

The length of rail next preceding the broken joint chair appears to have wanted support about the centre. There was no intermediate sleeper, and the joint chair appears to have given way, under the additional strain that was brought on it, in consequence of the want of support about the centre of the rail.

The line at the place is straight, and the gradient rises 1 in 1270 towards Shepreth. The cast-iron sleeper road is now almost obsolete, and the substitution of three transverse sleepers, with 26 to 33 lbs. joint chairs, and 28 and 16 lbs. chairs at each side, without fish plates; for the old cast-iron joint sleepers, which weigh 1 cwt. each, do not make a railway fit to run over at express speed, or with trains timed to travel 30 to 36 miles per hour.

The accident was caused by running at too high speed over a weak and indifferent road, and I recom-

mend, that the speed of all trains be reduced to 20 miles an hour, till such time as a good rail, properly fished, and laid on wooden sleepers is substituted for the present road.

It appears that the driver of the Great Northern train, previous to the accident, had made some remarks relative to the bad state of the road, to the sub-inspector of permanent way of the Great Eastern Railway Company, who was in charge of the Shelford and Shepreth section of the line, but he had never made any report to his own officers, who were the proper persons for him to report it to.

I have, &c.

F. H. RICH,
Capt. R.E.

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

GREAT NORTHERN RAILWAY.

*Board of Trade
(Railway Department),
Whitehall, 30th June 1866.*

SIR,

I AM directed by the Lords of the Committee of Privy Council for Trade to transmit to you, to be laid before the directors of the Great Northern Railway Company, the enclosed copy of the report made by Captain Rich, R.E., the officer appointed by their Lordships to inquire into the circumstances connected with the double collision between goods trains which occurred in the Welwyn Tunnel on the Great Northern Railway on the 9th inst.

I am, &c.

W. D. FANE.

*The Secretary of the
Great Northern
Railway Company.*

SIR,

Dulwich, 22nd June 1866.

IN compliance with the instructions contained in your minute of the 11th inst., 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 double collision that occurred in the Welwyn Tunnel on the Great Northern Railway, on the evening of the 9th inst., by which two men lost their lives and two others were injured.

There are two tunnels close to Welwyn Station on the north side.

The first tunnel is about 330 yards from the station, and is 448 yards long. The second (in which the collision occurred) is about 400 yards further north, and is 1,066 yards long. The railway, which is a double line through both tunnels, is straight, and rises towards Hitchin on a gradient of 1 in 200. The line is worked by telegraph on the interval system.

There is a telegraph signal station at Welwyn, and one at Knebworth on the north side of the tunnels. These telegraph stations are about $3\frac{1}{2}$ miles apart. The regulations of the Great Northern Railway are, that the signalman at Welwyn shall not allow a train to pass his station and enter the tunnel till he has received a telegraphic message from Knebworth, to say that the preceding train has cleared the latter station. At 11.20 p.m. on the 9th inst., a train consisting of an engine and tender, 38 empty coal trucks, and a guard's van, was allowed by the signalman at Welwyn to pass his station and proceed northward through the tunnels. This train passed through the first tunnel, and had got about 400 yards into the second tunnel when one of the tubes in the boiler of the engine burst, and in consequence of the water getting to the fire the engine had not sufficient power to draw the train, which came to a stand.

The driver sent his fireman back to the guard, who was in the van at the tail of the train, to ask what he was to do.

The guard Wray looked out of the window of his van, and replied that the driver was to push the train backwards to Welwyn station, which, owing to the falling incline, he might have done; but the driver, very properly refused to push back the train, it being dangerous to do so, and directly contrary to the regulations of the Great Northern Railway Company. The guard Wray should have got out of his van and gone back to protect his train, but he neglected this important duty, and was killed by the first collision. Rawlins, a servant of the Metropolitan Railway Company, who had formerly been employed at New England on the Great Northern Railway, was travelling in the van with the guard. He was so severely injured, that he died on the morning of the 12th inst. His travelling in the van was contrary to the regulations of the Great Northern Railway Company.

About 11.36 p.m. a Midland goods train, consisting of an engine and tender, 26 goods waggons, and a guard's van, arrived from London. The signals at Welwyn were at danger as this train approached Welwyn, and the driver slackened his speed, but when he got about 300 yards from the distant signal both it and the station signal were lowered for him to pass, and he stated that he entered the tunnel at a speed of about 20 or 25 miles per hour, and ran into the train of empties when he got about a third of the way through the second tunnel. The tunnel was full of smoke and steam, and the Midland driver got no notice of the danger, as he could not see the red lights on the guard's van, at the tail of the train of empties, till the moment that his engine struck the van.

His engine was knocked off the rails, and he was jammed against the fire box by the coals from the tender. He stated that he took about two minutes to disengage himself and assist his fireman and that then he heard an up train coming into the tunnel at the northern end. He started with his fireman to run towards Welwyn, which he had some trouble in reaching, as he had to climb over the "debris" of his train in the tunnel. He and his fireman had not got clear of their train when a Great Northern fast goods up train, consisting of engine and tender, 31 waggons, and two vans, came into collision with such waggons of the train of empties as had been thrown on to the up line by the collision with the Midland down train. The engine of the up train was thrown off the rails against the side of the tunnel; but what number of trucks of each train were thrown off could not be ascertained, as about four hours after the collision part of the trains in the tunnel caught fire and continued to burn till the afternoon of the 11th inst. Thirty trucks were burnt, and the engine of the Great Northern up train was a good deal injured by the fire. Fortunately, the drivers and firemen of the Midland goods and of the Great Northern up train escaped out of the tunnel immediately after the collision, and both Wray and Rawlins were found and got out before the fire took place.

The fire appears to have been caused by some of the naphtha from the lamps that the men were using whilst clearing the tunnel, having dropped in a burning state amongst a truck load of furniture, which had been packed in shavings, and which was scattered about in the tunnel by one of the collisions.

When the Midland down goods approached Welwyn about 11.36 p.m., the signalman at that station had not received the telegraphic notification from Knebworth that the train of empties which he had allowed into the tunnel at 11.20 p.m. had passed Knebworth, and therefore, before lowering his signals for the Midland goods, he telegraphed to the Knebworth signalman, to know if the train that entered at 11.20 had passed out. The Knebworth signalman stated most positively that he answered "No;" but the Welwyn signalman stated with equal decision that he received "Yes" in reply, and consequently that he lowered the signals for the Midland goods to pass in. This answer was received at 11.36 p.m., but the Welwyn signalman, considering that the telegraph announcing that the train of empties had passed Knebworth must have been sent at 11.30 p.m., when he was attending to the telegraphs relating to an up train, and that he must have missed observing it, entered the reply to his question as if he had received the telegraph notifying that the empties had passed Knebworth at 11.30 p.m. This was an incorrect entry, which he should not have made, and I am inclined to believe that the answer that he received was "No," but that in the hurry of the moment he read the "No" as "Out," which are somewhat similar on the telegraph instrument. "Out" would bear the same significance to him at that time as "Yes." The Welwyn signalman also disobeyed his instructions by the manner in which he asked whether the 11.20 train had passed out of the tunnel. He should have merely telegraphed to Knebworth, "train waiting."

The telegraph working at Welwyn and Knebworth is done with a single instrument, which is a speaking instrument with "Out" and "In" marked on it. The needle is pushed to the same side for "Out" and for "No;" the number of beats being the difference between them, and I think the Welwyn signalman mistook the reply sent from Knebworth.

The Knebworth signalman is borne out in his statement that he answered "No" by his refusing to acknowledge the "train in" signal which was given by the Welwyn signalman at 11.38 p.m. for the Midland goods. It is possible that he may have hastily replied "Yes," and immediately afterwards recollected, that there was a train in the tunnel, which was the case a short time since at Whitehaven; but I am more inclined to believe that the mistake was made by the signalman at Welwyn. I do believe that both signalmen intended to speak the truth, and that each feels confident in his own mind that the other committed the mistake.

The tunnel was not much injured. It appeared to have been originally a very good piece of work.

The bricks were burnt about 1½ deep, and the air-shaft was a good deal split and cracked with the heat of the fire. The Great Northern Railway Company had cut out the burnt parts of the brickwork, and were proceeding with the repairs when I was there on the 12th inst.

The tunnel was cleared about 9.30 p.m. on the 11th inst., and the traffic commenced to pass through it at 3 a.m. on the 12th inst.

This melancholy accident was caused by the neglect of guard Wray, who appears to have remained quietly in his van at the tail of the train of empties for about 16 minutes after his train came to a stand, instead of obeying the regulations of the Great Northern Railway Company, which specially provide that the guards in such cases shall proceed back one mile to protect their trains, or till they meet another servant of the company, with whom they can arrange for the safety of their train, and that they shall not trust to the protection of the telegraph.

Secondly, a mistake occurs between the signalmen stationed at the north and south ends of the tunnels, who are charged with the protection of the interval by the telegraph, and who are not permitted to allow two trains travelling in the same direction to be in the interval between their stations at the same time.

The engine that broke down was built by Mr. Sizers of Leeds. It was delivered to the Great Northern Railway Company on the 14th March 1865, and had run 40,936 miles up to the 25th May 1866.

The tube that burst was a 2 in. copper tube. Its weight when new was between 24 and 25 lbs, and when taken out of the boiler after the accident it weighed 22½ lbs. The part that burst was close to the fire-box at the upper side of the tube just where the flame strikes it. The engine was reported to have been in good order when it left London, and there is no reason to suppose otherwise, as the bursting was no doubt a sudden thing.

The Great Northern Railway Company are changing their system of telegraph. It is very desirable for them to do so and to adopt instruments for working the line which shall have the means of blocking over the needle to "line clear" or "line blocked," and to have separate speaking instruments.

I would also recommend a strict enforcing of the regulation that requires the guards to go back at once to protect their trains where they are stopped by unavoidable accident, as on the 9th inst.

There is no doubt that this most necessary precaution for the safeworking of all railways is too often neglected.

I have, &c.

*The Secretary of the
Great Northern
Railway Company.*

F. H. RICH,
Capt. R.E.

GREAT NORTHERN RAILWAY.

*Board of Trade
(Railway Department),
Whitehall, 16th July 1866.*

Sir,

I AM directed by the Lords of the Committee of Privy Council for Trade to transmit to you, to be laid before the Directors of the Great Northern 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 connected with the accident which occurred to a passenger train on the 3d instant, near Royston, on the Hitchin and Cambridge Branch of the Great Northern

Railway, recently transferred to that Company from the Great Eastern Railway Company.

I am, &c.

*The Secretary of the
Great Northern
Railway Company.*

W. D. FANE.

Sir,

Hampton Court, 10th July 1866.

In compliance with the instructions contained in your minute of the 4th instant, I have the honour to report, for the information of the Lords of the Committee of Privy Council for Trade, the result of