tion is on signal bridges. A typical method of using this open cable construction is shown in one of the pictures of the article on "Color Light Signals on C. & N. W." appearing elsewhere in this issue. It will be noted that the cable is made up of individual wires tied with marlin hooked to a messenger wire. The cable is carried on the top chord of the bridge and from there drops down to each signal and the relay box. The decking on the lower chord of the bridge protects the cable from the direct blast of locomotives passing under. Trunking has always been objectionable as it is impossible to keep cinders and moisture out which causes deterioration of the wires. Conduit tends to rust unless it is kept well painted and is liable to contain moisture which causes deterioration of the conduit and wires. In addition the open cable is the least expensive method and besides making the life of the wires longer, places them in a position where they can readily be inspected.

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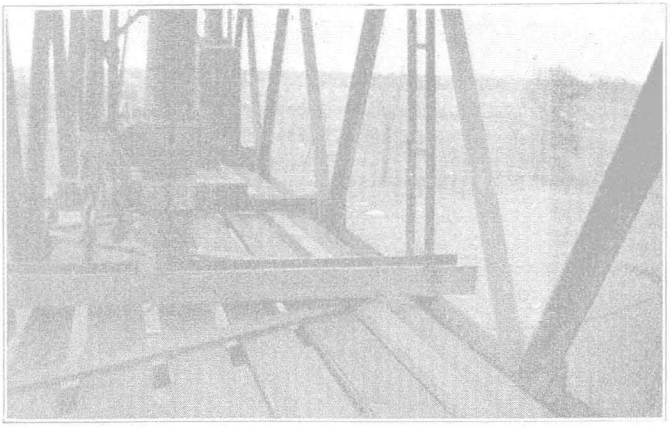
Assistant Signal Engineer, Chicago & North Western.

Third Answer

FOR carrying wire on overhead signal bridges the use of wooden trunking is one of the methods. The trunking can be laid so that the capping is practically flush with the floor on the lower chord of the bridge, as shown



Wooden Trunking in Service on Interlocking Signal Bridge

in the illustration herewith. However, if the trunking is laid over the planking on the bridge it can be run along the side out of the way. Additional wires can easily be run in wooden trunking when the need arises. When shooting trouble the defective wire can be located without much difficulty.

Comparison Between the A. P. B. System on Signal Track and Overlap Circuits

"What are the characteristics of the A. P. B. system for single track as compared to the overlap circuits?"

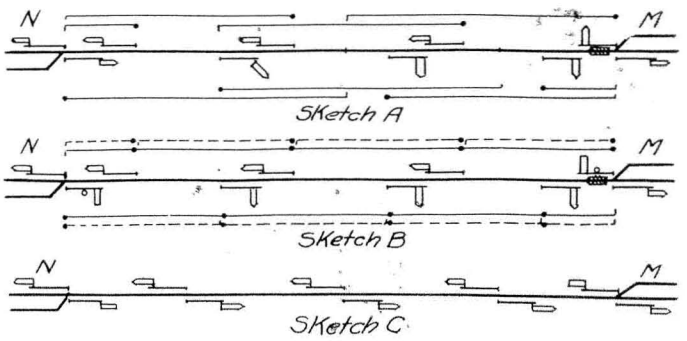
Answer

A COMPARISON of detailed circuits does not answer this question. A. P. B. circuits require more relays and consequently more local wiring, but less line wire than the overlap system. However, this additional material provides more flexibility and gives other offsetting advantages. The fundamentals common to both may be considered characteristics of each, but the comparative characteristics are those in which they differ.

The outstanding difference between A. P. B. and overlap circuits for single track is that for head-on protection A. P. B. blocks from siding to siding, whereas overlap blocks to or laps the second opposing signal.

Sketch *A* shows a typical overlap layout with the controls for head-on protection and Sketch *B* the same layout with A. P. B. head-on controls shown by full lines. When operating trains by signal indications with these two schemes it is seen that after a train leaves *M* with overlap signaling the leaving signal at *N* indicates clear for some little time, whereas with A. P. B. circuits the signal at *N* indicates stop.

The advantage gained is that after a train gets into



Sketches Showing Control Limits

the block at *M* all opposing traffic is stopped at *N*, saving stops of opposing trains between sidings with the consequent flagging and backing up into the clear, possible with the overlap system. The circuit characteristics are also in favor of the A. P. B. system for following moves, as each signal displays a proceed indication as soon as the train has passed the signal in advance (see the dotted control lines for following moves in Sketch *B*), but the overlap arrangement does not permit a following move until the overlap is cleared; the spacing for following and head-on moves being the same.

The A. P. B. circuit characteristics would also make it possible, if conditions were advantageous, and they often are, to signal this stretch differently by using double intermediate locations, as in Sketch *C* without losing any protection or operating advantage, but allowing a large saving in initial cost, as fewer battery shelters and a great deal less wire for line drops (about one-half) and possibly for track connections would be needed for this arrangement as compared to Sketch *B*.

The A. P. B. system provides information, which is not available with overlap signaling, as follows:

The operator at a station can tell that a train has left the next adjacent siding. This information when passed along to the dispatcher furnishes a basis for changing meets, if desired.

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Approach Locking Circuit Dependent on Signal Position

"What kind of an approach locking circuit has been designed that is dependent on the position of the home and distant signals? What are the advantages?"

Answer

THE sketch shows how approach locking is accomplished, dependent on the position of the home and distant signals. The circuit applies to electro-pneumatic interlocking equipped with the proper devices for electric locking. The instrument used to accomplish this is the approach indicator which is practically the same as the block indicator, except that it has a red disc instead of a small semaphore arm. This approach indicator is wired up as a straight indicator, that is, it is not a stick indicator, and is controlled through certain relays on each track, in automatic sections. The control for the