

INTERSTATE COMMERCE COMMISSION

FIFTH ANNUAL REPORT
OF THE
CHIEF INSPECTOR OF LOCOMOTIVE
BOILERS

TO THE
INTERSTATE COMMERCE COMMISSION

For the FISCAL YEAR
ENDED JUNE 30, 1916



WASHINGTON
GOVERNMENT PRINTING OFFICE
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ANNUAL REPORT OF THE CHIEF INSPECTOR OF LOCOMOTIVE BOILERS.

WASHINGTON, October 9, 1916.

To the Interstate Commerce Commission:

In compliance with the statute, the fifth annual report of the Chief Inspector of Locomotive Boilers for the fiscal year ended June 30, 1916, is herewith respectfully submitted.

During the year the work of this division has been materially changed and increased by the act of March 4, 1915 (Public, No. 318, 63d Cong.), amending the locomotive boiler inspection law by making its provisions apply to and include the entire locomotive and tender and all parts and appurtenances thereof, which has presented additional important problems for consideration.

Before a reasonable and effective administration of the law could be inaugurated, rules and instructions covering the additional requirements imposed by the amended act had to be established as provided in section 5 of the locomotive boiler inspection law.

At the expiration of the period provided by the law for filing with the Chief Inspector rules and instructions for the inspection of locomotives and tenders, a committee representing the carriers filed a proposed code as a basis for discussion only and expressed a desire that the Chief Inspector prepare a suitable code of rules as provided in section 5 of the law, to be submitted to the Commission for approval.

In accordance therewith rules and instructions for the inspection of locomotives and tenders were prepared under the direction of the Chief Inspector, and following the usual custom conferences with representatives of the railroads and representatives of the employees were initiated, at which the rules thus prepared were discussed and later submitted to the Commission for approval.

The enforcement of these rules required no material change in the form of our organization as originally established; the districts were already arranged, headquarters fixed, and inspectors assigned under the boiler inspection law, so that we could proceed with the administration of the law with comparatively little delay or expense.

It did, however, cause a substantial increase in the work of the inspectors, which is reflected by the number of locomotives inspected

during the year. This is due to the additional parts of the equipment which must be inspected and to the increased number of accidents which must be investigated that were not covered by the original act. Much of what might be termed educational work has also been performed, so that railroad inspectors and officials might have a correct and uniform understanding of the requirements.

Checking and recording reports, transcribing and transmitting to railroad companies defective or improper conditions reported by our inspectors, with necessary correspondence in connection therewith, has similarly increased the office work of this division.

These matters are all being taken care of in their turn, and the administration of the complete locomotive inspection law is being diligently and carefully worked out in a way that avoids expense to the carriers except that which is necessary to properly maintain their locomotives.

Section 2 of the amended act also provides that all inspectors and applicants for the position of inspector shall be examined touching their qualifications and fitness with respect to the additional duties imposed by this act.

Such examinations were conducted by the United States Civil Service Commission, as provided by the law, and it is gratifying to state that all inspectors employed by this division passed a very creditable examination.

A detailed statement of all accidents resulting from failure of locomotive boilers and their appurtenances which occurred during the year and of all accidents resulting from failure of any part of locomotives or tenders which occurred since the law became effective is given in this report.

As the work of this division now embraces the entire locomotive and tender and all parts and appurtenances thereof, it has been found necessary to make our tabulation of accidents, injuries, and defects found conform thereto, so that no practical basis exists upon which the comparative tables of accidents as shown in former reports can be continued.

A summary of the tabulated data contained herein for the fiscal year ended June 30, 1916, which includes inspections of all parts of locomotives or tenders and accidents resulting from failure thereof since the amendment became effective, follows:

Number of locomotives inspected.....	52, 650
Number found defective.....	24, 685
Percentage found defective.....	47
Number ordered out of service for repairs.....	1, 943
Number of accidents.....	537
Number killed.....	38
Number injured.....	599

The following table shows the total number of persons killed and injured by failure of locomotive boilers or their appurtenances during the year ended June 30, 1916, and by failure of any part of locomotives or tenders since the amendment became effective, classified in accordance with their occupations:

	Killed.	Injured.
Members of train crews:		
Engineers.....	11	205
Firemen.....	12	225
Brakemen.....	9	74
Conductors.....	1	6
Switchmen.....		6
Roundhouse and shop employees:		
Boiler makers.....	1	11
Machinists.....	1	11
Foremen.....	1	3
Inspectors.....		3
Watchmen.....		8
Boiler washers.....		10
Hostlers.....		6
Other roundhouse and shop employees.....	1	21
Other employees.....		7
Nonemployees.....	1	3
Total.....	38	599

Briefly summarizing the accidents and casualties resulting therefrom caused by failure of locomotive boilers and their appurtenances only, for the purpose of comparison it shows that there were 352 such accidents, with 29 killed and 407 injured thereby. This is a decrease over the preceding year in the number of accidents and in the number of casualties, but an increase in the number killed. This increase in the number of fatalities is due almost entirely to one single class of accidents, viz., crown sheet failures due to low water where contributory causes or defects were found, and forcibly emphasizes the importance of properly maintaining water gauges and boiler feeding appurtenances.

It is true that during the period covered by this report unprecedented traffic conditions existed and every available locomotive was pressed into service. Our records show that more than 6,000 locomotives, which were in storage the preceding year, were in use during the year covered by this report under service conditions which in some instances perhaps has made proper maintenance difficult. This, however, is not a justification for any carrier operating a locomotive in a condition that adversely affects the safety of employees and travelers, and our efforts, using all the means provided by the law, will be diligently exercised to prevent it.

A total of 653 applications for extension of time for removal of flues, as provided in rule 10, were filed during the year ended June 30, 1916. Our investigation disclosed 103 of the locomotives in such condition that no extension could properly be granted; on 79 locomotives the conditions were such that the full extension asked for

could not be granted, but an extension for a shorter period was allowed. Sixty-three extensions were granted after defects disclosed by our inspections had been repaired; 43 applications were withdrawn. The remaining 365 were granted as requested.

Attention was directed in my fourth annual report to the practice of filing applications for extension of time for removal of flues from locomotives which upon inspection were found to be defective, which showed that the railroad companies' inspectors had not made a proper effort to discover the defective conditions that existed.

During the fiscal year covered by this report there was a decrease of 41 per cent in the number of applications for extension of time for removal of flues, which indicates that more careful inspections are being made by the carriers before filing applications for such extension.

The order of the Commission of June 9, 1914, fixing the minimum factor of safety for old locomotive boilers, requires all such boilers to be brought up to the established standard within certain definite periods, those with the lowest factors being taken care of first.

Alteration reports filed as required by rule 54 gives us a complete check on this work and indicates that, with a few exceptions, satisfactory progress is being made by the carriers in complying with the requirements and that all boilers will be brought up to the established standard within the limits set.

The alteration reports also disclose instances where improper repairs are made before failure occurs and have brought about practically standard methods of repairing defects which affect the factor of safety.

No formal appeal from the decision of inspectors, as provided in section 6 of the law, has been filed during the year. What might be termed a general appeal, covering a number of cases, was filed by the receiver of the Missouri, Oklahoma & Gulf Railroad. The only specific actions referred to in the appeal were that inspectors had cracked a cylinder by applying the brakes and operating the reverse lever backward and forward while locomotive was standing, and that in another instance they tied up a locomotive on account of loose tire. In spite of the absurdity of the charge of cracking a cylinder in the manner described, it was investigated and it was found that such information had actually been given to the receiver by the master mechanic and traveling engineer, which caused him to file the appeal. Investigation disclosed the fact that the cylinder in question had been cracked and banded for more than four months and was leaking badly at the time the locomotive was ordered out of service. In the case of the loose tire, it was shown to have been so loose that repairs were made by applying a Russia iron shim entirely around the wheel

center. The investigation showed that the appeal was based on incorrect information given by the mechanical department and that the action of the inspectors was fully in accord with the law; therefore, it was sustained.

It is only fair to state that a large majority of the carriers are diligent in their efforts to comply with the requirements of the law and are sincerely cooperating with us with that end in view, and in such cases the beneficial results are particularly noticeable.

A few carriers have attempted to place the burden of inspecting their locomotives upon us by continuing to use defective equipment until it found and ordered out of service by a Government inspector, which has resulted, in some instances, in considerable inconvenience to shippers. While this is to be regretted and is avoided as far as possible, we can not permit it to influence our action where we find evidence of a disposition on the part of railroad officials to use locomotives that are defective and in violation of the law.

FRANK McMANAMY,
Chief Inspector.

Accidents and casualties resulting from failures of locomotive boilers or their appurtenances during the year ended June 30, 1916, and by failures of any part of locomotives or tenders since the amendment became effective.

Part or appurtenance which caused accident.	Year ended June 30, 1916.		
	Acci- dents.	Killed.	Injured.
Air reservoirs.....	6		9
Aprons.....	2		2
Arch tubes.....	5		7
Ashpan blowers.....	4	1	4
Axles.....	4	1	4
Blowoff cocks.....	19		20
Boiler checks.....	8		9
Boiler explosions:			
A. Shell explosions.....			
B. Crown sheet; low water; no contributory causes found.....	23	7	38
C. Crown sheet; low water; contributory causes or defects found.....	16	13	21
D. Firebox; defective staybolts, crown stays or sheets.....	1		3
E. Firebox; water foaming.....	1		2
Brakes and brake rigging.....	4	1	6
Couplers.....	4		7
Crank pins, collars, etc.....	8		9
Crossheads and guides.....	3		4
Cylinder cock rigging.....	1		1
Cylinder heads.....	1		1
Dome caps.....	1	1	2
Draft appliances.....	1		2
Draw gear.....	22	2	21
Fire doors, levers, etc.....	2		2
Flues.....	37		46
Flue pockets.....	1		2
Footboards.....	2		2
Gauge cocks.....	1		1
Grease cups.....	3		3
Grate shakers.....	23		23
Handholds.....	4	1	3
Headlights and brackets.....	6		7
Injectors and connection (not including injector steam pipes).....	27		28
Injector steam pipes.....	11		14
Lubricators and connections.....	13		13
Lubricator glasses.....	11		11
Patch bolts.....	2		3
Pistons and piston rods.....	5	1	4
Plugs (arch tube and washout).....	17	2	22
Plugs in firebox sheets.....	3		3
Reversing gear.....	38		38
Rivets.....	4		4
Rods (main and side).....	15	1	16
Safety valves.....	1		1
Sanders.....	1		1
Side bearings.....	1		1
Springs and spring rigging.....	8	2	7
Squirt hose.....	62	1	61
Staybolts.....	1		1
Steam piping and blowers.....	16		22
Steam valves (inside and outside of cab).....	10	1	13
Studs.....	10	2	8
Superheater tubes.....	3		4
Throttle glands.....	1		1
Throttle leaking.....	1		1
Throttle rigging.....	5	1	4
Valve gear, eccentrics and rods.....	7		7
Water bars.....	1		1
Water glasses.....	29		29
Water glass fittings.....	7		7
Miscellaneous.....	14		15
Total.....	537	38	599

Tables showing number of locomotives inspected, found defective,

[The ownership is generally in a railroad corporation and the abbreviation for railroad or railway

	Ala. Great Southern.	Ala., Tenn. & North-ern.	Alger-Sullivan Lmbr. Co.	Aliquippa & South-ern.	Ann Arbor.	Arizona Eastern.	Atch., Top. & Santa Fe.	Atlanta & West Point.
1 Air compressors.....						3	8	
2 Arch tubes.....							14	
3 Ash pans or mechanism.....								
4 Axles.....								
5 Blow-off cocks.....	5				6		68	
6 Boiler checks.....	5				1		9	
7 Boiler shell.....	5					2	72	
8 Brake equipment.....							82	
9 Cabs or cab windows.....	5						6	
10 Cab aprons or decks.....					1	1	7	
11 Cab cards.....	1	1					46	
12 Coupling or uncoupling devices.....	2				1	1	9	
13 Crossheads, guides, pistons or piston rods.....	1	1					6	
14 Crown bolts.....	1						12	
15 Cylinders, saddles, or steam chests.....					1		44	
16 Cylinder cocks or rigging.....	1						13	
17 Domes or dome caps.....							8	
18 Draft gear.....							87	
19 Draw gear.....	1				1	2	12	
20 Driving boxes, shoes, wedges, pedestals, or braces.....						6	53	
21 Firebox sheets.....						4	16	
22 Flues.....	1					1	16	
23 Frames, tail pieces or braces, locomotive.....							16	1
24 Frames, tender.....							9	
25 Gauges or gauge fittings, air.....							46	
26 Gauges or gauge fittings, steam.....	1	2			2		75	2
27 Gauge cocks.....	2	2	1				7	
28 Grate shakers.....							7	
29 Handholds.....	3					1	7	
30 Injectors inoperative.....							7	
31 Injectors and connections.....	11	4		1	3	2	294	1
32 Inspections or tests not made as required.....	2						83	
33 Lateral motion.....							17	1
34 Lights, cab or classification.....							17	
35 Lights, headlights.....							6	
36 Lubricator or shields.....							15	
37 Mud rings.....	1				2		64	
38 Packing nuts.....				1			17	
39 Pilot or pilot beams.....		1			3	2	6	
40 Plugs or studs.....	2						1	
41 Reversing gear.....							8	
42 Rods, main or side, crank pins or collars.....	2	1					169	
43 Safety valves.....							34	
44 Sanders.....							43	
45 Springs or spring rigging.....	6	2				5	31	
46 Squirt hose.....							31	
47 Staybolts.....	1					3	32	
48 Staybolts broken.....	13						30	
49 Steam pipes.....						1	108	8
50 Steam valves.....	1						25	
51 Steps.....				1			7	
52 Tanks or tank valves.....						5	69	
53 Telltale holes.....	1	1					26	
54 Throttle or throttle rigging.....							5	
55 Trucks, engine or trailing.....							6	1
56 Trucks, tender.....	3						3	
57 Valve motion.....	1				1	3	44	
58 Washout plugs.....	5						1	
59 Water bar or combustion flues.....					1	1	87	
60 Water glass, fittings or shield.....	5	1	1	1		2	75	1
61 Wheels.....		2			1		26	
62 Miscellaneous—Signal appliance, badge plates, brakes (hand).....							4	
Number of defects.....	85	18	2	4	24	61	1,975	15
Locomotives reported.....	91	23	14	10	44	42	1,745	44
Locomotives inspected.....	85	8	3	10	35	44	457	43
Locomotives defective.....	42	7	1	1	12	17	266	10
Percentage inspected found defective.....	49	88	33	10	34	39	49	23
Locomotives ordered from service.....	4	2			2	2	19	1

and ordered from service; and number and kind of defects.

is omitted in most cases. In designating other corporations the abbreviation "Co." is added.]

	Atlanta, Birm. & Atl.	Atlantic City.	Atlantic Coast Line.	Baltimore & Ohio.	Balt., Chesapeake & Atl.	Bangor & Aroostook.	Belt Ry. of Chicago.	Bessemer & Lake Erie.	Bingham & Garfield.	Birmingham South-ern.	Boston & Albany.	Boston & Maine.	Boyer City, Gay. & Alp.	Brooklyn East. Dist. Tern.	Buffalo & Susque-hanna.	Buffalo Creek.	Buffalo, Roch. & Pitts.	Butte, Anaconda & Pac.	Canadian Northern.	Canadian Pacific.	Carnegie Steel Co.	
1	3		4	5											3							1
2				23																		2
3			1	1								3										3
4				1																		4
5				1																		5
6				1																		6
7				1																		7
8				1																		8
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67				1																		67
68				1																		68
69				1																		69
70				1																		70
71				1																		71
72				1																		72
73				1																		73
74				1																		74
75				1																		

Tables showing number of locomotives inspected, found

Parts defective, inoperative, or missing, or in violation of rules.		Carolina & North Wn.	Carolina, Clinch, & Ohio.	Central Indiana.	Central New England.	Central of Georgia.	Central R. R. of N. J.	Central Vermont.	Charleston & W. Carolina.	Charlotte, Harbor & Nn.
1	Air compressors.....									
2	Arch tubes.....									
3	Ash pans or mechanism.....									
4	Axles.....									
5	Blow-off cocks.....		9				6			
6	Boiler checks.....		6		2		1		1	
7	Boiler shell.....					1				
8	Brake equipment.....		9		23	1	2		2	
9	Cabs or cab windows.....				2				6	
10	Cab aprons or decks.....									
11	Cab cards.....		1		2					
12	Coupling or uncoupling devices.....		1			2				
13	Crossheads, guides, pistons, or piston rods.....					1			1	
14	Crown bolts.....				5			2		
15	Cylinders, saddles, or steam chests.....					2			2	
16	Cylinder cocks or rigging.....	4	4		5		14		3	
17	Domes or dome caps.....				2					
18	Draft gear.....				1		3		1	
19	Draw gear.....				3			1		
20	Driving boxes, shoes, wedges, pedestals, or braces.....		2		3		3		1	
21	Firebox sheets.....		3	2	4					
22	Flues.....		3		11		7			
23	Frames, tail pieces or braces, locomotive.....		3		6		3			1
24	Frames, tender.....				1				4	
25	Gauges or gauge fittings, air.....						3		2	
26	Gauges or gauge fittings, steam.....		2		1					
27	Gauge cocks.....		10		20		5		2	
28	Grate shakers.....								1	
29	Handholds.....									
30	Injectors inoperative.....						1			
31	Injectors and connections.....		9		23	6	10	3	4	
32	Inspections or tests not made as required.....									
33	Lateral motion.....				5		1		3	
34	Lights, cab or classification.....								1	
35	Lights, headlights.....									
36	Lubricator or shields.....									
37	Mud rings.....		2		28		5		3	
38	Packing nuts.....		12		6		32		4	
39	Pilot or pilot beams.....				1		1			1
40	Plugs or studs.....				2		1			
41	Reversing gear.....									
42	Ro's, main or side, crank pins, or collars.....		1		10		1		3	
43	Safety valves.....		1				1			
44	San'ers.....						3			1
45	Springs or spring rigging.....		7		2		1		2	
46	Squirt hose.....		2		1		1		1	
47	Staybolts.....		2		3		1		2	
48	Staybolts broken.....	2	43		61		10		26	17
49	Steam pipes.....				1		1			2
50	Steam valves.....		2		4				1	
51	Steps.....		1						1	
52	Tanks or tank valves.....						1			
53	Telltale holes.....	1	4		2		2			
54	Throttle or throttle rigging.....				2					
55	Trucks, engine or trailing.....		2						6	4
56	Trucks, tender.....		3		2		2		6	4
57	Valve motion.....									
58	Washout plugs.....		4		9		4		1	1
59	Water bar or combustion flues.....						1		1	2
60	Water glass, fittings or shield.....		4		11		1		1	2
61	Wheels.....		1		2		6		2	1
62	Miscellaneous—Signal appliance, badge plates, brakes (hand).....		1				1			1
Number of defects.....		7	151	2	271	22	130	71	50	3
Locomotives reported.....		14	57	12	79	308	526	100	60	13
Locomotives inspected.....		15	41	6	184	215	230	99	99	17
Locomotives defective.....		3	33	1	97	17	68	45	28	3
Percentage inspected found defective.....		20	80	17	53	8	30	46	28	18
Locomotives ordered from service.....			2		31		4		1	

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

Chesapeake & Ohio.	Ches. & Ohio of Indiana.	Chicago & Alton.	Chicago & Eastern Ill.	Chicago & Northwest-ern.	Chicago & Western Ind.	Chicago, Burl. & Quincy.	Chicago Great Western.	Chicago, Indpls. & La. Ville.	Chicago Junction.	Chicago, Mil. & Gary.	Chicago, Mil. & St. Paul.	Chicago, Peoria & St. L.	Chicago, Rock I. & Gulf.	Chicago, Rock I. & Pac.	Chicago, St. P., M. & O.	Chicago, T. H. & SE.	Chicago, W. Pull. & Sou.	Cin., Ham. & Dayton.	Cin., Indianapolis & W.		
3		2		1		3		4			6		5		1				1		
3				11		1		3			26			34	2				2		
				1							1			6							
	4	9	4	28	1	12	8	3	2		48	1	5	84	6			10	5		
20	3	19	5	4	4	12	1	1			20	3	4	63	2			6	1		
11	3	12	5	32	4	29	3	1			69	6	9	141	16			24	7		
17	3	50	13	33		86	4	1			59	9	9	141	9	2		38	8		
4		5	3	6		7	7	1			7	1	1	7	1			1	9		
18				5		44	5	5			17	1	3	20				4	10		
7		11	4	14		3	3	7	3		26	1	1	42	1			3	11		
10				4		6	4				6	2	1	14				2	12		
7		16	1	6		13	3	2			18	3	1	49	8			2	13		
9	2	1	1	11		9	1	2			8	2	5	64	3			9	14		
313	4	68	8	85		93	15	2			204	6	5	648	22	1		33	15		
				1		8								7					16		
4		4		8		6					12		1	18	1			4	17		
		4		2		5					5			23	2			1	18		
10	1	22	4	31		42	6	1		1	62		4	89	2			4	19		
7		9		12		4		1			37	1	3	20	8			1	20		
28	3	7	9	105		16	6	4			61	5	2	92	33			36	21		
8		4	4	12		6	4				7	11	1	29	4			9	22		
1				3		9					4			26				1	23		
6		2	1	7		1	3				6	1	2	14				5	24		
2	1	1		2		4	1				7		4	13					25		
34	3	18	1	2		38	1				53	3	3	193	3			27	26		
47	5	48	15	71	2	61	9	7			114	12	21	297	15			19	27		
																			28		
1		2	1		1	3					4		1	26				2	29		
2				1		2					5		1	13					30		
104	10	68	16	102		138	28	3	3		231	17	52	970	18	5		49	31		
2		3		8		5					7		2	10				5	32		
8			2	9		15	4	3			13	2		28				6	33		
9		11				1							3	20				4	34		
																			35		
12	5	7	2	30		32	2				57	9		125	1			7	36		
50	1	52	13	57	12	14	2	1			20	15	15	65	7	1		19	37		
1	1		1	6		2					3			7				2	38		
8		3		16		12	2				6		1	51	8			1	39		
21		9	2	35		43	2	1			42	1	1	69	1			6	41		
			1	6		2					5			11				1	42		
				13		17	4				12			53					43		
33	2	14	3	29		14	7				27	1	9	101	7			23	45		
15	2	20		19		12	1				6			88					46		
8		7	1	19		10	8				33	11	10	103	15			7	47		
258		113	22	134	1	140	18	3	5		113	83	15	630	44			75	48		
37			15	15		12	4	2			35	1	2	76	6			3	49		
11		23	3	15		6	3	1			30		1	76	3			7	50		
		3	2	6		14	1				5	3	1	22					51		
13	3	21	3	29		16	15	1		2	56		7	83	11			1	52		
9		9		17		16	12				30	4	5	103				6	53		
8		5	1	6	1	13		1			7			28				4	54		
		4	1	7		6	2				1	1	1	16				1	55		
6		12	5	15		32	11	1			43	2	7	31	6			5	56		
						2					3			1					2	57	
22	3	23	7	19		26	5				45	6	11	161	9			18	58		
				5		2					10			4					1	59	
43	2	23	5	37	1	53	12	3		1	31	12	8	134	5	1		17	60		
9	1	12	1	18	1	22	10	2		1	49	2	4	74	3			21	61		
		2				2					1			2					1	62	
Number of defects.....		1,286	61	770	179	1,186	25	1,219	258	56	15	7	1,905	244	233	5,450	310	17	531	33	
Locomotives reported.....		830		327	394	1,882	28	1,761	291	140	70	15	1,988	51	56	1,546	379	73	10	175	52
Locomotives inspected.....		829	38	343	136	1,772	8	1,147													

Tables showing number of locomotives inspected, found

Parts defective, inoperative or missing, or in violation of rules.	Escanaba & Lake Superior.	Fernwood & Gulf.	Florida East Coast.	Fort Smith & Western.	Fort Worth & Denver City.	Fort Worth & Rio Grande.	Galveston, Har. & San A.	Galveston, Houston & Hend.
1 Air compressors.....			6					
2 Arch tubes.....								
3 Ash pans or mechanism.....								
4 Axles.....								
5 Blow-off cocks.....					4	1	3	
6 Boiler checks.....					1		1	
7 Boiler shell.....			3		3		1	
8 Brake equipment.....			1	1	1		4	
9 Cabs or cab windows.....					1		1	
10 Cab aprons or decks.....					4		4	
11 Cab cards.....			2		1		1	
12 Coupling or uncoupling devices.....							2	
13 Crossheads, guides, pistons or piston rods.....					3		4	
14 Crown bolts.....			7					
15 Cylinders, saddles or steam chests.....				3				
16 Cylinder cocks or rigging.....			1					
17 Domes or dome caps.....					3			
18 Draft gear.....								
19 Draw gear.....			2	2	7		21	
20 Driving boxes, shoes, wedges, pedestals or braces.....			1					
21 Firebox sheets.....			1		5			
22 Flues.....			1	1			1	
23 Frames, tail pieces or braces, locomotive.....								
24 Frames, tender.....					2			
25 Gauges or gauge fittings, air.....			6					
26 Gauges or gauge fittings, steam.....							3	
27 Gauge cocks.....				1	5		6	
28 Grate shakers.....					17		3	
29 Handholds.....							3	
30 Injectors inoperative.....								
31 Injectors and connections.....			15	2	21	2	2	
32 Inspections or tests not made as required.....					1		1	
33 Lateral motion.....			14		3			
34 Lights, cab or classification.....					3			
35 Lights, headlight.....							2	
36 Lubricator or shields.....								
37 Mud rings.....			8			1		
38 Packing nuts.....								
39 Pilot or pilot beams.....					15		3	
40 Plugs or studs.....							6	
41 Reversing gear.....								
42 Rods, main or side, crank pins or collars.....							1	
43 Safety valves.....			1		1		1	
44 Sanders.....			1				1	
45 Springs or spring rigging.....			6		4		1	
46 Squirt hose.....					7		1	
47 Staybolts.....			3	1	7		6	
48 Staybolts broken.....			42	8	96	2	17	
49 Steam pipes.....			1		1		1	
50 Steam valves.....			1				2	
51 Steps.....				1			1	
52 Tank or tank valves.....			1		1		34	
53 Telltale holes.....			1	2	5		1	
54 Throttle or throttle rigging.....								
55 Trucks, engine or trailing.....							4	
56 Trucks, tender.....							11	
57 Valve motion.....								
58 Washout plugs.....					6		3	
59 Water bar or combustion flues.....								
60 Water glass, fittings or shield.....					13		1	
61 Wheels.....				2			2	
62 Miscellaneous—Signal appliance, badge plates, brakes (hand).....					1			
Number of defects.....			125	26	246	7	154	
Locomotives reported.....	10	10	118	22	92	13	316	12
Locomotives inspected.....		2	171	13	118	11	183	17
Locomotives defective.....			65	11	86	4	84	
Percentage inspected found defective.....			38	84	73	35	46	
Locomotives ordered from service.....			5	1	17	1	2	

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

	Georgia & Florida.	Georgia Coast & Piedmont.	Georgia, Florida & Ala.	Georgia Northern.	Georgia.	Georgia, Southern & Fla.	Grand Rapids & Indiana.	Grand Trunk.	Great Northern.	Green Bay & Western.	Gulf & Sabine River.	Gulf & Ship Island.	Gulf, Colo. & Santa Fe.	Hooking Valley.	Holbrook, Cabot & Rollins.	Houston & Texas Central.	Houston East & West Tex.	Huntington & B. T. Mtn.	Illinois Central.	Illinois Southern.	Illinois Terminal.
			1					1	1										2		1
									3										3		3
																			8		8
																			15		7
																			37		8
																			2		1
																			18		9
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																			4		17
																			6		18
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																			5		25
																			2		26
																			5		27
																			41		28
																			4		29
																			60		30
																			5		31
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																			3		45
																			7		46
																			16		47
																			82		48
																			8		49
																			3		50
																			3		51
																			2		52
																			10		53
																			4		54
																			4		55
																			22		56
																			11		57
																			5		58
																			28		59
																			5		60
																			2		61
																			2		62
6	5	18	2	71	46	28	233	2,926	18			50	149	186		71	8	12	581	24	17
30	10	20	12	75	52	99	583	1,270	38	11	43	312	160	10	105	15	21	1,573	19	10	
17	5	3	12	14	123	85	352	1,310	29	3	47	135	147		99	14	11	989	8	11	
5	3	12	1	36	23	64	87	802	10		20	54	69		31	4	5	305	7	6	
30	25	37	7	29	27	23	25	61	34		43	40	47		31	29	45	32	87	54	
		1			1		16	62			3	7	3		1			8	1		

Tables showing number of locomotives inspected, found

Parts defective, inoperative, or missing, or in violation of rules.	Indiana Harbor Belt.	Indianapolis Union.	International & Great Nn.	Jonesboro, Lake City & E.	Kanawha & Michigan.	Kansas City, Mex. & Orient.	Kansas City Southern.	Kansas City Terminal.	Kentucky & Ind. Terminal.
1 Air compressors							1		
2 Arch tubes									
3 Ash pans or mechanism							4	1	4
4 Axles								2	1
5 Blow-off cocks									
6 Boiler checks	1	1		2	2	2	3	2	1
7 Boiler shell	1	1			1	2	2		1
8 Brake equipment		2		2	2	2			
9 Cabs or cab windows		1							
10 Cab aprons or decks									
11 Cab cards			1	2					
12 Coupling or uncoupling devices			1		3	1			
13 Crossheads, guides, pistons, or piston rods	1						2		
14 Crown bolts		1		1			1	2	
15 Cylinders, saddles, or steam chests				1	14	8	1		1
16 Cylinder cocks or rigging	1								
17 Domes or dome caps							2		
18 Draft gear					1	1	2	1	
19 Draw gear			7		2	2	2	1	
20 Driving boxes, shoes, wedges, pedestals, or braces		6			3	1	2		
21 Fire-box sheets						3	2		
22 Flues							1		6
23 Frames, tailpieces, or braces, locomotive			1					1	
24 Frames, tender									
25 Gauges, or gauge fittings, air									
26 Gauges or gauge fittings, steam	1	1		3	1	3	7	9	
27 Gauge cocks	1	1				5	11	6	
28 Grate shakers									
29 Handholds			1						
30 Injectors inoperative						1	2	1	
31 Injectors and connections			6	1	6	17	24	20	2
32 Inspections or tests not made as required									
33 Lateral motion			1		1	3			
34 Lights, cab or classification									
35 Lights, headlights						4			
36 Lubricator or shields									
37 Mud rings		2							
38 Packing nuts						3	1	2	5
39 Pilot or pilot beams		1		1		4	9	8	
40 Plugs or studs						1			
41 Reversing gear							1		
42 Rods, main or side, crank pins or collars					8	1			
43 Safety valves						2			
44 Sanders									
45 Springs or spring rigging	2	5		5	5	2	5	2	
46 Squirt hose		1		1	2	2		2	
47 Stay bolts						5			
48 Staybolts broken		16	5	26	28	33	32		15
49 Steam pipes			1				3	3	1
50 Steam valves		1		1	1				
51 Steps									
52 Tanks or tank valves	1	4		1	1	1	1		
53 Telltale holes		1		1	2	2		1	
54 Throttle or throttle rigging									
55 Trucks, engine or trailing		2						1	
56 Trucks, tender		1		1	2		4		
57 Valve motion									
58 Washout plugs		1	1			11	4	1	
59 Water bar or combustion flues									
60 Water glass, fittings or shield		1		1	5	7	5	1	
61 Wheels		2		2	14	10	3		
62 Miscellaneous—Signal appliance, badge plates, brakes (hand).									
Number of defects	10	66	16	85	165	154	113	38	
Locomotives reported	53	22	182	14	69	64	192	33	14
Locomotives inspected	2	5	85	7	81	87	147	31	13
Locomotives defective	4	26	5	36	54	68	28	9	
Percentage inspected found defective	80	30	71	44	62	47	90	70	
Locomotives ordered from service			1			9	1	1	

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

Lake Erie & Western.	Lake Superior & Ishp.	Lake Sup. Term. & Trans.	Lake Terminal.	Las Vegas & Tonopah.	Lehigh & Hudson River.	Lehigh & New England.	Lehigh Valley.	Long Island.	Louisiana & Arkansas.	Louisiana Ry. & Nav. Co.	Louisiana Western.	Louisville & Nashville.	Louisville, Hend. & St. L.	McCloud River.	McKeesport Connecting.	Macon, Dublin & Savannah.	Maine Central.
1			1									1					
2																	
3												5					
4							6					14					1
5							24		1			15	1				
6	4						89			1		14					
7			2				13					28					
8																	
9	1						2										
10		1					2										
11																	
12	1	3					3			3							
13							4										1
14	1						19										
15	4						1										
16	4						13										
17	1						17		2								
18	1						1										
19	1						9			1			16				1
20	5						72						14				
21	1						20		1	2			5				
22		1					4		2								
23							7										
24							4					3					
25							10										
26							89										
27	7	1					9		1								2
28	1						10										
29																	
30							3										
31	8	1					137		8	2	8	3	59	2			5
32	1	4					1						7				
33	2	1					6						5			1	1
34							5										
35																	
36	1						21		3	4			3				
37	5	1					37		1				8			3	37
38	1						48						21				2
39							1						3				
40							1						6				
41	3						2		5		1	1	1				
42							4						1				
43							14						5				
44							8						1				
45	2						17						15				
46	1	1					2						2				
47	1						18		3	1			8				1
48	28	8					240		4	1			80	11		1	42
49	2						15		1				8				
50	1						25		4				2				1
51																	
52	1						31						1				
53	1						1		1				9				3
54	2						7		1				2				
55							1						2				
56	4	2					18		1		4		5				
57																	
58	8						62		1				13				
59	2	2					7										
60	4	7					62		5				24				3
61							9		2				8				
Number of defects	100	37	35	34	2	22	110	1,400	54	14	56	8	487	22	11	3	68
Locomotives reported	144	21	13	18	17	48	63	967	163	31	47	38	1,088	29	14	13	214
Locomotives inspected	94	6	27	9	3	90	76	990	59	12	45	24	665	22	15	17	127
Locomotives defective	35	5	16	7	1	18	39	495	29	5	18	4	269	8	6	2	37
Percentage inspected found defective	37	84	60	77	33	20	51	50	42	40	17	40	36	40	40	13	29
Locomotives ordered from service	2	1		2			5	136	10		4		5	1			

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Tables showing number of locomotives inspected, found defective, and ordered from service, etc.—Continued.

	Manistee & Northeastern.	Maryland & Pennsylvania.	Maryland, Del. & Virginia.	Mason & Hangar Co.	Memphis, Dallas & Gulf.	Mercer Valley.	Michigan Central.	Midland Valley.
1 Air compressors.....								
2 Arch tubes.....								
3 Ash pans or mechanism.....								
4 Axles.....								
5 Blow-off cocks.....					1		6	1
6 Boiler checks.....					1		4	1
7 Boiler shell.....					3		6	4
8 Brake equipment.....							1	1
9 Cabs or cab windows.....								
10 Cab aprons or decks.....		2						
11 Cab cards.....					2		1	1
12 Coupling or uncoupling devices.....								
13 Crossheads, guides, pistons, or piston rods.....								1
14 Crown bolts.....								
15 Cylinders, saddles, or steam chests.....					3			3
16 Cylinder cocks or rigging.....							3	
17 Domes or dome caps.....					1			1
18 Draft gear.....							3	
19 Draw gear.....					2			5
20 Driving boxes, shoes, wedges, pedestals, or braces.....								
21 Fire-box sheets.....		3					3	1
22 Flues.....								
23 Frames, tail pieces, or braces, locomotive.....								
24 Frames, tender.....		2						
25 Gauges or gauge fittings, air.....		1						
26 Gauges or gauge fittings, steam.....							2	1
27 Gauge cocks.....					3		5	1
28 Grate shakers.....								
29 Handholds.....								
30 Injectors inoperative.....								
31 Injectors and connections.....					17		8	6
32 Inspections or tests not made as required.....								
33 Lateral motion.....		2			1		6	
34 Lights, cab or classification.....								
35 Lights, headlights.....								
36 Lubricator or shields.....			2					1
37 Mud rings.....					2		3	1
38 Packing nuts.....							23	1
39 Pilot or pilot beams.....					5		1	
40 Plugs or studs.....							1	
41 Reversing gear.....								
42 Rods, main or side, crank pins or collars.....							1	1
43 Safety valves.....								
44 Sanders.....								
45 Springs or spring rigging.....		1			3		3	1
46 Squirt hose.....		3			1		1	2
47 Staybolts.....							2	1
48 Staybolts broken.....		8			1		4	4
49 Steam pipes.....							3	
50 Steam valves.....							2	
51 Steps.....		1					2	
52 Tanks or tank valves.....		1					7	
53 Tell-tale holes.....					1		1	
54 Throttle or throttle rigging.....					1			
55 Trucks, engine or trailing.....							1	
56 Trucks, tender.....		4	1				1	
57 Valve motion.....								
58 Washout plugs.....					1		7	2
59 Water bar or combustion flues.....							5	
60 Water glass, fittings or shield.....							5	5
61 Wheels.....		2			3		4	3
62 Miscellaneous—Signal appliance, badge plates, brakes (hand).....								
Number of defects.....		32	3		55		121	48
Locomotives reported.....	16	16	11	14	13	17	699	37
Locomotives inspected.....	8	7	4		20	4	338	38
Locomotives defective.....		16	2		16		62	19
Percentage inspected found defective.....		44	50		80		18	50
Locomotives ordered from service.....								1

	Mineral Range.	Minneapolis & St. Louis.	Minn., St. Paul & S. Ste. M.	Minnesota & International.	Minnesota Transfer.	Mississippi Central.	Mississippi Riv. & Bon. T.	Missouri & North Ark.	Missouri, Kansas & Texas.	Missouri, Okla. & Gulf.	Missouri Pacific.	Mobile & Ohio.	Monongahela.	Monongahela Connecting.	Montour.	Montpelier & Wells River.	Morgan's La. & Texas.	Morgantown & Kingwood.	Murking, Marq. & S. E.	Nashville, Chatt. & St. L.	Nevada, California & Ore.	
1											1										4	1
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7																						8
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62																						62
Number of defects.....																						
Locomotives reported.....	36	282	14	75	6	3		63	1,257	236	1,776	255		23	15	3	19			12	360	39
Locomotives inspected.....	27	223	519	25	18	16	21	26	682	48	1,142	286	41	38	11	10	53	12	13	272	15	
Locomotives defective.....	11	203	135	23	8	12	6	32	758	73	735	266	52	7	14	10	17	5	9	238	13	
Percentage inspected found defective.....	11	105	10	17	2	3		16	452	56	579	130		7	5	3	8		2	130	8	
Locomotives ordered from service.....	100	51	7	74	25	25		50	60	77	79	49		100	36	30	47		22	54	61	
	3	16						2	36	17	38	6								7		

Tables showing number of locomotives inspected, found

	Nevada Northern.	Newburgh & South Shore.	New Orleans & Gt. Northern.	New Orleans, Mob. & Chi.	New Orleans Terminal.	New Orleans, Tex. & Mex.	New York Central (east).	New York Central (west).
Parts defective, inoperative, or missing, or in violation of rules.								
1 Air compressors.....			1					2
2 Arch tubes.....								2
3 Ash pans or mechanism.....								2
4 Axles.....								2
5 Blow-off cocks.....					1	2	7	33
6 Boiler checks.....		1	1				3	19
7 Boiler shells.....							3	35
8 Brake equipment.....				5	2		3	2
9 Cabs or cab windows.....								2
10 Cab aprons or decks.....	2					1	1	
11 Cab cards.....								3
12 Coupling or uncoupling devices.....		8	1					
13 Crossheads, guides, pistons, or piston rods.....					3		5	
14 Crown bolts.....								2
15 Cylinders, saddles, or steam chests.....		2					9	9
16 Cylinder cocks or rigging.....								4
17 Domes or dome caps.....								4
18 Draft gear.....								3
19 Draw gear.....	3					2	3	
20 Driving boxes, shoes, wedges, pedestals, or braces.....				1				
21 Firebox sheets.....			1				2	4
22 Flues.....		3						
23 Frames, tailpieces, or braces, locomotive.....							3	
24 Frames, tender.....	1							
25 Gauges or gauge fittings, air.....							4	6
26 Gauges or gauge fittings, steam.....		2	1	1			4	6
27 Gauge cocks.....	1	5	3	1	1	3	7	4
28 Grate shakers.....								
29 Handholds.....								
30 Injectors inoperative.....								
31 Injectors and connections.....	3	1	4	2	2	15	41	51
32 Inspections or tests not made as required.....							2	2
33 Lateral motion.....							3	6
34 Lights, cab or classification.....						1	1	
35 Lights, headlights.....								
36 Lubricator or shields.....								
37 Mud rings.....		5					5	19
38 Packing nuts.....	1		2			1	24	20
39 Pilot or pilot beams.....								
40 Plugs or studs.....				1			3	1
41 Reversing gear.....								
42 Rods, main or side, crank pins or collars.....				2			1	2
43 Safety valves.....								
44 Sanders.....							8	
45 Springs or spring rigging.....	2		2			1	6	14
46 Squirt hose.....	2					1	2	
47 Staybolts.....	1						1	6
48 Staybolts broken.....	9	84	8	12	1	3	9	9
49 Steam pipes.....			1				4	2
50 Steam valves.....							7	4
51 Steps.....						2	1	1
52 Tanks or tank valves.....							1	6
53 Telltale holes.....	2	7	2	5		1	5	7
54 Throttle or throttle rigging.....							3	15
55 Trucks, engine or trailing.....								1
56 Trucks, tender.....	3					5	11	23
57 Valve motion.....								
58 Washout plugs.....			1			1	9	40
59 Water bar or combustion flues.....								
60 Water glass, fittings or shield.....	2	13	2	1		1	12	2
61 Wheels.....	1			1		1	4	4
62 Miscellaneous—Signal appliances, badge plates, brakes (hand).								
Number of defects.....	33	133	30	32	7	53	232	358
Locomotives reported.....	14	22	32	58	16	40	2,064	998
Locomotives inspected.....	8	13	19	21	13	54	840	413
Locomotives defective.....	7	13	11	11	4	22	109	162
Percentage inspected found defective.....	87	100	58	52	30	40	12	39
Locomotives ordered from service.....		5	1	3		3	1	

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

	New York, Chicago, & St. L.	New York, N. H. & Hartford.	New York, Ont. & Western.	New York, Phila. & Norfolk.	New York, Susq. & Western.	Norfolk & Ports. Belt L.	Norfolk & Western.	Norfolk Southern.	Northern Ohio.	Northern Pacific.	Northwestern Pacific.	Ocean Shore.	Ohio River & Western.	Oregon Short Line.	Oreg.-Wash. R. R. & Nav. Co.	Pacific Coast R. R.	Pacific & Arctic.	Pennsylvania Lines West.	Pennsylvania Railroad.
1	1	4								3		1		1				1	1
2										1				2				1	3
3																			3
4	10	6		3						9				5	1			30	20
5	2	62						6	1	4				1	1			28	6
6	20	109	1	1	2			13	1	15	1		2	6	3			86	75
7	5	40						10		11				5				30	2
8	5	11			1			4		4			1	5	1			1	8
9	1	4								4				5				2	9
10	4	12						1		4			1	1				3	10
11	3	3																4	14
12	90	3			1	1		6		6	1	2		10				3	12
13	4	3						5		1				4				5	13
14	14	56	1	2				203	10	1			7	10	2			223	1
15	3	1								2				4				1	15
16	3	36						7	1					4				16	16
17		2								2				5				16	17
18	9	81						4		46	1	1		1				1	5
19		60								24				9				3	3
20	9	40	2	12	2			25	5	31		5	4	14				43	62
21	4	24			1	1		3	3	6			1	1				21	16
22	2	9	1					1		1			2	6				1	2
23	7	4						25	1				6	6				1	3
24	7	9						1		1				1					1
25	4	20	5	3	1			23	3	11		2	2	8	2			48	39
26	7	196	5	4	1			58	5	36	2	1	9	9				60	78
27																			27
28		1		1						2				1					28
29		5																	29
30	7	192	4	15	7	3		56	7	75	3	1		21	2			99	245
31	1	24						1		4	1			1	1			1	3
32	2	55	1					3		14				2				9	3
33	1							22			2			1	1			3	11
34																			
35	11	30						3		6									8
36	17	115	3					10	9	6			1	4	3			77	29
37	10	53	1	3	1	1		38	5	31				4	6			44	45
38		9						4		4				4				1	1
39		22						5		1				1				10	13
40		5																	10
41	2	72	1					7		8	1			1				4	7
42	1	9						2				3		2				4	4
43	2	10								1								3	18
44	4	52	2					16	1	18				6				38	17
45		6								6	1	1		28	4			15	16
46	11	58		4	1	1		8	8	16	4		1	5	4			16	12
47	18	812	6	10	1	8		122	68	93	23		10	11	12			90	47
48	4	12	2					10		10				7	1			27	45
49	1	88	1	3	3			37	1	16				1				17	19
50								1		3				1					5
51	4	30						1		16				11				28	15
52	2	18		4				4	4	14	3	2		1				6	5
53		23	1		1					3				2				18	16
54		23									1			5					2
55	1	62	2					18		28	2	1		2	1	1		6	8
56	22	21	2																

Tables showing number of locomotives inspected, found

Parts defective, inoperative, or missing, or in violation of rules.		Virginia & Southwestern.	Va. Iron, Coal & Coke Co.	Virginian.	Wabash.	Wabash-Pittsburgh Term. Co.	Washington Southern.
1	Air compressors.....						
2	Arch tubes.....						
3	Ash pans or mechanism.....						
4	Axles.....				1		
5	Blow-off cocks.....	3		4	21		
6	Boiler checks.....	2		3	23		
7	Boiler shell.....	1		3	23		
8	Brake equipment.....	3	1	3	42		
9	Cabs or cab windows.....	3		1	4		
10	Cab aprons or decks.....			1	1		
11	Cab cards.....	1		1	4		
12	Coupling or uncoupling devices.....	1		3	12		
13	Crossheads, guides, piston, or piston rods.....	1			6		
14	Crown bolts.....	2			6		
15	Cylinders, saddles, or steam chests.....	2	1	80	73		
16	Cylinder cocks or rigging.....				7		
17	Domes or dome caps.....	1			3		
18	Draft gear.....				3		
19	Draw gear.....	1			10		
20	Driving boxes, shoes, wedges, pedestals, or braces.....				3		
21	Firebox sheets.....				1		
22	Flues.....	2			8		
23	Frames, tail pieces, or braces, locomotive.....				7		
24	Frames, tender.....				6		
25	Gauges or gauge fittings, air.....			2	4		
26	Gauges or gauge fittings, steam.....				23		
27	Gauge cocks.....	5		6	37		
28	Grate shakers.....				3		
29	Handholds.....	1		3	1		
30	Injectors inoperative.....	11	1	7	102		
31	Injectors and connections.....				4		
32	Inspections or tests not made as required.....				6		
33	Lateral motion.....	1		1	1		
34	Lights, cab or classification.....				5		
35	Lights, headlights.....				5		
36	Lubricator or shields.....				6		
37	Mud rings.....	1		1	5		
38	Packing nuts.....	5	1	14	46		
39	Pilot or pilot beams.....				1		
40	Plugs or studs.....				2		
41	Reversing gear.....				11		
42	Rods, main or side, crank pins, or collars.....	1			3		
43	Safety valves.....	1			8		
44	Sanders.....	2			23		
45	Springs or spring rigging.....	2	1	1	8		
46	Squirt hose.....	2			17		
47	Staybolts.....	4			8		
48	Staybolts broken.....	2			10		
49	Steam pipes.....	11			48		
50	Steam valves.....	4			14		
51	Steps.....			3	18		
52	Tanks or tank valves.....				1		
53	Telltale holes.....	2			9		
54	Throttle or throttle rigging.....			3	9		
55	Trucks, engine or trailing.....				10		
56	Trucks, tender.....	1			1		
57	Valve motion.....	2	1	7	10		
58	Washout plugs.....				1		
59	Water bar or combustion flues.....	1		4	54		
60	Water glass, fittings, or shield.....				2		
61	Wheels.....	3			22		
62	Miscellaneous—Signal appliance, badge plates, brakes (hand).....	1		3	19		
	Number of defects.....	73	6	189	756		
	Locomotives reported.....	42	14	108	599	24	10
	Locomotives inspected.....	49	5	163	558	5	9
	Locomotives defective.....	31	3	94	310		
	Percentage inspected found defective.....	63	60	58	55		
	Locomotives ordered from service.....	2			12		

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

Washington Terminal.	Western Maryland.	Western Pacific.	West Jersey & Sea shore.	Wheeling & Lake Erie.	Wichita Falls & N.W.	Wichita Valley.	Woodward Iron Co.	Yazoo & Mississippi Valley.	Zanesville & Western.	Roads with less than 10 locomotives.	Total defects.	
		1								15	120	1
	1	1			1					1	201	2
										5	38	3
		2								1	16	4
		9		4	1					26	1,005	5
	5	9		1	1			1		51	1,087	6
	4	13		3	2			1	1	64	2,031	7
	2	5		9	1					146	1,965	8
	1	1								11	201	9
	6	6								83	539	10
	2	1		10				1		114	684	11
	1	1		4					1	85	389	12
		15		3						15	513	13
	9	2		26	16				2	23	686	14
		7								227	5,395	15
	3	25		2						5	172	16
	1	3								24	444	17
	1	1								10	257	18
	21	21		5	4					110	1,562	19
	1	1								15	435	20
	10	16		7	1			1		84	2,022	21
	1	18		3						77	798	22
	1	6		1	1					8	289	23
		5		1						31	336	24
	2	1								16	139	25
	6	30		2	1					42	1,700	26
	9	21		5	3				1	168	3,244	27
												28
				5						124	297	29
		1								12	132	30
	43	10		28	13			2	1	432	8,372	31
	1	24		1						57	512	32
		5		3						46	728	33
		12								31	462	34
		27								191	1,543	35
	2	8		13	2					69	1,419	36
	5	12		3						175	2,754	37
		7								34	235	38
		5		1						25	412	39
										3	60	40
	1	8		1						35	1,176	41
	1	23		1						24	223	42
		4								22	489	43
	4	14		11	2					74	1,671	44
	1	10		5	4					37	809	45
	4	2		5						72	1,133	46
	16	84		51	5					765	9,989	47
	10	76		2				8	2	37	1,059	48
	1	2		2	1					28	969	49
	2	2		2						90	354	50
		15		2						92	1,594	51
		19		3				2	1	91	906	52
		2		2						10	435	53
	1	10		2	2					18	266	54
		19		1						90	1,295	55
	3	5		17	4					7	21	56
		26								36	1,999	57
	21	13		2	1					3	105	58
	3	12		3	3					179	2,342	59
		5						1	2	205	1,407	60
										22	91	61
												62
	178	680		261	84	7		19	16	4,593	71,527	
12	258	115	85	205	21	11	19	57	14	2,655	66,781	
4	112	179	11	114	34	7		51	31	2,375	52,650	
	54	88		77	25	4		14	5	1,203	24,685	
	48	48		67	73	57		27	16	50	47	
	4	7		1	2					180	1,943	

**ACCIDENTS RESULTING FROM THE FAILURE OF LOCOMOTIVES
AND THEIR APPURTENANCES DURING THE FISCAL YEAR
ENDED JUNE 30, 1916.**

[A star (*) indicates accidents taken from records of the accident division of the Interstate Commerce Commission. Investigation thereof was impracticable, inasmuch as this division was not apprised thereof until 30 to 90 days subsequent to their occurrence, which was too late to permit an intelligent investigation.]

ATCHISON, TOPEKA & SANTA FE RAILWAY:

*July 12, 1915, locomotive 795, Hardy, Ariz. Brakeman scalded by leaky steam pipe; 1 injured.

August 29, 1915, locomotive 1325, Albuquerque, N. Mex. Water glass burst; inefficient shield; cut by flying glass and scalded by steam; 1 injured.

September 1, 1915, locomotive 1489, Argentine, Kans. Washout plug blew out while being tightened under pressure; defective threads on plug and in sheet; 1 killed, 1 injured.

*December 25, 1915, locomotive 2167, Harrold, Cal. Side rod broke, causing something to strike cab; 1 injured.

*December 28, 1915, locomotive 600, Carrollton, Mo. Drawbar pulled out back of locomotive; when engineer went back to inspect engine moved back and caught him; inspection showed no defect, and it is thought throttle was not closed tight; 1 injured.

March 17, 1916, locomotive 959, near Manuelito, N. Mex. Crown sheet failure; low water; no contributory causes found; 3 killed.

Six accidents; 4 killed, 5 injured.

ATLANTIC COAST LINE RAILROAD:

August 26, 1915, locomotive 1001, Sanford, Fla. Washout plug blew out; improperly applied; 1 injured.

December 12, 1915, locomotive 274, Yemassee, S. C. Flue broke; imperfect butt weld; 1 injured.

February 3, 1916, locomotive 272, near Willingham, Ga. Crown sheet failure; low water; no contributory causes found; 1 injured.

*February 13, 1916, locomotive 183, South Rocky Mount, N. C. Throttle flew open due to nut missing from spring, causing reverse lever to fly back; 1 injured.

March 22, 1916, locomotive 720, Newberry, Fla. Squirt hose blew off; insecurely applied; 1 injured.

Five accidents; 5 injured.

BALTIMORE & OHIO RAILROAD:

July 6, 1915, locomotive 888, Cleveland, Ohio. Blower in front end of smoke box tipped over, causing flame and smoke to blow into cab; blower casting cracked; 1 injured.

July 15, 1915, locomotive 1266, Baltimore, Md. Flue broke at safe end; overheated in welding; 1 injured.

July 15, 1915, locomotive 1938, Fairmont, W. Va. Squirt hose parted at splice; insecurely spliced; 1 injured.

July 29, 1915, locomotive 1785, Great Cacapon, W. Va. Quadrant stud blew out; stud improperly applied; screwed into sheet only one-fourth inch; 1 injured.

September 3, 1915, locomotive 2366, Cumberland, Md. Washout cap blew off; threads stripped; 2 injured.

September 8, 1915, locomotive 1880, Brunswick, Md. Nut on injector delivery pipe blew off; nut stretched due to use of improper tools; 1 injured.

September 14, 1915, locomotive 1672, West Alexandria, Pa. Drawbar and safety chains between locomotive and tender broke; defective pin and safety chains, allowing locomotive and tender to separate; 1 injured.

September 15, 1915, locomotive 1672, Boggs Run, W. Va. Drawbar pin between locomotive and tender broke; defective pin and long safety chains, allowing apron to drop; 1 injured.

*September 15, 1915, locomotive 1230, Cumberland, Md. Bolt came out of reverse lever reach rod; 1 injured.

*September 16, 1915, locomotive 77, Philadelphia, Pa. Reverse lever flew out of quadrant; 1 injured.

*September 19, 1915, locomotive 2133, Washington, Ind. Nut worked out of bolt in connecting rod, allowing cylinder cock rigging to come down; 1 injured.

October 15, 1915, locomotive 1783, Colfax, W. Va. Reflex water-glass gasket blew out; glass in worn condition; 1 injured.

October 31, 1915, locomotive 2272, Bridgeport, W. Va. Squirt hose valve worked open; 1 injured.

November 7, 1915, locomotive 2053, near Breese, Ill. Squirt hose valve worked open; 1 injured.

*November 11, 1915, locomotive 1919, Fairmont, W. Va. Fireman injured while opening ash-pan slides; slides warped; 1 injured.

November 25, 1915, locomotive 4233, near Cumberland, Md. Nipple blew out of main reservoir, due to defective threads, causing emergency application of brakes; 1 injured.

November 27, 1915, locomotive 2164, Derwood, Md. Lubricator feed pipe broke off at nipple; 1 injured.

December 9, 1915, locomotive 1795, Martinsburg, W. Va. Grate bearer stud blew out; defective threads; 1 injured.

December 13, 1915, locomotive 1960, near Fairhope, Pa. Lubricator drain cock obstructed by waste; burned by hot oil; pressure in lubricator not properly relieved when preparing to refill; 1 injured.

December 18, 1915, locomotive 2213, North Sewickley, Pa. Locomotive and tender parted, due to defective drawbar pin and safety chains; old break in drawbar pin; 1 injured.

January 14, 1916, locomotive 4257, Garrett, Ind. Low coupler on tender causing train to part, setting air in emergency; 4 injured.

January 17, 1916, locomotive 2863, near Silver Run, W. Va. Crown sheet failure; low water; no contributory causes found; 1 injured.

January 17, 1916, locomotive 683, Slate, W. Va. Grate shaker bar handle socket larger than staff; handle slipped off staff while fireman was shaking grates; 1 injured.

January 18, 1916, locomotive 2055, Sistersville, W. Va. Spring hanger broke; 1 injured.

January 23, 1916, locomotive 2048, Newark, Ohio. Throttle lever latch caught; unable to close throttle, losing control of locomotive; 1 injured.

January 23, 1916, locomotive 1768, Adamstown Junction, Md. Bolt in throttle lever latch guide caught in jacket; unable to close throttle, causing runaway locomotive; 1 injured.

January 30, 1916, locomotive 1687, Taylorstown, Pa. Reverse lever became unlatched due to quadrant nuts working loose; 1 injured.

January 30, 1916, locomotive 1668, Oak Hill, Ohio. Drawbar between locomotive and tender broke, permitting fireman to fall on track; excessive slack between locomotive and tender; 1 injured.

February 2, 1916, locomotive 1791, Empire, Md. Reverse lever slipped due to valve strips broken and valves out of square; 1 injured.

February 12, 1916, locomotive 1907, Philadelphia, Pa. Reflex water glass gasket blew out; scalded while closing water glass cocks; 1 injured.

February 27, 1916, locomotive 4074, Chicago Junction, Ohio. Front coupler casting pulled off due to bolts and casting breaking; 1 injured.

February 27, 1916, locomotive 2681, near Callery Junction, Pa. Blower pipe burned off in front end, causing back draft, due to leak in smoke box; 2 injured.

March 16, 1916, locomotive 1887, Harrisonburg, W. Va. Engineer injured while handling reverse lever; counterbalance spring broken; 1 injured.

March 17, 1916, locomotive 2254, near Chicago, Ill. Right injector throttle bonnet blew out; defective threads and improper fit; 2 injured.

April 1, 1916, locomotive 4293, near Cumbo, W. Va. Crown sheet failure; low water; no contributory causes found; 3 injured.

April 17, 1916, locomotive 1326, near Addyston, Ohio. Crosshead gib became detached while running, causing serious injury to workman along side of track, due to neglect in making repairs to crosshead; 1 injured.

May 15, 1916, locomotive 4289, Black Oak, W. Va. Injector steam pipe blew off at throttle connection, due to defective brazing; 1 injured.

May 18, 1916, locomotive 1241, Curtis Bay, Md. Adjusting screw and spring missing from safety valve used in air pipe leading from double check valve to driver brake cylinders, allowing brakes to release; 2 injured.

May 18, 1916, locomotive 1156, Bellaire, Ohio. Plug blew out of flue sheet, due to defective threads; 1 injured.

May 23, 1916, locomotive 1660, Cleveland, Ohio. Link block pin worked out of reverse lever; defect reported four times just previous to accident; 1 injured.

May 23, 1916, locomotive 4183, near Dawson, Md. Flue broke at weld; defective weld; 2 injured.

May 23, 1916, locomotive 1559, Cincinnati, Ohio. Reverse lever flew forward; back end of quadrant too high; reverse lever latch did not seat properly; 1 injured.

June 5, 1916, locomotive 4281, Washington Junction, Md. Flue failed; not welded at safe end; 1 injured.

June 29, 1916, locomotive 2707, near Bidwell, Pa. Scalded by hot water from squirt hose; valve defective; 1 injured.

Forty-four accidents; 54 injured.

BELT RAILWAY OF CHICAGO:

December 24, 1915, locomotive 71, Chicago, Ill. Water glass burst; scalded while attempting to close water glass cocks; 1 injured.

One accident; 1 injured.

ESSEMER & LAKE ERIE RAILROAD:

January 8, 1916, locomotive 95, near Chalmont Road, Pa. Flue broke; old fracture adjacent to safe end weld; 2 injured.

One accident; 2 injured.

BOSTON & ALBANY RAILROAD:

March 15, 1916, locomotive 1002, near State Line, Mass. Crown sheet failure; low water; no contributory causes found; 3 injured.

One accident; 3 injured.

BOSTON & MAINE RAILROAD:

September 21, 1915, locomotive 3232, Rockport, Mass. Water glass burst; defective shield; 1 injured.

* September 25, 1915, locomotive 1442, Valley Falls, N. Y. Grate shaker bar broke; 1 injured.

* November 4, 1915, locomotive 932, Concord, Mass. Driver rod broke; 1 injured.

November 19, 1915, locomotive 2321, Salem Junction, Mass. Throttle lever flew open, due to broken spring and worn condition of ratchet; 1 injured.

November 22, 1915, locomotive 1463, Proctor, Mass. Engineer caught finger between reverse lever and air-gauge pipe; not sufficient clearance around reverse lever; 1 injured.

January 4, 1916, locomotive 3643, near Barnet, Vt. Bolt lost out of apron edge between locomotive and tender; 1 injured.

January 21, 1916, locomotive 3657, near Boston, Mass. Bull's-eye water-glass gasket blew out; improperly applied; 1 injured.

February 22, 1916, locomotive 931, Barber, Mass. Left back spring hanger broke; 1 injured.

* April 15, 1916, locomotive 2641, Erving, Mass. Grate shaker lever slipped; 1 injured.

May 31, 1916, locomotive 964, Haverhill, Mass. Gratebar stud blew out, due to threads corroded away, caused by leakage; 1 injured.

June 25, 1916, locomotive 1347, Fitchburg, Mass. Injured while handling reverse lever, due to lubricator leaking, causing insecure footing and hand; 1 injured.

June 26, 1916, locomotive 2393, near Pepperell, Mass. Shovel caught on beveled edge of shovel plate; 1 injured.

June 26, 1916, locomotive 2416, Rockingham, N. H. Shaker bar became disconnected, due to pin being insecure; 1 injured.

June 27, 1916, locomotive 692, Lowell, Mass. Water glass burst; injured in attempt to close water-glass cocks; 1 injured.

Fourteen accidents; 14 injured.

BUFFALO, ROCHESTER & PITTSBURGH RAILROAD:

November 13, 1915, locomotive 258, Hamilton, Pa. Flue broke; beads missing from 20 flues; 1 injured.

June 14, 1916, locomotive 415, Bingham, Pa. Back head of left main air reservoir blew out; 1 injured.

Two accidents; 2 injured.

CANADIAN PACIFIC RAILWAY:

*December 20, 1915, locomotive 1067, Haleb, Me. Water glass broke; scalded shutting off cock; 1 injured.

One accident; 1 injured.

CENTRAL NEW ENGLAND RAILWAY:

July 29, 1915, locomotive 50, Goshen, N. Y. Scalded by hot water from squirt hose, due to valve working open; insufficient packing; 1 injured.

September 2, 1915, locomotive 101, St. Elmo, N. Y. Crown sheet failure; low water; no contributory causes found; 3 injured.

September 16, 1915, locomotive 10, Maybrook, N. Y. Scalded by steam and hot water from ash-pan blower; defective valve; 1 injured.

September 21, 1915, locomotive 159, Towners, N. Y. Injector steam pipe blew out of collar at brazing to pipe; improperly brazed; 2 injured.

*December 16, 1915, locomotive 128, Norfolk, Conn. Assisting engineer reverse engine when lever came back, catching hand between cab and lever; adjusting screw to spring balance not properly adjusted, which caused reverse lever to fly back; 1 injured.

Five accidents; 8 injured.

CENTRAL OF GEORGIA RAILWAY:

March 23, 1916, locomotive 1397, Smithville, Ga. Injector delivery pipe spanner nut broke, due to use of hammer and set used on it; 1 injured.

One accident; 1 injured.

CENTRAL RAILROAD OF NEW JERSEY:

February 10, 1916, locomotive 279, Bayonne, N. J. Water bar burst; defective material; 1 injured.

March 10, 1916, locomotive 276, Mauch Chunk, Pa. Gauge cock spindle blew out; not sufficient threads on spindle to properly open cock; 1 injured.

Two accidents; 2 injured.

CHESAPEAKE & OHIO RAILWAY:

*August 21, 1915, locomotive 241, Charlottesville, Va. Squirt hose burst; scalded by hot water; 1 injured.

September 16, 1915, locomotive 283, Sproul, W. Va. Squirt hose blew off nipple; improperly clamped and nipple not turned down; 1 injured.

September 20, 1915, locomotive 417, Ethel, W. Va. Cylinder head knocked out, due to improper fit of piston rod in crosshead; 1 injured.

*November 26, 1915, locomotive 1213, Snevets, Ind. Draw gear failure; 1 injured.

*February 29, 1916, locomotive 212, Shelby, Ky. Bolt in shaker bar broke; 1 injured.

Five accidents; 5 injured.

CHICAGO & ALTON RAILROAD:

July 7, 1915, locomotive 97, Venice, Ill. Injector steam pipe spanner nut blew off while being tightened under pressure; 1 injured.

August 25, 1915, locomotive 625, Slater, Mo. Waste pipe on blow-off cock blew off; 1 injured.

December 19, 1915, locomotive 815, Venice, Ill. Boiler check stuck open; defective check; 1 injured.

Three accidents; 3 injured.

CHICAGO & EASTERN ILLINOIS RAILROAD:

December 9, 1915, locomotive 903, Rosamond, Ill. Crown sheet failure; low water; no contributory causes found; 1 injured.

One accident; 1 injured.

CHICAGO & NORTHWESTERN RAILWAY:

*August 3, 1915, locomotive 44, Johnstown, Nebr. Whistle valve stuck open, due to valve stem broken off; 1 injured.

*September 3, 1915, locomotive 373, Green Bay, Wis. Handle on shaker bar came off; 1 injured.

September 17, 1915, locomotive 2021, Chicago, Ill. Squirt hose pipe broke at valve connection, due to pipe being worn thin; 1 injured.

September 28, 1915, locomotive 609, Green Bay, Wis. Lubricator glass burst; injured by escaping steam and oil; 1 injured.

October 9, 1915, locomotive 1743, Panola, Mich. Crown sheet failure; low water; no contributory causes found; 2 injured.

*October 25, 1915, locomotive 1853, Calamus, Iowa. Brakeman's foot caught between apron and tank of engine; 1 injured.

October 26, 1915, locomotive 1335, Chicago, Ill. Washout plug blew out of front flue sheet; defective threads; 1 injured.

*October 28, 1915, locomotive 1580, Appleton, Wis. Reverse lever went down into corner, catching engineer's foot; 1 injured.

November 10, 1915, locomotive 918, Chicago, Ill. Water glass burst; shield removed at time of accident; 1 injured.

*November 15, 1915, locomotive 1876, McCoy, Wis. Reverse lever slipped; 1 injured.

December 10, 1915, locomotive 43, Madison, Wis. Water glass burst; scalded by escaping steam and water; 1 injured.

January 1, 1916, locomotive 284, near Manchester, S. Dak. Main crank pin broke; old defect in pin; 2 injured.

January 31, 1916, locomotive 1887, Ralston, Iowa. Reverse lever latch slipped out of quadrant, due to worn and dirty condition of teeth on latch and quadrant; 1 injured.

February 2, 1916, locomotive 1736, near Ingalls, Mich. Crown sheet failure; low water; drain pipe to injector delivery pipe missing at time of accident, causing injector to waste water; 1 injured.

February 9, 1916, locomotive 1851, Clinton, Iowa. Cylinder head blew out; pin at crosshead arm connection to union link worked out, causing compression in cylinder; 2 injured.

February 22, 1916, locomotive 2084, Chicago, Ill. Main driving pin broke; old fracture in pin; 1 injured.

February 29, 1916, locomotive 779, Ironwood, Mich. Lubricator glass burst; injured by escaping hot oil; 1 injured.

March 4, 1916, locomotive 463, near Stephenson, Mich. Water glass burst; injured by escaping steam and water; 1 injured.

March 7, 1916, locomotive 366, Waukegan, Ill. Washout plug blew out of front flue sheet; defective threads; 1 injured.

March 7, 1916, locomotive 141, near Bonduel, Wis. Lubricator steam pipe broke at collar, due to defective brazing; 1 injured.

April 11, 1916, locomotive 2157, Chicago, Ill. Bushing screwed out of lubricator while tightening filling plug, due to left-hand threads on bushing and right-hand threads on plug; 1 injured.

*May 8, 1916, locomotive 224, Ridgefield, Ill. Injured due to grate pin breaking while shaking grates; 1 injured.

May 8, 1916, locomotive 1361, Duck Creek, Wis. Squirt hose burst; hose badly worn; 1 injured.

May 11, 1916, locomotive 1867, near Lowden, Iowa. Pin worked out of reverse lever latch, due to improper repairs; 1 injured.

Twenty-four accidents; 27 injured.

CHICAGO & WESTERN INDIANA RAILWAY:

February 10, 1916, locomotive 211, Chicago, Ill. Water glass burst; scalded while closing water glass cocks; 1 injured.

March 6, 1916, locomotive 203, Chicago, Ill. Broken radial staybolt blew out of crown sheet, due to threads corroded away on bolt and in sheet; 1 injured.

Two accidents; 2 injured.

CHICAGO, BURLINGTON & QUINCY RAILROAD:

July 25, 1915, locomotive 1699, Beardstown, Ill. Squirt hose burst; defective hose; 1 injured.

August 1, 1915, locomotive 5020, Riverside, Ill. Lubricator glass burst; inefficient shield; 1 injured.

August 23, 1915, locomotive 44, St. Joseph, Mo. Washout plug blew out while being tightened under pressure; cross-threaded; 1 injured.

September 12, 1915, locomotive 2207, near St. Joseph, Mo. Flue broke at weld; overheated in welding; 1 injured.

November 2, 1915, locomotive 2162, Kansas City, Mo. Water glass burst; inefficient shield; 1 injured.

November 4, 1915, locomotive 5222, Naperville, Ill. Water glass burst; inefficient shield; 1 injured.

December 2, 1915, locomotive 6001, Hookdale, Ill. Crown sheet failure; low water; no contributory causes found; 2 injured.

December 5, 1915, locomotive 3121, near Cadoma, Wyo. Crown sheet failure; low water; no contributory causes found; 1 killed, 2 injured.

January 8, 1916, locomotive 2203, Burlington, Iowa. Threads on union in steam-heat pipe stripped; 1 injured.

January 22, 1916, locomotive 1403, Chicago, Ill. Defective teeth on throttle-lever ratchet, allowing throttle to spring open, causing locomotive to move forward in engine house; employee caught between front end and brick wall; 1 killed.

April 6, 1916, locomotive 1491, St. Joseph, Mo. Cylinder cock lever stud in firebox wrapper sheet blew out; defective threads; 1 injured.

April 20, 1916, locomotive 2717, near Stewartsville, Mo. Right high-pressure main rod broke; main-crank pin worn $\frac{3}{8}$ inch out of round, and back end main-rod brass $\frac{1}{2}$ inch larger than pin diameter; 1 killed; 1 injured.

Twelve accidents; 3 killed; 13 injured.

CHICAGO GREAT WESTERN RAILROAD:

March 20, 1916, locomotive 201, Clarion, Iowa. Water glass burst; injured by escaping steam and water; 1 injured.

* April 4, 1916, locomotive 210, Winston, Ill. Drawbar between locomotive and tender broke, due to defect in material, 1 injured.

Two accidents; 2 injured.

CHICAGO INDIANAPOLIS & LOUISVILLE RAILWAY:

April 6, 1916, locomotive 410, near Bedford Junction, Ind. Crown sheet failure; low water; no contributory causes found; 2 injured.

One accident; 2 injured.

CHICAGO, MILWAUKEE & ST. PAUL RAILWAY:

July 4, 1915, locomotive 3511, Coburg, Mo. Collar on injector delivery pipe broke; collar too light; 1 injured.

July 26, 1915, locomotive 8073, Bird Island, Minn. Squirt hose parted at splice; insecurely clamped; 1 injured.

August 28, 1915, locomotive 5553, South Cle Elum, Wash. Scalded by hot water from lidgerwood pipe, due to valve in dome leaking; 1 injured.

September 3, 1915, locomotive 8162, Chicago, Ill. Filling lubricator; hot oil blew out, due to lubricator throttle leaking; 1 injured.

October 3, 1915, locomotive 1247, Montevideo, Minn. Left front cylinder head knocked out, due to crosshead piston-rod key working loose, allowing piston to strike; 1 injured.

October 9, 1915, locomotive 1197, Coburg, Mo. Scalded by hot water from drain pipe, due to boiler check sticking open and drain pipe defective; 1 injured.

October 11, 1915, locomotive 8141, Hampshire, Ill. Reverse lever became unlatched; defective attachment rear end of quadrant to running board and excessive vibration in reach rod; 1 injured.

October 19, 1915, locomotive 4379, Milwaukee, Wis. Water glass burst; inefficient shield; 1 injured.

November 24, 1915, locomotive 456, Minneapolis, Minn. Packing nut on injector steam ram blew off; defective threads in nut and on injector; 1 injured.

December 2, 1915, locomotive 2373, near Monroe, Wis. Drawbar pin and safety chains broke; pin and safety chains defective; 1 injured.

* December 11, 1915, locomotive 1163, Colorado Junction, Mont. Locomotive deck four inches lower than tender account spring hanger broken, causing apron between locomotive and tank to slant; 1 injured.

January 3, 1916, locomotive 4358, near Fond du Lac, Wis. Arch tube burst, due to accumulation of scale; 1 injured.

January 7, 1916, locomotive 8005, near Portage, Wis. Reverse lever would not stay latched; rear quadrant bolt loose in quadrant; all nuts missing from rear end quadrant bracket; 1 injured.

January 10, 1916, locomotive 4371, near Ripon, Wis. Crown-sheet failure; low water; top water-glass cock found closed at time of investigation; 3 injured.

January 13, 1916, locomotive 8032, Gordons Ferry, Iowa. Reverse lever slipped out of quadrant; defective and broken teeth in quadrant; 1 injured.

January 14, 1916, locomotive 8093, Kittredge, Ill. Connecting pin at lower end of grate shaker lever broke or worked out; 1 injured.

January 15, 1916, locomotive 2058, Adel, Iowa. Strip nailed on outside of tender floor alongside of tender pulled off, due to being insecurely attached; 1 injured.

January 17, 1916, locomotive 1182, Portage, Wis. Cylinder head knocked out; follower plate broken (old defect); 1 injured.

January 17, 1916, locomotive 1125, Austin, Minn. Injured by hot oil from lubricator; 1 injured.

January 29, 1916, locomotive 3122, near Waukesha, Wis. Lubricator steam pipe broke at brazing; 1 injured.

January 31, 1916, locomotive 1528, Galewood Ill. Bolt connecting injector handle disconnected; 1 injured.

February 3, 1916, locomotive 2442, Sanborn, Iowa. Bullseye lubricator glass blew out; 1 injured.

February 8, 1916, locomotive 8051, near New Lebanon, Ill. Pin connecting grate shaker lug with connecting rod worked out; 1 injured.

February 27, 1916, locomotive 1182, Milwaukee, Wis. Rivets in rear head-light brackets leaking badly, causing ice to form on top of sloping tender; had been reported three times previous to accident; 1 injured.

March 1, 1916, locomotive 2809, River Junction, Minn. Injector steam pipe blew off at injector connection; defective threads in spanner nut; 1 injured.

March 3, 1916, locomotive 1211, Chicago, Ill. Reverse lever slipped out of quadrant, due to defective latch and quadrant; 1 injured.

March 26, 1916, locomotive 2813, near Indian Creek, Iowa. Grate shaker lever slipped off, due to worn pin and lost motion in shaker rigging; 1 injured.

April 5, 1916, locomotive 408, Austin, Minn. Drawbar between locomotive and tender broke in weld; 1 injured.

April 19, 1916, locomotive 6333, Chicago, Ill. Blower pipe burned off in front end, causing back draft; 1 injured.

May 2, 1916, locomotive 3003, Milwaukee, Wis. Flue broke at weld; overheated at time of welding; 1 injured.

May 19, 1916, locomotive 2878, near Walworth, Wis. Arch tube burst, due to accumulation of scale in tube; 3 injured.

June 18, 1916, locomotive 1199, Seattle, Wash. Blow-off cock blew off at nipple, due to defective threads; 1 injured.

June 20, 1916, locomotive 6308, Chicago, Ill. Flue broke; overheated in welding; 1 injured.

June 20, 1916, locomotive 5644, Minneapolis, Minn. Rivet in patch at top of fire sheet blew out while being calked under pressure; old defect in rivet; 1 injured.

June 21, 1916, locomotive 7556, near Stillwater, Wash. Wooden plug used in place of bull's-eye glass blew out of lubricator; no material to make proper repairs; 1 injured.

Thirty-five accidents; 39 injured.

CHICAGO, ROCK ISLAND & PACIFIC RAILWAY:

* July 1, 1915, locomotive 1568, Chariton, Iowa. Squirt hose burst; 1 injured.

August 16, 1915, locomotive 1516, Lawton, Okla. Boiler check stuck open; scalded by hot water from overflow pipe; 1 injured.

* September 10, 1915, locomotive 1893, Biscoe, Ark. Reverse lever slipped; inspection of lever showed same to be in bad condition; 1 injured.

September 27, 1915, locomotive 132, Davenport, Iowa. Crown sheet failure; low water; gauge cock drip stopped up and heavy scale on crown sheet around stays; 1 injured.

* November 18, 1915, locomotive 606, Peoria, Ill. Pin broke off back driving wheel side rod; 1 injured.

January 1, 1916, locomotive 1620, Bendena, Kans. Crown sheet failure; low water; water foaming; bottom gauge cock stopped up and top one inoperative; 1 injured.

February 12, 1916, locomotive 1517, near Chilhowee, Mo. Rods stripped on left side caused by bad pound in rods and boxes; reported each trip from January 4 to February 10; 1 injured.

February 12, 1916, locomotive 1685, Coburn, Mo. Injector steam-pipe spanner nut broke, due to use of improper tools in making repairs; 2 injured.

February 14, 1916, locomotive 893, near Siebert, Colo. Main driving pin broke, stripping rods and machinery from both sides of locomotive; old crack in pin, and pin had been running very hot; pound in rod; 1 injured.

March 14, 1916, locomotive 1678, near Trenton, Mo. Flue broke; overheated in welding; 1 injured.

*April 7, 1916, locomotive 1766, Roland, Ark. Grate shaker rigging became disconnected; 1 injured.

*April 11, 1916, locomotive 1460, Ottawa, Ill. Engineer caught finger between throttle lever and gauge cock; 1 injured.

April 16, 1916, locomotive 1670, Minooka, Ill. Grease cup on main rod exploded; sulphur put in cup; main pin running hot, caused by broken and loose main and side rod brasses and main journal loose in box; 1 injured.

April 21, 1916, locomotive 508, Junction City, Okla. Boiler check cap blew out, due to defective threads; 1 injured.

May 12, 1916, locomotive 1774, Pulaski, Ark. Squirt hose burst; defective hose; 1 injured.

May 15, 1916, locomotive 2052, Manly, Iowa. Main crank pin broke, due to old fracture in pin; 1 injured.

June 14, 1916, locomotive 1201, Midlothian, Ill. Blower pipe became disconnected in front end, causing back draft when applied, due to defective threads in fittings; 1 injured.

Seventeen accidents; 18 injured.

CHICAGO, ST. PAUL, MINNEAPOLIS & OMAHA RAILWAY:

July 15, 1915, locomotive 313, Minneopa, Minn. Flue broke at weld; improperly welded; 1 injured.

March 31, 1916, locomotive 285, St. James, Minn. Rivet in door sheet seam blew out while calking leaks in firebox with 70 pounds pressure on boiler; head broken off on water side; 1 injured.

Two accidents; 2 injured.

CHICAGO, TERRE HAUTE & SOUTHEASTERN RAILWAY:

February 10, 1916, locomotive 315, Cheneyville, Ill. Key lost out of valve stem; key not properly secured in knuckle bushing and improper fit of valve stem; 1 injured.

One accident; 1 injured.

CINCINNATI, HAMILTON & DAYTON RAILWAY:

December 19, 1915, locomotive 4035 (B. & O.), near Cridersville, Ohio. Flue pulled out of back flue sheet, due to weak and defective bead; 3 injured.

March 4, 1916, locomotive 4049 (B. & O.), Toledo, Ohio. Top packing nut to reflex water glass blew off; defective threads; 1 injured.

May 4, 1916, locomotive 608, near Bates, Ohio. Flue broke at weld; overheated in welding; 3 injured.

Three accidents; 7 injured.

CINCINNATI, NEW ORLEANS & TEXAS PACIFIC RAILWAY:

*July 10, 1915, locomotive 912, Greenwood, Ky. Squirt hose burst; hose worn thin, due to rubbing on apron between locomotive and tender; 1 injured.

One accident; 1 injured.

CINCINNATI NORTHERN RAILROAD:

April 17, 1916, locomotive 6149, Scott, Ohio. Headlight fell off, due to not being properly fastened to bracket; 1 injured.

One accident; 1 injured.

CLEVELAND, CINCINNATI, CHICAGO & ST. LOUIS RAILWAY:

August 3, 1915, locomotive 6557, Mount Carmel, Ill. Injector steam pipe spanner nut blew off; nut too large for threaded connection; 1 injured.

December 21, 1915, locomotive 7266, Linndale, Ohio. Injector primer bonnet blew out, due to poor threads and loose fit; 1 injured.

January 17, 1916, locomotive 7051, Delaware, Ohio. Rear driving axle broke; old fracture; 1 injured.

February 4, 1916, locomotive 7398, Elmwood Place, Ohio. Front spring hanger of left front driving spring broke, allowing front end of locomotive to dip, causing footboards to catch crossing planks; 1 killed.

March 13, 1916, locomotive 6740, Deputy, Ind. Radius bar pin became galled in link block, due to insufficient lubrication, causing radius bar to break; reverse lever thrown in back motion; defective spring in reverse lever latch; 1 injured.

*May 13, 1916, locomotive 6679, Zionsville, Ind. Pilot beam handhold pulled out; 1 killed.

June 13, 1916, locomotive 6670, Paris, Ind. Right injector steam-pipe nipple blew out of fountain; nipple improperly fitted and steam pipe, 15 feet 5 inches long, unbraced; 2 injured.

Seven accidents; 2 killed, 6 injured.

CLIFTON & OKLAHOMA WESTERN RAILWAY:

January 17, 1916, locomotive 103, Clinton, Okla. Lubricator glass burst; injured by flying glass; shield removed at time of accident; 1 injured.

One accident; 1 injured.

COLORADO & SOUTHERN RAILWAY:

September 8, 1915, locomotive 616, near Cheyenne, Wyo. Piston head knocked out, due to nut working off end of piston rod; 1 killed.

February 21, 1916, locomotive 455, Louisville, Colo. Wooden plug blew out of injector delivery pipe where hole had rusted through; 1 injured.

April 23, 1916, locomotive 520, Williams, Colo. Injured by hot water from defective squirt hose; 1 injured.

Three accidents; 1 killed, 2 injured.

DELAWARE & HUDSON Co.:

October 24, 1915, locomotive 897, Worcester, N. Y. Injector delivery pipe banner nut blew off; cracked nut and defective threads; 1 injured.

January 25, 1916, locomotive 883, Oneonta, N. Y. Back head of main reservoir blew out; improperly constructed; 1 injured.

March 7, 1916, locomotive 537, Cooks Siding, N. Y. Flue broke at weld; overheated in welding; 1 injured.

March 28, 1916, locomotive 503, near Waterford, N. Y. Right and left side rods broke; 1 injured.

April 16, 1916, locomotive 762, near Delanson, N. Y. Draw gear casing broke, due to defective patches on tender frame and failure to make repairs; work reported 10 times just previous to accident; 1 injured.

Five accidents; 5 injured.

DELAWARE, LACKAWANNA & WESTERN RAILROAD:

*July 13, 1915, locomotive 365, Scranton, Pa. Squirt hose valve worked open while engineer was operating injector; 1 injured.

*July 24, 1915, locomotive 1169, Gouldsboro, Pa. Valve on squirt hose loose; galled by hot water; 1 injured.

December 21, 1915, locomotive 1103, Buffalo, N. Y. Arch tube pulled out of sheet; tube not extending through sheet; 2 injured.

January 10, 1916, locomotive 774, Waverly, N. Y. Injector steam pipe pulled out of brazing sleeve; improperly brazed; 1 injured.

March 30, 1916, locomotive 1221, near Tobyhanna, Pa. Stud in screw reversing gear bracket blew out, due to not being screwed into sheet far enough and three other studs broken off, which caused undue strain on remainder of studs; 1 injured.

Five accidents; 6 injured.

DENVER & RIO GRANDE RAILROAD:

July 5, 1915, locomotive 588, Colorado Springs, Colo. Water glass burst; injured by escaping steam and water; 1 injured.

August 7, 1915, locomotive 1056, Welby, Utah. Employee scalded by hot water from injector overflow pipe, due to boiler check leaking; 1 injured.

September 20, 1915, locomotive 786, near Grand Junction, Colo. Main fountain valve bonnet blew out, due to loose fit and defective threads; 2 injured.

September 28, 1915, locomotive 1104, Minturn, Colo. Water glass burst; inefficient shield; 1 injured.

January 28, 1916, locomotive 3 (C. B.), Cuprum, Utah. Blowoff cock blew off nipple in boiler; defective threads and absence of proper operating device; 1 injured.

April 11, 1916, locomotive 167, near Ridgway, Colo. Right main crank pin broke; old defect in pin; 1 injured.

April 25, 1916, locomotive 971, Salt Lake City, Utah. Hole in end of drawbar between locomotive and tender pulled out; safety chains too long (but held), allowing apron to drop down and fireman to fall between; 1 injured.

May 6, 1916, locomotive 421, Gunnison, Colo. Water glass burst; scalded while closing water glass cocks; 1 injured.

June 5, 1916, locomotive 1054, Welby, Utah. Injector delivery pipe coupling nut blew off, due to improper fit of nut and nut damaged by use of improper tools; 1 injured.

Nine accidents; 10 injured.

DULUTH, MISSABE & NORTHERN RAILWAY:

May 18, 1916, locomotive 5, near Payne, Minn. Crown sheet failure due to low water; no contributory causes found; 2 injured.

One accident; 2 injured.

EL PASO & SOUTHWESTERN RAILROAD:

* August 15, 1915, locomotive 207, Douglas, Ariz. Burned while priming injector, due to steam and hot water from defective squirt hose; 1 injured.

One accident; 1 injured.

ERIE RAILROAD:

September 8, 1915, locomotive 689 Jersey City, N. J. Squirt hose parted at splice; insecurely clamped; 1 injured.

October 4, 1915, locomotive 3136, Caledonia, Ohio. Superheater tube broke; overheated in welding; 1 injured.

October 14, 1915, locomotive 3029, Ashland, Ohio. Superheater tube broke in prosser groove, due to excessive use of prosser; 1 injured.

November 6, 1915, locomotive 1661, Castile, N. Y. Flue broke at weld; overheated in welding; 1 injured.

November 19, 1915, locomotive 2015, Buffalo, N. Y. Squirt hose blew off at splice; hose not clamped; 1 injured.

December 6, 1915, locomotive 746, Gravity, Pa. Flue broke near weld; 1 injured.

December 8, 1915, locomotive 1475, Hornell, N. Y. Grate shaker bracket stud blew out; improperly applied; 1 injured.

December 15, 1915, locomotive 1453, Jersey City, N. J. Tubular lubricator glass broke; shield missing; 1 injured.

* January 7, 1916, locomotive 901, Johnson City, N. Y. Drawbar pin on tender broke, allowing fireman's leg to slip down between locomotive and tender; 1 injured.

February 13, 1916, locomotive 1488, Deposit, N. Y. Drawbar between locomotive and tender broke, allowing apron to drop between, account apron being too narrow and safety chains too long; 1 injured.

February 19, 1916, locomotive 907, Overlook, N. J. Steam heat pipe union burst; defective union; 5 injured.

February 21, 1916, locomotive 103, Jersey City, N. J. Gasket blew out of reflex water glass; bolts not properly tightened; 1 injured.

March 10, 1916, locomotive 2048, Venango, Pa. Flue broke; overheated in welding; 1 injured.

* March 13, 1916, locomotive 1710, Meadville, Pa. Tender filling hole cover hinge broke; old break; 1 injured.

March 18, 1916, locomotive 1818, Leontia, Ohio. Flue broke at weld; defective weld; 1 injured.

March 19, 1916, locomotive 1763, Susquehanna, Pa. Arch tube cap blew off; studs broken; old defect in studs; 1 killed.

March 29, 1916, locomotive 1683, Windham, Ohio. Draft pipe came down, causing back draft; pipe improperly applied; 2 injured.

April 5, 1916, locomotive 2560, Hammond, Ind. Reverse lever slipped, due to defective latch and not sufficient clearance between lever and brake valve; 1 injured.

April 19, 1916, locomotive 1658, Waverly, N. Y. Low coupler on rear of tender, causing locomotive to part from train; 1 injured.

June 7, 1916, locomotive 1477, Port Jervis, N. Y. Scalded by hot water from injector overflow pipe; elbow used on end of pipe for deflecting water downward in ashpan missing; 1 injured.

June 23, 1916, locomotive 1706, Ontario, Ohio. Locomotive and tender brakes defective, and throttle lever quadrant in such condition as to allow the throttle lever to catch, causing engineer to lose control of locomotive; 1 injured.

Twenty-one accidents; 1 killed, 25 injured.

FLORIDA EAST COAST RAILWAY:

October 13, 1915, locomotive 106, New Smyrna, Fla. Squirt hose blew off; insecurely clamped; 1 injured.

* December 17, 1915, locomotive 89, Tropic, Fla. Blowoff cock nipple broke; 1 injured.

Two accidents; 2 injured.

FORT WORTH & DENVER CITY RAILWAY:

June 17, 1916, locomotive 209, near Memphis, Tex. Squirt hose blew off; insecurely clamped; 1 injured.

One accident; 1 injured.

GALVESTON, HOUSTON & HENDERSON RAILROAD:

* May 5, 1916, locomotive 83, Genoa, Tex. Piston rod broke, causing cylinder head to be knocked out; old crack through keyway of piston; 1 injured.

One accident; 1 injured.

GEORGETOWN & WESTERN RAILROAD:

November 27, 1915, locomotive 119, near Earles, S. C. Ashpan blower pulled out of back boiler head, due to pipe riding on driving box; 1 killed, 1 injured.

One accident; 1 killed, 1 injured.

GEORGIA, FLORIDA & ALABAMA RAILWAY:

* April 18, 1916, locomotive 201, Bainbridge, Ga. Squirt hose blew off; insecurely fastened; 1 injured.

One accident; 1 injured.

GEORGIA RAILROAD:

May 11, 1916, locomotive 302, near Union Point, Ga. Crown sheet failure; low water; no contributory causes found; 2 injured.

One accident; 2 injured.

GRAND RAPIDS & INDIANA RAILWAY:

* December 24, 1915, locomotive 29, Kalamazoo, Mich. Flue burst; 1 injured.

One accident; 1 injured.

GRAND TRUNK RAILWAY SYSTEM:

February 5, 1916, locomotive 2254, Battle Creek, Mich. Calking rivet in fire-box; drove rivet into boiler while under pressure; 1 injured.

March 3, 1916, locomotive 1709, Deering, Me. Head blew out of main reservoir, due to kerosene oil being injected through air pump; 4 injured.

Two accidents; 5 injured.

GREAT NORTHERN RAILWAY:

* July 15, 1915, locomotive 2011, Galata, Mont. Scalded due to leaky blow-off cock; 1 injured.

July 28, 1915, locomotive 1546, Barnesville, Minn. Water glass burst; inefficient shield; 1 injured.

August 16, 1915, locomotive 1817, Wilson Creek, Wash. Air pump throttle valve bonnet screwed out while opening pump throttle, due to being loosely applied; 2 injured.

September 10, 1915, locomotive 3011, Redland, Minn. Blow-off pipe broke at elbow coupling; defective elbow; 1 injured.

October 29, 1915, locomotive 1198, near Alexandria, Minn. Left injector steam pipe broke off at collar at throttle union, due to long pipe not properly braced; 1 injured.

November 2, 1915, locomotive 1310, Kelly Lake, Minn. Threads in main throttle packing nut stripped, causing nut to blow off; 2 injured.

November 12, 1915, locomotive 396, Breckenridge, Minn. Washout plug blew out; threads on plug and sheet crossed; poor threads in sheet; 1 killed.

February 28, 1916, locomotive 2014, Hillyard, Wash. Injector steam ram bonnet blew out; bonnet improperly fitted in valve body; 1 injured.

* March 13, 1916, locomotive 55, Breckenridge, Minn. Drawbar between locomotive and tender failed, causing fireman to fall between; 1 injured.

May 15, 1916, locomotive 1153, Great Falls, Mont. Washout plug blew out while being tightened under pressure; 1 injured.

Ten accidents; 1 killed, 11 injured.

GREENWICH & JOHNSONVILLE RAILWAY:

* November 25, 1915, locomotive 65, Lees, N. Y. Side rod broke; 1 injured. One accident; 1 injured.

GULF, COLORADO & SANTA FE RAILWAY:

December 17, 1915, locomotive 428, Flora, Tex. Crown sheet failure; low water; operating without water glass; 1 injured.

January 3, 1916, locomotive 786 (A., T. & S. F.), near Lampasas, Tex. Explosion due to failure of firebox sheets, caused by overheated crown, side, and door sheets; 3 injured.

April 3, 1916, locomotive 759, near Brownwood, Tex. Crown sheet failure; low water; no contributory causes found; 3 injured.

Three accidents; 7 injured.

HOCKING VALLEY RAILWAY:

March 7, 1916, locomotive 538 (K. & M.), near Enterprise, Ohio. Crown sheet failure; low water; no contributory causes found; 2 injured.

One accident; 2 injured.

HOUSTON & TEXAS CENTRAL RAILROAD:

March 9, 1916, locomotive 23, Houston, Tex. Left front spring hanger broke, knocking out washout plug, due to plug projecting out too far; 1 injured.

One accident; 1 injured.

ILLINOIS CENTRAL RAILROAD:

July 4, 1915, locomotive 235, Centralia, Ill. Scalded while using defective squirt hose; 1 injured.

July 17, 1915, locomotive 438, Biggs, Ill. Lubricator glass burst; inefficient shield; 1 injured.

July 26, 1915, locomotive 183, Memphis, Tenn. Squirt-hose valve open when injector was applied; valve improperly located; 1 injured.

July 31, 1915, locomotive 1009, McComb, Miss. Flue driven out of back flue sheet while punching flue plug out of front end of flue with rod with pressure on boiler; 1 injured.

August 4, 1915, locomotive 890, near Council Bluffs, Iowa. Squire hose burst; defective hose; 1 injured.

August 16, 1915, locomotive 748, Nonconnah, Tenn. Scalded by hot water from pipe attached to blow-off cock, due to improper arrangement of pipe; 1 injured.

August 17, 1915, locomotive 28, Central City, Iowa. Lubricator register glass broke; scalded by hot oil; 1 injured.

August 18, 1915, locomotive 1709, Waterloo, Iowa. Water glass broke; injured by escaping steam and water; 1 injured.

September 4, 1915, locomotive 598, Iowa Falls, Iowa. Injector frost cock spanner nut blew off, due to defective spanner nut, caused by use of hammer and set; 1 injured.

October 23, 1915, locomotive 102, Gardere, La. Burned while filling lubricator; 1 injured.

November 10, 1915, locomotive 1034, Cairo, Ill. Patch bolt in right fire-box side sheet blew out; defective bolt; 2 injured.

January 30, 1916, locomotive 1962, Fort Dodge, Iowa. Blow-off cock opened; 1 injured.

March 21, 1916, locomotive 842, Tangipahoa, La. Knuckle in coupler at rear of tender broke through pin hold; 1 injured.

March 30, 1916, locomotive 1612, Bloomington, Ill. Squirt-pipe union pulled apart; defective union; 1 injured.

April 21, 1916, locomotive 207, Jackson, Tenn. Scalded by hot water from defective squirt hose; 1 injured.

Fifteen accidents; 16 injured.

INDIANA HARBOR BELT RAILROAD:

* October 25, 1915, locomotive 26, Blue Island, Ill. Leaky throttle, allowing locomotive to move; 1 injured.

* April 8, 1916, locomotive 5607, Gibson, Ind. Air door fell on fireman's hand, due to bolt coming out of pedestal; 1 injured.

Two accidents; 2 injured.

INTERNATIONAL & GREAT NORTHERN RAILWAY:

* August 24, 1915, locomotive 122, Mart, Tex. Squirt hose burst; hose defective; 1 injured.

* January 6, 1916, locomotive 231, Palestine, Tex. Operating lever to sander broke; 1 injured.

Two accidents; 2 injured.

KANSAS CITY, MEXICO & ORIENT RAILROAD:

* October 9, 1915, locomotive 17, West Wichita, Kans. Water glass burst; injured by flying glass; 1 injured.

One accident; 1 injured.

KANSAS CITY SOUTHERN RAILWAY:

* August 5, 1915, locomotive 560, Kniveton, Kans. Squirt pipe broke off; scalded by hot water; 1 injured.

February 22, 1916, locomotive 85, East Kansas City, Mo. Operating rod to blow-off cock became disconnected; defective connection; 1 injured.

* March 15, 1916, locomotive 497, Lyons, Okla. Shaking grates on engine; shaker rigging became disconnected; 1 injured.

April 9, 1916, locomotive 497, near Watts, Okla. Flue broke; overheated in welding; 1 injured.

June 13, 1916, locomotive 708, Neosho Hill, Mo. Shaker bar slipped off post, due to loose fit and oil in socket; 1 injured.

Five accidents; 5 injured.

KENTUCKY & INDIANA TERMINAL RAILROAD:

November 17, 1915, locomotive 11, Louisville, Ky. Wash-out plug covered by socket blew out; threads defective; 2 injured.

One accident; 2 injured.

LAKE ERIE & WESTERN RAILROAD:

December 27, 1915, locomotive 5535, near Morris, Ohio. Steam pipe in front end burst, due to crack 9 inches long which had been repaired by plugging; 1 injured.

One accident; 1 injured.

HIGH VALLEY RAILROAD:

July 29, 1915, locomotive 3053, Pittston, Pa. Injector delivery pipe spanner nut broke while being tightened under pressure, due to use of improper tools; 1 injured.

August 14, 1915, locomotive 238, Penn Haven Junction, Pa. Flue broke; overheated in welding and end weakened by careless use of flue cutter; 1 injured.

September 16, 1915, locomotive 2233, Port Reading Junction, N. J. Injector steam pipe spanner nut broke; nut defective, due to frequent use of hammer and chisel used in tightening same; 1 injured.

December 14, 1915, locomotive 563, Jersey City, N. J. Main connection side strap bolts sheared on both sides; 2 injured.

December 17, 1915, locomotive 1690, Wende, N. Y. Quadrant bracket stud blew out; not screwed into sheet far enough; 1 injured.

January 17, 1916, locomotive 579, Pittston Junction, Pa. Side rod strap broke, due to old crack, causing rods to strip on both sides and knocking cab bracket stud out of boiler; 1 injured.

March 14, 1916, locomotive 1636, Gratwick, N. Y. Crown sheet failure; low water; mud ring cracked and leaking badly; reported 18 times, and crown bolts reported leaking badly 16 times, four times going into service, within past 30 days; 2 injured.

* April 12, 1916, locomotive 799, Caywood, N. Y. Shaker bar slipped off; 1 injured.

Eight accidents; 10 injured.

LOUISIANA WESTERN RAILROAD:

* October 16, 1915, locomotive 265, Crawley, La. Engineer's foot caught between reverse lever and boiler head; 1 injured.
One accident; 1 injured.

LOUISVILLE & NASHVILLE RAILROAD:

July 22, 1915, locomotive 934, Faxon, Tenn. Scalded by hot water from injector overflow, due to injector breaking and overflow pipe pointing outward; 1 injured.

* September 22, 1915, locomotive 1048, Busby, Tenn. Grease cup flew off of locomotive; 1 injured.

* October 22, 1915, locomotive 960, Kellys, Ky. Left main driver axle broke; old defect; 1 injured.

January 16, 1916, locomotive 1012, Neon, Ky. Air pump throttle bonnet backed out of valve body while fireman was attempting to open throttle; stem bent and bonnet fit to body of valve loose; 1 injured.

January 18, 1916, locomotive 860, near Hatton, Ky. Drawbar and safety chains between locomotive and tender broke; old fracture in drawbar and excessive lost motion between locomotive and tender; 1 injured.

May 8, 1916, locomotive 511, Crestview, Fla. Nipple in blow-off cock blew out; defective threads; 1 injured.

Six accidents; 6 injured.

MAINE CENTRAL RAILROAD:

November 13, 1915, locomotive 318, Ayer Junction, Me. Crown sheet failure; low water; lowest reading of water glass $\frac{3}{4}$ inch above highest part of crown sheet and bottom gauge cock located $2\frac{1}{4}$ inches above highest part of crown sheet; 2 killed; 2 injured.

May 5, 1916, locomotive 306, Brunswick, Me. Elbow blew off blowoff cock; defective threads on elbow; 1 injured.

Two accidents; 2 killed, 3 injured.

MICHIGAN CENTRAL RAILROAD:

February 7, 1916, locomotive 8362, McGraw Branch, Mich. Crown sheet failure; low water; no contributory causes found; 1 injured.

One accident; 1 injured.

MINERAL RANGE RAILROAD:

* October 1, 1915, locomotive 190, Osceola, Mich. Drawbar between locomotive and tender parted; 1 injured.

One accident; 1 injured.

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

February 13, 1916, locomotive 164, Lansford, N. Dak. Dome syphon cock handle pulled off; not properly fastened; 1 injured.

February 20, 1916, locomotive 2405, Phillips, Wis. Injector delivery pipe spanner nut broke while being tightened under pressure; 1 injured.

March 4, 1916, locomotive 2700, Cadott, Wis. Water glass burst; injured by escaping steam and water; 1 injured.

March 25, 1916, locomotive 454, Superior, Wis. Running board broke, due to being weak and improperly supported; 1 injured.

Four accidents; 4 injured.

MISSOURI, KANSAS & TEXAS LINES:

July 9, 1915, locomotive 713, near Aubrey, Tex. Squirt hose valve knocked open; valve improperly located; 1 injured.

* July 14, 1915, locomotive 463, Moran, Tex. Globe valve on squirt hose came open while fireman was putting in fire; 1 injured.

September 13, 1915, locomotive 213, Brinkham, Okla. Squirt hose blew off; 1 injured.

January 3, 1916, locomotive 559, Atoka, Okla. Arch tube plug blew out while being tightened under pressure; shoulder on plug and threads worn; 2 injured.

February 24, 1916, locomotive 201, Parsons, Kans. Rivet in flue sheet seam broke; blew out while being calked under pressure; 1 injured.

* March 9, 1916, locomotive 916, Nocana, Tex. Bolts holding side bearings on right tender truck sheared off, causing tender to turn over; 1 injured.

March 31, 1916, locomotive 754, Dallas, Tex. Bonnet to blowoff valve on top dome blew out while valve was being opened; bonnet not properly tightened; injured.

Seven accidents; 8 injured.

MISSOURI, OKLAHOMA & GULF RAILWAY:

April 15, 1916, locomotive 402, Hoffman, Okla. Crown sheet failure; low water; bottom water glass cock found closed and drain cock to water glass operative; 2 killed, 2 injured.

One accident; 2 killed, 2 injured.

MISSOURI PACIFIC RAILWAY SYSTEM:

July 4, 1915, locomotive 8603, Pindall Spur, Ark. Squirt hose blew off; improperly clamped and end of nipple not turned down; 1 injured.

* July 7, 1915, locomotive 2388, Lake, Village, Ark. Squirt hose blew off; injured.

August 3, 1915, locomotive 3657, Iola, Kans. Squirt hose blew off; insecurely applied; 1 injured.

August 10, 1915, locomotive 1268, Paul, Nebr. Scalded by hot water from squirt hose; valve accidentally opened due to improper location and insufficient packing; 1 injured.

September 22, 1915, locomotive 2337, Forrest Hill, La. Squirt hose blow off; not properly clamped and nipple not turned down; 1 injured.

* October 11, 1915, locomotive 9411, St. Louis, Mo. Brake beam under tank caught on switch point, after breaking; 3 injured.

November 16, 1915, locomotive 56, Padonla, Kans. Water glass burst; injured in escaping from cab; 1 injured.

* December 6, 1915, locomotive 1819, Kansas City, Mo. Drawbar between locomotive and tender broke; 1 injured.

December 13, 1915, locomotive 1811, Marche, Ark. Packing nut blew off of rattle gland; defective threads; 1 injured.

January 12, 1916, locomotive 3653, Neodesha, Kans. Crown sheet failure; low water; no contributory causes found; 1 injured.

January 13, 1916, locomotive 503, Gifford, Ark. Engineer's finger caught between reverse lever and injector feed pipe; (due to block in front end of quadrant having been removed); 1 injured.

January 28, 1916, locomotive 36, Falls City, Nebr. Blow-off cock froze up; when thawed out discharged on injured party; 1 injured.

January 30, 1916, locomotive 119, Garner, Ark. Water glass burst; scalded by escaping steam and water; 1 injured.

* February 21, 1916, locomotive 5505, Normoyle Junction, Kans. Left front crank pin broke; old defect in pin; 1 injured.

* March 14, 1916, locomotive 1812, Hartman, Ark. Reverse lever jumped out of quadrant; 1 injured.

* March 25, 1916, locomotive 2667, Monett, Kans. Nuts on reverse lever worked loose, causing reverse lever to slip; 1 injured.

April 7, 1916, locomotive 543, McGehee, Ark. Stop block in forward end of reverse lever quadrant missing, permitting lever to go forward and strike injector; 1 injured.

April 9, 1916, locomotive 171, Benton, Ark. Squirt hose burst; defective hose; 1 injured.

May 10, 1916, locomotive 1221, Osawatomie, Kans. Water glass burst; scalded by escaping steam and water; 1 injured.

May 24, 1916, locomotive 506, Winchester, Ark. Scalded by hot water from squirt hose; hole cut in hose by cab apron; 1 injured.

May 28, 1916, locomotive 3630, Nevada, Mo. Washout plug blew out while attempting to tighten under pressure; 1 injured.

June 1, 1916, locomotive 815, near Kansas City, Mo. Back end main rod trap broke; defective material; 1 injured.

June 9, 1916, locomotive 540, Bush, Ill. Headlight turbine wheel broke; 2 injured.

June 18, 1916, locomotive 53, Malden, Mo. Scalded by hot water from squirt hose pipe; pipe split; 1 injured.

June 22, 1916, locomotive 543, Gulpha, Ark. Hand caught between injector feed pipe and reverse lever; not sufficient clearance around handle of reverse lever; 1 injured.

June 23, 1916, locomotive 533, Bald Knob, Ark. Scalded by hot water from blow-off pipe; pipe insecurely clamped, allowing pipe to swing around when in use; 1 injured.

Twenty-six accidents; 29 injured.

MOBILE & OHIO RAILROAD:

July 26, 1915, locomotive 349, Jackson, Tenn. Scalded by hot water and steam from overflow pipe connection at injector; check valve stuck open; 1 injured.

August 22, 1915, locomotive 121, East St. Louis, Ill. Main air reservoir burst; badly corroded and cracked; 1 injured.

December 22, 1915, locomotive 217, Tuscaloosa, Ala. Bull's-eye lubricator packing nut blew out; nut cross-threaded; 1 injured.

May 20, 1916, locomotive 175, Tuscaloosa, Ala. Scalded by hot water from defective squirt hose; 1 injured.

June 3, 1916, locomotive 233, West Point, Miss. Washout plug blew out of front flue sheet; plug not in sheet sufficient depth and threads on plug and in sheet defective; 2 injured.

Five accidents; 6 injured.

NASHVILLE, CHATTANOOGA & ST. LOUIS RAILWAY:

September 23, 1915, locomotive 801, Dickson, Tenn. Washout plug blew out while being tightened under pressure; 1 injured.

* November 10, 1915, locomotive 317, De Rossett, Tenn. Reverse lever latch slipped out of quadrant; 1 injured.

* November 22, 1915, locomotive 420, Rockledge, Tenn. Scalded by hot water from squirt hose; valve defective; 1 injured.

January 9, 1916, locomotive 43, near Hico, Tenn. Grease cup thrown off front end of side rod; loose-fitting cup in hole of strap, allowing cup to unscrew when locomotive was in motion; 1 injured.

Four accidents; 4 injured.

NEVADA-CALIFORNIA-OREGON RAILWAY:

October 21, 1915, locomotive 14, Lakeview, Oreg. Crown sheet failure; low water; no contributory causes found; 1 injured.

One accident; 1 injured.

NEW ORLEANS GREAT NORTHERN RAILROAD:

October 31, 1915, locomotive 52, Bogalusa, La. Crown sheet failure; low water; fusible plug not properly maintained; left injector throttle valve defective; 1 killed.

One accident; 1 killed.

NEW YORK CENTRAL RAILROAD—LINES EAST:

December 14, 1915, locomotive 2839, Lacona, N. Y. Flue broke; defective weld; 1 injured.

* February 26, 1916, locomotive 1006, Schenectady, N. Y. Side rod broke; 1 injured.

Two accidents; 2 injured.

NEW YORK CENTRAL RAILROAD—LINES WEST:

July 15, 1915, locomotive 5799, Amherst, Ohio. Water glass burst; cut by flying glass; inefficient shield; 1 injured.

August 1, 1915, locomotive 5468, McNabb, Ill. Right injector steam pipe spanner nut broke; defective material in nut, and steam pipe 13 feet 4 inches long unbraced; 1 injured.

January 27, 1916, locomotive 4553, Youngstown, Ohio. Washout plug blew out while being tightened under pressure; cross-threaded; 1 injured.

February 9, 1916, locomotive 5682, near Air Line Junction, Ohio. Engine truck axle broke off, due to overheated journal, causing locomotive to leave track; 1 injured.

February 19, 1916, locomotive 5897, Ashtabula, Ohio. Bull's-eye lubricator glass blew out; attempted to tighten packing nut while under pressure; 1 injured.

May 5, 1916, locomotive 4414, Collinwood, Ohio. Headlight and bracket fell off, due to broken bracket; old break; 1 injured.

Six accidents; 6 injured.

NEW YORK, CHICAGO & ST. LOUIS RAILROAD:

* August 1, 1915, locomotive 121, Painesville, Ohio. Squirt hose burst; defective hose; 1 injured.

September 14, 1915, locomotive 300, Continental, Ohio. Scalded by hot water, due to boiler check sticking; 1 injured.

February 3, 1916, locomotive 311, Green Springs Junction, Ohio. Defective squirt hose and leaky valve allowed ice to form on tender sill step, which caused fireman to fall; 1 killed.

February 25, 1916, locomotive 9, Chicago, Ill. Main crank pin broke, knocking out cylinder head; old defect in pin; 1 injured.

Four accidents; 1 killed, 3 injured.

NEW YORK, NEW HAVEN & HARTFORD RAILROAD:

August 29, 1915, locomotive 309, near Stonington, Conn. Flue pulled out of flue sheet; beads entirely gone on 16 flues and flues pulling in sheet; 1 injured.

* September 6, 1915, locomotive 1250, Middleboro Junction, Mass. Left forward eccentric cam broke; 1 injured.

* October 20, 1915, locomotive 904, Danbury, Conn. Bolt worked out of left front eccentric, causing reverse lever to jump into back motion; 1 injured.

October 31, 1915, locomotive 357, Woodmont, Conn. Injector overflow pipe disconnected from injector when injector broke, due to defective tubes; 1 injured.

December 16, 1915, locomotive 2300, New Haven, Conn. Steam heat gauge burst, due to defective tubes in gauge; cut by flying glass; 1 injured.

December 17, 1915, locomotive 305, Pawtucket, R. I. Blower pipe loose and turned in front end, causing back draft, due to being insecurely applied; 1 injured.

January 14, 1916, locomotive 1673, near Taunton, Mass. Top longitudinal boiler brace broke and pulled out of front flue sheet; old defect; 2 injured.

January 31, 1916, locomotive 806, Andover, Conn. Main rod broke; old fracture; 1 injured.

February 24, 1916, locomotive 1309, Blackstone, Mass. Blower pipe became disconnected in front end, causing back draft; defective application of pipe; 1 injured.

* March 31, 1916, locomotive 465, Southport, Conn. Reverse lever slipped; 1 injured.

April 22, 1916, locomotive 317, Navy Yard, Conn. Flue broke off at weld; defective butt weld; 1 injured.

May 5, 1916, locomotive 804 (B. & A.), Readville, Mass. Water glass burst; defective shield; scalded by escaping water; 1 injured.

* May 20, 1916, locomotive 202, West Haven, Conn. Side rod broke; 1 injured.

Thirteen accidents; 14 injured.

NEW YORK, ONTARIO & WESTERN RAILWAY:

August 12, 1915, locomotive 314, Ferndale, N. Y. Pump throttle broke off where screwed into turret; 1 killed, 1 injured.

One accident; 1 killed, 1 injured.

NORFOLK & WESTERN RAILWAY:

* July 26, 1915, locomotive 872, Roanoke, Va. Packing blew out of water gauge; fireman had left hand burned; 1 injured.

July 31, 1915, locomotive 1358, Pepper, Va. Squirt hose valve worked open, due to valve not being properly packed; 1 injured.

August 31, 1915, locomotive 387, Shawsville, Va. Flue broke at weld; defective butt weld; 1 injured.

October 8, 1915, locomotive 1003, Doctor, Va. Crown sheet failure; low water; right injector wasted water through overflow pipe to ash pan and safety valves were set 10 pounds above allowed steam pressure; 1 killed; 1 injured.

December 3, 1915, locomotive 404, near Chattaroy, W. Va. Crown sheet failure; low water; no contributory causes found; 1 killed; 1 injured.

December 8, 1915, locomotive 1356, Arthur, Va. Crown sheet failure; low water; no contributory causes found; 2 killed; 1 injured.

* December 14, 1915, locomotive 587, Manor, Va. Valve stem on engine broke; 1 injured.

February 4, 1916, locomotive 708, Shenandoah, Va. Reflex water glass broke; injured by flying glass; 1 injured.

March 9, 1916, locomotive 1004, near Christiansburg, Va. Flue broke at weld; defective butt weld; 1 injured.

June 19, 1916, locomotive 929, Shenandoah, Va. Scalded while taking down tank hose; cold water sprinkler valve leaking, and repairs not made because of lack of material; 1 injured.

Ten accidents; 4 killed, 10 injured.

NORFOLK SOUTHERN RAILROAD:

* January 8, 1916, locomotive 54, Mizelle, N. C. Main driver axle broke; old defect in axle; 1 injured.

One accident; 1 injured.

NORTHERN ALABAMA RAILWAY:

April 8, 1916, locomotive 718 (Southern), near Bear Creek, Ala. Squirt hose blew off; insecurely clamped; 1 injured.

One accident; 1 injured.

NORTHERN PACIFIC RAILWAY:

August 1, 1915, locomotive 1118, Spokane, Wash. Scalded by hot water from overflow pipe, due to injector breaking and overflow pipe being turned out instead of downward; 1 injured.

September 21, 1915, locomotive 2353, Thompson, Minn. Employee injured due to being struck by air pump strainer falling from air pump while locomotive was running about 25 miles per hour; strainer insecurely applied; 1 injured.

* October 13, 1915, locomotive 346, point at which accident occurred not shown. Connecting rod between main rod and rear driving wheel broke, tearing through cab of locomotive; 1 injured.

October 16, 1915, locomotive 1704, Pasco, Wash. Air reversing gear defective; 1 injured.

November 16, 1915, locomotive 4003, Livingston, Mont. Injured while closing primer to injector, due to use of improper handle; 1 injured.

* January 30, 1916, locomotive 671, Toppenish, Wash. Piston rod broke, knocking out front cylinder head, due to old fracture; 1 injured.

February 4, 1916, locomotive 1649, Dehart, Mont. Transmission bar broke; defect in material; 1 injured.

February 19, 1916, locomotive 2373, Staples, Minn. Squirt hose blew off; hose not clamped; 1 injured.

March 14, 1916, locomotive 50, Melmont, Wash. Shaker bar hinge on top of vertical shaker post broke, allowing fireman to fall off locomotive; 1 injured.

June 3, 1916, locomotive 2162, Detroit, Minn. Hand caught between reverse lever and air pipe, due to stop pin at forward end of quadrant missing; 1 injured.

June 10, 1916, locomotive 1501, Snohomish, Wash. Water glass burst; scalded by escaping steam and water; 1 injured.

June 30, 1916, locomotive 2417, near Fargo, N. Dak. Reverse lever latch became loose, causing reverse lever to go forward; 1 injured.

Twelve accidents; 12 injured.

NORTHWESTERN PACIFIC RAILROAD:

April 9, 1916, locomotive 87, Sausalito, Cal. Center portion of cast-iron dome cap blew out; old crack extending entirely around cap one-eighth inch to three-eighths inch deep; 1 killed.

One accident; 1 killed.

OREGON SHORT LINE RAILROAD:

* November 12, 1915, locomotive 1522, Hot Springs, Utah. Shaker connecting rod broke; 1 injured.

One accident; 1 injured.

OREGON-WASHINGTON RAILROAD & NAVIGATION Co.:

* August 26, 1915, locomotive 170, Starbuck, Wash. Lubricator glass burst; 1 injured.

One accident; 1 injured.

PENNSYLVANIA LINES WEST:

July 8, 1915, locomotive 8696, Beverly Junction, Ill. Squirt hose burst; 1 injured.

August 24, 1915, locomotive 7225, Erie, Pa. Pipe attached to blow-off cock for blowing out boiler blew off; threads worn out on pipe and elbow; 1 injured.

October 6, 1915, locomotive 8359, Columbus, Ohio. Lubricator condensing valve bonnet broke; old fracture in bonnet; 1 injured.

October 26, 1915, locomotive 6 (C. L. & N.), Cincinnati, Ohio. Arch tube pulled out of back flue sheet, due to improper application; 1 injured.

November 21, 1915, locomotive 8666, Logansport, Ind. Injector overflow valve bonnet blew out; 1 injured.

* January 9, 1916, locomotive 8836, Carnegie, Pa. Injured due to reverse lever slipping; 1 injured.

January 22, 1916, locomotive 7617, Alliance, Ohio. Bull's-eye lubricator glass blew out; packing nut not screwed in far enough to hold; 1 injured.

March 28, 1916, locomotive 7055, Kenwood, Pa. Hand injured in stoker, due to use of an improperly constructed plug valve, allowing stoker to start while being repaired; 1 injured.

March 29, 1916, locomotive 8139, Dublin Junction, Ind. Valve yoke sprung, causing reverse lever to fly down; 1 injured.

April 25, 1916, locomotive 9764, near Orrville, Ohio. Blower-valve bonnet blew out; defective valve; 1 injured.

Ten accidents; 10 injured.

PENNSYLVANIA RAILROAD:

July 31, 1915, locomotive 5165, Bridgeville, Del. Flue broke, due to corrosion and improperly prossered; 1 injured.

* August 1, 1915, locomotive 2912, Brownsville Junction, Pa. Squirt hose burst; 1 injured.

September 21, 1915, locomotive 1984, Delanco, N. J. Boiler check cap blew out; old crack in check cage and threads defective; 2 injured.

September 23, 1915, locomotive 1493, Newark, N. J. Scalded by hot water from injector overflow pipe, due to union not being properly tightened; 1 injured.

* October 4, 1915, locomotive 530, Meadows Yard, N. J. Brake cylinder pipe broke; 1 injured.

October 10, 1915, locomotive 834, Shamrock, Pa. Crown sheet failure, due to accumulation of hard nonconductive scale on crown sheet around ends of bolts; 1 injured.

October 18, 1915, locomotive 4217, Littlestown, Pa. Crown sheet failure; low water; no contributory causes found; 2 injured.

* November 3, 1915, locomotive 342, Turkey Hill, Pa. Struck by driving rod; bolt missing from rod; 1 injured.

November 16, 1915, locomotive 920, York, Pa. Washout cap blew off; improperly applied by inserting washers in cap and attempted to tighten cap under pressure; 1 injured.

* November 16, 1915, locomotive 905, Phillipsburg, N. J. Packing nut blew off injector; 1 injured.

November 16, 1915, locomotive 2551, Ebenezer, N. Y. Flue failure, due to end of flue in back flue sheet being very thin and bead missing; 1 injured.

December 7, 1915, locomotive 2820, Trenton, N. J. Flue broke; flue worn thin; 1 injured.

* December 21, 1915, locomotive 1431, Youngwood, Pa. Reverse lever slipped out of quadrant; 1 injured.

* December 29, 1915, locomotive 3065, Snow Shoe, Pa. Attempted to turn headlight down when same fell, account being loose on bracket; 1 injured.

January 9, 1916, locomotive 1466, Portage, Pa. Flue broke, due to being overheated previous to application; 1 injured.

January 17, 1916, locomotive 2367, Linn, Pa. Drawbar between locomotive and tender broke; old defect; 1 injured.

January 19, 1916, locomotive 2909, Parksburg, Pa. Squirt hose blew off; hose frozen up and defective nipple; 1 injured.

January 29, 1916, locomotive 951, Ridgway, Pa. Packing nut on injector ram blew off; defective threads; 1 injured.

February 15, 1916, locomotive 1331, near Conewago, Pa. Flue broke; 3 injured.

March 14, 1916, locomotive 3228, Tacony, Pa. Superheater tube broke; defective welding; 2 injured.

March 18, 1916, locomotive 2316, near South Fork, Pa. Blower pipe union nut blew off, due to defective threads; 1 injured.

April 19, 1916, locomotive 3305, near Kiskiminetas Junction, Pa. Handhold on tender pulled off, due to nuts working off bolts; 1 injured.

April 25, 1916, locomotive 1246, New Brunswick, N. J. Keys and nuts worked off pedestal brace bolts on engine truck and brake spreader rod bolts, allowing parts to fly, while locomotive was moving at high rate of speed; 1 killed.

April 28, 1916, locomotive 3624, near Kane, Pa. Right eccentric rod broke; old fracture in rod; 1 injured.

May 3, 1916, locomotive 2570, Derry, Pa. Drain cock blew out of air reservoir, due to defective threads; 1 injured.

June 1, 1916, locomotive 2150, Mesta, Pa. Shaker bar slipped off shaker post; defective socket; 1 injured.

June 28, 1916, locomotive 220, Pitcairn, Pa. Injector broke while being primed, due to loose packing and worn threads on water regulating valve spindle; 1 injured.

Twenty-seven accidents; 1 killed, 31 injured.

PERE MARQUETTE RAILROAD:

August 18, 1915, locomotive 905, Saginaw, Mich. Arch tube plug blew out while being tightened under pressure; defective threads on plug and in sheet; 2 injured.

August 26, 1915, locomotive 624, Ewart, Mich. Pocket flue blew out; improperly applied; 2 injured.

* November 2, 1915, locomotive 320, point at which accident occurred not shown. Drawbar pulled out of locomotive; 1 injured.

June 4, 1916, locomotive 619, near Juniata, Mich. Flue broke at weld; 1 injured.

Four accidents; 6 injured.

PHILADELPHIA & READING RAILWAY:

October 20, 1915, locomotive 1190, Philadelphia, Pa. Reflex water glass gasket blew out; 1 injured.

November 10, 1915, locomotive 181, Perkastie, Pa. Air pump steam pipe pulled out of brass connection in dome; pipe improperly applied; 1 injured.

* November 15, 1915, locomotive 1556, Rutherford, Pa. Reverse lever did not work properly; 1 injured.

* December 21, 1915, locomotive 1030, Sunbury, Pa. Knob on handhold pulled off; 1 injured.

January 9, 1916, locomotive 1331, Newberry Junction, Pa. Lubricator water valve bonnet blew out; loosely-applied; 1 injured.

January 13, 1916, locomotive 1719, Rutherford, Pa. Steam pipe in front end burst; defective casting; 2 injured.

January 31, 1916, locomotive 346, Hopewell, N. J. Blow-off cock broke off flush with sheet, due to blow-off discharge pipe not being securely braced; 1 injured.

* March 14, 1916, locomotive 1119, Royersford, Pa. Grate shaker stuck; 1 injured.

Eight accidents; 9 injured.

ST. JOSEPH & GRAND ISLAND RAILWAY:

* July 5, 1915, locomotive 43, Seneca, Kans. Squirt hose valve came open; 1 injured.

One accident; 1 injured.

ST. LOUIS & SAN FRANCISCO RAILROAD:

January 16, 1916, locomotive 1402, near Sapulpa, Okla. Crown sheet failure; low water; top water glass cock closed at time of accident; 2 killed.

January 18, 1916, locomotive 2004, near Pratt City, Ala. Flue broke; improperly welded; 2 injured.

January 20, 1916, locomotive 717, Cherryvale, Kans. Defective handrail on locomotive; 1 injured.

February 3, 1916, locomotive 801, Okmulgee, Okla. Crown sheet failure; low water; bottom end of water glass stopped up solid with rubber; 1 injured.

February 16, 1916, locomotive 1104, Memphis, Tenn. Crown sheet failure; low water; no contributory causes found; 1 injured.

February 16, 1916, locomotive 1332, Monett, Mo. Water glass burst; injured by escaping steam and water; 1 injured.

March 8, 1916, locomotive 1000, near Sikeston, Mo. Right eccentric strap broke, causing reverse lever latch to become disengaged; 1 injured.

May 16, 1916, locomotive 1206, New Albany, Miss. Defective arm rest; 1 injured.

May 18, 1916, locomotive 1326, St. Louis, Mo. Arch tube cap blew off; studs broke due to old fractures; 1 killed.

May 25, 1916, locomotive 635, Springfield, Mo. Nipple blew out of air drum while union was being tightened, due to defective threads; 1 injured.

June 3, 1916, locomotive 1008, Verona, Mo. Reverse lever flew back, due to broken piston valve packing ring dropping into steam port; 1 injured.

Eleven accidents; 3 killed, 10 injured.

ST. LOUIS, BROWNSVILLE & MEXICO RAILWAY:

* July 17, 1915, locomotive 3, Armstrong, Tex. Pipe leading to blow-off cock broke; 1 injured.

One accident; 1 injured.

ST. LOUIS SOUTHWESTERN RAILWAY:

* March 11, 1916, locomotive 502, Zeta, Mo. Drawbar and safety chains on locomotive broke; 1 injured.

June 18, 1916, locomotive 251, Rob Roy, Ark. Drawbar and safety chains between locomotive and tender broke; 1 injured.

Two accidents; 2 injured.

SEABOARD AIR LINE RAILWAY:

* November 27, 1915, locomotive 119, Earle, S. C. Spring hanger broke, allowing engine and boiler to drop two inches below normal, causing valve and nipple to pull out, allowing steam to escape; 1 killed, 1 injured.

* December 10, 1915, locomotive 821, Middendorf, S. C. Cylinder head blew off; bolt head struck brakeman; 1 injured.

February 6, 1916, locomotive 46, near Irondale, Ala. Arch tube burst; tube overheated, due to mud and scale; 1 killed.

* April 13, 1916, locomotive 602, Sanderson, Fla. Bolt in grate shaker rigging broke; 1 injured.

* April 22, 1916, locomotive 678, Minturn, S. C. Spring hanger broke; 1 injured.

May 31, 1916, locomotive 759, Fort Lawn, S. C. Scalded while attempting to open plug type blow-off cock, due to stem on end of plug cock breaking while loosening nuts; 2 injured.

June 18, 1916, locomotive 771, Jacksonville, Fla. Squirt hose blew off nipple; insecurely applied; 1 injured.

Seven accidents; 2 killed, 7 injured.

SOUTHERN PACIFIC, ATLANTIC SYSTEM:

December 27, 1915, locomotive 830 (G. H. & S. A.), Glidden, Tex. Cap on blow-off pipe blew off; cap not properly tightened; 1 injured.

March 9, 1916, locomotive 773 (G. H. & S. A.), near McKees, Tex. Crown sheet failure; low water; 18 radial stays found broken with old breaks, and 10 found broken with old fractures; 2 killed.

April 2, 1916, locomotive 760 (G. H. & S. A.), Small, Tex. Injecting manure and paper into boiler through injector to stop leaks; 1 injured.

* April 13, 1916, locomotive 506 (G. H. & S. A.), San Antonio, Tex. Reverse lever slipped; 1 injured.

Four accidents; 2 killed, 3 injured.

SOUTHERN PACIFIC, PACIFIC SYSTEM:

July 5, 1915, locomotive 2763, Ogilby, Cal. Crown sheet failure; low water; reflex type water glass limed up, making it difficult to see water; 3 killed, 3 injured.

One accident; 3 killed, 3 injured.

SOUTHERN RAILWAY:

July 5, 1915, locomotive 666, Johnsburg, Ind. Scalded by hot water from injector overflow; pipe improperly located; 1 injured.

August 14, 1915, locomotive 3044, Lockhart, S. C. Squirt hose blew off; insecurely applied; 1 injured.

* November 19, 1915, locomotive 1557, South Richmond, Va. Injured due to defective running board; 1 injured.

December 27, 1915, locomotive 3889, Hodges, S. C. Flue broke; defective weld; 1 injured.

* December 30, 1915, locomotive 465, Keysville, Va. Water glass burst; 1 injured.

* January 6, 1916, locomotive 393, Riverside, Ala. Ash pan blower pipe broke; 1 injured.

January 16, 1916, locomotive 1107, Charleston, S. C. Washout plug blew out while being tightened under pressure; 2 injured.

February 11, 1916, locomotive 180, Piedmont, Ga. Squirt hose valve defective; 1 injured.

March 14, 1916, locomotive 329, near Advance, N. C. Squirt hose blew off; insecurely clamped; 1 injured.

April 21, 1916, locomotive 697, Swannanoa, N. C. Squirt hose blew off; insecurely applied; 1 injured.

Ten accidents; 11 injured.

SPOKANE, PORTLAND & SEATTLE RAILWAY:

October 23, 1915, locomotive 455, Snake River, Wash. Drawbar and safety chains between locomotive and tender broke; 2 killed.

One accident; 2 killed.

TEXAS & PACIFIC RAILWAY:

December 29, 1915, locomotive 418, Eastland, Tex. Solid plug blew out of crown sheet; 1 injured.

March 16, 1916, locomotive 309, Aledo, Tex. Expansion pad stud blew out; threads rusted off; 1 injured.

* March 24, 1916, locomotive 267, Fort Worth, Tex. Flue burst; 1 injured.

* March 30, 1916, locomotive 395, Kent, Tex. Shaker bar slipped off, due to worn staff; 1 injured.

April 1, 1916, locomotive 337, Westbrook, Tex. Shaker bar slipped out of socket, due to broken eye on bar; 1 injured.

* May 2, 1916, locomotive 373, Dallas, Tex. Reverse lever slipped out of quadrant, due to defective teeth on quadrant; 1 injured.

June 7, 1916, locomotive 370, Van Horn, Tex. Shaker bar slipped off shaft; 1 injured.

Seven accidents; 7 injured.

TOLEDO & OHIO CENTRAL RAILWAY:

January 4, 1916, locomotive 9507, Findlay, Ohio. Left front spring hanger pin broke, due to pin being too small, allowing locomotive to drop down, front footboard catching crossing plank and bending footboard brackets back under pilot beam; 1 injured.

One accident; 1 injured.

TOLEDO, ST. LOUIS & WESTERN RAILROAD:

October 23, 1915, locomotive 180, Decatur, Ind. Flue broke; flue weak and defective, caused by excessive use of expanding tool; 1 injured.

May 24, 1916, locomotive 133, near Toledo, Ohio. Turbine and casting of electric headlight burst; 1 injured.

Two accidents; 2 injured.

UNION PACIFIC RAILROAD:

September 3, 1915, locomotive 277, Rawlins, Wyo. Scalded by hot water from squirt hose valve, due to loose packing; 1 injured.

November 6, 1915, locomotive 257, Laramie, Wyo. Elbow in steam heat line blew out, due to threads corroded away; 1 injured.

December 3, 1915, locomotive 326, Otto, Wyo. Squirt hose blew off; insecurely applied and nipple pointing upward; 1 injured.

December 11, 1915, locomotive 1263, St. George, Kans. Union nut on ash pan blower pipe broke; nut defective; old break; 1 injured.

December 30, 1915, locomotive 4406, Omaha, Nebr. Feed pipe to air-pump lubricator broke off; 1 injured.

Five accidents; 5 injured.

UNION RAILROAD:

* October 24, 1915, locomotive 112, Duquesne, Pa. Side rod broke, causing engine to turn over on side, breaking steam pipe; flaw in rod; 1 injured.

One accident; 1 injured.

VIRGINIAN RAILWAY:

* January 19, 1916, locomotive 422, Lester, W. Va. Nipple in whistle broke off where screwed in dome, due to old crack; 1 injured.

February 15, 1916, locomotive 303, Princeton, W. Va. Safety valve casting blew off; threads stripped, and improper fit; 1 injured.

Two accidents; 2 injured.

WABASH RAILWAY:

July 12, 1915, locomotive 605, Kansas City, Mo. Blowoff pipe of house line blew off; defective threads on connection; 1 injured.

* October 15, 1915, locomotive 86, Morrisonville, Ill. Injector broke; scalded by hot water from overflow pipe; 1 injured.

December 10, 1915, locomotive 2014, Huntsville, Mo. Injector steam ram bonnet blew out, due to loose fit of bonnet in injector; called to personal attention of foreman before departure of locomotive and repairs not made; 1 injured.

January 10, 1916, locomotive 663, North Morencie, Mich. Crown sheet failure; low water; steam pipe to water glass practically closed, and top and middle gauge cocks stopped up; 2 injured.

March 9, 1916, locomotive 2019, near Truesdale, Mo. Crown sheet failure; low water; contributed to by water foaming; 2 injured.

May 31, 1916, locomotive 805, Randolph, Mo. Squirt hose parted at splice; hose not clamped; 1 injured.

June 19, 1916, locomotive 2404, near Jacksonville, Ill. Blower pipe bushing at throttle connection broke; old crack in bushing; 1 injured.

Seven accidents; 9 injured.

WESTERN MARYLAND RAILWAY:

* November 4, 1915, locomotive 786, Lap, Md. Crown sheet failure; 1 injured.

One accident; 1 injured.

WESTERN PACIFIC RAILWAY:

August 23, 1915, locomotive 18, Salt Lake City, Utah. Patch bolt blew out while calking patch seam; threads corroded entirely away on bolt and in hole; 1 injured.

One accident; 1 injured.

WHEELING & LAKE ERIE RAILROAD:

* November 1, 1915, locomotive 2201, Cleveland, Ohio. While locomotive was rounding curve fireman was caught between tank and cab; 1 injured.

* November 25, 1915, locomotive 2201, Cleveland, Ohio. Plug blew out of crown sheet; 1 injured.

Two accidents; 2 injured.

YAZOO & MISSISSIPPI VALLEY RAILROAD:

January 31, 1916, locomotive 690 (I. C.), Prichard, Miss. Air operative fire door fell out of slides at time fireman was putting in fire; 1 injured.

One accident; 1 injured.