TESTING REPEATING COILS

"In testing communication repeating coils to determine whether or not they are defective, what procedure have you found to be most effective?"

Two Measurements

By H. B. Hildreth
Equipment Engineer
Central of Georgia, Macon, Ga.

The most common test procedure used by the Central of Georgia for checking telephone repeating coils consists of two separate measurements. Coils suspected of being defective are first measured, using a bridge-type resistance test to determine individual winding resistance and balance. A Megger is then applied to test for cross or breakdown with other windings.

Both of these tests being satisfactory, a measurement of actual transmission is usually not required. We have found the above tests to be adequate for all previous cases of repeating coil breakdown.

CROSSING PROTECTION*

"Where manually-controlled crossing gates are in service, what precautions do you take at busy street crossings to insure that the gates are down before a train is permitted to pass over the crossing?"

Special Indicator

By H. P. Hancock
Supervisor of Signals
Norfolk & Western, Roanoke, Va.

Ever since the first manually-controlled crossing gates were installed, it has been realized that, since these gates were controlled by one man, their correct operation was entirely dependent upon the gate operator. In times past, where accidents occurred on grade crossings, caused by the failure of the gateman, it was considered unavoidable, as no one could have anticipated the failure on the part of the gateman. In recent years, this condition has been given considerable study, with the idea of correcting this situation wherever possible. Obviously, the solution was to prevent an engineman from operating his engine over the crossing until he knew that all of the gates were down.

The chance of both the engineman and the gateman failing simultaneously in handling a train movement over the crossing is very remote, so the solution, wherever operating conditions permit, is to prevent the engineman from going over the crossing until he has received a crossing gate signal indicating that all crossing gates are down. This signal, where position-light signals are in service, consists of a green color-light unit, which remains dark until all of the crossing gates are in the down position, at which time the indication is green. The crossing gate signal is controlled by a relay which can only be energized to display this signal when all gates are down. The circuit for this signal is completed through circuit controllers on each gate which are connected in series. This method of train movement protection at highway crossings for both automatic and manually-controlled gates has been in effect for some time and has proven entirely satisfactory.

*Other answers on this subject were published on page 326 of the May issue—Editor.

JACK PLUGS

"What is the quickest and most effective means you have found to clean and polish communication jack plugs on switchboard and patch cords?"

Machine Buffing

By T. C. Luke
Superintendent of Telegraph
Boston & Maine, Boston, Mass.

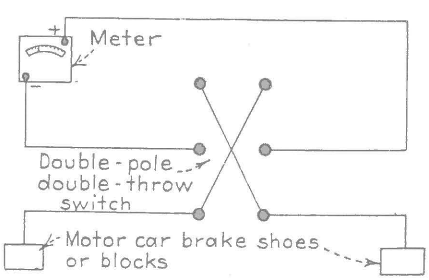
On the Boston & Maine, we have found machine buffing to be the most effective and quickest means to clean and polish the communication jack plugs and cords.

KINKS

TRAIN INDICATOR FOR MOTOR CAR

By T. S. Dutton
Signal Maintainer
Chicago, Rock Island & Pacific
Bowie, Tex.

The accompanying sketch shows the circuit for a train indicator on a motor car, which I have found to be a life saver in station-to-station automatic block territory with coded track circuits. By using a double-pole, double-throw switch, wired to a d.c. voltmeter and the brake shoes or blocks on a motor car, as shown, you can tell if there is a train in the station-to-station block in which you are traveling. The meter is set on the 1.5-volt scale.



Circuit for the indicator on motor car

The cost of this arrangement is small, and will afford a maintainer a great deal of protection in all kinds of weather. It is an idea which should help a lot of the boys, as it looks like we are coming to more and more coded track circuits, station-to-station automatic block and C.T.C.

INSULATED JOINTS

By T. W. Bell
Signal Mtr., St. Louis-San Francisco
Dixon, Mo.

The following is an idea which may prove of some help to other signal maintainers in the performance of their duties:

When the ends of rails overflow the end post of an insulated joint, use a rat-tail file to cut them off. This procedure is just as fast and a lot safer than using a hammer and chisel.

RAISING POLES

By W. A. Lane
General Foreman,
Communications Department
New York Central, Boston, Mass.

The accompanying sketch illustrates a means of raising heavy telephone line poles with a hand winch or at locations where a truck derrick cannot be used. By using the method, the poles can be set safely by two or three men.

A 10-ft. crossarm is used in the operation, and has been found to be very satisfactory. The end of the arm which the winch line is to ride should be proved, to hold the line in place. A three-bolt clamp is used on the line below the crossarm, as shown, so that when the line is tightened it pulls up the arm to a vertical position. The arm drops when the winch line clears. The crossarm should be set at about a 25-leg. angle in a slight depression and backed up with a piece of planking or flat stone.

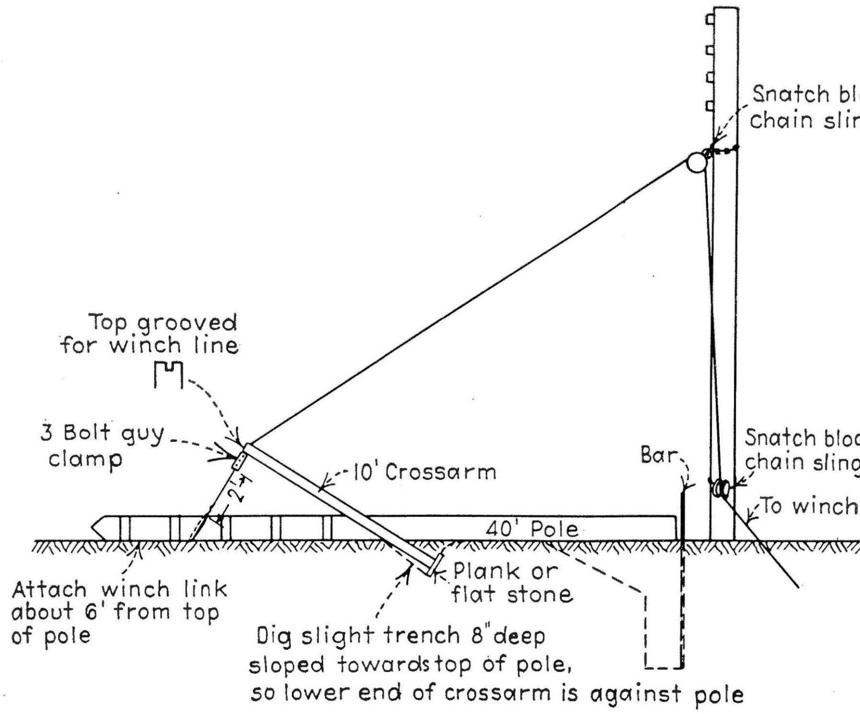


Diagram illustrating method of raising heavy telephone line poles

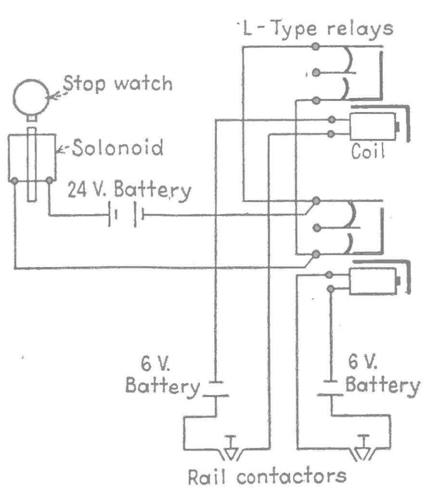
TRAIN SPEED CHECKER

By C. R. Stone

Signal Supervisor
Wabash, Moberly, Mo.

In order to accurately check the speed of moving trains or engines, I have built a machine that has proven very satisfactory on this division. This machine consists of two 48-ohm L-type relays equipped with close-before-open contacts, one 10-ohm solenoid, two rail contactors, stop watch and batteries for operating the circuits, as shown in the accompanying drawing.

The rail contactors are applied to the outside of the rail 264 ft. (1/20 mi.) apart. These contactors are the plunger type, the plunger moving up or down in an aluminum frame, adapted to fit over the outside base of a rail, with a 9/16-in. hole to allow an aluminum hook bolt to be used for fastening the contactor to the rail. The plungers are tapped in the top end and fitted with a standard A.A.R. Signal Section terminal bolt, to allow for adjustment for all sizes of rail. Fastened on the side of the frame and extending slightly above, is a set of contacts taken from an L-type relay. Since the plunger has a tapered head on the underneath side, any movement of the plunger downward will close these contacts. Once the contactor is fastened to the rail with the hook bolt and the plunger raised so the top is approximately ¼ in. above the ball of the rail, it is in a position for operation. The plungers are also grooved at the bottom and, when depressed, a small pin under spring tension engages this groove, preventing the plunger from again moving upward until the pin is reset manually.



Train speed checker circuits

Each rail contactor is connected to the machine with a light-weight duplex drop cord, each being 150 ft. in length, allowing the machine to be set a maximum distance of approximately 30 ft. away from the rail. Each wire is marked at a distance of 132 ft. from the rail contactor end, so that the exact 264 ft. can be assured each time the machine is set up, thus eliminating the necessity of measuring this distance with a tape measure. When the first wheel of a moving train or engine strikes the plunger of one of these contactors, it forces the plunger downward and closes its contacts, energizing the L relay in that circuit. During travel time of the contacts on the L relay, as it will be noted from the sketch, all contacts are momentarily made. During this period, the 24-volt circuit operating the solenoid is closed, applying energy to the solenoid, causing its core to make one thrust against the stop watch, and, to start the watch recording the time in seconds and fractions thereof it requires the train or engine to travel across the 264 ft. between the two rail contactors.

As viewed from the sketch, the same operation is performed by the other contactor when its plunger is forced down by the same wheel. The opposite L relay is energized, allowing another thrust by the solenoid core against the stop watch, stopping its timing. The stop watch we use in connection with this machine has its dial graduated into seconds. One complete revolution of the second hand registers 10 sec. Each second is graduated into tenths of a second, allowing a reading in hundredths of a second with one revolution of the second hand on the watch. We have a chart attached to the lid of the machine and, by checking the time required to travel the 264 ft. between the contactors against this chart, the actual miles per hour the train or engine was traveling can readily be determined. The L-relays were calibrated and set to the same values, and the relay contacts were checked with a cycle recorder for accuracy. Any lag in operation will be the same at both the starting and stopping contactors, so the time recorded on the watch is 100 per cent correct. When more than one train is to be checked at the same location, all that is necessary to do after the first check has been made is to reset both contactors and the stop watch. This machine was installed in a plywood box 12 in. by 12 in. by 20 in., which allows room for the contactors and two spools for winding the two 150-ft. drop cords when the machine is to be moved. The machine weighs 32 lb.