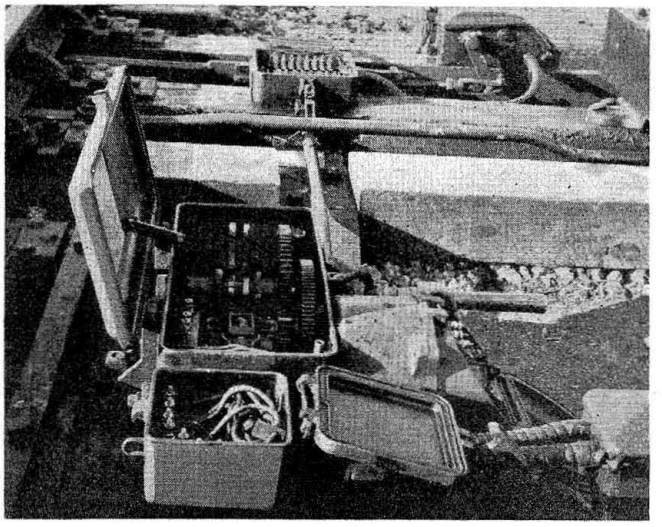
Electric Lock for Spring Switch

Standard switch rod with plunger operated by motor-driven mechanism—Automatic or remote control

By J. H. Oppelt
Signal Engineer, New York, Chicago & St. Louis, Cleveland, Ohio



The lock plunger is operated by a motor-driven machine

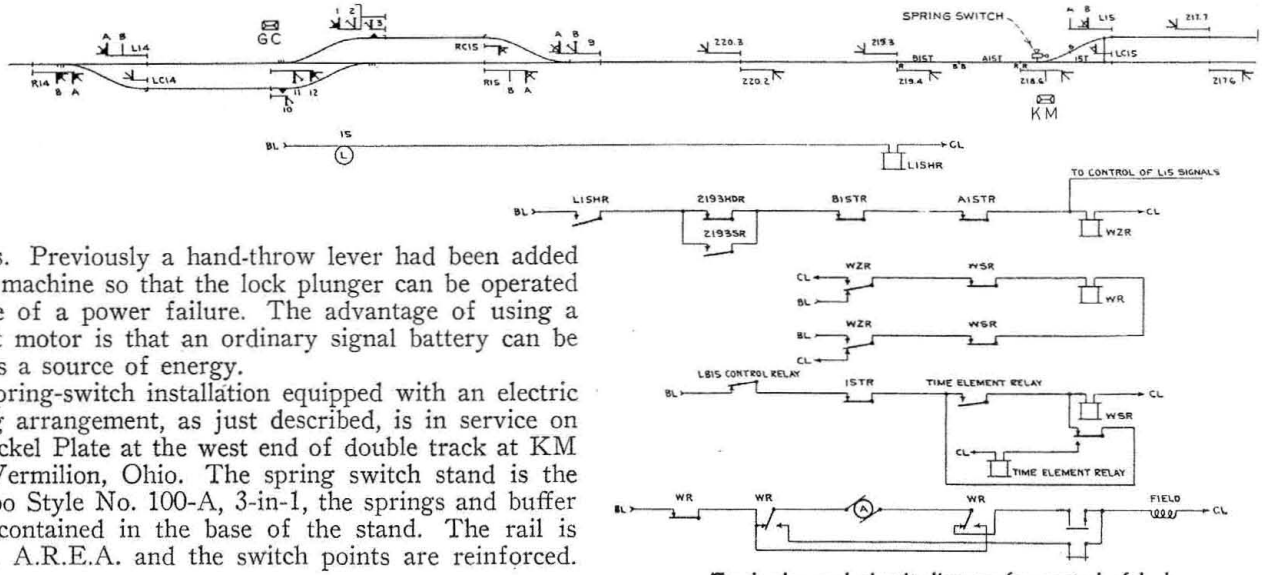
OBJECTIONS have been raised to the use of spring switches where it is necessary to operate trains at high speed in the facing direction over the switch. These objections would be removed if it could be assured that the switch points were locked securely in place during such facing-point train movements. A locking device was previously developed which required hand operation to release the switch for a trailing movement, after which the train could proceed, because the switch returned to the locked position automatically after the train had passed. However, this arrangement obviously reduced the efficiency of a spring switch installation, and is, of course, not satisfactory at an end of double track where train stops are undesirable.

With these limitations in mind, an electric locking scheme for a spring switch was devised including a standard facing-point lock, such as is commonly used in interlocking, the lock being driven by a small machine consisting of a train of gears operated by a 10-volt d-c. motor. The facing-point lock includes a circuit controller attached directly to the plunger, thereby permitting the use of a circuit which makes the position of the signals governing train movements over the switch absolutely dependent upon the position of the plunger. The machine used for driving the plunger was manufactured by the General Railway Signal Company, and was originally designed for, and has been used extensively as, a skate-placing device in classification yards equipped with retarders. Previously a hand-throw lever had been added to the machine so that the lock plunger can be operated in case of a power failure. The advantage of using a 10-volt motor is that an ordinary signal battery can be used as a source of energy.

A spring-switch installation equipped with an electric locking arrangement, as just described, is in service on the Nickel Plate at the west end of double track at KM near Vermilion, Ohio. The spring switch stand is the Ramapo Style No. 100-A, 3-in-1, the springs and buffer being contained in the base of the stand. The rail is 110-lb. A.R.E.A. and the switch points are reinforced. The switch is equipped with the same type of tie plates and rail braces as is standard for an interlocked switch. Full signal protection is considered essential for a spring switch layout, and as this installation is on high-speed track, both home and approach signals are used.

The single track from the west extends on a tangent to form the eastbound track on the double track. Therefore, eastbound train movements are at normal speed but the westbound movements take the No. 18 turnout to single track with a 35-m.p.h. speed restriction through the turnout. The electric lock is, therefore, arranged so that the switch is locked for eastward or facing-point movements, but is unlocked for westward or trailing movements.

A circuit was developed to control the operation of the switch lock automatically by track circuits. However, on this installation the operation is controlled manually from GC office, four miles distant. No additional wires were required, as the lock control was carried on the same circuit that controls the signals. GC is a water station,



Track plan and circuit diagram for control of lock