mately 40 in. off the ground. Its body measures 32 in. high in front, and has an outside depth of 15½ in. The roof, which has a 5 in. overhang in front, slopes to the rear, and is covered with asphalt paper. The color scheme is green, with two white stripes on the door, on which are lettered "Telephone" and "B.&M. R.R."

This type phone shelter has numerous advantages. Its wood construcstruction allows it to be made by company personnel. Small size and comparatively light weight permit it to be installed and handled much more easily than a steel or concrete booth, and the size presents a very inconspicuous appearance with the equal efficiency of a booth.

Boxes Preferred

By P. A. FLANAGAN
Communication Engineer
Chesapeake & Ohio, Richmond, Va.

THE Chesapeake & Ohio has in service several hundred shelter boxes to house telephones at the ends of passing sidings, at crossovers on double track, at certain signal locations, and near section tool houses on branch lines. Booths that offer complete protection from the weather for the telephone user probably number less than a hundred and, as a rule, are only found on branch lines at locations where, under certain operating rules, trainmen are permitted to copy train orders on occasions.

The present standard shelter box consists of a well-constructed lightweight wood box, with a lift door arranged to give maximum protection from rain and snow to both the user and the telephone. The box is mounted on a boiler tube equipped with a precast concrete base, and drilled and tapped at the top for a 5/16-in. stove bolt to take a standard two-groove knob. At each box there is a small wood platform to insulate the user from the ground, should he accidentally come in contact with the line conductors at the protector, cut-out switch or on certain portions of the telephone.

We feel certain that the shelter box has many adantages over a booth or shanty for most installations where the telephone is used only for a short time at widely-separated intervals. Some of the advantages are lower first cost for material and labor and subsequent maintenance, ease of relocation when operating conditions change and, as most communication men are aware, are better from the sanitation standpoint. While we feel that shelter boxes as a class are to be preferred over booths for the services listed, we do not believe that the present design of our own, or other railway telephone boxes now in service, answer fully all the requirements for a satisfactory telephone housing. Constant study to develop a better shelter box for maximum protection to the user and equipment at lower cost is in progress.

PULLING LINE WIRES

"When pulling signal, telephone or telegraph line wires under power circuits which cross overhead, what precautions should be observed by the men doing this work from the standpoint of safety?"

Should Not Be Pulled Under

By C. P. SNYDER
Communications Maintenance Foreman
Baltimore & Ohio, Willard, Ohio

SIGNAL, telephone or telegraph wires should not be pulled under power circuits which cross overhead and in my experience, it has never been necessary. The hazard is too great to take the chance, as anything can happen, causing a wire to break and snap back into the power circuits.

I have always (1) pulled the wires up to or away from the power-circuit crossing in both directions, and then taken up slack in the span crossing under the power circuits and cut through; or (2) pulled the wires up to the power-circuit crossing, stopped, set up the reels, pulled away as far as convenient, and then taken up slack in the span crossing under the power circuits and cut through.

In taking down wires that cross under power circuits, the wires should always be cut in the span adjacent to the power circuit, and then untied and slacked back easily under the power-circuit crossing. Wires should never be pulled out from under power-circuit crossings, just as they should never be pulled in under them.

No Special Equipment Used

By H. L. PETTY
General Signal Construction Foreman
Louisville & Nashville, Guthrie, Ky.

WE do not use any special equipment for safeguarding such wires, where there is danger of the wires going up into high-tension wires and other wires carrying different voltages of power which cross over us. However, when we come to a location where power wires are overhead and there is danger of our wires going up into them, we place our wires on the poles on each side of the overhead crossing and dead-end around the arm, pulling the slack in both directions.

We then string the wires on the one or two poles, whichever it may be that are under the high-tension wire, then use slack blocks on each end of the wire which is dead ended, and connect up the wire under the high-tension crossing. In doing this, we place a rope over the wire until the slack blocks are removed and the wires are tied in. It is my opinion this avoids the necessity of additional equipment and is the safest and most practical way of handling the wires.

FLASHING SIGNAL ASPECTS

"What use are you making of flashing signal aspects, at interlockings and in centralized traffic control or automatic block territory? Please Explain."

On Special Switching and Train Order Signals

By S. G. RABER
Signal Engineer
New York, Chicago & St. Louis
Cleveland, Ohio

AT certain locations in slow-speed territory on the Nickel Plate, such as in yard areas in C.T.C., where numerous switching movements require the switch engines to use the main line, we have a special switching-signal aspect. When a road train is to be moved through the territory, Standard Code aspects are displayed on the various home signals. For such movements, the bonded tracks must be clear of trains and the switches properly lined. At other times, the signals can be controlled to display a single

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flashing-red aspect, Stop; then Proceed at Restricted Speed to Make Switching Moves, Rule 291A. This authorizes engines to make the necessary moves past the signals to shift cars back and forth, or to change engines or cabooses on standing road trains being serviced. Road trains are not permitted to accept the aspect, either to enter or depart from the yard territory. To clear the main track through the yard for a road train movement, the flashing-red aspect is changed to steady red, Stop, Rule 292; a siren is sounded, notifying all yard movements to clear the main track and yard leads; and, after a time delay, if main tracks have been cleared and switches positioned, the proper aspects for road-train movements can be displayed. In this way, through train movements are protected, but yard moves are not delayed.

In addition to the flashing-red switching-signal aspect, we have a flashing yellow aspect which is displayed when the operator is holding orders for a road train. A flashing yellow unit below an interlocking home signal or train order signal displaying a proceed aspect, indicates Proceed Preparing to Receive Orders for Train. A flashing yellow below a home or train order signal at Stop indicates Stop—There are Orders for Train, and the absence of the flashing-yellow light, regardless of other aspects on the signal, indicates that there are no orders.

Flashing Yellow Interlocking Aspects

By E. N. FOX
Engineer of Signals & Telegraph
Boston & Maine, Boston, Mass.

AT interlockings where it is necessary to make diverging or converging moves to or from branch lines, or to signaled passing sidings, or to the other main track in multiple-track C.T.C. territory signaled for either-direction operation, we use a red-green-red aspect, indicating Proceed; Medium Speed Within Interlocking Limits, providing the turnouts or crossovers in the route are good for at least 30 m.p.h., and providing the next signal is indicating Approach or any less-restrictive indication. If the next signal is indicating Stop, the interlocking signal would display red-yellow-red—Proceed at Medium Speed Prepared to Stop at Next Signal. In either event, the automatic approach signal for the home interlocking signal would display yellow over green, staggered from upper left to lower right, indicating Approach Next Signal at Medium Speed. The purpose of the stagger is to serve as a reminder to the engineman that he is approaching an interlocking. At locations where the diverging track is good for 15 m.p.h. or more, but is not good for 30 m.p.h., and the next signal is Approach or better, we use a red-red-green aspect, indicating Proceed, Slow Speed Within Interlocking Limits. Slow speed is defined as "A speed not exceeding 15 m.p.h." For an approach signal, we display a staggered yellow over yellow, indicating Approach Next Signal at Slow Speed. Trains Exceeding Medium Speed Must at Once Reduce to That Speed.

However, in our aspects as used up to a few years ago, with the next signal at Stop on a slow-speed diverging route, we had no aspect corresponding to the red-yellow-red aspect for the medium-speed route. Therefore, under this condition, we used the red-red-yellow, Restricting indication which, in turn, required a staggered yellow-over-red Approach signal, necessitating train to be prepared to stop at the interlocking signal. With this set up, we were using the Restricting signal for two different conditions: (1) under true restricting conditons, such as an occupied block, open switch, broken rail, etc., and (2) under unoccupied block conditions, but with the next signal, which might be anywhere from 500 ft. to 2 mi. distant, at Stop. In some instances, trains passing through a complicated interlocking layout would receive two or more Restricting indications despite a clear track. It was recognized that this was not desirable, inasmuch as it accustomed enginemen to receiving Restricting indications at times when no true restricting condition existed, and thereby tended to weaken their strict observance of this indication. Furthermore, it unduly slowed up traffic, due to receiving a yellow-red Approach signal, as well as obeying the Restricting rule where there was a long block at the leaving end of the interlocking.

For the above reasons, we put in service a new aspect red-red-flashing yellow, indicating Proceed Prepared to Stop at Next Signal; Slow Speed Within Interlocking Limits. This aspect definitely assures the engineman that he has a clear track as far as the next signal, which signal is at Stop. Also, with the use of this aspect, it is possible to give a yellow-yellow approach signal instead of the former yellow-red which, in the case of heavy freights, sometimes caused them to unnecessarily come to a stop. This indication has been in service for some years now, and has worked out very satisfactorily. It is on the safe side in the event of the flasher relay failing to operate, as the indication would automatically change to a more restrictive one.

While this description has been confined to three-light interlocking signals, we use similar aspects on our dwarf interlocking signals, namely red over flashing yellow on a two-light dwarf interlocking signal, and flashing yellow on a one-light dwarf interlocking signal.

In Diverging-Approach Signal Aspect

By G. K. THOMAS
Signal Engineer System
Atchison, Topeka & Santa Fe
Topeka, Kan.

ON the Santa Fe, a red-over-flashing yellow aspect is displayed on high signals for Diverging-Approach, Rule 286. The yellow under the red is flashed 50 times per minute through a Style FN-16-A type relay. This aspect indicates Proceed Not Exceeding 40 M.P.H. for Passenger or 30 M.P.H. for Freight Trains Through Turnout; Approach Next Signal Preparing to Stop; If Exceeding Medium Speed, Immediately Reduce to That Speed.

The Restricting aspect, Rule 290, Proceed at Restricted Speed, is displayed by red-over-steady yellow on high or dwarf signals.

To Provide Fourth Aspect

By H. G. MORGAN
Signal Engineer
Illinois Central, Chicago

IN three-block, four aspect automatic block signal territory on certain parts of the Illinois Central, as for example, the Chicago Terminal division, we have three-unit color light signals—red, yellow and green. Red is displayed for the most restrictive aspect, yellow for Approach, green for Clear, and the yellow signal unit is flashed for the Advance Approach aspect.

The fourth aspect is thus obtained with minor circuit changes in two-block, three-aspect signaling, with only a small amount of additional equipment being required. Flashing is accomplished by use of standard d.c. flasher relays, 40 to 45 flashes per minute.

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