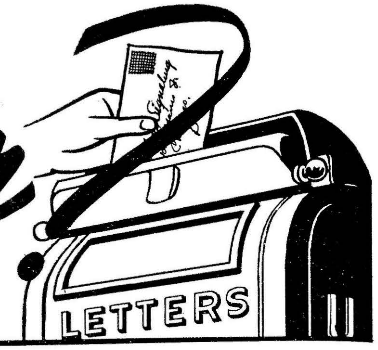
What's the Answer?



Testing Switches

"When making a test of an interlocked power-operated switch, using a ¼-in. gage between the point and the stock rail, should the switch be operated by hand or by power? If power is used, how do you prevent unnecessary damage to lock rods and plungers?"

Hand Operation

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All tests on power-operated machines, when using the ¼-in. gage between the switch point and stock rail, should, in my opinion, be made by hand. In favor of this statement I offer the following reasons: It is well to assume at all times when making such tests that ideal mechanical conditions do not exist, and we can expect to find at any time one or more of several faults, such as, movement of the stock rail, off-center lock rod adjustment, seized clutch, etc., all of which, if power were used, would place undue strain on switch connections and machine parts. With only a ¼-in. obstruction, this might allow the machine to lock up, shearing the edges of the lock rods, and in some cases, might result in buckling the throw bar.

However, when testing clutch slipping values, it is necessary to use power, and in order to guard against damage along these lines, a much larger obstruction than ¼ in. should be used, and the switch point brought up tight against the obstruction before cutting in the power, thus minimizing the effects of the shock if the clutch under test should have a tendency to seize.

To Be Answered in a Later Issue

(1) On large interlockings with complicated track layouts, and using dwarf signals of the searchlight type, what practices are followed to reduce the hazards which might be caused by lamp failures?

(2) At what voltage should thermal relays be tested, and what is the effect of variations of voltage in the timing operation?

(3) In your opinion, does "ionization" occur as a factor in improving the shunting of a track circuit by a train? (See page 279 of the May issue.)

(4) What success have you had in using pipe-pushers to install pipe conduit through railroad embankments or under the pavements of streets or highways?

If you have a question you would like to have someone answer, or if you can answer any of the questions above, please write to the editor.

Drafting Boards

"As compared with wooden drafting boards, what are the advantages of the more modern boards using working surfaces made of linoleum or composition material, thus requiring drawing sheets and tracings to be held by gummed paper strips?

Hard Surface Covering

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Some of the disadvantages of the soft wood drafting boards, which we used for many years, were that the surfaces were gradually worn and "chewed" by thumb tacks. Especially when working with large-sized sheets, difficulty was encountered in holding the tracing cloth in place because the holes would be gradually enlarged as the work progressed. Quite frequently holes were made in tracing cloth if the center point of compass or bow pen was pressed into one of these holes in the drawing board.

We have had no experience with the modern types of drafting boards made with working surfaces of linoleum or plastic material. We have, however, modernized our old wooden boards by placing a sheet of ¼-in. Masonite on the top of each board. The Masonite sheet stays in place by force of gravity, although it could be glued if necessary.

This material provides a smooth, hard, working surface. One slight disadvantage is that the material is too hard to take the center point of a compass when drawing circles, but this trouble can be overcome by using a piece of heavy drafting paper under a drawing or by covering the entire board with drawing paper. With some types of work, the lighter background afforded by the paper is an advantage.

The use of thumb tacks would, of course, ruin the working surface. The drawings and tracing, therefore, are held in place on the board by using short pieces of Scotch adhesive tape. This tape is made of a heavy grade of paper, with adhesive material on one side, which does not have to be damped to make it stick on the board or to paper. Each piece can be pulled off and reused three or four times before the adhesive is worn away. The adhesive material which sticks to the board or the paper does not leave a mess, but can be rubbed off readily. The tape comes in rolls, and can be secured in widths ranging from 1/4 in. to 1 in. or more. We use tape 1 in. wide, lapping about 1/2 in. of the width on the tracing and the other half on the board. By using pieces about 2 1/2 in. long and spacing them at intervals of 10 to 12 in. all the way around the drawing or tracing, the work is held in place and the surface is perfectly smooth.

Make-Up-Time Chart

"How can the time required for a train to make-up time at an increased speed be determined in chart form?"

Use a Nomogram

Carl P. Nachod

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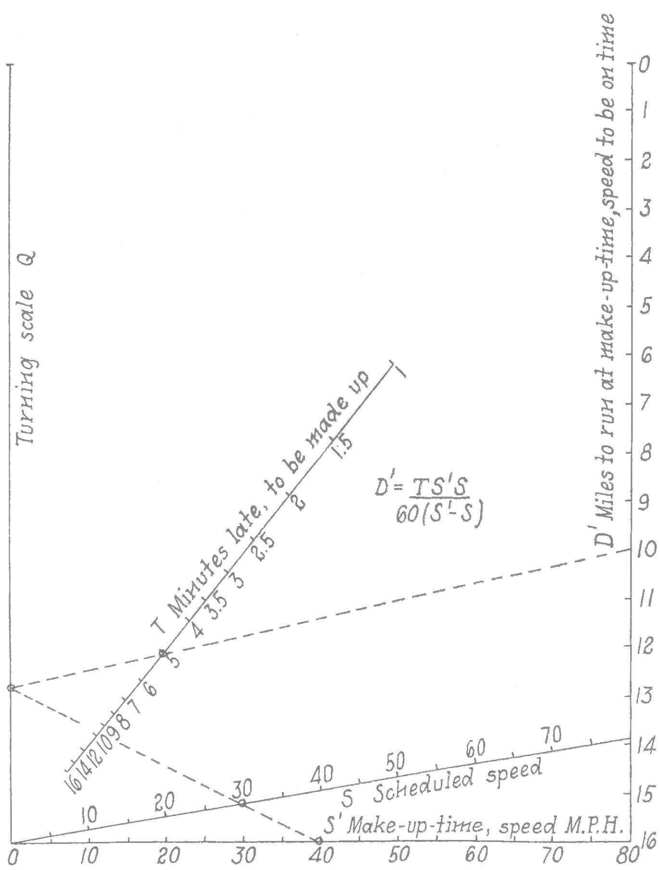
The accompanying illustration is a chart for make-up-time speed:

If a train is T minutes (5) behind time when running at scheduled speed, S m.p.h. (30), how far will it have to run on make-up-time speed of S' m.p.h. (40) to be on time again?

Draw the secant line through 40 on scale S' and through 30 on scale S, prolonging it to turning scale Q, whence it is to be reflected back through 5 on T, and prolonged until it cuts scale D', which it does at 10 miles, the required distance. In short, the two dashed lines just drawn are an example of the use of this chart or nomogram, and they graphically solve the equation $D' = \frac{TS'S}{60\,(S'-S)}$



Make-up time nomogram

This formula is excerpted from the report of Committee 1, on the Economics of Railway Signaling, Vol. 37, No. 1, opp. p. 18.

Each secant cuts 3 scales at the intersections marked with little circles, and avoids by breaks, those intersections not significant. Any similar V line that might be drawn, each leg cutting the 3 proper scales, will cut out values from these scales that satisfy the equation. Moreover, the compactness of the nomogram is shown by the fact that the broken line gives the result of the multiplication of 4 quantities, the subtraction of two and the division of the former by the latter.

Testing Insulated Joints

"How do you test an insulated rail joint to determine whether current is leaking through the insulation?"

Using the Voltmeter and Ammeter

J. H. Craig

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There are several types of insulated rail joints in service. The continuous insulated rail joint has been quite popular for several years, but has now been improved upon and the armored continuous insulated rail joint is being placed in service. Although each type of joint requires practically the same method of testing, the following tests apply particularly to the continuous and armored continuous insulated joint.

The insulated rail joint is installed for the purpose of dividing the track into the required length track circuits, and to insulate each track circuit from its adjoining circuit. Each track circuit has its own track battery.

The first inspection of an insulated rail joint is made visually. The bolts must be in their proper place and must be tight. All the insulation must be in its proper place, especially the bottom pieces, which occasionally on some joints have a tendency to work out lengthwise. The fibre side straps must be in place between the steel washer plate and the angle bar. The fibre washer plate should be noted carefully for breaks and cracks which are sometimes present over the bolt holes near the end of the plates. The end post will be noted to be sure it is in its place and that the rail ends are properly separated. The top pieces should be inspected for cracks and