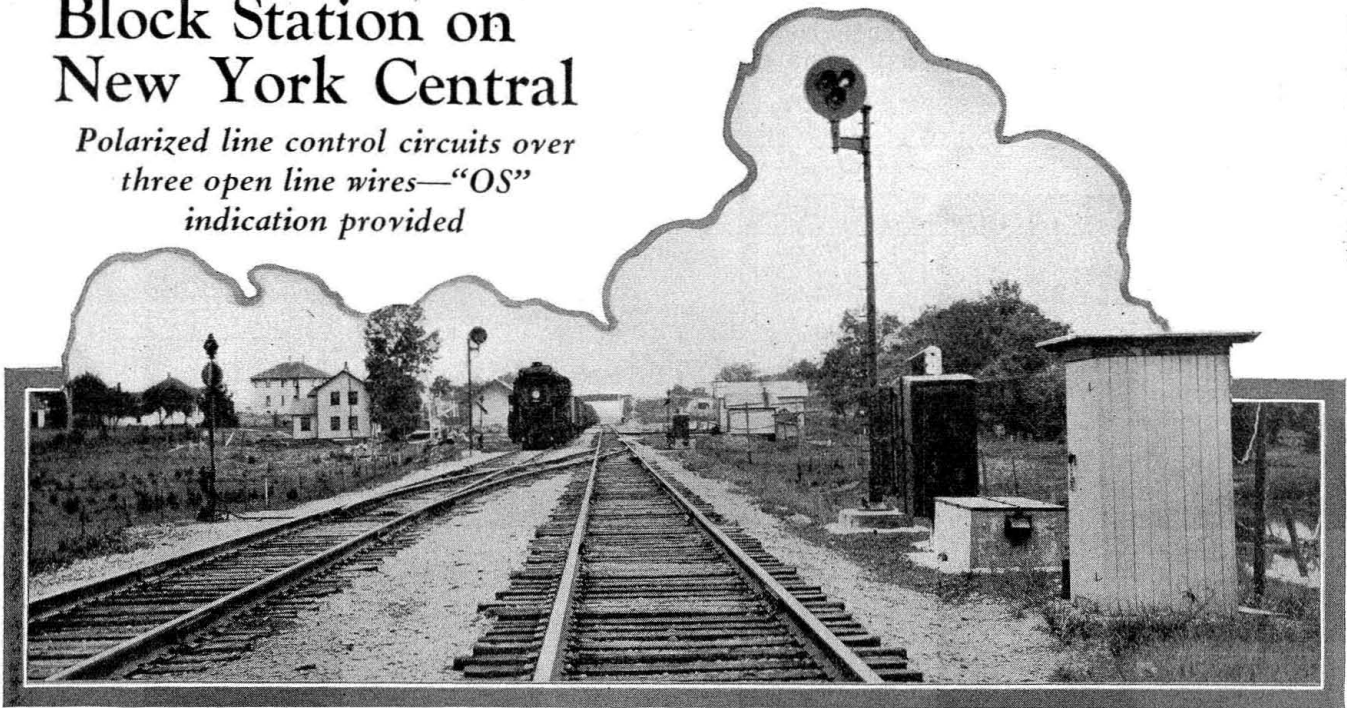


Remotely Controlled Signals Replace Manual Block Station on New York Central

Polarized line control circuits over three open line wires—"OS" indication provided



Northbound train passing controlled signal at Campbell

THE use of remotely-controlled signals to direct train movements without the expense of maintaining a telegraph station has been demonstrated by an installation recently completed on the Danville line of the New York Central at Campbell, Ill. Formerly a manually-operated block station working on two tricks daily, this station, located at a trailing point crossover on the double-track line extending northward from Danville, Ill., was a logical layout for the application of remotely-controlled signals.

Past and Present Operation

Campbell is a way-station located $5\frac{1}{4}$ miles north of Danville, from which point the signals are controlled. There are no telegraph offices between Campbell and Danville, and the nearest telegraph office north of Campbell is nine miles distant, at Sloan. A trailing-point crossover at Campbell is used to facilitate the departure on both tracks of northbound freight trains from Danville. Formerly, the telegraph office at Campbell functioned as a manually-operated block station, and telegraph operators on two tricks daily copied and transmitted train-orders to the train crews.

The grade is level from Danville to Campbell and from the latter point northward the grade descends at .0024 per cent. All of the functions formerly effected under manual block control are now performed by the new remotely controlled installation and the services of the operators were dispensed with when the present signals were placed in service. The operator at Danville now operates the signals and "OS" indications are automatically transmitted to his control machine, since it is desirable that he know when trains pass this station, to guide him in issuing train orders. The switches of the trailing-point crossover are hand-operated.

The traffic at this point consists of six passenger trains, six regular northbound freight, two local

freight, and about six southbound freight trains each 24 hours. The average tonnage of the time freight trains is about 2,360 tons in 39 cars.

Centralized Traffic Control Machine Is Used

The signals are the General Railway Signal Company's three-position Type-G, arranged triangularly, the indications being the standard red, yellow, and green. The operator at Danville may set these signals in any desired position by operating the levers of his control machine. Each of the two signals is controlled by a separate lever. The control machine is a four-lever frame with two of the spaces blanked out and reserved for future expansion. The General Railway Signal Company's standard centralized traffic control type of machine is used.

An OS indication is automatically transmitted to the operator's control machine upon the passage of a train through the route established by the signal. This indication is effected through two adjacent track circuits in order to reduce the possibility of a false indication if, for any reason, a track circuit should fail or accidentally be shunted by track forces. A train running against the current of traffic from Danville to Campbell, before crossing over to the other main track through the crossover at Campbell, must stop and call the operator to obtain permission to move with the current of traffic from Campbell to Sloan, the next station north. The train must also report when clear of the southbound track.

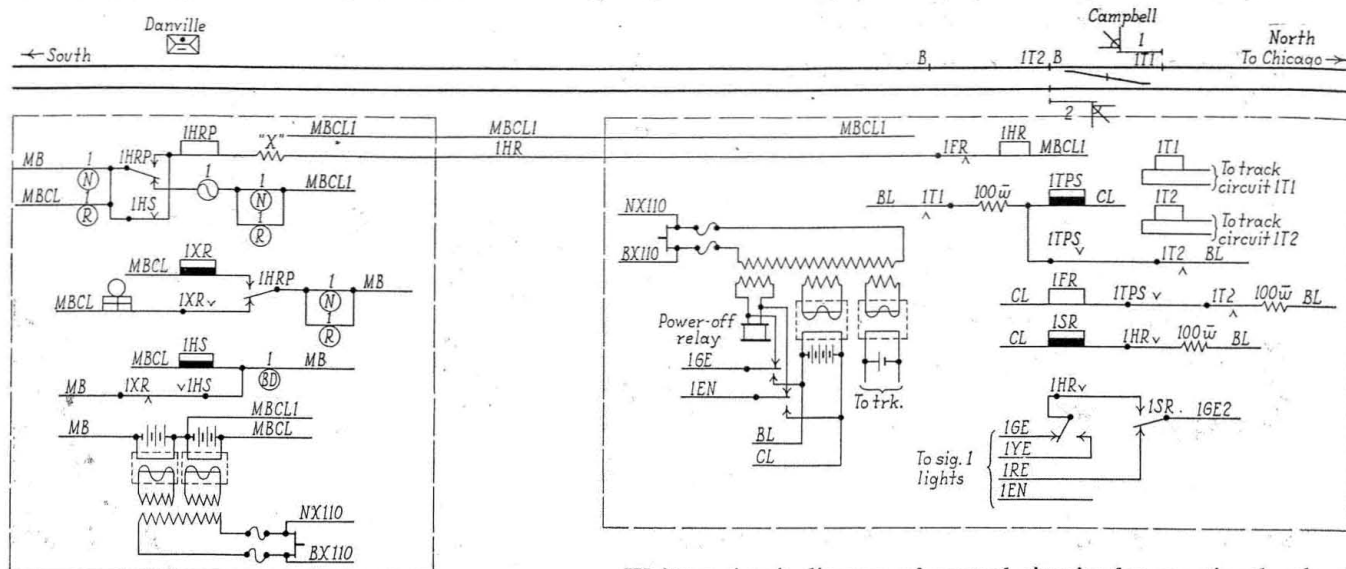
Upon receiving a stop signal when moving with the current of traffic, the train crew must call the dispatcher for train orders. A telephone, connected to the dispatching circuit, is provided for this purpose in a booth located at the crossover. A stop signal, however, does not necessarily imply that there are train orders for the crew; the operator may simply be using the signal to time-space a preceding train, as was formerly done with the manual block signals.

A yellow signal is the equivalent of a caution card authorizing the train to enter an occupied block and proceed prepared to stop short of a train ahead. A green signal indicates clear block, proceed.

Thus, it will be seen that these remotely controlled train order signals are of great assistance in giving

lighted, normally by alternating current. Each signal has a reserve power supply, consisting of 5 cells of Exide Type EMGO-7 storage battery, which is connected to the lights through a Type-H power-transfer relay when the regular source of power fails.

The lamp in the red unit is renewed every 1,000



Written-circuit diagram of control circuits for one signal only

the equivalent of a manual block station in operation 24 hours a day, as compared with only two-trick service heretofore. The saving in operators' wages, fuel, and other supplies more than offsets the interest on the investment in the new signal installation.

Engineering Details

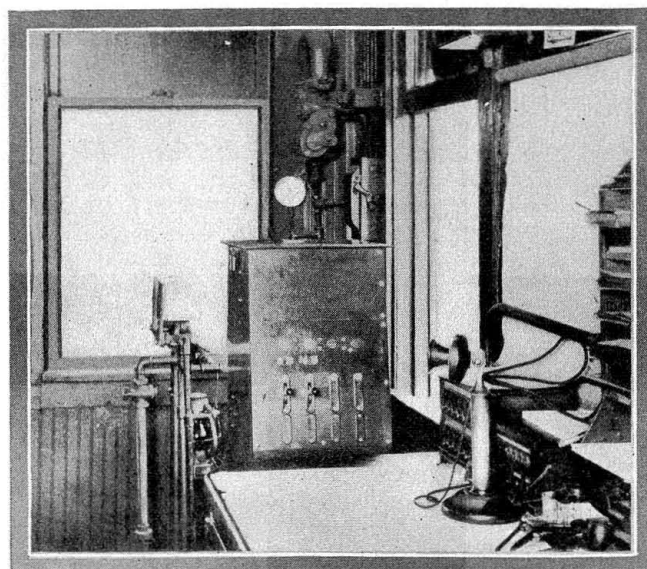
This installation is not in automatic signal territory. Therefore, it was necessary to install new bonding for the track circuits needed to secure the OS indication. Standard duplex single-conductor No. 6 bonding was used. In other respects the track circuit equipment is the same as that used on the San Pierre automatic crossing installation described in the August number of *Railway Signaling*.

The control circuits are carried over three No. 10 open line wires extending from Campbell to Danville. A General Railway Signal Company's Type-K polar relay is used to select the red, yellow, or green indication of the corresponding signal, the control lever serving as a pole-changer, as shown in the circuit diagram. The battery for these control circuits is located in BC Tower at Danville. It consists of 10 Exide Type EMGO-7 storage cells, and is used also for the OS lights and annunciator bell. The a-c. floating equipment includes two Kodol copper-oxide rectifiers, which are fed by separate secondaries of a charging transformer and which are floated across the two sections of the battery as shown in the circuit diagram. The power equipment at Danville is housed in N. Y. C. standard relay boxes which are located beside the tower, while the indication relays, which are the General Railway Signal Company's Type-K, are housed within the control machine itself.

Electric power at 110-volts a-c. is purchased from the power company at Campbell and, since the signals to be lighted are only a short distance away, it is transmitted at this pressure to the instrument case, where it is transformed to eight volts, the voltage which is applied to the lamps. The lamps are rated at 8 volts 18 watts and are continuously

hours, or approximately every 45 days. Those in the green and yellow units are renewed after an estimated life of 1,000 hours, but since these lamps are lighted only a small fraction of the time, their life expectancy may be only roughly approximated. However, the same life basis of 1,000 hours of actual service is assumed in deciding upon when these lamps should be renewed.

The plans for this installation were prepared under the direction of F. B. Wiegand, signal engineer. The construction was performed by the railroad com-



The control machine is located in the tower of an interlocking at Danville 5.25 miles from Campbell

pany's regular signal construction forces, under the supervision of C. E. Rowe, supervisor of signals. Except as herein stated, the construction standards are similar to those described in past descriptions of N. Y. C. installations.