

UNITED STATES PATENT OFFICE.

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RAILWAY-SWITCH.

SPECIFICATION forming part of Letters Patent No. 224,054, dated February 3, 1880.

Application filed July 15, 1878.

To all whom it may concern:

Be it known that I, CHARLES W. TARBOX, of New York city, in the county and State of New York, have invented certain new and useful Improvements relating to Railway-Switches; and I do hereby declare the following to be a full and exact description thereof.

According to this invention the switch-points are raised and lowered into and out of position by means of sliding filling-pieces formed with inclined and flat surfaces, which filling-pieces are operated either by hand devices of a particular construction, hereinafter more fully set forth, or by automatic mechanism under the control of the engineer of the train, which mechanism is adapted to operate the switch at will, when required, unaffected by the condition of the hand mechanism. The vertically-moving switch-points are located relatively to the rails of the main and side tracks so that the treads of the wheels in passing over them are always partly supported by the rails, which are themselves stationary. The filling-pieces which move the switch-points are connected by a transverse lever, which is itself connected with auxiliary frogs for automatic operation.

The following is a description of what I consider the best means of carrying out the invention.

The accompanying drawings form part of this specification.

Figure 1 represents a plan view, partly in section, of part of a railroad-track with my improvements applied thereto; Fig. 2, a side view of the same, also partly in section; Fig. 3, a detached view of suitable means for operating my improved switches by hand. Fig. 4 is an under-side view of a truck with the shifting-wheel applied for the purpose of operating the switches automatically. A similar truck is shown in side view in Fig. 2.

In each of the views similar letters of reference indicate corresponding parts wherever they occur.

A A represent the rails of the main track of a line of railroad, and B B portions of the rails of a side track or branch line, the junctions of which are controlled by means of switch points or frogs $c c'$, adapted to be moved into and out of position vertically, in place of being pivoted or deflected in the usual manner.

The switch-points $c c'$ work in bearings $c^2 c^2$ in the under side of the switches $C C'$, and are provided with projections c^3 , flat on the bottom, and having on one side an incline or cam surface, the portion c^4 between the projections being preferably flat or straight. The inclined sides or cam-surfaces are adapted to engage with similar surfaces on one side of the projections c^5 , with flat tops. These projections are on the upper surface of sliding filling-pieces C^2 , working on bearings c^6 , and controlled to move to and fro by means of a double lever, C^3 , mounted on a center, c^7 . The double lever C^3 is, by means of a pair of connecting-rods, $c^8 c^8$, attached one on each side of the center c^7 , connected to lever-arms $c^9 c^9$, mounted on one end of the rock-shafts $c^{10} c^{10}$, which, at their opposite ends, are provided with arms c^{11} , to which are pivoted vertical rods c^{12} , the upper ends of which are slotted at c^{13} and engage with the auxiliary frogs $C^4 C^5$, which work vertically in bearings c^{14} in the under side of the switches $C C'$.

D is a transverse lever mounted on a pivot, d , carried by a standard, D' , affixed to any suitable foundation in the pit E, formed beneath the track. This lever D serves to insure the simultaneous action in opposite directions of the points $c c'$, and is simply necessary as a precaution in the event of either of the points c or c' sticking, owing to dirt getting into the bearings, or on account of snow or ice in winter weather.

$f f$ are another pair of levers, one end of each of which is connected to the opposite arm of the double lever C^3 , while their other ends are connected to one arm, g , of the L-levers $G G'$, which are pivoted on an axis, g' . The opposite arms g^2 of the L-levers $G G'$ are connected with the slotted levers g^3 , working on a pin carried by the auxiliary frogs $H H'$, which work vertically in bearings $h h$ in a suitable frame arranged centrally of the track.

The auxiliary frogs $H H'$ are arranged in position to be operated, when desired, by means of the shifting-wheel I, mounted on a sleeve, i , sliding freely on (by preference) one of the axles of the wheels of the locomotive or tender, while the auxiliary frogs $C^4 C^5$ are arranged in position to be operated by the ordinary wheels of the engine or train passing along the road. The shifting-wheel is moved

sidewise on the axle I' by means of a crank-lever, I², provided with a suitable handle, I³, and a pivoted lever, I². By moving the handle I³ to the right or left the shifting-wheel I will be brought into position to depress either of the auxiliary frogs H or H', and consequently place the points c c' in the desired position, as hereinafter more fully explained.

K K are guard-rails, of the ordinary construction. L is a hand-wheel mounted on the upper end of a vertical shaft, l, capable of partial revolution in any suitable bearings by the side of the track or other convenient position. Upon the shaft l is mounted rigidly a forked lever, L', the arms l' l² of which are turned down or provided with vertical projections l³, adapted alternately to engage with a lever-arm, M, one end of which is mounted freely on the shaft l, while its opposite end plays in a slot or recess, l⁴, in one of the sliding filling-pieces C².

The object of this construction of the lever L' is to enable the points c c' to be operated by hand when desired, by turning the wheel L in one or the other direction, or to leave the same free to be operated only by the auxiliary frogs.

I esteem it very important that the rails proper should be stationary and the switch-points, which are independent, movable in vertical planes, and that the rails—one of the main and one of the side track—between which and the continuous rails the points rise and fall should be so projected forward that the wheel, in passing over the points, will be partly supported by one or the other of the fixed rails, the tread of the wheel lapping the space between them.

As shown in the drawings, the rails are so placed together and the switch-points so proportioned that in passing the wheels of the car are never entirely unsupported by the stationary rails. The points serve, therefore, mainly as directing means for determining the course of the train. The movement in vertical planes by the direct action of the wedges renders the switch-points much less liable to clog than in any other construction of which I am aware.

When the wheel L and its connecting-levers are not required for use it is locked in a central position, as shown by Fig. 3, by means of a locking-lever, N, which may be secured by a bolt, m, and a padlock or other suitable retaining and securing means.

The operation of my improved device is as follows: Supposing a train to be passing along the main line A in the direction of the arrows 1, Figs. 1 and 2, with its shifting-wheel placed in position so as to depress the right-hand auxiliary frog H, the parts will all be brought into the position shown by Fig. 1, so that the switch-point c will be depressed and the switch-point c' raised, thereby causing the car O, when it arrives at the switches c c', to be turned from the main track A onto the side or branch track B, and proceed on its journey in the direction of the arrow 2. At the same time that the auxiliary frog

H is depressed, the switch-point c is lowered, and the switch-point c' raised, the auxiliary frog H' and the frog C⁴ will be raised and the auxiliary frog C⁵ lowered, and the parts will remain in this position until either the auxiliary frog H' is depressed by the action of the shifting-wheel I of another train passing in the direction of the arrow 1 in Figs. 1 and 2, when the switch-point c will be raised, the point c' lowered, the auxiliary frogs H and C⁵ raised, and the auxiliary frog C⁴ lowered, thereby leaving the main line A clear.

Supposing a train to be approaching the switches C C' on the main line A in the direction of the arrow 3, Figs. 1 and 2, with the parts in the position shown in the drawings, with the auxiliary frog C⁴ elevated, immediately the front wheel touches the frog C⁴ it will depress it and raise the switch-point c, lower the switch-point c', raise the auxiliary frogs C⁵ and H, and lower the auxiliary frog H', thereby clearing the main line, and so on.

The switch-points c c' are raised and lowered by means of the sliding filling-pieces C². The inclined or cam surfaces of the projections c³ act on the inclined cam-surfaces on the projections c³ to raise the sliding points. After the points are raised the flat surfaces of the projections are in contact, so that the switch-points have a solid flat support which will not be moved by the weight of the train. The flat contact-surfaces also permit more or less motion to the sliding filling-pieces without altering the position of the points.

When the switch-point c or c' is up, the projections c³ c³ rest upon the projections c³ of the sliding filling-pieces C²; but when it is down the projections c³ c³ rest in the recesses c⁴, thereby bringing the parts close together.

The switch-points c c' are formed with inclined grooves c*, in order that in the event of the points c c' sticking at any time, owing to any accident to the machine or clogging of the same by reason of snow, ice, or other cause, the flanges of the wheels may be held therein and the train prevented from leaving the track while jumping the switch-point for the time in the way.

It will be observed from the above description that the hand mechanism for operating the switch is so constructed that the mechanism for operating it from the engine is entirely independent thereof, and may be employed whatever the condition of said hand operating mechanism.

Modifications of my device may be readily made by any competent mechanic within wide limits; and by the employment of suitable levers or operating means, in connection with the sliding filling-pieces C², or other suitable parts of the mechanism controlled by the auxiliary frogs, I can work or operate a signal or signals to indicate to an approaching train the position of the switch-points c c'.

The form and construction of the auxiliary frogs may also be varied.

Although I have particularly described this

device as applied to the tracks of steam-railroads, it is equally applicable to street or other railroads.

In place of employing a shifting-wheel, I, 5
mounted on a sleeve, *i*, carried on one of the axles of an engine or car, the said wheel may be otherwise applied, or other equivalent means may be employed in its stead—as, for instance, an inclined shoe or skid suitably supported, 10
so as to be placed in the position desired.

I claim as my invention—

1. In combination with the hand operating mechanism composed of the lever *M*, the forked lever *L'*, provided with projections *l'*, and devices for moving said forked lever, as shown, 15
the vertically-moving points *p c'* and the sliding filling-pieces *C²*, substantially as described.

2. In combination with a hand operating-lever and connections therefrom to the switch, 20
which are adapted to operate the switch at will when required, and to leave it free to be shifted by other mechanism without disturbing the

hand-lever, the points *c c'*, filling-pieces *C²*, and transverse connecting-lever, arranged for joint operation as specified. 25

3. The stationary rails of the main track *A* and branchline *B*, and vertically-moving points *c c'*, relatively arranged and proportioned as shown, so that in passing over said points the wheels of the train are always partly supported 30
by the stationary rails, in combination with sliding filling-pieces *C²*, formed with inclined and flat surfaces, as set forth, and automatic operating mechanism, when controlled by the engineer on the train, substantially as described. 35

In testimony whereof I have hereunto set my hand this 10th day of July, 1878, in the presence of two subscribing witnesses.

CHARLES W. TARBOX.

Witnesses:

W. COLBORNE BROOKES,
CHAS. C. STETSON.