No. 757,346. PATENTED APR. 12, 1904.

W. B. RAMSAY.

ELECTRIC SIGNAL FOR RAILWAYS.

APPLICATION FILED MAY 29, 1903.

NO MODEL.

Fig. 1.

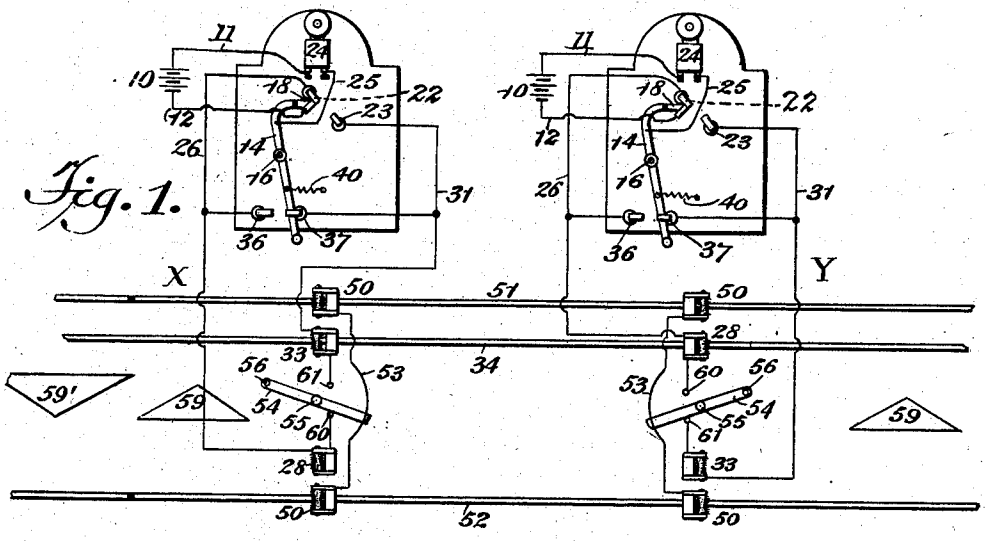


Fig. 2.

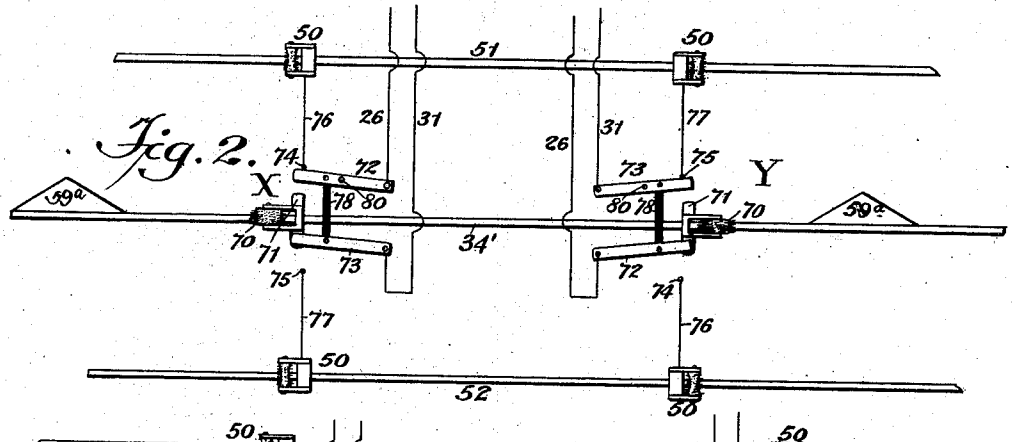
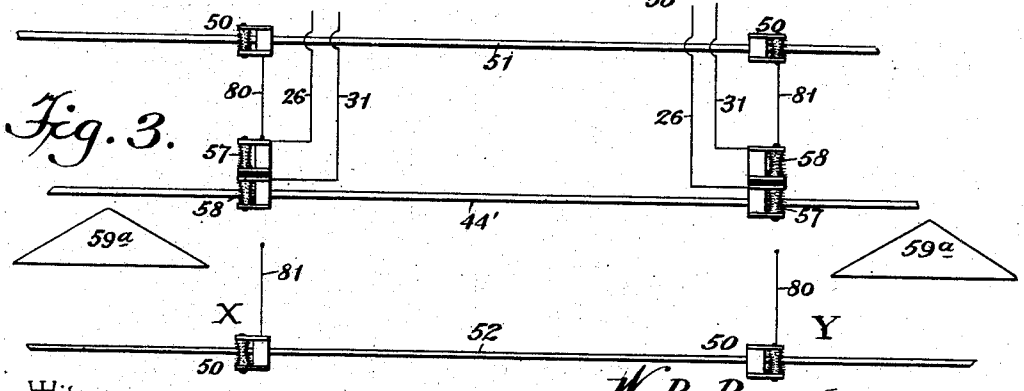


Fig. 3.



Witnesses

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THE NORRIS PETERS CO. PHOTO-LITHO., WASHINGTON, D. C.

No. 757,346. Patented April 12, 1904.

UNITED STATES PATENT OFFICE.

WILLIAM B. RAMSAY, OF HICKORY, NORTH CAROLINA.

ELECTRIC SIGNAL FOR RAILWAYS.

SPECIFICATION forming part of Letters Patent No. 757,346, dated April 12, 1904.

Application filed May 29, 1903. Serial No. 159,332. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM B. RAMSAY, a citizen of the United States, residing at Hickory, in the county of Catawba and State of North Carolina, have invented a new and useful Electric Signal for Railways, of which the following is a specification.

This invention relates to certain improvements in railway signaling appliances of that general class employed for signaling between trains or between the train and a station.

A further object of the invention is to provide a signaling system which employs a third rail or current-conductor to be used in connection with the ordinary traffic-rails for establishing circuits between trains on the same block whether approaching each other or traveling in the same direction.

A further object of the invention is to provide a device of this class in which automatically-operated switches serve to change the circuits in accordance with the direction of travel of the train, the switch-operating devices being placed on the road-bed and so arranged as to engage and move the switches to proper position as the train leaves the starting-point.

A still further object of the invention is to so arrange the automatic switch-operating mechanisms as to provide for closing the circuits for testing purposes, so that signals may be exchanged between trains traveling in the same direction.

With these and other objects in view the invention consists in the novel construction and arrangement of parts hereinafter described, illustrated in the accompanying drawings, and particularly pointed out in the appended claims, it being understood that various changes in the form, proportions, size, and minor details of the structure may be made without departing from the spirit or sacrificing any of the advantages of the invention.

In the accompanying drawings, Figure 1 is a diagram illustrating a railway signaling system constructed and arranged in accordance with the invention. Fig. 2 is a diagram illustrating a slight modification of the system. Fig. 3 is a similar view showing a still further modification.

In carrying out the invention each of the trains is equipped with an alarm mechanism and battery or other source of electrical energy, the alarm being arranged at a convenient point in the cab or caboose, and said alarm may be of either a visual or audible nature, as may be desired. Each of the trains is further provided with switches for changing the course of the current and in order to permit simple making and breaking of the circuits, so that signals may be sent in accordance with a predetermined code. In each of the trains is a battery 10, connected to wires 11 and 12, the wire 11 being electrically connected to one binding-post of a bell or other alarm 24, while the wire 12 is electrically connected to a contact-block 18, carried by but insulated from a manually-operated switch-lever 14. The switch-lever 14 is pivotally mounted on an insulated pin 16, and on opposite sides of said switch-lever are contacts 36 and 37, respectively, the lever being normally held in engagement with the contact 37 by means of a coiled tension-spring 40. To the switch-lever 14 is secured the contact-block 18, adapted to make engagement with contacts 22 and 23, disposed, respectively, on opposite sides of the block, the latter being normally held in engagement with the contact 22 by means of the spring 40. The alarm 24, together with all of the contacts, and such lever are mounted on a suitable insulating-base of any desired character. From the contact 22 extends a wire 26, leading to a trolley 28, which may make contact with a conductor 34, arranged, preferably, between the traffic-rails and at a point to one side of the center of the road-bed. The trolley-wheel is in the form of a metallic brush, preferably formed of wire, as shown, in order to insure good contact with the conductor and reduce friction. Wire 26 is further connected to the contact 36, while the contacts 23 and 37 are connected by a wire 31 to a trolley 33, which may also make contact with the conductor 34, and under all conditions either the trolley 28 or trolley 33 engages said conductor.

The trains are each provided with contact-

brushes 50, bearing on certain traffic-rails 51 and 52 and connected together by the bridging-wire 53, which is also connected to a lever 54, carried by the locomotive or other portion of the train about midway of the longitudinal center of the road-bed. The switch-lever 54 is pivoted on a stud 55 and is provided with a depending pin or lug 56, adapted to be engaged by a double cam 59, said cam having two inclined faces, one or other of which will engage with the depending pin or lug and move the lever in order to change the circuit in accordance with the direction in which the train is traveling.

At a point adjacent to the switch-lever are two contact blocks or plates 60 and 61, one of which is electrically connected to the wire 26 and the other to the wire 31 of the switch-lever, which serves to connect one or other of these wires with the bridging-wire 53 and from thence to the traffic-rails.

When two trains are approaching each other, as indicated in Fig. 1, with the parts in the position shown, a circuit will be established from a battery of train X through wire 11, alarm 24, wire 25, switch 14, contact 37, wire 31, trolley 33, conductor 34 to train Y, thence through trolley 28, wire 26, contact 22, block 18, wire 12 to battery of train Y. The circuit is thence completed from battery of train Y to wire 11, alarm 24, wire 25, switch-lever 14, contact 37, wire 31, trolley 33, wire and contact 61, switch-lever 54, wire 53, trolleys 50, rails 51 and 52 to trolleys 50 of train X, and from thence through wire 53, switch-lever 54, contact 60, trolley 28, wire 26, contact 22, block 18, and wire 12 to battery of train X, thus completing the circuit in which the batteries and alarms on both trains are connected in series.

Should two trains be on the same block with their corresponding trolleys 33 or trolleys 28 in engagement with the conductor 34, the batteries will be connected in opposition and no current will flow. In this event, trolleys 28 being supposed to be in engagement with conductor 34, the engineer or other attendant on train X moves the switch-lever until it engages the contact 36, effecting a corresponding movement of the link or switch member 18 into engagement with the contact 23. A current will then flow from battery on train X through wire 11, alarm 24, wire 25, switch-lever 14, contact 36, wire 26, trolley 28 to the current-conductor 34, and thence to train Y, trolley-wheel 28, train Y, wire 26, contact-block 18, contact 22, wire 12, battery 10, wire 11, alarm 24, wire 25, switch-lever 14, contact 37, wire 31, trolley 33, contact 61, switch-lever 54 and wire 53, trolleys 50 of train Y, traffic-rails 51 and 52, trolleys 50 of train X, wire 53, switch 54, contact 61, trolley 33, wire 31, contact 23, contact-block 18, and wire 12 to the battery. This sounds the alarm on both engines, and the engineer of each train is enabled to determine whether the adjacent train is traveling in the same or the opposite direction by the position of his switch-lever at the time of the closing of the circuits.

It is one of the principal objects of this invention to provide for automatically switching the switch member 54 in accordance with the direction in which the train is traveling, and for this purpose the cams 59 are placed in proper position on the road-bed, preferably at the starting-points of the trains and at such other convenient points as may be necessary. These switch-levers and the contacts with which they engage are so disposed that all trains traveling, say, east and north will have their switches automatically adjusted to engage the contacts 61, while all trains traveling south and west may have their switches moved into engagement with the contacts 60, and as this is accomplished automatically by the cams when the engine leaves the station the system will always be in readiness for instant service and will automatically sound an alarm as soon as the trains traveling in opposite directions approach within the signaling limit.

By the employment of a double cam of the character set forth it will be impossible for the switch-lever to be accidentally broken, inasmuch as the lever or its pin or lug 56 will always engage with an inclined cam-face when the engine is moving in either direction or in case the engine is backing up, the latter being in many cases an important consideration, where on single-track roads a train may be obliged to run on a siding and afterward back out onto the main line. A cam of this character may be placed in the center of the road-bed in position to engage the switch-levers of trains traveling in both directions, and it will only be necessary to install a single cam at the end of each block.

As trains traveling in the same direction cannot exchange signals except when the switch-lever 14 is moved into engagement with the contact-block 36, additional cams 59′ may be placed adjacent to the terminals of blocks, so as to automatically engage the switch-lever of a train as the latter passes and change the circuits in such manner as to provide an automatic test, the circuit being closed in order to sound an alarm on any other train traveling in the same direction within signaling distance, and when this is done additional cam 59 must be employed to restore the switch-lever to its original position.

In Fig. 2 is illustrated a slight modification of the invention wherein a single third rail or wire 34′ is used, the conductor in this case being placed midway between the two traffic-rails, and on this conductor runs a trolley-wheel or brush 70, to which is connected a

contact-plate 71. On each side of the trolley-wheel 70 is a switch-lever, (indicated at 72 and 73,) and adjacent to these switch-levers are contacts 74 and 75, respectively. The contact 74 is connected by wire 76 to a trolley-wheel or brush 50 on the traffic-wheel 51, while the contact 75 is electrically connected by a wire 77 to trolley-wheel or brush 51 on a traffic-rail 52. The two levers are insulated from each other and are connected by a cross-bar 78, formed of any suitable non-conductor, and one of said levers is provided with a depending pin or lug 80 for engagement with a cam 59ª on the road-bed. The lever 72 is connected to the wire 26 of a train system, while the lever 73 is correspondingly connected to the wire 31. When the parts are adjusted to the position shown in Fig. 2 for trains traveling in opposite directions, a current will be set up from the battery of one train through wire 31, lever 73, contact-plate 71, trolley-wheel 70, conductor 34′ to the other train, thence to trolley-wheel 70, contact-plate 71, lever 72, wire 26 to the alarm-circuit of the opposite train, and after traversing the alarm-circuit in the manner previously set forth return is made through wire 31 of second train to switch 73, contact 75, wire 77, trolley-wheel or brush 50, traffic-rail 51 to the first train. The circuit may then be traced from rail 51 to brush or trolley-wheel 50, wire 76, contact 74, switch-lever 72 to wire 26, and thence to the local train-circuit, it being deemed unnecessary to again illustrate the alarm and battery circuits of the trains, as these are precisely the same as those shown in Fig. 1, already described in detail. The switching is accomplished by the cams on the road-bed in the manner previously described, all trains traveling east and north having their switches adjusted in one direction, while those trains traveling south and west having their switches adjusted to the opposite direction. In Fig. 3 is illustrated a further modification of the invention in which a single third rail or conductor 44′ is employed. The trolley-wheels or brushes 50 are arranged in contact with the traffic-rails 51 and 52, and one of these is connected by a wire 80 to a trolley 57, while the other is connected by a wire 81 to a second trolley 58, the two trolleys being insulated from each other. The trolley 57 is connected to the wire 26, and the trolley 58 is in similar manner connected to the wire 31. Both trolleys are mounted for simultaneous movement and carried by guiding devices of any character, while on the road-bed are arranged cams 59ª, which operate to shift the trolleys and determine which of the trolleys shall remain in engagement with the third rail or conductor 44′.

When trains traveling in opposite directions are approaching each other, a circuit is established from the battery and alarm circuit of one train through wire 31, trolley 58, conductor 44′ to the opposite train, trolley 57, wire 26, through the alarm and battery circuit of the second train. From the second train the return-circuit is established through wire 31, trolley 58, wire 81, trolley 50, traffic-rail 51 to the first train, trolley or brush 50, wire 80, trolley 57, and wire 26 to the battery and alarm circuit of the first train, it being deemed unnecessary to illustrate the local circuits, as they remain the same as shown in Fig. 1.

In both the described modifications the arrangement of the auxiliary cam for testing purposes may form a part of the system.

Having thus described the invention, what is claimed is—

1. In an electric railway signaling system, a local battery and alarm circuit on each train, each of said circuits having two terminals, a road-bed conductor, traveling contacts engaging both the traffic-rails and the road-bed conductor, switching devices carried by the train, and a double cam arranged on the road-bed and serving to shift the switching devices and change connections between the terminals of the train-circuits and the rails in accordance with the direction of travel of the train.

2. In an electric railway signaling system, the combination with local alarm and battery circuits on the trains, a third rail disposed at one side of the longitudinal center of the road-bed, traveling contacts carried by each train and having fixed positions at points equidistant from the longitudinal center of the train so that one or other of such contacts will engage the third rail in accordance with the direction in which the train is moving, said third-rail contacts forming the terminals of the train-circuit, a switch controlling the train-circuit, and a double cam arranged on the road-bed and serving to engage the switch and change the direction of the circuits in accordance with the direction of travel of the train.

3. In an electric railway signaling system, local alarm and battery circuits on the trains, a third rail, a movable switch carried by each train, contact-blocks electrically connected to the terminals of the train-circuits, a double road-bed cam for engaging and moving the switches, and auxiliary testing-cams disposed adjacent to the road-bed cams and serving to automatically shift the position of the switch and change the circuits for testing.

4. In an electric railway signaling system, the combination with current-conductors arranged along the road-bed, of a local signaling system arranged in each train and comprising a battery, an alarm, a movable switch-lever, a pair of contacts disposed on each side of the switch-lever, a contact-block carried by and insulated from the switch-lever, a pair of contacts disposed one on each side of the

block, current-conducting wires connected to the road-bed conductors, one of said wires being connected to one of the contacts of the switch-lever and one of the contacts of the block and the other of said wires being connected to the oppositely-disposed contacts, a current-conducting wire connecting the switch-lever to one binding-post of the alarm, and wires leading from the opposite poles of the battery and connected respectively to the second binding-post of the alarm and the movable contact-block.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

WILLIAM B. RAMSAY.

Witnesses:
W. A. HALL,
M. H. YOUNT.