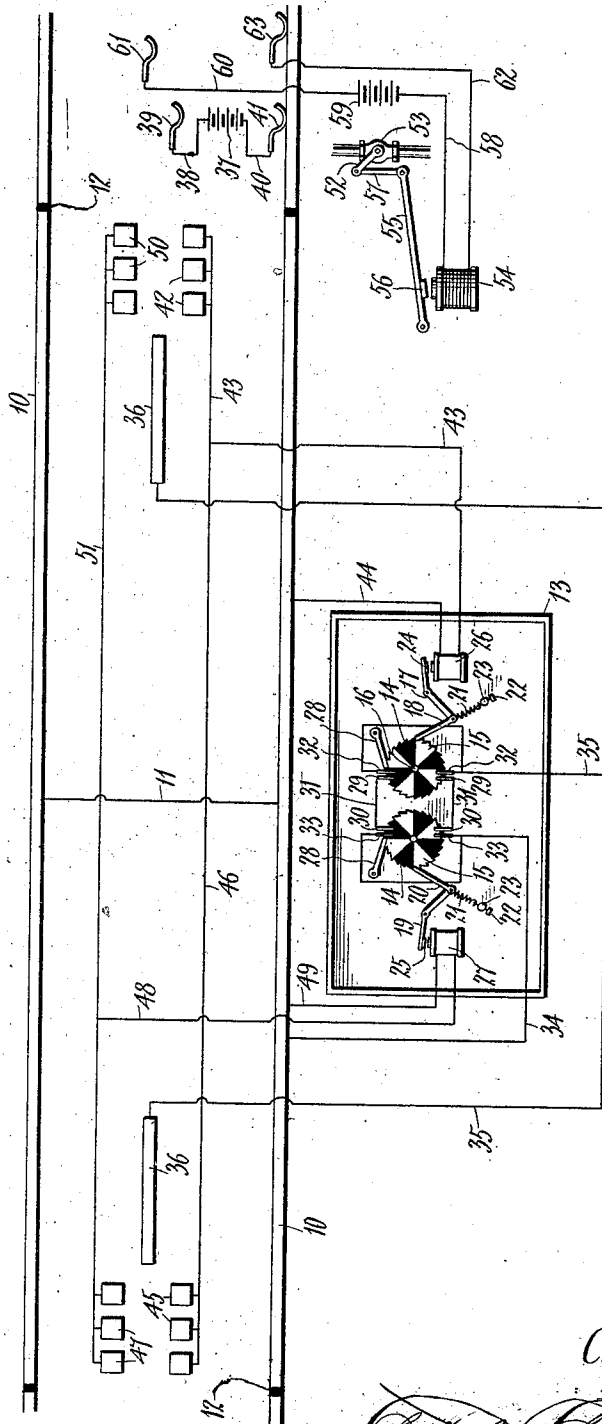


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BLOCK SYSTEM FOR RAILWAYS.  
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Patented Feb. 18, 1913.



Witnesses

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# UNITED STATES PATENT OFFICE.

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BLOCK SYSTEM FOR RAILWAYS.

1,053,338.

Specification of Letters Patent.

Patented Feb. 18, 1913.

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*To all whom it may concern:*

Be it known that I, CARL WOODS, a citizen of the United States, residing at Kansas City, in the county of Jackson, State of Missouri, have invented certain new and useful Improvements in Block Systems 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 railways and has special reference to a controlling apparatus to be used on steam and other railways.

The object of the invention is to provide an improved form of block system to control the movements of trains.

Another object of the invention is to provide an improved system whereby the danger of head-on collisions is prevented.

With the above and other objects in view, the invention consists in general of a step by step mechanism controlling circuit completing devices, one portion of the mechanism being controlled by the movement of one engine into a railway block and the other portion controlled by the movement of another engine, together with means for applying the air brakes to both of said engines when the circuit is completed.

The invention further consists in certain novel details of arrangement and combinations of parts hereinafter fully described, illustrated in the accompanying drawings and specifically set forth in the claims.

In the drawing the figure is a diagrammatic view of the various portions of this device as they appear when there is no engine in the block.

It is to be understood that wherever in the specification and claims the words "normal position" or "normally" are used with reference to the various parts of the mechanism, these expressions refer to the positions of the parts at the time when no train is in the block wherein these parts are located.

The numerals 10 indicate the rails of the track and these rails are bonded together within the block by means of a wire 11. The lines 12 indicate the limits of the block and the rails at these points are insulated from the rails of adjacent blocks.

At a suitable position adjacent the track there is provided a casing 13, which may, if desired, be supported on a pole to be out

of reach of interference by unauthorized persons. Within this casing is provided a pair of ratchet wheels each of which is provided with a non-conducting segment 14 and a conducting segment 15. The non-conducting segments 14 preferably forms one-half of each wheel. These wheels are pivotally mounted as at 16. A lever 17 is pivotally mounted within the casing and is provided with a spring-pressed pawl 18 normally engaging one of said ratchets. A similar lever 19 is provided with a pawl 20 which engages the other ratchet. Each of these levers is provided with a retracting spring 21, one end of which is attached to a screw 22 mounted in a post 23 for the purpose of regulating the tension. The lever 17 is provided with an armature 24 and the lever 19 with an armature 25. Suitably positioned below said armatures are magnets 26 and 27, the magnet 26 being adapted to attract the armature 24 and the magnet 27 being similarly adapted to attract the armature 25. Retaining pawls 28 are also provided within the casing and serve to prevent the rotation of the ratchet wheels in one direction. At 29 is a contact finger which bears against one of the ratchets and at 30 is a similar contact finger bearing against the other ratchet. These contact fingers are connected by means of a wire 31. In alinement with the contact finger 29 is a similar contact finger 32 and in alinement with the finger 30 is a similar finger 33. From the finger 33 a wire 34 extends to one of the rails 10 and from the finger 32 a wire 35 extends to a contact plate 36 located near the center of the track. Each of the engines is provided with a battery 37 connected by a wire 38 to a contact finger 39 and by a wire 40 to a contact finger 41. The contact finger 39 is adapted to bear against certain contact plates as the engine passes along the track and the contact finger 41 is at all times in contact with one of the rails. At 42 is provided a plurality of spaced contacts so that repeated contact may be made by the finger 39. The contacts 42 are connected to a wire 43 which in turn connects with the magnet 26. A wire 44 connects the opposite end of this magnet with the rail 10. The contacts 42 and 36 are placed at what may be called the entrance portions of the block. Similarly spaced contacts 45 are placed at what may be termed the exit from the block and a

wire 46 serves to connect these contacts with the wire 43 and thus with the magnet 26.

Each of the engines is provided with an auxiliary lever 52 controlling an air valve 53. At 54 is a magnet. A lever 55 is pivotally mounted in suitable relation to the magnet and is provided with a suitable armature 56. The end of this lever is connected to the valve lever 52 by means of a link 57. If now a current be sent through the magnet 54, the lever will be depressed and by that movement will open the valve 53 and set the brakes on the train. For the purpose of actuating this magnet a wire 58 connects the same with the battery 59 and a wire 60 extends from said battery to a contact finger 61 arranged to contact with the plate 36. A similar wire 62 extends from the magnet 54 to a contact finger 63 arranged to contact with the rail 10. Now when the circuit has been established by two engines entering the block, the current will flow when contact is made between the finger 61 and plate 36 from the battery 59 through the wire 60, finger 61, plate 36, wire 35, finger 32, the conducting side of the ratchet on which that finger bears, finger 29, wire 31, finger 30 and conducting side of that ratchet, finger 33, wire 34, rail 10, finger 63, wire 62, magnet 54 and wire 58 back to the battery. The magnet will thus be actuated and the brake set.

In operation and referring to the figure of the drawings, it will be observed that the lower wire 31 is in circuit with the wires 34 and 35 through the medium of the conducting sections of the disk. It will also be observed that in this position of the disks, the upper wire 31 is insulated from the wires 34 and 35 on account of the contacts 29 and 32 and 30 and 33 having engagement with the insulated segments of the disk. When an engine enters the block from the right hand side, the circuit will be closed, and as a result, the magnet 26 will be energized for three consecutive times, thereby rotating the disk on the right for a distance equal to the width of one segment. As a result, the upper contacts 29 and 32 will engage with a conducting segment of the disk, whereas the lower contacts 29 and 32 will engage with an insulating section of the disk. It will thus be observed that as this engine passes through the block there will be no circuit formed to energize the magnet 54. Should, however, a train enter the block at the same time from the left hand side, the magnet 27 will be energized as above described for three consecutive times, and as a result, the disk on the left hand side will be rotated for a distance equal to the width of one of the segments. As a result, the upper contacts 29 and 32 and 30 and 33 will contact with the conducting segments of the respective disks, as is clearly shown in the

drawing. In this position, as soon as the engines enter the block sufficiently so that the shoes 61 and 63 engage the plates 36 of the rail, circuits will be formed to actuate the magnet 54 and consequently automatically apply the brakes. It will furthermore be observed that when any number of engines pass through the block, one of the disks is partially rotated at each time, and by employing the four pairs of contacts, it is immaterial as to what position either of the disks assumes, because two pair of the contacts will always contact with a respective pair of conducting segments of the disks, and thereby retain the circuits including the magnets 54 in an open position ready to be closed by the shoes 61 and 63 whenever two engines enter from opposite ends of the blocks. It is thus seen that as soon as two engines enter the block equipped with this device the air brakes will be applied to both of said engines and collisions absolutely prevented.

From the foregoing it will be observed that by employing the two lower pairs of contact fingers, a circuit will be closed there-through should a train follow another into the block before the latter has passed out at the opposite end, and the magnet 54 of the following train will be energized to set the brakes. Also if the circuit connections through the magnet 26 and 27 are defective and one of these fails to operate on entry of a train into the block, a circuit will be closed through the magnet 54 of the train when contact 36 is reached, said circuit including the lower contacts.

It is obvious that minor changes may be made in the specific arrangement of these parts without departing from the principles involved. It is not therefore desired to confine the invention to the exact form shown and described, but it is wished to include all such as properly come within the scope thereof.

Having thus described the invention, what is claimed as new is:

1. In a block system, two circuit controlling disks provided with alternate segments of conducting and insulating material, contacts normally resting on the insulating segments, a train controlling contact adjacent each end of a block, circuit connections between each contact and the track, said connections including the aforesaid contact fingers, electromagnets one for effecting a step by step movement of each disk, contacts adjacent each end of the block connected with one of the electromagnets, train carried means adapted to engage said contacts when the train is moving in one direction, contacts adjacent each end of the block connected with the other magnet and adapted to be engaged by said train carried means when the train is moving in the opposite direction,

the contacts connected with said electromagnets being located nearer the ends of the block than said train controlling contacts.

2. In a block system, a train controlling  
5 contact adjacent each end of a block, connections between each contact and the track, two step by step circuit controllers each provided with means for alternately opening and closing said connections at one point,  
10 said connections being normally open at each controller, means controlled by a train traveling in one direction for operating one circuit controller to close said circuit connections thereat when entering the block

and before reaching said train controlling 15 contact and for operating the same circuit controller to open said circuit connections when leaving the block after having passed said train controlling contact at that end, and similar train controlled means for op- 20 erating the other circuit controller by a train moving in the opposite direction.

In testimony whereof, I affix my signature, in presence of two witnesses.

CARL WOODS.

Witnesses:

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