The results of preliminary work in alining each signal unit may be observed by walking along the track from the pick up point to within 50 ft. or so from the signal. Final adjustments should be made based on observations from the cab of a locomotive.

Practice on the Southern

W. J. Eck

Assistant to Vice-President, Southern, Washington, D. C.

It is our practice to use "spread light" lenses and to focus the light so that the engineman will get the best possible indication of the signal when he first comes within sighting distance of the signal. We have not used any special method of giving a close-up indication.

Indication Should be Visible Throughout Entire Approach

L. F. Howard

Chief Engineer, Union Switch & Signal Co., Swissvale, Pa.

The primary requisite for proper light indication on a curve has always been, in our minds, one requiring visibility of the light throughout the entire approach to the signal. With modern light signals the spread of the standard lens equipment is not sufficient to fill the whole curve and if the signal is lined up to the point where it can be first picked up by the engineman, there will be a dark portion on the curve unless some special means, such as the use of deflecting cover glasses, are used to carry the light around the curve on the approach to the signal.

The deflecting cover glasses referred to in the data on pages 10 and 11 of the Union Switch & Signal Company instruction pamphlet U-5034 are so designed that a certain portion of the light goes straight through for long-range indication and permits the signal to be focused to the most distant point. The prism design is such that the remainder of the light is deflected over to the track in diminishing degrees of intensity corresponding with the shortening of the distance as the engine approaches the signal. In all light-signal work, consideration must be given to this problem and we have furnished a large number of deflecting cover glasses in both the 10-degree and 20-degree sizes for just this purpose.

The question is not very clearly defined as applying to a color-light signal, but we have assumed that is what is intended. The need for the deflecting prisms on curves applies equally well to interlocking signals as it does to automatic signals.

If the question is meant to include semaphore signals also, with the usual semaphore lamp, we know of nothing that has been done except in a few special cases where deflecting lenses or spreadlight lenses have been applied to the semaphore lamps. The night indication of a semaphore lamp, however, is picked up at a much wider angle than is possible in daylight and the necessity for special means for signaling on curves, with such equipment, is not often encountered.

Annunciator Circuits

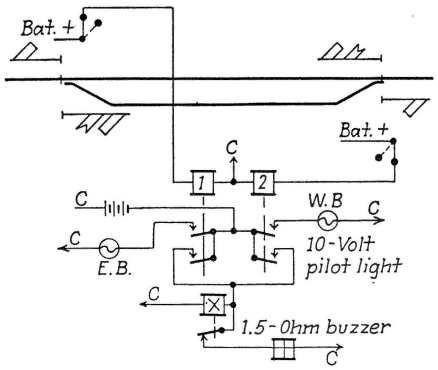
"What self-restoring annunciator circuits are available, that is, arrangements which do not require acknowledgment or push-button manipulation by the operator?

Automatic Station Annunciator

H. B. Garrett

Assistant Signal Supervisor, Southern Pacific, Phoenix, Ariz.

Several years ago, new station buildings were erected at two towns on the Tucson division of the Southern Pacific and it was desired that all the latest equipment be installed. For station annunciators we used the scheme shown, with



Annunciator applicable to single-track automatics

three 500-ohm two-point d-c. relays. With all signals clear, the relays are de-energized. When either relay 1 or 2 is picked up, relay X is also picked up. This cuts out the local battery from the buzzer which will give a short alarm while relay X is being picked up. This relay may have a slow pickup characteristic if a longer signal is desired.

In addition to the alarm given by the buzzer, we used two pilot lights which light up while a train is within holding distance of the outbound signals. These lights were made of automobile tail lights, using the red lens and socket for a standard 10-volt signal lamp.

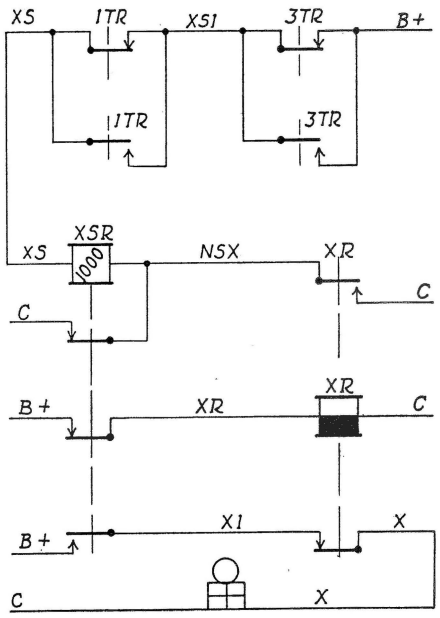
The voltage of the local battery is only 0.8 volt above the direct pick-up of relay X, thus retarding the pick-up of this relay and giving a longer alarm from the buzzer.

Circuit for Interlocking

R. H. Smedley

Circuit Draftsman, Reading, Philadelphia, Pa.

The accompanying circuit diagram shows a self-acknowledging annunciator circuit which replaces single stroke bells at interlockings. This circuit uses a neutral relay XSR with a stick feature in conjunction with a



This scheme can be applied at yard or at interlocking layouts

slow-release relay XR. The vibrating bell is energized by circuit X through a back contact on the XSR relay and a front contact on the XR relay.

The stick feature of XSR relay checks that the XR relay has operated, as XSR cannot pick up until the NXS circuit has been completed through the normally open back contact of the XR relay.

The ringing period is regulated by the time for which the slow-re-

lease relay has been set. Two to three seconds has been found to be sufficient where this circuit has been used.

Pushing Conduit Under Pavement

"When installing crossing signals, what success have you had in pushing pipe conduit under street pavements, and what kind of a device is used as a pusher?"

Battering-Ram Method

F. H. Bagley
Superintendent of Telegraph and Signals, Seaboard Air Line, Norfolk, Va.

The device used on the Seaboard Air Line in pushing pipe under paved roads and streets is made up from standard material on hand in any signal outfit. The illustration shows the assembled device, which was put together in the field by a Seaboard signalman, R. W. Pace, to whom credit is due for the efficient work done by this device. By referring to the drawing one can readily follow the make-up and its operation.

The driving point A is made from a piece of 2 in. pipe, heated and worked to obtain a rounded point. On the stub end of this point is attached a 2 in. coupling for forcing the point to the conduit C through the soil. Support rod D is run through impact plate F, and one end is passed into the 2 in. pipe to be driven, while the other end is passed into the end of the sliding support for ram H. This bar keeps the pipes H and C in line and supports the impact plate between the two pipes.

The battering ram is a piece of 4 in. wrought-iron pipe arranged to slide on the pipe H when slung by ropes. It will be noted that the impact plate is between the pipe C to be driven and the ram-supporting pipe H. A coupling E is fastened to the pipe C at the driving end to prevent damage to the threads.

Two men holding swinging ropes hold the ram while a third man on the other rope draws the ram to the rear. Then with men on forward ropes pulling forward, the ram moves forward and the impact plate against coupling E drives the pipe forward. It will be noted that it is necessary to support properly the pipes C and H on blocks, so that the battering ram can move forward freely to the impact plate.

It was found advantageous to oil the battering ram support H to eliminate friction.

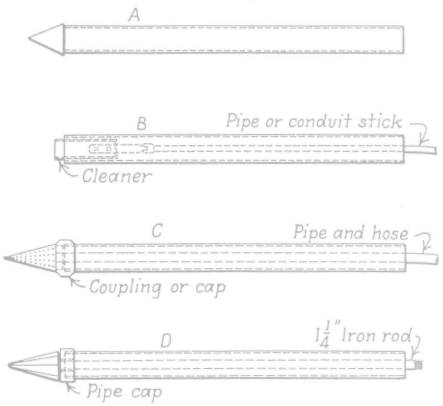
Four Types Illustrated

G. E. Beck
Supervisor of Signals, New York Central, Toledo, Ohio

There are several makes of pipe pushers on the market, but the larger and heavier makes with capacities to 4 in. pipe are usually warranted. In multiple-track territory the 4 in. pipe is none too large to take the required number of parkway and trench cables now generally used at flashing-light signal locations.

The accompanying sketches show four kinds of heads for the pipe, all of which have some advantage under varying soil conditions. Sketch A shows one having a pointed steel tip with a tang to fit into the end of the pipe, which is satisfactory for loam and sand. The head illustrated in sketch B is for use in clay and loose gravel. The cleaner is made of a piece of tubing ½ in. smaller than the pipe to be pushed and is used to remove the soil ahead of the pipe as it moves forward. Conduit sticks work well with this cleaner.

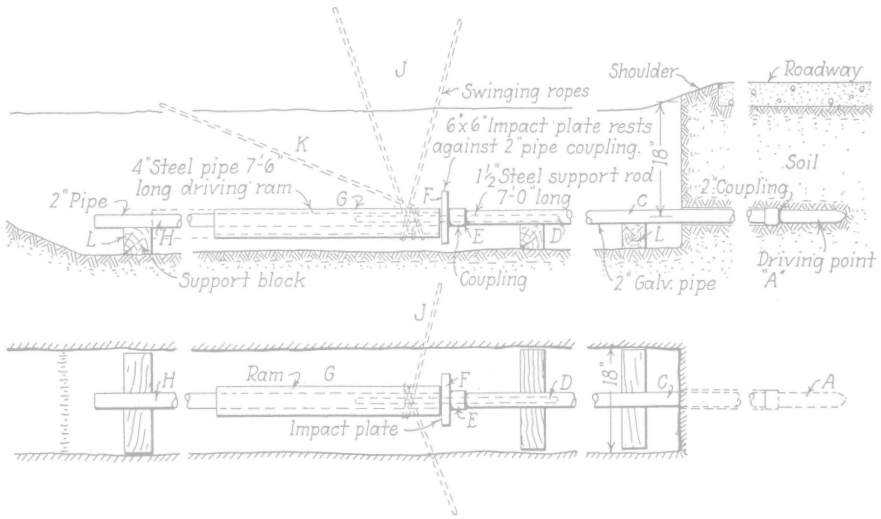
The point in sketch C has a tip similar to a drive-well point, and with the use of a hose connection to an elevated drum or barrel, will feed water to the point to soften the soil. The head illustrated in sketch D has



Soil conditions select the pipe-head

a tapered steel point connected through the pipe with short 1½ in. solid iron rods with couplings, so that while the pipe moves forward the steel point is turned, loosening the soil ahead of the pipe.

The character of the soil under the pavement can usually be determined by digging the hole for the pipe pusher on either side of the pavement. One must then trust to luck that an obstruction is not encountered. It is a good practice to contact city engineers regarding sewers, water and gas mains, conduit systems, etc., which might be encountered even though the railroad records show nothing of the above to be there.



This device developed by the Seaboard can be made by any signal outfit

An 80-ft. Pipe Installed

H. E. Eberle
Signalman, Atchison, Topeka & Santa Fe, Topeka, Kansas

From a practical standpoint, pushing pipe conduit under street pavements is a decided success when the proper equipment is available. Part of the equipment consists of a pipe pusher such as the Giant pipe pusher a product of the Giant Manufacturing Company, Council Bluffs, Ia.

Excellent results have been obtained with a No. 4 pusher having a capacity of 2 in. to 3 in. pipe. This device has been used by the signal forces of the A.T. & S.F. Eastern Lines to push pipe conduit under

(Continued on page 94)