

# Editorial COMMENT

## Protection at Hand-Thrown Switches in C. T. C. Territory

IN territory where controlled manual block or centralized traffic control is in service, various forms of protection have been used at outlying hand-throw main line switches which lead to branch lines or to extensive industry tracks where local freight trains may clear the main line for extended periods while other trains are operated on the main track.

Any local train which is to leave the main line for a branch line or industry track, has been authorized previously to move on the main line to the switch. Furthermore, the conductor carries authority for movement onto the branch, or carries waybills or other authority concerning switching moves to be made on the industry spurs. For these reasons, no signaling facilities are required at the switch to direct the train to leave the main line. The problem arises with regard to directing such trains to move from the branch line or industry track onto the main line and then proceed.

A conventional practice is to provide a telephone at each switch, and, in accordance with rules, supplemented on some roads with instruction signs at the switch, requires the conductor of the branch line train or of the local train on an industry track, when ready to move his train onto the main line, to communicate by telephone with an operator or the dispatcher, to determine the locations of other trains. With this information, the conductor can then direct the operation of his train accordingly. Many railroads contend that such practices provide adequate protection for train movements of this character, as has been proved by years of experience on numerous extended installations of centralized traffic control. On the other hand, increasing attention is being given to additional forms of protection, opinions of railroads, in this respect, differing between the use of an electric switch lock and a signal on the turnout.

Advocates of electric switch locks contend that such a device provides a physical means of preventing trainmen from carelessly or inadvertently opening a main line switch in the face of an approaching main line train. Opponents in the argument contend that there is no more reason for an electric lock on an ordinary hand-throw switch than on the selector and manual levers of a dual-control power switch machine. Obviously this application of electric locks would, in part, defeat the purpose of dual-control by preventing manual operations when control apparatus or circuits may be out of

order. These men contend further that, in centralized traffic control territory where train movements are directed by signal indications, this same practice, most logically, should be followed when directing movements from branch lines to the main line, rather than employing electric switch locks which involve operating practices differing from the remainder of the territory.

A practice on some C. T. C. territories is to control electric switch locks automatically. When a train on an industry track is ready to occupy the main line, the electric switch lock would be released if no main line train is approaching within the limits of approach sections beyond the second signal in each direction. If the electric lock is released and the switch is reversed immediately, the train can, with safety, occupy the main line because if any train approaches it will encounter signals displaying Approach and Stop aspects.

Another practice, using similar automatic controls, omits the electric switch lock but includes a signal, with an "S" marker, located on the turnout opposite the clearance point. If no train is approaching on the main line, the "S" marker would be illuminated, thus authorizing the trainman to reverse the switch, after which the signal would display a proceed aspect. In an installation using this form of automatic control of either an electric switch lock or a signal, a telephone is required ordinarily to enable a conductor to secure information.

An advantage of the automatic control of electric switch locks or signals is that the controls are local and do not form a part of the C. T. C. controls between the central office and the field stations. On the other hand, the disadvantage of automatic control is that, other than by use of the telephone, the operator in charge of the C. T. C. territory has no control of the train movements from the branch line to the main line. The provision of equipment and circuits to give the C. T. C. operator direct lever control of electric switch locks or signals at outlying switches with hand-throw stands may involve considerable expense. If the system has spare capacity, line circuits can be extended from the nearest existing field station to the switch. Perhaps the controls and indications can be combined on one line circuit or maybe superimposed on existing line wires, by the use of code at rates such as 80, 120 or 180 per minute, this practice being used for a different purpose on the Pennsylvania's installation near Terre Haute, Ind.

A conclusion from the above discussion is that, where local circumstances are such that telephones are not to be used for the purposes previously discussed, consideration may well be given to the use of a signal controlled by the C. T. C. operator for directing trains to move from a branch or industry track to the main line.