

between the two controlled layouts. One series of fences protects the face of an irregular bluff about 100 ft. high. One fence about 5 ft. high extends along parallel to the track, and four other fences of varying length are located at strategic places up the face of the bluff, the purpose being to have at least one fence in line with the path to be taken by any rock falling or bouncing toward the tracks.

### Panels and Cables

The wire panels in each section of fence are normally under tension by two heavy coiled springs, one at the top and the other at the bottom of the cross piece at the end of the panel. A detector cable, made of 5/16-in. flexible steel, extends from the center of the cross piece at the end of each panel section to an eye on a trigger arrangement which actuates the operating arm on a switch circuit controller as shown in one of the illustrations. The base of the control arrangement is made of two pieces of 1/2-in. boiler plate, welded together at right angles to fit on the corner of a square post. A slot, with the outer edges turned in, is welded in a vertical position on the left face of the plate base. A block strip, which fits in this slot, is welded to the rear of the vertical round rod which has an eye at the top and the bottom. A Union Model U-5 switch circuit controller is mounted on the plate at the right, the end of the crank arm being ground off to a pointed edge that fits in a notch in the lower end of the bar in the slide. The arm is operated downward by a coil spring.

If a rock strikes one of the fence panels to move it out of line 8 to 10 in., the corresponding detector cable is pulled, thus jerking the up-and-down trigger rod up, which releases the pointed end of the operating arm from the notch in the trigger; then the arm is pulled down by the coil spring. This movement actuates the contacts in the circuit controller and causes the signals to be set to the most restrictive aspect.

A special point of interest is that one trigger device and controller can serve several panels of one fence or several different fences. In the bluff protection mentioned previously, the detector cables from the five different fences all extend to and operate one trigger and controller.

The remote control project, as well as the detector fences, were planned and installed by the signal forces of the Norfolk & Western, the principal items of signaling material being furnished by the Union Switch & Signal Company.

## I. C. C. Approves Automatic Interlocking to Replace Mechanical Plant

THE Chicago, Rock Island & Pacific, on January 19, 1938, filed application No. BS-Ap-118 with the Interstate Commerce Commission for approval to install automatic interlocking in lieu of mechanical interlocking, and to eliminate derails at its crossing with the Burlington at Ottawa, Ill. The Order of Railroad Telegraphers, Brotherhood of Locomotive Firemen and Enginemen, Order of Railroad conductors, Brotherhood of Railroad Trainmen, and Brotherhood of Maintenance of Way Employees, by their authorized representatives, filed a protest with the Interstate Commerce Commission against the granting of the application, and a hearing was held in Chicago, July 27, before Examiner King.

### Abstract of Report

On December 16, the commission issued a report and an order approving the installation of the automatic interlocking in lieu of the mechanical plant with derails. Abstracts from the report of the Commission follow: "During the hearing, the petitioning railroads urged that the changes follow the general trend of interlocking practice; that they effect economy of operation on account of lessened maintenance and operating expense, and while no specific reference was made to the safety of operation in the application, it is claimed generally in the subsequent proceedings that safety of operation is not decreased in any respect, and that added safety results through automatic operation and the elimination of derails used in connection with the mechanical plant.

"A witness representing the locomotive firemen on the Rock Island testified that he considered a mechanically-operated plant safer than an automatic plant. It was testified on behalf of the Brotherhood of Railroad Signalmen that lightning and frost are two agencies which can interfere with the proper operation of electric signals, and that it is possible for false signal indications to be displayed in connection with both manually-operated and automatic interlocking plants. The testimony of witnesses for petitioning railroads indicates that the track circuits of the automatic plant have been cross-checked in every way known to signal engineering to insure that conflicting signal indications cannot be displayed, or routes changed under any conditions

which will permit an engine crew to approach and pass the signals without full opportunity to observe the change. The conclusion reached is that, in general, electric signal systems are highly efficient safety devices and there is no reason to believe that the signals used in the plant here considered will not function as intended.

"Petitioners show that within recent years it has been their practice to remove mechanical interlocking plants equipped with derails as they become worn out or obsolete, and to install in lieu thereof automatic interlocking plants without derails. They claim this is in accordance with the general practice of other railroads throughout the country. The Rock Island now has 38 automatic interlocking plants on its line and the Burlington has 23. Some of these have been in service for more than 10 years, and it is testified that they are practical and efficient, and have been operated without accidents or difficulty of any kind. The total number of such plants now in use in the United States is 341. It is urged that in some cases the use of derails on main track is a definite hazard and decreases rather than promotes safety. It is urged that in many cases no accident necessarily results from failure to properly observe the stop indication of a signal, but that the failure to observe such a signal equipped with derails almost invariably results in the locomotive being thrown off the rails. It is shown on behalf of the petitioning railroads that the Signal Section of the Association of American Railroads has indicated by resolution that "derails should not be used in main tracks." Our present consideration of the use or non-use of derails on main tracks relates only to the plant here involved, and we are of the opinion that under the particular circumstances here shown, including the traffic involved, physical characteristics of the tracks and the type of equipment used, we would not be justified in compelling installation which would require their use.

"We find that the use of the present automatic interlocking plant at Ottawa in lieu of the mechanical interlocking plant equipped with derails does not decrease safety of operation, but in view of the surrounding circumstances may reasonably be said to promote safety."