

INTERSTATE COMMERCE COMMISSION.

**REPORT OF THE CHIEF OF THE BUREAU OF SAFETY COVERING
THE INVESTIGATION OF AN ACCIDENT WHICH OCCURRED ON
THE BALTIMORE & OHIO RAILROAD NEAR NORTH VERNON,
IND., ON DECEMBER 29, 1917.**

FEBRUARY 7, 1918

To the Commission:

On December 29, 1917, there was a head-end collision between two passenger trains on the Baltimore & Ohio Railroad near North Vernon, Ind., which resulted in the death of 1 passenger and 7 employees and injury to 40 passengers, 4 employees, and 9 other persons. After investigation as to the nature and cause of this accident, I beg to submit the following report.

The accident occurred on the Cincinnati subdivision of the Indiana division, about 1 mile east of North Vernon, Ind. This portion of the division is a single-track line over which train movements are governed by time-table, train orders, and an automatic block-signal system.

The signals are upper-quadrant, normal clear, three-position, electric-motor semaphores, employing direct current for both track circuits and signal operating circuits, and are controlled by polarized line relays. The signal mechanisms are of the top-post type, and pole changers used in connection with the polarized relays are operated by the signal mechanisms. The signals on this line are installed and operated under a system of traffic-direction blocking, by means of which for opposing movements protection is provided from one passing siding to another, together with an overlapping section, while for train movements in the same direction the signals are arranged to provide a shorter block length, one stop and one caution signal being maintained behind each train. The signals located at the outlets of passing sidings have square-end semaphores and are "stop and stay" signals. Intermediate signals have pointed-end semaphores, and a train receiving a stop indication of one of these signals may, after stopping, proceed under the protection of a flag. The night color indications employed are red, yellow, and green for stop, caution, and proceed, respectively. The stop and stay signals have two arms, the bottom arm being fixed and having a red light at night.

In normal operation, when a train approaching North Vernon from the east passes Oakdale and enters upon a track circuit beginning 2,215 feet east of the Oakdale passing track switch at the west end of the siding, approximately 3 miles from North Vernon, the eastbound signal at the eastern end of North Vernon passing track, located about half a mile east of North Vernon station and known as signal E71-28, is set in the stop position. The movement of signal E71-28 to the stop position operates the pole-changer controlling the relay, which in turn controls signal E72-05, located near the end of North Vernon station platform, causing that signal to assume the caution position. At the same time, when the relay controlling signal E71-28 opens, a tower indicator in the office at North Vernon is operated, and that in turn causes a bell annunciator to sound, the indicator and the bell indicating the approach of a westbound train.

North Vernon is a register station and a scheduled stop for all trains. It is the practice to register trains by register slips delivered to the operator. Time-table rule No 23 provides that "Between telegraph offices Dearborn and Cochran and Milan and North Vernon superiority of trains may be restricted by 19 order," automatic-block signals being used on the lines designated.

The accident occurred near the middle of a tangent 187 feet long connecting two curves. Beginning at the telegraph office at North Vernon and approaching this tangent from the west, the track is practically straight for 2,532 feet; there is then a 4-degree curve to the left 1,932 feet in length, including easement curves at each end; then a tangent 444 feet in length, and then a 2-degree curve to the left 783 feet in length, including easement curves at each end, the one on the east end reaching to the tangent on which the collision took place. Approaching the point of accident from the east beginning at a point about 1 mile therefrom, there is a 4-degree curve to the right 1,675 feet in length, including easements at each end; a compound curve to the left, 1,657 feet in length varying in curvature from 1 degree 9 minutes to 4 degrees; a tangent 1,127 feet in length, and then a 4-degree curve to the left 1,877 feet in length, including easement curves at each end, the one on the west end extending to the tangent on which the accident occurred. Approaching from both directions, the enginemen involved in this accident were on the outside of the curves described on each side of the point of accident, and when approximately 10 car lengths from the point of accident the westbound train came out of a deep cut which obstructed the view from the eastbound train. Illustration No 1 is a view eastward from the point of accident.

Approaching the scene of the accident from North Vernon, there is a descending grade of approximately 1 per cent for a distance of

3,000 feet; then the grade is slightly ascending for a distance of 1,200 feet, and then approximately 1 per cent ascending for about 1,000 feet to the point of accident. Beginning at Oakdale and proceeding toward the scene of the accident, there is a descending grade for practically the entire distance, the maximum gradient being 1 per cent. At the point of accident the track is on a fill of 12 or 15 feet. The weather at the time was clear.

On the date of the accident eastbound passenger train No 2, consisting of locomotive 2128, 1 baggage and mail car, 1 passenger and baggage car, 1 coach, 1 sleeper, 1 dining car, and 1 parlor car, in charge of Conductor Shaner and Engineman Day, was received on the Indiana division at Washington, Ind., at 4 40 p. m., 44 minutes late, and at 7.04 p. m. arrived at North Vernon, 98 miles from Washington. At this point the crew received train order 142, on Form 19, reading as follows:

Second 2nd No twenty three 23 engi 1428 has right over No two 2 No sixty eight 68 and No forty six 46 engines 2128 1420 and 1448 Milan to North Vernon

In addition to order 142 the crew received five other Form 19 orders, one of them directing train No 2 to run 30 minutes late from North Vernon to Milan and the others containing information relative to cars on passing sidings. As the station stop at North Vernon is made some distance east of the telegraph office, the operator on duty, in accordance with his usual practice, placed two copies of these orders on a hoop and handed them on to Conductor Shaner as he passed the office. After train No 2 came to a stop, Conductor Shaner separated the two copies of orders and walked ahead and delivered one set to the engineman, but failed to read the orders before leaving North Vernon. According to the train sheet and testimony, this train left North Vernon at 7 12 p. m., 51 minutes late, the engine crew failing to obey the stop indication displayed by stop-and-stay signal E71-28 at the east end of the North Vernon passing siding, and while running at a speed estimated at about 40 miles an hour the train collided with westbound passenger train second No 23, about 1 mile east of North Vernon.

Westbound passenger train second No 23 consisted of locomotive 1428, one baggage car, two coaches, one sleeping car and one dining car, and was in charge of Conductor McEvilly and Engineman French. This train left Grand Central Station, Cincinnati, at 4 35 p. m., and at Milan received train order 142, previously quoted. Train second No 23 passed Nebraska, Ind., the last open telegraph office east of North Vernon and 10 miles distant therefrom, at 6 55 p. m., and at 7.15 p. m., while running at a speed estimated at about 20 or 25 miles an hour, collided with train No 2.

Both engines went off on the north side of the track, and were reversed in direction, they were entirely stripped of machinery, both boilers were torn loose and the frames and wheels were piled in a mass of wreckage. The tenders of both trains came to rest on the south side of the track, crushed between the mail car of train No 2 and the baggage car of train 2d No 23. Illustration No 2 is a view of the damaged locomotives. The baggage car of train 2d No. 23, which was an all-steel car, was telescoped by the tender for approximately a third of its length, but none of the other cars in this train was materially damaged and none of them was derailed. The combination mail and baggage car of train No 2, a steel car, was practically destroyed. The combination coach and baggage car, a wooden car with steel underframe, was telescoped under the all-steel mail car for approximately two-thirds of its length. The other cars in train No 2 were not seriously damaged and were not derailed. Illustration No 3 is a view of the wreckage on the south side of the track, while illustration No 4 shows a general view of the wreckage after the track had been cleared.

The enginemen and firemen of both trains were killed in the accident.

Operator Watkins, on duty at North Vernon, stated that as train No 2 passed his telegraph office at 7 05 on the night of the accident, he delivered to the conductor by means of a train order hoop six train orders, which included Order 142 giving train 2d No 23 right of track over train No 2 from Milan to North Vernon. The train came to a stop a short distance east of the telegraph office and west of signal E72-05, located at the east end of the station platform. Operator Watkins stated that he then went back into the telegraph office and upon looking out of the window saw signal E72-05 in the clear position, at about 7 09 or 7 10 p m, before train No 2 had moved, the annunciator sounded and the indicator indicating the approach of a train from the east dropped, then upon looking out of the window again he saw that signal E72-05 was in the caution position. He stated that he made particular note of these conditions for the reason that the dispatcher had been asking him if train 2d No 23 was there yet, and as soon as he could get the dispatcher on the wire, he reported that train 2d No 23 was getting close. He stated further that train No 2 departed from his station at 7 12 p m and he thought it was going down to the east end of the passing siding and would wait for train 2d No 23 there.

Conductor Shaner was so seriously injured in collision that he was unable to attend the hearing held in connection with the investigation of this accident. However, it is understood from the statements of other persons, that after train No 2 came to a stop just east of the telegraph office at North Vernon, he separated the

two sets of orders which he had received from Operator Watkins, walked ahead and delivered one set to Engineman Day. Subsequent to the accident he stated that he did not read these orders before leaving North Vernon, but that at the time of the accident he was in the baggage car with the baggageman and head brakeman reading the orders

Sandwich Venders V C Kutchback and Herbert Kutchback, who do business on the trains at North Vernon, stated that while train No 2 was standing at that point they noticed the signal at the east end of the platform in the caution position. The former stated that he made a remark concerning it to Head Brakeman Kempton; he was sure that Brakeman Kempton heard this remark, and although he made no reply, he looked up toward the head end of the train. Herbert Kutchback stated that he said to Brakeman Kempton, "There must be something in the block," and that Brakeman Kempton replied that it must be the accommodation from the east.

Engineman Smith, who was deadheading on train No 2, stated that he also noticed signal E72-05 in the caution position when the train left North Vernon.

In view of the polar relay control of this signal, the statements of the sandwich venders, Engineman Smith and Operator Watkins that it was in the caution position are conclusive evidence that signal E71-28, at the east end of the passing siding, was in the stop position.

Shortly after the accident, all of the signal apparatus in any way involved in the accident was locked and sealed by Signal Supervisor Prinn and Signal Repairman Sheets and the seals were not broken until January 1 when representatives of the Commission were present. When the track had been cleared of the wreckage, three rails replaced and bonded, and broken line wires connected up, the signals operated properly and continued to operate properly without any repairs or adjustments. Inspections and tests of the signal apparatus were made on January 1 and 2 and these also demonstrated that the signals were in proper operating condition. The condition of the stick relays employed in the control circuits between Oakdale and North Vernon also indicated that westbound train 2d No 23 entered the block between Oakdale and North Vernon passing sidings before train No. 2 left North Vernon.

This accident was caused by the failure of the crew in charge of train No 2 to read and be governed by train order 142, giving train 2d No 23 right over their train from Milan to North Vernon, and further by the failure of Engineman Day of train No. 2 to observe and obey stop indication of an automatic block signal.

No possible explanation can be advanced for overlooking the order referred to. It was received at North Vernon, and the train

remained at the station for a period of 7 minutes afterwards. Conductor Shaner's statement that he did not read the orders before leaving North Vernon is an admission of negligence and culpability. As previously stated, Conductor Shaner was seriously injured in the accident, and at the time of the investigation his condition was such that he could not be interviewed or questioned. It is understood, however, from statements made by him shortly after the accident that Engineman Day did not read the orders in his presence, although he no doubt had ample opportunity to do so afterwards and before leaving North Vernon. Any attempt to account for the failure of Engineman Day and Fireman Matthews, both of whom were killed in the collision, to observe the stop indication of signal E71-28 at the east end of the North Vernon passing siding would be based merely upon conjecture.

Head Brakeman Kempton of train No 2, who was killed in the accident, is also considered negligent in that he knew that signal E72-05 was in the caution position, and expressed the opinion to the sandwich vendors that this was due to a westbound train in the block, yet he failed to take any action to prevent the train from proceeding beyond signal E71-28.

This accident was due entirely to the failure of employees properly to perform their duty. It seems almost incredible that an experienced conductor would leave a station without reading his orders as Conductor Shaner did in this instance, or that Engineman Day would overlook both order and signal. The block-signal system provided for the protection of traffic on this line is complete, adequate, and well maintained, and had its indications been obeyed this accident would not have occurred, notwithstanding the failure of Conductor Shaner and Engineman Day to read their orders before leaving North Vernon.

The facts brought out by the investigation of this collision emphasize the conclusions, often reiterated in previous reports, that accidents of this nature can only be prevented by the use of devices that will automatically assume control of a train and bring it to a stop within the zone of safety whenever an engineman fails properly to obey a danger signal indication. Engineman Day was a man of long experience and good record. He was thoroughly familiar with the road and with the operating conditions and rules affecting the movement of his train. Why he absolutely disregarded the warning given him by both the caution and the stop signals will, of course, never be known; it is known, however, that he *did* disregard them, the result being this very regrettable accident. This accident again calls attention to the fact that the most perfect system of block signals can not insure against the failure of the man. Such a system is only effective when its indications are observed and obeyed.

To provide against nonobservance or disobedience of signal indications, the installation of automatic train-control devices is essential.

It will be noted that as a result of this collision there was but one fatality among the passengers, and while there were 40 passengers injured, the absence of more fatalities and more serious injuries was undoubtedly due to the use of steel and steel-underframe cars in the trains involved.

All of the men involved in this accident were experienced men with good records. The engine crew of train No. 2 had been on duty 3 hours and 29 minutes after a period off duty of 31 hours and 45 minutes, and the train crew had been on duty 8 hours and 14 minutes after a period off duty of 12 hours and 20 minutes

Respectfully submitted

H. W. BELNAP,
Chief, Bureau of Safety.

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ILLUSTRATION NO 1—VIEW EASTWARD FROM POINT OF ACCIDENT



ILLUSTRATION NO 2—VIEW OF DAMAGED LOCOMOTIVES

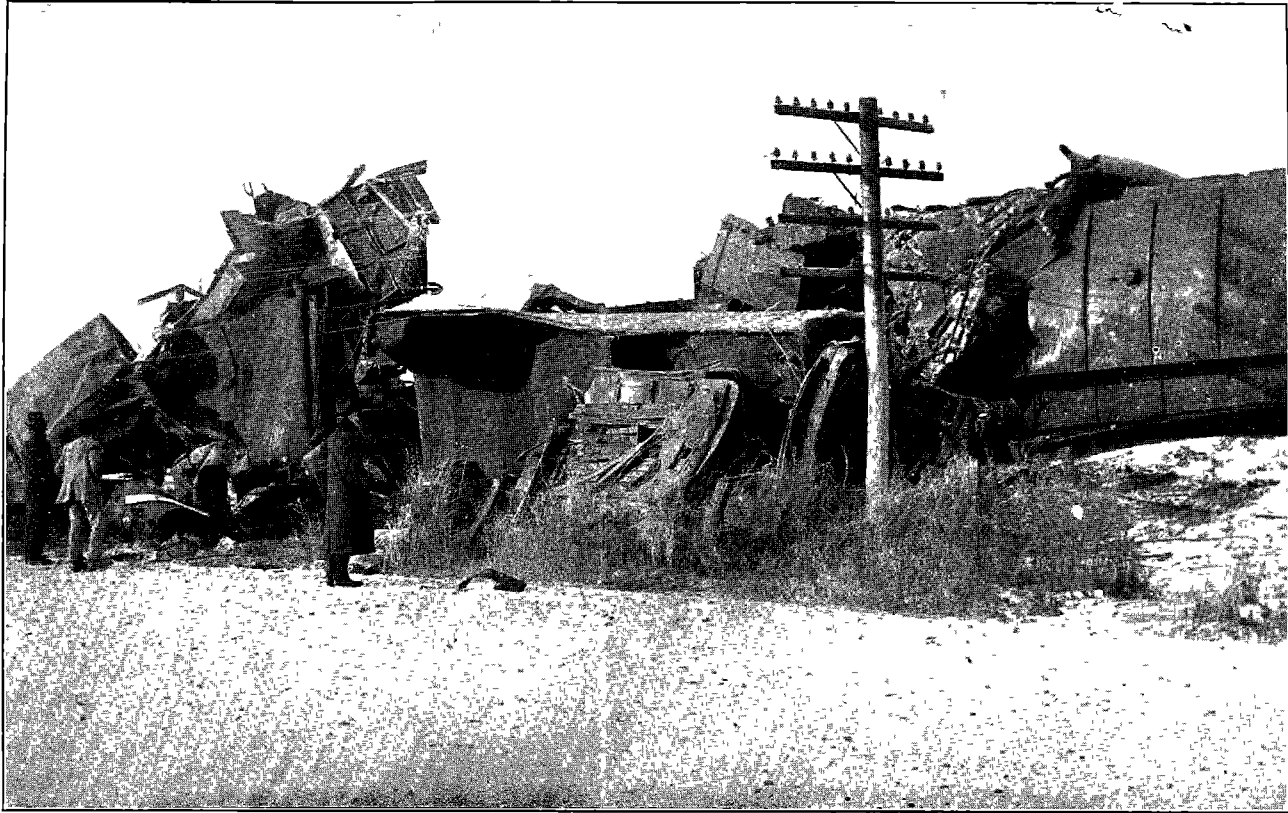


ILLUSTRATION NO 3—VIEW OF WRECKAGE ON SOUTH SIDE OF TRACK



ILLUSTRATION NO 4—VIEW OF WRECKAGE AFTER TRACK WAS CLEARED