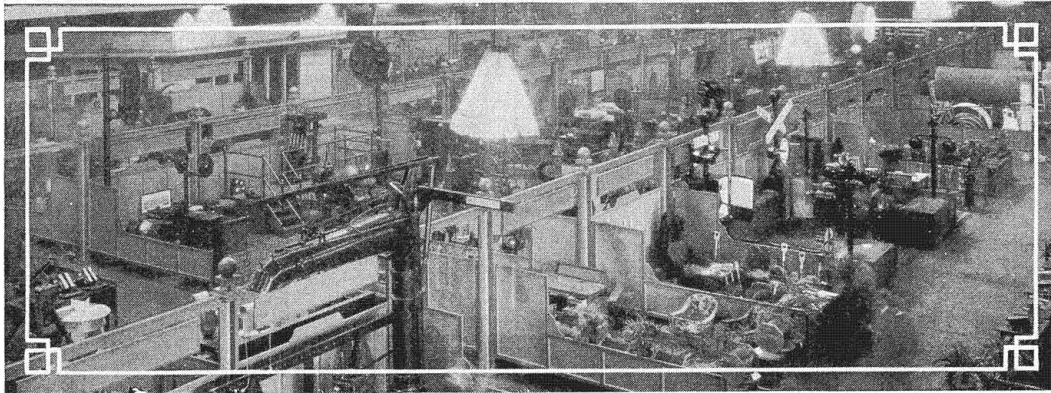
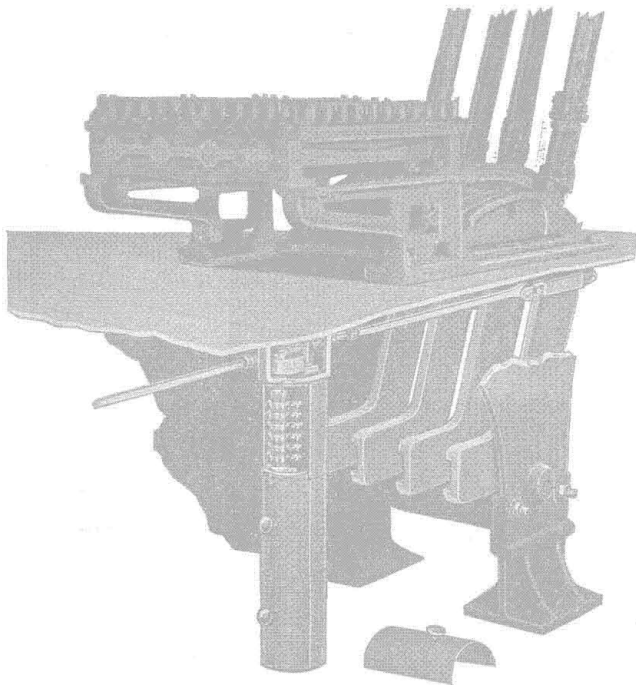


New and Improved Devices



Saco Lever Circuit Controller

THE Signal Accessories Corporation, Utica, N. Y., has developed the Saco circuit controller for mechanical interlocking levers. It is designed along simple lines without the use of gear wheels or complicated connections. The Saco circuit controller is fastened vertically below the floor line at the rear of the interlocking machine. The controller is operated by means of a rod connected to the circuit controller



Application of Saco lever circuit controller to mechanical machine

shaft and to the machine lever below the floor. Both rod and circuit controller are out of sight and out of the way.

The Saco circuit controller can be placed on every lever of an interlocking machine. It is $4\frac{1}{2}$ in. wide and can be placed side by side on any number of levers with ample clearance space. The circuit controller itself is composed of sections in multiples of six circuits each and as many sections as needed can be attached. The sections are interchangeable and can be added or removed at any time as circumstances may require.

Sections are compact and a complete circuit controller having 6 sections of 36 circuits is approximately 4 ft. long including the housing for attaching to the floor. The making and breaking of circuits is accomplished in the usual manner by hard rubber or fiber disks having heavy phosphor bronze bands mounted on them. Adjustment is simple. All wires are brought out through outlets in the rear of the controller facing the machine. Each section is provided with a sheet steel cover which is easily removed by turning a set screw one-quarter turn.

Saco circuit controllers can also be furnished to be attached to the rocker arm and thus give an indication as soon as the latch handle is operated.

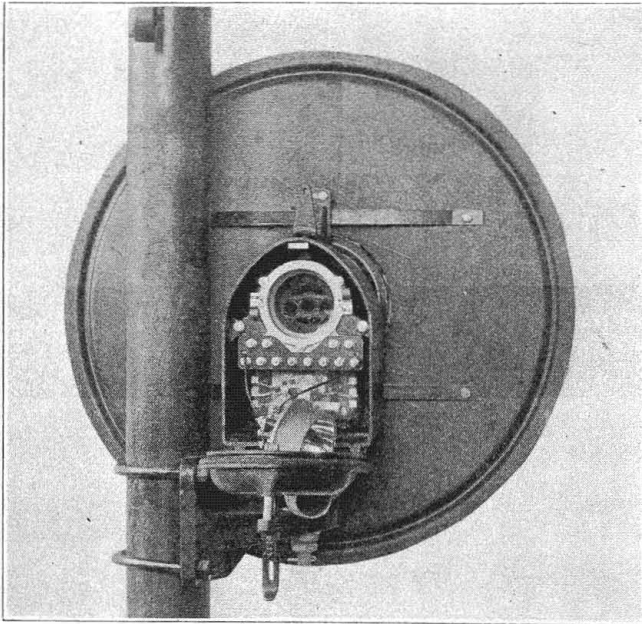
New Long-Range Search-Light Signal

A NEW search-light signal having all the indications in one head has been developed and placed on the market by the Union Switch & Signal Company. It is equipped with standard $8\frac{3}{8}$ -in. diameter long-range lenses and illuminated by a bayonet-socket, candelabra base, S-11, single filament, 11-volt, 11-watt lamp. Indications are given by a three-position relay, carrying a vane with 1-in. colored roundels of very thin heat-resisting glass. The relay operates on a battery or on a-c. through a copper-oxide rectifier. The relay armature winding, which is the controlling element, has a resistance of 250 ohms; the field, which is energized locally, has a resistance of 500 ohms. The normal working voltage of this signal is 8 volts on the field and armature. With 6 volts, the pick-up is from 6 to $6\frac{1}{2}$ volts. With 8 volts on the field and 12 volts charge on the armature the minimum release value is 2 volts. This release value is for full center or "red" position of the relay.

The mechanism is compact and can easily be taken out and replaced. The working parts have been enclosed in a glass case to facilitate inspection. The relay contacts are rugged and the whole mechanism has been given the same refinement in manufacture as has been given to the standard track and line relays. The horizontal and vertical adjustments are separately controlled and are incorporated in the supporting structure; jam nuts insure that once the adjustments are made they can be locked securely and permanently.

This signal can be furnished for installation either as a high or dwarf signal. When used as a high

signal, brackets for mounting directly in front and at the top of the mast, or else 9 in. to either side, can be supplied. Side mounting brackets can also be provided for mounting these units as suspended signals. The standard lenses for long-range are $8\frac{3}{8}$ in. in diameter, but provision is made for the use of a $10\frac{1}{2}$ -in. lens where it is required. Dwarf signals of



Rear view of signal with case open for inspection

this type, ordinarily, are equipped with $6\frac{3}{8}$ -in. lenses with a special deflecting cover glass to take care of the close-up indication. The mechanism is designed, also, to permit the application of prisms in front of $8\frac{3}{8}$ -in. lenses to provide indications on curves. The $10\frac{1}{2}$ -in. lens can be replaced by a spread-light type or by a combination of lens and spreader glass. Both the $8\frac{3}{8}$ -in. and $10\frac{1}{2}$ -in. lens are provided with means for giving a close-up indication.

Kuprox Rectifiers for Signaling

A COMPLETE line of rectifiers and transformers has been placed on the market for railway signaling application by the Kodel Radio Corporation, Cincinnati, Ohio, under the trade name of Kuprox. The latter name applies to a copper colored rectifying element which permits electric current to flow only in one direction. While originally adapted for the supplying of a-c. power from a light socket to a radio set the industrial possibilities of this device developed rapidly and are of special interest to electrical engineers engaged in railroad signal operation.

Considered from the standpoint of appearance and physical properties, Kuprox resembles a disk of sheet metallic copper. From an electrical standpoint, however, it differs from copper in that it permits an electric current to flow in but one direction, viz; from either or both of the outside surfaces to a small terminal extension of the center disk. Practically no current can flow in the reverse direction. This peculiar behavior is due to a thin layer of copper-oxide formed directly upon a sheet of pure copper and coated on its outer surface with a thin copper film. The direction of current flow, as previously explained, is from the copper films through the intervening oxide layers to the underlying copper plate. If the positive terminal of a battery or other source of energy be connected to the central

plate, and provided the critical voltage is not exceeded, no current will pass through the Kuprox disk upon completion of the external circuit. In the Kuprox process, intimate and permanent contact with the copper-oxide rectifying layer is accomplished by first forming the copper-oxide under proper heat and atmospheric conditions, and later reducing the outer surface of the oxide layer by chemical means into metallic copper. The resultant copper film, being formed from a portion of the copper-oxide itself, adheres to, and makes intimate contact with all of the exposed surface of the copper-oxide.

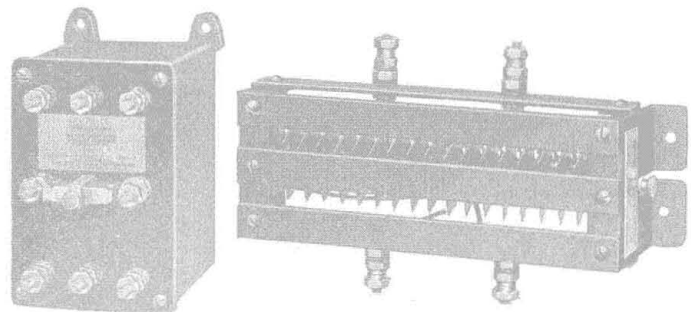
Due to the low electrical resistance of Kuprox, a small number of rectifying disks is required for a given



View of individual Kuprox rectifying unit (B shows connector strap employed for hooking up elements in parallel, series, or series-parallel)

output, resulting, it is said, in low weight, small space and a high efficiency. Perfect contact is established throughout the entire oxide surface by making contact with all parts of the copper film. Inasmuch as there is no pressure phenomenon involved, initial operating characteristics are claimed to be permanently maintained under all normal conditions of temperature and service. To protect Kuprox rectifying unit assemblies from atmospheric oxidization or deterioration, they are coated with a thin layer of moisture and acid-proof enamel. This also serves to protect them from acid spray if employed for battery charging purposes.

A complete Kuprox rectifier consists of the necessary transformer for stepping down the a-c. line supply current to approximately that required by the apparatus to be operated, together with a Kuprox metallic disk rectifier of the proper capacity. A variable resistance unit is also necessary wherever the output current must be varied over relatively wide ranges, such as the trickle charging of storage batteries, etc. While these three units may be furnished within a



Type-CA transformer and Type-RA rectifying unit

common frame or case, it is usually preferable, from a standpoint of standardization and installation, to use separate transformer and rectifying units, such as illustrated. This simplifies the replacement of either transformer or rectifying units in the event this becomes necessary through changed conditions of operation, etc. It also permits the use of Kuprox rectifying units with transformers which may already be on hand or in use.