

## APPENDIX.

## STATEMENT OF DAMAGE TO ROLLING-STOCK.

*Carriage Train.*

Engine No. 577.—Right inside frame broken; trailing buffer beam broken; leading buffer beam bent; bunker and cab framing smashed; trailing buffers broken; both draw-bar hooks broken; smoke box badly damaged; brake work damaged; Westinghouse brake air reservoir and brake pipes broken; guard irons broken; all foot-steps broken; foot-plating both sides badly damaged; bogie casting broken; both frames broken; spring saddles bent; all rubbing pieces broken; left bogie spring and spring hanger broken.

Third-class Brake Van No. 377, Empty Carriage Train.—Two headstocks and two sole bars broken; two ends knocked in; two bottom sides, two cant rails, draw gear, brake work and tail gas lamps and fittings badly damaged.

Second-class Carriage No. 5.—Two headstocks, three axle boxes, and one door broken; two sole bars damaged and one end and two quarters knocked in.

First-class Carriage No. 363.—Two headstocks, two diagonals and two longitudinals broken; one end knocked in and one partially; two bottom sides, two end quarters, two doors, roof, draw gear and brake work badly damaged.

Third-class Carriage No. 285.—End knocked in, one end bar, cant rail and roof damaged; two buffers bent; one axle box bottom and one buffer packing broken.

Third-class Carriage No. 311.—Headstock broken and buffers bent.

Third-class Carriage No. 289.—One dumb buffer damaged.

Third-class Carriage No. 316.—One buffer bent.

*Goods Train.*

Engine No. 344.—Right outside frame broken; both inside frames bent; both buffer beams twisted; trailing buffers broken; bunker and cab framing smashed; Westinghouse brake right air reservoir and brake pipes broken; right injector flange broken and injector pipes

damaged; right trailing sand box broken; brake gear badly damaged; foot-steps bent and foot-plating damaged.

Great Eastern Railway Low Side Waggon No. 9576.—One end rail, four side planks, three end boards, three bottom boards, two buffer guides, one axle box, and two end stanchions broken; one headstock, axle guards, two corner plates, all top plates, and two side knees bent.

Great Eastern Railway Covered Goods Waggon No. 20579.—One buffer and one buffer guide broken; one buffer and axle guards bent.

Great Eastern Railway High Side Waggon No. 22153.—Ten end boards, one end rail, five quarter boards, one brake rack, one buffer guide, two end capping irons, and three side spring shoes broken; two end stanchions, two corner plates, four side knees and axle guards bent.

Great Eastern Railway High Side Waggon No. 24309.—One side rail, one end rail, ten end boards, five quarter boards, two corner plates, two end capping irons, three buffer guides, three end stanchions, one brace plate, one axle box, one brake rack and block broken; one sole, two headstocks, two corner plates, two buffers, one side knee and axle guards bent.

Great Eastern Railway High Side Waggon No. 27602.—Axle guards bent.

Great Eastern Railway High Side Waggon No. 27911.—One buffer and one buffer guide broken; one buffer and axle guards bent.

Great Eastern Railway High Side Waggon No. 28129.—Six door boards broken; axle guards, two buffers, four side knees, and two door top plates bent.

Great Eastern Railway High Side Waggon No. 28166.—One buffer guide, three end boards, one quarter board, and one axle box broken; axle guards, three buffers, four side knees, and one headstock bent.

Great Eastern Railway High Side Waggon No. 15450.—Broken up.

Great Eastern Railway Covered Goods Waggon No. 2865.—Broken up.

## DAMAGE TO PERMANENT WAY.

Twenty-eight chairs broken; two crossing timbers and three sleepers destroyed; two 30-foot rails bent; one crossing damaged.

Printed copies of the above Report were sent to the Company on the 22nd June.

## LANCASHIRE AND YORKSHIRE RAILWAY.

Railway Department, Board of Trade,  
8, Richmond Terrace,  
Whitehall, London, S.W.,

9th June, 1905.

SIR,

I HAVE the honour to report, for the information of the Board of Trade, in compliance with the Order of the 9th May, the result of my inquiry into the causes of the accident which occurred on the 20th April to a goods train at Burnley, on the Lancashire and Yorkshire Railway.

In this case, as the 12.50 a.m. up goods train from Colne to Phillips Park, consisting of train engine, 110 loaded waggons, three empty waggons, a brake van, and two banking engines, was leaving Burnley (Bank Top) Station, the eighty-fifth waggon from the train engine, with the four following waggons, left the rails at a crossing of a siding connection in the up main line.

No one was injured.

The five derailed waggons were buffer-locked and slightly damaged.

#### *Description.*

The lines through Burnley (Bank Top) Station run approximately north and south, the up line being on the east of the down line.

Just at the north end of the up platform is Burnley E.L. No. 2 signal-box, and 33 yards north of the signal-box a through siding connection to the down line crosses the up line, the angle of the diamond crossing being 1 in 8.

The up line at this point is on a curve to the right, of  $21\frac{1}{2}$  chains radius, and the gradient is 1 in 251 falling towards the station.

There is a short piece of level line in the station, and then the gradient is 1 in 134 rising for a length of 12 chains, and then increases to 1 in 84 rising for a distance of 17 chains.

#### *Evidence.*

*Jonathan Hoyle* states: I have been in the Company's service since 1871, and a driver 22 years. I came on duty on April 19th, 1905, at 2.45 p.m., and would have finished in the ordinary course about 3.10 a.m. Prior to coming on duty I had 12 hours' rest. I started from Colne at 1.50 a.m., one hour late. My engine was No. 381, eight-wheels-coupled, and six - wheeled tender, vacuum brakes on all wheels. On leaving Colne I had on 40 waggons, and attached at Nelson. I had no bank engine prior to reaching Burnley. So far as I know I attached at Burnley 40 loaded and 3 empty waggons, making a total of 108 loaded and 3 empty waggons. On arrival at Burnley No. 2 I stopped clear of the crossing to the sidings, and unhooked my engine at the water column, which is at the end of the up passenger platform. I took my engine into the goods yard at Burnley; the waggons were attached, and I backed them on to the other portion of my train which I had left on the up main line. My engine would then be about half-way on the viaduct. I had then to wait some time for a second bank engine coming from Rose Grove. After getting a signal to start from the guard, I gave two crow whistles, and, after this signal was acknowledged by the drivers of the pilot engines, I started my engine. I knew there were two bank engines in rear. After travelling about 15 or 20 waggon lengths I felt a pull, and then I commenced to gain speed. I concluded I had broken loose, and kept on the move until reaching Burnley Barracks. I sent my fireman back, who found the link coupling of the twenty-seventh waggon from the engine had broken. The guard issued an order to set back, and I did so. The waggons between the twenty-seventh, which broke loose, and the eighty-fourth, which was off the road, were alongside the platform and had not moved. I did not know what was the cause of derailment, but it had apparently occurred immediately the train started. I am accustomed to working the train, and with the same class of engine, and had worked it every other week for six months. I have not previously had any derailment. I am well acquainted with the gradient. I am a passenger train driver, but the working of this goods train from Colne to Accrington forms part of my turn, and I am used to the working of goods trains.

It requires more care to work a long goods train than a short one, but we can really take anything. There is no trouble in working as far as Accrington; none whatever. We get used to large orders as well as small ones. A waggon standing on a diamond crossing is more liable to come off when being propelled than when drawn, and an empty waggon is more liable to come off than a loaded one. The waggon in question was loaded. The same accident might have happened with a train of 60 waggons, but with 60 waggons probably no bank engine would have been required unless they were very heavily laden. I have been acquainted with Accrington bank practically all my life. I worked a bank engine on it so far back as 1875, and there were then two bank engines employed to assist trains, but they were smaller engines. The load on other nights than Tuesdays and Thursdays is usually 30 to 45 waggons. A single load is 595 tons. The number of waggons varies on account of the load in the waggons. This train consisted of flats of cloth, the flats being loaded at the factory. Some have five to six tons of cloth on; some as little as two tons. The small flat takes up the same floor space as a heavy one. Being loaded by tonnage, the engine gets a full load; if loaded by waggons, we should not get the same tonnage. This explains the variation in length of trains. Thursday night is the worst night; the loads are heavier. We might have more tonnage in 45 waggons than on other nights in 60 waggons. I should prefer working the same weight in a smaller number of waggons, because there is not the same stretch on these couplings. I find no difficulty in starting the long trains from Burnley to Accrington, which is as far as I work them. Last night we had only 30 waggons, and did not require a pilot. I have no difficulty in starting with a heavy load, *i.e.*, the bank engines and train engines starting together. It requires greater care to work long trains when you are not accustomed to running a long train; formerly we had only 50 or 60 waggons. Of course you require care with only 30 or 40 waggons or you may break loose.

*Robinson Heap*, goods guard, states: I have been in the service 10 or 11 years, and a goods guard eight years. I came on duty on April 19th

at 4.15 p.m. after having been off about 12 hours. I travelled to Huncoat, worked trips as required, and arrived at Colne to prepare for this train at 11.50 p.m. In the ordinary course I should have finished duty about 5 a.m. I left Colne at 1.50 a.m., having been delayed waiting for the Midland connection. On leaving Colne we had on 41 loaded waggons (470 tons), and we attached waggons at Nelson and also Burnley No. 1. On arrival at Burnley No. 1 we had on 71 loaded waggons and one empty waggon (650 tons). We then made up to 110 loaded and 3 empty waggons (990 tons). This was more than a load for the train engine and Burnley pilot (No. 540) by about 40 tons, and we had to get a second bank engine from Rose Grove. The engines started quietly after exchanging signals by whistle. When the train had travelled about four or five waggon lengths, the signalman called out that some waggons were off the road, and the bank engines stopped and the train stopped. I walked forward, and found some broken timber, which I at first took to be a broken weft box, but I then remembered I had none on the train. The broken boards would be the casing protecting the signal rods and wires. I found five waggons buffer-locked and off the road. Each waggon was loaded with a flat bottom of cloth. The signalman afterwards told me that the train engine and 27 waggons were at Burnley Barracks. I walked forward and met the fireman, and afterwards, with the assistance of an engine from Rose Grove, in accordance with Rules 221 and 222, removed the 84 waggons which were in front of those derailed. I am accustomed to working long trains between Colne and Accrington, and had worked this train five or six months. For the greater portion of the time I can see my train engine; at night I can see the glare of the fire.

*Thomas Spenceley*, station-master, Burnley, states: I was called up at 4 a.m. on April 20th, and arrived on the scene of the accident at 4.20 a.m. I found five waggons buffer-locked, four of them off the road, each with one pair of wheels. I thought I should be able to get them on without the tool van, but after trying I decided to send for the tool van. The tool van arrived at 5.30 a.m. I put single line working into operation at 5.40 a.m. I examined the diamond crossing, and found the first wheel mark about two yards beyond the crossing. These long trains have been running during the whole of the 2½ years I have been at Burnley. I only recollect about three accidents during that time. One derailment was at the same crossing.

That was an empty waggon; these were loaded waggons. On the previous occasion I was standing near the crossing when the waggon came off. I have had no complaints from men working long trains, and there are plenty pass daily.

*Robinson Heap*, goods guard, recalled, states: I examined the broken link of the twenty-seventh waggon, which appeared to have a flaw in the iron. It looked blackish in the middle. The waggon was No. 1445, loaded Burnley to Salford. I cannot say what became of the link.

*James Smith*, driver of banking engine No. 1257, states: I have been in the Company's service since December, 1886. I am an acting-driver, and have been an acting-driver since about 1896. I came on duty on April 19th at 3.5 p.m. for two hours, was booked off three hours, and came on for this turn at 9.25 p.m., and finished at 5 or 5.10 a.m.; had there not been an accident I should have finished about 3.20 a.m. I can corroborate the statement of driver Hoyle as to exchanging signals before starting. After travelling about 30 yards I heard the pointsman call out that there were some waggons off the road. I immediately stopped my engine. I am accustomed to working heavy trains. We get accustomed to anything; doing all kinds of work. I have banked trains before, many a time, and have never had a mishap before. I have also acted as driver of the train engine. The other Sunday we brought 86 waggons out of Miles Platting, and we had no difficulty. The gradient and the weather were favourable. I have experienced no difficulty in either running or banking.

*Driver Cain*, driver of engine No. 540, states: I have been in the service 34 years, and a driver 26 years. I am a goods train driver, but have occasionally worked passenger trains. I came on duty at 4 p.m. on April 19th, signing on at Rose Grove. I am usually on 10 hours, but this varies with the traffic. I had been off duty from 4.15 a.m. on the 19th. I was called upon to assist this long train, and have frequently banked long trains—in fact, daily. I have often banked trains with over 100 waggons. I have never had an accident before. I do not find any difficulty or danger in working long trains. It is middling hard work for the engine, but there was no difficulty so far as the driver is concerned. All that they want is plenty of steam.

### Conclusion.

The circumstances attending this derailment were as follows: The goods train in question left Colne with the train engine and 41 loaded waggons. Some other waggons were attached at Nelson, and on arrival at Burnley Station it consisted of 71 loaded waggons, 1 empty waggon and a brake van; weight 650 tons. From Colne to Burnley the gradient is falling and no banking engine was required.

At Burnley the train was made up to 110 loaded waggons, 3 empty waggons and a brake van, weighing 990 tons, and as this exceeded by 40 tons the load for the train engine and one banking engine, a second banking engine was attached to assist the train up the gradient from Burnley to Accrington.

When the train had originally come to a stand at Burnley Station the first waggon subsequently derailed appears to have come to rest just short of the points of the diamond crossing in the up line where the up siding connection to the down line crosses.

When the train started the rear portion would be propelled by the banking engines, the front part being drawn by the train engine.

The 85th waggon being the 29th from the rear of the train would get a pretty sharp bump when the next waggon came against it, causing the front wheels to jump slightly, and as it was standing on a  $21\frac{1}{2}$ -chain curve its tendency would be to start in a direction tangential to the curve, or to the outside of the points of the crossing.

These points though somewhat worn were quite serviceable, but there can be little doubt but that the combination of these three conditions caused the left-hand wheels of the 85th waggon to mount the points and drop off on the wrong side of the rail, and the next four waggons followed in succession before the signalman at No. 2 signal-box, noticing the waggons were off the road, stopped the banking engines, after the rear part of the train had gone about 30 yards.

The leading part of the train, viz., 27 waggons, broke loose by the coupling of the 27th waggon parting owing to the heavy pull coming on it after the waggons were derailed, and the train engine and first 27 waggons proceeded to the next signal-box.

One of the points raised at this inquiry was whether long goods trains, of 100 waggons or more, are more liable to derailments and break-looses than short ones, or whether they are more dangerous to the men employed to work them, or to the travelling public generally, especially on the steep gradients near Burnley.

These gradients consist of a length of nearly two miles of 1 in 40 between Accrington and Baxenden, and also of the seven miles of gradients varying from 1 in 65 to 1 in 80 between Burnley and Todmorden, over the Copy Pit summit.

Deraillments of waggons at diamond crossings, after the waggons have come to a stand on them, are not of very uncommon occurrence should the wheels of a waggon have got somewhat askew when buffering up on stopping, and such cases are more liable to occur when waggons on starting again are propelled, than when drawn, and especially on curves; but such derailments could happen to short trains equally as to long trains should the gradients over which the train is to run require the use of a banking engine.

There is less danger of run-backs when a train becomes divided on a steep gradient when banking engines are employed, so there is no extra risk of this danger where long trains are employed as they always require banking engines on such gradients, and this reduces the liability to accidents to goods guards, who might suffer severely in the case of a run-back, if in the brake van.

I do not consider there is any extra danger to the men working long trains, though perhaps greater skill and care are required in the manipulation of them, but this has been forthcoming, as I am informed by the Company that their records show that accidents have been neither more numerous since the introduction of long trains in 1901, nor do they happen more frequently to long trains than to short ones.

The length of goods trains will be gradually reduced when larger numbers of high capacity waggons become available, but meanwhile the old type of waggons must be continued to be used. A smaller number of waggons though conveying the same tonnage will be more compact and easier to handle.

The Company claim a great advantage in working traffic, by using one long train in lieu of two short trains on a crowded line with numerous block sections, the saving of time being very considerable.

The principal source of danger to passenger trains from goods trains is probably that in the case of a long train, a waggon off the road might not be noticed by the trainmen so soon as in that of a short train, and the other road on which a passenger train might be passing may be fouled and the danger not noticed so soon; but no accident has happened from this cause so far as I am aware owing to the introduction of long trains, which are now limited to 120 vehicles on the Lancashire and Yorkshire Railway whether loaded or empty.

I have, &c.,  
E. DRUITT,  
*Lieut.-Col., R.E.*

The Assistant Secretary,  
Railway Department, Board of Trade.

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Printed copies of the above Report were sent to the Company on the 6th July.

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