

INTERSTATE COMMERCE COMMISSION

TWENTY-FOURTH ANNUAL REPORT
OF THE
CHIEF INSPECTOR
BUREAU OF LOCOMOTIVE INSPECTION
TO THE
INTERSTATE COMMERCE COMMISSION

FISCAL YEAR ENDED
JUNE 30, 1935



UNITED STATES
GOVERNMENT PRINTING OFFICE
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ANNUAL REPORT OF THE CHIEF INSPECTOR BUREAU OF LOCOMOTIVE INSPECTION

OCTOBER 1, 1935.

To the Interstate Commerce Commission:

In compliance with section 7 of the act of February 17, 1911, as amended, the Twenty-fourth Annual Report of the Chief Inspector, covering the work of the Bureau during the fiscal year ended June 30, 1935, 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.

TABLE I.—*Reports and inspections—Steam locomotives*

	Year ended June 30—					
	1935	1934	1933	1932	1931	1930
Number of locomotives for which reports were filed . . .	51,283	54,283	58,971	59,110	60,841	61,947
Number inspected	94,151	89,716	87,658	96,924	101,224	100,794
Number found defective	11,071	10,713	8,388	7,724	10,277	16,300
Percentage inspected found defective	12	12	10	8	10	16
Number ordered out of service	921	754	544	527	688	1,200
Total number of defects found	44,491	43,271	32,733	27,832	36,968	60,292

REPORT OF THE CHIEF INSPECTOR OF LOCOMOTIVES

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

	Year ended June 30—					
	1935	1934	1933	1932	1931	1930
Number of accidents.....	201	192	157	145	230	295
Percent increase or decrease from previous year.....	1 4.7	1 22.3	1 8.3	36.9	22	17.1
Number of persons killed.....	29	7	8	9	16	13
Percent increase or decrease from previous year.....	1 314.3	12.5	11.1	43.7	1 23	31.6
Number of persons injured.....	267	223	256	156	269	320
Percent increase or decrease from previous year.....	1 19.7	12.9	1 64.1	42	15.9	17.9

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—							
	1935	1934	1933	1932	1931	1930	1915	1912
Number of accidents.....	68	63	53	43	91	105	424	856
Number of persons killed.....	24	4	3	8	15	12	13	91
Number of persons injured.....	119	77	55	46	122	113	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—									
	1935		1934		1933		1932		1931	
	Killed	In-jured	Killed	In-jured	Killed	In-jured	Killed	In-jured	Killed	In-jured
Members of train crews:										
Engineers.....	7	65	1	57	2	58	3	59	5	73
Firemen.....	4	70	1	73	1	48	4	49	5	75
Brakemen.....	2	26	1	32		17	2	18		39
Conductors.....		10	1	17		10		7		21
Switchmen.....		3		6		8		3		8
Roundhouse and shop employees:										
Boiler makers.....		6		2		1		1		3
Machinists.....	1	3		6		2		1	1	4
Foremen.....		2							2	3
Inspectors.....		1		3		1				
Watchmen.....	1	1	1	4	2	3		1		6
Boiler washers.....						1				
Hostlers.....		3	1	5				5		4
Other roundhouse and shop employees.....		6		1		3		4	2	6
Other employees.....	14	49	1	4		2		2		6
Nonemployees.....		22		14	3	102		6	1	22
Total.....	29	267	7	223	8	256	9	156	16	269

REPORT OF THE CHIEF INSPECTOR OF LOCOMOTIVES

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

	Year ended June 30—				
	1935	1934	1933	1932	1931
Number of locomotive units for which reports were filed.....	1,911	1,288	1,349	1,274	1,242
Number inspected.....	1,620	1,436	1,363	1,411	1,256
Number found defective.....	146	69	74	57	75
Percentage inspected found defective.....	9	5	5	4	6
Number ordered out of service.....	5	4	4	6	3
Total number of defects found.....	447	158	176	126	192

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

	Year ended June 30—				
	1935	1934	1933	1932	1931
Number of accidents.....	8	1	2	2	5
Number of persons killed.....					1
Number of persons injured.....	8	1	2	2	5

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

	Year ended June 30—									
	1935		1934		1933		1932		1931	
	Killed	In-jured	Killed	In-jured	Killed	In-jured	Killed	In-jured	Killed	In-jured
Members of train crews:										
Engineers.....		3						1		1
Firemen.....		1				2			1	1
Brakemen.....		1								2
Roundhouse and shop employees:										
Inspectors.....										
Other roundhouse and shop employees.....		2		1						1
Other employees.....								1		
Nonemployees.....		1								
Total.....	8		1		2		2	1		5

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—														
	1935			1934			1933			1932			1931		
	Accidents	Killed	Injured	Accidents	Killed	Injured	Accidents	Killed	Injured	Accidents	Killed	Injured	Accidents	Killed	Injured
Air reservoirs	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Aprons	3	1	3	6	6	6	1	1	1	1	1	3	3	3	3
Arch tubes	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Ash-pan blowers	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Axles	3	20	2	2	2	2	2	2	2	2	2	2	2	2	2
Blow-off cocks	6	6	6	5	5	5	8	3	16	1	1	6	5	5	8
Boiler checks	2	2	2	4	4	4	4	4	8	1	1	1	1	1	1
Boiler explosions:															
A. Shell explosions															
B. Crown sheet; low water; no contributory causes found	6	17	52	6	4	18	5	2	6	5	5	6	10	7	32
C. Crown sheet; low water; contributory causes or defects found	5	4	8	1	1	3				1	3	3	3	8	8
D. Miscellaneous fire-box failures	1	3	1	1	1	1				2	2	1	1	1	1
Brakes and brake rigging	8	1	8	7	7	11	5	5	10		11	8	8	9	10
Couplers	6	6	7	9	10	10	8	3	4		4	9	1	1	9
Crank pins, collars, etc.	6	6	6	2	2	2	2	1	2		4	7	4	4	4
Crossheads and guides	2	2	2	2	2	2	3	1	2		2	4	4	4	4
Cylinder cocks and rigging	2	2	2	3	3	3	4		87		3	3	3	3	3
Cylinder heads and steam chests	2	2	2	3	3	3	4		87		1	1	1	1	1
Dome caps	1	1	1	1	1	1	1		1		1	1	1	1	1
Draft appliances	1	1	1	1	1	1	1		1		1	1	1	1	1
Draw gear	1	1	1	1	1	1	1		1		1	1	1	1	1
Fire doors, levers, etc.	1	1	1	4	4	4	5		3		2	2	2	2	2
Flues	3	3	3	4	4	4	5		6		4	4	13	13	13
Flue pockets	6	6	6	3	3	3	2		2		2	4	4	4	4
Footboards	1	1	1	1	1	1	1		1		1	1	1	1	1
Gauge cocks	4	4	4	4	4	4	4		4		4	4	4	4	4
Grease cups	7	7	7	7	7	7	7		7		7	7	7	7	7
Grate shakers	7	7	7	7	7	7	7		7		7	7	7	7	7
Handholds	1	1	1	1	1	1	1		1		1	1	1	1	1
Headlights and brackets	1	1	1	1	1	1	1		1		1	1	1	1	1
Injectors and connections (not including injector steam pipes)	6	2	1	1	1	1	1		1		1	1	1	1	1
Injector steam pipes	1	6	3	3	3	3	2		2		3	3	3	3	3
Lubricators and connections	1	1	1	1	1	1	1		1		1	1	1	1	1
Lubricator glasses	1	1	1	1	1	1	1		1		1	1	1	1	1
Patch bolts	1	1	1	1	1	1	1		1		1	1	1	1	1
Pistons and piston rods	1	1	1	1	1	1	1		1		1	1	1	1	1
Plugs, arch tube and washout	1	2	2	2	2	2	2		2		1	5	5	5	5
Plugs in fire-box sheets	1	1	1	1	1	1	1		1		1	1	1	1	1
Reversing gear	17	17	13	14	8	8	12		12		12	12	12	12	12
Rivets	2	3	3	3	3	3	3		3		3	3	3	3	3
Rods, main and side	5	5	10	12	3	3	8		9		4	4	4	4	4
Safety valves	1	1	1	1	1	1	1		1		1	1	1	1	1
Sanders	1	1	3	1	2	2	2		2		3	3	3	3	3
Side bearings	1	1	1	1	1	1	1		1		1	1	1	1	1
Springs and spring rigging	2	2	3	3	2	2	3		3		4	4	4	4	4
Squirt hose	12	12	9	10	4	4	10		10		7	7	7	7	7
Stay bolts	1	1	1	1	1	1	1		1		1	1	1	1	1
Steam piping and blowers	1	1	1	1	1	1	1		1		1	1	1	1	1
Steam valves	1	1	1	1	1	1	1		1		1	1	1	1	1
Studs	1	1	1	1	1	1	1		1		1	1	1	1	1
Superheater tubes	1	1	1	1	1	1	1		1		1	1	1	1	1
Throttle glands	1	1	1	1	1	1	1		1		1	1	1	1	1
Throttle leading	1	1	1	1	1	1	1		1		1	1	1	1	1
Throttle rigging	1	1	1	1	1	1	1		1		1	1	1	1	1
Trucks, leading, trailing or tender	1	1	1	1	1	1	1		1		1	1	1	1	1
Valve gear, eccentrics and rods	5	5	2	2	2	2	4		4		3	3	3	3	3
Water glasses	8	8	11	11	11	11	7		7		6	6	6	6	6
Water-glass fittings	1	1	1	1	1	1	1		1		1	1	1	1	1
Wheels	1	1	1	1	1	1	1		1		1	1	1	1	1
Miscellaneous	47	2	45	46	47	33	1		32		29	49	1	1	1
Total	201	29	267	192	7	223	157		8		256	145	9	156	230

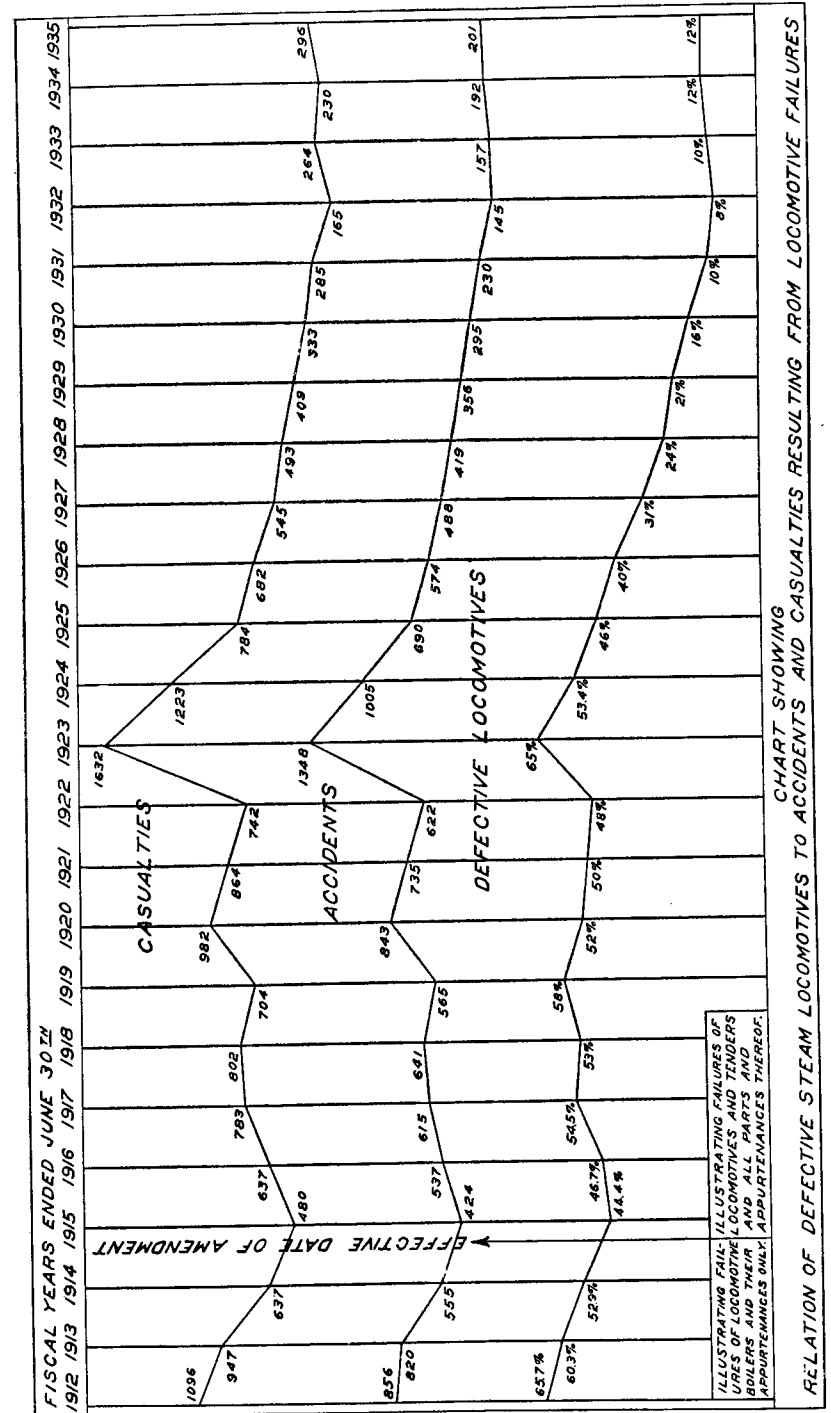


TABLE IX.—Accidents and casualties resulting from failures of locomotives other than steam, and their appurtenances

Part or appurtenance which caused accident	Year ended June 30—														
	1935			1934			1933			1932			1931		
	Accidents	Killed	Injured	Accidents	Killed	Injured	Accidents	Killed	Injured	Accidents	Killed	Injured	Accidents	Killed	Injured
Circuit breakers.....															
Insulation.....	1		1	1		1		1				1	1		
Pantographs and trolleys.....	1		1									1	1		1
Third-rail shoes.....										1		1			1
Transformers.....															
Miscellaneous.....	6		6			1		1					3		4
Total.....	8		8	1		1	2		2	2		2	5	1	5

TABLE X.—Number of steam locomotives reported, inspected, found defective, and ordered from service

Parts defective, inoperative or missing, or in violation of rules	Year ended June 30—					
	1935	1934	1933	1932	1931	1930
1. Air compressors.....						
2. Arch tubes.....	733	660	474	417	481	873
3. Ash pans and mechanism.....	74	127	51	54	60	87
4. Axles.....	94	87	40	69	81	76
5. Blow-off cocks.....	10	6	21	13	10	12
6. Boiler checks.....	283	289	210	144	191	325
7. Boiler shell.....	413	407	293	214	263	521
8. Brake equipment.....	396	372	296	220	430	579
9. Cabs, cab windows, and curtains.....	2,449	2,326	1,696	1,645	1,923	2,706
10. Cab aprons and decks.....	1,273	1,342	1,183	851	1,484	3,066
11. Cab cards.....	368	343	309	262	415	710
12. Coupling and uncoupling devices.....	142	129	121	162	211	226
13. Crossheads, guides, pistons, and piston rods.....	73	54	67	85	98	122
14. Crown bolts.....	1,086	1,100	773	763	856	1,421
15. Cylinders, saddles, and steam chests.....	75	77	67	50	96	95
16. Cylinder cocks and rigging.....	1,547	1,491	1,084	841	1,265	2,311
17. Domes and dome caps.....	627	654	374	376	411	848
18. Draft gear.....	94	105	76	45	83	154
19. Draw gear.....	423	401	318	325	568	950
20. Driving boxes, shoes, wedges, pedestals, and braces.....	414	480	357	371	640	1,003
21. Fire-box sheets.....	1,573	1,472	1,080	821	925	1,359
22. Flues.....	343	356	246	235	341	471
23. Frames, tail pieces, and braces, locomotive.....	173	203	150	120	187	254
24. Frames, tender.....	1,006	951	669	611	740	1,271
25. Gages and gage fittings, air.....	124	128	80	86	105	177
26. Gage and gage fittings, steam.....	275	212	145	156	192	290
27. Gage cocks.....	320	289	258	214	324	553
28. Grate shakers and fire doors.....	480	384	388	330	415	783
29. Handholds.....	394	404	245	288	410	767
30. Injectors, inoperative.....	464	377	363	382	562	865
31. Injectors, connections.....	39	33	20	31	55	103
32. Inspections and tests not made as required.....	2,035	1,909	1,357	1,168	1,815	3,275
33. Lateral motion.....	8,344	8,173	6,358	3,801	4,862	7,456
34. Lights, cab and classification.....	389	351	269	237	289	372
35. Lights, headlight.....	81	79	76	55	77	119
36. Lubricators and shields.....	257	218	169	119	180	373
37. Mud rings.....	191	215	157	119	176	312
38. Packing nuts.....	241	247	232	166	318	445
39. Packing, piston rod, and valve stem.....	527	491	419	402	523	828
40. Pilots and pilot beams.....	906	833	592	444	706	1,429
41. Plugs and studs.....	152	174	123	145	160	272
42. Reversing gear.....	167	242	151	176	182	348
43. Rods, main and side, crank pins, and collars.....	414	390	254	202	299	579
44. Safety valves.....	1,826	1,670	1,327	1,256	1,520	2,488
45. Sanders.....	100	108	53	63	61	116
46. Springs and spring rigging.....	779	697	376	289	314	804
47. Squirt hose.....	2,765	2,854	2,122	1,851	2,161	3,311
48. Stay bolts.....	113	107	93	96	184	313
49. Stay bolts, broken.....	240	285	219	181	293	395
	512	455	368	552	938	1,098

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

Parts defective, inoperative or missing, or in violation of rules	Year ended June 30—					
	1935	1934	1933	1932	1931	1930
50. Steam pipes.....	463	489	388	285	512	730
51. Steam valves.....	212	267	193	143	226	399
52. Steps.....	640	567	498	622	676	1,021
53. Tanks and tank valves.....	913	862	600	587	732	1,426
54. Telltale holes.....	102	93	90	108	151	183
55. Throttle and throttle rigging.....	733	639	448	434	574	1,175
56. Trucks, engine and trailing.....	811	898	664	648	714	1,141
57. Trucks, tender.....	1,120	918	747	766	1,059	1,531
58. Valve motion.....	799	784	640	520	497	827
59. Washout plugs.....	679	776	623	599	815	1,283
60. Train-control equipment.....	4	8	4	13	9	48
61. Water glasses, fittings, and shields.....	951	907	716	676	955	1,501
62. Wheels.....	697	734	580	603	750	1,025
63. Miscellaneous—Signal appliances, badge plates, brakes (hand).....	563	572	423	325	418	691
Total number of defects.....	44,491	43,271	32,733	27,832	36,968	60,292
Locomotives reported.....	51,283	54,283	56,971	59,110	60,841	61,947
Locomotives inspected.....	94,151	89,716	87,658	96,924	101,224	100,794
Locomotives defective.....	11,071	10,713	8,388	7,724	10,277	16,300
Percentage of inspected found defective.....	12	12	10	8	10	16
Locomotives ordered out of service.....	921	754	544	527	688	1,200

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

Parts defective, inoperative or missing, or in violation of rules	Year ended June 30—					
	1935	1934	1933	1932	1931	1930
Air compressors.....	5	3	2	3	4	5
Axles.....	1					
Batteries.....	7					2
Boilers.....	3	1				
Brake equipment.....	46	15	16	13	23	40
Cabs and cab windows.....	33	9	14	6	10	14
Cab floors, aprons, and deck plates.....	6	1	1	2	1	2
Controllers, relays, circuit breakers, and switch groups.....		5			3	
Current-collecting apparatus.....	3	3	2	7		7
Draft gear.....	21	8	8	13	11	17
Draw gear.....				2		1
Driving boxes, shoes, wedges, pedestals, and pedestal braces.....	5	7		4	6	1
Frames, tail pieces, and braces.....	4	6	2		2	3
Fuel tank, its piping and valves.....	15	4	1	3	3	15
Gages and gage fittings, air.....	4		2	3	1	5
Gears and pinions.....		1				3
Handholds.....	3					
High-tension equipment not properly guarded against accidental contact.....	7			2	4	7
Inspections and tests not made as required.....	124	52	58	23	41	45
Insulation.....	8	2	2			1
Internal-combustion engine defects, including parts and appliances.....	4	4	18		1	2
Jack shafts.....			1		2	4
Lateral motion, wheels.....		3		2	1	3
Lights, cab and classification.....	1			4	3	7
Lights, headlight.....	2		3	1	3	3
Meters, volt and ampere.....					2	2
Motors and generators.....	5	4	8	1	10	23
Pilots and pilot beams.....	5		4		2	4
Quills.....					1	
Rods, motor, main and side, drive shafts.....	10	4	2		1	1
Sanders.....	21	2			4	8
Springs and spring rigging, driving and truck.....	20	4	8	9	10	21
Steam pipes.....					1	
Switches, band-operated, and fuses.....	2	1	4		1	
Transformers, resistors, and rheostats.....	1	1		2		
Trucks.....	46	3	7	5	11	11

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—					
	1935	1934	1933	1932	1931	1930
Water glasses, fittings, and shields.....	6			1		
Wheels.....	6	8	5	11	12	5
Whistles, bells, and train-signal system.....					2	1
Miscellaneous.....	25	7	7	9	16	26
Total defects.....	449	158	176	126	192	289
Locomotive units reported.....	1,911	1,288	1,349	1,274	1,242	1,135
Locomotive units inspected.....	1,620	1,436	1,368	1,411	1,256	1,306
Locomotive units defective.....	146	69	74	57	75	120
Percentage inspected found defective.....	9	5	5	4	6	9
Locomotive units ordered out of service.....	5	4	4	6	3	6

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 accident investigation reports were furnished to parties interested when requested, and otherwise used in our effort to bring about a diminution in the number of such accidents.

A summary of all accidents and casualties to persons occurring in connection with steam locomotives compared with the previous year shows an increase of 4.7 percent in the number of accidents, an increase of 314.3 percent in the number of persons killed, and an increase of 19.7 percent in the number of persons injured.

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 12 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 as compared with 12 percent in the previous year, 10 percent in the year ended June 30, 1933, and 8 percent in the year ended June 30, 1932. There was an increase of 22 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.

BOILER EXPLOSIONS CAUSED BY CROWN SHEET FAILURES

Boiler explosions caused by crown sheet failures continue to be the most prolific source of fatal accidents. There was an increase of 4 accidents, an increase of 17 in the number of persons killed, and an increase of 39 in the number of persons injured from this cause, as compared with the previous year.

EXTENSION OF TIME FOR REMOVAL OF FLUES

One thousand four hundred and one applications were filed for extensions of time for removal of flues, as provided in rule 10. Our investigations disclosed that in 84 of these cases the condition of the locomotives was such that extensions could not properly be granted. One hundred twenty-nine were in such condition that the full extensions requested could not be authorized, but extensions for shorter periods of time were allowed. One hundred forty-one extensions were granted after defects disclosed by our investigations were required to be repaired. Twenty applications were canceled for various reasons. One thousand twenty-seven applications were granted for the full periods requested.

SPECIFICATION CARDS AND ALTERATION REPORTS

Under rule 54 of the Rules and Instructions for Inspection and Testing of Steam Locomotives, 209 specification cards and 3,185 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, 308 specifications and 29 alteration reports were filed for locomotive units and 92 specifications and 62 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.

A. G. PACK, *Chief Inspector.*

**ACCIDENTS AND CASUALTIES RESULTING FROM THE FAILURE OF
STEAM LOCOMOTIVES AND TENDERS AND THEIR APPURTENANCES
DURING THE FISCAL YEAR ENDED JUNE 30, 1935, 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.]

ALTON RAILROAD:

August 8, 1934, locomotive 79, Joliet, Ill. Fire hose burst; hose fabric badly worn and rubber lining separated from the outer fabric; one injured.
One accident; one injured.

ATCHISON, TOPEKA & SANTA FE RAILWAY:

July 4, 1934, locomotive 1385, near Dodge City, Kans. Crown sheet failure caused by overheating due to low water. Right top water-glass valve was found in closed position; 1 killed, 1 injured.

*July 15, 1934, locomotive 3810, Pueblo, Colo. Packing nut to stoker throttle leaking; one injured.

**September 10, 1934, locomotive 3271, near Streator, Ill. Grate shaker post latch broken off; one injured.

September 18, 1934, locomotive 2065, Colorado Springs, Colo. Wooden tread of tender sill step split, causing employee to fall; one injured.

October 30, 1934, locomotive 3839, Summit Switch, Calif. Slipped off small step on side of pilot; step covered with packed oil and dirt; one injured.

*December 7, 1934, locomotive 4073, Shopton, Iowa. Valve in oil cup of grate shakers blew out; one injured.

**December 31, 1934, locomotive 3415, Carrollton, Mo. Bell ringer valve stem broke; one injured.

**February 27, 1935, locomotive 4102, near Marceline, Mo. Grate shaker bar slipped off post; shaker bar being used account of power grate shaker being inoperative; power shaker reported defective on February 5, 17, and 25; one injured.

Eight accidents; 1 killed, 8 injured.

ATLANTA, BIRMINGHAM & COAST RAILROAD:

January 21, 1935, locomotive 82, Alma, Ga. Link block pin worked out and fouled in link housing; link block pin and grooves worn; one injured.

One accident; one injured.

ATLANTIC COAST LINE RAILROAD:

*January 3, 1935, locomotives 1500 and 1517, Savannah, Ga. Air hose uncoupled between locomotives, resulting in emergency application of the brakes; one injured.

January 25, 1935, locomotive 1563, Contentnea, N. C. Drain valve in steam heat line between locomotive and tender leaking, and the escaping steam obscured the view of enginemen; one killed.

February 21, 1935, locomotive 1713, near Savannah, Ga. Main rod brass broke and a part of brass was thrown into the cab and struck employee; crank pin, main rod strap, and brass were badly overheated; one injured.

Three accidents; 1 killed, 2 injured.

BALTIMORE & OHIO RAILROAD:

July 19, 1934, locomotive 4234, Blue Island, Ill. Insufficient clearance between back edge of cab apron and the tender cistern water legs; one injured.

*August 6, 1934, locomotive 2768, Barberton, Ohio. Insufficient clearance between reverse lever and boiler back head; one injured.

**September 13, 1934, locomotive 4548, Mitchell, Ind. Squirt hose valve worked open; valve stem packing nut was loose; one injured.

December 27, 1934, locomotive 1378, Gamble, Pa. Crown sheet failure caused by overheating due to low water. Boiler not properly cleaned at time of and

after resetting of flues. Oil in boiler caused excessive foaming with locomotive running light. Lowest reading of water glass was 1½ inches higher than lowest gage cock and enginemen depended upon indications from gage cocks. Gage cocks entered boiler direct and tests on a similar locomotive showed that they indicated much higher water level than the actual water level in the boiler. Deterioration of threads on crown stays and threads in stay holes in crown sheet impaired the holding power of the stays; two injured.

February 8, 1935, locomotive 174, Indianapolis, Ind. Tender sill step missing; one injured.

March 22, 1935, locomotive (Alton) 2968, Chicago, Ill. Cab hood curtain rod pulled out of coal gate post; curtain rod worn at holes in post and end of rod which was bent to form a hook around post straightened out; one injured.

April 9, 1935, locomotive 2449, Glenn, Ill. While attempting to shake the grates fireman's finger was caught between shaker bar and oil tray over fire door; no clearance between shaker bar and oil tray; one injured.

May 20, 1935, locomotive 3134, Newfield Junction, Pa. Safety valve casing blew off; no means provided for securing the casing in place; one injured.

June 27, 1935, locomotive 7146, Point Mills, W. Va. Injured while attempting to shake grates; no clearance between shaker lever and back wall of cab, due to a piece of timber having been applied to back wall for a curtain fastening; one injured.

Nine accidents; ten injured.

BOSTON & MAINE RAILROAD:

December 13, 1934, locomotive 3700, near Saco, Maine. Left main crank pin broke; old fracture covered approximately 75 percent of cross-sectional area; left main rod was reported hot or pounding 5 times between November 4 and December 3; one injured.

*March 7, 1935, locomotive 2104, Woburn Highlands, Mass. Wedge bolt lost out and struck a prospective passenger who was standing on station platform; threads in wedge bolt hole badly worn; one injured.

June 5, 1935, locomotive 4020, Newton Junction, N. H. Crown sheet failure caused by overheating due to low water; three injured.

Three accidents; five injured.

CENTRAL OF GEORGIA RAILWAY:

**June 4, 1935, locomotive 625, Rome, Ga. Employee's arm was cut on a fragment of broken glass in cab window; one injured.

One accident; one injured.

CENTRAL RAILROAD OF NEW JERSEY:

January 22, 1935, locomotive 916, White House, N. J. Grate shaker bar slipped off post due to improper fit; shaker bar socket and shaker post did not conform to company's standard; one injured.

May 24, 1935, locomotive 902, Nesquehoning Junction, Pa. Fire hook not of proper length, permitting handle to contact the fire door; fire hook 12 inches shorter than company's standard; one injured.

Two accidents; two injured.

CHESAPEAKE & OHIO RAILWAY:

*April 1, 1935, locomotive 2308, Strathmore, Va. Water spout hook straightened out, causing employee to lose his balance and fall from the tender; one injured.

June 9, 1935, locomotive 1206, Crane, Va. Employee scalded by escaping steam and hot water from priming valve to feed water pump; one injured.

Two accidents; two injured.

CHICAGO & EASTERN ILLINOIS RAILWAY:

July 9, 1934, locomotive 3643, Villa Grove, Ill. Blow-off cock stopped up with mud, and when wye in blow-off piping was disconnected from blow-off cock an accumulation of mud blew out and struck employee's face; obstructions in clean-out portion of blow-off pipe arrangement; one injured.

*December 18, 1934, locomotive 1022, Rileysburg, Ind. Trailer tire broke; one injured.

Two accidents; two injured.

CHICAGO & NORTH WESTERN RAILWAY:

October 18, 1934, locomotive 123, Evanston, Ill. Boiler tube broke off at defective safe end weld; excessive openings around fire door permitted the escaping steam and hot water to enter the cab; one injured.

November 21, 1934, locomotive 296, Marenisco, Mich. Piston packing on air pump leaking; one injured.

March 18, 1935, locomotive 29, Gladstone Park, Ill. Injector steam pipe collar failed; collar not properly brazed. "Bad leak in coupling on top of left injector" was reported on the last two days on which the locomotive was in service prior to date of accident; one injured.

Three accidents; three injured.

CHICAGO, BURLINGTON & QUINCY RAILROAD:

**December 24, 1934, locomotive 2819, Downers Grove, Ill. Coupler knuckle pin missing, permitting knuckle to drop out and strike employee's foot when he attempted to uncouple the locomotive; one injured.

One accident; one injured.

CHICAGO GREAT WESTERN RAILROAD:

November 2, 1934, locomotive 755, Council Bluffs, Iowa. Rivet in knuckle of door-sheet side-sheet seam blew out when attempt was made to calk leak at the rivet while the boiler was under steam pressure; rivet head and sheet had been excessively worked in previous attempts to stop leakage; two injured.

**January 22, 1935, locomotive 608, St. Paul, Minn. Water glass burst; one injured.

**February 15, 1935, locomotive 272, near Utica, Minn. Reverse lever, when disengaged from quadrant, jerked into extreme forward position and caught engineer's hand between lever and handle of air sander valve; stop pin which had been fusion welded in the fourth notch from front end was missing; one injured.

June 21, 1935, locomotive 471, St. Paul, Minn. Reverse shaft arm moved upward when power reverse gear cut-out valve was opened and caught employee's arm between reverse shaft arm and adjacent parts of locomotive; reverse gear air cut-out valve improperly located; one injured.

Four accidents; five injured.

CHICAGO, MILWAUKEE, ST. PAUL & PACIFIC RAILROAD:

*July 27, 1934, locomotive 2879, Lesterville, S. Dak. Fell from locomotive while attempting to adjust bell ringer; one injured.

September 24, 1934, locomotive 7065, Cedar Falls, Wash. Crown sheet failure, while in charge of engine-watchman, caused by overheating due to low water; one killed.

April 8, 1935, locomotive 8324, Manhattan, Ill. Sand pipe broke off; pipe badly worn due to being struck by driving wheel counterbalance; 1 injured.

Three accidents; 1 killed, 2 injured.

CHICAGO, ROCK ISLAND & PACIFIC RAILWAY:

**July 9, 1934, locomotive 2647, Bucklin, Kans. Main rod broke; one injured.

*November 14, 1934, locomotive 965, Bureau, Ill. Drifting valve leaking; one injured.

February 6, 1935, locomotive 973, Kansas City, Kans. Rivet blew out of crown-sheet door-sheet seam; rivet head on water side of seam missing; one injured.

February 12, 1935, locomotive 5017, Peabody, Kans. Broken disk yoke in blow-off cock valve prevented blow-off valve from closing; old break in rim of blow-off cock yoke; one injured.

Four accidents; four injured.

CHICAGO, ST. PAUL, MINNEAPOLIS & OMAHA RAILWAY:

**September 11, 1934, locomotive 602, near Hammond, Wis. Lubricator steam pipe pulled out of collar to lubricator connection; one injured.

One accident; one injured.

CLEVELAND, CINCINNATI, CHICAGO & ST. LOUIS RAILWAY:

October 28, 1934, locomotive 6531, Carlisle Junction, Ohio. Blow-off cock lever fouled on stoker steam pipe below cab floor; blow-off cock handle loose on stem; one injured.

One accident; one injured.

COLORADO & SOUTHERN RAILWAY:

June 19, 1935, locomotive 909, Louviers, Colo. Grease cup plug blew out while being replaced after applying grease to hot main pin; threads in grease cup and on plug defective; both main connections had been running hot; one injured.

One accident; one injured.

DELAWARE, LACKAWANNA & WESTERN RAILROAD:

April 10, 1935, locomotive 22, Secaucus, N. J. Waist sheet angle iron stud blew out of barrel sheet; threaded portion of stud badly corroded and threads wasted away; attempted to tighten under pressure; one injured.

June 5, 1935, locomotive 1189, Syracuse, N. Y. Main air reservoir failed while under pressure due to overheating caused by a tire heater being used to set a tire directly under the reservoir; 1 killed, 1 injured.

Two accidents; 1 killed, 2 injured.

DENVER & RIO GRANDE WESTERN RAILROAD:

August 11, 1934, locomotive 3608, Salida, Colo. Belly blow-off cock operated with discharge pipe missing, scalding employee who was in pit; locomotive in service with discharge pipe missing from August 3 to August 13; one injured.

August 18, 1934, locomotive 1409, near Wellington, Utah. Boiler exploded due to overheating of right and left side sheets, door sheet, and inside throat sheet. Overheating of the sheets was caused by foul boiler water which was not in condition to absorb heat with sufficient rapidity to maintain the heating surfaces at a safe temperature. The primary cause of the accident was failure to wash the boiler as often as water conditions require; three killed.

**October 18, 1934, locomotive 1510, near Codo, Colo. Rear coupler of locomotive disengaged from coupler of car; coupler carrier iron worn and bent; two injured.

December 1, 1934, locomotive 3402, Alamosa, Colo. Employee's clothing caught on projecting pilot sill step bracket bolt, resulting in his leg being broken in two places; bracket bolts extended $2\frac{1}{4}$ inches from face of end sill to accommodate the thickness of bracket and double nuts; one injured.

**June 21, 1935, locomotive 1013, Roper, Utah. Locomotive difficult to reverse; "Engine handles very stiff" was reported on June 20; one injured.

Five accidents; 3 killed, 5 injured.

DETROIT & TOLEDO SHORE LINE RAILROAD:

October 12, 1934, locomotive 22, Port Huron, Mich. Water glass burst, shattering glass panel in water-glass shield; one injured.

One accident; one injured.

ELKHORN PINEY COAL MINING Co.:

December 27, 1934, locomotive 834, Black's Stop, W. Va. Crown sheet failure caused by overheating due to low water; left injector delivery pipe line check valve stem broken and check valve found lodged in pipe; many appurtenances were lost in the explosion or damaged to such extent that their condition prior to the accident could not be determined; 16 killed, 44 injured.

One accident; 16 killed, 44 injured.

ERIE RAILROAD:

October 23, 1934, locomotive 1697, Linden, N. J. Insufficient clearance between reverse lever when in extreme forward motion and an improvised foot rest at front of quadrant; one injured.

December 13, 1934, locomotive 3054, near Ora, Ind. Main crank pin broke at hub fit; old fracture covered approximately 80 percent of cross-sectional area; rods reported as pounding or to be keyed 12 times between November 6 and December 12; one injured.

**January 26, 1935, locomotive 2495, Vails, N. J. Bolt came out of cylinder cock rod; one injured.

March 18, 1935, locomotive 3005, Creston, Ohio. Bonnet blew out of gage cock; lock nut not properly tightened, permitting bonnet to unscrew from body of gage cock; one injured.

Four accidents; four injured.

GEORGIA RAILROAD:

*August 19, 1934, locomotive 325, Barnett, Ga. While leaning out cab window to observe journal of rear tender truck, which had been running hot, employee's head was struck by corner of passenger shed; one killed.

One accident, one killed.

GREAT NORTHERN RAILWAY:

August 15, 1934, locomotive 1974, near Bernice, Mont. Burned by hot grease while repacking hot driving box; driving box wedge improperly adjusted and excessive vertical play in wedge bolt; one injured.

**October 19, 1934, locomotive 3384, Brockton, Mont. Squirt pipe broke from injector delivery pipe at nipple connection; one injured.

October 20, 1934, locomotive 2186, Breckenridge, Minn. Employee's hand caught between vertical handhold on tender at gangway and a bracket on tender formerly used for brake chain support, preventing him from getting off gangway steps in time to avoid being struck by the corner of roundhouse wall; handhold bent backward and inward so that it touched the bracket; one injured.

**January 18, 1935, locomotive 3141, Frazer, Mont. Grate shaker lever slipped off post, resulting in injury of engineer who was assisting the fireman shake the grates. Due to location of shaker posts, it was difficult to operate the lever safely as it was not easily accessible and it struck on stoker elevator when in open position and against back cab wall when in closed position. Power grate shaker inoperative and reports show that it had been repeatedly reported defective; one injured.

March 15, 1935, locomotive 2054, near Gildford, Mont. Burned by hot grease which spurted from cellar while removing cellar from hot driving box; hot driving box caused by stuck driving box wedge; one injured.

April 16, 1935, locomotive 1963, Butte, Mont. Vertical handhold at back of cab fouled top gangway step while locomotive was moving on curve, resulting in employee's hand being severely crushed; one injured.

Six accidents; six injured.

GULF COAST LINES:

July 24, 1934, locomotive (St. L. B. & M.) 253, Harlingen, Tex. Boiler check leaking; one injured.

One accident; one injured.

HUNTINGDON & BROAD TOP MOUNTAIN RAILROAD & COAL Co.:

**May 24, 1935, locomotive 38, Saxton, Pa. Classification lamp support failed when employee held onto lamp while putting up classification flag; socket on each side of smoke box so located that they interfered with free use of running board handrail; one injured.

One accident; one injured.

ILLINOIS CENTRAL RAILROAD:

July 21, 1934, locomotive 3553, Centralia, Ill. Squirt hose valve leaking; one injured.

September 3, 1934, locomotive 278, Chicago, Ill. Employee's head struck a long and jagged bolt which extended below cab roof overhang; cab roof overhang had been repaired with excessively long bolts; one injured.

September 24, 1934, locomotive 1740, Michigan City, Miss. Loose coal left on back of tender cistern caused employee to slip and fall into cistern manhole; one injured.

September 29, 1934, locomotive 1045, Rolling Fork, Miss. Employee's hand injured on sharp-pointed nail which was used in place of cotter key in pin to left front cab-door slide; one injured.

November 4, 1934, locomotive 2408, Central City, Ill. Water glass burst; one injured.

December 1, 1934, locomotive 2430, DeSoto, Ill. Link block pin running hot; injured while attempting to move reverse gear; link block pin galled in link block; one injured.

**December 30, 1934, locomotive 2429, near Kinmundy, Ill. Main driving axle broke due to old fracture; 18 injured.

January 7, 1935, locomotive 2906, Freeport, Ill. Water glass burst; one injured.

Eight accidents; 25 injured.

INDIANAPOLIS UNION RAILWAY:

February 2, 1935, locomotive 5, Indianapolis, Ind. Water glass broke; glass worn to approximately one-thirty-second inch in thickness at both ends; one injured.

One accident; one injured.

INTERNATIONAL-GREAT NORTHERN RAILROAD:

August 8, 1934, locomotive 379, Waco, Tex. Crown sheet failure caused by overheating due to low water; steam and water escaping from one or both blow-off cocks; blow-off cocks reported on July 13, 21, and August 6 (two times); one injured.

March 25, 1935, locomotive 347, Phelps, Tex. Employee slipped on top of sand box and fell to the deck. In returning to cab after filling water tank, the employee stepped on a package of pin grease which was lying on top of right leg of water tank before stepping on sand box; one injured.

Two accidents; two injured.

LEHIGH VALLEY RAILROAD:

November 11, 1934, locomotive 1142, Towanda, Pa. Handrail in front of smokebox gave way, causing employee to fall to the ground; handrail column bolt broken; one injured.

February 27, 1935, locomotive 3126, East Penn Junction, Pa. Injector steam pipe spanner nut failed; nut cracked and mutilated by the use of improper tools in tightening; one injured.

Two accidents; two injured.

LOUISIANA & NORTH WEST RAILROAD:

September 15, 1934, locomotive 23, Homer, La. Reverse lever latch did not drop when lever was placed in forward motion and when throttle was opened reverse lever came back unexpectedly, striking employee; fillet on reverse lever latch bolt and hole in reverse lever worn, permitting latch bolt to be tightened until latch would not drop when raised; one injured.

One accident; one injured.

LOUISVILLE & NASHVILLE RAILROAD:

**August 17, 1934, locomotive 402, Gap, Ky. Boiler check valve stuck open; opening below check valve seat restricted by an accumulation of scale which caused wings on valve to bind; one injured.

August 31, 1934, locomotive 1290, Mobile, Ala. Handrail on side of cab broke, causing employee to fall to the ground; one injured.

**October 12, 1934, locomotive 1512, Edgemoor, Tenn. Air compressor failed; nut had worked off main piston-valve bolt to air pump; one injured.

December 14, 1934, locomotive 1294, Etowah, Tenn. Cab apron worn; one injured.

*April 3, 1935, locomotive 1351, Henderson, Ky. Main journal ran hot; injured while applying fresh grease to grease cellar; one injured.

June 8, 1935, locomotive 1206, Jarrell, Tenn. Crank pin broke off flush with pin hub on wheel through old fracture covering approximately 65 percent of cross-sectional area; one injured.

Six accidents; six injured.

MACON, DUBLIN & SAVANNAH RAILROAD:

August 29, 1934, locomotive (S. A. L.) 994, Dublin, Ga. Water glass burst, breaking one section of water-glass shield; one injured.

**March 28, 1935, locomotive (S. A. L.) 993, Dublin, Ga. Nuts on eccentric-strap bolt loose; one injured.

**May 8, 1935, locomotive 50, Macon, Ga. Injured while operating reverse lever; improperly fitted valve strips caused lubrication to be blown from valve seat and allowed pressure to build up on the balanced portion of valve, increasing the friction and making reverse lever hard to handle with open throttle; one injured.

Three accidents; three injured.

MAINE CENTRAL RAILROAD:

*July 4, 1934, locomotive 358, Skowhegan, Maine. Squirt-hose valve leaking; packing on valve stem loose; one injured.

*April 11, 1935, locomotive 630, Belgrade, Maine. Air hose at rear of tender blew off; one injured.

Two accidents; two injured.

MICHIGAN CENTRAL RAILROAD:

**July 24, 1934, locomotive 118, Detroit, Mich. While attempting to calk a leak in fire tube, 2 inches from flue sheet, with boiler under steam pressure, the calking tool was driven through the tube; tube worn very thin around the leak; one injured.

**January 8, 1935, locomotive 251, Jackson, Mich. Booster engine would not cut in, due to preliminary valve being stuck; one injured.

May 10, 1935, locomotive 328, Galesburg, Mich. Stoker elevator cover plate flew off and struck employee who was loosening the lugs to remove the cover and clean elevator which was clogged; one injured.

Three accidents; three injured.

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

**July 11, 1934, locomotive 2427, Wisconsin Rapids, Wis. Reverse lever unlatched and moved violently to forward position, catching employee's knee between lever and bell ringer valve; lift shaft arm, right side, fouled on front section of side rod, throwing strain on reach rod and reverse lever; locomotive low on springs, and was lower on right side than on left side; one injured.

August 6, 1934, locomotive 476, Enderlin, N. Dak. Combination footboard and pilot fouled on wing rail of frog, due to having been applied too low; one injured.

**August 14, 1934, locomotive 4000, Schiller Park, Ill. Employee fell from step on side of cab, due to his grip on handrail above cab window being broken when his hand came in contact with support formed around handrail near middle of handrail; middle support for these handrails not standard; one injured.

September 4, 1934, locomotive 2421, Clearbrook, Minn. Coal gate latch handle bent, restricting clearance between latch and coal gate; one injured.

*January 22, 1935, locomotive 1003, Denham, Minn. Footboard at rear of tender was bent, causing employee's foot to slip; one injured.

March 5, 1935, locomotive 498, Glenwood, Minn. Footboard on rear of tender too low; one injured.

**May 20, 1935, locomotive 2723, Waupaca, Wis. Insufficient clearance between ash pan slide operating lever and clean-out door in ash pan flare; one injured.

June 11, 1935, locomotive 729, near Glen Flora, Wis. Shovel stuck on jagged edge of hole worn in tender shovel sheet; one injured.

Eight accidents; eight injured.

MISSOURI-KANSAS-TEXAS LINES:

**July 6, 1934, locomotive 852, Wichita Falls, Tex. Blow-off cock was inoperative; universal joint in blow-off cock extension rod became twisted, causing handle to bind against side of cab; one injured.

October 20, 1934, locomotive 860, near Olathe, Kans. Crown sheet failure caused by overheating due to low water; one injured.

*February 3, 1935, locomotive 35, Oklahoma City, Okla. Water glass burst; one injured.

*April 17, 1935, locomotive 866, Prospect Hill, Mo. Emergency application of brakes, due to improper operation of vent valve on locomotive; one injured.

Four accidents; four injured.

MOBILE & OHIO RAILROAD:

December 26, 1934, locomotive 407, near Finger, Tenn. Throttle stem packing gland blew out; gland improperly applied; one injured.

One accident; one injured.

NEW YORK CENTRAL—LINES EAST:

*July 16, 1934, locomotive 258, Troy, N. Y. Injured while repairing brake lever; one injured.

*August 4, 1934, locomotive 641, Albany, N. Y. Fire hose burst; one injured.

August 23, 1934, locomotive 3832, Rochester, N. Y. Fire tube broke off at front flue sheet due to being badly wasted away; one injured.

**September 18, 1934, locomotive 27, Kingston, N. Y. Steam heat valve leaking; one injured.

March 14, 1935, locomotive 5271, Albany, N. Y. Wheel to reversing gear stuck then suddenly let go and struck engineer's arm; nuts on radius bar bolts worked off permitting bolts to work out and foul the link frame, causing reverse gear to jam in forward position; bolts were not standard and were poor fit; one injured.

May 19, 1935, locomotive 2732, Corning, N. Y. Stoker conveyor slide difficult to open due to fine coal lodged between slide and deck and in the guides; one injured.

**June 7, 1935, locomotive 4302, Buffalo, N. Y. Throttle lever stuck open; throttle lever latch would not clear the quadrant teeth when throttle was wide open, due to improper radius of quadrant; one injured.

Seven accidents; seven injured.

NEW YORK CENTRAL—LINES WEST:

October 1, 1934, locomotive 3356, Oak Harbor, Ohio. Oil can dripper over fire door dropped off, striking employee's foot; when opened fire door struck the tray, jarring the nuts loose; one injured.

*December 4, 1934, locomotive 2813, Toledo, Ohio. Reverse gear suddenly became stuck, resulting in injury to employee who was operating the screw reverse wheel; one injured.

Two accidents; two injured.

NEW YORK, NEW HAVEN & HARTFORD RAILROAD:

**November 16, 1934, locomotive 1306, near Hebronville, Mass. Reverse lever latch spring retaining rod broke off at screw end, due to an 85-percent flaw where it screws into the latch; one injured.

January 9, 1935, locomotive 1354, South Lyme, Conn. Branch pipe connecting distributing valve with brake pipe broke, causing emergency application of the brakes; distributing valve bracket loose on cab floor plate and brake pipe nipple not properly applied to double-chamber reservoir; 1 killed, 1 injured.

April 3, 1935, locomotive 3218, Hopewell Junction, N. Y. Employee fell from locomotive at gangway; hooks missing from gangway safety chains, both sides of locomotive; one injured.

Three accidents; 1 killed, 3 injured.

NORFOLK & WESTERN RAILWAY:

February 11, 1935, locomotive 1483, near Petersburg, Va. Pipe line from blow-off cock to muffler uncoupled due to coupling nut being loose, and the discharge entered cab through opening in cab floor for grate shaker levers; one injured.

*April 18, 1935, locomotive 2013, Roanoke, Va. Hand wheel of power reverse gear jammed or kicked back while being operated, resulting in injury to employee; one injured.

Two accidents; two injured.

NORFOLK SOUTHERN RAILROAD:

*January 10, 1935, locomotive 129, Goldsboro, N. C. Insufficient clearance between reverse lever and independent brake valve; one injured.

One accident; one injured.

NORTHERN PACIFIC RAILWAY:

July 20, 1934, locomotive 1673, near Coon Creek, Minn. Reverse lever jerked violently to extreme front end of quadrant when latch was released, mashing employee's foot between lever and jacket on boiler head; insufficient clearance around reverse lever when in front end of quadrant; one injured.

**July 26, 1934, locomotive 5003, Dickinson, N. Dak. Foot caught between seat box and condensate valve handle which extended up through deck close to side of seat box; one injured.

August 29, 1934, locomotive 2160, Wapato, Wash. Spanner nut pulled off injector delivery pipe line check in cab due to improper fit; spanner nut tapered and threads worn and end of line check was tapered and out of round; two injured.

November 23, 1934, locomotive 1715, Jamestown, N. Dak. Shank of rear coupler failed at keyway, resulting in emergency application of the brakes; one injured.

December 3, 1934, locomotive 1787, near Philbrook, Minn. Front coupler of second locomotive opened and train parted, causing emergency application of brakes; coupler higher than prescribed standard; one injured.

February 7, 1935, locomotive 2226, White Bear, Minn. Main driving axle broke; old fracture covered approximately 75 percent of cross-sectional area at point of failure; one injured.

May 3, 1935, locomotive 1258, Yakima, Wash. Water glass burst; one injured.

Seven accidents; eight injured.

NORTHWESTERN PACIFIC RAILROAD:

October 14, 1934, locomotive 178, Black Point, Calif. Injector steam pipe collar broke, permitting steam pipe to pull out of the joint; one injured.

One accident; one injured.

OREGON SHORT LINE RAILROAD:

July 2, 1934, locomotive 2511, DeWoff, Idaho. Bolt in front end of eccentric rod came out, permitting rod to drop to the ties then swing back and strike cylinder cock rod with sufficient force to bend it, causing cylinder cock lever in cab to move back violently and strike engineer's leg; cylinder cock lever located only 18 inches ahead of engineer's seat; nut on eccentric rod bolt not properly tightened and cotter key not applied after rod bolt was loosened to permit repairs to main rod at the end of previous trip; one injured.

March 1, 1935, locomotives 3129 and 2025, Michaud, Idaho. Locomotive 3129 separated from locomotive 2025 while double-heading with train; one injured.

Two accidents; two injured.

PENNSYLVANIA RAILROAD:

**July 8, 1934, locomotive 4425, Cleveland, Ohio. Squirt hose valve worked open; packing nut on stem of squirt hose valve was very loose and leaked badly; one injured.

October 7, 1934, locomotive 3844, Derry, Pa. Snifting valve seat bushing, nut, screen and holding plate lost off valve chamber while train was going about 50 m. p. h. and holding plate struck the ground and rebounded against window in passenger coach, breaking the glass; one injured.

October 14, 1934, locomotive 5335, Perryman, Md. Employee's hand caught between wing of fire door and fire door frame while putting coal into fire box; mechanically operated fire door defective, permitting door to drift partially closed, and door did not hold open long enough for fireman to operate his shovel in the interval between the opening and closing; one injured.

December 2, 1934, locomotive 6743, Shock's Mills, Pa. Grate shaker bar slipped from post due to improper fit; shaker bar socket partially filled with coal and oily substance, reducing its engagement on post to 1½ inches; one injured.

**December 18, 1934, locomotive 1190, Altoona, Pa. Power reverse gear did not operate properly; "Make air reverse work easier" was reported on December 13, and subsequent to the accident the reverse gear was reported as hard to operate on December 18, 24, and 25; one injured.

December 28, 1934, locomotive 3070, Pittsburgh, Pa. Bonnet nut of globe valve in steam line to air compressor failed at old fracture permitting valve to blow out of valve body and strike employee; one injured.

January 17, 1935, locomotive 411, Philadelphia, Pa. Crown sheet failure caused by overheating due to low water; two injured.

**January 24, 1935, locomotive 8035, Conemaugh, Pa. Slipped on cab apron which was not properly roughened; one injured.

**January 28, 1935, locomotive 4619, King, Pa. Side rod broke; one injured.

January 31, 1935, locomotive 1529, Seabrook, Md. Main crank pin failed through outer edge at groove for crank arm bolt; groove had been built up by fusion welding; one injured.

February 11, 1935, locomotive 3883, near Winans, Md. Crank pin failed due to old fracture. Crank pin collar was thrown through the front cab window resulting in serious injury of engineer; one injured.

**March 4, 1935, locomotive 7228, New Castle, Pa. Headlight generator governor post pulled out of the body of generator due to threads on post and in hole in generator body being badly stripped and a defective set screw used to hold post in place, causing a train stop application of the brakes; one injured.

March 16, 1935, locomotive 6828, Sizerville, Pa. Water column steam pipe ruptured; metal badly crystallized and porous; one injured.

March 17, 1935, locomotive 4288, Pitcairn, Pa. Air compressor failed and locomotive collided with car account of ineffective brakes; one injured.

April 10, 1935, locomotive 3583, Baltimore, Md. Whistle valve stuck open account of a piece of broken whistle valve stem catching on valve seat; end of whistle valve stem broke off due to having slot sawed in it to facilitate use of grinding tool. Engineer went on top of boiler to close whistle valve and received fatal shock from overhead trolley wire; one killed.

April 29, 1935, locomotive 4451, Bolivar, Pa. Driving spring hanger failed; work reports show that locomotive had been pounding and riding rough for some time. On April 18, the engineer reported "Engine is very rough, engine not fit for service, account of being rough"; one injured.

May 9, 1935, locomotive 6812, LeRoy, Ind. Nut came off of side rod collar bolt permitting collar to come off and bushing to work out and a piece of bushing was thrown into cab and struck employee; side rod collar reported loose on May 2 and 6; one injured.

June 11, 1935, locomotive 563, Jersey City, N. J. Air compressor stopped, resulting in collision; one injured.
Eighteen accidents; 1 killed, 18 injured.

PERE MARQUETTE RAILWAY:

March 13, 1935, locomotive 1321, Grand Rapids, Mich. Injector steam pipe collar broke off at connection to throttle valve; one injured.
One accident; one injured.

PITTSBURGH & LAKE ERIE RAILROAD:

**November 6, 1934, locomotive 9020, Neville Island, Pa. Grate shaker bar slipped off post, due to oil in shaker bar socket; shaker bar was not the company's standard; one injured.
One accident; one injured.

PITTSBURGH & WEST VIRGINIA RAILWAY:

November 30, 1934, locomotive 1001, Venice, Pa. Crown sheet failure caused by overheating due to low water; openings through right water-glass bottom cock and spud, drain pipe and top fitting, left water-glass bottom cock and spud, and drain valve were seriously restricted; screen above right tank valve stopped up; holes in top of tender behind fuel space allowed fine cinders and coal to enter feed water tank; four injured.
One accident; four injured.

READING COMPANY:

*April 4, 1935, locomotive 1720, Ferndale, Pa. Trailer spring hanger broke, resulting in derailment of locomotive and eight cars; one injured.
One accident; one injured.

RICHMOND, FREDERICKSBURG & POTOMAC RAILROAD:

**October 23, 1934, locomotive 153, Milford, Va. Fell from top of tender tank while attempting to push water spout clear of tender; one prong missing from the hook being used; one injured.
March 21, 1935, locomotive 312, near Accotink, Va. Main crank pin broke off at fillet of side rod bearing; pin showed 85 percent old fracture; one injured.
Two accidents; two injured.

ST. LOUIS-SAN FRANCISCO RAILWAY:

September 18, 1934, locomotive 1266, Kansas City, Mo. Brake hanger pin broke; one injured.
*October 3, 1934, locomotive 1514, Verona, Mo. Air pipe on locomotive broke; one injured.
December 29, 1934, locomotive 1508, Monett, Mo. Whistle inoperative, due to fulcrum bolt missing; one injured.
Three accidents; three injured.

SEABOARD AIR LINE RAILWAY:

**August 28, 1934, locomotive 399, Seacoast, Va. Stoker became inoperative; nuts had worked off the differential piston in the steam head of stoker engine and the bull ring was loose; one injured.
October 8, 1934, locomotive 901, Raleigh, N. C. Reverse lever latch rode up on clevis used on front of quadrant while lever was being thrown, resulting in the latch grip being forced close to the lever, and employee's finger was caught between latch grip and lever; clevis used on front end of quadrant prevented free movement of the lever latch; one injured.
**November 9, 1934, locomotive 342, Savannah, Ga. Washout plug blew out; threads on plug worn; attempted to tighten while under steam pressure; two injured.
April 16, 1935, locomotive 359, Raleigh, N. C. Ash pan dump lever broke at fusion weld; one injured.
Four accidents; five injured.

SOUTHERN RAILWAY:

*July 27, 1934, locomotive 798, Wayne City, Ill. Grease cellar pressure plate stuck, causing driving box to run hot; one injured.
*August 30, 1934, locomotive 4057, Johnson City, Tenn. Relief valve broke, due to old defect; one injured.
**September 12, 1934, locomotive 1883, Hayne, S. C. Fire hose burst; one injured.

September 24, 1934, locomotive 4891, Holtsburg, N. C. Trailing truck box oil cellar dropped to the ground while locomotive was running about 45 m. p. h. and rolled 200 feet, striking two track employees; truck wheel tread worn and shelled out in several places causing wheel to pound which resulted in the nuts that held the end plate working off; one injured.

September 29, 1934, locomotive 4860, Efland, N. C. Arch tube burst; one injured.

December 15, 1934, locomotive 534, Asheville, N. C. Handhold column near end of buffer beam pulled off, due to bolt working out of column; one injured.

**December 29, 1934, locomotive 1217, Chattanooga, Tenn. Cylinder cock operating rod bent; one injured.

January 9, 1935, locomotive 5205, Knoxville, Tenn. Nut worked off bolt securing flag socket to end of pilot beam; one injured.

March 17, 1935, locomotive 1358, Timberville, Va. Tender sill step missing, causing employee to fall from locomotive; one injured.

**May 3, 1935, locomotive 6576, Chattanooga, Tenn. Wire for operating steam whistle became disconnected from whistle lever; one injured.

**May 3, 1935, locomotive 1897, Birmingham, Ala. Drop cab window stuck in down position in back of cab, due to coal or other foreign substance getting between the window and cab; no handhold on window to assist in raising it; one injured.

**May 24, 1935, locomotive 816, Spencer, N. C. Nut on injector steam pipe broke under steam pressure while being tightened with hammer and a piece of pipe used as a set; one injured.

June 29, 1935, locomotive 4896, near Braswell, Ga. Crown sheet failure caused by overheating due to low water; feed water pump inoperative due to pump reversing valve piston being broken; three killed.

Thirteen accidents; 3 killed, 12 injured.

SOUTHERN PACIFIC—LINES EAST:

**November 23, 1934, locomotive 3411, El Paso, Tex. Packing nuts to air compressor throttle and dynamo throttle leaking; one injured.

One accident; one injured.

SOUTHERN PACIFIC—LINES WEST:

**July 3, 1934, locomotive 4144, Marysville, Calif. Fire hose blew off sleeve at nozzle connection; one injured.

July 6, 1934, locomotive 4367, Carlin, Nev. Vertical handhold on cab fouled on tender gangway ladder; one injured.

July 12, 1934, locomotive 3715, Eugene, Ore. Brakeman's seat fell from elevated storage position, striking employee; seat not properly secured in raised position; one injured.

August 15, 1934, locomotive 2358, Fresno, Calif. Squirt hose burst; hose defective; one injured.

**August 20, 1934, locomotive 4302, Bloomington, Calif. Squirt hose valve worked open; one injured.

August 26, 1934, locomotive 1221, Milpitas, Calif. Sleeve in end of fire hose blew out due to being insecurely applied and unsuitable quality of hose which was softened by hot water from the injector to which it was attached; one injured.

February 27, 1935, locomotive 4129, Modoc Point, Ore. Nipple in brake pipe to distributing valve broke, causing emergency application of the brakes; one injured.

Seven accidents; seven injured.

TERMINAL RAILROAD ASSOCIATION OF ST. LOUIS:

**September 15, 1934, locomotive 174, St. Louis, Mo. Injector overflow pipe blew off; threads in spanner nut which secured overflow pipe to injector were badly worn; one injured.

One accident; one injured.

TEXAS & PACIFIC RAILWAY:

August 28, 1934, locomotive 661, Grand Saline, Tex. Two superheater flues broke off at back flue sheet due to being badly eroded along the line of bead raised by the prosser tool; engine reported not steaming properly on August 1, 5, 12, 19 (two times), 22, and 26 (two times). Employee was burned by steam escaping through baffle plate opening in fire door which did not close when subjected to pressure from inside the fire box as intended in this type door; one injured.

One accident; one injured.

UNION PACIFIC RAILROAD:

**August 30, 1934, locomotive 5031, Speer, Wyo. Reverse gear shaft broke between reverse shaft box and reverse shaft lever and arm, allowing the link blocks and radius bars to drop to lower end of links; one injured.

September 19, 1934, locomotive 9005, Bitter Creek, Wyo. Power reverse gear suddenly kicked while being reversed and caused hand wheel in cab to spin, resulting in injury to employee; one injured.

December 10, 1934, locomotive 4412, Kansas City, Kans. Section of cast iron steam heat radiator in cab floor burst; radiator badly corroded on outside and reduced to a minimum thickness of three-thirty-second-inch along the edge of the opening; one injured.

February 13, 1935, locomotive 2876, Byers, Colo. Front coupler knuckle broke permitting locomotive to separate from leading locomotive; excessive lost motion between coupler and coupler casting due to worn pin holes; one injured.

Four accidents; four injured.

WABASH RAILWAY:

**March 15, 1935, locomotive 2714, Columbia, Mo. While riding on engine step, employee's finger was mashed between cab grab iron and curtain rod; one injured.

One accident; one injured.

WASHINGTON TERMINAL Co.:

**February 9, 1935, locomotive 34, Washington, D. C. Burned by flames which came out of fire-box door while putting coal into fire box; 27 boiler tubes found stopped up; one injured.

One accident; one injured.

WESTERN MARYLAND RAILWAY:

October 24, 1934, locomotive 757, Poland, Md. Left main rod broke; old fracture covered approximately 30 percent of cross-sectional area; left main rod brass reported on October 2, 6, 8, 9, and 18; one injured.

One accident; one injured.

WHEELING & LAKE ERIE RAILWAY:

August 18, 1934, locomotive 6002, Brewster, Ohio. Broken radial stay blew out of crown sheet while being calked under steam pressure; stay was too long when applied and threads on stay did not engage with threads in fire-box sheet; one injured.

One accident; one injured.

WINIFREDE RAILROAD:

November 16, 1934, locomotive 5, near Winifrede, W. Va. Crown sheet failure caused by overheating due to low water; two injured.

One accident; two injured.

ACCIDENTS AND CASUALTIES RESULTING FROM THE FAILURE OF LOCOMOTIVES OTHER THAN STEAM AND THEIR APPURTENANCES DURING THE FISCAL YEAR ENDED JUNE 30, 1935, 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 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.]

CLEVELAND UNION TERMINAL:

**November 27, 1934, locomotive unit 1065, Cleveland, Ohio. Cab seat fell; seat became unfastened from side of cab due to bolt in guide and catch becoming loose; one injured.

One accident; one injured.

ILLINOIS CENTRAL RAILROAD:

September 27, 1934, locomotive unit 9002, Chicago, Ill. Employee slipped or stumbled on entering engine compartment; compartment floor between the end walls and center gangway (about 48 inches in width) was smooth metal plate and had several 1/2-inch hexagon bolt heads protruding above the metal floor; one injured.

One accident; one injured.

NEW YORK, NEW HAVEN & HARTFORD RAILROAD:

January 26, 1935, locomotive unit 088, South Norwalk, Conn. Switch stuck account of ice in magnet valve armature chamber; valve cap permitted water to seep through opening around operating pin and down into chamber; one injured.

One accident; one injured.

PENNSYLVANIA RAILROAD:

*July 17, 1934, locomotive unit 16, Manhattan Transfer, N. J. Locomotive separated from the remainder of train; one injured.

December 3, 1934, locomotive unit 4737, North Bergen, N. J. Fire brick used as fire-door shield broke and fell from fire door, due to not being properly supported on door; one injured.

June 21, 1935, locomotive unit 4855, Wilmington, Del. Bus bars not isolated, insulated, or guarded against accidental contact as required by rule 244; one injured.

June 26, 1935, locomotive unit 4827, Baltimore, Md. Unsafe installation of pantagraph auxiliary release mechanism which was operated accidentally from outside of cab; unit not equipped with the type of pantagraph locking and grounding device required by the rules; one injured.

Four accidents; four injured.

VIRGINIAN RAILWAY:

*December 8, 1934, locomotive unit 109, Kellevsille, W. Va. Coupler knuckle at end of locomotive unit failed, causing emergency stop; one injured.

One accident; one injured.

TABLE XII.—Number of steam locomotives inspected,

Parts defective, inoperative or missing, or in violation of the rules	Akron, Canton & Youngstown	Alabama, Tennessee & Northern	Alaquippa & Southern	Alton	Ann Arbor	Aetehison, Topeka & Santa Fe	Atlanta & West Point	Atlanta, Birmingham & Coast	Atlantic & Yadkin	Atlantic Coast Line
1 Air compressors.....					1	46				5
2 Arch tubes.....						1				1
3 Ash pans and mechanism.....						2				7
4 Axles.....										
5 Blow-off cocks.....	1					8	3			1
6 Boiler checks.....			1			7				1
7 Boiler shell.....						10				3
8 Brake equipment.....	3					101	1	3	1	20
9 Cabs, cab windows, and curtains.....					3	32				10
10 Cab aprons and decks.....						11				2
11 Cab cards.....										3
12 Coupling and uncoupling devices.....										2
13 Crossheads, guides, pistons, and piston rods.....	1	2		2		40				18
14 Crown bolts.....						2				2
15 Cylinders, saddles, and steam chests.....						57	2	4	1	18
16 Cylinder cocks and rigging.....						33				2
17 Domes and dome caps.....						1				1
18 Draft gear.....				1		13				2
19 Draw gear.....						9				3
20 Driving boxes, shoes, wedges, pedestals, and braces.....	2			1	1	107		1		20
21 Fire-box sheets.....		1				7				1
22 Flues.....						20				1
23 Frames, tailpieces, and braces, locomotive.....		4				32		2		30
24 Frames, tender.....						5				1
25 Gages and gage fittings, air.....						14				1
26 Gages and gage fittings, steam.....						25				9
27 Gage cocks.....		8				20				18
28 Grate shakers and fire doors.....						13				11
29 Handholds.....		4				17				7
30 Injectors, inoperative.....						1				1
31 Injectors and connections.....					1	109			1	74
32 Inspections and tests not made as required.....	2	9		4	2	338	7	5		113
33 Lateral motion.....		1				28			1	7
34 Lights, cab and classification.....						2				1
35 Lights, headlight.....						6				1
36 Lubricators and shields.....						9				1
37 Mud rings.....		1				8				5
38 Packing nuts.....				1		46				1
39 Packing, piston rod and valve stem.....					1	23				6
40 Pilot and pilot beams.....						4				3
41 Plugs and studs.....						8	1			4
42 Reversing gear.....	1					7				5
43 Rods, main and side, crank pins, and collars.....	1	2				57				28
44 Safety valves.....						2				3
45 Sanders.....						23				8
46 Springs and spring rigging.....	1	1		1	1	88		1		37
47 Squirt hose.....		1				11		1		10
48 Stay bolts.....						7				1
49 Stay bolts, broken.....		5								10
50 Steam pipes.....						18				21
51 Steam valves.....						3				3
52 Steps.....						28				3
53 Tanks and tank valves.....		1		1		41	2			17
54 Telltale holes.....		1				2				3
55 Throttle and throttle rigging.....	1					44				12
56 Trucks, engine and trailing.....					3	31		5		12
57 Trucks, tender.....						31				34
58 Valve motion.....						64				29
59 Washout plugs.....	1					24				15
60 Train-control equipment.....										
61 Water glasses, fittings, and shields.....					1	33		1		9
62 Wheels.....		1				22				12
63 Miscellaneous—Signal appliances, badge plates, brakes (hand).....						17				6
Number of defects.....	16	42		16	11	1,817	16	22	5	686
Locomotives reported.....	22	15	20	184	50	1,806	51	80	14	819
Locomotives inspected.....	61	23	30	385	107	3,298	73	161	21	1,521
Locomotives defective.....	4	9		5	4	490	7	9	2	216
Percentage of inspected found defective.....	7	39		1.3	3.7	15	10	6	10	14
Locomotives ordered out of service.....		2				14				17

found defective, and ordered from service, etc.

Baltimore & Ohio, lines east	Baltimore & Ohio, lines west	Bangor & Aroostook	Belt Ry. of Chicago	Bessemer & Lake Erie	Birmingham Southern	Boston & Albany	Boston & Maine	Buffalo Creek	Burlington-Rock Island	Camas Prairie	Canadian National	Canadian Pacific	Central of Georgia	Central R. R. of New Jersey	Central Vermont	Charleston & Western Carolina	Chesapeake & Ohio	Chicago & Eastern Illinois	Chicago & Illinois Midland	Chicago & North-western	Chicago & Western Indiana	
13	9		1	2		4	1	1		4	2		2	1				7				
6	5																	2	1			
7	2		1			1	2						3	6	1			4	1	9	1	
13	4		1			2	3						1	1				3	1	10	1	
9	2		2			10							19	5				16	15	31	7	
42	33		7	11		2	11						3	1				4	8	74	7	
22	41		6	1		5	7						1	3				2	3	21	3	
5	4		1			3	2						1	1				3	1	9	1	
6	2			3		2							2					3	1	1	1	
1			2	3		5	3						7	2			6	2	29	1		
33	18												1	1			1	1	40	1		
51	14		4	4			12						4	1			5	9	34	1		
11	7						14						1				1	7	34	1		
6	6						1						1				5	9	15	1		
4	7		3				2						11	2			1	2	41	1		
8	4		1				2						7	1			14	3	41	1		
55	16		2	2			11						2	2			6	1	21	1		
2	2		1				3						1	6			2	1	3	22		
3	3						2						5	6			4	1	52	3		
28	11						1						1	1			1	1	8	6		
5	1						1						5	6			1	1	6	2		
3	2		1	1			1						1	1			2	2	14	2		
12	5						4						2	4			2	1	14	2		
3	2						1						4	4			3	1	8	5		
12	9		2				1						2	2			1	1	14	2		
14	11						2						4	2			3	1	2	8		
9	1						1						2	2			1	1	14	4		
37	35		1	4			2						7	6			3	1	25	1		
338	143		14	21			40						19	13			24	110	50	215	1	
236	7						1						3	2				4	2	8	3	
7							1						1						3	2		
4	7		1				1						1					2	3	6		
3	5						2						2	5			3	3	18	1		
7	3		3				1						1	1				2	4	4		
1	21						4						8	3			4	13	17	40	1	
34	10		7				5						1	1				5	3	5	4	
2	2						2						1	1				5	3	5	4	
15	5						3						1	1				2	3	9	2	
32	15		3				3						4	3				10	5	47	2	
60	36		2	8			1						17	4			1	3	4	19	3	
3	3						3						1	1				2	4	4	4	
11	2						1						1	1				2	1	19	3	
112	52		2	2			10						31	11			7	24	8	123	1	
1	2		1				2						1	1			1	1	2	1	4	
5	2						1						3	1			5	7	2	7	1	
22			3				6						2	1			6	8	5	5	50	
14	1		4				1						1	1			2	1	4	4	51	
9	10						2						8	2				4	3	17	52	
13	7		1				2						4	5				1	3	38	1	
26	17		3	2			3						9	2				3	1	53	1	
1							2						1	1				1	1	1	54	
10	27		2				2						1	1				4	6	32	1	
21	23						1						8	1				4	1	34	1	
24	25		4	2			7						12	2				4	20	28	57	
48	8						3						6	1				9	2	14	58	
15	6						1						3	3				8	6	12	1	
32	20		10	1			8						1	5				10	2	20	60	
13	6		7	2			6						3	3				1	9	16	62	
20	7						4						3	2				6		7	63	
1,219	713		4	107	76		4,106				</											

TABLE XII.—Number of steam locomotives inspected,

Parts defective, inoperative or missing, or in violation of the rules	Chicago, Burlington & Quincy	Chicago Great Western	Chicago, Indianapolis & Louisville	Chicago, Milwaukee, St. Paul & Pacific	Chicago River & Indiana	Chicago, Rock Island & Pacific	Chicago, St. Paul, Minneapolis & Omaha	Chicago Short Line	Chicago, West Pullman & Southern	Cincinnati Union Terminal
	1 Air compressors.....	8	6	1	9		30	7		
2 Arch tubes.....										
3 Ash pans and mechanism.....		1	2			3				
4 Axles.....										
5 Blow-off cocks.....	2	3	3	9		5				
6 Boiler checks.....	3	3	1	3		20	1			
7 Boiler shell.....	3	3	4	5		9				
8 Brake equipment.....	23	27	15	55	2	116	40	1		1
9 Cabs, cab windows, and curtains.....	16	14	5	13		58	4			
10 Cab aprons and decks.....	4	3	6	8		17	5			
11 Cab cards.....		1		1		4				
12 Coupling and uncoupling devices.....				2		1				
13 Crossheads, guides, pistons, and piston rods.....	21	8	9	26	1	64	13			
14 Crown bolts.....	1			3		1				
15 Cylinders, saddles, and steam chests.....	16	20	4	46	1	97	1			
16 Cylinder cocks and rigging.....	9	14	2	9	3	20	1			
17 Domes and dome caps.....	1			1		2				
18 Draft gear.....	4	2	2	14		18	1			
19 Draw gear.....	6	9		5	1	20				
20 Driving boxes, shoes, wedges, pedestals, and braces.....	36	11	9	33	3	78	2			
21 Fire-box sheets.....	6	1	1	16		25	2			
22 Flues.....	2			4		4				
23 Frames, tailpieces, and braces, locomotive.....	11	12		15		40	8			
24 Frames, tender.....	3			5		5				
25 Gages and gage fittings, air.....	6	4		4		13	5		1	
26 Gages and gage fittings, steam.....	2	6		4		15				
27 Gage cocks.....	2	3		14		17	6			
28 Grate shakers and fire doors.....	7	2		6	1	30	3			
29 Handholds.....	12	5	1	5		28	1			
30 Injectors, inoperative.....	2	1		1		1				
31 Injectors and connections.....	36	3	5	17		63	11			
32 Inspections and tests not made as required.....	111	51	41	143		351	66			
33 Lateral motion.....	2	8		5		34				
34 Lights, cab and classification.....	1			7		7	1			
35 Lights, headlight.....	4	5	1	4		7	2			
36 Lubricators and shields.....	2	2	1	1		24				
37 Mud rings.....	1	1	1	6		8	2			
38 Packing nuts.....	7		3	2		23	1			
39 Packing, piston rod and valve stem.....	10	2		15	12	29	4			
40 Pilot and pilot beams.....	1	2		2		7				
41 Plugs and studs.....				2		7				
42 Reversing gear.....	3	4	2	6		25	1			
43 Rods, main and side, crank pins, and collars.....	20	12	11	35		130	16			
44 Safety valves.....	5			1		17				
45 Sanders.....	10	9	2	21		31	7			
46 Springs and spring rigging.....	24	24	28	73	1	133	18		1	
47 Squirt hose.....			1	3		5	1			
48 Stay bolts.....	3	3		3		6	1			
49 Stay bolts, broken.....		2		22						
50 Steam pipes.....	6	5	1	3		25	4			
51 Steam valves.....	2			1		10				
52 Steps.....	13	3	3	11		27	3			
53 Tanks and tank valves.....	14	8	2	16		54	6			
54 Telltale holes.....				4		1				
55 Throttle and throttle rigging.....	14	5	3	15	5	20	2			
56 Trucks, engine and trailing.....	13	10	8	18		37	4			
57 Trucks, tender.....	13	5	9	13	4	52	10			
58 Valve motion.....	11	5	1	7		50	1			
59 Washout plugs.....	7	3	2	2	1	25	2			
60 Train-control equipment.....										
61 Water glasses, fittings, and shields.....	9	1	9	14	2	75	5			
62 Wheels.....	4	2	1	10		31	4			
63 Miscellaneous—Signal appliances, badge plates, brakes (hand).....	7	2	1	9		26	3			
Number of defects.....	559	335	201	805	38	2,074	276	2	3	
Locomotives reported.....	1,066	187	170	1,234	66	1,346	295	10	11	12
Locomotives inspected.....	2,668	511	251	2,674	39	2,760	562	20	18	20
Locomotives defective.....	156	70	53	210	9	535	72	1	2	
Percentage of inspected found defective.....	6	14	21	8	23	19	13	5	11	
Locomotives ordered out of service.....	6	8	3	2	1	44	2			

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

Chicago, Cincinnati, Cleveland, Chicago & St. Louis	Clinchfield	Colorado & Southern	Colorado & Wyoming	Columbus & Greenville	Conemaugh & Black Lick	Copper Range	Cumberland & Pennsylvania	Delaware & Hudson	Delaware, Lackawanna & Western	Denver & Rio Grande Western	Denver & Salt Lake	Detroit & Mackinac	Detroit & Toledo Shore Line	Detroit Terminal	Detroit, Toledo & Iron-ton	Donora Southern	Duluth, Missabe & Northern	Duluth, South Shore & Atlantic	East St. Louis Junction	East Tennessee & Western North Carolina	Elgin, Joliet & Eastern	Erie	Florida East Coast	Fort Smith & Western
2	4	4	1	2				1	13	17	1			8	2						2	21		1
1	1	1	1	1					2	1	1			2								7		2
3	1	1	1	1					4	3	3			3								17		4
4	1	1	1	1					5	4	3			3								8		5
5	1	1	1	1					9	9	3			3								7		6
6	1	1	1	1					10	27	27			3								8		7
7	1	1	1	1					10	32	32			3								9		8
8	1	1	1	1					10	32	32			3								69		9
9	1	1	1	1					10	32	32			3								21		10
10	1	1	1	1					10	32	32			3								3		11
11	1	1	1	1					10	32	32			3								1		10
12	1	1	1	1					10	32	32			3								1		11
13	1	1	1	1					10	32	32			3								1		12
14	1	1	1	1					10	32	32			3								1		13
15	1	1	1	1					10	32	32			3								1		14
16	1	1	1	1					10	32	32			3								1		15
17	1	1	1	1					10	32	32			3								1		16
18	1	1	1	1					10	32	32			3								1		17
19	1	1	1	1					10	32	32			3								1		18
20	1	1	1	1					10	32	32			3								1		19
21	1	1	1	1					10	32	32			3								1		20
22	1	1	1	1					10	32	32			3								1		21
23	1	1	1	1					10	32	32			3								1		22
24	1	1	1	1					10	32	32			3								1		23
25	1	1	1	1					10	32	32			3								1		24
26	1	1	1	1					10	32	32			3								1		25
27	1	1	1	1					10	32	32			3								1		26
28	1	1	1	1					10	32	32			3								1		27
29	1	1	1	1					10	32	32			3								1		28
30	1	1	1	1					10	32	32			3								1		29
31	1	1	1	1					10	32	32			3								1		30
32	1	1	1	1					10	32	32			3								1		31
33	1	1	1	1					10	32	32			3								1		32
34	1	1	1	1					10	32	32			3								1		33
35	1	1	1	1					10	32	32			3								1		34
36	1	1	1	1					10	32	32			3								1		35
37	1	1	1	1					10	32	32			3								1		36
38	1	1	1	1					10	32	32			3								1		37
39	1	1	1	1					10	32	32			3								1		38
40	1	1	1	1					10	32	32			3								1		39
41	1	1	1	1					10	32	32			3								1		40
42	1	1	1	1					10	32	32			3								1		41
43	1	1	1	1					10	32	32			3								1		42
44	1	1	1	1					10	32	32			3								1		43
45	1	1	1	1					10	32	32			3								1		44
46	1	1	1	1					10	32	32			3								1		45
47	1	1	1	1					10	32	32			3								1		46
48	1	1	1	1					10	32	32			3								1		47
49																								

TABLE XII.—Number of steam locomotives inspected,

Parts defective, inoperative or missing, or in violation of the rules		Norfolk & Western	Norfolk Southern	Northern Pacific	Northern Pacific Terminal	Northwestern Pacific	Oregon Short Line	Oregon - Washington R. E. & Navigation Co.	Pataasco & Back Rivers	Pennsylvania	Pennsylvania - Reading Seashore Lines
1	Air compressors.....		1	59			6	6		75	3
2	Arch tubes.....			1						19	
3	Ash pans and mechanism.....			8			1			8	
4	Axles.....			1						1	
5	Blow-off cocks.....	1		26				1		14	
6	Boiler checks.....	1		8			2	3		44	1
7	Boiler shell.....	2		20			1	5		38	
8	Brake equipment.....	10	3	169				22		241	
9	Cabs, cab windows, and curtains.....	2	2	87				7		56	
10	Cab aprons and decks.....	2		23			1	2		35	
11	Cab cards.....	1		5						4	
12	Coupling and uncoupling devices.....			2						3	
13	Crossheads, guides, pistons, and piston rods.....	4		46			2	7		10	3
14	Crown bolts.....	1								10	
15	Cylinders, saddles, and steam chests.....	25		17				5		127	
16	Cylinder cocks and rigging.....	2	1	56						26	1
17	Domes and dome caps.....			3						11	
18	Draft gear.....	3	1	23	1		1	5		13	
19	Draw gear.....	2	2	12				4		23	
20	Driving boxes, shoes, wedges, pedestals, and braces.....	23		29			4	17		170	7
21	Fire-box sheets.....	1		3				5		37	
22	Flues.....	1		1						12	
23	Frames, tailpieces, and braces, locomotive.....	6		26			3	5		38	2
24	Frames, tender.....	1		6						7	
25	Gages and gage fittings, air.....		1	37			1	2		20	
26	Gages and gage fittings, steam.....	3		16				4		14	
27	Gage cocks.....	1		8			1	1		27	
28	Grate shakers and fire doors.....	1		13			1	4		78	
29	Handholds.....		1	17				3		19	1
30	Injectors, inoperative.....			1						11	
31	Injectors and connections.....	5		97			1	14		234	4
32	Inspections and tests not made as required.....	57	7	447	2	2	14	46		663	13
33	Lateral motion.....	1		22						15	
34	Lights, cab and classification.....			14			1			1	1
35	Lights, headlight.....			42			1			5	1
36	Lubricators and shields.....	1		11						24	
37	Mud rings.....	1		1						24	1
38	Packing nuts.....	1		17						32	
39	Packing, piston rod and valve stem.....	6		7				1		58	1
40	Pilot and pilot beams.....			10				2		9	
41	Plugs and studs.....	2		1						23	4
42	Reversing gear.....			5			1	1		72	
43	Rods, main and side, crank pins, and collars.....	8		38			5	2		187	3
44	Safety valves.....			1						8	
45	Sanders.....			146			3	9		83	6
46	Springs and spring rigging.....	4	2	172			2	37		208	1
47	Squirt hose.....			11						7	
48	Stay bolts.....	3		1				1		30	
49	Stay bolts, broken.....			5	3					30	2
50	Steam pipes.....	1		24				3		39	1
51	Steam valves.....	2		5						43	
52	Steps.....	1		32		1		5		56	
53	Tanks and tank valves.....		1	37			3	4		66	4
54	Telltale holes.....			2						6	
55	Throttle and throttle rigging.....	1		18				4		87	2
56	Trucks, engine and trailing.....	1	1	17			2	1		59	2
57	Trucks, tender.....			54			1	20		88	1
58	Valve motion.....	3		35			2	3		110	2
59	Washout plugs.....	5		33			4	4		55	
60	Train-control equipment.....									2	1
61	Water glasses, fittings, and shields.....	16	1	23			1			104	
62	Wheels.....	2		8	2	2	3	2		41	
63	Miscellaneous—Signal appliances, badge plates, brakes (hand).....	4		29			1	1		44	
Number of defects.....		216	25	2,087	8	5	70	279		3,781	81
Locomotives reported.....		622	70	935	12	58	287	237	25	4,748	76
Locomotives inspected.....		1,272	212	1,771	10	77	488	511	20	8,381	86
Locomotives defective.....		69	7	477	3	2	29	73		901	16
Percentage of inspected found defective.....		5.3	3.2	26.3	3.0	2.6	6.1	14.1		11.1	19.0
Locomotives ordered out of service.....				13			1	1		71	3

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

Peoria & Eastern	Peoria & Pekin Union	Pere Marquette	Bethlehem & New England	Pittsburgh & Lake Erie	Pittsburgh & Shawmut	Pittsburgh & West Virginia	Pittsburgh, Shawmut & Northern	Quebec Central	Reading	Richmond, Fredericksburg & Potomac	Rio Grande Southern	River Terminal	Rutland	St. Johnsbury & Lake Champlain	St. Joseph & Grand Island	St. Louis - San Francisco	St. Louis southwestern	San Diego & Arizona Eastern	Sandy River & Rangeley Lakes	Savannah & Atlanta	Seaboard Air Line	Sierra Ry. of California	South Buffalo	Southern Pacific, lines east		
2		5				6			5	2						6	5					4		2	1	
						12			4													1			2	3
		3							2	1															1	5
		5							14	4															6	4
									16	2															1	7
		4							45	5															3	8
		1							19	2															7	7
		1							2	1															8	8
									1																9	9
									2																10	10
									31	2															11	11
		1							1																12	12
		1							54	9															13	13
									6	2															14	14
									4	1															15	15
									6	2															16	16
									4	1															17	17
									6	1															18	18
									23	2															19	19
		10							51	12															20	20
									14	2															21	21
									15	1															22	22
									27	5															23	23
									6																24	24
									12	2															25	25
									5	1															26	26
									17	3															27	27
									17	3															28	28
									17	3															29	29
									1																30	30
		8							62	8															31	31
		20							210	29															32	32
									11	2															33	33
									1																34	34
									18	3															35	35
									3	1															36	36
									2																37	37
									11	1															38	38
									27	1															39	39
									8																40	40
									2	1															41	41
									13	1															42	42
									33	1															43	43
									3																44	44
									22	1															45	45
									58	2															46	46
									2																47	47
									6																48	48
									23																49	49
									16																50	50
									8	1															51	51
									7	1															52	52

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

Road	Percentage inspected defective						Ordered out of service							
	1935	1934	1931	1929	1927	1925	1923	1935	1934	1931	1929	1927	1925	1923
Akron, Canton & Youngstown	7	11	14	47	42	56	38	0	0	1	12	1	5	0
Alabama, Tennessee & Northern	39	32	28	37	56	53	78	2	1	3	1	2	1	1
Albion & Southern	0	3.4	0	31	26	69	0	0	0	0	0	0	0	0
Alton	1.3	1.3	0	3	14	35	75	0	1	0	3	5	9	29
Ann Arbor	3.7	0	0	9	25	71	97	0	0	0	0	2	15	24
Achison, Topeka & Santa Fe	15	11	8	14	24	32	49	14	9	9	14	40	30	84
Atlanta & West Point	10	7	4	6	9	23	27	0	1	0	0	1	4	1
Atlanta, Birmingham & Coast ¹	6	4.3	4.3	27	40	54	78	0	0	0	2	8	12	6
Atlantic & Yadkin	10	0	6	10	16	100	—	0	0	0	1	0	0	—
Atlantic Coast Line	14	10	14	10	30	35	58	17	4	7	2	4	14	45
Baltimore & Ohio, lines east ²	10	13	4.1	15	30	52	62	20	30	3	10	32	11	153
Baltimore & Ohio, lines west ³	9	11	4.7	17	49	—	—	10	14	8	17	72	—	—
Bangor & Aroostook	9	5	5	31	43	28	50	0	0	1	1	3	1	6
Belt Ry. of Chicago	27	34	4.3	35	54	51	66	1	3	0	4	5	4	6
Bessemer & Lake Erie	11	12	12	22	21	63	43	3	6	1	6	1	1	2
Birmingham Southern	17	0	0	14	100	0	—	1	0	0	0	0	0	—
Boston & Albany	11	12	15	16	26	47	54	0	2	0	0	0	10	7
Boston & Maine	15	10	13	16	23	36	67	13	4	6	3	13	23	191
Buffalo Creek	9	12	0	0	18	0	—	0	0	0	0	0	0	0
Burlington-Rock Island ⁴	45	20	9	18	41	61	58	0	1	0	0	2	4	2
Camas Prairie	53	50	47	16	—	—	—	2	1	0	0	—	—	—
Canadian National ⁵	32	15	37	34	50	50	84	1	2	5	7	30	24	4
Canadian Pacific	12	17	25	32	44	56	76	1	1	2	1	4	0	5
Central of Georgia	16	7	20	19	30	37	33	7	0	10	5	10	8	10
Central R. R. of New Jersey	6	20	13	42	38	47	77	0	3	2	14	20	46	139
Central Vermont	6	7	11	12	11	27	47	3	2	1	1	1	2	4
Charleston & Western Carolina	29	25	16	28	58	63	68	5	1	1	2	2	2	1
Chesapeake & Ohio ⁶	6	8	9	17	28	49	68	4	6	5	5	26	29	58
Chicago & Eastern Illinois	15	21	12	28	38	64	75	3	4	3	3	25	31	77
Chicago & Illinois Midland	0	0	0	14	83	—	—	0	0	0	0	29	—	—
Chicago & Northwestern	13	12	7	12	19	35	67	11	6	5	8	18	29	193
Chicago & Western Indiana	29	17	25	43	22	86	67	0	0	0	3	0	2	0
Chicago, Burlington & Quincy	6	6	6	14	21	46	60	6	4	4	18	39	185	176
Chicago Great Western	14	33	26	11	20	40	52	8	15	23	2	0	16	20
Chicago, Indianapolis & Louisville	21	20	11	26	29	45	57	3	3	1	2	14	7	13
Chicago, Milwaukee, St. Paul & Pacific	8	6	4.5	9	13	27	48	2	1	2	5	9	12	58
Chicago River & Indiana	23	24	0	5	0	70	62	1	0	0	0	0	5	0
Chicago, Rock Island & Pacific	19	14	11	17	29	55	76	44	28	17	13	49	124	367
Chicago, St. Paul, Minneapolis & Omaha	13	10	9	17	30	46	70	2	2	2	6	12	26	54
Chicago Short Line	5	29	0	44	38	—	—	0	0	0	3	0	—	0
Chicago, West Pullman & Southern	11	12	7	47	53	100	58	0	0	0	5	1	7	0
Cincinnati Union Terminal	0	0	—	—	—	—	—	0	0	—	—	—	—	—
Cleveland, Cincinnati, Chicago & St. Louis ⁷	8	11	6	24	34	44	67	7	10	3	16	37	47	77
Clinchfield	30	28	9	38	25	76	68	14	3	1	5	0	1	10
Colorado & Southern	22	24	8	43	40	76	81	11	2	2	10	4	52	71
Colorado & Wyoming	56	19	0	21	27	15	14	2	0	0	1	3	2	0
Columbus & Greenville	19	30	17	25	21	26	44	3	0	1	0	0	0	0
Conecough & Black Lick	—	40	16	58	0	—	—	0	0	1	1	7	7	0
Copper Range	12	0	18	28	84	59	75	0	0	0	1	0	0	0
Cumberland & Pennsylvania	12	20	12	29	13	20	25	1	0	0	0	1	2	52
Delaware & Hudson	1.3	2.4	2.7	2.6	9	24	62	0	0	0	0	1	2	47
Delaware, Lackawanna & Western	14	17	11	21	22	36	62	7	11	3	17	4	3	47
Denver & Rio Grande Western	21	4.3	10	36	54	58	92	11	0	7	32	88	72	174
Denver & Salt Lake	0	0	0	19	44	68	93	0	0	0	2	7	36	8
Detroit & Mackinac	22	25	41	33	36	82	26	1	0	0	0	0	2	0
Detroit & Toledo Shore Line	2.8	12	0	8	33	51	78	0	0	0	0	1	5	3
Detroit Terminal	38	32	18	31	46	72	76	1	0	0	1	0	7	0
Detroit, Toledo & Ironton	2.6	12	3.8	5	15	28	29	1	0	0	0	3	4	7
Donora Southern	17	14	5	0	0	—	—	0	3	1	0	0	—	—
Duluth, Missabe & Northern	1.2	6	4.2	1	12	37	74	0	0	0	0	0	1	2
Duluth, South Shore & Atlantic	14	10	10	24	29	35	69	0	1	4	2	5	1	3
East St. Louis Junction	12	28	17	27	46	59	100	0	0	0	0	0	1	0
East Tennessee & Western North Carolina	32	42	33	30	45	82	17	3	2	0	1	2	1	0
Elgin, Joliet & Eastern	8	6	7	4.7	13	68	50	1	1	0	0	1	58	1
Erle	7	13	4.5	30	39	70	17	19	17	137	41	26	100	0
Florida East Coast	9	2.2	1.4	7	21	22	0	0	0	0	0	0	0	0

¹ Atlanta, Birmingham & Atlantic prior to 1927.² Includes Buffalo & Susquehanna and Buffalo, Rochester & Pittsburg, 1933-35.³ Statistics prior to 1927 included in Baltimore & Ohio east.⁴ Trinity & Brazos Valley prior to 1931.⁵ Includes Grand Trunk Western, 1925-27.⁶ Includes former Hoeking Valley, 1931-35.⁷ Includes Peoria & Eastern prior to 1931.

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							
	1935	1934	1931	1929	1927	1925	1923	1935	1934	1931	1929	1927	1925	1923
Fort Smith & Western	24	23	71	49	60	62	87	1	1	29	5	5	2	2
Fort Worth & Denver City	13	10	5	13	23	36	27	8	6	2	2	3	8	4
Georgia & Florida	31	35	57	47	55	62	46	3	2	5	2	2	3	1
Georgia	8	4.6	1.1	11	12	34	28	3	0	0	3	0	2	5
Grand Trunk Western ⁸	6	9	7	28	—	—	—	61	2	2	0	4	—	26
Great Northern	16	14	8	31	33	46	76	7	9	5	42	27	31	262
Green Bay & Western	17	11	13	45	47	67	59	0	0	2	1	1	9	0
Gulf Coast Lines	2.2	.8	1	7	58	59	70	0	0	0	0	15	26	7
Gulf, Colorado & Santa Fe ⁹	12	12	7	19	47	45	—	10	6	3	6	31	32	0
Gulf, Mobile & Northern ¹⁰	25	16	18	22	23	38	62	6	4	0	1	2	7	6
High Point, Thomasville & Denton	0	0	18	33	—	—	—	0	0	0	0	0	—	—
Houston Belt & Terminal	0	1.4	1.4	8	—	—	—	0	0	0	0	0	—	—
Huntingdon & Broad Top Mountain	12	7	0	36	44	78	67	0	0	0	0	3	4	0
Illinois Central ¹¹	10	16	12	10	14	30	43	19	28	22	14	35	30	48
Illinois Terminal	0	0	32	29	40	12	—	0	0	4	1	0	0	—
Indiana Harbor Belt	9	5	0	1	14	52	68	0	0	0	0	0	18	4
Indianapolis Union	7	0	14	13	30	26	36	0	0	1	0	4	0	2
International-Great Northern	5	9	7	5	27	29	66	1	5	1	0	11	9	16
Interstate	17	7	42	60	83	94	78	1	0	1	4	6	6	3
Jacksonville Terminal	0	0	0	50	0	—	—	0	0	0	0	0	—	—
Kansas City Southern	7	2	1.9	7.9	26	52	92	1	0	0	1	12	11	121
Kansas City Terminal	12	5	0	24	24	80	88	0	0	0	0	0	2	3
Kansas, Oklahoma & Gulf	0	8	1.3	1	—	—	—	43	50	0	0	1	—	—
Kentucky & Indiana Terminal	8	0	3.7	8	6	0	—	0	0	0	0	1	0	10
Lake Erie & Eastern	0	0	0	—	—	—	—	0	0	0	—	—	—	—
Lake Superior & Ishpeming	6	12	17	52	39	46	59	0	0	1	7	1	2	3
Lake Superior Terminal & Transfer	25	0	0	10	21	44	67	0	0	0	0	0	1	2
Lake Terminal	4.8	0	10	56	20	50	0	0	0	1	1	0	0	0
Lehigh & Hudson River	12	17	14	25	20	14	60	0	0	0	1	0	1	0
Lehigh & New England	12	13	12	21	26	65	70	1	3	0	4	2	5	10
Lehigh Valley	6	8	10	39	26	36	71	2	1	8	42	14	26	219
Long Island	2.8	9	10	59	48	35	66	0	0	0	2	3	1	10
Los Angeles & Salt Lake	3.9	17	7	24	26	51	80	0	3	0	3	1	14	38
Louisiana & Arkansas	3.8	3.3	15	—	—	—	—	2	0	3	—	—	—	—
Louisiana & North West	48	27	17	50	—	—	—	36	75	1	1	0	2	8
Louisiana, Arkansas & Texas	38	31	26	—	—	—	—	8	1	2	—	—	—	—
Louisville & Nashville	6	8	9	33	41	57	68	4	9	6	32	54	94	136
McCloud River	0	0	0	29	25	63	46	0	0	0	0	0	0	0
Macon, Dublin & Savannah	20	15	9	24	56	64	60	2	1	0				

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						
	1935	1934	1931	1929	1927	1925	1923	1935	1934	1931	1929	1927	1925	1923
Norfolk Southern.....	3.3	3.3	16	24	45	45	57	0	1	3	2	4	5	10
Northern Pacific.....	26	23	16	13	29	37	61	13	6	22	6	50	28	113
Northern Pacific Terminal.....	30	7	20	12	22	12	32	0	0	0	0	0	0	0
Northwestern Pacific.....	2.6	4.5	8	1	6	6	57	0	0	0	0	0	0	12
Oregon Short Line.....	6	9	11	22	27	42	61	1	2	4	0	2	3	13
Oregon-Washington R. R. & Navigation.....	14	14	16	12	17	11	35	1	1	2	2	4	6	13
Patapsco & Back Rivers.....	0	8	0	50	47	44	60	0	0	0	1	1	0	1
Pennsylvania.....	11	13	10	33	44	61	76	71	70	33	153	335	573	687
Pennsylvania-Reading Seashore Lines.....	19	10	---	---	---	---	---	3	0	---	---	---	---	---
Peoria & Eastern ¹⁴	26	35	30	---	---	---	---	2	1	5	---	---	---	---
Peoria & Pekin Union.....	4.5	0	40	14	23	31	54	0	0	0	0	0	1	1
Pere Marquette.....	8	13	12	21	38	57	83	0	3	3	8	14	21	68
Philadelphia, Bethlehem & New England.....	24	34	21	65	74	76	67	6	6	1	16	14	2	2
Pittsburgh & Lake Erie.....	12	8	1.9	6	12	10	27	4	1	0	0	0	0	10
Pittsburg & Shawmut.....	0	2	4	4	0	47	52	0	0	0	0	0	0	2
Pittsburgh & West Virginia.....	42	10	32	57	39	0	33	27	1	4	30	8	0	0
Pittsburg, Shawmut & Northern.....	3.9	2.6	3.6	8	25	53	86	0	0	0	0	1	2	0
Quebec Central.....	20	100	0	100	---	---	---	1	1	0	0	0	0	0
Reading.....	14	21	13	33	42	48	59	10	23	5	31	22	26	12
Richmond, Fredericksburg & Potomac.....	21	8	14	18	30	43	58	2	0	0	1	1	2	3
Rio Grande Southern.....	46	0	0	0	70	62	100	0	0	0	0	8	8	2
River Terminal.....	33	45	0	71	43	70	0	3	0	0	5	1	0	0
Rutland.....	7	2.5	6	6	12	44	54	2	0	0	0	1	3	1
St. Johnsbury & Lake Champlain.....	4.8	4.5	16	---	---	---	---	0	0	0	0	0	1	1
St. Joseph & Grand Island.....	13	6	21	11	36	38	43	0	0	0	0	0	0	0
St. Louis-San Francisco.....	4.3	4.1	3.9	14	22	49	88	4	2	1	7	12	65	346
St. Louis Southwestern.....	13	11	8	4.3	22	47	86	10	10	4	2	22	14	54
San Diego & Arizona Eastern.....	9	10	13	38	30	55	44	0	1	2	4	3	0	1
Sandy River & Rangeley Lakes.....	17	0	10	0	62	7	---	0	0	0	0	1	1	0
Savannah & Atlanta.....	7	7	19	80	67	73	68	0	0	0	0	0	2	3
Seaboard Air Line.....	3	2.3	0	37	56	51	55	8	1	2	24	43	33	23
Sierra Ry. of California.....	4	0	0	---	---	---	---	0	0	0	0	0	0	0
South Buffalo.....	6	15	39	23	29	75	0	0	2	8	0	1	0	0
Southern Pacific, lines east.....	6	4	3.3	5	13	30	47	4	1	13	8	10	37	28
Southern Pacific, lines west.....	13	12	11	24	27	33	38	12	7	13	47	50	51	24
Southern Pacific of Mexico.....	22	18	0	30	100	100	---	1	1	0	2	3	1	---
Southern.....	7	9	9	12	24	36	59	20	33	16	13	38	56	177
Spokane International.....	30	9	9	15	28	0	37	1	0	0	0	0	0	2
Spokane, Portland & Seattle.....	33	38	22	22	33	32	60	2	6	1	1	2	4	13
Steelton & Highspire.....	23	24	19	24	48	---	---	0	1	0	2	---	---	---
Tennessee Central.....	24	38	14	47	65	74	89	2	11	0	14	40	23	63
Tennessee Coal, Iron & R. R.....	17	18	7	38	67	40	50	0	0	0	0	0	0	0
Terminal R. R. Association of St. L.....	36	32	32	41	44	62	76	44	11	4	0	3	1	6
Texas & Pacific.....	21	10	0	1	12	16	62	31	8	0	1	3	1	91
Texas-Mexican.....	11	22	27	43	50	33	50	0	0	0	0	0	0	1
Texas Pacific-Missouri Pacific Terminal R. R. of New Orleans.....	13	0	0	4	10	57	83	2	0	0	0	0	2	0
Tionesta Valley.....	0	12	100	38	17	80	100	0	0	0	2	2	7	0
Toledo, Peoria & Western.....	0	2.2	25	65	88	87	93	0	1	2	4	7	2	4
Toledo Terminal.....	0	0	5	45	35	3	41	0	0	0	0	0	0	3
Toronto, Hamilton & Buffalo.....	0	0	0	0	0	---	---	0	0	0	0	0	0	0
Tremont & Gulf.....	9	12	0	67	20	58	0	0	0	0	0	2	3	0
Uintab.....	0	0	0	0	0	75	---	0	0	0	0	0	0	0
Union Pacific.....	9	12	9	17	20	30	41	2	3	2	8	17	19	26
Union.....	0	11	11	9	29	80	10	0	0	1	2	0	0	2
Upper Merion & Plymouth.....	39	55	28	60	62	---	---	7	9	0	7	8	---	---
Utah.....	0	0	0	11	4	26	19	0	0	0	0	0	0	0
Virginian.....	23	12	17	22	50	58	75	4	0	1	0	2	5	45
Wabash.....	7	8	0	1.5	6	47	82	0	0	0	1	2	21	89
Washington Terminal.....	24	27	0	10	43	40	89	1	0	0	0	1	1	2
Western Maryland.....	8	7	13	26	42	54	76	1	0	1	3	13	22	90
Western Pacific.....	7	5	16	25	19	36	37	1	0	5	9	1	13	9
Wheeling & Lake Erie.....	8	6	8	42	55	67	74	2	0	1	7	10	20	31
Wichita Falls & Southern.....	33	33	18	4	0	87	100	1	1	1	1	0	6	1
Winston-Salem Southbound.....	0	0	22	33	50	56	77	0	0	0	0	0	1	1
Wrightsville & Tennille.....	5	7	3.2	12	24	54	29	0	0	0	0	0	3	0
Less than 10, discontinued roads, and industrial locomotives.....	31	30	32	40	51	56	56	186	155	213	331	562	581	381
All roads.....	12	12	10	21	31	46	65	921	754	688	1,490	2,539	3,637	7,075

¹⁴ Included in Cleveland, Cincinnati, Chicago & St. Louis prior to 1931. 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