(No Model.)

G. A. BURSCH.

RAILWAY SWITCH.

No. 569,612. Patented Oct. 20, 1896.

Fig 1

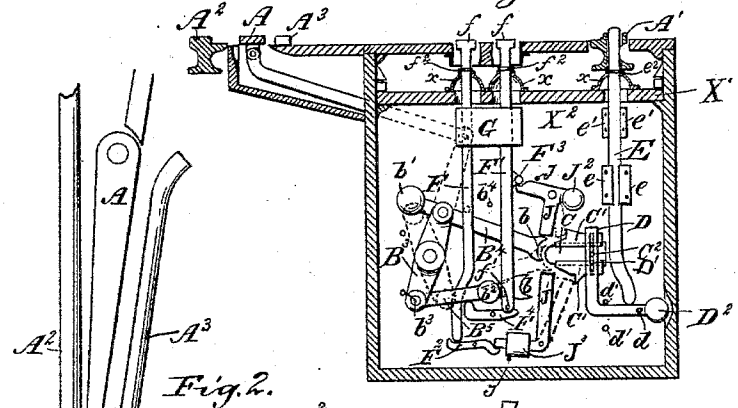


Fig. 2.

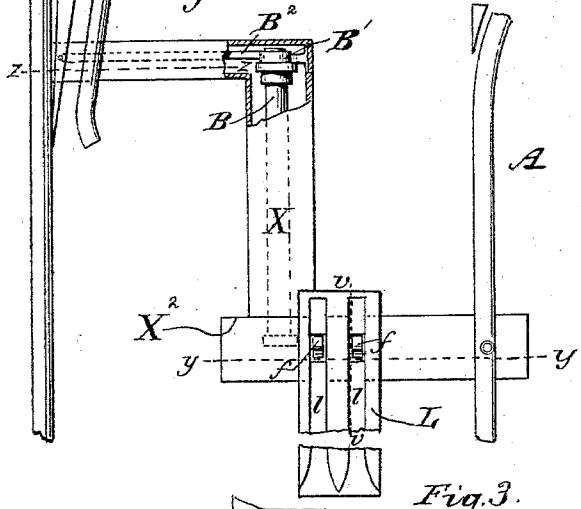


Fig. 4.

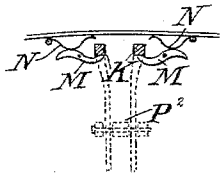


Fig. 3.

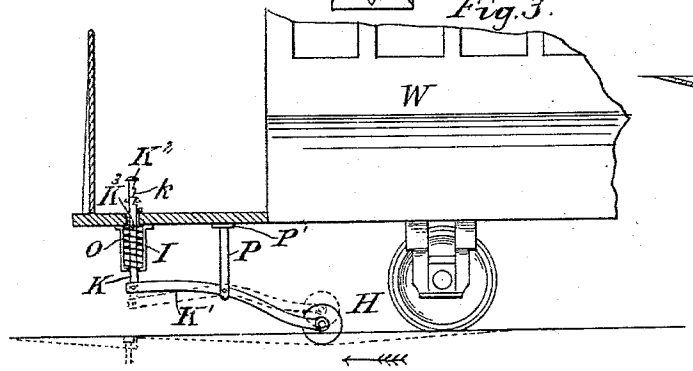
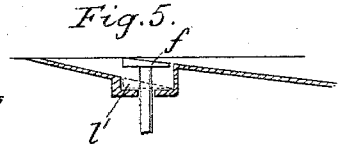


Fig. 5.



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UNITED STATES PATENT OFFICE.

GUSTAVUS A. BURSCH, OF BROOKLYN, NEW YORK, ASSIGNOR TO FREDERICK J. W. BURSCH, OF SAME PLACE.

RAILWAY-SWITCH.

SPECIFICATION forming part of Letters Patent No. 569,612, dated October 20, 1896.

Application filed November 14, 1895. Serial No. 568,875. (No model.)

To all whom it may concern:

Be it known that I, GUSTAVUS A. BURSCH, a citizen of the United States, residing at Brooklyn, in the county of Kings and State of New York, have invented a new and useful Improvement in Railway-Switches, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, in which like letters refer to like parts in each figure.

My invention relates to devices for switching street-railway cars, and particularly to such as are designed to be controlled and operated from the said cars. Its object is particularly to provide a reliable means whereby the tongue of the said switch may be shifted in one direction or the other, as desired, the moving impulse being supplied by the motion of the car and communicated to the said tongue by direct mechanical contact. This object I accomplish by means of the device illustrated in the accompanying drawings, in which—

Figure 1 is a transverse section through the line *y y* in Fig. 2, also showing a section through *z z* on the same figure, and showing parts of the device attached to the plate X^2. Fig. 2 is a top view of the device in position with a part of the box X cut away. Fig. 3 is a view of the part of the device attached to the car. Fig. 4 is a top view of parts of the same upon the platform of the car. Fig. 5 is a longitudinal section through the line *v v* in Fig. 2.

The tongue A between the rails A^2 and A^3 is connected to one end of the crank B′ by means of the switch-bar B^2. The crank is keyed at its other end to one end of the shaft B, which is mounted upon suitable bearings in the box X inclosing it, and has secured to its other end a rocking beam B^3. Upon either end of this rocking beam arms B^4 and B^5 are pivoted. The arm B^5 is pivoted at one end and provided with a weight b^2 at the other. The arm B^4 is pivoted near one end and is provided with a counterweight b' at the end nearest its pivot. Each of these arms is enlarged at one end and provided with jaws *b*, adapted to receive the impingement of the shuttle C, which operates in the guides C′ C′, and has a pin or key C^2 adapted to engage the slot D′ in the bent lever D, which has its fulcrum at the pivot *d* and has a counterweight D^2 upon one end.

The rod E operates vertically in the guides *e e* and *e′ e′* and impinges its lower end upon the bent lever D. Its upper end projects through the rail A′ and is adapted to receive the impress of the car-wheel in passing over.

The setting mechanism consists of the rod F, operating the arm B^4, and the rod F′, operating the arm B^5, (the latter by means of the intermediate lever F^4,) the lever F^2 and arm F^3, and the L-shaped dogs J J′, which are pivoted at their vertices.

The rods F and F′ are sleeved in the box G, which acts as a guide and prevents them from having any lateral motion. They are provided with contact-plates *f f* at their upper ends, adapted to receive the impress of the wheels of the set-operating mechanism attached to the car.

The intermediate lever F^4 is centrally pivoted and bears against the arm B^5 with one end, while the pin *f′* on the rod F′ impinges upon the other.

The dogs J and J′ swing upon pivots and are provided with weights J^2 J^3, the dog J′ at one of its ends and J upon a short arm near its pivot. Their action is confined in one direction by the guides C′ C′ and in the other by the stops *j j*. One end of the dog J extends beneath the arm F^3 on the rod F′, which the said arm impinges upon when the said rod is pressed downward. The lever F^2 is centrally pivoted, and has one end immediately beneath the end of the rod F and the other beneath the weighted arm of the dog J′.

The stops *d′ d′* serve to confine the action of the bent lever D within proper limits, and the stops b^4 and b^3 confine the action of the arm B^4 and rocking beam B^3, respectively, in like manner. These stops, as well as the stops *j j* and the guides C′ C′ *e e e′ e′* and the sleeve-box G, are secured to the plate X^2, which forms a part of the box X, inclosing the entire device. The pivots upon which the levers D F^2 F^4 and the dogs J J′ operate are also secured to this plate X^2.

Near the top of the box inclosing these parts of the device is the partition X′, through which the rods F, F′, and E pass. This par-

tition is secured to the four sides of the box by water-tight joints, and at the openings through which the said rods pass it is provided with washers *x x x*, which are conical in shape, extending above the partition surrounding the rods and coming in contact with them at their apices. The rods at the point of contact with the washers are provided with collars f^2, f^2, and e^2, so that when the rods are depressed the edges of the washers are held by these collars turned inwardly, following the rod, and returned again to their normal positions when the rods are pressed upward.

Set in the top cover of the box is the plate L, extending beyond the box on either side parallel to the rails A′ and A^2 and between them. This plate is provided with two slots or channels *l l*, leading up to the plates *f f*. These slots are made narrow enough in width to prevent the wheels of ordinary vehicles from entering them and are flared at the end opposite the plates *f f*. Beginning at this end and on a level with the street-pavement, they curve downwardly to a point near the middle and then curve upwardly again as they approach the plates, which are situated near their opposite ends, one in each slot. The plates *f f* are beveled to the slant of the slots, their upper ends being on a level with the street-pavement. The slots *l l* at the point where the contact-plates begin are stepped, sinking abruptly again to a suitable depth to allow for the necessary depression of the said plates, and are provided with recesses *l′* at the bottom of these depressions conforming to the shape of and adapted to receive the plates when pressed downward, so that they will fit snugly therein. The slots then run upward at an angle of about twenty degrees to the level of the street-pavement.

The mechanism attached to the car W, with the exception of the hanger P, is in duplicate. The contact-wheels H are axled upon one end of the elliptical rods K′, which are pivoted to the hanger P and secured at their other ends to the pedal-rods K, which operate in the sleeves I, and have the pedals K^2 upon their upper ends and pins K^3, adapted to compress the helical springs O when the rods are pressed downward. The pawls M engage the ratchets *k* on the rods K. They are **S**-shaped, being pivoted centrally and beveled at one end to fit into the said teeth, and are provided with springs N, adapted to press them against the teeth of the ratchets.

The sleeves I are secured to the under side of the car-platform and are capped at their lower ends, with an opening in the center of each large enough to admit of the rods K passing through. These rods pass through the center of the springs O, one end of which abuts against the caps of the sleeves I. The hanger P consists of three bars or rods P^2, (shown by dotted lines, Fig. 4,) mounted upon a plate P′, by means of which they are secured to the under side of the car-platform. The pivot upon which the rods K′ turn runs transversely through the rods P^2 near their lower ends, the rods K′ running between them and being separated by the central one.

In explaining the operation of this device let it be supposed that the car is moving in the direction indicated by the arrow, and that it is desired to move the switch-tongue to the right, the pedal-rods K and the pedals K^2 being in the position indicated by the dotted lines. The operator presses his foot against the right-hand pawl M, compressing the spring N and withdrawing the beveled edge from the teeth, and thus causing the right-hand pedal-rod K to fly upward by force of the spring O pressing against the pin K^3. This rod moving upward causes the rod K′ to turn upon its pivot and depress the wheel H until it comes in contact with the street-pavement, along which it will run, if necessary, until it reaches the plate L, the vibrations caused by the roughness of the pavement being absorbed by the spring O and the rod K′, which has a small amount of resiliency, any lateral movement of the wheel being prevented by the hanger P. On reaching the plate L the wheel enters the right-hand slot *l* through its flared end, the spring O expanding as the wheel runs down the incline and contracting again as it follows the incline upward until the wheel strikes the plate *f* near the end of the slot, which gives way beneath its pressure, sinking until it strikes the bottom of the slot. The wheel now runs up the short incline of the slot to the street-pavement again and may then be raised clear of the ground by pressing downward upon the pedal K^2, the pawl M engaging the ratchet and thus retaining the wheel in its position. The depressing of the right-hand plate *f* causes the rod F′ to bear downward upon the intermediate lever F^4 by means of the pin *f′*, thus rocking the lever and causing it to lift the arm B^5 until its enlarged end, with the jaws *b*, is opposite the end of the shuttle C, the dog J′ being pushed aside by the arm as it moves upward and falling back into position by force of the weight J^3 upon its lower end after the arm has passed, and thus sustaining the arm in its position when the pressure of the lever F^4 is withdrawn. The wheel H having passed over the plate *f*, and the downward pressure upon the rod F′ being released and the arm B^5 remaining in position, the wheel of the car next passes over the upper end of the rod E, pressing it downward through the guides *e e* and *e′ e′* upon the bent lever D, causing the said lever to oscillate and press the shuttle C against the enlarged end of the arm B^5 by means of the pin C^2 moving in the slot D^2. The arm B^5, being pressed backward, rocks the beam B^3, which imparts a rotary motion to the shaft B, oscillating the crank B′ on the other end of the shaft, and thus moving the switch-tongue to the right through the medium of the switch-bar B^2. At the same time that the rod F′ bears upon the lever F^4 the arm F^3 on the upper part of

the rod presses against the end of the dog J, forcing it downward and causing the other end to be withdrawn, as shown by the dotted lines, so that if the arm B^4 has previously been set in position, with the enlarged end opposite the shuttle, it will be released and caused to fly upward by the weight b' upon its other end until it strikes the stop b^4. If the arm B^4 is in this position and the rocking beam tilted, as shown in Fig. 1, the arm B^5 in rising will not come in contact with the dog J', and when the pressure of the lever F^4 is withdrawn will fall again to its former position by force of the weight b^2, and the tongue-moving mechanism will not operate, the tongue A being already in the desired position. If the rod F is depressed, the arm B^4 is moved to position in front of the shuttle C in a similar manner to the arm B^5, and the end of the rod pressing upon one end of the lever F^2 causes it to bear upon the weighted end of the dog J', thus causing its other end to be withdrawn and allowing the arm B^5 to drop from its position in front of the shuttle, if it has previously been set.

What I claim is—

1. The combination with a movable switch-tongue of a shaft, means to impart motion from said shaft to said tongue by the movement of said shaft, a beam secured to said shaft, a lever adapted to be operated by the passage of the car and non-automatic means, operated by power received from the momentum of the passing car, to cause said lever to act upon either of the said beams.

2. The combination with a movable switch-tongue of a shaft, means to impart motion from said shaft to said tongue, a beam secured to said shaft, arms secured to either end of said beam and non-automatic means operated by power received from the momentum of the passing car whereby a lever adapted to be shifted by the passage of the car may be caused to act upon either of said arms.

3. The combination with a movable switch-tongue of a shaft, means to impart motion from said shaft to said tongue, a beam secured to said shaft, arms secured to either end of said beam a lever adapted to be shifted by the passage of the car and a plurality of rods, operated independently of said lever, by the operation of which either of said arms may be caused to receive the action of said lever.

4. The combination with a movable switch-tongue, of a shaft, means to impart motion from said shaft to said tongue, a beam secured to said shaft, arms secured to either end of said beam, a buffer C adapted to be shifted by the passage of the car and means to cause one or the other of said arms to assume a position which will cause it to be acted upon by the said buffer.

5. The combination with a movable switch-tongue, a lever adapted to be shifted by the passage of the car and means to impart motion from said lever to said tongue, of a plurality of rods, means to cause said rods to act upon the mechanism intermediate the said lever and switch-tongue by the movement of said rods and cause the said tongue to be moved in one direction or the other by the said lever.

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