

## APPENDIX.

## DAMAGE TO ROLLING STOCK.

Passenger engine, No. 671.—Both leading buffers and buffer plate damaged; engine main framing bent; smoke box slightly buckled and vacuum pipes broken.  
Third bogie van.—Body moved and one head-stock slightly damaged.

Bogie composite, No. 692.—Body moved.  
Third bogie, No. 1,013.—Body moved.  
Third bogie, No. 120.—Body moved.  
Third bogie, No. 1,737.—Body moved.  
Third-class coach, No. 1,523.—Body moved and one buffer rod bent.

## DAMAGE TO PERMANENT WAY.

Two switch blades and three rails slightly bent; seven chairs broken.

Printed copies of the above Report were sent to the Company on the 4th February, 1902,

## LIVERPOOL OVERHEAD ELECTRIC RAILWAY.

Railway Department, Board of Trade,  
8, Richmond Terrace, Whitehall, London, S.W.,  
February 22nd, 1902.

SIR,

I HAVE the honour to report for the information of the Board of Trade, in compliance with the Order of the 24th December, 1901, the result of the enquiry held by me, in conjunction with Mr. Trotter, into the circumstances attending the disastrous fire which occurred on the evening of the 23rd December at Dingle Station, on the Liverpool Overhead Electric Railway, whereby six lives were lost.

The names of the victims were Messrs. Beadon and Bingham, passengers; Thomas Rendell, station foreman at Dingle; J. C. O'Brien, car cleaner; Robert Ashbee, motor man or driver; and Charles Maloney, guard; the four last being employed by the Company.

The fire commenced in the rear carriage of the 5 p.m. train from Seaforth Sands, due at Dingle at 5.32, but which was six minutes late, and which, owing to some defect in the rear motor, came to a stand about 80 yards outside Dingle Station. The fire, after spreading from carriage to carriage, finally attacked the station, which was entirely burnt out.

*Description.*

In order to convey a clear idea of this remarkable occurrence, it is necessary to give a brief description of the railway and of Dingle Station.

The Liverpool Overhead Railway was, as its name implies, originally carried entirely on a viaduct, constructed throughout of steel columns, steel girders, and steel flooring. It was opened for traffic in 1893, its length being then about 5 miles 71 chains.

Early in 1897 it was extended in an easterly direction from its eastern terminus at Herculaneum Station to Dingle, the extension being 1,144 yards in length, of which a length of about 300 yards is on viaduct, and the remainder in tunnel. It was originally intended that the railway should be continued still further eastward, but, up to the present, this has not been carried out, and the line terminates abruptly in the tunnel, at the extremity of which Dingle Station was built.

The tunnel, which is arched throughout, is 25 feet 6 inches wide and 19 feet high for a distance of 605 yards from its entrance. The width is then increased to 52 feet, and the height to 24 feet 6 inches, for a length of 163 yards, after which the tunnel resumes its normal section for a length of 41 yards, when it ends with a dead wall. In the widened part of the tunnel Dingle Station is placed. It may be remarked that the span over the station is unique, no tunnel arch of such magnitude having been previously constructed.

The station consists of an island platform 28 feet wide and 170 feet long, with lines on either side of it, the arrangement and signalling being such that each line can be used for the arrival or departure of trains. At the east end of the platform a flight of stairs leads to an inclined passage or subway about 160 feet long, communicating with the booking hall, which abuts on to the thoroughfare known as Park Road. The booking

hall has four double doors, each forming an opening 6 feet wide, facing the street. Three of these doors are said to have been open at the time of the fire.

At the west end of the platform there are cross-over roads between the up and down lines, near to which the signal-box is situated, while at the east end of the station there are sidings with a cross-over road between them. It often happens that a spare train is standing in these sidings, as was the case on the day of the disaster.

The platform, stairs, and passage were divided longitudinally by a fence or barrier for the purpose of separating outgoing from incoming passengers, and facilitating the station work, and small shelters were placed at intervals along the platform. Hydrants with sufficient lengths of hose were fixed at each end of the platform, and some chemical fire extinguishers were kept in the signal-box. The station was lighted by electricity, taken from the main current, and incandescent gas lamps were also provided for use in case the electric supply failed. The gas lamps on the platform were probably turned down, but those in the booking hall were burning brightly.

I attach a plan and longitudinal section of the station, which make the arrangements quite clear.

The railway is worked by means of electricity on the (500 volt) continuous current system, the electrical conductor being placed in the middle of each track.

The trains consist of two or three bogie carriages. In the case of the two-coach trains, each coach carries a motor; in the case of the three-coach trains the first and third coaches have motors. In all cases the motors are placed, one on the leading axle, and the other on the trailing axle of each train. There is a driver's compartment at each end of every train, and both motors can be controlled separately or simultaneously from either end. The trains can therefore travel in either direction without any re-arrangement of the carriages. The driver invariably occupies the compartment at the leading end of the train, and the guard that at the other end.

The signalling of the line is automatic.

The following general description of the motors has been supplied to me by Mr. Cottrell, the General Manager of the line:—

"The armature is wound direct on the axle. The magnets are maintained in their position round the armature by suitable yoke bearings direct on the axle.

"The motors are balanced and attached to the bogie frames by suitable springs and india rubber cushions, and are entirely detached from the body of the coach under-frames.

"The clearance between the top side of the motor magnet ferrule and the longitudinal timbers of the under-frame is 4 inches, and the clearance between the floor-boards and the top of the magnet ferrule is  $11\frac{1}{4}$  inches.

"Each train has two motors, one at each end. The output of each motor is 70 E. H. P."

Motors of this type have been in use since the line was opened in 1893, and are now somewhat out of date. They are not iron cased.

At 5.38 p.m., as the train due to reach Dingle at 5.32 p.m., but which was 6 minutes late, was approaching this station, it came to a stand in the tunnel about 80 yards from the platform, owing to the failure of the rear motor. Mr. Trotter is of opinion (see his Report in Appendix No. I.) that the insulation of a cable connected with the rear motor had broken down, and that "an electric arc was started," causing a rush of current, which opened the circuit breaker, and stopped the train. The evidence shows that the driver reset the circuit breaker, and made several attempts to restart the train, but without success. Each time the current was switched on a vivid flash was produced, which ended in setting fire to the woodwork of the coach.

A gale of wind was blowing from the west, that is from the mouth of the tunnel towards the station, which caused the fire to spread from carriage to carriage until the whole train was enveloped in flames. It is estimated that the train was well alight about 12 minutes after the stoppage.

There were 29 passengers, who, when the train first came to a stand, were urged by the driver and guard to keep their seats, as there was no danger. The driver and guard seem to have made some futile attempts to put out the fire, but it soon became apparent that the fire had obtained the mastery, and the passengers found it necessary to alight. They had only 80 yards to walk in order to reach the station, and the majority of them appear to have gone to their homes without any delay, and to have suffered no ill effects from the fire. It appears, however, from the evidence that a few remained behind, presumably to watch the progress of the conflagration and the result of the efforts to control it.

Station-foreman Rendell and car-cleaner O'Brien, who were on duty in the station, were soon called to the spot, and with the driver and guard did what they could in the first instance to control the fire, and when this was seen to be hopeless to direct the passengers to the exit from the station. About ten minutes after the outbreak Rendell telephoned to the booking clerk in the office upstairs to send a telephonic message over the National Telephone Company's wires to the generating station to cut off the current, while he himself at the same time sent a similar message to the works over the private wire belonging to the Railway Company. Both messages seem to have reached the Company's works at the same moment. The current was at once cut off, but it was too late to be of any service so far as the fire was concerned, and the only effect of this measure was to plunge the station into darkness.

The fire caused dense volumes of pungent smoke to arise from the ill-fated train, due no doubt partly to the insulating material in and around the electrical machinery and cables, and partly to the burning woodwork. This was driven by the wind along the under side of the arched roof of the station into the staircase, passage (or subway), and booking hall. As the flames increased so did the smoke, which was doubtless accompanied by heated gases—some inflammable, some suffocating—and gradually the entire tunnel became filled with the deadly fumes.

At first, I imagine, the accumulation of smoke above their heads, and the fact that their retreat was being cut off, escaped the notice of the men in the tunnel, intent as they were upon the efforts to save the train.

The passengers who first left the place probably experienced little inconvenience from the smoke and heat, but when those who had lingered realised their position, escape by the stairs had become almost impossible, and the danger was intensified by the darkness. It is not possible to say exactly what happened, but some idea of the situation may be gathered from the evidence of signalman Owen, boy Gough, and Mr. Stewart, who were the last persons to leave the station alive, though none of these can give any very clear idea of how he escaped, as each of them lost consciousness either before, or immediately after, reaching the booking hall. It may be remarked that Gough seems to have behaved with much intelligence, and to have rendered valuable assistance to the passengers. What happened to the unfortunate men who remained below can only be conjectured.

Station-foreman Rendell seems to have guided the two passengers, Messrs. Bingham and Beadon, to the foot of an air shaft which exists in the short tunnel east of the station, where doubtless they hoped to find safety; but the shaft had become a flue up which the smoke and fumes were being drawn. There were no means available of climbing the shaft, and if there had been it is doubtful whether a human being could have lived through the smoke and heat that filled it. The bodies of these men were subsequently found at the foot of the shaft, where they had perished of suffocation.

Guard Maloney and driver Ashbee remained alongside the train too long, and, judging by the position in which Ashbee was found, he must have been overcome by the fumes before he made any attempt to escape. Ashbee's body was, I understand, a good deal burnt. Maloney reached the end of the platform, and then succumbed. Car-cleaner O'Brien, who seems to have made himself useful at first, and who, when matters became critical, was conducted to the foot of the staircase by boy Gough, was unable to escape by that route, and crawled back to the hydrant at the west end of the platform, where he perished.

One of the most remarkable features of the case was the manner in which the fire spread. Although the train was separated by a considerable interval from the station, and although there was no woodwork at all in its immediate vicinity, the heat and gases evolved were such that some sleepers stored in the dead-end siding near the west end of the down platform 24 feet distant, the signal-box 55 yards distant, the platform 80 yards distant, and the spare train in the siding at the east end of the station 155 yards distant, were successively attacked. The station tunnel became a fiery furnace, and though the fire brigade were called to the spot within half an hour of the outbreak little could be done, as the smoke made it impossible to reach the tunnel by means of the subway and staircase. It is not possible to say the exact time when the flames reached the sleepers in the siding, but judging from signalman Owen's and boy Gough's evidence this can hardly have occurred till after they had left the station. It is true that Mr. Stewart is under the impression that the sleepers were on fire before he escaped, and the Company has been somewhat severely criticised in the public press for allowing sleepers to remain in the position referred to. It is easy to be wise after the event, but I do not consider that any blame can be fairly laid upon the Company for storing some sleepers in a corner of a wide tunnel such as this for the purpose of repairing and maintaining the permanent way in and near

the station. In future, however, no timber of any sort will be allowed to remain in the tunnel, except the sleepers actually laid in the permanent way.

### Conclusion.

The cause of the fire is, as already stated, explained in Mr. Trotter's report in Appendix I. It was due to a defect in one of the motors, and would have been productive of no serious danger if driver Ashbee had only acted with a moderate degree of prudence. When this man discovered that his rear motor had failed, his duty was to disconnect the rear motor by means of the plug provided for the purpose in his compartment. He should then have run into the station with one motor, as is often done. For some reason or other, which cannot be conjectured, Ashbee, instead of disconnecting the defective motor, and in disregard of the warning of the guard, made repeated efforts to bring it into use, the result being that before long the woodwork of the rear carriage was ignited by the flashes produced by the electric arc when the current was switched on to the defective motor. While Ashbee was so employed, both he and the guard appear to have told the passengers to keep their seats, as there was no danger.

Both these men and station-foreman Rendell seem to have exhibited a lamentable lack of judgment in this respect. It is impossible not to feel that the sacrifice of life on this occasion was unnecessary and might have been easily avoided. If the passengers had been hurried out of the train, as soon as it became evident that it had broken down, and if none of them had been permitted to loiter about the station, their safety would have been secured. And if the train men and station foreman, who deserve credit for their efforts to prevent the fire from spreading, had only realised sooner that the train was doomed, they too had ample time to escape. The cutting off of the current did no good, but by putting the place in darkness, rather increased the difficulties and danger of the situation.

The circumstances connected with this fatal occurrence direct attention to the advisability of removing all woodwork as far as possible from the neighbourhood of the electric machinery upon railway carriages, and of adopting for the purposes of insulation some material which is unflammable and smokeless. This subject is dealt with in Mr. Trotter's recommendations, which will be found in Appendix I., and with which I entirely agree. It is to be hoped that the engineers connected with electrical railways will act upon Mr. Trotter's valuable suggestions.

Stations situated in tunnels on electric railways should have as little woodwork about them as possible. The platforms should be of stone or concrete, and buildings such as signal-boxes of brick or iron. I am glad to be able to report that the Liverpool Overhead Railway Company have adopted this principle in reconstructing Dingle Station, there being now practically no woodwork at all about the place.

I have, &c.,

H. A. YORKE,  
*Lieut.-Col., R.E.*

The Assistant Secretary,  
Railway Department, Board of Trade.

### APPENDIX I.

#### LIVERPOOL OVERHEAD RAILWAY.—DINGLE FIRE.

The evidence goes to show that the insulated covering of a cable connected with the motor on the after part of the train had become deteriorated. The wet weather may have contributed to the defect, and, as the train was late, the driver may have forced the speed. The insulation broke down, an electric arc was started, the rush of current opened the automatic circuit-breaker, and stopped the train. The driver reset the circuit breakers and tried to start several times, and the arc broke out each time, causing the flashes. It is not unlikely that the driver held up the circuit-breaker, for the lights "went low," showing that a very heavy current was being taken. The arc, due to this heavy current, or, perhaps, the earlier flashes, set fire to the woodwork of the coach, and the strong wind caused the fire gradually to spread.

The opening of a circuit-breaker is a common occurrence; the driver should have disconnected the rear motor, and should have run in with one motor. In cases of break-down of one motor, the journey is often thus completed. Motors and the connecting cables on electric railways and tramways often break down through the failure of the insulation. The possibility of a panic from smoke arising from such failures on tunnel railways has been foreseen, and must be guarded against, but eight years' experience on this railway has shown that such failures, even when resulting in a "burn out" of a motor, have never before set fire to any part of the train. The risk of fire involved in the present railway, on which there is but one short terminal tunnel, was less than on ordinary steam railways.

This railway is one of the pioneer lines, on which the earliest American and other electric railways were afterwards modelled. The motors are identical in pattern with those first fitted in 1893, but the parts have been gradually replaced as they wore out. The motors are overhauled about once for every 30,000 miles run. The armature of the motor, to which the accident is attributed, was re-wound in February, 1896. Since then it has been overhauled and repaired, if necessary, 11 times, and since February, 1896, has run 153,571 miles. The magnets were re-wound in September, 1899, and were specially overhauled in December last. A train had been fitted experimentally with modern iron-clad motors, adapted for higher speeds than at present, but the absence of iron casings in the present instance is not an essential matter.

#### RECOMMENDATIONS.

Flexible cables covered with india rubber or other combustible material are used unnecessarily in many cases in electrical work. They are a survival from the earliest branch of electrical industry, namely, telegraph work. They are used from habit and for convenience. This mode of construction does not commend itself to mechanical engineers. Combustible insulating materials should not be used on the main current conductors of electric trains, particularly in tunnel railways. These conductors should be rigid, and might be bare, or enamelled, or protected by incombustible ferrules in iron pipes. Flexibility should be restricted to necessary points, and not used for convenience in arranging the conductors. Flexibility should be provided by pinned hinge or knuckle joints shunted by bare flexible links of wire gauze, or cable braided with wire, or by some other sound mechanical mode of construction.

Little or no woodwork should be used in the construction of electric locomotives, or of the driver's cabs of motor coaches, and in the latter, the resistances and the controlled switches should be placed, if possible, in front of and outside the cab.

ALEX. P. TROTTER.

January 10th.

#### APPENDIX II.

##### *Evidence.*

*William Owen* states: I am a signalman in the employ of the Liverpool Overhead Railway Company. I have been in the Company's service for upwards of six years. For some time past I have been in charge of the signal-box at the Dingle Station. On the evening of Monday, the 23rd of December, I was on duty in my box, having come on duty at 2 o'clock. I had the road set for the down platform for the train which was due to leave Seaforth Sands at 5 p.m. and to arrive at Dingle Station at 5.32. I noticed the train coming up the tunnel. All went well until the train was within about 80 yards or so of the platform, when it suddenly drew up. The signals were off, and there was no reason why it should not have come straight in, so far as I was concerned. I, therefore, concluded that something was wrong. The train was about two minutes late. The first thing I saw after the train stopped was the driver, Ashbee, "switch in" for the purpose of re-starting the train. As soon as he did this there was a flare-up at the rear of the train. It was an unusually big flare-up. When he saw this, Ashbee evidently "switched out" again. After this he again "switched in," and again there was a big flare-up; and Maloney, the guard of the train, shouted out from the rear of the train, "You will have us burnt up if you go on like that." As above stated, the train should, in the ordinary course, have come in on the down platform. This would have necessitated the train crossing the points at the entrance to the station; and about this time Ashbee shouted to me, "Let me go in on the up instead of the down." This would give him a straight run in and save the curve. I at once altered the road, so as to bring the train in on the up line, but it never moved. I then saw Maloney come forward to the front of the train, and heard him say to Ashbee, "Why do you not try one motor?" Ashbee's answer was, "I know my work." I cannot say whether he did try one motor or not. It was either shortly before or after this that Maloney said to Ashbee, "Switch in again, and I will watch behind." Ashbee then switched in, and there was at once another

flare-up behind, which continued, and it seemed to me that the woodwork of the rear coach—there were three constituting the train—had caught fire. Maloney shouted to me to tell them at the generating station to cut off the current. The station foreman—Rendell—was standing on the station platform, and heard the request. He accordingly hurried up to the platform telephone and, I believe, telephoned to the booking-office on the surface to request those in charge at the generating station to cut off the current. I believe that this message was duly conveyed, as the current was certainly cut off. I do not know what time that was. I should say that from the time of the first flash till the current was cut off would be four or five minutes. Before this I telephoned to the Herculaneum Station. I said, "We have a train on fire, and you will have to work the traffic from Herculaneum." I also told them to send up the platelayers. I also told them that they would have to move the train which I saw from its light was standing at the Herculaneum advance signal. I afterwards tried to get through to Herculaneum again, but could not do so. I also tried the bells, but they would not answer. I knew from this that the connection was cut. In the meantime I saw Ashbee leave his box, after switching off, and go to the rear of the train. I never saw him again. The next thing I saw was Maloney leaving the train and hurrying past my box to the station platform. He returned with a bucket of water. As he was passing my box I went down the steps and handed him a chemical fire-extinguisher, of which there are several about the station. He went off towards the train, and I never saw him again. I heard him, some little time after this, shout for the current to be turned off. I cannot say when the current was actually turned off, as I had two gas-lights in my box. As Maloney was returning to the train I saw two passengers coming along the line. They got on to the slope of the platform, and stood for some little time watching the train burn. As the fire had now become a big blaze I sent G. Gough, who is train booker, and the deceased, O'Brien (who

was a lamp cleaner), with the only two lamps I had in my box to light the passengers over the cross-over road. As O'Brien had come to me for a lamp I thought he must have been sent by Rendell. They went, and I saw them do all they could to assist the passengers. O'Brien came back afterwards to get his lamp refilled as he had fallen over the rails and upset his lamp. Shortly after this I left my box and went forward to the train to see if I could be of assistance. I got as far as the front coach. The heat and the smoke were intense, and I could not get any further forward. The second coach was then beginning to catch fire. That was the middle coach. The rear coach was in full blaze. The front coach at that time was not touched. Some of the passengers were still getting out of the train, and all had got out to the best of my belief before I left. I helped two over the cross-over road and left them by the signal box, telling them to keep to the right. They had only then to go up the slope on to the platform. I have every reason to believe they reached the surface safely. I then went back to my signal box, and as I was standing on the top of the steps leading to it I saw Rendell coming along the four-foot way on the up side with a lamp in his hand lighting a passenger. They were walking abreast—the passenger had on a top coat and a bowler hat—and I think from his description it must have been Mr. Bingham. As they passed my box I shouted to Rendell, "What about me?" As he was head man at the station I wanted his instructions before leaving my post. He did not, however, give me any answer. Some little time before this I saw O'Brien at the tap by my box getting a drink, and I told him to go upstairs or he would be suffocated. He left and went up the down platform as if he was going out. At that time the smoke was so dense I could see no distance. Some three minutes or so after I saw Rendell and the passenger go past, I left my box and groped my way along the platform. Before starting I took the precaution of soaking my handkerchief in water, and putting it in my mouth. I believe this saved me. I am sure that when I left my box the pile of sleepers had not caught fire, as the fumes from them must have suffocated me. I heard, however, part of the train falling to pieces, and the air from the Westinghouse brakes go—I mean I heard it escaping. I worked my way along the platform, feeling the seats, &c., with my hands to guide me, and at last reached the foot of the staircase. Up to that time I had never seen or heard anyone since I left my box. When I reached the staircase I heard someone calling for help. The cries seemed to come from somewhere behind the staircase, by 17 siding, near the air shaft. I could, however, do nothing as I was myself by this time half suffocated. I cannot recollect how I got up the stairs or passage between the booking office and the top of the stairs, but I remember reaching the street, and then I lost all consciousness. I understand that I was carried over to Porter's yard, and thence in the ambulance to the Southern Hospital. Although I am sure that the actual flames were never near me both my ears were scorched with the heat. That is why I am bandaged. My ears are blistered. I am sure that if Rendell and the passenger had got on to the platform instead of going along the four-foot they would have been saved, as they had quite three minutes' start of me. I should say that an awful wind had been blowing up the tunnel all the afternoon, and it was this which made the fire spread as it did. My only idea of the time when I left my box would be from the time the train came up and stopped

in the tunnel, and I cannot say exactly what that time was. The train was not booked what that it never arrived. The train reached Heron-laneum about 5.33, and it would take about four minutes to run through the tunnel. I did not look at the clock. It must have been 5.37 or 5.38. When the driver switched on every time there was this flash in the rear—always in the rear—not in the front. I have not had a similar experience before. The driver did not communicate to me what was wrong. I did not see if he made any attempt to disconnect by putting the plug in the box; all he did was to reverse the switch, putting it in the centre. Ashbee, whom I last saw him, went to the rear of the train. He was found about 12 feet from the front of his train. I am quite certain that I heard this conversation going on between the driver and the conductor. I saw two passengers stop on the platform, for the purpose of watching the fire, at the bottom of the staircase. When I left my box they had gone. I found my way out as I did because it is the way I always go up for home when I leave duty. When I got round the corner I said to myself, I shall be safe now for the platform. First I knocked against the starting signal on the north cross-over, and when I went further I got to the waiting sheds, and groped along them. They are covered sheds. I got along, and after knocking myself four or five times I got to the bottom of the staircase, and got hold of the bannister, which was wringing wet. I then heard somebody cry for help, and I took the handkerchief out and gasped for breath, but I could see nobody, and as I felt the smoke I put my handkerchief back in my mouth and got up. I told the passengers who were passing my box to keep to the right, because if they went to the left they would get on the four-foot. There was then no fire at all on the platform, nor were the sleepers on fire then, or I could not have stopped there. There was only smoke and heat; and the higher I got up the staircase the more heat I got. That rather surprised me, and I was very glad when I got to the top. I am confident that if those passengers I last saw there had kept on the platform they would have been saved. The last persons to pass me were Rendell and the gentleman in the round hat. If they had got on to the platform they would have been safe, but as it was they got on to the four-foot, and groped about, and got into the No. 17 siding. They were walking side by side when I saw them, and they had a good three minutes. If they once missed the front of the staircase they would go wrong.

*George Gough* said: I am train booker in the employ of the Company, and was on duty on the afternoon of Monday, the 23rd of December. It was my duty to stand in the signal box with Owen and book the trains as they passed the cabin in and out. I was in the cabin when the 5 o'clock train ex Seaforth, due at 5.32, was coming up the Dingle tunnel. It was about three minutes late. I was standing at the window waiting to catch the numbers of the coaches, and I saw the train suddenly stop and the lights in the train go very low. A short time after the train came to a standstill, I heard the guard, Maloney, shouting out for hand lamps. The electric light in the station had then gone out, and all was dark. Owen handed me two lamps. One of these I gave to O'Brien, and we went down to the train. There was only one coach alight then—the rear one. Even then it was a big blaze. The passengers were all coming out. One passenger refused the hand lamp which I offered him, as



he said he could find his own way without it. I heard Rendell twice tell the passengers to make their way upstairs as soon as ever they could, but several of them stood by on No. 12 siding by the pile of sleepers. They didn't appear to pay any attention to what Rendell said. If they had all gone off when I first went down they would all have been saved. I lighted three passengers from the train to the bottom of the staircase. I then returned to the train. On my way I picked three fire extinguishers up and handed them to Maloney, who, with Ashbee, was doing all he could to put the fire out. I then guided five more passengers from the train to the bottom of the staircase. I left O'Brien at the top by the signal box as he couldn't work any more; and I gave his lamp to one of the passengers. After seeing those five passengers start up the staircase I returned for O'Brien. I found him still by the tap. He was partially unconscious, and I had to shake him. I led him to the staircase and hoped he would make his way up. I heard someone shouting on the permanent way on the up line, about opposite the signal box. I crawled back along the platform on my hands and knees and found a passenger at the point indicated. He was moaning. I had previously wetted my coat and put it over my head. I led him to the platform and about half way along it, when he told me to leave him, as he couldn't go any further. He handed me a note to deliver. I unfortunately lost this. He had a light coat on and spectacles. I struggled along the platform, but fell off it on to the permanent way. At this time I heard Owen running along the platform. I knew it was him as I recognised his step. I eventually reached the slope on to the platform. I found my way up the staircase and passage into the booking hall. At the entrance I was met by driver James, and I do not remember anything further till I found myself in the hospital. I was not burnt at all, nor were my clothes singed. I had got under the tap and soaked all my clothes. I can account for O'Brien's movements up to the time I left him at the bottom of the staircase, and I do not think that he can have taken shelter in the foreman's hut, I have no idea how he came to wander down to the end of the platform where he was found. I left him at the foot of the stairs—I am sure of that—on the down side. I went the way the passengers go up—the proper way out. After that I went back on the up side, and tumbled into the four-foot, and then crawled up the slope on my hands and knees and got up again. I could see nothing before me at that time. Our gas in the signal box kept alight. The electric light in the station had gone out. I could not say how long that was after the train had come to a stand. The gas light was burning through the fog. There is no doubt it was there. I just heard the conversation between the driver and the guard. The guard shouted to the driver. I think it was to ask the signalman to let him come straight in on the straight run. I then heard a shout from the driver to the signalman. I saw flashes come from the train at the rear end after it came to a stand. I saw the driver come out of his box and examine his train. After the shouting we went with lamps to them. The passengers were coming out then, and the driver stood in the siding watching his train. I should say there were 15 to 18 passengers. Some of them went away at once, and some of them stayed behind to look at the train burning. Those I let out would be some of them. Those who went away at once did not need any assistance. I got away after Owen did. I was the last out of the station. The first set of passengers walked straight away

from the train; the others remained, but bye-and-bye began to move. I should say fully ten minutes elapsed between the two sets moving away. The last lot stood there watching in the siding, and the foreman, Rendell, remarked to them that if they valued their lives they should go, but they took no further notice of him. He cautioned them and told them to go. They had got off the platform on to No. 12 siding by the sleepers. They were standing alongside the train and watching it—some were right opposite the second smoker. When those passengers began to move out the middle carriage was well on fire. I should think there were five or six passengers there then.

*William Shuttleworth* said: I am booking clerk at the Dingle Station, Liverpool Overhead Railway. On the 23rd of December I was on duty in the evening. The first thing that drew my attention to anything being wrong down below was the foreman ringing me up to communicate with the generating station to turn off the current at once. He telephoned from the platform to the booking office to ring up the generating station on the Exchange wires, and tell them to cut the current off. We have a telephone from the booking office to the platform, and from the booking office to the Exchange, and there is a line wire as well direct to the generating station. We could also have telephoned to the generating station from the platform, and Rendell could have done it himself if he had wished. The generating station admitted receiving the other message. It is hard to say what time it was exactly that I got the message from Rendell. I did not look at the time. I did not know that anything was wrong until five minutes after, and then he gave me a message to fetch the Chief Inspector, Fox—he is chief inspector of the uniform staff—as there was a train on fire in the tunnel. I delivered the message. After coming down from Inspector Fox's house—he lives on the premises, over the station—he came down, and I met him in the hall. I went to the booking office again. I could not say what became of Fox. The smoke was then becoming thick and I left the booking office. At that time none of the passengers had come upstairs. I then went into the street and met a policeman, who asked me where the smoke was coming from, and I explained. I then saw some passengers come up. I could not say what the time was then. I remember some passengers getting caught in the passage where the bicycles are kept. I heard them shouting out. I ran over to Porter's, the undertakers, right opposite the station, and told them to get anything they could to smash in the doors and windows. I could not help them to climb over the barrier between the passage and the booking hall. I had been in there twice and had had to come out again, the smoke was so thick. All the station doors, except the one leading into the bicycle passage, were open. There are four doors altogether, and three were open, each six feet wide. I say that when I went back to the booking hall the smoke was so dense that I had to come out again. We then smashed in the windows in the passage, and two of the passengers were lifted out at the side, through the windows. Which way the others were got out I could not say. The barrier at that point is about up to my chest, say 4 feet 6 inches. It was very black smoke, and the passengers were excited, I think. The electric lights had gone out upstairs before that, but we still had the gas jets all alight. It was the smoke which would prevent those in the passage with the

closed door in front of them from seeing the other three doors. You could not see the wall in front of you. The bulk of the electric lights would go out about 5.48. That was the time the generating station switched off the current. If any of the passengers in that passage had thought of getting over that barrier they could easily have done so. There were some bicycle stalls there which would have given them help, and once over there was nothing to prevent them getting out at the other doors. They could have found their way out, but nobody could see them from the street. There was no bicycle obstacle in the way. The gas lights were not out; they are always lit, but they were practically useless because of the dense smoke. That would apply to the platform too. They are incandescent lights. We generally turn them up about four or five o'clock in the evening, and they are all lighted up just by the pull of a chain down. I am sure that they were burning. They were put out about 10 o'clock—at least it was then I told the firemen where the meter was. They were not put out before the firemen came and put them out. They were all alight in the booking office, except one, which had gone out with the draught, I suppose. I saw some of the passengers who came by this train simply walk out of the station. All was clear then. I did not know that there was anything wrong, and they did not say anything. About eight came up then. That was before I had any communication from below. There was no ticket collecting; the second-class have no tickets at all and the first-class tickets are collected at the Herculanum, so that there would be no delay in collecting tickets at the Dingle at all. It would not, therefore, be my duty to watch the passengers going out, but I happened to see them, with the booking office door open. When I was giving the message from Rendell by the telephone a passenger came up whom I had booked. There were only two to go out by that train, and one came up for his fare back, as he could not wait. I was then on the telephone. I did not see the other then, but I saw him again on Christmas morning at the station. As to the man who came back for his fare, I could not attend to him then as I was on the telephone, and he went away. I don't know where he went to. Between Dingle Station and the generating station there are eight stations. The generating station is between the Nelson and Huskisson Stations.

*Inspector Lenthall* said: I am a traffic inspector on the Overhead Railway. On the night in question I was going to the Dingle, with the idea of getting into the 6.20 train, but when I got to the station I found volumes of smoke coming out there. I inquired if there were any passengers down below, and they said they thought there were. I then went to the side leading to the bicycle house. A window was broken there, and I endeavoured to get through, but the fumes drove me back again. There was a passenger then came up from the inside, and two of the undertaker's men from the place opposite dragged the man through the window. I found that I could be of no use there, so I went round to the Herculanum, and walked up the tunnel, and met the night inspector who was on duty. He told me I should not go any further, as I could not be of any use up there, as it was like a furnace; so I came back with him to Dingle to see if I could be of any benefit there. I made myself known to Superintendent Thomas, of the Fire Brigade, and said that if I could be of any use to him I should be only too pleased, and I explained to him how and where the train was on fire, and how he could get at it by running a hose up

the tunnel. He said "You had better come round with me to the other end." Then I took him round and up the tunnel, and the hose pipe ran up to the train from the Herculanum. That was how the fire was first subdued from that end. When I first got to the Dingle it was about 6.18 p.m. I do not know at what time the message was sent to cut off the current.

*Richard Orford* said:—I am station foreman at the Herculanum Dock Station. The train in question arrived late, and I sent it on to the Dingle, and I was about to send on the train following, when I heard a telephone message coming through from the Dingle on the down platform. I said to the man there "What is the matter at the Dingle?" and he said "There is something wrong with Ashbee's train—the latter end of it is on fire, or something—so the signalman says." That was Owen who passed the word down to the signalman at the Herculanum. I went across to the telephone to speak to Rendell, the deceased station foreman—he was on the telephone trying to get to the generating station. I asked "What is the matter, Tommy," and he said "Ashbee's train is on fire in the tunnel, and I want to get the generating station to take the current off." I said "I will take off my switches, and get the traffic going from Herculanum." The current was then taken off immediately and I then went to take my switches out, which of course disconnected us with the Dingle. I telephoned then to the generating station to put the current on again, and they did so, and we worked the traffic from Herculanum. As near as possible that was ten minutes to six. That was when I heard this conversation between Rendell and the generating station on the up line wire. We could telephone direct without stopping at the intermediate stations. There is a code for each station, which of course would not be interrupted as they would know that it was an urgent message to the generating station. The train was booked to arrive at 5.32 and it was six minutes late. It was an ordinary train stopping at all stations. The run from our station to the Dingle takes four minutes. That is the booked time. I saw the train as it passed through our station. I collect the tickets, and as the train was a bit late the deceased driver said "Look as quick as you can, I am a bit late." Maloney, the guard, collected the tickets in the first non-smoker, and I collected the tickets in the first smoker; and I think there were about six tickets in the first smoker. I particularly remember that because there was a friend of mine in the coach—a Mr. Cornish. The first smoker is in the centre coach, in the three-coach trains. There are only two classes—first and second. The only thing I noticed in connection with the train was that the insulation was smelling; and often when the train is late they do smell, through over-heating of the resistance coil or something of that kind. It was in the rear of the train that I smelled it. It had been wet all day. Ashbee did not complain, but Maloney said "She is humming, isn't she?" That meant that she was smelling. That is merely a by-word amongst the employees when the train smells a little. That is not a frequent occurrence. It is the name that has been in use ever since the line was started—a by-word. I should say that there were about nine first and twenty second-class passengers in the train as far as I recollect when she left for the Dingle. A great number got out at Herculanum. The five o'clock train is one of the heaviest trains for workmen; but the majority get out at Brunswick, Toxteth, and Herculanum.



*Charles Cunliffe* said: I am the foreman driver. I have to see the drivers start work at the Seaforth Station first thing in the morning at 4.30. Four of them start duty at the south end, but I see them when they come down. I see every driver whilst I am on duty, to see if they are fit for their work. I am on the early shift, from 4.30 a.m. to 1.30 p.m., so that I was not on duty on Monday evening. I saw Ashbee come on duty at 1.15, and take his train at 1.30. I did not see him again. He was in proper condition for his work, and a steady man. I do not know that I ever saw him the worse for drink. He was a very good driver. I have had no complaints to make against him. He never made any mistakes in handling his train. I have nothing to do with the guards. I did not notice Maloney in particular. As to the trains and motors, if a driver makes a report to me I examine them, and if I think they are not fit to run I send them out of the service. I did not get any report whatever about the motor in question. Each driver is provided with a book in which to make reports on the behaviour of the motors, or other matters. I have nothing to do with the putting together of the motors. I am not an electrician. I saw the train when it went out at 1.30. I did not see the train again, of course, as I went off duty. If a driver reports to me that a train has something the matter with it, I look into it, and if necessary have it exchanged. I am satisfied that this train was in proper condition when I was on duty that day. I have never had any complaint about it on previous occasions. It only came out of the shed that morning after being overhauled. It went into the shed on the Saturday to be overhauled. It was the ordinary overhaul; only for the brakes to be put in proper condition and adjusted.

*George Jackson* said: I am coach lifter in the Company's employ. That means lifting the coaches, and doing general repairs to them. I have to do with the fixing of new, or the repairing of old motors. The motor in question was in working order when it went out of the shed. It went out on Monday morning about 8.48. I do not remember whether it underwent some extensive repairs about two months ago. I daresay it may have been under another coach. I could not say how long it had been under that coach. As far as I know it was in proper working order on Monday morning. No complaint had been made on Saturday about the train, except that it was running slow—losing time. That would be due to the brakes, and that is what it went into the shed for—and the brakes were adjusted. I am not aware that any complaint was made on Saturday about the motors that they were "humming." On that report given to me I adjusted the brakes, and left them in working order. If I had heard anything—any complaint—I would not have let the train go out on Monday morning. A little "humming" would not be regarded as a great matter. That would not prevent my sending the train out. They often make a bit of a "hum" on account of the friction of the brushes. The same driver does not always stick to the same train. Ordinarily, the same driver keeps to the same train till dinner-time, and then another man takes the train from him. I have not heard any complaint about that train since the motor was repaired or renewed some months back.

*Alfred Ingram* states:—I am motor and carriage superintendent in the service of the Company. I have been in its service ever since the opening of the railway. I have before me the history of the train, consisting of coaches Nos. 32, 5 and 35,

from the date of its building and delivery to us down to the 23rd December last, when it was burnt. Our original trains consisted of two coaches, but this one was converted in 1897 into a three-coach train. It was delivered to us by the makers in 1894, and then consisted of two motor coaches. In 1897 we introduced a third coach between the two motor coaches, and since then those three coaches have always been worked together. These coaches, including the controllers, bogies, &c. (but not including the motors), have been overhauled 14 times since they were delivered to us, and have been thoroughly repaired and varnished three times. The last time they were overhauled was between the 27th May and the 5th July, 1901, when they were in the carriage shed. I should say that every night the trains are examined to see that all is in order. I find that the total mileage of these coaches since they were delivered was 202,681 miles. The armatures and field magnets constituting the motors are interchangeable, and those which were under the ill-fated train at the time of its destruction had previously been under several other coaches. I have before me the history of the motors under both the front and rear coaches.

(1) *South Motor* (i.e., the one which was at the front of the train, and to which the accident is not attributed).

*The Armature* was re-wound and went for traffic on the 17th March, 1900. Since then its mileage had been 26,911 miles.

*The Field Magnets* were re-wound in March, 1897. In November, 1899, they were repaired, and three layers taken off and replaced.

(2) *North Motor* (i.e., the one at the rear of the train, and to which the accident is attributed).

*The Armature* was re-wound in February, 1896. From that date to the day of the accident this armature had been overhauled, and, when necessary, repaired 11 times. The last time this armature was under special observation was between the 26th November and the 10th December last, when it was in the repairing shed. Since February, 1896, the mileage of this armature had been 153,571 miles. During this period, however, it had, as above stated, been overhauled 11 times.

*The Field Magnets* were re-wound in September, 1899, and were also specially overhauled between the 26th November and the 10th December last.

I last saw the north motor out from under the train between these dates. I have a distinct recollection of it, as it stood during that time before my office. Under my directions the outer covering of the field magnets was stripped off and replaced. When this had been done I inspected it and found the motor was in good running order. The last time I saw both motors under the train was on the morning of Saturday, the 21st December last, when I walked round and examined the train. It was reported to me that the brakes were tight, but no other complaint was made about the train. I gave instructions to George Jackson, the Company's coach-lifter, to have the brakes let out and adjusted. This was done. The train again went into traffic on the morning of Monday, the 23rd December last, the day of the accident. From the 10th December last, when the train was put into traffic again, after the north motor had been overhauled, down to the

accident, no complaints were made regarding the electric mechanism of the train. I produce the foreman driver's reports for this period showing this to be the case. I find that, according to our experience, the average mileage of an armature has been 30,516 miles, but we have had an armature which has done as many as 180,000 miles. The average mileage of a field magnet I find to have been 139,478 miles. We have altogether 77 motors at one time or another in use. We overhaul the motors in their turn whether they appear to want it or not. The motors in this case had not escaped their turn. They had been examined at the usual times. What draws our attention to the necessity for more serious repairs, such as re-winding, is an armature burning out. Unless we have a special report from a driver the trains are taken in turn. According to my experience we have an armature burning out about once a fortnight, and a field magnet about every nine or ten weeks. This is not a matter of any consequence, and simply involves the re-winding of the armature or field magnets, as the case may be. We keep a staff of men for this purpose. This burning out arises from various causes, such as rain, sleet, or snow blowing under the train on to the motor, various parts of the motor being exposed, &c. There was a great deal of wind and rain on the afternoon of the 23rd December last. We have never before had a case of a fire setting alight the body of a carriage, arising from the burning out of an armature or field magnet. We had a fire in July, 1899, whilst I was away on my holidays, but this was caused by the resistance wires, and had nothing to do with the motor. Also a small one in a driver's cab during the first year of our running, which arose from a similar cause, viz., the resistance wires. These we have made a practice of covering, wherever exposed, with asbestos. The fire in the present case cannot, in my opinion have arisen from the resistance wires.

*Stephen B. Cottrell* states: I am the general manager and engineer of the Liverpool Overhead Railway. When, as the boy told us, the lights went low there must have been a pretty short circuit. Our trains are supplied with automatic circuit-breakers. They are set to go at about 160. They do frequently go from overloading; one may go half-a-dozen times on a journey with an extra load of passengers on a bad road. I should think it probable that when the driver brought the switch in again the circuit-breaker would go. But we cannot say; drivers sometimes hold their switch in. Whether he did that or not, of course, we cannot say. It has never been anticipated that an armature or field magnet taking fire would set fire to a train; and the question of smoke and suffocation has never occurred to us as a possible danger. Of course, now, after the event, we can be wise. Our motors are of the original type—the general type originally employed nine years ago. We have not altered them appreciably, in order that they may be all interchangeable. The only alteration we made, as Mr. Ingram said, was the converting some trains into three instead of two coaches each, and we re-wound the magnets to bring them up to be suitable for three-coach trains—that is the only alteration. After nine years, of course, a good many alterations have been made in motors; and if we should be altering or changing our motors, we should undoubtedly put in the iron-clad type now—it is a more up-to-date motor, undoubtedly. We have never had any serious fire breaking out in the cab; but, undoubtedly, it would be wise to take

all possible precautions in the cab also. The relative positions of the burnt train, and of the sleepers in the tunnel, are accurately marked on the plan before the inspector. The nearest point of the sleepers from the train would be 18 feet away from the front end of the train—that is, they were nearest to the last coach that caught fire, and when I was there at 9 o'clock that caught of sleepers looked like a fresh blaze, as though they had not caught fire more than an hour before. We have evidence that passengers were first standing here (indicating) and then here in the siding, which they could not have done if the sleepers had been on fire. That position would have been untenable, and so would the signal-cabin. As to the precautions taken to protect the station from fire, the station, from the very first, has been always equipped with suitable hydrants, situated at each end of the platform, with a proper length of hose to cover what is called the station ground. That hose was systematically run out, and had a periodical inspection by our own staff; and, further than that, I arranged with a gentleman named Isaacs, of South John Street, who is a fire appliance expert and a big amateur fireman, and he inspected our appliances gratuitously for us, and instructed the men in their proper use. Beyond that, we had the station equipped, as all our stations are, with chemical fire-extinguishers. The hydrants were in perfectly good order at this time, though, I suppose, there was no time to get them on. In regard to lighting, there were two systems of lighting available, viz. (1) the main electric current, and (2) gas. It was also formerly lighted by means of accumulators, but I put in gas, owing to the difficulty of keeping the accumulators in order. Therefore we gave our attention to the gas, and it was supplemented by the electricity; and the gas is always available to light all the vital positions. Being incandescent burners, they are always alight, and one action would put them all on. You have heard that the gas was on in the booking-hall and also in the signal-cabin, at the two extreme ends of the station, so we may say that it was on all the way through. The signal-cabin was the last place with a gas-light. The signals are lighted electrically, but we have gas in them as well. The fire did not apparently put the gas out. We have a lot of evidence that the gas was alight in the signal-cabin; but the other evidence shows that the smoke was so dense that, whatever light we had had, it would have been of no use. The train which was standing in the station would be there in the ordinary course. We keep a spare train there, if possible, to be available in case of an armature burning, and in this case Rendell would have changed the driver over to this spare train, if he had come in safely with the other train. We desire not to make any gap in our service. I have always made it a point, too, that the foreman porters at these stations are trained drivers, examined and passed by Mr. Jones, so that we have always a stand-by. Rendell was examined and passed as a skilled driver; and, if necessary, he could handle a train. He has been with us from the first, and was thoroughly reliable. I cannot account for his having gone along into that place there (indicating) instead of lighting the passengers upstairs. I can only assume that he was working his way along the four-foot, and thought that there was safety in getting to that air shaft. He was a man of intelligence—a very level-headed fellow. From what the station foreman at Herculaneum said about the "humming" I see no reason for not allowing

the train to go on. It is a common thing, and arises from the armature slightly overheating, due to the damp, but nothing should result from it. On a day like that it would undoubtedly be due to the damp. As soon as the motors get warmed up they begin to smell, just like a dynamo would smell slightly, or like rubber near a fire; it does not say that it is on fire, but it just smells. I may state, sir, that the Directors have instructed me to relay the platform with stone instead of wood; and, further than that, I have eliminated all timber about the station. The signal cabin will be reconstructed entirely of brick as far as possible. It had a wooden top before; now it will be entirely of brick. We shall eliminate all woodwork where we possibly can, with iron barriers instead of wooden ones, and even iron hand-rails. From my general knowledge of the circumstances, having heard the different accounts, I should say that the interval between the first flashing seen on the train—the first intimation that anything was wrong—and the time when things had arrived at a very serious state was about twelve minutes. By that time the train was well on fire—the rear coach, no doubt, was well on fire. In that twelve minutes there was plenty of time for everybody to get clear of the train and away; in fact, the passengers had more than half an hour in which they might have got away, as shown by Owen's evidence. Yesterday, Owen told me it was ten minutes past six when he escaped—a few minutes after the last passenger. Mr. Porter, from over the way, tells us that the passengers came out about ten minutes past six. As to the number of passengers actually in the train when it left Herculaneum, you could not have a better witness than Orford, who collected the tickets. You may take him as a reliable man. According to his estimate there were 29. The reason why the flames got ahead so extremely rapidly was that it

was blowing a hurricane up the tunnel. On an ordinary day, I do not think the fire would have spread at all. As far as I am aware the total loss of life is four servants of the Company and two passengers. I will give the names on the official report.

*Robert Sharp*, states: I am a switchman in the employ of the Company. I have been in the service of the Company seven years, and in charge of the switchboard three years. On the afternoon and evening of the 23rd December last I was on duty in the Company's generating station. I came on duty at 2 p.m. When I am on duty the switches at the generating station are under my control, and I receive all telephone messages. I produce my log sheet for the 23rd December. At 5.46 p.m. the Booster automatic switch flew out, indicating that something was wrong at the Herculaneum end of the line: It did not, however, indicate any serious trouble, as if anything serious had happened the main switch controlling the whole line would have thrown out automatically. At 5.48 I received two messages, one from Herculaneum, on the line telephone, and the other from Dingle, on the National line, instructing me to take the current off. The two telephones went at practically the same moment. I immediately switched off the current. This operation is an instantaneous one. I then went back to the telephone, which is only three or four yards from the switches, to await further instructions. I received a message from Herculaneum, along the line telephone, that there was a train on fire in Dingle tunnel, and that they were taking out the section switches at Herculaneum. At 5.53 I received another telephone message from Herculaneum that they had taken the section switches out, and instructing me to switch the current on again north of Herculaneum. This I at once did.

*Copy of the Evidence given by George Manderson Stewart at the Inquest held by T. E. Sampson, Esquire, J.P., Coroner for Liverpool.*

*George Manderson Stewart*, being sworn, says: I live at No. 40, Alwyn Street. I left Alexandra Dock Station in a first-class smoking compartment of an Overhead Railway train for Dingle Station shortly after 5 p.m. on the 23rd ultimo. On approaching the switch signals in the south end of the tunnel the train slackened speed and stopped on a crossing. The driver apparently tried and applied power two or three times, but the train did not move. He and the guard then got off and examined the connection between the cars. The guard said that he had got one plug out, but that the remainder were fused in. They continued their efforts, and soon after I heard the guard say he had burnt his hands. He then told the passengers in the second-class car to get out, but the driver said, "Stay where you are, as there is no danger." He then went into the forward motor and again applied the switch, but the guard, who was at the after motor, said, "For God's sake shut her off, or you'll burn us out." The driver then went to the after motor, and on his way assisted a gentleman to alight from the first smoker. On his return I asked him to assist me out, but he told me to shut the door, as I was safer than out about the metals. Being a regular traveller on the line, and having frequently seen fusings, I thought no more about it and sat down. After getting on again the driver must have applied the switch, as the train shook from end to end, but did not go ahead. A few minutes

later I heard a crackling and the sound of breaking glass, and looking out I saw the second non-smoker in a blaze. The guard told us to go into the second-class carriage by the connecting doors, as the centre bar of the crossing was right beneath our carriage door, which made that means of exit very dangerous. However, as the connecting doors were locked we had no option but to try and jump clear of the centre metals. I did so, and going along the line overtook a gentleman whom I believe was the deceased Mr. Bingham. When we reached the end of the platform all the passengers except one, so far as we could see for the smoke, had gone. We wetted our handkerchiefs, and further along the platform were joined by the guard and a boy. The latter said we could not get up the stairs for smoke, but the guard tried to get up but had to return. The station foreman telephoned for the current to be cut off to enable us to rush down the lines towards the Herculaneum Dock. As soon as the current was cut off the electric lights went out and we were in total darkness, neither the gas lights nor the light of the burning train being able to penetrate the dense clouds of smoke. We rushed back, but on getting to the signal-box saw, I think, that the sleepers had caught fire, but I can't say if it was the waggons; I feel that it was the sleepers; I think they must have been the sleepers, as they were nearer to the burning train; and we had to return. Before we left the

platform the guard and boy said they would go to some shaft at the other end, and the foreman and the gentleman I took to be the deceased Mr. Bingham now said they would do the same. I lay down alongside the rails and found the air quite cool, thinking that when the train and sleepers were burnt out the smoke would clear away. While lying there I shouted and was answered from the platform, but could not recognise or properly locate the voices. After a few minutes I heard someone cry "Help," and a fall, and the same thing occurred immediately afterwards. The heat suddenly became very

great, and thinking the platform had got on fire I made a rush for the stairs, and after falling once in the permanent way and stumbling twice over what appeared to have been bodies, I reached the stairs; but I have no recollection of what passed till I found myself in Park Road. I think the guard was trying to get the fire out by disconnecting.

(Signed) GEORGE MANDERSON STEWART.

Sworn before me,

(Signed) THOMAS EDWARD SAMPSON,  
Coroner.

Printed copies of the above Report were sent to the Company on the 20th March, 1902.

## LONDON AND SOUTH-WESTERN RAILWAY.

Board of Trade (Railway Department),  
8, Richmond Terrace, Whitehall, London, S.W.,  
November 6th, 1901.

SIR,

I HAVE the honour to report for the information of the Board of Trade, in compliance with the Order of 25th October, the result of my enquiry into the causes of a collision, which occurred on the 21st October, between an empty carriage train and a passenger train at Gunnersbury Station, on the London and South-Western Railway.

In this case the 8.35 a.m. passenger train from Twickenham to Clapham Junction was standing in Gunnersbury Station on the up loop platform line, when an empty carriage train was propelled from the down branch line into the up loop and collided with the rear vehicle of the standing passenger train.

The passenger train consisted of a tank engine with one six-wheeled and five four-wheeled carriages, and belonged to the London and South-Western Railway Company. The empty train was the property of the Midland Railway Company, and was composed of a third class six-wheeled brake and a bogie composite brake, which were being propelled by a four-wheels-coupled tank engine.

The collision was fortunately not a violent one. Five passengers in all complained of slight injury and shock.

No vehicles were derailed; actual particulars of damage done to carriage stock are given in the Appendix.

The accident happened about 9.11 a.m., at which time the atmosphere was considerably obscured by fog.

### *Description.*

There are four passenger lines running through Gunnersbury Station in a general north-east and south-west direction. Of these the two northern are used for up traffic, and pass on either side of an island platform; the line to the north of the platform is the up loop, that to the south is the up main line. Similarly, the two southern lines are for down traffic, and are separated by a second island platform; the down loop is on the north, and the down main line on the south side of the platform.

To the south-west of the station the four lines diverge. Two form the double line of the Hounslow branch, and two the main line to Richmond.

The double lines to Acton and Child's Hill, and to Clapham Junction and Waterloo, form a double junction at the north-east end of the station.

The gradient in the station falls towards the north-east at an inclination of 1 in 232. Separate signal cabins, known as the "East" and "West" respectively, control the junctions and signals at either end of the station.

The view from both cabins towards the station is much restricted by an intervening road overbridge, by the station buildings on the platforms, and the curve of the lines.

A series of treadles has therefore been provided on each of the four platform lines; and in connection with these treadles indicators for each line have been provided in the

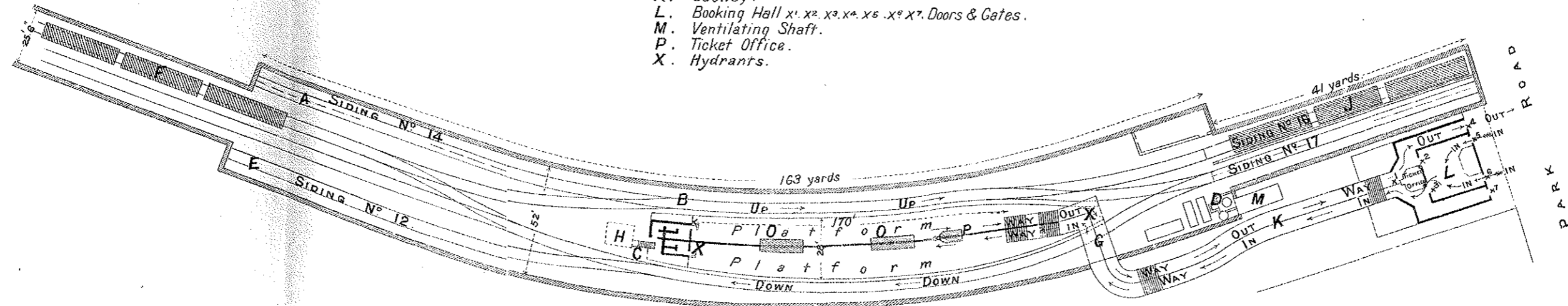
# LIVERPOOL OVERHEAD RAILWAY.

## PLAN OF DINGLE STATION.

PLATE N<sup>o</sup> 1.  
To accompany Lt Col. Yorke's  
Report of 22<sup>nd</sup> Feb. 1902.

### REFERENCE.

- A. Body of Driver Ashbee.
- B. " " Guard Maloney.
- C. " " Boy O'Brien.
- D. Bodies of M<sup>r</sup> Bingham, M<sup>r</sup> Beadon & Foreman Rendell.
- E. Sleepers.
- F. Train (that caught fire).
- G. Foot Bridge.
- H. Signal Box.
- O. Shelters.
- J. Spare Train in Siding.
- K. Subway.
- L. Booking Hall x<sup>1</sup>. x<sup>2</sup>. x<sup>3</sup>. x<sup>4</sup>. x<sup>5</sup>. x<sup>6</sup>. x<sup>7</sup>. Doors & Gates.
- M. Ventilating Shaft.
- P. Ticket Office.
- X. Hydrants.



0 5 10 20 30 40 50 100 150 200 Feet.



PLATE N<sup>o</sup> II.  
To accompany L<sup>t</sup> Col Yorke's  
Report of 22<sup>nd</sup> Feb. 1902.

# LIVERPOOL OVERHEAD RAILWAY. LONGITUDINAL SECTION OF DINGLE STATION.

