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ELECTRICALLY CONTROLLED SAFETY APPLIANCE FOR RAILWAYS.

APPLICATION FILED OCT. 15, 1909. RENEWED SEPT. 20, 1910.

996,344. **Patented June 27, 1911.**

2 SHEETS—SHEET 1.

Fig. 1.

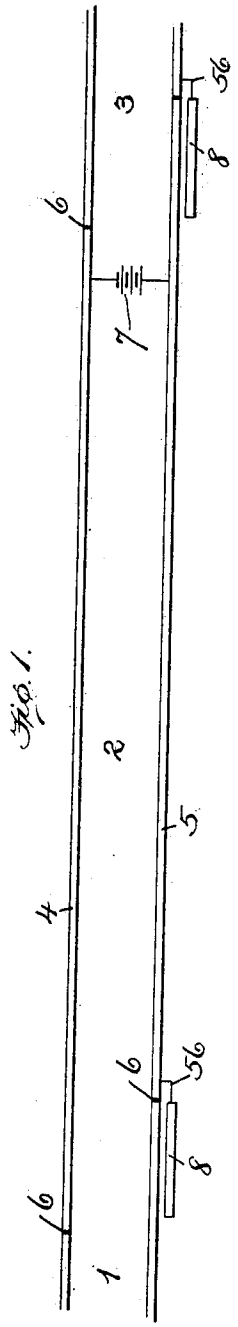
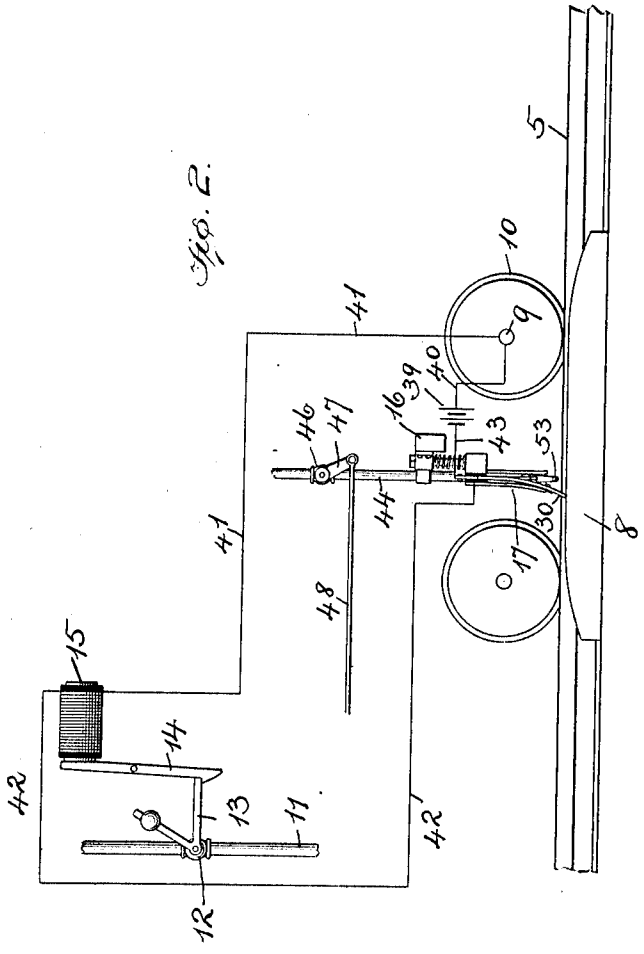


Fig. 2.



Witnesses

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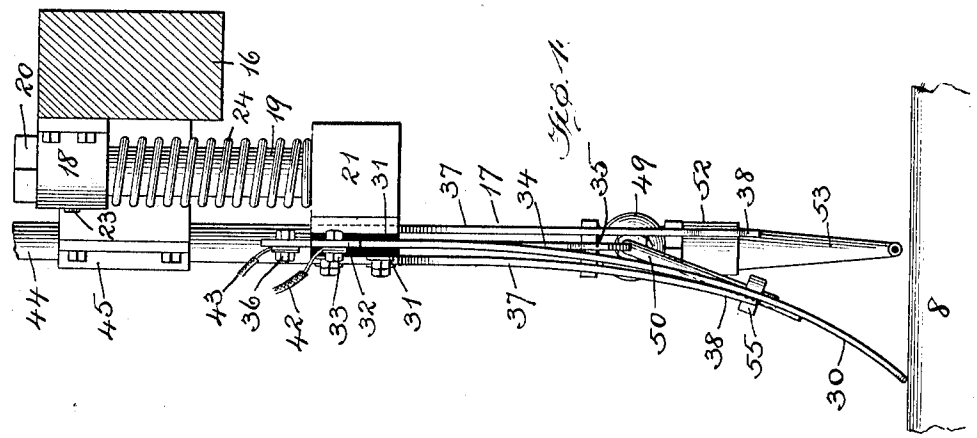

Fig. 1.

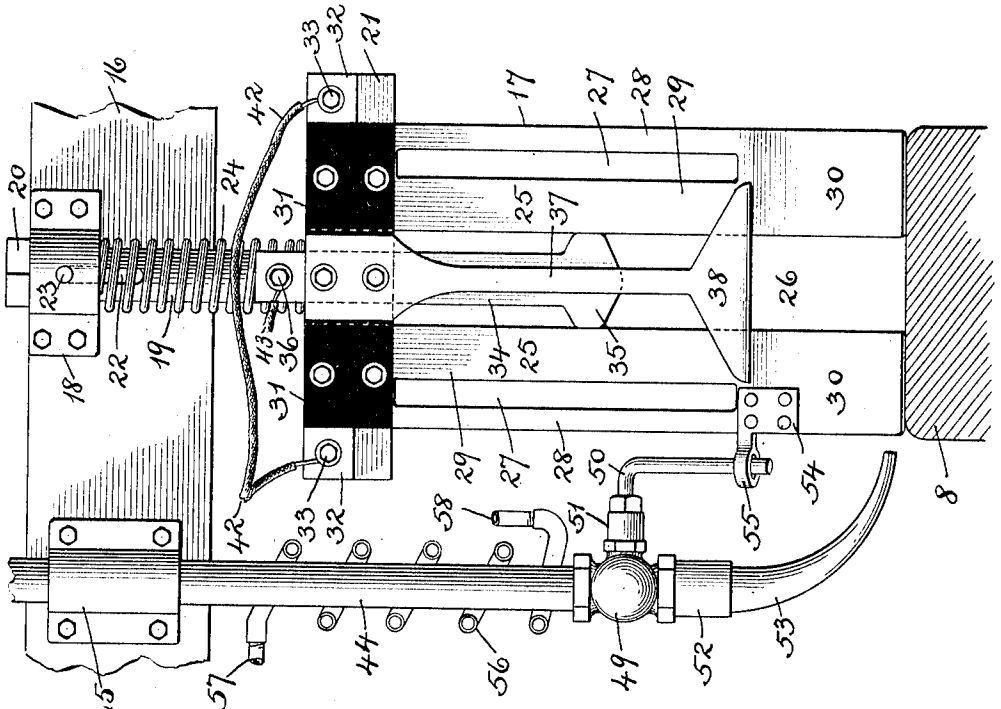

Fig. 3.

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UNITED STATES PATENT OFFICE.

RICHARD T. JONES AND FRANK T. JONES, OF BALTIMORE, MARYLAND.

ELECTRICALLY-CONTROLLED SAFETY APPLIANCE FOR RAILWAYS.

996,344. Specification of Letters Patent. Patented June 27, 1911.

Application filed October 15, 1909, Serial No. 522,718. Renewed September 20, 1910. Serial No. 582,927.

To all whom it may concern:

Be it known that we, RICHARD T. JONES and FRANK T. JONES, citizens of the United States, residing at Baltimore, in the State of Maryland, have invented certain new and useful Improvements in Electrically-Controlled Safety Appliances for Railways, of which the following is a specification.

This invention relates to improvements in an electrically controlled safety appliance for railways.

In the operation of various forms of railway safety appliances, such for example as electrically-controlled signals and electrically operated air brake apparatus, many of the forms employ a third rail or short sections of rails with which a contact device carried on the vehicle makes contact to effect a change or a break in the circuits. These third rails or contacts are often exposed to the elements, with the result that ice and snow will accumulate thereon and more or less interfere and prevent the contact necessary to effect the operation desired.

This invention, therefore has for its object to provide an improved means for clearing sufficiently or cleaning such third rails or rail-sections by removing the ice or snow to permit the desired contact to be made through the action of a heating agent such as steam or hot water.

While the inventive idea here involved may find expression in various forms and constructions we have preferred to adopt, for the present illustration a simple construction of air brake operating mechanism and railway block system in connection with which our present invention is shown.

The accompanying drawing illustrates the invention, in which,—

Figure 1 shows diagrammatically a road bed laid off in blocks and electrical connections with the rails with which the mechanism on the vehicle are to coact. Fig. 2, shows a portion of the vehicle and the mechanism and electrical circuits thereon. Fig. 3, is an enlarged detail front elevation of a device embodying features of the invention, and Fig. 4, is a side elevation of the same.

Referring to the drawings the numerals, 1, 2, and, 3, designate three blocks the rails, 4, and, 5, of one block insulated from the rails of the adjoining blocks by suitable insulating material, 6. Each block is provided near one end with a battery, 7, or other means, for supplying a current of electricity to the rails, 4, and, 5, at said end. By reference to Fig. 1 it will be noted that in the present instance the end of one rail of a block projects beyond the end of the other rail of the same block thus one rail of a block may be said to overlap into the next adjoining block. A third or short rail section, 8, is provided at the end of each block and in the present instance has position at the outer side of the rails, 5, and a connection, 56, is provided between the said rail section and the rail, 5. This latter connection may be made in any desired manner such as by a plate, bar wire or in any practical way. It will be noted that in the present instance the rail section, 8, has position beyond the insulated end of the rail with which it is connected, so that contact may be made with it while the wheels of the vehicle are on the rail, 4.

In the application of the invention as illustrated in the accompanying drawings we have preferred to show the invention in connection with an apparatus in the vehicle for automatically applying the air brakes, but it is to be understood that it may be otherwise utilized.

By reference to Fig. 2 it will be noted that the numeral 9, designates the axle of a vehicle and, 10, the wheels thereof which travel on the rails, 4, and, 5. An air pipe, 11, on the vehicle is in communication with the train pipe or other portion of the air-brake system on the train, and is provided with a valve, 12, having an arm, 13, which is normally held in an inoperative position through a trip lever, 14, and an electro-magnet, 15. This magnet controls the trip lever by attracting and holding it as long as the magnet is energized.

A suitable support, 16, is carried on the vehicle at any convenient place so that a contact shoe, 17, may depend and brush over the third or contact rail section, 8. The particular manner of hanging or supporting this shoe is not essential but in the present instance we provide a bracket, 18, which is bolted to the support, 16, so as to sustain a vertical stem, 19. This stem passes through the said bracket and has vertical movement therein,—a nut, 20, at the upper end serving to limit the downward movement. A head, 21, is carried by the lower end of the stem and it is to this head that the contact shoe itself is attached. The stem, in the present instance is provided with a vertical

slot, 22, and a pin, 23, passes through the bracket, 18, and also through the slot of the stem whereby to prevent the latter from turning, and a coiled spring, 24, encircles the stem and presses downwardly on the head, 21, to hold it down with a yielding pressure.

The contact shoe, in the present instance, employs two mechanically-disconnected spring-metal plates, 25, which are separated from each other so as to form a central vertical space, 26, for a purpose presently to be described. These contact plates are provided with vertical slots, 27, which extend downwardly from their upper ends so as to produce a plurality of fingers, 28, and, 29, which are disconnected at their upper ends but joined at their lower contact ends, 30. The upper disconnected ends of these plates are secured in the same vertical plane between suitable plates, 31, of insulating material so the fingers thereof will be insulated from each other at their upper ends. A lug, 32, projects laterally from each plate and a binding post, 33, is carried on each lug, for a purpose which will presently be explained.

A central, substantially rigid plate, 34, is clamped between the insulating plates, 31, and depends therefrom and into the central vertical space, 26. The lower end, 35, of this plate, 34, extends laterally and forms a contact with the inner vertical edges of the plates, 25, when the latter are in the normal vertical depending position and thereby forms a bridge for the passage of a current of electricity from either of the fingers, 29, to the plate, 34. The plate, 34, in the present instance, has its upper end projected above the insulated plates and carries a binding post, 36, for an electric connection as will presently appear.

On the outer side of the plates, 31, we secure suitable depending arms, 37, which have a central position with respect to the plates, 25, and the lower end of each arm is provided with a horizontal contact arm, 38, that projects laterally with its opposite ends in front of the contact plates, 25. Normally the arms, 38, are out of contact with the plates, 25, and merely hang pendantly at opposite sides thereof but when the lower ends of said plates are bowed one of said arms, 38, will form a contact between the spaced-apart plates. It will thus be seen that when the spring contact plates, 25, are in the vertical position they are in electrical contact with the central plate, 34, but when they are bowed, as seen in Fig. 5, they are brought into electrical contact with each other through the arm, 38. The arm, 38, also serves to reinforce the spring contact plates when they are bowed.

A battery, 39, is carried on the vehicle and is connected by a wire, 40, to the axle and through the latter by wire, 41, to the magnet, 15. Another wire, 42, connects the magnet with the two binding posts, 33, of the contact shoe while a wire, 43, connects the binding post, 36, on the central plate, 34, of the shoe with the other side of the battery, 39. It will thus be seen that a normal circuit is maintained on the vehicle to keep the magnet, 15, energized and hold the air-valve, 12, in the inoperative position. In passing through the contact shoe normally, it being presumed that the current approaches by wire, 42, it will enter the shoe by posts, 33, through fingers, 28, across the lower ends, 30, up through fingers, 29, to the lower end, 35, of the central plate, 34, and then out through binding post, 36, and by wire, 43, to battery.

It will be noted that as long as the fingers, 28, and, 29, of the shoe hang or extend straight down they will be in the electrical connection with the lower end, 35, of the plate, 34, but as the position of these fingers is such that they will wipe over the third or short contact rails, 8, as they pass the latter, during such contact the fingers will be bowed or sprung backwardly and at such times will be out of contact with the plate, 34. If therefore, some other circuit is not established through electro-magnet, 15, while the spring fingers are bowed, said magnet will become deënergized and the trip lever, 14, will release arm, 13, of the valve and permit the latter to turn to the operative position and thereby apply the brakes. If the block is clear, however, the magnet will be kept energized because the track current will pass from battery, 7; rail, 5; contact rail, 8, and shoe to wire, 42, to magnet, 15, then by wire, 41, to axle, 9, and wheels, 10, to rail 4, and back to battery, 7. It will therefore be seen that if the block is clear while the shoe is traveling over rail-section, 8, the magnet, 15, will be kept energized by the track circuit and when the shoe is out of contact with the rail section the battery, 39, on the vehicle will keep the magnet energized.

If a train is in a block and another train following in its rear attempts to enter the same block the fingers of the contact shoe will be sprung as they ride over the short rail section, 8, at the entrance to the block and will thereby be moved from contact with the plate, 35, thus breaking the local circuit on the vehicle and as the track circuit from battery, 7, will merely pass from said battery through the rail, 4, wheels and axle on the train ahead to rail, 5, and back to battery, 7, there will be no current in the short rail, 8, and consequently the magnet, 15, on the vehicle will become deënergized and the valve, 12, operated to apply the brakes.

It will thus be seen that if no current is taken up by the shoe during its passage

ver the short rail sections the brakes will be applied, thus if the track circuit is out of order the brakes are applied, and if a train is in the block the brakes on the second train will be applied. Now if the block is clear and the track circuit in working order snow or ice on the third rail section may prevent the shoe from taking up the track current and sending it through magnet, 15, and even then the brakes would be applied because the system is not in thorough working order and while this is desirable as a check or safeguard, it is undesirable to apply the brakes and stop a train when the block is clear. In order to avoid this we have provided an improved means for applying a heating agent to the short rail sections while the contact shoe is traveling over the same and thereby remove sufficient ice or snow to insure a proper contact. One means for effecting this application of the heating agent to the rail section is illustrated in Figs. 3 and 4 to which reference will now be made.

A pipe, 44, is sustained by the support, 16, by means of a suitable clamp plate, 45, and is in communication with the boiler of the engine whereby either hot water or steam may be conveyed therethrough. A valve, 46, in the pipe has an arm, 47, with which a rod, 48, is connected and said rod extends to a point within reach of the engineer so that the valve may be opened or closed at will. In warm or clear weather when neither ice nor snow can accumulate on the rail section, 8, the engineer can close the valve, 46, and thus entirely cut off the passage of water or steam through the pipe, 44, but when needed, the said valve will be opened and will remain so because there is another valve, 49, lower down that will control the escape of the heating agent. This latter valve, 49, is provided with an arm, 50, that is attached to the plug, 51, of the valve so as to turn the latter and thus open or close the valve and a pipe, 52, depends from said valve and carries a nozzle, 53, at its lower end which projects toward the short rail sections as the vehicle passes the latter, so that the heating agent may be directed against the contact surface of said rail section and thus clean the latter in advance of the shoe. Various forms or constructions of mechanism may be employed to operate the arm, 50, of this valve, 49, but in the present instance we provide a clip plate, 54, which is attached to the contact end of the spring fingers of the shoe and this clip-plate is provided, in the present instance with an eye, 55, through which the lower end of the valve arm, 50, extends freely. It will thus be seen that when the spring fingers are bent as they drag over the rail sections, they will throw or turn the valve arm and thus open the valve and permit the heating agent to discharge through the nozzle onto the rail section to clean the latter. The return of said fingers to their normal position upon passing off the rail will return the valve-arm and valve and thus shut off the heating agent.

In order to prevent rapid condensation of the steam in the pipe, 44, and the freezing of water therein we inclose said pipe in some desirable way so as to protect it from the direct action of the coil and in the present instance we show a steam pipe, 56, coiled about said pipe, the ends, 57, and, 58, of which are connected with the boiler of the locomotive so as to pass a continuous flow of steam therethrough and thus heat the pipe, 56, exteriorly.

It will be seen that each time the contact shoe travels over a rail section the latter will be heated and thus ice or snow removed to permit the shoe that follows to make the desired contact.

Having thus described our invention what we claim and desire to secure by Letters Patent is,—

1. In a traveling current collector for railways the combination with the stationary conductor along the road, of an electrical contact member on the vehicle which is movable by contact with the conductor; a pipe for supplying a heating agent to the conductor; a valve in said pipe and connections between the valve and the electrical contact member whereby the movement of the latter upon contacting with the conductor will open the said valve.

2. In a traveling current collector for railways, the combination with the stationary current conductor along the road; a pipe on the vehicle for supplying a heating agent to the said conductor and having a valve; a flexible contact member also carried on the vehicle to make electrical contact with the conductor and means connecting the flexible contact member with the valve whereby the movement of said contact will operate the valve.

3. In a traveling current collector for railways, the combination with the stationary current conductor along the road; a pipe on the vehicle for supplying a heating agent to the said conductor and having a valve; a flexible contact member also carried on the vehicle to make electrical contact with the conductor,—said member normally depending vertically and capable of being bowed and means for connecting the flexible member with the valve of the said pipe whereby the bowing of said member will open the valve.

4. In a traveling current collector for railways, the combination with the stationary current conductor along the road; a pipe on the vehicle for supplying a heating agent to the said conductor and having a valve; a flexible contact member also carried on the

vehicle to make electrical contact with the conductor,—said member depending and capable of being sprung in either of two directions and the valve of said pipe terminating at the side of the flexible member and connected thereto and movable in either direction as the said flexible member is sprung out of its normal depending position.

5. In a traveling current collector for railways the combination with the stationary current conductors along the road, of a bracket on the vehicle; a stem carried by said bracket; a head connected with the stem,—said head and stem being movable vertically; a flexible contact depending from the head to bow and wipe over the respective current conductors; a pipe on the vehicle; a valve in said pipe, and connections between the valve and the flexible contact to operate the valve as the contact is bowed.

In testimony whereof we affix our signatures in presence of two witnesses.

RICHARD T. JONES.
FRANK T. JONES.

Witnesses:
CHAS. B. MANN,
G. FERDINAND VOGT.