

INTERSTATE COMMERCE COMMISSION

REPORT OF THE DIRECTOR OF THE BUREAU OF SAFETY IN RE INVESTIGATION OF AN ACCIDENT WHICH OCCURRED ON THE LINE OF THE UNION TRACTION COMPANY OF INDIANA NEAR INGALLS, IND , ON FEBRUARY 2, 1924

MARCH 10, 1924

To the Commission

On February 2, 1924, there was a head-end collision between two passenger trains on the line of the Union Traction Company of Indiana near Ingalls, Ind , which resulted in the known death of 16 passengers and the injury of 35 passengers and 1 employee. The investigation of this accident was made in conjunction with the Public Service Commission of Indiana.

LOCATION AND METHOD OF OPERATION

This accident occurred on the Anderson Division, which extends between Muncie and Indianapolis, Ind , a distance of 56.52 miles, in the vicinity of the point of accident this is a single-track line over which trains are operated by time-table, train orders, and an automatic block-signal system. This block-signal system, however, was not in operation in this vicinity at the time of the occurrence of this accident, having been taken out of service by notice No. 122, dated December 27, 1923, it was restored to service by notice No. 19, dated February 6, 1924.

Scheduled trains have fixed time-table meeting points with opposing scheduled trains, if the opposing train has not arrived at a meeting point the crew is required to communicate with the dispatcher by telephone, superiority of trains is not conferred by direction. While duplicating machines for the taking of train orders are in some of the telephone booths, at the time of the accident the usual practice was for conductors to carry order pads with them, orders are made in duplicate, one copy being retained by the conductor and one to be given the motorman, should there be more than one car in the train the conductor of the first car is supposed to show his copy of the order to the conductor of the trailer car. Orders are all made on a special form, Forms 19 and 31 not being used. At the bottom of the order blank there is a space for the insertion of the dispatcher's order number. The dispatcher numbers his orders consecutively each day, and these are the numbers used in this

report in referring to the various train orders involved. Under the rules of this company, train orders are not required to be issued simultaneously to the trains addressed.

The stations mentioned in this report and their location are as follows:

Stations	Miles from Indianapolis	Stations	Miles from Indianapolis
Long	6 05	Pendleton	20.56
Lawrence	10 50	Goul	31 14
Bucy	19 22	Belt	36 70
Portville	21 94	Anderson	38 14
Mui	22 35	Anderson Junction	38 65
Dent	23 41	House	42 10
Ingalls	24 80		

The point of accident was about 3,800 feet west of Ingalls, approaching from the west beginning at the middle of the siding at Dent, there are about 2,000 feet of tangent and a curve of 1° to the left, which is about 400 feet in length, followed by about 1,000 feet of tangent extending to the point of accident. Approaching from the east there are about 2,000 feet of tangent, and a curve of 1° to the left, about 300 feet in length, followed by about 150 feet of tangent extending to the point of accident. The grade from each direction is ascending and then slightly descending practically to the point of accident. The view approaching from either direction is materially obscured by houses, shrubbery, and a pole line on the south side of the track, from a point 600 or 700 feet east of the point of accident it is practically impossible to see a one-car train located about the same distance west of the point of accident.

The weather was cloudy at the time of the accident which occurred at about 4 12 p m.

DESCRIPTION

The trains involved were eastbound train No 24 and westbound train No 21, which, according to the time-table, meet at Mui at 3 50 p m.

Train No 24 consisted of motor car 286 and trailer 305, in charge of Motorman Flinn and Conductors Sawyer and Campbell. Both cars were of wooden construction, with underframes reinforced with steel. Train No 24 left Indianapolis at 3 17 p m 17 minutes late, and at Lawrence the crew received a copy of train order No 45, directing them to meet a train at Goul. This order had been taken for the crew of train No 24 by the conductor of train No 917, a local train which had a time-table meet with train No 24 at Lawrence and was standing at Lawrence when train No 24 arrived. The dispatcher and crew of train No 917 said the order was to meet

train No 23, which was following train No 21, but the crew of train No 24 said the order was to meet train No 21, and after departing from Lawrence at 3 50 p m, two minutes after the order had been made complete to the conductor of train No 917, they



FIG No 1—View of point of accident from first curve west thereof

therefore operated then train past Mu, then time-table meeting point with train No 21, without stopping, passed Dent, and collided with train No 21 while traveling at a speed estimated to have been at least 20 miles an hour

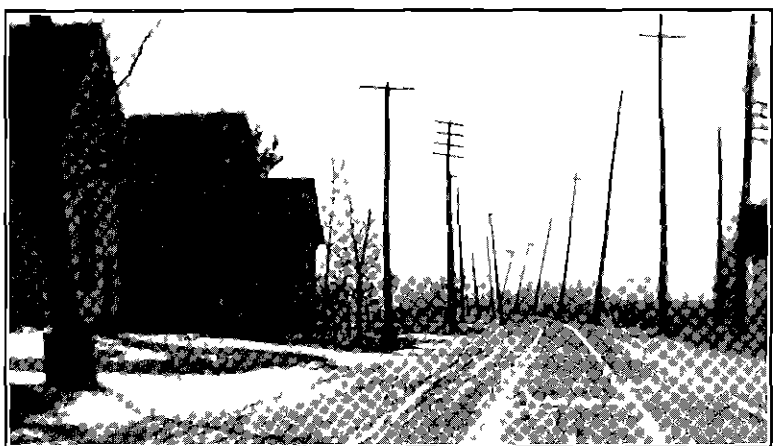


FIG No 2—Approaching from east point of accident just beyond curve there is a one car train a short distance beyond point of accident obscured by pole line

Train No 21 consisted of motor car 276 and trailer 306, in charge of Motorman Anthony and Conductors Mitchell and Engle Both cars were of wooden construction, with underframes reinforced with

steel Train No 21 left Anderson at 3 33 p m, 18 minutes late, and at Pendleton the crew received train order No 46, providing in part for a meet with train No 24 at Dent This order was made complete at 4 03 p m, and the train proceeded to Ingalls, from which point it departed at 4 11 p m, 27 minutes late, and collided with train No 24 between Ingalls and Dent while traveling at a speed estimated to have been about 15 miles an hour

The motor car of train No 21 was telescoped by the motor car of train No 24 a distance of about 15 feet Fire broke out a few minutes after the occurrence of the accident and destroyed both motor cars and the trailer of train No 21, and many of the passengers were burned, it was impossible at the time of this investigation to say definitely how many lives were lost

SUMMARY OF EVIDENCE

Trains Nos 24 and 21 were approximately the same number of minutes late in departing from Indianapolis and Anderson, respectively, and it therefore appeared that it was not then necessary to issue any orders changing their time-table meeting point at Muir Train No 21 was delayed en route, however, and when it became apparent it could not reach Muir in time for the schedule meet with train No 24 Conductor Mitchell called the dispatcher, who issued train order No 46, intending to issue this order also to train No 24 when that train stopped at Muir Train No 21 was approaching Dent and had reached a highway crossing which is approximately 400 feet east of the point of accident when Motorman Anthony saw train No 24 approaching He said power was not then being used, on account of this road crossing being considered a dangerous point, and he at once applied the air brakes in emergency, opened the Sanders, and later reversed the motor, after which he jumped Conductor Mitchell said he had been collecting fares and was just starting for the head end of the motor car when he felt the air brakes being applied in emergency, followed in a few seconds by the shock of the collision He said the speed had been about 25 miles an hour, and he thought the motorman had begun to increase speed just prior to the time the emergency application was made

Motorman Anthony's copy of the order to meet train No 24 at Dent was on the train number sign box, which is directly in front of the motorman, and was destroyed in the fire, while Conductor Mitchell said his orders were in his grip, and that when he returned from Ingalls after reporting the accident he obtained his grip, which was then in possession of some linemen at the point of accident, and returned to Ingalls, where Inspector Gibbens, of the Public Service

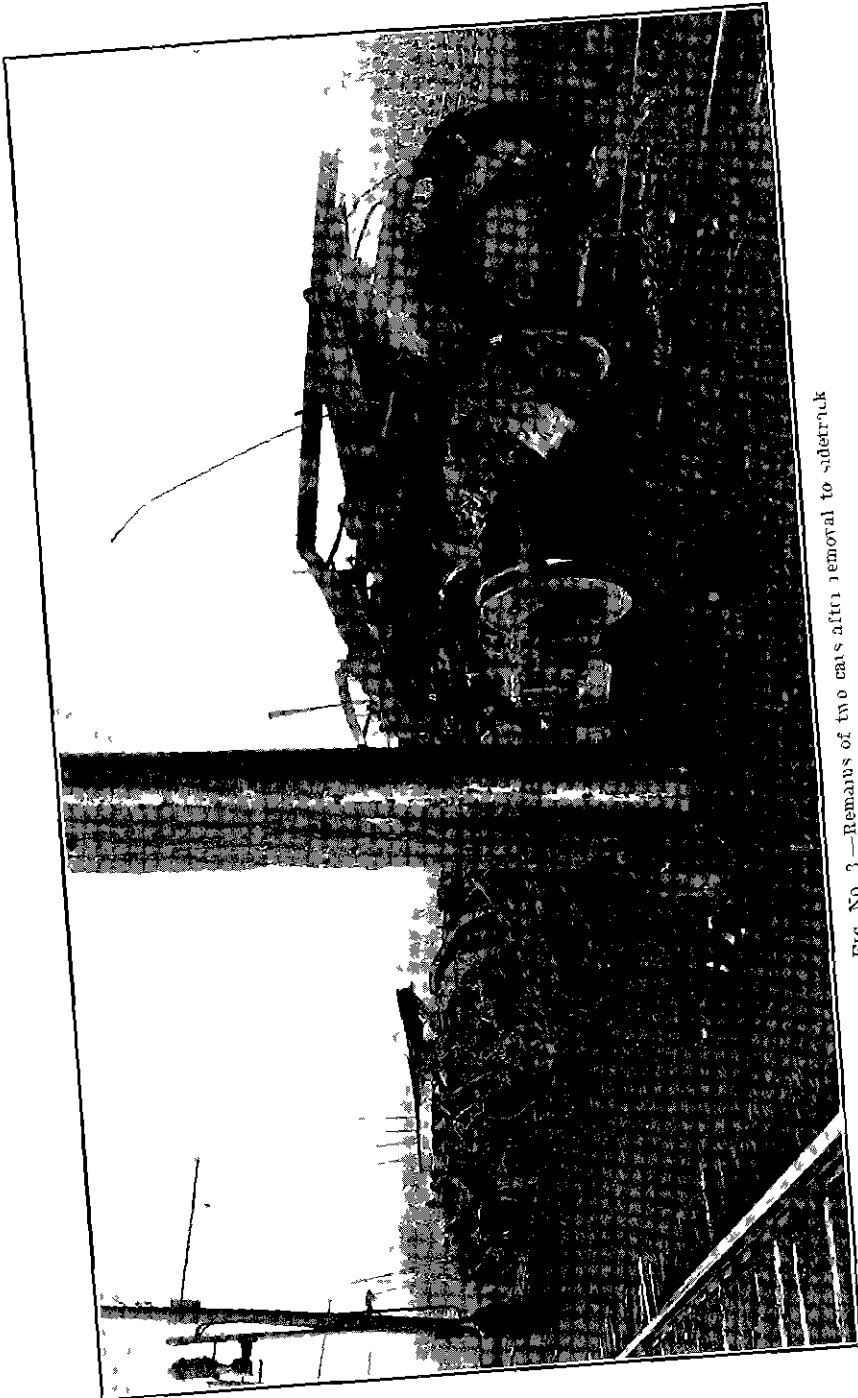


FIG No 3 —Remains of two cars after removal to sidetrack

Commission, asked to see his orders, and on opening the grip in Mr. Gibbens' presence he found the contents disarranged, the order in question was missing, although the other orders were intact and there was blood on them and also on other supplies which were in the grip. These statements were verified by Inspector Gibbens. Attempts to ascertain when and by whom the order was taken were unavailing.

Train No. 24 ordinarily would have met train No. 23 at Belt, but on account of train No. 24 being late it was necessary either to hold train No. 23 at this time-table meeting point until train No. 24 arrived, or establish a meeting point at a station farther west, and Dispatcher Boyle therefore decided to issue an order for the two trains to meet at Goul. Under the rules, an order must first be made complete to the train whose rights are to be restricted, and Dispatcher Boyle said he issued train order No. 45 to Conductor Danforth, of train No. 917, for delivery to the crew of train No. 24 on their arrival at Lawrence.

Conductor Danforth said the order he took for train No. 24 was for trains Nos. 24 and 23 to meet at Goul, and that he repeated the order back to the dispatcher, he also said that he registered for train No. 24. Motorman Kapp of train No. 917 was in the telephone booth with Conductor Danforth. He said he saw Conductor Danforth write the order, that it was plainly written, and that he heard the conductor repeat it back to the dispatcher. Conductor Danforth gave his own name to the dispatcher, who made a notation on the train-order book showing that Conductor Danforth had taken the order. Conductor Danforth, however, wrote on the order the names of Motorman Standish and Conductor Harris, these being the members of the crew he thought would be in charge of train No. 24, his own name did not appear upon it. Conductor Danforth said train No. 24 arrived about two minutes after he had completed the order and that he gave both copies of it to Motorman Flinn saying, "Here is an order for you to meet train No. 23 at siding Goul", Motorman Kapp said he heard Conductor Danforth make this remark, and both he and the conductor said Motorman Flinn correctly repeated the order back to Conductor Danforth. Conductor Danforth also said that Conductor Sawyer was on the back platform of the motor car and acknowledged that he should have given one copy of the order to Conductor Sawyer.

Motorman Flinn, of train No. 24, said the order as received by him read as follows: "No. 24, car No. 286, will meet No. 21, car No. 276, at Goul." He said this order was plainly written, that Conductor Sawyer was then checking up express in the baggage compartment in the forward end of the car, that he read the order to the conductor and then placed both copies in the edge of the

train number sign box, and that both copies were destroyed in the fire. Conductor Sawyer said he saw Motorman Flinn sign his own name and also the conductor's name to the order and that he saw the word "Goul," which the motorman had read to him as the meeting point with train No. 21. Conductor Sawyer afterwards said, however, that he was not in the baggage compartment when Motorman Flinn received the orders, but got off the rear end of the motor car, started ahead, saw the orders handed to the motorman, was given a wave of the hand to return, boarded the rear of the car, and that the train then proceeded. Trailer Conductor Campbell said he was in the trailer when the orders were received, that he did not see them or know what they contained, and that he did not make any effort to ascertain their contents.

On account of having an order which they said provided for a meet with train No. 21 at Goul, the crew of train No. 24 did not stop then train at Mul, at which point the dispatcher intended to give them the order to meet train No. 21 at Dent, passed Dent without stopping, and the train was moving at a speed estimated by the motorman at about 45 miles an hour when he saw train No. 21 approaching, approximately 1,500 feet distant, and apparently moving at about the same rate of speed. Motorman Flinn at once shut off the power and applied the air brakes, which he said were in good working order, and jumped from the car when he saw the collision could not be prevented. Motorman Flinn expressed the opinion that the accident was due to the fact that the order he had received at Lawrence was not correct. Conductor Sawyer said he had collected fares from passengers boarding the train at Fortville and then returned to the baggage compartment, and was there when he saw train No. 21 approaching, 2,000 or 2,500 feet distant, and shouted a warning to the motorman, who at once shut off the power and applied the air brakes. Trailer Conductor Campbell estimated that at the time of the accident the speed had been reduced from 35 miles an hour to 15 or 20 miles an hour.

Train Dispatcher Boyle, on duty at the time of the accident, said he instructed the crew of train No. 917 to take train order No. 45 for train No. 24, and that afterwards he issued train order No. 46 to train No. 21 at Pendleton, directing them to meet train No. 24 at Dent and train No. 26 at Lawrence. When writing these in the train-order book, however, he showed the name of the station at which the order was issued to train No. 21 as "Mul," having in mind the regular meeting point between trains Nos. 21 and 24, but he said this mistake had no bearing on the order. He explained issuing the order to train No. 24 so far ahead by saying that he had to restrict its rights in order to allow train No. 23 to pass the time-table meeting point. When questioned further as to why he could not have al-

lowed train No 24 to proceed from Lawrence without orders against train No 23, thus avoiding the issuance of the order through the conductor of train No 917, then allow train No 24 to make its timetable meet with train No 21 at Muir and after that had been done give it an order against train No 23, he said he expected that trains Nos 21 and 24 would make a good meet at Muir and that if train No 21 reached that point and entered the siding, train No 24 would not stop and communicate with him but would proceed in which case it would be necessary for him to hold train No 23 at Belt until he could get in touch with train No 24 and restrict its rights against train No 23. The rules, however, require trains so delayed as to arrive at a scheduled meeting point five minutes or more late to report to the dispatcher for orders or instructions if possible at least two sidings in advance of the meeting point. The second station west of the meeting point with train No 21 is Bucy. Dispatcher Boyle stated, however, that train No 24 would not have had to call him from Bucy because it had already passed Lawrence, which was the place to issue an order on train No 21 if it were needed apparently considering that the stop at Lawrence complied with the rule.

The investigation developed that it is a common practice for train orders to be issued to one crew for delivery to the crew of another train, as was done in this case, Superintendent of Transportation Keever said this practice was in effect before they had a rule book. Mr. Keever cited rule 218, of the Rules and Regulations for the Government of Employees, as authorizing the practice, although he admitted that the word "agent" as used in the rule means "station agent." This rule reads as follows:

To issue train orders at stations where there are operators or agents, the dispatcher will instruct the operator or agent to display a stop signal for the train to stop for orders. The train must not pass a station where such signals are displayed without reporting to the agent or train dispatcher and until such signals have been taken down, removed, or cleared.

When a train order is given through an agent, he must read it back to the dispatcher and complete it in the same manner as a motorman or conductor. The conductor and motorman receiving such an order must read it aloud back to the agent, and receipt for same by writing their names upon it before detaching the copies intended for them.

Mr. Keever stated, however, that the order issued to train No 24 at Lawrence was not handled in accordance with the usual practice, in that Conductor Danforth did not sign it, and also that he should not have inserted in it the names of the crew to whom he supposed he was going to deliver the order. The handling of train orders in accordance with this practice was also approved by Train Dispatcher Boyle, who considered a trainman to be an agent, and by General

Manager Nicholl, who said he thought the order was handled properly at Lawience

Time-table No 39, in effect at the time of the accident, provides for the registering of trains at two points, Long and Lawience, between Indianapolis and Anderson

The time-table rule states in part that "Conductor or motorman will register *in* and *out* at all registry stations, carefully noting signals carried" The crew of train No 24 did not register at Lawience nor did they check the train register, and investigation showed it to be a practice on this railway for the crew of one train to register for the crew of another train and that it was a practice which had existed for years Conductor Danforth was not able to refer to any rule which authorized this practice, but said there was no rule prohibiting it, and that as long as his own train was there and gave the orders to the crew of train No 24 the crew of that train did not have to register Dispatcher Boyle took a position similar to that of Conductor Danforth to the extent of saying that, while there was no rule relieving a crew of the duty of registering, there was no rule against it The statements of the superintendent of transportation also indicated his approval of the practice

The statements of various witnesses indicate that little if any importance is attached to the question of whether or not train orders are signed correctly Conductor Danforth signed to the order he delivered to the crew of train No 24 the names of Motorman Standish and Conductor Harris Motorman Kapp said he would accept orders with the name of some other crew signed to them, and that it was customary to do so Dispatcher Boyle, in answer to a question on the point said that any name might have been put on the order and it would have been the same as far as the order was concerned Superintendent of Transportation Kever said the fact that the name of some other crew appeared on the order meant nothing, as the name of anyone might have been there, that that part of the order meant nothing, in fact, Mr Kever went so far as to say that the only thing irregular at Lawience was the fact that the conductor of train No 24 was not where he could get his copy of the order

As previously stated, all of the cars involved were of wooden construction with underframes reinforced with steel Motor car 276 was 63 feet in length and motor car 286 was 65 feet 2 inches in length, and they weighed 82,000 and 84,000 pounds, respectively The two trailers were 47 feet 10 inches in length, and weighed 40,000 pounds The motor cars were equipped with combination automatic and straight air brakes and the trailers with automatic air brakes Nothing was developed in the investigation to indicate

that the air brakes were not working properly at the time of the accident

Motorman Flinn and Conductor Sawyer were assigned to this division about two weeks previous to the day of the accident, having been employed on another division of this railway for several years, both of them had previously operated trains in this territory. Motorman Flinn also stated that at the time of transferring back to this division he made two trips over the line in order to refresh his memory and to note any changes which might have taken place in his absence, and he said that he felt thoroughly competent in every way.

As previously stated, the automatic block-signal system on part of the line where this accident occurred was not in service. J. O. Penisten, superintendent of power distribution, stated that the signals were taken out of service for the purpose of permitting the installation of a larger signal feeder line. The work consisted of taking down two wires and stringing three larger wires, as well as changing the cross arms supporting these particular wires, and he thought it would not have been practicable to do this with the signals in operation on account of the danger from other wires on the same pole line. The company furnishes light and power for Fortville, and Mr. Penisten said the new wires, with the rearrangement of power transformers which was made at the same time, would result in considerable improvement in the lighting of Fortville and also make the automatic signals more reliable from the fact that one set of transformers would be eliminated and also because there would be more capacity back of the signal circuits so that trouble which might develop would not be so likely to interfere with the operation of many signals. Mr. Penisten further stated that power was placed on the line on February 2, but the bulletin taking the signals out of service was not then raised on account of the necessity for having the signals inspected before restoring them to service.

The reports of the signal department for the months of October, November, and December, 1923, covering the territory extending between Indianapolis and Muncie, show that there were 50 signals in operation, while the number of failures for the months in question was 24, 47, and 54, respectively, a total of 125. For the corresponding months of 1922 the number of failures was 92, 36 and 38, respectively, a total of 166 failures. The number of train movements per signal failure for these months of 1923 was 3,369, 1,654, and 1,477. For 1922 the corresponding figures are 937, 2,279, and 2,173. For the three months in question the average number of movements per month per signal failure was 2,167 in 1923 and 1,796 in 1922. When questioned concerning the number of signal failures above referred to, Mr. Penisten stated it was necessary to analyze the causes of failures,

and he appeared to think that the average compared favorably with other railways in the vicinity, and that so far as his own railway was concerned, the figure of 3,369 movements per signal failure in October, 1923, was comparatively good. He also stated that he considered the signal system as a whole to be in better condition than at the time of the Carmel accident in 1919.

Mr. Penisten further stated that there is no fixed program for signal maintenance. One, and sometimes two, maintainers do such maintenance work as is necessary, there are about 75 miles of track on which the automatic block-signal system is in use and the total expense for maintenance for the year 1923 was \$3,400, of which about \$800 was for material and the balance for labor. Mr. Penisten also said no steps were contemplated toward improving the signal system other than following up closely and remedying signal failures and other troubles.

Signal Maintainer Lyst said he was engaged in maintenance and repair work, together with some construction work, but that during the past six months most of his time had been spent hunting for causes of signal failures and making necessary repairs, previous to which he had spent about two months, with the assistance of one or two others, in maintenance work. He also stated that there are no regular periods for inspections, he considered the signals to be in fair condition. Signal Maintainer Lyst has had three years' service in that position with the Union Traction Company of Indiana, previous to which he had had practically no experience as a signal maintainer.

Testimony developed from the various employees examined indicated that train orders to disregard the indications of automatic block signals were common and that they had been in the habit of receiving such orders for years. As one employee expressed it he had made trips over the road without receiving such orders, but not very often. Dispatcher Boyle said that upon receipt of information from a train crew that a block signal was displaying a stop indication an order might be issued to disregard it and proceed with caution, but he admitted that if the signal was properly displaying a stop indication the issuance of such an order would place entire dependence for preventing an accident upon the instructions to proceed with caution. In this connection, trains were observed being operated at night with the crew in possession of such orders, and schedule speed was maintained, with the view in many places obscured by curves, speeds as high as 50 miles an hour were noted under such circumstances. Dispatcher Boyle also stated that after issuing an order to disregard a signal indication, he continued to issue such orders until notified by the signal maintainer that the signal in question was in proper working order.

A check was made of the dispatcher's train-order book for the purpose of ascertaining the extent to which orders to disregard stop-signal indications had been issued, taking periods at random during the last four months of 1923. From September 27 to October 5, inclusive, between Long and Belt, a distance of 30.64 miles, 26 such orders were issued to 40 trains, some of these orders covered all signals in the directions in which the trains involved were moving for a distance of approximately 13 miles. During the same period 7 orders were issued to 7 trains covering signals between Anderson Junction and House, inclusive, a distance of 3.45 miles, these are stations east of Anderson. A check of another train-order book covering the period from November 30 to December 5, inclusive, showed that out of a total of 288 train orders issued 82 were orders to disregard signal indications of this number, 24 were between Long and Belt 5 being issued to one train covering all signals within a distance of approximately 15 miles. Nineteen applied in the territory between Anderson Junction and House, and the remaining 39 to other points on the system. The check of a third train-order book which was only used by a dispatcher on duty from 1 to 9 p. m. and which covers signals not in the territory involved in this accident, showed that from October 11 to October 29, inclusive, 39 "disregard" orders were issued, only twice were there as many as two days in succession without one or more of these orders being issued. Several of these individual orders were sent to as many as five different trains.

When the attention of General Manager Nicholl was called to the fact that during December there had been an average of approximately one failure per signal, and that a similar condition was shown to exist at the time of the investigation of the accident at Carmel, Ind. on June 13, 1919 and he was asked what he intended to do toward making the signal system efficient, he replied that he did not see anything particularly wrong with the maintenance of the signal system, and that he did not consider such a large number of failures to be bad for an electric line. Questions concerning the existence of a system providing for signal maintenance brought the statement from him that there is no allowance for that purpose, that they are maintained as required.

It also was developed that the rules covering the use of the automatic block-signal system are not contained in the rule book. Superintendent of Transportation Keever said they were printed in 1914 in a separate pamphlet to be pasted in the back of the rule book. He also said that the employees were verbally instructed as to the operation of the signal system and that the rules were not necessary in the rule book so far as train operation is concerned. General Manager Nicholl took the same position, saying that the signal

rules never had been included in the rule book, and that when the new rule book was printed, taking effect January 1, 1923, it was not even then thought necessary to include them.

General Manager Nicholl, when asked what his company contemplated doing to prevent the occurrence of a similar accident in the future, said that every one would put his shoulder to the wheel to see if such a thing could not be prevented, when asked if he contemplated any changes in the operating practices, he replied "None."

CONCLUSIONS

The direct cause of this accident was an error in the transmission receipt, or reading of a train order. The underlying cause was lax operating practices which existed on this railroad.

On account of the fact that the two copies of train order No. 45 received by the crew of train No. 24 were destroyed in the fire, it can not be stated with absolute certainty whether the order as delivered by Conductor Danforth was incorrect or whether Motorman Flinn made the mistake in reading the order. It appears that for Conductor Danforth to have incorrectly copied the order as indicated by Motorman Flinn's statement he would have had to make a mistake both as to the train number and also as to the motor number. As to the possibility of the dispatcher having made a mistake, the evidence shows that only the motorman of train No. 24 actually read the order as delivered, whereas the order as transmitted and received was read by three persons, Dispatcher Boyle, Conductor Danforth, and Motorman Kapp, and an examination of the dispatcher's train-order book indicates no erasure or other alteration. The weight of evidence is against Motorman Flinn. The next train to be met was train No. 21, and it is believed that when Motorman Flinn received the order he expected it to refer to the first train to be met and read it as establishing a meeting point with that train. Conductor Sawyer did not receive a copy of the order nor did he read it, but under the rules he is equally responsible with Motorman Flinn.

In view of the manner in which this order was received and delivered to the crew of train No. 24, the safeguards which are clearly intended by the rules to surround such an operation were not present in this instance. That the word "agent" as used in rule 218, previously quoted, refers to station agents was admitted by Mr. Keever, but for the evident purpose of justifying the practice of issuing orders to crews for delivery to other crews the officials go outside of the plain intent of the rule and extend it so as to include trainmen as "agents" who can be used for that purpose. The rule requires an agent taking an order to have the motorman and conductor read

it back to him and receipt for it before detaching their copies, in this case no provision was made for making more than two copies of the order or of otherwise securing a receipt, and it was not read back and signed for as contemplated by the rule. Had this order been received directly from the dispatcher by the crew of the train for which it was issued, the mistake which resulted in this accident might have been avoided.

The crew of train No 24 was in communication with the dispatcher at Long, and the order subsequently issued to them at Lawience through the crew of train No 917 could have been given directly to them at Long, but in order to expedite the movement of the train this was not done. If the order issued to train No 24 related to a meet with train No 23, as is believed to have been the case, then train No 24 was without information concerning train No 21, an intervening train. Rule 158 reads as follows:

A train delayed so as to arrive at a scheduled meeting point (5) minutes or more late must report to the dispatcher for orders or instructions if possible at least two sidings in advance of the meeting point. If unable to get the dispatcher by company or long distance telephone, the train may proceed on its time table rights after executing all train orders. All regular trains or sections of a regular train, after they have become sixty minutes late, will lose their time table rights.

Under this rule the crew of train No 24 was required to report to the dispatcher, and it was incumbent upon the dispatcher to issue orders or instructions concerning their meet with train No 21. Dispatcher Boyle considered that the crew of train No 24 did not have to call him at the second station preceding its meeting point because it had already passed Lawience, which was the place to have given it an order against train No 21 if it were needed. No such orders or instructions were given to the crew of train No 24, however, either at Lawience or at any other point, and until he heard of the further delay to train No 21 the dispatcher intended that train No 24 should proceed to its time-table meeting point. However, had the rule been obeyed and had orders or instructions been given to the crew of train No 24 at Lawience concerning their meeting point with train No 21, it is probable that the error which was made in the handling or reading of train order No 45 would have been detected and the accident averted.

At the time of this accident the automatic block system on this line had been suspended, and no substitute therefor, adequate to safeguard traffic, had been provided. Had this company placed in service a system of manual blocking, with proper rules, during the period required for changes in the transmission line, this accident probably would have been averted.

The investigation disclosed many lax operating practices which, briefly, consisted of (1) trainmen taking orders for other crews, (2) trainmen checking train registers and registering for other trains, (3) the signing to an order by the trainman receiving it of the names of the crew to whom it is to be delivered, (4) poor maintenance of the automatic block-signal system, (5) the almost daily issuance of orders to disregard the stop indications of automatic signals and to proceed with caution, (6) the operation of trains at schedule speed when in the possession of such orders, and (7) the failure to include in the rule book the rules governing the operation of the block-signal system.

In addition to the practices pointed out above, which were developed principally by testimony, the commission's inspectors personally observed the following: (1) Signal mechanisms showing lack of proper care and attention, (2) operation of trains at night at full speed over main-track switches on which the switch lights were not burning, (3) failure to have a switch connected with the signal system at a point where trains for which it is a facing-point switch frequently move at full speed on a descending grade, (4) operation of a train at night with orders to run as first section but with no signal lamps displayed owing to the electric lights used for the purpose being out of order, (5) an employee's time-table which shows one train as having two time-table meeting points with the same opposing train, (6) the use of the dispatcher's wire for the carrying on of miscellaneous personal conversations, (7) an O. K. to an order on the dispatcher's train-order book which order had not been transmitted to and repeated back by the crew of the train involved, and (8) the presence of numerous alterations and erasures in the train-order book on orders which were issued to various trains.

That the officials of this railway were fully aware of many of the practices disclosed by this investigation is shown by the fact that in their testimony they defend such practices. Proper supervision would have disclosed all the irregularities noted within a few days by the commission's inspectors.

While it is believed the immediate cause of this accident was the failure of a crew to read a train order correctly, underlying that is the extreme carelessness and neglect shown in general operation. It is scarcely conceivable that any official having due regard for the safety of those who travel on his railway, or those who are employed thereon, should permit the existence of the conditions which this investigation disclosed. And yet General Manager Nicholl, who is the responsible operating officer of this railway, stated that he contemplated no changes in the operating practices. Such an attitude on his part is not only inexcusable but is a striking indication if one were needed, of the general disregard for the first prin-

ciples of safe operation manifested by officials and employees responsible for train operations. This investigation discloses that action should be taken forthwith to do away once and for all with the many dangerous, careless, and lax operating practices now existing on this road. If this is not done, accidents will again occur with possibly greater loss of life than in the instant case as a direct result of the inherently dangerous practices apparently countenanced by the present operating officials.

Had an adequate and properly maintained automatic train-control device been installed and in operation upon this road this accident would in all probability have been prevented.

With the exception of trailer Conductor Campbell, of train No. 24 all of the train-service employees involved were experienced men. Dispatcher Boyle was employed as a conductor in 1918, and in 1920 was promoted to train dispatcher. At the time of the accident Motorman Flinn and Conductor Sawyer, and Motorman Anthony and Conductor Mitchell, had been on duty about 12 hours, after about 16 hours off duty, and none of the other employees involved had been on duty in violation of any of the provisions of the hours-of-service law.

Respectfully submitted

W P BORLAND,
Director

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