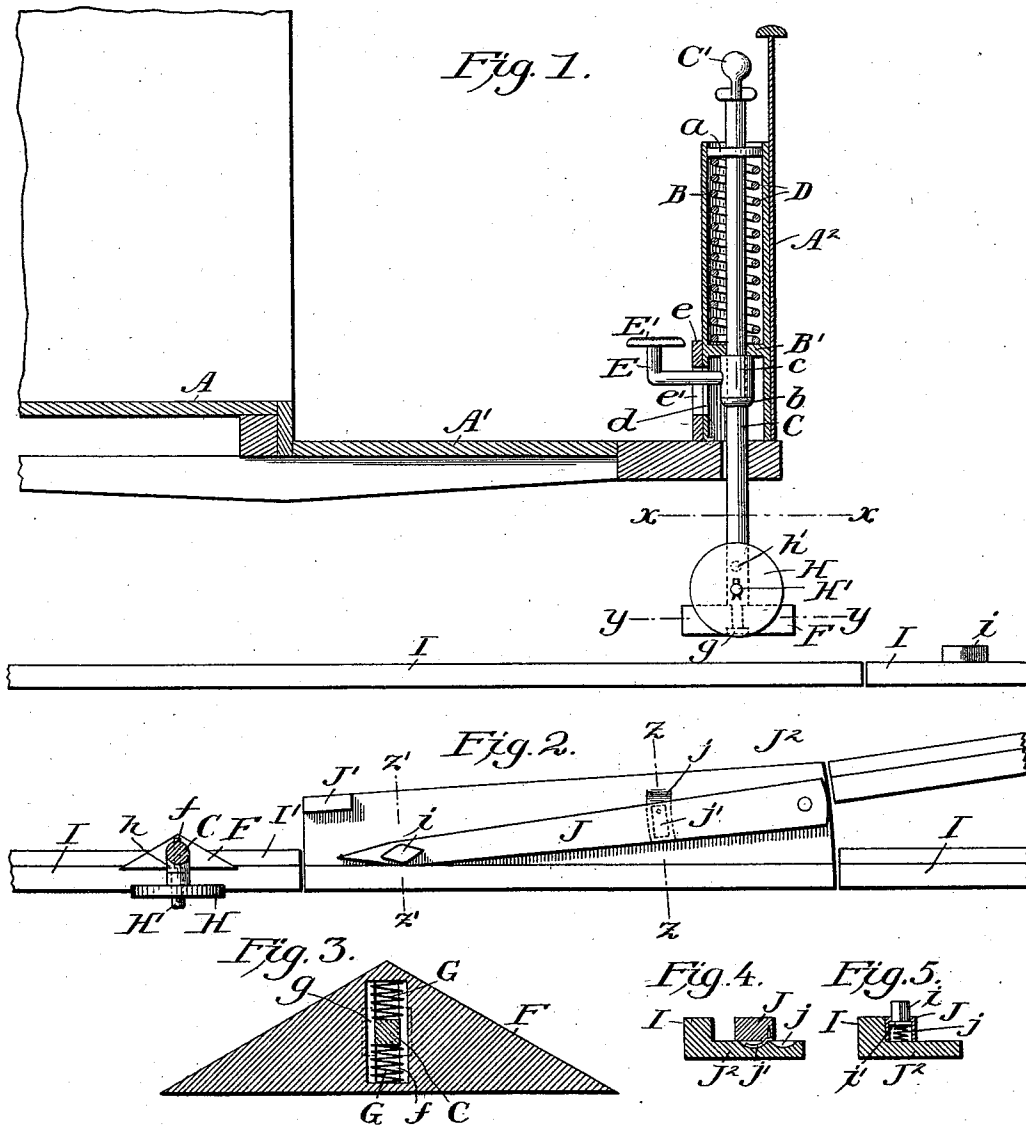


(No Model.)

C. DIENER.
SWITCH OPERATING DEVICE.

No. 531,166.

Patented Dec. 18, 1894.



Witnesses.
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UNITED STATES PATENT OFFICE.

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BERNARD BOMEISL, OF SAME PLACE.

SWITCH-OPERATING DEVICE.

SPECIFICATION forming part of Letters Patent No. 531,166, dated December 18, 1894.

Application filed August 30, 1894. Serial No. 521,707. (No model.)

To all whom it may concern:

Be it known that I, CHARLES DIENER, a citizen of the United States, and a resident of Brooklyn, county of Kings, and State of New York, have invented certain new and useful Improvements in a Switch-Operating Device for Street-Railway Cars, of which the following is a specification, reference being had to the accompanying drawings, forming a part thereof, in which similar letters of reference indicate corresponding parts in all the figures.

This invention relates to switches for street railways, and to means for operating the same, and has for its object to provide a simple, cheap, readily constructed, and perfectly operating device which may be secured to any car and be depressed to engage with the tongue of the switch, and also to provide a switch which will instantaneously open or close upon being engaged by the device upon the car and will be held in such opened or closed position while the car passes, without danger of dislodgement. Heretofore many obstacles have been encountered in the use of devices of this character, primarily among which is the inability of the operating shoe to enter between the tongue of the switch and the adjoining rail, and also if the said tongue be clogged by dirt or small stones, the shoe will immediately break off or become itself caught in the switch. Furthermore, the rapidity of motion of the car often throws the switch so forcibly that the same will recoil or spring back, thus derailing or blocking the car.

By the use of my invention, which consists in the novel construction and arrangement of parts hereinafter fully described, the above-mentioned and many other disadvantages are overcome.

In the accompanying drawings: Figure 1 is a longitudinal vertical section of the forward end of a car provided with a device embodying my invention, the operating shoe and the track beneath being in elevation. Fig. 2 is a plan view of one side of a track provided with a switch embodying my invention, with the operating shoe in front thereof, the same being a section taken upon the line $x-x$, Fig. 1. Fig. 3 is a horizontal section of the operating shoe taken upon the line $y-y$, Fig. 1. Fig. 4 is a vertical cross section of the switch

taken upon the line $z-z$, Fig. 2. Fig. 5 is a similar section taken upon the line $z'-z'$, Fig. 2.

In the practice of my invention, I secure to the forward end of the platform A' of the car A , or to each platform thereof if the front and rear are used interchangeably, a cylindrical box B , which is placed immediately behind the dash-board A^2 , and is secured to both the same and the platform A' by any suitable means. This box B is divided by a horizontal partition B' slightly below the vertical center thereof. Within the box is journaled a vertical shaft C , having upon the top thereof a crank C' , and somewhat below the same an annular collar a . Surrounding the shaft C between the collar a and the partition B' is a spiral spring D , the tendency of which is to expand. Resting upon a shoulder b upon the said shaft C , beneath the partition B' , is a loosely mounted sleeve c , having a radial arm E projecting therefrom through a longitudinal slot d in the front of the box, the said arm being turned upwardly at right angles to itself, and having mounted upon the top thereof a plate or pedal E' .

It will be observed that the shaft is normally raised by the expansion of the spring D bearing upon the collar a , and too great upward movement of the said shaft is prevented by the shoulder b and the sleeve c , bearing upon the under surface of the partition B' . At the front of the box throughout that portion in which is formed the longitudinal slot d , is secured a brace plate e having a slot e' therein in alignment with the slot d , the function of the said plate being to strengthen the lower portion of the box B , which being of thin metal is liable to be torn or abraded by the arm E as it ascends and descends by the pressing of the pedal E' .

Upon the lower end of the shaft C , which projects considerably below the platform A' , is secured a triangular block or shoe F , which is plain or straight upon one side thereof and beveled or inclined at the other from the center forwardly and rearwardly, as shown. At the center of the shoe F is a countersunk laterally ranging groove or slot f , the lower portion of which is widened. Through this slot f extends the lower end of the shaft C ,

which is reduced in diameter and formed sectionally square, whereby it slides in the said slot *f*. Upon the bottom of the shaft is secured a square nut *g* which slides in the enlarged portion of the slot.

At either side of the shaft *C*, between, and secured to, the same and the sides of the shoe bordering upon the slot *f*, are spiral springs *G*, of an appreciably high tension, the shoe being thus mounted upon the shaft with the same effect as if rigidly fastened thereto, except that under high lateral pressure it is yielding. Projecting from the shaft *C* slightly above its junction with the shoe *F* is an extension or journal *h* on which is mounted a wheel *H*, the lower edge of which is upon a substantial level with or preferably slightly beneath the shoe *F*, whereby as the said wheel rides upon the rail *I*, the shoe will be held just out of contact with the said rail.

The tongue *J* of the switch is pivoted in the usual manner, and at or near the point thereof is mounted a diamond shaped lug *i*, which by reason of this contour is thus beveled at each end, and also at each side of the said ends, thereby permitting the switch to be actuated upon the forward or rearward motion of the car, or by a car traveling in either direction. This lug projects slightly above the level of the tongue *J*, in practice about half an inch, and may if desired be formed as shown in Fig. 5, wherein the tongue is hollow immediately below the same, and beneath the said lug is a spiral spring *j* which holds the same normally upward. The said lug projects slightly into the tongue *J*, and is provided with a shoulder *i'* which engages with the top or roof of the tongue to prevent the said lug from projecting too far upwardly.

The operation of the device will be readily understood from the foregoing description taken in connection with the accompanying drawings.

The device being in the position shown in Fig. 1 is normally held above the track by the spiral spring *D*, and as the car proceeds and the switch is approached the driver or motorman depresses the shaft *C* by pressing upon the pedal *E'* with the foot or upon the top of the said shaft with the hand, preferably the former, thus forcing the wheel *H* to the track below, the shoe *F* being carried with it. It will be seen that it is not necessary to wait until the car is immediately upon the switch, as the wheel *H* will ride upon the rail *I* for any desired distance, and at the same time hold the shoe *F* out of contact therewith. As soon as the shoe *F* reaches the lug *i*, the engagement of the beveled side of the said shoe with that of the said lug will cause the tongue of the switch to be opened or forced away from the outer rail, thus permitting the car to proceed upon the main track.

By referring to Fig. 1, it will be observed that when the shoe is in the position to open the switch, the crank *C'* will rest against the dash-board *A*² upon the right hand side of

the box *B*, and should the switch be open, and it be desired to close the same, the crank *C'* is given a half turn whereby it abuts against the dash-board upon the opposite side to its former position, thus reversing the position of the shoe so that its bevel points inwardly, instead of outwardly as in Fig. 2. The radial arm *E* being secured upon the loosely mounted sleeve *c*, the shaft turns therein without difficulty, and by reason of the fixture of the crank handle *C'* thereon, no skill is required upon the part of the motorman to calculate the position of the shoe, as when the crank is against the dash-board to the right, the shoe is in proper position to open the switch, and when it is in the same position to the left, is in readiness to close the switch, and if it be found desirable, any suitable means may be devised to restrict the rotation of the shaft and prevent any slipping thereof. Of course upon the closure of the switch, the wheel *H* will not rest upon the rail *I*, but in practice guard rails are usually placed adjacent to such switches and the wheel would then ride upon these, and furthermore, it is not essential that but one wheel be used.

Should the tongue *J* be clogged by dirt or pebbles, as is very often the case, the shoe *F*, when it comes in contact with the lug *i* and is met by resistance therefrom will yield laterally against the springs *G* sufficiently to pass the lug, and thus any breakage of the said shoe or of the lug is prevented, and it is but necessary to reverse the motion of the car or push it back in front of the switch and release the tongue from the clogging material. When the switch is opened by the shoe, the car travels upon the main track and the lug *i* therefore does not come in contact with the car wheels, but upon the closure of the switch, the car passes over the tongue *J*, and were the lug rigid might cause jolting of the car, but in my improved form of switch, as more particularly shown in Fig. 5, the pressure of the wheel forces the lug into the tongue, whereby it does not project above the same.

It will be obvious that upon the throwing of the switch by a rapidly moving car, the tongue *J*, striking against the usual stop *J'*, would have a tendency to immediately recoil and thus either block the car or possibly derail the same, and to avoid this, I form concavities or depressions *j* in the frog *J*² on which the tongue is pivoted, and secure to the under side of the said tongue a curved plate spring or catch *j'*, which as the switch is moved in either direction engages in one of the depressions *j*, and serves to prevent slipping or other movement of the tongue except where sufficient pressure is exerted to throw the same.

Should it be desired to use the operating shoe and mechanism in conjunction with a switch already in use which it is not desired to change in form, the shoe *F* is forced farther downward to rest upon or immediately

above the base flange I' of the rail, whereby it will engage with the point of the tongue directly, and in order that this may be accomplished, I provide a bearing h' upon the shaft immediately above the main bearing h, which admits of the wheel H being detached, and the journal H' thereof inserted through the upper bearing, and thus the said wheel will run upon the top of the rail while the shoe will be immediately above the base flange; or if desired, in this case, the wheel H might be done away with altogether.

By the use of my invention the difficulties heretofore encountered with devices of this character are obviated, and the invention furthermore provides a device of simple structure, great durability and perfection of operation. I do not confine myself to the exact details of construction shown except as to such elements which directly appertain to the invention. With respect, however, to the peculiar fixture of the crank C', upon the top of the shaft C, while I have shown this as being capable of but a half revolution through the restriction of the dash-board, against which it rests, still I believe that it is broadly new so to restrict the movement of the shaft and therefore claim as well all other means which will accomplish the same result.

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

1. A switch operating device for street railway cars, comprising a box secured to the platform, having a horizontal partition therein, a vertical shaft journaled in the said box having a crank upon the top thereof, a collar below the crank, a spiral spring surrounding the shaft between the partition and the said collar, a sleeve loosely mounted upon the shaft below the partition, a shoulder beneath the sleeve to restrict the upward movement of the shaft, a radial arm projecting from the sleeve through the box to slide therein, a pedal upon the said arm to depress the shaft, and a shoe upon the lower end of the shaft adapted to engage with the switch and throw the same, substantially as shown and described.

2. A switch operating device for street railway cars, comprising a box secured to the platform against the dash-board, a vertical shaft journaled therein, a spring surrounding the same to maintain the shaft normally upward, a sleeve surrounding the shaft having a pedal mounted thereon to depress the same, a shoe upon the lower end of the shaft

beveled upon its forward end to open the switch, and also beveled upon the rear end thereof, whereby when the same is reversed, the said shoe will close the switch, a crank upon the top of the shaft to turn the same, and means whereby the movement of the said shaft is restricted to a half revolution, substantially as shown and described.

3. In a switch operating device for street railway cars, the combination, with a vertical shaft suitably journaled in the car-platform and normally raised by means of a spring surrounding the same, a pedal to depress the said shaft, and a crank to turn the same, of a substantially triangular shoe mounted upon the end of the shaft, having a lateral groove therein in which the said shaft works, and springs within the shoes at either side of the shaft whereby the same is yielding, substantially as shown and described.

4. A switch operating device for street railway cars, comprising a box secured to the car-platform against the dash-board, having a horizontal partition therein, and a longitudinal slot in the front thereof below the partition, a vertical shaft journaled in the said partition, having an annular collar near the top thereof, a spiral spring surrounding the shaft between the partition, and the collar to keep the same normally raised, a sleeve loosely mounted upon the shaft below the partition, a shoulder beneath the sleeve to limit the upward movement of the shaft, a radial arm projecting from the sleeve, having a pedal thereon, a shoe mounted upon the lower end of the shaft having a lateral slot in which the said shaft works, springs within the shoe at either side of the shaft, whereby the said shoe is laterally yielding, the said shoe being beveled from the center forwardly and rearwardly, a wheel journaled upon the shaft adjacent to the shoe and adjustable in height relatively thereto, and a crank upon the top of the shaft to reverse the shoe, the said crank being fixed upon the shaft against the dash-board whereby but a half revolution thereof is permitted, substantially as shown and described.

In testimony that I claim the foregoing as my invention I have signed my name, in presence of two witnesses, this 27th day of August, 1894.

CHARLES DIENER.

Witnesses:

PERCY T. GRIFFITH,
L. MULLER.