

fifteen miles an hour, and ten or twelve when they struck the other train. He also states that the slackening and stopping of the Lancashire and Yorkshire train was a momentary affair.

The guard of the London and North-Western train thinks they were 200 yards behind the Lancashire and Yorkshire train when they got in sight of the Mirfield Junction signal, and he was looking out on the righthand side, and observed that the signals were on, and the Lancashire and Yorkshire train whistled for the signals when he was about on the viaducts (210 yards from the signal), and his steam was on at the time, but he did not notice how long it was kept on, but that it was on up to the distant signal, which was also on when the Lancashire and Yorkshire train got to within three or four yards of it; that he did not see the distant signal taken off at all, neither did he notice how long his own driver kept the steam on. He also states that when they had got about 100 yards inside the distant signal he noticed that they were decreasing the distance between the two trains, and he walked across the van, and applied his break, and that he had not heard his driver whistle for the breaks; also that the distant signal was on when his van passed it, and he had not seen it taken off at all, though it might have been taken off and put on again; that although he had not heard his driver whistle for the breaks, he might have done so; neither had he heard the driver of the Lancashire and Yorkshire train whistle for the breaks.

There are a good many discrepancies in the statements made by the several witnesses as to what was done on the engines and also at the signal stations, but they are not material to the main facts which have been elicited.

It appears, first, as regards the accident, that the leading axle of the van next to the tender of the Lancashire and Yorkshire mail train broke close to the nave of the left wheel, about 30 yards before the train reached the distant signal worked from the Mirfield Junction (the first marks were found at that spot), and the end of the van dropped down on the left side, but was partly kept up by the coupling chain from the tender, and the driver of the train heard the guard call out, and immediately took steps to stop his train, and it was brought to a stand about 180 yards inside the distant signal, which may be regarded as a sharp pull up for the proportion of break power attached to this train. Unfortunately, the driver neglected to open the steam whistle for the guards breaks, which of itself was not of any importance, but it would have served as a warning to the driver of the London and North-Western train that something was wrong, and immediate steps might have been taken by him by which the collision might have been avoided, inasmuch as he was furnished with a much larger proportion of break power than the Lancashire and Yorkshire train.

It would also appear from the evidence that the driver of the London and North-Western train had not kept a very vigilant look-out ahead.

The axle which broke was made by the Low Moor Company, and the wheels have been in use nine years, and were put under the van with new tires on 8th December last, when it was last in the company's workshop. It is not known what number of miles it had run.

The fractured axle carried the leading pair of wheels of the van, and the fracture took place inside and close to the nave of the wheel. The diameter of

the axle, passing through the nave, is 4 inches; and inside, but close to the nave, where there is a shoulder, the diameter is $4\frac{1}{2}$ inches. There was a flaw extending for about three fourths of the circumference, and half an inch deep, on the opposite side to the key which fixes the nave and wheels on the axle. This flaw was evidently of long standing, but I think it could not be seen on account of the shoulder. There are many accidents precisely similar in character to this one, where the advantage of having a projection on the inner side of the nave of the wheel, to hold up the end of a broken axle for a short distance, or until it reached the next station, is very manifest. An invention of this kind has been patented by Mr. J. Beattie, of the London and South-Western Railway. In this instance, I believe, the axle did not drop to the ground, and the left wheel did not get out of the axle box, nor away from the horn plates, but dropped, and ran along inside the rails.

2. The collision was undoubtedly the almost inevitable result of the vicious system of working in operation on the Lancashire and Yorkshire Railway, by which one train is allowed by the company's servants, in defiance of the company's printed regulations, to follow another past stations at a distance of from 60 or 70 to 200 or 300 yards, as stated by the different witnesses, and by the entire want of discipline maintained on the line, by which an engine-driver is permitted to disregard danger signals with impunity.

If such regulations are allowed to be broken, and remain unpunished, when no accident occurs, as in the 99 cases out of the 100, they should not be appealed to in the 100th when some mishap takes place; and if the very large traffic along this line, at this part amounting to 88 passenger trains and 110 goods trains in the 24 hours, cannot be worked if a 5-minute interval at the various stations be preserved, then the chances of the public travelling safely on this line will be largely increased if a lesser interval of time, say of 3 minutes, be substituted for the 5 minutes, provided the 3 minutes be rigidly observed, and that the drivers are not permitted to pass danger signals.

3. The vicious system brought to light in the investigation of the circumstances connected with this collision is only exceeded in intensity by the practice adopted on many of the most important lines of railway in the kingdom, of slipping off two or three carriages from the tail of an express train when it is travelling from 40 to 50 miles an hour, in order to avoid the necessity for stopping the express at the stations for which these carriages are intended, which carriages are allowed gradually to stop, under the control of the guard. Now if, unfortunately, any mishap should at any time happen to the front part of the express train, by which its progress is suddenly arrested, after these carriages shall have been detached, a collision will in all probability be unavoidable, and then it will be pleaded as a justification that the practice is becoming a general one with railway companies, in order to save time.

4. There was no means of communication between the guard and driver in either of these trains; not, as it happened, that it would have exercised any effect in controlling the result, as the guards appear to have been on the alert.

*The Secretary,
Railway Department,
Board of Trade.*

I have, &c.,
W. YOLLAND,
Col. R.E.

LANCASHIRE AND YORKSHIRE RAILWAY.

*Railway Department Board of Trade,
Whitehall, 21st March 1861.*

SIR,
I AM directed by the Lords of the Committee of Privy Council for Trade to transmit to you, for

the consideration of the Directors of the Lancashire and Yorkshire Railway Company, the enclosed copy of the Report made by Captain Tyler, R.E., the officer appointed by my Lords to inquire into the circum-

stances which attended the collision that occurred on the 6th instant near the Blue Pits Station.

I am, &c.

*The Secretary of the
Lancashire and Yorkshire
Railway Company.*

JAMES BOOTH.

SIR, *Manchester, 18th March 1861.*

In compliance with the instructions contained in your minute of the 8th instant, I have the honour to report, for the information of the Lords of the Committee of Privy Council for Trade, the result of my inquiry into the circumstances which attended the accident, that occurred on the 6th instant, near the Blue Pits Station of the Lancashire and Yorkshire Railway.

The Station is 8½ miles to the north of Manchester, and is the site of a junction between the main line of the Lancashire and Yorkshire Railway from Manchester to Normanton, and the line from Liverpool, Bolton, and Bury. There is a triangle on the west of the station, for the more convenient working of the traffic; and the junction at the north-west angle of this triangle, communicating with Bury on the west, Manchester on the south, and Blue Pits, Rochdale, and Normanton on the east, is called the Spinthread Junction. It is provided with a raised stage, on which two signalmen take day and night duty alternately, and from which all the signals and points are worked by these men. To the east of this stage, and within the triangle, there are some sidings, the points of which are also worked from it.

On the afternoon in question a goods train arrived at 5.25 p.m. from the Blue Pits Station, and came to a stand on the east of the junction, for the purpose of setting back into and fetching out some waggons from these sidings; and a passenger train approached the junction at the same time from the opposite direction (from Liverpool) for Rochdale and Normanton. The signalman lowered his signals, as was his duty, for the passenger train to proceed on its own line to the Blue Pits Station, and when that train was within 30 yards of his stage, he opened the points, as he believed, to admit the goods train into the sidings.

Unfortunately, however, he seized the wrong handle, and opened the main-line points in front of the passenger train, instead of the siding points behind the goods train; and he thus turned the passenger train on the Manchester line, across which the goods engine was moving, and caused the passenger engine to come into collision with the goods engine with great violence, instead of allowing it to run forward on the straight road towards Blue Pits.

The passenger train was composed of an engine and tender, 3 carriages, and a break-van. Two of the carriages were in front of the break-van, and were connected with it by Fay's system of continuous breaks; the third carriage was behind the van. It left Liverpool at 4 p.m., and approached the junction in due course, at a speed of at least 25 miles an hour. The driver saw the points turned over for the Manchester line, when he was within 30 yards of them, and about 60 yards from the goods engine. He whistled for the breaks, and pulled his reversing lever partly over before the collision occurred; and the fireman also partly applied the tender-break. The guard remembers nothing, except that he felt a sudden shock after he had seen the signals all right at the junction, and that, having put his watch in his pocket at 25½ minutes past 5 o'clock, he pulled it out again after the collision, and observed that it was then 5.26.

The momentum of the passenger train was expended partly upon the goods engine, but principally on its tender, which was carried away in front of the passenger engine, and knocked to pieces. The tank was separated from the framing of this tender, and thrown off to the right, and the other remains of it got under the passenger engine; the wheels being

jammed under that engine in such a position as to bring it to a sudden stand at 20 or 30 yards from the point of collision. The smoke-box end of the passenger-engine, and other parts of it, were much damaged. The carriages of the passenger train did not suffer much, except that which was behind the break-van. The body of this carriage was shifted on its framing.

Of sixty passengers who were travelling in the train, it appears that only six were injured; a result which is very remarkable, considering the speed of the train, and the sudden way in which it was brought to a stand.

The driver and fireman of the goods engine were the greatest sufferers. The former saw the passenger train approaching while he was in the act of reversing his engine to put back into the siding. He heard the passenger driver give three sharp whistles for the breaks, when he had his back to him, and was applying his steam. On looking round he saw the passenger engine coming in the wrong direction through the points, and he attempted to jump off his engine; but he was caught as he passed out between the hand-railing, and thrown down. He received several severe contusions.

The fireman only remembers that he was suddenly carried off his engine, and that he found himself in a strange bed on the following morning. His leg was badly fractured, and he was otherwise seriously injured; but it is now hoped that he may recover.

This collision, which might have been far more serious in its consequences, has been caused by a simple mistake of the signalman, in catching hold of the wrong point-handle; and it is not much to be wondered at that he should make such a mistake, when it is considered that he has 14 handles in front of him, close together, in a row, and all precisely similar to one another. They are distinguished, it is true, by brass plates upon the hand-rail in front of them, indicating the purpose to which each is applied; but they might easily be kept more distinct, instead of being thus in a position which renders it necessary, almost, for the most experienced man to read the indications on the brass plates whenever it is necessary for him to move the handles. The signalman who made this mistake had been two years and nine months at the post; and the handle which he thus pulled back was the next one to that which he ought to have worked.

There are two remedies which may be applied for the prevention of future accidents of this description, and which would render such a mistake impossible. In the first place, the handles might be separated, and made to work each towards the points or the signal to which it applies; the handles of the junction points and signals working towards the north, those of the siding points and distant signal on the east working towards the east, and those of the siding points and distant signals on the west working towards the west. The signalman would thus have a means of distinguishing them one from another which could hardly lead to mistake under any circumstances.

In the second place, the main line points and the main signals at the junction stage may be so connected together as to prevent the possibility of such a mistake; and many junctions, constructed on this improved principle are now in existence. When a junction is so properly arranged, the signalman is prevented by mechanical arrangement from placing his main line points into a wrong position after he has lowered his main signal for a train to pass; and he is unable to lower his main signal to admit such a train unless his main line points are set right for it to proceed.

If the points and signals had been connected together in this manner at the Spinthread Junction, this accident could not, of course, have occurred, because the signalman, after lowering his main signal for this passenger train to proceed, could not have altered his points so as to turn it over to the wrong line.

There is one other important subject, also, to which it is right that I should draw attention, in connexion with the present inquiry, though it has nothing to do with the cause of the accident.

It will have been observed that there was a carriage behind the last van of the passenger train; and this is, though not an uncommon, yet always an objectionable arrangement. The Lancashire and Yorkshire Company are now constructing and employing break-vans of an improved description, (for which great credit is due to their carriage superintendent,) affording to the guard an excellent means of seeing along the top and sides of his train, and of observing, through glass, the progress and condition of the carriages before him at each moment; and they have set an excellent example to the other great companies in the application of continuous breaks, by means of which many accidents may be prevented altogether, by which those may be rendered comparatively harmless which would be otherwise attended with serious results, and by which an excellent means of communication may be provided between the guard and the driver; but they deprive these good arrangements of

a great part of their advantage when they attach vehicles behind the guard's van, and I trust they will be induced to prevent this practice from being adopted for the future. It appears to be the custom, under authority, for a carriage to be attached at the tail of this train, for the sake of greater convenience in placing it with the Bradford portion of the train at Rochdale; but it was only the other day that a carriage so attached was dragged for miles on another railway, without the guard or the driver of the train being aware of it, after it had lost its wheels and axles; and the risk that is attendant, for this and other reasons, upon the practice, ought to be sufficient to prevent its being constantly adopted, for the mere avoidance of a little extra trouble, and, perhaps, a slight delay at a station at which a change in the arrangement of the train has subsequently to be effected.

*The Secretary,
Railway Department,
Board of Trade.*

I have, &c.
W. H. TYLER,
Capt. R.E.

LONDON, BRIGHTON, AND SOUTH COAST RAILWAY.

*Railway Department, Board of Trade,
Whitehall, 21st March 1861.*

SIR,

I AM directed by the Lords of the Committee of Privy Council for Trade to transmit to you, for the consideration of the Directors of the London, Brighton, and South Coast Railway Company, the enclosed copy of the report made by Captain Tyler, R.E., the Officer appointed by my Lords to inquire into the circumstances which attended the collision that occurred on the 30th January last near the Ford Station.

I have, &c.

JAMES BOOTH.

*The Secretary to the
London, Brighton, and South-Coast
Railway Company.*

SIR,

York, 18th March 1861.

IN compliance with the instructions contained in your minute of the 2d ultimo, I have the honour to report, for the information of the Lords of the Committee of Privy Council for Trade, the result of my inquiry into the circumstances which attended the accident, that occurred on the 30th January last, near the Ford Station of the London, Brighton, and South Coast Railway.

To the east of that station there is a sliding bridge over the river Arun, carrying only one line of rails; and the points which connect the double lines with the single line of rails at the two ends of that bridge are under the charge of two pointsmen, one to each pair of points.

A double semaphore signal on the east of the bridge is considered as the governing signal, employed for the protection of the bridge and the single line passing over it. There are distant signals, working in each direction; and the station signal is not permitted to be lowered for the passage of a train from the westward, excepting when the signal on the east of the bridge is lowered also. A small wire signal communicates from the station to the west of the bridge.

On the 30th January, the 6 a.m. passenger train from Portsmouth, consisting of an engine and tender, 5 carriages, and 2 break-vans, approached the Ford Station about four minutes late; and the driver found the signals lowered for him to pass the station and bridge in the usual manner. He proceeded over the bridge at 14 or 15 miles an hour, which is the greatest speed permitted at this point by the Company's regulations; and he saw the engine of another train

waiting upon the down line of rails, for his train to travel first over the single line. As soon as he had passed the points on the east of the bridge, he became aware that the pointsman had turned him on to the down line, instead of allowing him to proceed along his own line, and that a collision was inevitable. He had just time to reverse his engine, but no time to whistle for his breaks, before he struck the engine of the cattle train. He remained on his engine, and was not much hurt. The fireman, after giving his break-handle one or two turns, also tried to jump off; but he only succeeded in getting on the lower step of the engine before the collision occurred; and he was stunned, by being thrown upon the ballast between the two lines, and cut about the face.

The guard who was riding in the leading van, Alfred Moore, remembers having passed the Ford Station, but nothing more. He was found senseless in his break-van after the collision, and was evidently much hurt. There were fortunately only 3 passengers altogether, 2 soldiers and a pensioner, in the passenger train; and they do not appear to have suffered much from the shock. There were some butchers also in the cattle train, who were some of them hurt; so that about 6 persons, besides the above fireman and guard, may be said to have been injured, more or less, from the effects of the collision.

The pointsman, who occasioned this accident, is an old servant of the company, with an excellent character, and he had been at the same post for 12 months. He saw the cattle train approaching from Brighton, about 5 minutes late; and he says that the driver passed the distant signal with his steam on, and he was a little afraid that he would not stop short of the points leading to the single line. He also saw the passenger train approaching from the opposite direction, and he lowered his signals, according to his usual practice, for this latter train, while he kept his signals at danger against the cattle train. He admits his mistake in turning on the points for the up line, and in thus causing the passenger train to run the wrong way through them; and he says that he did so unwittingly, while looking round, with some anxiety, to see whether the cattle train had come to a stand sufficiently far from them to allow the passenger train to pass in safety. He did not perceive his error until after the engine had passed through the points; and he then considered, wisely, that it was better to keep them in the wrong position, rather than to alter them, and throw the passenger train off the line.