

### THE GRETNA RAILWAY ACCIDENT.

On Saturday morning last, the 22nd inst., there occurred at Quintinshill signal-box, about a mile north of the Gretna Junction station of the Caledonian Railway, a double collision which resulted in the greatest death-roll from a railway accident on record. About 162 people were killed and 200 injured, the whole of the fifteen vehicles on one train, four vehicles on another, and twelve wagons, were destroyed by fire, and four locomotives were very extensively damaged.

We give below a diagram of the lines concerned to illustrate the evidence given at the Board of Trade inquiry, which fully explains how the accident happened. Four trains in particular are named. The local was a stopping train from Carlisle to Beattock; the 5.50 was the 11.45 p.m. West Coast express from Euston to Edinburgh; the 6.5 was the corresponding train to Glasgow, which left Euston at 12 midnight; the troop train was the third of four specials and was conveying the A and D companies of the 1/7th (Leith) Battalion of the Royal Scots under Lieut.-Colonel Peebles from Larbert en route for Liverpool. The local train was composed of three eight-wheeled coaches and a six-wheeled fish van, and was drawn by 4-6-0 tender engine No. 907. The 6.5 train consisted, in the following order from the engine, of a six-wheeled van, an eight-wheeled composite, three twelve-wheeled sleeping saloons, and eight eight-wheeled passenger carriages. It was drawn by two 4-4-0 tender engines, No. 140 being the pilot and No. 48 the train engine. The troop train was composed of fifteen Great Central passenger carriages, three Caledonian trucks and three vans, and was drawn by 4-4-0 tender engine No. 121. In view of the question of gas lighting of trains, we may say that only four of the 6.5 coaches were gas-lighted. These were the leading van and three third-class carriages. We do not yet know what illuminant was used on the Great Central coaches. As a result of the fire, all the carriages on

John Meehan, the signalman who had been on night duty in Quintinshill box, followed. He said that the local train arrived at 6.30, and explained how it was that he had to shunt it on to the up main line. His mate, Tinsley, arrived at 6.32; the reason why he was late was that he had made an unofficial arrangement with Meehan to change duty about 6.30 instead of at six o'clock. Meehan told Tinsley about the empty wagon train, that the troop train had passed Beattock at 6.17, where the 6.5 from Carlisle was, and about the local train. He then handed the box over to Tinsley at 6.35 or 6.36. Brakesman Young of the empty wagon train had been in the box, but he did not know what for. The fireman of the local train had also been and signed the train register book under Rule No. 55. He was there four or five minutes. The brakesman of the goods train also came and was there ten minutes. The first alarm Meehan got was the troop train passing the box. He was just going home, and he turned and asked Tinsley what he had done and where was the 6.5 from Carlisle. Just then the second collision occurred. The last block signal he gave was the acceptance of the 5.50 express from Carlisle at 6.32. Though he replaced the loop points and restored the home signal after the empty wagon train had got inside the up loop, he did not send the out-of-section block signal, as Tinsley was at the instrument. The reason he did not block back for the local when it was shunted was that the empty wagon train was then standing at the up home signal and the block instruments were at train-on-line for it. Had he given the out-of-section signal for the empty wagon train he should have at once followed this by blocking back. Asked by Colonel Druitt why he did not complete those operations he had commenced, Meehan said that his mate had then taken charge. He did not use the lever collar; signalmen rarely used them, as they thought blocking back was enough. In reply to the solicitor acting for the National Union of Railwaymen, Meehan said that the fireman of the local got off the engine before it had been shunted. It was usual for brakesmen to come to the signal-box to make inquiries as

restored the home signal. He was certain that he did not give the train-out-of-section signal for the empty wagon train, nor did he hear it.

After the brakesman of the goods train had testified that the fire started immediately after the collisions and spread very rapidly, James Wallace, the driver of the local train, went into the witness chair. After reciting how he was shunted on to the up line, he said that the fireman called his attention to the up home signal being "off." He looked up and saw the troop train. He and his mate jumped off the footplate, the latter on the up side. He got off on the down side and went through the wagons on the down loop. Remembering just then that the 6.5 was due and seeing soldiers on the down line, he went back to warn them, but the train arrived just then. In the first collision the troop train was practically wrecked, all but the last coach. He noticed fire in the middle of the troop train, so he used the extinguishers off the 6.5 train and his own. These subdued the fire but did not extinguish it. He thought it was the gas which started it, as it was practically impossible, from the way the engines were lying, for it to be started from the engine fires. It was not a fierce flame. While attempting to put out the fire explosions kept occurring and metal caps were flying. It was about ten minutes after the collision when he went for the extinguishers. They got all the salvage tools out of the brake vans and others from the trucks in the rear of the troop train. He did not think that if there had been more tools the number of men saved would have been any greater. It was want of water that was most felt. The 6.5 train must have killed a lot of men.

There was nothing of interest in the evidence of the guard of the troop train. He was badly hurt and his memory was affected. He remembered seeing a flame about two yards high rising from the wreckage. It was apparently under pressure. The driver of the empty wagon train did not see any flames that were under pressure; they were all apparently from the debris. His fireman said that he noticed the fire about fifteen minutes after the collision; it was in the centre of the debris where the engines were. The fireman of the local explained how he went to the box, and admitted that he ought to have seen that the collar was on the lever; whilst the guard testified as to his running towards the 6.5 to stop it. Afterwards he went on to Gretna and gave information as to what had happened. He got back to the scene of the accident in half an hour and the fire was burning fiercely then. It was underneath and all round the engines, which were covered with debris.

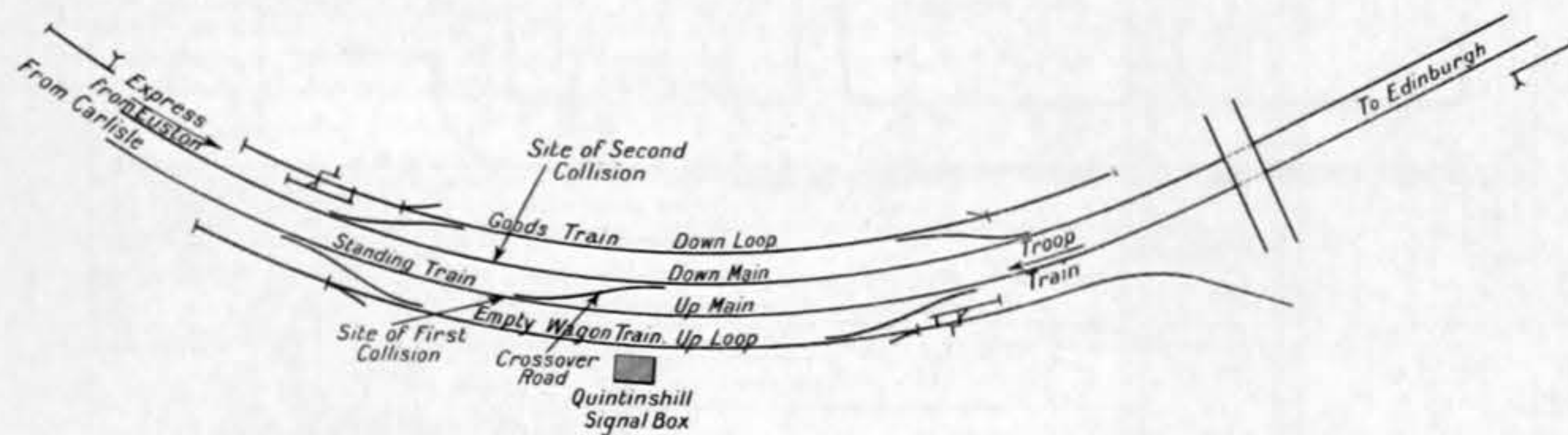
Johnson, the driver of the train engine of the express, said that he saw a man signalling to him when near the home signal and applied the brake fully, but could not pull up. He heard several explosions. After the collision he and his fireman went to release the driver of the pilot engine. The latter was buried in coal and so badly hurt that he could not attend the inquiry. The firemen on the two engines of the express, the guard and a sleeping car attendant also gave evidence. Lieutenant J. C. Brown, who was riding in the troop train, testified as to an ample supply of tools, and the inquiry closed with the evidence of Mr. Robert Killin, assistant superintendent of the line, as to the actions that the signalmen should have taken with the various trains.

### LIGHT CONTROL FOR ELECTRICAL APPLIANCES.

WITH the aid of selenium cells and a specially designed steering gear a student of electrical engineering at the Purdue University, Lafayette, has succeeded in steering a small electric truck by simply holding a small hand flash lamp in front of it. At a recent public demonstration the inventor caused his truck, which is really a small box mounted on three wheels, to follow him about the platform, turning corners and avoiding chairs with no other control beyond the beam of light emanating from the electric flash lamp, and by reversing the motor connections the truck was made to back away from the light. On turning the light away from the lenses in front of the truck the mechanism was immediately brought to a standstill. Behind the two lenses in front of the truck are the selenium cells, and these control a relay and two steering magnets at the rear of the truck. When both cells are illuminated equally the truck travels in a straight line, but if the light is applied to one lens only the truck turns and follows the light. Power for working the driving motor is derived from accumulators.

The inventor seems to think that torpedoes and submarines could be equipped with mechanism of this kind, the idea being that battleships showing searchlights would be followed automatically. The inventor has also shown that the apparatus can be used for ringing bells, extinguishing lights, and for firing revolvers. He has made a "thief catcher" on this principle, and this was also exhibited at the time of the demonstration to which we have referred. The slightest light from a lamp caused a bell to ring and a revolver to be fired. Moreover, a flashlight powder was ignited, the object of this being to take the burglar's photograph. It has been suggested that the directive mechanism might be made to direct a shot, thus leaving the robber no chance of escape.

DURING the year ended June 30th last there was a decrease of 13,619,164 dols. in the receipts of all the railways in Canada, accompanied by a decrease of 3,036,431 dols. in expenditure. The ratio of expenditure to receipts was 73.6 per cent., as against 70.9 per cent. in the previous year.



SITE OF THE GRETNA RAILWAY ACCIDENT

the troop train were destroyed, but the trucks and vans in the rear were saved, as in the second collision they broke loose from the train and ran back some distance. The leading four vehicles on the 6.5 train were destroyed by fire. The other nine vehicles were not damaged by the fire and were but little hurt by the collision. On the local train two vehicles were telescoped. There were goods trains in the loops, and twelve wagons of these were destroyed by fire. The line from the south or Carlisle end approaches Quintinshill on a curve of about 80 chains radius, which dies out on the north side of the overbridge about 300 yards north of the signal-box. Owing to the curve and a low cutting the enginemen on the 6.5 would get but a very short view of the obstruction, and the driver of the troop train would not see the local train until he was near to the overbridge. The fatalities included seven passengers and the sleeping-car attendant on the 6.5 train and the driver and fireman of the troop train.

The coroner of Carlisle opened on Tuesday his inquest on the twenty-one persons who died in or on their way to that city. After evidence of identification had been given he adjourned his inquiry until Wednesday, the 23rd prox. Colonel Druitt held the Board of Trade investigation the same day. This was open to the public, and as the evidence tendered fully explained all that happened, we give the following summary of the leading points:—

After the men in the Gretna Junction and Kirkpatrick signal-boxes had given evidence as to their respective exchange of block signals with Quintinshill, Robert Moss, the driver of the down goods train, who testified as to some useful work he did after the collisions, was called. His fireman disconnected as much of the train as he could and the engine drew the wagons out of the loop on to the down main line, and the driver then backed them down on the main line clear of the outlet from the loop. The engine then went forward and afterwards backed into the loop again and down the loop until the driver got near to the fire, on to which he played with water from the tender. There was only one bucket, and this proved to be insufficient to cope with the fire. Moss said the first engine of the express rose in the air on the top of the wreckage, and his opinion was that the live coal from the ashpan started the fire.

to why they were delayed or to get instructions, and the visit of the brakesman of the empty wagon train was therefore quite legitimate. James Tinsley, the other signalman at Quintinshill, followed, and explained that by changing duty at about 6.30 it allowed him to come from Gretna on the 6.17 from Carlisle when it was going to stop at Quintinshill. In order to prevent this irregularity being discovered the man going off duty used to make all the block entries after 6 a.m. on a piece of paper, and from this the other man would enter them into the train register when he arrived. When he arrived at the box on Saturday morning the local train was already on the up line, and his mate told him about the troop train and the empty wagon train. The first block signal for the up line Tinsley sent was the train-entering-section signal to Kirkpatrick and the train-out-of-section signal to Gretna for the 5.50 from Carlisle. The first block signal for the down line was the acceptance of the troop train. He did not "clear" for the empty wagon train, although Meehan said that he (Tinsley) did. The 6.5 train was offered and accepted at 6.42, he received the train-entering-section signal from Gretna and offered it to Kirkpatrick and it was accepted at 6.46, and he then lowered all his signals. The collision occurred at 6.50. When he went to the block instrument to accept the troop train the indicator was in the normal position. He was certain that he did not give the train-out-of-section block signal for the empty wagon train. He forgot all about the local train and did not look through the window to see if the line were clear. He could see his signals from the levers working them. After the second collision he saw that the down signals were at danger, but he could not say whether he restored them or not. He was not accustomed to use the lever collars, as he relied on the blocking-back signal. Answering Mr. Lightfoot (for the National Union of Railwaymen), Tinsley said that not a minute elapsed between the two collisions; there was not time to do anything effective to stop the 6.5 train. The empty wagon train stood in front of his box, and it would slightly prevent his seeing the local train. It was he, and not Meehan, who gave the local train fireman the register to sign.

Meehan, recalled, said that he threw the distant to danger. He did this when he asked Tinsley where the 6.5 train was, but he could not say if he also