No. 623,320. Patented Apr. 18, 1899.

A. KUNZ.

SWITCH.

(Application filed Nov. 25, 1898.)

(No Model.) 2 Sheets—Sheet 1.

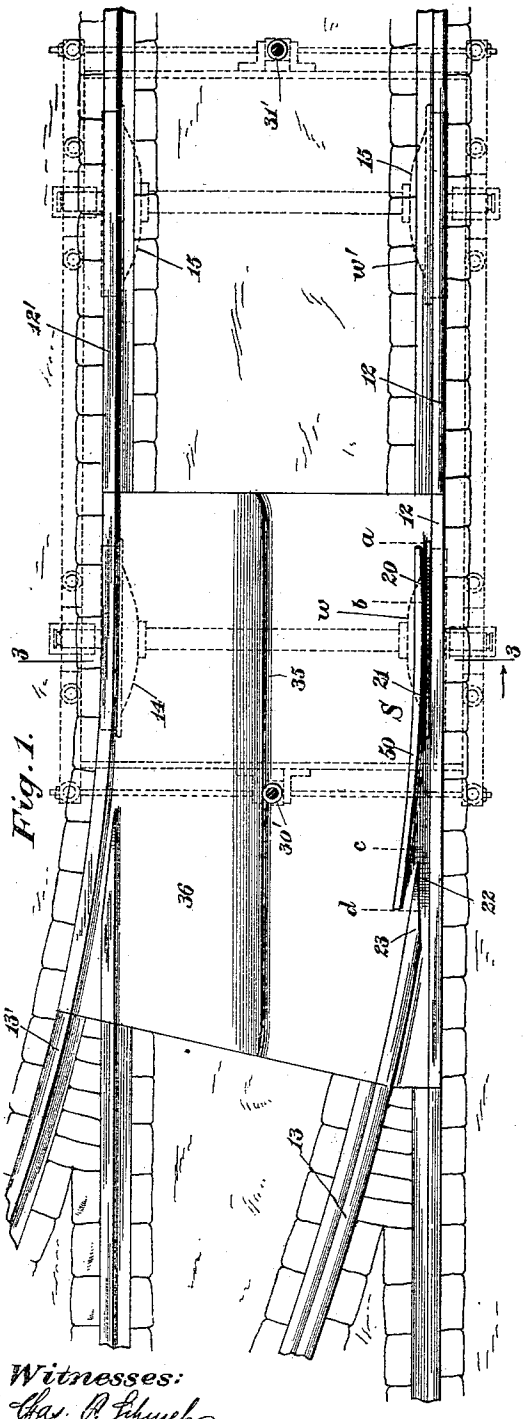


Fig. 1.

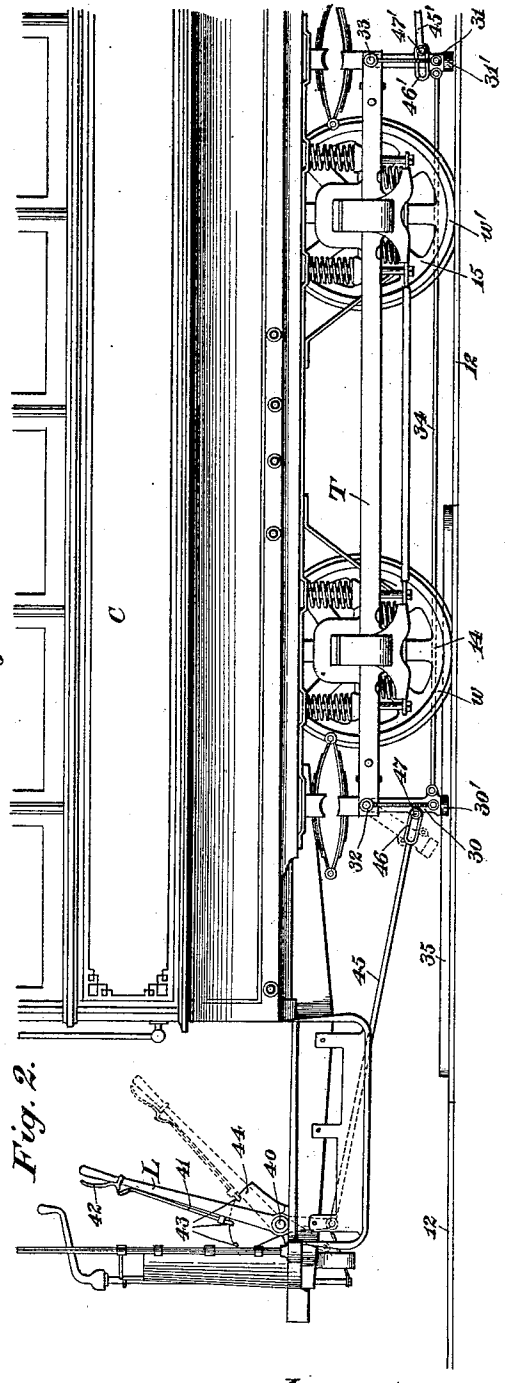


Fig. 2.

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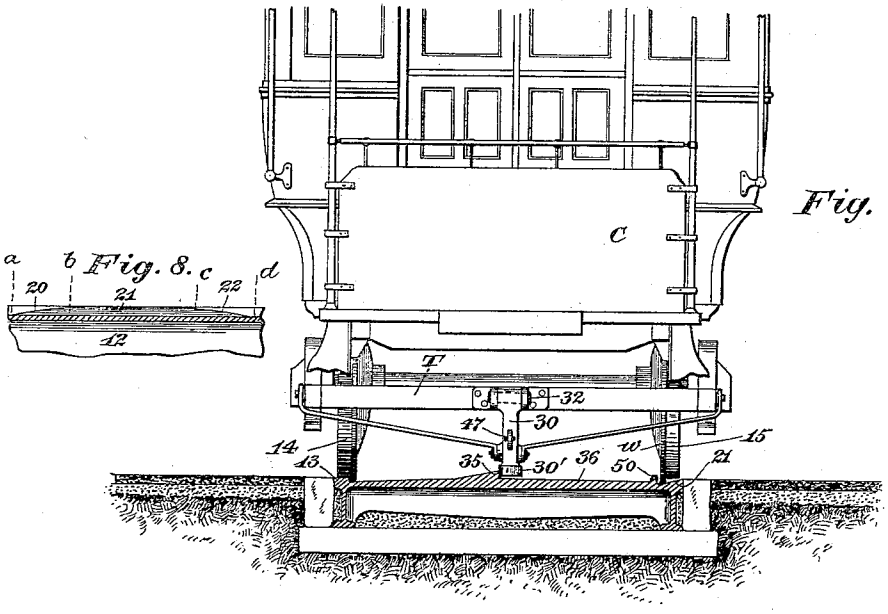


Fig. 8.

Fig. 3.

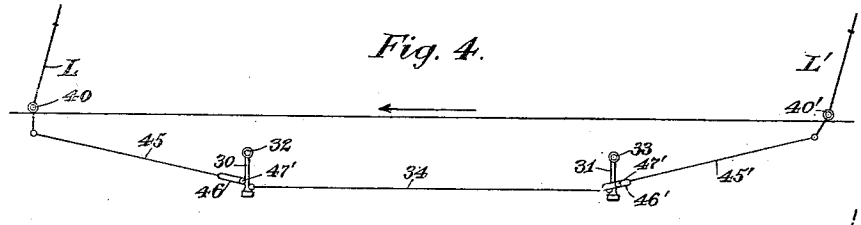


Fig. 4.

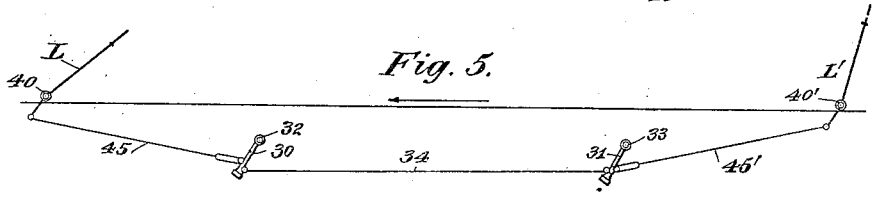


Fig. 5.

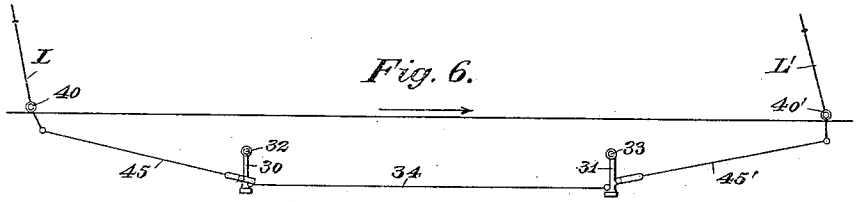


Fig. 6.

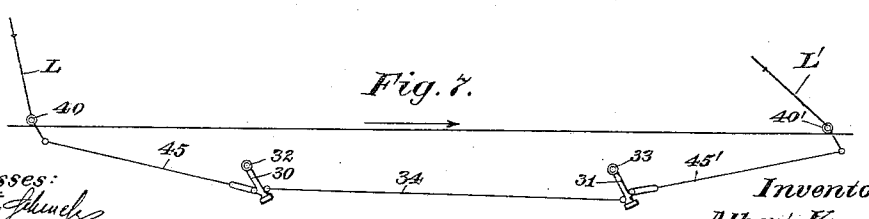


Fig. 7.

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UNITED STATES PATENT OFFICE.

ALBERT KUNZ, OF HARTFORD, CONNECTICUT, ASSIGNOR OF ONE-HALF TO JACOB SUTTER, OF SAME PLACE.

SWITCH.

SPECIFICATION forming part of Letters Patent No. 623,320, dated April 18, 1899.

Application filed November 25, 1898. Serial No. 697,323. (No model.)

To all whom it may concern:

Be it known that I, ALBERT KUNZ, a citizen of the United States, residing in Hartford, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Switches, of which the following is a specification.

This invention relates to a switching apparatus, the object being to provide a simple and effective appliance of this character in which all pivoted parts are dispensed with, it being well known that switches of such construction present joints and bearing-surfaces in and upon which dust, dirt, and snow can clog and adhere to such an extent as to seriously interfere with the proper operation of the switch, and by my improved apparatus a car can be switched onto a branch line or siding without the jar and shock usually accompanying certain kinds of switches.

My improved apparatus involves as one of its features and in connection with main and branch rails a guide or switch proper, adapted to connect with each of the rails and having an inclined or beveled portion upon which a car-wheel can travel. In the present case this guide is fixed in position at or near the junction between the main and branch rails, and it has what may be termed "a rise" and "a fall" or an ascending surface and a descending surface. When the car-wheels come in contact with this switch or guide, they will ascend the rise, and after passing the same will reach the fall and will thereby tend to descend or slide laterally. In case it is desired to switch the car this last-mentioned operation will be permitted and the wheels will gently slide toward the branch rails; but if the car is to be kept on the main line this lateral motion of the wheels will be prevented. While the side motion referred to may be blocked manually by the crew of the car, I prefer as a matter of convenience to employ mechanical means for the purpose, which may be mounted upon the car and within convenient reach of the motorman or driver. As a simple means for preventing the sidewise motion of the wheels when on the guide or switch an arm may be mounted on the car, and said arm may engage a stop located at a convenient point. The arm referred to is preferably connected with the car for swinging movement, and the stop engaged thereby is usually located intermediate the rails at the branch or siding.

The improvements are represented in connection with a four-wheeled car-truck, and as a manner of obtaining the best results I employ a swinging arm with each pair of wheels, and the arms are connected, preferably, for simultaneous operation, and I generally use two devices operative independently of each other and located conveniently upon the platforms of the car for operating the two arms in unison.

In the drawings accompanying and forming part of this specification, Figure 1 is a plan view of my improved apparatus, showing the car-truck by dotted lines. Fig. 2 is a side elevation of the apparatus. Fig. 3 is a transverse section taken in line 3 3, Fig. 1. Figs. 4, 5, 6, and 7 are diagrammatic views of the mechanism employed for blocking the sidewise operation of the car-wheels and illustrate more particularly the independent operation of the two devices for actuating the swinging arms; and Fig. 8 is a detail of the guide or switch proper, showing the inclined surfaces thereof.

Similar characters designate like parts in all the figures of the drawings.

The main-track rails are designated, respectively, by 12 and 12′ and the siding or branch rails by 13 and 13′, respectively, these parts being of ordinary construction, and at the junction or intersection of the main and branch rails 12 and 13, respectively, my improved switch is disposed.

In Figs. 1, 2, and 3 is represented by dotted and full lines, respectively, a car C, having the two pairs of wheels 14 and 15, respectively.

My improved apparatus includes, as one of its features, a switch or guide S, located at the junction between the main and branch rails 12 and 13, respectively, and for convenience said switch may be cast in one piece with portions of the two rails and it is understood connects both of the rails and has between the points *a* and *b* an ascending surface 20 and between the points *b* and *c* a descending and lateral surface 21 and between the points *c* and *d* a descending surface 22. It

will be assumed that a car is upon the main line, traveling upon the rails 12 and 12'. When the wheels come in contact with the inclined surface 20, they will of course rise upon the same and pass onto the inclined surface 21, and as it is understood that the highest point of the inclination 21 is next the rail 12 the natural tendency of the car-wheels will be to slide down this inclined surface, such action being due to the weight of the car, and this operation will be permitted should it be desired to transfer the car to the branch rails 13 and 13'. The inclination ends at a point in line with or opposite the pointed end 23 of the branch rail 13, and when a wheel reaches the end or base of said inclined surface 21 it can naturally follow the branch rail 13, and the opposite wheel will of course roll on the complemental and parallel branch rail 13'.

In case it is intended that the car should follow the main line the lateral or sidewise motion of the wheels will be prevented, and while this operation may be carried out by hand-pressure applied to the side of the car by one of the crew I prefer to employ mechanical means for insuring this result, and it will be understood that when the wheel leaves the inclination 21 between the points *b* and *c* it rolls upon and down the inclined surface 22 between the points *c* and *d* until it strikes the main rail.

I mount upon the car two arms, as 30 and 31, adjacent, respectively, to the pairs of wheels 14 and 15, said arms being pivoted, as at 32 and 33, upon the truck T, and said arms are connected, preferably, for simultaneous operation, the longitudinal rod 34 being illustrated for this purpose, said rod being pivoted at its opposite extremities to the two arms. In connection with the arms I employ independently-operative devices each adapted to shift the swinging arms into position to engage the stop, as will hereinafter appear, to hold the car-wheels against sidewise movement.

The two arms 30 and 31 operate in conjunction with a stop, as 35, herein represented as cast integral with the switch-plate 36, located between and conveniently made in one piece with the adjacent portions of the main and branch track rails 12 and 12' and 13 and 13', respectively, as shown in Fig. 1, the stop 35 being sufficiently long so as to be engaged by what is for the time being the rear swinging arm 31 before the rear wheels strike the laterally-inclined portion 21 of the switch, this being for the purpose of preventing the sidewise movement of the rear end of the car should the front end be on the main line.

It will be understood, of course, that the stop 35, which is in the nature of an elongated flange on the plate 36 and in parallelism with the main-track rails, is located a short distance above the normal plane of the road-bed, as indicated in Fig. 2, and that the two swinging arms 30 and 31 are held with their lower ends normally above the plane of the upper edge of the stop or flange 35, and consequently above the plane of the road-bed, but when it is desired to continue along the main line the two arms will be thrown down into position to engage said stop. Said arms conveniently carry rolls 30' and 31', respectively, serving in the well-known function and which are adapted to travel against the straight face of the stop. Just before the car reaches the switch the motorman will throw the arms down to the position shown in full lines in Fig. 2, so that the rolls can engage the stop when they come opposite the same, and as the car travels forward the rolls will of course rotate. It will be evident, of course, that when the wheel *w* comes in contact with the inclined portion 21 of the switch the tendency thereof will be to slide down the declivity; but this action will be blocked by the stop 35, which is engaged by the blocking-arm 30, and the same operation will take place with the rear wheel *w'*. Should it be desired to have the car take the siding or branch line, the blocking-arms will not be thrown down, in which case the wheels *w* and *w'* as they strike the inclined portion 21 of the switch can slide down the same and onto the branch rail 13.

As hereinbefore stated, I employ independent devices located, respectively, upon opposite ends of the car, each being adapted to simultaneously operate the blocking-arms 30 and 31, and said devices are represented herein as levers L and L'. (See Figs. 2 and 4 to 7, inclusive.) In Fig. 2 I have illustrated in detail the operating mechanism and will now describe the same, corresponding parts in the other mechanism being designated by a similar character with a prime-mark.

The arm-operating device in Fig. 2 consists of a lever pivoted, as at 40, upon the platform of a car and carrying a detent-bar 41, operated by the small lever 42 on the main lever L, the end of the detent-bar being adapted to enter into one of the three notches 43 on the segment 44 on the platform, thereby to hold the lever in an adjusted position. The lower end of the lever L, which is located below the car-platform, is pivoted to the link 45, connected by a slide-joint at its opposite ends with the arm 30, which, it will be remembered, is connected with the arm 31 by the rod 34. The slide-joint illustrated consists of a loop 46 on the end of the link 45 and a pin 47 on the arm 30, embraced by said loop.

In Figs. 4, 5, 6, and 7 the operation of the two levers is clearly illustrated, the two blocking-arms 30 and 31 being in their working positions and the car moving in the direction of the arrow. The pin 47', it will be observed, is near the right-hand end of the loop 46' at the end of the link 45', so that when the front lever L is forced down to the position indicated in Fig. 5 to lift the two arms the rear lever L' will not be affected by this operation, and this same advantageous result can be obtained when the car is moving in the oppo-

site direction, as indicated, respectively, by Figs. 6 and 7, it being obtained by the joint between the arms and the links, whereby the levers L and L′ can operate independently of each other.

The switch-plate 36 is provided with a curved guard-rail 50, serving to limit the lateral motion of the wheels *w* and *w*′.

Having thus described my invention, I claim—

1. In an apparatus of the class specified, and in combination with main and branch track rails, a guide adapted to connect with each of the rails and having an inclined portion for permitting the descent and lateral movement of a car-wheel; a stop in the track; a car; and means, carried by said car and coacting with the stop, for restraining the action of the wheel when desired.

2. In an apparatus of the class specified, and in combination with main and branch track rails, a guide adapted to connect with each of the rails and having an inclined portion for permitting the lateral movement of a car-wheel; a car; a stop in the track; and a movable arm on the car adapted to be thrown into contact with the stop to prevent lateral motion of the wheel when on said inclined portion.

3. In an apparatus of the class specified, in combination with main and branch track rails, a guide adapted to connect with each of the rails and having an inclined portion for permitting the lateral movement of a car-wheel; a car; a movable arm on the car; a stop; and means for throwing said arm into contact with said stop.

4. In an apparatus of the class specified, in combination with main and branch track rails, a guide adapted to connect with each of the rails and having an inclined portion for permitting a car-wheel to descend and move laterally toward the branch-track rail; a car; an arm on the car; and a stop-rail arranged in parallelism with the main-track rails and in position to be engaged by said arm, to prevent lateral movement of the car-wheel.

5. In an apparatus of the class specified, and in combination with main and branch track rails, a guide adapted to connect with each of the rails and having an inclined portion for permitting lateral movement of a car-wheel; a stop in the track; a car; two movable arms on the car, each adapted to prevent lateral movement of a car-wheel; and a lever connected with each arm and adapted to operate the arms simultaneously.

6. In an apparatus of the class specified, and in combination with main and branch track rails, a guide adapted to connect with each of the rails and having an inclined portion for permitting lateral movement of a car-wheel; a car; an arm on the car; a stop or guard rail adapted to be engaged by said arm to prevent lateral movement of the wheel; a lever for operating said arm; and connections between the lever and the arm, involving a sliding joint.

7. In an apparatus of the class specified, and in combination with main and branch track rails, a guide adapted to connect with each of the rails and having an inclined portion for permitting sidewise movement of a car-wheel; a car; a movable arm on the car; a stop or guard rail adapted to be engaged by said arm for preventing lateral movement of the wheel; a lever for operating said arm; and a link interposed between said arm and lever and jointed to one of them and having a loop connection with the other.

8. In an apparatus of the class specified and in combination, with main and branch track rails; a guide adapted to connect with each of the rails and having a portion along which a car-wheel can move laterally; a car; an arm; a lever; and connections between the lever and the arm involving a sliding joint.

9. In an apparatus of the class specified and in combination, with main and branch track rails; a guide adapted to connect with each of the rails and having a portion along which a car-wheel can move laterally; a car; an arm on the car; a lever also on the car; and a link jointed to one of said parts and having a loop at one end embracing a pin on the other of said parts.

ALBERT KUNZ.

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WM. H. BLODGETT.