

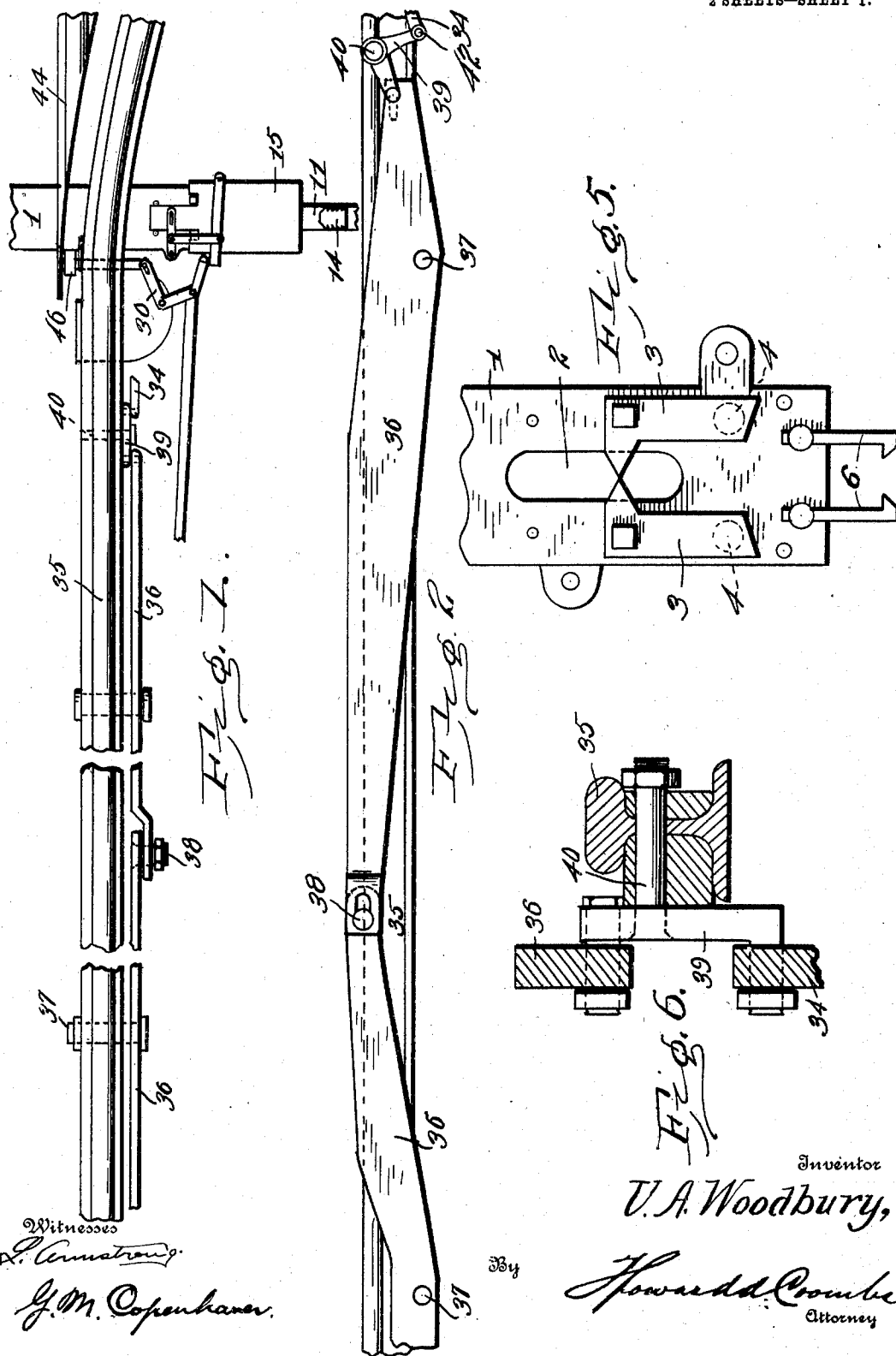
No. 788,572.

PATENTED MAY 2, 1905.

U. A. WOODBURY.
AUTOMATIC RAILWAY SWITCH.

APPLICATION FILED AUG. 2, 1904.

2 SHEETS—SHEET 1.



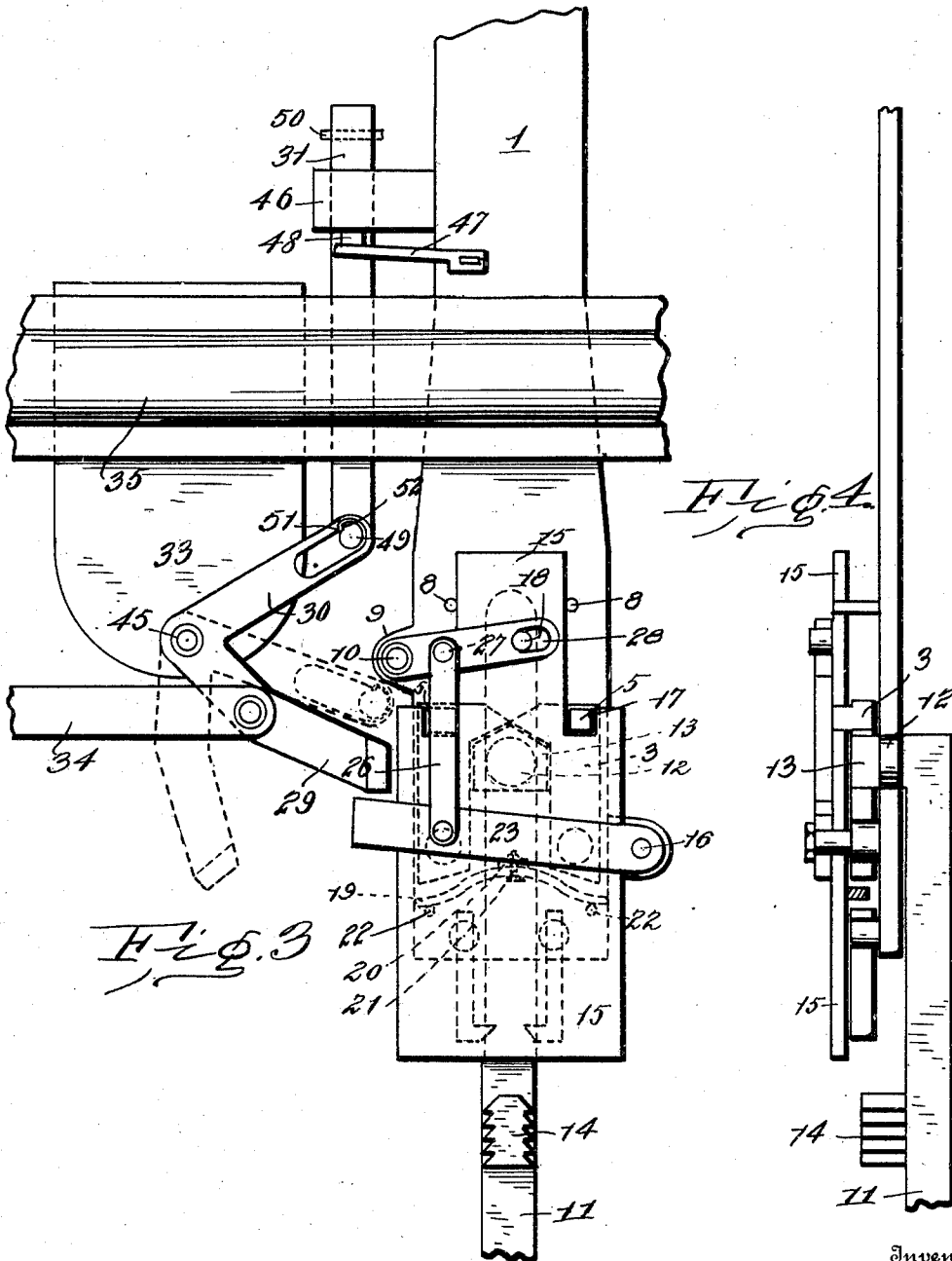
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UNITED STATES PATENT OFFICE.

URBAN A. WOODBURY, OF BURLINGTON, VERMONT.

AUTOMATIC RAILWAY-SWITCH.

SPECIFICATION forming part of Letters Patent No. 788,572, dated May 2, 1905.

Application filed August 2, 1904. Serial No. 219,206.

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 certain new and useful Improvements in Automatic Railway-Switches; and I do 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, reference being had to the accompanying drawings, and to the figures of reference marked thereon, which form a part of this specification.

My invention relates to that class of automatic railway-switches described in the Letters Patent of the United States granted to me April 26, 1904, under No. 758,401; and it consists more particularly in certain modifications of the mechanism therein shown and of the mode of operation of the same, all of which will be clearly understood from the detailed description to follow, taken in connection with the accompanying two sheets of drawings, in which—

Figure 1 is a plan view of a portion of a railway-switch equipped with my invention. Fig. 2 is a side elevation of a portion of Fig. 1.

Fig. 3 is a plan view, on a larger scale, of another portion of the mechanism shown in Fig. 1. Fig. 4 is a side elevation of the same. Fig. 5 is a plan view of one element; and Fig. 6 is a sectional view through the rail, showing the connection of certain parts.

It will be understood that the purpose of the mechanism shown in said views and hereinafter to be described in detail and claimed is, in general, the same as that of the mechanism described in my said patent—viz., to prevent accidents occurring on railways by reason of a switch having been misplaced or inadvertently left open—and that this result is obtained by the provision of means tending to close the switch and adapted to be released to close the switch by a train approaching the same.

Referring first more particularly to Fig. 1, 35 represents one of the rails of a railway-track near and at the location of a siding-switch, and 44 one of the switch-rails, the lat-

ter being attached to and carried by the switch-rod 1. The latter is normally rigidly connected to the rod 11, running to the switch-stand, (not shown,) by the following means: A pin 12, carried by the latter rod, passes through a slot 2 in the former and carries a head 13 of the shape shown in dotted lines in Fig. 3. The pin 12 is normally held against the end of said slot nearest the switch-stand by a pair of dogs 3 3, pivoted at 4 4 on switch-rod 1, which dogs have beveled faces engaging similar surfaces on the head 13. The dogs are in turn held in engaged position with said head by a sliding plate 15, having notches 17 engaging lugs 5 on the dogs, said plate being mounted over the dogs and guided to move longitudinally by pins 8 8 on the switch-rod. To a lug 20 on the lower side of said plate is attached by a bolt 21 a curved flat spring 19, which bears against pins 22, carried by the switch-rod 1. This spring presses the plate 15 toward the rails and keeps the notches 17 in engagement with the lugs 5 of the dogs 3. By this means the switch-rod and switch-stand rod are normally locked together.

The end of the switch-rod 1 carries a pair of spring-catches 6 6, and the adjacent portion of the switch-stand rod 11 is provided with a ratchet-block 14, with which said spring-catches can engage to hold the switch-rails in the closed-switch position. Obviously this holding means may take different forms, as found most suitable.

Pivoted at 16 on the rod 1 is a lever 23, connected by a link 26 to another lever, 27, pivoted at 10 to a lug 9 on the rod 1, the latter lever engaging by a slot 28 therein a pin 18 on the plate 15.

The mechanism for moving the plate 15 so as to unlock the dogs and allow the switch-rod 1 to be moved to close the switch consists in this form of my invention, as shown, of two levers 36 36, pivotally mounted at 37 37 to or adjacent to the rail 35 and connected together by a pin-and-slot connection 38 in the manner shown in Figs. 1 and 2. The member 36 which is farther from the switch is, as will be seen in said figures, shorter than the other member 36 nearer the switch. Both members have long and short arms, the for-

mer being the ones which are connected. The short arms of either or of both members may be constructed to act as counterweights for the purpose of helping to raise the connected arms to the position shown in Fig. 2, which is that in which they will be struck by the means provided for that purpose on the locomotive. To the short arm of the longer member 36, which, as stated, is nearer to the switch, is connected one arm of a bell-crank lever 39, which lever is pivoted to the rail at 40 and to the other arm of which is connected the rod 34, which extends to the switch-operating mechanism above described and is there connected to one arm 29 of a bell-crank lever 30, pivoted at 45 on a bracket 33, connected to the track, the arm 29 of said lever extending in proximity to the end of the lever 23 and being bent up, as shown, to contact therewith. The end of the other arm of said bell-crank lever is slotted, as shown, in which slot engages a pin 49 on the end of a bar 31, extending parallel to the switch-rod and passing through a lug 46 on said rod. A stiff flat spring 47, also carried by said rod, engages a lug 48 on said bar 31 and tends to keep the latter in the position shown in Figs. 1 and 3. A pin 50 prevents the bar 31 from becoming disengaged from the lug 46. The end of the slot in lever 30 and the pin 49 are provided with shoulders or offsets 51 and 52, respectively, for a purpose to be described.

Fig. 6 shows, partly in section, the lever 39 and its connections to lever 36 and rod 34 when the former is depressed.

The operation is as follows: The switch being open and a train approaching the same, but not with the intention of running into the switch, the means on the locomotive, which is preferably the vertically-adjustable wheel shown and described in my said patent, will strike the first lever 36, thereby depressing the same and the long arm of the other lever 36 and pulling the rod 34 through its connection with bell-crank lever 39. This causes the bell-crank 30 to swing on its pivot, and its arm 29 contacts with lever 23 and swings the same, thereby pulling on the link 26 and swinging the lever 27, which latter moves the plate 15 longitudinally against the pressure of the spring 19, removing the notches in said plate from engagement with the lugs 5 on the dogs 3. As soon as this movement has taken place the switch-rod 1 is moved over to close the switch by reason of the further movement of lever 30, 23, and 27 and of plate 15, which is connected to said rod through spring 19, the dogs 3 3 being separated by the wedge-shaped head 13, which of course remains stationary. By the swinging of the lever 30 the bar 31 is pulled over against the pressure of spring 47, and said spring being thereby put under tension acts to return said bar 31, as well as the bell-crank lever 30, rod 34, and levers 36, to their normal position

when the switch is opened again, as will appear farther on. The pin 49 normally remains in the end of the slot in lever 30; but if there is an excess of movement of the latter after the bar 31 is stopped it will be taken care of by the slot. The object of the offsets or shoulders 51 and 52 is to maintain the pin 49 in the end of the slot until the lever reaches the dotted-line position and to return said pin to the end of the slot as soon as the reverse movement of the lever 30 commences. It will be noticed that a relatively great angular movement of the lever 27 is obtained in relation to the angular movement of the lever 23 by reason of the link 26 being attached much nearer to the pivot of the former than to that of the latter. Also by pivoting the bell-crank lever 39 to the short arm of the longer trip member 36 a very powerful leverage on said lever is obtained. The spring 47 is made strong enough so that it will not yield in the ordinary process of switching, which can be carried on as usual by a switch-stand of the Ramapo or other well-known type. When the switch has been automatically closed in the manner described, it will be held in that position by the spring-catches 6 6 engaging the ratchet 14, and to reset the switch it is only necessary to disengage said catches and throw the switch-stand lever over, whereby pin 12 is brought back into the end of slot 2 in rod 1, and the dogs 3 3 are then reset by hand over the head 13 of said pin. Plate 15 then moves back so that its notches 17 re-engage the lugs 5 on the dogs.

It will be noticed that in the operation of ordinary switching in closing the switch the lug 46 on the rod 1 by its contact with lug 48 on bar 31 will cause the lever 30 to swing, the rod 34 to be moved toward the trip, and the members 36 36 to be depressed, so that they are automatically removed from operative position whenever the switch is closed.

Having now described my invention in the best form now known to me, but which I do not limit myself to, as various changes in detail and in proportions may be made without departing from the principle of my invention, what I claim is—

1. In an automatic railway-switch, the combination with the switch-rod, of a lever pivoted to the track adjacent said rod, mechanism adapted and arranged to be operated by a train and connected to said lever, means connected to said rod and arranged in the path of movement of said lever whereby said rod will be positively moved to close the switch by said train-operated mechanism.

2. In an automatic railway-switch, the combination with the switch-rod, of means to lock the same in one extreme position, a lever pivoted to the track adjacent said rod, mechanism adapted and arranged to be operated by a train and connected to said lever, means connected to said rod and to said locking means,

and arranged in the path of movement of said lever whereby said rod will be unlocked and then positively moved to close the switch by said train-operated mechanism.

5 3. In an automatic railway-switch, the combination with the switch-rod and the switch-stand rod, of locking devices normally connecting said rods rigidly together, a lever pivoted to the track adjacent said locking devices, means adapted and arranged to be operated by a train and connected to said lever, means connected to the said switch-rod and to said locking devices and arranged in the path of movement of said lever, whereby said switch-rod will be first unlocked from said switch-stand rod and then positively moved to close the switch by said train-operated mechanism.

4. In an automatic railway-switch, the combination with the switch-rod and the switch-stand rod, of locking devices to normally connect said rods rigidly together, a plate slidably mounted on said switch-rod and arranged to normally maintain said locking devices in operative position, a lever pivoted to the track adjacent said rods and locking devices, mechanism adapted and arranged to be operated by a train and connected to said lever, means connected to said plate and to said switch-rod and adapted and arranged to be actuated by said lever when the latter is moved by said train-operated mechanism whereby said plate is first moved to release said locking devices and then said switch-rod positively moved to close the switch.

5. In an automatic railway-switch, the combination with the switch-rod and the switch-stand rod, of locking devices to normally connect the same rigidly together, a plate slidably mounted on said switch-rod and adapted to engage said locking devices to maintain the same in operative position, a spring interposed between said plate and said switch-rod to normally maintain the former in engagement with said locking devices, a bell-crank lever pivoted to the track adjacent said switch-rod, mechanism adapted and arranged to be operated by a train and connected to said bell-crank lever, a lever pivoted to said switch-rod and connected to said plate and arranged to be engaged by said bell-crank lever when the latter is moved by said train-operated mechanism, whereby said plate is first moved against the pressure of said spring to release said locking devices and then the switch-rod is positively moved to close the switch.

6. In an automatic railway-switch, the combination with a slotted switch-rod, a switch-stand rod, of means to normally connect said rods rigidly together, comprising a pair of dogs on the switch-rod, a head on the switch-stand rod projecting through said slot in the switch-rod and arranged to be engaged by said dogs, and a yieldable plate to normally maintain said dogs in engagement with said head,

a lever adapted and arranged to be actuated by a train, and connections from said lever to first move said plate to release said dogs, and then move said switch-rod to close the switch.

7. In an automatic railway-switch, the combination with a slotted switch-rod, a switch-stand rod, of means to normally connect said rods rigidly together, comprising a pair of dogs on the switch-rod, a head on the switch-stand rod projecting through said slot in the switch-rod and arranged to be engaged by said dogs, and a yieldable plate to normally maintain said dogs in engagement with said head, a lever adapted and arranged to be actuated by a train, and connections from said lever to first move said plate to release said dogs, and then move said switch-rod to close the switch, and a catch device to hold said switch-rod in said last-mentioned position.

8. In an automatic railway-switch, the combination with a switch-rod and a switch-stand rod normally rigidly connected together, a device adapted and arranged to be actuated by a train and consisting of two pivoted members having their longer arms connected together by a pin-and-slot connection, a bell-crank lever having one of its arms connected to the short arm of one of said members, a rod connected to the other arm of said bell-crank lever, and a second bell-crank lever connected to said rod and arranged to first break the connection between said switch and switch-stand rods, and then move said switch-rod to close the switch.

9. In an automatic railway-switch, the combination with a switch-rod and a switch-stand rod normally rigidly connected together, a device adapted and arranged to be actuated by a train and consisting of two pivoted members having their longer arms connected together by a pin-and-slot connection, a bell-crank lever having one of its arms connected to the other arm of one of said levers, a rod connected to the other arm of said bell-crank lever, and a second bell-crank lever connected to said rod and arranged to first break the connection between said switch and switch-stand rods, and then move said switch-rod to close the switch, and a catch device to hold the said switch-rod in said last-mentioned position.

10. In an automatic railway-switch, the combination with a slotted switch-rod, of a switch-stand rod having a head projecting through said slot, a pair of dogs pivoted on said switch-rod and adapted to engage said head, lugs on said dogs, a plate slidably mounted over said dogs and having notches to engage said lugs to hold said dogs in engagement with said head, a spring between said plate and said switch-rod to keep said notches in engagement with said lugs, a system of levers to move said plate in opposition to said spring, a lever adapted and arranged to be actuated by a train to operate said first-mentioned le-

vers, whereby said dogs will be released and the switch-rod moved to close the switch.

11. In an automatic railway-switch, the combination of a switch-rod and a switch-stand
5 rod normally connected together, a pair of levers pivoted to the track and having their adjacent ends connected by a pin and slot, means to normally maintain the connected ends of
10 said levers elevated into position to be engaged by a train, a bell-crank lever pivoted adjacent said switch-rod, connections between said levers and said bell-crank lever and means
15 carried by said switch-rod and arranged to be engaged by said bell-crank lever, when said levers are depressed by a train, to first break the connection between said switch-rod and said switch-stand rod and then move the former to close the switch.

12. In an automatic railway-switch, the combination of a switch-rod and a switch-stand

rod normally connected together, a bell-crank lever pivoted to the track adjacent to said switch-rod, mechanism adapted and arranged to be operated by a train, connections therefrom to one arm of said bell-crank lever, a
25 bar guided on said switch-rod for parallel movement within limits relatively thereto and having a pin-and-slot connection with the other arm of said bell-crank lever whereby
30 when the switch-rod is manually moved said bell-crank lever and train-operated mechanism will also be moved into or out of operative position.

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

URBAN A. WOODBURY.

Witnesses:

J. E. TRAILL,

F. A. ROUSSEAU.