

INTERSTATE COMMERCE COMMISSION

TWELFTH ANNUAL REPORT

OF THE

CHIEF INSPECTOR
BUREAU OF LOCOMOTIVE INSPECTION

TO THE

INTERSTATE COMMERCE COMMISSION

FOR THE FISCAL YEAR
ENDED JUNE 30, 1923



WASHINGTON
GOVERNMENT PRINTING OFFICE
1923

ANNUAL REPORT OF THE CHIEF INSPECTOR BUREAU OF LOCOMOTIVE INSPECTION.

SEPTEMBER 25, 1923.

To the Interstate Commerce Commission:

In compliance with section 7 of the act of February 17, 1911, amended March 4, 1915, the Twelfth Annual Report of the Chief Inspector covering the work of the Bureau of Locomotive Inspection during the fiscal year ended June 30, 1923, is respectfully submitted.

A synopsis is given, by railroads, of all accidents showing the number of persons killed and injured due to the failure of parts and appurtenances of the locomotive and tender, including the boiler, as reported and investigated under section 8 of the locomotive inspection law, and those reported to the Bureau of Statistics under the accident report act of May, 1910, and not reported to this bureau as should have been.

The data contained herein cover all defects on all parts and appurtenances of the locomotive and tender, including the boiler, found and reported by our inspectors, arranged by railroads.

The tables show the number of accidents, the number of persons killed and number injured as a result of the failure of parts and appurtenances of the locomotive and tender, including the boiler.

Tables have been arranged so as to permit comparison with previous years as far as consistent and also show the number of locomotives inspected, the number and percentage of those inspected and found defective, the number for which written notices for repairs were issued withholding them from service because of being in violation of the law, and the total defects found and reported.

Number of accidents, number killed, and number injured caused by the failure of some part or appurtenance of the locomotive and tender, including the boiler, by comparison.

	Year ended June 30—				
	1923	1922	1921	1920	1919
Number of accidents.....	1,348	622	735	843	565
Per cent increase or decrease from previous year.....	¹ 117	15.4	12.8	149.2	11.8
Number killed.....	72	33	64	66	57
Per cent increase or decrease from previous year.....	¹ 118	48.4	3	115.8	123.9
Number injured.....	1,560	709	800	916	647
Per cent increase or decrease from previous year.....	¹ 120	11.3	12.6	141.6	14.4

¹ Increase.

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Number of accidents, number killed, and number injured as a result of the failure of parts and appurtenances of the locomotive boiler to which the original act only applied.

	Year ended June 30—				
	1923	1922	1919	1915	1912
Number of accidents.....	509	273	341	424	856
Number killed.....	47	25	45	13	91
Number injured.....	594	318	413	467	1,005

Number of persons killed and injured, classified according to occupations, during the fiscal years 1919-1923, inclusive.

	1923		1922		1921		1920		1919	
	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.
Members of train crews:										
Engineers.....	19	484	11	213	15	237	16	272	14	194
Firemen.....	16	597	10	277	25	360	20	404	22	265
Brakemen.....	12	137	7	66	13	64	9	77	11	82
Conductors.....	1	35	2	20	2	19	2	16		
Switchmen.....	2	32	1	13	3	15	4	19	1	7
Roundhouse and shop employees:										
Boiler makers.....	3	19	1	10	1	7	2	9	1	9
Machinists.....	2	14		9	1	3	1	20		5
Foremen.....	1	6		1	1	3		3		3
Inspectors.....		2		2		5		1		6
Watchmen.....	1	6		3		4		3		2
Boiler washers.....	1	9		7		7		13		7
Hostlers.....		31		10		8		13		6
Other roundhouse and shop employees.....	4	29	1	15	1	25	3	30	1	11
Other employees.....	4	36	2	23	2	16	4	26	3	23
Nonemployees.....	6	123		41		21	1	7	2	11
Total.....	72	1,560	33	709	64	800	66	916	57	647

Derailments due to defects in or failure of some part of the locomotive or tender, with the number of persons killed and injured as the result of such derailments.

	Year ended June 30—				
	1923	1922	1921	1920	1919
Number of derailments ¹	38	22	8	7	7
Number killed.....	4	5		7	6
Number injured.....	157	61	30	18	7

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

Accidents and casualties resulting from failures of locomotives and tenders and their appurtenances.

Part or appurtenance which caused accident.	Year ended June 30—														
	1923			1922			1921			1920			1919		
	Accidents.	Killed.	Injured.	Accidents.	Killed.	Injured.	Accidents.	Killed.	Injured.	Accidents.	Killed.	Injured.	Accidents.	Killed.	Injured.
Air reservoirs.....	6		7	3		3	1		1	2	1	2	2		2
Aprons.....	8		8	11		11	16		16	8		8	5		5
Arch tubes.....	12	2	17	4		5	5		5	9	1	15	7	2	9
Ash-pan blowers.....	19		17	7		7	5		5	6	1	5	11	1	10
Axles.....	6		7	5		17	5		6	5		5	2		2
Blow-off cocks.....	28		16	16		14	14		14	15		15	4		4
Boiler checks.....	12		12	4		4	7		1	7	5	6	4		4
Boiler explosions:															
A. Shell explosions.....				1		1									
B. Crown sheet; low water; no contributory causes found.....	19	24	27	13	15	23	20	19	26	24	22	35	31	26	46
C. Crown sheet; low water; contributory causes or defects found.....	34	15	56	14	6	27	33	24	52	35	19	46	34	13	63
D. Firebox; defective stay bolts, crown stays, or sheets.....	4	2	5	5	1	5	1	2		2		2	2		3
Brakes and brake rigging.....	27	1	56	10	2	24	6		6	3		3	8	3	10
Couplers.....	25	1	27	21		23	11		13	8		8	12		14
Crank pins, collars, etc.....	12		13	10		10	6		3	8		4	5		6
Cross heads and guides.....	10		10	4		4	4		1	4	5	2	3	5	5
Cylinder cocks and rigging.....	11		11	3		3	4		4			2	2		2
Cylinder heads and steam chests.....	8		8	3		3	6		6	9		9	5		7
Draft appliances.....	13		14	6		9	8		9	1		1	2		4
Draw gear.....	16	2	16	7		7	8		1	8	11	2	9	7	6
Fire doors, levers, etc.....	26		26	2		2	8		8	11		11	7		7
Flues.....	44		59	28		32	32		1	35	45	52	33	1	39
Flue pockets.....	2		5	1		1	1		1	1		2	2		2
Foot boards.....	36	1	35	11	1	10	8	3	5	23		23	7		7
Gauge cocks.....				2		2			2			2			
Grease cups.....	6	1	6	3		3	7		7	10		10	3		3
Grate shakers.....	138		138	49		49	85		85	108		109	37	1	36
Handholds.....	34	2	32	12	1	11	19		20	15	1	14	16	1	15
Headlights and brackets.....	8		8	2		2	8		2	6	9	1	9	4	5
Injectors and connections (not including injector steam pipes).....	33		33	21		24	15	2	13	23		27	21		22
Injector steam pipes.....	40		46	9		9	15		17	23	1	29	14		20
Lubricators and connections.....	22		22	9		9	12		12	14		15	11		13
Lubricator glasses.....	10		10	3		3	3		3	17		17	9		9
Patch bolts.....	3		3												
Pistons and piston rods.....	14	1	13	6		6	3		3	3	1	3	2		2
Plugs, arch tube and washout.....	18	3	27	12	1	19	15		18	28		40	30	1	34
Plugs in firebox sheets.....				2		2	1		2	1		2	2	1	1
Reversing gear.....	100		100	53		53	65		65	59		59	31		31
Rivets.....	5		8						4	5		2	2		2
Rods, main and side.....	53	3	57	23		27	18		21	16	2	20	14		15
Safety valves.....													1		1
Sanders.....	4		4	2		2				1		1			
Side bearings.....				1		1							1		1
Springs and spring rigging.....	25	2	25	10	1	9	3		3	9	2	18	5	2	4
Squirt hose.....	67		69	54		54	82		82	82		82	54		54
Stay bolts.....	7		8	6		8				2		2	2		2
Steam piping and blowers.....	19		19	9		11	9		9	18		19	8		11
Steam valves.....	16	1	16	6		6	11		12	17		17	9		10
Studs.....	6		8	7		8	7		7	9		11	7		9
Superheater tubes.....	10		15				1		2	4		6	1		1
Throttle glands.....	1		1	1		1				3		4			
Throttle leaking.....	6		6	3	1	2	3		3	1	1	1	1		1
Throttle rigging.....	19	2	19	5		5	1		1	6		6	4		7
Trucks, leading, trailing or tender.....	25	5	101	11	2	25	6		8	1	3	1	2	1	1
Valve gear, eccentrics and rods.....	59	2	59	18		18	10		10	6		6	9		9
Water glasses.....	35		35	19		19	25		25	32		32	26		26
Water-glass fittings.....	7		7	6		6	2		2	4		4	4		4
Wheels.....	10	1	19	8	1	7	4		1	4		1	4		5
Miscellaneous.....	170	1	179	61		61	91		2	117	87	2	86	35	2
Total.....	1,348	72	1,560	622	33	709	735	64	800	843	66	916	565	57	647

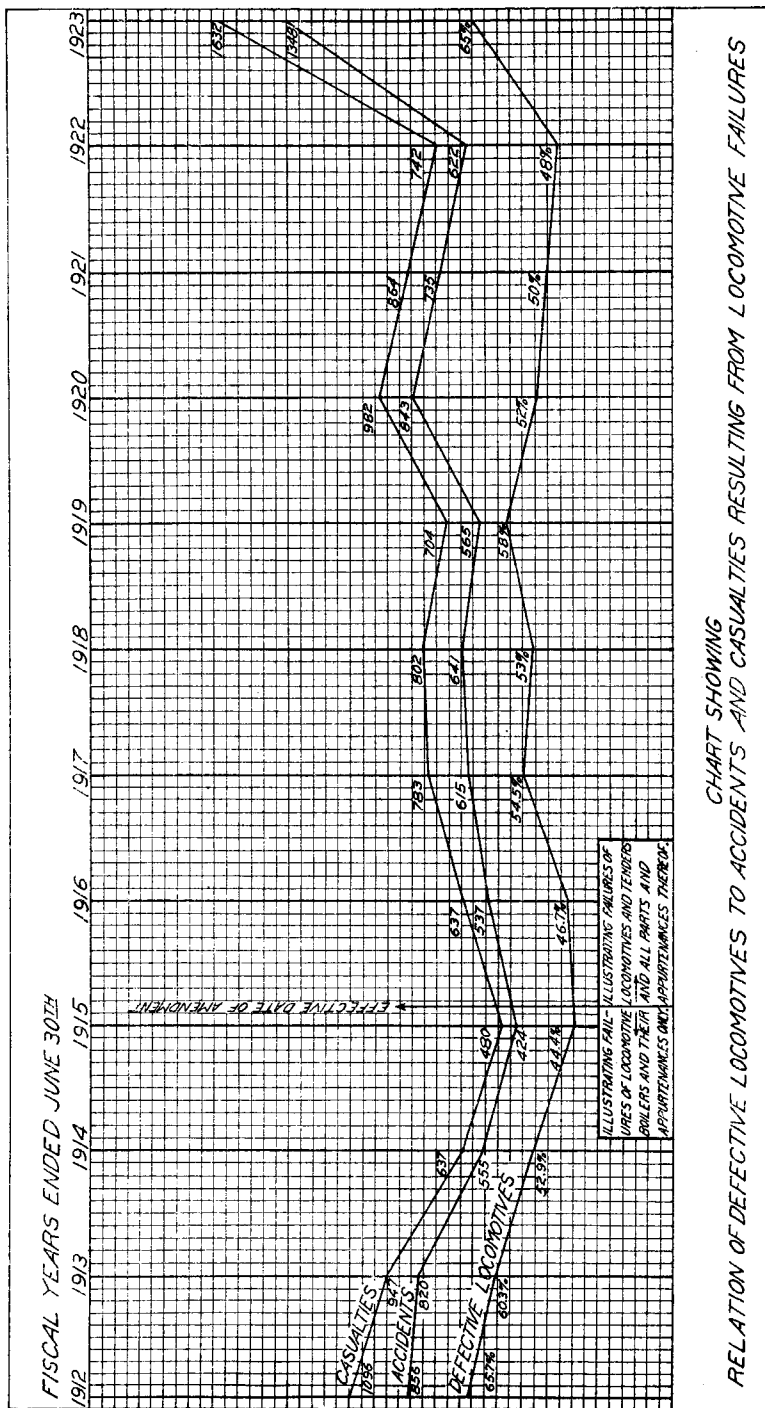


Table showing number of locomotives inspected, found defective, and ordered from service.

Parts defective, inoperative, or missing, or in violation of rules.	Fiscal years ended June 30--				
	1923	1922	1921	1920	1919
Air compressors.....	1,390	971	692	763	666
Arch tubes.....	468	151	160	150	148
Ash pans or mechanism.....	306	161	147	152	102
Axles.....	21	15	12	10	47
Blow-off cocks.....	1,578	975	969	771	1,310
Boiler checks.....	1,913	949	1,006	877	1,418
Boiler shell.....	2,370	1,598	1,550	1,598	2,335
Brake equipment.....	8,213	4,577	4,836	4,373	6,272
Cabs or cab windows.....	1,423	1,276	1,171	1,361	2,288
Cab aprons or decks.....	1,476	1,098	893	550	665
Cab cards.....	1,449	587	671	816	1,073
Coupling or uncoupling devices.....	634	423	547	707	1,194
Crossheads, guides, pistons, or piston rods.....	5,527	1,920	2,116	2,107	3,004
Crown bolts.....	630	331	392	348	516
Cylinders, saddles, or steam chests.....	4,875	3,234	3,304	4,212	5,115
Cylinder cocks or rigging.....	1,745	1,201	1,197	1,735	1,651
Dome or dome caps.....	628	331	396	372	593
Draft gear.....	2,613	1,526	1,418	722	1,169
Draw gear.....	4,513	3,042	3,134	2,857	4,857
Driving boxes, shoes, wedges, pedestals, or braces.....	4,269	2,776	3,361	2,128	2,717
Fire-box sheets.....	2,327	1,191	1,185	1,185	1,555
Flues.....	1,268	521	552	554	780
Frames, tail pieces, or braces, locomotive.....	2,683	2,078	1,999	2,921	3,560
Frames, tender.....	540	352	232	204	449
Gauge or gauge fittings, air.....	1,062	399	537	248	256
Gauge or gauge fittings, steam.....	3,075	1,595	1,769	1,283	1,673
Gauge cocks.....	5,895	3,275	3,657	3,413	5,933
Grate shakers.....	569	425	565	93	39
Handholds.....	1,990	1,533	894	593	993
Injectors inoperative.....	251	94	179	88	118
Injectors and connections.....	12,406	7,741	7,606	6,638	11,266
Inspections or tests not made as required.....	7,419	4,114	4,865	3,924	4,296
Lateral motion.....	1,625	976	1,066	1,052	1,612
Lights, cab or classification.....	90	80	86	115	254
Lights, headlights.....	1,164	705	539	639	626
Lubricator or shields.....	566	456	427	515	514
Mud rings.....	2,711	1,598	1,441	1,515	1,869
Packing nuts.....	4,755	3,151	3,294	3,779	5,753
Packing, piston rod and valve stem.....	3,359	1,756	2,176	2,818	3,245
Pilot or pilot beams.....	1,294	679	588	374	701
Plugs or studs.....	1,857	443	457	333	428
Reversing gear.....	1,272	789	745	470	571
Rods, main or side, crank pins or collars.....	10,080	3,915	4,464	4,392	5,839
Safety valves.....	192	162	144	197	197
Sanders.....	1,857	1,165	1,071	891	1,027
Springs or spring rigging.....	7,911	5,497	5,494	4,244	5,955
Squirt hose.....	1,098	935	916	512	702
Stay bolts.....	1,313	722	716	541	638
Stay bolts broken.....	10,089	4,261	4,871	5,551	9,623
Steam pipes.....	2,467	1,461	1,678	1,320	1,970
Steam valves.....	1,188	791	792	676	1,240
Steps.....	3,289	2,038	1,917	1,260	1,331
Tanks or tank valves.....	3,788	2,817	2,385	2,064	2,740
Telltale holes.....	715	630	567	437	818
Throttle or throttle rigging.....	2,633	1,880	1,730	1,087	1,677
Trucks, engine or trailing.....	3,899	2,467	2,493	1,927	2,632
Trucks, tender.....	3,714	2,551	2,408	2,240	3,409
Valve motion.....	1,761	710	691	463	589
Washout plugs.....	3,641	2,449	2,306	2,221	3,391
Water bars or combustion flues.....	3,224	57	24	82	51
Water-glass, fittings, or shields.....	5,641	3,640	4,045	2,954	4,260
Wheels.....	4,371	2,410	2,802	2,440	3,437
Miscellaneous—Signal appliances, badge plates, brakes (hand).....	972	403	504	184	143
Total number of defects.....	173,840	101,734	104,848	95,066	135,300
Locomotives reported.....	70,242	70,070	70,475	69,910	69,499
Locomotives inspected.....	63,657	64,354	60,812	49,471	59,772
Locomotives defective.....	41,150	30,978	30,207	25,529	34,557
Percentage inspected found defective.....	65	48	50	52	58
Locomotives ordered out of service.....	7,075	3,089	3,914	3,774	4,433

INVESTIGATION OF ACCIDENTS.

All accidents reported to this bureau, as required by section 8 of the law and rules 55 and 162, were carefully investigated and report rendered and action taken to prevent recurrences as far as possible. Copies of accident investigation reports were furnished to interested parties when requested, and otherwise used in our endeavor to bring about a diminution in the number of accidents.

The percentage of locomotives found defective increased from 48 per cent during the preceding year to 65 per cent, and the total number of defects found and reported increased approximately 70 per cent over the preceding year. The deteriorated condition of motive power is sharply reflected in the increased number of accidents and casualties. A comparison of accidents and casualties during the year as compared with the preceding year, covering the entire locomotive and tender and all of their parts and appurtenances, shows an increase of 117 per cent in the number of accidents, 118 per cent in the number killed, and 120 per cent in the number injured.

The chart shown on page 4 shows in graphic form the relation between the percentage of locomotives inspected, found defective, and the number of accidents and casualties resulting from failure thereof, and illustrates the result, from the viewpoint of safety, of operating locomotives in a defective condition.

Records examined covering locomotive failures on a large number of railroads indicate that the number of locomotive miles per locomotive failure decreased as much as from 50 to 70 per cent during the year as compared with the preceding year. Every locomotive failure caused by physical defects carries with it potential injury to persons, serious delay to traffic, and heavy property damage.

Of the 1,348 accidents and 1,632 casualties during the fiscal year, 839 accidents and 991 casualties were caused by parts and appurtenances not covered by the law prior to the effective date of the amendment.

BOILER EXPLOSIONS.

During the year there were 57 boiler explosions which resulted in the death of 41 persons and the serious injury of 88 others, an increase of 75 per cent in the number of such explosions, 86 per cent in the number of persons killed, and 93 per cent in the number injured, as compared with the preceding year. While most of these explosions were caused by the crown sheet having become overheated due to low water in the boiler, the number of such cases where contributory defects or causes were found increased approximately 135 per cent as compared with the preceding year. The contributory causes found clearly establish the necessity for proper inspection and repair of all

parts and appliances of the locomotive and tender if accident, injury, and delay to traffic are to be avoided.

In my ninth, tenth, and eleventh annual reports reference is made to investigations and tests made by this bureau on a number of railroads to determine the action of water in the boiler and its effect upon the water-indicating appliances, which investigations establish beyond question that gauge cocks when applied directly into the boiler do not correctly indicate the general water level while steam is being rapidly generated and escaping from the boiler. It having been made manifest that dependency on gauge cocks attached directly to the boiler for registering the general water level creates an unsafe condition and adds to the peril of operation, it was recommended that a suitable water column, the best appliance yet devised, should be applied, to which should be attached three gauge cocks and one water glass, with an additional water glass applied on the left side or boiler back head so that those operating the locomotive might have accurate knowledge of the general water level in the boiler under all conditions of service, which is necessary if safe and economical locomotive operation is to obtain.

Water columns as recommended have been applied to practically all new locomotives constructed during the past three years and on a large number of locomotives previously in service on most all of the larger railway systems. The findings of our investigation and recommendations in this matter have been almost universally accepted and are being carried out in varying degrees, and it is hoped that they will be carried out by all carriers with due promptness without the necessity of an order by this commission.

AUTOGENOUS WELDING.

During the year numerous accidents were investigated where welds made by the fusion or autogenous process were involved. The result of our investigations fully supports our position previously taken that this process has not reached a state of development where it can safely be depended upon in boiler construction and repair where the strain to which the structure is subjected is not carried by other construction which conforms to the requirements of the law and the rules and regulations issued in pursuance thereof, nor in fire-box crown sheet seams where overheating and failure are liable to occur, or on any part of the locomotive or tender subject to shock or strain where, through failure, accident and injury might result.

Numerous accidents have occurred due to the failure of autogenously welded seams and cracks in the boiler back head. One fatal accident of this nature occurred during the year where an autogenously welded crack 21½ inches long in the boiler back head failed

while the locomotive was hauling a passenger train at an estimated speed of 35 miles per hour, resulting in death to the engineer and the serious injury of the fireman. The scalding water and steam escaping through the rupture compelled the engineer to leave the cab without being able to close the throttle or apply the brakes in the usual way. The engineer and fireman climbed out of and around the left side of the cab to the running board and to the front end of the locomotive, where the angle cock was opened and the brakes applied.

Serious accidents of a similar nature and character have previously been investigated and reports made public. The seriousness of such accidents to a fast-moving train can scarcely be contemplated.

The autogenous welding process is practically in its infancy, and due to my desire to avoid hindering the progress or development of any process of such great value when properly and discreetly used I have hesitated to ask this commission to establish or approve rules or regulations restricting its use. However, unless it is confined by the carriers to parts and appliances where, through failure, accidents and injuries will not result, we will be compelled to adopt some more restrictive measures in the very near future.

GRATE SHAKING APPARATUS.

The number of accidents caused by defective grate-shaking apparatus increased from 48 during the preceding year to 138 during the present year, an increase of 187 per cent. The major portion of these accidents were caused by the shaker bar not having a proper fit on the fulcrum lever. Many of the carriers have no standard design of such parts whereby they may be made interchangeable. Since it is impossible to avoid the changing of shaker bars from one locomotive to another in common use, it is apparent that each carrier should adopt and maintain a standard whereby shaker bars are made interchangeable with a proper fit on the fulcrum levers on all locomotives operated by it.

INJECTOR STEAM PIPES.

Accidents due to the failure of injector steam pipes increased from 9 during the preceding year to 40 during the year. In a majority of these cases the accidents were due to the injector steam pipe pulling out of the brazing collar due to defective workmanship and to breakage caused by weak, light construction and to defective material. In many instances the failure of injector steam pipes was contributed to by the injector not being properly fastened so as to relieve the steam pipe from the weight and vibration of the injector and its connections. If injector steam pipe connections are properly made and maintained and injectors securely braced, accidents of this nature should be entirely eliminated.

ACCIDENTS WHICH REFLECT GENERAL CONDITIONS.

Accidents which reflect the general condition of driving gear, running gear, etc., increased materially during the year, as compared with the preceding year. For instance, main and side rod accidents increased from 23 to 53; valve-gear accidents increased from 18 to 59; and accidents due to failure of reversing gear increased from 53 to 100. The tabulation on page 3 shows similar increases in accidents due to the failure of other related parts.

Nearly all of these accidents could have been prevented by means well known to every well-qualified mechanical official and employee in charge of such inspections and repairs, and are due largely to the disregard for the requirements of law and well-established practices.

The accidents above referred to are only those resulting in serious or fatal injury to one or more persons as a direct result of the failure of some part or appliance of the locomotive or tender. Derailments which may or may not be caused by defects in or failure of some part of the locomotive or tender, not reported to us, frequently result in serious injury or death to a large number of persons and cause a great property damage.

ENGINE FAILURES.

In this connection, attention is again directed to the fact that the number of locomotive miles per locomotive failure decreased as much as 50 to 70 per cent during the year, as compared with the preceding year, and that every locomotive failure caused by physical defects carries with it potential injury to persons, serious delay to traffic, and heavy property damage.

RESPONSIBILITY OF CARRIERS.

Many of the carriers have apparently lost sight of the principal requirement of the law because the commission has not made rules and orders covering every defective condition or construction within the meaning of section 2 of the law, as amended, which provides in its essential features that it shall be unlawful for any common carrier, its officers or agents, subject to the act, to use any locomotive engine propelled by steam power unless said locomotive and tender and all parts and appurtenances thereof are in proper condition and safe to operate without unnecessary peril to life or limb.

In a decision rendered by the Circuit Court of Appeals, Sixth Circuit, sustaining a decision of the lower court, the following language was used which seems pertinent:

While the Interstate Commerce Commission is authorized to make rules and orders in furtherance of the enforcement of this law, nevertheless its failure to make a rule or order covering every defective condition or construction within the meaning of section 2 of the boiler-inspection act by no means relieves the carrier from complying with the provisions of that section.

GENERAL COMPLIANCE WITH REQUIREMENTS.

Soon after July 1, 1922, it was brought to our attention that inspections, tests, and repairs were not being made by many of the carriers as required. Therefore, in accordance with sections 6 and 9 of the law, it was necessary for our inspectors to issue special notices for repairs withholding 7,075 locomotives from service until proper inspections and repairs were made and to obtain information to show that locomotives were being used while in violation of the law, so that court proceedings might be instituted.

PROSECUTIONS.

During the year information covering 37 cases involving 377 counts was filed against 31 different carriers for violation of the locomotive inspection act and was transmitted to the proper United States attorneys for prosecution, as provided for in section 9 of the law. Pleas of guilty were entered either before or when called for trial in 10 cases involving 78 counts and the penalty of \$100 in each count imposed. There are 27 cases involving 299 counts now pending and awaiting action in the courts.

It is apparent that many other violations of the law and rules have occurred and our failure to furnish information of such violations has been due to the inadequacy of our inspectional force and the appropriation fixed.

The Bureau of Inquiry, by direction of the commission, has rendered valuable assistance in obtaining necessary information and in preparing such information for transmittal to the proper United States attorneys. The Bureau of Accounts has also rendered valuable assistance in obtaining information necessary in a number of cases which have been filed.

SCOPE AND EXTENT OF BUREAU'S WORK.

While considering the work of the bureau, I desire to respectfully direct your attention, in part to the scope and extent of the work required by the law and the number of inspectors provided to see that its purpose is carried out, for instance:

There are provided only 50 inspectors whose duties are to see that the provisions of the law and rules and regulations issued in pursuance thereof are properly complied with. There are at this time over 70,000 locomotives coming under our jurisdiction which are housed or repaired at approximately 4,600 different places throughout the United States and used on about 265,000 miles of main line.

With the number of inspectors provided and the appropriation fixed by Congress, it is a physical impossibility to inspect at regular

intervals and know the condition of any large percentage of this number of locomotives, as the conditions change from day to day and from trip to trip. To keep locomotives in proper condition and safe to operate without unnecessary peril to life or limb, as well as in condition to efficiently perform the service required of them, they should be carefully inspected after the completion of each trip or day's work and a record made of all defects needing repairs, and such repairs should be currently made.

The law places the responsibility for the general design, construction and maintenance of all locomotives and tenders upon the carriers owning or operating them. It appears, however, that many railroad officials and employees who are responsible for the general condition and repair of locomotives coming under their jurisdiction have evaded their responsibility and knowingly allowed locomotives to remain in service in a seriously defective condition until found by our inspectors and ordered removed from service for needed inspections and repairs.

Transcribed reports showing in detail the defects found by our inspectors which should have been repaired before the locomotives were put in use in order to maintain them in safe and proper condition for service, as well as the locomotives for which special notices for repairs were served ordering them withheld from service, giving in detail the reasons therefor, were sent to the chief operating officer of all carriers each month where inspections were made so that they might be kept informed of the conditions disclosed by our inspections.

SENATE RESOLUTION NO. 327.

Senate Resolution No. 327 of August 3, 1922, called for information as to whether or not the provisions of the locomotive inspection act were being violated and, if so, the extent of such violation, and as to whether inspection of locomotives were being made in all Federal inspection districts and upon the roads of all common carriers engaged in interstate commerce as required by said act. The requested information was furnished as fully as possible and under date of August 29, 1922, the commission transmitted to the Senate a report, the essential features of which were:

Instances have been brought to our attention where, in our opinion, the act, as amended, referred to in resolution 327, recently has been violated.

It is impossible for us to accurately report the extent of such violations. Inspection of locomotive boilers is at present being made in all Federal locomotive-boiler-inspection districts by our inspectors, but all inspections by the carriers as contemplated in section 5 of the act are not being made by and upon all common carriers engaged in interstate commerce. The reports from our inspectors indicate a very general let down in the matter of inspection by the carriers, which gives cause for

concern. The carriers report various reasons for not making these inspections. Some of the reasons assigned are as follows:

- "No monthly inspection made of this engine since June 16, 1922, account of not having competent inspectors in the service due to walkout of the shop crafts.
- "Unable to make inspection account insufficient help due to strike.
- "Not inspected account strike.
- "Inspection not made July.
- "Unable to make inspections or tests account strike conditions."

There are approximately 70,000 locomotives within the general purview of the act. A determination as to the extent to which the act currently is being violated would involve ascertainment of the condition of each locomotive and information as to the use being made thereof. The condition varies even as to the same locomotive from day to day. It is not possible for us to make this determination. The locomotives referred to are housed or repaired at approximately 4,600 different points and are operated on more than 265,000 miles of track. We are permitted by the act to have 50 district inspectors. During July last they made 717 separate inspections covering 4,085 locomotives and tenders on 162 railroads. The July activity of our inspectors is typical. The act does not contemplate that our inspectors shall inspect all locomotives. Section 6 of the act provides that the inspectors' first duty shall be to see that the carriers make inspections in accordance with the rules and regulations established and approved by the Interstate Commerce Commission, and that carriers repair the defects which such inspections disclose before the boiler or boilers or appurtenances pertaining thereto are again put in service. The services of our inspectors are general in character, and they are given such direction as is designed to bring about a compliance with requirements by the carriers.

While we are not in position to make report regarding the condition of all locomotives and the extent to which the requirements as to inspection and repairs are not being complied with currently, there are indications as to conditions generally, and certain deductions and conclusions may be drawn from the conditions disclosed by the work of our inspectors during the month of July last. At 717 different points they made personal inspection of 4,085 locomotives. Of these, 2,456 disclosed defects of the varied character mentioned above and more or less serious; 169 were found to be in such condition that they were not "safe to operate," and notices were served upon the carriers under section 6 of the act requiring them to be withdrawn from service. Of the others, 992 were found to have defects less serious in character but in need of prompt attention. In 1,295 cases, defects, though not such as to give cause for immediate concern, were such as, in accordance with sound practice, should have attention.

When considering the extent of our inspection, cognizance should be taken of the fact that the act limits the number of inspectors to 50, and that the amount directly appropriated to carry out its provisions for the current fiscal year is \$290,000. This sum may be spent in monthly allotments of \$24,166.66, as provided in the anti-deficiency act of February 26, 1906. The amount expended during the month of July, 1922, in carrying out the requirements of the act was \$24,025.63, or within \$141.03 of the fixed monthly pro rata of \$24,166.66. Had the instructions of the Director of the Bureau of the Budget to set up a "general reserve fund of \$20,000" been in effect during the month of July, we would have incurred a deficit of \$1,525.63.

Senate resolution 438, February 26, 1923:

Resolved, That the Interstate Commerce Commission be, and it is hereby requested to report to the Congress, and when Congress is not in session, to the President, as soon as possible after the first day of each month the condition of railroad equipment as revealed by the reports of the carriers, and by the inspections of the commission, the number of persons killed, the number of injured upon the railroads, and any other available data bearing upon the physical condition of the railroads, and of railroad

equipment, together with a statement of what action, if any, has been taken by the Interstate Commerce Commission within its statutory power to remedy the situation.

Resolved further, That such monthly reports as soon as transmitted to the President or to the Congress shall be available to the public.

In response to the above, we have been supplying information each month showing the number of locomotives inspected, the number found defective, the per cent inspected found defective, number ordered out of service and the number of accidents, killed, and injured, by comparison, similar to the following, to form a part of the commission's report:

Month.	In-spect-ed.	Defec-tive.	Per cent.	Ordered out of ser-vice.	Acci-dents.		Killed.		Injured.		Total.		
					(1)	(2)	(1)	(2)	(1)	(2)	Acci-dents.	Killed	In-jured.
1922.													
January.....	5,903	2,585	43	220	45	6	1	0	49	6	51	1	55
February.....	5,582	2,562	44	272	46	9	1	0	50	11	55	1	61
March.....	6,144	2,855	46	276	43	18	2	0	45	27	61	2	72
April.....	6,467	2,921	45	268	33	12	0	0	34	13	45	0	47
May.....	6,252	2,632	42	219	34	5	3	0	34	10	39	3	44
June.....	6,597	2,868	43	256	43	10	3	0	61	10	53	3	71
Total.....	36,945	16,423	44	1,511	244	60	10	0	273	77	304	10	350
1923.													
July.....	4,085	2,456	60	168	68	33	1	0	69	71	101	1	140
August.....	6,105	4,355	71	469	82	42	3	0	91	42	124	3	133
September.....	6,160	4,421	71	759	93	26	7	0	98	26	119	7	124
October.....	5,628	3,997	71	736	78	23	4	0	86	23	101	4	109
November.....	5,488	3,766	69	731	101	31	11	0	118	34	132	11	152
December.....	3,321	2,115	64	405	92	32	4	3	125	46	124	7	171
Total.....	30,787	21,110	68.5	3,268	514	187	30	3	587	242	701	33	829
1923.													
January.....	5,540	3,640	66	859	105	35	11	1	110	50	140	12	160
February.....	4,138	2,654	64	527	98	32	6	1	110	40	130	7	150
March.....	5,368	3,453	64.3	733	89	30	7	1	96	29	119	8	125
April.....	5,266	3,049	58	511	92	(3)	8	(3)	97	(3)	92	8	97
May.....	6,140	3,631	59	615	71	(3)	1	(3)	76	(3)	71	1	76
June.....	5,823	3,347	58	519	94	(3)	5	(3)	101	(3)	94	5	101
Total.....	32,275	19,774	61.5	3,764	549	97	38	3	590	119	646	41	709

¹ Number of accidents, killed, and injured, caused by the failure of some part or appurtenance of the locomotive or tender, as reported by carriers to the Bureau of Locomotive Inspection.

² Accidents, killed, and injured, reported to the Bureau of Statistics, but not reported as required by the boiler inspection act as amended.

³ Months for which records of Bureau of Statistics have not been checked.

"Inspected" indicates the number of locomotives inspected by the commission's inspectors.

"Defective" indicates the number of locomotives found defective, including those for which special notice for repairs was issued.

A defect is defined as a violation of the law or the rules and regulations established or approved by the Interstate Commerce Commission, or a defect which should be repaired in order to maintain a locomotive in safe and proper condition for service, as established by standard practices of the carriers and, if continued without repairs, would soon become violations of the law.

Our inspectors are usually accompanied during their inspections by a representative of the carrier, to whose attention all defects are directed. The object in reporting defects not yet violations of the law is to inform the carriers of the condition of their motive power, as found by the commission's inspectors.

On the 10th of each subsequent month a transcribed report of defects reported is sent to the chief operating officers of the carriers where inspections are made, so that they may be informed of the condition of their locomotives as disclosed by the commission's inspectors.

"Ordered out of service" indicates the number of locomotives inspected by Government inspectors found in violation of the law for which special notice for repairs was issued in accordance with section 6 of the act as amended.

"Accidents" indicates the number of accidents due to the failure of some part or appurtenance of the locomotive or tender, including the boiler, where one or more persons were killed or injured.

"Killed" indicates casualties resulting in death within 24 hours after the accident.

"Injured" indicates employees prevented from performing their accustomed duties for more than three days in the aggregate during the 10 days immediately following the accident; or, other persons incapacitated from following their customary vocation or mode of life for a period of more than one day.

EXTENSION OF TIME FOR FLUE REMOVAL.

During the year 230 applications were filed for extension of time for removal of flues, as provided in rule 10. Our investigation disclosed that in 34 of these cases the condition of the locomotives was such that no extension within the purpose and intent of the law could be properly granted. Fourteen were in such condition that the full extension requested could not be authorized, but an extension for a shorter period, within the limits of safety, was allowed. Fourteen extensions were granted after defects disclosed by our investigation had been repaired. Thirty applications were withdrawn by the carriers for various reasons, and the remaining 138 were granted for the period requested.

SPECIFICATION CARDS AND ALTERATION REPORTS.

In accordance with rule 54 there were filed 5,076 specification cards and 11,187 alteration reports necessary in determining the safe working pressure and other required data for the boilers represented. So as to determine whether or not the boilers covered were so constructed as to be in safe and proper condition for service and that the stresses were within the allowed limits, these specification cards and alteration reports were carefully analyzed and corrective measures taken with respect to numerous discrepancies which were found. It was required that many of the older and weak boilers be reinforced or the working pressure reduced.

APPEALS.

In two instances formal appeals were taken from the decision of our inspectors during the year and after careful consideration of the existing conditions the appeals were partially sustained and partially dismissed. The decisions of these inspectors were technically in error, but practically correct.

SPECIAL WORK.

During the year 1920, at the direction of the commission, inspectors of this bureau spent 2,439 days in special work in connection with the transportation act, 1920, and the interstate commerce act. During 1921 they spent 962 days in special work and during 1922 spent 200 days. The expense of this work was borne from the general appropriation, which materially assisted us in avoiding a deficiency in the appropriation made to carry out the purpose of the locomotive boiler inspection law, as amended. This work accounts largely for the variation in the number of locomotives inspected during those years. During the year approximately 100 days were spent in special work.

APPROPRIATIONS.

The amount appropriated to carry out the provisions of the law during the year was \$290,000, to be spent in monthly allotments of \$24,166.66, as provided in the antideficiency act of February 26, 1906. In order to keep within this appropriation and the monthly allotment, it was necessary to curtail materially the travel of our field force, and make a monthly allotment to each inspector to cover his traveling expenses, including railroad fare, which could not be exceeded under any circumstances. Allotments were made monthly to each inspector in proportion to the number of miles covered in their respective districts in the performance of their duties; in some instances as low as \$20 to \$40 per month.

The office force of the chief and assistant chief inspectors both in number and in salaries was kept to the lowest level in order to maintain the service.

RECOMMENDATIONS FOR BETTERMENT OF SERVICE.

Recommendations for the betterment of the service were made in my ninth, tenth and eleventh annual reports, in accordance with section 7 of the act. Experience has demonstrated the necessity and wisdom of these recommendations; therefore they are respectfully renewed and reasons therefor given:

ADDITIONAL INSPECTORS AND APPROPRIATIONS.

First. That the act of February 17, 1911, as amended, be further amended to provide for not less than 50 additional inspectors and increased compensation, and to provide for a sufficient appropriation to adequately carry out the purpose of the law.

The act of February 17, 1911, provides for 50 inspectors, whose duties shall be to make such personal inspections from time to time of locomotive boilers under their care as might be necessary to fully carry out the provisions of the act, so that the locomotives might be employed in moving traffic without unnecessary peril to life or limb, their first duty being to see that the carriers make inspections and repairs as required by the law and the rules and regulations established or approved by the commission.

At the time this law was enacted there were approximately 63,000 locomotives coming under its jurisdiction. The amendment of March 4, 1915, extended the authority of the bureau to cover the entire locomotive and tender and all of their appurtenances. The number of locomotives has increased to more than 70,000, which are operated on approximately 265,000 miles of main line by 941 different carriers, not including subsidiary lines going to make up the larger systems, and are housed or repaired at about 4,600 differ-

ent places. In addition to the increased number of locomotives coming under the jurisdiction of this bureau and its extended duties, the size and complexity of the locomotives and the appurtenances thereof have increased to such an extent that it renders the work of the bureau much more difficult and carries with it greater responsibility and requires a wider general knowledge, and renders it impossible for our inspectors to carefully inspect and report on the condition of as many locomotives as they could originally or when the act applied to the boiler only. With our extended duties and scope of the territory covered, it is impossible for the number now provided, and within the appropriation, to adequately accomplish the purpose for which the law was enacted.

In order to conserve as far as possible travel expenses, headquarters for our inspectors have been carefully planned and fixed at the larger and most centrally located points where the greatest number of locomotives are housed or repaired.

New duties and responsibilities have been imposed upon the commission by the transportation act, 1920, and the act to regulate commerce has been extended, and no doubt in the future as in the past we will be called upon from time to time to assist in making investigations necessary to carry out the requirements. In order to carry out our duties properly it is necessary to have an efficient and competent corps of well-trained inspectors.

Our inspectors must be men of good moral character and habits, active, intelligent and discreet, of good speech and manner, qualified to address and confer with railroad officials as occasion may require, and must act upon their own initiative, and inasmuch as they are clothed with wide authority, they must be men of good judgment, who have acquired, from practical training and experience in railroad service, a wide general and technical knowledge of the construction, repair and operation of the locomotive and tender and appurtenances thereof; therefore can not be trained to properly perform their duties after entering our service. In order to obtain and retain in the service such men their salaries should be increased so as to be commensurate with the duties performed and the responsibilities imposed, and be in keeping with the salaries of those with similar responsibilities and filling similar positions, from whom the commission must draw in order to obtain such men.

AUTOMATIC FIRE DOORS.

Second. That all locomotives not using oil for fuel have a mechanically operated fire door so constructed that it may be operated by pressure of the foot on a pedal or other suitable device located on the floor of the cab or tender at a proper distance from the fire door, so

that it may be conveniently operated by the person firing the locomotive.

This recommendation is based on the results of many investigations of boiler failures of such character as to permit the steam and water contained in the boiler at the time of the accident to be discharged into the fire box, many times being directed toward the fire door.

The old swing-type door, which is largely used at present, is almost invariably blown open in case of such accidents and permits the discharging steam and boiling water, with the contents of the fire box, to be blown into the cab of the locomotive, most frequently scalding and burning the persons therein. Such accidents frequently occur while coal is being put into the fire box, and with the fire door necessarily open, and under such circumstances it is impossible for it to be closed.

The automatic fire door would remain closed, if closed, when the accidents occur. If open, it would automatically close the moment the operator's foot was removed from the operating device, thus preventing the direct discharge of the scalding water and fire into the cab of the locomotive with such serious results.

The automatic fire door is not a new and untried device, as there are thousands of them in service, and they are required by law in some States. The automatic fire door is also of great value in prevention of serious cracks and leaks in fire-box sheets by limiting the time the fire doors are open when placing coal on the fire, thus reducing the amount of cold air admitted, which causes loss of temperature and consequent expansion and contraction and the setting up of great strain.

Their use is also very valuable in the conservation of fuel, which is one of the principal costs of operation.

POWER REVERSING GEAR.

Third. That a power-reversing gear be applied to all locomotives and that air-operated power-reversing gear have a steam connection with valves conveniently located in the cab, so arranged that in case of air failure steam may be quickly used to operate the reversing gear.

Our records indicate that since September 4, 1915, the effective date of the amendment to the act of February 17, 1911, 415 accidents have occurred, due to the failure of some part of the reversing gear, resulting in serious injury to 415 persons. Such accidents can be practically eliminated by the application of power-reversing gear, which will not only add to the safety of operation of a locomotive but will add greatly to its efficiency.

This device has proven a success, and has been applied on a large number of locomotives operated by the various carriers and on all standard locomotives constructed under the orders of the United States Railroad Administration.

POWER GRATE SHAKERS.

Fourth. That a power grate shaker be applied to all coal-burning locomotives.

This appliance has been in use for a number of years and tried out very thoroughly, and was adopted as standard by the standardization committee of the United States Railroad Administration, composed of 14 very prominent superintendents of motive power and railroad mechanical officials.

Our records indicate that since September 4, 1915, the effective date of the amendment to the act of February 17, 1911, 530 accidents, resulting in the death of 1 person and the serious injury of 530 others, have occurred, due to the failure of some part of the grate-shaking apparatus. These casualties could have been entirely eliminated had there been in use a power grate-shaking device such as that referred to above.

This appliance would not only prove of value in the conservation of life and limb but would be of great value in the conservation of fuel used on locomotives by enabling the firemen to keep the fire in proper condition at all times.

AUTOMATIC BELL RINGERS.

Fifth. That all locomotives be provided with a bell so arranged and maintained that it may be operated from the engineer's cab by hand and by power.

The reason for this recommendation has been thoroughly discussed on previous occasions, and its necessity seems so apparent that it hardly requires further comment. We believe, however, that this is an appliance which is vital to the safety of the employees and general public at highways and other public places traversed by the railroads. The operation of modern motive power demands the full attention of the enginemen, and it is frequently the case while passing over road crossings and through congested territories that the engineer and fireman are so occupied with their other important duties that it is impossible for them to ring a bell by hand in order to give warning of approaching danger.

HORIZONTAL HANDHOLDS AND STIRRUPS ON CABS.

Sixth. That cabs of all locomotives not equipped with front door or windows of such size as to permit of easy exit have a suitable

stirrup or other step and a horizontal handhold on each side approximately the full length of the cab, which will enable the enginemen to go from the cab to the running board in front of it, handholds and steps or stirrups to be securely fastened with bolts or rivets, the distance between the step and handhold to be not less than 60 inches nor more than 72 inches.

This recommendation is based on the result of investigation of accidents of a character which make it impossible for enginemen to remain in the cab and which compel them to make exit through the cab window to the ground or running board. While locomotives are operating at a high speed to be compelled to jump from the cab window is exceedingly dangerous and invariably results in serious if not fatal injury.

The front doors or windows on modern locomotives are so small that they will not permit the enginemen to pass out through them, thus making it necessary to climb over the roof of the cab or out through the side window when necessary to go from the cab to running board in front while in motion.

Such attachments can be applied at a nominal expense and practically without delay to the locomotive and would add greatly to the safety of the employees. Accidents resulting in fatal injury which have been investigated by this bureau show that injury and death would have been avoided had these appliances been in use.

A great number of locomotives have been equipped with the appurtenances above recommended, although, like many other appliances in use, they are frequently not maintained in a proper condition for service.

WATER COLUMNS.

Seventh. That all locomotives where there is a difference between the readings of the gauge cocks and water glass of 2 or more inches under any condition of service be equipped with a suitable water column, to which shall be attached three gauge cocks and one water glass, with not less than 6 inches, preferably 8 inches, clear reading, and one water glass with not less than 6 inches, preferably 8 inches, clear reading, on the left side or back head of the boiler.

Water glasses should be so located, constructed, and maintained that they will register the approximate general water level in the boiler under all conditions of service and show within 1 inch a corresponding level, and so maintained that the engineer and fireman may have under all conditions of service a clear view of the water in the glass from their respective and proper positions in the cab.

Gauge cocks should be located within easy reach of the engineer from his proper position in the cab while operating the locomotive, extension handles to be applied if necessary to accomplish this.

All gauge cocks to be supplied with suitable nipples that will directly discharge into a properly constructed and located drain or dripper that will convey the discharged water to near the cab deck or floor, nipples to be not less than one-half inch nor more than 1 inch above the dripper or drain and kept in correct alignment.

Gauge cocks and water glasses are now universally used for gauging the water level in the boiler; and since the two appliances located on the same boiler do not show a corresponding level under operating conditions it is clear that one or the other is incorrect and therefore misleading.

Investigations have clearly established that gauge cocks when screwed directly into the boiler do not correctly register the proper water level over the crown sheet. It is very important that at least two appliances attached separately be employed for this purpose so as to form a double check and so as to have one appliance in case of failure of the other while on the road and away from points where repairs can be made.

Should any other appliance than the water column or water glass be invented which will safely and correctly indicate the water level in the boiler, due consideration can be given. The requirements herein recommended should be complied with the first time the locomotive is shopped for classified repairs, as established by the United States Railroad Administration.

There are several devices now being used and being developed which apparently will give an audible alarm when the water becomes dangerously low in the boiler and prevent serious and fatal explosions, and it is hoped that the carriers will give due consideration to these devices and assist in their development and broaden their use in every way consistent.

A. G. PACK,
Chief Inspector.

ACCIDENTS AND CASUALTIES RESULTING FROM THE FAILURE OF LOCOMOTIVES AND TENDERS AND THEIR APPURTENANCES DURING THE FISCAL YEAR ENDED JUNE 30, 1923, BY ROADS.

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

ALABAMA & VICKSBURG RAILWAY:

December 29, 1922, locomotive 423, Vicksburg, Miss. Grate shaker lever became disconnected from post due to bolt working out. One injured.

January 15, 1923, locomotive 472, Morton, Miss. While shaking grates, reach rod became disconnected due to connecting pin working out. One injured.

Two accidents, two injured.

ANN ARBOR RAILROAD:

**November 14, 1922, locomotive 171, Shepherd, Mich. Right side rod broke, causing reverse lever to fly back, striking engineer; old flaw in rod which should have been detected by proper inspection; rods reported defective on November 1, 3, 5, 7, 9, 11, and 13. One injured.

One accident, one injured.

ATCHISON, TOPEKA & SANTA FE RAILWAY SYSTEM:

*July 18, 1922, locomotive 1159, Amarillo, Tex. Air hose blew off main reservoir connection. One injured.

**July 25, 1922, locomotive 890, between Magdalena and Socorro, N. Mex. Water glass burst; wire mesh shield inadequate protection against flying particles of glass. One injured.

**August 3, 1922, locomotive 574, Lockport, Ill. Water glass burst; cut by flying glass; wire mesh shield used. One injured.

**August 14, 1922, locomotive 421, near Heidenheimer, Tex. Flue broke at safe end weld; overheated in welding. One injured.

*September 1, 1922, locomotive 592, Chillicothe, Ill. Squirt hose defective. One injured.

*September 1, 1922, locomotive 3010, Argentine, Kans. Knuckle dropped out account of knuckle pin missing, striking switchman. One injured.

**September 12, 1922, locomotive 1077, Mulvane, Kans. Collar on sprinkler hose pipe pulled through union nut while joint was being tightened under pressure. One injured.

**September 13, 1922, locomotive 2107, Kansas City, Mo. Blow-off cock pipe broke off and flew around striking switchman. One injured.

September 14, 1922, locomotive 2120, Argentine, Kans. Injured while attempting to make repairs to defective injector due to steam escaping from injector bonnet. One injured.

*September 16, 1922, locomotive 3186, between Floyd and Sibley, Mo. Stoker elevator pawl would not stay in neutral position. One injured.

*September 24, 1922, locomotive 1087, near Tangier, Okla. Right main pin broke causing engine to strip. One injured.

*October 18, 1922, locomotive 866, Shawnee, Okla. Footboard on front of engine gave way. One injured.

*October 24, 1922, locomotive 2084, Shopton, Iowa. Broken slat over steam pipe caused engineer to slip while reversing engine. One injured.

October 24, 1922, locomotive 3805, Belen, N. Mex. Broken rivet in left flange of fire-box door sheet blew out while boiler maker and helper were working in the fire box. Two injured.

**October 26, 1922, locomotive 632, Richmond, Calif. Support to cab seat, which was of round iron, went through deck account of deck boards being burned and charred. One injured.

October 28, 1922, locomotive 669, Merryville, La. Left boiler check stuck open. One injured.

*November 11, 1922, locomotive 2049, Los Angeles, Calif. Spring hanger broke, permitting engine to drop down and footboard on which switchman was riding to catch on pavement. One injured.

*December 10, 1922, locomotive 673, El Pleasant, Tex. Eccentric blade broke. One injured.

December 13, 1922, locomotive 1871, Pinon, Colo. Street ell in right blow-off cock loose and turned so that steam and hot water were directed toward cab; threads in blow-off cock defective and street ell not properly tightened. One injured.

December 18, 1922, locomotive 589, near Cherryvale, Kans. Crown sheet failure caused by overheating due to low water. Two injured.

*January 5, 1923, locomotive 1830, Chillicothe, Ill. Reverse lever bolts were loose and working badly causing latch box to drag on quadrant, resulting in engineer being injured while reversing engine. One injured.

*January 6, 1923, locomotive 1482, between Asp and Orlando, Okla. Driving wheel tire broke causing derailment. Seven injured.

January 12, 1923, locomotive 1684, Klondike, Calif. Engine and tender separated, permitting brakeman to fall to track, due to center sills of tender frame, to which draw bar casting was attached, giving away; sills contained old fractures which should have been detected by proper inspection; front end sill reported loose and excessive slack between engine and tender reported on numerous occasions prior to accident. One injured.

*January 15, 1923, locomotive 1652, Lamy, N. Mex. Automatic fire door did not operate properly due to bolt in left leaf riding on frame and exhaust port being partially stopped up and while attempting repairs fireman was injured. One injured.

February 8, 1923, locomotive 1088, near Skedee, Okla. Injector steam pipe throttle valve blew off nipple connection at fountain, due to threads on valve and in spanner nut being stripped; this connection reported leaking badly one day prior to accident but proper inspection and repairs were not made. One injured.

March 31, 1923, locomotive 1065, near Gower, Mo. Flue broke off at safe end weld; flue slightly reduced in thickness and overheated in welding. One injured.

*April 12, 1923, locomotive 1176, Codman, Tex. Air supply pipe broke off at main reservoir, causing emergency application of brakes. One injured.

April 28, 1923, locomotive 410, Deming, N. Mex. Washout plug blew out while being tightened under pressure. One injured.

May 2, 1923, locomotive 3123, Chanute, Kans. Water glass broke; cut by flying glass. One injured.

*May 2, 1923, locomotive 539, Oakland, Calif. Hand caught between reverse lever and boiler clamp due to clamp being defective. One injured.

May 28, 1923, locomotive 3510, Newton Kans. Water glass burst; cut by flying glass. One injured.

**May 30, 1923, locomotive 543, Lexington Junction, Mo. Sprained back while operating reverse lever due to footboard in cab being loose and tipped. One injured.

**June 3, 1923, locomotive 1120, near Enid, Okla. Engine and four cars derailed and turned over due to brake rod on tender dropping down and under tender truck wheel. Two injured.

Thirty-three accidents, 42 injured.

ATLANTA, BIRMINGHAM & ATLANTIC RAILWAY:

December 23, 1922, locomotive 109, near Arp, Ga. Grate connecting rod broke while fireman was shaking grates causing shaker bar to strike him. One injured.

*March 2, 1923, locomotive 50, Moultrie, Ga. Main rod broke. One injured.

Two accidents, two injured.

ATLANTIC COAST LINE RAILROAD:

**July 14, 1922, locomotive 482, near Hardeeville, S. C. Eccentric rod became disconnected due to pin in front end working out. One injured.

**August 12, 1922, locomotive 716, Waycross, Ga. Stud securing handhold to smoke box pulled out, causing handhold to give way and employee to fall. One injured.

**August 27, 1922, locomotive 446, Florence, S. C. Flue burst. One injured.

**August 31, 1922, locomotive 974, Hartsville, S. C. Excessive lost motion in throttle lever, permitting engineer's hand to be caught between lever and air gauge. One injured.

**September 1, 1922, locomotive 8006, Jacksonville, Fla. Tender sill step loose causing engineer to slip and fall. One injured.

September 5, 1922, locomotive 188, Wilson, N. C. Broken molding around tender floor caught brakeman's glove and caused him to be struck by railer carried on tender frame. One injured.

**September 10, 1922, locomotive 1121, Lakeland, Fla. Bolt connecting grate shaker bar to post lost out, causing fireman to fall. One injured.

September 11, 1922, locomotive 1559, Fayetteville, N. C. Scalded while attempting to open coal pusher operating valve with Stillson wrench, due to valve stem being disconnected. One injured.

September 18, 1922, locomotive 1529, South Rocky Mount, N. C. Shaker bar slipped off fulcrum lever, due to improper fit. One injured.

September 23, 1922, locomotive 1010, Deland, Fla. Grate shaker bar slipped off fulcrum lever. One injured.

**October 28, 1922, locomotive 1545, Florence, S. C. Shaker bar slipped off lever due to improper fit. One injured.

November 6, 1922, locomotive 936, near Trego, Va. Crown sheet failure; low water; left tank hose strainer clogged with waste sufficiently to greatly restrict the flow of water. One injured.

November 13, 1922, locomotive 1000, near Haines City, Fla. Main driving wheel axle broke, due to old flaw covering approximately two-thirds of its diameter. One injured.

December 1, 1922, locomotive 1567, Weldon, N. C. Grate shaker bar slipped off fulcrum lever due to improper fit. One injured.

**December 16, 1922, locomotive 413, South Rocky Mount, N. C. Grate shaker bar slipped off fulcrum lever due to improper fit. One injured.

December 31, 1922, locomotive 700, near Florence, S. C. Steam pipe to headlight generator blew out of turret connection. One injured.

January 19, 1923, locomotive 1028, Orient, Fla. While fireman was attempting to repair defective whistle, engineer blew whistle, burning fireman. One injured.

**January 25, 1923, locomotive 272, Waycross, Ga. Sand lever became disconnected, due to bolt working out, causing hostler to fall from running board. One injured.

*February 7, 1923, locomotive 1040, Sanford, Fla. Hand was caught between reverse lever and sander valve. One injured.

*February 8, 1923, locomotive 369, Rodman, Va. Brake rod under engine broke and fell down, causing derailment. Two injured.

**March 3, 1923, locomotive 969, Fayetteville, N. C. Link block guide caught against bolt causing engineer who was reversing engine to receive a sudden jerk, wrenching his back. One injured.

March 24, 1923, locomotive 960, near Sanford, Fla. Crown sheet failure caused by overheating due to low water; opening through bottom water glass cock reduced approximately one-third by accumulation of scale. One killed, two injured.

April 4, 1923, locomotive 1124, Jacksonville, Fla. Scalded due to water glass drain pipe missing. One injured.

April 16, 1923, locomotive 1022, Wilson, N. C. Insufficient clearance between brake valve handle and reverse lever. One injured.

May 8, 1923, locomotive 404, Medulla, Fla. Squirt hose burst. One injured.

May 17, 1923, locomotive 1017, Columbia, S. C. Burned by steam heat pipe, due to leaky regulator valve. One injured.

June 18, 1923, locomotive 710, Manchester, N. C. Draw bar between engine and tender broke, when brakes were suddenly applied, causing fireman to fall against tender. One injured.

Twenty-seven accidents, 1 killed, 29 injured.

BALTIMORE & OHIO RAILROAD:

**July 5, 1922, locomotive 2009, Washington, Pa. Insufficient clearance between reverse lever and injector extension water control valve handle account of handle being loose and out of place. One injured.

**July 6, 1922, locomotive 5101, Garrett, Ind. Tender sill step at gangway missing, causing engineer to fall; defect reported July 1, 3, 5, 8, 9, and 10 and repairs not made. One injured.

**July 8, 1922, locomotive 5101, Deshler, Ohio. Bottom gangway step on left side of tank missing, causing engineer to fall; defect reported July 1, 3, 5, 8, 9, and 10 and repairs not made. One injured.

**July 10, 1922, locomotive 4529, Tontogany, Ohio. Blower pipe became disconnected in smoke box causing back draft account of threads on pipe stripped. One injured.

**July 16, 1922, locomotive 2595, Benwood, W. Va. Squirt hose valve leaking. One injured.

July 17, 1922, locomotive 2045, Connellsville, Pa. Washout plug blew out, account of being improperly applied. One injured.

*July 18, 1922, locomotive 4529, Ottawa, Ohio. Insufficient clearance between grate shaker lever and cab. One injured.

**July 20, 1922, locomotive 5124, between Rosedale and Sherwood, Ohio. Excessive lateral in trailer wheels due to hub liner missing; condition reported five times immediately preceding the accident and locomotive continued in service until July 29, without repairs being made. One injured.

*July 22, 1922, locomotive 4201, M. & K. Junction, W. Va. Finger caught between reverse lever and brake valve handle due to insufficient clearance. One injured.

July 27, 1922, locomotive 2704, New Concord, Ohio. Reverse lever became disengaged from quadrant and flew forward catching engineer's finger, due to quadrant being loose and insufficient tension in counterbalance spring. One injured.

**July 28, 1922, locomotive 4018, McCool, Ind. Shovel struck defective shovel sheet. One injured.

**July 28, 1922, locomotive 5124, between Chicago and Garrett, Ind. Excessive lateral in trailer wheels due to hub liner missing; condition caused similar accident on July 20, and was reported ten times immediately preceding this accident and repairs not made. One injured.

August 7, 1922, locomotive 4182, South Chicago, Ill. Scalded by water coming from leak in injector steam pipe flange joint. One injured.

**August 11, 1922, locomotive 1468, Parkersburg, W. Va. Bolt securing link hanger to lifting arm broke or worked out, causing eccentric rod to be broken and reverse lever to jump out of quadrant and fly back striking engineer. One injured.

**August 11, 1922, locomotive (SIRT) 34, Great Kills, N. Y. Nut blew off of throttle stuffing box gland. One injured.

**August 15, 1922, locomotive 5103, New Albany, Ind. Floating chafing block between engine and tender flew out. One injured.

August 17, 1922, locomotive 1710, Ivorydale, Ohio. Filling plug blew out of lubricator due to threads badly worn and plug too small. One injured.

August 24, 1922, locomotive 1344, Acosta, Pa. Tip blew out of exhaust nozzle, causing back draft; tip not securely fastened in place. One injured.

August 24, 1922, locomotive 1459, Caseyville, Ill. Injector steam pipe spanner nut blew off of injector throttle valve; nut cracked and threads in nut and on valve defective; top connection of steam pipe reported leaking bad seven times immediately preceding the accident. One injured.

August 26, 1922, locomotive 4403, Millers, W. Va. Locomotive and seven cars derailed due to cradle pin working out of engine truck, due to cotter key breaking or losing out, fouling coupler casting bolt and causing truck to bind and climb rail. One injured.

August 27, 1922, locomotive 4065, near Rosedale, Ohio. Two flues broke loose and started to pull out of sheet due to having been rolled thin; flues in generally bad condition and reported leaking eight times immediately preceding the accident. One injured.

**August 28, 1922, locomotive 1444, West Baltimore, Md. Squirt hose blew off nipple due to being insecurely clamped. One injured.

**August 29, 1922, locomotive 4243, near Republic, Ohio. Cover over stoker gear gave way, causing fireman's foot to be injured. One injured.

September 5, 1922, locomotive 2386, Odin, Ill. Drawbar, drawbar pin and safety chains broke, permitting engine and tender to separate, causing fireman to fall; drawbar pin had been broken for some time and could have been detected by proper inspection. One injured.

September 11, 1922, locomotive 2218, Willard, Ohio. Injector steam pipe blew off of injector due to threads in spanner nut stripping; nut badly mutilated and cracked in three places, due to tightening with hammer and chisel; joint between steam pipe and injector reported leaking on September 5, 6, 10 and 11, and if proper repairs had been made this accident should have been avoided. Two injured.

**September 12, 1922, locomotive (P. & R.) 1737, near Harpers Ferry, W. Va. Pneumatic fire door slipped out of guides due to defective operating arm bolt. One injured.

September 14, 1922, locomotive 2057, Benwood Junction, W. Va. Washout plug pulled out while being tightened under pressure; plug covered by heavy accumulation of foreign matter except for about three threads. Two injured.

October 9, 1922, locomotive 2723, Coburg, Ind. Crown sheet failure; crown stays loose in crown sheet. One injured.

*October 23, 1922, locomotive (C. N. J) 861, Philadelphia, Pa. Hinge on safety gate between engine and tender broke causing engineer to fall from step. One injured.

November 7, 1922, locomotive 181, Barnesville, Ohio. Crown sheet failure; low water; no contributory causes found. Three injured.

* November 24, 1922, locomotive 4030, Cogley, W. Va. Train parted from engine causing emergency application of brakes caused by coupler knuckle on rear of tender breaking, due to old flaw. One injured.

November 29, 1922, locomotive 2807, near Trebein, Ohio. Crown sheet failure caused by overheating due to low water; several appurtenances lost or damaged to such extent that their previous condition could not be determined. One killed, two injured.

December 25, 1922, locomotive 4267, Dover, Ohio. Flue burst in prosser groove, due to being thin and excessively worked; flues generally were thin, fire-cracked and had been heavily prossered. One injured.

* December 31, 1922, locomotive 4302, Chicago, Ill. Arm caught between brake lever and axle when brakes were applied to stop locomotive which had moved off of its own volition while engineer was removing broken brake rigging. One injured.

* January 3, 1923, locomotive 2692, Marysville, Ind. Rod which held reverse lever counter balance spring in place broke, causing reverse lever to fly forward, catching engineer's hand between lever and back boiler head. One injured.

January 5, 1923, locomotive 859, Point Pleasant, W. Va. Spring hanger broke due to defective metal and old fractures covering approximately 50 per cent of cross-sectional area. One injured.

January 6, 1923, locomotive 1305, Singerly, Md. Engine and tender separated due to drawbar breaking and safety chains pulling away from tender. One injured.

January 7, 1923, locomotive 2699, Glenwood, Pa. Broken stay bolt blew out of side sheet while boiler maker was in fire box caulking stay bolt under pressure; threads had deteriorated and were practically gone and no telltale hole in outer end of bolt; stay bolt showed evidence of having been broken for some time and stay bolts were 24 days past due for hammer test. One injured.

January 7, 1923, locomotive 2214, near Tygart Junction, W. Va. Crown sheet failed caused by overheating due to low water; autogenously welded seam between crown sheet of combustion chamber and firebox proper failed for a distance of 40 inches and apparently caused the initial rupture; gauge cocks applied directly in boiler back head. One injured.

January 8, 1923, locomotive 4856, Eaton Tunnel, W. Va. Crown sheet failure caused by overheating due to low water; no contributory causes found. Two killed, one injured.

** January 9, 1923, locomotive 1161, Cleveland, Ohio. Lubricator water valve bushing broke off, due to old flaw and poor material. One injured.

** January 12, 1923, locomotive 2369, Cleveland, Ohio. Spring hanger on engine tank broke. One injured.

January 17, 1923, locomotive 4204, Baltimore, Md. Stem of lubricator feed valve broke and blew out, due to stem being of insufficient strength. One injured.

** January 21, 1923, locomotive 4152, between Napanese and Milford Junction, Ind. Lubricator oil pipe broke off. One injured.

** January 28, 1923, locomotive 2525, Washington, Ind. Injector steam pipe blew off. One injured.

* January 31, 1923, locomotive 383, Lorain, Ohio. Injured while attempting repairs to defective handhold on line of road. One injured.

February 4, 1923, locomotive 2217, Garrett, Ind. Throttle lever fouled injector steam pipe, preventing throttle from being completely closed, and when conductor was chaining up cars' engine moved and he was caught. One injured.

* March 4, 1923, locomotive 7138, Blaser, W. Va. Slipped on cab apron, which had worn smooth. One injured.

March 8, 1923, locomotive 4098, Newton Falls, Ohio. Superheater tube broke near safe end weld; tube overheated in welding. One injured.

March 14, 1923, locomotive 5201, Clayton, Md. Grate shaker bar slipped off post; shaker bar socket had cracked at all bottom corners and had opened up about three-eighths inch on back side at bottom. One injured.

March 18, 1923, locomotive 2593, Bessemer, Pa. Fireman's hand caught between handhold and gangway step, due to insufficient clearance. One injured.

March 21, 1923, locomotive 1582, Moccasin, Ill. Reverse lever flew back, due to valves being dry, catching engineer's arm between lever and cab. One injured.

March 23, 1923, locomotive 2856, Argo, Ill. Boiler check cap blew out; cap too small and could be inserted in check to within one thread of seat without turning. One injured.

March 23, 1923, locomotive 4012, Bremen, Ind. Injured while attempting to start stoker with grate shaker bar due to locomotive having been dispatched without stoker wrenches. One injured.

March 28, 1923, locomotive 4004, near West Union, W. Va. Reverse lever unlatched and moved forward, striking engineer; latch spring weak, due to being short. One injured.

March 29, 1923, locomotive 2245, Benwood Junction, W. Va. Grate shaker bar broke, due to old defect. One injured.

April 5, 1923, locomotive 4020, Boughtonville, Ohio. Injured while attempting repairs to defective stoker while on line of road, due to worm gear stripping. One injured.

** April 13, 1923, locomotive 2579, Garrett, Ind. Injured while operating throttle, which was very hard to operate, due to lost motion in rigging and teeth in quadrant and latch badly worn; throttle reported defective on April 3, 6, 7, 11, and 12 and proper repairs evidently not made. One injured.

May 3, 1923, locomotive 4522, Bladensburg, Md. Delivery pipe union broke. One injured.

** May 10, 1923, locomotive 2210, Garrett, Ind. Scalded by water and cut by some substance coming from blow-off cock, which stuck up. One injured.

June 13, 1923, locomotive 2394, Benwood Junction, W. Va. Grate shaker bar slipped off fulcrum lever, due to improper fit. One injured.

** June 18, 1923, locomotive 1432, Halethorpe, Md. Reverse lever flew forward, catching engineer's foot, due to defective latch spring. One injured.

Sixty-two accidents, 3 killed, 67 injured.

BANGOR & AROOSTOOK RAILROAD:

** February 21, 1923, locomotive 60, Caribou, Me. Headlight generator burst. One injured.

One accident, one injured.

BELT RAILWAY OF CHICAGO:

* August 8, 1922, locomotive 91, Chicago, Ill. Shaker bar slipped off post, due to bar being worn. One injured.

* September 1, 1922, locomotive 4, Chicago, Ill. Squirt hose pulled off. One injured.

* October 9, 1922, locomotive 52, Chicago, Ill. Grab iron gave way, account of bolt missing. One injured.

* December 17, 1922, locomotive 74, Chicago, Ill. Brake beam dropped down. One injured.

February 4, 1923, locomotive 3, Chicago, Ill. Flue broke at safe end weld; flue at point of failure reduced to one-sixteenth inch in thickness. Two injured.

May 12, 1923, locomotive 62, Chicago, Ill. Pilot beam handrail gave way on account of column bolt missing; bolt reported missing on May 11 and repairs not made. One killed.

Six accidents, one killed, six injured.

BESSEMER & LAKE ERIE RAILROAD:

November 6, 1922, locomotive 52, Conneaut, Ohio. Drain valve in blower pipe worked open, causing steam and hot water to strike switchman. One injured.

One accident, one injured.

BOSTON & ALBANY RAILROAD:

* August 21, 1922, locomotive 554, Ninerville, N. Y. Nut flew from passing locomotive, striking brakeman. One injured.

* October 8, 1922, locomotive 1044, Van Hoesen, N. Y. Reverse lever spring broke due to old flaw in metal. One injured.

* November 14, 1922, locomotive 539, Palmer, Mass. Main rod broke. One injured.

** November 22, 1922, locomotive 302, Woodlawn, Mass. Broken stay bolt blew out of throat sheet, due to poor threads in sheet. One injured.

Four accidents, four injured.

BOSTON & MAINE RAILROAD:

August 9, 1922, locomotive 2337, Northampton, Mass. Cab apron hinge broke letting the apron down and causing engineer's foot to be caught between locomotive and tender; hinge reported broken prior to accident and repairs not made. One injured.

August 27, 1922, locomotive 3676, Worcester, Mass. Cap missing from ash pan blower valve. One injured.

September 8, 1922, locomotive 960, near Wakefield, Mass. Reverse lever unlatched and struck engineer. One injured.

* September 20, 1922, locomotive 2371, Newport, Vt. Water glass burst; cut by flying glass. One injured.

October 3, 1922, locomotive 1380, Northampton, Mass. Handhold on side of cab pulled out due to being insecurely fastened; top bolt pulled out due to nut missing. One injured.

October 22, 1922, locomotive 150, Boston, Mass. Side rod collar bolt broke, permitting side rod to come off and drop down, breaking left guide, guide yoke and rocker, causing reverse lever to fly back, striking engineer. One injured.

November 5, 1922, locomotive 3019, West Valley Falls, N. Y. Wrist pin broke; old flaw in pin approximately one-half inch deep; pin was reported loose on October 26, and wrist pin grease cup reported missing on November 3, and no evidence that defects were repaired. One injured.

November 9, 1922, locomotive 27, near Boscawan, N. H. Crosshead bolt broke and flew back striking fireman; bolt very loose and improper fit. One injured.

November 12, 1922, locomotive 3644, Plymouth, N. H. Lubricator filling plug blew out; threads on plug defective and plug applied cross threaded. One injured.

November 16, 1922, locomotive 2623, Portland, Me. Filling plug blew out of lubricator. One injured.

December 1, 1922, locomotive 1375, near Revere, Mass. Fire door chain became disconnected. One injured.

December 16, 1922, locomotive 1406, near Hillsboro, N. H. While operating reverse lever, it flew forward due to strip spring in valve breaking, causing engineer to be thrown against boiler backhead. One injured.

January 5, 1923, locomotive 1492, near St. Johnsbury, Vt. Grate shaker bar broke due to having been burned and reduced in thickness from 1½ inches to approximately one-half inch at point of failure. One injured.

** January 6, 1923, locomotive 2355, near Plymouth, N. H. Grate shaker bar slipped off fulcrum lever. One injured.

January 12, 1923, locomotive 1152, East Sudbury, Mass. Shaker bar slipped off lever due to improper fit. One injured.

January 30, 1923, locomotive 1430, near Shirley, Mass. Reflex type water glass burst; cut by flying glass. One injured.

** February 1, 1923, locomotive 413, Boston, Mass. Automatic air gauge burst account of gauge tube having split at the seam. One injured.

February 5, 1923, locomotive 1398, Northampton, Mass. Injector delivery pipe spanner nut broke; nut badly mutilated due to use of hammer and chisel in tightening. One injured.

* February 19, 1923, locomotive 2407, West Kennebunk, Me. Derailment due to broken tender truck frame. One injured.

** February 20 and 21, 1923, locomotive 3207, between Concord, N. H., and Boston, Mass. Fire box door latch missing, allowing door to strike fireman's knee a number of times, necessitating his remaining off duty 20 days; defect reported February 20 and repairs not made. One injured.

* February 27, 1923, locomotive 3669, Orange, Mass. Brake rigging on tender dropped down causing derailment. Seven injured.

** March 2, 1923, locomotive 1012, Chester, Mass. Ash pan slide rod became disconnected due to bolt working out. One injured.

March 9, 1923, locomotive 2051, Bedford, Mass. Connecting rod to ash pan slide disconnected due to bolt working out. One injured.

* March 13, 1923, locomotive 438, East Somerville, Mass. Throttle lever latch stuck preventing throttle from being closed, causing collision. One injured.

* March 18, 1923, locomotive 2418, Portland, Me. Injured while attempting to operate reverse lever due to two bricks and a bolt being under reverse lever. One injured.

* March 19, 1923, locomotive 274, Boston, Mass. Footboard bracket broke. One injured.

March 26, 1923, locomotive 1458, near Barrington, N. H. Side rod knuckle pin broke or lost out, permitting rod to strike running board; rods and boxes in poor condition prior to accident. One injured.

April 1, 1923, locomotive 3636, near Lawrence, Mass. Shaker bar slipped off lever, due to improper fit. One injured.

April 21, 1923, locomotive 2410, Newton Junction, N. H. Grate shaker lever disconnected due to pin coming out. One injured.

May 20, 1923, locomotive 304, Northampton, Mass. Footboard caught on guard rail and bent under, throwing switchman under locomotive; footboard too low. One injured.

May 22, 1923, locomotive 885, at Henniker Junction, N. H. Spring hanger broke due to old defect and tore top off spring box located in cab which struck fireman. One injured.

****May 23, 1923, locomotive 3640, Winchester Highlands, Mass.** Engine and train were derailed due to cotter key in brake rod under tender working out. Twenty-three injured.

June 6, 1923, locomotive 449, at Lawrence, Mass. Eccentric rod struck eccentric crank key, which had worked out due to poor fit, causing reverse lever to fly forward striking engineer; eccentric crank pin reported loose on May 24, and repairs said to have been made. One injured.

June 6, 1923, locomotive 56, Lowell, Mass. Headlight turbine exhaust pipe worked loose and fell from locomotive, striking brakeman; pipe was 32 inches long and not braced. One injured.

June 12, 1923, locomotive 2411, near Rockingham, N. H. Crown sheet failure caused by overheating due to low water; injector wasted considerable water at overflow while in operation; gauge cock dripper stopped up. One injured.

June 15, 1923, locomotive 211, Lawrence, Mass. Coupler lock block became disconnected due to cotter key losing out of pin, permitting lifting lever arm to fly up, striking brakeman. One injured.

Thirty-six accidents, 64 injured.

BUFFALO, ROCHESTER & PITTSBURGH RAILWAY:

December 28, 1922, locomotive 708, Midmont, Pa. Superheater flue broke at defective safe end weld; escaping fire and steam forced engineer, fireman, and brakeman from cab without applying brakes, and train ran for about 3 miles when brakes applied due to air compressor stopping because of no steam. Three injured.

May 30, 1923, locomotive 164, Saltvale, N. Y. Reverse lever latch slipped out of quadrant permitting lever to go forward, catching engineer's foot between lever and boiler back head. One injured.

Two accidents, four injured.

CAROLINA, CLINCHFIELD & OHIO RAILWAY:

August 9, 1922, locomotive 700, Trammel, Va. Tank step gave way due to bolts securing step having sheared. One injured.

May 4, 1923, locomotive 305, Kingsport, Tenn. Hand-rail column broke, permitting rail to slip and caused engineer to fall to ground. One injured.

Two accidents, two injured.

CENTRAL OF GEORGIA RAILWAY:

January 19, 1923, locomotive 1606, near Savannah, Ga. Dry pipe ruptured and collapsed account of deterioration, allowing water and steam to enter cylinders causing cylinder head to be knocked out. One injured.

December 21, 1922, locomotive 1115, Savannah, Ga. Spring hanger broke, permitting engine to drop down and footboard on which switchman was riding to strike rail and be torn off. One injured.

June 24, 1923, locomotive 1578, Pomona, Ga. Main crank pin broke due to old fracture which extended over approximately 85 per cent of cross sectional area. Two injured.

Three accidents, four injured.

CENTRAL NEW ENGLAND RAILWAY:

February 21, 1923, locomotive (N. Y., N. H. & H.) 393, Winsted, Conn. Bolt came out of grate shaker rigging. One injured.

March 15, 1923, locomotive (N. Y., N. H. & H.) 3201, Hopewell Junction, N. Y. Bonnet of injector regulating valve blew out. One injured.

April 9, 1923, locomotive 131, Maybrook, N. Y. Grate shaker connecting rod pin worked out of grate lug, due to cotter key having burned off. One injured.

Three accidents, three injured.

CENTRAL RAILROAD OF NEW JERSEY:

August 9, 1922, locomotive 151, Rockport, Pa. Rain spout at top of cab gave way when used for a handhold as engineer went from rear of locomotive to cab; no other handhold provided. One injured.

October 22, 1922, locomotive 855, Lockport, Pa. Crown sheet failure due to low water; left tank valve would open only 25 per cent of full area and right tank valve would open only 50 per cent of full area; both valves of the plug cock type; defective autogenously welded seam between crown sheet of combustion chamber and crown sheet proper failed for a distance of 36 inches. Three injured.

December 5, 1922, locomotive 110, Jersey City, N. J. Eccentric rod came off pin and pin flew up and struck engineer. One injured.

December 14, 1922, locomotive 163, Tunnel, Pa. Left side rod knuckle pin worked out, striking hub of main driving wheel, causing rods to break and back section of rod to strike cab. One injured.

December 27, 1922, locomotive 171, White House, N. J. Throttle flew open, causing collision. One injured.

January 14, 1923, locomotive 435, Elizabethport, N. J. Back section of grates fell down. One injured.

January 14, 1923, locomotive 753, Elizabethport, N. J. Leading engine, P. & R. 1613, broke loose from C. N. J. locomotive 753 account low drawhead on locomotive 753, causing derailment of several cars. One killed, one injured.

February 7, 1923, locomotive 550, Newark, N. J. Injector steam pipe blew out of valve at turret connection. One injured.

March 31, 1923, locomotive 684, South Amboy, N. J. Injector steam pipe collar broke off at fountain connection. One injured.

April 5, 1923, locomotive (P. & R.) 1731, Jenkintown, Pa. Pin worked out of eccentric arm, causing engine to be stripped. One injured.

Ten accidents, 1 killed, 12 injured.

CENTRAL VERMONT RAILWAY:

August 19, 1922, locomotive 423, Roxbury, Vt. Grate shaker bar slipped off lever due to key missing. One injured.

One accident, one injured.

CHARLESTON & WESTERN CAROLINA RAILWAY:

July 26, 1922, locomotive (no number given), Fairfax, S. C. Struck by piece of driving spring saddle, which broke, due to defective casting. One injured.

May 9, 1923, locomotive 228, Augusta, Ga. Injured due to water glass drain pipe being disconnected. One injured.

Two accidents, two injured.

CHESAPEAKE & OHIO RAILWAY:

August 19, 1922, locomotive 335, Fulton, Ind. Space block bolt pulled through valve gear link, causing reverse lever to fly back, striking engineer. One injured.

September 13, 1922, locomotive 760, Ashland Junction, Ky. Struck by steam escaping from elevator pipe of defective stoker. One injured.

October 17, 1922, locomotive 1053, near Warminster, Va. Engine parted from train causing emergency application of brakes due to key working out of coupler on rear of tender, permitting coupler to slip out. One injured.

November 23, 1922, locomotive 493, Dayton, Ky. Crown sheet failed. One injured.

December 24, 1922, locomotive 467, Greenwood, W. Va. Reflex water glass burst. One injured.

January 17, 1923, locomotive 320, Peru, Ind. Lift lever became disconnected from lock pin and struck switchman, due to cotter key working out. One injured.

January 22, 1923, locomotive 846, near Malden, Ind. Injector steam pipe spanner nut blew off at turret connection. Two injured.

Seven accidents, eight injured.

CHICAGO & ALTON RAILROAD:

August 29, 1922, locomotive 363, Virden, Ill. Shaker bar too long, allowing insufficient clearance between it and throttle rest. One injured.

October 17, 1922, locomotive 360, Larrabee, Mo. Grates disconnected. One injured.

October 19, 1922, locomotive 422, Roodhouse, Ill. Plug blew out of unused lubricator throttle valve hole. One injured.

November 21, 1922, locomotive 418, Roodhouse, Ill. Drawbar sleeve broke. One injured.

November 26, 1922, locomotive 342, Elkhart, Ill. Injured while operating ash pan slides due to operating lever being too long. One injured.

December 15, 1922, locomotive 880, Pontiac, Ill. Shaker bar slipped off post due to improper fit. One injured.

January 5, 1923, locomotive 72, Kansas City, Mo. Blow-off cock stuck open due to operating lever fouling air reducing valve handle and while endeavoring to close blow-off engineer was scalded. One injured.

April 15, 1923, locomotive 860, Mazonia, Ill. Scalded due to leaky blow-off cock. One injured.

Eight accidents, eight injured.

CHICAGO & EASTERN ILLINOIS RAILWAY:

*July 22, 1922, locomotive 1011, Summit Grove, Ind. Steam pipe to left injector blew off at fountain account of collar broken. One injured.

*August 29, 1922, locomotive 880, Terre Haute, Ind. Ash pan water valve opened up in a seam allowing bonnet to blow out. One injured.

*September 2, 1922, locomotive 945, Evansville, Ind. Guide block bolt broke which in turn broke eccentric arm and eccentric rod. One injured.

*September 5, 1922, locomotive 2538, Boone Grove, Ind. Main rod strap broke. One injured.

*October 4, 1922, locomotive 1928, Grant Park, Ill. Tender derailed account of loose wheel. One injured.

February 28, 1923, locomotive 964, Danville, Ill. Bolts worked out of link blade allowing it to drop which raised link and caused reverse lever to fly back striking engineer. One injured.

June 5, 1923, locomotive 3621, Terre Haute, Ind. Patch bolt blew out while being caulked under pressure. One injured.

Seven accidents, seven injured.

CHICAGO & NORTHWESTERN RAILWAY:

July 1, 1922, locomotive 1161, Tioga, Iowa. Cylinder cock slide rod bent. One injured.

**July 2, 1922, locomotive 1576, Milwaukee, Wis. Squirt hose burst; hose defective. One injured.

**July 9, 1922, locomotive 1873, near Utica, Minn. Reverse lever latch spring worked out permitting lever to fly forward striking engineer. One injured.

July 20, 1922, locomotive 2620, Chicago, Ill. Latch guide to power reverse lever broke in two, part of it flying back and striking engineer; latch guide of improper design. One injured.

**July 25, 1922, locomotive 1853, Chicago, Ill. Squirt hose parted at splice due to not being properly clamped. One injured.

**July 26, 1922, locomotive 867, Fort Atkinson, Wis. Ash pan wrench slipped off post due to improper fit; ash pan slides difficult to open and defect reported at end of previous trip and repairs not made. One injured.

July 27, 1922, locomotive 235, Sugar Bush, Wis. Throttle lever flew back, striking engineer; throttle lever latch very loose, latch spring weak and teeth on latch and quadrant worn. One injured.

August 3, 1922, locomotive 1606, near Ames, Iowa. Street ell in pipe to squirt hose broke. One injured.

August 10, 1922, locomotive 1528, Clinton, Iowa. Blow-off cock leaking; defect reported twice before accident occurred and repairs not made. One injured.

*August 12, 1922, locomotive 1627, North Lake, Wis. Reverse lever jerked and flew forward due to lack of lubrication, catching engineer's foot between lever and foot rest. One injured.

August 25, 1922, locomotive 1644, East Rapids, Iowa. Air pipe broke off at equalizing reservoir, causing emergency application of brakes. One injured.

*September 7, 1922, locomotive 38, Benld, Ill. Throttle flew open while engineer was reversing engine. One injured.

**September 12, 1922, locomotive 1181, Wisconsin, Wis. Fire door swung shut while fireman was shoveling coal, due to latch clip being loose and defective. One injured.

**September 12, 1922, locomotive 1089, Sussex, Wis. Apron raised up because of tender not being level due to broken frame brace. One injured.

**September 17, 1922, locomotive 1514, Grantville, Wis. Struck by cab window which fell out of place, due to frame being too small. One injured.

September 19, 1922, locomotive 1644, Dekalb, Ill. Grate shaker bar slipped off fulcrum lever due to improper fit. One injured.

September 26, 1922, locomotive 2514, Sterling, Ill. Grate shaker bar slipped off lever due to improper fit. One injured.

September 29, 1922, locomotive 1807, Buffalo, Wis. Flue broken off at defective safe end weld; overheated in welding. One injured.

**September 30, 1922, locomotive 1181, New Butler, Wis. Slipped on cab deck step due to worn and defective tread. One injured.

**October 5, 1922, locomotive 249, Milton Junction, Wis. Grate shaker bar slipped off lever. One injured.

**October 5, 1922, locomotive 1144, between Tracy and Waseca, Minn. Spring equalizers striking frame and spring rigging improperly adjusted, causing engine to ride very hard; condition reported 11 times prior to accident and not corrected. One injured.

October 5, 1922, locomotive 1080, Mequon, Wis. Glass from cab window fell striking fireman, due to frame being decayed and retaining strips missing. One injured.

October 6, 1922, locomotive 778, Fond du Lac, Wis. Grate shaker connecting rod broke. One injured.

**October 6, 1922, locomotive 165, Madison, Wis. Water glass broke; cut by flying glass. One injured.

*October 7, 1922, locomotive 1719, Baraboo, Wis. Brakeman's hand was caught between gangway step and handhold, due to insufficient clearance. One injured.

October 18, 1922, locomotive 2039, Milwaukee, Wis. Main crank pin broke off due to old flaw covering approximately 40 per cent of cross-sectional area. One injured.

October 25, 1922, locomotive 326, Missouri Valley, Iowa. Stepped into hole provided in deck to permit removal of safety chain pin which was not covered over. One injured.

November 2, 1922, locomotive 1766, near Hetland, S. Dak. Automatic fire door closed suddenly, account of defective connecting rod. One injured.

November 3, 1922, locomotive 2165, Nelson, Ill. Stud securing blow-off cock in place broke. One injured.

November 8, 1922, locomotive 2180, Milwaukee, Wis. Water glass burst. One injured.

November 9, 1922, locomotive 1702, between Winona and Waseca, Minn. Right back and right main wedges stuck, causing engine to ride very hard. One injured.

November 13, 1922, locomotive 2075, South Omaha, Nebr. Bolt securing eccentric crank to crank pin broke due to old flaw, permitting crank to turn on pin and causing reverse lever to fly back, striking engineer. One injured.

November 17, 1922, locomotive 115, near Niagara, Minn. Cab window fell, striking fireman, due to supporting strap breaking. One injured.

November 18, 1922, locomotive 1415, Steger, Mich. Whistle stuck open and could not be closed from cab. Two injured.

November 30, 1922, locomotive 1522, Escanaba, Mich. Bull's eye lubricator glass blew out. One injured.

**December 2, 1922, locomotive 1528, between Chicago and Kenosha, Wis. Dowel pin worked out of valve bull ring causing packing ring to catch in port and, in turn, caused reverse lever to fly backward, striking engineer. One injured.

December 15, 1922, locomotive 2374, Nelson, Ill. Ash pan wrench slipped off of shaft. One injured.

December 20, 1922, locomotive 1428, Manitowoc, Wis. Hand caught between throttle lever and brake valve due to insufficient clearance. One injured.

December 23, 1922, locomotive 1610, Braeside, Ill. Reverse lever flew forward striking engineer, due to insufficient clearance between reverse lever and foot rest, and valves being insufficiently lubricated. One injured.

**January 9, 1923, locomotive 985, East Clinton, Ill. Spring cover turned over due to bolts missing, causing fireman to fall. One injured.

**January 13, 1923, locomotive 689, Rhinelander, Wis. Less than one-eighth inch clearance between injector heater valve handle and cab caused engineer's hand to be caught. One injured.

January 13, 1923, locomotive 1867, Dover, Minn. Main rod broke at wedge bolt hole in back end, causing side rod and piston to be bent and front cylinder head to be knocked out; back end of main rod reported pounding on January 9 and 12 and reports indicated repairs made. One injured.

January 18, 1923, locomotive 235, Marshfield, Wis. Ice accumulated on step causing fireman to fall. One injured.

January 19, 1923, locomotive 513, Springfield, Minn. Grate shaker bar slipped off fulcrum lever; long bolt in dead grate lever prevented bar from being properly applied. One injured.

January 23, 1923, locomotive 1340, Orin, Wyo. Water glass burst. One injured.

January 25, 1923, locomotive 1872, Winona Junction, Wis. Insufficient clearance between handle of reverse lever and sander valve. One injured.

**February 3, 1923, locomotive 1348, Canby, Minn. Syphon hose blew off; hose did not properly fit nipple and was not securely clamped. One injured.

**February 5, 1923, locomotive 1875, Summit Lake, Wis. Flue broke off at safe end weld, overheated in welding. One injured.

February 6, 1923, locomotive 1336, Benld, Ill. Engineer slipped on loose boards over foot-warmer pipes in cab; wooden grating over warmer pipes missing. One injured.

**February 10, 1923, locomotive 839, Waseca, Minn. Leaks around stay bolts in cab caused fireman to contract a heavy cold. One injured.

February 10, 1923, locomotive 754, Heineman, Wis. Ice accumulated on gangway steps due to leaky tank and caused engineer to fall. One injured.

February 15, 1923, locomotive 847, Harvard, Ill. Insufficient clearance between reverse lever and feed valve attached to automatic brake valve. One injured.

February 17, 1923, locomotive 1297, near Stockton, Minn. Main rod broke due to old fracture; rod swung around knocking off blow-off cock and trailer truck box and breaking cab window; in getting out of cab engineer was struck by reverse lever which flew forward. One injured.

February 22, 1923, locomotive 1573, Chicago, Ill. Injured while attempting repairs to inoperative air brake feed valve. One injured.

**March 4, 1923, locomotive 1766, Soo Valley Junction, S. Dak. Grate shaker bar slipped off fulcrum lever due to improper fit. One injured.

**March 7, 1923, locomotive 1522, Pine Ridge, Mich. Window frame and glass broke and struck engineer. One injured.

March 29, 1923, locomotive 709, near Antigo, Wis. Stop pin in reverse lever quadrant sheared off allowing lever to go ahead and catch engineer's hand between lever and boiler back head. One injured.

April 1, 1923, locomotive 429, near Aberdeen, S. Dak. Fire door stuck open and then suddenly released catching fireman's finger. One injured.

April 2, 1923, locomotive 2223, near Janesville, Minn. Injured while reversing engine due to tumbling shaft being bent and rocker boxes too tight; condition reported on March 29 and 31 and repairs not made. One injured.

April 2, 1923, locomotive 1704, Chicago, Ill. Foot caught between handhold and tender sill due to insufficient clearance when rounding a sharp curve. One injured.

April 8, 1923, locomotive 2312, Mapleton, Wis. Fire door foot pedal worn smooth over entire surface, causing fireman's foot to slip off and fire door to close suddenly; fire door closing valve leaking. One injured.

April 8, 1923, locomotive 1621, Clarence, Iowa. Caught finger on loose jacket band; jacket not properly replaced after being removed for stay bolt examination. One injured.

April 21, 1923, locomotive 1082, near Lewiston, Minn. Whistle stuck open due to stem being bent. One injured.

April 22, 1923, locomotive 917, Beachwood, Mich. Fire door did not open properly and dropped down, catching fireman's hand. One injured.

April 25, 1923, locomotive 2173, Proviso, Ill. Scalded while attempting to open globe valve which had been applied to blow-off cock due to blow-off cock leaking. One injured.

April 26, 1923, locomotive 2612, Chicago, Ill. Oiling plug in fire door cylinder head blew out, causing fire door to close unexpectedly. One injured.

May 4, 1923, locomotive 2377, Benld, Ill. Cab apron worn smooth causing fireman to fall. One injured.

May 30, 1923, locomotive 257, Lawton, Iowa. Grate shaker rod became disconnected due to nut working off post. One injured.

June 5, 1923, locomotive 309, Redfield, S. Dak. Squirt hose parted at splice, due to being insecurely clamped. One injured.

June 7, 1923, locomotive 2160, Milwaukee, Wis. Accidentally opened blow-off cock, due to section of latch on operating lever being broken off. One injured.

June 19, 1923, locomotive 419, near Glenrock, Wyo. Squirt hose blew off nipple, due to being insecurely applied. One injured.

June 27, 1923, locomotive 2532, near Stanwood, Iowa. Shaker bar slipped off post due to improper fit. One injured.

Seventy-two accidents, 73 injured.

CHICAGO, BURLINGTON & QUINCY RAILROAD:

*July 29, 1922, locomotive 5048, Clarence, Mo. Steam pipe leaking very badly. One injured.

*July 29, 1922, locomotive 3140, Clyde, Ill. Engine was derailed on frog wye, due to tire slipping, causing reverse lever to fly back, hitting engineer. One injured.

August 5, 1922, locomotive 2532, Lincoln, Nebr. Flue ruptured at front flue sheet, due to being worn very thin. One injured.

*August 10, 1922, locomotive 504, Chicago, Ill. Engine tank derailed; tank wheel worn. One injured.

*August 14, 1922, locomotive 5060, Kidder, Mo. Engine derailed; pony truck wheel flange very sharp. One injured.

August 14, 1922, locomotive 1167, Lewiston, Ill. Water glass broke and shield gave way, due to being of too light construction. One injured.

*August 16, 1922, locomotive 1966, Hannibal, Mo. Flues were stopped up, causing back draft. One injured.

*August 19, 1922, locomotive 2081, Winchester, Ill. Tire came off back driving wheel. One injured.

September 6, 1922, locomotive 1557, Chicago, Ill. Squirt hose blew off, due to being insecurely clamped. One injured.

September 12, 1922, locomotive 2827, Dorchester, Nebr. Bolt in bottom end of link block lost out. One injured.

September 14, 1922, locomotive 1465, East St. Louis, Ill. Water glass burst; cut by flying glass. One injured.

September 25, 1922, locomotive 510, Centralia, Ill. Attempted to close squirt hose valve with wrench; valve handle missing and so reported before leaving terminal, but repairs not made. One injured.

September 30, 1922, locomotive 2109, Busch, Mo. Flue broke off at safe end weld; overheated in welding; flues reported leaking just prior to leaving terminal, but locomotive dispatched without repairs being made. One injured.

October 2, 1922, locomotive 1961, Denver, Colo. Washout plug blew out. Two injured.

October 27, 1922, locomotive 1810, Hillsdale, Ill. Squirt hose valve worked open; packing missing from valve packing nut. One injured.

November 1, 1922, locomotive 1966, Old Monroe, Mo. Grate shaker bar slipped off fulcrum lever. One injured.

November 4, 1922, locomotive 6108, Shattuc, Ill. Piece of wooden tread of gangway step broke off, account of extending out too far beyond the iron step. One injured.

November 6, 1922, locomotive 1719, St. Joseph, Mo. Bolts securing cab seat bracket to side of cab worked out, permitting bracket to work off seat rod and cause seat to fall. One injured.

November 13, 1922, locomotive 2088, Olin, Ill. Pilot knee brace came loose and fell away from pilot beam, striking employee as he stepped from pilot sill step. One injured.

November 27, 1922, locomotive 2177, near Hannibal, Mo. Slipped and fell, due to block on engine step being missing. One injured.

December 9, 1922, locomotive 2022, Byron, Nebr. Grate shaker lever slipped off lever, due to improper fit. One injured.

December 9, 1922, locomotive 2119, Humeston, Iowa. Flue broke at defective safe end weld. One injured.

December 15, 1922, locomotive 1374, Galesburg, Ill. Injector overflow valve stuck shut and while engineer was attempting to open it with wrench valve suddenly opened and hot water which had accumulated in injector and delivery pipe scalded engineer. One injured.

December 17, 1922, locomotive 3199, Chicago, Ill. Water glass burst, breaking shield, which was of faulty construction. One injured.

December 20, 1922, locomotive 4109, Browning, Ill. Washout plug blew out. One injured.

December 25, 1922, locomotive 542, Minneapolis, Minn. Bolts in pilot bracket worked off, permitting pilot to drop down, throwing brakeman to ground. One injured.

January 2, 1923, locomotive 5239, Bernhart, Iowa. Blow-off cock would not close, account being fouled by a chisel which had previously been left in water leg. One injured.

January 8, 1923, locomotive 5341, Waterman, Ill. Engine parted from train, due to coupler on rear of tender being too high and coupler on car being too low. One injured.

January 12, 1923, locomotive 2199, Lytle, Wis. Grate shaker-bar lug broke off. One injured.

January 12, 1923, locomotive 1557, Chicago, Ill. Squirt hose blew off nipple connection, due to being insecurely clamped. One injured.

January 17, 1923, locomotive 429, Wescott, Iowa. Pin worked out of reach rod, causing reverse lever to fly backward, striking engineer in forehead. One injured.

January 22, 1923, locomotive 2214, Albany, Mo. Pilot beam handhold gave way, due to bolt working out, causing engineer to fall backward. One injured.

January 25, 1923, locomotive 1685, Beardstown, Ill. Scalded by steam leaking through injector overflow-pipe. One injured.

January 26, 1923, locomotive 1968, Bevier, Mo. Foot slipped through hole in board and when brakeman grabbed pin lifter it broke, causing him to fall. One injured.

February 13, 1923, locomotive 1911, Pepin, Wis. Water glass and water-glass shield broke; cut by flying glass. One injured.

*February 16, 1923, locomotive 5345, Moorecroft, Wyo. Bonnet came out of a compressor steam valve. One injured.

February 20, 1923, locomotive 2028, Galesburg, Ill. "Bulls-eye" lubricator glass blew out; threads in retaining ring worn. One injured.

February 24, 1923, locomotive 2180, East Dubuque, Ill. Drawbar pin on engine dropped out of place, allowing engine to part from tender and fireman to fall to ground between engine and tender; drawbar pin not properly secured and safety chain between engine and tender not coupled. One injured.

**February 26, 1923, locomotive 1410, Lincoln, Nebr. Struck by cab window which was blown in; bottom guide which holds sash in place was worn and had been reported and repairs not made. One injured.

March 23, 1923, locomotive 2503, near Armour, Mo. Hook on cab seat broke allowing seat to drop. One injured.

*March 24, 1923, locomotive 2503, Block 4, Mo. Cab seat fell against engineer's leg, due to screws by which it was attached to cab-giving way. One injured.

*April 3, 1923, locomotive 5239, Lockridge, Iowa. Engine moved off, due to leaky throttle, causing fireman who was repairing governor pipe to fall to ground. One injured.

April 9, 1923, locomotive 5206, Ottumwa, Iowa. Lubricator filling-glass broke. One injured.

*April 14, 1923, locomotive 2823, Keokuk, Iowa. Injured while attempting repair on defective cylinder cock while on line of road. One injured.

**April 18, 1923, locomotive 1478, St. Louis, Mo. Headlight generator governor housing broke and was thrown upward, striking switchman. One injured.

*May 14, 1923, locomotive 2223, Thermopolis, Wyo. Transmission bar and link broke, which caused reverse lever to fly back, striking engineer. One injured.

June 1, 1923, locomotive 2138, Villisca, Iowa. Water glass and shield broke; cut by flying glass. One injured.

June 6, 1923, locomotive 1441, East St. Louis, Ill. Bolt in footboard hanger broke and flew out, striking switchman. One injured.

**June 13, 1923, locomotive 2866, Louisiana, Mo. Foot was caught and ankle broken, due to lid of box on top of tender being missing. Space between box and backboard filled with coal and considerable coal in box. One injured.

June 30, 1923, locomotive 959, Hannibal, Mo. Blow-off cock discharge pipe blew off, due to badly worn threads in cock and on nipple. One injured.

Fifty accidents, 51 injured.

CHICAGO GREAT WESTERN RAILROAD:

July 26, 1922, locomotive 354, St. Joseph, Mo. Center arch tube burst, due to being overheated, caused by accumulation of mud and scale in front water leg and boiler not washed as often as water conditions required in accordance with rule 45. Two injured.

November 9, 1922, locomotive 750, East Stockton, Ill. Flue broke at bead on back flue sheet and pulled through sheet; flue very thin, due to excessive working, and beads on this and other adjacent flues were partly gone; flues in generally bad condition. Four injured.

November 12, 1922, locomotive 508, near Empire, Minn. Side rod broke and swung around, puncturing door sheet, due to old flaw in rod which should have been detected by proper inspection. Two injured.

*December 9, 1922, locomotive 806, Graf, Iowa. Fire door came apart, due to nut working off. One injured.

*December 24, 1922, locomotive 757, Marshalltown, Iowa. Grate shaker-bar broke, due to defective weld. One injured.

*March 30, 1923, locomotive 729, Lindenwood, Ill. Squirt hose blew off nipple. One injured.

Six accidents, 11 injured.

CHICAGO, MILWAUKEE & ST. PAUL RAILWAY:

July 27, 1922, locomotive 8648, East Rio, Wis. Blow-off cock stuck open, due to obstruction on seat. One injured.

*August 1, 1922, locomotive 2143, Berlin, Wis. Eccentric strap broke. One injured.

*August 1, 1922, locomotive 2109, Barnard, S. Dak. Board in coal gate gave way. One injured.

August 11, 1922, locomotive 7617, Milwaukee, Wis. Ash-pan blower pipe burned off. One injured.

*August 14, 1922, locomotive 304, Avoca, Wis. Ash pan and grates dropped down truck, tearing brake rigging off and causing derailment. One injured.

August 18, 1922, locomotive 526, Austin, Minn. Washout plug blew out; attempted to tighten under pressure; plug applied cross threaded and threads on plug stripped. One injured.

*August 29, 1922, locomotive 2887, Savanna, Ill. Reverse lever unlatched account of valves being dry. One injured.

*September 3, 1922, locomotive 2440, Techy, Ill. Side rod broke. One injured.

September 17, 1922, locomotive 5011, Tacoma Junction, Wash. Water glass burst; cut by flying glass or other matter. One injured.

**October 1, 1922, locomotive 2360, between Rudolph and Junction City, Wis. Squirt hose burst; hose worn thin by rubbing on apron. One injured.

**October 25, 1922, locomotive 8086, Luton, Iowa. While shaking grates, cotter key sheared, allowing pin to come out, disconnecting the grates. One injured.

November 15, 1922, locomotive 7028, St. Paul, Minn. Injector overflow-valve bonnet and spanner nut blew off; threads in spanner nut were badly worn and nut could be slipped on to within two threads of its seat without engaging threads. One injured.

November 16, 1922, locomotive 5006, Perry, Iowa. Cylinder head blew out. One injured.

November 24, 1922, locomotive 6511, Almora, Ill. Patch bolt blew out of combustion chamber seam; threads in sheet were badly deteriorated and patch bolt had been broken and partly welded over; fire box in poor condition and several staybolts and rivet had heads welded over. One injured.

*November 24, 1922, locomotive 6538, between Chicago and Nahant, Iowa. Grate shaker-bar slipped off fulcrum lever. One injured.

November 25, 1922, locomotive 3111, Marquette, Iowa. Water glass and water-glass shield burst, causing injuries to engineer which resulted in the loss of one eye. One injured.

December 5, 1922, locomotive 8015, Nahant, Iowa. Spring hanger broke; engineer applied air brake in emergency, injuring the conductor who was in caboose on rear of train. One injured.

*December 28, 1922, locomotive 1277, Milwaukee, Wis. Water glass burst; injured when jumping from cab. One injured.

January 1, 1923, locomotive 2612, near Loomis, S. Dak. Crown sheet failed; sheet pitted and deteriorated around stay holes to such extent that the holding power stays was seriously impaired and when slightly overheated sheet pocketed. Two injured.

January 29, 1923, locomotive 2241, Vicksburg, Ind. Air reservoir came loose, due to broken bolts and fell to ground, rebounded and struck cab. One injured.

**February 3, 1923, locomotive (C., T. H. & S. E.) 2961, Jasonville, Ind. Head-generator steam-pipe nipple broke off at fountain, due to insufficient strength of material. One injured.

February 12, 1923, locomotive 2270, Zook's Spur, Iowa. Injector steam pipe spanner nut broke while being tightened with hammer and chisel; nut cut approximately halfway through by use of improper tools. One injured.

February 20, 1923, locomotive 534, Green Bay, Wis. Grate shaker bar slipped off fulcrum lever, due to improper fit. One injured.

March 24, 1923, locomotive 8205, Delmar, Ill. Flue broke off at safe-end weld; overheated in welding. One injured.

March 27, 1923, locomotive 8288, Stockland, Ill. Grate shaker bar slipped off fulcrum lever, due to improper fit. One injured.

*May 30, 1923, locomotive 7071, Glendora, Ind. Tender and seven cars derailed, due to tender-truck center-plate casting breaking. One injured.

*June 15, 1923, locomotive 6334, Council Bluffs, Iowa. Squirt hose valve worked loose. One injured.

June 19, 1923, locomotive 2086, Murdo, S. Dak. Squirt hose blew off, due to not being properly clamped. One injured.

**June 25, 1923, locomotive 5538, La Crosse, Wis. Blow-off cock stuck open and while attempting to close valve hostler was scalded. One injured.

June 29, 1923, locomotive 8211, near Russell, Ill. Crown sheet failure caused by overheating, due to low water; crown stays which sheet pulled away from were loose; sheet; water glass very dirty, making it very difficult to see water; gauge cock drip-stopped up. Two injured.

Thirty accidents, 32 injured.

CHICAGO, ROCK ISLAND & PACIFIC RAILWAY:

*July 3, 1922, locomotive 971, Smith Center, Kans. Universal joint in injector overflow valve extension handle broke off. One injured.

July 5, 1922, locomotive 2136, Bridgeport, Tex. Side rod knuckle pin broke or lost, causing side rod to be broken and blow-off cock to be knocked off. One injured.

July 9, 1922, locomotive 3010, Cameron Junction, Mo. While attempting to get latch of power grate shaker lined up so it would engage the posts, latch flew back catching fireman's hand. One injured.

July 18, 1922, locomotive 2317, Mercer, Mo. Crown sheet failure, due to being overheated; water glasses and shields discolored by smoke and sediment, making it very difficult if not impossible to read the water in the glasses; bottom openings to both water glasses reduced in area approximately 60 per cent by scale and sediment. Two injured.

*August 8, 1922, locomotive 1762, Marseilles, Ill. Side rod broke, causing engine to strip itself on right side. One injured.

*August 8, 1922, locomotive 312, El Reno, Okla. Reverse lever unlatched, due to worn notches on lever and quadrant. One injured.

*August 28, 1922, locomotive 2023, Cameron, Mo. Grab iron missing, causing engineer to fall. One injured.

September 7, 1922, locomotive 2054, near Sheffield, Ill. Knuckle pin worked out of side rod, permitting rod to swing around, stripping left side of engine. Two injured.

September 7, 1922, locomotive 3014, Trenton, Mo. Bonnet of turret valve blew out. One killed.

*September 11, 1922, locomotive 1848, Little Rock, Ark. Back section of grate rigging became disconnected account of cotter key coming out. One injured.

September 15, 1922, locomotive 2575, near West Liberty, Iowa. Crown sheet failure; low water; locomotive operating without water glass due to glass having broken en route; locomotive equipped with gauge cocks screwed directly in back head; initial rupture occurred in autogenously welded seam between crown sheet of combustion chamber and fire box proper. Three injured.

September 27, 1922, locomotive 2045, Plymouth, Nebr. Fulcrum casting on tender brake beam broke, allowing rigging to drop down. One injured.

October 1, 1922, locomotive 2101, near Monroe, Okla. Left injector steam pipe pulled out of collar at throttle connection, due to defective brazing. One injured.

October 15, 1922, locomotive 3022, near Keystone, Mo. Power grate shaker was inoperative and while attempting to shake grates by hand fireman was injured, power grate shaker reported defective on October 1, 3, 6, 9, and 14, and reports approved indicating repairs made. One injured.

October 27, 1922, locomotive 1643, Purdy, Okla. Steam pipe broke off at fountain. One injured.

*November 21, 1922, locomotive 241, Des Moines, Iowa. Step on tender broke. One injured.

**November 24, 1922, locomotive 2507, Cline, Kans. Slipped and fell due to bolts securing gangway step being loose, permitting step to slant $1\frac{1}{2}$ inches. One injured.

November 28, 1922, locomotive 2567, Eldon, Mo. Squirt hose blew off due to being insecurely clamped. One injured.

*November 28, 1922, locomotive 2313, Cambridge, Iowa. Grate shaker bar broke. One injured.

November 30, 1922, locomotive 415, near Dubach, La. Scalded by steam and water coming from squirt hose which had been cut by apron. One injured.

December 5, 1922, locomotive 3003, Harvard, Iowa. Hose used for cleaning ash pan blew off nipple due to not having been securely applied. One injured.

December 6, 1922, locomotive 3007, Sharon, Iowa. Grate shaker bar slipped off fulcrum lever due to improper fit. One injured.

December 9, 1922, locomotive 1504, near Radcliffe, Iowa. Nipple in injector steam pipe broke off at fountain connection. One injured.

**December 13, 1922, locomotive 1249, Enid, Okla. "Y" fitting in injector delivery pipe burst. One injured.

*December 27, 1922, locomotive (number not given), Cline, Kans. Burned by steam escaping from lubricator oil pipe. One injured.

December 31, 1922, locomotive 1881, Inver Grove, Minn. Flue pocket blew out of front flue sheet due to not having been properly applied; tube had not been rolled tight and was not prossered or beaded; four other flue pockets had been similarly applied to front flue sheet and five applied to back flue sheet had not been beaded, flues generally in poor condition, and had been reported leaking numerous times. Two injured.

*January 2, 1923, locomotive 1711, Joliet, Ill. Grate shaker bar broke. One injured.

January 10, 1923, locomotive 3009, Altamont, Mo. Handhold missing from headlight shelf, causing engineer to fall. One injured.

*January 11, 1923, locomotive 2613, Cline, Kans. Injured while attempting to close blow-off cock which stuck open. One injured.

January 20, 1923, locomotive 908, near Jamesport, Mo. Crown sheet failure caused by overheating due to low water; water glass had broken about two hours prior to accident and had not been replaced; monthly inspection and repair report filed three days prior to accident showed water glass cocks to have been cleaned, yet examination showed opening in bottom cock reduced to about one thirty-second inch in diameter.

One injured.

January 22, 1923, locomotive 1136, Lake Park, Iowa. Left front and back side rods broke; blow-off cock was knocked off permitting steam to enter cab. Two injured.

January 30, 1923, locomotive 1935, near Mineola, Kans. Crown sheet failure due to button heads on radial stays having been damaged by long and continued caulking and hammering; threads on radial stays and in sheet were badly corroded and wasted away due to leakage until their holding power was insufficient to render proper support to the crown sheet. Three injured.

*February 8, 1923, locomotive 2312, Sheffield, Iowa. Grate shaker bar broke. One injured.

*February 12, 1923, locomotive 1135, Garrison, Iowa. Boiler check cap blew off. One injured.

March 10, 1923, locomotive 815, near Atlantic, Iowa. Bolt in transmission bar broke, permitting link block to drop and reverse lever to fly forward, catching engineer's hand between lever and boiler back head. One injured.

March 14, 1923, locomotive 1575, Ingersoll, Okla. Step on smoke box gave way, while engineer was attempting to repair headlight cage, due to nut missing from bolt securing step. One injured.

March 18, 1923, locomotive 1686, near Hurley, Iowa. Left main rod and piston rod broke; main rod broke where section had been burned away to clear knuckle pin; main frame broken on left side; driving gear in generally poor condition prior to accident; numerous defects in running and driving gear had been reported and repairs were either neglected or improperly made. Two injured.

*March 26, 1923, locomotive 212, El Reno, Okla. Throttle lever stuck open and when endeavoring to close it engineer was injured. One injured.

**April 22, 1923, locomotive 3025, Holt, Mo. Grate shaker bar slipped off fulcrum lever due to improper fit. One injured.

*May 10, 1923, locomotive 1773, Calion, Ark. Blow-off cock stuck open. One injured.

May 11, 1923, locomotive 1927, Greensburg, Kans. Injector delivery pipe split in seam for a distance of 37 inches, causing fireman to be scalded and blown from running board to ground where he struck on his head and shoulders. One injured.

May 23, 1923, locomotive 1851, Little Rock, Ark. Tender sill step at gangway was bent, causing engineer to fall to ground with arm on adjacent track where it was run over by another train. One injured.

*June 2, 1923, locomotive 1901, El Reno, Okla. Squirt hose blew off. One injured.

*June 3, 1923, locomotive 217, Cedar Rapids, Iowa. Throttle stuck while attempting to close it. One injured.

June 14, 1923, locomotive 222, El Reno, Okla. Spanner nut on delivery pipe at check valve broke while an attempt was being made to tighten under pressure, which permitted valve seat to blow out; spanner nut too large and could be applied to full depth of threads without turning; check was ground in one day prior to accident and the defective spanner nut reapplied. One injured.

June 18, 1923, locomotive 2501, near Eldon, Mo. Struck fire door which would not stay open due to pneumatic opener not being properly adjusted. One injured.

June 24, 1923, locomotive 1922, Groveland, Kans. Grate shaker bar slipped off lever. One injured.

*June 25, 1923, locomotive 122, Cedar Rapids, Iowa. Squirt hose burst. One injured.

**June 27, 1923, locomotive 1760, Haileyville, Okla. Grate shaker bar slipped off post. One injured.

*June 29, 1923, locomotive 1543, Hartford, Iowa. Reverse lever unlatched and flew back due to teeth in quadrant being worn. One injured.

Fifty accidents, one killed, 58 injured.

CHICAGO, ST. PAUL, MINNEAPOLIS & OMAHA RAILWAY:

July 7, 1922, locomotive 319, Carney, Minn. Right main crank pin broke due to flaw in material, causing rods to bend and break which in turn broke injector delivery pipe. One injured.

July 20, 1922, locomotive 274, Pender, Nebr. Priming valve blew out of injector due to defective threads on bonnet. One injured.

**August 22, 1922, locomotive 327, Spooner, Wis. Engine and tender derailed and tipped over due to rigid tender truck. One injured.

September 4, 1922, locomotive 290, Sioux City, Iowa. Reverse lever flew forward catching engineer's hand between lever and boiler back head; balance ring in valve broken and stop pin improperly located in quadrant. One injured.

**September 23, 1922, locomotive 138, Currie, Minn. Tubular lubricator glass burst. One injured.

October 14, 1922, locomotive 340, Medelia, Minn. Tender derailed due to flange on tender truck wheel being sharp and vertical; flange was twenty-seven thirty-seconds inch thick and had flat vertical surface of fifteen-sixteenths inch. One injured.

**November 14, 1922, locomotive 422, Augusta, Wis. Grates became disconnected due to pin working out of back end of connecting rod. One injured.
Seven accidents, seven injured.

CINCINNATI, INDIANAPOLIS & WESTERN RAILROAD:

*February 28, 1923, locomotive 305, Connersville, Ind. Glass slipped back in cab window frame cutting engineer's fingers. One injured.

March 8, 1923, locomotive 309, near Indianapolis, Ind. Flue broke off at back flue sheet and was forced through front flue sheet until it struck superheater units; flue showed that it had been excessively prossered or worked until it was very thin; flues had been reported leaking on March 1, 2, 3, 4, 5, and 6. Two injured.
Two accidents, three injured.

CLEVELAND, CINCINNATI, CHICAGO & ST. LOUIS RAILWAY:

**July 17, 1922, locomotive (C. N.) 7037, Carlisle Junction, Ohio. Valve stem to blow-off cock pulled out of valve, due to being improperly applied. One injured.
August 16, 1922, locomotive 6176, Springfield, Ohio. Arch tube burst due to overheating. Two injured.

September 5, 1922, locomotive 6752, near Patterson, Ohio. Bolt securing guide yoke broke causing valve gear which was attached to guide yoke to drop down; bolts reported defective five times immediately prior to accident and engine dispatched without proper repairs being made. One injured.

**October 10, 1922, locomotive 6742, Grants, Ohio. Side rod knuckle pin came out, permitting rods to fly around and strike steam valve, which caused steam to enter firebox and force fire and steam into cab. Three injured.

November 23, 1922, locomotive 6107, South Anderson, Ind. Engine derailed, due to broken hanger to trailer spring causing, handhold at gangway to strike deck plank, catching fireman's hand. One injured.

May 4, 1923, locomotive 7451, Danville, Ill. Exhaust valve of air brake distributing valve broke, rendering brakes inoperative and causing collision. One injured.
Six accidents, nine injured.

COLORADO & SOUTHERN RAILWAY:

*January 9, 1923, locomotive 641, Trinidad, Colo. Scalded by water coming from defective blow-off cock. One injured.

June 20, 1923, locomotive 614, Semper, Colo. Grease cup bushing broke and blew out of side rod, causing fatal injury of engineer and serious injury of fireman. Two injured.

Two accidents, three injured.

DELAWARE & HUDSON Co.:

August 17, 1922, locomotive 1062, near Center Village, N. Y. Lubricator pipe to air compressor broke off; pipe not clamped to avoid vibration. One injured.

September 21, 1922, locomotive 1096, Colonie, N. Y. Handhold gave way, due to supporting stud working out. One injured.

November 8, 1922, locomotive 32, Troy, N. Y. Reverse lever unlatched, due to quadrant being loose; quadrant reported loose twice immediately preceding accident and repairs not made. One injured.

November 16, 1922, locomotive 725, Carbondale, Pa. Cylinder heads blew off. One injured.

November 19, 1922, locomotive 1078, Nineveh, N. Y. Flue failed at safe end weld; overheated in welding. One injured.

December 30, 1922, locomotive 1207, Oneonta, N. Y. Cylinder platform loose, causing trainman to fall; two bolts in platform sheet broken and two bolts pulled through sheet. One injured.

**January 11, 1923, locomotive 1020, Carbondale, Pa. Glass in cab door broke, due door being defective. One injured.

January 23, 1923, locomotive 1605, near Ararat, Pa. Flue broke off at defective safe end weld. Two injured.

March 5, 1923, locomotive 52, Binghamton, N. Y. Locomotive moved forward about of throttle valve leaking. One injured.

March 30, 1923, locomotive 1094, Cobleskill, N. Y. Sprained ankle when he stepped on apron, due to tender deck being approximately 4 inches higher than cab deck. One injured.

April 3, 1923, locomotive 794, Worcester, N. Y. Piece of wire attached to gangway safety chain to lengthen it broke, causing fireman to fall. One injured.

May 5, 1923, locomotive 1000, Tunnel, N. Y. Crown sheet failure, caused by overheating due to low water; water glass and shield in rear cab were so dirty it was difficult to observe registration. Two injured.

May 24, 1923, locomotive 538, near Mechanicville, N. Y. Injured while operating reverse lever, which would not stay latched in quadrant. One injured.

Thirteen accidents, 15 injured.

DELAWARE, LACKAWANNA & WESTERN RAILROAD:

*July 12, 1922, locomotive 986, Roseville Avenue (place not given). Curtain rod broke and fell, striking fireman. One injured.

August 1, 1922, locomotive 373, Gravel Place, Pa. Injector delivery pipe connection failed, due to threads on spanner nut being badly worn and nut mutilated by the use of hammer and chisel. One injured.

*August 9, 1922, locomotive 166, East Buffalo, N. Y. Shaker bar slipped off post, due to improper fit. One injured.

August 26, 1922, locomotive 852, Waterloo, N. J. Crown sheet failure, due to low water; no contributory causes found. One injured.

September 2, 1922, locomotive 751, Waverly, N. Y. Grate shaker bar slipped off drum lever. One injured.

**January 27, 1923, locomotive 767, Taylor, Pa. Rung in ladder on rear end of tender missing, causing fireman to fall. One injured.

*March 12, 1923, locomotive 1239, near Lowman, N. Y. Piston rod broke, causing cylinder head to be knocked out. One injured.

March 15, 1923, locomotive 166, East Buffalo, N. Y. Drawbar and safety chains broke, permitting locomotive and tender to separate; drawbar badly crystallized and a flaw extended through approximately one-fourth of its area; one of the yoke bolts which safety chain was attached was practically broken off on one side prior to accident. One injured.

March 17, 1923, locomotive 1121, Scranton, Pa. Extension handle to injector over-heat valve was bent, which prevented valve from being closed and resulted in fireman being burned. One injured.

March 29, 1923, locomotive 23, Binghamton, N. Y. Handhold bracket on front end of locomotive was loose and turned, which allowed handhold to fall out of place when fireman held it, and caused switchman to fall in front of locomotive while it was moving forward; handhold reported disconnected on March 26 and proper repairs not made. One killed.

*May 19, 1923, locomotive 732, Utica, N. Y. Ash-pan lever slipped off post, due to improper fit. One injured.

*May 28, 1923, locomotive 1151, Port Morris, N. J. Grate connecting rod became disconnected while fireman was shaking grates, causing him to fall. One injured.

**June 25, 1923, locomotive 360, Oswego, N. Y. Operating lever to ash-pan slides slipped off post, due to improper fit. One injured.

Thirteen accidents, 1 killed, 12 injured.

DENVER & RIO GRANDE WESTERN RAILROAD SYSTEM:

**September 5, 1922, locomotive 1181, near Pando, Colo. Reverse lever quadrant slipped down, permitting reverse lever to fly forward, striking engineer; studs supporting front end of quadrant had been broken off for some time and quadrant blocked with a piece of wood; quadrant reported defective ten times immediately prior to accident and seven times after accident occurred; broken studs at front end of quadrant reported immediately before accident and repairs not made. One injured.

* September 10, 1922, locomotive 1255, Pueblo, Colo. Cylinder cock rigging came down, due to connecting bolt losing out and caught in track, causing cylinder-cock lever to fly back and strike hostler. One injured.

October 16, 1922, locomotive 781, Akin, Colo. Boiler check stop valve and bonnet blew out, due to defective threads on bonnet and bonnet too small. One injured.

* October 18, 1922, locomotive 616, Denver, Colo. Shaker bar too long, preventing sufficient clearance between bar and tank. One injured.

* October 24, 1922, locomotive 1110, Rifle, Colo. Side rod broke. One injured.

* November 4, 1922, locomotive 581, Alamosa, Colo. Sand pipe broke off and was thrown upward, striking switchman. One injured.

* December 7, 1922, locomotive 214, Moffat, Colo. Side rod broke. One injured.

December 12, 1922, locomotive 615, Grand Junction, Colo. Tubular water glass burst. One injured.

February 4, 1923, locomotive 1153, Walsenburg, Colo. Squirt hose valve body cracked, permitting valve bonnet and valve to blow out. One injured.

April 24, 1923, locomotive 1061, Minturn, Colo. Reverse lever suddenly went from front to back of quadrant, catching foreman's arm, due to oil cylinder of power reverse gear having been inverted in applying. One injured.

May 26, 1923, locomotive 554, Salida, Colo. Water glass burst. One injured.

** June 15, 1923, locomotive 915, LaVeta Pass, Colo. Hand mashed, due to dump grate lever catching on injector feed pipe. One injured.

* June 21, 1923, locomotive 460, Marshall Pass, Colo. Fire door unlatched and caught fireman's hand, due to latch being loose. One injured.

Thirteen accidents, 13 injured.

DENVER & SALT LAKE RAILROAD:

* December 22, 1922, locomotive 402, Phillipsburg, Colo. Spanner nut on injector delivery pipe broke while being tightened with hammer and chisel. One injured. One accident, one injured.

DETROIT & MACKINAC RAILWAY:

* September 12, 1922, locomotive 150, Greenbush, Mich. Flue burst. One injured. One accident, one injured.

DETROIT, TOLEDO & Ironton RAILROAD:

** September 25, 1922, locomotive 7, Napoleon, Ohio. Side rod broke. One injured. One accident, one injured.

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY:

* October 20, 1922, locomotive 412, Chassell, Mich. Spring hanger broke. One injured. One accident, one injured.

EDWARD HINES YELLOW PINE TRUSTEES RAILROAD:

** August 3, 1922, locomotive 1210, Gum Pond, Miss. Crown sheet failure, due to low water; no contributory causes found; appurtenances damaged to such extent their previous condition could not be determined. One killed, five injured. One accident, one killed, five injured.

EL PASO & SOUTHWESTERN RAILROAD:

* September 20, 1922, locomotive 296, Osborn, Ariz. Pilot step gave way with engineer, due to being cracked and bent when piston rod broke off in crosshead, knocking out cylinder head. One injured. One accident, one injured.

ERIE RAILROAD:

** July 30, 1922, locomotive 3011, Kirkwood, N. Y. Side rod knuckle pin worked out, causing side rods to strip left side of engine. One injured.

August 9, 1922, locomotive 1805, Jamestown, N. Y. Grate shaker connecting rod broke at defective weld. One injured.

** August 16, 1922, locomotive 2564, Owego, N. Y. Main rod strap broke; old fracture at point of failure covering approximately 50 per cent of cross-sectional area. One injured.

August 26, 1922, locomotive 3092, Youngstown, Ohio. Struck by blow-off cock discharge pipe which was not secured in place. One injured.

* September 2, 1922, locomotive 3095, Olean, N. Y. Air pipe on tender was broken, causing emergency application of brakes. One injured.

September 25, 1922, locomotive 1467, Corning, N. Y. Reverse lever unlatched and flew back, due to weak latch spring. One injured.

* September 27, 1922, locomotive 808, Croxton, N. J. Knuckle on rear of engine tank dropped out of drawhead, account of pin missing. One injured.

December 10, 1922, locomotive 1731, Niagara Falls, N. Y. Vertical handhold at rear of tender gave way causing brakeman to fall; handhold consisted of two columns supporting a piece of pipe which was too short to properly engage columns and was not secured in place. One injured.

* December 20, 1922, locomotive 2035, Coleman, Ohio. Spring hanger broke. One injured.

February 4, 1923, locomotive 1607, near Susquehanna, Pa. Crown sheet failure caused by overheating due to low water; gauge cocks applied directly in back boiler head; flutes of reflex type water glass worn bad, making it difficult to determine the true water level in water glass. One injured.

February 16, 1923, locomotive 3024, Highland Mills, N. Y. Stud supporting running board bracket blew out, due to loose fit in sheet; condition reported immediately prior to accident but repairs were not made. Three injured.

* February 18, 1923, locomotive 2083, Hammond, Ind. Chafing iron between engine and tender fell out causing fireman to be caught between tank and cab frame. One injured.

March 9, 1923, locomotive 3033, Graham, N. Y. Flue failed at safe end weld due to overheating in welding. One injured.

April 19, 1923, locomotive 1870, Black Rock, N. Y. Bolts connecting eccentric became loose, permitting eccentric to separate and reverse lever to unlatch and fly back, striking the engineer. One injured.

June 11, 1923, locomotive 1549, Lake Ariel, Pa. Link saddle bolt broke causing reverse lever to move suddenly and catch engineer's arm between brake valve pipe and reverse lever. One injured.

June 23, 1923, locomotive 3174, Secaucus, N. J. Bushing on heater pipe which extended from stoker steam pipe to booster steam pipe broke off, due to being of insufficient thickness and pipe not clamped to prevent vibration. One injured.

June 25, 1923, locomotive 4004, Harding, Ohio. Crown sheet failure, caused by overheating due to low water; bottom water glass cock stopped up by gasket which was squeezed past and over end of stem, middle and bottom gauge cocks stopped up with mud and top gauge cock partly stopped up with mud; gauge cock dripper stopped up; openings in right injector feed pipe strainer were badly restricted by lint and hemp. Two killed; two injured.

June 26, 1923, locomotive 117, Jersey City, N. J. Hand caught between tender deck and handhold due to insufficient clearance caused by adjusting wedge between engine and tender being out of place. One injured.

Eighteen accidents, 2 killed, 21 injured.

FLORIDA EAST COAST RAILWAY:

July 17, 1922, locomotive 150, New Smyrna, Fla. Part of wooden tread on tender step broke off, causing switchman to fall. One injured.

January 3, 1923, locomotive 100, near Roy, Fla. Injector steam pipe pulled out of brazing collar, due to defective brazing. One injured.

* April 14, 1923, locomotive 69, Fort Pierce, Fla. Water glass burst. One injured. Three accidents, three injured.

FORT WORTH & DENVER CITY RAILWAY:

* August 20, 1922, locomotive 401, Fort Worth, Tex. Pilot caught in guard rail, causing conductor who was riding pilot to fall. One injured.

December 14, 1922, locomotive (C. & S.) 521, Texline, Tex. Injector steam pipe collar and spanner nut broke off at injector connection; nut mutilated by use of chisel set in tightening. One injured.

Two accidents, two injured.

GRAND TRUNK RAILWAY SYSTEM:

** February 16, 1923, locomotive 2254, Detroit, Mich. Injector overflow pipe pulled away from injector due to badly worn spanner nut; this joint reported leaking a day prior to accident and proper repairs not made. One injured.

** February 28, 1923, locomotive 431, Pontiac, Mich. Street ell fitting in foot warmer broke off, causing fireman to be burned. One injured.

* June 1, 1923, locomotive 1806, Detroit, Mich. Driving spring hanger broke. One injured.

Three accidents, three injured.

GREAT NORTHERN RAILWAY:

July 22, 1922, locomotive 1836, Monitor, Mont. Injector steam pipe defective and leaking; defect reported on July 1, when repairs were made by applying a rubber patch fastened with two tank hose clamps. One injured.

*July 25, 1922, locomotive 1449, St. Paul, Minn. Injured by steam escaping from pipe connection to steam governor, account of connection not properly tightened. One injured.

*August 1, 1922, locomotive 1076, Naylor, Wash. Left main crank pin broke due to old flaw, causing side rods to break and train to be derailed. One injured.

*August 5, 1922, locomotive 2013, Garry, Mont. Engine step gave way, due to bolts breaking off. One injured.

*August 19, 1922, locomotive 748, Dean, Wash. Water glass broke; cut by flying glass. One injured.

September 3, 1922, locomotive 1178, Power, Mont. Lower section of right injector overflow pipe missing. One injured.

**October 7, 1922, locomotive 3243, Irby, Wash. Hinge on tank manhole cover broken, causing fireman to fall to the ground. One injured.

**October 17, 1922, locomotive 3210, Galaton Hill, Mont. Right front section of grates became disconnected, causing fireman to fall. One injured.

October 27, 1922, locomotive 3138, Cut Bank, Mont. Grate shaker bar slipped off of fulcrum lever due to improper fit. One injured.

October 31, 1922, locomotive 1205, Cut Bank, Mont. Squirt hose burst; hose defective. One injured.

*November 10, 1922, locomotive 1127, Ruthon, Minn. Side rod strap bolts broke. One injured.

*November 16, 1922, locomotive 1103, Tumwater, Wash. Struck by piece of cylinder head which was knocked out, due to crosshead key shearing off. One injured.

**November 27, 1922, locomotive 3246, Columbia River, Wash. Grate shaker bar slipped off fulcrum lever. One injured.

**November 30, 1922, locomotive 1428, Temple, N. Dak. Piston head broke. One injured.

**December 1, 1922, locomotive 3111, Chelsea, Mont. Shaker bar slipped off post due to improper fit; shaker post badly worn. One injured.

December 4, 1922, locomotive 3133, Bowdoin, Mont. Shaker bar slipped off post due to improper fit; posts worn. One injured.

**December 5, 1922, locomotive 2023, near Essex, Mont. Back boiler head cracked, causing serious leak under jacket and while trying to determine source of leak, engineer was injured. One injured.

December 16, 1922, locomotive 2020, Chattaroy, Wash. Grate shaker bar slipped off fulcrum lever due to improper fit. One injured.

**December 18, 1922, locomotive 1434, Butte, Mont. Insufficient clearance between coupler pin lifter and back beam caused switchman's hand to be caught. One injured.

**December 23, 1922, locomotive 598, Redland, Minn. Tubular lubricator glass burst. One injured.

**December 28, 1922, locomotive 3026, Hillyard, Wash. Pin in forward end of reverse lever quadrant missing, allowing reverse lever to catch hostler's hand between lever and boiler head. One injured.

January 5, 1923, locomotive 1312, Fortine, Mont. Pilot step turned, due to bolts being loose, causing brakeman to fall. One injured.

**January 15, 1923, locomotive 3242, Irby, Wash. Shaker bar slipped off post due to improper fit; post worn. One injured.

January 16, 1923, locomotive 1564, Willmar, Minn. Water glass and water glass shield broke; cut by flying glass. One injured.

January 16, 1923, locomotive 3098, Brockton, Mont. Grate shaker bar slipped off fulcrum lever due to improper fit; lever badly worn. One injured.

**January 18, 1923, locomotive 1138, Redland, Minn. Gangway step gave away due to supporting bracket being broken. One injured.

January 22, 1923, locomotive 1152, Calumet, Minn. Tank leaking at front corner caused ice to accumulate on sill step and fireman to slip off step. One injured.

**January 26, 1923, locomotive 1505, near Noyes, Minn. Steam pipe to air compressor broke off. One injured.

**January 31, 1923, locomotive 555, Great Falls, Mont. Piece of steel thrown by a loose driving wheel tire struck fireman in the eye. One injured.

February 2, 1923, locomotive 1168, Collins, Mont. Tool box cover on back of tender was broken. One injured.

February 11, 1923, locomotive 3090, Aylmer, N. Dak. Pin worked out of grate connecting rod causing fireman's hand to strike oil can tray. One injured.

February 14, 1923, locomotive 3042, Sandstone, Minn. Shaker bar slipped off post due to improper fit. One injured.

February 18, 1923, locomotive 3003, Smith Lake, Minn. Flue pocket blew out of front flue sheet due to being improperly applied. Three injured.

February 27, 1923, locomotive 1143, Fisher, Minn. Side rod knuckle pin worked out. One injured.

February 28, 1923, locomotive 86, Devils Lake, N. Dak. Driver brake fulcrums defective and broken. One injured.

February 28, 1923, locomotive 3139, Katka, Idaho. Stumbled over bolt which protruded above top of tank approximately 6 inches. One injured.

March 12, 1923, locomotive 56, Superior, Wis. Handrail on tender broke causing fireman to fall to ground; handrail supports were badly rusted away where riveted to tender cistern and broke off. One injured.

March 22, 1923, locomotive 1313, Whitefish, Mont. Reverse lever suddenly flew forward, catching engineer's hand, due to counterbalance spring being weak. One injured.

March 30, 1923, locomotive 1539, near Elk River, Minn. Side rod broke due to old fracture, causing rod collar to break and rod to come off crank pin and fly upward, striking cab floor. One injured.

April 4, 1923, locomotive 3140, Hornby, Idaho. Shaker bar slipped off post due to improper fit; shaker post and bar worn. One injured.

April 5, 1923, locomotive 904, Devils Lake, N. Dak. Washout cap blew off while attempting to tighten under pressure; cap was approximately one-sixteenth inch too large for the nipple on which it was applied. One killed, two injured.

April 16, 1923, locomotive 3201, near Roach, N. Dak. Crown sheet failure caused by overheating due to low water; no contributory causes found; some of the appurtenances damaged to such extent that their condition prior to accident could not be determined. Three killed.

April 18, 1923, locomotive 203, near Hillyard, Wash. Main pin broke, due to a flaw covering approximately three-fourths of cross sectional area. One injured.

May 8, 1923, locomotive 413, at Barnesville, Minn. Slipped and fell under locomotive, causing loss of one foot and otherwise seriously and permanently injured, due to gangway step being coated with ice caused by leak in tender cistern. One injured.

May 12, 1923, locomotive 2022, Doody, Mont. Handrail gave way. One injured.

May 27, 1923, locomotive 3004, Atwater, Minn. Brake pipe became disconnected in brake valve, due to union nut working off, causing emergency application of brakes. One injured.

May 31, 1923, locomotive 950, Monticello, Minn. Gangway step gave way, due to hanger breaking and the other bending; step hanger had old fracture over about 50 per cent of cross sectional area. One injured.

June 5, 1923, locomotive 1451, Hillyard, Wash. Burned by steam and hot water when ash-pan swipe valve was opened; ash-pan swipe had been disconnected and not properly plugged. One injured.

June 15, 1923, locomotive 1121, Struble, Iowa. Air hose on rear of tender pulled off of nipple, due to being insecurely clamped, causing emergency application of brakes. One injured.

June 19, 1923, locomotive 521, York, N. Dak. Squirt hose valve worked open. One injured.

Forty accidents, 4 killed, 52 injured.

MOBILE & NORTHERN RAILROAD:

October 9, 1922, locomotive 105, Burnside, Miss. Derailed, due to broken pedestal on engine tank. One injured.

One accident, one injured.

CKING VALLEY RAILWAY:

August 31, 1922, locomotive 159, Columbus, Ohio. Lubricator sight feed glass broken. One injured.

September 23, 1922, locomotive 203, near Delaware, Ohio. Stoker steam jet pipe tube split, causing dial glass to be shattered and blown out, causing serious injury to fireman's eye. One injured.

June 23, 1923, locomotive 210, South Columbus, Ohio. Washout cap blew out while attempting to tighten under pressure; cap improperly applied. One injured.

Three accidents, three injured.

ILLINOIS CENTRAL RAILROAD:

*August 1, 1922, locomotive 1016, near Sullivan, Ind. Main rod strap broke, due to old flaw. One injured.

August 8, 1922, locomotive 1160, near Millwood, Ky. Injector steam pipe collar broke. One injured.

**August 16, 1922, locomotive 3518, Fort Dodge, Iowa. Bonnet on squirt hose valve leaking. One injured.

October 6, 1922, locomotive 951, Stoy, Ill. Injector steam pipe broke off at turret connection; collar reduced to one-eighth inch in thickness so as to fit spanner nut and pipe did not extend through collar. One injured.

October 13, 1922, locomotive 1506, Chicago, Ill. Foot slipped off fire door pedal and went through hole around grate shakers in false deck, which was too large for safety. One injured.

**October 24, 1922, locomotive 490, Decatur, Ill. Reverse lever flew forward, due to defective latch, causing engineer to be thrown against cab. One injured.

**October 25, 1922, locomotive 1719, Barlow, Ky. Locomotive moved off, due to leaky throttle and to brakes leaking off, causing fireman's foot to be caught. One injured.

November 4, 1922, locomotive 845, Carbondale, Ill. Broken rivet blew out of fire box side sheet while adjacent rivet was being caulked under pressure. Two injured.

November 21, 1922, locomotive 855, Chicago, Ill. Delivery pipe blew out of boiler check, due to threads on pipe being flat and too small. One injured.

*December 20, 1922, locomotive 579, Asylum, Miss. Staybolt blew out, due to defective threads. One injured.

*February 23, 1923, locomotive 1628, Chicago, Ill. Sand pipe broke. One injured.

March 2, 1923, locomotive 1741, Samoset, Ala. Side rod grease cup burst and piece of cup struck engineer. One injured.

**March 8, 1923, locomotive 3530, Chicago, Ill. Stepped into hole in cab deck, due to trapdoor being defective. One injured.

March 11, 1923, locomotive 340, East St. Louis, Ill. Grate shaker bar slipped off fulcrum lever, due to improper fit. One injured.

**June 21, 1923, locomotive 2951, Paducah, Ky. Blow off cock was accidentally opened, due to lever being too long and not latched. One injured.

Fifteen accidents, 16 injured.

INDIANA HARBOR BELT RAILROAD:

**July 6, 1922, locomotive 9, Hammond, Ind. Reverse lever jumped out of quadrant, due to accumulation of foreign matter in quadrant teeth and reverse lever fulcrum pin and tumbling shaft box badly worn. One injured.

**October 16, 1922, locomotive 162, Gibson, Ind. Blow-off cock inoperative; square on blow-off cock spindle was rounded and nut that holds lever in place was loose, allowing lever to turn on spindle. One injured.

November 17, 1922, locomotive 159, Gibson, Ind. Stud securing pneumatic fire door guide in place broke off, permitting guides to spread and section of fire door to fall, striking fireman. One injured.

June 29, 1923, locomotive 323, Blue Island, Ill. Arch tube plug blew out while being tightened under pressure on instructions from foreman; threads stripped and heavy shoulder on plug caused by accumulation of graphite. One injured.

Four accidents, four injured.

INTERNATIONAL-GREAT NORTHERN RAILROAD.

* August 23, 1922, locomotive 206, Goodwin, Tex. Driving axle broke. One injured.

* November 3, 1922, locomotive 152, Pearsall, Tex. Scalded due to blow-off cock leaking. One injured.

March 27, 1923, locomotive (H. B. & T.) 5, Houston, Tex. Footboard struck guard rail and bent under, throwing switchman to ground in front of engine which dragged him for about 150 feet; footboard less than 9 inches from top of rail. One killed. Three accidents, one killed, two injured.

KANSAS CITY, MEXICO & ORIENT RAILROAD:

* June 22, 1923, locomotive 301, Canton, Okla. Handhold on tender broke, causing engineer to fall. One injured.

One accident, one injured.

KANSAS CITY SOUTHERN RAILWAY:

October 7, 1922, locomotive 172, Shreveport, La. Crown sheet failed when slightly overheated, due to heavy accumulation of scale; entire surface of crown sheet badly pitted and improperly stayed; two crown bars had heels broken off at one end, three were not supported from wrapper sheet and three were supported by only one sling stay; very poor threads on many crown bolts and in many crown bolt holes. One injured.

October 10, 1922, locomotive 58, Fort Smith, Ark. Squirt hose blew off due to being insecurely clamped; squirt hose nipple extended straight out instead of being turned downward. One injured.

November 25, 1922, locomotive 517, Brushy, Okla. Cylinder head was knocked out, causing conductor to be injured, due to escaping steam. One injured.

December 29, 1922, locomotive 71, East Kansas City, Mo. Squirt hose blew off nipple, due to not being clamped. One injured.

April 5, 1923, locomotive 552, Bunch, Okla. Ash pan blower pipe broke open, due to being badly rusted and corroded. One injured.

June 11, 1923, locomotive 523, near Bunch, Okla. Flue broke off at safe end weld, due to being overheated in welding. Two injured.

Six accidents, seven injured.

KANSAS, OKLAHOMA & GULF RAILWAY:

* July 19, 1922, locomotive 304, Allen, Okla. Crosstie of engine truck radius bar came loose and dropped down, causing derailment of engine. Two injured.

One accident, two injured.

LAKE ERIE & WESTERN RAILROAD:

October 30, 1922, locomotive 5526, near Peru, Ind. Superheater flue burst. One injured.

One accident, one injured.

HIGH VALLEY RAILROAD:

* July 29, 1922, locomotive 750, Sayre, Pa. Reflex water glass broke. One injured.

* August 11, 1922, locomotive 1377, Glendon, Pa. Brake hanger pin broke. One injured.

* August 20, 1922, locomotive 2127, Coxton, Pa. Fell into tank cistern, due to cover and screen missing. One injured.

August 24, 1922, locomotive 4000, near Mountain Top, Pa. Bonnet blew out of timing valve; valve reported leaking on August 22, and repairs not properly made before returning locomotive to service; bonnet badly mutilated by use of hammer and chisel or other tools in tightening. One injured.

August 24, 1922, locomotive 1616, near Mahanoy City, Pa. Pin broke or lost out of eccentric rod. One injured.

September 4, 1922, locomotive 808, Sayre, Pa. Crown sheet failure, due to low pressure; no contributory causes found. Two killed, two injured.

* September 10, 1922, locomotive 917, Suspension Bridge, N. Y. Handhold bent allowing insufficient clearance between handhold and cab. One injured.

September 11, 1922, locomotive 4053, Buffalo, N. Y. Scalded by steam escaping from stoker exhaust pipe into cab. One injured.

September 15, 1922, locomotive 2035, Packerton, Pa. Struck by part of handrail on passing locomotive which swung around due to being broken. One injured.

* October 2, 1922, locomotive 1635, Ashmore, Pa. Fell while alighting from locomotive, due to pilot sill step missing. One injured.

October 10, 1922, locomotive 745, near Kennedy, N. J. Boards in tank floor around edge of deck plate broken and wasted away and deck plate bulged upward, causing fireman to fall. One injured.

October 24, 1922, locomotive 1690, Mauch Chunk, Pa. Burned by steam escaping from steam heat valve packing nut. One injured.

October 28, 1922, locomotive 4050, Tagues Eddy, Pa. Stoker trough cover gave way, due to not being secured in place, causing fireman to fall. One injured.

November 6, 1922, locomotive 556, Luzerne, Pa. Side rod strap broke; strap bolts were one thirty-second inch out of round and bolts working; approximately 50 per cent of bottom section of strap crystallized; rods reported pounding bad and defective at times immediately prior to accident and report approved in each case indicating repairs made. One injured.

**November 9, 1922, locomotive 2133, East Waverly, N. Y. Injector steam pipe failed out of collar due to defective brazing. One injured.

November 21, 1922, locomotive 2050, Wyoming, N. Y. Glass blew out of cab door due to not being securely applied. One injured.

November 22, 1922, locomotive 1148, Owego, N. Y. Scalded by steam and water from water glass due to drain pipe being missing. One injured.

November 25, 1922, locomotive 1165, Moravia, N. Y. Eccentric crank key sheared permitting crank to turn on crank pin and reverse engine, causing reverse lever to fly back striking engineer. One injured.

**November 26, 1922, locomotive 1812, Gratwick, N. Y. Vertical handhold at gangway gave way, causing fireman to fall. One injured.

December 8, 1922, locomotive 404, near White Haven, Pa. Main rod strap broke; main rods had been reported pounding on December 1, 2, 3, 4, 5, 6, and 7. One injured.

**January 1, 1923, locomotive 594, Coxton, Pa. Handhold on tank gave way due to rivet supporting it at top breaking. One injured.

January 10, 1923, locomotive 1608, Wilkes-Barre, Pa. Insufficient clearance between reverse lever and brake pipe; stop block in quadrant had been removed. One injured.

**January 15, 1923, locomotive 3433, Buffalo, N. Y. Loose handrail slipped and turned, causing Federal inspector to fall; tap bolt securing handrail to cab worked out 2 1/2 inches and front end of handrail was not properly secured in post. One injured.

**January 29, 1923, locomotive 4011, Lodi, N. Y. Lubricator inoperative; lubricator reported defective on January 18, 19, and 25 and reports indicate repairs had been made. One injured.

February 6, 1923, locomotive 4041, Falling Springs, Pa. Drifting valve bonnet blew out due to improper fit. Two injured.

February 15, 1923, locomotive 2052, Geneva, N. Y. Drifting valve steam pipe nipple pulled out of main steam pipe account of threads in steam pipe stripping. One injured.

February 27, 1923, locomotive 2053, Longwood, N. Y. Injector steam pipe separated from collar due to defective brazing. Two injured.

February 27, 1923, locomotive 264, Sayre, Pa. Tender truck stay plate dropped down and catching on tie was thrown up and back striking switchman. One injured.

March 5, 1923, locomotive 4046, Sayre, Pa. Engineer's clothing caught on nail protruding from side curtain causing him to fall to ground. One injured.

March 29, 1923, locomotive 1621, near North Leroy, N. Y. Crown sheet failure caused by overheating due to low water; several appurtenances damaged to such extent that their previous condition could not be determined. Two killed, one injured.

April 6, 1923, locomotive 405, Duryea, Pa. Boiler explosion due to 19 broken and 33 fractured staybolts in bottom of combustion chamber and the rupture of defective combustion chamber sheet. Two killed.

May 17, 1923, locomotive 2145, Coxton, Pa. Drain plug blew out of lubricator, due to not having been tightened. One injured.

June 13, 1923, locomotive 1653, Bethlehem, Pa. Pilot step gave way due to nuts working off supporting bolts and bolts loosening out. One injured.

June 17, 1923, locomotive 1640, South Easton, Pa. Scalded due to defective squirt hose. One injured.

*June 17, 1923, locomotive 747, Easton, Pa. Hand caught between throttle lever and brake valve due to insufficient clearance. One injured.

Thirty-five accidents, 6 killed, 37 injured.

LOS ANGELES & SALT LAKE RAILROAD:
*February 19, 1923, locomotive 7860, Tintic, Utah. Injured while attempting repairs to leaky drain cock on drifting valve due to locomotive starting. One injured. One accident, one injured.

LOUISIANA & ARKANSAS RAILWAY:
*April 25, 1923, locomotive 302, Bentley, La. Brake shoe on tender truck broke and fell on ties and was in turn thrown upward, striking employee. One injured. One accident, one injured.

LOUISIANA & NORTHWEST RAILROAD:
July 11, 1923, locomotive 25, near Gibbsland, La. Draw bar pin failed, then right and left hooks securing safety chains to tender failed, allowing locomotive to separate from tender; old crack five-eighth inch deep and 2 inches long in pin at point of failure and metal badly crystallized; locomotive being operated with portion of chafing iron missing and safety chains excessively long and improperly secured to tender; condition of chafing iron reported on July 10 and engine dispatched without repairs being made. One killed.

One accident, one killed.

LOUISVILLE & NASHVILLE RAILROAD:

**July 11, 1922, locomotive 1128, Etowah, Tenn. Injured while attempting to rake grates due to section of grates being burned. One injured.

*July 14, 1922, locomotive 1437, Tejay, Ky. Spring hanger broke. One injured.

**July 16, 1922, locomotive 1459, near Emanuel, Ky. Shovel struck protruding section of defective shovel sheet. One injured.

**July 25, 1922, locomotive 763, Bay St. Louis, Miss. While reversing engine, hand caught on jacket band which was improperly applied. One injured.

**August 8, 1922, locomotive 1292, near Calera, Ala. Tire came off back driving wheel, causing wheel to leave the rail. One injured.

August 16, 1922, locomotive 1435, Ravenna, Ky. Street ell in pipe to sprinkler hose broke. One injured.

August 19, 1922, locomotive 2215, Corbin, Ky. Injector steam pipe spanner nut burst; nut mutilated and cracked due to having been tightened with hammer and chisel. One injured.

September 1, 1922, locomotive 64, near Agnew, Ky. Main driving axle broke, due to old fracture covering approximately one-third of cross-sectional area, causing main rod strap and side rod to break and right side of engine to be stripped. One injured.

September 5, 1922, locomotive 1231, Calhoun, Ala. Handle of air compressor steam valve came off, causing engineer to fall. One injured.

September 8, 1922, locomotive 1536, Boyles, Ala. Struck by cylinder cock rigging. One injured.

September 10, 1922, locomotive 807, Fontainebleau, Miss. Piston rod broke, knocking front cylinder head out. One injured.

**September 21, 1922, locomotive 1469, Acosta, Ky. Ash pan operating lever came off, due to cotter key missing. One injured.

**September 23, 1922, locomotive 1179, near Sloan, Ky. Reverse lever became unlatched and flew forward due to teeth of quadrant being worn. One injured.

**September 25, 1922, locomotive 993, Howell, Ind. Reflex water glass gasket flew out, due to water glass and gaskets not being properly tightened. One injured.

September 25, 1922, locomotive 1757, Livingston, Ky. Head of main air reservoir flew out. One injured.

September 27, 1922, locomotive 1077, Lexington, Ky. Street ell in pipe to squirt hose broke. One injured.

September 29, 1922, locomotive 2056, Anniston, Ala. Footboard was bent downward, causing employee to fall. One injured.

**October 12, 1922, locomotive 2400, Blackey, Ky. Bolt connecting ash pan lever to slide broke, causing fireman to fall. One injured.

October 20, 1922, locomotive 1279, Salt River, Ky. Reverse lever flew back striking engineer, due to counterbalance spring being improperly adjusted. One injured.

**October 25, 1922, locomotive 1530, Riverside, Ky. Door over stoker trough, which formed part of deck, gave way due to broken hinges, causing fireman to lose balance and catch hand between fire door and scoop. One injured.

October 25, 1922, locomotive 1070, Pennington, Va. Fell from pilot step, account vision obscured by steam leaks on engine. One injured.

October 26, 1922, locomotive 1207, Miles, Ala. Main rod broke, due to old flaw extending two-thirds through rod; rod struck running board brace pulling two studs out of boiler. One injured.

November 6, 1922, locomotive 307, Ameron, Ky. Bolt securing fire door chain to cab wind sheet pulled through sheet causing fireman to fall from gangway. One injured.

**November 15, 1922, locomotive 1212, Keego, Ala. Eccentric pin broke. One injured.

**November 17, 1922, locomotive 1308, Crab Orchard, Ky. Bolt lost out of cab iron hinge and in attempting to make temporary repairs while locomotive was running at a speed of about 12 miles per hour fireman was injured. One injured.

**November 19, 1922, locomotive 1422, Deatsville, Ala. Main rod strap broke, causing engine to be stripped. One injured.

**November 20, 1922, locomotive 1279, Glenarm, Ky. Whistle valve stuck open due to foreign matter lodged between whistle valve and seat. One injured.

November 22, 1922, locomotive 159, Richmond, Ky. Locomotive derailed when pilot brace bolt broke permitting brace to drop down and catch in frog; brace had just been renewed and improperly applied. Two injured.

**November 23, 1922, locomotive 1490, Sloan, Ky. Stoker failed and, while attempting repairs, fireman was injured. One injured.

**November 27, 1922, locomotive 309, Stanford, Ky. Driving spring broke. One injured.

November 27, 1922, locomotive 1756, near Covington, Ky. Slide over stoker conveyor trough gave way due to having been improperly applied, permitting hostler's foot to be caught in conveyor. One injured.

December 4, 1922, locomotive 1434, Wadsworth, Ala. Main rod back end strap broke due to old defect; main rod struck switch rod, breaking it and allowing switch point to open and cause derailment of 10 cars. One injured.

*December 7, 1922, locomotive 1202, Pollard, Ala. Crossover pipe broke. One injured.

December 15, 1922, locomotive 1258, Rock Springs, Ala. Unused washout plug in bottom of front flue sheet blew out, the contents of the boiler being discharged into smoke box and back through flues into fire box and cab, filling cab with fire and steam; plug screwed into sheet only three threads and threads on plug and in sheet badly wasted away. Two injured.

December 17, 1922, locomotive 135, Montgomery, Ala. Boss on lubricator body into which drain plug was applied twisted off, permitting steam and oil to strike employee. One injured.

**December 24, 1922, locomotive 1416, Ravenna, Ky. Coupler key broke. One injured.

January 2, 1923, locomotive 1107, Ocoee, Tenn. Spanner nut on injector steam pipe burst, while being tightened under pressure, causing pipe to fly around striking engineer and knocking him from running board; spanner nut too large and threads did not engage threads on injector. One injured.

January 6, 1923, locomotive 1507, near Kelly, Ky. Stoker slide hook slipped out of slide causing fireman to fall; hole in slide badly worn and hook not properly bent. One injured.

January 6, 1923, locomotive 102, Georgiana, Ala. Street ell blew off ash plan blower manifold; brake rod was fouling this fitting and gradually forced it out of manifold. One injured.

**January 17, 1923, locomotive 283, near Bay Minette, Ala. Bracket holding extra steam hose in cab of engine came loose, allowing hose to fall and strike fireman on the head. One injured.

January 17, 1923, locomotive 987, South Louisville, Ky. Electric generator turbine wheel failed account of excessive speed due to defective governor. One injured.

January 31, 1923, locomotive 937, Gadsden, Ala. Brake beam on tender truck came down. One injured.

**February 3, 1923, locomotive 861, Andalusia, Ala. Main crank pin broke due to old flaw. One injured.

**February 9, 1923, locomotive 1765, Richmond, Ky. Engine separated from train causing emergency application of brakes, due to low coupler on tender. Two injured.

February 17, 1923, locomotive 503, Howell, Ind. Tubular lubricator glass broke; cut by flying glass. One injured.

**February 23, 1923, locomotive 609, New Orleans, La. Brake rod broke and struck link which caused reverse lever to fly back striking engineer. One injured.

March 18, 1923, locomotive 1008, DeCoursey, Ky. Spring hanger broke. One injured.

March 18, 1923, locomotive 2135, Hazard, Ky. Shaker bar slipped off fulcrum lever due to improper fit. One injured.

March 28, 1923, locomotive 903, Tulsa, Ala. Eccentric strap broke account of nuts having worked off bottom strap bolt. Two injured.

March 30, 1923, locomotive 1224, Albany, Ala. Insufficient clearance between reverse lever and gauge cock. One injured.

March 31, 1923, locomotive 1081, near Olinger, Va. Water cooler fell from top of tender striking fireman, due to not being fastened. One injured.

**March 31, 1923, locomotive 783, Crestview, Fla. Valve gland stud broke. One injured.

April 12, 1923, locomotive 812, near Cincinnati, Ohio. Cab apron hinge bolt pulled out causing apron to become loose on that side; bolts on both sides loose and improperly applied. One injured.

April 13, 1923, locomotive 761, between Albany and Hartsell, Ala. Injured while operating reverse lever due to counter balance spring being too stiff, caused by 2 1/2 inches having been cut off each end of spring while engine was undergoing repairs. One injured.

April 14, 1923, locomotive 1215, Searcy, Ala. Pin worked out of grate shaker connecting rod, causing fireman to fall. One injured.

April 14, 1923, locomotive 1300, Bailey's, Ky. Piston follower plate and bull ring came off, due to broken follower bolts, breaking cylinder. One injured.

April 15, 1923, locomotive 1537, Holmes Gap, Ala. Stoker elevator pawl shifter worn, and in attempting to operate stoker engineer was injured. One injured.

April 19, 1923, locomotive 1494, Lebanon Junction, Ky. Stoker steam gauge burst, flying pieces of dial glass striking fireman. One injured.

April 24, 1923, locomotive 1483, Junction City, Ky. Superheater flue broke off at end and pulled out of back flue sheet; copper ferrule was between flue and sheet on one side for about one-half thickness of sheet and on the other side was entirely flue badly thinned due to excessive working. One injured.

May 3, 1923, locomotive 2060, Latonia, Ky. Throttle lever flew open and stuck due to excessive play in throttle rigging and throttle lever quadrant not of proper radius and teeth worn. One injured.

May 10, 1923, locomotive 1758, Butler, Ky. Coal board fell from carrying rack due to being too short. One injured.

May 10, 1923, locomotive 232, McGehees, Ala. Reverse lever unlatched and flew forward injuring engineer; reverse lever reported defective just prior to accident and after accident and repairs not made. One injured.

May 10, 1923, locomotive 703, Paris, Ky. Vision obscured by steam coming around piston rod causing switchman to fall on switch stand. One injured.

May 19, 1923, locomotive 898, Covington, Ky. Wooden tread of tender sill step broken and gave way, causing switchman to fall. One injured.

May 24, 1923, locomotive 725, St. Elmo, Ala. Worn uncoupling lever permitted engine to turn completely over and catch flagman's hand between lever and pilot beam. One injured.

May 31, 1923, locomotive 1106, Atlanta, Ga. Lift lever gave away, due to cotter pin coming out causing brakeman to fall. One injured.

June 2, 1923, locomotive 1558, Hardy, Ala. Stoker slide hook slipped out, due to being worn and badly bent, causing fireman to fall. One injured.

June 8, 1923, locomotive 1079, Colesburg, Ky. Glass in cab door broke, due to being fouled by cab floor. One injured.

June 8, 1923, locomotive 933, Latonia, Ky. Tender brake rigging broke. One injured.

June 10, 1923, locomotive 1141, Radnor, Tenn. Blow-off cock blew out, due to being on cock and in sheet being stripped and corroded. One injured.

June 12, 1923, locomotive 1213, Montgomery, Ala. Drawbar between engine and tender broke, due to old crack and material being crystallized. One injured.

June 17, 1923, locomotive 1237, near South Tunnel, Tenn. Hand caught between reverse lever and water-glass drain pipe, due to insufficient clearance. One injured.

June 20, 1923, locomotive 1569, Clanton, Ala. Seat box turned over, throwing engineer to deck, due to not being fastened. One injured.

Seventy-three accidents, 77 injured.

THE CENTRAL RAILROAD:

March 25, 1923, locomotive 402, Bancroft, Me. Locomotive derailed, due to driving wheels becoming loose, due to overheating caused by driver brakes creeping on; automatic brake valve rotary valve leaking and equalizing portion of disturbing valve sticking. One killed, four injured.

April 9, 1923, locomotive 613, Lincoln, Me. Grease-cup plug at right main crank pin blew out, striking engineer; back end of right main rod reported running hot on day of the accident and repairs said to have been made. One injured.

June 20, 1923, locomotive 304, near Scoodic, Me. Bonnet of squirt hose valve blew out. One injured.

Three accidents, one killed, six injured.

MICHIGAN CENTRAL RAILROAD:

July 10, 1922, locomotive 8290, South Rockwood, Mich. Steam-heat pipe parted at union, due to threads on union nut being stripped; defect reported at end of previous trip and repairs not made. One injured.

December 8, 1922, locomotive 8787, Detroit, Mich. Lubricator plug blew out, due to not being properly applied. One injured.

December 22, 1922, locomotive 7918, Albion, Mich. Crown sheet failure, caused by heating due to low water; opening into bottom water-glass cock almost entirely closed by scale which had accumulated in a pocket created by application of a gusset on boiler backhead; gauge-cock drip pan stopped up; left injector wasted from 50 per cent of water through overflow, due to delivery nozzle being worn and broken. One killed, two injured.

April 13, 1923, locomotive 8477, Vermontville, Mich. Bolt flew from passing locomotive, striking employee. One injured.

April 21, 1923, locomotive 8810, Detroit, Mich. Throttle lever flew open, due to latch being badly worn. One injured.
Five accidents, one killed, six injured.

MIDLAND VALLEY RAILROAD:

January 26, 1923, locomotive 26, Belle Plaine, Kans. Pilot-beam handhold post gave way, due to bolt working out. One injured.
One accident, one injured.

MINNEAPOLIS & ST. LOUIS RAILROAD:

September 21, 1922, locomotive 147, near Eldora, Iowa. Blow-off cock stuck open. One injured.

October 30, 1922, locomotive 150, Keithburg, Ill. Piston rod broke, knocking out front cylinder head. One injured.

November 28, 1922, locomotive 410, Nemo, Ill. Bell of whistle loose on stem. One injured.

January 17, 1923, locomotive 331, Rapatee, Ill. Burned by oil and steam escaping from lubricator drain plug, due to plug not being properly applied. One injured.

*February 27, 1923, locomotive 623, Eden Prairie, Minn. Steam-valve bonnet blew off. One injured.

Five accidents, five injured.

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

**July 25, 1922, locomotive 434, Morocco Mine, Minn. Seat box, which was not properly secured to deck, turned over, causing fireman to fall. One injured.

January 10, 1923, locomotive 480, near Harvey, N. Dak. Crown sheet failure caused by overheating, due to water foaming; gauge cocks applied directly in back-boiler head. One injured.

February 3, 1923, locomotive 486, Thief River Falls, Minn. Defective fire door closed suddenly and caught fireman's hand. One injured.

February 12, 1923, locomotive 726, near Carrington, N. Dak. Crown sheet failure caused by overheating, due to low water; gasket had worked over and partially obstructed opening in bottom of water glass; approximately 50 per cent of area of right-tank valve openings obstructed by accumulation of coal and wood. One injured.

**February 15, 1923, locomotive 2654, Kolze, Ill. Throttle flew open while engineer was reversing engine, causing reverse lever to fly forward, striking engineer; throttle lever latch did not properly engage quadrant, due to worn bolts and holes. One injured.

April 2, 1923, locomotive 9, near Vergas, Minn. Pin securing side rod collar in place worked out, permitting collar and rod to work off crank pin and right side of engine to be stripped. One injured.

April 7, 1923, locomotive 449, Automba, Minn. Shaker bar slipped off lever, due to improper fit. One injured.

Seven accidents, seven injured.

MISSISSIPPI CENTRAL RAILROAD:

*August 27, 1922, locomotive 102, Coral, Miss. Injector steam pipe burst account of collar on injector pipe giving way where it was brazed. One injured.
One accident, one injured.

MISSOURI & NORTH ARKANSAS RAILROAD:

**September 28, 1922, locomotive 33, Pittsburg, Kans. Boiler check cap leaking due to defective threads. One injured.

*March 7, 1923, locomotive 15, Moro, Ark. Derailment caused by defective tender truck wheels. One injured.

Two accidents, two injured.

MISSOURI-KANSAS-TEXAS LINES:

*July 20, 1922, locomotive 391, Calera, Okla. Engine gave a sudden lurch when rounding curve, due to too much lateral motion. One injured.

*August 7, 1922, locomotive 21, Ney, Tex. Board in false tank floor gave way under weight of fireman. One injured.

August 18, 1922, locomotive 197, Trinity, Tex. Crown sheet failure due to low water; bottom end of water glass almost entirely stopped up by gasket; left injector defective, wasting a large amount of water through the overflow. One killed.

*August 30, 1922, locomotive 372, Buda, Tex. Side rod broke, knocking off air compressor and causing brakes to be applied. One injured.

**November 24, 1922, locomotive 846, near Deerfield, Mo. Reverse lever unlatched and flew forward, due to latch not properly engaging quadrant. One injured.

November 30, 1922, locomotive 15, Denison, Tex. Brake rigging adjusting nut broke, causing collision. One injured.

December 20, 1922, locomotive 712, Sedalia, Mo. Brazing collar on injector steam pipe broke off due to old fracture at turret connection; collar reported leaking twice immediately prior to accident and reports approved by foreman indicating repairs made when in fact they had not been made. One injured.

December 28, 1922, locomotive 572, Cumby, Tex. Footboard caught on crossing amount of being too low, bending it back and causing employee who was riding on it to fall. One injured.

February 2, 1923, locomotive 591, near Louisburg, Kans. Crown sheet failure caused primarily by overheating due to low water and contributed to by defective condition of firebox and stays; water glass inoperative due to drain pipe having broken off; gauge cocks applied directly in boiler back head. One killed, two injured.

*March 12, 1923, locomotive 873, Fort Worth, Tex. Insufficient clearance between reverse lever and water column drain valve caused engineer's hand to be caught. One injured.

*March 23, 1923, locomotive 806, Walnut, Kans. Reverse lever got away from engineer due to valves being insufficiently lubricated. One injured.

*March 25, 1923, locomotive 879, Gibson, Okla. Reverse lever unlatched and flew forward catching engineer's hand between reverse lever and gauge cock drainpipe. One injured.

Twelve accidents, 2 killed, 12 injured.

MISSOURI PACIFIC RAILROAD:

July 12, 1922, locomotive 2385, near Maringouin, La. Water glass burst. One injured.

July 14, 1922, locomotive 523, Menard, Ill. Throttle came open while fireman was operating reverse lever, causing lever to jerk. One injured.

July 15, 1922, locomotive 9422, St. Louis, Mo. Hasp on tank box of engine broke, causing employee to fall. One injured.

July 29, 1922, locomotive 1403, Mount Ida, Kans. Grates became disconnected. One injured.

**August 14, 1922, locomotive 1811, Popping, Ark. Ash pan blower pipe broke due to being rusted and corroded away. One injured.

August 15, 1922, locomotive 541, near Watson, Ark. Squirt hose burst; hose worn in account of being rubbed by cab apron. One injured.

August 25, 1922, locomotive 2730, Wichita, Kans. Eccentric blade broke. One injured.

August 27, 1922, locomotive 28, Benton, Ark. Excessive lost motion between engine and tender; defect reported six days prior to accident and repairs not made. One injured.

August 31, 1922, locomotive 136, Emmett, Ark. Main rod broke and knocked blow-off cock off. One injured.

**September 18, 1922, locomotive 1321, Valley Park, Mo. Power grate shaker latch popped off fulcrum lever, permitting power lever to move backward, catching fireman's foot. One injured.

September 18, 1922, locomotive 2629, Silverdale, Kans. Cab handhold broke at latch hole; handhold of 1-inch iron pipe with two five-eighths inch bolt holes drilled at each end by which it was fastened to cab. One injured.

September 21, 1922, locomotive 2612, Denning, Ark. Piston rod broke at key way, knocking out front cylinder head. One injured.

October 5, 1922, locomotive 5, Russellville, Ark. Ash pan blower pipe became disconnected. One injured.

**November 13, 1922, locomotive 130, near Rockview, Mo. Burned by steam escaping from blower valve. One injured.

*December 1, 1922, locomotive 9316, North Little Rock, Ark. Blow-off cock blew out of boiler while attempting to close it; blow-off cock was defective. One injured.

*December 3, 1922, locomotive 6417, Bryant, Ark. Trailer radial bar casting on engine broke, causing derailment of passenger train. Sixteen injured.

**December 20, 1922, locomotive 511, Bush, Ill. Engineer fell from running board due to vision being obscured by steam from leaky boiler check and injector delivery pipe coupling. One injured.

December 21, 1922, locomotive 39, Nevada, Mo. Patch bolt blew out of firebox sheet; threads on bolt badly corroded and attempted to walk under pressure. One injured.

*January 3, 1923, locomotive 2331, Eldorado, Kans. Water cooler fell due to chain which secured it in place becoming unfastened. One injured.

January 8, 1923, locomotive 42, Austin, Ark. Ash pan blower pipe nipple broke at elbow connection account of being cracked. One injured.

January 15, 1923, locomotive 2351, Carthage, Mo. Flue failed at safe end weld; flue thin and badly corroded at weld. One injured.

*January 20, 1923, locomotive 109, Sabula, Mo. Quadrant bolt had broken and engine was dispatched with this defect existing; while attempting repairs on line of road, engineer was injured. One injured.

*January 22, 1923, locomotive 101, Cypress Junction, Ark. Brake rigging and front end of equalizer dropped down on track, causing derailment. One injured.

January 28, 1923, locomotive 2607, near Sulphur Rock, Ark. Injured due to excessive lost motion in grate shaker rigging. One injured.

January 30, 1923, locomotive 145, near Opal, Mo. Operating lever slipped off dump grate due to construction preventing lever from being properly applied. One injured.

*February 22, 1923, locomotive 532, Riverton, La. Ash pan blower was inoperative and engineer was injured while under engine raking fire. One injured.

February 25, 1923, locomotive 1278, near Manning, Kans. Injector steam pipe pulled out of spanner nut at injector due to collar breaking. One injured.

**March 4, 1923, locomotive 2714, Jefferson, Mo. Piece broken out of top gangway step, causing employee to slip. One injured.

March 25, 1923, locomotive 64, near Tiff, Mo. Left "go ahead" eccentric strap broke; eccentric was hot and strap was evidently seized when engineer attempted to take slack out of train in starting on ascending grade, causing the reverse lever to fly back violently, striking engineer; eccentric had been reported hot on March 22 and on March 13 eccentric strap bolt nut was reported missing. One killed.

*April 1, 1923, locomotive 5202, Prairie Du Rocher, Ill. Lug broke off while engineer was shaking grates. One injured.

April 5, 1923, locomotive 5516, Lancaster, Kans. Both side rods broke causing engine to be stripped; old flaw extended into left side rod 2½ inches. One injured.

April 5, 1923, locomotive 2341, Coffeyville, Kans. Injector steam ram bonnet blew out due to being improperly applied; bonnet badly mutilated by use of set or chisel and a very loose fit; copper gasket had been applied to assist in stopping steam leak around threads. One injured.

*April 23, 1923, locomotive 9312, Kansas City, Mo. Brake beam on rear tender truck came down and truck ran over it, causing switchman to be thrown from footboard. One injured.

May 13, 1923, locomotive 6433, Haswell, Colo. Ash pan blower valve lifting arm had excessive lost motion due to nut securing arm to valve stem working off and caused fireman's finger to be mashed between lifting arm and operating lever. One injured.

**June 16, 1923, locomotive 1442, California, Mo. Shaker bar slipped off post. One injured.

June 24, 1923, locomotive 9303, St. Louis, Mo. Squirt hose blew off nipple due to being improperly applied. One injured.

**June 26, 1923, locomotive 2602, Flippin, Ark. Slipped on apron and fell to ground caused by apron being tilted due to cab deck being lower than tender deck. One injured.

Thirty-seven accidents, 1 killed, 51 injured.

MOBILE & OHIO RAILROAD:

*July 4, 1922, locomotive 227, Dyer, Tenn. Squirt hose became disconnected. One injured.

**August 9, 1922, locomotive 354, Billingsly, Ala. Grate shaker bar slipped off fulcrum lever. One injured.

September 6, 1922, locomotive 546, near Jordan, Ky. Lubricator drain plug became loose, allowing hot water and oil to escape. One injured.

**October 7, 1922, locomotive 410, near Wheelers, Miss. Injured while shaking grates due to insufficient clearance between shaker bar and oil stand. One injured.

*January 25, 1923, locomotive 381, Reform, Ala. Hand was caught between reverse lever and brake valve handle due to insufficient clearance. One injured.

*March 10, 1923, locomotive 379, Billups, Miss. Drawbar broke. One injured.

March 14, 1923, locomotive 406, Youngs, Tenn. Crown sheet failure caused by overheating due to low water; bottom connections to water glass and water glass blow-off valve completely stopped up by accumulation of mud; boiler was said to have been washed and water glass cocks cleaned three days prior to accident. Four injured.

*April 23, 1923, locomotive 231, Porterville, Miss. Eccentric came down. One injured.

*April 25, 1923, locomotive 358, Winchester, Miss. Piston rod broke at cross head, knocking cylinder head out. One injured.

April 28, 1923, locomotive 548, near Union City, Tenn. Shaker bar slipped off lever to improper fit. One injured.

*May 23, 1923, locomotive 37, Meridian, Miss. Brake beam on tender dropped down due to brake head breaking. One injured.
Eleven accidents, 14 injured.

PONGAHELA CONNECTING RAILROAD:

February 13, 1923, locomotive 58, Pittsburgh, Pa. Fell from locomotive account of portion of running board breaking off. One injured.
One accident, one injured.

SHVILLE, CHATTANOOGA & ST. LOUIS RAILWAY:

*July 24, 1922, locomotive 456, Tunnel Hill, Ga. Train stalled in tunnel, due to defective air compressor. Three injured.

*August 8, 1922, locomotive 216, Kingston Springs, Tenn. Leaf in driving spring broke and was thrown backward, striking fireman. One injured.

*October 27, 1922, locomotive 651, Wartrace, Tenn. Squirt hose burst. One injured.

*November 4, 1922, locomotive 457, Stevenson, Ala. Nut worked off of main rod cap bolt and flew back, striking brakeman. One injured.

November 22, 1922, locomotive 422, Atlanta, Ga. Handrail gave way permitting switchman to fall; bracket cracked which should have been discovered by careful inspection. One injured.

February 25, 1923, locomotive 653, Lavergne, Tenn. Shaker bar slipped off fulcrum lever due to improper fit. One injured.

June 5, 1923, locomotive 663, Acworth, Ga. Brakeman's foot was caught between handhold and gangway step, due to insufficient clearance. One injured.
Seven accidents, nine injured.

NEVADA NORTHERN RAILWAY:

*July 16, 1922, locomotive 21, McGill Junction, Nev. Headlight dynamo burst. One injured.

One accident, 1 injured.

NEW YORK CENTRAL LINES—EAST:

*July 4, 1922, locomotive 3163, Childwold, N. Y., tank and six cars derailed, due to rigid tank truck, caused by brake head wedging between wheel and truck frame. Thirty-four injured.

July 19, 1922, locomotive 531, Watertown, N. Y. Spanner nut at connection between branch pipe and boiler check blew off, due to threads in spanner nut stripped and nut mutilated by use of improper tools in tightening. One injured.

July 24, 1922, locomotive 4539, Buffalo, N. Y. Bonnet blew out of boiler check, due to improper fit. One injured.

*August 19, 1922, locomotive 2520, West Albany, N. Y. Steam hose on locomotive became disconnected due to clamps having loosened up. One injured.

*August 22, 1922, locomotive 3111, Piercesfield, N. Y. Reverse lever came out of quadrant. One injured.

September 6, 1922, locomotive 1985, Utica, N. Y. Injector steam pipe failed at injector connection, due to threads in spanner nut stripping. One injured.

September 28, 1922, locomotive 2518, near Harbor, N. Y. Crown sheet failure; low water; no contributory causes found; many parts and appurtenances damaged to such extent their previous condition could not be determined. Three killed.

October 2, 1922, locomotive 844, Suspension Bridge, N. Y. Arch tube plug blew out while being tightened under pressure; plug applied with threads crossed. Two killed.

October 7, 1922, locomotive 3959, Genesee Junction, N. Y. Squirt hose blew off, due to not being clamped. One injured.

**October 22, 1922, locomotive 3931, East Buffalo, N. Y. Lubricator drain plug broke off or blew out. One injured.

November 11, 1922, locomotive 5129, Moreland, N. Y. Crown sheet failure, due to overheating caused by low water; appurtenances damaged to such extent that their previous condition could not be determined; locomotives 5129 and 2974 were double-headed and boiler of locomotive 5129 was torn from frames and struck locomotive 2974. Four killed; three injured.

November 24, 1922, locomotive 3091, near Barrytown, N. Y. Crown sheet failure caused by overheating, due to low water; bottom opening to water glass partially closed by formation of scale; right injector steam ram seat cut; left tank valve out of cage and right tank valve packing nut stripped and valve closed. Two killed; one injured.

November 26, 1922, locomotive 338, Rensselaer, N. Y. Tank hose blew off of goose neck. One injured.

December 5, 1922, locomotive 3043, Chatham, N. Y. Plate over engine truck gave way, causing employee to fall. One injured.

December 10, 1922, locomotive 472, East Buffalo, N. Y. Piece of footboard broke off, causing brakeman to fall. One injured.

* December 22, 1922, locomotives 3856 and 2660, Depew, N. Y. Engines parted while double-heading and then collided, due to coupler block failing to drop in place. One injured.

January 6, 1923, locomotive 3160, New York, N. Y. Section of union in injector delivery pipe separated, due to worn threads on male section. One injured.

January 26, 1923, locomotive 3602, Clearfield, Pa. Grate shaker bar slipped off fulcrum lever. One injured.

February 2, 1923, locomotive 2963, West Karner, N. Y. Side rod broke. One injured.

February 5, 1923, locomotive 5122, Amboy, N. Y. Shaker bar slipped off post, due to improper fit. One injured.

February 7, 1923, locomotive 166, West Seneca, N. Y. Water glass burst. One injured.

February 18, 1923, locomotive 1998, Evan Mills, N. Y. Guide yoke broke permitting back end of guides to drop down and causing piston rod to break. One injured.

March 4, 1923, locomotive 2982, Beech Creek, Pa. Crown sheet failure caused by overheating, due to low water. One injured.

March 9, 1923, locomotive 799, Congers, N. Y. Valve stem broke, due to old flaw, causing reverse lever to fly back and catch engineer's arm between lever and cab. One injured.

March 12, 1923, locomotive 2360, Tiadaghton, Pa. Grate shaker fulcrum lever broke; cross-sectional area of lever reduced by oblong keeper bolt hole and contained an old flaw. One injured.

March 13, 1923, locomotive 3151, Crugers, N. Y. Shaker bar post broke off at weld; material overheated in welding. One injured.

* March 22, 1923, locomotive 2095, Schodack, N. Y. Finger caught between reverse lever and brake valve handle, due to insufficient clearance. One injured.

April 10, 1923, locomotive 3672, near Palatine Bridge, N. Y. Stack extension in smoke box fell down, due to nuts working off bolts securing it, causing back draft. One injured.

April 16, 1923, locomotive 3333, Carman, N. Y. Grease cup flew from side rod and struck fireman. One injured.

May 1, 1923, locomotive 669, Ravena, N. Y. Shaker bar slipped off lever due to improper fit. One injured.

May 5, 1923, locomotive 266, East Buffalo, N. Y. Cylinder cock operating lever flew back and struck engineer. One injured.

May 28, 1923, locomotive 5183, Dresden, N. Y. Grate shaker bar slipped off fulcrum lever, due to improper fit. One injured.

June 4, 1923, locomotive 3326, Syracuse, N. Y. Grate shaker bar slipped off fulcrum lever. One injured.

June 12, 1923, locomotive 4536, Gardenville, N. Y. Thrown from footboard due to pilot beam to which footboard hangers were attached jumping up caused by angle bracket breaking. One injured.

Thirty-four accidents, 11 killed, 67 injured.

NEW YORK CENTRAL LINES—WEST:

July 11, 1922, locomotive 2643, Kendallville, Ind. Crown sheet failure; low water; appurtenances removed from locomotive before investigation therefore their condition prior to accident could not be determined; top connection to water glass was reported leaking before locomotive left terminal but repairs were not made; left injector tested and failed to put water in boiler when water valve was opened more than three-eighths of a turn. One injured.

** August 11, 1922, locomotive 4453, La Porte, Ind. Tender sill step at gangway loose causing engineer to fall; defective condition of step reported immediately prior to accident and repairs not made. One injured.

September 26, 1922, locomotive 4071, near Perry, Ohio. Main rod broke through front end strap, due to old 85 per cent flaw in top portion of strap and remainder of metal very coarse grain and crystallized. One injured.

November 18, 1922, locomotive 4462, Chicago, Ill. Coupler pin lifting lever gave way, due to supporting brackets being broken. One injured.

* December 2, 1922, locomotive 5690, Otis, Ind. Reverse lever caught fireman's hand between lever and boiler back head, due to stop block at front of quadrant being missing. One injured.

December 29, 1922, locomotive 4888, Silver Creek, N. Y. Injector steam pipe fitting collar broke; collar had been machined off until only one-sixteenth inch thick. One injured.

February 21, 1923, locomotive 4840, Air Line Junction, Ohio. Bonnet of steam valve blew out, due to threads in valve body being badly worn and stripped. One injured.

May 22, 1923, locomotive 3963, Marcy, Ohio. Flue broke off at safe end weld; overheated in welding. One injured.

June 15, 1923, locomotive 5672, Schneider, Ind. Fire door stuck open and while attempt was being made to close it, top half became disconnected from operating mechanism and dropped catching fireman's foot; fire door reported defective on day prior to accident and proper repairs not made. One injured.

June 30, 1923, locomotive 5847, Adrian, Mich. Reverse lever unlatched and back striking engineer due to nut working off valve stem crosshead, allowing crosshead to come in contact with driving wheel which reversed the engine. One injured.

Twenty accidents, 10 injured.

* YORK, CHICAGO & ST. LOUIS RAILROAD:

August 1, 1922, locomotive 361, Lake View, N. Y. Right eccentric crank broke, due to poor material and old flaw, throwing the gear out and causing the reverse lever to fly back. One injured.

December 9, 1922, locomotive 460, Dunfee, Ind. Arch tube pulled out of throat at tube lapped one-eighth inch extending through sheet at bottom and was only one inch with inside of sheet at the top. One injured.

February 12, 1923, locomotive 64, Cleveland, Ohio. Headlight and supporting brackets fell, striking brakeman, due to bolts or rivets shearing or losing out. One injured.

March 26, 1923, locomotive 451, near Melrose, Ohio. Superheater flue failed at safe end weld; overheated in welding. Three injured.

May 18, 1923, locomotive 101, Leipsic Junction, Ohio. Step on side of boiler gave way, due to nuts on supporting stud having worked off. One injured.

Five accidents, seven injured.

* YORK, NEW HAVEN & HARTFORD RAILROAD:

July 7, 1922, locomotive 1367, Mansfield, Mass. Flue broke off at safe end weld. One injured.

July 26, 1922, locomotive 305, Natick, R. I. Reverse lever unlatched and flew forward, due to valves being dry and valve gear in generally bad condition; lubricator failed to valves stopped up which together with defective valve gear was reported at completion of previous trip and repairs not made. One injured.

July 27, 1922, locomotive 3232, Holmes, N. Y. Spreader rod on rear tender truck brake became disconnected due to connecting pin working out, allowing rod to drop and catch on crossing plank, derailing head car. One injured.

August 4, 1922, locomotive 2401, Worcester, Mass. While switching, struck account of rails being wet and slippery, due to tender leaking. Two injured.

August 9, 1922, locomotive 965, near Farmington, Conn. Link block bolt broke out and eccentric straps broke, causing reverse lever to jump out of quadrant and fly back, striking engineer. One injured.

August 10, 1922, locomotive 3248, Cedar Hill, Conn. Squirt hose disconnected at boiler, account of nipple being loose and unscrewing from fitting while being used. One injured.

August 14, 1922, locomotive 3246, Providence, R. I. Throttle stuck open, due to defective throttle lever latch, and caused locomotive to proceed at a high rate of speed and collide with another locomotive undergoing repairs in engine house. One injured.

September 3, 1922, locomotive 1561, near Pawtucket, R. I. Cab seat support gave way, due to screws which held support in place coming out. One injured.

September 14, 1922, locomotive 1370, Wickford Junction, R. I. While standing on station platform, employee was struck by a piece of sand pipe which flew from locomotive; bottom section of sand pipe apparently not screwed entirely into place, had become loose enroute and was knocked off. One injured.

September 15, 1922, locomotive 846, City Mills, Mass. Blower pipe became disconnected in front end, causing back draft; union in blower pipe badly corroded and threads stripped. One injured.

October 1, 1922, locomotive 2458, Boston, Mass. Injured while shaking grates, due to insufficient clearance between shaker bar and seat box. One injured.

October 2, 1922, locomotive 351, Harrison, N. Y. Throttle lever latch spring broke, allowing lever to fly back. One injured.

October 11, 1922, locomotive 1326, Woodlawn, R. I. Engine parted from train, due to defective coupler on rear of tender. One injured.

October 20, 1922, locomotive 301, Middleboro, Mass. Brake rigging dropped down. One injured.

November 1, 1922, locomotive 3000, Thompsonville, Conn. Lever leading to coal pusher valve broke at weld; lever badly corroded and worn. One injured.

November 9, 1922, locomotive 1399, near Berlin, Conn. Injector steam pipe broke off at turret connection, due to old flaw in brazing collar; bolts in injector brace reported missing and injector steam pipe reported leaking at turret immediately before accident and repairs not made. One injured.

November 10, 1922, locomotive 3232, Hopewell Junction, N. Y. Grate shaker connecting rod pin came out. One injured.

December 3, 1922, locomotive 2458, Boston, Mass. Grate shaker handle slipped off post. One injured.

December 15, 1922, locomotive 433, Whitman, Mass. Coal grate fell, due to broken hinge, striking fireman. One injured.

December 19, 1922, locomotive 156, Woonsocket, R. I. Fire door closed suddenly, due to worn latch. One injured.

December 27, 1922, locomotive 2311, East Hartford, Conn. Eccentric broke, causing reverse lever to fly back, striking brakeman. One injured.

January 10, 1923, locomotive 361, Forest Hills, Mass. Side rod broke, causing engine to strip on left side; employee was struck by flying parts. One killed.

January 21, 1923, locomotive 3405, Cedar Hill, Conn. Footboard caught on frog, due to being too low and bent underneath, throwing conductor to ground. One injured.

**January 23, 1923, locomotive 1394, near New London, Conn. Grate shaker bar slipped off lever. One injured.

February 5, 1923, locomotive 2334, Boston, Mass. Deck casting on engine broke; both rails of left engine frame broken near back end. One injured.

February 10, 1923, locomotive 3012, Berlin, Conn. Injector steam pipe broke off at brazing nipple, due to old fracture. One injured.

February 14, 1923, locomotive 834, Hazlewood, Mass. Shaker bar slipped off lever; shaker lever not proper taper for shaker bar and bar cracked and worn. One injured.

February 27, 1923, locomotive 3208, Waterbury, Conn. Arch tube plug blew out while attempting to tighten under pressure; threads on plug badly worn and stripped and plug applied cross threaded. Two injured.

March 7, 1923, locomotive 1415, Highwood, Conn. Right "go-ahead" eccentric strap blade broke and punctured throat sheet; blade had old fracture and connecting bolt had evidently broken or lost out; bolts in eccentrics and blades reported loose on February 21, 22, 27, March 2, 3, 5, and 6. Two injured.

March 13, 1923, locomotive 1331, Webster, Mass. Petticoat pipe dropped down, causing back draft; petticoat pipe worn thin, especially around bolt holes, causing pipe to pull over bolt heads. Two injured.

March 14, 1923, locomotive 813, Fall River, Mass. Eccentric arm fouled eccentric rod, causing reverse lever to strike engineer; condition reported prior to accident and repairs not made. One injured.

March 18, 1923, locomotive 2438, Danbury, Conn. Grate shaker bar became disconnected; nut on bottom of shaker post became loose and worked down. One injured.

March 21, 1923, locomotive 1344, near Attleboro, Mass. Petticoat pipe became disconnected, causing back draft. One injured.

March 28, 1923, locomotive 3329, Pine Orchard, Conn. Flue became loose in sheet; bead missing and flue worn very thin where inserted into sheet. Two injured.

April 4, 1923, locomotive 831, Rock Station, Mass. Valve rod broke off at weld near bell crank. One injured.

April 8, 1923, locomotive 3015, Hartford, Conn. Flue broke off at safe end weld; overheated in welding. Two injured.

April 9, 1923, locomotive 500, Roxbury, Mass. Blow-off cock blew out, due to not being properly applied; nipple entered sheet by only two threads and threads in sheet were very poor. Two injured.

April 14, 1923, locomotive 1347, Westerly, R. I. Grate shaker bar slipped off lever, due to improper fit. One injured.

April 21, 1923, locomotive 1306, Meriden, Conn. Injector steam pipe broke off at brazing collar, due to being of insufficient thickness. Two injured.

April 21, 1923, locomotive (L. & H.) 65, Stevenson, Conn. Cab window blew out, due to fastener being loose. One injured.

April 24, 1923, locomotive 1270, Roxbury, Mass. Expansion pad stud blew out, boiler backhead; threads on stud and in sheet badly worn and corroded and showed evidence of leakage; all other nuts on expansion pad studs were loose and expansion plate was loose; expansion pad reported loose just prior to accident and locomotive returned to service without repairs being made. One injured.

May 1, 1923, locomotive 1373, Hartford, Conn. Flue broke off at safe end weld; overheated in welding. Two injured.

May 12, 1923, locomotive 834, Middleboro, Mass. Cylinder head was knocked out, side rod broken when main rod strap bolts sheared. One injured.

May 15, 1923, locomotive 1393, near Westerly, R. I. Injector steam pipe broke off, brazing collar; injector steam pipe reported leaking on May 4, 9, and 14, and proper repairs not made. One injured.

May 29, 1923, locomotive (L. & H.) 69, Highland, N. Y. Scalded by water coming from overflow pipe due to leaky boiler check. One injured.

June 21, 1923, locomotive 322, Chickering Tower, Mass. Reverse lever unlatched, flew forward catching engineer's foot between lever and boiler. One injured.

Forty-six accidents, 2 killed, 53 injured.

NEW YORK, ONTARIO & WESTERN RAILWAY:

October 7, 1922, locomotive 36, Barbers, N. Y. Defective headlight turbine wheel broke, the flying portions of wheel breaking the main turbine casting which struck the fireman. One injured.

One accident, one injured.

FOLK & WESTERN RAILWAY:

August 3, 1922, locomotive 1393, Valley Crossing, Ohio. Reverse lever unlatched, reversed itself due to latch spring missing. One injured.

August 13, 1922, locomotive 401, White Post, Va. Cylinder cock valve broke. One injured.

September 22, 1922, locomotive 331, Helena, N. C. Grate shaker bar broke; metal crystallized due to recent weld near break. One injured.

September 25, 1922, locomotive 1724, Dorney, Ohio. Grate shaker handle slipped, staff worn causing improper fit. One injured.

November 7, 1922, locomotive 1010, Delano, Ohio. Crown sheet failure due to water; no contributory causes found. Two injured.

November 9, 1922, locomotive 411, Shepherdstown, W. Va. One of two bolts securing exhaust nozzle to stand dropped down due to nuts working off, permitting nozzle to swing around and deflect draft, causing fire to be forced into cab; rough eighths inch bolts had been applied in three-fourths inch holes two days prior to accident and no means used to prevent nuts working off. One injured.

November 10, 1922, locomotive 441, Carterton, Va. Arch tube pulled out of seat sheet due to not extending through sheet on one side and not being belled or edged. One injured.

November 18, 1922, locomotive 814, Portsmouth, Ohio. Reverse lever jumped out of quadrant and struck engineer. One injured.

November 23, 1922, locomotive 1363, Claren, W. Va. Lubricator glass blew out. One injured.

November 30, 1922, locomotive 921, Kenova, W. Va. Crown sheet failure caused overheating due to low water; right injector delivery nozzle disconnected and injector reported defective on the day prior to accident; right tank valve handle indicated valve wide open when valve was only one-half open. Two killed; one injured.

December 11, 1922, locomotive 1378, Tug, W. Va. Radius bar came loose from side of engine truck due to nuts on bolts securing bar to truck working off and nuts in radius bar brace shearing, which caused truck to skew and climb rail at frog. Three killed.

January 21, 1923, locomotive 1006, Adanac, W. Va. Cylinder head blew out. One injured.

January 31, 1923, locomotive 1071, near Christiansburg, Va. Flue broke off at defective safe end weld. One injured.

**March 10, 1923, locomotive 1720, Clifford, Ohio. Grate shaker bar slipped off lever. One injured.

**March 26, 1923, locomotive 1131, near Cloverdale, Va. Reverse lever unlatched and flew forward; reverse lever latch worn and spring weak. One injured.

April 23, 1923, locomotive 1336, Watts, W. Va. Shaker bar slipped off lever. One injured.

**May 9, 1923, locomotive 762, Portsmouth, Va. Reverse lever flew forward striking engineer, due to eccentric block working out of keyway, putting severe strain on reverse lever. One injured.

May 26, 1923, locomotive 473, Nolan, W. Va. Valve rod broke, causing reverse lever to fly back and strike engineer. One injured.

June 3, 1923, locomotive 1441, Sargents, Ohio. Grate shaker connecting rod became disconnected due to bolt working out, causing fireman to fall against boiler back head. One injured.

**June 27, 1923, locomotive 744, Columbus, Ohio. Side rod struck engineer when engine slipped due to sand pipe not being in line with rail. One injured.

Twenty accidents, 5 killed, 20 injured.

NORTHERN PACIFIC RAILWAY:

**July 8, 1922, locomotive 1179, Minneapolis, Minn. Collision due to steam from broken water glass obscuring the vision of the engineman. One injured.

*July 8, 1922, locomotive 130, Wickett, Mont. Syphon hose blew off account of clamp not being securely applied. One injured.

*July 16, 1922, locomotive 2142, Fishtrap, Wash. Eccentric strap broke; injured while making repairs on the road. One injured.

July 30, 1922, locomotive 1321, Drummond, Mont. Bonnet on syphon cock blew out due to defective threads, causing engineer to fall from top of boiler. One injured.

August 27, 1922, locomotive 2110, Ostrander, Wash. Cord holding cab curtain pole up broke, permitting pole to fall and strike fireman; cord of insufficient strength. One injured.

September 13, 1922, locomotive 1606, Belfield, N. Dak. Coupler on rear of tender broke. One injured.

** September 17, 1922, locomotive 1370, Pullman, Wash. Scalded by steam which had accumulated in pipe line, due to leaky steam heat valve on engine. One injured.

** October 26, 1922, locomotive 1812, Blossburg, Mont. Scalded due to leaky squirt hose valve. One injured.

December 2, 1922, locomotive 1771, Cheney, Wash. Guide dropped down at front end and bent guide yoke, throwing strain on reach rod which caused reverse lever to fly out of quadrant and strike engineer. One injured.

** December 3, 1922, locomotive 1555, Manitoba Jct., Minn. Ice formed on gangway step due to leaky tank hose, causing fireman to fall. One injured.

* December 13, 1922, locomotive 1576, Staples, Minn. Insufficient clearance between reverse lever and brake valve. One injured.

** December 21, 1922, locomotive 2503, Hinckley, Minn. Air pipe between brake valve and equalizing reservoir broke, causing emergency application of brakes. One injured.

** December 26, 1922, locomotive 3001, Kennedy, Wash. Eccentric rod bolt lost out, permitting rod to drop and swing around, knocking off injector, injector delivery and steam pipes. One injured.

January 18, 1923, locomotive 2169, Medina, N. Dak. Shaker bar slipped off fulcrum lever due to improper fit. One injured.

January 31, 1923, locomotive 2419, Sanders, Mont. Spanner nut at connection of injector delivery pipe to check valve pulled off valve due to branch pipe being too short. One injured.

February 27, 1923, locomotive 1902, Jamestown, N. Dak. Bottom water glass cock spindle blew out; no provision made to keep stem from coming entirely out of valve. One injured.

March 15, 1923, locomotive 2094, Bolack, N. Dak. Equalizing spring casting on trailer truck broke and dropped on track, causing derailment. One injured.

April 13, 1923, locomotive 1830, between Rosburg and McGregor, Minn. Reverse lever latch would not properly clear quadrant which caused lever to be hard to operate. One injured.

May 8, 1923, locomotive 13, Minneapolis, Minn. Drawbar and safety chains between engine and tender failed, permitting fireman to fall to track; material of drawbar highly crystallized. One injured.

June 15, 1923, locomotive 1181, Staples, Minn. Water glass and shield broke; cut by flying glass. One injured.

Twenty accidents, 20 injured.

REGON SHORT LINE RAILROAD:

July 14, 1922, locomotive 1553, Ontario, Oreg. Left boiler check stuck up and connecting tubes in left injector worn; defects reported twice immediately before and nine times after accident. One injured.

October 6, 1922, locomotive 2505, King Hill, Idaho. Squirt hose blew off due to threads in union badly stripped. One injured.

** October 11, 1922, locomotive 529, Caldwell, Idaho. Tender deck end boards to which a gangway step was attached gave way account of boards fastened together with nails instead of bolts and angles. One injured.

December 18, 1922, locomotive 3702, Glens Ferry, Idaho. Broken rivet blew out of fire box seam while being caulked under pressure. Two injured.

May 22, 1923, locomotive 531, Lava Hot Springs, Idaho. Scalded by water escaping from blow-off pipe due to blow-off cock leaking; blow-off cock reported leaking on May 4, 7, 9, 11, and 22 and proper repairs not made. One injured.

Five accidents, six injured.

REGON-WASHINGTON RAILROAD & NAVIGATION CO.:

August 16, 1922, locomotive (U. P.) 3620, Porters, Oreg. Superheater flue failed where it had been welded into back flue sheet. One injured.

* January 8, 1923, locomotive 2270, Perry, Oreg. Drawbar pin broke due to old defect. One injured.

February 24, 1923, locomotive (U. P.) 3625, Thorn Hollow, Oreg. Superheater flue cracked circumferentially for approximately 2 inches at water side of back flue sheet; flue sheet had been beveled and flue welded in solid. One injured.

February 24, 1923, locomotive (U. P.) 3625, Rieth, Oreg. Superheater flue broke at water side of back flue sheet; flue sheet had been beveled and flue welded in solid; 17 hours previous this flue had cracked in the same location for approximately 17 inches, resulting in the serious injury of brakeman and had been repaired by the autogenous process. One injured.

Four accidents, four injured.

Four accidents, four injured.

PENNSYLVANIA SYSTEM:

July 1, 1922, locomotive 2971, Black Diamond, Pa. Receiving valve cage worked out of bottom of air compressor while locomotive was running at high speed and struck track laborer. One injured.

July 1, 1922, locomotive (C. A. & C.) 9870, Lancaster, Ohio. Reverse lever stuck; quadrant at back end was not in line with the lever, causing it to bind on inside of quadrant. One injured.

July 6, 1922, locomotive 7965, Cincinnati, Ohio. Grate shaker rigging became disconnected account of pin in connecting rod working out. One injured.

** July 6, 1922, locomotive 969, Portage, Pa. Nut, washer and crosshead of left extension piston rod came off, breaking piston rod cover and plate. Cover fell to ground where it struck some object and was thrown upward striking fireman. One injured.

July 7, 1922, locomotive 7114, Chicago, Ill. Bonnet blew off steam heat valve due to threads in bonnet and on valve being badly worn and corroded. One injured.

July 8, 1922, locomotive 690, Rahway, N. J. Struck by lift shaft cap, thrown from locomotive running at speed of approximately 45 miles per hour, due to studs securing cap having worked loose and fallen out. One injured.

July 9, 1922, locomotive 7798, Ashtabula, Ohio. Bonnet of injector steam valve blew out due to being too small. One injured.

** July 12, 1922, locomotive 2, Gould, Ohio. Bolt broke or lost out of union link causing eccentric arm to be torn off and main rod bent. One injured.

* July 12, 1922, locomotive 9252, Fredericksburg, Ohio. Syphon hose burst; hose defective. One injured.

** July 21, 1922, locomotive 8314, New Alexandria, Ohio. Bolt in lap-and-lead lever broke or lost out causing valve to block exhaust port, trapping steam in cylinder which knocked cylinder head out, causing cylinder cock lever to fly back striking engineer's knee. One injured.

July 29, 1922, locomotive 7023, New Gallilee, Pa. Fire hose blew off; hose improperly applied to nozzle nipple. Two injured.

* August 9, 1922, locomotive 8102, Warford, Ohio. Reverse lever flew back striking engineer due to valves being dry. One injured.

August 11, 1922, locomotive 7198, Walnut, Pa. Engine and tender separated due to bolts and rivets securing draw bar casting to tender sill breaking or pulling out; condition of drawbar casting bolts reported on July 31 and August 2 and locomotive returned to service without proper repairs being made. Two injured.

**August 13, 1922, locomotive 1682, Elmira, N. Y. Flue cracked circumferentially for a distance of 1½ inches immediately back of front flue sheet; flue worn thin at point of fracture. One injured.

August 14, 1922, locomotives 1138 and 8280, near Dennison, Ohio. Leading engine 1138 parted from engine 8280 while double-heading and when brakes stopped engine 1138 it was struck by engine 8280, causing fireman to be thrown against coal gate. One injured.

**August 14, 1922, locomotive 7155, Starke, Ohio. Cab apron gave way due to broken hinge, causing hostler to fall out of gangway. One injured.

August 18, 1922, locomotive 8820, Gibson, Ind. Reverse lever jumped out of quadrant, striking engineer; valve chamber packing ring broken and valve not properly lubricated. One injured.

August 23, 1922, locomotive 7142, Fairhope, Ohio. Piston rod came out of cross-head and knocked front cylinder head out. One injured.

August 23, 1922, locomotive 850, Pittsburgh, Pa. Flue failed at water side of front flue sheet, due to having wasted away; several adjacent flues also wasted away. One injured.

August 23, 1922, locomotive 8820, near Hagerstown, Ill. Crown sheet failure due to low water; several flues and crown bolts leaking; one crown bolt had no threads in sheet. Three injured.

September 1, 1922, locomotive 7937, Bradford, Ohio. Automatic fire door closed after air valve was closed on fire door cylinder, catching fireman's wrist. One injured.

September 2, 1922, locomotive 7515, Upper Sandusky, Ohio. Steam heat pipe pulled out of collar at fountain connection due to defective brazing; this joint reported leaking on August 31 and September 1 and repairs not made. One injured.

**September 7, 1922, locomotive 2321, Frazer, Pa. Reverse lever flew back account of leaky throttle valve. One injured.

*September 8, 1922, locomotive 8615, Trinway, Ohio. Reverse lever unlatched and flew in back motion striking engineer. One injured.

September 9, 1922, locomotive 587, Nisbet, Pa. Reversing valve rod of air compressor broke. One injured.

*September 11, 1922, locomotive 8934, Indianapolis, Ind. Locomotive derailed at switch due to worn tire. One injured.

September 12, 1922, locomotive 2230, Pittsburgh, Pa. Bonnet on squirt hose valve loose, permitting hot water to escape, striking engineer. One injured.

*September 15, 1922, locomotive 7050, Hudson, Ohio. Eccentric rod became displaced. One injured.

September 19, 1922, locomotive 4216, Devault, Pa. Derailed; engine truck wheels mounted the rail due to sharp flange. One injured.

September 19, 1922, locomotive 8231, St. Paris, Ohio. Grate shaker bar slipped off fulcrum lever due to improper fit. One injured.

September 19, 1922, locomotive 1492, Newark, N. J. Injector steam valve bonnet blew out; threads on bonnet stripped, completely turned over and cross-threaded the entire length. One injured.

September 20, 1922, locomotive 5120, Glenolden, Pa. Side rod broke and dropped down causing engine to turn over; old flaw in rod covering approximately 8 per cent of cross-sectional area. One injured.

September 20, 1922, locomotive 9705, Girard, Ohio. Flue failed at front flue sheet due to material being deteriorated and wasted away. One injured.

September 22, 1922, locomotive 3622, Kearny, N. J. Reflex water glass broke; top gasket between cage and glass improperly applied. One injured.

September 23, 1922, locomotive 1421, near Forest Grove, N. J. Eccentric oil-cup cap worked loose and was thrown through window of a passing train, causing death of a passenger; threads in eccentric strap stripped. One killed.

**September 23, 1922, locomotive 5337, Washington, D. C. Defective distributing valve caused emergency application of brakes. One injured.

**September 26, 1922, locomotive 8038, Mingo Junction, Ohio. Reverse lever flew forward while engineer was attempting to secure it in quadrant with a U-shape piece of iron; latch worn and too much motion between latch and bolt head. One injured.

September 28, 1922, locomotive 8984, near Amo, Ind. Injector overflow valve bonnet blew out; threads on bonnet were distorted and one-sixteenth inch smaller than threads in injector connection; both sides of injector badly battered. One injured.

September 28, 1922, locomotive 1364, Radebaugh, Pa. Flue failed at defective safe end weld. One injured.

September 29, 1922, locomotive 7720, Cleveland, Ohio. Flue broke at safe end weld. One injured.

October 1, 1922, locomotive 548, Beatty, Pa. Flue failed at defective safe end. Three injured.

October 1, 1922, locomotive 7676, near Knightstown, Ohio. Shaker bar slipped from fulcrum lever. One injured.

October 2, 1922, locomotive 8029, near Lyons, Ind. Squirt hose blew off nipple; severely applied. One injured.

October 4, 1922, locomotive 920, Texas, Md. Prospective passengers struck by a piece of cab step which came off and broke in pieces as it struck. Two injured.

October 5, 1922, locomotive 370, Tyrone, Pa. Insufficient clearance between reverse lever and brake pipe. One injured.

October 7, 1922, locomotive 7144, Louisville, Ohio. Eccentric blade became disconnected from link, account of link pin working out, causing reverse lever to fly forward and strike engineer. One injured.

October 9, 1922, locomotive 8950, Greenville, Ill. Steam-heat throttle valve nut blew out; threads on bonnet smaller than threads in body of valve and badly tapered; body of valve fractured at bonnet fit on outlet side. One injured.

October 10, 1922, locomotive 8368, Clymers, Ind. Lubricator feed glass burst. One injured.

October 19, 1922, locomotive 431, Fort Wayne, Ind. Lubricator packing nut blew out due to having been improperly applied. One injured.

October 21, 1922, locomotive 1053, Vestaburg, Pa. Retaining bolt lost out of fireheater damper counterweight; when engineer was replacing the weight the lever flew up striking him in the face. One injured.

October 24, 1922, locomotive 3813, Enola, Pa. Slipped on cab apron account of apron worn smooth. One injured.

October 25, 1922, locomotive 4045, Erie Pa. Locomotive derailed due to right tire becoming loose and breaking retaining groove inside of tire. One injured.

October 30, 1922, locomotive 2745, Petersburg, Pa. Main rod bent and broke; worked out of lap-and-lead lever, rendering valve inoperative and causing steam to be trapped in cylinder; pin reported defective prior to accident and records indicated repairs made. One injured.

November 2, 1922, locomotive 2242 (place not given). Wooden plug blew out of bag in injector delivery pipe; squirt hose nipple broke off and hole was plugged with wood. One injured.

November 6, 1922, locomotive 2259, Earnest, Pa. Lubricator steam-valve bonnet blew off due to old fracture. One injured.

November 7, 1922, locomotive 1901, Donora, Pa. Petticoat pipe came loose from fastenings on right side of smoke box, due to bolts giving way, and dropped down causing back draft. One injured.

November 12, 1922, locomotive 3837, Pomeroy, Pa. Engines 3837 and 2102, uncoupled, and one car were derailed; flange on pony-truck wheel of engine 3837 worn. One injured.

November 13, 1922, locomotive 3740, Iselin, N. J. Waist sheet bolt worked out and thrown from rapidly-moving locomotive, striking employee. One injured.

November 18, 1922, locomotive 929, Enola, Pa. Washout cap blew off due to aged flange breaking; flange of inferior material and cracked prior to accident. One injured.

November 20, 1922, locomotive 9931, Cleveland, Ohio. Shovel struck end of fuel plate which was sticking up about three-sixteenths inch above deck plate, striking fireman to sprain his wrist. One injured.

November 23, 1922, locomotive 1710, near Trenton, N. J. Main rod broke due to fracture extending approximately 95 per cent of cross-sectional area; section of which failed was plainly visible and defect should have been detected by proper inspection. One injured.

November 23, 1922, locomotive 8361, near Carp Lake, Mich. Union nut on steam pipe to air compressor burst due to old flaw. One injured.

November 24, 1922, locomotive 0348, Wheeling, W. Va. Broken stay bolt blew out of bottom of flue sheet due to bolt being broken; threads on bolt and in sheet were defective; telltale hole had been hammered and closed. One injured.

November 25, 1922, locomotive 515, Portage, Pa. Flue failed at safe end weld; reheated in welding. Two injured.

November 30, 1922, locomotive 2562, New Castle, Pa. Blower pipe came out of exhaust pipe causing back draft; pipe screwed in only two threads which were crossed. One injured.

December 1, 1922, locomotive 2329, Pittsburgh, Pa. Arch tube pulled out of throat plate; tube lacked one-eighth inch extending through throat sheet, therefore was not welded or beaded; this and two adjacent arch tubes blistered and heavily coated with scale. One injured.

December 1, 1922, locomotive 9353, near Alliance, Ohio. Arch tube pulled out of throat sheet; this and other arch tubes were not belled or beaded to secure them in place and were blistered and dirty although monthly inspection and repair report rendered just prior to accident showed boiler washed and arch tubes in "good" condition. Three injured.

December 4, 1922, locomotive 9705, Canton, Ohio. Flue broke off at water side of back flue sheet due to being rolled thin and corroded away. One injured.

**December 6, 1922, locomotive 7556, Dennison, Ohio. Reverse lever unlatched and flew back striking engineer; bolt on bottom of lever worn and loose which permitted lever to bind on quadrant and prevented latch from properly engaging quadrant; reverse lever rigging reported defective four times immediately prior to accident and eight times after accident, and the locomotive continued in service until December 19. One injured.

December 7, 1922, locomotive 725, Philadelphia, Pa. Cut by glass window pane which fell out of cab window due to being insecurely fastened. One injured.

December 11, 1922, locomotive 7276, Canton, Ohio. Rivet blew out of combustion chamber seam while being caulked under pressure, due to head on water side having broken off. One injured.

*December 11, 1922, locomotive 7147, New Gallilee, Pa. Burned by steam from lubricator; removing filling cap and account of drain cock being partially stopped, sufficient pressure remained in lubricator to blow cap off when partially unscrewed. One injured.

December 13, 1922, locomotive 2490, Mt. Carbon, Pa. Tank hose burst; fire extinguisher valve open, building up a pressure in tank hose; tank valve and overflow valve closed at time. One injured.

December 16, 1922, locomotive 3329, South Fork, Pa. Throttle lever latch struck stoker elevator shaft, due to insufficient clearance, which prevented throttle from being closed and resulted in engine slipping while engineer was examining main rod which was pounding due to broken key block. One injured.

December 16, 1922, locomotive 7420, Fort Wayne, Ind. Engine truck spring dropped down and struck rail and was thrown forward striking switchman; left front driving spring had previously worked out and was lying on pilot and had been twice so reported, yet engine was dispatched three times in this condition; engine was continued in service for about six hours after both springs were out and condition had been called to official's attention and accident had occurred. One injured.

December 19, 1922, locomotive 3724, Grapeville, Pa. Flue failed at safe end weld; overheated in welding. One injured.

December 21, 1922, locomotive 2099, Snow Shoe Int., Pa. Patch which had been bolted on spark arrester blew off, striking engineer. One injured.

December 21, 1922, locomotive 2138, Kiskiminetas Junction, Pa. Flue broke off near front flue sheet. Two injured.

December 22, 1922, locomotive 1175, Pittsburgh, Pa. Grate shaker lever slipped off fulcrum lever. One injured.

December 23, 1922, locomotive 8540, Scully, Pa. Running board on top of tender was broken and a portion missing, which caused fireman to fall while going back over tender after dark. One injured.

December 23, 1922, locomotive 7921, near Columbus, Ohio. Dead grate lever was bent and grate was down; while trying to raise grate engineer's hand was caught between bar and cab. One injured.

*December 24, 1922, locomotive 6281, Elrama, Pa. Whistle valve stuck open. One injured.

December 27, 1922, locomotive 1604, Pittsburgh, Pa. Spring hanger broke permitting locomotive to drop down and footboard on which employee was riding to catch on rail and bend back, causing employee to fall to ground in front of locomotive and be run over. One killed.

December 29, 1922, locomotive 3081, Pittsburgh, Pa. Fell into tank cistern due to section of filling-hole cover being missing. One injured.

*December 31, 1922, locomotive 36, Trenton, N. J. Stepped into tender cistern account of filling hole cover missing. One injured.

January 1, 1923, locomotive (C. & P.) 7678, New Brighton, Pa. Reverse lever stuck, due to wind shield, which moved back and forth with lever, binding in guides and while trying to release lever it flew forward striking fireman. One injured.

**January 4, 1923, locomotive 3754, Stony Run, Md. Bolt in back end of main rod broke causing rod to fall to ground. One injured.

*January 4, 1923, locomotive 8793, Jefferson, Ind. Plug blew out of fire-door opener striking fireman and permitting oil to be blown into his ear. One injured.

January 5, 1923, locomotive 2155, Harrisburg, Pa. Injector delivery pipe burst due to old fracture. One injured.

January 6, 1923, locomotive 8599, Chicago, Ill. Exhaust nozzle blew out of stack, bending blower pipe and causing back draft; threads on bolts by which nozzle was secured to base stripped. One injured.

January 7, 1923, locomotive 8649, Costonia, Ohio. Cotter key in drawbar pin bent, permitting pin to work up and out of drawbar, which in turn allowed engine tender to separate as much as safety bars would permit and caused fireman to fall. One injured.

January 11, 1923, locomotive 2233, Seanor, Pa. Injector steam ram bonnet blew off of injector due to threads being stripped and bonnet being too small; bonnet could be slipped to within one thread of seat without engaging threads. One injured.

January 11, 1923, locomotive 8710, Terre Haute, Ind. Injector steam pipe collar came off at turret connection; pipe applied under strain and collar of improper fit. Two injured.

January 12, 1923, locomotive 5014, near Phoenix, Md. Engines 5041 and 5014 derailed while double heading, due to coupler knuckle breaking, causing emergency application of brakes. One injured.

January 17, 1923, locomotive 9089, Cleveland, Ohio. Grate connecting rod became disconnected from fulcrum lever due to pin working out, causing fireman's hand to be caught between shaker bar and fire door. One injured.

January 17, 1923, locomotive 7547, Perrysville, Ohio. Air compressor steam pipe bent out of turret due to pipe only extending into turret two threads and not being secured; threads in turret were poor and only one brace between turret and compressor. One injured.

January 18, 1923, locomotive 4040, near Newton Hamilton, Pa. Bolt in link slipped from passing locomotive and struck employee; bolt reported defective just prior to accident and repairs evidently not made. One injured.

January 20, 1923, locomotive 7076, Trinway, Ohio. Squirt hose blew off due to being insecurely applied. One injured.

January 21, 1923, locomotive 3354, Mount Union, Pa. Petticoat pipe dropped down due to bolts working out, causing back draft. One injured.

January 21, 1923, locomotive 7792, Canton, Ohio. Injector steam valve bonnet flew out due to poor threads and bonnet being too small. One injured.

January 21, 1923, locomotive 908, Mesta, Pa. Flue broke off at front flue sheet; badly corroded and wasted away. One injured.

January 22, 1923, locomotive 860, Dresher, Pa. Main rod key came out and struck employee, due to set screw working loose. One injured.

January 24, 1923, locomotive 7347, Conneautville, Pa. Grate shaker bar slipped from fulcrum lever due to bar being cracked and of improper fit. One injured.

January 24, 1923, locomotive 7324, Freedom, Pa. Bell rope broke causing fireman's elbow to strike cab. One injured.

January 27, 1923, locomotive 163, Conemaugh, Pa. Loose bracket securing cylinder cock lever to cab floor, permitted lever to strike reversing wheel and catch engineer's hand between lever and wheel; condition of lever reported twice on January 25 (two days prior to accident) and repairs not made. One injured.

January 27, 1923, locomotive 8472, Tyndall, Ohio. Crosshead caught on guide bolt which had worked down, breaking guide yoke, guide bars and back cylinder head bending main and piston rods. One injured.

January 28, 1923, locomotive 9027, Chicago, Ill. Flange of handhole plate broke while plate was being tightened under pressure. Two killed, two injured.

February 1, 1923, locomotive 254, West Morrisville, Pa. Burned by steam and oil spilling from auxiliary feed valve opening in lubricator which had been left open on locomotive had undergone repairs. One injured.

February 5, 1923, locomotive 269, Plainsboro, N. J. Crank pin collar and bolt slipped from locomotive while running at an estimated speed of 70 miles per hour; engine was struck evidently by collar or bolt or by ballast from track. One injured.

February 5, 1923, locomotive 2868, Gallitzin, Pa. Blower pipe cap blew off. One injured.

February 11, 1923, locomotive 755, Thompsettown, Pa. Locomotives separated while emergency application of brakes due to coupler on locomotive 755 being too tight. One injured.

February 12, 1923, locomotive 1084, Edgewood, Md. Eccentric rod broke and struck cylinder cock rigging which caused operating lever to fly back and strike engineer. One injured.

February 15, 1923, locomotive 3016, Arcade, N. Y. Struck by signal whistle operating valve which dropped down account of bolts securing it in place becoming loose and falling out. One injured.

February 17, 1923, locomotive 1656, near Wilcox, Pa. Side rod knuckle pin lost out and main crank pin broke causing engine to strip; flying parts struck cylinder cock rigging which caused operating lever to strike engineer's leg. One injured.

February 18, 1923, locomotive 4187, Langdon, Pa. Reverse lever became unlatched and flew back striking engineer's arm and breaking it, evidently due to latch and quadrant being worn; latch and quadrant again reported defective on February 25 and 26 after report had been rendered following accident on February 18. One injured.

February 18, 1923, locomotive 2647, Sheffield, Pa. Driver brake hanger pin broke, permitting brake head and shoe to drop down and front brake rod to also break; brakes had been reported defective on February 6, 9, 10, 12, 14, 15, 16, and 17. One injured.

February 19, 1923, locomotive 7398, Ravenna, Ohio. Injector steam pipe pulled out of brazing collar due to defective brazing and struck gauge cock, knocking it off the boiler. Two injured.

February 20, 1923, locomotive 7260, Alliance, Ohio. Liner under valve yoke broke and caught in steam port and when struck by valve caused reverse lever to jump out of quadrant and fly back striking engineer. One injured.

February 24, 1923, locomotive 1657, Groves, Pa. Pin connecting combination lever to union link lost out, causing valve not to function properly and steam to be trapped in cylinder which blew cylinder head off. One killed.

**February 24, 1923, locomotive 1986, Scotland, Pa. Studs securing screw reverse gear casting to boiler worked out, permitting casting and reverse gear to drop down. One injured.

February 24, 1923, locomotive 8002, Pittsburgh, Pa. Crown sheet failure caused by overheating due to low water; water glass cock shut off due to water glass drain valve leaking badly. Two injured.

**February 25, 1923, locomotive 1284, Huff, Pa. Studs securing reverse gear pad to frame pulled out, causing pad to drop and reverse wheel to catch engineer's hand between wheel and cab seat. One injured.

February 26, 1923, locomotive 3512, Sergeant, Pa. Grate shaker bar slipped off fulcrum lever due to lever being distorted and rounded at top. One injured.

*February 26, 1923, locomotive 7660, Logansport, Ind. Locomotive ran away due to throttle lever fulcrum breaking off. One killed, two injured.

February 28, 1923, locomotive 8135, Pitcairn, Pa. Rivet blew out of back flue sheet seam while being caulked under pressure; several rivets badly deteriorated and heavily caulked and some had heads autogenously welded over; arch tubes were blistered, dirty, and out of line; two stay bolt heads had been welded over. One injured.

March 2, 1923, locomotive 1184, East Altoona, Pa. Struck by link bracket bolt which became loose and was thrown from rapidly moving locomotive; bolts had previously been reported defective and report at end of previous trip (three hours prior to accident) showed "Renew right front link bracket bolts" and proper repairs not made. One injured.

March 4, 1923, locomotive 01854, Shire Oaks, Pa. Broken stay bolt blew out of door sheet into fire box; door sheet on water side so badly corroded and eaten away around this and other stay bolts that threads were entirely gone. One injured.

March 7, 1923, locomotive 7927, Greenfield, Ind. Grate shaker bar slipped off lever, due to improper fit. One injured.

*March 12, 1923, locomotive 3516, Cresson, Pa. Stoker was defective, and while attempting repairs stoker reversed, catching fireman's finger. One injured.

March 14, 1923, locomotive 9619, South Boardman, Mich. Left main rod broke, due to old fracture extending over large portion of cross-sectional area; on day of accident company's inspector reported "Left knuckle pin rubbing main rod," and reports indicated repairs not made. One injured.

March 17, 1923, locomotive 8023, Logansport, Ind. Shaker bar slipped off post. One injured.

**March 18, 1923, locomotive 7910, Indianapolis, Ind. Grate shaker bar slipped off fulcrum lever, due to improper fit. One injured.

March 19, 1923, locomotive 642, North Madison, Ind. Lug at bottom of sliding cab door was broken, causing door to swing outward, catching employee's foot between door and cab apron; lug made of too light material. One injured.

March 22, 1923, locomotive 6217, Trunkeyville, Pa. Struck by ash-pan rod, which flew from passing locomotive; rod worn thin at point of failure; rod reported defective on March 20 and 22, and proper repairs not made. One injured.

March 24, 1923, locomotive 9757, near Whitmore, Ohio. Injector steam ram bonnet blew out; threads in body of injector badly worn and flattened and threads on bonnet also flattened and did not engage with threads in body of injector account of bonnet being too small to properly fit into injector body; bonnet reported leaking on March 19, and proper repairs not made. One injured.

March 29, 1923, locomotive 4029, Baltimore, Md. Front cross equalizer hangers broke, causing engine to drop in front, catching footboard on rail; weld in cross equalizer hanger showed old defect, covering approximately 80 per cent of cross-sectional area. One injured.

March 31, 1923, locomotive 9380, Canal Fulton, Ohio. Cab apron was forced forward, throwing fireman against tank, due to worn tender truck center bearings and axle being low at back end. One injured.

April 2, 1923, locomotive 9854, Millbrook, Ohio. Shaker bar slipped off lever; bar lever badly burred, causing an improper fit. One injured.

April 6, 1923, locomotive 8391, Columbia Center, Ohio. Bolt in lap-and-lead lever broke or worked out, causing reverse lever to unlatch and fly back and forth, striking engineer. One injured.

April 6, 1923, locomotive 8114, Columbus, Ohio. Derailment due to engine truck axle breaking, which permitted engine to settle and truck to become rigid. Four injured.

April 8, 1923, locomotive 7283, Millersburg, Ohio. Arch tube blew out; tube was short and not properly belled or beaded to secure it in place. One injured.

April 9, 1923, locomotive 3540, Bristol, Pa. Fire-box door closed unexpectedly, due to defective latch. One injured.

April 10, 1923, locomotive 2872, Royalton, Pa. Shaker bar slipped off fulcrum lever, due to improper fit. One injured.

April 11, 1923, locomotive 561, Jersey City, N. J. Steam pipe to headlight generator valve disconnected; generator loose on boiler, causing threads to be stripped from steam pipe opening. One injured.

April 14, 1923, locomotive 18314, Alpha, Ohio. Blower pipe in smoke box became disconnected, due to threads in blower pipe union nut being stripped. One injured.

April 14, 1923, locomotive 1815, Enola, Pa. Reverse lever unlatched and flew back, striking engineer; reversing gear had been reported defective several times and proper repairs not made. One injured.

April 14, 1923, locomotive 2588, Verona, Pa. Ventilator inoperative from inside cab, making it necessary for employee to climb on top of cab, from which he fell. One injured.

April 16, 1923, locomotive 9845, Danville, Ohio. Cushion valve was missing from automatic fire door, which caused fire door to close too rapidly, catching fireman's hand. One injured.

April 19, 1923, locomotive 1736, Ganister, Pa. Drawbar pin and safety bar castings broke, allowing engine and tender to separate and fireman to fall to ground; drawbar pin had old fracture and was one-half inch smaller than specifications called for; safety bars in use did not belong to this class engine and were 2 1/4 inches too long and were too long, giving 6 1/2 inches slack. One injured.

April 27, 1923, locomotive 7678, Canton, Ohio. Locomotive moved off and ran over fireman's leg, due to throttle valve and dry pipe joint leaking; throttle had been reported leaking badly on April 10 and repairs not made, notation "serviceable" made on the report; throttle was again reported leaking badly on April 12, 25, and 26 and repairs not made; notation "serviceable" also made on report for April 26. One injured.

April 30, 1923, locomotive 8727, near White Lick, Ind. Reverse lever unlatched and flew forward, catching engineer's foot between lever and boiler back head; reverse lever latch did not properly fit quadrant. One injured.

May 5, 1923, locomotive 8255, Wilmerding, Pa. Arch tube pulled out of throat set, due to being improperly applied; tube extended into water space only one-eighth inch and was not belled or beaded to secure it in place; none of the five arch tubes had been belled or beaded and the end of one was flush with water side of sheet; monthly inspection and repair report, sworn to on April 23, or 12 days prior to accident, showed condition of arch tubes as "Good," notwithstanding existing conditions as disclosed by investigation. Two injured.

May 5, 1923, locomotive 2119, Mule Shoe, Pa. Crown sheet failure, due to low water; no contributory causes found. One killed; one injured.

May 6, 1923, locomotive 8095, Grandview, Ohio. Petticoat pipe dropped down, causing back draft, due to bolts in hangers losing out. One injured.

May 6, 1923, locomotive 326, Mingo Junction, Ohio. Reverse lever unlatched and flew forward, striking engineer, due to latch having five-eighths inch play; latch reported defective on May 5 and engine again dispatched and report approved indicating repairs made. One injured.

May 8, 1923, locomotive 7248, near Hillsville, Pa. Grate shaker bar slipped off fulcrum lever, due to improper fit. One injured.

**May 10, 1923, locomotive 7800, Girard Junction, Pa. Grate shaker bar slipped off fulcrum lever due to improper fit. One injured.

May 15, 1923, locomotive 635, Brackenridge, Pa. Front main rod key broke and worked out, resulting in side rod being bent. One injured.

May 16, 1923, locomotive 7507, near Lowellville, Ohio. Blower pipe pulled out of collar at turret connection due to defective brazing. One injured.

May 17, 1923, locomotive 8208, Richmond, Ind. Grate shaker bar slipped off fulcrum lever due to improper fit. One injured.

May 18, 1923, locomotive 3330, Warrior Ridge, Pa. Trailer axle guard was thrown from locomotive and struck employee; guard was insecurely applied. One injured.

**May 18, 1923, locomotive 3065, Deibler, Pa. Eccentric crank pin broke. One injured.

May 21, 1923, locomotive 7918, Unionville, Ohio. Flames came out in cab; section 19 inches by 30 inches of front end baffle plate missing and bottom portion of combustion chamber filled with cinders. One injured.

May 23, 1923, locomotive 7431, Erie, Pa. Reverse lever unlatched and flew backward, striking engineer; eccentric was loose on axle due to studs being loose which permitted eccentric to turn on axle and wedge in strap, which in turn caused blade to break and throw strain on reversing gear; new key and studs were said to have been applied before engine was put in service on May 17, or six days prior to accident. One injured.

May 27, 1923, locomotive 3376, Ryde, Pa. Eccentric rod broke. One injured.

June 5, 1923, locomotive 2140, Munhall, Pa. Blower pipe pulled out of collar at turret connection due to defective brazing; joint was reported leaking on the day prior to accident and repairs not made, notation being made on report as follows: "Deferred account leaking very slightly." One injured.

June 7, 1923, locomotive 8854, near La Paz Junction, Ind. Arch tube pulled out of throat sheet; tube was flush with water side of sheet at top and extended into water space only $\frac{1}{4}$ inch at bottom and was not belled or beaded at either end and was not properly rolled; remaining arch tubes were badly blistered. One injured.

June 9, 1923, locomotive 2876, Kipp's Run, Pa. Flue failed due to defective safe end weld. One injured.

June 12, 1923, locomotive 8804, Hagerstown, Ill. Petticoat pipe tipped over causing back draft; pipe was supposed to be supported by six $\frac{1}{2}$ -inch bolts and only four $\frac{1}{2}$ -inch bolts had been applied; nuts were missing from two of these bolts which left only two $\frac{1}{2}$ -inch bolts supporting pipe, one of which broke permitting pipe to tip over. One injured.

*June 13, 1923, locomotive 8154, Fredericksburg, Ohio. Pilot step struck track foreman when pilot came down. One injured.

June 16, 1923, locomotive 7508, Merrill, Pa. Side rod knuckle pin worked out, breaking side rod which struck running board bracket, knocking stud out of boiler; dowel pin reported missing from knuckle pin on June 13 and 15, and repairs shown to have been made both times. One injured.

June 16, 1923, locomotive 208, Rosslyn, Pa. Reverse lever jerked and flew forward; valve gear in bad condition and had been reported needing repairs ten times within the 15 days preceding the accident; locomotive was continued in service and valve gear reported defective eight times after the accident occurred. One injured.

**June 19, 1923, locomotive 2719, Enola, Pa. Struck by reverse lever which unlatched and flew forward due to latch being worn and excessive play in latch bolt. One injured.

June 20, 1923, locomotive 9949, Cleveland, Ohio. Grate shaker bar slipped off lever account of improper fit. One injured.

June 20, 1923, locomotive 1061, Newport, Pa. Engine truck pedestal cap bolt worked out and was thrown from locomotive striking employee. One injured.

June 21, 1923, locomotive 4176, Cameron, Pa. Grate shaker bar slipped off fulcrum lever due to improper fit. One injured.

June 22, 1923, locomotive 2784, Kearny, N. J. Spring equalizer hanger broke, permitting spring to work out of place, causing engine to drop down and footboard to catch on rail and bend back. One killed.

June 26, 1923, locomotive 8848, Culver, Ind. Injector steam valve packing blew out. One injured.

**June 27, 1923, locomotive 1486, Ganister, Pa. Hand was caught between throttle lever and injector starting lever, due to insufficient clearance between these parts. One injured.

June 28, 1923, locomotive 3807, near Gwynn's Run, Md. Cap on extension piston-rod guide flew from locomotive striking track walker. One injured.

**June 29, 1923, locomotive 797, Putman, Ohio. Lubricator oil pipe pulled out of collar connection due to defective brazing. One injured.

One hundred eighty-one accidents; 8 killed, 197 injured.

MARQUETTE RAILWAY:

July 18, 1922, locomotive 1409, Rougemere, Mich. Connecting rod to cylinder became disconnected. One injured.

April 2, 1923, locomotive 504, Elmdale, Mich. Cylinder cock rigging became disconnected and struck engineer. One injured. Two accidents, two injured.

PHILADELPHIA & READING RAILWAY:

August 18, 1922, locomotive 1723, Leesport, Pa. Injured while making repairs broken bell cord. One injured.

October 7, 1922, locomotive 1187, St. Clair, Pa. Protruding section of cap over bar pin hole caused fireman to fall. One injured.

November 4, 1922, locomotive 969, Lebanon, Pa. Coal board slipped out of car, due to being too short, causing fireman to fall. One injured.

November 14, 1922, locomotive 1023, Beaver Valley, Pa. Engine parted from tender causing emergency application of brakes; main pin of coupler at rear of tender worn and diameter one-half inch smaller than holes in coupler and base, allowing coupler 2 $\frac{1}{4}$ -inch vertical play. One injured.

November 24, 1922, locomotive 999, Biglerville, Pa. Blower pipe became disconnected at exhaust pipe due to badly worn threads on pipe. One injured.

December 12, 1922, locomotive 1712, Port Clinton, Pa. Trailer truck radius broke, due to old flaw, causing derailment of engine and 18 cars; second and third of passenger train on adjacent track were struck by wreckage and turned over. 2 killed; 24 injured.

December 27, 1922, locomotive 1092, Shamokin, Pa. Stud securing grate over fulcrum casting to boiler back head blew out; threads on stud and in sheet metal corroded and wasted away due to leakage. One injured.

January 6, 1923, locomotive 773, Lansdale, Pa. Insufficient clearance between reverse lever and handle of injector water valve. One injured.

January 24, 1923, locomotive 1810, Wetherill Junction, Pa. Tender deck floor was smooth, not affording a secure footing which allowed fireman to slip, his foot going into stoker trough and was caught in stoker worm. One injured.

February 5, 1923, locomotive 719, Shenadoah, Pa. Defective handle on sand cover pulled out of cover, allowing cover to drop on engineer's foot. One injured.

February 24, 1923, locomotive 1820, Locust Summit, Pa. Stoker elevator suddenly reversed catching fireman's hand between operating lever and wrench due to defective mechanism. One injured.

March 13, 1923, locomotive 113, Philadelphia, Pa. Broken and defective stay bolt blew out of fire box combustion chamber; section of bolt at combustion chamber had never been threaded. Two injured.

March 15, 1923, locomotive 1466, Port Richmond, Pa. Boiler check stop valve nut blew out, due to check body being too large. One injured.

March 24, 1923, locomotive 1008, Rutherford, Pa. Vertical handhold at left end of front buffer beam failed due to old fracture extending over approximately one-fourths of cross-sectional area. One injured.

March 29, 1923, locomotive 1470, Port Richmond, Pa. Boiler check stop valve nut blew out, due to check body being too large. One injured.

April 27, 1923, locomotive 1422, Bridgeport, Pa. Injector steam ram bonnet flew out while being caulked; threads on bonnet were badly worn and bonnet could be applied for full depth of threads without turning. One injured.

June 17, 1923, locomotive 1470, Port Richmond, Pa. Stepped into hole in deck plate; hole was approximately 14 inches in diameter. One injured.

June 21, 1923, locomotive 800, Philadelphia, Pa. Hand caught between cab and tool box due to insufficient clearance. One injured.

June 25, 1923, locomotive 1529, Joanna Heights, Pa. Door of tool box came down striking fireman; lock pin missing. One injured.

Nineteen accidents, 2 killed, 43 injured.

FREDERICKSBURG & LAKE ERIE RAILROAD.

February 16, 1923, locomotive 9563, Webster, Pa. Crown sheet failure caused by overheating due to low water; no contributory causes found. One injured. One accident, one injured.

RICHMOND, FREDERICKSBURG & POTOMAC RAILROAD:

October 17, 1922, locomotive 1, near Powells Creek, Va. Left crosshead wrist pin worked out causing engine to strip itself on that side; cotter key arrangement insufficient to prevent wrist pin nuts from working off. One injured.

March 10, 1923, locomotive 69, near Milford, Va. Autogenously welded crack 13 inches long in right knuckle of boiler back head suddenly failed its entire length; when the weld failed the crack extended $\frac{3}{4}$ inch at bottom and $7\frac{1}{4}$ inches at top, making the total length of crack $21\frac{1}{4}$ inches. Two injured.
Two accidents, three injured.

ST. LOUIS & SAN FRANCISCO RAILWAY:

July 6, 1922, locomotive 771, Potts Camp., Miss. Eccentric strap bolt broke. One injured.

*July 7, 1922, locomotive 1043, Springfield, Mo. Derailment caused by loose tire on trailer wheel. One injured.

*July 7, 1922, locomotive 698, Goodland, Okla. Derailment of engine tank due to sharp flange on tank wheel. One injured.

**August 13, 1922, locomotive 1062, near Afton, Okla. Grate shaker connecting rod became disconnected, due to cotter pin working out. One injured.

*August 30, 1922, locomotive 818, Fort Scott, Kans. Bell dropped due to nut on bolt which held it in place coming off. One injured.

September 11, 1922, locomotive 775, Koshkonong, Mo. Stem of bottom water glass cock came out; no provision made to prevent stem from being screwed entirely out of cock. One injured.

**October 11, 1922, locomotive 1632, between Memphis & Tupelo, Miss. Throttle-lever latch would not hold throttle in place; too much lost motion in the rigging and throttle hard to open; throttle reported defective on October 5, 7, 10, 12, 14, and 17. One injured.

**October 22, 1922, locomotive 1316, Sloan, Ark. Squirt hose burst. One injured.

October 29, 1922, locomotive 1022, near Henson, Kans. Right No. 1 crank pin collar bolt broke; allowing rod to come off pin; the increased strain on the left side rod caused it to break, and in turn forced reverse lever back violently; machinery in generally bad condition and condition of right front crank pin and collar reported 12 times immediately prior to accident. One injured.

**November 2, 1922, locomotive 1626, Memphis, Tenn. Arch tube plug blew out; attempted to tighten under pressure. Two injured.

November 9, 1922, locomotive 4000, Luthern, Okla. Union in ash pan sprinkler pipe line worked loose, permitting pipe to swing around and discharging water and steam to strike fireman. One injured.

November 10, 1922, locomotive 616, near Fort Worth, Tex. Crown sheet failure caused by defective and overheated crown stays due to heavy accumulation of scale around stays at crown sheet; of the 28 stays that pulled through sheet, the threads on five were badly deteriorated and on one were entirely gone. One injured.

**November 12, 1922, locomotive 1272, near Macy, Mo. Foot slipped into hole in deck while trying to operate fire door which was defective due to valve spring being defective; hole made in deck to permit removal of drawbar pin was $5\frac{1}{4}$ inches in diameter and not covered. One injured.

November 14, 1922, locomotive 480, Boswell, Colo. Flue broke off due to being overheated when safe end was applied. One injured.

November 23, 1922, locomotive 4, Newburg, Mo. Cylinder cock slide rod came out of cock due to retaining key missing. One injured.

November 30, 1922, locomotive 9, Turner, Mo. Engine derailed and tipped over; metal pilot sagged on right side and caught on guard rail due to defective bracket and bolts; $1\frac{1}{2}$ inches lateral play between wheels and boxes of engine truck. One injured.

December 9, 1922, locomotive (K. C. C. & S.) 403, Langston, Mo. Water glass burst. One injured.

December 23, 1922, locomotive 1272, near Carthage, Mo. Crosshead wrist pin broke and worked out causing guide, guide yoke, and rods to break and locomotive to be stripped; machinery in generally bad condition prior to accident and locomotive was dispatched in this condition after having been held at shop for 10 days. One injured.

*January 12, 1923, locomotive 1432, Racine, Mo. Reverse lever jerked and flew forward due to valves being dry, catching engineer between lever and boiler back head. One injured.

January 22, 1923, locomotive 593, Grandview, Mo. Locomotive side-wiped cars due to brakes being inoperative caused by air compressor failing; dowel pin securing lock nut on air compressor piston rod broke, permitting nut to work off and lodge so as to prevent piston from completing stroke and stop compressor. One killed.

January 24, 1923, locomotive 1306, near La Cygne, Kans. Reverse lever unlatched and flew forward, catching engineer's foot; foreign matter in teeth of reverse lever quadrant. One injured.

February 5, 1923, locomotive 10, Springfield, Mo. Arch tube plug blew out while tightened under pressure by instructions of the foreman. Two injured.

February 7, 1923, locomotive 4023, Claremore, Okla. Bolt connecting grate shaker drum lever to connecting rod lost out, causing fireman's hand to be caught between lever bar and boiler back head. One injured.

February 17, 1923, locomotive 1226, Johnsons, Ark. Reverse lever jumped out of quadrant, injuring engineer. One injured.

February 24, 1923, locomotive 28, Glen Allen, Ala. Crown sheet failure caused by heating due to low water; no contributory causes found. Three killed.

March 2, 1923, locomotive 1206, Dora, Ala. Air compressor steam valve bonnet came off. One injured.

March 8, 1923, locomotive 4017, Belfast, Mo. Injured while working with stoker which was defective due to pin losing out of conveyor shaft. One injured.

March 10, 1923, locomotive 499, Carleton, Okla. Blow-off cock stuck open; drain-pipe loose at connection to blow-off cock. One injured.

March 17, 1923, locomotive 3803, West Tulsa, Okla. Grate shaker bar slipped off drum lever due to improper fit. One injured.

March 21, 1923, locomotive 22, Stanton, Mo. Wooden plug in blower connection smoke box blew out causing fireman to be burned. One injured.

*April 1, 1923, locomotive 2, Springfield, Mo. Ash pan blow-off discharge pipe flew off due to not being securely clamped. One injured.

April 11, 1923, locomotive 1026, Kelleyville, Okla. Collar plate was thrown from locomotive, striking lady on station platform. One injured.

April 18, 1923, locomotive 623, near Westville, Okla. Flue broke off at safe end and overheated in welding. One injured.

April 27, 1923, locomotive 744, Lockwood, Mo. Squirt hose blew off due to being insecurely clamped. One injured.

May 12, 1923, locomotive 4031, Greene, Okla. Locomotive and 10 cars derailed due to excessive lateral play in engine truck. Three injured.

*May 20, 1923, locomotive 4015, near Okmulgee, Okla. Plate in deck floor gave way causing fireman to fall and arm to be caught between upper and lower sections of fire door. One injured.

*May 23, 1923, locomotive 649, near Harbin, Tex. Main driving axle broke due to flaw. One injured.

June 13, 1923, locomotive 1254, Madill, Okla. Crown sheet failure caused by overheating due to low water; right injector inoperative; opening into boiler at left side check greatly reduced by accumulation of scale; opening in bottom of water tank reduced to seven-sixteenths inch by accumulation of scale and mud. One injured; two injured.

June 17, 1923, locomotive 4025, Fitzhugh, Okla. Cylinder head blew out. One injured.

Thirty-nine accidents, 5 killed, 42 injured.

LOUIS SOUTHWESTERN RAILWAY:

August 6, 1922, locomotive 662, Mount Pleasant, Tex. Fireman became overheated, due to defective fire door. One injured.

August 7, 1922, locomotive 16, Almyra, Ark. Driving spring broke. One injured.

December 12, 1922, locomotive 250, near Pine Bluff, Ark. Arch tube pulled out of throat sheet; tube did not extend through sheet far enough to permit bolting or welding to secure it in place; fifteen flues had been renewed in bottom of boiler immediately prior to accident and boiler not washed or arch tubes cleaned of mud and scale. Two injured.

*January 17, 1923, locomotive 666, Texarkana, Tex. Metal shade used over steam engine cab light fell between throttle lever and boiler, preventing throttle from being used, and caused collision with passenger train. Three injured.

*February 6, 1923, locomotive 155, England, Ark. Hand was caught between reverse lever and boiler, due to insufficient clearance. One injured.

*February 15, 1923, locomotive 761, Finn, Ark. Apron flew up cutting fireman, due to edge being worn sharp. One injured.

March 9, 1923, locomotive 517, Tyler, Tex. Expansion pad stud blew out of boiler back head; stud entered sheet only three-eighths inch and threads on stud and in sheet were corroded and worn away by leakage. One injured.

*March 23, 1923, locomotive 580, Weiner, Ark. Grate shaker rigging became disconnected due to bolt pulling out. One injured.

Eight accidents, 11 injured.

SEABOARD AIR LINE RAILWAY:

** July 1, 1922, locomotive 802, near Dade City, Fla. Struck in the eye by hot water from leaky throttle gland. One injured.

July 31, 1922, locomotive 610, Waldo, Fla. Water glass burst; front glass missing from shield. One injured.

** October 27, 1922, locomotive 664, Fernandina, Fla. Piston valve ring broke, causing reverse lever to fly back, striking the hostler. One injured.

January 3, 1923, locomotive 702, near Tampa, Fla. Crown sheet failure caused by overheating due to low water; top water glass cock spindle very loose and lacked only one-sixth of a turn being closed; flues reported leaking 19 times and fire box reported leaking 28 times during the period October 5, 1922, to January 2, 1923. Two injured.

February 11, 1923, locomotive 785, near McClenny, Fla. Crown sheet failure caused by overheating due to low water; bottom water glass cock entered boiler through tee iron on back head and the opening therein was entirely closed by accumulation of hard scale; gauge cocks applied direct in flange of back head. One killed, one injured.

* February 14, 1923, locomotive 402, Hamlet, N. C. Reverse lever broke and while attempting to reverse engine engineer's hand was cut. One injured.

** March 24, 1923, locomotive 1022, Wilmington, N. C. Squirt hose became disconnected. One injured.

April 30, 1923, locomotive 707, Hamlet, N. C. Bolt supporting handrail column gave way, due to head having been worn away by cinders in smoke box. One injured.

** June 10, 1923, locomotive 395, Howells, Ga. Grate shaker bar slipped off fulcrum lever. One injured.

Nine accidents, 1 killed, 10 injured.

SOUTHERN RAILWAY:

July 11, 1922, locomotive 50, Pinners Point, Va. Grate bearer stud blew out of fire box side sheet, due to side sheet badly wasted away. One injured.

** July 12, 1922, locomotive 928, York, Ala. Cylinder cock valve blew out. One injured.

July 13, 1922, locomotive 595, Ensley, Ala. Handle slipped off air compressor steam valve, due to being loose allowing engineer who was closing valve to fall from running board. One injured.

** July 15, 1922, locomotive 964, Ellenwood, Ga. Insufficient clearance between reverse lever and cab seat. One injured.

August 3, 1922, locomotive 1072, Corinth, Miss. Grate shaker rod broke. One injured.

** August 4, 1922, locomotive 855, Culpeper, Va. Tender sill step at gangway loose, causing conductor to fall. One injured.

* August 7, 1922, locomotive 5039, Majolica, N. C. Autogenously welded side sheet seam cracked. One injured.

August 11, 1922, locomotive 1059, Steens, Miss. Side rod broke due to old fracture. Two injured.

August 12, 1922, locomotive 859, Keens, Ill. Eccentric strap broke. One injured.

August 17, 1922, locomotive 801, near Juliette, Ga. Eccentric blade bolt broke or came out. One injured.

* August 19, 1922, locomotive 763, Charlottesville, Va. Coupler pulled out due to bolts breaking. One injured.

August 28, 1922, locomotive 796, Phelps, Ga. Injector steam pipe broke off at bottom collar. One injured.

* September 3, 1922, locomotive 847, Buford, Ga. Bolt in front end of eccentric rod lost out. One injured.

September 10, 1922, locomotive 6205, Montlake, Tenn. Shaker bar slipped off post due to improper fit. One injured.

* October 5, 1922, locomotive 709, Morrisville, N. C. Engine step turned causing engineer to fall. One injured.

October 17, 1922, locomotive 1347, near Wenasoga, Miss. Insufficient clearance between reverse lever and brake valve. One injured.

October 18, 1922, locomotive 8344, Tamworth, Ga. Injector steam pipe collar broke, due to defective material and brazing. One injured.

October 26, 1922, locomotive 669, Limecut, Ala. Valve rod bent when key worked out. One injured.

* October 29, 1922, locomotive 1202, East Junction, Ind. Struck by reverse lever which kicked account of valves being dry and counter balance spring not properly adjusted. One injured.

November 1, 1922, locomotive 693, Fernback, Ala. Discharge pipe from blow-off cock became disconnected and flew around striking fireman; sleeve of pipe union had 10 threads per inch while nut had 8 threads per inch; pipe not clamped. One injured.

* November 1, 1922, locomotive 3839, Rock Hill, S. C. Spring hanger broke. One injured.

** November 4, 1922, locomotive 6165, Chattanooga, Tenn. Cylinder head blew out due to casting being defective and faced off until it was too weak to withstand pressure. One injured.

November 5, 1922, locomotive 680, Hempridge, Ky. Eccentric strap broke, causing reverse lever to fly back, striking engineer. One injured.

** November 11, 1922, locomotive 6594, Birmingham, Ala. Washout plug blew out; attempted to tighten under pressure. One injured.

* November 11, 1922, locomotive 6464, Lovick, Ala. Brake hanger broke. One injured.

** November 17, 1922, locomotive 1108, Granite, Va. Valve yoke broke, causing reverse lever to fly back, striking engineer on head. One injured.

** December 1, 1922, locomotive 1306, Raleigh, N. C. Burned by steam escaping from steam hose, due to defective valve which would not shut off. One injured.

** December 2, 1922, locomotive 6585, near Rising Fawn, Ga. Bolt lost out of combination lever, causing transmission bar to drop down and strike combination lever which threw reverse lever out of quadrant. One injured.

** December 5, 1922, locomotive 6125, Lexington, Ky. Throttle flew back, striking engineer, due to latch spring being broken. One injured.

** December 6, 1922, locomotive 1637 (place not given). Injector steam ram packing blew out. One injured.

December 7, 1922, locomotive 321, Barber, N. C. Ash pan blower pipe came loose at union, permitting hot water to escape and strike fireman. One injured.

** December 13, 1922, locomotive 6286, Norwood, Ky. Burned by steam escaping from vent in air compressor governor, due to drain pipe being missing. One injured.

January 7, 1923, locomotive 1346, Wheeler, Ala. Side rod broke; cause undetermined. Two killed.

January 11, 1923, locomotive 188, Edgefield, S. C. Grate shaker lever broke. One injured.

January 21, 1923, locomotive 4758, Inlet, Va. Crown sheet failure caused by overheating due to low water; gauge cocks applied directly in back boiler head; left injector all-tale pipe plugged at injector connection. Three killed.

February 10, 1923, locomotive 6284, Donerail, Ky. Reverse lever flew forward striking engineer's leg between lever and boiler back head. One injured.

** February 23, 1923, locomotive 574, Monetta, S. C. Reverse lever flew forward striking engineer's foot due to insufficient clearance between reverse lever and boiler backhead. One injured.

February 27, 1923, locomotive 6228, Spring City, Tenn. Engineer's leg caught between reverse lever and air pipe due to insufficient clearance. One injured.

February 28, 1923, locomotive 4582, Huffman, Tenn. Lubricator oil control valve stem twisted off; valve was stuck and could not be turned without wrench. One injured.

* March 6, 1923, locomotive 4614, Inman, S. C. Ash pan blower pipe became disconnected from blower valve and when valve was opened steam struck fireman. One injured.

March 12, 1923, locomotive 6940, Purvis, Miss. Piston rod broke, knocking out front cylinder head. One injured.

** March 16, 1923, locomotive 6275, Oneida, Tenn. Burned by hot grease which flew out when grease cup cap on back of main rod was removed account of rod running hot due to being keyed up too tight and grease hole stopped up with white lead. One injured.

** April 2, 1923, locomotive 5031, Asheville, N. C. Pilot step broke off, causing brakeman to fall to ground. One injured.

April 12, 1923, locomotive 6258, Faulconer, Ky. Nuts worked off of whistle valve stem permitting valve to drop down and whistle to blow continuously. One injured.

April 20, 1923, locomotive 688, Clinchcross, N. C. Squirt hose separated at splice, due to being insecurely clamped. One injured.

* April 21, 1923, locomotive 15, Spencer, N. C. Hand caught between reverse lever and gauge cock. One injured.

** May 13, 1923, locomotive 1719, near Stacy, N. C. Injector steam pipe pulled out of brazing collar due to defective brazing. One injured.

May 19, 1923, locomotive 6497, near Norwood, Ky. Scalded by water coming from injector indicator pipe due to clamp on pipe being loose, permitting it to turn. One injured.

May 27, 1923, locomotive 703, Marlow, Ill. Squirt hose burst. One injured.

**June 5, 1923, locomotive 1692, Spencer, N. C. Squirt hose blew off nipple. One injured.

June 9, 1923, locomotive 6283, Junction City, Ky. Grate shaker bar slipped off fulcrum lever due to defective condition of lever. One injured.

**June 11, 1923, locomotive 1358, Oak Ridge, Va. Grab iron broke, causing fireman to fall from running board. One injured.

*June 18, 1923, locomotive 6514, Finley, Ala. Handrail was loose at one end, causing employee to fall. One injured.

June 20, 1923, locomotive 82, Oak Mountain, Ga. Flue broke at safe end weld; material crystallized. One injured.

Fifty-four accidents, 5 killed, 53 injured.

SOUTHERN PACIFIC (ATLANTIC) SYSTEM:

*July 12, 1922, locomotive (H. & T. C.) 104, Houston, Tex. Grab iron gave way. One injured.

*August 26, 1922, locomotive (H. & T. C.) 322, Bremond, Tex. Lubricator glass burst; cut by flying glass. One injured.

*August 29, 1922, locomotive (H. & T. C.) 105, Ennis, Tex. Insufficient clearance between reverse lever and independent brake valve handle. One injured.

September 14, 1922, locomotive (G. H. & S. A.) 62, New Orleans, La. Scalded while attempting to remove obstruction from inoperative water glass blow-off cock. One injured.

December 12, 1922, locomotive (M. L. & T.) 901, Crosby, Tex. Cut by broken glass in front cab door while passing through door. One injured.

December 14, 1922, locomotive (T. & N. O.) 53, Denison, Tex. Crown sheet failure caused by overheating due to low water. One injured.

December 24, 1922, locomotive (G. H. & S. A.) 206, near Richland, Tex. Side rod broke and struck bottom of cab; metal badly crystallized. One injured.

February 4, 1923, locomotive (G. H. & S. A.) 460, Rockland, Tex. Insufficient clearance between reverse lever and boiler back head caused engineer's hand to be caught; stop pin in quadrant missing. One injured.

February 16, 1923, locomotive (G. H. & S. A.) 775, Browns Spur, Tex. Blow-off cock stuck open. One injured.

*February 18, 1923, locomotive 452, Jacksonville, Tex. Burned by escaping oil and steam due to plug missing from T fitting in oil tank heater pipe line. One injured.

**February 27, 1923, locomotive (H. & T. C.) 19, Waco, Tex. Step on engine gave way due to being insecurely fastened causing employee to fall from running board. One injured.

April 13, 1923, locomotive (G. H. & S. A.) 266, Avondale, La. Window frame and glass broke while window was being opened. One injured.

*April 22, 1923, locomotive 561, Albania, La. Main driving axle broke. One injured.

Thirteen accidents, 13 injured.

SOUTHERN PACIFIC (PACIFIC) SYSTEM:

July 1, 1922, locomotive 2684, Pulp, Ore. Locomotive collided with cars; driver brakes failed to hold account of excessive piston travel on right side, due to adjusting nut working loose. One injured.

August 24, 1922, locomotive 3665, Kern Junction, Calif. Air hose on rear of tender blew off, due to being improperly applied, causing emergency application of brakes. One injured.

August 25, 1922, locomotive (C. P.) 1192, Ogden, Utah. Heads of main air reservoir blew out. Two injured.

September 2, 1922, locomotive 3717, Hornbrook, Calif. Squirt hose burst. One injured.

September 9, 1922, locomotive 2782, Dragoon, Ariz. Handhold on smoke box gave way due to pin working out, causing brakeman to fall. One injured.

*January 2, 1923, locomotive 2721, Whitewater, Calif. Key in main rod lost out. One injured.

*March 15, 1923, locomotive 2918, Downey, Calif. Main crank pin broke. One injured.

*April 16, 1923, locomotive 1203, River Station, Calif. Stepped in a hole in cab floor. One injured.

June 13, 1923, locomotive 3265, Newcastle, Calif. Driving axle broke, due to old fracture, causing engine to be stripped and derailed while in tunnel; section of side rod knocked blow-off cock out of sheet. Two injured.

June 14, 1923, locomotive 2835, Tucson, Ariz. Superheater flue burst due to failure of autogenous weld. One injured.

June 18, 1923, locomotive 2672, Gila, Ariz. Boiler check cap blew out while being tightened under pressure; threads in check body and on cap were stripped. One injured.

Eleven accidents, 13 injured.

MISSISSIPPI CENTRAL RAILWAY:

June 16, 1923, locomotive 602, Creston, Tenn. Squirt hose became disconnected. One injured.

One accident, 1 injured.

NATIONAL RAILROAD ASSOCIATION OF ST. LOUIS:

January 17, 1923, locomotive 423, East St. Louis, Ill. Water glass and glasses in boiler broke; cut by flying glass and burned by escaping steam. One injured.

June 26, 1923, locomotive 79, St. Louis, Mo. Scalded by water coming from worn pipe in squirt hose. Two injured.

Two accidents, three injured.

PACIFIC COAST & PACIFIC RAILWAY:

September 4, 1922, locomotive 520, near Mineola, Tex. Superheater flue broke off at end weld; overheated in welding. Two injured.

*October 15, 1922, locomotive 27, Paris, Tex. Piston rod broke, due to old fracture, knocking out front cylinder head and portion of cylinder, which struck non-employee who was riding on footboard. 1 killed.

November 1, 1922, locomotive 275, Addis, La. Crown sheet failure due to overheating caused by low water; top cock of left water glass almost closed. One injured.

November 21, 1922, locomotive 355, Gates, Tex. Crown sheet failure caused by overheating due to low water; right water glass inoperative due to cocks being closed to drainpipe having broken off. Opening in bottom cock of right water glass reduced to one-sixteenth inch in diameter by accumulation of hard scale; left water glass very sluggish due to opening in bottom cock being reduced to one-sixteenth inch by accumulation of hard scale; right boiler check valve disconnected and

leaked; 16 crown stays broken and 15 crown stays had threads badly wasted away; drain pipe to right water glass reported broken off on November 15 and 18 and repairs made. Three injured.

January 10, 1923, locomotive 466, Dallas, Tex. Extension handle became disconnected from blower valve and while attempting repairs on line of road, fireman injured. One injured.

April 30, 1923, locomotive 209, Howard, La. Brake rod became disconnected due to hook straightening; while attempting repairs on line of road brakes were applied and brake lever caught fireman's head between lever and auxiliary reservoir. One injured.

April 30, 1923, locomotive 284, Boyce, La. Spindle of water glass valve blew out. One injured.

Seven accidents; two killed, eight injured.

LEDO & OHIO CENTRAL RAILWAY:

January 13, 1923, locomotive 9562, near Fostoria, Ohio. Main crank pin broke, due to old flaw covering approximately 75 per cent of cross-sectional area, permitting rods to drop, back side rod broke and flew around striking cab, also knocked blow-off cock out. One injured.

One accident; one injured.

UNITY & BRAZOS VALLEY RAILWAY:

November 1, 1922, locomotive 36, Wilmot, Tex. Crown sheet failure; low water; contributory causes found; many parts and appurtenances damaged to such extent that their previous condition could not be determined. Two killed.

March 6, 1923, locomotive 39, Gulf Coast, Tex. Handrail came loose, causing fireman to fall to ground. One injured.

Two accidents; two killed, one injured.

UNION PACIFIC SYSTEM:

**July 9, 1922, locomotive 5006, near Rock Springs, Wyo. Grate shaker connecting pin out of place, due to cotter key working out. One injured.

September 20, 1922, locomotive 2839, Rawlins, Wyo. Washout plug blew out. Two injured.

**December 28, 1922, locomotive 351, Granite Canon, Wyo. Engine parted from main due to bent knuckle pin in coupler on rear of tender and coupler 1½ inches too low. One injured.

January 2, 1923, locomotive 5001, near Castle Rock, Utah. Crown sheet failure caused by overheating due to low water; opening through bottom water glass cock reduced to approximately one-eighth inch in diameter by accumulation of scale. Two injured.

Four accidents, six injured.

VICKSBURG, SHREVEPORT & PACIFIC RAILWAY:

October 26, 1922, locomotive 332, Shreveport, La. Knuckle lock of front coupler on locomotive failed to operate, allowing cars to roll away and collide with other cars. One killed.

One accident, one killed.

VIRGINIAN RAILWAY:

**July 29, 1922, locomotive 602, Elmore, W. Va. Throttle was leaking and brakes defective and in trying to reverse engine in order to prevent a collision fireman was injured. One injured.

August 13, 1922, locomotive 459, near Sewalls Point, Va. Squirt hose blew off nipple; hose insecurely clamped. One injured.

**August 15, 1922, locomotive 471, Whitethorne, Va. Power reverse gear inoperative account of nuts lost off valve stem operating valve in valve chamber, causing injury to engineer while attempting to reverse locomotive by use of pinch bar. One injured.

October 19, 1922, locomotive 214, Sebrell, Va. Sprinkler hose blew off nipple due to being insecurely clamped. One injured.

Four accidents, four injured.

WABASH RAILWAY:

*July 9, 1922, locomotive 2445, Decatur, Ill. Latch lifter of reverse lever broken off, causing lever to release unexpectedly. One injured.

*July 22, 1922, locomotive 698, Hardin, Mo. Transmission bar bolt worked out, causing rod to drop and lever to unlatch and fly back. One injured.

*July 22, 1922, locomotive 2317, Hulls, Ill. Cross-equalizer on engine broke, tearing off ash pan door, brake and driver spring; some of these parts getting under caboose and causing it to derail. Three injured.

*July 27, 1922, locomotive 2402, Riverton, Ill. Side rod broke due to old flaw. One injured.

**September 10, 1922, locomotive 2452, Bluffs, Ill. Reverse gear suddenly went into full forward motion causing engineer's hand to be caught between reverse lever and boiler head; lever latch and quadrant defective and insufficient clearance between lever and boiler head. One injured.

September 22, 1922, locomotive 2003, between Wellsville, and Montgomery, Mo. Shaker bar slipped off post due to being worn and improper fit. One injured.

October 8, 1922, locomotive 2160, near McFall, Mo. Crown sheet failure; low water; opening through left boiler check where it enters boiler reduced from one and one-sixteenth inch to one-half inch in diameter by hard scale; water in boiler foaming. Two injured.

**December 17, 1922, locomotive 2082, near Wellsville, Mo. Defective guides lost off causing main rod and piston rod to break. One injured.

**February 2, 1923, locomotive 2525, Knights, Ill. Flue burst. One injured.

**February 3, 1923, locomotive 549, Moberly, Mo. Shaker bar slipped off post due to shoulder worn on post, preventing a proper fit. One injured.

**February 11, 1923, locomotive 2515, Harvel, Ill. Grate shaker staff broke off. One injured.

April 12, 1923, locomotive 2460, Decatur, Ill. Cotter key in fire door lost out, allowing door to drop to one side and disconnect. One injured.

April 28, 1923, locomotive 605, near Salisbury, Mo. Reverse lever unlatched and flew forward catching engineer's hand and leg between lever and boiler back head; on April 1, 3, 4, 5, 8, 22, and 27, it was reported that reverse lever would not stay latched and proper repairs were evidently not made. One injured.

June 10, 1923, locomotive 552, Toledo, Ohio. Main rod strap broke due to old fracture, causing front cylinder head to be knocked out and piston follower head to be broken; switchman was riding on front footboard and was knocked off and down an embankment. One injured.

**June 15, 1923, locomotive 2452, Decatur, Ill. Fire door dropped down and caught employee's hand due to latch fouling bolt in door frame which prevented it from functioning properly. One injured.

June 26, 1923, locomotive 485, Delray, Mich. Lubricator glass burst and wire mesh shield was blown off, striking engineer. One injured.

Sixteen accidents, 19 injured.

EASTERN MARYLAND RAILWAY:

July 4, 1922, locomotive 758, Twenty-first, Md. Reverse lever slipped out of quadrant. One injured.

*August 13, 1922, locomotive 208, Baltimore, Md. Drifting valve bonnet blew off valve; bonnet cracked and of too light construction. One injured.

August 15, 1923, locomotive 816, Broadback, Pa. Grate shaker slipped off fulcrum bar due to improper fit. One injured.

November 22, 1922, locomotive 610, Baltimore, Md. Reverse lever flew back; it end of quadrant three-sixteenth inch too low, preventing latch from entering latches sufficient to hold. One injured.

February 4, 1923, locomotive 207, Smithburg, Md. Drifting valve bonnet blew off valve due to bonnet being too small. One injured.

Five accidents, five injured.

DEWEES & LAKE ERIE RAILWAY:

September 22, 1922, locomotive 2307, Minerva, Ohio. Spring hanger broke. One injured.

November 2, 1922, locomotive 2302, Moran, Ohio. Whistle stuck open, due to excessive lost motion in rigging. Two injured.

November 10, 1922, locomotive 6051, Canton, Ohio. Automatic fire door failed, due to loose stud in pedal brace. One injured.

*November 30, 1922, locomotive 8412, Zoar, Ohio. Engine parted from train, due to low coupler on rear of tender. Three injured.

*December 12, 1922, locomotive 6006, Lodi, Ohio. Grate shaker bar slipped off fulcrum lever, due to improper fit. One injured.

December 18, 1922, locomotive 4314, between Gambrinus and Coshocton, Ohio. Injured by steam leaks in cab, due to staybolts, injector, and turret leaking. One injured.

January 14, 1923, locomotive 6070, Gambrinus, Ohio. Arch tube pulled out of flat sheet; tube did not extend through sheet and was not belled or beaded; copper tube had been beaded over end of tube, which made the tube appear to have been belled. One injured.

January 15, 1923, locomotive 4317, Cleveland, Ohio. Blower pipe broke off in smoke box, causing back draft; pipe reported defective on January 10 and 12, and proper repairs not made. One injured.

February 21, 1923, locomotive 6006, Brewster, Ohio. Hinges on front end door where attached to door, allowing door with headlight and bracket attached to fall on boilermaker; metal very porous and only about 30 per cent of net section of metal supporting the door. One injured.

February 25, 1923, locomotive 2307, Brewster, Ohio. Washout plug blew out while attempting to tighten under pressure; plug applied cross-threaded. One injured.

April 1, 1923, locomotive 8006, Wellington, Ohio. Flue broke off at back flue sheet where it had been worked very thin; flue loose in front flue sheet. Two injured.

June 22, 1923, locomotive 6009, Ironville, Ohio. Squirt hose blew off nipple, due to being insecurely clamped. One injured.

Twelve accidents, 16 injured.

CHITA FALLS & SOUTHERN RAILROAD:

September 1, 1922, locomotive 109, near Anarene, Tex. Crown sheet failure; low water; right injector would not operate and left injector would not supply the boiler while locomotive was working hard. One injured.

One accident, one injured.

CHITA VALLEY RAILWAY:

November 11, 1922, locomotive 207, Jayton, Tex. Plug in cylinder worked loose and blew out. One injured.

December 9, 1922, locomotive 153, Holliday, Tex. Grate-shaker connecting rod broke, causing fireman to fall against oil-can rack. One injured.

Two accidents, two injured.

MOBILE & MISSISSIPPI VALLEY RAILROAD:

July 18, 1922, locomotive 2019, Memphis, Tenn. Reach rod too long, causing striking ring to catch and reverse lever to fly out of quadrant, striking engineer. One injured.

November 29, 1922, locomotive 913, Gloster, Miss. Water glass burst and in turn broke electric-light globe, a piece of which struck and cut fireman. One injured.

Two accidents, two injured.

Table showing number of locomotives inspected

and defective, and ordered from service, etc.

Main data table with columns for locomotive parts and locations. Rows include categories like Air compressors, Arch tubes, Axles, Blow-off cocks, Boiler checks, etc., and locations like Akron & Barberton Belt, Alabama & Vicksburg, Ann Arbor, Arizona Eastern, Ashland Coal & Iron, etc.

Summary rows for the left page: Number of defects, Locomotives reported, Locomotives inspected, Locomotives defective, Percentage of inspected found defective, Locomotives ordered out of service.

Summary rows for the right page: Locomotives ordered out of service, Locomotives defective, Locomotives reported, Locomotives inspected, Locomotives defective, Percentage of inspected found defective, Locomotives ordered out of service.

Table showing number of locomotives inspected,

	Carnegie Steel.	Carolina & North-western.	Carolina, Clinchfield & Ohio.	Central New England.	Central of Georgia.	Central R. R. of New Jersey.	Central Vermont.	Charleston & Western Carolina.	Charlotte Harbor & Northern.
1 Air compressors.....									
2 Arch tubes.....									
3 Ash pans or mechanism.....									
4 Axles.....									
5 Blow-off cocks.....									
6 Boiler checks.....									
7 Boiler shell.....									
8 Brake equipment.....									
9 Cabs or cab windows.....									
10 Cab aprons or decks.....									
11 Cab cards.....									
12 Coupling or uncoupling devices.....									
13 Crossheads, guides, pistons, or piston rods.....									
14 Crown bolts.....									
15 Cylinders, saddles, or steam chests.....									
16 Cylinder cocks or rigging.....									
17 Domes or dome caps.....									
18 Draft gear.....									
19 Draw gear.....									
20 Driving boxes, shoes, wedges, pedestals, or braces.....									
21 Fire-box sheets.....									
22 Flues.....									
23 Frames, tail pieces, or braces, locomotive.....									
24 Frames, tender.....									
25 Gauges or gauge fittings, air.....									
26 Gauges or gauge fittings, steam.....									
27 Gauge cocks.....									
28 Grate shakers.....									
29 Handholds.....									
30 Injectors, inoperative.....									
31 Injectors and connections.....									
32 Inspections or tests not made as required.....									
33 Lateral motion.....									
34 Lights, cab or classification.....									
35 Lights, headlights.....									
36 Lubricator or shields.....									
37 Mud rings.....									
38 Packing nuts.....									
39 Packing, piston rod and valve stem.....									
40 Pilot or pilot beams.....									
41 Plugs or studs.....									
42 Reversing gear.....									
43 Rods, main or side, crank pins or collars.....									
44 Safety valves.....									
45 Sanders.....									
46 Springs or spring rigging.....									
47 Squirt hose.....									
48 Stay bolts.....									
49 Stay bolts, broken.....									
50 Steam pipes.....									
51 Steam valves.....									
52 Steps.....									
53 Tanks or tank valves.....									
54 Telltale holes.....									
55 Throttle or throttle rigging.....									
56 Trucks, engine or trailing.....									
57 Trucks, tender.....									
58 Valve motion.....									
59 Washout plugs.....									
60 Water bar or combustion flues.....									
61 Water glass, fittings or shield.....									
62 Wheels.....									
63 Miscellaneous—Signal appliances, badge plates, brakes (hand).									
Number of defects.....	9	212	22	333	1,853	98	86	1	
Locomotives reported.....	58	10	75	96	306	601	94	63	12
Locomotives inspected.....	11	14	56	12	306	583	63	66	4
Locomotives defective.....	5	5	38	7	100	447	30	45	1
Percentage of inspected found defective.....	36	68	68	53	77	77	47	68	25
Locomotives ordered out of service.....	1	10	1	10	139	4	1		

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

Chicago & Alton.	Chicago & Eastern Illinois.	Chicago & North-western.	Chicago & Western Indiana.	Chicago, Burlington & Quincy.	Chicago Great West-ern.	Chicago, Indianapolls & Louisville.	Chicago Junction.	Chicago, Milwaukee & St. Paul.	Chicago, Peoria & St. Louis.	Chicago, Rock Island & Pacific.	Chicago, St. Paul, Minneapolis & Omana.	Chicago Short Line.	Chicago, West Full-man & Southern.	Cincinnati, Indianapolls & Western.	Cleveland, Cincinnati, Chicago & St. Louis.	Colorado & Southern.
20	5	3	97	1	78	5	5	82	55	35	18	10	1			
21	4	4	24		5	5	3	3	32	1	5	2	3			
22	1	7	6		3	5	5	1	18	1	2	2	4			
23			2		1				1				3			
24	19	15	75	2	11	5	2	34	131	13	35	12	5			
25	15	15	52		45	4	3	19	54	14	38	11	6			
26	21	17	39		35	8	2	37	86	4	14	8	7			
27	56	57	365		238	17	10	147	404	53	63	64	8			
28	12	7	41		46	5	3	11	63	10	18	25	9			
29	7	7	42		38	10	2	20	23	67	12	5	10			
30	10	7	45		15	2	2	20	22	7	11	3	11			
31	12	4	1		13	2	2	20	22	7	11	15	16			
32	1	1	38		15	2	2	15	24	7	11	16	12			
33	27	46	181		213	13	7	77	368	16	61	41	13			
34	26	20	23		188	3	3	7	28	2	8	8	14			
35	24	47	140		183	3	3	30	182	22	18	64	15			
36	20	15	81		89	9	2	30	83	5	7	28	16			
37	5	6	31		31	2	2	8	23	2	5	1	17			
38	37	37	99		53	6	6	25	176	14	41	26	18			
39	13	41	171		113	20	13	40	293	34	40	29	20			
40	38	75	186		171	20	17	73	181	30	28	5	21			
41	28	75	58		28	11	3	24	70	9	10	3	22			
42	6	30	49		16	9	3	8	48	5	14	28	23			
43	12	6	57		99	5	2	38	242	6	2	9	24			
44	2	17	57		50	2	2	5	29		6	9	25			
45	6	7	28		11	5	2	14	54	14	6	37	28			
46	10	15	73		99	13	3	31	144	42	28	48	27			
47	28	28	225		101	16	8	79	228	76	18	48	27			
48	3	3	7		7	3	4	2	21		4	4	27			
49	12	11	45		59	6	6	18	55	7	13	23	20			
50	1	1	10		1	1	1	6	9	1	1	3	30			
51	63	82	267		361	33	21	110	734	82	154	103	31			
52	18	68	290		78	21	24	125	217	40	92	102	32			
53	10	13	72		38	3	1	21	62	17	10	21	33			
54	7	7	2		2	1					2	2	34			
55	49	46	46		46	5		31	23	6	17	8	35			
56	12	12	4		4	1		8	16	2	10	7	36			
57	13	28	62		32	4	3	17	5	126	15	1	37			
58	28	27	174		114	16	5	39	5	175	78	90	46			
59	23	31	188		10	98	16	31	9	86	31	18	32			
60	4	10	70		1	15	2	27	2	75	3	19	59			
61	6	5	33		9	8		10	1	38	19	2	7			
62	7	4	77		27	11	1	13	5	68	16	1	14			
63	53	131	370		316	31	22	132	6	561	34	9	141			
64	2	3	22		18	1		3		14	3	1	44			
65	8	4	131		93	6	6	43	4	154	30	1	28			
66	62	78	351		185	40	7	146	24	416	127	11	62			
67	10	13	39		65	5	1	7	1	69	49	1	9			
68	18	18	34		3	10	3	15	3	60	33		15			
69	53	124	176		82	7	6	29	24	321	258	3	38			
70	13	10	61		68	2	4	26	4	72	10	3	35			
71	5	9	35		32	3	4	17	2	65	4	1	2			
72	9	22	118		93	5	7	77	1	67	22	2	23			
73	14	50	99		83	4	5	38	8	139	39	1	45			
74	7	1	18		5	3		6		28	19	1	1			
75	6	11	86		63	5	8	42		91	13	3	23			
76	41	40	238		101	9	7	50	3	283	29	2	24			
77	10	45	109		4	149	13	51	4	215	9	4	24			
78	4	7	66		67	10	2	28		148	4		10			
79	42	19	82		4	70	9	35	2	166	17	4	1			
80	16	14	116		130	26	10	74	5	199	84	1	2			
81	10	32	166		1	120	14	81	14	151	27	1	3			
82	2	6	17		19	1	5	10		65	4		13			
83	952	1,553	5,988	42	4,503	537	324	37	2,310	230	8,036	1,630	25	140	1,792	1,577
84	341	348	2,101	26	1,934	275	156	89	2,054	51	1,634	396	12	10	59	974
85	322	382	2,388	21	1,988	276	124	39	1,471	28	2,364	673	10	12	35	626
86	242	304	1,523	14	1,202	147	71	24	714	28	1,823	471	7	28	422	287
87	75	75	67	60	52	57	62	48	100	76	70	58	80	67	81	
88	29	77	193		176	20	13		58	15	367	54		10	77	71

Table showing number of locomotives inspected,

Parts defective, inoperative, or missing, or in violation of rules.	Parts defective, inoperative, or missing, or in violation of rules.									
	Colorado & Wyoming	Columbus & Greenville.	Copper Range.	Copper River & Northwestern.	Cornwall.	Cumberland & Manchester.	Cumberland & Pennsylvania.	Delaware & Hudson.	Delaware, Lackawanna & Western.	Denver & Salt Lake.
1 Air compressors.....	1							1	2	1
2 Arch tubes.....								1	3	3
3 Ash pans or mechanism								10	17	17
4 Axles.....								19	13	13
5 Blow-off cocks.....								23	20	20
6 Boiler checks.....								25	25	25
7 Boiler shell.....								4	5	5
8 Brake equipment.....			1		1	1		4	5	5
9 Cabs or cab windows.....								4	5	5
10 Cab aprons or decks.....								10	10	10
11 Cab cards.....								3	3	3
12 Coupling or uncoupling devices.....	1		1					10	12	12
13 Crossheads, guides, pistons or piston rods.....								35	45	45
14 Crown bolts.....								3	3	3
15 Cylinders, saddles, or steam chests.....								18	18	18
16 Cylinder cock rigging.....								5	4	4
17 Domes or dome caps.....								4	4	4
18 Draft gear.....								4	3	3
19 Draw gear.....								3	3	3
20 Driving boxes, shoes, wedges, pedestals, or braces.....								12	12	12
21 Fire-box sheets.....								17	17	17
22 Flues.....	1		1					41	37	37
23 Frames, tail pieces or braces, locomotive.....								5	4	4
24 Frames, tender.....								4	2	2
25 Gauges or gauge fittings, air.....								2	2	2
26 Gauges or gauge fittings, steam.....								15	16	16
27 Gauge cocks.....	1		1			1		14	32	32
28 Grate shakers.....								1	2	2
29 Handholds.....								1	5	5
30 Injectors inoperative.....								64	119	119
31 Injectors and connections.....	1							19	32	32
32 Inspections or tests not made as required.....								14	18	18
33 Lateral motion.....	1	1	1		1	1		2	2	2
34 Lights, cab or classification.....								2	5	3
35 Lights, headlamps.....								1	2	2
36 Lubricator or shields.....								32	58	58
37 Mud rings.....	1							9	19	19
38 Packing nuts.....								23	22	22
39 Packing, piston rod and valve stem.....								5	5	5
40 Pilot or pilot beams.....								8	8	8
41 Plugs or studs.....								21	3	4
42 Reversing gear.....			2					26	83	83
43 Rods, main or side, crank pins or collars.....	1					1				
44 Safety valves.....	1							2	5	5
45 Sanders.....	1							43	39	39
46 Springs or spring rigging.....	1	1			1			2	2	2
47 Squirt hose.....								18	11	11
48 Stay bolts.....								11	83	83
49 Stay bolts, broken.....								13	14	14
50 Steam pipes.....		1	1					5	8	8
51 Steam valves.....								7	12	12
52 Steps.....	3							31	25	25
53 Tanks or tank valves.....	1							2	2	2
54 Telltale holes.....								16	14	14
55 Throttle or throttle rigging.....								4	4	4
56 Trucks, engine or trailing.....		3			2			3	3	12
57 Trucks, tender.....			1					3	3	3
58 Valve motion.....								23	32	32
59 Washout plug.....								18	46	46
60 Water bar or combustion flues.....								30	21	21
61 Water glass, fittings or shield.....	2									
62 Wheels.....		6								
63 Miscellaneous—Signal appliance, badge plates, brakes (hand). Number of defects.....	15	16	9	37	22	4	736	1,093		
Locomotives reported.....	28	28	20	20	10	11	24	500	760	
Locomotives inspected.....	36	9	8	10	9	8	8	358	527	
Locomotives defective.....	5	4	6	5	5	7	2	221	328	
Percentage of inspected found defective.....	14	44	75	55	55	88	25	62	62	
Locomotives ordered out of service.....								32	47	

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

Parts defective, inoperative, or missing, or in violation of rules.	Denver & Salt Lake.	Detroit & Mackinac.	Detroit & Toledo Shore Line.	Detroit, Bay City & Western.	Detroit Terminal.	Detroit, Toledo & Iron- ton.	Donors Southern.	Duluth & Iron Range.	Duluth, Missabe & Northern.	Duluth, South Shore & Atlantic.	East Broad Top R. R. & Coal Co.	East St. Louis Junc- tion.	East Tennessee & Western North Caro- lina.	Elgin, Joliet & Eastern.	El Paso & South- western.	Erie.	Escambia.
	1 Air compressors.....	5					1				1				1		15
2 Arch tubes.....																3	3
3 Ash pans or mechanism																39	5
4 Axles.....																73	6
5 Blow-off cocks.....																92	8
6 Boiler checks.....	1		1			3		8		1				1		43	7
7 Boiler shell.....						1		2		1				4		92	8
8 Brake equipment.....						3		1		2			2	1		19	9
9 Cabs or cab windows.....						1		2		5				2		29	1
10 Cab aprons or decks.....						1		6		2				2		13	1
11 Cab cards.....						1		2		8				2		5	1
12 Coupling or uncoupling devices.....						1		1		2				1		10	1
13 Crossheads, guides, pistons or piston rods.....						1		3		4				1		91	1
14 Crown bolts.....						1		1		1				1		6	1
15 Cylinders, saddles, or steam chests.....						1		1		1				1		13	1
16 Cylinder cock rigging.....						1		1		1				1		6	1
17 Domes or dome caps.....						1		1		1				7		42	1
18 Draft gear.....						1		3		1				2		17	1
19 Draw gear.....						1		5		2				1		13	1
20 Driving boxes, shoes, wedges, pedestals, or braces.....						1		2		2				1		77	1
21 Fire-box sheets.....						2		4		1				5		50	2
22 Flues.....	1		1			3		1		3				4		52	2
23 Frames, tail pieces or braces, locomotive.....						1		2		1				1		21	2
24 Frames, tender.....						1		4		1						23	2
25 Gauges or gauge fittings, air.....						1		2		1						22	2
26 Gauges or gauge fittings, steam.....						3		9		3						45	2
27 Gauge cocks.....	1		1			3		4		6						129	1
28 Grate shakers.....						4		3		4						6	1
29 Handholds.....						3		3		1						41	2
30 Injectors inoperative.....						8		8		1						2	2
31 Injectors and connections.....						8		1		1						2	30
32 Inspections or tests not made as required.....	1					10		16		11				10		181	2
33 Lateral motion.....	1	1	1		1	2		2		3				6		92	2
34 Lights, cab or classification.....						4		1		1				4		32	3
35 Lights, headlamps.....						2		1		1						2	34
36 Lubricator or shields.....						1		1						1		29	5
37 Mud rings.....	1					2		1								11	3
38 Packing nuts.....						3		3		1				3		75	3
39 Packing, piston rod and valve stem.....						1		1		4				2		11	2
40 Pilot or pilot beams.....						2		2		2						70	2
41 Plugs or studs.....						1		1						1		75	3
42 Reversing gear.....			2			3		3		3				2		12	2
43 Rods, main or side, crank pins or collars.....	1					1		1		1				1		12	1
44 Safety valves.....						3		9		2						162	4
45 Sanders.....	1					2		3		9				4		4	4
46 Springs or spring rigging.....	1	1			1	2		13		21			2	4		102	4
47 Squirt hose.....						2		2		7			1			11	1
48 Stay bolts.....						2		3		2						21	2
49 Stay bolts, broken.....						6		6		10		3				264	3
50 Steam pipes.....		1	1			1		4		10				1		32	1
51 Steam valves.....						1		2		1						26	2
52 Steps.....	3					6		11		6				1		44	1
53 Tanks or tank valves.....	1	</															

Table showing number of locomotives inspected,

	Parts defective, inoperative or missing, or in violation of rules.																				
	Fernwood, Columbia & Gulf.	Florida East Coast.	Fort Smith & Western	Fort Worth & Denver City.	Galveston, Houston & Henderson.	Georgia & Florida.	Georgia, Florida & Alabama.	Georgia.	Grand Trunk.	Great Northern.											
1									4	97											
2			2							19											
3										8											
4										1											
5		6	2				1	2	4	81											
6				1			2	1	4	103											
7		1	3	1			2	1	4	123											
8		3	5	4					11	23											
9									23	326											
10									17	49											
11							2	3	13	114											
12									1	53											
13		1							2	26											
14			4	1		1			5	82											
15		1							2	20											
16		2	5	4				1	6	179											
17									2	83											
18			1	1				1		18											
19			1					1	9	83											
20			4	1	2	3		7	4	85											
21			1	1	1			1	6	80											
22		1	1	1				1	6	84											
23								2	5	51											
24			2					2	5	42											
25								2		8											
26				1				2	2	74											
27		1	1	3				2	11	153											
28		1	3	1				17	39	255											
29	4							2	2	29											
30						1		2	25	44											
31										12											
32	3	12	24	6	1	6	1	12	75	246											
33		3	7	4	1	2		3	10	234											
34			1	1				2	10	69											
35								1	1	2											
36								1	1	44											
37									1	5											
38		2						1	11	146											
39			7					2	10	276											
40				2				3	8	258											
41								1	3	68											
42			2	1				1	9	35											
43								1	1	28											
44			11	3						27											
45										399											
46									4	89											
47								2	27	339											
48			9			1	1	2	5	16											
49									10	37											
50	1	12	6			2	4	12	26	507											
51									5	96											
52			2						3	19											
53								2	30	88											
54	1		1					3	9	239											
55									9	17											
56		3	1					2	20	112											
57									7	139											
58		2	5		1	1		1	16	149											
59			3						3	29											
60		1	1						1	13											
61									2	40											
62	6	10	2					2	40	187											
63			2					4	25	188											
64		1	1			1		1	4	57											
65																					
Number of defects.....												9	57	136	46	5	19	16	115	621	6,645
Locomotives reported.....												11	131	28	110	12	29	18	76	574	1,409
Locomotives inspected.....												8	179	30	52	9	13	23	157	262	1,775
Locomotives defective.....												4	40	26	14	2	6	12	44	160	1,351
Percentage of inspected found defective.....												50	22	87	27	22	46	52	28	61	76
Locomotives ordered out of service.....														2	4				5	26	262

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

	Gulf & Ship Island.	Gulf Coast Lines.	Gulf, Mobile & North-ern.	Hocking Valley.	Huntingdon & Broad Top Mountain.	Illinois Central.	Illinois Terminal.	Indiana Harbor Belt.	Indianapolis Union.	International & Great Northern.	Interstate.	Jonesboro, Lake City & Eastern.	Kanawha & Michigan.	Kansas City, Mexico & Orient.	Kansas City North-western.	Kansas City Southern.	Kansas City Terminal.
				4		18		4						2		12	2
				5		2										3	1
				1		1		2								2	4
				1		1		4		2						18	2
	1	1		1		7		3								11	7
		1		1		15		5	1							19	8
		6		1		24		6	2							12	9
				1		17		5		26	2	1				107	7
						1		1				2				12	9
						78		3		10						7	8
						17		1		2						17	10
						13		4	1	1						15	11
						13		1	1	1						7	12
						7		1								8	13
						20		3		12						6	14
						9		1		3						54	15
						9		4		4						6	2
						9		1								23	13
						6		1		1						5	17
						12		2		3	1					47	6
						31		5	2	15	1	3				60	2
						36		6		12	4					67	8
						29		3		1	1					9	4
						8		2		6						6	9
						16		1		1						11	1
						2		2		6						6	1
						5		6		20						27	2
						13		6		14	1	1				63	6
						25		13		9	3					3	1
						2		1		1						19	6
						29		3		9						8	30
						1		1		2	2	3				162	17
						72		3	2	7	1	1				51	6
						13		3		10						15	33
						1										2	2
						10		1		4						4	9
						5					1					6	36
						18		3	1	1						6	4
						75		1		1						46	17
						30		3								35	39
						14		1		1						20	2
						11		1		1						16	41
						11		1		3	2					7	1
						11				12						158	34
						57		1		25	2	2	1			9	45
						5				1						16	9
						6		6		2	4	1	1			91	3
						91		9		14						9	2
						17		1		4						17	1
						19		1								168	7
						87		3		66						37	1
						31		5		7						8	8
						11		4		1						19	3
						35		2		6	1					55	53
						49		9		12	1					6	6
						5		1								2	55
						22		6		8						103	56
						29		3		7						79	3
						35		1		20	2					18	3
						9		1		6	3					47	1
						54		8		2						61	4
						36				18	4					79	2
						4				1						9	1
29	72	172	123	514	19	1,519		179	20	377	43	31	4	192		2,121	215
40	40	91	63	166	21	1,794	12	108	26	182	12	11	70	64	15	186	37
17	55	54	56	181	18	1,182		80	22	143	14	5	26	42		288	60
10	27	38	35	134	10	486		55	8	84	11	4	1	36		278	

Table showing number of locomotives inspected,

	Minnesota, Dakota & Western.	Minnesota Transfer.	Mississippi Central.	Mississippi River & Bonne Terre.	Mississippi Southern.	Missouri & North Arkansas.	Missouri-Illinois.	Missouri-Kansas-Texas.	Missouri Pacific.	Mobile & Ohio.
Parts defective, inoperative, or missing, or in violation of rules.										
1 Air compressors	28				6		20	43	1	
2 Arch tubes							10	11		
3 Ash pans or mechanism					15		4	9		
4 Axles							1	1		
5 Blow-off cocks	12				3		39	75	8	
6 Boiler checks	8				4		54	37	2	
7 Boiler shell					5		38	60	1	
8 Brake equipment	1	17			22	1	189	332	22	
9 Cabs or cab windows	1	5			2		46	37		
10 Cab aprons or decks	7	5	1		2		16	5	2	
11 Cab cards	2				3		53	66	1	
12 Coupling or uncoupling devices		6					7	9	1	
13 Crossheads, guides, pistons, or piston rods	2	8					344	202	6	
14 Crown bolts					3		7	16	2	
15 Cylinders, saddles, or steam chests	22				10	2	124	164	3	
16 Cylinder cocks or rigging	6				6		47	80	3	
17 Domes or dome caps					3		21	12		
18 Draft gear	2	1			3		93	137	2	
19 Draw gear	1	15			12		231	199	7	
20 Driving boxes, shoes, wedges, pedestals, or braces	1	8	1		22	2	220	158	14	
21 Fire-box sheets	1	1			2	1	9	56	4	
22 Flues	1	3			1		10	32	4	
23 Frames, tailpieces or braces, locomotive		2	1		5		157	83	17	
24 Frames, tender					1		16	17		
25 Gauges or gauge fittings, air	5	5			2		22	35	2	
26 Gauges or gauge fittings, steam	1	7			4		64	105	4	
27 Gauge cocks	3	10	1		8		208	203	9	
28 Grate shakers							15	27		
29 Handholds	10	2			4	1	102	61	2	
30 Injectors, inoperative					2		8	26	1	
31 Injectors and connections	5	40			29	3	562	438	32	
32 Inspections or tests not made as required	5	10	1		7		191	201	6	
33 Lateral motion			1		2		50	27	4	
34 Lights, cab or classification					1					
35 Lights, headlights	1	4					7	28	1	
36 Lubricator or shields	1				2		16	9		
37 Mud rings		2			2		37	52	4	
38 Packing nuts	8	43			16		131	120	12	
39 Packing, piston rod and valve stem		13			7		28	89	2	
40 Pilot or pilot beams	2						41	44		
41 Plugs or studs	4	4			7		27	7	1	
42 Reversing gear	4						37	67	1	
43 Rods, main or side, crank pins or collars	22		2		8	5	491	422	16	
44 Safety valves	1						10	7	1	
45 Sanders	1						48	100		
46 Springs or spring rigging	1	39			13	5	212	190	14	
47 Squirt hose	1	2			1		67	54	2	
48 Stay bolts	1	2			1		25	17	5	
49 Stay bolts, broken	12	2	9		14	5	253	488	50	
50 Steam pipes	1	11			5		56	62		
51 Steam valves	1	10			4		25	38	3	
52 Steps	13	1			2		84	84	5	
53 Tanks or tank valves	6				5		84	68	4	
54 Telltale holes	2				2	1	26	26	1	
55 Throttle or throttle rigging	3				10	3	70	105	6	
56 Trucks, engine or trailing	1	3	1		15		195	217	17	
57 Trucks, tender	1	18	2		9	2	126	132	3	
58 Valve motion		1					125	76	4	
59 Washout plugs	1	24			8	1	104	123	5	
60 Water bar or combustion flues										
61 Water glass, fittings or shield	2	34	2		11		211	164	15	
62 Wheels	5	14			7	3	119	134	2	
63 Miscellaneous—Signal appliance, badge plates, brakes (hand).					1		25	66	1	
Number of defects	75	511	30	5	339	38	5,658	9,552	336	
Locomotives reported	12	17	20	18	12	24	14	718	1,152	241
Locomotives inspected	10	108	27	14		45	14	865	1,274	236
Locomotives defective	10	105	16	3		45	11	786	1,128	123
Percentage of inspected found defective	100	97	59	21	100	78	91	89	52	6
Locomotives ordered out of service	3	35	3		22	2	286	393	6	

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

	Monongahela.	Montour.	Muscle Shoals, Birmingham & Pennsylvania.	Nashville, Chattanooga & St. Louis.	Nevada - California - Oregon.	Nevada Northern.	Newburgh & South Shore.	New Orleans Great Northern.	New York Central-East.	New York Central-West.	New York, Chicago & St. Louis.	New York, New Haven & Hartford.	New York, Ontario & Western.	Norfolk & Portsmouth Belt.	Norfolk & Western.	Norfolk Southern.	Northern Pacific.
1				8					5	18	2	1			24		25
2				1			2		4	22	5	2			16	1	1
3				4					1	1	1	6			6		3
4				8					55	25	29	11			1	2	5
5				12					68	18	16	17			39	5	8
6				10			2		31	22	84	3			48		7
7				69			1		61	10	31	55			8		8
8	1	17		2					103	68	31	7			128	8	9
9	1	5		14				1	61	10	3	7			23	6	2
10	1	5		24					31	6	6	40			25	3	10
11	7	5	1	24					36	15	8	98			50		11
12	2			6					3	3	3	8			5		12
13	2	6		16		1			61	50	24	134			55	2	13
14		8		43					20	20	8	1			39		14
15				1					3	7	7	3			185		15
16		6		4					11	3	3	5			7	1	16
17				4			1	2	3	3	3	3			5	4	17
18		2	1	23			1		27	19	9	18			68	3	18
19	1	15	1	40			1		26	20	27	77	2		58	12	19
20	8	1		29					27	58	14	36			87	7	20
21	1	1		12					33	18	16	16			52	4	21
22	3	3		5					7	9	12	3			29	5	22
23	2		1	12					16	7	10	28			133		23
24		2		7					7	3	3	1			1		24
25	5	5		12					5	6	5	12			16		25
26	1	7		11					5	5	21	77			77	1	26
27	3	10	1	41				1	38	32	38	79			192	8	27
28				3					33	8	5	5			9		28
29	10	2		43					21	19	8	3			15	2	29
30				8					1	1	1	1			11		30
31	5	40		80					95	61	246	24			248	17	31
32	5	10	1	10					73	38	31	6			100	2	32
33			1	3					14	7	55	5			13	10	33
34				3					1	2	2				1		34
35	1	4		1					25	8	8	7			1		35
36	1			10					4	10	6	1			4	1	36
37		2		10					60	35	25	204			46	3	37
38	8	43		79					54	52	22	3	2		144	9	38
39		13		17					14	7	14	3			81	12	39
40	2			9					6	9	6	6			31		40
41		4		12					3	16	5	5			16		41
42	4			19					23	2	6	28			6		42
43	22		2	6					109	107	44	307			99	5	43
44		1		1					1	1	2	2			6		44
45	1	18		1					30	15	30	2			14		45
46	1	39		74					82	76	30	135			141	1	46
47		2		2					17	2	4	5			7		47
48	1	2		7													

Table showing number of locomotives inspected,

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

Table with 12 columns for locomotive systems (Northern Pacific Terminal, Northwestern Pacific, Oklahoma, New Mexico & Pacific, Oregon Short Line, Oregon-Washington Ry. & Navigation Co., Patapsco & Back River, Pennsylvania System, Peoria & Pekin Union, Pere Marquette, Philadelphia & Reading) and a final 'Total' column. Rows include components like Air compressors, Arch tubes, Ash pans, Axles, Blow-off cocks, Boiler checks, Boiler shells, Brake equipment, Cab windows, Cab aprons, Cab cards, Coupling or uncoupling devices, Crossheads, Crown bolts, Cylinders, Draft gear, Driving boxes, Fire-box sheets, Flues, Frames, Gauges, Grate shakers, Handholes, Injectors, Lateral motion, Lights, Lubricator, Mud rings, Packing nuts, Pilot or pilot beams, Plugs, Reversing gear, Safety valves, Sanders, Springs, Squirt hose, Stay bolts, Steam pipes, Steps, Tanks, Telltale holes, Throttle, Trucks, Valve motion, Washout plug, Water glass, Wheels, and Miscellaneous. Bottom rows show summary statistics: Number of defects, Locomotives reported, Locomotives inspected, Locomotives defective, Percentage of inspected found defective, and Locomotives ordered out of service.

Table with 17 columns for locomotive systems (Pittsburgh & Lake Erie, Pittsburgh & Shawmut, Pittsburgh & West Virginia, Pittsburgh, Shawmut & Northern, Portland Terminal, Public Belt of New Orleans, Quincy, Omaha & Kansas City, Raritan River, Republic Iron & Steel (Alabama), Republic Iron & Steel (Ohio), Richmond, Fredericksburg & Potomac, Rio Grande Southern, River Terminal, Rutland, St. Joseph & Grand Island, St. Louis & Hannibal, St. Louis & San Francisco) and a final 'Total' column. Rows include components like Air compressors, Arch tubes, Ash pans, Axles, Blow-off cocks, Boiler checks, Boiler shells, Brake equipment, Cab windows, Cab aprons, Cab cards, Coupling or uncoupling devices, Crossheads, Crown bolts, Cylinders, Draft gear, Driving boxes, Fire-box sheets, Flues, Frames, Gauges, Grate shakers, Handholes, Injectors, Lateral motion, Lights, Lubricator, Mud rings, Packing nuts, Pilot or pilot beams, Plugs, Reversing gear, Safety valves, Sanders, Springs, Squirt hose, Stay bolts, Steam pipes, Steps, Tanks, Telltale holes, Throttle, Trucks, Valve motion, Washout plug, Water glass, Wheels, and Miscellaneous. Bottom rows show summary statistics: Number of defects, Locomotives reported, Locomotives inspected, Locomotives defective, Percentage of inspected found defective, and Locomotives ordered out of service.

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

Table with columns for locomotive parts (e.g., Air compressors, Arch tubes, Ash pans) and locomotive lines (e.g., St. Louis-Southwestern, San Antonio & Arkansas, Southern Pacific). Rows are numbered 1 through 63.

Table showing number of locomotives inspected,

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

	Ulster & Delaware.	Union Pacific.	Union Railroad.	Utah Copper.	Utah.	Vicksburg Shreveport & Pacific.	Virginia Iron, Coal & Coke.	Virginian.	Wabash.	Wabash, Chester & Western.	Washington Terminal.	Western Maryland.	Western Pacific.	Wheeling & Lake Erie.	Wichita Falls & Southern.	Winston-Salem South-bound.	Woodward Iron Co.	Wrightsville & Tennille.	Yazoo & Mississippi Valley.	Youngstown Sheet & Tube Co.	Roads with less than 10 locomotives.	Total defects.	
1 Air compressors.....		14				2																24	1,390
2 Arch tubes.....		4			1				16			7	1	3	18							2	468
3 Ash pans or mechanism		1				1		3			1	1	3	1								4	306
4 Axles.....									2													4	21
5 Blow-off cocks.....		16				1			5		1	4	1	3								15	1,578
6 Boiler checks.....		6							32			33		4								23	1,913
7 Boiler shells.....		8							31		2	11	4	21								33	2,370
8 Brake equipment.....		61				35			25			62	9	21		2		2				139	8,213
9 Cabs or cab windows.....		8				9			43		6	3	4	5								21	1,423
10 Cab aprons or decks.....		2				2			15			20	2	10			3					46	1,476
11 Cab cards.....		12							20			24		5								48	1,449
12 Coupling or uncoupling devices		7							13			15	5	3								36	634
13 Crossheads, guides, pistons, or piston rods		41				18			2			2	5	3								35	5,527
14 Crown bolts.....		17				4			115		1	33	13	17								9	630
15 Cylinders, saddles, or steam chests		10				4			6		1	3	3	20								35	5,527
16 Cylinder cocks or rigging.....		52		2		4		101	63		1	47	3	10								66	4,875
17 Domes or dome caps.....		4						22	45		3	19		7								23	1,745
18 Draft gear.....		14				3			6			4		18								4	626
19 Draw gear.....		35				20		15	47		1	31	18	20								56	2,613
20 Driving boxes, shoes, wedges, pedestals, or braces		25				13		4	52		1	23	5	8								121	4,513
21 Fire-box sheets.....		21			3	10		46	60			30	1	1								57	4,269
22 Flues.....		21	1			6		12	12		2	25	1	13							1	46	2,327
23 Frames, tail pieces or braces, locomotive		18	1			7		5	6			15	5	10								40	1,268
24 Frames, tender.....		3				4		4	27			15	1	2								34	2,683
25 Gauges or gauge fittings, air.....		3						3	21	1		3	4	1								11	540
26 Gauges or gauge fittings, steam.....		27						20	63		2	30	2	16								10	1,062
27 Gauge cocks.....		50		3		16		17	77		5	48	3	22								23	3,075
28 Grate shakers.....		7			2	2		8	8			5	7	10								80	5,895
29 Handholds.....		7				5		1	8			24	4	7								71	1,990
30 Injectors, inoperative.....		2				2		8	53			4	7	10								3	251
31 Injectors and connections.....	106				1	51		40	5		8	122	19	48		3						166	12,406
32 Inspections or tests not made as required	34	2			1	21		21	213	2	14	132	5	13							1	137	7,419
33 Lateral motion.....	8					5		13	104			34	4	5								36	1,625
34 Lights, cab or classification.....		8						1	33	1		34	5	5								5	90
35 Lights, headlights.....		7				2		6	6			23	3	8								25	1,164
36 Lubricator or shields.....		5				6		7	15		1	18	6	25								22	566
37 Mud rings.....		10				1		38	16			7		8								32	2,711
38 Packing nuts.....		46				6		7	15			18	6	25								74	4,755
39 Packing, piston rod and valve stem.....		8				23		27	36		5	36	2	13								57	3,359
40 Pilot or pilot beams.....		7				3		4	4		6	2	6	3								25	1,294
41 Plugs or studs.....		11				2		20	7		4	2	6	3								10	857
42 Reversing gear.....		7				2		12	12		1	9	1	1								14	1,272
43 Rods, main or side, crank pins or collars		81				39		29	29			8	8	6								104	10,080
44 Safety valves.....		2				2		61	202		1	81	9	56								3	192
45 Sanders.....		38				2			3			11	1	12								7	1,857
46 Springs or spring rigging.....		24				12		42	13			9	1	41								105	7,911
47 Squirt hose.....		4				2		21	110		4	101	9	5								21	1,098
48 Stay bolts.....		10				6		21	21			24	1	1								23	1,313
49 Stay bolts, broken.....		48		7		6		21	6		2	29	2	16								367	10,089
50 Steam pipes.....		54			6	40		82	18			49	38	85								24	2,467
51 Steam valves.....		18				6		5	33			23	3	9								12	1,168
52 Steps.....		31				1		5	21			10	8	8								90	3,289
53 Tanks or tank valves.....		36				6		14	57			28	2	29								57	3,788
54 Teeltale holes.....		8				6		9	43			19	9	11		1						50	715
55 Throttle or throttle rigging.....		12		1		7		2	3			15	3	8								44	2,633
56 Trucks, engine or trailing.....		7				11		7	51		1	29	2	11								46	3,899
57 Trucks, tender.....		22				14		3	64			45	8	4								90	3,714
58 Valve motion.....		20				3		6	47		2	29	7	6								15	1,761
59 Washout plug.....		52				19		13	29			14	3	3								28	3,641
60 Water bar or combustion flues.....		57				28		12	107		3	70	8	9								127	5,641
61 Water glass, fittings or shield.....		14				22		4	64			23	4	14								170	4,371
62 Wheels.....		17						15	21			15	2	2								12	972
63 Miscellaneous—Signal appliance, badge plates, brakes (hand).																							
Number of defects.....		1,302	17	2	13	551	12																
Locomotives reported.....	29	940	161	12	16	(1)	16																
Locomotives inspected.....	5	863	31	7	16	87	6																
Locomotives defective.....		430	5	1	3	76	5																
Percentage of inspected found defective.....		41	10	14	19	87	83																
Locomotives ordered out of service.....		26	2			35																	
								842	2,494	13	84	1,644	257	761	9	23	12	11			12	11	3,082
								146	609	13	15	310	139	214	11	10	18	14					70,242
								279	643	3	19	339	179	125	1	13	4	14			(2)	11	1,341
								210	527	3	17	258	66	92	1	10	2	4		</			