Columbia 600 ampere-hour, high internal resistance type, housed in 8 ft. cast iron battery chutes. Track relays have a resistance of 4 ohms; front contacts are platinum to graphite, and back contacts platinum to platinum. These relays are housed in a cast iron relay box, which is mounted on the signal mast or on a cable post, depending upon the particular location. Wire used for track circuit connections is no. 9 B. & S. gauge, rubber covered. All connections may be identified by means of fiber tags on which appear the proper letters and figures.

**The Signals** conform to Railway Signal Association specifications; signal mechanisms are G.R.S. model 2 A top of mast type, operating in 3 positions in the upper right hand quadrant, and are equipped with 10 volt direct current motors. Absolute signals are distinguished by a square end red blade and by a red marker light below and in the same vertical plane as the active light. Permissive signals are distinguished by a pointed end red blade and by a red marker light below and to the left of the active light. Roundels are R.S.A. standard; the characters shown in the circuit plans.

**Instruction of Trainmen.**—Rules governing use of the automatic signals were adopted by the railway officers, and were printed in the back part of the time table with the operating rules. About the time the signals were ready for service, the railway officers held at the company's headquarters at Hamilton several meetings for instruction of the trainmen concerning the signal aspects and indications, and the rules governing their use. At these meetings the automatic signal system was thoroughly explained and discussed in connection with lantern slides of the signal aspects and indications which were thrown on a screen. A model 2 A signal mounted on a short mast, an indicator, a switch circuit controller and other signaling appliances, which were operated as under service conditions, afforded a practical demonstration of the signal system and fixed firmly in the minds of employes the essential features of the system. The practice of instructing trainmen concerning rules and other matters pertaining to their duties is a subject of the greatest importance, and not only increases the general efficiency of employes, but reduces to a minimum the chance of accident.

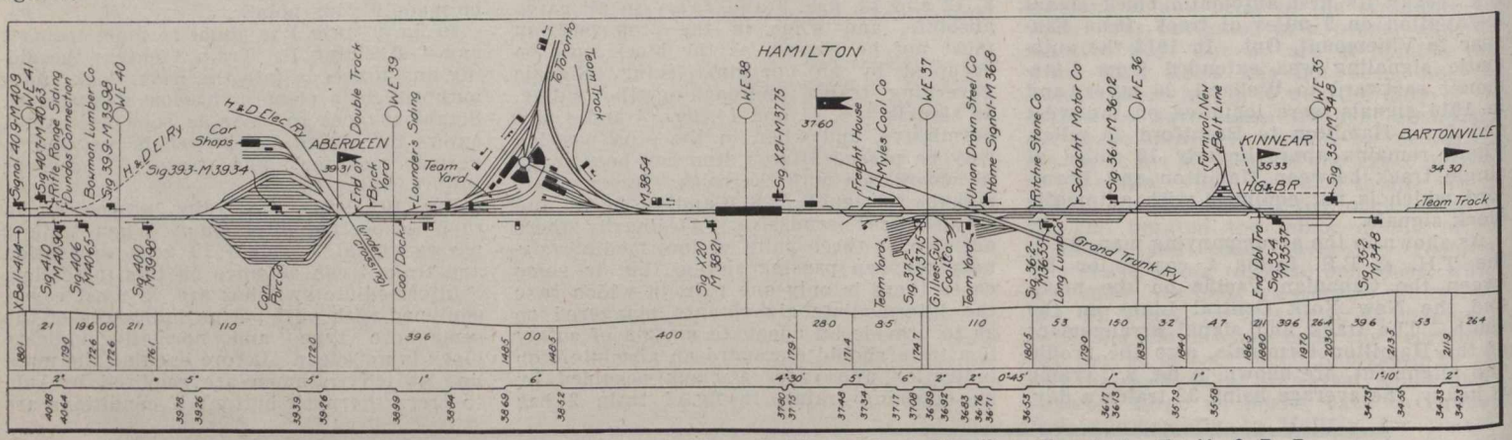


Fig. 2. Diagram showing Signals, Track, Profile and Alignment at Hamilton Terminals, T. H. & B. R.

**Line Circuits.**—The signal control wires are no. 9 B. & S. gauge, weatherproof, copper clad, and are supported on a separate cross arm below the telegraph line, which was practically reconstructed before the signal wires were strung. Wires extending from line to function are no. 14 rubber covered, and are formed into a cable, held together with marline, and supported by messenger wire. Line circuits are operated under the polarized line control system, which requires one less line wire than a similar neutral control system. Ordinarily there are 3 line wires extending from sidings and 5 line wires extending through sidings. Line and local relays have a resistance of 670 ohms; front contacts are platinum to graphite, and back contacts platinum to platinum. These relays are ordinarily housed in a cast iron relay box mounted on the signal mast. All relays and other mechanisms likely to be affected are protected by G.R.S. model 1 B lightning arresters, to which are attached suitable connections to ground. All connections in the relay boxes are conveniently arranged and attached to R.S.A. terminals, which are properly tagged and marked according to the colors are red for stop, yellow for caution, and green for clear. The automatic signals are numbered according to their respective mile post locations; odd numbers are assigned to signals governing west bound trains, and even numbers to signals governing east bound trains. The figures are arranged horizontally on the number plate as shown in the accompanying illustrations. The top and bottom parts of the signal masts and fittings are painted black, and the intermediate part white, making a conspicuous signal, which stands out clearly against the usual backgrounds.

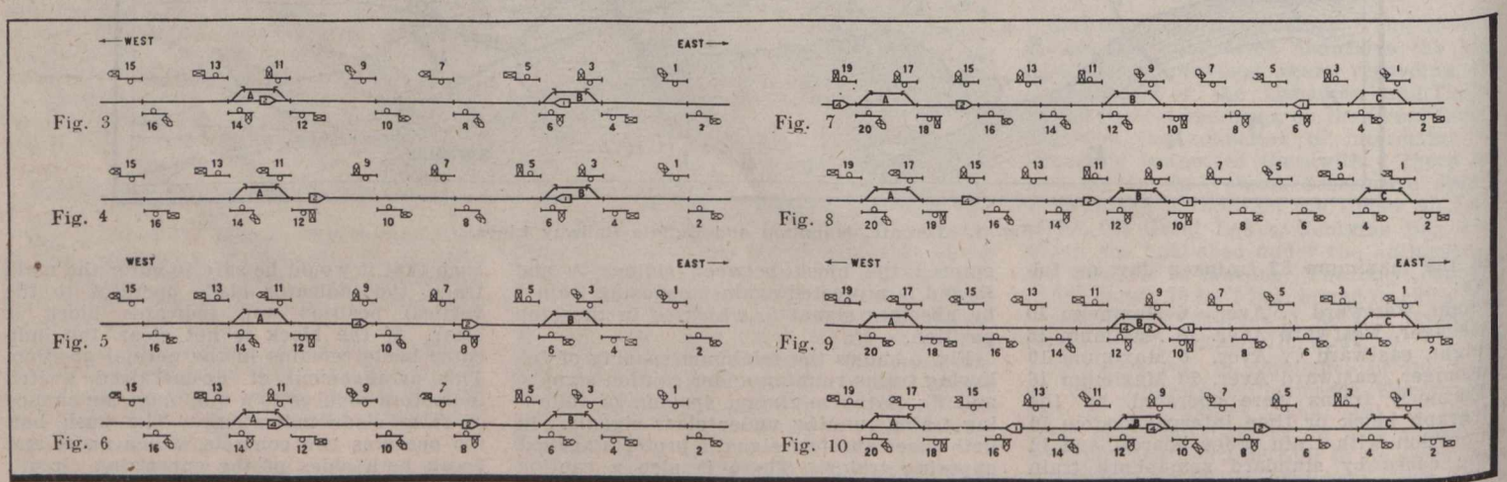


Fig. 3. Trains at Adjacent Sidings. Fig. 4. One Train in Block. Fig. 5. Minimum Spacing under Caution Signals. Fig. 6. Minimum Spacing under Clear Signals. Fig. 7. Trains Approaching Meeting Point. Fig. 8. Trains at Meeting Point following Eastward Train. Fig. 9. Trains Meeting. Fig. 10. Trains Proceeding from Meeting Point.

Semaphore lamps are R.S.A. standard, and are equipped with long-time oil burners. Each signal is operated by 16 cells of Schoenmehl R.S.A. standard potash battery, which is housed in a Potter Winslow no. 36 concrete battery well.

**Installation.**—The railway company furnished and installed in place all insulated joints, insulated switch rods and connections, also all line wire supports. The General Railway Signal Co. manufactured and installed in place all signals and signal appliances. Most of the material was delivered by work train. Signals were erected by means of a derrick, which was also used in setting the concrete battery wells. R. L. Latham, Chief Engineer, T.H. & B.R., had general charge of the installation, which was performed under the immediate supervision of A. A. Hurst, Supervisor of Signals. A. C. Holden was engineer in charge for General Railway Signal Co.

**Maintenance** is in charge of a signal supervisor, whose force consists of 2 maintainers, 4 battery men and 2 lampmen, who make a daily inspection of the signals and appliances on their respective districts.