(No Model.) 2 Sheets—Sheet 1.

B. W. SWEET.

INTERLOCKING SAFETY SWITCH.

No. 526,547. Patented Sept. 25, 1894.

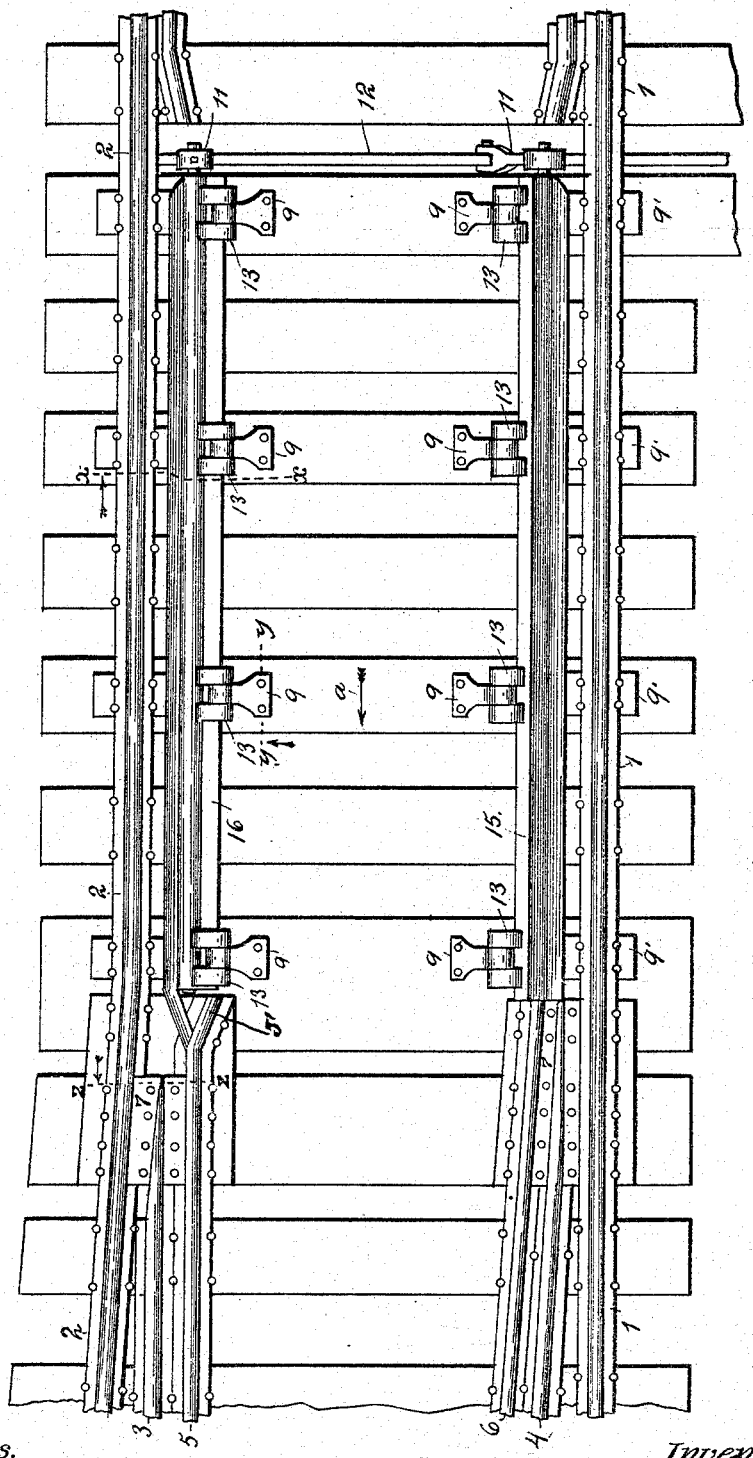

Fig. 1.

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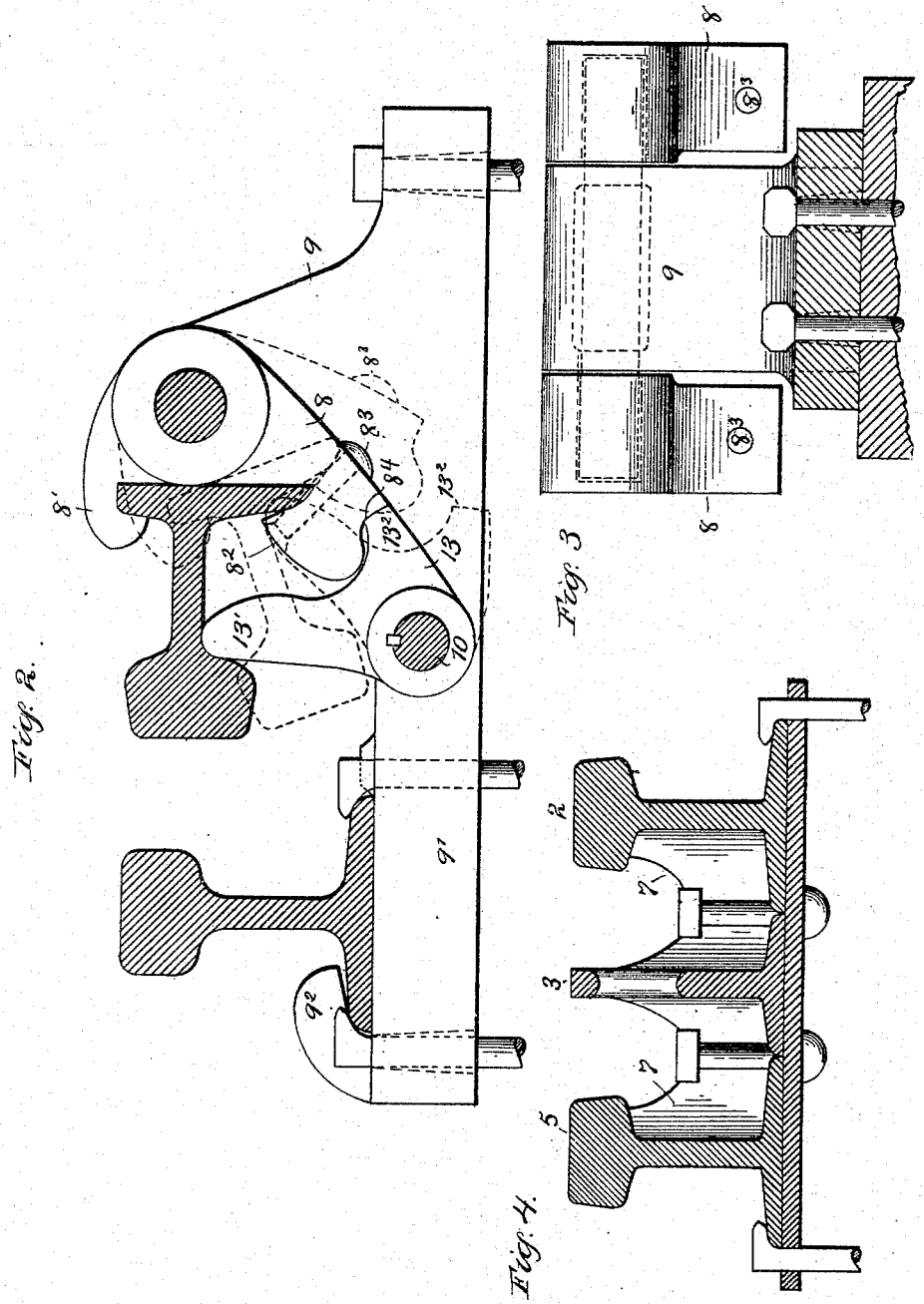

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UNITED STATES PATENT OFFICE.

BENJAMIN WILLIAM SWEET, OF CHICAGO, ILLINOIS, ASSIGNOR OF ONE-HALF TO S. S. CHISHOLM, OF SAME PLACE.

INTERLOCKING SAFETY-SWITCH.

SPECIFICATION forming part of Letters Patent No. 526,547, dated September 25, 1894.

Application filed February 6, 1894. Serial No. 499,290. (No model.)

To all whom it may concern:

Be it known that I, BENJAMIN WILLIAM SWEET, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Interlocking Safety-Switches; 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 improvements in interlocking safety switches to be used on street railways, tramways and railroads, and it consists in an improved switch which, departing entirely from the use of movable switch rails and using only fixed rails, put together in such a manner that at a point of siding, one of the rails of the main track will be curved outward to form one of the rails of the side track, and that rail of the main track be continued by, and the other rail of the side track formed of entirely independent rails, operates by virtue of the directive force of a pressure applied horizontally by a revolubly mounted directing guide bar to one or the other of the sets of wheels of the car; and also consists in an improved interlocking mechanism for operating the directing guide bar; both of which features of my invention will be hereinafter fully described and particularly pointed out in the claims.

The switches now in use have for their essential feature movable switch rails, which govern by their position the track over which the cars are to pass. These switches have many disadvantages. They are quite expensive to manufacture, and are subjected to a great deal of wear and tear. Moreover, the locking mechanism, which has to be used in connection with the switch to insure its complete movement, frequently gets out of order, and is the cause of many accidents.

The object of my invention is to provide a switch which will be more simple in construction than those now in use, which will be more durable, while at the same time permitting readier replacement of worn out parts, and in which the possibility of an open switch occurring will be much lessened.

In the accomplishment of the object of my invention, I depart entirely from the use of movable switch rails. I have found that if at the point of junction of a side track with the main track, one of the rails of the main track be curved outward, so as to form one of the rails of the side track, that side of the main track being continued by an independent rail, and the other side of the side track being formed by an independent rail, since there is an interruption in one rail of either track which the cars may follow, it is as easy to guide them on the one track as the other; and that a horizontal pressure, applied on one or the other of the continuous rails of the main track at the point of their divergence, is sufficient to thus determine which track the cars shall follow. In the construction shown in this application, I obtain this horizontal pressure by the use of revoluble mounted directing guide bars placed in a suitable position on the track just preceding and at the point of divergence of the rails of the same, and so connected together that only one of them will be at any one time in operative position to guide the wheels of the car; and it is in the locking mechanism which I employ to operate these directing guide bars that my invention resides, as well as in the new form of switch which I have invented.

My invention is fully illustrated in the drawings accompanying and forming a part of this application, in which the same reference numerals refer to the same or corresponding parts, and in which—

Figure 1 is a view of my improved switch, the switch guide bars being set for the main track. Fig. 2 is a section taken on the line *x x*, Fig. 1, showing the mounting of the directing guide bar, and the interlocking mechanism which operates the same. The position of the parts indicated by full lines is their operative position, while in dotted lines is shown the position the guide bar and locking mechanism assume when the parts are not in operative position. Fig. 3 is a vertical section of one of the journal boxes shown in Fig. 1, and is taken on the line *y y*. Fig. 4 is a view showing the means for supporting and securing in position the pointed end of one of the independent rails of the track. It is taken on the line *z z*, Fig. 1.

Referring to the drawings, 1 and 2 represent the rails of the main track. At the point where the siding begins, rail 2 is bent outward so as to form the outer rail of the side track, that side of the main track being continued by rail 3, and the other rail of the side track being formed by rail 4. It is necessary to commence rail 4 at a point somewhat in advance of rail 3, as shown in the drawings, for the reason that the gage of the tracks being uniform, the amount of jump of the wheels of the car in passing over the switch can be thus minimized. Rails 3 and 4 are formed with pointed ends, so as to more readily receive the wheels of the car when such wheels pass onto the same, and the points are somewhat lower than the rest of the rails, so that the tread of the wheels does not come in contact with them, the outer rails carrying the weight. The points are also protected from the side pressure of the wheels by the directing guide bars, presently to be described, which cause the wheels of the cars to pass by with ample clearance to be perfectly safe. The guard rails 5 and 6 also extend beside rails 3 and 4 for a short distance from their point of commencement. These guard rails receive in part the impact of the wheels, thus lessening the wear upon the pointed rails 3 and 4, and also make the change of direction of the wheels more gradual than if they were led off at once by the guide bars. The right end of the guide rail 5, is bent to form the portion 5′, and the directing guide bar 16 is correspondingly bent so as to reach the rail, thereby aiding the guide rail to perform its function of gradually effecting the change in direction of the wheels. As shown in Fig. 3 malleable castings 7 are fitted in between the main rail, the pointed rails, and the guard rails in the case of both rails 3 and 4. These castings completely fill the places assigned to them, and being bolted, as are the main and guard rails, to a flat metallic plate, which is in turn secured to the cross ties, serve to strengthen and make firm and durable the said pointed rails 4 and 5.

The directing guide bars 15 and 16, which in their operation determine the passage of the cars over the main track or over the side track, extend along the track close to the rails of the same just before and at the point of divergence of the rails of the main track. It is the function of these guide bars to apply a horizontal pressure to the wheels of the cars passing over the track, and each is placed in such close proximity to the rail in connection with which it operates, that when in operative position it will furnish such horizontal pressure. They are so arranged in relation to each other that only one can be in operative position at a time.

The form of guide bar which is shown in the drawings need not necessarily be used, but I have found it convenient because of the extreme simplicity and strength of the design, and because a common rail section can be used in the construction of the same. Each of the guide bars, in the construction shown, consists of an ordinary rail revolubly mounted, and provided with means for being locked in its operative position. The method of mounting the rail is shown in Fig. 2, where a section of the rail secured to the revolubly mounted clip fastening 8, the interlocking bell crank lever 13, and the journal box 9, which provides bearings for the clip fastening and the locking lever, and which is formed with a flat bottom plate, by means of projections on which the position of the guide bar with relation to the fixed rail in connection with which it operates is determined, are illustrated. There are several of these bearing boxes with accompanying mechanism stationed at different points along the rail to insure its positive movement. The revolubly mounted clip fastening 8 is, as shown in the drawings, formed with a claw $8'$, which embraces one side of the flanged base of the rail, and with a projecting portion 8^2, which embraces the other side of the flanged base of the rail. A rivet 8^3, passing through a notch in the flange and the clip fastening, firmly secures the rail to such fastening. On the lower side of the clip fastening is formed the re-entering portion 8^4, which, as will presently be seen, aids in locking the guide bar in position. The pin on which the clip fastening is mounted does not extend entirely through the journal box, as shown in Fig. 3, as thereby a more neat and attractive design is secured. The journal box itself is formed with a bottom portion $9'$, which extends across the rail upon which the box is situated, and has a hooked outer end, which embraces the outer bottom flange of the rail. A projecting boss 9^2, formed on said bottom portion, abuts against the other side of the bottom flange of the rail, and thus determines the position of the journal box, and therefore of the mechanism mounted thereon, with reference to the rail.

The journal boxes 9 form bearings for a rod 10, which extends the length of the guide bar, and which is operated through the interposition of a crank arm 11 by the rod 12. This rod 12 extends across the track and operates both guide bars, the two being so connected together that only one can be in operative position at a time. Where the rod 10 passes through the journal box 9, there is keyed to it a bell crank lever 13, the long arm $13'$ of which bears against the stem or upright portion of the rail, and thus moves the same up and down, and the short arm 13^2 of which, when the guide bar is raised, fits into the re-entering portion 8^4 formed on the lower surface of the clip fastening 8. When the shaft 10 is turned so that the long arm of the bell crank lever 13 moves upward into a vertical position, it will be seen, as shown in Fig. 2, that the guide bar is securely held in the position into which it has been forced, and that the fastening is so strong that it would be utterly impossible to move the said

guide bar either up or down without crushing the metal intervening between the bearings. When the bell crank lever is turned downward, the position of the parts is as is shown in dotted lines in Fig. 2.

To understand more fully the operation of the switch, consider the action of a train passing in the direction of the arrow *a* in Fig. 1, the directing guide bars being set as shown. When the train reaches the point of divergence of the rails of the main track, each set of wheels naturally desires to follow the rail on which it is moving. This is now, however, impossible, but the horizontal pressure afforded by the guide bar operating in connection with rail 1 is sufficient to continue the passage of the wheels over that rail, and in consequence to cause the other set of wheels to jump to rail 3, the train then passing onto the main track. A train going in the opposite direction on the main track will not be disturbed. If the position of the switch be changed, the train will pass onto the side track. In either position of the guide bars, a train can pass from the side track to the main track.

The advantages of my switch are apparent. It is much cheaper and simpler in construction than those now in use, and can be used with greater dispatch and certainty. By doing without movable rails a great cause of danger is overcome.

In case it is desired to clean out underneath the guide bars at any time, this can easily be accomplished by one man slowly turning the switch lever while another man raises or turns the guard rail, so that when the interlocking parts are in just the proper position, the man who is turning the guard rail can turn it clear up. This will permit the rail to be turned clear over.

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a switch, the combination with the track formed at a point of siding in such a manner that one of the rails of the main track curves outward to form one of the rails of the side track, the main track being continued by and the other rail of the side track being formed each by an independent rail, of revolubly mounted directing guide bars, coupled together so that only one of them shall be in operative position at a time, for applying horizontal pressure to either set of wheels passing over the said track at the point of divergence of the rails of the same to determine the passage of the cars over the main or side track, and means for operating the said bars, substantially as described.

2. In a switch, the combination with a fixed rail, of a revolubly mounted guide bar extending along and in close proximity to the same, and a lever for raising said guide bar so that it will apply a horizontal pressure to wheels passing over the fixed rail, substantially as described.

3. In a switch, the combination with a fixed rail, of a rail secured to a revolubly mounted fastening, and a lever bearing against the stem of said rail to raise it to a horizontal position, so that it will apply a horizontal pressure to wheels passing over the fixed rail, substantially as described.

4. In a switch, the combination with a fixed rail, of a rail secured to a revolubly mounted fastening having a re-entering lower surface, and a bell crank lever, the long arm of which bears against the stem of the rail to raise it into a horizontal position in which it can apply a horizontal pressure to wheels passing over the fixed rail, and the short arm of which locks with the re-entering portion of the fastening, substantially as described.

5. In a switch, the combination with a fixed rail, of a revolubly mounted guide bar extending along and in close proximity to the same, a lever for raising said guide bar so that it will apply horizontal pressure to wheels passing over the main rail, and means for determining the position of the guide bar relative to the fixed rail, substantially as described.

6. In a switch, the combination with a fixed rail, of a revolubly mounted guide bar extending along and in close proximity to the same, bearing boxes for said guide bar provided with outwardly extending bottom portions having projection thereon to grasp and hold the main rail, thus determining the position of the guide rail with reference to the main rail, and a lever for raising said guide bar so that it will apply horizontal pressure to wheels passing over the fixed rail, substantially as described.

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

BENJAMIN WILLIAM SWEET.

Witnesses:

JOHN J. MORONEY,

JOHN SWEET.