of the interlocking apparatus and bridge mechanism. This is accomplished by the above mechanical interlock, between the last lever to be thrown on the interlocking machine, when lined to open the draw and the clutch lever.

Interlocking between the bridge machinery and interlocking machine is designed to prevent the following conflicts. Before withdrawing the wedges and operating the lift rails and turning the draw, it is necessary that the plungers in the detector locks be withdrawn, also the circuit controller and the bridge coupler be disconnected.

The previous practice to secure interlocking protection between the draw machinery and interlocking machine was to break the ignition circuit of the gasoline engine, through the circuit controller contact, which is made by the full stroke of the last lever pulled when the draw is opened. This did not meet with favor, for it is always desirable to be able to run the engine, without being necessary to have to throw the levers for opening the draw.

To prevent the interlocking apparatus from being operated, when the draw is open, a butterfly plunger lock is provided on the last lever pulled in opening the draw. This also prevents improper manipulation of this apparatus, which would result in fouling of the interlocking apparatus, when the draw is swung into the closed position.

Is Indication Locking Needed?

"What advantages accrue from the elimination of indication locking on switch control levers? Are there any serious disadvantages?"

Absence of Indication Locking Speeds Up Lever Manipulation

By C. D. Cronk
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THE advantages from the elimination of indication locking on switch control levers of power interlocking machines are several, some of these being referred to in the article "Elimination of Lock Rods," page 33 of the January, 1929, issue of *Railway Signaling*. In addition, the elimination of indication parts speeds up the setting up of routes, as the switch levers are operated to full-stroke position, thus releasing the mechanical locking and permitting the operation of the signal levers. The signal clears when the switches in the route are in proper position. The actual time for the switch to operate is all that is required, before the signal will clear, thus reducing the operation to an automatic status. With the indication locking, the clearing of the signal is dependent on the operator going over the route to be set up, and taking up the indication, or awaiting the receipt of each indication, before proceeding with the set up.

There are no serious disadvantages, for as referred to in the article in the January, 1929, issue of *Railway Signaling*, the only function that indication locking performs is to derange the mechanical locking, pending the operation of the switch. Therefore, in summing up the problem we find the following advantages:

(1) Speeds up operation.

(2) Eliminates costly maintenance of indication locking parts.

(3) Eliminates delay and divided responsibility for signal clearing, as between operators and maintainers.

Unless the Possibility of Grounds Is Removed, Indication Locking Should Not Be Eliminated

By Max M. Knight
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ONE of the most recent developments in the trend towards the simplification of signaling facilities is the proposition of eliminating indication locking on switch control levers. I do not feel that it is a safe step to take. If the signal department can truthfully say that a method has been found that eliminates all possibility of ground trouble, then only is it safe to remove indication locking. With the switch control lever in full normal, or full reverse position, and the track switch fouled in a dangerous position, a grounded signal control wire between the indication relay and the signal might cause disastrous results. Despite the practice of selecting the signal control circuits through the switch circuit controllers at the track switch, the possibility of a false-clear signal is not entirely eliminated. At electric plants, where the train movements are numerous, the switch indication locking plays an important part because it notifies the maintainer immediately, whenever any switch is not functioning as it should.

W. S. Henry, service engineer, of the General Railway Signal Company briefly states his view:

"The advantages that accrue from the elimination of indication locking on switch control levers are a somewhat simplified interlocking machine, with greater ease and rapidity in manipulation. Some additional relays and circuit connections have to be added to compensate for the omission of indication locking. There appear to be no disadvantages."

How to Cure Ground Trouble

"What are some of the best ways to ferret out troubles from grounds at an electric interlocking plant and on automatic signal circuits?"

Outlines Two Methods of Hunting for Grounds at Electric Interlockers

By T. G. Inwood
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AT electric interlockings, when testing for negative grounds, we first set the ground switches on "positive battery" and on ground. Second, we operate the various functions, observing the ground light to see which, if any, of the functions affect the light, and if, when operating any particular function, we notice the light dim, or go out, indicating that the function being operated is grounded, we disconnect the control wires of that function and check the insulation resistance with a magneto or megger. If the control wires are found to be clear, we check the motor and field circuits. This usually gives us the desired results.

If, when operating the various functions, they do not materially affect the ground light, indicating that there are possibly a number of light grounds, or a ground between the operating switchboard and battery, we insert an ammeter between the positive battery and ground connection and disconnect the negative return wires for each function, one at a time. In doing so, we watch the ammeter, until we find those which are grounded, as these, when dis-