

Inv-2106

INTERSTATE COMMERCE COMMISSION

WASHINGTON

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REPORT OF THE DIRECTOR

BUREAU OF SAFETY

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ACCIDENT ON THE

PENNSYLVANIA RAILROAD

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MENLO PARK, N. J.

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OCTOBER 26, 1936

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INVESTIGATION NO. 2106

SUMMARY

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Railroad: Pennsylvania

Date: October 26, 1936

Location: Menlo Park, N. J.

Kind of accident: Derailment; wreckage struck by train on adjacent track.

Trains involved: Freight : Freight

Train numbers: Extra 6865 West : Second P-18 East

Engine numbers: 6865 : 6734

Consist: 122 cars, baboose : 89 cars, caboose

Speed: 10-15 m.p.h. : 30-35 m.p.h.

Track: Westward 1°38' left curve 1,953 feet, 1,483 feet tangent, 1°34' right curve 1,601 feet; ninth and tenth cars parted on 1°34' curve and one-hundred-fourth and one-hundred-fifth cars buckled on 1°38' curve; ascending grade westward

Weather: Raining

Time: 1:45 p. m.

Casualties: 1 killed; 4 injured

Cause: Train parted account of low coupler and excessive free slack in draft gears and attachments, and buckled as result of emergency application of brakes.

January 7, 1937.

To the Commission:

On October 26, 1936, there was a derailment of a freight train on the Pennsylvania Railroad near Menlo Park, N. J., the wreckage being struck by a freight train traveling in the opposite direction on an adjacent track, resulting in the death of 1 employee and the injury of 3 employees and 1 live stock caretaker. This accident was investigated in conjunction with the New Jersey Board of Public Utilities Commissioners.

#### 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 Holmsburg Junction, Pa., a distance of 78.2 miles; in the vicinity of the point of accident this is a 4-track line over which both steam and electric trains are operated by timetable, train orders on 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 derailment occurred on track 3, fouling track 2, at a point approximately 1,960 feet west of the station at Menlo Park.

Approaching the point of accident from the east, beginning at Menlo Park passenger station, the track is tangent for a distance of 693 feet; then there is a 1°38' curve to the left 1,955 feet in length, 1,483 feet of tangent, followed by a 1°54' curve to the right 3,413 feet in length. The grade in this vicinity is ascending for westbound trains, varying from 0.247 to 0.546 percent.

Tracks 2 and 3 are laid with 130-pound rail, 39 feet in length, with an average of 22 ties to the rail length, fully tieplated, double spiked, ballasted with stone, and is well maintained. The maximum authorized speed for freight trains is 50 miles per hour.

A light rain was falling at the time of the accident, which occurred about 1:45 p. m.

#### Description

Extra 6865, a westbound freight train, running on track 3, consisted of 122 empty cars and a caboose,

Track 1 E.B. Pass. →  
 Track 2 E.B. Frt. →  
 Track 3 W.B. Frt. →  
 Track 4 W.B. Pass. →

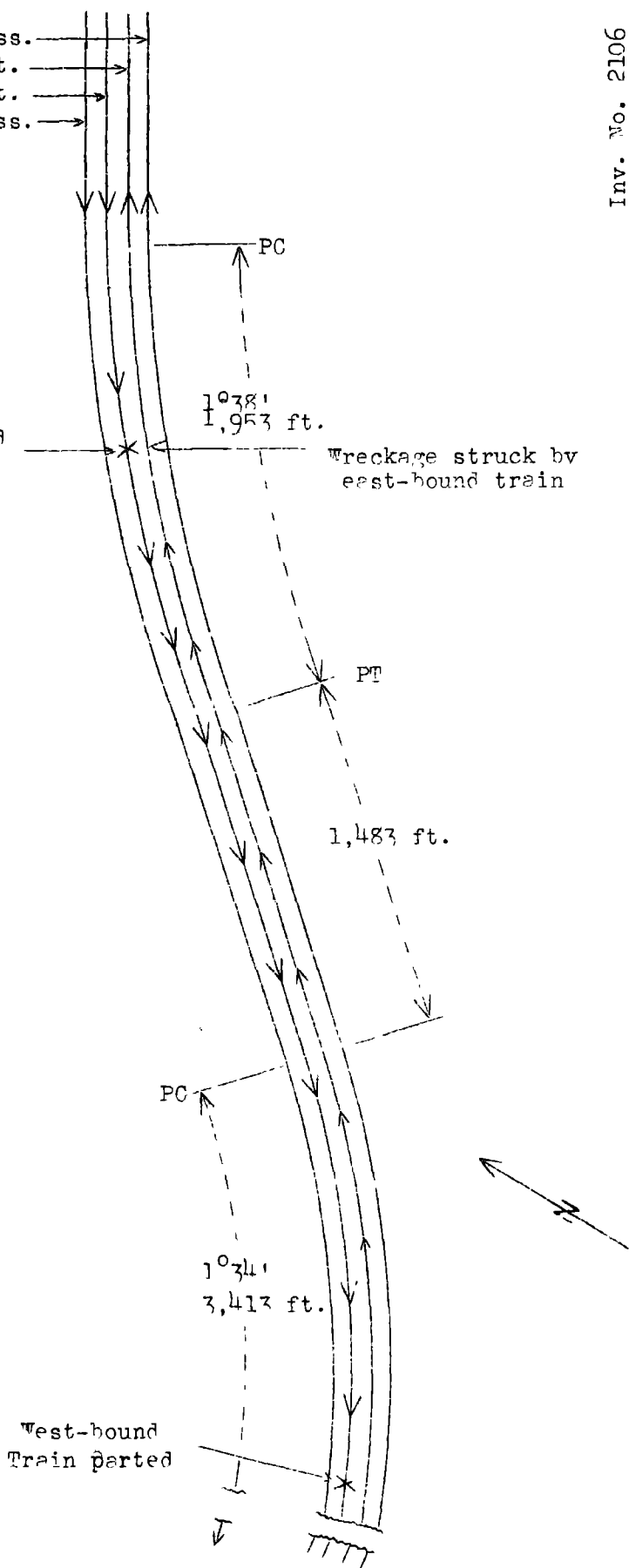
Inv. No. 2106  
 Pennsylvania Railroad  
 Menlo Park, N.J.  
 Oct. 21, 1936

○	New York, N.Y.
	13.6 mi.
○	Lane, N.J.
	1.9 mi.
○	Elizabeth, N.J.
	5.5 mi.
○	Union
	4.4 mi.
○	Menlo Park
X	(Point of accident)
	32.4 mi.
○	Fair
	0.3 mi.
○	Trenton
	1.4 mi.
○	Morrisville, N.J.
	18.7 mi.
○	Holmesburg Jct., Pa.

West-bound  
 Train buckled

Wreckage struck by  
 east-bound train

West-bound  
 Train parted



hauled by steam engine 6865, and was in charge of Conductor Hovek and Engineman Allen. This train left Waverly yard, near Lane, N. J., at 12:55 p. m., passed Union, the last open office, 4.4 miles east of Menlo Park, at 1:31 p. m., according to the train sheet, and shortly after passing Menlo Park, while traveling at a speed estimated to have been between 10 and 15 miles per hour, the train parted between P.R.R. empty box cars 84098 and 46155, the ninth and tenth cars, respectively, resulting in the air brakes being applied in emergency and causing the one-hundred-fourth and one-hundred-fifth cars to buckle out of the train and foul track 2 directly in front of Train Second P-18. The break-in-two occurred on the 1°34' curve at a point 1,601 feet from its eastern end, and the cars buckled and were struck on the 1°38' curve at a point 1,267 feet from its eastern end.

Train Second P-18, an eastbound freight train, running on track 2, consisted of 89 cars and a caboose, hauled by steam engine 6734, and was in charge of Conductor Bartlett and Engineman Goodfellow. This train passed Edison, the last open office, 2 miles west of Menlo Park, at 1:41 p. m., and struck the cars that buckled out of Extra 6865, while running at a speed estimated to have been between 30 and 35 miles per hour.

Engine 6734 and its tender stopped on their right sides across tracks 1 and 2. Twenty three cars in Train Second P-18 and 8 cars in Extra 6865 were derailed and damaged, obstructing all four tracks and breaking some of the overhead electric wires. The employee killed was the engineman of Train Second P-18, and the employees injured were the fireman and brakeman of that train.

#### Summary of evidence

Engineman Allen, Fireman Brinser and Head Brakeman Wagner, of Extra 6865 West, stated that the air brakes were tested at Waverly yard and worked properly and that the train departed from that point and entered upon the main track at Lane. A light rain was falling and the rails were wet, but visibility was good. The automatic block and cab signals displayed proceed indications and no stops were made. These members of the crew looked backed along the train at various points en route and while rounding curves, but they did not see anything wrong. The first intimation of trouble was when the engine gave a lurch, due to the train parting, while ascending the grade at a speed of between 10 and 15 miles per hour, and the engineman immediately closed the throttle

and lapped the brake valve and the forward portion of the train stopped within a short distance. Eastbound freight Train Second P-18 had passed their engine on track 2, at a speed of 25 or 35 miles per hour before the lurch occurred and there was no opportunity of flagging that train. After the accident Engineman Allen went back and found that his train had parted between the ninth and tenth cars, the forward portion of the train being separated from the rear portion by a distance of about one-half car length; at this time he noticed that the lock pin appeared to be raised and the knuckle was open on the coupler at the rear end of the ninth car, but whether this was done by the head brakeman or whether the lock pin had worked up he could not say. Head Brakeman Wagner stated that immediately after the accident he went back along the train to the point where it had parted and at that time he found that both knuckles of the couplers involved were closed; there did not seem to be anything wrong with them; he opened the knuckle on the east end of the ninth car, P.R.R. 84098, and then continued on to the point where the opposing train had struck the wreckage. As many of the cars as possible were later recoupled and moved to Morrisville yard.

Conductor Houck and Flagman O'Connor, of Extra 6865 West, were in the caboose when the accident occurred. They had looked the train over at various points en route, but saw no indication of dragging equipment or anything else wrong. Conductor Houck said that he did not feel any surge before the impact and that no unusual slack action was experienced en route and the train handled normally until the accident occurred. Flagman O'Connor also said that there was one crash which occurred at the time of the collision.

Fireman Rohrer and Head Brakeman Randall, of Train Second P-18, were on the engine and had made several running inspections of their trains, but saw nothing wrong. Approaching Menlo Park the train was drifting at a speed of from 30 to 35 miles per hour on the descending grade, with the throttle closed. Fireman Rohrer was on his seatbox maintaining a lookout ahead as Extra 6865 West was passing on track 3 and upon hearing the air brakes apply in emergency on that train, he immediately jumped to a place of safety behind the boiler head. He did not look to see whether any of the cars from the passing train were wrecked and fouling track 2 and he did not hear any warning sounded on the cab signal whistle of his engine. Head Brakeman Randall had been looking back along his train from both sides of the engine and he was standing in the right gangway looking back when the collision occurred, and was unaware of anything wrong prior to the impact.

Conductor Bartlett and Flagman Hudson were in the caboose and they had looked over their train en route; they were not aware of anything wrong until the impact occurred. The air brakes were tested at Enola and worked properly. Conductor Bartlett thought the cars near the rear end of Extra 6865 buckled out and fouled track 2 directly in front of his own train.

At the time of this accident eastbound passenger train No. 42 on track No. 1 had passed the home signal at Edison under clear signal indications; as this train passed the advance automatic signal at Edison at a speed of about 33 miles per hour the cab signal indication changed to "approach". Engineman Seeds noticed that the overhead wires were swaying violently, and he stopped his train just east of Grove Street crossing, Metuchen. Employees near the scene of accident also gave stop signals by means of a fusee and a gang watchman's banner.

Track Supervisor Greenough and Assistant Supervisor Miller, who were on eastbound passenger Train No. 42, went forward and found that Extra 6865 had parted between the ninth car, P.R.R. 84098, and the tenth car, P.R.R. 46156; the knuckle on the east end of P.R.R. 84098 was open, and the knuckle on the west end of P.R.R. 46156 was closed. Careful and thorough examination was made of tracks 2 and 3, but no marks could be found on the ties and rails in the vicinity of the wreck, or on either side adjacent to that point, to indicate that any equipment had become derailed in advance of the collision. Further examination after the wreckage was removed failed to disclose any indication of derailed equipment in either train in advance of the point of impact.

Road Foreman of Engines Hipkins arrived at the scene of the accident about 45 minutes after its occurrence. Engine 6734 was lying on its side and he observed that the automatic brake valve was in emergency position and the throttle valve was open approximately seven notches. At that time he could not observe the position of the reverse lever, but after the engine was raised he determined, from the position of the link block, that the lever was in approximately 35 percent forward motion.

Work Equipment Engineers Russert and Halliwell, engaged in grading work west of Menlo Park, heard the air brakes apply in emergency on Extra 6865 West. The train stopped on track 3 and they saw two cars near the rear of the train buckle out and foul track 2 directly in front of eastbound Train Second P-18; they were struck before they settled to the ground.

Car Inspectors Hillyer and Hoffman, at Harsimus Cove, stated that they inspected P.R.R. 84098 and P.R.R. 46156 on October 25; the cars, which were not coupled together at that time, left Harsimus Cove for Waverly in Extra 494 at 12:25 a. m. They did not take any exception to the cars, as the couplers lined up with the couplers of the cars to which they were attached and they issued a car inspector's form M.P. 111. The height of the couplers is not measured on cars they inspect unless two couplers are found that do not line up, in which event they are measured, and if the couplers are found to be low a shim is used to raise them; if this cannot be done the cars are shopped. The height of couplers is measured with a gauge; on empty cars the minimum height permitted is  $32\frac{1}{2}$  inches, to be adjusted to  $34\frac{1}{2}$  inches as nearly as practicable; on loaded cars it is  $31\frac{1}{2}$  inches, to be adjusted to  $33\frac{1}{2}$  inches as nearly as practicable.

Car Inspectors Ericson, Aitken, Hochstrasser and Hepp made statements to the effect that the proper terminal air brake test was made of the cars in Extra 6865 at Waverly and that all couplers were inspected and no exceptions taken to their condition.

Inspection of the track by the Commission's inspectors disclosed that good maintenance prevailed and no marks were found on the ties or rails of tracks 2 and 3 to indicate that any wheels had been derailed on either track preceding the point where the buckled cars were struck by the eastbound train.

Extra 6865 consisted of 122 cars, the fifty-fourth, seventy-sixth, eighty-fourth and ninety-fourth of which were equipped with "AB" brakes. Inspection of P.R.R. empty box cars 84098 and 46156 was made at Coalport Car Shop, Trenton, N. J., on October 28, 1936, and measurements taken were as follows:



<u>Car</u>	<u>P.R.R. 84098</u> <u>(East End)</u>	<u>P.R.R. 46156</u> <u>(West End)</u>
Date built	June, 1915	February, 1920
Kind of coupler attachment	Farlo key attachment	Cast steel yoke key attachment
Kind of draft gear	Westinghouse D-4	Westinghouse D-4
Coupler height slack pulled out	31"	31½"
Coupler height slack pushed in	31¾"	32½"
Coupler height coupler jacked up	-	36¾"
Coupler height coupler pulled down	31"	-
Distance between coupler horn and striking casting (coupler pulled out)	5½"	4¾"
Distance between coupler horn and striking casting (coupler pushed back)	2½"	3"
Amount of free slack in coupler	3"	1¾"
Vertical clearance at top of coupler shank	1½"	1¼"
Coupler contour	O.K.	O.K.
Air brake last cleaned	9-21-36 B&M RR	5-4-36 PRR
Journal boxes repacked	6-27-35 PRR	8-1-35 PRR

NOTES: P.R.R. 84098 coupler knuckle scraped new at top showing where knuckle on opposite car passed over.

P.R.R. 46156 coupler knuckle scraped new at bottom showing where knuckle on opposite car passed under.

It was also found that the coupler head of P.R.R. 84098 had a decided downward droop, the center line of the coupler shank being  $32\frac{1}{2}$ " in height at the carrier iron as compared to 31" in height at center line of knuckle. The coupler head of P.R.R. 46156 also drooped downwardly from the carrier iron. The newly scraped marks across the top and bottom of these couplers clearly indicated that the coupler on the east end of P.R.R. 84098 had slipped under the coupler on the west end of P.R.R. 46156.

The bodies of both cars were set properly on their center plates and side bearings, and the truck springs were in normal condition, measuring about 7<sup>2</sup>" in height under the empty cars and having a 1" wooden shim above spring plates. Variation from the standard height prescribed by the Association of American Railroad rules for couplers of empty cars was due primarily to general wear in the draft gear, attachments and supports, which when accumulated, resulted in excessive free slack in the couplers as well as in failure properly to support the couplers in a horizontal line of draft.

#### Discussion

The evidence disclosed that Extra 6865 West broke in two between P.R.R. 84098 and P.R.R. 46156, empty box cars, the ninth and tenth cars, respectively, in the train, while moving westward on track 3 on an ascending grade at a speed of about 10 to 15 miles per hour, thereby causing an emergency application of the air brakes. The emergency application of the brakes while the train was moving at this comparatively low rate of speed with the slack fully stretched, set up a retarding force in the forward portion of the train which caused severe bunching of slack in the train, which became so violent and destructive as it progressed through the train, that the car bodies of the one-hundred-fourth and one-hundred-fifth cars were lifted off their trucks and fell southward toward track 2, directly in front of Train Second P-18 which was traveling at a speed of about 30 or 35 miles per hour. The fireman of Train Second P-18, riding on that side of his engine adjacent to track 3, heard the air brakes apply in emergency on Extra 6865 West as the trains were passing. Work Engineers Russert and Halliwell, who were in the vicinity of the point of accident, heard the violent run-in of slack in Extra 6865 West and saw two cars near the rear of that train buckle upward and fall upon track 2 directly in front of Train Second P-18, where they were struck before they had settled to the ground.

Inspection of the automatic brake valve on engine 6734, of Train Second P-18, as it lay on its side at the point of accident, disclosed the handle to be in emergency position, indicating that the engineman, who was killed, apparently realized that a collision was imminent and applied the air brakes in emergency on his train. Inspection of the cars that parted disclosed that the knuckle on the east end of P.R.R. 84098 had slipped under the knuckle on the west end of P.R.R. 46156 and permitted the train to part, leaving well defined marks on the top and the bottom of the respective knuckles. The involved coupler on P.R.R. 84098 had 3 inches of free slack and the height of the coupler was 31 inches when the slack was pulled out with a bar and  $31\frac{1}{4}$  inches with slack pushed back; the coupler on the opposite end of this car also had  $2\frac{3}{4}$  inches of free slack, which caused a variation in height of  $\frac{3}{8}$  inch when the coupler was pulled out, and the striking plates at each end of the car showed that the coupler horns had been striking heavily against them. The involved coupler on P.R.R. 46156 had  $1\frac{3}{4}$  inches of free slack and its attachments and supports were such that it could be raised to a height of  $36\frac{3}{4}$  inches.

Both cars were inspected when empty at Harsimus Cove on the day prior to the accident, and the inspection made after the accident disclosed no new defects that would alter the condition that existed when the cars were inspected before leaving the terminal.

Free slack in couplers is not always discernible when cars are coupled together at time of terminal inspection, and pronounced drooping of coupler head, as noted in this case, may not always be evident when cars are coupled and the slack bunched with draft gears in more or less compression at the time. Aside from the increased shock produced in trains by free slack in couplers, which tends to damage equipment and loading, there is an element of serious hazard to the safety of train operation because of the variation produced in the height of couplers through excessive longitudinal travel, especially when there is a tendency for the coupler to droop so that it does not move in a horizontal plane because of being insecurely supported.

With good track conditions coupler knuckles cannot slip over in the manner in which they did in this accident provided the couplers, attachments and supports are in proper condition and within the limits prescribed by the Federal Safety Appliance Act and by the rules of the Association of American Railroads.

Under the Federal Safety Appliance Acts, the maximum prescribed standard height of drawbars for freight cars of standard-gauge railroads is  $34\frac{1}{2}$  inches, and the minimum is  $31\frac{1}{2}$  inches.

Under Rule 20, Association of American Railroads code of rules governing the condition of, and repairs to, freight and passenger cars for the interchange of traffic, effective January 1, 1936, it is provided that cars must be maintained within the limits of standard height for couplers, measured from the top of the rails to center of face of coupler knuckle. As far as possible, adjustment should be made when cars are empty. Empty cars measuring  $52\frac{1}{2}$  inches or less are required to be adjusted to  $34\frac{1}{2}$  inches, or as nearly as practicable thereto, but not exceeding  $34\frac{1}{2}$  inches. Loaded cars measuring  $31\frac{1}{2}$  inches or less are required to be adjusted to  $33\frac{1}{2}$  inches, or as nearly as practicable thereto, but not exceeding  $33\frac{1}{2}$  inches.

The following rules have been adopted as recommended practice of the Association of American Railroads, Mechanical Division, Circular No. D.V.-826, dated January 7, 1935, relative to inspection and maintenance of draft gears and attachments by car owners:

1. When cars are on repair tracks for periodic air brake attention, examine and renew defective parts of draft gears, couplers and their attachments and supports. This will not require removal of draft gear for this examination, except where found defective or where total slack from coupler horn to striking casting exceeds  $1\frac{1}{2}$  inches; slack to be the difference in distance between coupler striking horn and striking casting when coupler is pulled out with a bar and sledged back solid.

2. When cars are undergoing general repairs, draft gears will be dropped for examination, and couplers, their attachments and supports will be inspected and necessary repairs and replacements made.

3. In renewing defective draft gears, certified gears should be applied if spacing permits, or serviceable second-hand gears of other types, not considered inefficient or obsolete as per list shown in A.A.R. Interchange Rule 101, may be applied. Certified gears must be renewed with certified gears.

Car owners are requested to see that these rules are strictly enforced on their own cars, in order to improve the condition of the couplers and draft gears by the elimination of the slack in the gears as far as possible.

The air brake on P.R.R. 84098 was last cleaned on the B. & M. Railroad on September 21, 1936, and the 3 inches of free slack in one of the couplers undoubtedly existed at that time. The provisions of Par. 1 of A.A.R. Circular D.V.-826, of the recommended practice, are applicable only to owned cars; had these rules applied to other than owned cars also, the conditions creating the excessive free slack and permitting the coupler to fall below the prescribed height probably would have been corrected at the time the air brake was cleaned and it is reasonable to assume that this accident would have been avoided. However, as the periodic air brake cleaning in this case was made on a foreign line and the recommended practice as now in effect applies to owned cars only, it is not incumbent upon carriers to comply with these recommendations in connection with foreign cars and the corrective measures prescribed in the circular were not observed. This condition strongly points to the need for making the provisions of A.A.R. Circular No. D.V.-826 mandatory and at the same time provide for this attention being given to all cars.

The action of the air brakes on the train involved illustrates the well known fact that under certain conditions the serial action is not fast enough on existing air brakes, on freight trains of great length, to prevent destructive slack action when an emergency application takes place and this accident serves to emphasize the urgent need for improved brakes and the necessity for expediting the progressive change to the new type "AB" brake on freight cars.

#### Conclusions

This accident was caused by Extra 6865 West parting between the ninth and tenth cars in the train on account of a low coupler and excessive free slack in the draft gears and attachments.

#### Recommendations

The recommendations made in previous reports issued by the Commission in connection with similar accidents are hereby repeated:

1. That increased supervision be exercised over car inspection and repair work, and adequate forces maintained properly to perform such work.

2. That the car inspection and repair forces be properly instructed in regard to the matter of free slack in draft gears and the recommended practice relative to inspection and maintenance of draft gears and attachments be strictly complied with.

3. That the rules adopted as recommended practice of the Association of American Railroads, Mechanical Division, Circular No. D.V.-826, dated January 7, 1935, relative to inspection and maintenance of draft gears and attachments by car owners, be made mandatory and extended to include all cars, thereby insuring positive periodic checks and conditioning of draft gears, couplers and their attachments and supports.

Respectfully submitted,

W. J. PATTERSON

Director.