

G. R. S. Train Control Demonstrated on C. & N. W.

Actual Service Test Shows Practicability of Intermittent Tapered Speed Control and Stop Indications

THE CHICAGO & NORTH WESTERN demonstrated the General Railway Signal Company's system of intermittent inductive tapered train control on October 13, between West Chicago, Ill. and Forris (Elgin). A special train consisting of an Atlantic type locomotive, a business car and a parlor observation car left Chicago at 9:00 a. m., the test being completed at 3:00 p. m. Fifteen railroads

the "Call-on" signals is now enforced by the application of pairs of inductors suitably placed between the interlocking plant and West Chicago station.

The speed control and receiving apparatus for freight and passenger locomotives is identical except for the timing of the time element contactor. Locomotives that are, under certain circumstances, used in both passenger and freight service are equipped with time element contactors that may be automatically adjusted for either class of service. At present two passenger and two freight locomotives are equipped with receiver apparatus and mechanism for operating engineer's brake valve. A number of tests were made to demonstrate the operation of the system for both speed control and train stop features. Detailed description of the General Railway Signal Company's train control system was published on page 521 of the *Railway Age* for March 4, 1922.



Making Low Speed Tests Over Pair of Track Inductors

were represented by signal, mechanical and general officers, there being a total of 41 present.

The territory on which this device is installed is not a portion of the line designated in the Interstate Commerce Commission's order and this installation was made primarily for test purposes. From West Chicago to Wayne, there is five miles of double track, the balance being single track. The double track is equipped with Model 2A, direct-current signals located on bridges and the single track is equipped with the absolute permissive block system, Model 2A, direct-current signals being mounted on the masts in the usual manner.

The installation is of special interest due to the nature of the track and the varied classes of traffic which operate over it. Fixed limited speed is imposed at certain locations, as approaching the end of double track and interlocking plants, i.e., certain fixed speed limitations are in effect which are enforced through the use of pairs of inductors constructed without windings. The speed control scheme generally uses three pairs of inductors governing the approach to stop signals which force the deceleration of a train to insure a safe stop.

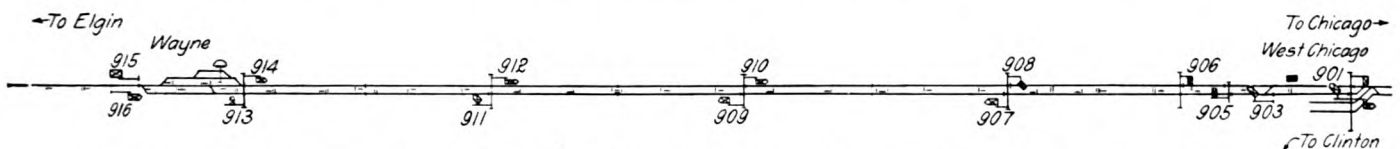
Actual Train Operation Tests Made

On leaving West Chicago, the special test train followed a scheduled milk train, the engineman of the special train being



Relays and Timing Element Are Housed in a Cast-Iron Box on the Tender

instructed to pass signals at "caution" or "danger" in an attempt to close up on the milk train. While the milk train was in the block signal 913 i.e., at the station at Wayne, signal 913 was at "stop," and signal 911, at "caution." Under these conditions the special train, in approaching



Track and Signal Plan for That Part of Installation from West Chicago to Wayne Showing Location of Track Inductors

Speed is so tapered as to handle the trains as they would be handled manually, automatic braking being used only when speed limits are exceeded.

There is an interlocking plant a short distance from the West Chicago station from which it has been customary, under certain traffic conditions, to advance trains to the station on "Call-on" signals. The limited speed indicated by

signal 913 at a speed of 55 m.p.h., received a brake application at the first pair of inductors after passing signal 911. This automatic application of the brakes brought the train to a stop in approximately 3,300 ft. with the locomotive and one-half the length of the first car past the signal.

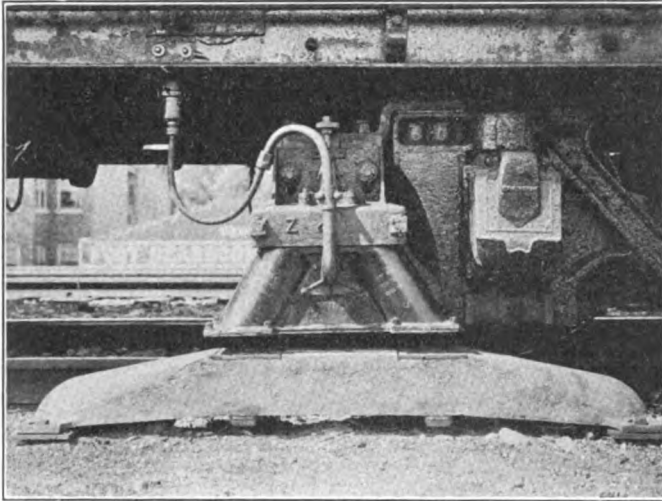
The special train then followed the milk train west from Wayne on the single track. Signal 919, in the caution

position, was passed at a speed of 40 m.p.h. and an automatic brake application was received at the second pair of inductors bringing the train to a stop at a point about 500 ft. before the signal was reached.

The train was then backed to West Chicago and turned. It then backed to Wayne where it was crossed over and headed east on the eastbound track. While a gravel train was in the block the special train attempted to pass signal 910 at 45 m.p.h., but was stopped automatically.

On the next test, signal 908 was disconnected and placed at stop purposely, thus causing signal 913 to assume the "caution" position. The train was again backed to Wayne and an effort was made, on again proceeding eastbound, to pass signal 910 in the caution position at maximum speed to see if the speed restriction would be enforced automatically. In this test, a brake application was received at the intermediate speed inductors and the train was stopped within 1,400 ft.

With signal 908 at "stop" and 910 at "caution" an attempt was next made to operate the train at a low speed over the first two sets of speed control inductors and to pass the third set near signal 908 at a low speed so as to disregard the signal indication. However, the apparatus functioned as intended the train being stopped automatically within 600 ft. when



Receiving Element on Tender Truck Standing Over a Track Inductor

traveling at 23 m.p.h. although working steam until actually stopped. In repetition of this test at 25 m.p.h. the train was stopped at the signal. All of the foregoing tests were made with a brake pipe pressure of 70 lb. instead of 90 lb. which accounted for the engine and part of one car over-running the signal in one test.

The system was not installed with the idea of stopping light trains with low brake pipe pressure and with throttle open short of the signal in case of an automatic application of the brakes. Should a railroad require an installation to give protection under such conditions it is provided by installing the control points further in the rear of the signal with which they are associated.

Tests were made next to determine the minimum speed at which an effective impulse could be received by the equipment from a track inductor. The low-speed pair of track inductors used for this test were 34 ft. apart, and the following results were obtained from timing the passing of the engine over the inductor with a stop watch.

It will be noted in the table below that no impulse was received at a speed of approximately 2.4 miles an hour. The engine used in this test, however, was one of the first ones equipped in which the receiver was placed between the journal box and springs. Later engines are now being equipped

having the receiver overhung and outside of the journal box which, it is claimed, results in more powerful impulse, and had the receiver been mounted in this way an impulse would have been received at speeds lower than those shown in the table below.

Speed M. P. H.

1.	2.41	No impulse received from either inductors
2.	2.79	Impulse received from first inductor only
3.	2.88	Impulse received from first inductor only
4.	3.22	Impulse received from first inductor only
5.	3.86	Impulse received from both inductors
6.	4.28	Impulse received from both inductors

On the final test with signal 908 at stop and 910 at caution and the train running past signal 910 at 57 m.p.h., the automatic brake application was received at the high speed inductors which stopped the train just short of signal 908. Steam was worked until the train was stopped.

Asked To Prevent Waste of Refrigerator Cars

WASHINGTON, D. C.

DELAYS IN THE UNLOADING of refrigerator cars at destination have become such a serious matter, causing car shortage in some sections of the west, and congestion and embargoes at eastern terminals, that the Car Service Division of the American Railway Association has called upon the principal fruit and vegetable associations of the country to make an investigation to determine if it is not in their own interest, as well as that of the railroads, to adopt some plan that will prevent the great waste of refrigerator cars and terminal facilities that now exists, due to various improper practices on the part of receivers of perishable traffic.

In a letter to the secretaries of these association, M. J. Gormley, chairman of the Car Service Division, says he has heretofore held the opinion that more could be accomplished by co-operation than by a penalty charge for the detention of refrigerator cars, but that the question has become so serious that the time has come to give serious consideration to a charge of such amount as may be effective, possibly \$25 a day.

There is comparatively little shortage of refrigerator cars except in California, but there have been loud complaints from that section from shippers anxious to load their fruits and vegetables, particularly grapes, before they spoiled, and the cars have been arriving in the East much faster than their contents have been disposed of. The reported shortage of refrigerator cars increased from 190 in the first week of September to 992 during the last week of the month, of which 919 were in the Central Western district, and during the first week of October the number had increased to 2,256, although at the same time surplus refrigerator cars to the number of 1,059 were reported from various sections. On October 8 reports received by the Car Service Division showed 1,737 refrigerator cars at 19 terminals that had been delayed for three days or longer awaiting unloading, some of them for 20 days or longer. The number had increased from 1,282 on September 22. These were at practically every large terminal in the country but the greatest number, as indicated by reports as of October 6, were at Pittsburgh, 375; Chicago, 311, and New York, 240.

Mr. Gormley's letter is as follows:

Mr. Gormley's Letter

"As you gentlemen know, I have been consistently of the opinion that the railroads should not restore the \$10 penalty charge at one time in effect on refrigerators delayed in unloading. I have held to this position in the belief that with the active co-operation of your various associations, and com-