The

VIRTUAL MUSEUM

of the

LANCASHIRE & YORKSHIRE RAILWAY

Accident Reports.

14 June 1863

BoT Report into Accident at

Mill Lane Junction.

(4 Pages).

The vehicles were coupled together in the order in which they are given.

The train left Castleblayney 17 minutes late. It had to wait for the down mail to pass it at Ballybay, as the railway is a single line.

The distance by railway from Castleblayney to Culloville is 5¾ miles. The up and down gradients are easy for the first 3¾ miles. The line then falls for about three-quarters of a mile, on gradients that average about 1 in 187, and at 4¼ miles it rises again towards Culloville. The gradient is reduced to 1 in 430 and 1 in 650 at the bottom of the incline, where the line after falling for three-quarters of a mile commences again to rise.

The train is reported to have been running at a speed of about 28 miles an hour when descending the incline at 3¾ miles from Castleblayney. As 28 miles an hour is the average speed at which the train is timed to run, the speed down this incline was probably somewhat greater; but I have no reason to suppose that it was much in excess of what it was stated to have been by the engine-driver, fireman, and guard, viz., 26 to 28 miles an hour.

When the train reached the foot of the incline, the horse-box, which was next to the tender, got off the rails. The first mark was found on the head of a dog spike in the sleeper next to the rail joint, and the marks of one pair of wheels being off the rails were distinctly visible on the sleepers for 300 yards forward from this point. The marks of two pairs of wheels being off the rails were then found, and at 345 yards from the mark on the dog spike the horse-box had broken loose from the tender. It ran against the stone parapet wall of a bridge under the railway, fell over into the road, and came to rest on three of its wheels, near the wing wall of the bridge. One axle of the horse-box was broken in two, and one wheel remained at the top of the bridge.

The flat waggon also struck the parapet wall of the bridge and carried away the greater part of the wall. The waggon was broken into small pieces. The four vehicles that came next in the train passed over the bridge and came to rest at the bottom of the embankment at the opposite side of the railway to where the horse-box and flat waggon were found. These four vehicles were turned in the opposite direction to that in which they had been running. The one that had been the third vehicle of the train was found nearest to Castleblayney and the one that had been the seventh stood nearest to Culloville. The guards van came to rest with the leading wheels on top of the composite carriage, and with the hind wheels across the railway. The remaining four vehicles remained on the rails. The engine and tender were stopped about 250 yards at the Culloville side of the under-bridge. They did not leave the rails.

About a quarter of a mile of the permanent way, at the place where the accident happened had been renewed shortly before the accident. This renewal had been completed 10 days, and the line for some distance at each side, and at the spot where the horse-box got off, was reported to have been found true to gauge, and in good order after the accident.

The part that had been relaid was in good order when I examined it. The horse-box was not in good working order. The flange of one of what were supposed to have been the leading wheels was very sharp, and much thicker at one side than the other, showing that it had been working with a strained axle, or with the tyre not quite in its proper place.

The brasses of the axle-boxes were much worn, and the slides of the axle-boxes in which the horn plates worked were also much worn. These several defects would admit of 1½ to 2 in. of play or side motion being given to the horse-box when running.

The Inspector of permanent way, who was at work with a gang of men some distance back from where the accident occurred, stated that he observed this horse-box oscillating considerably as the train passed him. This oscillation would be increased while the train was running down the incline and the slight check that the engine would get, after reaching the bottom of the incline, where the railway commenced to rise, and where the vehicles in the hind part of the train would close on those in the front of the train, probably jerked the horse-box off the rails. The couplings between the horse-box and the tender appear to have given way just as the engine reached the bridge. The railway at this place curves slightly to the left. The horse-box kept a tolerably straight course in the direction of the parapet wall of the bridge, neither the engine-driver, fireman, or guard were aware that anything was wrong until the engine and tender had separated from the train. The two first then observed the horse-box running towards the parapet wall of the bridge, and saw the flat waggon following in the same direction.

The four vehicles that came next were probably directed towards the opposite side of the railway by the front end of the flat waggon striking the bridge, and the back end, when twisted round, giving the horse-box next behind it, a push towards the opposite side of the railway, where it ran down the bank and swung the other three vehicles round by the coupling chains, which did not give way.

The two leading vehicles of the train which were next to the tender were broken to pieces and the five next were considerably damaged. The passengers in the composite carriage and the guard had a marvellous escape.

The accident appears to have been caused by the defective state of the horse-box next to the tender, which belonged to the Dublin and Drogheda Railway Company.

The wheel base of this vehicle was only 7ft. 6in. Horse-boxes of this class cannot run steadily even when they are in good order, in consequence of their short wheel base. They cannot be sent with passenger trains, without risking the safety of the train, and they certainly should never be put on in front.

I have, &c.,

F. H. Rich,
Colonel R.E.

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

Printed copies of the above report were sent to the company.

LANCASHIRE AND YORKSHIRE RAILWAY.

Sir, *Bradford, 12th July* 1873.

In compliance with the instructions contained in your minute of the 21st ultimo, I have the honour to report, for the information of the Board of Trade, the result of my inquiry into the circumstances which attended the collision that occurred on the 14th ultimo, near the Mill Lane junction on the Lancashire and Yorkshire Railway.

In this case the 9.30 p.m. Lancashire and Yorkshire passenger train, on its way from Bradford to Halifax, was over-taken and run into by a Great Northern passenger train, 9.35 p.m. from Bradford for Ardsley, at 440 yards from the Bradford station platform. Up to the present time, 13 passengers in the Lancashire and Yorkshire train, and two passengers in the Great Northern train, have complained of injury. None of the Company's servants were injured.

The line rises 1 in 50 from the joint station at Bradford towards the Mill Lane junction, which is about 650 yards from the Bradford station. About

470 yards from the station there is a level-crossing, called the Broomfields crossing, at which there is a cabin supplied with block-telegraph instruments; and the line is worked by block-telegraph between this cabin, called the B cabin, and the A cabin, 330 yards from it towards the Bradford station. Between these two cabins there is a tunnel 120 yards long, and the remainder of the line is in open cutting. The line is also worked by block-telegraph between cabin B and the Mill Lane junction cabin, 250 yards from it.

I append a printed copy of the regulations under which the block-telegraph is worked upon this part of the line, from which it will be seen that the signalmen are strictly prohibited from allowing an engine or train to pass cabin A until the previous engine or train has passed cabin B at the Broomfield crossing.

There is a semaphore signal opposite to cabin B, which acts as a home signal for the crossing, and also as a home-signal with reference to the block section; but there is no distant-signal towards the Bradford station from cabin B. There is a home-signal at the Mill Lane cabin, and a distant-signal 150 yards from it towards the Bradford station.

The Great Northern train left the Bradford station at 9.38, three minutes late, on the evening in question, consisting of 2 engines and tenders, 12 carriages, and 3 break-vans, with 2 guards. The driver of the leading engine states that the signal was lowered for him to pass cabin A, and that he passed that cabin at a speed of about 10 miles an hour; that he kept up that speed in passing through the tunnel; that he saw no light and received no warning till he was within 12 yards of the train in front of him; that he then caught sight of the off-side light; and that he shut off steam, whistled for the breaks, and reversed the engine, and came into collision with the last carriage of that train, at a speed of 8 to 10 ten miles an hour. This driver states that the atmosphere was so thick that he could not see a red light at a greater distance than 12 yards. The driver of the second engine was not aware of any obstruction in front of him until he heard the whistle from the leading engine, and then he caught sight of the near-side light of the train in front. He had previously shut off his steam, because he could not see the signal at the B cabin, and he had no time to do anything further before the collision occurred.

The guard who rode in the leading break-van was engaged in getting a piece of coal out of his eye when he heard the whistle from one of the engines. He ran to his break-handle, but had no time to apply his break before the collision occurred.

The head-guard, who rode at the tail of the train, was entering the time of departure in his book, when he heard a whistle, and was suddenly knocked from one end of the van to the other. All these men agree in asserting that the atmosphere was very thick with steam and smoke at the time. Neither of these engines was damaged or thrown off the line nor was any vehicle in the train.

The Lancashire and Yorkshire train left the Bradford station at 9.37, consisting of two engines and tenders, eight carriages, and a van. The van was next behind the tender of the second engine, and was coupled to three other vehicles fitted with Fay's continuous breaks. The leading engine-driver states that he travelled in due course towards the Mill Lane junction, but finding the signals from that junction at "danger," he brought his train to a stand in obedience to them. The train had been standing with its last carriage 32 yards from the B cabin-signal for a minute or a minute and a half, according to the leading driver and the guard, when it was overtaken, as above described, by the Great Northern train. The train was disconnected in three places by the collision, but very little damage was done to the carriages, and none of them were thrown off the rails.

The servants of the company with this train do not appear to have expected the collision, or to have had any notion that the Great Northern train was following them so closely.

Thomas Scott, the signalman who was doing duty in cabin "A," was not present to give his evidence at my inquiry. He had been dismissed from the service of the company in consequence of the collision, and pleaded, I am informed, when summoned to my inquiry, that he had other and more profitable business to attend to. In the evidence which he gave to the officers of the two companies on the 17th of June, I find that he admits having disobeyed the printed regulations in his cabin for the working of the block system, and having allowed the Great Northern train to pass his cabin,—A, before the Lancashire and Yorkshire train had been notified to him as having passed cabin B. He had been at cabin A for six months, and at cabin B for 1 year and 10 months previously. He adds in his evidence as follows:—"It is a daily "occurrence, but not regular, to admit another train "before Broomfield gives clear the preceding train. "I do it because the man may be attending to the "crossing-gates, and to prevent a delay; we have no "orders to do it; this has been the practice ever "since I went to the box; it was done when I was "at Broomfield crossing."

The signalman who was on duty at the B cabin has done duty there since December 1872, and has been working during the whole of that time with block telegraph instruments. On this particular occasion he kept his block on at "A" cabin, and the signalman at that cabin had no right to allow the Great Northern train to pass his cabin, according to his regulations; but it is quite clear from the evidence of this signalman, Charles Thorne, that the strict letter of the regulations for block telegraph working has not, in practice, been adhered to. He found, when he commenced work at the Broomfield crossing last December, a state of things existing which he and other signalmen have since continued. He says that "sometimes, "when the trains are timed closed together, and when "he can see the Mill Lane signals down, and knows, "in the case of through trains, that one train is going "on the Lancashire and Yorkshire, and one on the "Great Northern line from the Mill Lane junction, he "gives clear to cabin 'A' before the preceding train "has passed his cabin and signal, and that this was "his regular and ordinary mode of working." In such a case he gave one beat (the acknowledgment signal) instead of three beats (the all-clear signal) to cabin "A;" and there was an understanding between the signalmen themselves that one beat, which is intended by the regulations to mean acknowledgment only, should mean also that, subject to the discretion of the other signalman, as far as the signalman at B was able to judge, a train passing him was likely to go through without further obstruction. In an ordinary case of obstruction, it is the duty of signalman B to give five beats to signalman A, in answer to any notice received from him; and on this particular occasion Thorne did so—he states— to cabin A. But in order to facilitate the working, it has been the practice to give one beat in place of five beats when it appeared likely that a train approaching cabin B would go through in due course without stoppage or obstruction, past the Mill Lane junction; and in such a case, signalman A would use his discretion in allowing or not a second engine or train to pass him before the little semaphore in his cabin had been lowered from cabin B to indicate that the preceding train or engine had passed cabin B. This signalman states that the night was bright and clear; that it had been raining, but had cleared up; and that he saw the Great Northern train lights as that train passed cabin A. He noticed the Great Northern train as it came out of the tunnel; and, seeing that the leading driver did not shut the steam off, he ran to meet it; but he had not passed the last carriage of the Lancashire and Yorkshire train before the collision occurred. He asserts confidently that the Great Northern drivers might have seen the Lancashire and Yorkshire train when they were 100 yards from it.

A signalman who was on duty at a small cabin at the end of the platform, 133 yards from the A cabin, states that he gave the usual signals with his *plungers*

when the two trains started from the station; that he saw the signals turned to "all right" from the A cabin in the usual manner for both trains, and that he also observed that the signalman in the A cabin held a green light towards the Great Northern train. He states that the two trains passed him at 9.37 and 9.39 respectively.

This collision occurred on a portion of line supposed to be worked, and ordered to be worked, but not really worked, on the block telegraph system. No blame can be attached to the servants of the Company with the Lancashire and Yorkshire train. That train was simply stopped in obedience to the signals at the Mill Lane junction. The servants of the Company with the Great Northern train might have brought their train to a stand within a very short distance, on a rising gradient of 1 in 50; and it seems probable, that if they had kept a better look-out they might have seen the Lancashire and Yorkshire train in time to have avoided the collision; but the latter train would, no doubt, have left steam and smoke behind it; and there is no evidence, except that of the signalman and the driver and fireman of the second train, to show positively, for how great a distance the leading driver of the second train could have seen the lights at the tail of the first train before the collision.

The main cause of the collision was the disobedience to his printed regulations of Scott, the signalman in cabin A. He was clearly wrong in allowing the second train to pass his cabin before the first train had passed cabin B. There has evidently been a previous laxity in the working of the block telegraph regulations which has led to this act of disobedience, and therefore to the collision. The regulations, which are appended, are judiciously framed, but were habitually disregarded. But good regulations are useless unless by the maintenance of proper discipline obedience to them is enforced. It is very desirable and, indeed, most necessary that strict discipline should be maintained amongst the signalmen employed to work under the block system or any other system. Otherwise, sooner or later, a catastrophe of this description is only too likely to occur.

I have, &c.,
H. W. TYLER.

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

LANCASHIRE AND YORKSHIRE RAILWAY.

Special Instructions to Signalmen and all others concerned for Electric Train Signalling.

GENERAL RULES.

The object of the system of electric train signalling is to prevent more than one train or engine from running between any two signal-cabins on the same line at the same time. This is to be accomplished by signalling the approach, departure, and arrival of every train or engine from cabin to cabin, and by not allowing any other train or engine to leave or pass a cabin until the previous train has actually passed the cabin next in advance and the line has been signalled clear. For this purpose a bell communication is provided between each cabin to signal the approach, departure, and arrival of trains, and an electric semaphore signal worked from the next cabin for the protection of each line of rails.

EVERY TRAIN OR ENGINE, *without exception*, must be signalled in its progress between cabin and cabin, in the manner explained hereafter.

No release from duty can be allowed to take place until the *last* ALL CLEAR SIGNAL has been received from the next station.

Any remissness on the part of signalmen placed in charge and appointed to work the electric signals will be severely dealt with.

BELL SIGNALS.

NO SIGNAL IS COMPLETE UNTIL IT IS ACKNOWLEDGED BY ONE STROKE; AND ALL SIGNALS MUST BE REPEATED UNTIL ACKNOWLEDGED.

Signalmen are hereby instructed to press the bell keys down firmly, and to make a distinct pause between each stroke, so that the receiver of the signal may not be misled.

(A.) One beat ... Acknowledgment.
(B.) Two beats ... Train or Engine departure.
(C.) Two beats given twice ... Warning Signal—Train Coming or Waiting.
(D.) Three beats ... All Clear.
(E.) Four beats ... Attention Signal.
(F.) Five beats ... Obstruction Danger Signal.
(G.) Six beats ... Error Signal.
(H.) Eight beats ... Testing Signal.

(A.) One beat is an acknowledgment for all signals, including all movements of the semaphore arms, except the OBSTRUCTION AND TESTING SIGNALS, which must be repeated in full.

No private signals must be sent by means of the bell.

(E.) The attention signal is to be given to call attention when a signal has not been acknowledged or properly given.

(G.) The error signal is to be given when an erroneous signal has been sent, and will cancel the previous signal.

(H.) The testing signal is to be given by the telegraph superintendent or inspectors to test the state of instruments, and must be repeated as often as given, and the switch handle worked slowly backwards and forwards.

No other person must be allowed to touch the apparatus.

SPECIAL INSTRUCTIONS.

The receiver of an electric signal cannot alter it; the sender only is able to reverse it. A signal once given remains fixed until the next signal is sent, and can be referred to at any moment.

The ordinary position of the electric signal will be at DANGER, *except tunnel semaphores, which will be kept in the position of* ALL CLEAR *when the tunnel is clear.*

1. No train or engine must be allowed to pass you, unless the electric semaphore in your cabin for the section into which it is about to proceed stands at ALL CLEAR.

2. On the approach of a train or engine you will at once signal it forward by giving the warning signal (C), train coming.

3. If the line is clear at the next cabin the pointsman will pull off your electric semaphore to All Clear (which you must acknowledge), and you will allow the train or engine to proceed, signalling it to the next cabin by the "Departure Signal (B)."

4. The signalman at the next cabin will acknowledge this by throwing his switch handle over to ON, thereby placing your electric semaphore at DANGER, and preventing another train from following. This you will acknowledge by one beat, and the indicator in the cabin in advance will then show that the semaphore in your cabin is at DANGER.

5. The arrival of the train at the cabin in advance will be signalled to you by the All Clear Signal (D) being given. This you will acknowledge. Before giving the All Clear Signal the SIGNALMAN MUST SATISFY HIMSELF, BY SEEING THE TAIL BOARD OR TAIL LAMP, THAT THE WHOLE OF THE TRAIN HAS PASSED HIM.

6. Should another train or engine approach before the first has been signalled Clear, and whilst the electric semaphore is at Danger, it must be BROUGHT TO A STAND until the ALL CLEAR signal is received. The train waiting (C) signal must also be given.

7. When any necessity arises to block the line, from accident, shunting, &c., the OBSTRUCTION DANGER SIGNAL (F) must be given to the next cabin on each

side, and the electric signal placed at DANGER, and nothing will be allowed to pass that cabin until the ALL CLEAR SIGNAL is given by the signalman where the obstruction existed. Care must be taken to have the OBSTRUCTION SIGNAL REPEATED before allowing an engine or train to shunt on or across the main line.

IRREGULARITIES.

1. Should an incorrect signal have been given, or a signal misunderstood, give six beats (G), and then send the correct signal.

2. Should the electric semaphore remain at ALL CLEAR after you have signalled the departure of a train, give the attention signal (E), until the arm is raised.

3. In case of the entire stoppage of the electric communication the traffic must be worked in strict accordance with the General Rules in the Rule Book, and each engine-driver cautioned.

Notice of the stoppage of any part must be immediately sent to Mr. H. Moxon, Telegraph Superintendent, Victoria Station, Manchester.

OUT-DOOR SIGNALS.

1. When the electric semaphore is ON AT DANGER, the OUTSIDE SEMAPHORE MUST ALSO BE ON, and must not be taken off until the electric signal is lowered.

2. The usual rules as to caution signals being shown to trains following within three minutes of each other must be strictly adhered to.

H. BLACKMORE,
Superintendent.
HENRY MOXON,
Telegraph Supt.

Printed copies of the above report were sent to the two companies.

LONDON AND NORTH-WESTERN RAILWAY.

SIR, *St. Helen's, June 17th*, 1873.

In compliance with the instructions contained in your minute of the 31st ultimo, I have the honour to report, for the information of the Board of Trade, the result of my inquiry into the circumstances attending the collision which occurred on the 28th ultimo, near the Sutton Oak junction, on the London and North-Western Railway.

At the Sutton Oak junction the main line from Widnes to St. Helen's joins a branch line from the St. Helen's junction on the Liverpool and Manchester Railway. This latter line is a single line up to within a short distance of the Sutton Oak junction cabin. There are sidings on the west of this branch line, and between it and the Widnes line, and these sidings are connected with the up line to St. Helen's, at a point north of the double and single line junction of the branch line. The branch line above referred to is used for passenger trains only, running backwards and forwards between the St. Helens' junction and the Sutton Oak junction; and the approach of these trains to the station is protected by a home signal at 114 yards from the junction cabin, and by a distant signal at 310 yards from the junction cabin. There is also a ground disc at 142 yards from the junction cabin, for the control of traffic coming out of the siding above referred to, on the west of the branch line. The points and signals are worked by levers from the junction cabin, which are interlocked with one another, and the branch line above referred to is worked on the block system between the St. Helen's junction and the Sutton Oak junction.

The 7.35 p.m. passenger train from the St. Helen's junction through the Sutton Oak junction for St. Helen's started from the St. Helen's junction punctually, consisting of a tank engine and four passenger carriages, two of which were break-carriages. The engine-driver found the distant and home signals from the Sutton Oak junction lowered for him to proceed in due course through that junction, and he was travelling at the rate of about eight miles per hour, and within a short distance of the home signal, when he saw a goods engine running along the siding on the west of the branch line. It did not, of course, occur to him that it would run forward so as to foul the main line; and he did not therefore in the first instance use any efforts to stop the train; but he said to his fireman, "I hope he (the goods driver) is not going on the crossing," and the fireman replied, "Oh, no; he is stopping." He had not, however, "gone more than six yards further," when the engines came into collision with one another, near the point where the sidings join the up branch line. The tank of the passenger engine was bulged in, and the buffer-plank on the goods engine was also damaged. Neither of the carriages left the rails, but the two last carriages and two wheels of the second carriage were thrown off the line, and the sides of these carriages were more or less damaged by scraping along the side of the goods engine. No passengers have complained of injury.

The driver of the goods engine which thus came into collision with the passenger engine arrived in the sidings at 7.20 a.m. from St. Helen's, and after getting his engine round the waggons he began to shunt in the sidings. After making two shunts backwards and forwards, the driver proceeded with his engine towards the passenger line for the purpose of making a third shunt. He was watching the points from the near side of the engine, and did not observe the passenger train approaching on the other side. The fireman was at his break with his back towards the signal and the Sutton Oak junction, watching to see when the waggons got over the points, previous to setting them back through the points in another direction. Neither of them saw therefore that they were fouling the passenger line, nor did they see anything of the passenger train or engine until the collision occurred. The engine-driver did not look for or notice the ground disc applying to the siding, and indeed he would not have been guided in his operation by that disc, because he had no intention of coming on to the main line.

The signalman who was on duty at the Sutton Oak junction cabin saw the goods driver shunting his waggons for Millers Dale, and was aware that he was about to push them back into the "Manchester sidings," but he had of course no idea that in doing so he would foul the branch line; and he (the signalman) knew that the passenger train was coming, because he had received notice on his telegraph instrument of its approach, and had for that reason lowered his signals for it to run through the junction.

The collision thus occurred in consequence of the driver of the goods engine having run too far along the siding and fouled the main line, at a time when the passenger train was approaching the junction. There was a want of caution on the part of the engine-driver and fireman, in not keeping a better look-out for the approach of the passenger train, and the lowering of the signal, and in not taking care to keep clear of the main line.

In order to prevent such an accident from again occurring, I recommend that a safety-point be added to the siding, at a suitable distance from the junction of the siding with the up branch line. This safety-point should be worked by the signalman from his cabin, and interlocked with the signals applying to the passenger line. No engine-driver would then be able to foul the passenger line unless the safety-point was opened by the signalman, and the signalman would be unable to open the safety-point when the signals were lowered for the approach of a train along the passenger line.

I have, &c.,
H. W. TYLER.

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

Printed copies of the above report were sent to the company.