J. B. HENNIGER & J. K. GUTHRIE.

SWITCH OPERATING MEANS.

APPLICATION FILED APR. 30, 1915.

1,265,200.

Patented May 7, 1918.

3 SHEETS—SHEET 1.

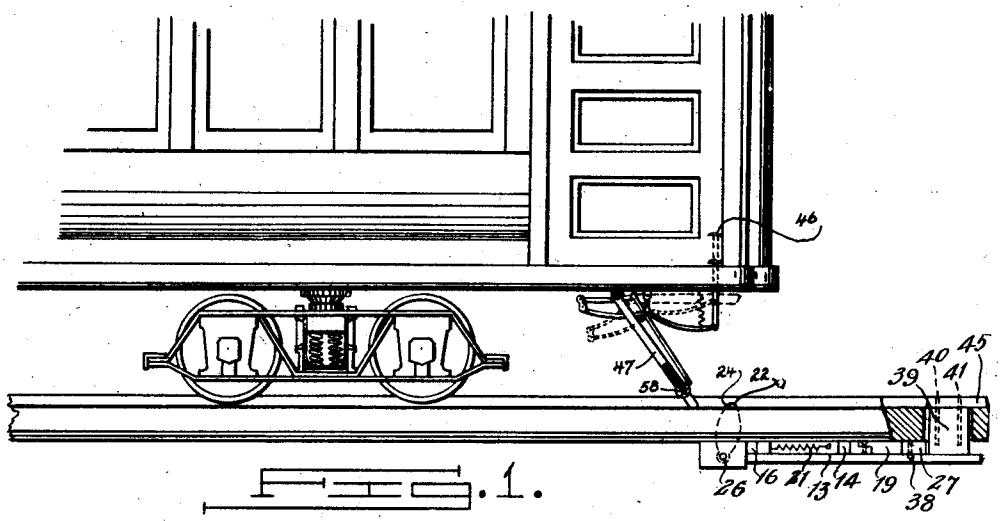


FIG. 1.

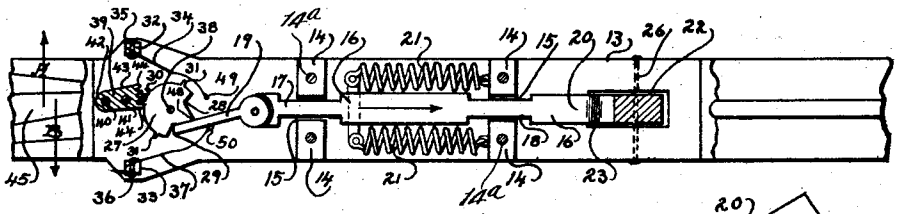


FIG. 2.

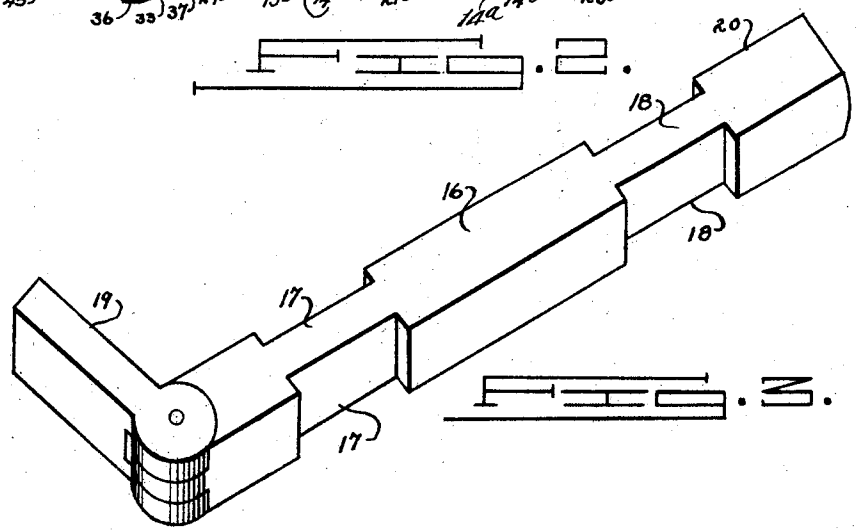


FIG. 3.

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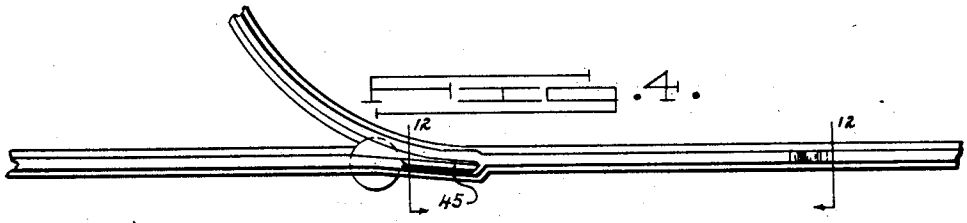
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3 SHEETS—SHEET 2.

FIG. 4.



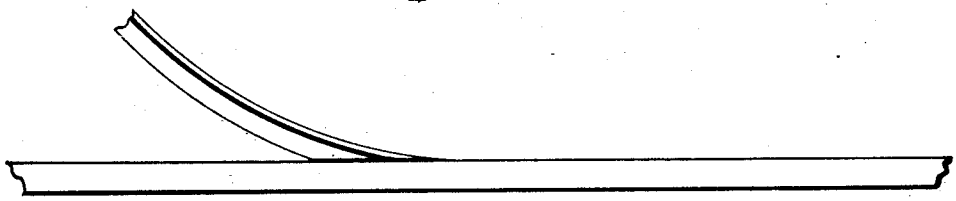


FIG. 5.

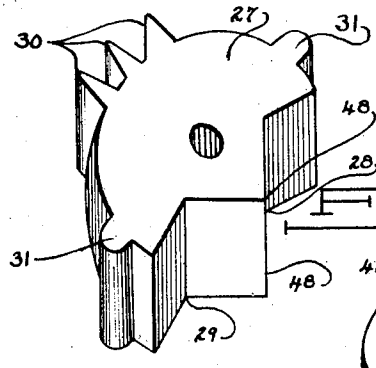


FIG. 7.

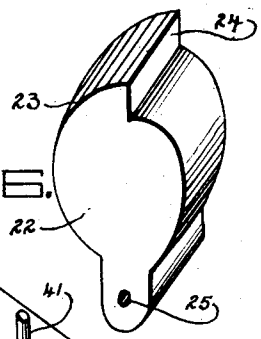
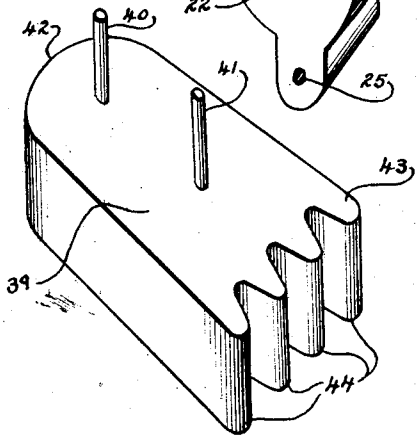


FIG. 6.



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3 SHEETS—SHEET 3.

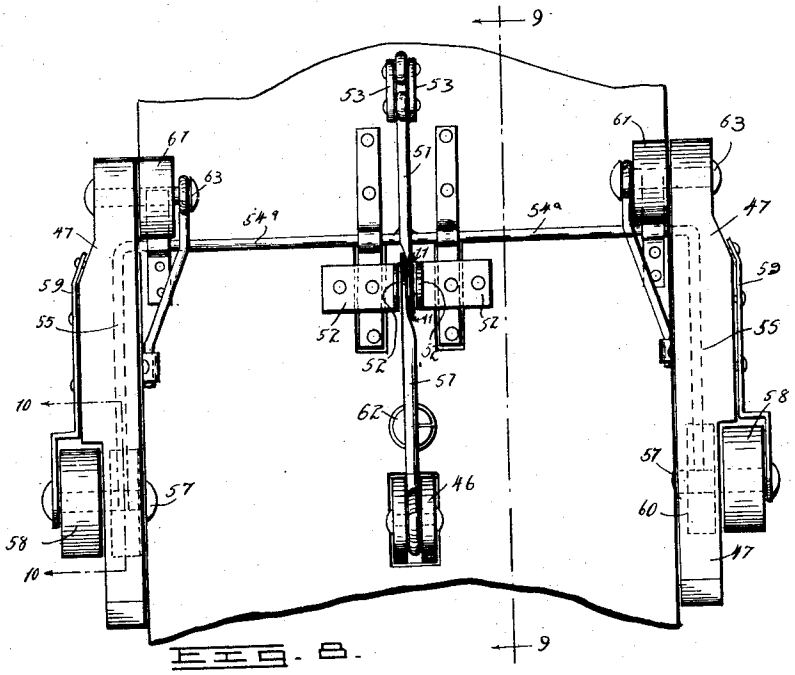


Fig. 8.



Fig. 11.

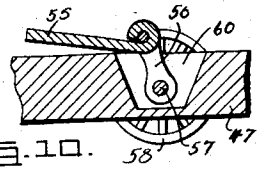


Fig. 10.

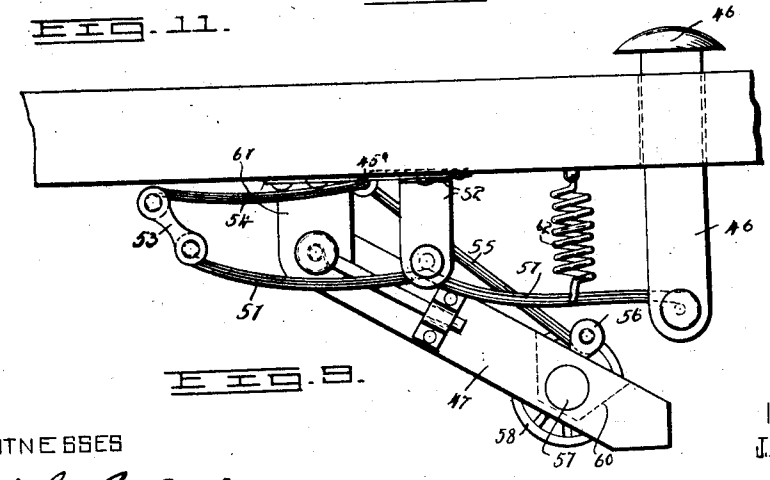


Fig. 9.

WITNESSES

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UNITED STATES PATENT OFFICE.

JOHN BROWN HENNIGER AND JOHN KIRBY GUTHRIE, OF PERTH ROAD, ONTARIO, CANADA.

SWITCH-OPERATING MEANS.

1,265,200. Specification of Letters Patent. Patented May 7, 1918.

Application filed April 30, 1915. Serial No. 25,086.

To all whom it may concern:

Be it known that we, JOHN B. HENNIGER and JOHN K. GUTHRIE, citizens of the Dominion of Canada, residing at Perth Road, in the county of Addington, Province of Ontario, Canada, have invented certain new and useful Improvements in Switch-Operating Means, of which the following is a specification.

This invention relates to switch operating means, and is particularly adapted for use on electric railways, although it may be used on various other rails over which moving bodies pass such as steam railroads, mine car railroads, etc.

In describing our invention, we have shown it as used in connection with an electric car. The invention consists of a pair of operating arms one on each side of the car mounted on suitable operating means underneath the front portion of the car. A foot lever extends up through the floor of the car near the controller near which the motorman stands. One of these arms when pushed down will come in contact with a dog which is suitably arranged in the track, and which, when struck will operate the switch from one position to another.

This device can be easily applied to switches already in use and also the operating means can be easily applied to practically all cars in use at the present time.

The object of the invention is to provide an easily operative switching means which can be readily attached to switches now in use and which can be operated with the car in motion.

A further object of the invention is to provide a switch operating means whereby a switch going to right or left of the direction in which the car is moving can be opened or closed as desired without stopping the car.

The invention consists of the novel features hereinafter described and claimed.

In the accompanying drawings:—

Figure 1 is a side elevation of a car with part of our invention attached thereto showing the relation of the operating means to the dog in the rail.

Fig. 2 is an enlarged top elevation of the operating means which is located under the rail, parts being shown in section.

Fig. 3 is the driving rod as shown in Fig. 2.

Fig. 4 is a top elevation of a set of tracks and the respective position of the dog to the switch.

Fig. 5 is a perspective view of one of the operating parts.

Fig. 6 is a perspective view of the part which will be attached to the switch.

Fig. 7 is a perspective view of the dog.

Fig. 8 is a view of the bottom of the car showing the operating arms on both sides and the operating parts connecting with the foot lever.

Fig. 9 is a side view on the line 9—9 of Fig. 8.

Fig. 10 is a sectional view along the line 10—10 of Fig. 8.

Fig. 11 is a detail view of the fulcrum support of the lever member which connects the foot operated lever with the evener.

In describing our invention, we will first describe the part of our switch operating means which is located under the rail. This part is located under the rail between the lines 12—12 as shown in Fig. 4. It consists of a bottom plate 13 on which are mounted the rectangular blocks 14, as shown in Fig. 2. These blocks have the openings 15 between them, through which passes the driving rod 16. This driving rod has the notches 17 and 18, and as will be seen from the drawings the driving rod 16 will be allowed to go only a certain distance back and forth. The driving rod 16 has a hinged end 19 at one end, and its other end 20 is practically square. The springs 21 tend to pull the driving rod 16 in the direction of the arrow.

22 is the dog which will be more particularly seen in Fig. 7. This is of a special design as shown, having the rounded side

23 and the flat face 24. The flat face 24 is always turned away from the switch and it is this face that the operating arms, which will be hereinafter described, strike. The rounded face 23 is adapted to come in contact with the end 20 of the driving rod 16. This dog 22 has an orifice 25 and is hinged on a pin 26.

27 is one of the main parts of the device. It is practically three-fourths of a circle with cogs as shown more particularly in Fig. 5. There are two V-shaped cut out portions 28 and 29. Opposite these are three cogs 30. On each side we provide a lug 31. Two blocks 32 and 33 are secured to the plate 13 through which the ends of the springs 34 and 37 pass. These ends of the springs 34 and 37 are securely held in the blocks 32 and 33 by means of the pins 35 and 36. The springs 34 and 37 when not in contact with the hinged end 19 of the driving rod 16, will lie against the lugs 31. The springs 34 and 37 are rounded outwardly near the ends away from the blocks 32 and 33. It will be seen from Fig. 2 that the spring 37 is in contact with the hinged end 19 while the spring 34 is in contact with the lug 31. Now, when the driving rod 16 is pulled back to its normal position in the direction of the arrow, the hinged end 19 will be sprung over to engage in the V-shaped notch 28 by the action of the spring 37. The member 27 is mounted to turn on a pin 38.

39 is a connecting member which is secured to the lower side of the switch 45 by means of the pins 40 and 41. We have shown in Fig. 6 one particular shape of this part, but it may be made in various shapes and styles. Some switches come to a very thin point, and this particular shape which we show in Fig. 6 would not be readily adapted to such switches. In this case, the end 42 would extend back to the desired distance, but the end 43 must always be at the end of the switch, no matter how long the member 39 may be. End 43 is provided with 4 cogs 44 into which will mesh the cogs 30 of the member 27. The plate 13, carrying the switch-operating mechanism, is adapted to be attached to the under side of the rail by any suitable means, as for instance, the bolts shown at 14^a in Fig. 2.

Now, we shall explain the operation of this switch throwing arrangement. The car is coming along the track in the usual manner and the motorman will notice that the switch is not turned in the right direction in which he intends going. He will at once put his foot on the lever 46 which will bring the end of the operating arm 47 in contact with the face 24 of the dog 22. Now, as the car moves forward, the dog 22 will also be pushed in a forward direction. The face 23 of the dog 22 will now come in contact with the end 20 of the driving rod 16 and will push it in the direction opposite to the arrow. The hinged end 19 will engage in the notch 29 and cause the member 27 to turn on its center pin 38. Now, the cogs 30 will operate and mesh with the cogs 44 and thus, cause the switch to be turned in the direction of arrow A. Now, the car does not have to stop at all, but can go straight ahead and the switch is turned in the direction desired. The flange will not come in contact with the face 24 of the dog 22.

As soon as the operating arm 47 passes over the dog, this forward motion pressure is taken off and the springs 21 cause the driving rod 16 to come back in the direction of the arrow to the normal position. During this motion, the hinged end 19 is pulled back past the point 48 of the member 27 and by the action of the spring 37 it is swung across to engage in the V-shaped notch 28. These springs 37 and 34 are preferably made of flat spring steel, and have their ends 49 and 50 bent around on the side next the hinged end 19.

A second car comes along and if it desires to go in the opposite direction to the first just mentioned, the motorman puts his foot on the lever 46 in his car which causes the operating arm 47 to engage in the face 24 of the dog 22. The forward motion of the car will then cause the dog 22 to hinge on the pin 26 and the face 23 will come in contact with the end 20 of the driving rod 16. The hinged end 19 will be in the V-shaped notch 28 and will cause the member 27 to turn on its center pin 38 in opposite direction to that previously mentioned. The cogs 30 will again cause the member 39 to be swung in the direction of the arrow B. As the member 39, is securely attached to the switch, the switch will also be swung in the direction of the arrow B, thus, you will see that without any further operation, than having the motorman put his foot on lever 46, the switch 45 can be thrown in either direction. The dog 22 can be put at any distance away from the switch that may be desired. All the change that is necessary in our device is to have the center portion of the driving rod 16 of a longer length. The springs 21 are shown here as two coil springs and they may be made of any desired shape, and may be one, two, or more in number, as desired.

Having thus described the part of our invention which throws the switch, we will now describe the operating means which is attached underneath the front portion of the car, more particularly shown in Figs. 8, 9, and 10. The lever 46 extends through the

floor of the front portion of the car and is connected to the member 51. This member 51 has a leverage on the pair of leverage braces 52, and the other end of member 51 is connected with the evener 53, which evener connects the same with the member 54. This member 54 has divided ends which extend toward the side of the car as shown at 54ª. These ends extend out to the operating arm 47 as shown at 55 and the ends of which connect with the eveners 56. These eveners have their other ends mounted on the pins 57. These pins 57 extend through the operating arm 47 and support wheels 58. 59 is a support for the outside of the pin 57 on which the wheel 58 revolves. 60 is a U-shaped opening in the operating arm 47 in which the evener 56 works back and forth. 61 is a block secured to the car through which the pins 63 pass. Each pin 63 also passes through the end of the operating arm 47 and it is on this pin 63 that the operating arm 47 hinges back and forth when put into operation. 62 is a spring secured to the bottom of the car and preferably secured to the member 51 between the ends secured to the foot lever 46 and the point of leverage 52.

The wheel 58 allows the end of the operating arm 47 to extend down into the flange groove only sufficient distance to come in contact with the face 24 of the dog 22, and it will be seen that if for any reason the motorman should put his foot on the foot lever 46 when not near the switch, it will cause no damage. It will only cause the operating arm 47 to have its end turned down toward the track and the wheel 58 will run along at the top of the rail. The same action will be apparent should the motorman keep his foot on the foot lever 46 after the end of the operating arm 47 has passed over the dog 22. Thus, we provide a simple arrangement whereby the motorman can operate the device without taking either hand off the controlling means of the car, and one which will operate easily and also will operate switches in either direction. The ordinary street cars which are made to run only in one direction will require the operating means on the car only at one end, but those cars which run to the end of their line and reverse their operating means to the opposite end of the car without turning, will require a foot lever and a set of operating means at both ends of the car, thus, having an operating arm at each of the 4 corners of the car.

This arrangement will be found of great service in shunting around railway centers. At the present time, several men are employed for each engine to throw the switches back and forth, but if the herein described invention was put into operation, the switches could be thrown by the engineer putting his foot on levers in the engine cabin.

It is evident that many changes and modifications of this device may be made by those skilled in the art without departing from the spirit and scope of our invention, and we do not wish to be limited to the details of construction herein disclosed, but

What we claim is,—

1. A switch operating means consisting of a switch throwing device located underneath the rail, said switch throwing device consisting of a base, a lug attached to the point of the switch rail, a bar slidable in the base member, a segmental cog mounted on the base and engaging said lug and adapted to be operated by the sliding bar, means on the base for sliding said bar, and a tripping device mounted on the car for operating said bar sliding means.

2. A switch operating means consisting of a switch throwing device located underneath the rail, said switch throwing device consisting of a base, a lug attached to the point of the switch rail, a geared wheel mounted to oscillate on said base, said lug having suitable gear teeth on one side and meshing with the teeth of the geared wheel, means for oscillating said geared wheel and thereby throwing the switch, and means on the car for operating the means for oscillating the gear wheel.

3. A switch operating means consisting of a switch throwing device located underneath the rail, said switch throwing device consisting of a base, a geared wheel mounted to oscillate on said base, a bar slidable on said base, means on the bar for oscillating said gear wheel, a lug attached to the point of the switch rail, teeth on the lug for engaging the teeth of the gear wheel, a cam pivoted to the base and adapted to operate the said sliding bar, and means on the car for operating said cam.

4. A switch operating means consisting of a switch throwing device located underneath the rail, said switch throwing device consisting of a base, a lug provided with teeth attached to the point of the switch rail, a wheel provided with teeth mounted to oscillate on said base, and engaging the teeth of the lug, a sliding bar mounted in the base, said bar having a lever pivoted at one end for operating said gear wheel, springs mounted on the base on either side of said pivoted lever and adapted to alternately engage first one side and then the other of said lever, a cam pivoted to said base and adapted to slide said bar in one direction, a spring attached to the sliding bar and the base for returning said sliding

bar, and means mounted on the car and adapted to be thrown into engagement with said pivoted cam.

5. A switch operating means consisting of a switch throwing device located underneath the rail, said switch throwing device consisting of a base, mechanism attached to the point of the switch rail, oscillating mechanism mounted on the base and engaging the mechanism on the switch point, sliding mechanism mounted on the base and engaging said oscillating mechansm, pivoted mechanism provided on the base for operating said sliding mechanism, and means on the car for operating said pivoted mechanism.

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

JOHN BROWN HENNIGER.
JOHN KIRBY GUTHRIE.

Witnesses:
JOHN GUTHRIE,
WM. I. CARROLL.

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