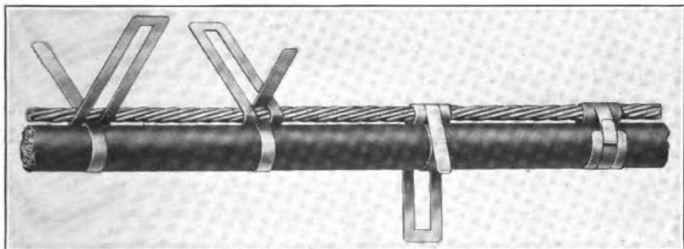


New Devices

THE DAVIDSON CABLE HANGER

A new metal cable hanger possessing a number of advantages has recently been placed on the market and is now in use by the signal departments of several railroads. The form of this hanger and its method of application are shown in the accompanying illustration. It is made from "Armco" iron with a tin and lead alloy coating. On account of the high degree of purity of this iron, the hanger corrodes very slowly as compared with ordinary metal hangers. It has the added advantages



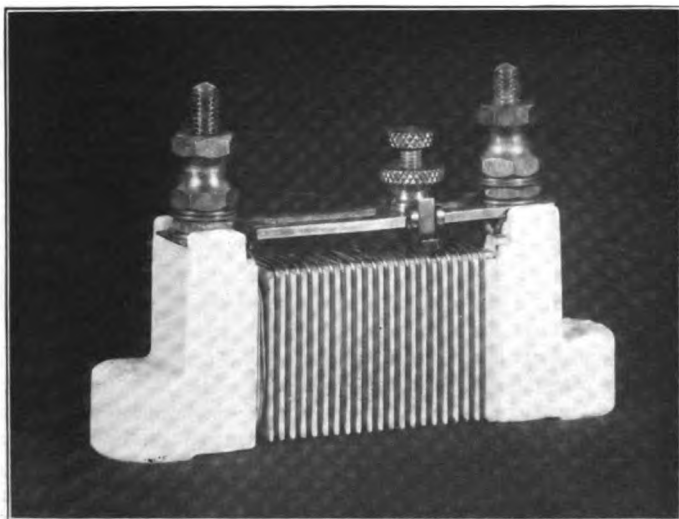
Four Stages in the Application of the Davidson Cable Hanger.

of holding the cable close to the messenger, thereby overcoming most of the vibration to which a loosely hung cable is subjected; of electrically bonding the cable to the messenger by a double tie at each hanger, thereby eliminating punctures caused by insufficient bonding; and of eliminating damage to the lead sheath of the cable at the points of contact on account of the large surface which supports the cable at each hanger. It is stated that cable men have been able to "tie in" 20 per cent more cable per day with these hangers than with either marlin or rings. No tools are required for applying the hangers.

G. R. S. ADJUSTABLE RESISTANCE UNIT

Modern signal practice requires that the flow of current to each track circuit be regulated individually in order that the losses in electrical energy be reduced to a minimum and that the highest efficiency in track circuit operation be obtained.

For this particular purpose, the G. R. S. adjustable resistance unit has been designed. This device, which is of the same



The New G. R. S. Adjustable Resistance Unit.

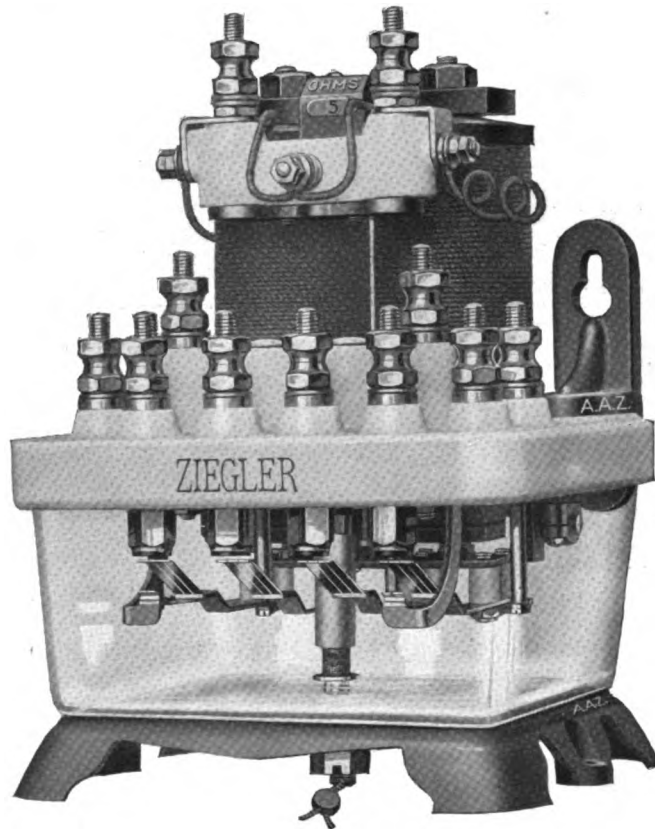
length and width as the G. R. S. lightning arrester, comprises a porcelain base $4\frac{3}{4}$ in. long, $1\frac{1}{8}$ in. wide and $1\frac{1}{8}$ in. high, a number of turns of resistance wire wound in grooves around the middle part of the base, two R. S. A. binding posts with

nuts and washers, a slotted bar which extends from one binding post to a point about one-eighth of an inch from the opposite binding post, and a contacting member consisting of a phosphor-bronze contacting strip, a guide, a tightening screw and a lock nut which can be moved along the slotted bar so as to make the contact with the resistance wire at any one of the several turns. The resistance unit may be mounted in the relay-box, battery-chute or any convenient place.

This unit is furnished in one-, two- and four-ohm sizes, with an adjustment of .05 ohm or .1 ohm at a step. The circuit always remains closed when making adjustments in resistance, and it is a simple matter to read the amount of resistance to which the contacting strip is set.

THE NEW ZIEGLER RELAY

The United Electric Apparatus Company, Boston, Mass., has devised an improved type of the Ziegler d. c. relay to meet the requirements indicated by discussions in the Railway Signal Association. The coils are wound with silk instead of cotton covered wire, and the contacts are graphite to platinum and platinum to platinum, which is believed to obtain the most reliable working results. All contacts are in plain sight from the front of the relay so that circuits can be easily traced, and the contacts are made wide and heavy to carry ample current. The back contacts have a self-cleaning or scraping contact, and are arranged in square inserts to prevent turning.



The Latest Type Ziegler D. C. Relay.

They are set at a distance from the bottom of the glass or casing to prevent trouble from water or moisture, also to eliminate short circuits.

The coils are interchangeable and are covered with cord or shells attached so they cannot turn or break the ends. The cross pieces are fitted with connectors so that in case of a short circuit or a burned-out coil, the other one can be connected for operating the relay until a new coil is provided. Both top and bottom ventilation assures a constant change of air around all of the working parts. A simple locking device is provided for the armature, keeping it closed to stop, so that the contacts cannot get out of place until ready for use. When opened, it cannot again be locked unless the seal is

broken. The relay is enclosed in glass with a perfectly insulated base, and a frame so made that it can be used for wall bracket or shelf types without changing any part of the relay. R. S. A. binding posts are used, and a simple metallic seal is attached to each relay.

THE Q & C MAGNETIC WIG-WAG

The general appearance of the Q & C magnetic wig-wag designed for all weather conditions is shown in the accompanying illustration. In southern California, however, where this signal has been extensively used prior to its acquisition by the Q & C Company, New York, the flag was suspended above the mechanism case by simply reversing the standard, and attaching it to the rocker shaft. This construction is suitable for such a climate. The signal may be mounted either



Improved Design of the Q & C Magnetic Wig-Wag.

on a post or a cantilever bracket, the latter type being shown in the illustration.

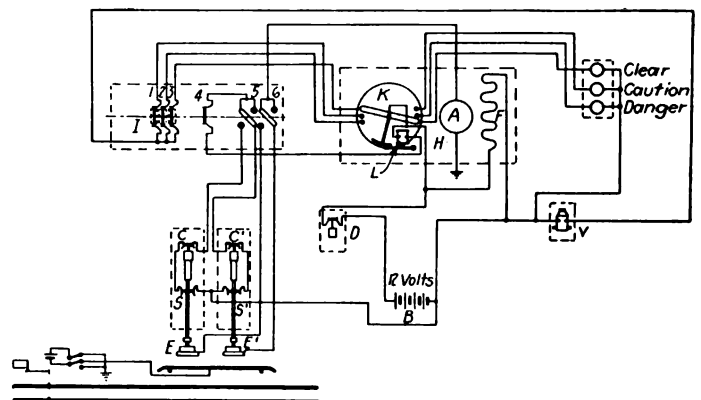
The indication is given by a disc, 26 in. in diameter, which is painted red, and bears the legend in aluminum-leaf lettering. "Stop—Look Out." At the center of the disc is a red bull's-eye lens, illuminated by two electric lamps. A twelve-inch gong is attached to the mechanism. In operation, the red disc is waved back and forth through an angle of approximately 60 deg. at a rate of 72 strokes a minute. At the same time the bull's-eye lens is illuminated, and the gong is sounded at the same rate of oscillation that the disc is waved. The gong, however, can be cut out if desired.

The operating mechanism consists of a pair of electro-magnets wound for any desired voltage. An independently pivoted walking beam switch serves to keep one of these magnets always in circuit. Between the magnets is hung an armature, which is also the rocker shaft for the oscillator. When the driving current is turned on the armature is pulled over to the energized magnet, throwing the walking beam switch to the opposing magnet as it goes over. The armature is then immediately pulled in the opposite direction, and this movement is maintained until the current is cut off.

An independent circuit lights the lamps in the bull's-eye and maintains them continuously until the signal has ceased operating. A simple mechanical attachment on the rocker shaft actuates the gong. These signals can be operated with either direct or alternating current. The magnets for the prevailing type for steam road operation are wound for 8 volts direct current. For electric road operation, the windings range from 500 to 1,200 volts direct current. Where it is desired to use current from a lighting circuit, windings for 110 or 220 volts alternating current are furnished.

IMPROVED JULIAN-BEGGS TRAIN CONTROL

A number of important developments have been made in the Julian-Beggs train control system since its first demonstration in May, 1915, as described in *The Signal Engineer* for July, 1915. It will be recalled that the automatic speed control is effected by a speed recorder which is connected to an axle on the locomotive, and to which is attached a series of contact segments arranged for any predetermined speeds. This basic principle of the system remains unchanged, although there has been added a pole-changing device attached to the recorder which is required for locomotives operating in both directions. The circuits have been very much simplified by the substitution of a three-position cab signal instrument for the three relays formerly used for con-



Revised Circuit of the Julian-Beggs Train Control System.

trolling the cab signals and the connections to the various segments in the speed recorder. The specially designed cab signal instrument has a further advantage over the relays that it is a rigid piece of mechanism which can withstand the shocks and vibrations in service on a locomotive without damage or derangement.

Another essential change has been made in the substitution of a ramp alongside the track for the track contactor previously used. This change makes it possible to secure a longer contacting surface than could be carried on the locomotive tender. The other essential parts of the engine equipment include a train brake valve, cab signal with red, yellow and green lights, air cutout and a twelve-volt battery. The instruments are connected by insulated wires, protected by standard iron conduit.

The special three-position instrument designed for this system consists of an armature mounted on the same shaft with a rotating three-position circuit controller, a constantly energized field coil acting on the armature, and an electro-magnetic lock for holding the armature and circuit controller in the respective positions, counter-weights being arranged to automatically restore these parts to the neutral position when left free to rotate. The accompanying illustration shows one end of this device with the counter-weights in the neutral position. The air cutout marked D in the circuit diagram is provided to open the battery connections when the engine is idle and no air pressure maintained. This is primarily a battery-saving device.

The engine contact shoe, shown in one of the illustrations, is attached to the engine buffer beam in position to engage the ramp rails located beside the track.