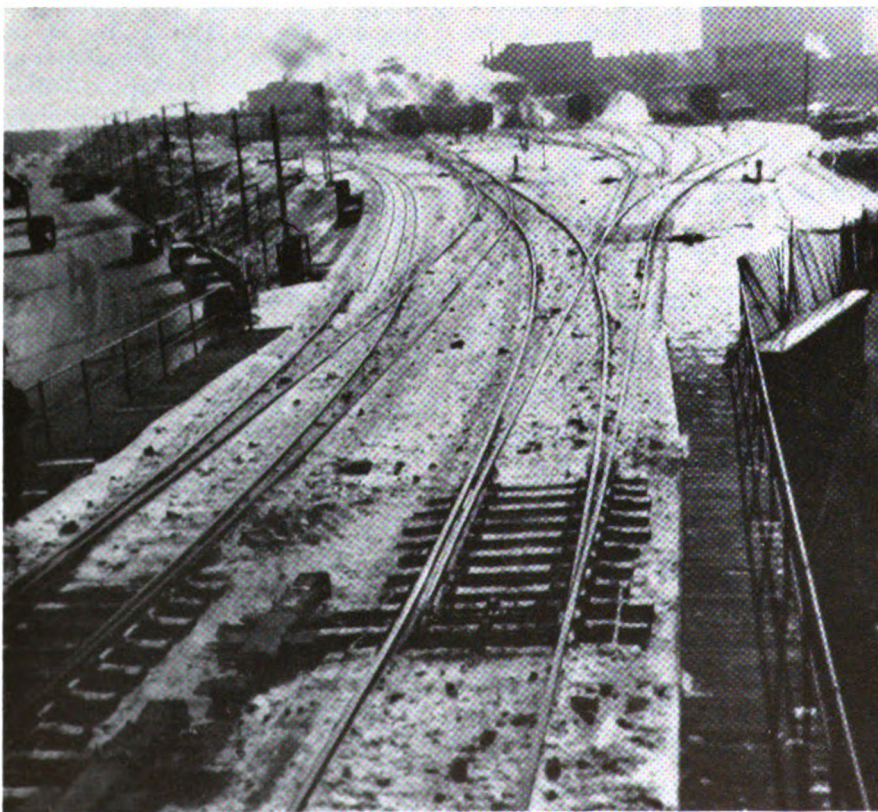


Track and signal plan of the entire project including power switches and signals at east end of station

Nine Layouts In One Interlocking

At Winnipeg, Man., the Canadian National Railways recently completed an extensive interlocking project, including switches and signals at east end of passenger station, as well as at six junctions or ends of yard and at a railroad crossing, extending about 15 miles on two main routes



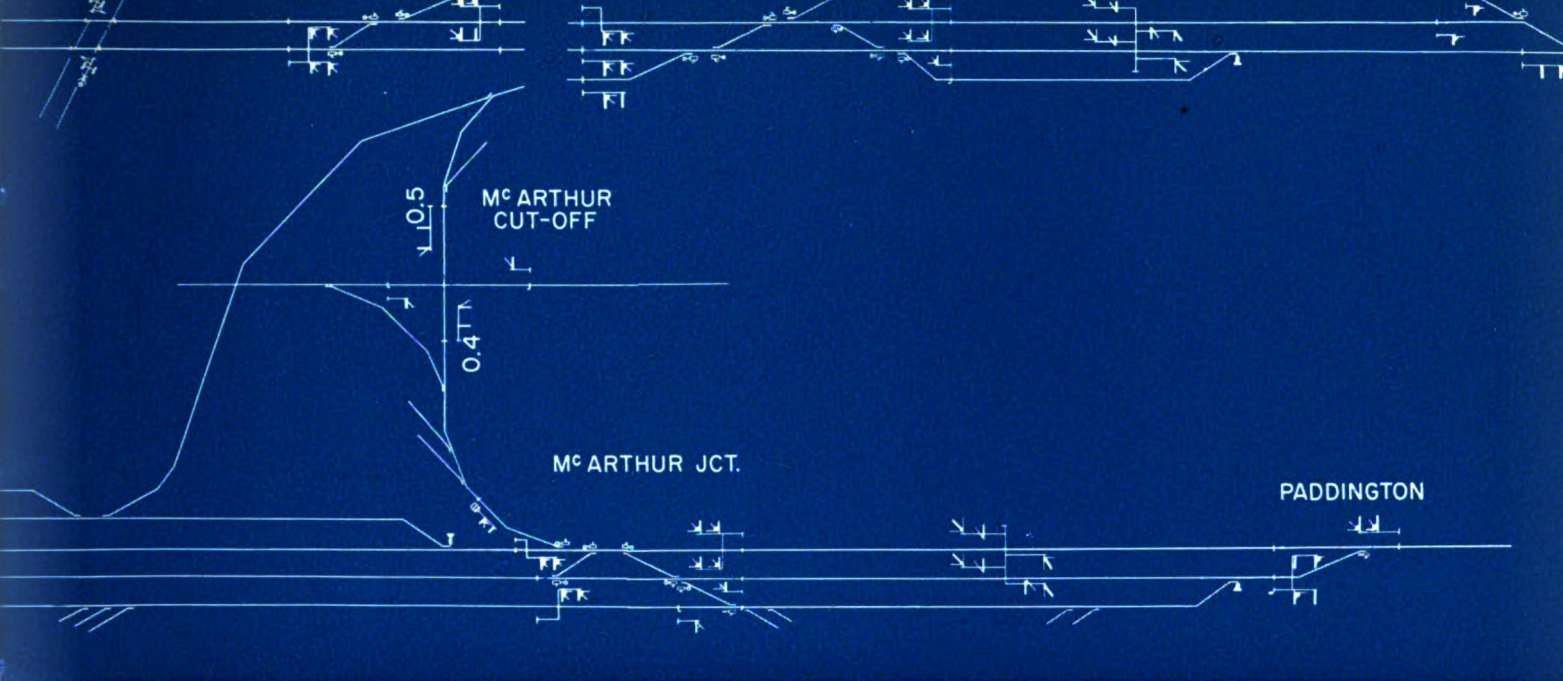
The switches and crossovers at the east end of the station are now power operated as a part of a new consolidated interlocking

IN THIS WINNIPEG project the switches at the east end of the station were previously operated by switchtenders, with a block operator on duty. This layout, as revised, now includes five interlocked single switches, four interlocked crossovers, two hand-thrown single switches with electric locks, and 27 home signals.

At Terminal Cut-off Junction the switches were hand-thrown by switchtenders, wire-pull signals being used to direct train movements. This junction area is now interlocked including six home signals, two single switches and three crossovers.

At the west end of the Transcona yard, the switches in the King Street area were hand-thrown by switchtenders, and the signals were controlled by a panel in an office. This area is now interlocked, including five power single switches, two crossovers, and nine home signals.

The crossover and junction switch at Beach Junction lead to a branch line extending 70.2 miles to Victoria Beach on Lake Winnipeg. This crossover and switch were



and at six junctions or ends of yards and at railroad crossing, all now controlled from one machine

formerly operated by hand-throw stands, equipped with electric locks controlled from the panel in the block office at King Street. This Beach Junction layout now includes one power single switch, and one power crossover, 5 home signals.

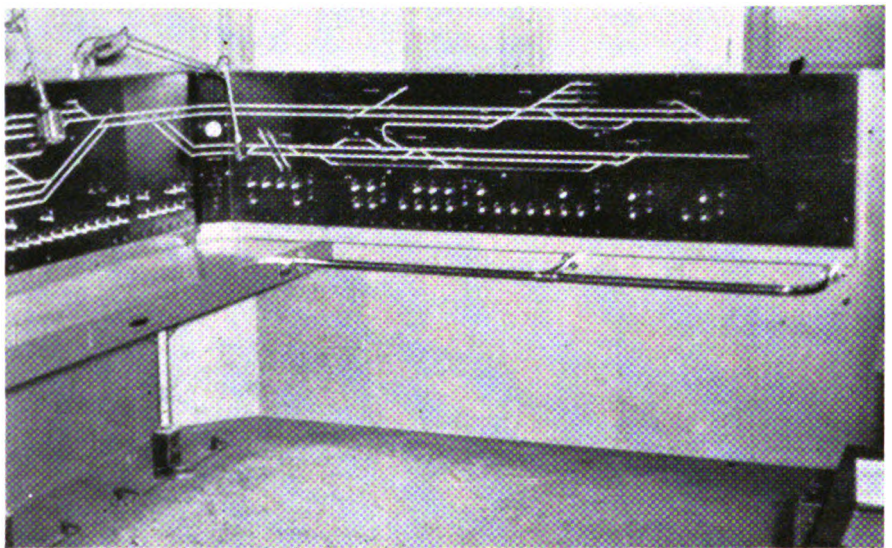
At the east end of Transcona yard, the switches in the area marked "Transcona," were hand-thrown by trainmen. An operator was on duty at the Transcona yard office. The new interlocking project at Transcona includes two power switches and four home signals. From Transcona, single track extends eastward toward Toronto and Montreal.

Important Junction

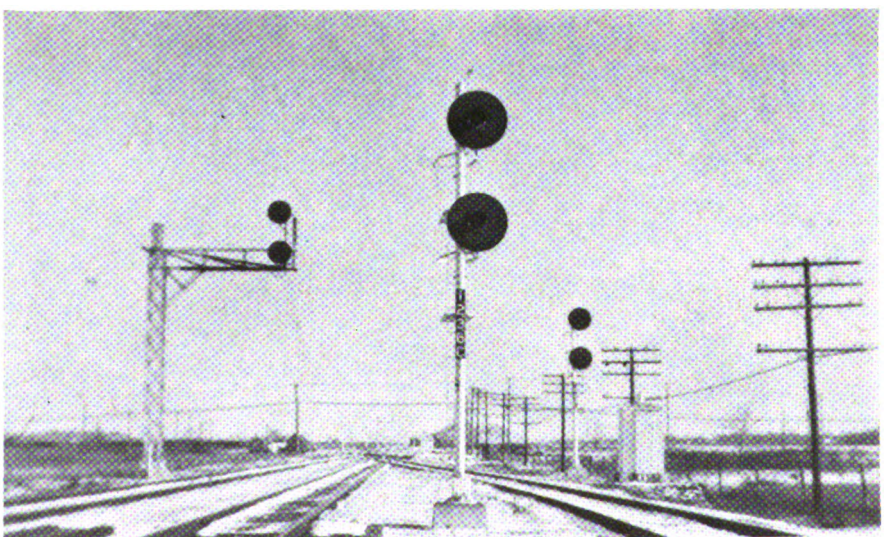
From Terminal Cut-off Junction, a second main line branches off to the south through St. Boniface, on the route to Fort Frances and Port Arthur. This line is double track from Terminal Cut-off Junction to Paddington. Formerly the crossing with the Canadian Pacific at St. Boniface was protected by a mechanical interlocking with a leverman on duty all the time.

As part of the improvements, this mechanical plant was replaced with electrical equipment, and one new crossover was added between the two Canadian National main tracks. The control of the new St. Boniface layout, as well as all the other layouts shown on the plan, are consolidated in a CTC type machine located in the passenger station.

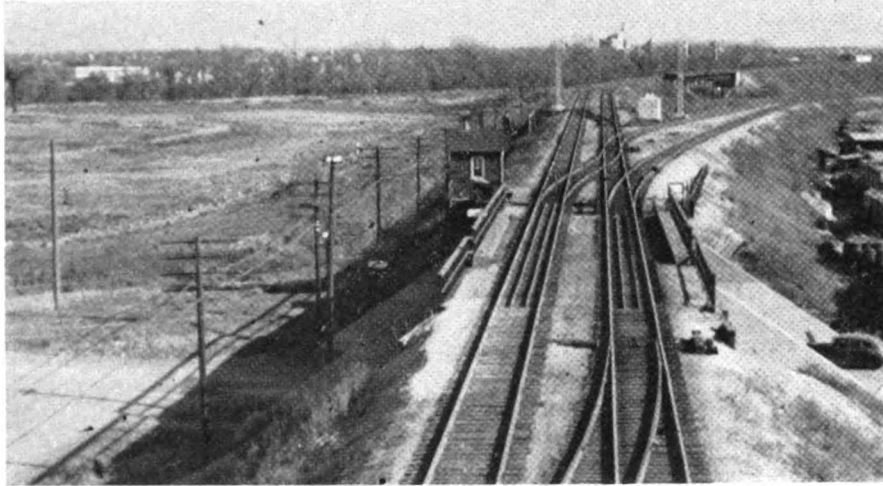
A single-track line, known as the McArthur cut-off, extends from King Street area to McArthur



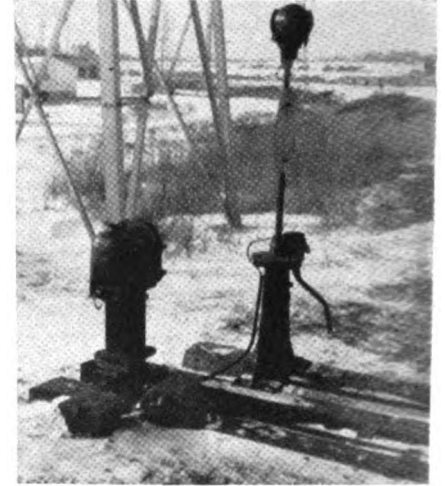
The entire project is controlled by this one machine in the passenger station and it can be expanded to control switches and signals west of the station



Power interlocking replaces hand-throw switches at Beach Jct.



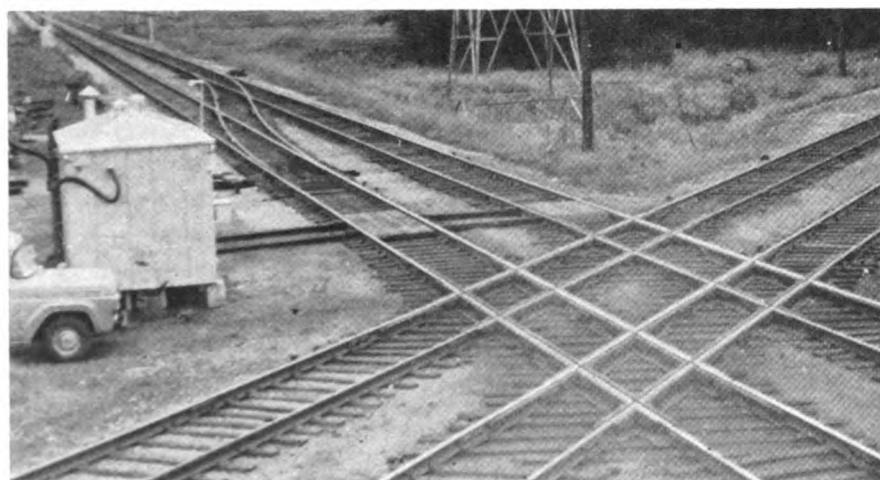
New power interlocking replaces switchtenders at Terminal Cut-Off Jct.



Hand-throw switch has electric lock



Pushbuttons and indication lamps in approach to GWWD signal



Mechanical interlocking was eliminated at railroad crossing

Junction. Formerly the switches at this junction were hand-thrown by trainmen. The new layout at this junction includes three power crossovers, one power single switch and seven home signals. This cut-off crosses the single-track railway known as the Greater Winnipeg Water District. Previously this crossing was not interlocked. All trains stopped before passing over the crossing. As part of the new project, interlocking home signals were installed at this crossing. All signals at this diamond crossing are normally stop. G.R.S. Trackcode circuits are used on this cut-off. Signals 0.4 and 0.5 on the CN will clear automatically when a route is lined over the cut-off from King Street or McArthur Junction. All movements over the cut-off are made at speeds under 20 mph, and the best signal received to enter is a "slow approach."

Pushbuttons and indication lamps are located 50 ft in advance of the G.W.W.D. signals. If no train is seen approaching the diamond, the pushbutton is operated and the signal will clear immediately. If a route has been lined for a CN train, CN Signal 0.4 or 0.5 will be put to stop and a red light come on beside the pushbutton. After time has run, this light will go out and the G.W.W.D. signal will clear. This signal will remain clear for two minutes, and if not accepted will automatically go to stop and again clear for CN train.

Power Switches Replace Hand-Throw

A yard, known as the Paddington yard is located south of the main tracks between McArthur Junction and Paddington. The end of double-track switch at Paddington

was previously equipped with a hand-throw stand operated by trainmen. The new layout at Paddington includes a power switch and three home signals.

Intermediate automatic signals serve also as approach signals for interlocking home signals. Electric locks were added at nine main-track hand-throw switches between Terminal Cut-off Junction and Paddington, and also at one switch between King Street and Transcona.

The various layouts discussed above include a total of 20 single power switches, 14 power cross-overs, 12 electric locks on hand-throw switches, 75 home signals and 18 automatic signals which serve also as approach signals. This entire layout is controlled from the one CTC type interlocking machine in the Winnipeg passenger station. This machine is arranged for expansion to control the area west of the station in the near future. Train movements are authorized and directed by signal indication. On the double-track sections, the signaling is arranged for train movements either direction on each track.

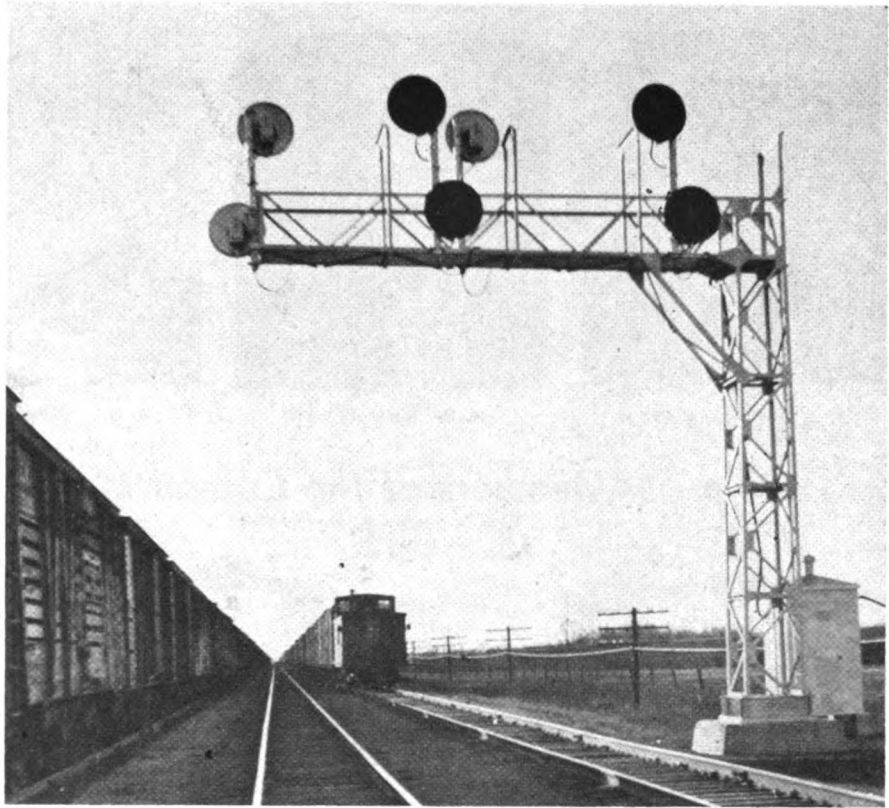
Circuit Arrangements

The switches and signals at the east end of the station are controlled by direct-wire circuits. The other switches and signals are controlled by line code equipment, the same as that used on CTC system. The project as a whole eliminates numerous trainstops and delays, and improves safety.

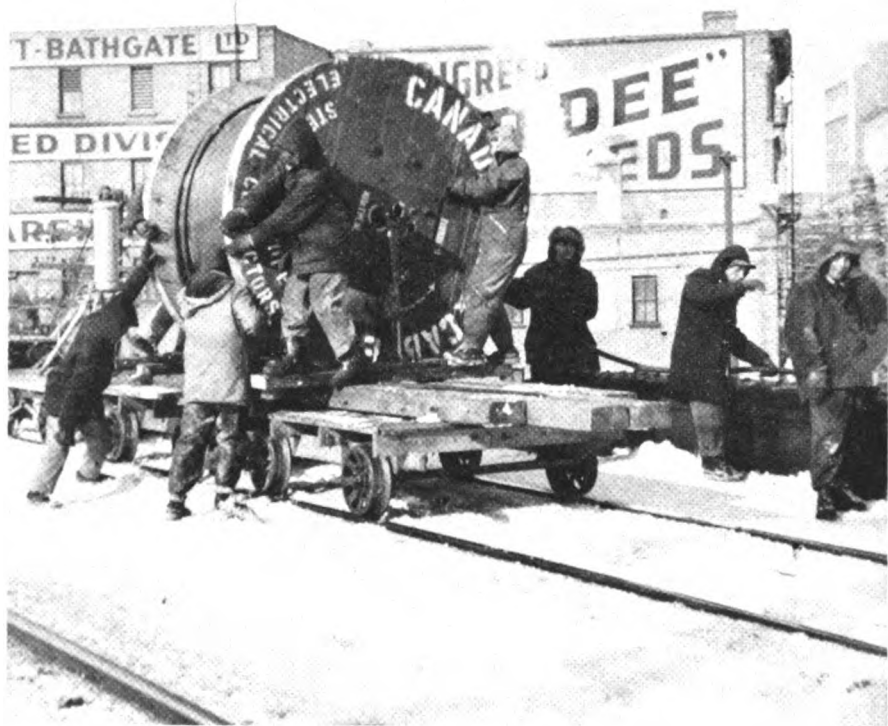
The track circuits are equipped with d.c. neutral relays rated at 1.8 ohms. Lead type storage batteries are used throughout to feed track circuits, signal controls, switch machines, etc., except that nickel-iron cells are used for track circuits in the station area. A total of about 10 miles of aerial cable was installed for the various control circuits. This cable is 19, 23, or 27-conductor, practically all No. 14.

Installation Work Performed By Canadian National Forces

This project was planned and constructed by Canadian National forces, under the direction of L. W. Matson, Signal Engineer, Western Region, with headquarters at Winnipeg, and under the jurisdiction of E. P. Stephenson, Signal Engineer, System, with headquarters at Montreal. The signaling equipment was furnished by General Railway Signal Company.



Cantilever signals for train movements either way on each of two main tracks between McArthur Jct. and Paddington Jct. and yard at Paddington. Running track on the left serves as a yard lead (view is looking west)



A total of 10 miles of aerial cable was installed, ranging from 19, 23 to 27-conductor with practically all of it No. 14 wire. Crew here is unreeing cable from track car on a vladuct. Much work was done in winter