INTERSTATE COMMERCE COMMISSION

REPORT OF THE DIRECTOR OF THE BUREAU OF SAFETY CONCERNING AN ACCIDENT ON THE LINE OF THE SOUTHERN PACIFIC COMPANY NEAR COCHRAN, OREGON, ON AUGUST 6, 1935.

October 12, 1935.

To the Commission:

On August 6, 1935, there was a derailment of a mixed train on the line of the Southern Pacific Company near Cochran, Oregon, which resulted in the death of 5 employees and injury of 3 employees.

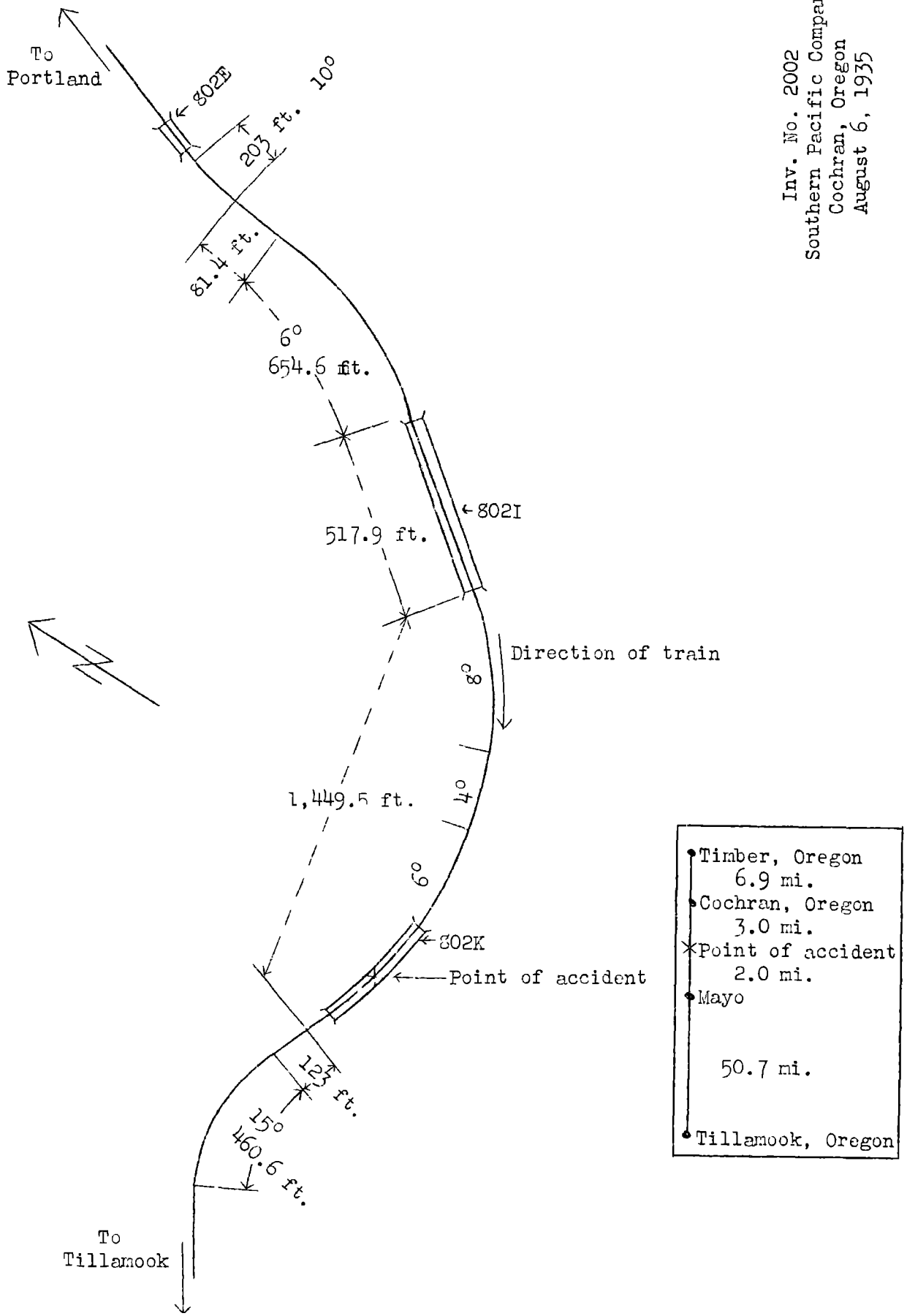
Location and method of operation

This accident occurred on the Tillamook Branch of the Portland Division, extending westward from Timber to Tillamook, Oregon, 62.7 miles. This is a single-track line over which trains are operated by time table and train orders, no block-signal system being in use.

The accident occurred on trestle 802-K, over Little Baldwin Creek, approximately 1 mile west of tunnel No. 26 and 3 miles west of Cochran, Oregon. In the vicinity of the point of accident the track skirts the western slope of the Coast Range Mountains, following the course of the Salmonberry River which lies several hundred feet below the level of the track. From a point near the western portal of tunnel No. 26, there is tangent track a distance of 864 feet westward, followed by a series of short curves and tangents for a distance of 2,864 feet, then tangent 518 feet over Big Baldwin Creek followed by a compound curve to the right, curvature varying from 4° to 8°, 1,471 feet in length, the accident occurring on this curve 1,161 feet from its eastern end. Curvature at the point of accident is 6° and grade is 2.7 percent descending for westbound trains.

Trestle 802-K, involved in this accident, is approximately 344 feet in length, with 6° curvature, and spans a deep canyon with precipitous slopes. The maximum height of the trestle is approximately 100 feet above Little Baldwin Creek. At the east end of the trestle is a concrete abutment, followed by 13 frame bents on concrete pedestal piers, bents 8 to 10, inclusive, practically spanning the creek. The trestle continues up the slope, bents 15 to 24, inclusive, consisting of cedar piles and timber bulkheads. The highest frame bent is No. 9, with

Inv. No. 2002
Southern Pacific Company
Cochran, Oregon
August 6, 1935



downstream height of 94 feet 4 inches from top of pedestal to top of cap.

This trestle is constructed in three separate stories, upper stories resting upon a floor system of overlay timbers, 12 by 12 inches in size, extending longitudinally. The lower story rests upon sills placed upon concrete pedestals. The deck of the trestle consists of 6 stringers, all bents bolted together, with longitudinal girt consisting of 8 courses of timbers, 6 by 8 inches in size.

Bent 9 is typical of the structure. The upper story consists of 5 posts, sills and cap, 24 feet 7 inches in height, sway bracing in standard manner, sash bracing at 12-foot intervals, and bent resting on overlay or interlay timbers. The second story is similarly constructed, 22 feet 8 inches in height, and rests upon the second system of overlay or interlay timbers. The lower story is similarly constructed except for variation in height, upstream 44 feet and downstream 48 feet; the bottom rests on sills placed upon concrete pedestals.

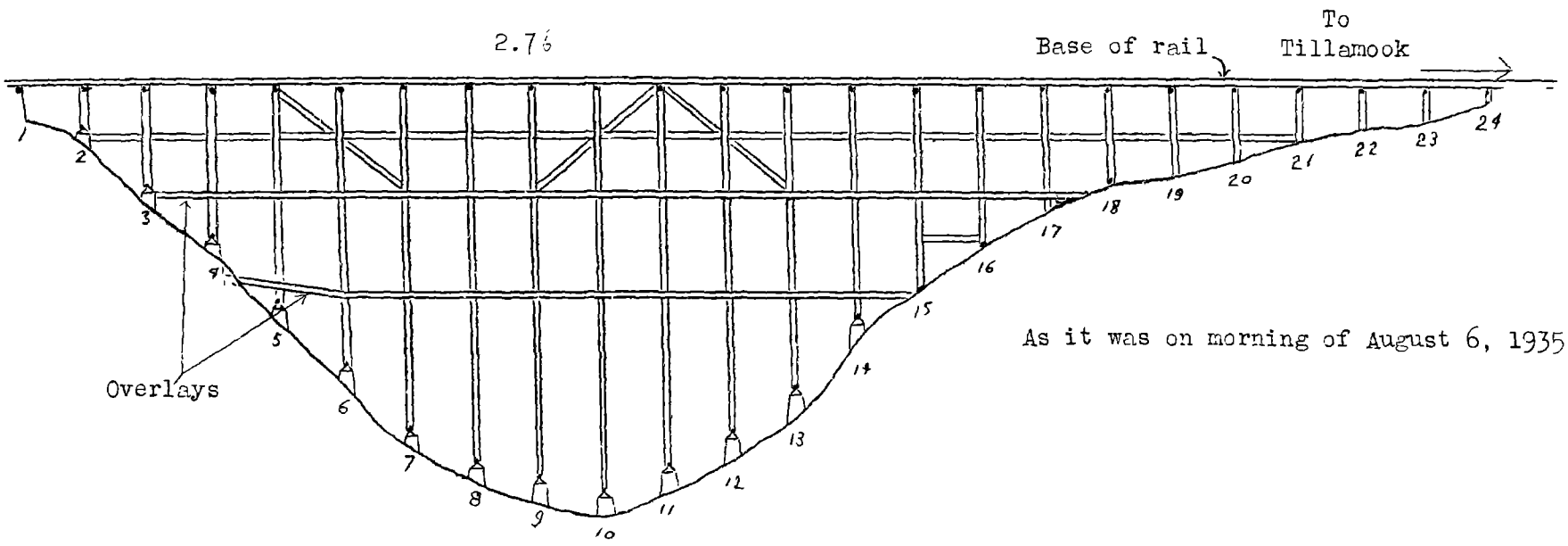
In 1931 the upper part of the structure was destroyed by fire, after which the entire deck of the trestle and the upper stories of bents 2 to 18 were renewed.

Repair work involving replacement of the lower stories of bents 4 to 14, inclusive, was commenced on July 8, 1935. The central story, including the overlay systems, had been completed; replacement of the lower story had progressed eastward from bent 14 and the bridge gang was working on bents 7 and 8 at the time of accident. The new creosoted bent 9 was completed and in place on pedestal piers, the old bent displaced to the west but not removed. Creosoted bent 8 had been shoved and framed into position east of old bent 8. The individual posts of creosoted bent 7 had been dropped into place but not framed. The duties of sash and sway braces are to prevent spreading of vertical members and to prevent lateral sway, while longitudinal and tower braces prevent longitudinal movement.

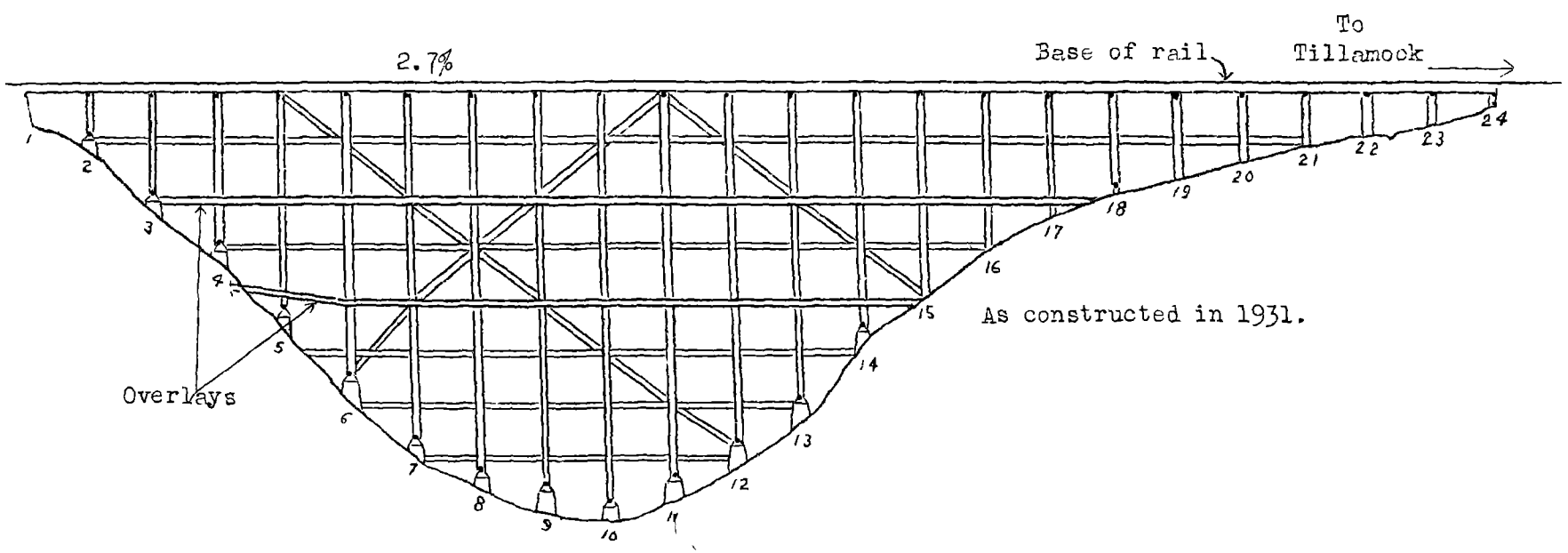
The weather was clear and warm at the time of the accident, which occurred at 10:55 a.m.

Description

Train No. 687, a west-bound mixed train, consisting of engine 2833, 35 freight cars, helper engine 2761, 1 coach and a caboose, in the order named, was in charge of Conductor Scruggs and Engineman Johnson and departed from Cochran at 10:38 a.m.

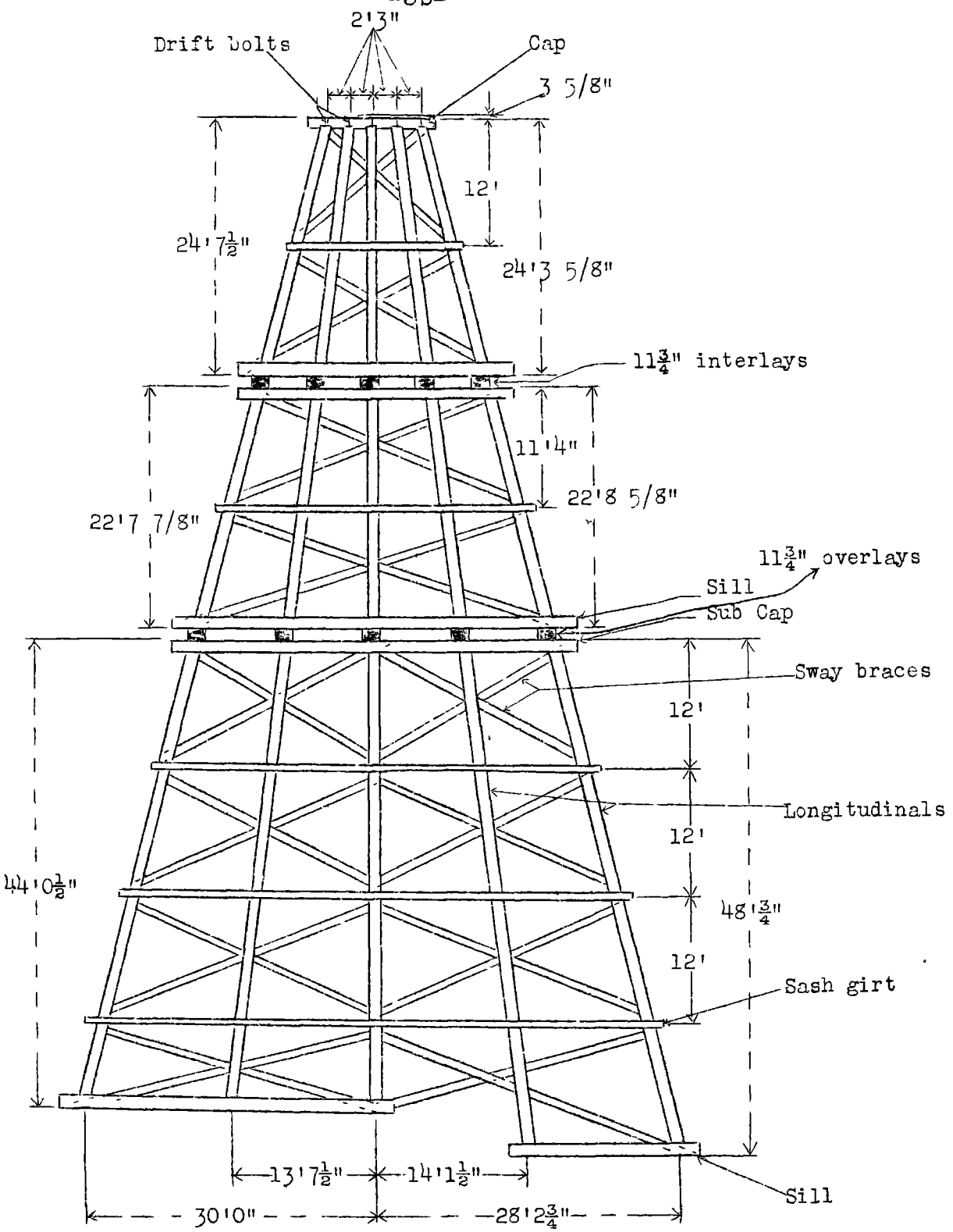


As it was on morning of August 6, 1935.



As constructed in 1931.

Profile on Centerline of Trestle 802-K


2'3"
Drift bolts
Cap
3 5/8"
12'
24'7½"
24'3 5/8"
11¾" interlays
11'4"
22'8 5/8"
22'7 7/8"
11¾" overlays
Sill
Sub Cap
Sway braces
12'
Longitudinals
12'
44'0½"
48'¾"
12'
Sash girt
13'7½"
14'1½"
30'0"
28'2¾"
Sill

Bent No. 9

Between the west end of tunnel No. 26 and the point of accident the train was stopped by the flagman for the bridge crew and also to unload freight at the outfit cars for this crew. The bridgemen cleared the track, the train proceeded approximately 106 feet on the trestle, moving at estimated speed of 4 to 6 miles per hour, when the structure failed, precipitating the engine and two cars to the creek bed below.

The locomotive lay on its left side, parallel with the track, the tender in jack-knife position against the boiler head, the first and second cars near the tender, and the third car stood on the track with the west end thereof hanging over the abutment. Other cars were not derailed.

The employees killed were the engineman, fireman, 2 brakemen and 1 bridge carpenter; the employees injured were 1 bridge foreman and 2 bridge carpenters.

Summary of evidence

Conductor Scruggs stated that his train was stopped west of Cochran by a flagman for the bridge crew; the train proceeded to some outfit cars, where freight was unloaded, and proceeded again approximately 15 car lengths, moving at a speed of about 6 miles per hour, when he felt an emergency application of the air brakes. After the train stopped he stepped to the ground, unaware that an accident had occurred until he observed the absence of the trestle. Movements over this bridge during repair work were being protected by slow flags and a flagman.

Rear Brakeman Hannapple was in the cupola of the caboose watching the cars as the train rounded the curve; he saw the engine go down through the trestle and felt an emergency application of the brakes at the same time.

Assistant Trainmaster McDonald, who was in the coach at the time of accident, stated that a stop was made about 18 car lengths east of Little Baldwin bridge to unload some freight; after 3 or 4 minutes the train started, and was moving between 5 and 8 miles per hour, the engine having reached a point at approximately the center of the bridge when the structure collapsed, precipitating the engine and two cars into the canyon below. Looking across the curve from the coach to the engine, he saw the bridge collapse and felt an emergency application of the brakes at the same time. He stated that he was unfamiliar with bridge construction and could not determine the cause of the accident.

Engineman Ward, of helper engine 2761, said that just prior to the accident the train was drifting at a speed of about 4 miles per hour; he saw the engine and the bridge go down together and the remainder of the train was stopped by an emergency application of the brakes.

Bridge Foreman Andrews stated that he has been bridge foreman on the Tillamook Branch since 1913, and that he has worked on and is familiar with construction of all bridges in that territory. On the morning of the accident he left Little Baldwin bridge to perform work at Wolf Creek; he had lined up work with Assistant Foreman Reamy but was unable to say what bracing was changed during his absence. Foreman Andrews was authorized to renew all that section of Little Baldwin trestle below the upper overlay, between bents 4 and 14, both inclusive. Work was commenced on July 8 and the entire second story had been completed except replacing the tower braces and the longitudinal braces. Work had progressed on the lower story and bents 14 to 9, both inclusive, had been renewed but none of the longitudinal braces or the tower braces had been replaced. He stated that a new bent 8 had been constructed and was in place on mud sills east of old bent 8, ready to be jacked into place as soon as the train had departed. Longitudinal braces had been removed from bent 14 to bent 8 and the longitudinal braces between bents 7 and 8 had been cut preparatory to removal of old bent 8 and placing of new bent 8. He had removed the longitudinal braces holding bent 8 and had removed the sash girts and sway braces from the east side of old bent 8 to make room for new bent 8. In his opinion removal of tower braces and longitudinal braces did not materially affect safety of the bridge and removal of sway braces creates no unusual hazard.

Assistant Bridge Foreman Reamy was seriously injured as a result of this accident and no statement was obtained from him.

Bridge Carpenter Heuer stated that he worked on new bent 8 on the day prior to this accident. New bent 8 was placed on blocks preparatory to being put in position but old bent 8 carried the load. At the time of accident he had been engaged in placing sash girts on new bent 7. Two men were engaged in stripping one side of old bent 8, but he did not know how many braces were removed. He observed no unusual condition about the trestle prior to the accident; but upon approach of the train he walked to bent 6 to be safe if tools were dropped while the train was passing. Sitting on bent 6 and hearing the bridge begin to crack, he observed bent 7 coming toward him; it appeared as if bent 7 was raised about 3 inches and then tipped off the pier. He had removed no braces from old

bent 7, and he had walked across from bent 7 to bent 6 on the longitudinal braces. All longitudinal braces from bent 4 to bent 8 were unbolted but still in place on the frame.

Bridge Carpenter Clark stated he was employed in removing sash girts on bent 8 at the time of the accident, all of which had been removed at one side, and the longitudinal braces had been removed. Bent 8 leaned and then tipped over toward him. He stated that lack of longitudinal braces might cause bents to kick off their pedestals.

Division Engineer Hampton stated that renewal of lower stories of trestle 802-K was commenced on July 8, 1935. In preparing to install a new bent it is necessary to release certain existing braces so that the bent may be placed; sash, girt, and longitudinal braces should be removed progressively and, after a new bent is installed, no train should be permitted to pass until bracing has been partially replaced. If too much bracing or too many bolts are removed, the vertical load may create a longitudinal kick. After inspecting wreckage of the structure he concluded that too many bolts had been removed from bent 8, basing his opinion on position and condition of timbers of the collapsed trestle. He stated that he believed the accident was caused by loosening or removal of too many bolts in longitudinal and sash braces on the old bents; however, in a supplementary statement, he stated that absence of longitudinal bracing had no bearing on failure of the structure.

Assistant Division Engineer Feikert stated that authority to rebuild a section of trestle 802-K below the upper overlay and between bents 4 and 14, both inclusive, was given early in July before work was started on July 8. Bridge Foreman Andrews was in charge of the work. All tower bracing was removed below the upper overlay and timbers were replaced in the second or lower overlay, after which bents from numbers 14 to 4 were renewed, which completed the operation on the second story except that longitudinal girt braces between upper and lower overlays had not been applied. Work then was started on the lower story at bent 14 and had progressed to bent 9; new bent 9 had been placed and was supporting traffic. New bent 8 had been fully framed and placed in position on mud sills preparatory to replacing old bent 8 that afternoon. Sway braces and sash girts had been removed from the east side but were intact on the west side of old bent 8, and longitudinal braces had been cut between bents 7 and 8, old bent 8 remaining in place with no sash or sway braces removed. Tower braces below the upper overlay and all longitudinal braces between bents 14 and 7 had been removed. Overlays performed the same function and were stronger than

longitudinal braces. Sills of the second story were bolted to caps of the lower story, preventing the bent from toppling or collapsing but not preventing longitudinal movement. He suggested no definite cause of the accident, but he believed that lack of longitudinal braces on old sections of the structure and strain or shearing effect intensified by slow movement of the train on the bridge were contributory factors and that either bent 7 or bent 8 caused the failure.

Bridge and Building Supervisor Chesney stated that longitudinal braces are not immediately replaced on new construction, but all sway braces and sash girts are in place and the overlay is sufficient to prevent longitudinal movement. All tower and longitudinal braces between bents 7 and 14, below the upper overlay, were removed during reconstruction and had not been replaced. He thought the accident was due to the fact that bent 8 was weakened by removal of sway braces from its east side and by absence of longitudinal braces, permitting both lateral and longitudinal movement; probably movement of the train upon this bent and an emergency application of air brakes caused the structure to collapse. Examination of the wreckage disclosed that sway braces on the west side of bent 8 were broken.

Bridge Inspector Jones stated that he inspects all bridges in his territory every 90 days and that he inspected trestle 802-K on June 21, finding bents 7 and 8 considerably decayed. Since prior annual inspection the structure had been strengthened by reinforcement of 54 posts with a timber, 6 by 8 inches, on each post, three reinforcements having been made to old bent 8. He considered immediate replacement of tower and longitudinal braces unnecessary on the new bents, bolted at their upper ends to the overlay, which was sufficient longitudinal bracing; however, he added that removal of a brace weakens the structure which is designed for certain braces to be in place.

Subsequent to the accident this bridge was examined by representatives of the Commission. A new creosoted bent, number 7, not completely framed, leaned against concrete pier 6; leaning on new bent 7 was old bent 7, which had been supporting its load, sash and sway braces not being removed; resting on old bent 7 was new bent 8, completely framed, old bent 8 had been supporting the load. Apparently the longitudinal braces on old bent 8 were unbolted and the sway braces on one side removed to permit replacement by new bent 8. New bent 9, fully framed and braced, rested on old bent 8; old bent 9, not in use, rested on new bent 9; new bent 10, completely framed, rested against old bent 9. Bent 10 was located at the bottom of the canyon.

Discussion

The investigation disclosed that Bridge Foreman Andrews, who was in charge of the work, was temporarily absent and did not know what braces had been removed that morning; that Assistant Foreman Reamy ordered and permitted removal of essential braces from already weakened members of the structure; that Bridge Inspector Jones visited the bridge on July 30, seven days prior to the accident, and at that time did not notice how much bracing had been replaced on the bridge; and that Bridge Supervisor Chesney had made no inspection of the work since its commencement, notwithstanding the importance of the repairs in progress. Failure of this structure could have been prevented by closer supervision of the repair work in progress by officers charged with that duty.

Conclusion

This accident was caused by collapse of a timber trestle beneath a mixed train, probably resulting from removal of essential braces while the structure was undergoing extensive repairs.

Respectfully submitted,

W. J. PATTERSON,

Director.