(No Model.)

E. BROMBACHER.

RAILWAY SWITCH.

No. 527,547. Patented Oct. 16, 1894.

Fig. 1.

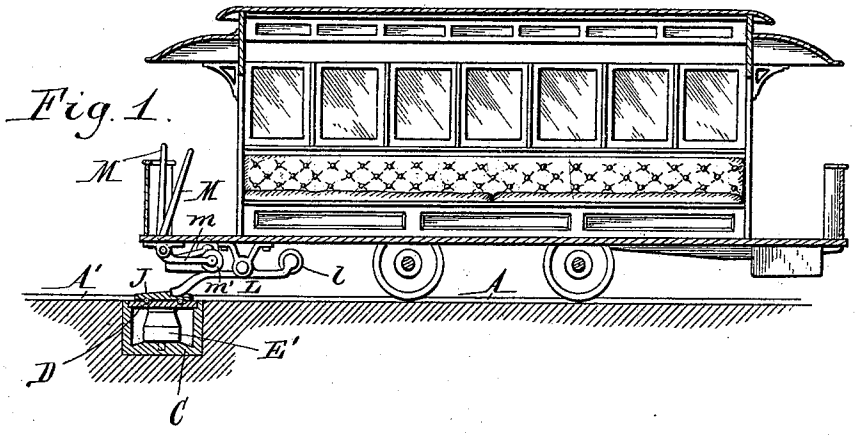


Fig. 2.

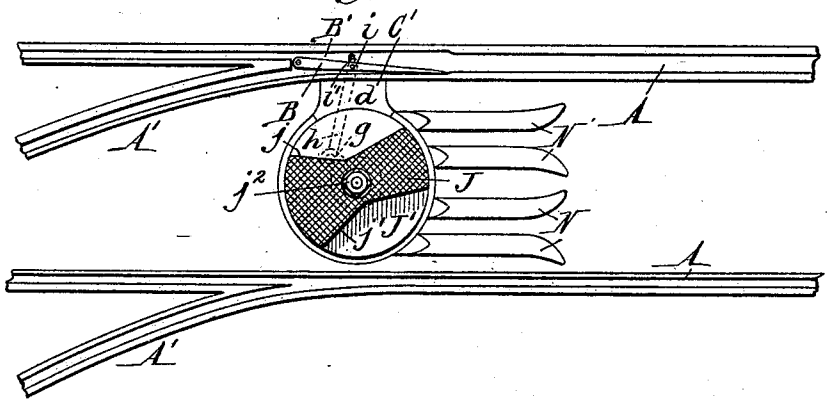
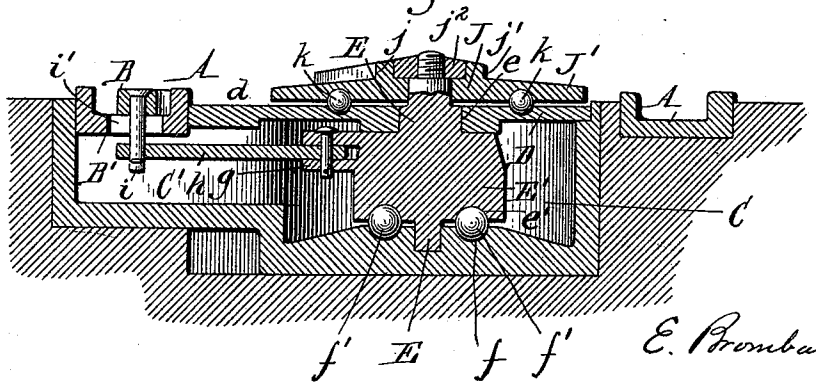


Fig. 3.



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UNITED STATES PATENT OFFICE.

EMIL BROMBACHER, OF BUFFALO, NEW YORK, ASSIGNOR OF TWO-THIRDS TO CHRISTIAN FLOERL AND EDWARD F. STEIN, OF SAME PLACE.

RAILWAY-SWITCH.

SPECIFICATION forming part of Letters Patent No. 527,547, dated October 16, 1894.

Application filed July 19, 1894. Serial No. 517,956. (No model.)

To all whom it may concern:

Be it known that I, EMIL BROMBACHER, a citizen of the United States, residing at the city of Buffalo, in the county of Erie and State of New York, have invented a new and useful Improvement in Railway-Switches, of which the following is a specification.

This invention relates to that class of railway switches which are employed more especially on street railroads and in which the switch is shifted by a trip device carried by the car and controlled by the operator on the car.

One of the objects of my invention is to provide a switch of this kind which permits the casing containing the operating parts to be located between the tracks, so as to avoid taking up the tracks and reduce the labor of placing the switch.

The invention has the further objects to simplify the construction of the switch and to reduce the friction of the movable parts to a minimum.

In the accompanying drawings:—Figure 1 is a longitudinal section of my improved switch, shown in connection with a street car having a trip device co-operating with the switch. Fig. 2 is a top plan view of the switch. Fig. 3 is a transverse vertical section of the same, on an enlarged scale.

Like letters of reference refer to like parts in the several figures.

A represents the rails of the main track and A′ the rails of the side or branch track, and B the pointed switch rail or tongue which is pivoted at its rear end to the base plate B′ on which the adjacent rails are arranged in a well known manner.

C is a metallic box or casing, preferably of cylindrical form, arranged between the main rails opposite the switch tongue and sunk into the ground with its cover or top plate D level with the surface of the street. The upper edge of the casing may be rabbeted to receive the cover, as shown, and the latter is removably secured in place by bolts or other suitable fastenings. The casing is formed with a hollow lateral extension C′ which extends under the base plate of the switch tongue, and the cover of the casing is formed with a corresponding wing *d* which forms the cover of said extension.

E is a vertical rock shaft or spindle arranged in the casing C and resting at its lower end in a bearing formed in the bottom of the casing and passing with its upper portion through a central opening or bearing *e* formed in the cover. This shaft is formed within the casing with a hub or enlargement E′ provided in its under side with an annular groove *e′*. The bottom of the casing is formed opposite said groove with a similar groove *f* and in these opposing grooves is arranged an annular row of balls *f′* which support the shaft E and whereby the friction is reduced.

g is a bifurcated arm or lug arranged on the rock shaft or its enlargement, and *h* is a rod connecting the laterally movable switch tongue with said rock arm, whereby the tongue is shifted in one direction or the other upon turning the rock shaft accordingly. The switch tongue is provided between its point and its pivot with a vertical actuating pin or projection *i* which extends downward through a transverse slot *i′* formed in the base plate B′ and which is attached to the adjacent end of the connecting rod *h*. The latter is arranged partly in the casing and partly in the lateral extension of the casing.

J is a shifting plate secured to the projecting upper end of the rock shaft above the cover of the casing and adapted to be operated by trip devices on the car. This shifting plate is preferably constructed in the form of a sector or dovetail, and its lateral edges *j* and *j′* diverge outward or toward the periphery of the sector so as to form cam faces against which the trip devices of the car are adapted to engage and whereby the plate is turned in one direction or the other.

In order to reduce the friction of the shifting plate to a minimum, an annular row of balls *k* is interposed between its under side and the cover of the casing, as shown in Fig. 3, the cover and the shifting plate being for this purpose formed in their opposing faces with annular grooves in which the balls run. The shifting plate is preferably formed with an extension J′ forming a continuation thereof on the opposite side of the rock shaft and the upper surfaces of the plate and its extension are sloped toward the periphery of the casing to facilitate the passage of vehicles

over the same. The nut j^2 whereby the shifting plate is secured to the rock shaft is countersunk so as to leave the upper surface of the plate free from projections.

Upon the car are located two tripping devices or projections one on each side of a longitudinal line passing through the upright rock shaft and each of these tripping devices is capable of being raised to clear the cam face of the shifting plate with which it cooperates and of being lowered for engaging against the same, for shifting the switch. The trip devices shown in Fig. 1 of the drawings, are preferably employed for this purpose. Each of these devices consists of a longitudinal lever L pivoted to the under side of the car platform and having its front arm formed with an abrupt end which is adapted to engage against the cam face of the shifting plate on the same side of the rock shaft, while the rear arm of the lever carries a weight l which tends normally to raise the front arm of the lever clear of the shifting plate.

M is an upright hand lever also pivoted to the car platform adjacent to the dash board of the car and provided underneath the platform with a rearwardly extending arm m adapted to bear upon the front arm of the trip lever L for depressing the same. The lower arm m of the hand lever preferably terminates in a roller m' for diminishing friction. The weighted arm of the trip lever holds the front arm of the latter and the rear arm of the hand lever in their elevated position, causing the hand lever to stand in the vertical position shown by the right hand lever in Fig. 1.

N represents parallel guide tracks arranged immediately in front of the casing and in line with the trip levers L, whereby the latter, when depressed, are reliably guided to the cam faces of the shifting plate.

When the switch is set for the main track and it is desired to run from the main track upon the siding the hand lever on the left side of the car is pulled rearward, thus depressing the corresponding trip lever into the path of the shifting plate J as shown in Fig. 1. The trip lever, striking the adjacent cam face of the shifting plate, turns the latter and the rock shaft toward the right, and this movement is transmitted to the switch tongue by the connecting rod h, thereby shifting the tongue to the proper position for directing the car upon the siding. When the switch is set for the siding and it is desired to run upon the main track, the hand lever on the right hand side of the car is pulled backward, thus causing the shifting plate to turn the rock shaft and the switch tongue in the opposite direction and directing the car accordingly.

As the shifting devices of my improved switch are not located directly under the track rails, but between the same, the casing with its contained parts can be readily placed without tearing up any of the tracks, it being only necessary to cut away a few of the adjacent ties. The switch can thus be applied to roads already constructed, at comparatively small expense. The shifting devices are connected with the switch tongue at a distance from its pivot and it can therefore be readily operated.

I claim as my invention—

1. In a railway switch, the combination with the main and branch track rails and a switch tongue, of a casing sunk between the main tracks and having a top plate provided on its upper side with an annular groove, an upright rock shaft journaled in said casing and having an arm connected with the switch tongue, a shifting plate secured to said shaft above said top plate and provided on its under side with an annular groove arranged opposite the groove in said top plate and balls arranged in said grooves, substantially as set forth.

2. In a railway switch, the combination with the main and branch track rails and a switch tongue, of a casing sunk between the main tracks and provided in its bottom with an annular groove, a vertical rock shaft journaled in said casing and having a hub or enlargement provided in its under side with an annular groove arranged opposite the groove in the bottom of the casing, balls arranged in said grooves and an arm arranged on said shaft and connected with said switch tongue, substantially as set forth.

3. The combination with a switch tongue or rail and a shifting device connected therewith, of a longitudinal trip lever pivoted to the under side of a car and adapted to engage with its front arm against said shifting device and having its rear arm weighted for normally raising its front arm clear of said shifting device, and an upright hand lever pivoted upon the platform of the car and having a rearwardly extending arm bearing upon the front arm of said trip lever, substantially as set forth.

Witness my hand this 14th day of July, 1894.

EMIL BROMBACHER.

Witnesses:
CARL F. GEYER,
ELLA R. DEAN.