Crossover Protection on the G. M. & O.

THE Gulf, Mobile and Ohio, after giving considerable study to the subject of protection of main-line crossovers, to meet the requirements of I. C. C. Rule 51 (b), will install electric switch locks on hand-throw crossover switches between main tracks in its double-track automatic block signal territory between Chicago and St. Louis. Most of the crossovers are not used ordinarily but, they are being retained in service for use in case of an emergency. These crossovers soon become so rusty that no dependence can be placed on the shunting of track circuits, especially by light engines.

As applying to these rusty crossovers, an analysis brought forth the facts that electric locks would automatically enforce the three-minute rule, i.e., control the signals in the approach to the crossover to their most restrictive aspect for three minutes or more before either switch could be opened, thus preventing the crew of a light engine from working its way through a crossover, by opening one switch, running the engine on to the crossover and closing the switch before setting the signals at Stop on the other track. The electric lock is applied to the pedal of the toe-operated toggle which holds the hand-throw lever of the stand in the normal position. This type of electric lock is applicable to any of the several types of switch stands which are operated by a throw-over lever. Included in the electric lock device is a circuit controller in which the contacts are normally closed by action of a cam that is held against the spring tension by the hasp of a regular switch lock.

When a train or light engine on either main track is to use the crossover, the rules require:

(1) Trainmen are to observe that no train is approaching on the other main track.

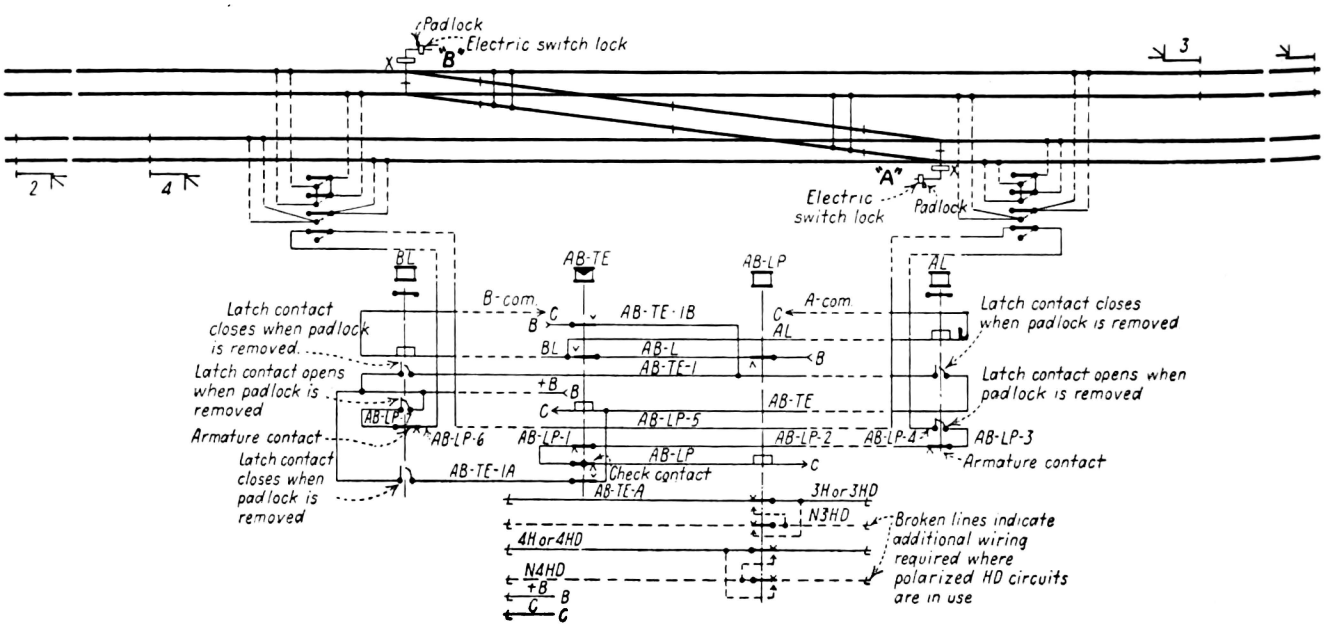
(2) If no train is approaching, trainman is to remove the padlocks from *both* switch stands of the crossover. To remove a padlock, the tension of the spring is released by pressing with his foot on the upper toe pedal marked "Depress to Apply Padlock."

(3) Having removed both padlocks, the trainman is to take no further action until the end of a specified time. Upon elapse of the time, the electric locks on both stands are released. As applying to a given stand, the release of the electric lock releases the lever latch so that the trainman can operate the latch by placing his toe on the toe pedal. Then the lever can be raised to throw the switch. Thus the trainman can reverse both switches, and permit the train movement.

(4) After completion of the train movement, both switches must be restored to the normal position and locked with the padlocks.

From the circuit standpoint, when the padlock on either stand is removed, the lock-repeat relay LP is released, and contacts of this relay open the line control circuits of the signals on both tracks, thereby controlling these signals to their most restrictive aspect. Having removed the padlocks on both stands, latch contacts are thereby closed to complete the circuit to start the operation of the time-element relay, the relay being set to operate in accordance with customary time locking basis, i.e., time for an approaching train to receive an Approach and a Stop aspect, or if a train has already passed the signal, to allow time for it to arrive at the crossover if traveling at a speed faster than slow speed prepared to stop.

When the time-element relay completes its operation, battery feeds through a back contact of the LP relay and a front contact of the TE relay to energize the coils of the locks on both switches. After the train movement is complete, the switches are placed normal and the latches are locked with the padlocks. This releases the time element relay TE, and an open front contact of this TE relay opens the circuit for the coils of the electric locks so that the back armature contacts are closed. This completes the circuit for the LP relay so that it is again picked up. Front contacts in this relay complete the circuit for the signals, thus restoring the circuits at the crossover to normal condition. When installing the electric locks, no change will be made in the track circuit arrangement on the crossovers, which is the previous standard arrangement, with the shunt from each main track extending, on the rails of the crossover, to insulated joints at middle of crossover.



Circuits for electric switch locks on non-interlocked main-to-main crossover in automatic block signal territory