

(No Model.)

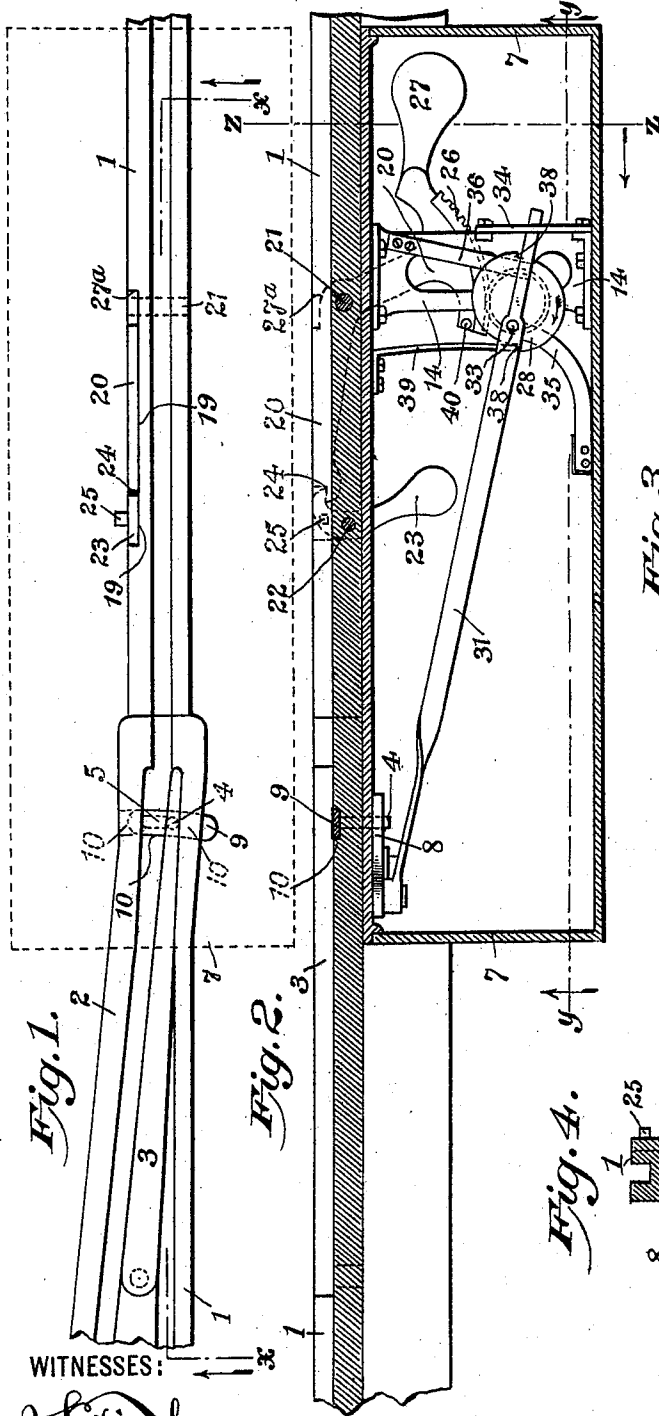
2 Sheets—Sheet 1.

C. R. OSBORNE.

SWITCH FOR STREET RAILWAY TRACKS.

No. 582,309.

Patented May 11, 1897.



WITNESSES:

J. F. Finch.
M. T. Longden

INVENTOR
Charles R. Osborne

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ATTORNEY

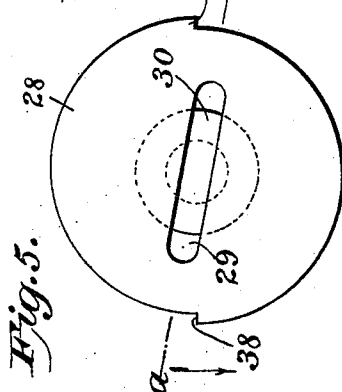
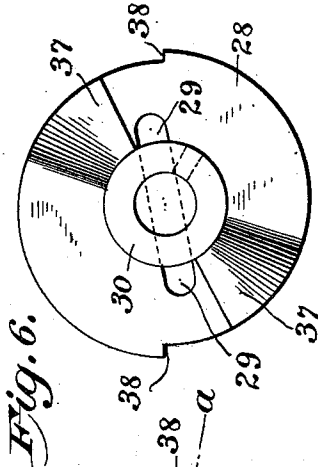
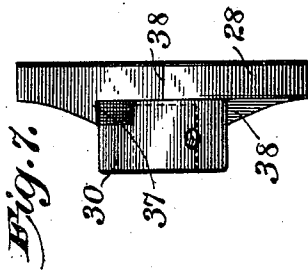
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C. R. OSBORNE.
SWITCH FOR STREET RAILWAY TRACKS.

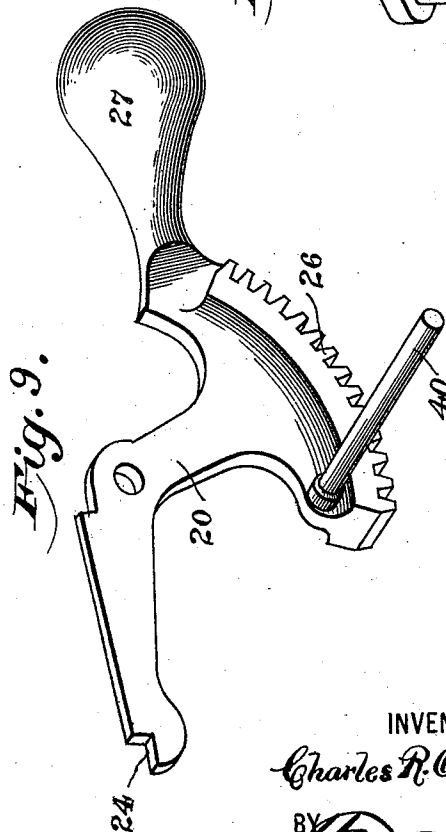
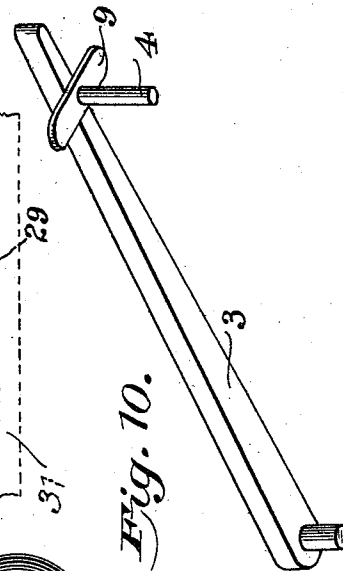
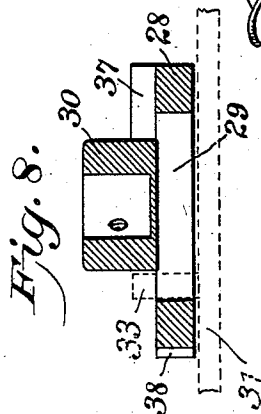
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INVENTOR

Charles R. Osborne

BY

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UNITED STATES PATENT OFFICE.

CHARLES R. OSBORNE, OF DANBURY, CONNECTICUT.

SWITCH FOR STREET-RAILWAY TRACKS.

SPECIFICATION forming part of Letters Patent No. 582,309, dated May 11, 1897.

Application filed September 19, 1896. Serial No. 606,416. (No model.)

To all whom it may concern:

Be it known that I, CHARLES R. OSBORNE, a citizen of the United States, residing at Danbury, in the county of Fairfield and State of Connecticut, have invented certain new and useful Improvements in Switches for Street-Railway Tracks; 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 certain new and useful improvements in switches for street-railway tracks, and has for its object to improve upon the construction shown and described in Letters Patent of the United States No. 564,837, granted to me July 28, 1896.

Referring to the accompanying drawings, which form a part of this specification, Figure 1 is a plan view of a short section of track equipped with my improvement; Fig. 2, a vertical sectional elevation of the same, taken on the line *xx* of Fig. 1; Fig. 3, a horizontal sectional elevation taken on the line *yy* of Fig. 2; Fig. 4, a cross-section taken on the line *zz* of Fig. 2; Fig. 5, a detail front elevation of the slotted disk from which the switch-frog receives its movements; Fig. 6, a detail rear elevation of said disk; Fig. 7, a detail side elevation of said disk; Fig. 8, a detail horizontal sectional elevation of said disk, taken on the line *aa* of Fig. 5; Fig. 9, a detail perspective of the weighted bell-crank, which when depressed by the wheels of the car is adapted to effect the movements of the various other elements and cause the pivoted switch-frog to be moved; and Fig. 10, a detail perspective view of the switch-frog.

Similar numbers of reference denote like parts in the several figures of the drawings.

1 represents the main line of track, and 2 a branch track diverging therefrom.

3 is the usual pivoted frog at the junction of these two tracks.

4 is a pin rigidly secured to the pivoted frog 3 near the tip of the same. Said pin depends through a slot 5 in the base of the track (shown in dotted lines in Fig. 1) and also through a slot 6 in the top of the casing 7, which incloses the mechanism for operating the switch and is engaged by a bell-crank lever 8, pivoted within said casing.

9 is a plate secured to the under side of the

pivoted frog 3 immediately over the slot 5, and said plate is of such dimensions as to completely cover said slot, so that all dirt and the like will be prevented from entering the casing 7 through said slot.

10 is a recess or way made in the track so as to properly accommodate said plate 9, and the latter is so arranged within said recess that no obstruction will be presented to the car-wheels.

11 is a horizontal shaft journaled in bearings 12 13 within the casing. The bearing 12 is bolted to and is supported by one of the side walls of said casing, while the bearing 13 is formed integral with a standard or bracket 14, secured within said casing.

15 is a pinion mounted loosely on the shaft 11, and 16 is a ratchet-wheel secured rigidly on the hub of said pinion.

17 is a collar tight on the shaft 11, and 18 is a spring-actuated pawl carried by said collar and adapted to engage the teeth of the ratchet 16. It will be evident from the foregoing that when the pinion 15 is rotated in one direction the pawl 18 will slip idly over the teeth of the ratchet 16 and permit said pinion to revolve independently of the shaft on which it is carried, but when the pinion is rotated in the opposite direction the pawl will cause said pinion and shaft to be locked together, whereby the rotation of the latter will be effected.

19 is a recess cut within the outside wall and tread of the main track 1, and 20 is a bell-crank pivoted at 21 to said track within said recess. Also pivoted within said recess 19 at 22 is a gravity-pawl 23, which is adapted to engage the notched outer extremity 24 of said bell-crank 20 to hold the latter in its depressed position.

25 is a lug formed on the outer flat face of said gravity-pawl, the function of which will be hereinafter explained.

The lower arm of the bell-crank 20 is formed into a segmental gear 26, which meshes with the pinion 15 on the shaft 11.

27 is an overpoise formed at one extremity of the segmental gear 26, the function of which is to rock the bell-crank 20 upon its pivot when the gravity-pawl 23 is disengaged from said bell-crank and to elevate the upper arm of the latter.

The overpoise 27 in causing the partial ro-

tation of the segmental gear 26 will of course effect the partial rotation of the pinion 15, but during this movement of said pinion the shaft on which the same is carried will remain stationary owing to the action of the spring-actuated pawl 18 and ratchet 16. The reverse movement of the segmental gear 26, which is caused by the wheels of the car depressing the upper arm of the bell-crank 20 to a level with the track, will, through the action of said pawl 18 and ratchet 16, effect the partial rotation of the shaft 11 and pinion 15, carried thereon. The relative diameters of the pinion 15 and segmental gear 26 are such that the latter will cause said pinion to be rotated exactly one-half a complete revolution each time said gear is oscillated. Of course the arc throughout which said gear moves is predetermined and is at each operation the same, and in Fig. 2 I have shown in dotted lines at 27^a a shoulder or abutment against which the upper arm of the bell-crank 20 strikes, whereby the movement of the latter in one direction is limited. The movement of this arm of said bell-crank is limited in the opposite direction by the track-rail, to which it is pivoted and against which said arm rests when in depressed position.

28 is a disk mounted on the end of the shaft 11, and 29 is a straight slot or groove in the face of said disk. The depth of said slot 29 is such that it extends clear down to the hub 30 of said disk, while the length of said slot is somewhat greater than the width of said hub, as clearly shown in Figs. 5, 6, and 8.

31 is a pitman-rod one end of which is pivoted at 32 to the longer arm of the bell-crank 8, while near the other end of said pitman is a crank-pin 33, which extends within the slot 29 in the face of the disk 28. The end of the pitman 31 extends somewhat beyond the periphery of the disk 28, and 34 is a cam-plate which embraces this end of said pitman and holds the crank-pin 33 within the slot 29 in the face of said disk.

35 36 are two springs which bear normally upon the rear face of the disk 28 at diametrically opposite points, and 37 are two cam-surfaces formed on the rear face of said disk, likewise at diametrically opposite points.

When the disk 28 is at rest, the ends of the springs 35 36 bear immediately over the two ends of the slot 29. The crank-pin 33 is somewhat longer than the depth of the slot 29 in the disk 28, as shown in dotted lines at Fig. 8, and when said disk 28 is being rotated said pin is confined on one side by the hub 30 and is further surrounded and confined by the end wall and top and bottom walls of the slot 29, as shown in dotted lines in Fig. 8, so that in effect said pin is at this time pivoted within said disk.

When the disk 28 begins to revolve, the pitman 31 will be elevated, owing to the engagement of the crank-pin with the slot 29. The shape of the cam-plate 34 is such that this raising of the pitman will force the same

against the cam-plate, so that the crank-pin will be forced inwardly to the position shown at Fig. 8.

The highest parts of the cam-surfaces 37 substantially overhang the ends of the slots 29, so that when the disk is rotated the springs 35 36 will ride up these cam-surfaces and one of said springs will, as it leaves the highest part of its cam-surface, impinge against the top of the crank-pin and drive the latter inwardly, so that it is no longer confined by the hub 30. Of course it will be understood that these springs alternately perform this function during the intermittent rotation of the disk. This throw of the pin is readily permitted, since the action of the disk has by that time carried the pitman so that it is opposite to that portion of the cam-plate which will readily permit the pitman to be forced outwardly.

When the projecting end of the crank-pin 33 has been pushed within the slot in the disk 28, as described, which is the normal position of said pin when the device is at rest, the pivoted switch-frog 3 may be moved readily to register with either track without causing the rotation of the shaft 11, since it will be clear that the crank-pin can slide freely within the slot 29—that is to say, at this time the frog may be operated entirely independent of this shaft 11.

Should the pivoted frog 3 be moved by hand, the bell-crank 8 will be rocked and the pitman 31 will move the crank-pin 33 from one end of the slot 29 to the other, without affecting any of the rotary elements in the slightest. This is a great desideratum, since in the event of the disarrangement of any of the mechanism the effectiveness of the switch will remain unimpaired.

In order to prevent the disk 28 from being revolved more than a half-revolution, I have provided on the periphery thereof two teeth 38 at diametrically opposite points, with which a spring-pawl 39 alternately engages.

40 is a finger carried at one extremity of the segmental gear 26, the function of which is to lift the spring-pawl 39 out of engagement with the teeth 38 on the disk 28 when the upper arm of the bell-crank 20 is elevated.

The operation of my improvement is as follows: My improvement is operated by any suitable appliance carried by the car, such as a depending rod which strikes against the lug 25, so as to effect the release and consequent elevation of the overpoised bell-crank, whereby the wheels of the car may depress said crank and effect the turning of the frog in the manner hereinbefore set forth. It has not been deemed necessary to show or describe any device of this sort carried by the car, since the same is very ordinary and is within the control of the motorman or other attendant, so that he may depress the same to effect the operation of the switch, as just described, or, if the switch is properly set, elevate the same so that the car will pass with-

out disturbing the switch. Of course an ordinary rod manipulated by the motorman may be used to free the bell-crank lever, and it is therefore quite immaterial as to what particular means is employed for this purpose.

The motorman is enabled to tell at a glance whether or not the switch is properly set, so that it will be clear that it is not at all necessary to stop the car or to materially slacken the speed thereof in making a switch.

I do not wish to be limited to the specific construction shown and described, since the form and arrangement of various elements may be greatly changed without departing from the spirit of my invention, as such alterations would be clearly within the field of ordinary mechanical skill.

What I claim as new, and desire to secure by Letters Patent, is—

1. In a switch for street-car tracks, the combination of the pivoted frog, the horizontally-disposed bell-crank beneath the track, the pin depending from the free end of said frog and loosely connected with one extremity of such crank, the vertically-disposed overpoised bell-crank pivoted at or near the base of the track, the retaining-pawl whereby the upper leg of said crank is held substantially flush with said track, and operative connection between the lower leg of said overpoised crank, and the horizontally-disposed bell-crank, whereby, when said upper leg is depressed the horizontal crank will be operated to throw the frog, substantially as set forth.

2. In a switch for street-car tracks, the combination of the pivoted frog, a bell-crank pivoted to the track and having its lower arm formed into a segmental gear, a gravity-pawl also pivoted to the track and adapted to engage the upper arm of said bell-crank to hold the same in depressed position, an overpoise carried by said bell-crank, whereby the upper arm of the latter is elevated when said gravity-pawl is disengaged therefrom, and operative connections between said bell-crank and the pivoted frog whereby the operation of the latter is effected when said bell-crank is depressed by the wheels of a car, substantially as set forth.

3. In a switch for street-car tracks, the combination of a bell-crank pivoted to the track and having its lower arm formed into a segmental gear, a gravity-pawl also pivoted to the track and adapted to engage the upper arm of said bell-crank to hold the same in depressed position, an overpoise carried by said bell-crank, whereby the upper arm of the latter is elevated when said gravity-pawl is disengaged therefrom, a shaft suitably journaled in a casing beneath said track and having loosely mounted thereon a pinion with which said segmental gear meshes, a pawl-and-ratchet connection between said pinion and shaft whereby the latter will be rotated in but one direction, the pivoted switch-frog operatively connected to one arm of a bell-crank pivoted within said casing, a pitman-

rod pivoted to the other arm of said bell-crank, and a suitable connection between said pitman and shaft whereby when the latter is rotated said pitman will effect the operation of said pivoted switch-frog, substantially as set forth.

4. In a switch for street-car tracks, the combination of the pivoted switch-frog, the pitman carrying the crank-pin, operative connections between said frog and pitman whereby the lengthwise movement of the latter will effect the operation of said frog, the overpoised bell-crank pivoted to the track, a shaft suitably journaled and adapted to be rotated by the depression of said bell-crank, a disk carried on the end of said shaft and having in its face a slot, as described, within which said crank-pin extends, and instrumentalities for locking said pin alternately within either end of said slot at predetermined times, substantially as set forth.

5. In a switch for street-car tracks, the combination of a shaft suitably journaled within a casing and capable of revolving in but one direction, a bell-crank pivoted to the track, operative connections between said shaft and bell-crank, whereby, when the latter is depressed said shaft will be rotated, a disk carried on the end of said shaft and having a slot in the face thereof as described, the pitman, a pivoted switch-frog operatively connected to said pitman, a crank-pin extending from said pitman within the slot in said disk, a cam-plate adapted to engage the end of said pitman whereby said crank-pin is made to project through said slot at the end thereof and is backed on one side by the hub of said disk and further surrounded by the walls of said slot so that in effect said crank-pin will be pivotally connected to said disk at predetermined times, and a spring for forcing the projecting end of said crank-pin back within said slot simultaneously with the termination of the movement of said disk, substantially as and for the purpose described.

6. In a switch for street-car tracks, the combination of a pivoted switch-frog, a pitman, operative connections between said frog and pitman, the pivoted overpoised bell-crank, a shaft suitably journaled and adapted to be rotated by the depression of said bell-crank, a disk provided with a hub and carried on the end of said shaft and having a slot in the face thereof as described, a crank-pin extending from said pitman within said slot, instrumentalities for locking said crank-pin between said hub and the end walls of said slot at predetermined times, springs for forcing the projecting end of said crank-pin back within said slot simultaneously with the termination of the movement of said disk, and cam-surfaces carried by said disk whereby said springs are alternately brought into position to impinge on top of said crank-pin during the rotation of said disk, substantially as described.

7. In a switch for street-car tracks, the com-

ination of a pivoted switch-frog, a pitman,
operative connections between said frog and
pitman, the pivoted overpoised bell-crank, a
shaft suitably journaled and adapted to be
5 rotated in one direction by the depression of
said bell-crank, a disk carried on the end of
said shaft and operatively connected to said
pitman-rod, diametrically opposite teeth
formed on the periphery of said disk, a pawl
10 which engages said teeth, and a finger carried

by said bell-crank whereby said pawl is dis-
engaged from said teeth at predetermined
times, substantially as and for the purpose
set forth.

In testimony whereof I affix my signature 15
in presence of two witnesses.

CHARLES R. OSBORNE.

Witnesses:

F. S. STEVENS,

M. L. LONGDEN.