

No. 815,888.

PATENTED MAR. 20, 1906.

U. A. WOODBURY.
AUTOMATIC RAILWAY SWITCH.

APPLICATION FILED OCT. 10, 1905.

2 SHEETS—SHEET 1.

Fig. 1.

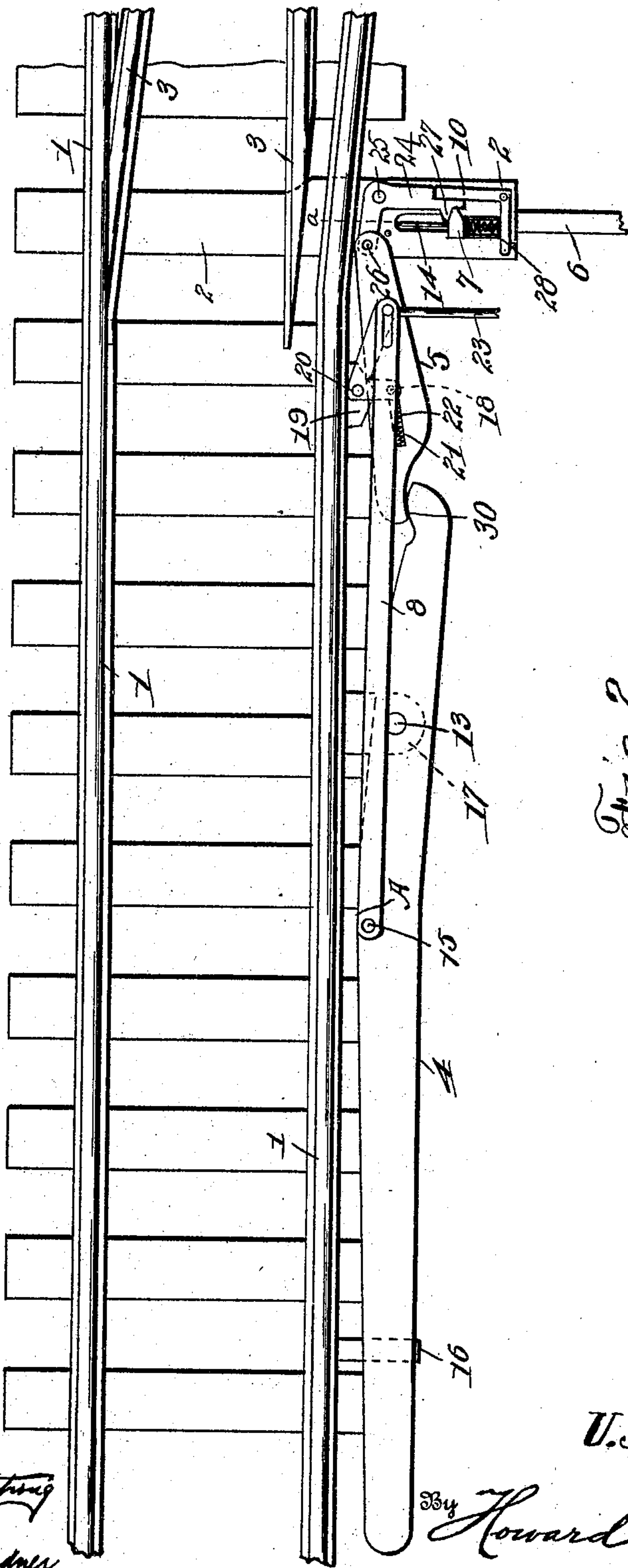
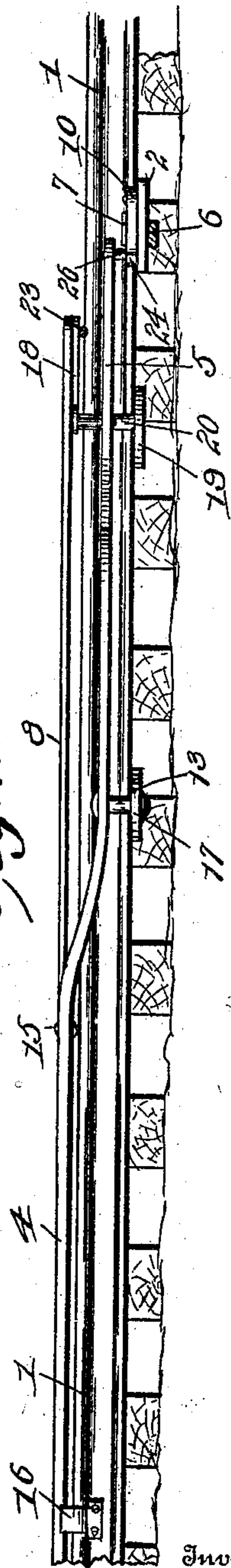


Fig. 2.



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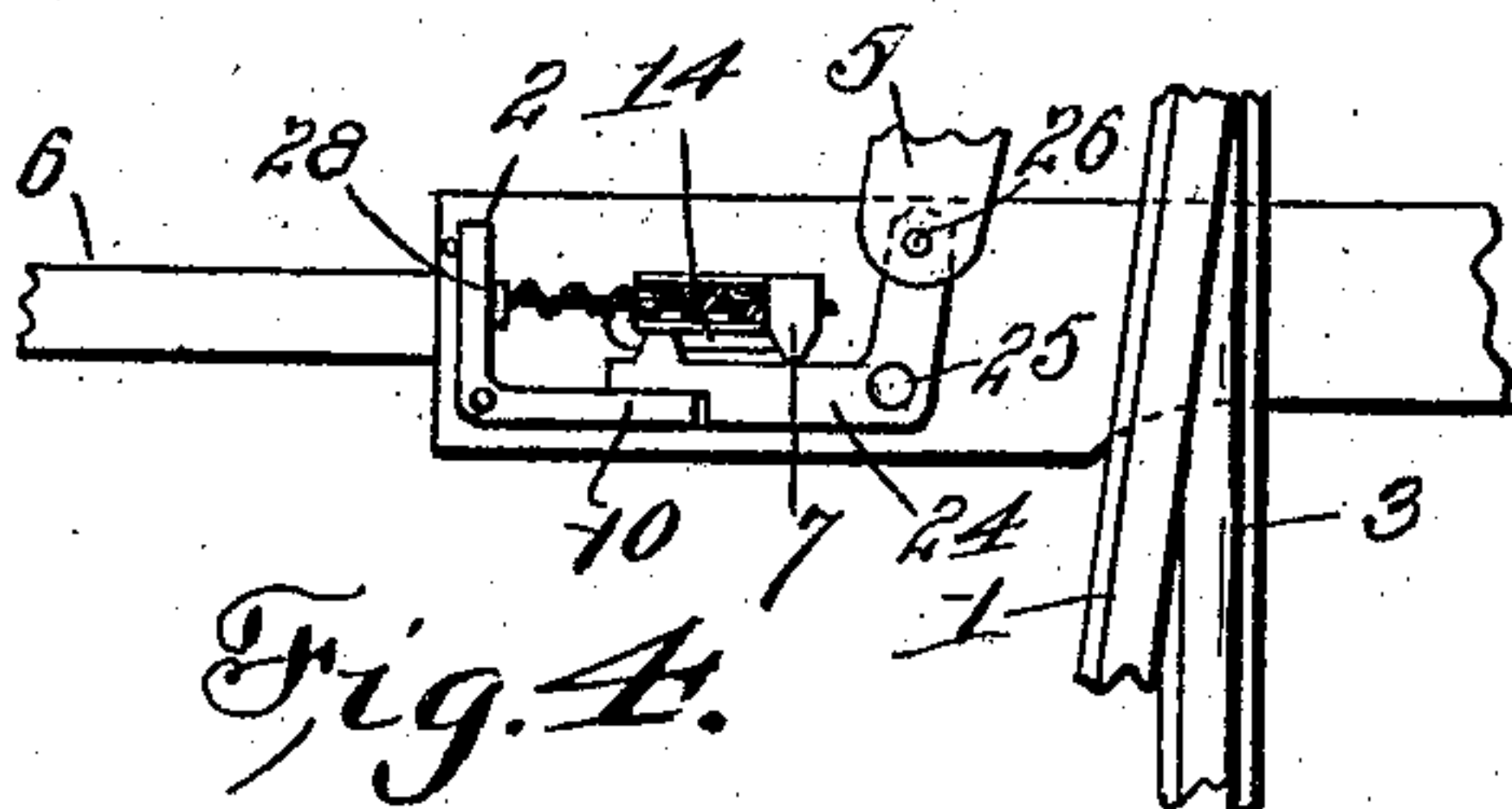
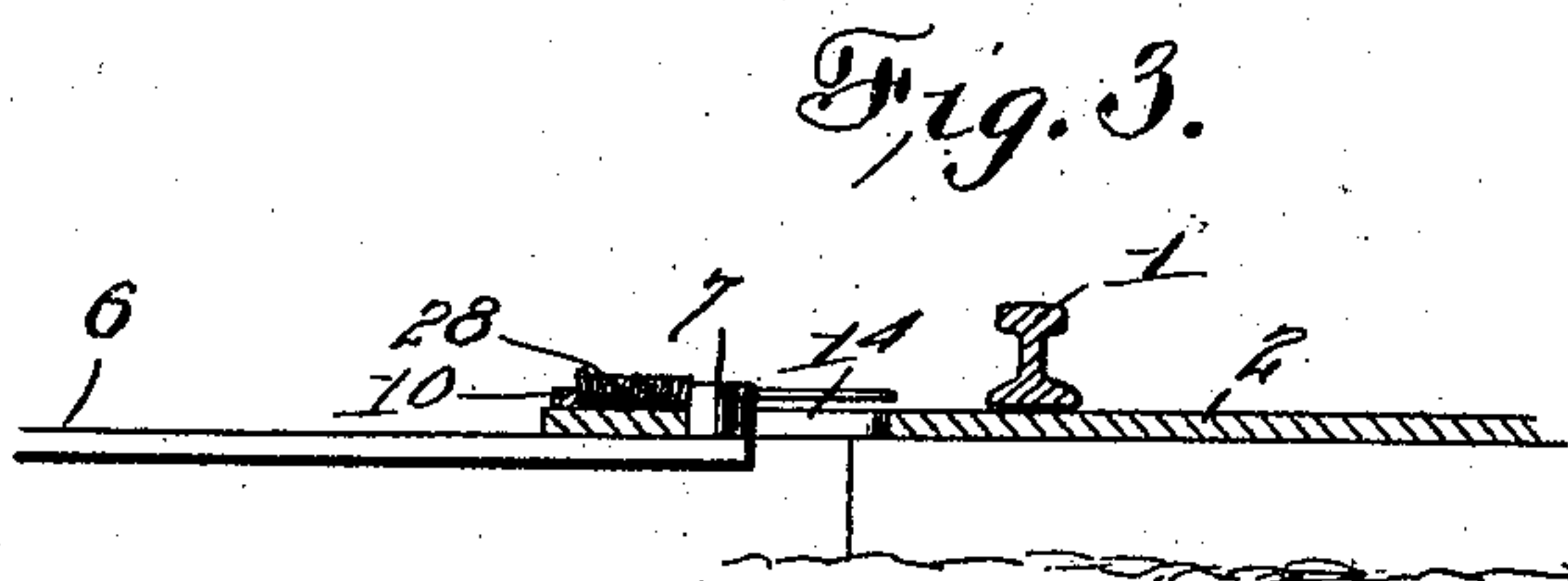
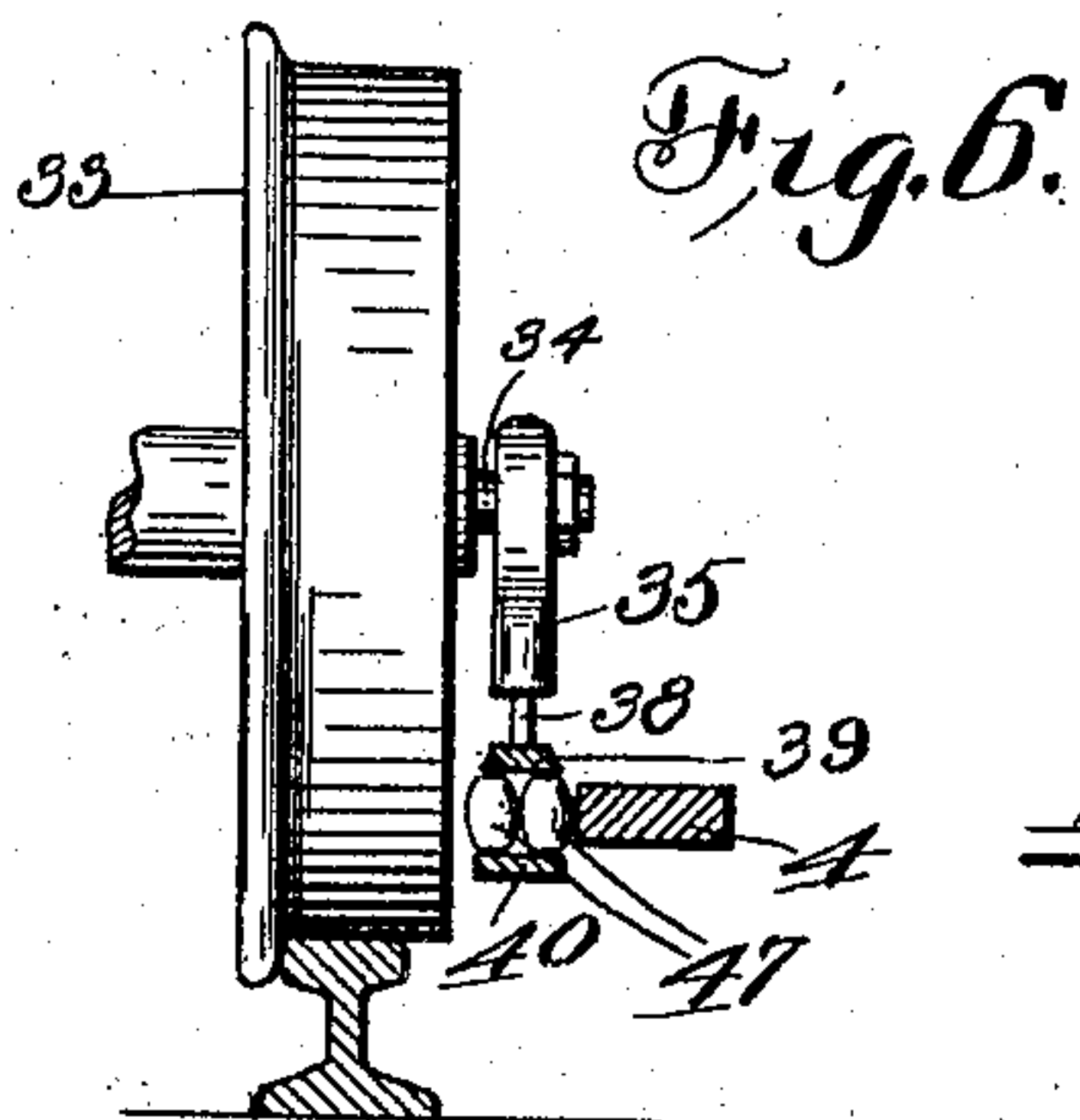
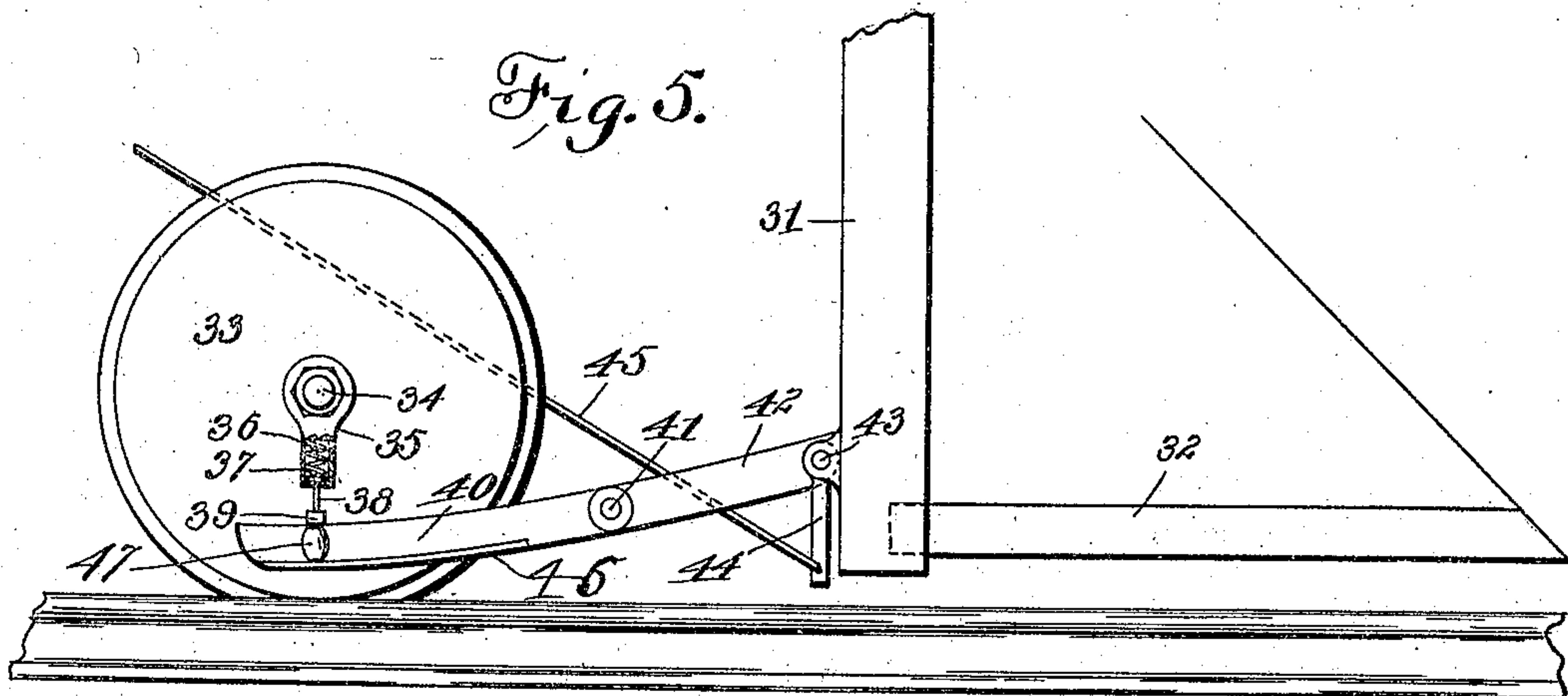
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2 SHEETS--SHEET 2.



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UNITED STATES PATENT OFFICE.

URBAN A. WOODBURY, OF BURLINGTON, VERMONT.

AUTOMATIC RAILWAY-SWITCH.

No. 815,888.

Specification of Letters Patent.

Patented March 20, 1906.

Application filed October 10, 1905. Serial No. 282,085.

To all whom it may concern:

Be it known that I, URBAN A. WOODBURY, a citizen of the United States, residing at Burlington, in the county of Chittenden and State of Vermont, have invented new and useful Improvements in Automatic Railway-Switches, of which the following is a specification.

My invention relates to automatic railway-switches of the same general class as the automatic switch described and claimed in my copending application filed June 21, 1905, Serial No. 266,348.

The general purpose of the present invention is the same as in the said prior application—viz., to provide a mechanism adapted to be set in operation by a train, whereby a switch, inadvertently left open, will be automatically closed before the train runs into it, thus providing a safeguard against one of the most common causes of railroad wrecks.

A further object of this invention is to construct the automatic mechanism so that it does not interfere in any way with the ordinary operation of switching and so that it can readily be rendered inoperative when it is desired to run the train onto the siding.

A further object of this invention is to construct the mechanism so that it will be automatically maintained inoperative when a train is running off the siding; and a still further object is the provision of an improved means on the locomotive to actuate the automatic switch-operating mechanism, said means being under the control of the engineer-driver, whereby it normally remains in operative position, but can be readily removed to an inoperative position, if desired.

Further objects and advantages of my invention will be apparent from the following detailed description, taken in connection with the accompanying two sheets of drawings, in which—

Figure 1 is a plan view of a switch provided with my improved automatic mechanism. Fig. 2 is a side elevation of the same, the rod running to the switch-stand being in section. Fig. 3 is a detail section on line *a a* of Fig. 1. Fig. 4 is a detail plan view of Fig. 1 with the parts in the position they occupy when the switch is closed. Fig. 5 is a side elevation, partly diagrammatic, of the improved means on the locomotive for actuating the automatic switch-closing mechanism; and Fig. 6 is an end view of the same, partly in cross-section.

In the views, 1 represents the main-line rails, and 3 the movable switch-rails, the same being attached to and moved by a switch-bar 2. This bar does not run to the switch-stand, as usual, but is connected to a switch-stand rod 6 by a sliding connection, herein illustrated by a slot 14 in the bar 2, through which a pin on the rod 6, provided with an enlarged head 7, projects. Normally the headed pin rests in the end of the slot 14 farthest from the rails, as shown in Figs. 1 and 3, and is retained there by the following mechanism: A bell-crank lever 24 is carried on the bar 2 with its pivot 25 adjacent the rail 1 and its longer arm engaging the head 7. The shorter arm of said bell-crank is pivoted at 26 to a lever 5, to be hereinafter described, which forms part of the actuating mechanism. The longer arm of the bell-crank and the head 7 have oblique engaging surfaces 27 and are normally kept in engagement by another bell-crank 10, carried by the bar 2 and held in position to do so by a spring 28, attached to the other arm of bell-crank 10 and to a projection 29 on rod 6.

The fulcrum of the lever 5, above referred to, is located on one arm of bell-crank 18, pivoted on a lug 19, attached to the rail 1 or to the ties, the pivot engaging a slot 21 in said lever 5 and being normally pressed up into one end of said slot, as shown in Fig. 1, by a spring 22. A rod 23 is connected to the other arm of the bell-crank 18, and the pin to which said rod 23 is connected engages also in a slot formed in the end of the bar 8, the function of which will be hereinafter explained.

The part which is engaged by the special means carried by the locomotive, to be hereinafter described, is a long bar or lever 4, pivoted at 13 to a lug 17, attached to the rail 1 and with its longer arm supported on a bracket 16, also attached to said rail, said arm gradually approaching the rail till at the point marked A it is only about one and one-half inches distant from the adjacent side of the rail-head. From that point to the pivot 13 it not only recedes from the rail, but descends below the level of the same, as shown in Fig. 2. The short arm of lever 4 terminates in a nose 30, which has a rocking engagement with the end of the lever 5.

The bar 8, hereinbefore referred to, has a pivotal connection at 15 with the lever 4, which coincides substantially with the point A of nearest approach of said lever to the adja-

cent rail 1 and then continues forwardly toward the switch at the same level as said point A, receding gradually from the rail, its forward end having a slotted engagement with the pin at the end of the longer arm of bell-crank 18, as mentioned above. The function of this bar 8 will hereinafter appear from the description of the operation of the apparatus.

The mechanism above described may be actuated by a special truck-wheel on the locomotive, such as is illustrated in my said prior application for patent, or like that shown in my prior patent, No. 758,401, dated April 26, 1904; but I have herein illustrated in Figs. 5 and 6 and will now describe a different form of mechanism which may be provided on the locomotive for the actuation of the automatic switch-closing mechanism. In said views 31 represents diagrammatically a portion of the frame of the locomotive, and 32 the cow-catcher or pilot, while 33 indicates a front truck-wheel. In the outer end of the axle of said wheel is secured a stud 34, on which is hung a member 35, the lower part of which is hollow and contains a spring 36, bearing on the head 37 of a rod 38, which terminates in a yoke 39, forming part of a bar 40, hinged at 41 to another bar 42, which is rigidly secured to a shaft 43, journaled in bearings carried by the member 31, above referred to. Normally projecting downwardly from said shaft 43 is an arm 44, to which is attached a rod 45, running to the engine-cab. The lower part of bar 40 is widened out or provided with a flange 46, so that it can ride on the lever 4, as will be explained. In the yoke 39 are journaled on vertical axes the rollers 47, one of which is adapted to bear against the lever 4 and the other to roll on the outer surface of the wheel 33 when in the position shown in said Figs. 5 and 6.

Having thus categorically described the essential elements of my improved switch-actuating mechanism, I will now explain the operation thereof under the various circumstances met with in actual practice. Assuming the switch to be open and a train to be approaching the same, the means above described or the special wheel rides against bar or lever 4, forcing the long arm thereof away from the rail, which of course causes said lever to swing upon its pivot and actuate lever 5, which in turn swings bell-crank 24 and disengages the surfaces 27 on the long arm of bell-crank and head 7, bell-crank 10 being also swung on its pivot, further compressing spring 28. As soon as bell-crank 24 is thus freed from head 7 bar 2 moves relatively to rod 6, the head 7 traveling to the other end of slot 14. Spring 28 assists lever 5 to move the bar 2 over to close the switch. The parts are then in the position shown in Fig. 4. This of course leaves the switch-stand rod 6 in the "open-switch" position,

and to reset the parts all that is necessary is to unlock the switch-stand, which may be of any of the usual types, and pull the rod 6 over to the "closed-switch" position. This movement brings the head 7 into the far end of the slot 14 again, and the bell-crank 24 snaps into position again to engage its surface 27 with the similar surface of the head 7, as shown in Fig. 1. Assuming now that a train provided with the special mechanism of Figs. 5 and 6 or with some equivalent actuating device is approaching the switch, and it is desired to run the train onto the siding, so that the automatic switch-closing mechanism is not desired to be operated, either the engine-driver may raise the rollers 47 out of the way by pulling on rod 45, or, if the special wheel is used in place of said roller mechanism, all that is necessary is for a brakeman to pull on the rod 23, which has the effect of swinging bell-crank 18 on its pivot 20, the pin at the end of the short arm thereof traveling in the slot 22 of the lever 5, compressing the spring 21. Now when the lever 4 is actuated by the locomotive its effect on lever 5 is not to swing it on its fulcrum as before, but simply to swing it still farther around on the pivot 26 as a fulcrum, bringing the pin on the short arm of bell-crank 18 farther into the slot 21 and still further compressing spring 22.

The function of the bar 8 is to do the same thing automatically as is accomplished manually by the rod 23—viz., to prevent the switch-closing mechanism from being operated by a train, but in this instance when the train is coming off the siding. If a cam-wheel is used, such as is shown in my said pending application, it strikes bar 8 and cams it outwardly, which swings bell-crank 18 in the same way that it is swung by pulling on rod 23, so that as the wheel approaches point A, although it moves lever 4 over, the latter does not swing lever 5 on its pivot, as it does when a train is coming in the other direction, but continues to swing said lever around pivot 26, the action being the same as when rod 23 is pulled. As soon as the cam-wheel has passed bar 8 and lever 4 spring 21 expands and throws bar 5 and crank 18 back into place.

If the mechanism illustrated in Figs. 5 and 6 is used, the bar 40 strikes lever 4, the spring 36 is compressed, and the rollers 47 are raised so that they cannot come in contact with the face of lever 4, but ride over its top, and consequently the switch is not closed. When the mechanism on the locomotive illustrated in Figs. 5 and 6 is used, it is of course unnecessary to provide the means whereby the automatic mechanism is rendered inoperative when struck, because the engine-driver can raise the shoe 40 out of the way, so that, in that case, bar 8, bell-crank 18, spring 22, and rod 23 can be dispensed with and lever 5 be pivoted directly on lug 19.

Obviously variations may be made in the form and dimensions of the parts described without departing from the spirit of my invention as set forth in the following claims.

I claim—

1. In a railway-switch, the combination with means adapted to be actuated by a train running toward the point of the switch to close the latter, of means adapted to be actuated by a train running through the switch off the siding to prevent the operation of the closing means.

2. In a railway-switch, the combination with a bar horizontally mounted adjacent to one of the main-line rails and adapted to be actuated by mechanism carried by a train, of a switch-rod, connections between said bar and rod, whereby actuation of said bar by train will normally close the switch, and means also operable by a train to render said connections inoperative to close the switch.

3. In a railway-switch, the combination with a bar horizontally mounted adjacent to one of the main-line rails and adapted to be actuated by mechanism carried by a train, of a switch-rod, a lever connected to said rod and adapted to be actuated by said bar to close the switch, and means to change the position of the fulcrum of said lever to render it inoperative to close the switch when actuated by said bar.

4. In a railway-switch, the combination with the switch-bar thereof, of a switch-stand rod, means on said bar to normally connect the same rigidly to said rod, means on the latter tending to move said bar relatively to said rod to close the switch, means adapted to be actuated by a train to break the connection between said bar and rod, and means adapted to be actuated by a train running off

the siding to prevent the operation of said train-actuated means.

5. In a railway-switch, the combination of a switch-bar and a switch-stand rod normally rigidly connected together, a lever adapted to be actuated by a train approaching the switch toward the point thereof, a second lever adapted to be actuated by said first lever, means connected with said second lever to break the connection between said bar and rod, and means connected with said second lever to prevent its breaking the said connection when a train is to run onto the siding or when a train is running off the siding onto the main line.

6. In a railway, the combination of a lever pivoted adjacent to the main line, a bell-crank lever also pivoted adjacent thereto, a second lever pivoted on one arm of said bell-crank lever and adapted to be actuated by said first-mentioned lever, a rod connected to the other arm of said bell-crank lever whereby the latter may be rendered inoperative by said first-mentioned lever, a switch-bar and a switch-stand rod, means connected to said second lever and carried by said bar to normally connect said bar and rod rigidly together, a spring to move said bar relatively to said rod to close the switch when said second lever breaks the connection between them, and means adapted to be actuated by a train running through the switch from the heel to prevent said second lever from breaking the connection between said bar and rod.

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

URBAN A. WOODBURY.

Witnesses:

O. C. HUGHES,
E. P. WOODBURY.