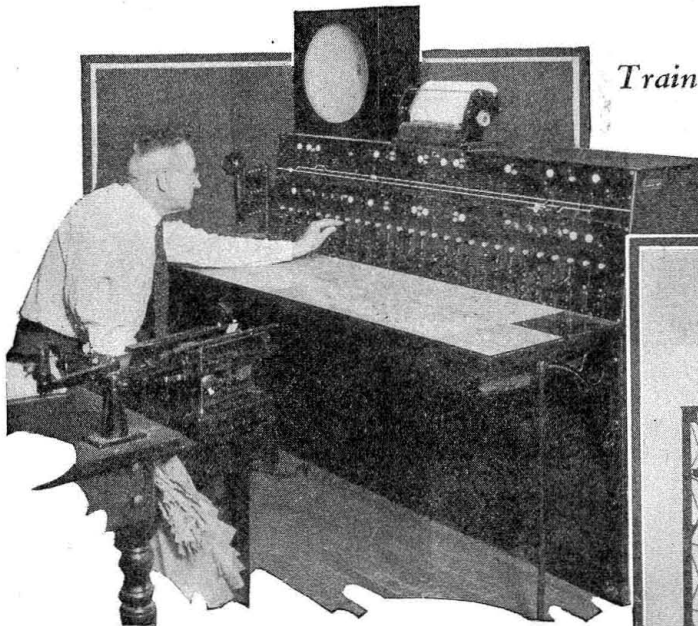


Burlington Installs

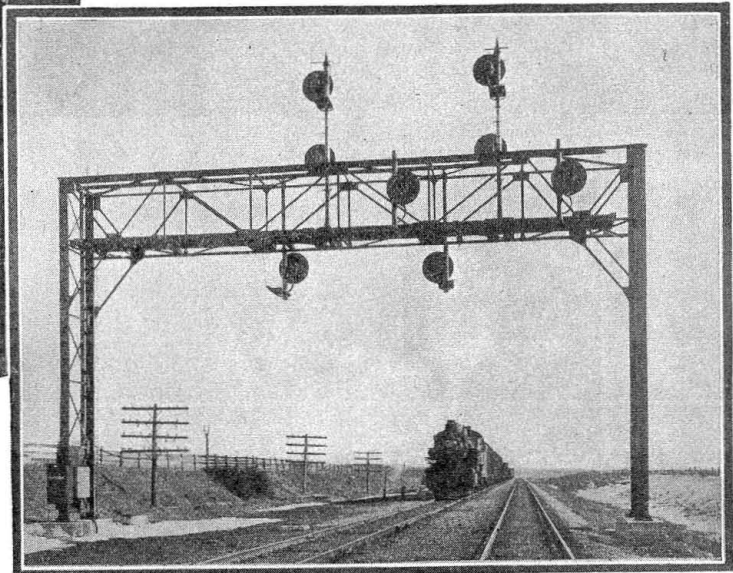
Centralized-Control

on Nine Miles of Double Track



The control machine at Rochelle

Train operation by signal indication in either direction on both tracks—Two interlockings removed



Train approaching home signal bridge at Flag Center

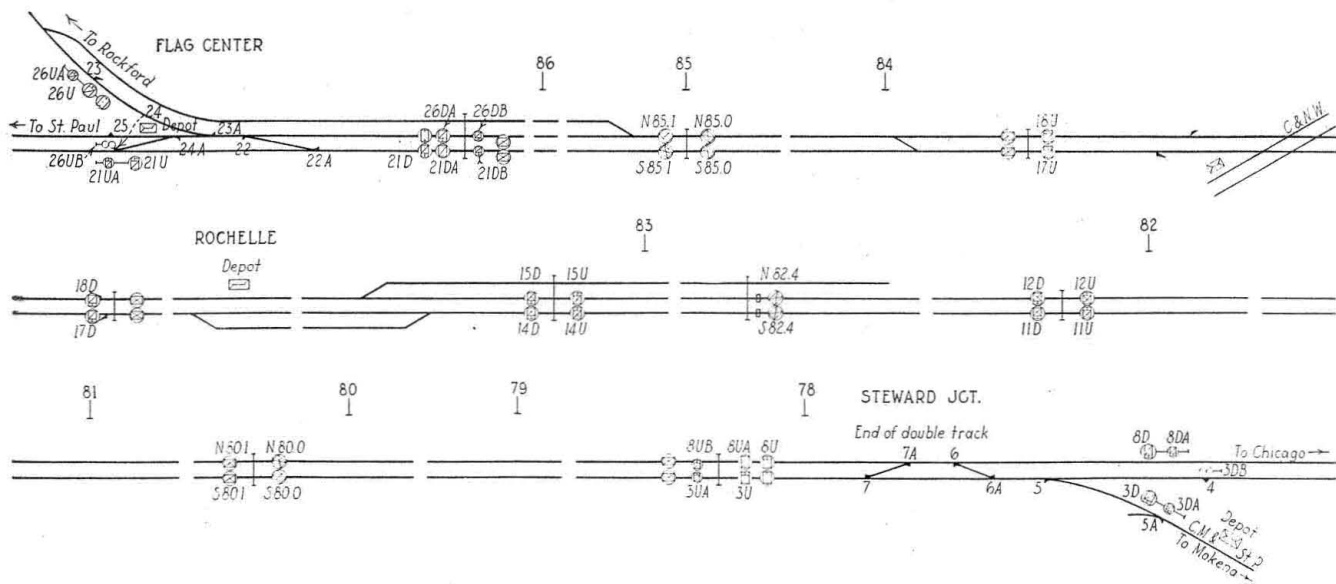
By W. F. Zane

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Chicago

IN pursuance of a policy of increasing efficiency economically, and at the same time promoting safety of operation, the Chicago, Burlington & Quincy has installed a centralized-control system on a nine-mile section of double track between Flag Center, Ill., and Steward Junction, on its main line between Chicago and

St. Paul, Minn. The control machine is located at Rochelle, Ill., three miles from Steward Junction, the west end of the territory.

Previous to the present installation, this territory was operated under a double-track automatic block system, employing semaphore signals of the lower-quadrant,



Track and signal plan of territory from Flag Center to Steward Junction

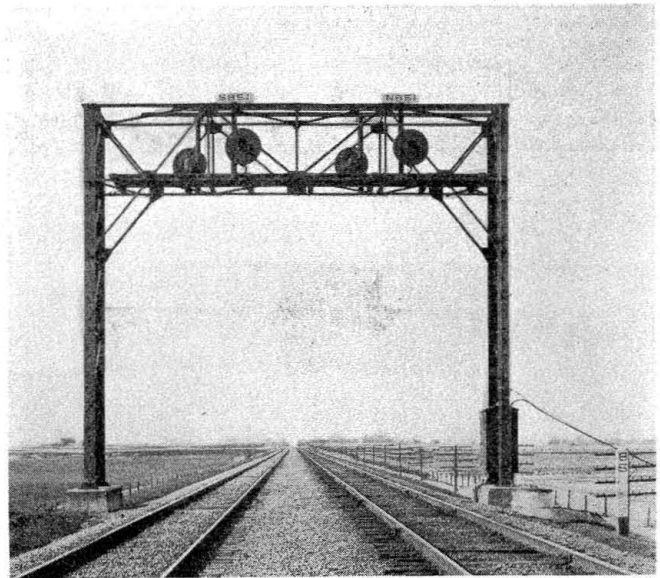
two-position type. At Steward Junction, a mechanical interlocking plant handled the end of double track as well as a junction with the Chicago, Milwaukee, St. Paul & Pacific, which plant required an operator for each track. At Flag Center a similar plant with the same number of operators controlled the end of double track, and also handled the junction switches for the Burlington's branch to Rockford, Ill. The Milwaukee operates branch-line service over Burlington rails from Steward Junction to Flag Center, and thence over the Rockford line to Davis Junction where its own rails are reached.

Track construction is of 90 and 110-lb. rail with washed gravel ballast. The ruling grade is 0.49 per cent westbound and 0.42 per cent eastbound, with a maximum curvature of 2 deg., all curves being comparatively short.

The traffic includes 35 scheduled trains daily besides extra freight trains, the number of which fluctuates with the movement of coal. The Burlington operates 6 through and 5 local passenger trains each way daily, while the Milwaukee has a local passenger each way daily, the local service on both roads being gas-electric motor cars. The Burlington also operates 3 through freight trains and the Milwaukee one such train each way daily. Also the Burlington has one local freight each way daily and another every second day. In addition a considerable number of extra coal trains are operated during certain seasons.

New Method of Operation

By the installation of the centralized control system, it was possible to control remotely the two interlocking plants at the ends of the double track, and eliminate the six operators. The signaling of each track in each direction and the use of A.P.B. circuits, made it possible to handle trains on either track in parallel movement, thus relieving directional congestion as well as enabling a fast train to be run around a slower one and



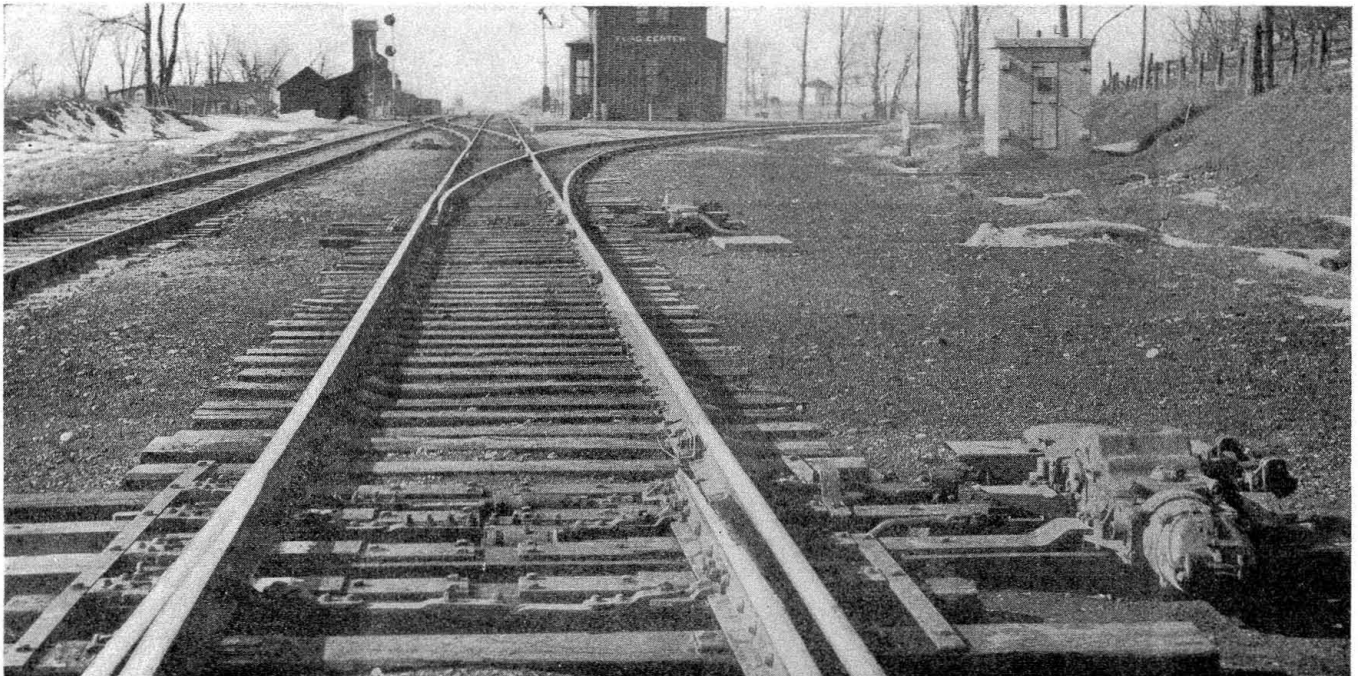
The intermediate automatic block signals are arranged for either-direction operation on both tracks

control installation are shown in the accompanying tables which give a comparison between the old arrangement and the new.

The cost of the project was \$65,815, so that the saving derived represents a 12.7 per cent return on the investment. In addition, there is the intangible saving of increased ease of movement, which should be evident during periods of increased traffic.

Operation of the System

The central machine, located in the office at Rochelle, governs the starting signals out of Rochelle on all the main tracks, the signals on all main tracks protecting the



The power switch machines are equipped for dual-control

keep both moving. This complete flexibility of operation is obtained without the use of train orders, all train movements being made on signal indication only. The tangible economies accomplished by the new centralized

station limits and the interlocking plants referred to. This machine has 6 switch, 2 derail, 10 signal levers and 10 spare spaces. The indication on the machine panel consists of a track diagram with complete track occu-

pancy and approach annunciator lights, normal and reverse derail and switch lights, directional arrow signal lights and a single-stroke bell to call attention to the approach of a train. Miniature mechanically-controlled switch points on the panel complete the field reproduction on the machine. A train graph, mounted on top of the machine, makes a graphic record of all train movements.

Comparative Statements of Costs Past Operating and Maintenance Costs

Six operators per year.....	\$11,036
Operating charges for supplies per year.....	500
Maintenance charges per year.....	1,800
Interest, depreciation, etc., per year.....	4,103
Operating charges, primary battery per year.....	684
Total operating and maintenance charges.....	\$18,123

Present Operating and Maintenance Costs

Operating charges for supplies per year.....	\$ 50
Maintenance charges per year.....	1,800
Interest, depreciation, etc., per year.....	6,472
Operating charges for charging current.....	300
One signal helper per year.....	1,095
Total operating and maintenance charges.....	\$9,717
Net yearly saving.....	\$8,406

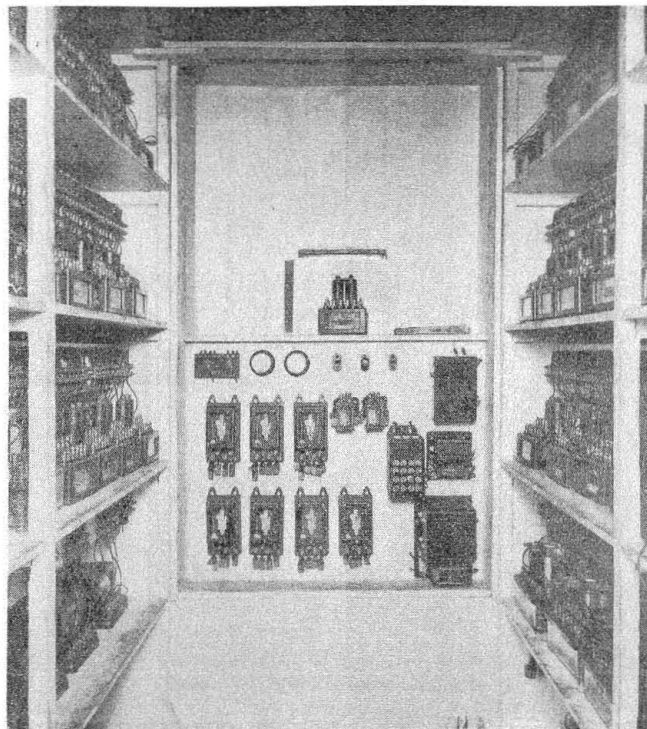
The entire signal arrangement was changed. The semaphore signals were retired and Type S-A single lens, three-color, color-light signals installed on two-track signal bridges. The circuits are of the signal company's standard design, modified to meet the requirements of the railroad. The signals are of the stick type, complete approach, route and detector locking being



The relay, batteries, etc., are located in small concrete houses

used. In fact, interlocking practice was followed. The bridges were located so as to obtain as nearly uniform blocks as possible in both directions on each track, the bridges resting on pre-cast foundations made at the concrete plant and set by crane. This installation was designed to secure a maximum of flexibility, safety and speed of operation, and to be applicable not only for the present operation conditions but to provide also for future expansion of traffic. Since the installation has been placed in service, results have been very satisfactory.

The switch machines are Model 5-B dual-control type with full lock-rod protection when on power operation, but not when on hand throw. The machines are placed on top of ties with very little framing, which locates them above the ground line and reduces frost trouble. Power for the operation of signals, switch machines and line control is provided from Exide stor-



Interior of one of the concrete houses—Note that the terminals are accessible

age battery, charged from the 220-volt line by Union rectifiers, the power being bought from the local power company at Rochelle.

The equipment for the centralized-control system including the control machine, the switch machines, signals and detailed apparatus was furnished by the General Railway Signal Company, and was installed by the regular signal construction forces of the Burlington.



On the M-K-T in southern Oklahoma