

1930

INTERSTATE COMMERCE COMMISSION

REPORT OF THE DIRECTOR OF THE BUREAU OF SAFETY CONCERNING AN
ACCIDENT ON THE SOUTHERN RAILWAY AT CHARLOTTE, N. C.,
ON JANUARY 13, 1935.

February 12, 1935

To the Commission:

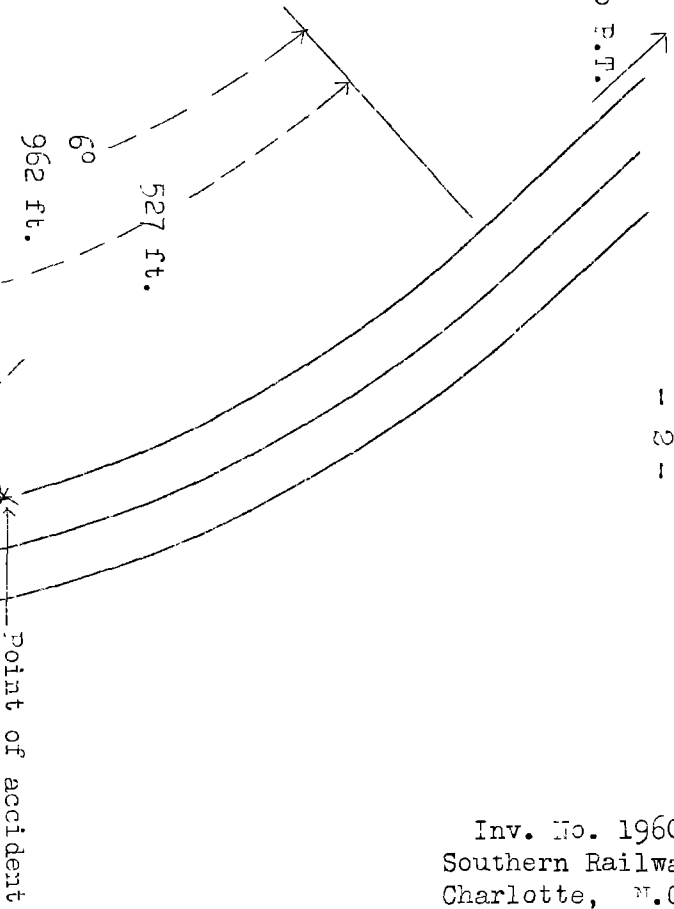
On January 13, 1935, there was a derailment of a passenger train on the Southern Railway at Charlotte, N. C., which resulted in the death of 1 express employee off duty and 1 trespasser, and the injury of 6 passengers, 1 employee, and 1 express messenger.

Location and method of operation

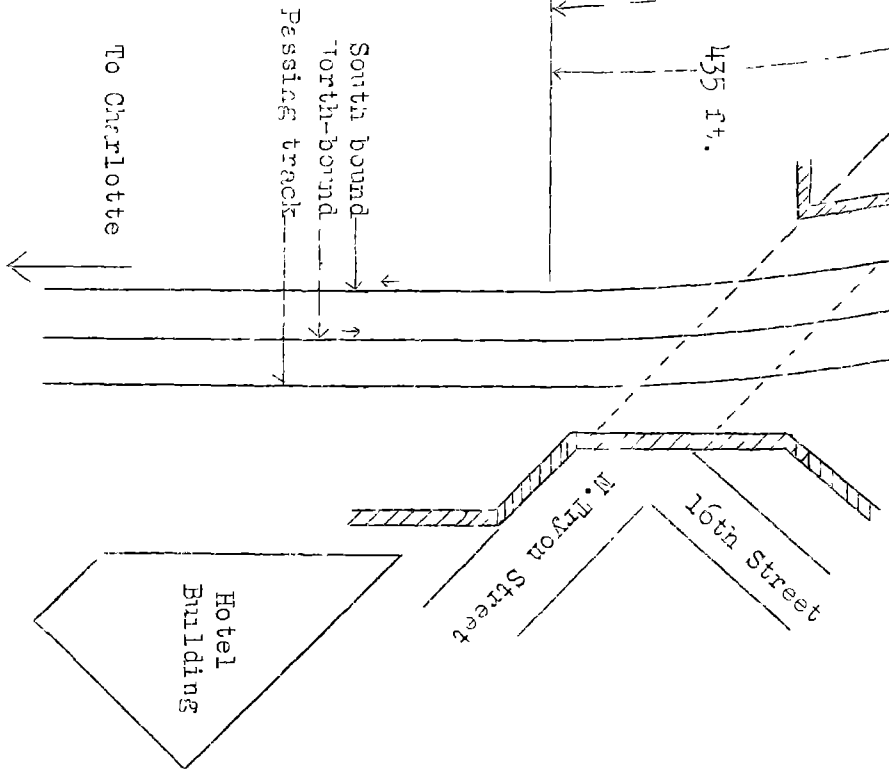
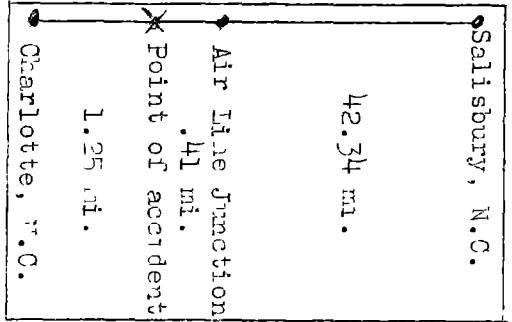
This accident occurred on that part of the Charlotte Division extending between Salisbury and Charlotte, N. C., a distance of 44 miles. In the vicinity of the point of accident this is a double-track line over which the movement of trains is governed by an automatic block-signal system; an automatic train-stop system of the intermittent inductive type is superimposed upon the signal system. At this point there are three tracks located on a viaduct and designated, from west to east, south-bound main, north-bound main, and north-bound passing track; the accident occurred on the south-bound track, at a point 1.25 miles north of the passenger station; approaching this point from the north, the track is tangent for a distance of 1 mile, followed by a 6° curve to the right 962 feet in length, the accident occurring on this curve 527 feet from its northern end. The tracks are laid with 100-pound rails, 33 feet in length, with 20 ties to the rail length, tieplated, and ballasted with stone; rail anchors also are used. Maximum superelevation of 4 $\frac{9}{16}$ inches is attained 217 feet south of the point of this curve, while the superelevation at the point of derailment, 527 feet south of the point of curve, is 2 $\frac{3}{4}$ inches. The gauge increased from 4 feet 8 $\frac{3}{8}$ inches at points 51 and 155 feet south of the beginning of the curve to 4 feet 9 $\frac{3}{8}$ inches at the point of derailment. Special instructions contained in the time table restrict the speed of passenger trains to 25 miles per hour within the corporate limits of the City of Charlotte, within which territory this accident occurred.

The weather was clear and it was dark at the time of the accident, which occurred about 6:09 a.m.

5,280 ft. to P.T.



Inv. No. 1960
Southern Railway,
Charlotte, N.C.,
Jan. 13, 1935



Description

Train No. 31, a south-bound passenger train, consisted of 1 combination baggage and express car, 2 coaches, and 3 Pullman sleeping cars, all of steel construction, hauled by engine 1341, and was in charge of Conductor Munday and Engineman Weir. This train left Salisbury, 44 miles north of Charlotte, at 5:22 a.m., 32 minutes late, passed Air Line Junction, the last open office, at 6:08 a.m., 30 minutes late, and was derailed while traveling at a speed estimated to have been between 45 and 50 miles per hour.

Engine 1341 overturned upon its left side and stopped about 500 feet south of the initial point of derailment, obstructing the north-bound main and passing tracks; the tender remained coupled to the locomotive, and stopped bottom up. The baggage-express car followed a course to the left, fell off the viaduct into North Tryon Street, demolished one corner of a brick hotel building and stopped bottom up with one end inside the hotel building and the other end obstructing the street; the first coach stopped on the south-bound main track, derailed but upright, more than 200 feet beyond the overturned engine; the second coach, derailed and slightly tilted, obstructed both main tracks opposite the hotel building, and the three sleeping cars also were derailed but remained upright. Trucks of the engine, the tender, and the baggage-express car were scattered southward between the underpass at North Tryon Street and the location of the tender; the rear truck of the tender, which was of the arch-bar type, and the front truck of the baggage-express car, equipped with cast-steel frames were badly broken and damaged. The employee injured was the fireman.

Summary of evidence

Engineman Weir stated that approaching the point of accident he had eased off on the throttle and permitted the train to drift, and that upon starting around the curve he made a brake-pipe reduction of 10 to 20 pounds. He had scarcely applied the brakes when a bumping noise was heard and the engine jumped as if on the ties, careened to the left, and overturned. The engine did not appear to have run over anything, and he was not aware of anything wrong with the equipment which might have caused the accident neither did his investigation indicate its cause. He estimated the speed of the train to have been between 45 and 50 miles per hour. The statements of members of the train crew corroborated the statement that the brakes were applied at or just before the time of derailment, and indicated that the speed of the train was approximately 50 miles per hour at the time of derailment.

Roadmaster Sharpe reached the point of the accident about 6:35 a.m. and made a close inspection of the track. The first indication of derailment that he discovered was a mark near the end of a tie on the outside of the curve; the next two ties were unmarked but the next tie and succeeding ties were marked more heavily, apparently by something with a sharp edge dragging and chipping off the ends of ties; the end of the seventh tie was badly scored and bore a light wheel mark and beyond that point the track was torn up. He thought the ties were marked by some part of the rear truck of the tender or front truck of the baggage-express car. Roadmaster Sharpe rode over this territory on the rear end of a passenger train on January 10 at a speed of 40 or 45 miles per hour; the track rode well and he was convinced it was in good condition and not responsible for this accident. Track Supervisor Carson and Track Foreman Lingle, of the section upon which this accident occurred, corroborated the statements of Roadmaster Sharpe.

Master Mechanic Brockman said that after the accident the arch bars from the left side of the rear tender truck were found between the location of the two main tracks immediately ahead of the left front wheels of the first sleeping car, or nearly 300 feet south of the point of derailment; the front tender truck was intact and stopped in an upright position a short distance back of the overturned tender; the front truck of the baggage-express car was near the front end, left side, of the first sleeping car. The top arch bar of the tender truck was broken in two places and the bottom arch bar in one place, while the steel frame of the front truck of the baggage-express car was broken in 10 places and partly broken in 3 other places; all of the breaks were new. Engine 1341 had been turned out of the shops on December 17, 1934, after receiving class 3 repairs; two new bottom arch bars and one new top arch bar had been applied, but the records did not indicate to which truck these bars were applied. Master Mechanic Brockman said he had about 20 Pacific type engines under his jurisdiction, the tenders of which were equipped with arch-bar trucks, and he considered them safe and satisfactory for the use to which subjected. Engine Inspector Harrison, Lachinist Fisher, and Tank Inspector Combs, employed at Spencer, stated that they inspected engine 1341 after its arrival on Train No. 32 the night of January 12. The tires, flanges, lateral motion and arch bars were in good condition, and the few repairs which were necessary were of a more or less minor character.

After engine 1341 had been rerailed an examination of the same was made by the Commission's inspectors; this examination included wheels and flanges, lateral motion, brake rigging, etc., and no defective condition was found which could have

contributed to the occurrence of this accident. Inspection made of the rear truck of the tender at the scene of accident, and also at a later date, revealed that the top arch bar was broken at each of the column bolt holes. The forward journal box and the section on top arch bar extending from this journal box to the forward column bolt were missing, while the bottom arch bar was severed at a point about 5 inches in front of the forward column bolt. Both top and bottom arch bars, also the tie bar, were badly bent and out of alignment and showed various newly-made abrasions and scoring marks. Both column posts were broken and the column bolts bent and battered beneath the tie bar. Apparently all of these breaks were new, with no evidence of old flaws or cracks being discovered; the breaks through the top arch bar at the forward column bolt hole and the break in the bottom arch bar were clear and sharp, while the break through the top arch bar at the rear column-bolt hole did not indicate a clean break but rather that the arch bar had been torn apart. The inside edge of the bottom arch bar was heavily scored for about 3 inches up to the point of fracture and the indications were that the blow from the object which caused the scoring also caused the break. Examination by the railway's engineer of tests showed that the top arch bar was made of iron and the bottom arch bar of soft steel. Examination of the cast steel truck which had been under the head end of the baggage-express car showed that the front end cross-tie beam had come in violent contact with some object, breaking the beam and distorting the side beams of the truck frame, also breaking the pedestals.

Conclusions

This accident apparently was caused by the failure of an arch bar truck.

Examination of the equipment after the accident showed that the rear tender truck, which was of the arch-bar type, and the front truck of the baggage-express car, were badly damaged. The damage to the latter truck was believed to have originated when the front cross-tie beam came in violent contact with some other object. As to the arch-bar truck, however, it appeared that both arch bars on the left side were broken, the bottom arch bar as the possible result of a blow from the inside; the top arch bar was broken at each of the column-bolt holes and the forward section was missing. The surfaces of the various fractures were clean and appeared to be free from defect. The first marks of derailment were on the ends of ties, on the left side of the high rail, and it is believed that it was at this point that the arch-bar truck, having failed, began to mark the ties and then to tear up the track, resulting in the derailment of the train.

The curve on which this accident occurred was not well maintained either as to elevation or as to gauge. The elevation increased with regularity until it reached 4 $\frac{9}{16}$ inches at a point 217 feet south of the point of curve, with a gauge of 4 feet 8 $\frac{5}{8}$ inches and a middle ordinate of 3 $\frac{5}{8}$ inches as measured with a 62-foot chord; the elevation then decreased gradually until at the point of derailment, 510 feet farther south, it was only 2 $\frac{3}{4}$ inches while in the same space the gauge gradually increased until it was 4 feet 3 $\frac{5}{8}$ inches at the point of derailment. A speed limit of 25 miles per hour is prescribed by time-table instructions for passenger trains in this territory; however, it appears from statements of the train crew that this train was being operated at a speed estimated to have been from 45 to 50 miles per hour, and the investigation indicates that this is not an unusual speed for south-bound passenger trains in this territory. The irregularities in the track, the relatively high speed and the brake application which was made at the beginning of the curve, no doubt combined to place an unusual strain upon the trucks and probably were important factors in the failure of the arch-bar truck in question.

In recent years this Bureau has investigated several serious accidents which were caused by the failure of arch-bar trucks; the danger attendant upon the use of cars equipped with trucks of this type has been recognized to such a wide extent as to result in the adoption of an interchange rule prohibiting the handling in interchange from owners of all cars with arch-bar trucks effective January 1, 1932. Attention was called to this rule in our report covering the accident on the Pennsylvania Railroad at Cly, Pa., on September 20, 1934, wherein it was stated that the close approach to the effective date of the interchange rule should give impetus to the work of making the changes necessary to comply with the rule within the time specified; reference was made again to this subject in our report covering the accident on the Missouri Pacific Railroad at Adrian, Mo., on December 3, 1934. Since these reports were issued, however, the effective date of the rule has been changed to January 1, 1938. The railroads having thus recognized the inherent dangers incident to operation of cars equipped with arch-bar trucks, it is self-evident that similar dangers attend the operation of engine tenders so equipped and this is particularly true in the case of the tenders of engines assigned to passenger service. Figures furnished by the Southern Railway, however, indicate that out of a system total of 1952 tenders, there are 1307 which are equipped with arch-bar trucks; the following table shows the assignment of tenders so equipped to the different types of power;

	<u>Trucks</u>		<u>Total Trucks</u>	<u>Percentage equipped with arch-bar trucks</u>
	<u>Arch-bar</u>	<u>Other types</u>		
Freight	844	423	1267	63.61
Passenger	265	124	389	68.12
Switch	<u>198</u>	<u>78</u>	<u>276</u>	<u>71.73</u>
	1307	625	1932	67.65

It is recommended that steps be taken at once, not only by this carrier but by all other carriers, to inaugurate a program which will definitely eliminate the use of trucks of this type from service and thus remove the constant menace of accidents due to the failure of trucks of this type.

Respectfully submitted,

W. J. PATTERSON,

Director.