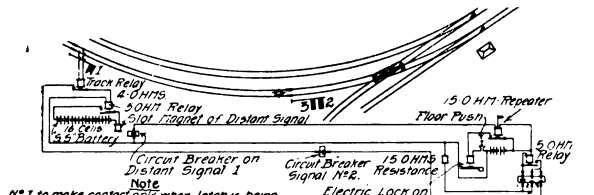
is hoppered so that delivery is made directly to the locomotives on either main track through special drop gates and movable aprons. The scale is used to determine both the amount of coal delivered to each locomotive and the amount remaining in storage. The motive power is a 12-horsepower Fairbanks-Morse vertical gasoline engine.

TRACK CIRCUIT CONTROL OF INTERLOCKING POWER DISTANT SIGNALS.

The use of power distant signals at interlocking plants having become general, owing to the difficulty of safely working at great distances signals with manual wire connections, it is often necessary to control the signal by a track circuit to be sure that it will assume the normal position as soon as the head end of a train has passed the signal. The control of the signal, by running its circuit through the contact points of a track relay, is easily arranged, and in the majority of cases is the plan usually followed. Such an arrangement causes the distant signal to assume the normal position when the head end of the train enters upon the rails of the track circuit. But unless the lever of the interlocking machine controlling the distant signal is returned to the normal position before the rear of the train passes off that track circuit, the signal will be cleared when the track circuit relay picks up and a proceed indication will be given to a following train if the distant signal was seen to clear after the passage of the preceding train. Should the



TRACK CIRCUIT CONTROL OF INTERLOCKING POWER DISTANT SIGNALS.

signalman fail to notice the approach of the second train and set the signals for a conflicting route there is the chance of an accident, since the engineman on the second train may properly believe that the signal had been cleared for his train to proceed and afterward signals had been changed by the signalman.

The use of a stick relay in the control or operating circuit of the distant signal will overcome the objection to the above-described arrangement and will force the signalman to return his lever to the normal position, thus picking up the armature and closing the contacts of the stick relay before the distant signal may again be cleared. With the stick relay in use the distant signal cannot be cleared after the passage of a train without the positive action of the signalman, and if on clearing the signal for a train it should then be taken away, he will be solely responsible for the act.

The circuits for controlling a power distant signal by means of a stick relay are not in general use and the arrangement here shown, which was designed by the signal engineer of a large road, will interest those who are using interlocking signals. As will be seen by an examination of the diagram, the controller worked by the distant signal lever is provided with three contact springs, and these are arranged for each spring to make a contact before the next one breaks the circuit when the lever is worked.

No. 1 contact closes the circuit through the stick relay S and picks up the armature as soon the latch is lifted. A 15-ohm resistance coil C is placed in series with the circuit made through this contact spring and also that of spring No. 2. This is to economize in the use of battery, as sufficient battery has to be provided to work the stick relay and the signal control relay and overcome the resistance in the line wire between the lever and the signal.

Contact spring No. 2 is closed before contact spring No. 1 opens, which it will do when the latch is raised enough to allow the lever to be reversed. This spring holds the circuit of the stick relay closed through the closed contact points of the relay armature and should the circuit be broken the armature cannot be picked up until the lever is put normal, the latch put back until contact No. 1 is again made and the stick relay energized.

On reversing the lever and releasing latch No. 3 contact is made, No. 2 contact is broken and the current is sent through the line energizing signal relay R, provided there is no train on the track circuit and the track relay T is energized, thus closing its contact points. On the closure of the contact points of signal relay R the motor circuit of the signal is completed and the signal is cleared by the operation of the motor.

The circuit to the signal relay is made to pass through the contact points of a circuit breaker or commutator attached to and worked by the home signal arm to insure that the home signal is in the proceed position before the circuit is completed to the distant signal. A similar circuit breaker is attached to the arm of the distant signal. This controls a circuit operating a repeater placed in the tower to show the signalman the position of the signal, and by means of an electric lock control indicates the release of the home signal lever latch should the distant signal remain improperly in the proceed position. The lock on the home signal lever is so arranged that the signal may be put normal at any time, but the latch cannot be put back so as to release the locking, thus allowing the route to be changed, so long as the distant signal remains in the clear position. If desired to have the home signal lever latch locked so that the route cannot be changed when a train is standing on the track circuit, the circuit of the repeater is cut through a second contact on the track relay, but this arrangement is not shown on the diagram.

The use of the stick relay circuit will not affect in any way the use of electric locking on the derail or facing point lock levers of the interlocking. Nor will the route be tied up until the passage of a train beyond the distant signal on the far side of the interlocking, as would be the case if the line was of single track and the locks, controlled by the track circuit to the distant signals, were put on the derail levers. Although more expensive than if the stick relay and track circuit were omitted, the arrangement is worth the additional cost for those places where the distant signal cannot be seen from the tower and where the track from the distant signal to the home signal can be seen for but a short distance ahead of an approaching train.

Pennsylvania's Holdings in Other Companies.—The annual report of the Pennsylvania Railroad Company shows that the stocks and bonds of other companies owned by it amount at par value to $214,845,937, the actual cost to the purchasing company being $219,581,161. The following table shows the shares under the five companies named, together with the total number of shares issued by each company.

	Shares Owned.	Total Shares Issued.
Baltimore & Ohio com	302,933	1,242,620
Baltimore & Ohio pfd	214,800	599,827
Chesapeake & Ohio	101,300	627,994
Long Island	135,958	240,000
N. Y. N. H. & H. R. R.	10,000	800,000
Norfolk & West com	203,300	644,692
Norfolk & West pfd	55,000	229,881

It will be seen that in every case except that of the Long Island the Pennsylvania holdings are much less than a majority of the total stock. In the Baltimore & Ohio it owns 25 per cent of the common and about 40 per cent of the preferred. In the Chesapeake & Ohio the Pennsylvania and the New York Central interests have joint control.

Toledo Peoria & Western is reported about to begin work on a new $15,000 station at Fairbury, Ill.