LONDON, MIDLAND AND SCOTTISH RAILWAY.

Ministry of Transport,
4, Whitehall Gardens,
London, S.W.1.
18th August, 1933.

SIR,

I have the honour to report for the information of the Minister of Transport, in accordance with the Order of 11th July, the result of my Inquiry into the circumstances of the accident which occurred at about 1.9 p.m., on Monday, the 10th July, at Little Salkeld, on the Midland Division of the London, Midland and Scottish Railway.

The 12.44 p.m. up Express Passenger train, Carlisle to London (St. Pancras), travelling under clear signals, at a speed which was probably not much less than 60 m.p.h., came into violent sidelong collision with a shunt of three wagons, which were being propelled over a trailing crossover, from the down to the up line, after having been detached and drawn forward from the 11.20 a.m. down freight train, Appleby to Carlisle; the object of the movement was to shunt a wagon of coal into the goods yard on the up side of the line.

I regret to report that Driver F. Shaughnessy, of the freight train, succumbed to his injuries next day. He was 64 years of age, and was stationed at Carlisle.

There were 50 to 60 passengers in the express, and 27 received injuries or suffered from shock effects, three having to be detained in hospital. In addition, the driver of the express, the fireman of each train, and five of the Dining Car staff were injured or received shock; the fireman of the express and the chef were detained in hospital, but discharged the same day.

The relief arrangements were expeditiously and efficiently carried out; the first doctor reached the scene at about 1.20 p.m., while four others, two nurses, and representatives of the police, arrived shortly afterwards from Appleby, Penrith, Carlisle and other places. In addition, a number of the Company's servants were available, including the guard of the express, who were trained in ambulance work.

The express was drawn by 3-cylinder compound engine No. 1010, type 4-4-0, with a 6-wheeled tender, weighing in working order 107 tons 12 cwts.; the train consisted of the following vehicles, marshalled from the front:—a L. & N.E.R. 6-wheeled yeast van, an all-steel 8-wheeled bogie corridor third brake, and five other bogie coaches, weighing empty 194¾ tons. The total loaded weight of the train was therefore about 305 tons, and its length, including the engine, was 460 feet.

The freight train was drawn by engine No. 4091, type 0-6-0, with a 6-wheeled tender, weighing 90 tons in working order; it was marshalled in the following order:—two empty all-steel bogie rail wagons, each some 48 feet long and weighing 15 tons, the wagon of coal which was being detached (these three vehicles formed the shunt) and seven other wagons and a goods brake van, the overall length being approximately 340 feet.

At the moment of collision, the freight train engine was slowly propelling the above-mentioned three leading vehicles over the crossover at the north end of the station; the off-side leading buffer of the express engine apparently hit the near-side corner (trailing in the direction of movement) of the first rail wagon which was next the tender of the freight engine. This corner of the rail wagon was very badly crumpled and the offside cylinder and motion, etc., of the express engine were carried away, its front buffer beam and frame on the off-side being heavily damaged. At the same time, contact between the express engine and the freight tender apparently occurred, owing to the continued movement of the latter, while the freight engine ripped the sides of the coaches behind.

The result was that the express engine was deflected from its path, and, very fortunately, it immediately broke away from the train, coming to rest on the road beyond the adjacent siding, 22 feet to the left of the main line; it was leaning over at an angle of approximately 60°, with its leading wheels buried.

and was some 90 yards ahead of the point of collision. The rail truck, which had thus been struck, was thrown over to the right, and remained with the freight engine, badly damaged and derailed near the actual site of the collision.

The diversion of the engine of the express thus permitted the coaches of the train to run on and lose momentum more slowly, and though all, except the one in rear, were derailed and deflected to the left, owing to contact with the off-side of the freight engine and tender, they remained more or less in line and did not turn over; there was no telescoping.

The coaches evidently swept the second rail wagon forward with the truck of coal, the leading coach being eventually deflected to the right, with the result that there was a second collision (104 yards ahead of the first) with the remaining vehicles of the freight train, which were standing on the down line; the yeast van, which had a wooden body and frame with plated sole bars, was demolished, and the all-steel corridor third brake van was heavily damaged in the process, both having taken up much of the shock, at any rate of the second collision.

Although the latter vehicle was badly ripped on the off-side and its front end was thus crumpled, it clearly illustrated the strength of all-steel construction. Generally it may be said that the stock throughout the train withstood the impact well, all the six bogie vehicles, except the fifth, having been fitted with special shock absorbing buffers.

Indeed, but for the ripping action at seat level, which was caused along the off-side of the five bogie vehicles (four bodies required replacement and the frames straightening, etc.), as the result of contact with the freight engine, the list of casualties would probably have been much smaller. On the other hand, it is evident that the parting of the engine from the coaches was a fortuitous factor which saved far more serious consequences, in that telescoping and wreckage in the usual star-formation were avoided.

The statements of damage sustained by the engines, the rolling stock, the permanent way, and signalling equipment, are attached as Appendices I, II and III.

The weather was fine, apparently without sunshine; visibility was excellent, temperature was normal, and there was little wind.

Description.

The Company's main line, Midland Division, at Little Salkeld station, lies in a general north (Lazonby 3 miles, and Carlisle 18⅜ miles) and south (Langwathby 1⅝ miles) direction. The station has up and down platforms, 300 feet long, the main buildings being on the up side; the signal box is located at the north end of the down platform.

There is a trailing connection in the down line, serving a down lie-bye siding, some 200 yards north of the box; south of that there is the trailing crossover concerned, and at the north end of the up platform there is a trailing connection in the up line, serving a small goods yard with mileage loop, and shed accommodation. There are starting, home and distant signals for each direction.

The station is approached from Lazonby on the up line over easy gradients, and it is situated at the foot of the climb of 30 miles to Ais Gill Summit. The immediate approach to the station in the up direction is over a left-handed curve, 41 chs. in length, terminating near the south end of the platforms. The radius varies from 76 chs. over the southern half, including the site of the collision, to 82 chs.

This curvature, the side slopes of the cutting in which the station is situated, and the trees on the up side, restrict a driver's view of the up home signal, which is located immediately in rear of the site of the collision, to some 360 yards. With regard, however, to his view of the up distant signal, this is excellent; it is uninterrupted for 550 yards with a sky background, and for 950 yards with a tree background.

The approximate distances from the centre of the box to points, signals, etc. relevant to this case are as follows:—

Up distant signal	893 yards	North
Down starting signal	265 ,,	,,
Up home signal, and crossover trailing points in down line	148 ,,	,,
Point of collision	120 ,,	,,
Crossover trailing points in up line	90 ,,	,,
Front of Express engine after coming to rest	30 ,,	,,
Debris of yeast van	27 ,,	,,
Leading end of second coach (all-steel) in contact with leading vehicle of remainder of freight train	16 ,,	,,
Centre of overturned rail wagon	7 ,,	,,
Foot-crossing at north end of platforms	10 ,,	South
Booking office and station building on up platform	90 ,,	,,
South end of platforms	117 ,,	,,

Report.

1. The case concerns the method of opening Little Salkeld box, in connection with the arrival and shunting of the freight train. The box is normally closed, and, like those at Lazonby and Langwathby, is equipped with a small Midland type frame (11 working levers with 1 spare) and drop-handle 3-position, 3-wire, needle-pattern block instruments, which are uncontrolled: there are no track circuits.

The block switches are of 3-position type, viz.: "Through", "Intermediate" and "Open". A copy of the Company's double line block Telegraph Regulation 24, is attached as Appendix IV. The box is not equipped with a telephone, but there is one in the booking office on the up platform: there are telephones in Lazonby and Langwathby boxes.

The object of the "Intermediate" position of the block switch is to permit the signalman, when switching in, to ascertain what the position of the block is by bringing his indicators into circuit without interfering with the Line-Clear and Train-on-Line indications on the instrument in rear, should either of these indications have been already pegged up.

If the needle is in either of these positions, the signalman switching in pegs his instrument accordingly, prior to turning the block switch to "open", so that the instrument in rear may retain its indication. Otherwise, if the block switch were turned directly from the "Through" to the "Open" position, the block indicator in rear, if it were recording Line-Clear or Train-on-Line, would return to Line-Blocked.

2. According to Driver J. Slee, the express left Carlisle at 12.45 p.m., a minute late, and passed Lazonby at 1.7 p.m., which is confirmed by the train register there. Slee estimated that he would reach Appleby at 1.25 p.m., on time, and that he was travelling at 50 to 60 m.p.h. He had covered the 15¾ miles from Carlisle to Lazonby in 22 minutes.

The engine was steaming and running normally; there was little smoke, and conditions of visibility from his position on the footplate, the right-hand side, were excellent. He estimated that the distant signal came into view at 1,000 yards. It was clear. He kept it in view for about half a minute, and he was certain that he would have seen it return to the "warning" position had it moved before he reached it.

He would have whistled had it displayed this aspect: on the contrary, he said he was naturally expecting a clear road through the station, and did not, in fact, remember having observed the home signal, of which it is not easy to obtain a good view from his side of the footplate when rounding this left-handed curve. For the same reason, Slee would have been unable to see the shunt taking place unless he had leaned out of the cab specially for the purpose, and even had he thus realised that his path was being fouled, it would then have been too late to take effectual action.

The result was that the collision took Slee entirely by surprise; he did not apply the brake, and it seems unlikely that speed could have been much less than 60 m.p.h. The results appear to confirm this, and I understand that normal speed of this express and other similar non-stop trains, through Little Salkeld, is 60-65 m.p.h., when hauled by engines of the class in question, the maximum obtained on test with the dynamometer car being 67 m.p.h.

Slee had a remarkable escape; he only received bruises and suffered from shock. He was apparently one of the first to speak to Signalman H. Hannah, whose only remark was that he had blocked-back.

Fireman F. Brown was not sufficiently recovered to attend my Inquiry, but his evidence in writing was to the effect that, having observed the distant signal at Lazonby in the clear position, he did not commence firing again until after passing Lazonby tunnel. (The gradient begins to rise steeply from Little Salkeld to Langwathby). Brown was thus occupied while approaching Little Salkeld, with the result that the collision took him as much by surprise as it did Slee.

Guard J. Gibson of the express referred to his brake test, and conversation with Slee, before leaving Carlisle. He estimated that speed at the time was normal, 50-55 m.p.h.; he heard no whistling; the collision also took him completely by surprise. Members of the Dining Car staff, T. E. Bell and G. H. Coleing, could merely relate their experiences in respect of the effects of the collision itself.

3. Ganger F. Slee and Undermen C. Harrison and J. E. Armstrong were weeding on the down lie-bye siding, adjacent to the crossover, when the collision occurred. None of them actually saw it happen; they did not hear the express approaching, nor was there any whistling.

Armstrong, however, saw the freight train come to a stand and the engine move forward with the three wagons, though he did not notice the guard unhook. He then observed the up home signal go to danger, he heard the crossover points being set, and saw the shunt movement commence. At that moment, he bent down to start work again, and, as stated, did not notice the express approaching.

He said that there was no delay between the setting of the points and the commencement of the propelling movement; tested as to the time which he estimated elapsed between the up home signal being replaced to danger and the collision, the stop watch registered 47 seconds. In evidence, he had suggested that the interval was three minutes, and having regard also to the fact that he was otherwise engaged, I do not place much reliance on this estimate.

4. Fireman J. Briscoe, of the freight train, is a man of 42 with 21 years' service, including five years with the Colours during the War. He had worked on this train for two years, and related how it left Langwathby on this occasion at 12.55 p.m., 25 minutes before schedule time, and came to a stand at Little Salkeld at 1.8 p.m.—I calculate with the front of the engine some 75 yards beyond the box. The train usually passes the express at Langwathby.

In approaching the station Briscoe noticed that signals were off, but it is uncertain whether he observed even one of them, the down starter, return to danger. Before leaving Langwathby, he had been advised by Guard T. Graham that a wagon of coal (the third) had to be dropped, and when passing the box, on arrival, he noted that there was no one there, and so informed Driver Shaughnessy, who he saw was observing Graham's signals.

Briscoe's statement as to what happened is as follows :—

"We only stood a minute. I did not see the guard uncouple, as he was on the other side. We then went forward over the crossing with two rail trucks and a wagon of coal. We were only waiting for the points to go back for a second or two. . . . We did not whistle before going back. I do not know where the guard was standing but he was on the driver's side. We set back at normal speed—about walking pace.

"Just as my mate was going to give steam (for the propelling movement over the crossover) I looked in the signal box to see if there was anyone in the box, and I saw the signalman had his hand on the bell. (The cab of the engine in this positon would then have been about 194 yards from the box, viz., 46 yards beyond the down line trailing points of the crossover.)

"I did not hear the express whistle. Driver Shaughnessy was standing on the right-hand side of the footplate with his back to the on-coming express. My impression is that the express hit the second wagon from the engine. My impression is that when the collision occurred our engine was not over the points." (The trailing points of the crossover in the down line.)

Guard T. Graham is a man of 45, with 25 years' service, and three years' experience of this particular freight train. He was a good witness, and his evidence, of which the following is an extract, was frank and clear:—

"I arrived at Little Salkeld at 1.8 p.m. and stopped the driver, and the signalman (A. Hannah) was standing on the up platform, and I told him I had a wagon of coal for Little Salkeld. I think the signalman had been in the office, but when I saw him he was standing at the north end of the up platform.

"The signals were all off for us on the down road, and I put the brake hard on, and I saw the up starter and up home were off. I walked down and hooked off and sent the driver ahead over the points. The train had been standing about half a minute when I unhooked.

"As the driver drew forward, the signalman walked round the wagon into the box. As he passed me I said 'I have a wagon of coal for you. It is funny all these fellows draw down as near to the crossover road as possible,' and the signalman said 'It took the other man (the up freight train which had left at 12.28 p.m.) about 15 minutes to put one wagon off.'

"The engine was going forward as the signalman went into the box, and I heard him throwing his levers over, and I shouted 'Are you right,' and he replied that he was. I heard him throw the levers over, and saw the signals go on to danger.

"The points were pulled up, and I called the driver back. I was standing near the box, as there are three sets of points to go through before detaching the wagon of coal. I stand so that I can shout to the signalman, as the driver cannot see if I am on the other side.

"Directly I waved the driver back I saw him give steam, and he no sooner did this than I saw the express come round the corner. I did not hear the express, and I did not hear a whistle."

From examination of the photographs, and allowing for the disturbance which resulted from the second collision between the coaches and the wagons of the freight train, it would appear that after the engine and the three wagons had gone forward, the leading vehicle of the freight train was standing about 23 yards ahead of the centre of the signal box, or 33 yards from the level crossing at the north end of the platform. This therefore indicates the location where Graham unhooked, approximately where he stood to give his hand signal, and how far Signalman Hannah had to walk to reach the box.

With regard to the last point, Fireman Briscoe confirmed Graham's account that Hannah thus passed across the down line on his way to the box, after the uncoupling had taken place; but Hannah, on the contrary (as will be noted later from his evidence), asserted that he approached the box by walking round in front of the engine, before it moved forward from the position in which it came to a stand, some 75 yards beyond the box.

When tested by stop watch, Graham estimated that only 5 to 5½ seconds elapsed between the return of the signals to danger and the time of the collision. To illustrate how short he thought the time was, he stated that had he seen "*the express coming round the corner a second or so sooner, I should not have given my hand signal, and the accident would not have happened. I saw the express merely a second or two after giving my signal.*" When in the box, I estimated that up trains come into sight at a point about 250 yards in rear of the up home signal, viz., say 400 yards from the box. Graham would probably not have had such a long view from his position on the ground.

Graham referred to Signalman Hannah as "*obviously distraught*" when the accident happened, and he said that Hannah ran out of the box. Graham obtained the keys of the office from him and telephoned to Langwathby. He did not go into the box himself, but he told Hannah to go back there when he "*said something about having blocked back to Lazonby.*" As a matter of fact Graham's evidence was to the effect that, from his position on the ground as described above, he had not heard Hannah transmitting or receiving any bell signals, though sometimes, on previous occasions, he had heard him operating the instruments from the same position.

5. Driver Slee's evidence to the effect that the distant signal was in the clear position when he passed it is confirmed by Graham's foregoing statement, and by test indicating that it was unlikely that the replacement of the six signal levers and the setting of the crossover points took Hannah more than 10 to 12 seconds.

Even if this full period of time be added to Graham's estimate of 5½ seconds, which elapsed between the up home signal being returned to danger and the collision, there is a considerable margin left to account for 25½ seconds, which

must have been the least time occupied by Slee in travelling the distance of 745 yards between the up distant and home signals, assuming that speed was as fast as 60 miles an hour.

Indeed, if allowance (say three seconds) be made for the fact that, in view of the interlocking, the up home signal lever would have to be returned to danger after the up distant lever, and for the possibility that Hannah reversed the down line levers before the up line levers, it would appear that Slee might even have been no further than 350 yards from the up home signal when it was thrown to danger, viz., perhaps within its maximum viewing distance.

On the other hand, this is based upon Graham's estimate, natural enough and honest as the estimate may be, of the lapse of an exceedingly short period of time between the return of the up home signal to danger and the collision, and calculation indicates that it might perhaps have taken the propelling movement, at an assumed speed of 7½ miles an hour, some 18 seconds to reach the position at which first contact with the express probably occurred. Adding that to the tested time (reduced as mentioned) of say at least seven to eight seconds, which must have been taken to replace the signals and set the road for the shunt movement, the total corresponds approximately with the period of 25½ seconds, already referred to, which is the minimum time assumed to have been taken by the express to traverse the distance between the up distant and home signals. On that calculation, therefore, the distant signal might be assumed to have been returned to its warning position just as Slee reached it.

6. Porter-signalman A. Hannah is 33 years of age, and he had been at Little Salkeld since March of this year. His booked hours of duty were 10.30 a.m. to 8.0 p.m. with meal times, 1.30 p.m. to 2.30 p.m., and 4.30 p.m. to 5.0 p.m. He had previously booked off duty at 5.20 p.m. on Saturday, 8th July.

Previous to the movement in question, he had shunted the up pick-up goods train from Carlisle at 12.12 p.m., to allow the 12.0 noon up express to pass at 12.24 p.m. Thereafter, he allowed the up goods train to proceed at 12.28 p.m., and he closed the box, apparently in conformity with Regulation 24 (*e*), transmitting bell signal 5 pause 1, which was repeated by Signalman G. Lane of Lazonby.

Hannah then went to his dinner at 12.30 p.m. at one of the railway cottages at which he lives near the station; from this time, till 12.55 p.m., when, according to his evidence, he returned, there was no one in charge of the station. Hannah explained that this had been the usual practice of his predecessor; the Station Master (Mr. H. Fell, who was also responsible for Langwathby and lived there) had advised him a month previously of his rostered meal times, but he had not informed Mr. Fell that he was not adhering to the instructions in this respect. Similarly, he was accustomed to take his tea at about 5.10 p.m., instead of from 4.30 p.m. to 5.0. p.m.

Hannah stated that on his return at 12.55 p.m. (after only 25 minutes absence instead of the permitted 1 hour) he went to the booking office, and was on the up platform when the down freight train arrived at 1.8 p.m.; this train stops at Little Salkeld when there is traffic to put off or pick up. His account of what happened is as follows :—

> " I walked down the platform and passed over the line in front of the engine. The engine was an engine and wagon length past the cabin. I walked round the engine and entered the cabin. The uncoupling took place after I had got in the cabin. I spoke to the Guard who was walking from his brake up the six foot, and he spoke to me but I do not remember what he said.
>
> " When I got in the cabin I at once turned the switch and gave the opening signals to Lazonby and Langwathby, and they were repeated. I then gave the ' Blocking-back-inside-Home Signal,' 2-4, to Lazonby, and this signal was acknowledged.
>
> " When I switched in I did not look at my instruments, but when I Blocked-back-inside-Home Signal, I placed my instrument to Train-on-Line.
>
> " I turned the switch right over in one movement, and did not place it to the intermediate position first of all. This is how I have been doing it. I was shown how to operate the switch by the Porter Signalman before me.
>
> " I was passed by Inspector Leslie and I opened the cabin and closed it in front of him. I did it in the same manner. I know now there is an intermediate position, I did not know before. I have never been taught to put it to the intermediate position and wait for the indication.

"Immediately Lazonby acknowledged the Blocking-Back signal, I put back the signals and pulled over the cross-over road, and let the Goods train over. The Guard was standing near and he could see the points move.

"Whilst I was having my meal I heard the express to Carlisle pass and assumed the up express had passed also. I came back to the office assuming the up express had gone, and made the move with the goods train. I had not received 'Train-out-of-section' for the up express and did not look at my block indicator, and took no steps, therefore, to ascertain whether there was a train in the section.

"I did not register this Blocking-Back signal to Lazonby. I sent it because I was using the section, and when I shunt this train I always send this blocking-back-inside-home signal. The last occasion I blocked back to Lazonby was on June 29th, when I did it on two occasions, and these signals were repeated by Lazonby. (They are also recorded in the Lazonby train register.)

"I never communicate with the signalmen on either side by telephone and ask the state of the line. I rely on my Block Instruments. I did not look at the Block Instruments on this occasion, as I thought both Up and Down expresses had passed, otherwise I would not have made the move.

"When I switched in, I looked at the down indicator and saw it showing train-on-line from Langwathby and from Lazonby for the down pick-up. When I gave the "Blocking Back" signal I turned my instrument for the Up line to train-on-line.

"I am aware the signalman at Lazonby states I did not give him the Blocking-Back signal. I did not touch the indicator again. I am also aware that the Station Master states that when he came into the box my instrument (the up pegging instrument) was not at Train-on-Line but that it was in the normal position, but I did not touch or alter the instrument.

"After letting the Goods train over the cross-over, the next thing I heard was the express. I did not hear the driver whistle, and I do not know whether the engine had shut off steam. The time of the accident is not recorded in my Book, but it was 1.8 p.m. when I arrived back from dinner, and I estimate it occurred three minutes from the opening of the box.

"I sent the 'obstruction danger' signal to Lazonby at 1.11 p.m., but I did not record it. I was too worried. I do not get any advice as to whether the pick-up has wagons to put off or pick up, and on this occasion I did not know it was going to stop at my box until it came to a stand, and, therefore, did not switch in until he had come to a stand.

"The signals were put to danger after I gave the opening signal. When I opened the guard had just come out of the brake and he was going forward to uncouple. He was walking along the line and had his coupling stick and he started to uncouple. I do not remember making a remark to him that the up pick-up had taken 15 minutes to knock off a wagon.

"I put the cause of my action down to the fact that I had the impression the up express had passed, and that I did not look at the Block Indicators, and that I did not telephone."

Hannah's train register had been entered up as follows :—

Cabin open	11.57 a.m.
Cabin closed	12.28 p.m.
Cabin open	1.8 p.m.

Signalman G. Lane of Lazonby had recorded the same times, but Signalman W. Strong of Langwathby had only entered up the two "opening" signals (at 11.57 a.m. and 1.9 p.m.) though he also received the "closing" signal.

Both Hannah and Lane had recorded the transmission, and receipt, of the 5 pause 1 signal at 12.28 p.m. The down express, to which Hannah referred, passed Little Salkeld at about 12.36 p.m., six minutes after he had left the station to go to his dinner.

7. Signalman G. Lane is 46 years of age; he has served in his present capacity for 19 years, and during the last 16 at Lazonby. He had received acceptance for the express from Langwathby at 1.2 p.m., it passed at 1.7 p.m., when he transmitted the entering-section signal and observed the block indicator change (by Langwathby) to the Train-on-Line position. A minute later, at 1.8 p.m., according to his statement, he received the 5 pause 5 pause 5 "opening" signal from Little Salkeld, but he entered up his register as having received the out-of-section (2 pause 1) signal for the express; this he stated he realised was a mistake, which he intended to correct later, as he noted that the indicator was still in the Train-on-Line position.

The next and only further signal received, however, was obstruction-danger at 1.10 p.m. when he noted that the indicator had gone to normal. He did not receive and acknowledge a blocking-back signal; he referred to the block working with Hannah, on the day in question, as normal. He thought that the instruments were in order, and was not in telephonic communication with Hannah before the accident; I will refer to this later.

With regard to the foregoing evidence there appears to be little doubt that Hannah, in the first place, turned the block-switch fully over to the " open ", instead of to the " intermediate ", position, in which case the indicator needle at Lazonby must have been released to normal, in spite of Lane's evidence to the contrary.

If Hannah then improperly sent the blocking-back-inside-home signal, 2 pause 4, to Lazonby at 1.8 p.m. (though he did not enter it in his register as he should have done) it might appear that Lane thoughtlessly took this for the out-of-section signal for the express and registered it accordingly; as stated above, he admitted that he mistook the much more distinctive " opening " signal for the out-of-section signal. Lane's explanation for his incorrect entry was not convincing, and there is no accounting for his statement that the instrument returned to normal when the obstruction-danger signal was transmitted.

Signalman W. Strong of Langwathby is 53 years of age; he has 32 years service and had acted in his present capacity at Langwathby for 20 years. He referred to his acceptance of the express at 1.2 p.m. and the receipt of the entering-section signal at 1.7 p.m., when, he stated, he turned the block indicator to the Train-on-Line position. When he subsequently received the " opening " signal from Little Salkeld, as late as 1.9 p.m., according to his booking, he noted again that the up line indicator was so pegged.

With regard to the block instruments themselves, Telegraph lineman R. W. Booth confirmed that they, the indicators, and the block-switch were all in proper order, when, at 4.0 p.m., he tested the circuits and indications.

Signal inspector H. Turland also tested the signal interlocking at 5.45 p.m. and found it in order. Both distant signals are repeated; at 8.30 p.m. the up distant was tried and the repeater was found to be in order. No alterations were required, and there is no record of any trouble with these signals, with their repeaters, or the switching apparatus.

8. Station Master H. Fell arrived from Langwathby at 1.35 p.m. He immediately went to the box and found that the up block needle to Lazonby was in the normal position. He stated that this indicated that Hannah had either failed to operate it to its proper position when he opened the box, or, subsequent to the accident, he must have released it. The up indicator from Langwathby was in the Train-on-Line position, and the lever controlling the crossover road was pulled. Mr. Fell stated that Hannah :—

> " was both mentally and physically upset. He was then in the booking office, having left the box and gone to the office. He was too upset to be interviewed and I did not question him at all. He was deranged nervously. I have known him since March this year, and have no complaints to make in regard to his conduct or his work as a signalman, and to the best of my knowledge and belief he is teetotal. I should say he is of a quiet nature and does appear to be rather nervous. His home is at Kilwinning and he is in lodgings at Little Salkeld."

9. Hannah's career in the Company's service has been as follows :—He joined as a signal box lad at Irvine in October, 1915, at the age of 15; he was promoted to porter at Kilwinning in November, 1917, and resigned in May, 1918. He rejoined in September, 1919, at Kilwinning, as a temporary porter, his services being dispensed with owing to redundancy in October, 1921. He rejoined at Kilwinning as porter in March, 1924, and served from May to July as signalman at West Kilbride, his services being again dispensed with owing to redundancy in October of that year.

Hannah rejoined for his fourth and present period of service as a temporary porter at Ardrossan in April, 1927, going to West Kilbride as a learner signalman in May, and to Bar Hill as a learner porter-signalman in October. He stayed there till October, 1929 (having been passed as a porter-signalman in November, 1928), when he went to Pinwherry as signalman. Thereafter, he was transferred in this capacity to Carlisle No. 9 in April, 1931, to Whithorn in November, 1931, to Castle Kennedy in April, 1932, and back to Whithorn in September, 1932, where he remained till he was posted to Little Salkeld, as porter-signalman, on 27th March this year.

10. With regard to Hannah's failure to use the telephone, his incorrect operation of the block switch, and his knowledge of the duties he was performing, Mr. Fell said he was responsible for his discipline, work and training. Hannah was learning his duties from 27th March to 15th April, with his predecessor, under Mr. Fell's supervision; the District Controller, Mr. C. G. Willson, was responsible for passing Hannah to take charge, after his period of training, an Inspector examining him for the purpose.

Mr. Fell visited Little Salkeld daily, and made it a practice to go into the box if he was there when it was open, and he last saw Hannah satisfactorily opening the box a week before the accident. Mr. Fell was evidently unaware that Hannah always turned the block switch in one movement to " open ", instead of to " intermediate " in the first place, in accordance with the instructions. But he had never thought it necessary to go through any part of Regulation 24 with Hannah, during his 14 days training, as he left the matter to the Inspector, whose duty it was to examine Hannah. He was also unaware that any irregularities were taking place with regard to meal times.

On the other hand, Mr. Fell was aware that Hannah did not comply with the Regulation as to the use of the telephone, to ascertain, before opening, what trains, if any, were in the section. He agreed that the telephone in the booking office on the up platform could be used for this purpose; the signalmen at Langwathby, where there is a telephone in the box, were also not accustomed to comply with the instruction. Mr. Fell's explanation was " *I do not interpret this clause to apply to 3-wire instruments,*" as the indicators show the state of the line when the switch is placed in the " intermediate " position.

This custom was confirmed by Signalman Strong, whose evidence, like that of Mr. Fell, was frank and reliable. He said that though he had had a block switch ever since he had been a signalman (20 years at Langwathby), and although he knew that the Regulation on the subject provided that the telephone was to be used before switching-in, to ascertain the state of the section, and after switching-out to ascertain if the through circuit is in order, he had not carried out the instruction, and no one had ever suggested that he was wrong.

Similarly Signalman Lane of Lazonby stated that he had not considered it necessary to telephone before using the block switch (which had been installed there for only about 12 months), the switch being of the 3-position type; in consequence, he had not reported the failure in this respect, which was taking place daily, and Station Master J. Rae concurred for the same reason. The latter had not discussed the Regulation with the signalmen to see whether they understood it.

11. With regard to Hannah's training for his duties, his career and experience have been referred to, and District Controller Willson, who is responsible for operation in the Carlisle area, gave evidence as follows:—

" I had him under my supervision at Carlisle No. 9, and he was there from 10 to 11 months. (By the record, the actual dates were 28.4.31 to 2.11.31, just over 6 months). Whilst he was at that box I frequently saw him myself as I was continually passing it, and the man seemed to do his work quite all right, although he was very quiet in manner.

" During his period here (Carlisle) I had no complaints of any kind about him, nor have I seen any record of any misdemeanour on his service card.

" When he came back to my district on March 27th this year he was appointed to Little Salkeld as Porter-Signalman and my assistant, within a day or two, went to Little Salkeld to see him and give him some general ideas of the place, the traffic, the Block Instruments and the methods of manipulation. I remember he came back and said it would take Hannah a little time to grasp the Midland Block as it is strange to him, and I told him that under no circumstances must he be rushed.

" Some days after that Mr. Turner went again and he saw the Station Master at Langwathby, and he came back and suggested to me it would be better for Hannah to learn at Langwathby than at Little Salkeld because Little Salkeld being opened only for a short time each day, the man did not get a good chance of becoming intimately familiar with the Block Instruments. I agreed and Hannah was sent to Langwathby and I believe he was there a week, and towards the expiration of three weeks the Staff Office were pressing me to get him appointed, but I held out until he had had three weeks training, explaining to the Staff Office that the new instruments necessitated the man being perfectly competent.

" At the end of that period, Leslie saw Hannah and he assured me that he spent well over two or three hours with him, explaining in detail the manipulation of the block instruments and their method of working, and he was quite satisfied that Hannah was averagely competent. I have been at Little Salkeld once or twice during the period Hannah has been there and as far as I could see the work was going on all right.

"I think now he is obviously not competent. As he is to-day he is certainly not, but before, although diffident, you would not take him to be incompetent. He could talk common sense and seemed to be very little below the average type of intelligence of the men we get.

. . . . . .

"My assistant and Inspector Leslie assure me he was shown thoroughly how to use the instruments and in view of the fact that he was sent to Langwathby I think he was given a good training. I believe Leslie was in the box a few days before and saw him opening." (This is contradicted by Leslie.)

Assistant Inspector Leslie stated that he passed Hannah, having examined him in block working, including switching in and out. He instructed him as to why, if the forward indicator showed Train-on-Line, he should alter his indicator. He made Hannah "*go through the thing thoroughly in order to satisfy myself, and he pegged correctly.*" He was satisfied that Hannah was competent, and he had received good reports of him. Though as a rule he paid periodical visits, he had not been to Little Salkeld to see Hannah since he was appointed.

District Inspector Turner stated he tested Hannah at Little Salkeld, on the 22nd June, in connection with the annual examination on Rules and Regulations, preparatory to the yearly certificate. Hannah was slow in answering the questions, but Turner thought him fit for his duties, and "*a suitable type of man to act in the capacity of signalman.*" There had been no cause for complaint while Hannah was at Carlisle, and Turner referred to him as a "*common sense fellow of a shy disposition.*"

Conclusion.

12. It is quite clear that the cause of this regrettable accident was Porter-Signalman A. Hannah's admitted and serious irregularities in connection with the switching-in of Little Salkeld Signal Box.

I am also satisfied that no responsibility rests upon Driver J. Slee or upon Fireman E. Brown; both have very good records, and the former was obviously a frank and entirely trustworthy witness.

The evidence of Guard Graham, and the calculations and tests which I made, indicate that at any rate the engine of the express had passed the distant signal in its clear position before this signal was returned to its warning position. In the circumstances explained, I should not have expected that Slee could have taken action by brake application even to mitigate the force of the collision.

I do not think that any good purpose will be served by discussing at length the various alternatives which occur to the mind as to what Hannah and Lane did, or did not do, in connection with their block operations. They contradicted each other, and were not reliable witnesses.

With regard to Hannah, it would appear, according to his statement, that he was ignorant of, and had not been instructed in, the significance of the operation of the block switch firstly to its "intermediate" position. Whether this had any bearing upon his action is perhaps a matter for conjecture, but it does not seem to affect the main issue. On the other hand, the explanation may be merely that he was not conscientious enough to operate the switch in the prescribed manner, or untruthful enough to make this an excuse for his failure and for the suggestion that the blocking-back signal was sent, even though the transmission of this signal would not have been permissible.

Whatever happened, however, it is evident that he failed, in the first place, to telephone in accordance with Regulation 24 (*b*), to "*ascertain what trains, if any, are in the section.*" Had he done so, the accident would probably not have occurred, as he would presumably have been reminded by this means that the express had only just passed Lazonby.

In the second place, besides admittedly failing altogether to examine his block indicator from Langwathby, which would also have given him all the information he required, he disregarded the fundamental and simple principle that, before acting as though the express had passed his post, he should have observed the train, or should have waited to receive the out-of-section signal for it from Langwathby, in accordance with Regulation 24 (*c*).

Indeed, I think that Hannah, having improperly left the station for his dinner, found himself, on return, taken by surprise by the early arrival of the goods train; he therefore hurriedly went to the box, and without any thought

or sense of responsibility (the engine by that time having possibly already come to a stand preparatory to the propelling movement) he replaced the signals, set the crossover, and permitted the shunt to proceed. His conversation with Graham perhaps indicates that he was irritated, and he appears to be a man of nervous, though quiet, disposition.

There is Graham's evidence that he heard no belling, and Fireman Briscoe's statement to the effect that Hannah was doing this when the propelling movement was about to commence. It appears, therefore, that Hannah might even have acted before completing the transmission of the long " opening " signals in each direction. In the words of Mr. C. G. Willson, District Controller, Carlisle :—

> " The whole thing gives the impression that he rushed into the box and possibly put his signals to danger before even touching his instruments. It seems like temporary mental aberration."

13. The circumstances, however, present certain features which will undoubtedly receive the Company's consideration.

Firstly, it would appear that Hannah is not a man who should have been trusted to act in a responsible position without close supervision. Secondly, his competence in, and understanding of, the principles of block working must obviously be in grave doubt, whatever his knowledge was thought to have been when he was appointed to take charge at Little Salkeld. Thirdly, there is the question of the general obedience to Regulation 24 on this section of the Midland Division, in respect of the use of the telephone.

Under present day conditions, when country station masters are responsible for the supervision of the staff at more than one station, it becomes increasingly necessary, particularly on main lines, to employ only men of character, who can be implicitly relied upon. This especially applies to those responsible for the safety of train operation such as signalmen; hitherto the service has been generally fortunate in its choice in this respect, and it is to be hoped that this will continue.

At the same time the efficient recruitment, selection and certification of such staff are of the greatest importance to the well being of the whole organisation; these duties throw heavy responsibility upon such officials as the District Controller at Carlisle and his Signalmen's Inspectors. These men should essentially be willing and capable of judging character and ability without fear or partiality, and much care and conscientious work is expected of them.

I do not think that Hannah was really fitted for main line operation, and he certainly proved that he was not competent to hold the position which he occupied; to that extent, therefore, as indeed the District Controller admitted, the selective and supervisory organisation unwittingly failed in this instance, even though Hannah had passed examinations as recently as April and June.

With regard to the failure to comply with Regulation 24, in respect of the use of the telephone, each Company promulgates its own instructions in connection with the opening and closing of signal boxes which are equipped with block switches.

There is a good deal to be said for the view that the prior use of the telephone might weaken the significance of the block, and that sole reliance upon three-position indicators is desirable and indeed sufficient. From examination of other Codes, I gather that one Company does not require this prior use of the telephone when these instruments exist, while another Company calls for its use merely for the purpose of notification as to the names of boxes, and not for the purpose of ascertaining whether trains are signalled in the section.

There is, however, no reason to criticise the Regulation in question, which in effect provides for the use of the telephone as an additional precaution; but it is clear that Clauses (*b*) and (*i*), in this respect, were not being observed on this section of line, and, in view of the circumstances explained, such infringement, without authority, is to be strongly deprecated. Corresponding considerations, in connection with cognate matters, were noted and referred to three years ago, in the Report upon the neighbouring accident between Culgaith and Langwathby.

14. I have no recommendations to make, and it is perhaps as well to state that it would be quite impracticable to take steps universally (by interlocking,

track circuiting, etc.) to safeguard irresponsible failure of the kind in question. Indeed, it is desirable to emphasise, in conclusion, the extraordinary immunity from accident in connection with the opening of signal boxes.

I can only find one precedent, namely, the accident at Cleckheaton on the 25th December, 1905. Perhaps the daily incidence of such operations is not fully realised; on the Midland Division alone of this system the number of boxes which are closed for any period during a week-day, when the section of line affected is open, is 201, or 17.2 per cent. of the total number of boxes.

Such information gives some idea of the constant, and probably growing, incidence of the closing and opening of signal boxes throughout the country, each occasion necessitating rigid adherence to Regulations, upon which the safety of railway operation is mainly based.

It speaks well for the extreme care which is generally exercised by signalmen, and the fact that this isolated failure, on the part of one man who seems to have lost his head, has taken place, in no way suggests that there is any laxity or weakening in discipline with which the Company cannot adequately deal.

I have the honour to be,

Sir,

Your obedient Servant,

A. H. L. MOUNT,

Lieut.-Colonel.

The Secretary,

Ministry of Transport.

Note.—The Coroner's Inquest on the deceased driver was adjourned and Porter-signalman A. Hannah was summoned to appear at the Penrith County Police Court on the 27th September, when he was committed for trial on a charge of manslaughter. At the Cumberland Assizes, Carlisle, on the 11th October, the Jury returned a verdict of " Not Guilty " and Hannah was acquitted.

At the resumed Inquest on the 17th October, the Jury returned a verdict that driver F. Shaughnessy " died from injuries received in an accidental collision " between a goods train and a passenger train at Little Salkeld in the County of " Cumberland on the 10th July, 1933 ".

APPENDIX I.

Damage to Engine No. 1010.

Roof of Firebox slightly scorched.
Front buffer beam badly damaged, and R.H. buffer torn off.
R.H. low pressure cylinder and frame broken off, and piston rod and connecting rod bent.
R.H. engine footplate damaged. All engine and tender footsteps damaged.
Both injectors and all feed and steam pipes broken, also vacuum pipes broken off.
Brake gear, sand boxes and pipes broken off. Engine cab damaged.
All valve gear damaged; eccentrics and reversing shaft strained.
All tender axleboxes broken. Water scoop broken off.
Front mudholes on firebox damaged. L.H. side of tender frame bent.
Tender brake screw column broken off. Both intermediate buffer beams broken.
Engine and tender wheels ⅛ inch out of gauge.

Damage to Engine No. 4091.

Engine buffer beam R.H. side badly bent.
All R.H. engine footplate torn off.
Reversing gear, shaft, screw and trailing splasher carried away.
Side rods bent. Boiler sheeting and engine cab torn off.
R. leading sand box smashed off.
Both intermediate buffer beams damaged, R.H. side.
All brake rods and hangers damaged.
All tender horn blocks, axleboxes and springs R.H. side, broken off.
Tender footplate and R.H. side of tank damaged.
All engine and tender footsteps R.H. side broken.
Sand traps and pipes L.H. side broken.
Vacuum pipes broken.

APPENDIX II.

Damage to Rolling Stock of the Express.

727605. L. & N.E. 6-wheel 7-ton Yeast Van.
Completely demolished.

5192. L.M.S. Standard Corr. Bogie Third Brake.
Derailed all wheels. Bogies badly damaged and buried. Solebars and headstocks bent. Ends damaged. R.H. Trailing Corridor side torn away 25 feet the steelwork being badly twisted and torn. R.H. leading corr. side badly damaged. Lights broken. Bottom panels damaged. R.H. Footboards and irons torn away. Gangways badly damaged. Buffer locked trailing end. Left side grazed. Three axleboxes broken, etc.

1381. L.M.S. Corr. Bogie Third.
Derailed all wheels. Bogies badly damaged and buried. Solebars damaged. Headstock badly bent. Stepboards torn away. End panels damaged. Lights smashed. Right hand leading bottom panels torn away 30 feet and body framing broken. Seats displaced, door and commode handles broken, step irons broken. Gangways badly damaged. Buffer locked both ends. Panels damaged. Left hand trailing body side torn away 20 feet and corridor partition broken inside. Five axleboxes broken, etc.

7713. L.M.S. Vestibule Bogie Third.
Derailed all wheels. Ends damaged. Leading right side torn away 5 feet. Right side panels damaged and lights broken. Leading right door broken. Bogie damaged and buried. Solebar bent. Stepboards broken. Gangways damaged. Buffer locked both ends. One axlebox broken. Two buffer rods bent, etc.

91. L.M.S. (Mid) First Dining Car.
Derailed all wheels. Both ends stove in, leading right side of body torn away 20 feet and trailing right side torn away 8 feet. Side panels smashed, and lights smashed (Right side). Kitchen smashed up. Buffer locked leading end. Footboards torn away. Bogies damaged and buried. Axleboxes broken. Headstock damaged, etc.

8110. L.M.S. (LNW) Corr. Bogie Compo.
Derailed leading bogie and leading right wheel on trailing bogie. Footboard and irons torn away. Leading half of body side torn away. Bottom panels broken. Both end panels broken. Seat displaced. Side lights smashed. Headstocks damaged. Axleboxes broken. Fuse box broken. All damage on right side.

5450. L.M.S. (Standard) Corr. Bogie Third Brake.
Dynamo belt broken.

Damage to Rolling Stock of the Freight Train.

11107. L.M.S. (Mid). 30-ton Steel Bogie Rail Wagon.

Body badly bent and twisted, both bogies torn out and badly damaged, two buffers torn off.

49851. L.M.S. 30 tons Steel Bogie Rail Wagon.

Both bogies torn out, and bogie centre pins broken, one bogie friction block broken, wheel tyres badly cut, 2 axleboxes broken, one bearing damaged, one buffer broken off, one steel headstock bent.

H. 8090. G.C. Rly. Hired Wagon. 12-tons oak frame.

Both solebars, both headstocks, both side rails, 6 end planks and 7 end door planks, all badly damaged, 3 buffer castings, 2 grease axleboxes, and 1 bearing spring shoe broken, axleguards and brakework bent and twisted, wheel tyres and flanges cut.

724565. L. & N.E. (NB). 10-tons Covered Goods.

One buffer casting, door moulding and 3 end boards broken, buffer rods bent.

71184. L.M.S. (Mid). 8-tons Highside.

Completely broken up.

148101. L. & N.E. 12-tons standard oak frame wagon.

Both solebars, all planks of one quarter and one end badly broken, one diagonal and one longitudinal damaged, one pair of wheels torn out and badly cut, body of wagon badly racked.

713078. L. & N.E. (N.B.) 10-tons Covered Goods.

One end pillar broken, buffer rods and axleguards bent, wheel tyres cut.

28513. L.M.S. (Mid.) 8-tons Covered Goods.

One buffer rod bent and casting bolts broken.

APPENDIX III.

Damage to Permanent Way and Signalling.

Up and Down Lines.

1 Set of 85 lb. M.R. Switches badly damaged
1 R.B.S. 95 lb. Crossing badly damaged.
228½ yards of M.R. 85 lb. Rail badly bent.
3 60 feet, 1 59/11 R.B.S. 95 lb. Rails badly bent.
5 R.B.S. 95 lb. Crossing chairs broken.
15 R.B.S. 95 lb. Check Chairs broken.
11 R.B.S. 95 lb. S.1. Chairs broken.
103 Plain Sleepers Ordinary broken.
2 Plain Sleepers Joint broken.
186 85 lb. M.R. 8-inch Chairs broken.
100 Galvanised Screws badly bent.
20 E.L. Bolts (Fish) broken.
567 Lin feet Crossing timber badly damaged.

Sidings.

4 sets of points (S. & C.) broken up.
1 set of 1 in 8 S. & C. Angles broken up.
2 1 in 8, S. & C. Crossing broken up.
57¼ yards S. & C. Rail badly bent and broken.
8 yards L. & H. Rail badly bent and broken.
22⅝ yards 85 lb. M.R. Rail badly bent and broken.
55 8-inch S. & C. Chairs broken.
50 8-inch 85 lb. M.R. Chairs broken.
4 85 lb. M.R. Fishplates broken.
2 S. & C. Clip plates broken.
14 Fishbolts broken.
39 Spikes badly bent.
47 Plain ordinary sleepers broken.
388 Lin feet Crossing timber broken up.
10 Point stretcher rods badly bent.
1 6-foot Connecting Rod broken.
1 Point Box and Handle broken.

Signalling Equipment.

2 Cranks torn off.
3 Rods badly bent in several places.
6 Wire posts displaced.
2 Detectors smashed.
1 Shunt signal demolished.

APPENDIX IV

EXTRACT FROM L.M.S.R. DOUBLE LINE BLOCK TELEGRAPH REGULATIONS.

Regulation 24.

24. *Opening and closing of signal-boxes where switches are provided.*—(*a*) At signal-boxes which are not open continuously, switches are provided to enable the boxes on either side to be put in through communication.

Opening (5—5—5).

(*b*) The signalman on taking duty must give notice to the boxes he communicates with by speaking instrument where available, and ascertain what trains, if any, are in the section. If the sections are clear he must at once place all the fixed signals at *Danger*, but if a section is occupied he must be careful not to do so in face of a train which may be travelling in the section towards him.

Where two position switches are provided the signalman must open the switch or switches and give the *Opening* signal to the signal-box on each side, which must be acknowledged. He must then place the block indicator for the rear section in accordance with the block indicator for the section in advance.

Where three position switches are provided the signalman must turn the switch or switches to the intermediate position, and if all the block indicators remain in the normal position the switch must be immediately turned to *Open* and the *Opening* signal sent to the signal-box on each side, which must be acknowledged. If on turning the switch to the intermediate position any of the block indicators point to *Line Clear* or *Train on line* position the handles or commutators of the block instruments must be so secured or turned that the position of the indicators may remain unaltered, the switch to be then turned to *Open* and the *Opening* signal sent to the signal-box on each side.

At signal-boxes where the block indicator cannot be placed to the *Line clear* position unless the home signal lever or levers for the line to which the block indicator applies are in the normal position, the signalman, before opening the switch, must ascertain whether the block indicator for the section in advance is in the *Line clear* position. If so, the switch must not be opened until it has been ascertained that the block indicator at the box in advance has been placed to the *Train on line* or normal position. Should the block indicator at the box in advance be in the *Line clear* position and some time is likely to elapse before the *Train entering section* signal is sent from the box in rear, the signalman at the box about to be opened must advise the signalman in rear of the circumstances and arrangements made for the *Is line clear* signal to be cancelled to enable the signal-box to be opened.

(*c*) If at the time the switch is opened the block indicator for the section in advance shows *Train on line*, the signalman must not give the *Train out of section* signal until the train has passed his signal-box or the *Train out of section* signal has been received from the box in advance.

Clauses (*b*) *and* (*c*) *do not apply where one-wire three-position instruments are in use.* (*See regulation in General Instructions to signalmen.*)

(*d*) When a signal-box which is usually closed during the time trains are running, is open specially, or opened earlier, or kept open later than usual, or when a signal-box that is only switched in when required is open, without notice to drivers and others, the signalman at that box must not acknowledge the *Is line clear* signal for any train to approach until the *Is line clear* signal has been acknowledged by the signalman in advance. If, however, the *Is line clear* signal has not been acknowledged by the signalman in advance, but the line is clear in accordance with Regulation 4 or as laid down in clause (*f*) of Regulation 14, the train may be allowed to approach in accordance with Regulation 5, and the signalman receiving the *Warning* signal must advise the driver that the box in advance usually switched out, is open.

Closing (7—5—5).

(*e*) When a signal-box is required to be closed the *Closing* signal must be sent to the signal-boxes on each side, provided :—

(i) That there are no trains in the section, or
(ii) That the signalman in advance has accepted the *Is line clear* signal for a train which has been given permission to approach from the box in rear.

If the *Train entering section* signal has been received, it must be forwarded to and acknowledged by the box in advance before the *Closing* signal is given.

Upon receiving the acknowledgment in reply to the *Closing* signal the switch may be closed, and the block indicators placed to the normal position, if not already in that position.

If the *Train out of section* signal for the previous train has not been received from, or the signal *Blocking back outside home signal* has been acknowledged to the signal-box in advance at the time of closing, the signalman at the signal-box about to be closed must give the special bell signal (5—1) to the signal-box in rear.

If the bell signal (2—1) has been received in accordance with clause (*f*) of Regulation 5 or the signal *Blocking back inside home signal* has been acknowledged to the signal-box in advance, the special bell signal (1—5) must be given to the signal-box in rear.

When either the (5—1) or (1—5) special bell signal has been acknowledged by repetition the block indicator for the rear section must be placed to the *Train on line* position before giving the *Closing* signal.

Should the special bell signal (5—1) be received by a signalman from a box about to be closed the *Is line clear* signal for another train must not be forwarded until the *Train out of section* or *Obstruction removed* signal has been received, but should the special bell signal (1—5) be received the signalman must act in accordance with Regulation 5, clause (*f*), or Regulation 13A, clause (*d*).

(*f*) The signalmen on each side of the closed box must immediately give to each other the signal (3—2—1), to test whether through communication has been established between them.

(*g*) Where there are more than two lines of way the *Opening* and *Closing* signals must be given on each instrument in each direction and also the signal (3—2—1).

(*h*) Except where instructions are issued to the contrary, a signal-box must not be switched out when any failure exists in connection with the block instruments, bells, signals, points, or interlocking apparatus, nor if a failure has been rectified, until the last train allowed to proceed cautiously has passed through the section with the notice prescribed in Regulation 25.

(*i*) When the signalman has switched his box out of circuit, he must ascertain by speaking instrument, where practicable, that through communication has been established by the signalman on either side. He must then (unless instructions are issued to the contrary) take off all the fixed signals applicable to trains passing his box on the lines to which the block indicators apply, extinguish his fire and lights (except such as require to be left burning), secure and lock up the box.

(*k*) At a signal-box where the signal controlling trains into the section in advance is released by the block indicator being placed to *Line clear* such signal-box must not be switched out until the *Train out of section* or *Obstruction removed* signal has been received and the block indicator for the section in advance is in the normal position.

The signalman before giving the *Closing* signal must give to the signalman in advance the bell signal *Place block indicator to line clear to release lock on signal* (3—3—3) and on receipt of this signal the signalman in advance must place the block indicator to *Line clear*. When the block indicator shows *Line clear* the signalman requiring to close must take off the controlled signal and then give the bell signal, *Signal taken off, replace block indicator to normal position* (4—1—3) and when this has been done the *Closing* signal must be given in the ordinary way.

(20612—361) Wt. 1691—162 665 11/38 P St. G. 8/13