Sept. 12, 1933. S. N. WIGHT ET AL 1,926,863

TRAIN DISPATCHING SYSTEM FOR RAILROADS

Filed Feb. 28, 1928 2 Sheets-Sheet 1

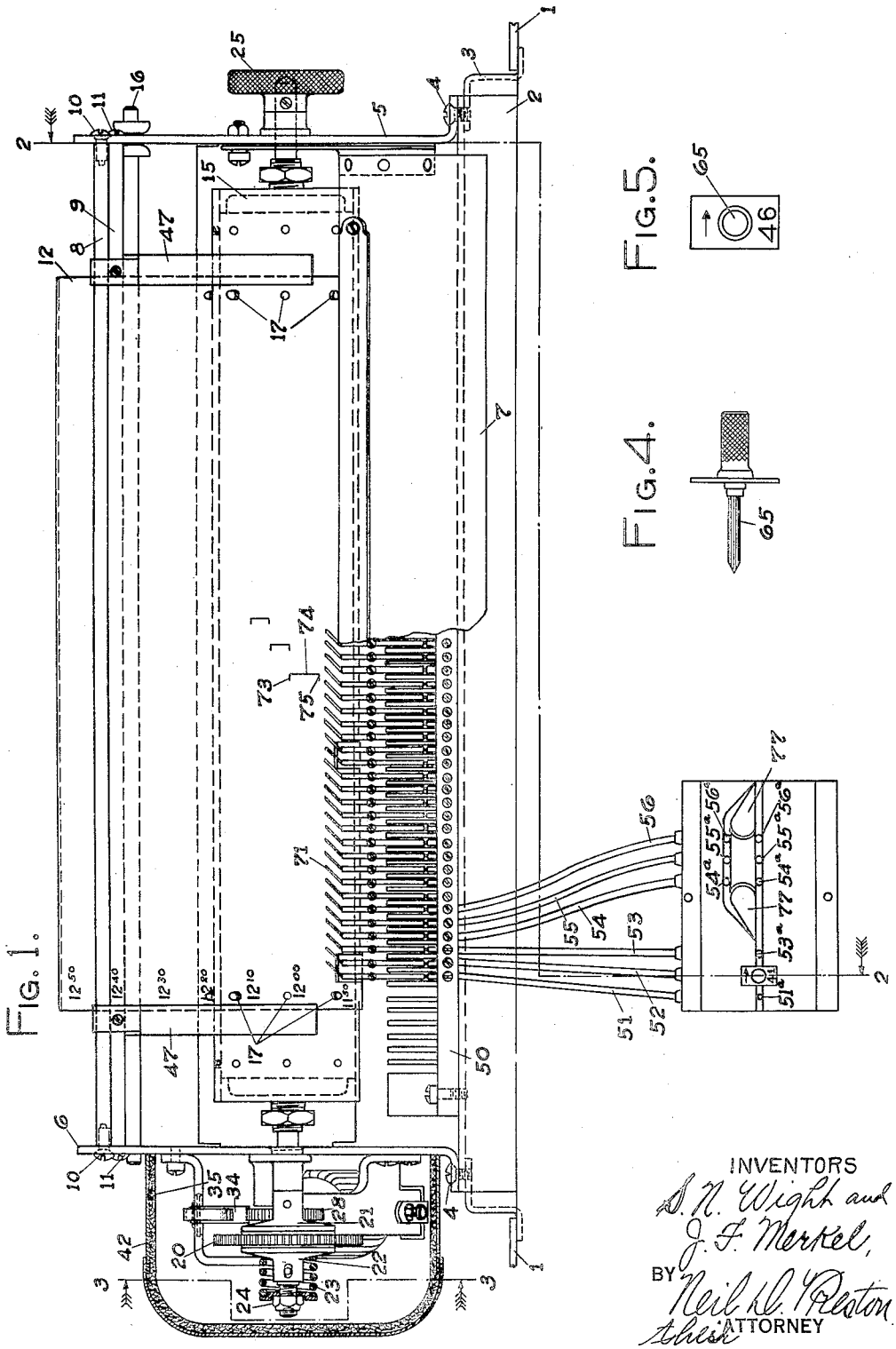


FIG. 1.

FIG. 5.

FIG. 4.

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FIG. 2.

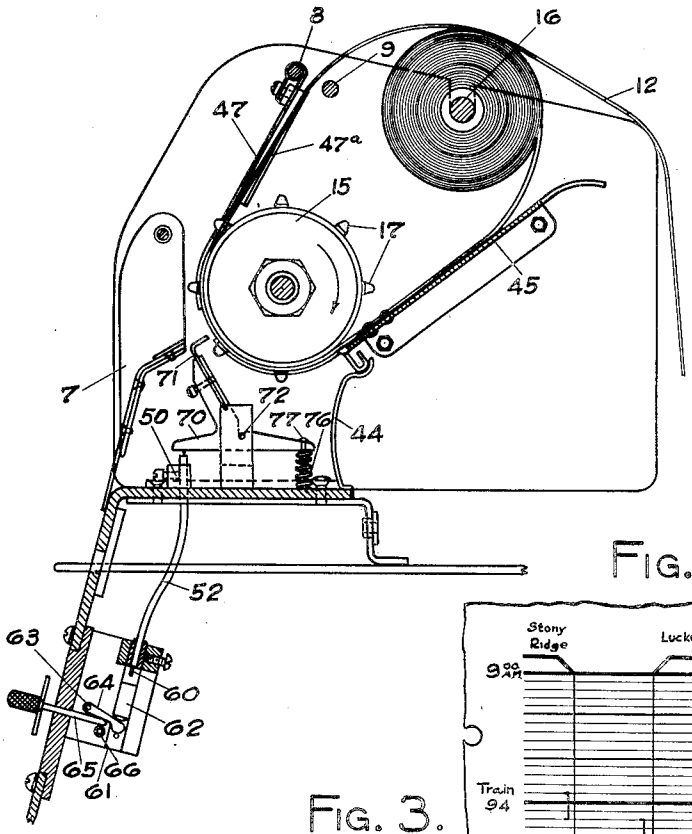


FIG. 6.

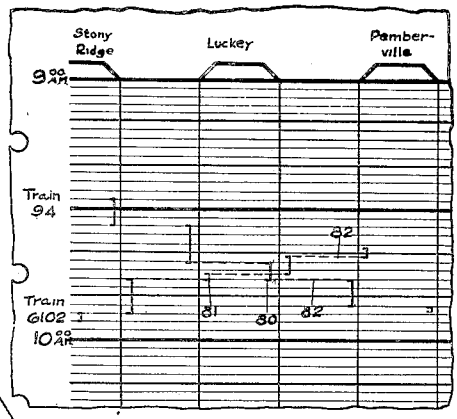
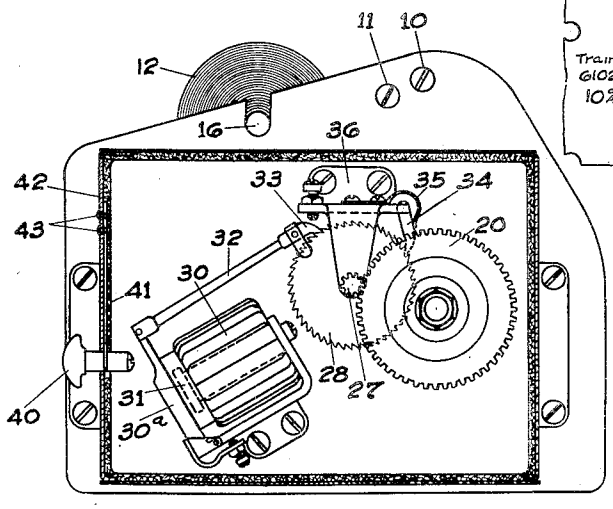


FIG. 3.



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TRAIN DISPATCHING SYSTEM FOR RAILROADS

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Application February 28, 1928. Serial No. 257,644

14 Claims. (Cl. 234—27)

This invention relates to train dispatching systems of the way-side signal indicating type, and more particularly to a recorder for automatically recording the movements of miniature train symbols along a miniature trackway.

In train dispatching system as disclosed in the application of Wight, Ser. No. 120,423 filed July 3, 1926, employing a dispatching machine such as disclosed in the Wight application, filed on the same day as the present application, a miniature track layout is provided in the dispatcher's office enabling the dispatcher to reproduce on a miniature scale the condition of train locations and movements on the railroad. In this train dispatching scheme, indications are transmitted from points along the track to the dispatcher's office informing the dispatcher of the passage of trains by such points and the direction in which such trains are moving. The miniature track layout located in front of the dispatcher is provided with plug holes adapted to receive plugs identifying the various trains, which plugs are advanced from one section to the other as the corresponding train moves from one section to another of the railway system.

In accordance with the present invention it is proposed to superimpose upon the dispatching machine, above mentioned, a recorder in which a paper is moved in accordance with the lapse of time, on which paper a record is made by automatically controlled scribers. It is further proposed to place these scribers in contact with the moving paper at such time only when there is a plug in the hole of the miniature track layout corresponding to such scriber. Another important feature of the present invention resides in the provision of scribers which make a distinctive mark, irrespective of the movement of the paper, when such scriber is brought into and out of contacting relationship with such paper.

Other objects, purposes, and characteristic features of the present invention will be in part obvious from the accompanying drawings and will in part be described hereinafter.

In describing the invention in detail reference will be made to the accompanying drawings in which:—

Fig. 1 illustrates a front view of the recorder with the front cover 7 partially omitted, and the end cover shown in cross section, together with a portion of the miniature track layout forming part of the train dispatching machine disclosed in the co-pending application of Wight above referred to;

Fig. 2 is a cross-sectionally end elevation of the recorder shown in Fig. 2 taken on the line 2—2 of Fig. 1 as viewed in the direction of the arrows;

Fig. 3 shows an end elevation of the time-responsive driving mechanism taken on the line 3—3 as viewed in the direction of the arrows;

Figs. 4 and 5 illustrate side and front views respectively of one form of plug representing a particular train by the number appearing thereon and the direction in which the train is headed by the arrow appearing thereon; and

Fig. 6 shows a portion of an actual train sheet with a train meet recorded thereon.

Referring more particularly to Fig. 1 of the drawings; the plate 1 (shown partly broken away) illustrates the top wall of the dispatching machine disclosed in the co-application of Wight. The main base plate 2 of the recorder embodying the present invention is supported directly by the dispatching machine over an opening cut into the wall 1 thereof, the part of said opening not covered by the plate 2 being closed by strips 3 fastened to the base plate 2 by screws 4. These screws 4 also serve to fasten the end walls 5 and 6 of the recorder to the base plate 2. These end walls are further reinforced by rods 8 and 9 screw fastened to these end walls by screws 10 and 11 respectively.

These end walls 5 and 6 pivotally support the driven roll 15 and a spool or roller 16 containing a suitable sensitized paper 12. The roll 15 is provided with teeth 17 near each end thereof, which teeth may be located at various distances from the end of the roll depending upon the width of the paper used at the particular time. As indicated the paper 12 in the recorder as shown is narrower than what could be used if the closely spaced pins were removed and placed in the holes near the ends of the roll. These teeth are properly spaced about the perifery of the roll to cooperate with holes in the paper. This roll 15, driven in accordance with the lapse of time, is driven by a gear 20 contained between the friction plates 21 and 22, of which the friction plate 22 is spring pressed by a spring 23 against the gear 20, the tension of which may be adjusted by the nut 24.

This frictional connection between gear 20 and the shaft of roll 15 is resorted to so that the roller 15 may be set according to railroad time by operating the knurled knob 25, without moving the gear 20. This gear 20 is driven by the pinion 27, which pinion 27 is contained on the shaft of a ratchet-wheel 28. This ratchet-wheel 28, although it may be driven directly by any suitable time responsive means, is in the particular ar-

rangement shown operated step by step by an electro-magnet having a coil 30, a core 31 and an armature 30^a. The armature 30^a of the electro-magnet through the rod 32 operates the pawl 33 engaging the ratchet-wheel 28. In order to prevent back lash of the wheel 28, the dog 34 urged against the ratchet-teeth of the wheel 28 by a spring 35, is provided. This spring and dog is preferably secured to the bracket 36, which bracket also pivotally supports the pinion 27 and ratchet-wheel 28. Although the roll 15 may be set as to time as heretofore explained by operating the knurled knob 25, if the roll is to be advanced only a very small amount this may be accomplished by mechanically operating the armature by repeatedly depressing the button 40. This button is suitably supported, and as shown is carried by a leaf spring 41 riveted to the casing 42 by rivets 43.

The roll 15 is driven by the electro-magnet in the direction of the arrow (see Fig. 2) thereby drawing paper off of the roller 16 along the guard plate 45, underneath the roll 15 and under the guide strips 47, having a portion 47^a bent to engage the back side of the train sheet 12, secured to the rod 3, this paper or train sheet 12 then passing over the top of the roller 16 to the back of the cabinet where it may drop to the floor and is readily available for inspection.

The guard plate 45 serves as a partial back wall for housing the paper and rolls, these parts being farther enclosed by sheet metal strip 44. On the base plate 2 is mounted a bar 50 having a large number of closely-spaced vertically disposed holes therein for receiving tubes 51, 52, 53, 54, 55, 56 of which the tube 52 is shown in Fig. 2 of the drawings. These tubes are somewhat bendable, preferably being made of brass, and contain flexible steel wires 60. The lower ends of these tubes are fastened in the castings of the miniature track way sections, as shown in Fig. 2, in a manner to allow the wires 60 to project into the cylindrical holes 61 containing slidable plugs 62.

In these castings are pivotally secured as by pins 63 suitable lifters 64 which are lifted upwardly in response to the insertion of symbolic train plugs 65 and in turn lift the slidable plugs 62, which plugs may roll over rollers 66. These train plugs 65 contain the train number and an arrow indicating the direction the train is heading or moving, as more particularly shown in Fig. 5 of the drawings. The upper end of the wires 60 engage the free ends scriber holders 70, containing scribers 71. These scriber holders are readily removable by reason of the fact that the bearing surface of each holder comprises a slit and such holder may be removed if depressed to permit disengagement of such slot with the bearing rod 72 by compressing the spring 76. Each holder 70 has a downwardly projecting pin 77 which serves to center and guide the spring 76 when in engagement with the holder 70, and this construction permits ready disengagement of the spring 76 and holder 70.

These scribers are made of suitable metal preferably bronze so that if they engage suitably sensitized paper, as by saturating or coating it with barium sulphate, a mark will be made on this paper by electrolytic, chemical, or abrasive action all without causing material wear on or consumption of, the scribers 71. Any suitable pens or pencils may of course be used instead of these scribers. These scribers are preferably somewhat flexible and disposed at an angle as shown in Fig. 1 of the drawings, so that if they are pressed against the roller they make a sidewise mark as indicated at 73, they make a vertical mark in response to movement of the roller 15 so long as depressed, as shown at 74, and make another horizontal mark 75 when again lifted in response to removal of the corresponding train plug. This construction of the scribers to make the horizontal marks 73 and 75 is resorted to so that even momentary insertion of a plug in a particular hole will be recorded even though the roll 15 has not moved at all or has moved insufficient distance to be otherwise noticeable. In order to illustrate the relation between the plug holes and the corresponding bendable tubes the plug holes have been assigned reference numbers containing exponent "a". The miniature track layout includes miniature movable switch points 77, the functioning and purpose of which are more particularly described in the Wight application disclosing the dispatching machine.

Referring to Fig. 6 of the drawings there has been shown a portion of the train sheet 12, on which the movement of two trains has been graphically recorded. This train sheet has vertical lines thereon terminating at the ends of passing sidings, of which the passing sidings Stony Ridge, Luckey, and Pemberville only have been shown. Train 94 is moving from west to east and train 6102 is moving from east to west. As indicated by the vertical line 80 the train 94 was the first of the two trains to get within the siding limits of the passing siding Luckey. This vertical line 80 was not only started to be inscribed before the line 81, but further the line 81 was completed before the line 80 was completed. This clearly indicates that the train represented by the line 80, namely, the train 94, because the ends of the vertical lines representing a particular train are always in horizontal alinement, was the first train to reach the siding Luckey and was the last train to leave this siding. In other words, the train 94 is the one that was waiting on the siding in order to allow the train 6102 to pass. If desired horizontal dotted lines may be drawn to connect the various vertical lines representing a particular train, as illustrated by the dotted lines 82. If this is done no difficulty is experienced in determining which vertical lines represent a particular train. The portion of the train sheet illustrated shows that the train 94 entered the passing siding Luckey a 9:42 and left this siding at 9:46½, and that the train 6102 entered the passing siding Luckey at 9:45 and left this passing siding at 9:46.

Applicants have thus shown and described a recorder for semi-automatically recording the movement of trains along the trackway in response to the locations and shifting of plugs on a miniature track layout, located in the dispatcher's office, these plugs being moved in response to indications automatically transmitted from way stations to the dispatcher's office.

Having thus shown and described one embodiment of the present invention, and having illustrated this embodiment rather specifically, it is desired to be understood that this has been done for the purpose of facilitating explanation of the features of the present invention and not with the intent of illustrating the particular construction preferably employed in practicing the invention nor to show the scope of the invention, and it is desired to be understood that various changes, modifications and additions may be

made to adapt the invention to the particular train dispatching system or OS-ing system to which it is to be applied, all without departing from the scope or spirit of the present invention or the idea of means underlying the same, except as demanded by the scope of the appended claims.

What we claim is:—

1. The method of recording the movement of trains along the track of a railway system, which consists in moving symbols from one place to another on a miniature track layout in accordance with movement of trains on the railway system and in response to indications transmitted from way stations of such railway system to the office where the miniature track layout is located, and in automatically recording on a sheet of paper moved in accordance with the lapse of time the location of these symbols on the miniature track layout.

2. Recording apparatus for train dispatching systems comprising, a miniature track layout corresponding to the actual track layout of the railway system, train symbols shiftable from one place to another in said miniature track layout, a recording paper moved in accordance with the lapse of time by suitable chronometer means, and means engaging such paper in accordance with the position a train symbol assumes in said miniature track layout.

3. Recording apparatus for train dispatching systems comprising, a miniature track layout corresponding to the actual track layout of the railway system, train symbols shiftable from one place to another in said miniature track layout, a train sheet advanced in accordance with the lapse of time, a plurality of scribers assuming positions corresponding to the various track sections of the miniature track layout, and means associated with each scriber for causing such scribers to engage said train sheet when a train symbol occupies the corresponding section of the miniature track layout.

4. Recording apparatus for train dispatching systems comprising, a miniature track layout corresponding to the actual track layout of the railway system, train symbols shiftable from one place to another in said miniature track layout, a train sheet, means for advancing said train sheet in accordance with the lapse of time, a plurality of scribers adapted to engage said train sheet and make a record thereon, any one of said scribers when brought into engagement with said train sheet making a mark transverse to a mark made by said scriber due to the advancing of said train sheet, and means for bringing a scriber in engagement with said train sheet when a train symbol occupies the corresponding section of the miniature track layout.

5. Recording apparatus for train dispatching systems comprising, a miniature track layout corresponding to the actual track layout of the railway system, train symbols shiftable from one place to another in said miniature track layout, a train sheet, a roll for advancing said train sheet, means for turning said roll in accordance with the lapse of time, and means for recording on said train sheet the presence of a symbol on said miniature track layout.

6. Recording apparatus for train dispatching systems comprising, a miniature track layout corresponding to the actual track layout of the railway system, train symbols shiftable from one place to another in said miniature track layout, a train sheet having spaced perforations, a roll having teeth for engaging said perforations, a gear concentric with said roll and driven by time-responsive means, frictional driving means for connecting said gear to said roll, and means for making marks at a position on said train sheet corresponding to the position of a symbol in said miniature track layout, whereby said roll and train sheet may be set to correspond to the railroad time of such railroad without interfering with said time-responsive means.

7. Recording apparatus for train dispatching systems comprising, a miniature track layout corresponding to the actual track layout of the railway system, train symbols shiftable from one place to another in said miniature track layout, a train sheet having perforations near the edge thereof and having the hours and minutes of the day engraved along such edge, a roll for driving said train sheet in accordance with the lapse of time so that correct time is indicated by the hours and minutes contained on such train sheet, a plurality of scribers corresponding to the various sections of the miniature track layout, and means for causing a particular scriber to engage said train sheet if the corresponding miniature track section contains a train symbol.

8. The method of indicating the position of trains, the direction of train movement and recording the time that trains assume certain positions, which consists in locating on a miniature track layout corresponding to the railway system on which the trains move a train symbol which indicates as by an arrow the direction the train it represents travels, in moving such symbol from place to place on said miniature track layout as the corresponding train moves correspondingly, and in recording the time such symbol assumes a particular position.

9. The method of indicating the position of particular trains, the direction of train movement and recording the time that trains assume certain positions, which consists in locating on a miniature track layout corresponding to the railway system on which the trains move a train symbol which as by a number identifies the train it represents and indicates as by an arrow the direction the train travels, in moving such symbol from place to place on said miniature track layout as the corresponding train moves correspondingly, and in recording the time such symbol assumes a particular position.

10. In a system of traffic control in which the main track layout including railway tracks and track switches is duplicated in an office by a miniature track layout including miniature track and miniature track switches and in which the miniature track switches assume positions corresponding to the main track switches, the combination of train symbols which may be moved from place to place on said miniature track layout in accordance with the position assumed by the miniature track switches and in accordance with the progress of the corresponding train on the railway system, and means for recording the time a particular symbol occupies a particular portion on the miniature track layout.

11. In a system of traffic control in which the main track layout including railway tracks and track switches is duplicated in an office by a miniature track layout including miniature track and miniature track switches and in which the miniature track switches assume positions corresponding to the main track switches, the combination of train symbols which may be moved from place to place on said miniature track layout in accordance with the position assumed

by the miniature track switches and in accordance with the direction and progress of the corresponding train on the railway system, and means for recording the time a particular symbol occupies a particular portion on the miniature track layout.

12. In a system of traffic control in which the main track layout including railway tracks and track switches is duplicated in an office by a miniature track layout including miniature track and miniature track switches and in which the miniature track switches assume positions corresponding to the main track switches, the combination of train symbols identifying particular trains which may be moved from place to place on said miniature track layout in accordance with the position assumed by the miniature track switches and in accordance with the progress of the corresponding train on the railway system, and means for recording the time a particular symbol occupies a particular portion on the miniature track layout.

13. In a system of traffic control in which the main track layout including railway tracks and track switches is duplicated in an office by a miniature track layout including miniature track and miniature track switches and in which the miniature track switches assume positions corresponding to the main track switches, the combination of train symbols identifying particular trains which may be moved from place to place on said miniature track layout in accordance with the position assumed by the miniature track switches and in accordance with the direction and progress of the corresponding train on the railway system, and means for recording the time a particular symbol occupies a particular portion on the miniature track layout.

14. In a system of traffic control in which the main track layout including railway tracks and track switches is duplicated in an office by a miniature track layout including miniature track and miniature track switches and in which the miniature track switches assume positions corresponding to the main track switches, the combination of train symbols identifying particular trains and the direction in which they move which may be moved from place to place on said miniature track layout in accordance with the position assumed by the miniature track switches and in accordance with the direction and progress of the corresponding train on the railway system, and means for recording the time a particular symbol occupies a particular portion on the miniature track layout.

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