same d-c. relays, signal mechanisms, etc., were continued in service as a d-c. system which was fed by the a-c. distribution line, enough reserve capacity being provided in the storage batteries to operate the signaling during an a-c. power outage of any reasonable duration.

Changing to Position-Light Signals

When the present change from semaphores to position-light signals was being planned, it was apparent that the existing signal storage batteries, as well as those for track circuits, were adequate for the new arrangement. However, it was also evident that the signal lighting load would be increased because each aspect of a position-light signal requires three 12-volt, 5-watt lamps. Therefore, a Union Style NL-15, 110 to 11.5-13.4 volt transformer was provided at each location.

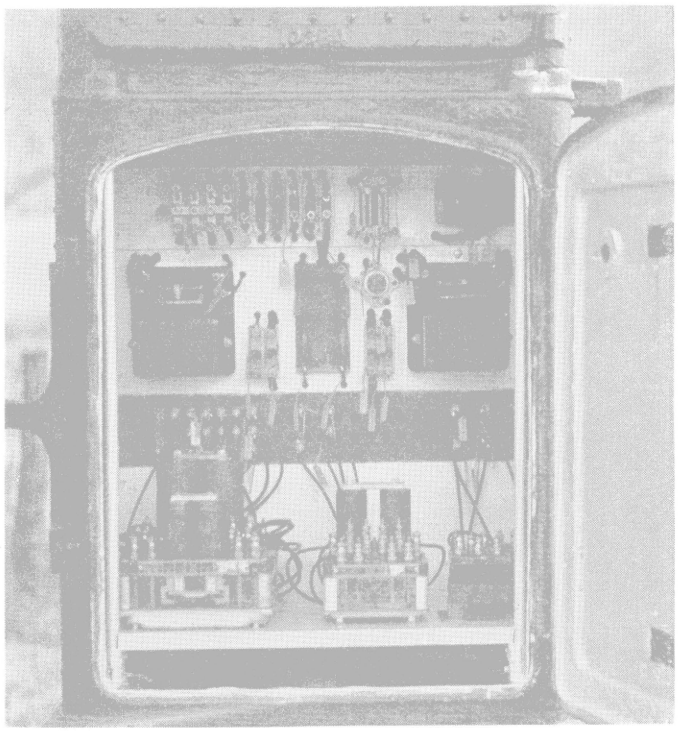
Likewise, in the control circuits, where the circuit breakers or pole-changers on the Style-B mechanisms had formerly been used to effect the 45-deg. to 90-deg. control, it was necessary, for the control of the position-light signal, to provide new Style DP-21 retained-neutral, slow pick-up polar track relays to effect the pole changing. One of the illustrations shows the interior of one of the newly-revised instrument cases, with a DP-21 retained-neutral polar track relay at the left, a new DN-11, 1,000-ohm line relay in the center and a 50-v.a. Type-NL lighting transformer at the right.

The dark colored terminal board shown just above the relays is made of hard wood and the brass terminal posts are set in this board, the incoming wires being brought out from the rear through individual ½-in. holes. This terminal board is treated with paraffin to make it moisture-proof and is not painted with aluminum, as the remainder of the panel is, because an aluminum surface is a conductor.

Low-voltage lightning arresters for all line circuits are mounted at the top of the panel, together with the 4.5-ohm adjustable resistance units, which are used to adjust the voltage on the signal lamps so as to secure the desired intensity, depending on local conditions.

At all places where the signals were moved to new locations, as well as at many of the old locations, the modernization program included the installation of new track wiring, No. 9 Kerite mummy finish underground cable being used in connection with Raco bootleg outlets at the rail. Thus the change-over, from semaphores to position-light signals, represents a complete reconstruction program practically equivalent to a new installation of automatic block signaling, in so far as the finished system is represented.

This modernization program was planned and executed by the signal department forces of the Norfolk & Western.



As a part of the changeover, new relays were installed and the cases were completely rewired

T. Geo. Stiles Rounds Out 60 Years of Signaling

On his eightieth birthday, June 15, T. Geo. Stiles, president of the T. Geo. Stiles Company, Arlington, N. J., received a pleasant surprise in the form of congratulations from numerous friends in the railway signaling field, complimenting him on the completion of his 60 years' service in the manufacture of signaling apparatus.

Mr. Stiles was born on June 15, 1856, at Stoke, Newton, London, England. He began his business career with Saxby & Farmer, London, in 1877, with which company he remained until 1882, when he joined the Johnson Compensator Company, Manchester, England. He traveled extensively in Europe for that company and also for Saxby & Farmer. He was with the Johnson Compensator Company until 1888, in which year he joined the Johnson Signal Company, Rahway, N. J. In 1890, he resigned on account of ill health and returned to England where he became associated with the Dutton Company of Worcester, England. He reorganized the plant of that company and then became superintendent of construction. In 1893, Mr. Stiles returned to the United States and again entered the employ of the Johnson Signal Company, where he remained until 1896, when he joined the Standard Signal Company of Arlington, N. J. In 1899, he became associated with the Thomas A. Edison Company plant ot Ogdensburg, N. J. In 1900, Mr. Stiles established the T. Geo. Stiles Company at Arlington, and has been head of that company since that time.

T. Geo. Stiles