J. R. LITTLE.

MESSAGE TRANSMITTING DEVICE FOR RAILWAYS.

APPLICATION FILED DEC. 28, 1915.

1,243,535.

Patented Oct. 16, 1917.

2 SHEETS—SHEET 1.

Fig. 2.

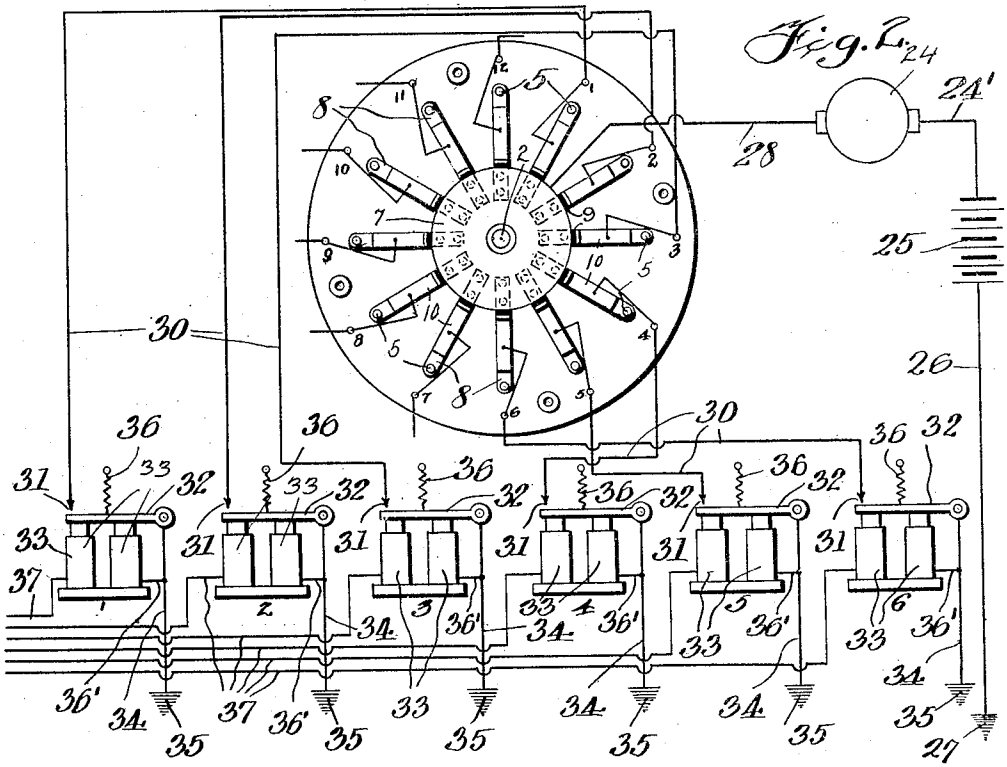
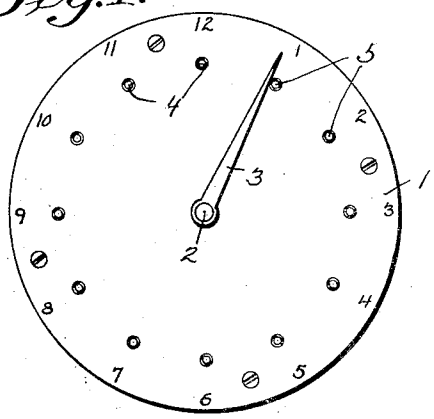


Fig. 1.



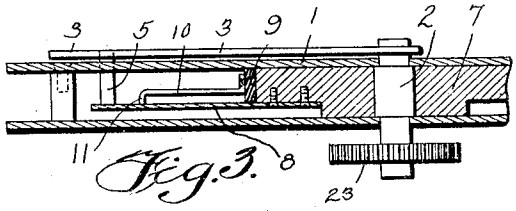
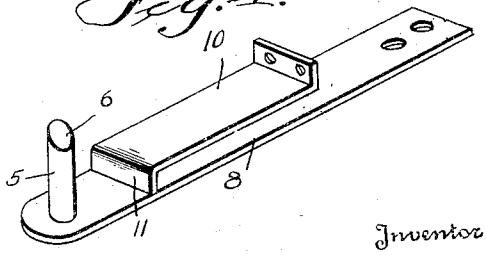


Fig. 3.

Fig. 4.



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2 SHEETS—SHEET 2.

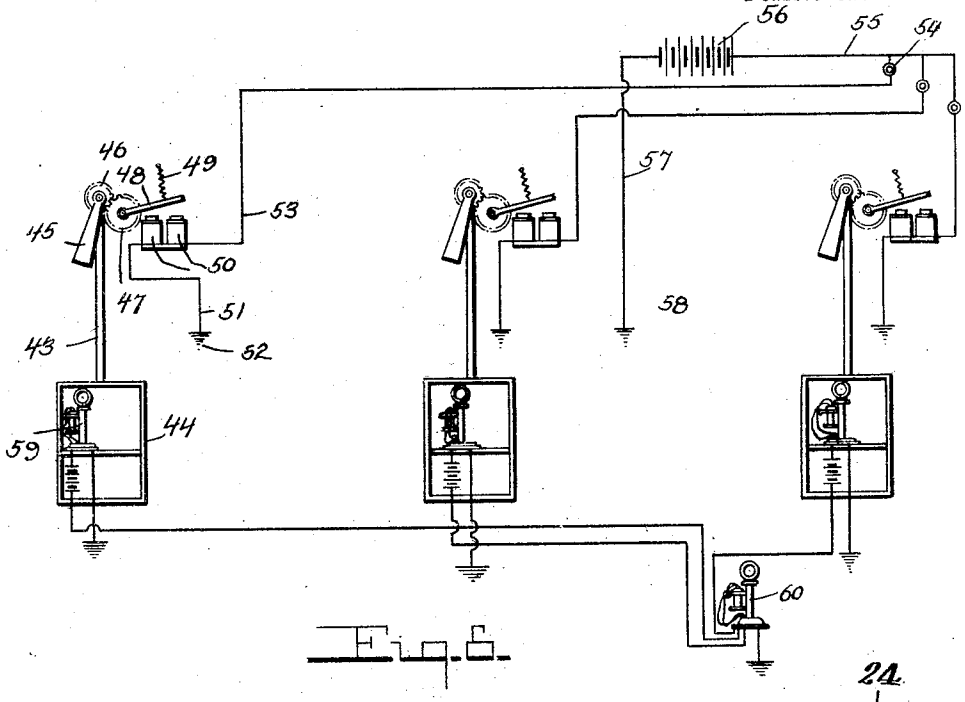


Fig. 1.

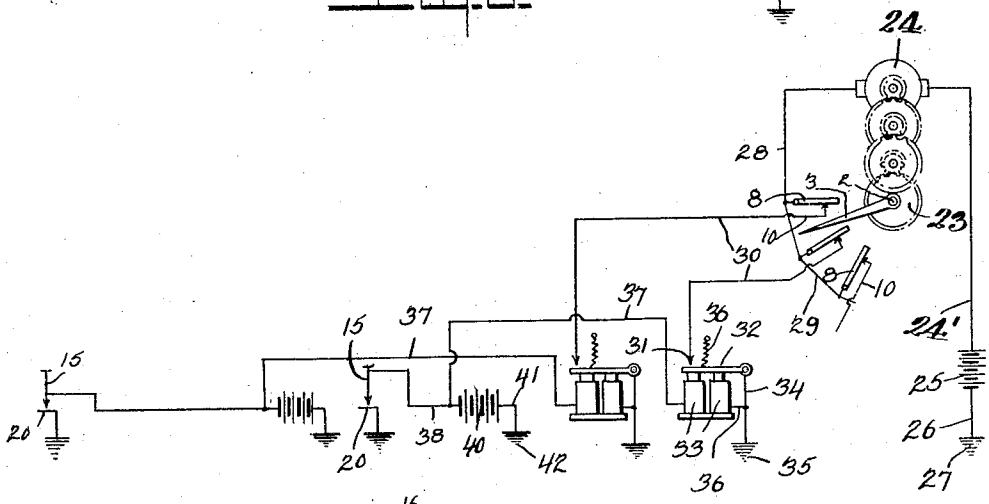


Fig. 7.

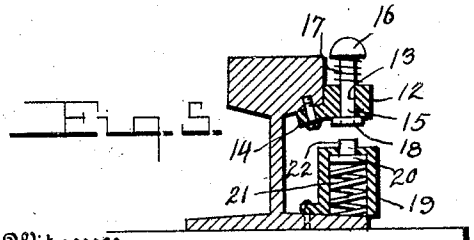


Fig. 5.

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MESSAGE-TRANSMITTING DEVICE FOR RAILWAYS.

1,243,535. Specification of Letters Patent. Patented Oct. 16, 1917.

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To all whom it may concern:

Be it known that I, JAMES R. LITTLE, a citizen of the United States, residing at Moline, in the county of Rock Island and State of Illinois, have invented certain new and useful Improvements in Message-Transmitting Devices for Railways; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to new and useful improvements in message transmitting devices for railways in order that orders and messages may be delivered to trains between stations and towers.

Another object of the invention is to provide a registering device which will enable the operator to tell the exact location of a train and to enable him to signal said train to stop and receive an order or message.

A still further object of the invention is to provide a device which will show at all times the exact location of a train or trains.

With these and other objects in view, the invention consists in the novel combination and arrangement of parts which will be fully set forth in the following specification and accompanying drawings, in which:—

Figure 1 is a face view of the dial on which the train positions are indicated.

Fig. 2 is a rear view of said dial illustrating the wiring diagram used in connection therewith showing the details of construction.

Fig. 3 is a fragmentary sectional view through the dial showing the details of construction.

Fig. 4 is a detail perspective view of one of the circuit breaking springs.

Fig. 5 is a sectional view through a rail illustrating the circuit closing pin used in connection with the registering device.

Fig. 6 is the wiring diagram of the stop signaling device showing the semaphores used in connection therewith, and

Fig. 7 is a partial wiring diagram of the system.

Referring to the drawings, the numeral 1 designates the dial of the train position indicator, the face of which is divided into a plurality of sections or blocks which are equal in number to the number of sections or blocks of a certain division of the road and the first section or block away from the tower in which the device is used is indicated on the face of the dial by the numeral 1; the second block is indicated by the numeral 2, while the third block is indicated by the numeral 3. As shown in Fig. 1, it will be seen that there are twelve sections or blocks illustrated, but it is to be understood that the number may be increased or decreased to suit varying conditions. The dial 1 above referred to is provided with a central opening through which the shaft 2 extends and this shaft carries the pointer 3 which is adapted to coöperate with the numerals on the face of the dial to indicate the position of the train. A plurality of concentrically arranged openings or apertures 4 are formed in the dial 1 near its periphery and extending through these apertures are the pins 5, the lower ends of which are connected to the contact spring which will be more fully hereinafter described. The upper ends of these pins 5 are beveled as at 6 so that as the hand 3 is moved over the face of the dial it will engage the beveled faces and force the pins downwardly, thereby depressing the contact spring and breaking the circuit.

Radially disposed on the rear of the dial and secured on a suitable hub member 7 are the contact springs 8 and surrounding the periphery of the hub member 7 is a suitable strip of insulating material 9. Extending outwardly from the insulating strip and in parallel relation to the springs 8 are the contact arms 10 provided with the downturned contact points 11 which are adapted to engage the springs 8 when the same are in their normal raised position and when the pins 5 are not engaged by the hand.

In order to selectively control the movement of the hand 3 there are provided the circuit closers illustrated in Fig. 5, each of which is positioned at the entrance to its respective block so that as a train passes over the circuit closer the same will operate in such a manner as to cause the hand 3 to travel over the face of the dial. Each of these circuit closers consists of a suitable body 12 provided with a vertical opening 13 and formed at one end of the body is a lug 14 which is riveted or otherwise secured to the ball of the rail.

Slidable in the opening 13 is a pin 15, the head 16 of which is disposed in a plane slightly above the upper face of the rail and

surrounding said pin between the upper side of the body 12 and the under side of the head is a compression coil spring 17, which is adapted to normally hold said pin upwardly. In order to limit the upward movement of the pin, there is provided a suitable stop nut 18 at its lower end and it will thus be seen that the pin will be held against upward movement beyond a predetermined point but may be forced downwardly against the force of the spring 17. The lower section of the circuit closer consists of a suitable insulating housing or body 19 which is preferably cylindrical and has mounted therein the contact elements 20, the under face of which is engaged by a compression coil spring 21, which rests on the base of the rail and normally urges the contact element upwardly as shown. A suitable reduced stem 22 is formed on the contact element and extends through the end wall of the housing so that upon downward pressure on the pin 15, the same will engage the contact element 20 thereby completing the circuit.

In order to drive the shaft 2, a suitable gear train is provided and is connected to the shaft of the motor 24 so that upon rotation of the motor, gear 23 will be driven so that the hand 3 will move around the face of the dial.

In order to control the operation of the motor, selectively, one terminal thereof is connected to the wire 24′, which leads to one terminal of the battery 25, the opposite terminal of which is connected to a wire 26, leading to the ground 27. The opposite terminal of the motor is connected to a wire 28 which in turn leads to and is in electrical connection with a wire 29 to which the various contact plates are electrically connected. The contact arms 10 are connected to suitable wires 30 which lead to suitable contact points 31. These contact points cooperate with the armatures 32 of the electromagnets 33 and these armatures are connected to the wires 34, which lead to the ground 35. Suitable retractile coil springs 36 are arranged so that when the magnets 33 are deënergized, the armatures 32 will be drawn upwardly to engage the contact points 31, and complete the circuit from the power source 25 through the wire 24′ into the motor 24, thence through the wire 28 into the wire 29 from whence the current passes through the contact spring 8 into the contact arm 10 and thence through the wire 30 to the contact point 31 and into the armature 32. The current passing through the armature 32 will pass through the wire 34 and the ground 35 back through the ground 27 to the wire 26 and back to the battery. It will thus be seen that so long as the armature 32 is raised under the influence of the spring 36 and the spring 8 engages the contact point 11 that the motor will continue to operate, but as soon as the hand 3 travels over the face of the dial a distance sufficient to engage the proper pin 5, the circuit will be broken and the motor stopped, thus leaving the hand in such a position as to point toward one of the numerals on the face of the dial and showing the position of the train.

In order that the magnet 33 may be energized and deënergized, it will be noted that one terminal of said magnet 33 is connected to a wire 36′ which in turn leads to the wire 34 to which it is electrically connected. A similar wire 37 is connected to the opposite terminal of the electromagnet 33 and leads to a wire 38 to which it is electrically connected. This wire 38 is connected to one terminal of the battery 40, the opposite terminal of which is connected to a wire 41 which in turn is connected to the ground 42. It will thus be seen that the current will flow from the battery 40 through the wire 38 and into the wire 37 and thence through the electromagnet 33 into the wire 36′ from whence it will pass into the wire 34 and the ground 35 back to the ground 42 and wire 41 to the battery. In this way it will be seen that under normal conditions the electromagnet 33 will be energized, thus holding the armature 32 out of electrical connection with the contact points 31.

In order to deënergize the magnet 33, a suitable short circuiting means is provided and is operated by the plunger 15. The wire 38 is continued and the end thereof opposite the end which is connected to the battery 40 is in electrical connection with the pin 15. The contact element 20 as will be seen is in electrical connection with the ground and it will be evident that when the pin 15 is moved downwardly into contact with the contact element 20, the circuit will be closed between the battery 41, wire 38, pin 15, plate 20 and the ground 42 and wire 41, thus discontinuing the flow of current through the electromagnet 33 and allowing the armature 32 to move upwardly.

From the foregoing it will be seen that the hand 3 will move as the train progresses to indicate on the dial the exact position of the train so that the operator may easily and quickly, by the proper manipulation of the signaling means, get in communication with the train crew and issue revised orders or send any desired message.

In order that the operator may signal the train crew, the signaling system illustrated in Fig. 6 is provided and consists of a plurality of standards 43 stationed at the various blocks along the road and these standards are mounted on a suitable box or housing 44 which contains the telephone or other order transmitting and receiving devices. Pivotally mounted at the upper end of the

standard 43 is a semaphore arm 45 carrying a gear wheel 46 which meshes with the gear 47 mounted on the shaft of the armature 48. A retractile coil spring 49 normally exerts upward pull on said armature to hold the same in position shown in the drawings and in order to move the armature downwardly there are provided the electromagnets 50. A wire 51 leads from the magnet 50 to a ground 52 and a similar wire 53 leads from the opposite terminal of the magnet to the circuit closer 54 at the central station or tower. This circuit closer is connected to the wire 55 which in turn is connected to one terminal of the battery or power source 56, the opposite terminal of which is connected to the wire 57, leading to the ground 58. It will thus be seen that upon closing the circuit closer 54, the magnets 50 will be energized as the current will flow from the battery 56 through the wire 55, circuit closer 54 and the wire 53 and thence through the magnet 50 into the wire 51 from whence it passes into the ground 52 and thence back through the ground 58 and wire 57 to the battery.

The energization of the magnet 50 will move the armature 48 downwardly against the influence of the spring 47, thereby moving the semaphore arm 45 to its operative position so that the train crew upon approaching the semaphore will be notified to stop and receive the message. The message is transmitted over the telephones designated by the numeral 59 which are contained within the boxes or housings 44 and these telephones are in electrical connection with the telephone 60 at the central office so that the train despatcher or tower man may readily transmit the message to the train crew. In this way, it will be seen that many accidents may be avoided through a mix-up in train orders as the tower man or train despatcher may amend the orders as the train proceeds on its way.

While in the foregoing there has been shown and described the preferred embodiment of this invention, it is to be understood that such changes may be made in the combination and arrangement of parts as will fall within the spirit and scope of the appended claims.

What is claimed is:—

1. In a device of the class described, a base plate, a disk secured to the upper face of said base plate, a plurality of radiating spring fingers secured to said disk and spaced upwardly from the base plate for a short distance, the base plate and disk being provided with central apertures, a shaft rotatable through said apertures, a plurality of radiating contact fingers secured to the disk and insulated therefrom and adapted to be normally engaged by the spring fingers, a dial having a central aperture therein secured to the upper side of the disk to house the contact fingers and the spring fingers, the dial being provided with annular series of openings, pins supported on the outer ends of the spring fingers and extending through the openings, the upper ends of said pins being inclined, and a hand attached to the shaft and adapted to be moved over the face of the dial to engage the inclined faces of the pins to cause said pins to move downwardly and press the spring fingers away from the contact fingers.

2. In a device of the class described, a base plate having a central aperture therein, a disk having a central aperture therein, an offset hub portion formed centrally of the disk and secured to the base plate, the opening in the hub portion and disk being of greater diameter than the opening in the base plate, a plurality of radiating spring fingers secured to the under side of the disk, a plurality of stubs extending upwardly from the outer ends of the spring fingers, the upper ends of said studs being provided with inclined faces, a band of insulating material surrounding the disk, a plurality of radiating contact fingers secured to said band, downturned contact points at the ends of said fingers adapted to normally engage the spring fingers, a shaft rotatably mounted within the aperture in the base plate, a hub formed on the shaft and fitting in the enlarged opening in the disk, the lower end of the hub engaging the inner face of the base plate, a dial secured to the outer face of the disk and provided with a central aperture through which the shaft extends, the hub engaging the inner face of the dial to hold the shaft against accidental longitudinal movement within the openings, a hand secured to the outer end of the shaft for movement over the face of the dial, whereby when the shaft is rotated the hand will progressively engage the studs to move the spring fingers downwardly away from engagement with the contact fingers and means for securing the dial in place.

In testimony whereof I affix my signature in presence of a witness.

JAMES R. LITTLE.

Witness:

GEORGE W. BLAND.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."