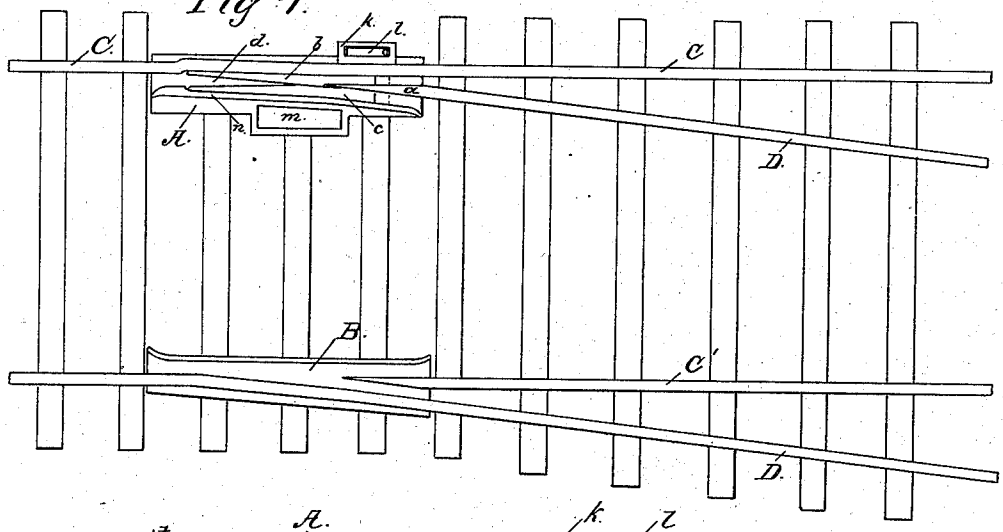
(No Model.)

J. CHRISTIANSEN.

RAILWAY SWITCH.

No. 559,481. Patented May 5, 1896.

Fig 1.



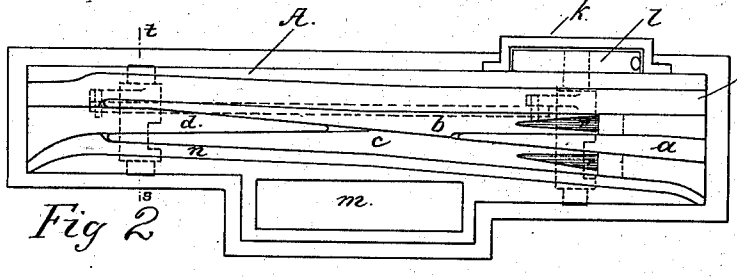


Fig 2

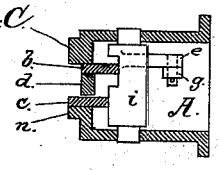


Fig 3

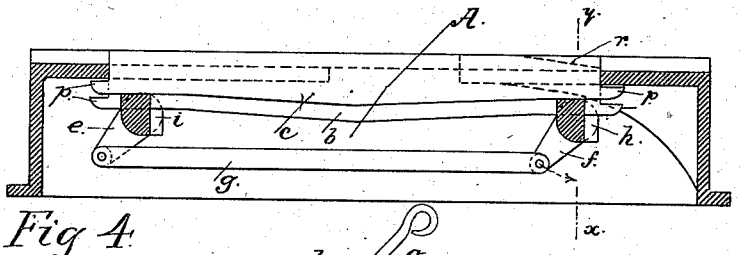


Fig 4.

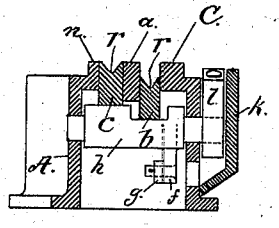


Fig 5.

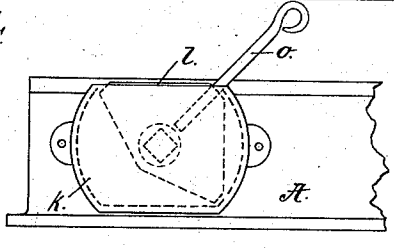


Fig 6.

WITNESSES:

B. M. Desjardins

Herbert O Wanner

INVENTOR

John Christiansen

ANDREW B. GRAHAM. PHOTO-LITHO. WASHINGTON, D.C.

UNITED STATES PATENT OFFICE.

JOHN CHRISTIANSEN, OF HARTFORD, CONNECTICUT, ASSIGNOR OF ONE-HALF TO WILLIAM A. LORENZ, OF SAME PLACE, AND HENRY T. BRÜCK, OF MOUNT SAVAGE, MARYLAND.

RAILWAY-SWITCH.

SPECIFICATION forming part of Letters Patent No. 559,481, dated May 5, 1896.

Application filed June 7, 1894. Serial No. 513,767. (No model.)

To all whom it may concern:

Be it known that I, JOHN CHRISTIANSEN, a citizen of the United States, residing at Hartford, in the county of Hartford and State of Connecticut, have invented a new and useful Railway-Switch, of which the following is a specification.

My invention relates to improvements in switches, and particularly in that class of switches used for street-railways; and the objects of my improvement are, first, to make a safe and effective switch which shall be as shallow as any other part of the street-track; second, to prevent clogging by dirt, snow, or sleet by moving my switch and guard rails vertically through slots in a hollow box instead of the usual construction, in which a tongued point-rail is moved laterally in a trough, which, being below the general level of the street, forms a receptacle for dirt, snow, and ice, which continually operate to impede the lateral movement of the tongue; third, to make a switch which shall automatically lock itself in whatever position it is set, whether for main or side track, and which shall not move while cars are passing over it; fourth, to make a switch the movable rails of which can never be otherwise than in an absolutely correct position, and therefore safer than the present customary tongue-switch, which is rarely in strictly correct position, owing to accumulation of dirt in the housing in which it moves; fifth, to protect in such a switch the delicate parts—that is, the points—from undue strain and wear, making lateral bending of switch rails and points an impossibility, which in the present tongue-switch is a continual source of annoyance. I attain these objects by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a plan view of track, showing switch on one side and frog on the other, as is now customary; Fig. 2, a plan view of switch in a larger scale; Fig. 3, a cross-section on line *st;* Fig. 4, a sectional elevation of switch; Fig. 5, a cross-section on line *x y;* Fig. 6, a detail of mechanism for throwing the switch.

Similar letters refer to similar parts throughout the several views.

A is a hollow box, of cast-iron or other suitable material, containing on top the main rail C, which is a part of main track; also the point *a* of side track D and the tongue *d;* also a supporting rib or projection *n*, terminating at each end into a guard-rail curved outward in the usual manner.

b and *c* are two steel rails, which completely, or very nearly so, fill the openings left in the top of the box. These rails rest upon the two cams or tumbling-shafts *i* and *h* in such a manner that when the top of one of the rails is even with the top of the track the top of the other rail is down and even with the top of the box, which is about seven-eighths of an inch below top of track. The cams formed upon the two tumbling-shafts are alike, and by means of levers *e* and *f* and connecting-rod *g* both move simultaneously. Thus, referring to Fig. 4, it will readily be seen that by a movement of rod *g* to the right or by turning lever *f* ninety degrees in the direction of the arrow the rail *c* will be lowered, while rail *b* will be elevated.

The operating of the switch is accomplished by placing a round iron rod *o* in the hole of the block *l*, which is fastened to the end of one of the tumbling-shafts, in this case on *h*, and which block is protected by and contained in the housing *k*.

An intermediate or half-way position of the switch is hardly possible, as the straight surfaces of the cam upon which the rails rest compel positively either one or the other position, and it will be noticed that the rail which is down rests on a longer straight surface than the one that is up, which insures the position of the switch in which it is placed while cars are passing over it, and no jar to track can possibly affect it. It will also be seen that the block *l* is so constructed that the center of gravity of same, when the switch is either thrown one way or the other, falls always on one or the other side of the tumbling-shaft, which also tends to hold the switch in position.

The projections *p p* at the ends of rails *b* and *c* make any misplacement of same impossible.

The inclined grooves *r r* in the heel ends of the rails *b* and *c* are provided for the purpose

of guiding the flange of wheels and making it ride up without a jar on top of the rails. When cars are trailing through switch which is set wrong, the flange of wheel will drop into its proper place again at or near the point of the switch-rails.

Looking now upon the plan Fig. 2 and section Fig. 3, it will be seen that as rail *c* is up and rail *b* is down cars will infallibly take main track C, rail *c* acting as a guard-rail and flanges of wheels passing over rail *b* without touching same, and, vice versa, when *c* is down and *b* is up cars will take side track D, the flanges of wheels passing over rail *c*; but rail *b* is in this case more than a guide or guard rail. It becomes a running-rail and carries the load of the wheel; and this is a point upon which I wish to lay particular stress, as it is intended in this wise to guard and protect the point *a*, for the load of the wheel does not fully come onto the side track D until it has passed well over the slim and delicate point and until about over the center of tumbling-shaft *h*, when the load leaves rail *b* entirely and is transferred onto the side track; and it is with this object in view that I carry the rail *b* back of the extreme point *a*.

n is simply a projection on top of the box-casting to better support rail *c* when elevated. It never receives any load or any wear and may be partly omitted in order to facilitate cleaning switch when such is required.

m is an opening in the top of box A through which access is had to the interior and to the mechanism of the switch, and through which accumulations of dust and dirt dropping through the crevices on top may from to time be removed. The opening is of course protected by a cover. In cases where peculiar conditions require a very much longer switch-rail *b* than the one shown on drawings, I may use three or more tumbling-shafts and cams in order better to support the load on rail.

What I do claim as my invention, and desire to secure by Letters Patent, is—

1. In a railway-switch, in combination with one of the continuous main-line rails, and with the adjacent point-rail of the side track, two switch or guard rails located in part on opposite sides of the general line of that point-rail, and arranged to be raised and lowered, each adapted when raised to reinforce the point-rail, and to guide passing wheels to the opposite side thereof.

2. In a railway-switch, in combination with one of the continuous main-line rails, and with the adjacent point-rail of the side track, two switch or guard rails located in part on opposite sides of the general line of that point-rail, and arranged to be raised and lowered, each adapted when raised to reinforce the point-rail, and to guide passing wheels to the opposite side thereof, with means adapted to raise the two switch or guard rails alternately, substantially as described.

3. In a railway-switch, in combination with one of the continuous main-line rails, and with the adjacent point-rail of the side track, two switch or guard rails located in part on opposite sides of the general line of that point-rail, and arranged to be raised and lowered, each adapted when raised to reinforce the point-rail, and to guide passing wheels to the opposite side thereof, the ends of the switch or guard rails which are on the opposite sides of the point-rail being provided with inclined grooves *r* in their tread-surfaces for the purpose specified, substantially as described.

4. In a switch such as described, the contiguously-located vertically-moving switch and guard rails *b*, and *c*, inclosing and guarding point *a*, all substantially as set forth.

5. In a railway-switch, the combination of two contiguously-located switch and guard rails, with two or more tumbling-shafts provided with cams, said tumbling-shafts being operated simultaneously by means of mechanical connections in such a manner that the motion of one rail is opposite in direction to the motion of the other, substantially as set forth.

6. In a switch such as described, two or more tumbling-shafts working through an arc of about ninety degrees each shaft being provided with two straight-surfaced cams for rails to rest upon in their elevated and depressed condition, the cam for the latter position offering the longest straight surface, all as described.

7. In a switch such as described, the block *l*, provided with hole by which to operate it, and contained in a housing *k*, and so arranged as to close the opening in top of housing at whichever position the switch is thrown, presenting a smooth even surface with the street, all substantially as described.

JOHN CHRISTIANSEN.

Witnesses:
BENJ. M. DESJARDINS,
HERBERT O. WARNER.