

The passenger engine knocked the body of one goods waggon to pieces, and stove in the end of a second; and the second- and first-class carriages, which were behind the front break-van, were thrown off the rails, the one with both pairs of wheels, the other with one pair only. There was but one passenger in the latter, who was unhurt; and there were no passengers in the former of these carriages. The two carriages in the hinder, or Manchester portion of the train, contained 6 or 7 passengers; but it appears that no injuries were sustained, either by any of these passengers or by the servants of the Company.

The manner in which the driver of the goods train, Thomas Firbank, a young man who had only acted in that capacity for six months, at once detached his engine from his train, and ran forward to stop the driver of the mail train, is deserving of great praise. The thoughtfulness and energy which he thus displayed, coupled with the promptitude of the driver and guards of the mail train, in pulling up that train, were the means of preventing what would otherwise have been a very serious accident.

Subsequent inspection showed that three of the goods-waggons had left the rails, and a fourth, with one pair of wheels. The first of these four, fifth from the engine, was loaded with bales of stockings, and had been thrown across the down line, on its side. It had lost both of its axles, one having been found under the waggon behind it, and the other, very much bent, but with its wheels unbroken, lying longitudinally on the line between the two waggons. The first waggon was that which was broken to pieces by the engine of the mail train.

The second waggon, which was similarly laden, and was also damaged, was found to have three axles under it, two of its own, and one belonging to the waggon in front of it. The first of these was much bent, but its wheels were complete. The second had lost its left wheel, which was lying in the ditch on the left of the line, with an unfractured tire on it. The third was partially displaced, and slightly bent, but its wheels were unbroken. There was an axle, also, under the third waggon, as it appears, that left the rails, which had lost its right wheel, the boss only remaining on the axle. A number of plates of springs, axle-guards, brasses, and axle-boxes, lay behind the train, and within about a hundred yards of it.

An inspector of the permanent way walked back on the following morning for seven miles, from the scene of the accident, to Nuneaton. The night had been very severe, and the ballast was in a frozen condition; but he traced, for three miles and a half, to the Bulkington Station, marks upon it, every here

and there, on the west of the up'line; and he observed that the chairs had been chipped in different places. He was there shown the tire and spokes of a wheel which had been found in pieces on the north of the station. A waggon-spring, part of an axle-box, and two clip-bolts, were found, also, a hundred yards south of Bulkington.

These and other remnants of broken material were forwarded to the central waggon department of the company, at Earlstown, near the Warrington Junction, where I have this day been to visit them. Two broken portions of a tire were shown to me, $4\frac{1}{2}$ inches wide, and an inch thick in the tread, formed of a crystalline iron, not of the best quality, which were the only remains of the tire in question that could then be found. An axle, also, was with them, having a wheel on one end of it, in a partially fractured state, but surrounded by an unbroken tire, and the boss of a wheel only on the other end, with all the spokes broken short off.

The wheels were of an old pattern, with cast-iron boss, spokes, and rim, of light dimensions, and were ill fitted for railway traffic. I understand that the company have a large number of them, transferred from their southern division, still on hand; and that they are being broken up as fast as their tires wear out, in cases in which they do not fail prematurely.

I am unable to ascertain from the evidence in this case whether the wheel or the tire failed first, but I understand that the failure of these wheels is a sufficiently common occurrence to warrant the belief that one or more of the spokes of the wheel may have been the first to give way. It appears to be certain, at all events, that one of the waggons of the goods train lost a wheel and tire to the north of Bulkington;—that the train ran on for several miles afterwards without any check on this account, and with little perceptible effect upon the permanent way;—that, at length, one of the axles got displaced, and a waggon was thrown on its side;—and that the jerks thus produced warned the driver and fireman of what had occurred, while the displacement of the wheels and axles at length caused the train to be suddenly brought to a stand.

This accident, which was happily, in consequence of the care and prompt action of the servants of the Company, unattended with serious consequences, demonstrates the danger, nevertheless, of employing wheels of an inferior description, even on goods waggons and in goods trains, upon a passenger line.

I have, &c.

The Secretary,
Railway Department,
Board of Trade.

H. W. TYLER,
Capt., R.E.

MANCHESTER, SHEFFIELD, AND LINCOLNSHIRE RAILWAY.

Railway Department, Board of Trade.
Whitehall, 16 February 1861.

SIR,

I AM directed by the Lords of the Committee of Privy Council for Trade to transmit to you, for the careful consideration of the Directors of the Manchester, Sheffield, and Lincolnshire Railway Company, the enclosed copy of Capt. Tyler's report of his inquiry into the circumstances connected with the accident which occurred on the 14th ult. to a passenger train near Lincoln, from the fracture of a tyre.

I have, &c.

The Secretary to the
Manchester, Sheffield,
and Lincolnshire Railway
Company.

JAMES BOOTH.

SIR,

Whitehall, 5th February 1861.

In compliance with the instructions contained in your minute of the 18th 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 14th ultimo near Lincoln, on the Manchester, Sheffield, and Lincolnshire Railway.

The 5.45 p.m. passenger train left New Holland at 6.11, 26 minutes late, on that day, in consequence of its having been kept waiting for the steamer from Hull, which was delayed by ice in the Humber. It consisted, in the following order, of an engine and tender, three fish-waggons, a cattle-truck, a break-van, a third-, a second-, and a first-class carriage, and a dummy van; and it was due to stop at 14 stations between New Holland and Lincoln. It left Langworth, the last of these stations, $35\frac{1}{4}$ miles from New Holland, and $6\frac{1}{4}$ miles from Lincoln, at 7.55, 24 minutes late; and, after travelling between three and four miles, it entered the Greetwell cutting at a speed of from 25 to 30 miles an hour.

In passing through that cutting the line curves, though not sharply, to the right, and falls towards Lincoln, on a gradient of 1 in 200. The driver was riding on the right and the fireman on the left of the footplate of the engine; and an engine-cleaner was

travelling with them, who had ridden in a carriage as far as Langworth, but had got upon the engine at that station, to assist in sanding the rails on the incline which rises to the south of it.

They had arrived within about $2\frac{1}{2}$ miles of Lincoln, when the driver saw fire flying from his right leading wheel, and the fireman felt the engine give a sudden jerk. The former shut off his steam and whistled for the guard's break, and the latter ran to the tender break, which he applied.

After running for about 200 yards with its leading wheels off the rails, the engine turned to the right, left the up line altogether, crossed the down line, and, partly mounting the bank beyond it, fell over on its left side. The tender was detached from it by the fracture of its draw-bar, and came to a stand about two yards behind it. The remaining vehicles were pulled up in their proper order behind the tender, across the two lines of rails, the dummy van only remaining on the rails on the up-line.

The shock was received principally by the fish-waggons and their contents, which were much damaged. The leading break-van mounted the last of the fish waggons, which was turned over; and one of its hind buffers was forced through the front end of the third-class carriage behind it. The splinters thus set free, and the shock which he received, so injured a passenger who was riding in this carriage, that he has since died. Three other passengers were injured in the same carriage, but about 15 passengers who were travelling in the train fortunately escaped without serious consequences.

The driver was thrown up in the air, from the foot-plate of the engine, when it turned over, and was pitched head-first into a hedge on the up side of the line. He was terribly cut on the top of the head, and is still a great sufferer. The fireman was thrown forward in the first instance from the tender to the foot-plate of the engine, and was then thrown back again, over the fish-waggons and the cattle-truck; falling finally between the latter and the guard's van, and under the van. He was stunned for the moment, but, strange to say, was not much the worse for it. On creeping into the van, he found the guard lying in it on his back. This man was also stunned, but has been since at work, and is only now obliged to lay up again, in consequence of an injury which he received in his leg having proved to be more severe than he at first imagined. The engine-cleaner unfortunately fell under the fire-box of the engine, as it turned over, and was killed on the spot.

The engine, No. 58, was manufactured by Messrs. Wilson of Leeds. It had 15-inch cylinders, and a stroke of 22 inches. Its leading wheels, 4 feet in diameter, carried a weight of 7 or 8 tons; its driving wheels, 6 feet in diameter, a weight of 12 tons; and its trailing wheels, 4 feet in diameter, a weight of 4 or 5 tons. The outer framing was very much damaged when it ran against the bank and fell over; the cast-iron dome was knocked off, and broken to pieces; its safety valves were blown away; a pin of the left trailing spring was fractured; and there was no tyre on its right leading wheel.

This tyre was found in 5 pieces by the side of the line. It appears to have given way at the first mark discovered on the rails, at 39 miles and 790 yards from New Holland. The first piece was picked up at 15, the second at 31, the third at 56, the fourth at 78, and the fifth at 128 yards from that mark. The engine left the up line in 80 yards more, and ran into the bank on the other side of the down line, at a point 50 yards further in advance.

The wheel to which the tyre belonged, was constructed with a cast-iron boss and round, wrought-iron spokes. The tyre was fixed to the rim by means of 5 rivets, $\frac{1}{2}$ " in diameter; it was turned down to a thickness of $1\frac{5}{16}$ " in October last; and it has, since that time, run between seven and eight thousand miles. Its minimum thickness now is about $1\frac{1}{8}$ to $1\frac{3}{8}$ inches. The smallest dimensions to which engine wheel-tyres are now turned down on the Manchester, Sheffield,

and Lincolnshire Railway, is $1\frac{1}{4}$ inches; so that this tyre may be considered to have been worn out.

Of the two sections of fracture on the first piece, or on that which was discovered furthest to the northward, one was through a rivet-hole, and the other was, apparently, close to the weld, and followed the plane of a small portion of the weld. It is doubtful at which of these two sections it first gave way. That which contained the rivet-hole was the weaker, and there were indications in it of a flaw in the material, though not of a very positive character. The tyre had been manufactured at the Low Moor Works, and the iron was of good quality.

The permanent way over which it was running when it failed, is not a satisfactory one. It consists of double-headed rails, weighing 71 lbs. to the lineal yard, only 15 feet long, and supported by only 3 intermediate chairs under each rail. The bearings are thus, on an average, 3' 9" apart, from centre to centre; and the joints are very numerous. They are not fished, and are in bad condition. The chairs are, many of them, chipped and fractured; the trenails securing them, to the sleepers are more or less defective; spikes have been driven into the holes in the chairs, in some cases, to replace them, without proper means having been taken for filling up those holes, which, being intended for trenails, are considerably larger in diameter than the spikes. It is true that this road was in its least favourable condition when I visited it, in consequence of the recent break-up of the late severe frost; and I abstain on that account from observing, as I should otherwise do, upon its irregularities of line and level; but I must add, that, in order to place it in the condition in which it ought to be, with a view to the public safety, there should be inserted an extra sleeper under every rail, and a large proportion of spikes in the chairs; and the joints of the rails should be fished without delay. I must not omit to notice here, that as many as 10 rails have been fractured in the ordinary course of traffic, within the last six weeks, on the district (29 $\frac{1}{2}$ miles long, between Barnetby and Lincoln alone), four on the main line, and six in the station yards, at Lincoln and other places.

The present accident has been directly occasioned by the fracture of a tyre, which, by flying off from the right leading wheel of the engine, caused it to leave the rails. The tyre had become reduced to the smallest dimensions at which it was considered fit for duty, and was not therefore one that it was prudent to employ, particularly on the *leading* wheel of an engine, at a time when the road was exceedingly rigid from frost, and when the iron composing it was, from the lowness of the temperature, in a more brittle condition than usual. The number of the rail-joints in the permanent way, the distance between the sleepers, and the unevenness of the joints, uniting to cause a succession of heavy blows upon the tyre, as it passed along the road, increased the risk; and that such a tyre should have given way under such circumstances cannot be considered as a remarkable occurrence, even though the quality of the iron was good.

I have entered at length, in my report upon the accident which occurred near Sittingbourne, on the London, Chatham, and Dover Railway, on the 4th of last month, upon the question of tyre-fastenings, and have forwarded with that report a number of diagrams, illustrative of the modes which have been, or may be adopted for the prevention of accidents of this description; and I need not recapitulate what I have there said. I will only add, on the present occasion, that, by placing the tyres in a dovetailed, or morticed form, upon the rims of the wheels; by securing them in their positions after they have been shrunk on to the wheels, round the whole of their circumferences, either by hammering down upon the inner edge of the rim a piece of metal rolled on to the tyre for the purpose, according to the designs of some, or by the insertion of wedges or rings, as proposed by others; and by other methods, — a mode of fastening may be employed, which makes

the tyre one fifth stronger, in consequence of its doing away with the necessity for rivet-holes ; which prevents it from flying off the wheel in the event of its becoming fractured, from rough usage or from defect ; which enables it to be safely used, down to that degree of thinness at which it is no longer fitted for service, irrespective of any defects of manufacture or of quality which it may accidentally contain ; and which deprives railway traffic of one great element of inconvenience, delay, expense, and risk. When I add, that 10 or 12 tyres, one third of which have been engine-wheel tyres, have failed on this line alone, during the recent frost, it will be observed that this is an element of risk which is well worthy of being thus guarded against.

The only other point to which I need draw attention in the present instance, is that there was no break-power, as there ought for many reasons to have been, at the tail of this train.

When an accident happens, which causes an engine or a leading carriage to be brought to a stand within a short distance, the vehicles in the rear have, of course, a tendency to run forward upon it ; and some of the most fatal cases have been brought about by the crushing up of the carriages, in consequence of this sort of result. The more break-power there is, available, at the tail of the train, in such a case, the better the chance of escape that is afforded to the passengers.

The fish-waggons no doubt did good service in this

instance, by acting as a series of buffers between the carriages and the tender, and saved the passengers from the increased loss of life, and from the injuries, that they would otherwise have experienced ; but, as it was, the passenger who died from the effects of his wounds, was killed in consequence of the carriage in which he was riding having run forward upon the break-van in front of it ; and a distance of 250 yards was afforded, after the fracture of the tyre, during which break-power might have been applied, if it had been at hand, from the tail of the train.

In such cases, and in many other cases, continuous breaks, applied simultaneously upon a van and two or three carriages, may be made to render essential service, in saving the lives and limbs of passengers, and in reducing the amounts of compensation for accidents which the company may be called upon to pay. These breaks are now employed regularly, and with excellent results, on many lines ; and the sooner they are permanently introduced upon the Manchester, Sheffield, and Lincolnshire Railway, the better for the company and their passengers. In the meantime, there never can be a valid excuse for their neglecting to provide at least one break-van, with a guard in it, at the tail of every train.

I have, &c.,

(Signed) H. W. TYLER,
Capt. R.E.

*The Secretary,
Board of Trade,
Whitehall.*

MIDLAND RAILWAY.

*Railway Department, Board of Trade,
Whitehall, 7 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 Midland 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 13th ultimo at the Methley Junction of the Midland Railway.

I have, &c.

JAMES BOOTH.

*The Secretary of the
Midland Railway Company.*

SIR,

Whitehall, 4th March 1861.

IN compliance with the instructions contained in your minute of the 18th 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 13th ultimo, near the Methley Junction of the Midland Railway.

A mile and three quarters to the north of Normanton, and a mile and a quarter to the south of the Methley Station, there are two junctions, between the Midland, the North Eastern, and the Great Northern Railways ; and a quarter of a mile to the south of these junctions there are some colliery sidings known as Briggs' and Burnley's sidings. A pointsman is employed for their protection, in a hut situated opposite to the points which connect the sidings with the down line ; and he is provided with a wire signal in each direction, his south signal being about 600 yards from his hut. The gradient on which the sidings are approached is a falling one from the direction of Normanton of about 1 in 330.

On the 13th instant, a coal train, due to leave Normanton at 6.45 p.m. for Leeds, started from that station, according to the station-master, at 6.55, but according to the statements of others at 6.57, 6.59, or 7 o'clock. It consisted of an engine and tender, seven waggons, and a break-van. It stopped at Pope's sidings, 1,300 yards to the south of Briggs' and Burnley's sidings, where 22 waggons were added to it, and

after staying there for about five minutes, proceeded forward at 7.10. It reached Briggs and Burnley's sidings at 7.15, and as soon as it arrived, the van and 27 waggons were left standing on the main line, while the engine was sent into the sidings to fetch out three other waggons which were waiting to be taken on.

Some empty waggons obstructed the entrance to the sidings, which had to be pushed back out of the way ; six waggons, which stood in front of the three waggons destined for Leeds, had to be shunted from the front siding to the back siding ; and the engine had then to return to the front siding again for the three waggons.

These operations had all been gone through, and the engine had just been attached by the goods guard to its three waggons, and had begun to move forward with them towards the main line, when three sharp whistles were heard from the engine of a passenger train, and that train was seen to approach at a rapid speed, and to dash with great violence against the van and waggons which were standing on the main line.

The passenger train consisted of an engine and tender, four break-vans, two first-class, two second-class, a composite, and two third-class carriages, with a break-van at the tail of them, making 13 vehicles in all. The driver stated that he proceeded at a speed of 20, the guard at a speed of 14 miles an hour, from Pope's siding towards Burnley's siding. The driver and fireman assert that, as they approached the distant signal from the latter siding, it was suddenly turned to danger in their faces, and that, although they then did their best to pull up, they were unable materially to reduce their speed before they came into collision with the van of the coal train, which was standing 372 yards within that distant signal.

The guard, who was riding in his van at the tail of the passenger train, kept a look out ahead for some little distance after leaving Normanton, but when he had passed the Altoft's Junction with the North-Eastern Railway, (which is three quarters of a mile to the south of Bromley's siding), and had seen the signals at that junction at "All right," he began to make up his time-book. He was thus engaged,