

installed, this pipe extending 10 or 12 in. above the surface. After the cable was put in place through this sewer pipe a quantity of hot petroleum asphaltum was poured around the cable until the pipe was filled. At the relay cases the sewer pipes are set so that their tops extend through the bottom and into the inside of the case. These latter pipes are filled with Lastik weatherproof cement furnished by the Lastik Products Corporation. This material has the advantage of a satisfactory seal for the cable, without being soft enough to run in hot weather, nor hard enough to crack in cold weather. Furthermore, it can be dug out with a blunt edged tool without the use of heat. This is desirable whenever it becomes necessary to add or replace a cable.

At the same time that the signals were relocated so as to have them in pairs, the circuits were changed. The A. P. B. scheme of signal circuits was used, thus the signals now operate in three positions and the signal overlaps are discontinued. At some of the shorter passing tracks, where there is not sufficient braking distance between signals, the overlap was supplemented by having two signals display the approach indication. At each signal location, all of the relays are housed in a wooden relay case measuring 15 in. by 35 in. by 5 ft. 6 in. high. This case is mounted on a creosoted oak block which is supported by two A. R. A. concrete pipe carrier foundations.

[Part II, explaining the train stop equipment, will be published in a later issue.]

## Report on C. & N. W. Side Collision at Chicago

**I**NABILITY to control the air brakes on a back-up train at the Chicago & North Western terminal, Chicago, on January 26, 1929, is given as the cause of a side-collision with an outbound suburban passenger train, in the recent report of the Bureau of Safety. The back-up man was not able to bring his train to a stop at an interlocking signal indicating "stop," owing to a stoppage of the air flow through the train brake pipe, caused by "the formation of an ice plug, which became lodged in the air hose at the head end of the next to the leading car." This rendered ineffective the attempt to apply the brakes by means of the "tail" hose valve. One passenger was killed and 51 were injured.

Lake street interlocking tower is located on the north side of the tracks and between the west end of the train shed and the point of accident. Signal bridge "A," which spans the lead tracks, is located about 95 ft. west of the point of accident. Interlocking signal 13, the signal involved, is of the three-position, semaphore type; it is located on the bridge and governs eastbound movements on lead track 2. A stop indication is displayed by this signal when the route is lined for a movement westbound from the station on lead track 2 and thence through the cross-over up movement eastward or inbound. From the California avenue coach yard to the passenger terminal at Madison street, a distance of about 3 miles, the movement is controlled by means of a tail-hose in charge of a back-up man. No train orders are issued covering these back-up movements.

After empty coach trains are made up in the California avenue coach yard they are inspected and the car inspectors test the air brakes by means of the yard plant. When a train is ready to start the move-

ment to the passenger terminal, the back-up man makes the coupling between the road engine and the train and after the air is pumped up the engineman makes a service air-brake application. The back-up man then walks the length of the train, inspecting the piston travel on the cars; on arrival at the rear end of the train, provided the air brakes have set properly on all of the cars and the piston travel is normal, the back-up man gives the engineman an air whistle signal to release brakes, then attaches his tail hose to the leading car and opens the valve on the tail hose to ascertain that the air flow is all right and that the brakes apply when operated from the leading end. The train then departs from the yard and the back-up man makes a running test of the air brakes to determine whether they are working properly. During the course of the back-up movement, enginemen leave the brake valve in the running position, placing the air brakes entirely under the control of the back-up man.

The leading car was uncoupled from the equipment of train No. 155 after the accident; the back-up man was instructed to have the balance of the equipment pulled ahead and then backed into the station on another track. He signaled the engineman to pull ahead a short distance so that he could go between the cars and couple his tail hose to the rear of the train line and at that time he discovered ice in the hose on the rear of the car. He tried to blow it out by opening the angle cock quickly but had no success; he then signaled the engineman to pull ahead and after reaching signal bridge "D" the train was again stopped and at about this time he saw Assistant Division Superintendent Koch and called the latter's attention to the matter. Mr. Koch stated that on examining the hose on the rear of the car he found that ice had formed in the hose and he expressed the opinion that it resulted in the opening being from 65 to 75 per cent closed. After they succeeded in blowing it out, it was found that the piece of ice was very dark, indicating the presence of oil; it varied  $1\frac{1}{8}$  to 2 in. in length and was from  $\frac{3}{4}$  to 1 in. in diameter and irregular in shape. There was an impression of a rim on one edge of it, where apparently it had lodged against the air hose gasket. After its removal the air brakes were tested and the train was then backed into the terminal and brought to a stop without incident by means of the tail hose valve.

The report concludes that, "This accident was caused by the failure of the back-up man to stop the train before passing interlocking signal 13, due to a stoppage of the flow of air through the brake pipe in the equipment of train No. 155 as a result of the formation of an ice plug which became lodged in the air hose at the head end of the next to the leading car, thereby preventing the air brakes from taking effect when an attempt was made to apply them by means of the tail hose valve.

"Careful inspection of the tail hose used in the back-up movement failed to disclose anything that would have caused or contributed to the accident, and the cause for the formation of the ice could not be determined. According to the records this was the first accident to occur on this railroad from such a cause since January, 1915, a period of 14 years, during which time between 2,200,000 and 2,500,000 back-up movements were controlled by means of tail hose. Coach 3251 had been in service on 16 trips between Chicago and northern Wisconsin from January 1, 1929, up to the time of the accident."