If a more accurate result is desired it is possible by the use of two temporary grounds to calculate very closely the resistance of any of them. For best results the grounds should be made in the form of a triangle with not more than six feet between the legs. A battery is then connected across each pair of ground connections and the voltage and current flow read. By referring to the diagram the reader will note that this gives three sets of readings.

The resistance shown in the three readings is then computed. The sum of these three resistances it will be noted is twice the sum of the resistance of the three ground connections as each one was read twice in arriving at the figures. There are two methods of finding the resistance of the ground connection in question. We can either divide the sum obtained above by two which will give us the combined resistance of the three grounds and subtract the resistance obtained between the two temporary grounds which will leave the resistance of the permanent ground; or we can add the resistance obtained between each of the temporary grounds and the permanent ground and subtract from this sum the resistance obtained between the two temporary grounds. The result will be twice the resistance of the permanent ground as its resistance was figured twice; once in connection with each of the temporary grounds. If we divide the remainder obtained above by two it will equal the resistance of the permanent ground. The sketch shows the resistance of the ground figured by each method. For convenience the readings are not shown, simply the resulting resistances figured from the readings taken, according to Ohm's law.

The tests outlined above cover only a small part of what can be done with the volt-ammeter but by applying variations of them practically all the testing done in signal work can be accomplished.

Pacific Electric Moves Electric Interlocking Machine "Ensemble"

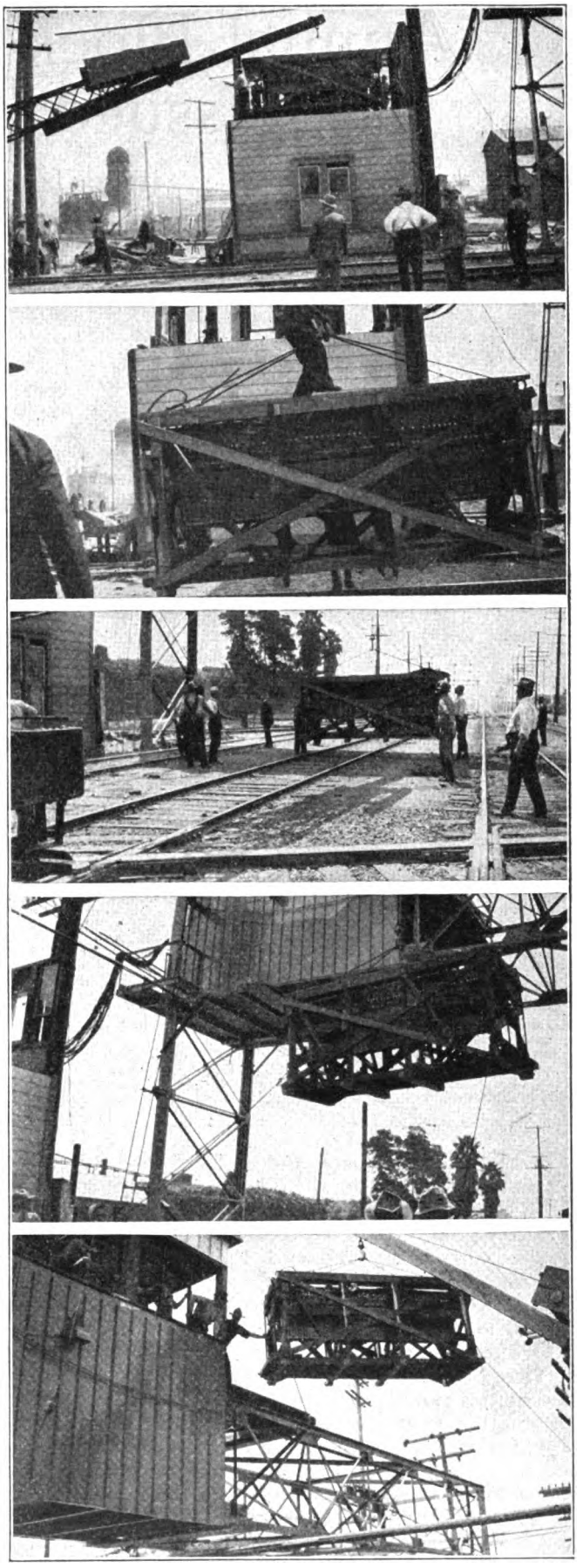
By Charles H. Lay

General Construction Foreman, Pacific Electric, Los Angeles, Calif.

THE Pacific Electric Railway recently moved a 64-lever Model-2 G. R. S. electric interlocking machine at Amoco, Los Angeles, from its old location in a two-story wayside tower to a new steel tower erected on a bridge which spans the Pacific Electric Railway's four tracks. This change in location was necessary because the city of Los Angeles had condemned the old site of the tower in order to extend a boulevard through this section of the city.

As shown in the accompanying illustration the roof and front wall of the tower was removed, the machine having been previously crated. All the wires were disconnected and the machine was picked up by a crane and deposited on the track. Taking a fresh hold the machine was next raised on to the bridge and slid into one end of the operating room that had been left open for this purpose.

A temporary cable had been hung previously from the old tower to the new one and splices made to the old wires on the machine. It was only necessary to connect the other end of the cable to the machine and the plant was ready for operation. The crating had been removed in the meantime. The permanent wiring was later installed under service without any train delays.



A Story Without Words Prepared From Photographs Taken by Felix Brac, Signal Maintainer, Pacific Electric, in Connection With Moving a 64-Lever Interlocking Machine By Means of a Locomotive Crane.