

INTERSTATE COMMERCE COMMISSION

FOURTH ANNUAL REPORT

OF THE

Chief Inspector of Locomotive
Boilers

TO THE

INTERSTATE COMMERCE COMMISSION

FOR THE FISCAL YEAR ENDED JUNE 30, 1915



WASHINGTON
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ANNUAL REPORT OF THE CHIEF INSPECTOR OF LOCOMOTIVE BOILERS.

WASHINGTON, October 9, 1915.

To the Interstate Commerce Commission:

In compliance with the statute, the fourth annual report of the Chief Inspector of Locomotive Boilers for the fiscal year ended June 30, 1915, is herewith respectfully submitted.

The work of the division of locomotive boiler inspection during the year has been substantially the same in character as the work of that division in previous years.

The tables given below show in concrete form the number of locomotives inspected, the number and percentage found defective, and the number ordered out of service on account of not meeting the requirements of the law during each of the four years the law has been in force.

They also show the total number of accidents due to failure from any cause of locomotive boilers or their appurtenances and the number of persons killed or injured thereby, with the percentage of decrease each year since the law became effective; also the total decrease during that period.

The data contained therein reflect the work performed and the results accomplished and further explanation or comment need not be made.

Locomotives inspected, number found defective, and number ordered out of service.

	1915	1914	1913	1912
Number of locomotives inspected.....	73,443	92,716	90,346	74,234
Number found defective.....	32,666	49,137	54,522	48,768
Percentage found defective.....	44.4	52.9	60.3	65.7
Number ordered out of service.....	2,027	3,365	4,676	3,377

Number of accidents, number killed, and number injured, with percentage of decrease.

	1915	1914	1913	1912
Number of accidents.....	424	555	820	856
Decrease from previous year..... per cent..	23.6	32.3	4.2	.....
Decrease from 1912..... do.....	50.5	.....	.....	.....
Number killed.....	13	23	36	91
Decrease from previous year..... per cent..	43.5	36.1	60.4	.....
Decrease from 1912..... do.....	85.7	.....	.....	.....
Number injured.....	467	614	911	1,005
Decrease from previous year..... per cent..	24	32.6	9.3	.....
Decrease from 1912..... do.....	53.5	.....	.....	.....

The following table shows the total number of persons killed and injured by failure of locomotive boilers or their appurtenances during the past four years, classified in accordance with their occupations:

	Year ended June 30—							
	1915		1914		1913		1912	
	Killed.	In-jured.	Killed.	In-jured.	Killed.	In-jured.	Killed.	In-jured.
Members of train crews:								
Engineers.....	5	150	8	187	12	268	22	310
Firemen.....	7	207	8	290	12	478	19	491
Brakemen.....		40		46	6	79	8	79
Conductors.....	1	4	1	6	2	7	4	16
Switchmen.....		4		1		2		7
Roundhouse and shop employees:								
Boiler makers.....		5	1	18		10	2	3
Machinists.....		10	2	5		11	7	11
Foremen.....		2	1	6		4	1	4
Inspectors.....		3		3		3	1	2
Watchmen.....		1	1	7		8	3	6
Boiler washers.....		9		8		4	1	4
Hostlers.....		6		9	1	6		5
Other roundhouse and shop employees.....		2	1	17	1	24	14	62
Other employees.....		2		10		4	3	3
Nonemployees.....		1		1	2	3	6	2
Total.....	13	467	23	614	36	911	91	1,005

All accidents reported to this division have been carefully investigated, the cause determined, when possible, and the information thus obtained given to the carriers; and this has been an important factor in reducing the number of accidents.

Prompt reports of accidents materially assist in the work of investigation and reduce the delay to equipment, and as carriers now fully understand the requirements in this respect such reports, with rare exceptions, are properly made.

While the total number of accidents has greatly decreased, two particular types show an increase over the previous year. These are accidents due to defective blowoff cocks and to injector steam pipe failures.

During the year there were 20 accidents due to defective condition of blowoff cocks or their operating mechanism, resulting in 1 killed and 19 injured. The fact that every one of those accidents was due to defects in the blowoff cock, or in the piping or operating mechanism, which could have been discovered by reasonable inspection, clearly indicates that these appurtenances are not receiving the same careful inspection and attention that other appurtenances are; therefore, the remedy is obvious.

Twenty-eight accidents due to failure of injector steam pipes, resulting in 1 killed and 30 injured, occurred during the year. These failures can be divided into two general classes, viz., failure of union

nut and failure of brazing sleeve or collar, both of which are in many instances contributed to by failure to properly brace the injector.

Failure of union nut is usually due to thread stripping, nut too large, or nut broken, which in practically every instance was caused by the use of improper tools, such as hammer and chisel, or set in tightening the nut; and our investigations have shown that the use of such tools is not confined to the enginemen on the road where proper tools are not available, but can be said to be almost a general practice of repairmen at terminals. While the failure does not always occur at the time the improper tools are used, it results in stretching or otherwise damaging the nut, ultimately resulting in failure which frequently causes injury.

Failure at brazing sleeve or collar is usually due to poor brazing, allowing the pipe to pull out of the sleeve, or failure of sleeve due to the fact that the spelter did not flow between the sleeve and pipe, resulting in the sleeve being brazed to the pipe only at its extreme end; therefore, the strain of the load and vibration, which should have been borne by the copper pipe, is thrown on the brass sleeve, which is not designed nor intended to carry it.

Investigation of all such accidents which have occurred during a period of more than four years has convinced us that failure of brazing or brazing sleeves can be practically eliminated by the adoption of what has been termed a "mechanical joint," which is made by extending the copper pipe through the sleeve, expanding it, and beading or flanging it over so that it will be firmly held in the union. This not only throws the load on the pipe, which is designed to carry it, but also makes it possible to determine by inspection before the pipes are applied whether or not the work has been properly done, which is not possible with the brazed joint.

We have been persistently recommending this form of joint, and as it is being adopted by many carriers and manufacturers as standard, we have refrained from recommending a rule requiring its use; but unless a reduction in accidents from failure of steam pipes at brazing sleeve can otherwise be brought about, some action in this direction will become necessary.

The number of applications for an extension of time for removal of flues, as provided in rule 10, has increased over the previous year, and this has materially added to the work of this division, as such extensions are granted only after a special inspection of the locomotive has been made. During the year 1,099 applications for extension of time for removal of flues were filed by 284 carriers; of this number 638, or 58 per cent, were granted; 461, or 42 per cent, were refused or granted only after defects disclosed by our inspection had been properly repaired.

The rule referred to requires all flues to be removed at least once every three years and a thorough examination made of the entire

interior of the boiler; that after flues are taken out the inside of the boiler must have the scale removed and be thoroughly cleaned. The rule also provides that this period may be extended upon application if an investigation shows conditions to warrant it. Removal of flues once in three years is required primarily to allow a complete interior inspection, as provided by rule 11, and the making of necessary repairs, and not, as some evidently believe, on account of the condition of the flues.

To properly handle this work, carriers have been asked, when an extension is desired which their inspection indicates conditions warrant, to file applications with the Chief Inspector approximately 60 days before flues become due for removal, and in each case show:

1. Number of each locomotive for which the extension is desired.
2. Class of service in which the locomotive is engaged.
3. Date of previous removal of flues.
4. Mileage made since flues were removed and interior of boiler cleaned and inspected.
5. Period of time for which the extension is desired.
6. Approximate date when it will be convenient to have the locomotive held and dome cap and throttle standpipe removed to permit an interior inspection by a Government inspector; also at what point locomotive will be held for this inspection.

It is to be presumed that carriers desire to properly maintain their locomotives; therefore, an application for an extension of time for removal of flues from a locomotive, which we find on examination to be defective, indicates that the railroad company's inspectors have not discovered the defective conditions.

In some instances it is evident that the application for extension of time has been filed without a proper attempt on the part of the carrier to determine whether the condition of the boiler would justify the application, as Federal inspectors find defects that could scarcely be overlooked if a reasonable inspection were made prior to filing the application, thus making it apparent that they are depending on us to do this work for them. When the conditions found indicate this practice exists, and that careful inspection is not being made by the carriers prior to filing application for extension of time, so they may know their request is a proper one, it becomes necessary for our inspectors to exercise extreme care in making their investigation, and to require the removal of all parts necessary to assure themselves whether or not the request for extension of time may properly be granted.

Alteration reports which are being filed, showing reinforcement of boilers which have a factor of safety below the standard fixed by the order of the Commission, dated June 9, 1914, indicate that diligent efforts are being made by the carriers to meet the requirements of that order, and with a few exceptions very satisfactory progress is being made.

A standard alteration report, Form 19, containing carefully prepared instructions for filing such reports in accordance with rule 54, was issued on March 29, 1915.

The use of this form in accordance with the instructions will simplify the reporting of alterations to boilers and enable the carriers to avoid considerable unnecessary work which some of them have been doing.

The act of March 4, 1915, amending the locomotive boiler inspection law by extending its provisions to include the entire locomotive and tender and all their parts has presented additional and important problems and will materially increase the work of this division.

The preparation of rules fixing minimum limits for all parts of locomotives and tenders, so that the requirements might be definite, has been diligently pursued and is progressing as rapidly as accuracy will permit.

Very satisfactory progress is being made in arranging the work of the division so that the additional duties imposed by the law may be properly performed. This will probably make it necessary for our Inspectors to follow more closely the requirements of section 6 of the law, which provides that their "first duty shall be to see that the carriers make inspections in accordance with the rules and regulations established or approved by the Interstate Commerce Commission, and that carriers repair the defects which such inspections disclose," before the locomotives are again put in service, and may result in eliminating reports to railroad officials of minor defects discovered by Federal inspectors, which, for the benefit of the carriers, have been directed to their attention; therefore, it will be necessary for each railroad company's inspectors to give more careful attention to such matters, as no change will be made in the method of handling violations of the law or the rules.

No formal appeal from the decision of inspectors, as provided in section 6 of the law, has been filed during the year. In one instance an appeal was filed from the findings of inspectors in an accident investigation, a complete report of which is contained herein. Reinvestigation by an assistant chief inspector, assisted by inspectors from other districts, not only sustained the original report but disclosed additional evidence in support thereof.

During the year 2,130 defective parts of locomotives not covered by the boiler inspection law, almost all of which were defective wheels, were reported to this division by inspectors and directed to the attention of the railroad officials with request that proper repairs be made before the locomotives were put in service. Such matters are now covered by the amended law, and will be handled in accordance therewith.

FRANK McMANAMY,
Chief Inspector.

8 REPORT OF CHIEF INSPECTOR OF LOCOMOTIVE BOILERS.

Accidents and casualties resulting from failures of locomotive boilers and their appurtenances.

Nature of failure or defect.	Year ended June 30--											
	1915			1914			1913			1912		
	Accidents.	Killed.	Injured.	Accidents.	Killed.	Injured.	Accidents.	Killed.	Injured.	Accidents.	Killed.	Injured.
Arch-tube failures.....	7	.....	9	12	.....	19	20	3	27	18	.....	23
Ash-pan blowers defective.....	11	.....	11	5	.....	5	14	1	14	3	.....	3
Blowers defective.....	5	.....	5	11	.....	11	13	.....	13	11	.....	12
Blow-off cocks defective.....	20	1	19	15	1	15	16	.....	18	23	2	22
Boiler checks defective.....	9	.....	10	14	.....	14	11	.....	12	11	1	11
Boiler explosions:												
A. Shell explosions.....				1	.....	1	.....	.....	.....	3	27	41
B. Crown-sheet failures due to low water where no contributory causes were found.....	14	7	20	36	13	59	44	23	67	69	35	129
C. Crown-sheet failures due to low water where contributory causes or defects were found.....	9	1	14	12	3	18	28	6	50	23	15	38
D. Fire-box failures due to defective staybolts, crown stays, or sheets.....	1	2	.....	4	1	7	5	.....	8	1	1	1
E. Fire-box failures due to water forming.....	1	.....	1	1	.....	2	1	2	.....	1	3	.....
Crown stays defective.....							1	.....	3	.....	.....	.....
Dome caps defective.....	3	.....	3	.....	.....	.....	1	.....	1	.....	.....	.....
Draft appliances defective.....	2	.....	2	1	.....	1	4	.....	4	3	.....	4
Exhaust nozzle breaking.....							1	.....	1	.....	.....	.....
Fire doors defective.....							2	.....	2	.....	.....	.....
Fire-hose failures.....	5	.....	6	3	.....	3	.....	.....	.....	.....	.....	.....
Flue failures.....	41	.....	52	51	.....	56	54	1	63	56	1	62
Flue-plug failures.....	2	.....	2	.....	.....	.....	.....	.....	.....	7	.....	8
Flue pockets defective.....				3	.....	4	2	.....	2	3	.....	4
Flue sheets defective.....				.....	.....	.....	1	.....	1	2	.....	2
Gauge cocks defective.....	3	.....	3	3	.....	3	2	.....	2	4	.....	4
Grates defective.....				.....	.....	.....	1	.....	1	.....	.....	.....
Handhole plates defective.....				1	.....	1	.....	.....	.....	1	.....	1
Injectors and connections defective (not including injector steam pipes).....	29	.....	31	33	.....	33	23	.....	28	47	.....	48
Injector steam-pipe failures.....	28	1	30	15	.....	18	36	.....	47	31	.....	38
Lubricators defective.....	8	.....	8	14	.....	14	11	.....	12	11	.....	12
Lubricator glasses bursting.....	13	.....	14	20	.....	20	45	.....	45	49	.....	49
Lubricator piping defective.....	2	.....	2	8	.....	9	4	.....	5	.....	.....	.....
Mud-drum failures.....	1	.....	4	1	2	.....	.....	.....	.....	.....	.....	.....
Mud ring defective.....										1	.....	1
Patch bolts defective.....	1	.....	1	.....	.....	.....	.....	.....	.....	1	.....	1
Plugs (arch-tube) defective.....	1	.....	2	4	1	5	.....	.....	.....	2	.....	4
Plugs in fire-box sheets defective.....	1	.....	1	6	.....	7	5	.....	6	1	.....	1
Plugs (fusible) defective.....				2	.....	2	1	.....	1	1	.....	1
Plugs in steam chest defective.....				.....	.....	.....	1	.....	1	.....	.....	.....
Plugs (washout) defective.....	15	.....	18	17	1	17	20	.....	23	11	2	14
Rivets defective.....	1	.....	1	4	.....	5	2	.....	2	.....	.....	.....
Safety valves defective.....	2	.....	2	1	.....	1	1	.....	1	.....	.....	.....
Squirt-hose failures.....	99	.....	100	139	.....	140	266	.....	267	243	.....	245
Stay bolts defective.....	3	.....	5	5	.....	5	2	.....	3	9	.....	11
Steam-heat hose defective.....	1	.....	1	.....	.....	.....	1	.....	1	.....	.....	.....
Steam piping defective.....	4	.....	4	14	.....	16	5	.....	6	11	2	11
Studs defective.....	16	1	17	18	.....	21	20	.....	21	14	.....	16
Superheater-tube failures.....	1	.....	3	.....	.....	.....	1	.....	1	.....	.....	1
Tank hose defective.....				2	.....	2	3	.....	3	.....	.....	.....
Throttle glands defective.....	1	.....	2	3	.....	3	3	.....	3	.....	.....	.....
Throttle leaking.....	1	.....	1	1	.....	1	.....	.....	4	.....	.....	.....
Valves defective (not including safety valves).....	8	.....	8	3	.....	3	6	.....	6	5	.....	5
Water-bar failures.....	1	.....	1	2	.....	2	1	.....	1	3	.....	4
Water glass bursting.....	48	.....	48	60	.....	60	128	.....	128	165	1	168
Water-glass fittings defective.....	3	.....	3	10	.....	10	7	.....	7	8	.....	8
Miscellaneous.....	3	.....	3	.....	.....	.....	.....	.....	.....	1	.....	1
Total.....	424	13	467	555	23	614	820	36	911	856	91	1,005

Tables showing number of locomotives reported, inspected, found defective, [The ownership is generally in a railroad corporation and the abbreviation for railroad or railway is

and ordered from service; and number and kind of defects. omitted in most cases. In designating other corporations the abbreviation "Co." is added.]

Defects.	Ala., Tenn. & Northern.	Alger - Sullivan Lumber Co.	Aliquippa & Southern.	Ann Arbor.	Arizona Eastern.	Atch., Top. & S. Fe.	Atlanta & West Point.	Atlanta, Birm. & Atl.
1 Arch tubes defective						8		
2 Arch tubes leaking ¹						1		
3 Back head leaking or defective						4		
4 Badge plate incorrectly applied								
5 Badge plate missing								
6 Barrel cracked or defective								
7 Barrel leaking								
8 Blow-off cock defective						2		
9 Blow-off cock inoperative						36		
10 Boiler check defective						55	1	
11 Boiler check leaking						1		
12 Cab card incorrect						18		
13 Cab card missing	2			1		16		
14 Combustion flues leaking						2		
15 Crown bolts broken						1		
16 Crown bolts defective ¹						1		
17 Cylinder, leaks at						11		
18 Dome cracked				14		81		
19 Dome leaking						1		
20 Expansion pads, leaks at						21		
21 Fire-box sheets defective						3		
22 Fire-box sheets leaking				1	4	35		
23 Flues defective ¹				2	2	33		
24 Flues leaking ¹						6		
25 Flues plugged						2		
26 Gauge cocks improperly located						6		
27 Gauge cocks inoperative						12		1
28 Gauge cocks leaking or defective						58		1
29 Injector inoperative	2			4	3	3		
30 Injector or connections defective						375		9
31 Lubricator shields defective	4	1		3	5	6	2	
32 Lubricator shields missing						7		
33 Mud ring leaking ¹						192		
34 Packing nuts, leaks at				1	1	17		
35 Plugs defective or improperly applied	7			2		110	1	
36 Plugs leaking ¹						8		
37 Safety valves defective						5		
38 Safety valves failed to relieve boiler						27		
39 Safety valves missing						3		
40 Side sheets (outside) defective						29		
41 Squirt hose or application defective						2		
42 Stay bolts broken				1	2	40		
43 Stay bolts defective ¹	1			6	2	129	4	33
44 Steam gauge defective			3	1	4	39	2	4
45 Steam-gauge fittings defective						9		
46 Steam gauge improperly located						28	1	
47 Steam-gauge siphon incorrectly applied						1		
48 Steam pipes in cab leaking						1		
49 Steam pipes outside of cab leaking				3		22		
50 Steam valves in cab leaking						10		
51 Steam valves outside of cab leaking				1		32		
52 Teiltals defective ¹						7		
53 Throat sheet defective	1		1	10	8	29		9
54 Washout plugs leaking ¹	1					6		1
55 Washout plugs not removed at washout ¹				4	3	92		
56 Water bars leaking ¹						12		
57 Water-glass fittings defective						58	1	1
58 Water glass improperly located	1					1		
59 Water glass inoperative						1		
60 Water glass missing						1		
61 Water-glass lamp missing or defective						1		
62 Water-glass shield defective						1		
63 Water-glass shield missing						21		
Number of defects	19	2	4	62	44	1,507	12	59
Locomotives reported	20	14	12	44	43	2,088	44	92
Locomotives inspected	6	7	7	52	74	2,455	55	45
Locomotives defective	5	2	3	23	18	792	9	28
Percentage inspected found defective	83	29	43	44	24	32	16	62
Locomotives ordered from service				3	5	6	1	4

¹ Number of locomotives reported with this defect.

Atlantic City.	Atlantic Coast Line.	Baltimore & Ohio.	Balt., Ches. & Atl.	Bangor & Aroostook.	Belt Ry. Co. of Chicago.	Bessemer & Lake Erie.	Bingham & Garfield.	Birmingham Southern.	Boston & Albany.	Boston & Maine.	Boyer City, Gay. & Alp.	Buffalo & Susquehanna.	Buffalo Creek.
		54							1				1
	4	28											2
	3	75				1				2			3
	6												5
		1											6
		6											7
	6	137			1								8
	21	89	1			6	1			1			9
													10
	7	165	4	1					4	5			11
	3	25	1										12
	1	6		1					2				13
	5	9											14
		269											15
	1	1,360	15	1		10				1		2	16
		1											17
	6		3	2						1			18
		55				1				3			19
	6	200	3						1			18	20
	1	31	388	3		3			2	4		13	21
		2	27							3		3	22
	21	120	1	1		2			2	5		6	23
		3											24
		20	1	1	1				1	21		2	25
	16	377	7	4	1	1			5	32		3	26
	72	23								5			27
	1	1								39		17	28
	8	1,411	15	12	2	2		1	5	6		3	29
		192	1							3			30
		57	4	8						30		1	31
	21	306	2	7		6			22	30			32
	2	34	9	5	15	1		4	3	18		3	33
		2											34
		5		1									35
		38											36
		27											37
		3											38
		149	5							13			39
	1	55	1	1	1					1		4	40
	10	1,262	19	116	3	17		8	70	287	1	7	41
	3	36	4	1						1	4	19	42
		80	1							1	2		43
	5	6	232	3	6	1			3	31		2	44
		2											45
		1											46
	2	3	187			1	1			6			47
		7	92							3			48
		15	104							1	14		49
		7	106	2						2	3		50
		18	178	6	2					7	9	2	51
	1	3	72			1				4			52
	3	31	288			4	2			8	11		53
		1	24	1						1			54
													55
	3	107	491	2	2		1		2	19		1	56
		11											57
		21		1									58
		1		1									59
		48		1									60
		1		1									61
		27		2					1	28			62
		3								2			63
	33	1,852	9,547	120	175	31	59	1	13	153	611	6	104
	17	805	2,427	10	100	98	188	11	38	395	1,204	12	77
	36	1,381	4,254	24	150	34	113	14	15	289	1,140	2	56
	25	745	2,752	18	71	12	25	1	7	90	360	2	39
	29	54	65	75	47	35	22	7	46	31	100	69	69
		19	228	6	5					2	3		18

Tables showing number of locomotives reported, inspected,

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

Defects.	Buffalo, Roch. & Pitts.	Butte, Anaconda & Pac.	Canadian Northern.	Canadian Pacific.	Carnegie Steel Co.	Carolina & North Wn.	Carolina, Clinch. & Ohio.	Central Indiana.	Central New England.
1 Arch tubes defective.....									
2 Arch tubes leaking ¹	1					3			
3 Back head leaking or defective.....	3								
4 Badge plate incorrectly applied.....						3			
5 Badge plate missing.....									
6 Barrel cracked or defective.....									
7 Barrel leaking.....	7		1					2	
8 Blow-off cock defective.....	1						4		
9 Blow-off cock inoperative.....									
10 Boiler check defective.....									
11 Boiler check leaking.....	6						6	2	
12 Cab card incorrect.....			1	2					
13 Cab card missing.....	2			3					
14 Combustion flues leaking.....									
15 Crown bolts broken.....									
16 Crown bolts defective ¹	2							1	
17 Cylinder, leaks at.....	20			3			3	2	
18 Dome cracked.....									
19 Dome leaking.....	6						2	2	
20 Expansion pads, leaks at.....									
21 Fire-box sheets defective.....	6						1	1	
22 Fire-box sheets leaking.....	10						2	6	
23 Flues defective ¹	1								
24 Flues leaking ¹	3			1			1		
25 Flues plugged.....									
26 Gauge cocks improperly located.....				1	1		1	4	
27 Gauge cocks inoperative.....	6								
28 Gauge cocks leaking or defective.....	10			5	1		4	9	
29 Injector inoperative.....					1				
30 Injector or connections defective.....				7	3		13	3	8
31 Lubricator shields defective.....	40								
32 Lubricator shields missing.....									
33 Mud ring leaking ¹	14		2				1	9	
34 Packing nuts, leaks at.....	22		1	2			7	2	
35 Plugs defective or improperly applied.....	1								
36 Plugs leaking ¹	1								
37 Safety valves defective.....									
38 Safety valves failed to relieve boiler.....							1		
39 Safety valves missing.....									
40 Side sheets (outside) defective.....	7			2				2	
41 Squirt hose or application defective.....	13								
42 Stay bolts broken.....	128		4	7			33	1	17
43 Stay bolts defective ¹	7		1				6		1
44 Steam gauge defective.....	2								
45 Steam-gauge fittings defective.....	7		1	1					
46 Steam gauge improperly located.....									
47 Steam-gauge siphon incorrectly applied.....									
48 Steam pipes in cab leaking.....	4				1				
49 Steam pipes outside of cab leaking.....	1				1				1
50 Steam valves in cab leaking.....	2								
51 Steam valves outside of cab leaking.....	1								
52 Telltales defective ¹	16		1				6	1	
53 Throat sheet defective.....									
54 Washout plugs leaking ¹	7						5	2	
55 Washout plugs not removed at washout ¹	2						2		
56 Water bars leaking ¹									
57 Water-glass fittings defective.....	25		1	2	2	1		5	
58 Water glass improperly located.....									
59 Water glass inoperative.....									
60 Water glass missing.....									
61 Water-glass lamp missing or defective.....									
62 Water-glass shield defective.....					1				
63 Water-glass shield missing.....									
Number of defects.....	384		2	33	25	1	105	4	78
Locomotives reported.....	331	25	35	151	45	14	49	11	72
Locomotives inspected.....	282	9	7	42	20	21	39	13	107
Locomotives defective.....	122	2	14	9	1	27	2	41	
Percentage inspected found defective.....	43		29	33	45	5	69	15	38
Locomotives ordered from service.....	10			1			3		2

¹ Number of locomotives reported with this defect.

Central of Georgia.	Central R. R. of N. J.	Central Vermont.	Charleston & Western Car.	Charlotte, Harbor & Nn.	Chesapeake & Ohio.	Ches. & Ohio of Ind.	Chicago & Alton.	Chicago & Eastn. Illinois.	Chicago & North Western.	Chicago & Western Ind.	Chicago, Burl. & Quincy.	Chicago Great Western.	
					1	1		1	3			3	1
					1	1		3	1			1	2
	1	1			5	1	4	2	12	1	9	2	3
	2								1				4
													5
	1	3	2		1	5	2	2	12		19	7	8
		7			31	10	12	13	45	1	27	11	9
					1				1				10
	1	5	2	1	69	7	33	9	9	4	17	1	11
		1			7	6	3	3	14		5		12
					6			2	1		6	1	13
							1	2	1		2		14
	2	3			11	5	6	1	15	1	9	5	15
	4		1		703	25	71	70	120	6	184	27	17
									1				18
	1	1	1		26	2	2	1	10	2	15	3	19
		2			5	1			10		13	1	20
		1			22	3	4	7	24		10	2	21
	1	10	2		65	8	10	7	26		20	3	22
								2	2				23
	2				17	4	6	4	8		6		24
								1	1		1		25
									1				26
	2	5	1		39		13	3	23		23	2	27
	6	11	3	1	177	16	53	17	92		95	16	28
					3	2	3	4	1		3		29
					3				95	5	195	47	30
	11	17	13	11	326	36	104	49	108		104		31
	4				3				1		11		32
													33
		3	11		31	8	9	5	17		24	3	33
	1	3	12	1	171	2	47	35	64	7	58	18	34
									2		4		35
		1			8		2		15	1	8	2	36
					5	1			1		1	1	37
					2								38
													39
	1	2	2		10	5	3	2	26	2	12	4	40
					13	6	35	3	53		56	24	41
	13	20	69	19	751	37	153	32	225	4	161	51	42
	4		2	4	59	3	29	8	64	2	27	12	43
		1			1		1		10		9	3	44
					45	5	10	5	25	1	30	5	45
													46
							1						47
							7	4	5	3	15	8	48
	1		1		32	4	7	4	10	1	20	5	49
					90	1	2	2	14		18	1	50
					18	7	7	4	3		17	3	51
	1	1	3	3	62	5	13	4	14		17	16	52
	1		2		54	9	19	3	108	1	24	16	53
		1			8	1	8		21		3	12	54
		7	2	3	82	7	23	11	43		37	5	55
					22		6	5	8		3	5	56
	6	7	6	2	101	15	22	7	19		67	17	57
													58
	1				1	1	1			1			59
													60
									1				61
									16	2	58	9	62
													63
Number of defects.....	60	118	144	43	7	3,124	245	724	333	1,388	44	1,428	325
Locomotives reported.....	336	524	99	59	13	778	52	352	401	1,891	27	1,753	283
Locomotives inspected.....	261	374	216	98	6	1,297	95	400	265	2,501	16	1,689	297
Locomotives defective.....	35	77	69	27	2	877	67	265	125	740	12	604	138
Percentage inspected found defective.....	13	21	32	27	33	67	71	66	47	29	75	35	46
Locomotives ordered from service.....		1		1		77	7	25	16			24	3

Tables showing number of locomotives reported, inspected,

Defects.	Chicago, Ind. & Southern.	Chicago, Indpls. & Lville.	Chicago Junction.	Chicago, Mil. & Gary.	Chicago, Mil. & St. Paul.	Chicago, Peoria & St. L.	Chicago, Rock I. & Gulf.	Chicago, Rock I. & Pac.
1 Arch tubes defective.		1			13	1		23
2 Arch tubes leaking.					1	2		14
3 Back head leaking or defective.		1			4	2		41
4 Badge plate incorrectly applied.					5			
5 Badge plate missing.					1			
6 Barrel cracked or defective.						2		
7 Barrel leaking.					38	2	8	27
8 Blow-off cock defective.	11	4			71	3	6	147
9 Blow-off cock inoperative.					1			
10 Boiler check defective.					1			
11 Boiler check leaking.					1			1
12 Cab card incorrect.	1	3			42	1	2	76
13 Cab card missing.		2			22	1		40
14 Combustion flues leaking.		1			2	1	1	2
15 Crown bolts broken.					13			1
16 Crown bolts defective.					1			
17 Cylinder, leaks at.		11			8	3	2	77
18 Dome cracked.	2	25	2		375	8		468
19 Dome leaking.					28	2		35
20 Expansion pads, leaks at.		2			4	5		30
21 Fire-box sheets defective.		3			20	7	5	41
22 Fire-box sheets leaking.		2		1	26	2	2	62
23 Flues defective.	1	16		1	2	2		13
24 Flues leaking.		2			7	3	1	24
25 Flues plugged.		1						
26 Gauge cocks improperly located.								
27 Gauge cocks inoperative.		1			40	4	1	117
28 Gauge cocks leaking or defective.	8	14	3		214	3	31	381
29 Injector inoperative.		1			9			19
30 Injector or connections defective.	16	32			446	13	58	1,065
31 Lubricator shields defective.					86	1	6	237
32 Lubricator shields missing.					48	1		83
33 Mud ring leaking.	2	6	1		30	3	1	90
34 Packing nuts, leaks at.	12	8	20		189	10	16	309
35 Plugs defective or improperly applied.					7			7
36 Plugs leaking.					18			9
37 Safety valves defective.		2			8	1		13
38 Safety valves failed to relieve boiler.					8			4
39 Safety valves missing.								
40 Side sheets (outside) defective.	7	3			51		6	119
41 Squirt hose or application defective.	2	8			55		13	308
42 Stay bolts broken.	2	17		2	332	43	29	1,296
43 Stay bolts defective.	1	9	1	4	87	10	12	355
44 Steam gauge defective.					32		1	19
45 Steam gauge fittings defective.	2	4			66	1	5	121
46 Steam gauge improperly located.								
47 Steam-gauge siphon incorrectly applied.								
48 Steam pipes in cab leaking.	3	7			35		2	45
49 Steam pipes outside of cab leaking.	2	3			53		1	48
50 Steam valves in cab leaking.		5	1		26		3	42
51 Steam valves outside of cab leaking.		2			35	1		37
52 Telltales defective.	1	1		3	98	5	15	235
53 Throat sheet defective.		1			3			53
54 Washout plugs leaking.	5	7	2		49	3	9	206
55 Washout plugs not removed at washout.		2		1	8		3	30
56 Water bars leaking.								
57 Water-glass fittings defective.	5	12			82	5	13	220
58 Water glass improperly located.								
59 Water glass inoperative.								
60 Water glass missing.							1	
61 Water-glass lamp missing or defective.								
62 Water-glass shield defective.			1	1	34	2		3
63 Water-glass shield missing.					1			
Number of defects.	83	222	31	13	2,826	139	268	6,593
Locomotives reported.	134	143	64	15	1,985	54		1,657
Locomotives inspected.	94	179	43	18	2,653	46	90	2,891
Locomotives defective.	38	86	15	5	1,164	32	75	1,916
Percentage inspected found defective.	40	48	35	28	44	69	80	66
Locomotives ordered from service.	1	3			72	7	3	168

¹ Number of locomotives reported with this defect.

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

	Chicago, St. P., M. & O.	Chicago, T. H. & SE.	Chicago, W. Full. & Sou.	Cin., Ham. & Dayton.	Cin., Leb. & Northern.	Cincinnati Northern.	Clev., Cin., Chi. & St. L.	Coal & Coke.	Colorado & Southern.	Colorado & Wyoming.	Colorado Midland.	Columbia & Puget Sound.	Copper Range.	Cornwall & Lebanon.
1				5			3							1
2				2			2							2
3				10		2	9			1				3
4				1										4
5														5
6														6
7			1	7	1	1	9		2					7
8	3			13	1	2	32		12		1			8
9	19													9
10														10
11				7	1	1	15	1	4					11
12	6			10			11		2					12
13	3			1			1							13
14				2			7							14
15	2													15
16			1	33	1	2	11		1	1	2			16
17	1		1	54	6	7	120	10	5	1	1			17
18	21	5	1											18
19	1	1		7			3		2				1	19
20	7			4		2	6		1	1				20
21	13	2		21			8	2	3	1				21
22	14	1		62	2	3	25	3	3	2	1	1		22
23	5			9									1	23
24	2	1		26	1	2	19		2					24
25	3													25
26														26
27	8	1		1			22		5					27
28	39	2	1	18	2	1	37	2	37		11		2	28
29	4			1			4		4		2			29
30	33		1	65	4	1	132	10	118	6	34	1	2	30
31	3						15		7	6	2			31
32	6			4										32
33	11		1	27		3	39	1	3		2	1	1	33
34	42	1	6	13	2		58	1	23	1	10			34
35														35
36														36
37	6		1	1			4							37
38			1	2										38
39														39
40	14		1	13		1	6		5		5			40
41	17			3	1		8		8	4	2	1		41
42	166	6	2	90	2	75	89	36	37	25	17	10	24	42
43	29			30		7	16	4	9	1	2		1	43
44	3			5			2		7		2			44
45	5	3		11			29		10		4			45
46														46
47														47
48	7			12			14	3	3					48
49	13	1		4			14	1	2		1			49
50	3		1	3			22	4	4		1			50
51	5		1	6	2		14	1	4					51
52	18	2	1	17		2	8	8	7	3	1	1		52
53	3			6			14		3					53
54	26			22	1		34		16	5	2			54
55	1	2		2			1	7						55
56														56
57	13		2	19		7	59	4	19	2	5			57
58														58
59				1										59
60	1						1							60
61														61
62	1	1							9		6			62
63														63
Number of defects.	582	30	20	650	27	123	897	87	372	66	114	15	29	11
Locomotives reported.	388	73	10	239	19	32	807	30	195	26	65	11	21	14
Locomotives inspected.	651	48	11	365	13	56	733	61	196	24	115	10	21	21
Locomotives defective.	280	13	6	198	8	29	324	31	126	17	46	4	11	8
Percentage inspected found defective.	43	27	55	54	62	52	44	51	64	71	40	40	52	38
Locomotives ordered from service.	13			19		7	18		3	2	2			

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

Defects.	Left Page							Right Page																	
	Cumberland & Penna.	Cumberland Valley.	Davenport, R. I. & N.W.	Delaware & Hudson Co.	Dela., Laeka. & Western.	Denver & Rio Grande.	Denver & Salt Lake.	Detroit & Mackinac.	Detroit, Toledo & Ironton.	Donora Southern.	Duluth & Iron Range.	Duluth & Northern Minn.	Dul., Missabe & Northern.	Duluth, So. Shore & Atl.	Duluth, Winn. & Pacific.	Elgin, Joliet & Eastern.	El Paso & Southwestern.	Erie.	Fernwood & Gulf.	Florence & Cripple Creek.	Florida East Coast.	Fort Smith & Western.	Fort Worth & Denver City.		
1 Arch tubes defective.....																1								1	
2 Arch tubes leaking ¹																	1							2	
3 Back head leaking or defective.....		1		2	1	3												3						3	
4 Badge plate incorrectly applied.....									4							1	2	22						4	
5 Badge plate missing.....				1																				5	
6 Barrel cracked or defective.....				1					1									1						6	
7 Barrel leaking.....					2	14																		7	
8 Blow-off cock defective.....		1	2	3	5	28				1						1	1	49						8	
9 Blow-off cock inoperative.....						1		1		11						5	3	48		3				9	
10 Boiler check defective.....																								10	
11 Boiler check leaking.....				3	5	18																		11	
12 Cab card incorrect.....	3		3		2	12		3		23								46		1			2	12	
13 Cab card missing.....		1			2	4				1								6				1		13	
14 Combustion flues leaking.....																		4						14	
15 Crown bolts broken.....																		3						15	
16 Crown bolts defective ¹	3		1	2	8	8																		16	
17 Cylinder, leaks at.....	2		4	4	2	14				33	1					1	1	30			1		1	17	
18 Dome cracked.....										160								226				8	4	18	
19 Dome leaking.....				5	6	8																		19	
20 Expansion pads, leaks at.....						5				14					1		2	16					3	20	
21 Fire-box sheets defective.....	4		1			4				4						2		4						21	
22 Fire-box sheets leaking.....	6		1	41	15	12				31						1		17						22	
23 Flues defective ¹										45							1	68				2		23	
24 Flues leaking ¹	2			3	4	4											3							24	
25 Flues plugged.....	1									23							3	27			2			25	
26 Gauge cocks improperly located.....																1								26	
27 Gauge cocks inoperative.....			2	1	1	4				2				2	4	2	13						6	27	
28 Gauge cocks leaking or defective.....		1	3	16	36	56	4	2		40						7	146	2	1		3	17	28		
29 Injector inoperative.....					1	4				2							3	9						29	
30 Injector or connections defective.....	1	3	17	21	18	337	26			2						3	53			18	4	8	78	30	
31 Lubricator shields defective.....			19	21	49	93				68						3								31	
32 Lubricator shields missing.....	2		1			7				3						3		32						32	
33 Mud ring leaking ¹	1			13	14	19		3									10							33	
34 Packing nuts, leaks at.....	6		2		7	107	8	5		22						2	97				1			34	
35 Plugs defective or improperly applied.....										38						1	9	143	1	1		2	25	34	
36 Plugs leaking ¹	2				1					1													1	35	
37 Safety valves defective.....			1			10											7							36	
38 Safety valves failed to relieve boiler.....						1				11							5						2	37	
39 Safety valves missing.....																	1							38	
40 Side sheets (outside) defective.....	1			8	2	26																		39	
41 Squirt hose or application defective.....	2			1		26				10				1		3	33					1	1	40	
42 Stay bolts broken.....	41	1	3	32	53	231	15	8		3						1	7	20		2			14	41	
43 Stay bolts defective ¹	2		2	3	2	36	3	2		156	2	1	12	1	2	50	274		23	19	13		55	42	
44 Steam-gauge defective.....				4	2	6				38				4	2	6	38		1	4	2	7	43	43	
45 Steam-gauge fittings defective.....										1						1	12							44	
46 Steam-gauge improperly located.....	3		1	5	3	22	4			32						4	62		4				16	45	
47 Steam-gauge siphon incorrectly applied.....																	1							46	
48 Steam pipes in cab leaking.....	3	1	1	1	2	30	1	1		6							14		2				5	47	
49 Steam pipes outside of cab leaking.....	1					17				12							16							48	
50 Steam valves in cab leaking.....				1	6	15				9							29						2	49	
51 Steam valves outside of cab leaking.....	1		1	1	2	11				17							20						4	50	
52 Telltales defective.....	6		6	7		34	2	1		12							26							51	
53 Throat sheet defective.....	1			4	1	2				6				1	1	4	20		6	27	2	23		52	
54 Washout plugs leaking ¹				5	9	81	1			20						1	17							53	
55 Washout plugs not removed at washout ¹				1	1					5							10					1	12	54	
56 Water bars leaking ¹				4	1																			55	
57 Water-glass fittings defective.....				1												3								56	
58 Water-glass improperly located.....	3	1	1		9	72	2			34					1	2	69		2	4	1	10	57		
59 Water-glass inoperative.....																								58	
60 Water-glass missing.....																								59	
61 Water-glass lamp missing or defective.....																								60	
62 Water-glass shield defective.....					2	25																		61	
63 Water-glass shield missing.....											1										3		3	6	62
Number of defects.....	97	9	77	215	271	1,407	76	28																	
Locomotives reported.....	26	64	12	492	772	617	44	35																	
Locomotives inspected.....	34	35	15	407	437	916	56	94																	
Locomotives defective.....	20	6	13	104	118	419	34	16																	
Percentage inspected found defective.....	59	17	87	26	27	46	57	17																	
Locomotives ordered from service.....			2	2	6	32																			

¹ Number of locomotives reported with this defect.

Tables showing number of locomotives reported inspected,

Defects.	Fort Worth & Rio Grande.	Gal., Har. & San Antonio.	Gal., Houston & Henderson.	Georgetown & Western.	Georgia.	Georgia & Florida.	Georgia Coast & Piedmont.	Georgia, Florida & Alabama.
1 Arch tubes defective.....					1			
2 Arch tubes leaking ¹								
3 Back head leaking or defective.....		2						1
4 Badge plate incorrectly applied.....					1			1
5 Badge plate missing.....								1
6 Barrel cracked or defective.....		1						
7 Barrel leaking.....		2						1
8 Blow-off cock defective.....		6			2			
9 Blow-off cock inoperative.....								
10 Boiler check defective.....								
11 Boiler check leaking.....		2			2			
12 Cab card incorrect.....	1							
13 Cab card missing.....								
14 Combustion flues leaking.....								
15 Crown bolts broken.....		553						
16 Crown bolts defective ¹		42						
17 Cylinder, leaks at.....				1	2	1		
18 Dome cracked.....								
19 Dome leaking.....	1	1		1	2	1		
20 Expansion pads, leaks at.....								
21 Fire-box sheets defective.....	1	22						
22 Fire-box sheets leaking.....		5						
23 Flues defective ¹								
24 Flues leaking ¹		1			1			
25 Flues plugged.....		1						
26 Gauge cocks improperly located.....								1
27 Gauge cocks inoperative.....		3						2
28 Gauge cocks leaking or defective.....	1	10			6	1		
29 Injector inoperative.....				1				
30 Injector or connections defective.....	6	42		6	15	8	3	11
31 Lubricator shields defective.....		3						
32 Lubricator shields missing.....								
33 Mud ring leaking ¹		1						
34 Packing nts, leaks at.....	1	17		1				
35 Plugs defective or improperly applied.....		3						
36 Plugs leaking ¹		2						
37 Safety valves defective.....		1				1		
38 Safety valves failed to relieve boiler.....								
39 Safety valves missing.....								
40 Side sheets (outside) defective.....		7						
41 Squirt hose or application defective.....		2			1			
42 Stay bolts broken.....	6	105			13	5	5	5
43 Stay bolts defective ¹	1	24			3	1	1	1
44 Steam-gauge defective.....		3			2			
45 Steam-gauge fittings defective.....		3		1	1			
46 Steam-gauge improperly located.....								
47 Steam-gauge siphon incorrectly applied.....								
48 Steam pipes in cab leaking.....		3			2			
49 Steam pipes outside of cab leaking.....		1						
50 Steam valves in cab leaking.....		2			3		1	
51 Steam valves outside of cab leaking.....		1						
52 Telltales defective ¹		13			1		2	2
53 Throat sheet defective.....								
54 Washout plugs leaking ¹		4		3				
55 Washout plugs not removed at washout ¹	2							
56 Water bars leaking ¹								
57 Water-glass fittings defective.....		9			3	3	1	1
58 Water glass improperly located.....								
59 Water glass inoperative.....					1			
60 Water glass missing.....								
61 Water-glass lamp missing or defective.....								
62 Water-glass shield defective.....	1							
63 Water-glass shield missing.....								
Number of defects.....	21	897		14	62	21	13	26
Locomotives reported.....	13	605	12	13	78	32	10	20
Locomotives inspected.....	25	354	10	13	147	23	15	44
Locomotives defective.....	12	187		6	41	6	6	15
Percentage inspected found defective.....	48	53		46	28	26	40	34
Locomotives ordered from service.....		79			3		3	2

¹ Number of locomotives reported with this defect.

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

Defects.	Georgia Northern.	Georgia Southern & Florida.	Grand Rapids & Indiana.	Grand Trunk.	Great Northern.	Green Bay & Western.	Gulf & Ship Island.	Gulf, Colo. & Santa Fe.	Hawkinsville & Fla. South.	Hooking Valley.	Holbrook-Cabot-Rollins Corp.	Houston & Texas Central.	Houston East & West Texas.	Huntingdon & B. T. Mtn.	Illinois Central.
1 Arch tubes defective.....				1											5
2 Arch tubes leaking ¹															1
3 Back head leaking or defective.....					3										6
4 Badge plate incorrectly applied.....															5
5 Badge plate missing.....															5
6 Barrel cracked or defective.....															1
7 Barrel leaking.....															6
8 Blow-off cock defective.....															7
9 Blow-off cock inoperative.....															8
10 Boiler check defective.....															16
11 Boiler check leaking.....															9
12 Cab card incorrect.....															10
13 Cab card missing.....															15
14 Combustion flues leaking.....															24
15 Crown bolts broken.....															17
16 Crown bolts defective ¹															16
17 Cylinder, leaks at.....															96
18 Dome cracked.....															18
19 Dome leaking.....															17
20 Expansion pads, leaks at.....															28
21 Fire-box sheets defective.....															13
22 Fire-box sheets leaking.....															21
23 Flues defective ¹															41
24 Flues leaking ¹															23
25 Flues plugged.....															24
26 Gauge cocks improperly located.....															25
27 Gauge cocks inoperative.....															26
28 Gauge cocks leaking or defective.....															28
29 Injector inoperative.....															83
30 Injector or connections defective.....															6
31 Lubricator shields defective.....															145
32 Lubricator shields missing.....															31
33 Mud ring leaking ¹															36
34 Packing nts, leaks at.....															32
35 Plugs defective or improperly applied.....															31
36 Plugs leaking ¹															37
37 Safety valves defective.....															33
38 Safety valves failed to relieve boiler.....															39
39 Safety valves missing.....															2
40 Side sheets (outside) defective.....															11
41 Squirt hose or application defective.....															35
42 Stay bolts broken.....															37
43 Stay bolts defective ¹															38
44 Steam-gauge defective.....															1
45 Steam-gauge fittings defective.....															39
46 Steam-gauge improperly located.....															15
47 Steam-gauge siphon incorrectly applied.....															40
48 Steam pipes in cab leaking.....															18
49 Steam pipes outside of cab leaking.....															41
50 Steam valves in cab leaking.....															42
51 Steam valves outside of cab leaking.....															44
52 Telltales defective ¹															3
53 Throat sheet defective.....															44
54 Washout plugs leaking ¹															46
55 Washout plugs not removed at washout ¹															47
56 Water bars leaking ¹															48
57 Water-glass fittings defective.....															14
58 Water glass improperly located.....															49
59 Water glass inoperative.....															16
60 Water glass missing.....															50
61 Water-glass lamp missing or defective.....															4
62 Water-glass shield defective.....															18
63 Water-glass shield missing.....															51
Number of defects.....	8	21	44	459	818	46	30	229	10	447	3	179	28	35	1,608
Locomotives reported.....	11	61	105	653	1,320	28	51	12	161	11	195	17	14	22	1,570
Locomotives inspected.....	15	53	72	434	1,197	65	31	183	10	204	4	86	12	11	1,665
Locomotives defective.....	5	13	20	196	442	23	10	95	4	154	2	36	12	11	762
Percentage inspected found defective.....	33	24	28	45	37	35	32	52	40	75	50	44	71	79	46
Locomotives ordered from service.....	2			10	18	3	2	4		1		6	2		29

Tables showing number of locomotives reported, inspected,

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

Defects.	Illinois Southern.	Illinois Terminal.	Indiana Harbor Belt.	Indianapolis Union.	International & Great No.	Jonesboro, Lake City & E.	Kanawha & Michigan.	Kansas City, Clin. & Spring.
1 Arch tubes defective.....							1	
2 Arch tubes leaking 1.....							1	
3 Back head leaking or defective.....				1				
4 Badge plate incorrectly applied.....								
5 Badge plate missing.....								
6 Barrel cracked or defective.....								
7 Barrel leaking.....								
8 Blow-off cock defective.....			1					
9 Blow-off cock inoperative.....				1				
10 Boiler check defective.....								
11 Boiler check leaking.....					6		3	1
12 Cab card incorrect.....	1				5			
13 Cab card missing.....					5			
14 Combustion flues leaking.....								
15 Crown bolts broken.....						3		
16 Crown bolts defective 1.....						1	1	
17 Cylinder, leaks at.....		1			1		12	
18 Dome cracked.....								
19 Dome leaking.....					2	1		
20 Expansion pads, leaks at.....								3
21 Fire-box sheets defective.....							3	
22 Fire-box sheets leaking.....		1			5		4	
23 Flues defective 1.....								
24 Flues leaking 1.....								
25 Flues plugged.....								
26 Gauge cocks improperly located.....					3			
27 Gauge cocks inoperative.....					30	1	3	2
28 Gauge cocks leaking or defective.....		1						
29 Injector inoperative.....								
30 Injector or connections defective.....	1			4	111	3	1	1
31 Lubricator shields defective.....					2	2		
32 Lubricator shields missing.....					4			
33 Mud ring leaking 1.....				2			3	
34 Packing nuts, leaks at.....	1	1		13			3	
35 Plugs defective or improperly applied.....								
36 Plugs leaking 1.....					1			
37 Safety valves defective.....					1			
38 Safety valves failed to relieve boiler.....								
39 Safety valves missing.....								
40 Side sheets (outside) defective.....	1				10			
41 Squirt hose or application defective.....				1	10			
42 Stay bolts broken.....	2	2		3	133	3	65	4
43 Stay bolts defective 1.....	2	1		3	14	2	2	1
44 Steam-gauge defective.....					5			
45 Steam-gauge fittings defective.....					10		2	
46 Steam gauge improperly located.....								
47 Steam-gauge siphon incorrectly applied.....								
48 Steam pipes in cab leaking.....					7		2	
49 Steam pipes outside of cab leaking.....					1		1	
50 Steam valves in cab leaking.....					2	1		
51 Steam valves outside of cab leaking.....					2			
52 Telltales defective 1.....	2				3		5	
53 Throat sheet defective.....					1			
54 Washout plugs leaking 1.....					12		2	1
55 Washout plugs not removed at washout 1.....					1			
56 Water bars leaking 1.....								
57 Water-glass fittings defective.....		3		1	6		1	1
58 Water glass improperly located.....								
59 Water glass inoperative.....								
60 Water glass missing.....								
61 Water-glass lamp missing or defective.....								
62 Water-glass shield defective.....					2	3		1
63 Water-glass shield missing.....								
Number of defects.....	10	10	1	12	413	16	115	16
Locomotives reported.....	19	10	30	23	189	11	70	12
Locomotives inspected.....	13	8	3	25	227	6	123	18
Locomotives defective.....	7	4	1	11	129	6	51	7
Percentage inspected found defective.....	54	50	33	44	58	100	41	39
Locomotives ordered from service.....	4				23	2	2	

1 Number of locomotives reported with this defect.

	Kansas City, Mex. & Orient.	Kansas City Southern.	Kansas City Terminal.	Kentucky & Ind. Terminal.	Lake Erie & Western.	Lake Shore & Mich. So.	Lake Superior & Ishpeming.	Lake Sup. Term. & Trans.	Lake Terminal.	Las Vegas & Tonopah.	Lehigh & Hudson River.	Lehigh & New England.	Lehigh Valley.	Long Island.	Louisiana & Arkansas.	Louisiana & North West.
1						4										
2						2										
3				1		3							11			
4													2			
5		1											59			
6		1				11							11			
7		8				6						1				
8						32										
9																
10													15			
11		5				7							7			
12		2				3							1			
13						2										
14						2										
15						1							20			
16		5				8						9	47			
17						20			3							
18		1											6			
19												2				
20													1			
21		6				1							10			
22		6				11						4	61			
23																
24		2				2							14			
25																
26																
27		6				1							2			
28		14				4							19			
29		1				2							4			
30		23				21							7			
31		3				29			4				66			
32									3				266			
33		6				8							7			
34		28				3							76			
35						26							87			
36													2			
37		4				3							3			
38						1										
39																
40													25			
41													5			
42		79				39							215			
43		1				4			2				9			
44		5				1							6			
45		4				3							69			
46						5							7			
47																
48		7				4							9			
49						5							3			
50		7				1							10			
51		4				2							1			
52		8				4							11			
53		3				7							9			
54		3				12							22			
55		6				39							97			
56		1				3			1							
57		9				11							6			
58						18							65			
59									3				2			
60																
61																
62		5							2				8			
63													1			
Number of defects.....	249	297	103	67	199	367		19		10	12	72	1,369	86	4	1
Locomotives reported.....	63	197	33	14	150	989		32	13	18	17	46	52	945	211	31
Locomotives inspected.....	107	212	32	23	233	524		8	28	8	8	29	84	804	58	9
Locomotives defective.....	67	100	20	15	85	192			12		4	5	32	469	38	3
Percentage inspected found defective.....	63	47	63	54	36	37			43		50	17	38	58	66	33
Locomotives ordered from service.....	9	6	2		2	3					1	1	1	32		10

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

Defects.	Louisiana Ry. & Nav. Co.								Other Regions																	
	Louisiana Ry. & Nav. Co.	Louisiana Western.	Louisville & Nashville.	Louisville, Hend. & St. L.	McCloud River.	McKeesport Connecting.	Macon, Dublin & Savannah.	Maine Central.	Manistee & Northeastern.	Maryland & Pennsylvania.	Maryland, Delaware & Va.	Memphis, Dallas & Gulf.	Mercer Valley.	Michigan Central.	Midland Valley.	Mineral Range.	Minneapolis & St. Louis.	Minn., St. Paul & S. Ste. M.	Minnesota & International.	Minnesota Transfer.	Mississippi Central.	Miss. River & Bonne Terre.	Missouri & North Arkansas.	Missouri, Kansas & Texas.		
1 Arch tubes defective.			1											1										9		
2 Arch tubes leaking ¹ .														1										3		
3 Back head leaking or defective.			4											1										3		
4 Badge plate incorrectly applied.																								4		
5 Badge plate missing.																								5		
6 Barrel cracked or defective.																								6		
7 Barrel leaking.																								1		
8 Blow-off cock defective.			8											20										7		
9 Blow-off cock inoperative.			10											22	1									8		
10 Boiler check defective.																								9		
11 Boiler check leaking.	4		27											37	2									10		
12 Cab card incorrect.			7	1										3										11		
13 Cab card missing.														4										12		
14 Combustion flues leaking.																								13		
15 Crown bolts broken.			1																					14		
16 Crown bolts defective ¹ .			13																					15		
17 Cylinder, leaks at.	2		73	8										3	6	14								16		
18 Dome cracked.																								17		
19 Dome leaking.			4											5										18		
20 Expansion pads, leaks at.	3		17	2																				19		
21 Fire-box sheets defective.			3																					20		
22 Fire-box sheets leaking.			19	1										3	1									21		
23 Flues defective ¹ .	1													6	1									22		
24 Flues leaking ¹ .			18																					23		
25 Flues plugged.														2										24		
26 Gauge cocks improperly located.																								25		
27 Gauge cocks inoperative.	2		11											2	1									26		
28 Gauge cocks leaking or defective.	13	2	63	3										20										27		
29 Injector inoperative.		1	3																					28		
30 Injector or connections defective.		6	91	2																				29		
31 Lubricator shields defective.	8	2	24				2	7						4	16	23	8							30		
32 Lubricator shields missing.																								31		
33 Mud ring leaking ¹ .			15											21										32		
34 Packing nuts, leaks at.	17	2	41	5										36										33		
35 Plugs defective or improperly applied.																								34		
36 Plugs leaking ¹ .			1											4										35		
37 Safety valves defective.			6	2										1										36		
38 Safety valves failed to relieve boiler.																								37		
39 Safety valves missing.																								38		
40 Side sheets (outside) defective.			7											13	3									39		
41 Squirt hose or application defective.	4		7											6										40		
42 Stay bolts broken.	23	6	149	20				115						8	18	5								41		
43 Stay bolts defective ¹ .	2		13	2				1						33	28									42		
44 Steam gauge defective.	1		12											1										43		
45 Steam-gauge fittings defective.	2		28	2										6										44		
46 Steam gauge improperly located.																								45		
47 Steam-gauge siphon incorrectly applied.																								46		
48 Steam pipes in cab leaking.			7																					47		
49 Steam pipes outside of cab leaking.			9											5										48		
50 Steam valves in cab leaking.			3											4										49		
51 Steam valves outside of cab leaking.	1		2	1										1										50		
52 Tell-tales defective ¹ .	6		21	2				5																51		
53 Throat sheet defective.			4											1										52		
54 Washout plugs leaking ¹ .	2		37											36	1									53		
55 Washout plugs not removed at washout ¹ .	1			2										3										54		
56 Water bars leaking ¹ .																								55		
57 Water-glass fittings defective.	4		57											23	1									56		
58 Water glass improperly located.																								57		
59 Water glass inoperative.																								58		
60 Water glass missing.																								59		
61 Water-glass lamp missing or defective.			1																					60		
62 Water-glass shield defective.														2	1									61		
63 Water-glass shield missing.																								62		
Number of defects.....	112	19	817	53			2	158	3	18	40	56	1	395	63	1	873	20	6	15	2	1	11	1,312		
Locomotives reported.....	44		1,060	29	13	15	13	235	16	16	10	11	17	740	40	25	226	534	24	19	17	21	27	662		
Locomotives inspected.....	48	8	892	46	20	24	21	170	14	21	19	13	3	634	46	6	386	307	25	14	3	5	11	879		
Locomotives defective.....	26	5	409	21			1	64	3	7	10	13	1	197	25	1	242	20	5	10	2	1	6	518		
Percentage inspected found defective.....	54	63	46	46			5	38	21	33	53	100	33	31	54	16	65	7	20	72	67	20	55	58		
Locomotives ordered from service.....	7		7	1			2	2			3	2		3	1		20							27		

¹ Number of locomotives reported with this defect.

Tables showing number of locomotives reported, inspected,

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

Defects.	Missouri, Oklahoma & Gulf.	Missouri Pacific.	Mobile & Ohio.	Monongahela.	Monongahela Connecting.	Montpelier & Wells River.	Morgan's Ia. & Texas.	Morgantown & Kingwood.
1 Arch tubes defective.....		6						
2 Arch tubes leaking 1.....		5						
3 Back head leaking or defective.....	1	4	1					
4 Badge plate incorrectly applied.....		4						
5 Badge plate missing.....		1						
6 Barrel cracked or defective.....								
7 Barrel leaking.....	6	18	3					
8 Blow-off cock defective.....	1	18	20	1				
9 Blow-off cock inoperative.....								
10 Boiler check defective.....								
11 Boiler check leaking.....	6	9	7				1	
12 Cab card incorrect.....		18	1					
13 Cab card missing.....	1	2	3					
14 Combustion flues leaking.....								
15 Crown bolts broken.....			3					
16 Crown bolts defective 1.....		28	1					
17 Cylinder, leaks at.....	54	24	4		2		1	
18 Dome cracked.....								
19 Dome leaking.....	7	18	8					
20 Expansion pads, leaks at.....		8	6					
21 Fire-box sheets defective.....	1	22					1	
22 Fire-box sheets leaking.....	1	39	3					
23 Flues defective 1.....	1	1						
24 Flues leaking 1.....	2	4	2		1			
25 Flues plugged.....								
26 Gauge cocks improperly located.....								
27 Gauge cocks inoperative.....	1	16	8		2			
28 Gauge cocks leaking or defective.....	9	105	30		1		4	
29 Injector inoperative.....	2	2	2					
30 Injector or connections defective.....	40	249	118		2		12	6
31 Lubricator shields defective.....		97			12		1	
32 Lubricator shields missing.....		14	4					
33 Mud ring leaking 1.....		25	5		1			
34 Packing nuts, leaks at.....	14	93	47		1		1	
35 Plugs defective or improperly applied.....								
36 Plugs leaking 1.....		5	2					
37 Safety valves defective.....		6					1	
38 Safety valves failed to relieve boiler.....	1							
39 Safety valves missing.....								
40 Side sheets (outside) defective.....	10	26	1		1			
41 Squirt hose or application defective.....	6	79	8		2		1	1
42 Stay bolts broken.....	102	363	184		1		6	12
43 Stay bolts defective 1.....	2	57	10		1			
44 Steam gauge defective.....		1						
45 Steam-gauge fittings defective.....	7	35	12				1	2
46 Steam gauge improperly located.....								
47 Steam-gauge siphon incorrectly applied.....								
48 Steam pipes in cab leaking.....	1	11	2					
49 Steam pipes outside of cab leaking.....		5	2					
50 Steam valves in cab leaking.....	3	20	4					
51 Steam valves outside of cab leaking.....	6	7	14					
52 Telltales defective 1.....	2	63	22		2		1	1
53 Throat sheet defective.....		15	4					
54 Washout plugs leaking 1.....	11	56	7				1	
55 Washout plugs not removed at washout 1.....		7	3				1	
56 Water bars leaking 1.....								
57 Water-glass fittings defective.....	4	36	12		1			2
58 Water-glass improperly located.....								
59 Water-glass inoperative.....	1							
60 Water-glass missing.....								
61 Water-glass lamp missing or defective.....								
62 Water-glass shield defective.....	6	40						
63 Water-glass shield missing.....	2	1						
Number of defects.....	311	1,658	568		31		34	24
Locomotives reported.....	43	1,195	232	39	35	10		12
Locomotives inspected.....	89	1,075	353	11	6	16	105	16
Locomotives defective.....	71	696	223		6		26	7
Percentage inspected found defective.....	80	57	64		100		25	44
Locomotives ordered from service.....	12	21	9		1			

1 Number of locomotives reported with this defect.

Nashville, Chatt. & St. L.	Nevada, California & Oregon.	Nevada Northern.	Newburgh & South Shore.	New Orleans & Gt. Northern.	New Orleans, Mob. & Chgo.	New Orleans, Nat. & Natchez.	New Orleans Terminal Co.	New Orleans, Tex. & Mex.	New York Cent. & Hud. Riv.	New York, Chicago & St. L.	New York, New H. & Hart.	New York, Ont. & Western.	New York, Phila. & Norfolk.	New York, Susq. & Western.
1														1
2														
3	1						1			1	3			
4														
5														
6														
7														
8	3	2			1			2	4	5	10	7	2	1
9									7	13	4	4	1	
10														
11	16	3				2		1	19	3	45	3	2	
12									1	1				
13														
14														
15	1									4	1	1		
16	5			2		2			16	16	14	1		3
17														
18														
19				1		1			4	5	32	1	1	
20	2								1	4	22			
21									3	5	12		6	
22	11	1		1					17	8	32	7	11	5
23									1	1	1			
24	15								3	2	20	1	3	1
25														
26														
27	3								4	1	21	1	4	
28	8	6			5	1	2	11	22	15	126	11	3	1
29														
30	60	2		2	7	2		5	13	69	19	165	4	29
31											7	3		
32									1		4			
33	11			1					37	28	72	10	2	5
34	29			1		1	2		19	13	25	2	4	3
35	1													
36	1								2		1			
37														
38														
39														
40														
41									9	4	34	3	5	
42	3	2				1		7	33	11	13	5	1	
43	171			27	8	7	2	7	56	50	579	21	17	15
44	5	1	1		3	1	1	1	7	13	30	5	7	
45														
46									6	5	6	3		
47														
48														
49	1								4	1	8		6	
50	1								2	2	7		2	
51	1								6	8	49			
52	1								4	4	89	2		
53	43			2	3	1		1	13	16	7	1	7	
54	6								8	8	9		1	
55	18			1				2	15	29	18	7	4	1
56														
57	19	4			1			1	6	14	18	73	5	1
58												1		3
59												1		
60												8		
61												1		
62														
63														
Number of defects.....	457	21	1	38	31	17	9	22	77	398	325	1,552	105	120
Locomotives reported.....	257	13	15	21	32	57	10	16	41	2,140	244	1,195	211	39
Locomotives inspected.....	335	15	18	7	30	37	5	28	61	1,211	190	1,887	144	57
Locomotives defective.....	174	6	1	3	16	11	3	15	35	222	119	778	52	36
Percentage inspected found defective.....	52	40	6	43	53	30	60	53	57	18	63	41	36	63
Locomotives ordered from service.....	5			2	1	1		2	1	3	7	16	1	1

Tables showing number of locomotives reported inspected,

Defects.	Norf. & Ports, Belt Line.	Norfolk & Western.	Norfolk Southern.	Northampton & Bath.	Northern Central.	Northern Pacific.	Northern Pacific Term. Co.	Northwestern Pacific.
1 Arch tubes defective.						1		
2 Arch tubes leaking 1.		1				1		
3 Back head leaking or defective.		2	1			2		
4 Badge plate incorrectly applied.						2		
5 Badge plate missing.						2		
6 Barrel cracked or defective.								
7 Barrel leaking.								
8 Blow-off cock defective.		21				7		
9 Blow-off cock inoperative.		13	1			11		
10 Boiler check defective.								
11 Boiler check leaking.								
12 Cab card incorrect.		14	4	1		1		
13 Cab card missing.		2				4		
14 Combustion flues leaking.		1				2		
15 Crown bolts broken.		2				1		
16 Crown bolts defective 1.			1			4		
17 Cylinder, leaks at.		9	5	2		4		
18 Dome cracked.		294				52		
19 Dome leaking.								
20 Expansion pads, leaks at.		14				4		
21 Fire-box sheets defective.		1						
22 Fire-box sheets leaking.		24	1			20		
23 Flues defective 1.		67	11			7		
24 Flues leaking 1.		1						
25 Flues plugged.		20	3			3		
26 Gauge cocks improperly located.								1
27 Gauge cocks inoperative.								
28 Gauge cocks leaking or defective.			6			6		
29 Injector inoperative.		88	9			45	1	2
30 Injector or connections defective.		1	1			1		
31 Lubricator shields defective.	1	121	13	5		75		2
32 Lubricator shields missing.		3				6		
33 Mud ring leaking 1.		1				1		
34 Packing nuts, leaks at.		31	14			10		
35 Plugs defective or improperly applied.	2	97	5			30		
36 Plugs leaking 1.						2		
37 Safety valves defective.		3				1		1
38 Safety valves failed to relieve boiler.		4						
39 Safety valves missing.								
40 Side sheets (outside) defective.						7		
41 Squirt hose or application defective.		4			1	7		
42 Stay bolts broken.		2	7			21		
43 Stay bolts defective 1.	5	244	73	13		136		3
44 Steam gauge defective.	1	38	10			20		3
45 Steam-gauge fittings defective.		18				1		
46 Steam gauge improperly located.		21				15		
47 Steam-gauge siphon incorrectly applied.								
48 Steam pipes in cab leaking.								
49 Steam pipes outside of cab leaking.		8				7		
50 Steam valves in cab leaking.		41	1			7		
51 Steam valves outside of cab leaking.		11				10		
52 Telltales defective 1.		18	1	1		12		
53 Throat sheet defective.		27	6	1	1	12		4
54 Washout plugs leaking 1.		1				2		
55 Washout plugs not removed at washout 1.		51	5			32		
56 Water bars leaking 1.		2				2		
57 Water-glass fittings defective.	1	25	12	1		44		
58 Water glass improperly located.								
59 Water glass inoperative.								
60 Water glass missing.			1					
61 Water-glass lamp missing or defective.		1						
62 Water-glass shield defective.	1					9		
63 Water-glass shield missing.						1		
Number of defects.	11	1,346	191	24	2	637	1	16
Locomotives reported.	10	1,082	89	17		1,375	10	76
Locomotives inspected.	18	1,239	241	25	4	1,485	15	71
Locomotives defective.	6	586	103	12	2	388	1	9
Percentage inspected found defective.	33	47	43	48	50	26	7	13
Locomotives ordered from service.		18				11		

1 Number of locomotives reported with this defect.

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

	Ocean Shore.	Ohio River & Western.	Oregon Short Line.	Oreg.-Wash. R. R. & Nav. Co.	Panhandle & Santa Fe.	Paris & Great Northern.	Pennsylvania.	Pennsylvania Lines West.	Peoria & Eastern.	Peoria & Peckin Union.	Pere Marquette.	Philadelphia & Reading.	Philadelphia, Balt. & Wash.	Pittsburgh & Lake Erie.	Pittsburgh, Shawmut & No.
			2	1	1		6	1			4				1
		1	1	2			9	6			1				2
							1	1	1		7	6	4		3
			1				1	3			1				4
							39	34			24	24	4	2	6
	1		2	2	1		40	49	3	2	14	14	4	4	7
															8
	1	1	7				58	48			20	42	7	2	10
			7	1			8	10			6	4	8	2	11
		2	1	1				1			6	1			12
								7			2				13
			1					4			2				14
			3	3			2	9	5	1	16	10		8	15
		3	8	6			152	257	10	10	102	42	14	8	16
														2	17
			9	1	1		31	16			11	11	5		18
							27	11	1		11	1	1		19
	1		3	6	2		5	18		2	5	3	1	3	20
			4	3	2		95	45		1	50	30	5	14	21
							2	1		1	4				22
							13	35	1	3	16	5		5	23
								1							24
										1					25
										1	2	1	3		26
										1					27
	1		12	4			18	15			2	1	3		28
							177	89	3		11	12	5	4	29
							4	3			1				30
	1		16	8	2		277	161	11	5	41	217	45	10	31
								171			3	11			32
								4			18				33
			7		1		61	85	4		41	11		9	34
	2		25	4	1		113	77	3		57	38	16	7	35
			1					1							36
							35	5				3	1		37
												1	3		38
															39
	1						27	15			17	5	2	6	40
			1	1	1		37	52			3	10		3	41
							1	1			105	82	22	19	42
	4	12	89	14	1		153	107	37	2	105	82	22	19	43
	2		19	2	2		45	49	4	4	22	3	3	1	44
			2	1			5	7			8	1	1		45
			13	1			38	46	2		1	68	17	4	46
												1			47
															48
															49
															50
															51
															52
	3	1	16		1		14	44	2	2	8	3	1	10	53
							9	11	1		14		2		54
			14	2	2	1	132	43	1	2	27	37	1	6	55
							2	2	1		1				56
															57
															58
															59
															60
															61
															62
															63
	28	20	359	86	18	6	1,878	1,749	96	48	717	766	182	147	9
	10	11	353	316			4,169	2,146	69	53	404	998	330	245	70
	14	17	637	317	9	4	2,220	1,319	63	63	611	1,018	240	208	44
	9	7	142	52	6	2	949	627	30	26	260	396	79	73	8
	64	41	22	17	67	50	43	48	48	41	43	39	33	36	8
	2		4			1	38	10	4	6	21	16	2	5	18

Tables showing number of locomotives reported, inspected,

Defects.	Portland Terminal Co.	Public Belt R. R. of New Or.	Queen & Crescent (No. Div.).	Queen & Crescent (So. Div.).	Quincy, Omaha & Kans. City.	Republic Iron & Steel Co.	Richmond, Fred. & Potomac.	Rio Grande Southern.
1 Arch tubes defective.....								
2 Arch tubes leaking 1.....								
3 Back head leaking or defective.....			1					
4 Badge plate incorrectly applied.....			1	1				
5 Badge plate missing.....								
6 Barrel cracked or defective.....								
7 Barrel leaking.....			1					
8 Blow-off cock defective.....		2	9	3	1			
9 Blow-off cock inoperative.....								
10 Boiler check defective.....								
11 Boiler check leaking.....		3	16	3	3		1	
12 Cab card incorrect.....			3				1	3
13 Cab card missing.....			2					
14 Combustion flues leaking.....			2					
15 Crown bolts broken.....								
16 Crown bolts defective 1.....			4		4			
17 Cylinder, leaks at.....			70		1		8	
18 Dome cracked.....								
19 Dome leaking.....			3	1	1			
20 Expansion pads, leaks at.....			2	1	1			
21 Fire-box sheets defective.....				1	1			
22 Fire-box sheets leaking.....			2	1				
23 Flues defective 1.....								
24 Flues leaking 1.....			3					1
25 Flues plugged.....					1			
26 Gauge cocks improperly located.....								
27 Gauge cocks inoperative.....			2	1	1			1
28 Gauge cocks leaking or defective.....	8	5	57	4	3		1	
29 Injector inoperative.....		1	4					
30 Injector or connections defective.....		4		53	5	2	3	11
31 Lubricator shields defective.....	1	4	54	4				
32 Lubricator shields missing.....								
33 Mud ring leaking 1.....			10	1				
34 Packing nuts, leaks at.....	1	2	54	24	4	1	3	1
35 Plugs defective or improperly applied.....								
36 Plugs leaking 1.....								
37 Safety valves defective.....			4					
38 Safety valves failed to relieve boiler.....								
39 Safety valves missing.....								
40 Side sheets (outside) defective.....			2		1			1
41 Squirt hose or application defective.....			11	6	2		4	3
42 Stay bolts broken.....	3	10	115	50	2		4	1
43 Stay bolts defective 1.....		1	10	2	1		1	
44 Steam gauge defective.....								
45 Steam-gauge fittings defective.....	7		6	8			1	1
46 Steam gauge improperly located.....								
47 Steam-gauge siphon incorrectly applied.....								
48 Steam pipes in cab leaking.....			6	1			2	
49 Steam pipes outside of cab leaking.....			6	2	3		1	
50 Steam valves in cab leaking.....		1						
51 Steam valves outside of cab leaking.....	1		8		2		1	2
52 Telltales defective 1.....			7	6				
53 Throat sheet defective.....			2					
54 Washout plugs leaking 1.....			13	3				
55 Washout plugs not removed at washout 1.....			5					
56 Water bars leaking 1.....								
57 Water-glass fittings defective.....			23	4	1		1	2
58 Water glass improperly located.....								
59 Water glass inoperative.....								
60 Water glass missing.....								
61 Water-glass lamp missing or defective.....					1			
62 Water-glass shield defective.....		1						
63 Water-glass shield missing.....								
Number of defects.....	21	30	520	183	35	3	28	27
Locomotives reported.....	21	10	353	154	27	19	52	17
Locomotives inspected.....	11	26	344	155	43	11	78	7
Locomotives defective.....	8	14	208	80	22	3	18	7
Percentage inspected found defective.....	73	54	57	52	51	27	23	100
Locomotives ordered from service.....		1	21	4	1		1	1

¹ Number of locomotives reported with this defect.

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

Defect.	Rutland.	St. Johnsbury & Lake Champ.	St. Joseph & Grand Island.	St. Louis & San Francisco.	St. Louis, Brownsville & Mex.	St. Louis, Iron Mtn. & Sou.	St. Louis Southwestern.	San Antonio & Aransas Pass.	San Antonio, Uvalde & Gulf.	San Diego & Southeastern.	Sandy Riv. & Rang. Lakes.	San Pedro, L. A. & Salt L.	Santa Fe, Pres. & Phoenix.	Savannah Northwestern.	Seaboard Air Line.	Sierra Ry. of California.
1 Arch tubes defective.....				6											1	1
2 Arch tubes leaking 1.....				7		3	1					2			1	1
3 Back head leaking or defective.....				1											2	
4 Badge plate incorrectly applied.....															1	
5 Badge plate missing.....															2	
6 Barrel cracked or defective.....															3	
7 Barrel leaking.....															4	
8 Blow-off cock defective.....				33		24	5					6	1		4	
9 Blow-off cock inoperative.....				37		1		5				1	2		3	
10 Boiler check defective.....															4	
11 Boiler check leaking.....						6	2					2			1	
12 Cab card incorrect.....				23		1						17			4	
13 Cab card missing.....				6		16	2					2			1	
14 Combustion flues leaking.....				2		2						2				
15 Crown bolts broken.....																
16 Crown bolts defective 1.....				15		9						4			9	
17 Cylinder, leaks at.....				179		20	9		7			19	6		9	
18 Dome cracked.....												1	6		9	
19 Dome leaking.....															3	
20 Expansion pads, leaks at.....				15		3	4	2								
21 Fire-box sheets defective.....				5		5	1									
22 Fire-box sheets leaking.....				20		18	1					33	12		3	
23 Flues defective 1.....				40		16						5	8		10	
24 Flues leaking 1.....				3			7					4			1	
25 Flues plugged.....				14		4						1	3		10	
26 Gauge cocks improperly located.....																
27 Gauge cocks inoperative.....																
28 Gauge cocks leaking or defective.....	8	5	57	4	1	14		3				5	5	1	9	
29 Injector inoperative.....		1	4			56	1					22	3		2	
30 Injector or connections defective.....		4		53	5	8		2	5	2					1	30
31 Lubricator shields defective.....	1	4	54	4	5	118	12	24	7	4		13	7	4	4	3
32 Lubricator shields missing.....						39	7	14							3	
33 Mud ring leaking 1.....				7		11										
34 Packing nuts, leaks at.....	1	2	54	24	4	64	2	2				7	6		3	
35 Plugs defective or improperly applied.....						109	2	10				12	5		48	
36 Plugs leaking 1.....						3										
37 Safety valves defective.....				4		2										
38 Safety valves failed to relieve boiler.....						3	1					1	3		2	
39 Safety valves missing.....						1							2			
40 Side sheets (outside) defective.....				2								1				
41 Squirt hose or application defective.....				11	6	21	2	5				1	1		1	
42 Stay bolts broken.....	3	10	115	50	2	15	1	6				1			5	1
43 Stay bolts defective 1.....		1	10	2	1	141	60	88				19	14	6	268	41
44 Steam gauge defective.....						64	3	14				25	11		10	43
45 Steam-gauge fittings defective.....						2		2				1			2	
46 Steam gauge improperly located.....						29		2				7				
47 Steam-gauge siphon incorrectly applied.....								6				1				
48 Steam pipes in cab leaking.....				6	1										5	
49 Steam pipes outside of cab leaking.....				6	2	18	1	2				1			4	
50 Steam valves in cab leaking.....		1		2	3	10		1				3			6	
51 Steam valves outside of cab leaking.....	1			2		8	1					3	1			
52 Telltales defective 1.....				7	6	22						3				
53 Throat sheet defective.....				2		3							2			
54 Washout plugs leaking 1.....				13	3	32	2	11	4	2		3	7		6	
55 Washout plugs not removed at washout 1.....				5		14		5					2		2	
56 Water bars leaking 1.....						63		26	3	12		5			4	
57 Water-glass fittings defective.....						9		4	9	1		1	5			
58 Water glass improperly located.....																
59 Water glass inoperative.....																
60 Water glass missing.....																
61 Water-glass lamp missing or defective.....																
62 Water-glass shield defective.....		1														
63 Water-glass shield missing.....																
Number of defects.....	30	11	19	1,731	16	808	155	244	24	13	3	242	123	14	599	4
Locomotives reported.....	100	29	23	996	51	574	250	95	18	14	14	172	28	13	550	10
Locomotives inspected.....	79	29	36	1,285	41	574	248	173	26	21	13	282	72	13	872	18
Locomotives defective.....	17	7	11	644	8	284	84	73	13	8	3	103	34	5	304	1
Percentage inspected found defective.....	22	23	31	50	41	49	34	42	50	37	23	37	47	38	35	6
Locomotives ordered from service.....				53	1	21	11	19	2			4	4	1	11	

Tables showing number of locomotives reported, inspected,

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

Defects.	South Buffalo.	Southern.	Southern Ry. in Miss.	Southern Pacific Co.	Spokane International.	Spokane, Port. & Seattle.	Stanley, Merrill & Phillips.	Staten Island Rap. Transit.
1 Arch tubes defective.								
2 Arch tubes leaking 1.								
3 Back head leaking or defective.		2		5				
4 Badge plate incorrectly applied.		7						
5 Badge plate missing.		4		1				
6 Barrel cracked or defective.								
7 Barrel leaking.		11		7		4		
8 Blow-off cock defective.		12		13		1	2	
9 Blow-off cock inoperative.								
10 Boiler check defective.								
11 Boiler check leaking.		14		7			1	
12 Cab card incorrect.		7		43		2		
13 Cab card missing.		1		2				
14 Combustion flues leaking.								
15 Crown bolts broken.				55				
16 Crown bolts defective 1.		11		80				
17 Cylinder, leaks at.		130		12			2	
18 Dome cracked.								
19 Dome leaking.		18						
20 Expansion pads, leaks at.		4		4				
21 Fire-box sheets defective.		16		167				
22 Fire-box sheets leaking.		25		53		1		
23 Flues defective 1.		1		14				
24 Flues leaking 1.		20		26				
25 Flues plugged.								
26 Gauge cocks improperly located.				4				
27 Gauge cocks inoperative.		61		22				
28 Gauge cocks leaking or defective.		130	1	98		1		
29 Injector inoperative.		3		2				
30 Injector or connections defective.		175	7	112			3	
31 Lubricator shields defective.		10		6		1		
32 Lubricator shields missing.		8				6		
33 Mud ring leaking 1.		26		15				
34 Packing nuts, leaks at.		110	3	73		8	1	
35 Plugs defective or improperly applied.				11				
36 Plugs leaking 1.		2		10				
37 Safety valves defective.		5		11				
38 Safety valves failed to relieve boiler.				8				
39 Safety valves missing.								
40 Side sheets (outside) defective.		8		19				
41 Squirt hose or application defective.		16	1	21		1		
42 Stay bolts broken.		339	7	133	4	19	1	1
43 Stay bolts defective 1.		38	1	131		4		
44 Steam gauge defective.		4		12				
45 Steam-gauge fittings defective.		36		15		3		
46 Steam gauge improperly located.		1		2			1	
47 Steam-gauge siphon incorrectly applied.								
48 Steam pipes in cab leaking.		22		9				
49 Steam pipes outside of cab leaking.		10		1				
50 Steam valves in cab leaking.		22	2	5		2		
51 Steam valves outside of cab leaking.		20		4		1		
52 Telltales defective 1.		1		3		5		
53 Throat sheet defective.		30		34			1	
54 Washout plugs leaking 1.		2		19			1	
55 Washout plugs not removed at washout 1.		25		54				
56 Water bars leaking 1.		10		10				
57 Water-glass fittings defective.								
58 Water glass improperly located.		109	4	41		1		
59 Water glass inoperative.		1						
60 Water glass missing.								
61 Water-glass lamp missing or defective.		4					1	
62 Water-glass shield defective.								
63 Water-glass shield missing.								
Number of defects.....	3	1,509	26	1,371	7	52	11	12
Locomotives reported.....	29	1,675		1,408	14	74	11	27
Locomotives inspected.....	16	2,213	25	2,063	6	82	4	13
Locomotives defective.....	3	731	15	667	5	28	2	6
Percentage inspected found defective.....	19	33	60	32	83	34	50	46
Locomotives ordered from service.....	1	16		33				

1 Number of locomotives reported with this defect.

Sumpter Valley.	Susquehanna & New York.	Tennessee Central.	Term. R. R. Assn. of St. L.	Texas & New Orleans.	Texas & Pacific.	Texas Midland.	Tionesta Valley.	Toledo & Ohio Central.	Toledo, Peoria & Western.	Toledo, St. L. & Western.	Toledo Terminal.	Toronto, Hamilton & Buf.	Trinity & Brazos Valley.	Uinta.	Ulster & Delaware.
								5							1
								2							2
			1							1					3
										1					4
															5
															6
	2	1	2		4			4		1					7
	1	1	1		6			5		10					8
															9
															10
	1	3		2	14	3		4		1					11
		1	1		3	2		5		5					12
								1							13
								8							14
								1							15
			4		2			11		9				2	16
			2	1	5	1		35	2	38				1	17
															18
		1	2		6			4		2				1	19
			2					4		2	1				20
	1	1		1	8	3		8		4					21
	2	2			7			22	1	7	2			2	22
					1			2		1					23
			1		1			10		3				1	24
															25
															26
															27
															28
															29
	2	17	2	1	119	15		10		4					30
	3	6	3	10	2	4		20	7	22	4		3	6	31
															32
															33
	1	8	4					7		5				1	34
															35
															36
															37
															38
															39
															40
															41
	4	57	12	24	208	21		34	5	60	3		7	2	42
		3			9			12		11	1		2	2	43
					1										44
					3										45
					10	1									46
															47
															48
															49
															50
															51
	1	9	1	1	17	1		8	2	10	2		2	2	52
					1			5	1	2	1				53
	1	3	4		25	1		9	1	5					54
					10	1		3		4			4		55
															56
															57
															58
															59
															60
															61
															62
															63
	18	152	53	62	611	64		296	21	279	16		24	22	37
10	12	36	146		394	19	13	132	43	99	12	20	58	10	29
3	10	49	51	93	463	14	6	178	23	131	10	1	21	9	35
	6	38	24	40	260	9		95	8	76	5		13	7	18
	60	78	47	43	56	64		53	35	58	50		62	78	51
		5		2	18	3		7	1	8					2

In the preceding tables the number of locomotives reported has been omitted in a number of cases where the railroad is part of a system. In these instances the number is given under the system with which the road is identified, as follows: Chicago, Rock Island & Gulf included in Chicago, Rock Island & Pacific; Gulf, Colorado & Santa Fe, Panhandle & Santa Fe, and Paris & Great Northern included in Atchison, Topeka & Santa Fe; Houston & Texas Central, Houston, East & West Texas, Louisiana Western, Morgan's Louisiana & Texas, and Texas & New Orleans included in Galveston, Harrisburg & San Antonio; Northern Central included in Pennsylvania Railroad; St. Johnsbury & Lake Champlain included in Boston & Maine; St. Louis, Iron Mountain & Southern included in Missouri Pacific; and Southern Railway in Mississippi included in Southern Railway.

It will be noted that in several instances the number of locomotives shown inspected exceeds the number reported. This is due to the fact that in some cases the same locomotives were inspected more than once during the year.

ACCIDENTS RESULTING FROM THE FAILURE OF LOCOMOTIVE BOILERS AND THEIR APPURTENANCES DURING THE FISCAL YEAR ENDED JUNE 30, 1915.

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

ALABAMA GREAT SOUTHERN RAILROAD:

February 3, 1915, locomotive 199, near Akron, Ala. Injector steam pipe collar broke; defective collar; 1 injured.
One accident; 1 injured.

ATCHISON, TOPEKA & SANTA FE RAILWAY:

August 5, 1914, locomotive 244, Larned, Kans. Mud drum cap blew off; defective cap; had been previously reported; 4 injured.

August 11, 1914, locomotive 519, near Ancona, Ill. Flue broke, due to being thin and pitted; 1 injured.

August 30, 1914, locomotive 614, Emporia, Kans. Threads stripped on injector steam pipe union nut: nut too light and threads badly worn; 1 injured.

September 1, 1914, locomotive 516, Verona, Ill. Squirt hose burst; defective hose; 1 injured.

October 28, 1914, locomotive 751, Chanute, Kans. Washout plug in mud drum cap blew out while being tightened under pressure; defective threads on plug and plug too small; 2 injured.

* March 13, 1915, locomotive 1405, Hamburg, Kans. Water glass burst; 1 injured.

April 8, 1915, locomotive 1054, Chillicothe, Ill. Bulls-eye lubricator glass and packing nut blew out; defective threads; 1 injured.

April 10, 1915, locomotive 1022, Arkansas City, Kans. Arch tube burst; cause not assigned; 1 injured.

Eight accidents; 12 injured.

ATLANTIC COAST LINE RAILROAD:

July 14, 1914, locomotive 716, Holder, Fla. Crown sheet failure, due to low water; no contributory cause found; 3 killed, 1 injured.

July 30, 1914, locomotive 1006, Barboursville, Fla. Crown sheet failure, due to low water; no contributory causes found; 2 injured.

August 12, 1914, locomotive 1121, Jacksonville, Fla. Water glass burst; injured by flying glass; inefficient shield; 1 injured.

August 31, 1914, locomotive 1116, Port Tampa, Fla. Squirt hose blew off; not latched; 1 injured.

May 6, 1915, locomotive 948, Winston, Fla. Arch flue became loose in flue sheet; improperly applied; 1 injured.

July 20, 1915, locomotive 378, Manor, Ga. Crown sheet failure, due to low water; no contributory cause found; 1 injured.

Six accidents; 3 killed, 7 injured.

BALTIMORE & OHIO RAILROAD:

July 12, 1914, locomotive 2846, near Ironton, Ind. Flue pulled through flue sheet, due to defective heading; 2 injured.

July 19, 1914, locomotive 553, Strasburg Junction, Va. Squirt hose burst; 1 injured.

* August 4, 1914, locomotive 2012, Gaither, Md. Squirt hose valve worked open; 1 injured.

August 5, 1914, locomotive 1404, Connellsville, Pa. Injector broke; scalded by hot water and steam from defective overflow pipe; 1 injured.

* August 5, 1914, locomotive 1821, Blaser, W. Va. Stud blew out of boiler; 1 injured.

August 13, 1914, locomotive 4207, Grafton, W. Va. Squirt pipe broke; 1 injured.

* August 14, 1914, locomotive 4320, Camden, Md. Squirt hose valve worked open; 1 injured.

* August 20, 1914, locomotive 4232, Riverside, Md. Bonnet blew out of valve; improper application of bonnet; 1 injured.

* August 22, 1914, locomotive 1815, Valley Falls, W. Va. Injector blew off; 1 injured.

August 25, 1914, locomotive 2832, near Eaton, W. Va. Flue broke; deterioration of metal at weld; 1 injured.

August 29, 1914, locomotive 2824, Industrial, W. Va. Squirt pipe blew out of branch pipe; defective threads and pipe not clamped; 1 injured.

September 3, 1914, locomotive 2678, Bakerstown, Pa. Squirt pipe valve defective; 1 injured.

September 7, 1914, locomotive 543, Arnold, W. Va. Scalded while cleaning tank hose strainer; defective and leaking check valve; 1 injured.

September 19, 1914, locomotive 4297, M. & K. Junction, W. Va. Nut on overflow pipe broke, due to use of improper tools while being tightened with injector working; 1 injured.

September 28, 1914, locomotive 4002, Cuyahoga Falls, Ohio. Squirt pipe broke off; pipe improperly located and not clamped; 1 injured.

October 27, 1914, locomotive 1615, Philadelphia, Pa. Arch tube pulled out of flue sheet; tube did not extend through sheet far enough to properly bead; heavy accumulation of scale in tube; 2 injured.

November 19, 1914, locomotive 120, Springfield, Ill. Expansion pad stud blew out; defective threads; 1 injured.

November 25, 1914, locomotive 2255, Dolo, W. Va. Squirt hose blew off; defective hose and not securely applied; 1 injured.

December 13, 1914, locomotive 2397, Glovers Gap, W. Va. Crown sheet failure, due to low water; no contributory causes found; 2 injured.

December 16, 1914, locomotive 77, Philadelphia, Pa. Drain cock in injector delivery pipe broke off; defective reducer in delivery pipe; 1 injured.

January 13, 1915, locomotive 2368, Chicago Junction, Ohio. Scalded by hot water from hole in delivery pipe; hole had been plugged with wooden plug, which blew out while injector was being operated; 1 injured.

January 21, 1915, locomotive 4119, Connellsville, Pa. Flue blew forward 11 inches while locomotive was working, due to defective bead and improperly rolled in front flue sheet; 2 injured.

February 13, 1915, locomotive 4245, Brunswick, Md. Bonnet blew out of main throttle valve to stoker; defective and loose fitting threads in valve and on bonnet; 1 injured.

February 14, 1915, locomotive 4034, Mount Airy, Md. Boiler check cap blew off, due to peculiar construction of check and not being properly vented; 1 injured.

February 23, 1915, locomotive 2110, Cumberland, Md. Scalded by hot water from squirt hose, due to check sticking; 1 injured.

March 1, 1915, locomotive 1901, Bartletts Cut, W. Va. Grate bearing stud blew out; improperly applied; 2 injured.

March 9, 1915, locomotive 1778, near Lansdowne, Md. Reverse lever quadrant bracket studs knocked out of boiler; studs improperly applied; not screwed through sheet; 1 killed.

* April 10, 1915, locomotive 2218, Chicago Junction, Ohio. Injector put on with squirt hose valve open, allowing hot water to blow out on foot; 1 injured.

May 10, 1915, locomotive 2404, Hardman, W. Va. Injector steam pipe collar broke; defective collar and improperly brazed; 2 injured.

June 30, 1915, locomotive 2619, Bloomingsburg, Ohio. Scalded while using squirt hose; 1 injured.

Thirty accidents; 1 killed, 35 injured.

BELT RAILWAY OF CHICAGO:

September 17, 1914, locomotive 102, West Chicago, Ill. Squirt hose blew off; insecurely applied; 1 injured.

One accident; 1 injured.

PESSEMER & LAKE ERIE RAILROAD:

October 2, 1914, locomotive 81, Jamisonville, Pa. Injector steam pipe collar broke at injector throttle connection; old crack in flange of collar, and wrapped with asbestos to stop leak; 1 injured.

June 2, 1915, locomotive 157, Albion, Pa. Crown sheet failure due to low water; no contributory causes found; 1 killed, 1 injured.

Two accidents; 1 killed, 2 injured.

BIRMINGHAM & NORTH WESTERN RAILROAD:

December 10, 1914, locomotive 10, near Jackson, Tenn. Center of cast iron dome cap blew out; old crack entirely through casting 8 inches long; 1 injured. One accident; 1 injured.

BOSTON & ALBANY RAILROAD:

July 6, 1914, locomotive 803, Worcester, Mass. Squirt hose parted at splice; insecurely clamped; 1 injured.

September 6, 1914, locomotive 1009, West Springfield, Mass. Squirt pipe broke off; defective nipple in feed pipe; 1 injured.

February 9, 1915, locomotive 309, Elliott Station, Mass. Flue broke; over-heated in welding; 1 injured.

Three accidents; 3 injured.

BOSTON & MAINE RAILROAD:

July 9, 1914, locomotive 2635, near South Charleston, N. H. Right injector steam pipe collar broke; old crack in collar; 1 injured.

July 20, 1914, locomotive 1022, near Raymond, N. H. Expansion pad stud blew out; threads corroded entirely away on stud and in sheet and only screwed into sheet one-fourth inch; 1 injured.

September 10, 1914, locomotive 1017, Worcester, Mass. Expansion pad stud blew out; threads corroded entirely away on stud, and not screwed far enough into sheet; 1 injured.

October 31, 1914, locomotive 3600, South Acton, Mass. Flue broke; over-heated in welding; 2 injured.

June 8, 1915, locomotive 3621, Charleston, Mass. Ash pan blower pipe blew off; defective threads; 1 injured.

June 10, 1915, locomotive 2074, Revere, Mass. Injector steam pipe collar broke; collar too light and improperly brazed; 1 injured.

Six accidents; 7 injured.

BUFFALO CREEK RAILROAD:

June 1, 1915, locomotive 16, Buffalo, N. Y. Scalded by hot water from defective squirt hose pipe; 1 injured.

One accident; 1 injured.

CAROLINA, CLINCHFIELD & OHIO RAILWAY:

* November 20, 1914, locomotive 553, Kingsport, Tenn. Flue broke off near field, due to vibration; engineer injured jumping from locomotive; 1 injured.

One accident; 1 injured.

CENTRAL NEW ENGLAND RAILWAY:

November 6, 1914, locomotive 112, Towners, N. Y. Collar on steam pipe to air pump blew off; defective brazing; 1 injured.

* March 27, 1915, locomotive 164, West Pawling, N. Y. Union in pipe to ash pan blower blew off; defective threads; 1 injured.

Two accidents; 2 injured.

CENTRAL RAILROAD OF NEW JERSEY:

January 13, 1915, locomotive 440, Coalport, Pa. Water bar burst; defective material; 1 injured.

One accident; 1 injured.

CENTRAL VERMONT RAILWAY:

July 18, 1914, locomotive 401, St. Albans, Vt. Washout cap blew off while being tightened under pressure; threads in cap defective and cap too large; 2 injured.

One accident; 2 injured.

CHESAPEAKE & OHIO RAILWAY:

* December 23, 1914, locomotive 382, Richmond, Va. Stay bolt blew out; defective threads; 1 injured.

* March 13, 1915, locomotive 761, Kellys Tunnel, Va. Stud in dry pipe collar broke; 1 injured.

April 18, 1915, locomotive 801, Stony Point, Ky. Crown sheet failure due to low water; no contributory causes found; 1 injured.

May 27, 1915, locomotive 1222, Peru, Ind. Washout plug blew out while being tightened under pressure; plug improperly applied; 1 injured.

Four accidents; 4 injured.

CHICAGO & ALTON RAILROAD:

* August 18, 1914, locomotive 89, Venice, Ill. Left injector feed pipe spanner-nut threads stripped; 1 injured.

September 8, 1914, locomotive 312, near Peoria, Ill. Squirt hose blew off nipple; squirt pipe pointing up and hose not clamped on pipe; 1 injured.

September 10, 1914, locomotive 344, Chenoa, Ill. Union nut on steam pipe, left injector, blew off, scalding fireman fatally while attempting to tighten under pressure; union nut too loose for threaded part of injector; 1 killed.

Three accidents; 1 killed, 2 injured.

CHICAGO & EASTERN ILLINOIS RAILROAD:

February 6, 1915, locomotive 1913, Milford, Ill. Crown sheet failure due to low water; top end of water glass nearly closed by rubber gasket, and right injector not working properly; 2 injured.

One accident; 2 injured.

CHICAGO & NORTHWESTERN RAILWAY:

July 11, 1914, locomotive 487, Chicago, Ill. Water glass burst; inefficient shield; 1 injured.

* August 2, 1914, locomotive 1797, Tama, Iowa. Squirt hose burst; defective hose; 1 injured.

* August 13, 1914, locomotive 1451, Volga, S. Dak. Water glass valve leaking; drip pipe blew off after having been plugged; 1 injured.

August 28, 1914, locomotive 186, Hitchcock, S. Dak. Right injector primer bonnet blew out; poor threads; 1 injured.

September 16, 1914, locomotive 189, Escanaba, Mich. Water glass burst; scalded while shutting off top cock; 1 injured.

November 18, 1914, locomotive 1364, Stockton, Minn. Water glass burst; injured by escaping steam and water; 1 injured.

December 25, 1914, locomotive 1326, Saylor, Iowa. Water glass burst; injured by escaping steam and water; 1 injured.

January 13, 1915, locomotive 1243, Deadwood, S. Dak. Lubricator glass burst; injured by flying glass; metal shield slotted $\frac{3}{8}$ by $1\frac{1}{4}$ inches; 1 injured.

April 29, 1915, locomotive 1747, Antigo, Wis. Water glass burst; injured by flying glass; defective shield; 1 injured.

May 4, 1915, locomotive 668, West Chicago, Ill. Lubricator glass burst; cut by flying glass; inefficient shield; slotted metal, slots $\frac{3}{8}$ by $1\frac{1}{4}$ inches; 1 injured.

Ten accidents; 10 injured.

CHICAGO, BURLINGTON & QUINCY RAILROAD:

July 21, 1914, locomotive 1049, Humboldt, Nebr. Stem of blow-off cock blew out; threads on stem and in valve corroded entirely away and had been reported as defective; 1 injured.

July 27, 1914, locomotive 1839, Humeston, Iowa. Squirt hose parted at splice; insecurely clamped; 1 injured.

July 31, 1914, locomotive 1841, St. Joseph, Mo. Squirt hose blew off; insecurely applied; 1 injured.

August 16, 1914, locomotive 2156, Brookfield, Mo. Water glass burst; inefficient shield; 1 injured.

August 27, 1914, locomotive 616, Laclede, Mo. Squirt pipe broke; 1 injured.

September 6, 1914, locomotive 5248, Cravat, Ill. Crown sheet failure; overheated; water foaming badly; reported six times by different engineers prior to accident and boiler not washed; 1 injured.

September 22, 1914, locomotive 3185, Aurora, Ill. Water glass burst; inefficient shield; 1 injured.

November 3, 1914, locomotive 1979, Murrays, Mo. Cylinder cock lever stud blew out; defective threads; 1 injured.

November 20, 1914, locomotive 1516, Herrin, Ill. Heater pipe blew out of boiler check body; threads badly corroded; 1 injured.

November 20, 1914, locomotive 5237, near Abingdon, Ill. Crown sheet failure due to low water; piece of rubber lining under left hose strainer restricted water supply; 2 injured.

November 29, 1914, locomotive 5282, near New Castle, Wyo. Water glass burst; injured by escaping steam; 1 injured.

November 29, 1914, locomotive 1411, Chicago, Ill. Scalded by steam and hot water from pipe attached to blow-off cock; operating rod disconnected and threads in blow-off cock defective; 1 injured.

December 4, 1914, locomotive 2165, Galesburg, Ill. Water glass burst; 1 injured.

December 12, 1914, locomotive 802, Powder River, Wyo. Injector steam pipe pulled out of collar; improperly brazed; 1 injured.

December 20, 1914, locomotive 5004, Denver, Colo. Spanner nut on left injector steam pipe broke while being tightened under pressure; improper tools used; 1 injured.

December 25, 1914, locomotive 1432, St. Joseph, Mo. Water glass burst; scalded by escaping steam and water; 1 injured.

January 3, 1915, locomotive 953, Moline, Ill. Injector steam pipe broke at flange; cause not assigned; 1 injured.

January 4, 1915, locomotive 1475, Chicago, Ill. Water glass burst; inefficient shield; 1 injured.

January 21, 1915, locomotive 1404, Aurora, Ill. Water glass burst; scalded while closing cocks; 1 injured.

January 24, 1915, locomotive 1451, Centralia, Ill. Flue plug blew out; flue plugged both ends; plugs not tied together with rod; 1 injured.

February 25, 1915, locomotive 1702, Aurora, Ill. Water glass broke; injured by escaping steam and water; 1 injured.

May 4, 1915, locomotive 2179, St. Joseph, Mo. Flue broke; defective weld; 2 injured.

June 8, 1915, locomotive 5043, Lakenan, Mo. Superheater tube broke; defective welding; 3 injured.

June 8, 1915, locomotive 2884, Trenton, Nebr. Injector steam pipe collar broke; defective and light sleeve, and improperly brazed; 1 injured.

June 13, 1914, locomotive 5264, Monmouth, Ill. Water glass burst; locomotive being operated without shield on water glass because of previous explosion of glass rendering shield useless; 1 injured.

Twenty-five accidents; 29 injured.

CHICAGO GREAT WESTERN RAILROAD.

July 16, 1914, locomotive 280, Conception, Mo. Squirt hose parted at splice; insecurely clamped; 1 injured.

September 18, 1914, locomotive 243, Fredericksburg, Iowa. Squirt hose burst; defective hose; 1 injured.

May 10, 1915, locomotive 251, South Des Moines, Iowa. Squirt hose burst; hose worn and defective; 1 injured.

Three accidents; 3 injured.

CHICAGO, INDIANAPOLIS & LOUISVILLE RAILWAY.

August 26, 1914, locomotive 11, New Albany, Ind. Washout plug blew out; defective threads; 1 injured.

One accident; 1 injured.

CHICAGO JUNCTION RAILWAY.

* July 14, 1914, locomotive 150, Chicago, Ill. Water glass burst; 1 injured.

One accident; 1 injured.

CHICAGO, MILWAUKEE & ST. PAUL RAILWAY:

July 2, 1914, locomotive 6541, near Portage, Wis. Squirt hose parted at splice; insecurely clamped; 1 injured.

July 7, 1914, locomotive 7244, Milwaukee, Wis. Squirt hose burst; defective hose; 1 injured.

July 14, 1914, locomotive 9507, Cedar Falls, Wash. Squirt hose defective; 1 injured.

July 25, 1914, locomotive 2311, near Farmington, Minn. Squirt hose blew out; insecurely applied; 1 injured.

August 7, 1914, locomotives 1180 and 1160, Beloit, Wis. Washout hose blew off while coupled to blow-off cocks on engines Nos. 1160 and 1180, to fill one boiler from the other, under 180 pounds steam pressure; 1 injured.

August 8, 1914, locomotive 1030, Eau Claire, Wis. Squirt hose valve opened with foot; valve improperly located and boiler check leaking; 1 injured.

August 12, 1914, locomotive 2250, Jefferson, S. Dak. Equalizer fulcrum post broke, causing equalizer to strike projecting washout plug, knocking plug out of boiler; 1 injured.

August 14, 1914, locomotive 4369, Kaines Siding, Iowa. Squirt hose blew off; pipe not pointing down and hose insecurely applied; 1 injured.

August 17, 1914, locomotive 7242, Milwaukee, Wis. Water glass broke; injured by escaping steam; 1 injured.

August 27, 1914, locomotive 411, Rosemount, Minn. Scalded by open squirt-hose valve; boiler check stuck open and leaking badly; 1 injured.

September 2, 1914, locomotive 8009, Bardwell, Wis. Steam and exhaust pipes to headlight turbine in defective and unbraced condition, causing injury to engineer while making temporary repairs on the road; 1 injured.

December 25, 1914, locomotive 1513, Mason City, Iowa. Bonnet blew out of drain valve in feed pipe while trying to seat check valve by hammering; 1 injured.

January 4, 1915, locomotive 8139, Franklin Park, Ill. Steam heat pipe connection between engine and tender became disconnected; parts not held for inspection; 1 injured.

January 16, 1915, locomotive 7032, Galewood, Ill. Flue broke; defective weld; 3 injured.

January 23, 1915, locomotive 8502, Vendome, Mont. Flue broke just inside of tube sheet, due to being cut by expanding tool; 1 injured.

March 16, 1915, locomotive 1222, Milwaukee, Wis. Water glass burst; injured by flying glass; defective shield; 1 injured.

May 2, 1915, locomotive 2072, near Durand, Ill. Flue broke; overheated in welding; 1 injured.

May 25, 1915, locomotive 2405, Ladd, Ill. Blow-off cock leaking; 1 injured.

June 12, 1915, locomotive 2121, Jerome, Iowa. Fireman scalded disconnecting delivery pipe to put in gasket to stop leak in delivery pipe; boiler check leaking bad; 1 injured.

June 18, 1915, locomotive 4212, Austin, Minn. Flue plug flew out; flue partly broken and plugged at both ends with solid plugs; 1 injured.

June 19, 1915, locomotive 7233, Laredo, Mo. Squirt hose burst; defective hose; 1 injured.

Twenty-one accidents; 23 injured.

CHICAGO, PEORIA & ST. LOUIS RAILWAY:

July 30, 1914, locomotive 53, Havana, Ill. Squirt hose valve rubbed open; defective hose and valve; 1 injured.

One accident; 1 injured.

CHICAGO, ROCK ISLAND & PACIFIC RAILWAY:

July 10, 1914, locomotive 179, Shawnee, Okla. Injector ram bonnet blew out; defective threads and loose fit; 1 injured.

July 17, 1914, locomotive 2136, Shawnee, Okla. Squirt hose valve opened by rubbing; defective valve; 1 injured.

July 20, 1914, locomotive 176, Shawnee, Okla. Pipe screwed into injector feed pipe for injecting boiler compound blew out; defective threads; 1 injured.

July 23, 1914, locomotive 1833, El Reno, Okla. Squirt hose parted at splice; not clamped; 1 injured.

August 1, 1914, locomotive 181, El Reno, Okla. Squirt hose blew off; not clamped and pipe not pointing down; 1 injured.

August 2, 1914, locomotive 1772, El Reno, Okla. Gauge-cock stem blew out when cock was opened; insufficient threads in packing nut; 1 injured.

October 20, 1914, locomotive 1267, Mangum, Okla. Blow-off cock stuck open; stem broken off valve; 1 injured.

November 19, 1914, locomotive 1711, Montrose, Nebr. Flue broke; overheated in welding; 1 injured.

November 22, 1914, locomotive 2557, near Fairport, Iowa. Crown sheet failure due to low water; obstruction in tank well interfering with water supply to injector and siphon pipes in tank disconnected; 3 injured.

December 25, 1914, locomotive 1654, Trenton, Mo. Crown sheet failure due to low water; no contributory causes found; 3 injured.

April 1, 1915, locomotive 2111, Hicks, Tex. Crown sheet failure due to low water; defective radial stays; 1 killed.

May 7, 1915, locomotive 1016, Forrest City, Ark. Squirt hose blew off; not clamped; 1 injured.

May 8, 1915, locomotive 1771, El Reno, Okla. Flue broke at weld; overheated in welding; 1 injured.

May 26, 1915, locomotive 1248, near Martins, Iowa. Crown sheet failure due to low water; obstruction in bottom water glass fitting; bottom gauge cock stopped up with solid scale and inoperative and water glass cocks and 3 gauge cocks not extending through reinforcing plates; 2 injured.

Fourteen accidents; 1 killed, 18 injured.

CHICAGO, ST. PAUL, MINNEAPOLIS & OMAHA RAILWAY:

November 26, 1914, locomotive 352, Madelia, Minn. Water glass burst; inefficient shield; 1 injured.

January 12, 1915, locomotive 282, Turtle Lake, Wis. Flue broke at weld; defective flue; broke in fifth weld from end; flue had 9 welds; 1 injured.

January 28, 1915, locomotive 328, Minneapolis, Minn. Flue burst; cause not determined; 1 injured.

Three accidents; 3 injured.

CHICAGO, TERRE HAUTE & SOUTHEASTERN RAILWAY:

July 8, 1914, locomotive 675, Blue Island, Ill. Injector broke; injured by steam escaping from defective overflow pipe in cab; 1 injured.

One accident; 1 injured.

CINCINNATI, HAMILTON & DAYTON RAILWAY:

September 20, 1914, locomotive 4007, Ivorydale, Ohio. Washout plug blew out while being tightened under pressure; plug not properly tightened when applied; 1 injured.

May 12, 1915, locomotive 90, Piqua, Ohio. Plug blew out of crack in door sheet; defective threads on plug and sheet, and sheet badly cut by excessive talking; 1 injured.

Two accidents; 2 injured.

CINCINNATI, NEW ORLEANS & TEXAS PACIFIC RAILWAY:

March 29, 1915, locomotive 677, Chattanooga, Tenn. Scalded by hot water squirting from loose flue while making repairs; 1 injured.

One accident; 1 injured.

CLEVELAND, CINCINNATI, CHICAGO & ST. LOUIS RAILWAY:

July 7, 1914, locomotive 7145, Alexandria, Ind. Squirt hose burst; 1 injured.

August 30, 1914, locomotive 6556, North Vernon, Ind. Squirt hose pipe disconnected at coupling; defective threads; 1 injured.

September 24, 1914, locomotive 6198, Tunnel Hill, Ill. Ash pan blower pipe blew off, breaking engineer's arm; pipe not braced and threads worn and corroded away; 1 injured.

November 21, 1914, locomotive 7352, Indianapolis, Ind. Nipple turned in blow-off cock; 1 injured.

June 8, 1915, locomotive 6800, Indianapolis, Ind. Right injector throttle knocked out of fountain, due to reach rod becoming disconnected at front end, caused by defective threads on reach rod connection; 1 injured.

Five accidents; 5 injured.

COLORADO & SOUTHERN RAILWAY:

August 11, 1914, locomotive 609, Garcia, Colo. Injector primer bonnet blew out; defective fit and threads; 1 injured.

October 18, 1914, locomotive 605, Trinidad, Colo. Water glass burst; cut by flying glass; inefficient shield; 1 injured.

Two accidents; 2 injured.

DELAWARE & HUDSON Co.:

September 11, 1914, locomotive 537, Hudson Falls, N. Y. Flue broke at weld; overheated in welding; 1 injured.

February 4, 1915, locomotive 1054, Jermyn, Pa. Three flues broke at weld; overheated in welding; 3 injured.

May 10, 1915, locomotive 831, West Richmondsville, N. Y. Crown sheet failure due to low water; lowest reading of water glass $1\frac{1}{2}$ inches and lowest gauge cock $2\frac{1}{2}$ inches above highest point of crown sheet; 1 injured.

Three accidents; 5 injured.

DELAWARE, LACKAWANNA & WESTERN RAILROAD:

October 5, 1914, locomotive 1207, near Portway, N. Y. Crown-sheet failure due to low water; no contributory causes found; 3 injured.

November 2, 1914, locomotive 873, Scranton, Pa. Water glass burst; injured by escaping steam and water; 1 injured.

June 12, 1915, locomotive 766, Elmira, N. Y. Squirt hose parted at splice; insecurely applied; 1 injured.

Three accidents; 5 injured.

DENVER & RIO GRANDE RAILROAD:

November 20, 1914, locomotive 1135, near Salt Lake City, Utah. Fireman burned by heat from fire door; excessive heat due to flues leaking in front end; 1 injured.

March 16, 1915, locomotive 1120, Denver, Colo. Safety valve blew off of base while being adjusted under pressure; loose and defective threads; 1 injured.

Two accidents; 2 injured.

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY:

* July 13, 1914, locomotive 709, Marquette, Mich. Water glass burst; cut by flying glass; inefficient shield; 1 injured.

One accident; 1 injured.

EL PASO & SOUTHWESTERN RAILWAY:

* May 14, 1915, locomotive 364, Duran, N. Mex. Water glass burst; inefficient shield; 1 injured.

One accident; 1 injured.

ERIE RAILROAD:

July 25, 1914, locomotive 1404, Sharon, Pa. Grate rest stud blew out; unable to find stud; 1 injured.

July 31, 1914, locomotive 2032, Montclair, N. J. Flue broke at weld, due to thin flue at weld; 1 injured.

July 31, 1914, locomotive 1597, near Hunts, N. Y. Crown sheet failure, due to low water; no contributory causes found; 2 killed, 1 injured.

August 18, 1914, locomotive 2705, near Narrowsburg, N. Y. Air pump steam valve broke off where it screws into turret; old crack in shank of valve; 1 injured.

September 20, 1914, locomotive 52, Swartswood Junction, N. J. Air reservoir exploded, due to being corroded and pitted; 1 injured.

October 15, 1914, locomotive 527, Northvale, N. J. Crown sheet failure, due to low water; no contributory causes found; 1 injured.

November 27, 1914, locomotive 2539, Hegewisch, Ill. Flue broke; overheated in welding; 1 injured.

December 6, 1914, locomotive 1680, Marion, Ohio. Washout plug blew out of front flue sheet; improperly applied; 2 injured.

December 24, 1914, locomotive 104, Jersey City, N. J. $1\frac{1}{4}$ -inch pipe in fountain with hose attached broke off; pipe not clamped; 1 injured.

* December 29, 1914, locomotive 603, Paterson, N. J. Closing drain cock on branch pipe to injector; drain cock broke off; 1 injured.

March 2, 1915, locomotive 76, Niles, Ohio. Injector steam pipe spanner nut blew off; damaged by use of improper tools used in tightening; 1 injured.

June 12, 1915, locomotive 1112, Alton, Pa. Hose attached to delivery pipe to fill barrels on bridge burst; defective hose; 1 injured.

Twelve accidents; 2 killed, 13 injured.

FORT WORTH & DENVER CITY RAILWAY:

January 31, 1915, locomotive 262, near Bellvue, Tex. Grate bar stud blew out; side sheet had corroded to one-eighth inch in thickness and locomotive was allowed to operate with only two studs to hold grate bar in place; 2 injured.

One accident; 2 injured.

GRAND TRUNK RAILWAY SYSTEM:

July 12, 1914, locomotive 2103, Pontiac, Mich. Squirt hose blew off; insecurely applied (clamp broken); 1 injured.

* November 19, 1914, locomotive 1693, Detroit, Mich. Water glass burst; injured by escaping steam and water; 1 injured.

June 13, 1915, locomotive 2324, Durand, Mich. While using injector with hose attached for washing stationary boiler, injector broke, due to obstruction in feed pipe; 1 injured.

Three accidents; 3 injured.

GREAT NORTHERN RAILWAY:

August 24, 1914, locomotive 1808, Wenatchee, Wash. Injector broke while working on strainer box; defective threads; 1 injured.

* October 1, 1914, locomotive 605, Sioux Falls, S. Dak. Squirt hose blew off; defective hose and clamp; 1 injured.

* November 4, 1914, locomotive 3022, Hillyard, Wash. Water glass burst; shield not in place; 1 injured.

November 12, 1914, locomotive 404, near Leavenworth, Wash. Lubricator glass burst; shield removed; 1 injured.

November 16, 1914, locomotive 1226, Fosston, Minn. Water glass burst; injured by flying glass; inefficient shield; 1 injured.

November 22, 1914, locomotive 2024, Waukon, Wash. Squirt hose parted at splice; insecurely clamped; 1 injured.

* January 9, 1915, locomotive 25, Willmar, Minn. Water glass burst; injured by escaping steam and water; 1 injured.

January 20, 1915, locomotive 1639, Glasgow, Mont. Water glass burst; inefficient shield; 1 injured.

April 6, 1915, locomotive 3062, Redland, Minn. Washout plug blew out while being tightened under pressure; plug cross threaded; 1 injured.

April 10, 1915, locomotive 389, Hillyard, Wash. Washout plug blew out while being tightened under pressure; plug improperly applied; cross threaded; 1 injured.

Ten accidents; 10 injured.

GULF, COLORADO & SANTA FE RAILWAY:

July 3, 1914, locomotive 2073, Cleburne, Tex. Squirt hose blew off; insecurely applied; 1 injured.

October 9, 1914, locomotive 2069, Temple, Tex. Injector put on while squirt-hose valve was open; injector would not prime with valve closed, due to boiler check leaking; 1 injured.

November 7, 1914, locomotive 2090, Cleburne, Tex. Squirt hose blew off; 1 injured.

January 25, 1915, locomotive 670, near Copeville, Tex. Crown sheet failure, due to low water; top end of water glass was closed by rubber gasket squeezing over end of glass; 2 injured.

February 21, 1915, locomotive 5, Oakdale, La. Lubricator glass burst; inefficient shield; 1 injured.

June 3, 1915, locomotive 674, Lampassas, Tex. Water glass burst; injured by flying glass; inefficient shield; 1 injured.

Six accidents; 7 injured.

ILLINOIS CENTRAL RAILROAD:

August 3, 1914, locomotive 1505, Nonconah, Miss. Washout plug blew out; not tightened when applied; 1 injured.

August 4, 1914, locomotive 831, near Aldridge, Ill. Squirt hose burst; defective hose; 1 injured.

* August 15, 1914, locomotive 250, Dauphin Park, Chicago, Ill. Water glass burst; 1 injured.

September 11, 1914, locomotive 470, Eldorado, Ill. Lubricator glass burst; inefficient shield; 1 injured.

November 6, 1914, locomotive 185, Fort Dodge, Iowa. Squirt hose parted at splice; hose not clamped; 1 injured.

November 16, 1914, locomotive 640, Chicago, Ill. Crown sheet failure, due to low water; cab arrangement such that it is very difficult for enginemen to read water glass and try gauge cocks; 1 injured.

February 5, 1915, locomotive 749, Benton, Ill. Scalded by hot water while calking loose mud ring rivet under pressure; 1 injured.

* March 20, 1915, locomotive 54, La Branch, La. Flue broke; 1 injured.

April 4, 1915, locomotive 441, Bayou Paul, La. Crown sheet failure, due to low water; no contributory causes found; 2 injured.

June 1, 1915, locomotive 12, Norfield, Miss. Filling plug blew out of lubricator; defective threads; 1 injured.

Ten accidents; 11 injured.

THE INDIANAPOLIS UNION RAILWAY:

* March 8, 1915, locomotive 8, Indianapolis, Ind. Turned steam into lubricator when packing nut on sight feed glass blew off; body of lubricator cracked; 1 injured.

One accident; 1 injured.

KALAMAZOO, LAKE SHORE & CHICAGO RAILWAY:

December 9, 1914, locomotive 39, South Haven, Mich. Crown sheet failure, due to low water; no contributory causes found; 1 injured.

One accident; 1 injured.

KANSAS CITY SOUTHERN RAILWAY:

August 11, 1914, locomotive 588, near Ardath, Mo. Squirt hose burst; defective hose; 1 injured.

October 31, 1914, locomotive 72, Kansas City, Mo. Reducer on globe valve to siphon broken while connecting nut was being tightened under pressure; 1 injured.

Two accidents; 2 injured.

LEHIGH VALLEY RAILROAD:

January 9, 1915, locomotive 1657, Wyoanna, Pa. Crown-sheet failure, due to low water; no contributory causes found; 1 killed.

January 20, 1915, locomotive 1617, Mount Carmel, Pa. Shaker-bar stud blew out; defective threads; 1 injured.

January 22, 1915, locomotive 786, Lehigh, Pa. Coal guard stud blew out of back head; threads defective; parts not held for inspection; 1 injured.

Three accidents; 1 killed, 2 injured.

LOUISVILLE & NASHVILLE RAILROAD:

July 19, 1914, locomotive 1195, Montgomery, Ala. Squirt hose burst; defective hose; 1 injured.

August 29, 1914, locomotive 1242, Boyles, Ala. Blow-off cock leaking; pipe to blow-off cock improperly bent, forming a trap for accumulation of water; 1 injured.

November 2, 1914, locomotive 894, Paris Junction, Ky. Bonnet screwed out of air pump throttle; bonnet loose; 1 injured.

December 15, 1914, locomotive 1219, Montgomery, Ala. Blow-off cock handle pulled off while attempting to open blow-off cock; handle defective; 1 injured.

December 19, 1914, locomotive 10, Richmond, Ky. Pipe nipple to ash pan blower blew out at fountain; 1 injured.

February 20, 1915, locomotive 1290, Minooka, Ala. Scalded by hot water from blow-off cock, due to packing nut leaking; 1 injured.

April 20, 1915, locomotive 912, Lexington, Ky. Air pump throttle packing nut leaking; stem bent and defective; 1 injured.

June 7, 1915, locomotive 769, Nashville, Tenn. Fire extinguishing hose blew off connection; insecurely applied; 1 injured.

June 8, 1915, locomotive 2070, Cincinnati, Ohio. Injector steam pipe spanner nut broke; nut defective, due to use of improper tools in tightening it at various times; 1 injured.

June 30, 1915, locomotive 912, Heidelberg, Ky. Squirt hose burst; defective hose; 1 injured.

Ten accidents; 10 injured.

MANISTEE & NORTHEASTERN RAILROAD:

February 3, 1915, locomotive 3, Platt River, Mich. Water glass burst; scalded by escaping steam and water; 1 injured.

One accident; 1 injured.

MARSHALL & EAST TEXAS RAILWAY:

* March 15, 1915, locomotive 62, Gilmer, Tex. Grate bar stud pulled out while fireman was putting coal in; spring hanger pin broke, allowing equalizer to fly out of place, going through ash pan and striking grate bar pulling stud that holds bar through the side sheet; 1 injured.

One accident; 1 injured.

MICHIGAN CENTRAL RAILROAD:

* July 9, 1914, locomotive 7741, Millington, Mich. Squirt hose burst; 1 injured.

One accident; 1 injured.

MIDLAND VALLEY RAILROAD:

July 13, 1914, locomotive 12, Rex, Okla. Squirt hose burst; defective hose; 1 injured.

One accident; 1 injured.

MINNEAPOLIS & ST. LOUIS RAILROAD:

October 30, 1914, locomotive 234, Oskaloosa, Iowa. Lubricator glass burst; inefficient shield; 1 injured.

March 1, 1915, locomotive 396, Minneapolis, Minn. Water glass burst; cut by flying glass; 1 injured.

Two accidents; 2 injured.

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

February 22, 1915, locomotive 2717, Fond du Lac, Wis. Water glass burst; scalded by escaping steam and water; 1 injured.

One accident; 1 injured.

MISSOURI, KANSAS & TEXAS LINES:

* July 1, 1914, locomotive 255, Russell Creek, Okla. Squirt hose blew off connection; 1 injured.

July 16, 1914, locomotive 484, Whitesboro, Tex. Squirt hose blew off; 1 injured.

August 25, 1914, locomotive 593, near Granger, Tex. Squirt pipe connection blew out of branch pipe; 1 injured.

October 1, 1914, locomotive 730, Waco, Tex. Water glass broke; inefficient shield; 1 injured.

March 18, 1915, locomotive 625, near Solan, Tex. Injector steam pipe collar broke; collar too thin and pipe 10 feet long not braced; 1 injured.

* March 22, 1915, locomotive 426, Konawa, Okla. Water glass burst while being blown out; cut by flying glass; 1 injured.

* March 28, 1915, locomotive 768, Denison, Tex. Lubricator steam pipe blew off while union was being tightened under pressure; 1 injured.

April 21, 1915, locomotive 437, Parsons, Kans. Arch tube plug blew out while being tightened under pressure; 2 injured.

June 3, 1915, locomotive 405, Denton, Tex. Squirt hose blew off at splice; improperly clamped; 1 injured.

June 29, 1915, locomotive 641, near Georgetown, Tex. Squirt hose burst; defective hose; 1 injured.

June 29, 1915, locomotive 505, Hillsboro, Tex. Squirt hose valve packing nut blew off; defective threads; 1 injured.

Eleven accidents; 12 injured.

MISSOURI, OKLAHOMA & GULF RAILWAY:

* April 11, 1915, locomotive 221, Allen, Okla. Water ram blew out of injector; 1 injured.

One accident; 1 injured.

MISSOURI PACIFIC RAILWAY:

July 3, 1914, locomotive 433, Pine Bluff, Ark. Squirt hose blew off; not clamped; 1 injured.

July 14, 1914, locomotive 2333, near Rice, Kans. Squirt hose accident; defective hose; 1 injured.

July 18, 1914, locomotive 803, Randall, Kans. Injector broke; scalded from overflow pipe; pipe improperly located; 1 injured.

July 23, 1914, locomotive 448, near Grays Summit, Mo. Squirt hose valve opened by rubbing; defective valve and valve improperly located; 1 injured.

July 26, 1914, locomotive 2353, near Haney, Ark. Steam pipe to left injector blew out of brazing collar; 1 injured.

August 11, 1914, locomotive 34, Lexa, Ark. Injector delivery pipe blew off at union to check valve; union nut defective, due to use of improper tools in making repairs; 1 injured.

August 11, 1914, locomotive 463, Monroe, La. Lubricator glass burst; shield improperly applied; 1 injured.

August 15, 1914, locomotive 507, Memphis, Tenn. Injector broke, overflow pipe being bent in such a manner hot water struck brakeman; defective injector and overflow pipe bent in improper manner; 1 injured.

August 16, 1914, locomotive 9420, McGehee, Ark. Squirt hose blew off; defective hose; 1 injured.

September 24, 1914, locomotive 5521, Omaha, Nebr. Squirt hose burst; badly worn and defective hose; 1 injured.

October 4, 1914, locomotive 2313, Watson, Ark. Squirt hose blew off; improperly clamped; 1 injured.

October 11, 1914, locomotive M. O. & G. 105, Joplin, Mo. Injector broke, due to pieces of coal entering injector; 1 injured.

November 23, 1914, locomotive 811, Falls City, Nebr. Lubricator glass burst; burned by hot oil; 1 injured.

November 28, 1914, locomotive 160, Cherokee, Kans. Water glass burst; scalded in shutting off water glass cock; stem of cock bent; 1 injured.

* January 26, 1915, locomotive 47, Annapolis, Mo. Water glass burst; injured by escaping steam and water; 1 injured.

January 27, 1915, locomotive 873, Lexa, Ark. Water glass broke; injured by escaping steam and water; 1 injured.

March 16, 1915, locomotive 30, near Wichita, Kans. Flue broke; overheated in welding; 1 injured.

May 25, 1915, locomotive 2361, near Linn, Kans. Blow-off cock blew out of throat sheet; defective pipe; 1 injured.

June 24, 1915, locomotive 2371, Alexandria, La. Equalizer broke, allowing flange of wheel to strike washout plug; plug extending out too far; 1 injured.

June 29, 1915, locomotive 2610, Atchison, Kans. Cast iron dome cap center blew out; old defect in casting; 1 injured.

Twenty accidents; 20 injured.

MOBILE & OHIO RAILROAD:

July 31, 1914, locomotive 21, Jackson, Tenn. Squirt hose blew off; insecurely applied; 1 injured.

August 8, 1914, locomotive 22, Cairo, Ill. Squirt hose blew off; not clamped and pipe not pointing down; 1 injured.

June 14, 1915, locomotive 17, Tamms, Ill. Nozzle blew out of fire hose; nozzle insecurely fastened; 2 injured.

June 27, 1915, locomotive 18, Meridian, Miss. Stud on back head blew out, due to threads being rusted away; 1 injured.

Four accidents; 5 injured.

NASHVILLE, CHATTANOOGA & ST. LOUIS RAILWAY:

* November 18, 1914, locomotive 92, Murfreesboro, Tenn. Ash pan blower valve came open, filling engine cab with steam; in attempting to get off locomotive engineer slipped on ice-covered step, head striking step; nothing wrong with valve which controlled the ash pan blower; pipe from right-hand side of ash pan had worn in two places at false-deck brace; 1 injured.

One accident; 1 injured.

NEW ORLEANS & GREAT NORTHERN RAILROAD:

October 21, 1914, locomotive 51, North Slidell, La. Squirt hose blew off; hose insecurely clamped; 1 injured.

March 7, 1915, locomotive 101, near Seabrook, La. Preheater in smoke box exploded; not of sufficient strength to withstand pressure; 1 injured.

Two accidents; 2 injured.

NEW ORLEANS, MOBILE & CHICAGO RAILROAD:

November 14, 1914, locomotive 73, Benmore, Miss. Boiler check stuck open; overflow pipe not connected to injector; 1 injured.

April 24, 1915, locomotive 36, Laurel, Miss. Blow-off cock nipple blew out; defective threads on nipple; 1 injured.

Two accidents; 2 injured.

NEW YORK CENTRAL & HUDSON RIVER RAILROAD—LINES EAST:

July 4, 1914, locomotive 1506, Rensselaer, N. Y. Water glass burst; shield defective; 1 injured.

July 11, 1914, locomotive 2122, Gouverneur, N. Y. Squirt hose blew off; insecurely applied; 1 injured.

July 28, 1914, locomotive 3625, Ilion, N. Y. Squirt hose parted at splice; insecurely applied; 1 injured.

July 30, 1914, locomotive 477, Geneva, N. Y. Water glass cock broke off; old crack; 1 injured.

August 14, 1914, locomotive 375, Charlotte, N. Y. Injector steam pipe blew off; union nut broke while being tightened under pressure; defective nut and use of improper tools; 1 injured.

September 18, 1914, locomotive 1980, Canton, N. Y. Squirt hose burst; defective hose; 1 injured.

September 21, 1914, locomotive 567, Utica, N. Y. Squirt hose valve leaking; 1 injured.

October 24, 1914, locomotive 3615, near Fonda, N. Y. Squirt hose parted at splice; not clamped; 1 injured.

December 9, 1914, locomotive 3754, De Witt, N. Y. Lubricator oil reservoir burst; 1 injured.

February 28, 1915, locomotive 543, Utica, N. Y. Flue broke at weld; overheated in welding; 1 injured.

May 20, 1915, locomotive 3093, Colonie, N. Y. Flue broke at weld; overheated in welding; 2 injured.

June 3, 1915, locomotive 3089, West Albany, N. Y. Gauge cock bonnet broke off; old fracture; 1 injured.

Twelve accidents; 13 injured.

NEW YORK CENTRAL & HUDSON RIVER RAILROAD—LINES WEST:

July 21, 1914, locomotive 4904, Madison, Ohio. Petticoat pipe came down, causing back draft; insecurely fastened in place; 1 injured.

October 12, 1914, locomotive 5819, Ashtabula, Ohio. Water glass burst; inefficient shield; 1 injured.

January 19, 1915, locomotive 5760, Elkhart, Ind. Spanner nut to right injector delivery pipe broke; hammer and set used in tightening nut; 1 injured.

Three accidents; 3 injured.

NEW YORK, CHICAGO & ST. LOUIS RAILWAY:

January 17, 1915, locomotive 441, Irving, N. Y. Burned by back draft from fire box, due to lift pipe dropping down on blower and nozzle; pipe improperly applied; 1 injured.

One accident; 1 injured.

NEW YORK, NEW HAVEN & HARTFORD RAILROAD:

January 2, 1915, locomotive 804, South Boston, Mass. Blow-off cock (plug cock) blew out; cock defective; 1 injured.

One accident; 1 injured.

NEW YORK, ONTARIO & WESTERN RAILWAY:

October 6, 1914, locomotive 272, Walton, N. Y. Water glass burst; scalded by escaping steam and water; 1 injured.

One accident; 1 injured.

NORFOLK & WESTERN RAILWAY:

* July 29, 1914, locomotive 1066, Dunlow, W. Va. Flue burst; 1 injured.

September 2, 1914, locomotive 878, Portlock, Va. Union nut in feed pipe stripped threads while being tightened with injector working; nut too large and defective, due to use of improper tools; 1 injured.

September 4, 1914, locomotive 490, Rocky Mount, Va. Flue burst, due to defective butt weld; 1 injured.

November 11, 1914, locomotive 447, Pisgah, Va. Flue broke at weld; defective butt weld; 1 injured.

March 6, 1915, locomotive 1365, Hull, W. Va. Flue broke off at weld; defective butt weld; 1 injured.

May 31, 1915, locomotive 1157, Disputanta, Va. Squirt hose valve worked open, due to insufficient packing; 1 injured.

Six accidents; 6 injured.

NORTHERN PACIFIC RAILWAY:

July 10, 1914, locomotive 1719, Glendive, Mont. Scalded by steam from blow-off cock, due to key missing from valve arm, allowing cock to open; 1 injured.

July 20, 1914, locomotive 2319, La Belle, Minn. Blow-off cock accidentally opened while passing locomotive; handle not provided with proper device for fastening; 1 injured.

August 23, 1914, locomotive 691, near Smeltz, Oreg. Equalizer fulcrum broke, allowing equalizer to strike projecting washout plug, knocking it out of boiler; 1 injured.

August 25, 1914, locomotive 2319, Audubon, Minn. Bull's-eye lubricator feed glass and packing nut blew out; 1 injured.

August 30, 1914, locomotive 2144, St. Paul, Minn. Injector steam pipe blew off; union nut broke while being tightened under pressure; 1 injured.

October 8, 1914, locomotive 1162, Northtown, Minn. Squirt hose valve opened to permit injector to prime more readily, and injector put on; defective boiler check; 2 injured.

October 19, 1914, locomotive 407, Craneville, Mont. Equalizer fulcrum broke, allowing equalizer to strike washout plug extending from side sheet, forcing plug out of sheet; plug extended out too far; 1 injured.

January 21, 1915, locomotive 216, near East Forest River, N. Dak. Right injector steam pipe collar broke; defective collar; 1 injured.

February 18, 1915, locomotive 936, Brainerd, Minn. Dome cap blew off; old crack in casting; 1 injured.

March 23, 1915, locomotive 252, Tacoma, Wash. Union bonnet nut in dome cock broke, allowing bonnet to blow out; old crack in nut; 1 injured.

May 18, 1915, locomotive 1113, Laurel, Mont. Water glass burst; inefficient shield; 1 injured.

June 1, 1915, locomotive 1644, Fox, Mont. Injector delivery pipe parted at union, due to defective union and boiler check sticking; 1 injured.

June 18, 1915, locomotive 2217, Livingston, Mont. Safety valve on steam heat and dynamo line raised while shutting off steam valve; valve improperly located; 1 injured.

Thirteen accidents; 14 injured.

OHIO RIVER & WESTERN RAILWAY:

* July 10, 1914, locomotive 10, Bellaire, Ohio. Lubricator burst; 1 injured.

One accident; 1 injured.

OREGON SHORT LINE RAILROAD:

January 22, 1915, locomotive 906, Bancroft, Idaho. Broken radial stay blew out of crown sheet; threads in hole and on stay entirely corroded away; three other stays at time of investigation when drilled out of wrapper sheet dropped through crown sheet account of threads corroded away; 3 injured.

February 28, 1915, locomotive 968, near Medbury, Idaho. Crown sheet failure, due to defective and broken crown bar braces; 2 killed.

Two accidents; 2 killed, 3 injured.

PENNSYLVANIA LINES WEST:

* July 11, 1914, locomotive 8976, Cincinnati, Ohio. Squirt hose blew off nipple; 1 injured.

July 27, 1914, locomotive 7565, Wellsville, Ohio. Squirt hose parted at splice; not clamped; 1 injured.

August 10, 1914, locomotive 9982, Alliance, Ohio. Squirt hose burst; defective hose; 1 injured.

September 3, 1914, locomotive 7309, Roby, Ind. Nozzle blew out of fire hose; coupling nipple smooth; not securely applied; 1 injured.

September 11, 1914, locomotive 9055, Whiting, Ind. Squirt hose parted at splice; insecurely clamped; 1 injured.

* October 14, 1914, locomotive 7021, New Galilee, Pa. Squirt hose burst; 1 injured.

October 16, 1914, locomotive 7469, near Lakeville, Ohio. Flue broke; overheated in welding; 2 injured.

November 16, 1914, locomotive 8298, Columbus, Ohio. Washout cap blew off while being tightened under pressure; threads crossed and defective; 1 injured.

November 19, 1914, locomotive 8587, Chicago, Ill. Flue burst; weakened by corrosion; 1 injured.

* November 21, 1914, locomotive 9372, Tyner, Ohio. Flue broke; defective welding; 1 injured.

December 17, 1914, locomotive 7673, Alliance, Ohio. Locomotive moved, due to throttle leaking; air brake defective and cylinder cocks inoperative; 1 seriously injured.

* December 22, 1914, locomotive 8340, Philadelphia, Ind. Steam pipe to air pump broke inside of cab; pipe thin and weak; 1 injured.

March 7, 1915, locomotive 9016, Mahoningtown, Pa. Blow-off cock defective; 1 injured.

March 21, 1915, locomotive 9909, near East Columbus, Ohio. Left injector steam pipe collar broke; defective collar; overheated and wasted away in brazing; 1 injured.

April 5, 1915, locomotive 9968, Leetonia, Ohio. Blower pipe blew out of collar at valve; collar too light and improperly brazed; 1 injured.

April 10, 1915, locomotive 7072, Pittsburgh, Pa. Injector steam pipe blew out of collar; collar weak and improperly brazed; 1 injured.

April 19, 1915, locomotive 8356, Jeffersonville, Ind. Fire hose blew off nozzle connection; improperly clamped; 1 injured.

May 14, 1915, locomotive CLN 11, Norwood, Ohio. Gauge-cock spindle blew out; defective thread; 1 injured.

Eighteen accidents; 19 injured.

PENNSYLVANIA RAILROAD:

August 26, 1914, locomotive 3526, near Harrisburg, Pa. Squirt hose burst; defective hose; 1 injured.

September 11, 1914, locomotive 829, Lock Haven, Pa. Expansion pad stud blew out; threads worn on stud and in sheet; 1 injured.

* September 19, 1914, locomotive 3441, near Altoona, Pa. Flue broke in weld; imperfect weld; 1 injured.

September 27, 1914, locomotive 3472, near Altoona, Pa. Burned by flame from fire door, due to defective blower; 1 injured.

November 23, 1914, locomotive 5110, Philadelphia, Pa. Drain cock broke off lubricator while being tightened under pressure; 1 injured.

December 10, 1914, locomotive 2798, Buffalo, N. Y. Spanner nut on injector steam pipe broke while being tightened under pressure; nut defective; had been badly damaged by use of hammer and set at previous times; 1 injured.

December 24, 1914, locomotive 5272, Woodside, Del. Union nut on blower pipe burst; defective union nut; 1 injured.

January 28, 1915, locomotive 4149, Sunbury, Pa. Injector ram packing nut blew off; defective threads; 1 injured.

February 13, 1915, locomotive 8, Pittsburgh, Pa. Lubricator throttle blew out of fountain while being tightened under pressure; improper workmanship and defective threads; 1 injured.

April 21, 1915, locomotive 1039, Trenton, N. J. Injector steam pipe collar broke; collar defective; weak and improperly brazed to pipe; 1 injured.

April 22, 1915, locomotive 4134, Orangeville, Md. Union on blow-off pipe pulled apart; threads worn off in union; 1 injured.

May 12, 1915, locomotive 2611, Whitmarsh Junction, Pa. Scalded by water from injector overflow pipe; overflow pipe defective; 1 injured.

June 17, 1915, locomotive 1967, Emporium Junction, Pa. Squirt hose valve worked open, due to loose packing nut; 1 injured.

Thirteen accidents; 13 injured.

GEORGIA & EASTERN RAILWAY:

December 3, 1914, locomotive 6588, Ogden, Ill. Injector steam pipe spanner nut broke while being tightened under pressure with hammer and chisel; 1 injured.

One accident; 1 injured.

MICHIGAN MARQUETTE RAILROAD:

February 20, 1915, locomotive 348, Cheboygan, Mich. Flue broke at weld; overheated in welding; 1 injured.

March 23, 1915, locomotive 413, Bay City, Mich. Patch bolt blew out while being calked under pressure; bolt improperly applied and defective; 1 injured.

Two accidents; 2 injured.

PHILADELPHIA & READING RAILWAY:

* August 7, 1914, locomotive 1070, Etna, Pa. Squirt hose blew off nipple; defective hose; 1 injured.

November 12, 1914, locomotive 270, Gordon, Pa. Injector steam pipe collar broke; defective collar; 1 injured.

Two accidents; 2 injured.

ST. LOUIS & SAN FRANCISCO RAILROAD:

November 23, 1914, locomotive 648, near Kiamichi, Okla. Squirt hose parted at splice; 1 injured.

January 20, 1915, locomotive 716, Ash Grove, Mo. Flue broke in weld; defective weld; 1 injured.

April 19, 1915, locomotive 832, Afton, Okla. Lubricator glass burst; 1 injured.

Three accidents; 3 injured.

SAN ANTONIO, UVALDE & GULF RAILWAY:

April 30, 1915, locomotive 5, near Campbellton, Tex. Connection between handle and blow-off valve failed; 1 injured.

One accident; 1 injured.

SEABOARD AIR LINE RAILWAY:

July 8, 1914, locomotive 48, near Summerfield, Fla. Arch tube burst; overheated; cause not determined; 1 injured.

September 22, 1914, locomotive 33, Ways, Ga. Steam pipe to left injector pulled loose at turret connection; defective brazing and injector not properly braced; 1 injured.

* December 5, 1914, locomotive 755, Jacksonville, Fla. Squirt hose blew off nipple; defective hose; 1 injured.

April 21, 1915, locomotive 756, near Oak, Fla. Injector steam pipe broke at collar brazing; 2 injured.

April 23, 1915, locomotive 848, Belt Junction, Ga. Water glass cock blew out; 1 injured.

Five accidents; 6 injured.

SOUTHERN RAILWAY:

July 11, 1914, locomotive 144, Lake Juanaluska, N. C. Squirt hose blew off; 1 injured.

July 14, 1914, locomotive 748, Denverside, Ill. Ash pan blower pipe blew out of union at blow-off cock; threads corroded away; 1 injured.

September 1, 1914, locomotive 777, Asheville, N. C. Nipple blew out of ash pan blower valve; threads on nipple corroded away; 1 injured.

September 2, 1914, locomotive 849, Bridgewater, N. C. Ash pan blower pipe disconnected or blown out; 1 injured.

September 10, 1914, locomotive 918, Corydon Junction, Ind. Deck casting stud blew out; deck casting loose and working; 1 injured.

September 21, 1914, locomotive 4561, Avondale, Ala. Squirt hose, blew off nipple; insecurely clamped; 1 injured.

October 6, 1914, locomotive 632, Covin, Ala. Ash pan blower pipe blew off; defective threads and pipe not properly braced; 1 injured.

October 8, 1914, locomotive 682, Montview, Va. Squirt hose blew off; hose not clamped; 1 injured.

October 28, 1914, locomotive 9, Donnah, N. C. Scalded while coupling up tank hose; injector ram leaking badly; 1 injured.

January 3, 1915, locomotive 1205, Westminster, S. C. Flue broke; improperly welded; 2 injured.

January 12, 1915, locomotive 601, Birmingham, Ala. Ash pan blower pipe blew off; defective unions and pipe not braced; 1 injured.

February 3, 1915, locomotive 400, near Jennings, Va. Injector delivery pipe spanner nut blew off, due to defective boiler check; check stuck open and loose and spanner nut defective; 3 injured.

February 18, 1915, locomotive 3848, Jeffries, Va. Arch pipe burst; overheated. due to being stopped up; 1 injured.

February 28, 1915, locomotive 905, near Sutherlin, Va. Lubricator steam pipe nipple broke off at fountain; nipple of too light construction; 2 injured.

March 24, 1915, locomotive 1287, Alexandria, Va. Blower pipe disconnected in smoke box, causing back draft; threads worn off and defective in union; 1 injured.

May 1, 1915, locomotive 1108, Goldsboro, N. C. Squirt hose blew off; defective hose and boiler check failing to seat; 1 injured.

May 4, 1915, locomotive 3796, Lula Branch, Ga. Flue burst; defective flue; thin and corroded; 1 injured.

May 23, 1915, locomotive 770, near Raybon, Ga. Squirt hose burst; defective hose; 1 injured.

June 9, 1915, locomotive 296, Anniston, Ala. Squirt hose blew off; insecurely applied; 1 injured.

June 23, 1915, locomotive 368, Franklin, Va. Squirt hose blew off; insecurely applied; 1 injured.

Twenty accidents; 24 injured.

SOUTHERN PACIFIC, ATLANTIC SYSTEM:

October 10, 1914, locomotive M. L. & T. 81, San Antonio, Tex. Washout plug blew out while being tightened under pressure; defective threads and shoulder of hard graphite; 1 injured.

* November 1, 1914, locomotive G. H. & S. A. 709, Houston, Tex. Filling lubricator oil blew out; lubricator valve in bad condition; 1 injured.

April 29, 1915, locomotive L. W. 107, Houston, Tex. Flue broke; 1 injured.

May 19, 1915, locomotive H. & T. C. 321, Mexia Junction, Tex. Scalded by hot water escaping around stem of emergency valve on blow-off cock; defective valve; 1 injured.

May 27, 1915, locomotive 78, San Antonio, Tex. Threads stripped on injector steam pipe union while nut was being tightened under pressure, due to nut being too loose and defective threads on injector; 1 injured.

Five accidents; 5 injured.

SOUTHERN PACIFIC, PACIFIC SYSTEM:

June 17, 1915, locomotive 2602, Colton, Cal. Injector steam pipe spanner nut slipped off while being tightened under pressure; nut too large; 1 injured.

One accident; 1 injured.

SUSQUEHANNA & NEW YORK RAILROAD:

* August 13, 1914, locomotive 112, Masten, N. Y. Squirt hose blew off; insecurely clamped; 1 injured.

One accident; 1 injured.

TAMPA & GULF COAST RAILWAY:

April 4, 1915, locomotive 9, Tarpon Springs, Fla. Blow-off cock blew out while engineer was attempting to seat valve; defective threads; 1 killed.

One accident; 1 killed.

TENNESSEE CENTRAL RAILROAD:

* September 18, 1914, locomotive 19, Green Pond, Tenn. Flue burst; 1 injured.

* March 1, 1915, locomotive 15, Monterey, Tenn. Lubricator glass broke while being changed; oil and glass struck engineer in eye; 1 injured.

Two accidents; 2 injured.

TEXAS & PACIFIC RAILWAY:

July 21, 1914, locomotive 286, New Boston, Tex. Squirt hose blew off; not clamped; 1 injured.

July 27, 1914, locomotive 106, Rosedale, La. Squirt hose blew off; insecurely applied; 1 injured.

September 29, 1914, locomotive 288, Iatan, Tex. Drain cock in air pump blew out while being tightened under pressure; 1 injured.

November 11, 1914, locomotive 400, Santo, Tex. Water glass burst; injured by escaping steam and water; 1 injured.

November 16, 1914, locomotive 8, Alexandria, La. Squirt hose blew off; hose improperly applied; nipple extending only five-eighths inch into hose; 2 injured.

December 16, 1914, locomotive 403, near Millsap, Tex. Crown sheet failure, due to low water; had leak at top water glass connection; 1 injured.

December 29, 1914, locomotive 194, Alexandria, La. Ash pan blower put on, blowing fire door open; 1 injured.

March 12, 1915, locomotive 139, New Orleans, La. Lubricator filling glass burst; injured by hot oil; 2 injured.

Eight accidents; 10 injured.

TEXAS CITY TERMINAL Co.:

* February 13, 1915, locomotive 18, Texas City, Tex. Water glass broke; inefficient shield; 1 injured.
One accident; 1 injured.

TOLEDO & OHIO CENTRAL RAILWAY:

March 10, 1915, locomotive 9728, Glenford, Ohio. Arch tube pulled out of flue sheet; improperly applied; 2 injured.
One accident; 2 injured.

TOLEDO, PEORIA & WESTERN RAILWAY:

August 7, 1914, locomotive 57, Peoria, Ill. Squirt hose blew off; insecurely applied and end of pipe not pointing down; 1 injured.
January 20, 1915, locomotive 16, Effner, Ind. Water glass burst; 1 injured.
Two accidents; 2 injured.

TOLEDO, ST. LOUIS & WESTERN RAILWAY:

August 20, 1914, locomotive 1168, Toledo, Ohio. Squirt hose valve opened by striking with foot; valve at improper location; 1 injured.
* October 24, 1914, locomotive 133, Bailey, Ohio. Squirt hose burst; 1 injured.
June 23, 1915, locomotive 167, Madison, Ill. Injector broke while sawdust was being injected to stop leaks; 1 injured.
Three accidents; 3 injured.

TONOPAH & TIDEWATER RAILROAD:

* August 22, 1914, locomotive 9, Tecopa, Cal. Squirt hose bushing burst; 1 injured.
One accident; 1 injured.

UNION PACIFIC RAILROAD:

March 27, 1915, locomotive 703, Ozone, Wyo. Flue broke at weld; overheated in welding; 1 injured.
One accident; 1 injured.

VICKSBURG, SHREVEPORT & PACIFIC RAILWAY:

October 6, 1914, locomotive 335, Shreveport, La. Center arch tube pulled out of flue sheet; arch tube improperly applied; not flared or beaded over in water space; 1 injured.
One accident; 1 injured.

VIRGINIAN RAILWAY:

October 30, 1914, locomotive 515, Herndon, W. Va. Crown sheet failure, due to low water; no contributory cause found; 1 injured.
One accident; 1 injured.

WABASH RAILROAD:

August 7, 1914, locomotive 2301, Moberley, Mo. Flue driven out of sheet while repairing flues under pressure; defective flue and improperly applied thimble; 1 injured.

September 26, 1914, locomotive 2321, Griggsville, Ill. Water glass burst; shield removed at time of accident; 1 injured.

December 3, 1914, locomotive 2155, Blanchard, Iowa. Broken radial stay blew out of crown sheet; threads entirely gone and bolt very loose in sheet; 1 injured.

December 21, 1914, locomotive 2442, Staunton, Ill. Water glass burst; scalded by escaping steam and water; 1 injured.

January 31, 1915, locomotive 2024, Montpelier, Ohio. Blow-off pipe blew off; defective threads in union; 1 injured.

* February 7, 1915, locomotive 815, Kinderhook, Ill. Lubricator glass broke; inefficient shield; 1 injured.

March 19, 1915, locomotive 814, French Landing, Mich. Blow-off cock nipple broken off at boiler; crossover pipe loose and out of position; 1 injured.

April 27, 1915, locomotive 2303, Kansas City, Mo. Throttle packing nut blew off; worn threads on stuffing box and nut; 2 injured.

Eight accidents; 9 injured.

WHEELING & LAKE ERIE RAILROAD:

September 15, 1914, locomotive 606, Conotton, Ohio. Squirt hose valve jarred open, account loose packing; 1 injured.
One accident; 1 injured.

WICHITA FALLS & NORTHWESTERN RAILWAY:

September 11, 1914, locomotive 512, Wichita Falls, Tex. Squirt hose blew off; not clamped; 1 injured.
One accident; 1 injured.

YAZOO & MISSISSIPPI VALLEY RAILROAD:

September 21, 1914, locomotive 74, Carr Spur, Miss. Plug blew out of siphon pipe at top of tank as engineer blew injector back; pipe improperly plugged; 1 injured.
One accident; 1 injured.