

ventilation, the opening should be screened and hooded and drain holes should be made small. A good trunking job of either cypress or redwood, carried on four-foot cast iron or concrete piers will give many years of satisfactory service.

In my opinion underground duct jobs are best adapted to congested territories where trunking or aerial cables would be in the way and where the cost of such a system may be justified. Aerial cables are more or less unsightly after a few years of service but offer certain advantages where the interlocking plant embraces a considerable territory and where not many wires are involved. In fact the wires may frequently be carried on open pole line to advantage.

Although many signal men prefer to use parkway cable I do not believe that this method of construction is to be recommended, because it seems to me there is always doubt as to the exact condition of the wiring in the cable. Locating trouble is a more difficult job when circuits are carried in parkway cable than when any of the other methods mentioned are used.

## Can Preliminary Latch Locking Be Eliminated?

*"Is there any good reason why electric locking cannot entirely displace, in many instances, the mechanical preliminary latch locking on interlocking machines as suggested by the 'Letter to the Editor' on page 449?"*

**Advocates Reducing the Amount of Mechanical Locking Where Possible**

By LEROY WYANT

Signal Engineer, Chicago, Rock Island & Pacific,  
Chicago, Ill.

I HOPE that your contributor's letter in the December issue will stir up sufficient discussion to make it possible to obtain a consensus of opinion on the matter. Frequently there are cases where we could save not only the cost of making the mechanical locking changes but also save the serious inconvenience to traffic necessitated by making the changes. I have in mind a case where we are installing some additional crossovers at a plant where the locking bed is practically filled up and it is going to be expensive and inconvenient to add the additional locking necessary to provide complete freedom of movement with these crossovers.

I believe that electric locking would be sufficient but would hesitate to go into the use of such an arrangement at a joint interlocking until the matter had been carefully analyzed and a consensus of opinion established among signal engineers.

**Doubts Feasibility of Operating Interlocking Plant Without Levers Locked Mechanically**

By E. J. RELPH

Mechanical Engineer of Signals, Northern Pacific,  
St. Paul, Minn.

"THERE 'ain't' no such animal as a 'non-interlocked interlocking machine.'" The writer of the letter having a machine such as described, in successful operation, should have favored the readers with its location, so that it could be inspected and the signal profession profit thereby. It is entirely possible to maintain and operate an interlocking plant with machines not equipped with lever or latch locking, but is it practical? Numerous cases are on record of signalmen not being able to get a signal lever due to the fact that they had not completed the combination, and, not detecting their error, have flagged trains past stop signals.

One can imagine a busy point protected by an interlocking plant, the machine of which is not equipped with lever or latch locking. Serious delays would be caused by a signalman not setting up the right combination of levers, who might, thinking he had, start looking for trouble at the very many points trouble could be expected to exist. While interlocking plants could be maintained and operated without lever or latch locking, it is my opinion that it is best to retain such safeguards. Machines for classification yards should, in my opinion, never be classed as interlocking machines.

## Electrical "Safety-First"

*"What safety measures are enforced to protect signalmen from electric shocks? How should breathing be restored artificially in a man who has been knocked unconscious by accidental contact with a high voltage circuit?"*

**440-Volt Signal Power Line Must Be Handled Carefully Because of Danger from Possibility of Higher Voltages Coming in Contact with Line**

By R. A. SHEETS

Assistant Signal Engineer, Chicago & North Western, Chicago

ALTHOUGH 440 volts, 60 cycles a-c. is the highest voltage used by the signal department on this road in open line construction (we have a 6,600-volt line in underground cable), we have endeavored to instruct all men as though it were a high-tension line.

First, it is distinguished by being of No. 6 copper, located on pins 1 and 2 of the top arm on the track side of pole line and is carried on porcelain insulators as distinguished from other circuits carried on glass insulators. Second, vertical drops are either rubber-covered wire or line wire insulated with sections of second-hand Oxweld hose. Third, the line is properly and frequently sectionalized by the use of primary plug cut-outs and these are also used at all transformer locations for disconnecting such transformers. Fourth, the lines are properly drained of static charges by lightning arresters. Fifth, enclosed safety switches are used in all housings and all open terminals are insulated to guard against accidental contact. Otherwise standard construction is used.

The men are urged to observe these safeguards and not to handle the 440-volt line carelessly. We have cautioned them that though this voltage in itself is not generally considered dangerous enough to kill a man, there is always the chance of some 2,300-volt line falling down on the signal power line. There is also the chance of a lightning discharge running throughout the 20-mile section of the transmission line even though the sun may be shining where the men are working. Linemen must always discharge an open line to ground with a wire before actually coming in contact with it. Methods of resuscitation from electric shock are studied and booklets are furnished to all but no examinations are held.

CORRECTION.—On page 474 of the "What's the Answer?" section of the December issue, an error in spelling the name of one of our contributors has been noted. Robert Lang, signal maintainer, New York Central, at Suspension Bridge, N. Y., was the author of the reply suggesting methods for overcoming frost trouble on motor brushes, his name being incorrectly shown as R. Laney.