

happens in cases of accident that the amount of break-power upon a train makes all the difference of life or death to the passengers. In this particular instance, there was (leaving the 1,100 yards from the green flag to where the platelayers were working out of the question) a clear 600 yards for the application of break-power after the leading engine left the rails with two of its wheels. And a sufficient amount of break-power applied to the carriages over that distance would have caused them to act as a drag upon the engines instead of forcing them forward, and have so far reduced the speed that the great destruction of carriages which took place would have been prevented, and probably no lives would have been lost, when the carriages were finally brought to a stand.

Having reference to the present accident, as well as to that which has recently occurred with such lamentable results on another railway, I would observe, in conclusion, that whenever it is necessary, in consequence of an alteration in the permanent way of a railway, or from any other cause, to warn the engine-driver of a train at a point where there are no fixed signals, it is desirable that explosive (commonly called fog) signals should invariably be employed in addition to those hand signals—flags by day and lamps by night—which are too frequently used alone on such occasions. An engine-driver, properly acquainted with the line on which he is running, knows where the fixed signals are situated, and exactly the points at which he ought to look for them; and he is less liable to miss seeing those

signals; but he is not, though he ought always to be on the look-out, so sure to catch sight of an unexpected flag or lamp at the proper moment. Travelling at high speed, perhaps at 30, perhaps even at 60 miles an hour, or, in other words, at from half a mile to a mile in a minute, he may, during a glance at his fire, or his gauges, or at some portion of the machinery of his engine, omit to observe a flag at the side of the line, or a man in front of him at a point where he would not expect to find the permanent way obstructed.

The servants of a company in charge of the permanent way may be compelled to replace damaged or broken materials at any moment, in order to secure the safety of the traffic; but it is incumbent upon them, under the printed rules which are in force upon the different railways, to exhibit a warning signal when the line is not safe for traffic at the speed ordinarily employed, not only to a train that may be expected, but also to any train that may approach them without notice. It is necessary, for the reasons above given, that they should, in doing so, appeal, by the use of explosive signals, to the sense of hearing as well as to the sense of sight of the engine-drivers, in order to ensure their obeying a signal thus made to them on a part of the line where they may not expect to find it.

I have, &c.

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

*The Secretary
Board of Trade,
Whitehall.*

SOUTH-EASTERN RAILWAY.

*Board of Trade
(Railway Department),
Whitehall, 22nd June 1865.*

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 South-Eastern 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 accident which occurred, on the 9th instant, to the tidal passenger train near Staplehurst on the South-Eastern Railway.

My Lords trust that the Directors will give the recommendations contained in Captain Rich's report their careful consideration.

I am, &c.

JAMES BOOTH.

*The Secretary of the
South-Eastern
Railway Company.*

SIR,

Dulwich, 21st June 1865.

IN compliance with the instructions contained in your letter of the 10th 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 lamentable accident that occurred on the 9th instant, near Staplehurst station, on the South-Eastern railway, by which 10 persons were killed and 40 others injured, some of them very seriously.

It appears that a gang of 4 carpenters, one laborer, and 3 platelayers, all of whom worked under the direction of the foreman of platelayers, has been employed for the last 8 or 10 weeks in taking out and renewing the longitudinal timbers that carry the rails on three viaducts, situated to the east of Staplehurst Station.

It was deemed expedient to execute these repairs during the intervals when the line would not be required for passenger traffic, rather than stop the

traffic on one line, and turn the whole traffic over a single line. The repairs, executed as they were one length at a time, (the new baulk always being fitted, ready for inserting, before the rail was disturbed,) could have been executed easily and safely, at properly selected intervals.

As the baulks had to be fitted ready for inserting before disturbing the road, it was desirable and necessary for the man on the spot who was in charge of the work to select these intervals. The platelayer or foreman of the gang, under whose orders all the carpenters and other platelayers were working, was that person. He bears the character of being a very steady and intelligent man, has been employed by the South-Eastern Railway Company 10 years, and has acted for 2 years and 10 months as foreman of platelayers on the two miles of road where the repairs were being executed.

His daily presence on this length of road must have given him a thorough knowledge of the times when all trains were due, except the tidal train; and he must have been equally aware that the time when the tidal train passed was always changing. The time service table that was furnished to him, that he had in his possession, and was seen to refer to, on the morning of the unfortunate calamity, afforded him the necessary information as to the time the tidal train would pass.

When at breakfast on the morning of the 9th inst. he informed some of the men sitting near him that the tidal train would not pass till 5.20 p.m. that day. He had the time service book in his hand at the time, and was seen to refer to it, but he mistook the time the tidal train would be due at Headcorn on the 10th June, for the time that it was due on the 9th, and read the time as 5.20 p.m. instead of 3.15 p.m., about which time it arrived.

The leading carpenter was also supplied with a time service book, but it had been cut in two, by a wheel passing over it, and as he was working under the orders of the foreman of platelayers, who had a

similar book, he did not consider it necessary to ask for another, in place of the one that was destroyed.

Norwithstanding the mistake of the foreman as to the time of arrival of the tidal train, no accident would have happened, had the regulations existing on the South-Eastern Railway been adhered to.

These regulations are, that previous to any rail being taken up, or the road opened or disturbed in any way, a signalman is to proceed, in the direction from whence a train may approach, with five detonating or fog signals and a red flag; that he is to place a fog signal on the rails, at every 250 yards, till he gets 1,000 yards (or more in case of curves or heavy gradients) from the spot where the repair is being executed; that he is to place 2 fog signals, 10 yards apart, at the extreme distance, where he is to remain and hold out a red flag, to warn any approaching train of danger, by waving the flag. This regulation was disregarded on the 9th June, and was not properly carried out by the foreman of platelayers in charge of the length between Headeorn and Staplehurst Station, during any part of the ten weeks, that the work had been going on. The inspector of the permanent way of this section of the South-Eastern Railway, does not appear to have visited the work as often as he should have done, or to have taken proper notice of the disregard of the regulations which he ought to have noticed when he visited the works.

It is also the custom and rule on the South-Eastern Railway, when "protracted repairs" are executed, that the engineer should report them to the manager, so that the latter gentleman may issue printed notices of the repairs and their locality, to all persons concerned. Such printed notices are referred to in the printed monthly service time tables.

This precaution, a most necessary one to insure drivers looking out when approaching the parts of the road under repair, was also omitted in the present case.

The engineer states, that the work on the viaducts was not looked upon as a "protracted repair," because each baulk or separate portion of the whole could be taken out, renewed, and the road made perfect, in the intervals between trains passing. I cannot agree in this view, and consider that a repair that requires the breaking of the permanent way (sometimes three times a day) at intervals for a period of ten weeks, or even for a much shorter period, should be looked upon as a "protracted repair."

In the present case, the inspector of permanent way did not report the repair to the engineer, and the latter states that he was not aware that the work was in progress. He could not, therefore, apply to the manager for the printed notices to be issued.

The platelayer's labourer, John Wiles, who had been employed as signalman during the ten weeks that the repairs were in progress on the viaducts (except for two days of that period), states, that he always went back to the 10th telegraph post, which is about 554 yards, and that he was at the same place on the afternoon of the 9th inst. when the tidal train arrived. He is borne out in this statement, by the carpenters and platelayers who were working on the viaduct, and by two laborers working in a bean field alongside the line; but the driver, fireman, and guards of the tidal train estimate the distance from where the signalman stood to the viaduct, as 150 or 200 yards. I believe from the evidence that the signalman was certainly beyond a crossing known as Slowman's crossing, which is 440 yards from the viaduct, and I see no reason to doubt his having been at the place stated by him, which was very little more than half the distance, that he should have been.

Moreover, his foreman only gave him two fog signals instead of five, and he was not instructed to use them, except in case of fog.

As the sun shone brightly, no fog signals were put down.

On the 9th June, John Bengé, the foreman of

platelayers, who was in charge of the repairs at the Beult Viaduct, had completed 29 out of 32 baulks which had to be renewed. One of these three remaining baulks was replaced before, and the other after breakfast. The whole of similar renewals on the other viaducts, which were completed before the Beult viaduct, had been so well timed, that no passenger train was stopped during the progress of the works. One engine without a train, and two ballast trains, were the only ones that had been stopped, and the position of the flagman had been sufficiently distant from the work to effect this. On the 9th inst. the foreman, having examined the service time table at his breakfast hour, resolved to complete the 32nd (which was the last part of the whole work) in the interval between the up train due at Staplehurst at 2.51 p.m. and the down train due at 4.15 p.m. He mistook the time the tidal train was due; and the distance at which he had allowed the signalman to stand, though sufficient to stop a ballast train, was not sufficient to stop a train like the tidal train, (which travels about 50 miles per hour over this part of the South-Eastern Railway,) unless the driver had perceived the signal, some time before reaching it. The driver of the tidal train on this day, only became aware of the danger when he was about 500 yards from the viaduct. He shut off steam, whistled for the breaks, reversed his engine, and again put on steam. He states that he had reduced his speed from 45 or 50 miles per hour to 10 or 12 miles per hour when he reached the viaduct. I consider that his estimate of the speed to which he reduced his train, is erroneous; and, considering the time that would be lost before the breaks came into action, and the result of the catastrophe, it appears probable that he had not reduced the speed of the train below 30 miles per hour, when he reached the viaduct.

It is stated by the several witnesses, that the tidal train, consisting of an engine and tender, a guard's van, a second-class, seven first-class, two second-class carriages, and three vans, coupled in the order given, left Folkestone Station between 2.36 p.m. and 2.39 p.m. The time of leaving, according to the company's time table, was 2.38 p.m. Three guards accompanied the train. The one who travelled in the front van was furnished with the means of applying Cremer's patent breaks to two of the passenger carriages, in addition to the ordinary break of his van.

The other two guards, who travelled in separate vans behind the passenger carriages, had an ordinary break attached to each of their vans.

Five out of the fourteen carriages in the train were therefore supplied with break-power, in addition to the tender break. The guard's vans had glazed observatories, so as to see along the tops of the carriages and along the line, and they were provided with a cord for communicating with the driver, by sounding a whistle on the engine.

None of the guards perceived the "danger" signal, before reaching it. Their first intimation was the driver's whistle, and they state that they immediately commenced to apply their breaks. The leading guard unfortunately applied his common break, which takes some seconds to put on, before he applied the patent breaks, which go on quickly, with a spring. The train had probably got over half the distance between the signalman and the viaduct from which two rails had been removed, before the break came into action.

The line from beyond Headeorn Station (which is two miles from the scene of the accident) is perfectly straight. It is practically level for a mile and a half before reaching the viaduct, the gradient being 1 in 2102. The permanent way is very good. It consists of a double-headed rail, which weighs 75 lbs. per lineal yard, laid in lengths of 21 feet. It is fished and fixed with wooden keys, in chairs, which weigh 24 lbs. each.

The chairs are spiked to sleepers 10" x 5", laid transversely, about 3 ft. 1 in. apart, except those

next the joints, which are about 2 ft. apart. The line is very well ballasted.

The Beult viaduct, on which the unfortunate occurrence took place, has 8 openings, each 21 feet wide. The railway on the viaduct, is about 10 ft. above the bed of the river, which is now a small muddy stream, but covers the whole space under the viaduct in winter.

The piers of the viaduct are brick, 3 ft. thick, and the rails are carried over each opening on wooden beams, which are laid in cast-iron trough girders. The outside girders of the bridge, which carry the platform only, are also cast iron, and the platform outside and between the rails consists of chalk laid on corrugated iron sheeting. In order to remove the last baulk on the Beult viaduct, two lengths of rail, each 21 ft. long, had been taken out of the up line, after the up train due at Staplehurst at 2.51 p.m. had passed on the 9th inst. Only 13 ft. of the baulk had been removed. This piece carried the rail on that part of the bank, next to the viaduct.

The remainder of the baulk, from which the second length of rail had been removed, was still in the trough girder, when the tidal train arrived.

This train passed Headcorn Station, at 3.11 p.m., about two minutes late; she reached the viaduct about 2.13 p.m. The speed at which she reached the viaduct, appears to have carried the engine over that part of the road, from which the first length of rail on the bank had been removed. She left no mark on the cross sleepers, which extended for half this distance. She apparently reached the part where the second length of rail had been removed from the longitudinal beam, which fortunately still remained in the trough girder; and travelling along these longitudinal beams, with the top flanges of the girders acting probably as guard rails, she succeeded in crossing the viaduct, and was brought to a stand in the ballast on the bank about 28 yards from the Staplehurst end of the viaduct. Her right wheels remained between the up line of rails; and the left wheels, between the up line and the boundary fence of the railway.

The tender remained attached to the engine, and stood across the up line. The van next to it was unhooked, but remained on the bank standing across the up line, in an opposite direction to the tender. This van remained coupled to the second-class carriage next to it, which had its leading wheels on the viaduct, and the hind wheels suspended over the bed of the river. The first-class carriage next behind, hung by its front end to the second-class, and the other end, rested in the dry bed of the river. The next first-class carriage was turned bottom upwards in the dry bed of the river. The five next first-class carriages were in the mud and water. The front one of this lot was turned bottom upwards, and the others were partly on their sides and ends, and partly on top of each other. The next was a second class, which was on its side in the dry bed of the river. The next second-class had its front end on the bed of the river, and the back end coupled to the van behind it. This van remained with its hind wheels, on the bank furthest from Staplehurst, and its front wheels, one on, and one over, the side of the viaduct. The next two vans remained on their wheels, in the ballast on the bank. The four last vehicles remained coupled together. The train contained 80 first-class passengers and 35 second-class passengers. Seven women and 3 men were taken out dead, and 40 others with injuries of various kinds; some of them very serious. The driver was not injured. The fireman was very slightly hurt. The guard in the front van was not injured. The guard in the rear van was slightly injured, and the through guard rather more seriously. Seven of the carriages were completely destroyed from falling over the viaduct, or by breaking them up to extricate the passengers. The draw-hooks of these were much bent and strained. The rest of the carriages were not much injured, and none of the couplings were broken.

The engine that drew the train is a first-class en-

gine, with 17-in. cylinders and 22-in. stroke. The leading wheels are 4 ft. 9 in. diameter, and carry about 11 tons 1 cwt. The driving wheels are 7 ft. diameter, and carry about 12 tons 12 cwt. The trailing wheels are 4 ft. diameter, and carry about 9 tons 9 cwt.

The distance between centre of leading wheels and centre of driving wheels, is 8 ft., and between driving and trailing wheels, 8 ft. 6 in.

The tender when loaded, weighs about 24 tons. It has 6 wheels. The distance between centre of leading and centre of trailing wheel, is 14 ft. After the accident it was found that the axles of the engine were bent. One guard was broken, and the other bent. The feed pipes were broken, and the gearing which showed that the engine had been reversed, was bent, so that it could not be moved. The middle axle of the tender was broken, probably from being pulled violently against the first outside main girder of the viaduct. The horn plates of the middle axle were also broken. The hind axle was bent, and the horn plates twisted. The feed pipes, one buffer, the break blocks, and rods were injured.

The whole of the near side rails of the up line on the viaduct, were torn away, and from the end of the viaduct to where the engine stopped, they were bent and the chairs broken. The off side rails were bulged where the engine first dropped, in consequence of the two rails having been taken out. The next two lengths of the off rail were all right. All the others, up to the place where the engine stopped, were torn up.

The cast-iron trough girders carrying the rails consisted of two beams bolted together. The outside beam of the first girder, where the rail had been taken out, had pieces broken off both ends. It was broken in two in the centre, and had fallen into the bed of the river.

It appears to have been broken by the tender striking it heavily. The second and third outside girders were also broken, and the sixth and eighth were cracked. The corrugated iron sheeting between the girders, which was covered with chalk, was broken through in several places. The eastern abutment of the viaduct, and the three first brick piers, were damaged by the falling carriages. The fourth pier was slightly grazed.

Before concluding this report, I think it right to call attention to the circumstance, that this melancholy disaster has occurred on a perfectly straight and nearly level part of the South-Eastern Railway, where the permanent way is kept in excellent order. It has happened to a train which had a good proportion of break power, was drawn by a first-class engine, and made up in a proper manner, with communication between guards and driver.

In all human probability this train would have reached London safely, (even though the road was broken at the Beult viaduct) had the rules of the South-Eastern Company been adhered to. The provisions in these rules, for always using fog signals when rails are taken up, is an additional precaution, not generally adopted by Railway Companies.

It appears, however, that for the last ten weeks these rules have been daily disregarded on the line between Headcorn and Staplehurst Stations, and that the inspector of permanent way, who is supposed to visit every part of the line several times during the week, if he is unable to do so daily, took no notice of such disobedience of the rules, though it does not appear possible for him to have been ignorant of the fact.

I fear that the regulations which provide for signalmen going out certain distances, and guards going back with flags, to protect disabled trains, which are in existence on railways generally, are too often disregarded, or only partially carried out.

It appears also improper that a work of such extent as the renewal of the longitudinal timbers on several viaducts, occupying a period of ten weeks, should be carried on without the knowledge of the

engineer of the railway, and consequently without any notice to the drivers and others employed on the line.

I would suggest, for the future, that the Inspectors be called upon to furnish returns weekly, or at such stated intervals as may appear best, showing the works in progress, and the date of their visits to those works, which can easily be checked by corresponding entries by the station masters or other officials. It might also be useful for them to state, that they have satisfied themselves that the men under them understand and carry out their orders.

If these returns include all the events that may

occur in their district, they will afford the engineer and all other officers of the Company the means of checking, for the future, such irregularities as have caused this fearful calamity.

The result of the coroner's inquest is a verdict of manslaughter against the foreman of platelayers and the district inspector of permanent way.

I have, &c.

F. H. Rich,

Capt. R.E.

The Secretary,
Railway Department,
Board of Trade.