

INTERSTATE COMMERCE COMMISSION

---

SIXTEENTH ANNUAL REPORT

OF THE

CHIEF INSPECTOR  
BUREAU OF LOCOMOTIVE INSPECTION

TO THE

INTERSTATE COMMERCE COMMISSION

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FISCAL YEAR ENDED  
JUNE 30, 1927



UNITED STATES  
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1927

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

OCTOBER 1, 1927.

*To the Interstate Commerce Commission:*

In compliance with section 7 of the act of February 17, 1911, as amended, the Sixteenth Annual Report of the Chief Inspector covering the work of the bureau during the fiscal year ended June 30, 1927, 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 as should have been.

The tables showing the number of accidents, the number of persons killed and number injured as a result of the failure of parts and appurtenances of locomotives 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*

	1927	1926	1925	1924	1923
Number of locomotives for which reports were filed..	67, 835	69, 173	70, 361	70, 683	70, 242
Number inspected.....	97, 227	90, 475	72, 279	67, 507	63, 657
Number found defective.....	29, 995	36, 354	32, 989	36, 098	41, 150
Percentage inspected found defective.....	31	40	46	53	65
Number ordered out of service.....	2, 539	3, 281	3, 637	5, 764	7, 077
Total number of defects found.....	112, 008	136, 973	129, 239	146, 121	173, 840

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

	Year ended June 30—				
	1927	1926	1925	1924	1923
Number of accidents.....	488	574	690	1,005	1,348
Per cent increase or decrease from previous year.....	14.9	16.8	31.3	25.5	117
Number of persons killed.....	28	22	20	66	72
Per cent increase or decrease from previous year.....	127.3	110	69.7	8.3	1118
Number of persons injured.....	517	660	764	1,157	1,560
Per cent increase or decrease from previous year.....	21.6	13.6	33.9	25	120

<sup>1</sup> Increase.

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

	Year ended June 30—				
	1927	1926	1925	1915	1912
Number of accidents.....	185	247	274	424	856
Number of persons killed.....	20	18	13	13	91
Number of persons injured.....	205	287	315	467	1,005

<sup>1</sup> The original act applied only to the locomotive boiler.

TABLE IV.—Derailments and casualties caused by defects in or failure of some part of the steam locomotive or tender

	Year ended June 30—				
	1927	1926	1925	1924	1923
Number of derailments <sup>1</sup> .....	15	23	22	30	28
Number of persons killed.....	1	2	-----	3	4
Number of persons injured.....	23	49	52	112	157

<sup>1</sup> Only derailments reported by carriers as being caused by defect in or failure of parts of the locomotive or tender were investigated or counted.

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

	1927		1926		1925		1924		1923	
	Killed	Injured	Killed	Injured	Killed	Injured	Killed	Injured	Killed	Injured
Members of train crews:										
Engineers.....	8	181	5	210	8	230	19	330	19	484
Firemen.....	9	179	6	230	6	300	22	434	16	597
Brakemen.....	4	51	3	77	2	84	9	102	12	137
Conductors.....	-----	25	2	28	-----	25	2	39	1	35
Switchmen.....	1	13	-----	19	-----	23	1	29	2	32
Roundhouse and shop employees:										
Boiler makers.....	-----	11	-----	5	-----	6	1	24	3	19
Machinists.....	1	5	-----	5	-----	13	1	9	2	14
Foremen.....	-----	1	-----	3	-----	-----	1	6	1	6
Inspectors.....	-----	-----	-----	-----	-----	2	1	3	-----	2

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

	1927		1926		1925		1924		1923	
	Killed	Injured	Killed	Injured	Killed	Injured	Killed	Injured	Killed	Injured
Roundhouse and shop employees—Continued										
Watchmen.....	2	4	1	5	1	3	-----	5	1	6
Boiler washers.....	1	2	-----	2	-----	5	2	5	1	9
Hostlers.....	1	7	-----	9	-----	16	-----	14	-----	31
Other roundhouse and shop employees.....	-----	10	1	15	-----	10	6	34	4	29
Other employees.....	1	9	3	10	1	13	-----	16	4	36
Nonemployees.....	-----	19	1	42	2	34	1	107	6	123
Total.....	28	517	22	660	20	764	66	1,157	72	1,560

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

	1927
Number of locomotives for which reports were filed.....	951
Number inspected.....	604
Number found defective.....	174
Percentage inspected found defective.....	29
Numbered ordered out of service.....	9
Total number of defects found.....	423

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

	Year ended June 30, 1927
Number of accidents.....	5
Number of persons killed.....	5
Number of persons injured.....	5

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

	1927	
	Killed	Injured
Members of train crews:		
Engineers.....	-----	1
Firemen.....	-----	2
Roundhouse and shop employees:		
Inspectors.....	-----	1
Other roundhouse and shop employees.....	-----	1
Total.....	-----	5

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

Part or appurtenance which caused accident	Year ended June 30—														
	1927			1926			1925			1924			1923		
	Accidents	Killed	Injured	Accidents	Killed	Injured	Accidents	Killed	Injured	Accidents	Killed	Injured	Accidents	Killed	Injured
Air reservoirs	3	3	3	5	4	4	2	2	6	7	7	6	6	7	
Aprons	6	6	11	11	4	4	11	11	8	8	8	11	8	8	
Arch tubes	2	5	5	3	3	3	5	5	11	17	17	8	11	17	
Ash-pan blowers	2	2	2	3	3	3	3	9	9	19	19	9	19	19	
Axles	6	7	7	1	12	8	24	10	16	6	7	10	16	6	
Blow-off cocks	10	1	9	10	10	13	13	18	18	28	29	28	28	29	
Boiler checks	2	2	8	8	8	8	8	8	12	12	12	12	12	12	
Boiler explosions:															
A. Shell explosions															
B. Crown sheet; low water; no contributory causes found	14	14	14	22	11	33	9	5	18	20	25	19	19	24	
C. Crown sheet; low water; contributory causes or defects found	5	3	12	15	6	30	13	5	22	22	20	37	34	15	
D. Fire box; defective staybolts, crown stays, or sheets															
Brakes and brake rigging	25	1	26	13	21	31	3	33	38	45	27	1	56	5	
Couplers	15	16	15	19	21	1	20	24	1	27	25	1	27	27	
Crank pins, collars, etc.	3	4	8	10	8	10	12	13	12	13	12	1	13	13	
Crossheads and guides	7	7	5	7	3	3	11	13	10	10	10	10	10	10	
Cylinder cocks and rigging	3	3		3	3	3	8	8	11	11	11	11	11	11	
Cylinder heads and steam chests	4	4	9	11	2	2	8	14	8	8	8	8	8	8	
Dome caps															
Draft appliances	2	2	1	1	4	8	4	5	13	14	16	2	14	16	
Draw gear	5	6	2	2	6	6	13	2	11	16	2	2	16	16	
Fire doors, levers, etc.	6	6	11	11	12	12	16	16	26	26	26	26	26	26	
Flues	23	1	26	26	31	36	41	1	54	44	59	59	59	59	
Flue pockets															
Footboards	10	10	9	1	8	11	11	24	2	2	36	1	5	5	
Gauge cocks															
Grease cups	1	1	3	3	7	7	8	1	7	6	1	6	6	6	
Grate shakers	29	29	38	38	57	57	96	1	97	138	138	138	138	138	
Handholds	12	11	14	14	13	13	21	1	20	34	2	32	32	32	
Headlights and brackets	6	1	5	2	2	5	6	2	4	8	8	8	8	8	
Injectors and connections (not including injector steam pipes)	12	12	19	22	20	20	35	1	36	33	33	33	33	33	
Injector steam pipes	4	5	8	9	12	15	16	20	20	40	46	46	46	46	
Lubricators and connections	7	8	12	1	11	16	16	12	22	22	22	22	22	22	
Lubricator glasses															
Patch bolts															
Pistons and piston rods	4	1	3	3	4	4	7	7	14	1	13	3	3	3	
Plugs, arch tube and washout	6	1	8	4	5	5	6	17	6	19	19	5	27	27	
Plugs in fire-box sheets	1	2													
Reversing gear	30	30	37	37	49	49	83	83	100	100	100	100	100	100	
Rivets	2	2	3	3	3	3	1	7	8	5	8	3	8	8	
Rods, main and side	16	1	18	20	24	23	1	25	21	53	3	57	57	57	
Safety valves															
Sanders	5	5			3	3	3	5	4	4	4	4	4	4	
Side bearings															
Springs and spring rigging	14	18	16	16	25	1	26	19	1	18	25	2	25	25	
Squirt hose	33	33	51	51	53	53	66	66	67	69	69	69	69	69	
Staybolts	8	8	4	4	5	5	6	2	3	7	8	8	8	8	
Steam piping and blowers	11	11	7	7	5	6	23	1	27	19	19	19	19	19	
Steam valves	6	6	4	4	7	8	15	15	16	1	16	1	16	16	
Studs	3	3	7	9	1	1	4	5	6	8	8	8	8	8	
Superheater tubes	5	7	7	10	3	3	4	6	10	15	15	15	15	15	
Throttle glands	2	2													
Throttle leaking															
Throttle rigging	6	1	6	12	10	10	13	14	19	2	19	2	19	19	
Trucks, leading, trailing, or tender	4	1	4	7	23	6	14	17	3	85	25	5	101	101	
Valve gear, eccentrics, and rods	20	23	13	13	16	16	27	27	35	2	59	2	59	59	
Water glasses	12	11	12	12	8	8	14	14	14	35	35	35	35	35	
Water-glass fittings	2	2	3	3	7	7	10	11	7	7	7	7	7	7	
Wheels	5	6	6	7	7	10	8	10	10	1	19	1	19	19	
Miscellaneous	69	1	68	81	2	82	101	1	101	124	133	170	1	179	
Total	488	28	517	574	22	660	690	20	764	1,005	66	1,157	1,348	72	1,560

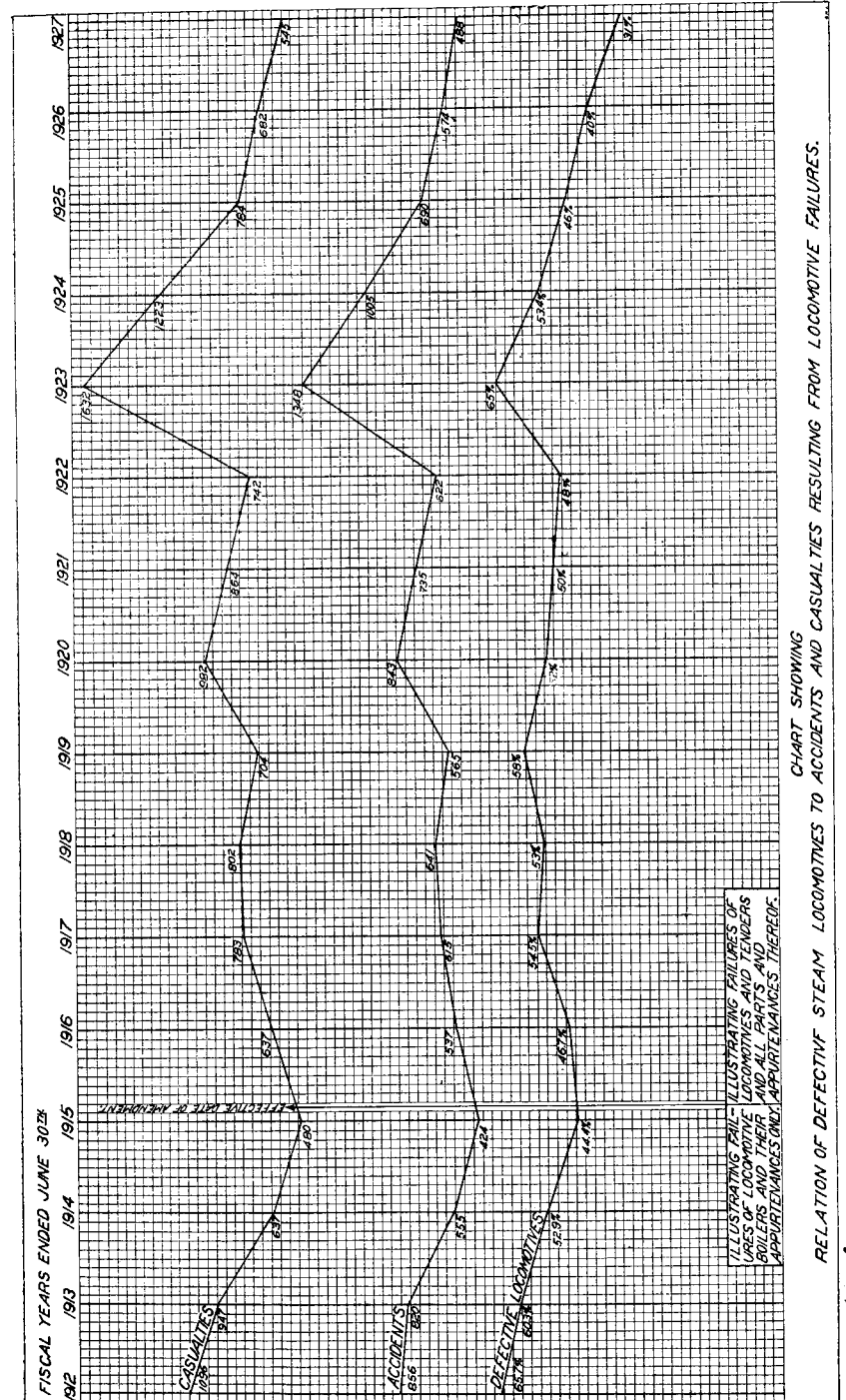


TABLE X.—Accidents and casualties resulting from failures of locomotives other than steam, and their appurtenances

Part or appurtenance which caused accident	Year ended June 30, 1927		
	Accidents	Killed	Injured
Circuit breaker.....	1		1
Insulation.....	1		1
Transformer.....	1		1
Miscellaneous.....	2		2
Total.....	5		5

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

Parts defective, inoperative or missing, or in violation of rules	Fiscal years ended June 30—				
	1927	1926	1925	1924	1923
1. Air compressors.....	1,679	2,151	1,574	1,221	1,390
2. Arch tubes.....	127	204	198	272	468
3. Ash pans or mechanism.....	192	211	216	257	306
4. Axles.....	13	8	14	19	21
5. Blow-off cocks.....	650	280	825	965	1,578
6. Boiler checks.....	1,043	1,200	991	1,329	1,913
7. Boiler shell.....	1,422	1,888	1,597	2,103	2,370
8. Brake equipment.....	6,572	7,062	6,497	6,920	8,213
9. Cabs or cab windows.....	2,055	2,666	2,541	1,627	1,423
10. Cab aprons or decks.....	1,086	1,307	1,165	1,293	1,476
11. Cab cards.....	575	696	665	758	1,449
12. Coupling or uncoupling devices.....	289	394	447	398	634
13. Crossheads, guides, pistons, or piston rods.....	2,602	3,018	2,922	3,577	5,527
14. Crown bolts.....	235	334	283	418	630
15. Cylinders, saddles, or steam chests.....	4,526	5,080	4,352	5,712	4,875
16. Cylinder cocks or rigging.....	1,634	1,904	1,801	2,376	1,745
17. Domes or dome caps.....	388	463	371	494	626
18. Draft gear.....	2,037	2,434	2,283	1,981	2,613
19. Draw gear.....	2,210	3,140	3,273	4,160	4,613
20. Driving boxes, shoes, wedges, pedestals, or braces.....	2,710	3,342	3,241	3,722	4,269
21. Fire-box sheets.....	796	1,129	1,152	1,471	2,327
22. Flues.....	465	556	624	698	1,268
23. Frames, tailpieces, or braces, locomotive.....	1,682	1,973	2,036	2,580	2,683
24. Frames, tender.....	264	373	391	414	540
25. Gauges or gauge fittings, air.....	721	886	694	626	1,062
26. Gauges or gauge fittings, steam.....	1,425	2,038	1,809	2,026	3,075
27. Gauge cocks.....	2,024	3,068	3,051	3,535	5,895
28. Grate shakers.....	613	720	832	1,006	569
29. Handholds.....	2,2	3,100	2,831	2,241	1,990
30. Injectors, inoperative.....	84	78	70	94	251
31. Injectors and connections.....	7,188	8,303	8,064	9,985	12,406
32. Inspections or tests not made as required.....	8,589	10,646	10,436	9,740	7,419
33. Lateral motion.....	673	758	659	939	1,625
34. Lights, cab or classification.....	107	106	86	72	90
35. Lights, headlight.....	835	946	928	904	1,164
36. Lubricator or shields.....	746	853	704	565	566
37. Mud rings.....	1,073	1,458	1,394	1,901	2,711
38. Packing nuts.....	1,851	2,772	2,701	3,304	4,755
39. Packing, piston rod and valve stem.....	2,214	2,489	2,411	3,187	3,359
40. Pilot or pilot beams.....	507	638	832	967	1,294
41. Plugs or studs.....	740	1,087	849	1,026	857
42. Reversing gear.....	1,247	1,539	1,274	1,217	1,272
43. Rods, main or side, crank pins or collars.....	5,137	5,683	4,813	6,507	10,080
44. Safety valves.....	212	270	234	188	192
45. Sanders.....	1,268	1,769	2,004	1,806	1,857
46. Springs or spring rigging.....	5,956	6,826	5,532	6,335	7,911
47. Squirt hose.....	644	975	1,006	1,221	1,098
48. Staybolts.....	631	905	741	916	1,313
49. Staybolts, broken.....	2,373	3,582	3,745	5,320	10,089
50. Steam pipes.....	1,308	1,587	1,590	2,305	2,467
51. Steam valves.....	774	962	869	931	1,168
52. Steps.....	2,440	3,227	2,867	2,820	3,289
53. Tanks or tank valves.....	2,747	3,430	3,352	3,393	3,788
54. Teltale holes.....	377	487	451	620	715
55. Throttle or throttle rigging.....	2,233	2,618	2,403	2,868	2,633
56. Trucks, engine or trailing.....	2,363	2,860	2,966	3,425	3,899
57. Trucks, tender.....	4,114	4,929	5,372	5,977	3,714

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

Parts defective, inoperative or missing, or in violation of rules	Fiscal years ended June 30—				
	1927	1926	1925	1924	1923
58. Valve motion.....	1,568	1,576	1,250	1,269	1,761
59. Washout plugs.....	2,786	3,049	3,588	3,204	3,641
60. Water bars or combustion flues.....	25	44	19	18	24
61. Water glass, fittings, or shields.....	2,973	3,021	3,713	4,201	5,641
62. Wheels.....	2,119	2,243	2,148	2,996	4,371
63. Miscellaneous—Signal appliances, badge plates, brakes (hand).....	1,486	1,702	1,510	1,342	972
Total number of defects.....	112,008	136,973	129,239	146,121	173,840
Locomotives reported.....	67,835	69,173	70,361	70,683	70,242
Locomotives inspected.....	97,227	90,475	72,279	67,507	63,657
Locomotives defective.....	29,995	36,354	32,989	36,098	41,150
Percentage inspected found defective.....	31	40	46	53	65
Locomotives ordered out of service.....	2,539	3,281	3,637	5,704	7,075

TABLE XII.—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, 1927
Air compressors.....	2
Batteries.....	1
Brake equipment.....	13
Cabs or cab windows.....	72
Current collecting apparatus.....	20
Draft gear.....	9
Draw gear.....	6
Driving boxes, shoes, wedges, pedestals, or pedestal braces.....	8
Frames, tail pieces, or braces.....	1
Fuel tank, its piping and valves.....	8
Gauges and gauge fittings, air.....	1
High-tension equipment not properly guarded against accidental contact.....	11
Inspections or tests not made as required.....	79
Insulation.....	1
Jack shafts.....	1
Lateral motion—wheels.....	18
Lights, cab or classification.....	5
Lights, headlight.....	1
Meters—volt and ampere.....	1
Motors or generators.....	5
Pilots or pilot beams.....	1
Rods, motor, main or side, drive shafts.....	38
Springs or spring rigging—driving and truck.....	18
Switches, hand-operated, and fuses.....	6
Transformers, resistors, and rheostats.....	2
Trucks.....	56
Water glass, fittings, or shields.....	2
Wheels.....	17
Miscellaneous.....	20
Total number of defects.....	423
Locomotives reported.....	951
Locomotives inspected.....	604
Locomotives defective.....	174
Percentage inspected found defective.....	29
Locomotives ordered out of service.....	9

## INVESTIGATION OF ACCIDENTS

All accidents reported to this bureau, as required by the law and rules, were carefully investigated and action taken to prevent recurrences as far as possible. Copies of accident investigation reports

were furnished to parties interested when requested, and otherwise used in an endeavor to bring about a decrease in the number of accidents.

A summary of all accidents and casualties to persons occurring in connection with steam locomotives compared with the previous year shows a decrease of 14.9 per cent in the number of accidents, an increase of 27.3 per cent in the number of persons killed, and a decrease of 21.6 per cent in the number injured during the year. There was a substantial decrease in the percentage of locomotives inspected by our inspectors found defective. During the year 31 per cent of the locomotives inspected were found with defects or errors in inspection that should have been corrected before being put in use as compared with 40 per cent for the previous year and 46 per cent for the fiscal year ended June 30, 1925.

While there was a substantial decrease in the total number of accidents during the year, our investigations indicate that a still greater decrease should have resulted had the requirements of the law and rules been complied with, especially so with respect to defects the repairs of which are frequently considered unimportant.

Boiler explosions caused by crown-sheet failures continue to be the most prolific source of serious and fatal accidents with which we have to deal, 60.7 per cent of the fatalities during the year being attributable to this cause. There was a decrease of 48.7 per cent in the number of crown-sheet failures, but the average number of fatalities per accident increased, resulting in the same number of fatalities from this cause as occurred in the previous year. The fatalities per accident may be expected to increase with the increasing size of locomotives and the higher pressure carried in the boilers of modern locomotives. Our investigations indicate that material reduction in this class of accident and resulting casualties can be accomplished only by proper location and maintenance of water-level indicating appliances that will accurately register the water level in the boiler under all conditions of service; the use of the safest practicable fire box construction, especially within the area which may be exposed to overheating due to low water; and the application of a device that will give an audible alarm when the water level approaches the danger point.

Table IX shows the various parts and appurtenances of the steam locomotive and tender which through failure have caused serious and fatal accidents which if taken advantage of and proper inspections and repairs are made in accordance with the spirit and intent of the law and rules a large portion of such accidents can be avoided. The graphic chart on page 5 shows the relation between the percentage of defective steam locomotives and the number of accidents

and casualties to persons resulting from failure thereof, and illustrates the effect of operating locomotives in a defective condition from the viewpoint of safety.

Data in connection with locomotives other than steam are shown under appropriate captions.

#### REDUCED BODY STAY BOLTS

In my fifteenth annual report attention was called to the danger resulting from the use of reduced body stay bolts having telltale holes which do not extend into the reduced section at least five-eighths inch. Failure of this type of bolt usually occurs at or close to the fillet joining the body of the bolt and the enlarged ends. Telltale holes which do not extend into the bolts to or beyond the usual point of breakage can not perform the function for which they are intended and mislead inspectors who depend upon the telltale holes as a check of the results of the hammer test.

When applying reduced body stay bolts, great care should be exercised to see that the bolts are of proper length so that the threads on the bolts engage the threads in the sheets for the full thickness of the sheets. If the bolts are too long, a full bearing for the threads is not obtained in each sheet and part of the bolt will blow out when breakage occurs, usually with fatal results.

Illustrations on pages 71 and 72 show typical failures of reduced body stay bolts.

#### EXTENSION OF TIME FOR REMOVAL OF FLUES

One hundred and forty-six applications were filed for extension of time for removal of flues, as provided in rule 10. Our investigations disclosed that in eight of these cases the condition of the locomotives was such that no extension could properly be granted. Eleven were in such condition that the full extensions requested could not be authorized, but extensions for shorter periods of time were allowed. Twenty extensions were granted after defects disclosed by our investigations had been repaired. Eleven applications were canceled for various reasons. Ninety-six applications were granted for the full period requested.

#### SPECIFICATION CARDS AND ALTERATION REPORTS

Under rule 54 of the Rules and Instructions for Inspection and Testing of Steam Locomotives 1,806 specification cards and 9,076 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, 414 specifications were filed for locomotive units and 90 specifications were filed for boilers mounted on locomotives other than steam. These were checked and analyzed and corrective measures taken with respect to discrepancies found.

#### PROSECUTIONS

Following is a brief summary of cases instituted and those disposed of during the year. Under the style of each case is shown the nature of the violations involved, number of counts, and status of the case.

*U. S. v. Bangor & Aroostook Railroad Company*, district of Maine, involved two counts for the use of a locomotive with a broken engine truck spring. Plea of guilty was entered in one count and a fine of \$100 imposed. One count was dismissed.

*U. S. v. Buffalo Creek Railroad Company*, western district of New York, involved one count for the use of a locomotive with a defective superheater flue. Plea of guilty was entered and a fine of \$100 imposed.

*U. S. v. Chicago & Illinois Midland Railroad Company*, southern district of Illinois, involved 146 counts for the use of locomotives while in defective condition. By agreement and with the approval of the Attorney General 46 counts were dismissed, plea of guilty was entered in 100 counts, and a fine of \$10,000 imposed.

*U. S. v. Cincinnati, Indianapolis & Western Railroad Company*, southern district of Illinois, involves 44 counts for the use of locomotives while in defective condition. Case pending.

*U. S. v. Jefferson & North Western Railway Company*, eastern district of Texas, involves 9 counts for the use of locomotives in defective condition. Case pending.

*U. S. v. Kansas City, Mexico & Orient Railway Company*, northern district of Texas, involves 20 counts for the use of a locomotive with arch tubes in defective condition. Case pending.

*U. S. v. Louisiana Railway and Navigation Company*, eastern district of Texas, involves 3 counts for permitting the use of defective locomotives on the line of the defendant. Case pending.

*U. S. v. Texas and Pacific Railway Company*, eastern district of Texas, involves 3 counts for permitting the use of defective locomotives on the line of the defendant. Case pending.

#### APPEALS

One formal appeal was taken from the decisions of our inspectors during the year. After careful investigation of the existing conditions the appeal was dismissed.

#### RECOMMENDATIONS FOR BETTERMENT OF THE SERVICE

In my former reports recommendations were made, in accordance with section 7 of the act, as amended, for the application of automatic fire doors, power reverse gears, power grate shakers, horizontal handholds, stirrups on cabs, and water columns with water glass and gauge cocks attached with an additional water glass located on the left side or boiler back head, and reasons given therefor.

While many of the carriers have recognized the value of these appliances and considerable progress has been made in the application thereof, the installations are not progressing as fast as could be desired to obtain the maximum degree of safety; therefore the recommendations are respectfully renewed and should be made a requirement of the rules.

#### LOW-WATER ALARMS

Reference was made in my last annual report to the application of audible low-water alarms by many of the carriers in an effort to reduce the number of explosions caused by low water. A number of such devices have been developed, some of which appear to have proved themselves reliable from the viewpoint of the users. A large percentage of the fatalities and many serious injuries would be prevented by the use of dependable low-water alarms, and the carriers who have applied these devices and those who assist in their further use and development are to be highly commended for the contribution to safety.

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, 1927, 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.]

**ATCHISON, TOPEKA & SANTA FE RAILWAY SYSTEM:**

July 20, 1926, locomotive 258, Topeka, Kans. Broken rivet blew out of door sheet while boilermaker was calking leaks in firebox under pressure; rivet had been broken for some time and the end on water side missing; 1 injured.

\*August 6, 1926, locomotive 1190, Mayfield, Kans. Squirt hose parted at splice; 1 injured.

\*August 13, 1926, locomotive 800, Sheffield, Mo. Pony truck wheels of engine derailed at switch, account of radius rod being bent; 1 injured.

November 8, 1926, locomotive 3201, near Cassoday, Kans. Crown-sheet failure; low water; no contributory causes found; 1 killed, 1 injured.

\*\*November 22, 1926, locomotive 3270, Shopton, Iowa. Automatic fire-door operating lever worn, allowing upper half of fire door to fall out of place and on operator's foot; 1 injured.

\*November 23, 1926, locomotive 1696, Tyrone, Colo. Brake shoe was thrown from locomotive; 1 injured.

December 5, 1926, locomotive 3305, Dugger, Tex. Valve stem to power reversing gear bent so that it would not allow valve to seat, rendering reverse gear inoperative from forward position; reversing gear reported on November 23, 25, and December 3; 1 injured.

\*December 20, 1926, locomotive 1030, Lawrence, Kans. Flue burst; 1 injured.

December 28, 1926, locomotive 3894, near Dennison, Ariz. Drain valve to feed-water heater pump lubricator broke while being tightened under pressure. Lubricator apparently contained low flash oil, which ignited from torch flame, burning engineer and fireman; 2 injured.

January 20, 1927, locomotive 798, Panhandle, Tex. Tubular water glass burst; cut by flying glass; 1 injured.

\*\*March 27, 1927, locomotive 961 (place not given). Flange of air-hose coupling worn so thin that air hose came uncoupled, causing brake to apply in emergency; 1 injured.

May 24, 1927, locomotive 4081, near Medill, Mo. Flue broke off at defective safe-end weld; overheated in welding; 2 injured.

Twelve accidents; 1 killed, 14 injured.

**ATLANTA, BIRMINGHAM & COAST RAILROAD:**

August 16, 1926, locomotive 101, Mystic, Ga. Squirt hose burst; hose defective; 1 injured.

\*\*January 1, 1927, locomotive 43, Fitzgerald, Ga. Blow-off cock discharge pipe disconnected and when blow-off was opened the discharging hot water struck employee; 1 injured.

Two accidents; 2 injured.

**ATLANTIC COAST LINE RAILROAD:**

July 4, 1926, locomotive 705, Jacksonville, Fla. Nut worked off worn link-block pin, allowing the cheek plate on right link block to foul link hanger; 1 injured.

July 12, 1926, locomotive 474, near Kissimmee, Fla. Driving spring hanger broke; 1 injured.

\*\*September 19, 1926, locomotive 1109, Waycross, Ga. Hole worn in sand trap, allowing sand to be blown into engineer's eyes; 1 injured.

\*November 13, 1926, locomotive 1537, Folkston, Ga. Bolt came out of top end of board used on back of cab as a wind shield, allowing board to fall and strike employee; 1 injured.

November 22, 1926, locomotive 995, Arcadia, Fla. Ash-pan lever loose on shaft; insufficient clearance between lever and feed pipe; 1 injured.

December 14, 1926, locomotive 431, Fort Meade, Fla. Ash pan came down and caught on roadbed; 1 injured.

January 1, 1927, locomotive 1200, Jacksonville, Fla. Front handhold on locomotive bent, allowing it to be pulled out of socket in bracket; 1 injured.

January 30, 1927, locomotive 1126, Sanford, Fla. Flue failed at defective safe-end butt weld; 1 injured.

\*March 31, 1927, locomotive 467, near Nansmond, Va. Left main driver broke off, due to old fracture inside of driving box; 1 injured.

May 11, 1927, locomotive 1040, Okahumpka, Fla. Right main crank pin broke, due to old fracture covering approximately two-thirds of cross-sectional area; 1 injured.

May 12, 1927, locomotive 472, Auburndale, Fla. Bolt in left eccentric rod lost out; 1 injured.

June 18, 1927, locomotive 1036, Lacoochee, Fla. Cut by edge of cab apron, which was worn sharp; 1 injured.

Twelve accidents; 12 injured.

**BALTIMORE & OHIO RAILROAD SYSTEM:**

\*\*July 17, 1926, locomotive 6156, Wapakoneta, Ohio. Plunger blew out of bell ringer, account of set screw in air cylinder coming out, due to threads being stripped; 1 injured.

July 28, 1926, locomotive 1857, Baltimore, Md. Automatic coupler damaged to the extent it would not couple automatically, causing injury while attempting manual operation; 1 injured.

July 30, 1926, locomotive 2770, Cleveland, Ohio. Grinding plug in left injector line check valve cap broke off; 1 injured.

\*\*August 11, 1926, locomotive 1410, Guyandotte, W. Va. Main rod strap failed in fillet at top of strap, account of old defect; 1 injured.

\*\*August 12, 1926, locomotive 4294, Willard, Ohio. Cab handhold broke through bolt hole at bottom end, due to old fracture; 1 injured.

\*\*October 8, 1926, locomotive 1941, Willard, Ohio. Sand-pipe flange union broken and crack filled with rod grease which blew out, blowing sand into engineer's eyes; "Left sand pipe broke off at sand box" was reported on October 5, 7, and 8, and sand pipe reported daily on subsequent reports until October 18; 1 injured.

October 11, 1926, locomotive 4004, Crescent, Ohio. Cast-iron reducer in steam pipe to air compressors broke at throttle connection in cab, due to weak construction and material; 1 injured.

October 16, 1926, locomotive 5074, Defiance, Ohio. Engineman fell from left front tender sill step, account of step being loose and swinging; bolting face of step casting was broken, leaving step supported by two front bolts only instead of four bolts as intended; sill step was reported loose on October 13 and 14; 1 injured.

October 17, 1926, locomotive 1885, Clarksburg, W. Va. Broken stay bolt blew out of outside wrapper sheet while being calked under pressure account of threads on bolt and in sheet practically gone. Bolt was  $1\frac{1}{8}$  inches diameter at threaded end and  $\frac{1}{2}$  inch in reduced body and broke at fillet in reduced section; bolt head showed evidence of heavy and frequent calking; 1 injured.

\*\*October 19, 1926, locomotive 5151, between Newark, Ohio, and Benwood Junction, W. Va. Sand box leaking, caused by washers on sand-box studs worn and loose. "Sand box leaks bad" was reported on October 18, and locomotive was again dispatched that day with notation on report to the effect that there was not enough time to complete the work; 1 injured.

\*\*October 31, 1926, locomotive 4193, Fostoria, Ohio. Insufficient clearance between reverse lever and independent brake valve; marks on reverse lever handle and on brake valve indicated this condition had existed for some time; 1 injured.

November 13, 1926, locomotive 1300, Otter, W. Va. Boiler check valve stuck open, due to scale deposit, also abuse of inlet union and valve seat, steam blowing pipe nipple out of discharge end of squirt hose; 1 injured.



November 19, 1926, locomotive 5220, Deshler, Ohio. Front draw-bar pin came out, allowing engine to separate from tender and causing fireman to fall between engine and tender; draw-bar stirrup missing and cotter key missing from bottom end of draw-bar pin; 1 injured.

\*\*December 24, 1926, locomotive 1364, Eddystone, Pa. Shaker bar broke at head of staff; 1 injured.

December 24, 1926, locomotive 5061, Clarksburg, W. Va. Chafing block between engine and tender locked at extreme left while locomotive was backing around an 18¼° curve and caused locomotive to derail and turn over on right side; horizontal contour of block was worn ⅜ inch at center; 2 injured.

January 4, 1927, locomotive 1177, Cincinnati, Ohio. Broken stay bolt blew out of firebox sheet, due to threads on bolt and in sheet being eroded away, due to long leakage. The head of bolt showed evidence of frequent hammering or riveting. The bolt was 1½ inches in diameter at threaded end and ⅜ inch in reduced body section and was broken at fillet ½ inch beyond depth of tell-tale hole; 1 injured.

January 10, 1927, locomotive 2361, Brunswick, Md. Injector throttle valve bonnet blew out, due to threaded portion being loose fit and threads badly worn. Bonnet could be slipped into position without engaging threads. Body had been calked to stop leakage around threads and had been badly damaged by use of hammer and set or chisel and pipe wrench in screwing it in and out; 1 injured.

January 17, 1927, locomotive 1015, Willard, Ohio. Handhold on back of tender was broken, causing employee to fall to track where he was run over by locomotives; locomotive had been in service with this defect known for at least 14 hours, during which time its condition was known to three crews and no apparent effort was made to have repairs made; 1 killed.

January 18, 1927, locomotive 7049, M. & K. Junction, W. Va. Superheater flue failed for one-half its circumference at water side of back flue sheet where a 3-inch circumferential crack had been electrically welded; flue was eroded to ⅜ inch in thickness; 1 injured.

February 1, 1927, locomotive 4483, Gaithers, Md. Lubricator feed-control valve stem twisted off and blew out when attempt was made to turn valve with wrench; control-valve handle loose and turning on stem; 1 injured.

February 6, 1927, locomotive 4151, Ayr, Ind. Reverse lever became unlatched account of quadrant teeth filled to ⅜ inch of top with hard accumulation of dirt; 1 injured.

February 10, 1927, locomotive 5075, Roney's Point, W. Va. Pipe nipple blew out of main air reservoir, causing emergency application of brakes; threads stripped; 1 injured.

March 7, 1927, locomotive 1673, Haselton, Ohio. Plug in firebox casing sheet in cab blew out, due to plug entering sheet only three threads. Sheet cracked out from hole and threads wasted away, caused by long leaking around threads. Sheet had been heavily calked around plug; 2 injured.

March 20, 1927, locomotive 2827, Grafton, W. Va. Marker fell out of defective bracket while fireman was adjusting marker lights, causing him to fall from top of tender to ground; 1 injured.

April 28, 1927, locomotive 2778, Oakley, Ohio. Knuckle pin in coupler on tender broke, allowing locomotive and tender to separate from train; 1 injured.

\*\*June 4, 1927, locomotive 4565, Curtis, Ind. Grease-cup plug blew out of main pin when loosened, account of pin running very hot; "Left main pin runs very warm and needs attention" was reported on June 3, and no explanation of work done was shown on the report; 1 injured.

June 19, 1927, locomotive 5175, Zanesville, Ohio. Fell from running board while giving attention to air bell ringer which had failed twice en route; bell ringer reported on June 3, 6, 7, 8, 10, 14, 16, and 19; bell crank arm did not conform to blue print; 1 injured.

\*\*June 22, 1927, locomotive 2695, Inghams, Ohio. Key in front end of main rod worked loose; 1 injured.

June 25, 1927, locomotive 2360, Parkersburg, W. Va. Headlight step on smoke box gave way, account of rivets for supporting it being too short. Two of the three rivets in the step did not enter the smoke-box sheet and the third rivet did not extend entirely through smoke-box sheet; 1 injured.

Twenty-nine accidents; 1 killed, 30 injured.

#### BELT RAILWAY OF CHICAGO:

August 13, 1926, locomotive 85, Chicago, Ill. Squirt-hose valve leaking, due to cut valve seat; 1 injured.

August 16, 1926, locomotive 106, Clearing, Ill. Tender brake rigging came down, derailing one tender truck; 1 injured.

Two accidents; 2 injured.

#### BOSTON & ALBANY RAILROAD:

\*August 13, 1926, locomotive 1422, Chester, Mass. Engine and tender broke away from train, account of low coupler on rear of tender; 1 injured.

\*\*November 16, 1926, locomotive 128, East Boston, Mass. Engineer's seat in cab fell, account of pin holding it in horizontal position working out; 1 injured.

March 26, 1927, locomotive 311, near Newton Center, Mass. Threaded end of throat-sheet stay blew out in firebox, due to being broken and threads eroded away. Seven other throat stays were found broken; 1 injured.

\*June 2, 1927, locomotive 549, near Auburndale, Mass. Turnbuckle screw broke, allowing brake rigging to come down, causing locomotive to derail and turn over; 1 injured.

\*\*June 6, 1927, locomotive 1421, White Mills, N. Y. Superheater unit failed. Injured while attempting to extinguish fire; forward sections of grates would not operate, due to grate rods being bent; 1 injured.

Five accidents; 5 injured.

#### BOSTON & MAINE RAILROAD:

\*\*November 16, 1926, locomotive 2734, East Deerfield, Mass. Burned by steam escaping through defective squirt hose; 1 injured.

November 19, 1926, locomotive 3215, East Cambridge, Mass. Generator steam-valve bonnet blew out, due to loose fit and poor threads; 1 injured.

\*December 14, 1926, locomotive 3704, Rosemont, Mass. Tire came off trailer wheel; 1 injured.

January 6, 1927, locomotive 800, near Scotia, N. Y. Fireman slipped on cab apron, account of apron having excessive curvature; curvature of apron not according to company's standard; 1 injured.

February 9, 1927, locomotive 3680, Boston, Mass. Steam-heat pipe became disconnected at throttle valve, account of loose spanner nut; threads on throttle valve in poor condition; 1 injured.

June 10, 1927, locomotive 2711, Deerfield, Mass. Insufficient clearance between reverse lever and train-control air pipe; 1 injured.

\*\*June 29, 1927, locomotive 2670, Millers Falls, Mass. While attempting to move reverse lever, bolt came out of forward end of quadrant; reversing gear reported on June 22, 23, 27, and 28; 1 injured.

Seven accidents; 7 injured.

#### BUFFALO CREEK RAILROAD:

December 14, 1926, locomotive 24, Buffalo, N. Y. Superheater flue burst near back flue sheet, due to being eroded to approximately ¼ inch in thickness; 1 injured.

One accident; 1 injured.

#### CANADIAN NATIONAL RAILWAYS:

\*October 12, 1926, locomotive (G. T.) 2575, Yarmouth, Me. Water glass burst; cut by flying glass; 1 injured.

\*December 15, 1926, locomotive (G. T.) 691, Chicago, Ill. Steam hose on engine became disconnected; 1 injured.

Two accidents; 2 injured.

#### CENTRAL OF GEORGIA RAILWAY:

\*December 13, 1926, locomotive 166, Macon, Ga. Reverse lever latch slipped out of quadrant; 1 injured.

May 12, 1927, locomotive 481, Orchard Hill, Ga. Defective stud securing right front cylinder-head casing worked out, allowing casing to come off and drop to the ground, where it was picked up and thrown by the machinery, striking the engineer, who was in the cab; 1 injured.

Two accidents; 2 injured.

## CENTRAL NEW ENGLAND RAILWAY:

\*\*October 17, 1926, locomotive (N. Y., N. H. & H.) 3245, Maybrook, N. Y. Section of grate approximately 9 inches long was broken off and missing and locomotive returned to service without proper repairs being made; 1 injured.

February 2, 1927, locomotive (N. Y., N. H. & H.) 3237, Green Haven, N. Y. Arch tube pulled out of inside throat sheet, due to not having been properly belled or beaded and tube not applied at right angle with the sheet; 3 injured.

\*\*February 4, 1927, locomotive (N. Y., N. H. & H.) 3233, Maybrook, N. Y. Two set screws worked out of throttle-operating levers, one of which lodged under lever and prevented throttle from closing; threads on flush head set screw badly hammered over; 1 injured.

Three accidents; 5 injured.

## CENTRAL RAILROAD OF NEW JERSEY:

\*\*August 10, 1926, locomotive 788, Matawan, N. J. Throttle opened, account of latch spring being broken, allowing train to move off unexpectedly; 1 injured.

\*\*October 12, 1926, locomotive 881, Bowmanstown, Pa. Bell became disconnected from yoke and fell, striking employee who was on pilot beam; bell and clapper not properly secured and bell ringer inoperative; bell ringer was reported on October 7, 9, and 11; 1 injured.

January 24, 1927, locomotive 828, Bethlehem, Pa. Rocker link of automatic fire door disconnected, account of cotter missing from link pin; 1 injured.

\*\*January 31, 1927, locomotive 768, South Amboy, N. J. Scalded while parting steam hose between tender and car, account of leak in cab valve; 1 injured.

Four accidents; 4 injured.

## CHESAPEAKE &amp; OHIO RAILWAY:

\*July 15, 1926, locomotive 2340, Dillon, Va. Priming hose connected to feed-water pump became disconnected from nipple, due to not being securely clamped; 1 injured.

July 27, 1926, locomotive 382, Martin, Ky. Squirt hose parted at splice; hose had been spliced, using a straight pipe nipple, and held together with adhesive tape; 1 injured.

Two accidents; 2 injured.

## CHICAGO &amp; ALTON RAILROAD:

\*October 23, 1926, locomotive 344, Odessa, Mo. Bolt in grate shank extended out too far, causing it to catch when grates were being shaken; 1 injured.

One accident; 1 injured.

## CHICAGO &amp; EASTERN ILLINOIS RAILWAY:

March 22, 1927, locomotive 1928, near Salem, Ill. Crown-sheet failure caused by overheating, due to low water; many appurtenances damaged to such extent that their previous conditions could not be determined; 3 killed.

June 6, 1927, locomotive 3674, Danville, Ill. Expansion plate stud blew out. All threads on stud and in sheet obliterated by corrosion due to leakage; 1 injured.

Two accidents; 3 killed, 1 injured.

## CHICAGO &amp; NORTH WESTERN RAILWAY:

July 9, 1926, locomotive 2001, Milwaukee, Wis. Crosshead key broke; piston rod loose and working in crosshead fit; 1 injured.

\*\*July 30, 1926, locomotive 1482, Proviso, Ill. Front coupler pivot pin broke; 1 injured.

August 14, 1926, locomotive 2212, Highland Park, Ill. Flue failed at safe-end weld near back flue sheet; 2 injured.

August 28, 1926, locomotive 70, Chicago, Ill. Left valve caught on obstruction in port of valve chamber, causing reverse lever to strike engineer; machinist's hammer found in steam port had appearance of having been in steam passages since locomotive received last heavy repairs; 1 injured.

\*\*October 13, 1926, locomotive 825, Elgin, Nebr. Stay bolts in firebox leaking, making it difficult to start oil fire; injured by flame when oil ignited; 1 injured.

November 3, 1926, locomotive 2342, near Otis, Iowa. Grate-shaker rigging disconnected account of pin working out, due to not having been properly secured in place; 1 injured.

December 17, 1926, locomotive 1132, Glenrock, Wyo. Crown-sheet failure while in charge of engine watchman, caused by overheating due to low water; 1 killed.

February 3, 1927, locomotive 1098, Crystal Lake, Ill. Tender brake shoe not properly secured in place, and while the engineer was trying to make repairs after locomotive was coupled to train the brakes were applied in emergency, causing one finger to be mashed off; 1 injured.

February 12, 1927, locomotive 2308, Casper, Wyo. Train stopped suddenly account of brakes applying when flexible joint in brake pipe between locomotive and tender became disconnected, due to nut unscrewing from body of joint; tension nearly all out of spring lock on nut; 2 injured.

February 15, 1927, locomotive 2632, Chicago, Ill. Water glass burst; top water-glass cock reported very difficult to close; 2 injured.

February 22, 1927, locomotive 2363, near Crystal Lake, Ill. Flue failed at front flue sheet, due to being badly grooved and thickness reduced for the entire circumference of tube. Adjacent flues were also grooved. Locomotive had other flue failures on February 5 and 14; 1 injured.

March 2, 1927, locomotive 2535, Marshalltown, Iowa. Elbow in blower steam pipe broke off at valve on boiler back head, due to being cracked through practically entire circumference; lower end of blower pipe was sprung more than 1 inch out of line, placing strain on elbow; 1 injured.

\*\*March 11, 1927, locomotive 1516, between Sioux City and Carroll, Iowa. Sanders leaking, allowing sand to be blown into engineer's eyes; 1 injured.

June 3, 1927, locomotive 1631, near Agnew, Ill. Main driving journal on left side broke, due to old fracture covering approximately 75 per cent of cross-sectional area, causing derailment of locomotive and six cars in train; 2 injured.

June 17, 1927, locomotive 2374, Union Grove, Ill. Squirt hose burst where badly worn; defect was of long standing and should have been detected and corrected before the failure occurred; 1 injured.

June 28, 1927, locomotive 530, Wendte, S. Dak. Burner of oil-burning locomotive did not operate properly, account of being partially stopped up with carbon and top of atomizer slot marred and distorted until slot was approximately 60 per cent closed; 1 injured.

Sixteen accidents; 1 killed, 19 injured.

## CHICAGO, BURLINGTON &amp; QUINCY RAILROAD:

July 4, 1926, locomotive 2214, near Foley, Mo. Squirt-hose valve leaking; 1 injured.

July 4, 1926, locomotive 6152, Sheridan, Wyo. Squirt hose burst, due to having been badly burned; 1 injured.

\*\*July 27, 1926, locomotive 2819, near Bellevue, Nebr. Squirt hose burst, due to being badly worn; 1 injured.

July 30, 1926, locomotive 5303, Chillicothe, Mo. Cab apron bolt broke or lost out, allowing apron to shift back on tender deck, leaving an opening between apron and deck; 1 injured.

August 2, 1926, locomotive 1820, Albany Junction, Mo. Blow-off cock stuck open, due to some foreign substance having lodged under valve; 1 injured.

August 26, 1926, locomotive 5304, near Brookfield, Mo. Cab ventilator cover shifted back on guides and fell off cab roof, striking brakeman who was standing in gangway; handhold which serves as a stop to prevent cover from shifting was missing; 1 injured.

\*October 23, 1926, locomotive 6149, Nonpareil, Nebr. Bull ring to left piston broke; 1 injured.

November 8, 1926, locomotive 722, Hannibal, Mo. Throat stay blew out while being calked under pressure; threads on stay were too small for hole in sheet and in lugs attached to barrel of boiler. Eight of the nine stays in this throat sheet had threads that did not engage the threads in the lugs and none of the entire set were in condition to carry the load to which they were subjected; 1 injured.

November 16, 1926, locomotive 1419, Quincy, Ill. Main air reservoir exploded. Cause not determined; 1 injured.

\*\*December 21, 1926, locomotive 417, Camp Grant, Ill. Driving-spring equalizer broke; 1 injured.

\*\*March 15, 1927, locomotive 2906, near Osborn, Mo. Cab apron became disconnected on one side, account of cotter key breaking or losing out of hinge; 1 injured.

March 19, 1927, locomotive 6166, near Sparta, Wyo. Piston rod broke at keyway in crosshead fit, due to old fracture, and knocked out front cylinder head; 1 injured.

\*\*April 15, 1927, locomotive 2168, Old Monroe, Mo. Whistle valve stuck open; slugs from torch cutting found back of whistle valve which held valve off seat; 1 injured.

June 24, 1927, locomotive 6000, Ayers, Ill. Shaker bar slipped off post, due to improper fit; shaker post did not conform to company's standard; 1 injured. Fourteen accidents; 14 injured.

#### CHICAGO GREAT WESTERN RAILROAD:

\* March 21, 1927, locomotive 708, Richardson, Ill. Engine separated from train, causing sudden stop. Tender coupler low on account of bent carrier iron; 1 injured.

One accident; 1 injured.

#### CHICAGO, MILWAUKEE & ST. PAUL RAILWAY:

\*\*August 7, 1926, locomotive 1527, Marinette, Wis. Tender brake-beam hanger and safety hanger broke; 1 injured.

August 29, 1926, locomotive 8160, St. Paul, Minn. Driving-wheel tire came off wheel center; 1 injured.

September 2, 1926, locomotive 3112, Dubuque, Iowa. Heads worn off three rivets securing right link block plate and the remaining rivet was broken off in link block, allowing plate to become disengaged and broken rivet to foul on link saddle, rendering reverse gear inoperative; 1 injured.

November 27, 1926, locomotive 3134, near Bardwell, Wis. Reverse-lever latch became disengaged, allowing reverse lever to move violently; teeth in latch badly worn and improperly fitted. Reverse lever had been reported "Reverse lever jumps out of quadrant." This report was approved by foreman, with notation "Reverse lever examined, no defects found"; 1 injured.

December 17, 1926, locomotive 7014, Chicago, Ill. Air compressor stopped, account of compressor reversing rod broken; reversing rod showed evidence of old fracture and compressor had been reported in "Poor" condition on December 2, 6, 7, 11, and defective on December 9 and 15 (twice); 1 injured.

December 22, 1926, locomotive 3507, Elgin, Ill. Water glass burst, breaking glass in water-glass shield; 1 injured.

December 24, 1926, locomotive 7122, Milwaukee, Wis. Emergency shut-off valve bonnet blew out of blow-off cock, account of threads in body of valve and on bonnet being badly worn. Bonnet would enter body of valve without engaging threads; 1 injured.

February 13, 1927, locomotive 8028, Kansasville, Wis. Flue broke off at front flue sheet, due to being badly grooved for its entire circumference; 1 injured.

March 7, 1927, locomotive 8280, near Manheim, Ill. Locomotive uncoupled from train, causing sudden stop; coupler-carrier iron was bent downward at center, causing coupler at rear of tender to be low; 1 injured. Nine accidents; 9 injured.

#### CHICAGO, ROCK ISLAND & PACIFIC RAILWAY:

\*\*July 6, 1926, locomotive 2063, Mankato, Kans. Wire fastened to top of tank manhole cover caused injury to employee's hand; 1 injured.

\*\*July 27, 1926, locomotive 1014, Calion, Ark. Extension handle on blow-off cock became disconnected from operating lever, due to bolt breaking or losing out; 1 injured.

\*\*August 12, 1926, locomotive 1497, Belleville, Ill. Coupler-pin lifter on rear of engine became disconnected; 1 injured.

August 20, 1926, locomotive 1487, Billings, Okla. Injector steam-ram bonnet blew out, account of loose fit; threads of injector and bonnet in poor condition and bonnet could be inserted into injector to the last thread without turning; 1 injured.

September 1, 1926, locomotive 1989, Blake, Mo. Blow-off cock extension handle bent while being closed, allowing employee's hand to strike edge of a piece of tin which was on footboard around handle; extension handle of too light construction and not properly guided; 1 injured.

October 16, 1926, locomotive 3031, Wabash Crossing, Mo. Squirt hose blew off nipple, due to being insecurely clamped; 1 injured.

October 23, 1926, locomotive 2687, Lineville, Iowa. Grate disconnected, due to connecting pin losing out; 1 injured.

October 25, 1926, locomotive 855, Memphis, Tenn. Crossover pipe under tender was cracked, causing tender brake to leak off, allowing tender to move backward and catch employee's foot in vestibule apron; 1 injured.

October 26, 1926, locomotive 4044, near Trenton, Mo. Back cab curtain dropped and pole struck fireman on the head, causing him to fall; curtain held in place by ropes at each end, which broke; standard practice of fastening these curtains is with leather strap at each end; 1 injured.

November 21, 1926, locomotive 2559, Bureau, Ill. Main throttle valve difficult to open and would not stay open, due to defective pilot valve. Throttle reported very difficult to operate on November 19 and 21 (prior to accident); 1 injured.

November 23, 1926, locomotive 1306, near Verden, Okla. Grate-bearer stud blew out of firebox side sheet; stud screwed into the sheet only three threads and threads in sheet and on stud were almost entirely rusted away; 1 injured.

November 25, 1926, locomotive 613, Durwood, Okla. Side-rod collar broke, allowing side rod to come off crank pin; 1 injured.

November 29, 1926, locomotive 1507, Stoneburg, Tex. Pin in connection of top brake rod on front tender truck and brake-cylinder lever lost out; 1 injured.

March 13, 1927, locomotive 495, Armourdale, Kans. Grate-shaker post broke, due to approximately 35 per cent old defect at weld; 1 injured.

\*\*June 16, 1927, locomotive 2703, Topeka, Kans. Squirt hose blew off pipe, due to not being properly clamped; 1 injured.

\*June 28, 1927, locomotive 2708, Topeka, Kans. Squirt hose pulled off; 1 injured.

\*\*June 29, 1927, locomotive 1518, Okeene, Okla. Blow-off cock worked open while nut on operating stem was being tightened; 1 injured.

Seventeen accidents; 17 injured.

#### CHICAGO, ST. PAUL, MINNEAPOLIS & OMAHA RAILWAY:

July 19, 1926, locomotive 291, near Dakota City, Nebr. Left main crank pin broke, due to old defect covering approximately 65 per cent of cross-sectional area; 1 injured.

\*\*February 21, 1927, locomotive 110, St. James, Minn. Blower pipe broke at fitting in smoke box, causing back draft; 1 injured.

Two accidents; 2 injured.

#### CLEVELAND, CINCINNATI, CHICAGO & ST. LOUIS RAILWAY:

February 8, 1927, locomotive 6842, near Rosamond, Ill. Reverse-lever latch became disengaged in quadrant, allowing reverse lever to go forward suddenly and catch engineer's foot between lever and main reservoir air pipes; bolts loose in reverse lever rod; 1 injured.

\*February 23, 1927, locomotive 6402, St. Louis, Mo. Locomotive derailed by brake beam coming down, account of pin losing out of top end of brake beam; 2 injured.

Two accidents; 3 injured.

#### COLORADO & SOUTHERN RAILWAY:

\*January 13, 1927, locomotive 634, Trinidad, Colo. Blow-off cock handle slipped out of socket; 1 injured.

March 17, 1927, locomotive 913, Walsenburg, Colo. Piston rod broke, due to old flaw extending through 50 per cent of cross-sectional area, knocking out cylinder head; right crosshead low and not in proper alignment, resulting in numerous reports being made for taking up wear in crosshead gibs and other loosened conditions; main and side rods frequently reported; 1 killed.

Two accidents; 1 killed, 1 injured.

#### DELAWARE & HUDSON COMPANY:

September 24, 1926, locomotive 594, Lyon Mountain, N. Y. Top valve in blow-back line to fuel-supply line leaking, account of disk cut and leaking; 1 injured.

March 30, 1927, locomotive 829, Glenville, N. Y. Flue failed at defective safe-end weld; 1 injured.

June 28, 1927, locomotive 1016, Minooka Junction, Pa. Flue failed at defective safe-end weld; 1 injured.

Three accidents; 3 injured.

## DELAWARE, LACKAWANNA &amp; WESTERN RAILROAD:

\*August 12, 1926, locomotive 1211, Big Flats, N. Y. Engineer was knocked off engine step by close bridge clearance while observing hot box on trailer truck of engine; trailer box had been given attention several times during the trip; journal was slightly cut; 1 killed.

\*\*February 4, 1927, locomotive 1016, near Newark, N. J. Handle on automatic fire door was broken off; this defect was reported on previous arrival at engine house and locomotive was dispatched without repairs; 1 injured.

\*April 15, 1927, locomotive 992, Messengersville, N. Y. Spring hanger broke; 1 injured.

Three accidents; 1 killed, 2 injured.

## DENVER &amp; RIO GRANDE WESTERN RAILROAD:

\*\*August 2, 1926, locomotive 788, Midvale, Utah. Left No. 2 side rod came in contact with blow-off cock lever jaw bolt, opening the blow-off cock; jaw bolt improperly applied; 1 injured.

\*\*November 5, 1926, locomotive 1501, Gypsum, Colo. Right front tank step broken, causing employee to fall. Broken step was reported on arrival at terminal, but locomotive was again dispatched without being repaired; 1 injured.

December 16, 1926, locomotive 690, Aspen, Colo. Tender chafing iron worked up and out of its vertical slot; 1 injured.

Three accidents; 3 injured.

## DULUTH, SOUTH SHORE &amp; ATLANTIC RAILWAY:

May 16, 1927, locomotive 607, Chassel, Mich. Water glass and water-glass shield panel broke; 1 injured.

One accident; 1 injured.

## ERIE RAILROAD:

\*July 10, 1926, locomotive 1723, Griffith, Ind. Knuckle of pilot coupler came out; knuckle not secured in place by pin; 1 injured.

\*\*July 17, 1926, locomotive 3173, Susquehanna, Pa. Pilot-beam handhold broke off flush with beam, due to old fracture comprising 90 per cent of cross section; 1 injured.

\*September 13, 1926, locomotive (W. & L. E.) 6002, Ferrona, Pa. Squirt hose burst; 1 injured.

September 18, 1926, locomotive 2600, Susquehanna, Pa. Broken stay bolt blew out of fire-box sheet while being calked under pressure, due to threads in sheet and on bolt being corroded away. Bolt was  $1\frac{1}{8}$  inches diameter at threaded end and  $\frac{1}{8}$  inch in reduced body and was broken in the reduced body below the  $1\frac{1}{4}$ -inch depth of telltale hole; 1 injured.

October 21, 1926, locomotive 3056, near Swains, N. Y. Petticoat pipe came down, account of not being properly fastened; 1 injured.

October 26, 1926, locomotive 1063, Union, N. Y. Quadrant foot brace was broken off and improper brace was being used which permitted fireman's foot to be caught between reverse lever and brace when lever was put in forward motion; 1 injured.

\*\*October 30, 1926, locomotive 2703, Hornell, N. Y. Washout cap blew out; attempted to tighten under pressure; cap was stretched and threads stripped; 1 injured.

November 15, 1926, locomotive 529, Hawthorne, N. J. Steam pipe burst, due to being worn to  $\frac{3}{8}$  inch in thickness at point of failure; hand-operated fire door blew open; 1 injured.

January 27, 1927, locomotive 1716, Passaic, N. J. Manhole cover hinge broke when handle was used as handhold in going to top of feed-water tank; hinges badly wasted away; 1 injured.

\*March 26, 1927, locomotive 3118, Maitland, Ohio. Left guide yoke broke; 1 injured.

\*\*March 29, 1927, locomotive 2007, Hornell, N. Y. Projection on new section of boiler jacket caused injury to employee when his hand came in contact with sharp edge; 1 injured.

April 5, 1927, locomotive 2702, Tappan, N. Y. Flue broke off at prosser groove adjacent to back flue sheet; flue reduced to  $\frac{3}{8}$  inch in thickness at point of failure due to being excessively worked; 2 injured.

\*April 15, 1927, locomotive 3050, Salamanca, N. Y. Ash-pan rod loose; 1 injured.

\*April 18, 1927, locomotive 546, Dayton, Ohio. Blow-off cock broke off. Employee in attempting to get away from engine stepped directly in front of another train; 1 killed.

\*\*May 5, 1927, locomotive 2029, Burns, N. Y. While engineer and fireman were attempting to hook up reverse lever, lever moved forward suddenly, catching engineer's arm between lever and injector pipe; 1 injured.

May 12, 1927, locomotive 2941, Hornell, N. Y. Power grate shaker cylinders out of adjustment, allowing insufficient clearance between grate shaker lever locks and cab floor; 1 injured.

May 18, 1927, locomotive 3180, Rutherford, N. J. Piston rod failed through keyway in crosshead fit, knocking out front cylinder head; old defects covered approximately 100 per cent of cross-section area on one side of keyway and 50 per cent on the opposite side of keyway; 1 injured.

May 31, 1927, locomotive 3078, Buffalo, N. Y. Throttle-stem packing blew out, allowing steam and hot water to escape into the cab; throttle-stem packing leaking previous to accident; 1 injured.

May 31, 1927, locomotive 1831, Hornell, N. Y. Eccentric blade broke, due to weakened condition; extra bolt hole had been drilled in blade near another bolt hole, reducing the net section; this hole had been closed by welding in a plug, but welding held by less than 50 per cent of its circumference, and blade was overheated at time of welding; metal of eccentric blade of poor quality; eccentrics reported eight times since May 1. Engine crew attempted to operate reverse gear, when reverse lever flew back and caught engineer's arm; latch on reverse-lever handle fouled on back of cab; 1 injured.

\*June 11, 1927, locomotive 109, Jersey City, N. J. Handrail over sloping portion of tender gave way, allowing employee to fall to ground. Handrail made of three sections, and apparently the initial failure occurred at rear of forward tee, the rear vertical support was then broken off near supporting plate, and finally handrail pulled out of street elbow; old fracture at point of the apparent initial failure covered approximately 65 per cent of the cross-sectional area and metal of rear vertical support was badly wasted away and reduced in thickness from 0.140 to 0.031 inch at point of failure; 1 injured.

Twenty-accidents; 1 killed, 20 injured.

## FLORIDA EAST COAST RAILWAY:

August 3, 1926, locomotive 106, New Smyrna, Fla. Crown-sheet failure while in charge of engine watchman, caused by overheating due to low water; no contributing causes found; 1 killed.

One accident; 1 killed.

## GREAT NORTHERN RAILWAY:

August 2, 1926, locomotive 389, Spokane, Wash. Insufficient clearance between driving-spring hanger and firing-valve lever; 1 injured.

\*\*October 4, 1926, locomotive 1239, near Doone, Iowa. Stay bolt in boiler head broke, blowing steam and particles of lagging through opening around washout plug; 1 injured.

\*\*October 5, 1926, locomotive 1752, Havre, Mont. Water glass burst; cut by flying glass; 1 injured.

October 20, 1926, locomotive 760, Aberdeen, S. Dak. Injured while wiring up tender truck brake beam, which dropped due to loss of hanger. Brake-beam safety chains too long; 1 injured.

October 24, 1926, locomotive 3063, near Morris, Minn. Draft gear on rear of tender failed, resulting in emergency application of brakes; pull rods of poor quality, coarse grained metal; 1 injured.

\*December 23, 1926, locomotive 215, Plentywood, Mont. Cylinder head blew out; 1 injured.

December 24, 1926, locomotive 1320, Troy, Mont. Driving brake adjusting rod broke; 1 injured.

December 29, 1926, locomotive 3230, Troy, Mont. Plug lost out of blower tee connection at smoke box, and emergency repairs were made by applying plug from sand trap which blew out account of threads on blower tee connection being stripped; 1 injured.

\*\*January 18, 1927, locomotive 1405, St. Paul, Minn. Top board in tender coal gate split, allowing fireman to fall; 1 injured.

January 23, 1927, locomotive 2010, Tagus, N. Dak. Grate-shaker lever became disconnected from rod due to connecting pin coming out, account of cotter key working out of pin; 1 injured.

\*\*February 24, 1927, locomotive 2031, Cut Bank, Mont. Bottom tender sill step was broken, causing employee to fall when he attempted to alight from gangway; 1 injured.

March 13, 1927, locomotive 3039, Great Falls, Mont. Front hanger of left No. 1 driving spring broke, allowing pilot to drop and catch on guard rail; 1 injured.

\*April 13, 1927, locomotive 1704, Savoy, Mont. Booster steam pipe blew off, due to threads on nipple at connection to booster being stripped; 1 injured.

\*\*June 2, 1927, locomotive 164, Hensel, N. Dak. Fireman slipped on cab apron, due to apron being excessively rolled and front tender truck center casting crossbeam badly worn, causing tender deck to be 2 inches lower than locomotive deck; 1 injured.

Fourteen accidents; 14 injured.

#### GULF COAST LINES:

July 15, 1926, locomotive (St. L., B. & M.) 9582, Orange, Tex. Spindle to top water-glass cock blew out; water-glass cocks of type that spindle valves can be screwed entirely out of packing nut and evidently had been left with the spindle screwed out until threads were barely holding; 1 injured.

August 13, 1926, locomotive (N. O., T. & M.) 306, Loreauville, La. Injector steam pipe spanner nut blew off, account of threads on nut badly worn and nut so loose that it could be placed on injector until it required only two-thirds of a full turn to bring shoulder of nut in contact with steam-pipe collar; threads on injector were pulled; locomotive had made only 105 miles since receiving general repairs, at which time the defective condition of spanner nut should have been detected and repairs made; 1 injured.

February 27, 1927, locomotive (St. L., B. & M.) 1016, Vanderbilt, Tex. Air compressor intermediate throttle valve bonnet blew off; valve bonnet hub nut was loose; 1 injured.

Three accidents; 3 injured.

#### GULF, COLORADO & SANTA FE RAILWAY:

\*July 23, 1926, locomotive 665, Bronson, Tex. Insufficient clearance between reverse lever and throttle lever; 1 injured.

\*September 11, 1926, locomotive 1903, Gainesville, Tex. Squirt hose pulled off; 1 injured.

\*\*December 4, 1926, locomotive 205, near Carthage, Tex. Flue failed, account of being badly deteriorated and wasted away; the entire flue (9 feet 4½ inches in length) was wasted away until its greatest thickness was approximately ¼ inch and average weight 1¼ pounds per foot of length; 1 injured.

February 20, 1927, locomotive (A., T. & S. F.) 1625, Temple, Tex. Vertical cab handhold broke off near bottom bolt hole, due to old fracture covering approximately 50 per cent of cross-sectional area; 1 injured.

March 1, 1927, locomotive (A., T. & S. F.) 960, Bellville, Tex. Right main rod safety yoke, to which guide step was attached, broke, allowing step to swing out and strike employee; old fracture in safety yoke involving 65 per cent of cross-sectional area at point of failure; safety yoke had been weakened by cutting away a portion of same; 1 injured.

April 21, 1927, locomotive (A., T. & S. F.) 964, Kenney, Tex. Air compressor discharge nipple was loose in end of reservoir; threads on nipple were stripped due to nipple having been applied cross-threaded; 1 injured.

Six accidents; 6 injured.

#### HOCKING VALLEY RAILWAY:

\*May 10, 1927, locomotive 134, Columbus, Ohio. Nozzle of squirt hose blew off, account of not being clamped; 1 injured.

One accident; 1 injured.

#### ILLINOIS CENTRAL RAILROAD:

July 18, 1926, locomotive 1845, Makanda, Ill. Fireman was knocked off step by close bridge clearance while observing dragging driving brake safety hanger which dropped due to loss of nuts from supporting bolt; 1 killed.

August 26, 1926, locomotive 5005, Geismar, La. Left main top brake hanger pin broke, the broken piece striking and breaking fireman's leg; pin showed old fracture extending nearly halfway through cross section; 1 injured.

\*\*September 29, 1926, locomotive 2985, Markham, Ill. Injured while attempting to open stoker-conveyor slide which was stuck; slides reported on September 7, 30, and October 2, and found binding badly on October 16; 1 injured.

\*\*November 16, 1926, locomotive 2441, Kankakee, Ill. Shaker bar slipped off post, due to improper fit; 1 injured.

March 28, 1927, locomotive 2440, Paxton, Ill. Bonnet blew off squirt-hose valve, due to improper packing of valve which prevented bonnet from screwing down on valve securely; 1 injured.

Five accidents; 1 killed, 4 injured.

#### INTERNATIONAL-GREAT NORTHERN RAILROAD:

\*October 20, 1926, locomotive 1057, Houston, Tex. Coupler knuckle pin broke; 1 injured.

One accident; 1 injured.

#### KANSAS CITY, MEXICO & ORIENT RAILWAY:

February 22, 1927, locomotive 701, Texon, Tex. Arch tube pulled out of inside throat sheet, due to having been cut too short to either bell or head when applied. The other arch tubes were applied in approximately the same manner. All the tubes had a heavy accumulation of scale and were badly mud burned and blistered; 2 injured.

One accident; 2 injured.

#### KANSAS CITY SOUTHERN RAILWAY:

\*July 18, 1926, locomotive 70, Kansas City, Mo. Bracket broke off brake-beam hanger, allowing brake beam to drop to rail; 1 injured.

One accident; 1 injured.

#### LEHIGH VALLEY RAILROAD:

July 21, 1926, locomotive 5001, Pittston Junction, Pa. Burned by hot water and steam escaping from squirt-hose nipple; nipple cracked and threads in poor condition; 1 injured.

\*\*July 31, 1926, locomotive 2475, Lockwood, N. Y. Glass in cab door fell out; 1 injured.

\*\*August 5, 1926, locomotive 4032, Packerton, Pa. Manifold valve throttle handle pulled off stem; handle loose on stem and no means provided to prevent it from pulling off; 1 injured.

August 30, 1926, locomotive 1159, Bernice, Pa. Whistle-rod bolt worked out; 1 injured.

October 4, 1926, locomotive 3359, Sayre, Pa. Footboard brackets bent back by coming in contact with some object in a track frog, causing injury to yard helper who was riding on footboard; 1 injured.

\*\*March 12, 1927, locomotive 2127, Mauch Chunk, Pa. Shaker bar broke; 1 injured.

Six accidents; 6 injured.

#### LONG ISLAND RAILROAD:

\*March 1, 1927, locomotive 99, Queens Village, N. Y. Front reverse quadrant bolt broke, which placed entire strain of reverse lever on rear bracket and studs and caused studs to break, freeing the quadrant, which went with reverse lever into forward position, striking engineer's foot; 1 injured.

\*May 6, 1927, locomotive 3, Southold, N. Y. Main driving axle broke, due to old flaw, causing derailment which broke steam pipes and scalded the engineer; 1 injured.

\*\*June 2, 1927, locomotive 196, Richmond Hill, N. Y. Driving brake adjusting rod broke, causing brake cylinder nonpressure head to be broken out, a piece of which struck employee; 1 injured.

Three accidents; 3 injured.

#### LOUISVILLE & NASHVILLE RAILROAD:

\*August 2, 1926, locomotive 1070, St. Charles, Va. Lubricator drain pipe turned when drain valve to lubricator was being opened, catching in engineer's sleeve and the escaping steam burned his arm; 1 injured.

August 17, 1926, locomotive 967, Dahlgren, Ill. Squirt hose leaking, due to threads on nipple and a portion of nipple wasted away; 1 injured.

\*\*September 7, 1926, locomotive 1780, Livingston, Ky. Burned by hot water escaping through hole in squirt hose; 1 injured.

October 16, 1926, locomotive 1335, Williamsburg, Ky. Both boiler checks stuck open and drain cock in boiler check broke and blew out, striking engineer; 1 injured.

\*\*October 18, 1926, locomotive 1576, near Calera, Ala. Arch brick fell and became wedged in grates, causing them to hang; 1 injured.

\*\*November 7, 1926, locomotive 2406, near Tallega, Ky. Brake beam disconnected and fell under locomotive, due to old defect in left main brake hanger; 1 injured.

\*\*December 9, 1926, locomotive 1872, near Falmouth, Ky. Stoker distributing plate bolt worked out; 1 injured.

\*\*December 12, 1926, locomotive 1184, Owassa, Ala. Main rod broke, due to old fracture; 1 injured.

December 21, 1926, locomotive 244, near Sadlers, Tenn. Brake rigging came down, account of top trailer brake beam hanger pin missing; 1 injured.

December 25, 1926, locomotive 241, near Howell, Ind. When closing cab ventilator, back end of ventilator latch swung upward with great force due to improper design of latch; 1 injured.

January 5, 1927, locomotive 295, near Munfordville, Ky. Bolt lost out of front end of cylinder cock slide rod connection link, allowing link to catch in tie and cause cylinder cock lever to fly back and strike engineer; 1 injured.

\*\*January 18, 1927, locomotive 258, Montgomery, Ala. Locomotive collided with car, account of failure of air pipe on engine; failure attributed to threads stripping at pipe connection to brake cylinder; 1 injured.

January 20, 1927, locomotive 857, Stapleton, Ala. Bolt in bottom end of ash-pan operating shaft bracket missing which permitted shaft to foul on frame, causing slides to be difficult to operate; 1 injured.

February 19, 1927, locomotive 1542, Robards, Ky. Grate shaker lever lock fell down and suddenly locked the grates while they were being shaken; lugs on lever lock were not properly fitted and would not stay back when grates were being shaken; 1 injured.

February 20, 1927, locomotive 1504, near Byington, Tenn. Handhold over cab window pulled off at cab-roof connection; cab roof sheet had wasted away to approximately  $\frac{1}{2}$  inch in thickness; 1 injured.

\*\*February 20, 1927, locomotive 2089, Birmingham, Ala. Defective lug broke off of ash-pan slide; 1 injured.

February 25, 1927, locomotive 1217, Tyson, Ala. Left crosshead arm bolts were sheared off, throwing valve motion out of gear and causing cylinder head to be blown out; 1 injured.

\*\*April 13, 1927, locomotive 770, Memphis, Tenn. Packing blew out of injector steam ram gland; 1 injured.

April 28, 1927, locomotive 1502, Thackery, Ill. Grate bar in right front section of grates broke off at bearer next to fire-box sheet; 1 injured.

\*\*May 17, 1927, locomotive 189, Hubbard Springs, Va. Latch pin worked out of closet door on tender, allowing door to swing open and strike fireman; 1 injured.

May 20, 1927, locomotive 1578, Elmore, Ala. Fireman fell from front end while attempting to tighten loose clamps on smoke-box door. Locomotive had gone only 12 miles since leaving terminal; 1 injured.

June 19, 1927, locomotive 25, Heidrick, Ky. Right eccentrics loose, account of set screws not properly tightened; 1 injured.

June 21, 1927, locomotive 197, near Atmore, Ala. Main driving axle broke, due to old fracture; 1 injured.

Twenty-three accidents; 23 injured.

#### MAINE CENTRAL RAILROAD:

October 19, 1926, locomotive 505, Enfield, Me. Crown-sheet failure caused by overheating, due to low water; middle and bottom gauge-cock nipples extended into gauge-cock drip; right tank hose strainer partially stopped up with sediment; tank dirty; 2 injured.

April 15, 1927, locomotive 289, Cumberland Mills, Me. Main driving axle broke, due to old flaw covering approximately 60 per cent of cross-sectional area; 1 injured.

Two accidents; 3 injured.

#### MICHIGAN CENTRAL RAILROAD:

November 11, 1926, locomotive 8954, Niles, Mich. Left valve gear connecting rod broke, badly damaging other parts of valve gear; rod at point of failure showed two old flaws and slag inclusion approximating 40 per cent of cross-sectional area and metal through break was coarse-grained and crystallized; 1 injured.

One accident; 1 injured.

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

December 9, 1926, locomotive 718, Cooks, Mich. Drawbar broke; locomotive deck casting and front tender end sill were striking on drawbar and metal of drawbar was crystallized; 1 injured.

\*\*January 4, 1927, locomotive 474, near Kennan, Wis. Grates could not be properly shaken with one section locked, account of fingers of end grates in each section being too long and fouling on body of adjacent grates; 1 injured.

May 23, 1927, locomotive 704, Prentice, Wis. Back end of left valve over-traveled the end of bushing, dropped down into the counterbore, and caught the packing ring on edge of the bushing, breaking the left rocker-arm shaft, and jacked the reverse lever out of the quadrant, causing lever to move back rapidly and strike the engineer; end bushing too short; 1 injured.

Three accidents; 3 injured.

#### MISSOURI & NORTH ARKANSAS RAILWAY:

\*January 1, 1927, locomotive 12, Wayne, Mo. Main rod broke; 1 injured.

One accident; 1 injured.

#### MISSOURI-KANSAS-TEXAS LINES:

\*July 27, 1926, locomotive 565, Sherman, Tex. Brakeman's foot slipped off footboard; footboard bent down about 1 inch out of level and had accumulation of dirt on it; 1 injured.

November 23, 1926, locomotive 888, near Keller, Tex. Crown-sheet failure; low water; no contributory causes found; 1 injured.

March 1, 1927, locomotive 413, near Oswego, Kans. Clear-vision window frame in right front cab door fell out; window frame was improperly applied at terminal and fell out when locomotive had gone about 20 miles; 1 injured.

\*April 10, 1927, locomotive 828, Parsons, Kans. Brake applied on long freight train, causing abrupt stop, caused by feed valve on engine not functioning properly; 1 injured.

May 2, 1927, locomotive 23, Denison, Tex. Right front cylinder head blew out and left one cracked; 1 injured.

Five accidents; 5 injured.

#### MISSOURI PACIFIC RAILROAD:

August 14, 1926, locomotive 424, Lynch Siding, La. Lubricator condenser blew off; threads on condenser pulled, partially stripped and crossed, and condenser so loose in body that it could be entered straight into threaded portion up to one-eighth of a turn before bottoming on flange; 1 injured.

\*\*September 12, 1926, locomotive 1477, near Independence, Kans. Shaker bar slipped off post, due to improper fit; 1 injured.

November 28, 1926, locomotive 7519, Walton, Nebr. Valve rod broke off at valve yoke, due to old fracture; 1 injured.

January 12, 1927, locomotive 9437, Omaha, Nebr. Ash-pan blow-out line not connected to blow-out cock after repairs had been made to blow-out cock; 1 injured.

January 22, 1927, locomotive 9701, Dupon, Ill. Squirt hose blew off nipple; hose not properly attached to nipple; 1 injured.

\*March 26, 1927, locomotive 2384, Wetmore, Kans. Blow-off cock leaking; 1 injured.

April 17, 1927, locomotive 1565, Valley Park, Mo. Classification lamp did not turn freely in clamp and bracket broke while attempting to turn the lamp; 1 injured.

\*May 8, 1927, locomotive 1420, Hoxie, Ark. Bolt in cylinder-cock rigging came out, allowing rigging to come down; 1 injured.

Eight accidents; 8 injured.



## MOBILE &amp; OHIO RAILROAD:

\*\*December 7, 1926, locomotive 329, Jackson, Tenn. Insufficient clearance between cab and reverse lever; 1 injured.  
One accident; 1 injured.

## NASHVILLE, CHATTANOOGA &amp; ST. LOUIS RAILWAY:

July 2, 1926, locomotive 535, Bolton, Ga. Injector steam pipe collar broke and pipe pulled out of brazing in part of collar which remained in spanner nut; collar cracked around one-half of circumference previous to accident; 1 injured.  
February 2, 1927, locomotive 624, Pegram, Tenn. Grate-shaker bar slipped off lever, due to improper fit; 1 injured.  
Two accidents; 2 injured.

## NEW YORK CENTRAL—LINES EAST:

\*\*July 11, 1926, locomotive 3153, Herkimer, N. Y. Squirt hose parted at splice; smooth pipe nipple used to connect hose and not properly clamped; 1 injured.

September 5, 1926, locomotive 3747, Catskill, N. Y. Bolt supporting forward end of eccentric rod failed, allowing eccentric rod to swing around and break bottom head of forward air compressor; 1 injured.

September 12, 1926, locomotive 2575, Port Gibson, N. Y. Main reservoir discharge pipe separated from elbow, causing emergency application of brakes; nipple connecting reservoir to elbow stripped from elbow account of threads on each being worn; 1 injured.

September 23, 1926, locomotive 2510, East Buffalo, N. Y. Flue broke off near safe end weld, overheated in welding; 1 injured.

January 13, 1927, locomotive 2758, near Rome, N. Y. Crown-sheet failure caused by overheating due to low water; 3 killed.

January 26, 1927, locomotive 3050, Childwold, N. Y. Handrail-column stud pulled out of boiler, account of threads on stud and in boiler being eroded and stripped and stud improperly applied; 1 injured.

\*\*April 3, 1927, locomotive 2789, Lyons, N. Y. Squirt hose blew off connection; 1 injured.

May 14, 1927, locomotive 2149, Pleasantville, N. Y. Insufficient clearance between reverse lever handle and air-pipe manifold with lever in full forward position; 1 injured.

June 9, 1927, locomotive 1900, New York, N. Y. Squirt hose pulled off nipple, due to not being properly clamped; 1 injured.

Nine accidents; 3 killed, 8 injured.

## NEW YORK CENTRAL—LINES WEST:

August 6, 1926, locomotive 59, Ashtabula, Ohio. Crown-sheet failure caused by overheating, due to low water; feed-water pump in poor condition account of steam head gasket on No. 2 cylinder broken; disk nut missing from stem on operating throttle of pump; most appurtenances, including water glass and gauge cocks, were lost or damaged in the accident, so their previous condition could not be determined. Feed-water pump had been reported on numerous occasions prior to accident, and defective pump-operating valve was reported on August 5, but had not been repaired, as indicated by work reports; 2 killed, 7 injured.

\*\*September 30, 1926, locomotive 5153, Gibson, Ind. Insufficient clearance between end of shaker bar and rear side wing of cab; 1 injured.

September 30, 1926, locomotive (T. & O. C.) 9660, Van Buren, Ohio. Strap on back end of main rod broke through keyhole due to old defect in bottom bar; 1 injured.

October 20, 1926, locomotive 4729, near Chesterton, Ind. Reverse lever became unlatched and flew forward; 1 injured.

January 10, 1927, locomotive 4729, Brocton, N. Y. Reverse lever became unlatched, account of teeth on latch worn and valves not properly lubricated; 1 injured.

February 7, 1927, locomotive (T. & O. C.) 9666, Toledo, Ohio. Arch tube plug blew out of boiler back head while being tightened under pressure; cap loose in threads and cross-threaded; 2 injured.

\*\*February 20, 1927, locomotive (T. & O. C.) 9705, near Hancock, Ohio. Coupler pocket bolts in pilot beam broke while double-heading, allowing locomotives to separate and causing brakes to apply in emergency, doing considerable damage to caboose and cars in the train; 2 injured.

\*\*March 31, 1927, locomotive 72, Vermilion, Ohio. Shaker bar slipped off post, account of being too large for proper fit; 1 injured.

April 3, 1927, locomotive 5100, Gibson, Ind. Water-glass drain valve stem screwed entirely out of valve body; 1 injured.

\*April 12, 1927, locomotive 3984, Renners, Ohio. Slipped on cab apron, account of apron being worn smooth; 1 injured.

\*\*April 14, 1927, locomotive 5423, Chicago, Ill. Pneumatic fire door stuck in slides; fire door reported on April 4, 5, 6, 7, and 15 (subsequent to accident); 1 injured.

\*\*April 22, 1927, locomotive 3776, Elkhart, Ind. Inside grate-bar pin fell out, account of cotter key missing, allowing bar to suddenly go forward; 1 injured.

\*\*April 28, 1927, locomotive 220, Chicago, Ill. Headlight generator throttle valve stem packing leaking; 1 injured.

April 30, 1927, locomotive (K. & M.) 9708, Rumer, W. Va. Crown-sheet failure caused by overheating, due to low water; 3 injured.

Fourteen accidents; 2 killed, 24 injured.

## NEW YORK, CHICAGO &amp; ST. LOUIS RAILROAD:

September 27, 1926, locomotive 101, Ashtabula, Ohio. Vertical cab handhold broke through bolt hole at bottom end, due to old fracture; 1 injured.

April 8, 1927, locomotive 362, near Mackie, Ind. Valve-gear bell crank failed at fusion weld in arm; 2 injured.

May 13, 1927, locomotive 851, Buckeye, Ind. Left injector steam pipe brazing collar broke off at flange, due to old fracture, allowing steam pipe to blow off at connection. Joint had been reported leaking two days prior to accident, but repairs were not made; 1 injured.

June 27, 1927, locomotive 220, Chicago, Ill. Front footboards struck on cross-over track and bent backward, throwing employee who was riding on footboard to the ground. Engine was riding low over No. 1 driving boxes, allowing both footboards to be less than the minimum required height above top of the rails; 1 injured.

Four accidents; 5 injured.

## NEW YORK, NEW HAVEN &amp; HARTFORD RAILROAD:

\*July 27, 1926, locomotive 1384, Kingston, R. I. Storm-curtain rod dropped and struck employee, due to nut working off supporting bolt; 1 injured.

\*\*September 7, 1926, locomotive 2448, Boston, Mass. Clevis missing from rear coupler operating-lever chain; 1 injured.

November 15, 1926, locomotive 3220, Milford, Conn. Reducing bushing pulled out of left main reservoir, causing sudden stop of train; threads on male portion worn and cross-threaded; 1 injured.

\*\*December 31, 1926, locomotive 1398, New London, Conn. Shaker bar slipped off post; 1 injured.

\*\*February 7, 1927, locomotive 331, Westbrook, Conn. Left go-ahead eccentric blade broke, due to old fracture at bolt hole, causing reverse lever to fly back; 1 injured.

\*\*March 8, 1927, locomotive 2374, New Haven, Conn. Shaker bar slipped off post, due to improper fit; 1 injured.

\*\*April 6, 1927, locomotive 2466, Springfield, Mass. Grate-shaker levers not properly adjusted to clear fire door when open; 1 injured.

Seven accidents; 7 injured.

## NORFOLK &amp; WESTERN RAILWAY:

March 13, 1927, locomotive 854, Portsmouth, Ohio. Crown-sheet failure while in charge of engine watchman, caused by overheating due to low water; no contributory causes found; 1 injured.

One accident; 1 injured.

## NORFOLK SOUTHERN RAILROAD:

\*September 13, 1926, locomotive 108, Pinetown, N. C. Side rod broke and struck cab under engineer's seat box, knocking engineer out of cab; old flaw where rod had been welded covered about one-sixth of fractured area; 1 injured.

\*December 5, 1926, locomotive 51, Simpson, N. C. Spring hanger broke; 1 injured.

Two accidents; 2 injured.

#### NORTHERN PACIFIC RAILWAY:

\*September 11, 1926, locomotive 1597, Yakima, Wash. Tender truck axle broke; 1 injured.

\*\*September 22, 1926, locomotive 2080, Aldrich, Minn. Lubricator pipe leaking; 1 injured.

\*October 11, 1926, locomotive 1824 Spokane, Wash. Air hose burst between locomotive and tender; 1 injured.

\*\*November 18, 1926, locomotive 1846, Curlew, N. Dak. Steam was not entirely shut off from stoker, due to operating valve fouling on the booster steam pipe covering; 1 injured.

January 30, 1927, locomotive 3005, Saltese, Mont. Broken crosshead in reversing mechanism rendered power reversing gear inoperative; 1 injured.

February 6, 1927, locomotive 1526, Cushing, Minn. Right back motion eccentric strap broke, due to old flaw, breaking eccentric blade and releasing reverse lever; 1 injured.

\*\*February 21, 1927, locomotive 1642, near West Duluth, Minn. Locomotive separated from train, causing sudden stop; excessive wear in coupler, pivot pin, and bushing, and loose bolts in pocket coupler casting on pilot beam; 1 injured.

February 28, 1927, locomotive 1599, Lester, Wash. Steam-heat hose chain was missing and hose was hooked on handhold, which caused it to kink and retain steam and water which came through leaky steam-heat throttle, intermediate throttle, and regulator valve; 1 injured.

March 7, 1927, locomotive 1779, Velox, Wash. Pipe in heater coil of brakeman's cab cracked; heater coil not constructed of double-strength pipe; 1 injured.

\*\*May 11, 1927, locomotive 1127, Spokane, Wash. Water glass burst; 1 injured.

Ten accidents; 10 injured.

#### OREGON SHORT LINE RAILROAD:

July 21, 1926, locomotive 3116, Portneuf, Idaho. Squirt hose parted at splice due to being improperly spliced; 1 injured.

One accident; 1 injured.

#### PEARL RIVER VALLEY RAILROAD:

September 15, 1926, locomotive 331, Mill Creek, Miss. Crown-sheet failure caused by overheating due to low water; top water-glass cock found in closed position; top end of water-glass opening closed with a rubber gasket and asbestos wicking and bottom end of water-glass opening found practically closed by gasket and wicking; water-glass cocks not properly cleaned at time of last monthly inspection; 1 injured.

One accident; 1 injured.

#### PENNSYLVANIA RAILROAD SYSTEM:

\*\*July 1, 1926, locomotive 1588, near Torrance, Pa. Side rod knuckle pin came out, permitting rod to disconnect and revolve with wheel; after side rod broke it punctured outside and inside throat sheets in two places; dowel pin missing from knuckle pin; threads on knuckle pin worn; hole for taper pin drilled from opposite sides and not in line; only one hole for taper pin in knuckle pin, though print shows provision for two holes; 2 injured.

July 7, 1926, locomotive 7404, Hudson, Ohio. Reverse lever flew into full reverse position when engineer attempted to move it; both valve seats, valves and pressure plates were badly cut and valve strip stuck; valve-yoke bearings built up and valve stems not in proper alignment; 1 injured.

July 9, 1926, locomotive 5241, Martin's Ferry, Ohio. Cylinder head blew out and flying parts struck a woman who was in her home alongside of track; 1 injured.

July 15, 1926, locomotive 3395, Braddock, Pa. Flue broke off at back flue sheet, due to being reduced in thickness by corrosion; 1 injured.

\*\*July 20, 1926, locomotive 9854, Columbus, Ohio. Fire door stuck, account of bolt or pin missing; 1 injured.

July 23, 1926, locomotive 3484, near Perkins, N. J. Front end of eccentric rod worked out, account of not having been properly secured; disengaged end of eccentric rod whirling around struck and broke lower front cab-bracket casting and tore out three 7/8-inch cab bracket studs, thus releasing hot water and steam inside of cab; 1 injured.

\*\*July 23, 1926, locomotive 8189, Logansport, Ind. Leak in squirt-hose pipe between nipple and elbow below the deck; threads on squirt-pipe nipple wasted away; 1 injured.

\*\*July 24, 1926, locomotive 5241, near Rayland, Ohio. Eccentric clevis pin worked out, account of taper pin losing out or not having been applied; 1 injured.

\*\*July 28, 1926, locomotive 137, near Shippenburg, Pa. Crosshead key worked out; 1 injured.

\*\*August 6, 1926, locomotive 8192, Leetsdale, Pa. Flue burst just inside of back flue sheet where prossered; 2 injured.

\*\*August 6, 1926, locomotive 1019, Frazer, Pa. Eccentric strap broke; 1 injured.

August 7, 1926, locomotive 4486, Danville, Ohio. Left No. 2 knuckle pin worked out and caught wheel center, bending rods and forcing back end of main rod off pin; 1 injured.

August 14, 1926, locomotive 9092, Cleveland, Ohio. Crown-sheet failure caused by overheating due to low water; water-glass cocks found closed; bottom water-glass cock and water-glass gasket leaked under test; gasket seat was cut in two places and five of the twelve clamp bolts were loose; water glass was reported leaking twice on August 11, the date locomotive was last turned in, and repairs not made, though locomotive was used and kept continuously under steam from then until time of accident. Mud ring leaking at all four corners and had been reported "leaking" or "leaking bad" on each of the 19 days that locomotive arrived at Kinsman Street engine house since July 10; numerous other defects seriously affecting safety had been reported repeatedly; 1 killed.

August 15, 1926, locomotive 4423, Franklin, Ohio. Grate-shaker bar broke off at socket, due to old fracture covering approximately 98 per cent of cross-sectional area; 1 injured.

\*August 19, 1926, locomotive 1895, West Monessen, Pa. Branch pipe leaking; 1 injured.

August 25, 1926, locomotive 1338, Nisbet, Pa. Air compressor stopped; compressor had been reported defective on August 6, 10, 18, 21, 22, and 24; 1 injured.

\*August 26, 1926, locomotive 9973, Alexis, Ohio. Flue burst at safe-end weld, due to defective condition of weld; 1 injured.

\*\*August 30, 1926, locomotive 7414, Niles, Ohio. Piece broken off plank which covers that part of running board extending back through cab to back boards; 1 injured.

September 3, 1926, locomotive 8712, Collinsville, Ill. Injector steam ram handle in operating position fouled on reverse lever, causing engineer to lose hold on reverse lever, and lever continued to the corner, catching his hand between lever and boiler head; injector operating handle not bent or cut off to provide proper clearance with reverse lever and no stop block on reverse-lever quadrant; 1 injured.

September 4, 1926, locomotive 1284, Wilmore, Pa. Flue failed at front flue sheet, due to being badly pitted; 1 injured.

September 4, 1926, locomotive 169, Wissinoming, Pa. Driving spring hanger broke, due to laminated material, releasing driving spring and tearing brake rigging down, which was dragged along road bed, throwing ballast which broke windows in passenger coaches; 3 injured.

September 6, 1926, locomotive 7548, Alliance, Ohio. Lubricator drain plug broke off flush with lubricator body, account of old circumferential crack; 1 injured.

September 7, 1926, locomotive 5337, Rahway, N. J. Struck by right front tender truck pedestal plate which was thrown from locomotive while passing station; 1 injured.



September 10, 1926, locomotive 9866, Midland, Pa. Flue broke off near front flue sheet, due to corrosion and pitting; 1 injured.

September 11, 1926, locomotive 4161, Baltimore, Md. Reverse-lever latch slipped out of quadrant; latch worn and fulcrum casting loose and working, which threw lever out of alignment with quadrant; 1 injured.

\*\*September 26, 1926, locomotive 1566, Harrisburg, Pa. Collar on blower pipe pulled loose; 1 injured.

September 27, 1926, locomotive 925, Conemaugh, Pa. Arch tube washout plug in cab blew out; plug not properly tightened when boiler was washed and attempt was made to tighten the plug while under pressure; 2 injured.

\*\*September 28, 1926, locomotive 6201, Olean, N. Y. Cab ventilator bracket loose on slide, account of one rivet having worked out and the other rivet being loose; 1 injured.

September 29, 1926, locomotive 7139, Columbus, Ohio. Throttle stuck open, account of defective rigging; throttle reported for repairs on September 11, 13, 15, 17, 19, 22, 23, 24, 25, 27, 28, and 29 (previous to accident); insufficient clearance between throttle handle and injector delivery pipe coupling nut at boiler-check connection; 1 injured.

September 29, 1926, locomotive 8672, Mansfield, Ohio. Overflow valve bonnet blew out of injector; wall of boss into which bonnet was fitted was badly distorted and threads inside of boss badly worn; injector reported not working on the two days preceding the accident; 1 injured.

\*\*October 5, 1926, locomotive 4462, Trafford, Pa. Engine truck wheels derailed at switch, due to flange of right truck wheel being worn to less than  $\frac{1}{8}$  inch in thickness gauged at a point  $\frac{3}{8}$  inch above the tread and wheels running to the right side; 2 injured.

October 7, 1926, locomotive 705, Philadelphia, Pa. Packing rings on the front end of right main valve broke, causing reverse lever to fly back and strike engineer when he attempted to use the lever; 1 injured.

October 7, 1926, locomotive 216, Shoenberger, Pa. Right No. 4 driving-wheel tire broke, resulting in emergency application of brakes and derailment of both No. 4 driving wheels; tire varied  $\frac{1}{8}$  inch in thickness; 1 injured.

\*October 16, 1926, locomotive 8656, Fisher, Ohio. Engine, mail car, diner, and five Pullman cars were derailed, the derailment being caused by insufficient clearance at bottom of left front tender truck box; 2 injured.

October 23, 1926, locomotive 1666, Baltimore, Md. Front cross equalizer broke, causing front end of engine to drop to rail; 1 injured.

October 23, 1926, locomotive 3689, New Cumberland, Pa. Screw reverse gear frame became detached from its bracket support and front end fell to cab floor, due to threads on three of the four studs securing it being stripped and bracket loose; bracket was reported loose on October 9, 12, 15, and 22; 1 injured.

October 27, 1926, locomotive 3267, South Wales, N. Y. Left back cab door rollers came off the rail, allowing door to fall; rail was very loose and bottom roller in back bracket was missing; 1 injured.

October 28, 1926, locomotive 4284, New Castle, Pa. Superheater flue failed at defective butt weld where safe end had been applied; 1 injured.

\*October 30, 1926, locomotive 8548, McLuney, Ohio. Insufficient clearance between reverse lever and handle of injector; 1 injured.

November 6, 1926, locomotive 3722, East Pittsburgh, Pa. Headlight turbine wheel and housing burst and flying parts struck employee; key missing from keyway and turbine wheel loose on shaft. Headlights or generator reported defective on October 20, 23, 27, and 28; 1 injured.

\*\*November 7, 1926, locomotive 7902, Lancaster, Ohio. Reversing gear did not operate properly; taper pins missing from right link radius bar holes, which allowed the die-block bolt to work out and catch in holes in link trunnion plate, fouling the valve gear; 1 injured.

November 9, 1926, locomotive 1364, Overbrook, Pa. Flue failed at defective safe-end weld; 1 injured.

\*\*November 19, 1926, locomotive 8808, near Waynesville, Ohio. Throttle latch spring broke while fireman had fire door open, causing throttle to close, and the back draft blew fire into his face; 1 injured.

November 22, 1926, locomotive 8584, Tiffin, Ohio. Dowels sheared off in right link plates, which allowed plates to turn out of alignment and catch on ends of eccentric rod clevis, causing reverse lever to kick back; valve gear was reported on November 21; 1 injured.

November 23, 1926, locomotive 1449, Pittsfield, Pa. Fireman's shovel struck ragged edge of hole worn around drawbar pinhole in tender shoveling sheet; 1 injured.

November 24, 1926, locomotive 4308, Glenfield, Pa. Stoker elevator wearing plate broke through oil groove and one-half of same worked its way past retaining ring which had a defective lug securing it to elevator casing; 1 injured.

November 26, 1926, locomotive 3642, Columbia, Pa. Lubricator-control valve bonnet was broken off due to old fracture covering about 60 per cent of cross section; defective condition of bonnet was known, as some corded packing had been wrapped around it to stop the leak; 1 injured.

December 1, 1926, locomotive 7170, Niles, Ohio. Screw reverse gear jammed tight in forward motion, account of counterbalance spring not being properly adjusted; reverse gear reported on November 3, 4, 9, 17, and 23, and on December 2 (subsequent to accident); 1 injured.

December 5, 1926, locomotive 2946, Hooks, Pa. Flue broke off immediately behind front flue sheet, due to being badly pitted and thinned to a sharp edge; 1 killed.

December 6, 1926, locomotive 8898, Rusie, Ind. Shaker bar being used as dump lever slipped off ash-pan operating post, due to post having excessive angle and improper taper for fit in shaker-bar socket; 1 injured.

December 18, 1926, locomotive 2314, Allentown, Pa. Injector-delivery pipe burst where it had been brazed by oxyacetylene process and thinned to less than  $\frac{1}{8}$  inch; rear section ( $\frac{1}{3}$  of pipe) had been brazed in five places; 1 injured.

\*\*December 20, 1926, locomotive 7385, Pittsburgh, Pa. Clinker-hook rod broke, due to old flaw; 1 injured.

December 23, 1926, locomotive 8546, Carnegie, Pa. Headlight-generator turbine burst and flying parts struck employee; key was missing from turbo-generator shaft and turbine wheel was loose on shaft; 1 injured.

\*December 30, 1926, locomotive 7426, Kokomo, Ind. Flue broke off at front flue sheet, due to pitting; 1 injured.

December 31, 1926, locomotive 7750, Canton, Ohio. Reverse-lever latch came out of quadrant, account of latch being badly worn; 1 injured.

January 1, 1927, locomotive 2114, Derry, Pa. Defective driver brake fulcrum casting broke, due to excessive pressure in cylinders, allowing brake rigging to strike eccentric rod, which caused reverse lever to unlatch and fly back, striking employee; feed valve for independent brake valve set at 85 pounds and brake cylinder safety valve set at 110 pounds; notches in reverse lever quadrant worn; 1 injured.

January 6, 1927, locomotive 2879, Frankstown, Pa. Side rod knuckle pin worked out, breaking clevis of back section of side rod and bending main rod; threads on knuckle pin were worn and taper pin missing; 1 injured.

January 7, 1927, locomotive 1562, near North East, Md. Back end of left union link became disconnected from crossarm and dropped down while locomotive was running 35 miles per hour, trapping steam in cylinder and causing front cylinder head to be blown out; locomotive had been in service less than 24 hours and had made less than 100 miles since union link was applied; 1 injured.

January 14, 1927, locomotive 1382, Lawrence, N. J. Main rod key failed at old fracture in threaded section; 1 injured.

January 14, 1927, locomotive 2375, Donora, Pa. Sand traps stopped up with foreign matter; 1 injured.

January 14, 1927, locomotive 4691, near Perrysville, Ohio. Handhole-plate gasket blew out; boss on handhole plate was undersize in the long diameter and was not properly centered in washout hole; 2 injured.

January 16, 1927, locomotive 4650, Thorndale, Pa. Injector delivery pipe joint separated at injector connection inside of cab, due to brazing collar being fractured 35 per cent of its cross-sectional area at throat of flange, and collar not properly brazed to pipe, 50 per cent of which failed to properly adhere.

Joint had been reported leaking on numerous occasions and soft gasket had been applied in an attempt to stop the leakage. Locomotive was dispatched from terminal with feed-water heater inoperative, leaving only one appliance to supply the boiler with water, which failed; 1 injured.

January 18, 1927, locomotive 4456, Beatty, Pa. Flue broke off near safe-end weld, due to safe end having been overheated and crystallized; 1 injured.

\*\*January 26, 1927, locomotive 8039, Condit, Ohio. Shaker-bar socket broke, due to defective weld; 1 injured.

January 29, 1927, locomotive 5038, Baltimore, Md. Locomotive collided with detached train, account of brakes on locomotive and tender failing to apply properly due to application valve in distributing valve not permitting air to flow to brake cylinders; distributing valve application piston graduating stem nut loose and worked almost entirely off stem; 1 injured.

\*\*February 6, 1927, locomotive 281, West Philadelphia, Pa. Cab door fell from runner, due to portion of flange broken off roller; 1 injured.

February 26, 1927, locomotive 7922, near Zanesville, Ohio. Lift pipe in front end became disconnected and tilted over exhaust nozzle, causing back draft; lift pipe entered top section about  $\frac{1}{8}$  inch instead of  $4\frac{1}{4}$  inches, as provided in blue print, and was secured by smaller bolts than hangers were slotted for; right top hanger bolt was loose and hanger bent  $\frac{3}{8}$  inch at strap lug. Locomotive was equipped with air-operated fire door, which was inoperative; 1 injured.

February 27, 1927, locomotive 7480, Pittsburgh, Pa. Reverse-lever latch stuck in quadrant, account of bottom dowel pin missing from outside of right link block, which allowed link-block plate to slip out of alignment and foul link saddle pin; link block and plates badly worn; valve motion reported after previous trip and repairs not made; 1 injured.

March 1, 1927, locomotive 3884, near New Brunswick, N. J. Reverse shaft bearing stud with nuts attached fell from locomotive and struck track employee; stud too small for proper fit in hole; 1 injured.

March 6, 1927, locomotive 9977, Cleveland, Ohio. Employee fell from step to sand dome, account of step improperly applied and slanting downward; 1 injured.

\*\*March 9, 1927, locomotive 6852, Leetsdale, Pa. Right engine truck spring failed completely, causing derailment of locomotive, tender, four cars, and caboose; twelve of the fifteen leaves of spring showed old defects; 1 injured.

March 20, 1927, locomotive 7253, Dennison, Ohio. Gutter strip on cab roof broke when used by employee in mounting cab roof in order to close cab ventilators; no provision made for opening and closing ventilators from inside of cab; 1 injured.

April 2, 1927, locomotive 7190, near Flint, Ohio. Superheater flue safe end broke off at defective weld. Locomotive was equipped with swing type, hand-operated fire door, which blew open, filling cab with fire, steam, and water; fire-door hinge bound and latch defective, rendering fire door difficult to close properly; 3 injured.

April 3, 1927, locomotive 1650, Baltimore, Md. Ash-pan blower hose nipple blew out, due to being insecurely applied; 1 injured.

April 8, 1927, locomotive 2065, Broadkill, Del. Blower pipe became disconnected at defective union inside of smoke box, causing back draft; 1 injured.

April 21, 1927, locomotive 4575, near Latrobe, Pa. Left front driving wheel tire broke, causing derailment of locomotive, tender, and six cars; inspection reports for 30 days previous to accident show that tire was repeatedly reported loose, turning, or liners working out; 1 injured.

\*\*May 1, 1927, locomotive 4401, South Duquesne, Pa. Finger amputated while repairing automatic bell ringer which had become inoperative. Bell not equipped with operating cord; 1 injured.

May 2, 1927, locomotive 3873, near North Penn Junction, Pa. Driving-spring hanger failed and hanger and gib were thrown from locomotive and struck track employee; hanger failed at old fracture extending over about 90 per cent of cross-sectional area, which should have been detected had the springs and rigging received proper attention when reported on April 4, 5, 18, 24, 26, 28, and 29; 1 injured.

May 10, 1927, locomotive 2034, Morrisville, Pa. Lower stud supporting reversing shaft box broke off flush with box, due to old fracture, and broken section with nuts attached was thrown from rapidly moving locomotive and struck track employee; 1 injured.

May 11, 1927, locomotive 6984, Fort Wayne, Ind. Left front side rod came down account of knuckle-joint pin losing out, due to the loss of nut and taper pin securing it; threads on knuckle-joint pin were badly stripped, indicating that proper repairs were not made when "Left No. 1 knuckle pin nut loose" was reported on May 2 at Crestline, where locomotive was held for monthly inspection from May 2 to 8; 1 injured.

May 14, 1927, locomotive 5708, Harrisburg, Pa. Locomotive without attendant moved off inspection pit when slightly jarred by another locomotive and continued across turntable into engine house, where it struck locomotive 1981, driving it into engine-house wall and crushing machinists who were working on it. Accident caused by defective throttle valve due to improper adjustment of its mechanism; throttle reported on April 30, May 8, 11, and 13; 1 killed, 1 injured.

\*\*May 15, 1927, locomotive 2461, East Aurora, N. Y. Flue failed at defective safe-end weld; 1 injured.

May 16, 1927, locomotive 2038, Kearney, N. J. Arch tube plug blew out, due to not being properly applied; attempted to tighten under pressure; 1 killed.

May 18, 1927, locomotive 4627, Ship Road, Pa. Crown-sheet failure caused by overheating due to low water; many appurtenances damaged to such extent their previous condition could not be determined; 3 killed, 1 injured.

May 21, 1927, locomotive 4581, Union City, Pa. Arch brick fell out, account of defective arch; arch reported at end of previous trip and repairs not made; 1 injured.

May 30, 1927, locomotive 6550, Richmond, Ind. Reflex type water glass burst; 1 injured.

\*\*June 22, 1927, locomotive 2947, Overbrook, Pa. Struck knee on brake valve while operating defective throttle. Defective condition of throttle had been reported eight times prior to accident and six times subsequent thereto; 1 injured.

Eighty-seven accidents; 7 killed, 94 injured.

#### PEORIA & PEKIN UNION RAILWAY:

May 31, 1927, locomotive 71, East Peoria, Ill. Tubular water glass burst, breaking water-glass shield; glass panel had been substituted for perforated plate at back of shield, allowing accumulation of pressure in the shield; 1 injured.

One accident; 1 injured.

#### PERE MARQUETTE RAILWAY:

\*\*July 29, 1926, locomotive 711, Grand Rapids, Mich. Flue broke off at defective safe-end weld; 1 injured.

One accident; 1 injured.

#### PITTSBURGH & LAKE ERIE RAILROAD:

\*\*April 12, 1927, locomotive (P., McK. & Y.) 9411, McKees Rock, Pa. Foot pedal on automatic fire door was loose, account of stud being loose in fulcrum bracket, causing fireman to fall; 1 injured.

One accident; 1 injured.

#### READING COMPANY:

\*July 17, 1926, locomotive 1422, Reading, Pa. Insufficient clearance between reverse lever and injector water-valve handle; 1 injured.

\*July 28, 1926, locomotive 989, Birdsboro, Pa. While reversing engine, throttle flew open, causing reverse lever to move forward and strike engineer; bolt holding latch to throttle lever was loose; 1 injured.

December 7, 1926, locomotive 1658, St. Clair, Pa. Washout plug blew out of boiler back head, due to not being properly tightened; 1 injured.

December 18, 1926, locomotive 1720, Manville, N. J. Insufficient clearance between vertical handhold and front corner of tender deck plate while locomotive was being operated over curved track, account of deck plate not being rounded off at corners; 1 injured.

\*January 4, 1927, locomotive 967, Hershey, Pa. Brake rigging came down, due to bolt losing out; 1 injured.

April 30, 1927, locomotive 2010, Hamburg, Pa. Gangway safety chain uncoupled at front end, causing employee to fall to the ground; only one of the two safety chains was in place at time of accident, and springs in both safety chain snap hooks were broken and would not hold the sliding bolts in closed position; 1 injured.

June 8, 1927, locomotive 1805, Reading, Pa. Flue failed at front flue sheet where it had been excessively rolled; 1 injured.

June 10, 1927, locomotive 1318, Philadelphia, Pa. Stop missing from rear end of reverse-lever quadrant, allowing lever to go to extreme rear end and catch employee's hand between lever and lower valve of water glass; 1 injured.

June 18, 1927, locomotive 1674, Roelofs, Pa. Shaker bar slipped off post, due to improper fit; 1 injured.

Nine accidents; 9 injured.

#### ST. LOUIS-SAN FRANCISCO RAILWAY:

October 31, 1926, locomotive 613, Sherman, Tex. Injector steam valve stem blew out; steam valve stem clamp rings had been improperly assembled; 1 injured.

November 15, 1926, locomotive 1250, Marion, Ark. Right main crank pin broke, due to old fracture, causing rods to strip off both sides of locomotive; 2 injured.

January 17, 1927, locomotive 810, Pittsburg, Kans. Step on side of boiler fell from bracket, account of nuts working off anchor bolt which secured step to bracket; 1 injured.

January 27, 1927, locomotive 1278, Cherokee, Kans. Fireman broke through canvas which covered defective cab roof; end of roof board had broken and had been improperly repaired; 1 injured.

March 10, 1927, locomotive 650, Pacific, Mo. Crown-sheet failure while in charge of engine watchman, caused by overheating due to low water; 1 injured.

April 3, 1927, locomotive 182, near McWillie, Okla. Crown-sheet failure; low water; no contributory causes found; 2 injured.

May 2, 1927, locomotive 441, near Advance, Mo. Squirt hose burst where chafed by deck apron; 1 injured.

May 5, 1927, locomotive 4160, Claremore, Okla. Fireman stepped into feed-water filling hole, account of cover missing from left side of filling hole; this defect was reported on this trip at West Tulsa and Afton, Okla., and locomotive continued in service without repairs being made; 1 injured.

\*\*May 13, 1927, locomotive 835, Monett, Mo. Grate-shaker bar slipped off dump grate fulcrum lever due to improper fit caused by pocket of bar being crushed inward at center the full length of pocket; 1 injured.

June 21, 1927, locomotive 1110, Ash Grove, Mo. Squirt hose burst, due to a badly worn place about 20 inches from outlet end; 1 injured.

Ten accidents; 12 injured.

#### ST. LOUIS SOUTHWESTERN RAILWAY:

November 26, 1926, locomotive 455, Texarkana, Tex. Stay bolt broke and blew out while being calked under pressure; bolt showed approximately 85 per cent old fracture, and threads in wrapper sheet and on end of bolt that blew out were entirely worn away by corrosion; 1 injured.

One accident; 1 injured.

#### SAN JOAQUIN & EASTERN RAILROAD:

December 19, 1926, locomotive 106, White Pine, Calif. Crown-sheet failure caused by overheating due to low water; metal in fusible plug did not fuse; plug defective and had not been removed and cleaned at time of last monthly inspection (eight days previous to accident) as was shown to have been done by the report; 2 injured.

One accident; 2 injured.

#### SEABOARD AIR LINE RAILWAY:

August 25, 1926, locomotive (C. H. & N.) 73, Achan, Fla. Tender sill step gave way, account of casting being fractured prior to accident; 1 injured.

September 13, 1926, locomotive (C. H. & N.) 8, Sarasota, Fla. Squirt hose burst; hose defective; 1 injured.

\*\*September 13, 1926, locomotive 711, Waldo, Fla. Reverse-lever stop broke, allowing insufficient clearance between lever and injector pipe; 1 injured.

October 14, 1926, locomotive 747, Tampa, Fla. Injector steam pipe broke. 2 injured.

October 27, 1926, locomotive 208, Cayce, S. C. Leaky steam-heat throttle; 1 injured.

November 11, 1926, locomotive 1057, Tampa, Fla. Rivet blew out of firebox seam while being caulked under pressure; rivet badly deteriorated by leakage; 1 injured.

November 12, 1926, locomotive 248, Raleigh, N. C. Grate-shaker bar slipped off fulcrum lever, due to improper fit; 1 injured.

December 8, 1926, locomotive 736, Ocala, Fla. Side rod broke; 1 injured.

February 4, 1927; locomotive 2490, Hamlet, N. C. Grate-shaker bar slipped off fulcrum lever, due to improper fit; 1 injured.

March 10, 1927, locomotive 313, West Frostproof, Fla. Bolt worked out of rod to grates; 1 injured.

Ten accidents; 11 injured.

#### SOUTHERN RAILWAY SYSTEM:

July 8, 1926, locomotive 801, Macon Ga. Bell cord broke, due to old defect; 1 injured.

July 13, 1926, locomotive 1226, Nickajack, Ga. Steam pipe in smoke box burst; pipe not uniform in thickness and at point of failure was only 1/8 inch thick; 1 injured.

August 7, 1926, locomotive 1108, Jennings, Va. Main or middle connection side-rod strap broke through keyway, due to old fracture in top section; rod and strap had been removed from locomotive on day prior to accident, at which time the defective condition of strap should have been detected; 1 injured.

August 7, 1926, locomotive 6587, Tifton, Ga. Coupler knuckle at rear of tender broke, causing train to separate and stop suddenly; 1 injured.

\*\*August 30, 1926, locomotive 1623, Macon, Ga. Front coupler pivot pin broke, allowing train to separate and cause emergency application of brakes; 1 injured.

September 1, 1926, locomotive 6565, Chattanooga, Tenn. Vertical handhold came loose at top fastening to cab; 1 injured.

September 16, 1926, locomotive 6295, Pennine, Tenn. Shovel caught in hole in shoveling sheet; a new shoveling sheet had been requested on work reports for September 8 and 12; 1 injured.

September 21, 1926, locomotive 1676, Durham, N. C. Nozzle blew out of end of fire hose, account of being too small for proper fit and not securely clamped; 1 injured.

\*\*October 5, 1926, locomotive 1481, Lincoln, Ala. Spring hanger broke; 1 injured.

January 8, 1927, locomotive 4503, Carroll, Ga. Brick arch came down; brick arch was reported on previous day and was evidently improperly repaired or applied; 1 injured.

\*\*January 9, 1927, locomotive 5039, Ridgecrest, N. C. Window sash fell out of cab window frame; 1 injured.

January 12, 1927, locomotive 785, Riley, S. C. Steam pipe in smoke box burst; pipe defective; 1 injured.

January 27, 1927, locomotive 1747, Winston-Salem, N. C. Front handrail turned when employee attempted to mount moving locomotive, due to bracket being loose and handrail not securely fastened; 1 injured.

\*\*February 26, 1927, locomotive 906, Bryson, N. C. Top board in coal gate pulled loose at its fastenings on one side, causing employee to fall; 1 1/2 inches of this board broken off at end prior to accident, and cleat to which it was secured was split through nail hole and other nails badly deteriorated and loose fit in the cleat; 1 injured.

March 17, 1927, locomotive 6335, Stearns, Ky. One of the two hinge pins in center filling hole cover was missing, which allowed cover to slip out of

position and cause employee who was standing on cover to lose his balance and release hold on water-valve lever, which flew up and struck him; 1 injured.

May 3, 1927, locomotive 1715, Lynchburg, Va. Fire hose burst; 1 injured.

May 13, 1927, locomotive 691, Turnpike, N. C. Struck by storm curtain, which unrolled due to being insecurely fastened; 1 injured.

\*\*May 28, 1927, locomotive 5234, Cleveland, Tenn. Supply pipe to power reverse gear broke off in threaded section at flexible union, due to vibration account of supply pipe not being clamped; 1 injured.

\*\*June 8, 1927, locomotive 1357, Coveseville, Va. Right valve crosshead guide block broke off at steam chest head; 1 injured.

\*\*June 21, 1927, locomotive 6199, near Mayday, Ga. Low voltage in train-control equipment on locomotive while engaged in pushing cars in work-train service prevented forestalling automatic brake application, thereby causing undesired stop; 1 killed.

Twenty accidents; 1 killed, 19 injured.

#### SOUTHERN PACIFIC—LINES EAST:

July 6, 1926, locomotive (M. L. & T.) 601, New Iberia, La. Jacket band worked back, allowing end of jacket to stick out and cause injury to engineer's hand; 1 injured.

July 7, 1926, locomotive (H. & T. C.) 552, Lafayette, La. Headlight generator turbine burst, hurling broken parts of turbine wheel and casing over a radius of 250 feet; governor arm of generator badly worn and broke in old fracture, allowing wheel to race; 1 injured.

September 27, 1926, locomotive (H. & T. C.) 24, Sherman, Tex. Headlight generator turbine burst; governor center piece and graphite ring were badly worn and galled, due to lack of lubrication allowing governor stand to strike spring pocket and break governor arm, permitting sufficient speed to burst turbine wheel; 1 injured.

\*November 9, 1926, locomotive (G., H. & S. A.) 426, Cuero, Tex. Spring hanger broke; 1 injured.

December 22, 1926, locomotive (S. A. & A. P.) 208, Waco, Tex. Vertical cab handhold broke off at bottom bolt hole, due to an old fracture covering approximately 95 per cent of cross-sectional area; false tender deck improperly applied and did not allow sufficient clearance for handhold, and the appearance of deck and handhold indicated this condition had existed for some time; proper inspection would have revealed the fracture in handhold; 1 injured.

December 24, 1926, locomotive (G., H. & S. A.) 484, Lafayette, La. Reverse lever was suddenly thrown from forward to back motion, striking engineer; a  $\frac{7}{8}$ -inch bolt had, at some previous time, been dropped into live steam passage and was forced up with end protruding through back steam port in valve bushing; bolt was struck by valve in its backward travel, which threw the reverse lever; 1 injured.

December 27, 1926, locomotive (G., H. & S. A.) 131, San Antonio, Tex. Crown-sheet failure while in charge of engine watchman caused by overheating due to low water; 1 injured.

April 23, 1927, locomotive (H. & T. C.) 249, Sherman, Tex. Improper application of raising block to tender deck allowed excessive opening in deck around holes cut for anchor lugs, which caught heel of engineer's shoe as he was getting off locomotive and caused him to fall to the ground; 1 injured.

Eight accidents; 8 injured.

#### SOUTHERN PACIFIC—LINES WEST:

October 16, 1926, locomotive 3725, Niland, Calif. Headlight on front of locomotive failed and locomotive continued in operation without headlight until it collided with a cut of cars on siding at 4.02 a. m.; dynamo reported on October 11 and 15; 1 killed.

January 17, 1927, locomotive 5033, Penryn, Calif. Reflex-type water glass burst; front section of water-glass case sprung account of set screws at back drawn up too tight, which placed strain on water glass; 1 injured.

\*March 25, 1927, locomotive 1757, Fowler, Calif. Left back pedestal jaw failed at defective weld, causing derailment of locomotive and first car. 1 injured.

\*\*May 15, 1927, locomotive (E. P. & S. W.) 3417, Tucson, Ariz. Cab ventilator adjusting lever turned on shaft, account of taper pin which secured it losing out, allowing ventilator to drop back in closed position and catch finger of employee who was attempting to adjust ventilator; 1 injured.

Four accidents; 1 killed, 3 injured.

#### SPokane, Portland & Seattle Railway:

August 3, 1926, locomotive 156, near Lyle, Wash. Main rod broke at bottom of front end brass, due to old fracture, causing locomotive and two passenger cars to be derailed and turned over while running at an estimated speed of 35 to 40 miles per hour; 1 killed, 2 injured.

One accident; 1 killed, 2 injured.

#### TERMINAL RAILROAD ASSOCIATION OF ST. LOUIS:

July 16, 1926, locomotive 86, St. Louis, Mo. Squirt hose pulled off nipple; 1 injured.

One accident; 1 injured.

#### TEXAS & PACIFIC RAILWAY:

December 20, 1926, locomotive 319, Shreveport, La. Front driving spring hanger broke, permitting locomotive to drop and front footboard to strike on street pavement; one side of hanger showed old fracture of approximately one-half its area and was further reduced at point of failure by being cut into by spring leaves account of improper spring clearance; 1 injured.

February 13, 1927, locomotive 464, Fort Worth, Tex. Water valve of left injector stuck and could not be opened by hand, and when brake-shoe key was used as a lever to open it the handle came off stem, catching employee's finger against overflow valve handle; 1 injured.

Two accidents; 2 injured.

#### TONOPAH & TIDEWATER RAILROAD:

March 16, 1927, locomotive (B. G.) 6, Death Valley Junction, Calif. Crown-sheet failure caused by overheating due to low water; 1 killed, 1 injured.

One accident; 1 killed, 1 injured.

#### UNION RAILROAD:

August 13, 1926, locomotive 158, Monongahela Junction, Pa. Drawbar broke through pinhole; safety chains, being too long, permitted apron to drop, causing fireman to fall to ground; end of drawbar badly laminated and overheated and had been broken through end of eye for some time; drawbar and pins overdue for inspection since August 2; 1 injured.

One accident; 1 injured.

#### UNION PACIFIC RAILROAD:

July 21, 1926, locomotive 3654, near Uintah, Utah. Pipe bushing connecting drop pipe to main squirt pipe broke; pipe-bushing nipples and valve were not of double strength, as required by rule 116 (c); 1 injured.

December 31, 1926, locomotive 358, Manhattan, Kans. Cotter key worked out of crosshead pin, allowing pin to work partly out and foul on side rod; 1 injured.

Two accidents; 2 injured.

#### WABASH RAILWAY:

\*\*November 12, 1926, locomotive 422, Orland, Ill. Cam screw lost off left driver brake rigging; 1 injured.

January 27, 1927, locomotive 692, Crocker, Ind. Relief cock in cylinder worked open; 1 injured.

March 26, 1927, locomotive 2329, Decatur, Ill. Left link fouled on link hanger, causing a violent jerk at reverse lever; 1 injured.

June 22, 1927, locomotive 2602, Forrest, Ill. Extension to front end of hand-rail on right side of locomotive, 8 inches in length, pulled off due to not being properly secured. Side handrails were used for conduits for electric wires, and the greater portion of threaded end of junction box into which this extension had been screwed was broken out and extension was not securely attached to handrail column; 1 injured.

Four accidents; 4 injured.

**WESTERN MARYLAND RAILWAY:**

July 31, 1926, locomotive 804, near Clear Spring, Md. Crown-sheet failure caused by overheating due to low water; 1 killed, 2 injured.

\*\*October 3, 1926, locomotive 719, Barnitz, Pa. Union link of left valve gear broke, due to defective forge weld; 1 injured.

\*January 20, 1927, locomotive 813, Woodmont, W. Va. Derailment; locomotive being operated with a broken spring hanger; 3 injured.

\*\*January 25, 1927, locomotive 514, Hagerstown, Md. Squirt hose failed approximately 60 per cent of cross-sectional area, due to having been burned; 1 injured.

\*\*January 31, 1927, locomotive 509, Hagerstown, Md. Whistle valve stuck open, account of whistle-valve bolt missing; 1 injured.

May 5, 1927, locomotive 511, Big Pool, Md. Reverse lever very difficult to operate, due to fulcrum pin binding bottom end of reverse lever. Throttle reported leaking seven times previous to accident; 1 injured.

Six accidents; 1 killed, 9 injured.

**WESTERN PACIFIC RAILROAD:**

\*July 20, 1926, locomotive 202, Land, Calif. Main rod broke, due to old flaw; 1 injured.

One accident; 1 injured.

**ACCIDENTS AND CASUALTIES RESULTING FROM THE FAILURE OF LOCOMOTIVES OTHER THAN STEAM AND THEIR APPURTENANCES DURING THE FISCAL YEAR ENDED JUNE 30, 1927, BY ROADS**

[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.]

**CHICAGO & NORTH WESTERN RAILWAY:**

January 18, 1927, locomotive 1001, Chicago, Ill. Starting compressor flywheel handle projected beyond flywheel rim, account of spring provided to return handle flush with wheel rim having insufficient tension; 1 injured.

One accident; 1 injured.

**LONG ISLAND RAILROAD:**

\*\*March 29, 1927, locomotive 326, Brooklyn, N. Y. Arc flashed from cable leading from pantagraph to circuit breaker. Insulation ruptured near circuit-breaker connection where cable was wrapped with empire tape covered with friction tape. Insulation not of sufficient thickness; 1 injured.

One accident; 1 injured.

**NEW YORK, NEW HAVEN & HARTFORD RAILROAD:**

September 20, 1926, locomotive 01, Stamford, Conn. Oil-circuit breaker exploded, due to ground through failed contact insulator; 1 injured.

January 15, 1927, locomotive 0311, Bridgeport, Conn. Flash boiler back-fired. Burner air gauge defective; 1 injured.

April 8, 1927, locomotive 023, Cos Cob, Conn. Contacts of circuit breaker fused and failed to open when transformer grounded; 1 injured.

Three accidents; 3 injured.

TABLE XIII.—Number of steam locomotives inspected,

Parts defective, inoperative or missing, or in violation of the rules	Akron, Canton & Youngstown	Alabama, Tennessee & Northern	Aliquippa & Southern	Ann Arbor	Atchison, Topeka & Santa Fe	Atlanta & West Point & Western Ry. of Alabama
1 Air compressors		1	1	2	48	
2 Arch tubes					3	
3 Ash pans or mechanism	2				3	
4 Axles					3	
5 Blow-off cocks	1				29	
6 Boiler checks			1		8	
7 Boiler shell	2		1	1	142	1
8 Brake equipment	2		1		50	
9 Cabs or cab windows	2	1	1	10	62	
10 Cab aprons or decks	2				22	
11 Cab cards	2	1	1		4	
12 Coupling or uncoupling devices					5	
13 Crossheads, guides, pistons, or piston rods		2	2	2	49	1
14 Crown bolts	1				12	
15 Cylinders, saddles, or steam chests	4	2			132	
16 Cylinder cocks or rigging	3				77	
17 Domes or dome caps	1				12	
18 Draft gear	7			2	19	
19 Draw gear	1	1	2	2	19	
20 Driving boxes, shoes, wedges, pedestals, or braces	13				33	1
21 Fire-box sheets	1				9	
22 Flues	1			3	10	
23 Frames, tail pieces or braces, locomotive	2	1			46	
24 Frames, tender	2				11	
25 Gauges or gauge fittings, air		1		3	22	
26 Gauges or gauge fittings, steam		1		2	19	
27 Gauge cocks				1	48	
28 Grate shakers					59	1
29 Handholds	5				5	
30 Injectors, inoperative	2		3	2	51	
31 Injectors and connections					1	
32 Inspectors or tests not made as required	3	1	3	7	258	1
33 Lateral motion	2			1	195	
34 Lights, cab or classification					9	
35 Lights, headlights			1	4	1	
36 Lubricator or shields					18	
37 Mud rings	3				20	
38 Packing nuts	1	5		1	25	1
39 Packing, piston rod and valve stem	2			5	41	
40 Pilot or pilot beams	1			2	70	
41 Plugs or studs	2				7	
42 Reversing gear	3		2	2	19	
43 Rods, main or side, crank pins or collars	1	2	2	1	34	
44 Safety valves	2	1	6	2	126	
45 Sanders					9	
46 Springs or spring rigging	2			8	59	
47 Squirt hose	3	1	1	4	170	3
48 Staybolts					15	
49 Staybolts, broken	1				10	
50 Steam pipes	6				7	
51 Steam valves	1				48	
52 Steps	2			2	11	
53 Tanks or tank valves	9		2	2	71	
54 Telltale holes	1			2	81	
55 Throttle or throttle rigging	1			5	3	
56 Trucks, engine or trailing	2	5			65	2
57 Trucks, tender		2	2	1	43	
58 Valve motion		1			73	1
59 Washout plugs	13			2	39	
60 Water bar or combustion flues					112	1
61 Water glass, fittings or shield					1	
62 Wheels	3			9	48	
63 Miscellaneous—Signal appliances, badge plates, brakes (hand)	3	1	4	1	36	1
					65	
Number of defects	104	28	35	100	2,729	14
Locomotives reported	28	14	14	58	2,119	53
Locomotives inspected	52	18	38	102	3,159	56
Locomotives defective	22	10	10	25	760	6
Percentage of inspected found defective	42	56	26	25	24	9
Locomotives ordered out of service	1	2		2	40	1

found defective, and ordered from service, etc.

	Atlanta, Birmingham & Coast	Atlantic & Yadkin	Atlantic Coast Line	Baltimore & Ohio Lines East	Baltimore & Ohio Lines West	Bangor & Aroostook	Belt Railway of Chicago	Dessemer & Lake Erie	Birmingham Southern	Boston & Albany	Boston & Maine	Brooklyn Eastern District Terminal	Buffalo & Susquehanna	Buffalo Creek	Buffalo, Rochester & Pittsburgh	Cambria & Indiana	Canadian National	Canadian Pacific
2	2		5	35	85		2	1		1	13		3		5		12	1
3				6	26						4						11	2
4	2			5	13					1	4						4	1
5																		
6	3		1	6	34					4	4				1		11	2
7	1		12	28	39		1			1	5				2		4	1
8	1		11	65	39		32			1	1				5		12	5
9	1		30	173	231		1			10	30	2	4	4	18		42	8
10	12		51	32	172		3			4	23	1	2	2	3		35	3
11	5		10	20	72		1			4	1	1	1	1	1		16	4
12	4		4	13	23		1			1	12		3				5	2
13	2		1	4	4		1			1	1						6	11
14	5		9	67	72		1			20	11		2	1			21	13
15	3		1	9	6										10		5	14
16	3		13	90	130		1			1	12				6		24	15
17	1		3	26	85					1	3				2		3	17
18	1		3	9	15					2	14	1	6		9	1	18	18
19	7		19	33	92		5			2	13		4	2	2		25	19
20	13		24	52	89		1			2	16				8		37	20
21	1		7	15	141		3			2	10						9	21
22	2		9	30	30		4				13						9	22
23	8		8	6	6		4				15	1			2		9	23
24	8		13	63	65		2			1	1				5		12	24
25	2		9	15	15						1				1		7	25
26	1		1	17	47		2			2	8				3		25	26
27	1		1	48	52		1			3	1				9	1	33	27
28	1		17	42	56		1			3	32				3		5	28
29	4		7	7	7		4			3	12						27	29
30	2		5	5	84						25	1	7	1	26		4	30
31																		
32	26	2	66	185	270		11		9	4	7	1	8		30		70	12
33	9		84	238	301		14		1	1	81	1			1		19	31
34	2		3	19	18		1				6		1		2		6	2
35				2	2		1											
36			5	16	39		1			1	4				3	1	13	35
37				27	28				3		2						4	2
38	6		10	28	38		5			13	17				6		8	37
39	5		28	11	70		1			9	9				1		40	38
40	1		5	34	114		12		3		14				4		12	1
41	2		7	9	9		1				8				1		6	39
42	3		3	31	18		1		3		7				5		4	41
43	1		2	58	122		1		1		4				11		7	42
44	5		4	132	162		7		3		33	1	3		18		30	6
45				9	7						1	2					1	3
46	2		6	16	51		4			3	2				2		13	45
47	7		58	273	220		1		9	10	35				4		32	7
48	2		7	15	15		1		1		1				1		4	47
49	3		11	14	24		1		2		4				1		4	48
50	20		36	40	17		2				21	5	6		23		30	4
51	1		6	23	55		1		6		14				10		18	50
52	1		4	12	32		4		3		8				3		20	3
53	8		19	37	83		1		2	4	1				5		20	1
54	4		109	69	199		1		3		14				2		39	6
55	2		1	6	8		1				39				2		4	5
56	1	2	23	65	89		4		1		4				6		1	5
57	18		43	82	68		2				22				8		23	4
58	12		70	69	94		2		5		16				13		38	6
59			1	74	44		1		5		14				1		5	58
60	1		33	49	51		2		1	1	12				1		24	4
61	1		37	1	6		1		4		20				5		1	60
62	14		9	62	121		1		8	2	8				13		37	1
63			38	32	32		1		2		2				3		23	1
			10	44	44		5				9				12		11	3
	247	4	962	2,774	4,142		55	174	92	13	282	868	22	116	18	359	6	993
	80	16	1,041	2,515	4,142		84	93	158	23	343	941	10	51	20	289	13	592
	165	19	1,784	2,034	1,979		53	68	94	6	466	1,458	5	75	17	496	31	495
	66	3	534	620	975		23	37	20	6	122	340	3	22	3	67	2	247
	40	16	30	30	49		43	54	21	100	26	23	60	29	18	14	6	50
	8		4	32	72		3	5	1			13	1	3		9		30



TABLE XIII.—Number of locomotives inspected, found

Parts defective, inoperative, or missing, or in violation of the rules	Number of locomotives inspected, found					
	Carnegie Steel	Carolina & Northwestern	Central New England	Central of Georgia	Central R. R. of New Jersey	Central Vermont
1 Air compressors.....	4			4	4	
2 Arch tubes.....						4
3 Ash pans or mechanism.....						2
4 Axles.....					1	
5 Blow-off cocks.....				12	3	1
6 Boiler checks.....	4	1	1	6	10	1
7 Boiler shell.....				3	23	1
8 Brake equipment.....	1		2	25	28	2
9 Cabs or cab windows.....				9	31	
10 Cab aprons or decks.....				2	18	
11 Cab cards.....	1		1			
12 Coupling or uncoupling devices.....	1			5	2	2
13 Crossheads, guides, pistons, or piston rods.....	2			6		
14 Crown bolts.....	2		1	10	19	2
15 Cylinders, saddles, or steam chests.....	1			8	32	7
16 Cylinder cocks or rigging.....	1	1				
17 Domes or dome caps.....				4		
18 Draft gear.....				1	4	
19 Draw gear.....	5	1	5	13	12	2
20 Driving boxes, shoes, wedges, pedestals, or braces.....				16	28	
21 Fire-box sheets.....	4	1		18	15	6
22 Flues.....				5	14	
23 Frames, tail pieces or braces, locomotive.....				1	2	
24 Frames, tender.....	1	2	1	25	20	
25 Gauges or gauge fittings, air.....				7	3	2
26 Gauges or gauge fittings, steam.....	2					
27 Gauge cocks.....		1		1	13	1
28 Grate shakers.....	3	1	1	8	41	2
29 Handholds.....		1		1	18	1
30 Injectors, inoperative.....	2			9	17	5
31 Injectors and connections.....						
32 Inspections or tests not made as required.....	9		4	29	49	
33 Lateral motion.....	7	11	13	23	60	4
34 Lights, cab or classification.....	2			3	10	
35 Lights, headlights.....						
36 Lubricator or shields.....				3	16	
37 Mud rings.....			1	6		
38 Packing nuts.....		1	3	2	17	1
39 Packing, piston rod and valve stem.....	1			1	5	6
40 Pilot or pilot beams.....	2			4	56	2
41 Plugs or studs.....				4	5	1
42 Reversing gear.....				8	2	
43 Rods, main or side, crank pins or collars.....		1		2	7	
44 Safety valves.....	10			11	40	6
45 Sanders.....						
46 Springs or spring rigging.....				2	15	
47 Squirt hose.....	1		2	50	41	9
48 Staybolts.....				24	10	4
49 Staybolts, broken.....			1	1	1	
50 Steam pipes.....		1	1	8	19	1
51 Steam valves.....				1	8	
52 Steps.....	2	1		22	6	1
53 Tanks or tank valves.....				6	15	
54 Telltale holes.....						
55 Throttle or throttle rigging.....	2		1	8	23	
56 Trucks, engine or trailing.....				11	10	1
57 Trucks, tender.....	1	1		14	21	
58 Valve motion.....			2	8	20	
59 Washout plugs.....	2			7	10	2
60 Water bar or combustion flues.....						
61 Water glass, fittings or shield.....		1	2	12	23	1
62 Wheels.....	2	5		21	19	
63 Miscellaneous—Signal appliances, badge plates, brakes (hand).....	1		1		7	
Number of defects.....						
Locomotives reported.....	75	32	52	513	882	67
Locomotives inspected.....	49	12	64	358	590	98
Locomotives defective.....	62	22	28	526	735	246
Percentage of inspected found defective.....	21	11	14	160	282	28
Locomotives ordered out of service.....	34	50	50	30	38	11
.....	5			10	20	1

defective, and ordered from service, etc.—Continued

Parts defective, inoperative, or missing, or in violation of the rules	Charleston & Western Carolina	Chesapeake & Ohio	Chicago & Alton	Chicago & Eastern Illinois	Chicago & Illinois Midland	Chicago & North Western	Chicago & Western Indiana	Chicago, Burlington & Quincy	Chicago Great Western	Chicago, Indianapolis & Louisville	Chicago, Milwaukee & St. Paul	Chicago River & Indiana	Chicago, Rock Island & Pacific	Chicago, St. Paul, Minneapolis & Omaha	Chicago Short Line	Chicago, West Pullman & Southern	Cincinnati, Indianapolis & Western			
	1 Air compressors.....		28	4	1	6	59		36	2	4	13		65	8			5	1	
2 Arch tubes.....		1				1					3		6					2	2	
3 Ash pans or mechanism.....		2			1	1		6	1	4			14					3	4	
4 Axles.....						1													5	
5 Blow-off cocks.....		3	1	1	3	21		5		1	7		33	4				3	6	
6 Boiler checks.....		10	1	5	5	17		13	1	2	9		17	6	1			5	7	
7 Boiler shell.....		18	2	4	6	12		17	1		13		46	3				8	8	
8 Brake equipment.....		37	13	29	14	198		50	22	20	100		185	29				9	9	
9 Cabs or cab windows.....		103	7	11	12	11		13	14	14	18		29	7	2			10	10	
10 Cab aprons or decks.....		10	3	7	3	5		8	1	6	7		16	4	1			11	11	
11 Cab cards.....		13	1			8		1			4		3	2				12	12	
12 Coupling or uncoupling devices.....		4				3		3		5	3		2	2				13	13	
13 Crossheads, guides, pistons, or piston rods.....		34	2	7	6	54		33	8	4	24		73	3				14	14	
14 Crown bolts.....		1				1		7					7					15	15	
15 Cylinders, saddles, or steam chests.....		184	7	41	21	138		127	18	18	119		276	4				16	16	
16 Cylinder cocks or rigging.....		40	1	18	10	70		43	5	6	43		84	10				17	17	
17 Domes or dome caps.....		4				3		4			1		6	2				18	18	
18 Draft gear.....		3				3		1			23		3					19	19	
19 Draw gear.....		19	1	13	5	30		19	3	12	20		28	9				20	20	
20 Driving boxes, shoes, wedges, pedestals, or braces.....		31	1	9	9	36		19	4	2	19		53	5	1			21	21	
21 Fire-box sheets.....		68	10	9	6	30		96	5	7	22		72	7				22	22	
22 Flues.....		7	1	13	2	7		9	2	1	2		19	3				23	23	
23 Frames, tail pieces or braces, locomotive.....		3				4		5			10		58	1				24	24	
24 Frames, tender.....		33	2	1	4	20		38	4	2	6		6	1				25	25	
25 Gauges or gauge fittings, air.....		9				27		16		1	15		27	11				26	26	
26 Gauges or gauge fittings, steam.....		11	4	7	2	8		12	3	2	17		43	11				27	27	
27 Gauge cocks.....		25	1	16	6	60		32	2	2	27		48	17	3			28	28	
28 Grate shakers.....		2	1			11		12	8	3	2		29	11				29	29	
29 Handholds.....		2	15	2	9	23		13	9	7	15		25	12	1			30	30	
30 Injectors, inoperative.....						2		1					6	4				31	31	
31 Injectors and connections.....		5				69		97		12	14		33	53				32	32	
32 Inspections or tests not made as required.....		38	211	7	36	24		104	11	15	57		317	50	6			33	33	
33 Lateral motion.....		7	1		5	11		2	10	1	9		17	1				34	34	
34 Lights, cab or classification.....						3		4	1	1	2		2	1				35	35	
35 Lights, headlights.....		11	4	7	10	12		16	3	4	19		9	2	1			36	36	
36 Lubricator or shields.....		9				11		19			8		14	4				37	37	
37 Mud rings.....		3				10		7			4		57	4				38	38	
38 Packing nuts.....		28	7	7	19	27		15	2	5	16		37	5	2			39	39	
39 Packing, piston rod and valve stem.....		62	5	40	27	56		61	10	2	31		73	4				40	40	
40 Pilot or pilot beams.....		8				4		2	10		16		27	1				41	41	
41 Plugs or studs.....		18				11		1			8		17	8				42	42	
42 Reversing gear.....		1	28	4	12	2		16	12	2	9		37	3				43	43	
43 Rods, main or side, crank pins or collars.....		1	78	11	17	109		109	3	22	88		167	10	1			44	44	
44 Safety valves.....		2				8		4		1	1		5	5				45	45	
45 Sanders.....		10	2			40		27		2	9		50	4				46	46	
46 Springs or spring rigging.....		1	122	21	47	37		70	17	10	68		206	31	1			47	47	
47 Squirt hose.....		11	4			13		11	2	1	14		14	14				48	48	
48 Staybolts.....		1	17			3		6			2		13	6				49	49	
49 Staybolts, broken.....		11				8		18			9		45	42	9			50	50	
50 Steam pipes.....		4	14	3	2	6		11	2	1	10		24	1				51	51	
51 Steam valves.....		1	5	1	1	3		6			13		27	1	2			52	52	
52 Steps.....		1	24	2	10	6		31	10	7	18		38	9	2			53	53	
53 Tanks or tank valves.....		8	19	3	5	27		21	3	5	16		65	10	2			54	54	
54 Telltale holes.....		3	7			1		1			3		2	3				55	55	
55 Throttle or throttle rigging.....		3	38	3	9	49		30	4	3	35		55	12	1			56	56	
56 Trucks, engine or trailing.....		2	24			55		43	9	4	18		42	6				57	57	
57 Trucks, tender.....		2	60	3	9	56		48	7	13	20		68	44	6			58	58	
58 Valve motion.....		1	16	3	4	11		12	2	1	4		32	2				59	59	
59 Washout plugs.....		6	65	1	14	20		44	5	3	9		183	11				60	60	
60 Water bar or combustion flues.....		3	38	6	7	62		49	5	12	41		100	22	4			61	61	
61 Water glass, fittings or shield.....		6	12	7	11	48		41	10	6	30		52	10	1			62	62	
62 Wheels.....		10				14		31	1	5	19		58	5				63	63	
63 Miscellaneous—Signal appliances, badge plates, brakes (hand).....		1																		
Total.....																				
126 1,747 171 603 386 1,881 7 1,741 261 277 1,141 3,361 626 40 63 238																				
Number of defects.....																				
Locomotives reported.....	61	1,027	328	341	17	1,995	27	1,900	272	166	1,939	86	1,546	365	12	11	59			
Locomotives inspected.....	71	1,599	489	450	60	3,572	9	3,232	468	298	2,921	10	3,260	740	13	17	102			
Locomotives defective.....	41	446	66	172	50	668	2	680	92	86	387		635	220	5	9	56			
Percentage of inspected found defective.....																				





TABLE XIII.—Number of locomotives inspected,

	Erie	Eschambia	Florida East Coast	Fort Smith & Western	Fort Worth & Denver City	Galveston, Houston & Henderson
1 Air compressors.....	20			3	1	
2 Arch tubes.....	4					
3 Ash pans or mechanism.....	4					
4 Axles.....	4					
5 Blow-off cocks.....						
6 Boiler checks.....	14		1	1	2	
7 Boiler shell.....	34					
8 Brake equipment.....	47		1	1	1	
9 Cabs or cab windows.....	84		2	9	9	
10 Cab aprons or decks.....	24		2		8	
11 Cab cards.....	19	1		1	8	
12 Coupling or uncoupling devices.....	5					
13 Crossheads, guides, pistons, or piston rods.....	5			2		
14 Crown bolts.....	53			2	1	
15 Cylinders, saddles, or steam chests.....	2					
16 Cylinder cocks or rigging.....	57			6	1	
17 Domes or dome caps.....	21			2	1	
18 Draft gear.....	16					
19 Draw gear.....	30		6		4	
20 Driving boxes, shoes, wedges, pedestals, or braces.....	37			3		
21 Fire-box sheets.....	31		1		1	
22 Flues.....	7		1		1	
23 Frames, tail pieces or braces, locomotive.....	6		1			
24 Frames, tender.....	30		2	6	1	
25 Gauges or gauge fittings, air.....	4				2	
26 Gauges or gauge fittings, steam.....	17				2	
27 Gauge cocks.....	43				1	
28 Grate shakers.....	69				3	
29 Handholds.....	7			4		
30 Injectors, inoperative.....	39			6	1	
31 Injectors and connections.....						
32 Inspections or tests not made as required.....	163	2	1	15	13	
33 Lateral motion.....	204			21	11	
34 Lights, cab or classification.....	23					
35 Lights, headlights.....	3					
36 Lubricator or shields.....	9		1		2	
37 Mud rings.....	15			2	1	
38 Packing nuts.....	38			5		
39 Packing, piston rod and valve stem.....	18				1	
40 Pilot or pilot beams.....	29					
41 Plugs or studs.....	7			2		
42 Reversing gear.....	24		3			
43 Rods, main or side, crank pins or collars.....	23			2		
44 Safety valves.....	139		1	4	4	1
45 Sanders.....	4					
46 Springs or spring rigging.....	34					
47 Squirt hose.....	130			19	4	
48 Staybolts.....	17		5	1	1	
49 Staybolts, broken.....	12		2			
50 Steam pipes.....	41			6		
51 Steam valves.....	29	1			1	
52 Steps.....	30			5		
53 Tanks or tank valves.....	78		1	3	1	
54 Telltale holes.....	36		10	1	3	
55 Throttle or throttle rigging.....	2			3		
56 Trucks, engine or trailing.....	57					
57 Trucks, tender.....	44		20	1	4	
58 Valve motion.....	39	1	4	1		
59 Washout plugs.....	40				3	
60 Water bar or combustion flues.....	20		7	4		
61 Water glass, fittings or shield.....	1					
62 Wheels.....	59		4	6	3	
63 Miscellaneous—Signal appliances, badge plates, brakes (hand).....	35			1	1	
	20			3	1	
Number of defects.....	2,151	6	76	151	98	1
Locomotives reported.....	1,385	11	250	26	108	12
Locomotives inspected.....	1,889	11	212	52	132	12
Locomotives defective.....	567	2	44	31	30	1
Percentage of inspected found defective.....	30	18	21	60	23	8
Locomotives ordered out of service.....	41			5	3	

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

Georgia & Florida	Georgia, Florida & Alabama	Georgia	Great Northern	Green Bay & Western	Gulf Coast Lines	Gulf, Colorado & Santa Fe	Gulf, Mobile & Northern	Hocking Valley	Huntingdon & Broad Top Mountain	Illinois Central	Illinois Terminal	Indiana Harbor Belt	Indianapolis Union	International Great Northern	Interstate	Jacksonville Terminal	Kansas City, Mexico & Orient
			19		6	7	1	7	2	12		2		2	3		16
			6					2	1	2							
			13					3	1	7							
			15					5	2	6							
	1	1	22					9	5	16							
	4		109	26	45	48	1	36	10	57	1	8		26	13		47
		1	60	10	19	2		15	9	15		1	1	4	4		4
			37	2	5	9		6	6	19	1	1	1	2	2		2
	1		15	1	4	1	1	3	3	3				4			2
	1		12	1	1	1		1	1	10				1			1
			18	18	16	18	3	13	1	3				15	15		12
			5					1		5							2
			31	1	12	33	2	29	3	41	1		2		3		20
	1		25	1	15	8		14		36		1	1	2	1		11
			3			6		3		1							1
	7		29	5	4	4	1	12	3	18		2		6	15		11
	2		40	3	13	11		15		27		1	1	8	6		13
			29	3	24	26		27	2	17		1		4	1		12
			2		1	3		8	1	14				3			4
			2		5	1		1		1				1			6
			21		15	30		10		22		1		1	2		5
			8	1		1		1		6							1
			12		2	1		2		12		5					3
			23		4	1		7		12				8	4		2
	9		26	2	23	9		7		17		1	1	4	6		11
			8					1		2							2
	4	1	62	6	7	13	2	5	1	22		2		5	6		32
			1														1
	5		111	7	36	76	9	43	3	60		3	1	13	28		59
	20		254	3	27	47		90	4	69				12	1		35
	4		14		13	10		5	3	2				18			5
			9					8		1							3
	1		15	2		4	1	5		8				1			2
	1		9	2	7	2		1	1	3				1			7
			14			2		1	3	16		1	1	1	1		3
	4		4		10	19	4	8		19		2	5	2	5		13
			31	2	6	14		8	1	27		2		1			1
			3	1	2	6		3		5				4			2
			17	3	5	7		2		3				2			3
			9	2	8	10		6		6				4			2
	4		72	3	25	33		33	7	42		2	1	14	23		37
			3		1	5		1		6				2			2
			45	1	3	4		4		13				1	3		1
	1		89	11	39	35	4	59	7	68		2	1	1	18		37
			13	4	12	9	1	1		3				2			3
			13		1	2	2	5	1	8							4
	1		38		7	37		11	10	44							10
	1		21		3	10		4	1	8				5	3		3
	7	1	5		2	5	1	2		15					2		6
			98	7	15	17	1	4	1	31		2		15	7		15
	1		62		6	1		14		20			2	4	6		1
			14		4	2		3		2							7
	2		33	10	12	13		14	1	12		3		3	1		7
			56	4	24	28		5	2	27				13	11		2
	4		112	1	26	39		29	1	48				10	4		10
			2	3	18	19		4		2		1		11	5		18
			44	1	7	32	5	15		36				9	4		28
			1														60
			66	7	22	14	2	10		22		1	1	2	1		26
	4		30	1	9	25		7		20		1	1	9	2		14
			41		9	26	1	5		31			2	12	2		19
	95	3	26	2,001	145	584	823	47	635	79	1,086	7	47	21	293	211	622
	30	23	69	1,288	42	105	ATSP	68	150	17	1,995	13	135	23	160	12	15
	40	7	81	2,034	81	152	289	97	268	36	2,457	10	117	23	230	47	3
	22	1	10	675	38	88	135	22	149	16	346	4	16	7	62	39	77
	55	14	12	33	47	58	47	23	56	44	14	40	14	30	27	83	73
	2			27	1	15	31	2	17	4	35			4	11	6	28

TABLE XIII.—Number of steam locomotives inspected,

Parts defective, inoperative, or missing, or in violation of the rules	Kansas City Southern	Kansas City Terminal	Kentucky & Indiana Terminal	Lake Superior & Ishpeming	Lake Superior Terminal & Transfer	Lake Terminal
1 Air compressors.....	4	2				
2 Arch tubes.....						
3 Ash pans or mechanism.....						
4 Axles.....						
5 Blow-off cocks.....						
6 Boiler checks.....						
7 Boiler shell.....						
8 Brake equipment.....		1		2		
9 Cabs or cab windows.....	25	2		4	3	
10 Cab aprons or decks.....	2	1				
11 Cab cards.....	5		1	1		
12 Coupling or uncoupling devices.....						
13 Crossheads, guides, pistons, or piston rods.....	1	2				2
14 Crown bolts.....	3					
15 Cylinders, saddles, or steam chests.....	11					
16 Cylinder cocks or rigging.....	6					
17 Domes or dome caps.....	2	1		1		
18 Draft gear.....					1	
19 Draw gear.....	3			4		
20 Driving boxes, shoes, wedges, pedestals, or braces.....	1					
21 Fire-box sheets.....	8					
22 Flues.....	1					
23 Frames, tail pieces or braces, locomotive.....	1					
24 Frames, tender.....	3					
25 Gauges or gauge fittings, air.....	2					
26 Gauges or gauge fittings, steam.....	6	2			1	
27 Gauge cocks.....	2					2
28 Grate shakers.....	4					
29 Handholds.....	4					
30 Injectors, inoperative.....	5			2		
31 Injectors and connections.....						
32 Inspections or tests not made as required.....	13	3		5	1	1
33 Lateral motion.....	38			2		
34 Lights, cab or classification.....						1
35 Lights, headlights.....				1		
36 Lubricator or shields.....	2	1				
37 Mud rings.....	1	1				
38 Packing nuts.....						1
39 Packing, piston rod and valve stem.....	3					
40 Pilot or pilot beams.....	6					
41 Plugs or studs.....	1					
42 Reversing gear.....	2	2				
43 Rods, main or side, crank pins or collars.....	2					
44 Safety valves.....	5			1		2
45 Sanders.....	1					
46 Springs or spring rigging.....						
47 Squirt hose.....	21			2	2	
48 Staybolts.....	3					
49 Staybolts, broken.....						
50 Steam pipes.....	14					
51 Steam valves.....	6					
52 Steps.....	2		1	1		
53 Tanks or tank valves.....	6				1	
54 Telltale holes.....	6					
55 Throttle or throttle rigging.....	1			2		
56 Trucks, engine or trailing.....	4					
57 Trucks, tender.....	4					
58 Valve motion.....	10			1		
59 Washout plugs.....	5					1
60 Water bar or combustion flues.....	13					
61 Water glass, fittings or shield.....		2		4		1
62 Wheels.....	5					
63 Miscellaneous—Signal appliances, badge plates, brakes (hand).....	15		1	2		
Number of defects.....	293	20	3	35	9	11
Locomotives reported.....	166	37	30	32	11	19
Locomotives inspected.....	44	121	1,003	19	161	368
Locomotives defective.....	9	31	262	16	77	97
Percentage of inspected found defective.....	20	26	26	84	48	26
Locomotives ordered out of service.....	12	24	6	39	21	20

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

Lehigh & Hudson River	Lehigh & New England	Lehigh Valley	Litchfield & Madison	Long Island	Los Angeles & Salt Lake	Louisiana & Arkansas	Louisiana Railway & Navigation Co.	Louisville & Nashville	Louisville, Henderson & St. Louis	McCloud River	McKeesport, Connecting, Dublin & Savannah	Maine Central	Maryland & Pennsylvania	Mercer Valley	Michigan Central	Midland Valley
		2		1				66	1			3			35	2
		1						5							2	1
		1						5							1	3
		1						23							22	5
		2						29				1			15	2
		3						33							26	7
		4						206	3			8			83	8
		5						58				1			68	1
		6						42				1			29	10
		7						14				10			14	11
		8						4				1			11	12
		9						4				1			24	13
		10						5				3			6	14
		11						44				9			27	15
		12						79				2			12	16
		13						7				1			21	17
		14						91				3			24	18
		15						200	1			2			32	19
		16						61				1			38	20
		17						13				1			17	21
		18						5				4			8	22
		19						45				5			8	23
		20						6				7			1	24
		21						39				1			17	25
		22						154				1			41	26
		23						115				1			41	27
		24						7				2			14	28
		25						23				1			47	29
		26						279				7			171	30
		27						44				10			19	31
		28						33				4			5	32
		29						1				4			5	33
		30						9				2			11	34
		31						27				2			8	35
		32						7				2			16	36
		33						102	9			1			79	37
		34						31				2			3	38
		35						34				2			3	39
		36						1				2			18	40
		37						31				2			11	41
		38						54				13			28	42
		39						169				8			64	43
		40						2				3			14	44
		41						19				1			37	45
		42						207				23			52	46
		43						18				3			26	47
		44						13				1			14	48
		45						2				2			9	49
		46						14				3			5	50
		47						47				1			66	51
		48						19				11			41	52
		49						100				13			81	53
		50						129				3			3	54
		51						3				7			8	55
		52						1				3			1	56
		53						27				3			54	57
		54						87				1			41	58
		55						17				3			31	59
		56						142				15			19	60
		57						35				3			39	61
		58						1				3			4	62
		59						118				3			11	63
		60						2				4			2	3
		61						92				4			118	3
		62						62				4			29	3
		63						26				4			21	1
								34				182			1,877	198
								42				15			10	706
								62				12			32	824
								2,166				52			18	828
								53				4			9	469
								893				29			16	57
								11				108			50	47
								21				56			50	37
								41				25			6	32
								37				10			38	1

TABLE XIII.—Number of steam locomotives inspected,

Parts defective, inoperative or missing, or in violation of the rules	Minneapolis & St. Louis	Minneapolis, St. Paul & Sault Ste. Marie	Minnesota & International	Minnesota, Dakota & Western	Minnesota Transfer	Mississippi Central
1 Air compressors		6		1	3	
2 Arch tubes	1					
3 Ash pans or mechanism						
4 Axles						
5 Blow-off cocks					1	1
6 Boiler checks	1	2			3	
7 Boiler shell		1			3	
8 Brake equipment	10	30	1		31	1
9 Cabs or cab windows	1	1	2		3	
10 Cab aprons or decks	4	2		2	2	
11 Cab cards						
12 Coupling or uncoupling devices	1	1			1	
13 Crossheads, guides, pistons, or piston rods	2	2			8	1
14 Crown bolts	1	1				
15 Cylinders, saddles, or steam chests	7	4	2			1
16 Cylinder cocks or rigging	6	3				
17 Domes or dome caps	1	1				
18 Draft gear	3	7	1		6	
19 Draw gear	6	7	1		5	
20 Driving boxes, shoes, wedges, pedestals, or braces	4	1			1	
21 Fire-box sheets	1	1				
22 Flues					3	
23 Frames, tail pieces or braces, locomotive	1	2			1	4
24 Frames, tender	1	1				
25 Gauges or gauge fittings, air		2			4	
26 Gauges or gauge fittings, steam	2					
27 Gauge cocks	4	7			9	2
28 Grate shakers	2	1		1		
29 Handholds	9	3			14	2
30 Injectors, inoperative					4	
31 Injectors and connections	8	10	1		21	1
32 Inspections or tests not made as required	14	10			20	
33 Lateral motion		1			2	
34 Lights, cab or classification	1				2	
35 Lights, headlights	1	3			5	
36 Lubricator or shields		1			1	
37 Mud rings	2				2	
38 Packing nuts	1	1			6	3
39 Packing, piston rod and valve stem		2	2			
40 Pilot or pilot beams	5					
41 Plugs or studs						
42 Reversing gear	2			1	1	
43 Rods, main or side, crank pins or collars	7	9			4	2
44 Safety valves						
45 Sanders		4			3	
46 Springs or spring rigging	13	8	1	2	6	2
47 Squirt hose	2	1			2	
48 Staybolts						
49 Staybolts, broken					8	
50 Steam pipes	1	2			1	
51 Steam valves		1				
52 Steps	4	10	1		12	1
53 Tanks or tank valves	5	4	1	1		
54 Telltale holes	1	1				
55 Throttle or throttle rigging	10	4			4	
56 Trucks, engine or trailing	4	7			2	2
57 Trucks, tender	5	18			18	1
58 Valve motion		1			6	
59 Washout plugs	13	1			3	1
60 Water bar or combustion flues						
61 Water glass, fittings or shield	11	9		1	11	2
62 Wheels	7	12		2	11	2
63 Miscellaneous—Signal appliances, badge plates, brakes (hand)	1	3			2	
Number of defects	186	211	12	11	257	29
Locomotives reported	218	497	19	11	21	20
Locomotives inspected	506	652	28	12	101	37
Locomotives defective	84	82	8	4	72	12
Percentage of inspected found defective	17	13	29	33	71	32
Locomotives ordered out of service	7	2		1	8	2

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

Mississippi River & Bonne Terre	Mississippi Southern	Missouri & North Arkansas	Missouri-Illinois	Missouri-Kansas-Texas	Missouri Pacific	Mobile & Ohio	Monongahela Connecting	Monogahela	Montour	Nashville, Chattanooga & St. Louis	Nevada, California & Oregon	Nevada Northern	Newburgh & South Shore	New Orleans & Great Northern	New York Central—Lines East	New York Central—Lines West	New York Chicago & St. Louis
		3		8	29	3		1		8	1		4		15	53	18
					1					3						12	2
					6					6						22	4
					13					15						13	8
					14					13						51	7
					81					46						27	36
					32					18						55	30
					8					5						15	4
					12					6						10	6
					3					6						5	7
					1					17						39	96
					47					12						3	26
					27					4						7	10
					1					9						22	40
					23					18						14	11
					17					23						112	18
					28					9						12	8
					9					13						4	2
					2					2						5	5
					34					34						12	30
					1					7						2	3
					1					7						3	24
					10					9						34	26
					22					18						21	21
					9					6						3	19
					12					10						58	39
					73					65						73	174
					19					6						195	111
					83					10						5	14
					8					1						4	22
					14					3						9	9
					40					14						15	19
					23					10						9	70
					5					2						7	40
					4					5						4	7
					1					4						10	10
					35					4						10	43
					36					38						121	138
					4					6						2	4
					13					8						31	64
					1					8						68	147
					20					55						1	4
					10					5						5	2
					9					7						1	12
					4					31						21	14
					24					13						8	39
					3					5						6	17
					33					16						21	46
					13					21						26	74
					3					4						3	2
					15					11						53	47
					24					17						26	42
					16					37						31	73
					20					4						31	24
					7					67						29	50
					8					3						1	2
					3					21						73	99
					11					29						29	29
					35					13						19	52
					392					833						1,399	2,504
					1,308					342						32	41
					227					63						15	15
					2,189					267						12	16
					439					72						31	37
					445					24						9	31
					127					196						4	16
					20					34						22	32
					13					29						44	52
					11					13						1	1
					3					7						1	2
					6					17						19	19
					544					2,572						1,854	1,332
					939					67						1,721	1,558
					119					45						425	636
					13					29						25	41
					6					16						5	14
					6					19						5	14

TABLE XIII.—Number of locomotives inspected,

Parts defective, inoperative or missing, or in violation of the rules	Number of locomotives inspected				
	New York, New Haven & Hartford	New York, Ontario & Western	Norfolk & Portsmouth Belt	Norfolk & Western	Norfolk Southern
1 Air compressors	5			14	5
2 Arch tubes					
3 Ash pans or mechanism	2			4	
4 Axles					
5 Blow-off cocks	20	1		10	
6 Boiler checks	15	2		7	6
7 Boiler shell	4	2		20	
8 Brake equipment	12	19	1	61	13
9 Cabs or cab windows	46	1		17	5
10 Cab aprons or decks	9			24	
11 Cab cards	2	1		10	1
12 Coupling or uncoupling devices	17	8	3	29	2
13 Crossheads, guides, pistons, or piston rods	2	1		10	
14 Crown bolts	4	1		196	11
15 Cylinders, saddles, or steam chests	1	2		28	6
16 Cylinder cocks or rigging	3	1		1	1
17 Domes or dome caps	1	1		21	5
18 Draft gear	9	6	2	28	4
19 Draw gear	9	2	1	97	5
20 Driving boxes, shoes, wedges, pedestals, or braces	5	1		11	7
21 Fire-box sheets	11			4	4
22 Flues	5			22	2
23 Frames, tail pieces or braces, locomotive	14			3	
24 Frames, tender				3	
25 Gauges or gauge fittings, air	9			16	
26 Gauges or gauge fittings, steam	4	6		12	2
27 Gauge cocks	10	13		21	8
28 Grate shakers				4	4
29 Handholds		14	2	12	4
30 Injectors, inoperative					
31 Injectors and connections	26	17	3	45	37
32 Inspections or tests not made as required	225	39		118	
33 Lateral motion	3	13		1	2
34 Lights, cab or classification					
35 Lights, headlights					
36 Lubricator or shields	1	3		2	2
37 Mud rings		3			
38 Packing nuts	51	3	5	14	1
39 Packing, piston rod and valve stem	1	2	1	26	4
40 Pilot or pilot beams	8	4		49	4
41 Plugs or studs	2			9	
42 Reversing gear	10			13	
43 Rods, main or side, crank pins or collars	6	2		14	
44 Safety valves	17	11	3	89	1
45 Sanders					1
46 Springs or spring rigging		5		6	
47 Squirt hose	22	12		37	5
48 Staybolts	2	2			
49 Staybolts, broken	6	1	3	14	6
50 Steam pipes	38			8	12
51 Steam valves	3	1	1	9	3
52 Steps	9	1		19	1
53 Tanks or tank valves	16			14	6
54 Telltale holes	31	1	4	28	17
55 Throttle or throttle rigging		1		1	
56 Trucks, engine or trailing	9	3		12	8
57 Trucks, tender	28	2		25	4
58 Valve motion	14	15	5	48	9
59 Washout plugs	1	3		18	
60 Water bar or combustion flues	27	2		39	2
61 Water glass, fittings or shield					
62 Wheels	6	7		32	3
63 Miscellaneous—Signal appliances, badge plates, brakes (hand)	2	4		27	3
	3	4		42	2
Number of defects	737	243	35	1,456	225
Locomotives reported	883	179	20	934	107
Locomotives inspected	1,181	242	50	981	225
Locomotives defective	274	88	22	412	101
Percentage of inspected found defective	23	36	44	42	45
Locomotives ordered out of service	5	10		24	4

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

Parts defective, inoperative or missing, or in violation of the rules	Number of locomotives inspected																	
	Northern Pacific	Northern Pacific Terminal	Northwestern Pacific	Ogden Union Ry. & Depot	Oklahoma City-Ada-Atoka	Oregon Short Line	Oregon - Washington Railroad & Navigation	Patapsco & Back Rivers	Pennsylvania	Peoria & Pekin Union	Pere Marquette	Philadelphia, Baltimore & New England	Pittsburgh & Lake Erie	Pittsburgh & Shawmut	Pittsburgh & West Virginia	Pittsburgh, Chartiers & Youghieny	Pittsburgh, Shawmut & Northern	Portland Terminal
1 Air compressors	41	2		1		2	4		298		13	1	3		3			1
2 Arch tubes	3								35									3
3 Ash pans or mechanism	1			1		2			40						1			4
4 Axles																		5
5 Blow-off cocks	5					1			78									6
6 Boiler checks	7	1		1		1			228		1							7
7 Boiler shell	140	1		1		4			373		9							8
8 Brake equipment	24			3		22			1,227		26							9
9 Cabs or cab windows	24			1		5			216		36							10
10 Cab aprons or decks	1			1		5			132		8							11
11 Cab cards	1			1					38		9							12
12 Coupling or uncoupling devices	3					5			14		1							13
13 Crossheads, guides, pistons, or piston rods	11					2			800		3							14
14 Crown bolts	27			8		21			17		4							15
15 Cylinders, saddles, or steam chests	23	2		12		4			317		14							16
16 Cylinder cocks or rigging	2			4		6			886		5							17
17 Domes or dome caps	39			1		2			201		11							18
18 Draft gear	25	1		2		6			129		8							19
19 Draw gear	24			1		7			179		15							20
20 Driving boxes, shoes, wedges, pedestals, or braces	10			1		4			324		2							21
21 Fire-box sheets	5			2		1			564		6							22
22 Flues	24					3			178		1							23
23 Frames, tail pieces or braces, locomotive	3					2			62		10							24
24 Frames, tender	3					1			224		1							25
25 Gauges or gauge fittings, air	9					2			16		5							26
26 Gauges or gauge fittings, steam	10			1		3			129		19							27
27 Gauge cocks	11	1		1		10			221		3							28
28 Grate shakers	12			1		1			225		3							29
29 Handholds	50	2				7			75		15							30
30 Injectors, inoperative	2					1			331									31
31 Injectors and connections	70	2		2		31			5		33							32
32 Inspections or tests not made as required	439			3		36			1,475		4							33
33 Lateral motion	3			1		4			1,306		70							34
34 Lights, cab or classification	10								52									35
35 Lights, headlights	8			1		3			12									36
36 Lubricator or shields	16					1			171		10							37
37 Mud rings	2			2		7			182		1							38
38 Packing nuts	2			4		1			233		1							39
39 Packing, piston rod and valve stem	17			9		2			112		52							40
40 Pilot or pilot beams	5					5			471		4							41
41 Plugs or studs	5					4			51		1							42
42 Reversing gear	2					4			184		6							43
43 Rods, main or side, crank pins or collars	35	1		2		32			260		20							44
44 Safety valves	101					7			1,059		9							45
45 Sanders	32					1			32		8							46
46 Springs or spring rigging	33					1			199		12							47
47 Squirt hose	23	1		1		4			1,004		20							48
48 Staybolts	1					1			53		8							49
49 Staybolts, broken	2					2			121		1							50
50 Steam pipes	11			3		7			85		2							51
51 Steam valves	8					3			336		9							52
52 Steps	38			1		2			99		10							53
53 Tanks or tank valves	17			1		9			287		6							54
54 Telltale holes	4					13			386		37							55
55 Throttle or throttle rigging	18					6			33		2							56
56 Trucks, engine or trailing	79					9			500		12							57
57 Trucks, tender	139	4				41			388		17							58
58 Valve motion	3					5			659		4							59
59 Washout plugs	3	1		2		3			594		1							60
60 Water bar or combustion flues	3					3			477		4							61
61 Water glass, fittings or shield	54			2		11			198		37							62
62 Wheels	20	2		1		34			224		6							63
63 Miscellaneous—Signal appliances, badge plates, brakes (hand)	21	1				1			271		2							
Number of defects	1,742	24	5	64	357	229	177	35	18,716	13	570	265	131		107	1	39	30
Locomotives reported	1,239	11	70	17	20	375	305	23	6,940	32	443	47	300	24	30	10	38	25
Locomotives inspected	1,959	58	52	19	38	405	544	15	9,124	26	426	94	354	42	41	6	44	20
Locomotives defective	567	13	3	12	38	110	93	7	4,028	6	160	70	44		16	1	11	12
Percentage of inspected found defective	29	22	6	63	100	27	17	47	44	23	38	74	12		39	17	25	60
Locomotives ordered out of service	50			3	22	2	4	1	335		14	14			8		2	1

TABLE XIII.—Number of steam locomotives inspected,

Parts defective, inoperative or missing, or in violation of the rules	Public Belt of New Orleans	Quebec Central	Quincy, Omaha & Kansas City	Raritan River	Reading	Republic Iron & Steel (Ala.)
	1 Air compressors.....					10
2 Arch tubes.....					1	
3 Ash pans or mechanism.....		1				
4 Axles.....					1	
5 Blow-off cocks.....					1	
6 Boiler checks.....					17	
7 Boiler shell.....					19	
8 Brake equipment.....					56	
9 Cabs or cab windows.....					110	1
10 Cab aprons or decks.....					25	
11 Cab cards.....		3		1	25	
12 Coupling or uncoupling devices.....		3			6	
13 Crossheads, guides, pistons, or piston rods.....		1			2	
14 Crown bolts.....		2	1		30	
15 Cylinders, saddles, or steam chests.....					8	
16 Cylinder cocks or rigging.....		3	1		88	
17 Domes or dome caps.....					11	
18 Draft gear.....					13	
19 Draw gear.....		2	4	1	42	
20 Driving boxes, shoes, wedges, pedestals, or braces.....				1	49	
21 Fire-box sheets.....					24	
22 Flues.....					46	
23 Frames, tail pieces or braces, locomotive.....					16	
24 Frames, tender.....					18	
25 Gauges or gauge fittings, air.....					6	
26 Gauges or gauge fittings, steam.....		1	1		54	
27 Gauge cocks.....					70	
28 Grate shakers.....					16	
29 Handholds.....					64	
30 Injectors, inoperative.....		4			4	
31 Injectors and connections.....					101	
32 Inspections or tests not made as required.....		1	2		402	
33 Lateral motion.....			6	1	13	
34 Lights, cab or classification.....						
35 Lights, headlights.....					32	
36 Lubricator or shields.....				1	21	
37 Mud rings.....					16	
38 Packing nuts.....		2		1	30	
39 Packing, piston rod, and valve stem.....				1	70	
40 Pilot or pilot beams.....					7	
41 Plugs or studs.....				1	6	
42 Reversing gear.....			3		6	
43 Rods, main or side, crank pins or collars.....		1	3	2	83	
44 Safety valves.....					12	
45 Sanders.....					12	
46 Springs or spring rigging.....		2	3		52	
47 Squirt hose.....			1		10	
48 Stay bolts.....		1			15	
49 Stay bolts, broken.....					35	
50 Steam pipes.....					18	
51 Steam valves.....					4	
52 Steps.....					16	
53 Tanks or tank valves.....					15	
54 Telltale holes.....					36	
55 Throttle or throttle rigging.....					1	
56 Trucks, engine or trailing.....					50	
57 Trucks, tender.....			5		13	
58 Valve motion.....		1	1		24	
59 Washout plugs.....			3		54	
60 Water bar or combustion flues.....				1	31	1
61 Water glass, fittings, or shield.....					81	
62 Wheels.....					21	
63 Miscellaneous—Signal appliances, badge plates, brakes (hand).....		1			13	
Number of defects.....	2	21	39	14	2,127	2
Locomotives reported.....	16	11	17	10	1,070	11
Locomotives inspected.....	20	7	50	28	1,542	5
Locomotives defective.....	1	7	15	4	650	2
Percentage of inspected found defective.....	5	100	30	14	42	40
Locomotives ordered out of service.....		1			22	

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

	Republic Iron & Steel (Ohio)	Richmond, Fredericksburg & Potomac	Rio Grande Southern	River Terminal	Rutland	St. Joseph & Grand Island	St. Louis & Hannibal	St. Louis San Francisco	St. Louis Southwestern	San Antonio, Uvalde & Gulf	San Diego & Arizona	Sandy River & Rangeley Lakes	San Joaquin & Eastern	Savannah & Atlanta	Seaboard Air Line	Sierra Ry. of California	Sloss-Sheffield Steel & Iron
	4		1	1		3	1	28	1						26		1
								2							1		4
								9	1	1					29		5
	1	3		1		1		19	5	2					38		6
	3			3				14	3	2					21	1	7
	10	2	1	5		3	3	48	19	3					174		8
	2							5	1	1					38		9
	2							1			4				5	1	10
	3	2	1		1			1		3					3	1	11
	3	2	1			1		12	3	1					20		12
	8	5	9			3	2	109	10	2					18		15
	6	1	6					15	2	2					17		16
	1	1				1									3		17
	9	4	1	3	1			7	3		1				168		18
	1	2	2	2				5	4	2					65		19
	1	11		1	2	8		15	8	2					74		20
	1			1	1			1	1						21		21
	1							1	1						16		22
	2	2			1			22	4	2					41		23
	1							3							8		24
	5	2			3			6	3						18		25
	2					1		14	1						80	1	26
	3	3	2	2		1		23							19		27
	14	6	5	5	3		2	81	18	4					21		28
	1	7	4		1			183	34	2	3	4	1	19	147	7	29
	4	1						3		7	1				13		30
	1		1					5							2		31
	2	1	2	1				13	7	1					10		32
	4	7	3	3	1			7	1						30		33
	4	1	4	4		1	1	18	8	1					95	3	34
	1		2	1				13							9		35
	1							6	1						16		36
	2	1						25							10		37
	17	6	4	1	1		2	44	21	4					14		38
	4							1	1						44		39
	6	1	12	3	1	1		13	5	1					1		40
	2		2	1	1			89	4	3					100		41
	1							6		1	1				11		42
	9	4		9		4		2							19		43
	3	1						10	10	1					56		44
	1							7	4	1					40		45
	14	5	6	9	1			7	1	1					27		46
			2	1	1			10	3	2					27		47
			3	2	1	3	1	19	3		2				85	4	48
	1	3						3	3	1					6		49
	14	1	2		3	1		19	2	1					80	1	50
								15	2	3					90		51
								31	3	5					140		52
								1	1						6		53
								35		7					147		54
	7	7		1	2	1	4	15	10	2	1				1		55
	1	3	2		7			17	14	5	2				64		56
	1				1			13	1						79		57
	176	96	91	71	25	34	25	1,090	232	83	12	9	1	51	2,674		68
	24	110	13	22	85	38	23	958	282	18	16	12	12	13	734	11	15
	109	30	49	122	50	14		1,727	356	33	30	8	5	27	1,715	5	7
	33	21	21	15	18	8		375	80	12	9	6	1	18	959		6
	30	70	43	12	36	57		22	22	36	30	62	20	67	56		86
	1	8	1					12	22	5	3	1			43		1

TABLE XIII.—Number of steam locomotives inspected,

Parts defective, inoperative or missing, or in violation of the rules		South Buffalo	Southern Pacific Lines East	Southern Pacific Lines West	Southern Pacific de Mexico	Southern	Spokane International
1	Air compressors		2	12		35	
2	Arch tubes	1				2	
3	Ash pans or mechanism					10	
4	Axles						
5	Blow-off cocks		1	13		6	
6	Boiler checks	1	5	11		36	
7	Boiler shell		2	10		13	
8	Brake equipment		40	66	4	98	1
9	Cabs or cab windows		3	26		32	
10	Cab aprons or decks		9	11		22	
11	Cab cards	2	2	9	3	6	
12	Coupling or uncoupling devices					9	
13	Crossheads, guides, pistons, or piston rods		16	42	3	49	
14	Crown bolts		2	37		3	
15	Cylinders, saddles, or steam chests		10	66	1	58	2
16	Cylinder cocks or rigging		5	13		24	
17	Domes or dome caps			4		7	1
18	Draft gear			19		68	
19	Draw gear		2	18	1	67	
20	Driving boxes, shoes, wedges, pedestals, or braces		15	54		27	
21	Fire-box sheets		2	18		27	
22	Flues			12		22	
23	Frames, tail pieces or braces, locomotive		11	25	1	44	
24	Frames, tender			5	1	6	
25	Gauges or gauge fittings, air		2	4		11	
26	Gauges or gauge fittings, steam		6	11		34	
27	Gauge cocks		11	53		54	
28	Grate shakers	4				16	
29	Handholds	2	3	24	6	52	
30	Injectors, inoperative			28		4	
31	Injectors and connections	4	30	66	3	145	
32	Inspections or tests not made as required		36	142	2	167	6
33	Lateral motion		4	15		7	
34	Lights, cab or classification		1	3		16	
35	Lights, headlights			6		7	
36	Lubricator or shields		3	4		11	
37	Mud rings			14		36	1
38	Packing nuts		4	25	1	22	
39	Packing, piston rod, and valve stem		2	11		19	
40	Pilot or pilot beams		1	8		9	
41	Plugs or studs		1	5		21	
42	Reversing gear		7	9		76	4
43	Rods, main or side, crank pins or collars		17	59	5	5	
44	Safety valves			1		21	
45	Sanders		1	21	1	113	
46	Springs or spring rigging		16	84	1	19	
47	Squirt hose		2	5	2	23	
48	Staybolts			19		23	
49	Staybolts, broken			42		23	
50	Steam pipes		1	10		25	
51	Steam valves		2	8		32	
52	Steps		13	12	4	66	2
53	Tanks or tank valves		6	30	2	83	
54	Telltale holes		7	5	2	9	
55	Throttle or throttle rigging			19		51	
56	Trucks, engine or trailing		12	41	1	68	
57	Trucks, tender		5	38	2	89	1
58	Valve motion		7	15		20	
59	Washout plugs	3	10	37	10	86	
60	Water bar or combustion flues					80	
61	Water glass, fittings, or shield	1	12	26		37	1
62	Wheels	2	10	36		27	
63	Miscellaneous—Signal appliances, badge plates, brakes (hand)		6	18		27	
Number of defects		24	376	1,435	56	2,230	19
Locomotives reported		30	652	1,765	47	2,288	10
Locomotives inspected		31	708	2,094	3	3,148	25
Locomotives defective		9	95	569	3	756	7
Percentage of inspected found defective		29	13	27	100	24	28
Locomotives ordered out of service		1	10	50	3	38	

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

Spokane, Portland & Seattle	Steatton & Highspire	Sumpter Valley	Tennessee Central	Tennessee Coal, Iron & R. R.	Terminal R. R. Assn. of St. Louis	Texas & Pacific	Texas-Mexican	Texas Midland	Texas Pacific-Mo. Pac. of N. O.	Tionesta Valley	Toledo, Peoria & Western	Toledo Terminal	Tonopah & Goldfield	Toronto-Hamilton & Buffalo	Trenton & Gulf	Trinity & Brazos Valley
			14			1	1				6					1
4																2
			3		1											7
	1		5		3						1	1				8
			3		1						1	2				9
	14	2	71	4	3	7	7	1			13	2				10
	2	1	4	3	1						4	1				11
	5		18	1	3	1										12
			1												2	13
1	1		11								1					14
			2					1								15
2			9			4					1					16
	1		3	1												17
			1		1											18
1	1		19		6						3					19
			7		1				1		1					20
2			41		5						4					21
			15								2					22
			8					1								23
1		3	20			4					3					24
	1	1	1													25
			1													26
			1													27
3	1		4	1	18			1								28
			4		1						2					29
			4		3											30
5			13		1						1					31
					3											32
5	4		34	2	7			2	1		4	2			3	33
			2		23			4			6					34
			22								1					35
			1													36
			2								2					37
			1													38
			2													39
			1													40
			2													41
			3													42
			1													43
4	1		5		2											44
			91		9											45
																46
4			3		1						2					47
12			45		2						20					48
2			3								3					49
			15													50
			26		4						1					51
			4													52
			1													53
1			18		6											54
2			1		2											55
			12		5											56
2	3	1	6		4											57
10	3	1	19		2			1			1					58
			43		1			3								59
9	2	2	9		1											60
			14		8											61
			6		2			2								62
1			22		1			3								63
			1													64
164	33	7	716	12	109	121	38	17	3	29	118	39	2		9	59
36	15	11	46	62	189	347	17	17	18	14	28	21	10	11	14	37
177	29	9	176	6	85	313	14	17	10	24	25	26	8	7	10	34
69	14	4	115	4	37	115	4	37	7	5	1	4	22	9	1	14
35	44	44	65	67	44	12	50	29	10	17	88	35	12		20	41
2			40		3	3	1	1		2	7				2	2

TABLE XIII.—Number of locomotives inspected.

Parts defective, inoperative or missing, or in violation of the rules	Utah	Utah & Delaware	Union Pacific	Union	Upper Merion & Plymouth	Utah
1 Air compressors.....			30		1	
2 Arch tubes.....						
3 Ash pans or mechanism.....			2			
4 Axles.....						
5 Blow-off cocks.....			4		1	
6 Boiler checks.....			9		1	
7 Boiler shell.....			2		3	
8 Brake equipment.....	1		59		6	
9 Cabs or cab windows.....			13			
10 Cab aprons or decks.....			12			
11 Cab cards.....			4			
12 Coupling or uncoupling devices.....					3	
13 Crossheads, guides, pistons, or piston rods.....			34			
14 Crown bolts.....			4			
15 Cylinders, saddles, or steam chests.....			76		1	
16 Cylinder cocks or rigging.....			27		2	
17 Domes or dome caps.....			3			
18 Draft gear.....			26		1	1
19 Draw gear.....			21		1	
20 Driving boxes, shoes, wedges, pedestals, or braces.....			31		1	
21 Fire-box sheets.....	1		2			
22 Flues.....			1		1	
23 Frames, tail pieces or braces, locomotive.....			13			
24 Frames, tender.....			3			
25 Gauges or gauge fittings, air.....			5			
26 Gauges or gauge fittings, steam.....			11	1		
27 Gauge cocks.....	4		10	3	3	
28 Grate shakers.....			5			
29 Handholds.....	7		13		1	
30 Injectors, inoperative.....			3			
31 Injectors and connections.....			59	5	11	
32 Inspections or tests not made as required.....			19		33	
33 Lateral motion.....			4			
34 Lights, cab or classification.....			2			
35 Lights, headlights.....			3			
36 Lubricator or shields.....			3			
37 Mud rings.....	4		3			
38 Packing nuts.....			20		2	
39 Packing, piston rod and valve stem.....			18	1	5	
40 Pilot or pilot beams.....			8			1
41 Plugs or studs.....			2			
42 Reversing gear.....			4			
43 Rods, main or side, crank pins or collars.....			32		4	
44 Safety valves.....			2			
45 Sanders.....			22			
46 Springs or spring rigging.....			80		2	
47 Squirt hose.....			7			
48 Staybolts.....			6			
49 Staybolts, broken.....			18			
50 Steam pipes.....			9			
51 Steam valves.....			6			
52 Steps.....	1		29		3	
53 Tanks or tank valves.....			28		4	1
54 Telltale holes.....	1		2		1	
55 Throttle or throttle rigging.....			10		2	
56 Trucks, engine or trailing.....			19			
57 Trucks, tender.....			28			
58 Valve motion.....			12			
59 Washout plugs.....			16		1	
60 Water bar or combustion flues.....						
61 Water glass, fittings, or shield.....	1		28	3	6	
62 Wheels.....			3		5	
63 Miscellaneous—Signal appliances, badge plates, brakes (hand).....			23			
Number of defects.....	20		945	13	105	3
Locomotives reported.....	10	29	889	173	12	16
Locomotives inspected.....	6	69	1,477	14	56	26
Locomotives defective.....	11		298	4	35	1
Percentage of inspected found defective.....	16		20	29	62	4
Locomotives ordered out of service.....			17		8	

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

Virginia	Wabash, Chester & Western	Wabash	Washington Terminal	Western Allegheny	Western Maryland	Western Pacific	Wheeling & Lake Erie	Wheeling Steel Corporation	Wichita Falls & Southern	Winston-Salem Southbound	Woodward Iron Co	Wrightsville & Tennille	Youngstown Sheet & Tube	Roads with less than 10 locomotives	Total defects
1	1	2	2		11	2	6			1				117	1,679
2					4									6	127
3												1		12	192
4							1							3	13
5														26	650
6					1		2					2		62	1,043
7	1	1	1	2	18	1	4							81	1,422
8	1		2		7		7							26	650
9	10		17	6	55	5	21	5				1	1	583	6,572
10	5				15	2	7			1			1	140	2,055
11	1			1	2	2	3	1						121	1,086
12					2		5				2	2		147	575
13					2		2							79	289
14	8		2	2	26	9	22	6				1		155	2,602
15	1				1		1							20	235
16	34	1	2	1	36	2	17	17			2		3	247	4,526
17	4	1	8		3	4	6	2						98	1,634
18	7		3		3	2	2	2					1	17	388
19	2		3		3	5	15	6		1			2	219	2,637
20	2	1	7		4	1	4	1				2		261	2,210
21	8		3		15	1	15	4		2		1		206	2,710
22	1		1		7		9	4						53	796
23					1		3	1					1	76	465
24	1		1		13	2	2	2				2		161	1,682
25	2		4	1	6	1	2	2						39	264
26	4		2		2	2	2	1						34	721
27	4		10		4	6	16	1		1		1	2	46	1,425
28			3		5	2	10	1				1	1	158	2,024
29	7		13		3	3	8	1						9	613
30			3		2	5	21	5		1	1		3	333	2,285
31			3		1	1	8	1						10	84
32	6		59	5	11	1	41	4			1	1	1	511	7,188
33	1	2	19		33	46	13	22	19	2		1	2	675	8,889
34			4			3	2	2						71	673
35			2											5	107
36			3			5	3	6	4					51	835
37	1		3			2	1	3						53	746
38	7		20		2	13	3	4						73	1,073
39	2		18		5	2	3	3		1				151	1,851
40	2		1		1	8	6	12						213	2,214
41	1		8			1	2	6				1	3	46	507
42	4		4			11	1	4						52	740
43	18		32		4	7	1	9	2					49	1,247
44			2			34	1	36	1					448	5,137
45	4		22			5	3	18						13	212
46	1		80		2	44	12	46	4					35	1,268
47	7		7			6	2	13			1	1		401	5,956
48	6		6			1	1	10	1					49	644
49	18		18			3	3	7	6					46	631
50	1		9			22	7	10	1					862	2,373
51	1		6			3	4	5						41	1,308
52	1		1			3	4	5		1				41	774
53	5		29		3	12	4	9	1				2	382	2,449
54	1		28		4	6	4	44	1					171	2,747
55	2		2		1	5	4	4	2				2	110	377
56	10		10		2	10	2	12			1			148	2,233
57	4		19			12		11				2		213	2,363
58	4		28			17	5	14				7		721	4,114
59	1		12			13	4	13	4					49	1,568
60	5		16		1	9	7	8		1				124	2,786
61	8	1				19	5	6	1			1	2	1	25
62	2		28	3	6	11	5	5						275	2,973
63	1		3		5	2	5	5	2					393	2,119
			23			2	5	3						54	1,486
171	9		145	23	3	638	164	580	114	12	7	30	28	10,062	112,008
161	11		689	18	12	295	160	198	17	10	12	16	13	12	2,362
127	10		1,075	21	13	399	253	278	23	17	18	5	34	9	3,194
68	2		61	9	1	168	47	153	20		9	3	8	6	1,680
50	80		6	43	8	42	19	55	87		50	60	24	67	53
			2	1		13	1	10	4					374	2,539







TABLE XIV.—Number of locomotives other than steam inspected,

	Niagara Junction	Norfolk & Western	Norfolk Southern	Northeast Oklahoma	Oklahoma Railway	Oregon Electric	Pacific Coast	Pacific Electric	Pacific Northwest Traction	Pennsylvania	Petaluma & Santa Rosa	Piedmont & Northern
Air compressors												
Batteries												
Brake equipment		4			1	1						
Cabs or cab windows			6							2		15
Current collecting apparatus												
Draft gear												3
Draw gear		3										1
Driving boxes, shoes, wedges, pedestals, or pedestal braces		1				2						2
Frames, tail pieces, or braces												1
Fuel tank, its piping and valves												
Gauges and gauge fittings, air												
High tension equipment not properly guarded against accidental contact										2		
Inspections or tests not made as required		9	1		3	3				1		9
Insulation						1						
Jack shafts		1										
Lateral motion—wheels		11										
Lights, cab or classification						1						
Lights, headlight												
Meters—volt and ampere												
Motors or generators												
Pilots or pilot beams												1
Rods, motor, main or side, drive shafts		23										
Springs or spring rigging—driving and truck		1										
Switches, hand-operated, and fuses		2										
Transformers, resistors, and rheostats		2										
Trucks		1	12			2						6
Water glass, fittings, or shields					1							
Wheels												5
Miscellaneous						3						
Total defects		58	19		5	13				5		43
Locomotives reported	5	32	4	2	3	10	7	63	3	95	7	17
Locomotives inspected	74	7	10	14	9	18	3	17	3	46	1	17
Locomotives defective	27	4	2	2	2	3	1	3	1	17	1	17
Percentage inspected found defective	36	57	20	14	22	17	14	5	33	17	14	37
Locomotives ordered out of service	5											1

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

Portland Electric Power	Salt Lake & Utah	Sand Springs	San Francisco-Sacramento	Southern Pacific	Southwest Missouri	Spokane, Coeur D'Alene & Palouse	Utah Copper Company	Utah Idaho Central	Virginian	Washington & Old Dominion	Waterloo, Cedar Falls & Northern	Yakima Valley Transportation	Youngstown & Ohio River	Roads with but one locomotive	Total defects
															2
															1
															13
		1			3	2									72
									9						20
															9
															6
															8
															1
															8
															1
															1
															11
															79
		2			1	2			7						1
															1
															1
									6						18
															5
															1
															1
															5
															5
															1
															38
		1							14						18
									13						2
															6
															2
															30
															56
															2
		4													17
															20
															84
		8							49						423
	15	6	3	4	3	3	13	2	7	36	2	6	2	3	24
			8		2	3	6			89				1	23
			3		2	3	2			34					12
			37		100	100	33			38					52
									1						29
															9