

signal operated by a signalman. The levers operating the signals at each end of a block section are so interlocked electrically, as to make it impossible for any single signalman to clear his signal without first communicating with the block operator in advance, who has to release the locking before a signal can be cleared. As this system is operated in Europe, all trains are moved absolutely by it, no schedule of trains is used except for the convenience of the traffic department, and the public. Trains only get the right to run from block to block by means of the signals. There is but one authority for the movement of trains and that is given by the signalman, at the time and place where it is required, thereby making it possible of getting the maximum capacity for traffic out of the track.

The first cost of the apparatus, and the future maintenance is considerably less than that of the Automatic. The cost for operation is principally the wages of the operators, which is undoubtedly more than the cost for the operation of the Automatics, if you leave out of consideration the fact that by the introduction of Automatics, you have not eliminated the charge for operators to handle the train orders, but still have the dispatcher and the operators, but fewer in numbers. Moreover, the cost of operating the controlled manual system will vary with the volume of traffic, whereas the Automatic does not. A block station can be cut out or added, to take care of the variations in the traffic, making the blocks longer or shorter as the case may be.

Viewed from the point of view of the engineman, there is an element of safety in the method of operation under the Manual Control system which is not given by the addition of Automatics. Even when these are used, when an engineer leaves his terminal he has the right given him by the timetable to run his train to the end of his division; if his movement is in any way to be restricted it is up to the dispatcher to catch him, it is not particularly to his interest to be caught, his attention is herefore not necessarily on the "qui vive" to notice the position of train order boards at each station, he has the feeling all the time that he has a right to continue running until he is caught, and that nothing can be done in the way of conferring right on some other train until he has been caught. On the other hand by the block method, divorced absolutely from the order system, the engineer knows that he has only the right to run from one block station to the next, and that, if he is to get over the road he must get permission to enter the next succeeding block at the entrance to that block. His attitude is entirely changed, he is directly responsible for getting his train over the road, and he is ever on the watch to see that he has got the necessary authority to do so.

In running trains on double track, the only danger is of getting two trains, running in the same direction, together. The problem on single track becomes more complicated, as head-on movements must also be provided for. In England, on single track lines the staff system is in use. This differs from the double track operation under the Lock and Block, in that a staff or piece of metal is given to the engineer as his authority to occupy a block, it being possible to give but one staff for any one block section at any one time. These staffs are contained in a machine at each end of the block, and are taken out by the signalman and delivered to the engineer, where high speed trains are being run these staffs are caught and delivered by a catching device located at the side of the track. In England, on some of the single track lines these staffs are being caught and delivered by trains running at fifty and sixty miles per hour.

This series of articles will be continued next week.

## ENGINEERING SOCIETIES.

**CANADIAN SOCIETY OF CIVIL ENGINEERS.**—413 Dorchester Street West, Montreal. President, Col. H. N. Rutan; Secretary, Professor C. H. McLeod.

Chairman, L. A. Vallee; Secretary, Hugh O'Donnell, P.O. Box 115, Quebec. Meetings held twice a month at Room 40, City Hall.

### TORONTO BRANCH—

96 King Street West, Toronto. Chairman, A. W. Campbell; Secretary, P. Gillespie, Engineering Building, Toronto University, Toronto. Meets last Thursday of the month.

### MANITOBA BRANCH—

Chairman, J. E. Schwitzer; Secretary, E. Brydone Jack. Meets first and third Fridays of each month, October to April, in University of Manitoba, Winnipeg.

### VANCOUVER BRANCH—

Chairman, Geo. H. Webster; Secretary, H. K. Dutcher, 40-41 Flack Block, Vancouver. Meets in Engineering Department, University

### OTTAWA BRANCH—

Chairman, W. J. Stewart, Ottawa; S. J. Chapleau, Resident Engineer's Office, Department of Public Works.

## MUNICIPAL ASSOCIATIONS.

**ONTARIO MUNICIPAL ASSOCIATION.**—President, Mr. George Geddes, Mayor, St. Thomas, Ont.; Secretary-Treasurer, Mr. K. W. McKay, County Clerk, St. Thomas, Ontario.

**UNION OF ALBERTA MUNICIPALITIES.**—President, H. H. Gaetz, Red Deer, Alta.; Secretary-Treasurer, John T. Hall, Medicine Hat, Alta.

**UNION OF NOVA SCOTIA MUNICIPALITIES.**—President, Mr. A. E. McMahon, Warden, King's Co., Kentville, N.S.; Secretary, A. Roberts, Bridgewater, N.S.

**UNION OF SASKATCHEWAN MUNICIPALITIES.**—President, Mayor Hopkins, Saskatoon; Secretary, Mr. J. Kelso Hunter, City Clerk, Regina, Sask.

## CANADIAN TECHNICAL SOCIETIES.

**ALBERTA ASSOCIATION OF ARCHITECTS.**—President, E. C. Hopkins, Edmonton; Secretary, H. M. Widdington, Strathcona, Alberta.

**ASSOCIATION OF SASKATCHEWAN LAND SURVEYORS.**—President, J. L. R. Parsons, Regina; Secretary-Treasurer, M. B. Weeks, Regina

**ASTRONOMICAL SOCIETY OF SASKATCHEWAN.**—President, N. McMurphy; Secretary, Mr. McClung, Regina.

**BRITISH COLUMBIA LAND SURVEYORS' ASSOCIATION.**—President, W. S. Drewry, Nelson, B.C.; Secretary-Treasurer, S. A. Roberts, Victoria, B.C.

**CANADIAN ASSOCIATION OF STATIONARY ENGINEERS.**—President, Charles Kelly, Chatham, Ont.; Secretary, W. A. Crockett, Mount Hamilton, Ont.

**CANADIAN CEMENT AND CONCRETE ASSOCIATION.**—President, Peter Gillespie, Toronto, Ont.; Vice-President, Gustave Kahn, Toronto; Secretary-Treasurer, R. F. W. Hagarty, 662 Euclid Ave., Toronto.

**CANADIAN CLAY PRODUCTS' MANUFACTURERS' ASSOCIATION.**—President, W. McCredie; Secretary-Treasurer, D. O. McKinnon, Toronto.

**CANADIAN ELECTRICAL ASSOCIATION.**—President, N. W. Ryerson, Niagara Falls; Secretary, T. S. Young, Canadian Electrical News, Toronto.

**CANADIAN FORESTRY ASSOCIATION.**—President, Thomas Southworth, Toronto; Secretary, James Lawler, 11 Queen's Park, Toronto.

**CANADIAN MINING INSTITUTE.**—Windsor Hotel, Montreal. President, Dr. Frank D. Adams, McGill University, Montreal; Secretary, H. Mortimer-Lamb, Montreal.

**CANADIAN RAILWAY CLUB.**—President, H. H. Vaughan; Secretary, James Powell, P.O. Box 7, St. Lambert, near Montreal, P.Q.

**CANADIAN STREET RAILWAY ASSOCIATION.**—President, D. McDonald, Manager, Montreal Street Railway; Secretary, Acton Burrows, 157 Bay Street, Toronto.

**CANADIAN SOCIETY OF FOREST ENGINEERS.**—President, Dr. Fernow, Toronto; Secretary, F. W. H. Jacombe, Ottawa.

**CENTRAL RAILWAY AND ENGINEERING CLUB.**—Toronto, President, J. Duguid; Secretary, C. L. Worth, 409 Union Station. Meets third Tuesday each month except June, July, August.

**DOMINION LAND SURVEYORS.**—President, Thos. Fawcett, Niagara Falls; Secretary-Treasurer, A. W. Ashton, Ottawa.

**EDMONTON ENGINEERING SOCIETY.**—President, Dr. Martin Murphy; Secretary, B. F. Mitchell, City Engineer's Office, Edmonton, Alberta.

**ENGINEERING SOCIETY, TORONTO UNIVERSITY.**—President, A. D. Campbell; Corresponding Secretary, A. H. Munroe.

**ENGINEER'S CLUB OF TORONTO.**—96 King Street West. President, C. M. Canniff; Secretary, R. B. Wolsey. Meeting every Thursday evening during the fall and winter months.

**INSTITUTION OF ELECTRICAL ENGINEERS.**—President, Dr. G. Kapp; Secretary, P. F. Rowell, 92 Victoria Street, London, S.W.; Hon. Secretary-Treasurer for Canada, Lawford Grant, Power Building, Montreal, Que.

**INSTITUTION OF MINING AND METALLURGY.**—President, Edgar Taylor; Secretary, C. McDermid, London, England. Canadian Members of Council:—Prof. F. D. Adams, J. B. Porter, H. E. T. Haultain, and W. H. Miller, and Messrs. W. H. Trewartha-James and J. B. Tyrrell.

**MANITOBA LAND SURVEYORS.**—President, George McPhillips; Secretary-Treasurer, C. G. Chataway, Winnipeg, Man.

**NOVA SCOTIA MINING SOCIETY.**—President, T. J. Brown, Sydney Mines, C.B.; Secretary, A. A. Hayward.

**NOVA SCOTIA SOCIETY OF ENGINEERS, HALIFAX.**—President, S. Fenn; Secretary, J. Lorne Allan, 12 Victoria Road, Halifax, N.S.

**ONTARIO PROVINCIAL GOOD ROADS ASSOCIATION.**—President, W. H. Pugsley, Richmond Hill, Ont.; Secretary, J. E. Farewell, Whitby, Ont.

**ONTARIO LAND SURVEYORS' ASSOCIATION.**—President, H. W. Selby; Secretary, Killaly Gamble, 703 Temple Building, Toronto.

**ROYAL ARCHITECTURAL INSTITUTE OF CANADA.**—President, F. S. Baker, F.R.I.B.A., Toronto, Ont.; Hon. Secretary, Alcide Chausse, No. 5 Beaver Hall Square, Montreal, Que.

**ROYAL ASTRONOMICAL SOCIETY.**—President, Prof. Alfred T. de Lury, Toronto; Secretary, J. R. Collins, Toronto.

**UNDERGRADUATE SOCIETY OF APPLIED SCIENCE, MCGILL UNIVERSITY.**—President, H. P. Ray; Secretary, J. P. McRae.

**WESTERN CANADA RAILWAY CLUB.**—President, Grant Hall; Secretary, W. H. Rosevear, 199 Chestnut Street, Winnipeg, Man. Second Monday, except June, July and August, at Winnipeg.