



Westward home signal on Alton & Southern

## Automatic Plant Replaces Mechanical Interlocking on Alton & Southern

Yard lead-out switch, formerly in plant, now controlled from yardmaster's office—Saves 36 per cent on cost

**I**N East St. Louis, Ill., the single-track main line of the Mobile & Ohio is crossed by a single-track main line of the Alton & Southern. A mechanical interlocking, with 14 working levers, was formerly in service at this crossing, and, in addition to the signals, this plant included a yard-lead switch on the M. & O. as well as derails on each of the four main-line tracks.

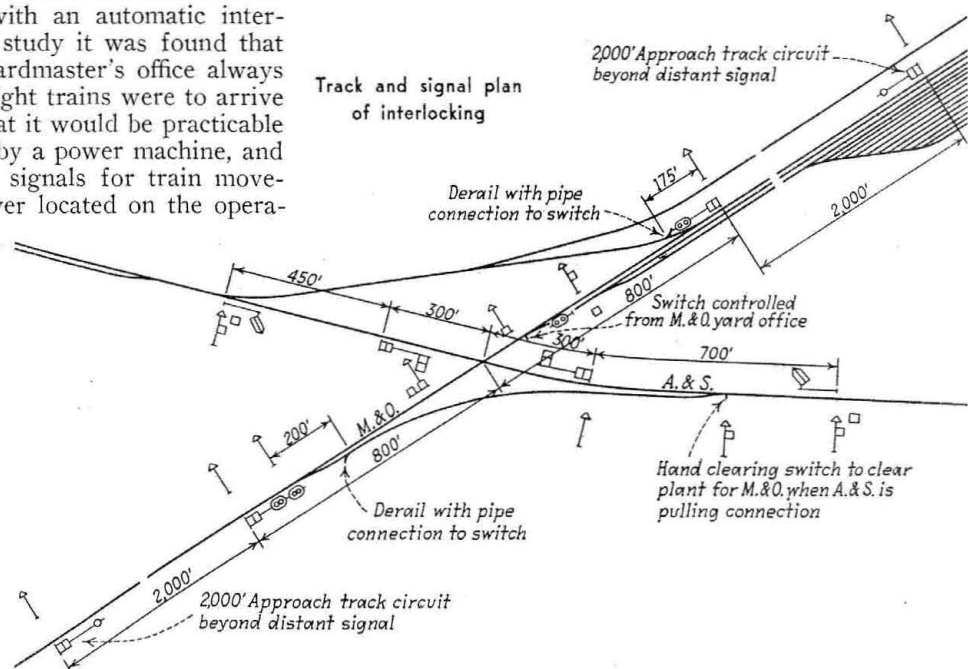
As it was not necessary to maintain this as a block office on either road, a study was made to determine means of reducing operation expenses at this crossing. As the Mobile & Ohio freight trains enter and leave the yard at the switch located about 65 ft. north of the crossing, it did not seem feasible at first consideration to replace the mechanical plant with an automatic interlocking. However, on further study it was found that the operator in the M. & O. yardmaster's office always had information as to when freight trains were to arrive or depart. It then developed that it would be practicable to operate the yard-lead switch by a power machine, and to control it, together with the signals for train movements over the switch, by a lever located on the operator's desk in the yardmaster's office. With the control of the switch thus arranged for, the mechanical plant was replaced by an automatic interlocking.

The Mobile & Ohio operates through passenger trains, as well as freight trains, over this line. Therefore, the distant signals are 2,000 ft. from the home signals, and the approach control section extends 2,000 ft. beyond the distant signals. However, the Alton & Southern trains operating

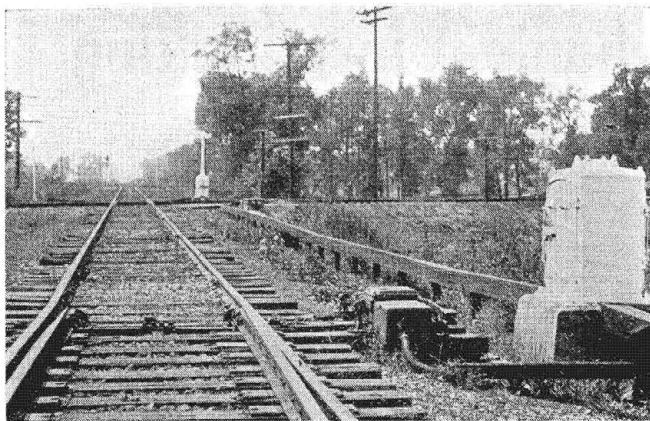
over this crossing are all freight cuts operating at low speeds. Therefore, it was satisfactory to locate the distant signals 450 ft. from the home signals and to use the intervening space as the approach control section for the interlocking.

The signals on the Alton & Southern are Style-B semaphores, and operate to two positions. The distant signals on this road are likewise semaphores fixed at the caution position. These signals are equipped with Style-D electric semaphore lamps. The distant signals have 10-volt .25-amp. lamps burned constantly, while the home signals have 10-volt .25-amp. lamps on approach control. The home signals on the Mobile & Ohio are two-unit color-light Style-R signals with 10-volt 18-watt lamps, while the distant signals are 2-unit color-light, yellow and green, Style R, with 10-volt 18-watt lamps. These signals are on approach control.

The control of the signals for through train movements over the crossing is arranged in the manner ordi-



narily employed for automatic interlockings. As mentioned previously, a single-unit lever is located in the yardmaster's office for the control of the M. & O. yard-lead switch, and to control the signals for directing train movements over this switch when reversed. When this lever is in its normal position, the main-line signals governing over the switch are governed by circuits the same as for an automatic interlocker, but when this lever is in its reverse position the switch is set for movements into or out of the yard track. If the movement is to be into



A view of the switch looking toward the crossing

the yard track, the operator does not reverse the lever and switch until the approaching train is on the approach circuit; this prevents the outbound signal from clearing. If the movement is to be out of the yard track, the operator reverses the lever and switch, and the outbound dwarf clears, the inbound signal being held at stop. This arrangement eliminates the need of a separate lever for the control of these signals. A two-unit Style-N color-light dwarf, located at the fouling point on the turnout, displays red for Stop and yellow for Proceed. A two-unit Style-R color-light signal is used as a lower "arm" on the northward M. & O. home signal. When the plant is normal, the red unit in this arm is lighted, but, when the yard switch is reversed and the plant is lined up for a movement into the yard, the yellow unit is lighted in combination with a red light in the upper arm. The control of these signals for movement in either direction over the switch is, of course, dependent on the occupancy of the approach circuits and home-signal limits of the plant.

Except for the instances explained above, the control of the new layout is automatic. When the Alton & Southern is setting out or picking up cars on the interchange south of the crossing, a part of the train is occupying the approach circuit and would, therefore, hold the crossing signals against the Mobile & Ohio, unless some special arrangement were provided. This condition is taken care of by providing a push button located in a box on a post near the turnout switch, the instruction to the trainmen being that, when making such switching moves on the main line, they are to operate the push button to release the plant for an approaching M. & O. train. The function of this push-button is to eliminate, from the control, the track circuit in the approach on the Alton & Southern. This arrangement automatically returns to normal when the train leaves the track circuit.

Storage batteries on a-c. floating charge through Union rectifiers are used for the power supply for the control circuits, signals and the switch machine; for example, one set of 12 cells of Exide DMGO-9 is used for the operation of the switch machine and the two southward signals on the M. & O.

The Alton & Southern traffic over this crossing varies from 6 to 8 trains a day. The Mobile & Ohio operates 4 passenger trains, from 6 to 8 freight trains, and 6 to 10 switching moves daily over the plant. So far as train operation is concerned, the automatic plant has given very satisfactory service. The changeover from the mechanical interlocking to the automatic arrangement with the switch controlled remotely cost about \$15,850 and the annual saving in operating expense is \$5,700.

This automatic interlocking plant was installed by Alton & Southern forces according to plans prepared by the Union Switch & Signal Company, which also supplied the signal equipment. The installation was handled under the jurisdiction of T. H. Pindell, general manager of the Alton and Southern, W. J. Nuebling, engineer of this road, being in direct charge of the construction.

## Accident at Crossing

ON August 3, at a crossing of two single-track lines at Marion, Ill., there was a side collision between a mixed train on the Illinois Central and a passenger train on the Chicago & Eastern Illinois. No interlocking or signals were in service at this crossing, the only protection afforded consisting of stop signs, the eastward sign on the I. C. being 310 ft. from the crossing and the northward sign on the C. & E. I. being 221 ft. from the crossing. Those signs also protect for a crossing of a Missouri Pacific line involved in the layout. An abstract of the Bureau of Safety's report of an investigation of this accident follows:

The I. C. train, consisting of 25 freight cars, 1 mail car and 1 combination baggage and coach, hauled by locomotive 1866, stopped at the STOP board on its line and proceeded toward the crossing at a speed between 5 and 10 m.p.h., and as the engineman applied the brakes he saw the C.&E.I. train. The I.C. train was practically stopped when arriving at the crossing. The C.&E.I. train consisting of a locomotive, 1 combination mail and baggage car and 1 coach, stopped at the STOP board on its line and proceeded to the crossing at a speed variously estimated between 4 and 17 m.p.h. At the crossing the C.&E.I. locomotive struck the front end of the I.C. locomotive shoving it along the track about 18 ft., the C.&E.I. locomotive being derailed to the right.

The accident happened at 8:08 a. m. on a clear day. The view from a northbound C.&E.I. train of an eastbound I.C. train is obstructed by oil tanks and buildings until a C.&E.I. train is 86 ft. from the crossing. When stopped at the STOP board the C.&E.I. fireman told his engineman that the way was clear and then went to work on the fire.

The evidence indicates that each train made the required stop, but that the I.C. train was the first to stop and then proceed toward the crossing, for it is obvious that this 27-car train would take more time in traveling 310 ft. from its STOP board to the crossing than would be consumed by the C.&E.I. 2-car train in moving 221 ft. The maintenance of a proper lookout by the fireman of the C.&E.I. train undoubtedly would have prevented the accident, but at the same time it is believed that because of the obstructed view and the absence of signal protection a flagman should be sent ahead after the required stop has been made; such a procedure would not result in increased expense or delay, and should be adopted unless these railroads, together with the Missouri Pacific, install an interlocking plant for the purpose of protecting not only the crossing involved but also the crossings of the Missouri Pacific in the immediate vicinity.