2. Interference may exist when passing over manganese frogs and crossings.
3. Introduction of rails of special material will be to some extent objectionable.

Continuous Electrical Contact Type (II-A-1)

This type employs a continuous conductor. When placed at the track level, the conductor is usually in the form of a rail of lighter section than the running rails of the track. In some devices of this type the track rails are utilized as conductors. In normal operation the train contract element must remain in constant engagement with the roadside contact element. The train apparatus may be of the same kind as that used in the intermittent electrical contact type. The chief characteristics, in addition to those already noted as common to its character and class, are as follows:

1. The use of a continuous conductor renders it possible to use current at a higher voltage than is generally feasible with other contact type devices.
2. Contact must be maintained with the roadside conductor.
3. Special construction will be required at highway and railway crossings, crossovers, turnouts, etc., to avoid breaks in the continuous conductor.
4. Frost and dirt may cause interference with contact.
5. Introduction of special conductors along the roadside will be objectionable.

Induction Type (II-B-1)

This type employs either the running rails of the track or special conductors on the roadside. Some of the roadside and train elements required are dissimilar to those used in other types, such as the alternating current track circuit and apparatus to amplify the current transmitted to the train.

The following are the chief characteristics of the type so far as known:

1. Energy required in the roadside apparatus is comparatively small in amount.
2. No roadside apparatus which interferes with clearance requirements is necessary.
3. Operation of the device is based directly on the track circuit.
4. The amplifying element proposed has not been subjected to service tests and its reliability for the purpose intended has, therefore, not yet been determined.
5. So far as known this type requires the use of alternating current in the track rails.
6. Its operation may be affected by location of insulated joints.

Wireless Type (II-B-2)

Some progress has been made in developing new methods of applying the wireless principle to the operation of an automatic train control device. Practically all the work accomplished in this line has been of a laboratory nature and definite information as to the results attained is not available. The chief characteristics of this type are as follows:

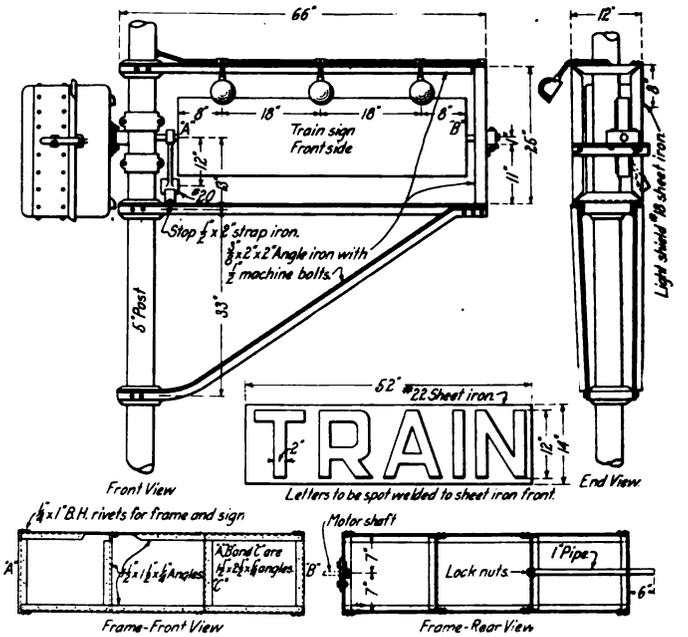
1. A continuous conductor is required along the roadside.
2. Different frequencies are required for different tracks or directions.
3. Special apparatus is required to produce current.

A Correction.—In the abstract of the report of the Automatic Train Control Committee, published in the last issue of the *Railway Signal Engineer*, on page 35, the name of the Nevens-Wallace Train Control Company—electrically-controlled mechanical trip type was omitted from the list of devices found available by the committee for further test and the description of this type was printed after the name of the National Safety Appliance Company, whose device is of the induction type.

A TRAIN SIGN USED AS AN INDICATOR

By G. K. Thomas
Assistant Signal Engineer, Atchison, Topeka & Santa Fe, Topeka, Kansas

A NUMBER of locations exist on a railroad where it does not appear to be economical to install switch indicators because of the fact that a number of switches are located close together and in such a position that one large indicator of some kind could easily perform the duty of as many as eight or ten standard switch indicators. The accompanying sketch shows an arrangement which has been designed for the above use. It consists of a signboard having the word "Train" on its face in large letters. It may be operated by almost any style of top post signal mechanism. Its normal indication (when no train is approaching) is face downwards, and it is held in this position by the hold-clear device in the signal mechanism in exactly the same manner as a blade is held in the clear position. When a train occupies the approach circuit, the current is cut off in the usual manner and the counterweight causes the sign to rotate through an angle of 90 deg. so that its indication can be read. A contact in the mechanism closes when the sign is indicating the approach of a train and energizes the three lights which are provided with parabolic reflectors. The lights may be operated from the regular signal battery and if 2½-watt 10-volt lamps are used the sign can be seen for a distance of approximately 700 ft. in ordinary weather. A number of these devices are in service and have proved very satisfactory.



Letters on train sign to be white enamel on a dark blue background. Motor shaft 1¼ in. square and to be 1½ in. longer than standard.

Construction Details of the Train Sign

An Anglo-Italian syndicate is reported to have presented to the Federal Government of Brazil an elaborate scheme for the electrification of the Central railways, a Government owned enterprise. A similar project has already been put before the Administration by a French syndicate and the granting of the concession will depend upon the terms offered. It is believed that the government engineers are in favor of the French offer being accepted.