INTERSTATE COMMERCE COMMISSION.

IN RE INVESTIGATION OF ACCIDENT ON THE NEW YORK, NEW HAVEN & HARTFORD RAILROAD NEAR NORTH HAVEN, CONN, ON SEPTEMBER 2, 1913

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J F Berry, counsel for the New York, New Haven & Hartford Railroad Co

H W Belnap, chief inspector of safety appliances of the Interstate Commerce Commission, and *M C Lest*, special counsel, for the Interstate Commerce Commission

REPORT OF THE COMMISSION

McCHORD, *Commissioner*

On September 2, 1913, there was a rear-end collision on the New York, New Haven & Hartford Railroad near North Haven, Conn, which resulted in the death of 21 passengers and the injury of 33 passengers and 2 employees. Inspectors who were in the vicinity at once proceeded to the scene of the accident, while others were ordered to that point to assist in the investigation A public hearing was held in New Haven, Conn, on September 5–6, 1913, and the Public Utilities Commission of the State of Connecticut, which was then engaged in an investigation on its own initiative, was invited to and did participate in this hearing

The investigation of this accident developed the following facts

Southbound train No 91, known as the Bar Harbor express, was made up of cars from various points on the Maine Central Railroad in southern Maine and was en route to New York, N Y On the day of the accident it consisted of two sections, the second of which was involved in this collision This section, known as second No 91, was hauled by locomotive No 1003 and was in charge of Conductor Adams and Engineman Wands It consisted of the following cars in the order named

Car	Weight	Construction	When built	Length over buffers
				Ft in
Maine Central baggage, No 311	65,400	Wood	1893	63 1¾
Sleeping cars				
Salvador	117,780	do	1893	77 10
San Ardo	115,500	do	1895	77 6
Messenia	148,760	Steel underframe	1904	78 6
Omena	127,200	Wood	1894	77 10
Elcaya	119,400	do	1906	78 6
Volta	121,900	do	1902	78 6
Tournay	127,730	do	1905	78 6
Chisholin	125,200	do	1906	78 6
Kasota	112,400	do	1893	72 8
Chancellor	131,800	do	1909	80 6

This train was delivered to the New Haven railroad by the Boston & Albany Railroad at Springfield, Mass, and left that point at 5 13 a m, passed Wallingford, Conn, about 3½ miles north of the point of accident, at 6 43 a m, and four or five minutes later came to a stop just after passing automatic signal No 23, located about a mile and a half north of North Haven On account of the fog, which limited the range of vision of the engineman to about 200 feet, he did not see this signal until very close to it He then applied the emergency brakes, the rear end of the train stopping at a point which he thought was about opposite the signal After a delay of two or three minutes on account of releasing the air brakes the train started ahead, but after it had moved about one car length it was again stopped on signal from the conductor, while the engineman, upon instructions from the conductor, sounded the whistle signal for the flagman to return to the train While waiting for the flagman to return, the rear end of the train was struck by train first No 95

Southbound train first No 95 was the first section of what is known as the White Mountain Express It originated at various White Mountain points on the Boston & Maine Railroad and was en route to New York This train was delivered by the Boston & Maine Railroad to the New Haven Railroad at Springfield Leaving that point it was hauled by locomotive No 1337, in charge of Conductor Fowler and Engineman Miller, and consisted of the following cars, in the order named

Car	Weight	Construction	When built	Length over buffers
				Ft in
New York, New Haven & Hartford baggage, 3098	84,400	Wood	1907	60 8½
New York, New Haven & Hartford coach, 517	79,600	do	1892	67 0
Sleeping cars				
Lumenes	124,000	do	1896	77 9
Samoa	124,000	do	1906	78 6
Clearfield	123,000	do	1903	79 6
Delhi	112,400	do	1893	72 8
Soden	113,900	do	1893	73 8

This train left Springfield at 5 33 a m, passed Wallingford at 6 51 a m, and collided with train second No 91 at about 6 55 a m while running at a speed of about 40 miles per hour

The rear two sleeping cars of second No 91 were entirely demolished, the third sleeping car was tipped over on its side and badly damaged, and the rear end of the fourth car was derailed The locomotive of train first No 95 was not badly damaged, while none of the cars of this train was damaged to any material extent

The third district of the Shore Line division of the New Haven railroad upon which this accident occurred, is a double-track line, running nearly north and south between Springfield and New Haven a distance of 62 5 miles Approaching the point of accident from the north the track is straight for about 2 miles, and for one-half mile north of the point of collision the grade is 0 17 per cent descending for southbound trains Trains are operated by train orders and time-table rights, and are spaced by automatic, inclosed disk, block signals, commonly known as banjo signals installed about 25 years ago At various points there are distant signals, and in some cases the signals are overlapped and cut track-sections are provided, these, however, being special conditions to meet local requirements In the vicinity of the point of accident there are no distant signals and none of the signals are overlapped The signals are located approximately 1 mile apart, the distance varying to some extent according to local conditions The inclosed disk signals installed on this line are about 20 feet high The indications are given in daytime by a disk in a glass-covered case at the top of the pole and at night by a lamp placed behind a small opening near the top of the case The day indications are red for stop and white for proceed, and the night indications are red for stop and green for proceed, the caution indication provided by distant signals, both day and night, is yellow When one of these home signals indicates stop, the engineman is required to bring his train to a full stop before passing the signal, he may then proceed at caution through the block in accordance with the following time-card rule

When automatic "block" signal displays "stop" indication train must stop before engine passes fixed signal, and if clear "block" indication is not displayed, proceed cautiously as the way is seen or known to be clear, except signal No 72 at Flower Street, Hartford, which is an absolute block and must not be passed while in "stop" position Trains must not enter block protected by this signal from the siding while signal is in "stop" position Enginemen entering a "block" as provided herein will be held responsible for accident to their train by reason of cars fouling main line, misplaced switches or overtaking preceding train

Rule No 7 of the general instructions published in the time card provides that "General rule No, 99 must be observed at all times,

notwithstanding the existence of block signals" This rule reads as follows

When a train stops or is delayed under circumstances in which it may be overtaken by a following train or needs protection flagman must go back immediately with danger signals a sufficient distance to insure full protection

If upon a level or up grade, he will fasten one torpedo on top of rail at least 12 telegraph poles from the rear of his train then go back 6 poles farther and fasten two more torpedoes on top of rail one rail length apart, if on a down grade he will fasten one torpedo on top of rail at least 18 telegraph poles from the rear of his train, then go back 18 poles farther and place two more torpedoes on top of rail one rail length apart, after doing this he may return to a point between the torpedoes placed and wait for any approaching train prepared to display proper signals in full view using every effort to attract attention in season to stop it When recalled he will look and listen for any approaching train, and if none is located take up the single torpedo nearest the train (leaving the other two) and return If recalled before placing torpedoes the required distance, a fusee should be lighted and left on the track If called in after the train which he is protecting has taken a siding to allow a following train to pass, he will leave no torpedoes or fusee Should the grade be heavy, weather bad or view likely to be cut off by smoke from passing trains, he must go as much beyond the distance named as circumstances may make necessary to safely protect his train

In flagging at night great care must be used that a green or white light does not obscure the red Stop signal should be swung until answered by approaching train

When, upon single track, it becomes necessary to protect the front of the train or when another track is obstructed the front brakeman (when necessary the fireman) must go forward and use the same precautions

Rule No 99b—When the flagman goes back to protect the rear of his train the next brakeman must immediately take the flagman's position on the train and remain there until relieved by the flagman, and on passenger trains the baggage-master must take the place of the front brakeman whenever necessary

Engineman Wands, of train second No 91, stated that after leaving Springfield his train did not stop until it reached the automatic signal at Wilson, a station 23 miles south of Springfield, which was set in the stop position On account of the fog he was unable to see it until it was only about 200 feet away, and he at once applied the emergency brakes He was unable to stop the train, however, until the engine had passed the signal He thought it took about five minutes to recharge the train line and release the brakes, the emergency application having exhausted the supply of air in the train line He then started his train, he did not sound the whistle signal recalling the flagman, and did not know whether or not the train was protected by flag while waiting there After passing Hartford his train was not stopped until he saw automatic signal No 23 in the stop position On account of the fog he also failed to see this signal until very close to it, and again used the emergency brakes in making the stop He did not know how far his engine ran by the signal, but testified that on looking back he was unable to see it In this

connection he further testified that at no time during the night had he been able to see the markers on the rear of his train On account of using the emergency brakes in making this stop it was again necessary to wait until the train line could be recharged and the brakes released, which, he thought, took three or four minutes As soon as this was done he sounded the whistle twice and started. The conductor, however, gave him a stop signal, and after stopping the train told him to recall the flagman, which he did by means of the whistle signal

At this time the conductor was standing on the ground near the baggage car The train had waited about two minutes after signaling the flagman to return when the collision occurred Engineman Wands further testified that although the rule required that when an engineman found an automatic signal at danger he should stop his train before the locomotive passed the signal, in foggy weather it was difficult to comply with this rule In fact, he frequently ran by signals when they were set against him He estimated that in very foggy weather the engine might run by signals once each trip He had never been disciplined on that account, however, and he had never made any report of such occurrences He did not think that a train should run faster than 10 or 15 miles per hour in foggy weather if it was the desire of the engineman in charge to comply with the rules and bring his train to a stop in every case before the locomotive passed a signal set in the stop position He further testified that a year ago last June the committee representing the enginemen on this division had protested to the management against the use of these signals without distant indications The book of rules now in use on the New York, New Haven & Hartford Railroad took effect June 1, 1907 Engineman Wands testified he had never been examined on those rules, his only examination having been taken when he was promoted on January 17, 1907 He had never received any instructions on these rules, but thought they were practically the same as the old rules with the exception of a few changes and additions Engineman Wands testified that he had been talked to by the trainmaster and master mechanic in the interests of safe operation, and had also been cautioned during the present summer by road foremen about running his train with regard to the signals and about making safety his first consideration

Engineman Wands entered the service as a fireman in 1902, and his record showed that since his promotion to the position of engineman in January, 1907, he had received demerit marks on six occasions and had been reprimanded on three occasions Among the offenses for which he had received demerit marks were running by an open switch after being properly flagged and on account of derailment of an engine The three reprimands were for failure to watch for sig-

nals, passing block signals in stop position, and exceeding the speed limit while running two light engines

The testimony of Engineman Wands was practically corroborated in all details by Fireman Barnfather, including the statement that it was a frequent occurrence for enginemen to run by signals in foggy weather Fireman Barnfather had been examined on the book of rules a few months ago, this being his first examination in about 10 years' employment, 7 of which had been as fireman

Conductor Adams testified that he had been a conductor for 10 years, the past five months of which he had been employed as a spare passenger conductor During the first part of the summer he had run the Bar Harbor Express between New Haven and New York for about one month The trip between Springfield and New Haven during which this collision occurred was his first trip between those points as a passenger conductor He stated, however, that he was well acquainted with the road between Hartford and New Haven but did not know the road between Springfield and Hartford

Conductor Adams testified that his train left Springfield at 5 13 a m and at Wilson ran by the automatic signal about one-half a train length It stood there about five minutes, and he sent his flagman back to protect the train, the latter going back until he flagged train first No 95 This train then pulled up behind second No 91 and came to a stop When his train stopped at signal No 23 he was standing in the fifth car in the train, and at once descended to the ground between the fourth and fifth cars He looked back, and could just barely see the signal, and saw what he supposed to be the flagman getting off the rear end of the train He testified that it was his duty to know that his flagman was protecting the train, and admitted that on account of the fog he could not see plainly, and therefore had no absolute knowledge as to the identity of the person who got off the train, but took it for granted that it was the flagman The man he stated he saw descending from the rear of his train might have been the flagman or it might have been a Pullman porter or a passenger His train stopped about four minutes before it started ahead, it then stopped again for the purpose of recalling the flagman He stated that the whistle signal recalling the flagman had hardly been sounded when he heard the explosion of the torpedoes, followed by the collision Conductor Adams further testified that he did not know where the rear end of his train stood with reference to signal No 23, as he did not go back there until after the collision occurred He did not think that his train had passed the signal, however and was therefore under the impression that it was still in the block protected by signal No 25 He had had Flagman Murray for about three weeks when running between New Haven and New York He said he had never seen him do short flagging

He thought, however, that he was inclined to short flag, and had talked with him about it Later on he said he had known the flagman to do short flagging and had "called him down" for it, and also had reported the matter to the crew dispatcher He had frequently known of trains passing signals set against them, but had never reported such occurrences, he did not know of anyone ever having been disciplined on account of running by signals During his 10 years' service as a conductor with the New Haven railroad he had never had any official travel with him except on one occasion, when a trainmaster rode one or two days on a way freight to see how the work was done

Conductor Adams entered the service as a freight brakeman in 1894 He was promoted to freight conductor in 1903 and to passenger conductor in 1913 His record shows that since his promotion in 1903 he had received demerit marks on six occasions and had been reprimanded on two occasions Among the offenses for which he received demerit marks were drinking while on duty and neglect and disobedience of orders, resulting in delay to a steamer at a drawbridge One of the two reprimands was for failing properly to protect his train

Flagman Murray stated that he entered the service of the company September 7, 1912, and that he passed the brakeman's examination on the book of rules about September 27, 1912 He stated that the railroad had an examination for the position of flagman which was different from the brakeman's examination, but he had never taken it, neither had he qualified for the duties of a flagman He went back to flag when the train stopped at Wilson Station He did not go back very far, however, on account of being called in He denied the statement of the conductor that he had flagged first No 95 at this point, and stated that he did not even hear any train coming during the time he was protecting his train at that point When the train was being brought to a stop at signal No 23 he was in the rear end of the next to the last car, and stated that the conductor was on the forward platform of this car When the train finally came to a stop he was on the rear platform of the last car and at once took his two lanterns, torpedoes, and a fusee and started to walk back to flag He kept walking until he heard the whistle signal to return He then placed two torpedoes on the right-hand rail one rail length apart, and as he looked up he could just make out the outline of the rear end of his train

He was then about to light a fusee, when he heard a train approaching He at once started back, swinging his red lantern, and at the same time trying to pull the cap of the fusee with his teeth, but before he could do so he had to jump from the track to avoid being struck He was not positive as to how far he had been standing

from the rear of his train, but thought the distance might have been two car lengths, possibly more When train first No 95 came to a stop after the collision, the rear end of that train had not passed him He stated that he could not remember that any conductor had ever called his attention to the manner in which he should perform his duties, neither did he remember that any instructions had been given him relative thereto He further testified that a qualified flagman is required to have a watch He did not have one, however, and no one had ever asked him about it He further stated that there were other men being used in passenger service as flagmen who had never qualified as such At the time of his examination as a brakeman he was questioned regarding signals, the flagging rules, and the movement of trains, and added that the fact that he was not a qualified flagman meant that he was not on the board as a flagman, but as a trainman

Flagman Murray's record showed that he had received demerit marks on two occasions, the first being for responsibility in the derailment of a car and the other for failure to place markers on the rear end of a passenger train resulting in a delay of six minutes

Brakeman Shanley testified that at the time the train stopped at signal No 23 he was in about the middle of the train He went back to the rear car and saw the flagman going back to flag At the time of the collision Brakeman Shanley was standing on the ground beside the rear two sleeping cars He did not think the force of the collision moved his train more than a few feet He had been in the employ of the New Haven railroad since the 1st of May, 1913 He had been examined on the book of rules and was qualified to act as a flagman in case of emergency

Engineman Miller, of train first No 95, testified that his train left Springfield at 5 33 a m , and that at that time it was very foggy He further stated that his train was not flagged near signal No 83 by the flagman of second No 91, as testified by Conductor Adams, and that he did not see that train until the time of the collision He stated that approaching the scene of the accident signal No 25, more than 1 mile north of signal No 23, was green, indicating that the track was clear as far as signal No 23 He used steam until he reached the top of a slight knoll, then shut off steam, applied the brakes, making a 5-pound reduction of the air, and prepared to look for signal No 23 As soon as he saw the flagman of second No 91 he made a reduction of 10 pounds, and almost at the same time he made an emergency application of the brakes, having seen the signal set in the stop position as well as the rear end of the train On account of the fog his range of vision was limited to not more than 150 or 200 feet In his opinion Flagman Murray was not more than 100 feet from the rear of second No 91 and about 50

feet north of the signal The torpedoes seemed to be about 50 feet north of the flagman

Engineman Miller stated that the only time he could remember having run past a signal was just after he began running an engine about nine years ago, although, in 1911, he failed to stop at a signal tower on account of the brakes failing to hold He attributed his failure to stop at signal No 23 to the fog and to the fact that there was no distant signal, landmark, or other means of enabling him to know when his train was approaching the signal If the signals were so located that they could easily be picked up by an engineman, he thought he could operate a train safely during foggy weather at a speed of from 25 to 30 miles per hour During the week of the Stamford accident, the superintendent issued orders for engine and train crews to meet at his office, and he attended this meeting, which was held the day before the Stamford wreck The superintendent talked for some time about being careful and running trains over the road in safety He stated that since that time he had done his best to live up to the rules After the Stamford wreck he had been talked to on several occasions by different road foremen of engines Since he became an engineman in 1903, on only two occasions had a road foreman of engines ridden over the road with him

Engineman Miller's regular run was from Springfield to Stamford and return, a total distance of 204 miles, leaving Springfield early in the morning and returning at about midnight Ordinarily this run is covered by two men, each man working every other day The regular manner in which Engineman Miller covered this run was to leave his home near North Haven at about 11 p m, deadhead to Springfield on train No 70, reaching there at 3 20 a m He would then go out on his run, train first No 95, at 4 20 a m, reaching Stamford at 6 56 a m He would then put up his engine, make out his reports, wash up, and start for home The first train he could take was train No 62, leaving at 9 09 a m, and this enabled him to reach his house at about 11 a m He would then have his dinner, go to bed at about 12, and sleep until 4 30 He would then take train No 89 back to Stamford, reaching there at 7 04 p m, prepare his engine for the return trip to Springfield, and leave for that point at 9 56 p m on train No 96 He would reach Springfield at 12 35 a m, wash up, make out reports, and return on train No 69, leaving Springfield at 2 45 a m, and reaching his home at about 5 a m He was then off duty until he had to return to Springfield on train No 70, at 11 p m that night, for the purpose of going out on his run at 4 20 a m the following morning

It will be noted that under this arrangement Engineman Miller was off duty about 15 hours at Stamford and about 28 hours at Springfield, but that on account of deadheading back and forth to his home,

his actual rest at the Stamford end of the run was between 4 and 5 hours, while at the Springfield end of the run his actual rest was about 16 hours During the week preceding the accident, however the engineman was sick who usually went out on the run on the days when Engineman Miller was off duty As no other engineman was available, Engineman Miller was advised of this fact, and he said, "All right, I will have to cover it" This arrangement was followed, therefore, and instead of being off duty at Springfield from 12 35 a m one morning until 4 20 a m the following morning, he went out the same morning, giving him less than 4 hours off duty at Springfield On account of doing this double duty, therefore, Engineman Miller's only extended period off duty was on his arrival at Stamford, when he would have 14 or 15 hours off duty, provided his train was not late in reaching that point As previously shown, however, on account of deadheading back to his home from Stamford, a distance of 40 miles, the actual amount of rest he secured at home in his bed was from 4 to 5 hours per day In addition he probably secured short periods of rest here and there while deadheading or while awaiting the arrival of his train from some other division In this particular case, however, it should be stated that Engineman Miller testified that he was not sleepy and had not felt so at any time

Engineman Miller entered the service of the New Haven railroad on October 7, 1899, as a fireman, and on July 14, 1903, he was promoted to the position of engineman His record shows that on May 23, 1904, he was suspended for four weeks for disregarding a signal On November 17, 1904, he was suspended for three weeks for responsibility for a collision, while on November 11, 1907, he was suspended for 30 days for responsibility for a collision Between January 1, 1906, and November 29, 1909, he had been given demerits on eight different occasions, cautioned once, reprimanded twice, and suspended once On November 29, 1910, having one year's clear record, six demerits were canceled On February 28, 1911, he received demerits for failure to stop at a danger signal On February 28, 1913, having two years' clear record, 18 demerits were canceled

Fireman Robertson corroborated the statement of Engineman Miller that the first red signal encountered by his train was signal No 23, and he also stated that the train had not been flagged at Wilson by the flagman of second No 95 After the collision he went back with several other people for the purpose seeing where the torpedoes had exploded He found them to have been located at a point about 60 or 70 feet north of signal No 23 He further testified that there was not so much trouble now with the flagmen failing properly to protect their trains as formerly was the case, as lately they had been living up to the rules better on account of the train-

masters watching them more closely and giving them instructions Fireman Robertson further testified that the cases of running by signals were numerous, the distance varying from two to six or eight car lengths No official of the road had ever been on an engine with him when it had run by a signal He entered the service of the company on May 27, 1911, and had been employed continuously as a fireman He had never been examined on the book of rules and was not required to carry a watch, the only examination he had ever taken being on his eyesight and hearing Previous to this he had had about seven years' experience on the New York Central, and in his opinion it was on that account that the New Haven officials considered it unnecessary to give him any instructions He stated that he was familiar with the rules, although they were slightly different from those on the New York Central

Conductor Fowler testified that when his train was delivered to him at Springfield the brakes on the baggage car were cut out He said that occasionally there were cars on passenger trains with brakes not working, but it was not a common occurrence Leaving Springfield, his train stopped at Springfield yard and at Hartford, no trouble with the brakes being experienced in making these stops Approaching signal No 23, the application of the brakes, the explosion of the torpedoes, and the shock of the collision seemed to occur almost at the same time When he descended to the ground, signal No 23 was about opposite the third car in his train He corroborated the statement of his engine crew that no stop was made at signal No 83 Conductor Fowler further testified that he had been examined on the book of rules and the time card about a year and a half ago He stated that he could not remember more than two or three instances of trains running by stop signals

Train Dispatcher Kelly testified that on the morning of the collision five southbound passenger trains left Springfield, Mass, as follows First No 93, 15 cars, 4 57 a m, second No 93, 9 cars 4 59 a m, first No 91 10 cars 5 06 a m, second No 91, 11 cars 5 13 a m, first No 95, 7 cars, 5 33 a m

The last two trains were those which were involved in this accident He further testified that none of these trains maintained its regular schedule, all of them losing time on account of the fog These trains passed Wallingford, Conn, at 6 19 a m, 6 21 a m, 6 35 a m, 6 43 a m, and 6 51 a m, respectively In addition, local train No 821, running from Hartford to New Haven, passed Wallingford at 6 32 a m He said that in foggy weather the speed at which a train was run depended entirely upon the engineman, he should run according to the distance he could see Dispatcher Kelly had no special instructions regarding speed or the operation of trains in foggy weather The distance from Meriden to Wallingford is 6

miles, and the train sheet shows that first No 93 consumed 10 minutes in running this distance, second No 93 used 9 minutes, and first No 95 used 7 minutes It thus appears that first No 95 maintained an average speed between the two points of about 51 miles per hour and that it was running faster than any of the other trains

Shortly before the accident occurred the dispatcher called the operator at Air Line Junction and learned that first 93 had not yet passed that station As five trains had passed Wallingford, and the first of them had not passed Air Line Junction, he directed the operator at Wallingford to hold first 95, the next train south Soon afterwards, however, the operator at Air Line Junction reported that first 93 was approaching, the dispatcher then canceled his order to the operator at Wallingford, and first 95 passed that station without being stopped The dispatcher knew that there were five passenger trains between Wallingford and Air Line Junction, a distance of approximately 10 miles, knowing that there were 7 signals between those two points, however, he canceled the order to stop first 95, as he wanted to keep the trains moving, and when he found that first 93 was going along properly he considered it good judgment to allow the other trains to go He was familiar with the rule governing the operation of the signal system, and knew that between Wallingford and the scene of the accident there were no distant signals

Signal Engineer Morrison stated that between Springfield, Mass, and New Haven, Conn, the block signals were approximately 1 mile apart, there being in all about 154 signals on the line between those two points He stated that there was no record of the date these signals had been placed in service, but he thought they were installed 20 or 25 years ago In connection with 25 of these signals, distant signals, providing caution indications when the home signals were at danger, were installed In a letter dated June 22, 1912, addressed to General Superintendent Pollock, regarding signals in use on this line, Mr Morrison stated that wherever the view of the signals was short, distant signals were installed, and that wherever the view of the signals was not clear or good, there was an overlap which holds the second signal in the rear in the danger position until a train has passed a predetermined distance beyond the home signal At points where enginemen can get a good view of the home signals and there are not any unusual conditions, neither distant signals nor the overlap is provided

Mr Morrison considered a signal system providing caution or distant-signal indications safer than a system in which caution signals were not used

Following investigation early in the year of two accidents where these signals were involved, authority had been given to replace these inclosed disk signals with semaphore signals providing distant indi-

cations, this work was authorized on April 9, 1913, and on the date of this investigation 60 per cent of the material was on the ground and 15 per cent of the work had been done It was expected that the work would be completed by January 1, 1914

Regarding the railroad company's investigation of automatic train-control devices, Mr Morrison stated that about 1,100 schemes had been submitted and two had been selected for experimental tests The installation of one of these devices had been nearly completed, the material for the other installation had not yet arrived

Supt Droege, of the Shore Line division, stated that he had been superintendent of that division since December 8, 1912, prior to that time he had been superintendent of the Providence division for about nine years He submitted a statement showing the number of trains operated between New Haven and Springfield during the month of August, 1913 as follows

	North bound	South bound
Total number		
Passenger trains	604	582
Freight trains	250	247
Light engines	21	18
Daily average		
Passenger trains	19 5	18 8
Freight trains	8 1	8 0
Light engines	7	6

There was greater density of traffic during the first few days of September than the daily average for August, the daily average for the first four days of September being as follows

	North-bound	South bound
Passenger trains	22 7	33 2
Freight trains	13 0	13 0
Light engines	3 5	2

Mr Droege stated that employees are examined by train masters and designated examiners who work under the direction of train masters, and that the rule is, except in extreme emergencies, to examine a man before he is put to work Owing to the merging of divisions, records of examinations of employees were not complete, and five men were at work examining all the men on the road for whom there was no record of examination

While the rules require flagmen to compare time with the conductor and engineman, there was no positive rule requiring flagmen to carry watches and they are not checked up carefully to see whether or not

they do carry watches It is the duty of train masters as they go over the road to see that men are supplied with the general equipment they are required to have

Mr Droege stated that on this division there were 8 train masters, including the assistants, they cover a territory of approximately 440 miles and have general supervision over 2,600 or 2,800 road employees and several hundred station men, a total of 3,000 or more employees Mr Droege had held a number of staff meetings at which he had urged train masters, road foremen of engines, assistant chief dispatchers, and other officers to get out among the men as much as possible, supervise their work, and impress upon them the importance of observing all rules, he further directed that officers should do or say nothing to imply that trains were not being operated at sufficiently high rates of speed, and all the men were to be interviewed and cautioned regarding observance of signals and speed restrictions Meetings of employees at which these matters were gone over were held at various places

In order that it might be known when all the men had been interviewed, a list was prepared containing the names of conductors and enginemen and those whose records were bad or showed certain offenses were indicated on this list When any of these men were present at meetings they were detained and particularly cautioned

Mr Droege himself had held 12 or 15 meetings of this character and he personally had interviewed between 150 and 200 men He said that at one meeting which he held on June 11, 1913, Engineman Miller was present, and after that meeting Miller and another engineman were detained and warned to be particularly careful

As a result of these meetings and the closer supervision over the men Mr Droege thought there had been considerable improvement in operating practices, fewer cases of poor flagging were found, but there were still too many cases of disregarding danger signals, he thought there had been no increase in that respect, but that more complete reports were being secured He stated that if employees failed to report cases of trains passing signals improperly and cases of improper flagging there was no method of securing information regarding such occurrences He believed that a large number of the men were sufficiently honorable and conscientious to report instances of that character The only check available was the general supervision of the men by officers of the company Recently he had discharged one important transportation officer for failure to report a case of overrunning a signal which he had known of

When asked regarding any effort having been made to ascertain whether or not signal indications were observed, he stated that trainmasters, road foremen of engines, and other officers had watched

the trains, and the men had been cautioned about observing and obeying signals

It was Mr Droege's opinion that any automatic-signal system is safer if distant indications are provided He said that under the signal system in use on the Springfield line, men were not expected to make schedule time during foggy weather, if an engineman reported that loss of time was due to fog, no further questions were asked or action taken

On June 1, 1913, a bulletin had been issued by General Manager Bardo calling attention, among other things, to certain rules and the necessity for their observance, and Mr Droege had also issued a bulletin, dated August 29, 1913, to passenger conductors, engineers, and trainmen calling attention to the expected increase of traffic incident to Labor Day and the large number of people returning from vacations, and pointing out the desirability of keeping trains on schedule and operating them safely, this bulletin also directed that flagging rules be rigidly lived up to and that enginemen should be particularly careful to observe all signals

Train Master Regan stated that he had been employed in that capacity for about two years and previous to that he had been employed as assistant train master, general yardmaster, and assistant general yardmaster He had never been examined on the book of rules He had general supervision of the assignment of men to trains out of Springfield through the crew dispatchers, one of whom assigned Murray to the position of flagman on train second No 91 It was his duty to know that the flagman had been examined on the rules and was competent He stated that from time to time he rides over the road to see whether or not men obey the rules, he had never seen an engineman run past a danger signal, although cases of that kind had been reported to him The greater number of men engaged in passenger-train service were taken from freight service, approximately 100 men had been transferred from freight to passenger service during the past summer When a man is to be transferred he is first sent to a train master for instructions Murray had been examined by the regular examiners, both of whom were experienced men, and when Murray was transferred Train Master Regan gave him his instructions Since he had been transferred, Murray had been called in twice in regard to minor infractions of the rules Train Master Regan considered Murray a competent man More than one inexperienced man was not permitted to go out in any train crew, he thought a man should have been in the service at least six months to be considered experienced He stated that the rules do not specifically require a flagman to carry a watch

General Manager Bardo stated that he had been employed in that capacity on this road since February 15, 1913 His testimony contained the following

On this road the divisional organization is in force, the superintendent of transportation has general supervision over all employees engaged in conducting transportation, including men engaged in maintenance of way, track, and structures Each division is divided into districts and each district has one or more train masters and assistants, whose duty it is to keep constantly in touch with the situation on the road Yardmasters are employed at principal terminals and station masters at principal stations Chief train dispatchers at all dispatchers' offices check up the movements of trains and the operation of towers, enginemen are under the immediate supervision of road foremen of engines In addition, a division engineer and a supervisor of track and his assistant exercise general supervision over track employees Discipline is administered almost exclusively by the division superintendent and his staff

Before a man is employed he must pass an examination to demonstrate his fitness for the service After passing the examination he may be assigned as a brakeman or a flagman, but he is not considered a "qualified flagman" until he has been in the service from three to five years and has passed another examination including matters relating to conductors' duties, in other words, he is not considered a "qualified flagman" until he is practically qualified to perform the conductors' duties He is given further examinations before being promoted to freight conductor and passenger conductor There is no specific rule regarding the amount of experience or training required before a man can be assigned as a flagman of a passenger train, although it is the aim to select competent men The officer who assigns the men to passenger-train service, either the train master or the crew dispatcher, designates the men who are to act as flagmen

There are eight train masters and assistants on the Shore Line division, these eight officers having general supervision over about 3 000 employees, in addition some supervision is exercised by other officers over certain classes of these employees

Mr Bardo stated that the flagman of a train should be at all times on the last car of a train, and that it was primarily the duty of the conductor to see that the flagman was in his proper place

He called attention to rule 788, containing instructions for passenger trainmen, as follows

When acting as rear brakeman or flagman, take post on the last car, only leaving it when necessary to protect the rear of train Always keep on rear of train a supply of red signals, torpedoes, and fusees, and go back with them

instantly when the rules so require, without waiting for engineman's signal or conductor's order

A list had been prepared showing all cases reported where enginemen on this road had overrun or disregarded signals from January 1, 1911, to September 1, 1913, together with a statement of the discipline administered in each case The list contains 158 such instances, and as a result 32 enginemen had been discharged and 117 disciplined, 9 cases were disposed of in other ways In three of these instances the enginemen were killed

A similar list, covering the same period of time, showing cases of improper flagging, was also submitted This list included 101 instances, in 28 of these cases men had been discharged, and in 73 cases discipline of some other form was administered

Mr Bardo stated one of the first things he did when he entered upon his duties as general manager of this road was to discuss with employees the question of improved service, holding meetings of the men for that purpose and he had directed other officers of the company to take up with employees the matter of safe operation and observance of the rules Weekly reports had been made, showing that since June 5, 1913, 2,605 enginemen, 1,165 conductors, and 1 721 other employees, a total of 5,491 employees, had been interviewed, 2,933 employees had been examined on vision color sense and hearing, and 1 476 employees had been examined on the operating rules Prior to this recent campaign, approximately from 50 to 100 employees of all classes were examined per week, since this campaign had been entered upon, from 103 to 252 employees had been examined per week

Following the investigation by the Connecticut Public Utilities Commission of an accident which occurred on the line between New Haven and Springfield on February 16, 1913, the inclosed disk signals on this line were ordered to be taken out of service, and steps were taken to replace them with a modern block-signal system

Mr Bardo stated that he considered the signal system on this line coupled with the time-card rule governing train operation, a safe method of spacing trains In his opinion the installation of distant signals would afford no greater degree of safety In foggy weather it would be necessary under this system to reduce speed to approximately 20 miles per hour, if distant signals were installed trains would have a greater distance to stop and could consequently be operated at a higher rate of speed In his opinion "the relative difference is about as between 30 or 35 miles an hour with a distant signal as compared with 20 miles an hour with this system" He stated that the time card rule required that in foggy weather trains should be run slow enough to be stopped within the engineman's range of vision

In June, 1912, the enginemen employed by this company had filed a protest against the signals in use on the line between New Haven and Springfield, the complaint, in substance, being that where no distant signal indications were employed enginemen were unable to make the time required of them without violating rules or running signals Mr Bardo stated that he had discussed the situation with the enginemen, and had said to them that they should not take any chances, but if they could not see the signals they should run as slow as might be necessary to insure safety Surprise or efficiency tests had been discontinued before he came to the road and had not been inaugurated again The change in the signal system was being made as a result of an order of the Connecticut Public Utilities Commission and not as a result of the protest filed by the enginemen

In an agreement between the New York, New Haven & Hartford Railroad Co and the Pullman Co, in force January 1, 1913, and covering a period of 20 years, it is stated that—

> It is expressly understood that the parlor and sleeping cars, observation cars buffet smoking cars, combination baggage and parlor smoking cars, now on the lines of the railroad company, are to be replaced by the Pullman Co as soon as is practicable by steel cars of the latest and most approved types, of such kinds and styles as the railroad company shall desire for operation upon its lines

Mr Bardo stated that the Pullman Co had been furnishing modern equipment at the rate of 10 or 12 cars a month since the 1st of January, and since that date four limited trains had been completely equipped with steel cars

Mr Bardo stated that the air-brake practice in effect had been followed for some time Under this practice trains were permitted to leave terminals provided the brakes on 85 per cent of the cars were in operative condition At Springfield, the point where trains are received from the Boston & Albany, trains have about six minutes station time, and light repairs may be made But if such extensive air-brake repairs are required that they can not be made in time available the brake is cut out, provided the percentage is not reduced below the prescribed minimum limit of 85 per cent

In response to this commission's request that information be furnished from the minutes of the executive committee and the board of directors showing what, if anything, had been done by either of those bodies to carry out the commission's recommendations in previous wreck reports and to make more safe the operation of the railroad, Mr Bardo submitted a report regarding the action of the board of directors of the New York, New Haven & Hartford Railroad Co looking toward increased safety At this meeting, which was held October 17, 1912, President Mellen reported in detail regarding the accident at Westport, Conn, on October 3, 1912, and after consideration of this matter it was voted that the president should "cause the

most searching investigation to be made into the competency of the engineers employed and that there shall be nothing left undone which in the judgment of himself and his associates will conduce to greater safety in the operation of the railroad and that there shall be no limitation placed upon the installation of signals, safety appliances, or anything else that will, in his judgment or that of his associates, improve the safety of passenger travel upon this company's lines * * *

"That the policy of this company is that all passenger equipment purchased in the future should be of the all-steel type"

Mr Bardo submitted a list of improvements, with cost of same, which had been made or authorized since August, 1911 This list included the following

		Steel cars		
Aug 31	1911	22 postal cars	$264 000 00	
Oct 31	1912	25 baggage cars	300, 000 00	
		5 postal cars	62, 500 00	
Dec 1	1912	9 dining cars	225, 000 00	
Jan 24	1913	25 baggage cars	300 000 00	
June 28	1913	50 smoking cars	825, 000 00	
		100 coaches	1, 650, 000 00	
		10 baggage and mail cars	135, 000 00	
		10 baggage and smoking cars	160 000 00	
July 31	1913	85 coaches	1, 402, 500 00	
		15 smoking cars	247, 500 00	
				$5, 571, 500 00
		Electric lighting		
Aug 31	1912	60 coaches	80, 403 00	
May 31	1913	60 coaches	80 403 00	
				160, 806 00
		Signals interlocking crossovers, derails, tie plates, double-spiking		
Aug 31	1911	Interlocking, New Rochelle	56, 462 00	
Oct 5,	1911	Derails	9, 336 40	
Apr 30,	1912	Signals, Stamford to New Haven	614, 380 00	
Aug 13,	1912	Signals, Botsford	7, 645 00	
Dec 30,	1912	Crossovers, Bridgeport	29, 590 00	
Jan 31,	1913	Tie-plates Shore Line Division	62, 685 00	
Jan 31,	1913	Double-spiking, Glenbrook to New Haven	37, 455 00	
Feb 8	1913	Interlocking plants	1, 500 00	
May 9,	1913	Crossovers, New Haven	10, 580 00	
Sept 5,	1913	Automatic signals between New Haven and Springfield	356, 700 00	
				1, 186, 333 40
Feb 11,	1913	Experiments with automatic stops		2, 000 00
June 29,	1913	Air pumps, 38 locomotives		5, 411 20
		Grand total		6, 926, 050 60

Mr Bardo stated that with the exception of two items, electric lighting of coaches and the interlocking plant at New Rochelle which replaced an old one, this total expenditure was for new equipment

From this tabulation it will be noted that the expenditures made or authorized during the period from August 31 to December 31, 1911, was $329,798 40, during the year 1912 it was $1,319,518, and during the period from January 1 to September 5, 1913, it was $5,276,734 20, making a total of $6,926,050 60 Of the total authorized for steel cars, expenditures amounting to $4,420,000 to purchase 270 steel cars were authorized during the months of June and July, 1913 Nearly all the steel equipment ordered was for future delivery Mr Bardo stated that not all of the cars ordered August 31, 1911, had been delivered The signal installation between Stamford and New Haven was not yet completed, but was expected to be ready for service about the first of the year 1914

Mechanical Superintendent Wildin submitted a statement showing the number of passenger-train cars owned by the New Haven railroad and in use on that road on September 1, 1913 According to this statement there were 2,124 passenger cars in service, of this number 2,087 were wooden cars and 37 were all-steel cars In addition there were 38 all-steel, 68 steel underframe, and 175 wooden Pullman cars in service There were on order 449 all-steel passenger-equipment cars, including the following

Motor	1
Multiple-unit motor	17
Multiple-unit trailer	26
Full mail	20
Mail apartment	10
Coaches	221
Smokers	79
Baggage	50
Dining	9
Combination baggage and smoker	10
Club	6

Mr Wildin stated that the club cars referred to are operated principally between Stamford and New York and are occupied by parties who pay special rates for the cars, these cars being somewhat similar to private cars He stated that the new steel club cars would cost approximately $15,000 each

Mr Wildin stated that he had general charge of all the motive and car equipment and the inspection and repair of such equipment Under the instructions which had been issued trains were permitted to leave terminals, such as Springfield or New Haven, provided 85 per cent of the cars in such trains were equipped with air brakes in working condition For a period of about two and a half months, beginning shortly after the Stamford accident, a record had been

kept of the air-brake inspections, adjustments, and repairs which were made on cars leaving Springfield, and daily reports were made regarding the condition of brakes on all these cars Mr Wildin stated that he had no recollection of any previous instance since that record had been kept when a train had been permitted to leave Springfield with the brake on one or more cars cut out of service Mr Wildin stated that to apply a metal brake beam to the baggage car in this case would require an hour or more, at the station the car was standing on the main line of the Boston & Albany Railroad, and to do this it would be necessary to switch it into the repair yard, approximately a quarter of a mile distant

This investigation disclosed the fact that five fast passenger trains, the first and second sections of No 93, known as the State of Maine express, the first and second sections of No 91, known as the Bar Harbor express, and the first section of No 95, the White Mountain express, left Springfield between 4 57 and 5 33 a m Another passenger train ran from Hartford to New Haven following the two sections of No 93 These six trains passed Wallingford, the last station north of the point where the accident occurred, between 6 19 and 6 51 a m The following tabulation shows the average rates of speed and the time lost by these trains between Springfield and Wallingford

Train No	Average speed Springfield to Wallingford, 50 miles	Average speed Meriden to Wallingford, 6 miles	Time late				Time lost on run
			Leaving Springfield		Passing Wallingford		
			Hours	Minutes	Hours	Minutes	Minutes
	Miles per hour	*Miles per hour*					
First 93	36 73	36	1	42	1	51	9
Second 93	35 64	40	1	42	1	53	11
First 91	33 64	30	1	0	1	20	14
Second 91	33 33	40	1	13	1	28	15
First 95	38 29	51	1	13	1	21	8

Train No 821 left Hartford 11 minutes late and arrived at Wallingford 15 minutes late, having lost 4 minutes between those points, a distance of 24 miles

From this tabulation it will be noted that the average speed of the five through passenger trains was from 33 33 to 38 29 miles per hour for a distance of 50 miles and from 30 to 51 miles per hour for a distance of 6 miles near the point where the accident occurred

The general manager himself stated that in foggy weather, in order to insure the safe operation of trains under the signal system in use on this line, it would be necessary, in his judgment, where no distant signals were installed, to reduce the speed of trains to approximately 20 miles per hour and where distant signals were in-

stalled to reduce speed to approximately 35 miles per hour Nevertheless, instead of absolutely requiring a reduction of speed the officers had simply notified employees verbally that if loss of time was reported as due to fog no discipline would be administered or other action taken

Just before the collision occurred the dispatcher issued an order directing the operator at Wallingford to stop train first 95, as there were at that time five passenger trains between Wallingford and Air Line Junction, and he thought it had been a long time since first 93 passed Wallingford and that train should have been at Air Line Junction But he canceled that order when the operator at Air Line Junction reported that train first 93 was coming If in his judgment it was necessary to issue this order to stop first 95 at Wallingford, he should not have canceled the order without first assuring himself that the trains preceding first 95 were being operated properly

When the dispatcher was asked how the operator at Wallingford could stop train first 95 he said the operator had a red light a red flag, and torpedoes, he would have to go out and flag the train It further developed that at Air Line Junction there was a fixed signal which was used as a train-order board, but at stations between Air Line Junction and Springfield there were no train-order signals, when an operator had orders to deliver it was necessary for him to flag the train

The automatic signals installed on this line were far from adequate to provide for the safe operation of high-speed trains, especially during foggy or stormy weather, notwithstanding the rule governing their operation In this district, with but few exceptions, there were no distant signals, and an engineman knew nothing of the condition of the block he was approaching until he saw the signal at the entrance of that block, and even in clear weather trains frequently drifted by, enginemen being unable to see the danger indications in time to stop before passing the signals If distant signals had been installed in connection with all the home signals on this line, so that the engineman would receive information regarding the condition of a block a sufficient distance away to permit him to bring his train to a stop before entering it, the signal system would be much safer

While it is apparent from this investigation that the officers of the New Haven road did not require enginemen to make schedule time in foggy weather and no action was taken in case an engineman lost time on account of the fog, there was no specific rule requiring reduced speed and no special instructions had been issued to the dispatcher or to enginemen regarding the operation of trains during foggy weather Furthermore, if the records in this case furnish any

criterion, it is not unusual to run trains at high speed through fog, and the officers of the road are aware of that fact While the records show that all five of the express trains leaving Springfield on the morning of the accident lost some time between Springfield and Wallingford on account of fog, one of them maintained schedule time from Hartford to Wallingford, a distance of 24 miles

The dispatcher who was on duty at this time was familiar with the signal system in use, as well as the rules governing its operation, and he was aware that the weather was foggy Nevertheless, these five passenger trains were permitted to close up within a distance of approximately 10 miles, with only seven signals properly to space them

Under such circumstances it is not to be wondered at that an accident such as this occurred It is remarkable only that accidents of this character have not occurred on this line with greater frequency

This investigation disclosed the fact that in June, 1912, the enginemen on this road had called the attention of the general superintendent to the inadequate signals in use on various portions of the road, mentioning, among other localities, the line between Springfield and New Haven, stating that it was impossible to comply with the rules governing these signals and to make the time required of them A protest was also made against the use of any signals requiring trains to stop without distant signals or caution indications being provided This communication and protest were given but scant consideration by the officers of the road The small number of accidents which had occurred was advanced by the general superintendent as adequate justification for no action being taken in the matter After investigation of a serious accident on this line, which occurred on January 10, 1913, the public utilities commission of Connecticut called the attention of the management to the inadequacy of the signal system in use, and after investigation of another accident on this line, which occurred on February 16, 1913, the public utilities commission again called attention to the inadequate signal system, as well as a recommendation made by the chief engineer of the public utilities commission that the signals in use on this line be replaced by automatic signals of the semaphore type, providing both home and distant indications Not until then did the railroad management take steps to remedy the dangerous situation existing on this line which had been called to its attention by its own employees more than eight months before

As a result of the action of the State commission, a modern signal system is now being installed between Springfield and New Haven However, to provide for the safe operation of trains until the new signal system is available, either distant signals should be provided in connection with all the signals now in use, or the signals should

be properly overlapped, or block operators should be located at stations along this line and required to space trains a full block apart Between Springfield and Air Line Junction, a distance of approximately 60 miles, there are 15 stations at which train orders can be received and delivered, an average of 1 station for every 4 miles In view of this fact, a manual block signal system could readily and quickly be placed in service

During foggy or stormy weather, when signal indications can be seen but a short distance, positive and definite instructions should be given prohibiting the running of trains at high speed

In view of the congested passenger-train service and the inadequate signal system on this line, as well as the fact that under the practices followed the danger of rear-end collisions is greater when a flagman is returning to his train, the rules should be changed so as to provide that when a flagman has gone back to protect his train he should not be recalled, but should remain out and be picked up by a following train, and if the number of men now provided is not sufficient properly to protect a train under this method, the number of men assigned to a train crew should be increased

Attention is called to the statement of General Manager Bardo that there is no specific rule regarding the amount of experience required of a man before he can be assigned to the position of flagman of a passenger train, continuing, he said

> We aim, just as far as it is possible, to select the men who, by their experience and by their training and by their knowledge of the rules and their general make-up, will make competent men

Under the existing method of operation on this line the position of flagman of a passenger train is one of great importance and grave responsibility The mere aim to select employees who will make competent flagmen is not sufficient, the responsibility for having in this position at all times a man who is known to be competent and reliable rests with the railroad company, and only those employees who have been thoroughly examined and tested and who have demonstrated their fitness in every respect for performing the duties required of a passenger-train flagman should be selected for this service

General Manager Bardo submitted a list of reported cases of enginemen disregarding danger signals between January 1, 1911, and September 1, 1913, a period of 32 months This list includes 156 cases of this nature In addition, on the date of this accident, Engineman Wands ran past two danger signals, and Engineman Miller ran past one danger signal A list of reported cases of improper flagging covering the same period was also submitted This list included 101 cases, and the failure properly to protect train second No 91 in this instance was not included in this list

The following table indicates the discipline administered in the various cases of enginemen running signals and of improper flagging reported during the 32 months ending August 31, 1913

Discipline imposed	Enginemen running by signals	Improper flagging	Discipline imposed	Enginemen running by signals	Improper flagging
Discharged	29	27	6 demerits		1
Discharged and later reinstated	3		10 demerits	11	11
Resigned to avoid investigation		1	12 demerits	1	
Reduced to yard service [1]	3		15 demerits	11	6
Suspended			20 demerits	9	4
2 days	1		30 demerits	32	23
7 days	2		45 demerits	21	18
10 days	1		Reprimanded	8	1
30 days	1		Cautioned	6	4
5 demerits	10	5	No discipline applied	4	
			Total number of cases	153	101

[1] Of these 3 cases, in addition to the reduction in service, 1 employee was given 15 demerits and another 45 demerits

In addition to the foregoing cases, three enginemen charged with having disregarded signals were killed in the accidents resulting from their failure to obey signals

Of these totals there had been 24 reported instances of enginemen disregarding signals and 30 reported instances of improper flagging since Mr Bardo had entered upon the duties of general manager In these 54 cases 4 employees had been discharged, 46 had received demerit marks 1 reprimanded, 3 reduced to yard service, including 2 who had also received demerit marks and in 2 cases no discipline was administered

The operating officers should have been cognizant of the fact that infractions of this character were occurring with alarming regularity and frequency, and their statements and the records furnished in this case is conclusive proof that they knew of these dangerous practices Their responsibility in the matter can not be evaded

In the bulletin issued by Mr Bardo under date of June 1, 1913 the question of the safe operation of trains was discussed and certain rules bearing upon the subject were quoted But the questions of economy and efficiency were also discussed In the bulletin issued by Mr Droege under date of August 29 1913, calling attention to the expected increase in traffic incident to Labor Day, it was stated that the company was "very desirous of handling this traffic successfully, both with respect to keeping the trains on schedule and operating them safely" In these bulletins the questions of economy, efficiency, and maintaining schedule time were brought out so prominently that it is probable employees might receive the impression from them that the company held these matters to be of equal importance with the question of safety

It is not sufficient for a railroad company merely to provide signals and rules to govern the operation of trains, to issue bulletins calling attention to the necessity for observing such signals and rules, and to interview and caution employees regarding the observance of signals and rules But it is the absolute duty of a railroad company to know beyond question whether or not signals are obeyed and rules are rigidly lived up to Only when this is done can a railroad company provide that measure of protection to which the traveling public is entitled Mr Droege's statement that in case employees failed to report instances where enginemen disregarded signals, or flagmen failed to protect their trains properly, there was no method of securing information regarding such occurrences, indicates the entire lack of any adequate system of supervision of employees and of train operation, and the railroad company should without delay reorganize or rearrange its methods of supervision so as to keep in closer touch with its employees and better informed regarding the practices and occurrences on its road

There were seven cars in train first No 95, and this train was run from Springfield to the point where the accident occurred with the brake on the baggage car cut out of service

Mr Bardo and Mr Wildin both stated it was their understanding that if the brakes on 85 per cent of the cars in a train were in working condition the train could be operated without violation of the safety appliance acts Attention is called to the provision of section 2 of the act of March 2, 1903, requiring that all power-braked cars in a train which are associated together with the prescribed minimum percentage shall have their brakes used and operated This provision of law clearly prohibits the practice of running a car with its brake cut out in a train otherwise fully equipped with power brakes To comply with this provision of law railroads almost universally require all the cars in passenger trains to be equipped with brakes in operating condition In the commission's report regarding the accident at Stamford, Conn , on June 12, 1913, the method of conducting inspections and tests of the brakes at Springfield and New Haven was described The commission stated its belief that such inspections and tests were not sufficiently thorough to furnish accurate information regarding the efficiency of the brakes, and attention was called to the necessity for conducting a more complete and reliable air brake test at Springfield particularly, in view of the fact that at that point trains are received from a foreign road As a result of this investigation it is believed that not only should more complete and thorough inspections and tests be made, but facilities should be provided and arrangements made for making necessary repairs or taking cars with defective brakes out of service in order that all the cars in passenger trains leaving that point may be equipped with efficient brakes

in operative condition In view of the high speed at which passenger trains are run, the increasing weight of trains, and the density of traffic over this line the requirements of safety demand that all possible braking power shall be available Under no circumstances should a passenger train be permitted to leave a terminal with less than 100 per cent of the cars in such train equipped with power brakes in operative condition

The direct cause of this accident was the failure of Flagman Murray properly to protect his train, the failure of Engineman Miller properly to control the speed of his train in order that he could bring it to a stop before passing automatic signal No 23, and the failure of Conductor Adams to make certain that his train was properly protected An additional cause was the failure of Engineman Wands to bring his train to stop, as required by the rules, before passing automatic signal No 23, which was in the stop position

While Flagman Murray had had only limited experience as a flagman, he was familiar with the duties required of him Had he immediately run back as far as possible and lighted a fusee, the accident probably would not have occurred The rule requires the flagman to ride in the rear car of his train Flagman Murray was in the second car from the rear, and, as the train was stopped by an emergency application of the brakes, it is obvious that his statement that he left the rear end of the train immediately after it came to a stop, can not be correct Instead of running back with stop signals to protect his train, he negligently loitered during the six or seven minutes his train must have stood at this place and at no time was he more than 200 or 300 feet from the rear end of the train

Enginemen Miller and Wands were experienced men and were well acquainted with the rules and requirements for the safe operation of their trains On account of the dense fog prevailing they should have run their trains at greatly reduced speed in order to observe signal indications and to stop before passing danger signals, as required by the rule Although the emergency required an engineman to double out of Springfield on this run there was no sufficient reason why one engineman should be required or permitted to continue double duty for a period of one week, as Engineman Miller had done In each 24-hour period Engineman Miller had had less than six hours of rest in bed at his home No engineman who takes his rest in such a manner as Engineman Miller did while performing this double duty can be in proper physical or mental condition to perform the exacting service required of an engineman on a high-speed passenger train Officers directly in charge should have kept sufficiently close watch over an engineman performing such service to know absolutely whether or not he was securing proper rest

Conductor Adams was a man of long experience It was his first duty when his train came to a stop to know that it was properly protected This duty was flagrantly neglected His evident lack of confidence in Flagman Murray, as well as the fact that he had previously called attention to his failure properly to flag, should have prompted him to make certain that Murray was protecting the train Conductor Adams was well aware that first No 95 was closely following his train, it was a serious error, amounting to dereliction of duty, for him to stop his train after it had started and to have the flagman recalled

While this accident was directly due to failure of employees properly to perform their duties, the signal system in use was entirely inadequate safely to direct and govern the movement of the large volume of traffic over this line and there was a deplorable lack of supervision on the part of operating officers, on this account the conditions which led up to this accident were possible Unless railroad officers know that employees are fully acquainted with the rules and qualified to perform the duties required of them, and by proper supervision and discipline insure that safe methods and practices are required to be followed and that the rules are properly lived up to under all conditions, they can not evade their share of responsibility for the occurrence of accidents of this character

General Manager Dean, of the Pullman Co, presented a table showing steel Pullman equipment in use on the railroads of the United States, and stated that the average number of cars operated by that company during the year ending July 31, 1913, was 5,953 Of this number 1,882 were of the all-steel type and 404 were of the steel-underframe type, in other words, of the total number of Pullman cars used 38 4 per cent were of steel or steel-underframe construction

In January, 1913, when the contract between the Pullman Co and the New Haven Railroad became effective, there were no steel or steel-underframe cars among the 256 cars purchased by the Pullman Co from the New Haven Railroad Forty of these cars were retired and have not since been placed in service, 216 cars had since been operated by the Pullman Co on the New Haven Railroad, and of that number, on September 1, 1913, 103 were of steel or steel-underframe construction, in other words, 47 6 per cent of the entire Pullman equipment on the New Haven Railroad on the 1st of September was of the steel or steel-underframe types Mr Dean stated that the capacity of the Pullman plant was 4 coaches or miscellaneous passenger-train cars and 2 Pullman cars per day He stated that on September 1, 1913, the Pullman Co had orders for 732 passenger-train cars, 705 of which called for all-steel cars and 27 for steel-underframe cars, there were on that date no orders for wooden cars

In addition to the work of constructing new steel and steel underframe cars, the Pullman Co has been engaged in applying steel underframes and steel ends to the highest grade of wooden cars which it is impossible at once to replace with steel cars, about 400 cars had been so reconstructed and 112 were in the shops for that purpose Mr Dean said that the Pullman Co had discontinued entirely the building of steel underframe cars and was building all-steel cars for its own use

Mr Dean stated that the first all-steel Pullman cars were completed in February, 1910 He stated that the all-steeel car was unquestionably stronger than cars of other types, and with the all-steel car properly reinforced at the end it is the most advanced type of car manufactured at the present time In his opinion, the steel underframe car having wooden posts was not as strong or as safe as the all-steel car with steel posts, due to danger in collision of a car overriding the steel underframe and telescoping the car body

The following information was furnished by Mr Dean as to the annual maximum capacity of the various car-building plants in the country, based upon being able to secure an adequate supply of the necessary material and labor

American Car & Foundry Co		
Jeffersonville plant	300	
St Charles	480	
Berwick	600	
Wilmington	300	
		1,680
Standard Steel Car Co, all plants		420
Pressed Steel Car Co		360
Barney & Smith		420
Harlan & Hollingsworth Corporation		250
Wasson Car Co		180
Laconia		120
The Pullman Co		
Passenger equipment	1,200	
Pullman cars	600	
		1,800
Total		5,230

The cars composing the equipment of both these trains were constructed of wood, with the exception of one car, which had a steel underframe The greater factor of safety provided by cars of steel construction over those of wooden construction has been discussed in previous accident-investigation reports It is interesting, however, to note the contrast between the condition of the wooden cars involved in this accident and the steel cars involved in a similar collision which occurred on the Pennsylvania Railroad at Tyrone, Pa, on July 30, 1913 In each case the speed of the approaching

train is thought to have been about 40 miles per hour In the Tyrone accident the train which was struck had just started from the station but had moved only about one car length, while in this accident the train which was struck was standing still In this accident the rear two cars were completely demolished, the third car badly damaged, and 21 passengers killed In the Tyrone accident, however, none of the cars was destroyed, although several were quite badly damaged on the ends, and none of the passengers was killed The shock of the collision was absorbed by the crushing of the platforms and vestibules

The total number of passenger cars operated on December 31, 1912, by 247 railroads operating 227,754 miles of track in the United States was 57,493, of which 46,926 were of wood, the remainder being of steel or of steel underframe construction

The following table gives in detail the number and kind of construction of cars operated on December 31, 1912, as well as those under construction or contracted for on that date

Number of passenger equipment cars operated	Number roads	In service Dec 31, 1912				Under construction or contracted for but not yet received on Dec 31, 1912			
		Steel	Steel underframe	Wood	Total	Steel	Steel underframe	Wood	Total
1 to 50	147	33	160	1,905		14	6	19	
51 to 100	23	103	136	1,203		16	18	6	
101 to 200	21	100	190	2 337		14	1		
201 to 500	23	391	380	6,250		281	6	1	
501 and upward	33	6,644	2,430	35,222		1,080	159	28	
Total	247	7,271	3,296	46,926	57 493	1 405	190	54	1,649
Sections									
New England	9	32	121	5,468		115	8	20	
East	78	3,153	1,060	16,021		380	72	13	
Southeast	54	75	582	4,901		135	81	16	
Northwest	30	315	51	3,643		98	2		
Southwest	35	328	265	3,283		73	5	4	
West	40	2,039	1,032	8,982		318	22	1	
Sleeping Car Co 's	1	1,320	185	4,648		276			
Total	247	7,271	3,296	46,926	57,493	1,405	190	54	1,649
Classes of equipment									
Postal		570	209	680		128			
Mail and baggage		274	275	2,724		137	13	1	
Mail, baggage, and passenger		32	30	679		22	10	3	
Baggage and passenger		281	144	3,757		63	16		
Baggage or express		854	881	7,431		121	43	32	
Passenger		2,801	1,323	23,692		432	97	11	
Parlor, sleeping, and dining		1,707	338	6,864		384	9	4	
Business		11	58	774		4	2	1	
Motor		741	38	325		114		2	
Total		7,271	3,296	46,926	57,493	1,405	190	54	1,649

General Passenger Agent Smith stated that six club cars are operated for the exclusive use of the members of clubs, running between New York and certain stations along the New Haven railroad These cars are somewhat similar to the Pullman car equipment and

are chartered by the clubs, which paid $3,000 a year for each car in addition to the transportation of the club members who use them None of these cars are used for any other service, they run from the stations at which the clubs are located to New York in the morning and returned in the evening, lying idle during the remainder of the day, and, as a rule, are in use not exceeding two or three hours per day About a year ago the question of steel cars for this service was taken up, and it was arranged to provide steel cars, the rate for each car, in addition to transportation, being increased to $4,000 per year These cars have been ordered for delivery about January 1, 1914 No passengers other than members of the clubs for which the six cars are provided are permitted to ride in them

The investigation of this accident justifies the following observations and conclusions

The recurrence of disastrous accidents on this railroad and the large numbers of deaths and injuries resulting therefrom makes advisable a less narrow treatment of the whole subject than that followed in mere inquests or in the ordinary official investigation of a train accident

This commission has heretofore expressed in strong terms its condemnation of the management of this railroad

In the "New England investigation" report of this commission (June 20, 1913), in the concurring report it was said

> If it were properly to be considered here, however, we would give weight to the suggestion that the merger has so overloaded the executive heads of the entire aggregation as to impair not only the correct and economical financial administration, but also the efficiency and safety of operation This suggestion is not based on a consideration of mileage, but of the complexity of the New England railroads and of the necessity of these railroads for close and intensive superintendence (27 I C C at p 617)

In reports by this commission of the investigation of previous accidents on this railroad, defects of management, neglect of obvious precautions for safety, ineffective rules and these not systematically enforced, high-speed trains closely following one another without adequate safeguards, dereliction of duty on the part of certain employees, as well as a general weakness of discipline, have been denounced and condemned

It is astounding that this state of affairs is allowed to continue to exist

The directors of this railroad as shown in Poor's Manual for 1912 were

William Rockefeller, New York, N Y
J Pierpont Morgan, New York, N Y
George Macculloch Miller, New York N Y
Lewis Cass Ledyard, New York, N Y
Charles M Pratt, New York, N Y

George F Baker, New York, N Y
Nathaniel Thayer, Boston, Mass
Amory A Lawrence, Boston, Mass
Alexander Cochrane, Boston, Mass
Charles F Brooker, Ansonia, Conn
George J Brush, New Haven, Conn
Charles S Mellen, New Haven, Conn
James S Hemingway, New Haven, Conn
A Heaton Robertson, New Haven, Conn
Frederick F Brewster, New Haven, Conn
I De Ver Warner, Bridgeport, Conn
Edwin Milner, Moosup, Conn
William Skinner, Holyoke, Mass
D Newton Barney, Farmington, Conn
Robert W Taft, Providence, R I
James S Elton, Waterbury, Conn
James McCrea, Philadelphia, Pa
Thomas De Witt Cuyler, Philadelphia, Pa
Henry K McHarg, Stamford, Conn
John L Billard, Meriden, Conn
F F Maxwell, Rockville, Conn
Edward Milligan, Hartford, Conn

The manual for 1913 shows the same list with the exception that the names of Nathaniel Thayer, Amory A Lawrence, George J Brush, and James McCrea do not appear, and the following names have been added

T N Vail, Boston, Mass
S W Winslow, Boston, Mass
A S May, Bridgeport, Conn
Samuel Rea, Philadelphia, Pa

On this directorate were and are men whom the confiding public recognize as magicians in the art of finance and wizards in the construction, operation, and consolidation of great systems of railroads The public therefore rested secure that with the knowledge of the railroad art possessed by such men investments and travel should both be safe Experience has shown that this reliance of the public was not justified as to either finance or safety

In view of the focusing of public attention upon the question of safety in the operation of this railroad, and in view of the frequent governmental inquiries, both National and State, as to the causes of and remedies for the frequent disastrous accidents, it would seem as if the directors themselves would feel called upon to turn from the consideration of the financial questions in which this road is involved and for a time at least give the benefit of their consideration and judgment to the question of safety

But the directors do not seem to have acted upon the subject until October 17, 1912, which was after the Westport wreck, which followed that at Bridgeport in July, 1911 They then voted that the

president "should make the most searching investigation into the competency of engineers employed by the road," and "that nothing be left undone which, in the judgment of himself and his associates, will conduce to greater safety in the operation of the railroad, and that there shall be no limitation placed upon the installation of signals, safety appliances, or anything else which will in his judgment or that of his associates improve the safety of passenger travel upon this company's lines" The president was never apparently called upon, nor was any other official of the railroad, to present to the directors any result of such searching investigation as had been authorized, or to get any information as to what particular action had been or was to be taken to "conduce to greater safety"

The directors assumed to dispose of their whole responsibility on this subject by a vote depositing it in bulk upon the president, and thereafter, as far as appears from the records, made no further inquiry and took no further action, although in quick succession these disasters continued

This typifies the whole situation They assumed the vote was self-enforcing

The president, general manager, and superintendents issued orders that all rules should be obeyed, and that employees should take all precautions for safety

But no intelligent system was devised by which to ascertain when rules were disobeyed

Rules were disobeyed largely, and only a small proportion of these violations was made the subject matter of reports to officials

Of some of the rules, as has recently been said by the general manager of this railroad when he issued new ones in their place, there had been "convincing demonstration" of their inadequacy

Dereliction of duty by those who are charged with the making and with the enforcement of safety regulations can not fail to weaken respect for all rules and to render nugatory to a large extent all efforts to maintain effective discipline Rules that are not intended to be enforced have no proper place in a railroad company's code of regulations, and when the operating officers of a railroad permit rules which have been established to secure safety to be violated with impunity, they can not reasonably expect to escape responsibility for the consequences of such violations

"Man failure" in this case began high up in official authority, and it was not an unnatural sequence that it reached down to those in positions lower in official rank, but still weighted with great responsibility

Discipline was weak and ineffective, certainly a fault of the management

Rules were inefficient, a fault of the higher officials

Rules were inadequately enforced, the blame for which must be charged to the officials And while all this was true, high speed was required And this high speed was required over the section of road where this accident occurred, while there were in use antiquated signals which were condemned by the locomotive enginemen as well as by the public service commission of Connecticut

There was an imperative call arising from the density of traffic and complex operating conditions on this railroad for close and intensive superintendence This call was unanswered until after the public hearing in this case

The proper spacing of the trains was a matter for which not the train employees but the management of the railroad was responsible

It is not necessary here to attempt to outline the technical rule of law governing the obligation of directors as trustees for the corporation, for the aggregate body of their stockholders, and for the public Suffice it to say that there can be little doubt that this legal obligation is more stringent than seems to be the generally accepted belief of many men of large fortunes who occupy many positions of this character

The rule is that where a corporation is handling agencies dangerous to life, its directors are required to exercise such reasonable supervision over the management of their company's business as will result in the observance of the utmost care on the part of subordinates Directors by law are not mere figureheads, nor are their duties confined to the mere direction of the finances of a corporation Their duties are such that mere delegation of them, if they are not in fact performed, does not satisfy the legal obligation unless there has been ordinary business care and diligence in supervision

The duty of safeguarding against the hazards inhering in this business can not be divested from themselves by a mere vote delegating it upon another unless there is an exercise of the legal standard of care and diligence in supervision to ascertain and know that it is performed

When public calamities call their attention to the nonperformance of the duty of safeguarding this enterprise, where governmental authorities call public attention to the necessity of further safeguards, it seems some further action by the directors of a railroad upon which such calamities are recurring is called for than a formal reaffirmation of a vote delegating the whole safety question to one official

The safety problem of this railroad is primarily a question for itself If governmental interference and action is called for it results from the inaction of the corporation itself The Government, through the enactment of legislation by Congress, has the power, if

this railroad will not itself exercise its own authority in the premises, to compel the safeguarding of traffic over this line

By what we have said with respect to the duty of supervision resting upon the directors and the duty of managing officials to provide for the safeguarding of traffic we do not mean to palliate in any degree the disobedience of rules by the trainmen and enginemen hereinbefore named and commented on When employees undertake the dangerous employment of railroading it is their duty to familiarize themselves with all the operating rules Disobedience of these rules where they are specifically applicable carries with it full responsibility for consequences

It can not be too strongly impressed upon railroad employees that they are most strictly bound to comply with all safety rules provided by the railroad for their guidance No matter how many contributing causes there may be for which others may properly be held answerable, the direct and proximate cause of this disaster was the failure of those members of these train crews before referred to to obey rules and to exercise the degree of care under the circumstances which was commensurate with the grave responsibilty resting upon them at the time

Our reference to the management of this railroad in the past of course, has no application to the new president, who was confronted with this accident on the day he took charge Presumably he was selected because of his ability and fitness as a railroad manager It is to be hoped that he may be permitted to devote himself primarily to the problems of safety of operation which this railroad management is now under the highest compulsion of duty and humanity properly to solve

The Congress has made it the duty of this Commission to investigate and report upon railway accidents and to make such recommendations as circumstances may require, but there has been no legislation by which such recommendations may be enforced It is manifest that so long as compliance with the Commission's recommendations remains discretionary the entire subject of safety of operation must remain dependent only upon the carrier's volition The ignoring in whole or in part by carriers of such recommendations and the resulting fatalities potently argue that safety of operation should not be left entirely to the discretion of any railroad, but, in the light of recent disasters, would seem to be a subject over which the Congress well might exercise its full authority, including the fixing of some definite time within which all high-speed passenger trains shall be required to be made up exclusively of all-steel cars Such recommendations as the Commission may deem proper in these premises will be submitted to the Congress in the Commission's forthcoming annual report

The density of traffic on this railroad requires an adequate block-signal system, and until the system now being installed between Springfield and New Haven is available for use an adequate method of providing a proper space interval between trains should forthwith be placed in operation

Definite instructions should be issued to enginemen and trainmen to approach signals in weather so foggy or stormy as to obscure in any degree the clear view of signals with train under full control Such instructions should also be enforced

An adequate system of superintendence and supervision should be immediately arranged which will give those in authority definite and positive information as to whether or not the safety requirements and rules of this railroad are observed

By the Commission

[SEAL] GEORGE B MCGINTY,
Secretary

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