

CHAPTER III.

SINGLE LINE WORKING.

45. No more important duty devolves upon the speaking telegraph than that required of it for the regulation of traffic on single lines of railway. Here it is invaluable, and without its aid whenever a train gets out of course delay must arise, sufficient perhaps to derange the entire service for hours. The working of single lines is one of the most onerous duties imposed upon a railway officer, and this increases with every increase of traffic, and in every case in which it becomes in the least out of course. These remarks are *not* applicable to sections of line worked by the *Train Staff*, for where the traffic is governed by it, delay is at times inevitable. With a telegraph service properly regulated, carefully administered, and efficiently supervised, not only need no danger exist, but delay may be reduced to a minimum.

46. The running of all regular trains, with their appointed crossing places, is usually set forth in the monthly service time tables; the running of all pre-arranged special traffic in the weekly working sheets; but where specials are required at so short a notice as to preclude the issue of printed notices, then written orders as to the crossing points, and other particulars, should, where time and means will admit, be sent forward and

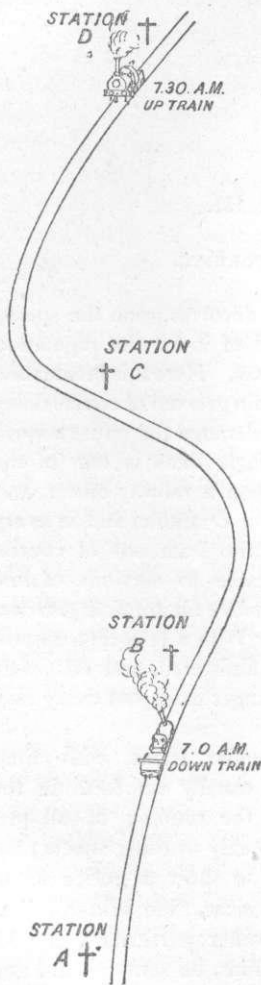


FIG. 12.

delivered personally by a responsible officer to every agent or his representative, on the single line section. Failing this, recourse must be had to the telegraph.

47. Dealing first with the crossing of trains, the running of which have been set down in the printed service sheets or time tables:—

It is very desirable that the running of all trains should be reported to the superintendent of the line from certain points selected by that officer, in order that he may be kept acquainted with their movements, and be prepared in good time to rearrange their crossing points should they get out of order.

Take now the following example:—

Let *A, B, C, D*, be a section of line with stations as indicated by the letters. Let it be assumed that at each station there is proper crossing convenience. Two trains proceeding in opposite directions are upon it, viz., the 7.0 A.M. down and 7.30 A.M. up train,

and they are timed to cross each other ordinarily at *B*, but the up train is sufficiently behind time to admit of the down train proceeding to *C*. It is evident that delay will ensue to the 7.0 down train if it is kept at *B* for the arrival of the 7.30 up, and that this will be greatly reduced if it is sent on to *C* to cross the latter there.

48. To effect this we must first arrange for holding the 7.30 up at *C* for the arrival of the down train there, and **not until this has been done** must the down train be ordered forward. All this should be done in the surest manner possible, with perfect order and regularity, and under a preconcerted system.

The following system is one which has stood the test of a number of years working with great success.¹

49. Each station is provided with specially provided message forms, applicable solely to crossing trains. These forms are made up into pads, of which each station is supplied with four kinds. Two of these are composed of red and white forms arranged alternately; the other two being composed of green and white forms similarly arranged. One of the red pads is headed "Order for train not to proceed on journey," and is used only for the receipt of messages of that character. On the back of the red form, on which the message as received from the instrument is written, is a printed form headed "*Special Order to Engineman and Guard not to proceed on journey,*" which has to be filled in, subject to the contents of the message, and signed by the station agent.

50. The other red pad is for the station-master's reply, and bears no endorsement to the engine-driver and guard.

51. One of the green pads consists of forms headed

¹ In the Appendix will also be found specimens of forms employed for crossing purposes by the Midland Great Western Railway of Ireland.

"Order for train TO PROCEED on journey," and bears on the back of each green leaf an endorsement headed "Special Order to Engineman and Guard TO PROCEED on journey," which has similarly to be filled up, subject to the contents of the message, and signed by the station agent.

52. The other green pad consists of similar forms, but with the heading "Agent's Reply," and without the special order on the back.

Specimens of these forms are given in the Appendix.

53. Now it will be borne in mind that the first proceeding is to stop the 7.30 up train at *C*, and the next proceeding to bring the 7.0 down train on to *C*. Two operations of a distinct character are involved. Two distinct characters of forms have been provided, the one red, the other green. Two distinctive prefixes to indicate the character of the message to be sent are needed. Let us take **SPR** for that applying to the red forms, and **SPG** for that applying to the green forms. *SPR* will consequently represent the prefix for orders *not to proceed*, and *SPG* for orders *to proceed*.

54. The crossing agent will first telegraph *C*—

SPR—"Keep 7.30 A.M. up train from _____ at *C* till 7.0 A.M. down train from _____ has arrived at *C*."

The clerk at *C* repeats this back to the office from whence it originated, and then, having filled in the time, date, &c., and signed it, hands it to the agent.

The agent at *C* has now to arrange for stopping the up train. His first duty is *to see* that the up signals—*home* and *distant*—are put on for this purpose. This done, he acknowledges the receipt of the order in the following terms :—

SPR—"I will keep 7.30 A.M. up train from _____ at *C* till 7.0 A.M. down train from _____ has arrived at *C*."

55. He then fills up and signs, in ink, the form headed "Order to Engineman and Guard NOT to proceed on journey," and on the arrival of the 7.30 up train he has to show the same (with the telegram on the reverse) to the guard, and when he (the guard) has read it, he should hand it to the engine-driver and both should attend to it.

56. In the meanwhile the crossing agent *on the receipt of the reply* "I will keep," &c., from *C*, has telegraphed Station *B*—

SPG—"Send 7.0 A.M. down train from _____ on to *C* to pass 7.30 A.M. up train from _____ at *C*."

which has in like manner to be repeated by the clerk at *C*, and handed to the agent, who replies—

SPG—"I will send 7.0 A.M. down train from _____ on to *C* to pass 7.30 A.M. up train from _____ at *C*."

57. The agent then fills in and signs, in ink, the green form headed "Special Order to Engineman and Guard to proceed on journey," which order he shows, with the telegram on the reverse, to the guard of the 7.0 down train, and when the guard has read it, passes it to the engine-driver, and it is to them a sufficient authority to proceed accordingly.

58. The trains having crossed at *C*, the agent there advises the crossing agent by

TA—"7.0 down and 7.30 up trains crossed at *C* at _____" (specifying the time).

and the transaction is then complete.

59. We now come to the working of **specials for which no provision has been made in the printed time tables or service sheets.**

The running of any such train, its crossing points, &c., should be arranged *before* it is allowed to start. Every station on the line should be advised of its running, and all crossing stations duly instructed. Three classes of messages will thus be needed; one arranging the crossings, one advising the trains to be crossed of their crossing points, and the other the simple advice of the running of the train. The crossing stations should be notified first in the following form.

60. **SP.**—Superintendent ——— to Agent *C*.

“A special will leave Portsmouth for London at 9.30 A.M., and should arrive at *C* at 10.0 A.M. Keep 8.0 A.M. down train from London till the 9.30 A.M. up special arrives, and cross them at *C*.”

61. And to this the agent at *C* should reply—

SP.—Agent *C*, to Superintendent ———.

“I will keep the 8.0 A.M. down train from London at *C* till the 9.30 A.M. up special from Portsmouth arrives, and cross them at *C*.”

62. Superintendent ——— to Agent *B*.

“Advise driver and guards of 8.0 A.M. down train from London that a special leaves Portsmouth at 9.30 A.M. for London, and that the 8.0 A.M. down train must cross it at *C*.”

63. To this *B* will reply—

SP.—Agent *B*, to Superintendent ———.

“I will advise the driver and guards of the 8.0 A.M. down train from London that a special leaves Portsmouth at 9.30 A.M. for London, and that the 8.0 A.M. down train must cross it at *C*.”

64. There now remains the ordinary advice, which would assume the following shape—

SP.—Superintendent ——— to Agent *A*.

“A special leaves Portsmouth at 9.30 A.M. for London, and should pass *A* at ——— A.M.”

65. *A* will repeat this in order to insure correctness, and all other stations should be advised in a similar manner.

66. When this has been done, **and not until then**, the order should be sent to Portsmouth to start the train. The time at which it should start, at which it should pass certain stations, and at which it should cross or pass other trains should be clearly stated, and the whole repeated back to insure correctness. A copy of the message, written in ink, and signed by the agent, should be given to the driver and to the guard, and it should be read to them in each other's presence by the officer in charge of the station.

It will be obvious that the examples given are merely *examples*, and have no connection with the actual working of any section of line. It is improbable any company would make use of a single line route, for a special of such a character as that instanced, when an alternative double line route is open to it.

67. It is equally obvious that at any and all such times as the services of the telegraph cannot be obtained, no such arrangements as those indicated can be made, and

hence no such special should be run. To run such a train, whether during the night or day, without such advice, in writing if possible, if not, then by telegraph, would be hazardous in the extreme.

68. The following points, in connection with the signalling of crossing orders, or special working on single lines, should be carefully observed.

69. The telegraph should in all cases be regarded merely as an auxiliary and never as a primary agent.

70. It is the duty of the clerk to receive and transmit the messages. *It is the duty of the agent to carry out the instructions contained in them.*

71. All messages should be *written and signed by the officer in whose name they are sent prior to their transmission by telegraph.* All received messages addressed to him should obtain his signature with the time at which they reach him.

72. Every exertion should be made to keep the wires free, and to secure prompt attention in moments of emergency. *It is when difficulties occur that the patience, skill, and value of an officer is shown,* and this should be borne in mind by every telegraphist. Should trains be delayed beyond their usual time, the wires should not be occupied by useless questions as to their whereabouts. The officer intrusted with the working of the line is the proper authority to make inquiries, and if those interested will watch the instrument all the information sent him will be at their service. Above all is it necessary to avoid quarrelling, obstinacy, and irritable conduct of every description on the instrument.

73. For the reason that should one wire be interrupted, there remains the other to use as a single needle, double needle circuits are preferable for single line working.

CHAPTER IV.

SUPERVISION AND CIRCUIT ARRANGEMENT.

74. IT will be readily understood that a system to be effectual must be under *good, careful, and constant supervision.* The staff employed upon single lines should be in every way competent for the duties required; acquainted with the system of working; good telegraphists, possessing, where the double needle is in use, a thorough knowledge of the single needle; and, if possible, having some knowledge of the traffic. All inattention and misconduct should be sharply suppressed, and care taken to see that, not only the clerks, but that the station-masters themselves, perform their allotted duties. All messages should be collected once a week, and checked for errors, irregularities, &c. All crossing orders and *SPs* should be very carefully examined, in order to see that the rules, under which the system is worked, have due effect, and no hesitation should be felt in bringing under the notice of the traffic manager the least departure therefrom. It must be remembered that great responsibility rests with all concerned in dealing with crossing orders, or with messages of any description having reference to the movement of trains; and that any laxity, involving the slightest departure from rules laid down for the government of this important duty, will, sooner or

later, in all probability, produce fatal results; messages upon this subject cannot therefore receive too much care or be dealt with with too much exactitude by those to whom they are intrusted.

75. It is only by such measures, by a periodical inspection of each station, and a careful observation of the conduct and behaviour of every individual concerned, that exactitude can be hoped for, and it is not too much to say that, this obtained, will amply repay any reasonable cost incurred in effecting it.

ARRANGEMENT OF CIRCUITS.

76. Convenience and despatch in all branches of a telegraph service must depend, in a great measure, upon the *arrangement of the circuits*.

77. The head-quarters of every Railway Company should have, if possible, direct communication with all its principal centres, and with the head-quarters of its divisional officers.

78. The head-quarters of each divisional officer should have direct communication with every junction station, and every important station in his division.

79. Every junction station should have communication with the terminal station of its branches, and as far as possible with all stations upon lines converging upon it.

80. All single lines, whether worked by a single engine, the staff system, or the "block," should be provided with telegraph communication. The single engine may break down; the staff may be forgotten, or the engine carrying it fail; and the "block" may be interrupted.

81. The number of stations or instruments upon a circuit should in no case exceed eight. As a rule railway

circuits are much over crowded. It is not unusual to find them fitted with twelve and even fifteen instruments. There is no doubt some convenience in giving each station upon a line or branch free intercommunication, but this can be done only, where the stations are numerous, at the cost of despatch, or duplication of instruments. A judicious arrangement of the circuits of a railway system will be found to add to the convenience and despatch of its business, and to economise its cost.

82. Where demands exist beyond those indicated, the grouping of stations, and the centralization of circuits should be based upon returns obtained from the actual work done. To this end, transmitting offices should be required to keep a record for a given time of all messages dealt with, showing the station from and station for. These returns, when analyzed, will show in which direction the demand lies—whether it is desirable to reorganize the existing circuit arrangements, or to extend any of those already in operation so as to afford direct communication, and thus avoid the delay which invariably accompanies retransmission, and the cost attending it. It will not unfrequently be found that the extension of a circuit will effect, in clerks' services alone, an annual saving which will largely exceed the interest on the outlay required for the extension of the circuit, and thus a net saving in the annual cost, independent of other obvious advantages, will be the result.