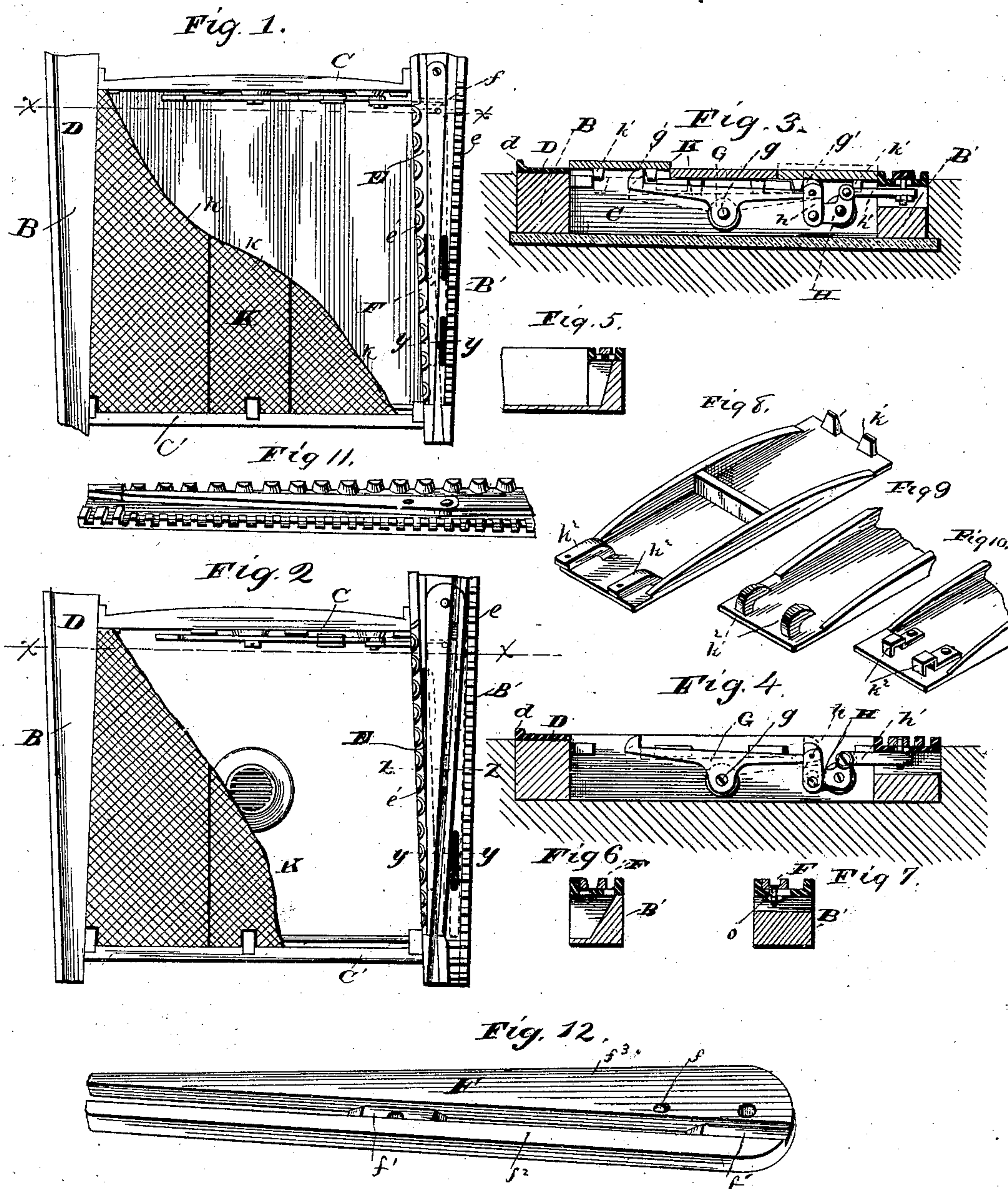


(No Model.)

F. DE H. ROBISON.
SWITCH FOR STREET RAILWAYS.

No. 343,398.

Patented June 8, 1886.



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SWITCH FOR STREET-RAILWAYS.

SPECIFICATION forming part of Letters Patent No. 343,398, dated June 8, 1886.

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To all whom it may concern:

Be it known that I, FRANK DE H. ROBISON, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Switches for Street-Railways; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to improvements in switches for street-railways, and more especially to the class in which the switching is effected by the weight of the animal drawing the car.

The object of the invention is to produce a switch in which the operating mechanism is wholly located within the track and in the ordinary line of travel of the horses, and is so constructed and arranged as to simplify and improve the means by which the shifting of the switch is accomplished.

In the accompanying drawings, Figure 1 is a plan view of one form of my improved device, showing an ordinary switch-tongue connected with the operating mechanism. Fig. 2 is a similar view of an improved form of tongue with the same operating mechanism. Figs. 3 and 4 are sectional views on lines *xx*, Figs. 1 and 2. Figs. 5 and 6 are sectional views on lines *yy*. Fig. 7 is a sectional view on line *zz*. Fig. 8 is a bottom view of one of the side sections of the platform, and Figs. 9 and 10 sections of the same, all showing different forms of keepers. Fig. 11 is a perspective of my improved switch-plate, and Fig. 12 an enlarged view of the tongue shown in Fig. 2.

A represents a rectangular box or frame to which the switch mechanism is attached, and consists of two stringers or sills, B B', and cross-bars C C', secured rigidly together. If preferred, a wooden, cement, or other bottom may be employed with the frame. The frame is sunk into the road-bed about flush with its surface, and forms a pit between its respective sides equal to their depth. Centrally in this pit an opening is formed and connection made with the main sewer by a sewer-trap for carrying off accumulating moisture.

D and E represent frogs or switch-plates, made tapering, as usual, and secured to the

stringers B B' in any suitable way. The plate D has a plain surface extending from its inner to its outer edge, along which latter there is a flange or rib, *d*, of the usual form. The construction of this plate is not material, and any well-known form may be used. The plate E has its side flanges broken into separate projections, with spaces between, which are cut to the level of the intervening channel supporting the tongue. As here shown, the construction along the outer edge, *e*, resembles that of the ordinary rack, while the projections on the inner edge, *e'*, are flat on their outer surface and rounded and tapering on the remaining surface, with the enlargement at the base to give them the requisite strength. By cutting the flanges in this way I prevent the undue accumulation of dirt, snow, and the like in the channel of the switch-plate and keep it unobstructed for the free and easy adjustment of the tongue from side to side. In fact, the tongue, in its lateral movements, aids materially in clearing its own track. The form of the projections which stand for the ordinary flange on the sides of the switch-plate is immaterial, provided they are strong enough to withstand the usual wear, and are placed at such intervals as to permit the free escape of dirt between them; but if for any reason this construction is not sufficient to keep the switch-rail clean, slots *e''* may be formed at intervals in the bottom of the channel, and corresponding recesses in the stringers to conduct the accumulations into the pit beneath the platform. In some cases the slots alone may be used without the broken flanges, and it rarely will become necessary to use both in the same switch.

F is the switch-tongue, which is pivoted at its base and has a screw-threaded pin, *f*, on its under side a short distance from its pivot, which projects through a transverse slot in the switch-plate.

G is a balance-lever pivoted centrally by a bolt, *g*, on the inner side of the cross-bar C, and is provided with upwardly-projecting lugs *g'* at its ends, the purpose of which will appear further along. Between the lever and the switch-plate is a bell-crank, H, likewise pivoted on the cross-bar C, and having one arm connected with the lever G by a link, *h*, and the other arm with the pin on the tongue by a link, *h'*, to which it is secured by a nut.

It will be seen by this arrangement that the oscillation or tilting of lever G on its pivot imparts a direct and positive movement to the tongue F in either direction, according as said lever is moved one way or the other, and the parts are so constructed that the lever will oscillate just enough to carry the tongue-point from one side to the other of the channel in which it rests. This mechanism may of course be varied somewhat and still be within the scope of my invention, my object being to operate the tongue by means of a single actuating-lever. This lever, as well as the bell-crank, might be pivoted on standards by the side of the cross-bar, or be otherwise supported so as to sustain substantially their present relation to the remaining mechanism, and other minor changes in arrangement and connection of parts might be made without departing from the spirit of the invention.

To effect the oscillation of the lever at the desired time and in the desired way, I employ a platform, K, preferably divided into three longitudinal sections, k . These sections are corrugated on top in the usual way, and have guide-lugs k' at one end and keepers k^2 at the other. Three different forms of keepers are shown, and others that will answer the same purpose may be adopted, it only being desirable to have them so formed as to prevent the sections from lifting at the pivotal end, and from being moved longitudinally or easily displaced. In working position said sections k are supported at one end on the tie-rod L, which is placed far enough away from the cross-bar C' to permit the sections to be connected thereto when raised to a perpendicular position, and at the other end the sections are supported on lugs or cleats c on the side of cross-bar C. These lugs are placed in such relation to the top surface of the cross-bar that when the sections k rest thereon they will be flush with the top of the cross-bar. The lugs k' on the bottom of sections k are adapted to pass between the cleats c in such manner as to serve as guides in their vertical play and to keep the sections in their proper position at the sides. It will, however, be observed that while all the sections are seated at one end on the pivot-rod L, only one of the side sections can be seated at the same time at the opposite end. This is owing to the lugs g' on lever G, which are of sufficient length to hold one section in suspension slightly above its seat while the other section has descended to its seat, and in its downward movement has switched the tongue F onto the corresponding side of the switch-plate. The central section of the platform meantime rests permanently on its supports at both ends and has no connection with the switch mechanism.

In Fig. 3 the mechanism is shown as when the team has been driven to the right, and the outer section on that side has been depressed by the weight of the animal till it rests on the cleats or lugs provided for its support.

The corresponding end of the lever is necessarily lowered to the same extent, which effects the desired adjustment, while the outer section is raised by the opposite end of the lever, and ready to perform its allotted function in turn when the team is driven to that side. If desired, the cleats or lugs c may be dispensed with and the cross-bar C be rabbeted, or rabbeted along its edge, to form a seat for the ends of the sections k ; or the cross-bar may be lowered in relation to the stringers, so that the sections will rest upon its top and still be flush with the switch-plates at the side. In either of these changes the balance-lever should be set in the same relation to the supporting-surface on the bar as it now is to the cleats or lugs c . I however prefer the construction shown.

In Fig. 2 and its details I show a somewhat different construction from that above described. The tongue F in this instance is provided with a channel or groove running its entire length, but slightly diagonal to its longitudinal center. This channel is cut through from side to side, except at the center and base of the tongue, at which points the sections are united by webs f' , having beveled edges, to allow carriages which run in the channel to ride over the webs more easily. The increased weight given to the tongue by this construction affords steadiness and strength, and avoids the liability to twist on its seat and to tilt up at its point when wagons ride over the heel or base, as is apt to be the case with the usual form of tongue. If it be found necessary to adopt further measures of security in these respects, the tongue may be provided with a pin or bolt about midway of its length, and the switch-plate with a corresponding transverse slot, in which the bolt can play laterally, but not vertically, a nut on its lower end serving to hold the tongue down in proper position.

It will be observed that the double tongue shown in Figs. 2 and 12 forms what may be termed a "combined tongue and rail," the outer section, f^2 , forming the rail portion and serving to carry the wheel, the same as the usual outside flange on the switch-plate, while the inner section, f^3 , serves as the tongue proper to switch the car. When the double tongue is used, the switch-plate E necessarily is made wider than with a single tongue, and the rack-formed edge becomes merely a guard or support along that side for the tongue and a limit to its outward movement. This being its only function, these projections might be dispensed with except at the end of the tongue.

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

1. In a street-railway switch, the main frame, a switch-plate, and a tongue, in combination with a balance-lever pivoted on one end of the main frame, a bell-crank, and links connecting the lever with the tongue, a platform consisting of sections independent of each

other, the side sections of which are pivotally fixed on one end of the main frame and rest on the arms of the balance-lever at the other end, substantially as set forth.

5 2. In a street-railway switch, a switch-plate having a transverse slot in its channel, and a tongue with a pin or bolt about midway its length, extending through said slot, whereby the tongue is prevented from rolling or tilt-
10 ing at its free end, in combination with means near the base of the tongue to operate the tongue, substantially as set forth.

3. In a street-railway switch, a tongue pro-
15 vided with a channel cut through from top to bottom and having its sections connected by webs, in combination with a switch-plate having slots in its bottom, substantially as set forth.

4. In a street-railway switch, a platform
20 section or plate provided with keepers at one end and guide-lugs at the other end, in combination with a pivotal bar or rod, and a cross-

bar having lugs between which the guide-lugs are adapted to be held, substantially as set forth.

5. In a street-railway switch, a switch-
25 tongue having an open channel running diagonally through its center, and having webs connecting its sides, substantially as set forth.

6. In a street-railway switch, a double tongue
30 divided into a tongue-section and a rail-section, with an open channel formed between the sections, in combination with a switch-plate, substantially as set forth.

7. In a street-railway switch, a switch-
35 tongue having an open channel diagonally through its center, in combination with a switch-plate having its vertical edges broken into projections, with open spaces between the projections, substantially as set forth.

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