

INTERSTATE COMMERCE COMMISSION
WASHINGTON

INVESTIGATION NO. 3187

UNION DEPOT COMPANY

THE BALTIMORE AND OHIO RAILROAD COMPANY
AND
THE PENNSYLVANIA RAILROAD COMPANY

REPORT IN RE ACCIDENT

AT COLUMBUS, OHIO, ON

JUNE 7, 1948

SUMMARY

Railroads: Union Depot : Baltimore and Ohio,
Company and Pennsylvania

Date: June 7, 1948

Location: Columbus, Ohio

Kind of accident: Derailment and collision

Trains involved: P.R.R. passenger : P.R.R. passenger

Train numbers: 30 : 155

Engine numbers: Diesel-electric : 5348
units 5754A-
5752A

Consists: 16 cars : 9 cars

Estimated speed: 10 m. p. h. : Standing

Operation: Hand signals : Automatic-block and
cab-signal systems

Tracks: Five; tangent; : Four; tangent;
0.875 percent 0.88 percent
ascending grade ascending grade
eastward eastward

Weather: Clear

Time: About 9:34 p. m.

Casualties: 6 injured

Cause: Double-slip movable-center-point
crossing improperly lined for
movement intended

Recommendation: That the Union Depot Company, the
Baltimore and Ohio Railroad Company,
and the Pennsylvania Railroad Company
install an interlocking in the terri-
tory where this accident occurred

INTERSTATE COMMERCE COMMISSION

INVESTIGATION NO. 3187

IN THE MATTER OF MAKING ACCIDENT INVESTIGATION REPORTS
UNDER THE ACCIDENT REPORTS ACT OF MAY 6, 1910.

UNION DEPOT COMPANY
THE BALTIMORE AND OHIO RAILROAD COMPANY
AND
THE PENNSYLVANIA RAILROAD COMPANY

AUGUST 8, 1948

Accident at Columbus, Ohio, on June 7, 1948, caused by a
double-slip movable-center-point crossing being
improperly lined for the movement intended.

REPORT OF THE COMMISSION¹

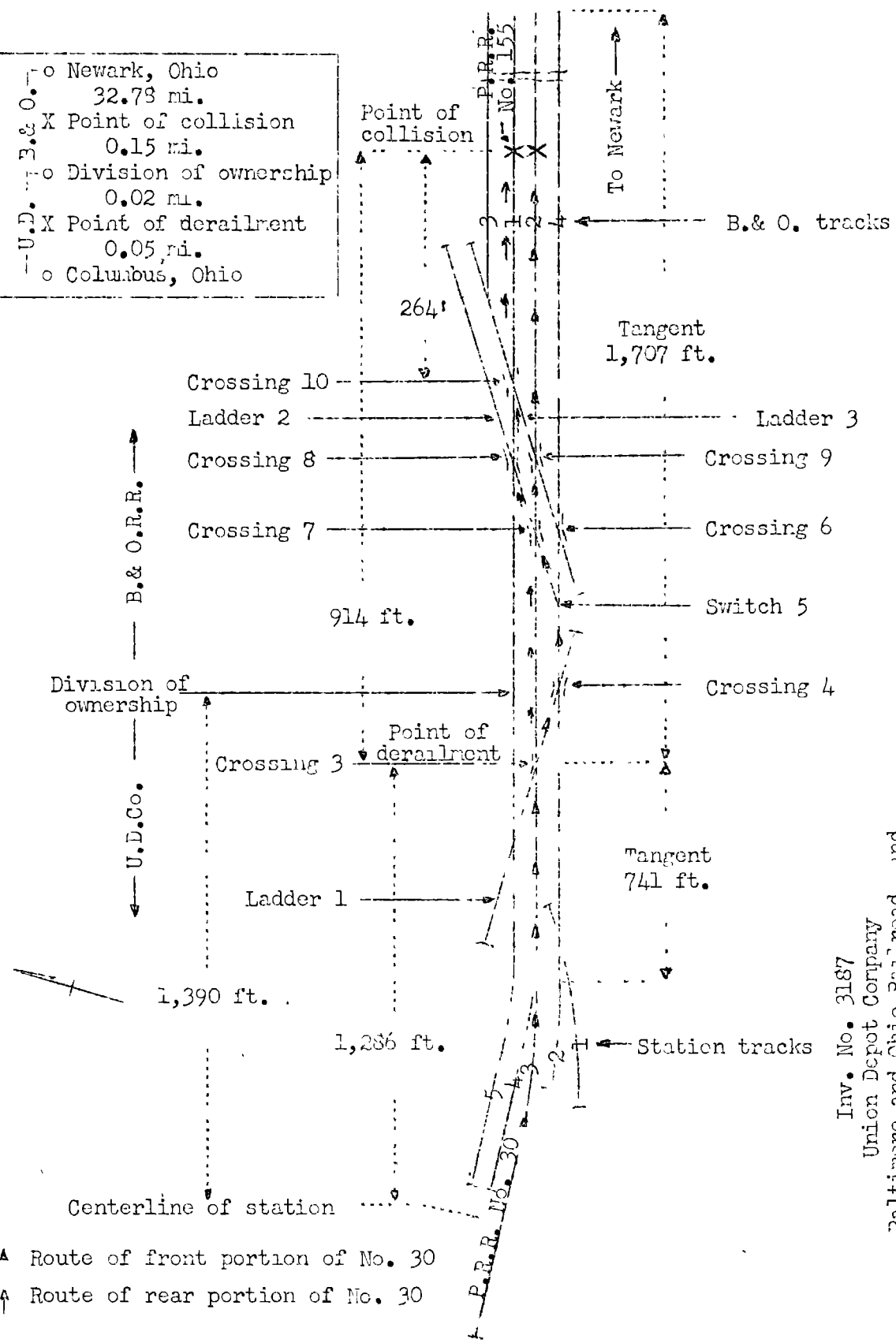
PATTERSON, Commissioner:

On June 7, 1948, there was a derailment of a Pennsylvania Railroad passenger train on the line of the Union Depot Company at Columbus, Ohio, and a collision between a derailed car of that train and a Pennsylvania Railroad passenger train standing on an adjacent main track operated jointly by the Baltimore and Ohio Railroad and the Pennsylvania Railroad. The collision resulted in the injury of five passengers and one Pullman employee. This accident was investigated in conjunction with representatives of the Public Utilities Commission of Ohio.

1

Under authority of section 17 (2) of the Interstate Commerce Act the above-entitled proceeding was referred by the Commission to Commissioner Patterson for consideration and disposition.

- o Newark, Ohio
32.73 mi.
- X Point of collision
0.15 mi.
- o Division of ownership
0.02 mi.
- X Point of derailment
0.05 mi.
- o Columbus, Ohio



▲ Route of front portion of No. 30
 ▲ Route of rear portion of No. 30

Inv. No. 3187
 Union Depot Company
 Baltimore and Ohio Railroad, and
 Pennsylvania Railroad
 Columbus, Ohio
 June 7, 1948

Location of Accident and Method of Operation

The derailment of the passenger-train car occurred on that part of the line of the Union Depot Company, Columbus, Ohio, extending eastward from the centerline of the station to the east limits, 1,390 feet, and the collision between the derailed passenger-train car and a passenger train standing on an adjacent track occurred on that part of the Columbus and Newark Division, which is jointly operated by the Baltimore and Ohio Railroad and the Pennsylvania Railroad, and which extends between Fourth Street, Columbus, and Newark, Ohio, 32.93 miles. Trains are operated over the tracks of the Union Depot by flag and lantern signals. P.R.R. trains moving with the current of traffic are operated over the C. & N. Division by automatic-block and cab-signal indications, and B. & O. R. R. trains are operated by automatic block-signal indications. The station tracks are designated from south to north as tracks Nos. 1 to 8, inclusive. They converge at the east end of the station into five tracks, which extend eastward 711 feet, and are designated from south to north as tracks Nos. 1 to 5, inclusive. These five tracks in turn converge with four tracks of the C. & N. Division designated from south to north as B. & O. track No. 4, eastward freight; B. & O. track No. 2, eastward passenger; B. & O. track No. 1, westward passenger; and B. & O. track No. 3, westward freight. The distance between the centerlines of these tracks is 13 feet. Between points 487 and 1,537 feet east of the centerline of the station, a single ladder track, designated as ladder 1 and extending from northwest to southeast, crosses the previously mentioned tracks at the point of convergence between the U. D. and the B. & O. tracks. Double-slip movable-point crossings are provided. Crossing 3, located 1,266 feet east of the centerline of the station, connects U. D. track No. 3 and B. & O. track No. 2 for through movement, but the crossing can be lined for a diverging movement from U. D. track No. 3 to B. & O. track No. 4 via ladder 1. Between points 1,547 and 2,059 feet east of the centerline of the station, a double-track ladder, designated as ladders 2 and 3, extends from the southwest to the northeast and crosses the B. & O. tracks on double-slip movable-point crossings. Ladder tracks 2 and 3 cross B. & O. track No. 1 at crossings 8 and 10, and B. & O. track No. 2 at crossings 7 and 9. The derailment occurred at crossing 3 and the collision occurred on B. & O. track No. 1 at a point 314 feet east of crossing 3 and 264 feet east of crossing 10. U. D. track No. 3 and B. & O. track No. 2 are tangent throughout a distance of 741 feet immediately west of crossing 3 and 1,707 feet eastward. The grade for east-bound trains is 0.875 percent ascending at the point of derailment and 0.88 percent ascending at the point of collision.

At the point of derailment the structure of U. D. track No. 5 consists of 130-pound cropped rail varying from 29 to 38 feet in length, relaid in its present location during 1930 on an average of 17 treated ties per 30-foot length. It is fully tieplated, spiked with 3 spikes per tieplate, and provided with 6-hole joint bars. It is ballasted with gravel to a depth of 12 inches below the ties. At the point of derailment the gage was 4 feet 9 inches, the south rail was 1/4-inch lower than the north rail, and the alinement was tangent.

Crossing 3 is a No. 8 double-slip crossing having opposed pairs of movable center-points, and is laid on 32 treated switch ties, and can be lined for four routes. Its diagonal length along the axis between the points of the outer rigid-type frogs is 76 feet 3 inches. The angle of each frog is 7°09'10" and they are protected by one-piece guard rails having integral end-blocks. The structure of the crossing consists of 131-pound rail sections, four switch rails operating in unison at each end, and two opposed pairs of movable-center points in the center of the crossing. The switch rails are 13 feet long. The center-point rails are 10 feet 4-1/2 inches long, and are chamfered to fit the angle of their respective knuckle rails. The north and the south inner stock-rails of the crossing are knuckle rails 21 feet 7 inches long having knuckle angles of 7°09'10", and are reinforced on the outside of the knuckle angle by easer rails 5 feet 8 inches long. The north and the south outer slip rails are curved and braced. The switch-points and the center-points are arranged for a throw of 4-1/2 inches, and each set of these points is maintained in proper relation by two switch rods at each location, except the west switch rails, which have one switch rod only. The operating mechanism consists of two vertical ground-throw levers having weighted ends and handholds, mounted side-by-side on a common trunnion-type base, and are located 2 feet north of the north stock rail and 5 feet west of the west center-points. The operating levers are pipe-connected to the operating switch rods. The inside lever operates the east switch rails and both pairs of center-points, and the outside lever operates the west switch rails. These levers operate independently of each other. Positive latches are not provided.

A spindle bearing a switch lamp having four flared disc targets is located 4 feet south of the west switch points, and the centers of the lenses and the targets are 4 inches above the level of the tops of the rails. A similar switch lamp is located 6.6 feet east of the operating levers and 3.3 feet north of the east center-points. When the crossing is lined normally for movement from U. D. track No. 3 to B. & O. track No. 2, the inside switch lever is lined to the west, the outside lever is lined to the east, and each switch lamp displays a green light and a white target.

The Union Depot Company has no book of operating rules. Trains of each tenant line are operated under time-table special instructions of the respective line.

Operating rules of the Pennsylvania Railroad read in part as follows:

104. * * *

* * *

When practicable, the engineman must see that the switches nearest the engine are properly lined.

A train or engine must not foul a track until switches connected with the movement are properly lined. * * *

* * *

104a. Trains and engines must approach switches where switch tenders are stationed prepared to stop clear of any switch or route unless signal to proceed is received from the switch tender.

A switch tender must not set a switch to divert an approaching train until he is assured of its identity and that its speed does not exceed 15 miles per hour.

Time-table special instructions of the Columbus Division, Pennsylvania Railroad, read in part as follows:

HAND, FLAG AND LAMP SIGNALS

1402. Switchtenders at Fourth Street, Columbus Union Depot * * * use a green flag by day and a green light by night to govern eastward movements; a yellow flag by day and a yellow light by night to govern westward movements.

2407. Switchtenders, other than P.R.R. employes, are stationed at and have charge of hand operated switches as indicated:

Location	Switches
Fourth Street	Crossovers
Columbus Union Depot, east end	All Switches

* * *

* * *

NOTE--Trains and engines must approach switches at Fourth Street and at east and west ends of Columbus Union Depot prepared to stop and must stop clear of switches or routes unless signal to proceed is received from switchtender as prescribed by Special Instruction 1402.

The time-table special instructions of the Columbus and Newark Division read in part as follows:

The movement of eastward and westward trains between Keilston and Union Station will be governed by the prescribed hand signals given by switchtender, and trains will not exceed 10 miles per hour.

The maximum authorized speed for any movement through crossings and switches in this territory is 10 miles per hour.

Description of Accident

No. 155, a P.R.R. west-bound first-class passenger train, consisted of steam engine 5548, four baggage cars, one mail car, two coaches, one sleeping car and one box-express car, in the order named. All cars were of steel construction. This train, moving on F. & O. track No. 1, stopped about 9:31 p. m., at a point 264 feet east of crossing 10. About 5 minutes later this train received a proceed signal given with a lighted yellow lantern by the switchtender located at that point, moved several feet westward and then stopped. Immediately afterward the engine was struck by the fifteenth car of No. 30.

No. 30, an east-bound P. R. R. first-class passenger train, consisted of Diesel-electric units 5754A and 5752A, coupled in multiple-unit control, one passenger-baggage car, six sleeping cars, one dining car, three sleeping cars, one dining car, three sleeping cars and one sleeping-lounge-observation car, in the order named. The sixth to eighth cars, inclusive, the tenth car, and the fifteenth and sixteenth cars were of light-weight high-tensile-steel construction, and the remainder of the cars were of conventional all-steel construction. After a terminal air-brake test was completed this train departed from the passenger station on U. D. track No. 3 at 9:32 p. m., 7 minutes late, passed the switchtender in charge of crossing 3, and entered crossing 3, where the rear truck of the fifteenth car was derailed. The front portion of the train made a diverging movement at crossing 3, entered F. & O. track No. 4 at crossing 4, passed the switchtender stationed at the west end of ladder tracks 2 and 3, entered ladder 2 at switch 5, was diverted to F. & O. track No. 2 at crossing 7, and the engine stopped about 1,700 feet east of crossing 10 when the brakes became applied in emergency. The rear two cars remained

coupled to the front portion of the train and the rear truck of the fifteenth car dragged between B. & O. tracks Nos. 1 and 2 and the sixteenth car continued on B. & O. track No. 2 from crossing 3 to crossing 7, on ladder 2 to crossing 8, thence to B. & O. track No. 1, and the rear end of the fifteenth car was diverted northward and fouled B. & O. track No. 1. While No. 30 was moving at a speed of about 10 miles per hour the fifteenth car sideswiped the engine of No. 155.

The front end of the engine of No. 155 was somewhat damaged. Because of a coupler failure at the rear of the thirteenth car of No. 30, a separation occurred at this point. The front end of the fourteenth car stopped 15 feet to the rear of the thirteenth car and 190 feet east of the point of collision. The fourteenth car separated from the fifteenth car. The fifteenth and sixteenth cars, remaining coupled, stopped upright, across B. & O. tracks Nos. 1 and 2 and at an angle of 15 degrees to them. Starting at a point 29 feet back of the front end of the fifteenth car, the side sheets above and below the windows on the left side and appurtenances below the floor were torn away throughout a distance of 42 feet. The left side-sill and the cross members were bent and broken, and the flooring and interior fixtures were torn away inward to the center sills. The injuries occurred in this car. No other cars in the train were damaged. The sixth, thirteenth, fifteenth and sixteenth cars were equipped at each end with tightlock couplers.

The weather was clear and it was dark at the time of the accident, which occurred about 9:34 p. m.

The fifteenth car of No. 30, Pullman Cascade Rapids, a sleeping car of lightweight high-tensile steel construction, is 84.5 feet long between the pulling faces of the couplers, and contains 5 bedrooms and 10 roomettes. The car is provided with two 4-wheel trucks spaced 59.5 feet between truck centers.

Discussion

The investigation disclosed that about 9:28 p. m. the terminal trainmaster, located in a tower 2,230 feet east of the centerline of the passenger station, gave instructions over the public-address system for all switchtenders concerned to line the switches and crossings for No. 30 to proceed from U. D. track No. 3 to B. & O. track No. 2. About 9:32 p. m. No. 30 was ready to depart from the station on track No. 3, and the engineer sounded four short blasts on the pneumatic horn as a signal to the switchtender in the charge of crossing 3. At this time the front end of the first Diesel-electric unit was standing about 270 feet west of crossing 3. The engineers, who were in the control compartment at the front end of the

first unit, said that the switchtender crossed over from the north and around a N. Y. C. yard engine and gave a signal with a lighted green lantern for No. 30 to proceed eastward. No. 30 departed at 9:32 p. m., entered crossing 3, where the front portion was diverted to ladder 1 and entered B. & O. track No. 4 through the north slip of crossing 4. The engineer saw that switch 5, at the junction of B. & O. track No. 4 and ladder 2, was not properly lined, and reduced speed accordingly. The switchtender in the charge of the switches and double-slip crossings in this vicinity lined the route to divert No. 30 from B. & O. track No. 4 to B. & O. track No. 2, then gave a signal with a green lantern for No. 30 to proceed over this route. This train entered ladder 2, moved through the south slip of crossing 7 and proceeded eastward on B. & O. track No. 2, which normally is the track used by east-bound passenger trains on the Columbus and Newark Division. The entire train had passed through crossing 7, and both Diesel-electric units and fourteen cars had passed the engine of No. 155; standing on B. & O. track No. 1 at a point 264 feet east of crossing 10, when the brakes of No. 30 became applied in emergency. Immediately afterward it was found that a separation had occurred between the thirteenth and fourteenth cars and between the fourteenth and fifteenth cars, and that the fifteenth and sixteenth cars were derailed to the north and were crosswise B. & O. tracks Nos. 1 and 2.

Examination of the cars of No. 30 did not disclose any condition which could have contributed to the cause of the derailment.

Examination of the tracks, the switches and the double-slip crossings immediately after the accident disclosed that the operating levers of crossing 3 were in position for normal movement from U. D. track No. 5 to B. & O. track No. 2. The operating rod of the west, or trailing, center-points was bent downward about 5 inches and westward at an angle of 45 degrees. These points had been trailed through. The south facing center-point was open about 3/4-inch and there were heavy marks on the point about 8 inches inward from its end. In addition, there were heavy abraded marks on the reverse side of this point. At a point 41 inches east of the south facing center-point a flange mark appeared on the top surface of the south knuckle rail then dropped to the ties inside this rail in a short distance. Corresponding flange marks appeared on the top surface of the north facing center-point and on the top surface of the north knuckle rail, then dropped to the ties in a short distance. These flange marks continued eastward to the east switch points, where the flange marks on the south crossed over the top of the south inside stock rail and dropped to the ties outside. Corresponding marks appeared south of the north outside stock rail and north of the north inside stock rail. From the east switch points eastward to crossing 4,

wheelmarks appeared on the south ends of the ties of B. & O. track No. 2, and corresponding marks appeared between the rails of B. & O. track No. 2 to switch 5, then there were marks indicating that these derailed wheels were diverted to ladder 2 and followed that track between switch 6 and crossing 7, then were diverted at crossing 8 to B. & O. track No. 1, crossed crossing 10 and continued along B. & O. track No. 1 to the point of collision.

From the condition of crossing 3 after the accident it is apparent that at the time No. 30 entered this crossing it was lined for movement from ladder 1 through the north slip switch to B. & O. track No. 2. In order for such movement to be made the two south points of the west switch rails would be closed and the two north points would be open, the south trailing center-point would be closed and the north point would be open, the north facing center-point would be closed and the south point would be open, the two south points of the east switch rails would be closed and the two north switch points would be open, the operating levers would both be lined toward the east, and the west switch lamp would display a green light and a green target, and the east switch lamp a red light and a red target. It is apparent that wheels of the Diesel-electric units, the first 14 cars and the front truck of the fifteenth car ran through the trailing center-point, forced the south point northward and bent the operating rod. This action was transmitted through the operating rod to the facing center-point, which closed the south point and opened the north point under the heavy blows, then the rear truck of the fifteenth car became derailed. The operating levers of crossing 3 are not provided with positive latches. It is apparent that the force exerted by the wheels against the trailing movable center-points during the derailment of the fifteenth car caused the inside lever to be operated to normal position for the sixteenth car.

The engineer and the fireman of No. 30 said they did not observe the indications displayed by the switch lamps of crossing 3, and that they do not depend upon observation of the switch lamps of any of the double-slip crossings, but depend solely upon signals given by the switchtenders in the charge of the crossings. In this instance, the engineer said he received a proceed signal given with a green lantern from the vicinity of crossing 3, and proceeded accordingly. The engineer said that when the first Diesel-electric unit entered upon crossing 3, the unit lurched and the traction wheels slipped. However, this action of the Diesel-electric is not unusual while moving over double-slip crossings at slow speed. The engineer said that it is not unusual for east-bound passenger trains to be diverted from U. D. track No. 3 to B. & O. track No. 4 at crossing 3, then back to B. & O. track No. 2 at either ladder 2 or 3. The first he knew of anything being wrong was when the brakes became applied in emergency at the time of the collision. All such movements are controlled by

switchtenders, who receive instructions over a public-address system from the terminal trainmaster. On this occasion, all double-slip crossings involved, except crossing 3, were lined for movement from U. D. track No. 3 to B. & O. track No. 2 and across ladders 2 and 3. The switchtenders in charge of the crossings involved in this movement, other than crossing 3, realigned the crossings to reroute No. 30 back to B. & O. track No. 2. The switchtender in charge of crossing 3 said that several minutes before No. 30 departed from U. D. track No. 3 he had lined crossing 3 for movement to B. & O. track No. 2, and at that time neither switch lamp was lighted. He was not certain whether he had given a proceed signal, but thought that his helper, who usually works south of crossing 3, had given the signal. The switchtender helper said that he had neither given a signal to No. 30, nor lined crossing 3 for the movement of No. 30. No unauthorized person was observed in the vicinity of crossing 3 by any employee on duty. Several other switchtenders said that the switch lamps of crossing 3 were lighted when No. 30 departed.

The movement of No. 30 leaving the station was governed by signals of a switchtender. In this instance, the hand signal to proceed was given when the route was improperly lined for the intended movement. If an interlocking had been in use the governing signal for No. 30 would not have permitted entry to the route when the switches were improperly lined.

Cause

It is found that this accident was caused by a double-slip movable-center-point crossing being improperly lined for the movement intended.

Recommendation

It is recommended that the Union Depot Company, the Baltimore and Ohio Railroad Company, and the Pennsylvania Railroad Company install an interlocking in the territory where this accident occurred.

Dated at Washington, D. C., this third day of August, 1948.

By the Commission, Commissioner Patterson.

(SEAL)

W. P. BARTEL,
Secretary.