IN RE INVESTIGATION OF AN ACCIDENT WHICH OCCURRED ON THE MISSOURI, KANSAS & TEXAS RAILWAY of Texas AT POWERS, TEXAS, ON FEBRUARY 22, 1921.

March 26, 1921.

On February 22, 1921, there was a derailment of a passenger train on the Missouri, Kansas & Texas Railway of Texas, at Powers, Texas, which resulted in the death of 2 employees and the injury of 12 passengers. After investigation the Chief of the Bureau of Safety reports as follows:

Location.

The accident occurred on the Fort Worth Division of the Denison District. Between Highlo and Bellmeade, Texas, a distance of 30 miles, the line is single track, and the movement of trains is governed by time-table, train orders and an automatic block-signal system. In the vicinity of the point of accident the line extends north and south; the track is tangent and practically level. The derailment occurred at the south switch of the passing siding at Powers, which siding parallels the main track on the east. At this point the track is laid on a fill of about three feet. The weather was clear.

Description.

Northbound passenger train No. 2, known as the "Texas Special" running between San Antonio, Tex., and St. Louis, Mo., hauled by locomotive 354, consisted of 1 combination coach and baggage car, 1 chair car, 1 dining car, and 3 Pullman cars, in charge of Conductor Skinner and Engineman Mays. It left Waco, Texas, its initial station for this division, at 1:20 p.m., 5 minutes late, and at 1.35 p.m. was derailed at the

south switch of the passing track at Powers, about 5.5 miles north of Waco, while running at a speed estimated to have been between 35 and 40 miles an hour.

The locomotive came to rest on its left side at an angle of about 45 degrees with the track, its forward end being about 40 feet east of the passing track, and the tender lying on its left side across the track; the combination car passed some 30 or 40 feet beyond the tender and came to rest with its forward end in the ditch on the west of the main track while its body lay diagonally across both tracks; the chair car came to rest partially turned over on its right side with its forward end against the cab of the locomotive; the dining car was derailed and tipped to an angle of about 20 degrees. The other cars of the train were not derailed. The employees killed were the engineman and fireman.

Summary of evidence.

The switch at the south end of the passing siding at Powers is of the type known as a channel switch. Connected to the inside of each switch point and separated therefrom by castings about 5 inches in thickness is a guard or channel rail to which the switch points are bolted. The guard or channel rails are connected to the switch rods so that movement of the switch lever results in the movement of both guard rails and switch points.

An examination of the switch immediately after the accident disclosed that the heads of the three bolts by which the west switch point was fastened to the channel rail

had been sheared off, leaving the switch point free, and that the west switch point was against the west rail or in its open position. The forward Pullman car stopped with its forward trucks on the switch and the wheels held both the east and the west switch points against the stock rails, one in open position and the other in closed position

Prior to the accident two southbound passenger trains, No. 3 and No. 25, which passed over this switch, arrived at Waco at 12.55 and 1.15 p.m., respectively, the latter time being 5 minutes before the departure of train No. 2. Upon the arrival of train No. 3 at Waco, it was discovered that the brake beam of the forward wheels of the rear truck of the tender of its locomotive, 403, was missing. The truss rod of this brake beam was still fastened to the brake head and brake hanger on the right side of the truck, but the rod had been twisted around clear of the wheels and was dragging outside of the west rail. The brake head and nut at the free end of the truss rod were missing.

Subsequent to the accident, in an effort to determine at what point the tender brake came down, an examination was made of the track north of the point of accident. The first marks appeared north of the north switch at Abbott, about 19 miles north of Powers. These marks consisted of bruises in the center of the ties and marks on a cattle guard. About 150 feet south of this point was found the brake beam and part of the fulcrum. A short

distance south of the station at Abbott was found a piece of the brake rod about 20 inches long, and two miles south, the brake lever. About 4 miles farther south a switch was found marked practically the same as the switch at Powers except that the markings were less severe. At the south switch at Powers there was a severe bruise on the north end of the filler block at the heel of the switch, the next mark was a bruise on a hold-down lug on the switch point; beyond this the heads of three bolts which fastened the west switch point to the channel rail, were sheared off. On the side of the switch point in line with these bolts, was a mark indicating that something had been dragged against the switch point under pressure. About 1,000 feet south of the switch were marks on a cattle guard and crossing planks. Other marks were found at various points between Powers and Waco.

On account of changing locomotives, train No. 2 was 5 minutes late leaving Waco. Approaching Powers, Conductor Skinner, who was riding at the rear of the train, started forward and had just entered the rear of the second sleeping car when he felt a jar, followed by a series of lesser shocks, which were followed by severe shock He estimated the speed at that time to have been 35 or 40 miles per hour. He did not notice any application of the brakes after his train left Waco.

While locomotive 403 was at Denison prior to its leaving on this trip Engine Inspector Rieman made an in-

spection of the tender trucks from the pit and found no defects with the brake apparatus except the worn brake shoes which were later replaced.

Before locomotive 403 left Denison on this trip Machinist Chandler, employed as a repairman on tender trucks at Denison enginehouse, replaced right Nos. 3 and 4 and left No. 2 brake shoes on the tender of that locomotive. This work was done at the pit and he said that had there been any defects in the brake rigging he would have noticed them.

While train No. 3 was at Hillsboro, about 18 miles north of Powers, Engineman Lewis got off his locomotive and as was his custom made a thorough inspection of locomotive 403 and the tender, but found no defect; after leaving Abbott he looked back along his train several times, but was unaware that there was anything wrong until his attention was called to the brake rigging, after his train had arrived at Waco. He knew that No. 23 was following him closely and he assumed that any damage done to the track by the dragging brake rigging would be found by that train and for that reason he did not make any effort to notify any of the members of train No. 2.

Neither the fireman nor any of the members of the train crew of train No. 3 were aware that there was anything wrong with their locomotive until after arrival at Waco.

Section Foreman Traywick stated that the south switch at Powers was inspected on February 21 and was found in proper working order. He stated that he was riding on the

rear of train No. 23 accompanied by the roadmaster when it passed over this switch on the day of the accident and was paying particular attention to switch points, but he did not notice anything wrong with this switch.

Judging from the appearance of the brake rigging after the accident, Master Mechanic Lewis thought the brake head broke in two where the truss rod passed through, allowing the brake beam to collapse; this might have been caused by excessive pressure or defective material.

The east switch point of this switch was directly connected to the switch circuit controller, and when the west switch point was freed by the shearing of the bolts its movement had no effect on the automatic block-signal system.

Investigation disclosed that prior to the accident this switch was properly maintained and in good working order. Subsequent to the accident no defects were found other than those apparently caused by the dragging brake rigging.

Conclusions.

This accident was caused by the brake rigging on the tender of locomotive 403 of train No. 3 falling down and being dragged through the trailing point switch of the south switch of the passing siding at Powers, shearing the bolts which secured the west switch point, freeing it and allowing it to move outward toward the stock rail sufficiently to engage the flange of the wheels of the locomotive of train No. 2, causing it to be derailed.

The construction of this switch was such that with the west point free there would be a tendency for it to spring outward toward the stock rail. It is quite likely that the passage of train No. 23 over this switch and the jar resulting therefrom would make this tendency more pronounced.

The inspection of the locomotive of train No. 3 both before it started and during its trip appears to have been such that had there been any defect in the brake rigging at the time of the inspection it would have been discovered The evidence is not such that it can be definitely determined whether the brake beam came down as a result of the failure of the brake hanger or of the brake head. Upon the arrival of locomotive 403 at San Antonio the safety brake bar on the bottom of the truck was missing. It is not known whether it was missing upon arrival at Waco.

The marks on the switch points indicate that the heads of the switch bolts were sheared by the nut on the free end of the brake beam truss rod, which nut probably was broken or forced off before the locomotive arrived at Waco.

The employees involved in this accident were men of experience. None of them were on duty in violation of the provisions of the hours of service act.