

APPENDIX.

DAMAGE TO ROLLING STOCK.

7.15 a.m. *Passenger Train to Hadfield.*

Tank Engine, No. 784.—Screw shackle bent ; one bolt in right hand buffer broken.

Brake Third, No. 935.—Off the road with two pairs of wheels ; four buffer castings, one step board, one headstock, one vacuum pipe, and two quarter lights broken ; four buffers, one leg iron, one flap plate, and one drawbar bent ; brake strained ; one headstock and one end bar damaged.

Third Class, No. 1,346.—Two buffers bent ; two buffer castings and two quarter lights broken.

Third Class, No. 1,371.—One steam trap pipe and five quarter lights broken.

Brake Third, No. 886.—Badly damaged ; frame will repair, but body will require renewing.

8.40 a.m. *Empty Passenger Train.*

Engine and Tender, No. 311.—Damage to tender : wrought iron vacuum pipe and flexible pipe damaged ; top framing, buffer plank, brake rods, and hangers bent ; side frame slightly bent.

Printed copies of the above Report were sent to the Company on the 12th February, 1907.

GREAT EASTERN RAILWAY.

Board of Trade, Railway Department,
8, Richmond Terrace,

Whitehall, London, S.W.,
15th January, 1907.

SIR,

I HAVE the honour to report, for the information of the Board of Trade, in compliance with the Order of the 3rd January, the result of my inquiry into the circumstances under which a collision occurred at about 6.42 p.m. on the 29th December, 1906, between the slip and main portions of a passenger train at Marks Tey, on the Great Eastern Railway.

In this case, whilst the main portion of the 5.30 p.m. down train from Liverpool Street to Ipswich, consisting of an engine, tender, and 12 vehicles, was standing in Marks Tey Station, where it had been brought to a stand owing to the signals being at danger, it was run into from the rear by the slip portion, consisting of four vehicles, which had just previously been detached from the train.

The speed of the slip portion at the time of the collision was not great, but the six rear vehicles of the main portion and all four vehicles of the slip portion were slightly damaged.

The Company has received notification of injuries sustained from 34 passengers, 20 of whom were in the main portion, and 14 in the slip portion ; it is understood, however, that none of the injuries are of a very serious description.

The engine of the train was a four-wheels-coupled tender engine, and it was running chimney first at the time of the accident. It was fitted with the Westinghouse automatic brake, working blocks on the four coupled wheels and on the tender wheels, and with a hand brake working the blocks on the tender wheels.

The train consisted of the following vehicles, attached to the engine in the order given :—

								Wheels.
One brake van	...	...	...	...	...	...	...	6
One third class carriage	...	...	...	...	...	...	...	6
One first class carriage	...	...	...	...	...	...	...	6
One composite carriage	...	...	...	...	...	...	...	8
One third class carriage	...	...	...	...	...	...	...	6
One first class carriage	...	...	...	...	...	...	...	6
One third class carriage	...	...	...	...	...	...	...	6
One brake van	...	...	...	...	...	...	...	6
One bullion van	..	...	...	...	...	...	...	4
One composite carriage	...	...	...	...	...	...	...	8
One third class carriage	...	...	...	...	...	...	...	6
One composite carriage	...	...	...	...	...	...	...	8
One slip brake third	...	...	...	...	...	...	...	6
Two composite carriages	...	...	...	...	...	...	...	6
One third class carriage	...	...	...	...	...	...	...	6

All these carriages were fitted with the Westinghouse automatic brake, working blocks on all the wheels of the four-wheeled and eight-wheeled vehicles, and on four wheels of each of the six-wheeled vehicles. The brakes are all reported as having been in good order.

The four rear vehicles of the train formed the slip portion which was due to be slipped at Marks Tey Station.

Particulars of the damage done to rolling stock are given in the Appendix ; that to permanent way was practically nil.

Description.

Marks Tey Station, at which this accident occurred, is situated between Chelmsford and Colchester, on the Great Eastern Railway Company's main line from London to Colchester. This station is the junction for the Sudbury branch, and it is customary for a portion of the 5.30 p.m. down train to be slipped here at 6.41 p.m. The up and down main lines run through the station in directions which are approximately north and south, the down line, with which alone this accident is concerned, being on the west side. The down platform is 200 yards in length, and the station signal-box is situated at the down end of it.

The down line is provided with the usual distant, home, and starting signals, the situation of these signals being as follows:—Down distant signal, 1,115 yards to the south of the station signal-box ; down home signal, 200 yards to the south of the station signal-box ; down starting signal, 10 yards to the north of the station signal-box.

The down distant signal, which is fixed on a tall post at a height of $47\frac{1}{2}$ feet above rail level, is provided with a repeater, consisting of a similar arm situated on a low post about five feet from the nearer rail and at a height of $11\frac{1}{2}$ feet above rail level. The two arms work simultaneously, the lower signal being specially provided to enable the signal to be seen in foggy weather by the driver and by the slip guard. The down home and down starting signals are fixed at heights of 48 feet and 45 feet respectively above rail level.

The line, as it approaches Marks Tey from the south, is on a slight curve to the right, but in clear weather the driver obtains an excellent view of his signals.

There is a public road level-crossing situated at a distance of 1,440 yards to the south of the signal-box, and there is a public road over-line bridge at a distance of 610 yards to the south of the same point. The down distant signal is therefore situated approximately half way between the public road level-crossing and the public road over-line bridge.

The gradient for a down train approaching the station is a slightly rising one up to the public road level-crossing, where there is a length of about 100 yards which is practically level ; from there the gradient into the station is a gently falling one, varying from 1 in 340 to 1 in 253.

The following are extracts from the Company's Rules as regards the working of slip carriages:—

6. (a.) If permanent way operations should be in progress of a character to render it undesirable to slip carriages, or if, owing to fog, falling snow, or other cause, the stationmaster at a place where a carriage is usually slipped considers it desirable that the train should stop instead of the carriages being slipped, he must take care that the fixed signals are kept at danger and the train stopped at the station for the slip portion to be detached.

(b.) Where practicable, the station at which the train last stops must be advised by telegraph or telephone of the circumstances. The stationmaster receiving this message must specially instruct the engine driver, the slip guard, and the other guards of the train that the train must stop at the slipping station instead of slipping the carriages, and he must see that the ordinary screw coupling is used instead of the slip coupling.

7. (a.) The slip guard must exercise great care as to the point at which the slip carriages are detached, having regard to the number of carriages in the slip portion, the gradient of the line, the state of the rails, and other circumstances.

(b.) He must be careful to maintain a sufficient interval between the slip portion and the train, so as to enable him to stop the slip portion clear of the train in the event of the latter slackening speed or coming to a stand from any cause before reaching the platform.

(c.) The engine driver or fireman, and the guards, must look back where the slip portion is usually detached, and on the side on which it can best be seen, in order to satisfy themselves whether or not it is properly detached ; but no attempt must be made to stop the train unless a signal be received from the slip guard to do so.

(d.) On approaching the station at which the slip carriages have to be left, the slip guard must look out for the distant and home signals, and if the distant signal is at "All right" (see note below), and the train is running at the usual speed, he must apply his hand brake so that the blocks may press slightly upon the wheels. He must then, and not before, uncouple the slip portion, and immediately afterwards apply the hand brake a little more forcibly, so as to allow the train to get some distance from him, and must give the engine driver and the guard or guards

of the train an "All right" hand signal by exhibiting a green flag by day or a green light by night waved slowly up and down, and the engine driver or fireman must acknowledge the signal. He may then, if necessary, release his hand brake, to allow the slip portion to run to the platform. The carriages must not be uncoupled if the engine driver is slackening speed, nor until the proper signals are exhibited for the train to pass through the station.

(e.) Except in case of emergency, the continuous brake must not be used by the slip guard after slipping.

(g.) If the engine driver finds it necessary to stop his train, otherwise than in obedience to a danger signal, he must take care that he does not stop until the train is well clear of the platform at which the slip portion will have to stop, in order to avoid the slip portion coming into collision with the train.

Evidence.

Mr. Arthur Green states: I am stationmaster at Marks Tey, and have held that appointment for six years and a half. On the afternoon of the 29th December it had been slightly foggy, but not sufficiently so to interfere with railway working. About 6.35 p.m. the fog became much denser, and in consequence of that fog I thought it would be unsafe for the 5.30 p.m. train to slip its carriages. Accordingly I went up into the junction signal-box and told the signalman to keep all his signals at danger, and told him that in consequence of fog I proposed to stop the train at the station. I was standing on the down platform at the time that the train reached the station. I was near the Colchester end of the platform. The fog was still thick at the time, but in my opinion one could see a signal at a distance of 200 yards. I was standing near the old passage to the branch platform. Foreman porter Rowland was standing at the time near the new passage to the branch platform. From the point where I was standing I could not see the down home signal back-light owing to the fog. When I had been in the station signal-box just previous to the arrival of the train I had been able to see the lights of the yard signal-box. From where I was standing on the platform I could distinctly see the down starting signal, and it was at danger. I could also see the up starting signal, and that was at danger also. I saw the train arrive at the station, and when the engine reached the down home signal the driver shut off steam. I heard him do so. At that time I thought that the train was going to stop at the station. When the engine was just about at the home signal I heard foreman porter Rowland shout out "She has slipped, pull off the signals," and I repeated the order to the signalman. The signalman at once lowered his starting signal, and the distant signal fixed underneath it came off with it. The train went on, but the engine came to a stand opposite the milk gate. At the time I shouted out the order to the signalman the engine was right upon me. The rear of the train came to a stand near the centre of the down platform, nearly opposite the new cut to the branch platform. A few seconds after it had come to a stand the rear portion crashed into the front portion. I saw the collision occur. I estimate the speed of the rear portion of the train at the time of the collision at from 15 to 20 miles an hour. I cannot say what brakes were applied on the slip portion. It is customary for the slip to come to a stand with its middle portion about opposite the old passage to the branch platform. There are usually three slip vehicles on this train, except on Saturdays, when there are usually four. The speed of the slip portion when passing the new cut was considerably higher than the speed usually is at this point. I believe that at that time one could see a vehicle with a head light at a distance of 200 yards. The rear end of the main portion of the train had the

usual tail light and two side lights, all three of which showed a red light to the rear, and I should say that these lights could have been seen at a distance of 200 yards. I noticed the lights at the rear of the main portion of the train, and they were burning brightly. On this occasion I had not sent word to Chelmsford that I was going to stop the train at this station, as I had not time to do so. I did not make up my mind to stop the train until after it had left Chelmsford. I myself saw the starting signal lowered. I cannot say for certain whether the engine of the train had passed the starting signal when it was lowered or not, but it was very close upon it. At 6.35 p.m. I did not consider that the fog was sufficiently dense to necessitate my calling out fogmen, but after the accident I did so.

Arthur Rowland, foreman porter, states: I have been 18 years in the service of the Company, and have been a foreman porter about eight years. I am stationed at Marks Tey Station, where I have been for four years. I was on duty on the evening of the 29th December when this accident occurred. At the time the accident occurred I was standing on the down main platform near the new cut to the branch platform. I knew that the station master had made arrangements to stop the train at the station. At the time the train arrived the down home signal was at danger, but I cannot say in what position the down starting signal was. I cannot speak positively about the down starting signal, as I did not specially look at it at the time, but I had looked at it just previously and saw that it was at danger. Just previous to the accident, therefore, I could see the down starting signal from where I was standing. I saw the train arrive. Just as the engine of the train was passing me I noticed that he had slipped. I can give no estimate as to the speed of the train at that time. Immediately I saw that he had slipped I shouted out to the signalman "He has made the slip, pull the signals off and let him go." I did not see what action the signalman took as I ran back at once and shouted to the guard of the slip portion to apply his Westinghouse brake. I cannot say whether I attracted the attention of the guard, but I do not think I did. I estimate the speed of the slip portion at the time it passed me at from 15 to 20 miles an hour. I had only got about 20 yards from the "cut" when I met the slip portion. I believe that some brakes were applied on the slip portion, but I cannot say what. The speed of the slip portion seemed to check very little after it passed me. I could not see the guard at all as the slip portion passed me. It may have been the steam and smoke which prevented my seeing him. I noticed that there were the usual lights at the rear of the main portion of the train, and they were burning brightly. I think that I could have seen the lights at a distance of about 100 yards. When the engine passed me I

Note.—If the distant signal should be at danger but, after passing it, the slip guard can see that the home signal is "Off," he may make the slip in the usual manner, provided the circumstances will admit of his doing so in safety.

could see the white light in the leading vehicle of the slip portion, and I knew therefore that the slip had been made.

William Nunn, signalman, states : I have been 35 years in the service of the Company, during the whole of which time I have been employed as a signalman. I am in charge of the Marks Tey Junction signal-box, and have been practically signalman here for 31 years. I had come on duty on the morning of the 29th December at 8 o'clock and had worked till 12 midday at the yard box. I had then come on duty at 4 p.m. to work till 8 p.m. in the junction box. I had come off duty on the 28th at 8 p.m. About 6.35 p.m. on the 29th the stationmaster came into my box and remarked that the fog had come on very thick during the last few minutes. We were both of opinion that the fog was so dense that it would not be safe to slip, and the stationmaster said, "We will be on the safe side; stop the train." Accordingly I kept all my signals at danger. At the time the train was arriving at the station I could not see the back-light of my down home signal, but I could see the light of my up starting signal. I think that I first saw the engine of the train when it was passing the refreshment room. Before I actually saw the train I heard foreman-porter Rowland call out to me. He said, "They have made the slip; lower your starting signal." I at once lowered my starting signal. This was just before I saw the engine in front of the refreshment room. The engine, however, passed about four lengths beyond the starting signal and then came to a stand. It was about a quarter of a minute after the engine came to a stand that the collision occurred. I heard the noise of it. When I lowered my starting signal the distant signal under it was lowered also. My down distant signal is repeated and its light is repeated also. I am quite certain that that repeater showed that the signal was at danger, and that the light was burning. At the time that I lowered the starting signal, the engine was somewhere near the refreshment room.

Harry Pizzev, driver, states : I have been nearly 30 years in the service of the Company, and have been 26 years in the service of the Locomotive Department. I have been a driver for 16 years. I came on duty on the 29th December at 7.15 a.m. to work till 7.30 p.m. During this time I was standing for two hours in the Stratford carriage sidings, and during this time I could have left my engine for short intervals. I was driver of the 5.30 p.m. down train from Liverpool Street to Ipswich. My engine was a four-wheels-coupled tender engine, and it was running chimney first at the time of the accident. My engine was fitted with the Westinghouse automatic brake, working blocks on the four coupled wheels and on the tender wheels, and with a hand brake working the blocks on the tender wheels. My brakes were in good order. It is customary for this train to slip a portion at Marks Tey. I had driven this train about three times previously, but I was quite acquainted with the usual working at Marks Tey. On approaching Marks Tey I found the distant signal at danger. At this time the weather was thick. I could not see the distant signal until I was quite close under it. As I passed the signal I was able to see the arm on the tall signal post. I had no difficulty in seeing the light on the short signal post as I passed it. I do not think, however, I could have seen that light more than an engine length away. I first thought that possibly the distant signal might, owing to the frost, have

stuck, but as soon as I saw that the signal was at danger I shut the regulator. At this time I should think that we were going about 45 miles an hour. I did not, however, apply my brakes because I was afraid that the slip portion might be slipped and run into me. The next signal I came to was the home signal, and that also was at danger. I had no difficulty in seeing that signal when I got close up to it. As soon as I saw that the home signal was at danger I applied my brake, but I intentionally ran past the home signal for fear of being run into by the slip portion. The starting signal was also at danger when I first sighted it. My intention was to pass the starting signal but to stop clear of the Yard box connections. When I passed the starting signal it was still at danger and I stopped my engine about 15 yards clear of the Yard box points. After the collision occurred I noticed that the starting signal and the distant under it were lowered. If the starting signal had come off for me before I passed it, I should have gone ahead. I saw the red light of the starting signal clearly as I passed it. At the time that I brought my engine to a stand, I did not know whether the slip had taken place or not. The first intimation that I received of it was the collision. It is customary when the slip is made for the guard of the slip portion to give me a signal. I did not look round on this occasion to see whether the guard gave me any signal. I knew that on account of the fog it would have been no use my doing so. It never occurred to me that the distant signal was at danger in order to prevent the slip taking place. I am, however, acquainted with the rule that if the distant signal is at danger, the guard is not to slip. If it had been intended for the slip not to take place I thought that I should have been warned at the previous station. I had not been warned at Chelmsford to that effect.

George Taylor, guard, states : I have been over 40 years in the service of the Company, and I have been a guard for over 30 years. I came on duty on the 29th December at 9.50 a.m. to work till 9.43 p.m. I was second guard of the 5.30 p.m. down train, and was riding in brake van No. 140 near the middle of the train. My train consisted of 16 vehicles, and the rear four were due to be slipped at Marks Tey. All the vehicles of my train were fitted with the Westinghouse automatic brake, working blocks on four wheels of each of the six-wheel vehicles, and on all the wheels of the four-wheel and eight-wheel vehicles. Our brakes were in good order. I did not receive any special instructions at Chelmsford about slipping. I remember the train approaching Marks Tey Station. I did not see the distant signal for Marks Tey; I was looking out to try and see it. I am well acquainted with the signal. There is a tall signal post, with a short one alongside it. I looked out for the short one as well as the tall one, and I was unable to see either of them. I cannot account for why the driver could see it and that I could not do so. I did not notice any alteration of speed when passing the distant signal. I know that the brakes were not applied when we passed the distant signal. I knew where I was because I could see the bottom of the signal post, though I could not see the arm. I could see the post, and I could see the bottom of the post where it went into the ground, but I could not see the light, and I could not see the arm either. I was standing in my van at the time. I was looking out of the door window of the van; the window was down. My face was just inside, where the window would have been

if it had been up. I did not notice that the speed of the train was checked at all until we went under the overline bridge. At that point the brakes went on. When we were entering the station, I looked out for the home signal, and could not see it. I could see the signal post, but I could not see the light. My van ran past the post, and when we had passed that signal a few lengths the train stopped. When the train stopped I got out on to the platform. I had a conversation with a first-class passenger, and then went to the rear of the train, but before I reached the rear of the train the collision occurred. At the time my train came to a stand I did not think that the slip had taken place, but I did not know for certain. When I got out on to the platform I saw the red light of the down starting signal, and saw that it was at danger. I could see that light from the part of the platform on to which I got from my van. I attribute my not seeing the distant and home signals to the smoke and fog. Before the collision occurred, I looked up and saw that the starting signal was at danger.

George Bonner, guard, states: I have been 35 years in the service of the Company and have been a passenger guard for 27 years. I came on duty on the 29th December at 7.30 a.m. to work till 8 p.m. I came off duty on the 28th at 10.15 p.m. I was slip guard of the 5.30 p.m. down train and I was riding in the slip brake, which was the leading one of the four vehicles which had to be slipped at Marks Tey. I believe we were a few minutes late in leaving Chelmsford. I did not receive any special instructions at Chelmsford about slipping at Marks Tey. I was on the look out when we were approaching Marks Tey. I did not see the distant signal; I was specially looking out for it. After leaving Chelmsford, I lowered the window of my van and I was standing at it, looking out the whole time. At one time I was looking out of one window and at other times out of the other, according to where the signals were placed. I was looking out of the left side of my van when I was looking for the distant signal at Marks Tey. I am well acquainted with that signal. For the last 14 years I have been slip guard on this train every other night. The Marks Tey distant signal consists of a tail pole and a repeater lower down. I could not see either one of the two signals at all. I could not see the posts and I could not see the lights. I account for my not seeing the signal owing to the fog and the steam and smoke from the engine. I knew when I passed the level crossing before reaching the distant signal, and I knew when I passed under the over-bridge after passing the distant signal, and when I got to the over-bridge I knew that I had passed the distant signal without seeing it. The train did not check speed before reaching the

over-bridge; had it done so I must have felt it. Just after I had passed under the over-bridge I made the slip. I thought that if the distant signal had been at danger the driver would have checked speed. I knew that the driver had not checked speed and that therefore he could not stop at the home signal. I thought, therefore, that I was quite safe in making the slip. When I made the slip I had my hand brake hard on and the sand running, and I had got my hand lamp ready with the green light turned on. I stepped to the window and waved my lamp up and down in the usual way, and I got back to the brake as quickly as possible, as I knew we were very rapidly approaching the station. The moment I slipped I saw the tail lamp of the main portion of the train vanishing rapidly. I stood then with my hand on the Westinghouse brake, ready to apply it as soon as I thought that it was necessary. On this night the hand brake and the sand held wonderfully well and they checked the speed of my carriages very quickly. When I reached the platform I saw the glimmer of one of the platform lights, and I knew that I had got to the platform. I estimate that we were then going at about 15 miles an hour. I felt that I could stop the vehicles in their usual place by the application of the Westinghouse brake. It is usual for the slip carriages to run to the down end of the down platform with the centre of the slip carriages opposite the old opening leading to the branch platform. I did not know and I could not see that the train had stopped in front of me, or else I could have stopped my vehicles clear of it. I did not see the train in front of us at all until we hit it. I cannot explain why it was that I did not see it, unless it be that the fog and smoke obscured it. My eyesight is very good. I do not think that we were going at more than 5 miles an hour at the time the collision occurred. I did not see the Marks Tey home signal, but I did not really look for it, nor did I see the starting signal. I am aware of the rule that if I am unable to see a signal that I should treat it as a danger signal, but I consider that I did treat it as a danger signal by not slipping in the usual place. The usual place to slip is immediately after passing the distant signal. I am acquainted with the rule which states that the slip should not be made unless the distant signal is at safety. I consider that under the circumstances I was justified in slipping. There was no fogman out at the distant signal. The lights at the rear of the main portion of the train were in good order. I account for my not seeing the tail lights of the train to the fog and the smoke, and to the fact of my windows being frosted. After I reached the platform I applied the Westinghouse brake slightly and kept it on. I had an hour and a half off in the middle of the day, during which I was able to leave my work, and I got about another hour off duty in the afternoon.

Conclusion.

The circumstances under which this accident occurred were as follows:—

The afternoon of the 29th December had been slightly foggy, though not to a sufficient extent to interfere with railway working. About 6.35 p.m., however, the fog became denser, and Mr. Green, the stationmaster at Marks Tey, became of opinion that on account of the fog it would be unsafe for the 5.30 p.m. train to slip its carriages. Mr. Green accordingly went into the signal-box and told signalman Nunn that he proposed to stop the train, and instructed him to keep all his signals at danger, which Nunn accordingly did.

The last station at which the train was due to stop before reaching Marks Tey was Chelmsford, and, as it was due to leave that station at 6.19 p.m., there was no time for Mr. Green to advise that station that the train was to be stopped at Marks Tey. Mr. Green also states that though at 6.35 p.m. he considered that on account of the fog

it was safer for the slip not to take place, he did not consider that the fog was dense enough to justify his calling out fogmen ; at the time of the accident, therefore, no fogmen were on duty.

The train accordingly left Chelmsford without any warning being given to the driver and guards that it would be stopped at Marks Tey. Driver Pizzey, who was in charge of the engine of the train, states that on approaching Marks Tey he found the distant signal at danger ; the weather was thick at the time, and he could not see the distant signal until he was quite close to it, but when near it he was able to see the arm on the tall signal post, and he had no difficulty in seeing the light on the short signal post as he passed it. Pizzey thinks that at this time the speed of the train was about 45 miles an hour, and as soon as he saw that the distant signal was at danger he shut the regulator, but he did not apply his brakes, as he was afraid that the slip portion might be slipped and might run into him. When he sighted the home signal, he saw that that also was at danger, so he then applied his brakes, but he intentionally ran past that signal for fear of being run into by the slip portion. The starting signal was similarly at danger, and that signal also Pizzey ran past for the same reason, but he brought his engine to a stand about 50 yards beyond it ; in this position, the rear end of the front portion of the train was resting opposite the centre of the down platform. At the time he brought his train to a stand, Pizzey did not know whether the slip had taken place or not ; he did not look round to see whether the slip guard gave him the usual signal, as he knew that on account of the fog it would have been useless for him to do so.

Guard Bonner, who was guard of the slip portion of the train, was riding in the slip brake, at the head of the portion which had to be slipped. He states that he is well acquainted with the Marks Tey distant signal, and that on approaching Marks Tey he had lowered the window of his van, and was standing at it looking out for that signal. He states that he was unable to see either of the two signal posts or their lights at all, and he attributes his not being able to do so partly to the fog and partly to the steam and smoke from the engine ; he saw, however, the level crossing before reaching the distant signal, and he also saw the over-bridge under which he passed after passing that signal, so on reaching that over-bridge he knew that he had passed the distant signal without seeing it. He states that up to the time of reaching the over-bridge the train had not checked speed, and he was confident, therefore, that the driver could not stop at the home signal ; he thought, therefore, that in spite of his not having seen the distant signal he was quite safe in making the slip, and he accordingly did so, and he states that the tail lamp of the main portion of the train vanished rapidly from his sight. He at once stepped to the window, and waved his lamp up and down in the usual way, and then stood with his hand on the Westinghouse brake, ready to stop the carriages if necessary. Bonner states that when he made the slip his hand brake was applied and the sand was running, and that the brake checked the speed of his carriages very quickly. He knew when he reached the platform by seeing the platform lights, and he estimates his speed at that time at about 15 miles an hour. It is usual for the slip carriages to run to the down end of the down platform, and Bonner states that he felt that he could stop the vehicles in their usual place by the application of the Westinghouse brake. He saw nothing whatsoever of the train in front of him until the collision occurred, and he thinks that his speed at that time was not more than five miles an hour.

At the time that the train was approaching the station Mr. Green was standing on the down platform, about 35 yards from the signal-box, and foreman porter Rowland was standing on the same platform, about 100 yards from the box, *i.e.*, at about the centre of the platform. Rowland states that just as the engine of the train passed him he noticed the light in the leading vehicle of the slip portion, and he realized that the slip had been made. The length of the main portion of the train behind the engine was about 150 yards, so it is evident that the fog at that time cannot have been of great density. Rowland, on seeing that the slip had been made, at once shouted out to the signalman "He has made the slip ; pull off the signals and let him go." Mr. Green heard foreman porter Rowland shout, and he himself at once repeated the order to the signalman, and the latter promptly lowered his starting signal ; this signal was not, however, lowered until the engine of the train was quite close to it, and there is therefore no ground for disbelieving driver Pizzey's statement that he never saw this signal lowered. After shouting out to the signalman, Rowland ran down the platform shouting to the guard of the slip portion to apply his brake, but he does not appear to have been able to attract his attention.

Driver Pizzey must certainly be held partially responsible for this accident ; even though he had received no warning at Chelmsford, he saw that the Marks Tey distant

signal was at danger, and he admits that he knew that with the distant signal at danger the slip should not take place; had he at once applied his brakes so as to bring his engine to a stand at the home signal he would have thereby given an unmistakeable check to the speed of his train, which would have warned the slip guard that something unusual was occurring, and under those circumstances the latter would almost certainly not have made the slip. Pizzey was undoubtedly taken by surprise at finding the signal at danger, but had he promptly taken what were clearly the right steps under the circumstances, the accident would not have happened.

Driver Pizzey also undoubtedly made an error in judgment with regard to the point at which he brought his engine to a stand. If, as he states, he considered that the possibility of the leading portion of the train being run into by the slip portion justified his passing both the home and starting signals at danger, he should certainly have taken his engine far enough to ensure that the rear of his portion of the train was clear of the platform at which the slip portion would stop; as a matter of fact, he brought the front portion of the train to rest with its rear end immediately opposite the centre of that platform.

Driver Pizzey must therefore be held partially responsible for this accident.

As regards guard Bonner: he states that he was unable to see either of the lights of the distant signal, even though he was looking out of the van window specially for them. The short signal post on which the repeater is fixed is, as stated above, erected close to the line, and actual measurements on the spot showed that the lamp on this post would not have been more than four feet from Bonner if, as he states, he was at the window of his door. Driver Pizzey, it will be remembered, stated that he had no difficulty in seeing the light on the short signal post as he passed it. On the other hand guard Taylor, who was riding near the middle of the train, states that he also could not see the light or the arm on the short signal post, but that he could see the bottom of the post where it went into the ground. It is possible therefore that the smoke and steam may have completely obscured the view of the distant signal from the two guards.

Apart, however, from the question whether Bonner should have seen the distant signal, he himself admits that when he reached the over-bridge he knew where he was, and he recognised that he had passed the distant signal without seeing it; under those circumstances, it was his duty to have treated the signal as a danger signal, and consequently not to have made the slip. He was doubtless misled by the fact of the driver not having checked the speed of the train, but that did not justify him in neglecting to carry out his own instructions; he could either have attracted the driver's attention by the application of the automatic brake, in which case the whole train would doubtless have been brought to a stand, or he could have allowed the slip portion to be taken forward to the next station. It is to Bonner's error in slipping the carriages when he did, that this accident must be mainly attributed.

When approaching the station also, Bonner does not appear to have adhered to his regulations. He states that when he reached the platform he was going at a speed of about 15 miles an hour, and that he felt that he could stop the vehicles in their usual place by the application of the Westinghouse brake. It is evident, therefore, that Bonner intended to make use of that brake in stopping the carriages, whilst Rule No. 7 (e), quoted above, states that except in cases of emergency the continuous brake must not be used by the slip guard after slipping. Bonner should, therefore, have entered the station at a speed at which he could have stopped his carriages by the application of the hand brake alone. Had he adhered to this Rule, the speed at the time of the collision would certainly not have been as great as it actually was.

It is difficult also to accept Bonner's statement that he was unable to see the tail lamp at the rear end of the main portion of the train, which according to the evidence was burning brightly at the time. It is quite clear that foreman porter Rowland, who was standing almost exactly opposite the spot where the collision took place, had been able to see the lights of the slip coach when it was at least 150 yards distant from him. Even allowing, therefore, for the fact that the windows of the brake-van were frozen, Bonner should certainly have seen the rear light in ample time to have prevented the collision.

The Company gives guard Bonner a very good character, and he has had great experience of the working of slip carriages; it is certain, however, that on this occasion he did not strictly adhere to the Company's rules, and it is difficult to resist forming the opinion that throughout the slipping operation he did not act with sufficient care. It is on him, therefore, that the responsibility for this accident must mainly rest.

I have, &c.,

P. G. VON DONOP,
Lt.-Col., R.E.

The Assistant Secretary,
Railway Department, Board of Trade.

APPENDIX.

DAMAGE TO ROLLING STOCK.

Third-class Carriage, No. 695.—Two buffers and one ascending iron bent; two end mouldings broken; body bolts strained.

Brake Van, No. 140.—Two buffers and two leg irons bent; body bolts strained.

Bullion Van, No. 2,029.—Two axle box bottoms and two body bolts broken.

Composite Carriage, No. 568.—One bolster split; one end bar of bogie frame bent; bogie frame strained; underframe steel sole bar buckled; two bogie centre castings, two bolts, two spring hanger U-bolts, gas tank band tie rod, and two lavatory lights broken.

Third-class Carriage, No. 1,628.—Body bolts strained and photo fascia glass broken.

Composite Carriage, No. 561.—One bogie centre casting, two gas tank band tie rods, three side

lights, one lavatory light, one w.c. pan (third-class), and one photo fascia glass broken; draw-bar cottar missing; gas fittings damaged.

Slip Brake Third, No. 236.—Two headstocks, two diagonal bearers, two centre axle-box bottoms, and one Westinghouse auxiliary spring rod broken; two buffers bent.

Composite Carriage, No. 536.—Body bolts strained, one broken.

Composite Carriage, No. 278.—Body bolts strained; two headstocks and two centre axle box bottoms broken.

Third-class Carriage, No. 161.—One axle box bottom, one side light, and two photo fascia glasses broken; body bolts strained; and gas fittings damaged.

Printed copies of the above Report were sent to the Company on the 20th February, 1907.

LANCASHIRE AND YORKSHIRE RAILWAY.

Board of Trade, Railway Department,
8, Richmond Terrace,

Whitehall, London, S.W.,

9th January, 1907.

SIR,

I HAVE the honour to report, for the information of the Board of Trade, in compliance with the Order of the 27th December, 1906, the result of my inquiry into the causes of the collision which occurred on the 20th December, between a passenger train and a portion of a goods train in Thurstonland Tunnel, between Brockholes and Stocksmoor, on the Lancashire and Yorkshire Railway.

In this case the 2.52 p.m. passenger train from Brockholes to Clayton West collided with the rear portion of a preceding goods train which had apparently broken loose from the front portion, and was standing in the tunnel.

The driver and fireman of the passenger train, and the guard of the goods train were injured, and the guard and one passenger of the passenger train slightly bruised.

The passenger train did not become derailed at all, and was hardly damaged, but the brake van and the two rear waggons of the goods train were much smashed up and derailed, blocking both lines.

The passenger train consisted of a four-wheels-coupled tank engine with leading and trailing radial axles, running chimney first, and of two bogie third vans, with an intermediate six-wheeled composite carriage. The engine was fitted with the automatic vacuum brake working blocks on the four coupled wheels, and the carriages were braked throughout, with the exception of the centre pair of wheels of the six-wheeled composite.

The goods train consisted of a six-wheels-coupled goods engine with six-wheeled tender, running tender first, with the automatic vacuum brake working blocks on all wheels of engine and tender, and of 37 empty coal waggons and a brake van.

The weather was very foggy on the day of the collision.

Details of damage to rolling stock are given in the Appendix. There was no damage to the permanent way.

Description.

The up line between Brockholes and Stocksmoor is on a steep rising gradient for the first mile and 642 yards, the remaining 1,158 yards being practically level. The last 1,680 yards of the steep gradient of 1 in. 100 is in a tunnel, known as Thurstonland Tunnel.

The total distance between the two signal-boxes is 2 miles and 40 yards, and the following distances may be noted :—

From Brockholes Junction signal-box to the junction with the Holmfirth line, 30 yards: