

INTERSTATE COMMERCE COMMISSION

TWENTY-SEVENTH ANNUAL REPORT

OF THE

CHIEF INSPECTOR
BUREAU OF LOCOMOTIVE INSPECTION

TO THE

INTERSTATE COMMERCE COMMISSION

FISCAL YEAR ENDED

JUNE 30, 1938



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**ANNUAL REPORT OF THE CHIEF INSPECTOR
BUREAU OF LOCOMOTIVE INSPECTION**

OCTOBER 1, 1938.

To the Interstate Commerce Commission:

In compliance with section 7 of the act of February 17, 1911, as amended, the Twenty-seventh Annual Report of the Chief Inspector, covering the work of the Bureau during the fiscal year ended June 30, 1938, is respectfully submitted.

Summaries are given, by railroads, of all accidents, showing the number of persons killed and injured due to the failure of parts and appurtenances of locomotives, as reported and investigated under section 8 of the locomotive inspection law, and those reported to the Bureau of Statistics under the accident report act of May 1910, and not reported to this Bureau in accordance with the requirements.

The tables showing the number of accidents, the number of persons killed, and number injured have been arranged to permit comparison with previous years as far as consistent. These tables also show the number of locomotives inspected, the number and percentage of those inspected and found defective, the number for which written notices for repairs were issued in accordance with section 6 of the law, and the total defects found and reported. The data contained therein cover all defects on all parts and appurtenances of locomotives found and reported by our inspectors, arranged by railroads.

Summaries and tables show separately accidents and other data in connection with steam locomotives and tenders and their appurtenances and accidents and other data in connection with locomotives other than steam.

In addition to the accidents shown in the tables and otherwise referred to in this report there was reported to the Bureau a total of 84 accidents in which 7 employees were killed and 77 employees injured in falls while in the performance of their duties on locomotives. None of these falls could be attributed to any features encountered in connection with the condition of locomotives, it being apparent in each instance that the falls were caused by inattention or sudden illness on the part of those killed and injured. These accidents do not come within the scope of the locomotive inspection law but are mentioned here in order to emphasize the necessity of alertness on the part of all persons employed on or about locomotives.

REPORT OF THE CHIEF INSPECTOR OF LOCOMOTIVES

TABLE I.—Reports and inspections—Steam locomotives

	Year ended June 30—					
	1938	1937	1936	1935	1934	1933
Number of locomotives for which reports were filed.....	47,397	48,025	49,322	51,283	54,283	56,971
Number inspected.....	105,186	100,033	97,329	94,151	89,716	87,658
Number found defective.....	11,050	12,402	11,526	11,071	10,713	8,388
Percentage inspected found defective.....	11	12	12	12	12	10
Number ordered out of service.....	679	934	852	921	754	544
Total number of defects found.....	42,214	49,746	47,453	44,491	43,271	32,733

TABLE II.—Accidents and casualties caused by failure of some part of the steam locomotive, including boiler, or tender

	Year ended June 30—					
	1938	1937	1936	1935	1934	1933
Number of accidents.....	208	263	209	201	192	157
Percent increase or decrease from previous year.....	20.9	125.8	14.0	14.7	22.3	18.3
Number of persons killed.....	7	25	16	29	7	8
Percent increase or decrease from previous year.....	72.0	152.2	44.8	314.3	12.5	11.1
Number of persons injured.....	216	283	215	267	223	256
Percent increase or decrease from previous year.....	23.7	31.6	19.5	19.7	12.9	164.1

¹ Increase.

TABLE III.—Accidents and casualties caused by failure of some part or appurtenance of the steam locomotive boiler ¹

	Year ended June 30—							
	1938	1937	1936	1935	1934	1933	1915	1912
Number of accidents.....	59	63	75	68	63	53	424	856
Number of persons killed.....	5	19	10	24	4	3	13	91
Number of persons injured.....	59	73	80	119	77	55	467	1,005

¹ The original act applied only to the locomotive boiler.

TABLE IV.—Number of casualties classified according to occupation—Steam locomotive accidents

	Year ended June 30—									
	1938		1937		1936		1935		1934	
	Killed	Injured	Killed	Injured	Killed	Injured	Killed	Injured	Killed	Injured
Members of train crews:										
Engineers.....	3	70	8	106	4	75	7	65	1	57
Firemen.....	2	80	5	78	6	72	4	70	1	73
Brakemen.....		31	3	30	3	28	2	26	1	32
Conductors.....		6	1	18		13		10	1	17
Switchmen.....		7		10		2		3		6
Roundhouse and shop employees:										
Boilermakers.....		2	2	2				6		2
Machinists.....		1		2		4	1	3		5
Foremen.....		1				3		2		
Inspectors.....		1				2		1		
Watchmen.....	2		1	1	1	1	1	1		3
Boiler washers.....		1		1	1	1	1	1		4
Hostlers.....		6		9		3		3	1	5
Other roundhouse and shop employees.....		1		3		3		6		1
Other employees.....		3		14		5		14		4
Nonemployees.....		7		10		4		22		14
Total.....	7	216	25	283	16	215	29	267	7	223

REPORT OF THE CHIEF INSPECTOR OF LOCOMOTIVES

TABLE V.—Reports and inspections—Locomotives other than steam

	Year ended June 30—					
	1938	1937	1936	1935	1934	1933
Number of locomotive units for which reports were filed.....	2,555	2,416	2,361	1,911	1,288	1,349
Number inspected.....	4,024	3,615	3,118	1,620	1,436	1,368
Number found defective.....	274	328	252	146	69	74
Percentage inspected found defective.....	7	9	8	9	5	5
Number ordered out of service.....	9	24	11	5	4	4
Total number of defects found.....	769	991	674	447	158	176

TABLE VI.—Accidents and casualties caused by failure of some part or appurtenance of locomotives other than steam

	Year ended June 30—				
	1938	1937	1936	1935	1934
Number of accidents.....	4	12	9	8	1
Number of persons killed.....	4	14	9	8	1
Number of persons injured.....	4	14	9	8	1

TABLE VII.—Number of casualties classified according to occupation—Locomotives other than steam

	Year ended June 30—									
	1938		1937		1936		1935		1934	
	Killed	Injured	Killed	Injured	Killed	Injured	Killed	Injured	Killed	Injured
Members of train crews:										
Engineers.....		3		7		7		3		
Firemen.....						1		1		
Brakemen.....				2						
Conductors.....										
Switchmen.....		1								
Roundhouse and shop employees:										
Inspectors.....										
Other roundhouse and shop employees.....								2		1
Other employees.....						1				
Nonemployees.....				3				1		
Total.....		4		14		9		8		1

TABLE VIII.—Accidents and casualties resulting from failures of steam locomotives and tenders and their appurtenances

Part or appurtenance which caused accident	Year ended June 30—														
	1938			1937			1936			1935			1934		
	Accidents	Killed	Injured	Accidents	Killed	Injured	Accidents	Killed	Injured	Accidents	Killed	Injured	Accidents	Killed	Injured
Air reservoirs.....															
Aprons.....	3						1		1	1	1	1			1
Arch tubes.....		3													
Ashpan blowers.....						3			1	3	3	3			6
Axles.....															
Blow-off cocks.....	2		6	2			1		1						2
Boiler checks.....	5		5	2					3		20	1			2
Boiler explosions:	5		5	1			2		4	6	6	5			5
A. Shell explosions.....															
B. Crown sheet; low water; no contributory causes found.....				1	4	2			3		2				4
C. Crown sheet; low water; contributory causes or defects found.....	5	5	3	5	9	2	6	8	5	6	17	52	6	4	18
D. Miscellaneous firebox failures.....				3	4	6	2		3	5	4	8	1		3
Brakes and brake rigging.....	6		7	1					2						1
Couplers.....	4		1	14			13		1	3			1		11
Crank pins, collars, etc.....	5	1	4	10			8		1	8			7		10
Crossheads and guides.....	2		2	3			4		6				9		3
Cylinder cocks and rigging.....				2			2		2				2		2
Cylinder heads and steam chests.....				3			3		2				2		3
Dome caps.....				2			2		2				3		3
Draft appliances.....									2				2		3
Draw gear.....	1														
Fire doors, levers, etc.....	4		1	1			1		1				1		1
Flues.....	4		4	4			5		1	1			1		4
Flue pockets.....	3		3	4			4		7	1			4		4
Footboards.....							1		1	3			1		3
Gage cocks.....	6		7	2			2		3	3			3		8
Grease cups.....									6	6			3		3
Grate shakers.....				1			1		1	4			4		3
Handholds.....	7		6	6			4		1	4			1		5
Headlights and brackets.....	1		1	10			8		7	7			7		7
Injectors and connections (not including injector steam pipes).....	2		2	5			5		4	4			2		1
Lubricators and connections.....	3		3	4			5		4	4			1		3
Lubricator glasses.....	3		3	4			4		2	1			3		3
Patch bolts.....															
Pistons and piston rods.....	3		3	3			3		1	1			2		2
Plugs, arch tube and washout.....	1		1	1			1		1				2		2
Plugs in firebox sheets.....									2	1					
Reversing gear.....	12		12	34			19		17	17			17		18
Rivets.....							1		2	2			2		2
Rods, main and side.....	5		5	5			5		5	5			5		10
Safety valves.....							5		4	1			1		1
Sanders.....	9		9	6			6		1	1			1		12
Side bearings.....							1		2	2			1		1
Springs and spring rigging.....	4		4	4			12		6	6			2		3
Squirt hose.....	7		7	5			5		4	12			3		3
Stay bolts.....	2		2	1			1		1	1			12		9
Steam piping and blowers.....	7		7	6			10		7	1			1		4
Steam valves.....	4		4	4			4		4	4			4		4
Studs.....															
Superheater tubes.....	1		1	1			1		1	1			1		1
Throttle glands.....															
Throttle leaking.....	1		1	1			1		1	1			1		1
Throttle rigging.....	2		2	5			5		1	1			2		5
Trucks, leading, trailing, or tender.....	5		5	5			6		1	1			1		2
Valve gear, eccentrics and rods.....	4		4	5			5		5	5			1		2
Water glasses.....	8		8	5			6		17	8			5		2
Water-glass fittings.....									2	2			4		1
Wheels.....	1		3	2			2		5	1			1		11
Miscellaneous.....	66		68	65			65		46	1			47		1
Total.....	208	7	216	263	25	253	209	16	215	201	29	267	192	7	223

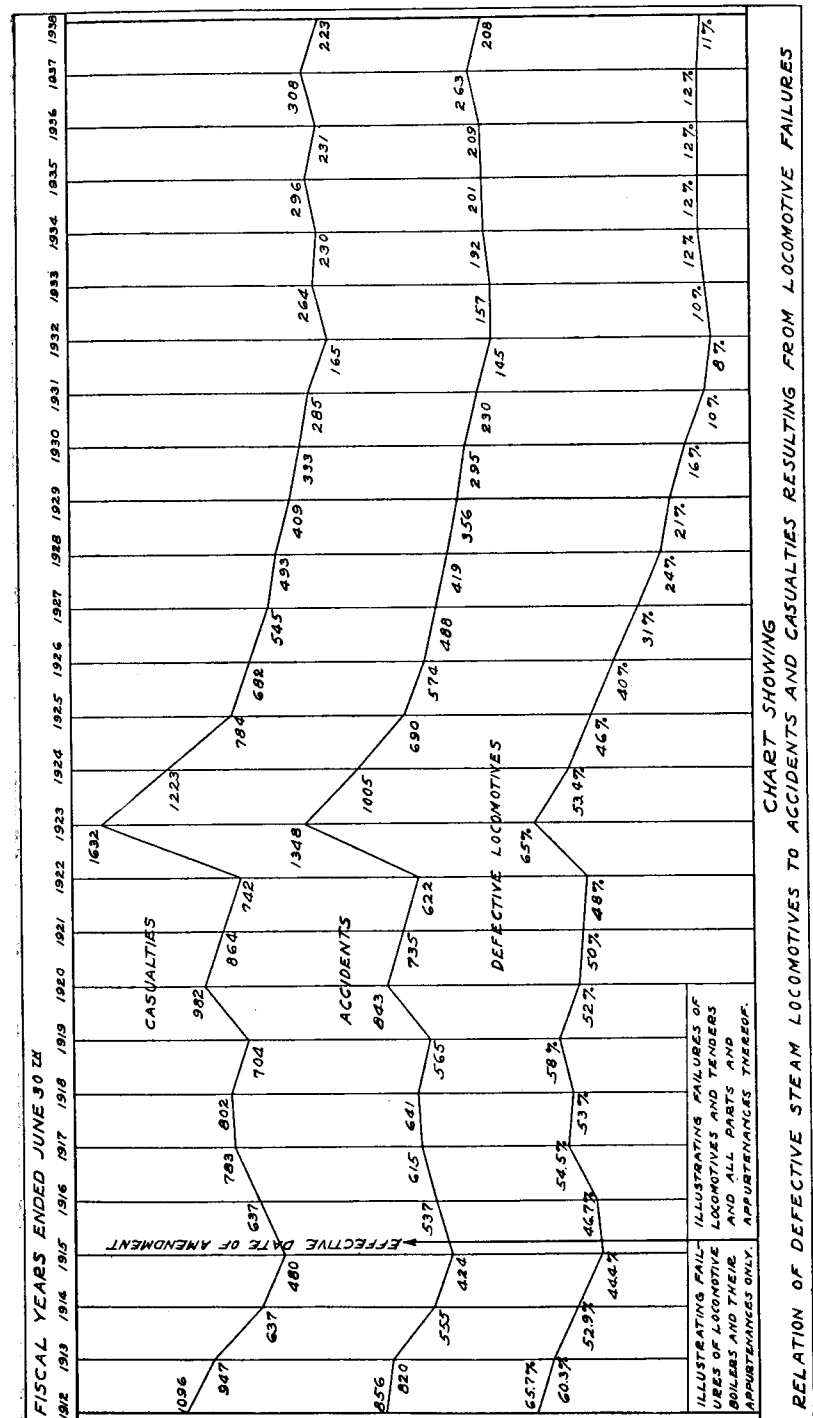


TABLE XI.—Number of locomotives other than steam reported, inspected, found defective, and ordered from service—Continued

Parts defective, inoperative or missing, or in violation of rules	Year ended June 30—					
	1938	1937	1936	1935	1934	1933
Steam pipes.....	5	1	2			
Steps, footboards, etc.....	23	13				
Switches, hand-operated, and fuses.....	7	2	2	2	1	4
Transformers, resistors, and rheostats.....	3			1	1	
Trucks.....	40	41	42	46	3	7
Water tanks.....		1				
Water glasses, fittings, and shields.....	3		4	6		
Warning signal appliances.....	3	2	1			
Wheels.....	11	21	26	6	8	5
Miscellaneous.....	7	20	39	25	7	7
Total defects.....	769	991	674	449	158	176
Locomotive units reported.....	2,555	2,416	2,361	1,911	1,288	1,349
Locomotive units inspected.....	4,024	3,615	3,118	1,620	1,436	1,368
Locomotive units defective.....	274	328	252	146	69	74
Percentage inspected found defective.....	7	9	8	9	5	5
Locomotive units ordered out of service.....	9	24	11	5	4	4

INVESTIGATION OF ACCIDENTS AND GENERAL CONDITION OF LOCOMOTIVES

All accidents reported to the Bureau as required by the law and rules were carefully investigated and appropriate action taken to prevent recurrence as far as possible. Copies of reports of our accident investigations were furnished to interested parties when requested and otherwise used in our effort to bring about a diminution in the number of such accidents.

STEAM LOCOMOTIVES

Two hundred and eight accidents occurred in connection with steam locomotives resulting in 7 deaths and 216 injuries. This represents a decrease of 20.9 percent in the number of accidents, a decrease of 72 percent in the number of persons killed, and a decrease of 23.7 percent in the number of persons injured compared with the previous year.

The chart on page 5 shows the relation between the percentage of defective steam locomotives and the number of accidents and casualties resulting from failures thereof, and illustrates the effect of operating locomotives in defective condition.

Table VIII shows the various parts and appurtenances of steam locomotives and tenders which through failure have caused serious and fatal accidents. If the information contained in this table is taken advantage of and proper inspections and repairs made in accordance with the requirements of the law and rules many accidents will be avoided.

During the year 11 percent of the steam locomotives inspected by our inspectors were found with defects or errors in inspection that

should have been corrected before the locomotives were put into use; this represents a reduction of 1 percent compared with the results obtained in each of the past 4 years. There was a decrease of 27.3 percent in the number of locomotives ordered withheld from service by our inspectors because of the presence of defects that rendered the locomotives immediately unsafe.

Detailed results of our inspections of steam locomotives of each railroad are shown in table XII, and a comparison of the condition of locomotives of each railroad over a period of years is shown in table XIII.

EXPLOSIONS AND OTHER BOILER ACCIDENTS

There was a decrease of 4 in the number of accidents, a decrease of 12 in the number of persons killed, and a decrease of 7 in the number of persons injured as a result of boiler explosions or crown sheet accidents as compared with the previous year.

All of the five explosions that occurred in the past fiscal year, in which five persons were killed and three injured, were caused by overheating of the crown sheets due to low water. This is the least number of explosions experienced in any one year ever recorded with the exception of the fiscal year ended June 30, 1933, in which year the same number of explosions occurred, resulting in the death of two persons and the injury of six persons.

In one of the accidents, which caused the instant death of two employees and the fatal injury of one employee who died 2 days later, the force of the explosion tore the boiler from the frame, hurling it upward and 486 feet directly forward where it struck the rails front end first, then bounded upward and forward and came to rest 741 feet from the point of the explosion. Parts of the wreckage were scattered in all directions for various distances up to 1,170 feet.

In another instance, while the locomotive was in charge of an engine watchman who was killed in the accident, the force of the explosion tore the boiler from the frame and it alighted on a highway approximately 200 feet from the place where the locomotive was standing at the time the explosion occurred. Parts of the wreckage were scattered over a radius of 840 feet.

Boiler and appurtenance accidents other than explosions resulted in the injury of 56 persons; compared with the previous year this is a reduction of 2 persons killed and 4 persons injured in accidents originating from failures of these parts.

EXTENSION OF TIME FOR REMOVAL OF FLUES

Six hundred and eighty applications were filed for extensions of time for removal of flues, as provided in rule 10. Our investigations

disclosed that in 46 of these cases the condition of the locomotives was such that extensions could not properly be granted. Thirty were in such condition that the full extensions requested could not be authorized, but extensions for shorter periods of time were allowed. Thirty-one extensions were granted after defects disclosed by our investigations were required to be repaired. Thirteen applications were canceled for various reasons. Five hundred and sixty applications were granted for the full periods requested.

LOCOMOTIVES PROPELLED BY POWER OTHER THAN STEAM

There was a decrease of 8 in the number of accidents occurring in connection with locomotives other than steam and a decrease of 10 in the number of persons injured as compared with the previous year. No deaths occurred in either year.

During the year 7 percent of the locomotives inspected by our inspectors were found with defects or errors in inspection that should have been corrected before the locomotives were put into use as compared with 9 percent in the previous year. There was a decrease of 15 in the number of locomotives ordered withheld from service by our inspectors, because of the presence of defects that rendered the locomotives immediately unsafe.

SPECIFICATION CARDS AND ALTERATION REPORTS

Under rule 54 of the Rules and Instructions for Inspection and Testing of Steam Locomotives, 412 specification cards and 4,438 alteration reports were filed, checked, and analyzed. These reports are necessary in order to determine whether or not the boilers represented were so constructed or repaired as to render safe and proper service and whether the stresses were within the allowed limits. Corrective measures were taken with respect to numerous discrepancies found.

Under rules 328 and 329 of the Rules and Instructions for Inspection and Testing of Locomotives Other Than Steam, 228 specifications and 51 alteration reports were filed for locomotive units and 98 specifications and 45 alteration reports were filed for boilers mounted on locomotives other than steam. These were checked and analyzed and corrective measures taken with respect to discrepancies found.

APPEALS

No formal appeal by any carrier was taken from the decisions of any inspector during the year.

JOHN M. HALL, *Chief Inspector.*

ACCIDENTS AND CASUALTIES RESULTING FROM THE FAILURE OF STEAM LOCOMOTIVES AND TENDERS AND THEIR APPURTENANCES DURING THE FISCAL YEAR ENDED JUNE 30, 1938, BY ROADS

[A star (*) indicates accidents taken from records of the Bureau of Statistics of the Interstate Commerce Commission. A double star (**) indicates accidents not properly reported, as required by rules 55 and 162. A complete investigation, therefore, could not be made, inasmuch as the Bureau was not apprised of the accidents in sufficient time after they occurred to permit them to be properly investigated.]

AKRON, CANTON & YOUNGSTOWN RAILWAY:

*December 1, 1937, locomotive 37, East Akron, Ohio. Insufficient clearance between cab handhold and tender when on a sharp curve; one injured.
One accident; one injured.

ALTON RAILROAD:

**July 13, 1937, locomotive 2612, Ocoya, Ill. Squirt hose valve leaking; valve defective; one injured.
One accident; one injured.

ATCHISON, TOPEKA & SANTA FE RAILWAY:

*September 28, 1937, locomotive 3451, Valley Center, Kans. Plug worked out of sand pipe; one injured.

October 16, 1937, locomotive 1652, Pueblo, Colo. Sanders inoperative; one injured.

December 22, 1937, locomotive 2542, Salina, Kans. Spanner nut on air end of front air compressor worked loose and started leaking. While attempting to tighten the spanner nut, employee took hold of hand wheel of shut-off valve in steam line to air pump and hand wheel gave way, causing him to fall from running board; nut to hold wheel on steam valve stem was missing; one injured.

December 23, 1937, locomotive 1056, Pampa, Tex. Scale or some foreign matter obstructing main air reservoir drain valve blew out and struck reservoir cooling coil piping which was in line with discharge from the drain valve and was deflected so that it struck employee's eye; one injured.

**January 1, 1938, locomotive 1868, Newton, Kans. Hinges to sand box lid were broken; one injured.

February 17, 1938, locomotive 3733, Laguna, N. Mex. Babbitt lining broke off removable type brass hub liner bolted to engine truck box and was thrown from locomotive, striking employee; babbitt lining not properly applied; one injured.

*February 19, 1938, locomotive 4088, Pampa, Tex. Injured while attempting to set wedges between locomotive and tender; one injured.

April 16, 1938, locomotive 1875, St. Joseph, Mo. Bell clapper bolt loose; clapper bolt reported loose on April 1 and 8; one injured.

May 1, 1938, locomotive 3764, Gallup, N. Mex. Centrifugal type boiler feed pump, which failed to function, burst while being tested due to excessive speed of turbine caused by speed control mechanism being inoperative; speed control had been broken for some time; pump impeller had broken loose from shaft, permitting turbine to spin free without putting water into the boiler; two injured.

June 28, 1938, locomotive 963, Kansas City, Kans. Boiler check leaking badly; boiler check reported on May 29 and 30, June 2, 12, 14, 21, 22, and 28; one injured.
Ten accidents; 11 injured.

ATLANTA, BIRMINGHAM & COAST RAILROAD:

December 7, 1937, locomotive 84, Sessoms, Ga. Employee stumbled over an emergency grate bar which was being carried on top of tank behind fuel space; one injured.

December 29, 1937, locomotive 23, Atlanta, Ga. Employee stepped into open manhole on feed water tank; manhole cover left open by enginehouse force before locomotive was placed in switching service; one injured.

May 21, 1938, locomotive 114, Manchester, Ga. Lower section of right front sand pipe fell from its position and knocked employee from footboard of moving locomotive; stud for holding clamp on this section of pipe was missing; union and threads in sand pipe badly worn; one injured.

Three accidents; three injured.

ATLANTIC COAST LINE RAILROAD:

August 26, 1937, locomotive 1670, Dunn, N. C. Employee's elbow struck on bolt which protruded through back wall of cab; bolt securing wood lining to cab wall was too long; one injured.

**December 20, 1937, locomotive 2003, Thomasville, Ga. Defective conveyor slide hook slipped out of hole in conveyor slide when employee attempted to close the slide; one injured.

February 22, 1938, locomotive 1520, near Selma, N. C. Driving spring hanger broke; one injured.

March 3, 1938, locomotive 1659, Stony Creek, Va. Cast iron steam pipe at front end burst; thickness of pipe at point of failure varied from 1- $\frac{3}{16}$ inches to $\frac{1}{16}$ inch; steam pipe contacted side of smoke box, preventing free expansion of the pipe; one injured.

Four accidents; four injured.

BALTIMORE & OHIO RAILROAD:

**August 15, 1937, locomotive 6159, GR Cabin, Ohio. Piece of sheet metal forming an inside shield over cab window jarred loose from its fastening to cab wall and swung down, striking employee; one injured.

October 23, 1937, locomotive 4266, Ribold, Pa. Stoker slide hook disengaged from slide plate; hook not proper fit in holes in slide plate; one injured.

November 19, 1937, locomotive (B. & O. C. T.) 2856, Chicago, Ill. Injector steam pipe collar broke off in spanner nut at injector throttle valve connection; end of steam pipe not belled over collar; proper repairs not made when spanner nut was reported leaking on November 3, 6, and 18; two injured.

February 12, 1938, locomotive 6221, Bakerstown, Pa. Hinges of tender cistern filling hole cover broke through rivet holes; one injured.

April 25, 1938, locomotive 5138, Mt. Vernon, Ohio. Penstock hook bent, causing employee to fall from tender; hook badly pitted and rusted away; hook was not company's standard; one injured.

June 11, 1938, locomotive 7115, Keyser, W. Va. Side rod collar bolt broke and was thrown from locomotive, striking a pedestrian; one injured.

Six accidents; seven injured.

BOSTON & MAINE RAILROAD:

**August 12, 1937, locomotive 1364, East Lynn, Mass. Push pole lying on rear of tank behind fuel space; one injured.

December 29, 1937, locomotive 2723, Westboro, N. H. Bonnet of feed water pump throttle valve became disconnected from valve body; one injured.

March 16, 1938, locomotive 3029, Scotia, N. Y. Tool box which was attached to back cab wall fell account of bolts breaking; bolts for securing tool box were smaller than company's standard and one of the two bolts had been broken for some time; one injured.

May 6, 1938, locomotive 1498, Waltham, Mass. Cab apron worn; one injured.

*May 26, 1938, locomotive 3653, North Billerica, Mass. Lubricator steam pipe pulled out of sleeve of the union connection to throttle valve; pipe not properly brazed in sleeve; one injured.

May 31, 1938, locomotive 4020, East Deerfield, Mass. Fireman lost his balance and fell from top of tender while attempting to take water; water spout out of reach and no means available to pull it around; one injured.

Six accidents; six injured.

CENTRAL OF GEORGIA RAILWAY:

June 14, 1938, locomotive 710, Sylacauga, Ala. Employee's hand cut by broken glass in cab door; one injured.

One accident; one injured.

CENTRAL RAILROAD OF NEW JERSEY:

July 22, 1937, locomotive 787, Hazlet, N. J. Driving box grease cellar guard plate was thrown from moving locomotive and through a window in a passenger car in a train on adjacent track; holes in grease cellar inside lugs not drilled according to company's standard; threads in keeper bolt hole in poor condition; cellar bolt and cellar bolt hole worn; one injured.

November 19, 1937, locomotive 874, Bloomsbury, N. J. Locomotive separated from train, resulting in sudden stop; rear coupler top lock lifter worn, permitting coupler lock to function and knuckle to open; one injured.

**June 29, 1938, locomotive 159, Sea Bright, N. J. Brake hanger guard was thrown from tender and struck an automobile which was near rail crossing, causing injury to the driver of the automobile; one injured.

Three accidents; three injured.

CHICAGO & EASTERN ILLINOIS RAILWAY:

*October 6, 1937, locomotive 1945, St. Anne, Ill. Main crank pin broke; old fracture extended over approximately 80 percent of cross-sectional area at point of failure; one injured.

One accident; one injured.

CHICAGO & NORTH WESTERN RAILWAY:

November 24, 1937, locomotive 2361, Ames, Iowa. Fire tube broke off at safe end weld; overheated in welding; one injured.

*January 25, 1938, locomotive 2068, Hawarden, Iowa. Drain valve to frost pipe under right boiler check stopped up; one injured.

Two accidents; two injured.

CHICAGO, BURLINGTON & QUINCY RAILROAD:

July 29, 1937, locomotive 5057, Denver, Colo. Water glass burst; one injured.

November 16, 1937, locomotive 7015, Sandwich, Ill. Air pump stopped; employee fell from side rod while attempting to open steam throttle valve of emergency air pump which was located under running board; "Air pump working slow and stopping" was reported on October 27; one injured.

December 6, 1937, locomotive 2585, near Canton, Ill. Blow-off cock operating rod handle was loose; one injured.

Three accidents; three injured.

CHICAGO GREAT WESTERN RAILROAD:

October 23, 1937, locomotive 476, South Des Moines, Iowa. Water glass burst; one injured.

January 22, 1938, locomotive 882, Bolton, Ill. Top portion of outside flange of No. 4 driving box shoe broke off and struck sectionman who was standing about 60 feet from the track; "All driving boxes pounding bad" and "Set up the right No. 4 driving box wedge" were reported on January 9, 12, 14, 15, 18, and 21; one injured.

January 28, 1938, locomotive 877, Melbourne, Iowa. Crown sheet failure caused by overheating due to low water; two killed, one injured.

March 1, 1938, locomotive 478, Waterloo, Iowa. Water glass burst; glass missing from one side of water-glass guard; one injured.

April 17, 1938, locomotive 884, Oneida, Iowa. Derailment caused by dislocated driving wheel tires; tires overheated due to brake friction; three injured.

**May 6, 1938, locomotive 750, Weitman, Iowa. Injured while attempting to adjust rib of stoker divider which had moved to left side; lock nut on divider was loose; one injured.

Six accidents; two killed, eight injured.

CHICAGO, MILWAUKEE, ST. PAUL & PACIFIC RAILROAD:

*May 3, 1938, locomotive 2600, Belvidere, S. Dak. Light in classification lamp inoperative account of bulb not properly screwed in socket; one injured.

May 20, 1938, locomotive 8073, Tomah, Wis. Injector steam pipe spanner nut at injector connection broke into two pieces; old fracture covered approximately 75 percent of one of the breaks; one injured.

Two accidents; two injured.

CHICAGO, ROCK ISLAND & PACIFIC RAILWAY:

August 14, 1937, locomotive 3025, McAlester, Okla. Insufficient clearance between vertical cab handhold and tender deck supporting block when on curve; one injured.

September 11, 1937, locomotive 1550, Camden, Ark. Crown sheet failure caused by overheating due to low water; one killed.

December 20, 1937, locomotive 902, Blue Island, Ill. Air hose at rear of tender was ruptured; one injured.

January 3, 1938, locomotive 2507, Clearing, Ill. Cab steam heat drain pipe was frozen; one injured.

**February 1, 1938, locomotive 2051, Limon, Colo. Employee's leg was cut on edge of cab apron while ascending gangway steps; apron projected over top gangway step when on curve; one injured.

March 5, 1938, locomotive 4055, Lawrence, Kans. Main crank pin broke through old fracture covering approximately 75 percent of cross-sectional area; rods and boxes reported pounding bad for 30 days preceding the accident; one killed.

*April 25, 1938, locomotive 443, Peoria, Ill. Seat box in cab came down; one injured.

Seven accidents; two killed, five injured.

COLUMBUS & GREENVILLE RAILWAY:

*December 12, 1937, locomotive 304, Carrollton, Miss. Injured while keying up main rod bearing on line of road; one injured.
One accident; one injured.

DELAWARE & HUDSON RAILROAD:

January 28, 1938, locomotive 82, Binghamton, N. Y. Employee's foot was caught between cab apron and post for opening ashpan slides; improperly located post fouled cab apron when on a curve; one injured.
One accident; one injured.

DELAWARE, LACKAWANNA & WESTERN RAILROAD:

August 21, 1937, locomotive 161, Secaucus, N. J. Employee slipped and fell from running board; accumulation of hard dirt on running board; one injured.
*October 3, 1937, locomotive 1250, Hackettstown, N. J. Glass in front cab door broke; one injured.

November 16, 1937, locomotive 241, Buffalo, N. Y. Connecting link between air piston link pin and pin on fire door became disconnected, permitting fire doors to close unexpectedly and catch employee's hand; one injured.
**November 24, 1937, locomotive 1405, near Greendell, N. J. Glass in front cab door broke; one injured.

Four accidents; four injured.

DENVER & RIO GRANDE WESTERN RAILROAD:

**September 23, 1937, locomotive 1013, Garfield, Utah. Valve gear counter-balance rod broke; one injured.

October 21, 1937, locomotive 54, Denver, Colo. Manually operated reverse lever moved violently to back end of quadrant, catching employee's arm between lever and back of cab; insufficient clearance between reverse lever and back cab wall; one injured.

**January 7, 1938, locomotive 470, Tiffany, Colo. Pilot snow plow caught under ball of lead rail of passing track at switch, causing derailment of locomotive, tender and one car; locomotive low at front end account of right front driving spring hanger working out of place; spring hanger seat casting and spring clip were missing; one injured.

January 19, 1938, locomotive 1400, Geneva, Utah. Valve stem broke through coarse crystallized metal near front end of its crosshead keyway, trapping steam in cylinder and resulting in the locomotive being stripped on one side; one injured.
Four accidents; four injured.

EL DORADO & WESSON RAILWAY:

April 9, 1938, locomotive 16, Wesson, Ark. Crown sheet failure caused by overheating due to low water; one killed.
One accident; one killed.

ELGIN, JOLIET & EASTERN RAILWAY:

*September 28, 1937, locomotive 94, Joliet, Ill. Squirt hose burst; one injured.
October 25, 1937, locomotive 740, Gary, Ind. Boiler check valve broke, permitting hot water to flow back through feed water pump to which squirt hose was attached and cause employee to lose control of squirt hose; one injured.
Two accidents; two injured.

ERIE RAILROAD:

July 15, 1937, locomotive 121, Buffalo, N. Y. Insufficient clearance between cab handhold at gangway and planking on tender deck when on sharp curve; one injured.

*August 21, 1937, locomotive 3401, Meadville, Pa. Front cab window broke; two injured.

October 2, 1937, locomotive 3307, Geneva, Pa. Main driving axle broke flush with wheel center hub face, resulting in broken side rods which punctured throat and back flue sheets; progressive fractures in fillet covered approximately 80 percent of cross-sectional area of axle; three injured.

October 19, 1937, locomotive 59, Jersey City, N. J. Lubricator gage glass packing nut blew out; threads on plug and in lubricator body were defective due to plug having been applied cross-threaded; one injured.

October 30, 1937, locomotive 3376, Campbell Hall, N. Y. Piston rod failed inside crosshead fit; piston rod improper fit in crosshead; old flaw at top inside edge of keyway in piston rod; rods, wedges, and guides reported repeatedly during the month preceding accident; one injured.

December 12, 1937, locomotive 2933, Spencerville, Ohio. Stoker conveyor trough slide stuck; one injured.

*June 1, 1938, locomotive 3327, Dayton, N. Y. Nail which protruded through cab seat box pierced employee's knee when he knelt to observe signals; one injured.
Seven accidents; 10 injured.

FLORIDA EAST COAST RAILWAY:

September 23, 1937, locomotive 269, Miami, Fla. Sander inoperative; one injured.

November 30, 1937, locomotive 702, near Fort Pierce, Fla. Main crank pin broke off flush with hub of driving wheel; old fracture covered approximately 90 percent of cross-sectional area; one injured.

Two accidents; two injured.

FORT WORTH & DENVER CITY RAILWAY:

July 8, 1937, locomotive 456, near Jolly, Tex. Squirt hose valve worked open; valve insufficiently packed and hose not properly secured in position when not in use; a similar accident occurred on this locomotive on January 24, 1937; one injured.

One accident; one injured.

GRAND TRUNK WESTERN RAILWAY:

*October 9, 1937, locomotive 6306, Harvey, Ill. Insufficient clearance between handhold at gangway and apron when on curve; one injured.

December 1, 1937, locomotive 3755, Hayford, Ill. Part of cab seat base broke off, causing employee to fall; wood seat base, which was rotted and cracked, failed where further weakened by hinge and leg support bolt holes; one injured.

December 24, 1937, locomotive 7479, Detroit, Mich. Bonnet of lubricator throttle valve in cab blew off due to failure of collar of union nut securing bonnet to body of valve; collar previously fractured due to excessive tightening; "Bonnet to boiler pressure valve to lubricator loose" was reported on December 23; one injured.

Three accidents; three injured.

GREAT NORTHERN RAILWAY:

October 4, 1937, locomotive 3080, Portland Junction, N. Dak. Driver brake hanger pin broke due to old fracture; one injured.

November 5, 1937, locomotive 84, Minneapolis, Minn. Driving spring hanger broke; old flaw covered approximately one-fourth of cross-sectional area; one injured.

Two accidents; two injured.

GULF COAST LINES:

**March 4, 1938, locomotive (N. O. T. & M.) 1034, near Sweeny, Tex. Deck sand box cover fell, striking employee's finger; hook that held cover in open position was too short to properly secure the cover; one injured.

May 5, 1938, locomotive (St. L. B. & M.) 927, near Riviera, Tex. Fell from running board while oiling hot engine truck boxes; engine truck cellars had not been properly packed; one injured.

Two accidents; two injured.

GULF, COLORADO & SANTA FE RAILWAY:

**September 13, 1937, locomotive 556, Celeste, Tex. Tender truck journal bearing ran hot, causing brass to break. Employee was injured while preparing to renew the journal bearing brass. After emergency repairs the locomotive proceeded five miles when the journal broke off; one injured.

February 5, 1938, locomotive (A. T. & S. F.) 4047, Crowley, Tex. Throttle lever latch guide stem broke; one injured.

Two accidents; two injured.

ILLINOIS CENTRAL SYSTEM:

August 14, 1937, locomotive 1085, Louisville, Ky. Coal on step of back coal board caused employee to fall; one injured.

**August 19, 1937, locomotive 334, Memphis, Tenn. Employee's hand was cut on nail protruding from cab seat box; one injured.

October 7, 1937, locomotive 2909, Forreston, Ill. Divider in stoker slipped out of proper position; threads on stud for securing divider were damaged, preventing divider from being properly tightened; one injured.

November 4, 1937, locomotive 2403, Grenada, Miss. Water glass burst; one injured.

February 18, 1938, locomotive 2950, Wenona, Ill. Headlight not properly focused; one injured.

February 25, 1938, locomotive 1666, Charles City, Iowa. Water glass burst; one injured.

April 1, 1938, locomotive 287, Memphis, Tenn. Water glass burst, breaking sight glass in water glass shield; one injured.

**May 30, 1938, locomotive 1010, near Eldena, Ill. Locomotive lurched, causing injury to employee; contact surfaces of buffer castings had been left rough when built up by autogenous welding; one set of springs for buffer casting was one inch shorter than the other set; one injured.

**June 1, 1938, locomotive 1595, Decatur, Ill. Mechanically operated fire door would not open properly; one injured.

Nine accidents; nine injured.

INTERNATIONAL-GREAT NORTHERN RAILROAD:

**July 27, 1937, locomotive (H. & B. V.) 310, Houston, Tex. Reverse lever difficult to operate; one injured.

August 29, 1937, locomotive (M. P.) 9762, Houston, Tex. Blower valve difficult to operate, and when employee used wrench to turn blower-valve extension handle the bonnet screwed out of valve body; blower valve reported on August 27 and 28 (two times); one injured.

Two accidents; two injured.

KANSAS CITY SOUTHERN RAILWAY:

August 13, 1937, locomotive 803, near Heavener, Okla. Lubricator transfer filler burst; one injured.

One accident; one injured.

LOUISIANA, ARKANSAS & TEXAS RAILWAY:

*December 19, 1937, locomotive 674, Shreveport, La. Piston crosshead key sheared off, knocking cylinder head out; one injured.

One accident; one injured.

LOUISVILLE & NASHVILLE RAILROAD:

July 15, 1937, locomotive 219, Uma, Ky. While being hooked up, manually operated reverse lever jerked to front corner of quadrant and caught employee's leg between lever and feed valve; feed valve located between reverse lever and foot brace cleared lever only 1½ inches; "Too much lost motion in reverse lever latch" was reported on July 14 and "Reverse lever hard to get in corner. Reverse lever latch hangs at times and won't latch" was reported at end of the trip on which the accident occurred; one injured.

One accident; one injured.

MACON, DUBLIN & SAVANNAH RAILROAD:

**October 4, 1937, locomotive 993, Danville, Ga. Nuts securing piston rod and crosshead pin worked loose, due to not having been properly tightened after repairs; crosshead pin improper fit in crosshead; excessive clearance between cotter keys and nuts on piston rod and crosshead pin; one injured.

One accident; one injured.

MAINE CENTRAL RAILROAD:

July 9, 1937, locomotive 178, Waterville, Maine. Tripped on unused ice box on top of leg of tender water tank; one injured.

March 4, 1938, locomotive 651, Lewiston, Maine. Locomotive separated from train, causing emergency application of the brakes; rear coupler of locomotive was 1½ inches below the minimum prescribed standard height; one injured.

Two accidents; two injured.

MINNEAPOLIS, ST. PAUL & SAULT STE. MARIE RAILWAY:

July 22, 1937, locomotive 2417, Eben Junction, Mich. While using manually operated reverse lever, employee's elbow struck on bolts which protruded through cab wall behind engineer's seat box; one injured.

**July 29, 1937, locomotive 438, Enderlin, N. Dak. Squirt hose valve opened; valve shifted from proper location and part of valve stem projected from under guard which was fastened to deck, permitting contact with employees' feet; one injured.

*August 19, 1937, locomotive 2630, Ashland, Wis. Fusee box in cab improperly located; one injured.

January 31, 1938, locomotive 728, Enderlin, N. Dak. Insufficient clearance between reverse lever handle and boiler head; water column drain valve improperly applied and its handle was fouled by reverse lever handle when in forward position; one injured.

Four accidents; four injured.

MISSOURI-KANSAS-TEXAS LINES:

**August 31, 1937, locomotive 411, Parsons, Kans. Cable to fuel oil automatic safety valve release pin broke; edges of holes in back cab wall for entrance of cables to cab were sharp and not protected to prevent cables from chafing; one injured.

One accident; one injured.

MISSOURI PACIFIC RAILROAD:

*July 13, 1937, locomotive 9728, Kansas City, Mo. Bar connecting toggle with coupler pin lifter became disconnected; one injured.

*February 24, 1938, locomotive 9306, Little Rock, Ark. Water-spout hook straightened out and separated from spout, causing employee to lose his balance and fall from locomotive; one injured.

**March 25, 1938, locomotive 5511, Grande Glaise, Ark. Improperly secured flag box fell from its position on back of cab, over the deck, striking employee; both bolts that secured flag box were broken; one injured.

Three accidents; three injured.

MOBILE & OHIO RAILROAD:

*February 5, 1938, locomotive 404, Vinegar Bend, Ala. Main driving axle broke; old fracture covered approximately 80 percent of cross-sectional area; three injured.

One accident; three injured.

NASHVILLE, CHATTANOOGA & ST. LOUIS RAILWAY:

June 11, 1938, locomotive 657, Kingston, Ga. Stoker inoperative account of a piece of metal in coal supply having lodged in stoker elevator; one injured.

One accident; one injured.

NEW YORK CENTRAL SYSTEM:

**July 10, 1937, locomotive 1629, Quincy, Ohio. Burned by hot water which blew out of steam heat pipe; steam heat throttle valve leaking; one injured.

**July 27, 1937, locomotive (P. & E.) 23, Pekin, Ill. Lug on upper section of vertical fire door slipped out of slot in operating lever, permitting section of fire door to fall; fire door operating mechanism loose on frame; one injured.

**July 29, 1937, locomotive 6713, Weehawken, N. J. Angle cock blew off brake pipe at rear of tender; threads on brake pipe defective and angle cock had been screwed onto pipe only 1½ threads; one injured.

*August 22, 1937, locomotive 2972, Hoffmans, N. Y. Sand pipes stopped up; one injured.

*August 29, 1937, locomotive 2958, Lydick, Ind. Cab window broke; one injured.

November 23, 1937, locomotive 2852, Toledo, Ohio. Precision reversing gear stuck in central position and when released the handwheel spun rapidly and struck employee; one reversing gear counterbalance spring pocket bolt was missing and the other bolt was loose, permitting spring pocket to swing out of position and foul on adjusting screw nut; one injured.

November 25, 1937, locomotive (B. & A.) 502, Newton, Mass. Piece of sheet metal which had been applied to close a gap between the main section of running board and the boiler broke off where welded to main section of running board and struck passenger coach of a meeting train; running board extension not securely fastened with bolts, rivets, or studs in accordance with the requirements; two injured.

*January 2, 1938, locomotive 5366, Barrytown, N. Y. Cab window glass broke; one injured.

**March 9, 1938, locomotive 5300, Rensselaer, N. Y. Stoker slide hook broke; one injured.

May 16, 1938, locomotive 7796, Selkirk, N. Y. Throttle stuck open and employee jumped from moving locomotive when collision appeared evident. Parts not held intact for Federal examination; however, throttle valve was being ground when Federal investigation was made on May 21; one injured.

June 23, 1938, locomotive 5264, Brocton, N. Y. Precision type reversing gear handwheel spun when forced, resulting in injury to engineman; link block seized in link and link block pin seized in block and sheared off; one injured. Eleven accidents; 12 injured.

NEW YORK, NEW HAVEN & HARTFORD RAILROAD:

*July 17, 1937, locomotive 3329, Readville, Mass. Stay bolt blew out; stay bolt fractured and welding on stay bolt sleeve defective; one injured.

*January 13, 1938, locomotive 1380, Thompsonville, Conn. Shattered glass from broken cab storm window struck employee, resulting in the loss of one eye; one injured.

**March 12, 1938, locomotive 3308, Brocton, Mass. Stoker conveyor stalled, due to pin which connected stoker engine drive shaft to stoker working out; one injured.

*May 9, 1938, locomotive 3409, South Providence, R. I. Insufficient clearance between handhold and deck of engine while on curve; one injured.

June 9, 1938, locomotive 1326, Meriden, Conn. Sprained shoulder while handling throttle; one injured.

June 24, 1938, locomotive 3326, East Haven, Conn. Piston rod broke, knocking out front cylinder head; break in piston rod was about 70 percent old fracture; one injured.

Six accidents; six injured.

NEW YORK, ONTARIO & WESTERN RAILWAY:

*October 28, 1937, locomotive 242, Cadosia, N. Y. Injured while adjusting brake on locomotive; one injured.

**January 30, 1938, locomotive 453, Middletown, N. Y. Air compressor throttle valve inoperative from cab due to extension handle ahead of supporting pipe being badly bent. While descending from running board after opening the throttle valve, employee fell due to the failure of handrail; handrail column stud near splice in handrail pulled out of smokebox ring and splice gave way; threads on column stud and in smokebox ring were stripped and rivet for securing the splice at one end was missing; one injured.

Two accidents; two injured.

NORFOLK & WESTERN RAILWAY:

**July 12, 1937, locomotive 1116, Cincinnati, Ohio. Fireman's shovel struck on bulged edge of seam in shoveling sheet; one injured.

**August 27, 1937, locomotive 2012, Roanoke, Va. Precision type reversing gear caught in central position and then released suddenly, permitting hand wheel to revolve rapidly and handle to strike employee; auxiliary reach rod, with valve gear in central position, fouled on top of opening where it passed through high pressure cylinder saddle; one injured.

November 9, 1937, locomotive 2005, near Kermit, W. Va. Main rod broke due to old fracture at bolt hole; one injured.

November 15, 1937, locomotive 1451, Giatto, W. Va. Sand pipe out of line with rail; sand pipe clamp and union loose; one injured.

**January 29, 1938, locomotive 2095, Lowry, Va. Blow-off cock leaking; lost motion in blow-off cock rigging prevented blow-off cock from being completely closed from the cab; one injured.

Five accidents; five injured.

NORTHERN PACIFIC RAILWAY:

August 8, 1937, locomotive 1579, Elk River, Minn. Reverse lever latch became disengaged from quadrant and reverse lever moved forward rapidly, striking employee's arm; teeth on reverse lever latch and quadrant worn; one injured.

*December 10, 1937, locomotive 2163, Syre, Minn. Steam hose burst back of tender; one injured.

**March 30, 1938, locomotive 1123, Seattle, Wash. Insufficient clearance between cab apron and handhold at gangway when on sharp curve; one injured. Three accidents; three injured.

PENNSYLVANIA RAILROAD:

August 7, 1937, locomotive 3522, Jersey City, N. J. Pipe union stud connecting air compressor governor pipe to main air reservoir pulled out of reservoir; threads on stud and in reservoir were flattened. Engineer was fatally shocked and burned while on cab roof in electrified territory for the purpose of closing a defective air compressor starting valve before attempting repairs; threads on air compressor starting valve stem were badly stripped and distorted and valve was inoperative when the locomotive was dispatched; one injured.

August 14, 1937, locomotive 6829, Barberton, Ohio. Sanders inoperative, due to sand trap passages being stopped up with wooden sticks and lumps of hard packed sand; one injured.

November 22, 1937, locomotive 6881, Sewickley, Pa. Side rod broke; old defect covered 20 percent of cross-sectional area at point of failure; wedges, driving-box pounds, and brake hangers fouling on side rods were reported numerous times in the 30 days preceding the accident; one injured.

December 26, 1937, locomotive 8014, East Brady, Pa. Air compressor stopped. When going from cab to examine the compressor, employee lost his hold on hand-rail and fell to the ground; handrail was obstructed by cab window awning frames which were badly bent; one injured.

December 26, 1937, locomotive 3204, Pittsburgh, Pa. Fire tube broke off at front flue sheet due to being badly eroded; one injured.

January 12, 1938, locomotive 4371, near Ravenna, Ohio. Crown sheet failure caused by overheating due to low water; one killed, one injured.

January 17, 1938, locomotive 6935, Bailey, Pa. Bulkhead doorkeeper became disengaged from hasp staple, due to having been improperly applied, allowing bulkhead door to swing open and strike employee; one injured.

January 19, 1938, locomotive 527, Philadelphia, Pa. Fire tube failed at safe end weld near front flue sheet; overheated in welding; excessive openings around stoker elevator distributor tubes at boiler head were contributory to the injuries sustained; one injured.

**February 10, 1938, locomotive 396, Jersey City, N. J. Driving spring equalizer hanger broke at gib hole; old fracture at point of failure; one injured.

February 14, 1938, locomotive 903, King of Prussia, Pa. Side rod broke due to old fracture starting at inside top edge of rod; one injured.

March 2, 1938, locomotive 7793, Cleveland, Ohio. Sand did not flow properly from sand pipe, permitting locomotive to slip badly; sanders reported on February 19, 23, and 25 (two times); one injured.

March 22, 1938, locomotive 1440, Vandergrift, Pa. Air pump groaning, due to lack of lubrication; air pump packing was reported leaking on March 14 and 19; one injured.

March 23, 1938, locomotive 6881, Heinz, Pa. Air compressor groaning badly, caused by lack of lubrication; "Piston packing leaking in air end of air pump" was reported on March 22 and five other similar reports were made during the 10 days preceding the accident; one injured.

March 27, 1938, locomotive 4270, Glenmont, Ohio. Front coupler pocket bolts of second locomotive broke, permitting locomotives to separate. After the train stopped by automatic application of the brakes the independent brake on the second locomotive was applied and the double heading cock was cut in, this permitted the brake pipe pressure to build up and release the brakes on the train; the train then moved forward on a 1.25 percent descending grade and collided with the leading locomotive, crushing employees who were removing the broken parts; one killed, one injured.

May 12, 1938, locomotive 6390, York, Pa. Bell ringer did not operate properly due to air port and inlet chamber being partially obstructed by thick grease and sediment; one injured.

May 13, 1938, locomotive 6868, Thompsontown, Pa. Rod brasses of left main pin overheated due to dirty grease or grit in same; "Left main engine driving pin running hot" was reported at end of previous trip; one injured.

*May 16, 1938, locomotive 7259, Shenango, Pa. Tender brake beam dropped down and lodged in heel of switch point, causing derailment of 2 locomotives and 10 cars of the next train attempting to pass over this point; two injured.

Seventeen accidents; 2 killed, 18 injured.

PERE MARQUETTE RAILWAY:

June 13, 1938, locomotive 298, Holly, Mich. Left boiler check stuck partly open; "L. boiler check stuck up" was reported on June 6; one injured.

One accident; one injured.

QUINCY RAILROAD:

**September 4, 1937, locomotive 2, near Quincy, Calif. Water glass burst; one injured.

One accident; one injured.

READING COMPANY:

August 21, 1937, locomotive 1414, Philadelphia, Pa. Spark arrester with base attached blew off smokebox; nut missing from one of the two base ring bolts; one injured.

October 13, 1937, locomotive 589, Woodmont, Pa. Blower valve extension handle became disconnected from universal knuckle due to loss of cotter key; lower end of cotter key broke off, permitting the key to work out; one injured. Two accidents; two injured.

RICHMOND, FREDERICKSBURG & POTOMAC RAILROAD:

**August 3, 1937, locomotive 406, Washington, D. C. Steam heat pipe at rear of tender failed; pipe worn due to rubbing on steel end sill; one injured. One accident; one injured.

RUTLAND RAILROAD:

June 26, 1938, locomotive 51, North Lawrence, N. Y. Eccentric blade pin lost out and eccentric blade dropped and was bent, causing reverse lever to unlatch and move violently back and forth; one injured. One accident; one injured.

ST. LOUIS-SAN FRANCISCO RAILWAY:

**February 7, 1938, locomotive (C. of Ga.) 121, Birmingham, Ala. Employee struck his eye on broken handle of injector rod; one injured.

April 17, 1938, locomotive 1012, Joplin, Mo. Trailer box ran hot; journal brass was broken; one injured.

June 22, 1938, locomotive 4152, Afton, Okla. Blow-off cock stuck in open position; booster steam pipe jacket band was fouled and pulled off by backward movement of blow-off cock operating lever, permitting jacket to spread and hold operating lever in open position; one injured. Three accidents; three injured.

ST. LOUIS SOUTHWESTERN RAILWAY:

January 24, 1938, locomotive 658, near Red Fern, Ark. Crosshead arm broke through old fracture which extended over approximately 80 percent of cross-sectional area; crack hidden by fusion welding which had been applied to cover the crack; one injured.

One accident; one injured.

SEABOARD AIR LINE RAILWAY:

August 10, 1937, locomotive 833, near Maxville, Fla. Manually operated reverse lever jerked from employee's control and flew back, striking him; one injured.

November 4, 1937, locomotive 854, near White House, Fla. Reverse lever unexpectedly went to forward motion, catching employee's foot between lever and boiler head; one injured.

December 17, 1937, locomotive 829, Marietta, Fla. Counterbalance spring box broke where bolted to guide yoke brace, permitting counterbalance spring to come out and throw all weight of valve gear on reverse lever which jerked from employee's grasp and caught his foot against boiler head; safety latch on reverse lever quadrant not in place; one injured.

February 1, 1938, locomotive 313, Eldorado, Fla. Apron separated from one side of cab, permitting employee to fall between locomotive and tender; shackles for securing apron failed through old fractures at bolt holes; one injured. Four accidents; four injured.

SOUTHERN RAILWAY SYSTEM:

July 16, 1937, locomotive 1480, Conover, N. C. Main crank pin broke inside wheel fit; old fracture covered about 70 percent of cross-sectional area; one injured.

July 17, 1937, locomotive 6354, near Robbins, Tenn. Locomotive stalled in tunnel due to failure of air compressor; compressor reported on July 5, 6, 11, 15, and 17; one injured.

July 23, 1937, locomotive 537, Hickory, N. C. Injured while adjusting ashpan dump lever lock pin; lock pin not in proper position and not locked; one injured.

**September 23, 1937, locomotive 6038, Danville, Ky. Fire hose burst; one injured.

October 25, 1937, locomotive 6594, near Woodstock, Ala. Crown sheet failure caused by overheating due to low water; one injured.

**October 29, 1937, locomotive 4632, Copper Ridge, Tenn. Boiler check stuck open; boiler check reported on October 3, 6, 7, 20, 23, 28, 29, and 30; one injured.

**January 29, 1938, locomotive 810, Courtland, Va. Right tank hose became disconnected from feed pipe due to clamp working off. After this failure, tank valve was closed and locomotive proceeded with left injector supplying the boiler

until it became inoperative account of opening in lifting steam nozzle being partially closed by a foreign substance and forcer steam nozzle badly worn and out of round; one injured.

February 11, 1938, locomotive 6900, New Orleans, La. Washout plug blew out; plug had not been properly tightened and blew out when attempt was made to tighten it while under steam pressure; one injured.

**February 18, 1938, locomotive 4861, Lake, N. C. Pilot sill step became disengaged and was thrown from locomotive striking track employee; bolts for securing step were broken; one injured.

**February 25, 1938, locomotive 1459, Danville, Va. Employee's foot caught in hole worn in cab curtain, causing him to fall to the ground; one injured.

**May 20, 1938, locomotive 1202, Louisville, Ky. Burned by hot water which blew out of steam heat hose at rear of tender; outer end of steam metallic connection on tender was suspended about 6 inches above horizontal position, causing the water formed by condensation to be trapped in connection and forced outward and upward. Reducing valve reported leaking on May 24, when it was removed and the seats faced and ground in prior to Federal examination; one injured.

June 2, 1938, locomotive 1396, Brown Summit, N. C. Superheater tube burst; tube worn to 0.020 inch in thickness at point of failure due to cinder cutting; one injured.

Twelve accidents; 12 injured.

SOUTHERN PACIFIC—LINES EAST:

December 20, 1937, locomotive (T. & N. O.) 166, Houston, Tex. Plug blew out of end of T connection in blow-off pipe for blow down connection; plug had excessive taper and engaged only two threads of fitting in the T connection; one injured.

December 21, 1937, locomotive 2706, El Paso, Tex. Water glass burst; one injured.

March 16, 1938, locomotive (T. & N. O.) 963, Houston, Tex. Foreign object on running board caused employee to lose his balance and fall to the ground; one injured.

Three accidents; three injured.

SOUTHERN PACIFIC—LINES WEST:

August 30, 1937, locomotive 2748, Gerber, Calif. Fire hose burst; one injured.

October 5, 1937, locomotive 4209, Portland, Ore. Radial stay blew out of crown sheet; threads which screwed into crown sheet were almost entirely wasted away. Employee had calked a leak at this stay and was calking an adjacent stay, while boiler was under pressure, when the failure occurred; one injured.

*January 21, 1938, locomotive 2406, Dixon, Calif. Storm window glass broke; one injured.

**January 26, 1938, locomotive 4417, North Los Angeles, Calif. Metal door in sheeting on side of streamlined locomotive fell from the rapidly moving locomotive; door hinges too small and latch locking device inadequate; one injured.

*March 17, 1938, locomotive 4159, Yuba Pass, Calif. Cab windows broke; cut by shattered glass; one injured.

*March 20, 1938, locomotive 3723, Lagol, Calif. Water box fell from bracket on front of tender; one injured.

*March 28, 1938, locomotive 3216, Roberts, Calif. Employee stumbled over deck floor board which had worked loose and protruded into gangway; one injured.

*April 1, 1938, locomotive 1298, Phoenix, Ariz. Blow-off cock stuck open and could not be closed from inside the cab; one injured.

June 18, 1938, locomotive 4352, Vevay, N. Mex. Trailing truck journal ran hot; "Left trailer warm" was reported at Tucson, Ariz., at 1:20 a. m. on day of accident and "Left trailer running above normal on account of cellar not holding oil. All the oil runs out the back. This trailer has run this way for several trips" was reported at Lordsburg, N. Mex., at 6:27 a. m., and 3 hours later the engineman was injured while extinguishing blaze in the journal box; one injured.

Nine accidents; nine injured.

SPOKANE, PORTLAND & SEATTLE RAILWAY:

*July 23, 1937, locomotive 3051, Benge, Wash. Water spout stuck in tender cistern manhole extension due to tight fit caused by bend in rim of extension; one injured.

One accident; one injured.

TENNESSEE CENTRAL RAILWAY:

*January 7, 1938, locomotive 725, Watertown, Tenn. Mechanically operated fire door failed to open properly; one injured.
One accident; one injured.

TERMINAL RAILROAD ASSOCIATION OF ST. LOUIS:

August 20, 1937, locomotive 139, St. Louis, Mo. Squirt hose separated from nipple; hose not properly clamped; one injured.

October 25, 1937, locomotive 138, St. Louis, Mo. Manually operated reverse lever latch failed to hold and lever unexpectedly moved forward violently; one injured.

Two accidents; two injured.

TEXAS & PACIFIC RAILWAY:

November 24, 1937, locomotive 660, Grand Saline, Tex. Feed water heater condensate return pipe became disconnected at ball joint between locomotive and tender; "Return pipe leaking left side" was reported on November 23; one injured.

June 26, 1938, locomotive 634, Atlanta, Tex. Rivet which supported one end of step on face of tender oil cistern failed, causing employee to fall; rivet had old fracture; one injured.

Two accidents; two injured.

TRONA RAILWAY:

*January 25, 1938, locomotive 2, Searles, Calif. Employee was thrown off balance due to stepping on measuring stick which was being carried on top deck of tank; one injured.

One accident; one injured.

UNION PACIFIC RAILROAD:

**August 16, 1937, locomotive 3916, Parco, Wyo. Driving box became hot; one injured.

September 13, 1937, locomotive 3614, Buford, Wyo. Left No. 4 low pressure driving box ran very hot; driving box reported on August 21 and 28, September 3, 4, 6 (two times), and 12. While putting block under driving spring saddle, employee was burned by discharge from drain pipe to feed water pump auxiliary steam cylinder, due to drain pipe not properly secured in place; one injured.

June 23, 1938, locomotive 9041, Owasco, Nebr. Main rod broke and punctured a large hole in the boiler; old fracture extended approximately 40 percent through cross-sectional area of rod at point of failure; one injured.

Three accidents; three injured.

WHEELING & LAKE ERIE RAILWAY:

November 26, 1937, locomotive 4110, Warmington, Ohio. Reverse lever unlatched and moved to full forward position; reverse lever latch teeth worn and notches in quadrant filled with a hard foreign substance; one injured.

One accident; one injured.

**ACCIDENTS AND CASUALTIES RESULTING FROM THE FAILURE OF
LOCOMOTIVES OTHER THAN STEAM AND THEIR APPURTENANCES
DURING THE FISCAL YEAR ENDED JUNE 30, 1938, BY ROADS**

[A star (*) indicates accident taken from records of the Bureau of Statistics of the Interstate Commerce Commission. A double star (**) indicates accident not properly reported, as required by rule 335. A complete investigation, therefore, could not be made, inasmuch as the Bureau was not apprised of the accidents in sufficient time after they occurred to permit them to be properly investigated.]

ERIE RAILROAD:

October 28, 1937, unit 19, New York, N. Y. Air pressure starting device failed to start engine; injured while using starting bar; one injured.

One accident; one injured.

ILLINOIS CENTRAL RAILROAD SYSTEM:

**December 11, 1937, unit 9000, Chicago, Ill. Footboard tread broke; one injured.

One accident; one injured.

ILLINOIS TERMINAL RAILROAD:

*August 14, 1937, unit 1577, Mindale, Ill. Fire caused by defective contactor; one injured.

One accident; one injured.

INTERNATIONAL-GREAT NORTHERN RAILROAD:

March 2, 1938, unit (N. O. T. & M.) 502, near Tyler, Tex. Explosion in motor crank case blew improperly fastened inspection plates from one side and the escaping flames passed into the cab and burned engineman; one foul spark plug (cylinder not firing) and worn cylinders and piston rings permitted gas mixture to accumulate in crank case which was ignited by overheated connecting rod bearings; worn main crank shaft bearings permitted oil to escape and caused a lack of lubrication of the connecting rod bearings; one injured.

One accident; one injured.

TABLE XII.—Number of steam locomotives inspected,

Table with 13 columns for locomotive lines and 63 rows for parts defective. Includes summary rows for 'Number of defects', 'Locomotives reported', 'Locomotives inspected', etc.

found defective, and ordered from service, etc.

Table with 13 columns for locomotive lines and 63 rows for parts defective. Includes summary rows for 'Number of defects', 'Locomotives reported', 'Locomotives inspected', etc.

TABLE XII.—Number of steam locomotives inspected, found defective, and ordered from service, etc.—Continued

Table with multiple columns for locomotive parts (e.g., Air compressors, Arch tubes, Ashpans) and rows for various railroad lines (e.g., Chicago River & Indiana, Delaware & Hudson). Includes summary rows for 'Locomotives reported', 'Locomotives inspected', 'Locomotives defective', 'Percentage of inspected found defective', and 'Locomotives ordered out of service'.

1 Atchison, Topeka & Santa Fe.

TABLE XII.—Number of steam locomotives inspected.

Table with 14 columns for locomotive parts and 14 columns for inspection locations. Rows list parts like Air compressors, Arch tubes, Ash pans, etc., and their counts across various regions.

found defective, and ordered from service, etc.—Continued

Table with 21 columns for locomotive parts and 21 columns for inspection locations. Rows list parts like Air compressors, Arch tubes, Ash pans, etc., and their counts across various regions.

TABLE XII.—Number of steam locomotives inspected,

Table with 10 columns for railway lines and rows for parts defective, inoperative or missing. Total rows: 63. Summary rows at bottom include: Locomotives reported, Locomotives inspected, Locomotives defective, etc.

found defective, and ordered from service, etc.—Continued

Continuation of Table XII with 10 columns for railway lines and rows for parts defective. Total rows: 63. Summary rows at bottom include: 966, 931, 1,667, 272, etc.

TABLE XII.—Number of steam locomotives inspected,

found defective, and ordered from service, etc.—Continued

Table with 12 columns for locomotive divisions and 62 rows of defect categories. The 'Number of defects' row shows totals for each category across divisions.

Continuation of Table XII with 12 columns for locomotive divisions and 62 rows of defect categories. The 'Number of defects' row shows totals for each category across divisions.

TABLE XIII.—Summary of comparison of the percentage of steam locomotives inspected and found defective, with the number ordered out of service for the years ended June 30, on roads reporting on 10 or more locomotives—Continued

Road	Percentage inspected defective							Ordered out of service						
	1938	1937	1931	1929	1927	1925	1923	1938	1937	1931	1929	1927	1925	1923
Patapsco & Back Rivers.....	17	3.7	0	50	47	44	60	0	0	0	1	1	0	1
Pennsylvania.....	8	11	10	33	44	61	76	36	61	33	153	335	573	687
Pennsylvania-Reading Seashore Lines.....	18	12						0	0					
Peoria & Pekin Union.....	11	18	40	14	23	31	54	0	0	0	0	0	1	1
Pere Marquette.....	3.2	9	12	21	38	57	83	0	2	3	8	14	21	68
Philadelphia, Bethlehem & New England.....	29	24	21	65	74	76	67	4	3	1	16	14	2	2
Pittsburgh & Lake Erie.....	12	24	1.9	6	12	10	27	2	0	0	0	0	0	10
Pittsburg & Shawmut.....	4	2.8	4	4	0	47	52	0	0	0	0	0	0	2
Pittsburgh & West Virginia.....	17	27	32	57	39	0	33	2	21	4	30	8	0	0
Pittsburgh, Chartiers & Youghiogheny.....	5							0						
Pittsburg, Shawmut & Northern Quebec Central.....	6	0	3.6	8	25	53	86	1	0	0	1	2	0	0
Reading.....	50	67	0	100				0	0	0	0			
Richmond, Fredericksburg & Potomac.....	7	8	13	33	42	48	59	2	5	5	31	22	26	12
Rio Grande Southern.....	19	17	14	18	30	43	58	1	2	0	1	1	2	3
River Terminal.....	57	84	0	0	70	62	100	2	2	0	0	8	8	2
Rutland.....	50	77	0	71	43	70	0	2	7	0	5	1	0	0
St. Louis-San Francisco.....	8	8	6	6	12	44	54	0	0	0	0	1	3	1
St. Louis Southwestern.....	3.4	4.8	3.9	14	22	49	88	3	1	1	7	12	65	346
San Diego & Arizona Eastern.....	9	12	8	4.3	22	47	86	3	6	4	2	22	14	54
Savannah & Atlanta.....	13	15	13	38	30	55	44	0	0	2	4	3	0	1
Seaboard Air Line.....	19	7	19	80	67	73	68	0	0	0	0	0	2	3
Seaboard Buffalo.....	6.2	7	9	37	56	51	55	11	5	2	24	43	33	23
Southern Pacific lines east.....	27	18	39	23	29	75	0	1	1	8	0	1	0	0
Southern Pacific, lines west.....	1.7	2.8	3.3	5	13	30	47	1	2	1	3	10	37	28
Southern Pacific, of Mexico.....	15	21	11	24	27	33	38	10	71	13	47	50	51	24
Southern.....	100	57	0	30	100	100		11	1	0	2	3	1	0
Spokane International.....	9	12	9	12	24	36	59	20	44	15	13	38	56	177
Spokane, Portland & Seattle.....	8	0	9	13	28	0	37	0	0	0	0	0	0	2
Steelton & Highspire.....	17	16	22	22	33	32	60	1	2	1	1	2	4	13
Tennessee Central.....	23	15	19	24	48			0	0	1	0	2		
Tennessee Coal, Iron & Railroad.....	25	24	14	47	65	74	89	7	5	0	14	40	23	63
Terminal Railroad Association of St. Louis.....	15	20	7	38	67	40	50	0	0	0	0	0	0	0
Texas & Pacific.....	19	32	32	41	44	62	76	2	10	4	0	3	1	6
Texas-Mexican.....	1	5	0	1	12	16	62	0	1	0	1	3	1	91
Texas Pacific-Missouri Pacific of New Orleans.....	12	13	27	43	59	33	50	0	0	0	0	1	0	1
Toledo, Peoria & Western.....	14	12	0	4	10	57	83	0	0	0	0	0	2	0
Toledo Terminal.....	6	0	25	65	88	87	93	0	0	2	4	7	2	4
Toronto, Hamilton & Buffalo.....	0	0	5	45	35	3	41	0	0	0	0	0	0	3
Union Pacific ¹¹	0	0	0	0	0			0	0	0	0	0	0	0
Union.....	12	14	9	17	20	30	41	14	24	2	8	17	19	26
Upper Merion & Plymouth.....	9	3.2	11	9	29	80	10	0	0	1	2	0	0	2
Utah.....	30	22	28	60	62			9	6	0	7	8		
Virginian.....	0	0	0	11	4	25	19	0	0	0	0	0	0	0
Wabash.....	35	37	17	22	50	58	75	10	4	1	0	2	5	45
Washington Terminal.....	.8	1.4	0	1.5	6	47	82	1	1	0	1	2	21	89
Western Maryland.....	20	0	0	10	43	40	89	0	0	0	0	1	1	2
Western Pacific.....	3.9	6	13	26	42	54	78	0	3	1	3	13	22	90
Wheeling & Lake Erie.....	6	9	16	25	19	36	37	0	2	5	9	1	13	9
Wrightsville & Tennille.....	13	16	8	42	55	67	74	4	6	1	7	10	20	31
Less than 10, discontinued roads, and industrial locomotives.....	0							0						
All roads.....	23	27	32	40	51	56	56	95	136	241	394	709	795	612

¹¹ Includes Los Angeles & Salt Lake, Oregon Short Line, Oregon-Washington Railroad & Navigation, and St. Joseph & Grand Island, last 6 months 1936-38.

Fractional percentages not shown unless percent defective is less than 5, otherwise nearest whole number is given.

NOTE.—Omitted statistics not comparable, due to consolidations, separations, changes in corporate identity, carrier not in existence in year shown, less than 10 locomotives, etc.

ILLUSTRATIONS OF LOCOMOTIVE BOILER EXPLOSIONS OR CROWN SHEET FAILURES AND LOCOMOTIVE DEFECTS