MODERN CROSSING PROTECTION BY G-R-S

TYPE XA AND XB SIGNALS

BULLETIN-165 JUNE-1931

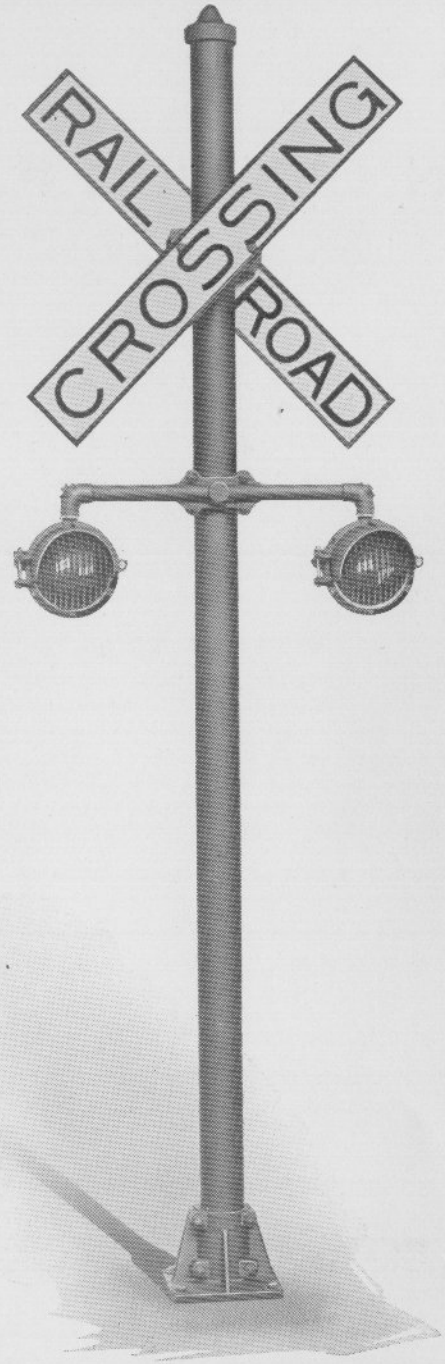

Figure 1. Highway Crossing Signal using either Type XA or Type XB Light-Units without backgrounds.

MODERN CROSSING PROTECTION

By G·R·S

BULLETIN 165

JUNE, 1931

GENERAL RAILWAY SIGNAL COMPANY

ROCHESTER, N. Y.

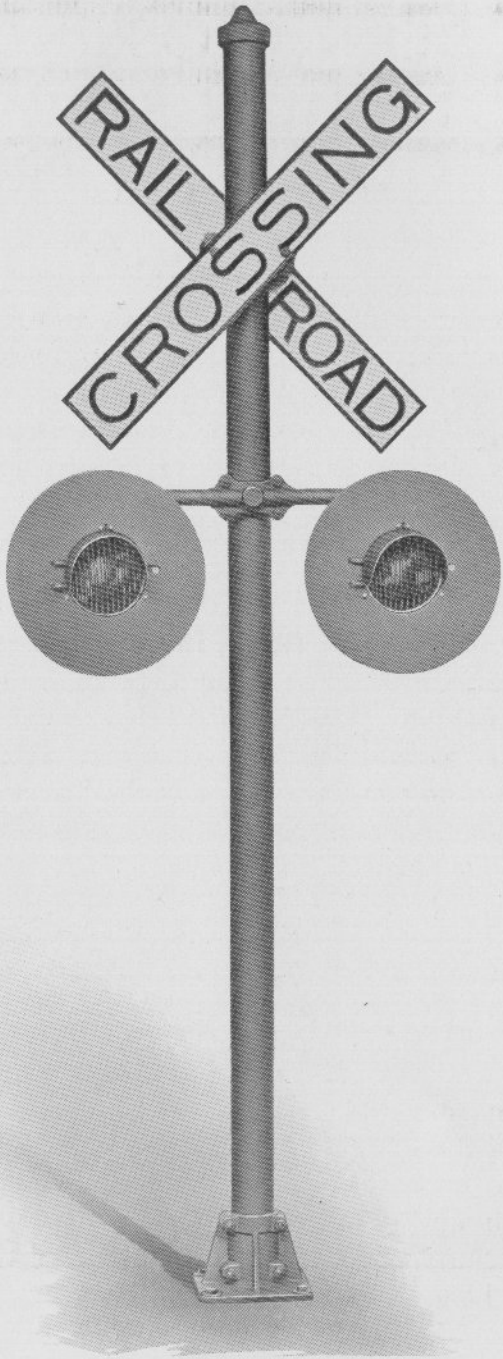

Figure 2. Highway Crossing Signal using either Type XA or Type XB Light-Units with backgrounds.

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MODERN CROSSING PROTECTION BY G·R·S

DURING recent years the improvement of highways has been going on at a prodigious rate, and the number of automobiles, trucks, and busses using these highways has also been increasing rapidly. This state of affairs has increased the demand on railroads for adequate protection of life and property at highway crossings.

Flashing-light Type Signals are more and more becoming the accepted standard as the best method for securing crossing protection twenty-four hours of the day. They give an indication that is distinctive in character from that employed in street traffic signaling. They meet the requirements of Public Service Commissions in most of the States of the United States and have the approval of the Signal Section of the American Railway Association.

G.R.S. Type XA and XB Highway Crossing Signals provide a very effective and dependable means of securing this protection at low cost.

The Type XA Light-Unit is of conventional design and gives an indication from the front of the signal only. This unit is especially suited to furnish protection at single track crossings where there is no possibility of a train on one track obscuring a train approaching the crossing on another track, although it may be used on multitrack crossings.

The Type XB Light-Unit, besides giving an indication from the front, is equipped with a backlight for giving an indication from the rear of the signal or across the tracks. This unit is especially suited to furnish protection at multitrack crossings when the near signal has been passed or the indication obscured and a train on one track obscures a train approaching the crossing on another track, although it may be used on single track crossings.

These units are unusually simple in design and operation. They are compact, light in weight, and easily accessible. Furthermore, they may be installed in a number of different ways to meet the requirements of different locations.

Type XA and XB Signals may be located either at the side or in the center of the highway, depending upon local conditions, standard practice, or individual view-point. When located in the center of the highway, the signal is usually mounted on a substantial concrete base which projects about two feet above the road surface. This base also serves as a buffer for the protection of the signal. Suitable markers are employed in this case to indicate the location of the signal at night. The reflector marker shown in Figure 9 being recommended for this purpose. Figure 10 shows the marker mounting.

Side lights, for observing the operation of the signal from the track, are furnished on both types of units as standard unless otherwise specified, in which case they are blanked out.

Some Signal Engineers and others believe that crossing signals should give indications conforming with street intersection signal indications.

That is, when there is no train approaching the crossing the indication should be green for "Go," and when a train is approaching the crossing the indication should be red for "Stop." For this application, a black background bearing the word "DANGER" is provided for two Type XA Light-Units which are suspended one foot, three inches apart horizontally. The indications given are non-flashing.

TYPE XA LIGHT-UNIT

Construction and Adjustment

THE Type XA Light-Unit consists of a cast case, a cast door with a hood as an integral part, a reflector, a lamp mounting, a colored roundel, and if desired a background. Figure 3 shows a front view of this unit with the door open. It is to be noted that the

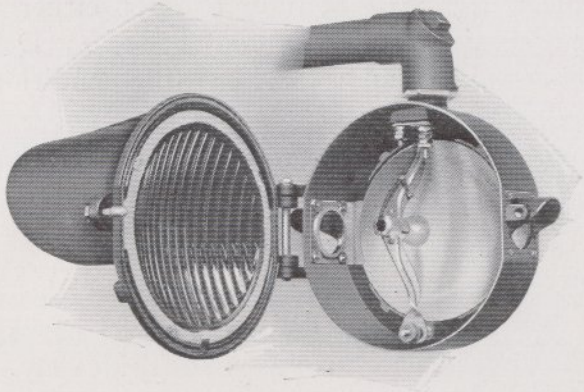


Figure 3. Front view of the Type XA Light-Unit. Door Open.

door opens to the front and gives easy access to all parts of the signal for inspection, cleaning the reflector, renewing the lamp, and tightening terminal nuts.

Mechanical adjustment of the unit in the horizontal and vertical planes, for aligning the beam, is accomplished through movement of the unit in the elbow and movement of the elbow on the cross-arm. Set-screws are provided for securing the unit and elbow in the adjusted position.

TYPE XA OPTICAL SYSTEM

THE optical system of the Type XA Unit, comprising a lamp, reflector, and roundel, is illustrated in Figure 4. The lamp is mounted base forward with the filament located at the focal point of the high grade reflector. This reflector, mounted in the back of the unit, collects the light emitted by the lamp filament and projects the beam of light through either an 8⅜" Red 30° Spredlite Roundel or an 8⅜" Red 45° Deflecting Roundel depending upon local crossing conditions.

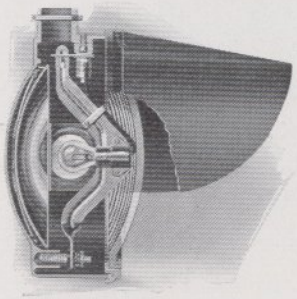


Figure 4. Optical Construction of the Type XA Light-Unit.

The light beam from the 30° Spredlite Roundel has a spread of 15° to each side or a total spread of 30°; while the light beam from the 45° Deflecting Roundel has a spread of 45° to one side only.

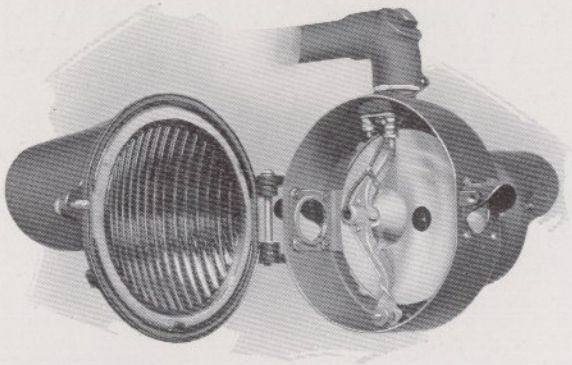


Figure 5. Front view of the Type XB Light-Unit. Door Open.

TYPE XB LIGHT-UNIT
Construction and Adjustment

THE Type XB Light-Unit consists of the same parts as the Type XA Light-Unit with an additional backlight casting, a backlight lens, and a backlight reflector. Figure 5 shows a front view of this unit. As in the Type XA Unit, the door opens to the front for easy access to all parts.

Mechanical adjustment of the main unit, for aligning the light beam, is accomplished in the same manner as in the Type XA Unit. Mechanical adjustment of the backlight is secured by means of a ball and socket joint and four bolts. To align the backlight beam the four nuts on the clamping bolts are loosened, the backlight casting moved about to secure the proper direction of the rear beam, and then clamped securely by tightening the nuts. Figure 6 shows a rear view of this unit and Figure 7 a side view.

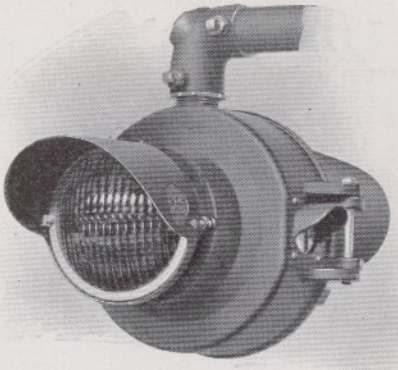


Figure 6. Rear View of the Type XB Light-Unit.

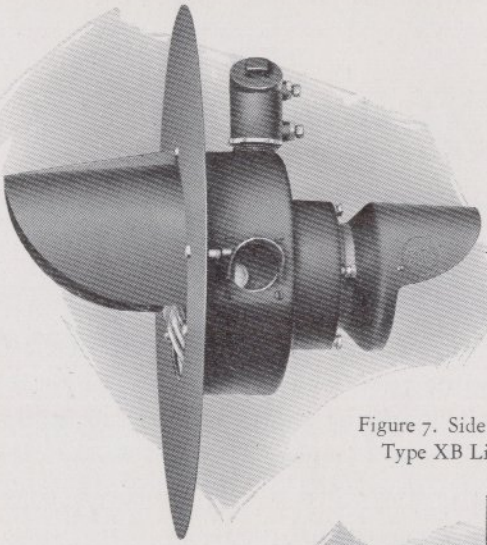


Figure 7. Side View of the Type XB Light-Unit.

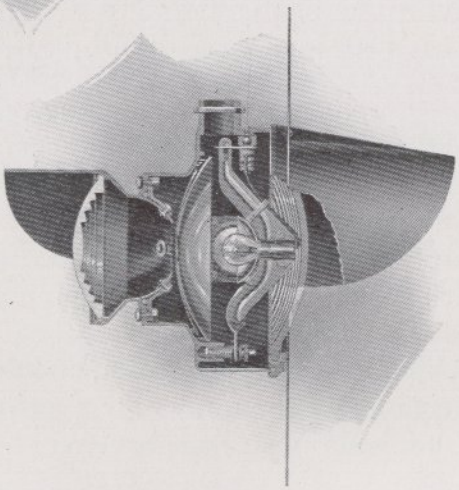


Figure 8. Optical Construction of the Type XB Light-Unit.

TYPE XB OPTICAL SYSTEM

THE optical system of the Type XB Unit, comprising a lamp, two reflectors, a roundel, and a lens, is illustrated in Figure 8. The main beam is produced in the same manner as in the Type XA Unit. The backlight beam is produced by means of a reflector, mounted in front of the lamp, which collects a portion of the light emitted by the filament of the lamp and projects this light through a small hole in the main reflector and thence through either a 5⅜" Red 30° Spredlite Lens or a 5⅜" Red 45° Deflecting Lens. With this construction the backlight reflector acts as a baffle to prevent outside light from passing directly through the signal from front to rear, or vice versa.

Lamps, Lamp Mounting, Adjustment

TYPE XA and XB Signals employ the type S-11 single contact, bayonet base lamp bulb having a single concentrated filament. These lamps are especially made for signal service, and are furnished in ratings suitable for use with either 6, 8, 10, or 12 volt storage batteries.

We recommend that lamps be burned slightly under rated voltage as this increases the life of the lamp and ordinarily produces a light beam of ample intensity for a good signal indication. All lamps furnished are stamped with the voltage and wattage at which the average life is 1000 hours.

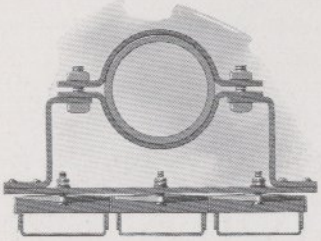


Figure 9. Reflector Marker.

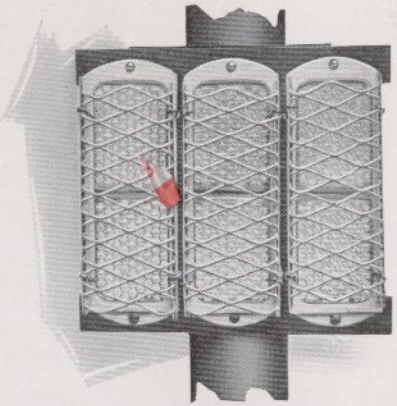


Figure 10. Reflector Marker Mounting.

The lamp socket is supported on a bracket and so arranged that the lamp may be moved vertically, horizontally, and longitudinally in order to place the filament exactly at the focal point of the main reflector.

All light-units are focused properly at the factory, and this adjustment should not be changed in the field unless found absolutely necessary.

REFLECTOR MARKER

THIS unit provides an effective marker for signals located in the center of the highway. No lamp is required since light from the headlights of an approaching automobile is reflected back to the driver so that the entire area of the unit appears as if filled with light. Each marker consists of one, two, or three reflectors, as specified, with the necessary brackets for mounting to the post just above the base. Each reflector is an independent unit, approximately 4″ x 11″ in size, consisting of a thick moulded glass, its support, and a

protecting mesh guard. The glass is especially moulded to present a reflecting surface which is effective even when the marker is approached from a considerable angle. Reflectors are furnished clear, yellow, or red as desired. Figures 9 and 10 show this marker and its mounting.

REFLECTOR BUTTON SIGNS

FOR certain locations Reflector Button Signs are especially desirable. One sign bears the warning "Stop on Red Signal" and the other states the number of tracks. The letters or numbers are formed in outline by reflector buttons inserted in metal plates. These signs are illustrated in the Catalog Section, Plate H 2911, Figures E and G.

ILLUMINATED STOP SIGN

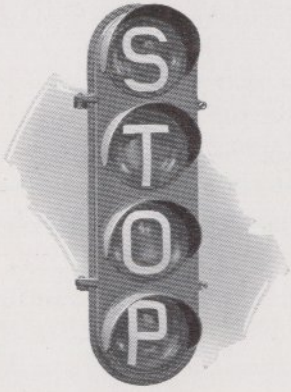


Figure 11. Illuminated Stop Signal.

AN illuminated Stop Sign, Figure 11, is also available in which the letters "S" "T" "O" "P" are illuminated from within when the crossing signal is flashing. This sign is mounted on the pole below the cross-arm.

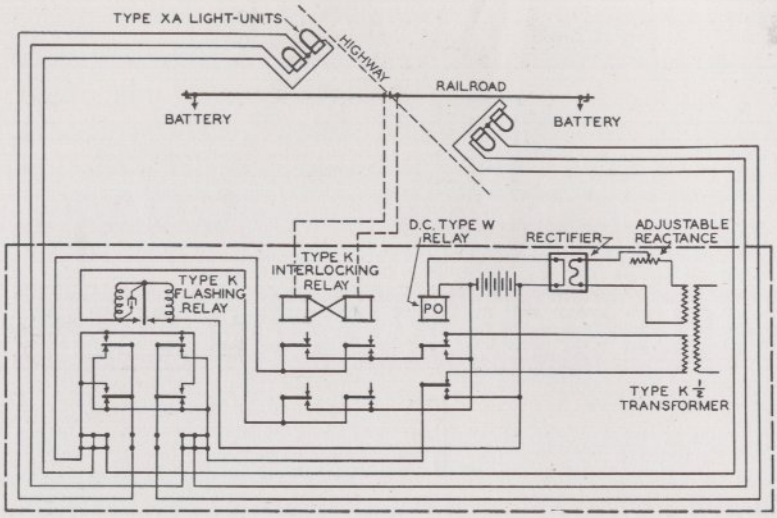


Figure 12. Typical Circuit for the control of Flashing-light Highway Crossing Signals where alternating current is available; with a D.C. power-off relay incorporated therein.

CIRCUITS

TYPICAL circuits for the control of flashing-light highway crossing signals on single and double track crossings are shown in Figures 12, 13, and 14. Each piece of apparatus used in the circuits is described in the following pages.

Where alternating current is available, a very economical and dependable control is obtainable by the use of the circuit shown in Figure 12. A storage battery on trickle charge supplies energy for the flashing relay, while the lamps are normally fed energy from the A.C. supply and upon failure of this supply are fed energy from the battery, the change-over being accomplished by means of a D.C. Type W Relay connected in series with the battery charging

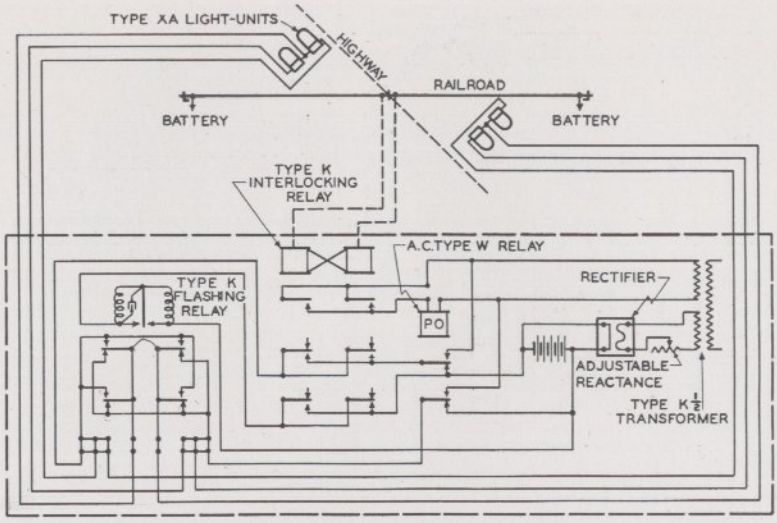


Figure 13. Typical Circuit for the control of Flashing-light Highway Crossing Signals where alternating current is available; with an A.C. power-off relay incorporated therein.

circuit. Type XA Light-Units are shown in this circuit, although Type XB Light-Units may be used instead.

Figure 13 shows another circuit for use where alternating current is available. A storage battery, trickle charged by means of a metallic-disc rectifier, is used to furnish direct-current energy for operating the flashing relay and, in case of an A.C. power failure, direct-current energy for lighting the signal lamps.

A unique feature of this circuit is that a normally de-energized A.C. Type W Relay is the power-off relay, which is approach controlled by the interlocking relay. This arrangement is of advantage in that energy is only consumed by the power-off relay upon the approach of a train, the relay is not maintained in an energized position over any considerable period of time, and its contacts are kept clean by intermittent operation. Type XA Light-Units are shown in this

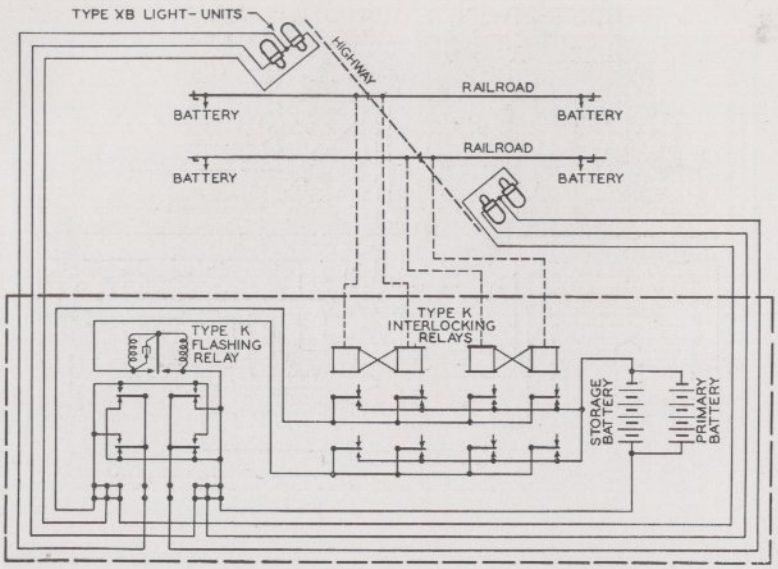


Figure 14. Typical Circuit for the control of Flashing-light Highway Crossing Signals where alternating current is not available.

circuit, although Type XB Light-Units may be used instead.

Where alternating current is not available, the circuit shown in Figure 14 is recommended. Energy is supplied the flashing relay and lamps by a storage battery which is trickle-charged by a primary battery. This circuit shows the crossing protected for both normal and reverse direction running. Type XB Light-Units are shown in this circuit, although Type XA Light-Units may be used instead.

The relay housings shown on Plate E 0933 make very neat and satisfactory housings for the control apparatus. If it is desired to bring wires from a pole line into the top of the 4 inch post supporting the signal, the post should be ordered the proper length equipped with cap, Figure 1, shown on Plate H 2911. Where the signals are located in the center of the high-

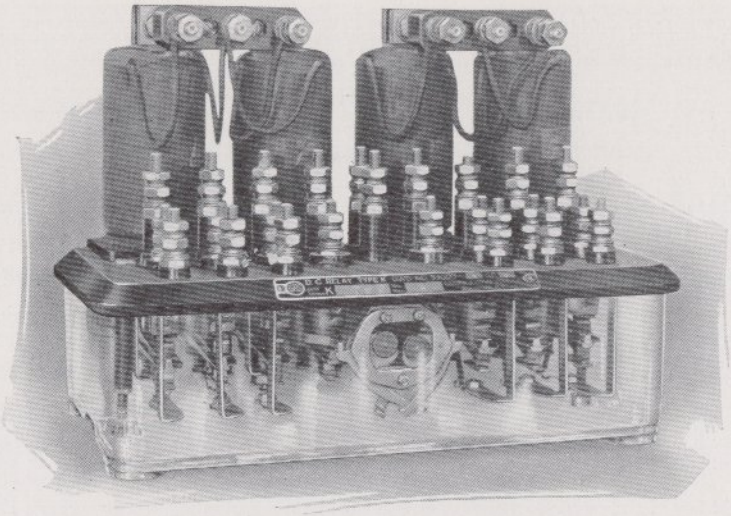


Figure 15. Type K Interlocking Relay.

way, it is usually more desirable to separate the relay case from the signal. See Plate E 0933 for relay cases. Specify the cover plate when desired for the above application.

TYPE K INTERLOCKING RELAY

THE G.R.S. Type K Interlocking Relay, Figure 15, is designed for the control of highway crossing signals where it is desired to furnish protection on both-direction running. It consists of two standard Type K, size four, neutral relays mounted on a common base with a simple, dependable, and safe interlocking mechanism between the two armatures.

The operation of a standard interlocking relay is as follows:—

1st—Normally the coils of both relays are energized and all front contacts are closed.

2nd—The dropping of either relay armature will close its back contacts and place the interlocking parts in position to prevent the back contacts of the other relay from closing when its armature drops.

3rd—With energy restored to the coils of the first relay, its front contacts close and the back contacts open while the armature of the second relay remains locked in its midposition, i.e., with both front and back contacts open.

4th—When energy is restored to the second relay with the first relay energized, the interlocking mechanism is restored to normal and is in position for operation from either relay as before.

The Type K Interlocking Relay has a contact capacity of four dependent front and back contacts on each side. Front contacts, or back contacts, closed with the armature in the locked position may be furnished if desired for special applications.

All contacts are universal.

Special locking combinations can be furnished as required.

STANDARD RESISTANCES IN OHMS

2	16	136	250	450	1000
4	50	150	300	500	2000
11	100	200	400	670	

Simply order Type K Interlocking Relay, specifying the resistance of the relay, and how the contacts are to be locked.

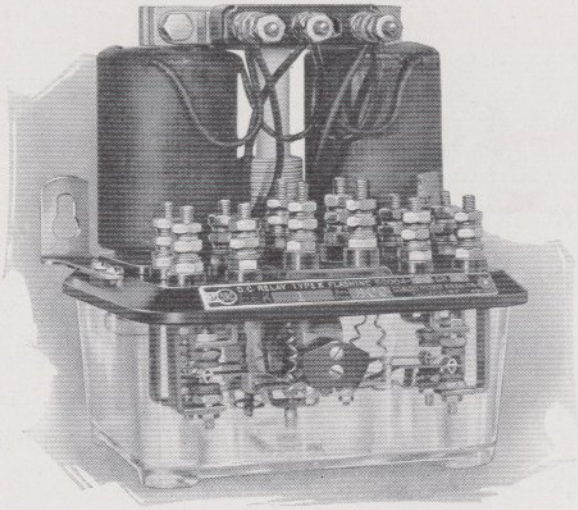


Figure 16. Type K Flashing Relay.

TYPE K FLASHING RELAY

THE G.R.S. Type K Flashing Relay, Figure 16, is a relay for the operation of flashing-light highway crossing signals. It is a compact, neat, and efficient relay that is no larger than the Type K, size four, neutral relay. Four front and back dependent contacts furnish sufficient contact capacity to control and regulate individually 8 lamps of 4 flashing-light crossing signals. With this relay, uniform flashing is not affected by variations in terminal voltage. Due to the construction of this relay all back contacts are made when the coils are deenergized. This feature has been used in the circuits of Figures 12, 13, and 14 to assure a light on each side of the railroad being lighted at full brilliancy continuously in case the relay should fail to operate.

A condenser is provided which eliminates radio interference.

All contacts are universal.

STANDARD RESISTANCES ARE AS FOLLOWS:—

6 volt service	300 ohms per side
8 volt service	600 ohms per side
10 or 12 volt service	800 ohms per side

Simply order Type K Flashing Relay, specifying voltage of battery.

D. C. TYPE W RELAY

THE D.C. Type W Relay as used in series with the battery charging circuit, Figure 12, for cutting the reserve battery on to the lamps when the normal A.C. supply fails is shown in Figure 17. This method of application provides for quiet operation.

This relay is provided with an adjustable air-gap which should be adjusted in the field so that the relay pick-up current is as close as possible to the normal battery-charging rate. When this condition is fulfilled and the circuit of Figure 12 is used, a transfer of energy to the lamps is affected at a much higher percentage of normal A.C. line voltage than when an A.C. power-off relay is used for this purpose.

Simply order D.C. Type W Relay, specifying max. and min. charging current for battery.

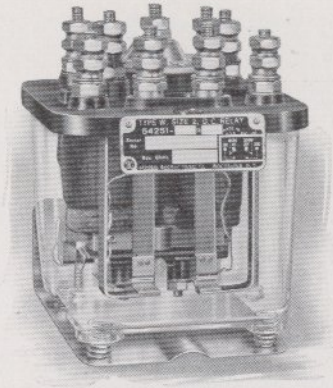


Figure 17. D.C. Type W Relay.

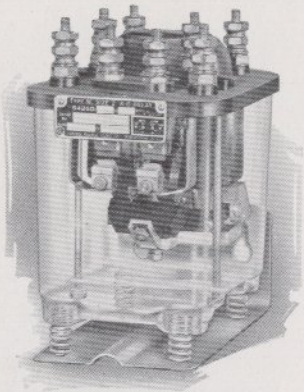


Figure 18. A.C. Type W Relay.

A. C. TYPE W RELAY

THE A.C. Type W Relay as used in a circuit, Figure 13, for selecting the source of energy supply to the lamps is shown in Figure 18.

This is an improved small relay designed to overcome the difficulties experienced with previous relays of this type. It is quiet in operation. It has a wide trunion structure. It has a heavy armature structure, which gives adequate back contact pressure and assures proper release.

It is recommended that the circuit of Figure 13 be used in the application of this relay.

Simply order A.C. Type W Relay, specifying frequency and voltage.

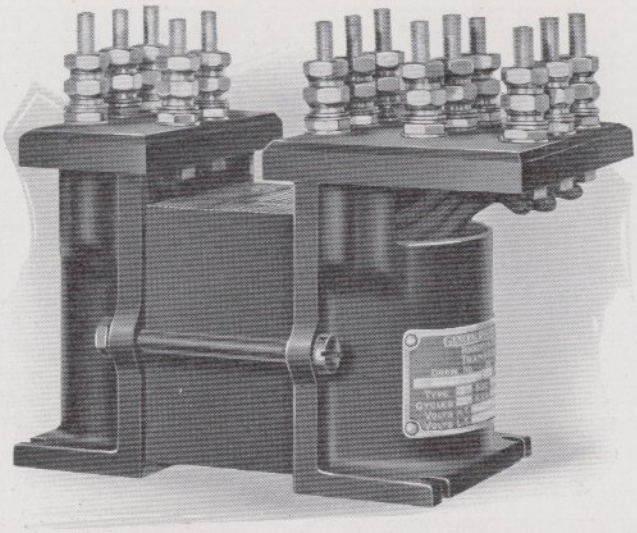


Figure 19. Type K ½ Transformer.

TYPE K ½ TRANSFORMER, RECTIFIER, STORAGE BATTERY

THE Type K ½ Transformer, Figure 19, is employed for supplying energy to the lamps of highway crossing signals and low voltage energy to the rectifier. It is a small air-cooled transformer 4½" wide by 5⅜" long, having a 110 volt primary and one or two secondary windings with taps for different voltages.

The G.R.S. Type BX, Size 1, Metallic Disc Rectifier, Figure 20, is recommended for charging the storage battery as shown in the circuits of Figures 12 and 13.

In using the D.C. Type W Relay in series with the battery charging circuit for power-off protection when the charging rate is over 300 mils, one coil of the relay must be shunted out to secure proper

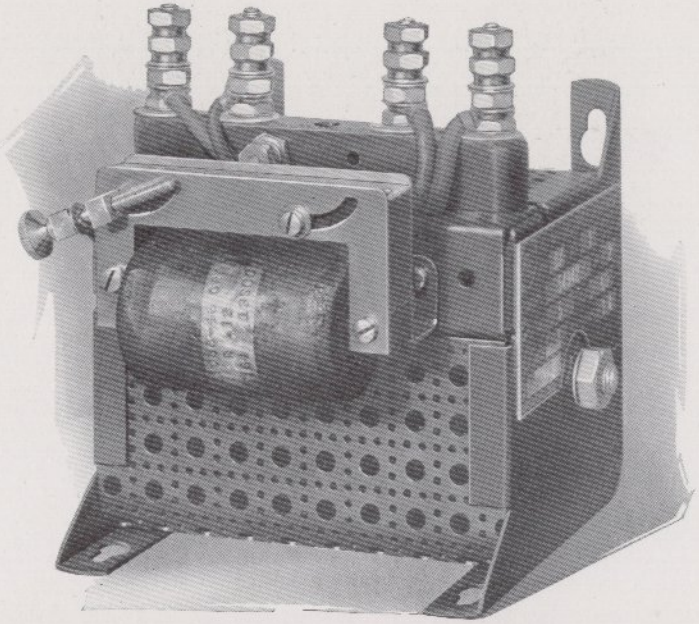


Figure 20. Type BX Metallic-disc Rectifier.

operation of the relay. For this case a Type BX, Size 1, 600 mil rating unit should be used. When the two relay coils are connected in series, the Type BX, Size 1, 350 mil rating unit should be used.

Both of the above units require a transformer for securing the proper voltage input, and both are equipped with a variable air gap reactor for adjusting the charging rate.

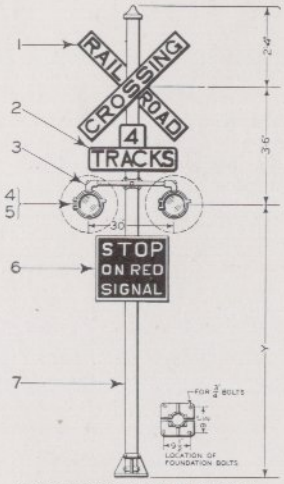
The Type K ½ Transformer, Rectifier, and Storage Battery may be ordered as a group. In this case the following information should be supplied:—

(a) Voltage and frequency of the alternating current supply.

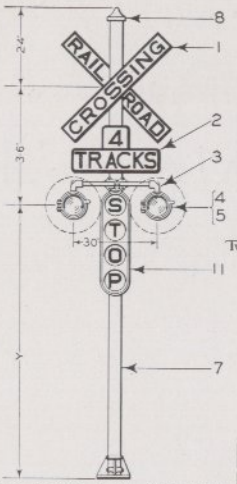
(b) Rating and number of lamps to be used in the installation.

(c) Ampere-hour capacity of the Storage Battery.

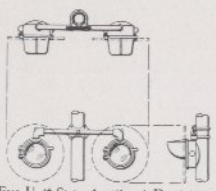
CATALOG SECTION



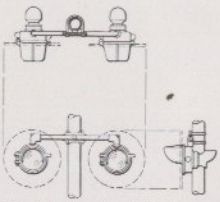
A-Two Unit Signal without Backlights
B-Two Unit Signal with Backlights
C-Four Unit Signal



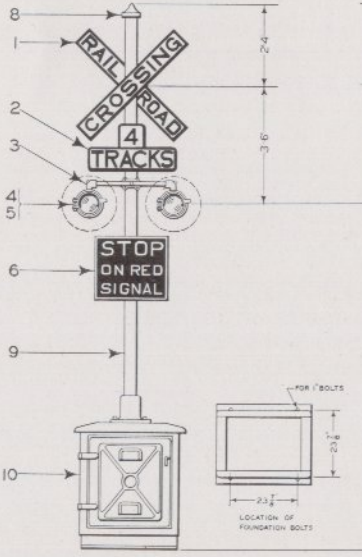
D-Two Unit Signal without Backlights
E-Two Unit Signal with Backlights
F-Four Unit Signal



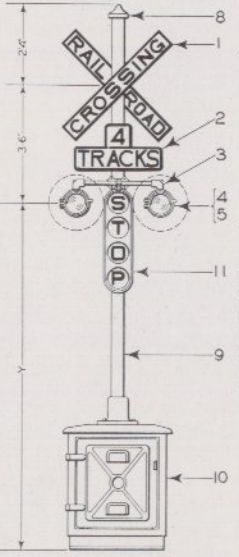
Two Unit Signal without Backlights
A-D-G-K



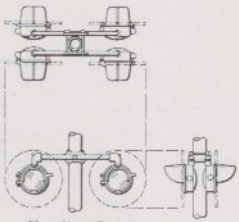
Two Unit Signal with Backlights
B-E-H-L



G-Two Unit Signal without Backlights
H-Two Unit Signal with Backlights
J-Four Unit Signal



K-Two Unit Signal without Backlights
L-Two Unit Signal with Backlights
M-Four Unit Signal



Four Unit Signal mounted
in pairs back to back
C-F-J-M

USUAL HEIGHTS		
DIMV	7'-6"	8'-0"
	8'-6"	9'-0"

TYPES XA AND XB HIGHWAY CROSSING SIGNALS

TYPES XA AND XB HIGHWAY CROSSING SIGNALS

NOTE: Signals listed below are equipped with sidelights unless otherwise specified. If combinations of equipment are to be mounted on signals other than those illustrated herein, same will be furnished when specified.

All signs of the non-reflecting type are furnished with black letters and border on white background as standard, and all signs equipped with reflector buttons are furnished with white letters and border on black background as standard. Other combinations of colors can be supplied when specified.

See Plate H 2911 for details of caps, pinnacles, reflectors, signs, cross-bucks, ladders and bases.

See Plate H 2913 for signal units. Backgrounds will be furnished only when specified.

Drawing references are shown for convenience in checking shipping lists and invoices.

FIG. NO.	NAME	DRAWING REFERENCE
	Order by plate, figure number and name	
A	Type XA Flashing-light Highway Crossing Signal Complete, as shown, equipped with two signal units without backlights for signal indication in one direction only. Signal units are equipped with 8⅜" dia., red, 30 degree spredlite roundels. Specify dimension Y. Lamps for signal units must be specified separately giving voltage of storage battery to be used with signal.....	45906-130
A1	as above, except has signal units equipped with 8⅜" dia., red, 45 degree deflecting roundels....	45906-130
B	Type XB Flashing-light Highway Crossing Signal Complete, as shown, equipped with two signal units having backlights, for front and back signal indications. Signal units are equipped with 8⅜" dia., red, front 30 degree spredlight roundels and 5⅜" dia., red, back 30 degree spredlite lenses. Specify dimension Y. Lamps for signal units must be specified separately giving voltage of storage battery to be used with signal.....	45906-130
B1	as above, except has signal units equipped with 8⅜" dia., red, front 30 degree spredlite roundels and 5⅜" dia., red, back 45 degree deflecting lenses.....	45906-130
B2	same as Fig. B, except has signal units equipped with 8⅜" dia., red, front 45 degree deflecting roundels and 5⅜" dia., red, back 45 degree deflecting lenses.....	45906-130

TYPES XA AND XB HIGHWAY CROSSING SIGNALS

Drawing references are shown for convenience in checking shipping lists and invoices.

FIG. NO.	NAME	DRAWING REFERENCE
	Order by plate, figure number and name	
C	Type XA Flashing-light Highway Crossing Signal Complete, as shown, equipped with four units mounted in pairs back to back, for front and back signal indications. All four units equipped with 8⅜" dia., red, 30 degree spredlite roundels. Specify dimension Y. Lamps for signal units must be specified separately giving voltage of storage battery to be used with signal	45906-130
C1	as above, except has front units equipped with 8⅜" dia., red, 30 degree spredlite roundels and back units equipped with 8⅜" dia., red, 45 degree deflecting roundels	45906-130
C2	same as Fig. C, except has all four units equipped with 45 degree deflecting roundels	45906-130
D	Type XA Flashing-light Highway Crossing Signal Complete, as shown, equipped with two signal units without backlights for signal indication in one direction only. Signal units are equipped with 8⅜" dia., red, 30 degree spredlite roundels. Specify dimension Y. Lamps for signal units must be specified separately, giving voltage of storage battery to be used with signal	45906-128
D1	as above, except has signal units equipped with 8⅜" dia., red, 45 degree deflecting roundels	45906-128
E	Type XB Flashing-light Highway Crossing Signal Complete, as shown, equipped with two signal units having backlights, for front and back signal indications. Signal units are equipped with 8⅜" dia., red, front 30 degree spredlite roundels and 5⅜" dia., red, back 30 degree spredlite lenses. Specify dimension Y. Lamps for signal units must be specified separately giving voltage of storage battery to be used with signal	45906-128

TYPES XA AND XB HIGHWAY CROSSING SIGNALS

Drawing references are shown for convenience in checking shipping lists and invoices.

FIG. NO.	NAME	DRAWING REFERENCE
	Order by plate, figure number and name	
E1	as above, except has signal units equipped with 8⅜″ dia., red, front 30 degree spredlite roundels and 5⅜″ dia., red, back 45 degree deflecting lenses	45906-128
E2	same as Fig. E, except has signal units equipped with 8⅜″ dia., red, front 45 degree deflecting roundels and 5⅜″ dia., red, back 45 degree deflecting lenses	45906-128
F	Type XA Flashing-light Highway Crossing Signal Complete, as shown, equipped with four units mounted in pairs back to back, for front and back signal indications. All four units equipped with 8⅜″ dia., red, 30 degree spredlite roundels. Specify dimension Y. Lamps for signal units must be specified separately giving voltage of storage battery to be used with signal	45906-128
F1	as above, except has front units equipped with 8⅜″ dia., red, 30 degree spredlite roundels and back units equipped with 8⅜″ dia., red, 45 degree deflecting roundels	45906-128
F2	same as Fig. F, except has all four units equipped with 45 degree deflecting roundels	45906-128
G	Type XA Flashing-light Highway Crossing Signal Complete, as shown, mounted on relay case, equipped with two signal units without backlights, for signal indication in one direction only. Signal units are equipped with 8⅜″ dia., red, 30 degree spredlite roundels. Specify dimension Y. Lamps for signal units must be specified separately giving voltage of storage battery to be used with signal. Unless otherwise specified relay case as shown on Plate E 0933, Fig. A, will be furnished	45906-130
G1	as above, except has signal units equipped with 8⅜″ dia., red, 45 degree deflecting roundels	45906-130

TYPES XA AND XB HIGHWAY CROSSING SIGNALS

Drawing references are shown for convenience in checking shipping lists and invoices.

FIG. NO.	NAME	DRAWING REFERENCE
	Order by plate, figure number and name	
H	Type XB Flashing-light Highway Crossing Signal Complete, as shown, mounted on relay case, equipped with two signal units having backlights, for front and back signal indications. Signal units are equipped with 8⅜" dia., red, front 30 degree spredlite roundels and 5⅜" dia., red, back 30 degree spredlite lenses. Specify dimension Y. Lamps for signal units must be specified separately giving voltage of storage battery to be used with signal. Unless otherwise specified relay case as shown on Plate E 0933, Fig. A, will be furnished.....	45906-130
H1	as above, except has signal units equipped with 8⅜" dia., red, front 30 degree spredlite roundels and 5⅜" dia., red, back 45 degree deflecting lenses.....	45906-130
H2	same as Fig. H, except has signal units equipped with 8⅜" dia., red, front 45 degree deflecting roundels and 5⅜" dia., red, back 45 degree deflecting lenses.....	45906-130
J	Type XA Flashing-light Highway Crossing Signal Complete, as shown, mounted on relay case, equipped with four units mounted in pairs back to back, for front and back signal indications. All four units equipped with 8⅜" dia., red, 30 degree spredlite roundels. Specify dimension Y. Lamps for signal units must be specified separately giving voltage of storage battery to be used with signal. Unless otherwise specified relay case as shown on Plate E 0933 Fig. A, will be furnished.....	45906-130
J1	as above, except has front units equipped with 8⅜" dia., red, 30 degree spredlite roundels and back units equipped with 8⅜" dia., red, 45 degree deflecting roundels.....	45906-130
J2	same as Fig. J, except has all four units equipped with 45 degree deflecting roundels.....	45906-130

TYPES XA AND XB HIGHWAY CROSSING SIGNALS

Drawing references are shown for convenience in checking shipping lists and invoices.

FIG. NO.	NAME	DRAWING REFERENCE
	Order by plate, figure number and name	
K	Type XA Flashing-light Highway Crossing Signal Complete, as shown, mounted on relay case, equipped with two signal units without backlights, for signal indication in one direction only. Signal units are equipped with 8⅜" dia., red, 30 degree spredlite roundels. Specify dimension Y. Lamps for signal units must be specified separately giving voltage of storage battery to be used with signal. Unless otherwise specified relay case as shown on Plate E 0933, Fig. A, will be furnished.....	45906-128
K1	as above, except has signal units equipped with 8⅜" dia., red, 45 degree deflecting roundels....	45906-128
L	Type XB Flashing-light Highway Crossing Signal Complete, as shown, mounted on relay case, equipped with two signal units having backlights, for front and back signal indications. Signal units are equipped with 8⅜" dia., red, front 30 degree spredlite roundels and 5⅜" dia., red, back 30 degree spredlite lenses. Specify dimension Y. Lamps for signal units must be specified separately giving voltage of storage battery to be used with signal. Unless otherwise specified relay case as shown on Plate E 0933, Fig. A, will be furnished.....	45906-128
L1	as above, except has signal units equipped with 8⅜" dia., red, front 30 degree spredlite roundels and 5⅜" dia., red, back 45 degree deflecting lenses.....	45906-128
L2	same as Fig. L, except has signal units equipped with 8⅜" dia., red, front 45 degree deflecting roundels and 5⅜" dia., red, back 45 degree deflecting lenses.....	45906-128

TYPES XA AND XB HIGHWAY CROSSING SIGNALS

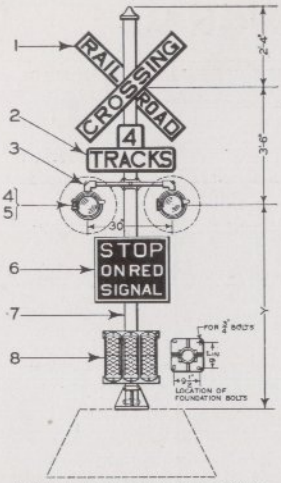
Drawing references are shown for convenience in checking shipping lists and invoices.

FIG. NO.	NAME	DRAWING REFERENCE
	Order by plate, figure number and name	
M	Type XA Flashing-light Highway Crossing Signal Complete, as shown, mounted on relay case, equipped with four units mounted in pairs back to back, for front and back signal indications. All four units equipped with 8⅜" dia., red, 30 degree spredlite roundels. Specify dimension Y. Lamps for signal units must be specified separately giving voltage of storage battery to be used with signal. Unless otherwise specified, relay case as shown on Plate E 0933, Fig. A, will be furnished.....	45906-128
M1	as above, except has front units equipped with 8⅜" dia., red, 30 degree spredlite roundels and back units equipped with 8⅜" dia., red, 45 degree deflecting roundels.....	45906-128
M2	same as Fig. M, except has all four units equipped with 45 degree deflecting roundels.	
1	Railroad Crossing Sign. For details and order references see Plate H 2911, Figs. H, J and K.	
2	"Tracks" Sign Complete. For details and order references see Plate H 2911, Figs. F and G.	
3	Arm Complete for mounting signal units to pole. For details and order references see Plate H 2911, Fig. B. Includes two U bolts for attaching to 4" pipe.....	48870-9 Gr.1 5183 Gr. 2 091
4	Type XA Color-light Signal Unit Complete. For details and order references see Plate H 2913	55050-1
5	Type XB Color-light Signal Unit Complete. For details and order references see Plate H 2913	55050
6	"Stop on Red Signal" Sign Complete, as shown. For details and order references see Plate H 2911, Fig. E.	
7	Mast Complete, of 4" pipe, with base, as shown, for mounting on concrete foundation. Specify length.	

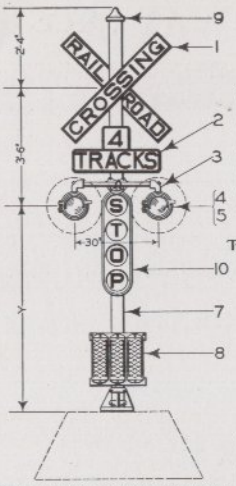
TYPES XA AND XB
HIGHWAY CROSSING SIGNALS

Drawing references are shown for convenience in checking shipping lists and invoices.

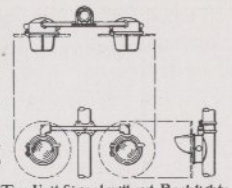
FIG. NO.	NAME	DRAWING REFERENCE
	Order by plate, figure number and name	
8	Pinnacle, for top of pole. For details and order references see Plate H 2911, Figs. 1, 2 and 3.	
9	Mast Complete, of 4″ pipe, with base as shown. For mounting on top of relay case. Specify length.	
10	Relay Case Complete. For details and order references see Plate E 0933.	
11	Illuminated Stop Sign Complete. For details and order references see Plate H 2911, Fig. A...	55200



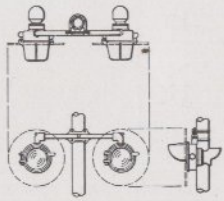
A-Two Unit Signal without Backlights
B-Two Unit Signal with Backlights
C-Four Unit Signal



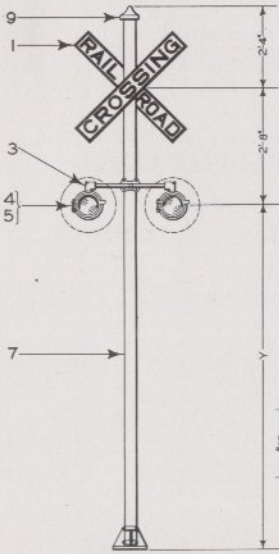
D-Two Unit Signal without Backlights
E-Two Unit Signal with Backlights
F-Four Unit Signal



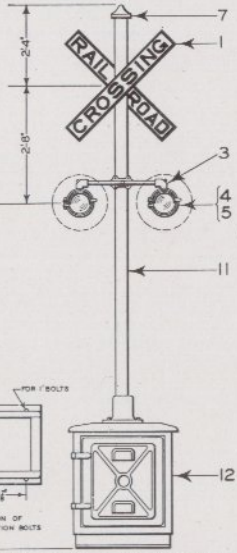
Two Unit Signal without Backlights
A-D-G-K



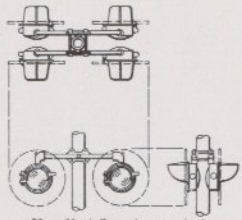
Two Unit Signal with Backlights
B-E-H-L



G-Two Unit Signal without Backlights
H-Two Unit Signal with Backlights
J-Four Unit Signal



K-Two Unit Signal without Backlights
L-Two Unit Signal with Backlights
M-Four Unit Signal



Four Unit Signal mounted
in pairs back to back
C-F-J-M

USUAL HEIGHTS		
DAY	7'-6"	8'-0"
	8'-6"	9'-0"

TYPES XA AND XB HIGHWAY CROSSING SIGNALS

TYPES XA AND XB HIGHWAY CROSSING SIGNALS

NOTE: Signals listed below are equipped with sidelights unless otherwise specified. If combinations of equipment are to be mounted on signals other than those illustrated herein, same will be furnished when specified.

All signs of the non-reflecting type are furnished with black letters and border on white background as standard, and all signs equipped with reflector buttons are furnished with white letters and border on black background as standard. Other combinations of colors can be supplied when specified.

See Plate H 2911 for details of caps, pinnacles, reflectors, signs, cross-bucks, ladders and bases.

See Plate H 2913 for signal units. Backgrounds will be furnished only when specified.

Drawing references are shown for convenience in checking shipping lists and invoices.

FIG. NO.	NAME	DRAWING REFERENCE
	Order by plate, figure number and name	
A	Type XA Flashing-light Highway Crossing Signal Complete, as shown, equipped with two signal units without backlights for signal indication in one direction only. For center of road installations. Signal units are equipped with 8⅜" dia., red, 30 degree spredlite roundels. Specify dimension Y. Lamps for signal units must be specified separately giving voltage of storage battery to be used with signal.....	45906-130
A1	as above, except has signal units equipped with 8⅜" dia., red, 45 degree deflecting roundels....	45906-130
B	Type XB Flashing-light Highway Crossing Signal Complete, as shown, equipped with two signal units having backlights, for front and back signal indications. For center of road installations. Signal units are equipped with 8⅜" dia., red, front 30 degree spredlite roundels and 5⅜" dia., red, back 30 degree spredlite lenses. Specify dimension Y. Lamps for signal units must be specified separately giving voltage of storage battery to be used with signal.....	45906-130
B1	as above, except has signal units equipped with 8⅜" dia., red, front 30 degree spredlite roundels and 5⅜" dia., red, back 45 degree deflecting lenses.....	45906-130
B2	same as Fig. B, except has signal units equipped with 8⅜" dia., red, front 45 degree deflecting roundels and 5⅜" dia., red, back 45 degree deflecting lenses.....	45906-130

TYPES XA AND XB HIGHWAY CROSSING SIGNALS

Drawing references are shown for convenience in checking shipping lists and invoices.

FIG. NO.	NAME	DRAWING REFERENCE
	Order by plate, figure number and name	
C	Type XA Flashing-light Highway Crossing Signal Complete, as shown, equipped with four units mounted in pairs back to back, for front and back signal indications. For center of road installations. All four units equipped with 8⅜" dia., red, 30 degree spredlite roundels. Specify dimension Y. Lamps for signal units must be specified separately giving voltage of storage battery to be used with signal	45906-130
C1	as above, except has front units, equipped with 8⅜" dia., red, 30 degree spredlite roundels and back units equipped with 8⅜" dia., red, 45 degree deflecting roundels	45906-130
C2	same as Fig. C, except has all four units equipped with 45 degree deflecting roundels	45906-130
D	Type XA Flashing-light Highway Crossing Signal Complete, as shown, equipped with two signal units without backlights for signal indication in one direction only. For center of road installations. Signal units are equipped with 8⅜" dia., red, 30 degree spredlite roundels. Specify dimension Y. Lamps for signal units must be specified separately giving voltage of storage battery to be used with signal	45906-128
D1	as above, except has signal units equipped with 8⅜" dia., red, 45 degree deflecting roundels	45906-128
E	Type XB Flashing-light Highway Crossing Signal Complete, as shown, equipped with two signal units having backlights, for front and back signal indications. For center of road installations. Signal units are equipped with 8⅜" dia., red, front 30 degree spredlite roundels and 5⅜" dia., red, back 30 degree spredlite lenses. Specify dimension Y. Lamps for signal units must be specified separately giving voltage of storage battery to be used with signal	45906-128

TYPES XA AND XB HIGHWAY CROSSING SIGNALS

Drawing references are shown for convenience in checking shipping lists and invoices.

FIG. NO.	NAME	DRAWING REFERENCE
	Order by plate, figure number and name	
E1	as above, except has signal units equipped with 8⅜" dia., red, front 30 degree spredlite roundels and 5⅜" dia., red, back 45 degree deflecting lenses	45906-128
E2	same as Fig. E, except has signal units equipped with 8⅜" dia., red, front 45 degree deflecting roundels and 5⅜" dia., red, back 45 degree deflecting lenses	45906-128
F	Type XA Flashing-light Highway Crossing Signal Complete, as shown, equipped with four units mounted in pairs back to back, for front and back signal indications. For center of road installations. All four units equipped with 8⅜" dia., red, 30 degree spredlite roundels. Specify dimension Y. Lamps for signal units must be specified separately giving voltage of storage battery to be used with signal	45906-128
F1	as above, except has front units equipped with 8⅜" dia., red, 30 degree spredlite roundels and back units equipped with 8⅜" dia., red, 45 degree deflecting roundels	45906-128
F2	same as Fig. F, except has all four units equipped with 45 degree deflecting roundels	45906-128
G	Type XA Flashing-light Highway Crossing Signal Complete, as shown, equipped with two signal units without backlights, for signal indication in one direction only. Signal units are equipped with 8⅜" dia., red, 30 degree spredlite roundels. Specify dimension Y. Lamps for signal units must be specified separately giving voltage of storage battery to be used with signal	45906-129
G1	as above, except has signal units equipped with 8⅜" dia., red, 45 degree deflecting roundels	45906-129

TYPES XA AND XB HIGHWAY CROSSING SIGNALS

Drawing references are shown for convenience in checking shipping lists and invoices.

FIG. NO.	NAME	DRAWING REFERENCE
	Order by plate, figure number and name	
H	Type XB Flashing-light Highway Crossing Signal Complete, as shown, equipped with two signal units having backlights, for front and back signal indications. Signal units are equipped with 8⅜" dia., red, front 30 degree spredlite roundels and 5⅜" dia., red, back 30 degree spredlite lenses. Specify dimension Y. Lamps for signal units must be specified separately giving voltage of storage battery to be used with signal	45906-129
H1	as above, except has signal units equipped with 8⅜" dia., red, front 30 degree spredlite roundels and 5⅜" dia., red, back 45 degree deflecting lenses	45906-129
H2	same as Fig. H, except has signal units equipped with 8⅜" dia., red, front 45 degree deflecting roundels and 5⅜" dia., red, back 45 degree deflecting lenses	45906-129
J	Type XA Flashing-light Highway Crossing Signal Complete, as shown, equipped with four units mounted in pairs back to back, for front and back signal indications. All four units equipped with 8⅜" dia., red, 30 degree spredlite roundels. Specify dimension Y. Lamps for signal units must be specified separately giving voltage of storage battery to be used with signal	45906-129
J1	as above, except has front units equipped with 8⅜" dia., red, 30 degree spredlite roundels and back units equipped with 8⅜" dia., red, 45 degree deflecting roundels	45906-129
J2	same as Fig. J, except has all four units equipped with 45 degree deflecting roundels	45906-129
K	Type XA Flashing-light Highway Crossing Signal Complete; as shown, mounted on relay case, equipped with two signal units without backlights, for signal indication in one direction only. Signal units are equipped with 8⅜" dia., red, 30 degree spredlite roundels. Specify	

TYPES XA AND XB HIGHWAY CROSSING SIGNALS

Drawing references are shown for convenience in checking shipping lists and invoices.

FIG. NO.	NAME	DRAWING REFERENCE
	Order by plate, figure number and name	
K (Cont'd)	dimension Y. Lamps for signal units must be specified separately giving voltage of storage battery to be used with signal. Unless otherwise specified relay case as shown on Plate E 0933, Fig. A, will be furnished.....	45906-129
K1	as above, except has signal units equipped with 8⅜" dia., red, 45 degree deflecting roundels....	45906-129
L	Type XB Flashing-light Highway Crossing Signal Complete, as shown, mounted on relay case, equipped with two signal units having backlights, for front and back signal indications. Signal units are equipped with 8⅜" dia., red, front 30 degree spredlite roundels and 5⅜" dia., red, back 30 degree spredlite lenses. Specify dimension Y. Lamps for signal units must be specified separately giving voltage of storage battery to be used with signal. Unless otherwise specified relay case as shown on Plate E 0933, Fig. A, will be furnished.....	45906-129
L1	as above, except has signal units equipped with 8⅜" dia., red, front 30 degree spredlite roundels and 5⅜" dia., red, back 45 degree deflecting lenses.....	45906-129
L2	same as Fig. L, except has signal units equipped with 8⅜" dia., red, front 45 degree deflecting roundels and 5⅜" dia., red, back 45 degree deflecting lenses.....	45906-129
M	Type XA Flashing-light Highway Crossing Signal Complete, as shown, mounted on relay case, equipped with four units mounted in pairs back to back, for front and back signal indications. All four units equipped with 8⅜" dia., red, 30 degree spredlite roundels. Specify dimension Y. Lamps for signal units must be specified separately giving voltage of storage battery to be used with signal. Unless otherwise specified relay case as shown on Plate E 0933, Fig. A, will be furnished.....	45906-129

TYPES XA AND XB HIGHWAY CROSSING SIGNALS

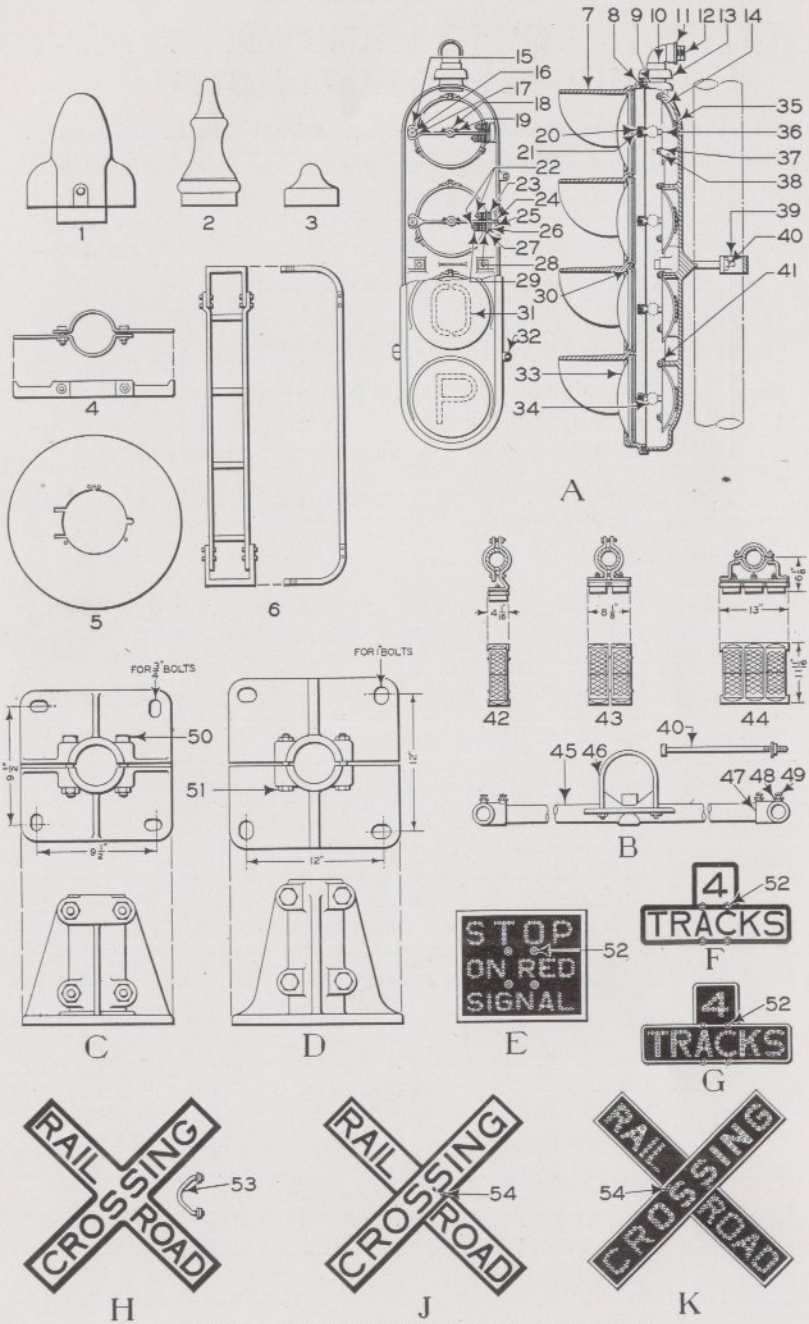
Drawing references are shown for convenience in checking shipping lists and invoices.

FIG. NO.	NAME	DRAWING REFERENCE
	Order by plate, figure number and name	
M1	as above, except has front units equipped with 8⅜" dia., red, 30 degree spredlite roundels and back units equipped with 8⅜" dia., red, 45 degree deflecting roundels.....	45906-129
M2	same as Fig. M, except has all four units equipped with 45 degree deflecting roundels..	45906-129
1	Railroad Crossing Sign. For details and order references see Plate H 2911, Figs. H, J and K.	
2	"Tracks" Sign Complete. For details and order references see Plate H 2911, Figs. F and G.	
3	Arm Complete, for mounting signal units to pole. For details and order references see Plate H 2911, Fig. B. Includes two U bolts for attaching to 4" pipe.....	48870-9 Gr.1 5183 Gr. 2 091
4	Type XA Color-Light Signal Unit Complete. For details and order references see Plate H 2913	55050-1
5	Type XB Color-Light Signal Unit Complete. For details and order references see Plate H 2913	55050
6	"Stop on Red Signal" Sign Complete, as shown. For details and order references see Plate H 2911, Fig. E.	
7	Mast Complete, of 4" pipe with base, as shown for mounting on concrete foundation. Specify length.	
8	Reflector Unit Complete. For details and order references see Plate H 2911, Figs. 42, 43 and 44.	
8a	Caution Marker, for use in place of reflector, for center of road installation.	
9	Pinnacle, for top of pole. For details and order references see Plate H 2911, Figs. 1, 2 and 3.	
10	Illuminated Stop Sign Complete. For details and order references see Plate H 2911, Fig. A...	55200

TYPES XA AND XB
HIGHWAY CROSSING SIGNALS

Drawing references are shown for convenience in checking shipping lists and invoices.

FIG. NO.	NAME	DRAWING REFERENCE
	Order by plate, figure number and name	
11	Mast Complete, of 4″ pipe with base, as shown for mounting on top of relay case. Specify length.	
12	Relay Case Complete. For details and order references see Plate E 0933.	



TYPES XA AND XB HIGHWAY CROSSING SIGNALS
DETAIL PARTS

TYPES XA AND XB HIGHWAY CROSSING SIGNALS—DETAIL PARTS

NOTE: The painting of signs Figs. E, F, G, H, J and K will be furnished as listed below unless other color combinations are specified.

Drawing references are shown for convenience in checking shipping lists and invoices.

FIG. NO.	NAME	DRAWING REFERENCE
	Order by plate, figure number and name	
A	Illuminated Stop Sign Complete, as shown. Includes clamp and bolts for mounting to 4″ pipe. Specify voltage of lamp	55200 Gr. 1
B	Arm Complete, as shown, for supporting signal units, includes two U bolts, Fig. 46, for mount-int to 4″ pipe	48870-9 Gr.1 5183 Gr. 2 091
B1	as above, except with bolt, Fig. 40, for use when four signal units are mounted in pairs back to back	48870-9 Gr.1 015 072
C	Base Complete, as shown, includes bolts and nuts for attaching to 4″ pipe	43951-7 Gr.1
D	Base Complete, as shown, includes bolts and nuts for attaching to 4″ pipe	43951-5 Gr.1
E	"Stop on Red Signal" Sign Complete, as shown, has white letters and border with glass reflector buttons on black background, includes two bolts, nuts and washers for mounting to 4″ pipe	55256-4 20476-18 1048 091
F	"Tracks" Sign Complete, has raised border and letters which are painted black on a white background, includes two U bolts, nuts and washers for mounting to 4″ pipe. Specify numeral desired on sign	55256-5 20476-18 1048 091
G	"Tracks" Sign Complete, equipped with glass reflector buttons, has raised border and letters which are painted white on a black background, includes two U bolts, nuts and washers for mounting to 4″ pipe. Specify numeral desired on sign	55256 20476-18 1048 091

TYPES XA AND XB HIGHWAY CROSSING SIGNALS—DETAIL PARTS

Drawing references are shown for convenience in checking shipping lists and invoices.

FIG. NO.	NAME	DRAWING REFERENCE
	Order by plate, figure number and name	
H	Railroad Crossing Sign, cast iron, as shown, has raised border and letters on one side of sign, which are painted black on a white background. Includes two U bolts for mounting to 4″ pipe	20896-5 31359 17492
J	Railroad Crossing Sign, cast iron, as shown, has raised border and letters on both sides of sign, which are painted black on a white background. Includes two bolts, nuts and washers for mounting to 4″ pipe	20896-7 0117 091-3
K	Railroad Crossing Sign, cast iron, one side of sign is equipped with glass reflector buttons mounted on raised letters which are painted white on a black background, the other side of sign has raised border and letters which are painted white on a black background. Includes two bolts, nuts and washers for mounting to 4″ pipe	55256-1 Gr.1 55256-2 Gr.1 0117 091-3
K1	as above, except both sides of sign are equipped with glass reflector buttons mounted on raised letters which are painted white on a black background. Includes two bolts, nuts and washers for mounting to 4″ pipe	55256-3 Gr.1 0117 091-3
1	Pinnacle and Cap, for use as wire inlet, for 4″ pipe	30391 36288-2
2	Pinnacle, as shown, for 4″ pipe	1661
3	Cap, as shown, for 4″ pipe	43957-2
4	Step Complete, as shown, for 4″ pipe	20416-3 Gr.1
5	Background, for use with Types XA and XB Highway Crossing Signal Units, shown on Plate H 2913	49162-70

TYPES XA AND XB HIGHWAY CROSSING SIGNALS—DETAIL PARTS

Drawing references are shown for convenience in checking shipping lists and invoices.

FIG. NO.	NAME	DRAWING REFERENCE
	Order by plate, figure number and name	
6	Ladder Complete, as shown, with clamps for attaching to 4″ pipe. Specify length.	
7	Cover, only, for stop signal	55202
8	Gasket, for use between cover and case	43786-2
9	Case, only, for housing reflectors	55201
10	Elbow, 1¼″, for mounting sign to pole	46082-1
11	Lock Nut, 1¼″, for nipple, Fig. 12	27060
12	Nipple, 1¼″ x 1⅝″ lg., for fastening elbow to pole	48117-1
12a	as above, except 2½″ lg., for fastening elbow to sign	48118
13	Shield, as shown, for nipple, Fig. 12a	54733-1
14	Reflector, as shown, for stop sign	53122-3
15	Arm, for supporting receptacle	55059
16	Eccentric Screw, with insulating washer and bushing for fastening arm, Fig. 15, to case	55134 493-85 6347-18
17	Knurled Nut, No. 14-24 for use with screw, Fig. 16	846-1
18	Receptacle, for lamp	34864-11
19	Screw, No. 4—36 x ⅜″ fil. hd., with nut and lock washer for fastening receptacle, Fig. 18, to arm, Fig. 15	47343-4 12680-10 48526
20	Spring, for receptacle, Fig. 18	586-67

TYPES XA AND XB HIGHWAY CROSSING SIGNALS—DETAIL PARTS

Drawing references are shown for convenience in checking shipping lists and invoices.

FIG. NO.	NAME	DRAWING REFERENCE
	Order by plate, figure number and name	
21	Screw, No. 4—36 x ¼″ fil. hd., with insulating washer for fastening spring, Fig. 20, to receptacle	12526-1 493-87
22	Screw, No. 14—24 x 1½″ sq. hd., for use as terminal post	350-3
22a	as above, except 1″ lg.	350
23	Nut, No. 14—24 x 3/16″ hex., for use on terminal post, Fig. 22a	42839-5
24	Screw, No. 10—32 x ⅜″, for fastening terminal block, Fig. 25, to case	12563-22
25	Terminal Block, as shown, for stop signal	5971-7
26	Insulating Bushing, for long terminal post, Fig. 22	7350-83
27	Clip, for terminal posts	55065
28	Insulating Washer, for terminal posts	493-62
29	Nut and Washer, No. 14—24 x ⅛″ hex. for terminal posts	46989-2 1225-2
30	Gasket, for use between roundel, Fig. 33 and case	13014-57
31	Plate "O," for use with stop sign, includes screw and washer for mounting	39754-83 2438-12 53029-7
31a	as above, except plate "T"	39754-82 2438-12 53029-7
31b	same as Fig. 31, except plate "S"	39754-81 2438-12 53029-7

TYPES XA AND XB HIGHWAY CROSSING SIGNALS—DETAIL PARTS

Drawing references are shown for convenience in checking shipping lists and invoices.

FIG. NO.	NAME	DRAWING REFERENCE
	Order by plate, figure number and name	
31c	same as Fig. 31, except plate "P"	39754-84 2438-12 53029-7
32	Lock Screw, 3/8"—16, for fastening cover to case	53141-1
33	Roundel, as shown, for stop sign	53142-6
34	Lamp, for receptacle, specify voltage of storage battery to be used with signal	34866
35	Washer, for use between reflector, Fig. 14 and case	4256
36	Spring, for reflector, Fig. 14	16111-29
37	Lock Washer, for screw, Fig. 38	53029-7
38	Screw, No. 10—32 x 1/4" rd. hd., for fastening reflector to case	2438-9
39	Clamp, for fastening stop sign to 4" pipe	318-84
40	Bolt and Nut, 1/2"—13 x 7", for fastening clamp Fig. 39, to stop sign, also for use with arm, Fig. B, when four signal units are mounted in pairs back to back	015 072 091
41	Clip, for reflector, Fig. 14	18547-25
42	Reflector Unit Complete, with one yellow reflector and clamps for attaching to 4" pipe. When specified clamps can be furnished for mounting to base	53276 Gr. 3
42a	as above, except with red reflector	53276 Gr. 2
42b	same as Fig. 42, except with clear reflector	53276 Gr. 1

TYPES XA AND XB HIGHWAY CROSSING SIGNALS—DETAIL PARTS

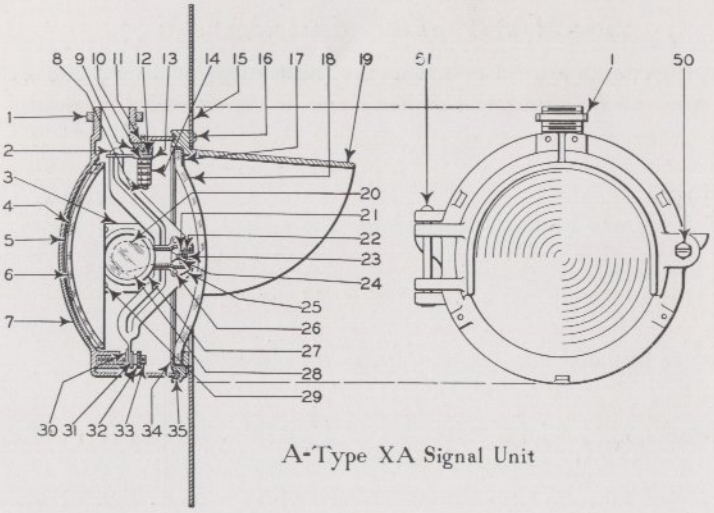
Drawing references are shown for convenience in checking shipping lists and invoices.

FIG. NO.	NAME	DRAWING REFERENCE
	Order by plate, figure number and name	
43	Reflector Unit Complete, with two yellow reflectors and clamps for attaching to 4″ pipe. When specified, clamps can be furnished for mounting to base	53276-1 Gr.3
43a	as above, except with red reflectors	53276-1 Gr.2
43b	same as Fig. 43, except with clear reflectors	53276-1 Gr.1
44	Reflector Unit Complete, with three yellow reflectors and clamps for attaching to 4″ pipe. When specified, clamps can be furnished for mounting to base	53276-2 Gr.3
44a	as above, except with red reflectors	53276-2 Gr.2
44b	same as Fig. 44, except with clear reflectors	53276-2 Gr.1
45	Arm, only, for arm complete, Fig. B	55215
46	U Bolt Complete, with nuts and washers, for fastening arm to 4″ pipe	5183 Gr. 2 072 091
47	Elbow, 1¼″, for use on each end of arm, Fig. 45, includes pipe plug, nut Fig. 48, and set screw, Fig. 49	53135-1 18524-5 35519 6894
48	Nut, ⅜″—16 x 3/16″, hex., for use on set screw Fig. 49	35519
49	Set Screw, ⅜″—16 x ¾″ lg., for use on elbow, Fig. 47	6894
50	Bolt and Nut, ⅝″ x 5″ sq. hd., for fastening base, Fig. C, to 4″ pipe	46464
51	Bolt and Nut, ¾″ x 6″ hex. hd., for fastening base, Fig. D, to 4″ pipe	0710

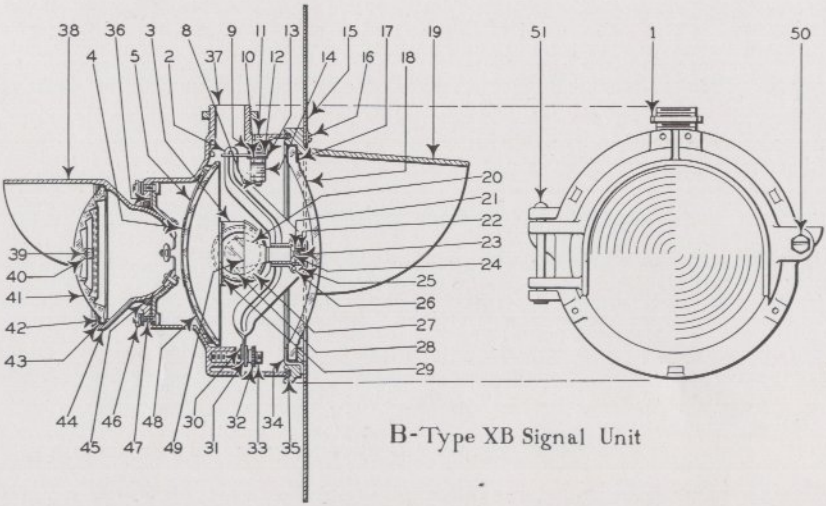
TYPES XA AND XB HIGHWAY CROSSING SIGNALS—DETAIL PARTS

Drawing references are shown for convenience in checking shipping lists and invoices.

FIG. NO.	NAME	DRAWING REFERENCE
	Order by plate, figure number and name	
52	U Bolt ½″—13, with nut and washer, for fastening signs, Figs. E, F and G to 4″ pipe	20476-18 1048 091
53	U Bolt, with nut and washer, for fastening sign, Fig. H, to 4″ pipe	31359 17492
54	Bolt, ½″ x 9″ lg. with nut and washer, for fastening signs, Figs. J and K, to 4″ pipe	0117 091-3



A-Type XA Signal Unit



B-Type XB Signal Unit

TYPES XA AND XB COLOR-LIGHT
SIGNAL UNITS

TYPES XA AND XB COLOR-LIGHT SIGNAL UNITS

NOTE: Signals listed below are equipped with standard roundel and lens combinations. When special combinations are desired same can be furnished when specified.

Drawing references are shown for convenience in checking shipping lists and invoices.

FIG. NO.	NAME	DRAWING REFERENCE
	Order by plate, figure number and name	
A	Type XA Color-light Signal Unit Complete, as shown with background. Equipped with 8⅜" dia., red, front 30 degree spredlite roundel. Signal Unit is equipped with sidelights unless otherwise specified	55050-1 Gr. 5
A1	as above, except without background	55050-1 Gr. 1
A2	same as Fig. A, except equipped with 8⅜" dia., red, front 45 degree deflecting roundel	55050-1 Gr. 7
A3	same as Fig. A2, except without background	55050-1 Gr. 3
B	Type XB Color-light Signal Unit Complete, as shown, with background and backlight. Equipped with 8⅜" dia., red, front 30 degree spredlite roundel and 5⅜" dia., red, back 30 degree spredlite lens. Signal Unit is equipped with sidelights unless otherwise specified	55050 Gr. 7
B1	as above, except without background	55050 Gr. 1
B2	same as Fig. B, except equipped with 8⅜" dia., red, front 30 degree spredlite roundel and 5⅜" dia., red, back 45 degree deflecting lens	55050 Gr. 9
B3	same as Fig. B2, except without background	55050 Gr. 3
B4	same as Fig. B, except equipped with 8⅜" dia., red, front 45 degree deflecting roundel and 5⅜" dia., red, back 45 degree deflecting lens	55050 Gr. 11
B5	same as Fig. B4, except without background	55050 Gr. 5
1	Lock Nut, for fastening signal unit to cross-arm	27060
2	Arm, for supporting receptacle	55059
3	Retainer, for use with reflectors, Figs. 6 and 48, also for retaining glass, Fig. 28	55133

TYPES XA AND XB COLOR-LIGHT SIGNAL UNITS

Drawing references are shown for convenience in checking shipping lists and invoices.

FIG. NO.	NAME	DRAWING REFERENCE
	Order by plate, figure number and name	
4	Washer, felt, for use between reflector and spring, Fig. 5	4256
5	Spring, for holding reflector in place	16111-29
6	Reflector, for use with signal unit, Fig. A	53122-3
7	Case, only, for signal unit, Fig. A	55051-1
8	Screw No. 14—24 x 1½″ sq. hd. used as terminal post for signal unit	350-3
8a	as above, except 1″ lg	350
9	Terminal Block, only, for signal unit	5971-7
10	Insulating Washer, for screw, Fig. 8	493-86
11	Screw, No. 10—32 x ⅜″ fil. hd., for fastening block, Fig. 9, to case	12563-22
12	Clip, for supporting arm, Fig. 2	55065
13	Insulating Washer, for clip, Fig. 12	493-62
14	Nut, No. 14—24 x ⅛″ hex. includes washer, for use on terminal post, Fig. 8	46989-2 1225-2
15	Background, as shown, for signal unit. For details and order references see Plate H 2911, Fig. 5	49162-70
16	Screw ¼″—20 x 5/16″ rd. hd., includes washer, for fastening background, Fig. 15, to hood, Fig. 19	3955-19 0510-1
17	Gasket, as shown, for roundel, Fig. 18	13014-57
18	Roundel, red, as shown, has 30 degree spread	53142-6
18a	as above, except has 45 degree spread	53142-7
19	Hood, for signal units equipped with background	55052-3

TYPES XA AND XB COLOR-LIGHT SIGNAL UNITS

Drawing references are shown for convenience in checking shipping lists and invoices.

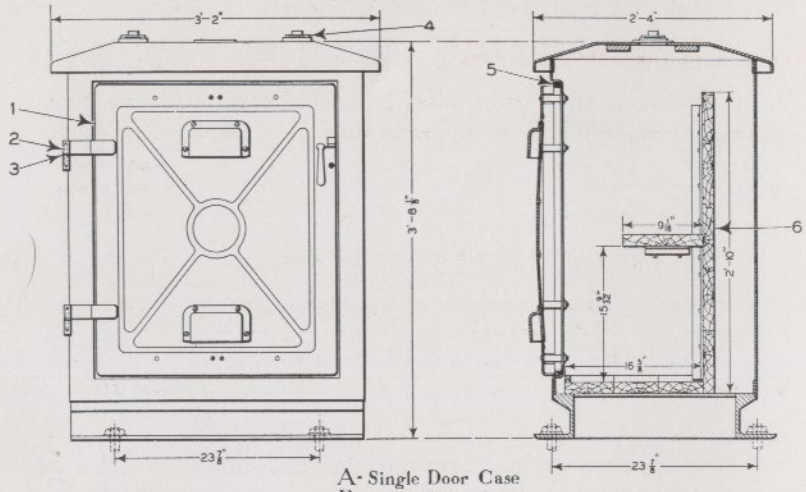
FIG. NO.	NAME	DRAWING REFERENCE
	Order by plate, figure number and name	
19a	as above, except for signal units not equipped with background	55052
20	Lamp, for signal units, specify voltage of storage battery to be used with signal	34866
21	Insulating Washer, for use between spring, Fig. 22 and washer, Fig. 24	493-87
22	Spring, as shown, for receptacle, Fig. 25	586-67
23	Screw No. 4—36 x ¼″ fil. hd., includes nut, for receptacle, Fig. 25	12526-1 12680-10
24	Washer, for screw Fig. 23	17540-1
25	Receptacle, for lamp, Fig. 20	34864-11
26	Screw No. 4—36 x ⅜″ fil. hd., includes nut and washer, for fastening receptacle, Fig. 25, to arm, Fig. 2	47343-4 48526 12680-10
27	Ring, for holding glass, Fig. 28, in place	43712-4
28	Glass, for signal units equipped with sidelights	924-3
28a	Disc, for signal units not equipped with sidelights	39719-21
29	Screw, No. 10—32 x ⅜″ rd. hd., includes nut, for fastening retainer, Fig. 3, to case	2438-12 577-2
30	Bushing, for screw, Fig. 33	6347-18
31	Insulating Washer for screw, Fig. 33	493-85
32	Knurled Nut No. 14—24 for screw, Fig. 33	846-1
33	Eccentric Screw, for supporting arm, Fig. 2	55134
34	Clip, as shown, for roundel, Fig. 18	18547-44
35	Gasket, fo use between case and hood	47562

TYPES XA AND XB COLOR-LIGHT SIGNAL UNITS

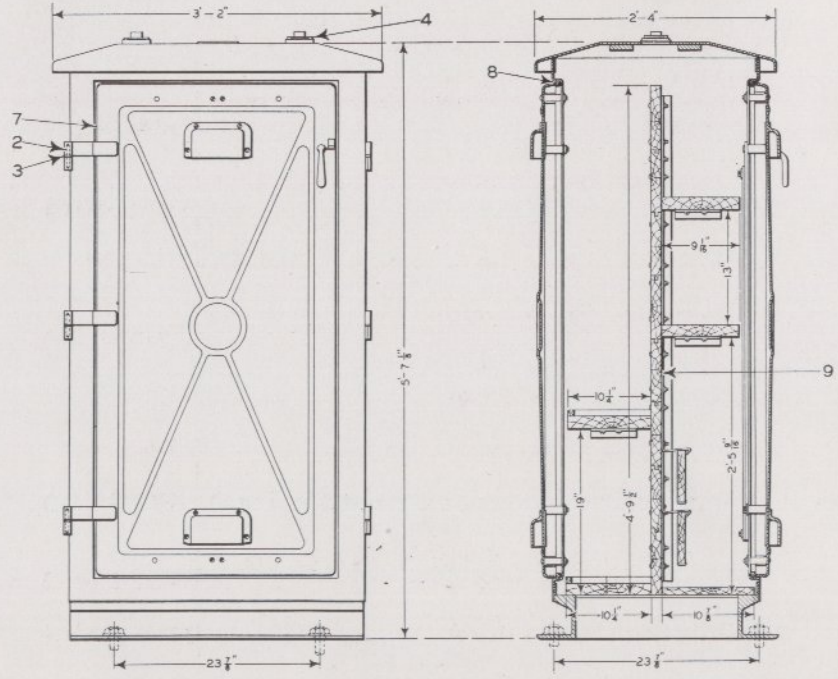
Drawing references are shown for convenience in checking shipping lists and invoices.

FIG. NO.	NAME	DRAWING REFERENCE
	Order by plate, figure number and name	
36	Ring, for use between case, Fig. 37, and hood on backlight	43712-5
37	Case, only, for use with signal unit, Fig. B	55051
38	Hood, as shown, for backlight	55052-1
39	Screw, No. 10—32 x 5/16″ fil. hd., for locking ring, Fig. 42, to lens	12280-3
40	Nut, No. 10—32 x 1/8″ sq. for screw, Fig. 39	31784-1
41	Lens, red, has 30 degree spread	45699-1
41a	as above, except has 45 degree spread	45699-2
42	Ring, for holding lens, Fig. 41, in signal unit	43712-3
43	Gasket, for lens, Fig. 41	13014-74
44	Retainer Complete, includes clip and rivets for fastening to hood	55132 Gr. 1
45	Gasket, for use between case, Fig. 37, and retainer, Fig. 44	47562
46	Nut, No. 14—24 x 5/16″ hex. for screw, Fig. 47	42843-1
47	Screw, No. 14—24 x 7/8″ sq. hd., for fastening retainer, Fig. 44, to case	3034-7
48	Reflector, as shown, for signal unit, Fig. B	53122-4
49	Reflector Complete, as shown, for backlights	55130 Gr. 1
50	Screw, 3/8″—16, for locking hood, Fig. 19, to case, for signal units, Figs. A and B	53141-1
51	Rivet, 3/8″ dia. x 3 3/4″ lg., used as hinge pin for hood	26733-5

Memoranda



A-Single Door Case
B-Double Door Case



C-Double Door Case

RELAY CASES

RELAY AND INSTRUMENT CASES

NOTE: The shelvings shown are merely typical arrangements and give principle dimensions. Shelvings to meet any requirement will be furnished when specified.

Drawing references are shown for convenience in checking shipping lists and invoices.

FIG. NO.	NAME	DRAWING REFERENCE
	Order by plate, figure number and name	
A	Relay and Instrument Case Complete, single door, as shown, arranged for mounting mast on top. Includes shelving, as shown, unless otherwise specified	36006-16
B	Relay and Instrument Case Complete, with front and back doors, arranged for mounting mast on top. Includes shelving, Fig. 6a	36006-15
C	Relay and Instrument Case Complete, with front and back doors, as shown, arranged for mounting mast on top. Includes shelving and terminal boards, as shown, unless otherwise specified	36006-14
1	Door Complete, as shown, for cases, Figs. A and B	37868-36 Gr. 1
2	Hinge Pin, for door, for cases Figs. A, B and C.	504-187
3	Washer, for use between hinges on door and case	1225-41
4	Pipe Plug, 2½", as shown	18524-3
5	Gasket, 10'-6" lg., for door, Fig. 1	43460-3
6	Shelving Complete, for single door case, Fig. A	54107-2 Gr. 3
6a	as above, except for double door case, Fig. B, includes terminal boards	54107-1 Gr. 5
7	Door Complete, as shown, for case, Fig. C.	37868-37 Gr. 1
8	Gasket, 28' lg., for door, Fig. 7	43460-3
9	Shelving Complete, for double door case, Fig. C, includes terminal boards	54107

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Rochester, New York

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