

About 8,000 tyres of this description are stated to be now in use on the Great Northern Railway, and an experience of six years has shown them to be a great improvement upon the old mode of attachment by means of bolts or rivets passing through the tyre. But the failure of this tyre, which was welded and affixed to the wheel at the Company's works at Doncaster, affords strong evidence in opposition to that experience, if it does not destroy the credit which the mode of fastening has previously obtained. The weld was very defective, as will be seen by an inspection of the section marked fig. 1; and the combined arrangement of the dovetail on the outer, and the keys on the inner side of the rim of the wheel proved to be insufficient, when the weld gave way, to resist the strain that was put upon it. When released from the condition of tension in which it had been retained the tyre evidently burst from its fastenings with considerable force, and as it did so a portion of the lip (E, fig. 2), which was hammered down upon one of the keys adjacent to the weld, was fractured. This was just the occasion on which the fastening ought to have done good service. Its great object was to prevent the tyre from flying off the wheel when it suddenly gave way, and, as it failed to do this, it only afforded a false feeling of security. The keys which ought to have assisted in retaining it, could not be found when I visited the spot, but they have since been forwarded to me. They both show symptoms of violence, and one of them, at least, appears to have done all that could be expected of it, inasmuch as the lip, which had been hammered down upon it, was fractured before it was displaced. I do not observe any signs of defective workmanship which would account for the giving way of the fastening, and I cannot but look upon this accident, therefore, as affording an instance of the failure of the principle upon which it is applied.

The form of weld which was used in this instance, and which is adopted at the Doncaster works, is that of the V weld. It is preferred by the locomotive superintendent of the company after trial of others, though it is not so well liked by some manufacturers as a "jump-weld" or a "scarf-weld." It is, however, in common use, and has been so for a great number of years. But no description of weld for wrought-iron ought to be depended upon for safety in the case of railway wheel-tyres. The important point to be attained is so

to fasten the tyre to the wheel as to avoid all danger of its flying in the event of its fracture either at the weld or at any other point of its circumference.

I took occasion, in my report of the 6th February 1861, upon an accident that occurred near Sittingbourne, on the London, Chatham, and Dover Railway, to describe the different modes that had been adopted for tyre fastenings on different railways, and to point out their relative advantages. I then explained that increased security might be obtained by notched rather than by dovetailed fastenings, and suggested a modified mode of fastening, which, if it had been employed, would certainly have prevented the present accident from occurring. Figs. 6 and 7 show that method of fastening; and I may observe, in regard to it, that it is as easy to groove the outer (or, if preferred, the inner) side of the tyre in the form of the notch at O, fig. 6, as in that of the dovetail B, section fig. 3; and that increased security would undoubtedly be obtained by the former. This notch on the outer side would be preferable to the dovetail, even if the keys (C, fig. 3) continued to be employed on the inner side of the tyre; but the key system does not appear to give the same amount of security as some other systems. Figs. 4 and 5, for instance, show the methods which have been adopted, respectively, by Mr. Mansell, on the South-Eastern Railway, and by Mr. Brotherhood, on the Great Western Railway, for many years with perfect success.

This is an important question for the Great Northern Company. Their trains run over portions of their railway at very high speeds, and an accident of this nature, more particularly to the leading wheel of an engine, is liable to be attended with the most serious results. They will do well on their own account, no less than for the safety of the public, to adopt that mode of tyre fastening which is the least liable to fail, from defective workmanship or otherwise, on the fracture of a tyre, when only its merits are really tested. The present accident certainly appears to have demonstrated, in spite of their previous experience, that the fastening that they have adopted is not to be depended upon.

I have, &c.

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

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

LANCASHIRE AND YORKSHIRE RAILWAY.

*Railway Department, Board of Trade,
Whitehall, 28th March 1863.*

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 Lancashire and Yorkshire Railway Company, the enclosed copy of the report made by Capt. Tyler, R.E., the officer appointed by my Lords to inquire into the circumstances connected with the accident that occurred to a passenger train, on the 6th inst., near the Ashton Station of the Lancashire and Yorkshire Railway.

I have, &c.

JAMES BOOTH.

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

SIR,

Manchester, 25th March 1863.

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 accident that occurred, on the 6th instant, near the Ashton Station of the Lancashire and Yorkshire Railway.

The Oldham, Ashton, and Guide Bridge Junction Railway joins the Staleybridge branch of the Lancashire and Yorkshire Railway a few hundred yards to the west of the Ashton Station at the Oldham Road Junction. The facing points (on the up-line) towards Manchester on the one side, and Guide Bridge on the other, are 16 yards to the west of the junction stage, and are worked by a lever from that stage, which is elevated considerably above the level of the rails.

The 9.45 a.m. passenger train left Staleybridge punctually for Manchester on the day in question, consisting of a tank engine and three passenger carriages. It stopped at Ashton as usual, and started again from that station at 9.50. The engine-driver passed the junction stage at Oldham Road at a speed of 12 miles an hour, and felt soon afterwards a sudden jerk in his train. On looking round he observed that all his carriages were off the rails. He reversed his engine, and brought it to a stand 50 or 60 yards beyond the junction points. It did not leave the line, but the two leading carriages were thrown on their sides against a slope on the south, and the third carriage remained (upon its wheels) across the Guide Bridge down-line.

None of the couplings gave way. The composite carriage, second from the engine, was a good deal damaged in consequence of its falling upon a plate-layer's truck, but the other carriages were not much the worse. The passengers escaped, fortunately, with trifling injuries, only three of them having suffered slightly, as is stated, from the shock that they received.

The signalman who was on duty at the junction had been employed there for 20 months, and had been for five years previously in the service of the Company as a platelayer. He came on duty at 7 a.m., and had not, therefore, been at his post for three hours when the accident happened. He admits frankly that he altered the points while the train was passing over them. He allowed the engine and two carriages to run forward along the straight line towards Manchester, and turned the third carriage in the direction of Guide Bridge. He did so in preparing the points too hurriedly for a second train, which was due to follow the first over the junction, but to pass towards Guide Bridge, and under the erroneous impression that the whole of the first train had passed over them. He ought not to have made this mistake, inasmuch as the points were only 16 yards, as I have stated, from his box; and he had from his elevated stage an excellent view of them.

The position in which the carriages are described to have been found after the accident completely bears out this man's statement. The third carriage had been pulled off the rails of the Guide Bridge up-line at 22 yards from the points, leaving marks on those rails;

and stood across the down-line from Guide Bridge; while the other carriages were dragged by it off the up-line towards Manchester, and turned over on their sides, as I have already described.

The facing points, which were thus improperly worked, had been allowed to get stiff and rusty for want of oil and paint, and the whole of the apparatus at the junction was in much need of attention. It is desirable that the exterior of the stage should be glazed, for the protection of the machinery as well as for the shelter of the men; and that means should be supplied of working the points and signals in connection with one another, according to the mode that is now generally adopted with so much success. It is stated that the machinery which was originally supplied for that purpose by the Manchester, Sheffield, and Lincolnshire Company, was subsequently removed by the officers of that Company.

As I find that the signalmen at this junction are in the habit of taking 24 hours of continuous duty once a month, I would recommend that this reprehensible practice be discontinued. I had occasion to point out in reporting upon a recent accident at Wakefield, also on the line of the Lancashire and Yorkshire Company, that the signalmen at that station were employed periodically for even longer periods.

I have, &c.

*The Secretary,
Board of Trade,
Whitehall.*

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

LONDON, BRIGHTON, AND SOUTH COAST RAILWAY.

*Railway Department, Board of Trade,
Whitehall, 15th April 1863.*

SIR,

I am directed by the Lords of the Committee of Privy Council for Trade to transmit to you the enclosed copy of the Report made by Captain Tyler, R.E., the officer appointed by my Lords to enquire into the circumstances connected with the collision which occurred on the 4th ultimo, near the Victoria Station, between a passenger train belonging to the London, Chatham, and Dover Railway Company and an engine belonging to the London, Brighton, and South Coast Railway Company.

I am, &c.

JAMES BOOTH.

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

*The Secretary to the
London, Chatham, and Dover
Railway Company.*

*Railway Department, Board of Trade,
1, Whitehall, 6th April 1863.*

SIR,

In compliance with the instructions contained in your minute of the 11th 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 collision that occurred on the 4th ultimo, near the Victoria Station, between a passenger train of the London, Chatham, and Dover, and an engine of the London, Brighton, and South Coast Railway Company.

The approach to this station is guarded by a signalman whose cabin has from its position acquired the name of the *hole-in-the-wall*. It is in fact the principal junction-box from which the communications with three separate stations are controlled. The two main lines diverge after passing it from the south into three sets of lines leading to and from three series of platforms. Those to the west are used for the Crystal Palace (Brighton) trains, those in the middle for the main line (Brighton) trains, and those on the east for the trains of the London, Chatham,

and Dover Company. The immediate approaches to these three stations are further protected by three separate switchmen, who control the traffic and work the points under the directions of the signalman at the principal box. The hut of the switchman for the Crystal Palace station is 75 yards from that box.

The Chatham and Dover trains, in entering their own station (on the east) from the main arrival line on the west, pass necessarily across the exit lines from the other stations; and it is the practice for the principal signalman to hold out a red flag from his box, to warn the Crystal Palace and main line switchmen of the approach of those trains, and of the danger of allowing engines or trains to leave their stations when such trains are expected.

The regular trains are started from the three stations in obedience to fixed signals, which are worked by the signalman from the principal box; but shunting engines and trains are controlled by hand signals only, the fixed signals remaining at danger while the shunting is being performed. When a shunting engine is prepared to start from one of the stations, the driver whistles, and the signalman replies by his arm or flag according to circumstances. He holds his arm in a horizontal position when he desires to indicate, either to the main line switchman or to the switchman for the Crystal Palace station, that they may allow the shunting to proceed, and he exhibits a green flag when he wishes to give a similar permission to the switchman for the Chatham and Dover Station.

It is the duty of the switchmen to seek and to obtain the leave of the signalman (either in this manner or by word of mouth) before they allow any engine to start from their respective stations for shunting purposes. But the foggy condition of the atmosphere, combined with the smoke and steam from passing engines, frequently renders it difficult for the signalman and the switchmen to see each other across the confined space that separates them, and the want of more perfect means of inter-communication has led to some irregularities in this system of working. The main line switchman, who can see a disc and hear a