Inv-2227

INTERSTATE COMMERCE COMMISSION

WASHINGTON

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REPORT OF THE DIRECTOR

BUREAU OF SAFETY

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ACCIDENT ON THE

SOUTHERN PACIFIC RAILROAD

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KERMAN, CALIF.

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NOVEMBER 23, 1937.

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INVESTIGATION NO. 2227

SUMMARY

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Inv-2227

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| Railroad: | Southern Pacific |
| Date: | November 23, 1937. |
| Location: | Kerman, Calif. |
| Kind of accident: | Derailment. |
| Train involved: | Freight |
| Train number: | 401 |
| Engine number: | 2433 |
| Consist: | 24 cars, caboose |
| Speed: | 38-40 m.p.h. |
| Track: | $0^{\circ}$ 30' curve to the right; level at initial point of derailment, slightly descending at point of general derailment. |
| Weather: | Heavy mist |
| Time: | 9:20 p.m. |
| Casualties: | 6 killed, 6 injured |
| Cause: | Not definitely determined but probably the result of a broken arch bar. |

December 21, 1937.

To the Commission:

On November 23, 1937, there was a derailment of a freight train on the line of the Southern Pacific Company at Kerman, Calif., which resulted in the death of six trespassers and the injury of six trespassers.

## Location and method of operation

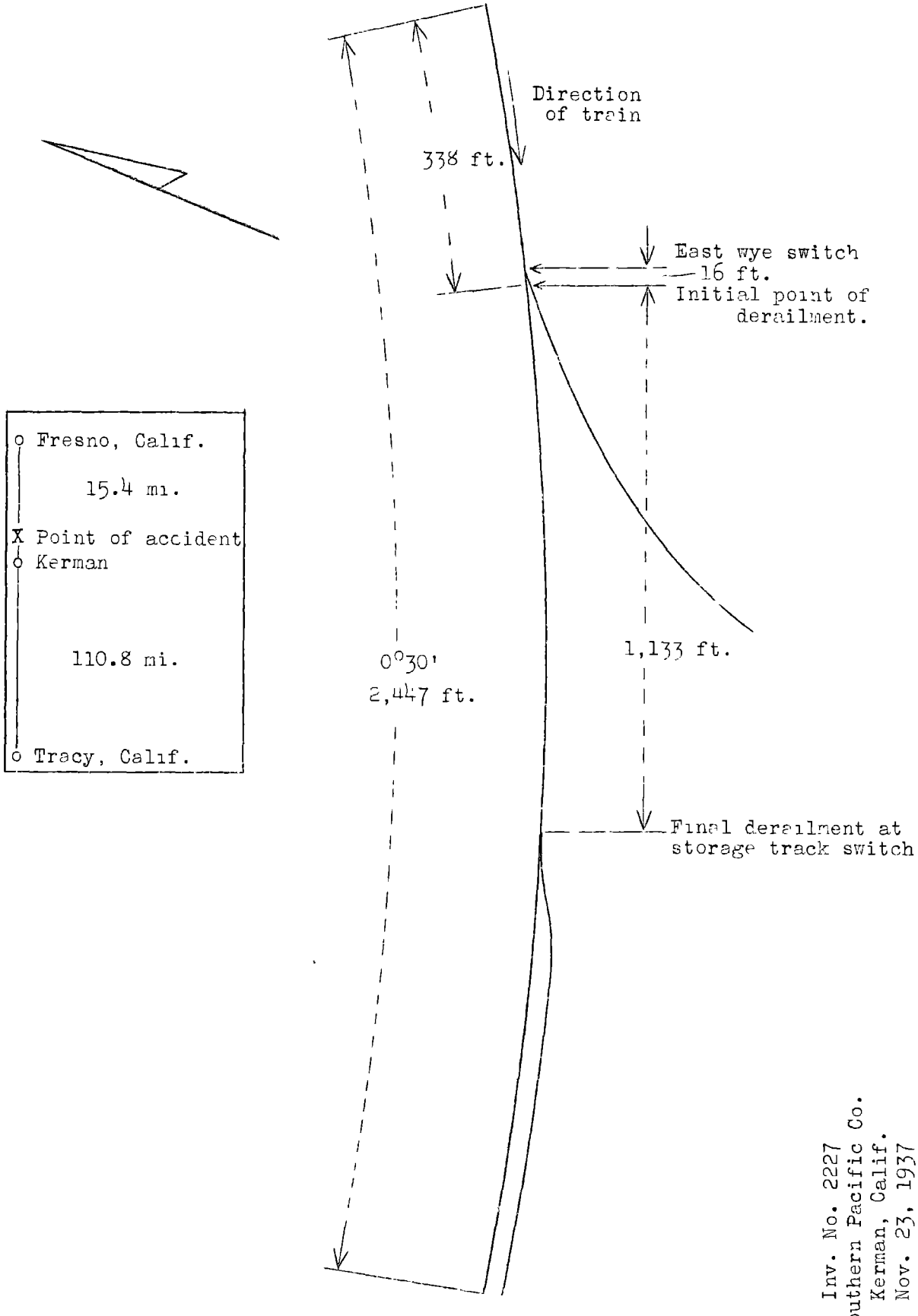
This accident occurred on that part of the Los Banos Subdivision of the Western Division, which extends between Fresno and Tracy, Calif., a distance of 126.2 miles. In the vicinity of the point of accident this is a single-track line over which trains are operated by timetable, train orders and an automatic block-signal system. At Kerman a wye leads off to the south from the main track, the east wye switch being a facing-point switch for west-bound trains. At a point 1,178 feet west of this switch there is another facing-point switch leading to a storage track which parallels the main track on the south. The initial derailment occurred at a point approximately 16 feet west of the switch points of the east wye switch, and the final derailment occurred at the siding switch. Approaching the point of accident from the east the track is tangent for a considerable distance, followed by a 0°30' curve to the right 2,447 feet in length, the initial derailment occurring on this curve at a point approximately 340 feet from its eastern end. The track is level at the initial point of derailment and slightly descending for west-bound trains at the final point of derailment.

The track is laid with 110-pound rails, 39 feet in length, with an average of 24 creosoted ties to the rail length, single-spiked, fully tie-plated, and ballasted with crushed rock to a depth of from 8 to 10 inches below the ties. The super-elevation of the outer rail is 1¼ inches. The track is well maintained. The maximum speed for freight trains is 40 miles per hour.

There was a heavy mist at the time of the accident, which occurred about 9:20 p.m.

## Description

West-bound freight train No. 401 consisted of 21 loaded cars, 3 empty cars and a caboose, hauled by engine 2433, and was in charge of Conductor Erwin and Engineman Leal. This train departed from Fresno, 15.4 miles from Kerman, at 8:50 p.m., according to the statements of the crew, 1 hour 50 minutes late, and

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Kerman, Calif.
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was derailed at Kerman while traveling at a speed estimated to have been 38 or 40 miles per hour.

The tenth to seventeenth cars, inclusive, were derailed and stopped in various positions about 100 feet beyond the storage track switch, all within a distance of approximately 200 feet. The tenth and thirteenth cars were badly damaged, while the other cars sustained less serious damage.

Summary of evidence

Engineman Leal stated that the air brakes had been tested before leaving Fresno. While approaching the yard limits at Kerman at a speed of about 40 miles per hour he looked back over the train and saw nothing wrong, but when rounding the curve on which the accident occurred the brakeman noticed fire in the train on the engineman's side. The engineman immediately made a full service application of the air brakes, as he thought some brake rigging had dropped. In a few minutes the train broke in two, but by that time the speed had been reduced considerably. He did not close the throttle until the train had practically stopped. There was a heavy, misty rain at the time of the accident but visibility was good. He inspected the track after the accident and found the first marks of derailment in the vicinity of the wye switch.

Fireman Randall stated that he felt a slight jerk just before the engineman applied the air brakes, which he thought was an emergency application. Head Brakeman Paris stated that he was in the gangway looking back on the right side when he saw fire and warned the engineman. After the train stopped he walked back and found that the train had broken in two between the ninth and tenth cars. The points of the wye switch were in good condition after the derailment.

Conductor Erwin stated that on approaching Kerman he was on the left side in the cupola of the caboose and he smelled an unusual odor; he left the cupola and went out on the rear platform and as he did so he felt the air brakes being applied and the train made a very rough stop. He was unable to say what the odor was that he had smelled; he said it was not a hot box, and he thought possibly it was acid with which some of the cars were loaded. The first mark of derailment appeared about half way between the switch points and the frog of the east wye switch.

Flagman Minton stated that on leaving Fresno he made an inspection of the right side of the train as it passed by him. He

boarded the caboose and on approaching Kerman he was on the right side of the cupola when he suddenly saw a large flash of sparks, followed almost instantly by an application of the air brakes. After the accident he went back to provide flag protection and inspect the track and did not see any mark of any kind east of the east wye switch.

Car Foreman Safford arrived at the scene of the accident on the wrecker about midnight and on reaching the east wye switch found it necessary to make some repairs to the wye track beyond the switch points; one rail was out of line, having been pulled over toward the main track. The switch points were in good condition, however, and in his opinion the switch did not in any way contribute to the cause of the accident. Examination of the track disclosed two flange marks; one on the gauge side of the north rail and the other on the outside of the south rail. A short distance beyond there were three more marks; one just south of the north rail, measuring about 4 inches in width, and about 2½ inches from that mark there was a round mark in the ties that appeared to have been made by a dragging bottom rod; the third mark was about 4 inches in width on the outer edges of the ties south of the south rail. These marks continued to the point where the equipment piled up. While picking up the wreckage he found a broken arch bar and its mate, torn from the truck, lying on the ground under one of the derailed cars. The broken arch bar was on the right side of the rear truck of S.P. tank car 47873, the first car to be derailed, and it was his opinion that the broken arch bar was the cause of the accident. It was the bottom bar and it failed at the bend at the top of the journal box, due to a crescent-shaped fracture in the under side of the bend in the bar, measuring approximately 1/2 by 2½ inches but not extending through to either side of the bar. It was his opinion that this defect could not have been detected by ordinary inspection. He also found a broken spring plank in the lead truck, showing a partially old break, but it was his opinion that this fracture was a result of the accident and did not contribute in any way to its cause.

Car Inspectors Morris, Mattox and McClure inspected the equipment of Extra 3253 on its arrival at Fresno at 6 p.m. on November 23, which included S.P. tank car 47873, which later departed in Train No. 401. A general inspection of the safety appliances, brake rigging, arch bar trucks, wheels, etc., was made and no defects were found and none of the cars were bad ordered. This inspection was made with the aid of an electric light, and it was their opinion that the broken arch bar involved in this accident did not exist at the time of their inspection. Particular attention is given to arch bars, but a

defect such as the one that existed on S.P. tank car 47873 could not be detected by an ordinary inspection, due to its location and the fact that it would be covered with oil, dirt and rust. Car Inspectors Morris and McClure also made the air brake test on Train No. 401 before its departure from Fresno and the brakes worked properly and nothing unusual was noted as they inspected the cars.

Assistant Superintendent Smith made a statement to the effect that examination of the track disclosed the first mark to be a flange mark on the ball of the south rail about 10 feet west of switch point leading to the east leg of the wye. This mark continued for a distance of about 6 feet where the wheel then dropped to the left, marking the ties about 12 inches from the rail. The south turnout rail of the wye showed an abrasion on the south side of the ball where it had been struck by some object; the north turnout rail also showed abrasion and was bent and broken. The flange marks continued in the center of the main track with a mark about 4 inches in width along the ends of the ties some of which were badly splintered. There was also a light flange mark on the gauge side of the south rail of the main track and outside of the north rail. All of these marks extended to the storage track switch, a distance of 1,133 feet, where the final derailment occurred, and the track was torn up for a distance of 282 feet. Examination of the wreckage disclosed a broken arch bar on S.P. 47873, a tank car loaded with acid sludge; also a wheel apparently from the same truck with about 9 inches of flange chipped off the inside. There was a broken spring plank on the truck at the opposite end of the car, which had been welded and reenforced in the center to repair an old break. It was his opinion that the break at the arch bar was on the forward truck, left side, lead wheel, and that the chipped flange and broken spring plank were a result of the accident and not a contributing cause.

Observations of Commission's inspectors

At the time of the examination made by the Commission's inspectors, the only repairs which had been made to the track were replacing three rails, two on the north or right side of the east leg of the wye that had been torn up and broken and one rail on the south or left side of the main track just west of the east wye switch rail. Observations of the track did not disclose any marks on the rails or ties indicating that any part of the equipment had been dragging east of the first marks of derailment. The first mark on the ties was to the left of the main track at a point 16½ feet west of the switch point, indicating the point where the lead wheel of the forward truck of S.P.

tank car 47873, the tenth car in the train, became derailed. The truck apparently became slued so that the right wheel struck the center sills of the car, with the left wheel on the ties on the inside of the north or right rail of the wye track, and as the movement progressed this rail was turned over and broken, flange marks being plainly shown on the inside of the web. The right rear wheel of this truck showed indications of having rubbed against metal. On the outside of the right rail in the main track all of the track bolt nuts had been sheared off and flange marks showed plainly on the spike heads; the east ends of the tie-plates had been battered and the bond wires torn off for a distance of 1,133 feet to the point of final derailment. There were two distinct marks on the ties between the rails apparently made by the right lead and left rear wheels. The spring plank also showed distinct marks on the bottom where it had slid along on the top of the rails; some of the column bolts and nuts were almost entirely burned off, which would indicate that they had been rubbing along the side of the rails for some distance. There was one brake hanger bracket on this truck broken off and one with the brake hanger and bolt missing.

S.P. tank car 47873 was a steel car built by the American Car and Foundry Company in April, 1909, and was acquired by the Southern Pacific Company in 1924. This car was equipped with arch bar trucks, 5½ by 10-inch journals, and a 10,000 gallon tank. At the time of the accident it was loaded with acid sludge of an estimated weight of 110,000 pounds. The bottom arch bar on left side of the lead truck was broken 15 inches from the end of the bar and 3 inches from the center of the inside journal box bolt hole of the lead pair of wheels. The size of this arch bar is 1¾ by 5 inches; it was not the original arch bar that came with the car as it was of different shaped metal. Where the break occurred there was an old flaw or crack on the under side of the bar 1/2 by 2½ inches, crescent-shaped, and the metal appeared crystallized. The flaw did not extend to either side of the arch bar but was practically in the middle of the arch bar.

## Discussion

The evidence indicates that the track was in good condition and there was no evidence of dragging equipment east of the point of the first marks of derailment. These marks which were on the ties 16½ feet west of the switch point and to the left of the rails paralleled the rails on the south until the north rail leading to the wye was reached. The truck apparently then was pulled or slued to the south until the right wheel encountered the center sill of the car. At this point the wye

rail overturned, allowing the south wheel to pass over the rail. From this point westward the marks indicated that the lead wheels of this truck were derailed to the south of both rails and the rear wheels were derailed to the north of both rails, with most of the weight carried on the spring plank riding on both rails. There were also marks on the ties south of the south rail and at the north wye rail, indicating the failure of an arch bar on this truck. All of these marks extended to the switch leading to the storage track where the final derailment occurred.

The bottom arch bar on the left side of the lead truck of the first car derailed, S.P. tank car 47873, was found broken at a point 15 inches from the end of the bar and 3 inches from the center of the inside journal box bolt hole of the lead wheel. At the break there was an old crescent-shaped flaw or crack on the under side of the bar 1/2 by 2½ inches, and the metal appeared crystallized. The flaw did not extend to either side of the bar but was practically in the middle.

The head brakeman was looking back over the train at the time of the accident and saw a flash of fire, which probably occurred at the time the lead truck became derailed; the engineman immédiately made a continuous service application of the air brakes.

## Conclusion

The cause of this accident could not be definitely determined but it probably resulted from the breaking of an arch bar.

Respectfully submitted,

W. J. PATTERSON,

Director.