the engineman's brake valve handle. The magnet coil has a resistance of approximately 4 ohms and draws about 2 amperes when passing over a clear ramp.

Description of the Operation

As the shoe engages a ramp the plunger is raised and the air line *L* to the shoe is opened to atmosphere. Pro-

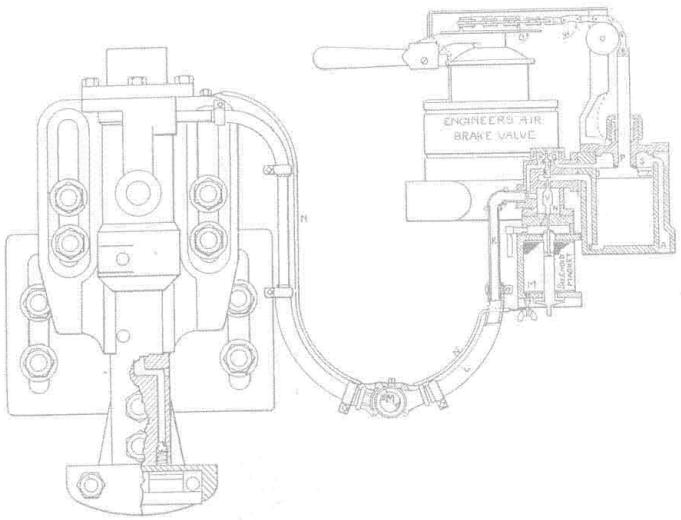
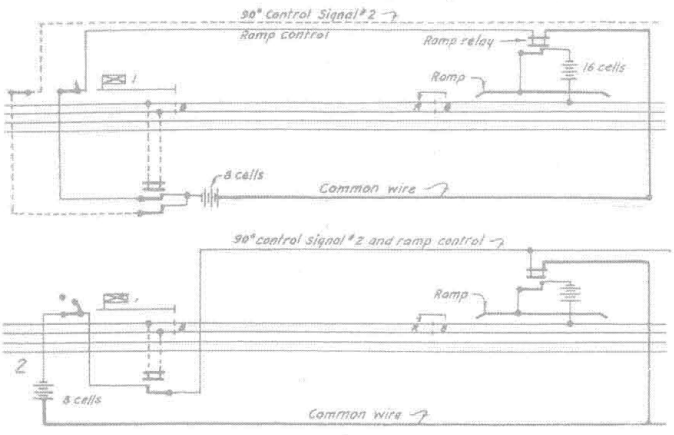


Diagram of the Shoe, the Air Valve and Operating Mechanism

viding the signal is clear and the ramp is energized the current from the ramp follows wire *N* to the magnet coil, which is at once energized, lifting the plunger and closing the valve *V*, which prevents further exhausting of air pressure through the pipe *K* to the shoe. This operation, of course, leaves the remaining apparatus in a *status quo* condition. When the shoe passes off the ramp the solenoid magnet is released and valve is opened; however, at the same time the shoe closes the port in the shoe housing and air is not allowed to exhaust through *K*. As an indi-



Circuit Diagram of Signal Connection and Ramp Circuit

cation to the engineman, the small whistle to the left of the magnet is blown continuously while passing a clear ramp.

When the signal is at danger the ramp is not energized, therefore, when the shoe is raised the port in the shoe housing is opened and air is free to exhaust through the pipe-line *L* and *K*, and as there is no energy to pick up the solenoid magnet the valve *V* remains open. Air is thus free to exhaust out of the chamber below the piston *P*, which is forced down by air pressure from the reservoir. As piston *P* goes down the chain *W* (which is tested for 1,000 lb. breaking strain) pulls the wheel *O* around, bringing the brake handle to the service application position.

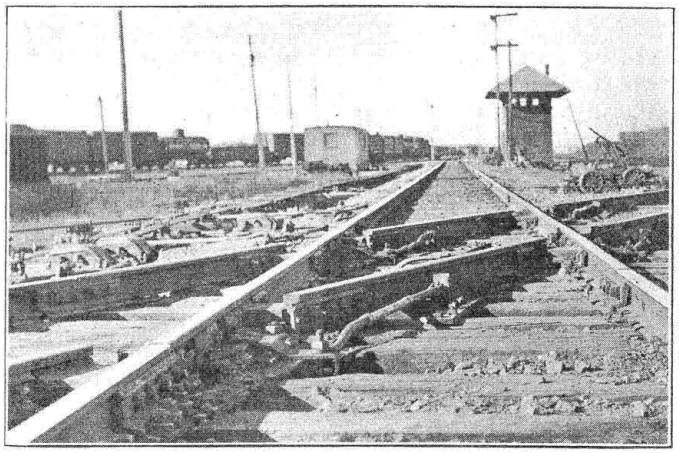
As installed on the C. & E. I., the engineman if alert may forestall the automatic application of the brakes by lifting the stem of the magnet armature, which extends below the magnet for this purpose. However, such action on the part of the enginemen can be prevented and the train automatically brought to a stop for each stop application by eliminating the extension of the stem below the magnet armature housing and having it self-contained therein. Speed control and other adjuncts to the stop system may be incorporated as a part of this device.

A Swing Rail Crossing

By W. H. R.

A SWING rail type of crossing was installed at Amarillo, Tex., at the main line crossing of the Atchison, Topeka & Santa Fe and the Chicago, Rock Island & Pacific, on November 19, 1921. This is the first crossing of this type manufactured by the Walls, Frogless Switch & Manufacturing Company, East St. Louis, Ill., and was connected into the interlocking by the signal forces of the Santa Fe, which road maintains the interlocking at Amarillo.

The crossing is operated and locked from the interlocking and has the same protection as an interlocked



View of the Swing Rail Crossing in Service on the Sante Fe

switch. The lever, normal or reversed, operates and locks the crossing and no extra lever is used for locking. There are four 4-ft. swing rails in this crossing, each having a 5-in. throw. The crossing is anchored to a 1-in. tie plate and there are toe-plates ahead of each of the adjoining rails. There has been no trouble on account of expansion. The crossing is set at an angle of 20 deg. and 21 min.

It is claimed that the swing rails will last as long as the running rails and that when new rail is laid all that is necessary is to cut 4 pieces of rail 4 ft. long and install same with the old equipment. The total cost of such renewal is estimated at $25.00 as compared with $1,000 or more for a solid crossing. In operating trains over this crossing it is not necessary to reduce the speed and there need not be any more noise or vibration than with an ordinary rail joint.

Employees in the offices of the Chicago & North Western at Chicago have been notified that they will have to work Saturday afternoons. It is reported that vacations will also be curtailed.