

## Electric Locomotives in Two Wrecks

Man Failure and Act of Providence Are Causes of Two Accidents on C., M. & St. P. Mountain Division—Electrical Equipment in No Way at Fault

**E**LECTRIC locomotives featured in two serious accidents which occurred in the spring in the Pacific Coast section of the Chicago, Milwaukee & St. Paul Railroad. All of the evidence has been taken and it is now possible to look back calmly upon the two accidents and to cite the circumstances on which B. B. Greer, vice-president, based his statement that one of the accidents was purely a case of man failure, while the other was the result of an act of providence, and in neither case was the electrical equipment or electrical operation of the road in any sense responsible.

One of these accidents is intensely interesting and informative as to the difficulties of mountain railroading. At 4:20 a.m. on June 16 train No. 74, with helper electric locomotive No. 10,239 on the front and a Mallet road engine on the rear end and fifty-eight loaded freight cars and one water car in the train, left Boylston, Wash., after the usual inspection of brakes.\* A short distance east from this point the train began its descent of the long 2.2 per cent grade known as Beverly Hill

The engineer, who was an experienced man, allowed his train to gather momentum up to a point where regenerative braking in parallel could be cut in. The permissible speed for cutting in the motors for regenerative braking is from 15 to 20 m.p.h. Apparently this engineer waited for the speed to exceed 15 m.p.h., but failed to cut in his regenerative switches until the speed had reached at least 20 m.p.h., and the breakers would not hold. The confusion in his mind resulting from the operation of the overload relays caused a loss of action on his part for perhaps a fatal half minute, during which time the speed of the train kept rapidly increasing. The engineer then made a service application of his automatic air brakes, but this did not check the train. He tried to cut in the regenerative system a time or two, but the speed was too

high and the breakers would not stay in. The service application of air was then released and an emergency application made, but the speed must have reached 35 m.p.h. by this time and the brakes had no effect in checking the train.

Running away, the train proceeded down the grade for a distance of 12 miles at a speed which is estimated was not in excess of 35 m.p.h., since it was held back to a certain extent by the independent driver and tank brakes on the Mallet engine on the rear, the retainers and the thirty-five hand brakes set up by the train crew. The train remained intact from the top of the hill to a switch at Doris, 12 miles, where the Mallet engine broke off the train on account of the tank becoming derailed. Presently this engine also left the rails, but was only slightly damaged.

Released from the holding power of the rear locomotive, the train gathered speed rapidly, and a little farther on twenty-eight cars of lumber and shingles piled up in a short space and were all consumed by fire. The remainder of the train proceeded eastward about 2½ miles, when thirteen more cars were derailed. Of these cars seven, carrying lumber and shingles, were badly damaged, but six cars carrying oil were practically unhurt. The remaining seventeen cars attached to the electric locomotive ran 1,000 ft. east of this point, where they were badly derailed in a short space and burned.

The electric locomotive, completely released from the train, proceeded 7 miles farther to a point 3 miles east of Beverly and stopped. The speed tape in this motor indicated that it ran at a maximum of 50 m.p.h. at some point, presumably after the Mallet broke off. There are several 10-deg. curves on this steep grade, and even with the excessive speed of the motor it did not leave the tracks nor did it cause any damage to the track. The total damage to the electric locomotive consisted of one motor-generator winding badly burned, one set of tires badly flattened and some minor damage to electrical connections. The entire damage, however, was slight.

\*A map and profile of this section of the railroad will be found in the issues of this paper for Nov. 3, 1917, pages 819 and 820; Nov. 1, 1919, page 830; March 6, 1920, page 481.



PARTS OF WRECKED MILWAUKEE LOCOMOTIVES AS RETURNED TO THE WEST TACOMA SHOPS  
These underframes are being straightened and the rehabilitated locomotives will soon be in regular service.

The first recorded indication of trouble was when the breakers at the Kittitas substation blew out, indicating the operation of the overload relays on a locomotive on the line. This occurred at 4:26 o'clock and records the time when the engineer first cut in his regenerative braking. At 4:45 o'clock the trolley line and feeder line at Doris substation went out, and at 4:48 the high-tension line went out on account of being broken with the derailment of the first lot of cars.

So far as the braking power of the train is concerned, the company has always considered the regenerative system as entirely supplementary to the air brake system and has drilled its engineers to place primary dependence on the air brakes. In this particular case, the tonnage of the train was 2,480, while the air brakes would hold 4,000 tons on this grade, providing the speed is kept below 15 m.p.h. The regenerative features in addition should hold 1,500 tons. This points to the fact that there was no question of braking capacity involved in this wreck. The fact that 15 m.p.h. was the maximum speed of freight trains permitted before electrification, while this is the minimum speed at which the regenerative features may be placed in operation, makes the opportunity for man failure particularly critical. The men are instructed to test the holding power of their brakes before attempting to cut in the regenerative system, but there is a possibility that this may not have been done on this particular train owing to the general desire to take advantage of the regenerative features for saving energy at the earliest possible moment upon descending a grade. Full examination has determined that the electrical condition of both the locomotive and the substations was absolutely normal and that each part of the equipment was functioning normally. The entire responsibility is placed upon the engineer, who failed to cut in his regenerative braking until the speed had become excessive.

#### BIG SLIDE WRECKS TWO LOCOMOTIVES

The other accident referred to occurred at 11:30 a.m. on Sunday, May 23, at a point 3 miles east of Ragnar, Wash. In this case two electric locomotives running light, with only a caboose attached, were just in time to reap the full result of an enormous slide on the side of a mountain which took away a considerable section of track.

A watchman patrolling the track happened to be in this vicinity at the time the slide occurred. He heard a rumbling noise and saw the slide start and could see that the track was going to be carried away. He knew that a passenger train was due there in a little while, and he hurried up the track to flag this train, not knowing about the two electric locomotives which were proceeding from the opposite direction.

These locomotives, Nos. 10,208 and 10,240, rounded a curve at 15 or 16 miles per hour and entered the sunken track, rolling and sliding down the slope to a point about 400 ft. below. The two engineers and two firemen carried down with them were practically uninjured. An instructor and brakeman had to be taken to a hospital, but they recovered. The cabs of both locomotives were almost completely wrecked. The underframes were badly bent and twisted and the sheeting on the sides and roof was stove in by hitting against rocks and trees as the engines slid down the embankment so that it was practically beyond reclamation. Inside the cabs the motor-generator sets, rheostats, control equipment, air compressors, wiring, etc., were practically all torn

from their fastenings and damaged more or less. The engine trucks, short and long main trucks, driving wheels and motors of both locomotives were very little damaged. The brake rigging on one engine was little damaged, while that on the other was damaged to some extent.

With the two wrecked locomotives some 400 ft. below grade, it was some problem to salvage them. This work was finally accomplished by loading the engines by pieces on wagons and carting them to North Bend on the Everett line, a distance of 7 miles, where they were loaded on cars and sent to the Tacoma shop.

#### Chicago Employees Support Commission

IN ITS current issue (Aug. 14), the *Union Leader*, official organ for Chicago of the Amalgamated Association of Street and Electric Railway Employees, has a strong editorial commendatory of the Illinois Public Utilities Commission.

Emphasizing the difficulty of the problem of the utilities with rising costs and fixed rates, the editorial says the commission members have attacked it fearlessly, honestly and in a practical way. These men of technical training and high ability, the "least understood, hardest worked and most abused" of all persons serving the Illinois public, are honorable men, and because they have done their duty have been "unreasonably criticised and abused by newspapers and politicians" who selfishly play the political game rather than work for the public welfare. The editorial concludes as follows:

We hold no brief for this commission, but have had occasion to observe its work and realize some of the difficulties it has labored under. We know that by using good judgment the members of the commission have saved the people of various communities in Illinois much inconvenience. For the valuable service they have given they are entitled to credit and a deeper appreciation by the press and people of this state.

#### Materials Handling Association

THE American Society of Mechanical Engineers has authorized the formation of a Materials Handling Section, the first and organizing meeting of which was held on Friday, Aug. 13, at the Engineering Societies' Building, New York.

It was indicated in this meeting that the work of this section of the American Society would be to study principles of the handling of materials, including the general problem of transportation, not of any particular transportation agency, but from the standpoint of linking up the transportation agencies so that material could be handled through in such a manner as to keep to a minimum the total cost of handling the material. Naturally, a large part of the work of this section will have to do with the handling of materials in manufacturing establishments.

In the article in last week's issue on "Training Platform Men" in Los Angeles, by J. G. Jeffrey, Director of Public Relations Los Angeles Railway, two titles were given to the author. That just mentioned with the Los Angeles Railway is correct. The title also given to him as an officer of the East St. Louis & Suburban Railway was due to a misplaced line, which was not caught by the proofreader.