

INTERSTATE COMMERCE COMMISSION

THIRTY-FIRST ANNUAL REPORT

OF THE

DIRECTOR
BUREAU OF LOCOMOTIVE INSPECTION

TO THE

INTERSTATE COMMERCE COMMISSION

FISCAL YEAR ENDED

JUNE 30, 1942



UNITED STATES
GOVERNMENT PRINTING OFFICE
WASHINGTON : 1942

ANNUAL REPORT OF THE DIRECTOR BUREAU OF LOCOMOTIVE INSPECTION

OCTOBER 1, 1942.

To the Interstate Commerce Commission:

In compliance with section 7 of the act of February 17, 1911, as amended, the Thirty-first Annual Report of the Director of the Bureau of Locomotive Inspection, covering the work of the Bureau during the fiscal year ended June 30, 1942, 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 Act and those reported to the Bureau of Transport Economics and Statistics under the Accident Reports Act of May 1910 and not reported to this Bureau in accordance with the requirements.

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

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

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

	Year ended June 30—					
	1942	1941	1940	1939	1938	1937
Number of locomotives for which reports were filed.....	42,951	43,236	44,274	45,965	47,397	48,025
Number inspected.....	113,451	105,675	102,164	105,606	105,186	100,033
Number found defective.....	10,970	9,570	8,565	9,099	11,050	12,402
Percentage inspected found defective.....	10	9	8	9	11	12
Number ordered out of service.....	474	560	487	468	679	934
Number of defects found.....	44,928	37,691	32,677	33,490	42,214	49,746

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

Part or appurtenance which caused accident	Year ended June 30—														
	1942			1941			1940			1939			1938		
	Accidents	Killed	Injured	Accidents	Killed	Injured	Accidents	Killed	Injured	Accidents	Killed	Injured	Accidents	Killed	Injured
Boiler explosions—Continued.															
B. Crown sheet; low water; no contributory causes found.	8	18	11	7	6	27	7	12	13	4	5	7	5	5	3
C. Crown sheet; low water; contributory causes or defects found.	5	5	7	4	5	2	1	2	2	7	4				
D. Miscellaneous firebox failures.	2		2												
Brakes and brake rigging	4	1	3	5		6	1	1	5		5	6			7
Couplers	3		3	1		10		12	1		1	4			4
Crank pins, collars, etc.	1		1	2		2		5	1		1	5			4
Crossheads and guides						2		2	2		2	2			2
Cylinder cocks and rigging	1		1			2		2							
Cylinder heads and steam chests	1		1			1		1							
Dome caps															
Draft appliances	1		2	1		1		33	2	1	1				1
Draw gear						1		1			1				1
Fire doors, levers, etc.	6		6	7		7		2	2		2	4			4
Flues	3	1	2	5		6		11	8		9	3			3
Flue pockets															
Footboards	5		5	2		2		1	3		3	6			7
Gage cocks	3		1												
Grease cups	1		3	1		1		2	1		1				
Grate shakers	12		12	4		4		1	5		5				
Handholds	10		10	11		11		8	8		8	7			7
Headlights and brackets	1		1			3		3	1		1	1			1
Injectors and connections (not including injector steam pipes)	4		4	3		3		6	2		2	2			2
Injector steam pipes	2		2			1		1			2	2			3
Lubricators and connections	5		5	3		3		2	1	1	3				3
Lubricator glasses	1		1			1		1	1		1				
Patch bolts															
Pistons and piston rods	1		1	1		2		1	2		2	3			3
Plugs, arch tube and washout	3	1	5	1		2					1				1
Plugs in firebox sheets															
Reversing gear	19		19	11		12		12	13		13	12			12
Rivets															
Rods, main and side	4		5	3		2		2	1		1	4			5
Safety valves															
Sanders	2		2	2		2		4	3		3	9			9
Side bearings															
Springs and spring rigging	2		2	6		6		2	4		4	4			4
Squirt hose	7	1	6	3		3		3	6		6	7			7
Staybolts	2	2		1		3		1	4		3	1			2
Steam piping and blowers	6	1	5	2		2		7	3		6	7			7
Steam valves	5	1	4	4		4		2	1		1	4			4
Studs	1		1			1		1	1		1				1
Superheater tubes	2		2	2		2		3	4		1	1			1
Throttle glands	1		1						1		1				1
Throttle leaking															
Throttle rigging	4		4	4		5		2	1		1	2			2
Trucks, leading, trailing, or tender	11	3	11	3		5		2	16		2	5			5
Valve gear, eccentrics and rods	3		4	4		4		1	4		4	4			4
Water glasses	7		7			6		6	3		3	8			8
Water-glass fittings															
Wheels	1		2	1		1		1	1		1				3
Miscellaneous	48		50	42		43		40	35		35	66			68
Total	222	34	227	153	15	182	164	18	225	152	15	164	208	7	216

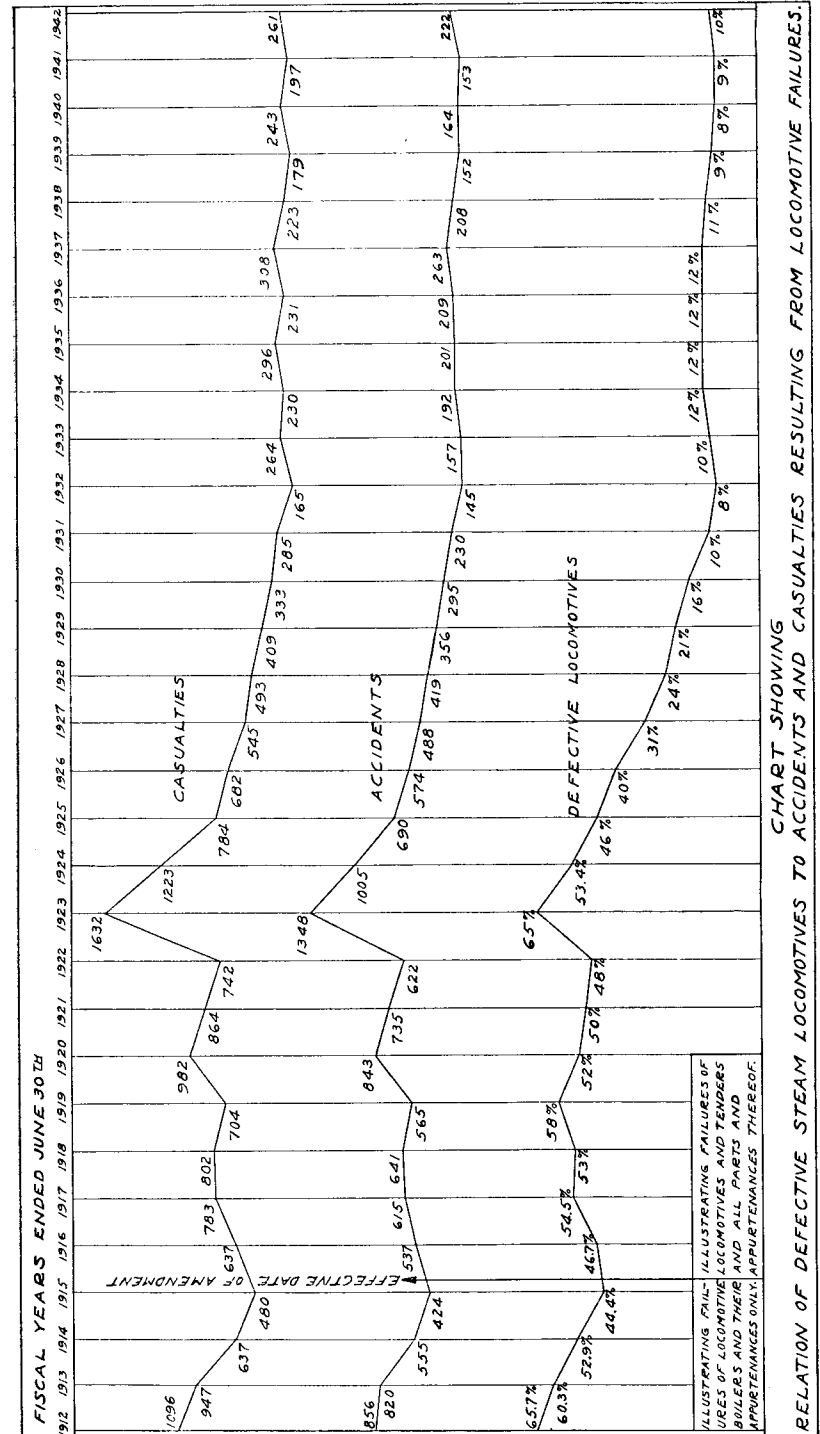


TABLE IX.—Accidents and casualties resulting from failures of locomotives other than steam, and their appurtenances

Part or appurtenance which caused accident	Year ended June 30—														
	1942			1941			1940			1939			1938		
	Accidents	Killed	Injured	Accidents	Killed	Injured	Accidents	Killed	Injured	Accidents	Killed	Injured	Accidents	Killed	Injured
Brakes and brake rigging				1	1	1	1								
Carburetors															
Couplers	1		1												
Crank pins and connecting rods															
Fires: Due to overflowing or leakage of fuel, crank case explosions, backfiring, etc.	3		3	4		4	2		2	1		1	2		2
Generators and starting devices				1		1							1		1
Insulation	1		1			2			2						
Pantographs and trolleys	1		1												
Short circuits						1		1	1		1		1		
Miscellaneous	3		3	5		5	1		1	3		3	1		1
Total	9		9	11		11	7		7	5		5	4		4

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

Parts defective, inoperative or missing, or in violation of rules	Year ended June 30—					
	1942	1941	1940	1939	1938	1937
1. Air compressors	829	684	567	518	680	766
2. Arch tubes	27	31	20	28	66	105
3. Ashpans and mechanism	80	67	37	67	72	80
4. Axles	2	5	3	2	13	10
5. Blow-off cocks	238	205	191	204	226	199
6. Boiler checks	393	313	288	279	301	382
7. Boiler shell	290	271	266	272	331	347
8. Brake equipment	2,382	1,945	1,506	1,577	2,044	2,322
9. Cabs, cab windows, and curtains	1,163	1,087	1,078	943	1,226	1,807
10. Cab aprons and decks	335	307	277	260	326	466
11. Cab cards	131	97	101	92	109	145
12. Coupling and uncoupling devices	70	74	53	60	73	74
13. Crossheads, guides, pistons, and piston rods	1,273	858	815	739	905	1,160
14. Crown bolts	75	97	54	47	59	76
15. Cylinders, saddles, and steam chests	1,514	1,332	1,329	1,232	1,645	2,206
16. Cylinder cocks and rigging	521	438	447	418	585	729
17. Domes and dome caps	112	94	78	90	109	101
18. Draft gear	651	620	508	450	740	522
19. Draw gear	369	347	306	360	479	560
20. Driving boxes, shoes, wedges, pedestals, and braces	1,743	1,348	1,243	1,330	1,688	1,637
21. Firebox sheets	255	224	191	238	244	371
22. Flues	178	150	147	165	159	225
23. Frames, tailpieces, and braces, locomotive	869	863	665	708	1,001	1,053
24. Frames, tender	86	83	78	71	131	120
25. Gages and gage fittings, air	193	183	132	155	230	261
26. Gages and gage fittings, steam	263	236	211	226	279	324
27. Gage cocks	497	373	400	361	451	538
28. Grate shakers and fire doors	491	430	273	252	403	470
29. Handholds	378	433	333	349	405	510
30. Injectors, inoperative	47	39	30	26	26	38
31. Injectors and connections	2,220	1,882	1,330	1,457	1,784	2,920
32. Inspections and tests not made as required	8,186	7,215	6,218	6,645	8,204	9,638
33. Lateral motion	498	357	313	243	325	446
34. Lights, cab and classification	131	50	49	50	48	90
35. Lights, headlight	218	190	180	177	257	313
36. Lubricators and shields	234	196	185	200	212	254
37. Mud rings	244	187	213	248	203	272
38. Packing nuts	689	508	418	408	448	487
39. Packing, piston rod and valve stem	738	675	660	739	913	1,393
40. Pilots and pilot beams	188	142	140	104	154	133
41. Plugs and studs	173	156	156	179	238	238
42. Reversing gear	411	387	320	317	404	492
43. Rods, main and side, crankpins, and collars	1,986	1,565	1,199	1,293	1,669	2,348
44. Safety valves	67	68	61	97	125	132
45. Sanders	738	490	415	432	536	655

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

Parts defective, inoperative or missing, or in violation of rules	Year ended June 30—					
	1942	1941	1940	1939	1938	1937
46. Springs and spring rigging	3,349	2,597	2,174	2,340	2,901	3,172
47. Squirt hose	67	62	50	75	94	133
48. Stay bolts	272	239	227	181	211	276
49. Stay bolts, broken	274	198	271	258	380	542
50. Steam pipes	290	385	255	285	410	446
51. Steam valves	150	110	106	115	141	165
52. Steps	594	555	449	490	631	678
53. Tanks and tank valves	1,150	952	768	837	955	1,009
54. Telltale holes	79	59	95	58	67	79
55. Throttle and throttle rigging	786	688	647	638	685	909
56. Trucks, engine and trailing	833	636	598	628	762	785
57. Trucks, tender	786	773	705	665	907	1,018
58. Valve motion	779	580	506	554	722	798
59. Washout plugs	569	445	478	487	626	598
60. Train-control equipment	7	1	2	5	11	12
61. Water glasses, fittings, and shields	1,133	788	753	690	915	1,049
62. Wheels	664	536	554	466	577	803
63. Miscellaneous—Signal appliances, badge plates, brakes (hand)	970	785	564	610	684	759
Total number of defects	44,928	37,691	32,677	33,490	42,214	49,746
Locomotives reported	42,951	43,236	44,274	45,965	47,397	48,025
Locomotives inspected	113,451	105,675	102,164	105,606	105,185	100,033
Locomotives defective	10,070	9,570	8,565	9,099	11,050	12,402
Percentage inspected found defective	10	9	8	9	11	12
Locomotives ordered out of service	474	560	487	468	679	934

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

Parts defective, inoperative or missing, or in violation of rules	Year ended June 30—					
	1942	1941	1940	1939	1938	1937
Air compressors	13	22	8	14	6	6
Axles, truck and driving		5		1	5	4
Batteries	1	6	1	1	1	4
Boilers	5	4	10	6	6	5
Brake equipment	86	69	50	50	74	97
Cabs and cab windows	27	45	22	36	25	51
Cab cards	20	24	13	18	11	25
Cab floors, aprons, and deck plates	10	14	17	13	8	17
Clutches	1					
Controllers, relays, circuit breakers, magnet valves, and switch groups	12	7	16	13	7	8
Coupling and uncoupling devices	5	2	6	4	4	3
Current-collecting apparatus	1	3	1	5	8	4
Draft gear	19	15	31	17	23	28
Draw gear	3	3	2	4	3	1
Driving boxes, shoes, and wedges	16	36	29	52	16	14
Frames or frame braces	5	1	12	9	37	5
Fuel system	81	62	51	35	47	152
Gages or fittings, air	8	3	1	6	11	1
Gages or fittings, steam			2			
Gears and pinions	4	2	1	2	2	2
Handholds	14	12	6	8	13	11
Inspections and tests not made as required	274	243	207	185	204	237
Insulation and safety devices	3	4	2	4	13	13
Internal-combustion engine defects, parts and appliances	62	54	35	32	26	50
Jack shafts	1	3	7	6	1	
Jumpers and cable connectors	1		1	1	1	2
Lateral motion, wheels		4	5	1		1
Lights, cab and classification	5	2	1	3	2	5
Lights, headlight	1	1	3	4	4	11
Meters, volt and amper	2		4	2	2	1
Motors and generators	16	16	12	19	18	10
Pilots and pilot beams	10	12	10	6	1	7
Plugs and studs						1
Quills	6		4	7	6	3
Rods, main, side, and drive shafts	2	4	2	2	2	23
Sanders	57	56	34	28	37	52

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

Parts defective, inoperative or missing, or in violation of rules	Year ended June 30—					
	1942	1941	1940	1939	1938	1937
Springs and spring rigging, driving and truck.....	35	58	50	16	43	36
Steam pipes.....	1	4	1	5	1	1
Steps, footboards, etc.....	21	35	22	18	23	13
Switches, hand-operated, and fuses.....	2	2	3	5	7	2
Transformers, resistors, and rheostats.....	3	2	1	1	3	.....
Trucks.....	28	30	43	33	40	41
Water tanks.....	1	1	.....	.....	.....	1
Water glasses, fittings, and shields.....	5	1	1	1	3	.....
Warning signal appliances.....	3	4	.....	.....	.....	2
Wheels.....	43	28	22	16	11	21
Miscellaneous.....	14	8	15	10	7	20
Total number of defects.....	926	905	766	696	769	991
Locomotive units reported.....	3,957	3,389	2,987	2,716	2,555	2,416
Locomotive units inspected.....	6,728	5,558	4,874	4,581	4,024	3,615
Locomotive units defective.....	358	319	298	260	274	328
Percentage inspected found defective.....	5	6	6	6	7	9
Locomotive units ordered out of service.....	12	21	16	14	9	24

INVESTIGATION OF ACCIDENTS AND GENERAL CONDITION OF LOCOMOTIVES

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

STEAM LOCOMOTIVES

Two hundred and twenty-two accidents occurred in connection with steam locomotives resulting in 34 deaths and 227 injuries. This represents an increase of 69 accidents, an increase of 19 in the number of persons killed, and an increase of 45 in the number of persons injured compared with the preceding year.

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

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

During the year 10 percent of the steam locomotives inspected by our inspectors were found with defects or errors in inspection that should have been corrected before the locomotives were put into use;

this represents an increase of 1 percent compared with the results obtained in the preceding year. There was a decrease of 15.3 percent in the number of locomotives ordered withheld from service by our inspectors because of the presence of defects that rendered the locomotives immediately unsafe.

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

EXPLOSIONS AND OTHER BOILER ACCIDENTS

All of the 13 explosions that occurred in the fiscal year, in which 23 persons were killed and 18 injured, were caused by overheating of the crown sheets due to low water. There was an increase of 2 accidents, an increase of 12 persons killed, and a decrease of 11 persons injured from this cause as compared with the preceding year.

In three of these accidents, in which nine employees were killed and two employees and two passengers injured, the force of the explosions tore the boilers from the running gears and hurled the boilers and other parts for considerable distances from the points of the explosions. In another instance where the boiler was torn from the running gear and two employees were killed and one was injured, the accident occurred in a tunnel, the boiler struck the roof of the tunnel and alighted on the front engine of the articulated running gear. In three other accidents, in which five employees were killed and four injured, the boilers remained attached to the running gears but the force of the explosions caused derailments. Three employees were killed and four employees injured in an accident that occurred while the locomotive was in the enginehouse; the rear end of the locomotive was lifted from the rails and displaced sidewise and parts of the enginehouse were wrecked. Four employees were killed and five employees injured in the remaining five accidents, in which the explosions were less violent than those described in the foregoing.

The serious results of boiler explosions are well known to railroad men and explosions have been materially reduced since the inception of the Boiler Inspection Act; however, there has been an increase in such accidents in the past 2 years with consequent increased loss of life and injuries and destruction of equipment.

Many locomotives are equipped with protective devices such as syphons, multiple drop or fusible plugs, and low-water alarms, all of which have no doubt prevented boiler explosions or minimized the severity thereof. Carriers that are continuing to make applications of devices of this character are making a distinct contribution to the conservation of human resources and equipment.

Boiler and appurtenance accidents other than explosions resulted in the deaths of 7 persons and injuries to 65 persons; this is an increase of 6 deaths and 30 injuries as compared with the preceding year.

EXTENSION OF TIME FOR REMOVAL OF FLUES

One thousand and seventy-nine applications were filed for extensions of time for removal of flues, as provided in rule 10. Our investigations disclosed that in 57 of these cases the condition of the locomotives was such that extensions could not properly be granted. Twenty-eight were in such condition that the full extensions requested could not be authorized, but extensions for shorter periods of time were allowed. Forty-six extensions were granted after defects disclosed by our investigations were required to be repaired. Twenty-seven applications were canceled for various reasons. Nine hundred and twenty-one applications were granted for the full period requested.

LOCOMOTIVES PROPELLED BY POWER OTHER THAN STEAM

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

During the year 5 percent of the locomotives inspected by our inspectors were found with defects or errors in inspection that should have been corrected before the locomotives were put into use; this represents a decrease of 1 percent compared with the results obtained in the preceding year. There was a decrease of nine in the number of locomotives ordered withheld from service by our inspectors because of the presence of defects that rendered the locomotives immediately unsafe.

SPECIFICATION CARDS AND ALTERATION REPORTS

Under rule 54 of the Rules and Instructions for Inspection and Testing of Steam Locomotives, 312 specification cards and 8,241 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, 666 specifications and 316 alteration reports were filed for locomotive units and 99 specifications and 111 alteration reports were filed for boilers mounted on locomotives other than steam. These were checked and analyzed and corrective measures taken with respect to discrepancies found.

LEGAL

One case of violation of the rules and instructions for inspection and testing of steam locomotives and tenders and their appurtenances, comprising 17 counts, was pending in the district court at the beginning of the year. This case was dismissed upon compliance with the provisions by the carrier and agreement to avoid such violations in the future.

SPECIAL WORK

In response to requests from military and naval authorities and other Government agencies engaged in the war effort, inspections of various locomotives and work equipment were made to determine the condition and suitability for the respective uses, and cooperative assistance was rendered in other respects. These locomotives are being generally maintained to the standards prescribed by the locomotive-inspection law and rules governing the condition of locomotives used on the lines of common carriers and inspections are currently made by our inspectors.

APPEALS

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

ACCIDENT PREVENTION

Due to the increase in accidents, I deem it advisable to repeat the following from my last annual report:

The practice, still too often indulged in, of applying temporary repairs in the hope that the locomotive will make a successful trip and that more adequate repairs may be applied thereafter when the time is most convenient, has been productive of many failures on the line of road; these failures, in addition to increasing the peril to life and limb of employees and others and increasing the ultimate cost of repairs, result in delays to the trains involved and frequently affect the orderly movement of other trains. Avoidance of failures of locomotives on the line of road is an essential component of satisfactory railroad performance and it is therefore essential that the practice of applying temporary repairs of the character indicated be reduced to the absolute minimum.

Before a locomotive is started on any trip it should be known that all parts and appurtenances are in safe and suitable condition for service rather than to assume, as is sometimes done, that if the locomotive arrived under its own power it can go out again. All parts to which repairs have been made, the condition or capacity of which may not be determinable by visual inspection, such as air compressors, injectors, and feed water pumps, should be appropriately tested for the output required under service conditions in addition to the usual examinations made when a locomotive is being prepared for service, since mere observation that these parts "work" when a locomotive is at the terminal is not sufficient to determine whether or not their capacity has been restored. In investigations of accidents we sometimes find reports on the defect that caused the accident repeated many times until failure eventually occurred, together with signatures

on the reports indicating that the reported work had been done, or at least that repairs to the reported defects had been attempted each time a report was made. This is proof that the safe repairs required to secure dependable operation of the locomotive had not been made and that labor and time had been wasted.

Complexity of the various appurtenances installed on modern locomotives, coupled with the placing in service of a large number of older locomotives which have been out of service for periods ranging up to 10 years or more, many of which are practically obsolete and therefore not well adapted to the giving of satisfactory performance under present conditions, and the intensive use of all locomotives now in service necessitate increased vigilance on the part of all concerned.

RECOMMENDATIONS

Section 7 of the act of February 17, 1911, amended April 22, 1940, requires, in addition to the annual report of the director to the Interstate Commerce Commission, that he shall make such recommendations for the betterment of the service as he may desire. In accordance with this the following recommendations are respectfully made:

First.—That the act be amended to increase the salaries of the director to \$8,000 per year, the two assistant directors to \$7,000 per year, and the district inspectors to \$4,600 per year. This recommendation is made in order that the salaries may be made commensurate with the duties and responsibilities of the positions involved.

Second.—That the act be amended to provide for five additional district inspectors at salaries of \$4,600 per year, and their traveling expenses while engaged in the performance of their duty, and in addition thereto an annual allowance for office rent, stationery, and clerical assistance, to be fixed by the Interstate Commerce Commission, but not to exceed in the case of any district inspector \$1,000 per year. This recommendation is made in order that the various railroads may be better policed by our inspectional forces in our efforts to promote safety, thereby preventing accidents and assisting the railroads in maintaining locomotives in safe and serviceable condition. This is particularly important at this time due to the entry into locomotive service of many new employees and to the use of many old locomotives, many of which have heretofore been standing idle for a number of years, and also due to the demand, because of war activities, for more intensive use of all locomotives.

ACKNOWLEDGMENT

I wish to acknowledge and express my sincere appreciation for the fine spirit of cooperation of the entire personnel of the Bureau and to our inspectors for the energy and good judgment exercised in the performance of their duties.

JOHN M. HALL,
Director.

ACCIDENTS AND CASUALTIES RESULTING FROM THE FAILURE OF STEAM LOCOMOTIVES AND TENDERS AND THEIR APPURTENANCES DURING THE FISCAL YEAR ENDED JUNE 30, 1942, BY ROADS

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

AKRON, CANTON & YOUNGSTOWN RAILWAY:

**May 10, 1942, locomotive 350, Akron, Ohio. Injured while operating manually operated reversing gear; one injured.

One accident; one injured.

ALIQUIPPA & SOUTHERN RAILROAD:

August 1, 1941, locomotive 211, Aliquippa, Pa. Cab vertical handhold at gangway fouled on corner of tender deck while locomotive was backing on a curve; one injured.

One accident; one injured.

ALTON RAILROAD:

July 3, 1941, locomotive 4375, Cayuga, Ill. Main pin broke through old flaw in the interior of pin; one injured.

One accident; one injured.

ALTON & SOUTHERN RAILROAD:

August 21, 1941, locomotive 14, St. Louis, Mo. Injector steam pipe spanner nut failed; attempted to tighten spanner nut while under steam pressure; one injured.

*January 9, 1942, locomotive 10, East St. Louis, Ill. Air pump did not operate properly; one injured.

Two accidents; two injured.

ATCHISON, TOPEKA & SANTA FE RAILWAY:

July 7, 1941, locomotive 3228, Winslow, Ariz. Employee slipped while stepping from coal pile to top of tender behind fuel space; step provided for going from coal pile to top of tender was covered with coal; one injured.

August 6, 1941, locomotive 2051, San Francisco, Calif. Cross-spring equalizer broke, permitting front end of locomotive to drop and front footboard to catch on pavement and turn under; one injured.

**September 9, 1941, locomotive 3464, near Lebo, Kans. Driving-brake head pin worked out, due to the cotter being missing, and was thrown from the rapidly moving locomotive and struck a track employee; one killed.

**October 11, 1941, locomotive 813, near Gallup, N. Mex. Insufficient clearance between overhanging back edge of cab and cab apron; one injured.

December 20, 1941, locomotive 3757, Ash Fork, Ariz. Fuel oil on top of fuel oil tank caused employee to slip and lose his balance; one injured.

January 8, 1942, locomotive 1309, Calwa, Calif. Insufficient clearance between cab apron and air-signal supply pipe; air pipe was improperly located, providing clearance of only 2½ inches between the pipe and cab apron; one injured.

**March 25, 1942, locomotive 4105, Baring, Mo. Throttle lever fouled on lubricator bracket; one injured.

April 5, 1942, locomotive 3929, near Cadiz, Calif. Collar broke off union sleeve of hydrostatic lubricator steam pipe, allowing sleeve to pull out of connecting nut; sleeve was made of bearing brass and brazing between sleeve and steam pipe did not extend to the collar; end of steam pipe was not properly belled; one injured.

May 19, 1942, locomotive 3843, Bakersfield, Calif. Explosion of gas in the firebox, caused by oil on the hot brickwork after the fire had been extinguished by water which had accumulated in the fuel oil; 2 or 3 gallons of water were drained from the fuel-oil tank after the accident; one injured.

June 14, 1942, locomotive 3775, Kingman, Ariz. Feed water pump water cylinder head joint leaking; one injured.

June 19, 1942, locomotive 4070, near Bosworth, Mo. Grate shaker lever slipped off shaker post, caused by excessive lost motion in power grate shaker mechanism; one injured.

Eleven accidents; one killed, ten injured.

ATLANTA & WEST POINT RAILROAD:

**September 16, 1941, locomotive (W. of A.) 376, Atlanta, Ga. Shaker bar fouled apron on oil-can rack which was located on boiler back head; one injured. One accident; one injured.

ATLANTIC COAST LINE RAILROAD:

July 22, 1941, locomotive 1217, Savannah, Ga. Headlight failed and the locomotive was continued in service in the darkness until it struck a cut of cars which were standing in the yard; irregularity of operation of headlight was reported on previous shift, this report was carried on locomotive and not filed until after the accident; one injured.

December 2, 1941, locomotive 437, near Darlington, S. C. Flue failed at defective safe end weld; one injured.

February 21, 1942, locomotive 1139, Wilmington, N. C. Grates hard to operate due to coal accumulated between casting ribs fouling shaker post; one injured.

May 7, 1942, locomotive 455, near West Bainbridge, Ga. Crown-sheet failure caused by overheating due to low water; three killed, four injured.

Four accidents; three killed, seven injured.

BALTIMORE & OHIO RAILROAD:

**July 14, 1941, locomotive 6215, Stobo, Pa. Back sand-box pipe leaking, permitting sand to blow back in cab; one injured.

*August 14, 1941, locomotive 6123, Brunswick, Md. Blower cap at smoke box lost off; one injured.

September 6, 1941, locomotive 4261, Newark, Ohio. Washout plug blew out of the barrel of boiler when attempt was made to tighten the plug while under steam pressure; threads on plug were distorted and threads in washout hole were crossed and stripped due to improper application of the plug; four injured.

*October 3, 1941, locomotive 4140, Philadelphia, Pa. Train heat pipe became disconnected from governor; threads on pipe union were burred, permitting union to pull away from the governor; one injured.

*October 7, 1941, locomotive 6166, Frederick Junction, Md. Handhold at gangway fouled on cab apron when on a curve; one injured.

October 18, 1941, locomotive 7511, Mill Creek, Pa. Sanders did not properly supply sand to the rails; sand did not feed into the pipes that supply sand traps when the sand boxes were less than one-half full; sanders were reported on October 4, 7, 13, 14, 16, and 17; one injured.

October 29, 1941, locomotive 4230, near Fort Ritner, Ind. Lubricator steam pipe collar broke; collar not properly brazed and lubricator had excessive vibration due to the brace from boiler back head to lubricator being missing; one injured.

January 8, 1942, locomotive 4416, Sherwood, Ohio. Stoker conveyor trough slide hook disengaged from slide; one injured.

March 9, 1942, locomotive 783, Rochester, N. Y. Reverse-lever latch disengaged from quadrant while the locomotive was in motion, causing a sudden stop and reverse movement; spring in reverse-lever latch was weak; one injured.

March 20, 1942, locomotive 7141, Hastings, W. Va. Locomotive derailed and turned over on a curve, caused by left engine truck wheel mounting pilot brace which had dropped out of position due to not being properly secured; two injured.

March 28, 1942, locomotive 6172, Kirkwood, Ohio. Flue failed at defective safe end weld; excessive openings between stoker elevator distributor tubes and draft rings; one killed.

April 4, 1942, locomotive 385, Demmler, Pa. Injured while operating main throttle; throttle was reported on April 3; one injured.

**May 20, 1942, locomotive 4474, Washington, D. C. Train stalled in tunnel; train line feed valve was defective; one injured.

Thirteen accidents; 1 killed, 16 injured.

BOSTON & MAINE RAILROAD:

August 5, 1941, locomotive 1382, Tufts College, Mass. Injured while attempting to move manually operated reverse lever to shorten cut-off; one injured.

April 2, 1942, locomotive 2906, Shelburne Falls, Mass. Coal on top of tender behind fuel space caused employee to sprain his ankle; one injured.

June 10, 1942, locomotive 4023, Silver Hill, Mass. Hand wheel of Precision-type reversing gear spun when unlatched; valve-gear bushings were worn; one injured.

Three accidents; three injured.

BURLINGTON-ROCK ISLAND RAILROAD:

March 8, 1942, locomotive (F. W. & D. C.) 406, Onion Creek, Tex. Head of one of the two bolts which secured baffle plate to fire door burned off, allowing one end of baffle plate to drop down and prevent the fire door from closing; one injured.

One accident; one injured.

CENTRAL OF GEORGIA RAILWAY:

December 14, 1941, locomotive 664, near Collier, Ga. Mechanically operated fire door did not open properly; liners at left side of fire-door lower guide were missing and nut on stud securing left side of guide was loose; one injured.

One accident; one injured.

CENTRAL RAILROAD OF NEW JERSEY:

February 9, 1942, locomotive 935, Mauch Chunk, Pa. Ice on tender sill step tread caused employee to slip and fall to the ground; ice on the step resulted from a leak in tender cistern water leg; ice on sill steps was reported on January 29 and February 3; one injured.

One accident; one injured.

CHICAGO & NORTH WESTERN RAILWAY:

August 4, 1941, locomotive 1654, near Carroll, Iowa. Babbitt broke loose from trailing truck box lateral-motion plate and was thrown from rapidly moving locomotive, striking employee who was working near the track; the babbitt had been insecurely applied; one killed.

August 13, 1941, locomotive 2618, West Allis, Wis. Insufficient clearance between cab vertical handhold at gangway and corner of tender deck when on a sharp curve; one injured.

**September 21, 1941, locomotive 2554, Milwaukee, Wis. Tender coal-retainer plate fell, due to locking device being missing; locking device not properly secured to retainer plate; one injured.

October 14, 1941, locomotive 2572, Eddy, Ill. Insufficient clearance between the end of coal pusher operating lever and wall of tender coal space; one injured.

October 29, 1941, locomotive 2603, Melrose Park, Ill. Insufficient clearance between cab handhold at gangway and tender deck when on sharp curve; one injured.

November 10, 1941, locomotive 1016, Sioux City, Iowa. Air bell ringer inoperative and cab windows were dirty; bell was improperly fitted in yoke, causing it to be off center; one injured.

November 12, 1941, locomotive 2606, Chicago, Ill. Insufficient clearance between cab handhold at gangway and tender deck when on a sharp curve; one injured.

**December 31, 1941, locomotive 2400, Proviso, Ill. Employee fell from running board after attempting to close the boiler check shut-off valve; one injured.

January 24, 1942, locomotive 2497, Glen Ellyn, Ill. Driving-wheel tire worked partly off the wheel center due to insufficient shrinkage allowance; one injured.

January 28, 1942, locomotive 1846, Nelson, Ill. Front end of handrail on side of smoke box broke off inside of supporting bracket, due to old fracture which started at retaining-pin hole; pin holes in handrail and in bracket were not in proper alignment; one injured.

February 26, 1942, locomotive 2551, near Green Bay, Wis. Driving-wheel axle failed through journal due to old fracture which extended through approximately 80 percent of cross-sectional area; one injured.

March 29, 1942, locomotive 1149, near Burke, S. Dak. Injured while operating manually operated reversing gear; one injured.

June 11, 1942, locomotive 1706, California Junction, Iowa. Injector did not operate properly, due to injector tubes, delivery nozzle, and line check being restricted by corrosion and lime deposits; "Water valve to left injector, and overflow to right injector leak" was reported on June 3, the day following monthly

inspection, and the item bore the notation "Do not have reamer" and was not signed for; one injured.

Thirteen accidents; 1 killed, 12 injured.

CHICAGO GREAT WESTERN RAILWAY:

September 20, 1941, locomotive 931, Dennison, Minn. Grates stuck in open position; one injured.

**January 9, 1942, locomotive 271, Osage, Iowa. Trailing truck centering pin came out of position and became lodged against the lower part of centering device which prevented free lateral motion of trailing truck and resulted in derailment of trailing wheels; apparently the centering pin had been damaged in a previous derailment; one injured.

April 12, 1942, locomotive 702, Stockton, Ill. Defective water-spout hook slipped from water spout while being used, causing employee to fall from the top of tender; one injured.

Three accidents; three injured.

CHICAGO, INDIANAPOLIS & LOUISVILLE RAILWAY:

December 9, 1941, locomotive 578, Greencastle, Ind. Grate connecting rod failed; rod had been overheated; one injured.

April 5, 1942, locomotive 576, Cloverdale, Ind. Grease cup was thrown from main rod and struck a nonemployee who was standing near the track; fusion welding applied to hold the cup in rod was not fused to the rod, permitting cup to work loose and damage the threads which screwed into rod; one injured.

Two accidents; two injured.

CHICAGO, MILWAUKEE, ST. PAUL & PACIFIC RAILROAD:

December 20, 1941, locomotive 514, Oakwood, Wis. Power reversing gear crosshead failed, causing reverse lever to move unexpectedly from forward to back position; inside cheek of reversing gear crosshead was cracked; one injured.

**January 23, 1942, locomotive 505, Bradshaw, Ind. Left main connection side rod broke at intermediate driving-wheel crank-pin bushing fit, due to old fracture in rod; one injured.

June 13, 1942, locomotive 585, Norpaul, Ill. Bell inoperative, due to bell rope being caught; one injured.

June 23, 1942, locomotive 125, Glenview, Ill. Crank pin and front end of side rod ran very hot and became distorted, permitting side rod to disconnect from crank pin and cause considerable other damage which resulted in derailment of the engine truck while passing a passenger station; two injured.

Four accidents; five injured.

CHICAGO, ROCK ISLAND & PACIFIC RAILWAY:

**December 17, 1941, locomotive 838, Little Rock, Ark. Rear part of the top of tender fuel tank was covered with waste fuel oil, making it very slippery; one injured.

**May 9, 1942, locomotive 5039, Chickasha, Okla. Trailer journal box lid fell off, due to the absence of lid pin; one injured.

May 25, 1942, locomotive 942, Robbins, Ill. Seat box in cab broke; seat box was defective; one injured.

Three accidents; three injured.

CLINCHFIELD RAILROAD:

*July 18, 1941, locomotive 513, Dante, Va. Water glass burst; one injured.

September 8, 1941, locomotive 402, Mayo, S. C. Air compressor radiator pipe separated from union at compressor discharge pipe, causing emergency application of the brakes; threads on pipe and in union were badly worn; one injured.

Two accidents; two injured.

DELAWARE AND HUDSON RAILROAD:

July 15, 1941, locomotive 1510, near Cobleskill, N. Y. Crown-sheet failure caused by overheating due to low water; three killed.

**February 23, 1942, locomotive 1011, Yatesville, Pa. Left back footboard on tender was bent inward; "Footboard back of tank left side bent" was reported on February 22; one injured.

March 11, 1942, locomotive 1216, Bainbridge, N. Y. Hinge on drop seat in cab pulled out, causing seat supporting leg to dislodge and seat to fall; one injured.

March 27, 1942, locomotive 1014, Carbondale, Pa. Washout plug blew out of boiler when attempt was made to tighten the plug while under steam pressure; evidently the plug had not been properly tightened after boiler wash; one killed. Four accidents; four killed, two injured.

DELAWARE, LACKAWANNA & WESTERN RAILROAD:

December 26, 1941, locomotive 2111, Greendell, N. J. Main steam pipe in front end of locomotive burst, caused by insufficient thickness. Due to manufacturing defect, steam pipe was $\frac{1}{16}$ inch thick at point of fracture while the opposite wall was $\frac{7}{8}$ inch thick; the carrier's standard provided that steam pipe be $\frac{3}{8}$ inch thick for entire circumference; one injured.

One accident; one injured.

DENVER & RIO GRANDE WESTERN RAILROAD:

July 16, 1941, locomotive 3605, Parkdale, Colo. Accumulation of cinders on top of tender behind fuel space; one injured.

**January 4, 1942, locomotive 3400, Moffat Tunnel, Colo. Stack hood not in proper operating condition, resulting in partial asphyxiation of engineer and fireman in tunnel; two injured.

January 19, 1942, locomotive 1704, Palmer Lake, Colo. Operating arm of drifting valve worked off valve stem, due to excessive wear; one killed.

**May 13, 1942, locomotive 3704, en route Helper to Roper, Utah. Stoker did not operate properly account of distributor jet being burned and cracked; one injured.

Four accidents, one killed, four injured.

DETROIT, TOLEDO & IRONTON RAILROAD:

*January 12, 1942, locomotive 104, Lima, Ohio. Blow-off pipe plug was missing; one injured.

One accident; one injured.

DULUTH, MISSABE & IRON RANGE RAILWAY:

**October 8, 1941, locomotive 500, Prossit, Minn. Motion plate failed through bottom stud holes, resulting in cylinder head being forced off; old fractures at stud holes; one injured.

One accident; one injured.

ERIE RAILROAD:

*July 15, 1941, locomotive 2559, Rutherford, N. J. Tie bolt in eccentric crank sheared, allowing the crank arm to come off; eccentric rod broke and fell to the road bed, causing ballast to fly and strike passengers; two injured.

February 20, 1942, locomotive 91, Port Jervis, N. Y. Tank hose burst; rear end of hose was frozen; one injured.

May 1, 1942, locomotive 3391, Pavonia, Ohio. Multiple throttle difficult to operate, apparently caused by water being carried over and depositing scale and sediment on valves which caused them to bind; one injured.

Three accidents; four injured.

GEORGIA RAILROAD:

March 19, 1942, locomotive 302, near Clarkston, Ga. Injector steam pipe collar failed at flange; collar was not properly brazed to steam pipe and end of steam pipe was not flanged; one injured.

One accident; one injured.

GRAND TRUNK WESTERN RAILWAY:

**June 18, 1942, locomotive 6039, Chicago, Ill. Cab gangway handhold broke at bottom bend due to old fracture; one injured.

One accident; one injured.

GREAT NORTHERN RAILWAY:

**November 5, 1941, locomotive 3233, Spion Kop, Mont. Defective spring hanger pin; one injured.

May 8, 1942, locomotive 2526, St. Paul, Minn. Broken stay blew out of crown sheet when attempt was made to calk it while under steam pressure; stay was too small for proper thread engagement in stay hole, and threads on stay and in stay hole were in poor condition, indicating previous leakage; one killed.

Two accidents; one killed, one injured.

GULF COAST LINES:

February 12, 1942, locomotive (N. O. T. & M.) 1032, near Cranell, Tex. Fusion-welded seam of patch in rear end of thermic syphon failed for 14 inches; rear end of syphon was overheated due to excessive accumulation of scale; one injured.

March 9, 1942, locomotive (M. P.) 1220, Bishop, Tex. Main rod brass broke and lost out; main rod and pin had overheated due to insufficient lubrication; one injured.

*May 12, 1942, locomotive (St. L. B. & M.) 1204, Kingsville, Tex. Blow-off cock handle was loose on stem, preventing blow-off cock from closing properly; one injured.

Three accidents; three injured.

HOUSTON BELT & TERMINAL RAILWAY:

**April 16, 1942, locomotive (A. T. & S. F.) 731, Houston, Tex. Water glass burst; one injured.

One accident; one injured.

ILLINOIS CENTRAL RAILROAD:

September 10, 1941, locomotive 229, Louisville, Ky. Piston packing on power reversing gear leaking; injured while attempting to tighten packing nut; spanner notches on packing nut were badly battered and mutilated; one injured.

**October 3, 1941, locomotive 1167, Stephensburg, Ky. Injured while attempting to adjust cab storm window; window sash, on which storm window was hung, was badly worn and had excessive play in the guides; one injured.

**November 7, 1941, locomotive 966, Vicksburg, Miss. Plug blew out of T in blow-off cock drain pipe; one injured.

**January 4, 1942, locomotive 1951, Central City, Ky. Brakeman's seat in cab fell when employee stepped on it to give attention to leaking packing nut on left injector; loose and displaced boiler jacket prevented seat supporting rod from being in normal perpendicular position and supporting rod was resting on metal pattering on the cracks of running board; one injured.

**February 8, 1942, locomotive 643, Memphis, Tenn. Water glass burst; water-glass guard did not furnish proper protection from the escaping steam and not water; one injured.

*May 31, 1942, locomotive 2418, Otto, Ill. Eccentric rod broke; one injured. Six accidents; six injured.

INDIANA HARBOR BELT RAILROAD:

November 14, 1941, locomotive 164, Norpaul, Ill. Lubricator sight glass blew out; packing nut broke during attempt to tighten packing follower; nut section of packing nut was reduced below standard during manufacture; "Sight feed glass to lubricator leaking oil" was reported on November 13; one injured.

One accident; one injured.

INTERNATIONAL-GREAT NORTHERN RAILROAD:

February 17, 1942, locomotive 1108, Spring, Tex. Employee slipped on tender sill step which had oil on it and fell to the ground; one injured.

One accident; one injured.

KANSAS CITY SOUTHERN RAILWAY:

*June 27, 1942, locomotive 909, Bunch, Okla. Flue broke; one injured.

One accident; one injured.

LEHIGH VALLEY RAILROAD:

*December 24, 1941, locomotive 421, Greenville, N. J. Trailer-wheel tire came off, causing derailment of the locomotive and five cars; tire worked loose due to not having proper shrinkage when applied; one injured.

One accident; one injured.

LOUISIANA & ARKANSAS RAILWAY:

*June 10, 1942, locomotive 82, Long Springs, La. Insufficient clearance between reverse lever and gage cock; one injured.

One accident; one injured.

LOUISVILLE & NASHVILLE RAILROAD:

July 13, 1941, locomotive 194, Biloxi, Miss. Insufficient clearance between reverse lever in full forward position and an extension handle to injector steam ram; extension handle was too long and reverse lever was not limited by a stop to full valve travel position; "Reverse lever hits steam ram handle to bottom in-

jector and will catch hand or finger in forward motion" was reported on July 6 and the item was signed for and the report approved, indicating that repairs had been attempted but were not effective; one injured.

August 11, 1941, locomotive 2410, Covington, Ky. Inside injector steam ram packing was leaking, causing excessive heat in the cab while switching in tunnel; one injured.

October 1, 1941, locomotive 1914, near Morgan, Ky. Crown-sheet failure caused by overheating due to low water; reflex-type water glass was badly worn and water-glass light improperly located, making close observation necessary to see the water level when the water was below the middle of the glass; one killed, one injured.

October 25, 1941, locomotive 197, near McGehees, Ala. Manually operated reverse lever became disengaged from quadrant and flew to full forward position, striking employee; lack of lubrication of valves resulted in excessive friction and the vibration in valve gear caused reverse lever to become unlatched; one injured.

October 31, 1941, locomotive 1840, near Winchester, Ky. Air compressor stopped and train stalled with rear end in tunnel; air compressor stopped three times on this trip, apparently due to lack of lubrication; "Air pump stops often" was reported on October 24; one injured.

**December 10, 1941, locomotive 2060, Boyles, Ala. Insufficient clearance between grate shaker lever and arch tube plug in boiler back head; one injured.

January 4, 1942, locomotive 1343, Theodore, Ala. Crown-sheet failure caused by overheating due to low water; one killed.

**April 7, 1942, locomotive 1345, Cartersville, Ga. Manually operated reverse gear was difficult to operate; pin in back end of valve-gear reach rod fouled equalizing reservoir; reversing gear reported on March 19, April 6, 7, 8, and 10; one injured.

April 15, 1942, locomotive 1500, Ardmore, Ala. Burned by steam which came through cold-water sprinkler hose, apparently caused by some obstruction in the water line stopping the flow of water to sprinkler body; one injured.

Nine accidents; two killed, eight injured.

MACON, DUBLIN & SAVANNAH RAILROAD:

**September 23, 1941, locomotive (C. of Ga.), 509, near Catlin, Ga. Hard riding locomotive; one injured.

One accident; one injured.

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

**July 20, 1941, locomotive 4007, Chicago, Ill. Squirt hose burst; hose badly worn; one injured.

One accident; one injured.

MISSOURI & ARKANSAS RAILWAY:

**November 25, 1941, locomotive 35, Helena, Ark. Gage-cock spindle blew out; threads worn on gage-cock union nut and stem; one injured.

One accident; one injured.

MISSOURI-KANSAS-TEXAS LINES:

*May 23, 1942, locomotive 62, Parsons, Kans. Water glass broke; one injured.

One accident; one injured.

MISSOURI PACIFIC RAILROAD:

*July 29, 1941, locomotive 6423, Osawatomie, Kans. Pilot sill step broke off; old fracture extended through 60 percent of cross-sectional area; one injured.

**January 7, 1942, locomotive 1915, Stanhope, Mo. Grate-shaker bar broke through old fracture which extended through approximately 40 percent of cross-sectional area; one injured.

**March 11, 1942, locomotive 1238, Wynne, Ark. Excessive length and side motion of blow-off cock handle permitted employee's hand to strike cab window while operating blow-off cock; one injured.

Three accidents; three injured.

NASHVILLE, CHATTANOOGA & ST. LOUIS RAILWAY:

October 16, 1941, locomotive 360, Ringgold, Ga. Handhold across bumper beam broke through old fracture in bend at left end; one injured.

January 8, 1942, locomotive 559, Hooker, Ga. Grate-shaker bar slipped off shaker post due to improper fit; one injured.

Two accidents; two injured.

NEW ORLEANS PUBLIC BELT RAILROAD:

November 20, 1941, locomotive 22, New Orleans, La. Water glass burst; out by flying glass; water-glass shield defective; one injured.
One accident; one injured.

NEW YORK CENTRAL RAILROAD:

**September 4, 1941, locomotive 7828, Suspension Bridge, N. Y. Stud securing blow-off cock to firebox side sheet broke; stud was fractured and metal very brittle at the point of failure; one injured.

September 17, 1941, locomotive 7342, Rochester, N. Y. Fire-door operating handle became disconnected due to nuts on the studs which held the operating cylinder to fire-door frame being loose; one injured.

October 7, 1941, locomotive 5272, Schenectady, N. Y. Grate-shaker bar slipped off lever, due to improper fit; shaker-bar socket and shaker lever were not of the company's standard dimensions; one injured.

**November 10, 1941, locomotive 1782, Dickinson, W. Va. Inside throat-sheet brace staybolt blew out when attempt was made to stop leakage at the bolt while under steam pressure; staybolt was improperly applied and threads on staybolt and in bolt holes in the brace and throat sheet were defective; one killed.

November 15, 1941, locomotive 6677, Albany, N. Y. Boiler-check cap blew off due to spanner nut breaking when attempt was made to tighten it with hammer and set while under steam pressure of 170 pounds; wrench slots on spanner nut were badly marred from the use of hammer and set; one injured.

November 19, 1941, locomotive 5263, Cleveland, Ohio. Piston valve stuck in back end of bushing, due to bushing being improperly bored and a very rough finish, and when forced, the reversing hand wheel of Precision-type reversing gear spun out of control; one injured.

December 30, 1941, locomotive 2587, Cedar Run, Pa. Pressure-gage pipe of boiler feed pump failed through old fracture in threads at union; pipe was not properly aligned to union connections; one injured.

**January 3, 1942, locomotive 7917, Elyria, Ohio. Push-pole hanger on tender bent; one injured.

January 12, 1942, locomotive 2994, Corning, N. Y. Superheater flue failed due to being reduced in thickness by cinder cutting; a similar flue failure occurred in this locomotive two days prior to this accident; one injured.

January 15, 1942, locomotive 5266, Rome, N. Y. Handwheel of Precision-type power reversing gear spun and struck the engineer's hand when force was applied to operate the reversing gear; reversing gear difficult to operate on account of rear bolt of left radius-bar splice having worked out and caught on valve-gear frame; the two remaining bolts in radius-bar splice were loose and inside half of sleeve end of rear section of radius bar was broken vertically through old fracture at the rear bolt hole; one injured.

February 26, 1942, locomotive 2558, Corning, N. Y. Sprinkler-hose air-pipe nipple failed at manifold; pipe connection at manifold was loose due to nipple and manifold threads being badly worn; one killed.

**March 25, 1942, locomotive 1443, Brocton, N. Y. Doubleheading locomotives separated, causing sudden stop; front coupler of second locomotive dropped down sufficiently to allow couplers to disengage, due to bolts which fastened the draw-casting pocket to pilot beam being broken or badly stretched; bolt holes in draw casting and in pilot beam were worn oversize; one injured.

April 25, 1942, locomotive 4922, Bellefontaine, Ohio. Crown-sheet failure caused by overheating due to low water; three killed, four injured.

May 31, 1942, locomotives 2897 and 2761, Ravenna, N. Y. Doubleheading locomotives separated while train was traveling about 50 miles per hour, causing sudden stop which resulted in injury of an employee; locomotives had parted previously on this trip due to defective coupler; one injured.

Fourteen accidents; 5 killed, 15 injured.

NEW YORK, CHICAGO & ST. LOUIS RAILROAD:

March 31, 1942, locomotive (C. & O.) 2314, Red Key, Ind. Crown-sheet failure caused by overheating due to low water; three killed.

One accident; three killed.

NEW YORK, NEW HAVEN & HARTFORD RAILROAD:

July 5, 1941, locomotive 1388, Westerly, R. I. Front slide of stoker conveyor rough stuck; one injured.

December 28, 1941, locomotive 3505, Sound View, Conn. Superheater flue failed at defective safe-end weld; one injured.

April 22, 1942, locomotive 1347, Boston, Mass. Main steam-valve bonnet blew out of turret; threads on bonnet and in casting were so badly deteriorated and distorted that bonnet could be inserted almost to the seat without being turned; valve was reported leaking on April 7, 8, and 21; one injured.

May 25, 1942, locomotive 392, State Line, Mass. Reverse lever difficult to operate; reverse-lever fulcrum pin badly worn; lever was reported difficult to operate on May 21, 22, 23, 25, 26, 28, June 8, and 9; one injured.

Four accidents; four injured.

NORFOLK & WESTERN RAILWAY:

**October 23, 1941, locomotive 2050, Lynchburg, Va. Feed water pump throttle valve stuck in closed position; one injured.

**April 23, 1942, locomotive 1123, Norwood, Ohio. Air-compressor turret-valve bonnet blew out; threads on bonnet and in valve body were badly worn; one injured.

Two accidents; two injured.

NORTHERN PACIFIC RAILWAY:

*December 25, 1941, locomotive 1548, Tacoma, Wash. Top of tender behind fuel space was obstructed by a piece of timber; one injured.

*March 17, 1942, locomotive 1741, Forsyth, Mont. Air pump did not operate properly; one injured.

Two accidents; two injured.

PENNSYLVANIA RAILROAD:

July 29, 1941, locomotive 6700, Swissvale, Pa. Ashpan blower hose was of excessive length and would not remain in hanger; rear hanger for nozzle of ashpan blower was missing from wing of ashpan; one injured.

July 30, 1941, locomotive 8896, Martinsville, Ind. Blow-off cock pipe separated from the top part of union near middle of the pipe, due to deteriorated threads; "Blow-off pipe union leaking" was reported on July 16 on company's special monthly inspection report, after which a new union was applied but nothing done to the threads on the pipe; one injured.

August 8, 1941, locomotive 3280, Baltimore, Md. Locomotive derailed at switch point, caused by engine-truck wheels running out of alignment and bearing hard to the left side, due to the pin at back end of engine-truck radius bar being missing and the left leg of radius bar being bent; one killed.

August 8, 1941, locomotive 65, Pitcairn, Pa. Injured while attempting to close main throttle valve; throttle reported hard to operate on July 31, August 3, 5, 6, 7, and 8 (before accident); one injured.

August 20, 1941, locomotive 6955, Terre Haute, Ind. Back head of main air reservoir blew out shortly after the introduction of water into the air end of the air compressor in an attempt to free an intake valve; irregularities in connection with the compressor were reported 33 times in the 42 days next preceding the date of accident; 1 injured.

September 4, 1941, locomotive 6347, Hammond, Ind. Undesired movement of locomotive, caused by defective brakes and defective throttle; air pipe to driver brake cylinders leaking; reducing valve was defective; excessive lost motion in throttle lever at latch and quadrant permitted steam to enter cylinders when throttle lever was latched in closed position; one injured.

September 16, 1941, locomotive 816, Chicago, Ill. Engine truck journal broke, due to excessive overheating; one killed, one injured.

November 25, 1941, locomotive 6368, Hamilton Township, N. J. Horizontal handhold on side of cab was obstructed by a piece of wire, used to fasten cab-window awning in open position, causing employee to fall to the ground; hook for securing awning tie-back strap was broken off; one injured.

**January 1, 1942, locomotive 4389, Kittanning Point, Pa. Fire door inoperative; fire-door slides were obstructed by deposits of carbon and left slide was loose; one injured.

January 10, 1942, locomotive 5493, near Pierceton, Ind. Crown-sheet failure caused by overheating due to low water; injectors were unreliable and of insufficient capacity; one killed, one injured.

January 30, 1942, locomotive 4258, Altoona, Pa. Mechanically operated fire door stuck in closed position, due to an accumulation of carbon and graphite on fire-door guides and lack of lubrication; fire door overheated and burned lubrica-

tion from the guides; fire door was reported sticking on January 12, 15, 16, 17, 18, 20, 21, 22, 23, 24, and 27; one injured.

February 20, 1942, locomotive 447, Newton Hamilton, Pa. Crown-sheet failure caused by overheating due to low water; neither injector was of sufficient capacity to supply the boiler; the lower two-thirds of the reflex-type water-gage glass was croded, causing this part of the glass to be dark which made it difficult to distinguish between the appearance of water and steam in the glass; two injured.

**April 5, 1942, locomotive 5368, East St. Louis, Ill. Left front engine truck journal broke, due to overheating, resulting in the locomotive being derailed and turned over; two injured.

April 13, 1942, locomotive 9360, Canton, Ohio. Lubricator oil control valve packing gland broke off through old fracture inside the end of packing nut, spraying the cab with oil which became ignited and set the cab on fire; one injured.

May 5, 1942, locomotive 6950, Black Run, Ohio. Grease-cup cap from back end of main rod was thrown into the cab where it struck and fatally injured an employee; threads on grease-cup cap were worn and cap a very loose fit; one injured.

**June 17, 1942, locomotive 6905, near Lewistown, Pa. Side rod broke, due to old fracture, and the portion of side rod attached to crank pin contacted and broke a flexible staybolt sleeve in throat sheet which permitted the escape of steam and hot water; daily work reports show that pounds in driving boxes and rods and excessive lateral play had been reported repeatedly during the 2 months preceding the accident; one injured.

June 25, 1942, locomotive 6845, Tyrone, Pa. Leak in train-line connection between locomotive and tender; one injured.

Seventeen accidents; 3 killed, 18 injured.

PERE MARQUETTE RAILWAY:

July 31, 1941, locomotive 714, New Buffalo, Mich. Union nut on coal pusher pipe in cab failed when valve was opened to operate coal pusher, permitting steam pipe to separate and steam to escape freely into the cab; nut had been badly battered due to use of hammer and chisel; one injured.

One accident; one injured.

PITTSBURGH & LAKE ERIE RAILROAD:

**March 24, 1942, locomotive 9503, Beaver Falls, Pa. Blow-off cock stuck while being operated; one injured.

One accident; one injured.

PITTSBURGH & WEST VIRGINIA RAILWAY:

July 3, 1941, locomotive 924, Wellsburg, W. Va. Knuckle of flange of boiler back head cracked vertically for 12 inches; one injured.

One accident; one injured.

READING COMPANY:

September 12, 1941, locomotive 1345, South Chester, Pa. Squirt hose blew off nipple near center of hose; hose not clamped; one injured.

**September 13, 1941, locomotive 133, Hershey, Pa. Drifting valve was held open by a broken valve stem which was lodged between the valve and valve seat, causing the locomotive to move forward unexpectedly; one injured.

*February 13, 1942, locomotive 3005, Sheridan, Pa. Valve stem broke; one injured.

Three accidents; three injured.

RUTLAND RAILROAD:

October 6, 1941, locomotive 18, Bangor, N. Y. Injured while operating reversing gear; manually operated reverse lever difficult to handle; one injured.

One accident; one injured.

ST. LOUIS-SAN FRANCISCO RAILWAY:

December 28, 1941, locomotive 987, Springfield, Mo. Tubular water glass burst; one injured.

One accident; one injured.

SAN DIEGO & ARIZONA EASTERN RAILWAY:

**January 7, 1942, locomotive 1, San Diego, Calif. Top of fuel-oil tank adjacent to water-cistern manhole was worn smooth, providing insecure footing; one injured.

One accident; one injured.

SEABOARD AIR LINE RAILWAY:

October 2, 1941, locomotive 650, near Edgemoor, S. C. Manually operated reverse lever became unlatched and flew to full forward position, catching employee's foot between the quadrant latch and foot rest applied on front end of reverse lever quadrant; oil in teeth of latch; no clearance provided between reverse lever when in full forward position and the foot rest; one injured.

November 18, 1941, locomotive 860, near Lock, Ala. Grate-shaker bar was improper fit on shaker post; shaker bar was not the carrier's standard bar; one injured.

December 1, 1941, locomotive 357, Fuller, S. C. Crown-sheet failure caused by overheating due to low water; two killed, one injured.

*December 1, 1941, locomotive 1094, Montgomery, Ala. Blow-off cock valve stuck in closed position; one injured.

April 24, 1942, locomotive 422, near Scholl, N. C. Crown-sheet failure caused by overheating due to low water; both water glasses were badly stained and dirty, making it difficult to determine the true water level; two killed, one injured.

May 18, 1942, locomotive 804, Plant City, Fla. Employee's foot was injured due to stepping on part of a tender brace which was located on top of tender behind fuel space and directly in the path of a person going over the tender to take water; web of the iron brace protruded above the water cistern and was not plainly visible due to being located directly behind coal space; one injured.

**May 29, 1942, locomotive 268, McKenney, Va. Hand wheel of Precision-type reversing gear spun violently when gear was released after being stuck; radius-bar trunnion bolt worked out of position and fouled the connection rod, causing the gear to stick in about central position; one injured.

June 20, 1942, locomotive 509, near Columbus, Ga. Top section of exhaust nozzle stand broke off and fell on the lower section, causing exhaust steam to be deflected back into the firebox and cab; back wall of nozzle stand was cinder cut; two injured.

Eight accidents; four killed, nine injured.

SOUTHERN RAILWAY:

July 1, 1941, locomotive 4889, near Charlotte, N. C. Crown-sheet failure caused by overheating due to low water; one killed, one injured.

**August 4, 1941, locomotive 4822, Weyburn, Va. Shaker bar slipped off post, permitting employee's elbow to strike rear cab panel; shaker-bar handle was bent, causing it to be directly in line with rear cab panel; one injured.

August 21, 1941, locomotive 6357, near Coulterville, Tenn. Side-rod grease cup was thrown from rapidly moving locomotive; threads on grease cup and in side rod were flattened and stripped; one injured.

September 23, 1941, locomotive 6887, Hattiesburg, Miss. Defective board in cab foot rest broke; one injured.

**October 4, 1941, locomotive 2504, Limestone, Tenn. Tender coal gate board fell out of rack and struck employee; one injured.

October 28, 1941, locomotive 1708, Atlanta, Ga. Moulding on side of tender floor boards was improperly applied and in unsafe condition; one injured.

**November 30, 1941, locomotive 845, Pelham, N. C. Fire hose burst; hose defective; one injured.

**February 20, 1942, locomotive 4816, New Holland, Ga. Grate-shaker bar slipped off post; apparently the latch for shaker post fell from its vertical position and partly engaged the post, which prevented the shaker bar from being properly fitted on the post; one injured.

**February 23, 1942, locomotive 4867, Lulu, Ga. Erratic operation of injector, caused by approximately 95 percent of the area of injector feed water hose strainer being obstructed by cotton waste; one injured.

Nine accidents; one killed, nine injured.

SOUTHERN PACIFIC—LINES EAST:

July 17, 1941, locomotive (T. & N. O.) 921, Small, Tex. Locomotive was dispatched with auxiliary shut-off valve on blow-off cock closed. When employee opened the valve, he was burned by steam and hot water which had built up between the blow-off cock and the auxiliary valve during previous attempts to use the blow-off cock; one injured.

February 10, 1942, locomotive (T. & N. O.) 973, El Paso, Tex. Steam whistle valve stuck open, apparently due to sediment accumulating on whistle valve stem; whistle valve spring was broken and a part of it missing; one injured.

**April 30, 1942, locomotive (T. & N. O.) 956, Hondo, Tex. Engine truck box became hot; evidently packing in truck box was not given proper attention before the locomotive was dispatched; one injured.

Three accidents; three injured.

SOUTHERN PACIFIC—LINES WEST:

**August 10, 1941, locomotive 4127, Redding, Calif. Injector starting valve and water-regulating valve were leaking; injector reported on August 3, 4, 8, and 11; one injured.

August 11, 1941, locomotive 2854, near Paola, Calif. Brakeman's seat in cab fell from its elevated storage position and struck fireman's foot; dowel pin for securing the seat to bracket at cab ceiling was not properly inserted in pin hole in bracket; one injured.

September 13, 1941, locomotive 4136, Bray, Calif. Injured while trying to avoid escaping steam from broken cylinder cock; one injured.

September 15, 1941, locomotive 1219, West Oakland, Calif. Emergency oil valve handle came off, due to pin missing from nut on valve stem; one injured.

September 22, 1941, locomotive 2766, Eugene, Oreg. Drinking-water container fell from position on front face of tender; hasp on retaining strap was not properly secured; one injured.

*November 6, 1941, locomotive 3669, Oreana, Nev. Trailer booster bearing became dislodged and dropped between the rails, breaking branch pipe under cars and resulting in sudden stop of the train; trailer tire had shelled spots which caused vibration, shaking the bearing nuts and bolts loose; one injured.

December 15, 1941, locomotive 1629, West Oakland, Calif. Manually operated reverse lever stopped suddenly while position was being adjusted, caused by an unattached pipe clamp becoming lodged between the two bars of reverse-lever quadrant; one injured.

January 28, 1942, locomotive 3909, Eugene, Oreg. Mechanical lubricator pipe to left No. 1 cylinder bulged and ruptured due to high pressure in pipe caused by delivery end of pipe inside of valve chamber being stopped up with carbon; lubricator pipe reported leaking over No. 1 cylinder on January 22, 26, 27, and 28; one injured.

March 28, 1942, locomotive (T. & N. O.) 983, Dome, Ariz. Valve to hot-water squirt hose worked open, due to insufficient packing in packing nut which caused valve stem to be exceptionally free in packing nut; one injured.

**March 29, 1942, locomotive 4127, Klamath Falls, Oreg. T handle pulled out of screw head on fuel-oil tank filling-hole cover; one injured.

**March 30, 1942, locomotive 3300, Tracy, Calif. One of the cab deck boards was raised $1\frac{1}{2}$ to 2 inches higher than the adjacent boards, due to dirt accumulating under it; one injured.

May 14, 1942, locomotive 3659, Ulmorris, N. Mex. Grate shaker bar slipped off shaker post; grease on shaker post; one injured.

May 17, 1942, locomotive 4216, Dunsmuir, Calif. Gas explosion in oil-fired firebox; one injured.

May 23, 1942, locomotive 4217, Cottonwood, Calif. Gas explosion in oil-fired firebox, caused by a closed air cut-out cock on tender; absence of air pressure in oil tank resulted in irregular flow of oil to burner, the presence of the cock on tender was not known by the engineer or the fireman; two injured.

May 24, 1942, locomotive 2755, Gerber, Calif. Employee's foot was caught between cab apron and cab running board; no guard around outer edge of running board to prevent a person's foot from going under the overhang; one injured.

June 3, 1942, locomotive 3306, near Kofa, Ariz. Brakeman's cab seat fell from elevated storage position, due to latch hole for securing the seat box to angle iron of cab wall breaking through old fracture; one injured.

June 24, 1942, locomotive 4348, Roseville, Calif. Insufficient clearance between cab vertical handhold and gangway ladder when on a sharp curve; one injured.

Seventeen accidents; 18 injured.

TENNESSEE CENTRAL RAILWAY:

May 1, 1942, locomotive 331, Nashville, Tenn. Crown-sheet failure caused by overheating due to low water; opening in bottom nipple of water glass was reduced from $\frac{1}{2}$ inch to $\frac{1}{8}$ inch in diameter by accumulation of scale; one killed, two injured.

One accident; one killed, two injured.

TEXAS & PACIFIC RAILWAY:

*November 18, 1941, locomotive 492, Shreveport, La. Water glass broke; one injured.

*December 30, 1941, locomotive 601, Mineola, Tex. Water pump was inoperative account of boiler check leaking; one injured.

**June 20, 1942, locomotive 643, Pershing, Tex. Throttle was difficult to operate due to operating cam shaft being bent and binding in housing; throttle reported very hard to operate on June 7 and 17 (two times); one injured.

Three accidents; three injured.

UNION PACIFIC RAILROAD:

August 7, 1941, locomotive 5518, Desert, Calif. Lugs securing the power reverse gear cylinder to boiler bracket broke, resulting in release of the reverse lever which struck employee; the four cast-iron lugs were porous and of poor grade material; one injured.

August 25, 1941, locomotive 808, Council Bluffs, Iowa. Reversing valve cap blew out when attempt was being made to repair air compressor; steam was trapped in compressor due to foreign matter obstructing the opening in drain cock; one injured.

September 26, 1941, locomotive 2490, Henderson, Colo. Water-column steam pipe separated from water-column connection, due to flange of joint sleeve breaking off; sleeve was not properly brazed to steam pipe and steam pipe was not belled or flanged over end of sleeve; broken surfaces of sleeve were porous and brittle and had the appearance of having been overheated; steam-pipe joint had been leaking and coupling nut was damaged by the use of hammer and chisel in tightening; one killed.

January 14, 1942, locomotive 5509, Caliente, Nev. Locomotive, tender, and first three cars of train were derailed at a right-turn cross-over switch, due to a worn flange on the left engine truck wheel and the left leg of the engine-truck radius bar being approximately $\frac{1}{16}$ inch shorter than the right leg which caused the wheel flange to crowd the rail; one injured.

Four accidents; one killed, three injured.

UTAH COPPER COMPANY:

February 21, 1942, locomotive 105, Bingham, Utah. Crown-sheet failure caused by overheating due to low water; two killed, one injured.

One accident; two killed, one injured.

VIRGINIAN RAILWAY:

July 4, 1941, locomotive 726, near Seneca, Va. Piston rod failed in crosshead fit through old fracture which extended through approximately 80 percent of cross-sectional area; one injured.

August 31, 1941, locomotive 481, Jarratt, Va. Hot driving box; apparently the box was short of grease when the locomotive was dispatched; one injured.

March 12, 1942, locomotive 481, Alberta, Va. Stoker conveyor-trough cover plates were stuck in the guides, caused by one of the cover plates being jammed on top of another plate; apparently the plates had been in this position for some time, as an additional plate had been applied to cover the opening; one injured.

Three accidents; three injured.

WABASH RAILROAD:

**November 7, 1941, locomotive 2813, North Kansas City, Mo. Excessive force required to open blower valve on account of its operating rod binding in conduit, due to dirt and grit inside of the conduit, and insufficient lubrication; "Blower operating valve handle broken off" was reported on November 2; one injured.

**December 12, 1941, locomotive 2258, Valley City, Ill. Tender separated from first car in train; coupler at rear of tender was below the prescribed standard height; one injured.

January 7, 1942, locomotive 685, Birmingham, Mo. Mechanically operated fire door became disconnected due to pin working out of piston; locking device on end of pin was defective; one injured.

**April 22, 1942, locomotive 2806, Crocker, Ind. Lubricator oil pipe union leaking due to loose union nut; one injured.

Four accidents; four injured.

WESTERN PACIFIC RAILROAD:

**June 7, 1942, locomotive 26, Elko, Nev. Washout plug blew out; attempted to tighten while under steam pressure; one injured.
One accident; one injured.

**ACCIDENTS AND CASUALTIES RESULTING FROM THE FAILURE OF
LOCOMOTIVES OTHER THAN STEAM AND THEIR APPURTENANCES
DURING THE FISCAL YEAR ENDED JUNE 30, 1942, BY ROADS**

[A double star (**) indicates accidents not properly reported, as required by rule 335. Complete investigations, 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.]

BOSTON & MAINE RAILROAD:

**November 14, 1941, unit 1181, Lawrence, Mass. Gasoline engine backfired; exhaust valve seat insert had become loose and cocked, preventing valve from seating properly; valves were reported on October 23 and November 3; one injured.

May 21, 1942, unit 1180, Portsmouth, N. H. Grease on handhold at front door of motorcar caused employee's hand to slip from the handhold, and he fell to the ground; one injured.

**May 21, 1942, unit 5006, Hoosac Tunnel, Mass. Insulation on two bus bars burned; one injured.

Three accidents; three injured.

CHICAGO, MILWAUKEE, ST. PAUL & PACIFIC RAILROAD:

February 23, 1942, unit 5929, Northern Junction, Mo. Fire occurred in engine room of gasoline-electric unit caused by backfiring due to inserted seat of intake valve dropping out of position and holding valve open; backfire traps were missing from carburetors; one injured.

One accident; one injured.

FLORIDA EAST COAST RAILWAY:

January 10, 1942, unit 1001, Fort Pierce, Fla. Employee's finger was caught in V-belt of the traction motor fan; belt was unguarded; one injured.

One accident; one injured.

MISSOURI PACIFIC RAILROAD:

**May 16, 1942, unit 7001, between Sedalia and Kansas City, Mo. Piston baffle broke in piston of No. 1 engine of Diesel-electric unit which caused the piston to overheat, resulting in an explosion in crankcase which caused the inspection covers to be blown off; one injured.

One accident; one injured.

PENNSYLVANIA RAILROAD:

**October 14, 1941, unit 4779, Baltimore, Md. Coupler broke through pin hole on shank end, due to old defect; one injured.

January 12, 1942, unit 4730, Landover, Md. Compressed-air-operated horn was inoperative; horn was defective; employee was fatally injured by coming in contact with energized pantograph while attempting to make emergency repairs to the horn while on the road; one injured.

Two accidents; two injured.

PIEDMONT & NORTHERN RAILWAY:

**January 25, 1942, unit 5601, Greenville, S. C. Pantograph did not latch down after the lowering device was operated but moved back up in contact with the overhead wire without the knowledge of the operator, and when change-over switch was pulled, under load, an arc occurred and burned the operator; one injured.

One accident; one injured.

TABLE XII.—Number of steam locomotives inspected,

found defective, and ordered from service, etc.

Parts defective, inoperative or missing, or in violation of the rules	Akron, Canton & Youngstown	Alabama, Tennessee & Northern	Albion & Southern	Alton	Ann Arbor	Atchison, Topeka & Santa Fe	Atlanta & St. Andrews Bay	Atlanta & West Point	Atlanta, Birmingham & Coast	Atlantic & East Carolina	Atlantic & Yadkin	Atlantic Coast Line
1 Air compressors		1		1		45	5					6
2 Arch tubes		1										3
3 Ashpans and mechanism						6						2
4 Axles												
5 Blow-off cocks						20						2
6 Boiler checks						11	1					3
7 Boiler shell						19						4
8 Brake equipment				6		80	8	1	7	4		35
9 Cabs, cab windows, and curtains		2		4		33						15
10 Cab aprons and docks	1			1		13	5		1	1	1	1
11 Cab cards		2				1						7
12 Coupling and uncoupling devices						2						
13 Crossheads, guides, pistons, and piston rods	4	2	2	4		28	2		2	1		15
14 Crown bolts						5						2
15 Cylinders, saddles, and steam chests	1	1		3		46	4		1	1	3	22
16 Cylinder cocks and rigging						22	4					11
17 Domes and dome caps			2	1		1	5	1	1	3		14
18 Draft gear				2		6			1	2		4
19 Draw gear				2		7			1	2		4
20 Driving boxes, shoes, wedges, pedestals, and braces	1					133	4		2			14
21 Firebox sheets						7	1					1
22 Flues				3		9				2		1
23 Frames, tail pieces, and braces, locomotive						25			1			4
24 Frames, tender						8	1					2
25 Gages and gage fittings, air				2		1	2					2
26 Gages and gage fittings, steam	4					23	1		6			9
27 Gage cocks						4	4					1
28 Grate shakers and fire doors	1			4		17			2			9
29 Handholds						3	1		1	1		11
30 Injectors, inoperative						3						1
31 Injectors and connections	1			5		79	4		3	3	3	34
32 Inspections and tests not made as required	4	9	1	1	31	304	10	3	6	20	3	128
33 Lateral motion						12			1	1		10
34 Lights, cab and classification						3	2					5
35 Lights, headlight						8	3					1
36 Lubricators and shields						7						2
37 Mud rings						12	1		1			5
38 Packing nuts						64	1					6
39 Packing, piston rod and valve stem						16	1					6
40 Pilots and pilot beams						10	1					
41 Plugs and studs						13			3			7
42 Reversing gear				1		14	1		1	1	1	18
43 Rods, main and side, crank pins, and collars	7	2		6		80	5		1	1	3	2
44 Safety valves						2						4
45 Sanders				1		29	1					4
46 Springs and spring rigging		13		2		128	13		6			42
47 Squirt hose				9		5						2
48 Stay bolts						15	2		1	5		1
49 Stay bolts, broken		9				2						7
50 Steam pipes						11	1					1
51 Steam valves				1		6	3		1	3		10
52 Steps	1					18	3		1	3		1
53 Tanks and tank valves			1			36	4		5	5		7
54 Telltale holes						2						8
55 Throttle and throttle rigging	2			1		17		1		2		15
56 Trucks, engine and trailing	2			2		37	3					11
57 Trucks, tender			1			29	5	1		3		11
58 Valve motion			1			35	2			1		13
59 Washout plugs						24						6
60 Train-control equipment												
61 Water glasses, fittings, and shields	2			3		28	1			2		12
62 Wheels	5					10	5					7
63 Miscellaneous—Signal appliances, badge plates, brakes (hand)	1	1		2		49	1	3				7
Number of defects	13	69	11	3	100	1,691	109	10	35	82	14	579
Locomotives reported	23	11	25	18	163	421,504	11	45	65	17	11	649
Locomotives inspected	72	21	51	10	404	103,415	36	73	265	60	26	1,563
Locomotives defective	4	12	2	1	34	466	19	4	12	24	3	154
Percentage of inspected found defective	6	57.3	9.10	8		10	53	5	4.5	40	12	10
Locomotives ordered out of service		2				8	2			2	1	9

Baltimore & Ohio, lines east	Baltimore & Ohio, lines west	Bangor & Aroostook	Belt Ry. of Chicago	Bessemer & Lake Erie	Boston & Maine	Camas Prairie	Cambria & Indiana	Canadian National	Canadian Pacific	Carolina & Northwestern	Central of Georgia	Central R. of New Jersey	Central Vermont	Charleston & Western Carolina	Chesapeake & Ohio	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 & Pacific
12	19			1	4		1	2			3	1	10	6	2		64			20	1	1	11
1																	3			1			2
1	4				1						2		2				14			1			3
1																	1						4
1	2				1			1			3		3				18			4	1		8
7	3				10			1	1	1	1		5				20			9	4		5
7					1			1			1		1				27			6	6	1	7
38	26			1	18			6	3	4	11	6	6	10	5	2	347			58	6		71
25	31	3		1	14			5	2	1	6	7	14	5	3	1	86			18	7	7	22
7	7				5			5			1	1	1	1	1		27			5	2		10
1											1	1	1	1	1		10			1			6
1					2			2			1	1	2				8			1			12
37	14			3	27			2			4	1	7	8			125			17	1	1	54
2	1										1	2					6			1			4
18	15			1	11			1	2	1	4	6	4	1	12	9	70			19	1	1	22
7	5				2					1	6						60			8	2	2	3
5	1				5						2	2					5			1			4
7	5			1	5				2		3	5	5				65			9	2		15
7	20				4			1	1		4	2	5	2			36			6	1		19
15	24				41			5	2		5	1	9	19			239			21			38
4	1			1	6						2	1	1				16			1	1	4	21
1					1						2	2	1	3			15			2			22
27	19				6				2		4	2	1	21	2		106			1		1	27
6	1				6						6			2			4			2			24
8	1				1						1	1		1			5			3			5
10	4				1						2	3	1	1	3		34			3	1	1	10
4	4				1						6		6				8			8			14
9	10				3						8	2	1	1			53			14	2	3	128
10	3				2						1	2	1	1			2			2			8
48	22	1		3	23			2	5	2	4	1	8	16	4	8	154			51	6	1	30
197	132	4	1	8	155	2		23	23	7	25	35	37	32	46	16	751		1	157	19	20	4731
6	9				5							3	3	1			37			5			9
3	4				1							1					4			1			3
1	2				1							4	1	2	1		14			5			12
2	4				3						1	2	2	2	1		19			4			6
17	4				3						3	3	2	2			23			1			8
19	13				4				1	2	2	2	2	5	2		28			13			12
9	11				4						4	4	1	1			72			17	4	3	14
4									3		1	1	1	4			10			3			2
6	6				7						2	3	2	2			22			2			7
23	20				14				6	2	12	1	21	28	6	3	183			34	2	3	59
2	2				1						1	1	1				6			1			14
8	5				7						10	2	8	18			54			10			31
94	45				44						7	16	18	12	2		438			42	7	9	91
3					3							1	1	2			3			5	3	1	17
6	1				3						1	1	2	9			13			1			18
8	11				1							2	2	4	2		15			2			17
3	3				2						2	5					33			4			5
7	3				1						3	1	1	1	5		35			8	5	1	13
54	38	1			8						2	7	6	5	1		104						

TABLE XII.—Number of steam locomotives inspected,

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

	Spokane, Portland & Seattle	Steelton & Highspire	Tennessee Central	Tennessee Coal, Iron & R. R.	Terminal R. R. Assn. of St. Louis	Texas & Pacific	Texas-Mexican
1 Air compressors.....	1		5		1		
2 Arch tubes.....							
3 Ashpans and mechanism.....							
4 Axles.....							
5 Blow-off cocks.....	2		1				
6 Boiler checks.....	2				2		
7 Boiler shell.....	2		3				
8 Brake equipment.....	2		10	6	2	2	
9 Cabs, cab windows, and curtains.....	13	3	2		2		
10 Cab aprons and decks.....							
11 Cab cards.....					1		
12 Coupling and uncoupling devices.....				1			
13 Crossheads, guides, pistons, and piston rods.....	1		5				
14 Crown bolts.....							
15 Cylinders, saddles, and steam chests.....	13		2		1		
16 Cylinder cocks and rigging.....							
17 Domes and dome caps.....					1		
18 Draft gear.....	4				4		
19 Draw gear.....	4						
20 Driving boxes, shoes, wedges, pedestals, and braces.....	11		2			1	
21 Firebox sheets.....	3		1		1		
22 Flues.....			2				
23 Frames, tail pieces, and braces, locomotive.....	6		2	1			
24 Frames, tender.....							
25 Gages and gage fittings, air.....				2			
26 Gages and gage fittings, steam.....							
27 Gage cocks.....	1	1	4	1	3		
28 Grate shakers and fire doors.....	5						
29 Handholds.....			1	2	1		
30 Injectors, inoperative.....	2						
31 Injectors and connections.....	6	5	2	2	2		
32 Inspections and tests not made as required.....	52	6	8	7	37	4	1
33 Lateral motion.....	4		7	8			
34 Lights, cab and classification.....							
35 Lights, headlight.....	1						
36 Lubricators and shields.....	3						
37 Mud rings.....		1					
38 Packing nuts.....			2		3		
39 Packing, piston rod and valve stem.....	5		1				
40 Pilots and pilot beams.....	1		2	1			
41 Plugs and studs.....							
42 Reversing gear.....							
43 Rods, main and side, crank pins, and collars.....	19		22	1	8		
44 Safety valves.....							
45 Sanders.....	12						
46 Springs and spring rigging.....	20		13	4	7		
47 Squirt hose.....	1						
48 Stay bolts.....	5		1		1		
49 Stay bolts, broken.....	4						
50 Steam pipes.....							
51 Steam valves.....	1		1				
52 Steps.....	7		5	1			
53 Tanks and tank valves.....					1		
54 Telltale holes.....	2						
55 Throttle and throttle rigging.....	1	1			6	2	
56 Trucks, engine and trailing.....	2		2				
57 Trucks, tender.....			3	21	1		
58 Valve motion.....	3		1				
59 Washout plugs.....	2		4		1		
60 Train-control equipment.....							
61 Water glasses, fittings, and shields.....	3		3		1	1	
62 Wheels.....			4				1
63 Miscellaneous—Signal appliances, badge plates, brakes (hand).....	4		5		1	1	
Number of defects.....	229	17	131	58	88	11	2
Locomotives reported.....	98	13	33	50	101	297	16
Locomotives inspected.....	262	41	132	17	184	634	6
Locomotives defective.....	55	7	38	8	40	4	1
Percentage of inspected found defective.....	21	17	29	47	22	.6	17
Locomotives ordered out of service.....	2		6		2		

Texas Pacific-Missouri Pacific of N. O.	Toledo, Peoria & Western	Toledo Terminal	Toronto, Hamilton & Buffalo	Union Pacific	Union R. R.	Upper Merion & Plymouth	Utah	Virginian	Wabash	Washington Terminal	Western Maryland	Western Pacific	Wheeling & Lake Erie	Roads with less than 10, and industrial locomotives	Total defects	
				35	9	1		20		1		1	2	50	829	
				1				4						4	27	
				7	1			1						13	80	
				24	3	1		3		1				17	238	
				25	1	1		4	1		1	1	4	39	6	
	4			90	30	3		28	7	2	1	1	4	215	2,388	
				67	3	11		17	2				2	105	290	
				34	1				1			2		31	33	
				6	1			15				1		32	131	
				6	1	4		1						15	70	
				46	9	6		8	3	1		2	1	63	1,277	
				2				1				1		8	77	
				106	1	1		74	1			2	6	122	1,514	
				42		9		7						49	521	
				2				1						3	115	
				47	5	6			2			1		97	651	
				10	1	1		9	3			1	1	58	369	
				86	1			48	3				2	73	1,747	
				6	4	2		2		1				29	255	
				4	2			1						32	178	
				56		2		14				2	1	43	869	
				4				1						6	86	
				23	3			5						18	198	
				15				5				1		19	268	
				20	4	2		5					2	53	497	
				48	2	2		4		1				19	491	
				48	5	1		3	1			2		68	378	
				1										2	47	
				143	24	5		12	2	3			1	166	2,220	
				400	23	39		102	19	5	5	13	14	550	8,180	
				35	1			14	2					35	498	
				5										6	131	
				5				9		1				28	218	
				9	1								1	7	234	
				11				3				1		24	244	
				30	3	2				1				69	689	
				47	7	3		36	6				8	106	738	
				20				3	1			1		20	188	
				5					1					7	173	
				20	1			21				1		21	411	
				55	19	15		26	2			1	3	167	1,986	
				8				1		1				1	67	
				52	3			4						44	738	
				246	8	10		100	3				5	214	3,349	
				1	3			1						8	67	
				13	4	1		2	1	1				18	272	
				17										91	274	
				16	1			7						34	290	
				4				4	1					3	150	
				21	3	9		12						112	594	
				57	8	1		10	1			3	1	90	1,150	
				6		2								32	79	
				32	4	5		3			1		3	71	786	
				50				20	1					58	833	
				35				5		1				115	786	
	1			19		1		18	1					43	779	
	2			25				8			1		2	28	569	
															7	
				82	9	4		7	2			2	1	98	1,133	
				29	4	1			3				3	102	664	
				98				10	3		2			38	970	
	22	6						702	72	21	15	61	68	3,697	44,928	
	12	16	20	13	1,433	123	10	14	103	400	22	228	165	151	1,682	42,951
	22	33	29	2	4,566	209	99	47	291	991	33	912	521	386	3,199	113,451
	5	3			503	41	39		115	25	6	5	42	18	730	10,970
	23	9			11	20	39		40	2.5	18	.5	8	4.7	23	10
					10	3	6		11	3				69	474	

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

Road	Percentage inspected defective ¹							Ordered out of service						
	1942	1941	1931	1929	1927	1925	1923	1942	1941	1931	1929	1927	1925	1923
Aron, Canton & Youngstown	6	3.2	14	47	42	56	38	0	1	1	12	1	5	0
Bahama, Tennessee & Northern	57	37						2	0					
Big Rapids & Southern	3.9	12	0	31	26	69	0	0	1	0	0	0	0	0
Chattanooga & Southern	10	26						0	0					
Chattanooga	8	8	0	3	14	35	75	0	3	0	3	5	9	29
Chattanooga, Topeka & Santa Fe	10	9	8	14	24	32	49	8	8	9	14	40	30	84
Chattanooga & St. Andrews Bay	53	17						2						
Chattanooga & West Point	5	0	4	6	9	23	27	0	0	0	1	4	1	
Chattanooga, Birmingham & Coast	4.5	7	4.3	27	40	54	78	0	1	0	2	8	12	6
Chattanooga & East Carolina	40	23						2	1					
Chattanooga & Yadin	12	11	6	10	16	100		1	0	0	1	0	0	
Chattanooga Coast Line	10	8	14	10	30	35	58	9	5	7	2	4	15	45
Chattanooga & Ohio, lines east	6	11	4.1	15	30	52	62	7	21	3	10	32	113	153
Chattanooga & Ohio, lines west	7	9	4.7	17	49			8	13	8	17	72		
Chattanooga & Aroostook	3.3	4.3	5	31	43	28	50	0	0	1	4	3	1	6
Chattanooga Railway of Chicago	2.9	20	4.3	35	54	51	66	0	0	0	4	5	4	6
Chattanooga & Lake Erie	3.7	8	12	22	21	63	43	0	2	1	6	1	2	
Chattanooga & Maine	13	11	13	16	23	36	67	1	3	6	3	13	23	191
Chattanooga Prairie	6	0	47	16				0	0	0	0			
Chattanooga & Indiana	2.6	0						0	0					
Chattanooga National	13	13	37	34	50	50	84	1	2	5	7	30	24	4
Chattanooga Pacific	15	16	25	32	44	56	76	0	1	2	1	4	0	5
Chattanooga & Northwestern	21	13						0	0					
Chattanooga of Georgia	9	10	20	19	30	37	33	3	2	10	5	10	8	10
Chattanooga Railroad of New Jersey	4.6	6	13	42	38	47	77	0	1	2	14	20	46	139
Chattanooga Vermont	19	13	11	12	11	27	47	2	3	1	1	1	2	4
Chattanooga & Western Carolina	28	32	16	28	58	63	68	5	3	1	2	2	2	1
Chattanooga & Ohio	3	2.6	9	17	28	49	68	0	1	5	5	26	29	58
Chattanooga & Eastern Illinois	4.4	4.6	12	28	38	64	75	1	0	3	3	25	31	77
Chattanooga & Illinois Midland	2.9	3.2	0	14	83			0	0	0	0	29		
Chattanooga & North Western	25	20	7	12	19	35	67	47	27	5	8	18	29	193
Chattanooga & Western Indiana	3.5	19	25	43	22	86	67	0	1	0	3	0	2	0
Chattanooga, Burlington & Quincy	6	6	6	14	21	46	60	6	3	4	18	39	185	176
Chattanooga Great Western	4.7	7	26	11	20	40	52	1	0	23	2	10	10	20
Chattanooga, Indianapolis & Louisville	9	22	11	26	29	45	57	1	14	1	2	14	7	13
Chattanooga, Milwaukee, St Paul & Pacific	9	6	4.5	9	13	27	48	7	0	2	5	9	12	58
Chattanooga River & Indiana	0	0	0	5	0	70	62	0	0	0	0	0	5	0
Chattanooga, Rock Island & Pacific	21	16	11	17	29	55	76	15	22	17	13	49	124	367
Chattanooga, St. Paul, Minneapolis & Omaha	14	11	9	17	30	46	70	1	2	2	6	12	20	54
Chattanooga, West Pullman & Southern	6	14	7	47	53	100	58	0	0	0	5	1	7	0
Chattanooga Cincinnati Union Terminal	10	18						0	0					
Chattanooga Cincinnati	33	23	9	38	25	76	68	13	8	1	5	0	1	10
Chattanooga Colorado & Southern	25	2.7	8	43	40	76	81	4	0	2	10	4	52	71
Chattanooga Colorado & Wyoming	7	6	0	21	27	15	14	0	0	0	1	3	2	0
Chattanooga Columbus & Greenville	28	40	17	25	21	26	44	3	8	1	0	0	0	0
Chattanooga Conemaugh & Black Lick	4.4	13	16	58	0	0		0	3	0	2	0	0	
Chattanooga Copper Range	0	0	18	28	84	59	75	0	0	1	1	7	7	0
Chattanooga Cumberland & Pennsylvania	8	30	12	29	13	20	25	0	1	0	1	0	0	0
Chattanoogaavenport, Rock Island & N. W.	10							0						
Chattanooga Delaware & Hudson	6	6	2.7	2.6	9	24	62	0	2	0	0	1	2	52
Chattanooga Delaware, Lackawanna & Western	10	13	11	21	22	36	62	13	18	3	17	4	3	47
Chattanooga Denver & Rio Grande Western	2.4	.5	10	36	54	58	92	0	0	7	32	88	72	174
Chattanooga Denver & Salt Lake	0	0	0	19	44	68	93	0	0	0	2	7	39	8
Chattanooga Detroit & Mackinac	23	19	41	33	36	82	26	0	0	0	0	0	2	0
Chattanooga Detroit & Toledo Shore Line	5	0	0	8	33	51	78	0	0	0	0	1	5	3
Chattanooga Detroit Terminal	21	24	18	31	46	72	76	0	0	0	1	0	7	0
Chattanooga Detroit, Toledo & Ironton	1.7	1.3	3.8	5	15	28	29	0	0	0	0	3	4	7
Chattanooga Donora Southern	24	21	5	0	0	0	0	0	2	0	0	0	0	0
Chattanooga Duluth, Missabe & Iron Range	0	4.6	4.2	1	12	37	74	0	1	0	0	0	1	2
Chattanooga Duluth, South Shore & Atlantic	16	7	10	24	29	35	69	0	1	4	2	5	3	
Chattanooga Elgin, Joliet & Eastern	10	8	.7	4.7	13	68	50	0	1	0	0	1	58	1
Chattanooga Erie	8	9	13	45	30	39	70	6	10	17	137	41	26	100
Chattanooga Florida East Coast	10	12	1.4	7	21	22	22	1	1	0	0	0	0	0
Chattanooga Fort Worth & Denver City	23	13	5	13	23	36	27	1	2	2	2	3	8	4
Chattanooga Georgia & Florida	15	21	57	47	55	62	46	2	1	5	2	2	3	1
Chattanooga Georgia	3.7	1.3	1.1	11	12	34	28	2	0	0	3	0	2	5
Chattanooga Grand Trunk Western	4	4.6	7	28				2	1	0	4			26
Chattanooga Great Northern	13	9	8	31	33	46	76	7	3	5	42	27	31	262
Chattanooga Green Bay & Western	3.6	6	13	45	47	67	59	0	1	2	1	1	9	0
Chattanooga Gulf Coast Lines	3.5	1.7	1	7	58	59	70	1	0	0	0	15	26	7
Chattanooga Gulf, Colorado & Santa Fe	6	7	7	19	47	45		1	1	3	6	31	32	

¹ Fractional percentages not shown unless percent defective is less than 5, otherwise nearest whole number given.

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

Road	Percentage inspected defective							Ordered out of service						
	1942	1941	1931	1929	1927	1925	1923	1942	1941	1931	1929	1927	1925	1923
Gulf, Mobile & Ohio	16	13						6	2					
Houston Belt & Terminal	3.1	0	1.4	8				0	0	0	0			
Illinois Central	2.9	2.6	12	10	14	30	43	1	1	22	14	35	30	48
Illinois Terminal	0	2.9	32	29	40	12		0	0	4	1	0	0	
Indiana Harbor Belt	3.2	3	0	1	14	52	68	0	1	0	0	0	18	4
Indianapolis Union	0	0	14	13	30	26	36	0	0	1	0	4	0	2
International-Grand Northern	1.4	7	7	5	27	29	66	1	2	1	0	11	9	16
Interstate	26	35	42	60	83	94	78	2	4	1	4	6	6	3
Jacksonville Terminal	0	0	0	50	0			0	0	0	0	0		
Kansas City Southern	14	17	1.9	8	26	52	92	5	7	0	1	12	11	121
Kansas City Terminal	17	27	0	24	24	80	88	1	1	0	0	0	0	3
Kansas, Oklahoma & Gulf	9	4.5	1.3	1	43	50	0	0	0	0	1	1	0	10
Kentucky & Indiana Terminal	6	12	3.7	8	6	0	79	0	0	0	0	1	0	10
Lake Superior & Ishpeming	0	0	17	52	39	46	59	0	0	1	7	1	2	3
Lake Superior Terminal & Transfer	4.3	2.9	0	10	21	44	67	1	0	0	0	0	1	2
Lake Terminal	2.1	0	10	56	20	50	0	0	0	1	1	0	0	0
Lehigh & Hudson River	1.4	7	14	25	20	14	60	0	0	0	1	0	1	0
Lehigh & New England	6	8	12	21	26	65	70	0	0	0	4	2	5	10
Lehigh Valley	12	8	10	39	26	36	71	4	3	8	42	14	26	219
Long Island	1.8	2	10	59	48	35	66	0	0	0	2	3	1	10
Louisiana & Arkansas	4.2	6	15					1	0	3				
Louisville & Nashville	8	6	9	33	41	57	68	10	6	6	32	54	94	136
McCloud River	0	0	0	29	25	63	46	0	0	0	0	0	0	0
McKeesport Connecting	0	2						0	0					
Macon, Dublin & Savannah	10	6						0	0					
Maine Central	7	10	12	27	42	41	68	1	1	4	1	6	14	15
Maryland & Pennsylvania	23	30	24	42	50	85	58	1	1	0	3	3	4	4
Midland Terminal	2.6							0						
Midland Valley	12	2	0	1	42	40	72	0	0	0	0	1	2	0
Minneapolis & St. Louis	9	12	7	9	17	35	57	4	0	2	1	7	6	49
Minneapolis, St. Paul & Sault Ste. Marie	12	7	6	14	13	25	60	2	1	0	5	2	4	14
Minnesota Transfer	44	11	31	32	71	67	97	0	0	1	0	8	1	35
Mississippi Central	16	10	12	14	32	32	59	0	0	0	1	2	4	3
Missouri & Arkansas	50	48	68	72	92	91	100	2	9	8	8	17	12	22
Missouri-Illinois	0	1.8	0					0	0					
Missouri-Kansas-Texas	6	7	3.5	1	13	42	91	2	2	0	0	6	22	286
Missouri Pacific	4.2	4.7	3.5	9	20	50	89	3	4	2	6	24	131	393
Monongahela Connecting	2.2	2.6	29	31	53	43	14	0	1	1	3	5	0	0
Monongahela	2.7	7	0	8	16	9	0	0	0	0	0	1	1	0
Montour	1.8	6	0	0	0	0	0	1	0					

ANNUAL REPORT OF THE DIRECTOR

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

Road	Percentage inspected defective						Ordered out of service							
	1942	1941	1931	1929	1927	1925	1923	1942	1941	1931	1929	1927	1925	1923
Louis-San Francisco.....	4	3.5	3.9	14	22	49	88	3	2	1	7	12	65	346
Louis Southwestern.....	7	7	8	4.3	22	47	86	1	2	4	2	22	14	54
Savannah & Atlanta.....	7	6	19	80	67	73	68	0	1	0	0	0	2	3
Seaboard Air Line.....	8	7	9	37	56	51	55	3	9	2	24	43	33	23
South Buffalo.....	0	16	39	23	29	75	0	0	0	8	0	1	0	0
Southern Pacific, lines east.....	1.9	1.5	3.3	5	13	30	47	0	0	1	3	10	37	28
Southern Pacific, lines west.....	13	10	11	24	27	33	38	17	12	13	47	50	51	24
Southern Pacific of Mexico.....	—	79	0	30	100	100	—	—	7	0	2	3	—	—
Southern.....	7	7	9	12	24	36	59	16	12	15	13	38	56	177
Spokane International.....	24	0	9	13	28	0	37	0	0	0	0	0	0	2
Spokane, Portland & Seattle.....	21	5	22	22	33	32	60	2	1	1	1	2	4	13
St. Louis & Highspire.....	17	19	19	24	48	—	—	0	0	1	0	2	—	—
Tennessee Central.....	29	23	14	47	65	74	89	6	4	0	14	40	23	63
Tennessee Coal, Iron & Railroad.....	47	23	7	38	67	40	50	0	0	0	0	0	0	0
Terminal R. R. Assn. of St. Louis.....	22	22	32	41	44	62	76	2	4	4	0	3	1	6
Texas & Pacific.....	.6	.9	0	1	12	16	62	0	0	0	1	3	1	91
Texas-Mexican.....	17	0	27	43	50	33	50	0	0	0	0	1	0	1
Texas Pacific-Missouri Pacific of New Orleans.....	23	17	0	4	10	57	83	0	0	0	0	0	2	0
Toledo, Peoria & Western.....	9	0	25	65	88	87	93	0	0	2	4	7	2	4
Toledo Terminal.....	0	11	5	45	35	3	41	0	0	0	0	0	0	3
Toronto, Hamilton & Buffalo.....	0	0	0	0	0	—	—	0	0	0	0	0	0	—
Union Pacific.....	11	13	9	17	20	30	41	10	17	2	8	17	19	26
Union.....	20	23	11	9	29	80	10	3	4	1	2	0	0	2
Upper Merion & Plymouth.....	39	36	28	60	62	—	—	6	11	0	7	8	—	—
Utah.....	0	0	0	11	4	26	19	0	0	0	0	0	0	0
Virginian.....	40	43	17	22	50	58	75	11	13	1	0	2	5	45
Washington.....	2.5	2.3	0	1.5	6	47	82	3	2	0	1	2	21	89
Washington Terminal.....	18	33	0	10	43	40	89	0	0	0	0	1	1	2
Western Maryland.....	.5	1.9	13	26	42	54	76	0	0	1	3	13	22	90
Western Pacific.....	8	10	16	25	19	36	37	0	0	5	9	1	13	9
Wheeling & Lake Erie.....	4.6	7	8	42	55	67	74	0	3	1	7	10	20	31
Less than 10, discontinued roads and industrial locomotives.....	23	21	32	40	51	56	56	69	105	279	415	758	826	638
All roads.....	10	9	10	21	31	46	65	474	560	688	1,487	2,535	3,637	7,075

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