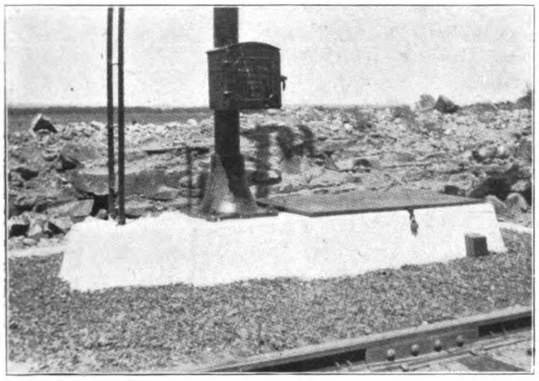
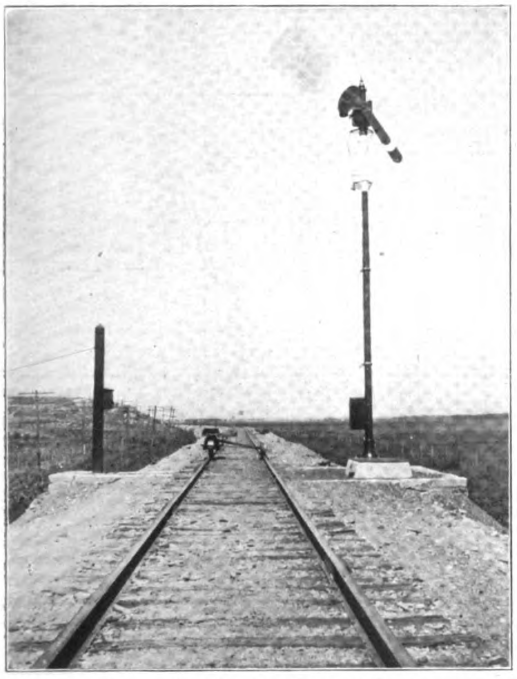
tion as shown in Fig. 7, being riveted to a ⅜ in. x 2½ in. x 8 in. iron strap which is set into the form, as illustrated. A hasp staple on the opposite side from the hinges is attached to an iron of about the same size, which also is set into the concrete. A 3-16 in. x 1¼ in. felt gasket is placed along the edges of the inside of the cover where it rests on the concrete.

Fig. 2 shows the plan of a combination re-inforced concrete stub pole, battery box, and relay box foundation. The method



Signal Foundation and Battery Box.

of construction is identical with that of the signal foundation and battery box in so far as the box and its details are concerned. Still another combination is shown in Fig. 3, which is the plan of a stub pole, battery box and signal foundation. The details of the stub pole are shown in Fig. 6. It is re-inforced with seven ½-in. x 12 ft. round iron rods



Automatic Signal and Foundation.

placed as shown, and a 2-in. fibre conduit extends vertically through its center. The standard six-way lightning arrester box is shown attached to the stub pole, ⅜-in. x 10 in. bolts being used for this purpose. The stub pole as used with the battery box and signal foundation, Fig. 3, and the battery box and relay stand, Fig. 2, is constructed in the same manner and to practically the same dimensions as when standing alone. The foundation of the pole in both cases is integral with the side of the battery box, and the fibre conduit is run into the box in the same manner as in Fig. 1. The stub pole in Fig. 6, is shown as 10 ft. high above the rail. When the pole is made part of the battery box, as in Figs. 2 and 3, the top of the pole is 9 ft. 4 in. above the top of the box, which is 8 in. above the rail. The signal foundations are made in each case of the proper depth to take advantage of the ground conditions at the point where the signal is erected. The whole outside of the box and whatever foundations are attached to it, are given a batter of 2⅜ in. to 1 ft. extending down 24 in. from the top of the box.

ELECTRIC INTERLOCKING AT GRIFFITH, IND.

An all-electric interlocking plant for the protection of the crossings of the Michigan Central, the Erie, the Elgin, Joliet & Eastern, and the Grand Trunk, has just been completed at Griffith, Ind. The work of construction was done by the Federal Signal Co., and the electric machine made by that company was used. The machine has a 64-lever frame with 11 spare spaces. There are 35 levers for 35 signals and 18 levers for 19 derails and 7 switches. Electric approach and

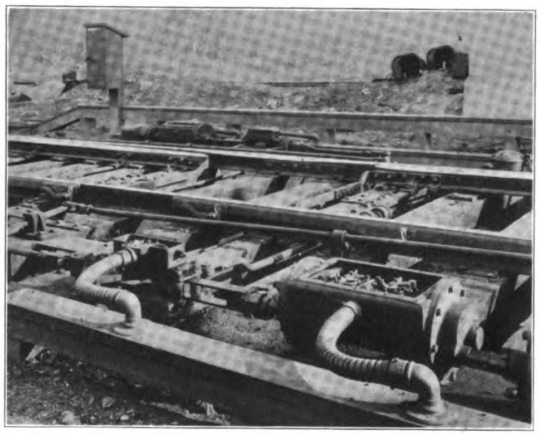


Fig. 1. Switch Movement and Connections.

detector locking is provided on the tracks of the Erie, and on the other roads there is detector locking only. This locking is effected by means of electric locks attached to the lever quadrants. Detector bars are also provided throughout the plant. Annunciators were installed to show the approach of a train to each distant signal. These are 10 in number. There are 9 electric locks, 15 track relays, and 8 secondary relays at this plant. The electric locking circuits are operated by 40 cells of potash primary battery, these being connected in two sets of 20 in parallel. The signals on the Erie are upper right hand quadrants, while those on the other roads are worked in the lower right hand quadrant. The plant was built for the Elgin, Joliet & Eastern. A diagram of the track connections and signals is shown in Fig. 2.

The Federal all-electric machine is a miniature mechanical Saxby & Farmer machine, to which have been attached the necessary circuit breakers and controllers and indicating devices, to enable the levers to govern the operations of the switch and signal mechanisms. The circuit controllers are mounted on a vertical roller, which, in turn, is mounted on a slate panel situated in the lower front portion of the machine. The roller is turned to open and close the various circuits through a crank attached to the lever. In case of a switch movement four contacts are provided for as follows: One to shift the current from one to the other of the control wires when the lever is moved, two to connect the control wire which will be used in the next operation of the switch to common, and the fourth to connect the indication coil to the indication wire which will be used in the next operation.

Only half as many connecuons are used in the operation of a signal as there is no reverse indication or normal control circuit. Two operation and two indication wires in addition to the main common wire are required for a switch movement.

Fig. 1 shows the switch movement made by the Federal Signal Company. It consists of an ordinary mechanical switch and lock movement driven by an electric motor through a screw motion, and it is provided with circuit controllers to cut out the motor at the end of the stroke and to close the indication circuit. The control wire for the next operation of a switch movement is connected to common at the same time the motor is cut out at the end of the stroke. The motor has two field windings, one for the normal and the other for the reverse operation.

The indication in the machine at Griffith consists of a single impulse from the secondary of an induction coil located in the tower. There is usually only one indication coil for a plant. The primary circuit is closed at the lever when it reaches the indicating position, and the impulse from the secondary goes out through a contact on the lever over the last operating wire to the movement and back through the common wire. The indication coil, which is in this circuit, is constructed so as to respond only to the high voltage current generated in the secondary winding of the induction coil. This indication circuit is different from that in former machines of the Federal Signal Company, a battery indication above noted, that only reverse control and normal indication wires are provided. It is not considered necessary for a signal to indicate reversed.

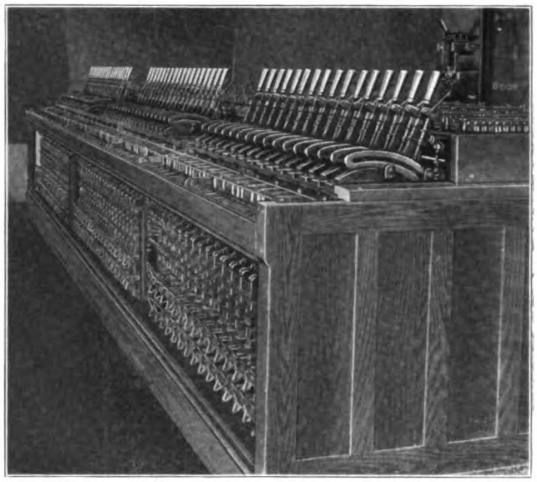


Fig. 3. Interlocking Machine, Griffith, Ind.

The machine installed at Griffith is shown in Fig. 3. It

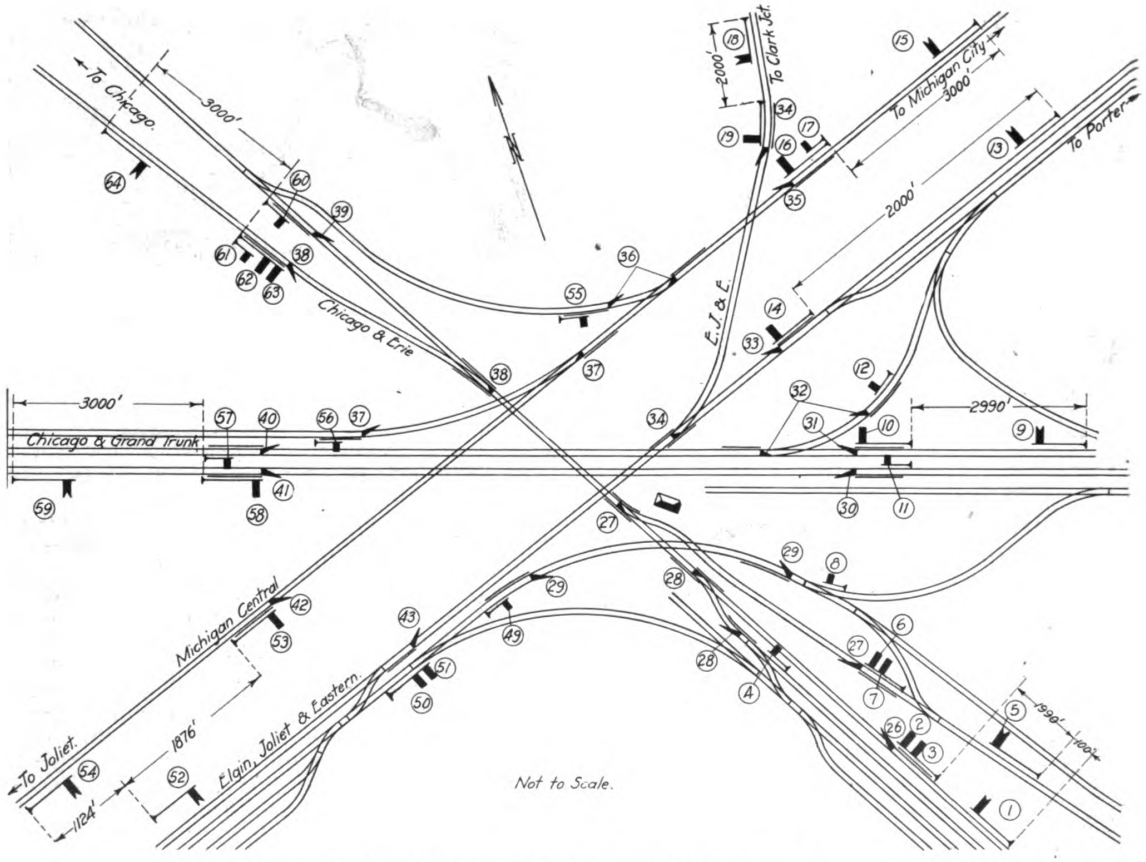


Fig. 2. Diagram of Tracks and Signals at Griffith, Ind.

having been used in several previous installations.

The control and indication circuits for the signals are substantially the same as for switches with the exception, will be seen that the circuit controllers placed, as they are, in the front of the machine, are very easy of access, for connecting up the wiring or for trouble hunting.