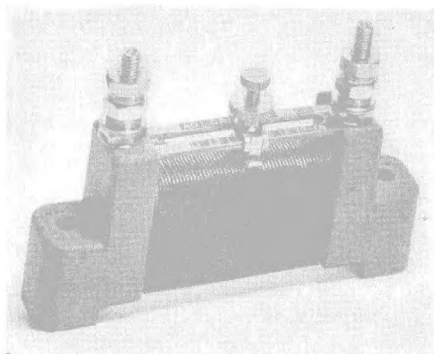


insulated, rubber-covered leads 8 ft. long, with a spade terminal on one end and a test clip on the other, are provided. Scales are approximately 4 in. in length, and all values are said to be easily readable with a high degree of accuracy. Batteries which are mounted in the bottom compartment of the case are readily accessible for replacement, which is claimed to be necessary only after several months of ordinary use.

## Adjustable Resistor

THE General Railway Signal Company announces an improved adjustable resistor known as Type T. The resistor consists of a rugged, low moisture absorption porcelain block wound with non-corrosive resistance wire. It has standard A.A.R. terminals and a slide-bar with resistance calibrations clearly identified. The overall dimensions are 15/16 in. wide, 3-7/16 in. high, and 5 in. long. This new resistor has a 20-watt



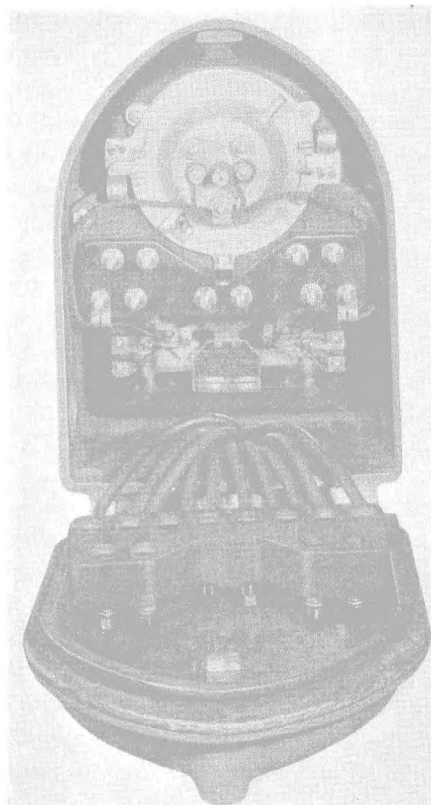
Type-T adjustable resistor

continuous capacity rating for 75 deg. C. rise. It can be wound to various resistances up to 50 ohms or more as specified. Standard resistances are: 2.6, 4, 8.5, and 21 ohms.

## Plug Connector for "H-2" Searchlight Signals

THE Union Switch & Signal Company, now has available an auxiliary plug-in type terminal board for application to either the Union H or H-2 type of searchlight signals, which permits the removal and replacement of the operating units without disconnecting any of the field wires. This plug connector consists of a moulded bakelite terminal board equipped with terminal posts spaced and marked the same

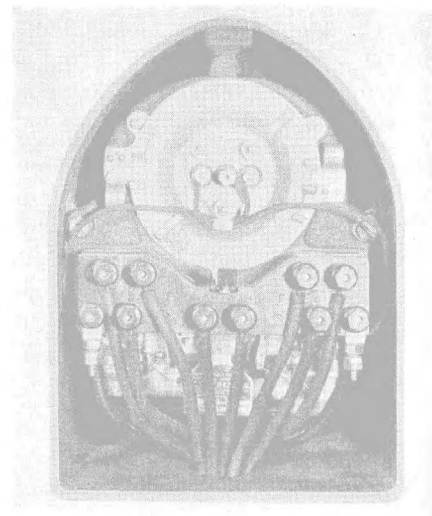
as the terminals on the regular operating unit terminal board. Attached to the under side of each terminal post, and housed inside the bakelite body, are spring clip connectors which slide over and make contact



Plug connector removed

with the terminal posts on the operating unit.

Some of the advantages claimed for this device are as follows: Materially shortens the time required to remove from service and replace operating units, thus preventing or shortening train delay time, especially in congested territories; eliminates any possibility of replacing field wires on wrong terminal when changing operating units, as wires are not removed from the plug connector; can be applied to signals now in service without making any change in the operating units. Wires are simply removed from the present terminal posts and placed on similarly marked posts on the plug connector, the nuts and washers taken off following removal of wires being discarded; plug connector spring clips have sliding contact on the terminal screws, and the clips are so designed that ample contact pressure will be maintained; plug connector board is self-aligning and uniform contact is made on all posts; the plug connector is maintained in position by a spring lock which is latched and unlatched without tools; and the terminal binding posts on

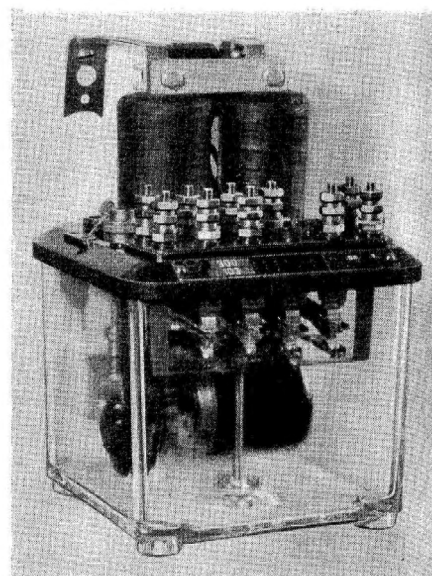


Plug connector in place

plug connector are equipped with a special insulated jam nut which prevents any possibility of grounding or short-circuiting the posts when the connector is removed.

## D-C. Time-Element Relay

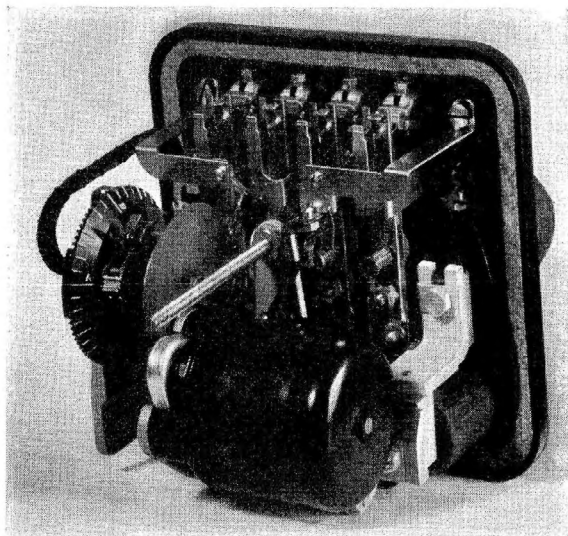
THE General Railway Signal Company has designed and is manufacturing a new constant-speed motor-driven d-c. time-element relay, to be designated Type-K, Class-T. This relay was designed for line or local operation to attain more accurate



Type-K d-c. time-element relay

and greater latitude in timing. The relay is slightly larger than the Type-K, Size-4, neutral relay. It is furnished with coils of any resistance required, equipped either with standard A.A.R. terminals or insulated terminals. Contact fingers are

Time-element relay with the case removed showing motor and contacts



articulated, the same type as used on all Type-K relays.

The timing device consists of a small constant-speed d-c. or a-c. motor as required, which drives the timing gear and adjustable calibrated timing wheel on which is mounted a trip for operating a check contact. Timing device sequence of operation is as follows: (1) Energy applied to relay which energizes the starting coils mounted in base of relay; (2) starting coils energized pull armature down depressing back contacts and engaging time gear with motor gear train; motor starts operation; (3) after completion of time interval, check contact is opened by trip on timing wheel, closing the circuit to the pickup coils; (4) relay picks up and holds up, disengaging the timing wheel from the gear train and opening the motor circuit; (5) check contact snaps back to closed position as timing wheel is disengaged and trip is returned to de-energized position.

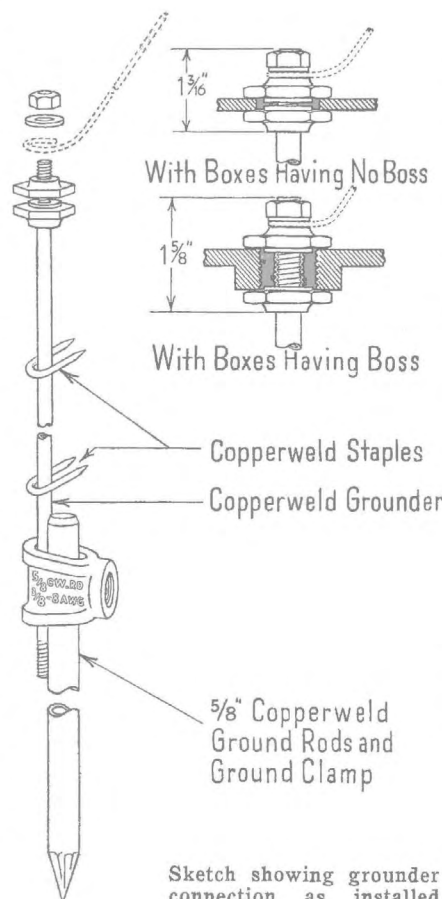
Four gear trains are available with time adjustments as follows: 2 to 32 sec., 4 to 64 sec., 15 sec. to 4 min., and 30 sec. to 8 min. Tests have shown that practically constant timing is maintained over the voltage range of the battery. Ambient variations in temperature have no appreciable effect.

This relay can be supplied with-out or with quick-detachable plug-coupler as required. The plug-coupler eliminates the possibility of circuit errors and saves considerable time when changing or replacing a relay at periodic inspection. The plug-coupler consists of a bakelite shell in which are moulded inserts that pass over hairpin-type springs affixed to the terminal posts of the relay. Wires to the relay are attached to the plug coupler by means

of bakelite-insulated-head terminal screws which screw into the inserts in the shell. The bakelite heads are shaped so that they may be tightened by an A.A.R. socket wrench.

## Copperweld Grounder

A new grounder recently has been developed and placed upon the market by the Copperweld Steel Company. The grounder, shown in the



Sketch showing grounder connection as installed

accompanying diagram, is made from the same material as Copperweld non-rusting ground rods; a thick layer of pure copper is inseparably welded to a tough steel core. It is fastened at the bottom to the ground rod by means of a clamp, and is taken into the case through a hole, being fastened to the case by a specially designed connector which permanently grounds the shell of the case or box. Lightning arrester ground leads may be fastened to the grounding terminal inside the case and held in place by a nut. Staples are provided for use where the ground rod is used adjacent to a wood pole, the grounder being formed by a wrench so that it lies against the pole.

## Plug-In Relays

To provide for quick, easy replacement of relays, without disturbing wire connections, the Union Switch & Signal Company has introduced a line of plug-in type relays. The wall space required is only about one-fourth the space necessary for the equivalent number of contacts in a standard type relay mounting.

Separate mounting bases, independent of the relays and containing receptacles for plug connections, are mounted permanently on a vertical rack or framework, and wire connections are soldered to the receptacle terminals. The plug connectors at the rear of the relays fit into these matching receptacles in the fixed base, so that the relay is pulled out horizontally, directly away from the rack, in order to remove it.

The plug connectors extending from the rear of the relays come in contact with spring sockets in the receptacles in the mounting base. The coil connections are made in a similar manner, but reversed, so that they function as guides for proper register of the other connectors. Each contact spring has an individual plug connector of rugged design. These are in a recess in the relay base, protected on all four sides by a wall of insulating material projecting beyond the tips so as to prevent damage when the relay is being handled. The spring sockets in the receptacles in the mounting base are designed to give high contact pressure with low friction so that it is easy to connect or disconnect the relay. The relays are so designed that soldering of wire connections can be done conveniently. When the relays are plugged into their mounting bases, a special latch automatically locks the relay in posi-