

**Report by the Senior Government
Inspector of Railways, Circle No. 1,
Calcutta, on the derailment of No. 9 Up
Dehra Doon Express between Chichaki
and Hazaribagh Road, E. I. Railway,
on 12th January 1939.**



*Issued by the Government of India,
Railway Department (Railway Board).*

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EAST INDIAN RAILWAY.

Derailment of No. 9 Up Dehra Doon Express between Chichaki and Hazaribagh Road, on 12th January 1939.

FROM MR. H. A. JOSCELYNE, M.I.C.E., SENIOR GOVERNMENT INSPECTOR OF RAILWAYS, CIRCLE No. 1, CALCUTTA, LETTER No. 96/XIII/39, DATED CALCUTTA, THE 25TH JANUARY 1939.

In continuation of my No. 80/XIII/39, dated 16th January 1939 with which I submitted to the Railway Board a preliminary narrative report on an accident which occurred on the morning of January 12th at mile 210 between Chichaki and Hazaribagh Road stations on the East Indian Railway when 9-Up Dehra Doon Express was derailed. I submit herewith for the information of the Board and in accordance with Rule 8 of Railway Department Notification No. 1926-T., dated 19th March 1930 my final report of the enquiry held by me into the circumstances attending the accident.

2. I started my enquiry at about 16-30 hours on Thursday, 12th at the site of the accident.

There were present :—

- Mr. R. E. Marriott, Chief Engineer, E. I. Railway.
 - Mr. G. A. R. Trimming, Chief Mechanical Engineer, E. I. Railway.
 - Mr. C. F. Gilbert, Divisional Superintendent, E. I. Railway, Asansol.
 - Mr. A. Hamid, Superintendent, Railway Police.
 - Mr. E. D. J. Jones, Superintendent, Watch and Ward, E. I. Railway.
 - Mr. J. C. Lamb, Superintendent, Power, E. I. Railway.
- and for the Civil authorities,
- Mr. J. W. Houlton, Deputy Commissioner, Hazaribagh.
 - Mr. C. R. B. Murray, Deputy Inspector-General of Police, Patna.
 - Mr. M. K. Sinha, C. I. D. Police, Patna.

Description of the Accident.

3. On Thursday, 12th January No. 9 Up-Express to Dehra Dun was running 3 minutes late and passed Chichaki station, nearly 209 miles from Calcutta, at 2-59 hours.

4. The composition of the train was as follows :—

- Engine HPS Class No. 1163,
- Bogie 3rd Class No. 3395,
- Bogie combined 3rd luggage and brake van No. 5017,
- Bogie 3rd Class No. 3593,
- Bogie Inter Class No. 3197,
- Bogie combined 1st and 2nd Class No. 2931,
- Bogie combined 1st and 2nd Class No. 3863,
- Bogie 3rd Class No. 3282,
- Bogie combined 3rd luggage and brake van No. 5020,
- Bogie 3rd Class No. 2951.

5. It is not possible to state how many passengers there were in the train, it was not crowded. The estimate is that there were about 480 passengers when it left Howrah the previous evening.

6. As the train passed the third telegraph post in mile 210 the crew of the engine experienced a severe jerk, the engine gave a leap which was followed by a plunging motion of the tender from side to side. The driver knew that a serious derailment had taken place. He put on his vacuum brake and stopped the train. The speed of the train as stated by him was, at the moment of the incident, about 55 m.p.h. It ran on for a distance of 680 ft. before coming to a standstill. On alighting from his engine the driver looked at his watch and saw that it was 3-04 hours.

7. The railroad being a double track on this section of the railway the driver immediately sent his fireman out with detonators to protect the down line half a mile ahead according to rules. He himself proceeded along his train towards the rear to ascertain what had happened. He found that his engine was standing intact on the rails but all the wheels of his tender were derailed to the right hand side. The two leading coaches were completely derailed but standing upright, the first across the track and the second entirely to the left and pointing down the bank. The next five coaches were also completely derailed and capsized onto their sides, lying either at the top or on the slope of the bank. The last two bogies were derailed but standing upright, the trailing bogie of the end coach alone of the whole train was still with all four wheels on the rails.

8. The guard was apparently badly hurt though conscious. He was incapable of movement.

There was certainly a great number of casualties. The passengers were extricating themselves as best they could but early help was needed and the driver realised that he must go himself to report the accident at Chichaki, a full mile and a half in his rear. Being badly shaken he, with great difficulty, eventually arrived at Chichaki station at 3-30 hours and made his report. He returned on foot immediately with two station porters.

9. In the meantime line clear had been given for No. 83-Down passenger due to leave Hazaribagh Road at 3-37, long after 9-Up should have passed. A caution order was therefore given to the driver of this train to proceed cautiously, see what had happened and report at Chichaki. He was stopped by the detonators placed on his track by the fireman of 9-Up, he picked up the fireman on his engine and again stopped opposite the engine of the derailed 9-Up. They saw that the derailed train was on fire and raging furiously. After deliberation with his guard they realised their helplessness and proceeded to Chichaki to report for assistance. The train arrived at Chichaki at 4-15 hours. At 4-30 hours the station master Chichaki with a guard, 3 porters and a few utensils of water proceeded, on a light engine which was detached from 901-Up, to the scene of the accident where they arrived at 4-40 hours. From a great distance the flames from the conflagration, it was eventually prevented from spreading to the fifth of the capsized coaches all of which had then slipped to the toe of the bank.

10. 83-Down having reported and cleared the section it was possible to advise Hazaribagh Road and to admit 4-Down mail, which was following closely and due to leave there at 4-13 hours, with medical and other assistance. This train left at 4-38 hours and arrived on the scene at 4-50 hours bringing the following:—

The Sub-Assistant Surgeon of the dispensary with compounder and hospital servant and sufficient dressing and appliances to deal with 100 persons.

The Permanent Way Inspector, Hazaribagh Road, with his wife.

The Station Master, Hazaribagh Road.

The Head mistry and a gang of coolies.

Two constables of the Government Railway Police.

11. Three of the bogies were then in flames and efforts were made to prevent the fire spreading. Several injured persons were extricated from the fourth coach, this coach also was eventually burnt out.

12. A number of injured passengers, 14 all told, of which two only were seriously hurt were put onto 4-Down mail. A number of uninjured passengers also boarded the train which left the scene and arrived at Chichaki at 6-05 hours. The injured persons received medical attention at Asansol, two had been detrained at Dhanbad and the remainder were sent through to Calcutta.

13. The relief train from Gomoh was promptly ordered out and arrived at the scene of the disaster at 6-45 hours. The relief train from Dhanbad arrived at 7-55 hours. Both these trains were fully equipped with assistance of every description including medical. A further special from Asansol was assembled and sent to the accident arriving there at 9-10 hours, this train also carried full medical assistance as well as the local Divisional officers.

14. A special conveying the injured and uninjured persons yet remaining left the scene of the accident for Hazaribagh Road station at 11-29 hours. From there 14 injured were despatched by 22-Down in-charge of Divisional Medical Officers, those who proceeded to Calcutta were in the charge of a doctor and nurses. Such of those injured who were proceeding to Gaya left Hazaribagh Road by 73-Up passenger in-charge of a Sub-Assistant Surgeon.

15. There were seven dead bodies recovered from the wreckage on 12th instant, these were taken over by the police. It was impossible to extricate those still beneath the burning coaches which continued to smoulder for hours later even until the morning of 13th instant in spite of all efforts. Even a heavy shower of rain in the afternoon and evening of the 12th instant made very little impression, if any.

16. The total casualty list up to midday of 12th January 1939 was 49 injured, of which 15 were serious, and 7 dead and recovered bodies, it being impossible to say how many remained in the wreckage.

17. On the morning of 13th January 1939 clearance of the debris from the track was taken in hand and through double line working was restored at 17-52 hours on 14th January 1939.

18. On 15th the burnt out coaches were lifted and examined in the presence of the Sub-Divisional Officer, Hazaribagh. The remains of what are believed to be 14 more passengers were then found in the debris, thus bringing the total of fatalities up to 21.

Description of site of Accident.

19. The accident occurred on the up line of a length of straight double line track at mile 210/3 between Hazaribagh Road and Chichaki stations, about 1½ miles from the latter, on the Grand Chord of the East Indian Railway. The nearest curves are exactly one mile distant in either direction. The country is undulating and well wooded, sparsely populated.

20. The point of derailment is on a high bank, 24' high, though a thousand feet away in either direction the formation is in cutting. In this high bank immediately below is an arched opening of 15' span. The gradient is falling, in the direction of motion of the ill-fated train, at 1 in 200. There is no stream or river through the opening and the countryside is arid.

21. The track of the up line on which 9-Up was travelling consists of 100 lbs. double headed rails 36' in length laid on D & O plate sleepers at 14 per rail length. The sleepers are well packed on a full section of stone ballast.

Evidence and Conclusion.

22. As has been already stated the train was running 3 minutes late. From a perusal of the performance of this train since it left Howrah at 20-48 hours the previous evening it is clear that there is nothing of particular import to note. At Burdwan the train left 2" late, from Asansol it left at right time, from Dhanbad at right time and from Gomoh 3" late. It was still 3" late passing Chichaki. The booked speed of the train is

50 m.p.h. so there is no reason to believe that this speed had been greatly exceeded throughout the run.

23. At the time of the accident the train was running downgrade and the driver states that he was probably running at nearer 55 m.p.h. The permissible speed of the section is 65 m.p.h. so there cannot be the slightest exception to 55 m.p.h. and this can be accepted as the highest speed at which the train could have been travelling at the time of the accident.

24. One witness, a private passenger, has stated that the train was going very fast, he stated that he constantly travels by this train which when going really fast on some days travels at 90 m.p.h. and 100 m.p.h. On being asked to estimate the speed on the day of the accident he put it at being from 60 m.p.h. to 70 m.p.h. to 75-m.p.h. so it is clear that even in the view of this inexperienced individual the speed could not have been excessive.

It may be stated that this same passenger who volunteered to give evidence eventually flatly refused to sign the record of his statements.

25. The speed being decided at 55-m.p.h. it remains to determine the approximate time of the accident. The driver says that after getting down from his engine he saw that it was 3-04 hours and he regards this as the time of the accident. Actually it must have been a minute or two earlier. His train ran 680' before coming to a standstill and this probably occupied half a minute. The driver then gave the fireman the detonators and instructions before alighting from his engine, time would be absorbed in doing this. If the train passed Chichaki at 2-59, to the nearest minute, and travelled at 55-m.p.h. for $1\frac{1}{2}$ miles before derailing, it would be approximately at 3-01 hours that the actual derailment took place. The difference between this and the driver's figure of 3-04 hours being accounted for by the hazy condition the driver was in, (the Station Master describes him as 'very much upset and trembling'), the time taken in stopping, the time elapsed before he got down from his engine and possible variation of a minute or so in his watch with that of the station clock.

26. I am of opinion therefore that the accident actually took place between 3-01 and 3-02 hours. The point is immaterial in this case but it has been raised and all possible discrepancies should be cleared up. What only matters is the speed of the train; there is not the slightest evidence that it was exceeding 55-m.p.h., a perfectly legitimate speed for the track, the stock and the engine. Had the speed been even up to 65-m.p.h. there would have been perfect safety. There was no need for such a speed, there being plenty of time and the train being booked at a modest 50-m.p.h.

27. In regard to the cause of the derailment several ideas have been expressed by passengers. One of these, excessive speed, may, as shewn above, be ruled out. Other passengers have remarked on the 'rattling' of the train and one individual, a first class passenger travelling in the 5th coach, has complained that his carriage 'rattled' at certain definite places, one being within half an hour of Howrah. Another passenger in the same coach who is an experienced traveller and knows the line well has elucidated this. He states that the coach was running smoothly and the rattling was merely noise, it was due to the patches of bad 'roaring rails' between Howrah and Burdwan and of which he now takes no notice.

28. There does not seem to be any other statement of a defective coach made on any sound basis. If any passenger experienced anything very unusual so early in the journey nobody pulled the communication cord, nor was any complaint made to the railway staff at any of the several stops the train made. One thing is certain and that is that the 5th coach of a train if it were defective and derailed would certainly not pull the tender of the engine off the track.

29. It is possible that suggestion may be made of neglected and imperfect permanent way. The gang in charge of this section has a length of 3 miles only from mile 209 to mile 212. They are locally recruited labour and have no regular gang hut on the beat. They had worked recently on the tracks where the accident occurred; from the 3rd January to 6th January, they

had through packed from mile 209/23½ to mile 210/5½. The Permanent Way Inspector had last trollied through on the 9th, less than 3 days before the accident, he had found nothing wrong with the track and had stopped to work with the gang which on that day was working in mile 209.

30. At the close of my enquiry I made a personal examination of the track for a full mile approaching the site of the derailment, including the previous curve. I checked gauge, levels and superelevation the whole distance and found the track to be in excellent order and well maintained, fit for speeds even in excess of the 65 m. p. h. for which I had passed it. No claim that the derailment was due to defective or neglected permanent way can stand.

31. I have stated in my preliminary narrative report that the derailment was due to the removal of a rail from the track. The evidence of this is clear and is as follows :—

In the description above I have stated that the trailing bogie wheels of the last coach were still on the track when the train stopped. The track where they were standing was sound and unharmed in any way. The leading wheels of the bogie had stopped about 2 feet from a rail joint, this may be seen from a reference to the blue plan attached and to photographs A and B. Had this coach travelled another 6 feet this bogie also would have been derailed as the left hand rail at that very joint was not linked up in line but was lying on its side towards the middle of the track (*vide* photographs A and C).

32. This was the position of the rail when first seen by the Permanent Way Inspector soon after his arrival and by other of the railway staff. The same individuals also saw some nuts and bolts lying on the ballast between or near the ends of the rails and an undamaged fishplate lying outside on the track. Nothing whatsoever was touched until the arrival of the police, myself and the senior railway officers from Calcutta. Full details were then recorded as shewn in the plan and the photographs. It was clear that derailment had started from this joint, the only point to be decided being whether these two rails had been parted before the arrival of the train or by the train itself. There can be no difficulty about deciding this.

33. When the wheels of a train break the track the rails are bent and the fastenings are broken. In this case the four fish-bolts were lying on the ballast with the nuts carefully unscrewed and undamaged. One fishplate was lying outside the track unmarked. The rail lying in the centre under the coach was straight and unbruised, not a mark except finger marks. Photographs A, B and C clearly shew the position. The opposite end of the rail was below the leading bogie of the same coach. On pulling back this last coach a search was made in the ballast at this second rail joint, another absolutely unharmed nut and bolt were found.

34. The fastenings of the D & O plate sleeper lend themselves to easy opening out and removal. The fourteen sleepers to this rail had all had their inner jaws carefully removed, almost every one was to be found undamaged close alongside and the majority of the cotters also undamaged, the outer jaws of the same sleepers being more or less in their original position and smashed by the impact of wheels on them.

35. The second rail was found lying half way down the bank badly bent and twisted and bearing the mark of a heavy blow at the end where it should have been protected by its adjacent rail had they been coupled up. The force of this blow has even bent the rail downwards. At the opposite end of this 2nd rail the fish bolt holes shew signs of the force with which the fish-plates were stripped off when the bolts were sheared. This evidence makes it clear that the rail lying in the middle of the track had been carefully removed and pushed there before the arrival of the train. It is a physical impossibility that anything else could be the case.

36. What has been considered a marvellous feature of the case and an apparent refutation of the above is the fact that the wheels of the engine never moved out of alignment throughout, and alone were on the rails after passing the gap. When rationally considered it is not really so marvellous and in fact it can be readily understood.

37. A train moving at 55 m. p. h. is covering over 80 feet per second. The length of a rail is 36 feet only. Therefore, if a rail is removed the gap is crossed by the engine in less than half a second, and, if the rail on one side only has been removed, it is, during that period, partially supported and kept straight by the rail on the intact side. Further, consider that the length of wheel base of an HPS locomotive, excluding tender, is over 27 feet. When the engine is half way across the 36 feet gap the four rear heavy driving wheels are still supported and the engine is being kept in direction by the rails, three of the 10 wheels of the engine alone are in the air. It is for *less than ¼ second* that the one side of the engine has no rail under its wheels. The whole movement is over, it may be said, 'instantaneously' and, like the flight of a rifle bullet, the engine *must go straight* at that terrific momentum unless some force acts to divert it. The only force in this case can be gravity. In $\frac{1}{4}$ second the front of the engine would, entirely unsupported and in mid-air, drop 1 foot. The engine is however fully supported on one side and the derailed side has fourteen cast iron sleeper jaws spaced at about 2 feet 7 inches apart along which the wheels rattle until they are pulverised. The result must be that the bogie wheels of the engine can only have dropped an inch or two during the split second that they have passed over the rail-less gap; they are almost certain to have kept in alignment, they would meet the exposed end of the following rail that same inch or two out of level and deal it a terrific blow as they mounted into correct running position. There is no reason why the remaining wheels of the engine should not follow suit there being nothing to divert them, the engine being one complete body.

38. Such would not be the fate of anything following the engine. The upward bound of the engine described by the driver would correspond with the impact of the wheels of his engine as they mounted the running rail. This impact would be communicated to the first joint, *viz.*, the tender coupling, and it is unlikely that the tender or the coaches following would run as straight as the engine did. They did not. The tender derailed all wheels and crashed along the ballast smashing chairs and tie bars, followed by the coaches tearing up the track until motion ceased. Marvellously the last bogie stopped a foot or two short of the gap.

39. This method of derailment by opening out a rail is by no means new, nor is the running of the gap, so made, by the wheels of the train new also. Photographs D and E shew a rail opened out at Bhadaura on October 16th last year. On that occasion after removing the fastenings the rail was merely turned over onto its side but left in alignment by the miscreants who did it. The result was that the whole train, engine and all, ran the gap with the exception of the last vehicle only which was smashed. In that case two wheels of the engine did derail but the *seven* coaches following kept perfectly straight and rerailed themselves on the track after running the gap. They all ran along the flat of the turned down rail and bumped up onto the exposed end of the next rail. The flat rail shews its bend under the repeated blows as the wheels dropped onto it. Photograph E shews the bruised end of the opposite rail as they mounted it. A comparison of this photograph with photograph F shews the exact similarity of the blow that the rail in this Hazaribagh accident received.

40. In the case of this last accident near Hazaribagh the rail after being turned onto its side was pushed into the middle of the road. The wheels had therefore nothing to run on except the ballast and outer jaws of the D & O plates. The engine only was therefore able to keep its alignment assisted by its speed of 55 m. p. h.

41. A most important feature of this disaster is the occurrence of fire. How this originated will never be determined definitely. When the driver left to report at the station fire had not broken out. From all available evidence it appears to have made a small beginning from the region of the first of the capsized coaches about 15 minutes after the accident took place. It appears to have taken hold and spread very rapidly, largely due to a strong wind. Unfortunately the country-side is very dry. There was no water available. A witness, the one who refused to sign his statement, says that he went to the engine for water and could get none and when he got back the compartment was ablaze. It was over 100 yards to the engine and back, the driver had gone to the station and the fireman was out with the fog signals.

42. One suggestion as to the cause of the fire is that it may have arisen from an electric fuse. The train was electrically wired throughout. Only four coaches, the two upper class and the two brake vans carried batteries, the others merely drew current from them. The fire started undoubtedly in the first of the capsized coaches, *i.e.*, a 3rd class T.-3593. The voltage is 24 volts only and it is extremely unlikely that any fire could have generated so quickly at all from the wiring of this coach. This apart from the probability that, in capsizing, the connections between each of the coaches would be separated.

43. Another suggestion as to the cause of the fire is that in the darkness passengers were lighting matches, one of them may have dropped a match and ignited the grass. This I consider a great probability, the grass and jungles were as dry as tinder and a spark would ignite them.

44. There was a fire extinguisher in the brake van. The guard was incapacitated, some passengers took the extinguisher and one of them who knew the method tried to work it. With a crippled arm he was unable to do so and others tried but failed to use it effectively before it was spent. The effective period of these extinguishers is only for about one minute and they can only be of use at the very outset of a fire. In the debris after the fire had burnt out one or two kerosine oil tins were found. This also lends a suggestion accounting for the rapidity of the fire.

45. By the time 83 Down arrived $\frac{3}{4}$ hour after the derailment the fire had taken a firm hold. Question has been raised as to why 83 Down did not stop and did not give assistance. It is clear that the train did stop twice. Once to pick up the fireman and once beside the wrecked engine. There were many uninjured passengers who were unable to do anything, what then could be expected of two men, a guard and driver, of another train? Several other points may also be mentioned to in this respect. Had the driver and guard decided not to proceed they would first have had to go out and protect their train with fog signals. It was unlikely that they had passengers in their train any more capable of dealing with the situation. It was not known whether the driver of 9 Up had ever got to Chichaki and given report of the accident, he had not done so by the time that 83 Down had left Hazaribagh Road. Had any passengers got out of their train they would not have got away for a long time. They had no relief of any sort with them. Their written orders were to proceed cautiously, see what had happened to 9 Up and report at Chichaki. The driver discussed it with his guard and rightly carried out his orders, thus giving full advice, clearing the section and enabling 4 Down, which was following closely, to reach the scene as soon as possible with medical and material relief.

46. The passengers who had hoped to escape by boarding 83 Down eventually got away shortly after by 4 Down and none were the worse for it. They also had the advantage of being taken direct to a hospital station.

47. I have dealt with the cause of the accident, the work done by the railway and others in attending to it, there remains only the matter as to whether detection could have been possible.

48. The place chosen for the crime is in an isolated spot in jungle, the nearest level-crossing where one gate-keeper resides is a mile away. There are no gang quarters nearer than Chichaki $1\frac{1}{2}$ miles away. The last train previous to pass on the up line ahead of 9 Up was 1 Up mail which passed Chichaki at 1-55 hours over an hour beforehand. This train and others before it had passed quite safely without any suspicion of anything being wrong.

49. The last Down train on the other line 2 Down mail had run through Chichaki at 2.53 hours and therefore had passed the scene of the accident about 10 minutes before it occurred. All these trains had headlights but it is not possible to see any defect in a single rail length at night when travelling at speed however careful a driver may be. Had any evil doers been working at the track when 2 Down approached they could have seen the headlight and could easily have hidden in the adjacent jungle until it passed. The whole work of removing a rail carried on D & O sleepers takes less than 10 minutes when done by three or four men. Even unskilled men can loosen a rail and leave it undetectable so as to be moved at the last minute.

50. A better site for the deed could not have been chosen nor could the drivers of any of the previous trains on either the Up or the Down lines be expected to have detected anything.

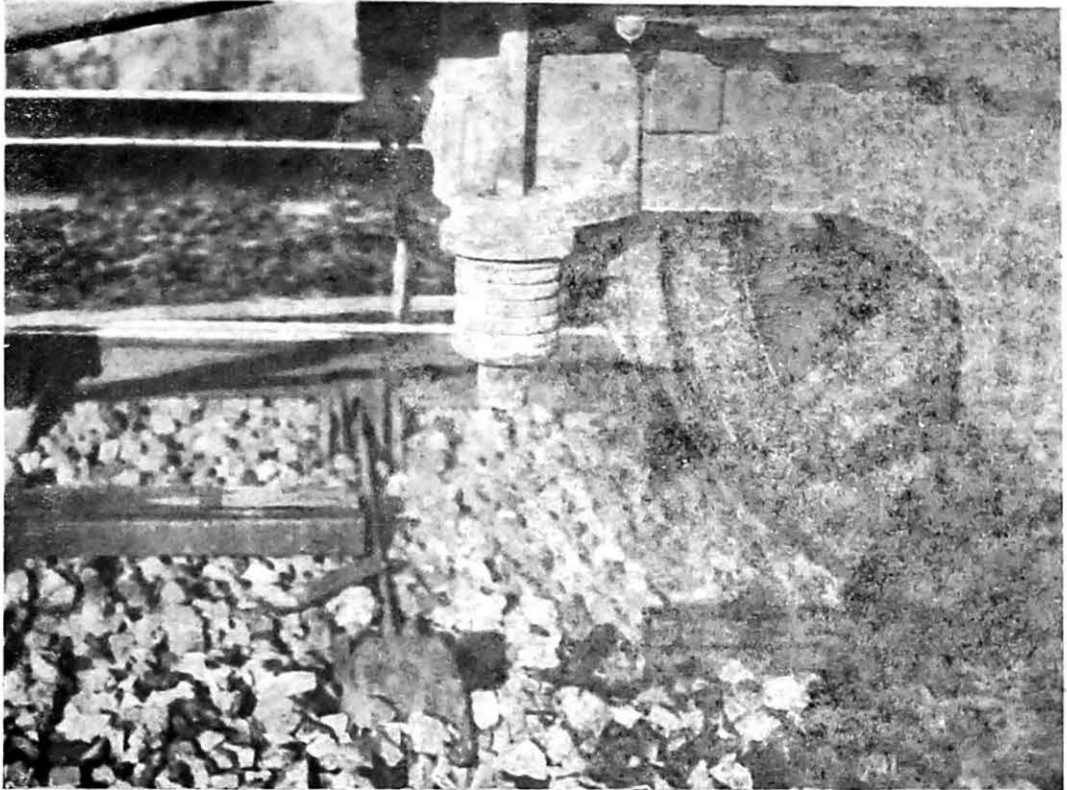
51. There is nothing more to be said. In the ordinary course of affairs in which accidents are due to technical or administrative errors I may be in a position to make recommendations. In such circumstances as this the question extends considerably beyond my sphere.

52. I would give one word of warning. This is by no means the first accident of the kind. In the past few years there has been a large number of foiled or unsuccessful attempts at train wrecking. There have now been three successful instances in rapid succession. The fact is that the technique of the culprits is improving. It is being realised that mere loosening of fastenings does not necessarily result in derailment.

53. There is evidently a deep root to this evil, the systematic derailment of trains, which can only be defeated by concerted action of the railway and civil authorities.

APPENDIX D.

A



Free and uninjured rail →

↑
loose nuts and bolts.

Beneath trailing bogie of last coach shewing rail joint opened out, freed rail lying on side and pushed into centre of track, absolutely unharmed. Opened out fish bolts and nuts lying also unmarked.

B



End of free rail →

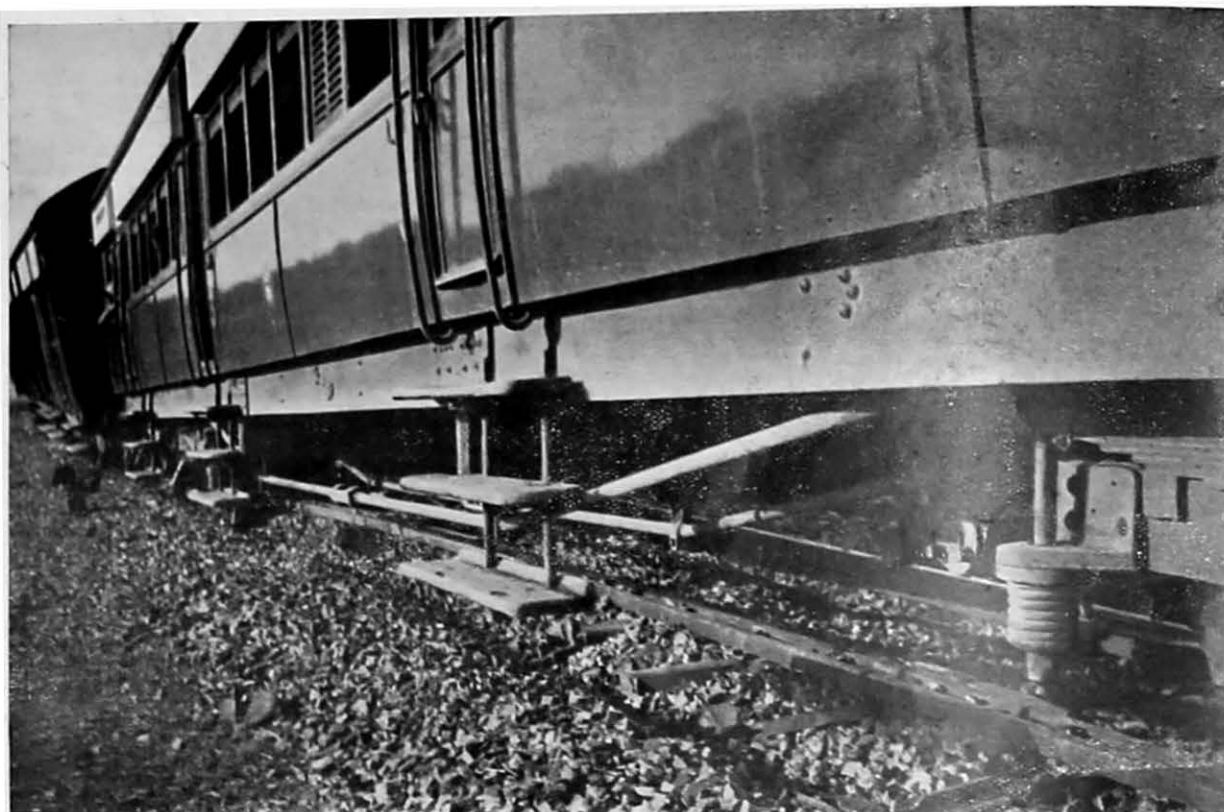
Undamaged cotter →

↑
Outside jaw bearing marks of wheel blows and broken through at face.

↑
Opened out bolts and nuts lying on ballast.

HAZARIBAGH ROAD ACCIDENT.

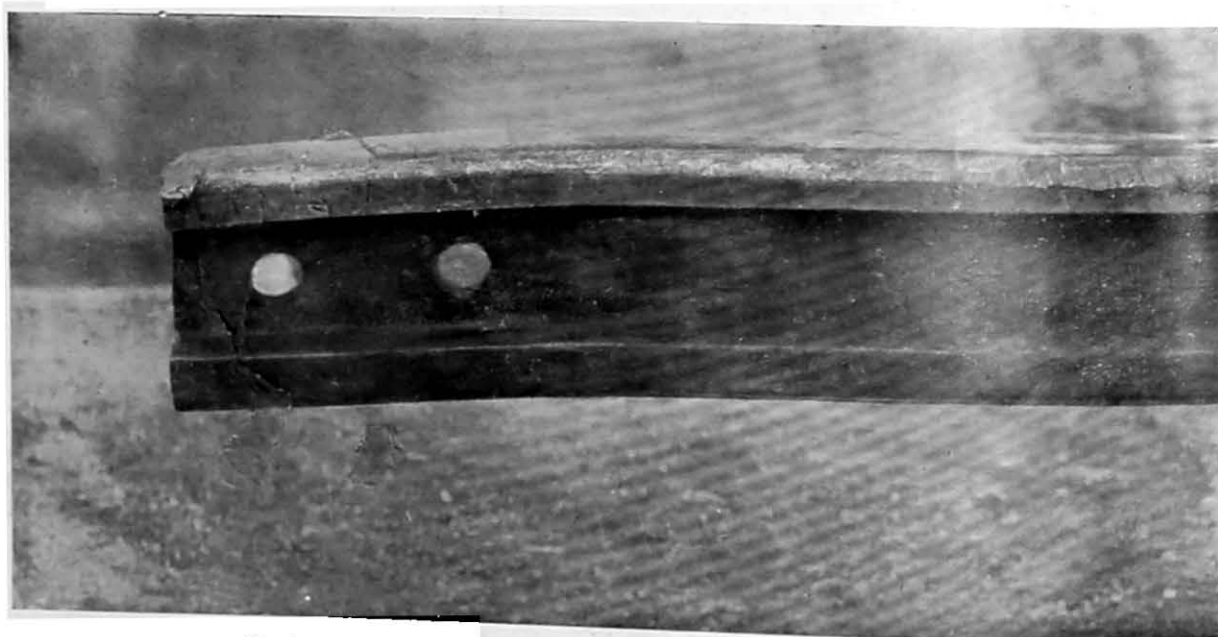
C



Looking forward beneath last coach shewing freed rail turned over and pushed into centre of track, lying across tie bars.

Note churned up pieces of ballast thrown onto web of rail.

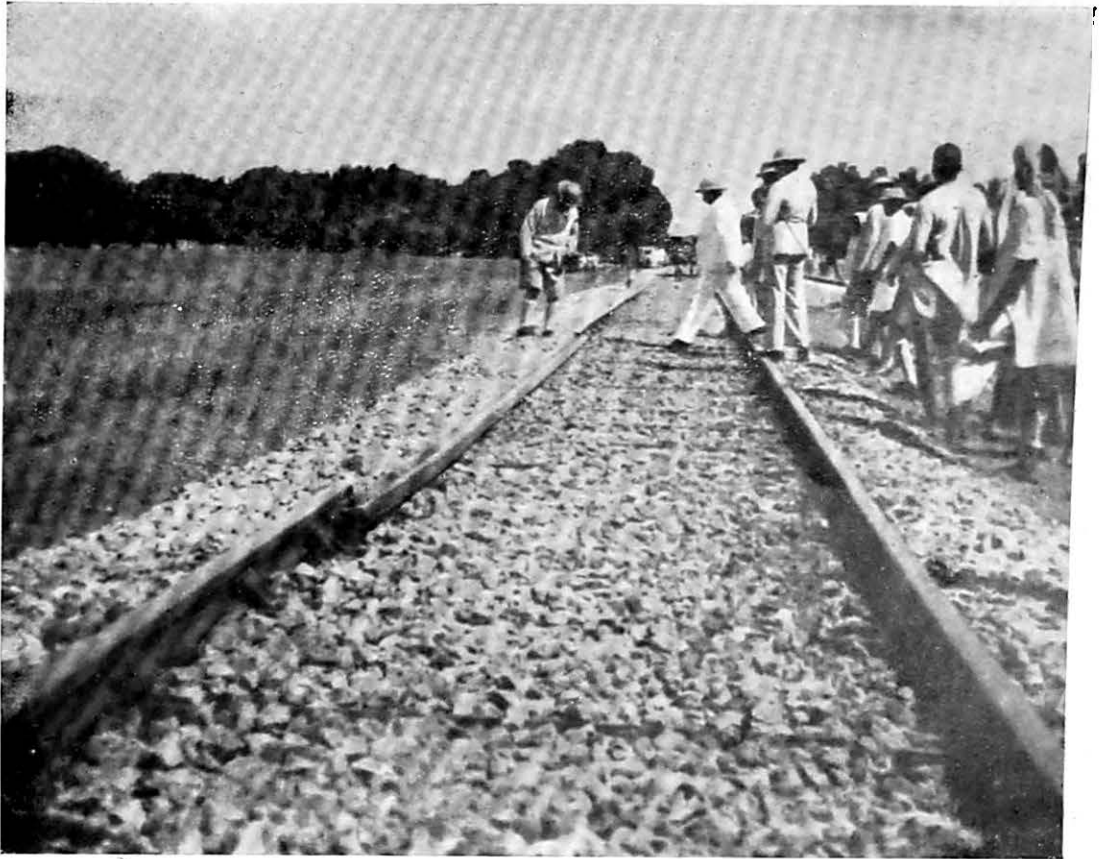
F



Facing end of exposed 2nd rail which received full impact of engine wheels. Note mark of blows bend of rail and distorted fish bolt holes.

BHADAURA ACCIDENT.

D



Note bend of rail caused by impact of wheels→

View of similar tampering at Bhadaura in October 1938. Rail was turned over in exactly same way but was not pushed into the centre. Hence engine and seven coaches ran the gap after impinging on the 2nd rail thus

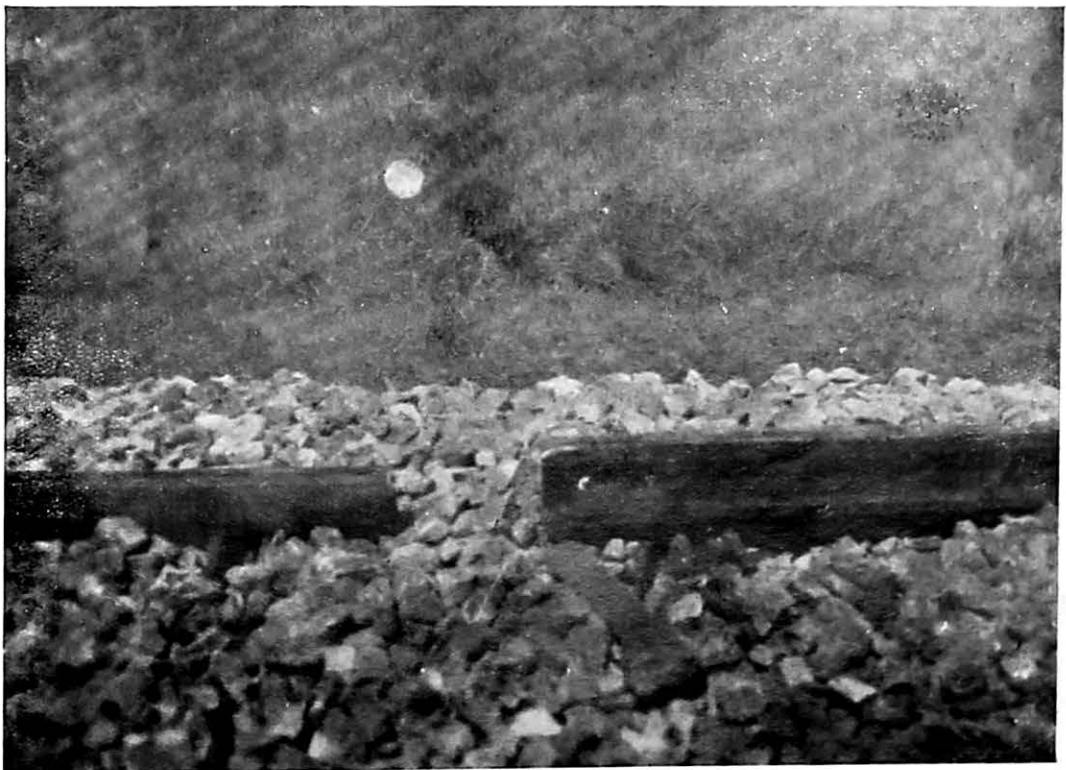


E

these two

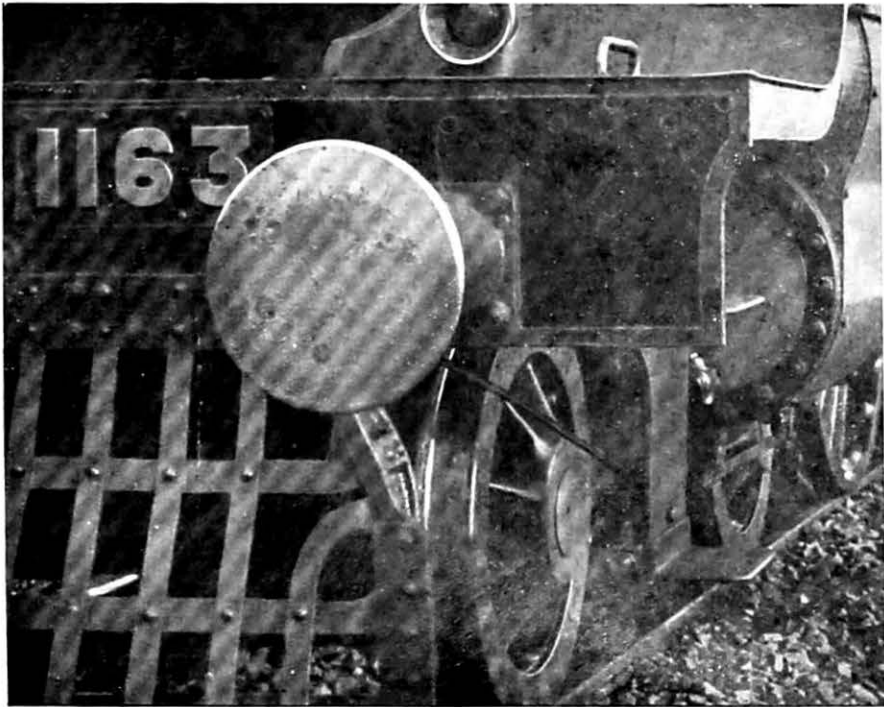


Bhadaura→



Side view of above rails at Bhadaura shewing nature of blow on 2nd rail (compare with photo F.)

G



↑
Front view of engine leading bogie wheel shewing marks of impact on rail end.