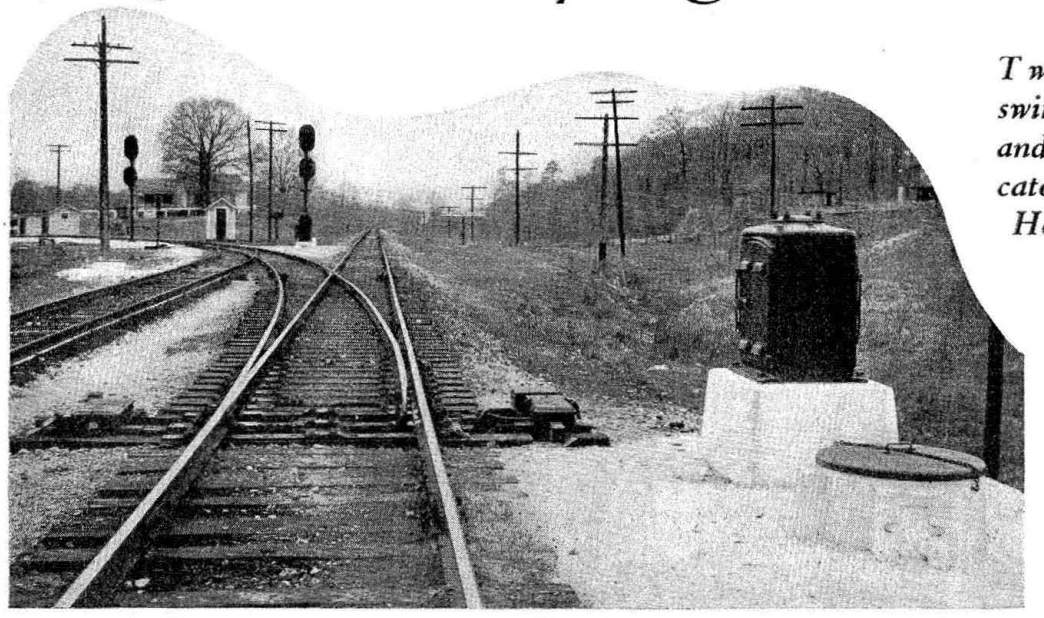
Rock Island Uses Novel System for Operation by Signal Indication



Remote-power switch with dual-control mechanism

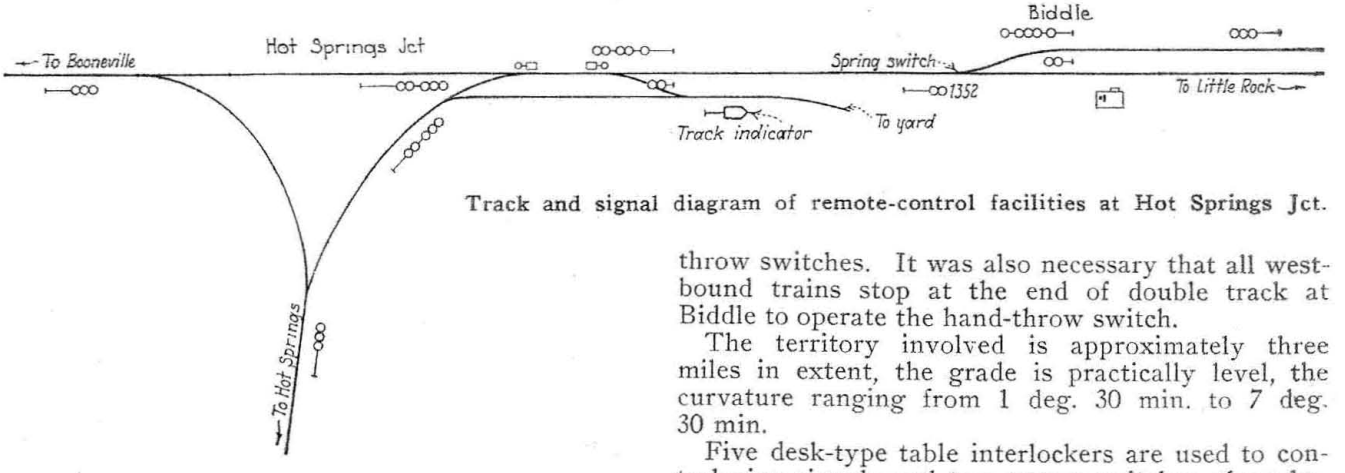
Two remote power switches, a spring switch and a yard track indicator expedite trains at Hot Springs Junction

By B. F. Beasley
Signal Supervisor, Chicago, Rock Island & Pacific, Ft. Worth, Tex.

A CREDITABLE saving in train operating costs has been achieved by the Chicago, Rock Island & Pacific as the result of a recent installation of remote power switches and associated signaling equipment at Hot Springs Junction, Ark. A striking feature of this installation is the use of a large yard-track indicator, which in appearance resembles the annunciators commonly found in Pullman cars, this yard track indicator being located on the yard lead for the purpose of informing trainmen as to which track they should enter. The track and signal layout between Biddle, Ark., and Hot Springs Junction is shown in Fig. 1.

The new arrangement permits the elimination of 21 passenger train stops and 20 freight train stops daily, or a total of 14,965 train stops annually. Every passenger train stop eliminated saves at least three minutes and each freight train stop at least seven minutes. This would total 382 train-hours for passenger trains and 851 train-hours for freight trains annually. The elimination of these delays is such a great assistance in facilitating train movements in this area that it is rather difficult to place a definite money value on these results. However, it is readily apparent that the installation is an economic success, as well as being a decided assistance in train operation.

Within this territory, trains are operated by signal indication entirely, train orders, time table superiority of direction and class being suspended. In this absolute block territory, permission to use the hand-throw switches must be secured from the operator through the medium of the telephone system. Prior to the present arrangement, trains were operated through this territory by means of train orders, time tables and manual block signals. It was the practice to stop all trains at Hot Springs Junction for the purpose of registering and operating the hand-throw switches. It was also necessary that all westbound trains stop at the end of double track at Biddle to operate the hand-throw switch.



Track and signal diagram of remote-control facilities at Hot Springs Jct.

The territory involved is approximately three miles in extent, the grade is practically level, the curvature ranging from 1 deg. 30 min. to 7 deg. 30 min.

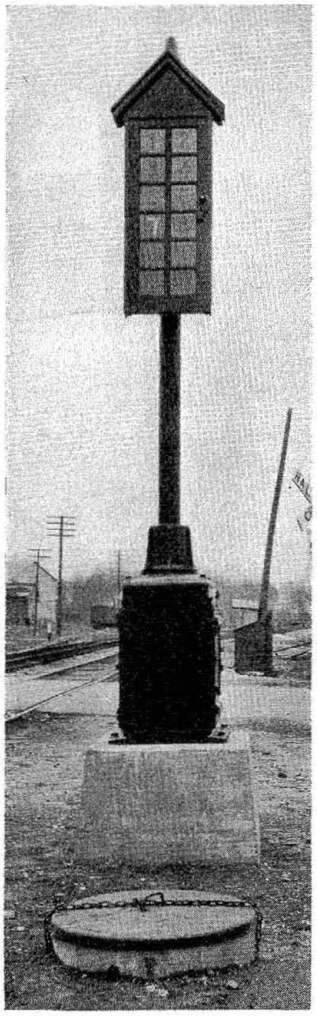
Five desk-type table interlockers are used to control nine signals and two power switches, there being no mechanical locking between levers as all checking is done electrically. The usual type of illuminated track diagram is used with releases, and the "track indicator" control dial is located on the

lower portion of this diagram. Route locking is of the "stick" arrangement, being ineffective when no trains are approaching home or distant signals.

Yard Track Indicator

The yard track indicator is a special feature in connection with the installation and is used to inform trainmen the number of the yard track on which their train is to be placed, thus eliminating a stop to ascertain such information on the telephone.

The capacity of the indicator is 12 tracks. However, many other combinations can be used should the necessity arise. The indicator lights are ordinary 50-watt 110-volt incandescent lamps set behind a stencil cut number and are controlled by a Strowger switch which is actuated by a "dial" impulser located on the operator's desk. This apparatus is made by the Automatic Electric Company, Chicago. The dialing is accomplished similarly to the method in vogue where automatic telephones are used. To display number 12, the operator dials "1" and then "2" and proper selection is made by the Strowger automatic switch. Energy for the Strowger switch is supplied direct from an electronic-type rectifier which delivers 1 amp. at 50 volts.

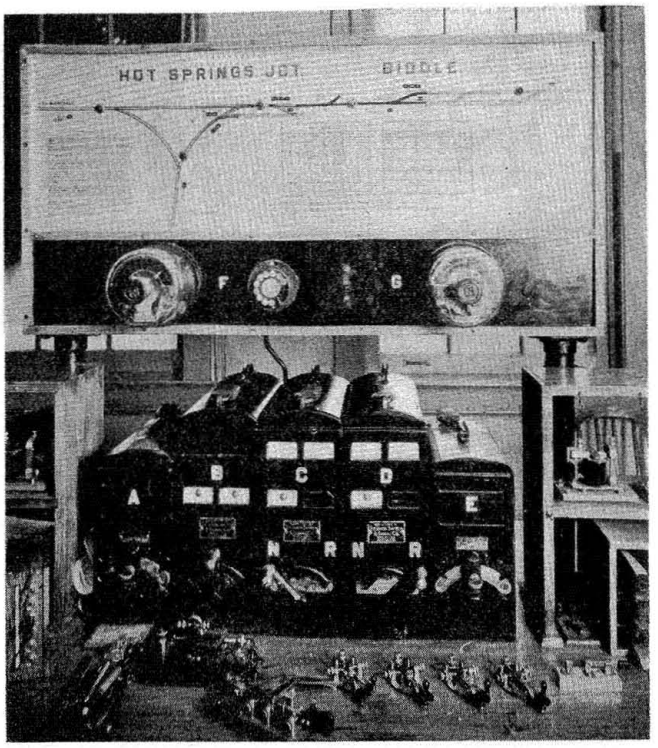


Yard track indicator

Power Switch Machines and Signals

Two Union Type-M electric switch and lock movements are used in connection with the dual-selectors. Energy is furnished by 10 cells of Exide Type-EMGO-7 storage battery, on a-c. floating charge by electronic rectifiers. The dual controls levers are painted, one red and one yellow to permit ready identification.

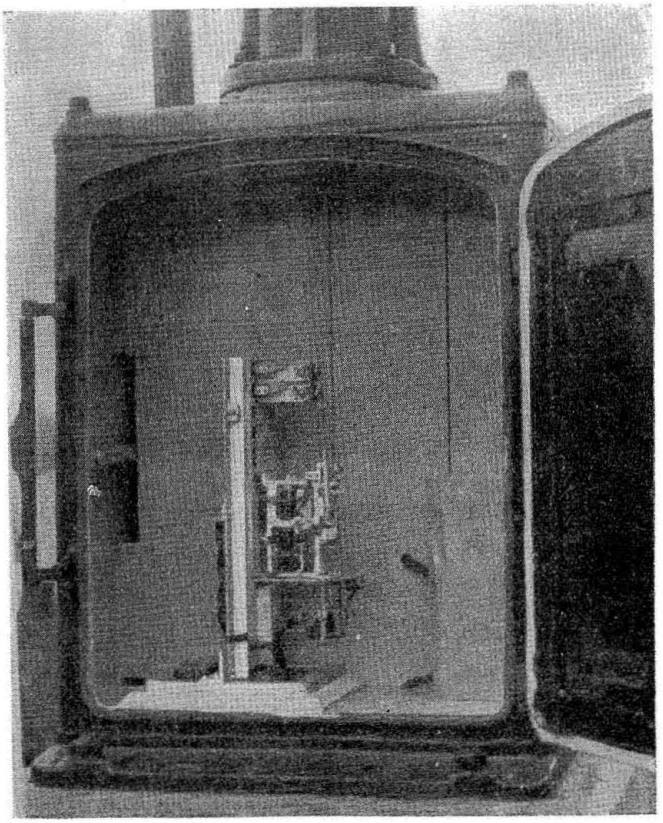
Signals are of the color-light type with red marker units mounted on 5-ft. centers where more than one unit is on the same mast. It should be noted that signal *1352*, which protects the spring switch at Biddle, is not equipped with a background owing to insufficient clearance. The absence of a background does not materially reduce the effectiveness of indication at the particular location, as the range of view is limited to 2,500 ft. The signals are equipped with 10-volt, 10-watt lamps, energy being normally supplied from an a-c. source. All "high" signals are approach lighted either through the medium of "DNL" or track relays. The reserve supply of energy is furnished by 5 cells of Exide Type-EMGO-7 and are floating charged by electronic rectifiers. Line relays have a resistance of 50 ohms, and are energized at most locations by primary battery.



Control equipment on station operator's desk—Dial for yard track indicator

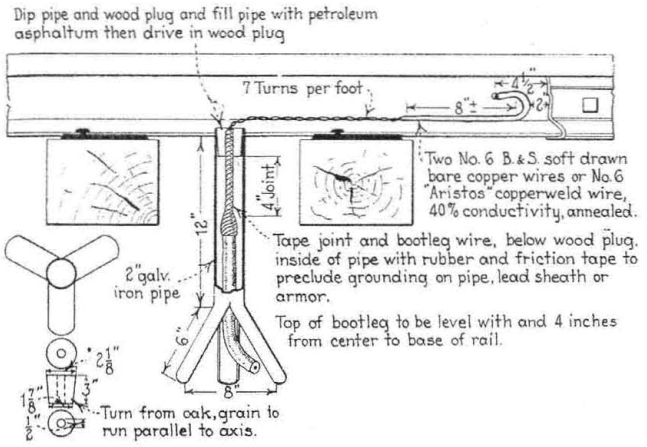
However, a few receive their energy from storage cells. The a-c. supply is furnished by a local power company at convenient points along the installation, generally at street crossings, and at no point are the power wires carried more than 1,000 ft. on the railway company's pole line. Distant signals are automatically controlled by the position of the home signals and the intervening track circuits.

Track circuits are fed by Edison or Waterbury



The Strowger switch, with cover removed

primary batteries. Most of the sections are center-fed and no insulated joints are used at the center of the track circuit. The resistances are of the variable type, adjustable between 0.2 and 0.9 ohms. Track relays are 4 ohms. Track connections are made with No. 6 copperweld wire. A wooden plug is used to center the bootleg wire in the pipe and all parts are given a coat of petroleum asphaltum. Parkway cable is used throughout the entire installation for all track leads, fouling circuits and line controls. For all



Details of parkway outlet at rail

switch circuit controller and fouling leads, two pieces of cable are run from each rail, each cable consisting of one No. 9 solid copper wire. Rail joints are bonded with two No. 6 copperweld bond wires and duplex channel pins. The joints in the fouling sections have four wires per joint, two on each side of the rail. All bond wires are placed between the angle bar and rail. Insulated rail joints are of the continuous type.

The line wire, No. 10 copper, weatherproofed, is carried on 10-ft. 10-pin fir crossarms. Dead ends are made with strain insulators, which are held in place by clevises bolted to the side of the arm. The a-c. power is carried on the same arms with the control circuits and the entire line is located on the company's pole line, being placed beneath the communication circuits. All circuits between dead-ends on cross arms and relay cases are carried in parkway cables. The various circuits on the line are identified by stenciled aluminum tags, which are nailed to the crossarm immediately under each wire. Number 6 bare copper wire is used for grounding, two wires being used at each location, one terminating at a copperweld ground rod, using 9/32-in. channel pins, and the other being secured to the instrument case.

Two Suggestions for Signalmen

By G. R. Goodwin

Signal Maintainer, Baltimore & Ohio, Meyersdale, Pa.

BOND wire inspection can be simplified where wires are located behind angle bars by using a hook-shaped puller about 24 in. long made from ⅜-in. iron rod. The hook portion should be shaped somewhat as a shoe button hook, while the handle can be formed by bending over the other end of the rod into a circular loop.

A ⅜-in. iron rod or bar bent into an inverted L shape, the top or horizontal arm being about 12 in. and the vertical part, 24 in., can be used as a solder pot holder if a small kink is made in the top arm to hang the pot from. The 24-in. vertical stem can be pointed to make it easier to push in the ground. A small wood fire under the pot will melt the solder.

Uses Lamp as Charging Resistor

By T. N. McCann

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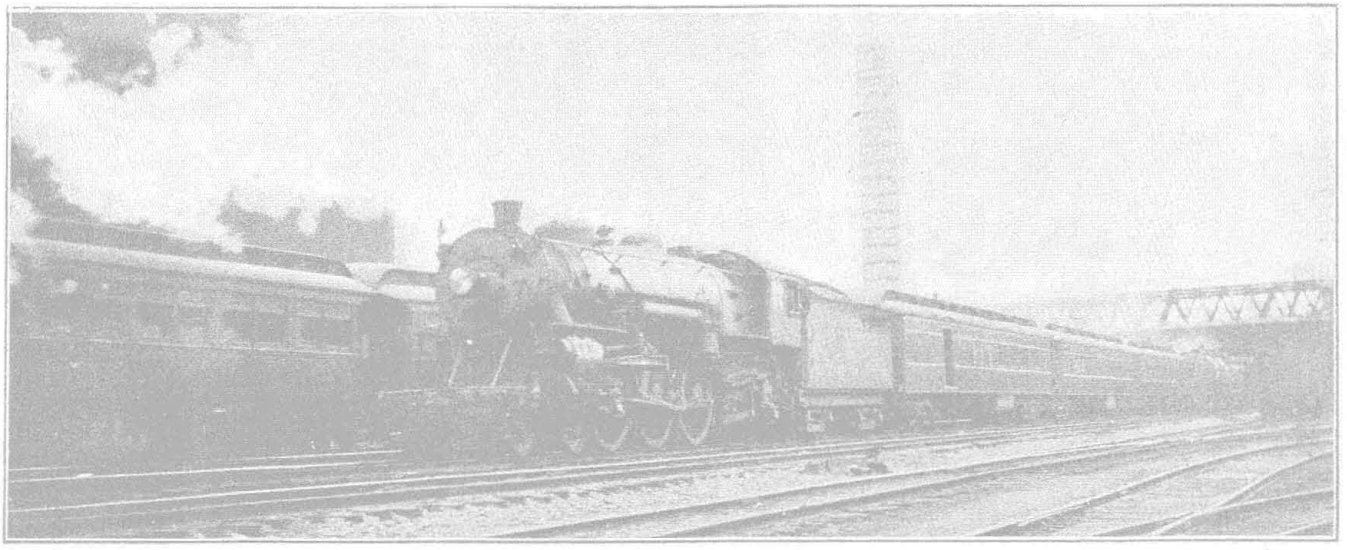
IN order to keep storage batteries which are operated on the a-c. floating system from becoming overcharged, it is sometimes necessary to insert additional resistance in the charging circuit. The usual resistance unit supplied with the rectifier and transformer is not enough under some conditions. To meet this problem, I have connected low-voltage electric lamps in series with the secondary charging circuit, thereby using the lamps as an additional resistor. Various resistance values may be obtained by connecting two lamps in series or by connecting two lamps in multiple, if a lower value is desired. If the lighting secondary on the transformers is not employed for electric lighting of signals, and if its voltage is somewhat less than that of the trickle charging secondary, the lighting winding may be employed to charge the battery. Several combinations of secondary voltages are thereby available.



New York Central's "Twentieth Century Limited" leaving Chicago