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.

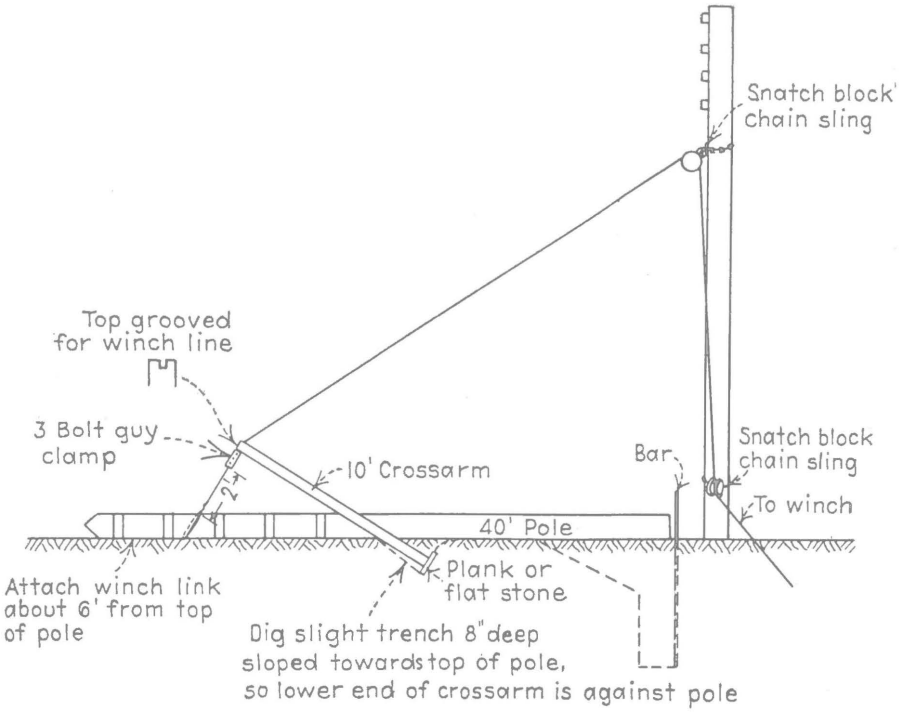


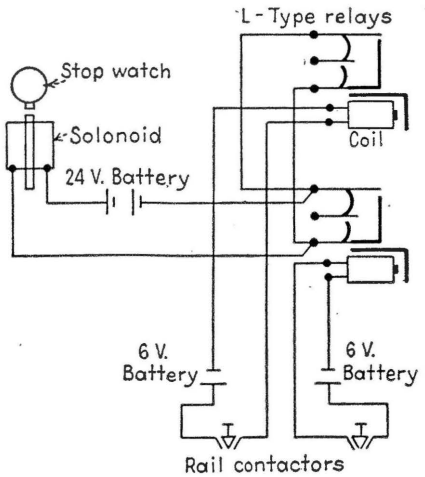
Diagram illustrating method of raising heavy telephone line poles

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.