

J. W. HUBBARD.
RAILWAY SWITCH.
APPLICATION FILED NOV. 14, 1911.

1,057,345.

Patented Mar. 25, 1913.

3 SHEETS—SHEET 1.

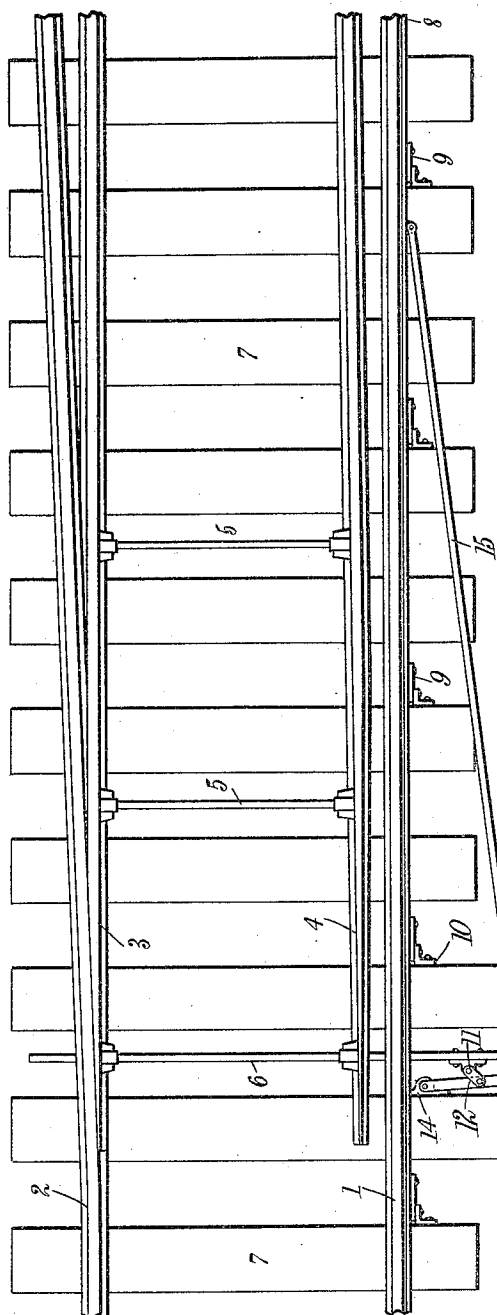
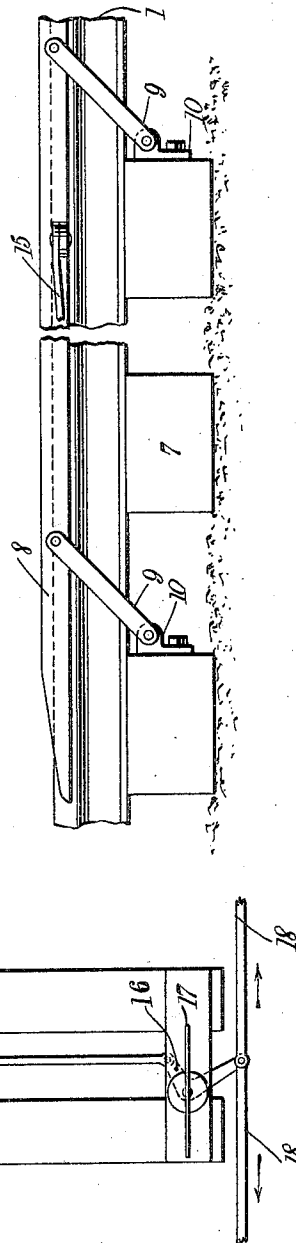


Fig. 2,

Fig. 1,



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3 SHEETS-SHEET 2.

Fig. 3,

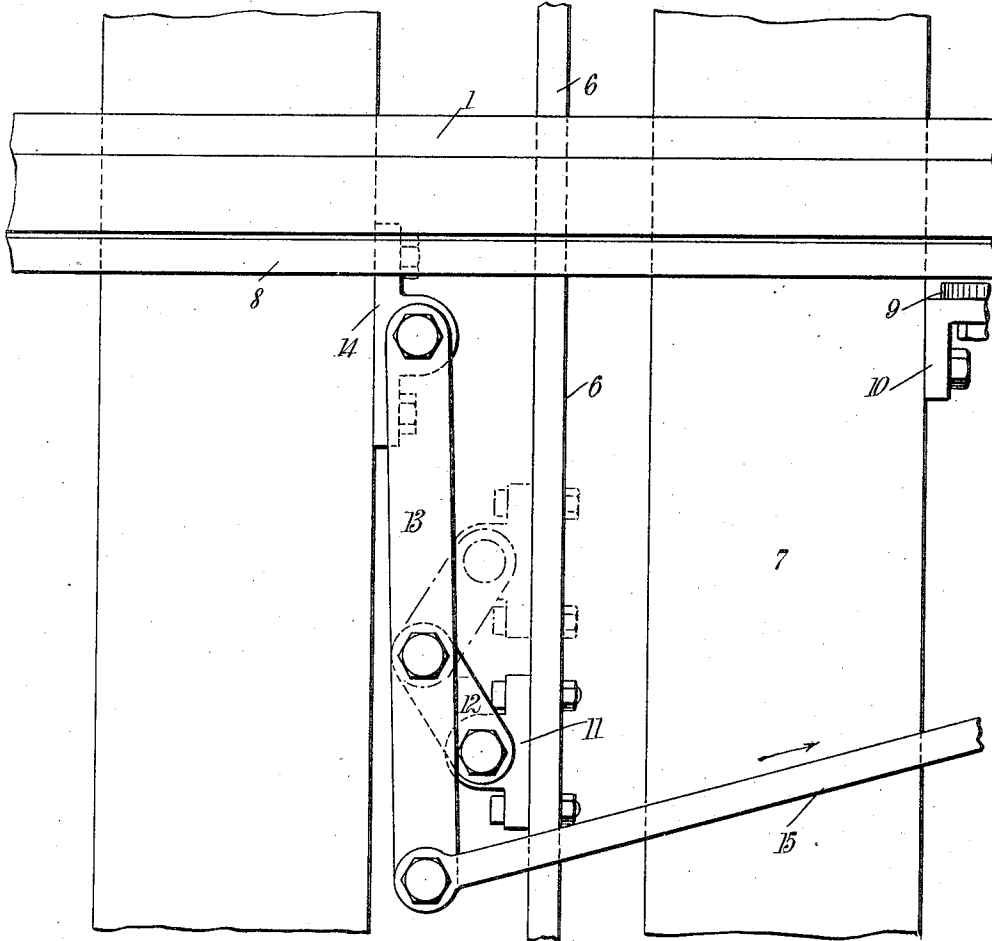
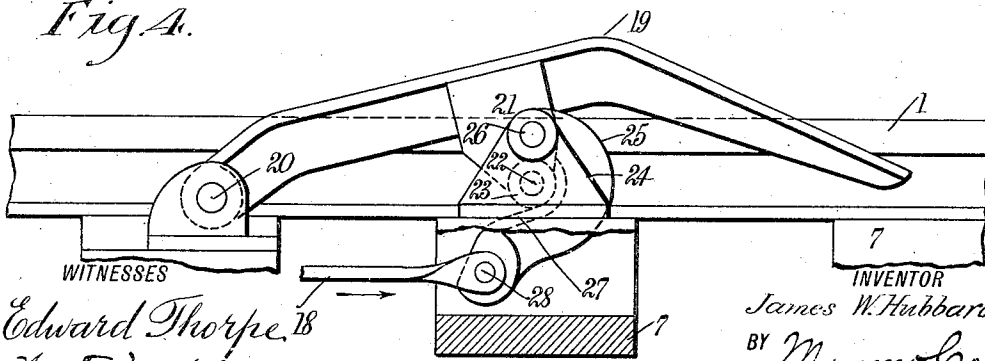


Fig. 4.



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JAMES WARREN HUBBARD, OF EAU CLAIRE, WISCONSIN.

RAILWAY-SWITCH.

1,057,345.

Specification of Letters Patent.

Patented Mar. 25, 1913.

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To all whom it may concern:

Be it known that I, JAMES W. HUBBARD, a citizen of the United States, and a resident of Eau Claire, in the county of Eau Claire and State of Wisconsin, have invented a new and Improved Railway-Switch, of which the following is a full, clear, and exact description.

My invention relates to improvements in railway switches, and it comprises novel means for operating the switch and locking the switch points in their open or closed position.

It is an object of my invention to produce a construction of this sort which will prevent derailing and other accidents to trains that are passing the switch, and for this purpose I provide means which are located in position to be engaged by the wheels of a train approaching the switch, to force the switch points over against the main rail. In this way, in case the switch points are not fully thrown, either to keep the main track closed or to open the way to the siding, the means operated by the wheels of the train, or rather the engine at the head of the train, will move the switch point over as far as is necessary, and all liability of mishap is obviated.

Another object of my invention is to provide a construction in which the locking means will operate with equal certainty and facility whether the switch be thrown by hand or whether it be actuated automatically just before the train approaches; or if it is not actuated at all but merely kept in one position as the train passes.

Reference is to be had to the accompanying drawings forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the views, and in which—

Figure 1 is a top plan of my improved switch; Fig. 2 is a side elevation of the means for operating the locking device; Fig. 3 is a top plan showing the members constituting the locking means, enlarged; Fig. 4 is a side elevational view of the operating means located outside the rail at either end of the switch, to be engaged by mechanism carried by the engine, to throw the switch; and Figs. 5 and 6 are top plans of modifications of the switch-locking means.

On the drawings, the numerals 1 and 2 indicate the main rails, and 3 and 4 are the switch points which are operated to allow

the train to pass over upon the siding. These switch points are connected by means of bars 5, to cause them to be operated in unison, and they are moved to one position or the other by means of a draw-bar 6.

The numeral 7 represents the ties on which the rails are supported in the usual way.

8 represents a locking bar arranged longitudinally of one of the main rails, for example, the rail 1. This locking bar is normally supported in such a position that its upper edge will be slightly higher than the top of the rail, and it is supported by a number of links 9, pivotally connected to the bar and to supports 10 mounted beside the track, preferably upon the ties 7. The pivotal connection of these links 9 to the bar 8 and to the supports 10 allows the bar to be moved when it is engaged by the wheels of a train, to be depressed, and thus lock the switch points in open or closed relation by means of connections which operate in a manner described later.

The numeral 11 represents a plate secured to the side of the draw-bar 6, this plate having a perforated ear projecting from the outer side thereof, to give pivotal connection to a link 12. This link 12 is pivotally connected at its opposite end to a longer link 13, this link being pivotally mounted on a plate 14 secured to the side of one of the ties 7 adjacent the outer edge of the rail 1, and normally lying in position substantially parallel to the tie and the draw-bar 6. The outer end of this link 13 is connected by means of an arm 15 to the locking bar 8, so that when the locking bar 8 is pressed down by the wheels of the engine or train, both the links 15 and 13 will be moved in the direction of the arrow on Fig. 3.

The draw-bar 6 is connected at one end to a bell-crank lever 16, on which is mounted a signal 17, and 18 is an operating arm connected to the other arm of the bell-crank-lever, to throw the switch to open or closed position. This operating arm 18 is actuated by means of a lever 19, having a sloping upper surface, and pivotally connected at 20 to a support mounted beside the rail 1, preferably upon one of the ties 7. This lever 19 has a projection 21, midway of its length extending downward, and carrying on its lower end a journal 22 for a roller 23; and 24 is a support carried by one of the ties 7 beneath the projection 21, and having a journal 26 at its upper end, to which is piv-

otally connected a curved link 25. This curved link 25 has an inclined surface 27, upon which the roller 23 moves, and at the lower end of the link 25 is a pin 28, which
 5 passes through an aperture in the arm 18, and pivotally connects the arm 18 and link 25 together.

I wish to have it understood that I may employ two levers 19 adjacent the rail 1, one to either side of the point where the switch points 3 and 4 are located. This lever 19 is designed to be engaged by means
 10 of a movable plunger or similar device carried by the locomotive, and when this plunger is moved to its outermost position, it will engage the top of the lever 19 to force it down. It will be noted that the top surface of the lever 19 is inclined both upward
 15 and downward, and this makes it possible for this lever to be depressed to move the arm 18, no matter in which direction the engine may be passing.

Referring to Fig. 1, if there be a train approaching the switch from the left, the lever 19 can be actuated to open the switch,
 25 if closed, and a train approaching from the right can operate the lever 19 to the right of the switch points, to close the switch points if they are open.

Figs. 5 and 6 show modifications of the locking means. Fig. 5 has a draw-bar 6 and link 12, the same as shown by the other views, but a bell crank lever 13' is employed,
 30 which has one end connected to the draw-bar 6, and its other end connected by links 15^a and 15^b to the locking bar 8. In Fig. 6, the draw-bar 6 has a triangular projection 6' on the left side thereof, and the link 15 has a roller 30 on its outer end,
 35 which moves along the side of the projection 6', this lever passing through a fixed guide 29.

The method in which my improved locking means operates will now be described:

45 Suppose a train coming from the right (referring to Fig. 1) be about to pass the switch, if the switch points are open, the engineer will cause the lever 19 to be operated to close them. This will move the
 50 draw-bar 6 from the position shown in Fig. 3 to the position shown in Fig. 1, the link 12 being rotated from the full-line position to the dotted-line position in Fig. 3, and as soon as the wheels of the engine pass
 55 upon the bar 8, this locking bar will be forced down, and when being forced down, it will move to a certain extent to the right, owing to the manner of mounting the links 9. This action will exert a strong pull on
 60 the link 15, which will rotate the link 13 to a certain extent around the plate 14 as an axis. As a result, a thrust will be exerted on the bar 6, through the link 12, to force the switch point 3 tightly over against
 65 the main rail 2, and the bar 8 extending

from the point at which the switch is located a considerable distance in either direction, the wheels of the train will hold the locking bar 8 down and firmly hold the operating bar 6 in such position that the switch
 70 point 3 will be locked against the main rail 2, and it will be impossible to move the switch point 3, either by hand or by automatic mechanism, until the train has passed the switch and the weight thereof is no
 75 longer on the locking bar 8.

If a train coming from the right, referring to Fig. 1, should find the switch points closed, the wheels thereof the moment they pass upon the locking bar 8, would actuate
 80 the links 15, 13 and 12, to hold the locking bar in its extreme closed position, it will be understood. If a train should be approaching the switch from the left, and the switch points be closed, the weight of the train
 85 in this case will be exerted upon the bar 8, to hold the switch in closed position until the train has passed the switch, if it be desired to travel over the main line. If it be desired to open the switch, the engineer
 90 causes the lever 19 to be actuated to pull the bar 18, to pull the switch, and this will move the bar 6 in such a way as to force the switch point 4 against the rail 1 and move the switch point 3 away from the rail
 95 2. When the switch is open, the link 12 will occupy the position shown in full lines in Fig. 3, and as soon as the weight of the train is thrown upon the bar 8, the bar 8 will move to a slight extent to the right,
 100 as before, pulling upon the bar 15, to swing the link 13 and thus exert a thrust through the link 12 upon the arm 6, in such a direction as to force the switch point 4 over as far as it will go, to open the way to the
 105 siding. I may, if desired, arrange a locking bar similar to the bar 8, along the outside of the rail 2, extending both ways past the switch, and this bar may be connected to the end of the operating bar 6, adjacent
 110 the rail 2, by an arrangement of links such as those shown at 12, 13 and 15, adjacent the rail 1. Furthermore, the end of the bar 6 adjacent the rail 2 may have a bell-crank lever to connect the same to an operating
 115 lever 19. These last-named parts will enable the switch to be opened by an engine passing from the siding upon the main track, and held in such open position by means of the locking bar adjacent the rail
 120 2, in the same way as described above.

Referring to the construction shown in Fig. 5, the operation will be exactly similar as above. In the modification shown in Fig.
 125 6, however, whenever the draw-bar 6 is moved, it causes the link 15 to move to the left, raising the locking bar 8 to a slight extent. When the wheels of the train press down the bar 8, the roller 30 will be thrown
 130 against the bar 6 at the base of the projec-

tion 6'. In the position of the parts shown in Fig. 6, the switch will be locked in open position, and if the switch be closed, the roller 30 will engage the projection 6' at the base thereof, on the opposite side, and when the train wheels engage the bar 8, they will move the same to pull the link 15 and the roller 30 against the bar 6 and lock the switch in open position. The bar 6 cannot be moved in either direction past the roller 30 until the weight of the train is no longer exerted on the bar 8, for, as long as the bar 8 is held down, the link 15 and the roller 30 will of necessity remain in their extreme right-hand position. It will be understood that the cam action of the roller 30 on the sides of the projection 6' will move the bar 6 enough to effect the locking in the manner required.

From the above description, it will be clear that my improved locking means will force the switch points against the main rails when the switch is either open or closed, and it makes no difference whether the switch be operated by hand or by automatic mechanism. Furthermore, as long as the weight of the train is exerted upon the locking bar 8, which will be as long as the train is passing over the switch, it will be impossible to throw the switch to open position; hence, the chance of derailment and other accidents to the trains, such as the wheels of the different trucks passing some on one track and some on the other, will be avoided.

It will be apparent from the above description that the means for causing the bar 6 to be operated to lock one of the switch points against one of the rails when the switch is in either open or closed position, are operated independently of the means by which the switch is thrown. The means for locking the switch in open or closed position, comprising the locking bar 8, is actuated by the wheels of the train, but the bar 6 may be moved to open or close the switch by connecting it to be operated from a system of hand levers, or by connecting it by means of links to the levers 19, actuated by a projection from a passing train. In other words, my essential inventive idea is comprised in the locking means above mentioned, irrespective of the particular kind of mechanical connections which are used to operate the bar 6 in the first instance to move the switch points 3 and 4 to the required position.

As stated above, the locking means will operate in the same way, regardless of how the switch points may be moved. In practice, I prefer to connect the bar 6 to lever such as shown at 19 on Fig. 4, so that these levers will be actuated to pull open the switch only, and in this case I may connect strong springs to the bar 6 to move the

switch point back to the position shown in Fig. 1. This is for the purpose of keeping the switch closed to the main line.

I wish to have it understood that I reserve to myself the right to make whatever changes in the shape, size and arrangement of the parts fall within the scope and spirit of my invention.

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

1. In a railway switch, the combination of a pair of main rails and a pair of switch points, a draw-bar for moving one of said switch-points against one of said main rails when the switch is opened or closed, a link pivotally mounted at one end adjacent one of the main rails, a second link pivotally connected to the first link intermediate its ends and to the draw-bar intermediate its ends, and means movably mounted beside one of the main rails and extending longitudinally thereof, and having a link connecting the same to the outer end of the first-named link, said means being in position to be engaged by the wheels of a train, to exert a force on the last-named link, to cause the draw-bar to force the switch point tightly against the rail and lock the switch point against the rail, whether the switch be in open or closed position.

2. In a railway switch, the combination of a pair of main rails and a pair of switch points, a draw-bar for moving one of said switch points against one of said main rails when the switch is to be opened or closed, a link pivotally mounted at one end adjacent one of said main rails, and a second link pivotally connected to the first link intermediate its ends and to the draw-bar intermediate its ends, a locking bar extending longitudinally of one of said main rails and normally held in position to have its upper edge higher than the top of the rail, a link connecting said locking bar to the outer end of the first-named link, the draw-bar being reciprocable and serving to rotate the second-named link around its point of pivotal connection with the first-named link as an axis, when moved to open or close the switch, whereby, when the locking bar is engaged and forced downward by the wheels of a passing train, said locking bar will exert a force on the first-named link, and will thus exert a thrust on the draw-bar through the second-named link, whether the switch be open or closed, to lock the switch against movement while the train is passing.

3. In a railway switch, the combination of a pair of main rails and a pair of switch points, a draw bar for operating said switch points, a lever pivotally mounted beside one of said main rails in position to be engaged by a projection on a passing vehicle, said le-

ver having oppositely sloping surfaces on its upper side and carrying a roller beneath the same, a link having a sloping surface pivotally mounted beneath said lever in position to be engaged by said roller, and means connecting said link to said draw-bar, whereby, when the lever is depressed, the link will be operated to move the draw-bar, to throw the switch.

4. In a railway switch, the combination of a pair of main rails and a pair of switch points, a draw bar for moving one of said switch points against one of said main rails when the switch point is opened or closed, a link pivotally mounted at one end adjacent one of said main rails, a second link connected to the first link and to the draw bar, and means movably mounted beside one of the main rails and extending longitudinally thereof and having a link connecting the same to the outer end of the first-named link, said means being in position to be engaged by the wheels of a train to exert a force on the last-named link to cause the draw bar to force the switch point tightly against the rail and lock the switch point against the rail, whether the switch be in open or closed position.

5. In a railway switch, the combination of a pair of main rails and a pair of switch points, a draw bar for moving one of said switch points adjacent one of said main rails when the switch is opened or closed, a link pivotally mounted at one end adjacent one of said main rails, a second link pivotally connected to the first link and to the draw bar, a locking bar extending longitudinally of one of said main rails and normally held in position to have its upper edge higher than the top of the rail, and a link connecting said locking bar to the outer end of the first-named link, the draw bar being reciprocable and serving to rotate the second-named link around its point of pivotal connection with the first-named link as an axis when moved to open or close the switch, whereby when the locking bar is engaged and forced down by the wheels of a passing train, said locking bar will exert a force on the first-named link

and thus exert a thrust on the draw bar through the second-named link, whether the switch be opened or closed, to lock the switch against movement while the train is passing.

6. In a railway switch, the combination of a pair of rails and a pair of switch points, a draw bar for moving one of said switch points against one of said rails when the switch is opened or closed, a lever pivotally mounted beside one of the main rails in position to be engaged by a projection on a passing vehicle, said lever having oppositely-sloping surfaces on its upper side, means for transmitting motion from the lever to the draw bar to operate the switch, a link pivotally mounted at one end adjacent one of the main rails, a second link pivotally connected to the first link and to the draw bar, and means movably mounted beside one of the main rails and extending longitudinally thereof and having a link connecting the same to the outer end of the first-named link, said means being in position to be engaged by the wheels of a train to exert a force on the last-named link to cause the draw bar to force the switch point tightly against the rail, whether the switch be in open or closed position.

7. In a railway switch, the combination of a main rail and a switch rail, a draw bar for moving the switch rail, a link pivotally mounted at one end adjacent the draw bar, a second link connected to the first link and to the draw bar, and locking means movably mounted beside one of the main rails and extending longitudinally thereof and having a link connecting the same to the first-named link, said locking means being in position to be engaged by the wheels of a train to exert a force on the last-named link and cause the draw bar to hold the switch rail securely in either open or closed position.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JAMES WARREN HUBBARD.

Witnesses:

B. HOGAN,

H. M. GOUGH.