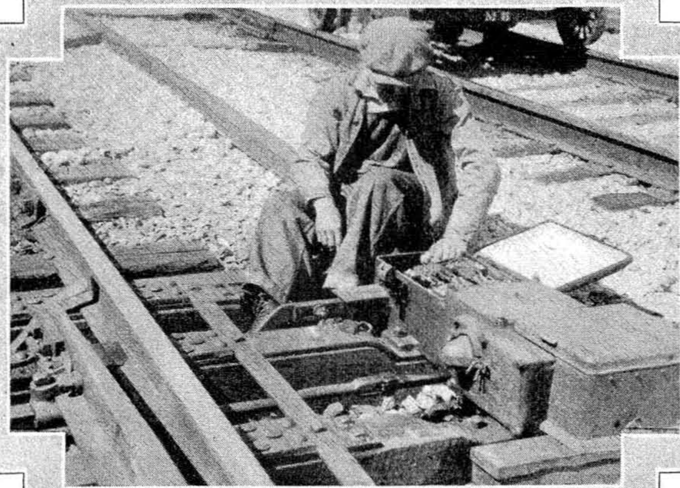


What's the Answer?

An open forum for the discussion of maintenance and construction problems encountered in the signaling field. *Railway Signaling* solicits the co-operation of its readers both in submitting and answering any questions of interest.

To Be Answered in a Subsequent Issue

(1) *What type of construction do you prefer for insulating tie plates for interlocked switches?*

(2) *Do you use switch indicators in automatic block signal territory? Have you abandoned the use of switch indicators?*

(3) *What tests are made on your road to be sure that automatic highway crossing signals are operating as intended; who makes the tests; how often, and what records are made?*

(4) *Do you use a 2-ohm track relay or a 4-ohm? If you use both how do you select the one best fitted to meet any particular track circuit conditions?*

(5) *At an automatic crossing protection layout without switches or derails, what provision should be made for release of signaling in event of trouble?*

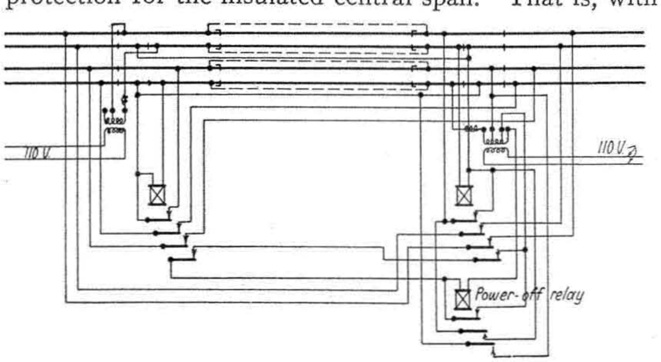
Several Effective Trap Circuit Schemes

"Can you locate the defect in the trap circuit in the sketch below? Can a simpler and better circuit be designed?"

* * *

Question No. 1—Can You Remedy This Trap Circuit Defect?

I am submitting herewith a trap circuit that has a weak point, which your readers perhaps would be interested in pointing out and correcting. If anything happened to the power-off relay to make it stay down it might remain so undetected for some time, and would result in false clear signals, since it would cut out the protection for the insulated central span. That is, with



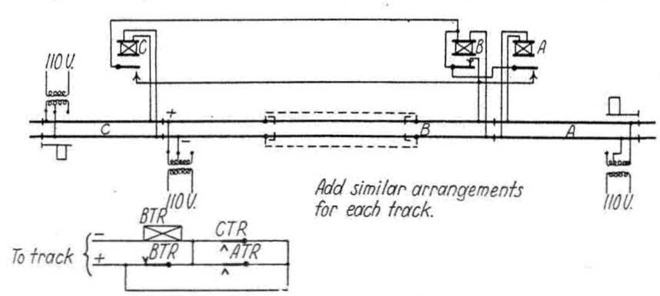
Trap circuit for a-c. track circuit operation which employs a power-off relay

the power-off relay open, the "trap" would be ineffective. —D. G.

* * *

Proposed Circuit in July Issue of *Railway Signaling* Would Not be Feasible Because Power Failure Would Make Signals Inoperative

THE accompanying trap circuit sketch will, I believe, answer the second part of the question. Since both written and detailed wiring circuits are submitted in my proposed circuit, it would seem that a descriptive explanation is hardly necessary. As to trap cir-



Trap circuit scheme which will better answer the purpose than the one submitted in the July issue

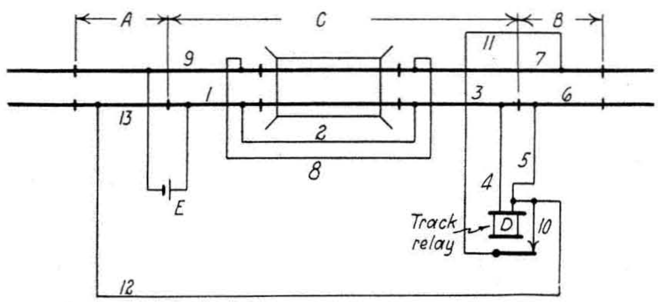
cuits in general, there are many different designs, but I think the one furnished will answer satisfactorily. It can be used on either single or double track with train operating in both directions and if, for any reason, the stick track relay should fail to pick up, the signals will always show the most restrictive position and the chances for the relay failing to shunt is not any greater than with any other track relay.

As to the weak point in the trap circuit, published in the July issue, I do not think I understand fully what is called "the power-off relay" because the way I understand the circuit, the "power-off relay" will never drop on account of being "stuck" up on one side direct to the negative side of the transformer and on the other through its own point direct to the positive side of the transformer. Only an interruption in the a-c. line would drop this relay. If this is the intention, all track relays would also fail with an interruption in the a-c. line and the signal system as a whole would become inoperative.

Nashville, Tenn. E. W. Anderson,
Signal Designer, Nashville, Chattanooga & St. Louis.

This Trap Circuit Scheme Employs but One Track Relay

If anything happened to the power-off relay in the circuit published in the July issue causing the relay to remain de-energized, current flowing to the track relays would result in false-clear signals. I believe the trap circuit shown in the sketch herewith is workable and simple. Any trap circuit to be effective must operate in both directions and this requirement is fulfilled by the simple scheme suggested. It will be noted that my circuit employs a normally energized stick relay. The single rail sections *A* and *B* are release and pick-up sections for the stick relay *D*, the particular func-



Simplified trap circuit which employs but one trap relay and one line wire

tion of these sections depending upon the direction of train movement. These short track sections may be from 15 to 33 ft. in length.

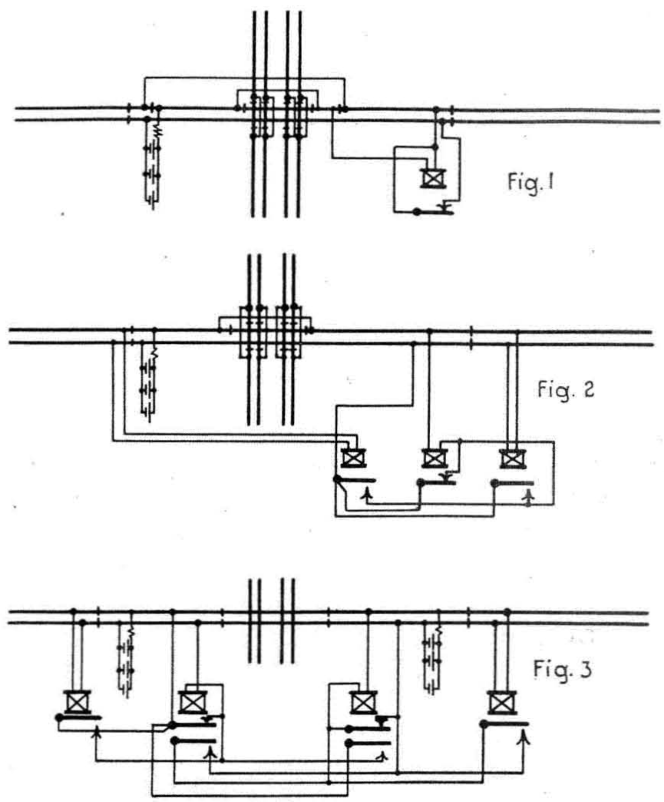
A train will, upon passing section *A* and entering section *C*, shunt the track relay *D* and the latter will not pick up again until the train has reached the pick-up section *B*. The pick-up circuit is completed by the current flow from track battery *E*, track connection *4*, coils of stick relay *D*, track connection *5*, rail *6*, wheels and axles of train, rail *7*, jumper *8*, rail *9* and back to battery. This relay when once picked up will remain picked up through the former circuit in conjunction with jumper wire *10* from the front point of the relay and track connection *11*. Conversely a train movement in the opposite direction will de-energize and pick up the stick relay *D*. For a reverse movement, wire *12*, which is connected to the rail in section *A* is used for pick-up purposes.

The outstanding feature of this circuit is its simplicity as it requires only one line wire and one track relay. It can of course be operated on either d-c. or a-c. and can be used for either single-track or double-track installations.

Chariton, Iowa. T. A. House,
Signal Maintainer, Chicago, Burlington & Quincy.

Three Different Schemes Suggested for Varying Degrees of Trap Circuit Protection

Inasmuch as I have not had much experience with the operation of alternating current track circuits I do not believe that I care to discuss the circuit submitted in the July issue. I am, however, enclosing three sketches of trap circuits that are used by the Delaware & Hudson. The first scheme is used wher-



Three trap circuits for various degrees of protection

ever we are not very particular about securing the maximum amount of trap circuit protection. Where the maximum amount of protection is required it is our practice to use the circuit shown in scheme 2. Where it is not desired to bond around the crossing or dead section of track, the circuit shown in scheme 3 is employed. The latter circuit also affords maximum protection.

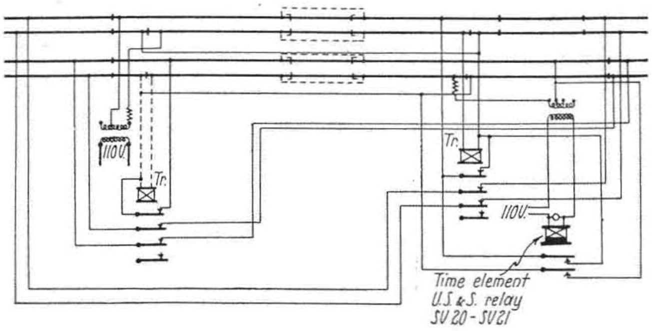
Albany, N. Y. A. Vallee,
Supervisor of Signal Construction, Delaware & Hudson.

If the Power-Off Relay Should Remain Open There Would Be a False Clear Failure If the Insulated Trap Section Was Occupied

In the trap circuit published in the July issue, the power-off relay serves but one purpose and that is to pick up the track relays over the back contacts of the power-off relay when the alternating current power "come on" after an outage. Apparently without some such an arrangement the track relays would fail to pick up until the train passed over the track circuit. However, the trouble with the circuit is due to the fact that if the power-off relay should remain open due to an open-circuited coil, broken wire, or some other cause, there would be a false clear failure if the insulated section was occupied.

The sketch submitted herewith I believe takes care of these features and at the same time eliminates the possibility of a false clear failure. It will be noted that I have shown a power-off relay in series with the

110-volt primary winding. It is necessary that this relay be a time-element relay such as for instance the vane Type SV-21, as manufactured by the Union Switch & Signal Company. When the power goes off this relay, of course, opens and its back contacts are closed, but when the power returns alternating current will flow over the back contacts of the power-off relay and pick up the track relays before the time-element feature of



This trap circuit employs a time-element relay to safeguard against power outages

the power-off relay becomes operative and opens the back contacts. As long as power is available this power-off relay cannot remain open. Therefore, no false clear failure can occur.

Huntington, W. Va. W. H. MILLER,
Signal Cabin Inspector, Chesapeake & Ohio.

Advantages of a "Floating Track Relay"

"What is meant by a 'floating track relay'?"

Necessity for Additional Track Circuit Eliminated—Used in Connection with A. P. B. Single Track Signaling for Stick Relay Pick-Up Circuits and Overlap Signal Controls

THE term "floating track relay" is used in connection with track relays which are energized from track circuit power at the terminals of track wires in the signal case located at the power or energy end of the track circuit. In this way they are "floating" or connected across the track circuit at the energy end. They are not entirely de-energized while trains are on the opposite end of the track circuit from the energy end, and in no case are they used as detector track relays or for controlling signal operating circuits, the track relay on the opposite end of the track circuit from the energy end being used for this purpose.

Floating track relays are used in alternating current and direct current A. P. B. signaling as used on the Seaboard Air Line. In alternating current signal territory "floating track relays" are used for two purposes; (1) for the pick-up circuit of stick relays at intermediate signals and (2) in connection with absolute signals for overlap control of the entering signal at the other end of the passing track. In direct current signaling territory, they are used but for one purpose, for the pick-up circuit of stick relays at intermediate signals, in which case no attempt is made to adjust for de-energization of the relay at fixed distances of train movement, the adjustment of voltage being purely for the most efficient operation of the track relay.

In track circuits in advance of absolute signals proper adjustment of voltage across the "floating track relay" terminals is made to provide for 1,500 to 2,000 ft. overlap for the entering signals at the other end of the passing track. As just stated in intermediate signals no attempt is made to adjust for de-energization of the relay at fixed distances of train movement from the signal.

In all instances where floating relays are used, there is another track relay at the other end of the track circuit from the energy end used for detector purposes and signal controls, the function or purpose of the "floating track relay" being for the pick-up circuit of a stick relay or overlap of signal circuits, which is not dependent on fixed distance of train movement for de-energization. The advantage of the floating track relay is the elimination of an additional track circuit with the complication and additional cost of insulated joints, battery or energy source, housing and necessary wiring.

Savannah, Ga. F. H. BAGLEY,
Signal Engineer, Seaboard Air Line.

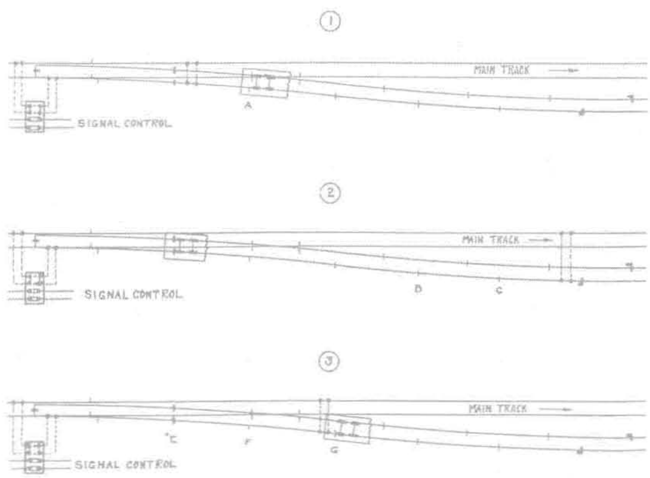
Where Should Fouling Wires Be Connected to Siding Rails?

"When installing wiring for shunt foulings is it your standard to make the connection to the outer rail on the siding as near the end insulated joint at the fouling point as possible or near the joint at the switch? What is your reason for so locating the connection?"

Recommends Attaching Fouling Wires to the Second Rail from the Switch Joint—Connection at the Far End of Siding is Too Ineffective if Bonds are Broken

WITH reference to the query as to the best location to make the shunt fouling wire connection to the outer rail on the siding: (1) as near the end insulated joint at the fouling point as possible or (2) near the joint at the switch. The answer is, I believe, neither of the locations mentioned. The best location for the fouling wire connection is to the second rail from the insulated joint, as can be demonstrated by sketches 1, 2 and 3.

Sketch 1 shows the wires connected to the rail nearest the switch, which is the prevailing practice on a great many railroads as it requires the least amount of wire, trunking, etc. However, should the bond wires at rail joint *A* be broken or torn away, it would be



Three possible locations for connecting fouling wires at sidings

possible for a car to stand as shown in the sketch, with its outside pair of wheels near the rail end, and the end and one side of its superstructure extending well out over the main track. Not only could a single car "drift" out from a siding and come to a stop at this point, but it might be the end car of a string of cars, in which case the first main line train to come along would probably be involved in a bad wreck.