

The fact that this set is furnished without a meter, and with space therein for a commonly used standard instrument, makes it comparatively low in first cost and permits the use of a meter to which the user has presumably already become accustomed. It has the further advantage of permitting the use of an instrument having scale values best suited to the tests to be made, and obviates the necessity of possessing more than one test set, even though meters of different scale range combinations are required for different classes of work.

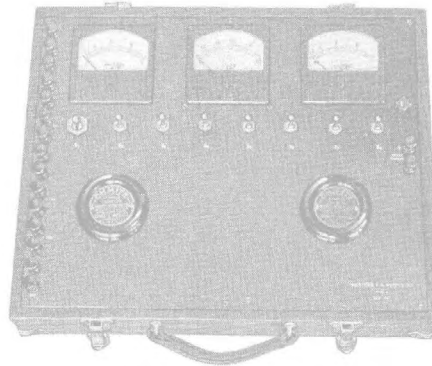
The Type-T Test Set

The second of the three new test sets placed on the market by the Western Railroad Supply Company is the Type-T, which is said to have all of the desirable characteristics of the Type-K test set above described. The Type-T has two built-in meters, one voltmeter and one ammeter, permitting simultaneous voltage and current readings. The instruments are shielded, and each has six scale ranges. The voltmeter is arranged to read both a-c. and d-c. when used independently. Sensitivity of 1,000 ohms per volt makes for highly accurate readings, and easy calculation of the effect of the instruments on the circuits can be made since the resistance of each current scale of the ammeter is shown on the instrument dial. A potentiometer-rheostat and series resistances are conveniently mounted. These total 300 ohms with the potentiometer of 75 ohms resistance having 150 watts capacity. Necessary toggle switches for setting up various test circuits are provided, as are rotary switches for selecting desired scale ranges on each independent meter. Binding posts are also provided so that the voltmeter and ammeter are made available for use in making ordinary voltage or current readings independent of the other test set equipment. This test set can be furnished with instruments having any desired scale combinations. The entire assembly is mounted on a black bakelite panel housed in a substantial polished wood case with slip-hinge cover and shoulder strap.

Model-200 Set for Relay Tests

The third new set made by this company is the Model-200 a-c. test set, which is for use in determining drop-away, pick-up and working values of a-c. relays, either single-element or two-element, line or track, except those few types of double-element relays which have high power-factor locals or are of the resonated vane types (with condenser).

Two ammeters having ranges 0-1 and 0-5 amp. and a voltmeter having a range of 0-150 volts permit accurate readings of the values encountered. Two 45-ohm fixed resistances enclosed in the case are used when testing track relays, so as never to have less than 90 ohms in series with the track element. These resistances also protect the meters, but are short circuited, by means of toggle switches, when testing line relays or single-



The Model-200 Type-C test set

element relays. Two non-inductive variable resistors each of 200 ohms total resistance, and having a carrying capacity of 1.4 amp., are conveniently located. One is connected directly across the supply line, as a potentiometer, while the other is connected as a variable series resistance. The potentiometer gives a coarse, wide-range adjustment and the series resistance gives a fine adjustment for accurate determination of the values for the relay under test.

The pole-changing switch is of the special design having a definite-center off position and contacts with negligible contact resistance. Other tumbler switches are used for short circuiting the ammeters. Binding posts are located on the right of the panel for connecting to the power supply, while those ranged along the left side are for connections of devices under test. They permit the use of the meters for direct measurements of current or voltage, and provide for the connection of an external wattmeter when required. An accessible fuse in the power supply circuit is located near the power supply terminals.

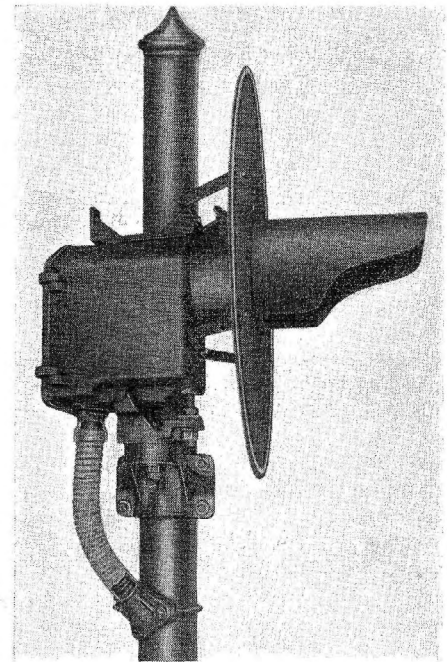
It is claimed that this test set can be used to take operating readings without introducing errors sometimes due to improper connection of voltmeters and ammeters. When testing two-element relays with the Model-200 test set, the values obtained are at the inherent phase angle of the relay, i.e., the phase angle between the local element volts and current, since the

large amount of resistance in series with the track winding gives a power factor very closely approaching service conditions.

The apparatus of the test set is mounted upon a black bakelite panel 15 in. by 18 in., and is housed in a polished hardwood case measuring 15 $\frac{3}{8}$ in. by 18 $\frac{3}{8}$ in. by 5 in. with cover in place. Metal corner plates, strap handle fittings, hinges and locks are of brightly polished nickel, enhancing the appearance. Slip-hinges allow the cover to be easily removed for convenience.

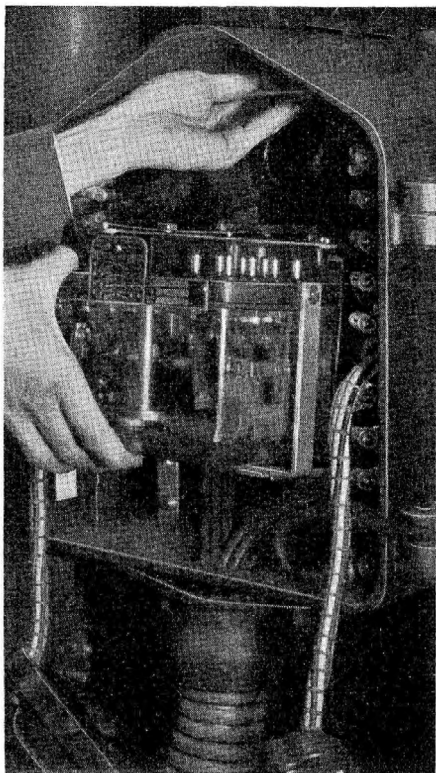
Improved Searchlight Signal

THE Union Switch & Signal Company announces an improved searchlight signal, the H-5, which is easily installed and maintained, and which has a quickly detachable operating unit. The H-5 searchlight signal incorporates all the basic principles and



Signal with mast mounting

the major advantages of popular searchlight signals, yet is a radical departure from the types familiar for the past 15 years. Its outstanding characteristics are as follows: The operating unit is quickly detachable and plug connected; the reflector and lamp bulb are independent of the operating unit, and are also quickly detachable on the plug-in principle; the reflector assembly and both lenses of the doublet combination are mounted in the signal case inde-



Removing plug-in mechanism

pendent of the operating unit and in fixed relation to each other; the contact capacity of the operating unit is 2F-2B independent for both the yellow and green position; all back contacts are closed at the red position; the operating units are interchangeable without affecting the lenses, reflector or wiring; the reflector assemblies are interchangeable without affecting the operating unit or lenses; the external wiring is permanently affixed to fixed terminals independent of the operating unit; the plug connector feature permits a complete removal and replacement of the operating unit in 30 seconds.

The H-5 searchlight signal consists of an outer case, an operating unit and a background. The outer case includes the doublet lens combination, reflector and lamp assembly, terminal boards for external wires, plug connectors, lens hood, and adjusting base support. The operating unit includes the contacts, the movable spectacle with colored roundels, and the plugs for plug connections.

Two types of support are available for high signals. One type is a bracket designed for either right- or left-hand "side of mast" mounting, and locating the center line of the signal approximately 10 in. from the center line of the mast. Another type provides for bridge or platform mounting. In this arrangement, the signal may be bolted to a flat plate or platform. All high signals are furnished with a background and bolts for

fastening the support on a mast or to a platform, and each signal is equipped with a sighting device for aligning the signal. Provision is made in the supports for making easy and accurate adjustments (separately) in both the horizontal and vertical alignments of the light beam.

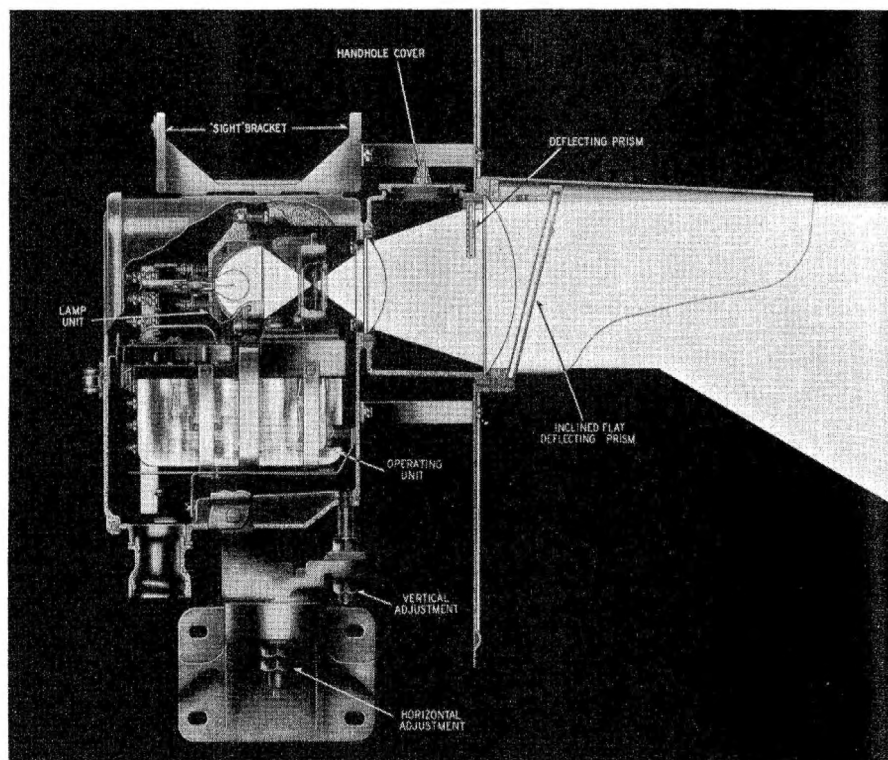
The dwarf signal is the same as the high signal except without background or sighting device, and is equipped with a special deflecting cover glass. The usual close-up prism is located at the bottom of the outer lens to provide an upward indication with minimum interference from the hood. In addition, a deflecting cover glass has been added to further improve the close-up indication. It is fitted with a base suitable for mounting on a flat surface such as a concrete foundation, instead of a support bracket. Slotted holes are provided in the base so that horizontal adjustment of the light beam may be secured. Vertical alignment is obtained in the same manner as in the high signal.

A removable fitting is provided for both dwarf and high signals, having internal threads to match single strip flexible conduit, thus eliminating the necessity of special elbows and conduit fittings. An external

safety factor and efficiency. The permanent magnet field has fewer magnets, yet provides a stronger resultant field. Vertical armature air gaps are retained, but with more liberal dimensions. The rotating pole shoes are suspended vertically downward from the armature, thus simplifying the counterbalancing weight structure on the spectacle support.

The H-5 searchlight signal is equipped with 2F-2B independent contacts on each side. All four back contacts are closed when the operating unit is de-energized. The entire working parts of the operating unit are enclosed and sealed. A glass case provides for ample visual inspection. This case is made without openings and is clamped against a special rubber gasket in the top plate by means of a strap support. The operating unit is accurately located and rigidly fastened in the signal case, yet it may be removed in a few seconds without the necessity of removing any bolts.

The H-5 operating unit has a feature which is a distinct advantage with present-day complex circuits and short allowable time for changing out operating units, in that it is unnecessary to remove any nuts or washers to disconnect the electrical connections to the operating unit. All in-



Cut-away view showing interior arrangement of the signal

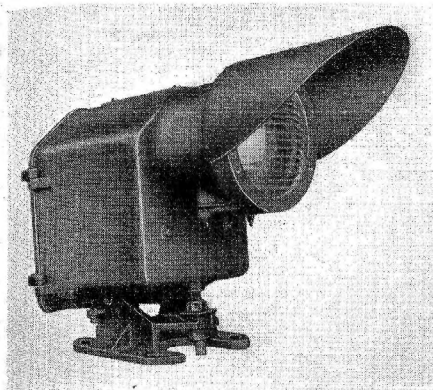
thread pole fitting is also provided and eliminates the necessity of tapping threads into the pole opening.

The signal operating unit, while following fundamentals of previous types, is improved with regard to

ternal electrical circuits are connected to eight plugs, moulded into each side of the top plate. External connections are made through "jacks" mounted in plug connector housings. The housings are so designed that it is impos-

sible to insert them improperly.

All optical parts, with the exception of the colored roundels, are separated from the operating unit and are permanently located in the signal



Signal with dwarf mounting

case, which provides for better beam alinement. The reflector mounting is adjusted and fixed at the factory to assure that the maximum efficiency may be obtained from the lens combination. Prefocused and sealed reflector assembly assures the maximum candlepower obtainable from a reflector and also provides complete interchangeability of all reflector assemblies. The snap-on mounting of the reflector assembly facilitates lamp and reflector maintenance and materially reduces the time necessary to replace an operating unit. A resistor can be provided on the reflector assembly for convenience in adjusting lamp voltages.

The operating values of the H-5 searchlight signal are shown in the following table:

Contacts All dependent		Armature Resistance Ohms	Mini- mum Re- lease	Armature Volts Max. Pick- up & Work- ing
Front	Back			
2Y-2G	2+2	250	2.0	5.5
2Y-2G	2+2	500	3.0	8.0

Prismo Beaded Signs

THE General Railway Signal Company has recently acquired the railroad rights on the sale of Prismo beaded signs. The Prismo process is applied by embedding thousands of miniature glass spheres into a special semi-plastic paint directly to steel or on a glass mat which may be cemented to a wooden support. Half of each sphere projects above the surface of the paint and reflects outside light at any angle back to its source so that the entire processed surface glows brilliantly. The lettering on the sign is of flat paint and is readily visible by contrast.

It is claimed that, at night, the sign is luminous to an automobile driver from any angle, that on a clear night it can be seen at a great distance, and that daylight visibility is not sacrificed; the roughened surface prevents sunlight glare by breaking up the reflected light, resulting in better legibility of the message the sign conveys. The process has many possibilities for rail-



Prismo beaded sign

road use on highway crossing signal signs, signal station numbers, depot markings, crossing gates, or any location where a reflector sign can be used to advantage.

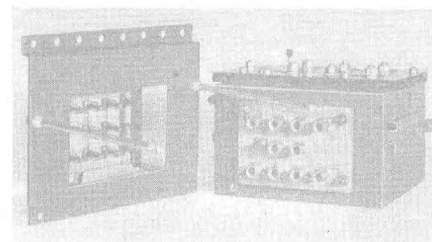
Quick-Detachable Switch Machine Controller

THE General Railway Signal Company announces the development of a new tower-type quick-detachable switch machine controller which permits the conversion of a dynamic

indication switch machine into remote control, using the same control and indicating wires if desired.

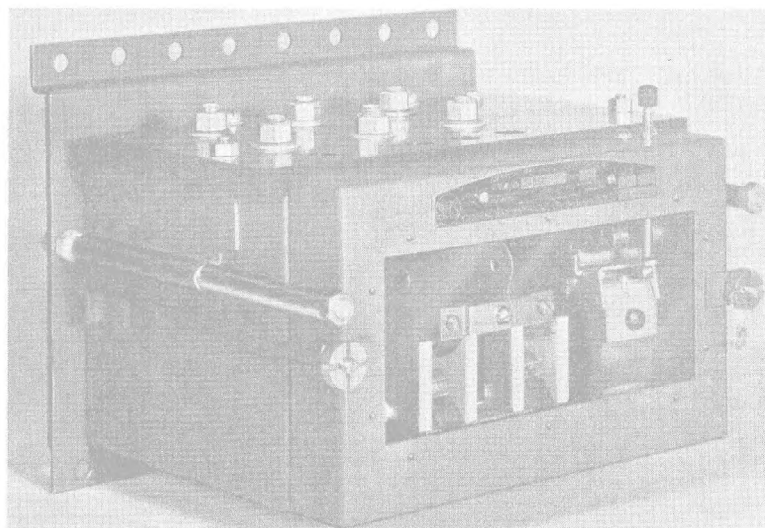
The controller is comprised of a normal and reverse contactor, an overload relay and a cross-protection circuit breaker with external reset button, housed in a metal case which may be mounted as a unit on the relay rack. The overall size of the unit is 9 $\frac{7}{8}$ in. wide, 6 $\frac{7}{8}$ in. high and 10 in. deep. The function of the two contactors is to make and break the positive switch-control energy. They also, when in the de-energized position, complete the snub circuit which stops the machine at the end of its stroke. Contactors have high-capacity contacts, equipped with blow-outs to carry and break relatively high currents.

The overload relay picks up after a short interval of time, if a machine



Plug connections on switch machine controller

is obstructed or stalled, and opens the contactor circuit, removing current from the motor. The relay restores automatically when the controlling lever is moved to opposite position. The cross-protection circuit-breaker functions when a cross is applied to the control wire for the next operating position. The cross-protection circuit breaker is equipped with a pointer-type indicator, mounted on the armature, which is visible through the trans-



Quick-detachable switch machine controller