

means of a self-locking nut riding on a knife edge structure on the underside of the fingers. All adjustments of the relay, with the exception of the back contact opening, are made on the moving finger structure, thereby avoiding the necessity of adjustable front contacts.

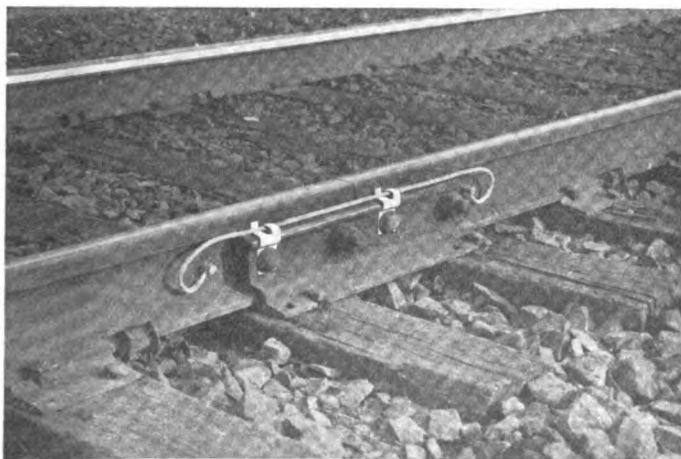
While the relay has been designed to take, when desired, the well known "gauze" contact, manufactured by the Hall Company, a new contact has been developed which has the combined qualities of high current capacity, and low resistance. This contact is a new departure and employs a laminated silver structure which is brought into contact with a large area of the carbon contact. The contact is self-aligning and automatically corrects for uneven burning of the carbon or other inequalities. The uniformly low resistance and high current carrying capacity of this contact is a timely development for the control of light signals employing low voltage high current bulbs.

The completed relay is of compact rugged construction and is adaptable to either shelf or wall mounting. The coil is easily removed without disturbing the relay adjustments, a wide range of resistance windings being available.

The release is approximately 60 per cent of the pick-up current and the working current is very little in excess of the pick-up value. The relay is claimed to be about 20 per cent more efficient than relays of the two coil type.

An Improved Bond Wire Protector

For several years it has been the practice, in connection with bond wire protection, to use a type of protector which required that the track bolt should at all times be tight to hold the protector securely



A View Showing How Bond Wire Is Held in Place by the New Form of Protector

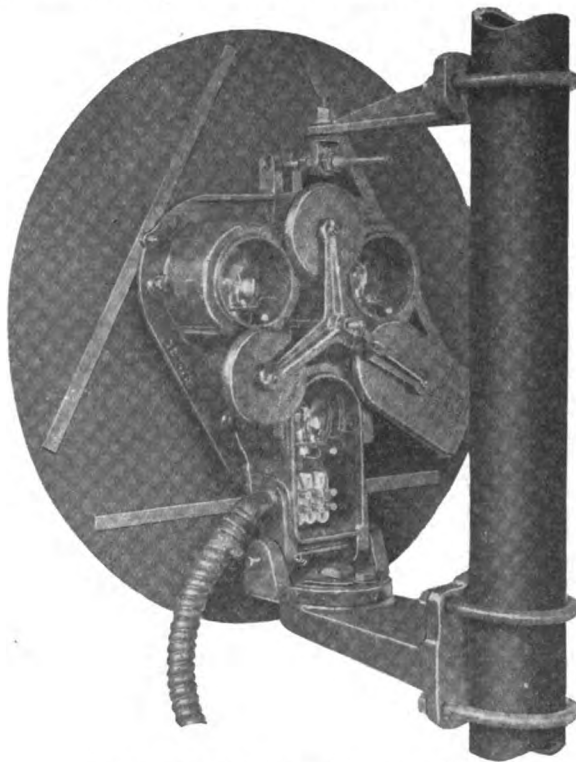
against the splice bar so that the top of the prong engaging the bond wire would be in contact with the slide bar at all times, thus preventing the bond wire from slipping out. It frequently happens, however, that the prong of this wire protector is accidentally bent away from the slide bar or that the bolts become loose, thereby permitting the wire to become disengaged from the protector.

An improvement over this form of protector is found in a new design which consists of two prongs instead of one, with the prongs bent in such a way as to carry the bond wire between them. The ends of the prongs, moreover, overlap so that when the protector is in place

the bond wire cannot become disengaged. To apply or remove the protector from the wire it is necessary to give the protector a quarter turn, otherwise the wire cannot pass in or out of the prongs. This type of protector does not depend for its effectiveness upon the prong coming in contact with the splice bar since it holds the bond wire within itself. This design has been developed by the P. & M. Company, Chicago.

A New Triangular Light Signal

A demand for more compact color-light signal units so that more than one may be placed conveniently on the same pole caused the Union Switch & Signal Company to modify a former triangular design to suit the present day requirements. The lamp units of this new signal, which is known as the Style-TR, are aligned with respect to the finished mounting surfaces



Rear View of Triangular Light Signal

and when placed in the triangular cast iron case, the main beams of light are parallel. Vertical and horizontal alignment of the complete light unit is accomplished by means of the combination adjustment and supporting brackets which secure the case to the mast. Provision is made for telescopic alignment of the light unit to bear on the desired point, however, it is possible to secure good range by using ordinary alignment methods.

The lamp unit consists of the doublet lenses, the outside member of which is $8\frac{3}{8}$ in. in diameter, a rebased lamp held in a receptacle, the position of which is definitely located with respect to the lenses, and a supporting casting. Lamp bulbs may be renewed without disturbing the optical precision of the adjustment.

The cover design of the back of the case is unique as ready access may be had to the lamps and terminals (illustrated in the rear view shown) and it is impossible through negligence to leave the cover off of one lamp unit without also leaving it off the other two, thus assuring that no one indication may be improperly displayed on account of a strong light behind the signal without the other two lenses receiving the same illumination. The

three covers are carried on a centrally supported spider. As the lower one is the heaviest, there is no chance of accidental exposure if the maintainer should fail to secure the hasp.

Balkite Electrolytic Rectifier for Signaling and Telegraph

A new type electrolytic rectifier claimed to require no renewals for at least five years has been announced by the Fansteel Products Company, Inc., of North Chicago, Ill., and is to be marketed as the Balkite rectifier. The rectifying element consists of the pure metal tantalum. This metal is characterized by a complete resistance to all acids common in concentration, excepting hydrofluoric. Therefore, in constructing the rectifier a standard sulphuric acid electrolyte is used in a cell with one lead electrode and a tantalum electrode, which produces a single half-wave rectifier of reasonable efficiency.

This rectifier maintains, according to the tests of the Bureau of Standards, an efficiency of about 43 per cent

reasonable degree of efficiency and no replacement of any sort over a very long period. The rate of charge is dependent as in most other rectifiers on the number of cells being charged and on the secondary voltage of the transformer used.

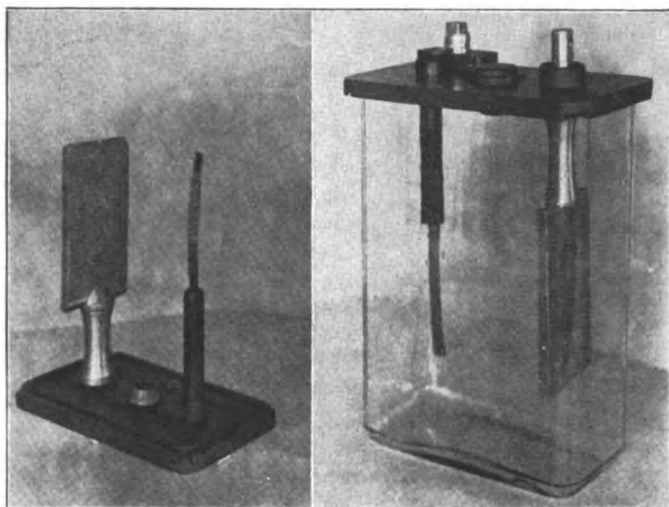
The tantalum rectifier is naturally unaffected by changes in frequency of the a.c. circuit. One special advantage claimed is that the tantalum rectifier will cause no disturbing inductive hum on adjacent circuits which is especially desirable for charging storage batteries for telegraph and telephone circuits.

The E. A. Lundy Company, with headquarters in Pittsburgh, Pa., is the railroad sales agent for this rectifier.

A New D. C. Power and Light Outfit

The Western Electric Company is offering a new model power and light outfit called the 8-DC. It is especially designed for railway needs where a small outfit will meet the requirements. The machine is rated at 750 watts but is claimed to actually develop more than 850 watts on a battery charging run. The design incorporates improvements such as automatic control of the tapering charge, positive oiling system, accurate timing, air cooling and close speed regulation.

The tapering charge is controlled automatically from the beginning to the end of the charge, which protects the battery and assures long service. In the oiling system of the 8-DC is a positive action pump which draws oil from the bottom of the crank case and forces it to the



Rectifier Elements
Attached to Cover

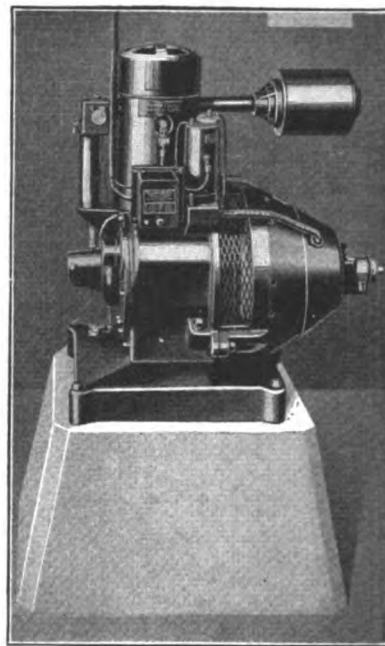
Rectifier Assembled
in Glass Jar

when charging 5 or 6 cells at about 10 volts, at a current of between $\frac{1}{2}$ amp. and 1 amp. Efficiencies when charging are lower for one cell than in other rectifying devices and in this case are not quite so favorable to the tantalum Balkite rectifier.

The electrolyte in this battery charger is not used up, and it is claimed that the only replacement is the addition of distilled water at intervals depending on the rate of charge and volume of electrolyte in the cell. With a charger of this type which has operated under test for 15 months on the Chicago & North Western, water was added for the first time at the end of a year. This rectifier was charging seven storage cells at about 350 m.a.

This test charger was made up in a standard primary battery glass jar. At the conclusion of the test the tantalum electrode showed no attack whatsoever and on the basis of its behavior it would be safe to estimate a minimum life under these conditions of at least five years.

The rectifying action of the tantalum metal is not affected by changes of temperature but will continue with about the same degree of efficiency in any point between the boiling point of the solution and the freezing point of the sulphuric acid electrolyte which, of course, is the same as in storage batteries. The device, therefore, appears to promise extremely low maintenance cost, a



The New Gas Engine Driven Power and Light Unit

main bearing. The cylinder, crank pin bearings and all other moving parts run in a bath of oil created by a splasher.

Air cooling provides an ideal operating temperature facilitated by a new type of fan especially developed for this outfit. Speed control that increases the battery life is obtained by a centrifugal type throttling governor. A constant speed is maintained which combined with the inherent characteristics of the generator and battery, results in a gradual reduction of current delivered to the battery. This control provides the so-called "Tapering Charge" generally accepted as a highly beneficial aid to increased battery life.