Inv-2072

INTERSTATE COMMERCE COMMISSION

WASHINGTON

REPORT OF THE DIRECTOR

BUREAU OF SAFETY

ACCIDENT ON THE

PENNSYLVANIA RAILROAD

NEW BRUNSWICK, N. J.

JUNE 17, 1936

INVESTIGATION NO. 2072

SUMMARY

Railroad:	Pennsylvania
Date:	June 17, 1936
Location:	New Brunswick, N. J.
Kind of accident:	Derailment
Train involved:	Freight
Train number:	First P-5
Engine number:	6745
Consist:	34 cars, caboose
Speed:	35-40 m.p.h.
Track:	Tangent; grade, slightly undulating; 0.52 percent ascending at point of accident
Weather:	Clear
Time:	8.03 p.m.
Casualties:	None
Damage:	Estimated $205,000
Cause:	Failure of arch-bar truck

To the Commission:

On June 17, 1936, there was a derailment of a freight train on the Pennsylvania Railroad near New Brunswick, N. J., which resulted in an estimated damage to property amounting to $205,000.

Location and method of operation

This accident occurred on that part of the main line of the New York Division extending between New York, N. Y., and Holmesburg Junction, Pa., a distance of 78.2 miles; in the vicinity of the point of accident this is a 4-track electrified line over which both steam and electric trains are operated by time-table, train orders, and an automatic block and cab-signal system. The tracks, numbered from the South are, 1, eastbound passenger; 2, eastbound freight; 3, westbound freight, and 4, westbound passenger. The freight train involved was westbound on track 3 and the point of accident was approximately 7,558 feet west of the station at New Brunswick and about 10 feet east of the heel of the frog of a cross-over leading from track 4 to track 3 at Canal interlocking tower.

Approaching the point of accident from the East, the track is tangent for a distance of 7,588 feet to the point of accident and for about 1,280 feet beyond. The track is laid with 130-pound rails, 39 feet in length, with an average of 22 ties to the rail length, ballasted with stone, and is well maintained. Mile Run yard parallels track 4 on the North in the immediate vicinity of Canal tower, and consists of a running track and three yard tracks, the latter tracks being used chiefly for storage of multiple-unit electric passenger cars, a number of which were standing on these tracks at the time of accident.

The weather was clear at the time of the accident which occurred about 8:03 p.m.

Description

First P-5, a westbound freight train, consisted of 34 loaded cars and a caboose, hauled by steam locomotive 6745, and was in charge of Conductor Redmond and Engineman Karr. This train left Greenville, 27.4 miles east of New Brunswick, at 6:35 p.m., passed Edison, the last open telegraph office, 5.3 miles east of New Brunswick, at 7:52 p.m., according to the

Inv. No. 2072
Pennsylvania R.R.
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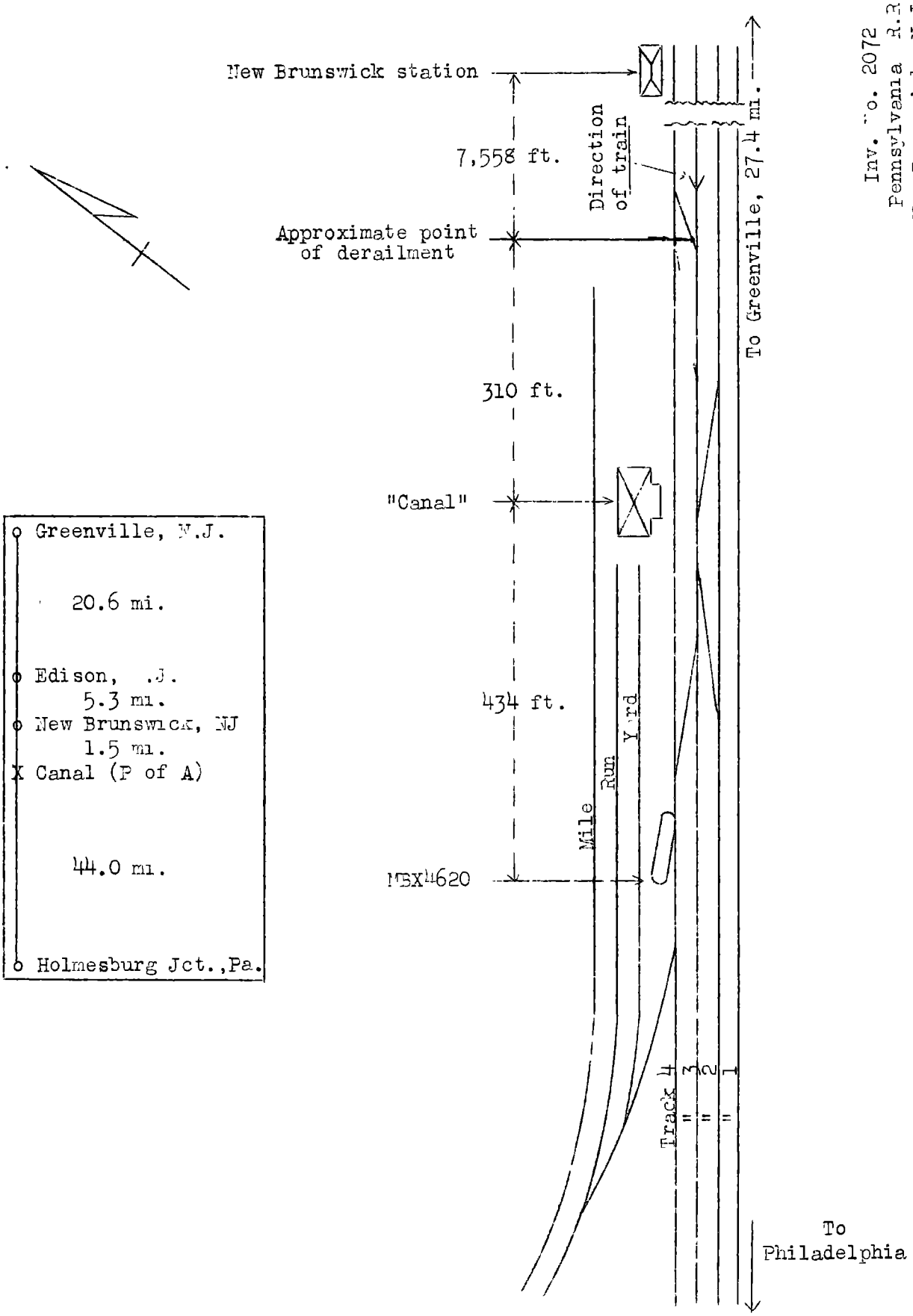

train sheet, and was derailed near Canal tower while running on track 3 at a speed estimated to have been between 35 and 40 miles per hour.

B.M.X. tank car 4620, loaded with crude drip oil, the twenty-sixth car in the train, was derailed and thrown out of the train and stopped on its side about 744 feet west of the initial point of derailment, with the west end against a steel pole on the north side of track 4 and the east end fouling track 4. The shell of the tank was punctured releasing the oil which was ignited, and the resultant fire seriously damaged 14 M.U. electric passenger cars standing on tracks 1, 2, and 3 in Mile Run yard. None of the other cars in the freight train was derailed or damaged and the 8 rear cars and caboose ran several car lengths beyond the derailed car.

Summary of evidence

Conductor Redmond stated that he picked up 11 cars at Greenville, including B.M.X. tank 4620, and proceeded to Waverly yard, where he picked up 23 additional cars; leaving Waverly B.M.X. 4620 was the twenty-sixth car from the head end; he inspected the cars as they pulled by him at that point but noticed nothing wrong with any of them. Approaching Canal tower he was in the north side of the caboose, the flagman was in the cupola on the south side, and Brakeman Schantz was standing on the rear platform looking over the train; they had been observing the train on all curves en route and saw nothing wrong at any time. His first intimation of trouble was when the train parted and the air-brakes were applied in emergency near Canal tower, the rear portion running about four car lengths after the train parted before coming to a stop; 2 or 3 minutes later fire broke out around the derailed car. He examined the track east of the point where his caboose stopped and the only marks he found were located 3 or 4 car lengths east of the derailed car. He estimated the speed of the train at the time of derailment to have been 35 or 40 miles per hour.

The statements of Flagman Watkins and Brakeman Schantz were substantially similar to those of Conductor Redmond as to the operation and speed of the train en route, and the first indication either of them had of anything wrong was when the air brakes were applied in emergency. Brakeman Schantz inspected the rear portion of the train as it pulled by him at Waverly and both he and Flagman Watkins had observed the train at frequent intervals en route, one from the left side of the caboose cupola and the other from the rear platform, and neither had noticed anything wrong with the train at any time.

They estimated the speed at the time of accident to have been between 35 and 40 miles per hour.

Engineman Karr stated that a test of the air-brakes was made at Waverly and all brakes were reported in working order. His train used track 3 from Waverly and at times was running 50 miles per hour but had slowed down to about 35 miles per hour at New Brunswick and was running about 40 miles per hour passing Canal tower. He looked back along the train at various times and at Edison he could see the entire train and everything appeared to be all right. His first indication of trouble was when the train parted and the air brakes were applied in emergency.

Fireman Wilson stated that he looked back along the train from his side of the cab several times en route, the last time at New Brunswick station, but saw nothing wrong with the train at any time. Approaching Canal tower the speed of the train was about 40 miles per hour and as the engine reached a point about 25 car lengths west of the tower the air brakes were applied in emergency and after his engine stopped he immediately protected tracks 1 and 2.

Gang Foreman Lorenz, at Greenville shops, stated that B.M.X. tank car 4620 was on the shop track on June 17, and he noticed that the arch bars were bent and the box and column bolts badly worn on both trucks; he instructed the repairmen to remove the arch bars from the north side of the west truck and take them to the blacksmith shop. He again saw the arch bars at the time they were being applied to the truck and they appeared to be in good shape; however the bolts were being tightened in place at that time and he was unable to see the bolt holes as they were covered by the bolt heads. When advised that the truck had failed, and elongated holes had been found in the arch bar that had been repaired at Greenville, he stated that he could not explain this as all his forces, including repairmen and blacksmiths are very careful concerning arch bars. He later identified the truck that failed as the one on which repairs were made at Greenville on June 17.

Car Repairman Pere, at the Greenville Shops, stated that he has worked as a car repairman for 24 years and that on June 17 he was assigned to make repairs to B.M.X. 4620. Gang Foreman Lorenz instructed him to remove the badly bent arch bars from the north side of the west truck and take them to the blacksmith shop, also to renew box bolts on the opposite side of this truck and on the truck on the opposite end of the car, as they were badly worn. He took the arch bars to the blacksmith shop as instructed and called the atten-

tion of Blacksmith Thorn to the bottom arch bar, which had the box and column bolt holes cut out with an acetylene torch; Blacksmith Thorn said he would make a new arch bar. After performing some other work, Repairman Pere returned to the blacksmith shop for the arch bars and noticed that the bottom bar had been renewed and the top bar had been straightened. When applying the bars to the truck he observed that the holes were worn in the top arch bar but he raised no question about this, neither did he bring it to the attention of his supervisor, his reason for not doing so being that as the blacksmith had straightened and returned it, he assumed it was in proper condition to apply. He stated that he did not use a torch on this bar. He later identified the arch bar that failed as the one on which he had made the repairs.

Blacksmith Thorn stated that Car Repairman Pere brought a top and a bottom arch bar to the blacksmith shop for straightening, which had been removed from B.M.X. 4620. Blacksmith Thorn noticed that the holes in the bottom bar had been cut out with a torch and he condemned this bar and ordered a new bar made, which was done by Blacksmith Kretzman. Mr. Thorn did not see the bar after it was made and his only knowledge of the condition of the top arch bar was that it was bent.

Blacksmith Kretzman stated that he received the arch bars when they were delivered at the blacksmith shop; the column and box bolt holes in the bottom bar had been burned out with a torch and there was some slight wear in the bolt holes in the top bar which is a usual condition in bent arch bars. Both of these bars were bent; however he did not notice that one of the box bolt holes in the top bar had been torch cut or he would have made a new top bar also as he fully realized the hazard of elongated holes in arch bars. He said that he used the top arch bar as a templet for laying out the holes in the bottom bar and he was quite sure that he would have noticed the torch-cut hole in the top bar while doing so had it been present at that time.

Master Mechanic Bickley stated that the derailment of car 4620 was caused by shearing off of the box bolts between the top and bottom arch bars, at the right journal box location, lead wheel of the west truck, due to elongated holes in the top arch bar. When the box bolts became sheared off, the wheel with the journal box was freed from the arch bars, and the arch bars struck the rail of the cross-over switch leading from track 4 to track 3, derailing the entire truck. When the derailment occurred the car turned on its side, rupturing the

tank shell, and the lading, which consisted of crude drip oil, became ignited.

Record of the movement of B.M.X. 4620 indicated that the car was received empty from the Nickel Plate Line and moved to Erie, Pa., on May 28, 1936, where it was loaded. The car then moved under load to Franklin Junction, Pa., (near Philadelphia) arriving at that point June 3, where it was unloaded and moved empty to Greenville, N. J. It was loaded at Greenville with 8,090 gallons of crude drip oil on June 15, weight of lading 60,675 pounds; the car was shopped and placed on the repair track at that point on June 17.

Inspection of this car, made by the Commission's inspectors, disclosed it to be a "T M" class tank car of all-steel construction with arch-bar trucks and cast-iron wheels having 5 by 9-inch journals. The stenciling on the car was as follows:

Date built:	3 - 1918
Lt. Weight:	40,800 pounds
Ld. Weight:	128,200 pounds
Capacity:	100,000 pounds - 8090 gals.

The inspection revealed that both journal box bolts, lead wheel, right side of the front truck, were sheared off approximately 13½ inches above the nuts, which corresponded to the point between the top and bottom arch bars; these bolts were 1-1/8 inches in diameter and appeared to be new bolts recently applied but the short portion of the top was missing; the column bolt at this location was also broken, evidently due to having come in contact with the rails or some part of the track. The bottom arch bar on the same side of the truck was 1¼ by 5 inches and appeared to be new and recently applied; the bolt holes in this bar were drilled to a snug fit for 1-1/8 inch box bolts and 1-5/8 inch column bolts.

The top arch bar, which had been in use for some time, was 1¼ by 4½ inches and the bolt holes in this bar were considerably worn and elongated and some of them bore evidence of having been burned out to enlarge them. This condition of bad alignment of holes contributed to a shearing effect on the bolts.

In order to further determine the condition of the truck, the unbroken bolts of the opposite journal box were removed and one of the box bolt holes was found to have been plugged and drilled, and the bolts, which had also been renewed at Greenville when the truck was repaired, were nearly sheared off; the alignment of bolt holes in the top and bottom arch

bars on the left side of the truck was fully as bad as that on the right side of the truck. The worn and badly elongated bolt holes in the arch bars were not visible to ordinary inspection with the truck assembled under the car and could be seen only when the truck was dismantled.

Inspection of the track disclosed the first mark to be on a paved crossing at New Brunswick passenger station where a section of steel rail, with its top approximately level with the top of the running rail, is located parallel to and on each side of the running rail as a retainer for the paving. A piece was broken off the eastern end of the section of retaining rail located on the north side of the north rail, track 3; it appeared to have been struck by some object and its top surface was scraped along its entire length, as was also the surface of the paving which was level with the retaining rail. This scrape mark was about 4½ inches wide and 8 inches outside the north edge of the north rail of track 3, which corresponds to the size and location of the right tie bar of the derailed truck. The next marks were found about 10 feet east of a cross-over leading from track 4 to track 3 near Canal tower, at which point heavy score marks were found on both the head and the base of the north side of the north rail on track 3, and these marks continued to the heel of the frog of the cross-over where distinct marks appeared extending across the frog, followed by flange marks on the ties on the north side of both rails of track 3. Near this frog, a piece of a truck tie bar was found measuring 5/8 by 4½ inches in size and about 24 inches in length, which corresponded to the broken tie bar of the truck of B.M.X. 4620. This piece of tie bar was badly bent and battered and held a portion of a sheared new bolt, 1-1/8 inches in diameter and 13½ inches in length. Westward from the frog the marks followed the lead rail of the cross-over at an angle to the north to track 4, and to the point where the derailed car stopped, which was about 744 feet west of the point where the heavy score marks were found on the north side of the north rail of track 3.

Discussion

The evidence indicates that B.M.X. tank car 4620 was loaded with 8,090 gallons of crude drip oil at Greenville, N. J., on June 15, 1936, and was shopped by the car inspectors before moving from that point. The car was on the repair track on June 17 and the gang foreman in charge noticed the arch bars were bent and the column and box bolts badly worn on both trucks and he instructed the repairman to remove the arch bars from the north side of the west truck and have them repaired at the blacksmith shop. The gang foreman did not see the bars again

until after they were replaced in the truck and the bolts were being tightened, at which time they appeared to be satisfactory. The repairman took the arch bars to the blacksmith as instructed and the blacksmith condemned the bottom bar because the holes were enlarged and torch cut, and a new one was made to replace it; however, the top arch bar was straightened and used as a templet for laying out the holes in the bottom bar, after which it was replaced in the truck. It is apparent that the blacksmith took the initiative in condemning the bottom bar and in straightening the top bar for re-use without specific instructions and his action was not questioned by the repairman working on the car, although the repairman noticed the worn and elongated holes in the top bar, while the blacksmith stated that these conditions were not noticed by him when the bars were in the shop.

The car was released from the repair track and went forward in Train First P-5 on June 17 and had moved a distance of approximately 28 miles when, due to the irregular alignment of holes in the arch bars, the newly applied box bolts were sheared off. Positive indications of distress in the trucks of this car was evident when the car was shopped at Greenville, but the responsibility of correcting this condition was delegated to the car repairman and the blacksmith, and the gang foreman did not inspect or pass upon the arch bars after they were removed from the car, and was not advised of, nor did he know the dangerous condition in these trucks.

While the evidence shows that car men are required to be particularly cautious with respect to arch-bar trucks, there is no reasonable doubt of the fact that although the car had made several movements and passed several inspection points immediately prior to the accident, hazardous conditions existed in these trucks for some time; however, these conditions cannot be readily determined by ordinary inspection when the trucks are assembled and under the car. In this case the carrier failed to take advantage of the opportunity to make full repairs when the truck was found to be in defective condition. Pending ultimate elimination of arch-bar trucks, the strictest inspection and maintenance should be exercised by handling carriers.

It is further noted that the car in question is stenciled for 100,000 pounds capacity with a load limit of 128,200 and light weight of 40,800 pounds, regardless of the fact that the car is equipped with 5 by 9-inch journals and the proper load limit should be 95,200 pounds. While the car was not overloaded, this indicates that the safe load limit of the car has not been given due attention by the owner.

Conclusion

This accident was caused by the failure of an arch-bar truck, due to the shearing off of the box bolts.

Recommendations

The recommendations made in previous reports are hereby repeated:

1. That arch-bar trucks be removed from service at the earliest practicable date.

2. That until arch-bar trucks can be eliminated from service, a reduction sufficient to guarantee safety of operation should be made in the permissible load limit on cars equipped with such trucks.

3. That inflammables, explosives or other dangerous articles should not be transported in cars which are equipped with arch-bar trucks.

4. That provision be made in interchange rules whereby a receiving line may refuse to accept from a connecting line any car equipped with arch-bar trucks.

Respectfully submitted,

W. J. PATTERSON,

Director.