Company's line, in the State of Indiana, and has been in use successfully for three months, operating successfully at speeds of 85 miles an hour. As a result of this test the Railroad Commission of Indiana has approved the system and has ordered its use on the entire Shelbyville division of this company, a distance of 45 miles. The Indianapolis & Cincinnati Traction Company were so well pleased with the test that they placed their order for the equipping of their entire mileage of 100 miles with Northey-Plummer, Limited, of Toronto and Indianapolis, Indiana, who control the patents of the Simmen System. The system is approved for test by the Block Signal and Train Control Board, and is endorsed by many signal engineers of the country. Electrically

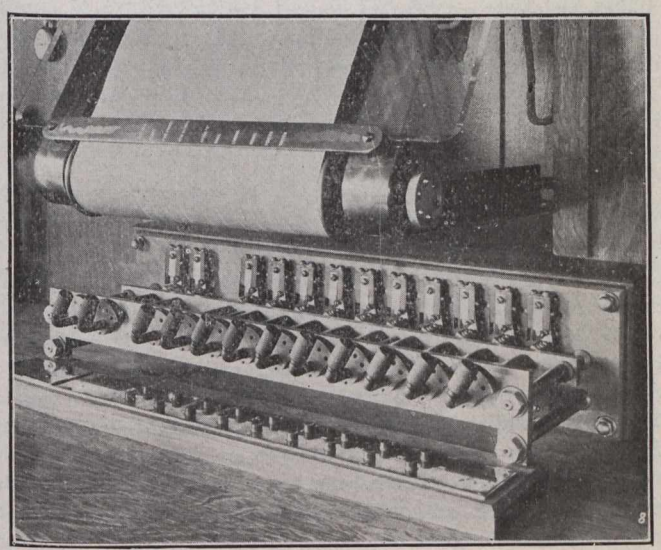

Fig. 2.—Dispatcher's Switchboard. (Switches all Set for Eastbound Movement.)

speaking, it is throughout, in accordance with the requirements of the Electric Railway Association.

An attractive feature of it is its elasticity and its fundamental simplicity. It provides for an automatic record of train movements in the dispatcher's office in graphic form, interlocked switches by which dispatcher can signal danger or clear indications to engineer or motorman direct in his cab, and direct telephone communication, between engineer and dispatcher. Additional protection which may be desirable and justifiable for heavy or high-speed traffic, such as automatic block, track circuits and automatic stop, can be added from time to time and made to fit in and work as auxiliary to this system without prohibitive complication.

The following are some of the advantages of the system:

Safety.—The dispatcher and engineer are protected against error by automatic devices. The entire system is so designed that any failure whatever in the equipment will result in danger indications. The telegraph operator being eliminated, his errors disappear also. Every movement into a new block must receive a positive clear signal, which an engineer must await, irrespective of the running orders or time table rights.

Facility.—The system facilitates quicker train movements to an extent equal to placing (eight-hour shift) telegraph operators at every passing siding on a single track road, or block station on a double track road. The time requisite to deliver instructions to the train crew through a third party (the telegraph operator) is saved, as all dispatchers' instructions go direct to engineer. The dispatcher can change a meeting or passing point instantly, without the least risk, simply by changing the switches in his office. Therefore, in case of delay to one train opposing trains will not waste time waiting for a meet. Extra trains and other unexpected train movement are directed with as great facility as the movements of regular trains.

Track Capacity.—Fifty per cent. more trains can be handled over a single track road, therefore the double tracking of a line may be postponed for many years. On double track roads westbound movements on the eastbound track or vice versa, are quickly arranged for.

Efficiency.—Ninety per cent. of all apparatus used is stock apparatus, simple in construction and thoroughly tested for signal and other purposes. A high degree of efficiency is therefore assured. The principal apparatus is in the dispatcher's office and under the dispatcher's immediate and direct care. The simple signal apparatus is entirely located on the locomotive or car and is subject to inspection by efficient mechanics at least once a day. Line wire and third rails are the only part of the system installed along the roadway, and are subject to few failures since they contain no moving parts. Lightning troubles cause no delay because all fuses and arresters are placed in the dispatcher's office and can promptly be replaced when burnt out. Trains are directed both by signal and telephone, therefore a complete tie-up is not possible unless both signal and telephone apparatus are out of order at the same time.

Discipline.—The automatic record in the dispatcher's office serves two purposes. It gives the dispatcher the fullest possible knowledge as to the whereabouts of all trains, etc., and enables him to direct very perfectly all train movements; and in addition to this it serves as a permanent record of many important acts of the train crews, such as a train running behind or ahead of schedule; the speed maintained through any block; length of delays; the efficiency of dispatcher in directing train movements, etc. This information is all recorded in graphic form and a few minutes perusal by the superintendent of each day's record will enable him promptly and justly to correct any weakness in his organization.

Economy.—The first cost is far less than the automatic block system and is in direct proportion to the amount of traffic. Maintenance expense is low because no specially

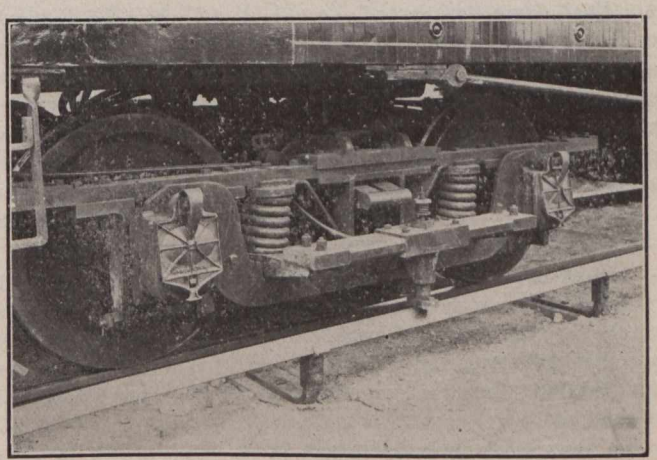

Fig. 3.—Showing Contact Shoe on Third Rail. (Cap Removed to Show Contact Detail.)

trained men are needed to look after the apparatus along the track. Dispatchers maintain the office equipment, and roundhouse or barn men the signal equipment. Roads now using the manual block system will save a large amount in operating expense by the elimination of block operators, and will find that expenses, arising from overtime to crews of delayed trains, are much reduced.