

# Section

# B

Plates B-2501 to B-2600 Inc.

## SIGNALS

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### COLOR LIGHT SIGNALS

Styles

“R”, “TR”, “N”, “N-2”, “TN” and “TN-2”

**Union Switch & Signal Co.**

Swissvale, Pa.

August 1924.

Printed  
in U. S. A.

## UNION SWITCH & SIGNAL CO.

### PREFACE

A system of cataloging necessitates very liberal assignment of plate numbers to permit of future listing of parts logically and in harmony with past practice. The Sectional loose-leaf system adopted by this Company in 1911, although meeting most demands, does not allow of sufficient expansion. All catalogs issued from December 1920 will be compiled on a new method of classification of apparatus. Piece numbers will be an important feature of the ordering reference.

Part catalogs will be printed as soon as possible after new material is developed or old material is redesigned, and ultimately the information given in pamphlet form will be reprinted and grouped under proper classifications in loose-leaf binders. Old catalogs will remain in vogue until they are completely incorporated under the new system. It will be noted in the following classification outline that material cataloged in former sections A, B and C will retain the same prefix letter; but will form a subdivision of a more general classification.

### MAIN CLASSIFICATIONS

#### Section

- A—Interlocking Machines.
- B—Signals.
- C—Switch and Lock Movements, Layouts and Ground Material.
- D—
- E—Relays, Indicators and Locks.
- F—Transformers, Reactors, Resistors, and Impedance Bonds.
- G—
- H—
- I—
- J—Circuit Controllers.
- K—Highway Crossing Protective Devices.
- L—Housings.
- M—Insulated Rail Joints.
- N—Automatic Train Control and Stops.
- O—
- P—Bond Wires, Trunking, Lightning Arresters, Terminals, Electro-Pneumatic Fittings, and Accessories. (Power Generators and Distributing Apparatus.)

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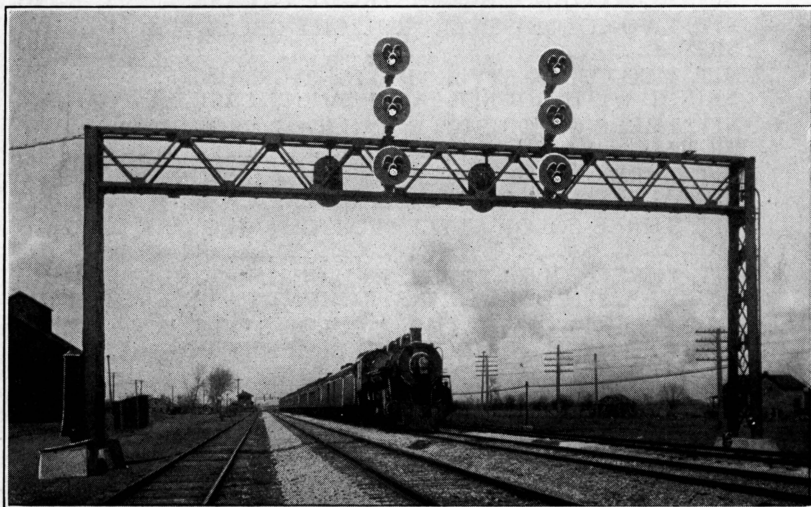
COLOR LIGHT SIGNALS

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STYLE "R" AND "TR" COLOR LIGHT SIGNALS ON I. C. R. R.



STYLE "N" COLOR LIGHT SIGNALS ON U. E. RYS.

**GENERAL INFORMATION AND ORDERING  
INSTRUCTIONS FOR COLOR LIGHT  
SIGNALS**

In this catalog will be found plates and ordering references covering assemblies and detail parts of the Style "R," "TR" and "N" Color Light Signals.

Light Signals are divided into classes by their range. The range required is determined by the speed at which trains may run, assuming an unobstructed view and signals on tangent track.

A long range signal is secured by accurate location of the lamp filament at the focal center of the lensing system. Maximum economy of energy is secured by the use of lamps having concentrated filaments. The range and spread of a light signal will vary considerably with the type of lamp used. The more distributed the filament, the greater the spread, and the shorter the range.

Extensive use has proved that the 8 $\frac{3}{8}$ " lens is ample for the very exacting requirements of long range signals in high speed steam road service. The 6 $\frac{3}{8}$ " lens serves the purpose very well for short range signals.

**Style "R" and "TR" Light Signals:**

The long range signals are the "R" (vertical arrangement of lamp units) and the "TR" (triangular arrangement of lamp units.)

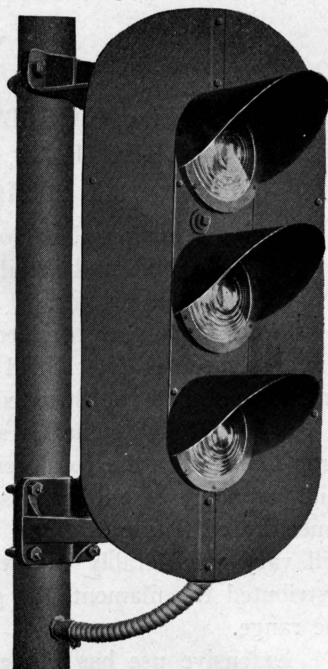
The Style "R" and "TR" signals consist of a signal case containing the lamp units, supporting brackets for attaching the case to the mast, a platform, ladder, mast, socket and pinnacle. The signal may be arranged for mounting directly on a foundation or on top of a single or double instrument case. By means of the adjustable supporting brackets any desirable variation of the position of the signal in either the horizontal or vertical plane may be secured. The adjustments in these two planes are entirely independent. The signal can be aligned approximately with very little difficulty by simply pointing it in the direction desired, but for accurate alignment and to secure the best long range indication on tangent as well as on curves, the sighting telescope shown on Plate B-2600 should be used.

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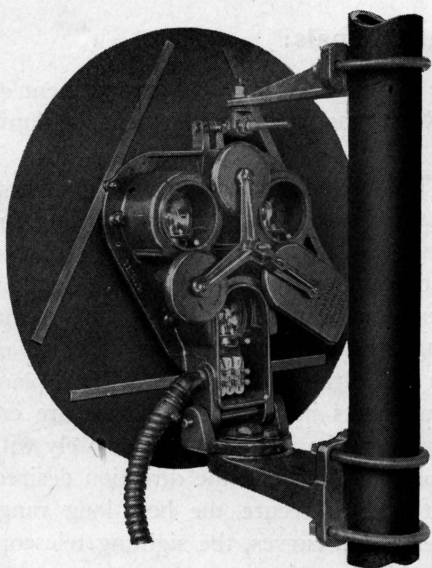
Special "deflecting prisms" of 10 or 20 degree spread can be applied over the  $8\frac{3}{8}$ " doublet lens where additional spread of light is required on account of curves. The 10 degree prism is sufficient in most cases. The 20 degree prism takes care of extreme requirements. Deflecting prisms spread the light in the horizontal plane and on one side only.

All Style "R" and "TR" signals will be furnished with 10-volt, 18-watt lamps unless otherwise specified. A special 8-volt, 10-watt lamp is available for use to meet the demands for extreme power economy when power is to be supplied from primary batteries. It is necessary that signals be approached lighted when this lamp is used.

The Style "R" or "TR" signal case for D.C. is provided with R.S.A. terminals to which the lamp



STYLE "R" COLOR LIGHT SIGNAL



STYLE "TR" COLOR LIGHT SIGNAL

receptacles are connected.

This same case can be used for A.C. where one transformer furnishes power for all units, the secondary circuit being selected through the proper control relays. A more satisfactory arrangement for A.C. is provided in the signal case with individual transformers for each unit as shown on Plate B-2527 and B-2543. With this arrangement the primary circuits of the transformers are selected through the proper control relays. This

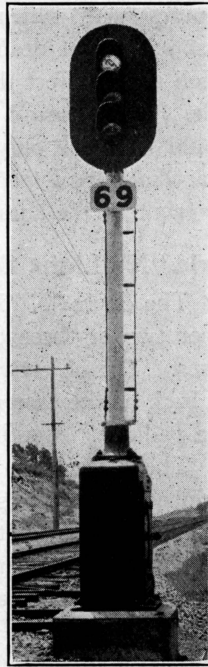
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provides better voltage regulation on the lamps, and considerably reduces the current carried by the relay contacts. Lamp receptacles are connected directly to the transformer secondary. Outside wires are brought to the primary side of the transformers in A.C. signals or to the R.S.A. terminals in D.C. signals. This arrangement affords a ready means for connecting instruments when taking voltage and current readings.

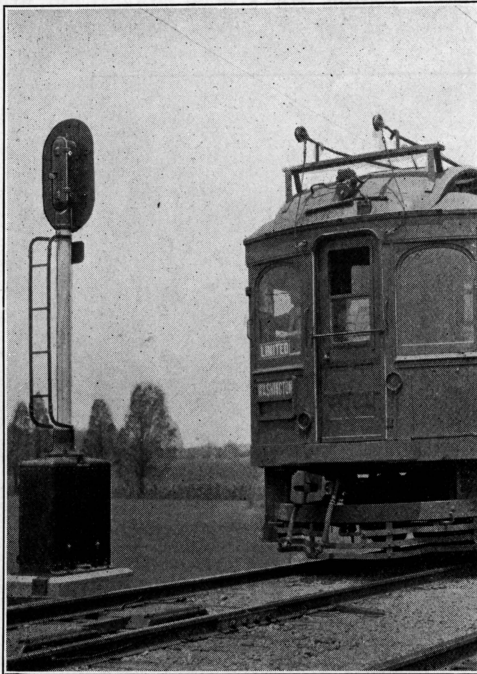
Both the case and the lamp units are ventilated. A hasp is provided for locking the door.

### Lamp Unit:

The lamp unit itself is the same in both "R" and "TR" signals. It consists of a doublet lens, the objective lens being clear



STYLE "N" SIGNAL



STYLE "N" SIGNAL W. B. & A. RY.

and the inner lens being colored. The lamp receptacle is supported in a fixed relationship to the lenses in order that the lamps, which are accurately based, may be interchangeable. Thus the lamp filament is brought to the exact focal point of the lens system and the range of the signal is not altered when a new lamp replaces an old. The superiority of the Style "R" and "TR" signals is largely due to the

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accuracy with which the lamp units are constructed. For this reason it is not desirable to have any changes made in the field which might affect the relative location of lenses and lamp receptacle. Any renewal or change which is necessary in a lamp unit should be made only at the U. S. & S. Co. plant. Lamp units as a whole are interchangeable, and can be readily removed from the front of the signal case.

### Style "N" Light Signals:

The Style "N" Light Signal consists of a cast-iron case with either two or three openings to which have been applied doublet lenses. The objective lens is  $6\frac{3}{8}$ " in diameter. A single door at the back of the case may be locked in its closed position by means of a padlock. Ventilators are provided.

The Style "N" Signal is aligned by means of a pipe socket equipped with three set screws which secure it to the top of a pole or supporting bracket.

Style "N" Signals are ordinarily installed with a separate transformer having a 110-volt primary winding with a secondary for 30-volt, 36-watt lamps. Lamps for special application are tabulated in Plate B-2570.



STYLE "TR" COLOR LIGHT SIGNAL  
ON C. & O. RY.

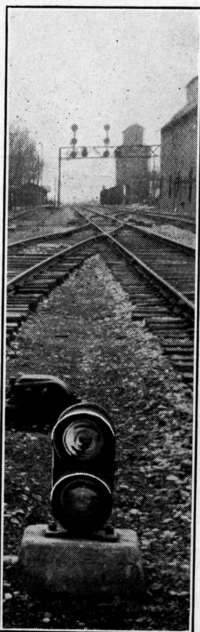


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The lamp receptacles are mounted on an adjustable bracket so that a maintainer can bring the lamp filament to such a location as will secure a satisfactory indication for the signal whenever lamps are replaced. Medium screw base lamps are used in the Style "N" Signal. Outside wires are brought direct to the lamp receptacle terminals.

### Dwarf Signals:

The Style "N" and "N-2" dwarf signals make use of the same case, the difference being in the type of lamp receptacle used, and the method of mounting. The Style "N" receptacles are mounted so that they can be adjusted in the field. The lamps used have medium screw bases. The Style "N-2" signal has a receptacle which is accurately located at the factory and which takes a rebased lamp with a bayonet base. Lamp replacement can be made without readjustment due to the accurately located filament.



**STYLE "N" DWARF  
SIGNAL**

signal with individual transformers. Similar applications can be made to the "N" and "N-2," for both two-color and three-color signals.

A triangular arrangement of lenses can be furnished, these signals being designated as "TN" and "TN-2" to correspond with the vertical designs "N" and "N-2" described above. The advantage of the triangular arrangement is that it provides greater clearances where a three-color dwarf signal is used.

These signals, like the high signals, are ordinarily installed with a separate transformer having a 110-volt primary winding with a secondary for 30-volt, 36-watt lamps.

### Backlights:

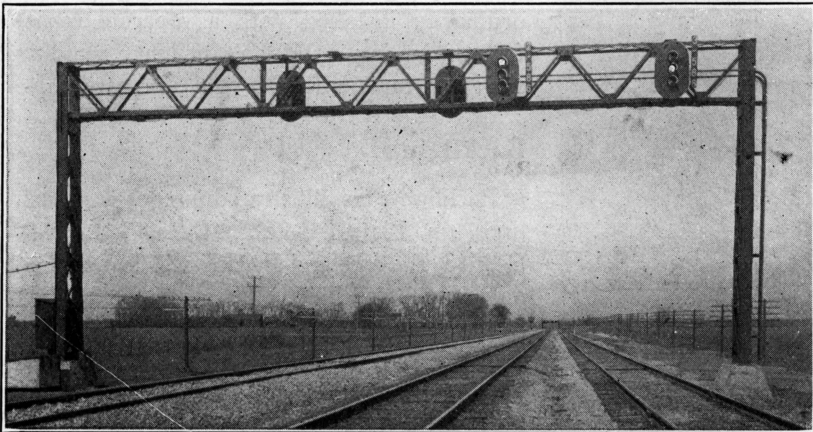
Backlights as illustrated in dot-and-dash lines on Plates B-2525, B-2527, B-2540, B-2543, B-2560, and B-2565 will be supplied only when specified. They can be applied to the bottom lamp unit of any "R" or "TR" signal, except the two-color Style "R" sig-

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STANDARD COLOR LIGHT SIGNAL

Style	Case	Lens	Lamp adjustment	Range
"R"	Vertical arrangement adjustable Brackets	8- $\frac{3}{8}$ " Doublet	Factory	2500-5000 Ft.
"TR"	Triangular arrangement, adjustable Brackets	8- $\frac{3}{8}$ " Doublet	Factory	
"N-2" Dwarf	Vertical arrangement, no adjustment	6- $\frac{3}{8}$ " Doublet	Factory	1200-2500 Ft.
"TN-2" Dwarf	Triangular arrangement, no adjustment.	6- $\frac{3}{8}$ " Doublet	Factory	
"N"	Vertical arrangement, Pipe Socket	6- $\frac{3}{8}$ " Doublet	Field	1200-2500 Ft.
"N" Dwarf	Vertical arrangement, no adjustment.	6- $\frac{3}{8}$ " Doublet	Field	
"TN" Dwarf	Triangular arrangement, no adjustment.	6- $\frac{3}{8}$ " Doublet	Field	

NOTE:—The ranges stated are for variable conditions of sunlight. Night ranges are naturally much greater.



STYLE "R" COLOR LIGHT SIGNAL