INTERSTATE COMMERCE COMMISSION

ELEVENTH ANNUAL REPORT

OF THE

CHIEF INSPECTOR
BUREAU OF LOCOMOTIVE INSPECTION

TO THE

INTERSTATE COMMERCE COMMISSION

FOR THE FISCAL YEAR
ENDED JUNE 30, 1922

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ANNUAL REPORT OF THE CHIEF INSPECTOR BUREAU OF LOCOMOTIVE INSPECTION.

OCTOBER 15, 1922.

To the Interstate Commerce Commission:

In compliance with section 7 of the act of February 7, 1911, as amended March 4, 1915, I respectfully submit the Eleventh Annual Report of the Chief Inspector, covering the work of the Bureau of Locomotive Inspection for the fiscal year ended June 30, 1922.

The data contained in this report cover all defects on all parts and appurtenances of the locomotive and tender, including the boiler, found and reported by our inspectors, together with all accidents as reported under section 8 of the law and the accidents report act of May, 1910, caused by the failure of some part or appurtenance of the locomotive or tender, including the boiler.

The tables have been arranged so as to permit comparison with previous reports as far as consistent. They show the number of locomotives inspected, the number and percentage of those inspected found defective, and the number for which written notice for repairs was issued because of not meeting the requirements of the law, with the total number of defects found and reported. They also show the number of accidents, with number of persons killed and injured, caused by the failure of some part or appurtenance of the locomotive and tender, including the boiler and appurtenances thereof. There is also given by railroads a brief summary of the nature and cause of all accidents, with number of persons killed and injured, as disclosed by investigation.

Number of locomotives inspected, number found defective, percentage inspected found defective, number for which written notice for repairs was served, and total number of defects found by comparison.

	Year ended June 30—				
	1922	1921	1920	1919	1918
Number of locomotives inspected	64,354	60,812	49,471	59,772	41,611
Number found defective	30,978	30,207	25,529	34,557	22,196
Percentage found defective	48	50	52	58	53
Written notice for repairs served	3,089	3,914	3,774	4,433	2,125
Total defects found	101,734	104,818	95,066	135,300	78,277

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

	Year ended June 30—				
	1922	1921	1920	1919	1918
Number of accidents	622	735	843	565	641
Decrease from previous year.....per cent.	15.4	12.8	[1] 49.2	11.8	4.1
Number killed	33	64	66	57	46
Decrease from previous year.....per cent.	48.4	3	[1] 15.8	[1] 23.9	25.8
Number injured	709	800	916	647	756
Decrease from previous year.....per cent.	11.3	12.6	41.6	14.4	4.8

[1] Increase.

Number of accidents, number killed, and number injured as a result of the failure of some part or appurtenance of the locomotive boiler to which the original act applied only, by comparison.

	Year ended June 30—			
	1922	1921	1915	1912
Number of accidents	273	342	424	856
Number killed	25	51	13	91
Number injured	318	379	467	1,005

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

	Year ended June 30—				
	1922	1921	1920	1919	1918
Number of derailments [1]	22	8	7	7	2
Number killed	5	.....	7	6	.....
Number injured	61	30	18	7	2

[1] Only derailments reported by carriers as being caused by defect in or failure of parts of the locomotives or tender were investigated or counted in this tabulation.

Number of persons killed and injured, classified according to occupations, during the fiscal years 1918–1922, inclusive.

	1922		1921		1920		1919		1918	
	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.
Members of train crews:										
Engineers	11	213	15	237	16	272	14	194	11	245
Firemen	10	277	25	360	20	404	22	265	19	306
Brakemen	7	66	13	64	9	77	11	82	6	62
Conductors	.....	25	2	20	2	19	2	16	.....	21
Switchmen	1	13	3	15	4	19	1	7	2	8
Roundhouse and shop employees:										
Boilermakers	1	10	1	7	2	9	1	9	.....	11
Machinists	.....	9	1	3	1	20	.....	5	.....	11
Foremen	.....	1	1	3	.....	3	.....	3	1	4
Inspectors	.....	2	.....	5	.....	1	.....	6	4	4
Watchmen	.....	3	.....	4	4	3	.....	2	.....	3
Boilerwashers	.....	1	.....	7	.....	13	.....	7	1	4
Hostlers	.....	10	.....	8	.....	13	.....	6	.....	8
Other roundhouse and shop employees	1	15	1	25	3	30	1	11	2	19
Other employees	2	23	2	16	4	26	3	23	.....	26
Nonemployees	.....	41	.....	26	1	7	2	11	.....	24
Total	33	709	64	800	66	916	57	647	46	756

All accidents reported to this bureau as required by section 8 of the law, and rules 55 and 162, were carefully investigated and reports rendered as required. Such action as was deemed appropriate was taken to prevent recurrences as far as possible. Copies of accident reports were furnished to interested parties when requested.

A summary of all accidents and casualties during the year ended June 30, 1922, as compared with the year ended June 30, 1921, covering the entire locomotive and tender and all of their parts and appurtenances shows a decrease of 15.4 per cent in the number of accidents, a decrease of 48.4 per cent in the number killed, and a decrease of 11.3 per cent in the number injured.

It was apparent during the latter part of the fiscal year that most, if not all, of the carriers were putting forth great efforts to put their locomotives in condition to meet the requirements of the law and the best possible operating condition. Attention is directed to the chart opposite page 12, which shows in graphic form parts and appurtenances which have, through failure, caused serious accidents, resulting in serious and fatal injury, as well as a heavy property damage. Space will not permit a detailed analysis of all failures, but the chart shows the number of accidents, persons killed and injured, as a result of the failure of each part or appliance indicated, with the total number of persons killed and injured since the law became effective. It will be noted that 664 boiler explosions resulting in the death of 385 persons, and the serious injury of 1,106 others, have occurred. During the fiscal year there were 33 boiler explosions, resulting in the death of 22 persons and the serious injury of 56 others, a substantial reduction as compared with the preceding year. Most of these explosions were caused by overheating of crown sheet, due to low water. In many instances contributory defects were found, while in others no contributory cause could be assigned. Proper inspection and repair of all parts and appurtenances of the locomotive, including the boiler, is essential to safe and efficient operation, especially the fire box, water feeding and indicating appliances, together with thorough boiler washing as often as water conditions require, and the removal of scale and sediment from the interior of the boiler, which cause heating surfaces to overheat, crack and weaken, and frequently cause failure with serious results.

In my ninth annual report an illustrated report of investigation, covering tests made to determine the action of water in the boiler with its effect on the water-indicating appliances was given. Reference to these tests was also made in my tenth annual report, which investigations established that gauge cocks, when screwed directly into the boiler, do not correctly indicate the general water level in

the boiler while steam is being rapidly generated and escaping from the boiler. It was recommended that a suitable water column, to which should be attached three gauge cocks and one water glass, be applied to the boiler, with an additional water glass applied on the left side or boiler backhead. It is felt that these recommendations, together with the increased attention given to the water-indicating appliances as a result of our report, and our personal efforts have largely tended to decrease the number of so-called "crown-sheet failures" or boiler explosions. Water columns, as recommended, have been applied to practically all new locomotives constructed during the past two years, and on a large number of old locomotives on most of the large railway systems throughout the country, and it is gratifying to advise that, with very few exceptions, the mechanical and other officials have accepted these recommendations and are carrying them out in varying degrees, and it is hoped that they will be carried out in the near future by all carriers without the necessity of being compelled to do so by an order of the commission.

Accurate knowledge of the general water level in the boiler is essential under all conditions of service to safe and economical locomotive operation.

Investigation of accidents during the year, where the fusion or autogenous welding process was involved, supports our position previously taken that the process has not yet reached a state of perfection where it can be safely 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 rules, nor in fire box crown-sheet seams where overheating and failure are liable to occur, nor its excessive use in repairing long and numerous cracks in side sheets.

Our records continue to show that approximately 80 per cent of all autogenously welded seams involved in so-called "crown-sheet failures" have failed, while 16.9 per cent of riveted seams have failed under like conditions. The fatalities where sheets tore have been seven and one-half times as great as where they did not tear. From July 1, 1916, to June 30, 1922, autogenously welded seams were involved in 22.1 per cent of the crown-sheet failures, while 44.1 per cent of the total killed in crown-sheet accidents were killed where the autogenously welded seams were involved.

A large number of accidents have been caused by defective grate-shaking apparatus, the majority of which were caused by the shaker bar not properly fitting the fulcrum lever. This condition on many roads has been brought about because of no standard design being maintained, making such parts interchangeable. We have records of many such accidents where permanent and fatal injuries resulted. Therefore it should be required that all carriers adopt a standard whereby shaker bars can be made interchangeable on all of their locomotives with a proper fit.

So that the chief operating officers of the carriers might be kept informed of the condition of their locomotives, as disclosed by our inspections, a transcribed report showing in detail the defects found has been sent to them each month; also informing them of the locomotives for which special notice for repairs was issued as required by section 6 of the law, because of defects constituting violations thereof.

During the year 148 applications were filed for extension of time for removal of flues, as provided in rule 10. An investigation disclosed that in 17 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. Fifteen 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. Six extensions were granted after defects disclosed by our investigation had been repaired. Nine applications were withdrawn by the carriers for various reasons, and the remaining 101 were granted for the period requested.

In accordance with rule 54 there were filed 1,508 specification cards and 5,519 alteration reports necessary in determining the safe working pressure and other required data for the boilers represented. These specification cards and alteration reports have been carefully analyzed in order 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 limits required. Numerous discrepancies were found and corrective measures taken.

In my ninth annual report attention was directed to the necessity for asking the court to inflict the penalty provided in section 9 of the law because of the defective condition in which locomotives were being operated by one carrier and its failure or refusal to comply with the lawful order of our inspectors. These cases were heard in the United States District Court for the Southeastern Division of the Eastern District of Missouri and decided October 13, 1921, when a judgment was rendered on 20 counts in favor of the Government.

By request of the commission, inspectors of this bureau spent 200 days in special work during the year, and during the fiscal year 1921 spent 962 days in connection with the transportation act, 1920, and the interstate commerce act, the expense of which 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.

In order to keep within the appropriation it has been necessary to curtail materially the travel of our inspectional force in the performance of their required duties, and to curtail the stenographic, clerical, and other office assistance furnished the chief inspector and his assistants to the detriment of the service.

This report shows more locomotives inspected by our inspectors than during the preceding year, but during that year, at the direction of the commission, our inspectors devoted an aggregate of 962 days to special work in connection with the transportation act, 1920, and the interstate commerce act, as against an aggregate of 200 days devoted to such special work during the ensuing fiscal year. On the other hand, during the fiscal year 1922 our inspectors were compelled to spend a greater amount of time than usual at such points as they were able to visit and at their headquarters, so as to reduce travel and subsistence charges. As a result they were unable to make inspections at 1,913 points where locomotives are housed or repaired. It should be borne in mind that locomotives are assigned to divisions or terminals for long and indefinite periods, and if our inspectors are to carry out the requirements of the law, which are, in part:

> It shall be the duty of each inspector to become familiar, so far as practicable, with the condition of each locomotive ordinarily housed or repaired in his district * * *. Each inspector shall make such personal inspection of locomotives under his care from time to time as may be necessary to fully carry out the provisions of this act.

they should visit points where locomotives are housed, repaired, or assigned.

To adequately carry out the purpose of the law a material increase in the number of inspectors and a material increase in the appropriation should be made so as to fully perform the duties required.

No formal appeal from the decision of any inspector, as provided in section 6 of the law, was filed during the year, which again demonstrates that good judgment was exercised by them in the performance of their duties.

In my ninth and tenth annual reports certain recommendations were made for the betterment of the service as required by section 7 of the act, which provides:

> That the chief inspector shall make an annual report to the Interstate Commerce Commission of the work done during the year, and shall make such recommendations for the betterment of the service as he may desire.

I am convinced from experience of the necessity and wisdom of these recommendations. Therefore they are respectfully renewed and reasons therefor given:

First. That the act of February 17, 1911, as amended, be further amended to provide for 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, however, is 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 chief inspector and his two assistants, together with all of the inspectors, 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 track by 941 different carriers, not including subsidiary lines going to make up the larger systems, and are housed or repaired at about 4,600 different 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 travel and act upon their own initiative and, inasmuch as they must be clothed with wide authority, they must be men of good judgment, who have acquired, from practical training

and experience, 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 should 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.

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, seriously and 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 strains.

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

Third. That a power-reversing gear be applied to all locomotives and that air-operated power-reversing gear have a steam connection with the operating 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, 315 accidents have occurred, due to the failure of some part of the reversing gear, resulting in serious injury to 315 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.

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, 392 accidents, resulting in the death of 1 person and the serious injury of 392 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 great 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.

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 operators 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.

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 not maintained in a proper condition for service.

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.

A. G. PACK,
Chief Inspector.

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

Part or appurtenance which caused accident.	Year ended June 30—														
	1922			1921			1920			1919			1918		
	Accidents.	Killed.	Injured.	Accidents.	Killed.	Injured.	Accidents.	Killed.	Injured.	Accidents.	Killed.	Injured.	Accidents.	Killed.	Injured.
Air reservoirs	3	....	3	1	....	1	2	1	2	2	....	2	5	....	7
Aprons	11	....	11	16	....	16	8	....	8	5	....	5	5	....	5
Arch tubes	4	....	5	5	....	5	9	1	15	7	2	9	9	....	16
Ash-pan blowers	7	....	7	5	....	5	6	1	5	11	1	10	7	....	7
Axles	5	....	17	5	....	6	5	....	5	2	....	2	4	....	4
Blow-off cocks	16	....	16	14	....	14	15	....	15	4	....	4	17	1	18
Boiler checks	4	....	4	7	1	7	5	....	6	4	....	4	13	....	14
Boiler explosions:															
A. Shell explosions	1	....	1	....	....	....	....	....	....	....	....	....	....	....	....
B. Crown sheet; low water; no contributory causes found	13	15	23	20	19	26	24	22	35	31	26	46	34	15	61
C. Crown sheet; low water; contributory causes or defects found	14	6	27	33	24	52	35	19	46	34	13	63	51	17	82
D. Fire box; defective stay bolts, crown stays, or sheets	5	1	5	1	2	....	2	....	2	2	....	3	5	....	6
E. Fire box; water foaming	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Brakes and brake rigging	10	2	24	6	....	6	3	....	3	8	3	10	2	....	2
Couplers	21	....	23	11	1	13	8	....	8	12	....	14	6	2	4
Crank pins, collars, etc	10	....	10	6	3	8	4	....	4	5	....	6	7	....	9
Crossheads and guides	4	....	4	4	1	4	5	2	3	5	....	5	1	....	1
Cylinder cocks and rigging	3	....	3	4	....	4	....	....	....	2	....	2	2	....	2
Cylinder heads and steam chests	3	....	3	6	....	6	9	....	9	5	....	7	4	....	4
Dome caps	....	....	....	....	....	....	....	....	....	....	....	....	1	....	1
Draft appliances	6	....	9	8	....	9	1	....	1	2	....	4	5	....	5
Draw gear	7	....	7	8	1	8	11	2	9	7	1	6	11	2	9
Fire doors, levers, etc	2	....	2	8	....	8	11	....	11	7	....	7	6	....	6
Flues	28	....	32	32	1	35	45	....	52	33	1	39	40	....	47
Flue pockets	1	1	....	1	1	....	....	....	....	2	....	2	2	....	2
Footboards	11	1	10	8	3	5	23	....	23	7	....	7	7	....	7
Gauge cocks	2	....	2	....	....	....	2	....	2	....	....	....	1	....	1
Grease cups	3	....	3	7	....	7	10	....	10	3	....	3	1	....	2
Grate shakers	49	....	49	85	....	85	108	....	109	37	1	36	39	....	39
Handholds	12	1	11	19	....	20	15	1	14	16	1	15	15	1	14
Headlights and brackets	2	....	2	8	2	6	9	1	9	4	....	5	9	....	10
Injectors and connections (not including injector steam pipes)	21	....	24	15	2	13	23	....	27	21	....	22	23	....	24
Injector steam pipes	9	....	9	15	....	17	23	1	29	14	....	20	16	....	18
Lubricators and connections	9	....	9	12	....	12	14	....	15	11	....	13	12	....	12
Lubricator glasses	3	....	3	3	....	3	17	....	17	9	....	9	12	....	12
Patch bolts	....	....	....	....	....	....	....	....	....	....	....	....	2	....	3
Pistons and piston rods	6	....	6	3	....	3	3	1	3	2	....	2	2	....	2
Plugs, arch tube, and washout	12	1	19	15	....	18	28	....	40	30	1	34	14	2	19
Plugs in fire box sheets	2	....	3	2	....	2	1	....	2	2	1	1	3	....	3
Reversing gear	53	....	53	65	....	65	59	....	59	31	....	31	40	....	40
Rivets	....	....	....	4	....	5	....	....	....	2	....	2	3	....	3
Rods, main and side	23	....	27	18	....	21	16	2	20	14	....	15	18	....	22
Safety valves	....	....	....	....	....	....	....	....	....	1	....	1	....	....	....
Sanders	2	....	2	....	....	....	1	....	1	....	....	....	2	....	2
Side bearings	1	....	1	....	....	....	....	....	....	1	....	1	....	....	....
Springs and spring rigging	10	1	9	3	....	3	9	2	18	5	2	4	7	....	7
Squirt hose	54	....	54	82	....	82	82	....	82	54	....	54	47	....	50
Stay bolts	6	....	8	....	....	....	2	2	1	2	....	2	6	....	8
Steam piping and blowers	9	....	11	9	....	9	18	1	19	8	....	11	10	....	11
Steam valves	6	....	6	11	....	12	17	....	17	9	....	10	7	....	17
Studs	7	....	8	7	....	7	9	....	11	7	....	9	12	....	13
Superheater tubes	....	....	....	1	....	2	4	....	6	1	....	1	3	....	4
Throttle glands	1	....	1	....	....	....	3	....	4	....	....	....	3	....	3
Throttle leaking	3	1	2	3	....	3	1	1	....	1	....	1	2	....	2
Throttle rigging	5	....	5	1	....	1	6	....	6	4	1	7	5	....	5
Trucks, leading, trailing, or tender	11	2	25	6	....	8	1	3	1	2	1	2	1	....	1
Valve gear, eccentrics, and rods	18	....	18	10	....	10	6	....	6	9	....	9	12	....	12
Water bars	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Water glasses	19	....	19	25	....	25	32	....	32	26	....	26	20	....	20
Water-glass fittings	6	....	6	2	....	2	4	....	4	4	....	4	11	1	10
Wheels	8	1	7	4	1	4	2	1	4	3	....	5	7	5	5
Miscellaneous	61	....	61	91	2	117	87	2	86	35	2	35	32	....	43
Total	622	33	709	735	64	800	843	66	916	565	57	647	641	46	756

ACCIDENTS AND CASUALTIES RESULTING FROM THE FAILURE OF LOCOMOTIVES AND TENDERS AND THEIR APPURTENANCES DURING THE FISCAL YEAR ENDED JUNE 30, 1922, 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.]

ANN ARBOR RAILROAD:

**October 8, 1921, locomotive 162, Toledo, Ohio. Top of auxiliary dome blew off, due to an old crack extending 22 inches around dome from whistle connection; repairs had been attempted by autogenously welding the crack from the outside; 1 injured.

One accident; 1 injured.

ATCHISON, TOPEKA & SANTA FE RAILWAY:

*August 12, 1921, locomotive 1352, near Devine, Colo. Right high pressure crank shaft on compound locomotive broke, due to old fracture, and fell on track while running at a speed of approximately 50 miles per hour with 10 passenger cars, 8 of which were derailed; 12 injured.

**August 31, 1921, locomotive 2053, Kansas City, Kans. Water glass burst; cut by flying glass; wire mesh shield insufficient; 1 injured.

*November 2, 1921, locomotive 3206, Salter, Kans. Insufficient clearance between shaker bar and tank leg; shaker bar handle too long; 1 injured.

**November 22, 1921, locomotive 2185, Wichita, Kans. Sash fell out of cab window; sash too small for frame; 1 injured.

December 16, 1921, locomotive 3185, near Standish, Mo. Crown sheet failure; low water; no contributory causes found; appurtenances destroyed and damaged to such extent that their previous condition could not be determined; 3 killed, 1 injured.

**December 24, 1921, locomotive 2003, Clovis, N. Mex. Water glass burst; cut by flying glass; inefficient shield; 1 injured.

December 30, 1921, locomotive 1849, La Junta, Colo. Water glass burst; cut by flying glass; 1 injured.

January 2, 1922, locomotive 1558, Ottawa, Kans. Link saddle pin broke; pin showed old fracture 40 per cent of cross-sectional area; 1 injured.

**February 6, 1922, locomotive 3840, Cosuino, Ariz. Water glass broke; cut by flying glass; water glass guard came open at the time of accident; 1 injured.

*February 7, 1922, locomotive 926, Lamy, N. Mex. Coupler on rear of tank broke, causing emergency application of brakes; 1 injured.

May 25, 1922, locomotive 521, Dallas City, Ill. Coupling nut on injector delivery pipe broke, due to old crack, while being tightened with injector in operation; 1 injured.

Eleven accidents; 3 killed, 22 injured.

ATLANTA, BIRMINGHAM & ATLANTIC RAILWAY:

October 24, 1921, locomotive 118, Senoia, Ga. Left crosshead pin broke off and came out, due to old flaw halfway through pin, bending piston rod, crosshead, and main rod; 1 injured.

March 13, 1922, locomotive 121, Brunswick, Ga. Injector steam pipe valve broke off at turret; 1 injured.

Two accidents; 2 injured.

ATLANTIC COAST LINE RAILROAD:

October 12, 1921, locomotive 425, Warsaw, N. C. Handle pulled off front air compressor throttle while being used for a handhold, due to being insecurely attached; 1 injured.

November 17, 1921, locomotive 801, Gibara, Fla. One of the main steam pipes in front end burst, due to old defect in material; 1 injured.

January 17, 1922, locomotive 366, Brunswick, Ga. Handrail gave way, due to set screw which held it in bracket coming loose, causing hostler helper to fall from running board; 1 injured.

February 6, 1922, locomotive 480, Waycross, Ga. Bottom bracket on front end handrail broke, due to old defect, causing handrail to give way and brakeman to fall while locomotive was running at speed of approximately 10 miles per hour; 1 killed.

*March 4, 1922, locomotive 429, Hilda, S. C. Shaker bar slipped off lever, account of bar being worn; 1 injured.

March 4, 1922, locomotive 189, Rocky Mount, N. C. Insufficient clearance between reverse lever and independent brake valve handle with handle in application position, causing engineer's hand to be caught; springs missing from valve handle; 1 injured.

March 5, 1922, locomotive 704, Tampa, Fla. Blow-off cock handle broke, due to old defect, causing engineer to fall from running board; 1 injured.

March 6, 1922, locomotive 352, Smithfield, N. C. Excessive slack between engine and tender, permitting employee's leg to be caught; wedge missing from chafing casting; 1 injured.

April 14, 1922, locomotive 353, Warsaw, N. C. Tender step was loose and slippery, due to water coming from leak in tank, causing brakeman to slip and fall; 1 injured.

Nine accidents; 1 killed, 8 injured.

BALTIMORE & OHIO RAILROAD:

July 23, 1921, locomotive 5082, Markleton, Pa. Injector steam pipe coupling separated, due to loose fitting coupling nut; nut had been badly damaged and stretched by the use of hammer and set or chisel in removing and applying it; 1 injured.

**August 4, 1921, locomotive 2846, Stock Yards, Ohio. Squirt hose burst; hose defective; 1 injured.

September 10, 1921, locomotive 4568, New Castle Junction, Pa. Blow-off cock discharge pipe blew off; discharge pipe was entered only three threads; threads badly corroded and pipe not clamped; 1 injured.

September 17, 1921, locomotive 1199, Cleveland, Ohio. Expansion brace stud pulled out of boiler, due to other studs being broken; main frame broken in two places and other violations of the law existing, which had been reported continuously since August 17 up to time of accident; 1 injured.

September 23, 1921, locomotive 5101, Wolf Lake, Ill. Lubricator throttle blew out where screwed into boiler, due to being cross-threaded and screwed in only three threads; 1 injured.

September 25, 1921, locomotive 2335, West Alexander, Pa. Squirt hose pipe broke off at delivery pipe connection, caused by vibration due to clamp missing from pipe; 1 injured.

October 7, 1921, locomotive 1558, Camp Sherman, Ohio. Left guide yoke failed at forge weld, due to old defect; 1 injured.

October 16, 1921, locomotive 2077, near Seville, Ohio. Crown-sheet failure; low water; bottom gauge cock opening in boiler obstructed by tee iron of backhead brace; bottom water glass opening partially obstructed by stem when open four full turns; 1 killed, 2 injured.

* October 18, 1921, locomotive 4248, Clarksburg, W. Va. Tank cover gave way, due to rivets missing from hinges; 1 injured.

October 23, 1921, locomotive 2906, near Dover, Ohio. Flue failed at safe end; flue improperly welded and embedded in mud; 1 injured.

November 3, 1921, locomotive 1268, Berryburg, W. Va. Unstayed plug in fire-box sheet, 1¾ inches in diameter, blew out; threads on plug and in sheet almost entirely eaten away. Plug and sheet had been heavily caulked due to leakage; 1 injured.

** November 11, 1921, locomotive 4131, near Massillon, Ohio. Engine separated from train due to drawbar on rear of tender being too low, causing emergency application of brakes; 1 injured.

November 12, 1921, locomotive 4250, Center Road, Ohio. Piston rod broke through keyway in crosshead fit, knocking out front cylinder head, due to old fracture in piston rod; 1 injured.

** November 24, 1921, locomotive 4589, near Monrovia, Md. Shaker bar slipped off post due to improper fit, account of strip autogenously welded to bar to make it standard size breaking off; 1 injured.

** November 29, 1921, locomotive 1768, Benwood, W. Va. Shaker bar slipped off post due to improper fit; 1 injured.

December 3, 1921, locomotive 4067, Philadelphia, Pa. Radiator steam-pipe fitting cracked; fitting of too light construction; 1 injured.

** December 17, 1921, locomotive 4578, Smithton, Pa. Side rod broke, due to knuckle pin working out; 1 injured.

December 21, 1921, locomotive 1266, near Stevenson, Va. Grate-shaker lever, which was hinged to upright post, broke at defective weld, causing fireman to fall out of gangway while running at a speed of approximately 28 miles per hour; 1 injured.

January 2, 1922, locomotive 4845, Gaithers, Md. Struck by ash-pan operating lever while attempting to open slides, due to excessive lost motion in rigging; 1 injured.

** January 4, 1922, locomotive 4246, Carlisle, Ohio. Grate-shaker rod became disconnected from grates, due to bolt working out; 1 injured.

January 10, 1922, locomotive 2911, Valley City, Ohio. Flue broke off inside back flue sheet, due to being worn thin by prosser expander. Numerous other flues worn thin and beads cracked; 2 injured.

January 17, 1922, locomotive 1919, New Castle Junction, Pa. Injector steam-ram bonnet blew out; threads on bonnet and in injector stripped and bonnet badly mutilated by tightening with set; 2 injured.

January 18, 1922, locomotive 4121, near Bloomington, Md. Tender truck frame of Bettendorf type on locomotive 4121 broke, due to old defect, while double-heading passenger train with locomotive 5063, causing tender to derail, separate from engine, and turn over. Locomotive 5063 struck tender of locomotive 4121, derailed, and tender turned over, causing express and Pullman cars to also be derailed; 2 injured.

January 19, 1922, locomotive 5087, near Kensington, Md. Left back side rod broke due to old fracture at weld approximately 50 per cent of cross-sectional area, puncturing throat sheet and flue sheet. Rod reported cracked four times previous to accident and reports approved each time by foreman in charge with notation "Hammer tested and found no cracks"; 2 injured.

January 23, 1922, locomotive 4868, Martinsburg, W. Va. Handrail on Vanderbilt tank broke; center upright pipe supporting handrail pulled out of bracket account of defective threads, causing handrail to give way at both ends; 1 injured.

**January 24, 1922, locomotive 4324, Cromwell, Ind. Regulator valve cap and valve blew out of left injector; 1 injured.

January 26, 1922, locomotive 1597, Camp Sherman, Ohio. Autogenously welded seam in outside wrapper sheet failed full length, or 115 inches; portions of seam had broken and been rewelded twice prior to accident; 1 injured.

January 27, 1922, locomotive 2216, Vienna, Pa. Side rod broke due to old flaw, causing engine to strip and stud to be knocked out of boiler; 1 injured.

January 27, 1922, locomotive 4509, Bessemer, Pa. Burned by hot grease which blew out of rod cup, due to pin running hot account of loose rod bushing; rods reported defective on January 6, 8, 11, 14, 17, 18, 20, 22, 23, 25, 27, and 30; 1 injured.

January 31, 1922, locomotive 52, Baltimore, Md. Flue broke at safe end weld; 1 injured.

February 9, 1922, locomotive 301, Wooddale, Del. Excessive lost motion between locomotive and tender caused cab apron to suddenly move up and down, causing fireman to fall; 1 injured.

February 17, 1922, locomotive 1507, near Sandyville, Ohio. Crack 20½ inches long opened up in back head knuckle; back head had previously cracked and had been welded and patched; the crack afterwards extended at both ends of patch and was welded, and at the time of accident the patch cracked and the welded seam opened up for its entire length; 1 injured.

February 20, 1922, locomotive 4225, Homer, Ohio. Main rod broke due to old flaw covering approximately 85 per cent of cross-sectional area; 1 injured.

February 24, 1922, locomotive 1562, Cincinnati, Ohio. Wooden running board gave way account of being badly decayed, allowing engineer to fall to ground; 1 injured.

February 25, 1922, locomotive 1830, Baltimore, Md. Engine chafing casting, which was loose and tilted on frame, allowing it to raise when backing against cars, struck apron throwing it upward and causing fireman who was riding on it to fall; 1 injured.

*March 6, 1922, locomotive 2651, Breese, Ill. Piece of gas pipe used for a shaker bar slipped off, due to improper fit; engine left terminal without a shaker bar; 1 injured.

March 8, 1922, locomotive 2023, Clarington, W. Va. Autogenously welded seam of patch of knuckle of back head failed for a distance of 17 inches; 1 injured.

**March 10, 1922, locomotive 4194, Wolf Summit, W. Va. Struck by stoker screen slide which fell from passing locomotive; 1 injured.

*March 31, 1922, locomotive (B. & O. C. T.) 56, East Chicago, Ind. Reverse lever came out of quadrant, due to spring hanger missing, catching engineer's foot against boiler head; 1 injured.

April 1, 1922, locomotive 2341, Wylandville, Pa. Engine separated from tender, due to center sills of tender frame breaking; right sill was entirely broken prior to accident and left sill had old crack 85 per cent of cross-sectional area, which could have been detected by inspection; lost motion between engine and tender reported on March 15, 17, 24, 26, 27, and 30; 1 injured.

*April 5, 1922, locomotive 4328, Osborne, Md. Lubricator oil pipe broke at nipple connection to lubricator, due to old flaw covering approximately 60 per cent of cross-sectional area of nipple; 1 injured.

May 2, 1922, locomotive 7156, near Fairhope, Pa. Crown-sheet failure; low water; no contributory causes found; appurtenances damaged to such extent that their previous condition could not be determined; 3 killed.

*May 16, 1922, locomotive 2363, Garrett, Ind. Wheel on throttle of air pump pulled off, allowing fireman to fall from running board; 1 injured.

**May 18, 1922, locomotive 387, Pittsburgh, Pa. Shaker bar slipped off post; piece of pipe, temporarily applied in place of bolt in front end of shaker connection rod, broke when attempt was made to shake grates; 1 injured.

June 7, 1922, locomotive 1509, Benwood Junction, W. Va. Grate-shaker lever broke, due to old defect covering about 55 per cent of cross-sectional area; 1 injured.

*June 17, 1922, locomotive 4316, Chicago, Ill. Insufficient clearance between reverse lever and brake valve handle; 1 injured.

June 18, 1922, locomotive 4301, Piqua, Ohio. Keys securing ash-pan dumping arms to shaft sheared, causing operating lever to drop, catching fireman's hand; 1 injured.

June 27, 1922, locomotive 1856, Poplar, Md. Throttle stuck in wide-open position due to throttle-lever quadrant being improperly located, causing engine to move forward and collide with crane car; 1 injured.

Forty-eight accidents; 4 killed, 52 injured.

BOSTON & ALBANY RAILROAD:

July 23, 1921, locomotive 1200, near North Wilbraham, Mass. Crown-sheet failure; low water; gauge-cock drip stopped up; Nos. 1 and 2, gauge-cock nipples, extending into gauge-cock drip one-half inch; No. 3 gauge cock inoperative by hand; water supply to left injector restricted, due to lost motion of valve; overflow valve leaking badly; 75 per cent of superheater tubes stopped up; 3 injured.

One accident; 3 injured.

BOSTON & MAINE RAILROAD:

November 13, 1921, locomotive 2634, Farley, Mass. Right front driving wheel tire broke; 1 injured.

November 23, 1921, locomotive 232, Nashua, N. H. Water glass broke; back of water-glass shield missing; 1 injured.

February 1, 1922, locomotive 1001, South Acton, Mass. Eccentric stud broke, due to old fracture, allowing eccentric to separate and cause reverse lever to suddenly fly back; 1 injured.

February 20, 1922, locomotive 3232, Wakefield Center, Mass. Trailer truck journal box cover came off, due to being insecurely fastened; 1 injured.

March 3, 1922, locomotive 1475, Somerville Highlands, Mass. While double-heading locomotives separated, due to defective knuckle pin on leading locomotive 1475; 1 injured.

*March 6, 1922, locomotive 1362, Arlington, Mass. Axle under tender broke, due to old defect, causing derailment of tender, combination car, and leading trucks of coach; 2 injured.

April 21, 1922, locomotive 2327, South Wilmington, Mass. Draw-bar pin broke and cab apron dropped between locomotive and tender; metal in draw-bar pin was crystallized and otherwise defective; safety chains too long and of uneven length; 1 injured.

Seven accidents; 8 injured.

BUFFALO, ROCHESTER & PITTSBURGH RAILWAY:

January 6, 1922, locomotive 279, East Salamanca, N. Y. Blow-off cock nipple broke off at throat sheet while trying to close or stop blow-off cock from leaking; 1 injured.

One accident; 1 injured.

CANADIAN PACIFIC RAILWAY:

**September 25, 1921, locomotive 3494, near Brownville Junction, Me. Petticoat pipe became loose in front end and fell down, shutting off draft; 1 injured.

One accident; 1 injured.

CENTRAL NEW ENGLAND RAILWAY:

** October 27, 1921, locomotive 370, near Slocums, R. I. Spring hanger to engine-truck equalizer broke, due to old flaw; 1 injured.

December 20, 1921, locomotive 128, near West Norfolk, Conn. Reverse lever became unlatched and flew forward, due to defective latch spring; stop block on quadrant loose, allowing engineer's hand to be caught; 1 injured.

February 11, 1922, locomotive (N. Y., N. H. & H.) 3247, Poughquag, N. Y. Main crank pin broke, due to fracture covering approximately 90 per cent of cross-sectional area; 1 injured.

Three accidents; 3 injured.

CENTRAL OF GEORGIA RAILWAY:

* July 5, 1921, locomotive 1008, Stevens Pottery, Ga. Squirt hose pulled off; 1 injured.

One accident; 1 injured.

CENTRAL RAILROAD OF NEW JERSEY:

* July 28, 1921 (number not given), Jersey City, N. J. Sprinkler hose pulled off; 1 injured.

** August 19, 1921, locomotive 446, Somerville, N. J. Cap and valve blew out of right steam chest relief valve casing; cap applied cross-threaded; 1 injured.

August 30, 1921, locomotive 16, Mauch Chunk, Pa. Barrel sheet ruptured longitudinally for a distance of 22 inches, where a triple-riveted lap seam patch 50 inches wide by 84 inches long had been applied. This patch had been offset five-eighths inch to make it conform to a true circle. An old crack had developed extending 41½ inches in length and to within one-sixteenth inch of the surface. The crack developed under the inside caulking edge of the lap seam extending 10½ inches beyond the rupture at one end and 9 inches at the other; 1 injured.

September 22, 1921, locomotive 397, Matawan, N. J. Stud in back head supporting a drop-grate dog blew out, due to being improperly applied; 1 injured.

December 2, 1921, locomotive 175, Elizabethport, N. J. Step loose on smoke-box brace, causing fireman to fall under the locomotive; 1 killed.

February 17, 1922, locomotive 803, Bound Brook, N. J. Insufficient clearance between reverse lever and drifting valve pipe; 1 injured.

Six accidents; 1 killed, 5 injured.

CHARLESTON & WESTERN CAROLINA RAILWAY:

* April 3, 1922, locomotive 310, Augusta, Ga. Squirt hose burst; 1 injured.

One accident; 1 injured.

CHESAPEAKE & OHIO RAILWAY:

** November 3, 1921, locomotive 774, Russell, Ky. Broken radial stay blew out while being caulked under pressure; threads on stay and in fire-box sheet eaten away, due to leakage. Head of stay showed signs of excessive caulking previous to accident; 1 injured.

November 4, 1921, locomotive 1030, Oliver, Ky. Crown-sheet failure, due to low water; no contributory causes found; 3 injured.

** January 1, 1922, locomotive 482, Vanceburg, Ky. Left main rod broke; old crack 1 inch deep across bottom of rod at point of failure; 1 injured.

April 24, 1922, locomotive 779, Quinnimont, W. Va. Locomotive parted from train, due to low coupler on rear of tender; 1 injured.

May 3, 1922, locomotive 719, Mead, Ky. Injector feed hose blew off, due to defective steam ram, compelling overflow valve to be kept closed and pressure to accumulate in feed pipe and hose; 1 injured.

Five accidents; 7 injured.

CHICAGO & ALTON RAILROAD:

**July 18, 1921, locomotive 808, Centralia, Mo. Shaker bar slipped off, due to improper fit; 1 injured.

October 31, 1921, locomotive 807, Kansas City, Mo. Flue pocket blew out of back flue sheet, due to being improperly applied; flue hole was 2¼ inches, flue pocket 2 inches, applied with one-eighth inch copper ferrule and not properly prossered; 1 killed.

*November 19, 1921, locomotive 413, Williamsville, Ill. Spring hanger broke: 1 injured.

January 30, 1922, locomotive 509, Ocoya, Ill. Right and left side rods broke, causing engine to be stripped; 1 injured.

March 28, 1922, locomotive 624, Chicago, Ill. Struck by overhead viaduct while attempting to adjust defective power bell ringer; bell ringer reported defective on March 24 and 25; 1 injured.

Five accidents; 1 killed, 4 injured.

CHICAGO & NORTH WESTERN RAILWAY:

*July 9, 1921, locomotive 2410, East Clinton, Ill. Blow-off cock opened; bolt missing in right blow-off safety-cock block; 1 injured.

July 10, 1921, locomotive 1907, near Merrimac, Wis. Injured while operating reverse lever, due to insufficient clearance between reverse lever when in full forward position and air pipe; 1 injured.

July 25, 1921, locomotive 1413, Ishpeming, Mich. Grate shaker rod became disconnected from lever, due to pin coming out of rod account of cotter key missing; 1 injured.

July 29, 1921, locomotive 68, Chicago, Ill. Injured while operating reverse lever, due to insufficient clearance between reverse lever when in full backward motion and seat box; 1 injured.

August 1, 1921, locomotive 504, Maywood, Ill. Boiler check stuck open; when fireman closed stop valve at boiler check on delivery pipe and opened drain valve under check valve he was struck by steam and hot water, due to section of drain pipe missing; 1 injured.

August 3, 1921, locomotive 158, Antigo, Wis. Drain pipe to lubricator was threaded and screwed loosely into drain valve, and while blowing out lubricator under pressure the pipe flew around and scalded the person preparing to fill lubricator; 1 injured.

*August 18, 1921, locomotive 1233, Seward, Nebr. Right front tender truck axle broke, causing derailment of tender, combination car, smoking car, and coach; 1 injured.

August 21, 1921, locomotive 1398, near Antigo, Wis. Reverse lever latch became disengaged from quadrant; no suitable stop pin provided to prevent lever from going into extreme forward motion; 1 injured.

September 1, 1921, locomotive 557, Chicago, Ill. Squirt hose parted at splice; hose not clamped; 1 injured.

September 11, 1921, locomotive 1635, Palatine, Ill. Lateral-motion plate of left trailer box became detached and was thrown from locomotive while running about 35 miles per hour onto station platform, striking prospective passenger; 1 injured.

September 25, 1921, locomotive 1517, Merrimac, Wis. Squirt hose blew off nipple; hose loose and not securely fastened; 1 injured.

September 27, 1921, locomotive 1491, near Elcho, Wis. Reverse lever came out of quadrant, due to notches and teeth of quadrant and latch being worn; insufficient clearance around lever when in front end of quadrant; 1 injured.

October 10, 1921, locomotive 1786, Ridgefield, Ill. Fireman scalded by steam and hot water escaping through hole in coal pusher steam pipe. Steam pipe badly deteriorated and proper repairs not made when reported on September 9 and October 5; 1 injured.

October 24, 1921, locomotive 1865, Bain, Wis. Fireman slipped on cap apron and fell, account of apron worn very smooth and slippery over entire surface; 1 injured.

November 18, 1921, locomotive 2613, Chicago, Ill. Left injector starting valve bonnet broke off; valve at point of fracture of too light construction; 1 injured.

*December 30, 1921, locomotive 21, Belvidere, Ill. Spanner nut on left injector broke; attempted to tighten under pressure with hammer and chisel; 1 injured.

January 24, 1922, locomotive 96, Wausau, Wis. Handrail gave way, due to threads in column being stripped; 1 injured.

January 24, 1922, locomotive 1582, Grand Junction, Iowa. Plug in fire door air cylinder blew out, releasing fire door and allowing it to close on fireman's hand; one-half inch bolt had been applied in place of three-eighths inch pipe plug, and threads were stripped in applying; 1 injured.

February 3, 1922, locomotive 2445, Sterling, Ill. Main crank pin broke, due to old flaw; 1 injured.

**March 21, 1922, locomotive 2499, Lowden, Iowa. Shaker bar slipped off post, due to improper fit; 1 injured.

April 16, 1922, locomotive 417, Eagle Grove, Iowa. Water glass burst; cut by flying glass; water glass not protected by shield; 1 injured.

April 18, 1922, locomotive 2321, near Denison, Iowa. Squirt hose valve bonnet blew off account of being broken; 1 injured.

May 7, 1922, locomotive 2487, Bluff, Ill. Squirt hose blew off, due to being insecurely applied; 1 injured.

**May 26, 1922, locomotive 2396, South Pekin, Ill. Bonnet on squirt hose valve worked off; 1 injured.

June 8, 1922, locomotive 1304, Ree Heights, S. Dak. Reverse lever came out of quadrant, due to weak latch spring, and flew forward suddenly, catching engineer's foot between lever and boiler head; 1 injured.

June 18, 1922, locomotive 1897, Houles, Mich. Reverse lever became unlatched and flew forward; 1 injured.

June 18, 1922, locomotive 575, Mason City, Iowa. Valve chamber bushing broke, causing reverse lever to jerk out of quadrant and fly backward and forward, striking engineer; 1 injured.

**June 19, 1922, locomotive 1005, Heinemann, Wis. Injured while operating reverse lever, due to main throttle valve leaking; 1 injured.

June 28, 1922, locomotive 1612, between Dodge Center and Meriden, Minn. Whistle valve stuck open while locomotive covered a distance of 26½ miles, due to obstruction on seat; 1 injured.

*June 30, 1922, locomotive 1768, Hubbard, Iowa. Reverse lever latch failed to operate account of insufficient lubrication; 1 injured.

Thirty accidents; 30 injured.

CHICAGO & WESTERN INDIANA RAILROAD:

June 15, 1922, locomotive (B. R. R. of C.) 85, Chicago, Ill. Squirt hose blew off, due to being insecurely clamped; 1 injured.

One accident; 1 injured.

CHICAGO, BURLINGTON & QUINCY RAILROAD:

July 6, 1921, locomotive 2937, Genoa, Wis. Injector steam pipe brazing collar broke off at spanner nut connection, due to being made of too light material; 1 injured.

July 7, 1921, locomotive 6304, Sesser, Ill. Squirt hose burst, due to being defective; 1 injured.

July 8, 1921, locomotive 2111, near Plum River, Ill. Flue broke at safe end weld; overheated in welding; 1 injured.

July 25, 1921, locomotive 5221, Ottumwa, Iowa. Piston rod broke off in crosshead fit, knocking out the front cylinder head, due to old fracture; 1 injured.

July 29, 1921, locomotive 1966, near Breckenridge, Mo. Flue broke off at safe end weld; overheated in welding; 1 injured.

August 31, 1921, locomotive 2826, near Eckley, Colo. Left piston rod broke, knocking out front cylinder head, due to old fracture extending nearly one-half of diameter of rod at shoulder next to piston; 1 injured.

*September 10, 1921, locomotive 5242, Biggsville, Ill. Scalded, due to leaky squirt hose valve; 1 injured.

September 12, 1921, locomotive 4100, near Crawford, Nebr. Injured due to defective squirt hose; hose spongy and leaking badly and had been reported defective; 1 injured.

*November 7, 1921, locomotive 5318, Erie, Ill. "Bull ring" on piston head broke while train was running at a speed of approximately 30 miles per hour, causing front cylinder head to be knocked out and main rod to be bent; 1 injured.

*November 14, 1921, locomotive 5209, Mount Pleasant, Iowa. Glass broke in stoker lubricator, breaking shield and striking fireman's eye; 1 injured.

December 21, 1921, locomotive 3003, Centralia, Ill. Crown-sheet failure; low water; opening in top end of water glass almost entirely closed by gasket being squeezed over end, due to glass being one-half inch too short; 1 injured.

*January 6, 1922, locomotive 5211, Creston, Iowa. Derailment, due to sharp flange on left pony truck wheel; 1 injured.

*February 9, 1922, locomotive 1430, Aurora, Ill. Spring hanger pin broke, due to old fracture, allowing footboard to drop down and catch on crossing plank, throwing employee to ground; 1 injured.

February 15, 1922, locomotive 2159, Pleasant Dale, Nebr. Water glass burst while shield was removed for the purpose of cleaning while en route; 1 injured.

February 27, 1922, locomotive 1825, Pacific Junction, Iowa. Lubricator glass burst; cut by flying glass; 1 injured.

*April 18, 1922, locomotive 1445, Aurora, Ill. Grease cup cap blew off, due to being insecurely applied; 1 injured.

May 10, 1922, locomotive 2208, Granite City, Ill. Squirt hose burst, due to being badly worn; 1 injured.

May 16, 1922, locomotive 1412, Rock Island, Ill. Cast-iron head of main air reservoir blew out; old crack 12 inches long extended almost through head, which shattered at time of accident; 1 injured.

**June 4, 1922, locomotive 2106, St. Louis, Mo. Main air reservoir drain cock broke off, due to old flaw, striking engineer; 1 injured.

**June 6, 1922, locomotive 1711, Beardstown, Ill. Bolts in bottom of foot board on rear end of tank caught in switch frog, causing switchman to fall; foot board 3½ inches lower than standard; 1 injured.

*June 10, 1922, locomotive 6163, Belmont, Ill. Air hose coupling blew off; 1 injured.

June 23, 1922, locomotive 1569, Daytons Bluff, Minn. Cab apron became disconnected, due to bolt in apron hinge breaking or working out; 1 injured.

Twenty-two accidents; 22 injured.

CHICAGO JUNCTION RAILWAY:

*February 4, 1922, locomotive 150, Chicago, Ill. Defective water glass shield blew off when water glass burst; 1 injured.

One accident; 1 injured.

CHICAGO, MILWAUKEE & ST. PAUL RAILWAY:

July 7, 1921, locomotive 1228, Milwaukee, Wis. Water glass burst, breaking glass panels in water glass shield; glass panels inadequate in strength; 1 injured.

August 4, 1921, locomotive 8247, New Lebanon, Ill. Shaker bar slipped off lever, due to improper fit; 1 injured.

*August 8, 1921, locomotive 114, Spokane, Wash. Reverse lever became unlatched and flew in backward motion, striking engineer; 1 injured.

September 7, 1921, locomotive 8024, Ladd, Ill. Squirt hose blew off nipple; hose defective; 1 injured.

October 10, 1921, locomotive 8201, Deerfield, Ill. Shaker bar slipped off lever, due to improper fit; 1 injured.

October 28, 1921, locomotive 2883, near Darwin, Wis. Main axle broke off flush with outside of left driving box, due to old fracture approximately one-third of the cross-sectional area of axle; 1 injured.

November 13, 1921, locomotive 520, Whitewater, Wis. Engine, tender, and four cars derailed account of loose tires on both driving wheels on right side; tires improperly fit and shimmed; 1 killed.

November 20, 1921, locomotive 7106, Bensonville, Ill. Handrail pulled apart at a pipe coupling, causing engineer to fall to ground; handrail screwed into pipe coupling with only one and one-half threads holding; 1 injured.

**December 14, 1921, locomotive 2433, Houston, Minn. Shaker bar slipped off fulcrum lever; 1 injured.

**January 11, 1922, locomotive 8518, Milwaukee, Wis. Wooden tread, applied of fir wood and extending out over edge of gangway step, split off and caused hostler to fall; 1 injured.

**January 12, 1922, locomotive 8069, Stewart, Minn. Hose used in ash pan blower pipe line burst; 1 injured.

**January 24, 1922, locomotive 2311, Lyons, Wis. Eccentric blade broke, due to overheating at weld, causing reverse lever to unlatch and fly back and forth; 1 injured.

*February 6, 1922, locomotive 2890, Alden, Minn. Stepped in hole in engine deck which had not been covered; 1 injured.

March 10, 1922, locomotive 5013, Nahant, Iowa. Injector overflow valve cap blew off due to badly worn threads in the body of the injector and on spanner nut; 1 injured.

*March 16, 1922, locomotive 7208, between Monona and Launa, Iowa. Reverse lever became unlatched; 1 injured.

April 7, 1922, locomotive 6326, Mobridge, S. Dak. Washout plug blew out while attempting to tighten under pressure; plug had been improperly applied; 1 injured.

*April —, 1922, locomotive 5537, Whitewater, Wis. Struck by swinging coal gate, caused by bent lug which did not hold gate in place; 1 injured.

*April 14, 1922, locomotive 2802, Mapleton, Iowa. Right main crank pin broke; 1 injured.

*April 29, 1922, locomotive 2191, Chicago, Ill. Injured due to broken driving spring; 1 injured.

May 16, 1922, locomotive 6312, Shermerville, Ill. Reverse lever unlatched and flew forward striking engineer's leg, due to right and left lap-and-lead levers striking studs on back cylinder heads; 1 injured.

June 10, 1922, locomotive 8679, Perry, Iowa. Water glass burst, causing glasses in shield to break; cut by flying glass; 1 injured.

*June 11, 1922, locomotive 8115, Bristol, S. Dak. Squirt hose burst; 1 injured.

Twenty-two accidents; 1 killed, 21 injured.

CHICAGO, ROCK ISLAND & PACIFIC RAILWAY:

July 10, 1921, locomotive 1715, near Hennessey, Okla. Main rod broke, due to old fracture which was concealed, account of being covered by block clamped to main rod for operating valve gear; 1 injured.

July 28, 1921, locomotive 865, near Enid, Okla. Right injector steam-pipe brazing collar broke off at throttle connection, due to brass collar being of too light construction; 1 injured.

July 28, 1921, locomotive 1945, Preston, Kans. Insufficient clearance between shaker bar and air pipes on boiler head; shaker-bar handle bent in two places; reach rod longer than necessary, requiring bar to be shoved too far forward; 1 injured.

July 31, 1921, locomotive 836, Cove Creek, Ark. Insufficient clearance around handle of reverse lever when in forward position; 1 injured.

*August 10, 1921, locomotive 1990, Nemack, Okla. Squirt hose burst; 1 injured.

**August 16, 1921, locomotive 604, Hartshorne, Okla. Vertical rod became disconnected from shaker rod, account of bolt in bottom of shaker rod working out, due to nut lost off; 1 injured.

August 16, 1921, locomotive 1759, Biddle, Ark. Scalded by hot water from defective squirt hose; 1 injured.

**August 26, 1921, locomotive 1853, Lindale, Ark. Eccentric blade broke, due to weak spot caused by crystallization, causing reverse lever to fly back and strike engineer; 1 injured.

September 26, 1921, locomotive 2048, Hudson, N. Mex. Driving-wheel tire which was loose slipped, causing locomotive, tender, and three cars to be derailed; 1 injured.

October 8, 1921, locomotive 1103, Morrison, Iowa. Dry pipe collapsed; 1 injured.

October 15, 1921, locomotive 892, near Limon, Colo. Right main rod broke, due to old fracture covering nearly one-half cross-sectional area of rod; 1 injured.

October 31, 1921, locomotive 629, Blue Island, Ill. Blow-off cock operating rod broke, due to old fracture extending one-half of cross-sectional area, causing fireman to fall from running board; 1 injured.

December 19, 1921, locomotive 80, Leavenworth, Kans. Flue broke at weld; overheated in welding; 1 injured.

**January 1, 1922, locomotive 920, Hickory Creek, Mo. Flag box which was located on back of cab fell and struck fireman, due to box being insecurely constructed and fastened in place; 1 injured.

**February 9, 1922, locomotive 3002, between Allerton and Eldon, Iowa. Power grate shaker defective and inoperative account of connecting rods disconnected; employee injured while using hand lever; 1 injured.

February 15, 1922, locomotive 142, Blue Island, Ill. Injector steam-ram bonnet blew out, due to injector being cracked causing bonnet to fit loosely; 1 injured.

February 26, 1922, locomotive 1511, El Reno, Okla. Headlight turbine burst due to excessive speed; governor valves badly worn; 1 injured.

March 2, 1922, locomotive 1813, Wichita, Kans. Grates became disconnected account of pin working out of connecting rod, due to cotter key missing; 1 injured.

April 26, 1922, locomotive 2559, near Hickory Creek, Mo. Shaker bar slipped off of fulcrum lever, due to improperly designed lever; 1 injured.

June 4, 1922, locomotive 891, Holson, Okla. Eccentric rod broke, due to old flaw, causing reverse lever to jerk out of quadrant and fly forward, striking engineer; 1 injured.

June 10, 1922, locomotive 3015, Allerton, Iowa. Insecure footing on deck of locomotive caused fireman to slip while attempting to shake grates; 1 injured.

June 12, 1922, locomotive 3017, Trenton, Mo. Hose used for cleaning ash pan burst; hose defective, having previously been burned; 1 injured.

June 14, 1922, locomotive 1246, near Plains, Kans. Eccentric strap broke due to old defect, causing reverse lever to unlatch and fly back and forth, striking engineer's arm; 1 injured.

Twenty-three accidents; 23 injured.

CHICAGO, ST. PAUL, MINNEAPOLIS & OMAHA RAILWAY:

August 27, 1921, locomotive 338, near Heron Lake, Minn. Left main crank pin broke, due to old fracture approximately one-fourth of its area and caused front cylinder to be knocked out, air compressor to be knocked off, crosshead piston key to be sheared, and other serious damage to locomotive; 1 injured.

September 14, 1921, locomotive 290, Sioux City, Iowa. Spindle blew out of bottom gauge cock, scalding engineer; gauge cock was stopped up and spindle had been screwed out to within two threads and when tried it blew out; gauge cock of improper design and construction; 1 injured.

** October 16, 1921, locomotive 354, Kasota, Minn. Pin lifter on rear of tender broke, due to old flaw; 1 injured.

*June 18, 1922, locomotive 403, Trego, Wis. Derailment due to tire coming off front driving wheel; 1 injured.

Four accidents; 4 injured.

CINCINNATI, INDIANAPOLIS & WESTERN RAILROAD:

*February 21, 1922, locomotive 201, Dana, Ind. Tender brake beam came down, causing derailment of engine, tender, first car, and pair of trucks of second car; 2 injured.

One accident; 2 injured.

CLEVELAND, CINCINNATI, CHICAGO & ST. LOUIS RAILWAY:

July 23, 1921, locomotive (CN) 5566, near Van Wert, Ohio. Crosshead broke due to old fractures between piston rod fit and cross pin, knocking out cylinder head; 1 injured.

*December 13, 1921, locomotive 7322, Cairo, Ill. Top section of coal gate which was defective gave way, permitting fireman to fall; 1 injured.

*December 21, 1921, locomotive 7468, Linndale, Ohio. Cab apron bent up approximately 2 inches on one side, permitting fireman's foot to be caught; 1 injured.

February 9, 1922, locomotive 6027, near Osborn, Ohio. Crown-sheet failure; low water, no contributory causes found; 3 injured.

May 8, 1922, locomotive 6190, near Taft, Ind. Squirt hose valve worked open; bonnet of globe valve broken off at lower end of stuffing box, which allowed stem of valve to turn, unseating valve; 1 injured.

May 25, 1922, locomotive 6945, near Colfax, Ind. Injector steam pipe collar broke and pulled off, due to being improperly brazed and not belled or beaded; 1 injured.

Six accidents; 8 injured.

COLORADO & SOUTHERN RAILWAY:

December 25, 1921, locomotive 228, Denver, Colo. Main air reservoir exploded due to failure of autogenously welded longitudinal seam for its entire length; 1 injured.

April 18, 1922, locomotive 600, near Semper, Colo. Flue failed at safe end weld; overheated in welding; 1 injured.

Two accidents; 2 injured.

DELAWARE & HUDSON CO.:

July 14, 1921, locomotive 557, near Glens Falls, N. Y. Flue failed at safe end weld; defective weld; 1 injured.

**September 10, 1921, locomotive 1057, Plymouth, Pa. Slipped on cab apron account of apron worn smooth; 1 injured.

September 22, 1921, locomotive 434, Troy, N. Y. Gangway-safety chain between engine and tender, which was connected with a piece of wire, gave way when fireman lost his balance and fell against it allowing him to fall out of gangway to ground; 1 injured.

February 16, 1922, locomotive 600, near Fort Edwards, N. Y. Flue broke at safe end weld; overheated in welding and welding mandrel too small; 2 injured.

February 19, 1922, locomotive 506, Montcalm Landing, N. Y. Insufficient clearance between apron and coal pan when locomotive was taking a curve; 1 injured.

March 2, 1922, locomotive 833, Elmora, N. Y. Drop seat on tender gave way, due to nuts working off hinge bolts; 1 injured.

March 20, 1922, locomotive 1051, Mechanicsville, N. Y. Carrier iron on rear of tender came loose and fell off, due to nuts working off bolts; 1 injured.

**April 13, 1922, locomotive 1089, Crescent, N. Y. Grate broke while grates were being shaken; 1 injured.

Eight accidents; 9 injured.

DELAWARE, LACKAWANNA & WESTERN RAILROAD:

November 9, 1921, locomotive 94, Solvay, N. Y. Crown-sheet failure due to low water; no contributory causes found; 4 injured.

June 14, 1922, locomotive 396, Dansville, N. Y. Draft pipe dropped to one side, due to nuts working off two bolts, and one other bolt breaking; 3 injured.

Two accidents; 7 injured.

DENVER & RIO GRANDE WESTERN RAILROAD:

July 11, 1921, locomotive 773, near Grand Junction, Colo. Right front section of side rod broke, due to old crack; 1 injured.

March 13, 1922, locomotive 724, near Payne, Colo. Crown-sheet failure due to low water; right boiler check-stop valve disconnected from stem; 1 injured.

Two accidents; 2 injured.

DENVER & SALT LAKE RAILROAD:

**February 11, 1922, locomotive 113, Corona, Colo. Handhold at gangway on left side of locomotive came loose at top end; 1 injured.

One accident; 1 injured.

DETROIT & TOLEDO SHORE LINE RAILROAD:

*January 1, 1922, locomotive 13, Wyandotte, Mich. Welded side sheet seam of fire box failed for a distance of 3 inches; 1 injured.

One accident; 1 injured.

DETROIT, TOLEDO & IRONTON RAILROAD:

*August —, 1921, locomotive 93, Delray, Mich. Drawbar casting dropped down, allowing tank and engine to separate; 1 injured.

*April 15, 1922, locomotive 87, Delray, Mich. Stepped into reverse-lever slot, which was 5 inches wide; 1 injured.

Two accidents; 2 injured.

ELGIN, JOLIET & EASTERN RAILWAY:

*July 29, 1921, locomotive 115, Gary, Ind. Bonnet of top water glass cock broke; 1 injured.

*May 29, 1922, locomotive 116, Gary, Ind. Cylinder cock rigging became disconnected; 1 injured.

Two accidents; 2 injured.

EL PASO & SOUTHWESTERN RAILROAD:

**December 6, 1921, locomotive 256, El Paso, Tex. Water glass burst, breaking glass panel in water glass shield; cut by flying glass; 1 injured.

One accident; 1 injured.

ERIE RAILROAD:

July 19, 1921, locomotive 2917, Tuxedo, N. Y. Fusible plug blew out of crown sheet, due to being improperly applied; plug applied cross-threaded, due to damaged threads in sheet; 2 injured.

August 1, 1921, locomotive 1657, West Cameron, N. Y. Knuckle pin worked out of left side rod, causing rod to break, ash pan blower to be knocked off, and blow-off cock to be knocked off flush with boiler. The knuckle pin had been reported loose 38 times previous to accident and reports approved each time, indicating proper repairs had been made between May 13 and August 1, when the accident occurred; 2 injured.

September 6, 1921, locomotive 1654, near Red House, N. Y. Crown-sheet failure, due to low water; water glass was shut off enroute, due to gasket blown out; 3 injured.

*September 29, 1921, locomotive 3066, Attica, N. Y. Engine derailed, due to front end of engine frame being too low, preventing engine truck from curving properly; 1 injured.

November 10, 1921, locomotive 1819, Hegewisch, Ill. Drawbar pin and safety chains broke, permitting locomotive and tender to separate; drawbar pin defective and metal crystallized; 1 injured.

**November 23, 1921, locomotive 1044, Port Jervis, N. Y. Foot crushed under feed water tank, due to anchor bolt to right lug broken at old fracture and nuts missing from left lug bolt, allowing tank to raise from deck when compact was caused by coupling up string of cars; 1 injured.

*November 29, 1921, locomotive 1588, Erwins, N. Y. Carrier iron on tender came loose, due to defective bolts, allowing coupler to drop and engine to part from train, setting brakes in emergency; 2 injured.

December 15, 1921, locomotive 59, Brier Hill, Ohio. Reverse lever unlatched and flew forward; lever latch worn and spring weak; 1 injured.

February 18, 1922, locomotive 2490, River Junction, N. Y. Piston valve ring broke and caught in steam port, causing screw reverse to back-lash; 1 injured.

February 19, 1922, locomotive 4114, Akron, Ohio. Washout plug blew out, due to poor threads in sheet and on plug and threads crossed in applying; 1 injured.

February 25, 1922, locomotive (N. Y. S. & W.) 35, Butler, N. J. Pilot step bracket broke through bolt hole, throwing brakeman to ground; metal crystallized at point of failure; 1 injured.

March 1, 1922, locomotive 1670, Cleveland, Ohio. Radial stay blew out while being calked under pressure; stay broken off about 2 inches from wrapper sheet and threads in wrapper sheet very defective; 1 injured.

March 28, 1922, locomotive 1845, Jersey City, N. J. Flue broke off, due to being worn thin, and wasted away at point of failure; 1 injured.

April 30, 1922, locomotive 535, Secaucus, N. J. Crown-sheet failure; low water; lowest reading of water glass 2½ inches above highest point of crown sheet; 2 injured.

May 2, 1922, locomotive 2469, Hornell, N. Y. Screw reverse gear backlashed due to latch spring too weak to hold it in place; 1 injured.

**May 7, 1922, locomotive 3075, Secaucus, N. J. Grate-shaker rod became disconnected from fulcrum lever, due to pin coming out; 1 injured.

June 7, 1922, locomotive 935, Secaucus, N. J. Side rod broke, due to old flaw; 1 injured.

Seventeen accidents; 23 injured.

FLORIDA EAST COAST RAILWAY:

May 1, 1922, locomotive 69, Miami, Fla. End of cab apron gave down, due to hinge bolt missing; 1 injured.

One accident; 1 injured.

GEORGIA & FLORIDA RAILWAY:

*April 8, 1922, locomotive 354, Willachoochee, Ga. Cast-iron sleeve on branch pipe burst; 1 injured.

One accident; 1 injured.

GRAND TRUNK RAILWAY:

*November 8, 1921, locomotives 526 and 475, near Durand, Mich. Locomotives parted, causing air to go into emergency, due to coupler on engine 526 slipping over coupler on engine 475; 1 injured.

*March 27, 1922, locomotive 12, Richmond, Mich. Struck by ventilator section of cab window, which came down, account of fastenings becoming loose; 1 injured.

Two accidents; 2 injured.

GREAT NORTHERN RAILWAY:

*July 1, 1921, locomotive 1972, North End, Minn. Shaker bar slipped off rigging, account of bar being bent out of shape; 1 injured.

**July 12, 1921, locomotive 1113, near Asbury, Minn. Squirt hose blew off nipple, due to being improperly applied and not properly clamped; 1 injured.

September 23, 1921, locomotive 536, Manvel, N. Dak. Crown-sheet failure; low water; no contributory causes found; 2 injured.

*November 23, 1921, locomotive 1956, Fielding, Mont. Cover plate over left shaker post gave way when engineer stepped on it, causing him to receive a severe fall and fracture of left arm; 1 injured.

**January 13, 1922, locomotive 1213, Willmar, Minn. Slipped and fell from tender step, due to ice on step caused by leak in tender; 1 injured.

**January 22, 1922, locomotive 3247, Harrington, Wash. Shaker bar slipped off lever, due to improper fit; 1 injured.

**February 22, 1922, locomotive 3251, Edwall, Wash. Bushing worked out of grate-shaker fulcrum lever, due to cotter key missing, allowing lever to drop down and fireman's hand to be caught between shaker bar and stoker; 1 injured

**March 3, 1922, locomotive 1200, Scotia, Wash. Wire used to fasten coal gate open gave way, allowing gate to close on fireman's hand; 1 injured.

March 5, 1922, locomotive 1084, Dutton, Mont. Expansion-pad stud blew out; pad was binding on the stud, and tended to loosen it in the boiler and cause it to be blown out; 1 injured.

March 19, 1922, locomotive 3206, Delano, Minn. Shaker bar slipped off post, due to improper fit; 1 injured.

April 1, 1922, locomotive 1762, Cato, Mont. Shaker bar slipped off lever, due to improper fit; 1 injured.

April 8, 1922, locomotive 3110, Williston, N. Dak. Squirt hose burst; hose defective; 1 injured.

April 11, 1922, locomotive 63, Fargo, N. Dak. Injured while attempting to remove obstruction which had been placed in sand pipe; flow of sand could not be controlled from cab, due to defective apparatus; 1 injured.

** April 19, 1922, locomotive 464, Grand Forks, N. Dak. Throttle stuck open, due to wings on valve being worn; 1 injured.

** June 12, 1922, locomotive 3138, Newport, Wash. Upper section of petticoat pipe broke loose and dropped crosswise in the bottom of smokestack, causing back draft; bolts in petticoat pipe defective; 2 injured.

Fifteen accidents; 17 injured.

GULF COAST LINES:

February 17, 1922, locomotive (St. L., B. & M.) 52, San Benito, Tex. Crown-sheet failure due to low water; four flues found collapsed, due to accumulation of mud 16 inches deep in the belly of boiler; 23 hammered head-crown stays which pulled out of sheet had no threads on them or in sheet; 1 injured.

One accident; 1 injured.

HOCKING VALLEY RAILWAY:

July 16, 1921, locomotive 229, Toledo, Ohio. Engineer fell, due to number plate to which he was holding breaking off account of a broken and defective stud; 1 injured.

October 30, 1921, locomotive 91, Columbus Ohio. Water-glass cock blew out, due to improper design and construction; 1 injured.

** January 24, 1922, locomotive 155, Walbridge, Ohio. Locomotive ran away, caused by throttle flying open, due to latch spring being broken and in violation of rule 156; 1 injured.

Three accidents; 3 injured.

ILLINOIS CENTRAL RAILROAD:

July 29, 1921, locomotive 1157, Centralia, Ill. Squirt hose burst; hose defective, due to chafing against grate-shaker rigging; 1 injured.

* September 10, 1921, locomotive 2902, Mendota, Ill. Locomotive and two cars derailed, due to sharp flange on front driving wheel; 1 injured.

December 2, 1921, locomotive 237, Mounds, Ill. Squirt hose burst where it was worn thin by rubbing on apron; 1 injured.

December 28, 1921, locomotive 938, Water Valley, Miss. Washout plug blew out while attempting to tighten under pressure; plug applied with threads crossed; 1 injured.

* December 30, 1921, locomotive 1932, Owensboro, Ky. Shaker bar broke, due to old defect; 1 injured.

April 19, 1922, locomotive 1076, Jackson, Miss. End of broken stay bolt blew out of crown sheet; bolt loose and threads in crown sheet stripped; 1 injured.

** March 16, 1922, locomotive 1681, Mexico, Ky. Locomotive derailed and turned over, due to front driving-wheel tires being out of gauge, contributed to by track gauge being 1 inch wide; tires measured back to back 52¼ inches, the minimum requirement being 53 inches; 1 injured.

Seven accidents; 7 injured.

INDIANA HARBOR BELT RAILROAD:

September 8, 1921, locomotive 254, Melrose Park, Ill. Ash pan connecting rod became disconnected, due to pin being lost out of front end; 1 injured.

January 30, 1922, locomotive 170, Gibson, Ind. Squirt hose blew off; hose soft and defective from continuous use of hot water; 1 injured.

Two accidents; 2 injured.

INTERNATIONAL & GREAT NORTHERN RAILWAY:

December 18, 1921, locomotive 150, Houston, Tex. Steam pipe to headlight turbine broke off at collar, due to defective material; 1 injured.

May 12, 1922, locomotive 202, near Devine, Tex. Crown-sheet failure; low water; no contributory causes found; 2 injured.

Two accidents; 3 injured.

KANSAS CITY SOUTHERN RAILWAY:

September 26, 1921, locomotive 485, Panama, Okla. Squirt hose parted at splice, due to threads in nipple at splice being worn and stripped; 1 injured.

October 23, 1921, locomotive 703, Asbury, Mo. High pressure main rod broke, due to crystallization of metal; 3 injured.

March 20, 1922, locomotive 470, Kansas City, Mo. Stud supporting grate rest and ash pan blew out, due to defective threads; 1 injured.

Three accidents; 5 injured.

LEHIGH VALLEY RAILROAD:

August 28, 1921, locomotive 413, Hickory Run, Pa. Fell from running board, due to compressor-throttle handle to which he was holding while oiling air compressor pulling off the valve because of not being securely attached; 1 injured.

*October 9, 1921, locomotive 3166, Sayre, Pa. Injured by stepping into hole in cab floor caused by broken board; 1 injured.

*December 11, 1921, locomotive 1640, Bethlehem, Pa. Defective plank in tender floor gave way when fireman stepped on it; 1 injured.

*December 30, 1921, locomotive 1616, Coplay, Pa. Engine derailed, account of tire coming off right front driving wheel; 1 injured.

*January 4, 1922, locomotive 1672, Easton, Pa. Insufficient clearance between reverse lever and train-pipe line; 1 injured.

**March 8, 1922, locomotive 1116, Hughesville, N. J. Tender brake beam dropped down on rail, account of hanger bolt working out of place, due to cotter key missing; 1 injured.

May 25, 1922, locomotive 2014, Three Bridges, N. J. Engine truck hub liner broke and flew from locomotive and struck station agent; 1 injured.

Seven accidents; 7 injured.

LONG ISLAND RAILROAD:

*February 9, 1922, locomotive 124, Long Island City, N. Y. Brake hanger broke, causing brake beam to be pushed into links and blades, which in turn threw reverse lever back in quadrant, striking fireman; 1 injured.

One accident; 1 injured.

LOUISVILLE & NASHVILLE RAILROAD:

July 6, 1921, locomotive 1005, Sayre, Ala. Shaker bar became disconnected, due to pin coming out of connecting rod; 1 injured.

July 23, 1921, locomotive 960, Carmi, Ill. Outside injector line check spanner nut blew off while attempting to tighten with injector working; threads on casing and nut stripped, due to being old and badly worn; 1 injured.

July 31, 1921, locomotive 1373, near Delrose, Tenn. Main rod broke, due to old crack in rod; 1 injured.

October 22, 1921, locomotive 1212, Mobile, Ala. Handrail gave way, causing brakeman to fall, due to handrail column coming loose from smoke-box front, account of bolt head burning off; 1 injured.

October 26, 1921, locomotive 218, near Coopers, Ala. Reverse lever became unlatched and flew forward, due to worn latch and quadrant; 1 injured.

November 11, 1921, locomotive 604, New Orleans, La. Shaker rod became disconnected while fireman was shaking grates, due to cotter key working out of connecting pin; 1 injured.

November 13, 1921, locomotive 864, Pigeon, Ala. Pin missing from top of wedge, which allowed wedge to work up, raising apron and causing fireman to fall off of locomotive; 1 injured.

**November 18, 1921, locomotive 1133, Humbolt, Tenn. Lubricator steam pipe blew out of collar at turret connection, due to defective brazing; 1 injured.

**November 19, 1921, locomotive 1289, Calera, Ala. Insufficient clearance between handle of reverse lever and bell-ringer air valve; reverse-lever latch spring missing and bolt from connecting link missing; 1 injured.

January 25, 1922, locomotive 849, Covington, Ky. Reflex type water glass broke; 1 injured.

February 17, 1922, locomotive 1253, Bowling Green, Ky. Handrail column missing at jointed section of handrail, causing fireman to fall to ground; 1 injured.

February 22, 1922, locomotive 2105, Louisville, Ky. Slipped on cab apron, which had worn smooth; 1 injured.

March 4, 1922, locomotive 1202, Welka, Ala. Crown sheet failure, due to low water; no contributory causes found; 2 injured.

**March 14, 1922, locomotive 763, Hurricane, Ala. Counterbalance-spring bolt broke, causing reverse lever to drop down suddenly; 1 injured.

**March 21, 1922, locomotive 1256, Verona, Ky. Lugs on grate bars fouled the wings of ash pan, account of ash pan being warped; 1 injured.

**April 14, 1922, locomotive 1267, Cynthiana, Ky. Injured while reversing engine, account of reach rod fouling the sprinkler pipe and drainpipe to gauge-cock dripper; radius-rod hanger twisted and radius rod cramped in link; 1 injured.

**April 15, 1922, locomotive 1267, Boyd, Ky. Injured while reversing engine, account of reach rod fouling the sprinkler pipe and drainpipe to gauge-cock dripper; radius-rod hanger twisted and radius rod cramped in link; 1 injured.

**April 29, 1922, locomotive 1312, Campbellsburg, Ky. Squirt hose burst; hose worn and defective; 1 injured.

*May 16, 1922, locomotive 1146, Domino, Ky. Water cooler jarred from its position on tender, due to not being properly secured; 1 injured.

May 19, 1922, locomotive 1002, Mitchellville, Ky. Spring hanger broke, due to old fracture; 1 injured.

June 4, 1922, locomotive 1175, Norton, Va. Bonnet on air compressor steam valve blew out, due to loose fit; 1 injured.

*June 23, 1922, locomotive 1240, Nebo, Ky. Spring hanger broke; 1 injured.

June 26, 1922, locomotive 1279, near Elliston, Ky. Insufficient clearance between grate-shaker lever and fire door; 1 injured.

Twenty-three accidents; 24 injured.

MICHIGAN CENTRAL RAILROAD:

October 29, 1921, locomotive 7934, Jackson, Mich. Back end of quadrant loose and latch badly worn; no secure footing afforded to brace oneself while operating reverse lever; 1 injured.

November 28, 1921, locomotive 7737, Jackson, Mich. Spanner nut on injector delivery pipe broke while being tightened with chisel; 2 injured.

Two accidents; 3 injured.

MIDLAND VALLEY RAILROAD:

* July 24, 1921, locomotive 7, Warner, Okla. Angle iron from edge of running board came loose, account of bolt holes rotting through running board; 1 injured.

June 1, 1922, locomotive 70, Porum, Okla. Flue broke at defective safe-end weld; 1 injured.

Two accidents; 2 injured.

MINNEAPOLIS & ST. LOUIS RAILROAD:

** October 3, 1921, locomotive 400, Winthrop, Minn. Water glass burst; cut by flying glass; 1 injured.

* January 23, 1922, locomotive 477, Emmons, Minn. Key lost out of coupler on rear of tender; 1 injured.

Two accidents; 2 injured.

MISSOURI & NORTH ARKANSAS RAILROAD:

** July 9, 1921, locomotive 9, Harrison, Ark. Washout plug blew out, due to being improperly applied and tightened; 2 injured.

One accident; 2 injured.

MISSOURI, KANSAS & TEXAS LINES:

* July 1, 1921, locomotive 498, Paola, Kans. Slipped and fell from footboard, which was slippery, due to water leaking from tank; 1 injured.

July 3, 1921, locomotive 481, near Whitney, Tex. Crown-sheet failure; low water; no contributory causes found; 2 killed.

July 15, 1921, locomotive 285, Arcadia, Okla. Blower-valve bonnet blew out, due to being improperly applied; 1 injured.

July 28, 1921, locomotive 847, Kimball, Kans. Shaker bar slipped off post, due to improper fit; 1 injured.

September 4, 1921, locomotive 865, Smithville, Tex. Water glass burst; cut by flying glass; wire-mesh shield used; 1 injured.

** September 21, 1921, locomotive 504 (place not given). Board in deck floor gave way under weight of engineer, due to being decayed; 1 injured.

October 18, 1921, locomotive 174, Bellmead, Tex. Lubricator glass burst; shield of insufficient strength to prevent glass from flying; 1 injured.

** October 25, 1921, locomotive 860, Reams, Okla. Engine broke away from train account of defective lock key in drawbar on rear of tender; 1 injured.

** November 16, 1921, locomotive 733, Beagle, Kans. Insufficient clearance between reverse lever and water-column drain cock; 1 injured.

January 30, 1922, locomotive 537, Dublin, Tex. Blow-off cock would not close account of foreign matter lodged under seat; 1 injured.

* June 27, 1922, locomotive 879, Roanoke, Tex. Blow-off cock operating lever became disconnected; 1 injured.

Eleven accidents; 2 killed, 10 injured.

MISSOURI PACIFIC RAILWAY:

July 29, 1921, locomotive 67, Russellville, Ark. Squirt hose burst where badly worn; 1 injured.

July 31, 1921, locomotive 1201, Midian, Kans. Top half of automatic fire door was broken and missing; locomotive back-fired while being operated in this condition, burning fireman badly; 1 injured.

** August 11, 1921, locomotive 2607, Batesville, Ark. Tender deck uneven, due to end sill being worn away and tilted, causing fireman's foot to be caught between cab apron and tender frame; 1 injured.

**September 10, 1921, locomotive 1240, near Lenapah, Okla. Injured while attempting to close Oakadee ash pan blow-out valve; nut lost off blow-out valve stem allowing handle to come off; 1 injured.

*September 16, 1921, locomotive 1227, Kansas City, Mo. Squirt hose blew off; 1 injured.

October 20, 1921, locomotive 78, near Oak Mills, Kans. Draw bar pin worked up and out of drawbar, allowing engine and tender to separate. Drawbar pin was too short; pin had tapered beginning above bottom pinhole and no means provided for securing it in place; 1 injured.

**October 25, 1921, locomotive 480, Monroe La. Squirt hose blew off; insecurely applied; 1 injured.

*October 29, 1921, locomotive 527, Bush, Ill. Water glass burst; cut by flying glass; 1 injured.

*October 30, 1921, locomotive 1802, Cherry Valley, Ark. Main rod broke; 1 injured.

November 3, 1921, locomotive 9456, Kansas City, Mo. Cap on end of blow-off cock discharge pipe blew off; threads badly worn; 1 injured.

*November 29, 1921, locomotive 429, Benton, Ark. Right front driving spring broke; 1 injured.

December 9, 1921, locomotive 453, Atchison, Kans. Gauge cock body broke in threaded section at bonnet end due to defective material; 1 injured.

December 9, 1921, locomotive 8732, Gorham, Ill. Blow-off cock lever inoperative, requiring employee to get under locomotive and use hammer to open, and discharge pipe not securely connected to cock; 1 injured.

**December 27, 1921, locomotive 1234, Jefferson City, Mo. Scalded due to leaky blow-off cock permitting water to accumulate in discharge pipe which was applied so as to form a trap; 1 injured.

*January 6, 1922, locomotive 32, Yale, Kans. Drawbar pin broke, due to crystallization, permitting fireman to fall between locomotive and tender; cab apron too short for safety; 1 injured.

*April 29, 1922, locomotive 1416, Comiskey, Kans. Blow-off cock rigging became disconnected; 1 injured.

June 12, 1922, locomotive 5207, near Modoc, Ill. Crown-sheet failure due to low water; gauge cocks screwed directly into back boilerhead; appurtenances damaged to such extent that their previous condition could not be determined; initial rupture occurred in autogenously welded crown-sheet combustion chamber seam; 2 killed.

**June 18, 1922, locomotive 2369, Guion, Ark. Injured while attempting to open dump grate, due to fulcrum lever being too large for shaker bar and improperly located; 1 injured.

*June 21, 1922, locomotive 2321, El Dorado, Ark. Insufficient clearance between reverse lever and injector handle; 1 injured.

Nineteen accidents; 2 killed, 18 injured.

MOBILE & OHIO RAILROAD:

July 25, 1921, locomotive 20, Corinth, Miss. Squirt hose blew off, due to being insecurely clamped; nipple pointed out in the cab; 1 injured.

July 26, 1921, locomotive 319, Wheelers, Miss. Pilot sill step bracket broke off through bolt hole; one side had been broken off for some time and other showed old break of more than half the area; 1 injured.

*December 18, 1921, locomotive 380, Chunchula, Ala. Engine step broke; 1 injured.

March 15, 1922, locomotive 357, Egypt, Miss. Crown-sheet failure, due to low water; lowest reading of water glass and lowest gauge cock only 2¼ inches above highest point of crown sheet; autogenously welded seam of patch at front of crown sheet failed for approximately 12 inches. Right side sheet seam, which had originally been riveted and had been converted by cutting through the line of rivet holes and plates made flush and filled in by the autogenous process, failed for about 60 inches. Crown sheet badly pitted and corroded around radial stays and nine radial stays broken. Boiler was torn from frame and thrown 130 feet from point of accident; 1 killed, 3 injured.

May 16, 1922, locomotive 384, Prairie, Miss. Main crank pin broke; 1 injured.

Five accidents; 1 killed, 7 injured.

NASHVILLE, CHATTANOOGA & ST. LOUIS RAILWAY:

November 2, 1921, locomotive 250, Hickman, Ky. Drain cock screwed out of lubricator while attempting to open valve; cock insecurely applied; 1 injured.

One accident; 1 injured.

NEW YORK CENTRAL LINES—EAST.

July 7, 1921, locomotive 965, Wellsboro Junction, Pa. Injector steam pipe spanner nut broke, due to having been damaged by the use of hammer and set in tightening; 1 injured.

August 3, 1921, locomotive 3037, Spencerport, N. Y. Crown-sheet failure; low water; no contributory causes found; 3 injured.

*August 13, 1921, locomotive 2101, Albany, N. Y. Eccentric rod strap broke, causing reverse lever to fly back and forth; 1 injured.

*November 2, 1921, locomotive 3691, Tribes Hill, N. Y. Train parted, due to coupler on car slipping over coupler on tender; 2 injured.

November 10, 1921, locomotive 3431, Syracuse, N. Y. Water glass burst; cut by flying glass; one of the glass guards in the shield was not in place; 1 injured.

November 17, 1921, locomotive 3557, Colonie, N. Y. Whistle lever broke through fulcrum pin hole; burned while attempting to make repairs; 1 injured.

*November 28, 1921, locomotive 2808, Granton, N. Y. Reverse lever flew out of quadrant; insufficient clearance between reverse lever and boiler head; 1 injured.

May 25, 1922, locomotive 832, North White Plains, N. Y. Air compressor throttle bonnet flew off; threads on body of valve practically destroyed, due to bonnet having been applied with threads crossed; 1 injured.

June 6, 1922, locomotive 3095, Chelsea, N. Y. Reverse lever flew forward catching fireman's hand between lever and blower pipe; teeth of quadrant filled with dirt, preventing lever from being latched; 1 injured.

Nine accidents; 12 injured.

NEW YORK CENTRAL LINES—WEST:

*November 1, 1921, locomotive 3741, Marcy, Ohio. Engine parted from train, due to coupler on tender being 3 inches lower than coupler on car; 1 injured.

February 16, 1922, locomotive 5898, Collinwood, Ohio. Arch tube plate stud blew out while being tightened under pressure; defective threads on stud and in sheet; 2 injured.

March 7, 1922, locomotive 857, Indiana Harbor, Ind. Stop pin missing from reverse lever quadrant, permitting engineer's hand to be caught between lever and gauge cock drip pipe; 1 injured.

March 16, 1922, locomotive 5670, Kankakee, Ill. Spanner nut on boiler check valve broke while attempting to seat check valve, which was stuck open, by pounding; 1 injured.

June 28, 1922, locomotive 856, near Schneider, Ind. Main crank pin loose in fit account of cracked wheel center, causing engine to be out of quarter and

reverse herself when reverse lever latch was disengaged from quadrant; 1 injured.

Fourteen accidents; 18 injured.

NEW YORK, CHICAGO & ST. LOUIS RAILROAD:

July 13, 1921, locomotive 418, McComb, Ohio. Reverse lever flew forward suddenly, due to collar and nut missing off right valve rod pin; 1 injured.

August 12, 1921, locomotive 468, Colby, Ohio. Discharge from blow-off cock struck air pipe under cab and was deflected, causing fireman to be badly scalded while blowing out boiler; 1 injured.

September 30, 1921, locomotive 440, Chicago, Ill. Water glass gasket leaking, steamed up glass panels in shield; when hostler raised shield in order to read the water glass, water glass burst and particles of glass entered both eyes; 1 injured.

October 5, 1921, locomotive 447, near Fort Wayne, Ind. Squirt hose burst; hose badly worn account of rubbing on apron; 1 injured.

November 26, 1921, locomotive 348, Chicago, Ill. Washout cap blew off; cap defective; attempted to tighten under pressure; 1 injured.

March 8, 1922, locomotive 471, Van Loon, Ind. Reverse lever unlatched and flew forward, due to broken spring in latch; 1 injured.

June 12, 1922, locomotive 414, between Sheffield and Avon, Ohio. Reverse lever became unlatched and flew forward, catching engineer's foot between lever and boiler head, due to quadrant being worn and latch spring weak; 1 injured.

Seven accidents; 7 injured.

NEW YORK, NEW HAVEN & HARTFORD RAILROAD:

July 16, 1921, locomotive 463, Newport, R. I. Stop pin or block missing from quadrant allowed reverse lever to move forward and strike sand valve, injuring engineer's hand; 1 injured.

**July 28, 1921, locomotive 337, Maybrook, N. Y. Injured, due to squirt-hose valve leaking, account of seat having been badly mutilated; 1 injured.

August 12, 1921, locomotive 3020, Cedar Hill, Conn. Washout plug blew out while attempting to tighten under pressure; plug applied cross-threaded and threads defective; 3 injured.

August 19, 1921, locomotive 3405, Cedar Hill, Conn. Throttle packing and gland blew out, due to throttle-gland studs not being screwed in far enough; 1 injured.

September 22, 1921, locomotive 1308, Taunton, Mass. Cap on ash pan reverting valve lost off or removed, permitting hot water and steam to escape; 1 injured.

September 26, 1921, locomotive 2377, Mansfield, Mass. Petticoat pipe became disconnected at bottom, due to bolts missing, causing back draft; 1 injured.

September 26, 1921, locomotive 3001, Midway, Conn. Derailment, due to parts of brake equipment on front tender truck becoming disengaged or broken and dropping down, catching the point of switch and throwing it; 1 killed.

**November 9, 1921, locomotive 264, Blackstone, Mass. Flue broke at weld; 1 injured.

November 11, 1921, locomotive 261, Washington, R. I. Fulcrum bolt lost out of grate-shaker lever; 1 injured.

November 18, 1921, locomotive 539, Abbington, Mass. Air-pump steam pipe broke off at valve at steam turret; 3 injured.

November 26, 1921, locomotive 1358, Central Falls, R. I. Flue broke at weld; automatic fire door would not close due to operating lever catching on hand-lever latch; 2 injured.

December 23, 1921, locomotive 1274, Campello, Mass. Lubricator-valve bonnet blew out while opening valve, due to not being properly tightened; 1 injured.

December 24, 1921, locomotive 393, Relyeas, N. Y. Arch tube burst, due to pitting and wasting away of material; 1 injured.

February 2, 1922, locomotive 376, Parkville, Conn. Pressure strip in left valve broke, causing the reverse lever to fly back and catch engineer's arm between lever and back of cab; 1 injured.

February 9, 1922, locomotive 500, Needham Heights, Mass. Blower pipe fell over causing back draft, due to pipe and coupling being corroded and worn; 1 injured.

February 18, 1922, locomotive 841, Campello, Mass. Shaker bar slipped off fulcrum lever; bar worn and improper fit; 1 injured.

March 1, 1922, locomotive 1598, Hanover, Mass. Drain cock on lubricator broke off; 1 injured.

March 16, 1922, locomotive 3221, Shelton, Conn. Shaker bar slipped off lever, due to improper fit; 1 injured.

March 27, 1922, locomotive 1543, Boston, Mass. Left back driving-spring hanger broke due to old fracture; 1 injured.

May 26, 1922, locomotive 1578, Cos Cob, Conn. Flue broke at defective safe-end weld; 1 injured.

Twenty accidents; 1 killed, 24 injured.

NORFOLK & WESTERN RAILWAY:

July 13, 1921, locomotive 323, White Top, Va. Washout plug was knocked out of side of boiler, due to weak driving spring, permitting plug to come in contact with driving wheel; 1 injured.

July 22, 1921, locomotive 1328, Glen Hayes, W. Va. Radius bar on Baker valve gear broke, due to defective steel casting; 1 injured.

August 1, 1921, locomotive 1441, Kermit, W. Va. Shaker bar slipped off lever; shaker-bar handle bent in at socket causing improper fit; 1 injured.

August 1, 1921, locomotive 1048, Shenandoah, Va. Handle to outside throttle to air pump pulled off while engineer was passing around air pump, causing him to fall from running board to ground, due to handle being insecurely applied; 1 injured.

**August 4, 1921, locomotive 379, Shenandoah, Va. Coal board broke, due to old defect; 1 injured.

November 27, 1921, locomotive 1130, Loch Laird, Va. Insufficient clearance between independent brake valve and handhold on end of reverse lever; 1 injured.

December 17, 1921, locomotive 1488, Williamson, W. Va. Washout-plug bushing blew out of back head, due to hole in sheet being practically without threads. The hole had never been tapped with full threads; 1 killed, 4 injured.

**December 31, 1921, locomotive 411, Shenandoah Junction, W. Va. Flue broke off at butt weld; flue broken through weld about three-fourths of its circumference and leaking for some time prior to failure; 1 injured.

February 13, 1922, locomotive 466, Coeburn, Va. Injector delivery pipe pulled away from injector due to spanner nut being too large and threads stripped; nut mutilated by tightening with chisel; 1 injured.

**May 5, 1922, locomotive 2046, Evergreen, Va. Flue failed at safe end due to defective weld; 1 injured.

May 13, 1922, locomotive 1404, Naugatuck, W. Va. Shaker bar slipped off staff, due to use of bar with improperly designed handle which prevented the bar from going down on staff properly; 1 injured.

Eleven accidents; 1 killed, 14 injured.

NORFOLK SOUTHERN RAILROAD:

*March 18, 1922, locomotive 218, Troy, N. C. Flue failure; 1 injured.

*April 17, 1922, locomotive 35, Bailey, N. C. Squirt hose blew off; 1 injured.

Two accidents; 2 injured.

NORTHERN PACIFIC RAILWAY:

March 7, 1922, locomotive 2097, Staples, Minn. Water glass blow-off cock stopped up with sediment which blew out while bonnet was removed, striking fireman in the eye; 1 injured.

June 6, 1922, locomotive 2147, Cable, Minn. Bolt in tumbling-shaft bearing-box broke, causing reverse lever to unlatch and fly forward, catching engineer's hand between lever and boiler back head; 1 injured.

June 14, 1922, locomotive 1508, Frost, Mont. Squirt hose burst; hose defective; 1 injured.

June 17, 1922, locomotive 1357, Van Asselt, Wash. Link saddle bolt broke, causing reverse lever to fly back and forth, catching engineer's leg between lever and air pipe; 1 injured.

Four accidents; 4 injured.

OREGON SHORT LINE RAILROAD:

June 22, 1922, locomotive 1552, Malad, Idaho. Squirt hose burst, due to having been cut by cab apron; 1 injured.

One accident; 1 injured.

OREGON-WASHINGTON R. R. & NAVIGATION CO.:

January 11, 1922, locomotive 762, Spokane, Wash. Crown-bolt broke and blew out, due to old fracture approximately two-thirds through bolt and defective threads in sheet and on bolt; 1 injured.

One accident; 1 injured.

PENNSYLVANIA SYSTEM:

July 1, 1921, locomotive 452, Blairsville Intersection, Pa. Left extension piston rod crosshead was thrown from locomotive while moving at speed of 35 miles per hour, due to stud having worked loose in the front end of piston rod; 1 injured.

July 8, 1921, locomotive 1014, Huntingdon, Pa. Cylinder cock would not close, due to accumulation of carbon; cotter pin missing from rod and throttle leaking so badly that locomotive would not stand without wheels being blocked; 1 injured.

*July 11, 1921, locomotive 7974, Bicknell, Ind. Squirt hose became disconnected at splice, due to not being properly clamped; 1 injured.

*July 14, 1921, locomotive 8656, Wheeling, W. Va. Brake rigging came down, due to bolt coming loose on brake hanger; 1 injured.

August 20, 1921, locomotive 9430, Brooklyn, Ind. Guide block broke at old and defective weld; 1 injured.

August 26, 1921, locomotive 2813, Newark, N. J. Reverse lever knocked out of quadrant caused by front end of bottom guide coming loose, dropping down, and catching ties, due to nuts on guide bolts working off; cotter keys missing from guide bolts; 1 injured.

*August 31, 1921, locomotive 7696, Allegheny, Pa. Squirt hose pulled off; hose insecurely attached; 1 injured.

*September 5, 1921, locomotive 9534, Stanwood, Mich. Right main crank pin broke, due to old fracture covering one-half cross-sectional area, and caused rods on that side to strip and one of them to swing up through the cab; 1 injured.

September 13, 1921, locomotive 8442, Scully, Pa. Hand caught between reverse lever handle and injector pipe, due to insufficient clearance; 1 injured.

*October 3, 1921, locomotive 7924, Latonia, Ky. Reverse lever jumped out of quadrant, due to lever latch being worn; 1 injured.

October 16, 1921, locomotive 4032, Odenton, Md. Struck by piece of ash-pan slide which flew from passing locomotive; trailer brake rod became disconnected, dropped down and struck ash-pan slides and rigging; 1 injured.

*October 18, 1921, locomotive 8149, Westville, Ohio. Blow-off cock operating rod became disconnected, due to bolt working loose; 1 injured.

October 20, 1921, locomotive 7216, Cleveland, Ohio. Right front sand pipe came loose at union above driving wheel and slipped down through the clamp which was loose on pipe; 1 injured.

*October 22, 1921, locomotive 2608, Elrama, Pa. Squirt hose burst; hose defective; 1 injured.

October 22, 1921, locomotive 8787, Terre Haute, Ind. Lubricator-filling plug blew out, due to plug being too small for hole; 1 injured.

October 23, 1921, locomotive 7519, Davis, Ind. Crank pin collar bolt broke, allowing collar to come off and to be thrown through cab window, striking fireman and rendering him unconscious; 1 injured.

October 29, 1921, locomotive 7552, Sharpsville, Pa. Grease cup plug blew out when fusee powder was applied in cup to cool hot main rod pin; 1 injured.

**October 29, 1921, locomotive 1967, Marietta, Pa. Derailment; left wheel of engine truck mounted switch point at crossing, due to sharp flange; engine truck out of alignment; 2 killed, 1 injured.

November 4, 1921, locomotive 2201, Trenton, N. J. Arch tube burst, due to being overheated; circulation of water in arch tube may have been restricted by a wooden block found resting on stay bolts in water space near mouth of arch tube; 1 injured.

November 7, 1921, locomotive 1580, Cly, Pa. Flue broke off 2¾ inches from safe end weld where it was found grooved as if done in scaling by machine; 1 injured.

November 9, 1921, locomotive 58, Philadelphia, Pa. Reverse lever foot brace loose and insecurely attached to cab floor, allowing brace to turn and engineer to fall while using brace for foot rest while attempting to open dynamo throttle; 1 injured.

November 17, 1921, locomotive 1452, Paint Creek Junction, Pa. Cylinder head gasket blew out; studs loose; 1 injured.

November 24, 1921, locomotive 8606, Crestline, Ohio. Injector delivery pipe burst, due to being worn thin by rubbing against backhead; 2 injured.

November 28, 1921, locomotive 2453, Latrobe, Pa. Struck by water scoop handle which flew back, due to scoop being defective; defect reported six times prior to accident; 1 injured.

December 3, 1921, locomotive 2589, South Amboy, N. J. Coal board gave way, due to bottom of guides being rusted away, causing fireman to fall; 1 injured.

December 6, 1921, locomotive 2599, Gould Mine, Pa. Back head ruptured for a distance of 24 inches at top edge of mud ring, due to being badly grooved, and six adjacent stay bolts found broken with old breaks in first row above rupture, five of which were broken at inner sheet and one at outer sheet where telltale hole had been plugged with a nail; stay bolts had not been hammer-tested, as required by the rules, because of being covered by grate bearers; 1 killed, 1 injured.

*December 8, 1921, locomotive 2446, Linden, N. J. Rocker arm shaft broke; 1 injured.

December 13, 1921, locomotive 3605, near Lilly, Pa. Flue broke off adjacent to front flue sheet where it was badly corroded; beads on both the small and superheater flues were cracked and in poor condition; 1 injured.

* December 14, 1921, locomotive 8489, Roxanna, Ohio. Shaker bar slipped off, due to improper fit; 1 injured.

December 16, 1921, locomotive 3251, Harrisburg, Pa. Studs securing plate used to blank opening in flange on dome broke, permitting steam to rapidly escape when dome casing was removed; 1 injured.

December 19, 1921, locomotive 9856, Pittsburgh, Pa. Blower pipe broke, causing back draft, due to being entirely wasted away at connection in smoke box; repairs had been attempted by autogenous welding and the metal applied blew off; 1 injured.

December 24, 1921, locomotive 2030, Trenton, N. J. Steam pipe to headlight turbine burst; 1 injured.

December 30, 1921, locomotive 8096, Cincinnati, Ohio. Nozzle blew out of fire hose, due to being insecurely applied; 1 injured.

** January 1, 1922, locomotive 7498, Hudson, Ohio. Shaker bar slipped off fulcrum lever, due to improper fit; 1 injured.

January 10, 1922, locomotive 3724, Conemaugh, Pa. Flue broke at defective safe end weld; 1 injured.

** January 27, 1922, locomotive 7487, Mingo Junction, Ohio. Squirt hose became disconnected, due to being insecurely clamped; 1 injured.

February 2, 1922, locomotive 8833, Dexter, Ill. Collar on left injector steam pipe at injector connection broke off; collar improperly brazed and old fractures in collar; 1 injured.

** February 2, 1922, locomotive 5086, North East, Md. Main rod broke; 1 injured.

February 6, 1922, locomotive 01200, Brownsville Junction, Pa. Exhaust casting and nozzle worked loose, due to being insecurely fastened, causing blower pipe to become disconnected and cause back draft; casting and nozzle studs badly worn and broken and exhaust casting improperly keyed to cylinder base; 1 injured.

February 7, 1922, locomotive 4105, Woodberry, Md. Injector steam ram bonnet blew out; threads on bonnet and in body of injector worn; 1 injured.

* February 9, 1922, locomotive 8141, Worthington, Ind. Fireman's foot became fastened in drawbar pinhole, due to cover missing; 1 injured.

** February 13, 1922, locomotive 8839, near H. O. Tower, Ind. Bolts securing coupler pocket casting to pilot beam broke, causing engine to separate from leading engine; one bolt had old fracture about 50 per cent of cross sectional area; 1 injured.

February 15, 1922, locomotive 945, Stelton, N. J. Flue burst near front flue sheet, due to flaw in material; 2 injured.

** February 15, 1922, locomotive 1651, Mill Creek, Pa. Wire used to secure back ventilator door on cab of engine broke allowing door to drop and strike fireman; 1 injured.

** February 20, 1922, locomotive 436, Altoona, Pa. Seat box tore loose, causing fireman to fall; 1 injured.

February 24, 1922, locomotive 7273, East Columbus, Ohio. Flue burst, due to corrosion and pitting; 1 injured.

February 27, 1922, locomotive 1443, Union Furnace, Pa. Flue broke at defective safe end weld; 1 injured.

March 2, 1922, locomotive 3751, Washington, D. C. Shaker bar slipped off post, due to improper fit; 1 injured.

March 11, 1922, locomotive 5184, Baltimore, Md. Engine moved off while engineer was underneath making needed repairs; dry pipe or throttle leaking and throttle lever latch broken and spring missing; throttle reported defective on February 10, 15, 27, and March 4, 6, 7, 8, and 9; 1 killed.

*March 15, 1922, locomotive 2430, Philadelphia, Pa. While locomotives 2430 and 3366 were double-heading, bolts securing coupler pocket to pilot beam of locomotive 2430 broke, causing locomotives to separate; 1 injured.

March 17, 1922, locomotive 8287, Conway, Pa. Stay bolt blew out in fire box; stay bolt broken and no threads on it or in sheet; telltale hole had been riveted over for some time previous to acident; 1 injured.

April 8, 1922, locomotive 3732, Lawrence, N. J. Oil pipe broke off at nipple connection to lubricator; pipe badly mutilated; 1 injured.

*April 8, 1922, locomotive 2609, Blairsville, Pa. Knuckle pin on rear of tender broke; 1 injured.

April 11, 1922, locomotive 7622, Linesville, Pa. Squirt hose burst; 1 injured.

April 14, 1922, locomotive 8416, Roseville, Ohio. Pressure strips in left valve broke, causing reverse lever to fly back and catch engineer's arm between lever and back of cab, when changing cut-off; 1 injured.

April 17, 1922, locomotive 3122, Sunbury, Pa. Top of washout cap broke entirely off from the threaded flange, due to old flaw covering approximately 50 per cent of the cross-sectional area of flange; 1 injured.

April 18, 1922, locomotive 2439, Harrisburg, Pa. Washout cap blew off while being tightened under pressure; threads on flange crossed and stripped; 2 injured.

May 2, 1922, locomotive 8110, Conesville, Ohio. Signal bracket pulled off, due to nut working off of bolt which secures bracket to pilot beam; 1 injured.

May 4, 1922, locomotive 3445, Lilly, Pa. Flue failed at safe end weld; defective weld; 1 injured.

May 4, 1922, locomotive 2152, Verona, Pa. Washout cap blew off while boiler was under hydrostatic pressure; threads on flange badly worn and crossed, due to cap fitting so loosely; 1 injured.

*May 17, 1922, locomotive 8419, Miller, Ohio. Engines separated, due to knuckle breaking in front coupler of engine 8419; 1 injured.

**May 23, 1922, locomotive 3282, Glenloch, Pa. Brake hanger bolt dropped out, due to cotter key shearing off, allowing brake rigging on tender to drop down; 1 injured.

June 7, 1922, locomotive 1387, Brillhart, Pa. Bolt lost out of left end of brake head tie rod on front brake beam of engine truck, allowing rod to fall and cause something to be thrown on the rail, causing engine and train to derail; 1 killed, 15 injured.

June 8, 1922, locomotive 3492, near Holland, N. J. Flexible stay bolt blew out of flue sheet, due to bolt being broken and threads on bolt and in sheet wasted away; adjacent flexible bolt was also found broken at time of investigation of this accident; 3 injured.

June 14, 1922, locomotive 3745, Philadelphia, Pa. Portion of flange on main rod brass broke off, due to old flaw and flew from passing locomotive, striking employee who was repairing track; 1 injured.

**June 18, 1922, locomotive 5113, Philadelphia, Pa. Scalded by hot water coming from defective squirt hose; 1 injured.

June 19, 1922, locomotive 7082, near Massillon, Ohio. Injector broke on account of badly cut tubes; steam nozzle loose in body and warning pipe being out of line with drip pan caused steam to blow on engineer's ankle; injector reported defective on June 2, 4, 6, 7, 9, 11, 12, 14, and 16; 1 injured.

June 29, 1922, locomotive 1212, Renovo, Pa. Back stop of footboard broke, causing switchman to fall; 1 injured.

June 30, 1922, locomotive 7427, Houston Junction, Pa. Flue failed at defective safe end weld; overheated in welding; 1 injured.

Sixty-nine acidents; 5 killed, 87 injured.

PERE MARQUETTE RAILWAY:

October 26, 1921, locomotive 418, Detroit, Mich. Spring band on front driving spring broke, allowing front end of engine to come down so that footboard caught on rail, throwing employee under the moving locomotive; 1 killed.

One accident, 1 killed.

PHILADELPHIA & READING RAILWAY:

**July 2, 1921, locomotive 1582, Muncy, Pa. Grate-shaker wrench slipped off, due to striking on step casting, causing fireman to fall from gangway; "coal-saver apron" not roughened and lower safety chain at left side of gangway not coupled, due to coupling bracket missing; 1 injured.

October 19, 1921, locomotive 1069, Rutherford, Pa. Handhold broke, due to old defect; 1 injured.

October 26, 1921, locomotive 1091, Mooresburg, Pa. Crown-sheet failure, due to low water; inside injector inoperative, due to valve cam being disconnected; gauge cock drip stopped up with waste; many of the appurtenances damaged by the accident to such extent their previous condition could not be determined; 2 killed, 3 injured.

November 14, 1921, locomotive 814, Reading, Pa. Air compressor throttle valve bonnet screwed out of valve body, due to not being properly tightened; 1 injured.

**December 20, 1921, locomotive 588, Fort Washington, Pa. Bolt came out of cab hood brace, permitting brace to fall and strike fireman; 1 injured.

**January 2, 1922, locomotive 343, Laurel Springs, N. J. Right front driving wheel tire broke in three pieces while engine was hauling a passenger train at speed of approximately 65 miles per hour; 1 injured.

**February 10, 1922, locomotive 1683, Gladwyn, Pa. Insufficient clearance between cab apron and coal-saver gate; 1 injured.

**April 18, 1922, locomotive 611, Quakertown, Pa. Main rod broke, due to old transverse fracture extending full width of top of rod and covering approximately 45 per cent of the cross-sectional area of rod; 1 injured.

**May 5, 1922, locomotive 692, Mahanoy City, Pa. Right front side rod broke, due to old fracture, causing rods to strip; 1 injured.

Ten accidents; 2 killed, 11 injured.

PITTSBURG & LAKE ERIE RAILROAD:

November 3, 1921, locomotive 9379, McKeesport, Pa. Flue failed, due to being pitted and corroded until too weak to withstand the boiler pressure; 1 injured.

One accident; 1 injured.

RICHMOND, FREDERICKSBURG & POTOMAC RAILROAD:

*June 8, 1922, locomotive 1, Seminary, Va. Branch pipe to distributing valve broke off at valve connection; 1 injured.

One accident; 1 injured.

RUTLAND RAILROAD:

**September 15, 1921, locomotive 73, Rutland, Vt. Leaky washout plug blew out while attempting to tighten under pressure; threads in bad condition and crossed; 1 injured.

One accident; 1 injured.

ST. LOUIS-SAN FRANCISCO RAILWAY:

**August 8, 1921, locomotive 1317, Lockwood, Mo. Shaker bar slipped off, due to improper fit; 1 injured.

**August 18, 1921, locomotive 1228, Walkers, Ark. Reverse lever came out of quadrant, due to defective latch; 1 injured.

**September 1, 1921, locomotive 49, Cuba, Mo. Injured account of elevator pawl on stoker defective and would not stay in central position; 1 injured.

September 12, 1921, locomotive 1406, near Depew, Okla. Left injector steam pipe collar pulled through the spanner nut at injector connection; collar of sleeve too small for the spanner nut used, giving insufficient holding power; 1 injured.

September 20, 1921, locomotive 747, Fort Worth, Tex. Leaky valve on squirt hose; 1 injured.

October 5, 1921, locomotive 3704, Lawton, Okla. Piece broke off board at front of tender at gangway and causde fireman to fall; 1 injured.

October 30, 1921, locomotive 28, Verona, Mo. Air hose on rear of tender burst, causing emergency application of air, causing the conductor to be thrown from caboose cupola; air hose old and rotten fabric; 1 injured.

November 22, 1921, locomotive 988, Sapulpa, Okla. Fell from running board when handrail broke; handrail had previously been broken and improperly repaired; 1 injured.

**November 27, 1921, locomotive 755, Pawnee, Okla. Link saddle pin broke off; 1 injured.

January 6, 1922, locomotive 1343, near Fulton, Kans. Nut worked off of union link pin, permitting pin to work out and link to drop down, striking ties; 1 injured.

January 7, 1922, locomotive 811, near Columbus, Kans. Left go-ahead eccentric blade broke; 1 injured.

January 20, 1922, locomotive 3684, Kansas City, Mo. Flue broke at safe end weld; overheated in welding; 1 injured.

February 20, 1922, locomotive 566, near Fay, Okla. Part of squirt-hose valve handle broken off, permitted valve to be opened accidentally; 1 injured.

**March 13, 1922, locomotive 789, Muskogee, Okla. Squirt hose burst; 1 injured.

**May 15, 1922, locomotive 1020, Wellston, Okla. Water glass burst; cut by flying glass; shield defective; 1 injured.

Fifteen accidents; 15 injured.

ST. LOUIS SOUTHWESTERN RAILWAY:

*February 10, 1922, locomotive 765, Illmo, Mo. Power reverse gear creeped, causing engine to be reversed; 1 injured.

One accident; 1 injured.

SAN ANTONIO & ARANSAS PASS RAILWAY:

September 12, 1921, locomotive 231, Skidmore, Tex. Nipples blew out of blow-off cock elbow, due to being loose and insecurely applied; 1 injured.

One accident; 1 injured.

SAVANNAH & ATLANTA RAILWAY:

December 6, 1921, locomotive 502, Camack, Ga. Headlight turbine shattered when turbine wheel burst, due to old fracture; 1 injured.

One accident; 1 injured.

SEABOARD AIR LINE RAILWAY:

July 25, 1921, locomotive 991, West Jacksonville, Fla. Bottom water glass cock spindle screwed out of cock while under pressure, due to improper design; no provision made for knowing when valve was wide open or to prevent it from being screwed entirely out; 1 injured.

August 17, 1921, locomotive 778, Live Oak, Fla. Hinge on manhole cover broke, due to bolt missing from one of the hinges, allowing manhole lid to fall off of tender and strike brakeman; 1 injured.

August 21, 1921, locomotive 626, near Townsend, Ga. Squirt hose pulled off; hose insecurely clamped; 1 injured.

November 26, 1921, locomotive 409, near Youngsville, N. C. Crown-sheet failure; low water; no contributory causes found; 3 killed.

January 28, 1922, locomotive 214, Dinwiddie, Va. Crown-sheet failure; low water; appurtenances damaged to such extent at time of accident that their previous condition could not be determined; autogenously welded seam between crown sheet of combustion chamber and fire box proper failed for a distance of 62 inches; 1 killed, 1 injured.

*March 1, 1922, locomotive 1040, Greenwood, S. C. Plug in boiler check drain valve blew out; drain cock had previously been broken off at valve stem and had been plugged with a wooden plug; 1 injured.

*March 3, 1922, locomotive 835, Starke, Fla. Side rod broke, striking reach rod and causing reverse lever to unlatch and strike engineer; 1 injured.

*March 23, 1922, locomotive 207, Alberta, Va. Derailment, due to tender-truck equalizer breaking; 9 injured.

Eight accidents; 4 killed, 15 injured.

SOUTHERN RAILWAY:

July 13, 1921, locomotive 6272, Flat Rock, Ky. Pin lost out of front end of right valve motion radius bar, causing combination lever to strike rod and throw reverse lever back out of quadrant; 1 injured.

July 20, 1921, locomotive 788, Riceville, Ind. Sides and ends of seat box spread, permitting top which was not secured to box to fall into seat box and causing injury to fireman; 1 injured.

July 26, 1921, locomotive 6675, Springville, Ala. Injured while operating reverse lever, due to weak spring which would not hold lever on quadrant; 1 injured.

*August 6, 1921, locomotive 862, Selma, N. C. Ratchet flew out of quadrant, causing reverse lever to fly back; 1 injured.

**August 15, 1921, locomotive 792, Heflin, Ala. Insufficient clearance between throttle lever and gauge cocks; 1 injured.

**September 17, 1921, locomotive 1630, Macon, Ga. Injured while operating reverse lever, due to insufficient clearance between lever and brake valve; 1 injured.

September 18, 1921, locomotive 5026, Spartansburg, S. C. Injector steam pipe pulled out of brazing collar at top end; brazing improperly done; 1 injured.

**September 25, 1921, locomotive 588, Cleveland, Tenn. Ash pan blower pipe became disconnected and blew around and struck fireman, due to bad pipe threads and missing pipe clamp; 1 injured.

September 26, 1921, locomotive 4593, Junction City, Ky. Reverse lever became uncontrollable when attempting to shift positions due to defective valve gear; valve gear reported defective on August 26, 27, 28, and 31 and September 4, 5, 18, 19, 21, 23, 24, and 25 and repairs not made; 1 injured.

September 28, 1921, locomotive 1036, Atlanta, Ga. Injured while shaking grates, due to insufficient clearance between shaker bar and oil can rest which projects out on right side 12 inches; 1 injured.

**September 29, 1921, locomotive 1587, Selma, Ala. Fire hose burst; hose defective; 1 injured.

October 2, 1921, locomotive 4582, Nemo, Tenn. Right rocker arm broke, causing reverse lever to fly back and forth; 1 injured.

October 29, 1921, locomotive 637, Ayrshire, Ind. Arch tube pulled out of door sheet; arch tube did not extend through sheet far enough to permit beading; bead had been formed of copper ferrule, which had been excessively rolled to extend it beyond the inside of the sheet for this purpose; 2 injured.

**November 14, 1921, locomotive 219, Greenlee, N. C. Main and side rods broke, causing engine to be stripped; 1 injured.

**November 20, 1921, locomotive 6499, Somerset, Ky. Injector warning pipe broke, due to being worn thin where it came through the deck; 1 injured.

November 20, 1921, locomotive 773, Corona, Ala. Arch tube blew out of back flue sheet, due to tube not extending through sheet far enough to be belled or beaded; 1 injured.

*November 21, 1921, locomotive 862, Haw River, N. C. Reverse lever flew out of quadrant; 1 injured.

November 24, 1921, locomotive 5004, Nocona, N. C. Crown-sheet failure; low water; reflex water glass deceptive due to its reflex feature not extending to lowest reading, causing a dark surface approximately one-half inch at lowest reading, indicating water when glass was empty; locomotive equipped with one water glass, which was rendered inaccurate, due to section of gasket blowing out; 2 injured.

**December 2, 1921, locomotive 7054, Chattanooga, Tenn. Insufficient clearance between reverse lever and brake valve; 1 injured.

**December 6, 1921, locomotive 1713, Alexandria, Va. Leaky union in ash pan blower pipe; joint was corroded and union nut too large for the threaded section; 1 injured.

*December 10, 1921, locomotive 6117, Ludlow, Ky. Engine parted from train due to coupler pocket of engine breaking off, causing emergency application of air; 1 injured.

December 13, 1921, locomotive 6294, Lancing, Tenn. Squirt hose valve had worn and cut seat, causing it to leak badly; 1 injured.

December 23, 1921, locomotive 6267, Lorain, Tenn. Grate shaker lever stuck, due to fulcrum pinhole being too large, permitting shaker rod pins to foul; 1 injured.

* December 23, 1921, locomotive 5018, Harrisburg, N. C. Air pipe on engine broke; 1 injured.

January 13, 1922, locomotive 6603, Birmingham, Ala. Pilot sill step bracket broke off through bottom bolt hole; 1 injured.

January 17, 1922, locomotive 759, Columbia, S. C. Engine and tender separated when center sills, to which tender drawbar casting was attached, broke, due to old fractures, causing fireman to fall; 1 injured.

** January 25, 1922, locomotive 1111, near Woodstock, Va. Waist sheet stud blew out; threads in boiler and on stud corroded almost entirely away, due to leakage, and stud originally screwed in only half the thickness of the sheet; 1 injured.

* February 1, 1922, locomotive 5232, Concord, N. C. Plank in platform on top of tender broke, causing fireman to fall; 1 injured.

March 6, 1922, locomotive 604, Montieth, Ga. Left steam pipe burst, due to old crack 8½ inches long in pipe; 1 injured.

* March 13, 1922, locomotive 776, Gainesville, Ga. Leaky throttle and steam in cylinders caused reverse lever to jerk back, catching engineer's hand between reverse lever and panel of cab; 1 injured.

March 13, 1922, locomotive 699, near Rockmart, Ga. Insufficient clearance between shaker bar and oil can drip pan; 1 injured.

** March 13, 1922, locomotive 6457, Barton, Ala. Slipped on apron and fell; engine deck was 2½ inches higher than tender deck and apron was worn smooth; 1 injured.

March 17, 1922, locomotive 1334, Doubling, Ala. Squirt hose valve came open; valve handle improperly located; 1 injured.

* March 28, 1922, locomotive 883, Braswell, Ga. Spring hanger broke; 1 injured.

April 8, 1922, locomotive 304, Williamson, Ga. Insufficient clearance between reverse lever and injector feed pipe; 1 injured.

April 10, 1922, locomotive 6468, Rockwood, Tenn. Main rod key came out, striking cylinder cock rigging and causing operating lever to strike engineer; 1 injured.

** April 24, 1922, locomotive 6978, Laurel, Miss. Insufficient clearance between end of throttle lever and gauge cocks, due to throttle lever pins being worn; 1 injured.

April 30, 1922, locomotive 4599, Pacelot, S. C. Grease cup plug blew out account of loose fit and feed hole in cup stopped up, allowing pressure to accumulate; I injured.

* April 30, 1922, locomotive 45, Bullock, N. C. Valve gear failure; 1 injured.

** May 8, 1922, locomotive 593, Collierville, Tenn. Reverse lever flew back, due to right valve being badly cut and dry; 1 injured.

May 25, 1922, locomotive 4579, Telford, Tenn. Reverse lever became unlatched and flew forward, due to broken latch spring, catching engineer's foot between lever and brake pipe; 1 injured.

May 30, 1922, locomotive 702, Fremont, Ala. Drawbar pinhole in shovel sheet being ragged and defective, caused shovel to catch and sprain fireman's wrist; 1 injured.

June 22, 1922, locomotive 6657, Pell City, Ala. Flue broke, due to defective safe end weld; 1 injured.

** June 28, 1922, locomotive 6104, Cincinnati, Ohio. Injured while operating reverse lever; cylinder cocks inoperative from the cab; 1 injured.

Forty-four accidents; 46 injured.

SOUTHERN PACIFIC—ATLANTIC SYSTEM.

* July 6, 1921, locomotive (H. & T. C.) 130, Houston, Tex. Coaches became disconnected from engine account of low coupler on engine; 1 injured.

September 28, 1921, locomotive (G. H. & S. A.) 774, near Rona, Tex. Heater cock bonnet and check blew out of left injector, due to nut holding bonnet to body of injector not being properly tightened; 1 injured.

** October 19, 1921, locomotive (M. L. & T.) 560, Ramos, La. Side rod collar broke, due to a flaw, allowing rod to come off pin; 1 injured.

December 1, 1921, locomotive (G. H. & S. A.) 65, Dallas, Tex. Blow-off pipe came out of T connection; pipe improperly applied and insecurely clamped; 1 injured.

December 8, 1921, locomotive (H. & T. C.) 240, Waxahachie, Tex. Crown-sheet failure; low water; water foaming badly; gauge cocks applied directly in back head; bottom gauge cock entered through T iron with opening directly behind brace lug; 2 injured.

May 5, 1922, locomotive (G. H. & S. A.) 955, Valentine, Tex. Squirt hose blew off, due to being insecurely attached; 1 injured.

May 22, 1922, locomotive (M. L. & T.) 33, Alexandria, La. Injured while attempting to make repairs to boiler check; 1 injured.

June 28, 1922, locomotive (G. H. & S. A.) 411, Lake Charles, La. Injector delivery pipe spanner nut blew off; spanner nut too large for fit on injector and one thirty-second inch out of round, due to having been hammered to make it fit; 1 injured.

Eight accidents; 9 injured.

SOUTHERN PACIFIC—PACIFIC SYSTEM:

* October 14, 1921, locomotive 2759, Picacho, Ariz. Finger caught between throttle and gauge cock, due to insufficient clearance between these parts; 1 injured.

* October 17, 1921, locomotive 1133, Colton, Calif. Clevis bolt dropped out, due to cotter key coming out; 1 injured.

December 17, 1921, locomotive 2369, near Yuma, Ariz. Pilot step gave way; nut on supporting bolt missing; 1 injured.

January 25, 1922, locomotive 2616, Araz Junction, Calif. Handrail on front end of smoke box gave way when columns broke, causing fireman to fall; 1 injured.

April 1, 1922, locomotive 2568, Cortaro, Ariz. Injector heater cock blew out, due to not being properly tightened after having been removed; 1 injured.

May 12, 1922, locomotive 2366, Stoval, Ariz. Injector steam pipe blew out of collar at fountain connection account of collar breaking; collar reduced at point of fracture and not properly brazed to pipe; injector bracket bolt missing; 1 injured.

** June 20, 1922, locomotive 2031, Nashville, Oreg. Blow-off cock opened when struck by eccentric; insufficient clearance between blow-off cock handle and eccentric; 1 injured.

Seven acidents; 7 injured.

TERMINAL RAILROAD ASSOCIATION OF ST. LOUIS:

** January 10, 1922, locomotive 40, St. Louis, Mo. Water glass burst, breaking side glasses in shield; 1 injured.

** January 23, 1922, locomotive 69, East St. Louis, Ill. Blower steam pipe blew off at throttle connection on account of union nut being stretched by being tightened with set tool and otherwise mutilated till it was loose fitting; 1 injured.

Two accidents; 2 injured.

TEXAS & PACIFIC RAILWAY:

August 29, 1921, locomotive 402, Iona, Tex. Pilot step bracket broke, due to old fracture; 1 injured.

November 8, 1921, locomotive 508, near Clyde, Tex. Crown-sheet failure; low water; no contributory causes found; 3 killed.

Two accidents; 3 killed, 1 injured.

TOLEDO & OHIO CENTRAL RAILWAY:

**February 18, 1922, locomotive 9740 (place not given). Engine parted from train account of low coupler; 1 injured.

One accident; 1 injured.

TRANS-MISSISSIPPI TERMINAL RAILROAD:

January 9, 1922, locomotive (T. & P.) 323, Gouldsboro, La. Insufficient clearance between reverse lever handle and brake valve; 1 injured.

One accident; 1 injured.

TRINITY & BRAZOS VALLEY RAILWAY:

*September 3, 1921, locomotive 51, Teague, Tex. Blower valve bonnet blew off; attempted to tighten under pressure; 1 injured.

*September 5, 1921, locomotive 40, Fort Worth, Tex. Squirt hose blew off; 1 injured.

*October 19, 1921, locomotive 41, Teague, Tex. Squirt hose blew off; 1 injured.

*April 28, 1922, locomotive 52, Cleburne, Tex. Main driving axle broke due to old fracture, with only a very small portion holding at the time of the accident; 1 injured.

Four accidents; 4 injured.

TRINITY VALLEY & NORTHERN RAILWAY:

December 23, 1921, locomotive (St. L. B. & M.) 34, Dayton, Tex. Crown-sheet failure; low water; locomotive dispatched with water glass missing; lowest reading of gauge cocks only 1⅜ inches above crown sheet; boiler very dirty and water foaming; rupture occurred at welded transverse seam of patch in crown sheet which failed full length; 22 of the 58 crown stays which sheet pulled away from were practically without threads on stay or in sheet; 4 injured.

One accident; 4 injured.

UNION PACIFIC SYSTEM:

*August 23, 1921, locomotive 40, Price, Kans. Fire hose burst; 1 injured.

November 3, 1921, locomotive 2481, near Knobs, Wyo. Crown-sheet failure due to low water; water glass and gauge cocks removed prior to investigation, so their previous condition could not be determined; water glass extensions into the boiler were found nearly closed with hard scale; 2 injured.

June 28, 1922, locomotive 1947, Seymore, Nebr. Journal of main driving axle broke due to old flaw extending over approximately 75 per cent of cross-sectional area; driving wheels had been dropped and new driving box brasses applied 10 days prior to accident, at which time proper inspection should have disclosed this defect; 1 injured.

Three accidents; 4 injured.

VIRGINIAN RAILWAY:

July 18, 1921, locomotive 462, Sewalls Point, Va. Piston rod broke through key fit, causing right front cylinder head to be knocked out; 1 injured.

*January 5, 1922, locomotive 501, East Gulf, W. Va. Engine parted from train, due to low coupler on rear of tender, causing emergency application of brakes; 1 injured.

*March 1, 1922, locomotive 605, Matoake, W. Va. Engine separated from train, account of low coupler on engine; 1 injured.

*March 11, 1922, locomotive 502, Micajah, W. Va. Main pin of right high pressure engine broke; 1 injured.

Four accidents; 4 injured.

WABASH RAILWAY:

**August 30, 1921, locomotive 818, St. Louis, Mo. Crank-pin collar broke off, due to flaw, permitting side rod to come loose; 1 injured.

December 9, 1921, locomotive 531, Kansas City, Mo. Drawbar and safety chains broke, permitting engine and tender to separate; old fracture at eye of drawbar and material crystallized; 1 injured.

*March 1, 1922, locomotive 818, Ferguson, Mo. Squirt hose became disconnected; 1 injured.

**March 25, 1922, locomotive 2430, Bement, Ill. Shaker bar slipped off fulcrum lever, due to improper fit; 1 injured.

*March 28, 1922, locomotive 2513, Carpenter, Ill. Engine, tank, and 19 cars were derailed, due to tire slipping on trailer truck wheel; 1 injured.

**April 8, 1922, locomotive 2402, Evansville, Mo. Shaker bar slipped off post; 1 injured.

**April 19, 1922, locomotive 2439, Lafayette, Ind. Obstruction on top of rear of tender caused fireman to fall; 1 injured.

*May 6, 1922, locomotive 664, Wolcotville, Ind. Derailment, due to defective condition of engine tender; truck brass broken and center casting not properly lubricated; 6 injured.

Eight accidents; 13 injured.

WESTERN MARYLAND RAILWAY:

July 6, 1921, locomotive 924, Hagerstown, Md. Lubricator throttle valve ell connection broke; 1 injured.

August 25, 1921, locomotive 1006, York, Pa. Brazing collar on right injector delivery-pipe union broke off, due to being improperly brazed and of too light construction; 1 injured.

Two accidents; 2 injured.

WHEELING & LAKE ERIE RAILWAY:

July 14, 1921, locomotive 8411, Dewey, Ohio. Shaker bar slipped off lever, due to improper fit; 1 injured.

*July 22, 1921, locomotive 6019, Cleveland, Ohio. Engine derailed, account of worn flange on engine truck wheel; 1 injured.

*July 29, 1921, locomotive 4151, Adena, Ohio. Engine and tender derailed, due to tender-truck side bearing broken and in contact, caused by defect in side bearing; 1 injured.

August 31, 1921, locomotive 4154, Pine Valley, Ohio. Tubular water glass burst, shattering panel in shield, allowing glass to fly and seriously cut fireman's eyeball; 1 injured.

March 5, 1922, locomotive 8005, Adena, Ohio. Locomotive parted from train, setting brakes in emergency; carrier iron on rear of tender bent downward and two bolts in carrier iron missing, with others loose; 1 injured.

April 1, 1922, locomotive 8005, Pine Valley, Ohio. Squirt hose pipe parted at coupling; threads in coupling worn and pipe not clamped; 1 injured.

Six accidents; 6 injured.

YAZOO & MISSISSIPPI VALLEY RAILROAD:

*March 12, 1922, locomotive 217, Memphis, Tenn. Engine derailed, due to tire slipping off right front driving wheel; 1 injured.

One accident; 1 injured.

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

	Parts defective, inoperative or missing, or in violation of rules.	Akron & Barberton Belt.	Akron, Canton & Youngstown.	Alabama & Vicksburg.	Alabama, Tennessee & Northern.	Aliquippa & Southern.	Ann Arbor.	Arizona Eastern.	Ashland Coal & Iron Co.	Atchison, Topeka & Santa Fe.	Atlanta & West Point.	Atlanta, Birmingham & Atlantic.	Atlantic Coast Line.	Baltimore & Ohio.	Bangor & Aroostook.	Bessemer & Lake Erie.	Birmingham Slag.	Birmingham Southern.	Boston & Albany.	Boston & Maine.	Boyne City, Gaylord & Alpena.	Brooklyn Eastern District Terminal.	Buffalo & Susquehanna.	Buffalo Creek.	Buffalo, Rochester & Pittsburgh.	Canadian Northern.	Canadian Pacific.	Carnegie Steel Co.	Carolina & Northwestern.	
1	Air compressors	1	....	2	....	....	7	....	....	3	....	1	1	46	1	....	....	....	1	....	....	....	....	....	1	4	....	....	....	1
2	Arch tubes	....	....	1	....	....	....	....	....	2	....	....	....	12	....	....	....	....	....	1	....	....	....	....	....	....	....	....	....	2
3	Ash pans or mechanism	....	....	....	....	....	....	....	....	....	....	....	....	9	....	....	....	....	2	....	....	....	....	....	....	....	....	....	....	3
4	Axles	....	....	....	....	....	....	....	....	1	....	....	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	4
5	Blow-off cocks	....	....	5	....	....	2	....	....	24	....	1	15	33	....	....	....	....	11	1	....	....	....	....	....	....	1	....	....	5
6	Boiler checks	....	2	1	....	....	6	....	....	8	....	1	8	47	....	....	....	....	3	5	....	....	....	....	1	1	....	....	....	6
7	Boiler shell	....	1	....	....	....	7	....	....	50	....	4	12	37	5	....	....	....	5	11	1	....	....	....	3	....	1	....	....	7
8	Brake equipment	2	....	16	....	....	15	1	....	94	1	20	48	227	....	....	....	....	11	11	1	....	....	....	2	....	....	....	....	8
9	Cabs or cab windows	....	....	4	....	....	....	....	....	33	....	1	19	53	....	....	....	....	4	4	3	....	....	....	3	8	4	....	....	9
10	Cab aprons or decks	1	....	3	2	....	10	5	....	36	....	2	13	67	2	....	....	....	4	5	1	....	....	....	....	3	2	1	....	10
11	Cab cards	....	....	1	1	....	3	....	....	4	....	4	5	9	2	....	....	....	13	20	1	....	....	....	2	5	3	....	....	11
12	Coupling or uncoupling devices	....	....	....	....	....	3	....	....	8	....	3	10	17	....	....	....	....	....	1	1	....	....	....	....	....	....	....	....	....	12
13	Crossheads, guides, pistons, or piston rods	2	....	8	....	....	2	....	....	44	....	14	8	72	....	....	....	....	1	9	....	....	....	....	2	2	....	....	....	13
14	Crown bolts	....	....	6	....	....	4	....	....	6	....	....	....	11	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	14
15	Cylinders, saddles, or steam chests	....	....	6	....	....	2	....	2	65	....	....	16	243	1	....	....	....	1	2	....	....	....	....	2	2	....	1	....	15
16	Cylinder cocks or rigging	....	....	....	....	....	1	....	....	14	....	2	6	55	....	....	....	....	....	2	....	....	....	....	1	....	....	....	....	16
17	Domes or dome caps	....	....	....	....	....	....	....	1	15	....	1	1	31	....	....	....	....	1	1	....	....	....	....	....	....	....	....	....	17
18	Draft gear	1	1	4	1	....	4	....	....	13	....	3	18	38	2	....	....	....	2	21	....	....	....	....	2	....	5	....	....	18
19	Draw gear	6	2	9	1	....	12	....	....	52	....	24	44	85	....	....	....	....	1	23	3	....	....	....	....	1	....	....	....	19
20	Driving boxes, shoes, wedges, pedestals, or braces	1	....	3	....	....	26	....	1	45	....	9	7	149	1	....	....	....	3	20	1	....	....	....	....	2	....	....	....	20
21	Fire-box sheets	....	....	6	....	....	6	....	....	6	....	2	3	38	3	....	....	....	2	24	....	....	....	....	1	....	....	....	....	21
22	Flues	....	....	10	....	....	4	....	....	11	....	....	4	12	2	....	....	....	3	6	....	....	....	....	....	....	1	....	....	22
23	Frames, tailpieces, or braces, locomotive	....	....	12	1	....	2	....	....	77	....	8	42	79	1	....	....	....	2	8	....	....	....	....	....	....	....	....	....	23
24	Frames, tender	....	....	....	....	....	....	....	....	8	....	1	2	24	....	....	....	....	1	2	....	....	....	....	....	....	....	....	....	24
25	Gauges or gauge fittings, air	....	....	....	....	....	1	....	....	10	....	....	5	12	1	....	....	....	3	5	1	....	....	....	....	1	....	....	....	25
26	Gauges or gauge fittings, steam	....	....	3	....	....	6	....	....	35	....	6	2	66	....	....	....	....	5	14	....	....	....	....	....	1	....	....	....	26
27	Gauge cocks	1	1	19	5	....	10	2	....	40	....	6	54	112	6	....	....	....	22	34	2	....	....	....	1	1	2	....	....	27
28	Grate shakers	....	1	1	....	....	3	....	....	6	....	1	21	8	....	....	....	....	....	10	....	....	....	....	....	....	....	....	....	28
29	Handholds	2	2	4	....	....	3	....	....	40	....	8	17	43	....	....	....	....	5	13	1	....	....	....	....	7	1	....	....	29
30	Injectors, inoperative	....	....	....	....	....	....	....	....	4	....	....	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	30
31	Injectors and connections	6	2	23	4	....	21	....	....	222	....	44	103	341	14	....	....	....	21	37	2	....	....	....	6	5	7	....	....	31
32	Inspections or tests not made as required	....	1	3	....	....	12	8	....	235	....	4	30	171	2	....	....	....	....	23	1	....	....	....	....	4	3	....	....	32
33	Lateral motion	....	....	2	....	....	5	....	....	32	....	3	7	42	5	....	....	....	5	7	....	....	....	....	....	....	....	....	....	33
34	Lights, cab or classification	....	....	1	....	....	....	....	....	2	....	11	3	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	34
35	Lights, headlights	....	....	4	....	....	3	....	....	5	....	2	4	42	....	2	....	....	....	....	....	....	....	....	3	1	....	....	....	35
36	Lubricator or shields	....	....	....	....	....	1	....	....	2	....	2	3	16	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	36
37	Mud rings	1	....	5	....	....	10	....	....	14	....	....	21	53	....	....	....	....	23	14	....	....	....	....	1	....	1	....	....	37
38	Packing nuts	2	....	20	....	....	9	....	....	43	....	27	76	69	....	....	....	....	5	6	2	....	....	....	....	....	1	....	....	38
39	Packing, piston rod and valve stem	....	....	6	....	....	9	....	....	41	....	....	6	91	....	....	....	....	1	4	....	....	....	....	....	1	....	....	....	39
40	Pilot or pilot beams	1	....	1	....	....	2	....	....	14	....	....	4	19	1	....	....	....	1	7	....	....	....	....	....	3	....	....	....	40
41	Plugs or studs	....	1	2	....	....	1	....	....	16	....	1	7	35	1	....	....	....	....	3	....	....	....	....	....	....	....	....	....	41
42	Reversing gear	....	....	1	....	....	2	....	....	20	....	1	3	9	28	2	....	....	3	7	....	....	....	....	....	....	....	....	....	42
43	Rods, main or side, crank pins or collars	2	....	18	....	....	15	....	....	92	....	1	13	24	246	4	....	....	23	83	1	....	....	....	9	1	2	....	....	43
44	Safety valves	....	....	1	....	....	....	....	....	5	....	....	....	1	27	....	....	....	....	....	....	....	....	....	....	....	....	....	....	44
45	Sanders	....	....	....	....	....	1	....	....	67	....	....	2	1	48	....	....	....	1	1	....	....	....	....	1	....	....	....	....	45
46	Springs or spring rigging	2	....	10	....	....	25	....	....	97	....	4	8	21	341	3	....	....	21	53	....	....	....	....	14	11	2	....	....	46
47	Squirt hose	....	1	3	....	....	1	....	....	18	....	....	5	2	18	1	....	....	1	3	....	....	....	....	....	....	2	....	....	47
48	Stay bolts	....	1	4	....	....	3	....	....	15	....	....	1	10	24	2	....	....	....	7	1	....	....	....	1	1	1	....	....	48
49	Stay bolts, broken	3	....	39	13	....	19	1	2	65	2	5	145	161	24	....	....	....	25	18	2	....	....	....	....	2	....	4	....	49
50	Steam pipes	2	....	1	....	....	4	2	....	24	....	9	21	72	3	....	....	....	6	8	1	....	....	....	1	....	....	....	....	50
51	Steam valves	....	....	1	....	....	3	....	....	17	....	4	21	49	1	....	....	....	7	4	....	....	....	....	1	....	....	....	....	51
52	Steps	1	....	4	1	....	9	1	....	43	....	9	17	60	1	....	....	....	1	14	....	....	....	....	1	5	3	....	....	52
53	Tanks or tank valves	1	....	4	....	....	16	1	....	62	....	....	63	164	....	....	....	....	37	22	....	....	....	....	1	2	3	....	1	53
54	Telltale holes	....	....	6	....	....	1	....	....	29	....	6	18	19	6	....	....	....	2	1	....	....	....	....	1	....	....	1	....	54
55	Throttle or throttle rigging	....	1	7	....	....	9	....	....	43	....	5	19	101	1	....	....	....	2	16	1	....	....	....	....	....	....	....	....	55
56	Trucks, engine or trailing	....	....	5	2	....	8	....	....	97	....	9	28	110	3	....	....	....	13	32	....	....	....	....	1	....	1	....	....	56
57	Trucks, tender	3	1	19	2	....	13	....	....	66	1	6	15	123	1	....	....	....	11	28	....	....	....	....	....	3	....	....	....	57
58	Valve motion	....	....	4	1	....	1	....	....	19	1	1	3	24	....	....	....	....	5	3	....	....	....	....	....	....	....	....	....	58
59	Washout plugs	....	1	13	....	....	14	....	....	81	1	3	34	75	3	....	....	....	16	8	....	....	....	....	6	1	....	....	....	59
60	Water bar or combustion flues	....	....	....	....	....	....	....	....	....	....	....	....	3	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	60
61	Water glass, fittings or shield	3	4	13	....	....	32	....	....	62	....	15	61	160	3	....	....	....	31	39	2	....	....	....	....	11	1	....	....	61
62	Wheels	2	....	16	1	....	28	1	....	76	1	5	12	96	4	4	....	....	7	9	....	....	3	....	4	4	....	....	....	62
63	Miscellaneous—Signal appliance, badge plates, brakes (hand).	....	....	....	....	....	1	....	....	10	....	....	3	14	....	....	....	....	....	1	....	....	....	....	....	2	....	....	....	63
	Number of defects	46	23	360	35	....	417	22	6	2,388	9	325	1,173	4,479	112	6	....	....	374	711	29	....	3	....	72	96	47	7	1	
	Locomotives reported	10	22	65	20	12	55	46	12	2,161	48	81	908	2,725	95	197	10	11	346	1,103	10	11	51	21	294	48	133	58	10	
	Locomotives inspected	5	20	158	13	6	93	15	14	2,312	43	152	1,655	2,317	103	76	....	....	421	1,267	9	10	17	....	130	39	22	8	18	
	Locomotives defective	5	10	96	8	....	79	8	2	377	6	85	617	1,213	36	5	....	....	179	346	9	....	3	....	16	32	13	2	1	
	Percentage inspected found defective	100	50	61	61	....	85	53	14	38	14	56	37	52	35	7	....	....	42	27	100	....	18	....	12	82	59	25	6	
	Locomotives ordered out of service	3	....	32	3	....	16	1	....	49	1	20	16	87	6	....	....	....	3	13	....	....	....	....	1	....	....	....	....	

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

	Parts defective, inoperative, or missing, or in violation of rules.	Carolina, Clinchfield & Ohio.	Central Indiana.	Central New England.	Central of Georgia.	Central New Jersey.	Central Vermont.	Charleston & Western Carolina.	Charlotte Harbor & Northern.	Chesapeake & Ohio.
1	Air compressors	1	....	....	....	2	....	3	....	13
2	Arch tubes	....	....	....	....	....	....	....	....	1
3	Ash pans or mechanism	....	....	....	....	....	....	....	....	1
4	Axles	....	....	....	....	1	....	....	....	....
5	Blow-off cocks	1	1	....	7	17	1	....	....	16
6	Boiler checks	1	....	2	1	10	....	....	....	21
7	Boiler shells	1	....	2	....	40	6	....	....	15
8	Brake equipment	8	1	....	11	40	4	2	....	48
9	Cabs or cab windows	....	....	1	....	10	....	10	....	9
10	Cab aprons or decks	1	....	1	2	4	1	....	....	8
11	Cab cards	1	....	....	....	....	1	....	....	8
12	Coupling or uncoupling devices	....	....	....	....	....	....	....	....	....
13	Crossheads, guides, pistons, or piston rods	....	....	....	3	2	1	....	....	6
14	Crown bolts	1	....	1	1	33	....	....	....	30
15	Cylinders, saddles, or steam chests	....	....	....	....	2	....	....	....	4
16	Cylinder cocks or rigging	13	1	2	3	24	....	1	....	110
17	Domes or dome caps	2	....	2	....	9	....	....	....	31
18	Draft gear	1	....	2	....	2	1	....	....	10
19	Draw gear	4	2	....	4	7	4	4	....	22
20	Driving boxes, shoes, wedges, pedestals, or braces	3	....	....	13	47	1	2	....	38
21	Fire-box sheets	19	....	....	3	36	1	....	....	60
22	Flues	....	....	1	2	34	5	....	....	28
23	Frames, tailpieces, or braces, locomotive	....	....	....	1	12	1	....	....	5
24	Frames, tender	6	1	....	2	23	....	4	....	18
25	Gauges or gauge fittings, air	1	....	....	2	12	....	....	....	9
26	Gauges or gauge fittings, steam	....	....	....	....	....	....	....	....	14
27	Gauge cocks	....	....	....	....	15	6	....	....	29
28	Grate shakers	6	....	....	1	60	8	5	....	67
29	Handholds	....	....	1	....	1	....	....	....	3
30	Injectors, inoperative	1	....	....	4	5	....	2	....	24
31	Injectors and connections	13	1	5	11	82	5	6	....	93
32	Inspections or tests not made as required	1	1	1	....	31	3	....	....	49
33	Lateral motion	....	....	1	....	35	3	....	....	5
34	Lights, cab or classification	....	....	....	....	....	....	....	....	....
35	Lights, headlights	....	....	1	....	11	3	....	....	19
36	Lubricator or shields	1	....	1	....	2	....	....	....	10
37	Mud rings	1	....	....	1	30	5	....	....	20
38	Packing nuts	12	....	2	1	16	4	....	....	29
39	Packing, piston rod and valve stem	....	2	2	1	35	....	....	....	32
40	Pilot or pilot beams	....	2	....	1	9	....	....	....	7
41	Plugs or studs	3	....	....	....	4	1	....	....	4
42	Reversing gear	3	....	....	2	5	3	....	....	....
43	Rods, main or side, crank pins, or collars	7	2	2	2	47	5	1	....	58
44	Safety valves	....	....	....	....	1	....	....	....	5
45	Sanders	....	1	1	....	5	....	1	....	6
46	Springs or spring rigging	8	1	5	10	40	12	5	....	92
47	Squirt hose	1	....	1	3	....	1	....	....	7
48	Stay bolts	3	....	....	....	4	3	....	....	6
49	Stay bolts broken	3	....	....	7	41	1	....	....	99
50	Steam pipes	6	....	....	3	11	4	....	....	27
51	Steam valves	2	....	1	1	7	3	....	....	10
52	Steps	14	3	3	7	17	5	2	....	17
53	Tanks or tank valves	4	....	4	3	29	3	4	....	36
54	Telltale holes	2	....	....	2	1	....	....	....	8
55	Throttle or throttle rigging	2	....	....	3	8	2	....	....	5
56	Trucks, engine or trailing	8	....	....	....	13	3	....	....	16
57	Trucks, tender	4	2	....	5	7	1	....	....	26
58	Valve motion	6	....	....	....	9	3	....	....	9
59	Washout plugs	1	2	....	....	25	5	....	....	52
60	Water bar or combustion flues	....	....	....	....	....	....	....	....	....
61	Water glass, fittings, or shield	2	1	7	6	58	11	1	....	41
62	Wheels	3	....	....	9	27	4	....	....	30
63	Miscellaneous—Signal appliance, badge plates, brakes (hand).	....	....	....	1	1	....	....	....	8
	Number of defects	181	24	52	139	1,054	134	53	....	1,474
	Locomotives reported	81	10	76	315	579	99	63	13	945
	Locomotives inspected	60	6	26	292	564	129	83	4	792
	Locomotives defective	45	5	13	78	310	46	31	....	396
	Percentage inspected found defective	75	83	50	26	55	36	37	....	50
	Locomotives ordered out of service	4	....	1	2	44	5	....	....	32

	Chicago & Alton.	Chicago & Eastern Illinois.	Chicago & North Western.	Chicago & Western Indiana.	Chicago, Burlington & Quincy.	Chicago Great Western.	Chicago, Indianapolis & Louisville.	Chicago Junction.	Chicago, Milwaukee & Gary.	Chicago, Milwaukee & St. Paul.	Chicago, Peoria & St. Louis.	Chicago, Rock Island & Pacific.	Chicago, St. Paul, Minneapolis & Omaha.	Chicago Short Line.	Chicago, Terre Haute & Southeastern.	Chicago, West Pullman & Southern.	Cincinnati, Indianapolis & Western.	Cleveland, Cincinnati, Chicago & St. Louis.	Colorado & Southern.	
1	5	1	100	4	42	13	6	2	....	95	1	25	21	....	1	....	1	9	2	1
2	....	....	6	....	....	....	....	....	....	1	....	12	....	....	....	....	....	2	....	2
3	1	....	10	....	8	6	1	....	....	4	....	17	....	....	1	....	....	....	1	3
4	....	....	....	....	1	....	....	....	....	....	1	....	....	....	....	....	....	....	....	4
5	9	2	79	....	9	....	5	2	....	8	3	51	19	....	....	1	1	19	4	5
6	8	6	16	1	12	2	3	2	....	4	1	27	9	....	....	....	2	22	11	6
7	32	1	33	4	16	....	5	....	....	22	11	42	6	....	2	....	2	14	3	7
8	35	11	336	3	89	9	14	....	....	104	28	230	31	....	2	....	9	35	42	8
9	7	3	45	2	37	10	3	....	....	42	2	39	15	....	4	....	1	10	22	9
10	8	4	68	5	12	7	4	....	....	14	3	25	12	....	2	....	7	8	....	10
11	1	2	28	2	20	2	....	....	....	9	....	4	6	....	....	....	....	1	....	11
12	1	....	36	4	4	....	1	....	....	4	....	11	....	....	1	....	1	11	7	12
13	11	2	80	3	130	7	6	....	1	23	10	101	4	....	1	....	1	7	15	13
14	9	2	5	5	3	3	3	....	4	3	3	16	1	....	2	....	2	8	....	14
15	45	12	181	6	147	19	8	2	....	27	16	143	34	....	2	....	2	22	30	15
16	26	9	97	3	82	16	2	....	....	17	4	37	30	....	2	....	3	10	10	16
17	....	1	15	2	10	1	1	....	....	4	....	3	3	....	....	....	....	1	2	17
18	4	10	54	6	42	3	11	....	1	9	13	70	16	....	1	....	3	32	14	18
19	12	13	146	5	83	19	14	1	1	23	13	148	33	....	4	....	3	44	14	19
20	40	17	169	3	143	11	14	3	....	19	26	96	16	....	....	....	4	40	8	20
21	13	10	42	12	15	....	6	....	1	14	17	21	12	....	1	....	5	15	4	21
22	10	5	10	4	5	....	2	....	1	5	4	11	5	....	....	....	1	2	....	22
23	10	3	55	2	96	2	1	....	....	15	16	208	7	....	1	....	3	16	12	23
24	2	....	20	1	13	....	4	....	2	7	6	8	1	....	....	....	....	7	1	24
25	5	....	9	....	23	1	6	....	....	2	....	21	5	....	1	....	1	7	....	25
26	10	1	64	....	52	3	5	....	....	22	7	85	23	....	3	....	2	24	10	26
27	16	11	175	6	90	6	9	3	....	33	4	94	35	....	4	....	7	17	8	27
28	7	1	17	4	13	5	2	....	1	6	....	34	1	....	2	....	....	....	....	28
29	6	4	64	5	48	15	21	....	....	10	4	38	6	....	4	....	6	13	6	29
30	1	....	3	....	2	....	1	....	....	2	....	5	....	....	....	....	....	....	....	30
31	40	21	244	9	200	22	27	10	2	62	38	498	81	....	16	....	20	105	62	31
32	82	43	145	3	118	11	32	....	....	53	22	96	13	....	7	....	12	51	13	32
33	6	3	53	....	24	3	4	....	....	7	24	32	24	....	2	....	....	4	14	33
34	....	....	1	....	4	5	....	....	....	1	....	2	....	....	....	....	....	....	....	34
35	12	....	61	4	11	2	10	....	....	10	4	17	5	....	1	....	3	4	7	35
36	3	1	5	....	41	1	4	....	....	4	1	6	2	....	2	....	3	11	1	36
37	12	8	43	9	13	....	4	....	....	6	10	59	12	....	1	3	2	30	6	37
38	24	17	106	10	69	4	5	12	1	14	4	92	34	2	....	....	5	29	21	38
39	16	12	214	2	81	17	5	....	1	27	9	63	28	....	....	....	1	9	16	39
40	3	1	56	2	12	....	2	....	....	14	5	28	5	....	1	....	....	12	38	40
41	2	....	31	1	6	2	....	....	....	3	3	16	12	....	....	....	....	8	5	41
42	1	3	81	2	30	3	....	....	....	21	4	39	28	....	....	....	1	5	3	42
43	27	12	199	15	173	5	12	....	2	34	14	154	29	....	....	....	10	39	10	43
44	....	....	10	....	3	....	1	....	....	3	....	3	1	....	....	....	....	1	1	44
45	8	4	77	3	57	1	3	....	....	17	....	95	12	....	....	....	3	21	29	45
46	55	14	232	8	110	22	11	....	....	78	54	336	42	....	2	....	7	47	40	46
47	10	3	61	1	31	1	3	....	....	10	2	52	25	....	3	....	4	4	10	47
48	18	7	24	3	15	6	....	....	....	11	4	25	12	....	....	....	2	4	2	48
49	22	5	79	....	63	14	28	....	....	36	28	67	106	....	....	....	....	47	82	49
50	6	3	41	....	38	2	10	1	....	10	2	61	14	....	1	....	3	15	13	50
51	3	3	35	3	16	....	9	1	1	5	2	22	2	....	....	....	....	13	4	51
52	4	2	121	3	53	3	6	1	1	83	5	36	27	....	1	....	6	22	67	52
53	8	19	80	2	64	9	6	....	....	24	20	108	19	....	....	....	7	35	25	53
54	1	....	7	2	16	4	6	....	....	5	2	18	20	....	....	....	....	3	1	54
55	6	5	75	5	27	12	2	2	1	26	6	66	8	....	4	....	5	20	9	55
56	35	5	172	4	85	10	9	....	....	26	7	156	10	....	5	....	1	16	3	56
57	16	9	91	3	112	11	6	....	....	42	25	110	5	....	....	....	4	25	5	57
58	4	3	36	....	44	3	2	....	....	8	1	47	2	....	1	....	....	2	3	58
59	24	3	40	10	41	11	11	....	1	18	5	186	14	....	1	2	4	54	30	59
60	....	....	1	....	....	....	....	....	....	3	....	....	1	....	....	....	....	....	....	60
61	18	3	91	12	62	10	12	4	....	32	1	117	50	1	2	....	4	47	15	61
62	16	5	86	....	63	8	16	4	2	13	28	52	17	....	4	....	5	23	13	62
63	2	....	19	....	6	....	3	....	....	6	1	22	....	....	3	....	....	2	....	63
	818	345	4,580	208	2,938	362	407	50	24	1,260	524	1,305	1,011	3	98	6	179	1,104	774	
	341	348	2,064	106	1,915	272	153	87	15	1,944	51	1,632	403	12	70	11	57	942	184	
	389	208	2,255	87	1,807	332	141	46	17	1,721	70	2,131	615	4	60	13	57	793	195	
	243	95	1,185	52	914	140	77	20	9	521	64	1,222	370	1	33	4	28	385	96	
	62	45	52	60	51	42	55	44	53	30	91	57	60	25	55	31	49	49	49	
	35	11	129	4	95	10	15	....	1	11	32	106	26	....	3	....	9	32	21	

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

	Parts defective, inoperative, or missing, or in violation of rules.	Colorado & Wyoming.	Colorado Springs & Cripple Creek District.	Columbus & Greenville.	Copper Range.	Copper River & Northwestern.	Cornwall.	Cumberland & Pennsylvania.	Dayton, Toledo & Chicago.	Delaware & Hudson.	Delaware, Lackawanna & Western.	Denver & Rio Grand Western.	Denver & Salt Lake.	Detroit & Mackinac.	Detroit & Toledo Shore Line.	Detroit, Bay City & Western.	Detroit Terminal.	Detroit, Toledo & Ironton.	Donora Southern.	Duluth & Iron Range.	Duluth, Missabe & Northern.	Duluth, South Shore & Atlantic.	East Broad Top R. R. & Coal Co.	East St. Louis Junction.	East Tennessee & Western North Carolina.	Elgin, Joliet & Eastern.	El Paso & Southwestern.	Erie.	Escambia.	
1	Air compressors								1				3	3		1		2			14					1		8		1
2	Arch tubes														1			1				2						3		2
3	Ash pans or mechanism											1						1			1						1	4		3
4	Axles								1	1								1												4
5	Blow-off cocks										2	4	1			1		3			3	2					1	35		5
6	Boiler checks								1	2	2	20	2	1			1	8				1				1	1	61		6
7	Boiler shell								3	2	7	19			1	3	1	7		1	1							61		7
8	Brake equipment			5					3	12	14	63	11	1		5	1	4		4	2	5		1			2	74		8
9	Cabs or cab windows			1					2	12		21	2					6			4	1						41		9
10	Cab aprons or decks				1				1			5		3		3	2				4	3	2		1			30	1	10
11	Cab cards				3				1			3			1		2	1						1				4		11
12	Coupling or uncoupling devices							1				2				2	1					1			2			8		12
13	Crossheads, guides, pistons, or piston rods			2						1	3	46	16	1			2	1		2	2	1					1	34		13
14	Crown bolts								1		1	9						1		1	1							8		14
15	Cylinders, saddles, or steam chests								1	1	2	38	7		2	5		7			2	1						50	1	15
16	Cylinder cocks or rigging									2		10	2			6		1		1								6		16
17	Domes or dome caps									3		5						1										11		17
18	Draft gear								1	2	4	28			1		1	9		2		2		1	2		1	26		18
19	Draw gear								1	4		14	3			3	4	5			2			2		4	2	79		19
20	Driving boxes, shoes, wedges, pedestals, or braces			2					3	2		9	4					4				1					1	43		20
21	Fire-box sheets								1	13	7	11			1	1		3						2		1	1	35		21
22	Flues										2	1									1			1				11		22
23	Frames, tailpieces, or braces, locomotive									5	4	28			1			1		2	1						1	33		23
24	Frames, tender							1			3	1	1															9		24
25	Gauges or gauge fittings, air											1				2					1							5		25
26	Gauges or gauge fittings, steam								1	1	2	18	2			1		1		1	3	2				1		38		26
27	Gauge cocks				2					2	4	20	4	1		4	5	8		1		3	1	1				68		27
28	Grate shakers										1	1					1											19		28
29	Handholds									1		24		1	12	4	1	8						1		2		26		29
30	Injectors, inoperative																													30
31	Injectors and connections			1	2				7	14	43	100	19	1		2	2	19		4	1	2	1	11	1	3		176		31
32	Inspections or tests not made as required			1	2		1		1		2	22	9	3	3	4		5		1	2	2		1		2	4	66		32
33	Lateral motion	1		1	2			1		2		12	4			1										1	1	18		33
34	Lights, cab or classification											5		1														1		34
35	Lights, headlights											24	1			1		1					2					21		35
36	Lubricator or shields										1	2																9		36
37	Mud rings								6	14	5	8		2		2	1	5			2							76		37
38	Packing nuts		1				1		3	3	3	69	10	7		10	4	13		2	1		3	1				82		38
39	Packing, piston rod and valve stem				1					4	2	16				6		1		1	3		1					33		39
40	Pilot or pilot beams								2	4	2	7	2	1												1		12		40
41	Plugs or studs				1					1		3								1	1							4		41
42	Reversing gear				1					6		2	1			2		2			2	2						29		42
43	Rods, main or side, crank pins, or collars									5	6	22	21					7		1	2					1	3	128		43
44	Safety valves											4				2												4		44
45	Sanders								1			29	1		1			3								2		23		45
46	Springs or spring rigging		1					1	3	15	3	68	32		1	2		14		3	14	5	3			3	2	130		46
47	Squirt hose			2							2	5		1				2		1	2	1						14		47
48	Staybolts		1	1					1	2	1	3						2		2	3						1	18		48
49	Staybolts broken			5			1	3		4		34								4	8		4	1			1	107		49
50	Steam pipes									2	6	57	7			2	1	4			1			1				28		50
51	Steam valves						1		2		4	22	1	1				3		1				1			1	23		51
52	Steps			2					1	2		22	2	1		7		1		2	1	6	2		2	1		26		52
53	Tanks or tank valves			3					4	8	8	27	2	3		3	2	2			2							133		53
54	Telltale holes		1	2			1					2				1				2	2	2						1		54
55	Throttle or throttle rigging								2	2	2	17	1	1	1	2		3			1	1	2	2		1		25		55
56	Trucks, engine or trailing		3	1						1		32	7															35		56
57	Trucks, tender		2						4	3		1	19	1		1					4	1	1					29	2	57
58	Valve motion									1	2	4	6	1				8		1							1	18		58
59	Washout plugs		1						2	5	6	25	1					8		1	1	1						44		59
60	Water bar or combustion flues																													60
61	Water glass, fittings or shield		1	4					1	6	8	41	1	2		4	1	6		1	1	4	2	4	1	1	2	97		61
62	Wheels			4				1	1		2	6	2	5	2	1	1	8			1	1	3				5	47		62
63	Miscellaneous—Signal appliance, badge plates, brakes (hand).										2	6	2	1		2		1									1	4		63
	Number of defects	1		24	39		6	9	62	170	169	1,117	191	42	28	96	34	200		43	97	53	27	32	8	27	34	2,291	4	
	Locomotives reported	28	12	33	21	23	11	24	15	500	763	568	59	33	24	15	17	75	18	109	119	99	11	14	11	271	157	1,587	14	
	Locomotives inspected	8		17	30		4	8	16	373	382	669	43	29	20	16	17	154	15	39	65	73	5	11	5	72	111	1,069	6	
	Locomotives defective	1		10	14		1	2	11	80	73	314	33	16	11	14	16	57		18	42	31	5	8	2	10	13	657	2	
	Percentage inspected found defective	12		59	47		25	25	69	21	18	47	77	55	55	87	94	34		46	65	43	100	73	40	14	11	61	33	
	Locomotives ordered out of service			2	3				2	3	3	29	9	3		4	2	9		1	1	1	1	3			1	97		

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

	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 Railroad.	Georgia & Florida.	Georgia, Florida & Alabama.	Georgia Northern.
1	Air compressors								1	
2	Arch tubes									
3	Ash pans or mechanism									
4	Axles									
5	Blow-off cocks			1	1			1	1	
6	Boiler checks			1					1	
7	Boiler shell		1	1	4					
8	Brake equipment		1	3	17		2	1		1
9	Cabs or cab windows			7	9					
10	Cab aprons or decks									
11	Cab cards									
12	Coupling or uncoupling devices					1				
13	Crossheads, guides, pistons, or piston rods		1		1		2		1	
14	Crown bolts			1	1					
15	Cylinders, saddles, or steam chests			5	6				1	
16	Cylinder cocks or rigging				1					
17	Domes or dome caps			1			2			
18	Draft gear				1					1
19	Draw gear			3	11		5	2		
20	Driving boxes, shoes, wedges, pedestals, or braces				2			1		
21	Fire-box sheets				1			1		
22	Flues			2	6	1			1	
23	Frames, tailpieces, or braces, locomotive				2					
24	Frames, tender						1			
25	Gauges or gauge fittings, air				3		1			
26	Gauges or gauge fittings, steam			4	8		4	1		
27	Gauge cocks									
28	Grate shakers				3					
29	Handholds									
30	Injectors, inoperative			15	30		4	1	3	
31	Injectors and connections			4	6			2	1	
32	Inspections or tests not made as required				2					
33	Lateral motion									
34	Lights, cab or classification									
35	Lights, headlights									
36	Lubricator or shields									
37	Mud rings		1	2	1					
38	Packing nuts			1	4					
39	Packing, piston rod and valve stem				1					
40	Pilot or pilot beams			1						
41	Plugs or studs		1	1						
42	Reversing gear			2	1			1		
43	Rods, main or side, crank pins, or collars			3	16		1	2	2	
44	Safety valves									
45	Sanders			2						
46	Springs or spring rigging			10	9			3		
47	Squirt hose				2		2			
48	Staybolts									
49	Staybolts, broken		6	5	8		15	6	6	
50	Steam pipes		1	2	4			1		
51	Steam valves									
52	Steps				4		2	1		
53	Tanks or tank valves			1	10					
54	Telltale holes				2		1			
55	Throttle or throttle rigging			2	4		1	1	1	
56	Trucks, engine or trailing			7	3		1		1	
57	Trucks, tender			4	13		4			
58	Valve motion			1	1					
59	Washout plugs		1	4	9					
60	Water bar or combustion flues									
61	Water glass, fittings or shield			4	3		3			
62	Wheels			3	6		1	1		
63	Miscellaneous—Signal appliance, badge plates, brakes (hand).									
	Number of defects		13	103	216	2	52	26	20	2
	Locomotives reported	10	136	29	103	12	75	29	18	10
	Locomotives inspected		90	43	197	22	99	29	23	7
	Locomotives defective		14	27	73	1	26	15	11	2
	Percentage inspected found defective		16	63	37	5	26	52	48	28
	Locomotives ordered out of service			1	14					

Grand Trunk.	Great Northern.	Green Bay & Western.	Gulf & Ship Island.	Gulf Coast Lines.	Gulf, Mobile & Northern.	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, Clinton & Springfield.	Kansas City, Mexico & Orient.	Kansas City Northwestern.	
4	132					9		7		9			2				1		1
2						5										2			
	12																		
																	1		
3	33			5		2		3		9	1					3	3		
1	28	1				9		7		1			1		1		1		
7	118	1	1	1		4		15			1					1	1		
9	135	5	2	10		11		64		6		17	4	1		3	6		
6	122		1	4		2		30			3	1				2	1		
17	42	3	1	1		7	2	9		7	1	2							
5	36			1				7		4		3	2				1		
6	5	3		1		1		2		2	1								
6	79			14		12		9		6		5			1		4		
	4			1		1		3		1		1							
1	63			4		25		48				6	4		3	2	7		
4	21					7		14		1	3	1	2		1		1		
3	20					3		3		1		1					2		
9	19	3		5		15		19		1	1		3			1			
6	54	3	2	8	1	11		44		7		11	8	1	1	1	8		
9	48		2	2	2	29		48		18		9	5		7	1	2		
2	37			2		12		12				3					2		
	13					2		2	1										
	28		1	12	1			17		1		7	5				5		
2	8					1		18		1									
	16							14				5					1		
5	54			1		4		16		2		13				2	2		
7	108	1		11	1	1		27		5	1	17	1			4	2		
3	9					1		2				2					1		
5	35	2		7		9	2	27		2	2	3	4				3		
								1											
22	189	5		4	3	23	2	112	2	14	2	7	1		1	7	16		
12	35	4	1	13		6		80	1	13	1	11			1	2	9		
2	29			4	2			2		2		9	1		1				
	7																		
	11					8		9		1									
3	4						4	2		1	1	2					1		
4	11			1		7	2	16			1						4		
8	67		2	3	1	4		74		3		1	3			1	8		
13	36			2		17		23		1	1	1	3						
5	20	5		2				16		3		1	1				1		
4	8					1		5		1		1							
5	24	1		3		1		12				2				2			
4	58		2	8	1	38		42		18	1	9	9		1		7		
3	5					4		1		1		2					4		
16	39	1	2			8		14		5			1				2		
17	177	1	2	10	6	31		75		12		20	12		7	2	10		
3	25			6		1		15		4	1		1			2	3		
	17				1	5		8		1							2		
7	154		13	17	6	18		16			12	15			2		1		
8	21					6		20		3		1	1			1			
9	13					8		12		2							4		
22	66			7		2		32		1	1	2		1			2		
7	91			7	2	13		40		3		9	3			2	1		
9	7			4		3	1	6		1	4	1					2		
3	61	2		13		1	1	11		10		4	1			1	4		
9	61		6	4	1	1		39		3		12	3			1	3		
4	74	5		5	2	9		51		2	1	6	5	1		2	12		
	22		1	7		1		10		1	2	3					3		
6	57			3		11		32		9		1				3	5		
	1							2											
13	113		1	9	1	22	4	61		9		9	1			2	10		
10	52	1		10	1	4	1	33		23	2	12	3		1	2	1		
1	23	10		3		1		9		1						1			
351	2,857	57	40	235	32	437	19	1,348	4	232	44	248	90	4	28	53	170	0	
550	1,422	43	42	100	59	169	21	1,747	11	111	21	182	12	11	70	11	61	15	
222	1,643	39	62	96	41	209	11	1,256	7	122	37	171	27	5	77	25	58		
126	937	24	25	59	13	116	7	501	1	75	11	75	19	2	8	19	42	0	
57	57	62	40	61	32	55	64	40	14	61	30	44	70	40	10	76	72		
11	31		2	14	4	9	1	21		4	2	8	2				4		

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

	Parts defective, inoperative or missing, or in violation of rules.	Kansas City Southern.	Kansas City Terminal.	Kansas, Oklahoma & Gulf.	Kentucky & Indiana Terminal.	Lake Erie & Western.	Lake Superior & Ishpeming.	Lake Superior Terminal & Transfer.	Lake Terminal.	Lehigh & Hudson River.	Lehigh & New England.	Lehigh Valley.	Long Island.	Los Angeles & Salt Lake.	Louisiana & Arkansas.	Louisiana & Northwest.	Louisiana Railway & Navigation Co.	Louisville & Nashville.	Louisville, Henderson & St. Louis.	Macon, Dublin & Savannah.	Maine Central.	Manistee & Northeastern.	Maryland & Pennsylvania.	McCloud River.	Mckeesport Connecting.	Mercer Valley.	Michigan Central.	Midland Valley.	Minneapolis & St. Louis.	
1	Air compressors	1	....	....	....	3	1	1	....	....	....	1	....	1	1	....	....	21	....	....	....	3	....	....	....	....	10	....	10	1
2	Arch tubes	7	....	....	....	....	....	....	....	....	....	3	....	1	....	....	....	3	....	....	....	....	....	....	....	....	1	....	1	2
3	Ash pans or mechanism	1	....	....	....	....	....	....	....	....	....	3	....	1	....	1	....	1	....	....	....	....	....	....	....	....	....	....	....	3
4	Axles	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	4
5	Blow-off cocks	4	2	....	....	2	....	....	....	....	1	17	5	4	....	....	2	3	....	....	....	1	....	....	....	....	13	....	....	5
6	Boiler checks	4	....	....	....	2	....	1	....	....	....	5	1	1	7	....	1	36	....	....	2	....	....	....	....	....	5	2	1	6
7	Boiler shell	8	....	....	....	4	....	1	....	1	1	64	14	2	1	....	....	27	....	....	4	1	....	....	....	....	15	....	3	7
8	Brake equipment	19	1	1	....	17	....	....	....	1	1	45	5	11	7	4	19	69	....	....	4	1	1	....	....	....	29	1	6	8
9	Cabs or cab windows	2	....	....	1	....	....	....	....	....	....	12	3	....	1	....	7	5	1	....	2	....	....	....	....	....	11	....	3	9
10	Cab aprons or decks	6	3	....	....	....	1	1	....	....	11	4	....	10	....	....	2	11	....	....	1	....	....	....	....	....	20	....	3	10
11	Cab cards	2	....	....	1	1	....	....	....	....	....	1	....	1	....	....	....	7	....	....	8	....	1	....	....	....	3	....	2	11
12	Coupling or uncoupling devices	1	....	....	....	2	....	....	....	....	3	33	1	1	3	1	4	9	....	....	1	....	....	....	....	....	6	....	....	12
13	Crossheads, guides, pistons, or piston rods	8	6	....	....	1	....	1	....	....	1	1	1	23	....	....	1	....	....	....	....	....	....	....	....	....	6	....	1	13
14	Crown bolts	1	1	....	....	1	....	....	....	....	3	12	....	6	....	....	3	65	....	....	....	....	1	....	....	....	3	....	2	14
15	Cylinders, saddles, or steam chests	5	....	1	....	3	....	....	....	....	1	2	....	5	....	....	....	12	....	....	....	....	....	....	....	....	22	8	10	15
16	Cylinder cocks or rigging	....	7	....	....	....	....	2	....	....	1	5	3	....	....	....	....	7	....	....	....	....	....	....	....	....	8	....	12	16
17	Domes or dome caps	....	....	....	....	....	....	....	....	....	....	3	....	....	4	1	6	41	....	....	7	....	1	....	....	....	2	....	1	17
18	Draft gear	19	4	1	1	3	....	1	....	....	5	35	....	4	2	2	12	102	....	2	7	....	5	....	....	....	2	....	3	18
19	Draw gear	14	1	....	1	2	1	....	....	....	1	19	1	1	2	....	1	63	....	....	3	1	....	....	....	....	27	....	5	19
20	Driving boxes, shoes, wedges, pedestals, or braces	10	....	....	....	4	....	....	....	....	2	34	7	4	1	....	2	5	1	....	2	....	2	....	....	....	27	....	19	20
21	Fire-box sheets	1	....	....	....	3	....	1	....	3	9	20	....	1	....	....	3	5	....	....	....	....	....	....	....	....	12	....	5	21
22	Flues	1	1	....	....	1	....	....	....	1	1	32	1	10	8	1	1	51	1	....	1	....	1	....	....	....	2	....	....	22
23	Frames, tailpieces, or braces, locomotive	17	4	4	....	....	....	....	....	....	....	21	....	1	1	....	....	2	....	....	....	....	....	....	....	....	1	3	3	23
24	Frames, tender	....	....	....	....	....	....	....	....	....	....	....	....	2	....	....	2	20	....	....	3	....	....	....	....	....	2	....	1	25
25	Gauges or gauge fittings, air	2	....	....	....	1	....	....	....	....	....	23	2	4	1	....	....	75	....	....	4	....	....	....	....	....	10	....	1	26
26	Gauges or gauge fittings, steam	5	2	....	....	6	....	....	....	....	....	6	2	16	7	7	18	76	....	2	5	....	....	....	....	....	70	....	5	27
27	Gauge cocks	23	5	....	2	....	....	....	....	....	....	5	....	....	....	....	....	....	....	....	....	....	....	....	....	....	17	....	....	28
28	Grate shakers	....	3	....	....	....	....	....	....	....	....	4	1	18	6	7	9	33	....	....	2	....	....	....	....	....	1	....	....	29
29	Handholds	14	2	2	....	8	....	1	....	....	....	1	....	1	....	....	....	3	....	....	....	....	1	....	....	....	1	....	....	30
30	Injectors, inoperative	1	....	....	....	....	....	....	....	....	....	74	13	11	6	9	9	130	2	2	10	1	4	....	....	....	68	5	10	31
31	Injectors and connections	56	7	3	1	16	....	4	....	1	6	18	....	65	3	5	11	57	2	....	3	2	5	....	....	....	27	1	22	32
32	Inspections or tests not made as required	7	1	1	4	9	1	....	....	....	....	27	....	4	1	....	2	26	....	....	....	....	....	....	....	....	9	....	2	33
33	Lateral motion	2	....	....	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	6	....	....	34
34	Lights, cab or classification	....	....	....	....	1	....	....	....	....	....	6	....	3	1	1	1	1	....	....	1	....	....	....	....	....	5	....	2	35
35	Lights, headlights	....	1	....	....	1	....	....	....	....	....	2	1	....	....	....	....	10	1	....	....	....	....	....	....	....	4	1	....	36
36	Lubricator or shields	....	....	....	....	4	....	....	....	....	....	34	5	14	....	....	2	6	....	....	3	1	1	....	....	....	28	4	3	37
37	Mud rings	1	2	....	1	5	....	....	....	1	....	20	2	9	6	....	5	106	....	....	3	....	....	....	....	....	65	1	....	38
38	Packing nuts	14	1	....	....	5	....	....	....	4	....	7	....	3	2	....	3	9	....	....	....	....	2	....	....	....	7	1	7	39
39	Packing, piston rod and valve stem	....	....	....	....	2	....	9	....	4	1	6	....	....	....	1	2	17	....	....	....	....	....	....	....	....	2	....	4	40
40	Pilot or pilot beams	10	....	1	....	1	....	....	....	....	....	6	4	....	3	....	....	22	....	3	1	1	1	....	....	....	5	1	2	41
41	Plugs or studs	4	....	....	....	2	....	....	....	....	2	6	....	2	....	....	1	13	....	....	1	....	....	....	....	....	10	2	....	42
42	Reversing gear	2	1	....	1	....	....	....	....	....	....	90	....	4	8	....	12	34	....	....	8	....	1	....	....	....	19	4	10	43
43	Rods, main or side, crank pins, or collars	19	6	4	....	6	....	....	....	....	....	1	....	2	....	....	....	1	....	....	1	....	....	....	....	....	2	....	....	44
44	Safety valves	....	....	....	....	1	....	....	....	....	....	2	....	2	....	....	....	7	....	....	....	2	....	....	....	....	28	2	3	45
45	Sanders	2	....	....	....	3	....	....	....	....	....	88	4	7	16	3	15	104	....	....	3	1	2	....	....	....	54	2	19	46
46	Springs or spring rigging	26	3	1	....	7	3	1	....	3	2	5	....	1	8	2	2	56	....	....	....	....	....	....	....	....	6	....	5	47
47	Squirt hose	4	2	....	....	2	1	....	....	1	1	7	4	4	3	....	4	9	....	....	....	....	....	....	....	....	6	....	13	48
48	Stay bolts	2	....	....	....	....	....	1	....	1	16	67	9	5	5	....	33	12	....	....	6	....	9	....	....	....	24	7	9	49
49	Stay bolts broken	22	....	....	....	....	....	....	....	....	....	7	1	....	....	....	....	33	....	....	1	....	....	....	....	....	19	....	1	50
50	Steam pipes	4	....	....	1	2	....	....	....	....	....	2	....	2	....	....	1	11	....	....	2	....	1	....	....	....	17	1	1	51
51	Steam valves	1	....	....	1	1	....	....	....	....	....	24	1	2	5	....	19	47	....	....	7	....	3	....	....	....	25	....	3	52
52	Steps	7	2	....	2	11	....	3	....	....	....	51	4	20	6	1	28	23	....	....	6	1	....	....	....	....	48	....	5	53
53	Tanks or tank valves	21	1	....	....	1	....	....	....	1	....	2	....	4	2	4	3	1	....	....	5	....	....	....	....	....	7	1	2	54
54	Telltale holes	6	....	....	....	1	1	2	....	....	....	19	1	4	3	3	3	15	....	....	....	....	1	....	....	....	14	1	3	55
55	Throttle or throttle rigging	10	3	....	....	5	....	....	....	1	....	15	....	5	6	....	5	63	1	....	4	1	....	....	....	....	12	2	3	56
56	Trucks, engine or trailing	19	....	1	....	2	....	....	....	....	....	30	1	5	15	5	12	33	....	....	3	....	2	....	....	....	10	2	11	57
57	Trucks, tender	39	11	....	1	5	....	....	....	....	....	7	....	1	1	....	3	8	....	....	2	....	....	....	....	....	2	....	....	58
58	Valve motion	....	....	....	....	....	....	....	....	....	....	47	13	14	....	1	5	26	1	....	1	....	....	....	....	....	23	9	4	59
59	Washout plugs	14	....	....	....	6	....	....	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	60
60	Water bar or combustion flues	....	....	....	....	....	....	....	....	....	....	38	7	12	11	9	12	128	3	....	5	....	4	....	....	....	57	5	8	61
61	Water glass, fittings or shield	17	1	....	2	5	....	1	....	1	....	23	2	3	7	7	22	36	....	....	2	1	2	....	....	....	4	6	14	62
62	Wheels	28	....	....	....	4	....	....	....	....	....	2	....	3	....	....	....	9	....	....	....	1	....	....	....	....	9	....	....	63
63	Miscellaneous—Signal appliance, badge plates, brakes (hand).	....	....	....	....	4	....	....	....	....	....																			
	Number of defects	513	84	20	20	177	9	31	....	41	116	1,142	119	340	168	74	310	1,808	14	9	134	19	51	....	....	....	949	72	263	
	Locomotives reported	187	37	39	19	152	33	11	18	48	60	1,007	149	191	40	15	52	1,248	30	12	231	14	14	12	14	11	804	47	226	
	Locomotives inspected	223	55	24	7	134	18	25	8	23	40	816	116	282	100	15	95	1,035	23	15	256	4	14	....	....	....	411	46	219	
	Locomotives defective	149	43	6	4	58	5	9	....	11	27	365	43	135	49	14	80	527	7	3	90	3	13	....	....	....	266	24	91	
	Percentage inspected found defective	67	78	25	57	43	28	36	....	48	67	44	37	48	49	93	84	51	30	20	35	75	93	....	....	....	65	52	42	
	Locomotives ordered out of service	41	1	....	....	3	....	1	....	....	2	44	3	10	10	6	24	54	....	....	2	....	3	....	....	....	14	4	10	

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

	Parts defective, inoperative, or missing, or in violation of rules.	Minneapolis, St. Paul & Sault Ste. Marie.	Minnesota & International.	Minnesota, Dakota & Western.	Minnesota Transfer.	Mississippi Central.	Mississippi River & Bonne Terre.	Missouri & North Arkansas.	Missouri-Illinois.	Missouri, Kansas & Texas.
1	Air compressors	3	1	1	1	.....	.....	7	.....	3
2	Arch tubes	1	.....	.....	.....	.....	.....	.....	1	.....
3	Ash pans or mechanism	.....	.....	.....	.....	.....	.....	9	.....	.....
4	Axles	.....	.....	.....	.....	.....	.....	.....	.....	4
5	Blow-off cocks	.....	.....	.....	1	.....	.....	4	.....	26
6	Boiler checks	.....	.....	.....	.....	.....	.....	.....	.....	16
7	Boiler shell	.....	.....	.....	.....	.....	.....	.....	.....	26
8	Brake equipment	14	.....	3	.....	1	26	4	.....	69
9	Cabs or cab windows	8	.....	3	.....	.....	3	.....	.....	27
10	Cab aprons or decks	6	.....	.....	1	1	1	3	.....	11
11	Cab cards	2	.....	1	.....	.....	.....	1	.....	10
12	Coupling or uncoupling devices	.....	.....	.....	1	.....	.....	.....	1	1
13	Crossheads, guides, pistons, or piston rods	6	.....	.....	.....	.....	.....	9	.....	88
14	Crown bolts	.....	.....	.....	.....	.....	.....	4	.....	1
15	Cylinders, saddles, or steam chests	9	.....	1	.....	.....	.....	6	2	54
16	Cylinder cock or rigging	1	.....	.....	1	.....	.....	.....	.....	11
17	Domes or dome caps	1	.....	.....	.....	.....	.....	1	.....	16
18	Draft gear	8	.....	.....	.....	.....	.....	1	.....	32
19	Draw gear	9	.....	1	1	.....	.....	17	4	84
20	Driving boxes, shoes, wedges, pedestals, or braces	7	.....	.....	.....	.....	1	17	.....	76
21	Fire-box sheets	2	.....	.....	.....	.....	.....	4	.....	4
22	Flues	1	.....	.....	.....	.....	.....	3	1	2
23	Frames, tailpieces, or braces, locomotive	5	.....	.....	.....	.....	.....	4	.....	91
24	Frames, tender	.....	.....	.....	.....	.....	.....	2	1	11
25	Gauges or gauge fittings, air	1	.....	2	1	.....	.....	.....	.....	1
26	Gauges or gauge fittings, steam	9	.....	4	4	1	.....	2	.....	26
27	Gauge cocks	2	1	.....	6	1	.....	2	.....	80
28	Grate shakers	1	.....	.....	.....	.....	1	.....	.....	10
29	Handholds	1	.....	2	.....	.....	.....	7	.....	38
30	Injectors, inoperative	.....	.....	.....	.....	.....	.....	.....	.....	4
31	Injectors and connections	14	.....	.....	9	.....	.....	30	.....	226
32	Inspections or tests not made as required	10	.....	.....	4	.....	1	4	7	45
33	Lateral motion	.....	.....	.....	.....	.....	.....	11	.....	39
34	Lights, cab or classification	.....	.....	.....	.....	.....	.....	.....	.....	1
35	Lights, headlights	2	.....	.....	.....	.....	.....	1	.....	4
36	Lubricator or shields	.....	.....	1	.....	.....	.....	2	.....	36
37	Mud rings	2	.....	.....	.....	.....	.....	.....	.....	33
38	Packing nuts	9	.....	5	8	1	.....	14	2	62
39	Packing, piston rod, and valve stem	3	.....	4	1	.....	.....	2	2	7
40	Pilot or pilot beams	3	.....	1	.....	.....	.....	1	.....	7
41	Plugs or studs	3	.....	.....	1	.....	.....	4	.....	4
42	Reversing gear	3	.....	.....	2	.....	.....	1	.....	17
43	Rods, main or side, crank pins, or collars	14	.....	.....	6	.....	.....	24	.....	148
44	Safety valves	1	.....	.....	.....	.....	.....	.....	.....	2
45	Sanders	4	.....	.....	3	.....	.....	1	.....	20
46	Springs or spring rigging	72	2	1	2	.....	.....	15	1	142
47	Squirt hose	6	.....	.....	.....	.....	.....	2	1	25
48	Staybolts	3	.....	2	.....	.....	.....	.....	.....	11
49	Staybolt, broken	2	.....	12	.....	7	.....	37	.....	38
50	Steam pipes	4	.....	.....	3	1	.....	4	.....	34
51	Steam valves	2	.....	.....	.....	.....	.....	3	.....	16
52	Steps	4	.....	.....	5	.....	1	2	.....	13
53	Tanks or tank valves	9	.....	1	.....	.....	.....	3	.....	59
54	Telltale holes	4	.....	.....	1	.....	1	2	1	9
55	Throttle or throttle rigging	3	1	.....	3	.....	.....	6	.....	36
56	Trucks, engine or trailing	10	.....	.....	1	.....	.....	9	1	103
57	Trucks, tender	5	.....	1	5	2	2	6	4	68
58	Valve motion	.....	.....	.....	2	.....	.....	4	.....	32
59	Washout plugs	4	1	.....	.....	.....	.....	6	.....	93
60	Water bar, or combustion flues	1	.....	.....	.....	.....	.....	.....	.....	.....
61	Water glass, fittings or shield	14	1	1	10	1	.....	2	1	71
62	Wheels	15	.....	1	2	.....	.....	2	2	45
63	Miscellaneous—Signal appliance, badge plates, brakes (hand).	1	.....	.....	.....	.....	.....	1	.....	6
	Number of defects	324	7	45	88	15	9	334	36	2,274
	Locomotives reported	535	24	12	17	20	21	24	15	702
	Locomotives inspected	480	14	7	43	30	10	16	22	853
	Locomotives defective	178	5	7	34	7	5	16	12	599
	Percentage inspected found defective	37	36	100	79	23	50	100	55	70
	Locomotives ordered out of service	1	.....	1	1	1	.....	16	2	78

	Missouri Pacific.	Mobile & Ohio.	Monongahela.	Monongahela Connecting.	Montour.	Muscle Shoals, Birmingham & Pensacola.	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.	
1	11	.....	.....	.....	.....	.....	8	.....	.....	.....	.....	1	9	1	3	.....	.....	6	.....	1
2	11	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	.....	10	.....	.....	.....	.....	2	.....	2
3	4	.....	.....	.....	.....	.....	2	.....	.....	.....	.....	1	.....	1	4	.....	.....	7	.....	3
4	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	4
5	51	7	.....	.....	.....	.....	4	.....	.....	.....	.....	41	11	6	8	1	.....	10	2	5
6	18	.....	.....	.....	.....	.....	4	.....	.....	1	.....	35	14	3	12	.....	.....	14	8	6
7	32	4	.....	.....	.....	.....	11	.....	.....	4	.....	23	30	8	59	2	.....	20	1	7
8	149	20	.....	.....	.....	1	61	.....	.....	.....	.....	42	70	18	34	.....	1	36	7	8
9	34	5	.....	.....	.....	.....	5	.....	.....	.....	.....	13	8	3	10	.....	.....	13	9	9
10	10	4	.....	.....	.....	2	8	.....	.....	.....	.....	19	16	3	25	.....	.....	21	5	10
11	17	1	4	.....	.....	.....	20	.....	.....	.....	.....	14	1	1	26	.....	.....	24	3	11
12	12	.....	.....	.....	.....	.....	4	.....	.....	.....	.....	.....	12	5	1	.....	.....	2	.....	12
13	51	5	.....	.....	.....	.....	2	.....	.....	.....	.....	28	14	2	27	1	.....	24	9	13
14	27	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	5	3	.....	.....	.....	4	1	14
15	69	1	.....	.....	.....	.....	38	.....	.....	.....	.....	14	27	2	8	.....	.....	174	12	15
16	31	2	.....	.....	.....	.....	11	.....	.....	.....	.....	8	14	1	5	.....	.....	35	.....	16
17	5	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	2	4	.....	4	.....	.....	6	2	17
18	63	8	.....	.....	.....	1	15	.....	.....	.....	.....	20	12	.....	9	.....	.....	52	10	18
19	105	13	1	.....	.....	3	32	.....	.....	1	1	21	23	13	24	1	.....	47	8	19
20	64	4	.....	.....	.....	1	41	.....	.....	.....	1	12	73	3	27	1	.....	68	13	20
21	19	1	.....	.....	.....	.....	4	1	.....	.....	.....	8	26	2	12	.....	1	14	6	21
22	15	3	.....	.....	.....	.....	1	.....	.....	.....	.....	3	6	2	2	.....	.....	7	1	22
23	63	16	.....	.....	.....	3	41	.....	.....	.....	.....	6	5	1	13	.....	.....	39	14	23
24	7	.....	.....	.....	.....	.....	3	.....	.....	.....	.....	2	1	.....	1	.....	.....	.....	.....	24
25	17	4	.....	.....	.....	.....	10	.....	.....	.....	.....	1	2	1	6	.....	.....	5	.....	25
26	68	6	1	.....	.....	.....	13	.....	.....	.....	.....	13	17	7	19	.....	.....	27	1	26
27	97	4	.....	.....	.....	.....	35	.....	.....	3	.....	28	15	13	64	2	2	97	17	27
28	24	3	.....	.....	.....	.....	3	.....	.....	.....	.....	.....	1	.....	4	.....	.....	7	1	28
29	51	1	5	.....	.....	.....	8	.....	.....	2	.....	14	14	1	2	.....	.....	10	5	29
30	6	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	30
31	303	24	.....	.....	.....	1	59	.....	.....	5	1	77	83	13	112	5	.....	133	37	31
32	98	15	1	.....	.....	.....	7	.....	.....	1	.....	18	39	14	4	.....	.....	23	4	32
33	9	2	.....	.....	.....	.....	8	.....	.....	.....	.....	16	7	.....	33	.....	.....	4	8	33
34	2	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	34
35	10	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	8	2	2	.....	1	.....	5	.....	35
36	5	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	5	8	1	2	.....	.....	8	1	36
37	29	2	.....	.....	.....	.....	1	.....	.....	2	.....	39	35	11	137	2	1	17	7	37
38	79	11	.....	.....	.....	.....	59	.....	.....	1	.....	27	17	22	10	1	6	103	24	38
39	23	2	.....	.....	.....	.....	1	.....	.....	.....	.....	14	19	1	9	1	.....	23	6	39
40	23	2	.....	.....	.....	.....	3	.....	.....	.....	.....	4	4	1	7	1	.....	9	3	40
41	11	.....	.....	.....	.....	.....	3	.....	.....	.....	.....	.....	2	2	3	.....	.....	7	.....	41
42	40	3	.....	.....	.....	.....	8	.....	.....	.....	.....	6	1	.....	9	.....	.....	4	2	42
43	107	9	.....	.....	.....	2	29	.....	.....	5	.....	65	42	6	75	1	.....	19	4	43
44	3	.....	.....	.....	.....	.....	8	.....	.....	.....	.....	.....	8	.....	.....	.....	.....	1	.....	44
45	68	.....	.....	.....	.....	.....	2	.....	.....	.....	.....	16	32	10	1	.....	.....	6	1	45
46	149	25	.....	.....	.....	.....	64	.....	.....	.....	.....	57	97	20	79	1	.....	86	5	46
47	44	4	.....	.....	.....	.....	7	.....	.....	.....	.....	14	7	.....	1	.....	.....	22	5	47
48	13	4	.....	.....	.....	.....	1	.....	.....	3	.....	10	21	5	20	1	1	9	6	48
49	161	35	.....	.....	.....	.....	27	.....	.....	62	.....	10	8	6	156	.....	.....	23	2	49
50	35	2	.....	.....	.....	.....	32	.....	.....	1	1	21	25	7	7	1	.....	36	8	50
51	26	3	.....	.....	.....	.....	7	.....	.....	2	.....	4	14	1	31	.....	.....	20	3	51
52	62	3	.....	.....	.....	.....	19	.....	.....	.....	.....	17	23	10	10	1	2	29	6	52
53	54	5	.....	.....	.....	2	15	.....	.....	.....	.....	42	22	12	90	2	.....	31	14	53
54	36	1	.....	.....	.....	.....	6	.....	.....	.....	.....	5	4	5	7	.....	.....	6	3	54
55	44	1	.....	.....	.....	.....	7	.....	.....	.....	.....	66	21	1	7	.....	2	13	7	55
56	88	19	.....	.....	.....	3	31	.....	.....	.....	2	21	21	.....	74	.....	.....	19	2	56
57	90	2	1	.....	.....	1	31	.....	.....	.....	.....	23	28	5	38	3	.....	18	4	57
58	19	1	.....	.....	.....	1	2	.....	.....	.....	.....	40	7	3	3	.....	.....	11	1	58
59	87	5	.....	.....	.....	.....	24	.....	.....	2	.....	49	78	23	31	1	.....	49	5	59
60	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	1	.....	60
61	89	10	2	.....	.....	.....	42	.....	.....	1	1	101	56	13	34	.....	1	34	10	61
62	63	3	1	.....	.....	.....	17	.....	.....	4	.....	51	21	8	25	.....	.....	26	4	62
63	24	1	1	.....	.....	.....	11	.....	.....	.....	.....	6	4	3	.....	.....	.....	5	.....	63
	3,025	306	17	.....	.....	21	917	1	.....	101	7	1,202	1,197	305	1,424	30	17	1,571	318	
	1,126	249	56	50	19	13	269	12	17	30	34	2,518	908	273	1,142	195	14	1,059	109	
	1,499	262	50	.....	29	15	278	6	.....	11	28	1,097	480	221	1,341	68	45	999	216	
	923	126	5	.....	0	8	185	1	.....	8	6	520	283	95	572	21	10	534	119	
	62	60	10	.....	.....	53	63	17	.....	73	21	47	59	43	43	31	22	53	55	
	147	14	.....	.....	.....	.....	27	.....	.....	5	1	38	34	11	41	1	.....	30	5	

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

	Parts defective, inoperative or missing, or in violation of rules.	Northern Pacific.	Northern Pacific Terminal.	Northwestern Pacific.	Oklahoma, New Mexico & Pacific.	Oregon Short Line.	Oregon-Washington Ry. & Navigation Co.	Pacific Coast (Washington).	Patapsco & Back River.	Pennsylvania.	Peoria & Pekin Union.
1	Air compressors	18								54	1
2	Arch tubes	3				1				20	
3	Ash pans or mechanism	1								7	
4	Axles										
5	Blow-off cocks	8				3				88	
6	Boiler checks	6			1	2			2	137	
7	Boiler shell	34			2	5	2			196	6
8	Brake equipment	81	1		1	8	5		2	387	1
9	Cabs or cab windows	18				8	2			101	
10	Cab aprons or decks	20		1	1	9				94	
11	Cab cards	6				2				18	
12	Coupling or uncoupling devices									44	
13	Crossheads, guides, pistons, or piston rods	32			3	1	2			209	
14	Crown bolts	2				5				10	2
15	Cylinders, saddles, or steam chests	16			13	14	9			312	5
16	Cylinder cocks or rigging	1				5				176	3
17	Domes or dome caps	8								38	
18	Draft gear	15			4					107	
19	Draw gear	36	1	1	3	2	1			225	
20	Driving boxes, shoes, wedges, pedestals, or braces	31			3	2	1			239	1
21	Fire-box sheets	14			1	3	5		1	157	2
22	Flues					3	1		1	58	
23	Frames, tailpieces, or braces, locomotive	17			3	5	2			124	2
24	Frames, tender	4				2	1			12	
25	Gauges or gauge fittings, air	19								31	
26	Gauges and gauge fittings, steam	14				5	1			164	
27	Gauge cocks	44	1	2		6	2			421	
28	Grate shakers									48	
29	Handholds	26		1		29	3			95	
30	Injectors inoperative	1				1				13	
31	Injectors and connections	83			3	18	1		1	731	2
32	Inspections or tests not made as required	33		1	1	4	3		3	583	6
33	Lateral motion	3			3	1				60	1
34	Lights, cab or classification	1								5	
35	Lights, headlights					3				169	
36	Lubricator or shields	3				3				87	
37	Mud rings	3			6	12	1		1	279	6
38	Packing nuts	26	1			41				246	1
39	Packing, piston rod and valve stem	9				5	3			244	5
40	Pilot or pilot beams	5								53	
41	Plugs or studs	1								34	
42	Reversing gear	20				2	1			24	
43	Rods, main or side, crank pins, or collars	21				2	1			303	
44	Safety valves									2	
45	Sanders	9			1	3				159	
46	Springs or spring rigging	82			3	4	1			368	3
47	Squirt hose	8					1			76	
48	Staybolts	6			1	5				49	3
49	Staybolts broken	54	3	6	2	3	3			154	
50	Steam pipes	13		1	2	3				177	
51	Steam valves	7				2				61	
52	Steps	13		1	2	1			1	145	
53	Tanks or tank valves	14		1	5	7	5			283	1
54	Telltale holes	1				3				43	
55	Throttle or throttle rigging	15				2			2	317	
56	Trucks, engine or trailing	21		1	2	3	1			141	
57	Trucks, tender	30		2	23		1		1	199	3
58	Valve motion	41								52	
59	Washout plugs	38				4	1			250	3
60	Water bar or combustion tubes									1	
61	Water glass, fittings, or shields	42				12				365	
62	Wheels	32		3	6	2	3		1	147	5
63	Miscellaneous—Signal appliance, badge plates, brakes (hand).	1				2				45	
	Number of defects	1,083	7	21	95	268	63	....	16	9,437	62
	Locomotives reported	1,439	10	69	15	421	313	10	25	7,491	33
	Locomotives inspected	1,398	13	55	19	304	307	5	7	4,684	43
	Locomotives defective	475	4	13	18	87	46	....	4	2,650	23
	Percentage inspected found defective	30	32	24	95	29	15	....	57	59	54
	Locomotives ordered out of service	19	....	....	1	6	1	....	....	279	5

	Pere Marquette.	Philadelphia & Reading.	Philadelphia, Bethlehem & New England.	Pittsburgh & Lake Erie.	Pittsburgh & Shawmut.	Pittsburgh & West Virginia.	Pittsburgh, Chartiers & Youngstown.	Pittsburgh, Shawmut & Northern.	Portland Terminal.	Public Belt of New Orleans.	Quincy, Omaha & Kansas City.	Raritan River.	Republic Iron & Steel (Ala.).	Republic Iron & Steel (Ohio).	Richmond, Fredericksburg & Potomac.	Rio Grande Southern.	River Terminal.	Rutland.	St. Joseph & Grand Island.	St. Louis & Hannibal.	St. Louis & San Francisco.	
1																						1
2				2							1										7	2
3																1					8	3
4																						4
5		15	1								1									1	34	5
6		12		1					1	1	1										11	6
7		41		3														3	1		34	7
8		51	8	1					2		3				3			1	1	2	97	8
9		8		2							3	3									28	9
10		25	2								3							2			13	10
11		3	2	1		1												6		1	12	11
12		1	1	2		1												3			3	12
13		21	4	1	1				1	1	10							1	1	2	36	13
14		7									2							1		1	1	14
15		47	2									1						2	2		96	15
16		9																	1	2	13	16
17		6																			7	17
18		24		3					2		2				1				1	1	45	18
19		47	6						2		1					1	1	5		4	93	19
20		19							4		6					1			2	3	59	20
21		27									2				1			2		1	14	21
22		16	3	1							1										6	22
23		16									5					1		2	1		81	23
24																					12	24
25		1									1										9	25
26		93									5				2	1		1		1	19	26
27		82	2	4					1	1	4				1			4		3	50	27
28		38		1							1										4	28
29		11	2	2							3				3					1	21	29
30		1																			1	30
31		96	3	8					2	2	10				1	5		5	1	11	115	31
32		261	17	2							8							7		4	38	32
33		13		1	2											1		2		1	11	33
34		1																				34
35		21	5	1	1										1						1	35
36		18									4					1					7	36
37		15		1						1							1	2			25	37
38		86													3			2		2	62	38
39		56		1																	13	39
40		7							1												15	40
41		3	1								3							2			10	41
42		2		1							3									1	28	42
43		34	5	6							6							4	1	3	76	43
44		7																			5	44
45		8									1										16	45
46		28		1		1			5		7	1				5		5	1	1	211	46
47		13	1	1							6					1		1			16	47
48		7		1						1								1			10	48
49		18	7							15	6	4			2					25	26	49
50		26	1								3				1	1		1		1	22	50
51		17									1										18	51
52		13	4	1		2			2		3										22	52
53		18	1						1		6				1			2			30	53
54		2	2						1		1									4	8	54
55		79	10	1							1				3					1	62	55
56		13									3										84	56
57		8	3	1						1	20				5			1		3	101	57
58		7	1													1				1	10	58
59		20	3									1						1		1	112	59
60		1																				60
61		59	5	1						1	1				7			5		2	62	61
62		15	3	5	1						4							3			55	62
63		9	1																	1	5	63
		949	1,603	106	57	5	5	....	....	25	24	152	10	....	....	35	20	2	77	14	84	2,091
		432	1,099	26	319	25	40	11	46	27	16	27	13	10	18	93	17	23	89	43	15	942
		311	769	28	148	18	14	9	7	21	30	43	27	....	....	75	13	6	95	19	13	1,172
		222	426	27	22	2	2	....	....	10	11	33	2	....	....	20	8	1	34	7	12	751
		71	55	97	16	11	16	....	....	48	37	77	7	....	....	27	62	17	37	37	92	64
		25	27	4	1	....	....	....	....	....	4	7	....	....	....	....	....	....	2	....	5	57

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

	Parts defective, inoperative, or missing, or in violation of rules.	St. Louis Southwestern.	San Antonio & Aransas Pass.	San Antonio, Uvalde & Gulf.	San Diego & Arizona.	Sandy River & Rangeley Lake.	Savannah & Atlanta.	Seaboard Air Line.	Shreveport, Alexandria & Southwestern.	Sierra Ry. Co. of California.
1	Air compressors	1						12		
2	Arch tubes							1		
3	Ash pans or mechanism							3		
4	Axles									
5	Blow-off cocks							20		
6	Boiler checks	10						12		
7	Boiler shell	4	2					16		
8	Brake equipment	29	7	1			1	82	1	
9	Cabs or cab windows	9						22	2	
10	Cab aprons or deck	5						12		
11	Cab cards				1			1		
12	Coupling or uncoupling devices	1			1			7		
13	Crossheads, guides, pistons, or piston rods	14	2	1			1	20		
14	Crown bolts	1	3					10		
15	Cylinders, saddles, or steam chests	7	2					20	1	
16	Cylinder cocks, or rigging	4						7		
17	Domes or dome caps	1	1					6		
18	Draw gear	13	1				1	25		
19	Draft gear	18	1	5			3	35	3	
20	Driving boxes, shoes, wedges, pedestals, or braces	4	1	1	1			52		
21	Fire-box sheets	1	3					44		
22	Flues				1			38		
23	Frames, tail pieces, or braces, locomotive	17	6	6				53	2	
24	Frames, tender	1						15		
25	Gauges or gauge fittings, air	1	1					6		
26	Gauges or gauge fittings, steam	11		1				17		
27	Gauge cocks	11		6				63	3	
28	Grate shakers	1						11		
29	Handholds	6		1			1	9		
30	Injectors inoperative	1						2		
31	Injectors and connections	37	1	2	3	1	1	121	2	
32	Inspections or tests not made as required	18	1	6	12	2		13		
33	Lateral motion	1	2	1			1	24		
34	Lights, cab or classification			1						
35	Lights, headlight		1					6		
36	Lubricator or shields		3	1				3		
37	Mud rings	3						27		
38	Packing nuts	7						76		
39	Packing, piston rod, and valve stem	1				4	1	5		
40	Pilot or pilot beams							9		
41	Plugs or studs	1						7		
42	Reversing gear	1						24	1	
43	Rods, main or side, crank pins, or collars	19	2	3		1	2	79	4	
44	Safety valves							2		
45	Sanders	1								
46	Springs or spring rigging	63	3	2		1		75	1	
47	Squirt hose	7	1					9		
48	Staybolts	6	1					23		
49	Staybolts, broken	13	32		2		1	179	2	
50	Steam pipes	5		1				26		
51	Steam valves	2						24		
52	Steps	5	1		4			36	3	
53	Tanks or tank valves	4	2	1			1	80	1	
54	Telltale holes	2	1					12	1	
55	Throttle or throttle rigging	16	1	5				43	1	
56	Trucks, engine or trailing	12	8	8	3			31		
57	Trucks, tender	9	5	2	1			19		
58	Valve motion	3						5		
59	Washout plugs	6	1	2	4			45		
60	Water bar or combustion flues									
61	Water glass, fittings or shield	14	1	5	2			63	2	
62	Wheels	15	2	4	1		3	39	4	
63	Miscellaneous—Signal appliance, badge plates, brakes (hand).							2		
	Number of defects	442	98	66	36	9	17	1,728	34	
	Locomotives reported	283	84	18	17	14	13	609	10	10
	Locomotives inspected	233	40	29	36	17	24	1,353	7	7
	Locomotives defective	163	18	16	18	4	10	688	6	
	Percentage inspected found defective	70	45	55	50	24	42	51	85	
	Locomotives ordered out of service	31	6	1	1	1	2	52	3	

South Buffalo.	Southern.	Southern Pacific—Lines East.	Southern Pacific—Lines West.	Southern Pacific of Mexico.	Spokane International.	Spokane, Portland & Seattle.	Sumpter Valley.	Tennessee Central.	Tennessee Coal, Iron & R. R.	Terminal Railroad Association of St. Louis.	Texas & Pacific.	Texas-Mexican.	Texas Midland.	Texas, Oklahoma & Eastern.	Tionesta Valley.	Toledo & Ohio Central.	Toledo, Peoria & Western.	Toledo, St. Louis & Western.	
.....	42	.....	2	.....	.....	.....	.....	6	....	1	2	.....	.....	.....	.....	2	1	3	1
.....	1	.....	.....	.....	.....	.....	.....	.....	....	.....	1	.....	.....	.....	.....	.....	.....	1	2
.....	10	1	.....	.....	.....	.....	.....	.....	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	3
.....	1	.....	1	.....	.....	.....	.....	.....	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	4
.....	25	3	6	1	.....	1	.....	2	....	.....	1	.....	.....	.....	.....	3	.....	2	5
.....	54	2	3	1	.....	2	.....	3	....	.....	2	.....	.....	.....	.....	6	.....	.....	6
.....	36	5	14	.....	.....	3	.....	14	....	.....	1	.....	.....	.....	.....	1	1	1	7
.....	214	52	49	2	.....	6	.....	52	....	.....	13	.....	.....	.....	.....	1	5	17	8
.....	56	10	22	.....	.....	2	.....	1	....	.....	3	.....	.....	.....	.....	1	.....	1	9
.....	23	3	17	.....	7	1	1	10	....	.....	1	.....	.....	.....	.....	3	.....	1	10
.....	24	2	5	.....	.....	1	1	7	....	.....	2	.....	.....	.....	.....	.....	.....	.....	11
.....	33	2	4	.....	.....	.....	.....	.....	....	.....	.....	.....	.....	.....	.....	1	.....	4	12
.....	75	60	13	.....	.....	2	.....	4	....	1	13	1	.....	.....	.....	2	.....	2	13
.....	9	4	15	.....	1	.....	.....	1	....	.....	3	.....	.....	.....	.....	.....	.....	1	14
.....	140	10	8	.....	.....	2	.....	91	....	2	6	.....	.....	.....	.....	12	6	9	15
.....	79	3	3	.....	.....	.....	.....	16	....	1	2	.....	.....	.....	.....	.....	2	.....	16
.....	16	1	2	.....	.....	.....	.....	5	....	.....	.....	.....	.....	.....	.....	1	.....	.....	17
.....	128	5	7	.....	.....	.....	.....	11	....	.....	1	1	.....	.....	.....	5	.....	4	18
.....	199	40	33	.....	.....	1	.....	26	1	3	8	7	1	.....	.....	4	3	9	19
.....	166	41	11	.....	.....	.....	.....	65	....	.....	7	.....	.....	.....	.....	17	2	1	20
.....	34	17	23	.....	.....	2	.....	9	....	.....	.....	.....	.....	.....	.....	2	4	12	21
.....	25	2	14	.....	.....	.....	.....	9	1	.....	1	.....	.....	.....	.....	1	.....	1	22
.....	125	62	12	.....	.....	8	.....	39	....	1	10	.....	.....	.....	.....	.....	2	5	23
.....	18	1	5	.....	.....	.....	.....	7	....	.....	1	.....	.....	.....	.....	2	.....	.....	24
.....	21	2	2	.....	.....	.....	.....	2	....	.....	.....	.....	.....	.....	.....	.....	.....	2	25
.....	41	13	9	.....	.....	2	.....	2	....	.....	3	.....	.....	.....	.....	4	.....	2	26
.....	165	26	37	.....	.....	4	.....	21	....	1	2	.....	.....	.....	.....	1	5	.....	27
.....	30	.....	.....	.....	.....	.....	.....	1	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	28
.....	134	29	9	.....	.....	1	4	5	....	2	7	.....	.....	.....	.....	.....	.....	2	29
.....	3	.....	16	1	.....	.....	.....	.....	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	30
.....	352	33	27	3	.....	5	1	17	....	1	6	.....	.....	.....	.....	10	3	23	31
.....	193	19	153	3	6	1	.....	15	2	2	4	1	1	.....	.....	8	3	20	32
.....	38	6	10	.....	.....	2	.....	28	....	1	.....	.....	.....	.....	.....	1	.....	.....	33
.....	2	1	1	.....	.....	.....	.....	2	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	34
.....	30	.....	7	.....	.....	.....	.....	.....	....	.....	.....	.....	.....	.....	.....	2	.....	2	35
.....	9	6	.....	.....	.....	1	.....	1	....	.....	1	.....	.....	.....	.....	.....	.....	1	36
.....	35	2	12	.....	.....	2	.....	17	....	.....	.....	.....	.....	.....	.....	1	1	3	37
.....	272	6	24	.....	.....	.....	.....	8	....	1	1	.....	.....	.....	.....	3	.....	11	38
.....	95	4	3	.....	.....	2	.....	7	....	.....	1	.....	.....	.....	.....	2	1	3	39
.....	53	1	3	.....	.....	.....	.....	8	....	.....	.....	.....	.....	.....	.....	1	.....	1	40
.....	10	2	2	.....	.....	.....	.....	12	....	.....	1	.....	.....	.....	.....	1	.....	.....	41
.....	68	7	5	.....	.....	2	.....	3	....	.....	1	.....	.....	.....	.....	.....	.....	.....	42
.....	223	57	20	.....	.....	1	.....	15	2	2	19	.....	1	.....	.....	9	3	2	43
.....	6	6	.....	.....	.....	.....	.....	.....	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	44
.....	11	1	10	.....	.....	.....	.....	3	....	.....	.....	.....	.....	.....	.....	1	.....	5	45
.....	292	54	24	.....	.....	3	.....	46	....	2	8	1	.....	.....	.....	12	1	17	46
.....	54	11	9	1	.....	.....	.....	3	....	.....	1	1	.....	.....	.....	.....	.....	2	47
.....	29	.....	10	.....	.....	2	.....	6	....	.....	.....	.....	.....	.....	.....	1	2	4	48
.....	177	12	30	7	.....	.....	.....	149	....	.....	13	.....	.....	4	....	8	.....	6	49
.....	109	4	11	.....	.....	.....	.....	2	....	.....	1	.....	.....	.....	.....	.....	.....	5	50
.....	52	1	7	.....	.....	.....	.....	.....	....	.....	1	.....	.....	.....	.....	1	.....	.....	51
.....	132	20	13	1	.....	2	1	22	....	.....	1	.....	.....	.....	.....	.....	.....	5	52
.....	158	37	39	.....	.....	5	.....	19	....	.....	4	.....	.....	.....	.....	3	4	5	53
.....	25	8	2	1	1	.....	.....	8	....	.....	1	.....	.....	1	.....	.....	.....	.....	54
.....	99	33	7	.....	.....	5	.....	3	....	.....	4	1	1	.....	.....	1	.....	1	55
.....	168	22	8	.....	.....	2	.....	48	....	.....	4	2	.....	.....	.....	2	.....	2	56
.....	111	22	8	.....	.....	4	.....	35	....	1	14	1	.....	.....	.....	7	.....	8	57
.....	42	17	2	.....	.....	.....	.....	3	....	.....	3	.....	.....	.....	.....	.....	.....	2	58
.....	87	5	20	.....	.....	1	.....	3	....	.....	2	.....	.....	.....	.....	6	1	2	59
.....	1	.....	.....	.....	.....	.....	.....	.....	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	60
.....	188	21	27	.....	.....	.....	.....	8	....	3	11	1	.....	.....	2	1	.....	9	61
.....	129	22	53	.....	.....	9	.....	52	....	.....	7	.....	.....	.....	.....	24	1	12	62
.....	24	1	3	.....	.....	.....	.....	2	....	.....	.....	.....	.....	.....	.....	.....	1	.....	63
.....	5,201	837	892	21	15	87	8	954	6	25	199	17	4	5	2	174	52	231	
31	2,360	569	1,538	27	12	70	11	38	59	182	373	15	17	15	13	169	29	92	
4	2,975	762	1,383	3	15	97	7	159	6	32	479	11	14	3	7	203	34	117	
.....	1,534	265	426	3	7	40	3	137	3	13	83	7	4	1	2	76	14	66	
.....	52	35	31	100	47	41	43	86	50	40	18	64	29	33	28	37	41	56	
.....	168	32	13	2	.....	3	.....	70	....	2	15	.....	.....	.....	.....	3	1	7	

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

	Parts defective, inoperative or missing, or in violation of rules.	Toledo Terminal.	Tonopah & Goldfield.	Toronto, Hamilton & Buffalo.	Trans-Mississippi Terminal.	Tremont & Gulf.	Trinity & Brazos Valley.	Uintah.	Ulster & Delaware.	Union Pacific.	Union R. R.	Utah.	Utah Copper Co.	Virginia Iron, Coal & Coke Co.	Virginian.	Wabash.	Washington Terminal.	Western Maryland.	Western Pacific.	Wheeling & Lake Erie.	Wichita Falls, Ranger & Fort Worth.	Winston-Salem Southbound.	Woodward Iron & Steel Co.	Wrightsville & Tennille.	Yazoo & Mississippi Valley locomotives reported shown with I. C.	Youngstown Sheet & Tube Co.	Roads with less than 10 locomotives.	Total defects.	
1	Air compressors									4						26		14		3							26	971	1
2	Arch tubes									2									2	16							4	151	2
3	Ash pans or mechanism									1						2		1									6	161	3
4	Axles						1											1										15	4
5	Blow-off cocks						1			7	1				1	21			1	6	3						18	975	5
6	Boiler checks									15		1			4	13		18	5	4	1						22	949	6
7	Boiler shell									8	2	1			9	20		5	7	26	1						40	1,598	7
8	Brake equipment	2			2	5		1		72					6	117		81	7	30	2	1			1		191	4,577	8
9	Cabs or cab windows					7	2			18					3	13		5	3	8					1		48	1,276	9
10	Cab aprons or decks					1	1			4		2			2	10		1	6	13	1						72	1,098	10
11	Cab cards									4					3	4		3	3		1				1		67	567	11
12	Coupling or uncoupling devices					2				4					2	8		2		4							50	423	12
13	Crossheads, guides, pistons, or piston rods					2				23					2	30		22	5	19	2						46	1,920	13
14	Crownbolts									8						1		1	2	13	1	1					8	331	14
15	Cylinders, saddles, or steam chests						1	1		43					55	60		16	1	32	1						114	3,234	15
16	Cylinder cocks or rigging				2					26					8	42		2		14	2						38	1,201	16
17	Domes or dome caps															1		2		1							4	331	17
18	Draft gear					3	2			11					7	38		17	1	11	1						84	1,526	18
19	Draw gear					4	5			27	1				3	67	2	11	1	17	1						158	3,042	19
20	Driving boxes, shoes, wedges, pedestals, or braces						5			28					2	31		41	3	27					1		68	2,776	20
21	Fire-box sheets									5	1				1	6	1	7	3	55						2	40	1,191	21
22	Flues									1	1				2	1		7	3	14							45	521	22
23	Frames, tailpieces, or braces, locomotive					3	5	3		10					2	37		18	2	1							51	2,078	23
24	Frames, tender									8						2		5	1								21	352	24
25	Gauges or gauge fittings, air									5					1	14		3		4							10	399	25
26	Gauges or gauge fittings, steam							1		23	1				7	28		14	1	23	1						36	1,595	26
27	Gauge cocks	1			1	2	1			37					3	35		15	3	28	2	1					109	3,275	27
28	Grate shakers									1						6		1		2							4	425	28
29	Handholds				2	3	4			11	2	1			7	27		14	3	13	1						137	1,533	29
30	Injectors, inoperative									4	1					1		1			1						7	94	30
31	Injectors and connections	1			2	4	5	4		89		2			15	130	2	71	13	44	1				4		247	7,441	31
32	Inspections or tests not made as required					2	2	1		36						83	1	68	7	9							241	4,114	32
33	Lateral motion						3	1		11					2	10		21	3	3	5						37	976	33
34	Lights, cab or classification							1								3											5	80	34
35	Lights, headlights														1	8		2		8							28	705	35
36	Lubricator or shields					2	1			4						20		1		2							28	456	36
37	Mud rings				1					13		1			6	5		3	10	18							44	1,598	37
38	Packing nuts				3			3		41					19	61		43	5	30		3					127	3,151	38
39	Packing, piston rod and valve stem					1				12					4	28		32		28	1						81	1,756	39
40	Pilot or pilot beams					2	1			17					4	8		2	7	1							24	679	40
41	Plugs or studs				1	1				9					1	5		5		2							30	443	41
42	Reversing gear									7						15		3		1							11	789	42
43	Rods, main or side, crank pins, or collars				2		2			46					2	81		69	11	36		1					119	3,915	43
44	Safety valves															1		2		1							3	162	44
45	Sanders							1		19					1	29			1	13							19	1,165	45
46	Springs or spring rigging	1				9	5	4		21		2			13	74		54	14	44	2	3			1		150	5,497	46
47	Squirt hose					4				9						27		3	2	8	2						40	935	47
48	Staybolts	1				1				9	3	1			3	5		8	1	38							26	722	48
49	Staybolts, broken						10			27					13	5		47	15	147					5		464	4,261	49
50	Steam pipes									45					5	28		4	5	15						1	28	1,461	50
51	Steam valves					1				16						12			2	10							16	791	51
52	Steps	1								13					2	46	1	29	2	21							147	2,038	52
53	Tanks or tank valves	1				8	4			37					8	31		14	6	15	1	1					74	2,817	53
54	Telltale holes				1	4	1		2	13					2	2		15	2	9	1						80	630	54
55	Throttle or throttle rigging						1			7		1			4	31		12	4	9	3	2					66	1,880	55
56	Trucks, engine or trailing	1			1	2	1			18					4	51		34	4	9	3				2		57	2,467	56
57	Trucks, tender						9			36					2	49	3	73	6	5	1						117	2,551	57
58	Valve motion				1	9				8					3	22		9		2							14	710	58
59	Washout plugs	1			1		2			33					8	28		8	8	29		3					29	2,449	59
60	Water bar or combustion flues						1											38									1	57	60
61	Water glass, fittings or shield	2				2		1	1	41		1			12	47	2	30	8	23	2				1		171	3,640	61
62	Wheels				1	2	4	2		16					1	46		12	4	9	10				2		222	2,410	62
63	Miscellaneous—Signal appliance, badge plates, brakes (hand).						1			3						12		8	2	1							6	403	63
	Number of defects	12			21	86	81	24	3	1,066	12	13			265	1,664	12	1,048	205	974	54	16		10	12		4,276	101,734	
	Locomotives reported	18	10	20	13	11	56	13	29	955	163	15	11	15	146	623	15	302	139	225	13	10	18	14		11	2,144	70,070	
	Locomotives inspected	9	4	1	14	20	22	8	14	1,033	57	22	2	1	244	656	9	293	213	252	19	10		15	50		1,857	64,354	
	Locomotives defective	5			8	20	14	6	2	363	7	5			111	463	4	197	72	199	11	6		6	7		953	30,978	
	Percentage inspected found defective	55			57	100	64	75	14	35	12	23			46	71	44	67	34	79	58	60		40	14		51	48	
	Locomotives ordered out of service					7	5	3		18					7	48		37	10	43	6						182	3,089	