

Junction and a Crossing Included

Numerous train delays eliminated by new project between Van Buren and Ft. Smith, Ark.

THE Missouri Pacific has recently completed an installation of centralized traffic control, including a junction and a railroad crossing, between Ft. Smith and Van Buren, Ark. This project is on the Central division extending 319 miles between Coffeyville, Kan., and Little Rock, Ark. In the vicinity of the new C.T.C., the main line is located on the north side of the Arkansas river and passes through Van Buren, which is a freight subdivision point. At Greenwood Junction, 6 miles west of Van Buren, a single-track line branches off to the south and crosses the river to Ft. Smith. All passenger trains are operated into and out of Ft. Smith via this route. Considerable freight traffic is received and delivered not only in Ft. Smith but also on two short branch lines extending to outlying industries and other points. Switch engines are used to handle the traffic between the yard in Van Buren and the various

freight houses and industries in the Ft. Smith area.

In the previous operating arrangement, the switches at Greenwood Junction and at Ft. Smith were operated by hand-throw stands; no automatic signaling was provided, and train movements were authorized by time table and train orders. As the number of trains and freight transfer movements increased, the delays became excessive. In order to move passenger trains in and out of Ft. Smith promptly, the freight transfer movements, as well as through freight trains, were held either at Van Buren or Greenwood Junction, often resulting in considerable delay to these latter movements. In order to correct these conditions, automatic block signaling and centralized traffic control were installed.

Track Layouts Involved

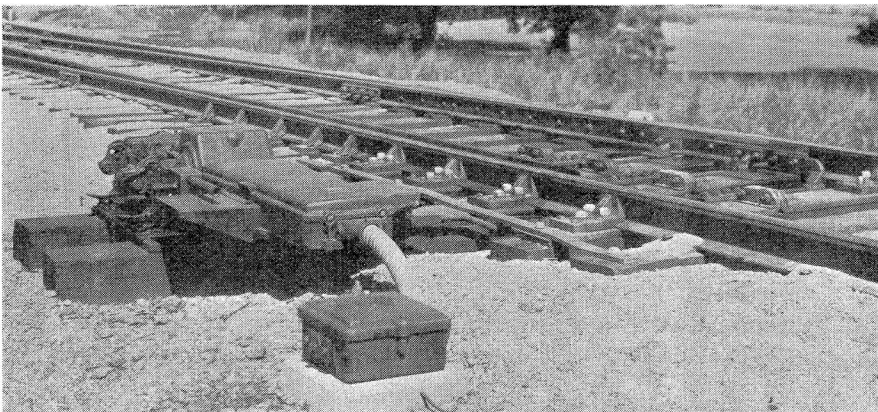
The track layouts are shown in Fig. 1. At Greenwood Junction, power switch machines and C.T.C. signals were installed at the three junction switches so that train movements can be authorized on the various routes and without stops for throwing the switches. Signals at these switches al-

low meets being made at either leg of the wye as may become necessary.

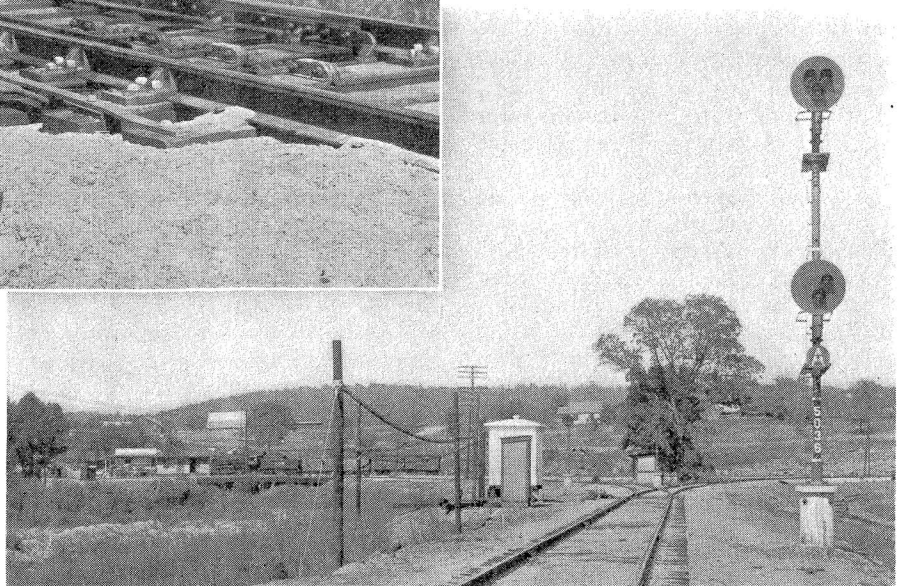
When a passenger train is making a move into Ft. Smith, it pulls down south of signal No. 5080. Then the C.T.C. operator sends out a control which causes the lower "arm" of signal No. 5080 to be illuminated, thus displaying the letter "S", which authorizes the brakeman to reverse the hand-throw switch No. 14, after which the train is backed down around the wye to the passenger stations. This lower "arm" is a single-light signal unit with an 8 $\frac{3}{8}$ -in. glass. The lamp is normally extinguished, but, when lighted, displays the illuminated letter "S".

The use of the hand-throw switch in the passenger train movement, explained above, introduces no loss of train time, and the reason that a spring switch was not installed to obviate this hand operation was that numerous freight transfer moves are made on the route from South Ft. Smith direct to Greenwood Junction. Thus, in order to prevent stops for these movements, the normal position of switch No. 14 must be with the points to the right.

When a passenger train is ready to depart from the Ft. Smith passenger station, the C.T.C. operator causes a Proceed aspect to be displayed on signal No. 5078R, which authorizes the train to trail out through spring switch No. 12 for a



Above—The switches are the dual control type
Right—Signal 5036 at the Greenwood Junction



in Centralized Traffic Control

On the Missouri Pacific

move over the main line to Greenwood Junction.

The freight transfer trains for serving the Ft. Smith area are made up in the yard at Van Buren. A large percentage of these trains handle cars to and from industries or other points on the line to South Ft. Smith, thus passing through Ft. Smith on the west leg of the wye with both the switches No. 12 and No. 14 in the normal position.

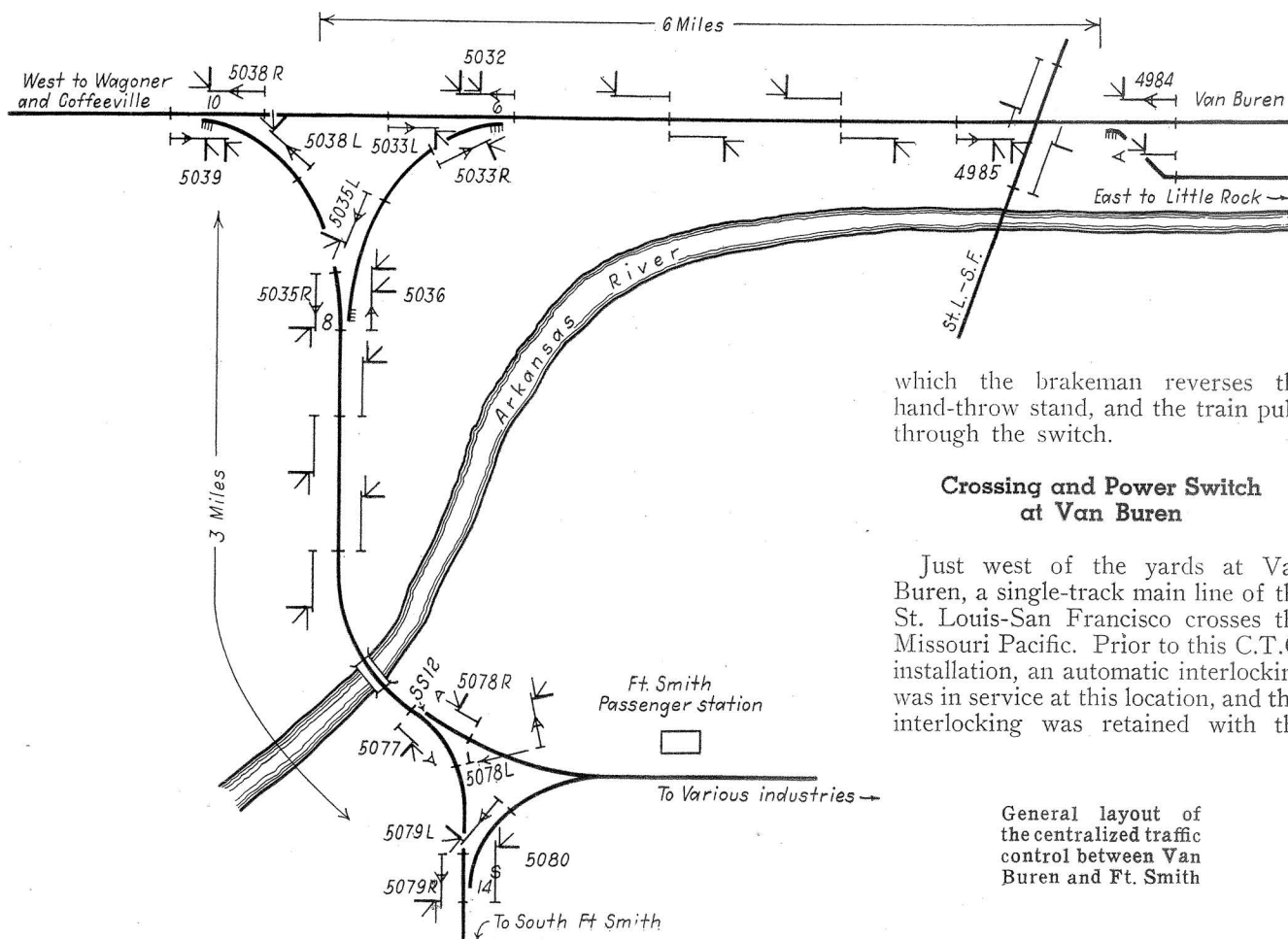
Some of the freight transfers, which are to do switching in Ft. Smith in the area east of the passenger station, pull down past signal No. 5080 and back down past the station in a move similar to that made by passenger trains, as explained previously. If a freight transfer train from Van

Signal No.
5078L at
Ft. Smith
Junction



Buren is to head in through the passenger station track at Ft. Smith, it stops short of switch No. 12, and the

C.T.C. operator sends out a control to cause an "S" unit on dwarf signal No. 5077 to be illuminated, after

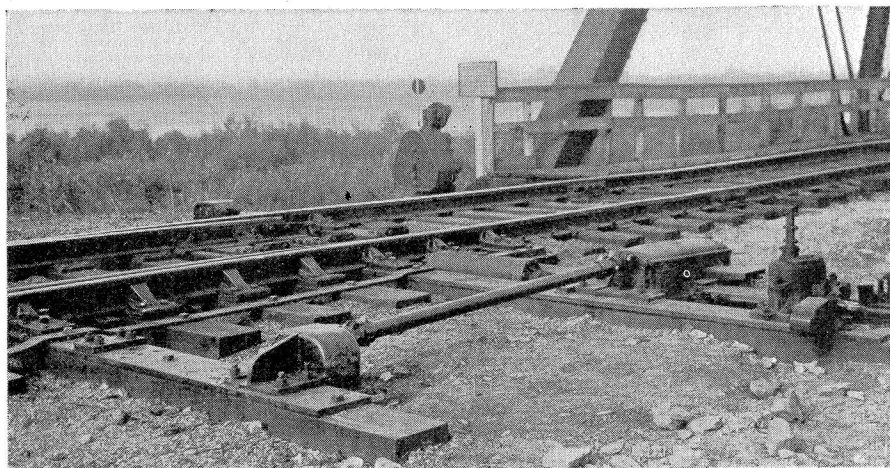


which the brakeman reverses the hand-throw stand, and the train pulls through the switch.

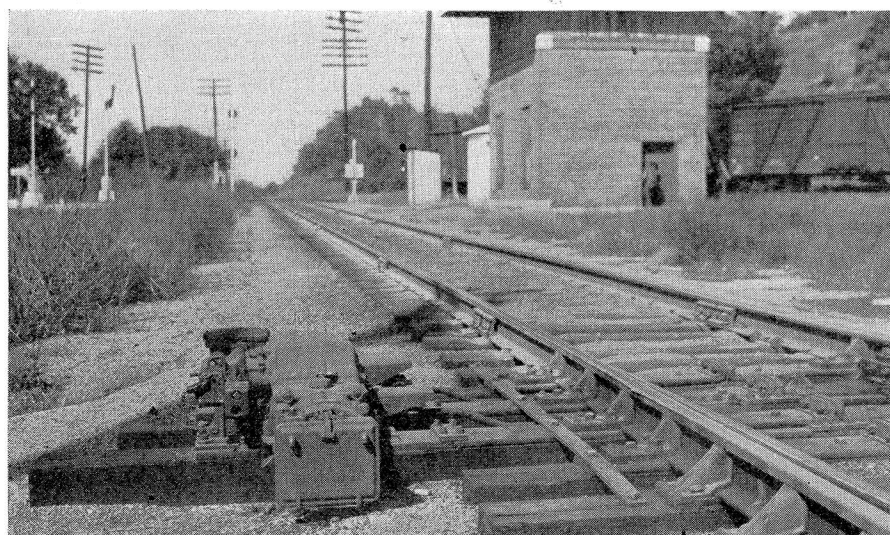
Crossing and Power Switch at Van Buren

Just west of the yards at Van Buren, a single-track main line of the St. Louis-San Francisco crosses the Missouri Pacific. Prior to this C.T.C. installation, an automatic interlocking was in service at this location, and this interlocking was retained with the

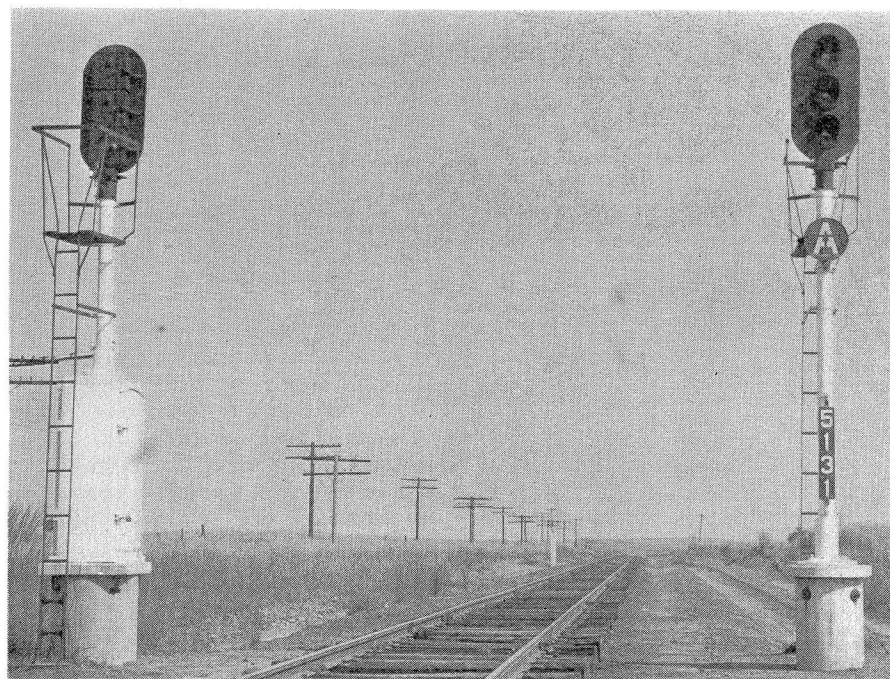
General layout of the centralized traffic control between Van Buren and Ft. Smith



Spring switch 12 with an automatic mechanical facing point lock



The switch machines are of the latest type with outboard brakes



Typical station-leaving automatic block signal location showing concrete foundations

C.T.C. control of Missouri Pacific signals superimposed on the automatic interlocking circuits.

Control of the C.T.C.

The C.T.C. control machine, located in the office at Greenwood Junction, is handled by an operator who works under the direction of the train dispatcher at Coffeyville. This machine includes 8 levers for the control of 20 signals, 4 levers for the control of 4 power switch machines, and 2 levers for selections required in connection with signal controls over the hand-throw switch and the spring switch at Ft. Smith.

The illuminated track diagram repeats the locations of trains on the entire territory. Telephones are provided at Van Buren, as well as at all the various switches, so that the C.T.C. operator can be informed concerning the various freight transfer movements to be made. By means of the C.T.C. facilities, the operator can arrange for the freight transfer movements between the various through passenger and freight train operations so that delays are reduced to a minimum. Before the C.T.C. was installed, the delays to trains approached the point of serious congestion. Since the project was placed in service, the traffic has increased further, on account of various new industries and other activities as a part of the war program, so that as many as 45 or more moves are being made through this territory daily. A conclusion, therefore, is that if the C.T.C. had not been installed, important traffic would now be seriously delayed in this area.

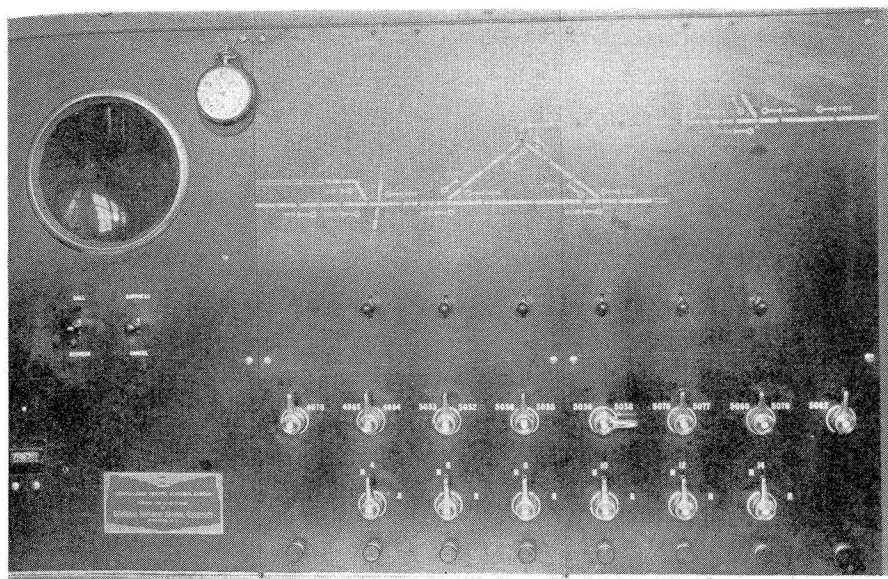
Also Automatic Block

As a further means for improving safety and expediting train movements, color-light automatic block signaling was installed on the branch line from Ft. Smith south for 12 miles to Barling, as well as on 78 miles of the single-track main line between Greenwood Jct. and Wagoner, Okla.

Details of Apparatus

The C.T.C. equipment is the General Railway Signal Company's Type-F Class-M. Sheet metal houses are provided at the outlying points to house the instruments and batteries.

The power switch machines are the General Railway Signal Company's Model 5D with dual-control. Switch No. 12 at Ft. Smith is equipped with a Pettibone-Mulliken, Mechanical-Switchman type spring and buffer mechanism, as well as a General Railway Signal Company mechanical facing-point lock.



The C. T. C. control machine has 8 levers for signals and 6 levers for switch controls

Each switch is equipped with 1-in. by 9-in. insulated gage plates on four ties, including the one ahead of the points. Rail braces are used on these plates, a special feature being the braces on the gage sides of rails on the tie ahead of the point so that the rails cannot roll. On two ties, the gage plates extend and are attached to the switch machine, thus preventing lost motion.

Color-light signals are used. In the semi-automatic signals, the lamps are arranged in a triangle, using a circular background, which provides a distinguishing difference from the automatic block signals in which the color-light units are in a vertical row with an oblong background. Each C.T.C. controlled semi-automatic signal is equipped with a reflectorized "A" marker, thus designating it is an absolute stop signal.

The concrete signal foundations are of the pre-cast type, furnished by the Concrete Products Company, St. Louis, Mo.

Power Supply

Alternating current at 550 volts single phase is distributed over the territory on a line circuit of two No. 6 weatherproof copper wires. At each power switch, a set of 12 cells of Exide Type-DMGO-7 storage battery, on floating charge, is provided for operation of the switch machine, as well as for operation of the coding equipment. One set of 5 cells of the same type of battery is used at each signal, and one cell of the same type feeds each track circuit.

This centralized traffic control project, as well as the automatic block signaling mentioned previously, was planned and installed by the signal

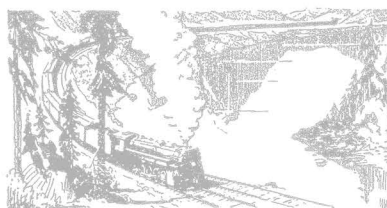
department forces of the Missouri Pacific, under the direction of L. S. Werthmuller, signal engineer. The major items of equipment were furnished by the General Railway Signal Company.

Signals Ordered on the Kansas City Southern

On December 30, the Interstate Commerce Commission issued an order as follows:

It is ordered. That the Kansas City Southern be required to install a block signal system which complies with the specifications and requirements prescribed by our order of April 13, 1939, on that part of its line extending between DeQuincy, La., and Beaumont, Tex., and between Joplin and McElhany, Mo., and that said installations be completed on or before July 1, 1944, and *provided* that if a centralized traffic control system is installed to meet this requirement, all hand-operated main track switches within the installation will be equipped with electric switch locks.

It is further ordered. That this proceeding be held open for further consideration with respect to what block signal systems or other similar appliances, methods, or systems should be required to be installed on other portions of respondent's line between



Kansas City, Mo., and Port Arthur, Tex.

The report, preceeding this order, stated in part that during the period from August 18, 1941, to May 25, 1942, four serious collisions between trains occurred on the line of the Kansas City Southern. Investigations of the foregoing accidents disclosed that a block signal system was not in use on the parts of respondent's railroad where these accidents occurred, and that had an adequate block signal system been in use these accidents would not have occurred. The establishment of an adequate block signal system was recommended. In connection with the reports upon the Holly and Joplin accidents, orders were issued calling upon the Kansas City Southern and other interested parties to show cause, if any, why that carrier should not be required to install an adequate block signal system on the lines of the districts in which those accidents occurred. In connection with the Acorn accident, a similar show-cause order was issued July 30, 1942, applicable to all portions of its main line between Kansas City, Mo., and Port Arthur, Tex., except one section of about 16 miles on which an automatic block signal system was then in service.

The Kansas City Southern filed a return to each of these show-cause orders setting forth reasons why it believed it should not be required to install a block signal system on any part of its lines. Returns also were filed by representatives of organizations of railroad train-service employees in which it is claimed that the Kansas City Southern does not have an adequate block signal system in use and that such installations as are set forth in the show-cause orders should be required to be made.

At a hearing held September 14, 1942, respondent asked permission to withdraw its returns to the show-cause orders and to file a new return, which request was granted. In its new return it proposed to install a centralized traffic control system on its line between DeQuincy, La., and Beaumont, Tex., a distance of approximately 37 mi., and an automatic block signal system on its line between Joplin and McElhany, Mo., a distance of 26.5 mi. It states that these are the two sections of heaviest traffic density, that between DeQuincy and Beaumont being used also by the Beaumont, Sour Lake & Western, and that between Joplin and McElhany by the Missouri & Arkansas. Applications covering these two proposed installations were approved October 21, 1942.

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