Fibre Insulation

Code Word	No.		List per 100
<i>Abjure.</i>	8852—	Hanger, Mall. Iron, Sher., $\frac{1}{2}$ -inch Stud, for $1\frac{1}{2}$ -inch Tubing...	\$280 00
<i>Ablation.</i>	8858—	" " " " $\frac{1}{2}$ " " 2 " "	... 305 00

With Fibre Insulation

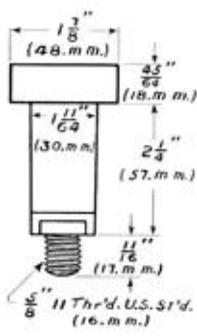
<i>Ablaut.</i>	8864—	Hanger, Mall. Iron, Sher., $\frac{1}{2}$ -inch Stud, for $1\frac{1}{2}$ -inch Tubing...	\$295 00
<i>Ablaze.</i>	8870—	" " " " $\frac{1}{2}$ " " 2 " "	... 320 00

For listing of Insulated Bolts, see page 265.

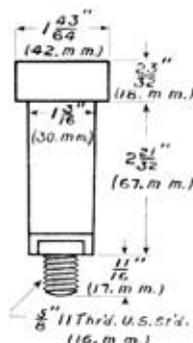


INSULATED BOLTS

Types D and M—750 Volts



Type D



Type M



CONSIST of a sherardized forged steel stud effectively insulated by Dirigo Insulation.

Lower portion has two broad, flat surfaces for application of wrench.

Type D Bolts—For O-B Type D Hangers

Code Word No. List per 100
Abnormal. 2018—Insulated Bolt, Type D, $\frac{1}{2}$ -inch Stud, Sherardized.....\$60 00

Type M Bolts—For O-B Type M Hangers or Any Standard "West End" Hangers

Abutment. 2054—Insulated Bolt, Type M, $\frac{1}{2}$ -inch Stud, Sherardized.....\$56 00

Above can be furnished with $\frac{3}{8}$ -inch Stud.

TYPES D AND M HANGER WRENCH



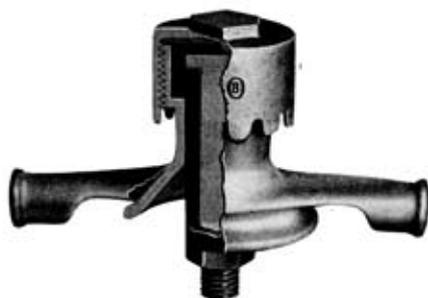
FITS interchangeably insulated bolts and hanger caps on Types D and M Hangers.

Code Word No. List per 100
Aborted. 2020—Hanger_Wrench, Sherardized.....\$40 00



TYPE M STRAIGHT LINE HANGER

750 Volts



THIS is the standard West End Type. Insulated bolt has two broad, flat surfaces for application of wrench.

Threaded portion of body casting is $2\frac{1}{8}$ inches in diameter, bottom of skirt $2\frac{1}{16}$ inches in diameter.

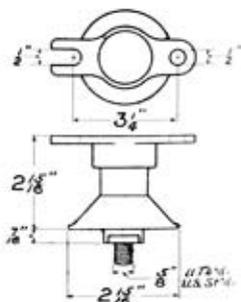
Hanger includes Type M Bolt No. 2054.

Code Word	No.	List per 100
Abortion.	3166—Straight Line Hanger, Mall. Iron, Sherardized, $\frac{1}{2}$ -inch Stud...	\$148 00

Above can be furnished with $\frac{3}{4}$ -inch Stud.
For listing of Insulated Bolts, see page 265.

TYPE M BARN HANGER

750 Volts



Hanger includes Type M Bolt No. 2054.

Code Word	No.	List per 100
Absorber.	3985—Barn Hanger, Malleable Iron, Sherardized, $\frac{1}{2}$ -inch Stud.....	\$140 00

Above can be furnished with $\frac{3}{4}$ -inch Stud.
For listing of Insulated Bolts, see page 265.



TYPE M SINGLE AND DOUBLE CURVE HANGERS

750 Volts



No. 3176



No. 3178

Holes for span wire are $\frac{1}{8}$ inch in diameter.

Hangers include Type M Bolt No. 2054.

Code Word
Abraid.
Abridger.

No.	List per 100
3176—Single Curve Hanger, Mall. Iron, Sherardized, $\frac{1}{8}$ -inch Stud.	\$156 00
3178—Double " " " " " " " "	.. 172 00

Above can be furnished with $\frac{1}{8}$ -inch Stud.
For listing of Insulated Bolts, see page 265.



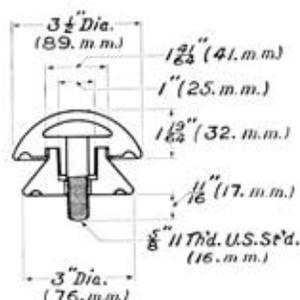
TYPE G INSULATOR CAPS AND CONES

750 Volts

Conform to A. E. R. A. Specifications



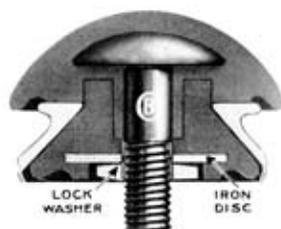
Cap



Cone



Showing Construction of Plain Cone



Showing Construction of Lock Cone

MADE of Dirigo Insulation and used interchangeably with Type G Hangers listed on the following pages and with all standard Cap and Cone Hanger Bodies of other makes.

Stud in Cap is made of forged steel, sherardized.

Cone is listed both plain and with lock washer.

Lock Cone is far superior to other cones on the market because it absolutely prevents the cap from working loose in service. Lower face of Lock Cone has a recess into which is moulded an iron disc to provide bearing surface for a lock washer.

When installed, lock washer makes a tight joint between the lock cone and boss of ear or clamp.

Code Word	No.	List per 100
<i>Adagial.</i>	5440—Insulator Cap, $\frac{3}{8}$ -inch Stud, Sherardized.....	\$56 00
<i>Adamant.</i>	5441— " " Cone, Plain, for $\frac{3}{8}$ -inch Stud.....	28 00
<i>Adaply.</i>	5442— " " Lock, " " " With Lock Washer... ..	30 00

Any of above can be furnished for $\frac{1}{4}$ -inch Stud.



TYPE G STRAIGHT LINE HANGER

750 Volts



Code Word	No.	List per 100
<i>Absume.</i>	10432—Hanger, Malleable Iron, Sherardized, $\frac{3}{8}$ -in. Stud, Plain Cone	\$132 00
<i>Absurd.</i>	10433— “ “ “ “ “ “ Lock “	134 00
<i>Accite.</i>	10436—Casting only, Malleable Iron, Sherardized.....	48 00

Above can be furnished with $\frac{3}{8}$ -inch Stud.

For listing of Caps and Cones and advantages of Lock Cones, see preceding page.

CAP AND CONE HANGER WRENCH

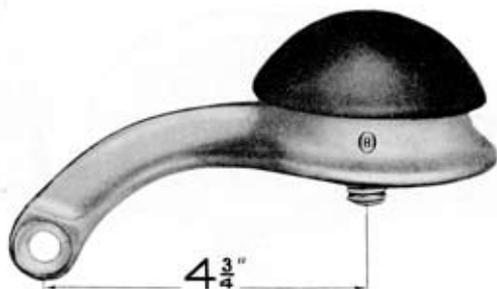


DESIGNED for holding cap of Type G Straight Line, Single and Double Curve Hangers while ear or clamp is screwed in place. Contour of jaws is such that great gripping power is obtained without danger of injuring insulation.

Code Word	No.	List Each
<i>Hausse.</i>	10675—Cap and Cone Hanger Wrench, Mall. Iron, Japanned.....	\$1 40

TYPE G SINGLE AND DOUBLE CURVE HANGERS

750 Volts



Nos. 10437-10438



Nos. 10442-10443

Holes for span wire are $\frac{1}{8}$ inch in diameter.

Single Curve

Code Word	No.	List per 100
<i>Accloy.</i>	10437—Hanger, Malleable Iron, Sherardized, $\frac{1}{4}$ -in. Stud, Plain Cone	\$140 00
<i>Accoast.</i>	10438— " " " " " $\frac{1}{2}$ " " Lock "	142 00
<i>Acentic.</i>	10441— " Casting only, "	56 00

Double Curve

<i>Acerbate.</i>	10442—Hanger, Malleable Iron, Sherardized, $\frac{1}{4}$ -in. Stud, Plain Cone	\$168 00
<i>Acetify.</i>	10443— " " " " " $\frac{1}{2}$ " " Lock "	170 00
<i>Acraze.</i>	10446— " Casting only, "	84 00

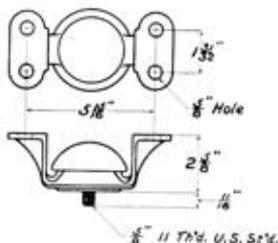
Above can be furnished with $\frac{1}{4}$ -inch Stud.

For listing of Caps and Cones and advantages of Lock Cones, see page 268.



TYPE G BARN OR MINE HANGER

750 Volts



Code Word	No.	List per 100
<i>Accentor.</i>	5454—Hanger, Malleable Iron, Sherardized, $\frac{5}{8}$ -in. Stud, Plain Cone.	\$184 00
<i>Accosted.</i>	5455— " " " " " " " " Lock "	186 00
<i>Accrouch.</i>	8666— " Casting only, Sherardized.	100 00

Above can be furnished with $\frac{1}{4}$ -inch Stud.

For listing of Caps and Cones and advantages of Lock Cones, see page 268.

TYPE G POLE BRACKET HANGER

750 Volts—Patented



HHEIGHT from top of ear boss to bottom of pole bracket arm is $3\frac{3}{8}$ inches. Casting is malleable iron, sherardized.

Code Word	No.	List per 100
<i>Acrimony.</i>	8898—Hanger, Sher., for $1\frac{1}{2}$ -inch Tubing, $\frac{5}{8}$ -inch Stud, Plain Cone.	\$234 00
<i>Acrobat.</i>	8899— " " " " " " " " Lock "	236 00
<i>Actress.</i>	8815— " Casting only, Sherardized, for $1\frac{1}{2}$ -inch Tubing.	150 00
<i>Actuary.</i>	8816— " Sher., for 2-inch Tubing, $\frac{5}{8}$ -inch Stud, Plain Cone.	250 00
<i>Actuate.</i>	8817— " " " " " " " " Lock "	252 00
<i>Adage.</i>	8820— " Casting only, Sherardized, for 2-inch Tubing.	166 00

Above can be furnished with $\frac{1}{4}$ -inch Stud.

For listing of Caps and Cones and advantages of Lock Cones, see page 268.

**TYPE N STRAIGHT LINE HANGERS**

750 Volts



PARTICULARLY adapted for ordinary conditions on city lines. Dirigo Insulation is used, and shell completely encloses it, giving protection from blows from trolley.

The forged stud is sherardized and is moulded directly into insulation, being provided with a flanged head which, together with ribs inside shell, firmly anchors parts of hanger together.

Lower end of stud is fitted with a washer which forms a broad bearing surface for boss of trolley ear or clamp and serves to reinforce the insulation.

Type N-1 Hanger

Type N-1 Hanger is the old time standard in this type using the same shell as the Type N Lock Hanger illustrated on page 275. The shell is $3\frac{1}{8}$ inches diameter at lower edge of metal skirt. Weight per 100, 225 pounds.

Code Word	No.	List per 100
<i>Adjument.</i>	3144—Type N-1 Straight Line Hanger, Mall. Iron, Sher., $\frac{3}{8}$ -inch Stud.	\$115 00
	Above can be furnished with $\frac{1}{2}$ -inch Stud.	

Type N-2 Hanger

Type N-2 Hanger is built along the same lines as the Type N-1 Hanger but is somewhat lighter. It has equivalent mechanical and electrical characteristics. The shell is $3\frac{1}{4}$ inches diameter at lower edge of metal skirt. Weight per 100, 200 pounds.

Code Word	No.	List per 100
<i>Sagacious.</i>	13801—Type N-2 Straight Line Hanger, Mall. Iron, Sher., $\frac{1}{4}$ -inch Stud.	\$105 00

TYPE F STRAIGHT LINE HANGER

750 Volts

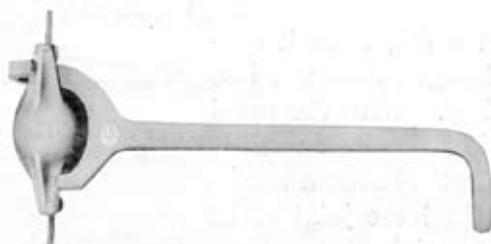


SIMILAR to Type N Hanger, except larger and heavier throughout. Shell is $3\frac{1}{2}$ inches in diameter at lower edge of skirt.

Code Word	No.	List per 100
<i>Adhibit.</i>	8876—Straight Line Hanger, Mall. Iron, Sherardized, $\frac{1}{4}$ -inch Stud.	\$120 00

Above can be furnished with $\frac{1}{2}$ -inch Stud.

THROW-IN HANGER WRENCH



CAN be used for installing upon the span wire, any type of straight line Hanger, listed in this Catalog.

It consists of a one-piece forging with circular jaws, one of which is provided with a hook and the other with a V-shaped notch.

The Hanger is first put into place with one of the hanger suspension lugs on the span wire and the wrench is then applied and the Hanger turned sufficiently to permit the other suspension lug to be hooked over the span wire as shown in the illustration.

Length overall is 20 inches.

Code Word	No.	List Each
<i>Haunter.</i>	10625—Throw-In Hanger Wrench, Japanned.	\$2 70



O-B LOCK HANGER

Patented

O-B LOCK HANGER does everything the usual hanger does and more. For every ear fits tightly against every O-B Lock Hanger.

The stud and a heavy lock washer are contained in a malleable iron cup casting which is swaged on an anchor casting. The assembled unit is moulded into the hanger shell with Dirigo Insulation. The stud can not rotate but it has a limited vertical movement against the pressure of the washer.



The Lock Construction

It works out this way:

Ordinarily the ear, when it contacts with the hanger, does not line up with the trolley. With the usual hanger the ear is backed off until it does aline. Either the lineman wastes time shimming the loose joint or he lets it go as a sloppy job.

Now, if O-B Lock Hangers are on the span wire, the ear is turned ahead—still further compressing the heavy lock washer—and the result is a tight, weatherproof joint between ear and hanger.



Ear out of line with trolley when it touches hanger



Ear backed off usual hanger to aline with wire



Ear tightened on Lock Hanger to aline with the wire

TYPE N-1 STRAIGHT LINE LOCK HANGER

750 Volts—Patented

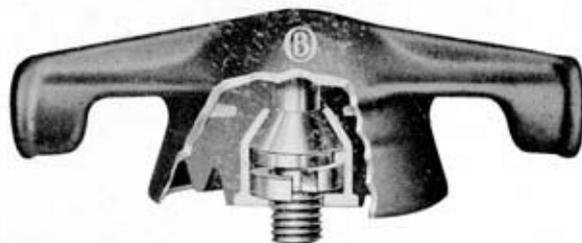


SHELL casting same as that used in regular Type N-1 Hanger. Bottom of insulation moulded into double petticoat; shell $3\frac{1}{2}$ inches in diameter.

Code Word No. List per 100
Infumate. 11062—Straight Line Hanger, Mall. Iron, Sherardized, $\frac{3}{8}$ -inch Stud. \$122 00
Above can be furnished with $\frac{1}{2}$ -inch Stud.

TYPE F STRAIGHT LINE LOCK HANGER

750 Volts—Patented



SHELL is same as used in regular Type F Hanger, being $3\frac{1}{2}$ inches in diameter at bottom of skirt

Code Word No. List per 100
Infumed. 11064—Straight Line Hanger, Mall. Iron, Sherardized, $\frac{3}{8}$ -inch Stud. \$137 00
Above can be furnished with $\frac{1}{2}$ -inch Stud.



TYPE N-1 BARN OR MINE HANGER

750 Volts



DIAMETER of skirt at bottom is $3\frac{1}{8}$ inches. Takes $\frac{1}{2}$ -inch lag screws spaced $3\frac{3}{4}$ inches between centers. Height, top ear boss to top shell, $2\frac{3}{16}$ inches.

Code Word	No.	List per 100
<i>Adnation.</i>	3994—Hanger, Malleable Iron, Sherardized, $\frac{1}{2}$ -inch Stud.....	\$110 00

Above can be furnished with $\frac{1}{4}$ -inch Stud.
See also Type H Mine Hangers listed on pages 286 and 287.

TYPE N-1 SWIVELED POLE BRACKET HANGER

750 Volts



DISTANCE from top of ear boss to bottom of pole bracket arm is $3\frac{1}{4}$ inches.

Diameter of skirt at bottom of Hanger is $3\frac{1}{8}$ inches. Hanger body is supported by a $\frac{3}{8} \times 3\frac{3}{4}$ -inch machine bolt.

Bolts are fitted with lock washers.

Code Word	No.	List per 100
<i>Admanish.</i>	8828—Hanger, Mall. Iron, Sher., $\frac{1}{2}$ -inch Stud, for $1\frac{1}{2}$ -inch Tubing..	\$225 00
<i>Reboant.</i>	8834— " " " " $\frac{1}{2}$ " " " 2 " " ..	250 00

TYPE N SINGLE AND DOUBLE CURVE HANGERS

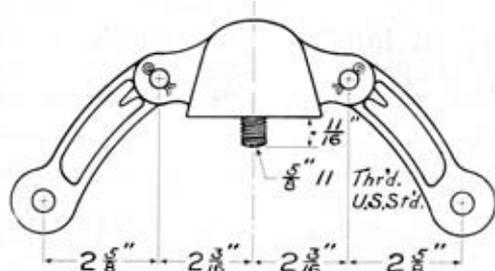
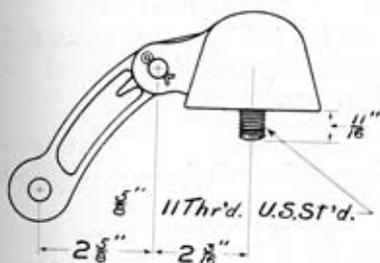
750 Volts—Patented



No. 11650



No. 11651



BODY of hanger is similar to our Standard Type N-1 Hanger listed on page 272 except that it is provided with clevis. Separable arms are attached to clevis by $\frac{7}{16} \times 1\frac{5}{8}$ -inch blank bolt and cotter pin.

This construction permits renewing a hanger body without detaching the arm from the span wire and also makes it possible to screw a long ear or clamp upon the hanger stud.

Diameter of hole for strand, $\frac{3}{8}$ inch. Diameter of hanger at bottom of skirt, $3\frac{1}{8}$ inches. Malleable iron, sherardized.

Code Word	No.	List per 100
Mated.	11650—Single Curve Hanger Complete, $\frac{3}{8}$ -inch Stud.	\$140 00
Mateced.	11651—Double " " " " "	175 00
Matting.	11652—Single " " without arm, with Bolt and Cotter.	110 00
Mauldin.	11653—Double " " " Bolts " Cotters.	115 00
Mattress.	11654—Separable Arm only, Mall. Iron, Sher.	30 00

Clevis Bolts and Cotter Pins

Safeguard.	13688—Clevis Bolt, Sherardized, $\frac{7}{16} \times 1\frac{1}{2}$ inch, without Cotter.	2 20
Saffron.	13689—Cotter Pin, Galvanized, $\frac{3}{8} \times \frac{1}{4}$ -inch.	20

Above Hangers can be furnished to order with $\frac{3}{4}$ -inch Stud, Plain or in Lock Type.

TWIN STRAIGHT LINE SUSPENSION

With Composition Strain Insulators
Type B—Form 1—750 Volts



ESPECIALLY adapted for suspending two parallel trolley wires in electrical and mechanical connection with each other from a flexible pole bracket, but used to equal advantage on span wire construction. Fitted with 2¼-inch Composition Strain Insulators No. 11526 attached by bolts and cotter pins; spacing between wires is 6 inches.

For advantages of Cap Nut, see preceding page.
Opening in clevis is $\frac{9}{16}$ inch.

Code Word	No.	List per 100
<i>Mazurka.</i>	11846—Suspension, Mall. Iron, Sherardized, $\frac{3}{4}$ x1¼-inch Stud. . . .	\$411 00

Suspension Without Insulators

<i>Rebuke.</i>	13440—Casting, Sher. with Clevis Bolts and $\frac{3}{4}$ x1¼-inch Stud. . . .	215 00
	Either of above can be furnished with $\frac{3}{4}$ x1¼-inch Stud.	

SINGLE STRAIGHT LINE SUSPENSION

With Composition Strain Insulators
Type C—Form 2—750 Volts



USED under same conditions as Twin Suspension listed above. Fitted with 2¼-inch Composition Strain Insulators No. 11526 attached by bolts and cotter pins.

For advantages of Cap Nut, see preceding page.
Opening in clevis is $\frac{9}{16}$ inch.

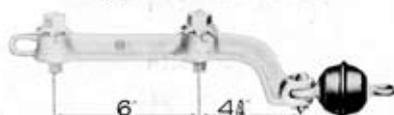
Code Word	No.	List per 100
<i>Pendular.</i>	12983—Suspension, Mall. Iron, Sherardized, $\frac{3}{4}$ x2¼-inch Stud. . . .	\$306 00

Suspension Without Insulators

<i>Majoram.</i>	11806—Casting, Sher. with Clevis Bolts and $\frac{3}{4}$ x2¼-inch Stud. . . .	110 00
	Either of above can be furnished with $\frac{3}{4}$ x2¼-inch Stud.	

SINGLE AND DOUBLE CURVE PULL-OVERS

Type B—750 Volts



No. 11842



No. 11844



No. 8888



No. 8892

DESIGNED to suspend two parallel trolley wires with a separation of 6 inches. Insulation is furnished by our 2 $\frac{1}{4}$ -inch Composition Strain Insulator No. 11526 or by Wood Strain Insulator No. 8574.

Opening in clevis is $\frac{9}{16}$ inch and will take any of our standard Composition or 1 and $\frac{1}{4}$ -inch Wood Strain Insulators.

With Composition Insulators

Code Word	No.	List per 100
<i>Mayweed.</i>	11842—Single Curve Pull-Over, Sherardized, $\frac{1}{2}$ x1 $\frac{1}{4}$ -inch Studs.....	\$283 00
<i>Mazdean.</i>	11844—Double " " " " $\frac{1}{2}$ x1 $\frac{1}{4}$ " " " ".....	466 00

With Wood Strain Insulators

<i>Aflame.</i>	8888—Single Curve Pull-Over, Sherardized, $\frac{1}{2}$ x1 $\frac{1}{4}$ -inch Studs.....	260 00
<i>Aggrate.</i>	8892—Double " " " " $\frac{1}{2}$ x1 $\frac{1}{4}$ " " " ".....	420 00

Yokes Without Insulators

<i>Rebloom.</i>	13504—Single Curve Yoke, Sher., with Clevis Bolt, $\frac{1}{2}$ x1 $\frac{1}{4}$ -inch Studs	185 00
<i>Rebucous.</i>	13505—Double " " " " " " $\frac{1}{2}$ x1 $\frac{1}{4}$ " " " ".....	270 00

Clevis Bolts and Cotter Pins

<i>Safeguard.</i>	13688—Clevis Bolt, Sherardized, $\frac{1}{2}$ x1 $\frac{1}{4}$ -inch, without Cotter.....	2 20
<i>Saffron.</i>	13689—Cotter Pin, Galvanized, $\frac{1}{2}$ x $\frac{1}{4}$ -inch.....	20

Any of above yokes can be furnished with $\frac{1}{2}$ x1 $\frac{1}{4}$ -inch Stud.



TYPE SH MINE HANGER

Patented

550 Volts



No. 13216



No. 13217

USED for insulating trolley wires in mines, and has the advantage of adjustability in all directions.

Upper and lower portions of Hanger are connected by a ball and socket joint. This allows lower portion to be rotated to make a tight joint with trolley clamp when latter is aligned with wire, and also allows Hanger to adapt itself to general plane of wire regardless of pitch of timbers.

When clamp and wire are installed, three set screws on Hanger are tightened, making it perfectly rigid.

Attached to roof timbers by means of two $\frac{1}{2}$ -inch lag screws. Lugs project far enough so that body does not interfere with lags in installing.

Height, top of ear boss to top of hanger shell.....	$2\frac{1}{16}$ inches
Diameter of Hanger.....	$3\frac{1}{2}$ "
Width of slots in lugs.....	$\frac{9}{16}$ "
Distance between centers lag screws (minimum).....	$4\frac{1}{2}$ "

Code Word	No.	List per 100
<i>Queenly.</i>	13216—Mine Hanger, Malleable Iron, Sherardized, $\frac{3}{8}$ -inch Stud.....	\$125 00
<i>Queerish.</i>	13217—Hanger Wrench, Malleable Iron, Sherardized.....	75 00



TYPE SK MINE HANGER

Patented

550 Volts



No. 12982



No. 12982—Installed in Sloping Roof



No. 12986

USED for insulating trolley wires in mines and has the advantage of adjustability in all directions.

Upper and lower portions of Hanger are connected by a ball and socket joint. This allows lower portion to be rotated to make a tight joint with trolley clamp when latter is aligned with wire and also allows Hanger to adapt itself to general plane of wire regardless of irregularities of holes in the roof.

When clamp and wire are installed, three set screws on Hanger are tightened, making it perfectly rigid.

Attached directly to mine roof by means of Type A-3 Expansion Bolt or Mine Hanger Screw and Wood Plug.

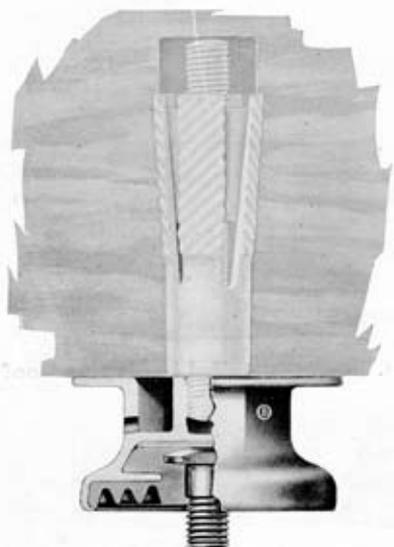
Height, top of ear boss to top of flange.....	2 $\frac{1}{16}$ inches
Diameter of Hanger.....	3 $\frac{1}{2}$ "
Hole in top boss tapped for bolt.....	$\frac{5}{8}$ "

Code Word	No.	List per 100
<i>Quatrain.</i>	12982—Mine Hanger, Malleable Iron, Sherardized, $\frac{1}{2}$ -inch Stud.....	\$125 00
<i>Queach.</i>	12986—Hanger Wrench, Malleable Iron, Sherardized.....	75 00

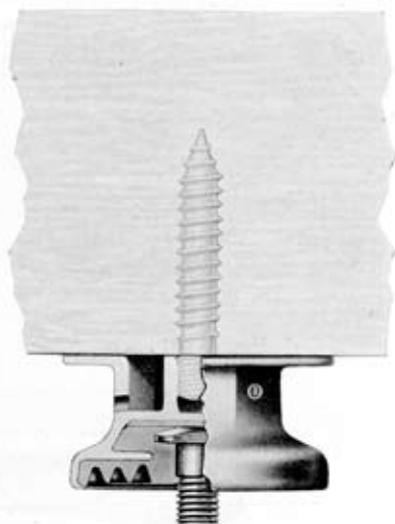


UNIVERSAL MINE HANGERS

550 Volts



Universal-1 Hanger
Installed in Roof



Universal-1 Hanger
Installed on Timber

USED for insulating trolley wires in mines and may be attached either directly to mine roof or to roof timbers, thus obviating necessity of carrying a stock of two kinds of hangers at the mine.

All three Hangers listed on the opposite page are made of the same high-quality materials, varying only in size and weight.

Broad bearing surface at top makes hanger very rigid when installed. This feature is particularly desirable on curve work.

Sherardized stud bolt is moulded into shell with Dirigo Insulation and head of bolt is effectively insulated from shell by a disc of built-up mica. Lower surface of insulation is moulded into multiple petticoats which prevents surface leakage in wet mines.

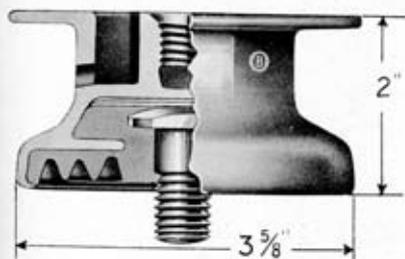
May be attached directly to the mine roof by means of Type A-3 Expansion Bolt, or Mine Hanger Screw and Wood Plug. For applying to roof timbers, the Mine Hanger Screw only is necessary.

See following page for listing.

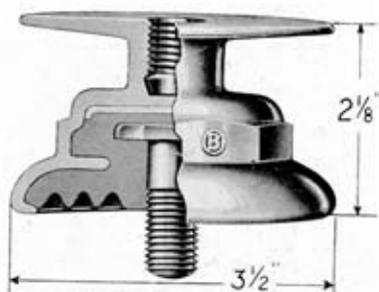


UNIVERSAL MINE HANGERS

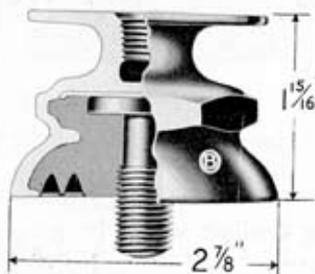
550 Volts



Universal-1 Hanger
No. 11309



Universal-2 Hanger
No. 11907



Universal-4 Hanger
No. 13174

Universal-1 Hanger

Code Word	No.	List per 100
<i>Judaize.</i>	11309—Mine Hanger, Malleable Iron, Sherardized, 1/2-inch Stud...	\$125 00
<i>Amender.</i>	9993—Hanger Wrench, Malleable Iron, Sherardized.....	70 00

Universal-2 Hanger

<i>Meatics.</i>	11907—Mine Hanger, Malleable Iron, Sherardized, 1/2-inch Stud....	110 00
<i>Meazling.</i>	11555—Hanger Wrench, Malleable Iron, Sherardized.....	80 00

Universal-4 Hanger

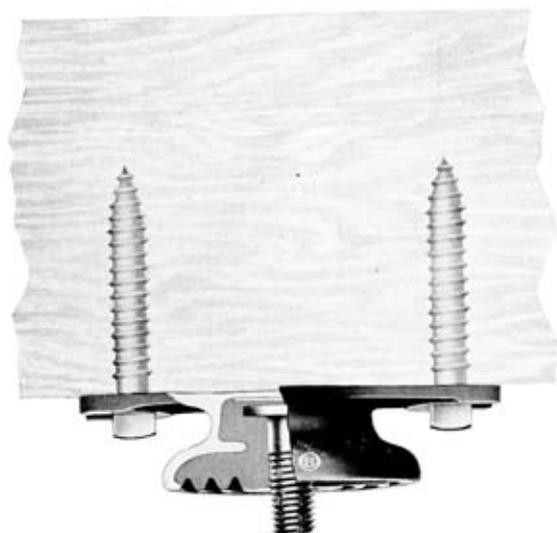
<i>Queerness.</i>	13174—Mine Hanger, Malleable Iron, Sherardized, 1/2-inch Stud....	90 00
<i>Quench.</i>	13177—Hanger Wrench, Malleable Iron, Sherardized.....	75 00

See preceding page for description.



TYPE H MINE HANGERS

550 Volts



Type H-3 Hanger Installed on Roof Timber

USED for insulating trolley wires in mines and is designed for attachment direct to mine timbers by means of $\frac{1}{2}$ -inch lag screws.

All four Hangers listed on the following page are made of the same high-quality materials, differing only in size and weight.

Lugs project far enough so that body does not interfere with lag screws when installing.

Outer shell of malleable iron contains sherardized stud bolt and Dirigo Insulation, which are moulded into shell under hydraulic pressure.

Top of stud bolt is effectively insulated from inside of hanger casting by a disc of built-up mica.

Double petticoat prevents surface leakage and makes hanger particularly suitable for wet mines.

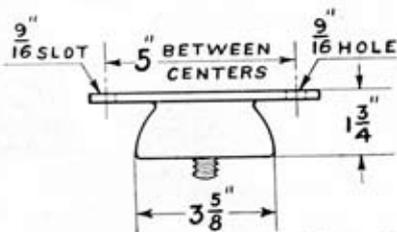
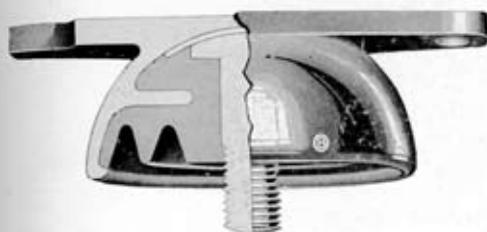
See following page for description.



TYPE H MINE HANGERS

550 Volts

Type H-1 Hanger

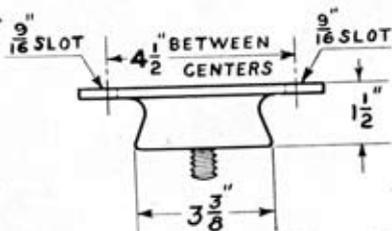


Code Word
Amplify.

No. 9959—Type H-1 Mine Hanger, Mall. Iron, Sher., 3/8-inch Stud . . . \$125 00

List per 100

Type H-2 Hanger

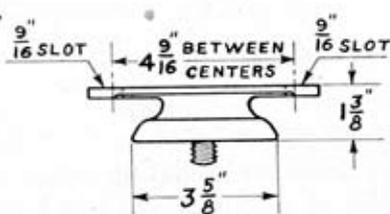


Code Word
Hauberk.

No. 10603—Type H-2 Mine Hanger, Mall. Iron, Sher., 3/8-inch Stud . . . \$110 00

List per 100

Type H-3 Hanger

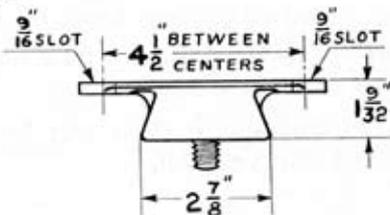


Code Word
Meander.

No. 11553—Type H-3 Mine Hanger, Mall. Iron, Sher., 3/8-inch Stud . . . \$95 00

List per 100

Type H-4 Hanger



Code Word
Quenelle.

No. 13175—Type H-4 Mine Hanger, Mall. Iron, Sher., 3/8-inch Stud . . . \$85 00

List per 100

See preceding page for description.

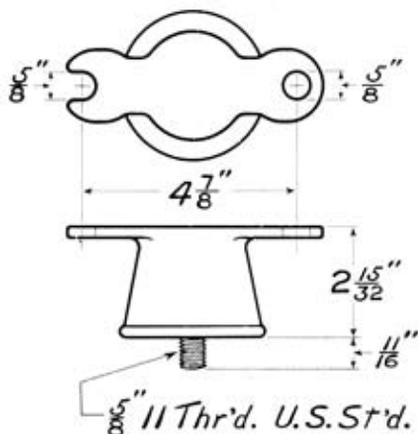


STANDARD MINE HANGER

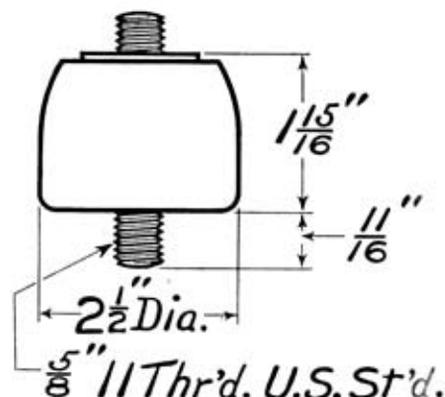
550 Volts



No. 1080



No. 1080



No. 8675

USED for insulating trolley wire in mines and attached to roof timbers by means of $\frac{1}{2}$ -inch lag screws.

Consists of a sherardized, malleable iron shell into which is screwed a Dirigo insulator with a sherardized forged stud moulded into it.

Space between insulator and interior wall of iron shell gives added leakage surface and prevents deposit of a conducting layer forming across bottom face of insulator to stud bolt.

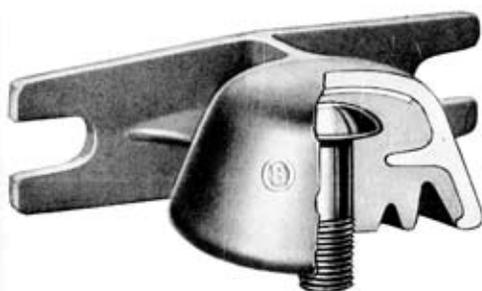
Insulated portion can be renewed, if desired, without taking down hanger shell.

Code Word
Amputate.
Penknife.

No.
1080—Mine Hanger, Malleable Iron, Sherardized, $\frac{1}{2}$ -inch Stud. . . \$135 00
8675—Dirigo Insulator, without Shell, with Upper and Lower Studs 75 00

TYPE P MINE HANGER

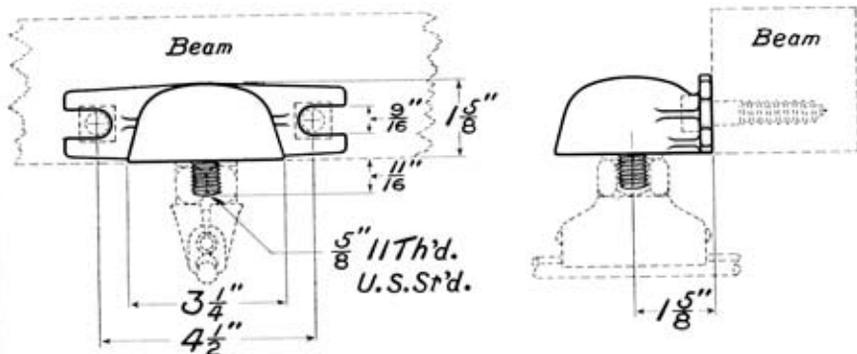
550 Volts



No. 11032



Hanger Installed



USED for insulating trolley wires in mines, and is particularly desirable in low vein mines where it is necessary to place trolley wire as close to roof as possible.

Attached to side of roof timber by means of two $\frac{1}{2}$ -inch lag screws in such a position that bottom of insulation is flush with bottom of roof timber, thus raising trolley wire from $1\frac{1}{2}$ to 2 inches higher than when ordinary type of hanger, fastened to bottom of timber, is used.

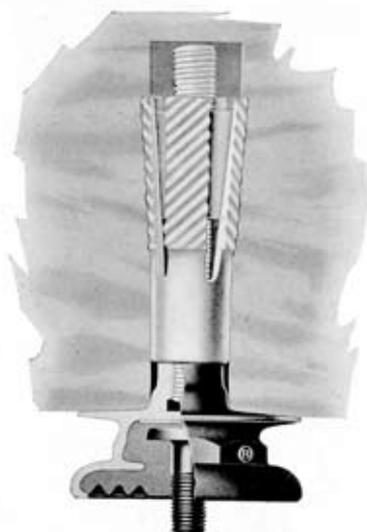
Lugs project far enough so that body does not interfere with lags in installing.

Sherardized stud bolt is moulded into shell with Dirigo Insulation and head of bolt is effectively insulated from shell by a disc of built-up mica, while lower surface of insulation is moulded into a double petticoat which prevents surface leakage in wet mines.

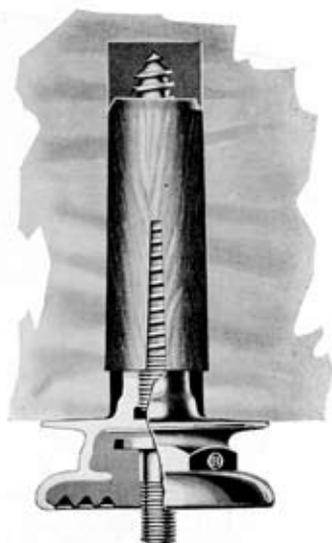


TYPE K MINE HANGERS

550 Volts



**Type K-3 Hanger
Installed with Type A Ex-
pansion Bolt**



**Type K-3 Hanger
Installed with Mine Hanger
Screw and Wood Plug**

USED for insulating trolley wires in mines and is designed for attachment direct to mine roof by means of an expansion bolt or a similar fastening.

All four Hangers listed on the opposite page are made of the same high-quality materials; they differ only in size and weight.

Mica is used to insulate top of sherardized stud bolt from malleable iron hanger casting, and lower surface of Dirigo Insulation is moulded into multiple petticoats which prevent tendency to surface leakage in wet mines.

Flanged top presents a broad bearing, a feature especially valuable on curve work.

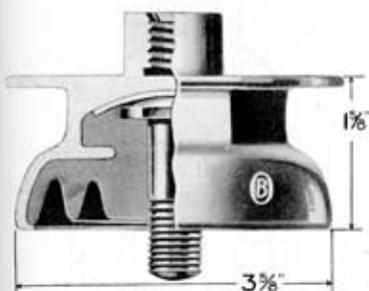
May be attached directly to mine roof by means of Type A-3 Expansion Bolt, or Mine Hanger Screw and Wood Plug.

See following page for listing.

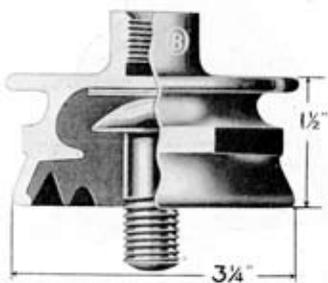


TYPE K MINE HANGERS

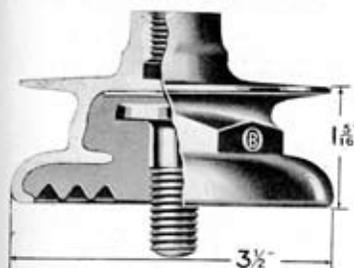
550 Volts



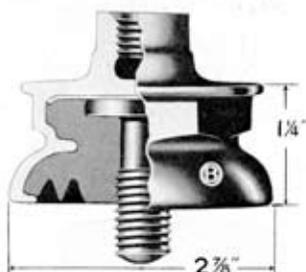
Type K-1 Hanger



Type K-2 Hanger



Type K-3 Hanger



Type K-4 Hanger

Type K-1

Code Word	No.	List per 100
<i>Ambush.</i>	9975—Type K-1 Mine Hanger, Mall. Iron, Sher., $\frac{1}{8}$ -inch Stud . . .	\$125 00
<i>Amender.</i>	9993—Hanger Wrench, Malleable Iron, Sherardized	70 00

Type K-2

<i>Haugh.</i>	10602—Type K-2 Mine Hanger, Mall. Iron, Sher., $\frac{1}{8}$ -inch Stud	110 00
<i>Hauler.</i>	10604—Hanger Wrench, Malleable Iron, Sherardized	80 00

Type K-3

<i>Mealless.</i>	11554—Type K-3 Mine Hanger, Mall. Iron, Sher., $\frac{1}{8}$ -inch Stud	95 00
<i>Meazling.</i>	11555—Hanger Wrench, Malleable Iron, Sherardized	80 00

Type K-4

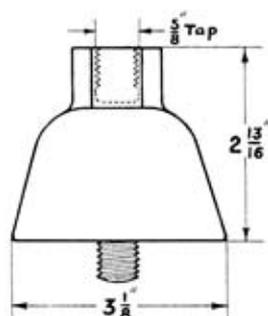
<i>Quercite.</i>	13176—Type K-4 Mine Hanger, Mall. Iron, Sher., $\frac{1}{8}$ -inch Stud	85 00
<i>Quench.</i>	13177—Hanger Wrench, Malleable Iron, Sherardized	75 00

See preceding page for description.



TYPE B MINE HANGER

550 Volts



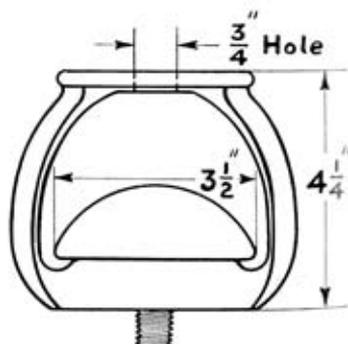
USED for insulating trolley wire in mines. Dirigo Insulation and sherardized forged stud are moulded directly into sherardized malleable iron hanger casting.

Attached directly to mine roof by Type A-2 Expansion Bolt.

Code Word	No.	List per 100
<i>Amusable.</i>	5784—Mine Hanger, Malleable Iron, Sherardized, 3/8-inch Stud.	\$114 00

TYPE G MINE HANGER

550 Volts



USED for insulating trolley wire in mines. Consists of heavy malleable iron body casting, sherardized, and Type G Insulator Cap and Cone.

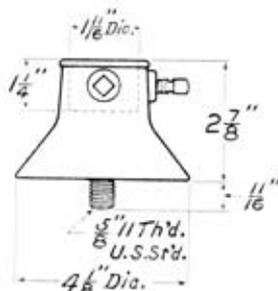
May be attached to mine roof by Type A-1 Expansion Bolt.

Code Word	No.	List per 100
<i>Analogue.</i>	5777—Mine Hanger, Mall. Iron, Sher., 3/8-inch Stud, Plain Cone.	\$209 00
<i>Analogy.</i>	5778— " " " " " " " " " " Lock " "	211 00

For listing of Caps and Cones and advantages of Lock Cones, see page 268.

TYPE U MINE HANGER

550 Volts



USED for insulating trolley wires in mines and is designed to be attached to 1 1/4-inch standard iron pipe (outside diameter, 1.66 inch) installed in the roof.

Fastened to pipe by two 3/8 x 3/4-inch steel set screws 90° apart.

All metal parts are sherardized.

A sheet of mica is used between head of stud and shell in addition to the moulded Dirigo Insulation.

Code Word
Pentail.

No. 12995—Mine Hanger, Malleable Iron, Sherardized, 3/8-inch Stud. . . \$120 00

List per 100

TYPE U PIPE ADAPTOR



USED where it is desired to install Type U Mine Hangers, listed above, on 1 1/4-inch horizontal pipe (outside diameter, 1.66 inch).

Adaptor fits over pipe and is secured in position by means of set screw. Hanger is slipped over bottom of adaptor and fastened by tightening set screws on Hanger which fit into groove in adaptor.

Code Word
Quibble.

No. 13214—Type U Adaptor, Mall. Iron, Sher., for 1 1/4-inch Pipe. \$72 00

List per 100

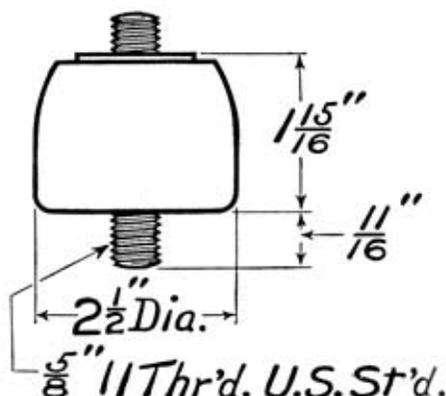


JAMME-1 MINE HANGER

550 Volts



No. 9230



No. 8675

USED for insulating trolley wires in mines and is attached directly to mine roof. Consists of a malleable iron body casting, into which is screwed a renewable Dirigo insulator. Space between insulator and shell prevents deposit of a conducting layer forming across bottom of insulator to stud.

When driven upward into a hole of proper depth in mine roof, plug strikes against bottom of hole and forces sides of shell outward, firmly wedging in position.

Height, top of ear boss to top of hanger casting	2 $\frac{1}{8}$ inches
Diameter of Hanger	3 $\frac{1}{4}$ "
Length of expansion shell from top of hanger boss	5 $\frac{1}{2}$ "
Diameter of expansion shell	1 $\frac{1}{4}$ "
Hanger tapped for standard iron pipe	$\frac{3}{4}$ "

Code Word	No.	List per 100
<i>Ambulant.</i>	9230—Mine Hanger complete, Mall. Iron, Sher., $\frac{1}{4}$ -inch Stud.	\$162 00
<i>Penknife.</i>	8675—Dirigo Insulator, without Shell, with Upper and Lower Studs	75 00
<i>Pension.</i>	12437—Slotted Shell, Malleable Iron, Sherardized	28 00
<i>Pensive.</i>	12438—Wood Plug, Japanned	4 00

Where it is desired to use a suspension longer than 5 $\frac{1}{2}$ inches we can supply to order slotted pieces of pipe cut to any desired length in place of expansion shell.



JAMME-2 MINE HANGER

550 Volts



USED for insulating trolley wires in mines and is attached directly to mine roof.

Sherardized forged stud bolt and Dirigo Insulation are moulded directly into hanger casting, and top of stud bolt is effectively insulated from hanger casting by a disc of built-up mica.

When driven upward into a hole of proper depth in mine roof, plug strikes against bottom of hole and forces sides of shell outward, firmly wedging in position.

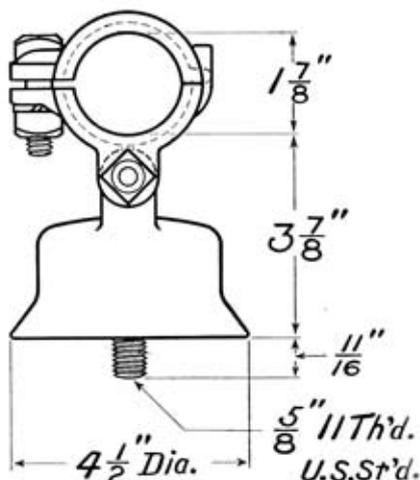
Height, top of ear boss to top of hanger casting	2 $\frac{1}{4}$ inches
Diameter of Hanger	3 $\frac{5}{8}$ "
Length of expansion shell from top of hanger boss	5 $\frac{1}{2}$ "
Diameter of expansion shell	1 $\frac{1}{4}$ "
Hanger tapped for standard iron pipe	$\frac{3}{4}$ "

Code Word	No.	List per 100
<i>Amiable.</i>	9994—Mine Hanger complete, Mall. Iron, Sher., $\frac{3}{8}$ -inch Stud . . .	\$145 00
<i>Pension.</i>	12437—Slotted Shell, Malleable Iron, Sherardized	28 00
<i>Pensive.</i>	12438—Wood Plug, Japanned	4 00

Where it is desired to use a suspension longer than 5 $\frac{1}{2}$ inches we can supply to order slotted pieces of pipe cut to any desired length in place of the expansion shell.

O-B COKE-OVEN HANGER

550 Volts—Patented



A STURDY design using high voltage porcelain for the insulating member. Intended for use over coke ovens where temperature is high and atmosphere is filled with smoke and steam.

The porcelain is well protected from blows by the malleable iron shell which covers it completely.

Has long leakage path.

Outer shell and casting holding the stud are cemented securely to the porcelain.

The stud has a limited vertical movement in opposition to a heavy spring washer. This preserves a tight joint between the hanger and ear or clamp when the latter is alined with the trolley wire.

The shell is malleable iron, sherardized.

Diameter of porcelain at bottom, $3\frac{1}{2}$ inches.



I-BEAM CLAMP



I-Beam Clamp



Showing Mine Hanger Installed with I-Beam Clamp. Illustration at Right Shows Double Insulation.

USED for attaching mine timber hangers to steel I-Beam mine timbers.

Quickly installed by hooking over edges of flange of I-Beam and tightening nut, two lugs on Clamp fitting into slots or holes in arms of hanger and holding latter firmly in place as shown in illustrations.

Either Clamp can be used with the Type H and Standard Mine Hangers.

Double insulation as shown above is recommended when Hangers are installed on steel timbers in order to prevent short circuits due to flying trolley and to give additional leakage surface, particularly in wet mines. Secondary insulation is Type B Mine Hanger shown on page 292, or No. 8675, listed on page 294.

Made of malleable iron, sherardized.

Code Word	No.	List per 100
<i>Junket.</i>	11236—Clamp for 5 to 8-inch I-Beams, having 3 to 4½-inch Flange.....	\$53 00
<i>Infusion.</i>	10980—Clamp for 8 to 12-inch I-Beams, having 4 to 5¼-inch Flange.....	77 00



PIPE ADAPTORS



No. 12810



No. 12809



No. 11848



No. 12811

THESE adaptors are used for attaching mine hangers to horizontal or vertical pipes.

No. 12810—Vertical Adaptor will fit $1\frac{1}{4}$ -inch standard pipe (outside diameter, 1.66 inch). Is fastened securely to pipe by two set screws spaced 120 degrees apart.

No. 12809—Threaded Vertical Adaptor will fit $\frac{3}{4}$ -inch pipe (outside diameter 1.05 inch), threaded with standard pipe threads.

No. 11848—Combination Adaptor will fit a $1\frac{1}{4}$ -inch standard pipe fastened vertically into the roof or a $1\frac{1}{2}$ -inch standard pipe suspended horizontally from a side wall or used as a bracket arm in outside construction. Is fastened to pipe by tightening nuts on the two bolts which hold the castings together. Provided with a $\frac{5}{8}$ -inch stud for attaching hanger.

No. 12811—Horizontal Adaptor will fit $1\frac{1}{2}$ -inch standard pipe (outside diameter 1.9 inch). Tightening one set screw fastens Adaptor securely on pipe.

Code Word	No.	List per 100
<i>Penury.</i>	12810—Vertical Adaptor, Malleable Iron, Sherardized, $\frac{3}{8}$ -inch Stud.	\$72 00
<i>Penwoman.</i>	12809—Threaded " " " "	22 00
<i>Meconate.</i>	11848—Combination " " " "	85 00
<i>Penult.</i>	12811—Horizontal " " " "	72 00



TYPE A EXPANSION BOLTS



Type A-1 Bolt—For use with Type G Hanger



Type A-2 Bolt—For use with Type B Hanger



Type A-3 Bolt—For use with Type K, SK and Universal Hangers

USED for attaching mine hangers direct to mine roof. Malleable iron shell is $1\frac{1}{4}$ inches in diameter.

Type A-1 Bolt—For Type G Hanger

Code Word	No.	List per 100
Anarch.	5773—Type A-1 Bolt, Sherardized, length of Shell 4 inches, $\frac{3}{8}$ -inch Stud.	\$48 00
Anatine.	5774— " A-1 " " " " " " 6 " " " " " " " " " " " "	61 00

Type A-2 Bolt—For Type B Hanger

Anatomy.	5775—Type A-2 Bolt, Sherardized, length of Shell 4 inches, $\frac{3}{8}$ -inch Stud.	62 50
Ancestor.	5776— " A-2 " " " " " " " 6 " " " " " " " " " " " "	75 00

Type A-3 Bolt—For Type K, SK and Universal Hangers

Aneroid.	10072—Type A-3 Bolt, Sherardized, length of Shell 4 inches, $\frac{3}{8}$ -inch Stud.	42 00
Ancient.	10073— " A-3 " " " " " " " 6 " " " " " " " " " " " "	55 00

Parts for A-1, A-2 and A-3 Bolts

Peonage.	12440—Slotted Shell only, 4 inches long, Sherardized.	20 00
People.	12442— " " " 6 " " " " " " " " " " " " " " " " " "	27 00
Pepper.	12439—Bolt only, for 4-inch Shell, Sherardized.	15 00
Pepsin.	12441— " " " 6 " " " " " " " " " " " " " " " " " "	18 00
Peptogen.	12443—Expansion Plug only, Sherardized.	9 50

MINE HANGER SCREW AND WOOD PLUG



Nos. 13003-8770-13005



Nos. 13004-8771-13006

THIS combination affords a convenient and economical means for attaching Type K, SK, Universal and similar hangers directly to mine roof.

A hole is drilled in roof of such a size that wood plug will make a driving fit. Hanger screw is then attached to mine hanger and is screwed into wood plug by means of a wrench, thereby expanding the wood plug.

When hanger is to be attached to roof timbers, mine hanger screw only is necessary.

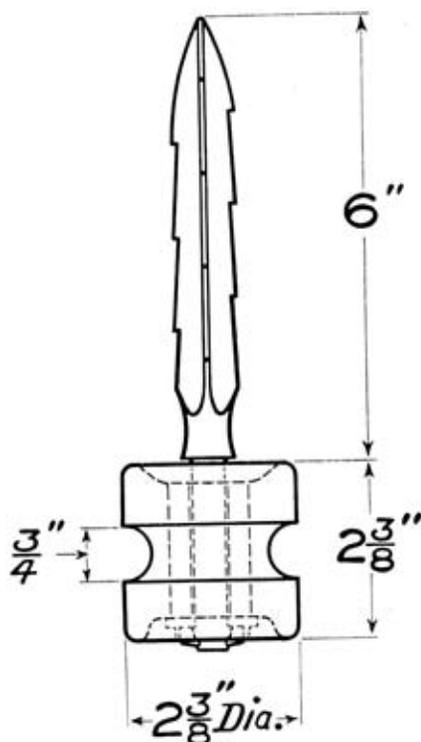
Code Word	No.	List per 100
<i>Pequots.</i>	13003—Wood Plug, Japanned, 1½x3 inches.....	\$6 00
<i>Peracute.</i>	13004—Lag Screw Support, Sherardized, ½x4 inches.....	15 00
<i>Animate.</i>	8770—Wood Plug, Japanned, 1½x4 inches.....	8 00
<i>Annoint.</i>	8771—Lag Screw Support, Sherardized, ½x5 inches.....	18 00
<i>Perceive.</i>	13005—Wood Plug, Japanned, 1½x5 inches.....	8 50
<i>Percher.</i>	13006—Lag Screw Support, Sherardized, ½x6 inches.....	19 00

SECURITY MINE FEEDER WIRE INSULATOR

Form 1



No. 3207



No. 3209



No. 3210

INTENDED for supporting and insulating feeder wires in mines and consists of three parts, viz.: porcelain Insulator, malleable iron Pin and Locking Washer.

One end of Pin is pointed, fluted and barbed to make it easy to drive into wall or roof of mine, and to secure a firm anchorage when in place. Opposite end is formed to facilitate placing Insulator on easily and quickly and then securely holding it there.

Grooves are provided through Insulator to drain off any moisture which may accumulate and run down Pin.

Code Word	No.	List per 100
<i>Browse.</i>	3207—Insulator complete.....	\$26 00
<i>Bruise.</i>	3208—Porcelain Insulator only.....	9 00
<i>Brussels.</i>	3209—Malleable Iron Pin, plain finish.....	17 00
<i>Brutal.</i>	3210— " " Washer, plain finish.....	1 80

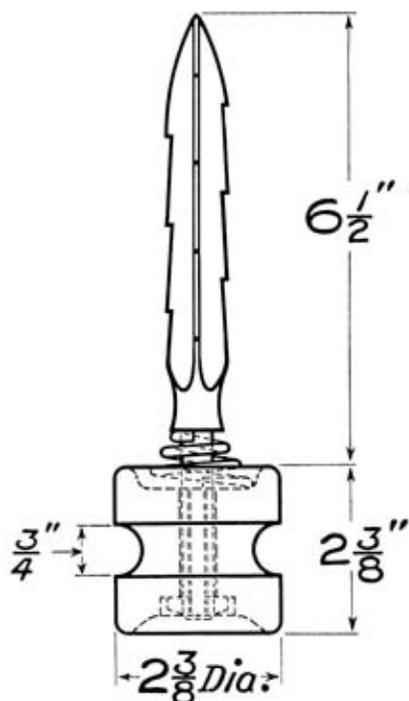


SECURITY MINE FEEDER WIRE INSULATOR

Form 2



No. 8737

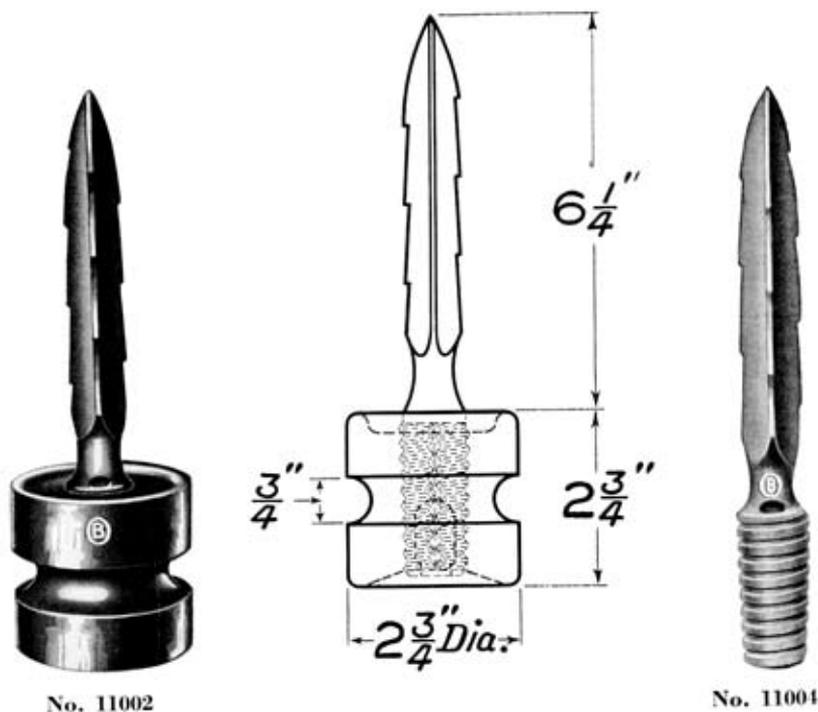


SIMILAR to the Form 1, but provided with a spring, which should be used when Insulator is installed in a horizontal position. It is not necessary to use the spring when Insulator is placed in roof of mine or in a vertical position, as insulator spool would then be in a position to lock itself upon pin.

Code Word	No.	List per 100
Bubble.	8737—Insulator complete with Sherardized Spring.....	\$27 00
Buckram.	8738— " " without Spring.....	24 00
Budding.	8739—Porcelain Insulator only.....	9 00
Buffet.	8740—Spring only, Sherardized.....	3 00
Brussels.	3209—Malleable Iron Pin only, plain finish.....	17 00

SECURITY MINE FEEDER WIRE INSULATOR

Form 3



USED for supporting and insulating feeder wires in mines and is similar to the Forms 1 and 2, except that barbed pin is threaded at lower end and screws into porcelain spool.

Installation is simple, it being only necessary to drive barbed pin into roof or wall and then screw spool onto pin.

Porcelain insulator is recessed on top and lower part of pin is hollow for draining off moisture which runs down from mine roof and preventing it from collecting on feeder wire.

Spool and pin have standard 1-inch insulator threads.

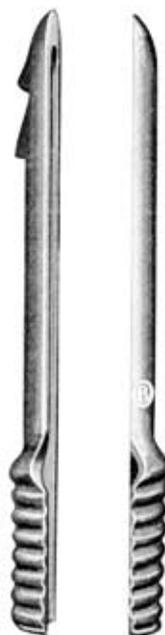
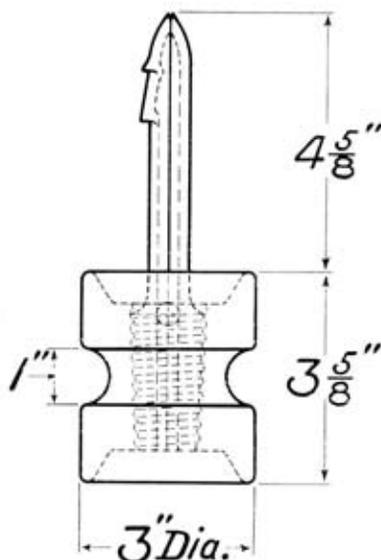
Code Word	No.	List per 100
<i>Inoculate.</i>	11002—Insulator complete.....	\$33 50
<i>Inoculator.</i>	11003—Porcelain Insulator only.....	12 00
<i>Inodiate.</i>	11004—Malleable Iron Pin, plain finish.....	21 50



STANDARD MINE FEEDER WIRE INSULATOR



No. 10630



No. 10632

USED for supporting and insulating feeder wire in mines and consists of a porcelain spool and a malleable iron pin made in two parts. One half of the pin is barbed and the other half is plain. In installing, the barbed half is first inserted in a hole in the mine roof, which should be drilled slightly smaller than the diameter of the pin, and the plain half of the pin is then driven into the hole, forcing the barbs into the side of the hole and securing the pin firmly in place.

The porcelain insulator is recessed on the top and the pin is hollow in the center and has an opening for draining off moisture which runs down from the roof of the mine, thus preventing it from collecting on the feeder wire.

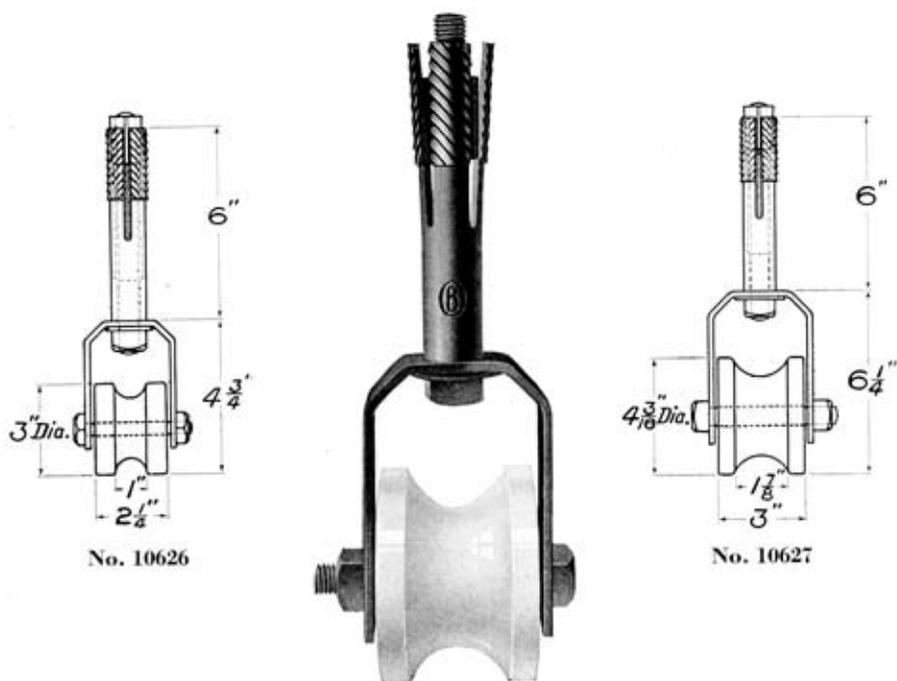
Spool and pin have standard 1-inch insulator threads.

Code Word	No.	List per 100
<i>Heretic.</i>	10630—Insulator complete.....	\$44 00
<i>Herodian.</i>	10631—Porcelain Insulator only.....	16 00
<i>Heroic.</i>	10632—Malleable Iron Pin, plain finish.....	28 00



TYPE C MINE FEEDER WIRE INSULATOR

For Heavy Cable



USED for supporting and insulating large feeder cables in mines where the cable is to be suspended from the mine roof. It is made in two sizes, one for 300,000 C. M. and smaller, weatherproof cable, and the other for 1,000,000 C. M. and smaller.

It consists of a porcelain spool insulator, a clevis made from heavy bar iron and an Expansion Bolt, No. 5774, by means of which the insulator may be attached directly to the mine roof.

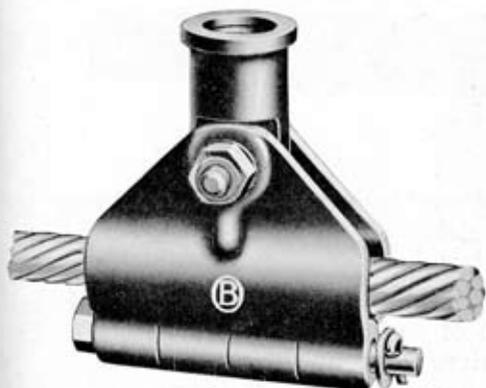
No. 10626 is equipped with porcelain spool No. 2545 listed on page 230; No. 10627 with spool No. 13681, page 230.

Code Word	No.	List per 100
<i>Heroine.</i>	10626—Insulator for 300,000 C. M. weatherproof cable and smaller	\$97 50
<i>Heroism.</i>	10627— " " 1,000,000 " " " " " "	140 00

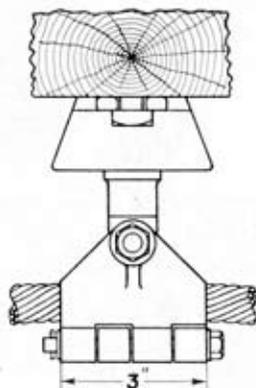
For separate listing of spools, see page 230.



FEEDER WIRE SLING



Nos. 13210-13213



Installed on Mine
Roof Timber

USED in mines or on railways for suspending feeder cable from insulated hanger.

Consists of two clamp castings hinged at the bottom and attached to a boss casting at the top by a bolt which also serves to tighten the clamp on the cable.

After being installed on hanger, sling can be opened up easily for insertion or removal of cable.

Made of malleable iron, sherardized.

Boss is tapped for $\frac{5}{8}$ -inch stud.

No. 13210 has $\frac{3}{8}$ -inch opening in sling.

No. 13211 has $\frac{1}{2}$ -inch opening in sling.

No. 13212 has $1\frac{1}{8}$ -inch opening in sling.

No. 13213 has $1\frac{1}{4}$ -inch opening in sling.

Code Word	No.	List per 100
<i>Quiescent.</i>	13210—Sling for 4-0 to 250,000 C. M. Bare Cable.....	\$70 00
<i>Quilter.</i>	13211— " " 300,000 to 500,000 C. M. Bare Cable.....	73 00
<i>Quilting.</i>	13212— " " 550,000 to 800,000 " " "	76 00
<i>Quinine.</i>	13213— " " 850,000 to 1,000,000 " " "	80 00



CUTTING MACHINE CONNECTOR



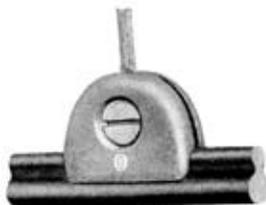
USED for connecting cutting machines and other apparatus to the trolley wire. May be quickly put in place by slipping over the wire, either from above or below.

The machine cable is soldered into the connector, the brass sleeve fitting over the insulation of the cable and preventing sharp bending at the point where it enters the connector.

Jaws and springs are made of phosphor bronze. Will fit any size of trolley wire. Shank regularly drilled $\frac{5}{16}$ inch for No. 4 stranded cable. Length overall, $7\frac{1}{2}$ inches.

Code Word	No.	List per 100
<i>Moveless.</i>	11433—Connector for 0 to 4-0 Round, Fig. 8 and Grooved Trolley Wires.....	\$142 00

CURRENT TAP



No. 11160



No. 13684

USED for attaching lighting or other small-current circuits to the trolley wire in mines. Will fit any ordinary lighting circuit wire and 2-0, 3-0 and 4-0 grooved and Fig. 8 trolley wires. Castings offer no obstruction to the trolley wheel.

No. 11160 is composed of two iron castings which grip both wires when screw is tightened.

No. 13684 is bronze. Lighting wire is gripped by a set screw.

Code Word	No.	List per 100
<i>Lingence.</i>	11160—Current Tap, Malleable Iron, Sherardized.....	\$20 00
<i>Sailing.</i>	13684— " " Bronze.....	35 00



CUTTING MACHINE CONNECTOR



DESIGNED for connecting welding or cutting machine to mine trolley. The connector has a steel spring which holds the copper lips tight against the wire.

A soft rubber handle with fibre hand shield is provided, affording good protection from electrical shock when tapping trolley.

The handle is recessed and threaded, permitting the cable to be soldered into a socket terminal which screws into the handle.

Length over all, 12 inches. Width contact spring, 1 inch.

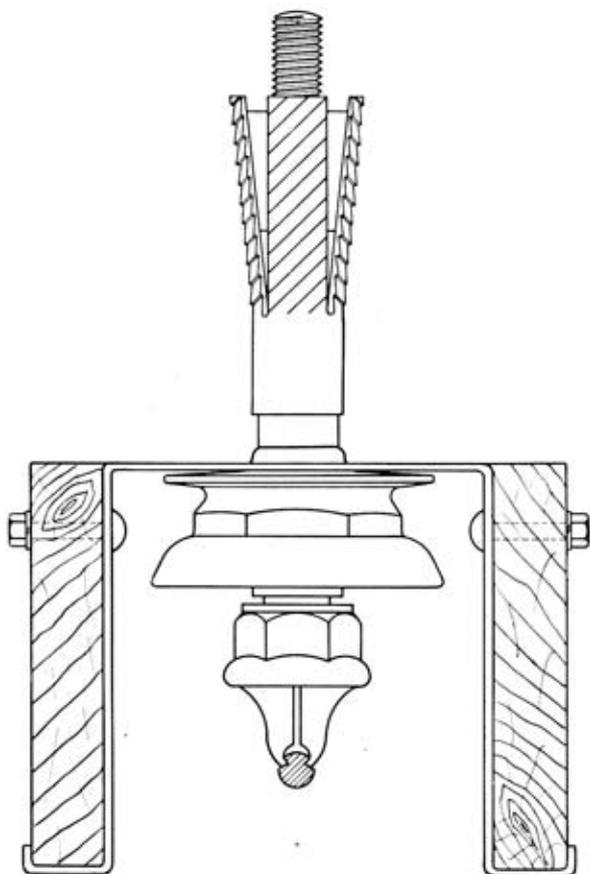
Code Word No.

List per 100

Sirloin. 13965—Cutting Machine Connector with handle \$320.00



TROLLEY GUARD BOARD CONSTRUCTION



STATE mining laws, generally, call for a guard to project below the level of the trolley wire and prevent accidental contact of men or of mules with the live wire.

A suggested construction is shown here. The strap iron support can easily be formed of about $3 \times \frac{1}{8}$ -inch stock. A hole is punched to allow the boss of the hanger to go through. When the entry way is timbered the support can be lagged directly to the wood.

The guard board should extend at least one-half inch below the wire to shield the trolley even at the center of the span where the sag is greatest.



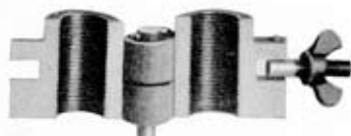
SELF-FEEDING MINE DRILL



Drill, Nos. 8218-10693



Feed Shaft Gear No. 8736



Split Feed Nut, Nos. 8733-10694



Upper Gear Case
No. 12583



Lower Gear Case
No. 12582



Gear Case Rivet, No. 12798

Handle Gear No. 8734
With Bushing No. 12584



Foot Casting No. 13685



Auger Bits, Nos. 8219-8224

See following page for description and listing.



SELF-FEEDING MINE DRILL—Continued

DESIGNED especially for drilling holes in mine roofs and walls, for installing hangers, as well as for blasting purposes, etc.

Can be anchored at lower end either against ground or a projecting ledge in wall, or both, as desired, by properly adjusting movable brace on pipe standard.

Auger is operated by a crank which feeds the Drill automatically.

Drill can be quickly set up or removed by loosening clamping piece bearing against feed screw, allowing screw to drop back in pipe standard.

Perfect lubrication can be assured by keeping pipe standard filled with oil. Leather washer prevents dirt from falling into gears.

Form 1 Drill is recommended in all cases except where roof or wall is hard, when Form 2 Drill, with slower feed, should be used.

Drills differ only in Split Bronze Feed Nut and Threaded Feed Shaft, threaded 14 threads per inch in Form 1 and 18 threads per inch in Form 2. Drill may be converted from fast feed to slow feed or vice versa by simply changing these two parts.

Minimum height from bottom of pipe standard to top of drill chuck is 51½ inches; maximum height is 86¾ inches.

Hole in chuck is $\frac{9}{16} \times 1\frac{7}{16}$ inches and 2½ inches deep.

Code Word	No.	List Each
<i>Annuary.</i>	8218—Self-Feeding Mine Drill, Form 1 (Fast Feed).....	\$36 00
<i>Haunch.</i>	10693—“ “ “ “ “ 2 (Slow Feed).....	36 00
<i>Antedate.</i>	8733—Split Bronze Feed Nut for Form 1 Drill, 14 threads per inch..	6 00
<i>Haunched.</i>	10694—“ “ “ “ “ 2 “ 18 “ “ “ ..	6 00
<i>Anthem.</i>	8735—Threaded Feed Shaft, for Form 1 Drill, Catalog No. 8218...	8 75
<i>Havnt.</i>	10695—“ “ “ “ “ 2 “ “ “ “ 10693...	8 75
<i>Antelope.</i>	8734—Handle Gear, Steel, 18 Teeth with Bushing, for Forms 1 and 2 Drills.....	4 50
<i>Perclose.</i>	12584—Handle Gear Bushing, Bronze, for Forms 1 and 2 Drills.....	1 20
<i>Antic.</i>	8736—Feed Shaft Gear, Steel, 28 Teeth, for Forms 1 and 2 Drills....	4 90
<i>Perempt.</i>	12582—Lower Gear Case, Mall. Iron, for Forms 1 and 2 Drills.....	4 60
<i>Perfidy.</i>	12583—Upper “ “ “ “ “ “ “ 1 “ 2 “	4 20
<i>Perflate.</i>	12798—Gear Case Rivet, $\frac{1}{4} \times 1\frac{1}{2}$ inch, (3 required), for Forms 1 and 2 Drills.....	01
<i>Sailor.</i>	13685—Foot Casting, Mall. Iron., Japanned, with Bolt, for Forms 1 and 2 Drills.....	1 60
<i>Infusive.</i>	11015—Bit Chuck, Malleable Iron, for Form 1 Drill.....	1 60
<i>Ingate.</i>	11016—“ “ “ “ “ “ “ 2 “	1 60
<i>Antimony.</i>	8219—Auger Bits, 1½ inches in diameter, 12 inches long.....	3 10
<i>Antique.</i>	8220—“ “ 1½ “ “ “ “ 12 “ “	3 25
<i>Antler.</i>	8221—“ “ 1½ “ “ “ “ 24 “ “	5 00
<i>Apace.</i>	8222—“ “ 1½ “ “ “ “ 24 “ “	5 40
<i>Apathy.</i>	8223—“ “ 1½ “ “ “ “ 36 “ “	6 85
<i>Apical.</i>	8224—“ “ 1½ “ “ “ “ 36 “ “	7 35

See preceding page for illustration of drill and parts.



O-B MINE TROLLEY WHEEL



THIS Wheel is especially designed for use on mine locomotives, and is well proportioned with a heavy section of metal at the bottom of the groove where the wear is heaviest and has heavy flanges which resist bending.

It is made of a special high grade alloy that will give maximum service.

Wheel is furnished with a bushing which is made of a special bearing metal with graphite inserted in grooves on the inside, and in addition, is provided with a reservoir, which is filled before shipment with a specially selected lubricant.

Bushing is $\frac{7}{8}$ -inch outside diameter, $\frac{1}{2}$ -inch bore and $1\frac{1}{2}$ inches long.

The O-B Wheel is used with the Mine Harp listed on the following page but can be used with any standard mine harp. Width of flange is $1\frac{1}{2}$ inches, hub $1\frac{1}{2}$ inches, bore $\frac{1}{2}$ inch.

Code Word	No.	List Each
<i>Intervital.</i>	11017—4-inch Wheel for $\frac{1}{2}$ -inch Axle.....	\$3 20
<i>Huronian.</i>	10819—Graphite Bushing, $\frac{7}{8}$ x $1\frac{1}{2}$ x $\frac{1}{2}$ inch.....	35

The above Wheel is designated by its nominal diameter; the actual diameter is $4\frac{1}{4}$ inches.



O-B MINE TROLLEY HARP

Patented



USED with mine locomotives and possesses several features very desirable in that service.

Harp casting is connected to pole end casting by a pivot, permitting harp to swing through a wide angle. Pivot is set forward of wheel axle so that a trailing action is imparted to the Harp, causing it to readily follow irregularities in trolley wire.

Rib on pole end casting prevents Harp from catching on overhead I-beams or roof timbers.

Can be used with any standard 4-inch wheel having a $\frac{1}{2}$ x $1\frac{1}{2}$ -inch bushing.

Fits 2-inch diameter wooden pole tapered to $1\frac{1}{8}$ inch.

Feeder lug will take 4-0 stranded or smaller wires and in addition is provided with a separable brass terminal which may be soldered to a 4-0 stranded cable.

Harp complete, as listed below, includes contact springs and washers, axle and cotter pins while Harp castings only, include simply the contact springs.

Code Word	No.	List Each
<i>Lawful.</i>	11161—Harp, complete, Malleable Iron, Japanned.....	\$5 40
<i>Lawless.</i>	11162— " " " Bronze, with Malleable Iron Pole Casting..	8 75
<i>Lawmaker.</i>	11163—Harp Casting only, Malleable Iron, Japanned.....	2 10
<i>Leafcup.</i>	11164— " " " Bronze.....	5 75
<i>Leafless.</i>	11165—Phosphor Bronze Contact Spring.....	20
<i>Leamer.</i>	11166—Copper Contact Washer.....	05
<i>Leanness.</i>	11167—Axle, $\frac{1}{2}$ -inch Diam., Case Hardened, with Cotter Pins.....	20
<i>Leaping.</i>	11168—Pole Casting, Malleable Iron, Japanned.....	2 90
<i>Perfume.</i>	12959—Pivot Bolt, complete with Eye, Rivet, Copper Washer and Phosphor Bronze Spring.....	35

**MANSFIELD TROLLEY CLAMP**

Patent Applied For



IS tightened onto hanger stud and trolley wire in one operation and always makes a tight joint with hanger when aligned with wire.

Has great holding power.

Jaws are hinged in such a way that tightening the nut forces them apart at the top and causes them to grip the wire.

Jaws are narrow, giving good clearance for trolley wheels.

Height overall, 2 $\frac{1}{4}$ inches; length, 3 inches.

Made of malleable iron, sherardized.

Code Word	No.	List per 100
<i>Recanter.</i>	13507—Clamp, $\frac{1}{2}$ -inch Boss, for 0 and 2-0 Round Wire.....	\$66 00
<i>Recaption.</i>	13508— “ $\frac{3}{8}$ “ “ “ 3-0 “ 4-0 “ “	66 00
<i>Recaptor.</i>	13509— “ $\frac{3}{8}$ “ “ “ 0 to 4-0 Fig. 8 and Grooved Wires.	66 00
<i>Reducing.</i>	13523—Wrench, Malleable Iron, Sherardized.....	50 00



PREMIER CLAMP

Patented



IS screwed on to the hanger and backed off until clamp aligns with the wire. The only necessary operations in installing this clamp are; insert the wire in the jaws of the clamp, then tighten the nut making a positive grip.

All parts are malleable iron sherardized.

Height overall $2\frac{1}{2}$ inches; length of jaws 3 inches.

Code Word No.

List Per 100

Sinner. 13956—Premier Clamp $\frac{1}{8}$ in. Boss for 1-0 to 4-0 Grooved and Fig. 8 Wires.. \$52.00

O-B WEDGE CLAMP

Patented



DESIGNED for use where a clamp of the wedge type is preferred. This clamp is of the self-aligning type. When on the line it grips the wire the entire length of its jaws.

All parts are malleable iron sherardized.

Height overall $2\frac{1}{2}$ inches; length of jaws $4\frac{1}{4}$ inches.

Code Word No.

List Per 100

Siren. 13940—O-B Wedge Clamp $\frac{1}{8}$ inch Boss for 1-0 to 4-0 Grooved and Fig. 8

Wires..... \$66.00



BULLDOG TROLLEY CLAMP

Patented



CONSISTS of two substantial jaws with their upper portions interlocking and held together by a high strength steel rivet, upon which the jaws have a hinge action, clamping upon the wire by means of a yoke casting which is forced down upon them by a hex nut threaded on outside of boss.

Height overall, 2½ inches; length of jaws, 3 inches.

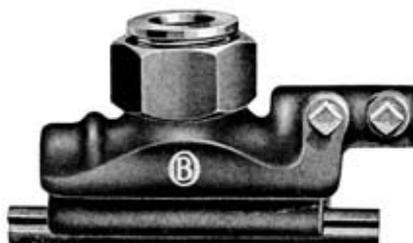
Code Word	No.	List per 100
<i>Arduous.</i>	10344—Clamp, Malleable Iron, Sherardized, Bronze Jaws, ½-inch Boss, for 0 and 2-0 Round Wire.....	\$82 00
<i>Argosy.</i>	10345—Clamp, Malleable Iron, Sherardized, Bronze Jaws, ½-inch Boss, for 3-0 and 4-0 Round Wire.....	84 00
<i>Arcades.</i>	10340—Clamp, Malleable Iron, Sherardized, ½-inch Boss, for 0 to 4-0 Fig. 8 and Grooved Wire.....	62 50

00

For Wrench listing, see page 317.

BULLDOG FEEDER CLAMP

Patented



DUPLICATE of clamp listed above with addition of a feeder lug for No. 2-0 to 4-0 B. & S. solid or stranded feeder wire.

Code Word	No.	List per 100
<i>Aridity.</i>	10347—Feeder Clamp, Bronze, ½-inch Boss, for 0 and 2-0 Round Wire.....	\$132 00
<i>Armament.</i>	10348—Feeder Clamp, Bronze, ½-inch Boss, for 3-0 and 4-0 Round Wire.....	132 00
<i>Arguer.</i>	10346—Feeder Clamp, Bronze, ½-inch Boss, for 0 to 4-0 Fig. 8 and Grooved Wires.....	132 00

For Wrench listing, see page 317.

**MODOC TROLLEY CLAMP**

Form 1—Patented



ALWAYS fits tightly against hanger when aligned with wire. To install, screw onto hanger stud until boss (A) is in contact with trolley hanger. Then back off to align with wire, insert wire and tighten nut (C). Sleeve (B) then fits tightly against bearing surface of hanger.

Jaws are very narrow, providing good clearance for trolley wheel. All parts malleable iron, sherardized.

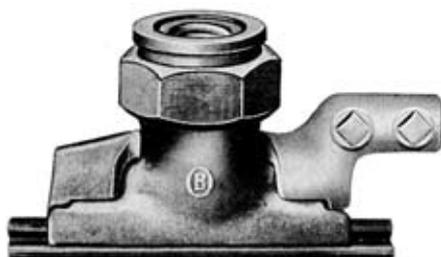
Height overall, $2\frac{1}{4}$ inches; length of jaws, $3\frac{1}{2}$ inches.

Code Word	No.		List per 100
<i>Ingeny.</i>	10875	—Clamp, Form 1, $\frac{1}{2}$ -inch Boss, for 0 and 2-0 Round Wire.....	\$66 00
<i>Ingraft.</i>	10876	— “ “ 1, “ “ “ 3-0 and 4-0 Round Wire....	66 00
<i>Ingress.</i>	10877	— “ “ 1, “ “ “ 0 to 4-0 Fig. 8 Wire.....	66 00
<i>Hautcin.</i>	10760	— “ “ 1, “ “ “ 0 to 4-0 Grooved Wire....	66 00

For Wrench listing, see page 317.

MODOC FEEDER CLAMP

Form 1—Patented



SAME as Clamp listed above with addition of feeder lug for 2-0 to 4-0 B. & S. solid or stranded wire.

Jaw castings are bronze; other parts malleable iron, sherardized.

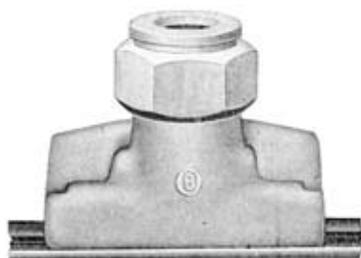
Code Word	No.		List per 100
<i>Inherit.</i>	11018	—Feeder Clamp, $\frac{1}{2}$ -inch Boss, for 0 to 4-0 Fig. 8 Wire.....	\$111 00
<i>Inhesion.</i>	11019	— “ “ “ “ “ 0 to 4-0 Grooved Wire.....	111 00

For Wrench listing, see page 317.



MODOC TROLLEY CLAMP

Form 2—Patented



SIMILAR to Form 1 Clamp listed on the preceding page, except that Form 2 Clamp is without aligning feature and is, therefore, best adapted for use with hangers that are attached to the mine roof by means of expansion bolts, etc.

Jaws are very narrow, providing good clearance for all trolley wheels. All parts malleable iron, sherardized.

Height overall, 2 $\frac{1}{4}$ inches; length of jaws, 3 $\frac{1}{2}$ inches.

Code Word	No.		List per 100
<i>Inhabite.</i>	10967	Clamp, Form 2, $\frac{3}{8}$ -inch Boss, for 0 and 2-0 Round Wire.....	\$52 00
<i>Inhabit.</i>	10968	" " " " " " 3-0 and 4-0 Round Wire....	52 00
<i>Inhalent.</i>	10966	" " " " " " 0 to 4-0 Fig. 8 Wire.....	52 00
<i>Inhaler.</i>	10965	" " " " " " 0 to 4-0 Grooved Wire.....	52 00

WRENCH FOR MINE CLAMPS



USED for installing I-Beam Clamps, and Modoc or Bulldog Trolley Clamps. Made of malleable iron, sherardized.

Code Word	No.	List per 100
<i>Hausen.</i>	10616	Wrench, Malleable Iron, Sherardized.....\$50 00



TYPE M-W TROLLEY CLAMP



TWO interlocking jaws are hinged on a steel pin which passes through lower end of stud bolt. Special nut is cone-shaped on one end to correspond to a recess on top of Clamp, and hexagonal on other end so that the Type D Wrench may be used on it.

Stud bolt in Clamp has a left-hand thread, while thread on hexagonal end of nut is right-hand, thus allowing Clamp to be either loosened or tightened on wire by simply turning nut in proper direction.

It may be used with any hanger having a $\frac{5}{8}$ -inch stud. Height overall is $2\frac{3}{4}$ inches and the length of jaws is $4\frac{3}{8}$ inches.

Code Word	No.	List per 100
<i>Apposer.</i>	10422—Clamp, Bronze, for 0 and 2-0 Round Wire.....	\$114 00
<i>Apprizer.</i>	10423— " " 3-0 " 4-0 " "	122 00
<i>Apricot.</i>	10424— " " 0, 2-0, 3-0 and 4-0 Fig. 8 Wire.....	122 00
<i>Aproned.</i>	10425— " " 2-0, 3-0 and 4-0 Grooved Wire.....	122 00
<i>Aplate.</i>	10426— " Mall. Iron, Sher., for 0, 2-0, 3-0 and 4-0 Fig. 8 Wire.	62 50
<i>Aptness.</i>	10427— " " " 2-0, 3-0 and 4-0 Grooved Wire...	62 50

TYPE M-W FEEDER CLAMP



DUPLICATE of clamp listed above with addition of a feeder lug for No. 2-0 to 4-0 B. & S. solid or stranded wire.

Code Word	No.	List per 100
<i>Aquarium.</i>	10428—Feeder Clamp, Bronze, 0 and 2-0 Round Wire.....	\$135 00
<i>Aqueduct.</i>	10429— " " " 3-0 " 4-0 " "	145 00
<i>Arbiter.</i>	10430— " " " 0, 2-0, 3-0 and 4-0 Fig. 8 Wire.	140 00
<i>Arborist.</i>	10431— " " " 2-0, 3-0 and 4-0 Grooved Wire...	140 00

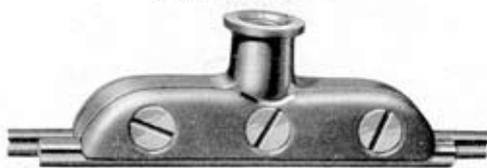


DOUBLE DETROIT TROLLEY CLAMP

Forms 1 and 2



No. 13787



No. 13787



No. 13788

DESIGNED to carry two parallel wires. Forms 1 and 2 are similar except that in Form 1 the clamp castings are secured to their body casting by means of flat head machine screws, while in Form 2 the parts are secured together by through-bolts.

Length, 5 inches; height, $1\frac{1}{8}$ inches.

Form 1—With Screws

Code Word No. *Scream.* 13787—Clamp, Bronze, $\frac{1}{2}$ -in. Boss, for 2-0, 3-0 and 4-0 Grooved Wire. List per 100 \$175 00

Form 2—With Through-Bolts

Scribble. 13788—Clamp, Bronze, $\frac{1}{2}$ -in. Boss, for 2-0, 3-0 and 4-0 Grooved Wire. 185 00

DETROIT TROLLEY CLAMPS

Forms 1 and 2



WILL meet ordinary requirements for straight line suspension, but the several styles shown on the succeeding pages are recommended where longer and heavier clamps are desired.

Clamp is $1\frac{1}{8}$ inches high.

Form 1—For $\frac{3}{8}$ -inch Stud Bolt—Length 4 Inches

Code Word	No.	List per 100
<i>Recital.</i>	13407—Clamp, Bronze, for No. 6 to No. 1 Ine. Round Wire.....	\$80 00
<i>Armory.</i>	8912— " " " 0 Round Wire.....	80 00
<i>Arnica.</i>	8913— " " " 2-0 " ".....	80 00
<i>Arrear.</i>	8917— " Mall. Iron, Sher., for 0 and 2-0 Fig. 8 Wire.....	46 00
<i>Artery.</i>	8920— " " " " 3-0 " 4-0 " 8 ".....	46 00

Form 2—For $\frac{3}{8}$ -inch Stud Bolt—Length 5 Inches

Inhiation. 10969—Clamp, Mall. Iron, Sher., for 2-0, 3-0 and 4-0 Grooved Wire. 50 00



DETROIT TROLLEY CLAMPS

Form 3



INTENDED for use where the weight or strain is greater than Forms 1 and 2 Clamps will safely carry and is recommended only for straight line suspension or for very moderate curve construction.

Length of jaws, $7\frac{1}{4}$ inches; height overall, $1\frac{7}{8}$ inches.

For $\frac{5}{8}$ -inch Stud Bolt

Code Word	No.	List per 100
<i>Inhibit.</i>	10970—Clamp, Mall. Iron, Sher., for 2-0, 3-0 and 4-0 Fig. 8 Wire	\$ 58 00
<i>Inhibition.</i>	10971— " Bronze, for 2-0, 3-0 and 4-0 Grooved Wire	120 00
<i>Inhibitor.</i>	10972— " Mall. Iron, Sher., for 2-0, 3-0 and 4-0 Grooved Wire	58 00

Any of above can be furnished for $\frac{3}{4}$ -inch Stud Bolt.

Form 6

Conforms to A. E. R. A. Specifications



DIFFERS from Form 3 Clamp listed above in that it has wide boss $1\frac{1}{2}$ inches in diameter.

Length of jaws, $7\frac{1}{4}$ inches; height overall, $1\frac{7}{8}$ inches.

Code Word	No.	List per 100
<i>Medalist.</i>	11528—Clamp, Malleable Iron, Sherardized, $\frac{1}{2}$ -inch Boss, for 2-0, 3-0 and 4-0 Grooved Wire	\$ 58 00
<i>Medallic.</i>	11529—Clamp, Bronze, $\frac{3}{4}$ -inch Boss, for 2-0, 3-0, 4-0 Grooved Wire	120 00

Either of above can be furnished also with $\frac{3}{4}$ -inch Boss.



DETROIT TROLLEY CLAMPS

For Grooved Wire

Form 4



INTENDED especially for supporting trolley wire on curves where, on account of severe side strains placed on wire, a clamp of extra length is required.

End jaws are $2\frac{1}{2}$ inches long, overall length 10 inches and height overall 2 inches.

For $\frac{3}{8}$ -inch Stud Bolt

Code Word
Aspirant.

No. 8973—Clamp, Mall. Iron, Sher., for 2-0, 3-0, 4-0 Grooved Wire . . . \$84 00

List per 100

Above can be furnished for $\frac{1}{2}$ -inch Stud Bolt.

Form 5



IS longer and correspondingly heavier throughout than the Form 4 Clamp and is adapted for heavy work on curves.

Overall length is 14 inches, end jaws are 5 inches long and height overall is 2 inches.

For $\frac{1}{2}$ -inch Stud Bolt

Code Word
Inholder.

No. 10975—Clamp, Mall. Iron, Sher., for 2-0, 3-0, 4-0 Grooved Wire . . . \$110 00

List per 100

Above can be furnished for $\frac{3}{4}$ -inch Stud Bolt.



DETROIT DOUBLE STRAIN CLAMP



SCREWS are set close together, giving great gripping power. Length 12 inches; diameter of holes for strand, $\frac{1}{2}$ inch; height overall, $2\frac{1}{2}$ inches.

Code Word	No.	List per 100
<i>Asterisk.</i>	10370—Clamp, Malleable Iron, Sherardized, $\frac{5}{8}$ inch Boss, for 2-0, 3-0 and 4-0 Grooved Wire.....	\$140 00
	Above can be furnished with $\frac{3}{4}$ -inch Boss.	

DETROIT HALF STRAIN CLAMP



INTEENDED for use where strain is not excessive. Length, $7\frac{1}{4}$ inches; diameter of hole for strand, $\frac{1}{2}$ inch.

Code Word	No.	List per 100
<i>Mediate.</i>	11599—Anchor Clamp, Mall. Iron, Sher., for 2-0, 3-0 and 4-0 Fig. 8 and Grooved Wires.....	\$70 00

DETROIT FEEDER CLAMP



LENGTH $7\frac{1}{4}$ inches. Provided with feeder lug which will take a No. 2-0 to 4-0 B. & S. solid or stranded wire. Lips tinned for soldering if desired. Height, 2 inches.

Code Word	No.	List per 100
<i>Astral.</i>	8992—Clamp, Bronze, $\frac{1}{2}$ -inch Boss, for 0 Round Wire.....	\$140 00
<i>Astride.</i>	8993— " " " " 2-0 " "	140 00
<i>Asunder.</i>	8994— " " " " 3-0 " "	140 00
<i>Asylum.</i>	8995— " " " " 4-0 " "	140 00
<i>Atheist.</i>	8996— " " " " 0 and 2-0 Fig. 8 Wire..	140 00
<i>Athlete.</i>	8997— " " " " 3-0 " 4-0 " 8 " ..	140 00
<i>Inhumanly.</i>	10978— " " " " 2-0, 3-0 and 4-0 G'v'd Wire	140 00

No. 10978 can be furnished with $\frac{3}{4}$ -inch Boss.



O-B EXTRUDED EARS

Patented

AN unusual manufacturing process puts unusual properties into O-B Extruded Ears.

Extruded metal is made by forcing red hot—not molten—brass through a die under tremendous pressure.

Long life is literally squeezed into the metal as the process makes it exceedingly dense and tough.

Extruded metal is ductile and remarkably uniform and exact in dimensions. Consequently Extruded Ears fit the wire accurately and provide a smooth underrun. Because the metal is so dense, it does not curl in spite of constant battering by the trolley wheel.

O-B Extruded Ears consist of an extruded metal runner piece, to which is clinched and riveted a sherardized malleable iron boss. Threads are greased at the factory to give extra protection against rust.



Round Wire



Grooved Wire



Figure 8 Wire

Cross-Section of Extruded Ears Installed



O-B EXTRUDED TROLLEY EAR

Patented

Conforms to A. E. R. A. Specifications



Height, top trolley wire to top boss, $1\frac{1}{2}$ inch

Length 10 Inches

Round Wire

Code Word	No.					List per 100
<i>Purgatory.</i>	13148	—Ear for	0	Round Wire,	$\frac{1}{2}$ -inch Boss	\$ 88 00
<i>Puritan.</i>	13150	— " " "	2-0	" " "	" " "	96 00
<i>Purplish.</i>	13152	— " " "	3-0	" " "	" " "	104 00
<i>Purulence.</i>	13154	— " " "	4-0	" " "	" " "	112 00

Fig. 8 Wire

<i>Puzzle.</i>	13156	—Ear for	2-0	Fig. 8 Wire,	$\frac{1}{2}$ -inch Boss	96 00
<i>Pyralid.</i>	13158	— " " "	3-0	" " "	" " "	104 00
<i>Pyrena.</i>	13160	— " " "	4-0	" " "	" " "	112 00

Grooved Wire

<i>Pyridine.</i>	13162	—Ear for	2-0	Grooved Wire,	$\frac{1}{2}$ -inch Boss	96 00
<i>Pyrocoll.</i>	13164	— " " "	3-0	" " "	" " "	104 00
<i>Pyrophane.</i>	13166	— " " "	4-0	" " "	" " "	112 00

Length 12 Inches

Round Wire

<i>Jurist.</i>	11329	—Ear for	0	Round Wire,	$\frac{1}{2}$ -inch Boss	102 00
<i>Justice.</i>	11331	— " " "	2-0	" " "	" " "	110 00
<i>Kabook.</i>	11333	— " " "	3-0	" " "	" " "	120 00
<i>Kanchil.</i>	11335	— " " "	4-0	" " "	" " "	130 00

Fig. 8 Wire

<i>Mediator.</i>	11849	—Ear for	2-0	Fig. 8 Wire,	$\frac{1}{2}$ -inch Boss	110 00
<i>Medley.</i>	11851	— " " "	3-0	" " "	" " "	120 00
<i>Medulla.</i>	11853	— " " "	4-0	" " "	" " "	130 00

Grooved Wire

<i>Kedger.</i>	11337	—Ear for	2-0	Grooved Wire,	$\frac{1}{2}$ -inch Boss	110 00
<i>Keeler.</i>	11339	— " " "	3-0	" " "	" " "	120 00
<i>Keener.</i>	11341	— " " "	4-0	" " "	" " "	130 00

Above Ears can be furnished in any length desired or with $\frac{3}{4}$ -inch Boss.

See general description page 323.



O-B EXTRUDED FEEDER EAR

Patented



SIMILAR to regular Extruded Ear described on preceding pages with addition of a horizontal bronze feeder lug drilled to accommodate No. 2-0 to 4-0 B. & S. solid or stranded wire.

Feeder lug is both riveted and soldered to Extruded metal runner piece.

Wire groove is tinned for soldering.

Height, top trolley wire to top boss, $1\frac{3}{8}$ inch.

Length 12 Inches

Code Word	No.	Round Wire	List per 100
<i>Keller.</i>	11343—Feeder Ear for	0 Round Wire, $\frac{3}{8}$ -inch Boss.....	\$156 00
<i>Kernel.</i>	11345— " " "	2-0 " " $\frac{3}{8}$ " "	164 00
<i>Killdeer.</i>	11347— " " "	3-0 " " $\frac{3}{8}$ " "	180 00
<i>Kilting.</i>	11349— " " "	4-0 " " $\frac{3}{8}$ " "	190 00

Fig. 8 Wire

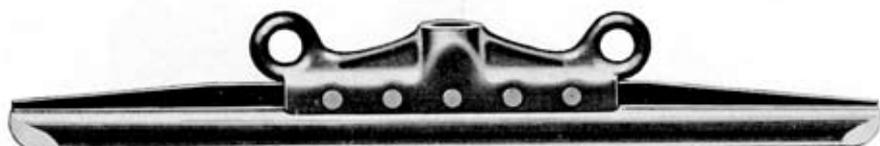
<i>Meekly.</i>	11855—Feeder Ear for 2-0 Fig. 8 Wire, $\frac{3}{8}$ -inch Boss.....	164 00
<i>Megaderm.</i>	11857— " " " 3-0 " " $\frac{3}{8}$ " "	180 00
<i>Melanure.</i>	11859— " " " 4-0 " " $\frac{3}{8}$ " "	190 00

Grooved Wire

<i>Kindred.</i>	11351—Feeder Ear for 2-0 Grooved Wire, $\frac{3}{8}$ -inch Boss.....	164 00
<i>Kingbird.</i>	11353— " " " 3-0 " " $\frac{3}{8}$ " "	180 00
<i>Kinglet.</i>	11355— " " " 4-0 " " $\frac{3}{8}$ " "	190 00

Any of above can be furnished with $\frac{1}{4}$ -inch Boss.

See general description page 323.

**O-B EXTRUDED DOUBLE STRAIN EAR****Patented**

CONSISTS of a sherardized, malleable iron boss and an extruded metal runner piece, same as used in Extruded Ears described on preceding pages.

Wire groove is tinned for soldering.

Height, top trolley wire to top boss, $1\frac{3}{8}$ inch. Eyes are $\frac{7}{16}$ inch in diameter.

Length 15 Inches**Round Wire**

Code Word	No.				List per 100
<i>Melchite.</i>	11861	—Ear for	0	Round Wire, $\frac{3}{8}$ -inch Boss	\$165 00
<i>Melibian.</i>	11863	— " " 2-0	"	" $\frac{5}{8}$ " "	175 00
<i>Mellific.</i>	11865	— " " 3-0	"	" $\frac{5}{8}$ " "	200 00
<i>Melodic.</i>	11867	— " " 4-0	"	" $\frac{5}{8}$ " "	210 00

Fig. 8 Wire

<i>Melodize.</i>	11869	—Ear for 2-0 Fig. 8	Wire, $\frac{3}{8}$ -inch Boss	175 00
<i>Melotype.</i>	11871	— " " 3-0	" " $\frac{5}{8}$ " "	200 00
<i>Memento.</i>	11873	— " " 4-0	" " $\frac{5}{8}$ " "	210 00

Grooved Wire

<i>Memorate.</i>	11875	—Ear for 2-0 Grooved	Wire, $\frac{3}{8}$ -inch Boss	175 00
<i>Memphian.</i>	11877	— " " 3-0	" " $\frac{5}{8}$ " "	200 00
<i>Menhaden.</i>	11879	— " " 4-0	" " $\frac{5}{8}$ " "	210 00

Any of above can be furnished with $\frac{3}{8}$ -inch Boss.

See general description page 323.

**FLEXIBLE EXTRUDED TROLLEY EAR**

Patented



CONSISTS of two short extruded ears attached to a flat tempered steel spring having a boss at its center for attachment to hanger.

Ear units may be renewed without loosening spring and center boss.

Especially adapted for use under elevated structures and similar places where suspension is ordinarily very rigid.

Spring provides great flexibility, eliminates the "hard spot" and reduces tendency of wire to crystallize and break at suspension point.

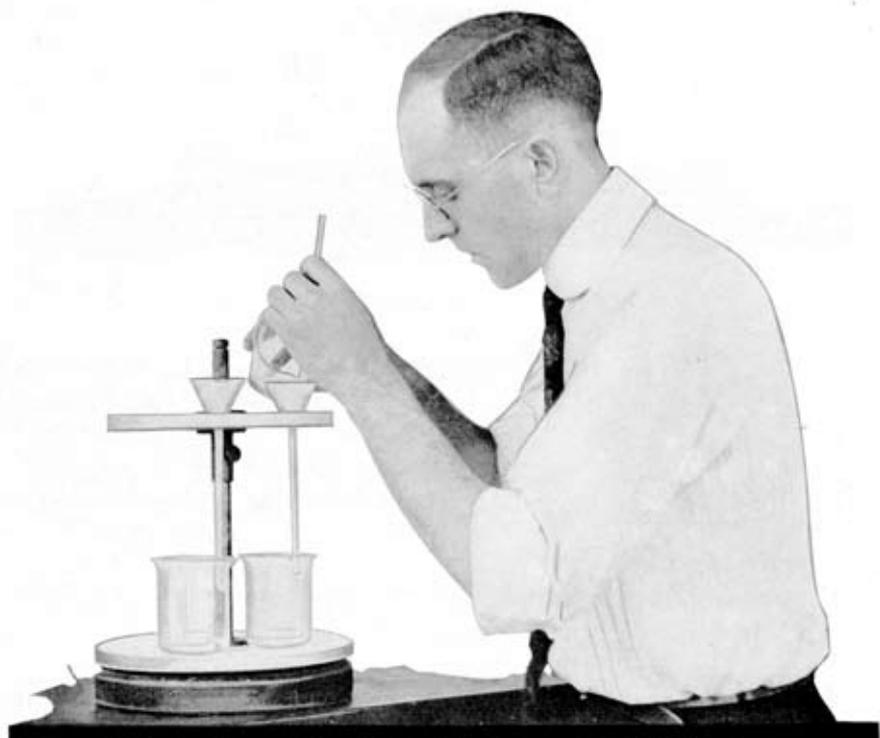
Length overall, 15 inches; length ears, 5 inches; height overall, 2 $\frac{3}{8}$ inches.

Code Word	No.	List per 100
<i>Mercenary.</i>	11615—Ear for 0 Round Wire, $\frac{5}{8}$ -inch Boss.....	\$167 00
<i>Merciful.</i>	11616— " " 2-0 " " " "	178 00
<i>Mercuric.</i>	11617— " " 3-0 " " " "	186 00
<i>Meresman.</i>	11618— " " 4-0 " " " "	190 00
<i>Mericarp.</i>	11619— " " 2-0 Grooved " " " "	178 00
<i>Meridian.</i>	11620— " " 3 0 " " " "	186 00
<i>Merils.</i>	11621— " " 4-0 " " " "	190 00

See general description page 323.



O-B BRONZE



THE splendid service given by O-B Bronze gets back to a simple plan of action: Know what results are wanted; know how to get them; get them.

Bronze is an alloy of varying composition. The proportions of the basic metals determine the properties of the finished composition.

Long and intimate contact with the circumstances under which O-B products are used reveals what qualities are most desirable. So there is one formula for cast ears, another for splicers, a different one for extruded ears and so on. A. E. R. A. Specifications are followed for all devices to which they apply.

An unusually well equipped laboratory originates the formulas and regulates the foundry. Metallurgical control is thorough and complete. It includes chemical analyses of content, photomicrographic examinations of structure, tests of such mechanical characteristics as hardness, and tensile strength.

Constant vigilance is exercised to maintain the highest quality possible.



TYPE A TROLLEY EAR

For Round Wire

Conforms to A. E. R. A. Specifications



THIS Ear is cast solid and wire groove in lips is milled out accurately to size.

Lips are of uniform thickness, and a slight bevel on outside of lips produces a sharp edge, but retains original tough skin of bronze casting for a wearing surface and eliminates brittleness sometimes caused by grinding.



Lips afford a smooth under-run to trolley wheel.

A heavy web extends to top of boss and boss extends entirely down to lips.

Ears are regularly furnished not tinned, but can be tinned if desired.

Metal used is a high grade bronze conforming to A. E. R. A. specifications. It is extremely tough, though not brittle, and has exceptionally long life.

This metal mixture is continually checked by our chemical laboratory so as to insure absolutely uniform results from every heat. See page 328.

Height, top trolley wire to top boss, $1\frac{11}{32}$ inch.

Length 12 Inches

Code Word	No.	List per 100
<i>Recode.</i>	13312—Ear, Bronze, for 2-0 Round Wire, $\frac{3}{8}$ -inch Boss.....	\$ 96 00

Length 15 Inches

<i>Receipt.</i>	13313—Ear, Bronze, for 2-0 Round Wire, $\frac{3}{8}$ -inch Boss.....	110 00
<i>Receiver.</i>	13314— " " " 3-0 " " " " " ".....	120 00
<i>Receuse.</i>	13315— " " " 4-0 " " " " " ".....	130 00

Any of above can be supplied with $\frac{1}{2}$ -inch Boss.



CLINCH TROLLEY EAR

For Figure 8 Wire



PROVIDED with heavy boss and web. Lips conform closely to shape of trolley wire.

Regularly furnished not tinned but can be tinned for soldering if desired.

Height, top trolley wire to top boss, $1\frac{1}{4}$ inch. Length, 10 inches.

Code Word	No.	List per 100
<i>Bachelor.</i>	2351—Clinch Ear, Bronze, for 2-0 Fig. 8 Wire, $\frac{1}{2}$ -inch Boss	\$100 00
<i>Bachelry.</i>	2353—“ “ “ “ 3-0 “ 8 “ “ “ “ “	108 00
<i>Bacillus.</i>	2355—“ “ “ “ 4-0 “ 8 “ “ “ “ “	116 00

CLINCH FEEDER EAR

For Figure 8 Wire



SIMILAR to the Ear listed above with the addition of a feeder lug drilled for 2-0 B. & S. solid wire.

Groove is tinned for soldering.

Height, top trolley wire to top boss, $1\frac{1}{4}$ inch. Length, 10 inches.

Code Word	No.	List per 100
<i>Backbone.</i>	4059—Feeder Ear, Bronze, for 2-0 Fig. 8 Wire, $\frac{1}{2}$ -inch Boss	\$120 00
<i>Backed.</i>	4060—“ “ “ “ 3-0 “ 8 “ “ “ “ “	128 00
<i>Backhand.</i>	4061—“ “ “ “ 4-0 “ 8 “ “ “ “ “	140 00

**CLINCH TROLLEY EAR****For Grooved Wire**

BOTH web and boss are heavy and lips conform closely to shape of trolley wire. Regularly furnished not tinned but can be tinned for soldering if desired.

Height, top trolley wire to top boss, $1\frac{1}{2}$ inch.

Length 12 Inches

Code Word	No.		List per 100
<i>Badgerer.</i>	10355	—Ear, Bronze, for 2-0 Grooved Wire, $\frac{3}{8}$ -inch Boss.....	\$115 00

Length 15 Inches

<i>Badinage.</i>	10356	—Ear, Bronze, for 3-0 Grooved Wire, $\frac{3}{8}$ -inch Boss.....	\$144 00
<i>Baffler.</i>	10358	— " " " 4-0 " " " $\frac{3}{8}$ " "	156 00

Either of above 15-inch Ears can be supplied with $\frac{1}{2}$ -inch Boss.

CLINCH FEEDER EAR**For Grooved Wire**

SAME design Ear as described above, with addition to feeder lug drilled for 2-0 to 4-0 solid or stranded feeder wire. Lips are tinned for soldering.

Height, top trolley wire to top boss, $1\frac{1}{2}$ inch.

Length 12 Inches

Code Word	No.		List per 100
<i>Baggager.</i>	10373	—Ear, Bronze, for 2-0 Grooved Wire, $\frac{3}{8}$ -inch Boss.....	\$190 00

Length 15 Inches

<i>Bagging.</i>	10374	—Ear, Bronze, for 3-0 Grooved Wire, $\frac{3}{8}$ -inch Boss.....	216 00
<i>Bagpipe.</i>	10376	— " " " 4-0 " " " $\frac{3}{8}$ " "	228 00

Either of above 15-inch Ears can be supplied with $\frac{1}{2}$ -inch Boss.

**SPILLMAN TROLLEY EAR**

For Round Wire



THIS ear is well suited for use on curves under slow speed operation. It should be hung so that side strain of trolley wire is against closed side of groove. Length, 9 inches.

Code Word	No.				List per 100
<i>Awaken.</i>	1110—	Ear, Bronze, for	0	Round Wire, $\frac{1}{2}$ -inch Boss	.... \$ 91 00
<i>Axial.</i>	2271—	" " " "	2-0	" " " "	.... 91 00
<i>Axled.</i>	2305—	" " " "	3-0 and 4-0	" " " "	.... 102 00

JEWELL TROLLEY SLING

For Round Wire



OFFERS a flexible support for wire on straight line work. To install, remove swiveled boss, place trolley wire in groove and bend lips over it, finally replacing boss and attaching Ear to hanger. Can be used to advantage where several styles of wire are found on the same line.

Length, $9\frac{1}{4}$ inches; height overall, $2\frac{5}{8}$ inches.

Sling is bronze with sherardized malleable iron boss.

Code Word	No.				List per 100
<i>Arman.</i>	1113—	Sling, for	0	Round, Fig. 8 and G'y'd Wires, $\frac{1}{2}$ -inch Boss.	\$70 00
<i>Azoic.</i>	2307—	" " " "	2-0	" " S " " " "	.. 72 00
<i>Azoth.</i>	2309—	" " " "	3-0	" " S " " " "	.. 76 00
<i>Azure.</i>	2311—	" " " "	4-0	" " S " " " "	.. 76 00



WALKER TROLLEY EAR

For Round Wire



Nos. 6679-6685



No. 1108

LOWER surface of Ear and trolley wire are on same plane, and of same size, making a straight, under-running surface.

Trolley wire is easily bent to conform to shape of Ear by special tool.

On curves, it affords a solid wall of metal on one side against which trolley wire can rest. Length $8\frac{1}{4}$ inches.

Code Word	No.	List per 100
<i>Avise.</i>	6679—Ear, Bronze, for 0 Round Wire, $\frac{1}{2}$ -inch Boss	\$ 93 00
<i>Avoke.</i>	6681—“ “ “ 2-0 “ “ “ “	93 00
<i>Avolate.</i>	6683—“ “ “ 3-0 “ “ “ “	96 00
<i>Avowals.</i>	6685—“ “ “ 4-0 “ “ “ “	100 00
<i>Avulsion.</i>	1108—Forming Tool for Walker Ear	600 00

STRIPPING TOOL

For Trolley Ears



DESIGNED to facilitate removal of ears from trolley wire. When pointed end is placed between wire and lips of ear, a few blows of a hammer will open lips sufficiently to strip ear from wire.

Can be used with any cast or extruded clinch ear listed in this catalog.

Code Word	No.	List Each
<i>Elective.</i>	8123—Stripping Tool, Forged Steel	\$4 40

**CLINCH HALF STRAIN EAR**

For Round and Grooved Wires



LIPS are tinned for soldering. Made of bronze of high tensile strength. Hole for guy wire is $\frac{3}{8}$ inch in diameter and is ribbed to give bearing surface for guy wire.

Code Word	No.	List per 100
<i>Merino.</i>	11881—Ear, Bronze, for 0 Round and G'v'd Wires, length 8 in..	\$96 00
<i>Meritory.</i>	11882— " " " 2-0 " " " " " 8 " ..	100 00
<i>Merling.</i>	11883— " " " 3-0 " " " " " 9 " ..	104 00
<i>Mermaid.</i>	11884— " " " 4-0 " " " " " 9 " ..	108 00

CLINCH DOUBLE STRAIN EAR

For Round Wire



STRAIN lugs for attaching guy wires have holes $\frac{7}{16}$ inch in diameter. A bronze of high tensile strength is used. Length 15 inches. Lips are tinned for soldering.

Height, top wire to top boss, $1\frac{1}{2}$ inch.

Code Word	No.	List per 100
<i>Isopathy.</i>	11176—Strain Ear, Bronze, for 0 Round Wire, $\frac{3}{8}$ -inch Boss ...	\$165 00
<i>Isopoda.</i>	11177— " " " " 2-0 " " " $\frac{3}{8}$ " " ...	175 00
<i>Isorcin.</i>	11179— " " " " 3-0 " " " $\frac{3}{8}$ " " ...	200 00
<i>Isosceles.</i>	11181— " " " " 4-0 " " " $\frac{3}{8}$ " " ...	210 00

*Ears marked can be supplied also with $\frac{1}{2}$ -inch Boss.

**METROPOLITAN STRAIN PLATE****Patented****With Extruded Ear**

PLATE is a sherardized malleable iron casting and is intended to be supported from some form of straight line hanger.

A hole $\frac{1}{2}$ inch in diameter at each corner of Strain Plate permits attachment of guy wires. Extreme width of plate, $6\frac{1}{2}$ inches.

Two $\frac{3}{8}$ x 1-inch sherardized machine bolts equipped with lock washers are included with each plate. Separation between bolt holes in plate is $7\frac{3}{4}$ inches.

Extruded ear is equipped with two bosses for attaching to strain plate and is tinned for soldering. Length of ear, 15 inches.

Code Word	No.	List per 100
<i>Ballads.</i>	2442—Strain Plate only, Mall. Iron, Sher., for $\frac{3}{8}$ -inch Hanger Stud.	\$180 00
<i>Meniscus.</i>	11601—Ear only, Extruded, for 0 Round Wire.	165 00
<i>Meniver.</i>	11602— " " " " 2-0 " "	175 00
<i>Mentally.</i>	11603— " " " " 3-0 " "	200 00
<i>Menthene.</i>	11604— " " " " 4-0 " "	210 00
<i>Mentor.</i>	11605— " " " " 2-0 Grooved "	175 00
<i>Mercable.</i>	11606— " " " " 3-0 " "	200 00
<i>Mercaptal.</i>	11607— " " " " 4-0 " "	210 00

*Strain Plate can be furnished for $\frac{3}{4}$ -inch Hanger Stud.

Two Detroit Trolley Clamps, Forms 1, 2 or 3 listed on pages 319 and 320, may be used with Metropolitan Strain Plate instead of Extruded Ear listed above.

**TYPE B-1 STRAIN PLATE**

Patented

Conforms to A. E. R. A. Specifications



WIRE is gripped firmly by clamp casting held in place by two $\frac{3}{8}$ x $1\frac{1}{2}$ -inch standard carriage bolts equipped with lock washers. Clamp is serrated to give great holding power.

This plate is intended for trolley wheel operation; Type B-2, for pantograph operation, is listed on page 437.

Renewable bronze tips hold wire in bottom of groove by cam action. Regularly furnished with $2\frac{1}{2}$ -inch tips but can be equipped with 6-inch tips if desired.

Gives smooth under-run and good clearance for trolley wheel.

Holes for attaching guy wires to body are in same horizontal plane as trolley wire. This arrangement reduces tendency to tilt should strain be removed on one side. Holes are $\frac{9}{16}$ inch in diameter.

Length overall, $15\frac{1}{2}$ inches. Malleable iron, sherardized.

Code Word	No.	List per 100
Reception.	13392—Strain Plate for 0 Round Wire.....	\$420 00
Printing.	13069— " " " 2-0 " and Grooved Wires.....	420 00
Peridot.	12594— " " " 3-0 " " " "	420 00
Perilous.	12595— " " " 4-0 " " " "	420 00

Can be furnished to order with long Renewable Cam Tips.

For listing of Renewable Cam Tips, see page 374.



O-B SPLICER LIPS

Patented

Here's a solid casting the shape of a trolley splicer.



A hole goes through it the way the trolley wire should go.



A split is made along the bottom just past the point where the wire turns up.



The edges are laid back so the trolley can be laid in.



And that is the shape, exactly, of O-B Splicer Lips.

When the lineman reverses the process and pounds the lips down they fit snugly around, under and against the wire. The trolley wheel rolls smoothly onto the splicer and off again—finds neither bump nor depression.



Splicers for every class of service are listed on the following pages. Each one designed for round or grooved wire has these patented lips.

**O-B CLEVELAND TROLLEY WIRE SPLICER**

Patented

Conforms to A. E. R. A. Specifications



WIRES are held in place by steel chucks, serrated on inside to give a grip on wires and tapered on outside to fit into a tapered hole in the body. Any tension added to the wire tends to increase the grip of the chucks. Chucks will hold badly worn wire as tightly as new wire. When wire is badly worn, it is often advantageous to split the chucks before installing.

Improved under-run gives exceptionally smooth passage for trolley wheel, free from bumps or depressions. See page 339.

Length 21 Inches

Code Word	No.		List per 100
<i>Recipient.</i>	13442	Splicer, Bronze, for 0 Round Wire.....	\$360 00
<i>Persian.</i>	12638	" " " 2-0 " "	400 00
<i>Perspire.</i>	12639	" " " 3-0 " "	440 00
<i>Persuade.</i>	12640	" " " 4-0 " "	490 00
<i>Proudly.</i>	12641	" " " 2-0 Grooved "	400 00
<i>Pervious.</i>	12642	" " " 3-0 " "	440 00
<i>Persade.</i>	12643	" " " 4-0 " "	490 00

Length 30 Inches

<i>Reciprok.</i>	13443	Splicer, Bronze, for 0 Round Wire.....	600 00
<i>Pulverate.</i>	13126	" " " 2-0 " "	600 00
<i>Pulverize.</i>	13127	" " " 4-0 " "	700 00
<i>Pampage.</i>	13128	" " " 2-0 Grooved "	600 00
<i>Pumping.</i>	13129	" " " 4-0 " "	700 00

Chucks for Cleveland Splicers

<i>Milesian.</i>	11676	Chuck, Sherardized, for 0 Round Wire.....	42 00
<i>Milfoil.</i>	11677	" " " 2-0 " and 0 Grooved Wires...	42 00
<i>Militant.</i>	11678	" " " 3-0 " Wire.....	42 00
<i>Military.</i>	11679	" " " 4-0 " "	42 00
<i>Militia.</i>	11680	" " " 2-0 Grooved "	42 00
<i>Milker.</i>	11681	" " " 3-0 " "	42 00
<i>Milkmaid.</i>	11682	" " " 4-0 " "	42 00

**O-B CLEVELAND SPLICING EAR**

Patented

Conforms to A. E. R. A. Specifications



SAME as Splicers listed on preceding page but is provided with a removable boss made of cold-rolled steel.

Height overall, $2\frac{1}{4}$ inches.

Length 21 Inches

Code Word	No.							List per 100
<i>Reckless.</i>	13444	—	Splicing Ear, Bronze, for	0	Round Wire,	$\frac{1}{2}$ -inch	Boss.....	\$400 00
<i>Pester.</i>	12644	—	" " " " 2-0	"	" " " " " " " " " " " "	" " " " " " " " " " " "	440 00	
<i>Petard.</i>	12646	—	" " " " 3-0	"	" " " " " " " " " " " "	" " " " " " " " " " " "	480 00	
<i>Petiole.</i>	12648	—	" " " " 4-0	"	" " " " " " " " " " " "	" " " " " " " " " " " "	530 00	
<i>Petrol.</i>	12650	—	" " " " 2-0 Grooved	"	" " " " " " " " " " " "	" " " " " " " " " " " "	440 00	
<i>Petrify.</i>	12652	—	" " " " 3-0	"	" " " " " " " " " " " "	" " " " " " " " " " " "	480 00	
<i>Petrous.</i>	12654	—	" " " " 4-0	"	" " " " " " " " " " " "	" " " " " " " " " " " "	530 00	

Length 30 Inches

<i>Reckon.</i>	13446	—	Splicing Ear, Bronze, for	0	Round Wire,	$\frac{1}{2}$ -inch	Boss.....	640 00
<i>Pumpkin.</i>	13130	—	" " " " 2-0	"	" " " " " " " " " " " "	" " " " " " " " " " " "	640 00	
<i>Punctilio.</i>	13132	—	" " " " 4-0	"	" " " " " " " " " " " "	" " " " " " " " " " " "	740 00	
<i>Puncture.</i>	13134	—	" " " " 2-0 Grooved	"	" " " " " " " " " " " "	" " " " " " " " " " " "	640 00	
<i>Pungled.</i>	13136	—	" " " " 4-0	"	" " " " " " " " " " " "	" " " " " " " " " " " "	740 00	

Chucks for Cleveland Splicers

<i>Milesian.</i>	11676	—	Chuck, Sherardized, for	0	Round Wire.....	42 00
<i>Milfoil.</i>	11677	—	" " " " 2-0	"	and 0 Grooved Wires...	42 00
<i>Militant.</i>	11678	—	" " " " 3-0	"	Wire.....	42 00
<i>Military.</i>	11679	—	" " " " 4-0	"	" " " " " " " " " " " "	42 00
<i>Militia.</i>	11680	—	" " " " 2-0 Grooved	"	" " " " " " " " " " " "	42 00
<i>Milker.</i>	11681	—	" " " " 3-0	"	" " " " " " " " " " " "	42 00
<i>Milkmaid.</i>	11682	—	" " " " 4-0	"	" " " " " " " " " " " "	42 00

Removable Bosses for Cleveland Splicers

<i>Reclamate.</i>	13448	—	Removable Boss, Sherardized, $\frac{1}{2}$ inch.....	40 00
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Any of above can be furnished with $\frac{1}{4}$ -inch Boss.

**TYPE C TROLLEY WIRE SPLICER****Patented****"No Wire Bend"****Conforms to A. E. R. A. Specifications**

GIVES unusual clearance for trolley wheel and smooth under-run, free from bumps or depressions. See page 339.

Lips are ground to knife edge at ends and left thicker toward center. Metal is so distributed that Splicer is not top heavy.

Installation is easy. Wire enters in straight line, no forming being necessary. Barrier at center prevents wire from going past center of Splicer.

Heavy steel set screws will not twist off. They are set far enough apart to give plenty of wrench room.

Can be used efficiently on either new or badly worn wire. Length, 20 inches.

Regular

Code Word	No.		List per 100
<i>Overbear.</i>	12473—	Splicer, Bronze, for 0 and 2-0 Round and Grooved Wires.	\$300 00
<i>Overcrow.</i>	12474—	" " " 3-0 Round and Grooved Wires.....	330 00
<i>Overdo.</i>	12475—	" " " 4-0 " " " "	360 00
<i>Peronate.</i>	12993—	" " " 2-0 Fig. 8 Wire	352 00
<i>Overdose.</i>	12476—	" " " 3-0 " 8 "	356 00
<i>Permuter.</i>	12477—	" " " 4-0 " 8 "	380 00

Combination

<i>Peroxide.</i>	12795—	Splicer Bronze for 0 and 2-0 Round and Grooved to 3-0 Fig. 8 Wires.....	\$390 00
<i>Perpender.</i>	12796—	Splicer, Bronze for 3-0 Round and Grooved to 4-0 Fig. 8 Wires.....	400 00
<i>Perplex.</i>	12797—	Splicer, Bronze for 4-0 Round and Grooved to 4-0 Fig. 8 Wires.....	412 00

Wrench for above Splicers listed on following page.

**TYPE C SPLICING EAR**

Patented

"No Wire Bend"

Conforms to A. E. R. A. Specifications



SIMILAR to splicer listed on preceding page, except provided with a boss for attachment to a hanger. Length, 20 inches; height overall, 2 inches.

Code Word	No.	List per 100
<i>Overdye.</i>	12478—Ear, Bronze, for 0 and 2-0 Round and Grooved Wire, 3/8-inch Boss.....	\$346 00
<i>Overget.</i>	12480—Ear, Bronze, for 3-0 Round and Grooved Wire, 3/8-inch Boss.	376 00
<i>Overhand.</i>	12482— " " " 4-0 " " " " " " " " " " " "	406 00

Any of above can be furnished with 3/8-inch Boss.

WRENCH FOR TYPE C SPLICERS

A HANDY tool for use in installing Type C Splicers or Splicing Ears. Set screws can be tightened completely without removing wrench from head.

Code Word	No.	List per 100
<i>Persall.</i>	12633—Wrench, Malleable Iron, Sherardized.....	\$30 00

**TYPE D TROLLEY WIRE SPLICER****For Heavy Service—Patented****Conforms to A. E. R. A. Specifications**

COMBINES great strength and long life with good clearance for trolley wheel and smooth under-run. See page 339.

Especially valuable on heavy city or interurban lines or steam road catenary. Has strength sufficient to break any copper, Phono-Electric or steel trolley wire with which it can be used.

The ends of the wires are bent back over the Splicer on top and are always in sight for visual inspection from the ground.

Distance between centers wire openings at top Splicer, 2 inches. Length 20 inches. Set screws are $\frac{1}{2}$ x1 inch.

Code Word	No.	List per 100
<i>Quirpele.</i>	13178—Splicer, Bronze, for 0 and 2-0 Round and Grooved Wires.	\$400 00
<i>Quitter.</i>	13179— “ “ “ 3-0 Round and Grooved Wires.	440 00
<i>Quixotic.</i>	13180— “ “ “ 4-0 “ “ “ “	490 00

TYPE D SPLICING EAR**For Heavy Service—Patented****Conforms to A. E. R. A. Specifications**

SIMILAR to the Splicer listed above but is provided with a central boss for attachment to hanger.

Distance between centers wire openings at top Ear, $3\frac{1}{4}$ inches. Length, 22 inches; height overall, $2\frac{1}{16}$ inches.

Code Word	No.	List per 100
<i>Quodlibet.</i>	13181—Ear, Bronze, for 0 and 2-0 Round and Grooved Wires $\frac{1}{2}$ -inch Boss.	\$440 00
<i>Quotidian.</i>	13183—Ear, Bronze, for 3-0 Round and Grooved Wires, $\frac{3}{8}$ -inch Boss	480 00
<i>Quotum.</i>	13185— “ “ “ 4-0 “ “ “ “	530 00

Any of above can be furnished with $\frac{1}{2}$ -inch Boss.



CLARK SPLICING EAR

For Figure 8 Wire



INTENDED primarily for use on mining and industrial properties where the strains are not excessive. The fastening obtained by $\frac{7}{16} \times \frac{3}{8}$ -inch set screws is amply secure for all ordinary conditions in this class of service.

Solder may be used in addition, however, the strength of the fastening being materially increased thereby. Made of high strength bronze. Length, 12 inches; height overall, $2\frac{1}{4}$ inches.

Distance between centers wire openings at top Ear, $4\frac{1}{2}$ inches.

Code Word	No.	List per 100
<i>Bantling.</i>	2517—Ear, Bronze, for 0 and 2-0 Fig. 8 Wire, $\frac{1}{2}$ -inch Boss.....	\$272 00
<i>Baptism.</i>	2518— " " " 3-0 Fig. 8 Wire, $\frac{3}{4}$ -inch Boss.....	282 00
<i>Barbaric.</i>	2519— " " " 4-0 " 8 " $\frac{3}{4}$ " "	294 00

CLARK TROLLEY WIRE SPLICER

For Figure 8 Wire



INTENDED primarily for use on mine and industrial properties where the strains are not excessive. Same design as the Clark Splicing Ear listed above, differing only in having the central boss omitted. Made of high strength bronze. Length, 10 inches; set screws $\frac{7}{16} \times \frac{3}{8}$ inch.

Distance between centers wire openings at top Splicer, $2\frac{1}{2}$ inches.

Code Word	No.	List per 100
<i>Barbecue.</i>	2521—Splicer, Bronze, for 0 and 2-0 Fig. 8 Wire.....	\$187 00
<i>Barbican.</i>	2522— " " " 3-0 Fig. 8 Wire.....	200 00
<i>Barback.</i>	2523— " " " 4-0 " 8 "	216 00



TYPE CM TROLLEY WIRE SPLICER

Patented

"No-Wire-Bend"

Conforms to A. E. R. A. Specifications



DESIGNED along the same general lines as the Type C Splicer, listed on page 342, but is shorter and intended for use on lines operating at slow speed, such as mine and industrial properties, and on light railway work.

Has exceptionally smooth under-run. See page 339.

Wire enters with practically no bend.

Length, 11 inches; set screws $\frac{3}{8} \times \frac{7}{8}$ inch.

Code Word	No.		List per 100
<i>Recognize.</i>	13423	Splicer, Bronze, for 0 and 2-0 Round and Grooved Wires	\$230 00
<i>Recoiler.</i>	13424	" " " 4-0 Round and Grooved Wires	250 00
<i>Recollect.</i>	13425	" " " 2-0 Fig. 8 Wire	250 00
<i>Recompense.</i>	13426	" " " 4-0 " 8 "	260 00

For listing of wrench, see page 343.

IMPROVED CLARK TROLLEY WIRE SPLICER

Patented

Conforms to A. E. R. A. Specifications



DESIGNED along the general lines of the Clark Splicer on opposite page except shorter. Well suited to all classes of service. Has exceptionally smooth under-run. See page 339. Made of high strength bronze. Length, 10 inches; set screws, $\frac{7}{16} \times \frac{1}{2}$ inch.

Distance between centers wire openings at top Splicer, 2 inches.

Code Word	No.		List per 100
<i>Messiad.</i>	11886	Splicer, Bronze, for 0 and 2-0 Round and Grooved Wires	\$170 00
<i>Messmate.</i>	11887	" " " 3-0 Round and Grooved Wires	180 00
<i>Mestizo.</i>	11888	" " " 4-0 " " " " "	200 00

**EXTRUDED METAL TROLLEY WIRE CONNECTORS**

Patented

For Round and Grooved Wires



MADE with extra metal at top as shown in sectional view, giving additional strength. Smaller dimension given in listing is width across flats.

Extruded metal is very dense and has high tensile strength.

Central portion of Connector is left solid and a milled slot is provided on each side of center for pouring in solder. Connectors are tinned.



Cross Section

Code Word	No.				List per 100
<i>Outlet.</i>	12468—	Connector,	$\frac{3}{8}$ "x14 inches,	for 0 Round Wire.....	\$180 00
<i>Outshine.</i>	12469—	"	$\frac{3}{8}$ "x15 " "	2-0 " and Grooved Wires..	200 00
<i>Outsider.</i>	12470—	"	$\frac{3}{8}$ "x17 " "	3-0 " " " "	300 00
<i>Outskirt.</i>	12471—	"	$\frac{3}{8}$ "x12 " "	4-0 " " " "	270 00
<i>Outstare.</i>	12472—	"	$\frac{3}{8}$ "x19 " "	4-0 " " " "	420 00

BRASS TROLLEY WIRE CONNECTORS

For Round and Grooved Wires



MADE from high strength drawn brass rod and has circular cross section. Tinned for soldering.

Code Word	No.				List per 100
<i>Barker.</i>	8700—	Connector,	$\frac{3}{8}$ "x10 inches,	for 0 Round Wire.....	\$132 00
<i>Barley.</i>	8650—	"	$\frac{3}{8}$ "x15 " "	0 " " "	180 00
<i>Baronage.</i>	8702—	"	$\frac{3}{8}$ "x10 " "	2-0 " " "	132 00
<i>Baronet.</i>	8651—	"	$\frac{3}{8}$ "x16 " "	2-0 " " "	200 00
<i>Baronial.</i>	8703—	"	$\frac{3}{8}$ "x18 " "	2-0 " " "	270 00
<i>Barpost.</i>	8704—	"	$\frac{3}{8}$ "x11 " "	3-0 " " "	200 00
<i>Barrack.</i>	8652—	"	$\frac{3}{8}$ "x18 " "	3-0 " " "	300 00
<i>Barrage.</i>	8705—	"	$\frac{3}{8}$ "x18 " "	3-0 " " "	380 00
<i>Barrenly.</i>	8706—	"	$\frac{3}{8}$ "x12 " "	4-0 " " "	270 00
<i>Barret.</i>	8653—	"	$\frac{3}{8}$ "x20 " "	4-0 " " "	420 00
<i>Barriers.</i>	8707—	"	$\frac{3}{8}$ "x11 " "	2-0 Grooved Wire.....	200 00
<i>Barrulet.</i>	8654—	"	$\frac{3}{8}$ "x18 " "	2-0 " " "	300 00
<i>Barter.</i>	8708—	"	$\frac{3}{8}$ "x18 " "	2-0 " " "	380 00
<i>Baseless.</i>	8709—	"	$\frac{3}{8}$ "x12 " "	3-0 " " "	270 00
<i>Basement.</i>	8655—	"	$\frac{3}{8}$ "x20 " "	3-0 " " "	420 00
<i>Bashful.</i>	8710—	"	$\frac{3}{8}$ "x12 " "	4-0 " " "	270 00
<i>Basify.</i>	8656—	"	$\frac{3}{8}$ "x20 " "	4-0 " " "	420 00

**K-I TYPE TROLLEY WIRE SPLICERS**

Made by The Ohio Brass Company

Regular

TROLLEY wire is secured in place by steel dogs, barbed on one side to grip wire, and tapered on the other to correspond to tapered inner wall of Splicer. No soldering is necessary, as tension of wire is sufficient to keep dogs in place. Circular in shape and made of high strength bronze. Furnished complete with dogs.

Code Word	No.		List per 100
<i>Beacon.</i>	5692	—Splicer for 0 Round Wire, length 10 inches	\$130 00
<i>Beagle.</i>	5693	— " " 2-0 " " " 11 "	140 00
<i>Beaked.</i>	5694	— " " 3-0 " and 2-0 Grooved Wires, length 12 inches	160 00
<i>Beamful.</i>	5695	— " " 4-0 " " 3-0 " " 15 "	200 00
<i>Beard.</i>	5696	— " " 0 Fig. 8 Wire, length 9 $\frac{1}{4}$ inches	130 00
<i>Beast.</i>	5697	— " " 2-0 " 8 " " 9 $\frac{1}{2}$ "	140 00
<i>Beautiful.</i>	5698	— " " 3-0 " 8 " " 11 $\frac{1}{2}$ "	160 00
<i>Rabinet.</i>	13171	— " " 4-0 " 8 " " 10 "	170 00
<i>Beautiful.</i>	5699	— " " 4-0 " 8 " " 15 "	220 00
<i>Bedeck.</i>	8573	— " " 4-0 Grooved " " 15 "	220 00
<i>Rabidly.</i>	13170	— " " 4-0 Round and Grooved Wire, length 10 inches	165 00
<i>Behavior.</i>	5700	—Dogs for Splicer	6 00

Combination

SIMILAR in internal construction to regular form listed above but arranged for splicing the various combinations as listed below.

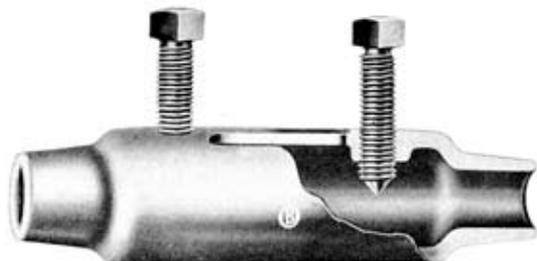
Code Word	No.	Size Wires	Length Inches	List per 100
<i>Beehive.</i>	5703	0 Fig. 8 to 0 Round	10	\$170 00
<i>Reconcile.</i>	13408	2-0 " 8 " 0 "	12	240 00
<i>Recondite.</i>	13409	2-0 " 8 " 2-0 "	12	240 00
<i>Pettish.</i>	12792	3-0 " 8 " 2-0 "	12	250 00
<i>Beelle.</i>	5705	3-0 " 8 " 3-0 " or 2-0 Grooved	12	240 00
<i>Beguile.</i>	10415	3-0 " 8 " 4-0 " " 3-0 "	15	270 00
<i>Reconquer.</i>	13410	4-0 " 8 " 2-0 " " 3-0 "	15	270 00
<i>Beggar.</i>	5706	4-0 " 8 " 4-0 " " 3-0 "	15	270 00
<i>Petunia.</i>	12793	4-0 " 8 " 3-0 Fig. 8	15	270 00
<i>Begrimer.</i>	10414	2-0 Round to 4-0 or 3-0 Grooved	15	270 00
<i>Record.</i>	13411	4-0 Grooved to 2-0 Round	15	270 00
<i>Recount.</i>	13412	4-0 " " 3-0 " or 2-0 Grooved	15	270 00
<i>Behavior.</i>	5700	Dogs for Splicer		6 00

In ordering Combination Splacers state name of gauge and gauge number of both Round or Grooved and Fig. 8 Trolley Wires.



FEEDER WIRE SPLICER

For Stranded Copper Wire



CONSISTS of a special high-strength bronze sleeve with an enlarged recess at the center. Cable ends are inserted and butted together at the center of the Splicer and the two heavy set screws are forced through the strands, spreading them out within the enlarged center recess. The Splicer is then completely filled with solder, making an absolutely perfect splice, both electrically and mechanically.

The projecting set screws may be cut off if it is desired to pull Splicer over a cross arm.

Splicer is tinned all over and can be quickly installed.

Code Word	No.		List per 100
<i>Flippant.</i>	10489	— Splicer for 4-0 to 300,000 C. M. Cable, length 5½ inches.	\$280 00
<i>Flitter.</i>	10490	— " " 350,000 C. M. Cable, length 5½ inches.	290 00
<i>Flitting.</i>	10491	— " " 400,000 " " " 6 "	326 00
<i>Flobert.</i>	10492	— " " 500,000 " " " 6 "	326 00
<i>Flogger.</i>	10493	— " " 800,000 " " " 7 "	550 00
<i>Flooder.</i>	10494	— " " 1,000,000 " " " 7 "	550 00

K-I TYPE FEEDER WIRE SPLICER

Made by The Ohio Brass Company

For Solid Wire



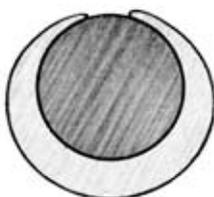
A SIMPLE and effective Splicer using the popular K-I principle with the steel dogs which, when driven into place, hold the wire firmly. Solder is then poured into the opening in the center, filling the interior and making a permanent electrical contact between the wires.

Splicer is tinned for soldering. Length, 6½ inches.

Code Word	No.		List per 100
<i>Juratory.</i>	11310	— Splicer, Bronze, for 0 and 2-0 Round Wire	\$110 00
<i>Injoint.</i>	11014	— " " " 3-0 " 4-0 " "	140 00



EXTRUDED TROLLEY ARMOR



Sectional View of
Armor Installed on
Wire

USED for reinforcing trolley wire at the approach and leading-out of trolley frogs, crossings, or at any point where the wire shows excessive wear. The armor is peened around the wire with the opening on top, thus protecting both the bottom and sides of the wire.

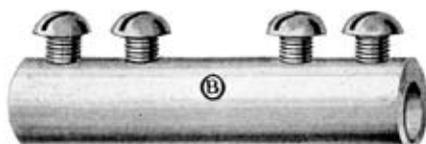
Made of Extruded Metal, the same as used in O-B Extruded Ears. This metal has a uniform cross section and is very dense and ductile. See page 323. The Armor fits the wire closely and has long life.

Length, 48 inches.

Code Word	No.	List per 100
Quintain.	13206—Extruded Trolley Armor for 0 Round Wire	\$155 00
Quintet.	13207— " " " 2-0 " "	192 00
Quintile.	13208— " " " 3-0 "and 2-0 Grooved Wires	250 00
Quirites.	13209— " " " 4-0 " " 3-0 " "	300 00



TWO-WAY WIRE CONNECTOR



Code Word	No.	Size B. & S. Solid Wire	Diameter Drilling, Inches	Length, Inches	List per 100
<i>Dialect.</i>	1214	No. 6	$\frac{3}{16}$	2	\$14 00
<i>Dialogue.</i>	1213	No. 4	$\frac{7}{32}$	2	15 50
<i>Diamond.</i>	1212	No. 2	$\frac{9}{32}$	2	17 50
<i>Diction.</i>	1211	No. 0	$\frac{23}{64}$	2	21 00
<i>Digress.</i>	4303	No. 2-0	$\frac{25}{64}$	2	23 00
<i>Dilate.</i>	4304	No. 3-0	$\frac{9}{16}$	2	26 50
<i>Diluent.</i>	4305	No. 4-0	$\frac{21}{32}$	2	30 00

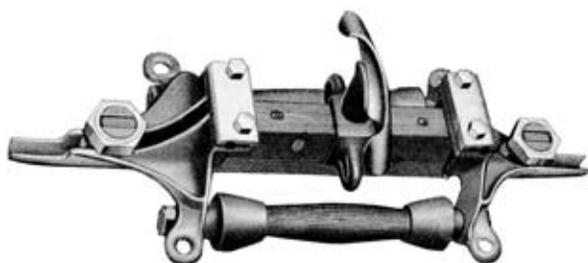
TEE WIRE CONNECTOR



Nos. 13572 and 13573 are tinned and should be soldered when installed.

Wire sizes given below for Nos. 13572 and 13573 are for stranded cable; sizes given for all other connectors are for solid wire.

Code Word	No.	Size B. & S. Wire		Diameter Drilling, Inches		List per 100
		Main	Branch	Main	Branch	
<i>Darken.</i>	4300	No. 6	6	$\frac{3}{16}$	$\frac{3}{16}$	\$60 00
<i>Dashing.</i>	4301	No. 4	4	$\frac{7}{32}$	$\frac{7}{32}$	60 00
<i>Datable.</i>	4302	No. 2	2	$\frac{9}{32}$	$\frac{9}{32}$	78 00
<i>Dative.</i>	2592	No. 0	0	$\frac{23}{64}$	$\frac{23}{64}$	83 00
<i>Davnter.</i>	2593	No. 2-0	2-0	$\frac{25}{64}$	$\frac{25}{64}$	83 00
<i>Deafen.</i>	2594	No. 3-0	3-0	$\frac{9}{16}$	$\frac{9}{16}$	94 00
<i>Debate.</i>	2595	No. 4-0	4-0	$\frac{21}{32}$	$\frac{21}{32}$	94 00
<i>Saligot.</i>	13572	1,000,000C.M	4-0	$1\frac{5}{32}$	$\frac{7}{16}$	220 00
<i>Salivate.</i>	13573	1,000,000C.M	250,000C.M	$1\frac{3}{32}$	$\frac{5}{8}$	220 00

**TYPE A-2 SECTION INSULATOR****Bronze—750 Volts**

SIMILAR in design to the Type A-1 Insulator listed on following page but is lighter, being intended for use on 0 and 2-0 wires while the Form 1 is recommended for 3-0 and 4-0 wires.

End castings are lighter than in Form 1 and have one clamping nut and wedge each.

Strain is borne by two 1-inch Wood Strain Insulators giving 5 inches of insulation.

Feeder wire connection on each end piece will accommodate 2-0 to 4-0 solid or stranded feeder wire.

Provided with a suspension yoke for attaching to cross-span wire, a $\frac{3}{8}$ -inch threaded boss for attaching to hanger stud and a pair of eyes with holes $\frac{1}{2} \times 1$ inch for fastening to guy wires.

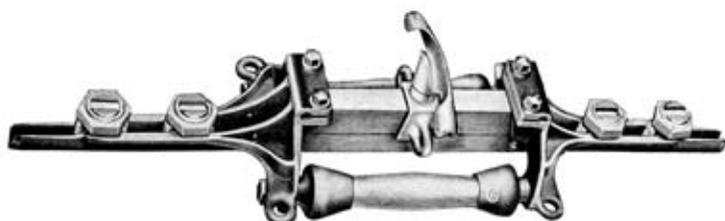
When a hanger is used to support insulator, the yoke casting may be unscrewed and hanger stud threaded directly into boss.

Holes in eyes in end pieces are $\frac{1}{2}$ inch in diameter.

Length overall, $20\frac{1}{2}$ inches; suspension bar, $1\frac{1}{2} \times 1\frac{1}{8} \times 9$ inches; runner piece, $1\frac{5}{8} \times 1\frac{1}{8} \times 9$ inches.

Approximate weight, $14\frac{1}{4}$ pounds.

Code Word	No.	List Each
<i>Millet.</i>	11038—Insulator, for 0 and 2-0 Round, Fig. 8, and Grooved Wires.	\$15 00
<i>Mimetite.</i>	11556—Runner Piece.....	30

**TYPE A-1 SECTION INSULATOR****Bronze—750-1500 Volts**

No. 9956

ENTIRE pull of trolley wires is sustained by two wood strain insulators which are in same horizontal plane as wire, thus overcoming any tendency of the device to buckle.

Wood Strain Insulators are $1\frac{1}{4}$ inches in diameter and give 5 and 12 inches of insulation respectively for 750 and 1500 volt service. They are secured to end castings by $\frac{5}{8}$ -inch machine bolts provided with lock washers.

End castings are bronze provided with $\frac{1}{2}$ -inch holes for guy wire and feeder wire connections for 2-0 to 4-0 solid or stranded wire.

Suspension beam and runner bar are separate pieces of impregnated and varnished hard wood which fit into sockets in end castings.

Suspension beam $1\frac{1}{2} \times 1\frac{1}{8}$ inches; $9\frac{7}{8}$ inches long for 750 volts and $16\frac{5}{8}$ inches long for 1500 volts.

Runner piece $1\frac{3}{8} \times 1\frac{1}{8}$ inches; $9\frac{7}{8}$ inches long for 750 volts and $16\frac{5}{8}$ inches long for 1500 volts.

Length overall, 750 volts, $29\frac{3}{8}$ inches; 1500 volts, $36\frac{5}{8}$ inches.

Approximate weight, 750 volts, 19 pounds; 1500 volts, 22 pounds.

Provided with a suspension yoke for attaching to cross-span wire, a $\frac{5}{8}$ -inch threaded boss for attaching to hanger stud and a pair of eyes with holes $\frac{1}{2} \times 1$ inch for fastening to guy wires.

When a hanger is used to support insulator, the yoke casting may be unscrewed and hanger stud threaded directly into boss.

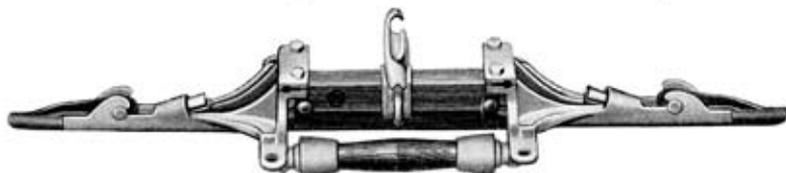
750 Volts

Code Word	No.	List Each
<i>Birchen.</i>	9956—Insulator, 750 Volts, for 3-0 and 4-0 Round, Fig. 8 and Grooved Wires.....	\$20 00
<i>Birlaw.</i>	9957—Runner Piece for 750 Volts.....	50

1500 Volts

<i>Amateurs.</i>	10409—Insulator, 1500 Volts, for 0 to 4-0 Round, Fig. 8 and Grooved Wires.....	\$22 00
<i>Ambler.</i>	10410—Runner Piece for 1500 Volts.....	1 00

Above Insulators can be furnished with boss tapped for $\frac{1}{2}$ -inch stud if so ordered.

**TYPE A-3 SECTION INSULATOR****Patented—Malleable Iron, with Renewable Bronze Tips—750 Volts**

ENTIRE trolley tension is sustained by two strain insulators in same horizontal plane as trolley wire. This prevents buckling. There are four $\frac{1}{2}$ -inch eyes for guy wires, also in same horizontal plane as wire.

Wood Strain Insulators are $1\frac{1}{4}$ inches in diameter and give 5 inches of insulation. They are secured to end pieces by $\frac{3}{8}$ -inch machine bolts provided with lock washers.

Fibre runner piece has bronze arcing clips at each end. Runner and clips are renewable as a unit—remove two bolts; take out runner, insert new runner, replace bolts.

Central compression beam is slotted to receive runner piece which is held firm and straight by this means.

Trolley wire is held by tapered chucks serrated on inside. As strain on wires increases the grip of the chucks tighten. Chucks are same as furnished with Cleveland Splicers listed on pages 340-341.

Equipped with $2\frac{1}{2}$ -inch renewable bronze cam tips; forming a smooth approach. Can be furnished with long tips. Easily installed or renewed.

Insulator may be suspended by yoke casting directly from cross span wires, or the yoke may be unscrewed and a standard trolley hanger with $\frac{5}{8}$ -inch stud threaded directly into boss. Suspension casting has a pair of eyes $\frac{1}{2}$ inch in diameter for guy wires.

Feed lugs take wire up to $\frac{1}{2}$ -inch diameter. Feeder may be run straight through and across street without taking off taps—on double track or double trolley both insulators are fed from same wires.

End castings are malleable iron, sherardized.

Length overall, 34 inches; length break, $8\frac{7}{8}$ inches.

Approximate weight, 19 pounds.

Code Word	No.		List Each
<i>Redemise.</i>	13373	—Insulator for 0 Round Wire.....	\$17 60
<i>Quaffer.</i>	13070	— " " 2-0 " "	17 60
<i>Quagmire.</i>	13071	— " " 2-0 Grooved "	17 60
<i>Quaintly.</i>	13072	— " " 3-0 Round "	17 60
<i>Quaker.</i>	13073	— " " 3-0 Grooved "	17 60
<i>Quaking.</i>	13074	— " " 4-0 Round "	17 60
<i>Quandong.</i>	13075	— " " 4-0 Grooved "	17 60
<i>Quarrel.</i>	12755	—Runner Piece, Fiber, with Clips	2 00

For description and listing of Renewable Bronze Cam Tips, see page 374.

For listing of Chucks, see page 341.

**TYPE C SECTION INSULATOR****Patented****Malleable Iron—With Renewable Bronze Cam Tips****750 Volts**

CONSISTS of a substantial second-growth hickory beam, impregnated and varnished, to which are attached sherardized malleable iron end castings having $2\frac{1}{2}$ -inch renewable bronze tips. Can be furnished with long tips.

Wires are fastened to end pieces by means of "U" Bolts made of $\frac{7}{16}$ -inch stock. Bronze tips are inserted under hooks upside down with tips pointed toward center and are forced over and outward until tips encircle wires. Cam action of tips forces the wires into bottom of grooves and holds them securely in place.

Each end casting has a feeder lug which will take feeder wire up to and including 4-0 Strand.

Central fibre runner and bronze retaining clips may be taken off as a unit by removing two bolts. A new unit is then inserted and the bolts replaced.

Provided with a suspension yoke for attachment to cross-span wire, a $\frac{5}{8}$ -inch threaded boss for attaching to hanger stud and a pair of eyes with holes $\frac{5}{8}$ inch in diameter for fastening to guy wires.

When a hanger is used to support insulator, the yoke casting may be unscrewed and hanger stud threaded directly into boss.

Length overall, 38 inches; length break, 7 inches.

Approximate weight, $12\frac{1}{2}$ pounds.

Code Word	No.		List Each
<i>Redemptory.</i>	13374—	Insulator for 0 Round Wire.....	\$15 60
<i>Middling.</i>	11900—	" " 2-0 " and Grooved Wires.....	15 60
<i>Midgard.</i>	11901—	" " 3-0 " " " ".....	15 60
<i>Midland.</i>	11902—	" " 4-0 " " " ".....	15 60
<i>Midway.</i>	11906—	Runner Piece, Fibre, with Clips.....	2 60

This Insulator can be furnished for use on Fig. 8. Wire.

For description and listing of Renewable Bronze Cam Tips, see page 374.



FIBRE AND WOOD SECTION INSULATORS

For Round, Figure 8 and Grooved Wires

Bronze—750 Volts



PROVIDED with either white fibre or impregnated and varnished hard wood insulation, 12 inches long, to which are attached bronze end castings.

A feeder lug is provided on each end casting drilled for a 2-0 to 4-0 solid or stranded feeder wire.

Intended to be supported by some form of straight line hanger by means of suspension boss tapped for $\frac{5}{8}$ -inch stud. Length overall, 25 $\frac{1}{2}$ inches; height, 3 $\frac{7}{8}$ inches; set screws, $\frac{1}{2}$ x1 inch.

With Fibre Insulation

Code Word	No.				List Each
<i>Beseech.</i>	3193	—Section Insulator for	0	Round Wire	\$9 80
<i>Besought.</i>	4143	— “ “ “	2-0	“ “	9 80
<i>Besiege.</i>	4144	— “ “ “	3-0	“ “	9 80
<i>Betoken.</i>	4145	— “ “ “	4-0	“ “	9 80
<i>Betrayed.</i>	4146	— “ “ “	0	Fig. 8 “	9 80
<i>Betwixt.</i>	4147	— “ “ “	2-0	“ 8 “	9 80
<i>Beverage.</i>	4148	— “ “ “	3-0	“ 8 “	9 80
<i>Bewilder.</i>	4149	— “ “ “	4-0	“ 8 “	9 80
<i>Bewitch.</i>	4150	— “ “ “	2-0	Grooved “	9 80
<i>Biblical.</i>	4151	— “ “ “	3-0	“ “	9 80
<i>Bickern.</i>	4152	— “ “ “	4-0	“ “	9 80
<i>Bicuspid.</i>	3195	—Fibre Beam			2 20

With Wood Insulation

<i>Bidental.</i>	5720	—Section Insulator for	0	Round Wire	\$8 80
<i>Biferous.</i>	5721	— “ “ “	2-0	“ “	8 80
<i>Biform.</i>	5722	— “ “ “	3-0	“ “	8 80
<i>Bigamy.</i>	5723	— “ “ “	4-0	“ “	8 80
<i>Bigoted.</i>	5724	— “ “ “	0	Fig. 8 “	8 80
<i>Billet.</i>	5725	— “ “ “	2-0	“ 8 “	8 80
<i>Billiard.</i>	5726	— “ “ “	3-0	“ 8 “	8 80
<i>Binary.</i>	5727	— “ “ “	4-0	“ 8 “	8 80
<i>Binnacle.</i>	5728	— “ “ “	2-0	Grooved “	8 80
<i>Biology.</i>	5729	— “ “ “	3-0	“ “	8 80
<i>Biometry.</i>	5730	— “ “ “	4-0	“ “	8 80
<i>Biramous.</i>	5719	—Wood Beam			45

Boss can be furnished tapped for $\frac{1}{4}$ -inch Stud if so ordered.

**MIAMI SECTION INSULATOR****For Round, Figure 8 and Grooved Wires****Bronze—750 Volts**

BODY portion is a heavy block of thoroughly seasoned hickory impregnated and varnished to which bronze end castings are securely bolted. The outer ends of these castings are grooved at bottom to receive trolley wire, which is fastened in place by means of set screws.

Lips on end castings are arranged to clinch under wire after the latter is in place.

Runner piece is hard wood impregnated and varnished, and is arranged so as to be easily removed and replaced. A feeder lug is provided on each end casting drilled for a 2-0 to 4-0 B. & S. solid or stranded feeder wire.

Has a straight under-run and offers a smooth passage for the trolley.

Provided with a suspension boss tapped for a $\frac{1}{2}$ -inch stud bolt and is designed to be supported by some form of straight line hanger.

Length overall, 29 $\frac{1}{4}$ inches; height, 5 inches; set screws, $\frac{3}{8}$ x $\frac{1}{2}$ inch.

Code Word	No.		List Each
<i>Behest.</i>	5805—	Section Insulator for 0 Round Wire.....	\$11 30
<i>Belfry.</i>	5806—	" " " 2-0 " "	11 30
<i>Bellow.</i>	5807—	" " " 3-0 " "	11 30
<i>Bemoan.</i>	5808—	" " " 4-0 " "	11 30
<i>Benedict.</i>	5809—	" " " 0 Fig. 8 " "	11 30
<i>Benefic.</i>	5810—	" " " 2-0 " 8 "	11 30
<i>Benign.</i>	5811—	" " " 3-0 " 8 "	11 30
<i>Benumb.</i>	5812—	" " " 4-0 " 8 "	11 30
<i>Bequeath.</i>	5813—	" " " 2-0 Grooved " "	11 30
<i>Bequest.</i>	5814—	" " " 3-0 " "	11 30
<i>Bereave.</i>	5815—	" " " 4-0 " "	11 30
<i>Berry.</i>	5804—	Runner Piece.....	34

Boss can be furnished tapped for $\frac{1}{2}$ -inch Stud if so ordered.

**MIAMI SECTION INSULATOR WITH SWITCH**

For Round, Figure 8 and Grooved Wires

Bronze—750 Volts



SAME design as our Miami Section Insulator listed on the preceding page, with the addition of a knife switch mounted on the side for closing the trolley circuit around the insulator.

The device is intended for use in mines where it is desired to keep any section of the trolley alive only when a locomotive is operating in it. The insulator should be mounted so that the motion of the switch in closing is in the direction of traffic entering the dead section. This enables the motorman to throw the switch without leaving the cab and without stopping the locomotive either entering or leaving the dead section.

The contact clips are interchangeable and bolted upon the center portion so that it is easy to change them around and thus reverse the operating direction of the handle, if desired.

The switch handle projects out from the insulator when the switch is closed and the connecting wires are insulated, thus eliminating danger from contact with the live terminal.

The switch and its connections with the feeder lugs have a carrying capacity equal to that of 4-0 copper wire. All wood parts are impregnated and painted with black acid-proof paint, the same as used on storage batteries.

Length overall is 29½ inches; height, 5 inches; set screws, ⅜x⅛ inch; and boss is tapped for a ⅝-¹/₂-inch stud.

Code Word	No.	List Each
<i>Heirloom.</i>	10606—Section Insulator with Switch, for 2-0 Round Wire	\$18 00
<i>Heirship.</i>	10607— " " " " " 3-0 " "	18 00
<i>Helena.</i>	10608— " " " " " 4-0 " "	18 00
<i>Heliac.</i>	10609— " " " " " 0 Fig. 8 "	18 00
<i>Helicin.</i>	10610— " " " " " 2-0 " 8 "	18 00
<i>Helicoid.</i>	10611— " " " " " 3-0 " 8 "	18 00
<i>Helicon.</i>	10612— " " " " " 4-0 " 8 "	18 00
<i>Helio.</i>	10613— " " " " " 2-0 Grooved "	18 00
<i>Helium.</i>	10614— " " " " " 3-0 " "	18 00
<i>Heliz.</i>	10615— " " " " " 4-0 " "	18 00
<i>Berry.</i>	5804—Runner Piece	34

Boss can be furnished tapped for ¼-inch Stud if so ordered.

**TYPE M-1 MINE SECTION INSULATOR SWITCH**

750 Volts—Patented

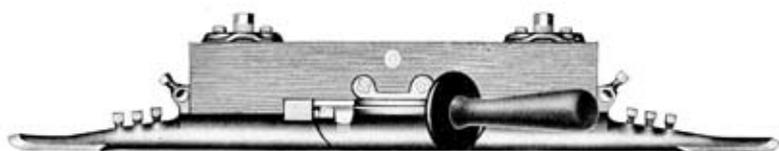


Fig. 1—Switch Closed

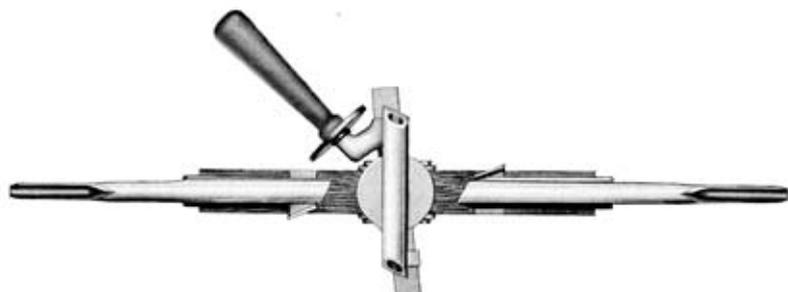


Fig. 2—Switch Open

USED in mines where it is desired to have current in any section of the trolley wire only when a locomotive is operating there. Switch is closed by locomotive driver when entering the section and opened on leaving it.

Beam is made of hickory, impregnated and painted with black acid-proof paint, the same as used on storage batteries. End castings are bronze. Rotatable center is malleable iron, equipped with a copper switch blade. Handle is soft rubber.

Metallic under-run allows locomotive to operate under Insulator with current on without arcing or sudden rush of current to motors.

Rigidly fastened to mine roof by two $\frac{5}{8}$ -inch insulated hangers.

Feeder lugs will take 4-0 solid or smaller wires. Capacity of switch is ample for any current that will be carried by trolley wire.

Height, $5\frac{7}{8}$ inches; set screws, $\frac{3}{8}$ x $\frac{3}{8}$ inch; length overall, regular length, 30 inches—extra length, $34\frac{1}{4}$ inches.

See listing on the opposite page.

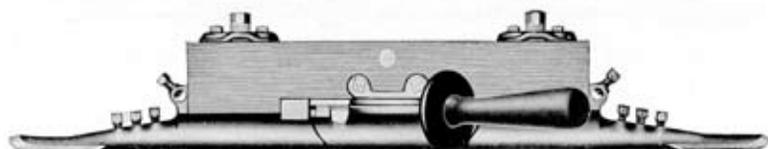


TYPE M-1 MINE SECTION INSULATOR SWITCH

750 Volts—Patented

Continued

With Two Suspensions

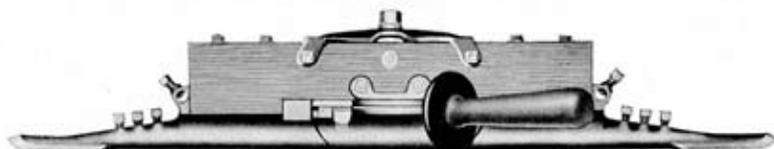


Code Word	No.	Regular Length	List Each
<i>Minaret.</i>	11631—	Section Insulator Switch, for 2-0 Round and Grooved Wires.	\$18 00
<i>Mincer.</i>	11600—	" " " " 4-0 " " " " "	18 00
<i>Minerva.</i>	11632—	" " " " 2-0 Fig. 8 Wire	18 00
<i>Minibus.</i>	11633—	" " " " 4-0 " 8 " "	18 00

Extra Length

<i>Pullback.</i>	13115—	Section Insulator Switch, for 2-0 Round and Grooved Wires.	19 50
<i>Pullicate.</i>	13116—	" " " " 4-0 " " " " "	19 50
<i>Pulmonate.</i>	13117—	" " " " 2-0 Fig. 8 Wire	19 50
<i>Pulmonic.</i>	13118—	" " " " 4-0 " 8 " "	19 50

With One Suspension at Center



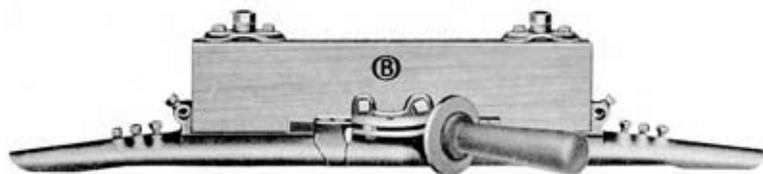
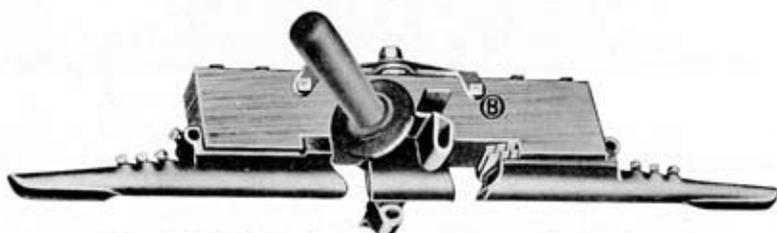
Regular Length

<i>Seaward.</i>	13789—	Section Insulator Switch, for 2-0 Round and Grooved Wires.	18 00
<i>Secale.</i>	13790—	" " " " 4-0 " " " " "	18 00
<i>Secess.</i>	13791—	" " " " 2-0 Fig. 8 Wire	18 00
<i>Secretion.</i>	13792—	" " " " 4-0 " 8 " "	18 00

Switch Handle

<i>Sallet.</i>	13691—	Switch Handle, Soft Rubber	1 70
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See description on the opposite page.

**TYPE M-2 MINE SECTION INSULATOR SWITCH****750 Volts—Patented****Nos. 13450-13453—Two Suspensions—Switch Closed****Nos. 13793-13796—Center Suspension—Switch Open**

SIMILAR to M-1 Section Insulator Switch shown on preceding page but has a different arrangement of rotating member.

Center section of runner is stationary so that a smooth passage is afforded for trolley wheel at all times, whether switch is open or closed.

A spring latch holds switch in open position against vibration but does not interfere with its easy operation by hand.

Hickory beam is impregnated and painted with acid-proof paint. End castings are bronze; rotatable parts malleable iron with copper switch blade.

Feeder lugs will take 4-0 solid or smaller wires. Switch large enough capacity for any current carried by trolley.

Length, 30 inches; height, 5 inches; set screws, $\frac{3}{8} \times \frac{7}{8}$ inch.

With Two Suspensions

Code Word	No.	List Each
<i>Recover.</i>	13450—Section-Insulator Switch, for 2-0 Round and Grooved Wires.	\$19 50
<i>Recreant.</i>	13451— " " " " 4-0 " " "	19 50
<i>Recreative.</i>	13452— " " " " 2-0 Fig. 8 Wire	19 50
<i>Recruit.</i>	13453— " " " " 4-0 " 8 "	19 50

With One Suspension at Center

<i>Secretive.</i>	13793—Section Insulator Switch, for 2-0 Round and Grooved Wires.	19 50
<i>Sectism.</i>	13794— " " " " 4-0 " " "	19 50
<i>Secular.</i>	13795— " " " " 2-0 Fig. 8 Wire	19 50
<i>Sedately.</i>	13796— " " " " 4-0 " 8 "	19 50

Switch Handle

<i>Sallet.</i>	13691—Switch Handle, Soft Rubber	1 70
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**AUTOMATIC MINE SECTION INSULATOR****For Round, Figure 8 and Grooved Wires****750 Volts**

INTENDED for use in mines where it is desired to keep the trolley on any section alive only when a locomotive is operating in that section. The function of the device is to automatically close the circuit as locomotive enters upon the section and to open it as locomotive passes out.

Switch mechanism is operated by pressure of trolley wheel against central rocker portion, and switch is so arranged that circuit is not opened or closed except when no current is being drawn through the switch. This does away with destructive arcing and burning of the switch contacts.

Attachment can be made directly to mine roof timbers by means of braces shown on top. Trolley wires are attached rigidly to each of the end castings by means of two heavy clamps.

Can also be used on overhead construction where it is desired to maintain a trolley section which is not used frequently and upon which current is to be maintained only when a car is operating on that section.

Length overall is 30 inches and height is 5 inches.

Holes for lag screws or bolts in support castings are $\frac{7}{16}$ inch in diameter. Long distance between centers of holes is $10\frac{1}{2}$ inches and short distance $3\frac{1}{4}$ inches.

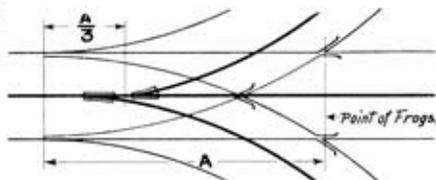
Code Word	No.	List Each
<i>Biscotin.</i>	9034—Section Insulator for Nos. 0, 2-0, 3-0 and 4-0 Round, Fig. 8 and Grooved Wires.....	\$19 20
<i>Bisect.</i>	9035—Switch Clips and Screws.....	24
<i>Bisque.</i>	9036—Locking Springs.....	06



O-B TROLLEY FROGS

In the O-B Frogs listed on the following pages the designation "right-hand," "left-hand," etc., indicates the direction of the turnout. For ordinary city service, with turnout radii not exceeding 50 feet, the 20 degree frogs are suitable, but with the longer radii introduced by suburban and interurban work, smaller divergence angles are necessary, and the employment of high speeds has necessitated the use of longer pans to allow overcoming the inertia of the trolley wheel in transition between the inner ends of tongues.

Instead of the old three-way frogs, many prefer to use a right and left-hand frog, installed one in front of the other.

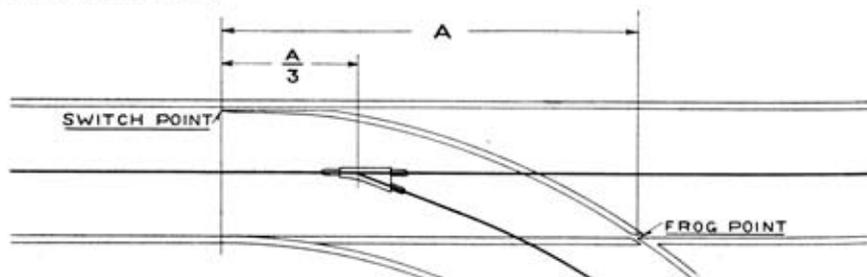


Right and left-hand frogs used instead of three-way

Installation and Proper Location

The following is the recommendation of the American Electric Railway Engineering Association:

"Frogs shall be installed with both main line and branch trolley wires led straight through, the latter to end six (6) feet beyond frog in eye of strain insulator to other end of which is close tied a seven (7) wire steel strand, secured to pole at a level as nearly that of frog as will allow safe clearance over other wires. The frog itself shall be held on each side by a guy of seven (7) wire steel strand with strain insulator attached to frog and secured to proper poles at the point of span attachment.



"Frogs shall be temporarily located on center line of main track and one-third ($\frac{1}{3}$) distance from track switch points to track frog point back from switch points, and if need be shall be shifted to suit conditions and equipment. Until final location is made, trolley wire should be clamped just firmly enough to prevent slipping without bruising or kinking. Care must be taken that frog is not located too far back of track switch points, as such location while often giving satisfactory running, will result in excessive wear of trolley wire."



TYPE D TROLLEY FROG

Patented

Conforms to A. E. R. A. Specifications



With Short Cam Tips



With Long Cam Tips

CONSISTS of only six parts—pan casting, clamping piece, clamping bolt and three bronze combination tip and cam wedge castings.

Installation is accomplished with a minimum amount of time because of few operations necessary.

Wires are clamped to pan by tightening nut on central clamp casting.

End pieces are then inserted under hooks upside down with tips pointed toward center of pan and are forced over and outward until lips encircle the wires, the cams meantime forcing wires into bottom of grooves and holding them securely in place.

Lips are then clinched around wires and operation is completed.

Clamping arrangement is amply strong for holding wire and cams are designed to force either a new or badly worn old wire into bottom of groove.

Pan offers a smooth under-run for all sizes of trolley wheels. Sides are flared outwardly at the ends to catch wheel and a deflector bar between branch arms prevents wedging of wheel in case it should jump.

Tips have lips ground to a knife edge at outer end and left full thickness at inner to provide an easy approach to pan runner. As listed on the following pages, frogs are furnished either with short tips having 2½-inch lips or with long tips having 6-inch lips.

Pull-off rings have holes ½x1 inch. All iron parts are sherardized.

See listing on following pages.



TYPE D TROLLEY FROGS

Patented—Continued

20°



With Short Cam Tips—Length Overall, 23 Inches

Code Word	No.		List Each
	13376	—Right-Hand Frog, 20°, for 0 Round Wire	\$7 10
<i>Redfin.</i>	11248	— " " 20°, " 2-0 R'd and G'v'd Wires	7 10
<i>Jacobus.</i>	11249	— " " 20°, " 3-0 " " " "	7 10
<i>Jactancy.</i>	11250	— " " 20°, " 4-0 " " " "	7 10
<i>Jadish.</i>	11251	— " " 20°, " 2-0 Fig. 8 Wire	7 10
<i>Jaggery.</i>	11252	— " " 20°, " 4-0 " S "	7 10
<i>Jailer.</i>	13377	—Left-hand " " 20°, " 0 Round Wire	7 10
<i>Redhead.</i>	11253	— " " 20°, " 2-0 R'd and G'v'd Wires	7 10
<i>Jainism.</i>	11254	— " " 20°, " 3-0 " " " "	7 10
<i>Jangle.</i>	11255	— " " 20°, " 4-0 " " " "	7 10
<i>Janker.</i>	11256	— " " 20°, " 2-0 Fig. 8 Wire	7 10
<i>Japery.</i>	11257	— " " 20°, " 4-0 " S "	7 10
<i>Jargle.</i>	13378	—"V" Frog, 20°, for 0 Round Wire	7 10
<i>Redient.</i>	11258	— " " 20°, " 2-0 R'd and G'v'd Wires	7 10
<i>Jargonie.</i>	11259	— " " 20°, " 3-0 " " " "	7 10
<i>Jarring.</i>	11260	— " " 20°, " 4-0 " " " "	7 10
<i>Jasmine.</i>	11261	— " " 20°, " 2-0 Fig. 8 Wire	7 10
<i>Jasper.</i>	11262	— " " 20°, " 4-0 " S "	7 10
<i>Jaspoid.</i>			

With Long Cam Tips—Length Overall, 30 Inches

<i>Sedative.</i>	13806	—Right-Hand Frog, 20°, for 0 Round Wire	7 70
<i>Seduce.</i>	13807	— " " 20°, " 2-0 R'd and G'v'd Wires	7 70
<i>Seducer.</i>	13808	— " " 20°, " 3-0 " " " "	7 70
<i>Seed.</i>	13809	— " " 20°, " 4-0 " " " "	7 70
<i>Seedless.</i>	13810	—Left-Hand " " 20°, " 0 Round Wire	7 70
<i>Secmless.</i>	13811	— " " 20°, " 2-0 R'd and G'v'd Wires	7 70
<i>Secress.</i>	13812	— " " 20°, " 3-0 " " " "	7 70
<i>Seersucker.</i>	13813	— " " 20°, " 4-0 " " " "	7 70
<i>Seignion.</i>	13814	—"V" Frog, 20°, for 0 Round Wire	7 70
<i>Selection.</i>	13815	— " " 20°, " 2-0 R'd and G'v'd Wires	7 70
<i>Selfish.</i>	13816	— " " 20°, " 3-0 " " " "	7 70
<i>Selless.</i>	13817	— " " 20°, " 4-0 " " " "	7 70

See description on page 365.

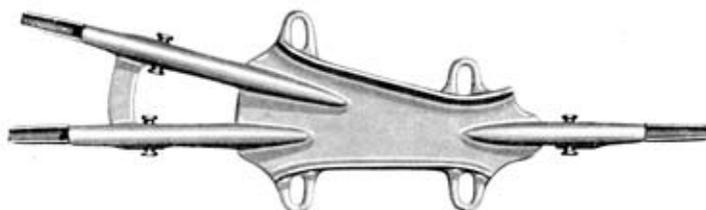
For description and listing of Renewable Bronze Cam Tips, see page 374.



TYPE D TROLLEY FROGS

Patented—Continued

15°



With Short Cam Tips—Length Overall, 26 Inches

Code Word	No.	List Each
<i>Redolent.</i>	13379—Right-Hand Frog, 15°, for 0 Round Wire	87 60
<i>Jaunce.</i>	11263—“ “ 15°, “ 2-0 R'd and G'v'd Wires	7 60
<i>Jauntily.</i>	11264—“ “ 15°, “ 3-0 “ “ “ “	7 60
<i>Javelin.</i>	11265—“ “ 15°, “ 4-0 “ “ “ “	7 60
<i>Juliform.</i>	11315—“ “ 15°, “ 2-0 Fig. 8 Wire	7 60
<i>Jawing.</i>	11266—“ “ 15°, “ 4-0 “ 8 “	7 60
<i>Redouble.</i>	13380—Left-Hand “ 15°, “ 0 Round Wire	7 60
<i>Jazerant.</i>	11267—“ “ 15°, “ 2-0 R'd and G'v'd Wires	7 60
<i>Jeames.</i>	11268—“ “ 15°, “ 3-0 “ “ “ “	7 60
<i>Jeering.</i>	11269—“ “ 15°, “ 4-0 “ “ “ “	7 60
<i>Jumble.</i>	11316—“ “ 15°, “ 2-0 Fig. 8 Wire	7 60
<i>Jejunity.</i>	11270—“ “ 15°, “ 4-0 “ 8 “	7 60
<i>Redraft.</i>	13381—“V” Frog, 15°, for 0 Round Wire	7 60
<i>Jentling.</i>	11271—“ “ 15°, “ 2-0 R'd and G'v'd Wires	7 60
<i>Jerquer.</i>	11272—“ “ 15°, “ 3-0 “ “ “ “	7 60
<i>Jervine.</i>	11273—“ “ 15°, “ 4-0 “ “ “ “	7 60
<i>Jument.</i>	11317—“ “ 15°, “ 2-0 Fig. 8 Wire	7 60
<i>Jessant.</i>	11274—“ “ 15°, “ 4-0 “ 8 “	7 60

With Long Cam Tips—Length Overall, 33 Inches

<i>Senator.</i>	13824—Right-Hand Frog, 15°, for 0 Round Wire	8 20
<i>Senior.</i>	13825—“ “ 15°, “ 2-0 R'd and G'v'd Wires	8 20
<i>Sennet.</i>	13826—“ “ 15°, “ 3-0 “ “ “ “	8 20
<i>Senora.</i>	13827—“ “ 15°, “ 4-0 “ “ “ “	8 20
<i>Senorita.</i>	13828—Left-Hand “ 15°, “ 0 Round Wire	8 20
<i>Sensation.</i>	13829—“ “ 15°, “ 2-0 R'd and G'v'd Wires	8 20
<i>Senseless.</i>	13830—“ “ 15°, “ 3-0 “ “ “ “	8 20
<i>Sensible.</i>	13831—“ “ 15°, “ 4-0 “ “ “ “	8 20
<i>Sensitive.</i>	13832—“V” Frog, 15°, for 0 Round Wire	8 20
<i>Sensuous.</i>	13833—“ “ 15°, “ 2-0 R'd and G'v'd Wires	8 20
<i>Sentence.</i>	13834—“ “ 15°, “ 3-0 “ “ “ “	8 20
<i>Sentential.</i>	13835—“ “ 15°, “ 4-0 “ “ “ “	8 20

See description on page 365.

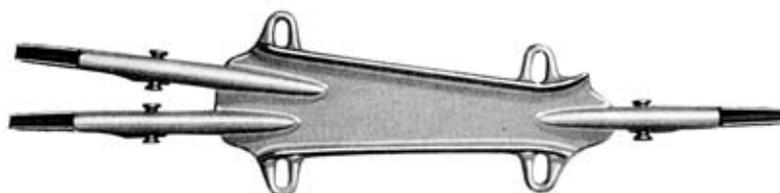
For description and listing of Renewable Bronze Cam Tips, see page 374.



TYPE D TROLLEY FROG

Patented

8°



With Short Cam Tips—Length Overall, 28½ Inches

Code Word	No.		List Each
<i>Redraw.</i>	13382—	Right-Hand Frog, 8°, for 0 Round Wire.....	\$8 50
<i>Minister.</i>	11890—	" " " 8°, " 2-0 R'd and G'v'd Wires.....	8 50
<i>Miniver.</i>	11891—	" " " 8°, " 3-0 " " " " " ".....	8 50
<i>Minnov.</i>	11892—	" " " 8°, " 4-0 " " " " " ".....	8 50
<i>Minobird.</i>	11893—	" " " 8°, " 2-0 Fig. 8 Wire.....	8 50
<i>Mintage.</i>	11894—	" " " 8°, " 4-0 " S " " " ".....	8 50
<i>Redress.</i>	13383—	Left-Hand " 8°, " 0 Round Wire.....	8 50
<i>Mintman.</i>	11895—	" " " 8°, " 2-0 R'd and G'v'd Wires.....	8 50
<i>Minuet.</i>	11896—	" " " 8°, " 3-0 " " " " " ".....	8 50
<i>Mirage.</i>	11897—	" " " 8°, " 4-0 " " " " " ".....	8 50
<i>Mirksome.</i>	11898—	" " " 8°, " 2-0 Fig. 8 Wire.....	8 50
<i>Mirthful.</i>	11899—	" " " 8°, " 4-0 " S " " " ".....	8 50

With Long Cam Tips—Length Overall, 35½ Inches

<i>Sequester.</i>	13842—	Right-Hand Frog, 8°, for 0 Round Wire.....	9 10
<i>Sequin.</i>	13843—	" " " 8°, " 2-0 R'd and G'v'd Wires.....	9 10
<i>Seraph.</i>	13844—	" " " 8°, " 3-0 " " " " " ".....	9 10
<i>Servile.</i>	13845—	" " " 8°, " 4-0 " " " " " ".....	9 10
<i>Servitor.</i>	13846—	Left-Hand " 8°, " 0 Round Wire.....	9 10
<i>Servitude.</i>	13847—	" " " 8°, " 2-0 R'd and G'v'd Wires.....	9 10
<i>Settee.</i>	13848—	" " " 8°, " 3-0 " " " " " ".....	9 10
<i>Settlement.</i>	13849—	" " " 8°, " 4-0 " " " " " ".....	9 10

See description on page 365.

For description and listing of Renewable Bronze Cam Tips, see page 374.



TYPE DM MINE TROLLEY FROG

Patented

Conforms to A. E. R. A. Specifications



SIMILAR in general construction to the Type D Frog but shorter and lighter. Intended for use on mine and industrial lines where operation is at slow speed.

Body is sherardized malleable iron, equipped with renewable bronze cam tips having lips $2\frac{1}{2}$ inches long.

Two pull-off rings on body casting have holes $\frac{1}{2} \times \frac{3}{8}$ inch.

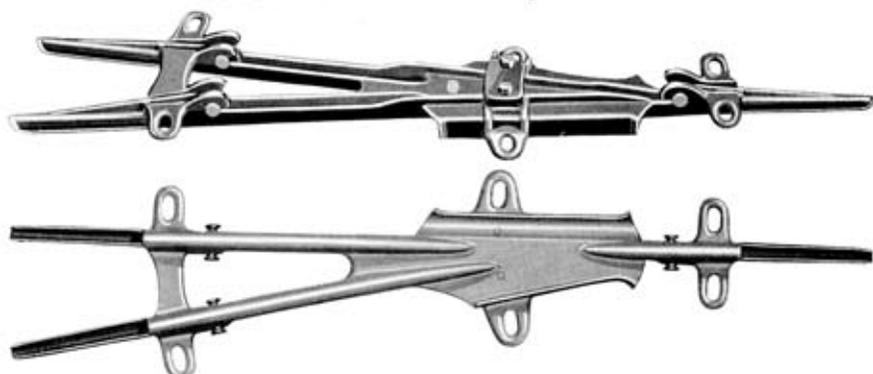
All iron parts are sherardized.

Code Word	No.		List Each
<i>Scribe.</i>	13636	—Right-Hand Frog, 20°, for 0 Round Wire.....	\$6 00
<i>Scroll.</i>	13637	— “ “ 20°, “ 2-0 “ and Grooved Wires.....	6 00
<i>Scrolled.</i>	13638	— “ “ 20°, “ 3-0 “ “ “ “	6 00
<i>Scrubber.</i>	13639	— “ “ 20°, “ 4-0 “ “ “ “	6 00
<i>Scullery.</i>	13640	— “ “ 20°, “ 2-0 Fig. 8 Wire.....	6 00
<i>Scullion.</i>	13641	— “ “ 20°, “ 4-0 “ 8 “	6 00
<i>Scurry.</i>	13642	—Left-Hand “ 20°, “ 0 Round Wire.....	6 00
<i>Scylla.</i>	13643	— “ “ 20°, “ 2-0 “ and Grooved Wires....	6 00
<i>Seacoast.</i>	13644	— “ “ 20°, “ 3-0 “ “ “ “	6 00
<i>Seagod.</i>	13645	— “ “ 20°, “ 4-0 “ “ “ “	6 00
<i>Scaletter.</i>	13646	— “ “ 20°, “ 2-0 Fig. 8 Wire.....	6 00
<i>Seaman.</i>	13647	— “ “ 20°, “ 4-0 “ 8 “	6 00

**TYPE E TROLLEY FROG**

Patented

Conforms to A. E. R. A. Specifications



MADE along the standard Detroit or Dunne lines but fitted with O-B Renewable Bronze Cam Tips with lips 6 inches long.

Provided with a groove in pan to prevent wobbling of trolley wheel and tendency of wheel to take turnout when car is passing on straight line.

Extra long legs or body extensions serve to steady the trolley wheel and take side wear, thus protecting trolley wire.

Deflector bar prevents wild trolley from hooking in or fouling in acute angle formed by turnout wire.

Provided with six oblong pull-off eyes $\frac{1}{2} \times 1$ inch which will take two $\frac{3}{8}$ -inch guys each, if necessary.

Wire clamp is secured to body by two $\frac{3}{8}$ -inch cap screws and lock washers.

All Frogs listed below are 12 degrees; they work equally well on any turnouts for which several different angles are required in the shorter frogs.

Length overall, 37 inches. All iron parts are sherardized.

Code Word	No.		List Each
<i>Redundant.</i>	13375	—Right-Hand Frog, for 0 Round Wire	\$11 00
<i>Palisade.</i>	12570	— " " " " 2-0 " and Grooved Wires	11 00
<i>Palladic.</i>	12571	— " " " " 3-0 " " " " " " " " " "	11 00
<i>Pallor.</i>	12572	— " " " " 4-0 " " " " " " " " " "	11 00
<i>Rectangle.</i>	13397	—Left " " " 0 " Wire	11 00
<i>Palmary.</i>	12573	— " " " " 2-0 " and Grooved Wires	11 00
<i>Palmed.</i>	12574	— " " " " 3-0 " " " " " " " " " "	11 00
<i>Palmette.</i>	12575	— " " " " 4-0 " " " " " " " " " "	11 00
<i>Rectifier.</i>	13398	—"V" Frog, for 0 Round Wire	11 00
<i>Palmped.</i>	12576	— " " " " 2-0 " and Grooved Wires	11 00
<i>Palpable.</i>	12577	— " " " " 3-0 " " " " " " " " " "	11 00
<i>Palsied.</i>	12578	— " " " " 4-0 " " " " " " " " " "	11 00

For description and listing of Renewable Bronze Cam Tips, see page 374.

**TYPE A TROLLEY FROG****All Bronze****Conforms to A. E. R. A. Specifications****20°**

	Length overall, 17 inches	List Each
<i>Camping.</i>	No. 10527—Right-hand Frog, 20° angle, for 0 and 2-0, Round, Fig. 8 and Grooved Wires.....	\$ 8 40
<i>Blandly.</i>	No. 10013—Right-hand Frog, 20° angle, for 3-0 and 4-0, Round, Fig. 8 and Grooved Wires.....	9 00
<i>Campus.</i>	No. 10528—Left-hand Frog, 20° angle, for 0 and 2-0, Round, Fig. 8 and Grooved Wires.....	8 40
<i>Blarney.</i>	No. 10014—Left-hand Frog, 20° angle, for 3-0 and 4-0, Round, Fig. 8 and Grooved Wires.....	9 00
<i>Canard.</i>	No. 10529—V Frog, 20° angle, for 0 and 2-0, Round, Fig. 8 and Grooved Wires.....	8 40
<i>Blatter.</i>	No. 10385—V Frog, 20° angle, for 3-0 and 4-0, Round, Fig. 8 and Grooved Wires.....	9 00

15°

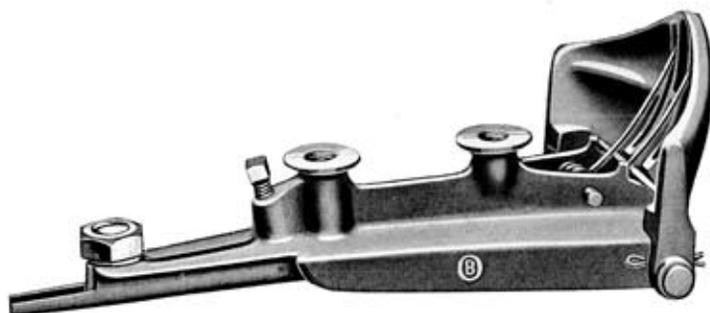
	Length overall, 18 inches	
<i>Blazing.</i>	No. 10015—Right-hand Frog, 15° angle, for 0 to 4-0 inclusive, Round, Fig. 8 and Grooved Wires.....	10 50
<i>Bleach.</i>	No. 10016—Left-hand Frog, 15° angle, for 0 to 4-0 inclusive, Round, Fig. 8 and Grooved Wires.....	10 50
<i>Bleakish.</i>	No. 10386—V Frog, 15° angle, for 0 to 4-0 inclusive, Round, Fig. 8 and Grooved Wires.....	10 50

8°

	Length overall, 21 $\frac{1}{4}$ inches	
<i>Blender.</i>	No. 8685—Right-hand Frog, 8° angle, for 0 to 4-0 inclusive, Round, Fig. 8 and Grooved Wires.....	13 00
<i>Blight.</i>	No. 8686—Left-hand Frog, 8° angle, for 0 to 4-0 inclusive, Round, Fig. 8 and Grooved Wires.....	13 00
<i>Blinder.</i>	No. 8687—V Frog, 8° angle, for 0 to 4-0 inclusive, Round, Fig. 8 and Grooved Wires.....	13 00

Three Way

	Length overall, 18 inches	
<i>Blinkard.</i>	No. 8642—Three-way Frog, 15° angle, for 0 to 4-0 inclusive, Round, Fig. 8 and Grooved Wires.....	16 00

**DRAWBRIDGE FROG****All Bronze**

No. 11389

USED to provide electrical connection for trolley wire on draw bridges and passage for trolley wheel from one section of wire to the other.

Frogs are installed in pairs, so that when bridge is closed, they face each other and contact plates are forced together by springs.

Contact plate is heavy bronze casting, ample to give good contact under varying positions. Under certain conditions the contact plate is not required and No. 11391 is therefore supplied without the plate and springs.

With Contact Plate

Code Word	No.	List Each
<i>Lactose.</i>	11389—Frog, $\frac{3}{4}$ -inch Bosses, for 0 to 4-0 Round and Grooved Wires.	\$18 00

Without Contact Plate

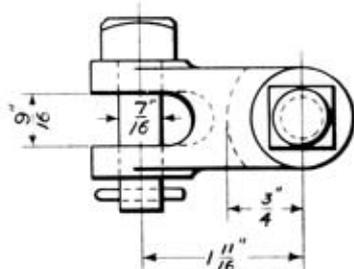
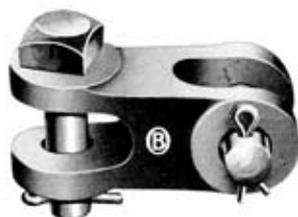
<i>Ladanum.</i>	11391—Frog, $\frac{3}{4}$ -inch Bosses, for 0 to 4-0 Round and Grooved Wires.	12 50
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Either of above can be furnished with $\frac{1}{2}$ -inch Bosses.



CLEVIS ATTACHMENT

For Frogs, Cross-Overs, Section Insulators, Etc.



No. 11104



Clevis Attachments on Type D Frog

ONE end of this Clevis Attachment is intended to be attached directly to the pull-off eyes of frogs, cross-overs, section insulators, etc., and the other end to the span wire by means of bolts and cotter pins.

The advantage of its use lies in the fact that this arrangement makes it unnecessary to make up a new splice in the span wire every time the frog or cross-over is replaced.

The openings in both clevises are $\frac{9}{16}$ inch, and the bolts are $\frac{7}{16}$ inch in diameter. It can be used with 1 and $1\frac{1}{4}$ -inch O-B Wood Strain Insulators, and with all sizes of O-B Composition Strain Insulators.

Code Word
Inusitate.

No.
11104—Clevis Attachment, Malleable Iron, Sherardized.

List per 100

\$37 00

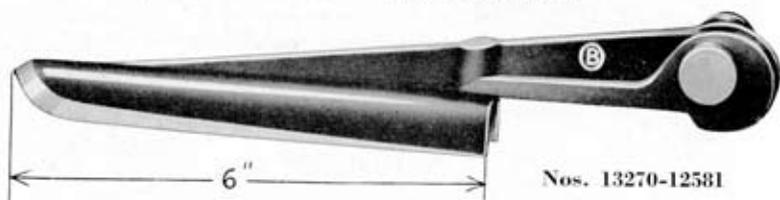


RENEWABLE BRONZE CAM TIPS

Patented



Nos. 13269-11279



Nos. 13270-12581

GIVES a readily renewable approach for malleable iron overhead trolley devices.

In installing, tips are placed upside down under hooks with ends pointing toward center of the frog or other device. Then they are forced over and outward to the position where lips encircle trolley wire. The cam (A) forces wire into bottom of groove at (B).



Lips give a smooth approach for wheel—no bump or depression at (C).

Short tips are regularly furnished on Type B Strain Plate, Types D and DM Frogs, Types A-3 and C Section Insulators, Types E and ER Cross-Overs.

Long tips are regularly furnished on Types D and E Frogs and Types C, F and Wheel-Pantograph Cross-Overs.

Long and short tips are interchangeable on any of the above devices.

Short Tips

Code Word	No.	List per 100
<i>Redwing.</i>	13269—Tip, Bronze, 2 1/2-inch Lips, for 0 Round Wires.....	\$ 80 00
<i>Jesting.</i>	11275— " " " " " 2-0 " " and G'v'd Wires.	80 00
<i>Jeterus.</i>	11276— " " " " " 3-0 " " " " " " "	80 00
<i>Jettison.</i>	11277— " " " " " 4-0 " " " " " " "	80 00
<i>Jeweler.</i>	11278— " " " " " 2-0 Fig. 8 Wire.....	80 00
<i>Jewelry.</i>	11279— " " " " " 4-0 " 8 "	80 00

Long Tips

<i>Reefer.</i>	13270—Tip, Bronze, 6-inch Lips, for 0 Round Wires.....	100 00
<i>Palster.</i>	12579— " " " " " 2-0 " " and G'v'd Wires.	100 00
<i>Paltry.</i>	12580— " " " " " 3-0 " " " " " " "	100 00
<i>Paludal.</i>	12581— " " " " " 4-0 " " " " " " "	100 00

TYPE E LIVE ADJUSTABLE CROSS-OVER

Patented

Conforms to A. E. R. A. Specifications



Form 1—With Deflector Bars

FOR use at trolley wire crossings where it is not desired to insulate the wires from each other. Form 1 should be used on crossings of from 30 to 60 degrees as deflector bars prevent a flying trolley from being caught. For crossings of from 60 to 90 degrees, remove deflector bars or order Form 2 Cross-Over.

Malleable iron pan and cross runner castings interlock and are held together without the use of screws or bolts.

Wires are held in bottom of grooves and prevented from slipping by cam action of renewable bronze tips having lips $2\frac{1}{2}$ inches long. Can be furnished with long tips.

It is not necessary to cut wires to install; simply lay wires in place, insert compression bars at center and attach renewable tips.

All malleable iron parts are sherardized.

Overall dimensions are: height, $3\frac{1}{8}$ inches; length, $23\frac{1}{2}$ inches.

Form 1—With Deflector Bars

Code Word	No.		List Each
<i>Redroot.</i>	13389—	Cross-Over for 0 Round Wire	\$12 20
<i>Misaimed.</i>	11915—	" " 2-0 " and Grooved Wires	12 20
<i>Misalter.</i>	11916—	" " 3-0 " " " "	12 20
<i>Miscall.</i>	11917—	" " 4-0 " " " "	12 20

Form 2—Without Deflector Bars

<i>Reenforce.</i>	13390—	Cross-Over for 0 Round Wire	\$11 20
<i>Miscolor.</i>	11918—	" " 2-0 " and Grooved Wires	11 20
<i>Misfaith.</i>	11919—	" " 3-0 " " " "	11 20
<i>Misgive.</i>	11920—	" " 4-0 " " " "	11 20

These Cross-Overs can be furnished for use with Figure 8 Wire on request. For description and listing of Renewable Bronze Cam Tips, see page 374.

**TYPE ER LIVE RIGID CROSS-OVER****Right Angle****Patented****Conforms to A. E. R. A. Specifications**

FOR use at right angle trolley wire crossings where it is not desired to insulate the wires from each other.

Malleable iron pan is fitted with renewable bronze tips which have cam action that holds wires in bottom of grooves and prevents slipping. Tips regularly furnished have lips $2\frac{1}{2}$ inches long. Can be furnished with long tips.

It is not necessary to cut wires to install; simply lay wires in place, insert compression block at center and attach renewable tips.

All iron parts are sherardized.

Length is $18\frac{1}{4}$ inches. Holes for guy wires in pan casting are $\frac{9}{16}$ inch in diameter.

Code Word	No.	List Each
<i>Redstart.</i>	13384—Cross-Over for 0 Round Wire.....	\$8 20
<i>Ovenbird.</i>	12465— " " 2-0 " and Grooved Wires.....	8 20
<i>Overact.</i>	12466— " " 3-0 " " " ".....	8 20
<i>Overawe.</i>	12467— " " 4-0 " " " ".....	8 20

These Cross-Overs can be furnished for use with Figure 8 Wire on request.

For description and listing of Renewable Bronze Cam Tips, see page 374.



TYPE ER LIVE RIGID CROSS-OVER

Acute Angle—Patented

Conforms to A. E. R. A. Specifications



Nos. 13388-12637

FOR use at acute angle trolley wire crossings where it is not desired to insulate wires from each other.

Malleable iron pan is fitted with renewable bronze tips which have cam action that holds wires in bottom of grooves and prevents slipping. Regularly furnished with tips having lips $2\frac{1}{2}$ inches long. Can be furnished with long tips.

It is not necessary to cut wires in installing; simply lay wires in place and attach renewable tips.

Holes for guy wires are $\frac{1}{2} \times 1$ inch. All iron parts sherardized.

Code Word	No.	8°—Length Overall, 33 $\frac{1}{4}$ Inches	List Each
<i>Redcap.</i>	13385	Cross-Over, 8°, for 0 Round Wire	\$10 20
<i>Phaeton.</i>	12973	" 8°, " 2-0 " and Grooved Wires	10 20
<i>Phalanx.</i>	12974	" 8°, " 3-0 " " " " " " " " "	10 20
<i>Phantasm.</i>	12975	" 8°, " 4-0 " " " " " " " " " "	10 20
15°—Length Overall, 27$\frac{3}{4}$ Inches			
<i>Redden.</i>	13386	Cross-Over, 15°, for 0 Round Wire	10 20
<i>Pharaoh.</i>	12976	" 15°, " 2-0 " and Grooved Wires	10 20
<i>Pharisee.</i>	12977	" 15°, " 3-0 " " " " " " " " "	10 20
<i>Pharmacy.</i>	12978	" 15°, " 4-0 " " " " " " " " " "	10 20
23°—Length Overall, 23$\frac{1}{2}$ Inches			
<i>Reddour.</i>	13387	Cross-Over, 23°, for 0 Round Wire	9 20
<i>Phasel.</i>	12979	" 23°, " 2-0 " and Grooved Wires	9 20
<i>Phenix.</i>	12980	" 23°, " 3-0 " " " " " " " " "	9 20
<i>Philomot.</i>	12981	" 23°, " 4-0 " " " " " " " " " "	9 20
33°—Length Overall, 23$\frac{1}{2}$ Inches			
<i>Rectitude.</i>	13514	Cross-Over, 33°, for 0 Round Wire	9 20
<i>Rector.</i>	13515	" 33°, " 2-0 " and Grooved Wires	9 20
<i>Recumbent.</i>	13516	" 33°, " 3-0 " " " " " " " " "	9 20
<i>Recuperate.</i>	13517	" 33°, " 4-0 " " " " " " " " " "	9 20
35°—Length Overall, 23$\frac{1}{2}$ Inches			
<i>Redeem.</i>	13388	Cross-Over, 35°, for 0 Round Wire	9 20
<i>Phocenic.</i>	12635	" 35°, " 2-0 " and Grooved Wires	9 20
<i>Phonetic.</i>	12636	" 35°, " 3-0 " " " " " " " " "	9 20
<i>Phonic.</i>	12637	" 35°, " 4-0 " " " " " " " " " "	9 20
37°—Length Overall, 23$\frac{1}{2}$ Inches			
<i>Recurt.</i>	13518	Cross-Over, 37°, for 0 Round Wire	8 30
<i>Recusant.</i>	13519	" 37°, " 2-0 " and Grooved Wires	8 30
<i>Recurvate.</i>	13520	" 37°, " 3-0 " " " " " " " " "	8 30
<i>Redaction.</i>	13521	" 37°, " 4-0 " " " " " " " " " "	8 30

These Cross-Overs can be furnished for use with Figure 8 Wire on request. For description and listing of Renewable Bronze Cam Tips, see page 374.

TYPE A INSULATED ADJUSTABLE CROSS-OVER

All Bronze—750 Volts

Conforms to A. E. R. A. Specifications

MADE of bronze, insulation being provided by a bar of thoroughly seasoned hickory, impregnated and varnished.

Provided with renewable runner pieces and has a perfectly straight under-run.

The live crossings are braced to prevent buckling and wire is held in grooved extensions by clamping wedges.

Installation is quickly and easily accomplished as it is not necessary to cut trolley wires.

A wide range of angular adjustment is possible, the Cross-Overs being adaptable to any angle between 45 and 90 degrees.

Renewable runners are $5\frac{1}{2}$ inches long overall and provide a separation between end castings and center castings of $4\frac{1}{4}$ inches.

Type A-1



Code Word
Distort.

No. 9984—Cross-Over, Form 1, for 0 to 4-0 Round, Fig. 8 and Grooved
Wires.....

List Each
\$24 00



TYPE A INSULATED ADJUSTABLE CROSS-OVER

All Bronze—750 Volts

Conforms to A. E. R. A. Specifications

Type A-2



For two live parallel trolley wires crossing a dead one.

Code Word	No.	List Each
<i>Biting.</i>	9985—Cross-Over, Form 2, for 0, 2-0, 3-0 and 4-0 Round, Fig. 8 and Grooved Wires.....	\$42 00

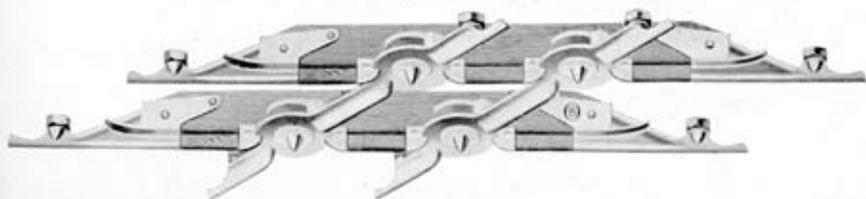
Type A-3



For crossing two dead parallel trolley wires over a live one.

Code Word	No.	List Each
<i>Bitter.</i>	9986—Cross-Over, Form 3, for 0, 2-0, 3-0 and 4-0 Round, Fig. 8 and Grooved Wires.....	\$54 00

Type A-4



For two live and two dead parallel trolley wires crossing each other.

Code Word	No.	List Each
<i>Bivious.</i>	9987—Cross-Over, Form 4, for 0, 2-0, 3-0 and 4-0 Round, Fig. 8 and Grooved Wires.....	\$80 00

In ordering Cross-Overs state the Angle of crossing and the separation between the parallel Trolley Wires.

**TYPE C INSULATED ADJUSTABLE CROSS-OVER****Patented****750 Volts****Conforms to A. E. R. A. Specifications**

USED at trolley wire crossings where it is desired to insulate the two wires from each other.

Insulated member consists of an impregnated and varnished hickory beam to which are attached malleable iron end castings equipped with renewable bronze cam tips having lips 6 inches long.

Cross runner is malleable iron, also equipped with renewable bronze tips, and is adjustable to any angle from 45 to 90 degrees.

Installed without cutting wires and by the removal of only one machine bolt as shown in the illustration.

Runner pieces with their bronze arcing clips are easily renewed as a unit.

Length overall of insulated member, 49 $\frac{3}{4}$ inches; of live member, 28 inches.



**Removing the
Cross Runner**

Code Word	No.	List Each
<i>Redback.</i>	13391—Cross-Over for 0 Round Wire.....	\$30 00
<i>Posgene.</i>	12804— " " 2-0 " and Grooved Wire.....	30 00
<i>Photogen.</i>	12596— " " 3-0 " " " ".....	30 00
<i>Phrasing.</i>	12597— " " 4-0 " " " ".....	30 00
<i>Phreatic.</i>	12598—Runner Piece, Fibre, with Clips.....	3 50

These Cross-Overs can be furnished on request for use with Fig. 8 Wire.
For description and listing of Renewable Bronze Cam Tips, see page 374.



TYPE F INSULATED ADJUSTABLE CROSS-OVER

Patented

750 Volts

Conforms to A. E. R. A. Specifications



ADJUSTABLE to suit any crossings of from 45 to 90 degrees.

Possesses exceptional strength; will withstand more strain than the copper trolley wire with which it is used.

Insulating members at center are best grade white fibre. Runner pieces are sherardized malleable iron, provided with renewable bronze cam tips having 6-inch lips.

Installation is easy. Wires are put in place without cutting and are held by the renewable tips.

Overall dimensions $25\frac{3}{4} \times 27\frac{3}{4}$ inches.

Upper fibre disc is $\frac{3}{4}$ inch thick; lower disc is $\frac{5}{8}$ inch thick.

Code Word	No.	List Each
<i>Redbreast.</i>	13510—Cross-Over for 0 Round Wire.....	\$30 00
<i>Redbird.</i>	13511— " " 2-0 " and Grooved Wires.....	30 00
<i>Redbud.</i>	13512— " " 3-0 " " " ".....	30 00
<i>Redcoat.</i>	13513— " " 4-0 " " " ".....	30 00

These Cross-Overs can be furnished on request for use with Fig. 8 Wire.
For description and listing of Renewable Bronze Cam Tips, see page 374.



NATIONAL TROLLEY GUARD

Patented

NATIONAL Trolley Guard offers an effective means of overcoming the danger of cars being stalled due to trolley jumping. It is in use on several hundred electric roads where it is installed, not only at steam road grade crossings, but at viaducts, car barn entrances and similar points. Well over 100,000 feet are in service.

National Trolley Guard is simple but very positive in action. It consists of a wire mesh formed into an inverted trough mounted above the trolley wire. In case the trolley leaves the wire the wheel is caught

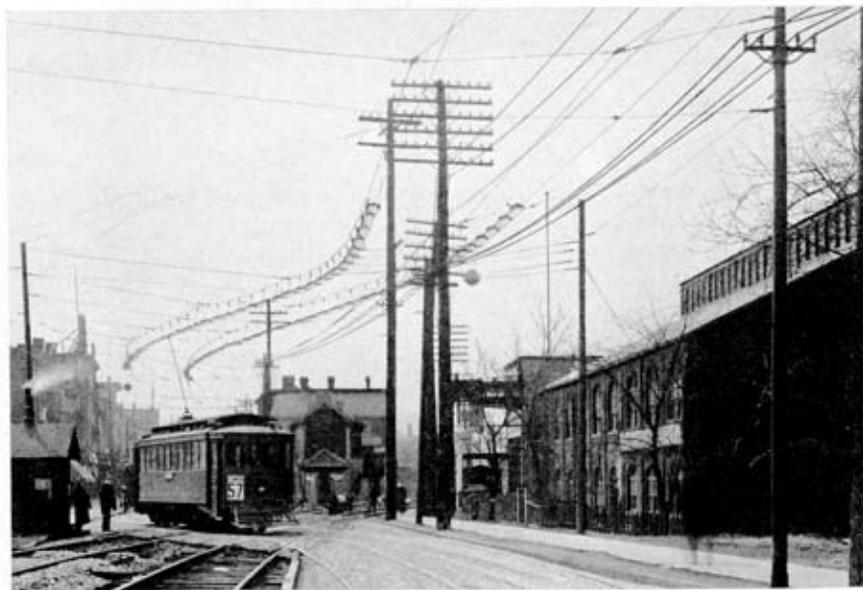


Fig. 1—National Trolley Guard Installed Where Electric Tracks Cross Steam Tracks on a Curve

under the mesh, which is energized and gives power to carry the car to safety.

The wire mesh used for National Guard is diagonal 1-inch square made from No. 10 gauge wire, either Galvanized Iron or Copper. The selvage or binding wire is No. 6 Galvanized Iron or Copper wire.

Diagonal woven mesh is used entirely as it holds its shape much better than the square mesh which was used at one time.

Open mesh has the advantage that it offers little resistance to wind or to the exhausts from locomotives passing under it and will not collect ice and snow to any extent.

See listing on page 386.



NATIONAL TROLLEY GUARD

Patented—Continued

A Galvanized Pressed Steel Yoke or Hanger is used for supporting and holding the Guard in shape. One Yoke is furnished for each five feet of Guard.

Studs for attaching Trolley Ears are also included as part of the regular equipment. The Trolley Ears, Strain Insulators, Messenger and Guy Wire, and Spool Insulators must be ordered extra.

The Guard is furnished for single trolley and for double trolley with 6-inch separation between wires. Installation may be made from cross-span, from pole bracket or from bridges. It is also readily handled on catenary overhead construction. Details of construction will differ in almost every individual case because of local conditions but there are a few broad general principles that may be outlined.

Wherever possible, it is recommended that the Guard be suspended from a messenger or supporting wire. Fig. 4 shows this method of suspension with alternate yokes attached to the messenger wire for single trolley guard; for double trolley guard it is better to attach every yoke to the messenger. It is advisable to insulate the Guard from the messenger by means of porcelain spools, as shown, and also to insulate the messenger from the supporting poles with Wood Strain or Porcelain Strain Insulators.

Anchor guys should be attached to the yokes at each end of the Guard and should be anchored through Strain Insulators to guyed poles. Side guys spaced about 100 feet apart are sufficient to prevent excessive swaying in the wind.



NATIONAL TROLLEY GUARD

Patented—Continued

The additional weight to be supported will be about 150 pounds per 100 feet due to the Trolley Guard itself. Trolley Ears installed at intervals of five feet will add approximately another 25 pounds per 100 feet, making a total additional weight of approximately 175 pounds per 100 feet.

The horizontal loads at the top of poles carrying cross spans for supporting the guard and trolley are given in the following table. The table is based on the cross spans being 100 feet apart and with 4-0 trolley and ears. The load per 100 feet for single guard is 250 pounds and for double guard 425 pounds. From the table a sag can be selected that will not over load the poles, or the correct pole or back guy can be selected.

Horizontal Load on Cross-Span Pole

Length of Cross-Span		30 Feet			40 Feet			50 Feet			60 Feet				
		2	3	4	2	3	4	3	4	5	3	4	5		
Single Track	Single Guard	940	625	470	*	1250	835	625	1045	785	625	*	1250	940	750
	Double Guard	**	*			*	*	**	*				**	*	
		1595	1065	790	....	1415	1065	1775	1335	1065	....	1595	1275	
Double Track	Single Guard	*			**	*		**	*			**	*		
	Double Guard	1190	795	595	1815	1210	910	1625	1220	975	....	1535	1225	
			*				**			**			**		
		....	1350	1010	....	....	1545	....	....	1660	....	....	2085	

NOTE: Use 3-S regular galvanized steel strand except where marked.

Where marked * use $\frac{3}{8}$ -inch Siemens-Martin galvanized steel strand or $\frac{1}{4}$ -inch regular galvanized steel strand.

Where marked ** use $\frac{1}{8}$ -inch Siemens-Martin galvanized steel strand.

Galvanized Iron Trolley Guard is recommended for all average conditions, the Copper being advisable only where locomotive exhausts or atmospheric conditions are exceptionally severe.



NATIONAL TROLLEY GUARD

Patented—Continued

Fig. 2 shows a method of installation in which the entire Guard is laid out on the ground and then pulled into place with blocks. This method can be varied to suit any local conditions.

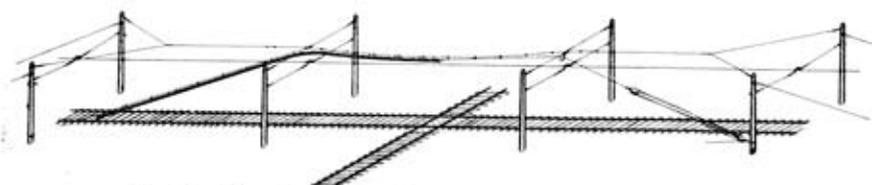


Fig. 2—Showing Method of Sliding Guard into Position

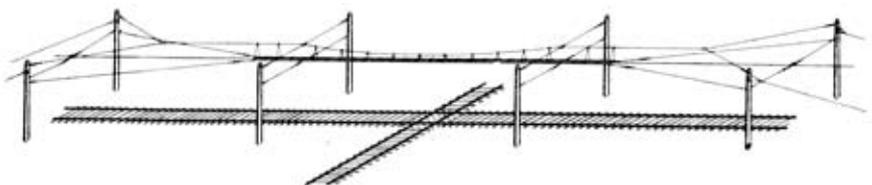


Fig. 3—Showing Completed Installation

Length of Guard Required

THE Crossing specifications recommended by the joint committee of the American Railway Association, the American Railway Engineering Association and the American Electric Railway Engineering Association gives the following:

“Live trolley guards shall be of such length that when the car is approaching the crossing the trolley wheel shall be within the guard when the forward bumper is fifty feet from the nearest rail of the crossing, and shall remain within the guard until the rear bumper of the car has cleared the last rail of the crossing by eight feet.”

See listing on page 386.

