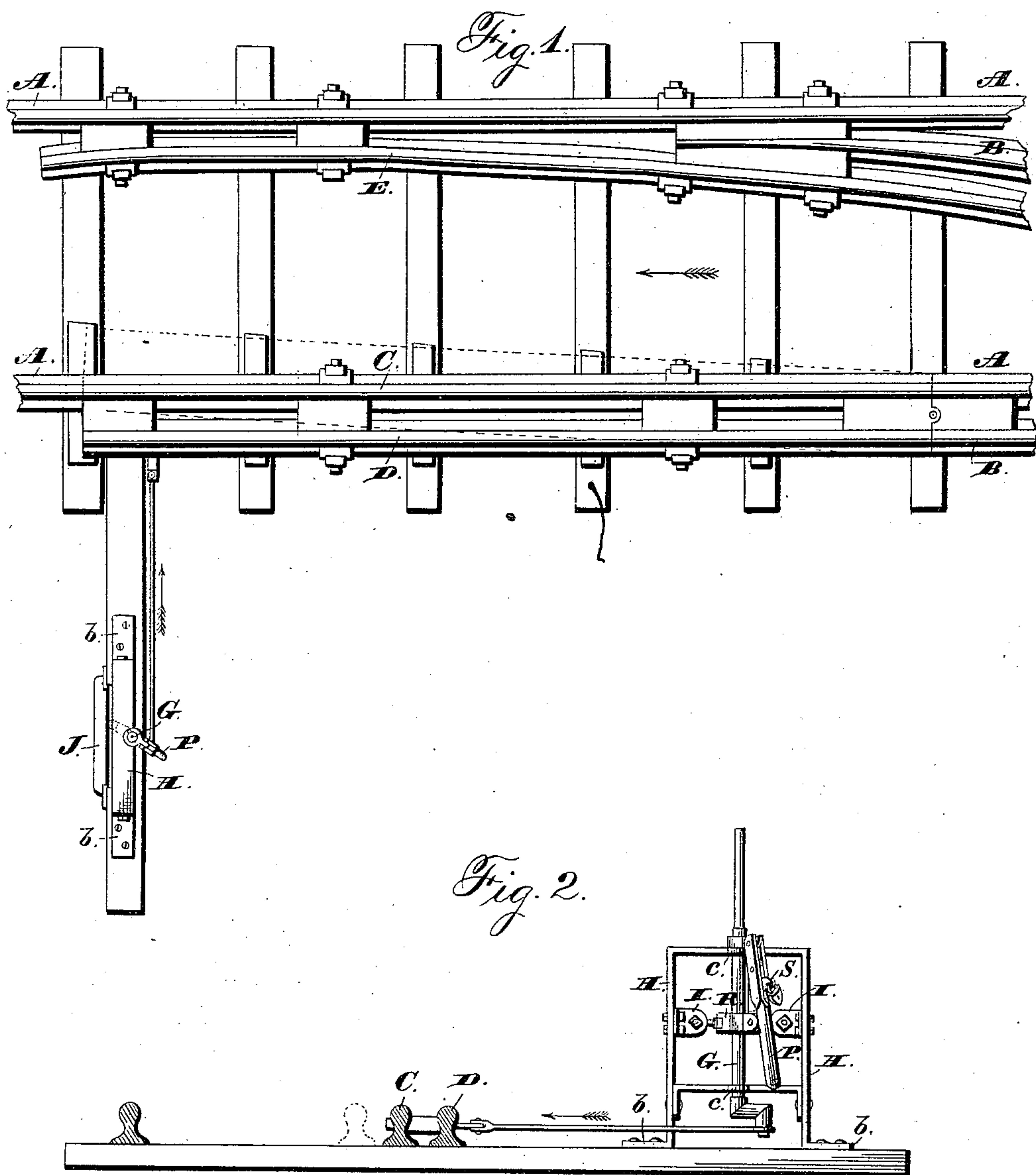


2 Sheets—Sheet 1.

No. 447,186.

Patented Feb. 24, 1891.



WITNESSES

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(No Model.)

2 Sheets—Sheet 2.

H. N. HOPKINS & E. H. BRYANT.
SAFETY SWITCH.

No. 447,186.

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Fig. 3.

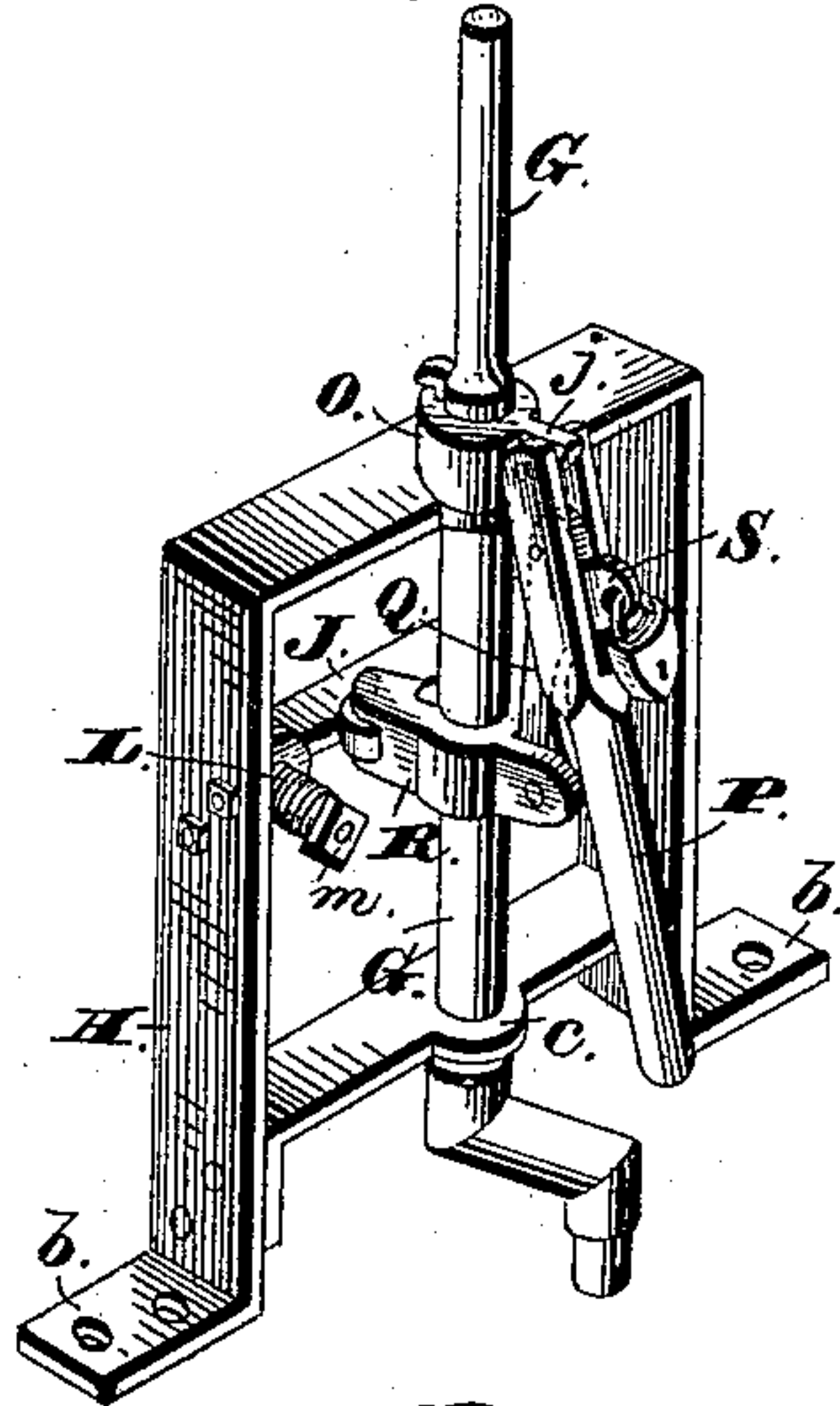


Fig. 4.

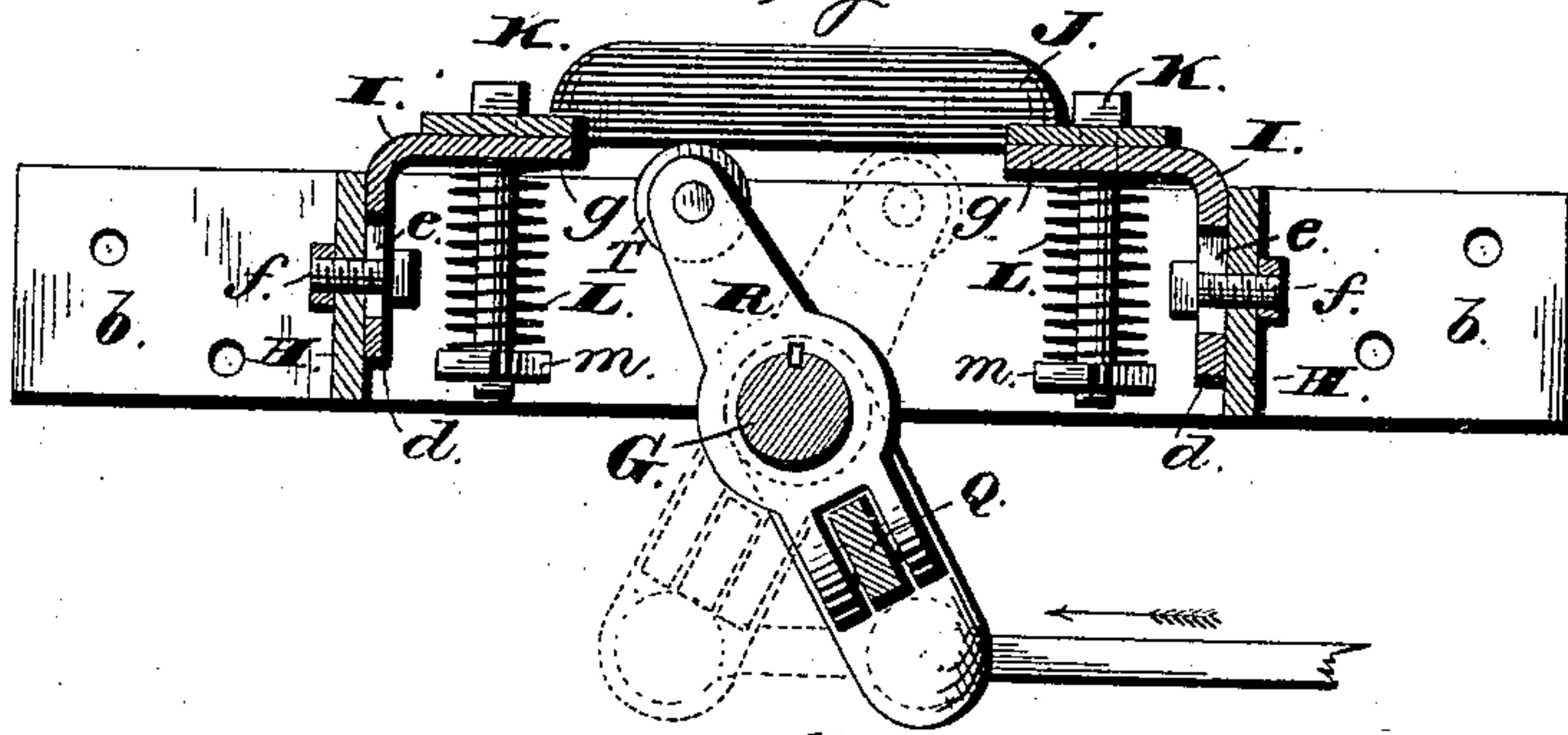
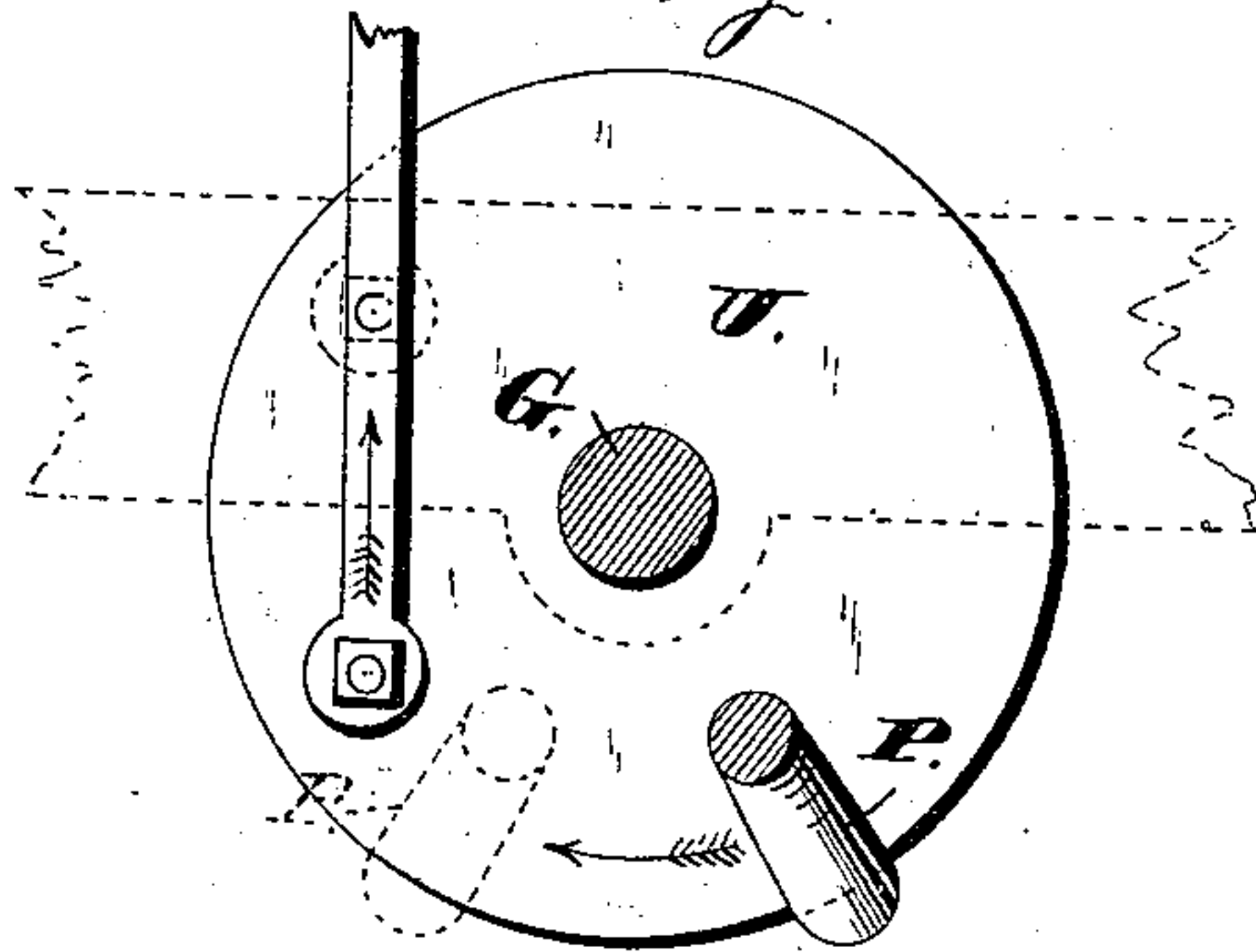


Fig. 5.



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UNITED STATES PATENT OFFICE.

HENRY N. HOPKINS, OF TAUNTON, AND EMERY H. BRYANT, OF NEW BEDFORD, MASSACHUSETTS.

SAFETY-SWITCH.

SPECIFICATION forming part of Letters Patent No. 447,186, dated February 24, 1891.

Application filed April 3, 1883. Serial No. 90,517. (No model.)

To all whom it may concern:

Be it known that we, HENRY N. HOPKINS, of Taunton, and EMERY H. BRYANT, of New Bedford, respectively, in the county of Bristol and State of Massachusetts, have invented certain new and useful Improvements in Safety-Switches; and we 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.

Our invention relates to an improvement in safety-switches, the object of the same being to provide a switch-stand which shall be simple and efficient in its construction, and adapted to be operated so as to shift the switch either manually or automatically by a passing train.

The invention consists in certain features of construction and combinations of parts, as will be hereinafter described, and pointed out in the claims.

In the accompanying drawings, Figure 1 is a plan view of our improvement applied to a switch. Fig. 2 is a side view of the same. Fig. 3 is a perspective view of the switch-stand, with its connected parts. Fig. 4 is a transverse section of the switch, taken through the yielding plate; and Fig. 5 is a modification.

A represents the rails of the main track; B, the rails of the side track; and C D, the movable switch-rails, and E a guard-rail, the rail C forming a continuation of the main track and the rail D a continuation of the side track, both, however, being secured together side by side and operated and moved simultaneously by one switch-rod. This switch-rod is secured at one end to the rails C D, while the opposite end thereof is connected to the cranked end of the vertical spindle G, which latter is supported in the stand H. This stand H is preferably made of cast metal, in one or more pieces, and is provided at its lower ends with the flanges b, by means of which it is secured to a suitable base and held in position against displacement. This stand is provided centrally with the bearings c, in which the vertical spindle G is journaled, and on opposite sides with the

adjustable metallic plates I, which latter support and hold the yielding cross-bar J.

The arms d of the plates I are each provided with two or more oblong slots e, running in the direction of the length of said arms, through which the bolts f pass. These bolts pass through the said openings and through openings in the stand, and are held in place by nuts. By means of the oblong slots the arms g of the metallic plates (and consequently the yielding cross-bar which is secured thereto) can be adjusted outward or inward relative to the vertical spindle, as circumstances demand.

The object of providing means for adjusting either end of the yielding cross-bar is the following: In the event the switch-stand should not be accurately spiked to the ties it would fail to throw the switch-rail accurately and so that it would be moved into perfect alignment with the rail of the main track. To obviate pulling out the spikes, filling the spike-holes in the ties, and respiking the switch-stand, we provide the means above set forth for adjusting the ends of the yielding cross-bar J so that the latter may be adjusted to throw the switch-rail accurately, although the stand may not have been properly spiked down in the first instance.

The arms g of the metallic plates I point inwardly toward each other, and form rests or seats for the opposite ends of the yielding cross-bar J. Each arm g is provided with an opening for the passage of the bolts K, the heads of which bear against the outer faces of the opposite ends of the yielding cross-bar. These bolts pass through the cross-bar and through the arms g, and each is encircled by a spiral spring L, which latter are kept in place and their tension controlled by the nuts m.

The spindle G is provided with the collar O, which latter is secured thereto, and in the present instance forms a support therefor by resting or bearing on the top plate of the switch-stand. This collar is provided with a laterally-projecting stud j, to which the bifurcated or slotted end of the operating-handle P is pivotally secured. This handle is also pivotally connected through the intervention

of the link Q to the movable locking-bar R, which latter is prevented from rotating on the spindle by an ordinary feather and groove, but is free to be moved vertically by the handle

5 P. The link Q is provided with an outwardly-extending hasp S, which latter when the handle is in a depressed position projects upwardly through the bifurcated end thereof. A lock secured on this hasp holds the handle
10 in a depressed position and prevents unauthorized persons from tampering therewith. When the handle P is depressed, the locking-bar rests and abuts against the yielding cross-bar J, which prevents the said bar and its
15 spindle from turning until the locking-bar has been elevated above the yielding cross-bar or sufficient power exerted on the cranked end of the spindle to overcome the tension of the springs which hold the cross-bar in posi-
20 tion. The outer end of the locking-bar is provided with a roller T, which latter is adapted to bear against the yielding cross-bar and decrease the friction between the parts.

The switch-stand constructed as above de-
25 scribed is adapted to rest at right angles to the trackway, as shown in Fig. 1, and can be operated by a switch-tender or other authorized person by first unlocking the handle, which allows the locking-bar to be elevated
30 above the yielding cross-bar and the crank to be turned from one extreme to the other, or can be operated automatically by a passing train.

To illustrate the automatic operation of the
35 switch, I will suppose for the sake of convenience that the rails are in position shown in Fig. 1 and a train is approaching the main track from the turnout. As soon as the wheels of the locomotive pass the end of the guard-
40 rail E, the flanges of the wheels on the opposite side of the engine strike or bear against the movable rail C and force it, together with the rail D, over to the position shown in dotted lines. The movement of the rails C and
45 D act on the spindle through the intervention of the switch-bar and turn the spindle from one extreme to the other, the pressure of the wheels against the rail C being sufficient to overcome the tension of the springs which
50 hold the yielding cross-bar in place. If the rails C and D should remain in the last position mentioned, a train on the main track running in the direction of the arrow would force the rails back to the position shown by
55 the solid lines and pass the switch safely. The switch-rails, when moved in either direction by a passing train, are moved positively and a distance which will insure the perfect safety of any succeeding train passing over
60 the switch, owing to the fact that the springs L L complete the throw of the switch-rails in either direction, and hence by our improvement we obtain any desired range of movement of the switch-rails, and further provide
65 for their being positively shifted and locked at the limit of their movement in either direction. After the automatic operation of the

switch the parts are still retained in their locked positions, and consequently bar all out-
side interference.

Sometimes it is necessary when two or more tracks run side by side to set the switch-stand parallel with the rails instead of at right angles thereto. To do this it is simply necessary to change the relative position of the
75 crank and locking-bar. In the present instance the crank and locking-bar rest in the same vertical plane; but by bending the crank so that it will be at an angle of about forty-five degrees from the locking-bar and move
80 in the arc of a circle under the stand instead of outside of it, the necessary throw can be given to the switch-bar; or, if necessary, a construction similar to that shown in Fig. 5
85 can be employed. In this last-mentioned construction a disk U is employed instead of the crank. The switch-bar is pivotally secured to the disk to one side of the handle and moves under the switch-stand instead of out-
90 side of it, as in the first-mentioned form.

From the foregoing it will be seen that when the locking-bar has been raised above the yielding cross-bar and the rails of the switch started the locking-bar cannot be depressed until the switch-rails are thrown so that one
95 of them will register with the adjacent rail of the main track. Then by simply releasing the handle it will instantly drop by its own weight, carrying with it the locking-bar, and thereby securing the rails for immediate use
100 without the necessity of locking the parts down. As a passing train has no tendency to move the handle upward, considerable time and trouble of putting lock, key, or pin in position is saved, especially when the device is
105 employed in yards where a great deal of switching is necessarily done.

This improvement is exceedingly simple in construction, is durable in use, can be manu-
110 factured at a small initial cost, and is thorough and effective in operation.

It is evident that slight changes in the construction and relative arrangement of the several parts might be resorted to without departing from the spirit of our invention, and
115 hence we would have it understood that we do not limit ourselves to the exact construction shown and described, but consider ourselves at liberty to make such slight changes and alterations as fairly fall within the spirit
120 and scope of our invention.

Having fully described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. The combination, with the switch-stand, 125 the switch-operating rod, and target-shaft, of an engaging device carried by the shaft, a yielding engaging device connected with the stand, and a lever and connections to relieve the target-shaft from the strain of the yield-
130 ing engaging device.

2. The combination, with a switch-rod and a switch-stand provided with a yielding cross-bar, of a vertically-movable locking-bar adapt-

ed to rest in the same horizontal plane with the yielding cross-bar when the parts are in a locked position, and means for elevating the said locking-bar above the yielding cross-bar, substantially as and for the purposes set forth.

3. The combination, with a switch-rod and a switch-stand provided with a yielding cross-bar, of a vertical spindle journaled in the frame, a movable locking-bar keyed to the spindle, a handle for elevating the locking-bar, and means for locking the handle in a depressed position, all of the above parts combined as described.

4. The combination, with a switch-rod and a switch-stand provided with a yielding cross-bar adjustably secured thereto, of a vertical spindle journaled therein, a movable locking-bar keyed to the spindle and provided with a roller adapted to bear against the cross-bar, and a handle for elevating the locking-bar above the yielding cross-bar, substantially as and for the purpose set forth.

5. The combination, with a switch-bar and a switch-stand provided with a cross-bar, springs for holding the cross-bar in place, and nuts for regulating the tension of said springs, of a spindle mounted in the stand, a collar secured to the spindle, a locking-bar made vertically adjustable on the spindle, a handle pivoted to said collar, a link connecting the handle and locking-bar and provided with a hasp, and a lock for holding the handle on the link, said handle being adapted to the hasp, substantially as set forth.

6. The combination, with a switch-stand, its operating-rod, and target-shaft, of a yielding locking-plate, an engaging device carried by the shaft and vertically movable to engage and disengage said locking-plate, and means for operating the said engaging device with reference to the locking-plate, substantially as set forth.

7. The combination, with a switch-stand, a switch-operating rod, and target-shaft, of an engaging device carried by the shaft, a spring-actuated engaging device upon the stand and aiding to complete the movement of the switch, and means to engage and disengage said devices.

8. The combination, with a moving rod connected with the switch-rails, of a spindle or crank-shaft adapted to operate said rod, a yielding locking-plate checking the rotation of the spindle, and an engaging part rotating with the spindle and thrown out of connection with the yielding locking-plate by the vertically-moving lever, substantially as set forth.

9. The combination of the standard or fixed parts, the spindle, and switch-operating rod with spring-actuated engaging parts, one of which is carried by the spindle and the other by the stand, so formed that the spring shall aid in the completion of the movement of the switch, and means whereby said switch or its lever may be relieved of the resistance of-

ferred by the spring engaging devices, substantially as set forth.

10. The combination of the standard, the spindle, and switch-operating rod with engaging devices which are brought together by a spring and one of which is carried by the spindle and the other by the stand, and a vertically-swinging lever adapted to disengage the engaging devices and permit the spindle to be freely revolved, substantially as set forth.

11. The combination, with a switch-stand, a switch-operating rod, and a target-shaft, of a spring-actuated engaging device to lock the switch in either of its positions and to complete the movement of the switch.

12. The combination, with a switch-stand, a target-shaft, and a switch-rod, of an arm extending laterally from the target-shaft and a yielding device arranged to engage the outer end of said arm on the target-shaft and complete the movement of the target-shaft in either direction, substantially as set forth.

13. The combination, with a switch-stand, a rotary crank-shaft journaled therein, and a switch-rod connected with the crank of said shaft, of a spring-actuated device for locking the switch in either of its positions and for completing the movement of the switch, substantially as set forth.

14. The combination, with a switch-stand, a switch-operating rod, and a target-shaft, of a horizontally-yielding engaging device to complete the movement of the switch in either direction, and a lever for operating and locking the switch.

15. The combination, with a switch stand, a switch-rod, and a target-shaft provided with a laterally-projecting arm, of an engaging device for completing the movement of the switch, and a lever for raising and lowering the arm on the target-shaft, substantially as set forth.

16. The combination, with a switch-stand, the switch-operating rod, and the target-shaft, of an engaging device carried by the shaft, and a sliding spring-actuated engaging device connected to the stand and moving transversely to and from the shaft, as and for the purpose set forth.

17. The combination, with the switch-stand, the switch-operating rod, and the target-shaft having a crank, of an engaging device carried by the shaft, a yielding engaging device carried by the stand, and a lever and connections to engage and disengage said devices and to turn the shaft.

18. The combination, with the switch-stand, the switch-operating rod, the crank-shaft, an engaging device checking the rotation of the shaft, of an engaging device rotating with the shaft, said devices being disengaged by movement of one of them independently of the rotary movement of the shaft, as set forth.

19. In a switch-stand, the combination, with the target-shaft, an engaging device carried

by the shaft, and a yielding engaging device
connected with the stand, of means for en-
gaging and disengaging said devices, and
means for varying the relative adjustment of
5 said engaging devices and thereby adjusting
the throw of switch-rail, substantially as set
forth.

In testimony whereof we have signed this

specification in the presence of two subscrib-
ing witnesses.

HENRY N. HOPKINS.
EMERY H. BRYANT.

Witnesses:

GEO. F. CASE,
W. A. CLARK.