

train was drawing near to the home-signal, and he accordingly threw up the home and advanced signals to danger, and showed the driver a red light. The driver fortunately saw the signals thrown to danger, at once shut off steam, and applied the automatic vacuum-break fitted to the four coupled wheels of the engine and to the six tender wheels, and whistled for the guard's breaks, the speed being thus reduced from about 25 miles an hour at the home-signal to about 6 or 7 miles an hour on collision, which occurred about 40 yards inside the home-signal. This reduction of speed is very creditable to the driver, and shows that he must have been keeping a very good look-out.

The guard did not observe the signals thrown to danger, but heard the break whistle, and got two or three turns at his break when he was knocked down by the collision.

With a good continuous break in the driver's hands, applying to the whole train instead of only to the engine and tender, it is probable that the collision would have been almost, if not entirely, prevented.

The goods guard, an experienced man of 20 years service as such, declares that before leaving the 18 waggons and van standing on the Bolton branch he had put the van-break tight on, and had pinned down the breaks on at least four of the front waggons, and that the whole were perfectly at rest, and some distance inside the branch home-signal when he went away with the engine, front break-van, and three waggons to work in the sidings. He could only account for the break-van and waggons having moved from the high wind blowing, and the vibration of a shunting engine working on an adjoining siding. However this may be, it is evident he was mistaken in supposing he had put down sufficient breaks to properly secure the 18 waggons and van on the falling gradient on which they were standing, and of the nature of which gradient he was well aware.

There is this to be said in the goods guard's excuse, that he had been severely shaken about 2½ hours previously by a sudden stoppage caused by the violent application of the steam break on his engine, and that he was still suffering from this, and was probably not up to the mark at the time he applied the breaks to the van and waggons left on the Bolton branch.

The Assistant Secretary,
(Railway Department,) Board of Trade.

I have, &c.,
C. S. HUTCHINSON,
Major-General, R.E.

Printed copies of the above report were sent to the Company on the 24th January.



LANCASHIRE AND YORKSHIRE RAILWAY.

Board of Trade, (Railway Department,)
1, Whitehall, London, S.W.,

9th February 1885.

SIR,

I HAVE the honour to report, for the information of the Board of Trade, in compliance with the instructions contained in the Order of the 31st December last, the result of my inquiry into the causes of the collision which occurred on the 29th December, at Crow's Nest junction, near Wigan, on the Lancashire and Yorkshire Railway.

In this case, the 1.40 p.m. up passenger train from Liverpool to Bolton and the Yorkshire District, while running through Crow's Nest junction, was turned through facing-points into an up goods loop line, where it came into collision with a pilot engine at the tail of a coal train, which train had a few minutes previously been turned into the loop line to allow the passenger train to pass.

Forty-two passengers, a locomotive inspector who was on the engine of the passenger train, a traffic inspector who was in the van, and the driver, fireman, and guard of this train, were all more or less injured.

In the passenger train (which consisted of engine and tender and five vehicles, the break-power consisting of a hand-break on the tender and Fay's break, actuated by the guard in the rear van, applying to all the vehicles,) the engine had its buffer-beam and buffer broken, its left and right hand frame-plates and side foot-plates bent, its cylinders damaged and cylinder covers broken, two third-class carriages next the engine were badly damaged, and the three other vehicles slightly so.

In the coal train (consisting of engine and tender, 33 waggons, break-van, and a pilot tank engine, which had been assisting the train up the bank between Hindley

and Crow's Nest junction,) the pilot engine had its right and left hand frame-plates bent, its smoke-box and cylinder covers broken, both buffer-planks broken, and its coal bunker much damaged; the break-van and waggon next it were also a good deal damaged.

No wheels left the rails, except the driving and trailing wheels of the pilot engine and the wheels of the break-van of the coal train, which were knocked from under it.

Owing to the injuries sustained by the driver of the passenger train he was unable to be examined when I opened the inquiry on the 8th ultimo, and I was consequently prevented taking his evidence till within the last few days.

Description.

At Crow's Nest junction (about $3\frac{1}{2}$ miles east of Wigan, at the top of a rising gradient of 1 in 97, which extends for about $1\frac{1}{2}$ miles in the Wigan direction) the lines to Chorley and Bolton diverge; 90 yards on the Bolton side of the junction facing-points there is another set of facing-points (No. 12) on the up main line to Bolton, giving access to an up goods loop, on which loop and 250 yards inside No. 12 facing-points the collision occurred.

The junction is well signalled and the facing-points are provided with the usual safety appliances, the 24 levers for working the points and signals being concentrated and properly interlocked in a raised cabin opposite the junction of the main lines, and 90 yards from the junction of the goods loop. The junction arrangements were renewed about 10 years since, at which time it was customary to connect the joints of the point-rod connections with a screw union piece and a solid plug about 7 inches long, kept in its place by two riveted pins one quarter of an inch in diameter, near each end. It was the failure of one of these joints in the cross rod leading from the main rod to No. 12 loop facing-points which was the cause of this collision.

Evidence.

1. *Isaac Roberts*, locomotive inspector, 20 years in the service, 10 months locomotive inspector.—I joined the 1.40 p.m. passenger train from Liverpool to Rochdale at Wigan, and I was riding on the foot-plate of the engine. On approaching Crow's Nest junction I saw the distant and home-signals off for the main line. The speed on passing the home-signal was about 35 miles an hour. I was standing on the left side of the engine, immediately behind the driver. I had noticed the main line points lying right, but turned my head towards the signal-cabin as I passed it, and did not observe how the goods loop points were lying, and I had no knowledge that they were in the wrong position till I felt the engine lurch to the left on passing through them. Immediately on this the driver shut off steam and reversed his engine, got steam against it, and commenced to whistle at the same time. The fireman also at once applied the tender-break, and got it full on before the collision, and upon striking the tank-engine at the back of the coal train speed had been reduced to about 20 miles an hour. The coal train was quite stationary. None of us jumped off. The engine travelled five or six yards after collision, no wheels leaving the rails in the passenger train. I was injured in the ribs and back, and was off duty for several days. The driver was also injured in the hip and the fireman on the shin. The coals came over from the tender into the foot-plate. I was injured by a small box being thrown from the tender on to the foot-plate. Neither driver or fireman appear to have observed the points being wrong. I should think the coal train was 200 yards inside the safety points. The driving and trailing wheels of the tank engine were knocked off the rails. Our engine got fastened under the coal bunker of the tank engine. I think the train would have been stopped if the driver had had control of a good continuous break. I think I felt the train break applied immediately before we struck. The day was fine and the rails dry. No sand was applied. I think the speed was quite 35 miles an hour at the loop points. I felt no rebound in the train.

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2. *James Harter*, fireman, eight years in the service, $2\frac{1}{2}$ years fireman.—I was fireman of the 1.40 p.m. train, Liverpool to Rochdale, on the 29th ult. The engine was No. 116, a six-wheeled engine, with the driving and trailing wheels coupled, and a six-wheeled tender. The only break was the ordinary screw break to the tender on the right-hand side. The train consisted of five vehicles, with a break throughout, applied by the guard. We left Wigan about 2.16 p.m., three minutes late, having next to stop at Bolton. Inspector Roberts was riding (from Wigan) on the foot-plate. I believe he was standing behind me as we were passing through Crow's Nest junction. The distant and home signals were both off for us as we approached and passed them. As we approached the loop points the speed was about 30 miles an hour, and I was standing looking out over the hand-rail at the Crow's Nest siding signals, and did not observe the points of the loop standing open for the loop, and I was not aware we were going wrong till I felt the engine swerve, and was thrown into the middle of the foot-plate. As soon as I recovered myself I applied the tender break, and I got it full on before the collision. The driver shut off steam, reversed the engine, and got back steam on before I had finished applying my break. He also whistled three times as soon as he had shut off steam. On striking, the speed was, I think, reduced to about 25 miles an hour. We did not run above a yard or so after collision. None of us jumped off. I was thrown against the front of the fire-box, and was hurt in the back and shin. I am still on the sick list. The tool box, which was not fastened, flew off on to the foot-plate and injured both inspector and driver. There is no rule restricting speed on passing through facing-points on the main line. About a minute after the collision I looked back and saw the junction home-signal still off, as it had been when we passed it. I had not looked back after passing the signal till after the collision. No wheels left the rails in my train. I felt the train break go on a short distance before the collision.

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3. *Thomas Layfield*, guard, 26 years in the service, guard 24 years.—I was guard of the 1.40 p.m. passenger train from Liverpool on the 29th ultimo. The train consisted of two third-class, one first-class, one second-class carriages, and guard's van in the rear, five altogether, coupled in the order stated. Fry's break was attached to all the vehicles, and was in good order. Inspector Greatorex joined the train at Rainford junction, and was in the van when the collision occurred. We started from Liverpool three minutes late, having been detained partly from signals and partly from station work. We left Wigan at 2.17 p.m., four minutes late, having lost a minute at Wigan in checking tickets. The next stop would have been Bolton. I did not observe the junction signals as we approached Crow's Nest, as I was attending to parcels in the bottom of the van. I was just going into the elevated portion of the van as we passed through the loop points, when I felt an unusual swerve in the train, the speed at the time being between 25 and 30 miles an hour,—hardly 30 miles, I think. I said to the inspector, who was beside the break-wheel, on feeling the swerve, "Where in the world are we, on the road or off?" and then came the collision, which knocked me off from the elevated portion on to the van floor, and I was injured in the head and leg, and am still off duty. The inspector began applying the break directly he felt the swerve, and had got it on before the collision. I could not say whether there was any reduction of speed, but the break prevented any rebound in the carriages. I did not hear any break-whistle before the collision. I believe the collision occurred at 2.24 p.m. I did not look back at the signal till after the collision, and I then noticed that it was still off for the main line. The spokes of the break-wheel, while the inspector was holding it, were all broken off by the shock.

4. *James Greatorex*, traffic inspector, 25 years in the service, 3 years traffic inspector.—I joined the 1.40 p.m. train from Liverpool on the 29th ultimo at Rainford junction, and was riding in the rear van. There was no one in the van but guard Layfield and myself. I was in the elevated portion of the van as we approached Crow's Nest junction. The distant and home signals were off for Bolton. The home-signal was off when I passed it, but I did not look at it again till three or four minutes after the collision, when it was still off. I did not observe that the train was entering the loop till I felt the swerve in the van, when, knowing that we were going wrong, I at once got to the break-wheel and applied the break, and I got it well on before the collision. The speed on entering the loop was about 30 miles an hour, and on collision 15 to 20 miles. I heard no break-whistle before the collision, nor any check to speed at the head of the train. I had still hold of the break-wheel when the collision occurred; it broke in my hands, and I was stunned by the blow and was injured in the head, but had not to go on the sick list. I think the time of the collision was about 2.21½, but this is only a guess, judging from the distance run. There was no rebound in the van, and no wheels left the rails in the passenger train. When I had recovered myself I went to the signal-cabin and found the levers properly pulled for the main line, although the points were lying open for the loop, and the home-signal still off the main line; but while I was there it was discovered that the point rod which should have moved the facing-points had separated.

5. *James Tollitt*, signalman, 12 years in the service, 11½ years signalman.—I have been seven years at Crow's Nest junction, where I came on duty at 2 p.m. on the 29th ult., to remain till 10 p.m., and was alone in the cabin when the collision occurred. The Wigan-to-Entwistle coal train had arrived at Crow's Nest at 2.15 p.m. I admitted it into the loop with the home-signal, and as soon as it had run in I put back No. 14 signal, then No. 13 locking-bar lever, and then No. 12 facing and catch-point lever, and felt nothing unusual in the weight of the latter. I then

again pulled over No. 13 locking-bar lever without any difficulty. At 2.18 p.m. I got the "Be ready" for the express from Hindley station cabin, gave it on to Crow's Nest siding, and got it accepted at 2.18 p.m. I then lowered No. 2 home and No. 1 distant-signal, and got "Train on line" from Hindley at 2.20 p.m. I had looked forward towards Bolton, but had not seen that No. 12 facing-points were lying open for the loop. I saw the train pass the cabin at a speed of from 25 to 30 miles an hour. There were three men on the engine. The inspector was standing on the right-hand side of the engine in front of the fireman. After the train passed I turned round to put back the signals, but did not do so, as I heard a noise in the frame, which must have been from the engine bursting the catch-points, and then I turned my head and saw the passenger train going into the loop; directly after this I heard the break-whistle. I left my signals off in consequence of what had occurred until the cabin was inspected. I gave "Train on line" to Crow's Nest siding, at 2.21 p.m., as the train passed, but did not clear back to Hindley. I told the lamp man to stand at the cabin steps to prevent any one going in, and went to No. 12 points and found them lying open for the loop, and not at all injured. The locking-bolt was properly through the slot, but the catch-points were burst. I then took Inspector Greatorex to the cabin and told him to look at the levers. I then left the cabin in charge of Blundell, whom I had relieved, telling him to work the down but not the up-line, and then I went with Inspector Southern to try and find where the point-rod had failed. We uncovered the boxing and found the point-rod in two pieces opposite No. 12 facing-points. The thread had stripped on the part of the rod furthest from the cabin, and the pin was broken, the lower piece lying on the ground, but the upper portion of the pin was gone. I do not recollect seeing the rods examined for the past three or four years.

6. *William Southern*, foreman platelayer, 30 years in the service, foreman platelayer about 10 years.—I have charge of the main line from Hindley station for about two miles toward Bolton, including Crow's Nest junction. I have never considered it was part of my duty to examine point-rods which are covered over with boards, unless anything has gone wrong; this duty I consider to belong to signal-fitter John Kirby, who is not under my orders directly, but under Mr. Rimmer. It is about four years since the covers were removed, to my knowledge, when the facing-points were altered. I do not think the rods were renewed at that time, but only overhauled. They had been originally put in 9 or 10 years ago, when the new cabin was erected. I was present when the defective rod was found on the 29th. I think it was the pins that had held the joint together; the thread had stripped previously. I found one half of the pin or rivet still in the rod, but projecting out, and quite loose. The fracture was quite bright as if it had just broken. I did not find the other half of the pin.

7. *John Kirby*, signal-fitter, 10 years in the service, all the time signal-fitter under Mr. Rimmer, permanent way inspector.—I have never had any orders to examine point-rod connexions, and I never take off the boxing to inspect the rods. I had never seen the rods at Crow's Nest with the boxing off them.

8. *Nathan Rimmer*, inspector of permanent way from Lostock to Fazakerley, including Crow's Nest.—I have been engaged for some time past in overhauling the connexions at all cabins, and Crow's Nest junction was next on the list to be dealt with. We are doing away with the boxing as much as possible, so that the platelayers may be able to see the condition of the rods. From the state of the rod in question, I should consider Southern more responsible than Kirby.

I believe the rods were last inspected about four years since. I think rods which are boxed over should be examined about once a month.

9. *John Lyfas*, driver, 16 years in the service, four weeks driver.—I was driver of the assistant engine to the 1.55 p.m. coal train from Wigan to Entwistle on the 29th ult. Mine was a tank engine running chimney first. We arrived at Crow's Nest junction about 2.10 p.m., and went at once right into the loop, and stopped well up the loop. The train consisted of 33 waggons and a van. We had been standing about 10 minutes when the collision occurred. My attention was drawn by the driver of the passenger train whistling when about 30 yards off. We had no time to do anything except to jump off. The speed of the passenger train was, I think, 30 miles an hour on collision. Our guard had time to jump out of his van. My engine was knocked under the guard's van a short distance. The driving and trailing wheels of my engine were knocked off the rails; the wheels of the van were knocked from under it, but no waggons were knocked off the rails. The driver at the front of my train was not hurt.

10. *William Wallwork*, driver, 28 years in the service, and 23 years driver.—I started with the 1.40 p.m. passenger train from Liverpool to Rochdale on the 29th December. My engine was a six-wheeled

engine, with four wheels coupled, and a six-wheeled tender, with a screw-break for the tender, and a continuous break, in the guard's hands, on the five vehicles of which the train was composed. I left Liverpool $1\frac{1}{2}$ minutes late, and last stopped at Wigan, which we left three minutes late, having next to stop at Bolton. On approaching Crow's Nest junction I found all the signals off, and I was running past the junction at about 30 miles an hour, standing on the left side of the engine, with the inspector standing between me and the fireman. I saw nothing of the loop points, and did not know of anything being wrong till I was twisted to the left and knocked down, though still keeping hold of the regulator. I managed to shut it, and popped the whistle twice. I also reversed the engine and got steam against it, and then struck the other train at a reduced speed of about 25 miles an hour. I stuck to the reversing-lever, and was struck by a loose box off the tender, which cut the feed off, and then struck me on the hip. I was knocked senseless. I am still on the sick list. The engine I was driving was not my usual one, and I had taken the tool-box from my own engine to it, or the box would have been fastened. I believe the fireman got his break on before the collision, and I felt a little check from the guard's break. I have never driven trains with the air or vacuum break. I shut my regulator just before the collision.

Conclusion.

This very serious collision was caused by the failure of a joint in the point-rod connecting No. 12 goods loop facing-points with the signal-cabin, in consequence of which failure the Crow's Nest junction signalman was unaware, when he lowered the junction signals for the up passenger train, that No. 12 facing-points were standing open for the goods loop, into which he had a short time previously turned an up coal train to get it out of the way of the up passenger train.

The up passenger train passed through the junction at a speed of between 25 and 35 miles an hour, without either driver, fireman, or a locomotive inspector (who was on the engine) observing that the goods loop facing-points were lying open for the goods loop, and it was only on feeling the lurch on the engine as it swerved to the left in passing into the loop that the driver and the other men became aware that anything was wrong. The driver, who was partly knocked down by the sudden swerve, though still keeping his hold of the regulator, shut off steam, whistled for the breaks, reversed, and got steam against his engine before the collision occurred with the pilot engine at the back of the coal train, at a spot 250 yards from the goods loop facing-points. He had the presence of mind to again shut off steam just before the collision, when the speed was reduced to from 15 to 25 miles an hour. The fireman, who was also nearly thrown down by the swerve, managed to get his tender-break hard on before the collision. A traffic inspector, who was riding in the elevated part of the van at the rear of the train, on feeling the swerve as the van was turned into the loop, at once applied the break (Fay's) which was connected with all the five vehicles in the train; and although its application did not result in much diminution of speed, it did no doubt prevent the vehicles from telescoping and from rebounding. The force of the collision broke the spokes from the break-wheel while the inspector was still holding it, and he was a good deal hurt.

As before stated, the joint arrangement in the point-rod tubing, which failed on the present occasion, is one which was commonly used when the Crow's Nest junction fittings were renewed some 10 years ago; it has, however, since been abandoned for a more secure arrangement; it consisted of a screw union piece $1\frac{3}{4}$ inches long, and of a solid plug about $6\frac{3}{4}$ inches long, held in position inside the tubing by a $\frac{1}{4}$ -inch iron pin $\frac{3}{4}$ of an inch from each end of the plug. It was evident that the thread of the screws had long since perished from corrosion, and that the tubing had been held together by the pins near the ends of the plug, one of which pins had at last worked loose and broken in the centre, thus allowing the joint to separate, so that when the signalman pulled No. 12 lever to make the points right for the main line, the safety-points on the goods loop alone responded to his pull, the facing-points remaining open for the goods loop, the joint having failed in the tubing which led from the main rod to the facing-points.

The tubing had been laid in a covered wooden trough (as was more customary formerly than at present), and had probably not been examined for at least four years. It had been no one's duty in particular to make this examination, and unless the ganger had been specially instructed to remove the covers of the trough and examine the condition of the rods at periodical intervals, he can hardly, I think, be held responsible for not having done so.

The inspector of permanent way stated in evidence that he thought rods which are covered over should be inspected once a month; and holding this opinion he must, I think, be held responsible for not having given definite orders relative to such inspections. Had there been a recent inspection of the joint which failed, its condition would no doubt have been seen and remedied before it had led to the present disastrous collision.

I understand that an improved method of securing the joints of all facing-point rods has been for some time in progress on the Lancashire and Yorkshire Railway, and that there are at the present moment none of the old joints, such as that which failed on the present occasion, in existence; and also that the practice of covering over the rods in troughs is as much as possible being given up.

As there is, however, always a possibility of failure occurring in some part of the facing-point connexions, and as the consequences of such failure are frequently of a serious character, it is most desirable that at all facing-points which trains are likely to pass over at speed, some simple arrangement should be adopted to prevent any junction-signal being lowered unless the facing-points are in the proper position.

Had the passenger train in the present instance been fitted with a good quickly-acting continuous break, under the driver's control, it is most probable that—seeing the train had to travel about 200 yards from the time the driver became aware he was turned into the loop to the engine at the tail of the goods train—the collision would have been altogether avoided, or its results very much mitigated.

I have, &c.,

The Secretary,
(Railway Department,) Board of Trade.

C. S. HUTCHINSON,
Major-General, R.E.

Printed copies of the above report were sent to the Company on the 3rd March.

LONDON AND NORTH-WESTERN RAILWAY.

Board of Trade, (Railway Department,)
1, Whitehall, London, S.W.,

17th November 1884.

SIR,

I HAVE the honour to report, for the information of the Board of Trade, that in compliance with the instructions contained in the Order of the 3rd instant, I have inquired into the circumstances connected with the accident and slight collision between two passenger trains travelling in opposite directions, which happened on the 30th ultimo, near the North Pole junction of the West London Railway, nearly a mile south from the Willesden station of the London and North-Western Railway.

In this case, the 6.32 p.m. up passenger train from Willesden to Addison Road Station, Kensington, immediately after it quitted the platform at Willesden, passed on to the down line or wrong road, owing to a pair of points of a cross-over road not having been properly set for the up line, and this train continued to run on the down line, or wrong road, to North Pole junction, until it reached a pair of catch points at the foot of a steep incline of 1 in 60, which had been put in for the purpose of intercepting any vehicles that might break away from any down train in the act of ascending this incline, and run back. The passenger train, consisting of an engine and six carriages, passed through the catch points into the catch siding, continued to run forward until the engine came in contact with, and carried away, the stop blocks at the end of the catch siding, and ran partly down the embankment on which the line at this point was constructed, and fell over on its right side, the leading break-carriage next the engine, and the carriage behind it, being thrown off the rails, and this last carriage fouled the down line, which it had just left, as a down passenger train from Kensington for Willesden was approaching the catch points from the opposite direction, and a slight collision occurred.