

Crossing Signals on the C. & N. W. at Oshkosh, Wis.

Flashing-light signals
with rotating STOP sign
at two crossings on a
double-track main line

THE DOUBLE-TRACK main line of the Chicago & North Western crosses several rather heavily traveled streets in the residential section of Oshkosh, Wis. For some time there has been considerable agitation for some kind of protection at these crossings, and after several conferences between city authorities and representatives of the railroad, the railroad agreed to install automatically controlled signals at the crossings at Sterling and Lincoln streets.

Traffic Involved

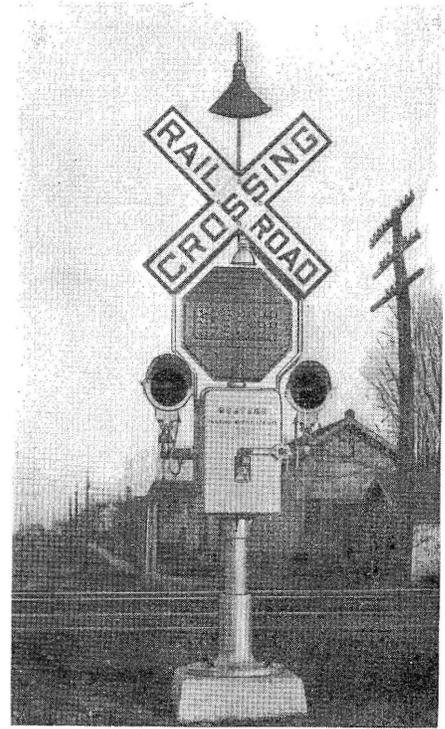
Neither of these streets handles through traffic of a U.S. highway, but the local traffic between the business and residential sections of the city is confined to these streets in this territory. Furthermore, the view of approaching trains is partially cut off by homes and other buildings. The railroad traffic includes seven passenger trains, four freight trains and about six switching movements daily. The through trains operate in this

territory at speeds from 30 to 60 m.p.h.

The rulings of the Wisconsin Railroad Commission approve the use of either the wig-wag signal or the flashing-light signal with an illuminated rotating stop sign. The latter type was suggested by the city council for this installation at Sterling and Lincoln streets. The signals are mounted on masts which are situated at the right of the streets approaching the tracks. Each signal consists of standard flashing lights, with separate back lights mounted at the side of the mechanism which operates a Federal standard octagonal stop sign, and a "Railroad Crossing" sign, with a flood light, is mounted at the top.

Type of Signals

The signals, complete with signs, were furnished by the Western Railroad Supply Company, the mechanism being the Model-6, equipped to operate on 10 volts d-c. The main light units have $8\frac{3}{8}$ -in. roundels and



Signal indicating "Stop"

are equipped with 10-volt 18-watt lamps, while the back light units, with $5\frac{3}{8}$ -in. lenses, are equipped with 10-volt 5-watt lamps. The small floodlight, which illuminates the rotating disk STOP sign, when in the danger position, has a 10-volt 10-watt lamp. The larger floodlight, which constantly illuminates the "Railroad Crossing" sign during the hours of darkness, has a 110-volt 25-watt lamp. As an additional safety feature, the word STOP, on the rotating disk, is outlined with $\frac{3}{4}$ -in. clear reflector buttons, which show up at night under the reflection of light from the head lights of approaching motor vehicles. The lettering on the sign is 6 in. high, being printed in black on a yellow background. As special protection for pedestrians, a Model-222 10-volt d-c. crossing bell is provided at each crossing, this bell being mounted on the mast above the relay case.

Operating Mechanism

The mechanism for rotating the STOP banner, is operated by a $1/300$ hp. 10-volt d-c. motor requiring 4.1 amp. to drive a planetary gear through a worm gear, clearing the signal in 1.5 seconds. The signal is held in the clear position by a slot magnet requiring 17 m.a. at 10 volts



View of two signals in clear position

d-c. When a train enters an approach section, the slot magnet is de-energized, thus permitting the entire planetary gear to rotate freely and allowing the weight to drop, which rotates the vertical shaft and banner 90 deg. to the stop position. When the train clears the crossing, the slot magnet and the motor are energized simultaneously. A latch engages a ratchet on one-half of the planetary gear case, thus holding it stationary, and the motor driving the shaft of the planetary gear causes the other half of the gear case to rotate, thus pulling a chain which raises the

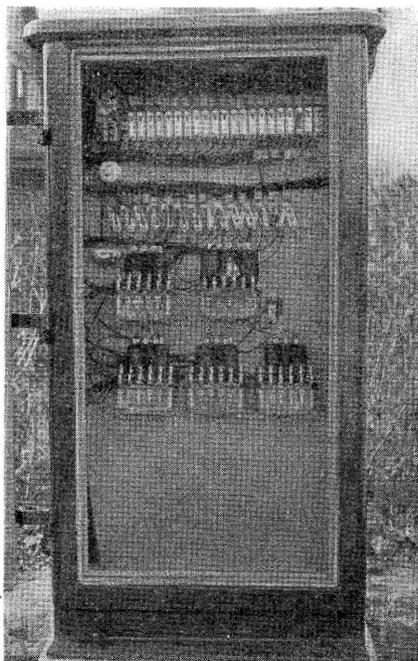
the stop indication will continue until the rear of the train passes.

Instrument Cases

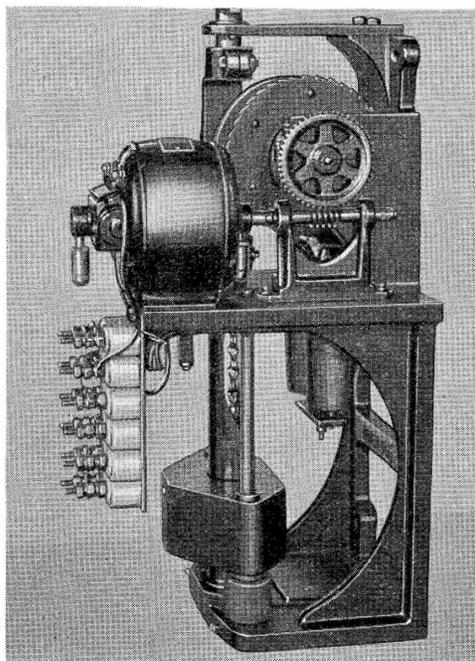
At each crossing there is a Style-C, G.R.S. welded sheet-metal case, with a door on the front and rear, and a center partition dividing the case into two compartments, the one on the track side being used for the relays and the other for the battery, transformer, rectifier and time-clock.

The relays are the General Railway Signal Company's Style-K, of the wall-mounted spring-suspended

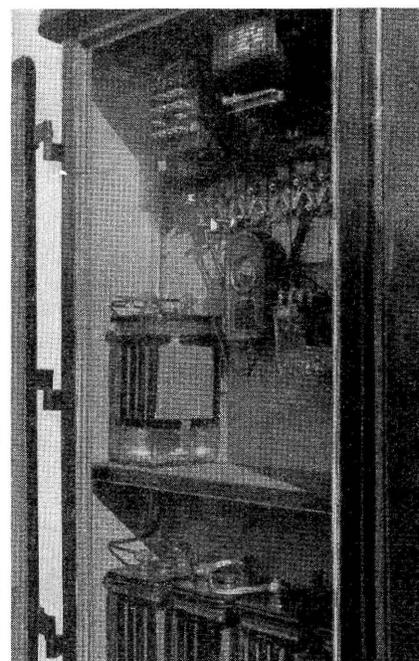
by a G.R.S. Type-BT-232 rectifier which is fed from a G.R.S. Universal, Size U1 transformer. Under normal conditions this transformer also feeds the flasher lights but, in case of an a-c. power outage, the power-off relay functions to switch this feed to the battery. The W.R.S. Co. Model-89 time clock controls the 110-volt feed to the floodlights above the crossbuck signs. This device can be set to turn the lights on in the evening and turn them off in the morning, and is operated by a clockwork mechanism which is electrically wound by an induction motor but does not depend on ac-



Porcelain-based terminals above relays are set at 45 deg.



View of signal mechanism removed from case to show parts



Rectifier, battery and time clock mounted on field side

weight. The weight fits around the vertical shaft, and by means of rollers running in a spiral slot in this shaft, it is rotated, thus causing the banner to turn through 90 deg. from the stop to the clear position. At the completion of this operation, the motor is cut out.

Track-Circuit Control

The signals are controlled automatically by track circuits for normal direction operation on each of the two tracks. A 50-ohm Style-K neutral line relay, controlled through the track relays in the approach sections, is used at each crossing for the control of each track. The release of either or both of the line relays causes the signal to indicate stop. The insulated joints are located on the receding side at each crossing so that

type. Fifty-ohm relays are used for the line control circuits and four-ohm relays for track circuits. One Style-K flasher relay is used for the two signals at each crossing. The row of porcelain-based terminals just above the relays is set at an angle of 45 deg. Each base has an independent terminal post at each end, and metal link plates are used where necessary to connect diagonally to the lower post on the adjacent base. The purpose of this arrangement is to prevent overlapping or bending of the wires from the relays to these posts as well as wires extending from the terminals up to the cable above.

On the field side of each case, four cells of the main battery are located on the bottom shelf, with a fifth cell at one side of the second shelf. This battery is of the Exide lead-plate DMGO-9 type. The battery is charged

curately controlled frequency for time keeping. It will continue to keep accurate time during power outages of a duration up to three hours.

Parkway Cable Used

The wiring between the instrument case and each signal is in a nine-conductor No. 9 Okonite parkway cable which is made up with insulated conductors, jute, lead sheath, jute, two wraps of steel tape, and jute covering. The track wiring, which is buried in the ground, is single conductor No. 9 Okojute with underground finish. The new signals at these two crossings have been in service since October 25, 1934, and the protection afforded has been highly satisfactory to the users of the crossing, as well as to the mayor and members of the city council.