Editorial COMMENT

Facing-Point Locks On Main Line Switches

A FACING-POINT lock is an arrangement that includes a lock rod, one end of which is connected to the movable portion of a switch while the other end of the rod extends to a mounting that includes a plunger so arranged that when the switch points are either normal or reversed, the plunger in notches in the lock rod cause the switch to be held in position and locked there, entirely independent of the rod and connections used for operating the switch from one position to another.

This practice of using a facing-point lock was undoubtedly initiated during the development of mechanical interlocking, in which pipe connections through cranks were used to operate switches, with a facing-point lock on each switch to insure that the switch would be held in the full normal or full reverse position even though the operating connections became disconnected.

This practice of using lock rods and facing-point locks independent of the operating connections has likewise been incorporated in power-operated switch mechanisms used, with very few exceptions, at interlockings, remote control layouts and c.t.c. switches on main-line territories where trains are operated at high speeds. Many of the types of power switch machines include escapement arrangements by means of which the switch is definitely held in the normal and the reverse positions by the operating rod. Nevertheless, additional protection in the form of facing-point lock rods is considered necessary by the vast majority of signal engineers. An additional feature of lock rods and plungers is that circuits to control signals can be checked through contacts operated by the plungers, thus checking not only that the switch is in proper position but also that it is locked.

An additional feature which can be incorporated in modern power switch machines as well as in the hand-operated switch and lock machines, is the point-detector which has certain advantages as compared with an ordinary switch circuit controller. If a switch is obstructed by a foreign object, it may be possible with either a power machine or a hand-operated stand to force the operation of the mechanism by springing or bending rods or connections, or a switch might be trailed through, thus bending rods or connections which might spring back to close the point and thus place the contacts in a switch circuit controller in the normal position. A point-detector, however, has the characteristic feature that once the operating mechanism is out of correspondence with the actual position of the switch point, circuits are actuated and locked to hold the signals at the most restrictive aspect until the switch is inspected and the device is reset.

Locking of Hand-Operated Switches

In contrast with this practic of using facing-point locks with lock rods, many of the conventional types of hand-operated switch stands utilize the switch operating rod not only for operating but also for locking the switch, the locking being accomplished in many of the designs by lowering the hand lever, which action places a portion of the lever in a notch in a quadrant or by an equivalent arrangement. The lever itself is held in the locking position by a padlock through a hasp. Although the pins used are equipped with cotter keys, and the bolts are equipped with nuts, nut-locks and cotter keys, switch operating rods sometimes become disconnected while trains are passing.

In rare instances, loose equipment, such as car doors, knocks switch stands off their bases. In some cases, automobiles or trucks on crossings have been struck by trains and thrown against switch stands, thus smashing them. In any of these instances, the switch points are free to move under the train, and serious accidents have resulted. For these reasons at least, one large railroad has decided that facing-point lock protection is desirable on all hand-operated main-line switches on high-speed heavy traffic lines. Therefore, over extensive territories, this road has replaced conventional type switch stands with hand-operated facing-point-lock switch stands, which, in effect, are the equivalent of manually-operated switch and lock movements in that they include plungers operating in lock rods which are independent of the operating rods.

Facing-Point Locks for Spring Switches

In order to develop spring switch arrangements for practicable use on main lines handling long trains, signal engineers developed the buffer arrangement. Shortly after spring switch mechanisms with buffers were installed in large numbers, signal engineers, by reason of their experience with interlocked switches, recognized the need for facing-point locks for these spring switches. An arrangement was devised to include a lock rod independent of the switch operating rod, with a plunger power operated under the control of track circuits, so that the plunger would be withdrawn as a train approached in the direction to force the points open for a trailing move. Another more widely used arrangement for facing-point locking of spring switches is an accessory feature of a hand-operated switch-and-lock movement in which

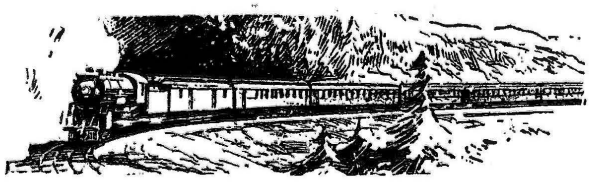
the operation of the plunger is accomplished mechanically and automatically. With this device, the flexing of the mid-positions of the points by a train making a trailing move causes a pipe connection from that section of the switch to withdraw the plunger. After the train clears the switch, and the points return to normal position, the plunger is pushed in place through the lock rod by spring action.

Facing-Point Locks for All Switches?

A recapitulation shows that facing-point lock arrangements are used on practically all interlocked switches, that such arrangements are available and are used by certain roads on spring switches and on all hand-throw switches on important lines on at least one road. The question for consideration, therefore, is whether facing-point locks with plungers and lock rods independent of operating rods are justified not only on all spring switches but also on all hand-throw switches on main tracks handling heavy high-speed traffic.

The answer from many signal engineers may be an emphatic "No!" One contention is that spring switches, as well as those equipped with conventional-type hand-throw stands, are equipped with accurately adjusted switch circuit controllers so that if a switch point is not in proper position a wayside signal will be controlled to present an aspect to stop an approaching train so that a member of the crew can inspect the switch. Thus, if the combination operating rod or its connections are broken or disconnected, and the point is open, this condition will be checked prior to the arrival of a train, and this reasoning applies regardless of whether a spring switch mechanism is included in the layout.

Other signal engineers grant that the use of a switch circuit controller checks the position of the closed point up to the time a train arrives but contend, nevertheless that some connection, pin or part may be so broken or damaged that, during the passage of a train, the switch may become disconnected and open under the train. These men contend, therefore, that facing-point locks with plungers and lock rods independent of the switch operating rods, a practice which has been standard on interlocked switches for many years, is equally desirable for all non-interlocked switches and especially so for spring switches. A further contention is that the lock rods and locking must be of such construction that the switch will actually be held in such position as to insure safe operation of a train regardless of whether the operating rod may be broken or disconnected. An important factor is that control circuits for signals can be checked through contacts which insure not only that the point is closed, but also that the plunger is in place through the lock rod. Many of these engineers advance the argument that the protection provided by a point-detector, as compared with a switch circuit controller, is a further argument in favor of the switch and lock machines.

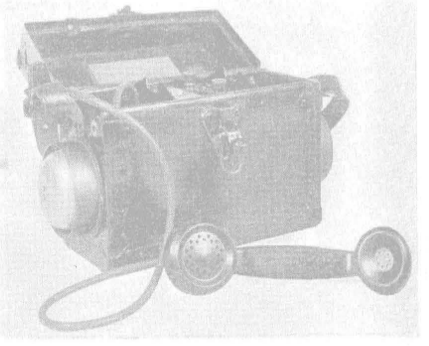


NEW DEVICE

New Portable Telephone

A portable magneto telephone just placed on the market by Automatic Electric Company features a new and more powerful light-weight generator, improved transmission qualities and more durable construction. The instrument is designed for use by railroads, pipeline companies and other organizations having occasion to make emergency and service calls along the right-of-way.

Other novel construction and design features include the use of "Impact Bakelite," a shock-resisting plastic, for the handset; the use of fibre-covered plywood for the case,



Portable telephone set

which is of trunk-type construction; and the substitution of a new, more durable, rubber impregnated material for the ordinary leather carrying strap.

Both transmitter and receiver are of the latest Automatic Electric capsule-type. The telephone operates on a high efficiency, local battery circuit with a low bridged loss. A butterfly-type thumb switch on the handset acts as a talking switch, connecting the transmitter into the circuit, and at the same time placing a resistance in series with the receiver.

Transmission current is supplied by four standard flashlight cells, which are conveniently housed in tubular containers of fiber.

Gas-Filled Cable

LOW-GAS-PRESSURE cable has recently been announced by the General Electric Company. The general construction of the new cable is quite similar to that of the oil-filled cables which are now widely used. The principal difference is that instead of being filled with gas-free oil, the channel spaces are drained before the cable leaves the factory and the cable system is filled with a neutral gas, nitrogen, under a moderate pressure (10 to 15 lbs. per square inch). In line with its function of filling the gap between two earlier types of cable construction, its operating voltage stress, in volts per mil, is not as high as that of the oil-filled type but is considerably higher than that of the conventional solid-type impregnated paper-insulated cable.