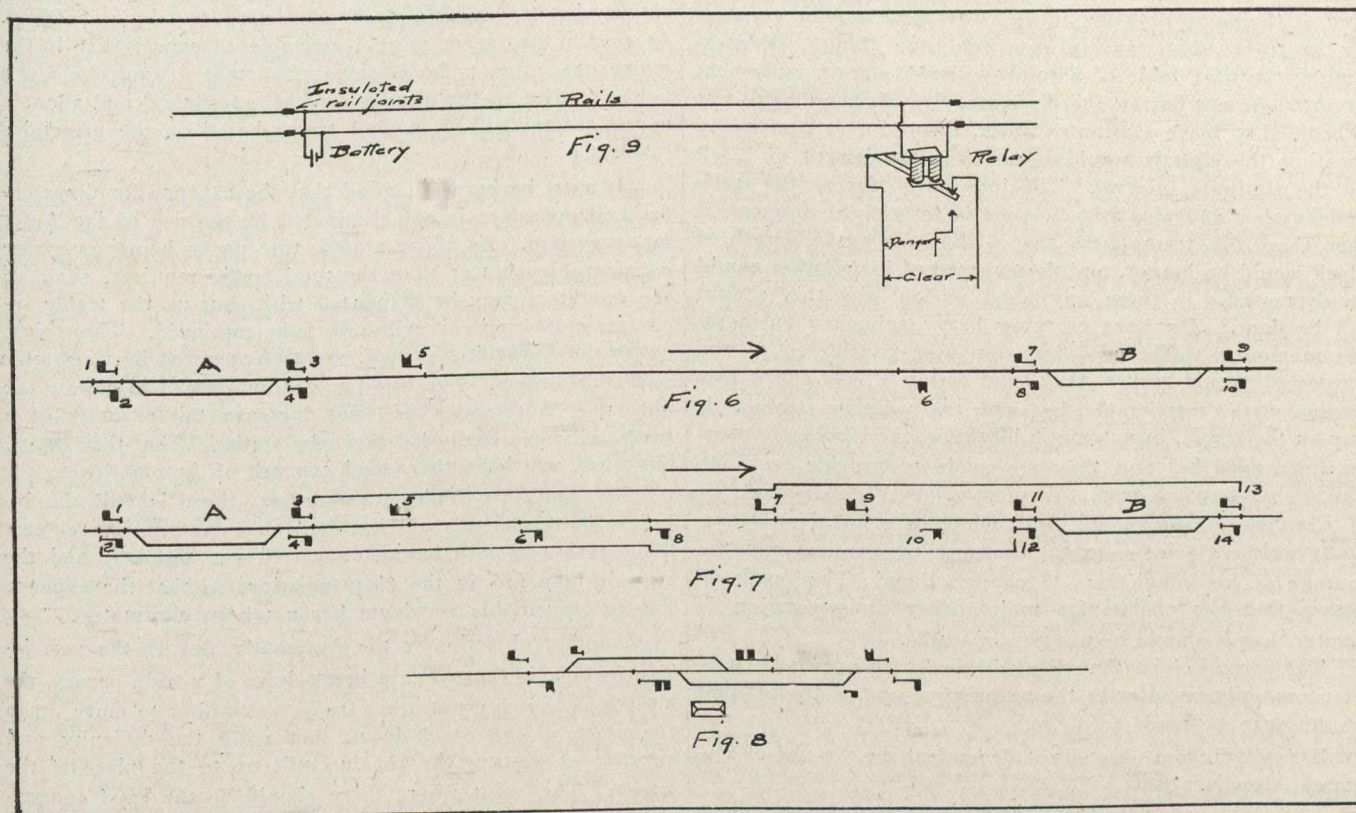


the necessity for the train order rules has not been done away with, no complex thing like a railway can be operated automatically, there must be some means having intelligence which can distinguish between trains of superior class, and which can confer right on one train and restrict the right of others, therefore the automatic does not eliminate the order system.

The Standard Code rule 502 reads as follows: "Block signals control the use of blocks, but unless otherwise provided, do not affect the movement of trains under the time table or train rules nor dispense with the use or observance of other signals whenever and wherever they may be required." With the automatic it cannot be "otherwise provided," therefore the train rules and train orders remain. The automatic is essentially a permissive signal as if a signal is out of order and assumes the stop position, traffic

average daily failures for the month of December last year was 11 per day, these were failures to the stop position, but they, as every other road has had and will have, failures to the clear position. Breakages in the mechanisms, lightning, and break down of insulation, all have produced false, clear failures, and once the possibility of such failures is admitted the reliability of the system is lost. One of the most distressing things in connection with these failures is, that everyone connected with the maintenance and operation of the signals feels that it is part of his duty to hide the false clear failures, not only from the public, but even from the railroad officials themselves. For every false clear failure that is reported, I think I am safe in saying that there are ten others that never get into the records. The attitude of the signalling fraternity toward these false clear failures seems to be that of the ostrich with regard to its enemies.



would have to be suspended, to overcome this necessity the rule is used that if a signal is found at stop, the train must be brought to a stop, and then may proceed under caution. Moreover, the automatic can fail in such a way as to give a clear indication when it should have indicated stop. Accident Bulletin 32, and Bulletin 33, have accounts of two collisions which occurred on account of a false clear indication of an automatic; the number of failures of this kind that do not cause accidents would be hard to arrive at, as failures of this sort are not for publication. The great weakness of the automatic is the track circuit, it is an extremely delicate thread to hang the safety of the trains on. In the first place, the material used to insulate the joints is paper fibre, and the safety of the whole scheme depends on the integrity of this insulation, should it break down, a clear signal with a train in the block is the result. Automatic signals require very careful and high-class men for their maintenance, and even with the very best maintenance numerous failures will occur.

There is probably no better organized maintenance force on any railroad, than that of the Harriman Lines, yet the

The claims made in favor of the use of Automatic signals over the manual control signals are; 1st, they are cheaper to operate; 2nd, they will detect an open switch; 3rd, they will detect a car left within fouling distance of the main track; 4th, they will detect a broken rail.

The first claim that they are cheaper to operate is partly true, as the chief charge is for battery renewal, there is no claim, however, that they are cheaper to maintain. In locating automatics, maximum traffic conditions are assumed as a basis for the lengths of the blocks, and once the signals are located, the charge for maintenance and operation forms a fixed charge per mile, even though the maximum traffic conditions only exist for a few weeks during the twelve months, the charge does not vary with the traffic.

On page 63 of the Railway Age Gazette of this year, is a summary of the expense due to maintenance and operation of 27 miles of automatic signals just installed on the Baltimore & Ohio R. R. outside of Washington, D.C. "Cost per mile, per annum, double track, operation and maintenance, \$233.79;" this is made up of labor and material and superintendence. Nothing is included for depreciation or