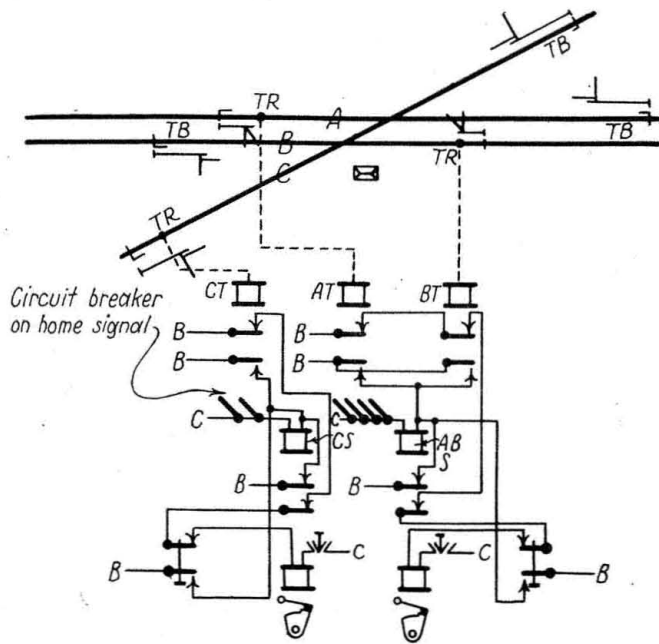


Electric Locking Protection at Interlockers Operated Without Derails

"When and where is electric locking needed to lock signal levers normal (normal release lock) in a plant operated without derails? How should such a lock be controlled?"

Circuit Scheme Employs Master Levers Electrically Locked

THE accompanying sketch of electric lever locking is based upon the standard practice of the Canadian National, Central region. The volume and character of the traffic at the crossing would determine whether or not electric locking such as indicated in the sketch



Typical Canadian National locking circuit for crossing operated without derail protection

would be needed. It can be seen from the circuit that master levers are used in order to lock one route against the other, one lever only being required for each road. While the circuit illustrated is for detector locking, it may be converted to approach or route locking by carrying the control of the electric lock to the approach signal or beyond.

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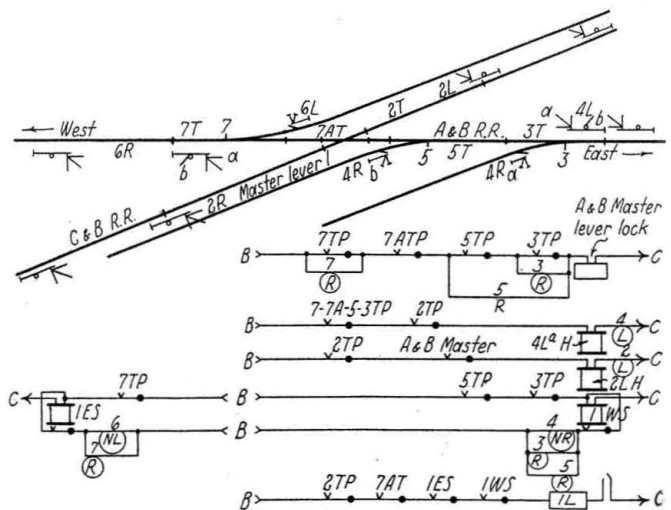
Recommends Use of a Master Lever for Each Road to be Locked Electrically by Master Relays—Operating Flexibility May Be Secured by Providing Release Lock on Such a Lever

WHERE a grade crossing interlocking is installed with derails, the interest of each road extends only to the derail protection on the other road. However, where derails are omitted each road at once becomes vitally interested in the signal arrangement on the crossing road. It cannot be denied that derails afford protection to a railroad crossing, but it is doubtful whether the protection, so afforded, is commensurate with the hazard introduced when installed in high speed tracks, especially when a great part of the protection so afforded can be accomplished by means of electrical devices and strict discipline.

The derail is a relic of the "link and pin and hand brake days" with their contemporary signaling when trains were liable to become parted, or control of the

trains was dependent upon the train crews, rather than the enginemen. With modern equipment the greater majority of derailments in main tracks occur through a slight misjudgment on the part of the engineman and if no derail had been present, the train would have been stopped short of the crossing without any serious results. With the heavy motive power and equipment of today, a derailment entails needless delay and expense to slow moving trains, if not fatalities, due to engines upsetting and for high speed trains almost sure death for engine crews, if not to some of the passengers.

Where derails are omitted at grade crossings it is essential that the electrical protection be as complete as possible. This involves three principal features: First, operating distant signals located full braking distance from the home signals with approach or time locking. Second, the signals on each road arranged to assume the stop position with any route leading over the crossing on the opposing road occupied, to guard against the over-running of signals. Third, locking, to prevent a route being set up until previous moves through the crossing on the opposing route have been completed. The first of these is, of course, a part of any modern interlocking in high speed territory. The second is required only where derails are omitted while



Electric locking circuit for interlocker operated without derail protection

the derails themselves, where detector locked, accomplish the third.

The fulfilling of the second requirement is simple where only routes over the crossing are involved, but becomes more complicated when there are diverting routes to contend with. In the latter case, the circuit consists of a master relay for each road controlled over all track circuits that may be included in any route over the crossing on their respective roads. The control of the master relay is by-passed by contacts on switch levers for those track circuits included in diverting routes.

The third requirement is most readily accomplished by providing a master lever, the mechanical locking being so arranged as to require this lever to be set normal for one road and reversed for the other. Where there are three roads crossing, a three-position lever could be utilized and locked normal left and right respectively. The master lever should be locked through the master relays, so that if the crossing is not clear, the route cannot be changed, thus eliminating any possibility of a leverman setting up a route with the crossing occupied, and through error, flagging a train by a signal.

In general, the above arrangements will take care of

