

Crossing Protection Installed Extensively on the Milwaukee

Recent installation of wig-wag, flashing-light and rotating disk types of signals has increased safety and reduced cost of operation

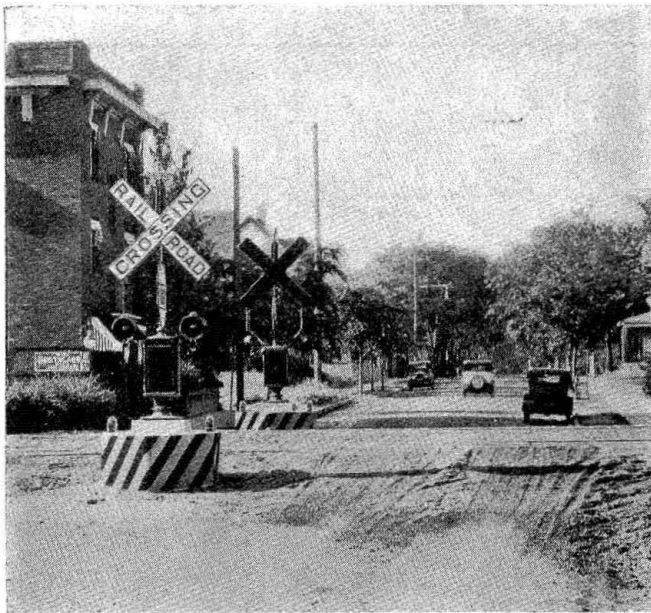
By L. B. Porter

Assistant Signal Engineer, Chicago, Milwaukee, St. Paul & Pacific

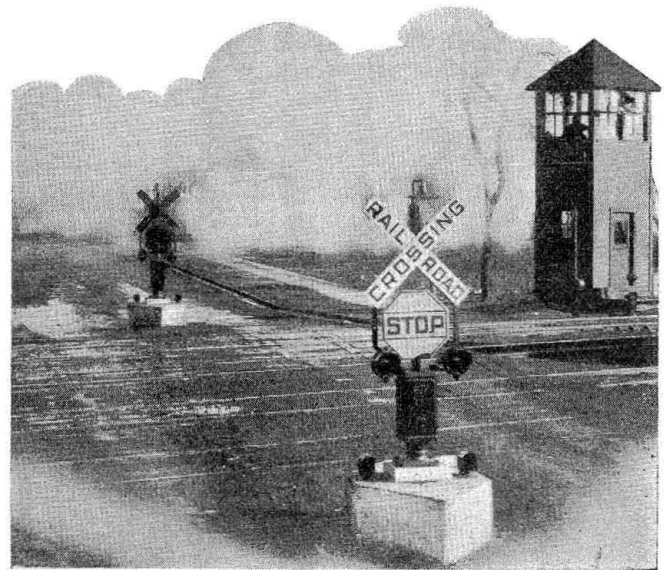
A GREAT deal of consideration is now being given to the means of providing protection for the public at street and highway grade crossings of railroads. The objective is, of course, to afford maximum protection at minimum cost. Different schemes of control such as automatic, manual, or a combination of both, are being used. In many instances, centralized manual control of the signals at several crossings is feasible. Where only part-time manual protection had previously been in effect, the installation of crossing signals arranged for operation throughout the 24 hours, increases the safety. When this, together with other features such as greater effectiveness, flexibility and dependability, are fully explained, city authorities are more ready to go along with the idea of replacing the older forms of protection.

Griswold Signals Installed in Twin Cities

During the past year and a half, 88 Griswold signals, including 11 of the traffic type, have been in-



Stop disk is rotated 90 deg. when no trains are approaching stalled at crossings on the C. M. St. P. & P. in St. Paul and Minneapolis. This type of signal was adopted as a result of a number of conferences with the city planning engineer, traffic committee and



Rotating disk-type crossing signals at 24th street, Minneapolis

other city officers. The most recent installation, consisting of 50 signals providing protection for 19 adjacent street crossings, is probably one of the largest single installations of its kind ever made.

This installation, as well as six others in the Twin Cities, was handled by the Griswold Signal Company under contract. This particular installation was completed in one month. An idea of its size may be gained from the fact that 65,000 ft. of wire and 5,000 ft. of conduit were used. The contractor used metal forms for concrete work and cabinets made of celotex, with oil heaters inside, were placed over the foundations to keep them from freezing as the work was done in cold weather. An Ingersoll-Rand pavement breaker was used to cut through the pavements to lay cables. The cables are No. 8 single-conductor 600-volt, lead-covered.

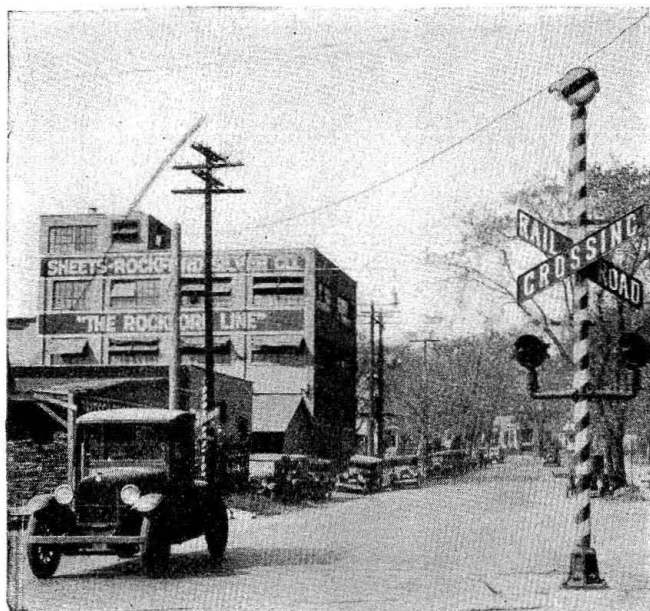
Heavy Traffic Conditions

The 19 crossings are located between the Minneapolis passenger station and South Minneapolis, at which point the tracks from St. Paul and East, the Iowa and Minnesota divisions from the south, and the Hastings and Dakota divisions from the west, converge. In addition to trains of the Milwaukee, the Chicago, Rock Island & Pacific and the Minneapolis, St. Paul & Sault Ste. Marie also operates over the Milwaukee tracks in this territory. A total of 140 regular trains are scheduled over these crossings daily and in addition a great many coach and switching movements are made. The number of tracks over the crossings varies from 5 to 11. The right-of-way cuts diagonally through a highly congested area of the city, intersecting several streets on which the traffic is exceptionally heavy. A number of the streets carry over 15,000 vehicles in 8 hr. in addition to a heavy street car movement.

A total of 66 gates were removed from the 19 crossings. Twenty-four-hour protection is provided in place of 10 and 18 hr. protection, previously furnished at all except three of the crossings. The number of accidents occurring at these crossings has

this was not possible with the slower operation of the gates. Street traffic is thus speeded up.

Some of the other special features connected with this double crossing are: (1) Longer timing of the "Traffic Change" for signals on one side to prevent vehicles being caught on the tracks by the opposite



Flashing-light signal at Rockford, Ill.

stream of traffic, because of the greater distance to be traveled from that side on account of the diagonal nature of the crossing; (2) elimination of the "Traffic Change" from "Stop" to "Go"; (3) the co-ordination of manual with time control; (4) the use of indicators to tell the policeman when he has control and to aid the watchman in synchronizing his control.

While the circuit scheme is naturally rather complicated, the actual control and operation is quite simple. Both the railroad officers and city authorities are enthusiastic over the new signal system. The crossing signals (except where supplemented by traffic signals) are considered "Stop and Proceed" signals rather than "Stop and Stay." The stop is, however, required by city ordinance and state laws when the signal so indicates. Inasmuch as the "Stop" sign is identical with that which is now being used nationally at highway intersections and other points, the observance of the signal has been very good and the number of accidents has been materially reduced. Bells are not considered necessary with this type of signal and are not used.

Flashing-light Signals in Other Cities

Signal Section, A. R. A., flashing-light signals were installed recently at six crossings in Rockford, Ill. The signals at five of these crossings are grouped under a single manual control and at the other crossing the operation is automatic with track circuit control. Formerly four of these crossings had part-time gate protection and the other two were unprotected. The installation of the signals, in addition to affording better protection, has resulted in a saving in operating expenses.

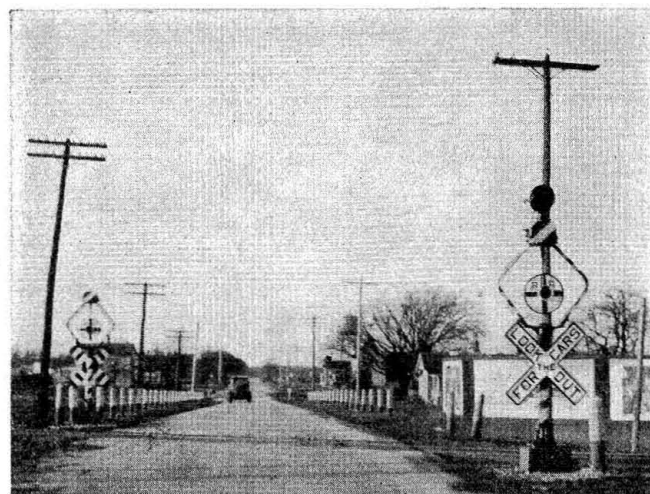
These signals are operated direct from a-c. power with a central battery of seven large capacity storage cells for reserve. One of the signals at each crossing is equipped with a bell, and the bells, together with

the flasher relays, are operated from the storage battery. Signals were placed at the side of the street and pilot lamps were, therefore, not required.

One crossing is located at a distance of about 900 ft. from the control tower, and for that reason a track indicator is provided to show when trains are approaching or have cleared the crossing. The use of such indicators often makes it possible to lengthen out the control zone so that additional crossings can be included. It is planned to extend this installation so as to include four additional crossings, although in this case the signals will be arranged for automatic operation with time-element "cut-outs" and automatic "restarts" to take care of switching movements.

Wig-Wag Signals Used Effectively

In a recent installation, 10 crossings at Iron Mountain, Mich., were protected by Signal Section, A. R. A., wig-wag signals. This protection was installed as a result of joint survey made by representatives of the railroads, the city, the chamber of commerce, and the Michigan Public Utilities Commission covering all crossings inside the city limits. Eighteen signals were installed on the C. M. St. P. & P. and about the same number of crossings on the C. & N. W. The signals are arranged for operation under a combination of automatic and manual control. Standard track circuit, interlocking relay control is provided and, in addition, two men are employed during the day time when most of the switching is done. The controls are arranged so that these men can cut out the signals at any time or put them in operation. Six of the crossings are grouped



Wig-wag type of signals with bell

under one control and four under the other. Track indicators are provided in the towers for the crossings that are located some distance away.

Two wig-wags are provided at each crossing and they are located in the center of the street where space permits, otherwise they are at the side of the street. These wig-wags are of the low top-os-post type and the banners are equipped with two 18-watt lamps with a reflector behind each. These lamps give a good daylight indication and, with the swinging banner, make an effective signal. There is the added advantage of an indication in each direction. Bells are also used in this installation.

The central battery scheme is used and all signals are operated from three storage batteries which are on a-c. floating charge.