Burning the Lamp at Substantially Below Rated Voltage Reduces Possibility of Burn-Out

By F. B. Wiegand
Assistant Signal Engineer, New York Central, Cleveland, Ohio

WE have used marker lights for the past 20 years or more on automatic signals for the purpose of distinguishing between "stop-and-proceed" and "stop" signals, and we have never considered it necessary to provide a check to determine whether the lamp is burned out or not. The possibility of this lamp burning out is reduced by burning it at a lower voltage than the voltage at which the operating lights burn. In color-light territory the voltage at the operating light is 7.8 and at the marker it is but 5, although both lamps are rated at 8 volts.

In the event the marker light burns out, if there is any hesitancy on the part of the engineman, trains should stop as the signal may be regarded as an imperfectly displayed signal; however an interpretation could be placed on Code Rule 27, adopted January 17, 1928, which would permit the engineman to proceed, "except that when the day indication is plainly seen it will govern." The marker light tends to complete the signal aspect; the operating light gives the indication.

The greatest advantage of having a marker light is, as the name implies, the marking of the signal location, should the operating light burn out. For this reason it should always be of a color which will give the most restrictive indication that can be given by the operating light. The lower voltage insures longer life and less possibility of a burn-out.

H. E. Brashares, assistant superintendent of signals, Great Northern, is of the opinion that, "No light is necessary on a marker for either purpose. This marker has no effect on a train unless the signal to which it is applied displays the stop indication, and under such circumstances there is no difficulty for the engineman to determine whether the signal is a permissive or an absolute one."

Track Circuit Shunts at Switches and Foulings

"For connections between the rails and switch circuit controllers for track shunts, what are the advantages or disadvantages of using: (1) bare stranded cables stapled to ties; (2) parkway cable buried; (3) insulated wire in trunking nailed to switch tie; (4) or insulated wire in trunking on stakes?"

Parkway Cable Is Safer Because It Cannot Be Damaged by Dragging Equipment

By A. J. Yarrell
General Signal Inspector, Texas & Pacific, Dallas, Tex.

IN my opinion underground parkway cable forms the most satisfactory connection between rails and switch circuit controllers for track shunts, both from the standpoint of reliability and maintenance economy. In many instances, dragging equipment is responsible for switches being damaged to such an extent that they become dangerous. The switch circuit controllers, together with the necessary shunt wires, are installed to provide protection in such cases.

It appears to me that when the shunt wires are placed where they may be damaged by the same dragging object which damages the switch, their purpose has been defeated to a certain extent. The first cost of installing parkway cable, when compared with other methods, is somewhat greater. However, the lower maintenance cost offsets this to some extent, and I believe the added protection alone is worthy of the additional cost. In using (1) stranded cable stapled to the ties, (2) insulated wire in trunking nailed to the switch tie, or (3) insulated wire in trunking on stakes, the disadvantages in each arrangement are that the conductors are continually being subjected to a certain amount of abuse by the track forces and are located where they may be damaged by dragging equipment.

Favors Bare Stranded Cables Stapled to the Ties

By L. E. Carpenter
Signal Engineer, Pennsylvania, Philadelphia, Pa.

SHUNT connections on track circuits should have high conductivity, be easily accessible for inspection and at the same time not be excessively costly to install. The bare stranded cables stapled to the ties (1) meet these requirements better than any of the other schemes referred to in the question as methods (2), (3) or (4). They can be readily inspected to determine if they are intact without making an operating test. The cost of installation and maintenance is comparatively low as there is no conduit nor insulation. The only possible disadvantage, but one which would not apply to all cases, is the greater probability of an accidental shunting of the track by workmen getting tools across the bare conductors, or by the connections becoming short-circuited by cinders, etc. This objection is more imaginary than real, as it has not proved troublesome in practice.

Electric Approach and Stick Locking Features

"What is the difference between approach and stick locking? Why is the latter sometimes used instead of approach locking?

The Circuit Differences and Relative Flexibility Are Clearly Defined

By Oscar E. Miller
Circuit Engineer, Cleveland, Cincinnati, Chicago & St. Louis, Cincinnati, Ohio

APPROACH locking and stick locking (sometimes called "approach-stick" locking) are both designed to prevent the moving of a switch or derail in the route of an approaching train, in case the leverman restores the home signal to normal and attempts to change the "line up" which has been set up for the approaching train. These two types of electric locking differ in that stick locking is effective on the clearing of a signal, while approach locking depends on the presence of a train on an "outside" or "approach" circuit located in approach of the home signal.

Stick locking may be applied advantageously in territory where there are no track circuits outside the home signal limits. As soon as the leverman clears a home signal, the stick locking becomes effective. The route is then tied up until it is released by the train passing on to the "inside" track circuit. In the event that the train does not accept the signal, the route is usually released by means of a clockwork time release, after the expiration of a time interval. Stick locking has the disadvantage of being rather inflexible, for if a home

signal is cleared and the train does not accept it, the time release must be operated before a conflicting route is lined up. This hampers operation at busy plants and is detrimental in testing the plant, because whenever a signal is cleared for test purposes, the stick locking is made effective, and the time release must be operated to release the locking after restoring the home signal to normal.

Approach and stick locking are sometimes combined to good advantage. When this is done, the locking of the route does not occur until the signal is cleared and a train is actually on the "outside" or approach circuit. If the train comes on the approach circuit and no home signal is cleared, there is no reason for locking the route, as obviously the train will be prepared to stop at the home signal. Likewise, if the signal is cleared and no train comes on the approach section, there is no reason for locking the route. In this way maximum flexibility is obtained.

Transformer Ground Connection

"What advantage is there, if any, in connecting a transformer ground to a signal arrester ground in territory where signals are operated direct from alternating current?"

Transformer Case Is Grounded, But Not Any Secondary Power Wires

By W. J. Eck
Assistant to Vice-President, Southern, Washington, D. C.

WE have found that it is almost impossible to have too many grounds or too good a ground, and it is our practice to run separate grounds for the high-tension lightning arresters and the low-tension arresters, as these are usually some distance apart. We do not ground any of the power circuit wires, but we do ground the transformer case on the lightning arrester ground, because the high-tension wires, the lightning arresters and the transformers are on the same poles. Originally, we installed lightning arresters one pole span away from the transformers, but later found that we did not get as good protection with this arrangement, as when the lightning arresters were on the transformer poles.

The Southern does not use a three-wire distribution system with a neutral, and, hence, we have had no occasion for grounding any of the circuit wires. It is our belief that, as far as possible, grounds should be kept off of the signal control wires.

Transformer Ground Should Never Be Connected to Signal Arrester Ground

By W. F. Follett
Assistant Signal Engineer, New York, New Haven & Hartford, New Haven, Conn.

THERE is a great disadvantage in connecting a transformer ground lead to a signal arrester ground connection. This disadvantage lies in the hazard that would be created by the breaking of the common connection to the ground, or the ground connection developing a high resistance. With the transformer ground lead connected to the signal arrester ground, and the insulation on the primary coil broken down, so that the coil is in contact with the core or case, there would be a direct connection from the high-tension circuits to the low-voltage signal circuits, except for the air gap obtaining in the signal arrester. This air gap offers but little resistance to high-tension signal circuits such as 2,200 to 11,000 volts. We always specify that the transformer ground must be separate and independent from the grounds provided for the signal lightning arresters.

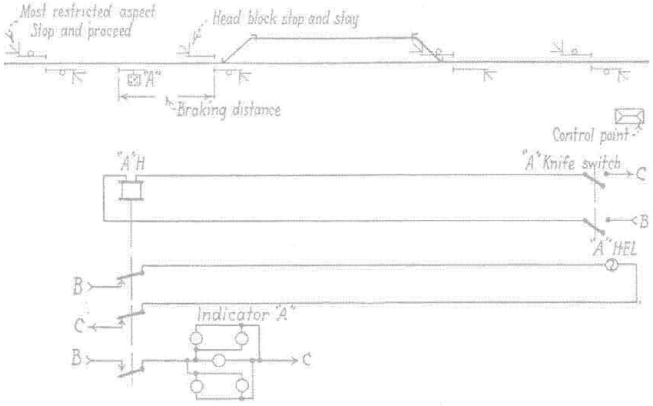
Control Schemes for Take-Siding Indicators

"Where take-siding signals are added to existing automatic signals to direct trains to enter passing tracks equipped with hand-throw switches, how are the take-siding signals controlled, and is an indication of the signal repeated or checked in any way at the point of control?"

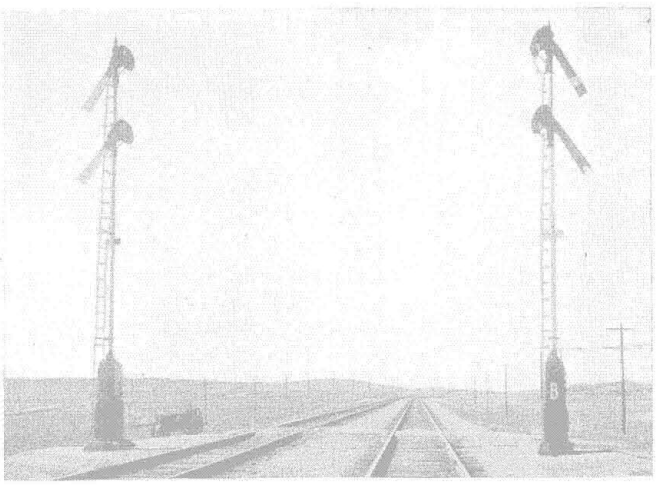
Believes Simple Control Circuit Adequate

By E. T. Weaver
Signal Draftsman, Pennsylvania, Chicago

MY interpretation of a take-siding signal or indicator is that such a signal is just another form of a train order, the control of which does not necessarily have to be incorporated in the control circuits of the automatic signals. I believe a knife switch control, as shown in the accompanying sketch, is all that is necessary. I also believe that an indication of the working of the take-siding indicator is superfluous. However, a light or an annunciator can be installed as shown through the back contact of the control relay, thus being on the safe side if a failure of either light or control relay occurs.



Take-siding indicator control circuit



Lower-quadrant semaphores on the Union Pacific