

**PEERLESS MANUFACTURING
CORPORATION**

LOUISVILLE, KENTUCKY

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List and arrangement of bulletins and blueprints in signal catalog to date May 8th, 1934.

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Bulletin	6-A	Parkway Outlets, Model "A"
Bulletin	6-C	Parkway Outlets, Model "D"
Blueprint	6-B3	Parkway Junction Box
Blueprint	6-B7	Trunking Riser
Blueprint	6-B4	Bolt Head Lock Strap, 3/4"
Blueprint	6-B5	Bolt Head Lock Strap, 3/4"
Blueprint	6-B6	Adjustable Resistance Unit
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Bulletin	7-B	Safe Lock Switch Machine
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Cat. Dwg.	42	Two way Railroad Switch Lamp
Cat. Dwg.	43	Round Reflex Unit. 10" Diam. W-51A
Cat. Dwg.	44	Railroad Crossing Signs
Cat. Dwg.	45	"STOP ON RED" Sign, W-153
Cat. Dwg.	46	Vertical "R R STOP" Sign, CW 103-4
Cat. Dwg.	47	"LEFT", "RIGHT" and "LEFT" Signs
Blueprint	606-2-C	Gauge Rod
Bulletin	24	Kiel Ball Joint

MODEL C "FUSTICLO" RAIL CONTACTORS



PATENTED

LOUISVILLE FROG, SWITCH & SIGNAL COMPANY

Incorporated

SUCCESSOR TO

Louisville Frog & Switch Co.

Southern Signal Corporation

MANUFACTURERS OF

Track and Signal Equipment



February 1, 1931

LOUISVILLE, KENTUCKY, U. S. A.

Bulletin No. 3-C



DIRECTIONAL FUSTICLOS

(With two sets of circuit breakers)

Used as starters in one direction and cut-outs in the opposite direction.
This arrangement is economical where signals are located close together
and their controls overlap.

THE FUSTICLO

A RAIL contactor or track instrument, as it is often called, for controlling highway crossing signals, train annunciators or similar apparatus on steam and electric railroads. Essentially, it is a mechanism, having contacts within, which are actuated by a train passing over the section of track to which it is attached.

Many track instruments have been made by various companies in the past which were not very satisfactory and some railroads, for this reason, have not used the Fusticlo. It is not our intention to discredit the early track instruments, as they were pioneers and like the first automobile, were not made to the high degree of perfection attained by the present day machine, but we do claim that the Fusticlo is a modern twentieth century product and should not be compared with apparatus of the past. Without the least doubt it is the most dependable and reliable rail contactor which has ever been offered to the railroads. Its principle of operation is sound and practical and it is constructed to stand the severe test to which it is subjected on the track.

During its eight years of existence it has given very encouraging results. It is now used on more than forty railroads in the United States and also in five foreign countries.

Generally the use of the Fusticlo is very economical when installing highway crossing signals in automatic signal territory as it is then unnecessary to cut into the track circuits. The saving thus effected will be appreciated by the Signal Engineer who has found it necessary to re-arrange two or three track circuits and install one or two additional ones in order to secure proper operation of one highway crossing signal.

A very large saving can be made by using the Fusticlo in alternating-current track circuit territory, where as much as several thousand dollars may be saved on each highway crossing signal location.

The installation of Fusticlo Rail Contactors require less time than that of a track circuit.

At an ordinary single-track highway crossing, the entire equipment for Fusticlo control consists of two starting instruments, one stopping or cut-out instrument, a stick relay at the signal and two line wires from one starting instrument to the other. The use of the Fusticlo eliminates track batteries with housing, bond wires, insulated rail joints, switch rod insulations, wire connections to rails with housing and interlocking relays.

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There are two types of Fusticlo Rail Contactors, namely, directional and non-directional:

Directional instruments are commonly used as starters, on single track. They are so arranged that contacts, within, which are actuated by a train going in one direction will not be operated by a train moving in the opposite direction. Or in other words, trains approaching the highway, operate a set of contacts while those leaving the crossing do not operate these contacts.

In some special cases two sets of contacts are used in a directional instrument, in which case one set operates for a train moving in one direction while the other set will operate for a train moving in the reverse direction.

This selective operation is accomplished by an ingenious selector mechanism which is operated by deflection of the rail transmitted to the selector through a compound lever arrangement. The deflection of the rail is insured by spring plates placed between the tie and the rail base.

These spring plates raise the rail about 3-8 of an inch at the point where they are located, causing a slight hump in the rail normally but when a train passes over the point the springs are flattened and the rail becomes smooth, as if no spring were in use. The springs are made of the very best grade of vanadium spring steel, are designed so that they are self cleaning and will not become clogged with dirt, ballast, snow or ice.

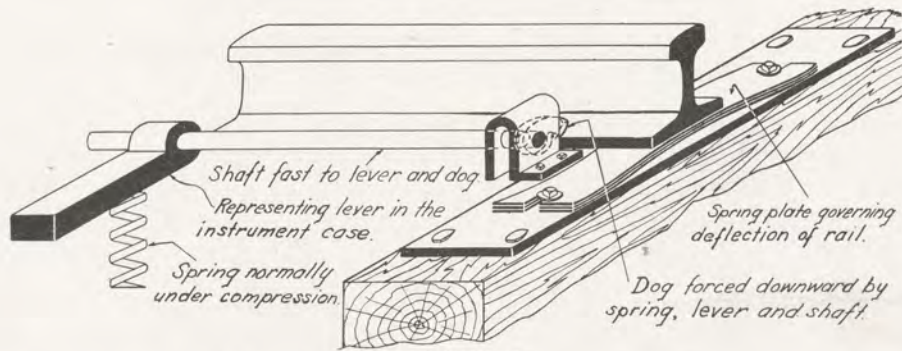
Non-directional instruments are used chiefly as stopping or cut-out instruments and also for starters on double track where no reverse movements occur. They have contacts which are operated by trains moving in either direction. The principle of operation is the same as the directional type except that no selective device is employed.

The Fusticlo is very compact and is supported between two ties sufficiently low to provide ample clearance for rolling stock.

We can furnish a number of contact combinations to take care of practically every requirement. Ordinarily the directional instruments are furnished with contacts for one normally open and one normally closed non-independent circuit for one direction and the non-directional with contacts for one normally open and one normally closed non-independent circuit. The maximum which we can furnish is two pairs (that is four contacts) of independent contacts, for each direction, on the directional contactor and four pairs of contacts on the non-directional.

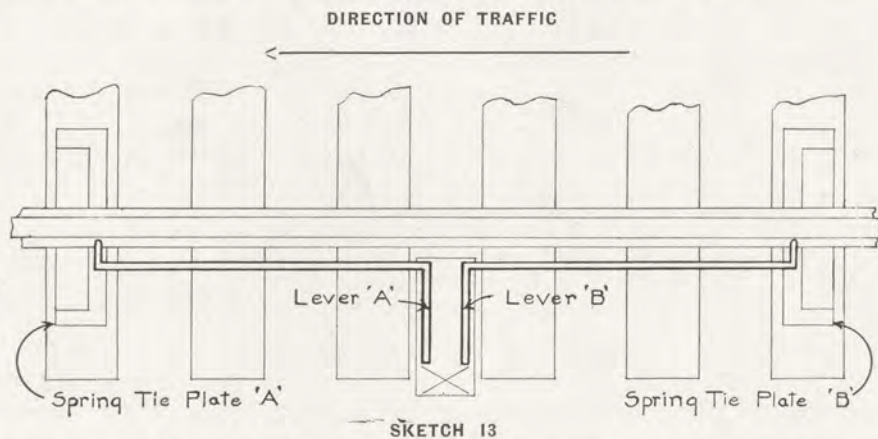
The Fusticlo is very easy to install and with the complete instructions for installing and maintaining furnished with each contactor the signalman should experience no difficulty with the Fusticlo.

Excepting the contact selectors the principle of operation is the same for both the directional and non-directional instruments. As the directional Fusticlo is more complex, its operation is thoroughly outlined below and then the differences of the non-directional are pointed out.



SKETCH 12

Referring to sketch 12, the spring plate governing the deflection of the rail is placed between the rail and tie, raising the rail at this point about three-eighths of an inch. The spikes are lifted about the same amount on two ties each side of the tie bearing the spring plate, so that the hump in the rail spreads over five ties. A dog rests, on the top of the rail base, at the point where the spring plate is located. This dog is securely fastened to one end of a shaft which has a lever fastened to its other end. A spring, normally under compression, is placed under the lever, thus the dog is forced against the rail base by the compression spring. This compression spring, however, is not of sufficient size to affect the deflection of the rail in the least. The other end of the lever engages the mechanism, which operates the circuit breaker. In operation, a train approaching the point where the spring plate is located depresses the rail, (flattening the spring plate) smoothing out the hump in it so that the track is in the same condition as if no spring plates were used. When the rail is depressed the dog on the base of the rail follows the rail downwardly, due to the action of the compression spring, turning the shaft and moving the end of the lever (which engages the mechanism) upwardly.

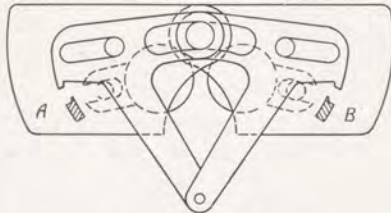


SKETCH 13

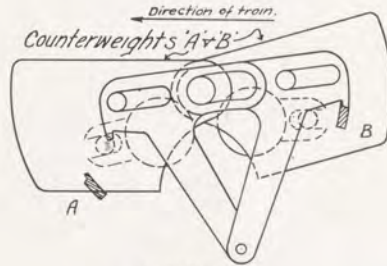
A directional Fusticlo has two sets of the spring plates and levers described above and they are arranged right and left, as shown in sketch 13. It will be seen that if a train approaches in the direction of the arrow, spring plate B and lever B

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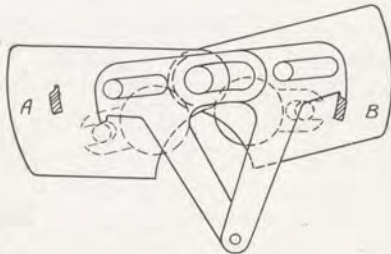
will operate first and after a short interval spring plate A and lever A will also operate.



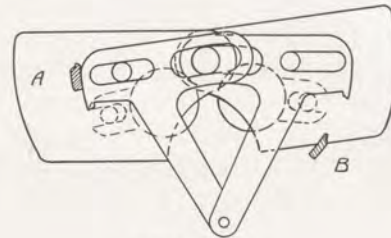
SKETCH 14



SKETCH 15



SKETCH 16



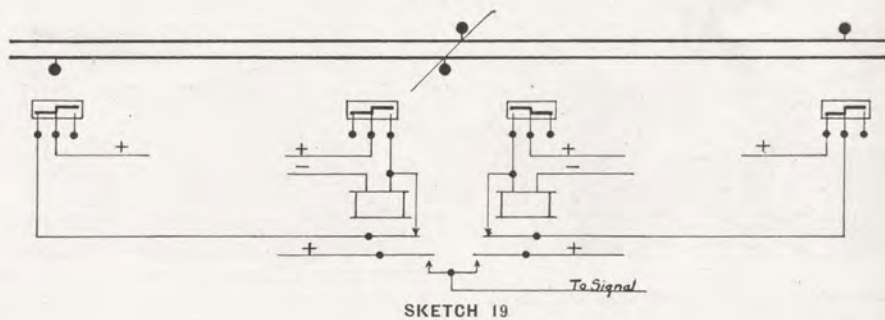
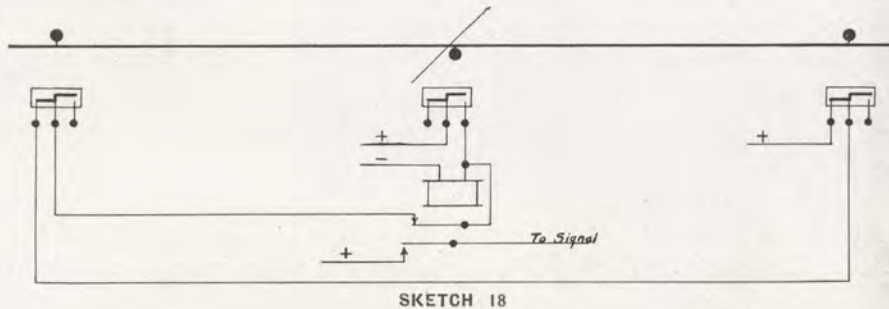
SKETCH 17

Sketches 14, 15, 16 and 17 are diagrams showing the essential parts of the selecting mechanism, illustrating the position of the several parts during one cycle of operation. The tips A and B are mechanically connected to the levers A and B of sketch 13, therefore when the levers are moved upwardly the tips are also raised. The dotted portion of the diagrams represent the circuit controller drums and for convenience two are shown, though in practice only one is generally used. In this case we will consider the circuit controller to the right, operated by the tip B, connected to a circuit which it is desired to control. Then a train approaching the instrument in the direction of the arrow (figures 13 and 15) will first operate spring plate B which in turn will move the lever B and lift the tip B which will engage the hook on its selector, turning it and the counterweight B on their axis, sliding the opposite selector link to the right and rotating the circuit controller drum, connected to counterweight B, thus opening or closing the circuit. As the train progresses it will pass over the spring plate A lifting the tip A as shown in sketch 16. But as the link for tip A is moved to the right it does not engage the link and consequently the counterweight A is not lifted and the circuit controller drum attached is not operated. As the train goes farther the engine wheels pass from the point, allowing the spring plate B and all parts controlled by it to return to their normal position as shown in sketch 17. Next the engine wheels leave the other point and spring plate A and all parts which it operates return to normal, leaving the selector mechanism in the position shown in sketch 14 and completing one cycle of operation. Except for very fast trains the instrument operates once for the engine and each car in the train. The space from the rear truck of a car

and the front truck of the car following is not great enough to cause the instrument to operate but the space between trucks of the same car is generally enough for an operation.

Operation for a train moving in the reverse direction is exactly the same as outlined above except that spring plate A operates first and the circuit controller drum attached to counterweight A is operated instead of the one attached to counterweight B.

The same principle of operation is employed in the Model C-2 Non-directional Fusticlo but the two long arms and the selecting mechanism are not used. The Non-directional Fusticlo has but one rail dog and its circuit controller operates for trains moving in either direction.



The circuits for the Fusticlo are very simple. Sketch 18 shows a typical circuit for single track and sketch 19 one for double track. The sketches show normally closed stick circuits, which are almost always used. The relay is held up through one of its front contacts and at any time that one of the starter Fusticlos opens the circuit the relay drops. The contacts on the starter are of course soon closed again but this will not cause the relay to pick up, because the front contact of the relay is open, thus the circuit is not complete. A set of normally open contacts on the stopping or cut-out Fusticlo (at or near the highway) is in multiple with the front contact of the relay and the train in passing over the instrument closes this set of contacts momentarily, picking up the relay. This closes the front contact of the relay and it will remain in the picked up position until the circuit

is again broken. During the time the relay is down or de-energized the signals are operated through its back contacts.

The two circuits shown are for the simplest highway crossing location and are intended principally to illustrate the application of the Fusticlo. However the Fusticlo can be used for any location, it matters not how complicated it may be. With the use of time elements and various combinations of Fusticlo instruments some difficult problems are often solved. On pages 16 to 19 inclusive, of our bulletin number 5A, describing our relays and time elements, will be found a number of interesting and useful circuits in which Fusticlos are used.

The Fusticlo has numerous other uses in the signal field. We have had wide experience in designing special circuits for the Fusticlo and if you have locations where Fusticlos may be used, we will gladly make complete plans and specifications, upon receipt of the necessary data, such as a plan or sketch of the track showing road crossings, stations, sidings, water tacks, and any thing which may affect the movement of trains.

Sometmes it is desirable that the contacts of the Fusticlo hold their position during the entire length of the train. That is the circuit breaker to operate only once for the whole train and not for each car. This is accomplished by the Pneumatic Retarder, which can be applied to any directional Fusticlo. Though seldom used on the non-directional Fusticlo, the Retarder can be applied to it at the factory.



DIRECTIONAL MECHANISM WITH RETARDER



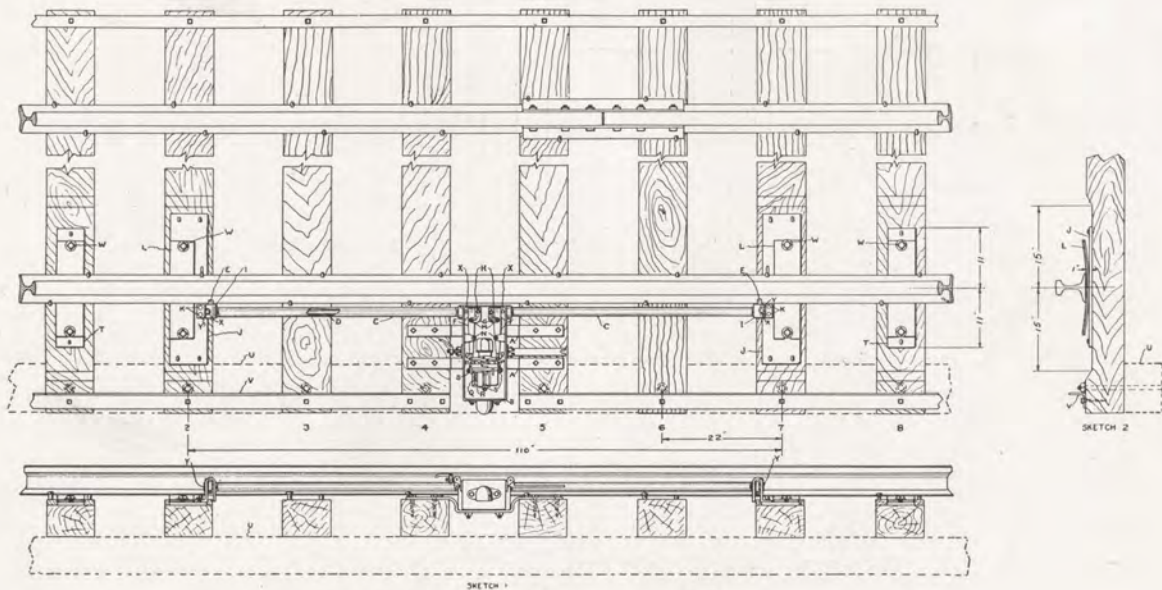
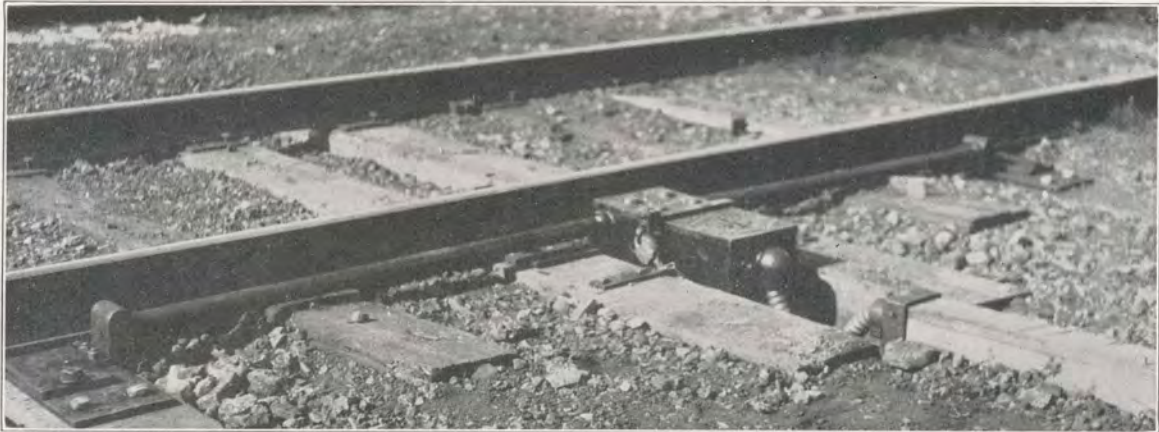
DIRECTIONAL MECHANISM WITH RETARDER,
HAVING COVER REMOVED TO SHOW PARTS.

One of the chief uses of the Retarder is to prevent reverse selection of the directional Fusticlo. Reverse selections are generally caused by freight trains containing what might be called "bouncing cars" whose brakes are defective and partially applied, so that a car, in passing over the spring plates, sometimes rises slightly on one end, skipping the first spring plate and dropping just in time to depress the second spring plate, which will produce a reverse selection, provided the Fusticlo is in its normal position. If however the selection is made by the engine and held in this position (which the retarder does) it cannot be changed by a car acting in this manner.

The accompanying photographs show the Retarder applied to the selector mechanism and also show the mechanism within the retarder.

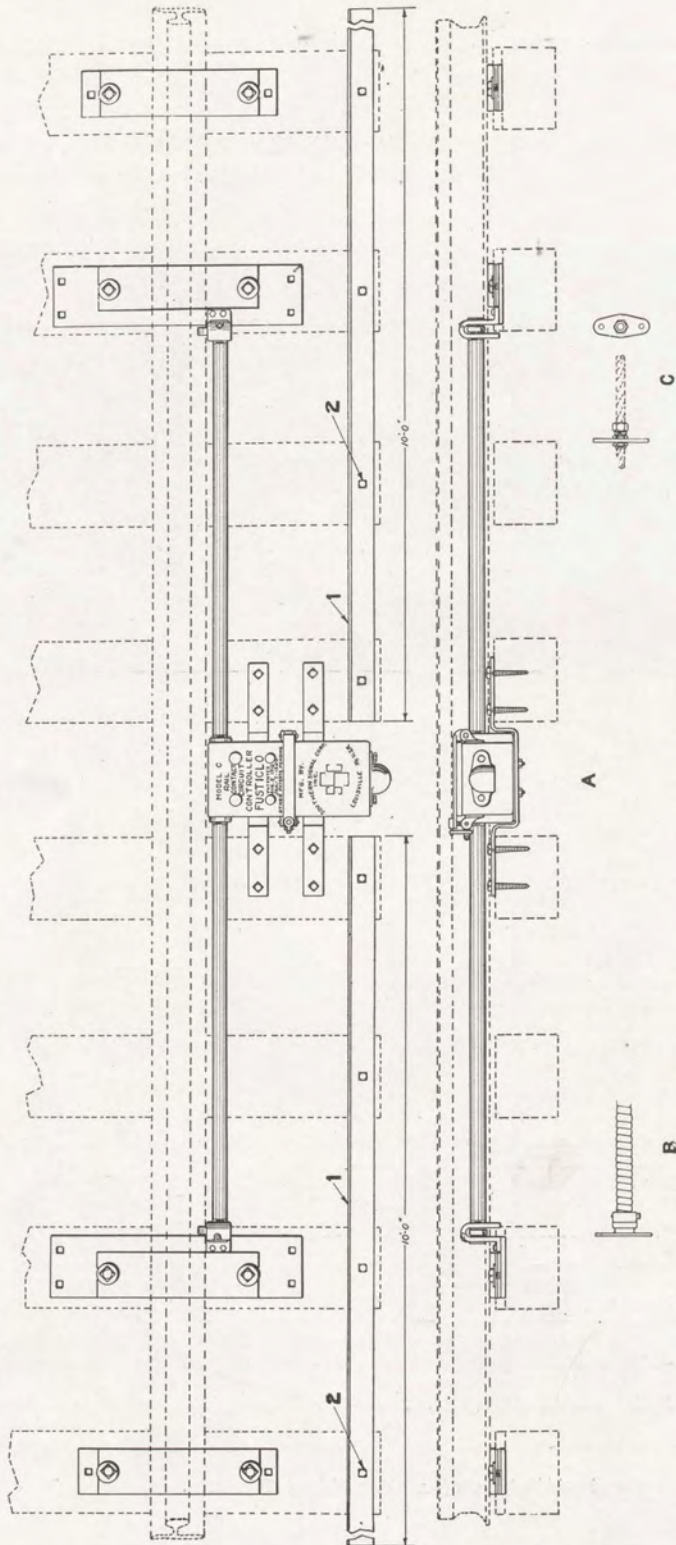
·:·] LOUISVILLE FROG, SWITCH & SIGNAL COMPANY [·:·

The Retarder is a vacuum type dash-pot connected to the selector links by a series of levers. The cylinder is of brass and the piston of graphite. This combination of material will prevent sticking and requires no lubrication. The mechanism of the Retarder is enclosed in a cast iron case which is treated with a rust-proofing material and all parts within are made of materials which will not rust.



Installation of a Directional Fusticlo.

Plate A-1



LOUISVILLE FROG, SWITCH & SIGNAL COMPANY

Plate A-1

Model C-1 Fusticlo Directional Rail Contactors

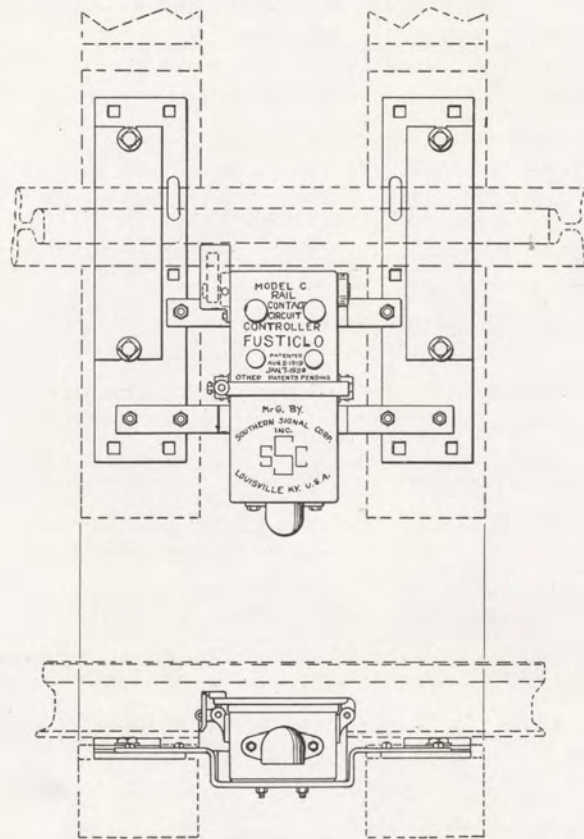
Directional Fusticlo Rail Contactors are equipped with Zerk fittings.
 Tie Bars and lag screws for same are not furnished with the Fusticlo and must be ordered separately when they are wanted.
 Contact combinations other than those listed below can be furnished, up to and including four contacts per drum but they are special and made to order only.
 Directional Fusticlo Rail Contactors can be furnished with ventilators but unless specified on order they will be shipped without them.

Order by Plate, Figure and Name

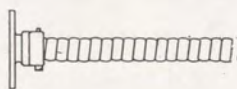
For Grease and Grease Guns See Plate A-10. For Fusticlo Parts see Plates A-90, A-91 and A-92.

FIG.	NAME AND DESCRIPTION	DWG. No.
A	Model C-1 Directional Fusticlo Rail Contactor with contacts for one normally open and one normally closed non-independent circuit, for one direction only. (One contact drum)	10000
A-1	Model C-1 Directional Fusticlo. As figure A except with contacts for one normally open and one normally closed non-independent circuit, for each direction. (Two contact drums)	10000-8
A-2	Model C-1 Directional Fusticlo. As figure A except with contacts for one normally open and one normally closed independent circuit, for one direction only. (One contact drum)	10000-16
A-3	Model C-1 Directional Fusticlo. As figure A except with contacts for one normally open and one normally closed independent circuit, for each direction. (Two contact drums)	10000-24
A-4	Model C-1 Directional Fusticlo Rail Contactor with pneumatic retarder and with contacts for one normally open and one normally closed non-independent circuit, for one direction only. (One contact drum)	10000-3
A-5	Model C-1 Directional Fusticlo. As figure A-4 except with contacts for one normally open and one normally closed non-independent circuit, for each direction. (Two contact drums)	10000-11
A-6	Model C-1 Directional Fusticlo. As figure A-4 except with contacts for one normally open and one normally closed independent circuit, for one direction only. (One contact drum)	10000-19
A-7	Model C-1 Directional Fusticlo. As figure A-4 except with contacts for one normally open and one normally closed independent circuit, for each direction. (Two contact drums)	10000-27
B	Model C-1 Directional Fusticlo. As figure A except with flexible conduit, (as shown at B) instead of wire outlet.	10000-32
B-1	Model C-1 Directional Fusticlo. As figure A-1 except with flexible conduit, (as shown at B) instead of wire outlet.	10000-33
B-2	Model C-1 Directional Fusticlo. As figure A-2 except with flexible conduit, (as shown at B) instead of wire outlet.	10000-34
B-3	Model C-1 Directional Fusticlo. As figure A-3 except with flexible conduit, (as shown at B) instead of wire outlet.	10000-35
B-4	Model C-1 Directional Fusticlo. As figure A-4 except with flexible conduit, (as shown at B) instead of wire outlet.	10000-36
B-5	Model C-1 Directional Fusticlo. As figure A-5 except with flexible conduit, (as shown at B) instead of wire outlet.	10000-37
B-6	Model C-1 Directional Fusticlo. As figure A-6 except with flexible conduit, (as shown at B) instead of wire outlet.	10000-38
B-7	Model C-1 Directional Fusticlo. As figure A-7 except with flexible conduit, (as shown at B) instead of wire outlet.	10000-39
C	Model C-1 Directional Fusticlo. As figure A except with plate and bushing for parkway cable, (as shown at C) instead of wire outlet.	10000-40
C-1	Model C-1 Directional Fusticlo. As figure A-1 except with plate and bushing for parkway cable, (as shown at C) instead of wire outlet.	10000-41
C-2	Model C-1 Directional Fusticlo. As figure A-2 except with plate and bushing for parkway cable, (as shown at C) instead of wire outlet.	10000-40
C-3	Model C-1 Directional Fusticlo. As figure A-3 except with plate and bushing for parkway cable, (as shown at C) instead of wire outlet.	10000-43
C-4	Model C-1 Directional Fusticlo. As figure A-4 except with plate and bushing for parkway cable, (as shown at C) instead of wire outlet.	10000-44
C-5	Model C-1 Directional Fusticlo. As figure A-5 except with plate and bushing for parkway cable, (as shown at C) instead of wire outlet.	10000-45
C-6	Model C-1 Directional Fusticlo. As figure A-6 except with plate and bushing for parkway cable, (as shown at C) instead of wire outlet.	10000-46
C-7	Model C-1 Directional Fusticlo. As figure A-7 except with plate and bushing for parkway cable, (as shown at C) instead of wire outlet.	
1	Tie Bar. (Not furnished with the Fusticlo and generally not necessary for satisfactory operation. Used only where ties shift and road-bed is not solid)	10117
2	Lag Screw for above. (Also not furnished with Fusticlo)	011001

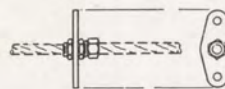
Plate A-10



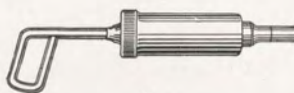
A



B



C



6



5



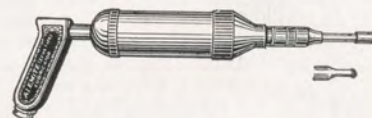
1



3



2



4

Plate A-10

Model C-2 Fusticlo Non-Directional Rail Contactors and Supplies

Non-directional Fusticlo Rail Contactors are equipped with Zerk fittings.

Contact combinations other than those listed below can be furnished, up to and including four contacts per drum but they are special and made to order only.

Non-directional Fusticlo Rail Contactors can be furnished with ventilators but unless specified on order they will be shipped without them.

Order by Plate, Figure and Name

For Fusticlo Parts See Plates A-90, A-91 and A-92.

FIG.	NAME AND DESCRIPTION	DWG. No.
A	Model C-2 Non-directional Fusticlo Rail Contactor with contacts for one normally open and one normally closed non-independent circuit. (One contact drum)	10000-4
A-1	Model C-2 Non-directional Fusticlo. As figure A except with contacts for two normally open and two normally closed non-independent circuits. (Two contact drums)	10000-12
A-2	Model C-2 Non-directional Fusticlo. As figure A except with contacts for one normally open and one normally closed independent circuit. (One contact drum).	10000-20
A-3	Model C-2 Non-directional Fusticlo. As figure A except with contacts for two normally open and two normally closed independent circuits. (Two contact drums).	10000-28
B	Model C-2 Non-directional Fusticlo. As figure A except with flexible conduit, (as shown at B) instead of wire outlet.	10000-48
B-1	Model C-2 Non-directional Fusticlo. As figure A-1 except with flexible conduit, (as shown at B) instead of wire outlet.	10000-49
B-2	Model C-2 Non-directional Fusticlo. As figure A-2 except with flexible conduit, (as shown at B) instead of wire outlet.	10000-50
B-3	Model C-2 Non-directional Fusticlo. As figure A-3 except with flexible conduit, (as shown at B) instead of wire outlet.	10000-51
C	Model C-2 Non-directional Fusticlo. As figure A except with plate and bushing for parkway cable, (as shown at C) instead of wire outlet.	10000-52
C-1	Model C-2 Non-directional Fusticlo. As figure A-1 except with plate and bushing for parkway cable, (as shown at C) instead of wire outlet.	10000-53
C-2	Model C-2 Non-directional Fusticlo. As figure A-2 except with plate and bushing for parkway cable, (as shown at C) instead of wire outlet.	10000-54
C-3	Model C-2 Non-directional Fusticlo. As figure A-3 except with plate and bushing for parkway cable, (as shown at C) instead of wire outlet.	10000-55

Supplies

FIG.	DESCRIPTION	DWG. No.
1	1 gallon can of Fusticlo Spring Plate Lubricant.	
1a	5 gallon can of Fusticlo Spring Plate Lubricant.	
2	1 pound can of Alemite Lubricant.	L-939
3	5 pound can of Alemite Lubricant.	L-900
4	Alemite-Zerk Compressor for grease or oil. Capacity 9 oz. With low pressure nozzle.	Z-3-G
4a	Alemite-Zerk Compressor. As figure 4 except with regular nozzle.	Z-3-G
5	Alemite-Zerk Compressor, for grease or oil. Capacity 9 oz.	Z-3-A
6	Alemite-Zerk Compressor. Small size.	1046

Plate A-90

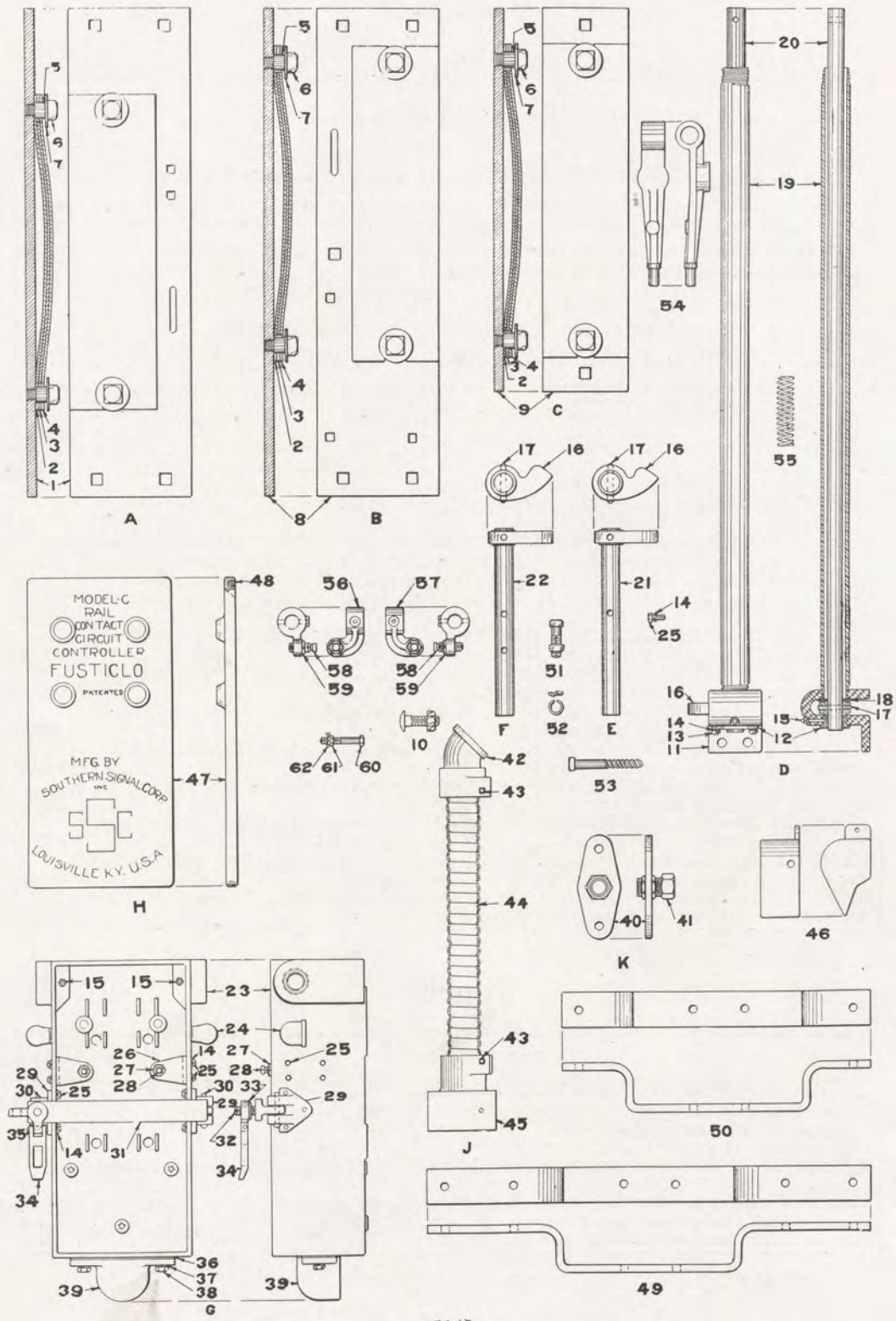


Plate A-90

Models C-1 Directional and C-2 Non-Directional
Fusticlo Parts

Order by Plate, Figure and Name

FIG.	NAME AND DESCRIPTION	DWG. No.
A	Right Tie Plate Complete as shown, for Model C-1 Directional Fusticlos. (1 figure 1, 1 figure 4a, 2 figures 5, 2 figures 6 and 2 figures 7).	10101AR
A-1	Left Tie Plate Complete, for Model C-1 Directional Fusticlos. (1 figure 1, 1 figure 4a, 2 figures 5, 2 figures 6 and 2 figures 7).	10101AL
B	Right Tie Plate Complete as shown, for Model C-2 Non-directional Fusticlos. (1 figure 4a, 2 figures 5, 2 figures 6, 2 figures 7 and 1 figure 8).	10102AR
B-1	Left Tie Plate Complete, for Model C-2 Non-directional Fusticlos. (1 figure 4a, 2 figures 5, 2 figures 6, 2 figures 7 and 1 figure 8).	10102AL
C	Auxiliary Tie Plate Complete, for Model C-1 Directional Fusticlos. (1 figure 4a, 2 figures 5, 2 figures 6, 2 figures 7 and 1 figure 9).	10112AX
D	Right Operating Shaft Complete without Zerk fitting for Model C-1 Directional Fusticlos. (1 figure 16, 1 figure 17, 1 figure 18, 1 figure 19a and 1 figure 20).	10109AR
D-1	Left Operating Shaft Complete without Zerk fitting, for Model C-1 Directional Fusticlos. (1 figure 16, 1 figure 17, 1 figure 18, 1 figure 19a and 1 figure 20).	10109AL
D-2	Right Operating Shaft Complete with Zerk fitting, for Model C-1 Directional Fusticlos (1 figure 16, 1 figure 17, 1 figure 18, 1 figure 19b and 1 figure 20).	10109-1AR
D-3	Left Operating Shaft Complete with Zerk fitting, for Model C-1 Directional Fusticlos. As shown. (1 figure 16, 1 figure 17, 1 figure 18, 1 figure 19b and 1 figure 20).	10109-1AL
E	One Drum Operating Shaft Complete, for Model C-2 Non-directional Fusticlos. (1 figure 16, 1 figure 17 and 1 figure 21).	10110X
F	Two Drum Operating Shaft Complete, for Model C-2 Non-directional Fusticlos. (1 figure 16, 1 figure 17 and 1 figure 22).	10111X
G	Controller Box Complete without Zerk fittings and ventilators as shown, for Model C-1 Directional Fusticlos. (14 figures 14, 1 figure 23, 14 figures 25, 2 figures 26a, 1 figure 31a, 1 figure 32a, 1 figure 34a, 1 figure 36, 2 figures 37, 2 figures 38 and 1 figure 39).	10201X
G-1	Controller Box Complete with Zerk fittings and ventilators, for Model C-1 Directional Fusticlos. (14 figures 14, 2 figures 15, 1 figure 23b, 2 figures 24, 14 figures 25, 2 figures 26a, 1 figure 31a, 1 figure 32a, 1 figure 34a, 1 figure 36, 2 figures 37, 2 figures 38 and 1 figure 39).	10201-2X
G-2	Controller Box Complete without Zerk fittings and ventilators, for Model C-2 Non-directional Fusticlo with one contact drum. (7 figures 14, 1 figure 23a, 7 figures 25, 1 figure 26a, 1 figure 31a, 1 figure 32a, 1 figure 34a, 1 figure 36, 2 figures 37, 2 figures 38 and 1 figure 39).	10201-1X
G-3	Controller Box Complete with Zerk fittings and ventilators, for Model C-2 Non-directional Fusticlos with one contact drum. (7 figures 14, 2 figures 15, 1 figure 23c, 2 figures 24, 7 figures 25, 1 figure 26a, 1 figure 31a, 1 figure 32a, 1 figure 34a, 1 figure 36, 2 figures 37, 2 figures 38 and 1 figure 39).	10201-3X
G-4	Controller Box Complete without Zerk fittings and ventilators, for Model C-2 Non-directional Fusticlos with two contact drums. (14 figures 14, 1 figure 23d, 14 figures 25, 2 figures 26a, 1 figure 31a, 1 figure 32a, 1 figure 34a, 1 figure 36, 2 figures 37, 2 figures 38 and 1 figure 39).	10201-4X
G-5	Controller Box Complete with Zerk fittings and ventilators, for Model C-2 Non-directional Fusticlos with two contact drums. (14 figures 14, 2 figures 15, 1 figure 23e, 2 figures 24, 14 figures 25, 2 figures 26a, 1 figure 31a, 1 figure 32a, 1 figure 34a, 1 figure 36, 2 figures 37, 2 figures 38 and 1 figure 39).	10201-5X
H	Cover Complete, for Models C-1 and C-2 Fusticlos. (1 figure 47 and 1 figure 48).	10203X
J	Flexible Conduit Complete for Models C-1 and C-2 Fusticlos. (1 figure 42a, 1 figure 44 and 1 figure 45a).	10214X
K	Parkway Plate and Bushing, for Models C-1 and C-2 Fusticlos. (1 figure 40 and 1 figure 41).	10216X

Plate A-90

Models C-1 Directional and C-2 Non-Directional
Fusticlo Parts

Order by Plate, Figure and Name

FIG.	NAME AND DESCRIPTION	DWG. No.
1	Tie Plate, for Model C-1 Directional Fusticlos.	10101
2	Bottom Spring Plate, for Models C-1 and C-2 Fusticlos.	10103-2A
3	Center Spring Plate, for Models C-1 and C-2 Fusticlos.	10103-1A
4	Top Spring Plate, for Models C-1 and C-2 Fusticlos.	10103A
4a	Spring Plate Complete. (1 figure 2, 1 figure 3 and 1 figure 4).	10103AX
5	Sleeve, for figure 4a.	10104A
6	Square Head Machine Bolt only, for figure 5.	006028
7	Washer, for figure 6.	005003
8	Tie Plate, for Model C-2 Non-directional Fusticlos.	10102
9	Auxiliary Tie Plate for Model C-1 Directional Fusticlos.	10112
10	Carriage Bolt with hexagon nut, for figures 1 and 8.	015001X
11	Outside Bearing only, for figure D.	10105A
11a	Outside Bearing Complete. (1 figure 11, 1 figure 12, 2 figures 13, and 2 figures 14).	10105AX
11b	Outside Bearing Complete with Zerk fitting. (1 figure 11, 1 figure 12, 2 figures 13, 2 figures 14 and 1 figure 15).	10113X
12	Outside Bearing Bushing only for figures 11a and 11b.	10113
13	Round Head Brass Machine Screw, for figure 12.	004042
14	Lock Washer, for figures 13 and 25.	002001
15	Zerk fitting, for figures 11b, 23b, 23c and 23e.	10114X
16	Rail Dog only, for figures D, D-1, D-2, D-3, E and F.	10106A
17	Taper Pin, for figure 16.	007001
18	Special Washer, for figures 20, 21 and 22.	10107
19	Shaft Housing, for figures D, D-1, D-2 and D-3.	10108
19a	Shaft Housing Complete, for figures D and D-1. (1 figure 11a and figure 19)	10108AX
19b	Shaft Housing Complete with Zerk fitting, for figures D-2 and D-3. (1 figure 11b and 1 figure 19)	10108-1AX
20	Operating Shaft only, for figures D, D-1, D-2 and D-3.	10109
21	One Drum Operating Shaft only, for Model C-2 Non-directional Fusticlos.	10110
22	Two Drum Operating Shaft only, for Model C-2 Non-directional Fusticlos.	10111
23	Controller Box only, for Model C-1 Directional Fusticlos without Zerk fittings and ventilators.	10201
23a	Controller Box only, for Model C-2 Non-directional Fusticlos, without Zerk fittings and ventilators.	10201-1
23b	Controller Box only, for Model C-1 Directional Fusticlos, having Zerk fittings and ventilators.	10201-2
23c	Controller Box only, for Model C-2 Non-directional Fusticlos, having Zerk fittings and ventilators.	10201-3
23d	Controller Box only, for Model C-2 Non-directional Fusticlos, having two contact drums and without Zerk fittings and ventilators.	10201-4
23e	Controller Box only, for Model C-2 Non-directional Fusticlos, having two contact drums and having Zerk fittings and ventilators.	10201-5
24	Ventilator, for figures G, G-1, G-2, G-3, G-4 and G-5.	10202X
25	Hexagon Head Cap Screw, for figures G, G-1, G-2, G-3, G-4, G-5 and 4 6.	009001
26	Primary Lever Stop only, for Models C-1 and C-2 Fusticlos.	10305
26a	Primary Lever Stop complete, for Models C-1 and C-2 Fusticlos. (1 figure 26, 1 figure 27 and 1 figure 28)	10305X
27	Hexagon Check Nut, for figure 28.	003004
28	Oval Point Set Screw, for figure 26a.	010001
29	Hinge Ear, for figures 31a and 32a.	10205
30	Button Head Rivet for figure 29.	008002
31	Locking Arm only, for Models C-1 and C-2 Fusticlos.	10206

Plate A-90

Models C-1 Directional and C-2 Non-Directional
Fusticlo Parts

Order by Plate, Figure and Name

FIG.	NAME AND DESCRIPTION	DWG. No.
31a	Locking Arm Complete, for Models C-1 and C-2 Fusticlos. (1 figure 29, 1 figure 30 and 1 figure 31).	10206X
32	Eye Bolt only, for Models C-1 and C-2 Fusticlos.	10207
32a	Eye Bolt Complete, for Models C-1 and C-2 Fusticlos. (1 figure 29, 1 figure 30 and 1 figure 32).	10207X
33	Nut for Hasp, for figure 34a.	10208
34	Hasp only for Models C-1 and C-2 Fusticlos.	10209
34a	Hasp Complete, for Models C-1 and C-2 Fusticlos. (1 figure 33, 1 figure 34 and 1 figure 35).	10209X
35	Button Head Rivet, for figure 34a.	008001
36	Gasket, for figure 39.	10211
37	Lock Washer, for figure 38.	002002
38	Hexagon Head Cap Screw, for figure 39.	009002
39	Wire Outlet, for Models C-1 and C-2 Fusticlos.	10210
40	Parkway Bushing Plate only for figure K.	10216
41	Parkway Bushing complete, for figure K.	10218X
42	1½ inch—45° Flexible Conduit Connector only, for figure J.	10222
42a	1½ inch—45° Flexible Conduit Connector Complete, for figure J. (1 figure 42 and 1 figure 43)	10222X
43	Square Head Machine Bolt and Nut for figures 42a and 45a.	006006X
44	Flexible Conduit, for figure J.	10214
45	Trunking Coupling only for 4 inch trunking, for figure J.	20204
45a	Trunking Coupling Complete for 4 inch trunking, for figure J. (1 figure 43 and 1 figure 45).	20204X
46	Hood, for Model C-2 Non-directional Fusticlos.	10215
47	Cover only, for figure H.	10203
48	Packing only, for figure H.	10204
49	Long Tie Strap, for Models C-1 and C-2 Fusticlos.	10212
50	Short Tie Strap, for Model C-2 Fusticlos.	10217
51	Square Head Machine Bolt and Nut for figures 49 and 50.	006001
52	Lock Washer for figure 51.	002003
53	Lag Screw, for figure 49.	011001
54	Primary Selector Lever, for Models C-1 and C-2 Fusticlos.	10301
55	Compression Spring for figure 54.	10304
56	Left Adjusting Dog only, for Models C-1 and C-2 Fusticlos.	10303
56a	Left Adjusting Dog Complete, for Models C-1 and C-2 Fusticlos. (1 figure 56 and 1 figure 59).	10303X
57	Right Adjusting Dog only, for Models C-1 and C-2 Fusticlos.	10302
57a	Right Adjusting Dog Complete, for Models C-1 and C-2 Fusticlos. (1 figure 57, 1 figure 58 and 1 figure 59).	10302X
58	Special Set Screw, for figures 56a and 57a.	10307
59	Special Check Nut, for figure 58.	10306
60	Hexagon Head Cap Screw, drilled for cotter, for figures 56a and 57a.	009004
61	Castle Nut, for figure 60.	003002
62	Spring Cotter, for figure 60.	001001

Plate A-91

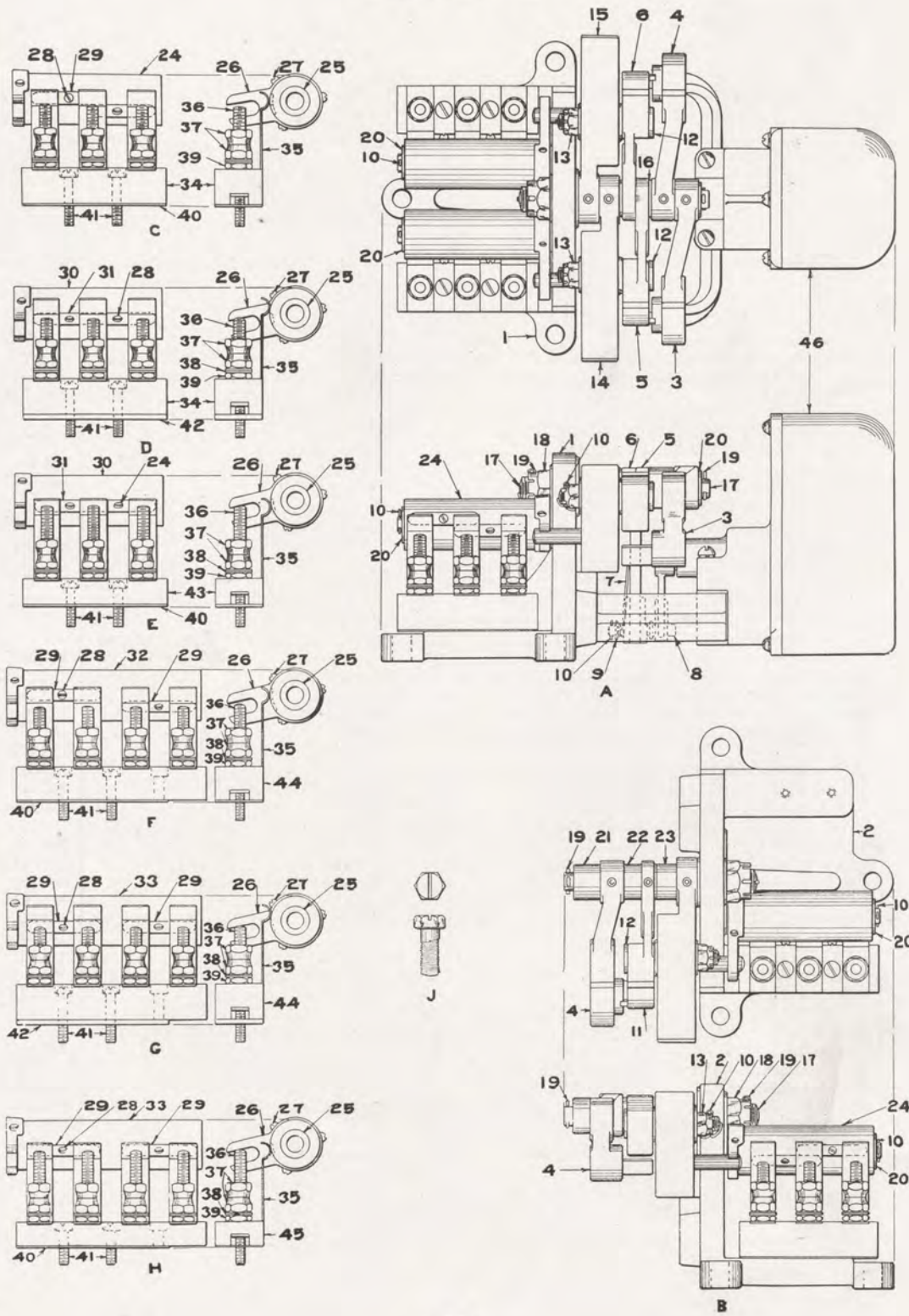


Plate A-91

Models C-1 Directional and C-2 Non-Directional
Fusticlo Parts

Mechanisms with standard circuit breakers are listed below. If mechanisms with special circuit breakers are wanted they should be ordered by specifying the figure number of the circuit breaker as:—Directional Mechanism figure A, except with one figure D circuit breaker.

Other circuit breakers than those shown can be furnished having as many as four contacts but are made to order only.

Order by Plate, Figure and Name

FIG.	NAME AND DESCRIPTION	DWG. No.
A	Directional Mechanism Complete with contacts for one normally open and one normally closed non-independent circuit for each direction and with pneumatic retarder, as shown (Two contact drums).	10400-11
A-1	Directional Mechanism Complete. As figure A, except with contacts for one normally open and one normally closed non-independent circuit for one direction only. (One contact drum).	10400-3
A-2	Directional Mechanism Complete. As figure A, except with contacts for one normally open and one normally closed independent circuit for each direction. (Two contact drums).	10400-27
A-3	Directional Mechanism Complete. As figure A, except with contacts for one normally open and one normally closed independent circuit for one direction only. (One contact drum).	10400-19
A-4	Directional Mechanism Complete with contacts for one normally open and one normally closed non-independent circuit for each direction. Without retarder. (Two Contact drums).	10400-8
A-5	Directional Mechanism Complete. As figure A-4, except with contacts for one normally open and one normally closed non-independent circuit for one direction only. (One contact drum).	10400
A-6	Directional Mechanism Complete. As figure A-4, except with contacts for one normally open and one normally closed independent circuit for each direction. (Two contact drum.)	10400-24
A-7	Directional Mechanism Complete. As figure A-4, except with contacts for one normally open and one normally closed independent circuit for one direction only (One contact drum).	10400-16
B	Non-directional Mechanism Complete with contacts for one normally open and one normally closed non-independent circuit, as shown. (One contact drum).	10400-4
B-1	Non-directional Mechanism Complete. As figure B, except with contacts for two normally open and two normally closed non-independent circuits. (Two contact drums).	10400-12
B-2	Non-directional mechanism complete. As figure B, except with contacts for one normally open and one normally closed independent circuit. (One contact drum).	10400-20
B-3	Non-directional Mechanism Complete. As figure B, except with contacts for two normally open and two normally closed independent circuits (Two contact drums).	10400-28 10428X
C	Circuit Breaker Complete for figures A, A-1, A-4, A-5, B and B-1.	10428-1X
D	Special Circuit Breaker Complete, for directional and non-directional mechanisms, with contacts for two normally open non-independent circuits.	10428-2X
E	Special Circuit Breaker Complete for directional and non-directional mechanisms, with contacts for two normally closed non-independent circuits.	10428-3X
F	Circuit Breaker Complete for figures A-2, A-3, A-6, A-7, B-2 and B-3.	10428-4X
G	Special Circuit Breaker Complete for directional and non-directional mechanisms, with contacts for two normally open independent circuits.	10428-5X
H	Special Circuit Breaker Complete, for directional and non-directional mechanisms, with contacts for two normally closed independent circuits.	009003
J	Slotted Hexagon Head Cap Screw for holding mechanism in place.	10401X
1	Support, for figures A, A-1, A-4, A-5 and B-1.	10401-2X
1a	Support, for figures A-2, A-3, A-6, A-7 and B-3.	10401-1X
2	Support, for figure B.	10401-3X
2a	Support, for figure B-2.	10402AX
3	Right Secondary Selector Lever, for directional and non-directional mechanisms.	10403AX
4	Left Secondary Selector Lever, for directional and non-directional mechanisms.	10407C
5	Right Selector Link, for directional mechanisms.	

Plate A-91

Models C-1 Directional and C-2 Non-Directional
Fusticlo Parts

Order by Plate, Figure and Name

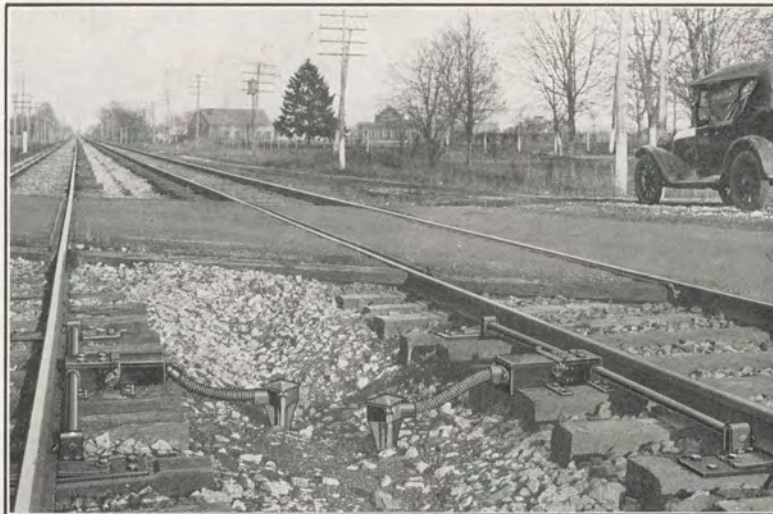
FIG.	NAME AND DESCRIPTION	DWG. No.
5a	Pair of Selector Links Complete, for directional mechanisms. (1 figure 5, 1 figure 6, 1 figure 7, 1 figure 8, 1 figure 9 and 1 figure 10).	10407CX
6	Left Selector Link, for directional mechanisms.	10408C
7	Link Spring, for figure 5a.	10412
8	Connecting Pin, for figure 5a.	10411A
9	Washer, for figure 5a.	10615
10	Spring Cotter, for figures 5a, 13 and 20.	001001
11	Selector Link, for non-directional mechanisms.	10435
12	Retaining Screw, for figures 5a and 11.	10415A
13	Castle Nut, for figure 12.	003002
14	Right Counterweight, for directional and non-directional mechanisms.	10413R
15	Left Counterweight, for directional and non-directional mechanisms.	10413L
16	Spacer Washer, for directional and non-directional mechanisms.	10417
17	Selector Shaft, for directional and non-directional mechanisms.	10416
18	Castle Nut for figure 17.	003003
19	Spring Cotter for figures 18 and 20.	001003
20	Circuit Controller Washer.	10419
21	Long Spacer for figures B and B-2.	10434
22	Short Spacer for figures B and B-2.	10433
23	Medium Spacer for figures B and B-2.	10432
24	Contact Drum only, for figure 24a.	10422
24a	Contact Drum Complete for figures A, A-1, A-4, A-5, B, B-1, and C. (1 figure 24, 1 figure 25, 1 figure 26, 3 figures 27, 2 figures 28, and 2 figures 29).	10422X
25	Bushing, for figures 24a, 30a, 32a and 33a.	10423
26	Operating arm, for figures 24a, 30a, 32a and 33a.	10421
27	Round Head Brass Machine Screw, for figure 26.	004002
28	Round Head Brass Machine Screw, for figures 29 and 31.	004001
29	Short Segment, for figures 24a, 32a and 33a.	10424A
30	Contact Drum only, for figure 30a.	10422-1
30a	Contact Drum Complete, for figures D and E. (1 figure 25, 1 figure 26, 3 figure 27, 2 figure 28, 1 figure 30 and 1 figure 31).	10422-1X
31	Long Segment, for figures 30a.	10439
32	Contact Drum only, for figure 32a.	10437
32a	Contact Drum Complete, for figure F. (1 figure 25, 1 figure 26, 3 figures 27, 2 figures 28, 2 figures 29 and 1 figure 32).	10437X
33	Contact Drum only, for figure 33a.	10437-1
33a	Contact Drum Complete, for figures G and H. (1 figure 25, 1 figure 26, 3 figures 27, 2 figures 28, 2 figures 29 and 1 figure 33).	10437-1X
34	Terminal Block only, for figure 34a.	10426
34a	Terminal Block Complete, for figures C and D. (1 figure 34, 3 figures 35, 3 figures 36, 6 figures 37, 6 figures 38 and 3 figures 39).	10426X
35	Contact Spring for figures 34a, 43a, 44a and 45a.	10425
36	Terminal Post for figures 34a, 43a, 44a and 45a.	10427
37	A. R. A. Binding Nut for figures 34a, 43a, 44a and 45a.	10430
38	A. R. A. Washer for figures 34a, 43a, 44a and 45a.	10431
39	A. R. A. Clamp Nut figures 34a, 43a, 44a and 45a.	10429
40	Thin Insulating Strip for figures A, A-1, A-2, A-3, A-4, A-5, A-6, A-7, B, B-1, B-2, B-3, C, E, F and H.	10428
41	Round Head Brass Machine Screws, for figures A, A-1, A-2, A-3, A-4, A-5, A-6, A-7, B, B-1, B-2, B-3, C, D, E, F, G and H.	004003
42	Thick Insulating Strip for figures D and G.	10440

Plate A-91

Models C-1 Directional and C-2 Non-Directional
Fusticlo Parts

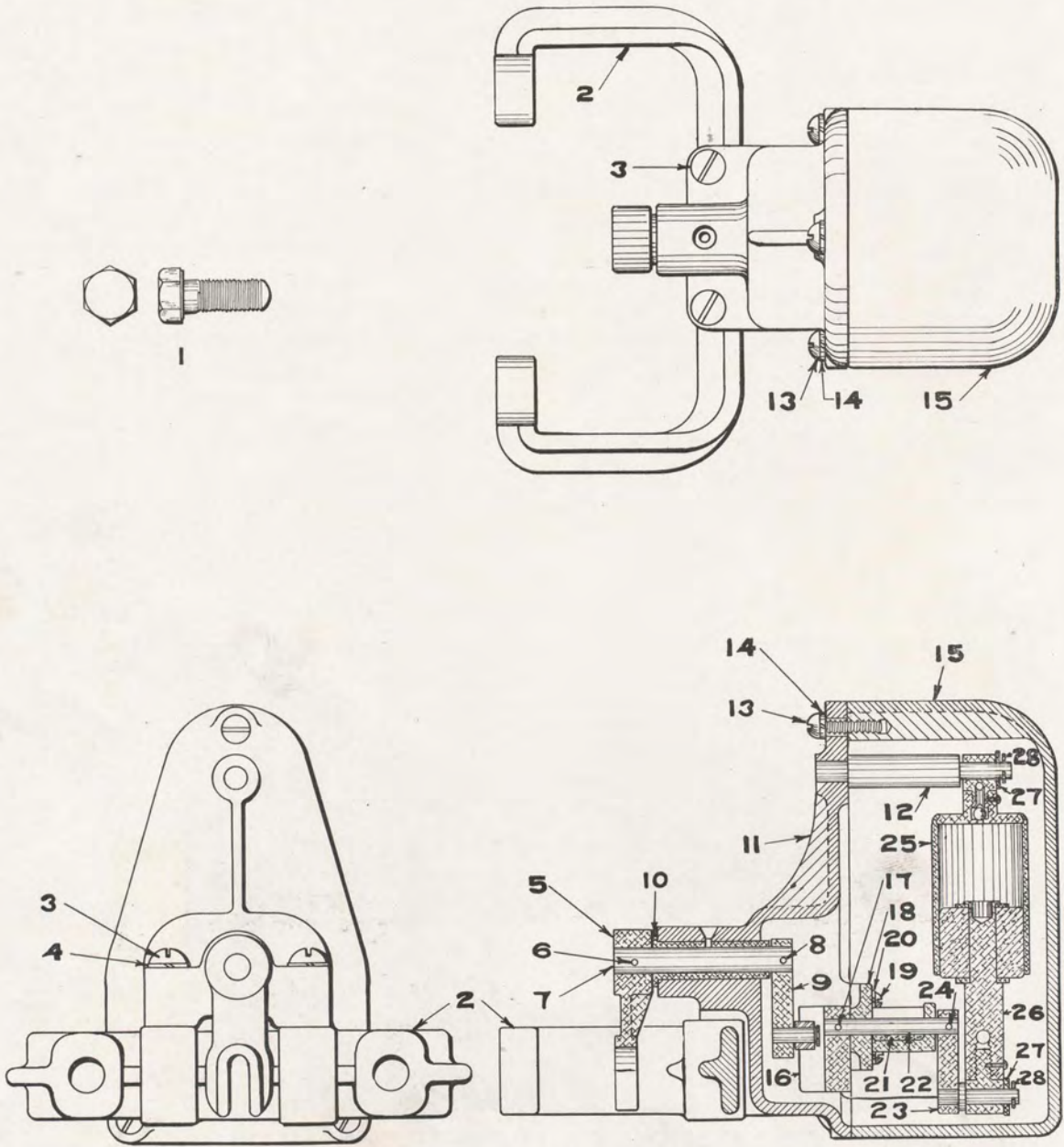
Order by Plate, Figure and Name

FIG.	NAME AND DESCRIPTION	DWG. No.
43	Terminal Block only, for figure 43a.	10426-1
43a	Terminal Block Complete, for figure E. (3 figures 35, 3 figures 36, 6 figures 37, 6 figures 38, 3 figures 39 and 1 figure 43).	10426-1X
44	Terminal Block only, for figure 44a.	10438
44a	Terminal Block Complete, for figures F and G. (4 figures 35, 4 figures 36, 8 figures 37, 8 figures 38, 4 figures 39 and 1 figure 44).	10438X
45	Terminal Block only, for figure 45a.	10438-1
45a	Terminal Block Complete, for figure H. (4 figures 35, 4 figures 36, 8 figures 37, 8 figures 38, 4 figures 39 and 1 figure 45).	10438-1X
46	Pneumatic Retarder Complete with bracket and two cap screws, for figures A, A-1, A-2 and A-3.	10600



TWO DIRECTIONAL FUSTICLO RAIL CONTACTORS USED AS COMBINATION CUT-OUTS AND STARTERS. ALSO SHOWS PARKWAY OUTLETS MADE BY THIS COMPANY.

Plate A-92



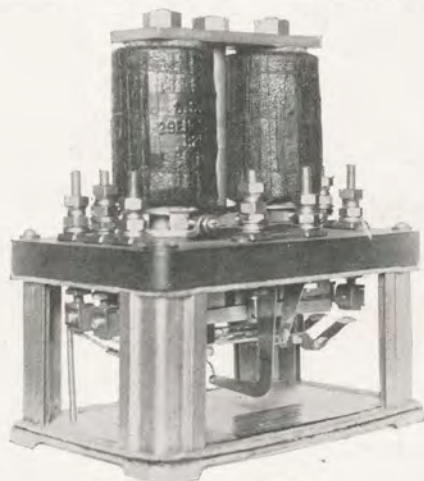
A

Plate A-92

Model C-1 Directional Fusticlo Pneumatic Retarder and Parts

Order by Plate, Figure and Name

FIG.	NAME AND DESCRIPTION	DWG. No.
A	Pneumatic Retarder with bracket and two cap screws, for Model C-1 Directional Fusticlo Rail Contactors.	10600
1	Hexagon Head Cap Screw, for holding retarder to Fusticlo mechanism.	009002
2	Retarder Bracket	10601
3	Round Head Brass Machine Screw, for figure 2.	004026
4	Lock Washer, for figure 3.	002001
5	Outside Rocker Arm only.	10504
6	Outside Rocker Arm Pin, for figure 5.	10505
7	Rocker Shaft only.	10605
7a	Rocker Shaft Assembly. (1 figure 7, 1 figure 8 and 1 figure 9).	10605X
8	Inside Rocker Arm Pin, for figure 7a.	10607
9	Inside Rocker Arm Complete, with roller, for figure 7a.	10606X
10	Rocker Shaft Bearing only.	10626
11	Retarder Body only.	10602
11a	Retarder Body Complete. (1 figure 10, 1 figure 11 and 1 figure 12).	10624X
12	Suspension Pin, for figure 11a.	10624
13	Round Head Brass Machine Screw, for figure 11a.	004009
14	Lock Washer, for figure 13.	002007
15	Retarder Cover.	10603
16	Operating Lever only.	10609
16a	Operating Lever Complete. (1 figure 16, 1 figure 17 and 1 figure 22).	10609X
17	Operating Lever Pin, for figure 16a.	10612
18	Retarder Bearing only.	10604
19	Round Head Brass Machine Screw, for figure 18.	004013
20	Lock Washer, for figure 19.	002004
21	Oil Pad.	10625
22	Lever Shaft, for figure 16a.	10610
23	Retarder Lever Complete with crank pin.	10611X
24	Retarder Lever Pin, for figure 23.	10613
25	Dash Pot Cylinder Complete with value and bearing.	10620X
26	Dash Pot Piston Complete with bearing.	10619X
27	Washer for figures 12 and 23.	10615
28	Brass Spring Cotter for figures 27.	001005

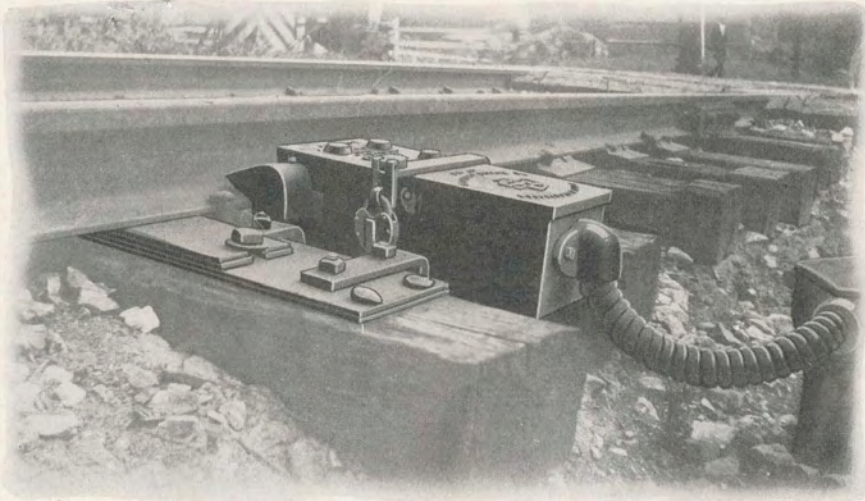


C-1 FLASHING RELAY



C-3 FLASHING TIME RELAY

Bulletin 5A describes these relays and shows circuits for signal installations using the Fusticlo.



MODEL C-2 NON-DIRECTIONAL FUSTICLO



Instructions for Installation and Maintenance of Model C "Fusticlo" Rail Contactors.

THE same careful consideration should be given in locating the Fusticlo Rail Contactor as is given in locating signals, etc. Three prime factors to be taken into consideration are, PROPER DRAINAGE, SOLID ROAD-BED and LOCATING NEAR THE CENTER OF THE RAIL. The track should be solid. By shifting the starting instruments in one direction or the other a rail length or so, a more solid location can often be found with proper drainage. The same applies to the cut-out instruments. Locate them on side of track and crossing where track is most solid and drainage best.

In locating a Directional Instrument, where the joints break even centers, one side of tiestrap, (A) which fastens the instrument to the ties, should be secured to the joint tie of the opposite rail as shown in Sketch 1. In other words, the joint ties of the opposite rail can be ties, 3 and 4 or 5 and 6, thus eliminating the shifting or disturbing of joint ties. The joint ties are harder to keep tamped and are the first to go down due to the wheels pounding the joints and if the spring plates are located close to the joint it will not only add unnecessary strain on the springs, due to the splices but when the joint ties go down it gives the springs more of the rail to support. It is not practical to place the spring plate on the same tie which holds up the joint on the opposite rail.

The old road-bed once disturbed, takes many tampings to get it back to its former solid condition, therefore, by merely moving a rail length or so it may be possible to locate the track instrument where the ties are in good condition and so spaced that they would not have to be disturbed to install the instrument. For a Directional Instrument, if ties 2 and 7 are paced from 106" to 114" centers, with four ties between and approximately evenly spaced, then hew ties 1, 2, 7 and 8, 1" below the base of the rail and 15" each way from the center of the rail as shown in Sketch 2 and install large tie plates "J" and auxiliary tie plates (T). For a Non-Directional Instrument hew ties 1 and 2, Sketch 3, 1" below the base of the rail, 15" from the center of the rail on the inside of the track and all the way to the end of the ties on the outside as shown in Sketch 4. If ties 4 and 5 (Sketch 1) are in the way of sides of tie straps (A) on the box (B), the ties should be notched to clear the straps. Where new ties are necessary it is recommended that wider and longer ties be used, such as switch ties, so they may have as large a bearing surface on the ballast, as possible. It is also recommended that these ties be sawed, as they are straight and the equipment is, therefore, more easily applied. These ties should be about 10" wide and 6" or 8" longer than the other ties, leaving the extra length on the spring plate end.

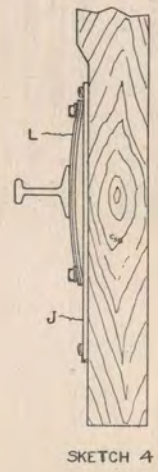
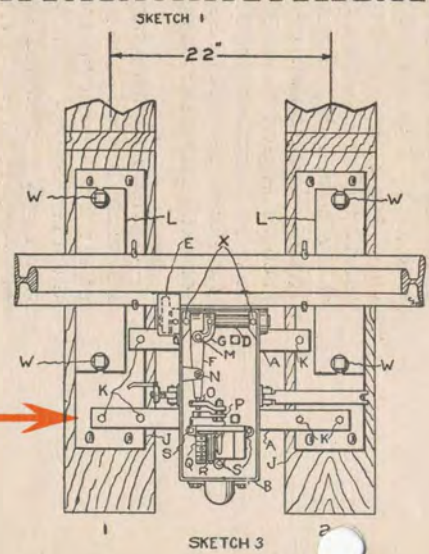
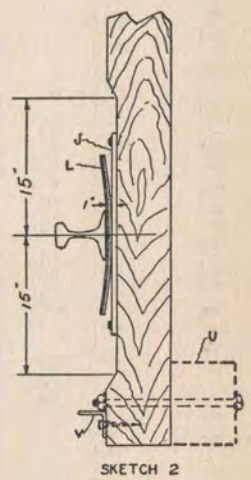
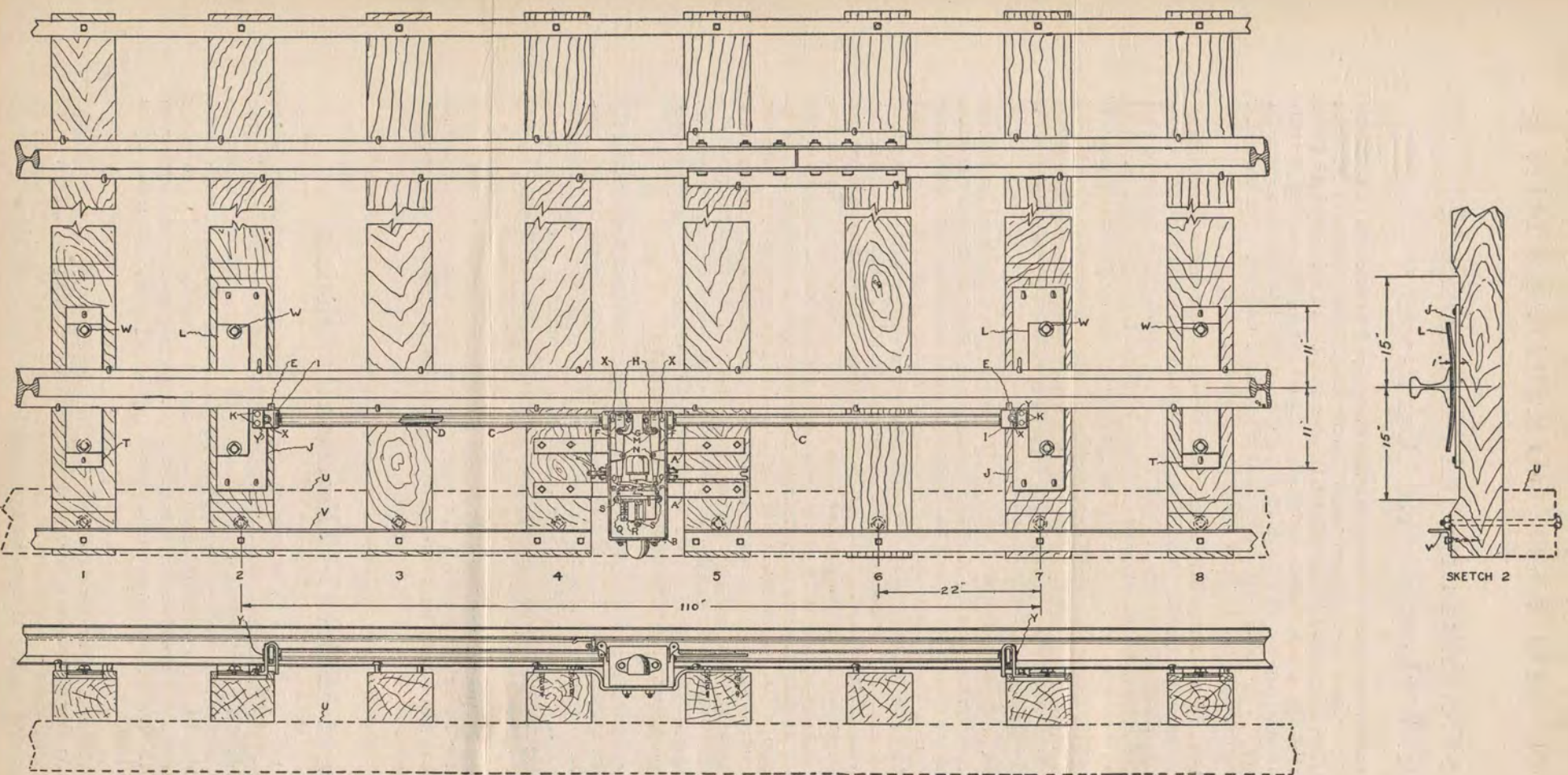
In soft places where it is hard to hold the ties, if a stringer or bridge timber, (U) shown in Sketch 1, is placed under the ends of the ties, catching at least one tie on each side of the instrument or a total of ten ties and each tie bolted to it, it will eliminate danger of the ties shifting. This is the best method to keep the ties in place but pieces of angle iron as (V) in Sketch 1, lagged or spiked on top of the ties are also very effective. These pieces should be about 10 ft. long and made from 3" x 3" x 1/4" angle iron.

Strap (A) should be bolted to the box (B) before the instrument is installed, bolts for this as well as the lag screws for securing the straps to the ties will be found inside the box. Put the bolts in place from the inside, allowing the heads to fit in the grooves which keep them from turning.

Installation of Model C-I Directional "Fusticlo"

BEFORE installing plates (J) and (T) of the Model C-1 Directional Fusticlo, place bolts (K) in plates (J) and remove one of the bolts (W) and the springs (L) from each plate, then place the plates on their respective ties (in position as shown in Sketch 1) under the rail and place the springs (L) in an inverted position, on each plate, as shown in Sketch 2. Place the instrument in position, seeing that bearings, (I) drop over bolts (K) and place nuts and lock washers on the bolts. Shift the plates and instrument so that bearings (I) touch the edge of the rail base and the box (B) is 1/4" from it. Spike the plates (J) and (T) to ties.

Now tamp ties in the same manner as if nothing had been installed, that is, the track should be put into running condition. After this has been done raise the spikes 3/8 of an inch on the ties supporting spring plates and on two ties each side of them. Do this on one rail only, the one under which the springs are placed.



All tie plates (J and T) must fit flat on the ties so there will be no deflection in these plates. If necessary hew ties to obtain flat surface.



If it is found that the arms (C) of the instrument are not parallel with the rail after tamping, shim or sink straps (A) as may be necessary, until the arms are parallel and then lag straps (A) to ties.

The springs (L) should now be taken out, thoroughly oiled and replaced in their upright position and bolts (W) replaced. Ordinary black oil is very satisfactory for oiling the springs but a more effective and lasting lubricant is a mixture of $2\frac{1}{2}$ pounds of flake graphite to one gallon of good machine oil. This can be mixed in the railroad shop or can be secured from us, ready mixed, in gallon cans.

The rail will show a slight hump where the springs are located and when a train passes the rail will be straightened thus the train will not be effected in any way by the springs or the instrument. Inspect all bolts, spikes and lag screws mentioned above, tighten them where necessary, after which the instrument is ready for adjustment inside the controller box (B).

Turn adjusting screws (M) back until adjusting dogs (G) can be moved freely. If they are tight and seem to be under a strain see if operating arms, (C) are approximately parallel with the rail and if not, follow instructions above to make them so. This will remove the strain and allow the shafts and dogs to turn freely. Next turn screws (M) back as they were and keep turning them until the bosses on the secondary selector levers (O) line up horizontally with corresponding bosses on the selector links (P), then tighten the check nuts on screws (M). Stop screws (N) need not be adjusted on new instruments as they are set at our factory and their use will be fully explained below under maintenance.

As most ordinary circuits require only one contact drum, two drums are not often used. Where only one contact drum (R) is used, it should be placed in the controller box on the side farthest from the crossing signal to be operated. In other words, if a north-bound train is to operate the contacts, then the circuit controller drum, (R) and contact block (Q) should be on the south side of the instrument, that is, the side nearest the approaching train. If it is found that the circuit controller contacts and drum are on the wrong side remove screws (S), take the mechanism from the controller box, remove terminal block (Q) and drum (R), place them on the opposite side and replace the mechanism and screws (S). If the contacts do not make or break at the desired point remove contact block (Q) and either add or remove insulating strips until contacts are the right height. Always leave at least one insulating strip between the contact block and the mechanism frame as this is necessary to assure proper insulation of the terminal posts.

Installation of Model C-2 Non-Directional "Fusticlo"

THE Model C-2 Non-Directional Instrument is installed in practically the same manner as the Directional type except of course, there is much less to do. Referring to Sketch 3, remove one of the bolts (W) and the springs (L) from each of the plates (J). Bolt plates (J) to straps (A) as shown and slide the assembly under the rail so that controller box (B) is $\frac{1}{4}$ inch from the edge of the rail and spike plates (J), to ties. Place springs in an inverted position, tamp ties and remove, oil and replace springs, as outlined above for the Directional type. Sketch 4 shows how a set of spring plates look when properly installed.

To adjust, turn screw (M) until boss on the secondary selector lever (O) lines up horizontally with a corresponding boss on the selector link (P).

If contacts do not make or break at proper point adjust as for Directional Instruments.

Maintenance of Directional and Non-Directional "Fusticlos"

THE spring plates should be kept clean, free from ballast, cinders, etc., so that hard rains will not wash small particles under the springs, which sometimes prevent them from functioning properly, for in winter there is danger of water collecting with the cinders and dirt under the plates and freezing solid. It is good practice to dig the ballast about two inches lower than the top of the spring plate ties as this will prevent foreign matter from getting under the springs.

The springs should be taken out and oiled from time to time, as they were when installed, to prevent rusting and to help overcome friction between the springs, plates and rail base. It is the practice on some railroads to have the track men, when oiling switches, also oil the spring plates, arms, bearings, etc., of the Fusticlo Instruments. Besides preventing rust, from rain and water, it also keeps salt brine of refrigerator cars from attacking these parts. Sleet falling on the oily surface freezes in small balls and rolls off.

•S] SOUTHERN SIGNAL CORPORATION]S•

Spring plate ties should be maintained so that the rail is never less than $\frac{1}{4}$ inch from ties 3, 4, 5 and 6, for Directional Instruments, and the distance between springs (L) and the tie plates, on both Directional and Non-Directional types, should never be less than $\frac{1}{4}$ inch. If this distance is less there is either too much pressure on the springs or they have lost some of their tension. If the former, adding another leaf to the springs will help, and if the latter, the springs should be replaced with new ones.

The $\frac{1}{4}$ inch hump in the track, where springs are under the rail, should taper off to about the third tie, as the springs should support from 66 to 88 inches of rail.

Remove anti-creepers on spring plate or controller box ties as they sometimes interfere with perfect operation of the instrument. When raising spikes use a standard A. R. E. A. spike puller which can be used between the rail and arm (C). Do not allow claw bar to rest on the arm (C) for this may bend the sleeve and shaft and cause binding in the bearings. It may also shear off the sleeve of the arm at the box, or rail dog.

On Directional Instruments, bearings at (Y), get very hard service and wear in time. These bearings are held in place by two machine screws and can be very easily renewed by removing the screws and old bearings and replacing them with new ones, without disturbing any other part of the device.

Screws (N) are stops for limiting the stroke of the primary selector levers (F). They are always set at the factory and the screw on the Non-Directional Instrument requires no further attention. However, on the Directional Instrument it is necessary to inspect and readjust them occasionally to take up wear between the screw (N) and the lever (F). To readjust, turn screw (M), (on one side) back until lever (F) strikes stop screw (N), then try to slide selector link (P), on the opposite side of the instrument, that is, if screw (M) on the right side was turned back, try the selector link on the left side. With primary lever (F) against stop screw (N) the opposite selector link (P) should have not less than $\frac{1}{16}$ to $\frac{3}{32}$ inch play or clearance when moved lengthwise. If it is found that the selector link has less play, increase it by turning screw (N) down until the desired clearance is obtained. Then tighten check nut on screw (N).

Before readjusting screw (M), operate adjusting dog (G), by hand and if it does not move freely, locate trouble and correct as outlined above in instructions for installing. Then turn screw (M) back until boss on secondary selector lever (O) lines up with the boss on selector link (P) and tighten nut on screw (M). Adjust screw (M) on the other side in the same manner. It is important that the selector links (P) have this clearance, otherwise they receive a blow for each operation of the instrument, which eventually breaks them and wears away the selector tips on their lower side.

Due to varying conditions of the track both the Directional and Non-Directional Instruments must be inspected from time to time to see how the bosses on the secondary selector levers (O) line up with those on the selector links (P). If they are found to be out of line turn screws (M) until they line up and then tighten check nuts.

Sometimes it becomes necessary to replace the selector links, counterweights or other parts on the mechanism and quite frequently when this is done on the track the retaining screws, which hold the selector links, (P) are carelessly battered and bent so that the links stick and will not move. In putting these screws in be very careful not to dent the surface, bend them or batter the heads, then the links (P) will slide freely.

Oil all moving parts, both inside and outside the instrument, at regular intervals. We furnish both Directional and Non-Directional Types equipped with Zerk Fittings, at the points (X) as indicated in Sketches 1 and 3, when specified but all are made so that they can be put on at any time. When Zerk Fittings are not used, use oil at these points and when they are used apply grease with a Zerk Grease Gun.

In cold weather, a small quantity of vaseline applied to the contact drum will prevent frosting of the contacts.

If condensation sets up inside the controller box, the box should be equipped with ventilators. These can be obtained from us and can be applied by drilling and tapping each side of the box for $\frac{1}{2}$ inch pipe.

Some of the Directional Instruments are equipped with pneumatic retarders. This retarder is enclosed in a dust-proof case and requires no care except that oil should be put in the oil hole of the main bearing when oiling the other parts of the track instrument. Do not open and attempt to repair the retarder on the track. If it fails to operate properly remove it by taking out the two round head machine screws, which hold it in and replace it with a good one, sending the defective one to the railroad repair shop or our factory for repairs. Never open the retarder and oil its parts on the track. Ordinary machine oil will dry out and gum so that the retarder cannot operate. The piston requires no lubrication at all and the other parts are so designed that the small quantity of clock oil applied at the factory is all that is necessary for them. All of the parts are made of materials which will not rust.

MODEL A PARKWAY OUTLET



PATENT APPLIED FOR

LOUISVILLE FROG, SWITCH & SIGNAL CO.

INCORPORATED

SUCCESSOR TO

SOUTHERN SIGNAL CORPORATION

Incorporated

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February 15, 1928

Bulletin No. 6A



Model "A" Parkway Outlets

Model "A" Parkway Outlet

SINCE the introduction of parkway cable in railway signal work it has been found advisable to protect the ends or terminals from injury because generally splices are not permitted and as there is always a danger of breaking or otherwise injuring the wire at bootleg and switch circuit controller terminals, due to vibration, dragging equipment and so forth, it sometimes becomes necessary to renew the whole cable. With this in mind we developed the Model "A" Parkway Outlet, which we believe to be the most practical device of this kind.

When parkway cable connections become damaged, only a short piece of wire from the outlet to the rail or switch circuit controller must be renewed where the Model "A" Parkway Outlet is used.

It is very strong and at the same time quite light. This is accomplished by the ribbed construction. It is very neat in appearance. One of its big advantages is its simplicity, there being only three main parts, namely, the two castings forming the body and the cover. Another advantage of this construction is that no concrete is necessary. It is easily installed.

Time is also saved when inspecting locations where the Model "A" Parkway Outlet is used as the cover is easily removed and replaced. It is secured by two $3/16$ -inch spring cotters (which are very easily replaced should they become broken or lost) only one of which must be taken out to remove the cover. This can be done with a pair of pliers, no wrenches or other bulky tools being necessary.

The Model "A" Parkway Outlet is made in one size which is large enough to take care of all ordinary locations. The two-inch vertical hole through the center will accommodate four parkway cables. The wire chamber is large enough to take four A. R. A. Standard terminal blocks. When soldered joints are used the terminal blocks are not necessary. Ample space will be found in the outlet to coil any surplus wire.

Because it is made of cast-iron, which has very good rust resisting qualities, the Model "A" Parkway Outlet is very durable. At the bottom where the cable enters the outlet the corner is well rounded to prevent injury of the cable and the base is of such shape that the outlet is not easily pulled up or displaced.

Sand or clay should be packed in the vertical hole through which the cable enters. Where it is desired to "seal in" the end of the cable about four inches at the top of the hole should be filled with pitch or other suitable material instead of sand or clay. Some railroads fill the whole wire chamber with pitch after connections have been made.

This outlet is designed to be buried about one foot in the ballast and as it is 17 and $5/16$ inches high over all, five inches will extend above the ballast.

·S· SOUTHERN SIGNAL CORPORATION ·S·

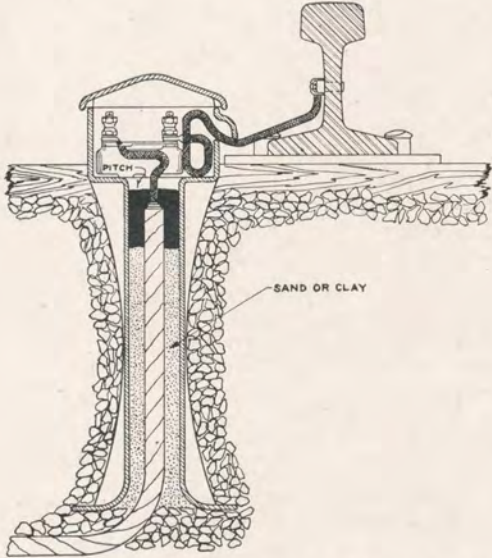


Bootleg Connections Using Model A-1 Parkway Outlets.

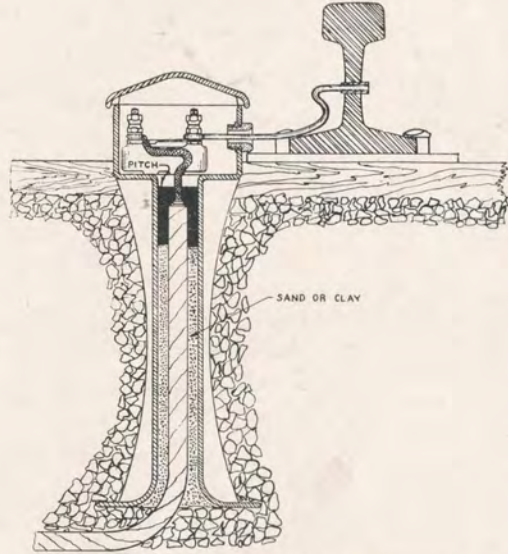


Model A-3 Parkway Outlet In Service at a Switch Circuit Controller.

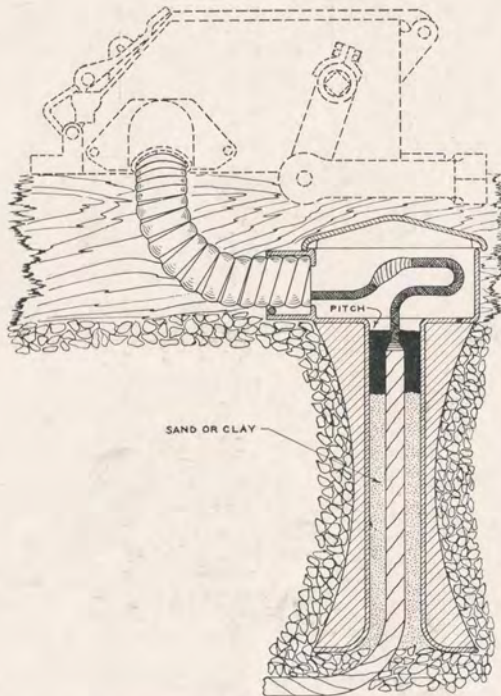
·SOUTHERN SIGNAL CORPORATION·



Section Through Model A-1 Parkway Outlet and Bootleg Connection. A. R. A. Terminal Block Used.



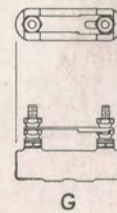
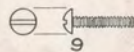
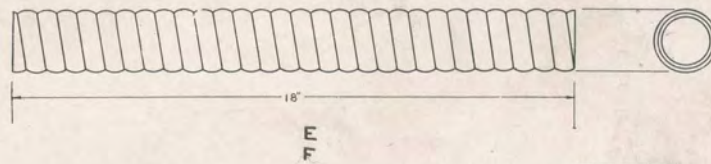
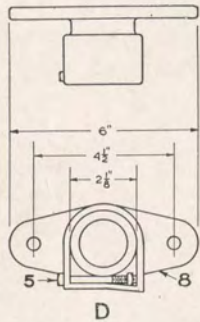
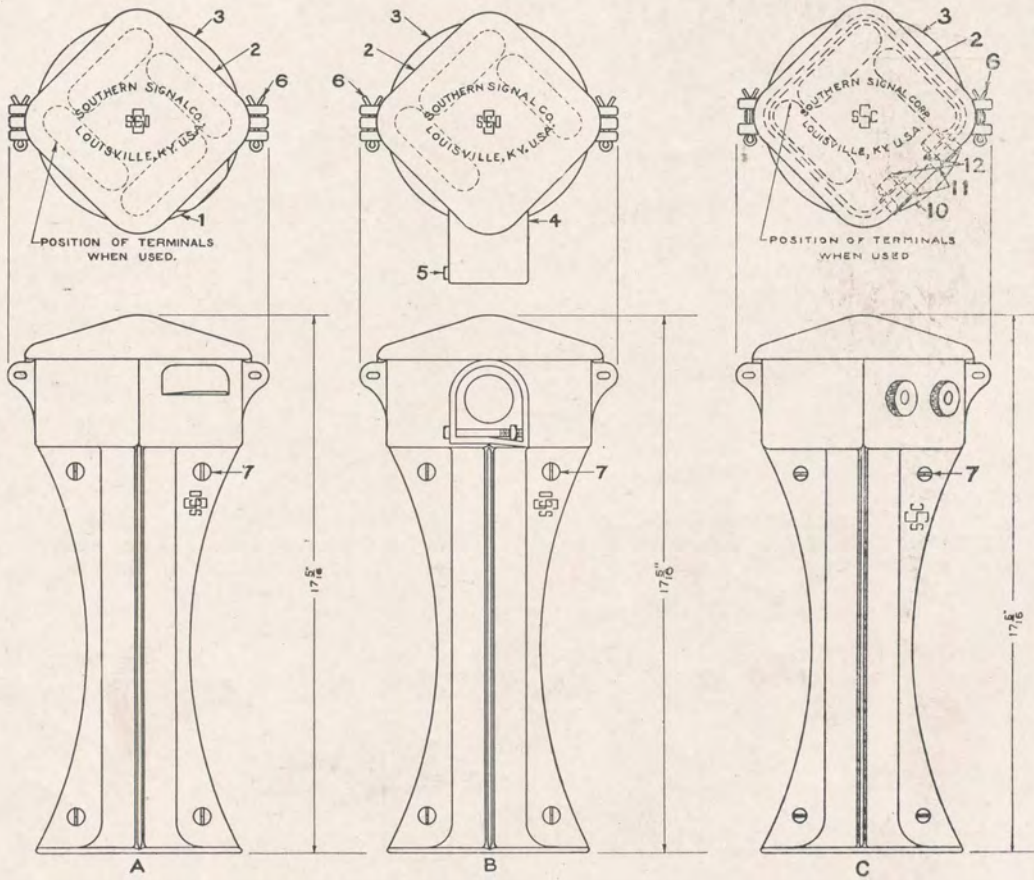
Section Through Model A-4 Parkway Outlet and Bootleg Connection. A. R. A. Terminal Block Used.



Section Through Model A-3 Parkway Outlet With Conduit Connection. Soldered Joint.

SOUTHERN SIGNAL CORPORATION

Plate B-20



SOUTHERN SIGNAL CORPORATION

Plate B-20

Model A Parkway Outlets and Parts

Order by Plate, Figure and Name

FIG.	NAME AND DESCRIPTION	DWG NO.
A	Model A-1 Parkway Outlet complete with single wire outlet, as shown; drilled and tapped for four A. R. A. terminal blocks. (Terminal blocks not furnished)	20500
A-1	As figure A, except equipt with one No. 10565 A. R. A. terminal block.	
A-2	As figure A, except equipt with two No. 10565 A. R. A. terminal blocks.	
A-3	As figure A, except equipt with three No. 10565 A. R. A. terminal blocks.	
A-4	As figure A, except equipt with four No. 10565 A. R. A. terminal blocks.	
A-5	Model A-2 Parkway outlet complete with wire outlet on each side (not shown) drilled and tapped for four A. R. A. terminal blocks. (Terminal blocks not furnished).	20500-1
A-6	As figure A-5, except equipt with one No. 10565 A. R. A. terminal block.	
A-7	As figure A-5, except equipt with two No. 10565 A. R. A. terminal blocks.	
A-8	As figure A-5, except equipt with three No. 10565 A. R. A. terminal blocks.	
A-9	As figure A-5, except equipt with four No. 10565 A. R. A. terminal blocks.	
B	Model A-3 Parkway Outlet with conduit connection for 1/2" flexible conduit; (conduit not furnished) drilled and tapped for three A. R. A. terminal blocks. (Terminal blocks not furnished)	20500-2
B-1	As figure B, except equipt with one No. 10565 A. R. A. terminal block.	
B-2	As figure B, except equipt with two No. 10565 A. R. A. terminal blocks.	
B-3	As figure B, except with three No. 10565 A. R. A. terminal blocks.	
C	Model A-4 Parkway Outlet with two insulating bushings; drilled and tapped for three A. R. A. terminal blocks. (Terminal blocks not furnished.)	20500-3
C-1	As figure C, except equipt with one No. 10565 A. R. A. terminal blocks.	
C-2	As figure C, except equipt with two No. 10565 A. R. A. terminal blocks.	
C-3	As figure C, except equipt with three No. 10565 A. R. A. terminal blocks.	
D	Conduit Connector complete, for connecting 1/2" flexible conduit to switch circuit controllers, rail contactors, etc.	10213X
E	1 1/2" Flexible Conduit 18" long.	10214
F	1 1/2" Flexible Conduit 18" long.	
G	No. 10565 A. R. A. Terminal Block	40446-7X

PARTS

1	Casing, with wire outlet, only.	20501
2	Cover only.	20502
3	Blank Casing only.	20503
4	Casing, with 1/2" flexible conduit connection, only	20504
5	Square head machine bolt	006006
6	Spring Cotter.	001006
7	Round head stove bolt.	014001
8	Conduit Connector only.	10213
9	Round head brass machine screw. (For fastening A. R. A. terminal blocks).	004017
10	Casing, with two bushing holes, only.	20505
11	Porcelain Bushing	20506
12	Bushing Holder	20507

SOUTHERN SIGNAL CORP.



LOUISVILLE, KY. U.S.A.

MODEL D PARKWAY OUTLETS

Patent Applied For



The Model D type Parkway Outlet was made to meet the demand for a small outlet and has been very favorably accepted by the railroads.

It is made of cast iron, painted black, and is like our Model A Parkway Outlet in every respect except that it is smaller; it has all the advantages of the Model A.

The wire chamber is large enough for two standard A. R. A. terminal blocks. The vertical hole, through which the parkway cables pass, is flat with rounded corners and measures $1\frac{1}{8}$ " x 2". The outlet is $4\frac{3}{8}$ " deep, $5\frac{5}{8}$ " wide and $16\frac{7}{8}$ " high.

There are four forms of the Model D Parkway Outlets, for various types of bootleg connections:

The Model D-1 has a rectangular hole in one side through which the insulated bootleg wires are passed. The bootleg wires may be secured to the parkway cables by means of A. R. A. terminals as shown in the section in figure A, or if no terminals are used soldered and taped joints may be employed.

In the Model D-2, the bootleg wire, which may be bare or insulated, passes through a porcelain bushing having a $\frac{3}{16}$ " hole. The bushing is held in place by a pressed copper nut and can be quickly and easily replaced if broken.

An insulated terminal post passes through the side of the Model D-3. The bootleg wire is connected to the portion of the terminal post on the outside and the parkway cable to that portion extending inside the outlet. The terminal post is threaded for 14-24 nuts and is of stainless steel, which is strong and will not corrode. The nuts are brass and the lock washers cadmium plated steel. The insulation is of vulcanized fibre.

The Model D-4 has an insulated bronze clamp designed to grip $\frac{1}{4}$ " galvanized stranded steel duplex bootleg wires. If the single wire bootleg is used, instead of the duplex, it is best to bend the wire U shaped at the end so that the wire passes through both sets of grooves in the clamp. A $\frac{1}{2}$ " galvanized bolt is used to draw up the clamp. The end of the parkway cable is held between two galvanized washers inside the outlet. The insulation is of the best grade of bakelite and the steel lock washer is cadmium plated.

All of the parts of the Model D Parkway Outlets are interchangeable. The porcelain bushing of the Model D-2, the terminal post of the Model D-3, and the wire clamp of the Model D-4 all mount in the same size hole; therefore, if one type is in use and it is desired to change to one of the other types, the change can be readily made.

The end of the parkway cable may be sealed in with pitch, as shown in the section in figure A. This pitch also acts as a clamp to hold the cable firmly in place.

If a larger outlet is needed use Model A.

PEERLESS MANUFACTURING CORPORATION
LOUISVILLE, KENTUCKY

Successor to LOUISVILLE SWITCH AND SIGNAL CO. and PEERLESS MFG. CO.

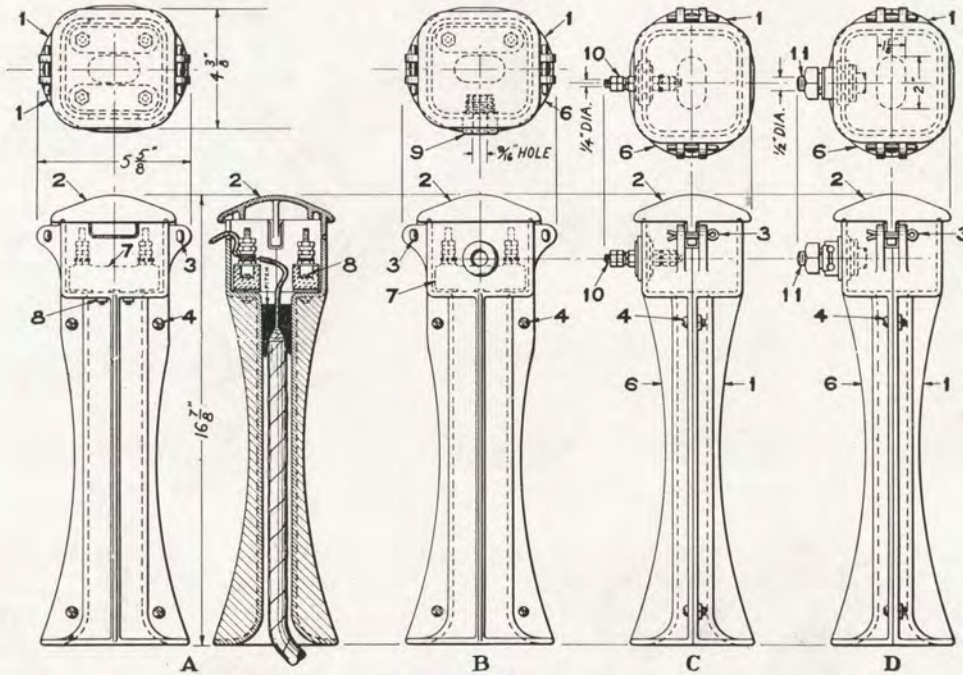
JUNE 1, 1933.

Bulletin No. 6C

(Supersedes S. S. Corp. Bulletin No. 6B and L. F. S. & S. Co. BP 6-B)

Plate B-23

Model D Parkway Outlets and Parts

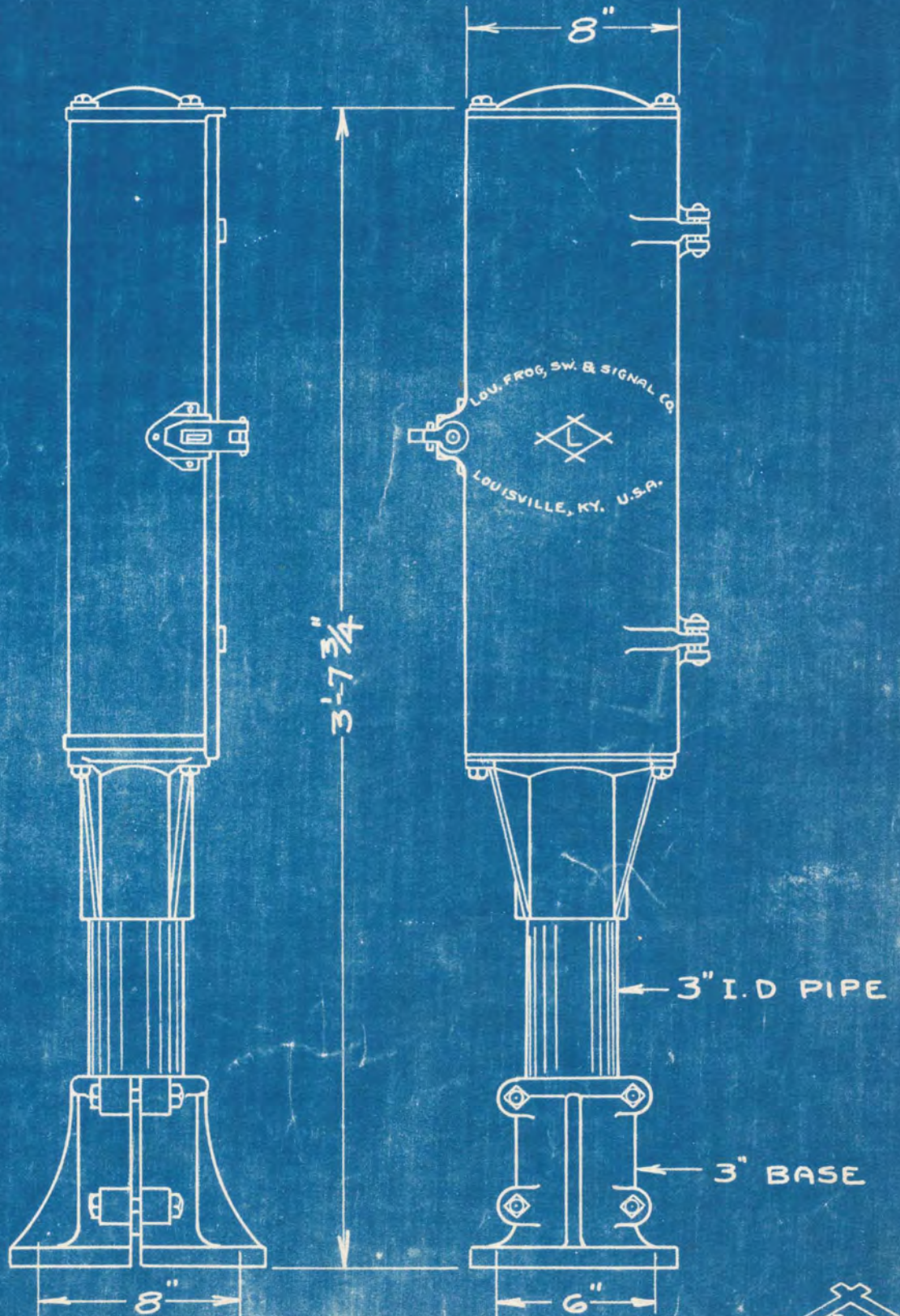


Order by Plate, Figure and Name

FIG.	NAME AND DESCRIPTION	DWG. No.
A	Model D-1 Parkway Outlet complete, as shown; drilled for two A. R. A. terminal blocks (Terminal blocks not furnished)	21100
A-1	As figure A, except equipped with one No. 10565 A. R. A. terminal block	21100-2
A-2	As figure A, except equipped with two No. 10565 A. R. A. terminal blocks	21100-3
B	Model D-2 Parkway Outlet complete, as shown; drilled for one A. R. A. terminal block. (Terminal block not furnished)	21100-1
B-1	As figure B, except equipped with one No. 10565 A. R. A. terminal block	21100-4
C	Model D-3 Parkway Outlet complete, as shown	21100-5
C-1	As figure C, except equipped with two insulated terminal posts, that is, one on each side of the outlet	21100-9
D	Model D-4 Parkway Outlet complete, as shown	21100-7
D-1	As figure D, except equipped with two insulated wire clamps, that is, one on each side of the outlet	21100-10

Parts

1	Casing only	21101
2	Cover	21102-A
3	Spring Cotter	001006
4	Round Head Stove Bolt	014001X
5	5-lb. Can of Sealing Compound (not shown, for sealing ends of parkway cable in outlet.)	
6	Casing with hole in side	21103
7	A. R. A. No. 10565 Terminal Block	40446-1X
8	Brass Screw and Nut, for fastening A. R. A. Terminal Blocks	004003X
9	Porcelain Bushing with retaining nut	21104X
10	14-24 Insulated Terminal Post complete with nuts and washers	21106X
11	Insulated Wire Clamp complete with bolt and washers	21110X

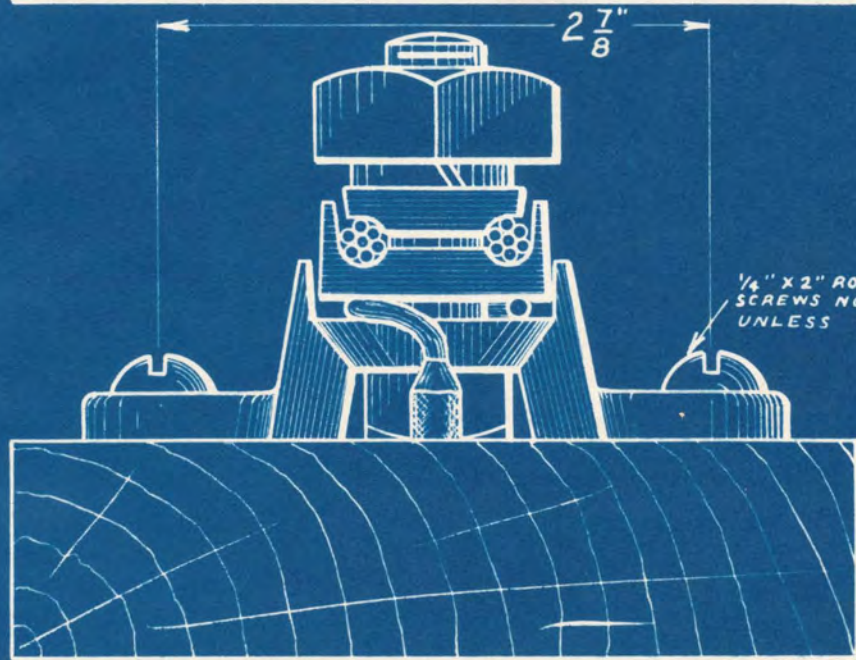
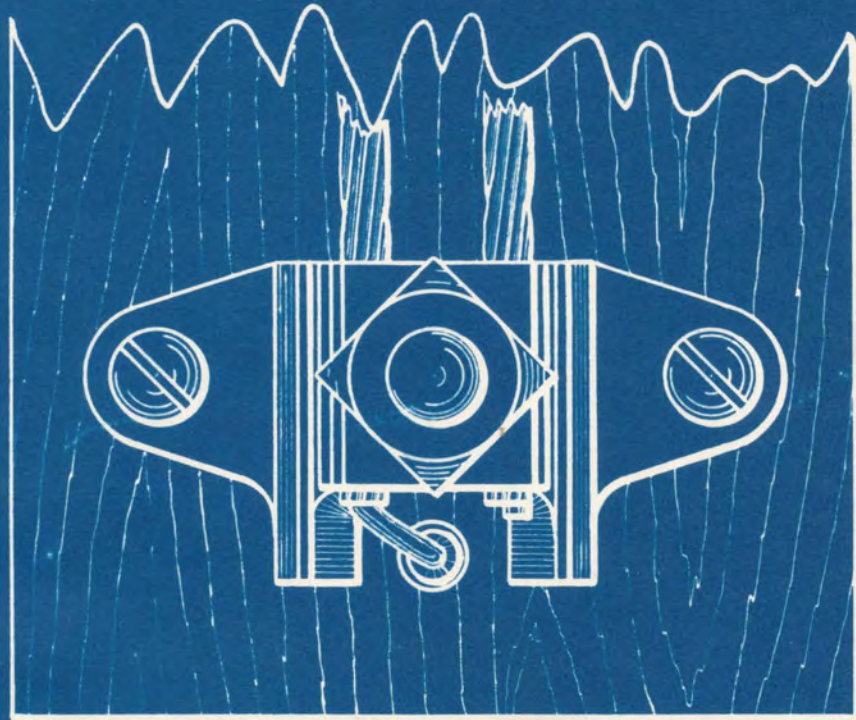


BP 6-B3

DWG. No. 50300-3
SKETCH No. 545

MODEL-A
PARKWAY JUNCTION BOX
DWG. BY C.S.B. 3/14/30

MODEL B TRUNKING RISER.

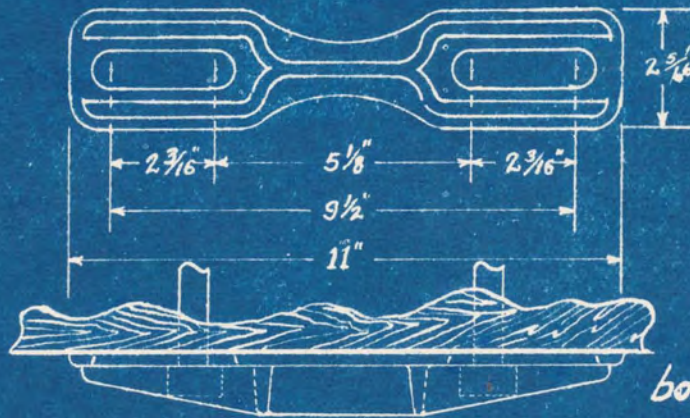


FOR TWO 1/4" DIA. RAIL CONNECTIONS, AND ANY SIZE TRUNKING WIRE.

CASTINGS AND BOLT OF BRONZE.

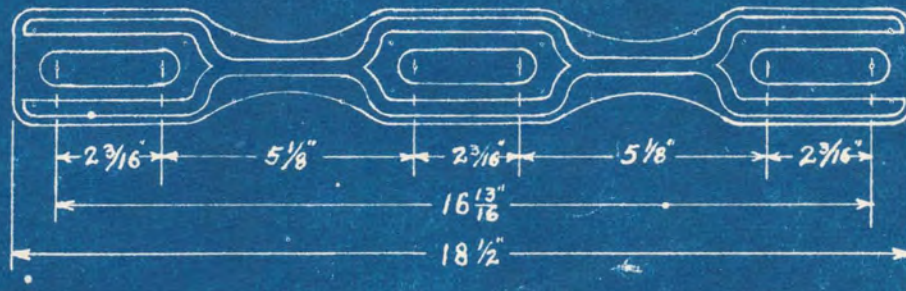
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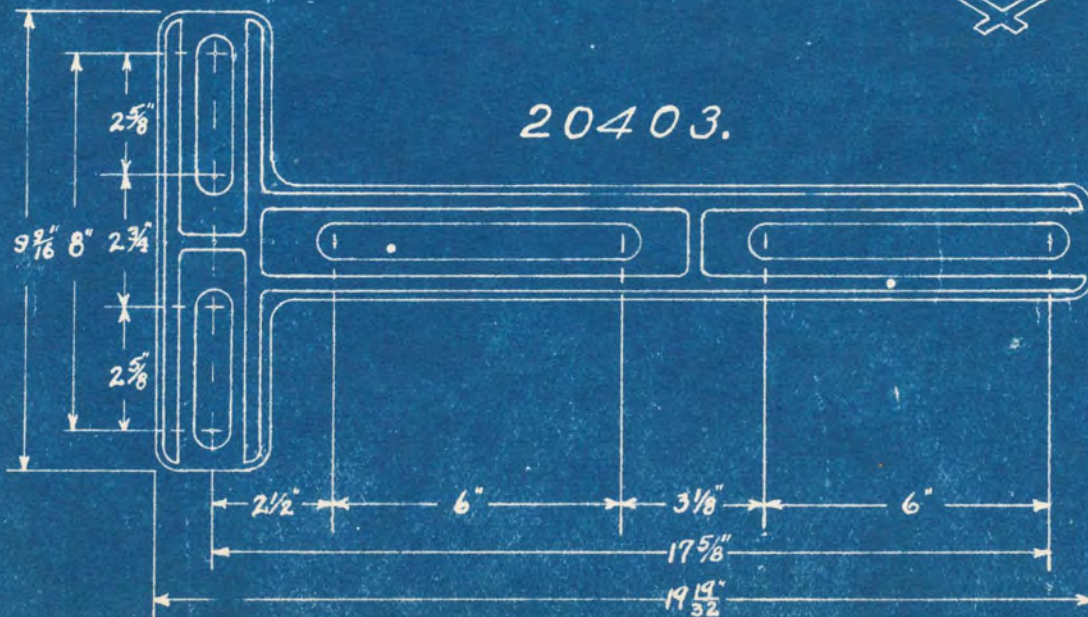


Application showing bolts under tie.

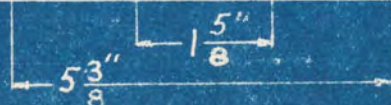
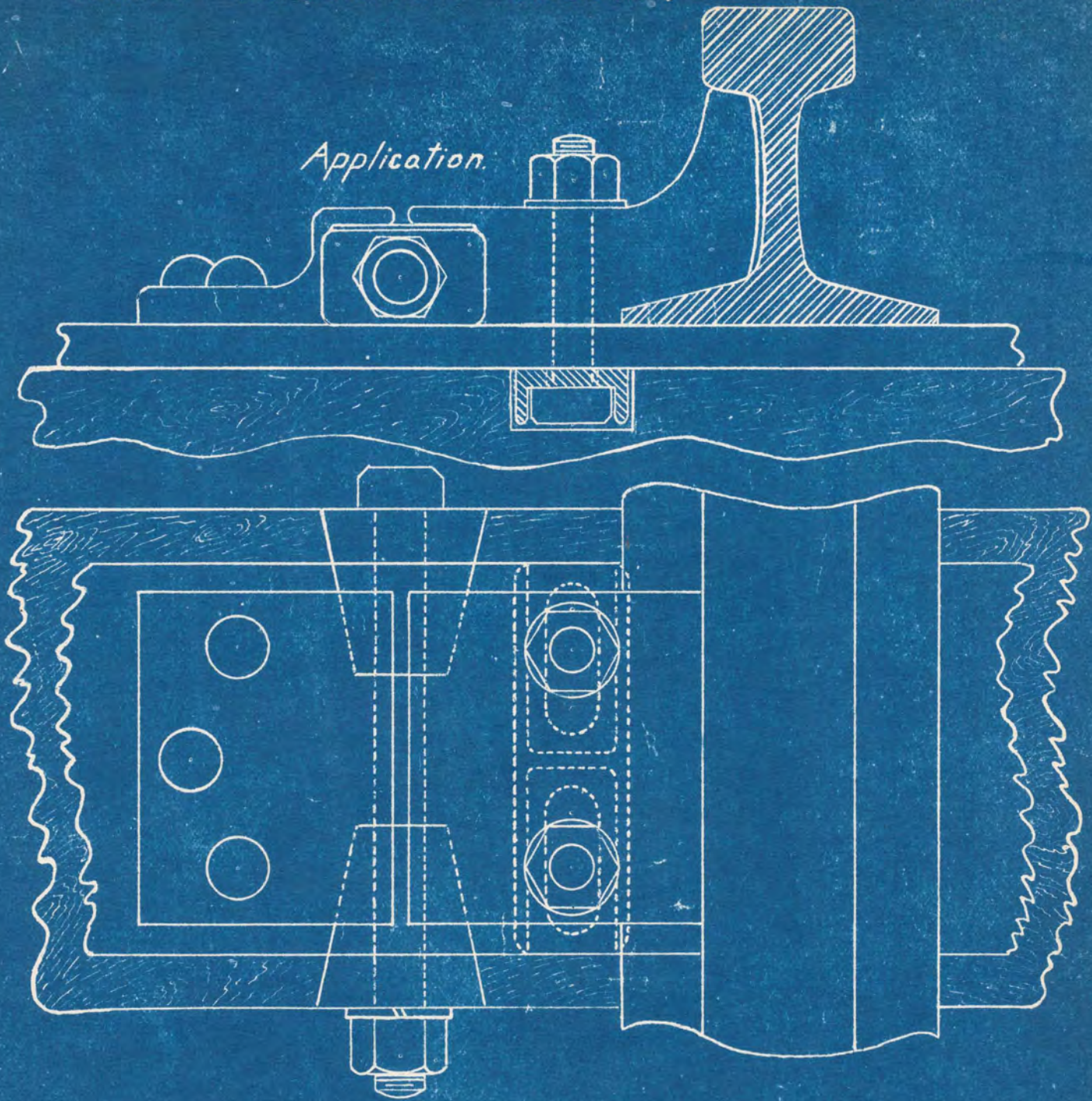
20402.



20403.



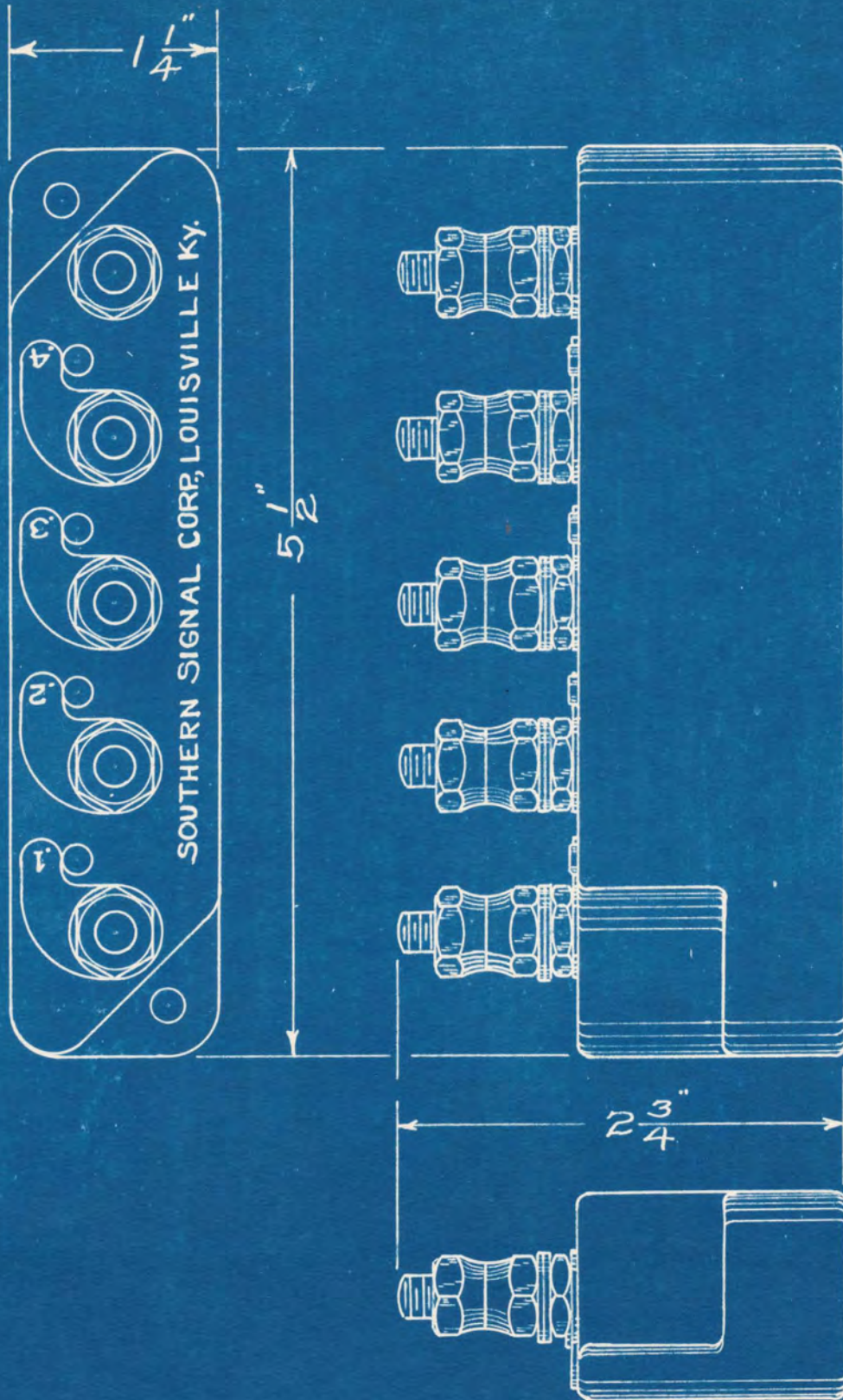
Application.



20404.



PEERLESS MANUFACTURING CORP., LOUISVILLE, KY.



BP 6-B6

Model A-1
Adjustable Resistance Unit
DWG. No. 21000

MODEL A RAIL CONNECTOR

PATENT APPLIED FOR



Model A Rail Connectors used with Model A Parkway Outlets

This is a very simple, practical and durable rail connector. It is quickly and easily installed; a drill, a hammer and a pair of pliers are the only tools required.

To apply it to a rail it is only necessary to drill a $\frac{3}{8}$ inch hole in the web of the rail and drive the tapered lug into the hole. The free end is then attached to the wire in the regular way. The Connector can be used to connect with wires in trunking, parkway cable, etc.

The Model A Rail Connector is made of a piece of number 9 stranded rubber covered signal wire, one end of which is inserted into a hole in the head of the lug. The whole lug is then dipped in hot solder, mechanically and electrically, uniting the wire with the lug. A support, through which the wire passes, is made of a coil of spring wire and secured to the lug.

This Connector is furnished in any length with or without terminal eyes. Lengths are measured from the center of the lug to the center of the eye or end of wire. Clips for anchoring the wire to the rail are made in two sizes; one for a $\frac{3}{16}$ inch hole and one for a $\frac{3}{8}$ inch hole. These clips are not always used and are not furnished with connectors. If they are wanted they should be ordered separately.

Lugs with supports are also furnished without wire.

LOUISVILLE FROG, SWITCH & SIGNAL COMPANY

INCORPORATED

SUCCESSOR TO

Louisville Frog & Switch Co.

Southern Signal Corporation

MANUFACTURERS OF

Track and Signal Equipment

LOUISVILLE, KENTUCKY, U. S. A.



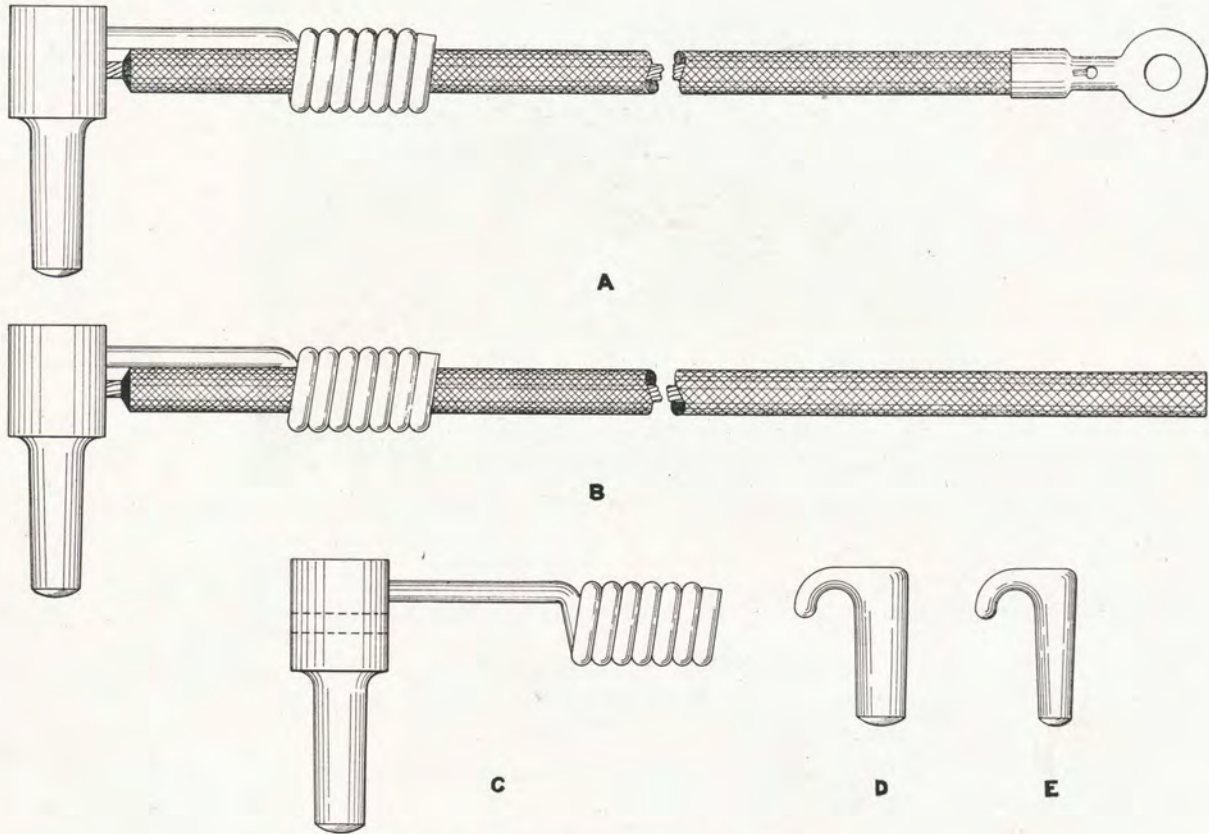
March 1, 1930



Bulletin No. 12

Plate B-40

Model A Rail Connector



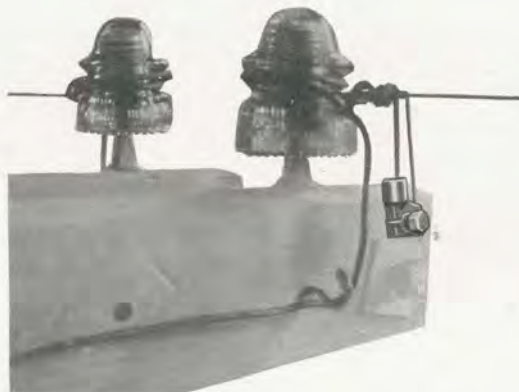
Order by Plate, Figure and Name

FIG.	NAME AND DESCRIPTION	DWG. No.
A	Model A Rail Connector—With terminal eye; 24 inches long.	21200-2
A-1	Model A Rail Connector—With terminal eye; 30 inches long.	21200
A-2	Model A Rail Connector—With terminal eye; 42 inches long.	21200-1
A-3	Model A Rail Connector—With terminal eye; specify length.	
B	Model A-1 Rail Connector—Without terminal eye; 24 inches long.	21200-5
B-1	Model A-1 Rail Connector—Without terminal eye; 30 inches long.	21200-3
B-2	Model A-1 Rail Connector—Without terminal eye; 42 inches long.	21200-4
B-3	Model A-1 Rail Connector—Without terminal eye; specify length.	
C	Lug with support only, cadmium plated.	21201X
D	Clip for $\frac{3}{8}$ " hole.	21205
E	Clip for $\frac{9}{32}$ " hole.	21206

RE-ISSUE PATENT
No. 17828

MODEL C WIRE CONNECTOR

Patents Applied for



The Model "C" Wire Connector was developed for making quick, dependable line taps for either temporary, or permanent work on signal, telegraph or telephone lines.

It is made in two sizes, which fit all sizes of wires from No. 2 to No. 20 A. W. G. (B. & S.) inclusive, insulated or bare. Size No. 1 takes wires from No. 2 to No. 14 inclusive and size No. 2 wires No. 14 to 20 inclusive.

This device is very simple there being but three parts to it. The two halves, which are made of high grade bronze castings, and the brass cap screw. The head of the cap screw for the No. 1 Connector is the same size as a standard 14-24 A. R. A. Terminal Nut, therefore a regular socket wrench, which nearly all signal men have, will fit the screw. The No. 2 size is smaller, and the cap screw head measures 5/16" across the flats. The screws in both sizes are long enough to allow one to open and apply the connectors without having them fall apart. This added length to the screw also permits the use of a locking nut, which nut is not necessary for satisfactory use but is furnished to those who prefer it. This nut is not furnished unless so specified on order.

The Connector clamps the line wire, tap and insulation if the tap is insulated. When these connectors are used it is not necessary to cut the line wire nor use sleeves or solder. Experience has taught us all that cutting the line wire is more or less objectionable, and soldering on a pole line is a slow and expensive job. The Model "C" Connector can be applied in a few seconds, and the time saved will pay for its first cost many times over.

Aside from its reliability one of the greatest advantages is that it is so easy to open a line tap when testing for grounds or similar troubles. Some railroads use junction boxes to facilitate testing, and although perfectly satisfactory they cost much more than the Model "C" Connector. Where junction boxes are not used it is then necessary to open the joint, which when made with a sleeve or soldered is a costly proposition.

LOUISVILLE FROG, SWITCH & SIGNAL CO.



August 1, 1928

SUCCESSOR TO

SOUTHERN SIGNAL CORPORATION

INCORPORATED

LOUISVILLE, KENTUCKY, U. S. A.

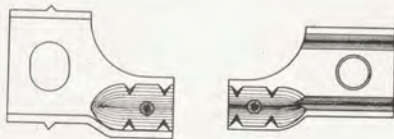


Bulletin No. 9.

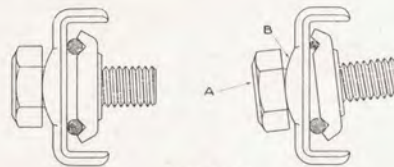
SOUTHERN SIGNAL CORPORATION

This Connector is very light, and is ribbed on the outside where necessary to give it ample strength. There is a recess with projections on the inside for gripping the insulation, thus a certain amount of the strain caused by vibration and bending is taken up by the insulation. Sketch No. 10 shows the projections used for gripping the insulation. The center conical projection prevents the wire from rotating while the four knife edged projections keep it from pulling out.

One half of the Connector has two shallow "V" grooves for the wires and the other half has a flat surface. This construction insures a three-point contact for each wire. Sketch No. 11 shows how the connector adjusts itself to various sizes of wires. The slotted hole allows the cap screw "A" to rotate in a manner such that the lower surface of the cap screw head is always tangent to the curved surface "B" of the boss around the slotted hole.



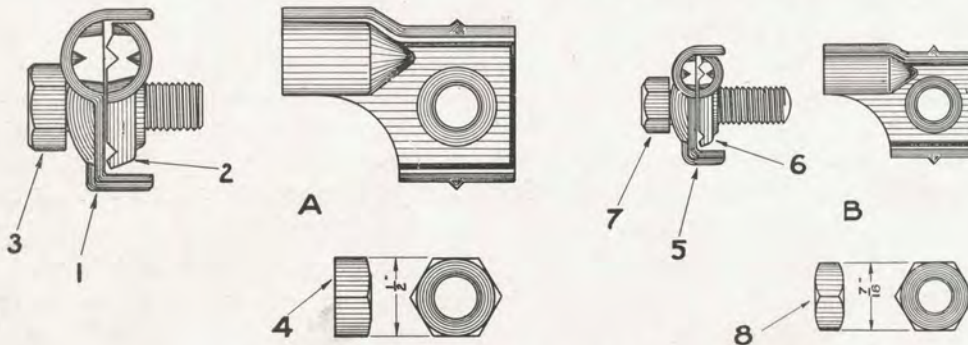
Sketch 10



Sketch 11

Plate B-50

Model C Wire Connectors and Parts



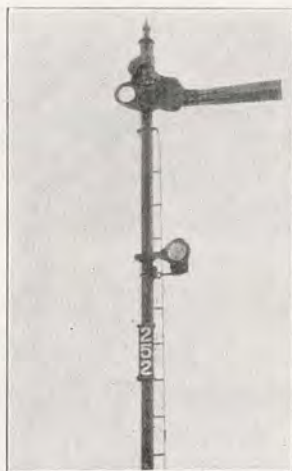
Order by Plate, Figure and Name

FIG.	NAME AND DESCRIPTION	DWG. No.
A	Model C, Size No. 1, Wire Connector, for numbers 2 to 14 A. W. G. (B. & S.) wires inclusive. (As shown without lock nut).	20605X
B	Model C, Size No. 2, Wire Connector, for numbers 14 to 20 A. W. G. (B. & S.) wires inclusive. (As shown without lock nut).	20609X

Parts

1	Large Half for Size No. 1.	20605
2	Small Half for Size No. 1.	20606
3	Brass Cap Screw for Size No. 1.	20607
4	Lock Nut for Size No. 1.	20608
5	Large Half for Size No. 2.	20609
6	Small Half for Size No. 2.	20610
7	Brass Cap Screw for Size No. 2.	20611
8	Lock Nut for Size No. 2.	20612

SIGNAL NUMBERS



This bulletin shows our line of numbers used for marking automatic and interlocking signals. Two types are shown, the A. R. A. Standard, with which all signalmen are familiar, therefore this requires no description and our own Model A type which we believe to be superior to any other signal number, because of its several very decided improvements in design and construction.

The Model A Signal Number consists of a cast iron back plate which is fastened to the signal mast with "U" bolts. Because of the "V" block construction on the back, these numbers fit all sizes of masts up to and including 6" pipe ($6\frac{5}{8}$ " outside diameter). The characters or digits are raised on a cast iron plate and when assembled on this plate give a panel effect which is pleasing in appearance. The digits are designed to be fastened to the back plate with a standard No. 5 steel taper pin, but in case of an emergency it is not necessary to have this taper pin as a $\frac{3}{32}$ " channel pin, a nail or even a piece of wire will hold them on.

The digits are quickly applied and removed for there is but one fastening unit for each digit as compared with four screws and nuts, sometimes used. It is very awkward and inconvenient to work on a signal mast with a number of small parts. There are no bolts or screws to rust and make it difficult to change or renew digits. A small monkey wrench is the only tool needed to assemble and install the Model A Signal Number.

The durability of the Model A Signal Number is its winning feature. It is made entirely of cast iron. There are no vitreous enameled surfaces to peel or chip off and no wood to decay. There are no screw heads on the face of the number to cause streaks of rust and dirt. The numbers can be kept clean and distinct year after year by merely painting the surfaces when the signals are painted each year.

These numbers are furnished coated with a durable baked enamel made especially for this purpose. We can furnish the characters and background in any desired color but if not specified we supply them enameled black with white characters.

Since their introduction in 1923, a number of railroads have adopted these signal numbers as a standard.

LOUISVILLE FROG, SWITCH & SIGNAL COMPANY

INCORPORATED

SUCCESSOR TO

Louisville Frog & Switch Co.

Southern Signal Corporation

MANUFACTURERS OF

Track and Signal Equipment

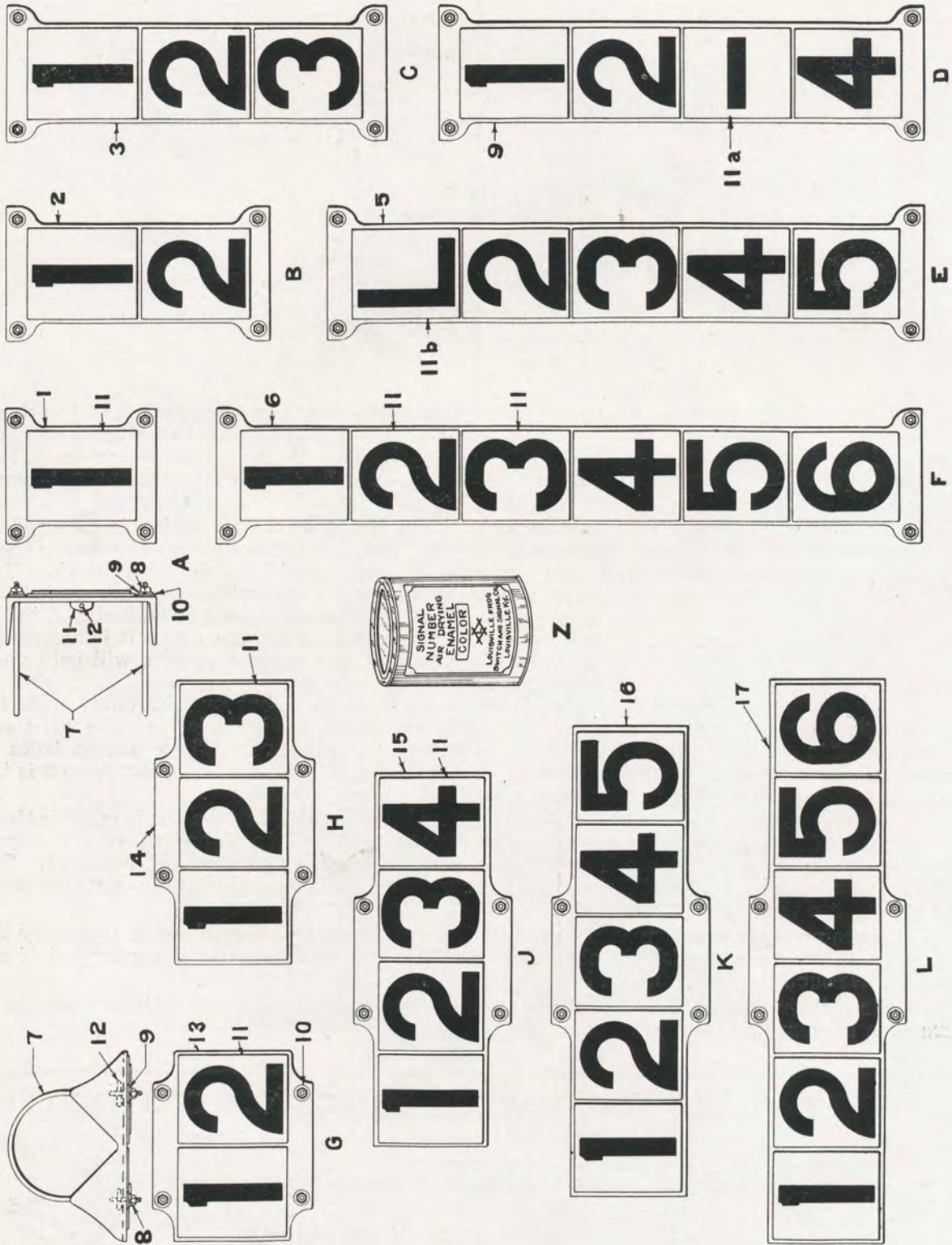


February 1, 1929

LOUISVILLE, KENTUCKY, U. S. A.

Bulletin No. 2-A

Plate C-1



LOUISVILLE FROG, SWITCH AND SIGNAL COMPANY

Plate C-1

Model A Signal Numbers and Parts

Patent Applied for

Specify if white or black background is wanted. If not specified white characters on a black background will be furnished.

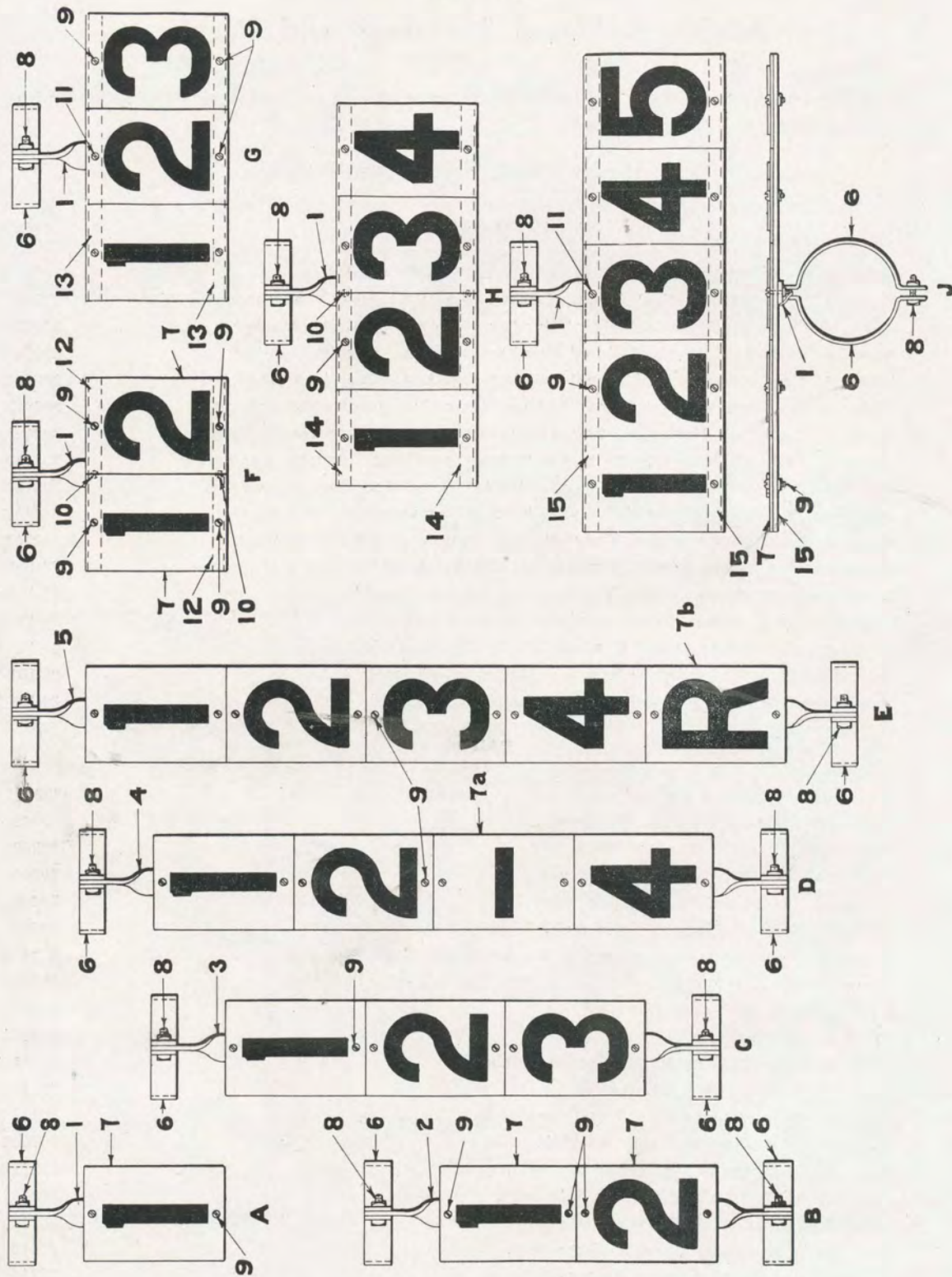
Order by Plate, Figure and Name

FIG.	NAME AND DESCRIPTION	DWG. No.
A	Model A, One Digit Signal Number complete. Specify number.	30201X
B	Model A, Two Digit Vertical Signal Number complete. Specify number.	30202X
C	Model A, Three Digit Vertical Signal Number complete. Specify number.	30203X
D	Model A, Four Digit Vertical Signal Number complete. Specify number.	30204X
E	Model A, Five Digit Vertical Signal Number complete. Specify number.	30205X
F	Model A, Six Digit Vertical Signal Number complete. Specify number.	30206X
G	Model A, Two Digit Horizontal Signal Number complete. Specify number.	30212X
H	Model A, Three Digit Horizontal Signal Number complete. Specify number.	30213X
J	Model A, Four Digit Horizontal Signal Number complete. Specify number.	30214X
K	Model A, Five Digit Horizontal Signal Number complete. Specify number.	30215X
L	Model A, Six Digit Horizontal Signal Number complete. Specify number.	30216X
Z	One-quart Can, Black Signal Number, Air Drying Enamel.	25-400-1
Z-1	One-gallon Can, Black Signal Number, Air Drying Enamel.	25-400-4
Z-2	Five-gallon Can, Black Signal Number, Air Drying Enamel.	25-400-20
Z-3	One-quart, Can, White Signal Number, Air Drying Enamel.	20-101-1
Z-4	One-gallon Can, White Signal Number, Air Drying Enamel.	20-101-4
Z-5	Five-gallon Can, White Signal Number, Air Drying Enamel.	20-101-20

PARTS

1	One Digit Number Plate only.	30201
2	Two Digit Vertical Number Plate only.	30202
3	Three Digit Vertical Number Plate only.	30203
4	Four Digit Vertical Number Plate only.	30204
5	Five Digit Vertical Number Plate only.	30205
6	Six Digit Vertical Number Plate only.	30206
7	U Bolt with two hexagon nuts, two lock washers and 2 cut washers.	30210X
8	Hexagon Nut, for figure 7.	003011
9	Lock Washer, for figure 7.	002002
10	Cut Washer, for figure 7.	005004
11	Numeral Digit, with taper pin. Specify number.	30101-8
11a	Dash Digit, with taper pin. (—)	30109
11b	Letter Digit, with taper pin. Specify letter.	30110-35
12	Taper Pin, for figures 11, 11a and 11b.	007002
13	Two Digit Horizontal Number Plate only.	30212
14	Three Digit Horizontal Number Plate only.	30213
15	Four Digit Horizontal Number Plate only.	30214
16	Five Digit Horizontal Number Plate only.	30215
17	Six Digit Horizontal Number Plate only.	30216

Plate C-2



LOUISVILLE FROG, SWITCH AND SIGNAL COMPANY

Plate C-2

A. R. A. Signal Numbers

Digits are made of cast iron and finished in baked enamel. Characters are white on a black background. Other color combinations will be supplied if specified on order.

Brackets and bolts are of soft steel, coated with black baked enamel. All machine screws and machine screw nuts are brass.

For enamel used in refinishing numbers see plate C-1.

Order by Plate, Figure and Name

FIG.	NAME AND DESCRIPTION	DWG. No.
A	A. R. A. One Digit Signal Number complete, for 5" mast. (5 ³ / ₁₆ " o. d.) Specify number.	30538-2X
A-1	A. R. A. One Digit Signal Number complete, for 6" mast. (6 ⁵ / ₈ " o. d.) Specify number.	30538-3X
B	A. R. A. Two Digit Vertical Signal Number complete, for 5" mast. (5 ³ / ₁₆ " o. d.) Specify number.	30539-2X
B-1	A. R. A. Two Digit Vertical Signal Number complete, for 6" mast. (6 ⁵ / ₈ " o. d.) Specify number.	30539-3X
C	A. R. A. Three Digit Vertical Signal Number complete, for 5" mast. (5 ³ / ₁₆ " o. d.) Specify number.	30540-2X
C-1	A. R. A. Three Digit Vertical Signal Number complete, for 6" mast. (6 ⁵ / ₈ " o. d.) Specify number.	30540-3X
D	A. R. A. Four Digit Vertical Signal Number complete, for 5" mast. (5 ³ / ₁₆ " o. d.) Specify number.	30541-2X
D-1	A. R. A. Four Digit Vertical Signal Number complete, for 6" mast. (6 ⁵ / ₈ " o. d.) Specify number.	30541-3X
E	A. R. A. Five Digit Vertical Signal Number complete, for 5" mast. (5 ³ / ₁₆ " o. d.) Specify number.	30542-2X
E-1	A. R. A. Five Digit Vertical Signal Number complete, for 6" mast. (6 ⁵ / ₈ " o. d.) Specify number.	30542-3X
F	A. R. A. Two Digit Horizontal Signal Number complete, for 5" mast. (5 ³ / ₁₆ " o. d.) Specify number.	30543-2X
F-1	A. R. A. Two Digit Horizontal Signal Number complete, for 6" mast. (6 ⁵ / ₈ " o. d.) Specify number.	30543-3X
G	A. R. A. Three Digit Horizontal Signal Number complete, for 5" mast. (5 ³ / ₁₆ " o. d.) Specify number.	30544-2X
G-1	A. R. A. Three Digit Horizontal Signal Number complete, for 6" mast. (6 ⁵ / ₈ " o. d.) Specify number.	30544-3X
H	A. R. A. Four Digit Horizontal Signal Number complete, for 5" mast. (5 ³ / ₁₆ " o. d.) Specify number.	30545-2X
H-1	A. R. A. Four Digit Horizontal Signal Number complete, for 6" mast. (6 ⁵ / ₈ " o. d.) Specify number.	30545-3X
J	A. R. A. Five Digit Horizontal Signal Number complete, for 5" mast. (5 ³ / ₁₆ " o. d.) Specify number.	30546-2X
J-1	A. R. A. Five Digit Horizontal Signal Number complete, for 6" mast. (6 ⁵ / ₈ " o. d.) Specify number.	30546-3X

A. R. A. SIGNAL NUMBER PARTS

1	A. R. A. No. 15573 Support.	30538
1a	A. R. A. No. 15581 One Digit Bracket complete for 5" mast. (1 figure 1, 2 figures 6, 2 figures 8 and 2 figures 9).	30538X
1b	A. R. A. No. 15582 One Digit Bracket complete for 6" mast. (1 figure 1, 2 figures 6a, 2 figures 8 and 2 figures 9).	30538-1X
2	A. R. A. No. 15578 Two Digit Vertical Support.	30539
2a	A. R. A. No. 15583 Two Digit Vertical Bracket complete for 5" mast. (1 figure 2, 4 figures 6, 4 figures 8 and 4 figures 9).	30539X
2b	A. R. A. No. 15584 Two Digit Vertical Bracket complete for 6" mast. (1 figure 2, 4 figures 6a, 4 figures 8 and 4 figures 9).	30539-1X
3	A. R. A. No. 15579 Three Digit Vertical Support.	30540
3a	A. R. A. No. 15585 Three Digit Vertical Bracket complete for 5" mast. (1 figure 3, 4 figures 6, 4 figures 8 and 6 figures 9).	30540X
3b	A. R. A. No. 15586 Three Digit Vertical Bracket complete for 6" mast. (1 figure 3, 4 figures 6a, 4 figures 8 and 6 figures 9).	30540-1X
4	A. R. A. No. 155710 Four Digit Vertical Support.	30541

LOUISVILLE FROG, SWITCH AND SIGNAL COMPANY

Plate C-2

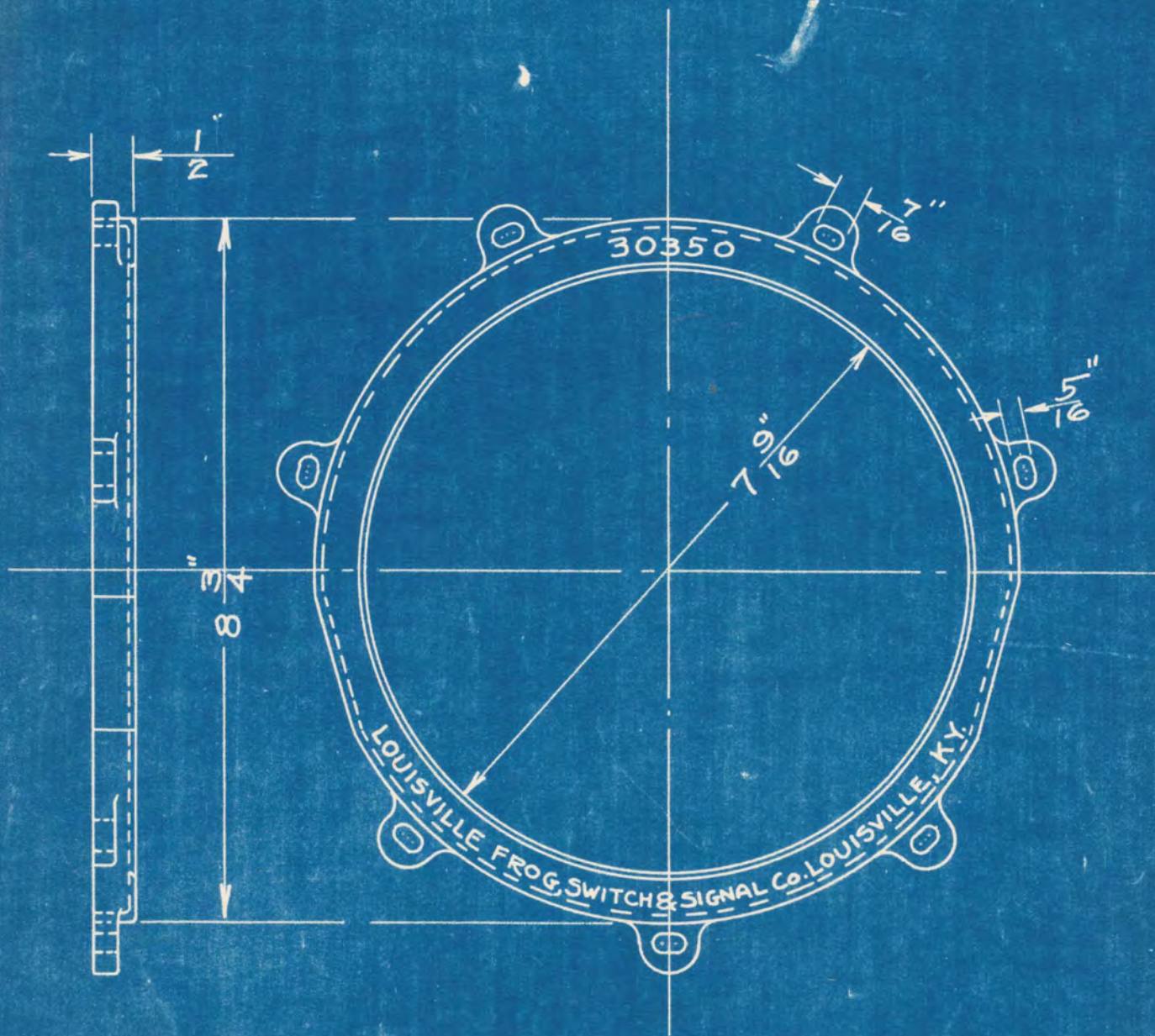
A. R. A. Signal Number Parts

Order by Plate, Figure and Name

FIG.	NAME AND DESCRIPTION	DWG. No.
4a	A. R. A. No. 15587 Four Digit Vertical Bracket complete for 5" mast. (1 figure, 4, 4 figures 6, 4 figures 8 and 8 figures 9).	30541-X
4b	A. R. A. No. 15588 Four Digit Vertical Bracket complete for 6" mast. (1 figure 4, 4 figures 6a, 4 figures 8 and 8 figures 9).	30541-1X
5	A. R. A. No. 155711 Five Digit Vertical Support.	30542
5a	A. R. A. No. 15589 Five Digit Vertical Bracket complete for 5" mast. (1 figure 5, 4 figures 6, 4 figures 8 and 10 figures 9).	30542X
5b	A. R. A. No. 155810 Five Digit Vertical Bracket complete for 6" mast. (1 figure 5, 4 figures 6a, 4 figures 8 and 10 figures 9).	30542-1X
6	A. R. A. No. 10291 5" Clamp.	30536
6a	A. R. A. No. 10292 6" Clamp.	30537
7	A. R. A. No. 15571 Numeral Digit. Specify number.	30501-8
7a	A. R. A. No. 15571 Dash Digit. (—)	30509
7b	A. R. A. No. 15572 Letter Digit. Specify letter.	30510-35
8	Square Head Machine Bolt and Nut, for figures 6 and 6a.	006001X
9	Round Head Brass Machine Screw with square nut.	004047X
10	Flat Head Brass Machine Screw with square nut.	004048X
11	Round Head Brass Machine Screw with square nut. Longer than figure 9, for center digit.	004049X
12	A. R. A. No. 15574 Two Digit Horizontal Support.	30543
12a	A. R. A. No. 155811 Two Digit Horizontal Bracket complete for 5" mast. (1 figure 1, 2 figures 6, 2 figures 8, 4 figures 9, 2 figures 10 and 2 figures 12).	30543X
12b	A. R. A. No. 155812 Two Digit Horizontal Bracket complete for 6" mast. (1 figure 1, 2 figures 6a, 2 figures 8, 4 figures 9, 2 figures 10 and 2 figures 12).	30543-1X
13	A. R. A. No. 15575 Three Digit Horizontal Support.	30544
13a	A. R. A. No. 155813 Three Digit Horizontal Bracket complete for 5" mast. (1 figure 1, 2 figures 6, 2 figures 8, 4 figures 9, 2 figures 11 and 2 figures 13).	30544X
13b	A. R. A. No. 155814 Three Digit Horizontal Bracket complete for 6" mast. (1 figure 1, 2 figures 6a, 2 figures 8, 4 figures 9, 2 figures 11 and 2 figures 13).	30544-1X
14	A. R. A. No. 15576 Four Digit Horizontal Support.	30545
14a	A. R. A. No. 155815 Four Digit Horizontal Bracket complete for 5" mast. (1 figure 1, 2 figures 6, 2 figures 8, 8 figures 9, 2 figures 10 and 2 figures 14).	30545X
14b	A. R. A. No. 155816 Four Digit Horizontal Bracket complete for 6" mast. (1 figure 1, 2 figures 6a, 2 figures 8, 8 figures 9, 2 figures 10 and 2 figures 14).	30545-1X
15	A. R. A. No. 15577 Five Digit Horizontal Support.	30546
15a	A. R. A. No. 155817 Five Digit Horizontal Bracket complete for 5" mast. (1 figure 1, 2 figures 6, 2 figures 8, 8 figures 9, 2 figures 11 and 2 figures 15).	30546X
15b	A. R. A. No. 155818 Five Digit Horizontal Bracket complete for 6" mast. (1 figure 1, 2 figures 6a, 2 figures 8, 8 figures 9, 2 figures 11 and 2 figures 15).	30546-1X



Model A 5 Digit Horizontal Signal Number



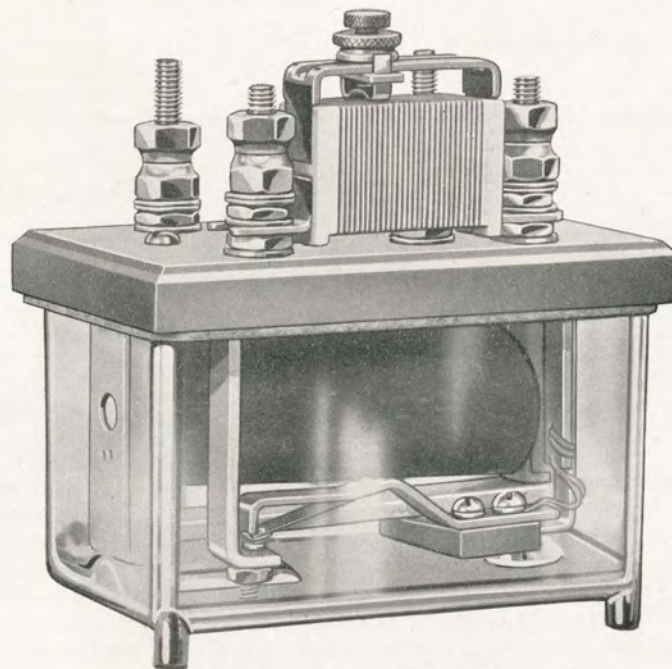
CAST ALUMINUM

BP 2-A

DWG. No. 30350

A.R.A. SPECTACLE RING
DWG. BY. P.S.B.
APRIL, 25, 1930

This Instrument Will Keep Your Battery Fully Charged At All Times



Model A-1 Battery Charge Regulator

MANUFACTURED BY

LOUISVILLE FROG, SWITCH & SIGNAL COMPANY

INCORPORATED

LOUISVILLE, KENTUCKY



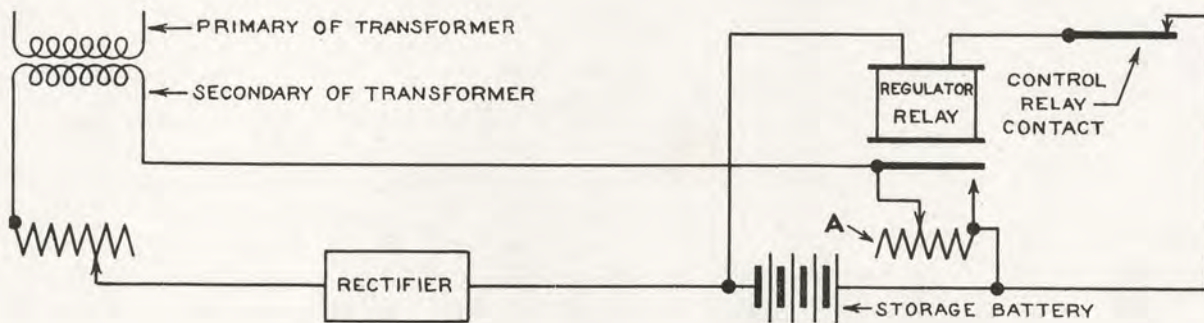
March 1, 1930

Bulletin No. 13

LOUISVILLE FROG, SWITCH AND SIGNAL COMPANY

The Model A-1 Battery Charge Regulator keeps the storage battery fully charged irrespective of how severe the service conditions may be. Signal circuits are so arranged that the signals require the maximum amount of power when the control relay is open or in the de-energized position, therefore it is desirable to have the battery take a higher charge during this time than at any other time. Referring to the circuit diagram it will be seen that the scheme of the Battery Charge Regulator is to give the battery a heavy charge when the control relay is de-energized and a light charge at other times. Thus the advantages of both the cycle charge and trickle charge systems are had without their disadvantages.

The essential parts of the regulator are a relay having a contact (which is closed when the relay is de-energized) and an adjustable resistance unit in multiple with the contact.



It is a very simple matter to apply the Regulator to any trickle charge system. In the above circuit an adjustable resistance or reactance is shown between the rectifier and the transformer secondary, because it is generally a part of trickle charge system but it is not necessary for the successful operation of the Regulator.

When the control relay drops, the control relay contact opens, which in turn cuts battery off the Regulator Relay, so that it drops, closing its contact, which being in multiple shunts the adjustable resistance A. When the resistance A is shunted the resistance of the charging circuit, of the storage battery, is reduced, allowing a heavy charge of current to flow to the battery. If the drain on the battery has been very heavy the Regulator Relay will not pick up even though the control relay has picked up because the Regulator Relay is adjusted to pickup only when the battery is fully charged. This adjustment is made in the field to suit the conditions of the location. As soon as it does pickup the shunt is removed from the adjustable resistance A and the battery is again charged at a low rate, so that it will not be overcharged.

Service requirements of signal batteries are so varied that it is not possible to charge a battery at a uniform rate without either overcharging or undercharging it.

With the trickle charge scheme there is no means to prevent overcharging the battery, when service requirements are light. Overcharging is very destructive to the battery, it is a waste of electrical energy and causes the electrolyte, in the battery, to evaporate rapidly. There is also no means of increasing the charge, except manually, when service requirements are heavy, resulting in the battery becoming discharged, which means signal failures and deterioration of the battery, because it has been found that whenever a battery is totally or nearly discharged it can never be brought to as high a charge as formerly.

In winter the voltage of a storage battery is lower than in summer but the service requirements are not necessarily less. The Battery Charge Regulator will keep it up.

During line failures the battery must supply current without receiving a charge; lowering the reserve energy in the battery. The Battery Charge Regulator will bring it up.

When ordering a Model A-1 Battery Charge Regulator it is necessary to state the voltage of the battery, number of cells and type, that is, whether lead or Edison.

MODEL "G" SNUBBING RELAY

PATENT APPLIED FOR



THE PERFECT SNUBBER FOR MODEL 2A SIGNALS

(For D. C. Signals Only)

- 1. Does not open motor circuit.**
 - A. No failures because of open contact in motor circuit.
 - B. No cams or other wearing parts.
- 2. Eliminates arcing at motor brushes.**
- 3. Continuous snubbing (not intermittent)**
 - A. Prevents jerking and breaking of operating wire.
 - B. No adjustment for blade position necessary.
- 4. Easy to install.**
 - A. Only a socket wrench or a pair of pliers necessary.

Manufactured by

PEERLESS MANUFACTURING CORPORATION
INCORPORATED

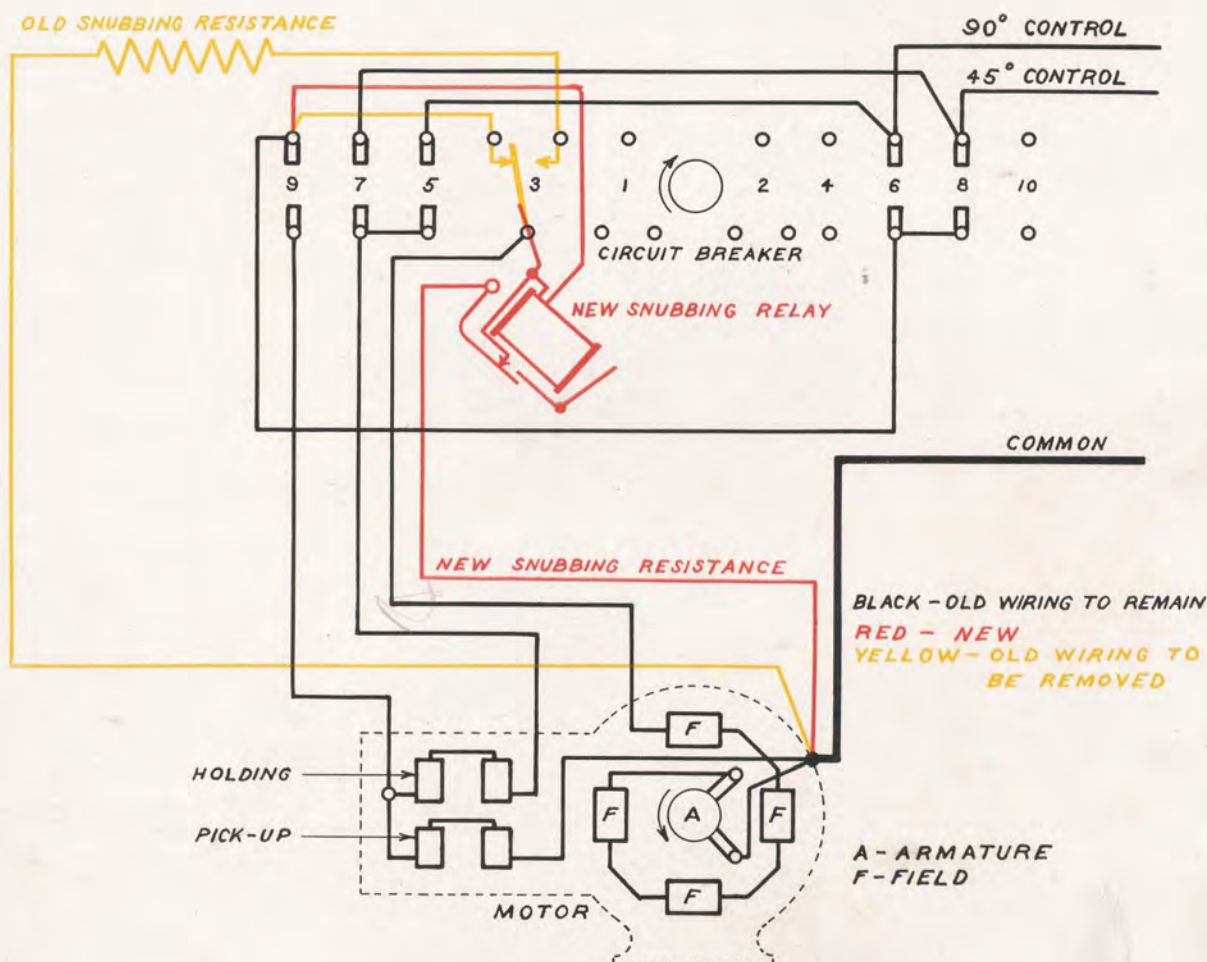
LOUISVILLE, KENTUCKY

Successor to Louisville Switch and Signal Co. and Peerless Mfg. Co.

MARCH 15, 1934

Bulletin No. 20

PEERLESS-LOUISVILLE



TO INSTALL—Remove the snubbing contact and snubbing resistance from the circuit controller and apply the Model G Snubbing Relay to the lower terminal post; then make connections as shown in the above circuit.

OPERATION—When the Model G Snubbing Relay is used the motor circuit is not broken by a snubbing contact, but instead the very low resistance relay coil is placed in series with the motor as shown in the circuit. Thus at no time can the motor circuit be left open. Further, the

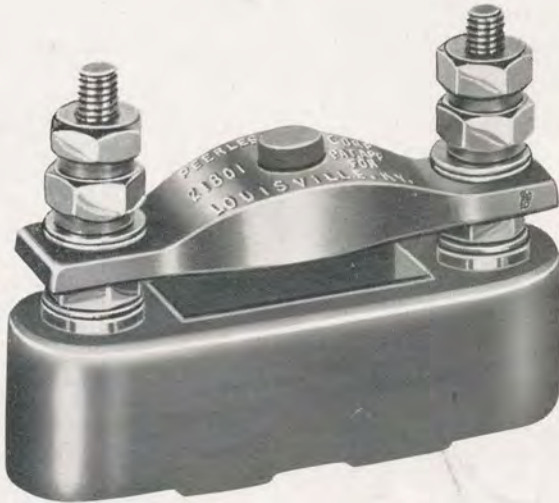
snubbing action is continuous so that the blade starts slowly and continues to do so, at a uniform speed, throughout its movement downward, and consequently the current generated is correspondingly low and no perceptible arcing occurs at the brushes. Tests show that the wattage of the current generated in the motor is about 1/23 of the wattage generated when the old snubbing contact is used.

WHEN ORDERING—Specify operating voltage of signal.

PEERLESS TEST SWITCH

PUSH BUTTON TYPE

PATENT APPLIED FOR



THIS SWITCH SAVES TIME . . . ALL YOU DO IS PRESS A BUTTON

This new Test Switch mounts on a standard AAR No. 10565 Terminal Block replacing the connector generally used. It is made in two forms; normally closed and normally open.

There are many uses in railway signaling for this Test Switch, some of them being: For testing signal batteries, block signals, crossing signals, automatic gates, train control apparatus, battery chargers, relays, slot arms and test boards in repair shops.

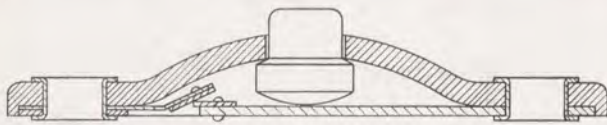
The Peerless Test Switch is ideal for taking ammeter readings because it is not necessary to open the circuit until after the ammeter has been connected, thus the circuit is actually never opened, because when the button is pushed the current flow is thru the meter. In this way the signal circuit being tested is not disturbed and train movements are not retarded because of the test.

Another advantage of the Peerless Test Switch is that it is self returning, so that the signal or other device cannot be left in an inoperative condition. There are no connectors, nuts and washers to remove and replace where the Peerless Test Switch is installed; you just push a button. You can't forget to put the circuit in its normal condition, the Peerless Switch does this for you automatically.

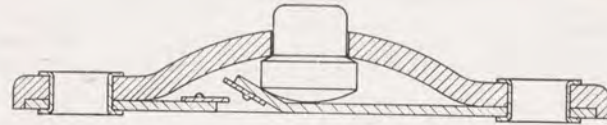


PEERLESS MANUFACTURING CORPORATION

LOUISVILLE, KENTUCKY



NORMALLY CLOSED TYPE



NORMALLY OPEN TYPE

SPECIFIC USES

Some specific uses of the Peerless Test Switch are:

1. In positive battery lead between rectifier and storage battery at automatic signal, crossing signal or remote controlled switch layouts to permit maintainer or inspector to check charging rates without first opening of circuits, which might cause train delays.
2. In positive battery lead where primary battery is used in order to check discharge rate, without first opening of circuit.
3. In positive battery lead of primary battery used on track circuits where the battery is floated across a rectifier in order that maintainer may readily take

current readings to determine that battery is discharging and not being charged by rectifier.

4. In track leads at outlying crossing signal locations where tests of protection are made by section foremen.

CONSTRUCTION

This switch is made with a very heavy contact spring to insure good contact, and the points of contact are faced with silver to further insure a good contact of low electrical resistance, so that the presence of the switch in a circuit has no effect on the rest of the apparatus. The switch is constructed so that there is ample sliding action when the contact closes, which cleans the contact surfaces.

The switch is well made, reliable, strong, compact and convenient to install and to operate. The silver tipped springs in the switch are of the best grade of phosphor bronze mounted in a supporting frame of brown moulded bakelite.

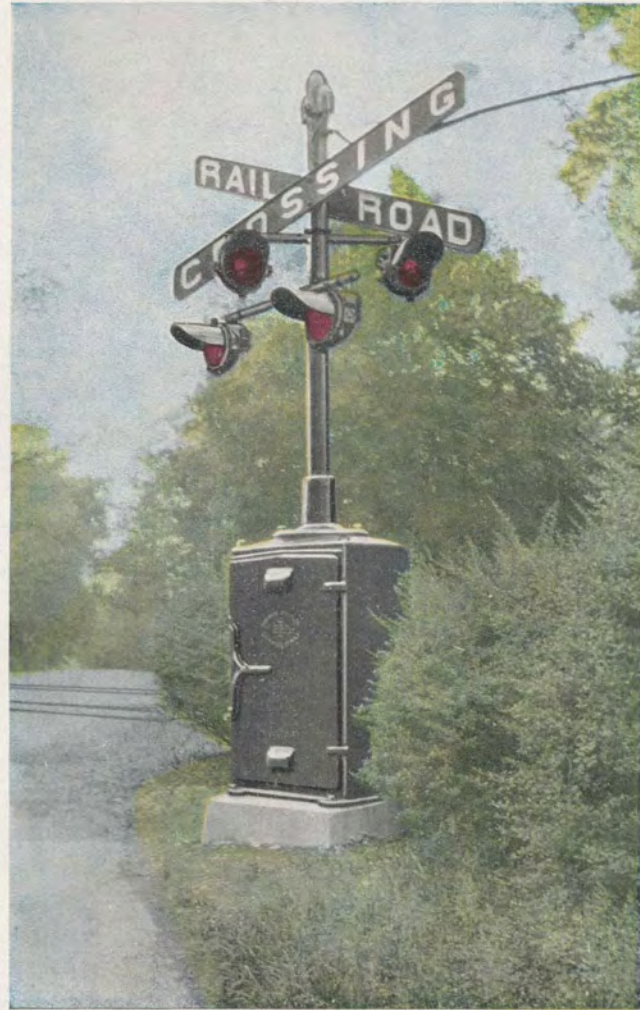
The Peerless Test Switch is furnished with or without the terminal block.

The terminal block which we furnish is exactly like the AAR No. 10565 terminal block in every respect except that the base is of brown moulded bakelite instead of porcelain. The posts used in this terminal block are made of Everdure which is a high strength bronze.

In ordering use the following references:

- No. 21801X Peerless Test Switch only (normally closed).
- No. 21801-1X Peerless Test Switch only (normally open).
- No. 21801-2X Peerless Test Switch (normally closed) with terminal block.
- No. 21801-3X Peerless Test Switch (normally open) with terminal block.
- No. 40446-AX Bakelite Terminal Block (like AAR 10565).

HIGHWAY CROSSING SIGNALS



LOUISVILLE FROG, SWITCH & SIGNAL COMPANY

INCORPORATED

SUCCESSOR TO



Louisville Frog & Switch Co. Southern Signal Corporation



LOUISVILLE,
KENTUCKY

March 1, 1930

Bulletin No. 10



Flashing Light Highway Crossing Signals

Our Model D Flashing Light Signals are of the very latest design and meet all requirements of the Signal Section of the American Railroad Association.

An outstanding feature of the Model D Flashing Light Signal is the Unispread reflector which is used in the lamp unit. This is a very recent development, and is found in no other signal. A ruby spreading roundel is used with this reflector, projecting a beam, in a horizontal plane, having a spread of a little more than 100°, with a very intense center. This combination is a most efficient projector, sending out a maximum of light for a given power consumption.

Most of the lamps used in flashing light signals have black spots, which are objectionable. Our Unispread reflector is almost entirely free of these spots and the slight trace which remains is divided into narrow strips which are hardly perceptible.

The lamps have an $8\frac{3}{8}$ inch roundel and are spaced 2 feet six inches apart. Each lamp is provided with two clear side lights, so as to enable trainmen to ascertain whether the signal is in operation. If the side lights are not wanted they can be covered with a coat of paint when the signals are installed. The lamp housings are cast iron and the lamps supported from an arm of $1\frac{1}{4}$ inch steel pipe. To facilitate wiring, tees with ends plugged, are used to connect the lamps to the arm. Horizontal adjustments are made by turning the lamp in the tee, and vertical adjustments by turning the tee on the arm. Large set screws are provided at each point of adjustment, to firmly lock these adjustments after they have been made. The fitting used to connect the lamp to the tee is flanged and bolted to the lamp, with a gasket between it and the lamp. This construction eliminates all pipe lock nuts, nipples and bushings and insures a leak-proof connection which will not come loose and throw the lamp out of alignment.

The lamp arm is secured to the mast by a clamp which is very simple, dependable and convenient to install and wire. These clamps will fit all pipe masts measuring from 3 to 5 inches (inside diameter), inclusive. A small U bolt is used for 3, $3\frac{1}{4}$ and 4 inch pipe and a larger one for $4\frac{1}{2}$ and 5 inch pipe. These clamps are so designed that one man can place a set of lamps on a mast without assistance. One half of the clamp, called the saddle, is placed over the $1\frac{1}{2}$ inch wire hole in the mast, and secured to the mast with the U bolt and two nuts. The arm is then put into position, resting on the ends of the U bolt, after which the other half of the clamp, called the cap, is slipped over the ends of the U bolt and two more nuts placed thereon, clamping the arm. The U bolts are made of $\frac{5}{8}$ inch diameter stock. When lamps are mounted back to back two straight studs, with threads and nuts on both ends, are used instead of the U bolt for mounting the arms on the mast but no change is made in the clamps.

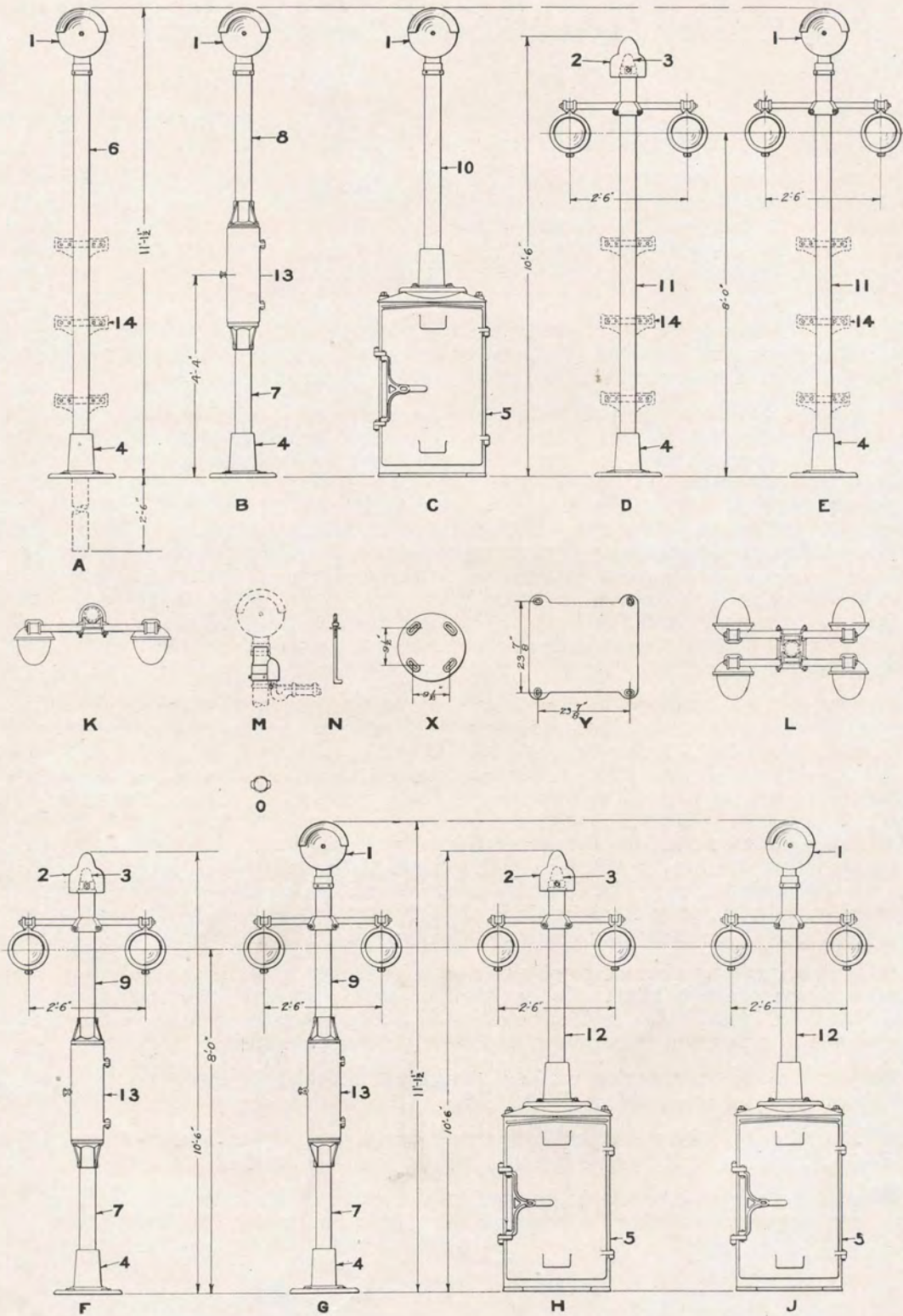
We list a large number of combinations of highway crossing signals but there are many more which are not listed. To list them all would be impracticable. Therefore even if the combination is not listed in this bulletin, do not hesitate to send us your specifications because we are in a position to supply it and solicit your patronage.

For convenience in ordering we have arranged the signals into two groups. Those without crossing signs are listed as Model D-1 and those with signs as Model D-2 signals.

We do not supply incandescent lamps with our signals unless they are specified and if wanted the voltage and wattage should be given in the specification.

We guarantee our products to be free from defects in workmanship, to be of the best materials and to give satisfactory service, unless abused or damaged by accident.

Plate D-1



LOUISVILLE FROG, SWITCH AND SIGNAL COMPANY

Plate D-1

Model D-1 Highway Crossing Signals

Signals will be furnished with pilot lights if specified.

We can furnish signals any height desired, with the lamps any distance from the base but unless otherwise specified, signals with heights and lamp centers as shown on the opposite plate will be furnished.

Bases and masts other than those shown will be furnished if specified.

Bolt centers for signals without relay and battery cases are shown in figure H and for those with cases in figure Y.

Lamps will be supplied with Edison medium screw sockets if specified.

Incandescent lamps are not furnished with signals and should be ordered separately if wanted.

Pole steps are furnished only when specified.

Unless otherwise specified all parts of signals are coated with a durable black paint.

Order by Plate, Figure and Name.

FIG.	NAME AND DESCRIPTION	DWG. No.
A	Highway Crossing Signal—Bell-1, (specify voltage), Sleeve-4 and Mast-6.	40000-1
A-1	Highway Crossing Signal—Bell-1, (specify voltage), and Mast-6a, as shown by dotted lines, for mounting in concrete.	40000
B	Highway Crossing Signal—Bell-1, (specify voltage), Sleeve-4, Lower Mast-7, Upper Mast-8 and Cable Terminal Box-13.	40000-3
B-1	Highway Crossing Signal—Bell-1, (specify voltage), Lower Mast-7a, for mounting in concrete, Upper Mast-8, and Cable Terminal Box-13.	40000-2
C	Highway Crossing Signal—Bell-1, (specify voltage), Case-5 and Mast-10.	40000-4
D	Highway Crossing Signal—Pinnacle-2, Sleeve-4, Mast-11 and Lamps-K.	40000-9
D-1	Highway Crossing Signal—Pinnacle-2, Sleeve-4, Mast-11a and Lamps-L.	40000-10
D-2	Highway Crossing Signal—Pinnacle-3, Sleeve-4, Mast-11 and Lamps-K.	40000-11
D-3	Highway Crossing Signal—Pinnacle-3, Sleeve-4, Mast-11a and Lamps-L.	40000-12
D-4	Highway Crossing Signal—Pinnacle-2, Mast-11b, for mounting in concrete and Lamps-K.	40000-5
D-5	Highway Crossing Signal—Pinnacle-2, Mast-11c, for mounting in concrete and Lamps-L.	40000-6
D-6	Highway Crossing Signal—Pinnacle-3, Mast-11b, for mounting in concrete and Lamps-K.	40000-7
D-7	Highway Crossing Signal—Pinnacle-3, Mast-11c, for mounting in concrete and Lamps-L.	40000-8
E	Highway Crossing Signal—Bell-1, (specify voltage), Sleeve-4, Mast-11 and Lamps-K.	40000-15
E-1	Highway Crossing Signal—Bell-1, (specify voltage), Sleeve-4, Mast-11a and Lamps-L.	40000-16
E-2	Highway Crossing Signal—Bell-1, (specify voltage), Mast-11b, for mounting in concrete and Lamps-K.	40000-13
E-3	Highway Crossing Signal—Bell-1, (specify voltage), Mast-11c, for mounting in concrete and Lamps-L.	40000-14
F	Highway Crossing Signal—Pinnacle-2, Sleeve-4, Lower Mast-7, Upper Mast-9, Cable Terminal Box-13 and Lamps-K.	40000-21

LOUISVILLE FROG, SWITCH AND SIGNAL COMPANY

Plate D-1

Model D-1 Highway Crossing Signals

Order by Plate, Figure and Name.

FIG.	NAME AND DESCRIPTION	DWG. No.
F-1	Highway Crossing Signal—Pinnacle-2, Sleeve-4, Lower Mast-7, Upper Mast-9a, Cable Terminal Box-13 and Lamps-L.	40000-22
F-2	Highway Crossing Signal—Pinnacle-3, Sleeve-4, Lower Mast-7, Upper Mast-9, Cable Terminal Box-13 and Lamps-K.	40000-23
F-3	Highway Crossing Signal—Pinnacle-3, Sleeve-4, Lower Mast-7, Upper Mast-9a, Cable Terminal Box-13 and Lamps-L.	40000-24
F-4	Highway Crossing Signal—Pinnacle-2, Lower Mast-7a, for mounting in concrete, Upper Mast-9, Cable Terminal Box-13 and Lamps-K.	40000-17
F-5	Highway Crossing Signal—Pinnacle-2, Lower Mast-7a, Upper Mast-9a, Cable Terminal Box-13 and Lamps-L.	40000-18
F-6	Highway Crossing Signal—Pinnacle-3, Lower Mast-7a, Upper Mast-9, Cable Terminal Box-13 and Lamps-K.	40000-19
F-7	Highway Crossing Signal—Pinnacle-3, Lower Mast-7a, Upper Mast-9a, Cable Terminal Box-13 and Lamps-L.	40000-20
G	Highway Crossing Signal—Bell-1, (specify voltage), Sleeve-4, Lower Mast-7, Upper Mast-9, Cable Terminal Box-13 and Lamps-K.	40000-27
G-1	Highway Crossing Signal—Bell-1, (specify voltage), Sleeve-4, Lower Mast-7, Upper Mast-9a, Cable Terminal Box-13 and Lamps-L.	40000-28
G-2	Highway Crossing Signal—Bell-1, (specify voltage), Lower Mast-7a, Upper Mast-9, Cable Terminal Box-13 and Lamps-K.	40000-25
G-3	Highway Crossing Signal—Bell-1, (specify voltage), Lower Mast-7a, Upper Mast-9a, Cable Terminal Box-13 and Lamps-L.	40000-26
H	Highway Crossing Signal—Pinnacle-2, Case-5, Mast-12 and Lamps-K.	40000-29
H-1	Highway Crossing Signal—Pinnacle-2, Case-5, Mast-12a and Lamps-L.	40000-30
H-2	Highway Crossing Signal—Pinnacle-3, Case-5, Mast-12 and Lamps-K.	40000-31
H-3	Highway Crossing Signal—Pinnacle-3, Case-5, Mast-12a and Lamps-L.	40000-32
J	Highway Crossing Signal—Bell-1, (specify voltage), Case-5, Mast-12 and Lamps-K.	40000-33
J-1	Highway Crossing Signal—Bell-1, (specify voltage), Case-5, Mast-12a and Lamps-L.	40000-34
K	One Pair of Model D Lamps— $8\frac{3}{8}$ " diameter, with arm and fittings for 3", $3\frac{1}{2}$ " and 4" pipe mast, single contact bayonet sockets and Unispread parabolic glass reflectors.	41200-2
K-1	One Pair of Model D Lamps— $8\frac{3}{8}$ " diameter, with arm and fittings for $4\frac{1}{2}$ " and 5" pipe mast, single contact bayonet sockets and Unispread parabolic glass reflectors.	41200-3
K-2	One Pair of Model D Lamps— $8\frac{3}{8}$ " diameter, with arm and fittings for 3", $3\frac{1}{2}$ " and 4" pipe mast, Edison medium screw sockets and parabolic glass reflectors.	41200-4
K-3	One Pair of Model D Lamps— $8\frac{3}{8}$ " diameter, with arm and fittings for $4\frac{1}{2}$ " and 5" pipe mast, Edison medium screw sockets and parabolic glass reflectors.	41200-5
L	Two Pairs of Model D Lamps— $8\frac{3}{8}$ " diameter, with arms and fittings for 3", $3\frac{1}{2}$ " and 4" pipe mast and for back to back mounting, single contact bayonet sockets and Unispread parabolic glass reflectors.	41200-6
L-1	Two Pairs of Model D Lamps— $8\frac{3}{8}$ " diameter, with arms and fittings for $4\frac{1}{2}$ " and 5" pipe mast and for back to back mounting, single contact bayonet sockets and Unispread parabolic glass reflectors.	41200-7

LOUISVILLE FROG, SWITCH AND SIGNAL COMPANY

Plate D-1

Model D-1 Highway Crossing Signals and Parts

Order by Plate, Figure and Name.

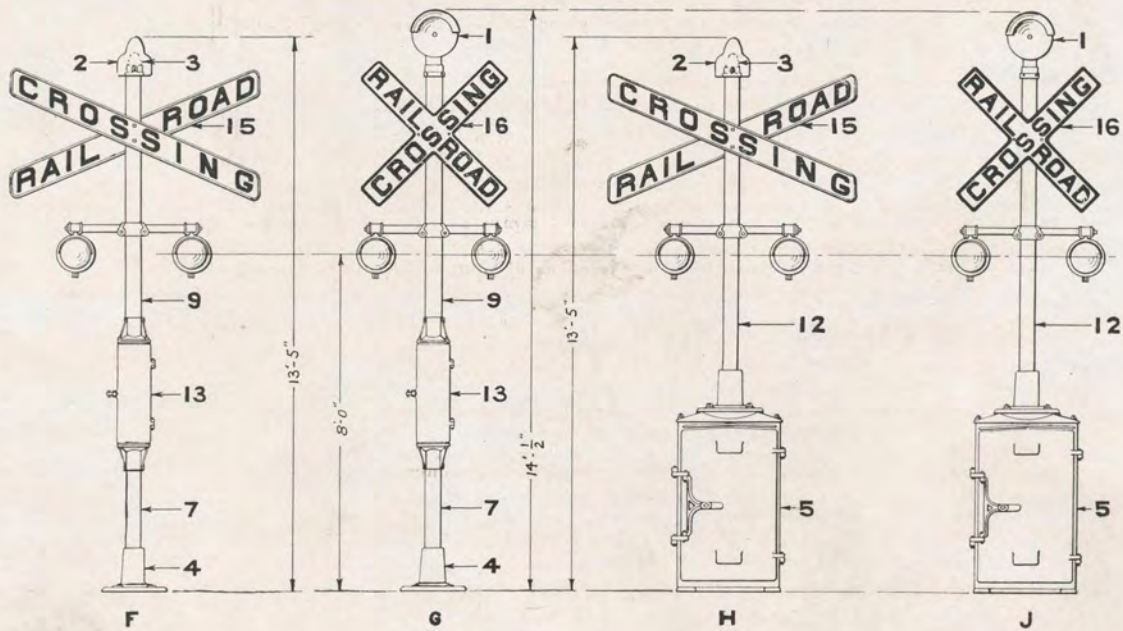
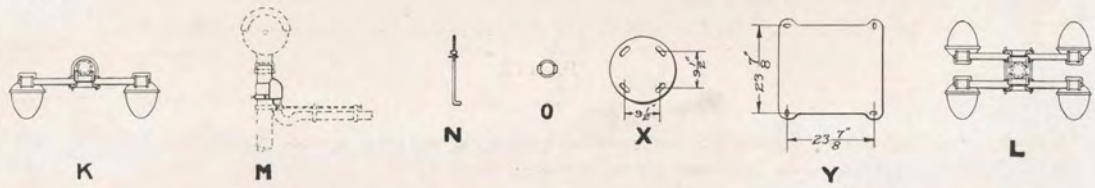
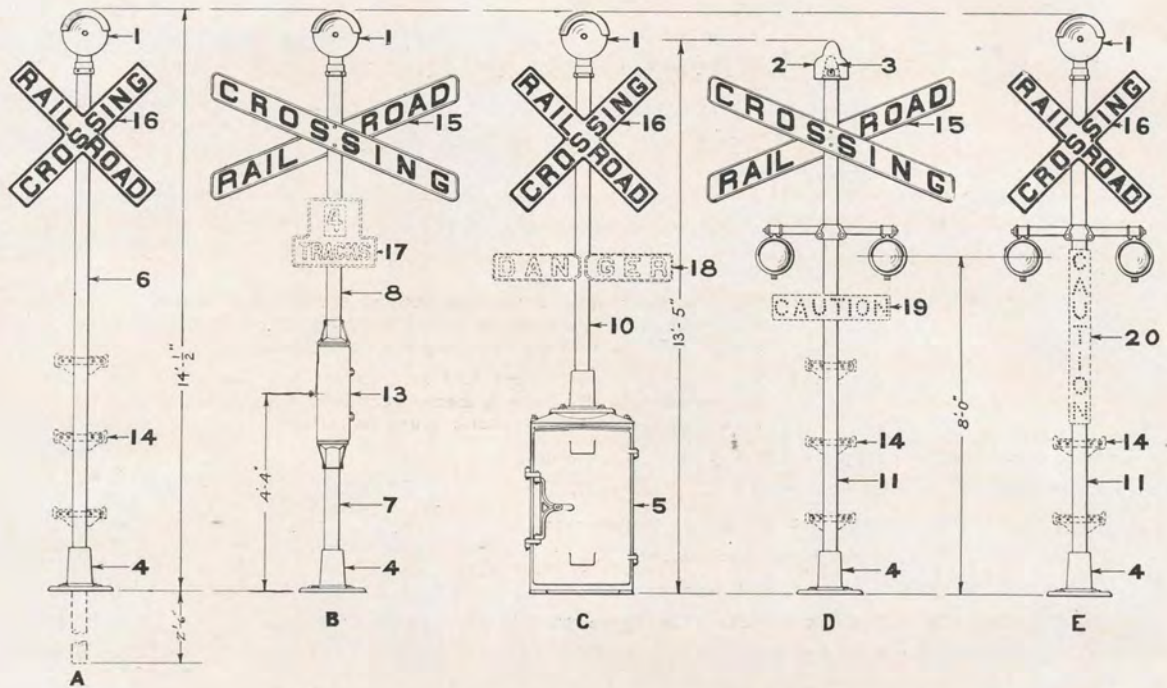
FIG.	NAME AND DESCRIPTION	DWG. No.
L-2	Two Pairs of Model D Lamps— $8\frac{3}{8}$ " diameter, with arms and fittings for 3", $3\frac{1}{2}$ " and 4" pipe mast and for back to back mounting, Edison medium screw sockets and parabolic glass reflectors.	41200-8
L-3	Two Pairs of Model D Lamps— $8\frac{3}{8}$ " diameter, with arms and fittings for $4\frac{1}{2}$ " and 5" pipe mast and for back to back mounting, Edison medium screw sockets and parabolic glass reflectors.	41200-9
M	Bell Cable Outlet Complete for $3\frac{1}{2}$ " i. d. pipe mast.	40443X
M-1	Bell Cable Outlet Comple for 4" i. d. pipe mast.	40443-1X
M-2	Bell Cable Outlet Complete for 5" i. d. pipemast.	40443-3X
N	Anchor Bolt, $\frac{3}{4}$ "x18" with nut and washer.	50104X
N-1	Anchor Bolt, 1"x24" with nut and washer.	50115X
O	A. R. A. No. 11812 Bushing for use with figure M.	50106
O-1	4" Bushing for use with figure M-1.	40451
O-2	5" Bushing for use with figure M-2.	40451-2

PARTS

1	Model D Bell. D. C., 12" gong, for top post mounting on $3\frac{1}{2}$ " (i. d.) pipe mast.	40200
2	A. R. A. No. 11814 Pinnacle with set screw and nut.	50105X
3	Cone Pinnacle with set screw, for $3\frac{1}{2}$ " (i. d.) pipe mast.	40447X
4	Sleeve for $3\frac{1}{2}$ " (i. d.) pipe mast.	40508
5	Model D Relay and Battery Case with one door, wood lining, sleeve for $3\frac{1}{2}$ " (i. d.) pipe mast.	50500
6	Mast ($3\frac{1}{2}$ " i. d. pipe) for figure A.	41223
6a	Mast ($3\frac{1}{2}$ " i. d. pipe) for figure A-1.	41224
7	Lower Half Mast ($3\frac{1}{2}$ " i. d. pipe) for figures B, F, F-1, F-2, F-3, G and G-1.	50308
7a	Lower Half Mast ($3\frac{1}{2}$ " i. d. pipe) for figures B-1, F-4, F-5, F-6, F-7, G-2 and G-3. (Specify distance between center of lamps and top of concrete foundation).	41225
8	Upper Half Mast ($3\frac{1}{2}$ " i. d. pipe) for figures B and B-1.	41226
9	Upper Half Mast ($3\frac{1}{2}$ " i. d. pipe) for figures F, F-2, F-4, F-6, G and G-2 having one pair of lamps. (Specify distance between center of lamps and bottom of signal base).	41230
9a	Upper Half Mast ($3\frac{1}{2}$ " i. d. pipe) for figures F-1, F-3, F-5, F-7, G-1 and G-3 having two pairs of lamps. (Specify distance between center of lamps and bottom of signal base).	41230-1
10	Mast ($3\frac{1}{2}$ " i. d. pipe) for figure C.	41227
11	Mast ($3\frac{1}{2}$ " i. d. pipe) for figures D, D2 and E, having one pair of lamps. (Specify distance between center of lamps and bottom of signal base).	41228
11a	Mast ($3\frac{1}{2}$ " i. d. pipe) for figures D-1, D-3 and E-1, having two pairs of lamps. (Specify distance between center of lamps and bottom of signal base).	41228-1
11b	Mast ($3\frac{1}{2}$ " i. d. pipe) for figures D-4, D-6 and E-2, having one pair of lamps. (Specify distance between center of lamps and top of concrete foundation).	41229
11c	Mast ($3\frac{1}{2}$ " i. d. pipe) for figures D-5, D-7 and E-3, having two pairs of lamps. (Specify distance between center of lamps and top of concrete foundation).	41229-1
12	Mast ($3\frac{1}{2}$ " i. d. pipe) for figures H, H-2 and J, having one pair of lamps. (Specify distance between center of lamps and bottom of signal base).	41231
12a	Mast ($3\frac{1}{2}$ " i. d. pipe) for figures H-1, H-3 and J-1, having two pairs of lamps. (Specify distance between center of lamps and bottom of signal base).	41231-1
13	Model A-1 Cable Terminal Box complete for $3\frac{1}{2}$ " pipe mast.	50200
14	Pole Step complete for $3\frac{1}{2}$ " pipe mast.	41025-1X

LOUISVILLE FROG, SWITCH AND SIGNAL COMPANY

Plate D-2



LOUISVILLE FROG, SWITCH AND SIGNAL COMPANY

Plate D-2

Model D-2 Highway Crossing Signals

Signals will be furnished with pilot lights if specified.

We can furnish signals any height desired, with the lamps any distance from the base but unless otherwise specified, signals with heights and lamp centers as shown on the opposite plate will be furnished.

Bases and masts other than those shown will be furnished if specified.

Bolt centers of signals without relay and battery cases are shown in figure X and for those with cases in figure Y.

Lamps will be supplied with Edison medium screw sockets if specified.

Incandescent lamps are not furnished with signals and should be ordered separately if wanted.

Pole steps, track signs, danger signs and caution signs are furnished only when specified.

Unless otherwise specified all parts of signals are coated with a durable black paint except crossing signs which are painted black with white characters or white with black characters.

Order by Plate, Figure and Name.

FIG.	NAME AND DESCRIPTION	DWG. No.
A	Highway Crossing Signal—Bell-1, (specify voltage), Sleeve-4, Mast-6 and Sign-16, (specify how painted).	40000-38
A-1	Highway Crossing Signal—Bell-1, (specify voltage), Sleeve-4, Mast-6 and Sign-15, (specify how painted).	40000-37
A-2	Highway Crossing Signal—Bell-1, (specify voltage), Mast-6a, as shown by dotted lines for mounting in concrete, and Sign-16, (specify how painted).	40000-36
A-3	Highway Crossing Signal—Bell-1, (specify voltage), Mast-6a, as shown by dotted lines for mounting in concrete and Sign-15, (specify how painted).	40000-35
B	Highway Crossing Signal—Bell-1, (specify voltage), Sleeve-4, Lower Mast-7, Upper Mast-8, Cable Terminal Box-13 and Sign-15, (specify how painted).	40000-41
B-1	Highway Crossing Signal—Bell-1, (specify voltage), Sleeve-4, Lower Mast-7, Upper Mast-8, Cable Terminal Box-13 and Sign-16, (specify how painted).	40000-42
B-2	Highway Crossing Signal—Bell-1, (specify voltage), Lower Mast-7a, for mounting in concrete, Upper Mast-8, Cable Terminal Box-13 and Sign-15, (specify how painted).	40000-39
B-3	Highway Crossing Signal—Bell-1, (specify voltage), Lower Mast-7a, for mounting in concrete, Upper Mast-8, Cable Terminal Box-13 and Sign-16, (specify how painted).	40000-40
C	Highway Crossing Signal—Bell-1, (specify voltage), Case-5, Mast-10 and Sign-16, (specify how painted).	40000-44
C-1	Highway Crossing Signal—Bell-1, (specify voltage), Case-5, Mast-10 and Sign-15, (specify how painted).	40000-43
D	Highway Crossing Signal—Pinnacle-2, Sleeve-4, Mast-11, Sign-15, (specify how painted) and Lamps-K.	40000-53
D-1	Highway Crossing Signal—Pinnacle-2, Sleeve-4, Mast-11, Sign-16, (specify how painted) and Lamps-K.	40000-54

LOUISVILLE FROG, SWITCH AND SIGNAL COMPANY

Plate D-2

Model D-2 Highway Crossing Signals

Order by Plate, Figure and Name.

FIG.	NAME AND DESCRIPTION	DWG. No.
D-2	Highway Crossing Signal—Pinnacle-2, Sleeve-4, Mast-11a, Sign-15, (specify how painted) and Lamps-L.	40000-55
D-3	Highway Crossing Signal—Pinnacle-2, Sleeve-4, Mast-11a, Sign-16, (specify how painted) and Lamps-L.	40000-56
D-4	Highway Crossing Signal—Pinnacle-3, Sleeve-4, Mast-11, Sign-15, (specify how painted) and Lamps-K.	40000-57
D-5	Highway Crossing Signal—Pinnacle-3, Sleeve-4, Mast-11, Sign-16, (specify how painted) and Lamps-K.	40000-58
D-6	Highway Crossing Signal—Pinnacle-3, Sleeve-4, Mast-11a, Sign-15, (specify how painted) and Lamps-L.	40000-59
D-7	Highway Crossing Signal—Pinnacle-3, Sleeve-4, Mast-11a, Sign-16, (specify how painted) and Lamps-L.	40000-60
D-8	Highway Crossing Signal—Pinnacle-2, Mast-11b, for mounting in concrete, Sign-15, (specify how painted) and Lamps-K.	40000-45
D-9	Highway Crossing Signal—Pinnacle-2, Mast-11b, for mounting in concrete, Sign-16, (specify how painted) and Lamps-K.	40000-46
D-10	Highway Crossing Signal—Pinnacle-2, Mast-11c, for mounting in concrete, Sign-15, (specify how painted) and Lamps-L.	40000-47
D-11	Highway Crossing Signal—Pinnacle-2, Mast-11c, for mounting in concrete, Sign-16, (specify how painted) and Lamps-L.	40000-48
D-12	Highway Crossing Signal—Pinnacle-3, Mast-11b, for mounting in concrete, Sign-15, (specify how painted) and Lamps-K.	40000-49
D-13	Highway Crossing Signal—Pinnacle-3, Mast-11b, for mounting in concrete, Sign-16, (specify how painted) and Lamps-K.	40000-50
D-14	Highway Crossing Signal—Pinnacle-3, Mast-11c, for mounting in concrete, Sign-15, (specify how painted) and Lamps-L.	40000-51
D-15	Highway Crossing Signal—Pinnacle-3, Mast-11c, for mounting in concrete, Sign-16, (specify how painted) and Lamps-L.	40000-52
E	Highway Crossing Signal—Bell-1, (specify voltage), Sleeve-4, Mast-11, Sign-16, (specify how painted) and Lamps-K.	40000-66
E-1	Highway Crossing Signal—Bell-1, (specify voltage), Sleeve-4, Mast-11, Sign-15, (specify how painted) and Lamps-K.	40000-65
E-2	Highway Crossing Signal—Bell-1, (specify voltage), Sleeve-4, Mast-11a, Sign-16, (specify how painted) and Lamps-L.	40000-68

Plate D-2

Model D-2 Highway Crossing Signals

Order by Plate, Figure and Name.

FIG.	NAME AND DESCRIPTION	DWG. No.
E-3	Highway Crossing Signal—Bell-1, (specify voltage), Sleeve-4, Mast-11a, Sign-15, (specify how painted) and Lamps-L.	40000-67
E-4	Highway Crossing Signal—Bell-1, (specify voltage), Mast-11b, Sign-16, (specify how painted) and Lamps-K.	40000-62
E-5	Highway Crossing Signal—Bell-1, (specify voltage), Mast-11b, Sign-15, (specify how painted) and Lamps-K.	40000-61
E-6	Highway Crossing Signal—Bell-1, (specify voltage), Mast-11c, Sign-16, (specify how painted) and Lamps-L.	40000-64
E-7	Highway Crossing Signal—Bell-1, (specify voltage), Mast-11c, Sign-16, (specify how painted) and Lamps-L.	40000-63
F	Highway Crossing Signal—Pinnacle-2, Sleeve-4, Lower Mast-7, Upper Mast-9, Cable Terminal Box-13, Sign-15, (specify how painted) and Lamps-K.	40000-77
F-1	Highway Crossing Signal—Pinnacle-2, Sleeve-4, Lower Mast-7, Upper Mast-9, Cable Terminal Box-13, Sign-16, (specify how painted) and Lamps-K.	40000-78
F-2	Highway Crossing Signal—Pinnacle-2, Sleeve-4, Lower Mast-7, Upper Mast-9, Cable Terminal Box-13, Sign-15, (specify how painted) and Lamps-L.	40000-79
F-3	Highway Crossing Signal—Pinnacle-2, Sleeve-4, Lower Mast-7, Upper Mast-9a, Cable Terminal Box-13, Sign-16, (specify how painted) and Lamps-L.	40000-80
F-4	Highway Crossing Signal—Pinnacle-3, Sleeve-4, Lower Mast-7, Upper Mast-9, Cable Terminal Box-13, Sign-15, (specify how painted) and Lamps-K.	40000-81
F-5	Highway Crossing Signal—Pinnacle-3, Sleeve-4, Lower Mast-7, Upper Mast-9, Cable Terminal Box-13, Sign-16, (specify how painted) and Lamps-K.	40000-82
F-6	Highway Crossing Signal—Pinnacle-3, Sleeve-4, Lower Mast-7, Upper Mast-9a, Cable Terminal Box-13, Sign-15, (specify how painted) and Lamps-L.	40000-83
F-7	Highway Crossing Signal—Pinnacle-3, Sleeve-4, Lower Mast-7, Upper Mast-9a, Cable Terminal Box-13, Sign-16, (specify how painted) and Lamps-L.	40000-84
F-8	Highway Crossing Signal—Pinnacle-2, Lower Mast-7a, Upper Mast-9, Cable Terminal Box-13, Sign-15, (specify how painted), and Lamps-K.	40000-69
F-9	Highway Crossing Signal—Pinnacle-2, Lower Mast-7a, Upper Mast-9, Cable Terminal Box-13, Sign-16, (specify how painted) and Lamps-K.	40000-70
F-10	Highway Crossing Signal—Pinnacle-2, Lower Mast-7a, Upper Mast-9a, Cable Terminal Box-13, Sign-15, (specify how painted) and Lamps-L.	40000-71
F-11	Highway Crossing Signal—Pinnacle-2, Lower Mast-7a, for mounting in concrete, Upper Mast-9a, Cable Terminal Box-13, Sign-16, (specify how painted) and Lamps-L.	40000-72
F-12	Highway Crossing Signal—Pinnacle-3, Lower Mast-7a, for mounting in concrete, Upper Mast-9, Cable Terminal Box-13, Sign-15, (specify how painted) and Lamps-K.	40000-73
F-13	Highway Crossing Signal—Pinnacle-3, Lower Mast-7a, for mounting in concrete, Upper Mast-9, Cable Terminal Box-13, Sign-16, (specify how painted) and Lamps-K.	40000-74

LOUISVILLE FROG, SWITCH AND SIGNAL COMPANY

Plate D-2

Model D-2 Highway Crossing Signals

Order by Plate, Figure and Name.

FIG.	NAME AND DESCRIPTION	DWG. No.
F-14	Highway Crossing Signal—Pinnacle-3, Lower Mast-7a, for mounting in concrete, Upper Mast-9a, Cable Terminal Box-13, Sign-15, (specify how painted) and Lamps-L.	40000-75
F-15	Highway Crossing Signal—Pinnacle-3, Lower Mast-7a, for mounting in concrete, Upper Mast-9a, Cable Terminal Box-13, Sign-16, (specify how painted) and Lamps-L.	40000-76
G	Highway Crossing Signal—Bell-1, (specify voltage), Sleeve-4, Lower Mast-7, Upper Mast-9, Cable Terminal Box-13, Sign-16, (specify how painted) and Lamps-K.	40000-90
G-1	Highway Crossing Signal—Bell-1, (specify voltage), Sleeve-4, Lower Mast-7, Upper Mast-9, Cable Terminal Box-13, Sign-15, (specify how painted) and Lamps-K.	40000-89
G-2	Highway Crossing Signal—Bell-1, (specify voltage), Sleeve-4, Lower Mast-7, Upper Mast-9a, Cable Terminal Box-13, Sign-16, (specify how painted) and Lamps-L.	40000-92
G-3	Highway Crossing Signal—Bell-1, (specify voltage), Sleeve-4, Lower Mast-7, Upper Mast-9a, Cable Terminal Box-13, Sign-15, (specify how painted) and Lamps-L.	40000-91
G-4	Highway Crossing Signal—Bell-1, (specify voltage), Lower Mast-7a, Upper Mast-9, Cable Terminal Box-13, Sign-16, (specify how painted) and Lamps-K.	40000-86
G-5	Highway Crossing Signal—Bell-1, (specify voltage), Lower Mast-7a, Upper Mast-9a, Cable Terminal Box-13, Sign-15, (specify how painted), and Lamps-K.	40000-85
G-6	Highway Crossing Signal—Bell-1, (specify voltage), Lower Mast-7a, Upper Mast-9a, Cable Terminal Box-13, Sign-16, (specify how painted) and Lamps-L.	40000-88
G-7	Highway Crossing Signal—Bell-1, (specify voltage), Lower Mast-7a, Upper Mast-9a, Cable Terminal Box-13, Sign-15, (specify how painted) and Lamps-L.	40000-87
H	Highway Crossing Signal—Pinnacle-2, Case-5, Mast-12, Sign-15, (specify how painted) and Lamps-K.	40000-93
H-1	Highway Crossing Signal—Pinnacle-2, Case-5, Mast-12, Sign-16, (specify how painted) and Lamps-K.	40000-94
H-2	Highway Crossing Signal—Pinnacle-2, Case-5, Mast-12a, Sign-15, (specify how painted) and Lamps-L.	40000-95
H-3	Highway Crossing Signal—Pinnacle-2, Case-5, Mast-12a, Sign-16, (specify how painted) and Lamps-L.	40000-96
H-4	Highway Crossing Signal—Pinnacle-3, Case-5, Mast-12, Sign-15, (specify how painted) and Lamps-K.	40000-97
H-5	Highway Crossing Signal—Pinnacle-3, Case-5, Mast-12, Sign-16, (specify how painted) and Lamps-K.	40000-98
H-6	Highway Crossing Signal—Pinnacle-3, Case-5, Mast-12a, Sign-15, (specify how painted) and Lamps-L.	40000-99
H-7	Highway Crossing Signal—Pinnacle-3, Case-5, Mast-12a, Sign-16, (specify how painted) and Lamps-L.	40000-100

Plate D-2

Model D-2 Highway Crossing Signals and Parts

Order by Plate, Figure and Name.

FIG.	NAME AND DESCRIPTION	DWG. No.
J	Highway Crossing Signal—Bell-1, (specify voltage), Case-5, Mast-12, Sign-16, (specify how painted) and Lamps-K.	40000-101
J-1	Highway Crossing Signal—Bell-1, (specify voltage), Case-5, Mast-12, Sign-15, (specify how painted) and Lamps-K.	40000-102
J-2	Highway Crossing Signal—Bell-1, (specify voltage), Case-5, Mast-12a, Sign-16, (specify how painted) and Lamps-L.	40000-103
J-3	Highway Crossing Signal—Bell-1, (specify voltage), Case-5, Mast-12a, Sign-15, (specify how painted) and Lamps-L.	40000-104
K	One Pair of Model D Lamps— $8\frac{3}{8}$ " diameter, with arm and fittings for 3", $3\frac{1}{2}$ " and 4" pipe mast, single contact bayonet sockets and Unispread parabolic glass reflectors.	41200-2
K-1	One Pair of Model D Lamps— $8\frac{3}{8}$ " diameter, with arm and fittings for $4\frac{1}{2}$ " and 5" pipe mast, single contact bayonet sockets and Unispread parabolic glass reflectors.	41200-3
K-2	One Pair of Model D Lamps— $8\frac{3}{8}$ " diameter, with arm and fittings for 3", $3\frac{1}{2}$ " and 4" pipe mast, Edison medium screw sockets and parabolic glass reflectors.	41200-4
K-3	One Pair of Model D Lamps— $8\frac{3}{8}$ " diameter, with arm and fittings for $4\frac{1}{2}$ " and 5" pipe mast, Edison medium screw sockets and parabolic glass reflectors.	41200-5
L	Two Pairs of Model D Lamps— $8\frac{3}{8}$ " diameter, with arms and fittings for 3", $3\frac{1}{2}$ " and 4" pipe mast and for back to back mounting, single contact bayonet sockets and Unispread parabolic glass reflectors.	41200-6
L-1	Two Pairs of Model D Lamps— $8\frac{3}{8}$ " diameter, with arms and fittings for $4\frac{1}{2}$ " and 5" pipe mast and for back to back mounting, single contact bayonet sockets and Unispread parabolic glass reflectors	41200-7
L-2	Two Pairs of Model D Lamps— $8\frac{3}{8}$ " diameter, with arms and fittings for 3", $3\frac{1}{2}$ " and 4" pipe mast and for back to back mounting, Edison medium screw sockets and parabolic glass reflectors.	41200-8
L-3	Two Pairs of Model D Lamps— $8\frac{3}{8}$ " diameter, with arms and fittings for $4\frac{1}{2}$ " and 5" pipe mast and for back to back mounting, Edison medium screw sockets and parabolic glass reflectors.	41200-9
M	Bell Cable Outlet Complete for $3\frac{1}{2}$ " i. d. pipe mast.	40443X
M-1	Bell Cable Outlet Complete for 4" i. d. pipe mast.	40443-1X
M-2	Bell Cable Outlet Complete for 5" i. d. pipe mast.	40443-3X
N	Anchor Bolt— $\frac{3}{4}$ "x18" with nut and washer.	50104X
N-1	Anchor Bolt—1"x24" with nut and washer.	50115X
O	A. R. A. No. 11812 Bushing for use with figure M.	50106
O-1	4" Bushing for use with figure M-1.	40451
O-2	5" Bushing for use with figure M-2.	40451-2

LOUISVILLE FROG, SWITCH AND SIGNAL COMPANY

Plate D-2

Model D-2 Highway Crossing Signal Parts

Order by Plate, Figure and Name.

PARTS

1	Model A, Bell. D. C., 12" gong, for top post mounting on 3½" (i. d.) pipe mast.	40200
2	A. R. A. No. 11814 Pinnacle with set screw and nut.	50105X
3	Cone Pinnacle with set screw, for 3½" (i. d.) pipe mast.	40447X
4	Sleeve for 3½" (i. d.) pipe mast.	40508
5	Model D Relay and Battery Case with one door, wood lining, sleeve for 3½" (i. d.) pipe mast.	50500
6	Mast (3½" i. d. pipe) for figure A and A-1.	41232
6a	Mast (3½" i. d. pipe) for figures A-2 and A-3.	41233
7	Lower Mast (3½" i. d. pipe) for figures B, B-1, F, F-1, F-2, F-3, F-4, F-5, F-6, F-7, G, G-1, G-2 and G-3.	50308
7a	Lower Mast (3½" i. d. pipe) for figures B-2, B-3, F-8, F-9, F-10, F-11, F-12, F-13, F-14, F-15, G-4, G-5, G-6 and G-7.	41225
8	Upper Mast (3½" i. d. pipe) for figures B, B-1, B-2 and B-3.	41234
9	Upper Mast (3½" i. d. pipe) for figures F, F-1, F-4, F-5, F-8, F-9, F-12, F-13, G, G-1, G-4, and G-5 having one pair of lamps. (Specify distance between center of lamps and bottom of signal base).	41235
9a	Upper Mast (3½" i. d. pipe) for figures F-2, F-3, F-6, F-7, F-10, F-11, F-14, F-15, G-2, G-3, G-6 and G-7 having two pairs of lamps. (Specify distance between center of lamps and bottom of signal base).	41235-1
10	Mast (3½" i. d. pipe) for figures C and C-1.	41236
11	Mast (3½" i. d. pipe) for figures D, D-1, D-4, D-5, E and E-1 having one pair of lamps. (Specify distance between center of lamps and bottom of signal base).	41237
11a	Mast (3½" i. d. pipe) for figures D-2, D-3, D-6, D-7, E-2 and E-3 having two pairs of lamps. (Specify distance between center of lamps and bottom of signal base).	41237-1
11b	Mast (3½" i. d. pipe) for figures D-8, D-9, D-12, D-13, E-4 and E-5 having one pair of lamps. (Specify distance between center of lamps and top of concrete foundation).	41238
11c	Mast (3½" i. d. pipe) for figures D-10, D-11, D-14, D-15, E-6 and E-7 having two pairs of lamps. (Specify distance between center of lamps and top of concrete foundation).	41238-1
12	Mast (3½" i. d. pipe) for figures H, H-1, H-4, H-5, J and J-2 having one pair of lamps. (Specify distance between center of lamps and bottom of signal base).	41239
12a	Mast (3½" i. d. pipe) for figures H-2, H-3, H-6, H-7, J-2 and J-3, having two pairs of lamps. (Specify distance between center of lamps and bottom of signal base).	41239-1
13	Model A-1 Cable Terminal Box complete for 3½" pipe mast.	50200
14	Pole Step complete for 3½" pipe mast.	41025-1X
15	Model A Crossing Sign complete with clamps and bolts for 3½" pipe mast. (Specify how painted). Cast iron, raised letters.	40435X
16	7" A. R. E. A. Crossing Sign complete with U bolt for 3", 3½" and 4" pipe masts. (Specify how painted). Cast iron, raised letters.	40437X
17	A. R. E. A. Track Sign complete with U bolts for 3½" pipe mast. (Specify number of tracks and how sign should be painted). Cast iron, raised letters.	41035-2X
18	Danger Sign complete with bolts for 3½" pipe mast. (Specify how painted). Cast iron, raised letters.	40440X
19	Reflex Unit No. W-126-A Horizontal Caution Sign, 25" long, complete with clamps for 3½" pipe mast. (Specify how painted and color of buttons). Cast aluminum, 1½" No. 2 Buttons.	80220-1X
20	Reflex Unit No. W-127-A Vertical Caution Sign, 46" long, complete with clamps for 3½" pipe mast. (Specify how painted and color of buttons). Cast aluminum, 1½" No. 2 Buttons.	80270-1X

Model D-3 Highway Crossing Signals

The Model D-3 Highway Crossing Signal is a two indication signal arranged so that normally, that is when no train is approaching the crossing, it displays a green light, or go indication, and when a train is approaching the green light is out and a red light appears giving a stop indication. The word GO is moulded in black in the lens of the green lamp and the word STOP in the lens of the red lamp.

The two lamps are our standard design used in the Models D-1 and D-2 Flashing Light Signals. They are mounted in a large sheet metal shield, or background of rectangular shape, painted black and the word "Danger" is painted above the lamps, on the background, in 5 inch white letters. The entire unit is mounted on a mast of 3 inch steel pipe with a cast iron crossing sign mounted above. The signal can also be furnished with a bell. The base has holes spaced 6 inches by 8 inches for foundation bolts.

The lamps are supported from a pipe arm back of the background and may be turned on their vertical axis to align them with the highway. Set screws are provided to hold the lamps in alignment.

The signal is made in two forms, one for center of street installations (island signals) and the other for side of street installations. The center of street signal has the lamps mounted directly under the crossing sign and the side of street signal has them mounted to the left of the mast.

Model D Highway Crossing Signal Lamps

These lamps have an $8\frac{3}{8}$ inch diameter ruby spreading roundel, a cast iron housing, heavy sheet metal hood, heavy glass reflector with a guaranteed mirrored surface, two $1\frac{1}{4}$ inch clear side lights, a brass lock screw with a brass cotter passed through it to prevent it from falling out when the lamp is opened, and an insulated socket arranged to be moved in and out from the focal point of the reflector, so that lamp filaments may be brought to the focal point.

The lamp unit is very simple, compact and efficient. All parts are accessible, and arranged so that adjusting, and focusing, can be done with ease. To focus the lamp filament it is only necessary to loosen one small screw and slide the socket back and forth until the focal point is found; the screw is then tightened. To remove the globe, or incandescent lamp when it burns out, open the lamp by backing out the lock screw, let the front drop forward and pull the reflector assembly from the front. After the globe has been changed, simply push the reflector assembly in place and close the lamp. The lock screw is made to fit the regular socket wrench used on relay terminal posts, etc.

The socket is insulated from all metal parts of the lamp. All of the insulation used in the socket is laminated bakelite which will not soften under summer heat and will not absorb moisture. The leads from the socket terminate on a standard A. R. A. Terminal Block.

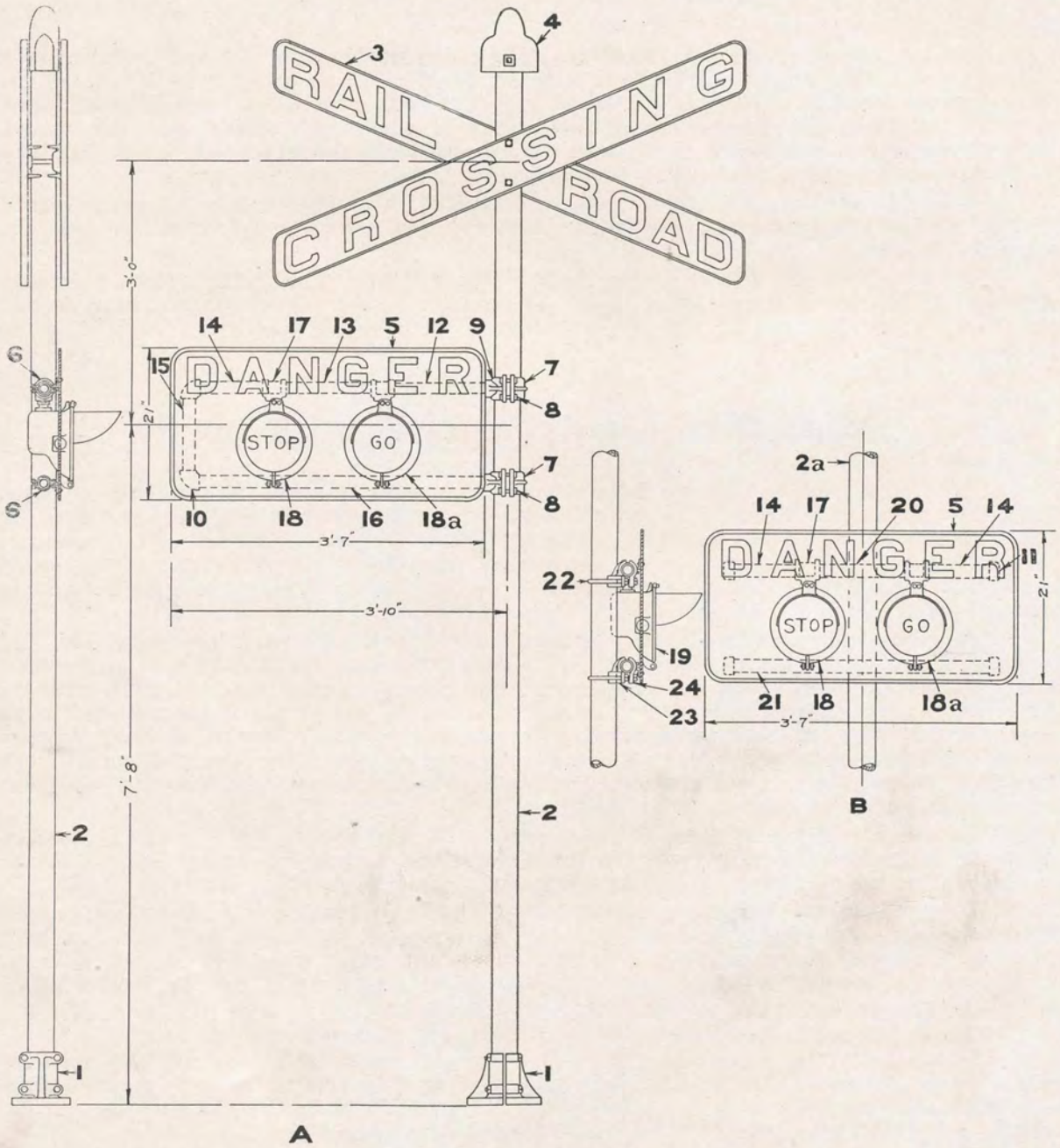
The gap between the front and back half of the lamp housing is filled with a gasket, sealing the lamp and rendering it waterproof. Pipe nipples, lock nuts, and bushings have also been eliminated, for suspending the lamp from its arm, and a flanged fitting bolted to the housing and packed with a gasket used in their stead, making a waterproof connection which will not become loose and change the alignment of the lamp.

The Unispread reflector used in our lamps is a feature not found in any other signal lamp. This reflector is the result of much experimental work and is more efficient and projects a beam of light almost entirely free from dead or black spots. Its principal advantage is its wide angle spread, which is somewhat more than 100° with the central part of the beam of a high intensity and the sides of a lower candle power.

The lamps have ears for locking with a padlock.

A full description of the supporting arm and clamps will be found on page three of this bulletin.

Plate D-10



LOUISVILLE FROG, SWITCH AND SIGNAL COMPANY

Plate D-10

Model D-3 Highway Crossing Signals and Parts

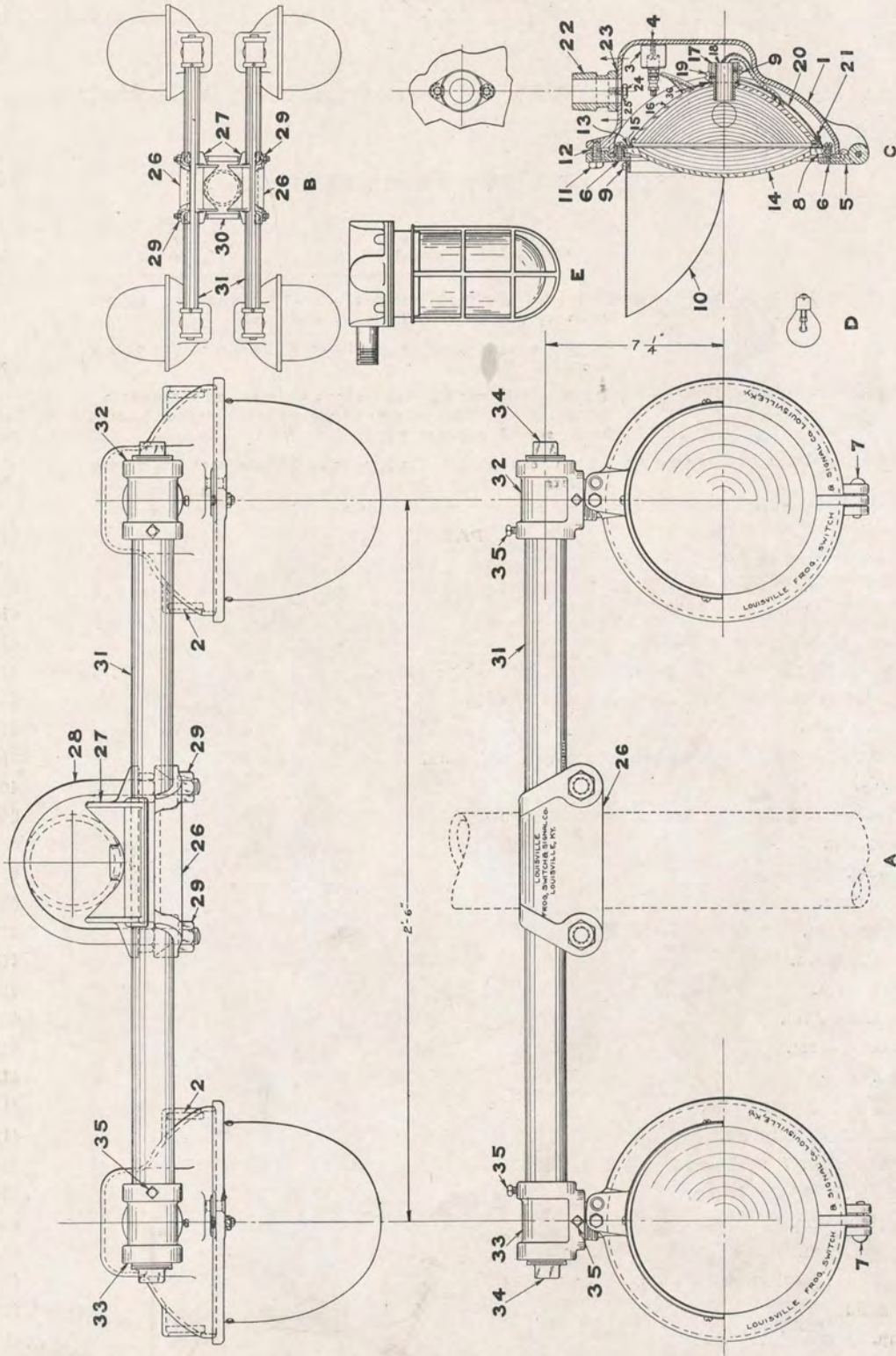
Order By Plate, Figure and Name.

FIG.	NAME AND DESCRIPTION	DWG. No.
A	Highway Crossing Signal—Complete as shown, for side of street installation. Lamps have single contact bayonet sockets.	40000-113
A-1	Highway Crossing Signal—As above except that lamps have Edison medium screw sockets.	40000-114
B	Highway Crossing Signal—Complete with mast, base, crossing sign and pinnacle as figure A but for center of street insallation. Lamps have single contact bayonet sockets.	40000-115
B-1	Highway Crossing Signal—As above except that lamps have Edison medium screw sockets.	40000-116

PARTS

1	Base complete, (for 3" i. d. pipe).	50305AX
2	Mast for figure A and A-1.	41243
2a	Mast for figure B and B-1.	41244
3	Crossing Sign complete, painted black with white letters.	40435-1X
4	Pinnacle complete with set screw and nut.	50303X
5	Shield only.	41245
6	Clamp, for shield, complete with screws and nuts.	41246X
7	Strap.	40417
8	Square Head Machine Bolt and nut for figure 7.	006032X
9	Coupling.	40439
10	Elbow.	016013
11	Pipe Cap.	016007
12	Right Arm.	41248
13	Middle Arm.	41249
14	Left Arm.	41250
15	Vertical Arm.	41251
16	Bottom Arm.	41252
17	Tee.	41253
18	Stop Lamp Complete.	41200-10
18a	Go Lamp Complete.	41200-11
19	Roundel for Stop Lamp.	41032
19a	Roundel for Go Lamp.	41032-1
20	Center Arm.	41254
21	Lower Arm.	41255
22	U Bolt complete with nuts.	41217X
23	Saddle.	41216
24	Cap.	41215

Plate D-20



LOUISVILLE FROG, SWITCH AND SIGNAL COMPANY

Plate D-20

Model D Highway Crossing Signal Lamps and Parts

Order by Plate, Figure and Name.

FIG.	NAME AND DESCRIPTION	DWG. No.
A	One Pair of Model D Lamps with $8\frac{3}{8}$ " spreading roundels, arm and fittings for 3", $3\frac{1}{2}$ " and 4" pipe mast, single contact bayonet sockets and unispread parabolic glass reflectors.	41200-2
A-1	One Pair of Model D Lamps with $8\frac{3}{8}$ " spreading roundels, arm and fittings for $4\frac{1}{2}$ " and 5" pipe mast, single contact bayonet sockets and unispread parabolic glass reflectors.	41200-3
A-2	One Pair of Model D Lamps with $8\frac{3}{8}$ " spreading roundels, arm and fittings for 3", $3\frac{1}{2}$ " and 4" pipe mast, Edison medium screw sockets and parabolic glass reflectors.	41200-4
A-3	One Pair of Model D Lamps with $8\frac{3}{8}$ " spreading roundels, arm and fittings for $4\frac{1}{2}$ " and 5" pipe mast, Edison medium screw sockets and parabolic glass reflectors.	41200-5
B	Two Pairs of Model D Lamps with $8\frac{3}{8}$ " spreading roundels, arms and fittings for 3", $3\frac{1}{2}$ " and 4" pipe mast and for back to back mounting, single contact bayonet sockets and Unispread parabolic glass reflectors.	41200-6
B-1	Two Pairs of Model D Lamps with $8\frac{3}{8}$ " spreading roundels, arms and fittings for $4\frac{1}{2}$ " and 5" pipe mast and for back to back mounting, single contact bayonet sockets and Unispread parabolic glass reflectors.	41200-7
B-2	Two Pairs of Model D Lamps with $8\frac{3}{8}$ " spreading roundels, arms and fittings for 3", $3\frac{1}{2}$ " and 4" pipe mast and for back to back mounting, Edison medium screw sockets and parabolic glass reflectors.	41200-8
B-3	Two Pairs of Model D Lamps with $8\frac{3}{8}$ " spreading roundels, arms and fittings for $4\frac{1}{2}$ " and 5" pipe mast and for back to back mounting, Edison medium screw sockets and parabolic glass reflectors.	41200-9
C	Model D Lamp with single contact bayonet socket and Unispread parabolic glass reflector.	41200
C-1	Model D Lamp with Edison medium screw socket and parabolic glass reflector.	41200-1
D	Mazda Globe—S-11 Bulb and single contact bayonet base. Specify voltage.	40433
E	Pilot Lamp with A. R. A. No. 15441 Adapter. (Specify color of globe.)	41042X

PARTS

1	Lamp Housing Complete, 1 figure 1 and 2 figures 2.	41201X
2	Side Light Glass.	40442
3	A. R. A. Terminal Block.	40446X
4	Round Head Brass Machine Screw for figure 3.	004017
5	Lamp Cover.	41202
6	Round Head Brass Machine Screw for figures 5, 13 and 21.	004057
7	Button Head Iron Rivet for figures 1 and 5.	008003
8	Cover Gasket.	41205
9	Round Head Brass Machine Screw for figures 10 and 20.	004024
10	Hood.	41204
11	Lock Screw.	41203
12	Brass Spring Cotter for figure 11.	001005
13	Rounded Clamp.	41207
14	Ruby Roundel, $8\frac{3}{8}$ " dia., 30° spread.	40405
15	Roundel Gasket.	41206
16	Unispread Glass Parabolic Reflector only for figure 16a.	41210
16a	Unispread Reflector Assembly (with single contact bayonet socket). 1 figure 9, 1 figure 16, 1 figure 17, 1 figure 18, 3 figures 19 and 3 figures 20.	41210-1
16b	Parabolic Glass Reflector only for figure 16c.	
16c	Glass Reflector Assembly (with Edison medium screw socket). 1 figure 9, 1 figure 16a, 1 figure 17a, 1 figure 18a, 3 figures 19 and 3 figures 20a.	41210-1X
17	Socket Sleeve for figure 16a.	41211
17a	Socket Sleeve for figure 16c.	41211-1
18	Socket Assembly for figure 16a.	41209X
18a	Socket Assembly for figure 16c.	41241X
19	Round Head Brass Machine Screw for figures 16a and 16c.	004060
20	Reflector Clamp for figure 16a.	41212X
20a	Reflector Clamp for figure 16c.	41212-1X
21	Reflector Spring.	41208
22	Connector.	41214
23	Connector Gasket.	41220
24	Cap Screw for figure 22.	009016
25	Lock Washer for figure 24.	002002
26	Cap.	41215
27	Saddle.	41216
28	U Bolt with nuts for 3", $3\frac{1}{2}$ " and 4" pipe.	41217X
28a	U Bolt with nuts for $4\frac{1}{2}$ " and 5" pipe.	41217-1X
29	Hexagon Nut for figures 28, 28a, 30 and 30a.	003022
30	Four Way Bolt with nuts for 3", $3\frac{1}{2}$ " and 4" pipe.	41240X
30a	Four Way Bolt with nuts for $4\frac{1}{2}$ " and 5" pipe.	41240-1X
31	Double Lamp Arm only.	41221
31a	Double Lamp Arm Complete. 1 figure 31, 1 figure 32, 1 figure 33, 2 figures 34 and 2 figures 35.	41221X
32	Right Tee.	41222-1
33	Left Tee.	41222
34	Pipe Plug for figures 32 and 33.	016009
35	Set Screws for figures 32 and 33.	010008
36	Socket Sleeve Gasket.	41242

Plate D-30

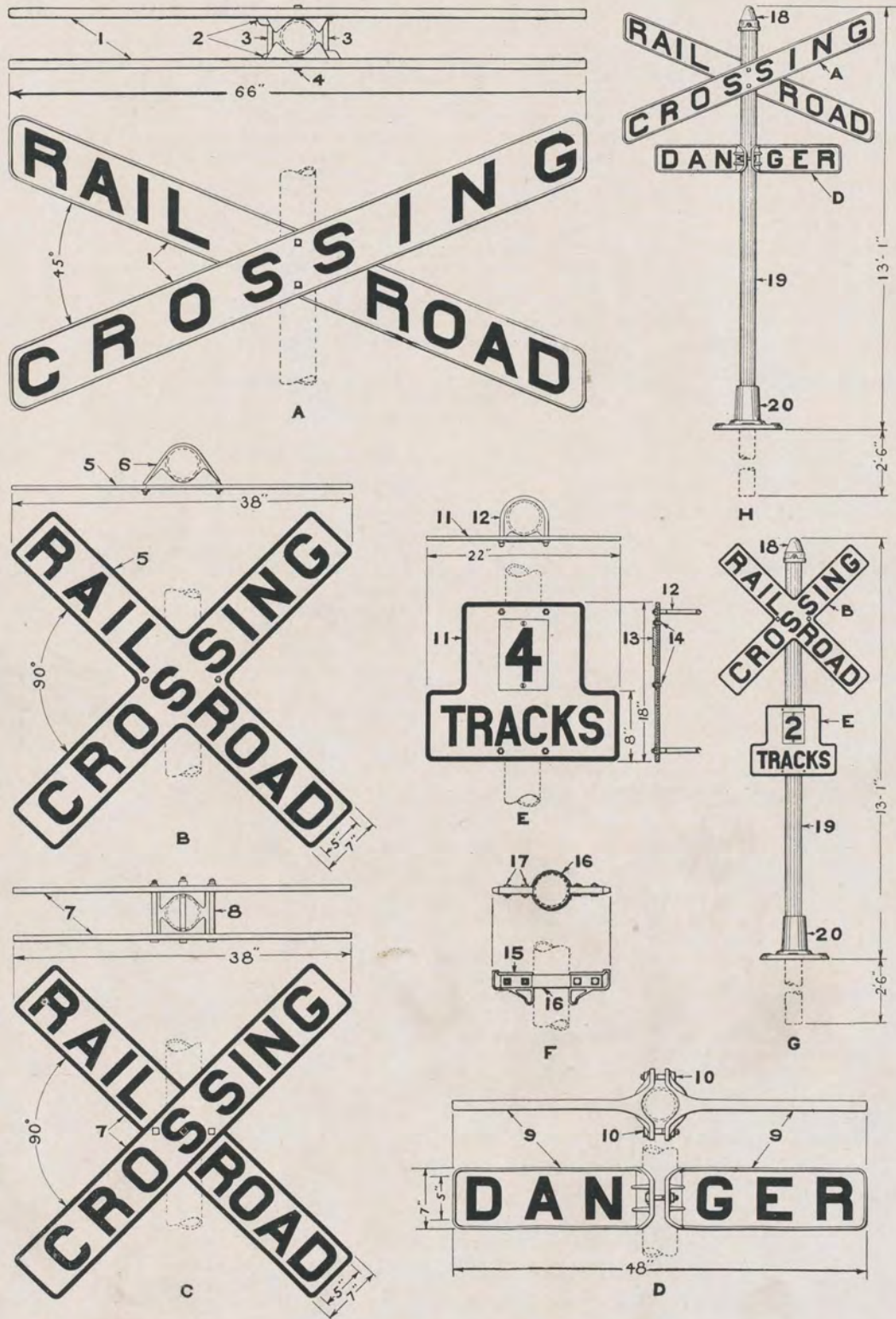


Plate D-30

Crossing Signs

All of the signs listed below are made of cast iron with raised letters. The castings are smooth, clean, and free from all defects. Each sign is coated with high grade enamels, and carefully wrapped and packed to insure the sign reaching its destination in good order.

Signs can be furnished with white letters on a black background, or black letters on a white background, to meet the requirements of the railroad when required.

We can also furnish special signs made to various railroad specifications.

Order by Plate, Figure and Name.

FIG.	NAME AND DESCRIPTION	DWG. No.
A	Model A Crossing Sign—Complete with clamps and bolts for 3½" (i. d.) pipe mast, (specify how painted). Lettered on both sides.	40435X
A-1	Model A Crossing Sign—As figure A except for 3" (i. d.) pipe mast.	40435-1X
A-2	Model A Crossing Sign—As figure A except for 4" (i. d.) pipe mast.	40435-2X
A-3	Model A Crossing Sign—As figure A except for 4½" (i. d.) pipe mast.	40435-3X
A-4	Model A Crossing Sign—As figure A except for 5" (i. d.) pipe mast.	40435-4X
B	7" A. R. E. A. Crossing Sign—Complete with U bolts for 3", 3½" and 4" (i. d.) pipe mast, (specify how painted). Lettered on one side only.	40436X
B-1	7" A. R. E. A. Crossing Sign—As figure B except for 4½" and 5" (i. d.) pipe mast.	40436-1X
C	Model C Crossing Sign—Complete with bolts for 3" (i. d.) pipe mast, (specify how painted). Lettered on both sides.	41034X
C-1	Model C Crossing Sign—As figure C except for 3½" (i. d.) pipe mast.	41034-1X
C-2	Model C Crossing Sign—As figure C except for 4" (i. d.) pipe mast.	41034-2X
C-3	Model C Crossing Sign—As figure C except for 4½" (i. d.) pipe mast.	41034-3X
C-4	Model C Crossing Sign—As figure C except for 5" (i. d.) pipe mast.	41034-4X
D	Danger Sign—Complete with bolts for 3½" (i. d.) pipe mast, (specify how painted). Lettered on both sides.	40440X
D-1	Danger Sign—As figure D except for 3" (i. d.) pipe mast.	40440-1X
D-2	Danger Sign—As figure D except for 4" (i. d.) pipe mast.	40440-2X
D-3	Danger Sign—As figure D except for 4½" (i. d.) pipe mast.	40440-3X
D-4	Danger Sign—As figure D except for 5" (i. d.) pipe mast.	40440-4X
E	A. R. E. A. Multiple Track Sign—Complete for mounting on wood pole (no U bolts required), (specify how painted and number of tracks). Lettered on one side only.	41035X
E-1	A. R. E. A. Multiple Track Sign—As figure E except for 3" (i. d.) pipe mast.	41035-1X
E-2	A. R. E. A. Multiple Track Sign—As figure E except for 3½" (i. d.) pipe mast.	41035-2X
E-3	A. R. E. A. Multiple Track Sign—As figure E except for 4" (i. d.) pipe mast.	41035-3X
E-4	A. R. E. A. Multiple Track Sign—As figure E except for 4½" (i. d.) pipe mast.	41035-4X
E-5	A. R. E. A. Multiple Track Sign—As figure E except for 5" (i. d.) pipe mast.	41035-5X
F	Pole Step—Complete for 3" (i. d.) pipe mast.	41025X
F-1	Pole Step—Complete for 3½" (i. d.) pipe mast.	41025-1X
F-2	Pole Step—Complete for 4" (i. d.) pipe mast.	41025-2X
F-3	Pole Step—Complete for 4½" (i. d.) pipe mast.	41025-3X
F-4	Pole Step—Complete for 5" (i. d.) pipe mast.	41025-4X
G	Crossing Sign and Mast—Complete with Signs-B and E, (specify number of tracks and how signs are to be painted.) Pinnacle-18, Mast-19 and Sleeve-20.	40000-105
G-1	Crossing Sign and Mast—Complete with Signs-B and E, (specify number of tracks and how painted.) Pinnacle-18 and Mast-19a for mounting direct in concrete.	40000-106
G-2	Crossing Sign and Mast—Complete with Sign-B, (specify how painted.) Pinnacle-18, Mast-19 and Sleeve-20.	40000-107
G-3	Crossing Sign and Mast—Complete with Sign-B, (specify how painted.) Pinnacle-18 and Mast-19a for mounting direct in concrete.	40000-108
H	Crossing Sign and Mast—Complete with Signs-A and D, (specify how painted.) Pinnacle-18, Mast-19 and Sleeve-20.	40000-109

LOUISVILLE FROG, SWITCH AND SIGNAL COMPANY

Plate D-30

Crossing Signs and Parts

Order by Plate, Figure and Name.

FIG.	NAME AND DESCRIPTION	DWG. No.
H-1	Crossing Sign and Mast—Complete with Signs-A and D, (specify how painted.) Pinnacle-18 and Mast-19a for mounting direct in concrete.	40000-110
H-2	Crossing Sign and Mast—Complete with Sign-A, (specify how painted.) Pinnacle-18, Mast-19 and Sleeve-20.	40000-111
H-3	Crossing Sign and Mast—Complete with Sign-A, (specify how painted.) Pinnacle-18 and Mast-19a for mounting direct in concrete.	40000-112

PARTS

1	Board only, for Model A Crossing Sign. (Specify how painted).....	40435
2	Sign Clamp only, for Model A Crossing Sign.....	40434A
3	Square Head Machine Bolt with nut for use with 3½" pipe mast.....	006021X
3a	Square Head Machine Bolt with nut for use with 3" pipe mast.....	006022X
3b	Square Head Machine Bolt with nut for use with 4" pipe mast.....	006037X
3c	Square Head Machine Bolt with nut for use with 4½" pipe mast.....	006038X
3d	Square Head Machine Bolt with nut for use with 5" pipe mast.....	006039X
4	Square Head Machine Bolt only for figure 1.....	006029X
5	Board only for A. R. E. A. Crossing Sign. (Specify how painted).....	40436
6	U Bolt with nuts and washers for 3", 3½" and 4" pipe masts.....	40437X
6a	U Bolt with nuts and washers for 4½" and 5" pipe masts.....	40437-1X
7	Board only for Model C Crossing Sign. (Specify how painted).....	41034
8	Square Head Machine Bolt with nut for use with 3" pipe mast.....	006037X
8a	Square Head Machine Bolt with nut for use with 3½" pipe mast.....	006038X
8b	Square Head Machine Bolt with nut for use with 4" pipe mast.....	006039X
8c	Square Head Machine Bolt with nut for use with 4½" pipe mast.....	006040X
8d	Square Head Machine Bolt with nut for use with 5" pipe mast.....	006041X
9	Board only for Danger Sign. (Specify how painted).....	40440
10	Square Head Machine Bolt with nut for use with 3½" pipe mast.....	006012X
10a	Square Head Machine Bolt with nut for use with 3" pipe mast.....	006019X
10b	Square Head Machine Bolt with nut for use with 4" pipe mast.....	006004X
10c	Square Head Machine Bolt with nut for use with 4½" pipe mast.....	006022X
10d	Square Head Machine Bolt with nut for use with 5" pipe mast.....	006010X
11	Board only for Multiple Track Sign. (Specify how painted).....	41035
12	U Bolt with nuts and washers for use with 3" pipe mast.....	41036X
12a	U Bolt with nuts and washers for use with 3½" pipe mast.....	41036-1X
12b	U Bolt with nuts and washers for use with 4" pipe mast.....	41036-2X
12c	U Bolt with nuts and washers for use with 4½" pipe mast.....	41036-3X
12d	U Bolt with nuts and washers for use with 5" pipe mast.....	41036-4X
13	Digit only. (Specify number). (Specify how painted).....	30501-8
14	Round Head Brass Machine Screw for figure 13.....	004059
15	Pole Step only.....	41025
16	Pole Step Band for use with 3" pipe mast.....	41026
16a	Pole Step Band for use with 3½" pipe mast.....	41026-1
16b	Pole Step Band for use with 4" pipe mast.....	41026-2
16c	Pole Step Band for use with 4½" pipe mast.....	41026-3
16d	Pole Step Band for use with 5" pipe mast.....	41026-4
17	Square Head Machine Bolt with Nut.....	006029X
18	Cone Pinnacle with set screw and nut for 3½" (i. d.) pipe mast.....	40447X
19	Mast (3½" i. d. pipe) for figures G, G-2, H and H-2.....	41223
19a	Mast (3½" i. d. pipe) for figures G-1, G-3, H-1 and H-3.....	41224
20	Sleeve for 3½" (i. d.) pipe mast.....	40508



MODEL D ISLAND FLASHING LIGHT
HIGHWAY CROSSING SIGNAL

Luminous Stop Signs

These signs are used by some railroads, as auxiliary signals in connection with highway crossing protection and others use them alone as a crossing signal without the use of other apparatus.

Three types are shown on the following plate. The Model A Luminous Stop Sign is a horizontal type with an oblong housing enclosing the entire device. The letters in the word "stop" are six inches high. The sign is equipped with parabolic metal reflectors, one for each letter in the word "stop". These reflectors have single contact bayonet sockets, with individual adjustments, so that the incandescent lamps may be focused. The sockets are fully insulated with bakelite, as in our other types. A ruby glass, with a stencil back of it is mounted in a frame in front of each reflector. When the lamps are illuminated the word "stop" appears in red light but when the lights are out the word "stop" is not visible because the stencils are back of the glass. Packing is used in the joint between the front and back half to render the sign moisture proof and means are provided for locking with a padlock.

The Model A sign is cylindrical on its back side so that it can be rotated, in its bracket, for vertical alignment and the bracket may be rotated about the mast for horizontal alignment. One large hood, of sheet iron, shields the sign from sun and skylight. The housing and bracket parts are of cast iron while the metal parts of the sockets and other small parts are of brass.

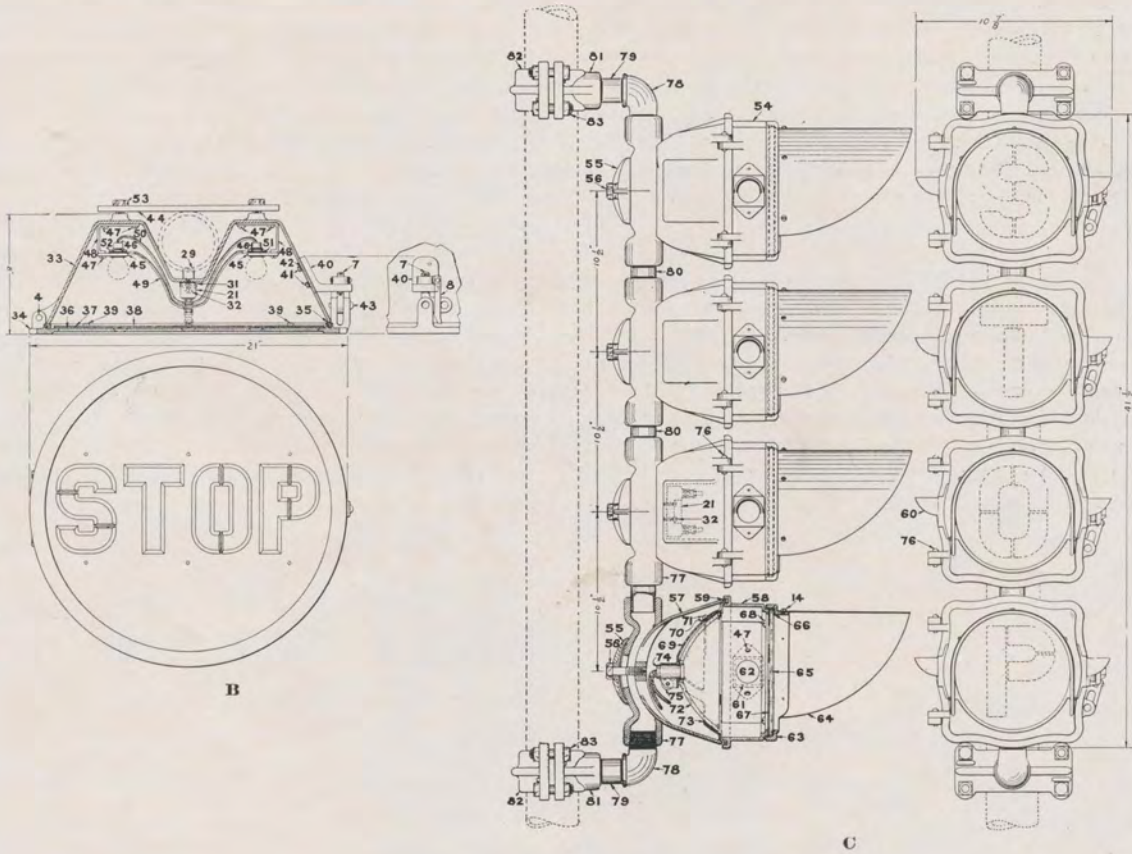
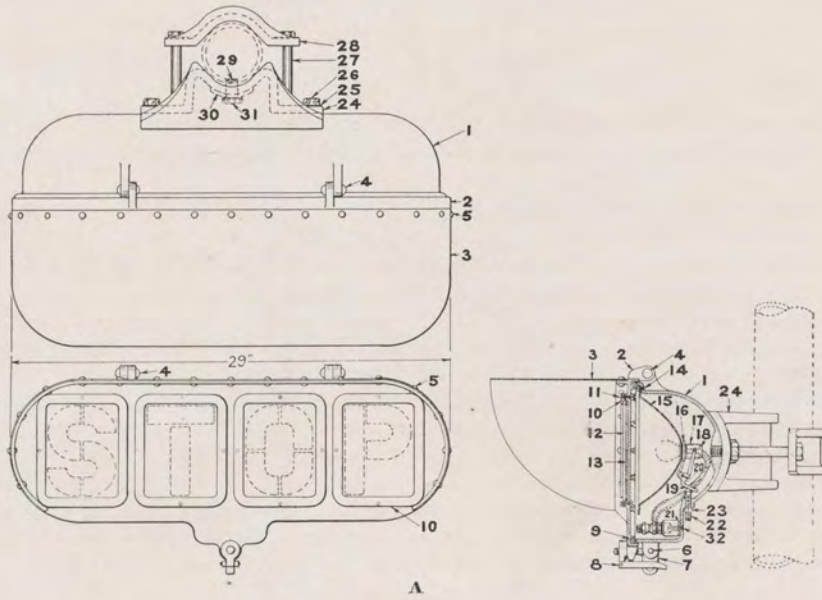
The Model B Stop Sign is a circular disc, twenty-one inches in diameter, painted white with a one-inch raised black border and letters, five and one-half inches high, having a one-inch stroke outlined with a quarter inch black stripe. The letters are cut out, and backed with ruby glass. Directly back of the letters is a case housing two lamps. This case is sealed with a gasket, is moisture proof and has means for locking. No reflectors are used in this sign but the interior of the case is painted with aluminum to help project the light forward. Sockets are furnished for single contact bayonet base or for Edison medium screw base lamps. The case is large enough to take a regular 60 watt Edison medium screw base lamp. The sockets are insulated, but not adjustable. The sign is clamped to the mast by means of a strap, and is not adjustable. The housing and disc are made of cast iron. The word "stop" is always visible, but luminous only when the lamps are lighted.

The Model C Stop Sign is of the vertical type and has a separate lamp unit for each letter. The lamp units are our regular Model C Highway Crossing Signal Lamps, mounted in a ball and socket bracket, providing a very flexible means for aligning. Flat ruby roundels, eight and three-eighths inches in diameter are used in the lamp units with stencils of 6" letters behind them. Each unit has two side lights to indicate to the trainmen when the signal is in operation. Parabolic glass reflectors are used to project the light from the lamps. Sockets are furnished either for single contact bayonet base or Edison medium screw base lamps. They are adjustable and insulated throughout with laminated bakelite. Each unit has a separate hood of heavy sheet iron. The lamp housings and brackets are of cast iron and the units are assembled with malleable iron and steel pipe fittings.



MODEL B LUMINOUS STOP SIGN
Used with Flashing Light Signal

Plate D-40



LOUISVILLE FROG, SWITCH AND SIGNAL COMPANY

Plate D-40

Luminous Stop Signs and Parts

Order by Plate, Figure and Name.

FIG.	NAME AND DESCRIPTION	DWG. No.
A	Model A Luminous Stop Sign—Complete for mounting on 3½" (i. d.) pipe mast, with single contact bayonet sockets and parabolic metal reflectors.	70100
A-1	Model A Luminous Stop Sign as figure A, except for mounting on 3" (i. d.) pipe mast.	70100-1
A-2	Model A Luminous Stop Sign as figure A, except for mounting on 4" (i. d.) pipe mast.	70100-2
A-3	Model A Luminous Stop Sign as figure A, except for mounting on 4½" (i. d.) pipe mast.	70100-3
A-4	Model A Luminous Stop Sign as figure A, except for mounting on 5" (i. d.) pipe mast.	70100-4
B	Model B Luminous Stop Sign—Complete for mounting on 3½" (i. d.) pipe mast, with single contact bayonet sockets.	70200
B-1	Model B Luminous Stop Sign as figure B, except for mounting on 3" (i. d.) pipe mast.	70200-1
B-2	Model B Luminous Stop Sign as figure B, except for mounting on 4" (i. d.) pipe mast.	70200-2
B-3	Model B Luminous Stop Sign as figure B, except for mounting on 4½" (i. d.) pipe mast.	70200-3
B-4	Model B Luminous Stop Sign as figure B, except for mounting on 5" (i. d.) pipe mast.	70200-4
C	Model C Luminous Stop Sign—Complete for mounting on 3½" (i. d.) pipe mast, with single contact bayonet sockets and parabolic glass reflectors.	41000-41
C-1	Model C Luminous Stop Sign as figure C, except for mounting on 3" (i. d.) pipe mast.	41000-40
C-2	Model C Luminous Stop Sign as figure C, except for mounting on 4" (i. d.) pipe mast.	41000-42
C-3	Model C Luminous Stop Sign as figure C, except for mounting on 4½" (i. d.) pipe mast.	41000-43
C-4	Model C Luminous Stop Sign as figure C, except for mounting on 5" (i. d.) pipe mast.	41000-44

PARTS

1	Case for Model A Luminous Stop Sign.	70101
2	Front for Model A Luminous Stop Sign.	70102
2a	Front complete with hood, (1 figure 2, 1 figure 3, 17 figures 5 and 1 figure 9).	70102X
3	Hood for Model A Luminous Stop Sign.	70103
4	Button Head Iron Rivet for figures 1, 2a, 33 and 34.	008004
5	Button Head Copper Rivet for figures 2 and 3.	008008
6	Button Head Iron Rivet for figure 7.	008002
7	Eye Bolt.	10207
8	Hasp Complete.	10209X
9	Gasket for figure 2a.	70112
10	Glass Holder.	70104
11	Round Head Brass Machine Screw for figures 2a and 10.	004057
12	Glass for Model A Luminous Stop Sign.	70113
13	"S" Plate for Model A Luminous Stop Sign.	70108
13a	"T" Plate for Model A Luminous Stop Sign.	70109
13b	"O" Plate for Model A Luminous Stop Sign.	70110
13c	"P" Plate for Model A Luminous Stop Sign.	70111
14	Round Head Brass Machine Screw for figures 1, 15a, 15c and 64.	004024
15	End Reflector.	70114
15a	End Reflector Complete. 1 figure 15, 1 figure 16, 1 figure 17, 1 figure 18, 1 figure 19 and 1 figure 20.	70114X
15b	Middle Reflector.	70115
15c	Middle Reflector Complete. 1 figure 15b, 1 figure 16, 1 figure 17, 1 figure 18, 1 figure 19 and 1 figure 20.	70115X
16	Socket Nut Complete for figure 17.	40421X
17	Socket Sleeve Complete.	40422X
18	Socket Assembly for Model A Luminous Stop Sign.	40424-1X
19	Adjusting Lever Complete.	40419X
20	Brass Spring Cotter.	001002
21	A. R. A. Terminal Block.	40446X
22	Adjusting Screw.	40409
23	Adjusting Screw Nut.	40418
24	Bracket.	70105
25	Cut Washer for figure 26.	005002
26	Cap Screw for figure 24.	009009
27	Cap Screw for use with 3" pipe.	009010
27a	Cap Screw for use with 3½" pipe.	009011
27b	Cap Screw for use with 4" pipe.	009012
27c	Cap Screw for use with 4½" pipe.	009013
27d	Cap Screw for use with 5" pipe.	009014
28	Clamp.	70106

LOUISVILLE FROG, SWITCH AND SIGNAL COMPANY

Plate D-40

Luminous Stop Sign Parts

Order by Plate, Figure and Name.

FIG.	NAME AND DESCRIPTION	DWG. No.
29	Pipe Nipple.	016005
30	Cylindrical Washer.	70107
31	Conduit Bushing.	70116
32	Round Head Brass Machine Screw for figure 21.	004017
33	Case for Model B Luminous Stop Sign.	70201
34	Front for Model B Luminous Stop Sign.	70202
35	Packing for figure 34.	70203
36	Glass for Model B Luminous Stop Sign.	70204
37	Cork Gasket for glass figure 36.	70205
38	Glass holder for Model B Luminous Stop Sign.	70207
39	Round Head Brass Machine Screw for figure 38.	004009
40	Locking Bracket.	70208
41	Hexagon Head Cap Screw for figure 40.	009001
42	Lock Washer for figure 41.	002001
43	Button Head Iron Rivet for figure 34.	008003
44	Strap for 3½", 4", 4½" and 5" pipe mast.	70209
44a	Strap for 3" pipe mast.	70209-1
45	Socket Holder.	70210
46	Socket Complete.	30307X
47	Round Head Brass Machine Screw for figure 48.	604006
48	Socket Bracket.	40211
49	Side Lead Complete.	70213-1X
50	Center Lead Complete.	70213X
51	Washer for figure 52.	30309
52	Socket Nut for figure 46.	30310
53	Cap Screw for use with 3" and 3½" pipe.	009005
53a	Cap Screw for use with 4" pipe.	009009
53b	Cap Screw for use with 4½" pipe.	009006
53c	Cap Screw for use with 5" pipe.	009015
54	Model C Lamp, 8% diameter, single contact bayonet socket and parabolic glass reflector.	41000
55	Spherical Washer.	40410A
56	Cap Screw.	009006
57	Lamp Housing.	41001
58	Lamp Cover Complete.	41002X
59	Cover Gasket for figure 58.	41005
60	Side Light Hood.	40441A
61	Side Light Gasket.	40448
62	Side Light Glass.	40442
63	Bezel Ring.	41003
64	Hood.	41004
65	8% Ruby Roundel.	41037
66	Roundel Gasket.	40406
67	"S" Plate for Model C Luminous Stop Sign.	41038
67a	"T" Plate for Model C Luminous Stop Sign.	41039
67b	"O" Plate for Model C Luminous Stop Sign.	41040
67c	"P" Plate for Model C Luminous Stop Sign.	41041
68	Round Head Brass Machine Screw for figures 58 and 63.	004007
69	Cradle only.	41009
69a	Reflector Assembly. 1 figure 69, 3 figures 70, 3 figures 71, 1 figure 72, 1 figure 73, 1 figure 74 and 1 figure 75.	41011X
70	Reflector Clamp Complete.	41013X
71	Round Head Brass Machine Screw for figure 70.	004044
72	Glass Reflector.	41011
73	Reflector Gasket.	41012
74	Socket Assembly.	41015X
75	Thumb Screw.	41010
76	Button Head Iron Rivet for figures 57 and 58.	008015
77	Middle Cup.	40438
78	Street Elbow.	016010
79	Pipe Nipple for figure 81.	016011
80	Pipe Nipple for figure 77.	016012
81	Coupling.	40439
82	Strap.	40417
83	Square Head Machine Bolt and Nut for use with 3" pipe.	006032X
83a	Square Head Machine Bolt and Nut for use with 3½" pipe.	006033X
83b	Square Head Machine Bolt and Nut for use with 4" pipe.	006034X
84c	Square Head Machine Bolt and Nut for use with 4½" pipe.	006035X
84d	Square Head Machine Bolt and Nut for use with 5" pipe.	006036X

Reflex Signs and Units for Highway Crossings

U. S. Patent No. 1725766

Reflex is a name used by us registered in U. S. Patent Office to designate a type of sign, which we manufacture, which reflects light from oncoming vehicles or locomotives, causing the sign to become luminous. They can be used wherever a suitable beam of light (as a locomotive or automobile headlight) can be cast upon them and in such places they are very efficient, effective and economical. Economy is the first reason for using them as large savings can be made by eliminating oil and electric lamps, markers, etc., and using Reflex signs or units instead. The first cost is practically the last.

The second reason for their use is their attractiveness, the flash of their gleaming beams cannot fail to attract the one in front of them.

These signs and units are made up of many small inserts or buttons, as they are called, arranged in the form of letters and conventional symbols. The buttons are really small lenses, backed with mirrors, and are made in clear or crystal, amber, green and red.

The housings for Reflex signs, and units, are all made of cast aluminum, which will not break, crack, corrode, rust or warp, when exposed to the elements. They are painted with a durable egg-shell finish enamel in colors to suit the purpose for which the sign, or unit, is intended. Each housing is divided into two halves, a front and a back. The buttons are inserted into holes in the front half and clamped between the two halves.

A cushion material is placed inside to hold the buttons firmly in position. Brass screws, and nuts, are used to bolt the two halves together. These screws have special heads, which require a special screw driver to remove them. This is done to prevent mischievous boys, or others, from removing the screws and dismantling them. It is not necessary to disturb these screws when installing a sign or unit, but we can supply screw drivers to those who want them. This screw driver is shown on the following plate.

Reflex signs and units may be applied to anything to which any other sign can be attached, they can be screwed to wood; they can be bolted to sheet metal plates; or they can be bolted to clamps for securing them to round metal poles. Clamps for securing them will be found show on Plate D-60 of this bulletin.

We have a large line of standard Reflex signs and units for various purposes, which are listed in special bulletins. These may be had upon request, but in this bulletin we have listed only a few, particularly adaptable for use at highway crossings. We are constantly adding new ones to our line and if you cannot find a Reflex sign or unit to suit your need, just send a rough sketch and description to us and we will gladly design a Reflex for your purpose. When possible it is well to use standard units, and signs, as they can generally be supplied from stock, and where only a small quantity is wanted they are less costly than special ones.

The picture at the bottom of this page shows how a Reflex square unit may be used as a marker for island highway crossing signals.

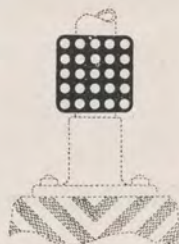
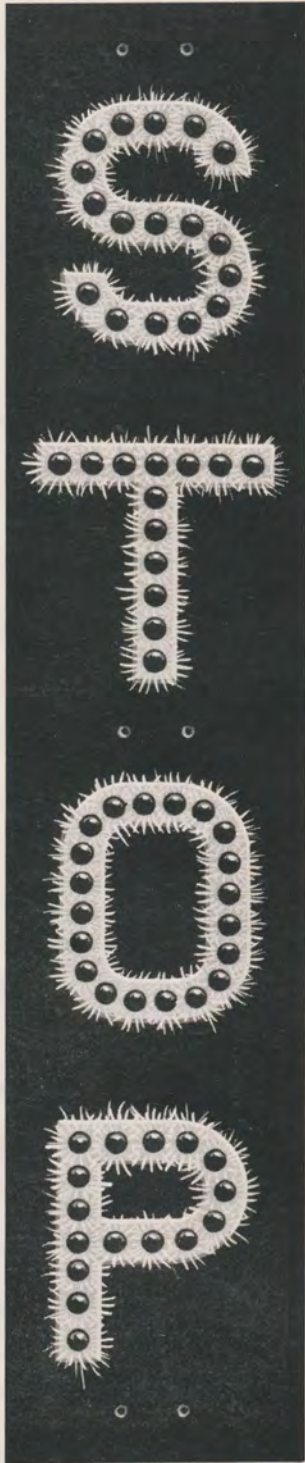


Plate D-50



W-33-SIGN
12" x 59" x 1/8" Plate
Letters 1 1/4" Thick



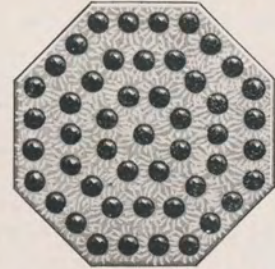
W-101-SIGN
24" Dia. x 1/8" Plate.
Letters 1 1/8" Thick



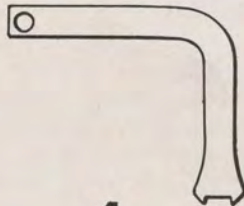
W-103-SIGN
24" Dia. x 1/8" Plate.
Letters 1 1/8" Thick



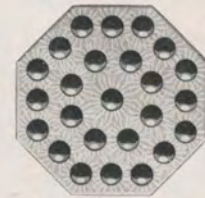
W-102-SIGN
24" Dia. x 1/8" Plate.
Letters 1 1/8" Thick



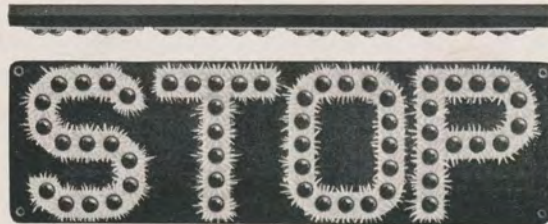
W-12-A-UNIT
10 3/4" Dia. x 1 1/8" Thick



1



W-134-B-UNIT
7 3/4" Dia. x 1 1/4" Thick



W-103-A-UNIT
6 1/2" x 22" x 1/8" Thick

Plate D-50

Reflex Signs and Units

Unless otherwise specified signs and units will be furnished in colors as listed below. Other colors will be furnished if specified.

Number 1 button is $\frac{7}{8}$ " in diameter.

Number 2 button is $\frac{11}{16}$ " in diameter.

Buttons are made in clear or crystal, amber, green or red. The clear reflect the greatest amount of light and for this reason we recommend their use wherever possible to do so. The amber buttons are next in efficiency.

Order by Plate, Figure and Name.

FIG.	NAME AND DESCRIPTION	DWG. No.
SIGNS		
W-33	Stop Sign—Letters $9\frac{3}{4}$ " high. Painted white, mounted on steel plate painted black. Number 1 buttons; specify color.	80271X
W-101	Single Track R. R. Crossing Sign—Letters $6\frac{3}{16}$ " high. Painted black, mounted on steel plate painted yellow with cross and border embossed and painted black. Number 2 buttons; specify color.	80131X
W-102	Double Track R. R. Crossing Sign—Letters $6\frac{3}{16}$ " high. Painted black, mounted on steel plate painted yellow with double cross and border embossed and painted black. Number 2 buttons; specify color.	80132X
W-103	Octagon Stop Sign—Stop unit is painted yellow, has black letters 6" high and is mounted on a steel plate painted yellow with border embossed and painted black. Number 2 buttons; specify color.	80273X
UNITS		
W-12-A	Octagon Unit—Painted yellow. Has 49 number 1 buttons; specify color also specify if to be mounted on wood or metal.	80117X
W-103-A	Stop Unit—Painted yellow with black letters 6" high. Has 54 number 2 buttons; specify color also specify if to be mounted on wood or metal.	80184X
W-134-B	Octagon Unit—Painted yellow. Has 25 number 1 buttons; specify color also specify if to be mounted on wood or metal.	80264X
1	Special Reflex Screw Driver.	80274

Plate D-51



W-110-A-UNIT
6½" x 22½" x 1/8" Thick



W-35-SIGN
10" x 23" x 1/8" Plate
Characters 1 1/4" Thick



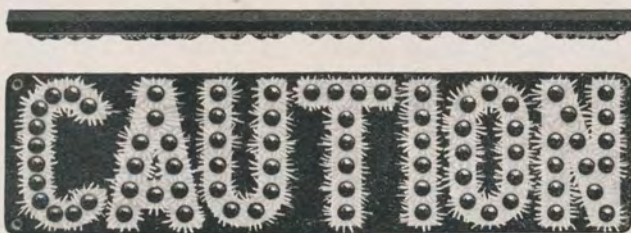
W-19-A-UNIT
6 1/8" Square
1 1/8" Thick



W-17-A-UNIT
5 1/4" Square
1 1/8" Thick



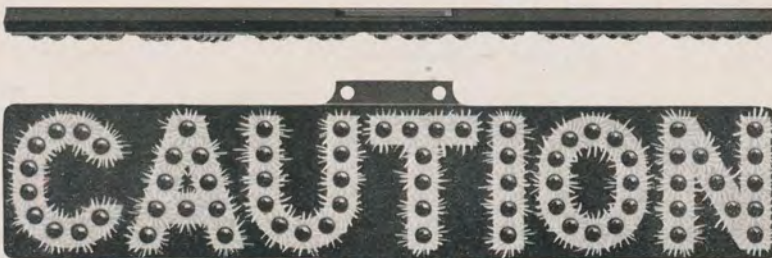
W-127-A
UNIT
5 3/8" x 46"
1/8" Thick



W-111-A-UNIT
6 1/2" x 25" x 1/8" Thick



W-101-A-UNIT
5 3/8" x 6 1/8"
1/8" Thick



W-126-A-UNIT
6 1/4" x 31" x 1/8" Thick
Bolt Centers 2 3/4" x 7". 1/8" Holes.

LOUISVILLE FROG, SWITCH AND SIGNAL COMPANY

Plate D-51

Reflex Signs and Units

Unless otherwise specified signs and units will be furnished in colors as listed below. Other colors will be furnished if specified.

Number 1 button is $\frac{7}{8}$ " in diameter.

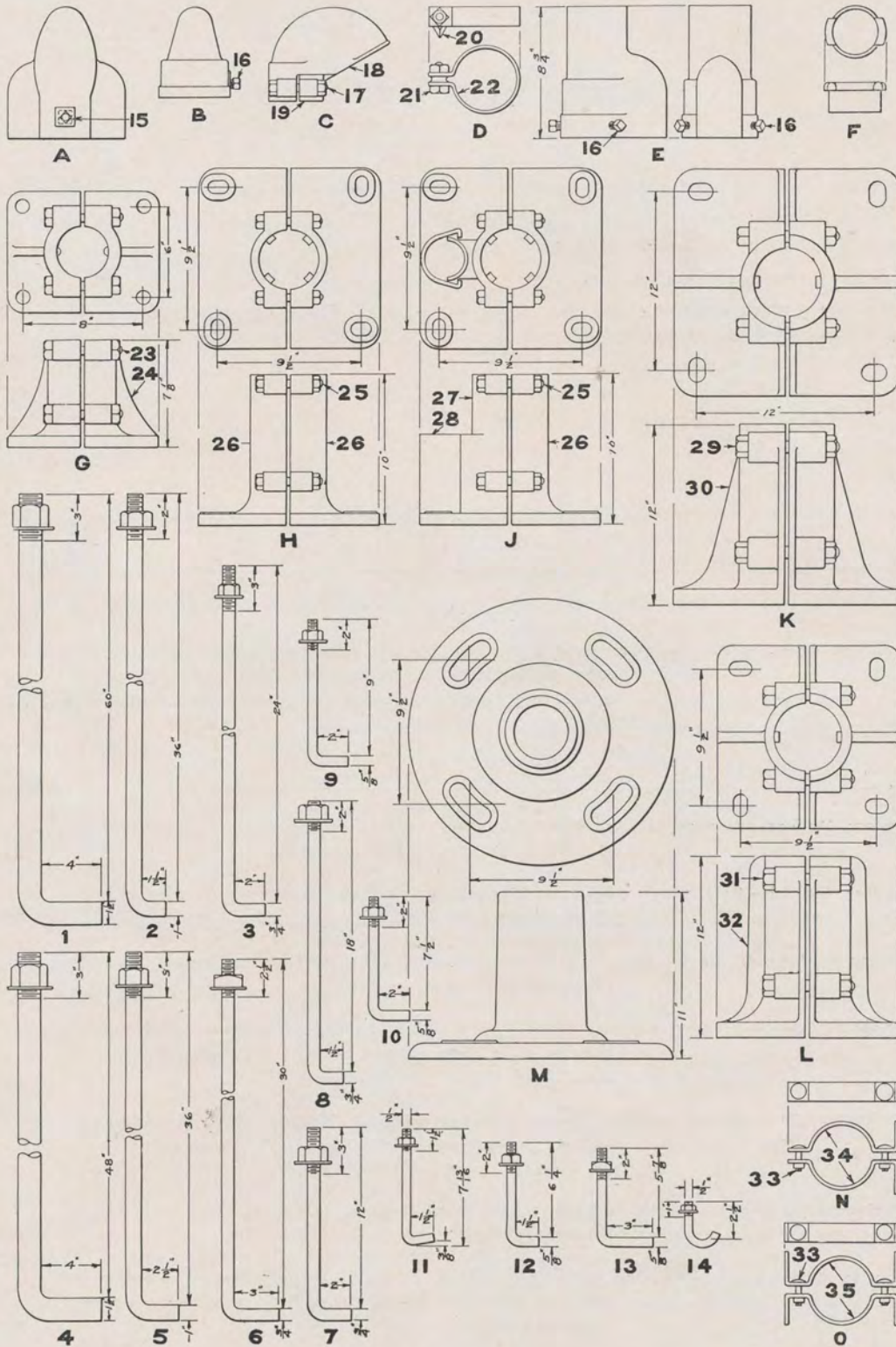
Number 2 button is $\frac{11}{16}$ " in diameter.

Buttons are made in clear or crystal, amber, green or red. The clear reflect the greatest amount of light and for this reason we recommend their use wherever possible to do so. The amber buttons are next in efficiency.

Order by Plate, Figure and Name.

FIG.	NAME AND DESCRIPTION	DWG. No.
SIGN		
W-35	Railroad Crossing Sign—Letters $6\frac{1}{8}$ " high. Letters and X painted white, mounted on steel plate painted black. Letters have number 2 buttons and X has number 1 buttons. Specify color of buttons.	80272X
UNITS		
W-17-A	Square Marker—Painted yellow. Has 16 number 1 buttons; specify color also specify if to be mounted on wood or metal.	80101X
W-19-A	Square Marker—Painted yellow. Has 25 number 2 buttons; specify color also specify if to be mounted on wood or metal.	80175X
W-101-A	Letter R—Painted black. Has 14 number 2 buttons; specify color also specify if to be mounted on wood or metal.	80125-1X
W-110-A	Danger Unit—Painted yellow with black letters 6" high. Has 76 number 2 buttons; specify color also specify if to be mounted on wood or metal.	80139-1X
W-111-A	Horizontal Caution Unit—Painted yellow with black letters 6" high. Has 74 number 2 buttons; specify color also specify if to be mounted on wood or metal.	80267X
W-126-A	Horizontal Caution Unit—Painted yellow with black letters $5\frac{1}{2}$ " high. Has 69 number 2 buttons; specify color.	80220X
W-127-A	Vertical Caution Unit—Painted yellow with black letters $5\frac{1}{2}$ " high. Has 69 number 2 buttons; specify color also specify if to be mounted on wood or metal.	80270X

Plate D-60



LOUISVILLE FROG, SWITCH AND SIGNAL COMPANY

Plate D-60

Parts for Signals

Order by Plate, Figure and Name.

FIG.	NAME AND DESCRIPTION	DWG. No.
A	A. R. A. No. 11814 Pinnacle complete with set screw and nut.	50105X
A-1	Pinnacle complete with set screw and nut for 3" (i. d.) pipe.	50303X
B	Cone Pinnacle with set screw for 3 1/2" (i. d.) pipe.	40447X
B-1	Cone Pinnacle with set screw for 4" (i. d.) pipe.	40447-1X
C	A. R. A. No. 11817 Cable Outlet Complete.	50432X
D	A. R. A. No. 13746 Cable Support Clamp Complete.	50110X
D-1	Cable Support Clamp Complete, for 3" (i. d.) pipe.	50307X
E	Bell Cable Outlet Complete, for 3 1/2" (i. d.) pipe.	40443X
E-1	Bell Cable Outlet Complete, for 4" (i. d.) pipe.	40443-1X
E-2	Bell Cable Outlet Complete, for 5" (i. d.) pipe.	40443-3X
F	3" Bushing, for use with figure A-1.	50306
F-1	A. R. A. No. 11812 Bushing for use with figures A and E.	50106
F-2	4" Bushing, for use with figure E-1.	40451
F-3	5" Bushing, for use with figure E-2.	40451-2
G	Base Complete (6"x8" bolt centers) for 3" i. d. pipe.	50305AX
H	A. R. A. No. 11806 Base Complete (9 1/2"x9 1/2" bolt centers).	50102X
J	A. R. A. No. 11805 Base Complete (9 1/2"x9 1/2" bolt centers).	50101X
K	Base Complete (12"x12" bolt centers) for 4" i. d. pipe.	41033X
L	A. R. A. No. 14492 Base Complete (9 1/2"x9 1/2" bolt centers).	41018X
M	Sleeve (9 1/2"x9 1/2" bolt centers) for 3 1/2" i. d. pipe.	50508
M-1	Sleeve (9 1/2"x9 1/2" bolt centers) for 4" i. d. pipe.	50508-1
M-2	Sleeve (9 1/2"x9 1/2" bolt centers) for 5" i. d. pipe.	50508-2
N	Reflex One Way Clamp Complete for 1 1/2" i. d. pipe.	80136X
N-1	Reflex One Way Complete for 2" i. d. pipe.	80136-1X
N-2	Reflex One Way Clamp Complete for 2 1/2" i. d. pipe.	80136-2X
N-3	Reflex One Way Clamp Complete for 3" i. d. pipe.	80136-3X
N-4	Reflex One Way Clamp Complete for 3 1/2" i. d. pipe.	80136-4X
N-5	Reflex One Way Clamp Complete for 4" i. d. pipe.	80136-5X
N-6	Reflex One Way Clamp Complete for 4 1/2" i. d. pipe.	80136-6X
N-7	Reflex One Way Clamp Complete for 5" i. d. pipe.	80136-7X
O	Reflex Two Way Clamp Complete for 1 1/2" i. d. pipe.	80137X
O-1	Reflex Two Way Clamp Complete for 2" i. d. pipe.	80137-1X
O-2	Reflex Two Way Clamp Complete for 2 1/2" i. d. pipe.	80137-2X
O-3	Reflex Two Way Clamp Complete for 3" i. d. pipe.	80137-3X
O-4	Reflex Two Way Clamp Complete for 3 1/2" i. d. pipe.	80137-4X
O-5	Reflex Two Way Clamp Complete for 4" i. d. pipe.	80137-5X
O-6	Reflex Two Way Clamp Complete for 4 1/2" i. d. pipe.	80137-6X
O-7	Reflex Two Way Clamp Complete for 5" i. d. pipe.	80137-7X

LOUISVILLE FROG, SWITCH AND SIGNAL COMPANY

Plate D-60

Parts for Signals

Order by Plate, Figure and Name.

FIG.	NAME AND DESCRIPTION	DWG. No.
1	A. R. A. No. 11051 Anchor Bolt with hexagon nut and washer, 1½"x60".	30801X
2	A. R. A. No. 11071 Anchor Bolt with hexagon nut and washer, 1"x36".	30802X
3	Anchor Bolt with hexagon nut and washer, ¾"x24".	30803X
3a	Anchor Bolt 1"x24" with hexagon nut and washer.	50115X
4	A. R. A. No. 11081 Anchor Bolt with hexagon nut and washer, 1½"x48".	30804X
5	Anchor Bolt with hexagon nut and washer, 1"x36".	30805X
6	Anchor Bolt with square nut and washer, ¾"x30".	30806X
7	A. R. A. No. 16151 Anchor Bolt with hexagon nut and washer, ¾"x12".	30807X
8	Anchor Bolt with hexagon nut and washer, ¾"x18".	50104-1X
9	Anchor Bolt with hexagon nut and washer, 5/8"x9".	30808X
10	Anchor Bolt with hexagon nut and washer, 5/8"x7½".	30809X
11	Hook Bolt with hexagon nut and washer, ½"x7½".	30810X
12	Anchor Bolt with square nut and washer, 5/8"x6¼".	60217X
13	Anchor Bolt with square nut and washer, 5/8"x5¾".	30811X
14	Hook Bolt with hexagon nut and washer, ½"x2½".	30812X
15	Set screw and square nut for figure A.	010003X
15a	Set screw and square nut for figure A-1.	010004X
16	Set screw for figures B, B-1, E, E-1 and E-2.	010005
17	Hexagon Head Machine Bolt and nut for figure C.	006023X
18	A. R. A. No. 11851 Back Half Cap.	50432
19	A. R. A. No. 11816 Front Clamp.	50433
20	¾" Guy Thimble, for figures D and D-1.	50111
21	Square Head Machine Bolt with square nut for figures D and D-1.	006001X
22	Cable Support Clamp only, for figure D.	50110
22a	Cable Support Clamp only, for figure D-1.	50307
23	Square Head Machine Bolt with square nut for figure G.	006022X
24	Half Base, for figure G.	50302A
25	A. R. A. No. 11804 Hexagon Head Machine Bolt with hexagon nut for figures H and J.	006017X
26	A. R. A. No. 11802 Right Half Base, for figures H and J.	50102
27	A. R. A. No. 11801 Left Half Base, for figure J.	50101
28	A. R. A. No. 11803 Cap, for figure J.	50103
29	Hexagon Head Machine Bolt with hexagon nut for figure K.	006027X
30	Half Base, for figure K.	41033
31	Hexagon Head Machine Bolt with hexagon nut for figure L.	006026X
32	A. R. A. No. 14491 Half Base for figure L.	41018
33	Carriage Bolt for figures N, N-1, N-2, N-3, N-4, N-5, N-6, N-7, O, O-1, O-2, O-3, O-4, O-5, O-6 and O-7.	015003X
34	One Way Clamp for figure N.	80136
34a	One Way Clamp for figure N-1.	80136-1
34b	One Way Clamp for figure N-2.	80136-2
34c	One Way Clamp for figure N-3.	80136-3
34d	One Way Clamp for figure N-4.	80136-4
34e	One Way Clamp for figure N-5.	80136-5
34f	One Way Clamp for figure N-6.	80136-6
34g	One Way Clamp for figure N-7.	80136-7
35	Two Way Clamp for figure O.	80137
35a	Two Way Clamp for figure O-1.	80137-1
35b	Two Way Clamp for figure O-2.	80137-2
35c	Two Way Clamp for figure O-3.	80137-3
35d	Two Way Clamp for figure O-4.	80137-4
35e	Two Way Clamp for figure O-5.	80137-5
35f	Two Way Clamp for figure O-6.	80137-6
35g	Two Way Clamp for figure O-7.	80137-7



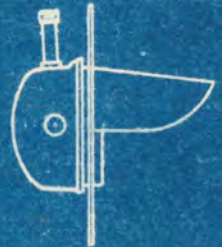
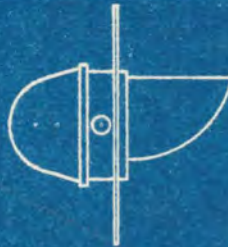
"CROSS CROSSINGS CAUTIOUSLY."

THE BAKER CO., NEW ALBANY, IND.

16292 4M 2 24 30

PEERLESS MANUFACTURING CORPORATION, LOUISVILLE, KENTUCKY.

CONDENSED LIST OF FLASHING LIGHT SIGNAL LAMP REPAIR PARTS



MODELS A AND B
MODEL A DOES NOT
HAVE PEEP HOLE

MODEL C

MODEL D

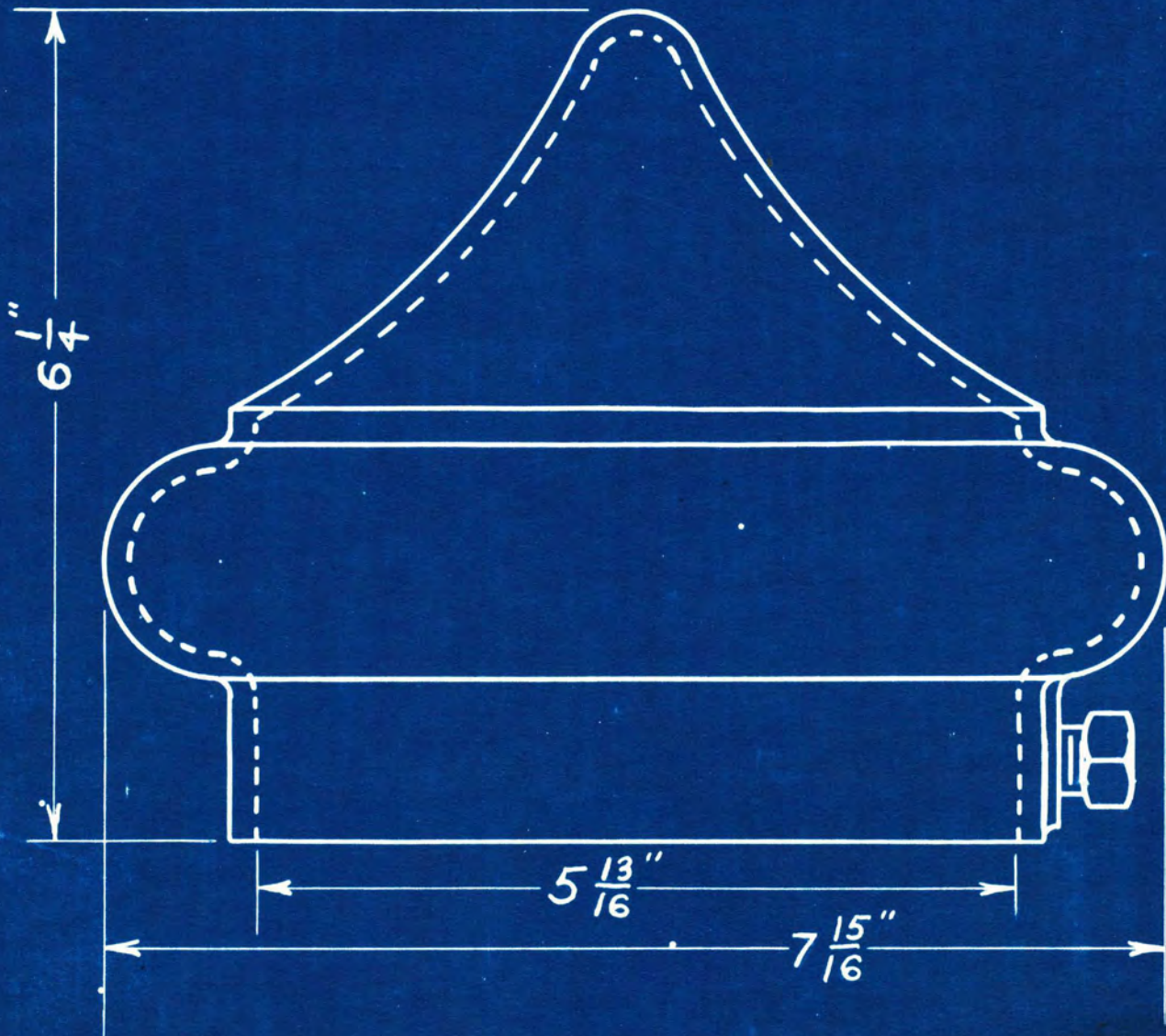
MODEL F

ADJUSTING LEVER	40419X			
ADJUSTING SCREW	40408			
BACKGROUND	40452A	41017	41218A	41408
BEZEL RING	40403A	41003		
LAMP COVER	40402	41002	41202	41402
HOOD	40404A	41004	41204	41407
LAMP HOUSING	40401A	41001	41201X	41401X
LOCK SCREW	10207	41006	41203A	41203A
REFLECTORS FOR BAYONET SOCKET	40408-1	41011	SPREADING 41210	41411
			PLAIN 41210-2	
			GROUND & POLISHED 41210-4	
REFLECTOR FOR EDI- SON SCREW SOCKET	40408-2	41011	PLAIN 41210-1	41411
REFLECTOR CLAMP FOR BAYONET SOCKET	40431X	41013X	41212X	41410
REFLECTOR CLAMP FOR EDISON SCREW SOCKET	40431X	41013X	41212-1X	41410
REFLECTOR CRADLE FOR BAYONET SOCKET	40430	41009		41409
REFLECTOR CRADLE FOR EDISON SCREW SOCKET	40430-1	41009-1		41409
REFLECTOR GASKET	40444	41012		
REFLECTOR SPRING			41208	
ROUNDEL 8 ³ / ₈ " 30° RED	40405	40405	40405	40405
ROUNDEL GASKET	40406	40406	41205	41405
SIDE LIGHT GASKET	40448	40448		41406
SIDE LIGHT GLASS	40442	40442	40442	41416
SIDE LIGHT HOOD	40441A	40441A		41403-1
SOCKET, SINGLE CONTACT BAYONET	40424X	41015X	41209Y	41418Y
SOCKET, EDISON MEDIUM SCREW	40424-1X	41015-1X	41241X	41418-1Y
BAYONET SOCKET ARM				41404
EDISON SCREW SOCKET ARM				41404-1
ROUNDEL CLAMP			41207X	41423

PEERLESS MANUFACTURING CORPORATION LOUISVILLE, KENTUCKY.

5 INCH CAST IRON PINNACLE
FOR HIGHWAY CROSSING SIGNALS ETC.

PAINTED BLACK.



DRAWING No. 41256X

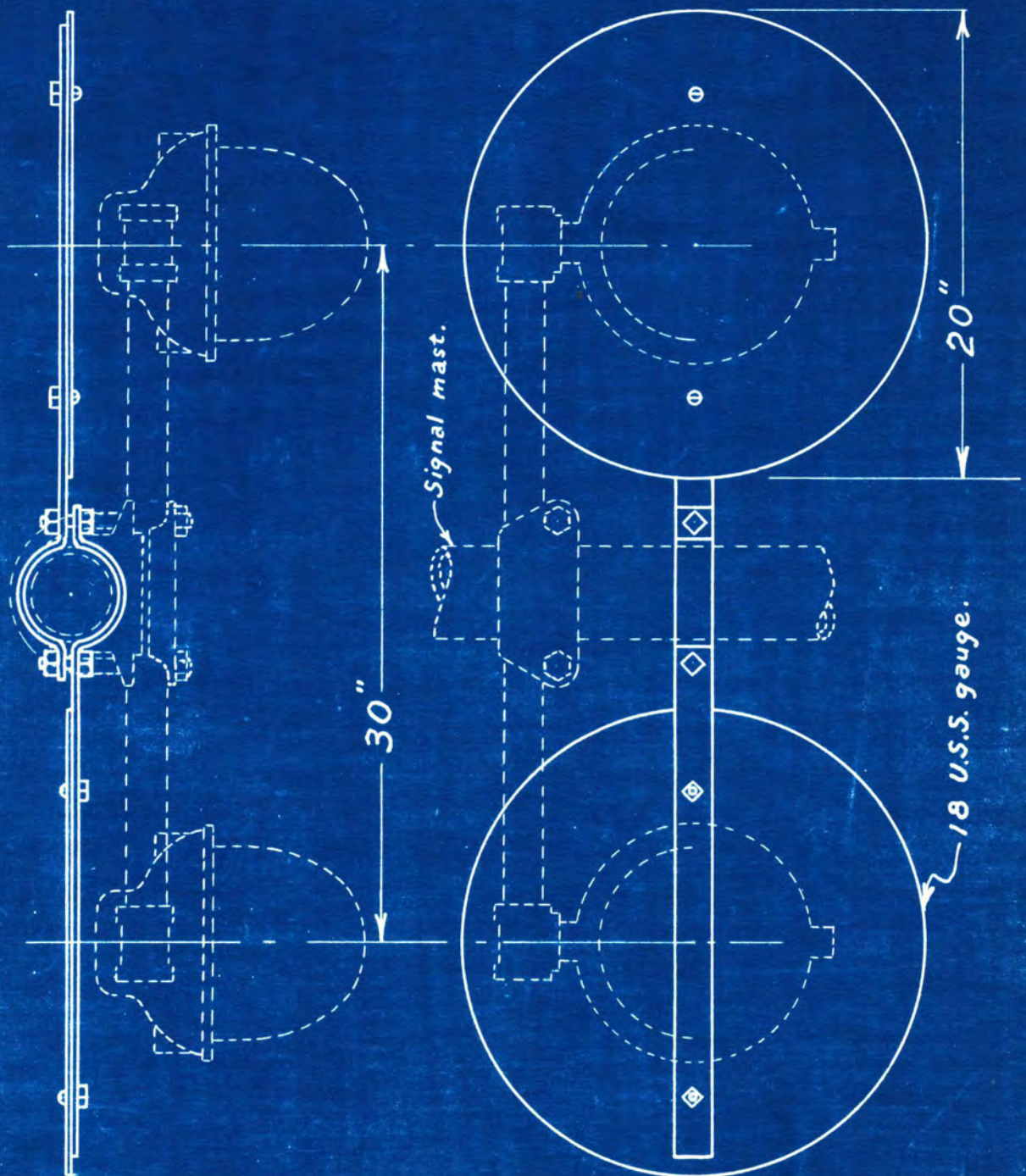
SEPT. 14, 1931.

BP 10-1

PEERLESS MANUFACTURING CORPORATION, LOUISVILLE, KY.

UNIVERSAL
20 INCH BACKGROUND
FOR FLASHING LIGHT SIGNALS

For one pair of lamps, as shown, or for two pairs mounted
back to back.



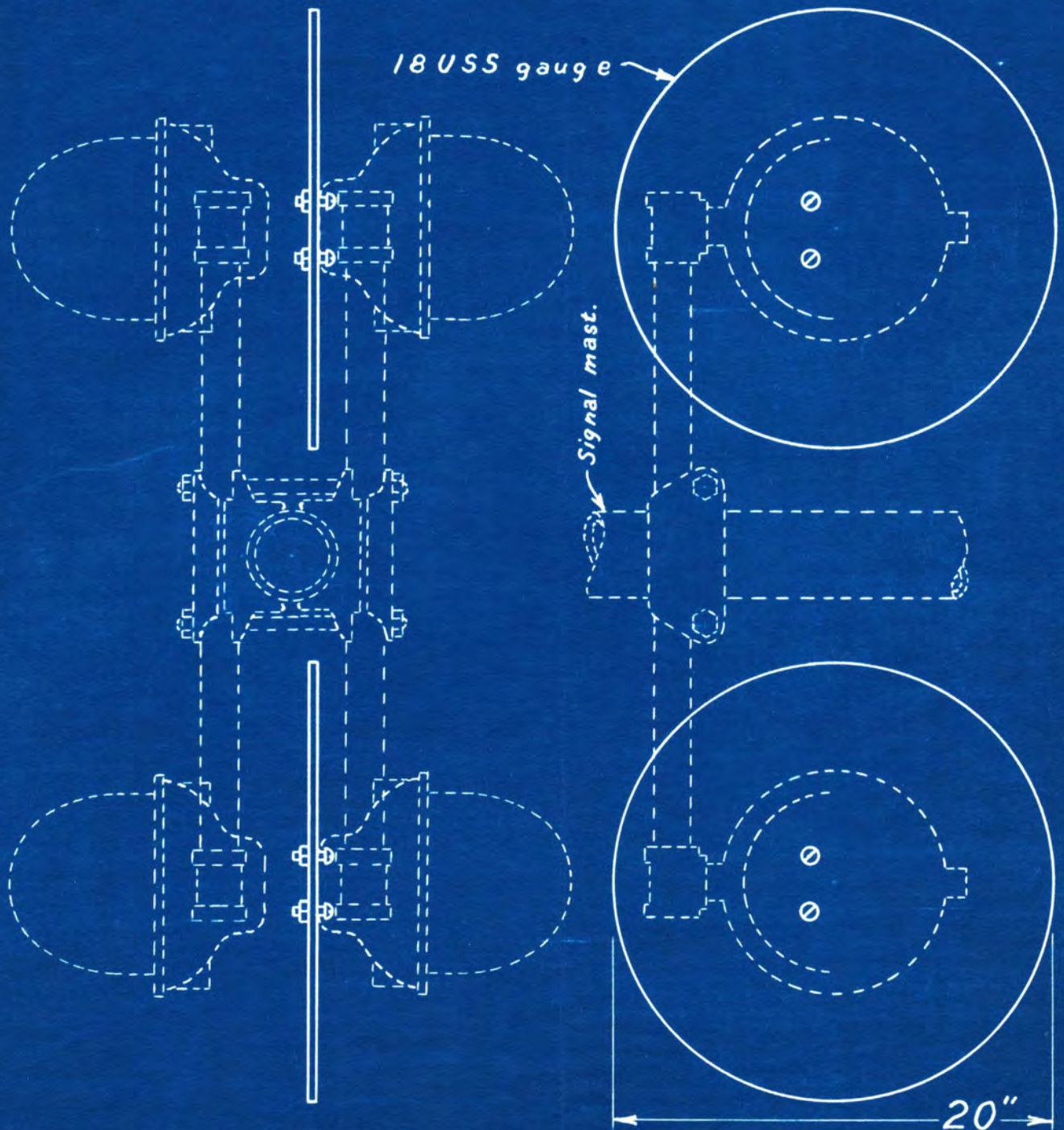
Dwg. No. 41218X for 3" pipe mast
Dwg. No. 41218-1X for 3½" pipe mast
Dwg. No. 41218-2X for 4" pipe mast

Dwg. No. 41218-3X for 4½" pipe mast
Dwg. No. 41218-4X for 5" pipe mast
Dwg. No. 41218-5X for 6" pipe mast

PEERLESS MANUFACTURING CORP., LOUISVILLE, KY., U.S.A.

20 INCH BACKGROUND FOR MODEL D FLASHING LIGHT SIGNAL

For two pairs of lamps mounted back to back, as shown, or
for one pair only.

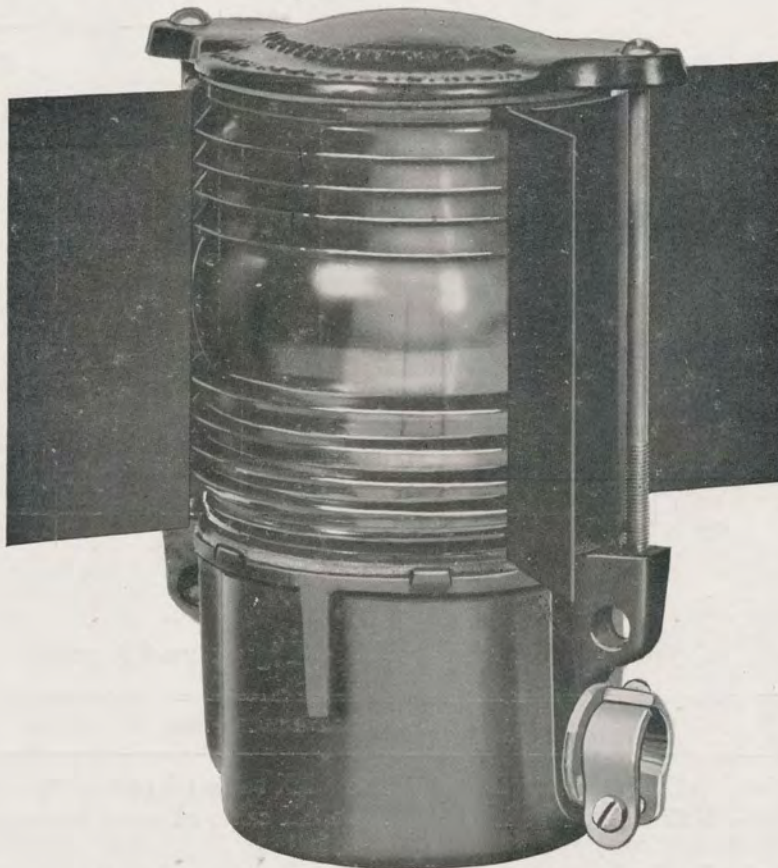


Made of sheet steel painted black. Screws and nuts brass.

Dwg. No. 41218AX. (One disc only order two for a pair.)

L.R.Z. BP 10-3 AUG. 18, 1933.

MODEL "E" LAMP



An electric lamp for use on railroad crossing gates, for a pilot lamp on highway crossing signals and for any other purpose where a light and durable lamp is required. It weighs two and one quarter pounds, complete. This lamp projects a beam of light in both directions, along the highway and it is amply shielded to prevent an indication to the enginemen. The shields are adjustable.

LOUISVILLE FROG, SWITCH & SIGNAL COMPANY

INCORPORATED

SUCCESSOR TO

Louisville Frog & Switch Co.

Southern Signal Corporation

MANUFACTURERS OF

Track and Signal Equipment

LOUISVILLE, KENTUCKY, U. S. A.



June 1, 1932



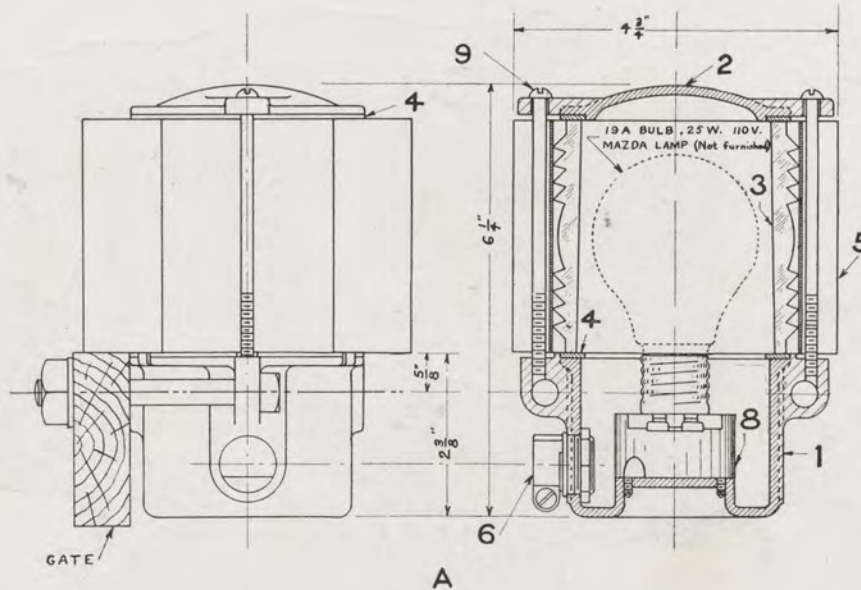
Bulletin No. 17

LOUISVILLE FROG, SWITCH AND SIGNAL COMPANY

Plate D-29

All castings in this lamp are of aluminum, the shields are of galvanized iron and all screws are of brass. The metal parts are coated with a good dull black paint.

The lamp is regularly supplied with a red Fresnel type marine lens (can furnish amber or crystal) but unless otherwise specified a red lens will be furnished. It is equipped with an Edison medium screw socket, with two binding screws on each terminal.



Order by Plate, Figure and Name

FIG.	NAME AND DESCRIPTION	DWG. No.
A	Model E Crossing Gate Lamp, with one BX cable adapter (as shown)	41265X
A-1	Model E Crossing Gate Lamp with two BX cable adapters, one on each side (not shown)	41265-1X
A-2	Model E Pilot Lamp; same as figure A, except that a 1/2"x4" pipe nipple with lock nuts, is supplied instead of the BX cable adapter.	41265-4X

PARTS

1	Base	41265
2	Cover	41266
3	Fresnel type marine lens (specify color)	41267
4	Gasket (for top or bottom)	41268
5	Shield (for either side)	41269
6	BX cable adapter, with nut	41270X
7	1/2"x4" pipe nipple, with two lock nuts (not shown)	016016X
8	Socket, with two mounting screws	41271X
9	Machine Screw	004042

MODEL C
D. C. RELAYS

Model C-I Flasher

Model C-2 Flashing Time Element

Model C-3 Flashing Time Relay

Model C-5 Neutral Relay

Model C-6 Interlocking Relay

Patents Applied for

LOUISVILLE FROG, SWITCH & SIGNAL CO.

SUCCESSOR
TO

SOUTHERN SIGNAL CORPORATION

Incorporated

LOUISVILLE, KENTUCKY, U. S. A.

District Office Managers

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136 Liberty St.
New York, N. Y.

T. F. CARLIN,
631 Pennsylvania Ave., N. W.,
Washington, D. C.

L. M. HARTZELL,
Union Trust Bldg.,
Cincinnati, Ohio

P. M. ETTERS,
214 Harrison Bldg.,
Philadelphia, Penn.



E. A. MANN,
1603 Manadnock Bldg.,
Chicago, Ill.

C. H. QUINN,
681 Market Street,
San Francisco, Cal.

C. W. STEVENS,
Mutual Bldg.,
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J. R. HAYWARD,
312 Liberty National Bank Bldg.,
Roanoke, Va.



L. R. PAYTON,
1944 Railway Exchange Bldg.
St. Louis, Mo.

July 1, 1928

Bulletin No. 5-A

THE line of Model "C" Direct Current Relays, which you will find described in this bulletin have been developed by experienced railroad signal engineers in connection with signal men who have had actual experience in operation and maintenance of relays.

Every part has been designed for reliability and service and the material used throughout is the very best that can be obtained for relays of this nature.

We can furnish to the railroads who have their own repair shops, parts for repairing any relays that may become damaged or, we are in a position to give quick service and reship any relays that have been sent to us for repairs.

Our motto is Quality and Service which we attempt at all times to give our customers.

SOUTHERN SIGNAL CORPORATION



IN developing the line of Model "C", D. C. Relays we have spared no effort to make them the best instruments of their kind. All the important elements were carefully considered as were also the minor details, which are not always seen at first but which nevertheless mean so much to the successful operation and resultant good service of any device. We call attention to the means provided for preserving the shipping screws for future re-shipment; the convenience of adjusting the time interval, and the number of flashes. All these adjustments can be made without breaking the seals of the instrument. The absence of any internal wiring, permits the instruments to be used with any circuit requiring apparatus of this character.

Model C-1 Flasher

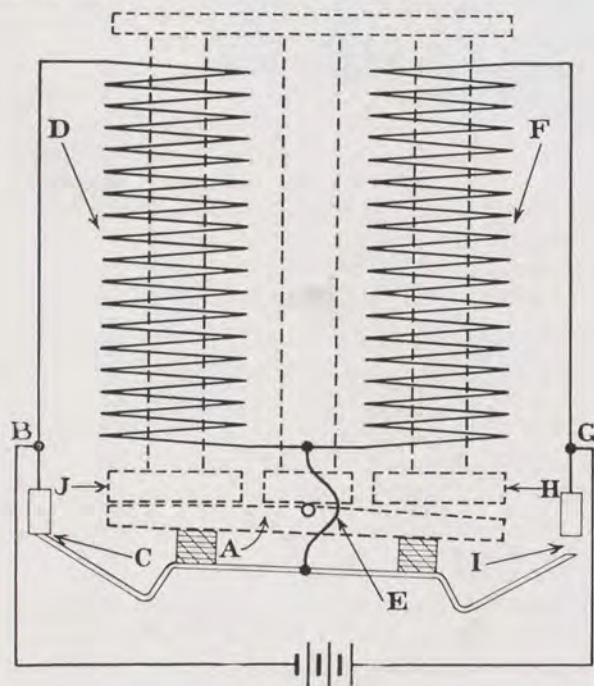
THE Model C-1 Flasher is a simple and rugged unit capable of flashing from twenty-five to sixty flashes per minute and is adjustable over a range of approximately fifteen flashes from the outside, without breaking the seals and getting inside the instrument. Unless otherwise specified it is furnished adjusted to flash from thirty to forty-five flashes per minute.

The speed of the Model C-1 Flasher is not appreciably affected by variable voltage. If operated at a speed of forty flashes per minute on ten volts, the speed will increase to forty-three when the voltage is increased fifty per cent.

It is one of the smallest low voltage, D. C. flashers made and there are not many relay cases so crowded that room cannot be made for it. If room cannot be found on the shelf, it can be provided with hangers to fasten it to the side of the case. Its dimensions are $4\frac{7}{8}$ " deep by $7\frac{3}{8}$ " wide by $8\frac{7}{8}$ " high.

It has three sets of contact springs, two of which are silver to carbon and are used to operate the lights in the signals. The other, which is the center contact, is silver to silver and is used to operate the flasher. It may be operated over a line wire, having as high as fifty ohms resistance, without affecting the operation. The armature is so designed and counterbalanced that it is impossible to get it on center and fail to start.

Referring now to Sketch 5 the operation is as follows: With the armature, A, in the position shown, positive battery enters at B, and flows through contact C, (which is closed and which shunts magnet coil D) flexible connector E, and magnet coil F, to negative battery at G, attracting armature A, to pole piece H, opening contact C, and closing contact I. Positive battery now flows through magnet coil D, flexible connector E, contact I, (which shunts magnet coil F) to negative battery, attracting armature A, to pole piece J, thus completing one cycle of operation.



SKETCH 5

The arc at the contacts is very small because the magnets are shunted, instead of breaking the electrical circuit, thus the contacts have a long life and contact resistance is kept to a minimum. The same circuit may be used for flashing the lights and the life of the contacts thereby greatly increased. The circuits shown elsewhere in this bulletin show the lights wired in this manner. The current consumption of the flasher varies during its operation. At one period, when a contact is shunting one magnet coil, the resistance of the flasher is that of one coil while at another period, when the armature is moving from one side to the other, both contacts are open, its resistance is that of both coils in series. Therefore at the latter period the current flow is half that of the former. The values in accompanying table are for the period when both flasher contacts are open.

The Model C-1 Flasher is inclosed in a dust-proof case, with clear, double strength glass sides and does not collapse when the instrument is opened. The whole assembly

SOUTHERN SIGNAL CORPORATION

is so arranged that no part on the inside can be moved or re-arranged without breaking both seals or the glass sides. All of the terminal posts are non-turning, non-adjustable and non-removable from the outside. Yet when the instrument is opened they can be removed and re-arranged very easily, from the inside, if necessary. Every nut and screw on the inside is securely locked with lock washers. The seals are on two diagonally opposite corners of the top, thus it is not necessary to turn the flasher over to inspect the condition of the seals.

In designing and building the Model C-1 Flasher the A. R. A. specifications for relays have been followed wherever possible. The coils can be changed from the outside without affecting the internal adjustment and the number of flashes per minute can be changed from the outside.

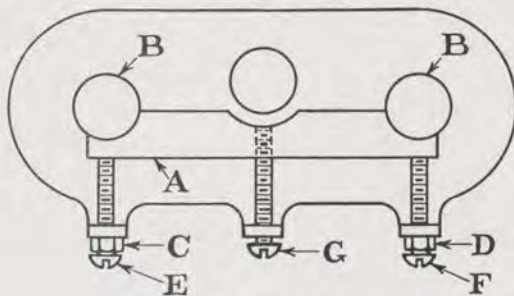
The top of the flasher is of heavy porcelain, properly proportioned to give it strength and coated with a black, baked, moisture proof enamel. Only the best materials are used in its construction and all parts are of uniform finish, accurate and interchangeable. Most of the parts are also used on our D. C. relays. All of the brass parts are nickel plated and all iron parts are plated with a heavy coat of cadmium, which makes them practically rust proof. The dull black top with the plated parts presents a very neat appearance. All magnets and contacts have their own terminal posts and no internal wiring is employed so that the flasher may be used in any circuit.

Volts	Ohms	Amperes	Watts
6	200	.030	.180
8	330	.024	.192
10	500	.020	.200
12	670	.018	.216

Each instrument is thoroughly tested, calibrated, inspected and sealed, after which it is carefully and securely packed to insure being received in good condition.

The installation of a Model C-1 Flasher is about like that of an ordinary relay and therefore very few instructions are necessary to the signalman. After the instrument has been carefully unpacked, dusted and the shipping screw removed and preserved for future re-shipment, as outlined on page 10 of this bulletin, thoroughly inspect to make certain that it has not been broken or otherwise injured in shipping.

After the flasher is connected to the circuit it should be adjusted for the desired frequency of flashes. They are always set to the minimum frequency when they leave the factory. The minimum and maximum number of flashes per minute will be found marked on the small label on the base, inside the instrument. Knowing the range and also that the instrument is set for the minimum number of flashes, it is a very easy matter to adjust it. All that is necessary, is to move the adjusting armature A, (under the magnet coils as shown

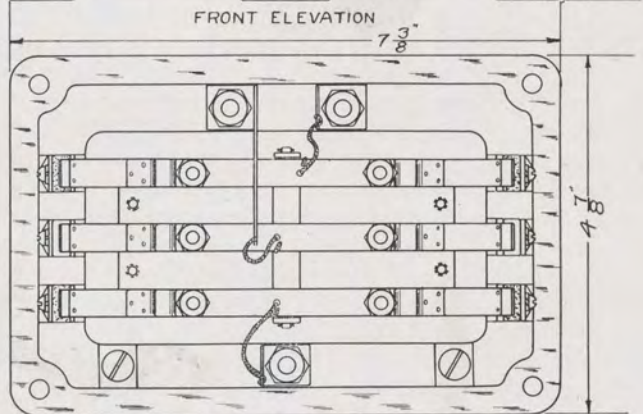
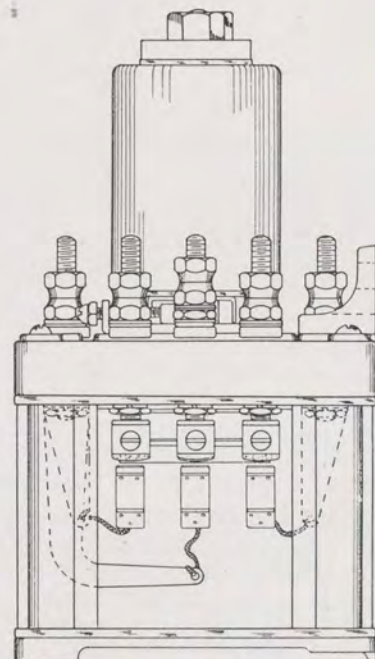
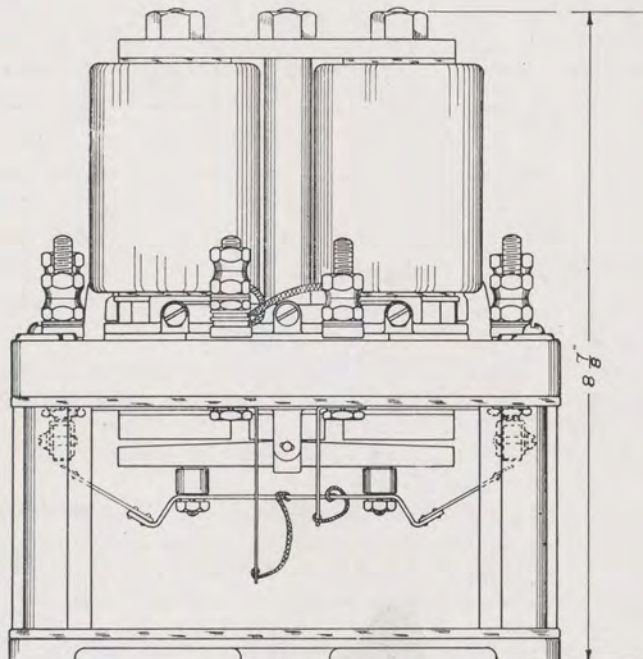
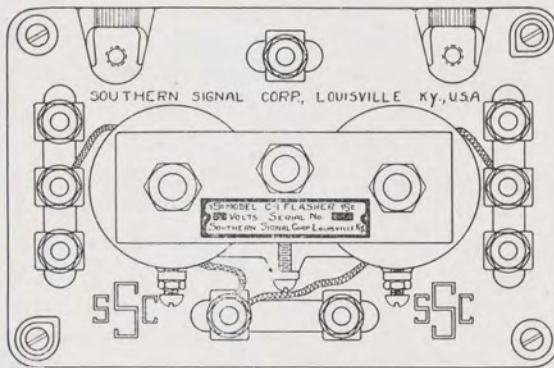


SKETCH 6

in Sketch 6) from the cores, B. As the distance between the cores and armature is increased the flasher increases in speed. To move the adjusting armature A, loosen nuts C and D and turn screws E and F, back a few turns, then turn screw G, forward until armature A, is drawn against the ends of screws E and F again and tighten nuts C and D. Next, time the flasher with a watch and if it is too slow repeat the above operation and if too fast the armature will have to be moved back a bit. To move it back, reverse the above method of adjustment, that is, turn the screw G, back, loosen nuts, C and D, turn screws E and F forward until they stop against the armature and tighten nuts C and D. The flasher must now be timed again to ascertain whether or not it is flashing at the desired speed. As there are two clicks to each cycle the number of flashes per minute can be counted in one-half minute by counting both clicks.

SOUTHERN SIGNAL CORPORATION

Plate E-1



A

SOUTHERN SIGNAL CORPORATION

Plate E-1

Model C-1 Flashers

When ordering, always specify voltage. If not specified, on order, 10 volt flashers will be shipped.

Flashers with coils wound for the following D. C. voltages are standard and are carried in stock. Others are special and are made to order only:

6, 8, 10 and 12 volts.

Figures A to A-2 inclusive, do not have hangers on the top plates for wall mounting.

Figures A-3 to A-5 inclusive, have hangers for wall mounting and can be used either as shelf or wall type instruments. The drawings on the opposite plate show the hangers.

Flashers can be furnished with ventilators in bases, but unless specified on order they will be shipped without ventilators.

Order by Plate, Figure and Name

For parts of Flashers see Plates E-90, E-91, and E-92.

FIG.	NAME AND DESCRIPTION	DWG. No.
A	Model C-1 Flasher, shelf type. Adjustable from 25 to 35 flashes per minute. Has one set of silver to silver and two sets of silver to carbon contacts. Specify operating voltage.	40500
A-1	Model C-1 Flasher, shelf type. As figure A, except adjustable from 30 to 45 flashes per minute. Specify operating voltage.	40500-1
A-2	Model C-1 Flasher, shelf type. As figure A, except adjustable from 45 to 60 flashes per minute. Specify operating voltage.	40500-2
A-3	Model C-1 Flasher, wall or shelf type. Adjustable from 25 to 35 flashes per minute. Has one set of silver to silver and two sets of silver to carbon contacts. Specify operating voltage.	40500-3
A-4	Model C-1 Flasher, wall or shelf type. As figure A-3, except adjustable from 30 to 45 flashes per minute. Specify operating voltage.	40500-4
A-5	Model C-1 Flasher, wall or shelf type. As figure A-3, except adjustable from 45 to 60 flashes per minute. Specify operating voltage.	40500-5

SOUTHERN SIGNAL CORPORATION

Model C-2 Flashing Time Element

FOR a long time there has been a demand for a reliable time element, in the signal field, especially for use with automatic highway crossing signals.

Many were developed and tried but each, though better than its predecessor, had some serious fault. For this reason, time elements have not been used as frequently as they should have been, although the need for them to-day is greater than it has ever been.

With this thought in mind, we developed a time element, which we believe is the best and most reliable made. The Model C-2 is the final result.

More than four years were spent in laboratory and field tests before a single instrument was placed on the market. After this period of experimental work the first instrument was made and placed in service in a local railroad terminal, where traffic is heavy and much switching done, to see how long it would last. To date (June, 1928) it has given almost four years of service, without a single failure and is still operating perfectly, and from all appearances it is as good as new.

Since this Time Element has been offered to the railroads, hundreds have been put in service, all over the country. All are giving the most satisfactory service, and are now generally accepted as the best time element available.

The principal reason for this remarkable performance is that the Model C-2 was built for railroad service. It is not a delicate mechanism that will be thrown out of adjustment and become inoperative by the slightest shock, but a train of strong gears made with watch-like precision.

The driving unit of the Model C-2 Flashing Time Element consists of the Model C-1 Flasher mechanism mounted on the same base with the time element. The flasher was selected for this purpose because of its uniform speed and where flashing light signals are used it also operates the lights.

In renewing primary battery the gas voltage has but little effect on the speed of the flasher and therefore the time element is not appreciably affected as it is operated by the flasher. With the flasher operating at forty flashes per minute on ten volts, it was found, on changing battery, that with a gain of five volts the flasher would speed up to forty-three flashes per minute and that this would cut a two minute time interval about eight seconds.

The Time Element is a very important auxiliary to a highway crossing signal, to stop the signal after a pre-determined time has elapsed in places such as yards where switching is done. Knowing that the signal will not be allowed to operate unnecessarily, will cause traffic to regard it more seriously. The time element, in the Model C-2, stops the signal after a set time has elapsed if for any reason it has not been stopped previously by some other means.

Another desirable feature of the Model C-2 Flashing Time Element is its wide range of adjustment, which like the flasher is adjustable from the outside without breaking the seals of the instrument. The time interval may be varied from a few seconds to approximately seven and one-half minutes.

The mechanism, which is driven by the flasher armature, is so designed that regardless of the amount of voltage applied or how hard an impulse it receives, only one tooth of the ratchet can be taken for a stroke of the armature. A pair of magnet coils, (like those used on an ordinary neutral relay) called the clutch magnet, when energized, picks up an armature having a bar which engages the time element and holds it during the time interval. When the moving arm, driven by the gears, has traveled the pre-determined time, a contact is closed, de-energizing the clutch magnet, which releases the armature and bar, allowing the time element mechanism to be restored to its normal position, by gravity, ready for another operation. A second or two before the moving arm closes this contact it also opens another contact which is useful in some circuit arrangements.

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The distance that the arm travels is governed by a telescoping screw. As the time element is driven by the flasher, its time is dependent upon the flasher speed but the scale is graduated in flashes, so that when the flasher speed is known, the time may be easily calculated. For example if the flasher is operating at forty flashes per minute and it is desired to operate the time contact in two minutes, set the indicator (on the moving arm) at eighty, or if the speed is thirty flashes per minute and a three minute period is desired set the indicator at ninety. The table on page 11, shows the indicator settings for the various time intervals and flasher speeds.

The time element is equipped with one normally open and one normally closed non-independent contact. Which is furnished in either silver to silver or silver to carbon. Contacts can be made or broken at any given time up to seven and one-half minutes after starting the instrument and by the use of suitable relays can control any apparatus or machine where a time interval is desired.

Like the Model C-1 Flasher, the current consumption of the Model C-2 Flashing Time Element varies during its operation, because of the flasher, which is part of it. Considering the period when a contact shunts one flasher coil as period number one, and the period when both contacts are open as period number two, the operating values for the Model C-2 are as follows:

Volts	Ohms		Amperes	
	Flasher	Clutch Magnet	Period No. 1	Period No. 2
6	200	250	.084	.054
8	330	250	.080	.056
10	500	500	.060	.040
12	670	500	.056	.038

The Model C-2 Flashing Time Element is inclosed in a non-collapsing, dust-proof, clear, sectional glass, shield of the same design as the Model C-1 Flasher. None of the parts inside the instrument can be removed or rearranged without breaking the glass or seals. The magnet coils are removable from the outside without disturbing the mechanism inside. The speed of the flasher and time interval of the time element is adjusted from the outside. All terminal and contact posts are non-turning, non-adjustable and can be removed from the inside only. All nuts and screws on the inside are securely locked with lock washers. The seals are on top, where they can be easily inspected.

The A. R. A. specifications, for relays, have been followed wherever possible in this instrument.

The top plate is of heavy porcelain, coated with a black, baked moisture-proof enamel. The materials used in the construction of the Model C-2 Flashing Time Element, like those of the Model C-1 Flasher and all of our relays, are of the best. All parts are interchangeable, uniform and accurate. All of the brass parts are nickel plated and all iron parts are plated with a heavy coat of cadmium, which makes them practically rust-proof. Internal wiring is avoided by providing a terminal post for each magnet and contact.

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No springs, which so frequently cause failures, are found in its construction as all moving parts of the time element are restored by gravity.

Each instrument is thoroughly tested, calibrated, inspected and sealed, after which it is carefully and securely packed to insure being received in good condition.

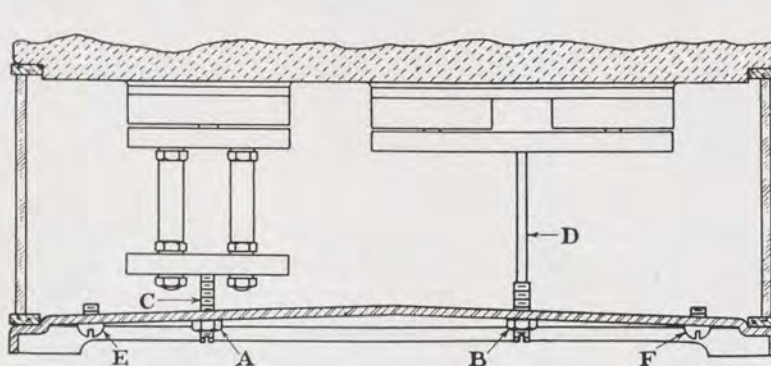
When an instrument is received, unpack it carefully, dust and thoroughly inspect it, to see that it has not been broken or otherwise injured in shipping and remove the shipping screws. The bases of the Model C-2 Flashing Time Element, the flasher and all of our relays are so arranged that the shipping screws may be preserved for future re-shipping. To remove the shipping screws, loosen the nuts A and B, (sketch 7) with a small wrench or a pair of pliers, then remove the screws E and F, place them in the holes left by the shipping screws C and D and place the shipping screws in the plug screw holes and tighten nuts A and B. The Model C-1 Flasher and Model C-5 Neutral Relay have only one shipping screw and one plug screw.

It is necessary to adjust the flasher unit of the Model C-2 before the time element, as the time is dependent upon the speed of the flasher. The flasher unit is adjusted in exactly the same manner as our Model C-1 Flasher, instructions for which are given on page 5 of this bulletin. Having set the flasher unit for the desired frequency, the time element may be adjusted.

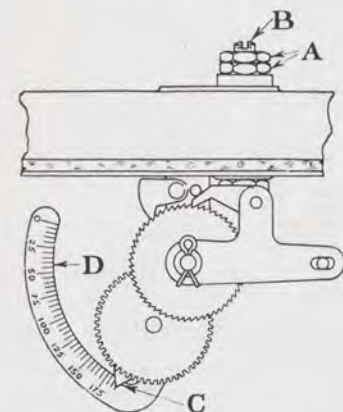
To adjust the time element for the desired time interval loosen nuts A (sketch 8) and turn screw, B to the right to increase the time interval and to the left to decrease it. The time element is always set for the maximum time at the factory as shown in the sketch, therefore on new instruments never try to increase the time interval.

To set, refer to the table on the opposite page, find the desired time interval in the column under the proper number of flashes per minute (the number of F. P. M. to which the flasher has been set) and to the extreme left will be found the scale reading. Now turn screw B, (sketch 8) until indicator C, points to the reading, (on the scale D) found in the table and lock by holding screw B, with a screwdriver, while the nuts A, are tightened with a small open end wrench.

For example if the flasher has been set to 35 F. P. M. and a two minute time interval is desired, we find in the table, for the 35 F. P. M. column that 70 is the scale value to the left of the two minute time interval and the indicator C, must be set to point to 70 on the scale D.



SKETCH 7



SKETCH 8

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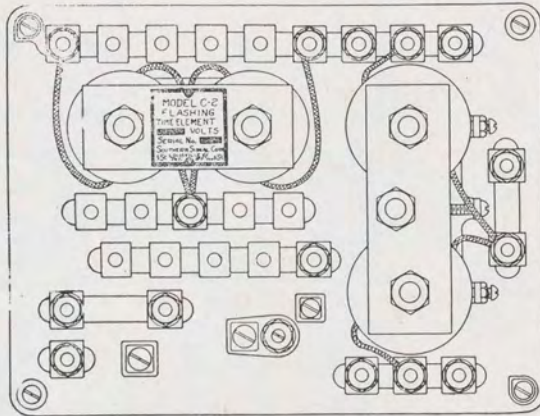
TABLE SHOWING TIME IN MINUTES AND SECONDS FOR SCALE SETTINGS AT VARIOUS FLASHER SPEEDS

Scale	25 F. P. M.		30 F. P. M.		35 F. P. M.		40 F. P. M.		45 F. P. M.		50 F. P. M.		55 F. P. M.		60 F. P. M.	
	Min.	Sec.	Min.	Sec.	Min.	Sec.	Min.	Sec.	Min.	Sec.	Min.	Sec.	Min.	Sec.	Min.	Sec.
5		12		10		9-		7.5		7-		6		5+		5
10		24		20		17+		15		13+		12		11-		10
15		36		30		26-		22.5		20		18		16+		15
20		48		40		34+		30		27-		24		22-		20
25	1			50		43-		37.5		33+		30		27+		25
30	1	12	1			51+		45		40		36		33-		30
35	1	24	1	10	1			52.5		47-		42		38+		35
40	1	36	1	20	1	9-	1			53+		48		44-		40
45	1	48	1	30	1	17+	1	7.5	1			54		49+		45
50	2		1	40	1	26-	1	15	1	7-	1			55-		50
55	2	12	1	50	1	34+	1	22.5	1	13+	1	6	1			55
60	2	24	2		1	43-	1	30	1	20	1	12	1	5+	1	
65	2	36	2	10	1	51+	1	37.5	1	27-	1	18	1	11-	1	5
70	2	48	2	20	2		2	45	1	33+	1	24	1	16+	1	10
75	3		2	30	2	9-	1	52.5	1	40	1	30	1	22-	1	15
80	3	12	2	40	2	17+	2		1	47-	1	36	1	27+	1	20
85	3	24	2	50	2	26-	2	7.5	1	53+	1	42	1	33-	1	25
90	3	36	3		2	34+	2	15	2		1	48	1	38+	1	30
95	3	48	3	10	2	43-	2	22.5	2	7-	1	54	1	44-	1	35
100	4		3	20	2	51+	2	30	2	13+	2		1	49+	1	40
105	4	12	3	30	3		2	37.5	2	20	2	6	1	55-	1	45
110	4	24	3	40	3	9-	2	45	2	27-	2	12	2		1	50
115	4	36	3	50	3	17+	2	52.5	2	33+	2	18	2	5+	1	55
120	4	48	4		3	26-	3		2	40	2	24	2	11-	2	
125	5		4	10	3	34+	3	7.5	2	47-	2	30	2	16+	2	5
130	5	12	4	20	3	43-	3	15	2	53+	2	36	2	22-	2	10
135	5	24	4	30	3	51+	3	22.5	3		2	42	2	27+	2	15
140	5	36	4	40	4		3	30	3	7-	2	48	2	33-	2	20
145	5	48	4	50	4	9-	3	37.5	3	13+	2	54	2	38+	2	25
150	6		5		4	17+	3	45	3	20	3		2	44-	2	30
155	6	12	5	10	4	26-	3	52.5	3	27-	3	6	2	49+	2	35
160	6	24	5	20	4	34+	4		3	33+	3	12	2	55-	2	40
165	6	36	5	30	4	43-	4	7.5	3	40	3	18	3		2	45
170	6	48	5	40	4	51+	4	15	3	47-	3	24	3	5+	2	50
175	7		5	50	5		4	22.5	3	53+	3	30	3	11-	2	55
180	7	12	6		5	9-	4	30	4		3	36	3	16+	3	
185	7	24	6	10	5	17+	4	37.5	4	7-	3	42	3	22-	3	5
190	7	36	6	20	5	26-	4	45	4	13+	3	48	3	27+	3	10

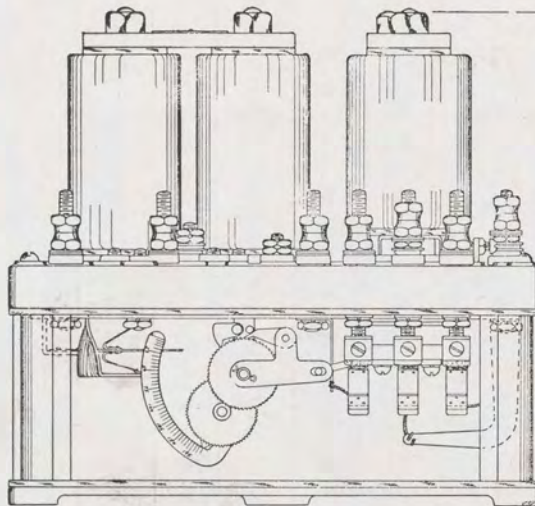
THE ABOVE ARE THEORETICAL AND MAY VARY IN PRACTICE

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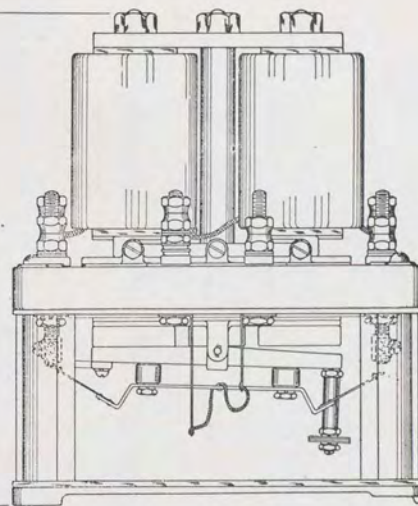
Plate E-10



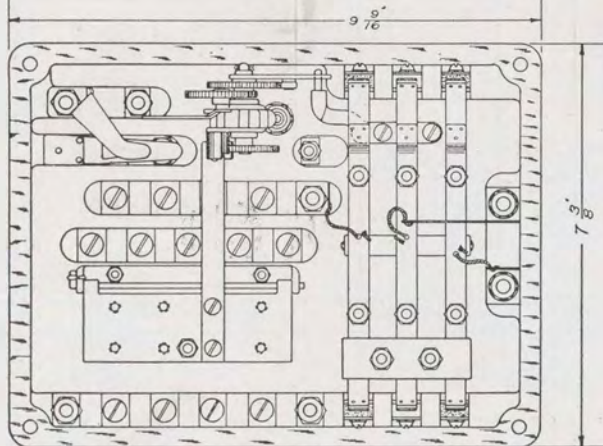
PLAN



FRONT ELEVATION



SIDE ELEVATION



INVERTED PLAN (SHIELD REMOVED)

A

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Plate E-10

Model C-2 Flashing Time Elements

When ordering, always specify voltage. If not specified on order, 10 volt instruments will be shipped.

Flashing Time Elements with coils wound for the following D. C. voltages are standard and are carried in stock. Others are special and are made to order only:

6, 8, 10 and 12 volts.

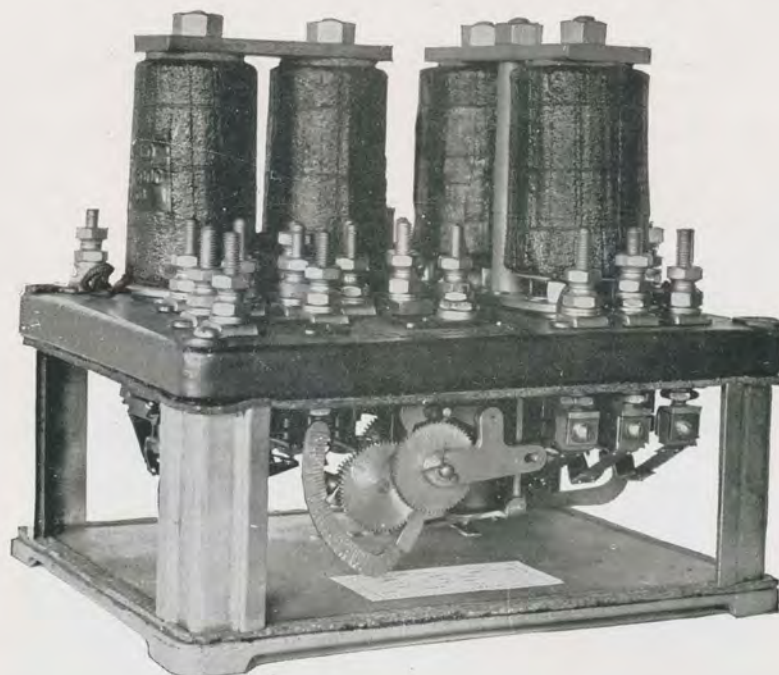
Flashing Time Elements can be furnished with ventilators in bases but unless specified on order they will be shipped without ventilators.

Order by Plate, Figure and Name

For parts of Flashing Time Elements see Plates, E-90, E-91 and E-92.

FIG.	NAME AND DESCRIPTION	DWG. No.
A	Model C-2 Flashing Time Element. Flasher is adjustable from 25 to 35 flashes per minute and has one set of silver to silver and two sets of silver to carbon contacts. Time element is adjustable from $\frac{1}{2}$ to $7\frac{1}{2}$ minutes and has one normally open and one normally closed dependent silver to silver contact. Specify operating voltage.	40600
A-1	Model C-2 Flashing Time Element. As figure A, except that flasher is adjustable from 30 to 45 flashes per minute and time element from $\frac{1}{2}$ to $6\frac{1}{8}$ minutes. Specify operating voltage.	40600-1
A-2	Model C-2 Flashing Time Element. As Figure A, except that flasher is adjustable from 45 to 60 flashes per minute and time element from $\frac{1}{2}$ to $4\frac{1}{4}$ minutes. Specify operating voltage.	40600-2
A-3	Model C-2 Flashing Time Element. Flasher is adjustable from 25 to 35 flashes per minute and has one set of silver to silver and two sets of silver to carbon contacts. Time element is adjustable from $\frac{1}{2}$ to $7\frac{1}{2}$ minutes and has one normally open, silver to silver and one silver to carbon, normally closed dependent contact. Specify operating voltage.	40600-3
A-4	Model C-2 Flashing Time Element. As figure A-3, except that flasher is adjustable from 30 to 45 flashes per minute and time element from $\frac{1}{2}$ to $6\frac{1}{8}$ minutes. Specify operating voltage.	40600-4
A-5	Model C-2 Flashing Time Element. As figure A-3, except that flasher is adjustable from 45 to 60 flashes per minute and time element from $\frac{1}{2}$ to $4\frac{1}{4}$ minutes. Specify operating voltage.	40600-5

Model C-3 Flashing Time Relay



THIS instrument was developed to fill the need for a compact, rugged and reliable device of this kind incorporating a dependable time element. Although it was designed primarily for use with highway crossing signals with track-instrument control, it is used in many other circuits. It can be used with track-circuits, as well as track-instruments, using either normally open or normally closed local circuits.

The Model C-3 Flashing Time Relay saves relay box space: First, because no other relay is necessary on an ordinary single track highway crossing signal installation having track instrument control, as it is a combination flasher, time element and four point neutral relay; and second, it is very compact, measuring only $7\frac{3}{8}$ inches by $9\frac{9}{16}$ inches by $8\frac{7}{8}$ inches high and weighs approximately 26 pounds. The flasher and time element mechanisms are the same as those used in the Model C-1 Flasher and Model C-2 Flashing Time Element respectively and the neutral relay is the Model C-5 Neutral Relay mounted on the same top plate with the flasher and time element.

As the Model C-3 Flashing Time Relay is a combination of several units which are fully described elsewhere, in this bulletin, it will not be necessary to describe them here.

The neutral relay, which is constructed according to the latest A. R. A. specifications, is built in one corner of the case and has no mechanical or electrical connections whatever with the other two units, except that it is mounted on the same top plate. It occupies the same place used by the clutch magnet on the Model C-2 Flashing Time Element. It is an ordinary four point neutral relay, built with the instrument for convenience, neatness and to

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save space. A neutral relay of some kind is generally necessary where a time element is used. It is necessary for the front contacts of the relay to close before the clutch magnet circuit, of the time element, is broken, otherwise the clutch magnet will release the time element and the time element contact will open before the relay has had time to pick up and hold through one of its front contacts. To accomplish this we adjust one of the back contacts, which is used to break the clutch magnet circuit, to overlap the front contacts, that is, the front contacts are allowed to make before this back contact opens. The terminal of this contact is plainly marked C. M., so that no trouble will be experienced in wiring. The other back contact or contacts, as the case may be are adjusted in the usual manner and are used to break the signal and flasher circuits, when a normally closed circuit is used.

A smaller clutch magnet is used on the Model C-3, which is placed inside the instrument between the flasher and time element.

The operation of the Flashing Time Relay is exactly like that of the Model C-2 Flashing Time Element and the neutral relay is used in the same manner as if it were a separate instrument.

Besides its use for highway crossing signal service the Model C-3 has been found particularly useful where time elements are needed about automatic interlocking plants. A number of railroads are now using them for this purpose. An article, beginning on page 209 of the June, 1928 issue of Railway Signaling, clearly describes how the Model C-3 is used in connection with interlockers.

The current consumption of the Model C-3 is the same as that of the Model C-2 plus that of the neutral relay which will vary according to its resistance. Where a normally closed stick circuit is used the relay is energized only when the flasher and time element are inoperative and when they are operating the relay is de-energized. In this case the current consumption would be exactly the same as for the Model C-2 Flashing Time Element.

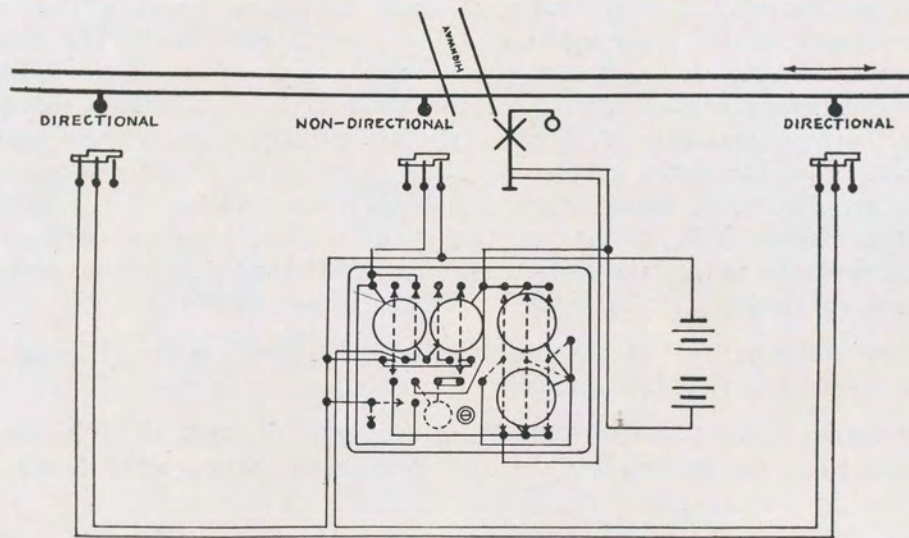
The Flashing Time Relay is regularly furnished for operation on 6, 8, 10 or 12 volts D. C. The relay is regularly furnished in the following resistances: 250, 500, 670 or 1000 ohms for operation on 6, 8, 10 or 12 volts respectively but other resistances can be furnished to order.

When a Flashing Time Relay is received it should be carefully unpacked, dusted and thoroughly inspected for injuries it may have received in shipping and remove the shipping screws according to instructions on page 10 of this bulletin.

To adjust follow the instructions for the Model C-2 Flashing Time Element. In wiring be very careful to break the clutch magnet circuit through the contact whose terminals are marked C. M. as this contact is adjusted especially for this purpose.

A few circuits are shown on the next several pages. They are more or less typical and we will gladly furnish circuits for more complicated situations upon request. A request should be accompanied by prints or sketches showing switches, station platforms, water tanks, crossings, etc., giving distances and train movements through the location. We will also be glad to work out any special circuit where the conditions require it, however, our numerous regular circuits cover almost every conceivable combination of track layouts and train movements.

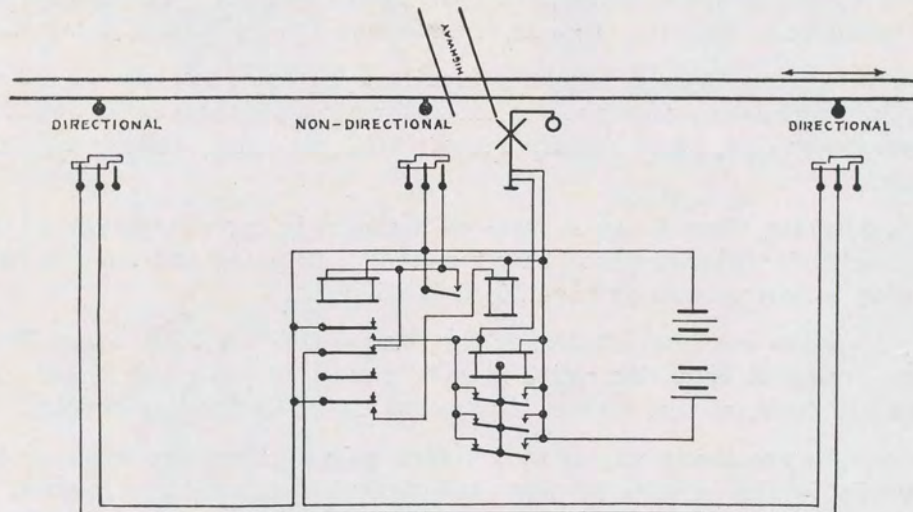
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No. 1 WIG WAG SIGNAL

TYPICAL CIRCUIT FOR SIGNAL-TRACK MOVEMENT, WITH TRACK-INSTRUMENT CONTROL. NORMALLY CLOSED

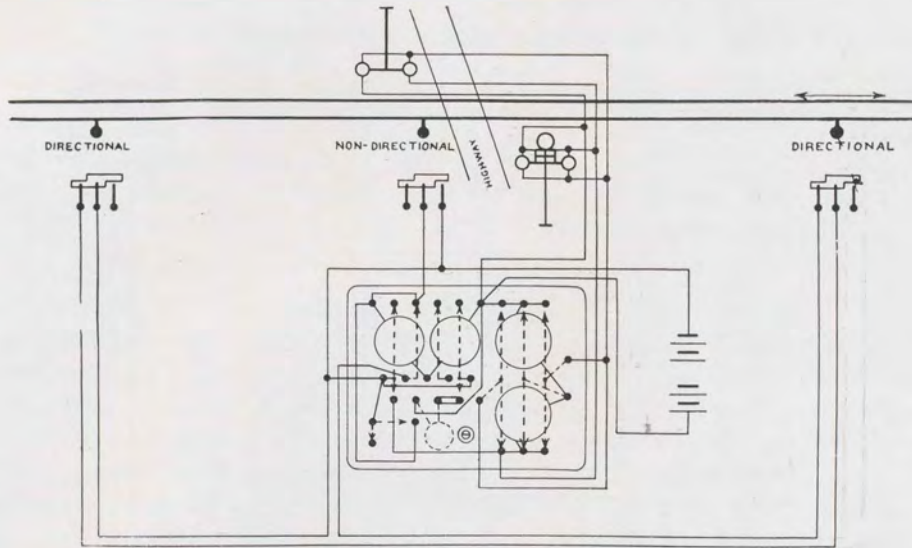
Signal begins to operate as the train approaches the highway and stops as the engine reaches the highway. Except for an incomplete movement, when signals are stopped by the time element in a pre-determined time.



No. 2 WIG WAG SIGNAL

Same circuit as above, except that the regular symbols, as used by most railroads, are used to represent the contacts, coils, etc. of the Model C-3 Flashing Time Relay.

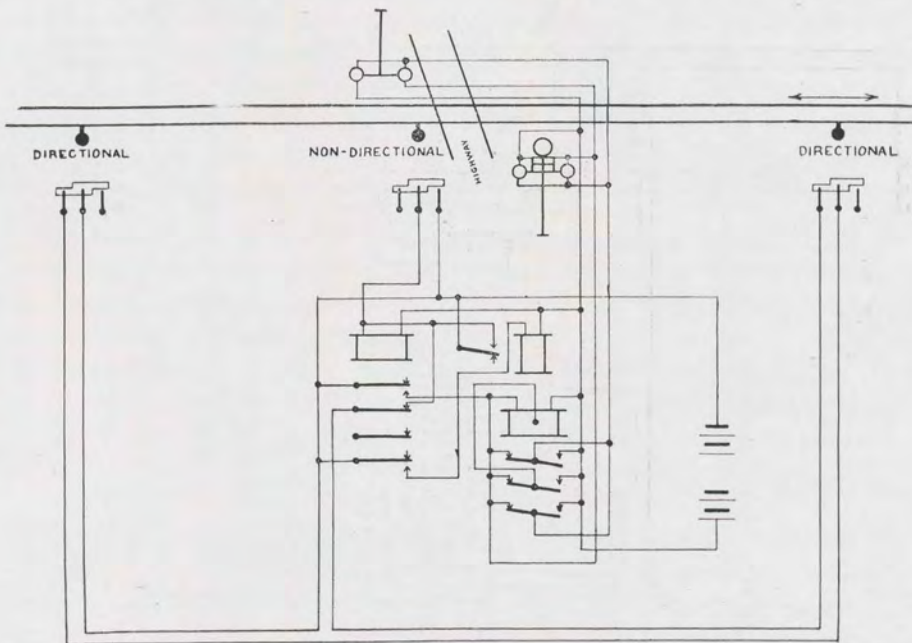
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No. 3 FLASHING LIGHT SIGNAL.

TYPICAL CIRCUIT FOR SINGLE-TRACK MOVEMENT, WITH TRACK-INSTRUMENT CONTROL. NORMALLY CLOSED.

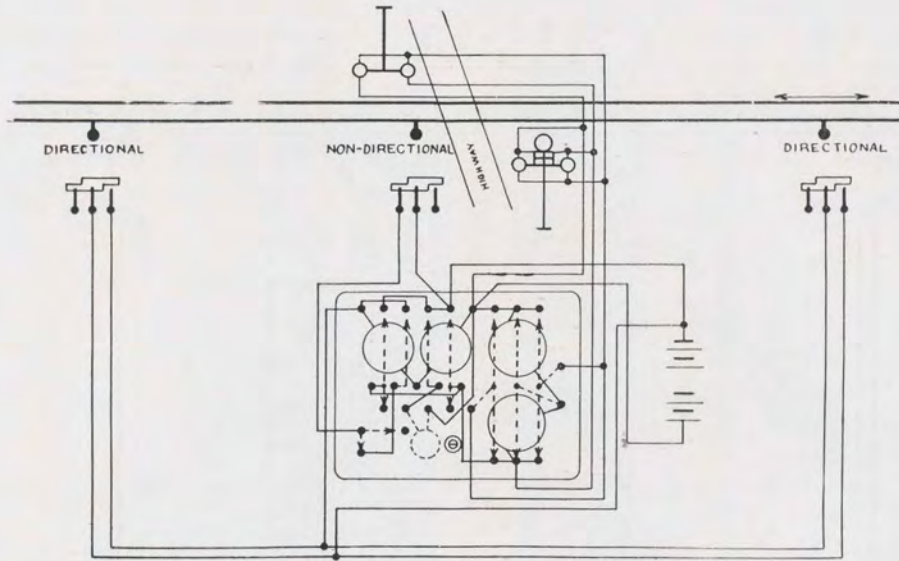
Signals begin to operate as the train approaches the highway and stop as the engine reaches the highway. Except for an incomplete movement, when signals are stopped by the time-element in a pre-determined time.



No. 4 FLASHING LIGHT SIGNAL

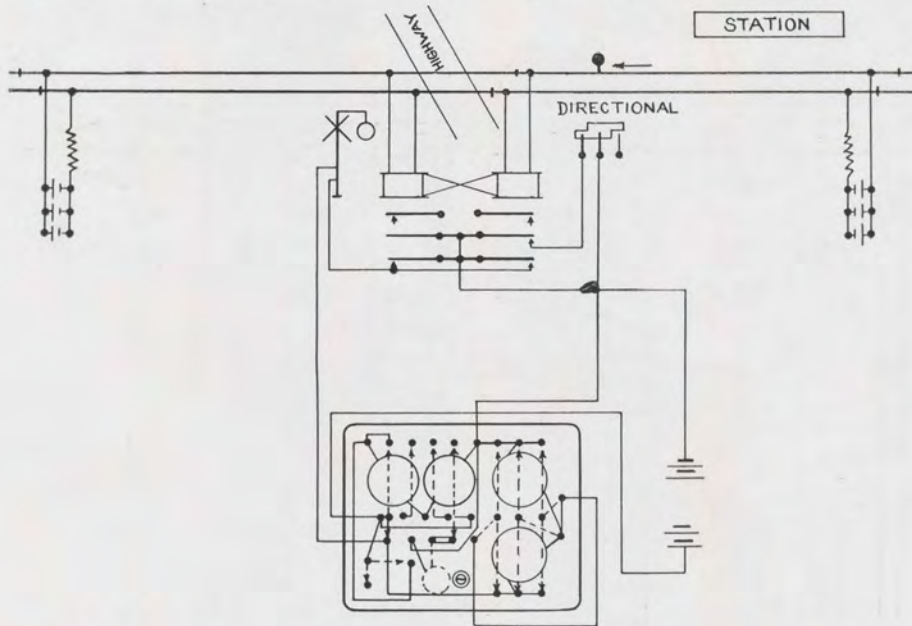
Same circuit as above, except that the regular symbols, as used by most railroads, are used to represent the contacts, coils, etc. of the Model C-3. Flashing Time Relay.

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No. 5 FLASHING LIGHT SIGNAL
TYPICAL CIRCUIT FOR SINGLE-TRACK MOVEMENT, WITH TRACK-
INSTRUMENT CONTROL. NORMALLY OPEN.

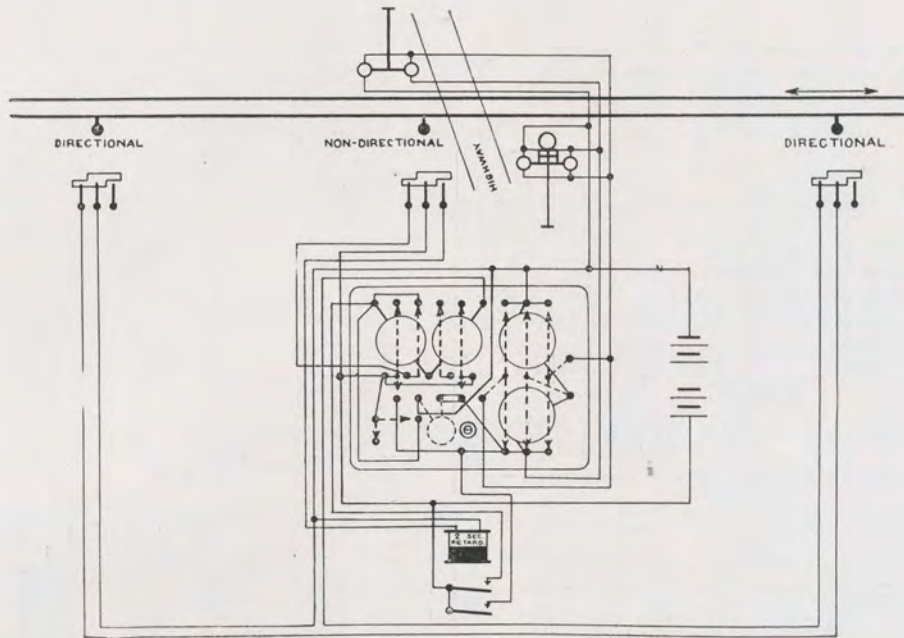
Signals begin to operate as the train approaches the highway and stop as the engine reaches the highway. Except for an incomplete movement, when signals are stopped by the time element in a pre-determined time.



No. 6 WIG WAG SIGNAL
TYPICAL CIRCUIT FOR SINGLE TRACK, (WHERE TRAIN STANDS ON
ONE SIDE) WITH TRACK CIRCUIT CONTROL. NORMALLY CLOSED.

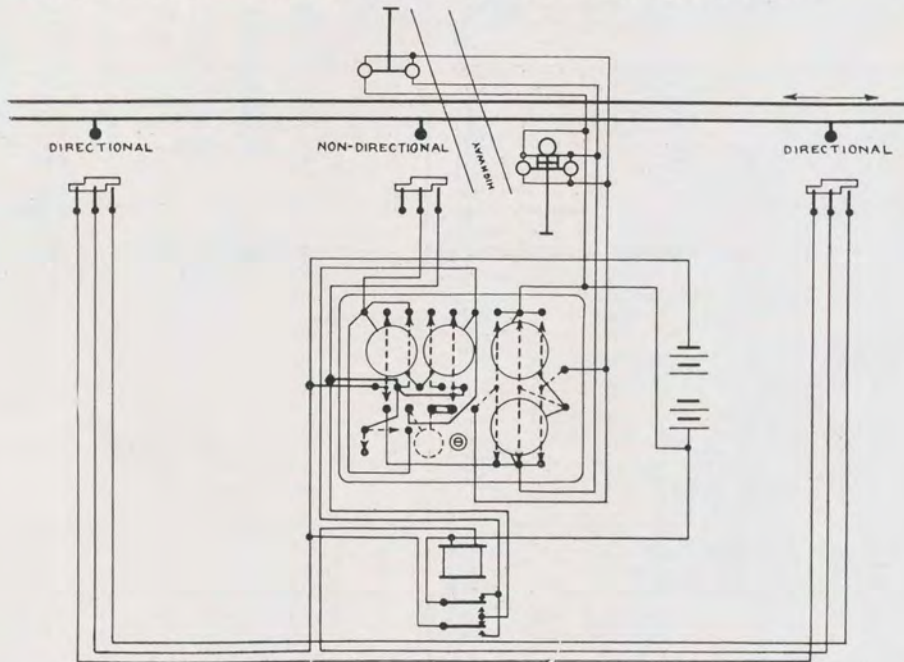
Signal begins to operate as the train approaches the highway. When a train, moving in the direction of the arrow, stops at the station, the signal is stopped, in a pre-determined time by the time element relay and when the train starts again the track-instrument starts the signal.

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**No. 7 FLASHING LIGHT SIGNAL
TYPICAL CIRCUIT FOR SINGLE-TRACK MOVEMENT, WITH TRACK-
INSTRUMENT CONTROL, NORMALLY CLOSED**

Signals begin to operate as the train approaches the highway and stop as the rear end of the train reaches the highway. Except for an incomplete movement, when signals are stopped by the time-element in a pre-determined time.

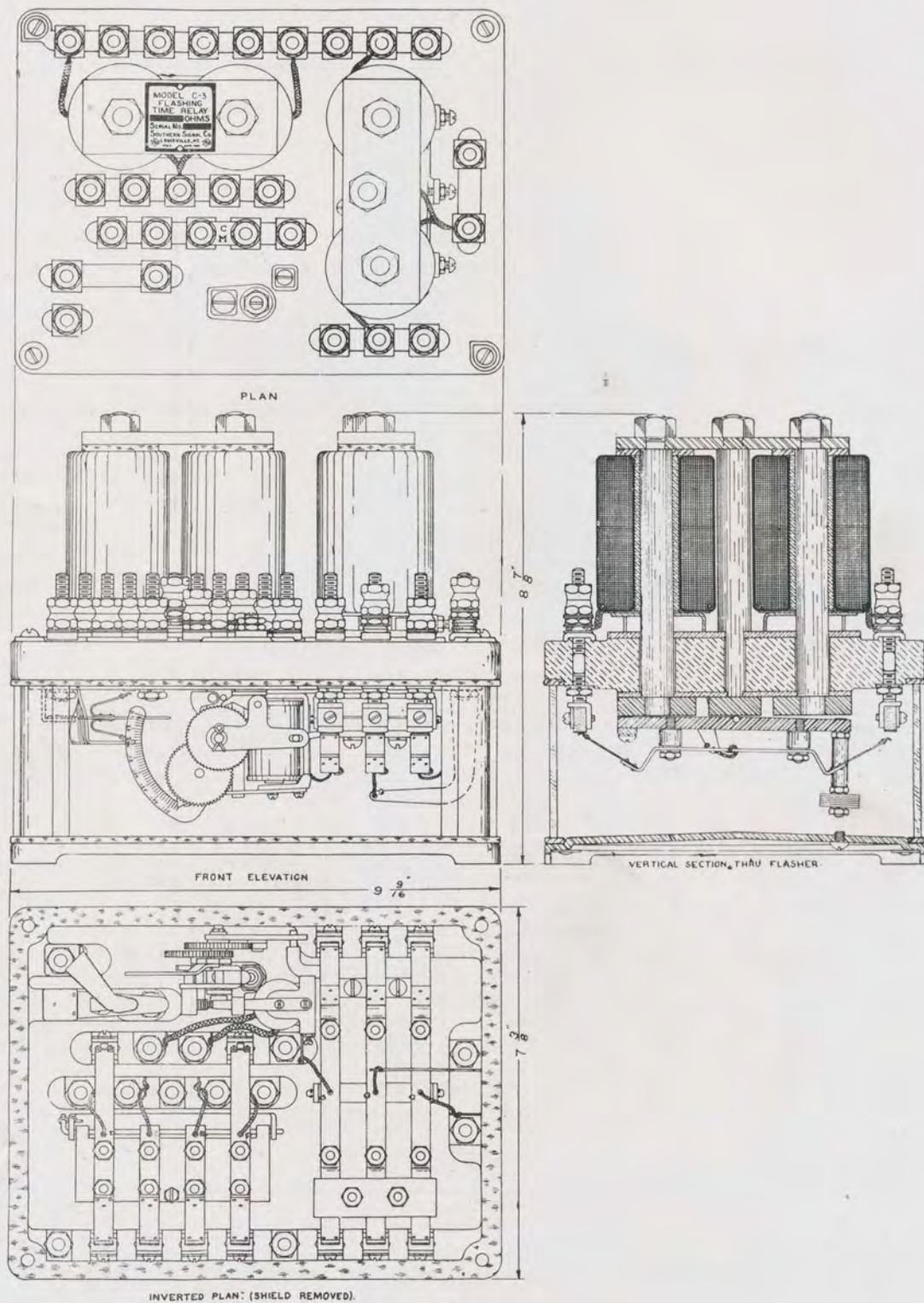


**No. 8 FLASHING LIGHT SIGNAL
TYPICAL CIRCUIT FOR SINGLE-TRACK MOVEMENT, WITH TRACK-
INSTRUMENT CONTROL, NORMALLY CLOSED**

Signals begin to operate as the train approaches the highway and stop as the engine reaches the highway. Should a train, approaching the highway, stop on a directional instrument, signals are stopped by the time-element in a pre-determined time but begin to operate as the train begins to move toward the highway. Should the train begin before the time-element has functioned, it is reset for the full time interval.

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Plate E-20



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Plate E-20

Model C-3 Flashing Time Relays

When ordering, always specify operating voltage and resistance of neutral relay. If not specified, on order, instruments for operation on 10 volts with 670 ohm neutral relays will be shipped.

Flashing Time Relays for operation on the following D. C. voltages and with neutral relays of the following resistances are standard and are carried in stock. Others are special and are made to order only.

6, 8, 10 and 12 volt instruments with neutral relays having a resistance of 250, 500, 670 and 1000 ohms respectively.

Flashing Time Relays can be furnished with ventilators in bases but unless specified on order they will be shipped without ventilators.

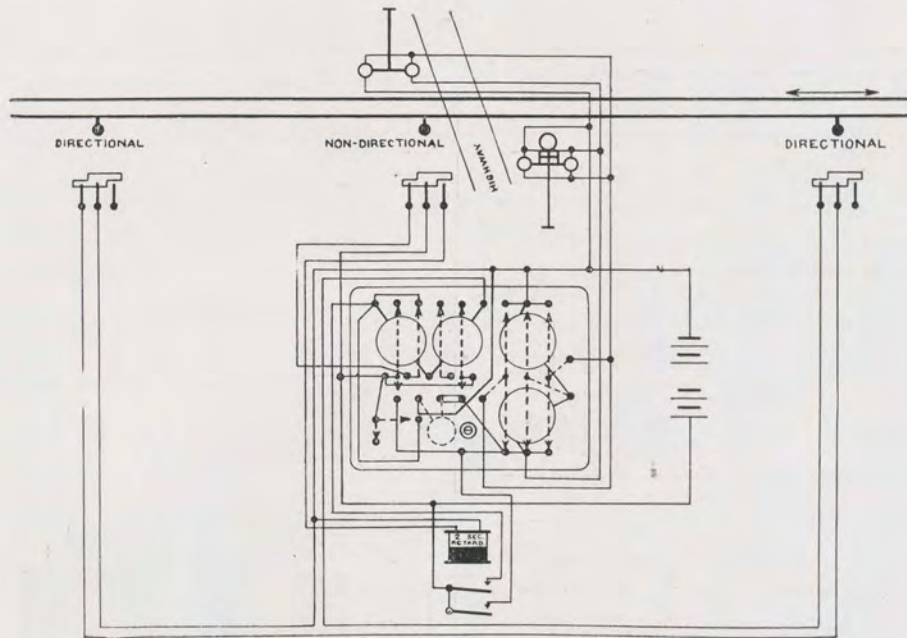
Contact combinations other than those listed below can be furnished, on the time element or neutral relay, in silver to silver, silver to carbon or carbon to carbon if specified on order.

Order by Plate, Figure and Name

For parts of Flashing Time Relays see Plates, E-90, E-91 and E-92.

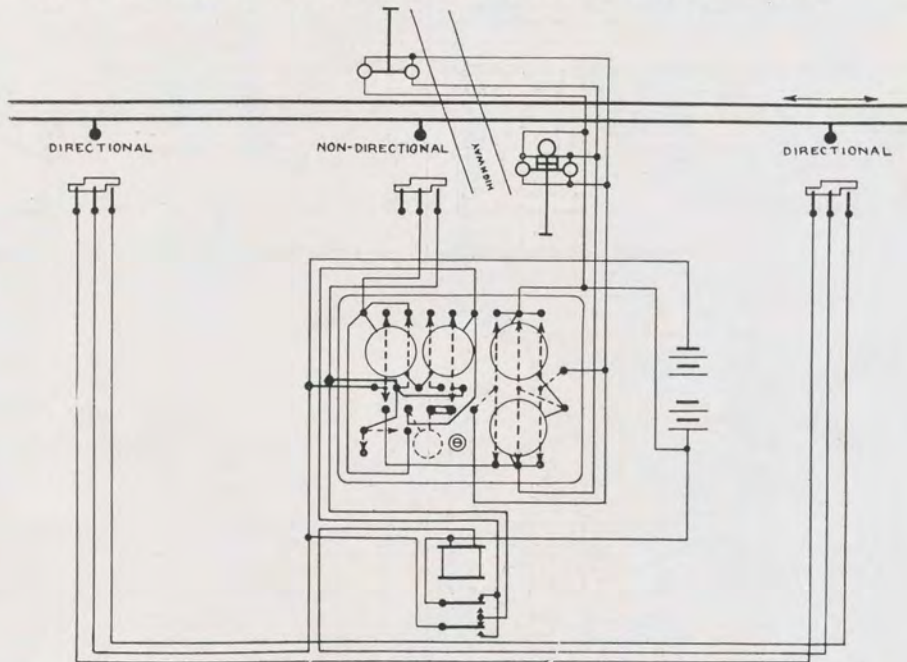
FIG.	NAME AND DESCRIPTION.	DWG. No.
A	Model C-3 Flashing Time Relay. Flasher is adjustable from 25 to 35 flashes per minute and has one set of silver to silver and two sets of silver to carbon contacts. Time element is adjustable from $\frac{1}{2}$ to $7\frac{1}{2}$ minutes and has one normally open and one normally closed dependent silver to silver contact. Neutral relay has two silver to carbon front and silver to silver back dependent contacts and two independent silver to carbon front contacts. Specify operating voltage and resistance of neutral relay.	40500-12
A-1	Model C-3 Flashing Time Relay. As figure A except that flasher is adjustable from 30 to 45 flashes per minute and time element from $\frac{1}{2}$ to $6\frac{1}{8}$ minutes. Specify operating voltage and resistance of neutral relay.	40500-13
A-2	Model C-3 Flashing Time Relay. As figure A except that flasher is adjustable from 45 to 60 flashes per minute and time element from $\frac{1}{2}$ to $4\frac{1}{4}$ minutes. Specify operating voltage and resistance of neutral relay.	40500-14
A-3	Model C-3 Flashing Time Relay. Flasher is adjustable from 25 to 35 flashes per minute and has one set of silver to silver and two sets of silver to carbon contacts. Time element is adjustable from $\frac{1}{2}$ to $7\frac{1}{2}$ minutes and has one normally open and one normally closed dependent silver to silver contact. Neutral relay has three silver to carbon front and silver to silver back dependent contacts and one independent silver to carbon front contact. Specify operating voltage and resistance of neutral relay.	40500-15
A-4	Model C-3 Flashing Time Relay. As figure A-3 except that flasher is adjustable from 30 to 45 flashes per minute and time element from $\frac{1}{2}$ to $6\frac{1}{8}$ minutes. Specify operating voltage and resistance of neutral relay.	40500-16
A-5	Model C-3 Flashing Time Relay. As figure A-3 except that flasher is adjustable from 45 to 60 flashes per minute and time element from $\frac{1}{2}$ to $4\frac{1}{4}$ minutes. Specify operating voltage and resistance of neutral relay.	40500-17

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**No. 7 FLASHING LIGHT SIGNAL
TYPICAL CIRCUIT FOR SINGLE-TRACK MOVEMENT, WITH TRACK-
INSTRUMENT CONTROL, NORMALLY CLOSED**

Signals begin to operate as the train approaches the highway and stop as the rear end of the train reaches the highway. Except for an incomplete movement, when signals are stopped by the time-element in a pre-determined time.



**No. 8 FLASHING LIGHT SIGNAL
TYPICAL CIRCUIT FOR SINGLE-TRACK MOVEMENT, WITH TRACK-
INSTRUMENT CONTROL, NORMALLY CLOSED**

Signals begin to operate as the train approaches the highway and stop as the engine reaches the highway. Should a train, approaching the highway, stop on a directional instrument, signals are stopped by the time-element in a pre-determined time but begin to operate as the train begins to move toward the highway. Should the train begin before the time-element has functioned, it is reset for the full time interval.

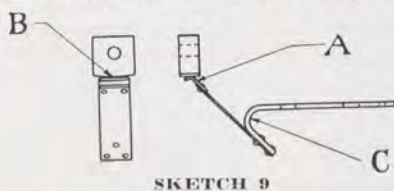
SOUTHERN SIGNAL CORPORATION

The operating values of the Model C-5 Relay are very good and well within the limits of the A. R. A. For a four front and two back contact, 2 ohm, neutral relay, with the following adjustment the values are:

Minimum Working Air Gap.....015"	Drop-away044 amps.
Front and Back Contact Openings....050"	Direct Pick-up.....092 amps.
Contact Pressure.....1 $\frac{5}{8}$ oz.	Direct Working Current.....115 amps.

The contact on the Neutral Relay, which is also used on all the other relays described in this bulletin, is very efficient. It is the result of a long period of research and experimental work and its performance both in the laboratory and in service are very satisfactory. The maximum resistance of the silver to carbon contacts, on relays leaving the factory, is .217 ohms and tests, made on a number of relays, taken at random and in service for more than a year, show that the average resistance is .270 ohms per contact. This average includes all contacts, both those used and the idle ones, on the relays tested. The contact has a spring with a silver tip, curved at A, as shown in sketch No. 9 and is very similar to the regular spring except that it is solid instead of being divided into three parts at the tip. The contact block has a curved contact surface, B. This arrangement results in a contact having about three times as much pressure, per square inch, at the point of contact, as one having three points; the size and kind of spring and slide of the contact being the same in either case. The curved surfaces of the contact have less tendency to groove than flat ones. One of the biggest advantages of this contact is its property to hold its adjustment. As there is only one point of contact it is not necessary to twist and bend the spring to get the points in line, thus all possibility of putting the spring in a strain, which sometimes results in warping, is eliminated. Another advantage of the contact is that it is very easy to adjust. To adjust, bend the finger at the point C, in the direction necessary to get the desired contact alignment. The finger is of soft but rigid material and will not change its shape in service. With a pressure of 30 volts, a silver to carbon contact will carry 5 amperes.

The Model C-5 Neutral Relay, which is constructed according to A. R. A. specifications, has a porcelain top plate, coated with a black insulating, moisture-proof enamel; clear dust-proof glass shield, which will not collapse when the relay is opened or when the glass is broken; non-turning and non-adjustable terminal posts; removable, form wound, vacuum impregnated magnet coils; highest grade phosphor-bronze contact springs and trunnion; 99.9% pure silver contacts; best grade Swedish Iron in cores, polepieces, armature and yoke; all iron parts cadmium plated, to prevent rusting and all brass parts nickel plated.



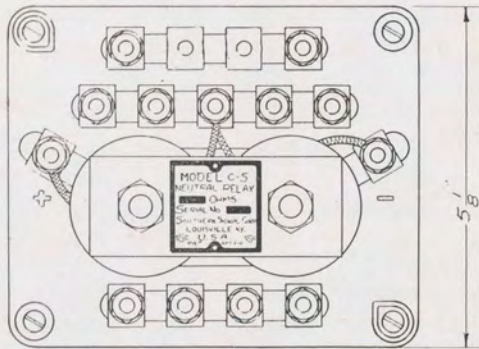
No part inside the glass shield can be re-adjusted or tampered with, without breaking the seals, which are on top of the relay where they can be easily inspected without inverting the relay. All nuts inside are locked with lock washers.

The relay is arranged so that the shipping screw may be preserved for future re-shipment.

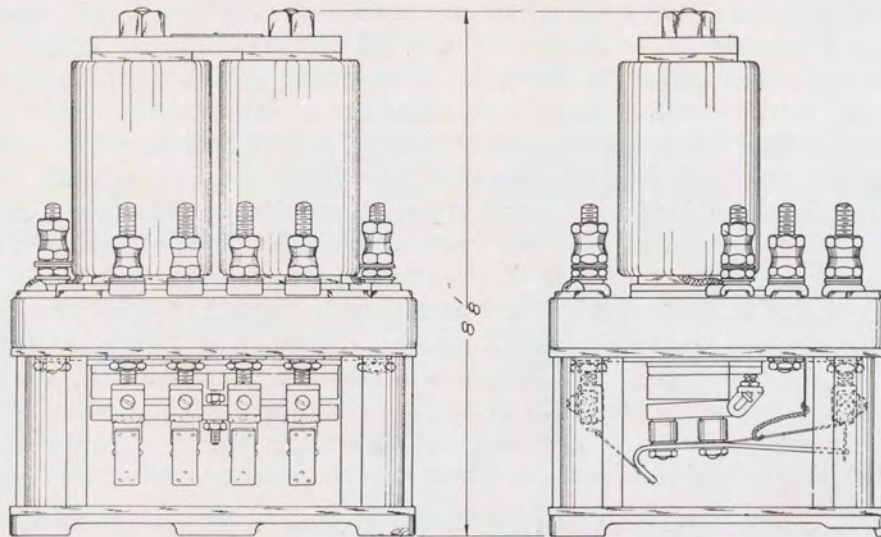
The Model C-5 is furnished either regular or slow releasing and can be furnished with carbon to carbon contacts for high voltage. It is made for both wall and shelf type mounting.

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Plate E-30

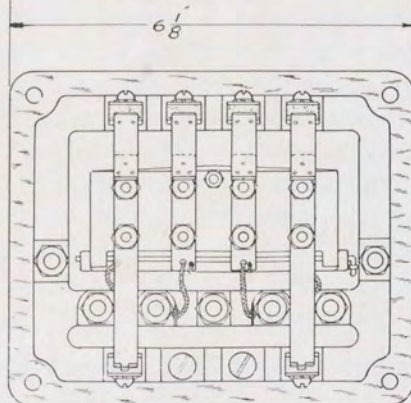


PLAN



FRONT ELEVATION

SIDE ELEVATION



INVERTED PLAN(SHIELD REMOVED)

A

SOUTHERN SIGNAL CORPORATION

Plate E-30

Model C-5 Shelf Type Neutral Relays

When ordering always specify resistance of relay. The following resistances are standard but relays with coils of other resistances can be furnished if required:

2, 4, 9, 16, 50, 250, 500, 670 and 1000 ohms.

Relays can be furnished with ventilators in bases but unless specified on order they will be shipped without ventilators.

Contact combinations other than those listed below can be furnished, in silver to silver, silver to carbon or carbon to carbon if specified on order.

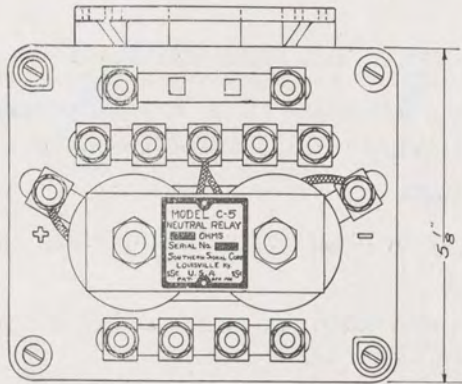
Order by Plate, Figure and Name

For parts of Neutral Relays see Plates, E-90, E-91 and E-92.

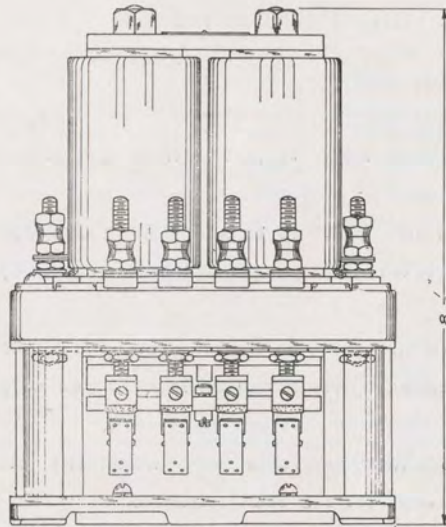
FIG.	NAME AND DESCRIPTION	DWG. No.
A	Model C-5 Neutral Relay, regular releasing with two silver to carbon front and silver to silver back dependent contacts. Specify resistance.	40700
A-1	Model C-5 Neutral Relay, regular releasing with two silver to carbon front and silver to silver back dependent contacts and one independent silver to carbon front contact. Specify resistance.	40700-1
A-2	Model C-5 Neutral Relay, regular releasing with two silver to carbon front and silver to silver back dependent contacts and two independent silver to carbon front contacts. Specify resistance.	40700-2
A-3	Model C-5 Neutral Relay, slow releasing with two silver to carbon front and silver to silver back dependent contacts. Specify retardation period, voltage and resistance.	40700-3
A-4	Model C-5 Neutral Relay, slow releasing with two silver to carbon front and silver to silver back dependent contacts and one independent silver to carbon front contact. Specify retardation period, voltage and resistance.	40700-4
A-5	Model C-5 Neutral Relay, slow releasing with two silver to carbon front and silver to silver back dependent contacts and two independent silver to carbon front contacts. Specify retardation period, voltage and resistance.	40700-5
A-6	Model C-5 Neutral Relay, quick releasing with two silver to carbon front and silver to silver back dependent contacts. Releasing interval .3 seconds. Specify resistance.	40700-6
A-7	Model C-5 Neutral Relay, quick releasing with two silver to carbon front and silver to silver back dependent contacts and one independent silver to carbon front contact. Releasing interval .3 seconds. Specify resistance.	40700-7
A-8	Model C-5 Neutral Relay, quick releasing with two silver to carbon front and silver to silver back dependent contacts and two independent silver to carbon front contacts. Releasing interval .3 seconds. Specify resistance.	40700-8

SOUTHERN SIGNAL CORPORATION

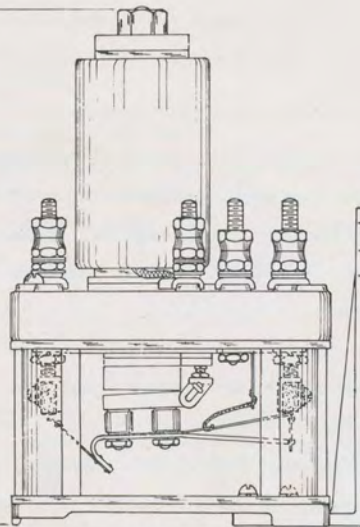
Plate E-31



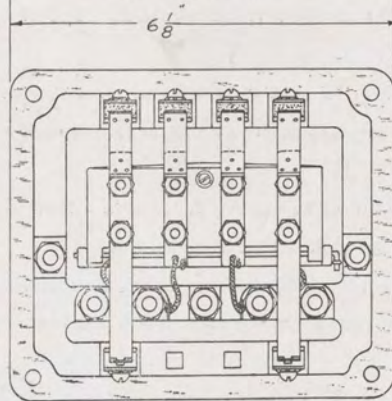
PLAN



FRONT ELEVATION



SIDE ELEVATION



INVERTED PLAN (SHIELD REMOVED)

A

SOUTHERN SIGNAL CORPORATION

Plate E-31

Model C-5 Wall or Shelf Type Neutral Relays

When ordering always specify resistance of relay. The following resistances are standard but relays with coils of other resistances can be furnished if required:

2, 4, 9, 16, 50, 250, 500, 670 and 1000 chms.

Relays can be furnished with ventilators in bases but unless specified on order they will be shipped without ventilators.

Contact combinations other than those listed below can be furnished, in silver to silver, silver to carbon or carbon to carbon if specified on order.

Order by Plate, Figure and Name

For parts of Neutral Relays see Plates, E-90, E-91 and E-92.

FIG.	NAME AND DESCRIPTION	DWG. No.
A	Model C-5 Neutral Relay, wall or shelf type, regular releasing with two silver to carbon front and silver to silver back dependent contacts. Specify resistance.	40700-9
A-1	Model C-5 Neutral Relay, wall or shelf type, regular releasing with two silver to carbon front and silver to silver back dependent contacts and one independent silver to carbon front contact. Specify resistance.	40700-10
A-2	Model C-5 Neutral Relay, wall or shelf type, regular releasing with two silver to carbon front and silver to silver back dependent contacts and two independent silver to carbon front contacts. Specify resistance.	40700-11
A-3	Model C-5 Neutral Relay, wall or shelf type, slow releasing with two silver to carbon front and silver to silver back dependent contacts. Specify retardation period, voltage and resistance.	40700-12
A-4	Model C-5 Neutral Relay, wall or shelf type, slow releasing with two silver to carbon front and silver to silver back dependent contacts and one independent silver to carbon front contact. Specify retardation period, voltage and resistance.	40700-13
A-5	Model C-5 Neutral Relay, wall or shelf type, slow releasing with two silver to carbon front and silver to silver back dependent contacts and two independent silver to carbon front contacts. Specify retardation period, voltage and resistance.	40700-14
A-6	Model C-5 Neutral Relay, wall or shelf type, quick releasing with two silver to carbon front and silver to silver back dependent contacts. Releasing interval .3 seconds. Specify resistance.	40700-15
A-7	Model C-5 Neutral Relay, wall or shelf type, quick releasing with two silver to carbon front and silver to silver back dependent contacts and one independent silver to carbon front contact. Releasing interval .3 seconds. Specify resistance.	40700-16
A-8	Model C-5 Neutral Relay, wall or shelf type, quick releasing with two silver to carbon front and silver to silver back dependent contacts and two independent silver to carbon front contacts. Releasing interval .3 seconds. Specify resistance.	40700-17

Model C-6 Interlocking Relay



THE interlocking relay is of the same importance to the automatic highway crossing signal, (controlled by a track circuit) as the neutral relay is to the automatic block signal, therefore it should be reliable.

Because of the mechanical interlocking mechanism, interlocking relays have never been considered as dependable as other relays. This uncertainty has been reduced to a minimum in the Model C-6 Interlocking Relay with its very simple mechanism. As a rule, the less complicated the device, the more dependable will be its operation. There are only six major parts to the locking mechanism and all are most accurately made from the best materials.

The units used are our Model C-5 Neutrals mounted on a double base and with armatures drilled to accommodate the locking arms. Small counterweights, which act by gravity and are more dependable than springs, are employed to bring the locking dog to its neutral position. As the counterweights are heavier than the locking dog, it will always come to its neutral point, even though the relay is not level. This is an advantage not found in all interlocking relays.

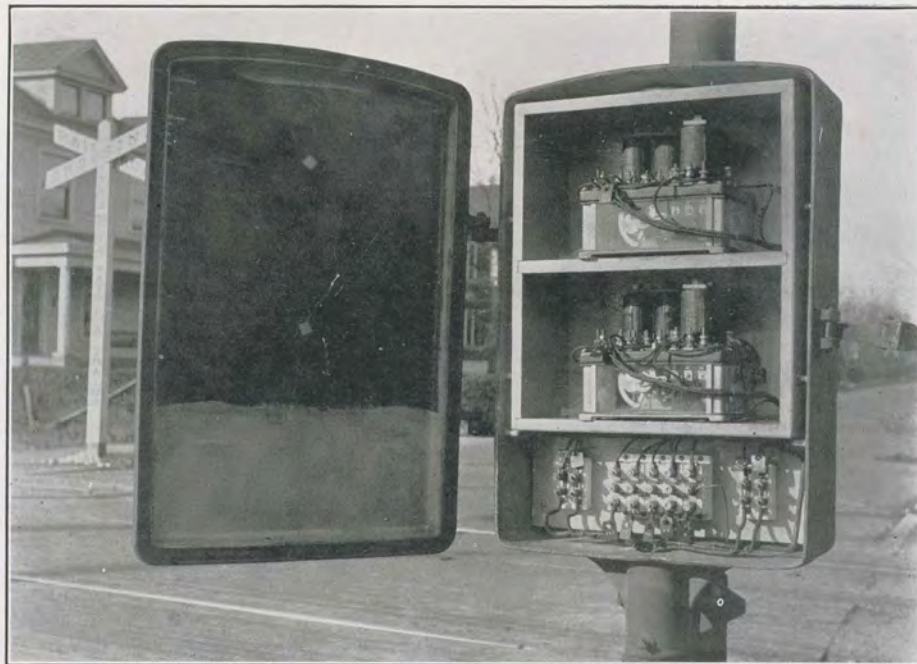
In designing the Model C-6 Interlocking Relay, its size was considered and like our other relays, it was made as small as possible. This is a big advantage in an interlocking relay because even the smallest are larger than any other D. C. relay used in signal work. The Model C-6 is $10\frac{1}{8}$ " long, $6\frac{1}{8}$ " deep and $8\frac{1}{8}$ " high.

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The material and workmanship are of the same high standard as that of our other relays. The top plate is of porcelain, coated with a black, baked enamel; the coils are form wound and removable without disturbing the adjustment of the relays or the locking; all iron, in the magnetic circuits, is of the best Swedish brand, properly annealed; all iron parts on the relay are cadmium plated and the brass parts nickel plated; the terminal posts are non-turning and non-adjustable and the glass shield is clear as well as dust-proof and non-collapsible.

The top plate, being of porcelain, is rigid and will not bend or warp when screwed to the glass shield so that the relays and locking will not be thrown out of adjustment.

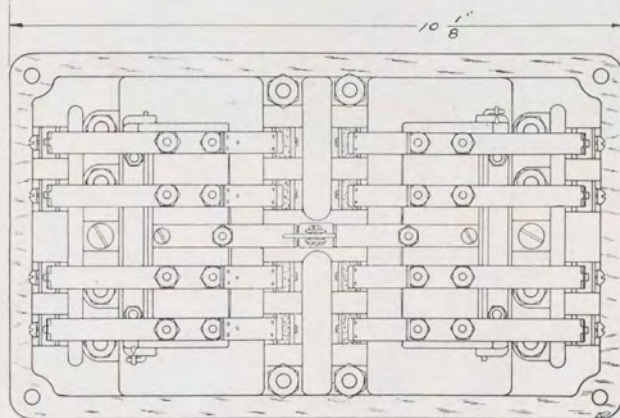
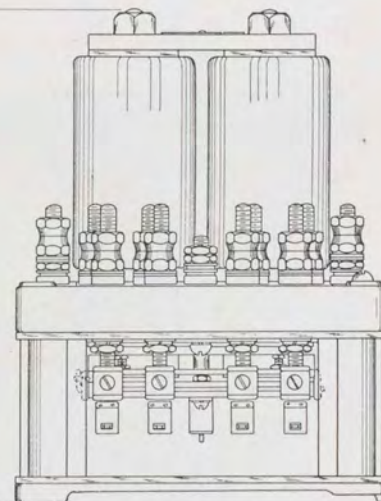
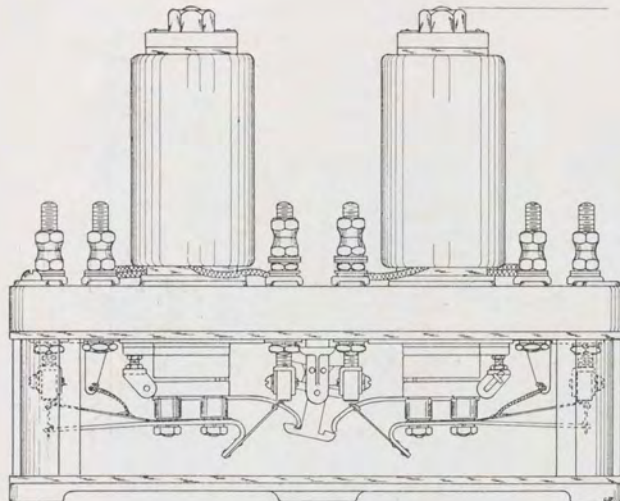
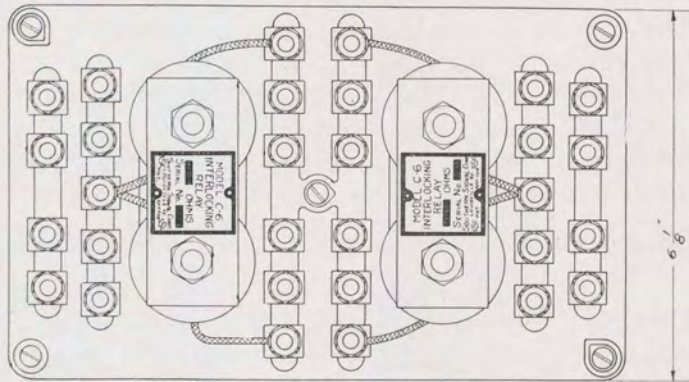
No part within the case can be reached without breaking either the seals or the glass. The seals are on top where they are easily seen for inspection. The instrument is made so that the shipping screws may be saved for future reshipment. This arrangement is described on page 10 of this bulletin.



MODEL C-3 FLASHING TIME RELAYS

SOUTHERN SIGNAL CORPORATION

Plate E-40



A

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Plate E-40

Model C-6 Interlocking Relays

When ordering always specify resistance of relay. The following resistances are standard but relays with coils of other resistances can be furnished if required.

2, 4, 9, 250, 500, 670 and 1000 ohms.

Relays can be furnished with ventilators in bases but unless specified on order they will be shipped without ventilators.

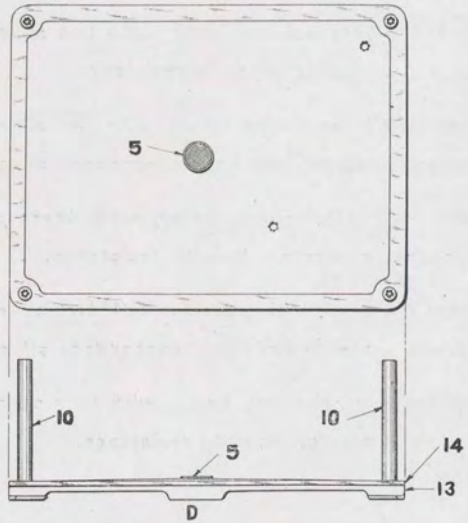
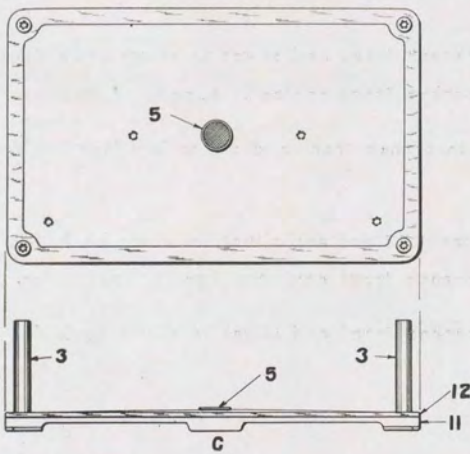
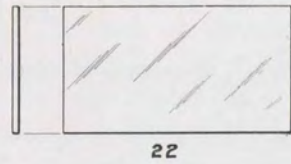
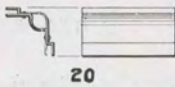
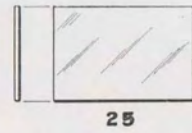
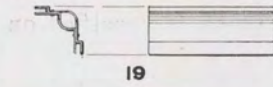
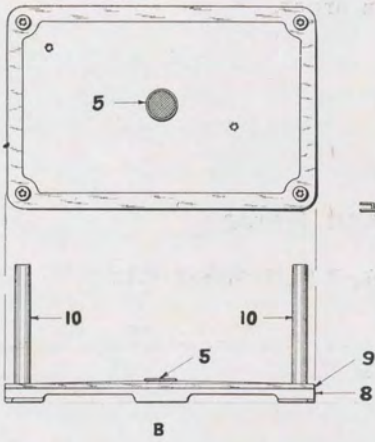
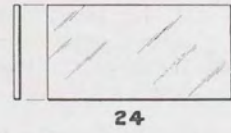
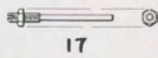
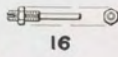
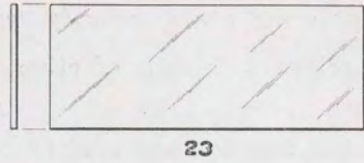
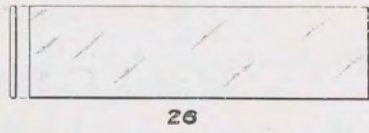
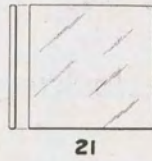
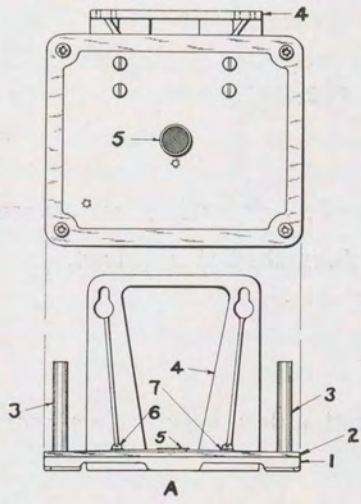
Contact combinations other than those listed below can be furnished, in silver to silver, silver to carbon or carbon to carbon if specified on order.

Order by Plate, Figure and Name

For parts of Interlocking Relays see Plates, E-90, E-91 and E-92.

FIG.	NAME AND DESCRIPTION	DWG. No.
A	Model C-6 Interlocking Relay, with two silver to carbon front and silver to silver back dependent contacts. Specify resistance.	40800
A-1	Model C-6 Interlocking Relay, with two silver to carbon front and silver to silver back dependent contacts and one independent silver to carbon front contact. Specify resistance.	40800-1
A-2	Model C-6 Interlocking Relay, with three silver to carbon front and silver to silver back dependent contacts. Specify resistance.	40800-2
A-3	Model C-6 Interlocking Relay, with two silver to carbon front and silver to silver back dependent contacts and two independent silver to carbon front contacts. Specify resistance.	40800-3
A-4	Model C-6 Interlocking Relay, with four silver to carbon front and silver to silver back dependent contacts. Specify resistance.	40800-4

Plate E-90

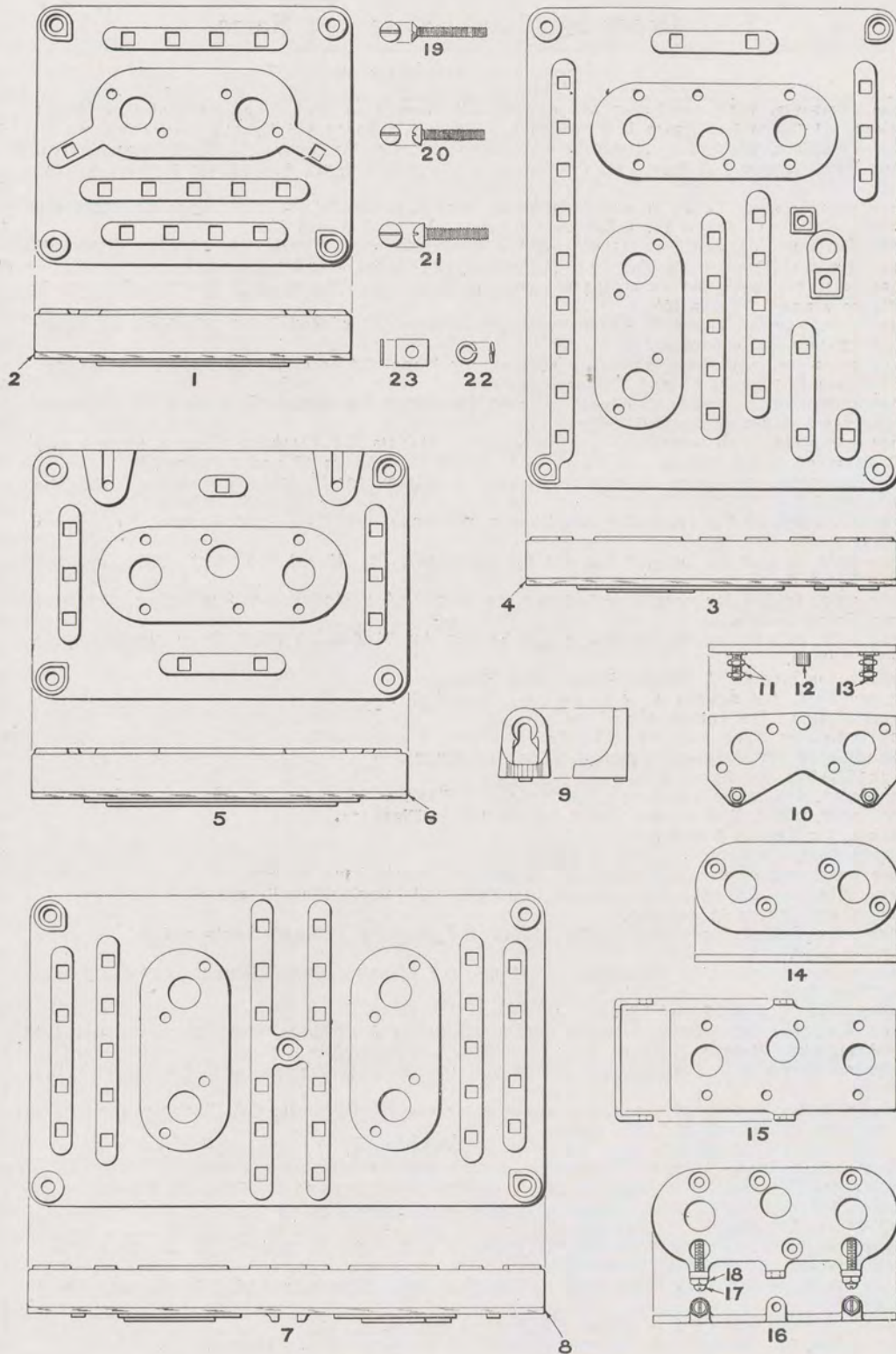


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Plate E-90 Model C Relay Parts Order by Plate, Figure and Name

FIG.	NAME AND DESCRIPTION	DWG. No.
A	Base complete, with ventilator (as shown), for Model C-5 Wall Type Neutral Four Point Relays. (1 figure 1, 1 figure 2, 4 figures 3, 1 figure 4, 1 figure 5, 4 figures 6 and 4 figures 7).	40701-3X
A-1	Base complete, as figure A, except without ventilator, for Model C-5 Wall Type Neutral Four Point Relays. (1 figure 1a, 1 figure 2, 4 figures 3, 1 figure 4, 4 figures 6 and 4 figures 7).	40701-2X
A-2	Base complete, as figure A except without hanger, for Model C-5 Shelf Type Neutral Four Point Relays. (1 figure 1b, 1 figure 2, 4 figures 3 and 1 figure 5).	40701-1X
A-3	Base complete, as figure A except without ventilator and hanger, for Model C-5 Shelf Type Neutral Four Point Relays. (1 figure 1c, 1 figure 2 and 4 figures 3).	40701X
B	Base complete, with ventilator (as shown), for Model C-1 Flashers. (1 figure 5, 1 figure 8, 1 figure 9 and 4 figures 10).	40501-1X
B-1	Base complete, as figure B, except without ventilator, for Model C-1 Flashers (1 figure 8a, 1 figure 9 and 4 figures 10).	40501X
C	Base complete, with ventilator, (as shown), for Model C-6 Interlocking Relays. (4 figures 3, 1 figure 5, 1 figure 11 and 1 figure 12).	40802-1X
C-1	Base complete, as figure C except without ventilator, for Model C-6 Interlocking Relays. (4 figures 3, 1 figure 11a and 1 figure 12).	40802X
D	Base complete, with ventilator (as shown), for Models C-2 Flashing Time Elements and C-3 Flashing Time Relays. (1 figure 5, 4 figures 10, 1 figure 13 and 1 figure 14).	40503-1X
D-1	Base complete, as figure D, except without ventilator, for Models C-2 Flashing Time Elements and C-3 Flashing Time Relays. (4 figures 10, 1 figure 13a and 1 figure 14).	40503X
1	Base only, drilled for ventilator and hanger, for Model C-5 Wall Type Neutral Four Point Relays.	40701-3
1a	Base only, drilled for hanger but not for ventilator, for Model C-5 Wall Type Neutral Four Point Relays.	40701-2
1b	Base only, drilled for ventilator but not for hanger, for Model C-5 Shelf Type Neutral Four Point Relays.	40701-1
1c	Base only, not drilled for ventilator and hanger, for Model C-5 Shelf Type Neutral Four Point Relays.	40701
2	Gasket, for Model C-5 Neutral Four Point Relays.	40702
3	Corner Post, for figures A, A-1, A-2, A-3, C and C-1.	40703
4	Relay Hanger, for figures A and A-1.	40735
5	Ventilator, for figures A, A-2, B, C and D	40706
6	Round Head Brass Machine Screw, for relay hanger.	004009
7	Lock Washer, for figure 6.	002007
8	Base only, drilled for ventilator, for Model C-1 Flashers.	40501-1
8a	Base only, not drilled for ventilator, for Model C-1 Flashers.	40501
9	Gasket, for figures 8 and 8a.	40502
10	Corner Post, for figures B, B-1, D and D-1.	40505
11	Base only, drilled for ventilator, for Model C-6 Interlocking Relays.	40802-1
11a	Base only, not drilled for ventilator, for Model C-6 Interlocking Relays.	40802
12	Gasket, for figures 11 and 11a.	40803
13	Base only, drilled for ventilator for Models C-2 Flashing Time Elements and C-3 Flashing Time Relays.	40503-1
13a	Base only, not drilled for ventilator, for Models C-2 Flashing Time Elements and C-3 Flashing Time Relays.	40503
14	Gasket, for figures 13 and 13a.	40504
15	Short Shipping Screw with hexagon nut, for Models C-2 Flashing Time Elements and C-3 Flashing Time Relays.	40508X
16	Shipping Screw with hexagon nut, for Models C-5 Neutral Relays and C-6 Interlocking Relays.	40705X
17	Long Shipping Screw with hexagon nut, for Models C-1 Flashers, C-2 Flashing Time Elements and C-3 Flashing Time Relays.	40507X
18	Plug Screw for shipping screws for Models C-1 Flashers, C-2 Flashing Time Elements, C-3 Flashing Time Relays, C-5 Neutral Relays and C-6 Interlocking Relays.	004024
19	Corner, for Models C-1 Flashers, C-2 Flashing Time Elements and C-3 Flashing Time Relays.	40509X
20	Corner, for Models C-5 Neutral Relays and C-6 Interlocking Relays.	40706X
21	End Glass, for Model C-1 Flashers.	40511
22	Glass, for front and back of Model C-1 Flashers and ends of Models C-2 Flashing Time Elements and C-3 Flashing Time Relays.	40512
23	Glass, for front and back of Models C-2 Flashing Time Elements and C-3 Flashing Time Relays.	40513
24	Glass, for front and back of Model C-5 Neutral Relays.	40708
25	End Glass, for Models C-5 Neutral Relays and C-6 Interlocking Relays.	40709
26	Glass, for front and back of Model C-6 Interlocking Relays.	40804

Plate E-91



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Plate E-91

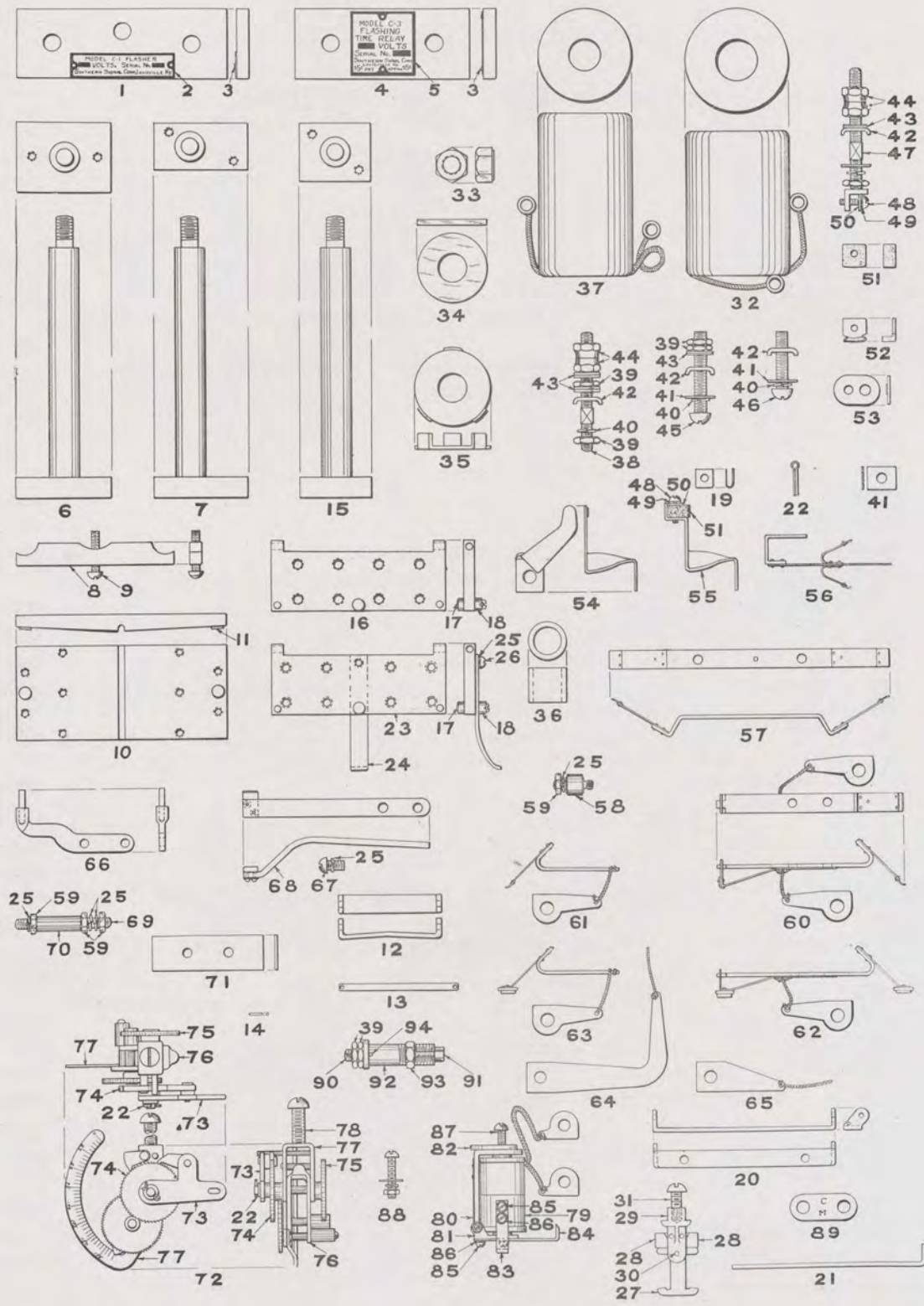
Model C Relay Parts

Order by Plate, Figure and Name

FIG.	NAME AND DESCRIPTION	DWG. No.
1	Porcelain Top Plate only, for Model C-5 Neutral Four Point Relays.	40710
1a	Porcelain Top Plate complete, with gasket, for Model C-5 Four Point Neutral Relays. (1 figure 1 and 1 figure 2).	40710X
2	Gasket, for Model C-5 Neutral Four Point Relays.	40702
3	Porcelain Top Plate only, for Models C-2 Flashing Time Elements and C-3 Flashing Time Relays.	40516
3a	Porcelain Top Plate complete, with gasket, for Models C-2 Flashing Time Elements and C-3 Flashing Time Relays. (1 figure 3 and 1 figure 4)	40516X
4	Gasket, for figure 3a.	40504
5	Porcelain Top Plate only, for Model C-1 Flashers.	40515
5a	Porcelain Top Plate complete, with gasket, for Model C-1 Flashers. (1 figure 5 and 1 figure 6).	40515X
6	Gasket, for Model C-1 Flashers.	40502
7	Porcelain Top Plate only, for Model C-6 Interlocking Relays.	40801
7a	Porcelain Top Plate complete, with gasket, for Model C-6 Interlocking Relays. (1 figure 7 and 1 figure 8).	40801X
8	Gasket, for Model C-6 Interlocking Relays.	40803
9	Hanger, for Model C-1 Wall or Shelf Type Flashers.	40567
10	Relay Lower Core Plate only, for Models C-2 Flashing Time Elements, C-3 Flashing Time Relays, C-5 Neutral Relays and C-6 Interlocking Relays.	40712
10a	Relay Lower Core Plate assembly, for Models C-2 Flashing Time Elements, C-3 Flashing Time Relays, C-5 Neutral Relays and C-6 Interlocking Relays. (1 figure 10, 4 figures 11, 1 figure 12 and 2 figures 13)	40714X
11	Bracket Nut, for figure 10a.	40726
12	Stop, for figure 10a.	40713
13	Bracket Stud, for figure 10a.	40714
14	Relay Upper Core Plate, for Models C-2 Flashing Time Elements, C-3 Flashing Time Relays, C-5 Neutral Relays and C-6 Interlocking Relays.	40715
15	Flasher Lower Core Plate, for Models C-1 Flashers, C-2 Flashing Time Elements and C-3 Flashing Time Relays.	40517
16	Flasher Upper Core Plate only, for Models C-1 Flashers, C-2 Flashing Time Elements and C-3 Flashing Time Relays.	40518
16a	Flasher Upper Core Plate assembly, for Models C-1 Flashers, C-2 Flashing Time Elements and C-3 Flashing Time Relays. (1 figure 16, 2 figures 17 and 2 figures 18)	40518X
17	Round Head Brass Machine Screw, for figure 16a.	004020
18	Hexagon Brass Nut, for figure 16a.	003010
19	Flat Head Brass Machine Screw, for figures 14 and 16.	004010
20	Round Head Brass Machine Screw, for holding top plates (figures 1, 3, 5 and 7) to glass shields.	004004
21	Round Head Brass Machine Screw, for figure 9.	004043
22	Lock Washer, for figure 21.	002001
23	Lock Plate, for figure 22.	40543

SOUTHERN SIGNAL CORPORATION

Plate E-92



SOUTHERN SIGNAL CORPORATION

Plate E-92

Model C Relay Parts

Order by Plate, Figure and Name

FIG.	NAME AND DESCRIPTION	DWG. No.
1	Flasher Yoke only, or Models C-1 Flashers, C-2 Flashing Time Elements and C-3 Flashing Time Relays.	40549
1a	Flasher Yoke complete, for Model C-1 Flashers. (1 figure 1, 1 figure 2 and 2 figures 3)	40549X
2	Name Plate, for Model C-1 Flashers.	40550
3	Brass Escutcheon Pin, for figures 2, 5, 5a, 5b and 5C.	012005
4	Relay Yoke only, for Models C-2 Flashing Time Elements, C-3 Flashing Time Relays, C-5 Neutral Relays and C-6 Interlocking Relays.	40718
4a	Relay Yoke Complete, for Model C-2 Flashing Time Elements. (2 figures 3, 1 figure 4 and 1 figure 5.)	40642X
4b	Relay Yoke complete, for Model C-3 Flashing Time Relays. (2 figures 3, 1 figure 4 and 1 figure 5a)	40566X
4c	Relay Yoke complete, for Model C-5 Neutral Relays. (2 figures 3, 1 figure 4 and 1 figure 5b)	40718X
4d	Relay Yoke complete, for Model C-6 Interlocking Relays. (2 figures 3, 1 figure 4 and 1 figure 5c)	40812X
5	Name Plate, for Model C-2 Flashing Time Elements.	40642
5a	Name Plate, for Model C-3 Flashing Time Relays.	40566
5b	Name Plate, for Model C-5 Neutral Relays.	40719
5c	Name Plate, for Model C-6 Interlocking Relays.	40812
6	Flasher End Core, for Model C-1 Flashers, C-2 Flashing Time Elements and C-3 Flashing Time Relays.	40520X
7	Flasher Center Core, for Models C-1 Flashers, C-2 Flashing Time Elements and C-3 Flashing Time Relays.	40521X
8	Flasher Adjusting Armature, for Models C-1 Flashers, C-2 Flashing Time Elements and C-3 Flashing Time Relays.	40522
9	Round Head Brass Machine Screw, for Figure 8.	004012
10	Flasher Armature complete, for Models C-1 Flashers, C-2 Flashing Time Elements and C-3 Flashing Time Relays.	40532X
11	Stop Pin, for figure 10.	40533
12	Flasher Armature Support, for Models C-1 Flashers, C-2 Flashing Time Elements and C-3 Flashing Time Relays.	40529
13	Flasher Trunnion, for Models C-1 Flashers, C-2 Flashing Time Elements and C-3 Flashing Time Relays.	40530
14	Trunnion Key for figure 13.	40531
15	Relay Core, for Models C-2 Flashing Time Elements, C-3 Flashing Time Relays, C-5 Neutral Relays and C-6 Interlocking Relays.	40716X
16	Relay Armature only, for Models C-2 Flashing Time Elements, C-3 Flashing Time Relays and C-5 Neutral Relays.	40720X
17	Stop Screw, for figures 16 and 23.	40722
18	Stop Screw Nut, for figures 16 and 23.	40736
19	Nut Lock for figure 20.	40725
20	Relay Armature Bracket, for Models C-2 Flashing Time Elements, C-3 Flashing Time Relays, C-5 Neutral Relays and C-6 Interlocking Relays.	40724
21	Relay Trunnion, for Models C-2 Flashing Time Elements, C-3 Flashing Time Relays, C-5 Neutral Relays and C-6 Interlocking Relays.	40723
22	Brass Spring Cotter, for figures 21 and 72.	001005
23	Interlocking Relay Armature only, for Model C-6 Interlocking Relays.	40807X
24	Locking Arm, for Model C-6 Interlocking Relays.	40808

SOUTHERN SIGNAL CORPORATION

Plate E-92

Model C Relay Parts

Order by Plate, Figure and Name

FIG.	NAME AND DESCRIPTION	DWG. No.
25	Lock Washer, for figures 26, 58, 67 and 69.	002007
26	Round Head Brass Machine Screw, for figure 24.	004024
27	Locking Dog only, for Model C-6 Interlocking Relays.	40809
27a	Locking Element complete, for Model C-6 Interlocking Relays. (1 figure 27, 2 figures 28, 1 figure 29, 3 figures 30 and 1 figure 31)	40809X
28	Counterweight, for Model C-6 Interlocking Relays.	40810
29	Locking Bracket for Model C-6 Interlocking Relays.	40811
30	Pin for figure 29.	012010
31	Round Head Brass Machine Screw, for figure 29.	004042
32	Flasher Magnet Coil, for Models C-1 Flashers, C-2 Flashing Time Elements and C-3 Flashing Time Relays. (specify resistance per coil)	40525
33	Nut for cores, figures 6, 7 and 15.	003009
34	Cork washer, for figures 32, 37 and 37a.	40524
35	Coil Support, for Models C-1 Flashers, C-2 Flashing Time Elements and C-3 Flashing Time Relays.	40523
36	Retarding Sleeve, for Models C-1 Flashers, C-2 Flashing Time Elements C-3, Flashing Time Relays and C-5 Slow Releasing Neutral Relays.	40568
37	Relay Magnet Coil, for Models C-2 Flashing Time Elements, C-3 Flashing Time Relays, C-5 Regular Releasing Neutral Relays and C-6 Interlocking Relays.	40717
37a	Relay Magnet Coil, for Model C-5, Slow Releasing Neutral Relays.	40737
38	Terminal Post, for Models C-1 Flashers, C-2 Flashing Time Elements, C-3 Flashing Time Relays, C-5 Neutral Relays and C-6 Interlocking Relays.	40550
39	Clamp Nut, for figures 38, 45 and 90.	10429
40	Lock Washer, for figures 38, 45 and 46.	002001
41	Lock Plate, for figures 38, 45 and 46.	40543
42	Base Nut, for figures 38, 45, 46 and 47.	40541
43	Terminal Washer, for figures 38, 45 and 47.	10431
44	Binding Nut, for figures 38 and 47.	10430
45	Binding Post, for connecting magnet coils.	004035
46	Plug Screw, for closing idle terminal post holes.	004015
47	Contact Post with clamp nut, lock washer and lock plate, for Models C-1 Flashers, C-2 Flash-Time Elements, C-3 Flashing Time Relays, C-5 Neutral Relays, and C-6 Interlocking Relays.	40542AX
48	Round Head Brass Machine Screw for figures 47 and 55 with carbon contacts.	004013
48a	Round Head Brass Machine Screw, for figure 47 with silver contact.	004027
49	Lock Washer, for figures 48 and 48a.	002004
50	Contact Washer, for figures 47 and 55.	40548
51	Carbon Contact, for figures 47 and 55.	40547-1
52	Silver Contact, for figure 47.	40545AX
53	Upper Time Contact, for Models C-2 Flashing Time Elements, and C-3 Flashing Time Relays.	40601X
54	Silver Lower Time Contact, for Models C-2 Flashing Time Elements and C-3 Flashing Time Relays.	40603AX
55	Carbon Lower Time Contact Stirrup, for Models C-2 Flashing Time Elements, and C-3 Flashing Time Relays.	40604A
56	Time Contact Finger, for Figure 54.	40606AX
56a	Time Contact Finger, for Figure 55.	40641X
57	Flasher Contact Finger, for Models C-1 Flashers, C-2 Flashing Time Elements and C-3 Flashing Time Relays.	40534X

SOUTHERN SIGNAL CORPORATION

Plate E-92

Model C Relay Parts

Order by Plate, Figure and Name

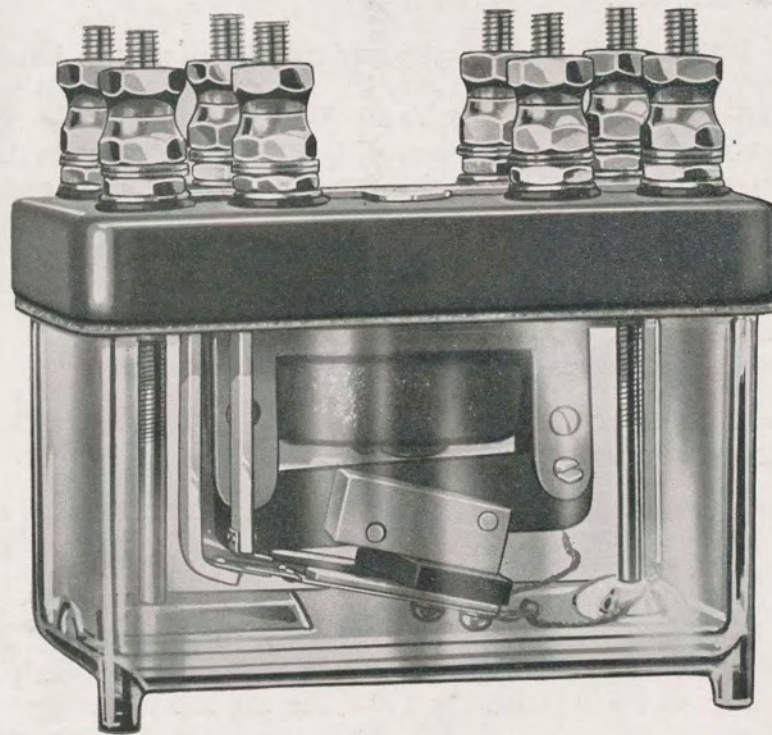
FIG.	NAME AND DESCRIPTION	DWG. No.
58	Insulating Stud for Figures 57, 60, 60a, 61, 62 and 63.	40528X
59	Hexagon Brass Nut, for Figures 58 and 69.	003010
60	Silver Front and Back Contact Finger, for Models C-3 Flashing Time Relays, C-5 Neutral Relays and C-6 Interlocking Relays.	40727X
60a	Special Clutch Magnet Silver Front and Back Contact Finger, for Model C-3 Flashing Time Relays.	40727-2X
61	Silver Front Contact Finger, for Models C-3 Flashing Time Relays, C-5 Neutral Relays and C-6 Interlocking Relays.	40728X
62	Carbon Front and Back Contact Finger, for Models C-3 Flashing Time Relays, C-5 Neutral Relays and C-6 Interlocking Relays.	40727-1X
63	Carbon Front Contact Finger, for Models C-3 Flashing Time Relays, C-5 Neutral Relays and C-6 Interlocking Relays.	40728-1X
64	Long Terminal complete, for Figure 57.	40739X
65	Short Terminal complete, for Figure 57.	40738X
66	Driving Lever, for Models C-2 Flashing Time Elements and C-3 Flashing Time Relays.	40632AX
67	Round Head Brass Machine Screw, for figures 66 and 68.	004006
68	Latch complete, for Model C-2 Flashing Time Elements.	40638X
69	Counterweight Stud, for Model C-3 Flashing Time Relays.	40552
70	Stud Insulator, for figure 69.	40553
71	Counterweight, for Model C-3 Flashing Time Relays.	40551
72	Time Element Mechanism complete, for Models C-2 Flashing Time Elements and C-3 Flashing Time Relays. (1 Figure 22, 1 Figure 73, 1 Figure 74, 1 Figure 75, 1 Figure 76, 1 Figure 77 and 1 Figure 78)	40623AX
73	Driving Arm complete with pawl, for figure 72.	40627X
74	Ratchet Wheel complete with pinion, for figure 72.	40626X
75	Main Shaft and Gear, for figure 72.	40624X
76	Operating Arm complete with gear and pinion for figure 72.	40617X
77	Time Element Bracket complete for Figure 72.	40609X
78	Round Head Brass Machine Screw, for Figure 72.	004023
79	Clutch Coil, for Model C-3 Flashing Time Relays.	40555X
80	Clutch Yoke complete, for figure 79.	40562X
81	Clutch Armature complete with Trunnions, for Figure 79.	40558X
82	Adapter, for figure 79.	40554
83	Armature Stop, for figure 79.	40564
84	Small Latch, for figure 79.	40559
85	Round Head Brass Machine Screw, for figures 83 and 84.	004018
86	Lock Washer, for figure 85.	002005
87	Round Head Brass Machine Screw, for figure 79.	004022
88	Plug Screw with nut and washers, for Model C-2 Flashing Time Elements.	40643X
89	C. M. Connector, for Model C-3 Flashing Time Relays.	40572
90	Adjusting Screw only, for Models C-2 Flashing Time Elements and C-3 Flashing Time Relays.	40634
90a	Adjusting Screw complete, for Models C-2 Flashing Time Elements and C-3 Flashing Time Relays. (2 figures 39, 1 figure 90, 1 figure 91, 1 figure 92, 1 figure 93 and 1 figure 94)	40634X
91	Plunger, for figure 90a.	40635
92	Adjusting Screw Sleeve, for Figure 90a.	40633
93	Special Nut, for figure 90a.	40637
94	Pin, for figure 90a.	40636

SOUTHERN SIGNAL CORP.



LOUISVILLE, KY. U.S.A.

MODEL D-1 A. C. POWER TRANSFER RELAY



MANUFACTURED BY
LOUISVILLE FROG, SWITCH & SIGNAL COMPANY
INCORPORATED
LOUISVILLE, KENTUCKY



March 1, 1930

Bulletin No. 8 A

Model D-1 A. C. Power Transfer Relay

A new "Power Off Relay" that meets A. R. A. specification 14830. Its design is such that it positively will not stick up when the power is cut off. It is silent in operation; the A. C. hum is almost inaudible.

The demand for an alternating current power transfer relay is no less than it has been, in fact it is probably greater now than before, but the performance of these relays in the past has not been all that the railroads required. We have been working diligently, for the past several years, trying to build a good relay, of this type, and when the A. R. A. specifications were made known we immediately considered them and incorporated them into our models. The Model D-1 A. C. Power Transfer Relay is the final result of our labors.

It has two front and two back dependent silver to silver contacts. They are of very heavy silver, have a large contact area and our tests have shown that they will carry considerably more than the A. R. A. requirement of fifteen amperes at fifteen volts. They have ample slide and better than one ounce pressure per contact.

There are eight standard 14-24 binding posts, one for each contact, contact connector and coil lead. Proper clearances are maintained throughout.

The power consumption roughly is about one watt, this varies with relays wound for different frequencies and voltages. For 25 cycles 8 volts it is .85 watt; for 60 cycles 15 volts it is 1.1 watts; and for 100 cycles 10 volts, 1.5 watts. The volt-ampere consumption for 25 cycles 8 volts is 2; for 60 cycles 15 volts, 2.2; and for 100 cycles 10 volts, 3.15. These values are given to show how the power values run. Space does not permit to list all the possible combinations of voltages and frequencies but we are prepared to furnish data for relays wound for any particular frequency and voltage, to 100 cycles and 220 volts.

The relay will operate in a normal manner at 85% of the rated voltage and the pick-up and dropaway are well within the limits set in the specification.

It is very small, compact and simple in construction with the least possible number of parts. Yet nothing has been omitted. It is $4\frac{1}{2}$ " high, $4\frac{1}{8}$ " wide and $2\frac{1}{8}$ " deep. A shipping screw is provided to hold the armature during shipment and the relay is sealed so that it cannot be adjusted without breaking the seals.

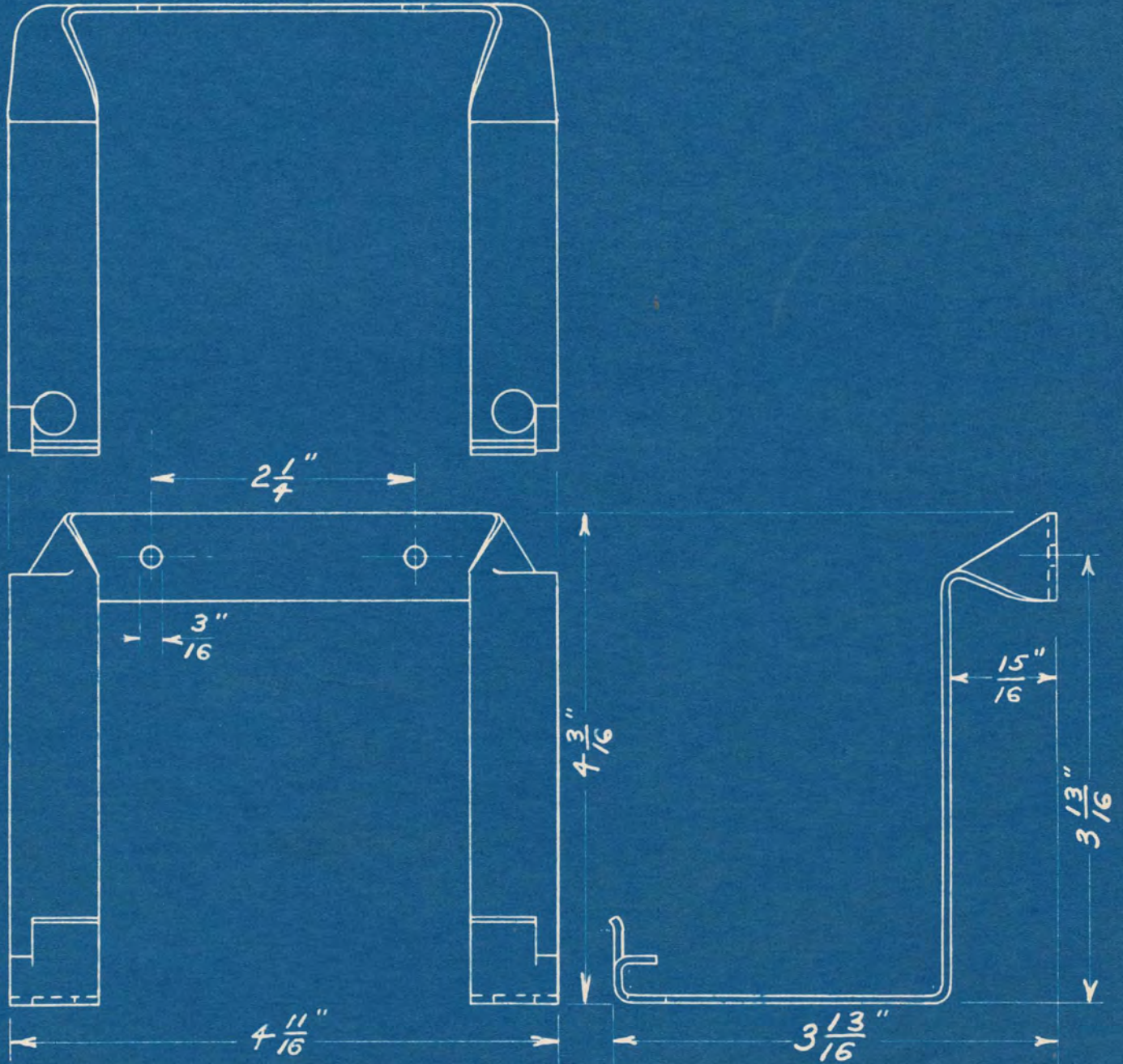
The relay is enclosed in a clear pressed glass shield and rendered moisture proof by a cork gasket. The top plate is of porcelain, coated with a durable black rubber finish enamel. The terminal posts and other brass parts are nickel plated. The iron core and armature are lacquered black and the contact springs, which are of phosphor bronze are coated with clear lacquer.

When ordering specify operating voltage and frequency. We can supply relays wound for any voltage up to and including 220 volts and any frequency to 100 cycles inclusive.

LOUISVILLE FROG, SWITCH AND SIGNAL COMPANY

SPRING HANGER (WALL BRACKET)

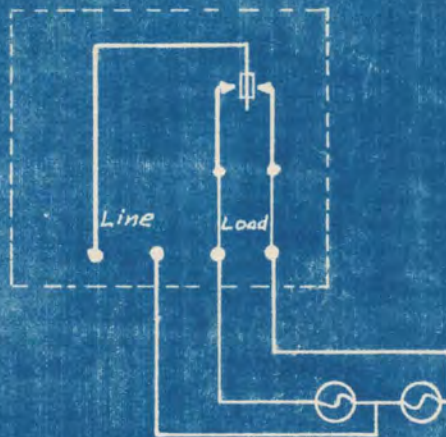
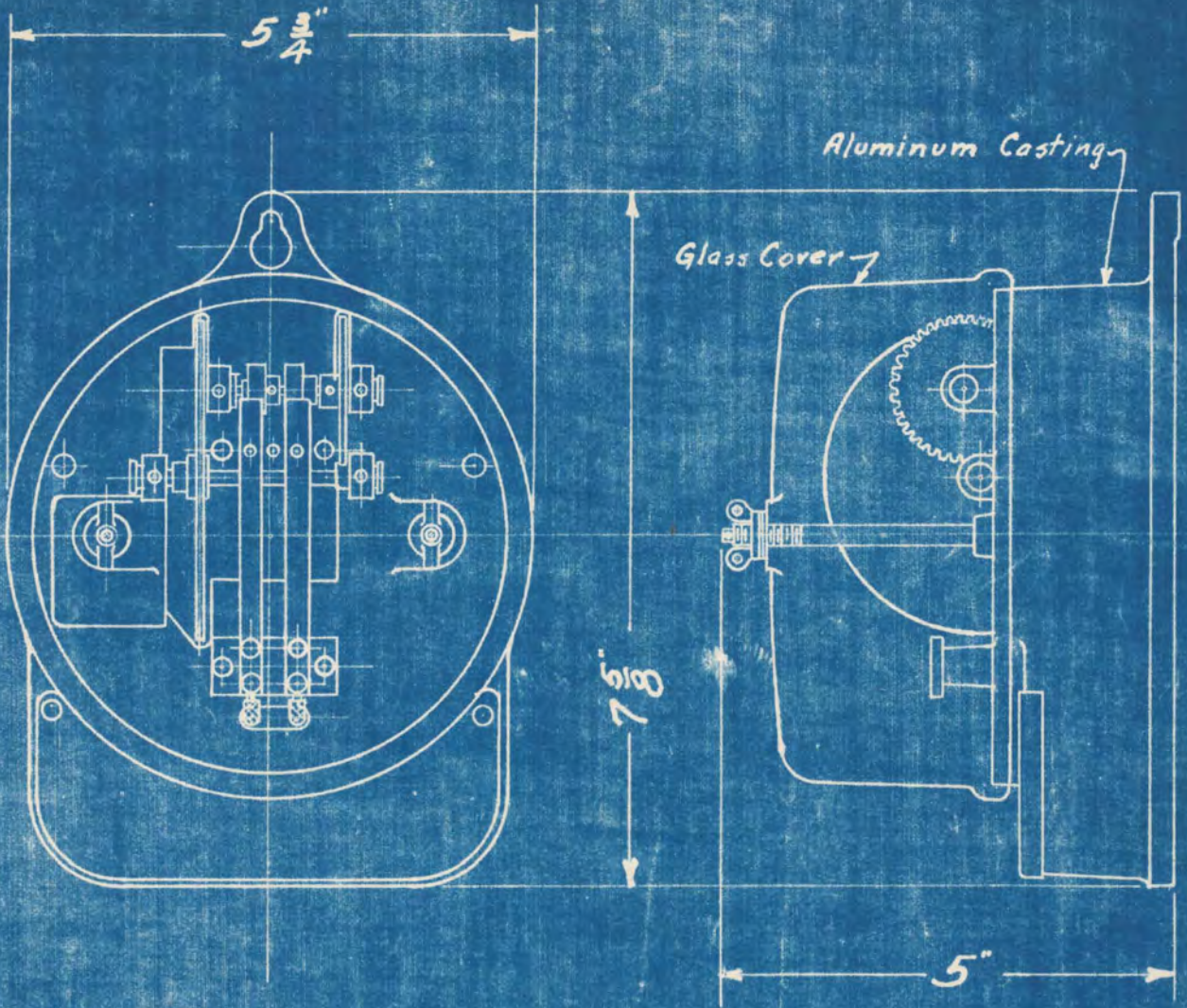
For mounting Model D-1 Power Transfer Relays on walls.



NICKEL PLATED

DRAWING No. 41329

LOUISVILLE FROG SWITCH & SIGNAL CO. LOUISVILLE, KY.



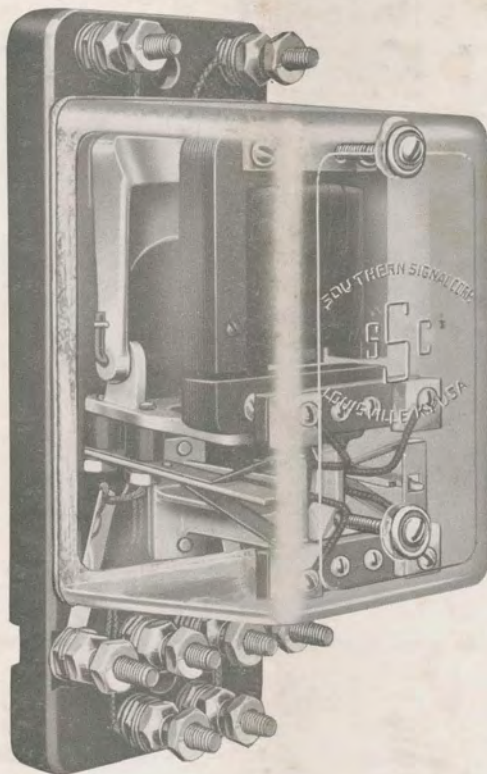
Operates on $3\frac{1}{2}$ Watts
Adjustable 10 To 45 Flashes
Contacts Handle 500 Watts Each



BP 8-B

TYPE HP-1
110VOLT A.C. FLASHER

MODEL B-I A. C. LIGHTING RELAY



SOUTHERN SIGNAL CORPORATION

Incorporated

LOUISVILLE, KENTUCKY, U. S. A.

NOW

LOUISVILLE FROG, SWITCH & SIGNAL CO.

Incorporated

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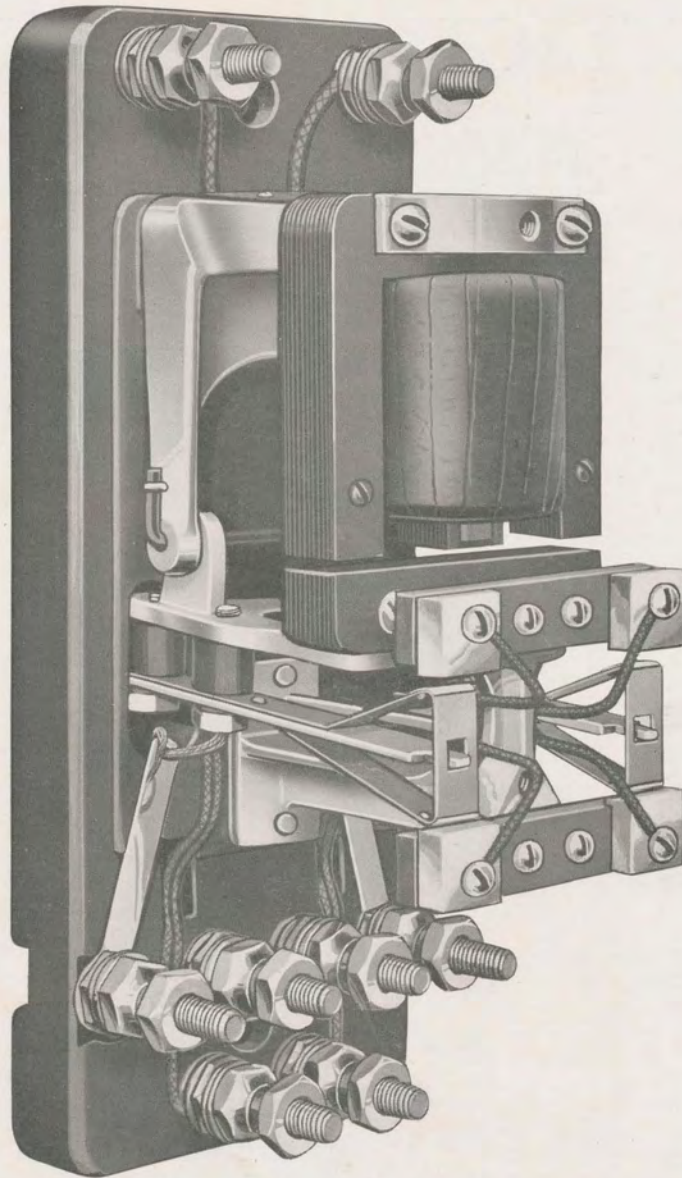
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1944 Railway Exchange Bldg.,
St. Louis, Mo.



March 15, 1928

Bulletin No. 8



Model B-1 Lighting Relay with glass shield removed.

Model B-1 Lighting Relay

An alternating-current lighting relay, (quite frequently called a "power off" relay) when used in conjunction with a floating battery system allows the lights of highway-crossing signals, block signals or other apparatus to be lighted from the alternating-current source and in case of a power failure connects the lights with the storage battery. Normally the relay is held up by the alternating-current and supplies A. C. to the lights through its front contacts but upon failure of the A. C. the relay drops and supplies D. C. from the storage battery through its back contacts. As soon as the A. C. power returns the relay picks-up and the lights are again lighted from the A. C. source.

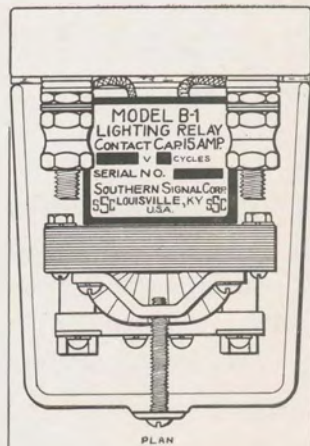
Modern electrically lighted signals require more current than the old oil lamp type and it has been found much more economical to use A. C. for the lights, where available, as it is cheaper than rectified current and a much smaller storage battery and rectifier can be used. Without the "power off" relay however reliable service cannot be expected as no power line is free from storms, sleet, or power plant and transformer trouble.

Durability, reliability and economical operation are three attractive features of the Model B-1 Lighting Relay. It is noiseless and the power necessary to operate the relay is very low, varying according to the voltage and frequency of the current, from five tenths (.5) to one watt. The relay was designed to operate in a vertical position and we recommend that it be used in this manner although it can be used when placed horizontally. The contacts have a safe carrying capacity of fifteen amperes, which will take care of all ordinary requirements. They have a large opening, heavy pressure and ample slide. The solid type contact spring in combination with the curved contact block forms a contact having unusually low resistance. The relay is easily installed as all jumpers are visible and binding posts are in the same relative position as the contacts and heel connections. Deep recesses in the base for the terminal post heads assure freedom from grounds.

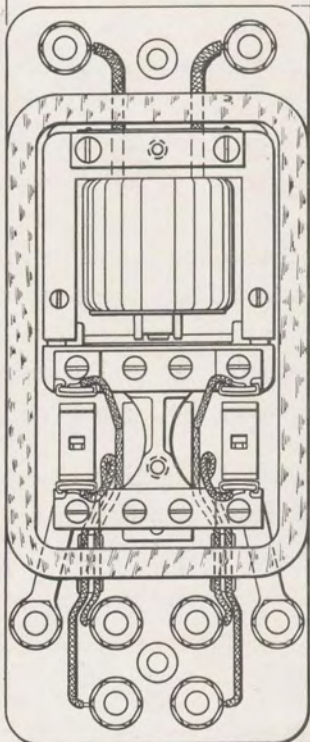
Good material and workmanship only enter into the Model B-1 Lighting Relay. The base is of porcelain and all parts, except the terminals are enclosed in a dust proof glass case. All current carrying parts have standard A. R. A. clearances and each relay has a large etched name plate giving all necessary data pertaining to the instrument.

SOUTHERN SIGNAL CORPORATION

Plate E-100



$3\frac{1}{4}$ "



8"

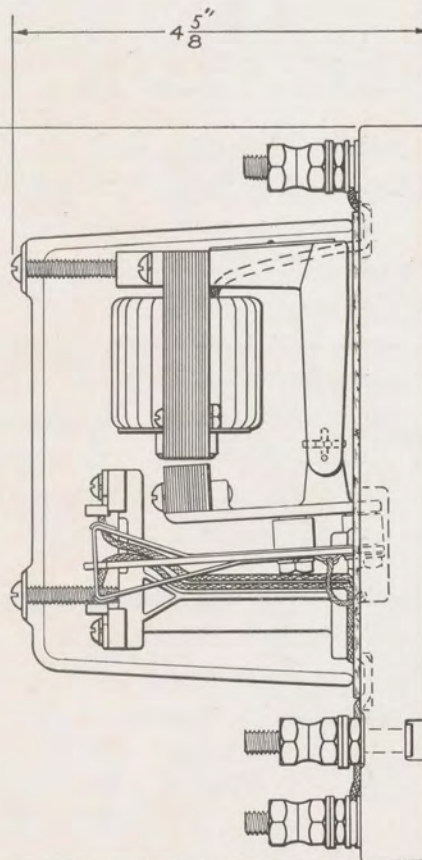


Plate E-100

Model B-1 Lighting Relay

Can be furnished for operation on alternating current of any voltage up to and including 220 volts of any frequency, but the following voltages and frequencies are standard and are carried in stock. Others are special and are made to order only.

Voltages, 6-8, 8-10, 10-12, 12-15, 20, 110 and 220.

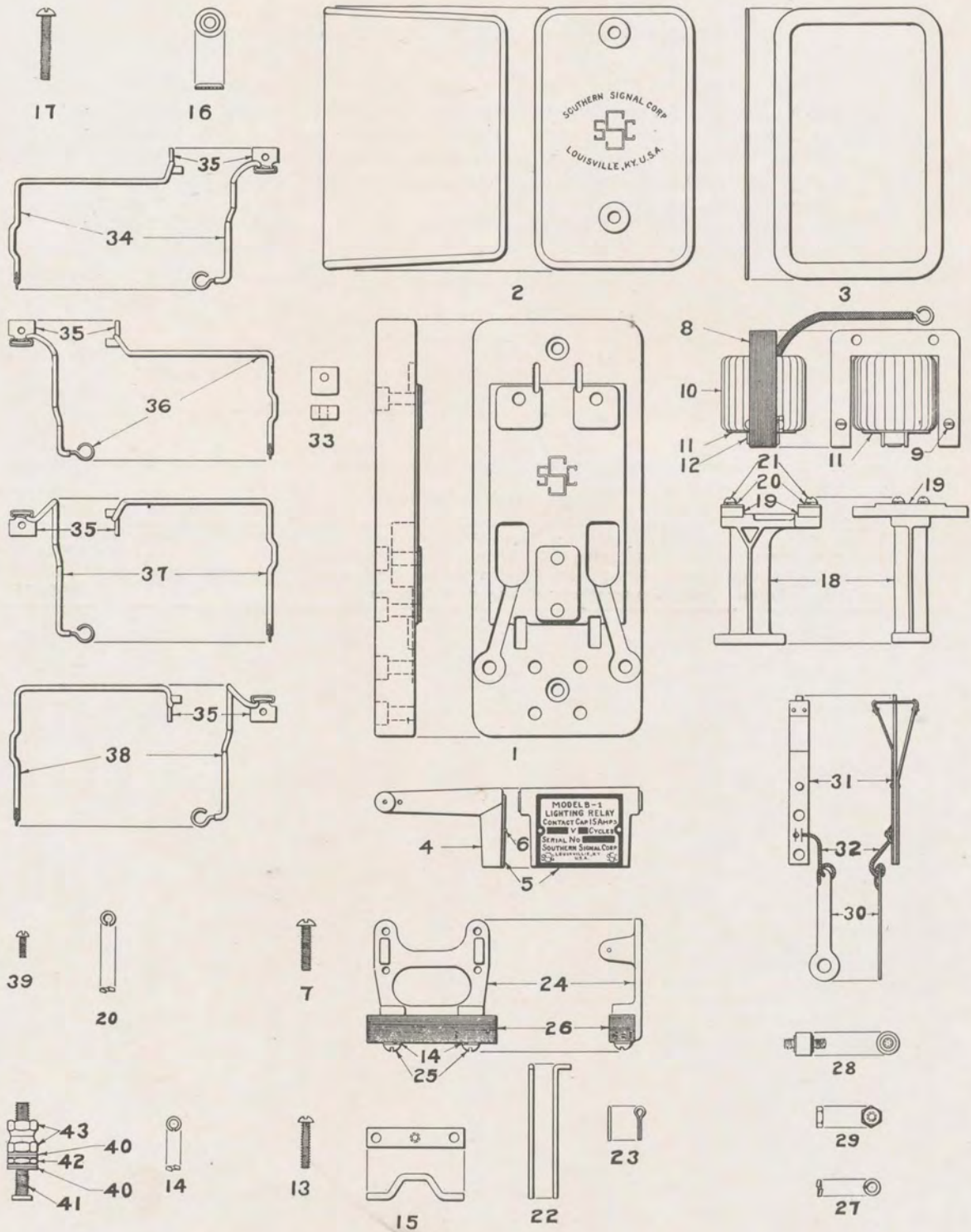
Frequencies, 25, 40, 60 and 100 cycles.

Contacts are regularly furnished silver to silver or silver to carbon but other combinations can be furnished if specified on order.

Order by Plate, Figure and Name

FIG.	NAME AND DESCRIPTION	DWG. NO.
A	Model B-1 A. C. Lighting Relay, two front and two back non-independent silver to silver contacts. Specify operating voltage and frequency	40900
A-1	Model B-1 A. C. Lighting Relay, two front and two back non-independent silver to carbon contacts. Specify operating voltage and frequency	40900-25

Plate E-101



SOUTHERN SIGNAL CORPORATION

Plate E-101

Model B-1 Lighting Relay Parts

Order by Plate, Figure and Name

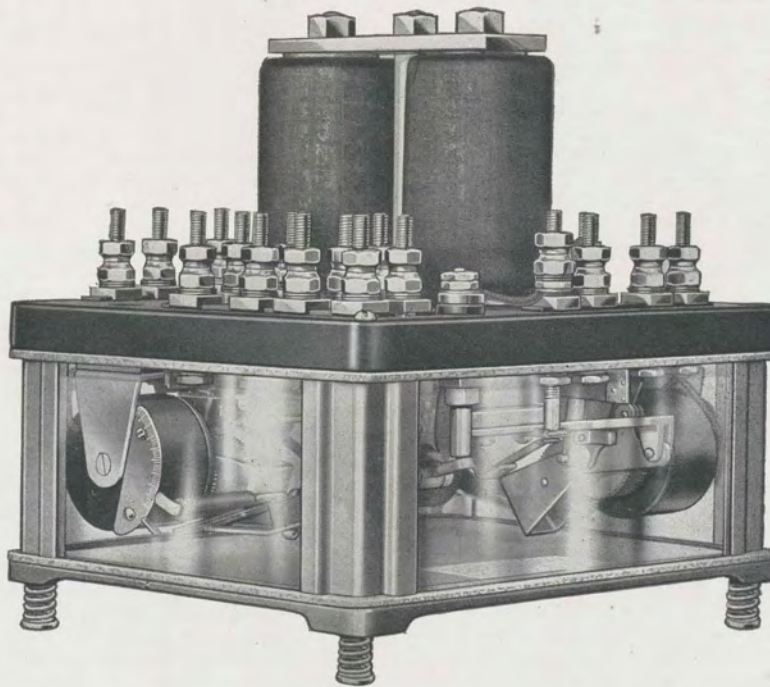
FIG.	NAME AND DESCRIPTION	DWG. NO.
1	Base.	40901
2	Cover.	40916
3	Gasket.	40917
4	Core Support only.	40905
4a	Core Support complete. (1 figure 4, 1 figure 5 and 2 figures 6).	40905X
5	Name Plate.	40902
6	Escutcheon Pin, for name plate.	012005
7	Round Head Brass Machine Screw, for figures 4 and 18.	004017
8	Laminated Core, complete with machine screws, nuts and lock washers	40906X
8a	Magnet complete, specify operating voltage and frequency. (1 figure 8, 2 figures 9, 1 figure 10, 1 figure 11 and 1 figure 12).	40907X
9	Round Head Iron Machine Screw with lock washer and hexagon iron nut	004025X
10	Magnet Coil, specify operating voltage and frequency.	40907
11	Coil Washer.	40918
12	Shading Coil.	40908
13	Round Head Brass Machine Screw, for figures 8 and 15.	004020
14	Lock Washer, for figures 13, 15, 25 and 26.	002006
15	Cover Strap.	40904
16	Asbestos Washer, for cover, figure 2.	40924
17	Round Head Brass Machine Screw for figures 2 and 16.	004004
18	Contact Support only.	40903
18a	Contact Support complete. (1 figure 18, 2 figures 19, 4 figures 20 and 4 figures 21).	40903X
19	Contact Insulator.	40914
20	Lock Washer, for figures 19, 21, 35 and 39.)	002004
21	Round Head Brass Machine Screw for figures 18 and 19.	004013
22	Trunnion.	40911
23	Brass Spring Cotter.	001005
24	Armature Bracket only.	40910A
24a	Armature complete. (2 figures 14, 1 figure 24, 2 figures 25 and 1 figure 26.)	40910AX
25	Round Head Brass Machine Screw, for figures 24 and 26.	004021
26	Laminated Armature.	40909X
27	Lock Washer, for figures 28 and 29.	002007
28	Insulating Stud, for figures 24 and 31.	40528X
29	Hexagon Brass Nut, for figure 28.	003010
30	Terminal complete with flexible connector.	40923X
31	Contact Finger complete with terminal and flexible connector.	40912AX
32	Flexible Connector.	40923
33	Carbon Contact Block.	40547
34	Upper Left Connector with silver contact block.	40919AX
34a	Upper Left Connector for use with carbon contact figure 33.	40919
35	Silver Contact Block only.	40545AX
36	Upper Right Connector with silver contact block.	40920AX
36a	Upper Right Connector for use with carbon contact figure 33.	40920
37	Lower Right Connector with silver contact block.	40922AX
37a	Lower Right Connector for use with carbon contact figure 33.	40922
38	Lower Left Connector with silver contact block.	40921AX
38a	Lower Left Connector for use with carbon contact figure 33.	40921
39	Round Head Brass Machine Screw for figures 19 and 35.	004016
40	Terminal Washer.	10431
41	Terminal Post.	10427
42	Clamp Nut.	10429
43	Binding Nut.	10430

SOUTHERN SIGNAL CORP.



LOUISVILLE, KY. U.S.A.

A NEW AUTOMATIC TIME RELEASE



PATENT No. 1864255
OTHER PATENTS PENDING

PEERLESS MANUFACTURING CORPORATION

INCORPORATED

LOUISVILLE, KENTUCKY

SUCCESSOR TO LOUISVILLE SWITCH AND SIGNAL CO. AND PEERLESS MFG. CO.

OCT. 15, 1933

Bulletin No. 11-A

(SUPERSEDES L. F. S. & S. CO. BULLETIN No. 11)

Model C-7 Automatic Time Release

This new instrument, known as the Model C-7 Automatic Time Release, was designed to replace time releases of various types used in connection with manually, or automatically, controlled interlocking, or other signal arrangements, regardless of the types of machine or controlling devices used; also for use in connection with highway crossing protection, automatic train control, or where it is desired to introduce one or more intervals of time.

The Automatic Time Release is an ideal device to use at interlockings for the following reasons:

1. It is economical, because only one release is required for two routes, providing a long and short time intervals for each route.
2. It is economical, because the operator is not required to start the release or return it to the normal position, thus giving him more time to manipulate the machine and attend to other duties.
3. It saves train delays, as the time interval starts immediately upon the return of the signal involved to the normal position; therefore the minimum time for the safe release of the signal is provided, the instrument being adjusted to provide the proper time interval for that signal.
4. Operators need not be instructed as to its operation; a visual or audible indication may be given when lever can be returned to full normal position, if desired.
5. This Automatic Time Release may be substituted for mechanical releases by making a few slight changes in the circuits, whether or not lock stick relays are used.

APPLICATION

At automatic interlockings, it may be so arranged that a pre-determined time interval will elapse before a signal will return to stop, and a further pre-determined time interval will elapse before a conflicting signal will clear, or indicate proceed, for the train on the intersecting line. In such a case it is suggested that a slow speed signal be displayed, or that time table instructions be placed in effect governing movement through the automatic interlocking.

The Automatic Time Release may be used advantageously, to introduce time intervals at special signal locations, such as remotely controlled interlocking, cabin door interlocking, half automatic interlocking, and arrangements having hand throw switches and interlocked signals. It should prove particularly desirable where employes of other departments manipulate the apparatus for control of signals and switches.

At highway crossings, where warning signals and devices are located, the Automatic Time Release may be used to cut out the warning after a pre-determined time, where long station stops, switching, etc., cause the warning to be given improperly or for a longer time than is necessary. It may also be used to reduce the warning time for slow freight trains where the length of track required by fast trains makes this warning for slow freight trains too long.

In train control territory, and at other locations where it is desired that trains reduce speed when approaching draw bridges, dangerous curves, grades and other locations where reduced speed is necessary, the Automatic Time Release may be used to select a more restrictive signal indication in the cab, or wayside signals, or the train control system may be changed to give a more restrictive speed.

CONSTRUCTION

Each of these instruments is equipped with a motivator, which operates the two timing elements, independently of each other, and simultaneously, and holds the contacts of each timing element in the full reverse position upon completion of the time periods until the energizing circuit is broken and the magnetic clutch on the timing element is released.

Each timing element has a set of primary and secondary contacts, so called because the primary contacts are operated at the beginning of the first time interval, and the secondary contacts are operated at the end of the time intervals. The primary contacts are adjustable with respect to the secondary contacts, so that the elapsing period between the operation of the former and latter may be varied from fifteen seconds to seven minutes. These adjustments are made from the outside of the instrument and seals may be applied after adjustments have been made.

The primary contacts of each timing element consist of two independent normally closed contacts, one of which has in addition a non-independent normally open contact which closes thirty seconds after its normally closed contact has opened. This time may be varied but adjustment can be made only by opening the instrument and re-adjusting the contacts. Variation in time between the operation of the primary and secondary contacts does not affect the short time interval. The secondary contacts include two non-independent normally closed and normally open contacts.

Sufficient contacts are provided to check that all time elements are in full normal position.

This Automatic Time Release is constructed quite similar to a standard signal relay and A. R. A. specifications have been adhered to. There are of course a number of parts and characteristics for which there are no standard specifications.

The instrument may be operated by distant signal battery in multiple with the lever lock, thus making it unnecessary to have a source of power for operating the release at the tower. The instrument is made to operate on standard voltages, with direct current or rectified alternating current.

CABLE TERMINAL BOXES
CABLE POSTS
RELAY BOXES
RELAY & BATTERY CASES
PARTS



LOUISVILLE FROG, SWITCH & SIGNAL Co.

INCORPORATED

SUCCESSOR TO

SOUTHERN SIGNAL CORPORATION

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February 15, 1928

Bulletin No. 4B



Model A, Cable Terminal Box.

Model A Cable Terminal Box

DESIGNED to meet the constantly growing demand for a cable terminal box (something durable yet inexpensive) for use at locations where a signal is located on the opposite side of the track from the pole line, at switches, and at other locations where the line is broken but where housings large enough for relays are not required.

The Model A Cable Terminal Box is placed in the middle of the cable post forming a straight path for the wires, thus eliminating all the troublesome and undesirable bends resulting from other methods of attaching the box. Another advantage is, the water shield over the door, which should meet with the approval of every practical signalman. It is a well known fact that it is practically impossible to keep water out without a shield even though the crevice between the box and door is sealed with a good packing, and we use the best obtainable for this purpose. The box is very roomy, being sufficiently large to take care of any ordinary installation without crowding the terminal blocks or lightning arrestors. It measures $5 \times 7\frac{1}{2} \times 23$ inches inside, was designed to take twelve large type lightning arrestors but is capable of holding more if necessary. If the smaller type arrestors or terminal blocks are used many more may be added. The terminal board is made of soft wood, clear of knots, to prevent the possibility of twisting off the screws in fastening the terminals to it, is well seasoned and coated with black insulating varnish. Brass machine screws are used to fasten it to the box, as they will not rust to the box, so that the board may be removed when necessary.

While the initial cost of a cable post with a terminal box is slightly more than a regular cable post it is nevertheless economical to use, as it is not necessary to renew the whole cable when the lower end becomes damaged, but only that part below the terminals, in the box. Another way in which the Model A Cable Terminal Box will save the user money is in providing a housing for lightning arrestors, for in many cases where regular cable posts are used it is necessary to install extra housings for them. Much of the signalman's time is also saved as testing can be done more quickly and better at the terminal box than on the pole.

The Model A Cable Terminal Box is very durable being made almost entirely of cast iron (which is noted for its rust resisting qualities) reinforced with four large through bolts. It is covered inside and out with a good black paint and is very neat in appearance.

We manufacture the Model A Cable Terminal Box in several sizes, to fit any size cable post. We also manufacture cable posts with terminal boxes and recommend their use for new work. Where regular cable posts are in service, and it is desired to add the terminal boxes, it is more economical to buy the boxes only and install them in the field. This is done by cutting two feet out of the posts and sulphuring the ends into the terminal boxes.

Plate F-1

Model A Cable Terminal Box

Order by Plate, Figure and Name

FIG.	NAME AND DESCRIPTION	DWG. NO.
A	Model A-1 Cable Terminal Box complete, for 3½" cable post. (Measuring 4" outside diameter.)	50200
A-1	Model A-2 Cable Terminal Box, complete for 3" cable post. (Measuring 3½" outside diameter.)	50200-1

PARTS

1	Upper Sleeve, for 3½" cable post. (Measuring 4" outside diameter.)	50201
1a	Upper Sleeve, for 3" cable post. (Measuring 3½" outside diameter.)	50209
2	Lower Sleeve, for 3½" cable post. (Measuring 4" outside diameter.)	50202
2a	Lower Sleeve, for 3" cable post. (Measuring 3½" outside diameter.)	50210
3	Box.	50203
4	Door only.	50204
4a	Door complete. (1 figure 4 and 1 figure 5.)	50204X
5	Packing, for door.	50205
6	Gasket.	50206
7	Packing Ring.	50207
8	2½ pounds of Ground Sulphur. (Enough for one Cable Terminal Box.) (Not furnished with Cable Terminal Boxes, figures A or A-1.)	
9	Terminal Board.	50208
10	Hinge Ear.	10205
11	Eye Bolt only.	10207
11a	Eye Bolt complete. (1 figure 10, 1 figure 11 and 1 figure 18.)	10207X
12	Nut, for hasp.	10208
13	Hasp only.	10209
13a	Hasp complete. (1 figure 12, 1 figure 13 and 1 figure 17.)	10209X
14	Through Bolt.	006005
15	Square Nut, for through bolt.	003014
16	Washer, for through bolt.	005004
17	Button Head Rivet, for hasp.	008001
18	Button Head Rivet, for hinge ear.	008002
19	Lock Washer, for hinge ear.	002001
20	Hexagon Head Cap Screw, for hinge ear.	009001
21	Round Head Brass Machine Screw, for terminal board.	004034
22	Washer, for terminal board.	005005

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Plate F-2

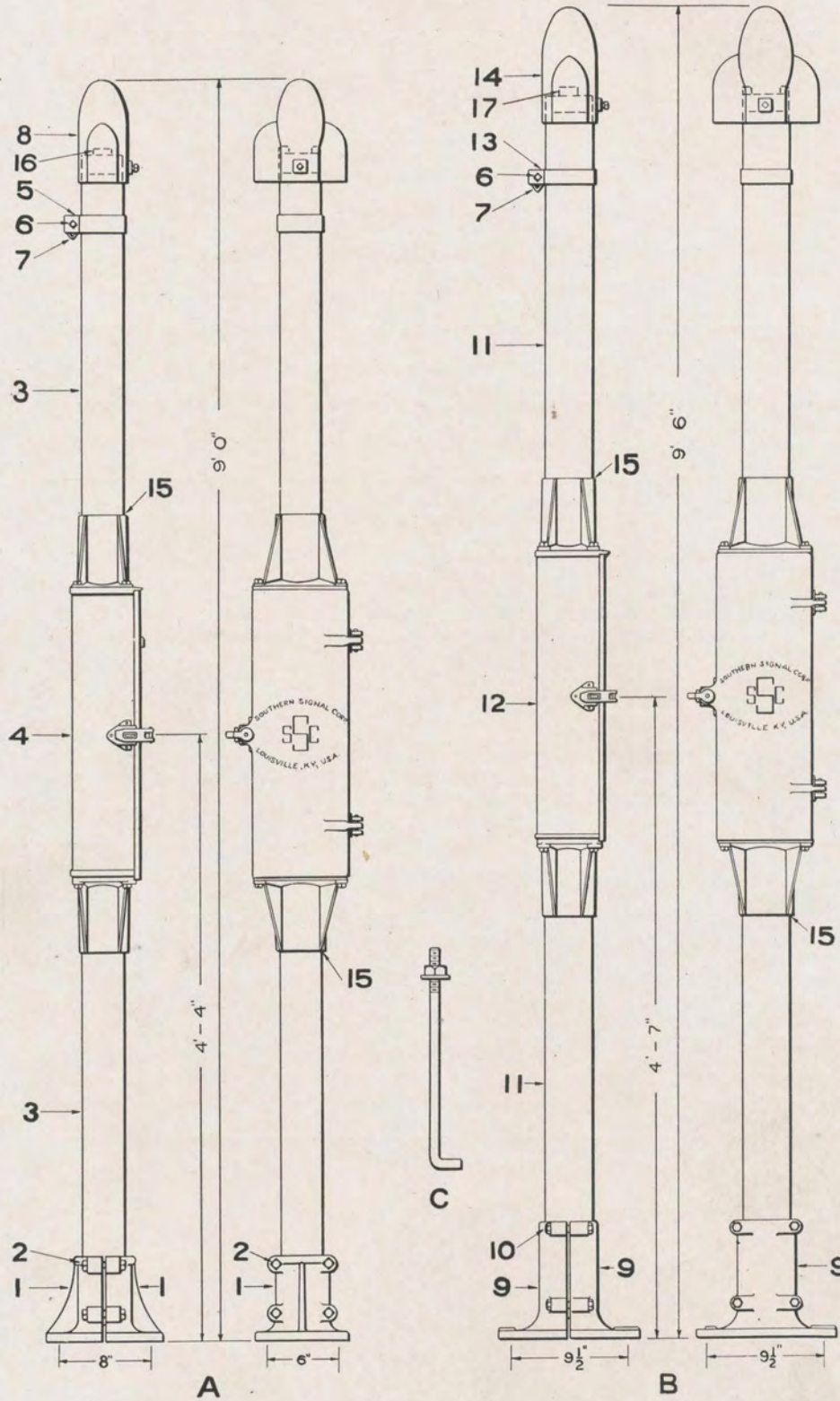


Plate F-2

Cable Posts with Cable Terminal Boxes

Order by Plate, Figure and Name

For parts of Terminal Boxes see Plate F-1

FIG.	NAME AND DESCRIPTION	DWG. NO.
A	3" Cable Post complete with Model A-2 Cable Terminal Box. (Base 6"x8" bolt centers.)	50300-1
B	3 1/2" (A. R. A.) Cable Post complete with Model A-1 Cable Terminal Box. (Base 9 1/2" x 9 1/2" bolt centers.)	50100-1
C	3/4"x18" Anchor Bolt complete with nut and washer.	50104X

PARTS

1	Half Base.	50302A
1a	Base complete. (6"x8" bolt centers) (2 figures 1 and 4 figures 2)	50302AX
2	Square Head Machine Bolt with square nut, for figure 1a.	006022X
3	Post. (3" i. d. pipe)	50308
4	Model A-2 Cable Terminal Box, complete for 3" cable post. (Measuring 3 1/2" outside diameter)	50200-1
5	Cable Support Clamp only.	50307
5a	Cable Support Clamp complete. (1 figure 5, 1 figure 6 and 1 figure 7)	50307X
6	Square Head Machine Bolt with square nut, (for figures 5a and 13a)	006001X
7	3/8" Guy Thimble, for figure 5a and 13a.	50111
8	Pinnacle complete, with set screw and nut.	50303X
9	A. R. A. No. 11802 Right Half Base.	50102
9a	A. R. A. No. 11806 Base complete. (2 figures 9 and 4 figures 10)	50102X
10	A. R. A. No. 11804 Hexagon Head Bolt with hexagon nut, for figure 9a.	006017X
11	Post. (3 1/2" i. d. pipe)	50115
12	Model A-1 Cable Terminal Box complete, for 3 1/2" cable post. (A. R. A.) (Measuring 4" outside diameter)	50200
13	Cable Support Clamp only.	50110
13a	A. R. A. No. 13746 Cable Support Clamp complete. (1 figure 6, 1 figure 7 and 1 figure 13)	50110X
14	A. R. A. No. 11814 Pinnacle complete with screw and nut.	50105X
15	2 1/2 pounds of Ground Sulphur. (Enough for one Cable Terminal Box)	
16	Bushing for 3" cable post.	50306
17	A. R. A. No. 11812 Bushing.	50106

Plate F-3

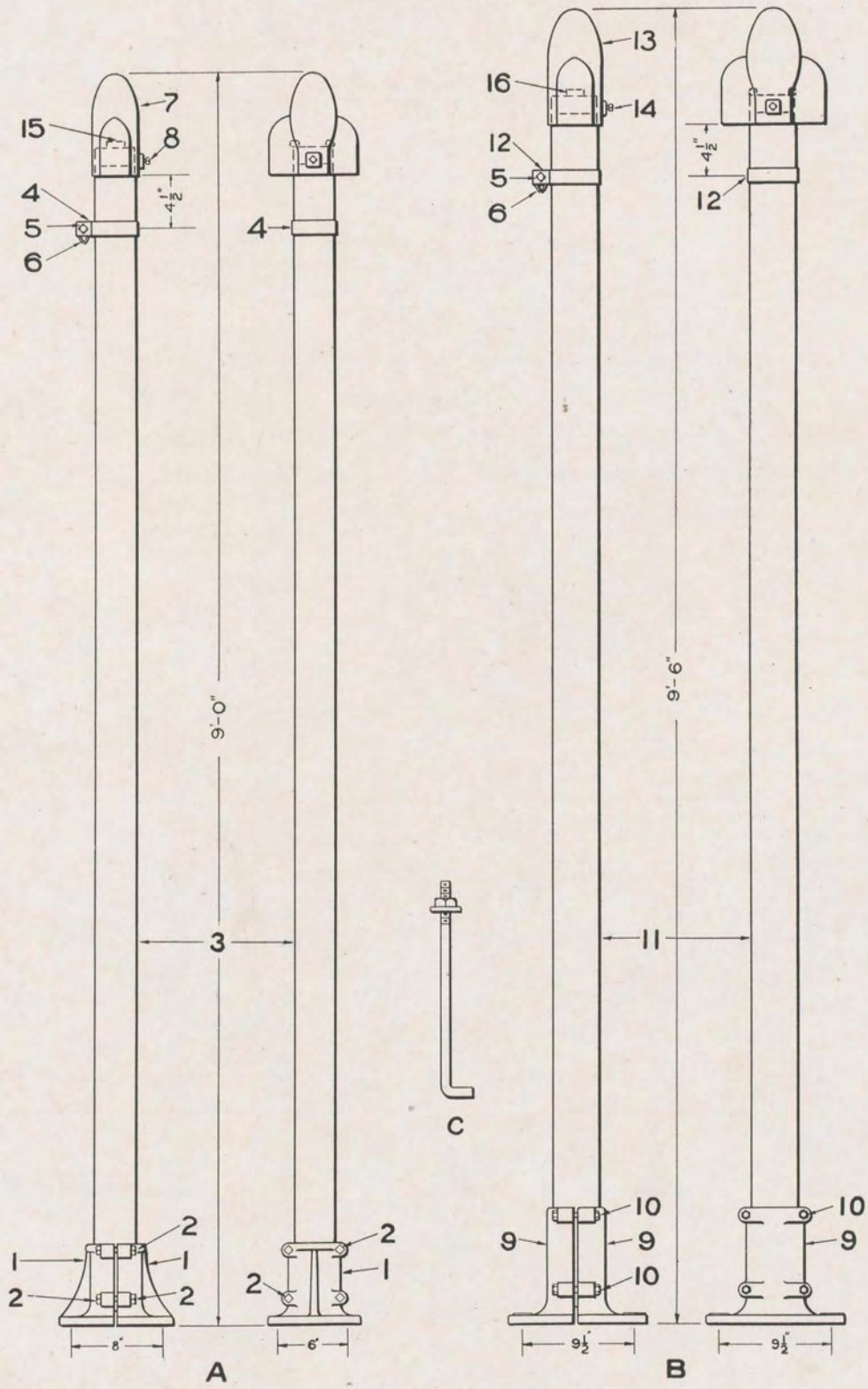


Plate F-3

Cable Posts

Order by Plate, Figure and Name

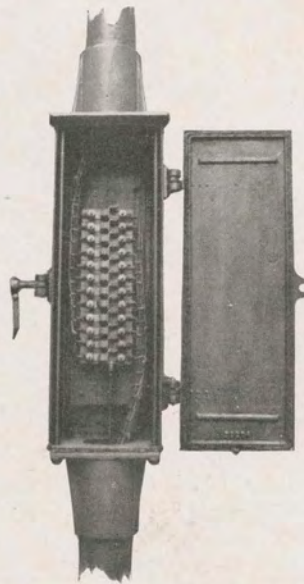
FIG.	NAME AND DESCRIPTION	DWG. NO.
A	3" Cable Post complete. (6"x8" bolt centers)	50300
B	A. R. A. No. 118510 Cable Post complete. (9 1/2"x9 1/2" bolt centers)	50100
C	3/4"x18" Anchor Bolt complete with nut and washer.	50104X

Parts

1	Half Base.	50302A
1a	Base complete. (6"x8" bolt centers) (2 figures 1 and 4 figures 2)	50302AX
2	Square Head Machine Bolt with square nut, for figure 1a.	006022X
3	Post. (3" i. d. pipe)	50305
4	Cable Support Clamp only.	50307
4a	Cable Support Clamp complete. (1 figure 4, 1 figure 5 and 1 figure 6)	50307X
5	Square Head Machine Bolt with square nut, for figure 4a and 12a.	006001X
6	3/8" Guy Thimble, for figure 4a and 12a.	50111
7	Pinnacle complete with set screw and nut.	50303X
8	Set Screw and square nut, for figure 7.	010004X
9	A. R. A. No. 11802 Right Half Base.	50102
9a	A. R. A. No. 11806 Base complete. (2 figures 9 and 4 figures 10)	50102X
10	A. R. A. No. 11804 Hexagon Head Bolt with hexagon nut, for figure 9a.	006017X
11	A. R. A. No. 13741 Post. (without slotted hole)	50107
12	Cable Support Clamp only.	50110
12a	A. R. A. No. 13746 Cable Support Clamp complete. (1 figure 5, 1 figure 6 and 1 figure 12)	50110X
13	A. R. A. No. 11814 Pinnacle complete with set screw and nut.	50105X
14	Set screw and square nut, for figure 13.	010003X
15	Bushing for 3" cable post.	50306
16	A. R. A. No. 11812 Bushing.	50106

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Signal material manufactured by the Southern Signal Corporation is used on many of the largest Railways in this Country and on many Foreign Railroads.



Model A Cable Terminal Box

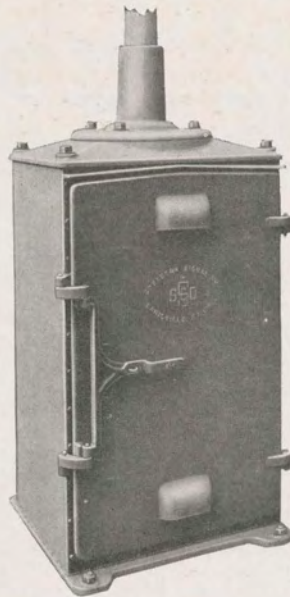
We take great pride in the quality of our product as well as the service we render our customers.

Relay Boxes, Relay and Battery Cases and Combinations

Among the relay boxes, cases and combination listed on the following pages will be found all of the A. R. A. standards and a few of our own design which are used by a large number of railroads throughout the country.

We are prepared to make relay boxes, etc., to railroad specifications, both in metal or wood, and will gladly quote prices upon receipt of specifications and quantity wanted.

As in our other products the material and workmanship are the best obtainable.



[SOUTHERN SIGNAL CORPORATION]

Plate F-20

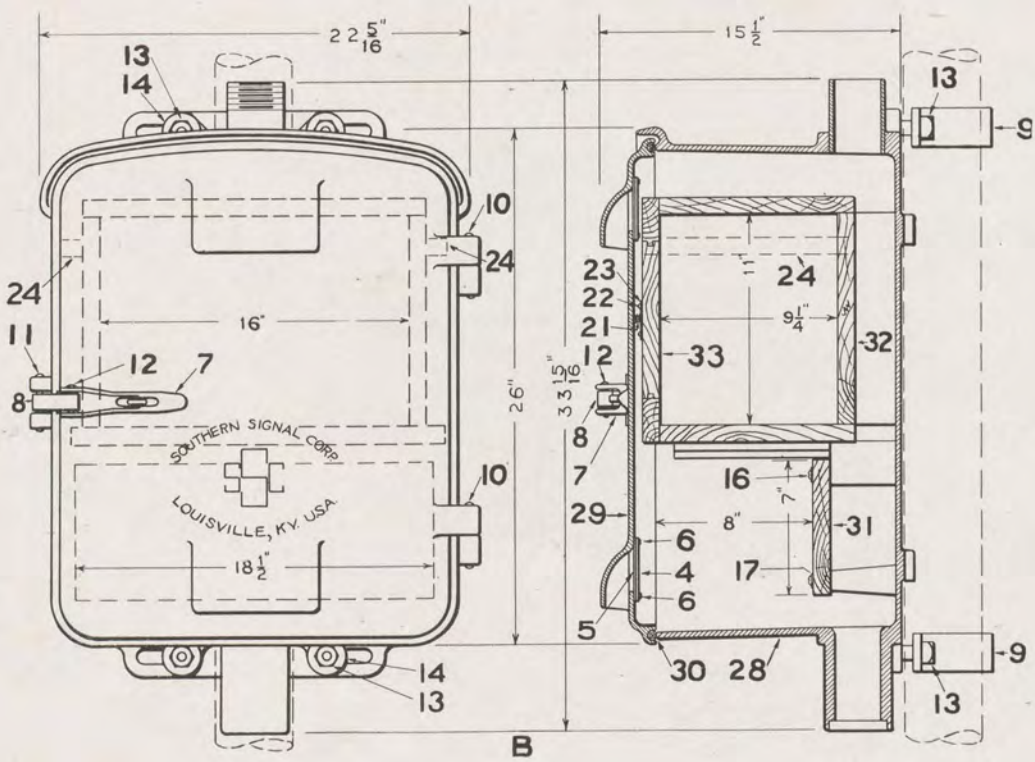
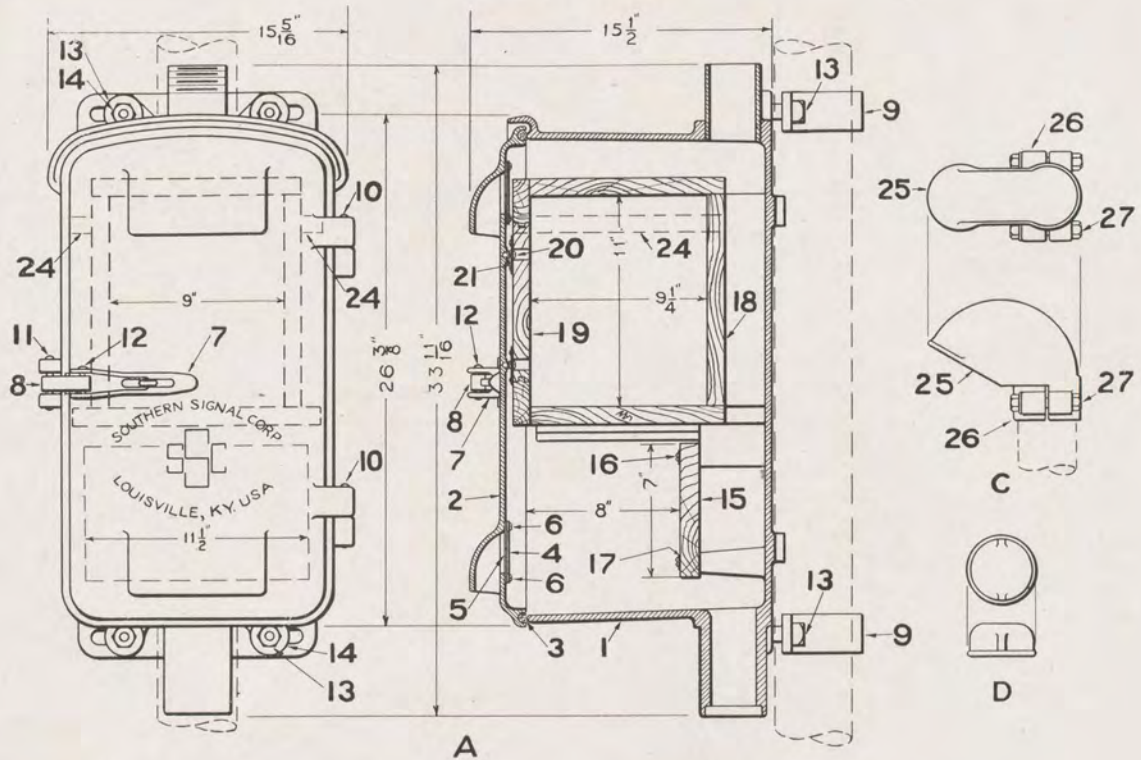


Plate F-20

A. R. A. Sizes "A" and "B" Relay Boxes

Order by Plate, Figure and Name

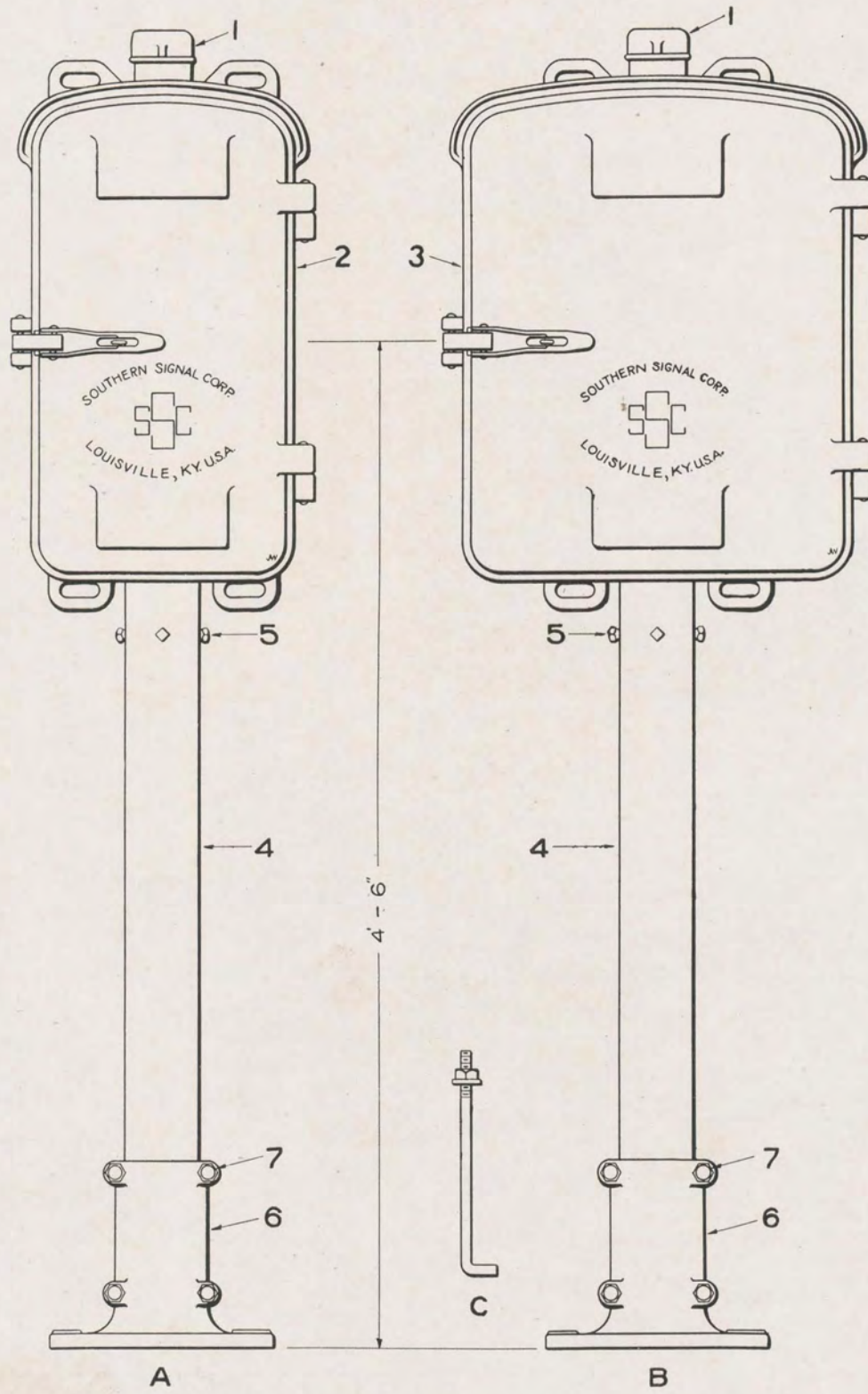
FIG.	NAME AND DESCRIPTION	DWG. NO.
A	A. R. A. No. 11822 Size A Relay Box complete with wood lining and terminal board.	50400-2
A-1	A. R. A. No. 11821 Size A Relay Box complete without wood lining and terminal board.	50400
B	A. R. A. No. 11824 Size B Relay Box complete with wood lining and terminal board.	50400-3
B-1	A. R. A. No. 11823 Size B Relay Box complete without wood lining and terminal board.	50400-1
C	A. R. A. No. 11817 Cable Outlet complete.	50432X
D	A. R. A. No. 11818 Pipe Cap.	016003

Parts

1	A. R. A. No. 11841 Box.	50401X
2	A. R. A. No. 11842 Door only.	50403
2a	Door complete. (1 figure 2, 1 figure 3, 2 figures 4, 2 figures 5 and 10 figures 6)	50403X
3	Packing, for door, figure 2a.	50404
4	A. R. A. No. 13698 Ventilator Holder.	50405
5	A. R. A. 136910 Ventilator Screen.	50408
6	Round Head Brass Machine Screw, for Ventilator.	004037
7	A. R. A. No. 13692 Hasp only.	50409
7a	Hasp complete. (1 figure 7, 1 figure 8 and 1 figure 12)	50409X
8	A. R. A. No. 13691 Link.	50410
9	A. R. A. No. 13696 Clamp only.	50411
9a	A. R. A. No. 13697 Clamp complete. (1 figure 9, 2-figures 13 and 2 figures 14)	50411X
10	Button Head Rivet, for door.	008010
11	Button Head Rivet, for link.	008011
12	Button Head Rivet, for hasp.	008012
13	Square Head Bolt with hexagon nut, for clamp.	006018X
14	Washer, for clamp.	005003
15	A. R. A. No. 136810 Terminal Board.	50412
16	Round Head Brass Machine Screw, for terminal board.	004026
17	Brass Washer, for terminal board.	10431
18	Lining less door.	50416X
18a	A. R. A. No. 136813 Lining complete. (1 figure 18, 1 figure 19, 2 figures 20 and 2 figures 21)	50416-IX
19	A. R. A. No. 136811 Door Lining complete.	50418X
20	Round Head Brass Machine Screw, for door lining.	004023
21	Spring, for door lining.	50422
22	Flat Head Iron-Wood Screw, for door lining.	013002
23	Escutcheon, for door lining.	50421
24	A. R. A. No. 13688 Filler.	50417
25	A. R. A. No. 11815 Back Half Cap.	50432
26	A. R. A. No. 11816 Front Clamp.	50433
27	Hexagon Head Machine Bolt with hexagon nut, for figure C.	006023X
28	A. R. A. No. 11831 Box.	50423
29	A. R. A. No. 11832 Door.	50424
29a	Door complete. (2 figures 4, 2 figures 5, 10 figures 6, 1 figure 30 and 1 figure 31)	50424X
30	Packing, for door, figure 30a.	50425
31	A. R. A. No. 13689 Terminal Board.	50426
32	Lining less door.	50429X
32a	A. R. A. No. 136814 Lining complete. (2 figures 20, 2 figures 21, 1 figure 32 and 1 figure 33)	50429-IX
33	A. R. A. No. 136812 Door Lining complete.	50430X

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Plate F-21



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Plate F-21

Post with A. R. A. Sizes "A" and "B" Relay Boxes

Order by Plate, Figure and Name

For Parts of Sizes A and B Relay Boxes see Plate F-20

FIG.	NAME AND DESCRIPTION	DWG. NO.
A	A. R. A. No. 137410 Post with Size "A" Relay Box complete.	50100-10
B	A. R. A. No. 137411 Post with Size "B" Relay Box complete.	50100-11
C	$\frac{3}{4}$ "x18" Anchor Bolt complete with nut and washer.	50104X

Parts

1	A. R. A. No. 11818 Cap.	016003
2	A. R. A. No. 11822 Size "A" Relay Box complete with wood lining and terminal board.	50400-2
3	A. R. A. No. 11824 Size "B" Relay Box complete with wood lining and terminal board.	50400-3
4	Relay Box Post only.	50114
4a	A. R. A. No. 13744 Relay Box Post complete. (1 figure 4 and 3 figures 5)	50114X
5	Set screw, for relay box post.	010006
6	A. R. A. No. 11802 Right Half Base.	50102
6a	A. R. A. No. 11806 Base complete (2 figures 6 and 4 figures 7)	50102X
7	A. R. A. No. 11804 Hexagon Head Bolt with hexagon nut, for figure 6a.	006017X

Plate F-22

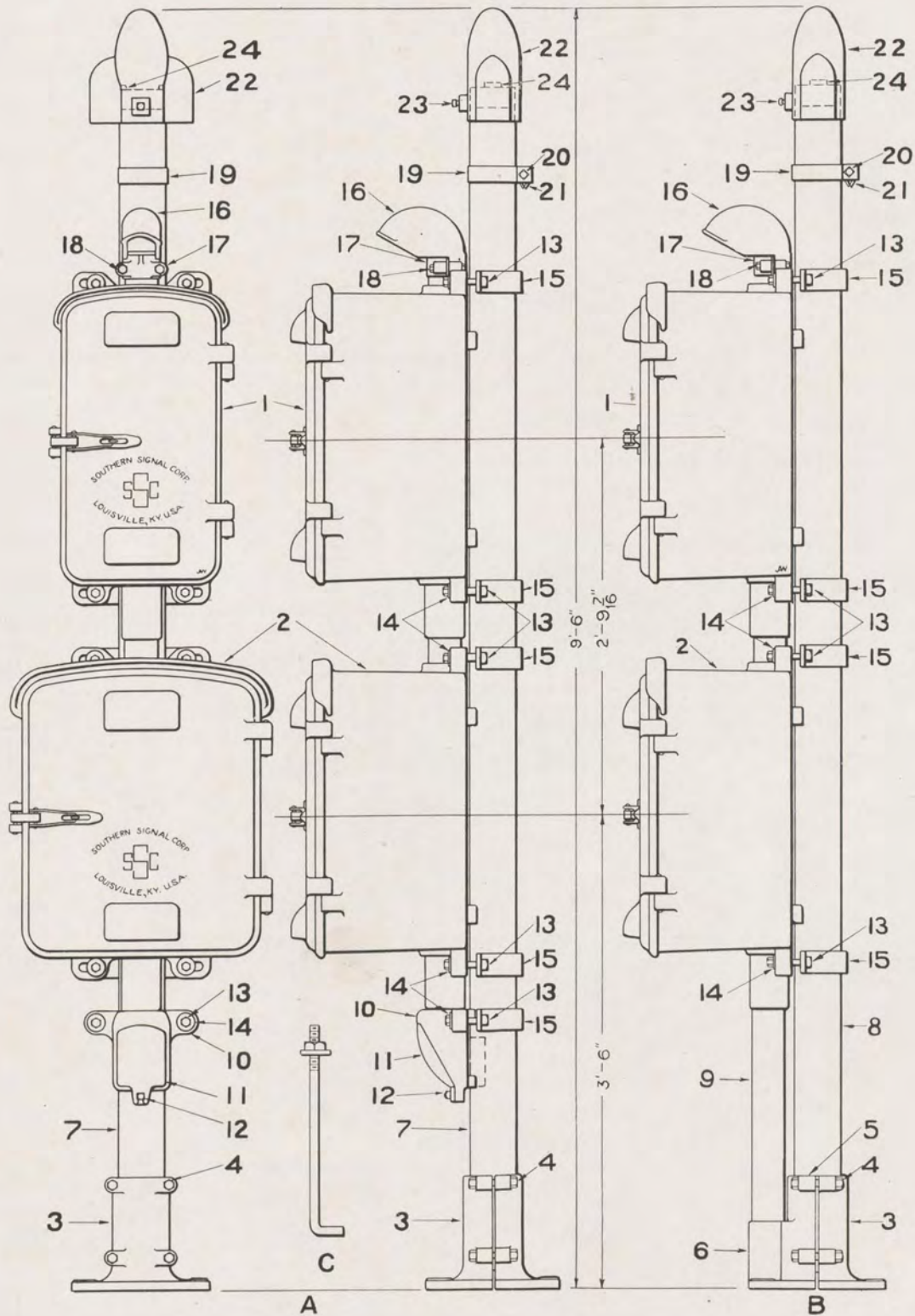


Plate F-22

A. R. A. Cable Posts and Relay Boxes

Order by Plate, Figure and Name

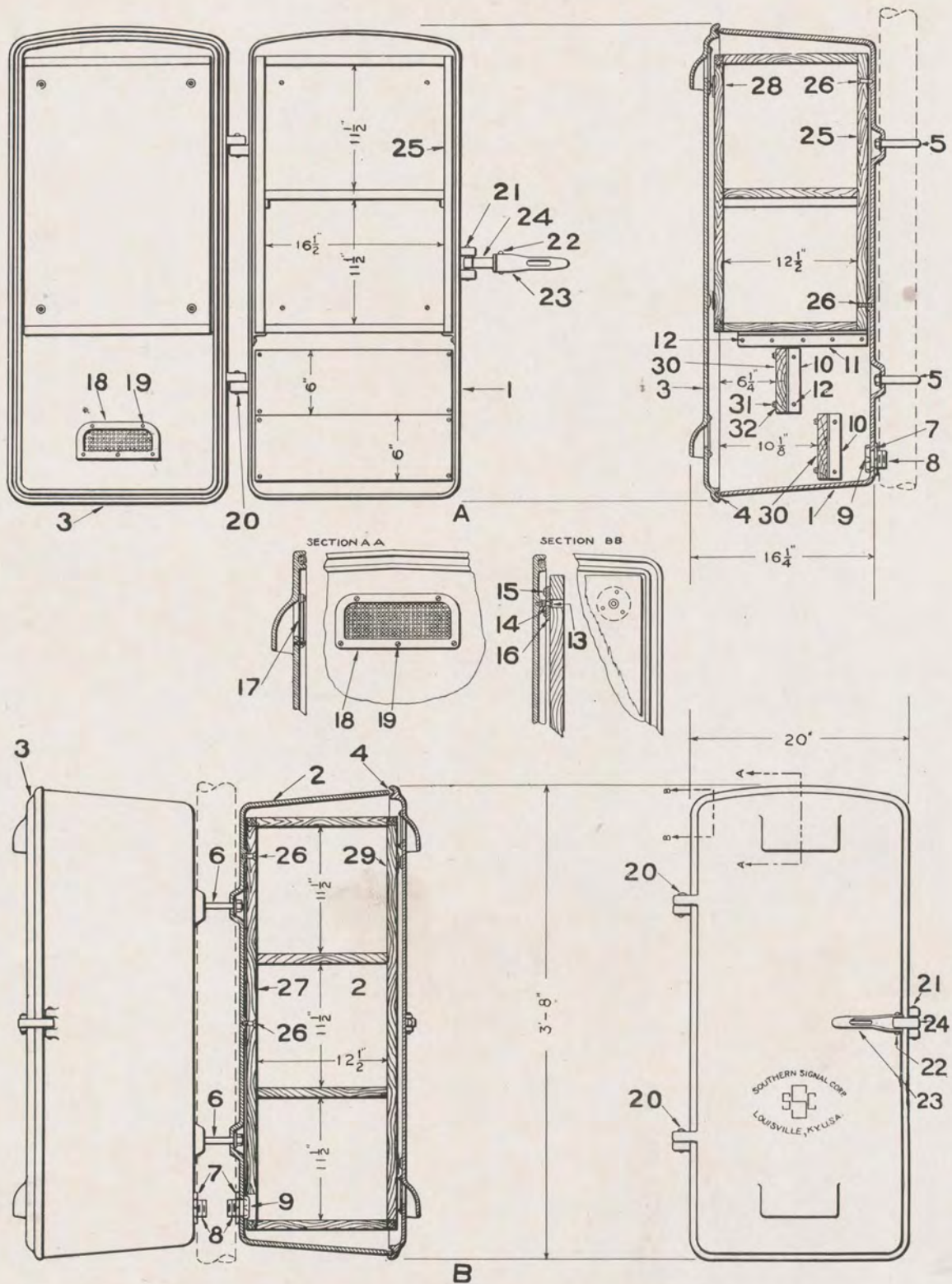
For Parts of Sizes A and B Relay Boxes see Plate F-20

FIG.	NAME AND DESCRIPTION	DWG. NO.
A	A. R. A. No. 11855 Cable Post complete with one Size "A" and one size "B" relay box (as shown) with bracket connection.	50100-5
A-1	A. R. A. No. 11852 Cable Post complete with one size "A" relay box (not shown) with bracket connection.	50100-2
A-2	A. R. A. No. 11853 Cable Post complete with one size "B" relay box (not shown) with bracket connection.	50100-3
A-3	A. R. A. No. 11854 Cable Post complete with two size "B" relay boxes (not shown) with bracket connection.	50100-4
B	A. R. A. No. 11859 Cable Post complete with one size "A" and one size "B" relay box (as shown) with pipe connection.	50100-9
B-1	A. R. A. No. 11856 Cable Post complete with one size "A" relay box (not shown) with pipe connection.	50100-6
B-2	A. R. A. No. 11857 Cable Post complete with one size "B" relay box (not shown) with pipe connection.	50100-7
B-3	A. R. A. No. 11858 Cable Post complete with two size "B" relay boxes (not shown) with pipe connection.	50100-8
C	$\frac{3}{4}$ " x 18" Anchor Bolt complete with nut and washer.	50104X

Parts

1	A. R. A. No. 11822 Size "A" Relay Box complete with wood lining and terminal board.	50400-2
2	A. R. A. No. 11824 Size "B" Relay Box complete with wood lining and terminal board.	50400-4
3	A. R. A. No. 11802 Right Half Base.	50102
3a	A. R. A. No. 11806 Base complete. (2 figures 3 and 4 figures 4)	50102X
4	A. R. A. No. 11804 Hexagon Head Bolt with hexagon nut, for figure 3a.	006017X
5	A. R. A. No. 11801 Left Half Base.	50101
5a	A. R. A. No. 11805 Base, for pipe connection complete. (1 figure 3, 4 figures 4, 1 figure 5 and 1 figure 6)	50101X
6	A. R. A. No. 11803 Cap.	50103
7	A. R. A. No. 13742 Post. (With slotted hole)	50108
8	A. R. A. No. 13741 Post. (Without slotted hole)	50107
9	A. R. A. No. 13745 Pipe Connector.	50109
10	A. R. A. No. 13671 Bracket.	50112
10a	A. R. A. No. 13673 Bracket complete. (1 figure 10, 1 figure 11 and 1 figure 12)	50112X
10b	A. R. A. No. 13747 Bracket with Clamp. (1 figure 10a and 1 figure 15a)	50113X
11	A. R. A. No. 13672 Cover.	50113
12	Square Head Machine Bolt with square nut, for figure 10a.	006016X
13	Square Head Machine Bolt with hexagon nut, for figure 15a.	006018X
14	Washer, for figure 15a.	005003
15	A. R. A. No. 13696 Clamp only.	50411
15a	A. R. A. No. 13697 Clamp complete.	50411X
16	A. R. A. No. 11815 Back Half Cap	50432
16a	A. R. A. No. 11817 Cable Outlet complete. (1 figure 16, 1 figure 17, 2 figures 18)	50432X
17	A. R. A. No. 118616 Front Clamp.	50433
18	Hexagon Head Machine Bolt with hexagon nut, for figure 16a.	006023X
19	Cable Support Clamp only.	50110
19a	A. R. A. No. 13746 Cable Support Clamp complete. (1 figure 19, 1 figure 20 and 1 figure 21)	50110X
20	Square Head Machine Bolt with square nut, for figure 19a.	006001X
21	$\frac{3}{8}$ " Guy Thimble, for figure 19a.	50111
22	A. R. A. No. 11814 Pinnacle complete with set screw and nut.	50105X
23	Set Screw and square nut, for figure 22.	010003X
24	A. R. A. No. 11812 Bushing.	50106

Plate F-23



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Plate F-23

Model C Relay Boxes

Order by Plate, Figure and Name

FIG.	NAME AND DESCRIPTION	DWG. NO.
A	Model C Relay Box with two shelf wood lining and two terminal boards and U bolts for single mounting on 3½" i. d. pipe. (As shown)	50400-4
A-1	As figure A, except with U bolts for 4" i. d. pipe.	50400-5
A-2	As figure A, except with U bolts for 5" i. d. pipe.	50400-6
A-3	As figure A, except with U bolts for 6" i. d. pipe.	50400-7
A-4	Two Model C Relay Boxes as figure A, except with four straight bolts for double mounting on 3½" i. d. pipe.	50400-8
A-5	As figure A-4 except with straight bolts for 4" i. d. pipe.	50400-9
A-6	As figure A-4 except with straight bolts for 5" i. d. pipe.	50400-10
A-7	As figure A-4 except with straight bolts for 6" i. d. pipe.	50400-11
B	Model C Relay Box with three shelf wood lining and two U bolts for single mounting on 3½" i. d. pipe.	50400-12
B-1	As figure B, except with U bolts for 4" i. d. pipe.	50400-13
B-2	As figure B, except with U bolts for 5" i. d. pipe.	50400-14
B-3	As figure B, except with U bolts for 6" i. d. pipe.	50400-15
B-4	Two Model C Relay Boxes as figure B, except with four straight bolts for double mounting on 3½" i. d. pipe. (As shown)	50400-16
B-5	As figure B-4, except with straight bolts for 4" i. d. pipe.	50400-17
B-6	As figure B-4, except with straight bolts for 5" i. d. pipe.	50400-18
B-7	As figure B-4, except with straight bolts for 6" i. d. pipe.	50400-19

Parts

1	Two Shelf Box, with brackets for lining and terminal boards and hasp.	50440X
2	Three Shelf Box.	50440-IX
3	Door, with packing and ventilators.	50441X
4	Packing, for figure 3.	50442
5	U Bolt with nuts and washers for 3½" i. d. pipe.	50445X
5a	U Bolt with nuts and washers for 4" i. d. pipe.	50445-IX
5b	U Bolt with nuts and washers for 5" i. d. pipe.	50445-2X
5c	U Bolt with nuts and washers for 6" i. d. pipe.	50445-3X
6	Hexagon Head Bolt and hexagon nut with washer, for 3½" i. d. pipe.	006024X
6a	Hexagon Head Bolt and hexagon nut with washer, for 4" i. d. pipe.	006025X
6b	Hexagon Head Bolt and hexagon nut with washer, for 5" i. d. pipe.	006026X
6c	Hexagon Head Bolt and hexagon nut with washer, for 6" i. d. pipe.	006027X
7	Conduit Lock Nut.	003024
8	Pipe Nipple.	016004
9	Conduit Bushing.	50446
10	Terminal Board Bracket.	50444
11	Lining Bracket.	50443
12	Round Head Brass Machine Screw, for figures 10 and 11.	004038
13	Round Head Brass Machine Screw, for door lining.	004023
14	Spring, for door lining.	50422
15	Flat Head Iron Wood Screw, for door lining.	013002
16	Escutcheon, for door lining.	50421
17	Ventilator Screen.	50408
18	Ventilator Holder.	50405
19	Round Head Brass Machine Screw, for ventilator.	004037
20	Button Head Rivet for door.	008010
21	Button Head Rivet for link.	008011
22	Button Head Rivet for hasp.	008012
23	Hasp only.	50409
23a	Hasp complete. (1 figure 22, 1 figure 23 and 1 figure 24)	50409X
24	Link.	50410
25	Two Shelf Lining complete.	50448X
26	Flat Head Brass Machine Screw, for linings.	004039
27	Three Shelf Lining complete.	50454X
28	Two Shelf Door Lining complete.	50452X
29	Three Shelf Door Lining complete.	50456X
30	Terminal Board.	50447
31	Round Head Brass Machine Screw, for terminal board.	004026
32	Brass Washer, for terminal board.	10431

Plate F-24

Model D Relay and Battery Cases

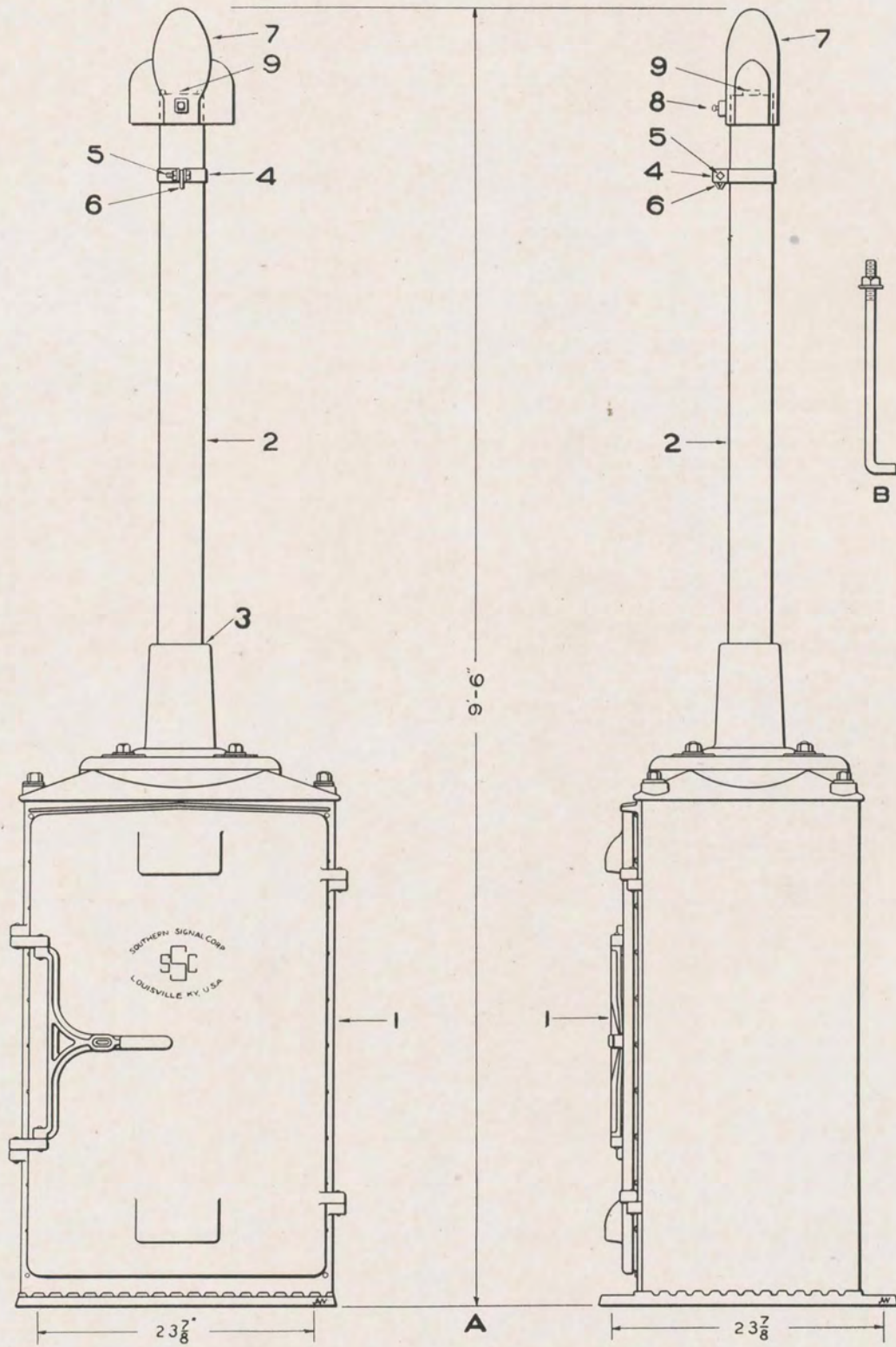
Order by Plate, Figure and Name

FIG.	NAME AND DESCRIPTION	DWG. NO.
A	Model D Relay and Battery Case complete with one door, wood lining and sleeve for 3½" i. d. pipe.	50500
A-1	As figure A, except with sleeve for 4" i. d. pipe.	50500-1
A-2	As figure A, except with cap, figure D, instead of sleeve.	50500-2
B	Model D Relay and Battery Case complete with two doors, wood lining and sleeve for 3½" i. d. pipe.	50500-4
B-1	As figure B, except with sleeve for 4" i. d. pipe.	50500-5
B-2	As figure B, except with cap, figure D, instead of sleeve.	50500-6
C	¾"x18" Anchor Bolt with nut and washer.	50104X
D	Cap.	50522

Parts

1	Base.	50501
2	Door Frame.	50504
3	Door, with packing and ventilators.	50505X
4	Packing, for figure 3.	50506
5	Top.	50507
6	Sleeve, for 3½" i. d. pipe. (Pipe measuring 4" outside dia.)	50508
6a	Sleeve, for 4" i. d. pipe. (Pipe measuring 4½" outside dia.)	50508-1
7	Sleeve gasket, for figures 6 and 6a.	50509
8	Packing ring for figure 6.	50207
8a	Packing ring for figure 6a.	50207-1
9	2½ pounds of Ground Sulphur. (Enough for sulphuring pipe in sleeve.) (Not furnished with above cases.)	
10	Stud for top.	50511
11	Hexagon nut for figure 10.	003021
12	Washer for figure 10.	005003
13	Through Bolts.	50512
14	Asphalt Washer.	50515
15	Corner Support.	50521
16	Casing (for one door case only).	50513
17	Side (for two door cases only).	50503A
18	Side Gasket.	50514
19	Hexagon Head Bolt and nut for side.	009007X
20	Round Head Brass Machine Screw, for door lining.	004023
21	Spring, for door lining.	50422
22	Flat Head Iron Wood Screw for door lining.	013002
23	Escutcheon, for door lining.	50421
24	Ventilator Screen.	50408
25	Ventilator Holder.	50405
26	Round Head Brass Machine Screw, for ventilator.	004037
27	Lining complete, for figure A, A-1 and A-2.	50525X
28	Door Lining complete.	50523X
29	Lining complete, for figure B, B-1 and B-2.	50530X
30	Terminal Board.	50520
30a	Terminal Board complete. (1 figure 30, 2 figures 31 and 4 figures 32)	50520X
31	Terminal Board Bracket.	50519
32	Round Head Iron Wood screw for figure 31.	013001
33	Hasp.	50516
34	Link.	50517
35	Button Head Rivet for figures 3, 33 and 34.	008008

Plate F-25



SOUTHERN SIGNAL CORPORATION

Plate F-25

Model D Relay and Battery Cases with Cable Posts

Order by Plate, Figure and Name

For Parts of Model D Relay Cases See Plate F-24

FIG.	NAME AND DESCRIPTION	DWG. NO.
A	Model D Relay and Battery Case complete with one Door and Cable Post (as shown).	50500-3
A-1	Model D Relay and Battery Case complete with two Doors and Cable Post (not shown).	50500-7
B	$\frac{3}{4}$ "x18" Anchor Bolt complete with nut and washer.	50104X

Parts

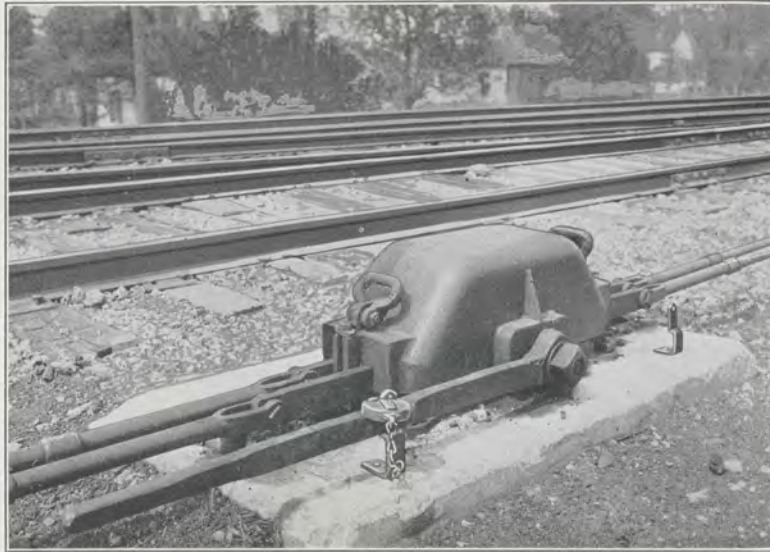
1	Model D Relay and Battery Case complete with one door, wood lining and sleeve for $3\frac{1}{2}$ " i. d. pipe. (As shown)	50500
1a	Model D Relay and Battery Case complete with two doors, wood lining and sleeve for $3\frac{1}{2}$ " i. d. pipe. (Not shown)	50500-4
2	Post. ($3\frac{1}{2}$ " i. d. pipe)	50529
3	$2\frac{1}{2}$ pounds of Ground Sulphur. (Enough for sulphuring pipe in sleeve.)	
4	Cable Support Clamp only.	50110
4a	Cable Support Clamp complete (1 figure 4, 1 figure 5 and 1 figure 6).	50110X
5	Square Head Machine Bolt with square nut, for figure 4a.	006001X
6	$\frac{3}{8}$ " Guy Thimble, for figure 4a.	50111
7	Pinnacle complete with set screw and nut.	50105X
8	Set Screw and Square nut, for figure 7.	010003X
9	Bushing.	50106

SOUTHERN SIGNAL CORP.



LOUISVILLE, KY. U.S.A.

MODEL A SAFE LOCK SWITCH MACHINE



PATENTED

The Model A Safe Lock Switch Machine enables one to quickly and safely operate single switches, crossover switches, single or double slip switches, single switches and derails and standard facing point locks in connection with any of the above arrangements.

It combines in one unit for any combination of functions the operating lever and facing point lock lever which are ordinarily connected to an interlocking machine, as for example, a single switch, or any of the arrangements mentioned above.

Its use adds to the safety of operation. When applied to a crossover, one operation of the lever unlocks, throws and re-locks both switches, thus insuring safe and expeditious handling of crossover movements.

The first movement of the lever through sixty degrees unlocks the switches; the movement through the next sixty degrees throws the switches and the movement through the last sixty degrees locks the switches in the new position. A stroke of six inches is provided for throwing the switches.

The Safe Lock Switch Machine removes the possibility of trainmen or others having or leaving one of the switches set for movement through the crossover while the other is set for straight track. Furthermore, with this machine, the chance of having a light engine on a crossover with one or both switches set for a conflicting movement is remote, as the occasion of such handling on the part of trainmen is removed. The desirability of having both switch-

PEERLESS MANUFACTURING CORPORATION

INCORPORATED

LOUISVILLE, KENTUCKY

SUCCESSOR TO LOUISVILLE SWITCH AND SIGNAL CO. AND PEERLESS MFG. CO.

OCT. 15, 1933

Bulletin No. 7-B

(SUPERSEDES L. F. S. & S. CO. BULLETIN NO. 7-A)

PEERLESS MANUFACTURING CORPORATION

es of a crossover open before a train starts to make a crossover movement and the movement completed before either switch is restored to its normal position is obvious, and in an effort to fulfill these conditions in a safe and practical way, while at the same time facilitating the work of the trainmen, this machine was designed.

The Model A Safe Lock Switch Machine is particularly adapted for crossovers where automatic train control is in use. In such territory it is supposed that, if all apparatus is in working condition, no collision can occur; yet it is possible to have a light engine, on the crossover, fouling both tracks with clear signal and train control indications on one of the tracks. When the Safe Lock Switch Machine is used both switches must be set for the crossover movement before the engine can enter the crossover. In this position the signals and train control will display stop indications.

The machine is inclosed in a rugged, weatherproof, cast-iron case and is very simple in construction, having only three major working parts, the crank, the lock link and the switch link.

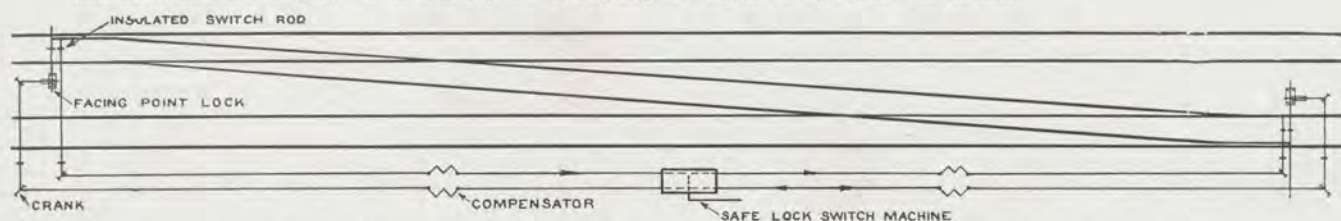
Every part is heavy and designed to take many times the load to which it is actually subjected on the railroad. There are no small keys or parts to work loose, shear or become broken and no rack and pinion to clog with sand, dirt and ice. The crank bearings are bab-bitt lined. The slide bearings for the switch and lock links are of bronze and are removable. Only a few bolts and cap screws are used in the Safe Lock Switch Machine, all of which are large and firmly held with head locks and spring lock washers.

All of the parts are lubricated by machine oil held in the lower half of the case. Four gallons of regular machine oil are required.

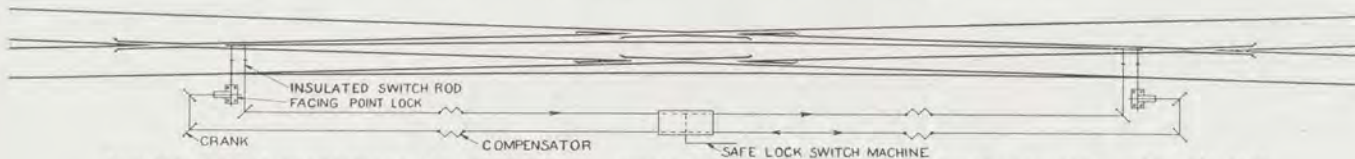
The rollers on the crank are on non-turning pins so that wear is confined to the rollers and pins, which are very easily replaced without disturbing any other part of the machine. The arrangement of the mechanism is such, however, that the whole crank must pass through the oil in a cycle of operation; thus the rollers and pins are thoroughly lubricated and the wear on the parts is negligible. It is seldom necessary to replace them.

A long lever, which is secured to the crank by a large castellated nut, locked with a spring cotter, is provided for operating the machine. The crank has a shank on both ends so that the lever may be placed on whichever side is found most convenient. The lever is held in the normal and reverse positions by lever catches such as used on regular switch stands. Thus all possibility of the lever changing its position while a train is passing through the switches is eliminated. The lever catches are arranged for locking with pad locks.

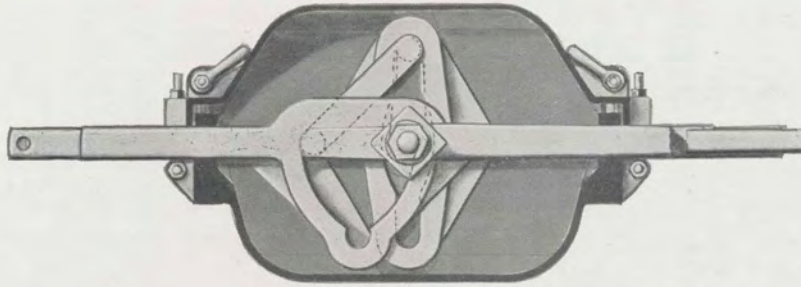
Standard interlocking material is used to connect the machine with the track, eliminating the necessity of ordering or carrying a stock of special material.



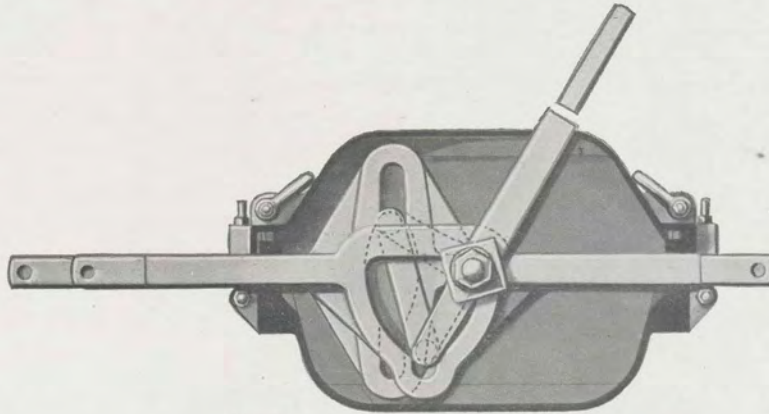
Typical plan of connections for switches of a crossover, equipped with safe lock switch machine, operating both switches simultaneously and locking same in both normal and reversed position with standard facing point lock.



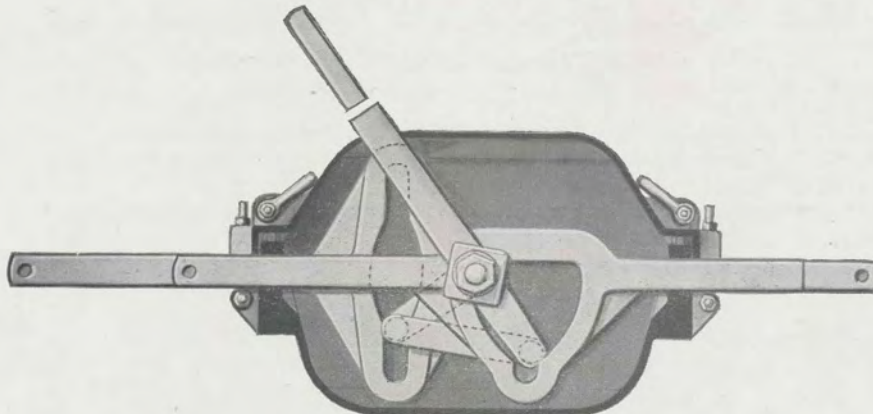
Typical plan of connections for switches of a single slip switch with rigid frogs, equipped with safe lock switch machine, operating both switches simultaneously and locking same in both normal and reversed position with standard facing point lock.



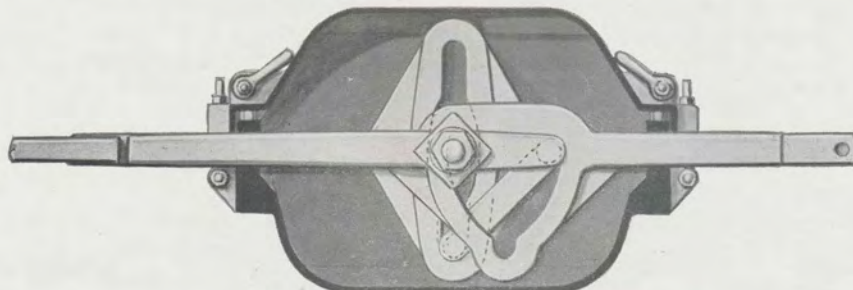
Switch Normal and Locked.



Switch Normal and Unlocked.



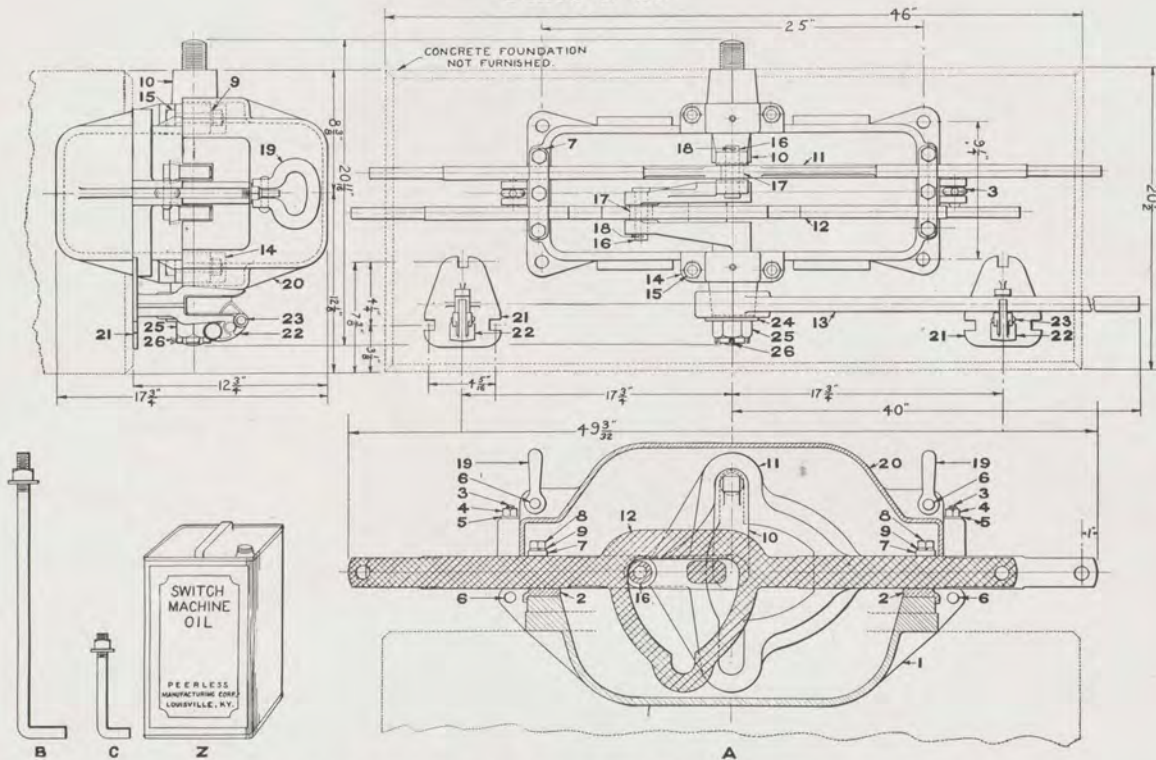
Switch Reversed Unlocked.



Switch Reversed and Locked.

PEERLESS MANUFACTURING CORPORATION

Plate G-20



Model A Safe Lock Switch Machine and Parts

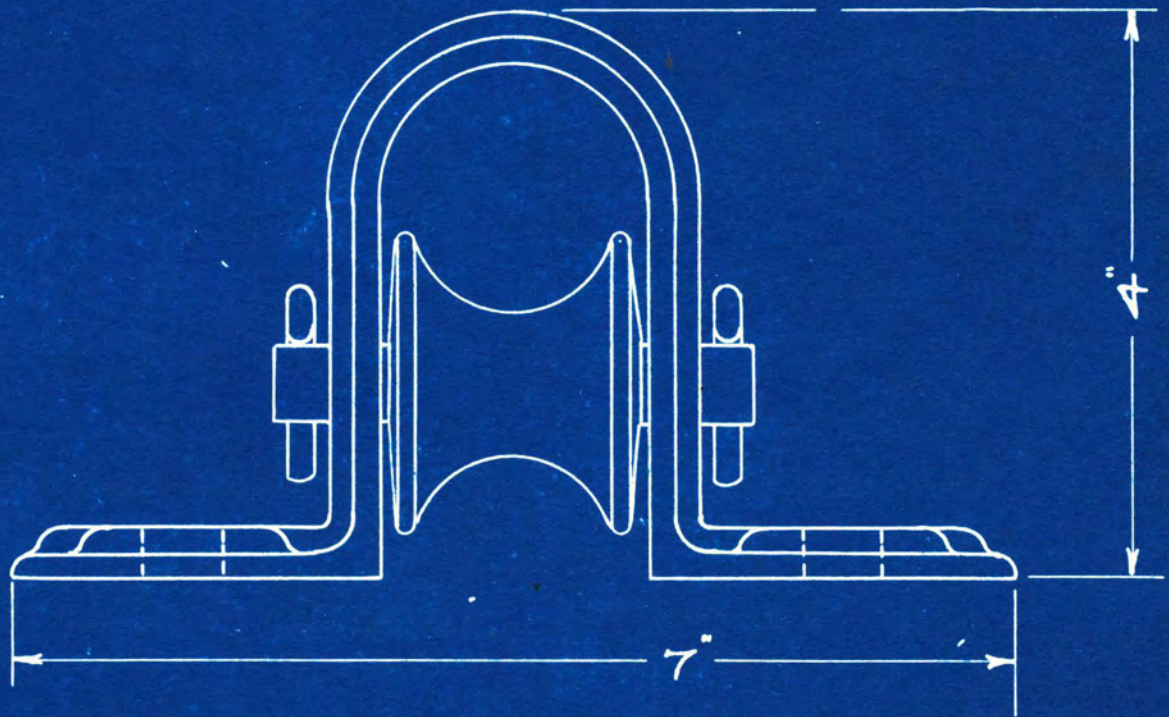
ORDER BY PLATE, FIGURE AND NAME.

FIG.	NAME AND DESCRIPTION	DWG. No.
A	Model A Safe Lock Switch Machine complete. (Anchor bolts not included.)	60200
B	3/4"x18" Anchor Bolt complete with nut and washer, for securing switch machine to foundation.	50104X
C	5/8"x6 1/4" Anchor Bolt complete with nut and washer, for securing lever catch to foundation.	60217X
Z	One-gallon Can, Switch Machine Oil.	
Z-1	Five-gallon Can, Switch Machine Oil.	

PARTS

1	Case only.	60201	15	Square Head Machine Bolt with hexagon nut for bearing cap.	006030X
1a	Case, complete. (1 figure 1, 4 figures 2, 2 figures 3a, 2 figures 6 and bearings babbitted.)	60201X	16	Pin.	60211
2	Bearing Plate.	60202	17	Roller.	60212
3	Eye Bolt only.	60203	18	Spring Cotter for figure 16.	001009
3a	Eye Bolt with hexagon nut and washer.	60203X	19	Handle.	60213
4	Hexagon nut, for eye bolt.	003006	20	Cover only.	60214
5	Washer for eye bolt.	005002	20a	Cover, complete. (2 figures 6, 2 figures 19 and 1 figure 20.)	60214X
6	Rivet for figures 3 and 19.	008016	21	Lever Catch Stand.	60215
7	Strap.	60204	21a	Lever Catch, complete. (1 figure 21, 1 figure 22 and 1 figure 23.)	60215X
8	Cap Screw.	009008	22	Catch.	60216
9	Lock Washer, for figures 8 and 15.	002009	23	Rivet, for catch.	008017
10	Crank.	60205	24	Washer, for figure 25.	005008
11	Lock Link.	60206	25	Castellated Nut, for figure 10.	003029
12	Switch Link.	60207	26	Spring Cotter for figure 25.	001008
13	Lever.	60208A			
14	Bearing Cap, babbitted lined.	60210X			

PEERLESS MANUFACTURING CORP., LOUISVILLE, KY.



BP 7-A

MALLEABLE STRAP PIPE CARRIER
DWG.No. 60501X DWG. By E. J. B OCT. 16-28

Catalogue of POLE LINE MATERIAL Manufactured

To conform with the specifications of the
following companies and associations

AMERICAN ELECTRIC RAILWAY ASSOCIATION
RAILWAY SIGNAL ASSOCIATION
AMERICAN RAILWAY ASSOCIATION
AMERICAN TELEPHONE & TELEGRAPH CO.
POSTAL TELEGRAPH & CABLE COMPANY
NATIONAL ELECTRIC LIGHT ASSOCIATION
THE WESTERN UNION TELEGRAPH COMPANY

LOUISVILLE FROG, SWITCH & SIGNAL CO.

I N C O R P O R A T E D

SUCCESSOR TO

SOUTHERN SIGNAL CORPORATION

Incorporated

LOUISVILLE, KENTUCKY, U. S. A.



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April, 1928

Bulletin No. 22

Drop Forged Anchor Rods

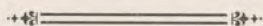


All Anchor rods are made from one solid piece of open-hearth steel with drop forged oval eye which in all cases is stronger than the rod itself insuring greater strength than welded eyes. Rods 3/4 in. dia. and under have 3 1/2 ins. of rolled thread. The 1 and 1 1/4 in. dia. rods have 3 1/2 ins. of cut thread.

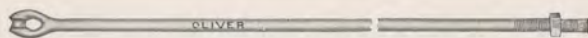
HOT GALVANIZED

Stock No.	Diameter	Length	Size of Eye		Weight Per 100 Pes.
			Width	Length	
8005	1/2"	5'	3/4"	1"	335
8006	1/2"	6'	3/4"	1"	402
8007	1/2"	7'	3/4"	1"	469
8105	5/8"	5'	1 1/2"	2"	540
*8106	5/8"	6'	1 1/2"	2"	640
8107	5/8"	7'	1 1/2"	2"	740
*8108	5/8"	8'	1 1/2"	2"	840
8206	3/4"	6'	1 1/2"	2"	910
8207	3/4"	7'	1 1/2"	2"	1060
*8208	3/4"	8'	1 1/2"	2"	1210
8209	3/4"	9'	1 1/2"	2"	1360
*8210	3/4"	10'	1 1/2"	2"	1510
8308	1"	8'	1 1/2"	2"	2165
8310	1"	10'	1 1/2"	2"	2700
8312	1"	12'	1 1/2"	2"	3290
8410	1 1/4"	10'	1 3/4"	2 1/4"	4400

*N. E. L. A. St'd.



Guy Anchor Rods



The exclusive feature of this eye is the elimination of the use of guy thimbles. Eye will accommodate strands from 3/8 in. to 5/8 in.

HOT GALVANIZED

Stock No.	Diameter	Length	Weight Per 100 Pes.
8506	1/2"	6'	400
8507	1/2"	7'	510
8606	5/8"	6'	690
8608	5/8"	8'	890
8706	3/4"	6'	995
8708	3/4"	8'	1295
8709	3/4"	9'	1460
8808	1"	8'	2365
8810	1"	10'	2895



Copperweld Anchor Rods



Copperweld Anchor Rods consist of a Copperweld rod, roll-threaded at one end to receive a brass nut with a wrapped eye for the upper end of the rod. The anchors are permanent. They will not rust even when placed in cinder fills where sulphur is present. Other sizes than listed below can be furnished.

Stock No.	Size	Weight Per 100 Pes.
9866	1/2" x 6'	450
9867	1/2" x 7'	515
9876	5/8" x 6'	650
9877	5/8" x 7'	750
9878	5/8" x 8'	850
9887	3/4" x 7'	1125
9888	3/4" x 8'	1255

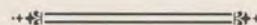
"Steelscrew" Anchor



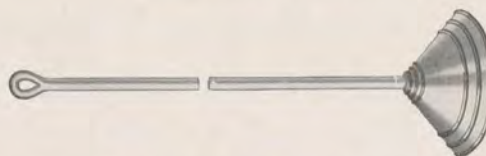
Easy to install. Large bearing surface against undisturbed earth insures ample holding power. Drop forged from special high carbon steel means greater strength. It replaces the expensive "dead man" or "log." For installing, the only tool required is a crowbar.

HOT GALVANIZED

Stock No.	Diameter		Length	Weight Per 100 Pes.
	Rod	Wing		
1306	3/4"	8"	6'	1040
1308	1"	8"	6'	1860
1310	1 1/4"	10"	6'	2900



Bierce Guy Anchors



The "Bierce" guy anchor acts on the principle of the inverted wedge. The conical point being in the general direction of the pull causes the anchor to hold more firmly when subjected to heavy strains. Use 1/2, 5/8 and 3/4 in. standard N. E. L. A. anchor rods for the 8 in. dia. anchor and 1 in. rods with the 12 and 16 in. dia. anchors. Rods are not included with anchors.

PLAIN

Diameter of Cone	Weight Per 100 Pes.
8"	570
12"	1500
16"	2300



Rock Guy Anchors

Rock guy anchors may be used where the solid rock extends to the surface. Also in stone or concrete walls.



No. 8930



No. 8932

HOT GALVANIZED

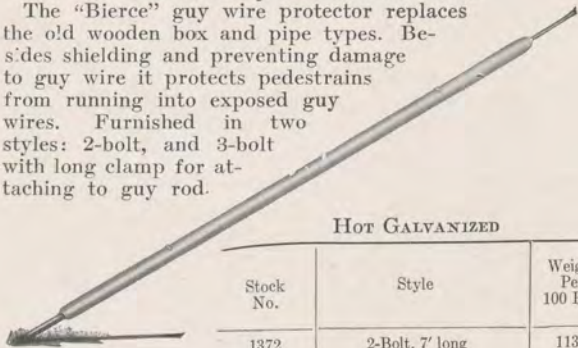
Stock No.	Length	Weight Per 100 Pes.
*†8930	9 1/2"	496
8932	18"	600

*A. T. & T. Co. St'd.

†W. U. T. Co. St'd.

Bierce Guy Wire Protectors

The "Bierce" guy wire protector replaces the old wooden box and pipe types. Besides shielding and preventing damage to guy wire it protects pedestrains from running into exposed guy wires. Furnished in two styles: 2-bolt, and 3-bolt with long clamp for attaching to guy rod.



HOT GALVANIZED

Stock No.	Style	Weight Per 100 Pcs.
1372	2-Bolt, 7' long	1131
1382	2-Bolt, 8' long	1200
1383	3-Bolt, 8' long	1300



Guy Thimbles

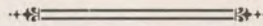
A true lay for guy wire. Made from crescent shaped stock and grooved to fit the various strand sizes.



HOT GALVANIZED

Stock No.	Size of Strand	Size of Guy Rod	Weight Per 100 Pcs.
*9030	3/8"	1/2" and 5/8"	10
*9031	1/2"	5/8" and 3/4"	21
*9032	5/8"	1"	40

*N. E. L. A. St'd.



Guy Clamps



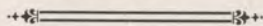
Made in two types. Made from hot-rolled open-hearth steel sections. Light type (1 1/8 in. wide by 3/8 in. thick with 1/2 in. bolts.) Heavy type (1 3/4 in. wide by 3/8 in. thick with 5/8 in. bolts.) Very sturdy construction. Bolts will not turn when tightening nuts.

HOT GALVANIZED

Light Type			Heavy Type		
Stock No.	Type	Weight Per 100 Pcs.	Stock No.	Type	Weight Per 100 Pcs.
9000	2-Bolt 3" long	122	9003	2-Bolt 4" long	174
9001	3-Bolt 4" long	155	*9004	3-Bolt 6" long	274
†9002	3-Bolt 6" long	226	9005	4-Bolt 8" long	365

*N. E. L. A. St'd.

†W. U. T. Co. St'd.



Drop Forged Wire Rope Clips

Drop forged from the best quality open-hearth steel. Complete with U-bolt and hexagon nuts.

HOT GALVANIZED



Stock No.	Size of Strand	Weight Per 100 Pcs.
9012	1/2"	29
*9013	3/8"	32
*9014	1/2"	68
9015	5/8"	87
9016	3/4"	149
9018	1"	300

*N. E. L. A. St'd.

Strain Plates

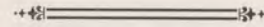
Made in two styles—standard and moulding types. Broad bearing surface prevents guy wire from cutting into pole. Moulding type is formed to fit 1 in. N. E. L. A. Standard ground wire moulding.



HOT GALVANIZED

Stock No.	Style	Size	Weight Per 100 Pcs.
*9050	Standard	4"x8"	75
9051	Moulding	4"x6"	75

*N. E. L. A. St'd.



Guy Hooks

Used to keep guy wires from creeping down the pole. Made of half-oval steel, bent with the flat side to the pole to protect guy wire.

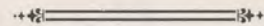


HOT GALVANIZED

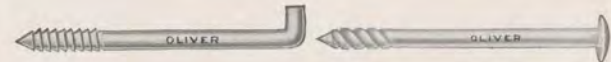
Stock No.	Size of Steel	Length	Diameter Hole	Weight Per 100 Pcs.
*†9041	1 1/2" x 3/8"	4"	1 1/16"	87
9042	1 1/2" x 3/8"	3 1/2"	3/16"	59
9043	1 1/2" x 3/8"	6"	9/16"	88

*N. E. L. A. St'd.

†A. T. & T. Co. St'd.



Pole Steps



Made from the best grade hot-rolled open-hearth steel, which insures maximum strength. Three styles as follows: Standard Hook Head type, has fetter drive thread which permits easy installation. Long Hook Head type has fetter drive thread. Used at points on pole where lineman stands to work, the three-inch hook prevents lineman's foot from slipping off. Button Head type, has twist drive thread and square shoulder under head for wrench.

HOT GALVANIZED

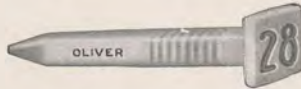
Stock No.	Type	Weight Per 100 Pcs.
7980	3/16" x 9" Hookhead	70
7981	3/8" x 9" Hookhead	87
*†7982	3/8" x 10" Hookhead	95
†7983	3/8" x 10" Long Hookhead	115
7984	3/8" x 9" Buttonhead	91
7985	3/8" x 10" Buttonhead	105

*N. E. L. A. St'd.

†A. T. & T. Co. St'd.

‡W. U. T. Co. St'd.

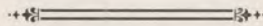
Pole Dating Nails



For indicating the year poles were set, also for designating the height. Special markings can be furnished in keg lots of 2000 pieces or more.

HOT GALVANIZED

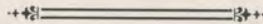
Stock No.	Size	Weight Per 100 Pcs.
1927	1/4"x2 1/2" long	4
1928	1/4"x2 1/2" long	4
1929	1/4"x2 1/2" long	4
1930	1/4"x2 1/2" long	4
1935	1/4"x2 1/2" long	4
1940	1/4"x2 1/2" long	4
1945	1/4"x2 1/2" long	4
1950	1/4"x2 1/2" long	4
1955	1/4"x2 1/2" long	4
1960	1/4"x2 1/2" long	4



Copperweld Nails

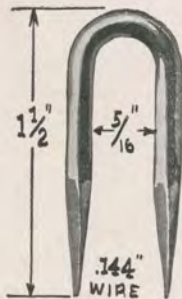
Do not rust. They retain their original holding power year after year. Extensively used for securing locust pins to cross arms.

Size	Length	Diameter	Nails Lb. Approx.	Weight Per 100 Pcs.
4d	1 1/2"	.091"	297	.4
5d	1 3/4"	.102"	221	.6
6d	2"	.102"	170	.8
8d	2 1/2"	.128"	100	1.1
10d	3"	.144"	65	1.6
12d	3 1/4"	.144"	59	1.8
16d	3 1/2"	.162"	46	2.5
20d	4"	.182"	29	3.3
30d	4 1/2"	.204"	22	4.8
40d	5"	.204"	17	6.3
50d	5 1/2"	.229"	13	7.5
60d	3 1/2"	.258"	17	6.
60d	6"	.258"	10	10.



Copperweld Staples

They drive easily. The heavy protecting layer of Copperweld is smooth and does not flake. Reduces maintenance costs and repair work. Rolled point staples. Used for securing moulding to poles.



Length	Width	Size Wire	Weight Per 100 Pcs.
1 1/4"	1/2"	114	1.
1 1/2"	5/16"	144	1.5
1 3/4"	3/8"	144	2.
2"	1/2"	162	2 25
2 1/2"	1 1/16"	3/16	4.
3"	3/4"	3/4	7.
3 1/2"	1 1/8"	3/4	8.
3 3/4"	1 1/4"	3/4	8.5
3 1/2"	1 3/4"	3/8	15.

Hub Guards

Used on poles to protect them from wheel hubs. Curved to fit the pole. Made in two styles—18 in. and 30 in. The 18 in. guards have a 5 1/2 in. radius with 3 holes on each side of the guard. The 30 in. guards have a 7 1/2 in. radius with 5 holes on each side. All holes are 1/8 in. dia. for 1/2 in. lag screws.



HOT GALVANIZED

Stock No.	Size	Weight Per 100 pcs.
*†8000	14"x18" long	700
*†8001	16"x18" long	1020
8002	14"x30" long	2233
8003	16"x30" long	2550

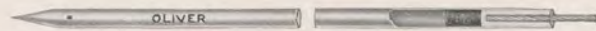
*N. E. L. A. St'd.

†A. T. & T. Co. St'd.



Ground Pipe

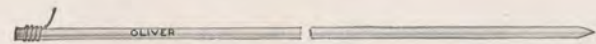
HOT GALVANIZED



Made from 3/4 in. high grade steel pipe forged to a long, sharp point for easy driving. Galvanized inside and out. A plug driven six inches from the open end provides a pocket for solder, used to make the ground connection. Stock No. 9070 has a length of 8 ft. and weighs 880 pounds per 100 pieces.



Ground Rods



Ground Rod with Wire

Made from high carbon open-hearth steel with a long, sharp point for driving. Furnished with or without copper wire. Wired rods have five turns of No. 12 wire soldered to rod with free end of 5 in. for attaching ground wires. The unwired rods are provided with holes 1 in. from the end for attaching ground wire running down pole. These holes are 1/8 in. dia. for 3/8 in. rods, 3/16 for 1/2 in. rods, and 1/8 for 5/8 and 1 in. rods.

HOT GALVANIZED

With Wire

Stock No.	Diameter	Length	Weight Per 100 Pcs.
9205	1/2"	5'	320
9206	1/2"	6'	395
9306	3/8"	6'	595
9408	1"	8'	2167

Without Wire

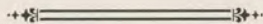
Stock No.	Diameter	Length	Weight Per 100 Pcs.
9115	3/8"	5'	185
9116	3/8"	6'	223
9215	1/2"	5'	300
9216	1/2"	6'	360
9217	1/2"	7'	420
9316	5/8"	6'	600
9317	5/8"	7'	700
9318	5/8"	8'	800
9418	1"	8'	2133

Copperweld Ground Rods



The molten-welded copper exterior of Copperweld ground rods give non-rusting properties which other rods cannot provide. Long life in a driven ground is extremely important. Moisture or soil treatment does not shorten the life of Copperweld ground rods on account of their thick layer of protecting copper. For equal rigidity, solid Copperweld rods do not require as great a diameter as hollow pipe. Wherever Copperweld rods are used to replace galvanized rods, a small diameter may be safely employed. Moulds for soldering ground rods to wire can be supplied to insure a permanent electrical connection. Connecting Copperweld ground rods to copper ground wire insures protection against corrosion and galvanic action.

Stock No.	Size	Weight Per 100 Pcs.
9805	3/8" x 5'	200
9806	3/8" x 6'	240
9815	1/2" x 5'	350
9816	1/2" x 6'	420
9817	1/2" x 7'	490
9818	1/2" x 8'	550
9820	1/2" x 10'	770
9825	3/8" x 5'	540
9826	3/8" x 6'	650
9827	3/8" x 7'	760
9828	3/8" x 8'	870
9829	3/8" x 9'	980
9830	3/8" x 10'	1090
9835	3/4" x 5'	770
9836	3/4" x 6'	940
9837	3/4" x 7'	1090
9838	3/4" x 8'	1250
9839	3/4" x 9'	1400
9840	3/4" x 10'	1550
9842	3/4" x 12'	1850
9845	1" x 5'	1400
9846	1" x 6'	1690
9847	1" x 7'	1960
9848	1" x 8'	2250
9849	1" x 9'	2530
9850	1" x 10'	2810
9852	1" x 12'	3370
9855	1" x 15'	4200
9860	1" x 20'	5600



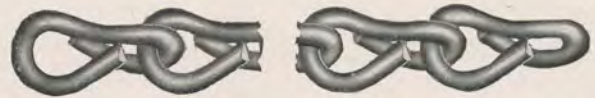
Copperweld Mechanical Ground Rod Clamp

(As illustrated on Ground Rod shown above)

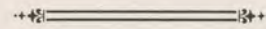
For attaching grounding wires to Ground Rods by a mechanical method making a permanent and secure bond between the rod and wire. The clamp and safety screw are made of high grade non-ferrous metal, corrosion and fatigue resisting. After safety screw has been tightened it requires a pull of more than one ton to cause any slippage in the wire.

Size Rod	Size of Wire	Weight Per 100 Pcs.
3/8"	6-12 B & S solid	25
1/2"	4-10 B & S solid	30
5/8"	5/16" Strand to 8 B & S solid	55
3/4"	3/8" Strand to 8 B & S solid	75
1"	1/2" Strand to 4 B & S solid	90

Copperweld Grounding Chain

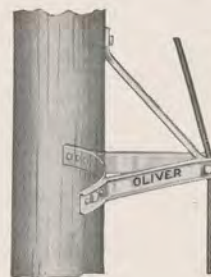


Adequate protection of linemen against premature or accidental "throwing in" of the current, is a necessity. Shunting the conductors by wrapping a chain around all of them, and contracting the loose end with the tower or with the ground, is a common, simple and effective method of protecting the crew. Then, if current is accidentally turned into the line while the men are at work on a section, the chain brings about a short circuit which immediately and automatically trips the switch and prevents the current from reaching the men at work. To afford adequate protection the grounding chain used should be of non-rusting construction to insure permanent high conductivity. It must be so constructed that it may be easily pieced or repaired. The links, are designed to give maximum contact to the conductors, shaped to prevent abrasion of the wires and made to slide over the wires easily. Double Jacks type links made of No. 8 B. & S. wire.

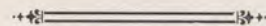


Pole Strut

HOT GALVANIZED



Where it is impossible to secure guying privileges at corners in the line, a pole can be made self-supporting by installing this strut. Two are necessary for each pole. Made of heavy channel steel with broad bearing surface drilled for three 1/2 in. lag screws for attaching to pole. The strut extends 11 ins. from the pole. Stock No. 1355. Weights, 850 lbs. per 100 pcs.



Carriage Bolts



All bolts have square nuts, finished points and rolled threads—assuring good nut fit. Any size of manufacturer's standard Carriage Bolts can be furnished. The 3/8 in. bolts have 1 3/4 ins. of thread, 1/2 in. bolts have 3 ins. of thread. Can also be supplied from Monel Metal.

HOT GALVANIZED

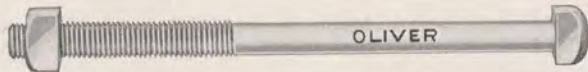
Stock No.	Dia.	Lgth.	Weight Per 100	Stock No.	Dia.	Lgth.	Weight Per 100
5303	3/8"	3"	12.9	5403	1/2"	3"	24.7
5303 1/2	3/8"	3 1/2"	14.3	5403 1/2	1/2"	3 1/2"	27.3
*5304	3/8"	4"	15.8	5404	1/2"	4"	29.8
*5304 1/2	3/8"	4 1/2"	17.2	5404 1/2	1/2"	4 1/2"	32.4
*5305	3/8"	5"	18.7	5405	1/2"	5"	34.9
5305 1/2	3/8"	5 1/2"	20.1	5405 1/2	1/2"	5 1/2"	37.5
5306	3/8"	6"	21.6	5406	1/2"	6"	40.0

*N. E. L. A. St'd.

†A. T. & T. Co. St'd.

SOUTHERN SIGNAL CORPORATION

Machine or Cross Arm Bolts

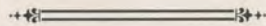


All bolts have square nuts, finished points and rolled threads. Perfect rolled threads insure good nut fit. Any size of manufacturer's standard Machine Bolts can be furnished. Can also be supplied from Monel Metal.

HOT GALVANIZED

Stock No.	Dia. In.	Lgth. In.	Lgth. of Thrd.	Weight Per 100	Stock No.	Dia. In.	Lgth. In.	Lgth. of Thrd.	Weight Per 100
5903	3/8	3	3	13.1	*5905	3/8	5	3	18.9
5903 1/2	3/8	3 1/2	3	14.6	5905 1/2	3/8	5 1/2	3	20.4
*5904	3/8	4	3	16.0	5906	3/8	6	3	21.8
*5904 1/2	3/8	4 1/2	3	17.5					
6004 1/8	1/2	4 1/2	3	33.8	6010	1/2	10	4	61.8
6004 3/4	1/2	4 3/4	3	35.0	6012	1/2	12	4	72.0
*6005	1/2	5	3	36.3	6014	1/2	14	6	82.2
*6006	1/2	6	3	41.4	6016	1/2	16	6	92.4
*6007	1/2	7	3	46.5	6018	1/2	18	6	102.6
6008	1/2	8	4	51.6	6020	1/2	20	6	112.8
*6108	5/8	8	4	82	*6120	5/8	20	6	167
*6110	5/8	10	4	97	*6122	5/8	22	6	181
*6112	5/8	12	4	111	*6124	5/8	24	6	195
*6114	5/8	14	6	125	6126	5/8	26	6	209
*6116	5/8	16	6	139	6128	5/8	28	6	223
*6118	5/8	18	6	153					
6208	3/4	8	4	112	6220	3/4	20	6	244
6210	3/4	10	4	134	6222	3/4	22	6	266
6212	3/4	12	4	156	6224	3/4	24	6	288
6214	3/4	14	6	178	6226	3/4	26	6	322
6216	3/4	16	6	200	6228	3/4	28	6	344
6218	3/4	18	6	222					

*N. E. L. A. St'd.



Drop Forged Eye Bolts



All standard bolts except the 6 in. are rolled threaded 6 ins. The 6 in. bolts have a rolled thread of 4 ins. Furnished with one square nut but no washers.

HOT GALVANIZED

INSIDE DIAMETER OF EYE 3/4"x1"

Stock No.	Dia.	Lgth. to Center of Eye	Weight Per 100	Stock No.	Dia.	Lgth. to Center of Eye	Weight Per 100
*6606	1/2	6	55	*6614	1/2	14	95
*6608	1/2	8	65	*6616	1/2	16	105
*6610	1/2	10	75	*6618	1/2	18	115
*6612	1/2	12	85	*6620	1/2	20	125

INSIDE DIAMETER OF EYE 1 1/2"x2"

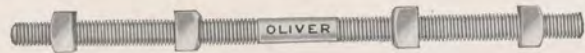
*6706	5/8	6	84	*6716	5/8	16	164
*6708	5/8	8	100	*6718	5/8	18	180
*6710	5/8	10	116	*6720	5/8	20	196
*6712	5/8	12	132	*6722	5/8	22	212
*6714	5/8	14	148	*6724	5/8	24	228

INSIDE DIAMETER OF EYE 1 1/4"x2"

6806	3/4	6	116	6814	3/4	14	212
6808	3/4	8	140	6816	3/4	16	236
6810	3/4	10	164	6818	3/4	18	260
6812	3/4	12	188	6820	3/4	20	284

*N. E. L. A. St'd

Double Arming Bolts

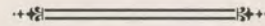


Used to tie two cross arms together. An economical method eliminating the old wood block and machine bolt. Furnished with four square nuts but no washers. Thread lengths as follows: 5 ins. of threads on 12 in. bolts, 6 ins. on 14 and 16 in. bolts, 8 ins. on 18, 20, 22, and 24 in. bolts.

HOT GALVANIZED

Stock No.	Dia.	Lgth.	Weight Per 100	Stock No.	Dia.	Lgth.	Weight Per 100
6312	1/2	12	72	6320	1/2	20	110
6314	1/2	14	83	6322	1/2	22	119
6316	1/2	16	92	6324	1/2	24	128
6318	1/2	18	101				
6412	5/8	12	144	*6420	5/8	20	200
*6414	5/8	14	158	*6422	5/8	22	214
*6416	5/8	16	172	*6424	5/8	24	228
*6418	5/8	18	186				
6512	3/4	12	230	6520	3/4	20	310
6514	3/4	14	250	6522	3/4	22	330
6516	3/4	16	270	6524	3/4	24	350
6518	3/4	18	290				

*N. E. L. A. St'd.



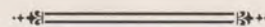
Drop Forged Double Arming Eye Bolts



An easy method of dead-ending lines on double arms. Furnished with three square nuts. Thread is cut within two inches of the eye.

HOT GALVANIZED

Stock No.	Diameter Inches	Length to Center of Eye	Weight Per 100 Pcs.
6974	5/8	14"	172
6976	5/8	16"	188
6978	5/8	18"	204
6980	5/8	20"	220
6982	5/8	22"	236
6984	5/8	24"	252



Square Nuts

HOT GALVANIZED

Stock No.	Size of Nut	Weight Per 100 Pcs.
6920	3/4"	3
6921	1 1/2"	8
6922	5/8"	13
6923	3/4"	24

CAN SHIP FROM STOCK

Washers

Round and Square



Made in three styles—round washers for carriage and machine bolts, square washers for cross arm bolts, and large square washers for anchor rods. Can also be supplied from Monel Metal.



HOT GALVANIZED

Round Washers

Stock No.	Outside Diameter	Diameter Hole	Weight Per 100 Pcs.
*6930	1"	7/16"	1.6
*6931	1 1/4"	1 1/2"	3.0
*†6932	1 3/8"	1 3/8"	4.2
6933	1 3/4"	1 1/2"	7.5
6934	2"	1 1/2"	11.2

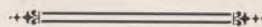
*N. E. L. A. St'd.

†A. T. & T. Co. St'd.

Square Washers

Stock No.	Size Inches	Diameter Hole	Weight Per 100 Pcs.
6940	2 x2 x 1/8	1 1/16"	14.5
6941	2 1/4 x 2 1/4 x 3/16	1 1/16"	24.
6942	2 1/4 x 2 1/4 x 3/16 with nail hole	1 1/16"	24.
*6943	2 1/4 x 2 1/4 x 3/16	1 3/16"	24.
6944	3 x3 x 3/16	1 3/16"	43.5
*6945	3 x3 x 1/4	1 3/16"	58.5
6946	4 x4 x 3/16	1 3/16"	83.
6947	4 x4 x 1/4	1 3/16"	117.
*6948	4 x4 x 1/2	1 1/16"	215.

*N. E. L. A. St'd.



Expansion Bolts

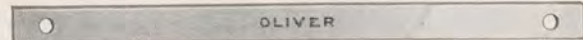


For attaching brackets or fixtures to brick or concrete walls, this bolt has maximum holding strength. Consists of tapered head steel bolt with long, soft lead sleeve. To install drill hole, insert bolt, and drive lead sleeve against tapered head. Extra lead sleeves can be furnished upon request.

HOT GALVANIZED

Stock No.	Dia. In.	Lgth. In.	Weight Per 100	Stock No.	Dia. In.	Lgth. In.	Weight Per 100
1001 1/4	1/4	1 3/4	7.1	1003 1/4	1/4	3 1/4	9.5
1002	1/4	2	7.5	1004	1/4	4	10.7
1002 1/2	1/4	2 1/2	8.3	1005	1/4	5	12.3
1012 1/2	3/8	2 1/2	14.9	1014 1/2	3/8	4 1/2	18.9
1013	3/8	3	15.9	1015	3/8	5	19.9
1013 1/2	3/8	3 1/2	16.9	1015 1/2	3/8	5 1/2	21.0
1022 1/2	1/2	2 1/2	41.2	1025	1/2	5	56.0
1023 1/2	1/2	3 1/2	47.2	1025 1/2	1/2	5 1/2	59.0
1024	1/2	4	50.2	1026 1/2	1/2	6 1/2	62.0
1024 1/4	1/2	4 1/2	43.0	1028	1/2	8	73.0

Flat Cross Arm Braces



Braces, unless otherwise ordered are punched at one end with 1/8 in. hole, other end with 1/16 in. hole. Holes are punched 1 in. from end to center of hole. Special braces of any length and width can be furnished upon request.

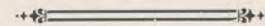
HOT GALVANIZED

1 1/2 x 1 1/2" Braces			1 1/4 x 1 1/4" Braces		
Stock No.	Length Over All	Approximate Weight Per 100 Pcs.	Stock No.	Length Over All	Weight Per 100 Pcs.
†5120	20	142	5220	20	167
5122	22	156	5222	22	183
5124	24	17	5224	24	200
5126	26	184	5226	26	216
†5128	28	198	*5228	28	233
†5130	30	212	5230	30	250
5132	32	226	5232	32	266

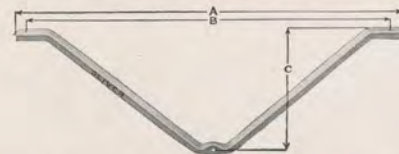
*N. E. L. A. St'd.

†A. T. & T. Co. St'd.

‡W. U. T. Co. St'd.



Angle Cross Arm Braces



Braces are furnished with 1/8 in. holes for mounting on cross arm and 1/16 in. hole for pole mounting.

This brace can be furnished in any desired dimension A, B and C, for special requirements. State size of angle and holes desired.

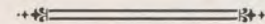
HOT GALVANIZED

N. E. L. A. Standard

Stock No.	Size of Angle	A	B	C	Weight Per 100 Pcs.
5240	1 1/2 x 1 1/2 x 3/16	45	42	12	776
5242	1 1/2 x 1 1/2 x 3/16	51	48	18	967
5244	1 1/2 x 1 1/2 x 3/16	63	60	18	1095
5246	1 3/4 x 1 3/4 x 3/16	75	72	22	1560

Our Standard

Stock No.	Size of Angle	A	B	C	Weight Per 100 Pcs.
5250	1 1/2 x 1 1/2 x 3/16	40	37	12	705
5252	1 1/2 x 1 1/2 x 3/16	51	48	14 3/4	885
5254	1 3/4 x 1 3/4 x 3/16	63	60	18	1281
5256	1 3/4 x 1 3/4 x 3/16	69	66	20	1409
5258	1 3/4 x 1 3/4 x 3/16	75	72	18	1485



Alley Arm Braces



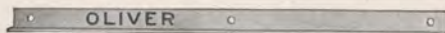
Used for side arm construction. All braces are furnished with lineman's steps. Vertical braces are used when more than one arm is to be supported.

HOT GALVANIZED

Stock No.	Length	Size of Angle	Weight Per 100 Pcs.
*5170	5'	1 3/4 x 1 3/4 x 3/16	1295
5171	5'	1 1/2 x 1 1/2 x 3/16	1100
5172	6'	1 1/2 x 1 1/2 x 3/16	1285
*5173	7'	1 3/4 x 1 3/4 x 3/16	1760
5174	10'	2 x 2 x 1/4	3800

*N. E. L. A. St'd.

Vertical Braces



These braces are used for supporting two or more cross arms. All braces made from 1½ in. x 1½ in. x 1/8 in. angle unless otherwise specified.

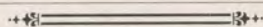
HOT GALVANIZED

Our Standard

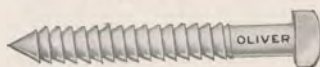
Stock No.	No. of Arms	Weight Per 100 Pcs.
5160	2 Arm, 18" spacing	300
5161	3 Arm, 18" spacing	570
5162	4 Arm, 18" spacing	840

N. E. L. A. Standard

5163	2 Arm, 24" spacing	390
5164	3 Arm, 24" spacing	750
5165	4 Arm, 24" spacing	1110



Lag Screws



Fetter Drive Type

Made in two types—fetter drive and gimlet point. Fetter drive thread is furnished unless otherwise specified. Any size of manufacturer's lag screws can be furnished. Can also be supplied from Monel Metal.

HOT GALVANIZED

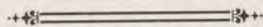
GIMLET POINT TYPE

Stock No.	Dia. In.	Lgth. In.	Weight Per 100	Stock No.	Dia. In.	Lgth. In.	Weight Per 100
5502	3/4	2	2.8	5502½	3/4	2½	3.3
5512	5/8	2	4.7	5513	3/8	3	6.5
5512½	5/8	2½	5.6	5513½	3/8	3½	7.3

FETTER DRIVE TYPE

5602¼	3/8	2¼	7.8	5604	3/8	4	12.2
5602½	3/8	2½	8.3	5604½	3/8	4½	13.5
5603	3/8	3	9.6	5605	3/8	5	14.8
5603½	3/8	3½	10.9	5606	3/8	6	17.4
5702½	3/2	2½	16.7	5705	3/2	5	28.2
5703	3/2	3	19.0	5705½	3/2	5½	30.5
5703½	3/2	3½	21.3	5706	3/2	6	32.8
*5704	3/2	4	23.6	5706½	3/2	6½	35.1
5704½	3/2	4½	25.9	5707	3/2	7	37.4
5804	5/8	4	35.1	5805½	5/8	5½	46.5
5804½	5/8	4½	38.9	5806	5/8	6	50.3
*5805	5/8	5	42.7				

*N. E. L. A. St'd



Reinforcing and Safety Straps

The number 5065 strap is used to support messenger bolt at points of extreme stress. The number 5066 is used to prevent the cable from falling should the hangers fail. The number 5067 is a combination of numbers 5065 and 5066 in one piece. Holes are provided for 1½ in. lag screws.

HOT GALVANIZED

Stock No.	Type	Weight Per 100 Pcs.
†5065	Reinforcing strap	36
†5066	Safety strap	76
†5067	Combination strap	116

†A. T. & T. Co. St'd.

Cable Suspension Clamps

Made in one and three bolt sizes. One bolt type is used for light cables and on cable arms and three bolt type for heavy cables and on long spans. Two ½ in. high carbon steel track bolts are furnished with the three bolt clamp. When attaching the clamp to the pole and square washer are placed between the clamp and pole to provide clearance for the cable.



HOT GALVANIZED

Stock No.	Type	Length	Weight Per 100 Pcs.
†15061	1-Bolt	2½"	74
†15063	3-Bolt	5¾"	220

†A. T. & T. Co. St'd.

†W. U. T. Co. St'd.

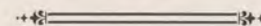


Copperweld Cable Rings



Blackburn "Never-slip" and National rings are manufactured under the Copperweld process. All Copperweld rings are made of special temper Xtra-Hi-Tensile wire.

In ordering Copperweld Cable Rings, use listings under Blackburn or National Rings for code sizes.



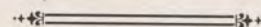
Cable Racks and Hooks

Used for interior cable and manhole work. Rack sections made in three lengths which can be combined into any desired length. Hooks have smooth, well rounded surface 1½ ins. wide which prevents injury to the cable sheath.

HOT GALVANIZED

Racks				Hooks		
Stock No.	No. of Holes	Length	Weight Per 100 Pcs.	Stock No.	Extension	Weight Per 100 pcs.
4708	8	15"	120	4595	4"	52
4714	14	24"	260	4596	7½"	104
4718	18	30"	310	4597	10"	126

Racks and Hooks are A. T. & T. Co. and W. U. T. Co. St'd



Dowel Pin

PLAIN

For use in connecting clay conduit to keep adjacent lengths in proper alignment. Stock No. 4585. 1/8 in. by 3 in. long, weighs 8 pounds per 100 pieces.



Transposition Brackets



The four styles of transposition brackets listed are the standards of the Western Union and the A. T. & T. Co. The number 5045 is the Western Union standard. This bracket is clamped on the arm with a 3/8 in. x 4 in. carriage bolt but does not have the 3/8 in. round hole for lagging the bracket to the arm. Bracket number 5046 is the A. T. & T. Co.'s standard for one wire and number 5047 for two wires on a transposition insulator.

These brackets are provided with a 3/8 in. round hole for lagging to the arm to prevent side movement. All brackets have holes for 1/2 in. pins.

The number 5048 is the standard bracket for four wire transpositions and includes two parts, the smaller part projects above the arm.

HOT GALVANIZED

Stock No.	Type	For Cross arms	Weight Per 100 Pes.
5045	1 1/4" x 3 1/8" 1-wire	3" x 4"	245
5046	1 1/4" x 3 1/8" 1-wire	3 1/4" x 4 1/4"	245
5047	1 1/2" x 3 3/8" 2-wire	3 1/4" x 4 1/4"	378
5048	1 1/2" x 3 3/8" 3-wire	3 1/4" x 4 1/4"	750

A. T. & T. Co. St'd.

W. U. T. Co. St'd.

Break Iron Bracket

HOT GALVANIZED

This bracket is furnished complete with two standard 5/8 in. pins with wood cobs, and 1/2 in. by 6 in. machine bolt. Pins are spaced on 6 1/2 in. centers. Stock No. 5050 weight 407 pounds per 100 pieces. WUT Co. St'd.



Telephone Distributing Brackets

On pole and house work these brackets are ideal for running twisted pairs. Used with two or four groove porcelain knobs. Stock No. 5085 has 1/8 in. dia. holes and Stock No. 5086 has 1/16 in. dia. holes for mounting.

HOT GALVANIZED

Stock No.	Length of Legs	Weight Per 100 Pes.
5085	2 7/8" x 3 7/8"	51
5086	3" x 4"	87

A. T. & T. Co. St'd.

Telephone Corner Brackets

Used where the lead from the pole comes to the building at an angle; also used with either two or four groove porcelain knobs. Brackets are provided with 1 1/2 in. dia. holes for mounting.



HOT GALVANIZED

Stock No.	Length of Legs	Weight Per 100 Pes.
5087	3 1/4" x 5 3/4"	65
5088	2 1/2" x 11"	90

W. U. T. Co. St'd.

Porcelain Knobs

For telephone distributing and corner brackets.

Stock No.	Type Knob	Weight Per 100 Pes.
5090	2-Groove	18
5091	4-Groove	33

Bolts for Porcelain Knobs

HOT GALVANIZED

Stock No.	Type of Bolt	Weight Per 100 Pes.
5095	5/16" x 2" Stove, for 2-groove knob	6
5903	3/8" x 3" Machine, for 4-groove knob	13
5905 1/2	3/8" x 5 1/2" Machine, for 2-4 groove knob	20

Telephone Knob Bracket

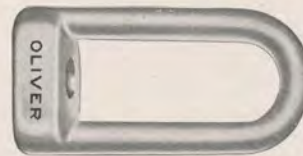
HOT GALVANIZED

Used extensively for telephone work and many other uses. Straight stem is 5/8 in. x 2 1/2 ins. long and has sharp, clean cut threads. Stock No. 4930 weighs 44 pounds per 100 pieces.



Drop Forged Bolt Eyes

Used extensively for attaching suspension insulators with clevis or hook to the cross arm. Also for dead ending and guying. Bolt eye may be used on either the head or nut end of a machine bolt.



HOT GALVANIZED

Stock No.	Type Eye	Weight Per 100 Pes.
9470	Standard 2 3/8" long for 5/8" bolt	83
9480	Long 4 1/2" long for 5/8" bolt	103
9481	Long 4 1/2" long for 3/4" bolt	100

Drop Forged Eye Nuts

Most commonly used for dead-ending, back guying, and attaching pole head guy on the threaded end of a cross arm bolt. Eye nuts are tapped for 1/2, 5/8 and 3/4 in. bolts.



HOT GALVANIZED N. E. L. A. Standard

Stock No.	Type	Weight Per 100 Pes.
9450	1/2" Standard	49
9451	5/8" Standard	46
9460	5/8" N. E. L. A.	60
9461	3/4" N. E. L. A.	56

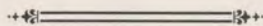
Double Arming Channels and Plates



Channels are 4 ins. wide x 1½ ins. deep. Plates are made from 4 ins. x 1½ in. flat steel. Adjustable to poles from 7 ins. to 12 ins. top diameter. Pin holes are 1⅜ in. diameter and slots are 1⅜ in. x 3 ins. long.

HOT GALVANIZED

Stock No.	Type	Weight Per 100 Pcs.
1324	Channel 24" long	1080
1330	Channel 30" long	1350
1344	Plate 24" long	1300
1350	Plate 30" long	1650

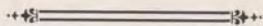


Dead-Ending Tongue Clevis

HOT GALVANIZED



By attaching this unit to a cross arm almost any type of strain insulator clevis or metal cap insulators with either clevis or hook can be used. Provided with 1½ in. hole. Stock No. 4220 weighs 88 pounds per 100 pieces.



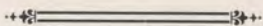
Thimble Clevises

Used for dead-ending insulated lines by attaching to stud of suspension type insulators. Smooth, well rounded surface prevents injury to insulation.



HOT GALVANIZED

Stock No.	Type	Weight Per 100 Pcs.
4250	2" x No. 11 Ga. for 1" cable	49
4255	2½" x No. 9 Ga. for 1" cable	67



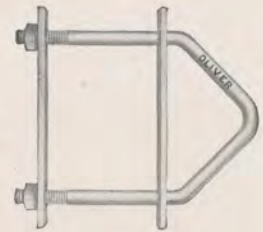
Dead-Ending Clevis

HOT GALVANIZED



Used for anchoring metal cap, strain or suspension insulators to the side of a cross arm or building. Stock No. 4200 has 1⅜ in. hole for mounting. Clevis extends 3½ ins. from cross arm. Weighs 94 pounds, per 100 pieces.

Dead-Ending Clamp Type Clevises



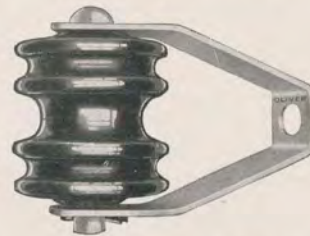
For safe and economical installation this clevis clamps around the arm instead of the old method of bolting through. Made from ½ in. round steel with broad, flat plates bearing on the arm.

HOT GALVANIZED

Stock No.	Size of Arm	Weight Per 100 Pcs.
4301	3½" x 4¼"	191
4302	3½" x 4½"	215
4303	3½" x 4¾"	224
4304	4" x 5"	233



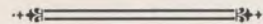
Dead-Ending Insulated Clevises



Made in four styles. Two are furnished with wet process insulators for dead ending primary lines, and two are furnished with dry process insulators for secondary work. Clevises are provided with 1⅜ in. holes for mounting.

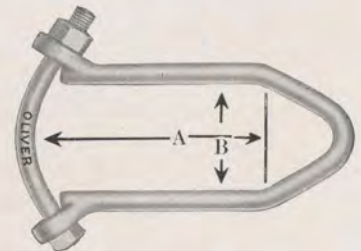
HOT GALVANIZED

Stock No.	Type	Insulators	Weight Per 100 Pcs.
4400	Small	Wet Process	125
4405	Large	Wet Process	269
4410	Small	Dry Process	136
4415	Large	Dry Process	225



Strain Insulator Clevises

Designated for the popular sizes of strain insulators. Drop forged from ½ in. diameter open hearth-steel and furnished with ½ in. curved bolt and hexagon nut.



HOT GALVANIZED

Standard Heavy Type				Standard Heavy Eye Type			
Stock No.	A	B	Weight Per 100 Pcs.	Stock No.	A	B	Weight Per 100 Pcs.
4003	3	1½	96	4103	3	1½	117
4013	3	1¾	102	4113	3	1¾	119
4023	3	2	105	4123	3	2	121
4024	4	2	117	4124	4	2	133
4033	3	2¼	108	4133	3	2¼	123
4034	4	2¼	120	4134	4	2¼	125
4035	5	2¼	132	4135	5	2¼	147
4044	4	2½	125	4144	4	2½	138
4045	5	2½	137	4145	5	2½	150

Insulated Forks

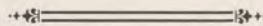


Made from channel steel in two types. The small type No. 4830 has a square hole for carriage bolt which prevents the fork from turning. The large type No. 4835 for attaching with machine bolt has lugs on each side of the bolt hole to prevent fork turning. Holes are

$\frac{1}{16}$ in. dia. for $\frac{5}{8}$ in. bolts.

HOT GALVANIZED

Stock No.	Type	Weight Per 100 Pcs.
4830	Light Service	115
4835	Heavy Service	230



Western Union Pins

Standard with the leading telephone and telegraph companies. Complete with best grade oak cobs thoroughly boiled in paraffine to exclude all moisture. Pins are made of high-carbon steel. Long shank type for wood arms and short shank type for transposition brackets. Also long cob type for transposition brackets and lag screw type for wood arms and poles.



PLAIN

Long Shank Type

Stock No.	Diameter	Shoulder		Weight Per 100 Pcs.
		Above	Below	
‡5001	$\frac{1}{2}$	$4\frac{1}{4}$	5	70
‡5003	$\frac{5}{8}$	$4\frac{1}{4}$	5	108

HOT GALVANIZED

Long Shank Type

Stock No.	Dia.	Shoulder		Weight Per 100 Pcs.
		Above	Below	
‡5000	$\frac{1}{2}$	$4\frac{1}{4}$	5	70
‡5002	$\frac{5}{8}$	$4\frac{1}{4}$	5	108

Lag Screw Type

Stock No.	Dia.	Shoulder		Weight Per 100 Pcs.
		Above	Below	
5005	$\frac{1}{2}$	$4\frac{1}{4}$	3	63
5006	$\frac{5}{8}$	$4\frac{1}{4}$	3	90

Short Shank Type—Short Cob

Stock No.	Dia.	Shoulder		Weight Per 100 Pcs.
		Above	Below	
5010	$\frac{1}{2}$	5	1	48
5012	$\frac{5}{8}$	5	1	74

Short Shank Type—Long Cob

Stock No.	Dia.	Shoulder		Weight Per 100 Pcs.
		Above	Below	
5011	$\frac{1}{2}$	6	1	51
5014	$\frac{5}{8}$	6	1	77

‡W. U. T. Co. St'd.

Wood Top Pins

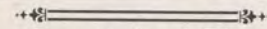


Made in two styles. For insulators having 1 and $1\frac{3}{8}$ in. pin holes. Cobs are made from best grade locust, seasoned, air dried, and thoroughly impregnated with paraffine to exclude all moisture. Pins are shipped assembled as shown.



HOT GALVANIZED

For 1" Pin Hole					For $1\frac{3}{8}$ " Pin Hole				
Stock No.	Dia.	Shoulder		Weight Per 100 pcs.	Stock No.	Dia.	Shoulder		Weight Per 100 Pcs.
		Above	Below				Above	Below	
5020	$\frac{1}{2}$	$4\frac{1}{2}$	1	56	5030	$\frac{5}{8}$	$4\frac{1}{2}$	1	95
5021	$\frac{1}{2}$	$5\frac{1}{4}$	$1\frac{1}{4}$	68	5031	$\frac{5}{8}$	$5\frac{1}{4}$	$1\frac{1}{4}$	105
5022	$\frac{1}{2}$	$4\frac{1}{2}$	5	75	5032	$\frac{5}{8}$	$4\frac{1}{2}$	5	130
5023	$\frac{1}{2}$	$5\frac{1}{4}$	$5\frac{1}{4}$	85	5033	$\frac{5}{8}$	$4\frac{1}{2}$	6	136
5024	$\frac{1}{2}$	$5\frac{1}{4}$	$6\frac{1}{4}$	90					



Forged Steel Pins For Low Voltage Insulators

For electric light, telephone and telegraph lines on which insulators with 1 in. pin holes are used. Furnished with lead thread of uniform size and shape. A perfect bond between the lead and zinc coating positively prevents removal of the lead. Short shank-type for steel arms and brackets long shank-type for wood arms and lag screw type for poles and transformer wiring. Pins are shipped assembled as shown.



HOT GALVANIZED

Long Shank Type

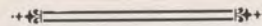
Stock No.	Dia.	Shoulder		Weight Per 100 Pcs.
		Above	Below	
3500	$\frac{1}{2}$	$4\frac{3}{4}$	$4\frac{3}{4}$	108
3501	$\frac{1}{2}$	$4\frac{3}{4}$	$5\frac{3}{4}$	113
3505	$\frac{5}{8}$	$4\frac{3}{4}$	$4\frac{3}{4}$	135
3506	$\frac{5}{8}$	$4\frac{3}{4}$	$5\frac{1}{2}$	142
3507	$\frac{5}{8}$	$4\frac{3}{4}$	$6\frac{1}{2}$	149
3508	$\frac{5}{8}$	6	$4\frac{3}{4}$	146
3509	$\frac{5}{8}$	6	$5\frac{1}{2}$	152
3510	$\frac{5}{8}$	6	$6\frac{1}{2}$	160
3515	$\frac{3}{4}$	$4\frac{3}{4}$	$5\frac{3}{4}$	190
3516	$\frac{3}{4}$	6	$5\frac{3}{4}$	205
3517	$\frac{3}{4}$	6	$6\frac{3}{4}$	218

Short Shank Type

Stock No.	Dia.	Shoulder		Weight Per 100 Pcs.
		Above	Below	
3550	$\frac{1}{2}$	$4\frac{3}{4}$	$1\frac{1}{4}$	94
3555	$\frac{5}{8}$	$4\frac{3}{4}$	$1\frac{1}{4}$	105
3558	$\frac{5}{8}$	6	$1\frac{1}{4}$	116
3565	$\frac{3}{4}$	$4\frac{3}{4}$	$1\frac{1}{2}$	120
3566	$\frac{3}{4}$	6	$1\frac{1}{2}$	136

Lag Screw Type

3570	$\frac{1}{2}$	$4\frac{3}{4}$	3	92
3572	$\frac{1}{2}$	6	3	103
3575	$\frac{5}{8}$	$4\frac{3}{4}$	3	108
3578	$\frac{5}{8}$	$7\frac{1}{2}$	4	140
3586	$\frac{3}{4}$	6	4	143



Transformer Pin

HOT GALVANIZED

Forged from mild open-hearth steel. A popular pin for running leads from transformer arm to primary cross arm. Furnished with 1 in. lead thread and No. 22 x 2 ins. wood screw. Stock No. 3600, $4\frac{3}{4}$ ins. high, weighs 63 pounds per 100 pieces.





Forged Steel Pins

For High Voltage Insulators

Made from high carbon open-hearth steel with uniform strength in all directions and full strength carried to top of pin. Lead thread is bonded to pin actually locked against removal. Made in two types: lead thread for 1 and 1 3/8 in. pin holes and separable zinc thimble for cementing into insulators. Shanks are 3/4 in. dia. for bolting through cross arms. Pins are shipped assembled as shown.



LONG SHANK TYPE—HOT GALVANIZED

Stock No.		Shoulder		Pin Hole	Weight Per 100	
Separable Thimble	Lead Thread	Above	Below		Separable Thimble	Lead Thread
3004	3054	4	5 1/2	1	196	225
3005	3055	5	5 1/2	1	209	240
3006	3056	6	5 1/2	1	233	267
3016	3066	6	6 1/2	1 3/8	374	450
3017	3067	7	6 1/2	1 3/8	409	485
3018	3068	8	6 1/2	1 3/8	354	530
3019	3069	9	6 1/2	1 3/8	546	618
3020	3070	10	6 1/2	1 3/8	595	682
3021	3071	11	6 1/2	1 3/8	668	753
3022	3072	12	6 1/2	1 3/8	732	820

SHORT SHANK TYPE—HOT GALVANIZED

3104	3154	4	1 3/4	1	139	167
3105	3155	5	1 3/4	1	152	181
3106	3156	6	1 3/4	1	178	207
3116	3166	6	1 3/4	1 3/8	302	365
3117	3167	7	1 3/4	1 3/8	339	400
3118	3168	8	1 3/4	1 3/8	384	450
3119	3169	8	1 3/4	1 3/8	471	530
3120	3170	10	1 3/4	1 3/8	523	599
3121	3171	11	1 3/4	1 3/8	596	673
3122	3172	12	1 3/4	1 3/8	656	733



Forged Steel Pins

Malleable Thimble Type

Made from high carbon open-hearth steel with thimble for cementing into high voltage insulators having 1 3/8 in. pin hole. Unless otherwise specified thimbles will be furnished as shown. Top of pin has 3/4 in. dia. stud 1 3/4 ins. long suitable for any malleable thimble. Shank has 3/4 in. dia. for bolting through cross arm. Pins are shipped assembled as shown.



HOT GALVANIZED

Long Shank Type				Short Shank Type			
Stock No.	Shoulder		Weight Per 100 Pcs.	Stock No.	Shoulder		Weight Per 100 Pcs.
	Above	Below			Above	Below	
3216	6	6 1/2	393	3266	6	1 3/4	321
3217	7	6 1/2	453	3267	7	1 3/4	383
3218	8	6 1/2	505	3268	8	1 3/4	433
3219	9	6 1/2	555	3269	9	1 3/4	483
3220	10	6 1/2	609	3270	10	1 3/4	539
3221	11	6 1/2	676	3271	11	1 3/4	699
3222	12	6 1/2	825	3272	12	1 3/4	755



Pole Top Pins

Made in two types—Pressed steel and pipe. Furnished with lead thread or separable zinc thimbles for cementing into insulators. For higher voltage lines, pipe pins are usually specified because of their strength and light weight. Both types have 1/4 in. holes for mounting.



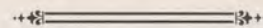
HOT GALVANIZED

Pressed Steel Type

Stock No.		Size In.		Weight Per 100 Pcs.	
Separable Thimble	Lead Thread	Length	Pin Hole	Separable Thimble	Lead Thread
3740	3720	18	1	275	331
3745	3725	24	1	400	447
3750	3730	18	1 3/8	286	404
3755	3735	24	1 3/8	406	510

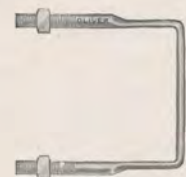
Pipe Type for 1 3/8 in. Pin Holes

Stock No.	Lead Thread	Dia. Pipe	Length	Weight Per 100 Pcs.	
				Separable Thimble	Lead Thread
3840	3820	1 3/8	18	340	457
3845	3825	1 3/8	24	703	826
3850	3830	2	30	1265	1398
3855	3835	2	36	1433	1566



Cross Arm Straps

Drop forged from round steel with broad flat surface bearing on the arm. Ends have 2 1/2 ins. sharp, clean cut threads. Made in two types for horizontal, and one type for vertical mounting.



HOT GALVANIZED

LIGHT TYPE HORIZONTAL

Stock No.	Dia.	Size of Arm	Weight Per 100 Pcs.
3301	1 1/2"	3 1/4" x 4 1/4"	80
3302	1 1/2"	3 1/2" x 4 1/2"	85
3303	1 1/2"	3 3/4" x 4 3/4"	90
3304	1 1/2"	4" x 5"	95

LIGHT TYPE VERTICAL

3321	1 1/2"	3 1/4" x 4 1/4"	94
3322	1 1/2"	3 1/2" x 4 1/2"	100
3323	1 1/2"	3 3/4" x 4 3/4"	106
3324	1 1/2"	4" x 5"	112

HEAVY TYPE HORIZONTAL

3311	5/8"	3 1/4" x 4 1/4"	132
3312	5/8"	3 1/2" x 4 1/2"	138
3313	5/8"	3 3/4" x 4 3/4"	144
3314	5/8"	4" x 5"	150

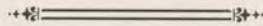


Clamp Pins

Furnished with 1 in. dia. lead thread. Adjustable to arms 4 in. x 5 in. and smaller. Height of pins, 4 3/4 ins. above cross arm, 1/2 in. dia. cross arm straps used in mounting but not included with the pin.

HOT GALVANIZED

Stock No.	Type	Weight Per 100 Pcs.
3300	Drop forged	155
4300	Channel	110



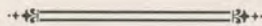
Cross Arm Saddles

For seating pins on roofed cross arms. Made of pressed steel. Saddles have 1 1/8 in. hole for forged steel pins having 3/4 in shank.



HOT GALVANIZED

Stock No.	Size of Arm	Weight Per 100 Pcs.
3081	3 1/4" x 4 1/4"	87
3082	3 1/2" x 4 1/2"	93
3083	3 3/4" x 4 3/4"	99
3084	4" x 5"	105
3085	5" x 6"	130



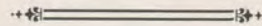
Centering Washers

For centering steel pins on cross arms previously bored for wood pins. Stock No. 3091 for 1 1/2 in. bore with 1 1/8 in. hole and No. 3092 for 1 1/2 in. bore with 1 1/16 in. hole.



HOT GALVANIZED

Stock No.	Size of Hole	Weight Per 100 Pcs.
3091	1 1/8"	31
3092	1 1/16"	29



Three-Prong Lock Washers

Specially designed for long shank insulator pins. Sharp tooth bites well into the arm when nut is drawn up. Bending the edges of the washer over the corner of nut prevents loosening. These washers are standard equipment on all long shank forged steel pins.



HOT GALVANIZED

Stock No.	Size of Pin	Weight Per 100 Pcs.
3094	1 1/2"	44
3095	5/8"	42
3096	3/4"	40

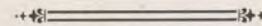


Secondary Racks

An innovation in secondary rack manufacture because of the combination of a new-rolled open-hearth steel one-piece back and drop forged points. Design of back eliminates necessity of using washers under bolt heads when mounting. Design of point eliminates scoring line wires during their installation. Designed for the heaviest construction with ample factor of safety. Greater rust-resisting qualities because all small parts are eliminated. Weights include insulators.

HOT GALVANIZED

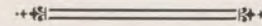
Standard Heavy Type				Extended Back Heavy Type			
Stock No.	No. of Wires	Spacing	Weight Per 100 Pcs.	Stock No.	No. of Wires	Spacing	Weight Per 100 Pcs.
2024	2	4"	591	2124	2	4"	664
2026	2	6"	694	2126	2	6"	749
2028	2	8"	734	2128	2	8"	804
2034	3	4"	866	2134	3	4"	936
2036	3	6"	1056	2136	3	6"	1111
2038	3	8"	1116	2138	3	8"	1186
2044	4	4"	1108	2144	4	4"	1178
2048	4	8"	1488	2148	4	8"	1581
2054	5	4"	1380	2154	5	4"	1450



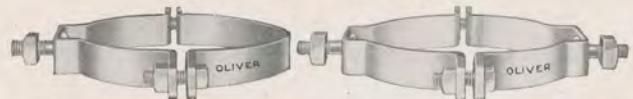
Insulators for Secondary Racks

Brown glazed dry process insulators furnished on all heavy type racks unless otherwise specified. Wet process and white glazed insulators can also be furnished.

Stock No.	Type	Weight Per 100 Pcs.
2000	Dry Process—brown glaze	132
2100	Wet Process—brown glaze	132
2200	Dry Process—white glaze	132



Pole Bands for Secondary Racks



For attaching all styles of racks to tubular steel poles having an outside diameter of 4 1/2, 5, 5 1/2 and 6 5/8 ins. Made in two styles. Single type for attaching one rack and double type for attaching two racks. Furnished with carriage bolts for easy installation.

HOT GALVANIZED

Single Type			Double Type		
Stock No.	Out. Dia. of Pole	Weight Per 100 Pcs.	Stock No.	Out. Dia. of Pole	Weight Per 100 Pcs.
2204	4 1/2	320	2214	4 1/2	366
2204 1/2	5	376	2214 1/2	5	421
2205	5 1/2	388	2215	5 1/2	433
2206	6 5/8	415	2216	6 5/8	460

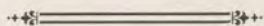
Dead-Ending Straps



For temporarily dead-ending a line on secondary racks where extensions may be made later without removing the rack. Two types: Number 2050 for heavy duty and Number 2350 for light duty. Straps have one $\frac{1}{8}$ in. hole for $\frac{1}{2}$ in. lag screw.

HOT GALVANIZED

Stock No.	Type	Weight, Per 100 Pes.
2050	Heavy— $\frac{1}{4}$ "x $1\frac{1}{4}$ "	100
2350	Light—No. 14 x $1\frac{1}{4}$ "	60



Extension Brackets

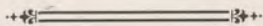
For Secondary Racks

Where obstructions are to be overcome and where proper clearances are required, this bracket is fastened to the pole for mounting secondary racks. It has an extension of 6 ins. with broad curved surface bearing on the pole. Special brackets of any desired length can be furnished upon request.



HOT GALVANIZED

Stock No.	Type	Weight Per 100 Pes.
2250	Flat base for walls	250
2255	Curved base for poles	250



All Porcelain House Brackets

This type bracket is rapidly replacing the metal bracket for house service connections. Made from high-grade dry porcelain with screws or toggle bolts cemented firmly into base. Broad rounded surfaces of hole permit line wire to be tied in any direction. Will drain water easily in any position. Clean-cut threads makes easy installation. Stock Nos. 2600, 2610 and 2620 for medium service work and Nos. 2650, 2660 and 2670 for light service work. Center of holes is $1\frac{3}{4}$ ins. from base.

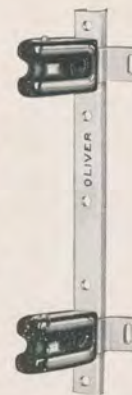
Stock No.	Type	Size of Hole	Weight Per 100 Pes.
2600	Heavy—with No. 22 x 2" Galv. Screw	$1\frac{1}{16}$ "	108
2610	Heavy—with No. 22 x 2" Brass Screw	$1\frac{1}{16}$ "	108
2620	Heavy—with $\frac{3}{8}$ x5" Toggle Bolt	$1\frac{1}{16}$ "	110
2650	Light—with No. 20 x 2" Galv. Screw	$\frac{9}{16}$ "	60
2660	Light—with No. 20 x 2" Brass Screw	$\frac{9}{16}$ "	60
2670	Light—with $\frac{3}{8}$ x5" Toggle Bolt	$\frac{9}{16}$ "	62



No. 2510

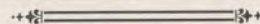
House Brackets

Very popular for house service connections. Practically unbreakable due to sturdy construction. Suitable for medium services and span work. Insulator designed with round surface to drain water in all directions.



HOT GALVANIZED

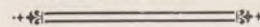
Stock No.	No. Wires	Wire Spacing	Weight Per 100 Pes.
2510	1	6	78
2526	2	6	204
2528	2	8	208
2534	3	4	284
2536	3	6	308
2544	4	4	390



Swinging Knob Bracket

HOT GALVANIZED

A very economic installation for light service work on houses. Long screw with sharp clean threads reaches well into the studding. The flexible features provide for all angles of approach eliminating excessive strain usually found in rigid supports. Insulator has deep wide groove for use with duplex wires. Stock No. 2700. Weighs 102 pounds, per 100 pieces.



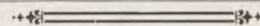
Cross Arm Spreader Brackets

For taking off service connections from secondary circuits supported on cross arms, eliminating the old method of buck arming. A strong bracket made from channel steel and equipped with 1 in. lead thread— $\frac{1}{2}$ in. dia. cross arm straps are used for mounting but not included with the bracket.



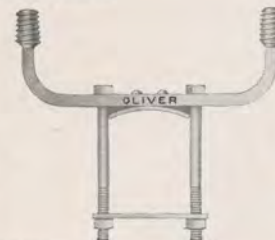
HOT GALVANIZED

Stock No.	Type	Weight Per 100 Pes.
1720	2 Wire—12" spacing	290
1730	3 Wire—6" spacing	400



Break Arm Brackets

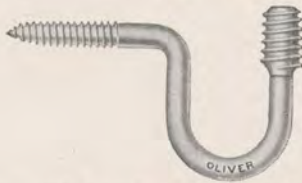
A popular bracket for breaking series lighting circuits. Made from channel steel with 12 ins. wire spacing. Has 1 in. lead thread. Two types: Stock number 1700 adjustable to cross arms, 4 ins. x 5 ins. and smaller; 1710 with pin for bored arms.



HOT GALVANIZED

Stock No.	Type	Weight Per 100 Pes.
1700	With cross arm clamp.	360
1710	With pin for bored arms.	365

Forged Hook Brackets

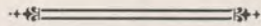


This bracket is stronger and more dependable than other types formerly employed because it is forged from mild open-hearth steel. It is used for running secondaries

on poles and making service attachments on buildings. Equipped with sharp gimlet point threads for easy installation. Furnished with wood cob or lead-thread for 1 in. pin hole.

HOT GALVANIZED

Stock No.	Type	Weight Per 100 Pcs.
2720	1/2" Lag screw, 4 1/2" extension, 1" lead thread	140
2730	1/2" Round, 4 1/4" extension, 1" lead thread	86
2731	1/2" Round, 4 1/4" extension, 1" wood cob	75
2740	1/2" Square, 4 1/4" extension, 1" lead thread	105
2750	5/8" Round, 4 1/2" extension, 1" lead thread	130
2751	5/8" Round, 4 1/2" extension, 1" wood cob	120
2760	5/8" Square, 4 1/2" extension, 1" lead thread	170



Trolley Pole Bands

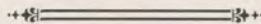
For attaching span wires, guys and messengers, to tubular steel poles Two Type Solid (1 and 2 bolt) and split (2 and 3 bolt). Bands are made for poles with outside diameter of 4 1/2, 5, 5 1/2 and 6 5/8 ins. Special sizes upon request.



HOT GALVANIZED

Solid 1-Bolt Type			Solid 2-Bolt Type		
Stock No.	Outside Diameter of Pole	Weight Per 100 Pcs.	Stock No.	Outside Diameter of Pole	Weight Per 100 Pcs.
8044	4 1/2	160	8144	4 1/2	200
8044 1/2	5	172	8144 1/2	5	212
8045	5 1/2	185	8145	5 1/2	225
8046	6 5/8	210	8146	6 5/8	250

Split 2-Bolt Type			Split 3-Bolt Type		
Stock No.	Outside Diameter of Pole	Weight Per 100 Pcs.	Stock No.	Outside Diameter of Pole	Weight Per 100 Pcs.
8064	4 1/2	205	8164	4 1/2	245
8064 1/2	5	220	8164 1/2	5	260
8065	5 1/2	235	8165	5 1/2	275
8066	6 5/8	255	8166	6 5/8	295



Lamp Trimmer's Leg Rest

HOT GALVANIZED



A dependable and safe support for the lamp trimmer when working from the pole. Stock No. 1328—23 1/2 in s.

overall. Made from 3/4 in. open-hearth steel and provided with round washer and square nut. Weighs 352 pounds, per 100 pieces.

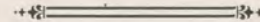
Insulated Fork Bolts



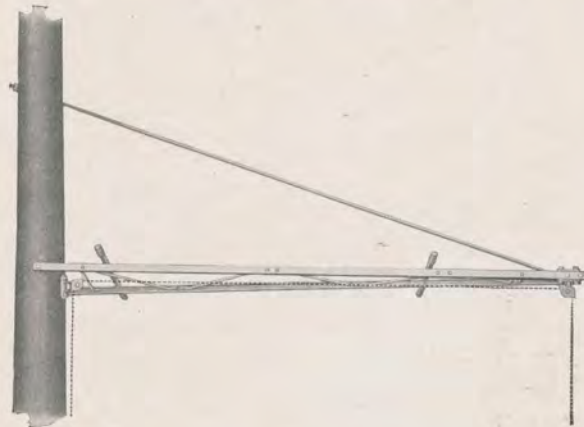
Used principally as span wire supports. Made from open-hearth steel. Furnished complete with insulator and 3/8 in. machine bolt. Length is measured from end of bolt to center of insulator. All bolts have 6 ins. of thread.

HOT GALVANIZED

Stock No.	Size	Weight Per 100 Pcs.
4810	1 1/2" x 10"	104
4812	1 1/2" x 12"	114
4814	1 1/2" x 14"	124
4822	5/8" x 12"	156
4824	5/8" x 14"	171
4826	5/8" x 16"	186



Mast Arms—Rigid Type



In places where there is little street traffic to interfere with inspector's work, this arm is very popular. Lamp unit is fastened to chain or rope which permits it to be lowered to street level. Made from steel channels with strong diagonal supports. Complete with two spreader arms and two sleet-proof pulleys.

HOT GALVANIZED

Stock No.	Length	Weight Per 100 Pcs.
4606	6	2500
4608	8	4100
4610	10	4600
4612	12	5400
4614	14	6000
4616	16	6500

SOUTHERN SIGNAL CORP.



LOUISVILLE, KY. U.S.A.

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PEERLESS MANUFACTURING CORPORATION
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BULLETIN No. 23C

5/34

PEERLESS REFLEX SIGNS



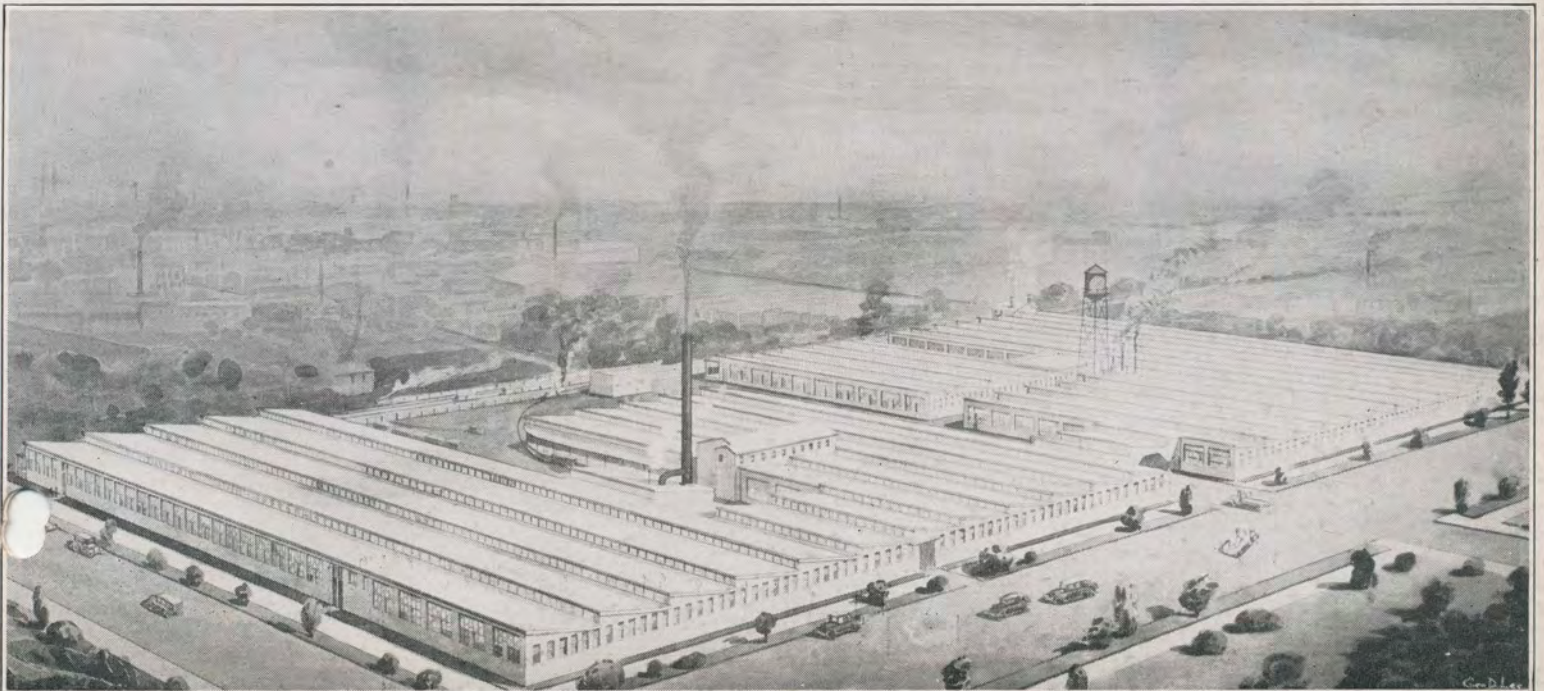
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Established in 1894



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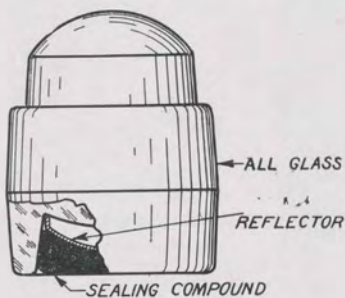
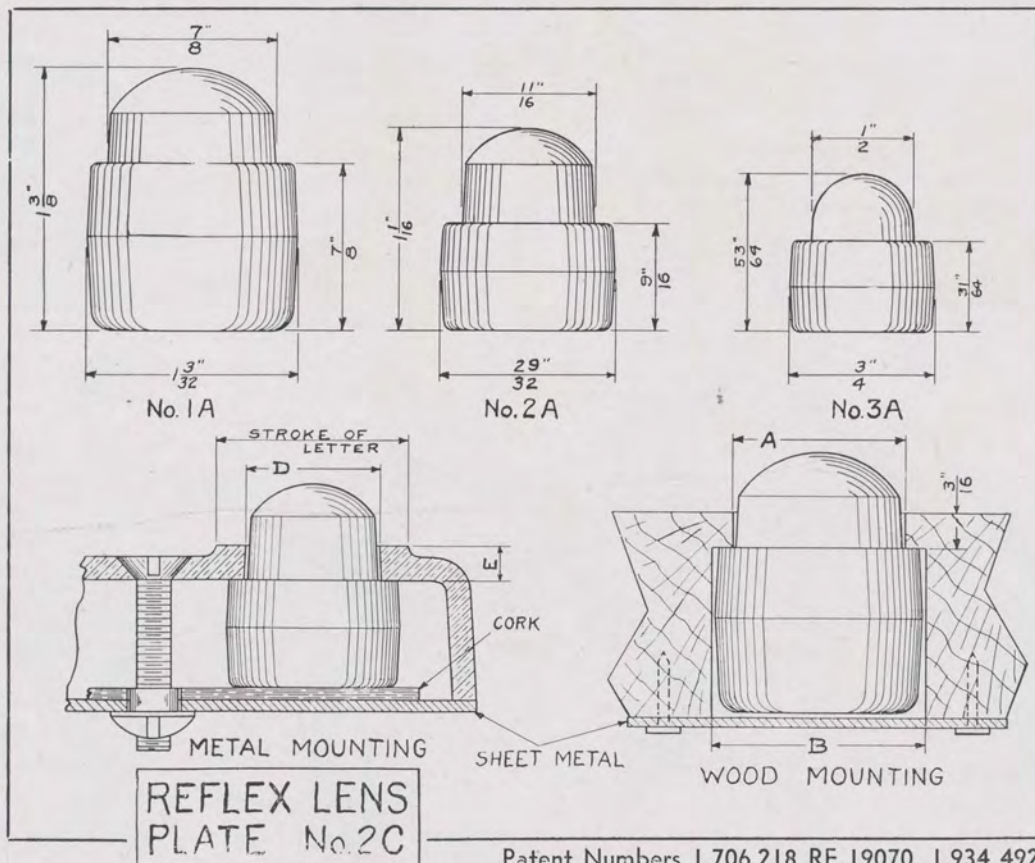


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EFFICIENCY

RAYS of light projected from a motor vehicle, or other sources, entering the lens from almost any angle, are returned with well over seventy-five percent of their original intensity, directly to the source of light. Any sign or symbol made up of these reflecting units command instant attention of the motorist, or engineer, being clearly visible as far away as the lights will penetrate.

FLEXIBILITY-HIGHWAY, CITIES, ETC.

GREAT flexibility is afforded in the adaptability of signs and symbols. They have proven a revelation to City, State, County and other officials associated with the regulation of traffic, as it is impossible for a motorist to pass unnoticed a REFLEX sign at night if head lights are lighted.

BOULEVARDS, State Arterials, Detours, Curves, Grade Crossings, Obstructions, Embankments, Dead-End Streets, etc. are positively and clearly indicated at all times, regardless of weather or other conditions.

RAILROADS

ADVANTAGES of REFLEX Signs for conveying Absolute, Permissive, Whistle, Ring, Grade, Speed Reduction or other warning signs to the engineer have been proven to a great number of Railroad Officials. Crossing Gates, Grade Crossings or other locations are positively, permanently and definitely protected. Are a major economy to replace oil lamps at Switches and on Semaphores.

Wherever used REFLEX signs will flash your message without any attention or operating expense.

For Highways, Railroads, Streets, Bus Markers or General Advertising purposes REFLEX signs have proven their effectiveness.

Our engineers, and designers, are at your disposal to cooperate with you on any problems.

REFLEX DATA—See Plate No. 2C, Page 4

LENS SIZE	GUIDE TO DRILLING AND SPACING BUTTONS					BUTTON WEIGHTS	
	Wood Mounting		Metal Mounting		Minimum Spacing of Lens	Weight of Lens Per Hundred	
	A	B	D	E	Center to Center	Net Weight	Shipping Weight
1A	15/16"	1 5/32"	15/16"	3/16"	1 5/32"	8 lbs. 10 ozs.	10 lbs. 8 ozs.
2A	47/64"	31/32"	47/64"	3/16"	31/32"	4 lbs. 3 ozs.	5 lbs. 12 ozs.
3A	37/64"	13/16"	37/64"	3/16"	13/16"	2 lbs. 2 ozs.	3 lbs. 4 ozs.

Dimension "D" as shown above applies to all thickness of metal up to 3/16"

REFLEX DATA

Approximate Number of Lens in PEERLESS

Height	Average Width	Stroke	Lens Number	Button Spacing	Average	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
4"	2 11/16"	1 1/16"	3A	7/8"	10	10	13	9	12	10	8	11	11	5	7	11	7	13	12	12	10
5"	3 11/32"	2 7/32"	3A	2 7/32"	13	13	16	11	15	11	9	13	14	6	8	13	8	15	14	14	12
5"	3 11/32"	2 7/32"	2A	1 1/32"	10	10	13	9	12	10	8	11	11	5	7	11	7	13	11	12	10
6"	4"	1"	2A	1"	12	13	16	11	15	11	9	14	14	6	8	13	8	15	14	12	12
8"	5 3/8"	1 5/16"	2A	1 1/8"	15	15	20	13	18	15	12	16	17	7	10	16	10	19	17	16	15
8"	5 3/8"	1 5/16"	1A	1 3/8"	13	14	17	11	15	11	9	13	14	6	8	13	8	15	14	14	12
10"	6 5/8"	1 11/16"	1A	1 5/8"	13	13	17	11	15	14	11	14	14	6	8	13	9	19	17	14	13
12"	8"	2"	1A	1 11/16"	15	15	20	12	17	15	12	15	16	7	9	15	10	19	18	15	15

LETTER SPACING

FOR best results do not space buttons too widely apart. Values for button spacing are given in table for Peerless Series D. letter. The more uniform the spacing the better the effect produced. The legibility of a sign depends largely on adequate letter spacing, and as furthermore the pleasing appearance of a sign depends on correct balance, it is recommended that the spacing be studied. Where there is room use wide spacing as this increases legibility.

DRILLING

ALL words and letters should be laid off carefully and button centers spaced properly before drilling any holes for the buttons.

SIGN MATERIAL

DIMENSIONS for application of REFLEX Buttons are shown for both wood and metal signs. In the manufacture of special signs in our plant, we use sheet metal construction. The cost is a little more than wood, but the durability is considerably greater.

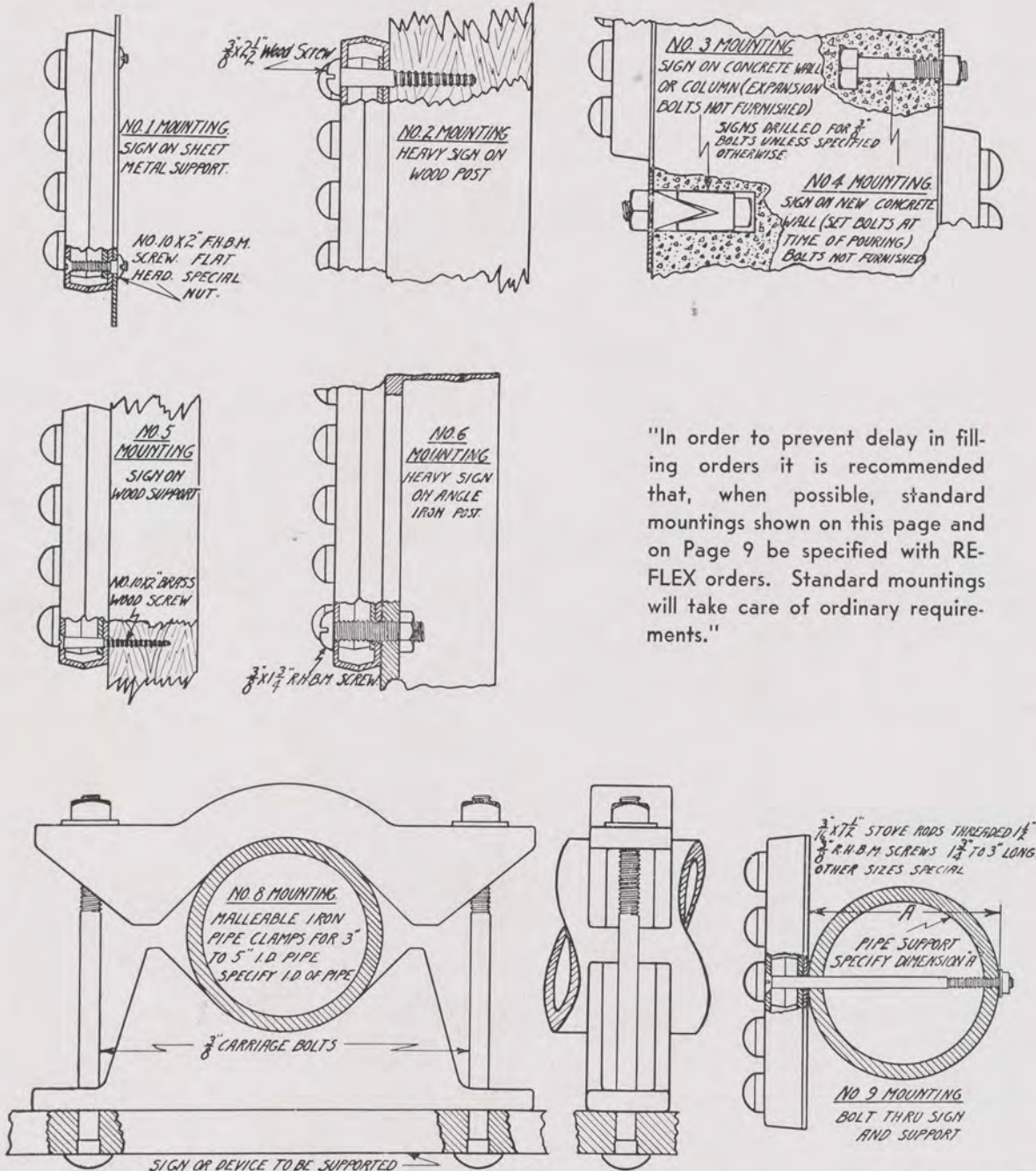
Standard signs listed in this catalog may serve your purpose and thus save you money.

—See also Plate No. 2C, Page 4

Series "D" Letters and Numbers

Average	Q	R	S	T	U	V	W	X	Y	Z	1	2	3	4	5	6	7	8	9	0	Average
10	13	12	10	7	11	9	13	9	7	9	5	10	11	10	11	12	7	12	12	12	10
13	16	14	13	9	13	11	15	13	9	12	6	13	13	13	13	15	9	16	15	14	13
10	14	12	11	7	11	9	13	9	7	9	5	10	11	11	11	12	7	13	12	12	10
12	14	14	13	8	13	11	15	9	9	10	6	12	12	13	12	14	8	16	14	12	12
15	18	18	15	10	15	13	19	13	11	13	7	15	15	16	16	18	10	20	18	16	15
13	16	14	13	9	13	11	15	13	9	12	6	13	13	14	13	15	9	16	15	14	13
15	15	15	13	9	13	11	17	13	9	12	6	13	13	13	14	14	8	16	13	14	13
15	16	18	14	10	14	13	19	13	10	13	7	14	14	15	15	15	10	18	14	15	15

Typical Method of Mounting REFLEX Signs or Units

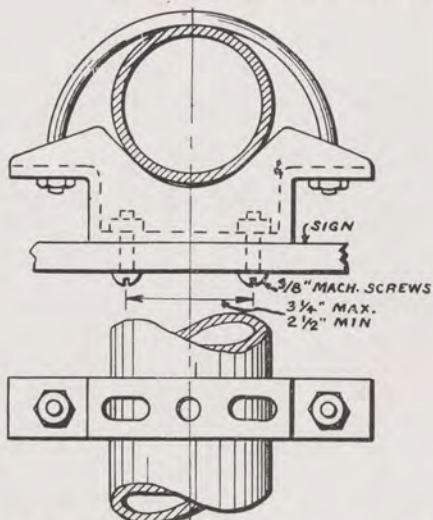


"In order to prevent delay in filling orders it is recommended that, when possible, standard mountings shown on this page and on Page 9 be specified with REFLEX orders. Standard mountings will take care of ordinary requirements."

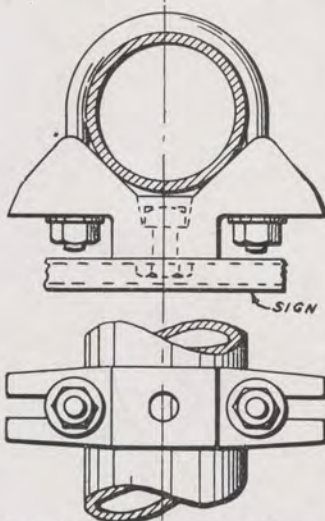
MOUNTING METHODS
FOR REFLEX SIGNS
PLATE 2B

IN ORDERING SIGNS SPECIFY TYPE OF MOUNTING WANTED

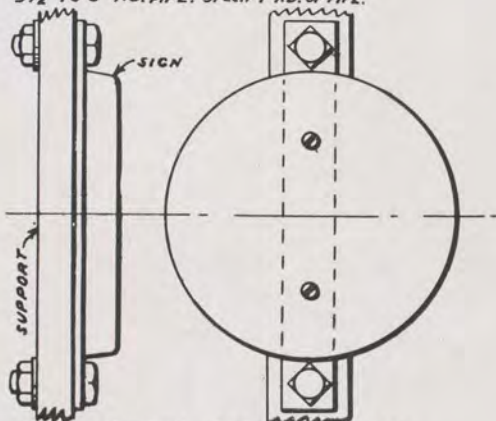
Additional Methods of Mounting REFLEX Signs or Units



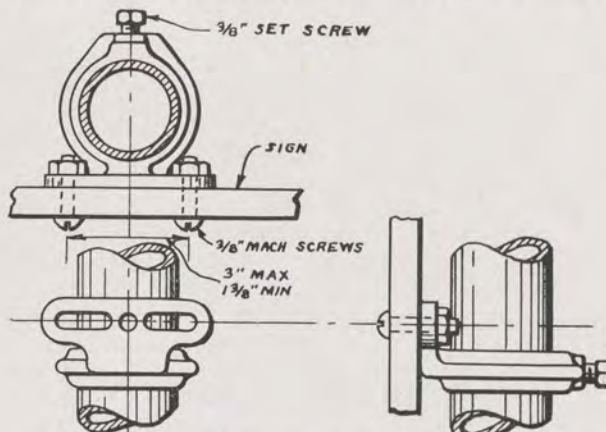
No. 10 MOUNTING. GRAY IRON CLAMP, WITH $\frac{3}{8}$ " U BOLT, FOR 3" TO 5" I.D. PIPE. SPECIFY I.D. OF PIPE.



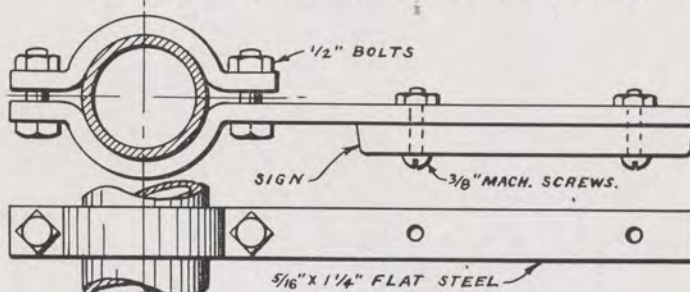
No. 11 MOUNTING. GRAY IRON CLAMP, WITH $\frac{1}{2}$ " U BOLT, FOR $3\frac{1}{2}$ " TO 5" I.D. PIPE. SPECIFY I.D. OF PIPE.



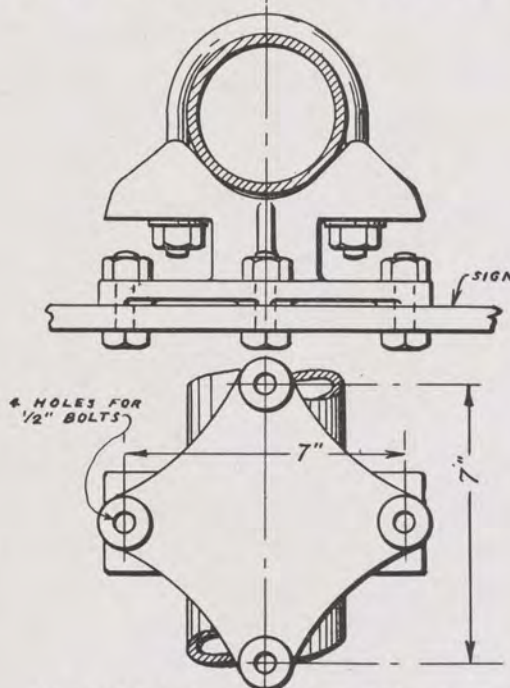
No. 12 MOUNTING. STEEL STRAP AND BOLTS. SPECIFY SIZE OF BOLTS.



No. 13 MOUNTING. GRAY IRON CLAMP, WITH $\frac{3}{8}$ " SET SCREW, FOR $1\frac{1}{4}$ " TO $2\frac{1}{2}$ " I.D. PIPE. SPECIFY I.D. OF PIPE.

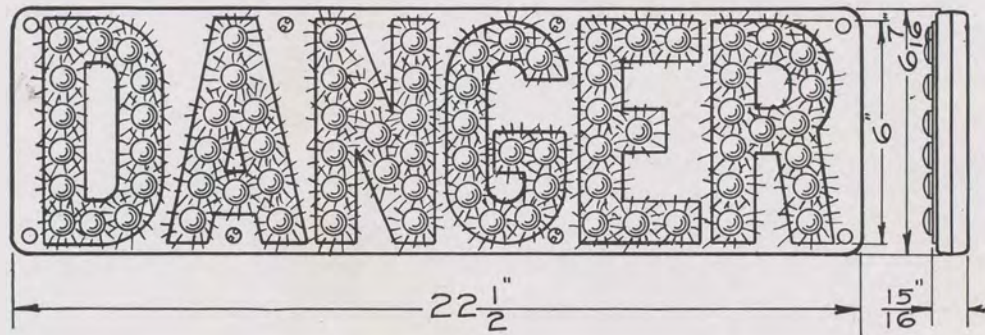


No. 14 MOUNTING. STEEL STRAP AND BOLTS, FOR 3" TO 6" I.D. PIPE. SPECIFY I.D. OF PIPE.

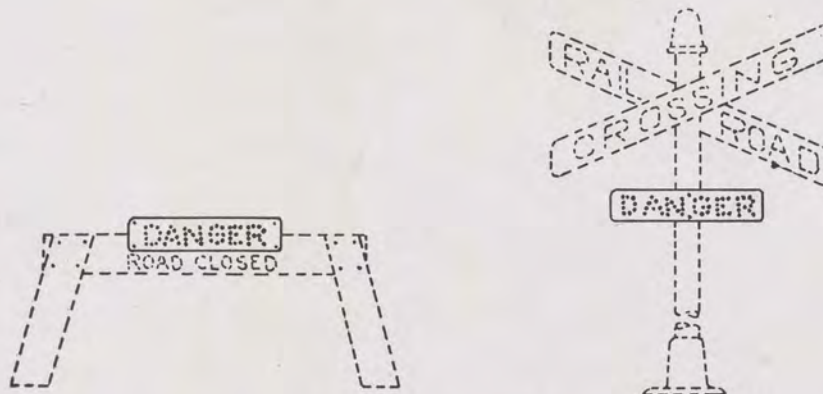


No. 15 MOUNTING. GRAY IRON CLAMP WITH $\frac{1}{2}$ " U BOLT, FOR $3\frac{1}{2}$ " TO 5" I.D. PIPE. SPECIFY I.D. OF PIPE.

MOUNTING METHODS
FOR REFLEX SIGNS
PLATE 2D



W-110A UNIT

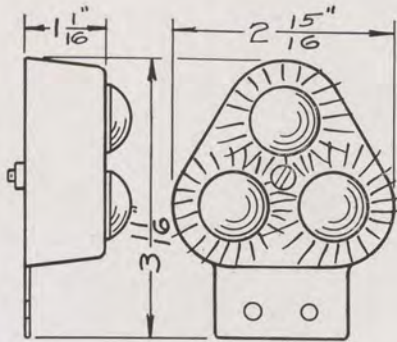


APPLICATIONS

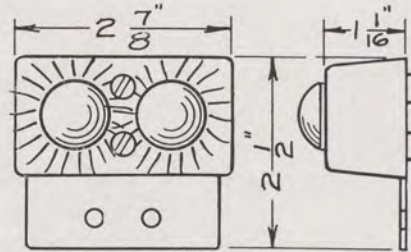
REFLEX DANGER
PLATE No. 1

SPECIFICATIONS

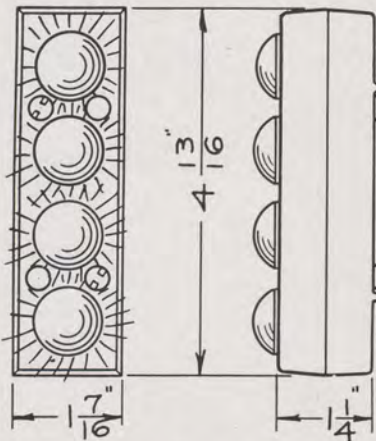
- LENS: 77 No. 2A ($\frac{11}{16}$ " dia.); white (colorless)*.
- HOUSING: Aluminum—Painted yellow* with black* letters raised $\frac{1}{16}$ ".
- SCREWS: Brass Machine No. 10-32; with special heads to prevent theft.
- MOUNTINGS: Furnish $\frac{5}{16}$ " x 2" R.H.B. Machine Screws or $\frac{5}{16}$ " wood screws when specified. Clamps extra.
- WEIGHTS: Approximate, net W-110A Unit 8 lbs.
- NOTE*: When above specifications are not in accordance with your requirements, please advise changes wanted.



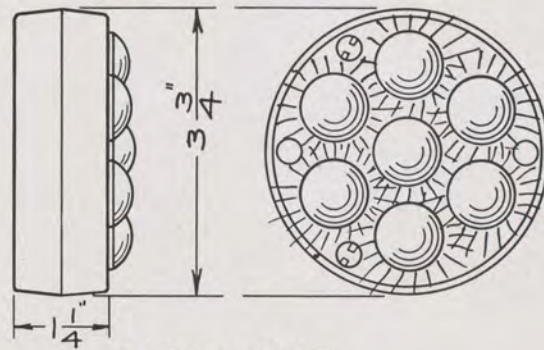
W-13A UNIT



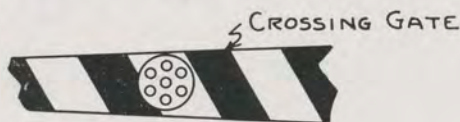
W-14A UNIT



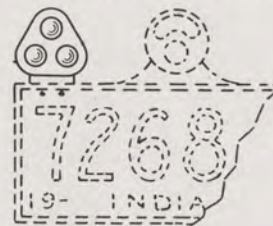
W-24A UNIT



W-23A UNIT



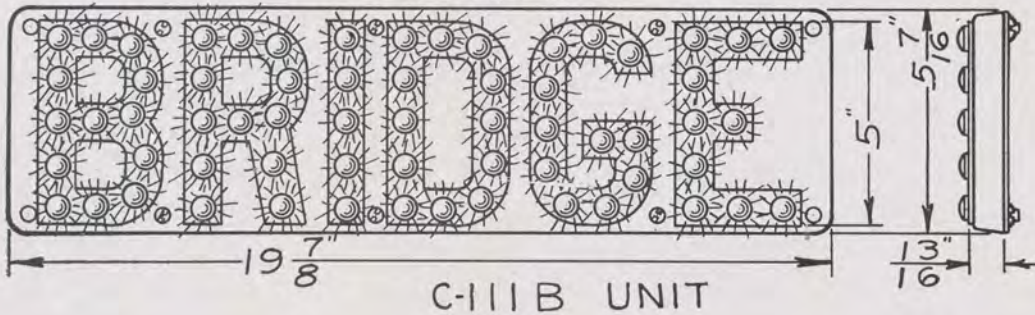
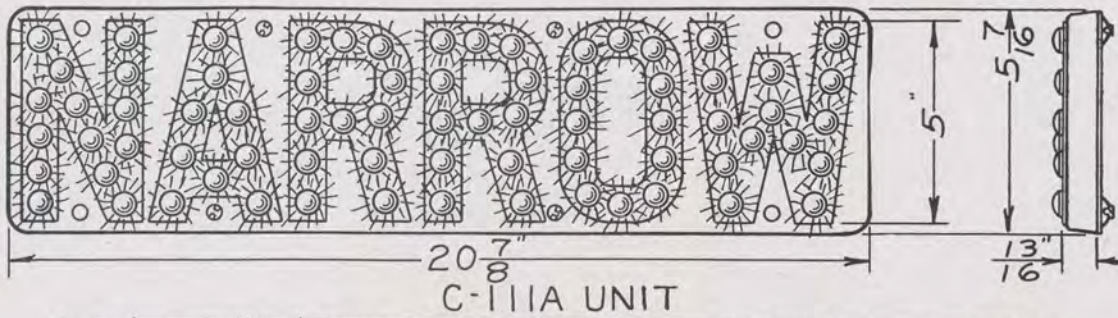
APPLICATIONS



REFLEX
BUS MARKERS
PLATE No. 3

SPECIFICATIONS

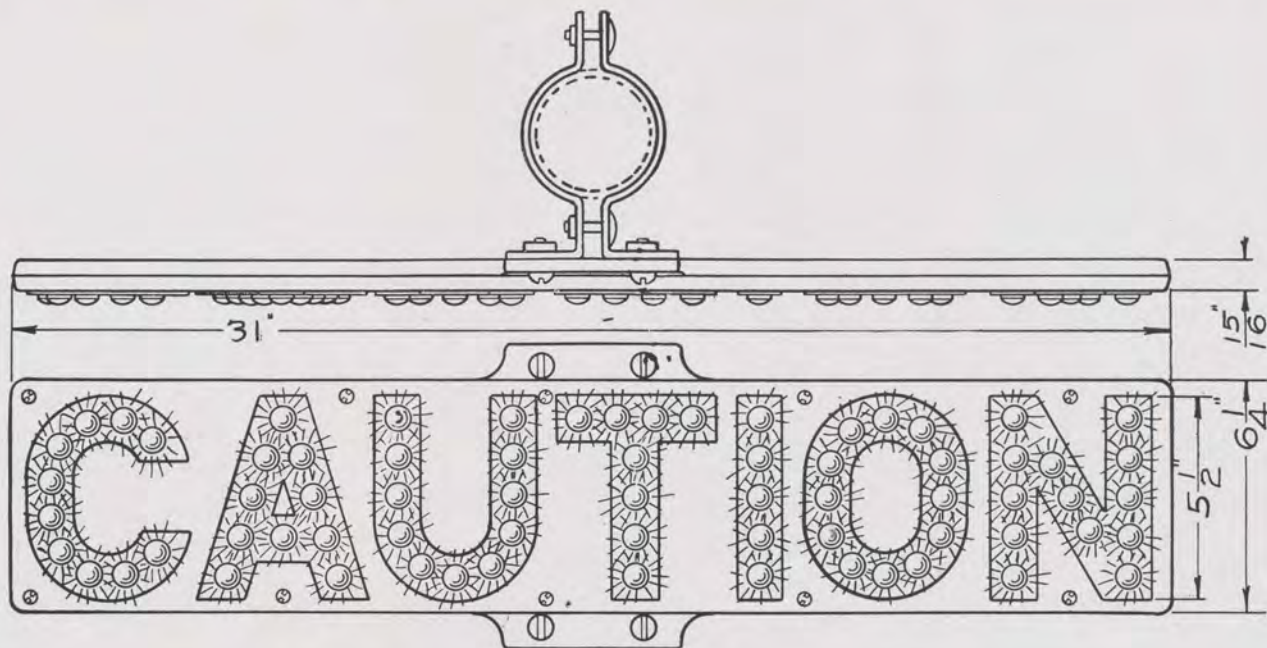
- LENS:** All No. 1A (7/8" dia.) Number of buttons as shown. Red color unless otherwise specified.
- HOUSING:** Aluminum—with stamped sheet metal back for two and three button units. All painted black*.
- SCREWS:** Brass Machine No. 10-32, with special heads to prevent theft.
- MOUNTING:** W-13A and W-14 attach to license plate holder as shown. W-23A and W-24A equipped with No. 10-32 x 2" bolts for fastening to flat surface, unless otherwise specified*
- WEIGHTS:** Approximate, net. W-13A Unit 11 oz.; W-14A Unit 7 oz.
W-23A Unit 16 oz.; W-24A Unit 10 oz.
- NOTE*:** When above specifications are not in accordance with your requirements, please advise changes wanted.



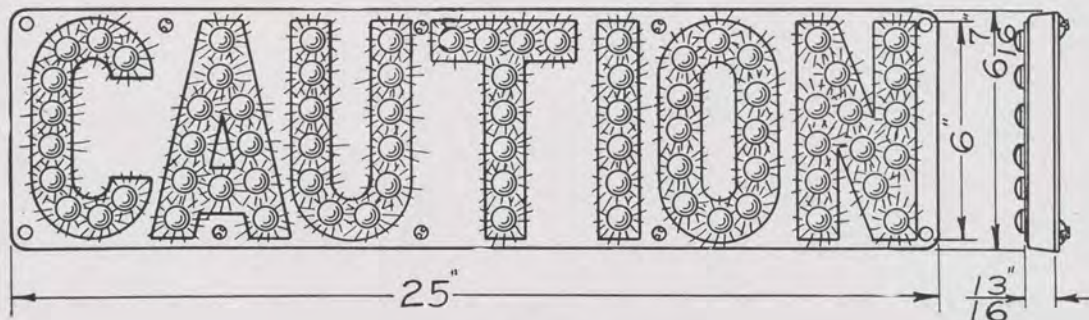
REFLEX
NARROW BRIDGE
PLATE No. 6

SPECIFICATIONS

- LENS:** All No. 2A ($\frac{1}{16}$ " dia.) 73 in "NARROW" and 63 in " BRIDGE"; white* (colorless).
- HOUSING:** Aluminum—Painted yellow* with black* letters raised $\frac{1}{16}$ ".
- PLATES:** 24" square; embossed; galvanized steel or equal; 16 gauge. Painted Federal yellow with black border.
- SCREWS:** Brass Machine No. 10-32; with special heads to prevent theft.
- MOUNTING:** Furnish $\frac{5}{16}$ " x 2" R.H.B. Machine Screws or $\frac{5}{16}$ " Wood Screws when specified. Clamps extra.
- WEIGHTS:** Approximate, net. C-111A Unit 8 lbs.; C-111B Unit 7 $\frac{1}{2}$ lbs.; C-111 Sign 19 $\frac{3}{4}$ lbs.
- NOTE*:** When specifications are not in accordance with your requirements, please advise changes wanted.



W-126A UNIT

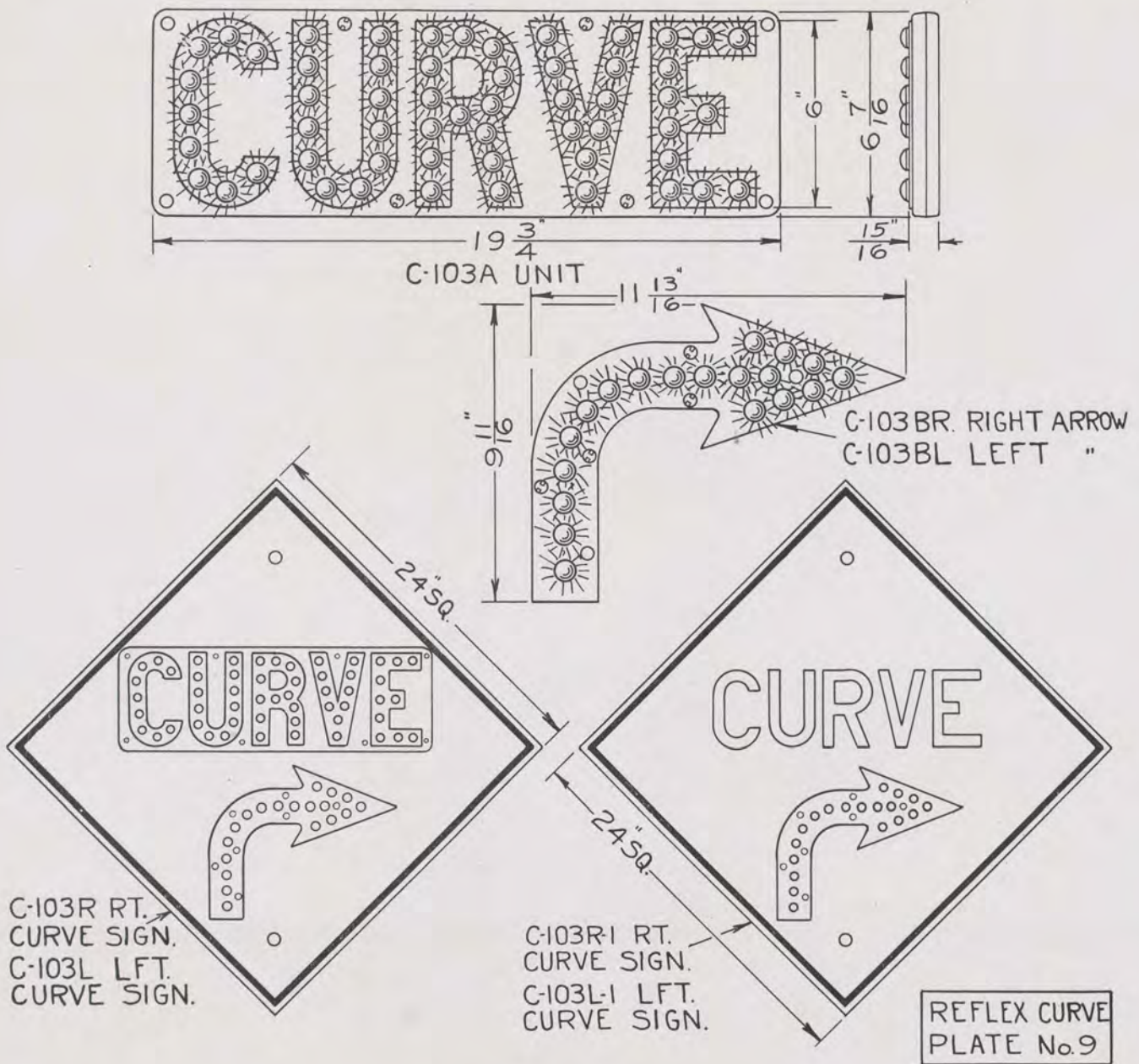


W-111A UNIT

REFLEX
CAUTIONS
PLATE No. 7

SPECIFICATIONS

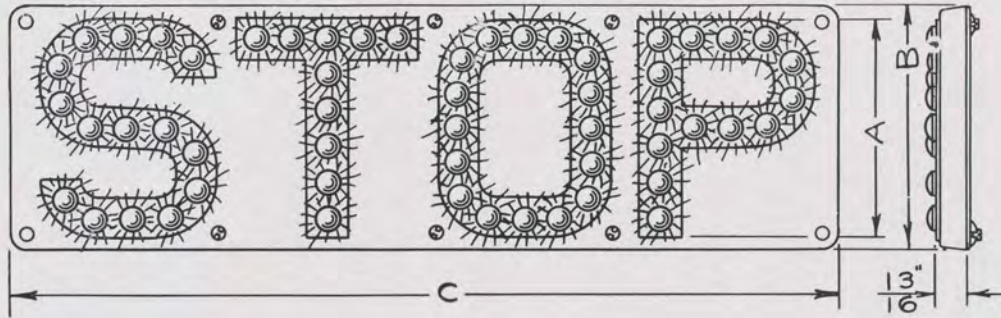
- LENS: All No. 2A ($\frac{11}{16}$ " dia.); 69 in W-126A Unit and 72 in W-111A Unit; white (colorless)*.
- HOUSING: Aluminum—Painted yellow* with black* letters raised $\frac{1}{16}$ ".
- SCREWS: Brass Machine No. 10-32; with special heads to prevent theft.
- MOUNTINGS: Furnish $\frac{5}{16}$ " x 2" R.H.B. Machine Screws or $\frac{5}{16}$ " Wood Screws when specified. Clamps extra.
- APPLICATION: In place of "DANGER" as shown on Page 10.
- WEIGHTS: Approximate, net. W-126-A Unit 10 lbs.; W-111A Unit 8 $\frac{1}{4}$ lbs.
- NOTE*: When above specifications are not in accordance with your requirements, please advise changes wanted.



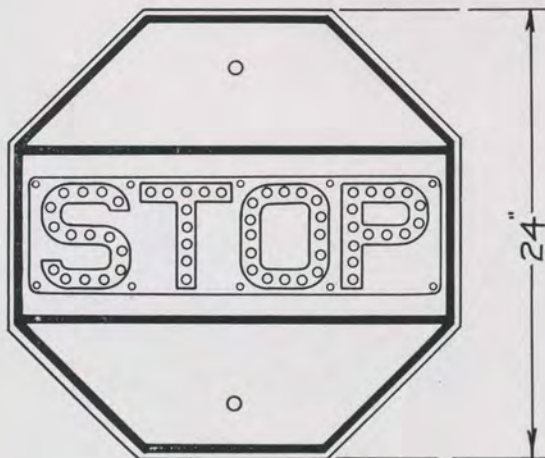
SPECIFICATIONS

- LENS: All No. 2A ($\frac{11}{16}$ " dia.) 56 in "CURVE" and 19 in arrow; white (colorless)*.
- HOUSING: Aluminum — "CURVE" painted yellow* with black* letters raised $\frac{1}{16}$ "; arrow painted black*.
- PLATES: 24" square; embossed; galvanized steel or equal; 16 gauge. Painted Federal yellow with black border and letters*.
- SCREWS: Brass Machine No. 10-32; with special heads to prevent theft.
- MOUNTINGS: Furnish $\frac{5}{16}$ " x 2" R.H.B. Machine Screws or $\frac{5}{16}$ " Wood Screws when specified. Clamps extra.
- WEIGHTS: Approximate, net. C-103A Unit 5 $\frac{3}{4}$ lbs.; C-103B Unit 2 $\frac{3}{4}$ lbs.
 C-103R or L Sign 18 $\frac{1}{2}$ lbs.
 C-103R-1 or L-1 Sign 13 lbs.

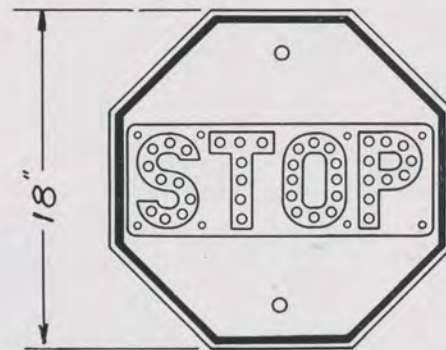
NOTE*: When above specifications are not in accordance with your requirements, kindly advise changes wanted.



UNIT No.	Dimensions of Units			No. and size of lens.
	A	B	C	
W-103A	6"	6 ⁹ / ₁₆ "	22 ¹ / ₈ "	55 No. 2A
CW-103A	5 ¹ / ₄ "	6"	16 ¹ / ₄ "	39 No. 2A



W-103 SIGN

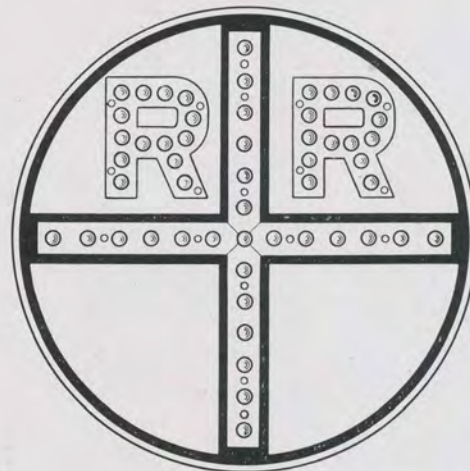
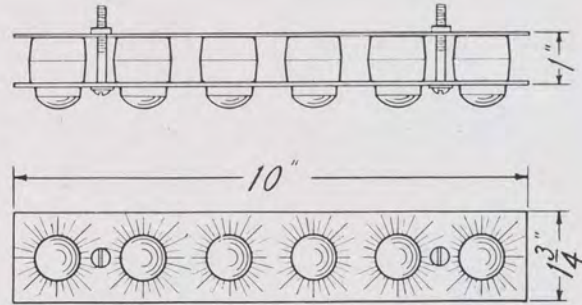
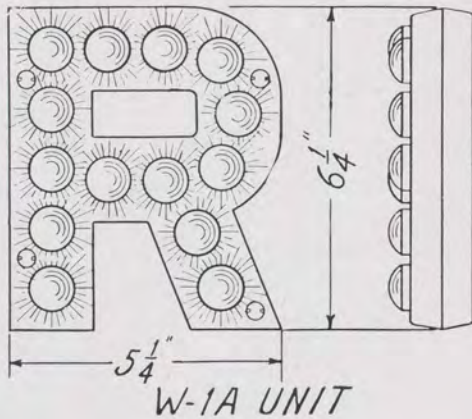


CW-103 SIGN

REFLEX STOP
PLATE No.10

SPECIFICATIONS

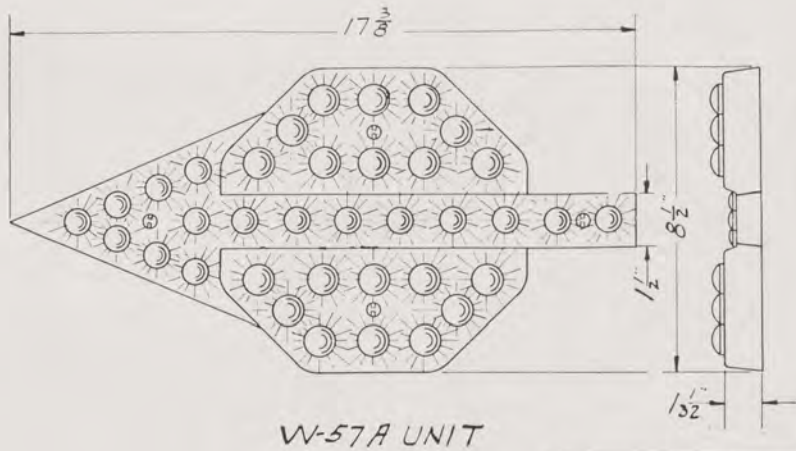
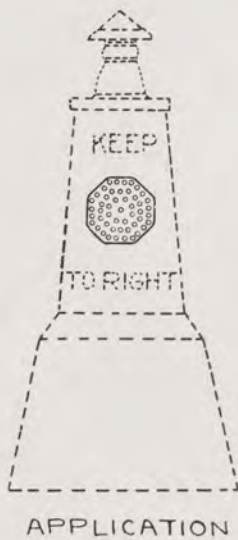
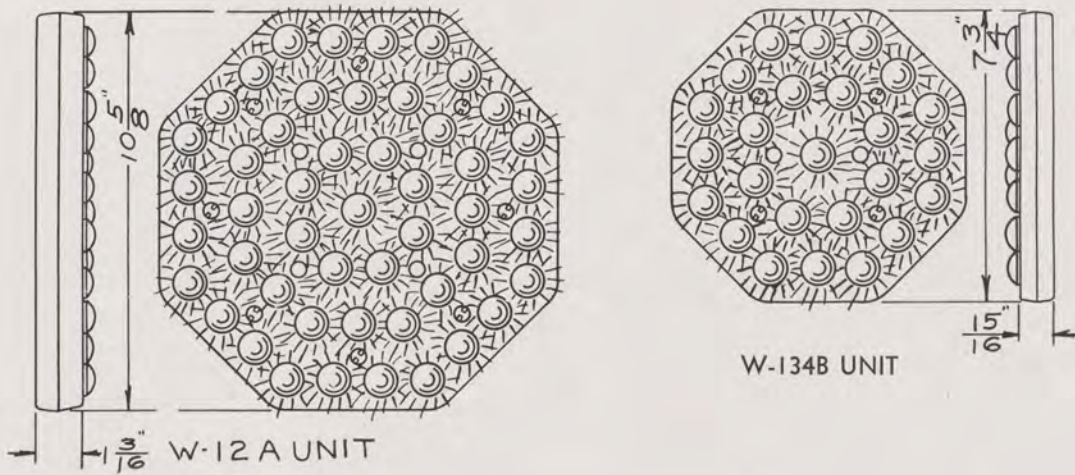
- LENS:** All No. 2A (¹/₁₆" dia.); exact number as shown; white (colorless)*.
- HOUSING:** Aluminum—Painted yellow* with black* letters raised ¹/₁₆".
- PLATES:** 24" Octagon; embossed; galvanized steel or equal; 16 gauge.
18" Octagon; embossed; galvanized steel or equal; 18 gauge.
Painted Federal yellow with black border and letters*.
- SCREWS:** Brass Machine No. 10-32; with special heads to prevent theft.
- MOUNTINGS:** Furnish ⁵/₁₆" x 2" R.H.B. Machine Screws or ⁵/₁₆" Wood Screws when specified. Clamps extra.
- WEIGHTS:** Approximate, net. W-103A Unit 7³/₄ lbs.; W-103 Sign 16 lbs.
CW-103A Unit 4¹/₄ lbs.; CW-103 Sign 7¹/₂ lbs.
CW-103C Unit 7 Lbs.
- NOTE*:** When above specifications are not in accordance with your requirements, kindly advise changes wanted.



REFLEX
R.R. CROSSING
PLATE NO. 12A

SPECIFICATIONS

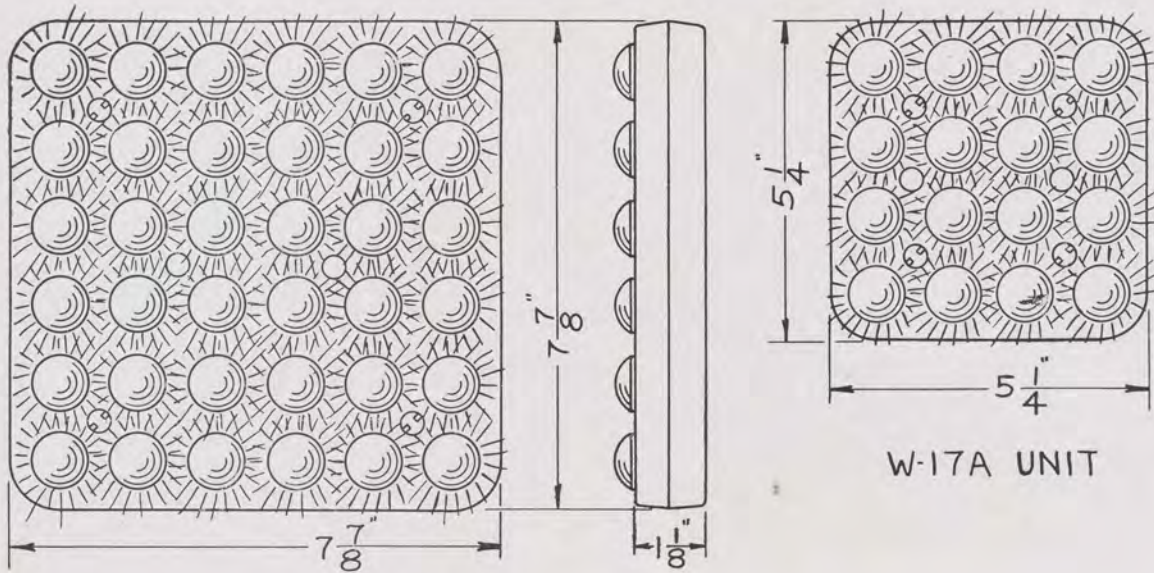
- LENS:** All No. 1A ($\frac{7}{8}$ " dia.) 14 in W-1A Unit; 6 in W-11B Unit; 28 in W-1 Unit; 53 in W-11 Unit. White (colorless)*.
- HOUSING:** W-1, W-1A and W-11 Aluminum. W-11B, 16 gauge steel front, 20 gauge steel back. All housings painted black*.
- PLATES:** 24" diameter embossed galvanized steel or equal, 16 gauge. Painted Federal yellow with black border*.
- SCREWS:** Brass Machine No. 10-32; with special heads to prevent theft.
- MOUNTING:** Furnish $\frac{5}{16}$ " x 2" R.H.B. Machine Screws or $\frac{5}{16}$ " Wood Screws. Clamps extra.
- WEIGHTS:** Approximate, net. W-1A Unit 2 $\frac{1}{4}$ lbs. W-11B Unit 1 lbs.;
W-1 Sign 11 $\frac{1}{4}$ lbs. W-11 Sign 15 $\frac{3}{4}$ lbs.
- NOTE*:** When above specifications are not in accordance with your requirements, kindly advise changes wanted. See also W-35 Sign Page 39.



REFLEX
OCTAGONS
PLATE No. 13A

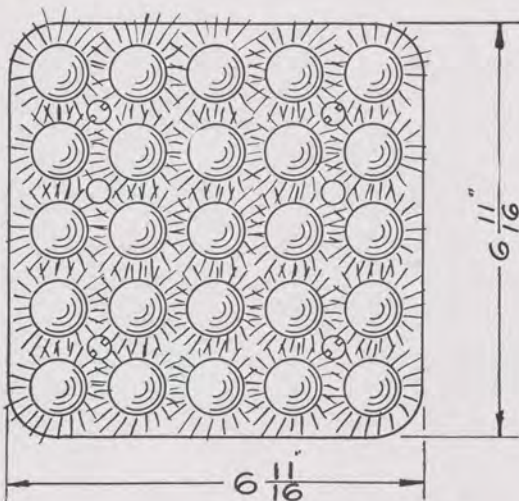
SPECIFICATIONS

- LENS:** No. 1A (7/8" dia.) 49 in W-12A; 25 in W-134B. Color as specified*. 20 No. 1A (7/8" dia.) RED; 16 No. 2A (1 1/16" dia.) GREEN in W-57-A unit.
- HOUSING:** Aluminum—For railroads paint W-12A and W-134B Units same color as buttons. For highways paint yellow unless otherwise specified. W-57A Unit paint Octagon yellow, arrow black, unless otherwise specified.
- SCREWS:** Brass Machine No. 10-32; with special heads to prevent theft.
- MOUNTING:** Furnish 5/16" x 2" R.H.B. Machine Screws or 5/16" Wood Screws when specified. Clamps extra.
- WEIGHTS:** Approximate, net. W-12A Unit 6 3/4 lbs.; W-134B Unit 4 lbs.; W-57A Unit 5 lbs.
- NOTE*:** When above specifications are not in accordance with your requirements, kindly advise changes wanted.

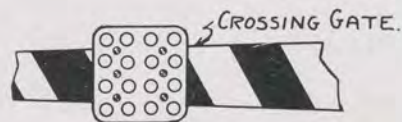


W-39A UNIT

W-17A UNIT



W-19A UNIT

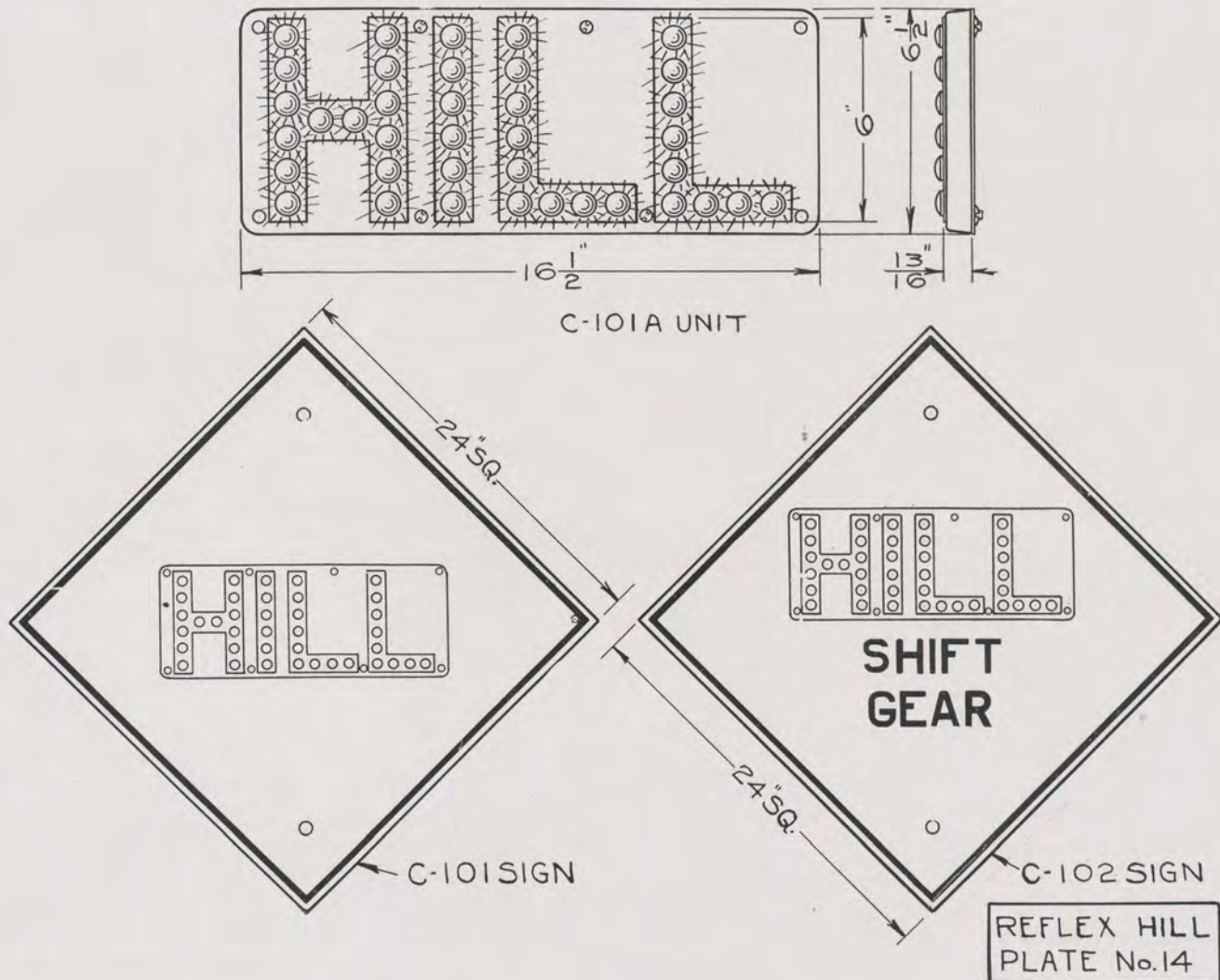


APPLICATION

REFLEX
SQUARES
PLATE No.16

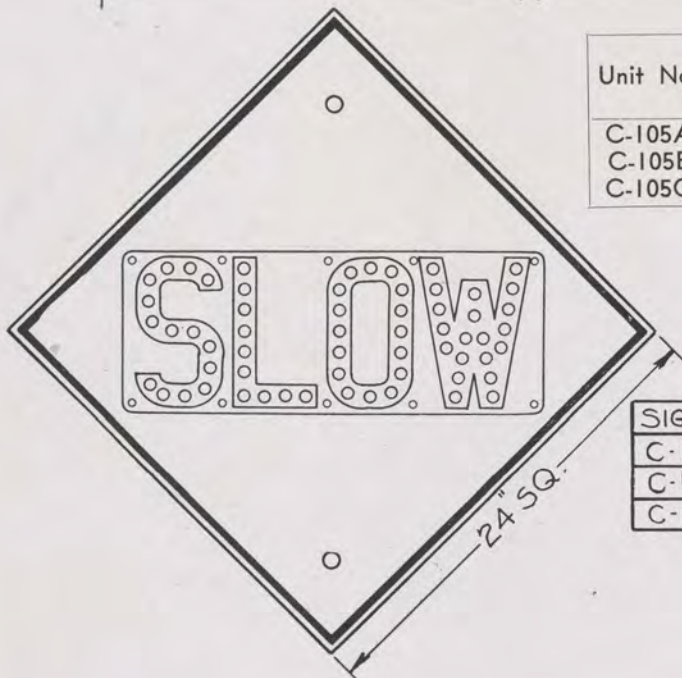
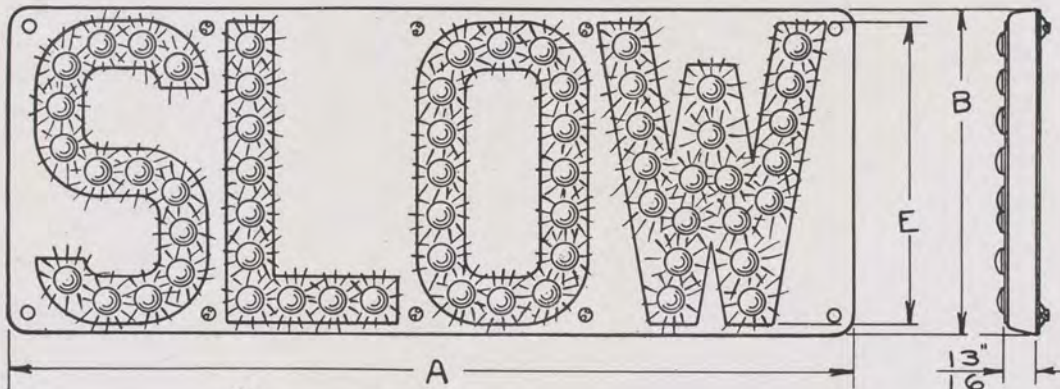
SPECIFICATIONS

- LENS:** All No. 1A ($7/8$ " dia.) 16 in W-17A; 25 in W-19 A; 36 in W-39A; color as specified.
- HOUSING:** Aluminum—For railroads, paint same color as lens.
For highways, etc. paint Federal yellow*.
- SCREWS:** Brass Machine No. 10-32; with special heads to prevent theft.
- MOUNTINGS:** Furnish $\frac{5}{16}$ " x 2" R.H.B. Machine Screws or $\frac{5}{16}$ " Wood Screws when specified. Clamps extra.
- WEIGHTS:** Approximate, net. W-17A Unit 2 lbs.; W-19A Unit $3\frac{3}{4}$ lbs.
W-39A Unit $4\frac{3}{4}$ lbs.
- NOTE*:** When above specifications are not in accordance with your requirements, please advise changes wanted.



SPECIFICATIONS

- LENS:** All No. 2A ($\frac{11}{16}$ " dia.) 38 in C-101A Unit; White (colorless)*.
- HOUSING:** Aluminum—Painted Federal yellow* with black* letters raised $\frac{1}{16}$ ".
- PLATES:** 24" square; embossed; galvanized steel or equal; 16 gauge. Painted Federal yellow with black border and letters*.
- SCREWS:** Brass Machine No. 10-32; with special heads to prevent theft.
- MOUNTINGS:** Furnish $\frac{5}{16}$ " x 2" R.H.B. Machine Screws or $\frac{5}{16}$ " Wood Screws when specified. Clamps extra.
- WEIGHTS:** Approximate, net. C-101A Unit 5 lbs.; C-101 or C-102 Sign 15 lbs.
- NOTE*:** When above specifications are not in accordance with your requirements, please advise changes wanted.



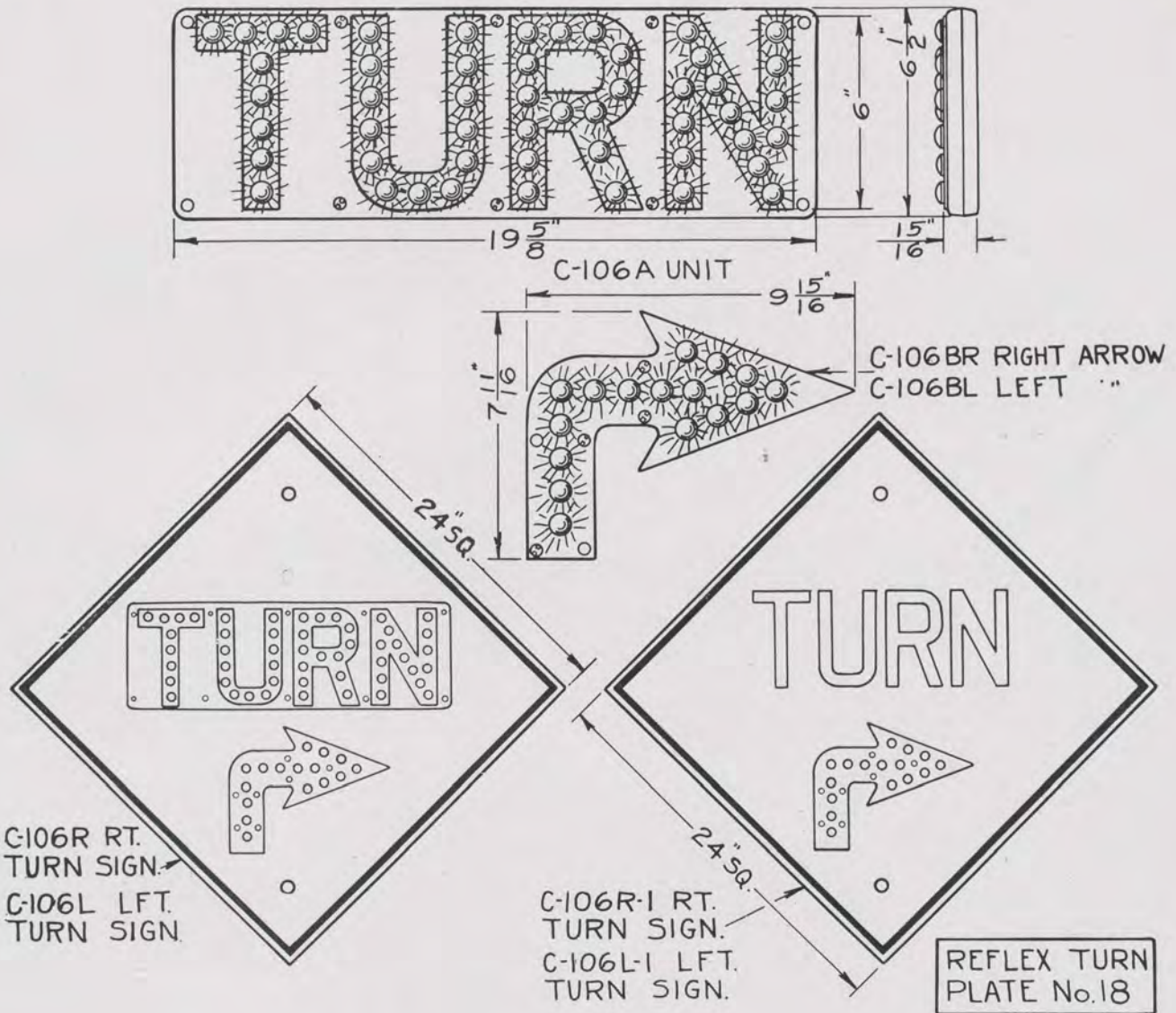
Unit No.	DIMENSIONS OF UNITS			No. and size of Lens	App. Wt.
	A	B	C		
C-105A	22 ³ / ₁₆ "	8 ⁹ / ₁₆ "	8"	60 No. 2A	8 1/2 lbs.
C-105B	21 ⁹ / ₁₆ "	7 "	6"	51 No. 2A	7 1/4 lbs.
C-105C	17 ³ / ₄ "	5 1/2 "	5"	37 No. 2A	4 3/4 lbs.

SIGN No.	SIZE OF SIGN	APP.WT.
C-105	C-105A UNIT MOUNTED ON 24" DIAMOND PLATE.	15 1/4 LBS.
C-105-1	C-105B UNIT MOUNTED ON 24" DIAMOND PLATE.	14 3/4 "
C-105-2	C-105C UNIT MOUNTED ON 18" DIAMOND PLATE.	13 "

REFLEX
HORIZONTAL SLOW
PLATE No.15

SPECIFICATIONS

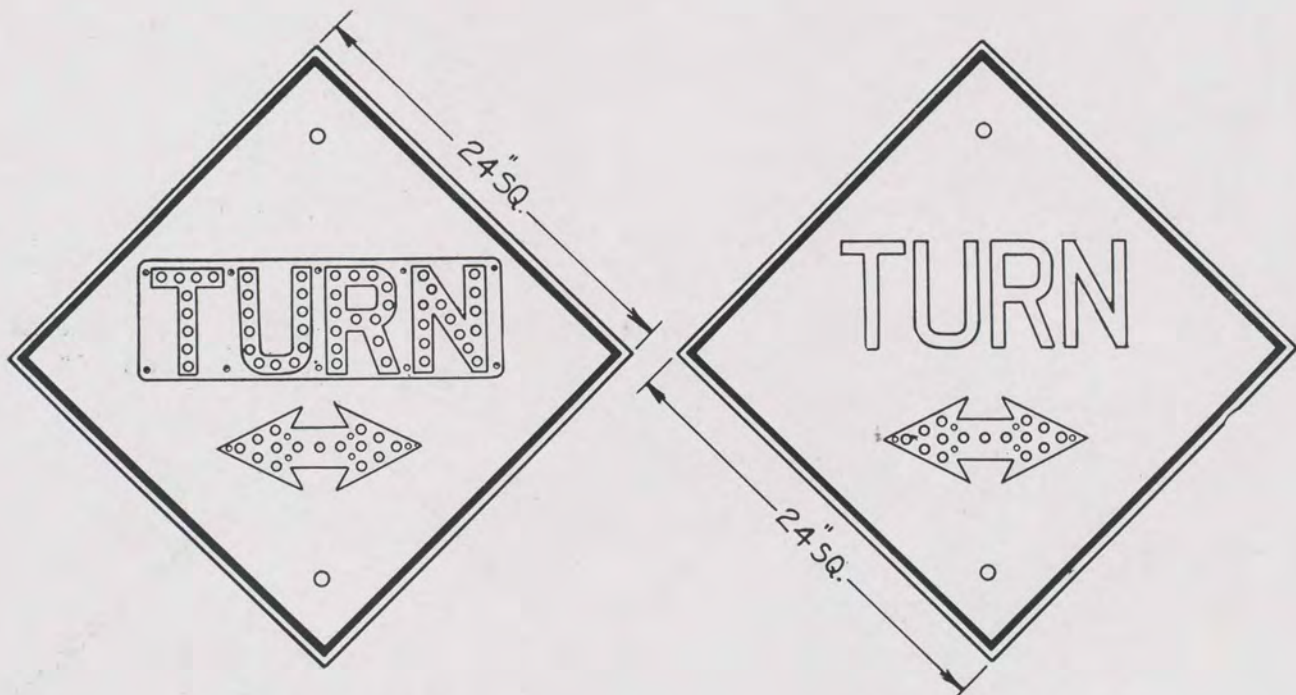
- LENS: All No. 2A (1 1/16" dia.) White (colorless)*.
- HOUSING: Aluminum—Painted Federal yellow* with black* letters raised 1/16".
- PLATES: 24" square; embossed galvanized steel or equal; 16 gauge.
18" square; embossed galvanized steel or equal; 18 gauge.
Painted Federal yellow with black borders and letters*.
- SCREWS: Brass Machine No. 10-32; with special heads to prevent theft.
- MOUNTINGS: Furnish 5/16" x 2" R.H.B. Machine Screws or 5/16" Wood Screws when specified. Clamps extra.
- NOTE*: When above specifications are not in accordance with your requirements, please advise changes wanted.



SPECIFICATIONS

- LENS: All No. 2A ($\frac{1}{16}$ " dia.) 51 in "TURN"; 16 in arrow; White (colorless)*.
- HOUSING: Aluminum—Painted Federal yellow* with black* letters raised $\frac{1}{16}$ ".
- PLATES: 24" square; embossed galvanized steel or equal; 16 gauge. Painted Federal yellow with black border and letters*.
- SCREWS: Brass Machine No. 10-32; with special heads to prevent theft.
- MOUNTINGS: Furnish $\frac{5}{16}$ " x 2" R.H.B. Machine Screws or $\frac{5}{16}$ " Wood Screws when specified. Clamps extra.
- WEIGHTS: Approximate, net. C-106A Unit $6\frac{1}{4}$ lbs.
C-106BR or C-106BL Unit $2\frac{1}{8}$ lbs.
C-106R or C-106L Sign 18 lbs.
C-106R-1 or C-106-L-1 Sign 12 lbs.

NOTE*: When above specifications are not in accordance with your requirements, please advise changes wanted. See also Page 14 for further applications.



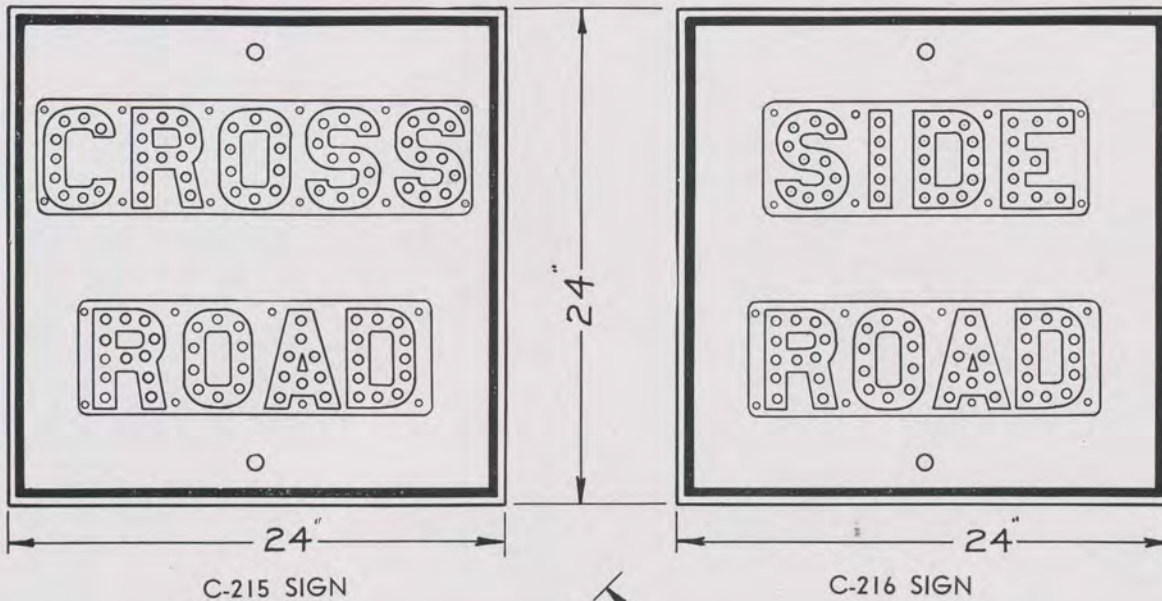
C-106-2 SIGN

C-106-3 SIGN

REFLEX
DOUBLE TURN
PLATE No.18a

SPECIFICATIONS

- LENS:** All 2A ($\frac{1}{16}$ " dia.) 51 in "TURN"; 15 in arrow; White (colorless)*
- HOUSING:** Aluminum—Painted Federal yellow* with black* letters raised $\frac{1}{16}$ ".
- PLATES:** 24" square; embossed; galvanized steel or equal; 16 gauge. Painted Federal yellow with black border and letters*.
- SCREWS:** Brass Machine No. 10-32; with special heads to prevent theft.
- MOUNTINGS:** Furnish $\frac{5}{16}$ " x 2" R.H.B. Machine Screws or $\frac{5}{16}$ " Wood Screws when specified. Clamps extra.
- WEIGHTS:** Approximate, net. C-106-2 Sign 17 $\frac{3}{4}$ lbs.; C-106-3 Sign 11 $\frac{1}{2}$ lbs.
- NOTE*:** When above specifications are not in accordance with your requirements, please advise changes wanted. See Page 21 for TURN; Page 26 for ar.ow.



C-215 SIGN

C-216 SIGN

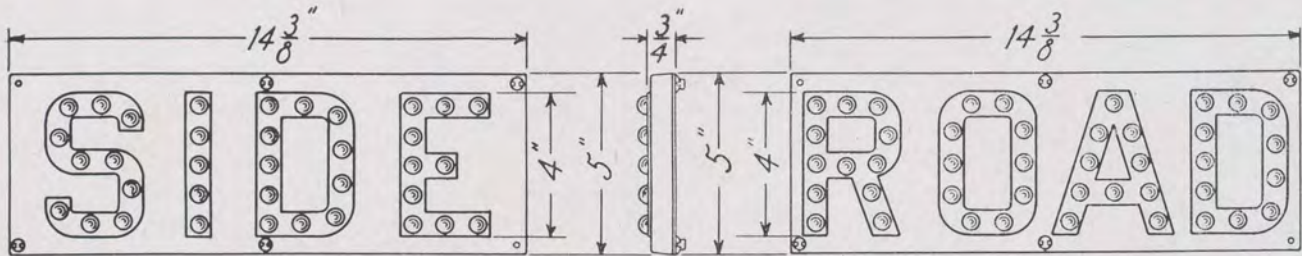


C-226 SIGN

REFLEX
ROAD SIGNS
PLATE No. 19

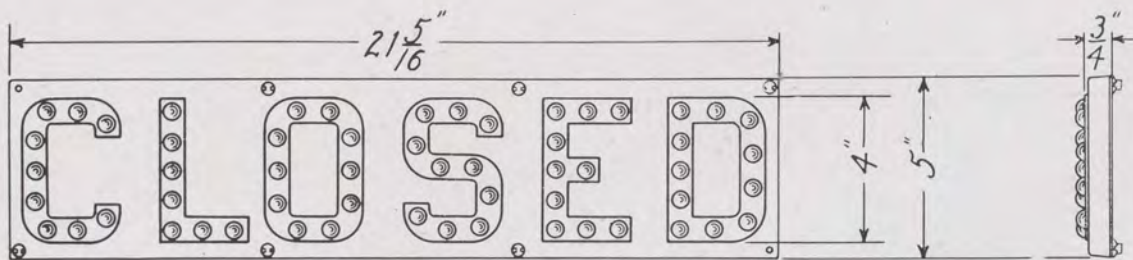
SPECIFICATIONS

- LENS: All No. 3A (1/2" dia.) See next page for detail of units. Color as specified.
- HOUSING: See next page.
- PLATES: 24" square; embossed; galvanized steel or equal; 16 gauge. Painted Federal yellow with black border and letters*.
- SCREWS: Brass Machine No. 10-32; with special heads to prevent theft.
- MOUNTING: Furnish 5/16" x 2" R.H.B. Machine Screws or 5/16" Wood Screws when specified. Clamps extra.
- WEIGHTS: Approximate, net. C-215 Sign 17 1/4 lbs.; C-216 Sign 16 3/4 lbs.
C-226 Sign 17 1/2 lbs.
- NOTE*: When above specifications are not in accordance with your requirements, please advise changes wanted.

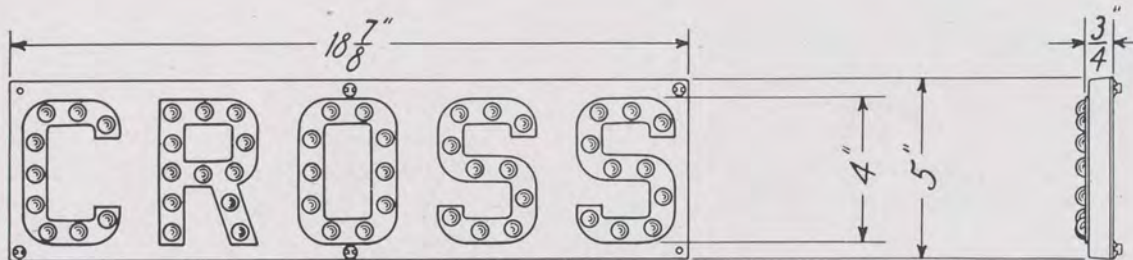


C-216A UNIT

C-215A UNIT



C-226A UNIT



C-215B UNIT

REFLEX
ROAD UNITS
PLATE NO 19C

SPECIFICATIONS

- LENS:** All No. 3 A (1/2" dia.) 36 in "SIDE"; 43 in "ROAD"; 57 in "CLOSED"; 51 in "CROSS". White (colorless)*.
- HOUSING:** Aluminum—Painted Federal yellow* with black* letters raised $\frac{1}{16}$ ".
- PLATES:** See application on preceding page for back plates.
- SCREWS:** Brass Machine No. 10-32; with special heads to prevent theft.
- MOUNTING:** Furnish $\frac{5}{16}$ " x 2" R.H.B. Machine Screws or $\frac{5}{16}$ " Wood Screws when specified. Clamps extra.
- WEIGHTS:** Approximate, net. C-216A Unit 3 1/2 lbs.; C-215A Unit 3 1/2 lbs.;
C-226A Unit 4 1/4 lbs.; C-215B Unit 4 lbs.
- NOTE*:** When above specifications are not in accordance with your requirements, please advise changes wanted.

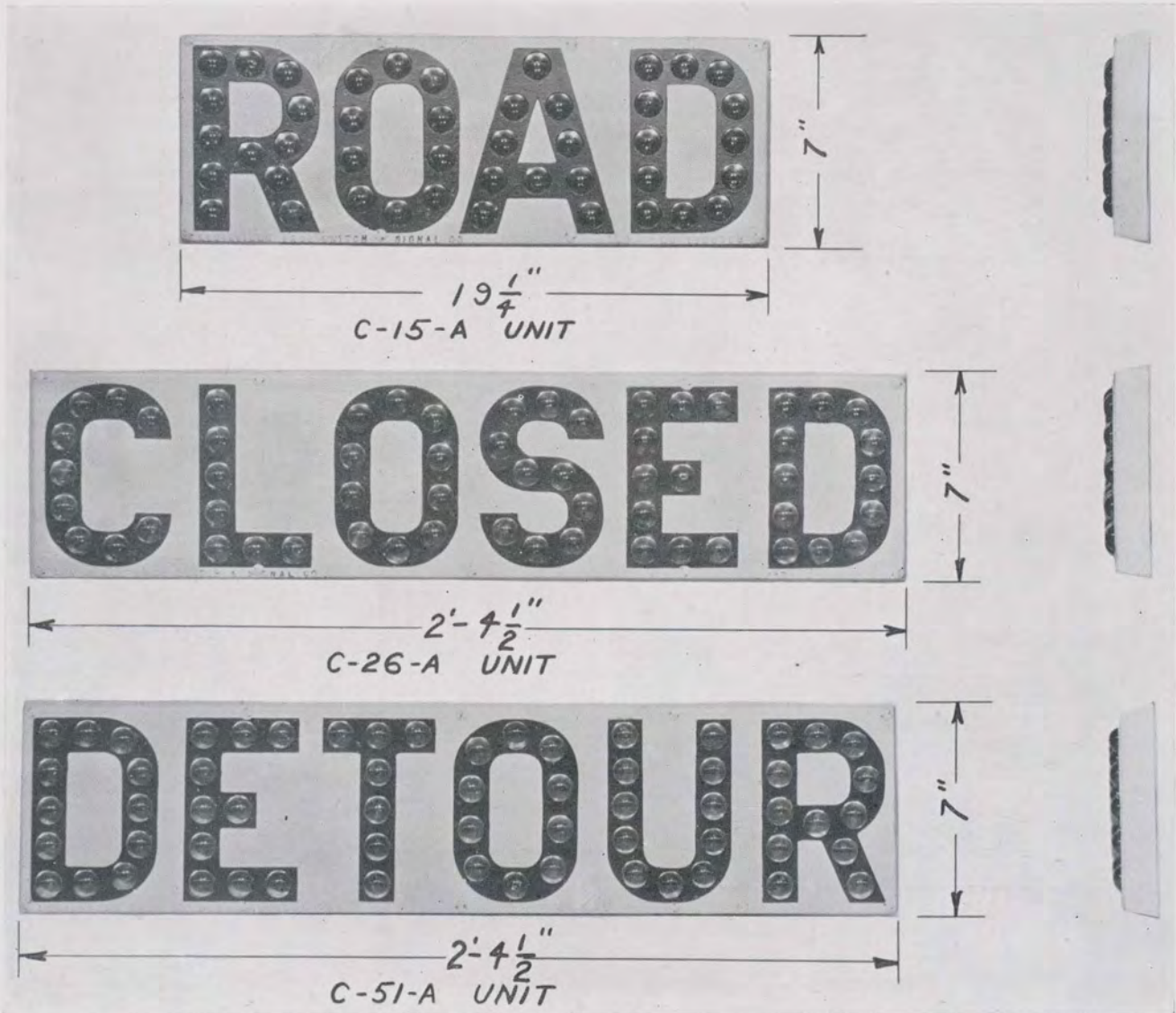
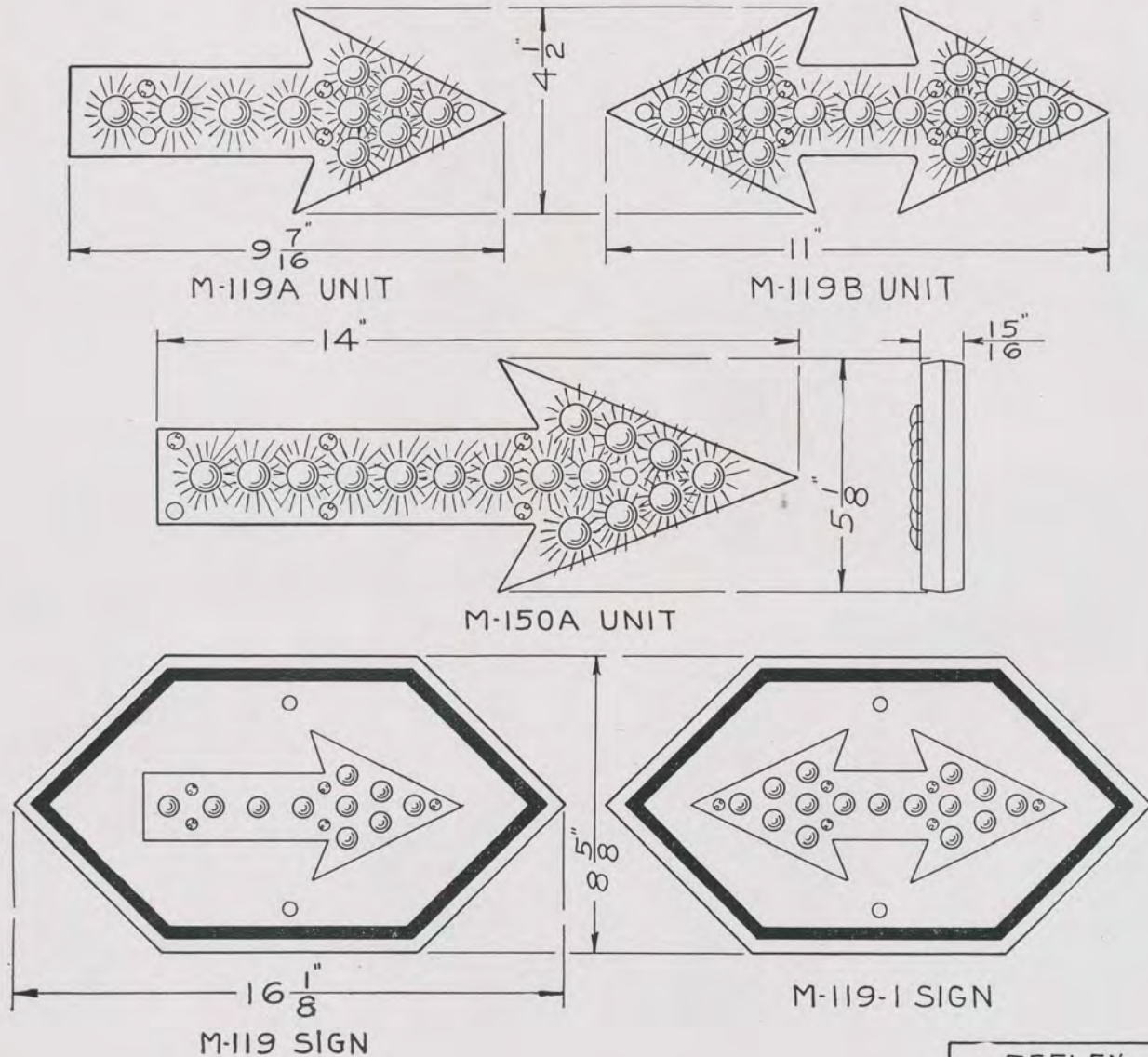


PLATE No. 19B

SPECIFICATIONS

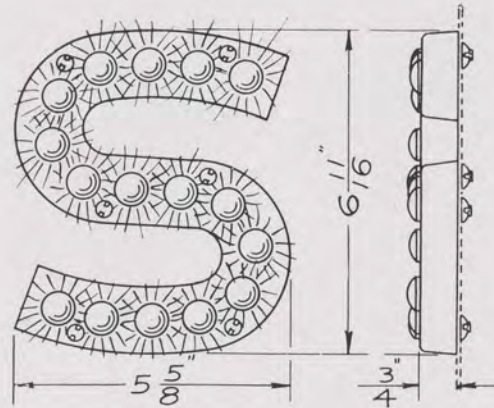
- LENS: All No. 1A (7/8" dia.) 44 in "ROAD"; 58 in "CLOSED" 62 in "DETOUR". White (colorless)*.
- HOUSING: Aluminum—Painted white*, black letters, raised 1/16".
- SCREWS: Brass Machine No. 10-32; with special heads to prevent theft.
- MOUNTING: Furnish 5/16" x 2" R.H.B. Machine Screws or 5/16" Wood Screws when specified. Clamps extra.
- Application: The above units are recommended for use where a road is being constructed, etc. The large arrow M-150A Unit shown on page 26 is recommended to indicate the direction of detour.
- WEIGHTS: C-15 A Unit 9 lbs.; C-26A Unit 13 lbs.; C-51A Unit 13 lbs.
- NOTE*: When above specifications are not in accordance with your requirements, please advise changes wanted.



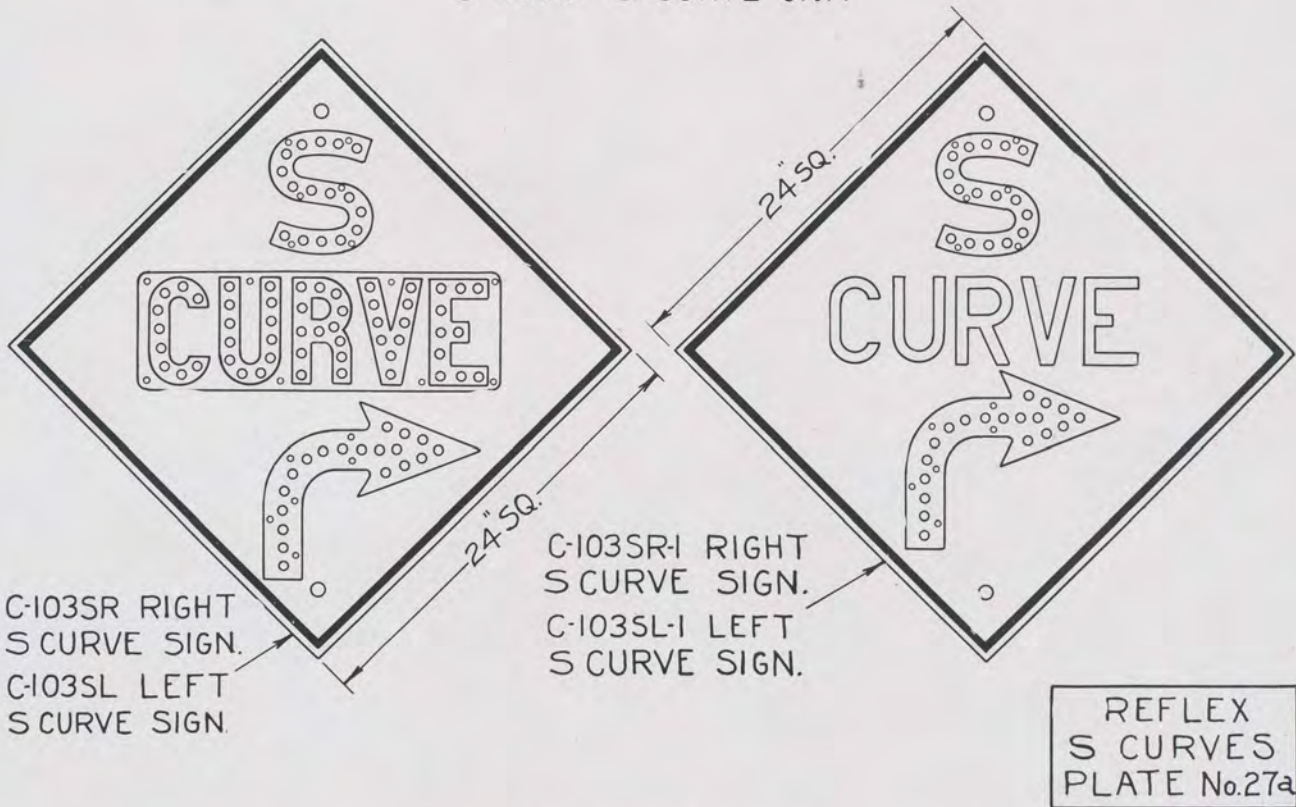
REFLEX
ROUTE ARROWS
PLATE No. 26

SPECIFICATIONS

- LENS:** All No. 2A ($\frac{1}{16}$ " dia.) Number as shown in each.
- HOUSING:** Aluminum—Painted black*
- PLATES:** Embossed, galvanized steel or equal; 18 gauge. Painted white with black border*.
- SCREWS:** Brass Machine No. 10-32; with special heads to prevent theft.
- MOUNTING:** Furnish $\frac{5}{16}$ " x 2" R.H.B. Machine Screws or $\frac{5}{16}$ " Wood Screws when specified. Clamps extra.
- WEIGHTS:** Approximate, net. M-119A Unit 1 lb.; M-119B $1\frac{1}{2}$ lbs.
M-119 Sign $2\frac{1}{2}$ lbs.; M-119-1 Sign 3 lbs.
M-150A Unit 2 lbs.
- APPLICATION:** See also Page 22 and 28.
- NOTE*:** When above specifications are not in accordance with your requirements, please advise changes wanted.



C-103AS "S" CURVE UNIT



C-103SR RIGHT S CURVE SIGN.
C-103SL LEFT S CURVE SIGN.

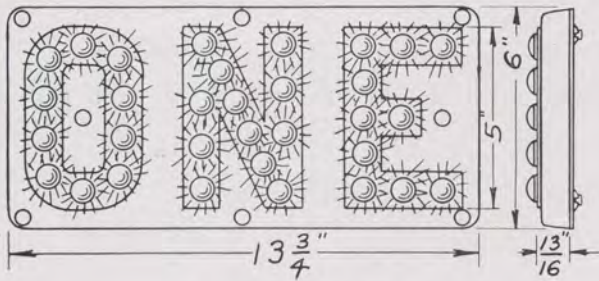
C-103SR-I RIGHT S CURVE SIGN.
C-103SL-I LEFT S CURVE SIGN.

REFLEX
S CURVES
PLATE No.27a

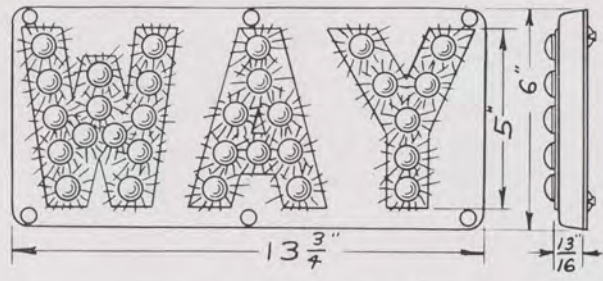
SPECIFICATIONS

- LENS: All No. 2A ($\frac{11}{16}$ " dia.) 16 in "S"; 19 in arrow; 56 in "CURVE". White (colorless)*.
- HOUSING: Aluminum—Painted Federal yellow* with black* letters raised $\frac{1}{16}$ ".
- PLATES: 24" square, embossed, galvanized steel or equal; 16 gauge. Painted Federal yellow with black border and letters.*
- SCREWS: Brass Machine No. 10-32; with special heads to prevent theft.
- MOUNTING: Furnish $\frac{5}{16}$ " x 2" R.H.B. Machine Screws or $\frac{5}{16}$ " Wood Screws when specified. Clamps extra.
- WEIGHTS: Approximate, net. C-103AS Unit 1 1/4 lbs.
C-103SR or C-103SL Sign 19 lbs.
C-103SR-I or C-103SL-I Sign 14 1/4 lbs.

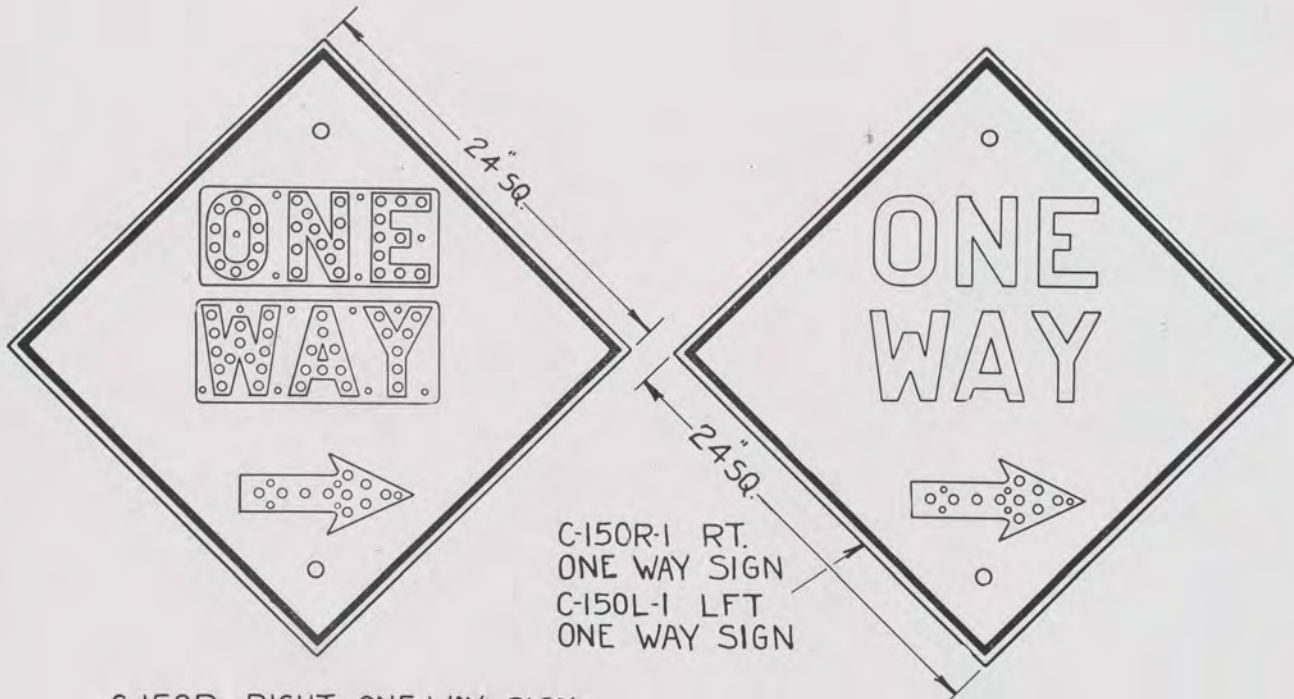
NOTE*: See Page 14 for "CURVE" detail; Page 14 for arrow details. When above specifications are not in accordance with your requirements, please advise changes wanted.



C-150A UNIT



C-150B UNIT



C-150R-1 RT.
ONE WAY SIGN
C-150L-1 LFT
ONE WAY SIGN

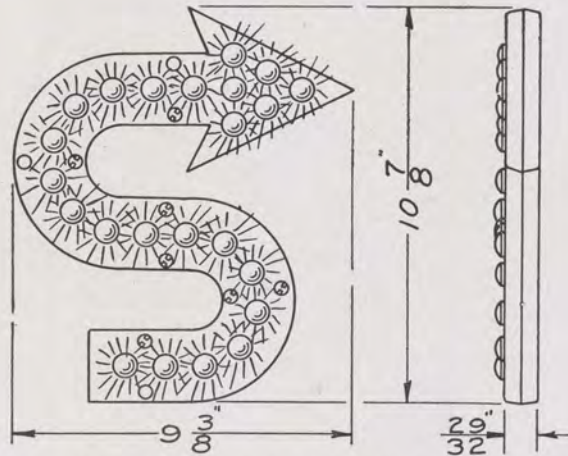
C-150R RIGHT ONE WAY SIGN
C-150L LEFT " " "

REFLEX
ONE WAY
PLATE No.24

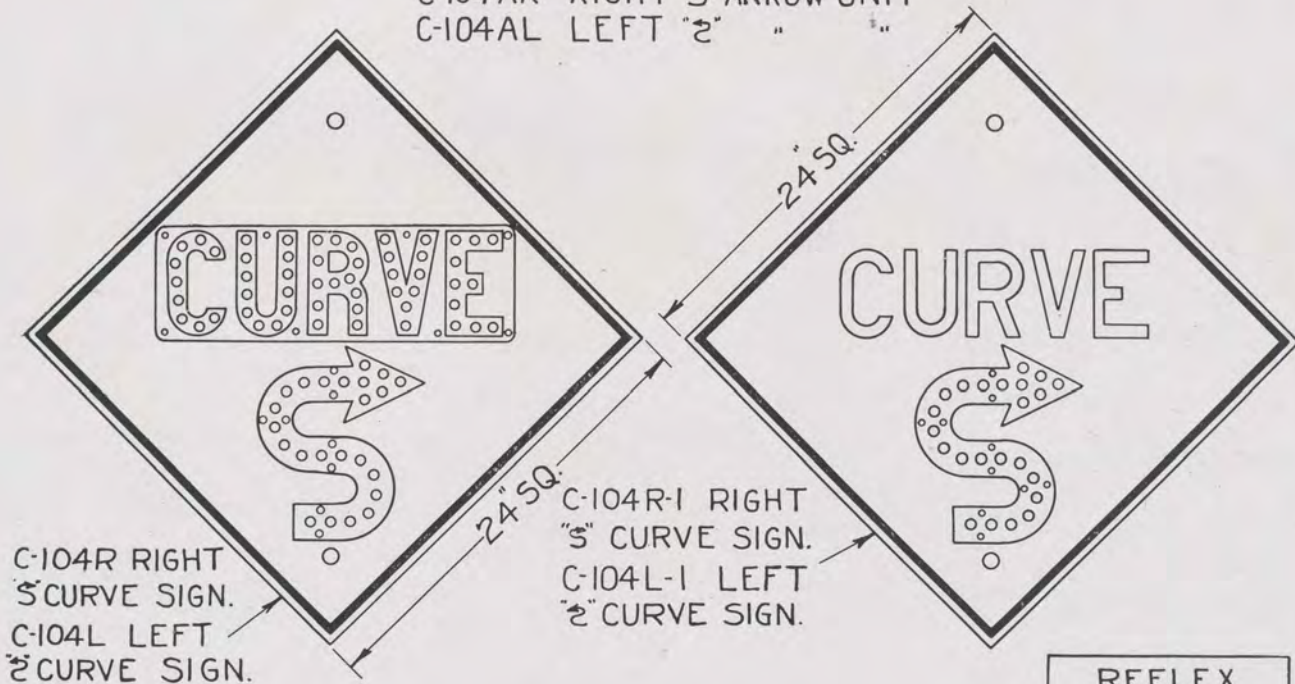
SPECIFICATIONS

- LENS:** All No. 2A ($\frac{11}{16}$ " dia.); 36 in "ONE"; 31 in "WAY" and 10 in arrow. White (colorless)*.
- HOUSING:** Aluminum—Painted Federal yellow* with black* letters raised $\frac{1}{16}$ ".
- PLATES:** 24" square, embossed, galvanized steel or equal; 16 gauge. Painted Federal yellow with black border and letters.*
- SCREWS:** Brass Machine No. 10-32; with special heads to prevent theft.
- MOUNTINGS:** Furnish $\frac{5}{16}$ " x 2" R.H.B. Machine Screws or $\frac{5}{16}$ " Wood Screws when specified. Clamps extra.
- WEIGHTS:** Approximate, net. C-150A Unit 4½ lbs.; C-150B Unit 4½ lbs.
C-150R or L Sign 18 lbs.
C-150R-1 or C-150L-1 Sign 11½ lbs.

NOTE*: When above specifications are not in accordance with your requirements, please advise changes wanted.



C-104AR RIGHT "S" ARROW UNIT
C-104AL LEFT "S" " " "



C-104R RIGHT "S" CURVE SIGN.
C-104L LEFT "S" CURVE SIGN.

C-104R-1 RIGHT "S" CURVE SIGN.
C-104L-1 LEFT "S" CURVE SIGN.

REFLEX
"S" CURVES
PLATE No. 27

SPECIFICATIONS

- LENS: All No. 2A ($\frac{1}{16}$ " dia.) 23 in C-104A Units; 56 in "CURVE"; white (colorless)*.
- HOUSING: Aluminum—Painted Federal yellow* with black* letters raised $\frac{1}{16}$ ".
- PLATES: 24" square, embossed, galvanized steel or equal, 16 gauge. Painted Federal yellow with black border and letters.*
- SCREWS: Brass Machine No. 10-32; with special heads to prevent theft.
- MOUNTING: Furnish $\frac{5}{16}$ " x 2" R.H.B. Machine Screws or $\frac{5}{16}$ " Wood Screws when specified. Clamps extra.
- WEIGHTS: Approximate, net. C-104A Units 23/4 lbs.
C-104R or C-104L Sign 18 1/2 lbs.
C-104R-1 or C-104L-1 Sign 13 lbs.
- NOTE*: See Page 14 for "CURVE" detail. When above specifications are not in accordance with your requirements, please advise changes wanted.



C-152-R1 SIGN

24" SQUARE



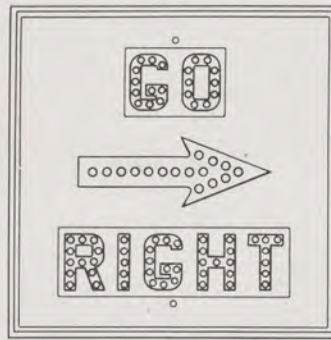
C-152-R2 SIGN



C-152-R3 SIGN



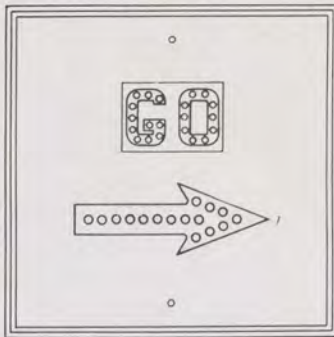
C-152-R4 SIGN



C-152-R5 SIGN



C-152-R6 SIGN



C-152-R7 SIGN

REFLEX
RIGHT & LEFT SIGNS
PLATE NO. 47a

RIGHT OR
LEFT
SIGNS

Both Right and Left Signs can be furnished. Ordinary numbers for Right Signs are shown. In ordering Left Signs, simply substitute an "L" for the "R" in above numbers.

SPECIFICATIONS

LENS:

No. 3A (1/2" dia.) in reflectorized words; No. 2A (1 1/8" dia.) in arrow; White (colorless)*.

HOUSING:

Aluminum—Painted Federal yellow*, letters black*, raised 1/16".

PLATES:

24" square; embossed; galvanized steel or equal; 16 gauge. Painted Federal yellow, with black border*.

SCREWS:

Brass Machine No. 10-32; with special heads to prevent theft.

MOUNTING:

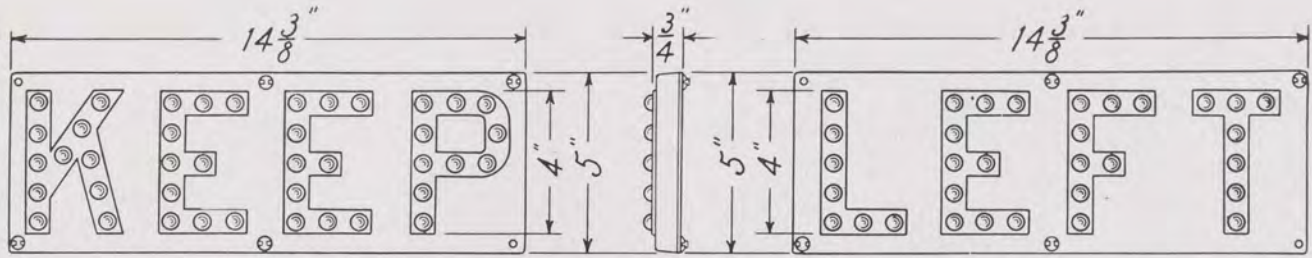
Furnish 5/16" x 2" R.H.B. Machine Screws or 5/16" Wood Screws when specified. Clamps extra.

WEIGHTS:

Approximate, net. C-152-R1 15 1/2 lbs.; C-152-L1 15 1/4 lbs.; C-152-R2 16 lbs.; C-152-L2 15 3/4 lbs.; C-152-R3 16 3/4 lbs.; C-152-L3 16 1/2 lbs.; C-152-R4 14 3/4 lbs.; C-152-L4 14 1/2 lbs.; C-152-R5 16 3/4 lbs.; C-152-L5 16 1/2 lbs.; C-152-R6 17 1/2 lbs.; C-152-L6 17 1/4 lbs.; C-152-R7 14 1/4 lbs.; C-152-L7 Sign 14 1/4 lbs.

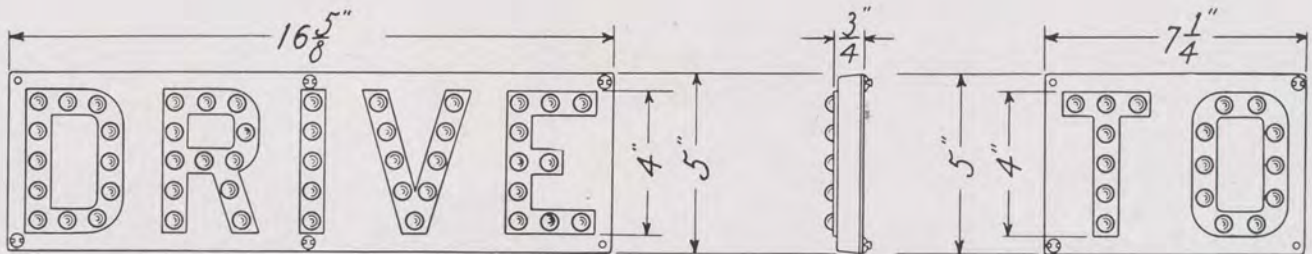
NOTE*:

See next page for detail of units, Page 26 for arrow unit. When above specifications are not in accordance with your requirements, please advise changes wanted.



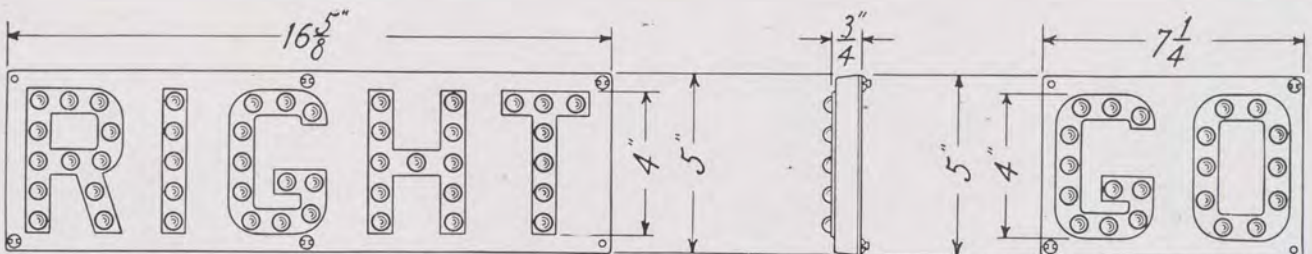
C-253A UNIT

C-256A UNIT



C-257A UNIT

C-255A UNIT



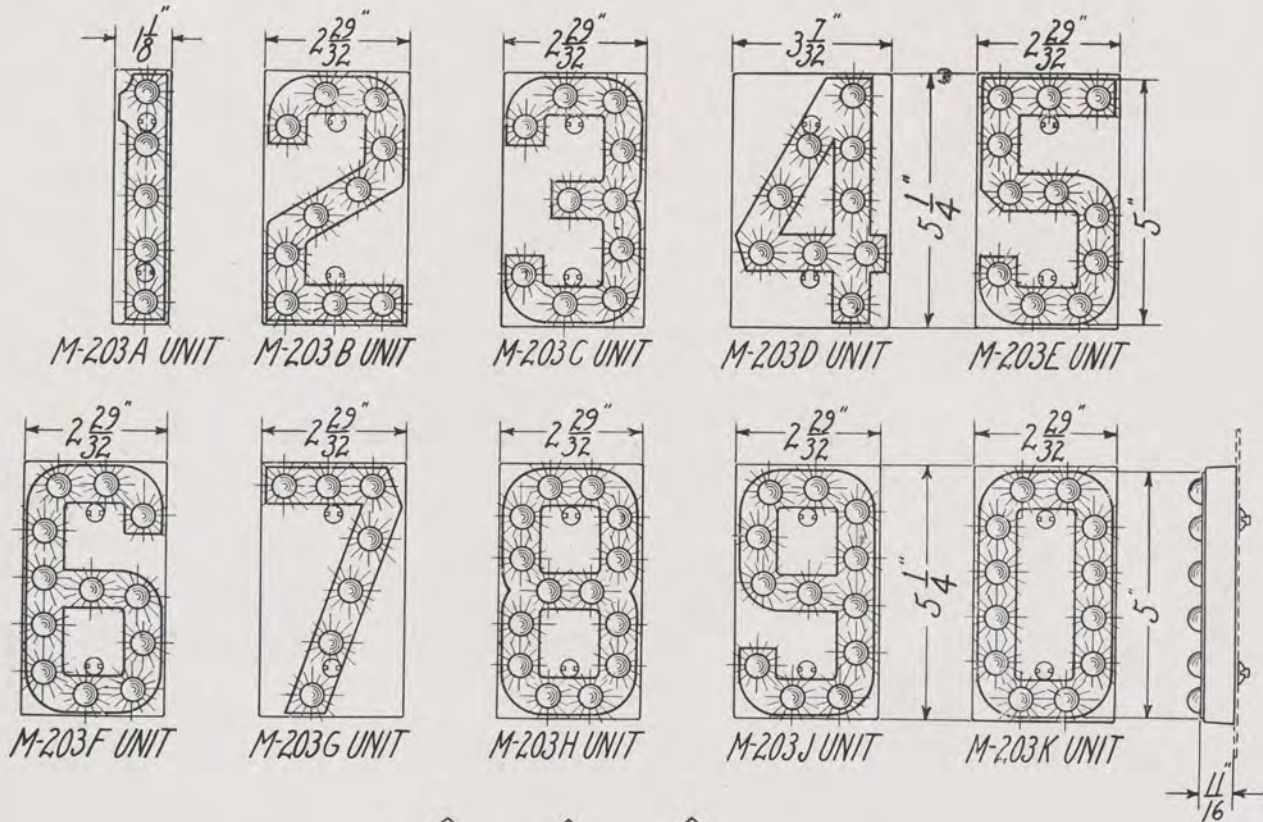
C-252A UNIT

C-254A UNIT

REFLEX
RIGHT & LEFT UNITS
PLATE NO. 47

SPECIFICATIONS

- LENS: All No. 3A (1/2" dia.) 41 in "KEEP"; 32 in "LEFT"; 48 in "DRIVE"; 46 in "RIGHT"; 17 in "TO"; 21 in "GO". White (colorless)*.
- HOUSING: Aluminum—Painted Federal yellow* with black* letters raised 1/16".
- PLATES: See preceding page.
- SCREWS: Brass Machine No. 10-32; with special heads to prevent theft.
- MOUNTINGS: Furnish 5/16" x 2" R.H.B. Machine Screws or 5/16" Wood Screws when specified. Clamps extra.
- WEIGHTS: Approximate, net. C-254A Unit 3 1/2 lbs.; C-256A Unit 3 1/2 lbs.; C-257A Unit 4 lbs.; C-252A Unit 4 lbs.; C-225A Unit 2 lbs.; C-154A Unit 2 lbs.
- NOTE*: When above specifications are not in accordance with your requirements, please advise changes wanted.

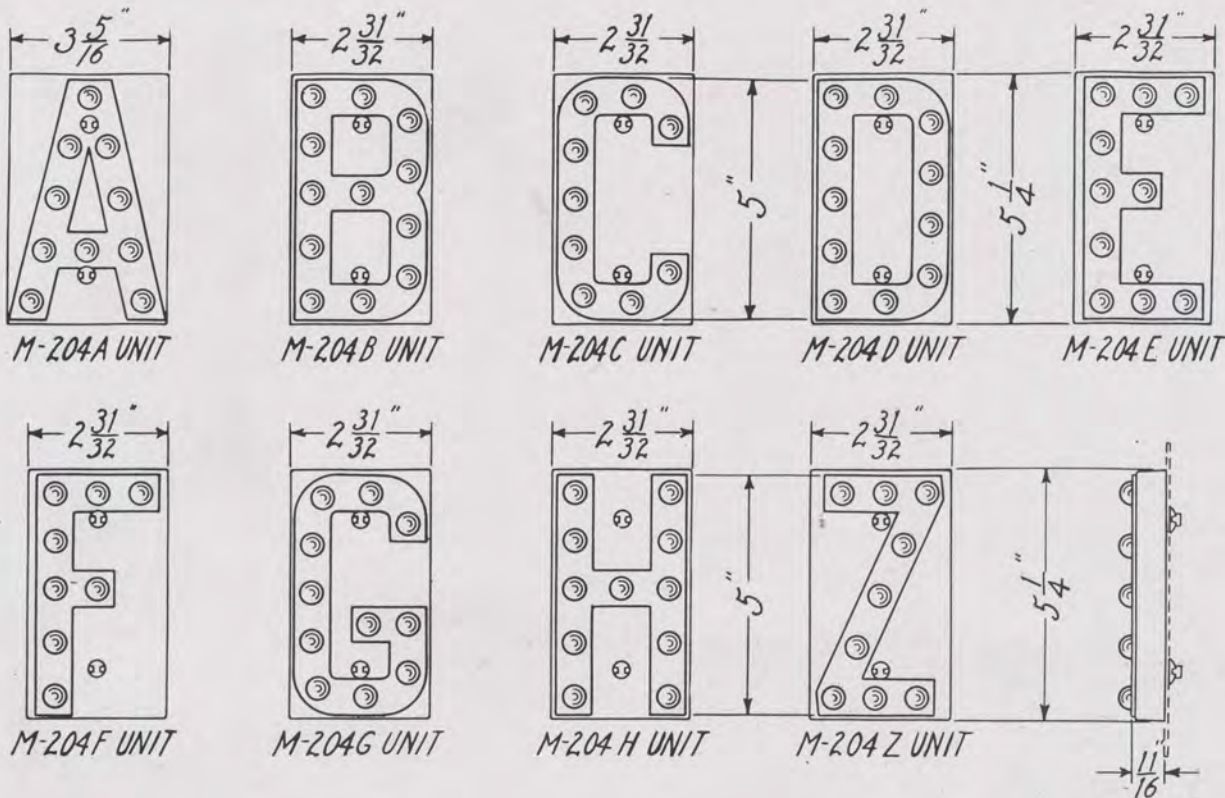


M-203 SIGN

REFLEX
ROUTE NUMBERS
PLATE NO. 22 A.

SPECIFICATIONS

- LENS: All No. 3 A (1/2" dia.) Number of buttons as shown. White (colorless)*.
- HOUSING: Aluminum; panel type, background painted white, letters black*.
- PLATES: Embossed, galvanized steel or equal; 18 gauge. Painted white with letters and borders*.
- SCREWS: Brass Machine No. 10-32; with special heads to prevent theft.
- MOUNTING: Furnish 5/16" x 2" R.H.B. Machine Screws or 5/16" Wood Screws when specified. Clamps extra.
- WEIGHTS: Approximate, net. "1" 5 oz.; "2" 10 oz.; "3" 10 oz.; "4" 11 oz.; "5" 11 oz.; "6" 11 oz.; "7" 10 oz.; "8" 12 oz.; "9" 11 oz.; "0" 11 oz.
- Application: Two mounting screws in each digit are located so as to make digits and letters interchangeable. See also Page 35 for signal digits.
- NOTE*: When above specifications are not in accordance with your requirements, please advise changes wanted.

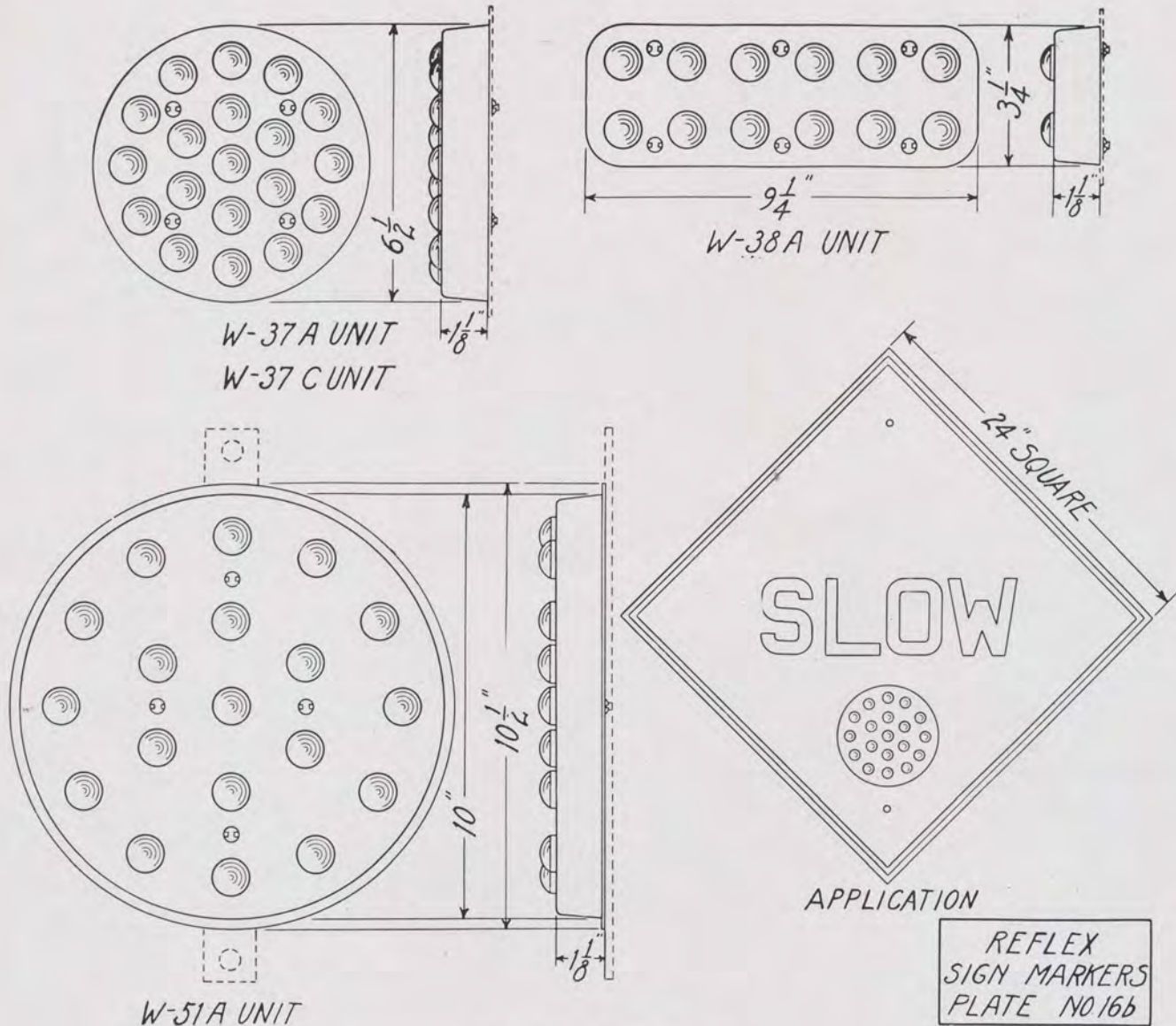


	I	J	K	L	M	N	O	P	R	S	T	U	V	W	X	Y
3A LENS RQ'D	5	7	11	7	15	14	10	9	11	10	7	10	9	15	9	7
PANEL WIDTH	1 1/8"	2 31/32"	2 31/32"	2 31/32"	4"	3 7/32"	2 31/32"	2 31/32"	2 31/32"	2 31/32"	2 31/32"	2 31/32"	3 7/32"	4"	3 7/32"	3 7/32"
UNIT NUMBER	M-204I	M-204J	M-204K	M-204L	M-204M	M-204N	M-204O	M-204P	M-204R	M-204S	M-204T	M-204U	M-204V	M-204W	M-204X	M-204Y

REFLEX
SERIES C ALPHABET
PLATE NO. 23A

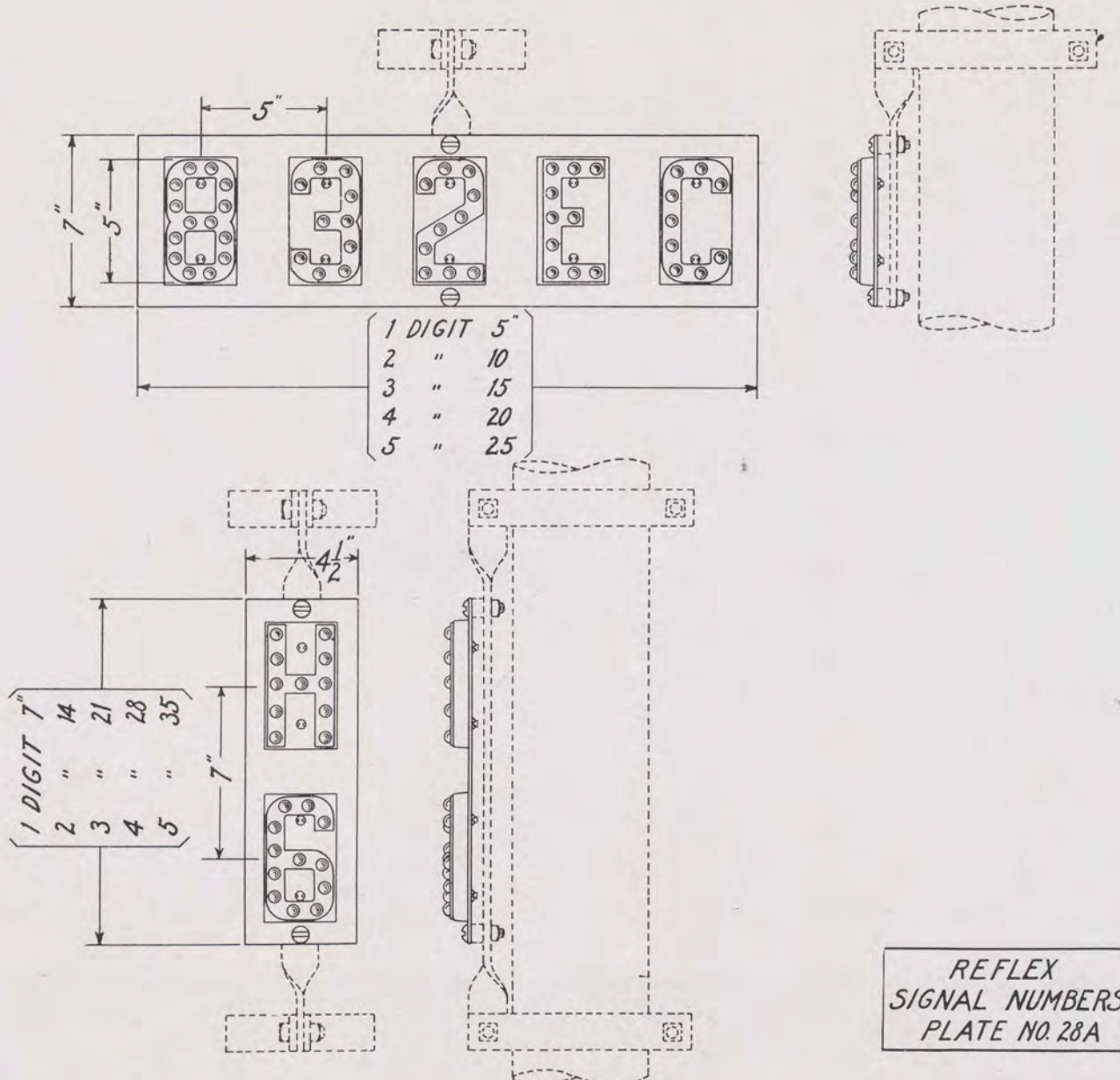
SPECIFICATIONS

- LENS: All No. 3A (1/2" dia.) Number of buttons as shown. White (colorless)*.
- HOUSING: Aluminum, panel type; background painted white, letters black*.
- SCREWS: Brass Machine No. 10-32; with special heads to prevent theft.
- MOUNTINGS: Furnish 1/8" x 2" R. H. B. Machine Screws or 1/8" Wood Screws when specified. Clamps extra.
- WEIGHTS: Approximate, net. 11 oz. each.
- Application: Two mounting screws in each letter are located so as to make letters and digits interchangeable. See also Page 35 for signal letters.
- NOTE*: When above specifications are not in accordance with your requirements; please advise changes wanted.



SPECIFICATIONS

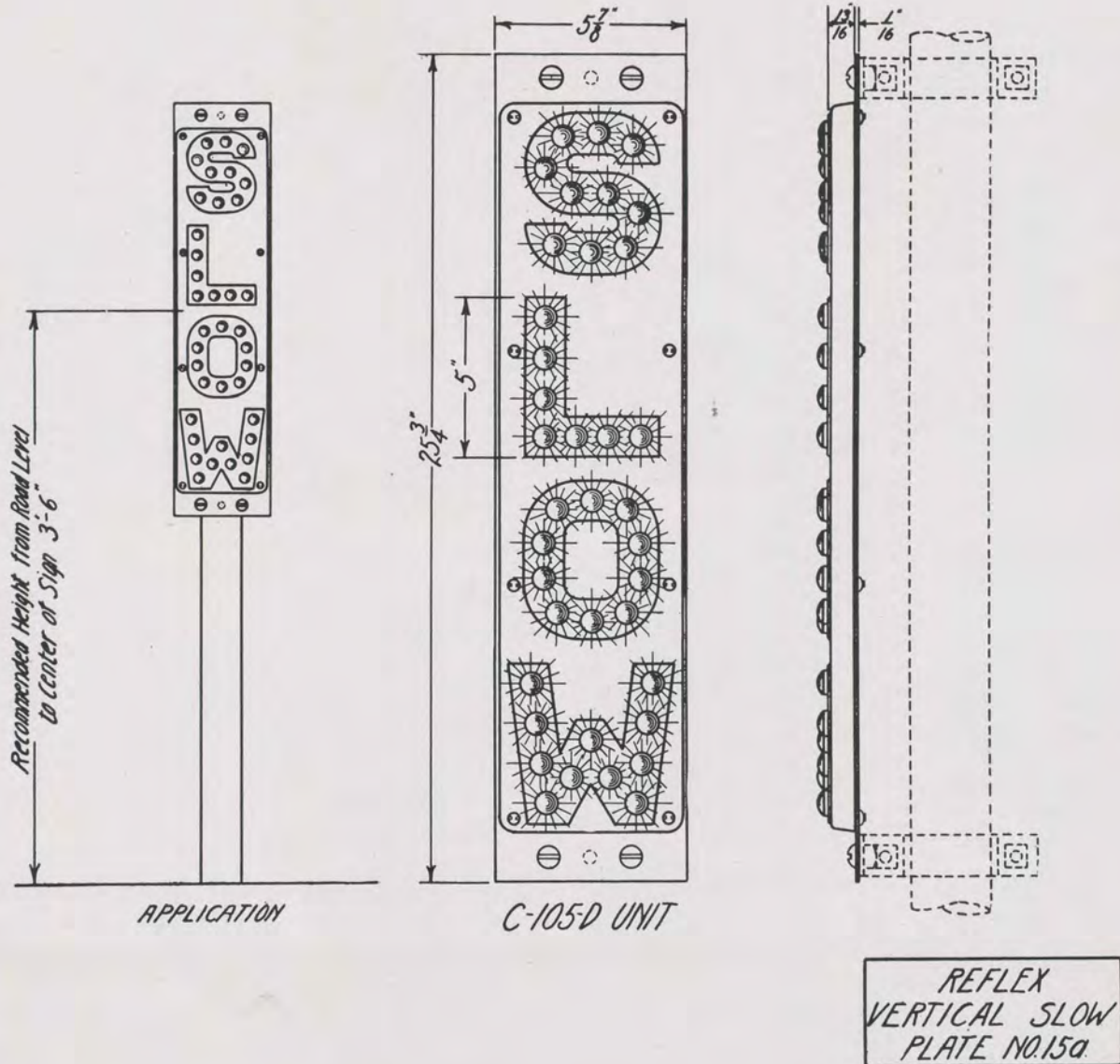
- LENS:** All No. 1A ($\frac{7}{8}$ " dia.) 19 in W-37A Unit; 12 in W-38A Unit; 19 in W-51A Unit; 19 in W-37C Unit. White (colorless)*.
- HOUSING:** Aluminum—Painted Federal yellow*. W-37C same as W-37A unit but with 16 gauge steel housing vitreous enamel.
- PLATES:** 24" square, embossed galvanized steel or equal; 16 gauge. Painted Federal yellow* with black border and letters*. Plate on No. 51-A Unit flat No. 16 gauge.
- SCREWS:** Brass Machine No. 10-32; with special heads to prevent theft.
- MOUNTING:** Furnish $\frac{5}{16}$ " x 2" R.H.B. Machine Screws or $\frac{5}{16}$ " Wood Screws when specified. Clamps extra. Mounting strap on W-51-A Unit furnished only when specified.
- Application:** To act as night signal where one does not want to incur the expense of studding letters. W-37C Unit also used in W-130-C Switch Lamp Page 42 and on switch stand targets.
- WEIGHTS:** Approximate, net. W-37A Unit $2\frac{1}{2}$ lbs.; W-38A Unit $2\frac{1}{4}$ lbs.; W-51A Unit $4\frac{5}{8}$ lbs. (without strap).
- NOTE*:** When above specifications are not in accordance with your requirements, please advise changes wanted.



REFLEX
SIGNAL NUMBERS
PLATE NO. 28A

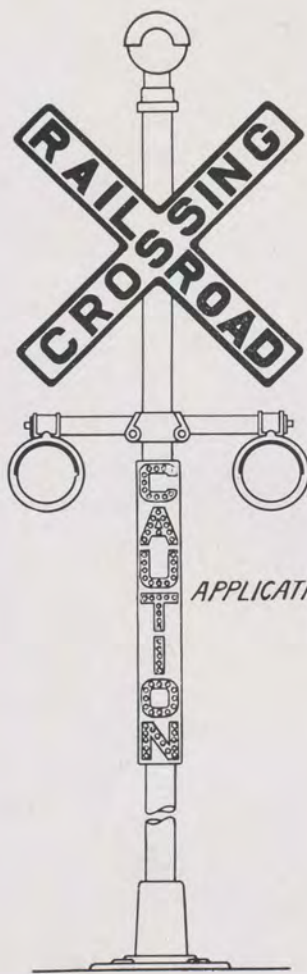
SPECIFICATIONS

- LENS: All No. 3A (1/2" dia.) exact number as shown; White (colorless)*.
- HOUSING: Aluminum—Painted black*.
- PLATES: Galvannealed steel or equal, 12 gauge. Painted white.
- SCREWS: Brass Machine No. 10-32; with special heads to prevent theft.
- MOUNTING: No. 10-32 x 2" long bolts furnished. Clamps not furnished unless specified.
- WEIGHTS: Approximate, net. Vertical arrangement 1 7/8 lbs. per digit. Horizontal arrangement 2 lbs. per digit.
- Application: Two mounting screws in each digit and letter located so as to make them interchangeable. For Signal Digits see Page 32; Signal Letters see Page 33.
- NOTE*: When above specifications are not in accordance with your requirements, please advise changes wanted.

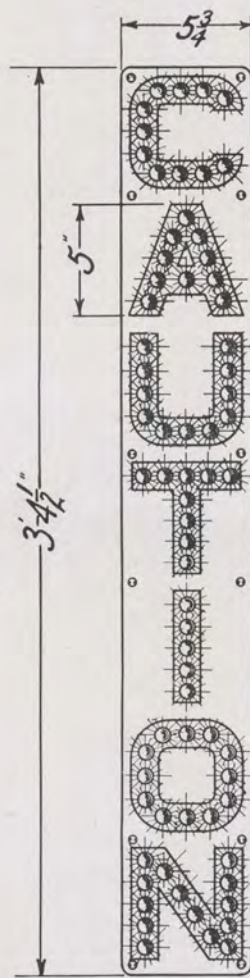


SPECIFICATIONS

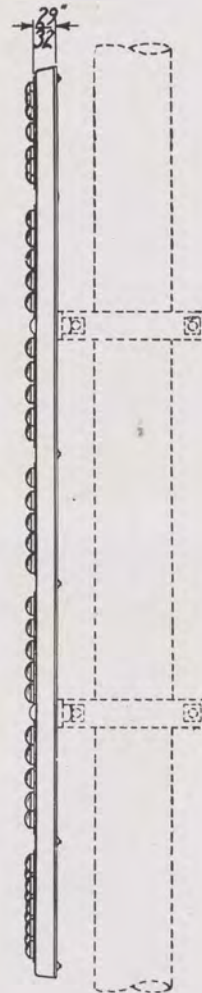
- LENS: All No. 2A ($\frac{1}{16}$ " dia.) White (colorless)*.
- HOUSING: Aluminum—Painted Federal yellow* with black* letters raised $\frac{1}{16}$ ".
- SCREWS: Brass Machine No. 10-32; with special heads to prevent theft.
- MOUNTINGS: Furnish $\frac{5}{16}$ " x 2" R.H.B. Machine Screws or $\frac{5}{16}$ " Wood Screws when specified. Clamps extra.
- WEIGHTS: Approximate, net. 7 1/2 lbs.
- NOTE*: When above specifications are not in accordance with your requirements, please advise changes wanted.



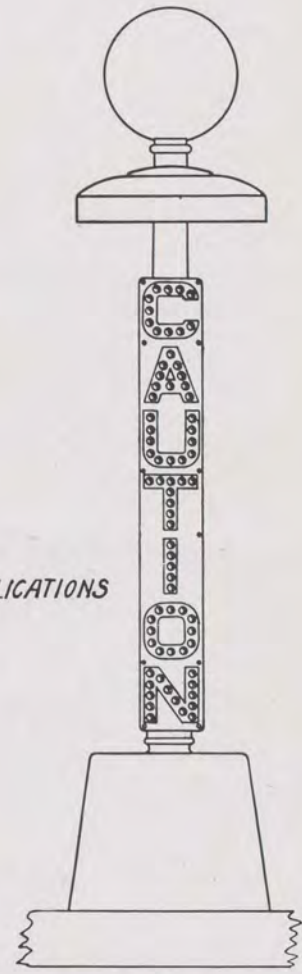
APPLICATION



W-127-A UNIT



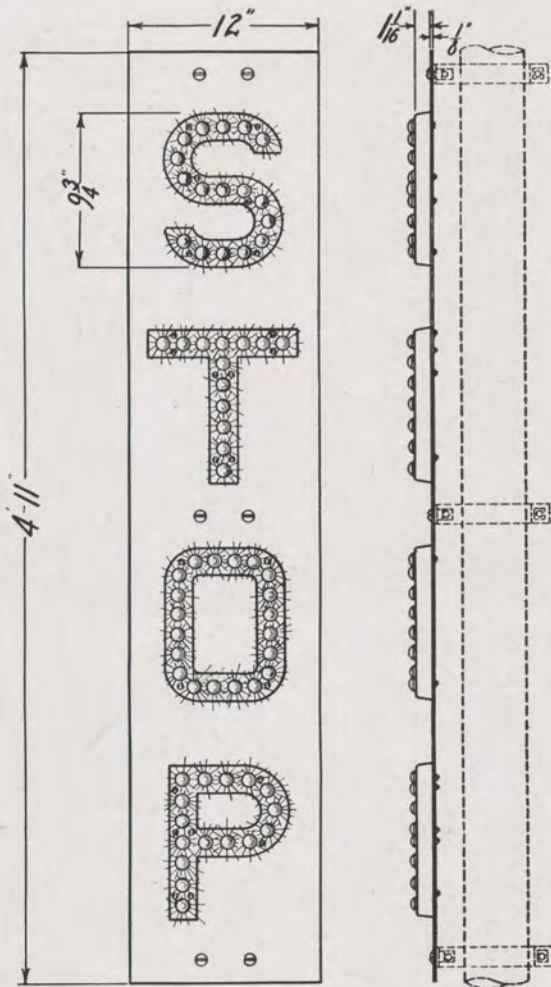
APPLICATIONS



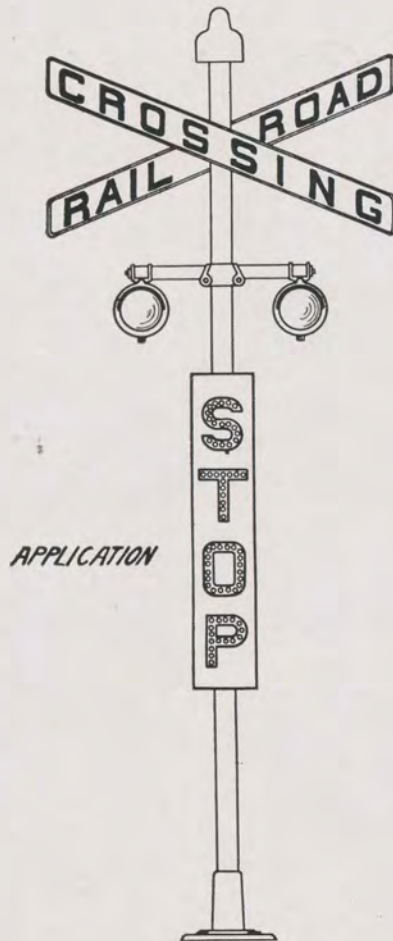
REFLEX
VERTICAL CAUTION
PLATE NO 32

SPECIFICATIONS

- LENS: All No. 2A ($\frac{1-1}{16}$ " dia.) Number 72; white (colorless)*.
- HOUSING: Aluminum—Painted Federal yellow* with black* letters raised $\frac{1}{16}$ ".
- SCREWS: Brass Machine No. 10-32; with special heads to prevent theft.
- MOUNTINGS: Furnish $\frac{5}{16}$ " x 2" R.H.B. Machine Screws or $\frac{5}{16}$ " Wood Screws when specified. Clamps extra.
- WEIGHT: Approximate, net. 13 lbs.
- NOTE*: When above specifications are not in accordance with your requirements, please advise changes wanted.



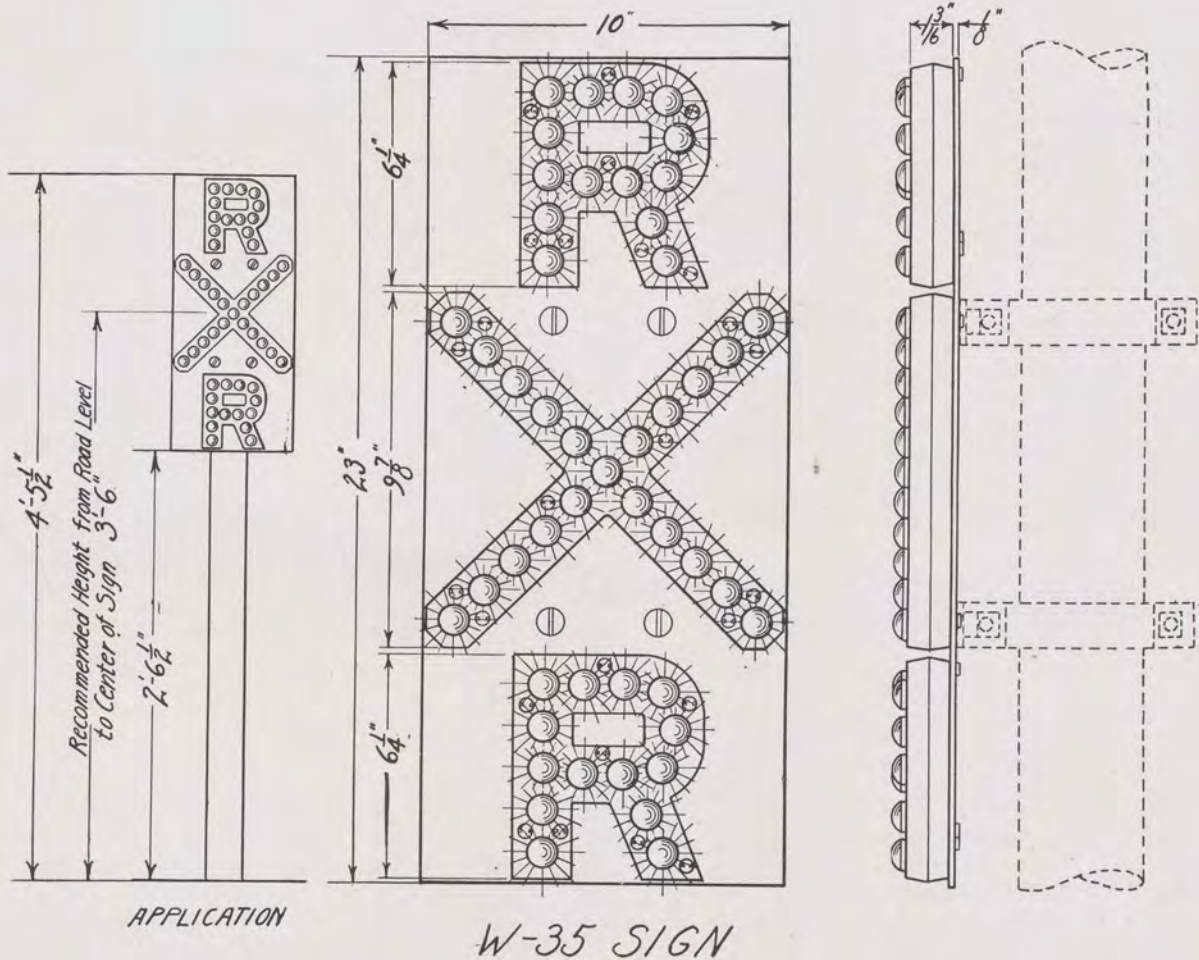
W-33 SIGN



REFLEX
VERTICAL STOP
PLATE NO.36

SPECIFICATIONS

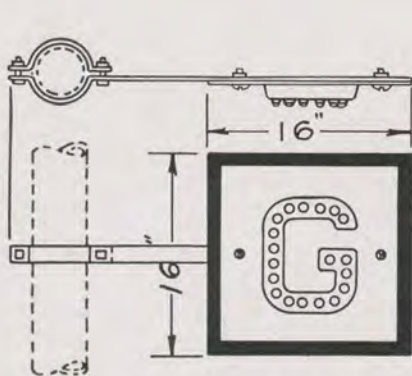
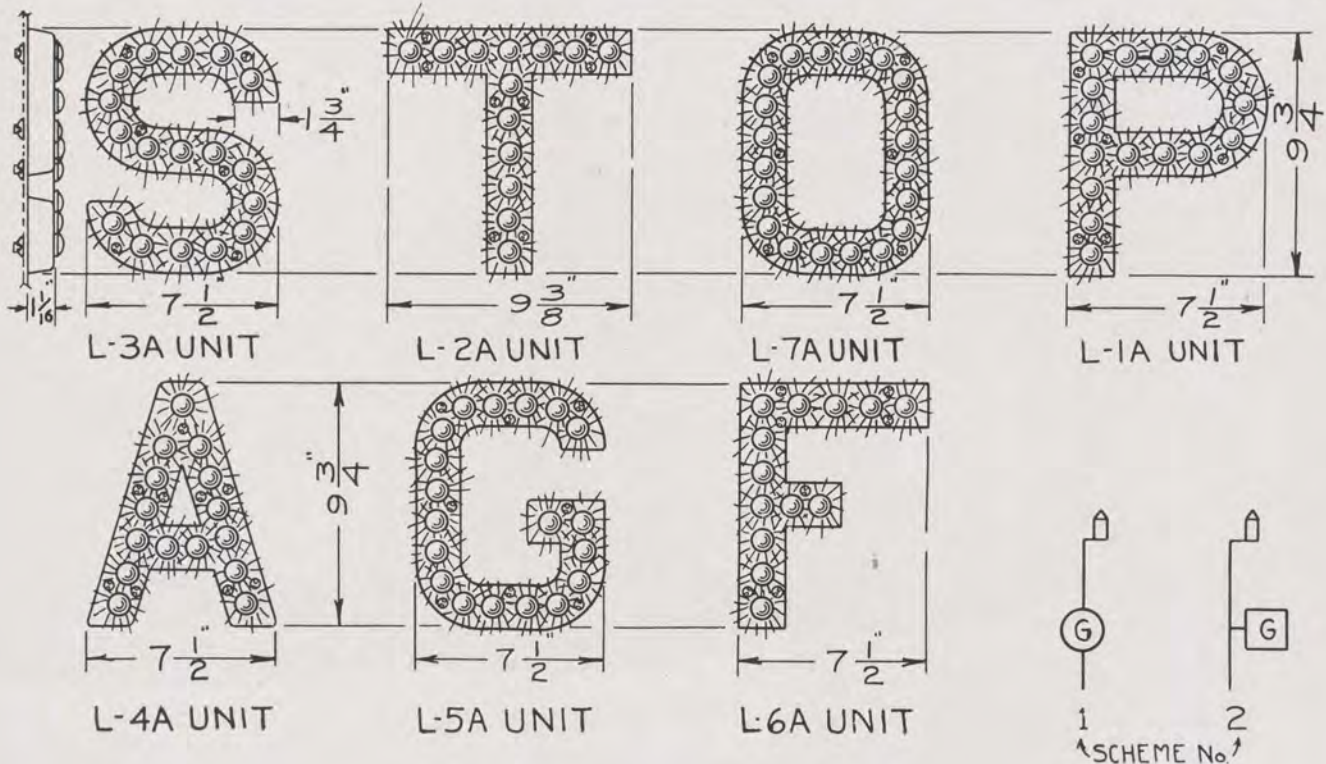
- LENS: All No. 1A (7/8" dia.) Number 66; white (colorless)*.
- HOUSING: Aluminum—Painted black*.
- PLATES: Galvanized steel or equal; 14 gauge. Painted Federal yellow*.
- SCREWS: Brass Machine No. 10-32; with special heads to prevent theft.
- MOUNTING: Furnish 5/16" x 2" R.H.B. Machine Screws or 5/16" Wood Screws when specified. Clamps extra.
- WEIGHT: Approximate, net. 39 1/4 lbs., without clamps.
- NOTE*: Also see L-1A, L-2A, L-3A and L-7A Units on Page 40.
- NOTE: When these specifications are not in accordance with your requirements, please advise changes wanted.



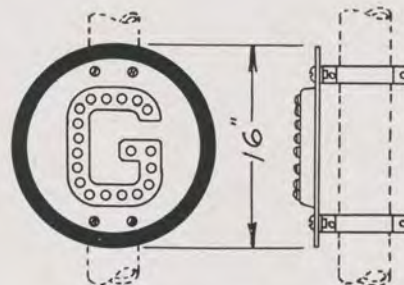
REFLEX
VERTICAL R.R. CROSSING
PLATE NO. 38

SPECIFICATIONS

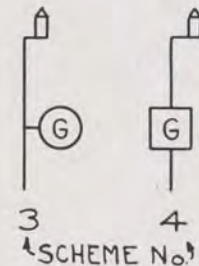
- LENS: All No. 1A (7/8" dia.) 14 canary yellow* in each "R" and 21 white* (colorless) in "X".
- HOUSING: Aluminum—painted white*.
- PLATES: Galvannealed steel or equal; 14 gauge. Painted black*.
- SCREWS: Brass Machine No. 10-32, with special heads to prevent theft.
- MOUNTING: Furnish 5/16" x 2" R.H.B. Machine Screws or 5/16" Wood Screws when specified. Clamps extra.
- WEIGHTS: Approximate, net. 16 lbs. without clamps. Clamps with bolts 2 1/2 lbs.
- NOTE: See Page 16 R.R. Crossing Sign.
- NOTE*: When these specifications are not in accordance with your requirements, please advise changes wanted.



L-5 SIGN SCHEME No. 2



L-5 SIGN SCHEME No. 1



SCHEME OF MOUNTING.

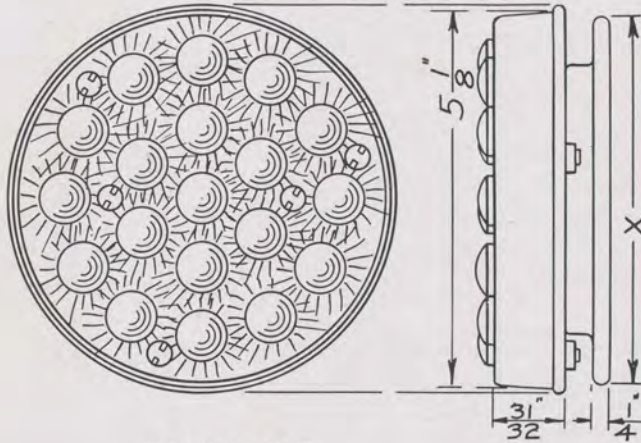
REFLEX
SIGNAL LETTERS
PLATE No. 8

SPECIFICATIONS

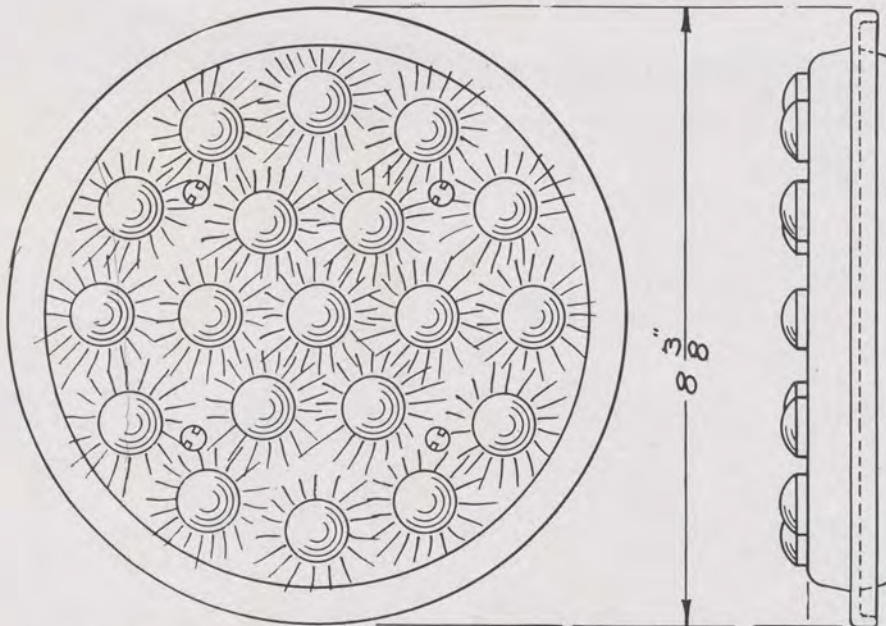
- LENS:** All No. 1A ($\frac{7}{8}$ " dia.) Exact number as shown in each unit; White (colorless). Can also furnish green, yellow, amber or red color if specified.
- HOUSING:** Aluminum—Painted black*.
- PLATES:** Galvannealed steel; 16 gauge. Painted white with black border*.
- SCREWS:** Brass Machine No. 10-32 with special heads to prevent theft.
- MOUNTING*:** Clamps not furnished unless specified. Please state size of pipe and scheme of mounting.
- WEIGHTS:** Approximate, net. "S" Unit 3 lbs.; "T" Unit $2\frac{1}{2}$ lbs.;
"O" Unit 3 lbs.; "P" Unit $2\frac{3}{4}$ lbs.;
"A" Unit $2\frac{3}{4}$ lbs.; "G" Unit $3\frac{1}{2}$ lbs.
"F" Unit $2\frac{1}{2}$ lbs.; Additional $8\frac{7}{8}$ lbs. for 16" square plate and $6\frac{1}{8}$ lbs. additional for 16" round plate without clamps.

NOTE*: When above specifications are not in accordance with your requirements, please advise changes wanted.
Also see W-33 Sign on Page 38.

Made to fit roundels from 4" to 5 $\frac{5}{8}$ " dia. Specify "X" Dimension, or Roundel diameter to replace.



W-128A UNIT



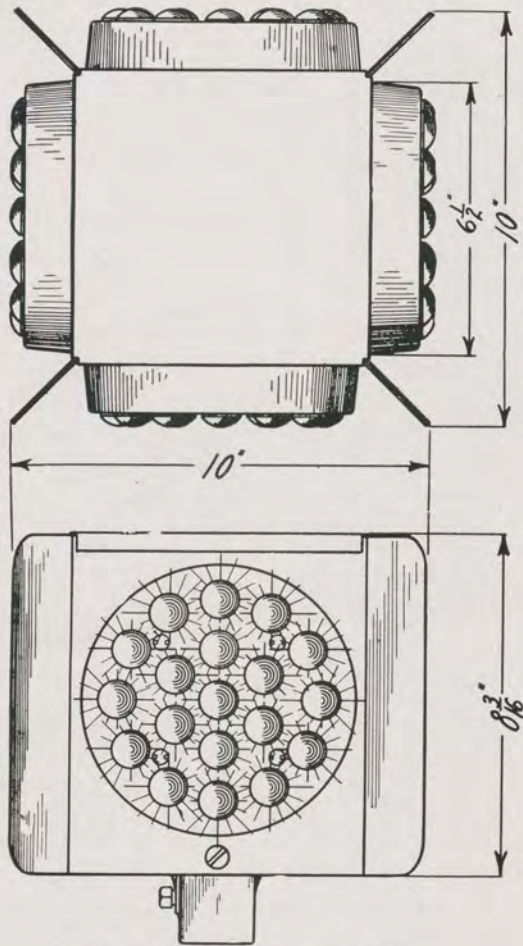
W-21A UNIT

U. S. PATENT No. 1,837,184
CANADIAN PATENT No. 339,876

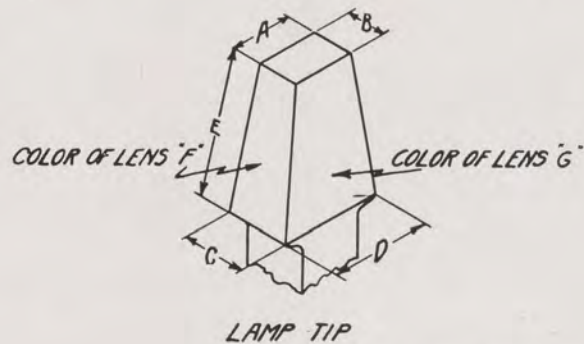
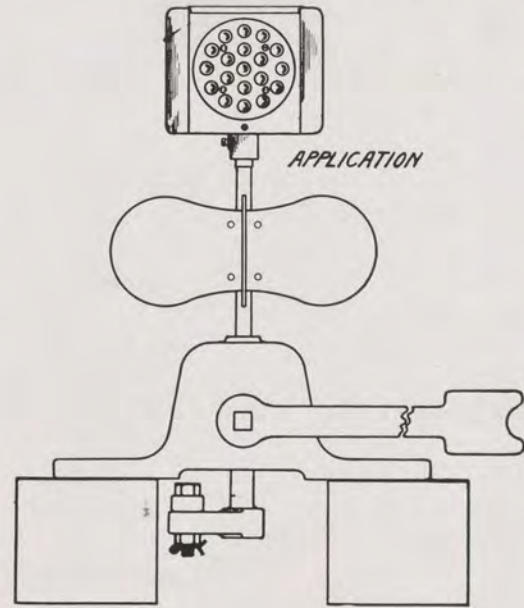
REFLEX SEMAPHORE
& SWITCH LAMP UNITS
PLATE No. 21

SPECIFICATIONS

- LENS: No. 1A ($\frac{7}{8}$ " dia.) for W-21A Unit; No. 2A ($\frac{13}{16}$ " dia.) for W-128A Unit. White, green, canary, amber and red colors.
- HOUSING: Aluminum—Painted same color as lens.
- SCREWS: Brass Machine No. 10-32; with special heads to prevent theft.
- MOUNTING: Made to fit standard switch or signal lamps replacing roundels. Specify diameter of roundel.
- WEIGHTS: Approximate, net. W-21A Unit 3 $\frac{1}{2}$ lbs.; W-128A Unit 2 lbs.
- NOTE: Specify color of lens required.



W-130-C SWITCH LAMP

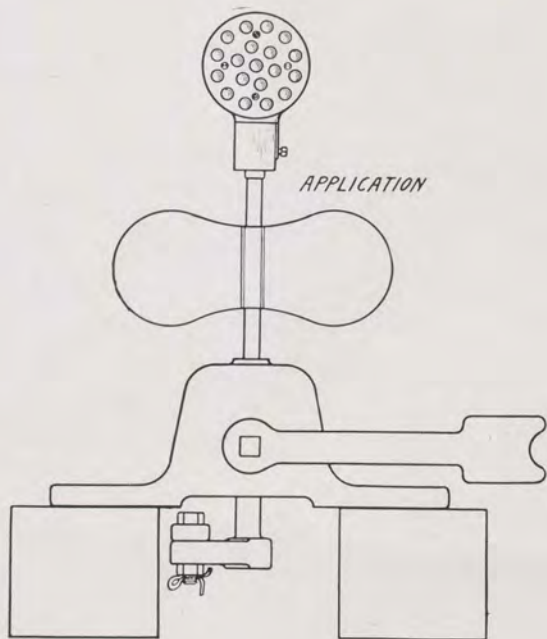


U. S. PATENT No. 1,837,184
 CANADIAN PATENT No. 339,876

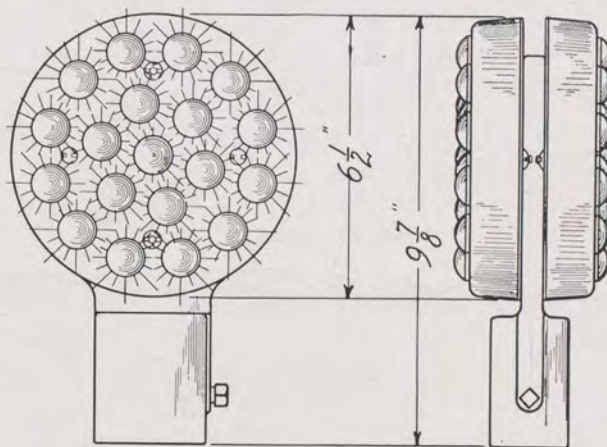
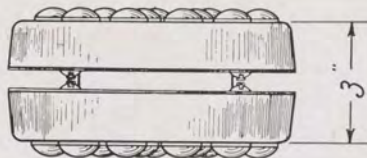
REFLEX
 SWITCH LAMP
 PLATE NO. 39

SPECIFICATIONS

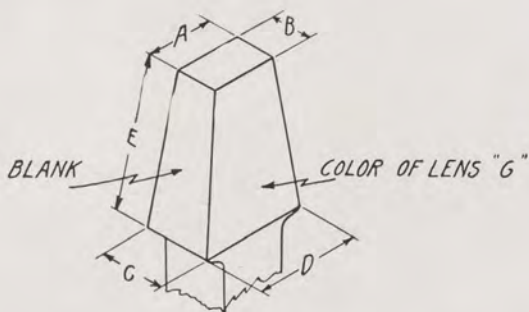
- LENS: All No. 1A (7/8" dia.) 19 on each of four sides; specify colors "F" and "G".
- Lens Housing: Galvannealed steel or equal, 16 gauge; Vitreous enameled same color as lens.
- Lamp Housing: Galvannealed steel or equal, 16 gauge. Painted same color as lens on respective sides.
- SCREWS: Brass Machine No. 10 x 2", with special heads for lens housing.
 3/8" x 1" Brass Machine for socket assembly.
 3/4" x 3/4" Set Screws for clamping to lamp tip.
- MOUNTING: Adapter in accordance with dimensions "A" to "E" furnished to fit lamp tip. Please specify "A" to "G".
- LAMP SOCKET: Cast Iron, painted black.
- WEIGHT: Approximate, net. 20 lbs.
- SPRING SWITCH: Substituting the letter "S" No. C-103AS, Page 27. Aluminum color with green lens on two green sides of lamp—gives distinct day and night indication.
- NOTE: Lamp will not be satisfactory in yards where backing up movements are made; nor when located on inside of stiff curves. On tangent tracks tests have shown them to be more efficient than oil lamps. They are easily visible as signals at 1600 feet and more.



APPLICATION



W-52 A
2 WAY SWITCH LAMP



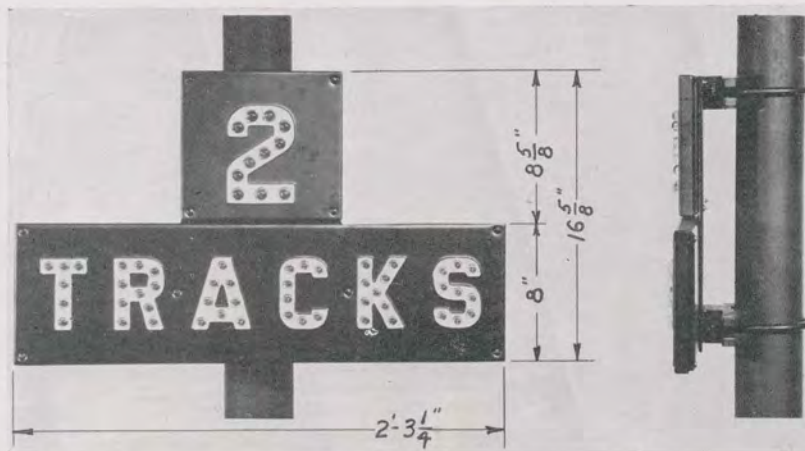
LAMP TIP

REFLEX
2WAY SWITCH LAMP
PLATE NO. 42.

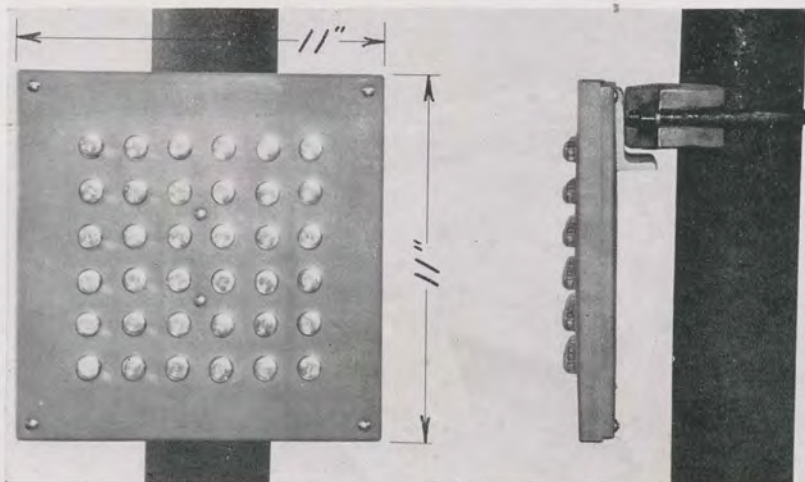
U.S. Pat. No. 1,837,184.

SPECIFICATIONS

- LENS: All No. 1A (7/8" dia.) 19 in each of two indicating sides; Specify color "G". Red furnished unless otherwise specified.
- Lens Housing: Aluminum, with galvanized steel or equal, 16 gauge back. Painted same color as lens.
- SIDES: Painted black unless otherwise specified.
- SCREWS: Brass Machine No. 10-32 with special head for lens housing. 3/8" x 3/4" Set Screws for clamping to lamp tip.
- MOUNTING: Socket to fit tip dimensions "A" to "E". Please specify "A" to "G".
- Lamp Support and Socket: Cast Iron, painted black.
- WEIGHT: Approximate, net. 10 3/8 lbs.
- NOTE: Lamp will not be satisfactory in yards where backing up movements are made; nor when located on inside of stiff curve. On tangent tracks tests have shown them to be more efficient than oil lamps. They are easily visible as signals at 1600 feet or more.



MULTIPLE TRACK W-136-2 ARA No. 16455



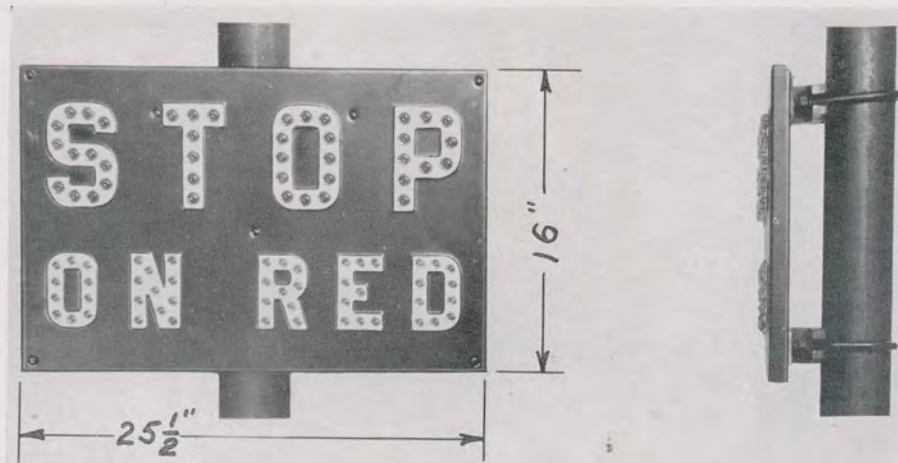
CROSSING MARKER

W-139B (ARA No. 16493) Marker complete with clamps.
W-139B (ARA No. 16491) Marker only.

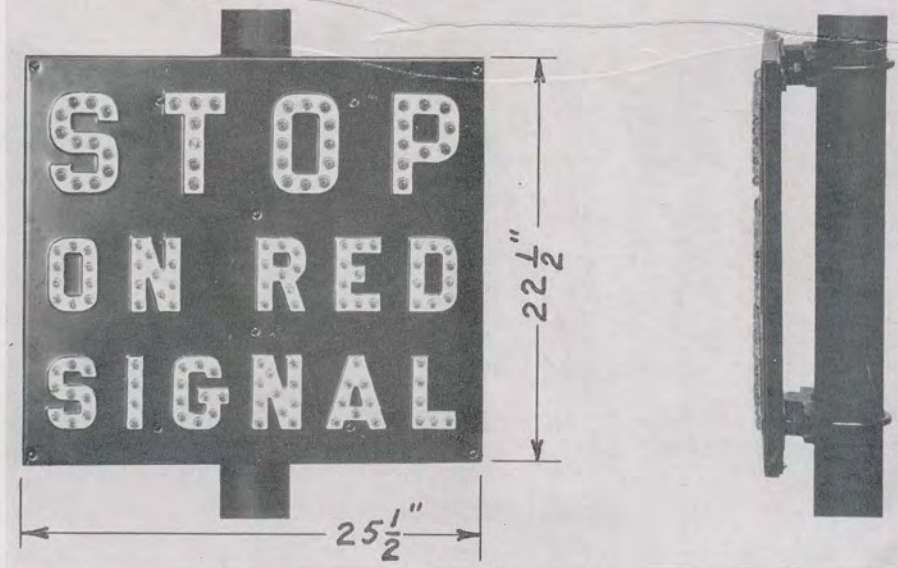
SPECIFICATIONS (Per ARA Drawing No. 1645A and 1649A)

- LENS:** MULTIPLE TRACKS, No. 2A ($\frac{11}{16}$ " Dia.) in digits; 11 in No. 2; 11 in No. 3; 11 in No. 4; 12 in No. 5; 13 in No. 6; 7 in No. 7; 13 in No. 8; 13 in No. 9.
No. 3A ($\frac{1}{2}$ " Dia.) 50 in TRACKS; white (colorless)*.
CROSSING MARKER, No. 2A ($\frac{11}{16}$ " Dia.) 36 buttons, canary yellow*.
- HOUSING:** MULTIPLE TRACK. Sheet steel front and back; 16 gauge. Number and letters embossed; painted black, eggshell finish; number and letters painted white, semi-gloss finish.
CROSSING MARKER, sheet steel front and back, 16 gauge, painted enamel yellow, semi-gloss finish.
- INTERMEDIATE PLATE:** Sheet steel, 16 gauge. Painted black, eggshell finish.
- SUPPORTING PLATE:** MULTIPLE TRACK; O. H. Steel, $\frac{1}{4}$ " thick. Painted black, eggshell finish.
- ANGLE:** CROSSING MARKER; O. H. Steel, $2\frac{1}{2}$ "x $1\frac{1}{2}$ "x $\frac{1}{4}$ "x8" long. Painted lemon yellow, semi-gloss finish.
- SCREWS:** Brass Machine, No. 10-32, with special heads to prevent theft.
- MOUNTINGS:** ARA No. 16471 Clamps with A. R. A. fittings. Specify diameter of pipe.
- DETAILS:** Assembly, welding and fittings per ARA 1645-A and 1649-A.
- WEIGHT:** MULTIPLE TRACK—Approximate, net 41 lbs.
CROSSING MARKER—Approximate, net 14 lbs.

STOP ON
RED
No. W-153-2

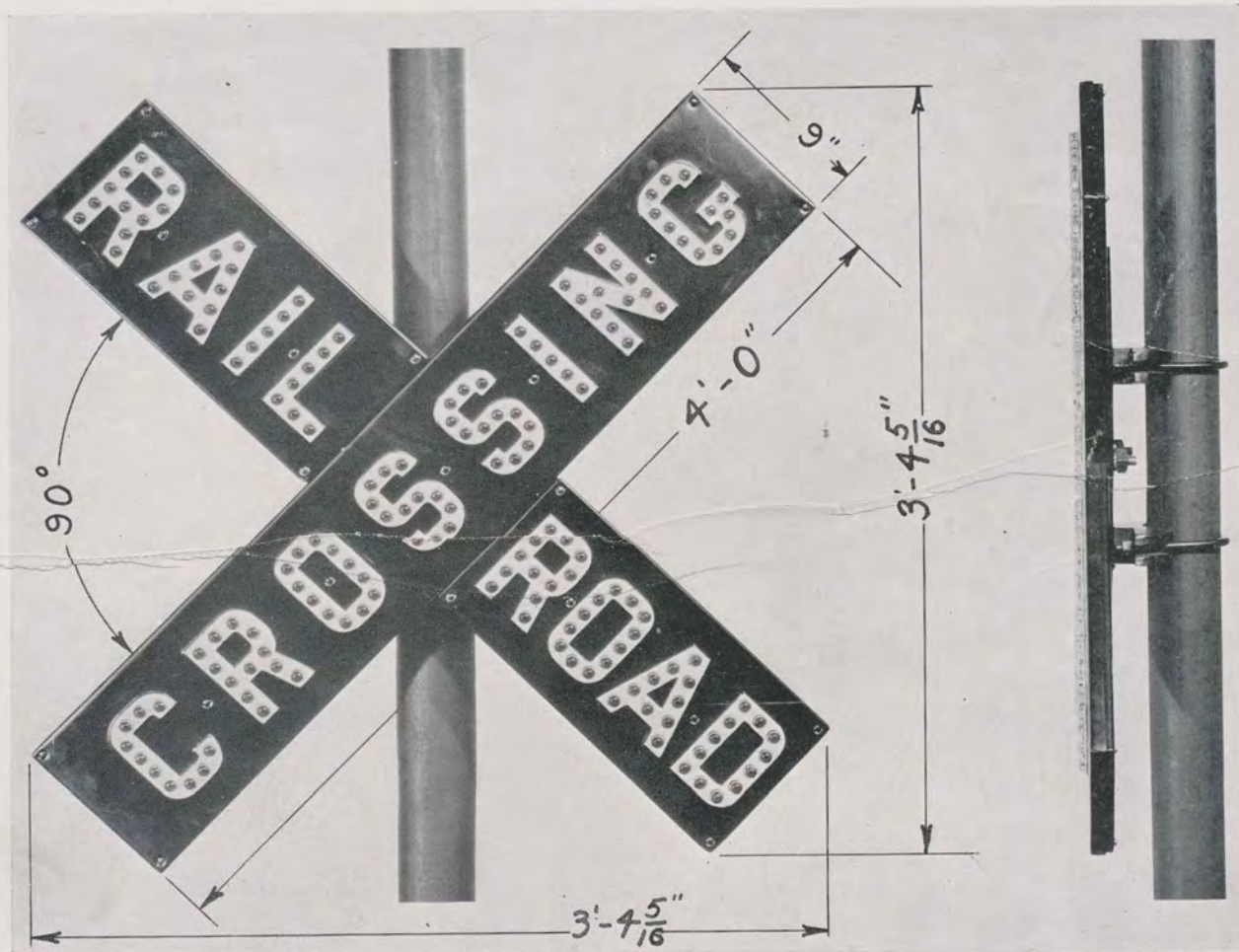


STOP ON
RED SIGNAL
W-140-2
ARA No. 16462



SPECIFICATIONS (Par ARA Drawing 1646-A and 1647-A)

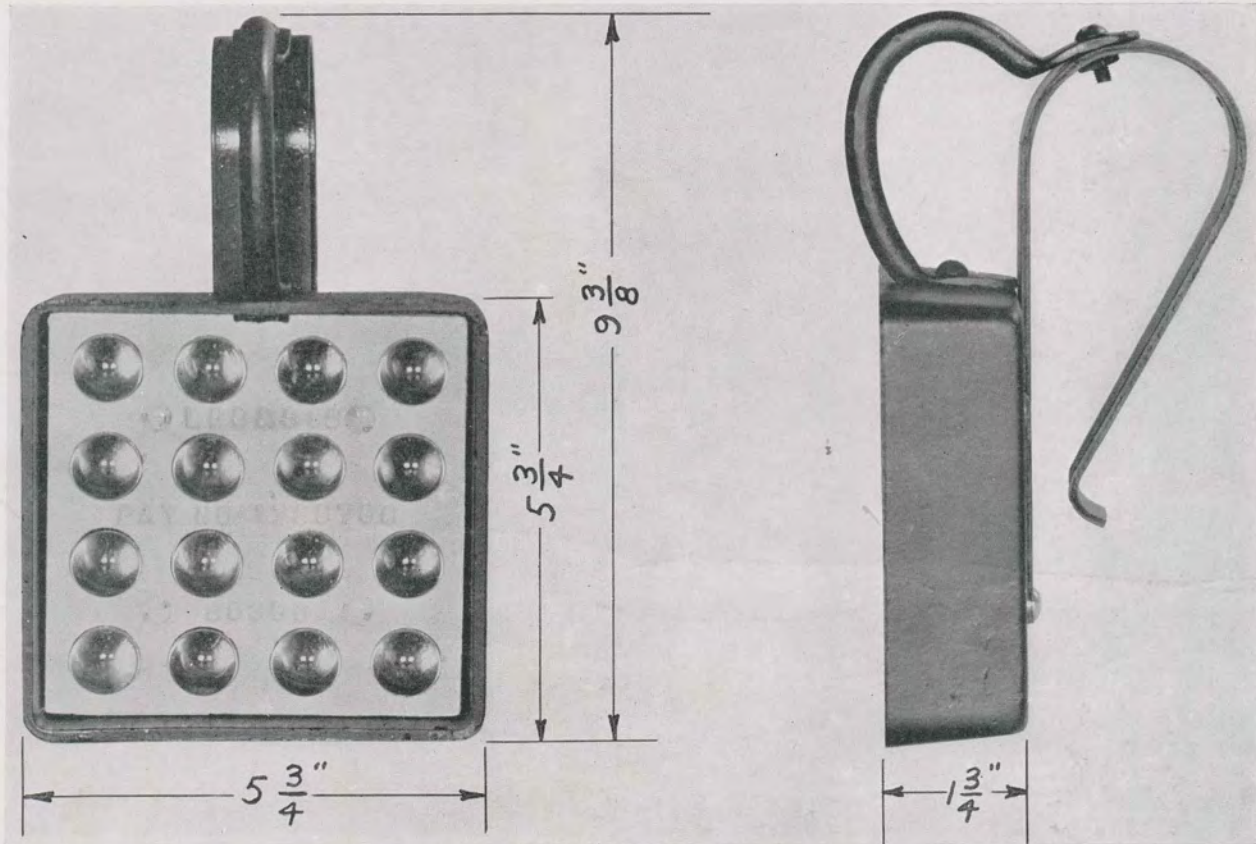
- LENS: No. 2A ($\frac{11}{16}$ " dia.) 41 in "STOP".
No. 3A ($\frac{1}{2}$ " dia.) 98 in "ON RED SIGNAL"; 50 in "ON RED".
- HOUSING: Sheet steel front and back, 16 gauge. Letters embossed. Painted black, eggshell finish. Letters painted white, semi-gloss finish.
- INTERMEDIATE PLATE: Sheet steel, 16 gauge. Painted black, eggshell finish.
- SCREWS: Brass Machine No. 10-32, with special heads to prevent theft on housings.
- MOUNTINGS: A.R.A. No. 16471 Clamps with A.R.A. fittings. Specify diameter of pipe.
- DETAILS: Assembly, welding and fittings per A.R.A. 1646-A and 1647-A.
- WEIGHT: Approximate, net W-140-2 Unit 51 lbs.; W-153-2 Unit 42 lbs.
- NOTE: In the manufacture of our W-153-2 "STOP ON RED" Sign shown above, we follow the A.R.A. construction specified in our W-140-2 "STOP ON RED SIGNAL".



90° CROSSING SIGN No. W-149 (ARA No. 16422)

SPECIFICATIONS (Per ARA Drawing 1642-A and 1643-A)

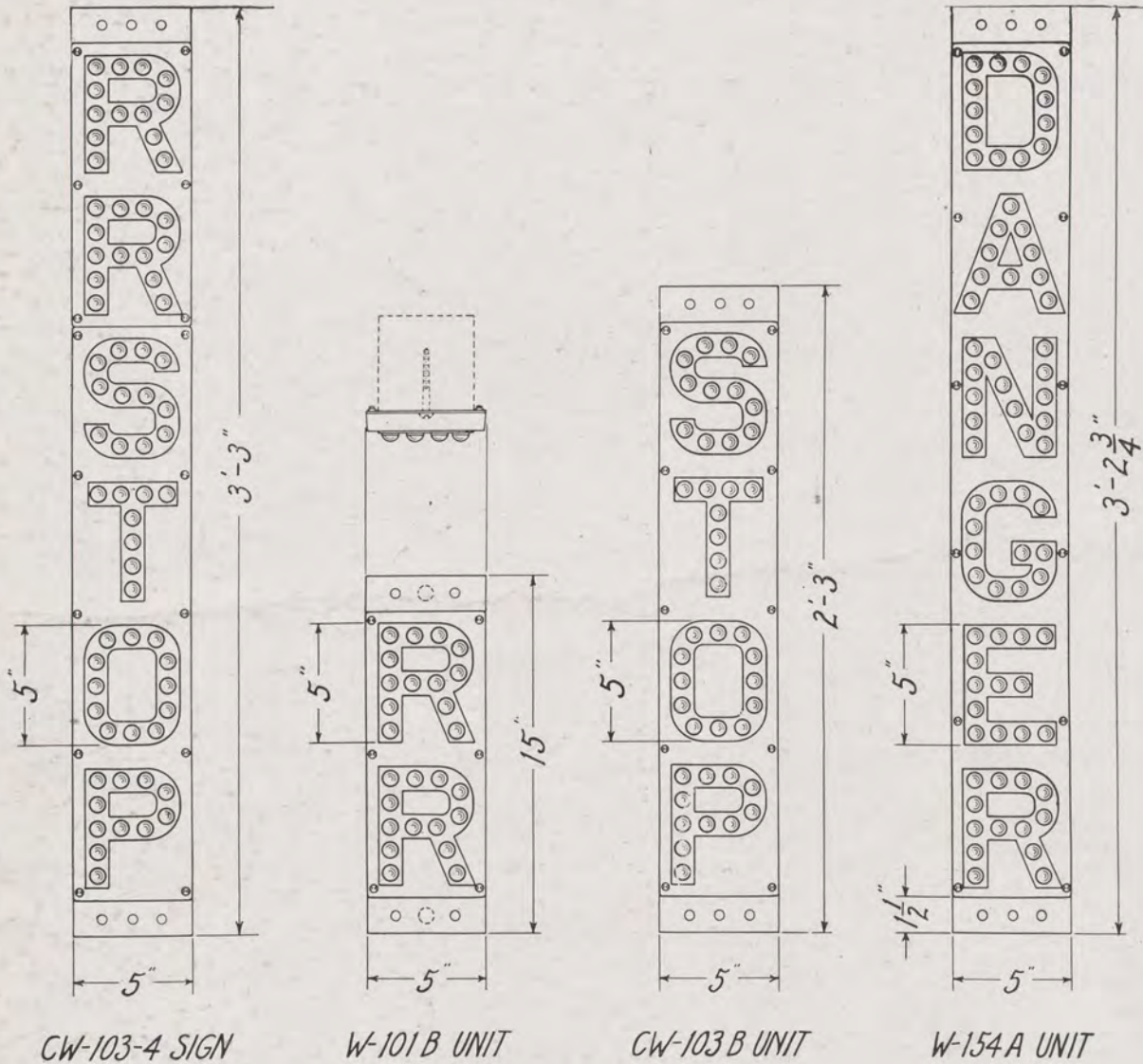
- LENS: All No. 2A ($\frac{11}{16}$ " dia.) 167 total; 87 in "CROSSING"; 34 in "RAIL"; 46 in "ROAD". White (colorless)*.
- HOUSING: Sheet steel front and back, 16 gauge. Letters embossed. Painted black, eggshell finish. Letters painted white, semi-gloss finish.
- SUPPORTING PLATE: O. H. Steel, $\frac{1}{4}$ " thick. Painted black, eggshell finish.
- INTERMEDIATE PLATE: Sheet steel, 16 gauge. Painted black, eggshell finish.
- SCREWS: Brass Machine No. 10-32, with special heads to prevent theft, on housings.
- MOUNTINGS: ARA 16471 Clamps with ARA fittings. Specify diameter of pipe.
- DETAILS: Assembly, welding and fittings per A.R.A. 1642-A and 1643-A.
- WEIGHT: Approximate, net. 77 lbs.



REFLEX MINE TRIP MARKER W-17B

SPECIFICATIONS

- LENS: All No. 1A ($\frac{7}{8}$ " dia.) 16 in number; RED*.
- HOUSING: Aluminum front and back.
- PAINTING: Face yellow* with other parts painted black.
- HANDLE: Forged steel.
- HANGER: Spring steel.
- SCREWS: Brass Machine No. 10-32, with special heads to prevent theft.
- WEIGHT: Approximate, net. $3 \frac{3}{4}$ lbs.
- NOTE: When above specifications are not in accordance with your requirements, please advise changes wanted.



CW-103-4 SIGN

W-101 B UNIT

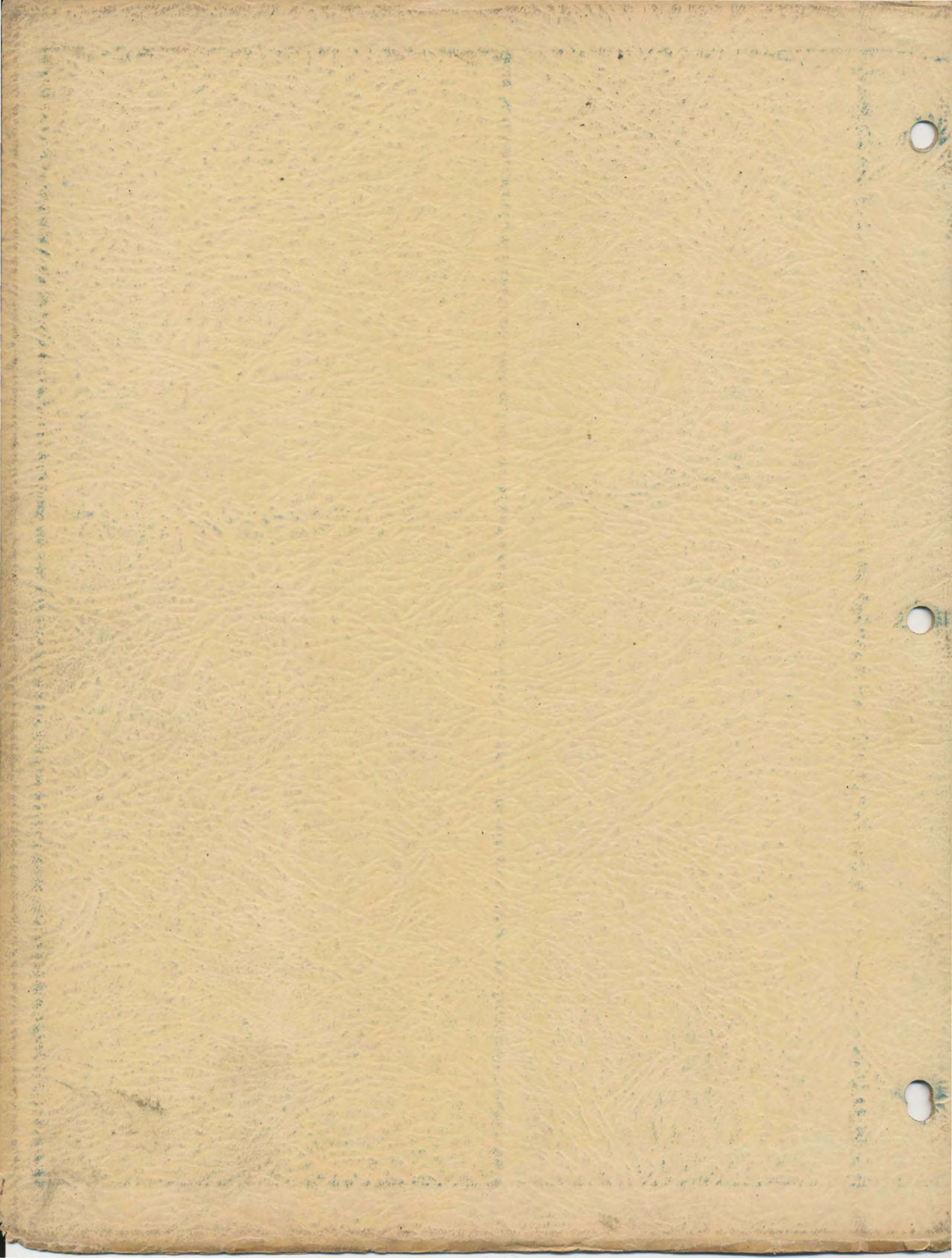
CW-103 B UNIT

W-154 A UNIT

REFLEX
R.R. STOP & DANGER
PLATE NO. 46

SPECIFICATIONS

- LENS:** All No. 2A ($\frac{1}{16}$ " dia.) 26 Red* in "R.R."; 43 White* (colorless) in "STOP"; 75 White* (colorless) in "DANGER".
- HOUSING:** Aluminum—Painted Federal yellow*; letters painted black* raised $\frac{1}{16}$ ".
- SCREWS:** Brass Machine No. 10-32, with special heads to prevent theft.
- MOUNTINGS:** Furnish $\frac{5}{16}$ " x 2" R.H.B. Machine Screws or $\frac{5}{16}$ " Wood Screws when specified. Clamps extra.
- APPLICATION:** For use in narrow passages, or where there is not much side clearance.
- WEIGHTS:** Approximate, net. W-101B Unit $3\frac{3}{8}$ lbs.; CW-103B Unit $6\frac{3}{8}$ lbs.; CW-103-4 Sign $9\frac{3}{4}$ lbs.; W-154A Unit $9\frac{3}{4}$ lbs.
- NOTE*:** When above specifications are not in accordance with your requirements, please advise changes wanted.





Louisville Frog, Switch & Signal Company

INCORPORATED

SUCCESSOR TO

Louisville Frog & Switch Co.

Southern Signal Corporation

MANUFACTURERS OF

TRACK AND SIGNAL EQUIPMENT

LOUISVILLE, KENTUCKY

Dear Sir:

Gauge Rods are now standard equipment on the tracks of many large railways because of the safety they insure and the money they save in maintenance of tracks.

Placed on bad curves -- they prevent spreading of rails and loosening of spikes, also prolong the life of cross-ties.

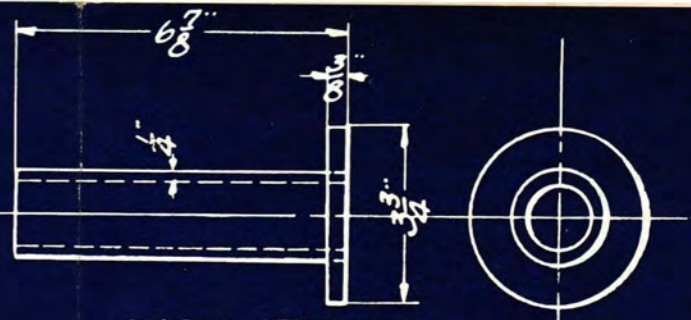
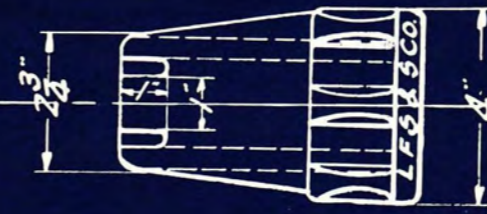
Many railroad men place them on crossings, at the point of all switches, and other places where they have found their maintenance figures justify such action.

Wrecking crews carry a supply on their trains, as they assist materially in getting a track back in condition after it has been torn out.

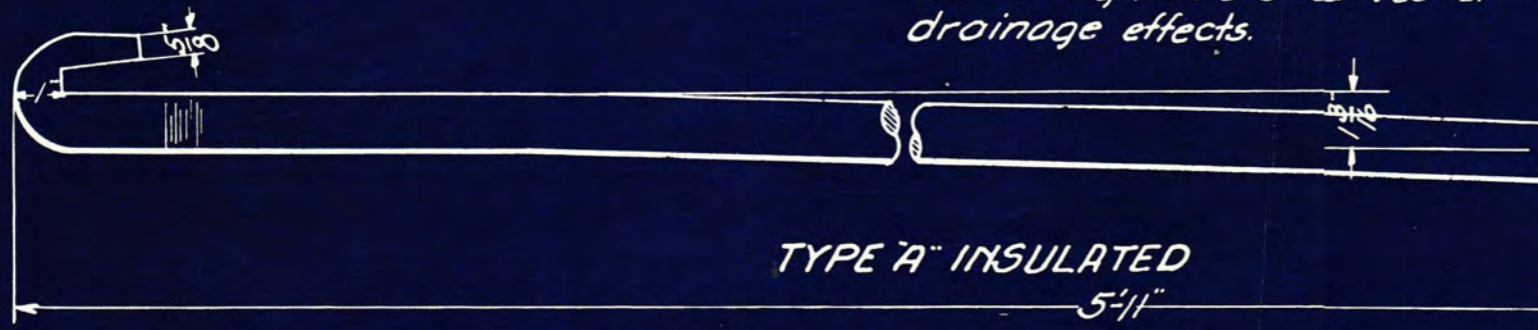
Their first cost is very reasonable. Their maintenance is practically nothing. Why not use them where you know they will save your company money?

Yours very truly,

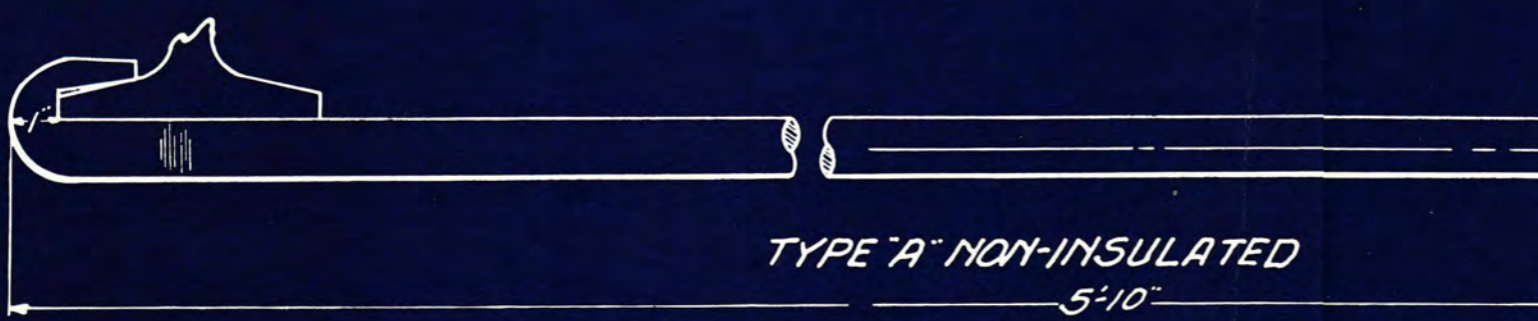
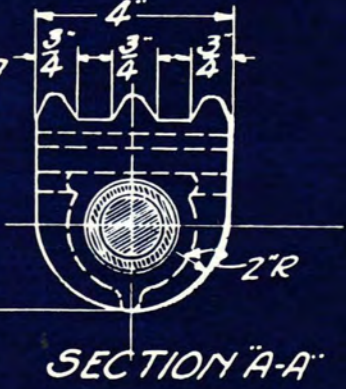
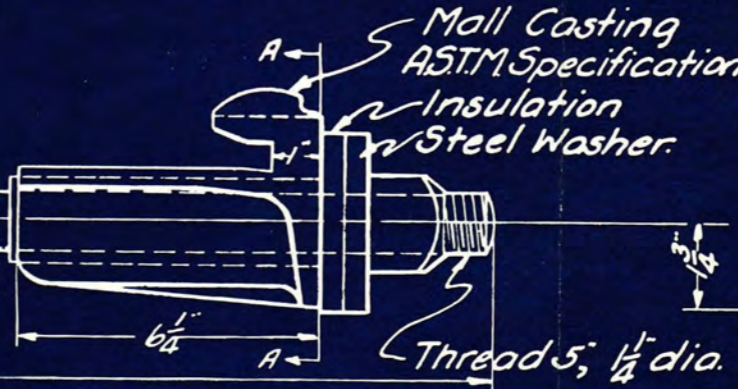
President.



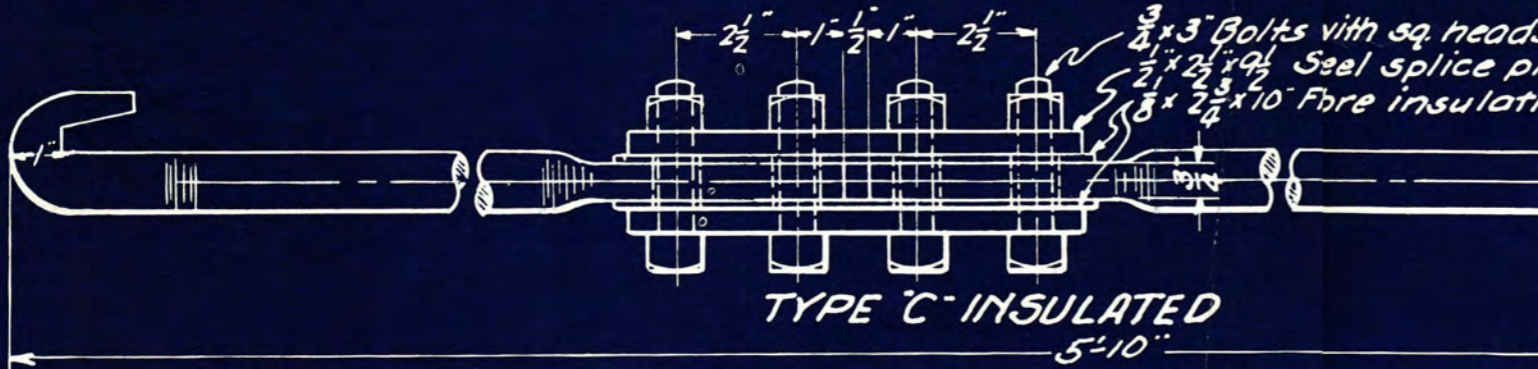
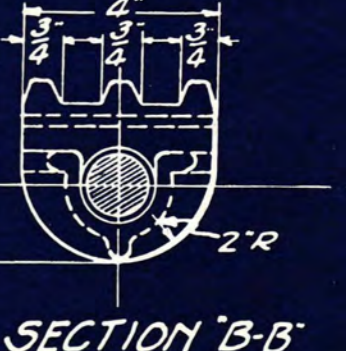
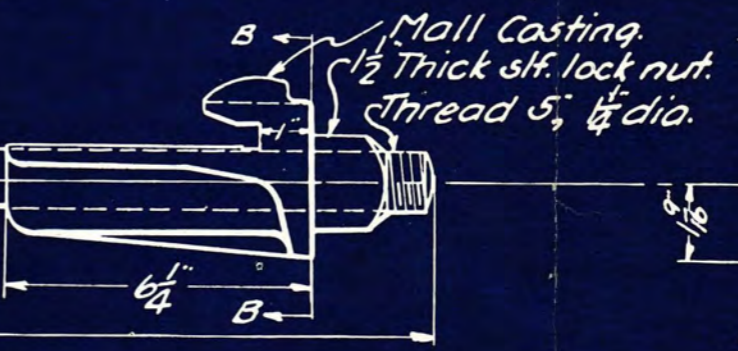
NOTE: Install insulated end of rod on high side of curves for drainage effects.



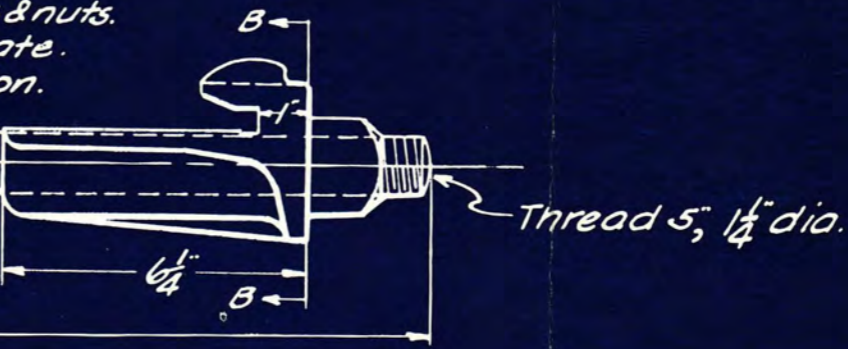
TYPE "A" INSULATED
5'-11"



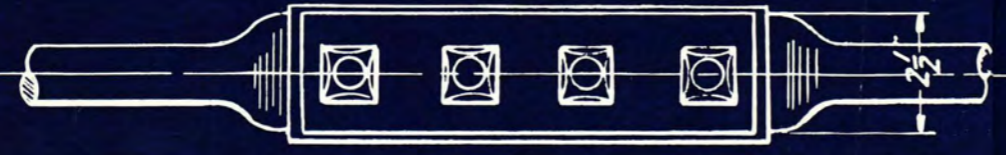
TYPE "A" NON-INSULATED
5'-10"



TYPE "C" INSULATED
5'-10"



FIBRE BUSHING.



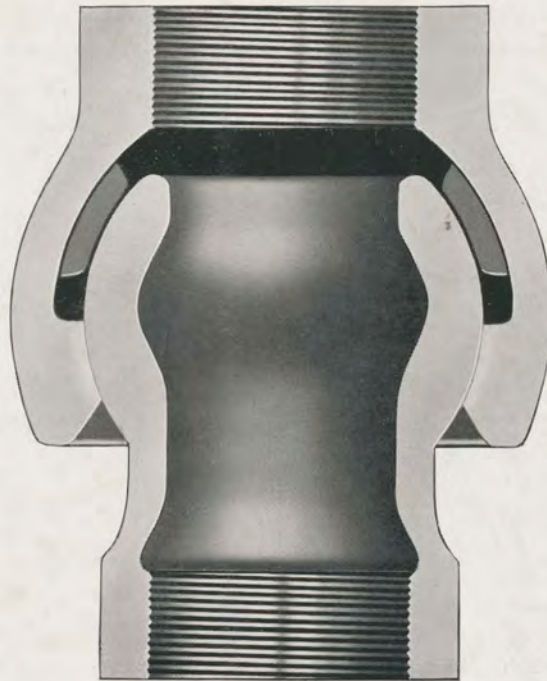
GAUGE RODS.
INSULATED & NON INSULATED
LOUISVILLE FROG, SWITCH & SIGNAL CO.
Louisville Ky. 8/26/30.
Scale 3"-12"
606-2-C

KIEL BALL JOINTS

FOR ROUND HOUSE BLOWER LINES

NO SPRINGS

NO
PACKING



NO
GASKETS

KIEL TWO PIECE JOINTS are built for lasting service. No gaskets to replace. Manufactured by a special formula of metal to obtain maximum hardness and toughness. Ball is cast and turned to a sphere, after which bell is cast around it. This results in a chilled seat that is harder than tool steel. Ball and bell are then ground in the same manner as an automobile valve with the result that a perfectly tight seat is assured. Making for a joint which will be leakproof at all service angles. Needs but two pounds of pressure to seal.

This method of construction permits of a greater degree of radial activity than is possible in other types of joints. Ball has a movement of fifty-two degrees. Work satisfactory under pressure up to two hundred pounds. For higher pressures, can furnish extra heavy joints, at small additional cost.

PEERLESS MANUFACTURING CORPORATION

FORMERLY SUPPLIED BY LOUISVILLE BALL JOINT COMPANY

1400 W. ORMSBY

LOUISVILLE, KY.

BULLETIN No. 24



