

No. 850,604.

PATENTED APR. 16, 1907.

E. J. RICE.
SWITCH OPERATING DEVICE.
APPLICATION FILED JAN. 25, 1907.

FIG. 1.

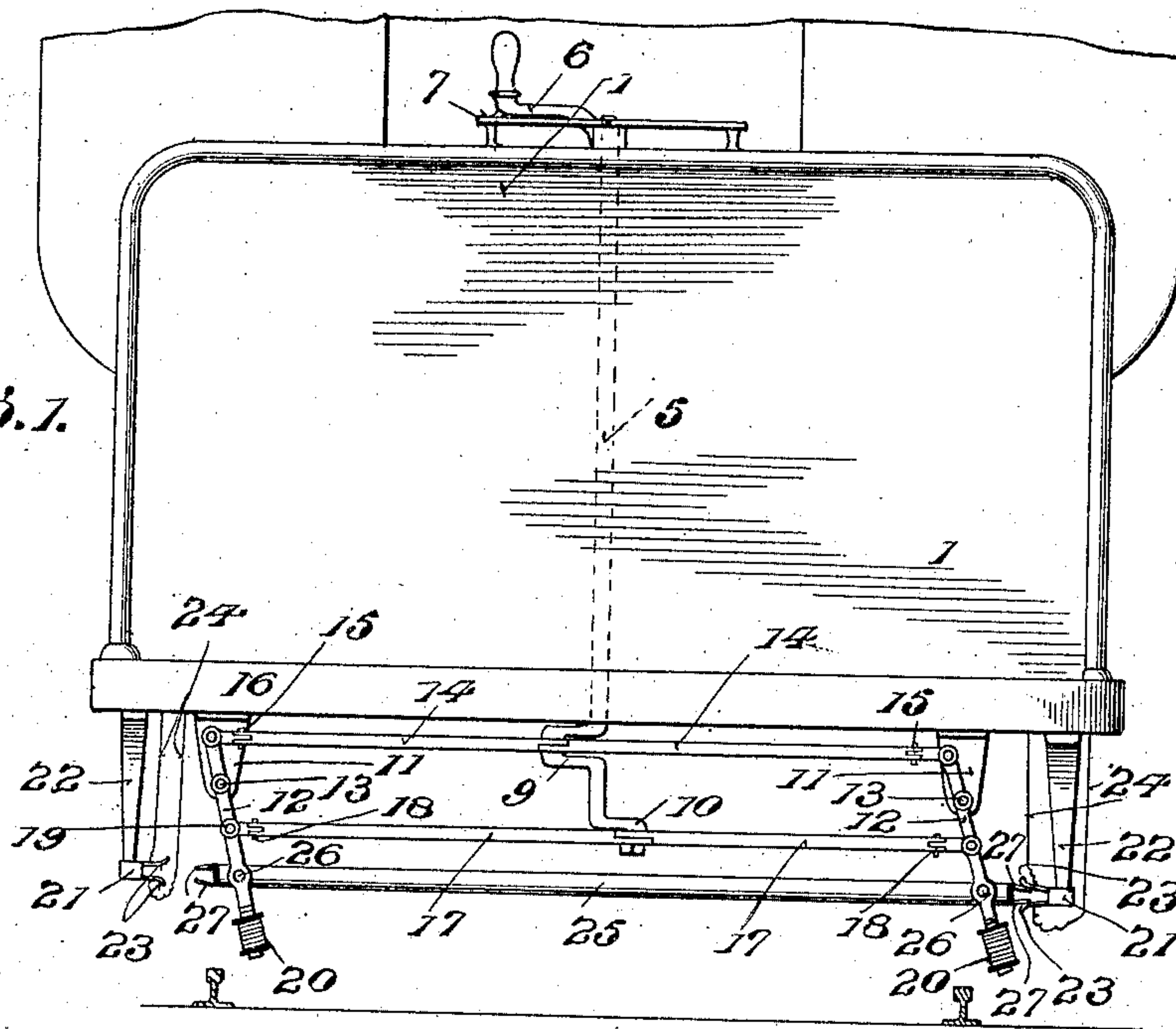


FIG. 2.

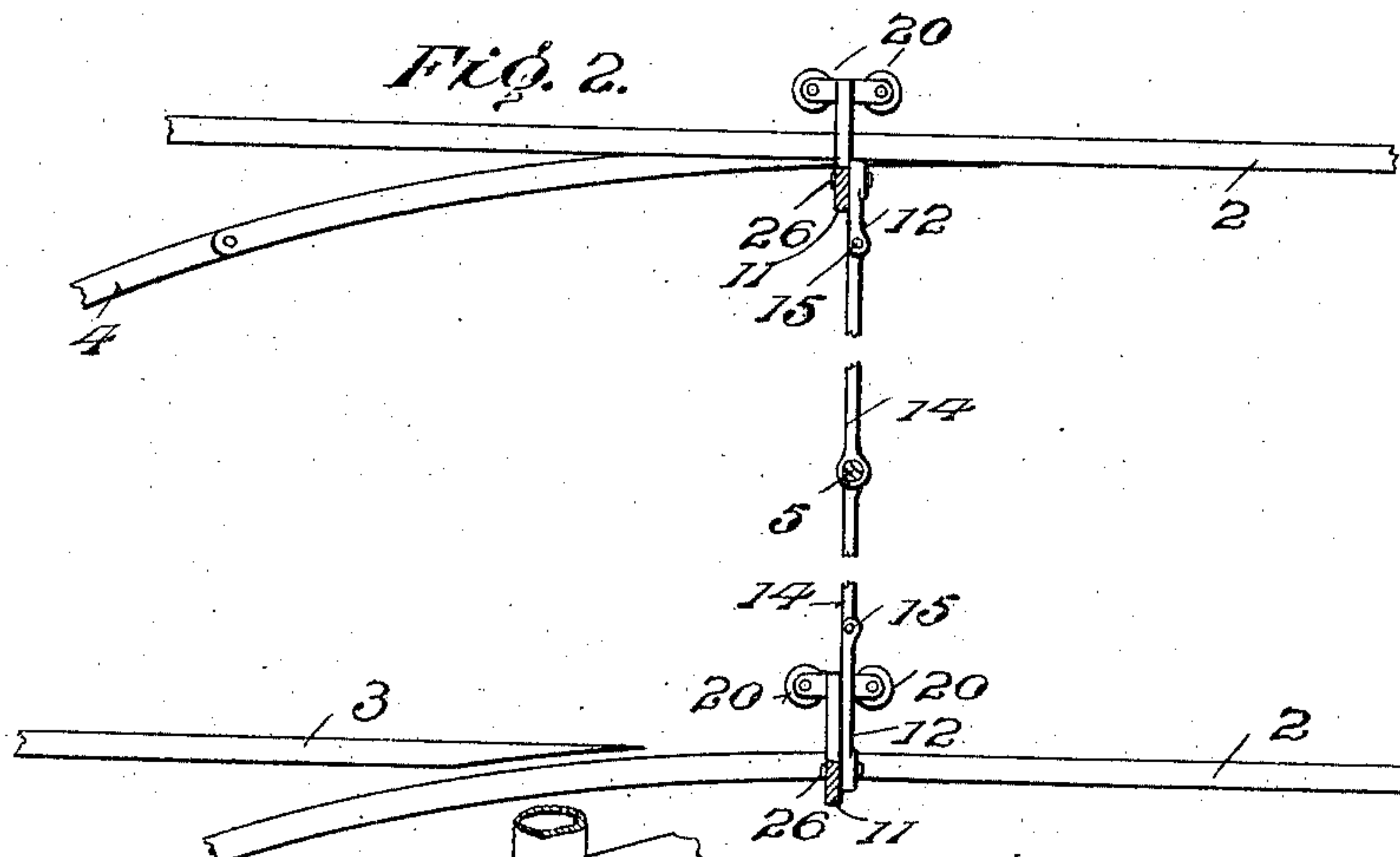
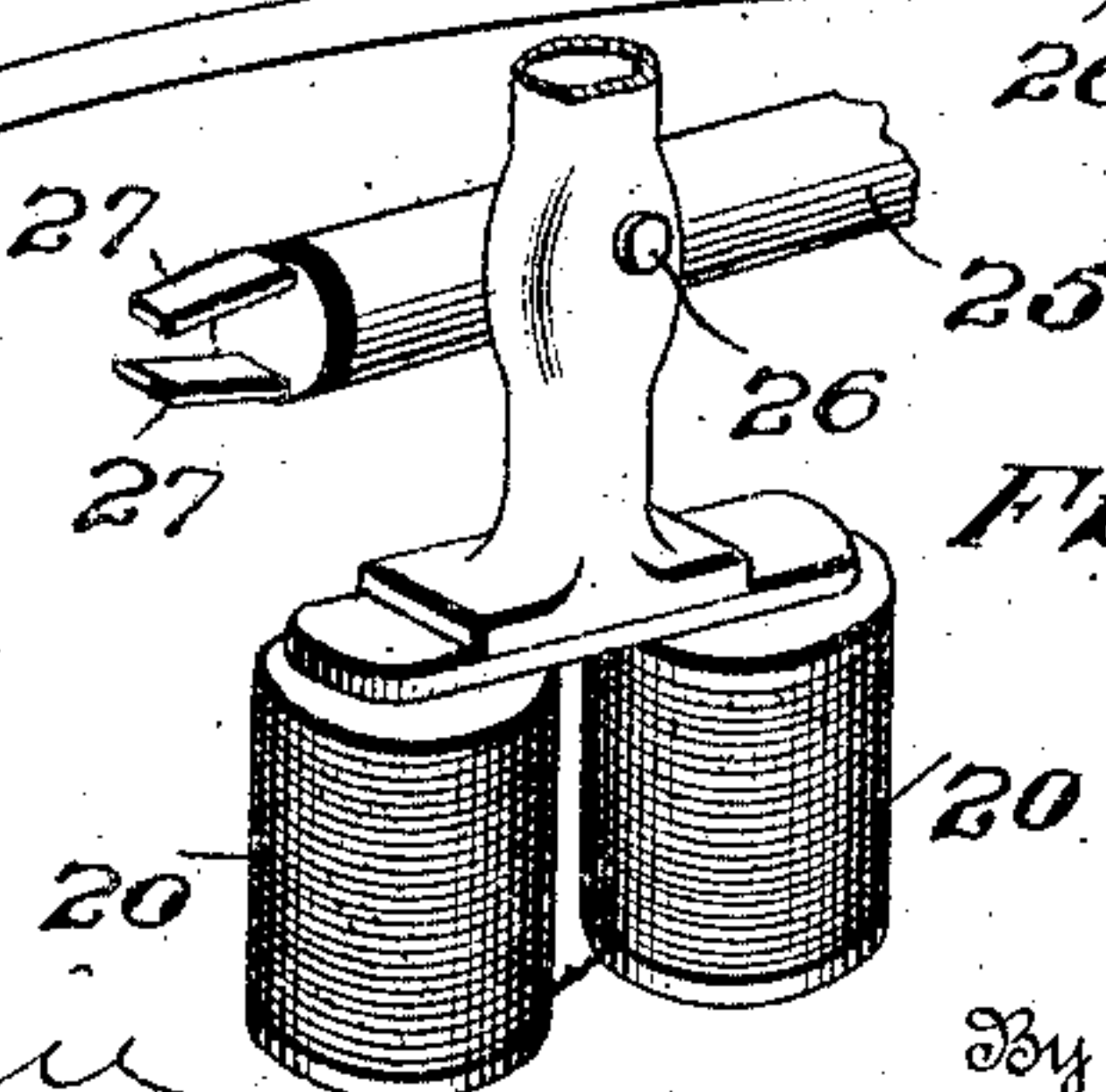


FIG. 3.



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SWITCH-OPERATING DEVICE.

No. 850,604.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, ELTON J. RICE, a citizen of the United States, residing at Spokane, in the county of Spokane and State of Washington, have invented certain new and useful Improvements in Switch-Operating Devices; 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.

My invention relates to improvements in devices for operating switches on railways; and the object of my invention is to provide means for operating the switch on a railroad by means of a magnet carried by the car, my invention being particularly applicable for use in operating the pivoted switches of street-railways. It is to be understood, however, that the device can also be applied on other railways.

With these objects in view my invention consists in certain constructions, combinations, and arrangement of parts, the preferred form of which will be first described and then the invention particularly pointed out in the claims.

Referring to the drawings, wherein I show the preferred form of my invention and wherein the same part is designated by the same reference-numeral wherever it occurs, Figure 1 is a front elevation of a car provided with my invention. Fig. 2 is a top plan view of a switch, showing diagrammatically the arrangement of my invention in relation therewith. Fig. 3 is a detail view of the magnet and contact-carrying rod.

1 designates the dashboard of a street-railway car; 2, the main line of the tracks, upon which the car is adapted to run; 3, a pivot switch-point, and 4 the tracks of the switch. These parts are merely shown for the purpose of illustrating the application of my invention, and they form no part thereof.

5 designates an operating rod or shaft, which, as shown, is mounted upon the dash 1. This shaft at its upper end is provided with an operating-handle 6, provided with a spring-pressed pin 7, adapted to engage notches in a sector 8, whereby the shaft 5 can be held in any one of its three positions. The

shaft 5 is provided with a crank 9, extending in one direction, and a second shaft 10, extending in the opposite direction. Preferably and as shown these cranks extend from the shaft in line with the operating-handle 6, so that the cranks will be in middle position when the operating-handle is in its middle position.

Mounted on the frame of the car are a pair of lugs 11 11, these lugs being preferably mounted in line with the rails on which the car is adapted to run.

12 12 are a pair of arms pivoted at 13 13 in the lugs, these pivots 13 being shown as intermediate the ends of the arms.

14 14 are connecting-links, preferably formed in a rule-joint 15 15 intermediate their ends and connected at their adjacent ends to the crank 9 and at their outer ends to one end of the arms 12 by means of the pivots 16.

17 are a second pair of links, provided with rule-joints 18, each link being connected at one end to the crank 10 and at its outer end to one of the arms 12 by the pivots 19, the point of connection for the connecting-links 17 being on the opposite side of the pivot from that for the arms 12, the distance between the pivot 13 and the pivot 19 being equal to the distance between the pivot 13 and the pivot 16. From this construction it will be seen that when the handle 6 is turned the arms 12 12 will be swung around their pivots 13 and always kept parallel. The links are preferably so arranged that when the handle 6 is in its middle position the arms 12 will be vertical.

20 are electromagnets mounted on the free ends of the arms 12, and the ends of these magnets are located as close to the top of the rail as possible, due allowance being made for the movement of the car.

21 are a pair of contacts each carried by a suitable support 22, one of these contacts being preferably located on each side of the car. The contacts 21 are preferably each provided with a pair of contact-fingers 23, which are connected, by means of wires 24, either to the current supplied to the car or to a suitable storage battery, the source of current being entirely immaterial.

25 is a bar secured to the arms 12 12 adjacent the ends of the bar by means of the pivots 26 or any other suitable connection. At each end of the bar is a pair of contacts 27. The bar 25 is mounted in line with the contacts 21, and the contacts 27 are adapted to engage either set of contacts 23 to complete the circuit, the pair of contacts engaged being dependent upon which way the handle 6 is turned from its central position. The contacts 27 are connected up with the electromagnets 20, so as to cause both of said electromagnets to be energized when either set of contacts is closed. In other words, the current will pass through both magnets when the parts are in either the position shown in Fig. 1 or when the handle 6 has been moved through the arc of one hundred and eighty degrees from the position shown in Fig. 1.

It being understood that normally the magnets 20 are in their middle position, which is directly over the rails, so that there is no current passing through the magnets, I will now describe the operation of my device. When a switch is approached which is not in the desired position, the operator by swinging the handle 6 moves the magnets to one side of the track or the other, dependent upon which way the switch is to be thrown. This movement causes the contacts 23 and 27 to close the circuit and energize the magnets. As one of the magnets passes over the switch-point it will attract the steel of the point and move the same. As soon as the switch has been passed the parts are returned to their normal position, which shuts off the current to the magnets. The device being mounted over the front end of the car has sufficient space to operate before the wheels meet the switch.

While I have described what I believe to be the preferred form of my invention, I desire to have it understood that many changes may be made in the form, construction, and arrangement of parts without departing from my invention.

The mechanical details in construction can be varied, the location of the apparatus changed on the car, and the apparatus modified to adapt it for use on various kinds of cars under various conditions within the scope of the appended claims.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. A switch-operating device comprising a pair of arms pivoted to a railway-car, magnets carried by the arms, a crank-shaft, links connecting said arms to said cranks, whereby said magnets may be swung from one side of the rail to the other.

2. A switch-operating device, comprising a pair of arms pivoted to a railway-car, mag-

nets carried by the arms, a shaft having two oppositely-extending cranks, a pair of links connecting said arms to one of said cranks and a second pair of links connecting arms to the other of said cranks, one pair of links being connected to the arms on one side of their pivots and the other pair on the other side.

3. A switch-operating device comprising an arm pivoted to a railway-car, a magnet carried by the arm and means for swinging the arm on its pivot to move the magnet from one side to the other of the rails.

4. A switch-operating device comprising an arm pivoted to a railway-car, a magnet carried by the arm, a crank mounted on the car and a link connecting the crank and arm whereby the magnet can be swung from one side to the other of the rail.

5. A switch-operating device comprising an arm pivoted to a railway-car, of a magnet carried by the arm, a shaft provided with a pair of oppositely-extending cranks, a pair of links connected to the cranks at one end and to the arms at the other on opposite sides of the pivot of the arm whereby the operation of the crank-shaft will swing the magnet from one side to the other of the rail.

6. A switch-operating device comprising an arm pivoted to a railway-car, a magnet carried by the arm, means for swinging the arm on its pivot to move the magnet to one side or the other of the rail, a pair of stationary contacts on opposite sides of the pivoted arm movable contacts connected to the arm whereby when the arm is moved to either of its side positions the contacts will come together, and electrical connections between said contacts and said magnet.

7. A switch-operating device comprising an arm pivoted to a railway-car, a magnet carried by the arm, a shaft provided with a pair of oppositely-extending cranks, links connecting each of the cranks with the arm, connections between the links and the arm being on opposite sides of the pivot of the arm, a bar connected to the arm and provided with contacts at its ends, a pair of stationary contacts and electrical connections between the contacts on the bar and the magnet.

8. A switch-operating device comprising a pair of arms pivoted to a railway-car, magnets carried by the arms, a crank-shaft, links connecting said arms to said cranks and a bar connected near its extremities to said arms and carrying at its ends contacts, stationary contacts with which said first-mentioned contacts are adapted to alternately engage and connections between said movable contacts and said magnets.

9. A switch-operating device comprising a pair of arms pivoted to a railway-car, magnets carried by the arms, a shaft having two oppositely-extending cranks, a pair of links connecting said arms to one of said cranks, a

second pair of links connecting said arms to
the other of said cranks, one pair of links be-
ing connected to the arm on one side of the
pivots and the other arm on the other side,
5 a bar connected to both said arms, contacts
mounted on said bar, stationary contacts
with which said movable contacts are adapt-
ed to alternately engage and connections be-

tween the contacts on the bar and the mag-
nets.

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

ELTON J. RICE.

Witnesses:

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A. D. GRITMAN.