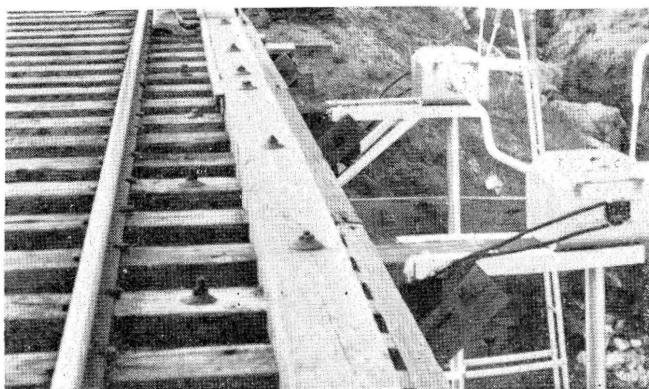


The controllers of the detectors are at the level of track



Flood-Detectors on the Katy

RECENT heavy rain storms resulted in a service test of a new type of flood-detectors on the Missouri-Kansas-Texas. This story of flood-detectors on the Katy started about 20 years ago. A passenger train, headed south through Oklahoma, was derailed at a place where the track had been damaged by a flash flood. This accident set the minds of the Katy's signal force to work on an automatic flood-detector. A float arrangement was devised to operate a circuit controller to set automatic signals in each direction at Stop when flood water came up into the float box which is at the level of the toe line at the edge of the ballast. Detailed explanations of the design, installation and operation of these flood-detectors are included in an article in the May, 1949 issue of *Railway Signaling and Communications*.

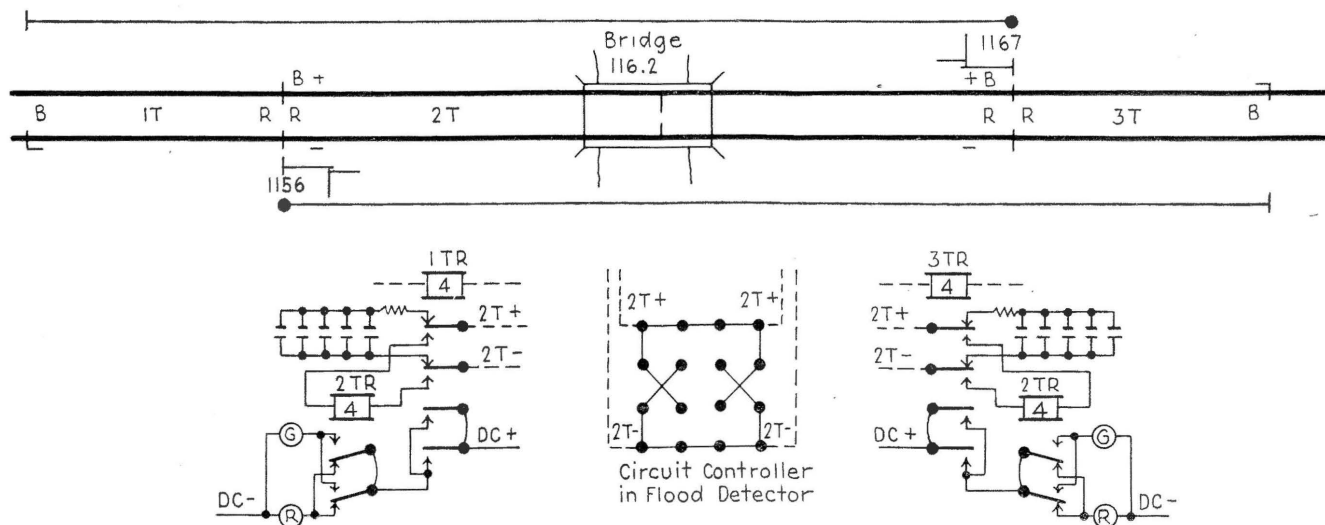
Last year, the Katy's signal depart-

ment was given a problem of applying flood-detectors on a high wooden trestle over a stream bed north of Wichita Falls, Tex., on the Northwestern Branch of the Katy, where no automatic block signaling was in service. The flood-detectors on this installation are of a new design, attached to the down-stream side of the trestle. Two detectors on separate bents, 14 ft. apart were used so that if one fails, the other will provide protection. In each detector, the box bolted to cap on top of the piling, contains the circuit controller which is operated by an up-and-down rod in a vertical pipe extending down to a float in a housing bolted to cross bracing of the trestle, 17 ft. below track level, as shown in the accompanying picture. A ladder and platform are provided so that the maintainer can get down to the float to inspect it readily. When flood water

Rising water operates float

raises the float, the upper end of the up-and-down rod operates the controller. Having once operated to open the controller contacts, the controller sticks open mechanically, and remains open until restored by some responsible man, such as a bridge supervisor.

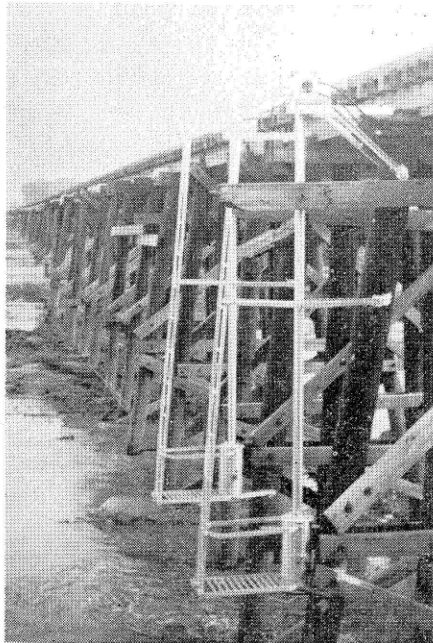
As no signals were previously in service on the Northwestern Branch, new signals were installed train-stopping distance from the bridge, for operation in connection with the flood detector. The northbound signal is 2,300 ft. from the end of the trestle and the southbound signal is 2,500 ft. from its end of the trestle.



Track and circuit diagram of signals and flood detectors

These signals are the color-light type and are normally dark.

In approach to each signal, there is a track circuit, about 2,500 ft. long, which is for the approach lighting control of its respective signal. At the



Water at level below detector floats

right of the track at the point where a train enters an approach track circuit, there is a fixed sign which is the equivalent of a fixed distant signal. The track relay for an approach track section is at its signal.

A special track circuit extends from one signal to the other. This circuit is connected at either end to the contacts of the approach track relay so that, as long as this approach relay is energized, four cells of battery in multiple are connected to the middle track circuit at each end. When the approach relay contacts are down, a four-ohm track relay replaces the track battery, through the back contacts, and then the circuit becomes a conventional circuit with battery flowing from the opposing signal through the rails, around the insulated joints through the closed contacts of the flood detectors.

When the track relay for an approach track section is released by an approaching train, a circuit is complete through a back contact of this relay, and a front contact of the relay of the track circuit extending to the flood detector, to light the green lamp in the signal. If the flood-detector has been operated, the track relay is down and the red lamp is lighted in the signal, when a train approaches. Also the red lamp is lighted if a train is occupying the track circuit between this signal and

the opposing signal, thus giving regular automatic protection to this extent. Each signal has two green lamp units. If the lamp in one green unit fails, the second green lamp is cut in automatically.

Four cells of Edison 500-ah. primary cells are for each track circuit

and a set of 12 cells of the same type of battery feeds the lamps at each signal. The signals and relays were made by the Union Switch & Signal Company. The flood-detector project was planned and installed by Katy forces under the direction of R. R. Wood, signal engineer.

C.T.C. on Rio Grande

(Continued from page 493)

train, so that switches can be operated to line up another route promptly.

At the ends of double track, switches 68 and 86, the turnouts were made equilateral so that the speed through the turnout is the same regardless of the direction of the route selected. For this reason, signals 35 and 14 were made single-arm signals. Speeds up to 55 m.p.h. are permitted over these switches. The signals are the searchlight type. New sheet-metal houses for the relays, battery, etc. were installed at Fox, Utah Junction, Zuni and other locations as required.

The switch machines are the model 5D with dual control, and with d.c. motors rated at 24 volts. The ties on which the switch ma-

this switch. These are Ramapo-Ajax vertical-type rods with vertical pins designed to prevent "rolling" of the switch points. These switch points are 33 ft. long, and in order to be sure that the entire length is moved over properly, a pipe connection from the operating rod extends through cranks to a second operating connection on the fifth tie rod, 14 ft. 7 in. from the points of the switch. An extra switch circuit controller checks the position of the switch points at the second connection.

Master Stepper Added

The control machine was equipped with a second master stepper unit. The original stepper unit controls and receivers indications from



Power switch No. 68 with 33-ft. curved switch points

chines are mounted, are dapped just enough so that the operating rod is straight. The switch layouts are well constructed as shown in one of the accompanying pictures which shows No. 68 at Utah Junction. This layout has a No. 15 turnout with 33-ft. curved switch points. Insulated gage plates, 1 in. thick and 8 in. wide, are used on three ties, including the No. 0 tie and the No. 1 and No. 2 ties. Ramapo-Ajax adjustable rail braces are used on these ties. A Type-MF front rod and five Type-M switch rods are used on

Ralston (M.P. 7.2) to Winter Park and the new master controls and receives indications from Fox Junction to Zuni inclusive. This necessitated a second set of code wires from the control office to Zuni. At the same time, a set of transfer relays were installed so that either master unit could be cut out and the other unit would take over the duties of both units by converting from single- to double-end operation on the master unit retained in service. This makes it possible to avoid failures due to faulty master