INTERSTATE COMMERCE COMMISSION

REPORT NO. 3306

IN THE MATTER OF MAKING ACCIDENT INVESTIGATION REPORTS UNDER THE LOCOMOTIVE INSPECTION ACT OF FEBRUARY 17, 1911, AS AMENDED

BIRMINGHAM BELT RAILROAD

March 10, 1950

Accident at Birmingham, Ala., on January 13, 1950, caused by failure of a driving spring hanger pin and a defective footboard.

REPORT OF THE COMMISSION[1]

PATTERSON, Commissioner:

On January 13, 1950, about 11:50 p.m., at Birmingham, Ala., the front end of St. Louis-San Francisco Railway locomotive 3743, operated by the Birmingham Belt Railroad Company in switching service, lowered while the locomotive was moving at an estimated speed of 5 to 6 miles per hour; the left front footboard brackets struck a crossing guard rail and the footboard assembly was badly damaged. A broken driving spring hanger pin had worked out and released the spring; tread of the left front footboard had been bent downward prior to the accident. A switchman was thrown from the footboard and seriously injured.

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[1]Under authority of section 17 (2) of the Interstate Commerce Act the above-entitled proceeding was referred by the Commission to Commissioner Patterson for consideration and disposition.

DESCRIPTION OF ACCIDENT

St. Louis-San Francisco Railway Company locomotive 3743, operated by the Birmingham Belt Railroad Company, was delivered at Powell Yard, Birmingham, Ala., at 11:30 p.m., January 13, 1950, for a regular eight-hour switch turn. Before the locomotive was placed in service the tread of the left front footboard was found to slope downward. The yardmaster ordered the locomotive to No. 2 team track where attempt was to have been made to straighten the footboard. En route, while the locomotive was moving at a speed of 5 to 6 miles per hour, a broken left number 1 driving spring hanger bottom pin worked out and released the spring as the locomotive was about to cross the Southern Railway track. Release of the spring caused the front end of the locomotive to lower; the brackets supporting the left section of the front footboard struck the crossing guard rail and the left footboard was bent backward under the locomotive.

The switchman, who was riding on the right footboard, was thrown violently forward and fell, face downward, just outside and parallel to the right rail with his left leg across the rail. After the accident he was found on the outer end of the ties, about 10 feet to rear of tender, with left leg severed above the knee and was hospitalized immediately.

DESCRIPTION OF LOCOMOTIVE

Locomotive 3743 was built by the Baldwin Locomotive Works in 1911; type 0-6-0; tractive effort 33,700 pounds; steam pressure 187 pounds per square inch; cylinders 20-1/2 by 26 inches; diameter of driving wheels with full tires 51 inches; weight on driving wheels 155,200 pounds.

DESCRIPTION OF PARTS INVOLVED

The left front driving spring arrangement consisted of a No. 124 semi-elliptic driving spring which had 19 leaves, 4 inches in width. The long leaves of the spring were 43-1/2 inches in overall length. The front end of the spring was coupled to a cross equalizer by a short hanger. The cross equalizer had a center hanger which was anchored to a frame cross tie secured to the bottom rails of the main frames. The back end of the spring was secured by two strap hangers which were held in place to a main frame block below the top rail of the left main frame by a 1-1/2 inch hanger pin. The hanger pin was secured

by a 1/4-inch split key. A new hanger pin is 6 inches in length from under the head to the split key slot.

The left front driving spring back hanger bottom pin which was involved in this accident was found broken 3-15/16 inches under the head. The pin had an old crack at the point of the failure which extended around about one-half the circumference of the pin and approximately 15 per cent through the cross section. The remainder of the cross section showed a new break. The broken pin end with the split key and the hanger frame block were not found. The head end of the pin remained in the outside hanger pin hole and was pulled up between the left main frame and the driving wheel.

The front end footboard was applied in two sections which were connected by a metal bracket securely bolted to each tread board. The two sections of the footboard were applied in accordance with standard design and the measurements of each section were identical. Each section was supported by two 1 x 4 inch metal brackets which were securely fastened to the buffer beam by two 7/8-inch bolts in each bracket. The outside brackets were located 13 inches from the ends of the buffer beam to the center of the brackets and the inside brackets were 27 inches from the outside brackets, or 40 inches from the ends of the buffer beam.

The front footboard treads which were made of wood, 2 inches thick, 11 inches wide, and 39 inches long, were secured by two 1/2-inch bolts in each bracket. The back-stops, 1-1/2 inches thick and extending 5 inches above the treads, were fastened to each bracket by one 1/2-inch bolt. A metal bracket constructed from 1/4 x 12-3/16 inch boiler steel, 44 inches long, extended across the 25-inch space between the two sections of the footboard at the top of the tread back-stops and connected the two sections of the footboard. It was bent down at an angle of 90 degrees at the inside edge of each section and served as an end-stop for both treads. The bracket was securely fastened to the inside edge of each section tread board by two 1/2-inch bolts. The outside edges of the footboards were 7-5/8 inches from the ends of the buffer beam and with the locomotive on straight track extended 22 inches outside the rails. The tread of the left section of footboard measured only 2-1/4 inches above the top of the rail before the brackets were straightened. After the footboard brackets were straightened, the top of the left section footboard tread was 4-3/8 inches and the top of the right section footboard tread was 6-1/4 inches from the top of the rails. After the spring rigging was recoupled by applying a new pin to the hangers and block, the tops of the footboard treads of both sections measured 10-5/8 inches from the top of the rails.

The front end handrail extended entirely across the front buffer beam. It was constructed of 1-1/4 inch double strength pipe and each end of the pipe was fitted into a handhold bracket or column post and held in place in each column post by a 3/8-inch rivet. The handrail columns were securely applied to each end of the front buffer beam by a 7/8-inch bolt. The handrail had a center stiffener brace, constructed from 3/8 x 2-1/2 inch iron. The brace was bent around the handrail and secured to the buffer beam by two 1/2-inch bolts. The front end handrail had a minimum clearance of 6-3/4 inches above the uncoupling lever.

CONDITION OF TRACK AT POINT OF ACCIDENT

The track was generally ascending to the point of the accident and the left rail was low 9 feet southwest or back of the crossing. Locomotive 3745, same class as locomotive 3743, was placed at this location and the left front footboard tread measured 9-1/8 inches above the rail. The locomotive was moved back 90 feet, on track which was approximately level, and the footboard then measured 11 inches above the rail, a difference of 1-7/8 inches between the height of the footboard on level track and on the low joint at the point of the accident. The distance between the center of the front driving wheel and the front footboard was 9 feet, which would indicate the footboard struck the crossing guard rail when the front drivers of the locomotive were on the low joint in the track. The markings on the crossing guard rail were very distinct where the two left footboard brackets struck and dragged over the crossing rail. These markings were measured and they were identical with the measurements of the left front footboard brackets inside and outside the left rail.

INSPECTION AND REPAIR REPORTS

The last annual inspection was made at East Thomas enginehouse, Birmingham, Ala., on April 5, 1949. The last monthly inspection was made at East Thomas enginehouse, Birmingham, Ala., on December 16, 1949.

Daily inspection reports for a period of 60 days prior to the accident were examined and no reports were found which had any bearing on the accident.

SUMMARY OF EVIDENCE

The switchman who was injured stated that all crew members knew the tread of the left section of the front footboard sloped

down toward the rail but that in accordance with instructions of the yardmaster the locomotive was being moved from the freight house lead to the No. 2 team track. At the time of the accident he was riding on the right section of the front footboard. As the locomotive neared the Southern Railway crossing he felt the front end of the locomotive go down and the footboard seemed to fall under him. This was followed by a severe screaching sound. The footboard vibrated violently, causing him to lose his grasp on the handhold, and he was thrown forward from the footboard in the path of the moving locomotive. He struck face downward just outside and parallel to the right rail with his left leg over the rail. As the footboard passed over his body he was able to grasp the tread board with his left arm but could not retain his hold. All wheels on the right side of the locomotive passed over his left leg, severing it above the knee.

Another switchman stated that while preparing for duty he noticed the tread of the left front footboard sloped toward the rail. He reported the defect to the engineer and the switchman who were in the cab. The two switchmen then reported the defect to their foreman. Then as a group the three switchmen reported the bent footboard to the yardmaster and all went to the locomotive and examined the bent footboard. Not being able to find an angle bar with which to straighten the footboard, the yardmaster instructed the crew to move the locomotive around to No. 2 team track where a transfer cut of cars was located and he would try to find something with which to straighten the footboard. The switchman, who was later injured, was complying with instructions when the accident occurred.

The engineer verified the statement of the above switchman and stated he did not inspect the locomotive. He turned on the guide cups before entering the cab and believed he would have noticed spring distortion if the hanger pin had been broken. After the crew failed to find means to straighten the footboard he received a signal from the switchman (later injured), who was standing on the ground near the switch, to turn the locomotive back into the freight house tail track; he moved the locomotive ahead through this switch and the switchman relined it. The locomotive was then backed up, moving southwestward on the freight house tail track, with the switchman riding the right back footboard. The locomotive was stopped again at the switch leading into the Powell team track from the freight house tail track. The switchman lined this switch, then walked back and got on the right front footboard and gave the engineer a signal to move forward. He started the locomotive and as it started over the Southern Railway crossing at a speed of 5 or 6 miles

per hour, he heard a scream. Realizing something unusual had happened he stopped the locomotive as soon as possible and turned on the rear headlight. He saw the switchman on the ground outside the right rail about 10 feet back of the tender with his left leg severed. He did not notice the footboard strike the crossing as the locomotive usually rode rough and made a large amount of noise when moving over this crossing.

The pilot, who delivered locomotive 3743 from the Frisco East Thomas enginehouse to the Birmingham Belt Powell team track, stated that locomotive 3743 was delivered light to the Powell team track for service by a Birmingham Belt crew. The distance between these two points is approximately 2 miles and there are numerous switches and crossings en route. He rode on both the front and rear footboards since he had several switches to line ahead and back of the locomotive. He experienced no rough riding and had no trouble in staying on either footboard and was not aware of anything wrong with either. Upon arrival at the Powell team track he did not inspect the locomotive but did wait for the hostler to walk around it before they departed for the Terminal station.

The hostler verified the pilot's statement and stated he was positive the footboard did not strike anything en route from the Terminal station to Powell team track and that he did not notice anything unusual about the riding condition of the locomotive. After he arrived at Powell team track at about 9:00 p.m., he walked around locomotive 3743 and looked at it casually as he always did when he delivered locomotives in this manner but he did not observe anything out of order.

The yardmaster stated that at the time of the accident he was talking to the foreman at the Frisco's East Thomas enginehouse trying to get a replacement for locomotive 3743. He estimated the footboard of the locomotive to have been about 6 inches above the rail before the locomotive was dispatched. (This would be 3 inches below the minimum requirements.)

DISCUSSION

This accident resulted from failure of a spring hanger pin at a point 3-15/16 inches under the head and 2-1/16 inches from the split key slot. The point of failure was inside of the spring frame block which precluded discovery in course of usual inspections, thus the failure did not become apparent until parts of the pin worked out of position and released the spring

which in turn allowed the front end of the locomotive to lower. The defective condition of the left section of the footboard contributed directly to the accident. Evidence disclosed that, because of the bent position, the footboard brackets struck the crossing guard rail thereby causing a shock which threw the brakeman directly in the path of the moving locomotive. The defective condition of the footboard was known to members of the crew and the yardmaster. Movement of the locomotive was nevertheless ordered.

CAUSE OF ACCIDENT

It is found that this accident was caused by the failure of a number 1 driving spring hanger pin which resulted in the release of the spring and consequently lowered the front end of the locomotive. The front footboard, which previously had been bent downward, struck a crossing guard rail and the vibratory shock caused employee who was riding on the footboard to fall in the path of the moving locomotive.

Dated at Washington, D. C., this 10th day of March, 1950.

By the Commission, Commissioner Patterson.

SEAL

W. P. BARTEL,

Secretary.