

No. 698,108.

Patented Apr. 22, 1902.

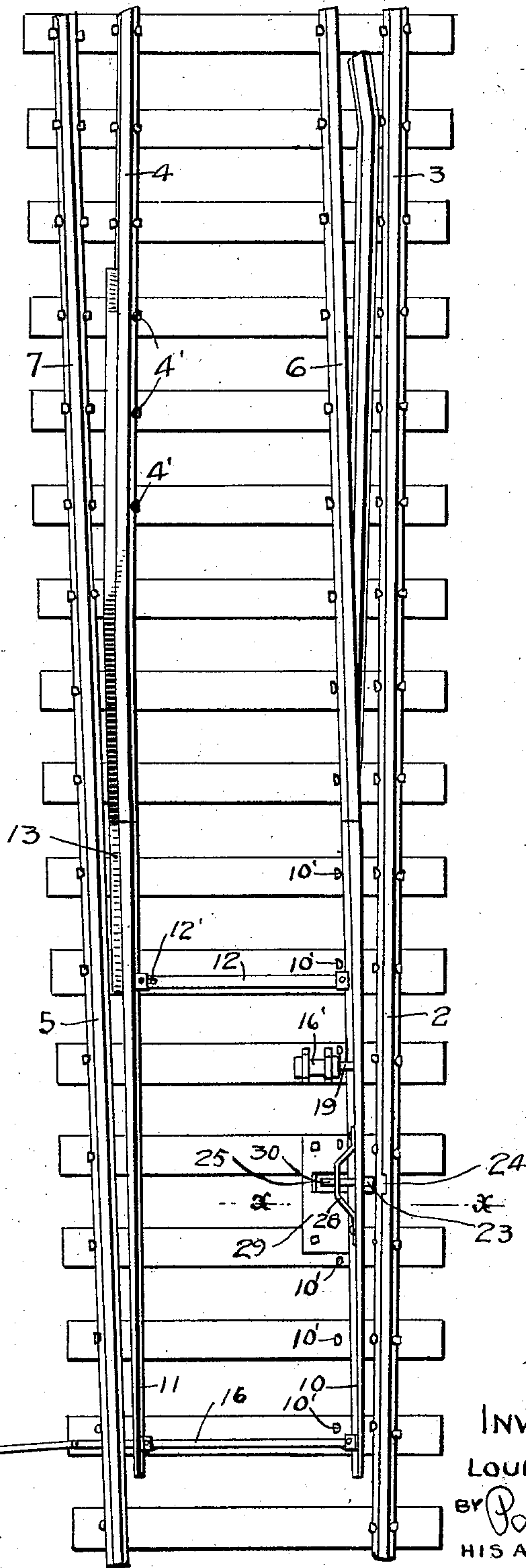
L. DUNN.

SAFETY DEVICE FOR POINT SWITCHES.

(Application filed Dec. 14, 1900.)

(No Model.)

2 Sheets—Sheet 1.



WITNESSES

E. G. Stange
M. F. Goolery

INVENTOR

LOUIS DUNN

BY *Paul Hawley*
HIS ATTORNEYS

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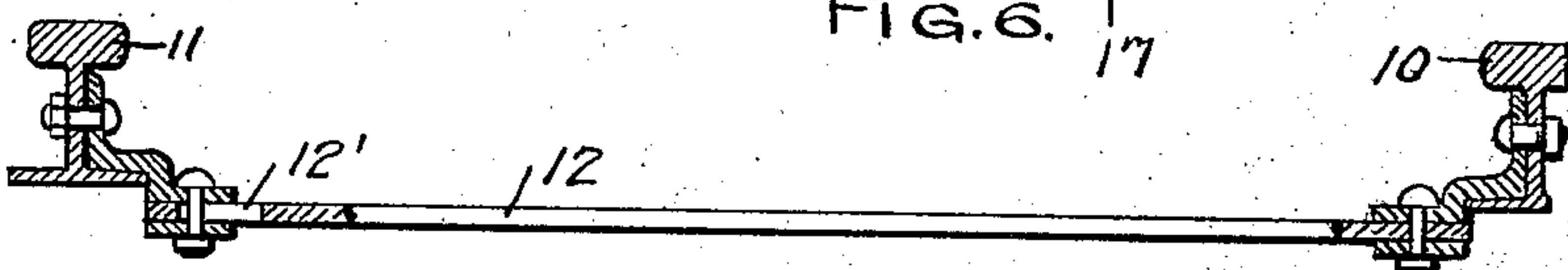
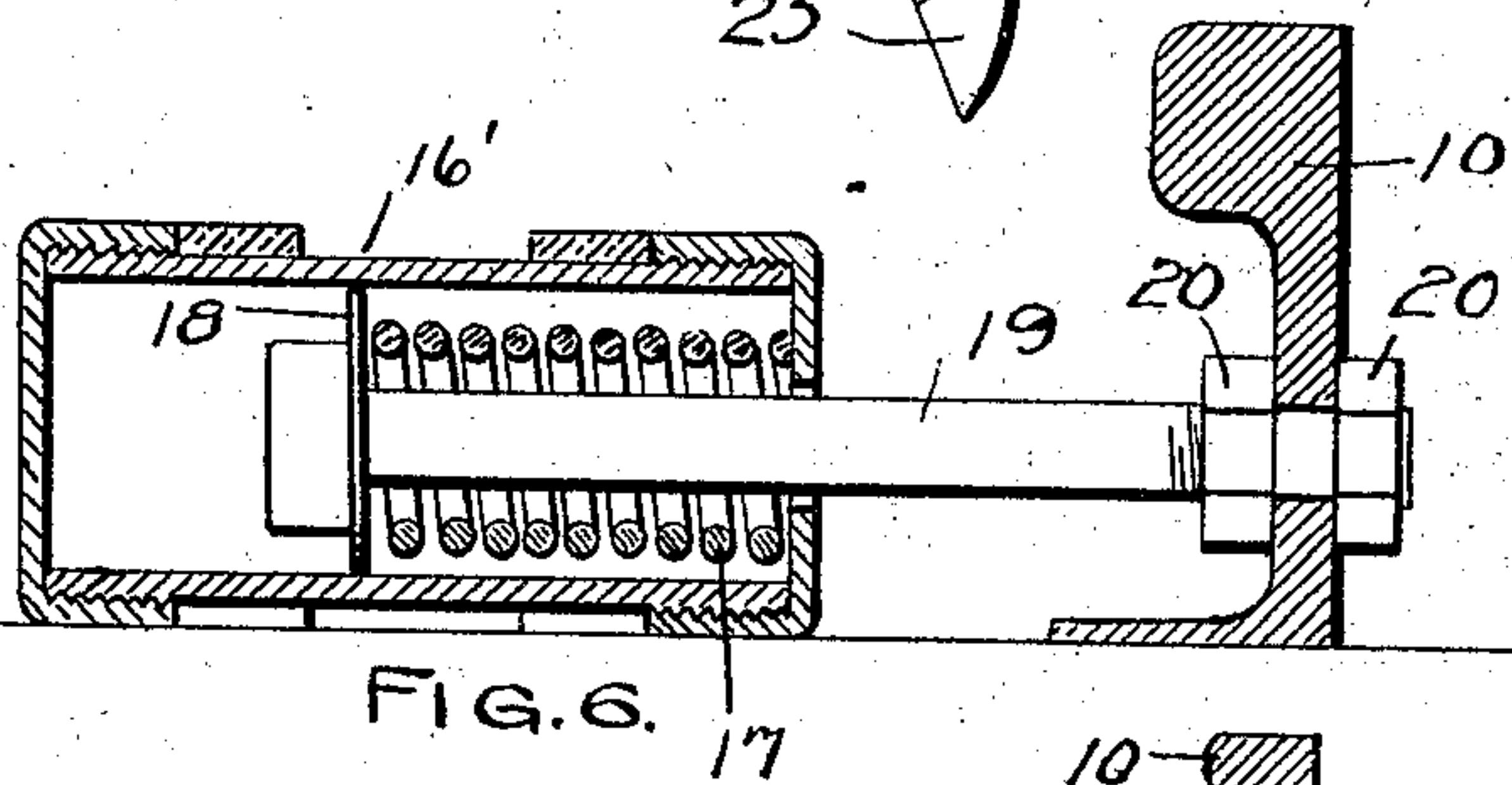
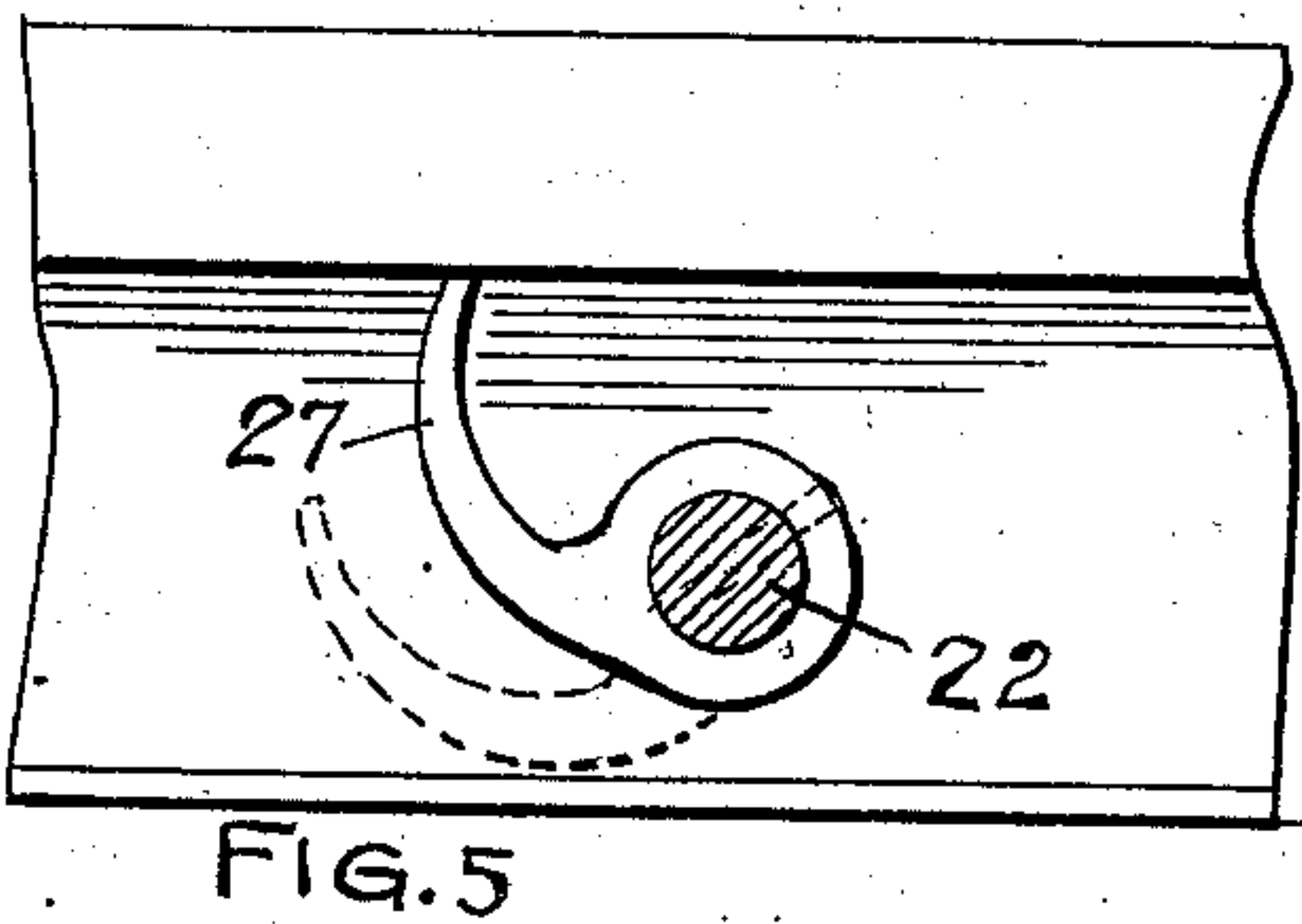
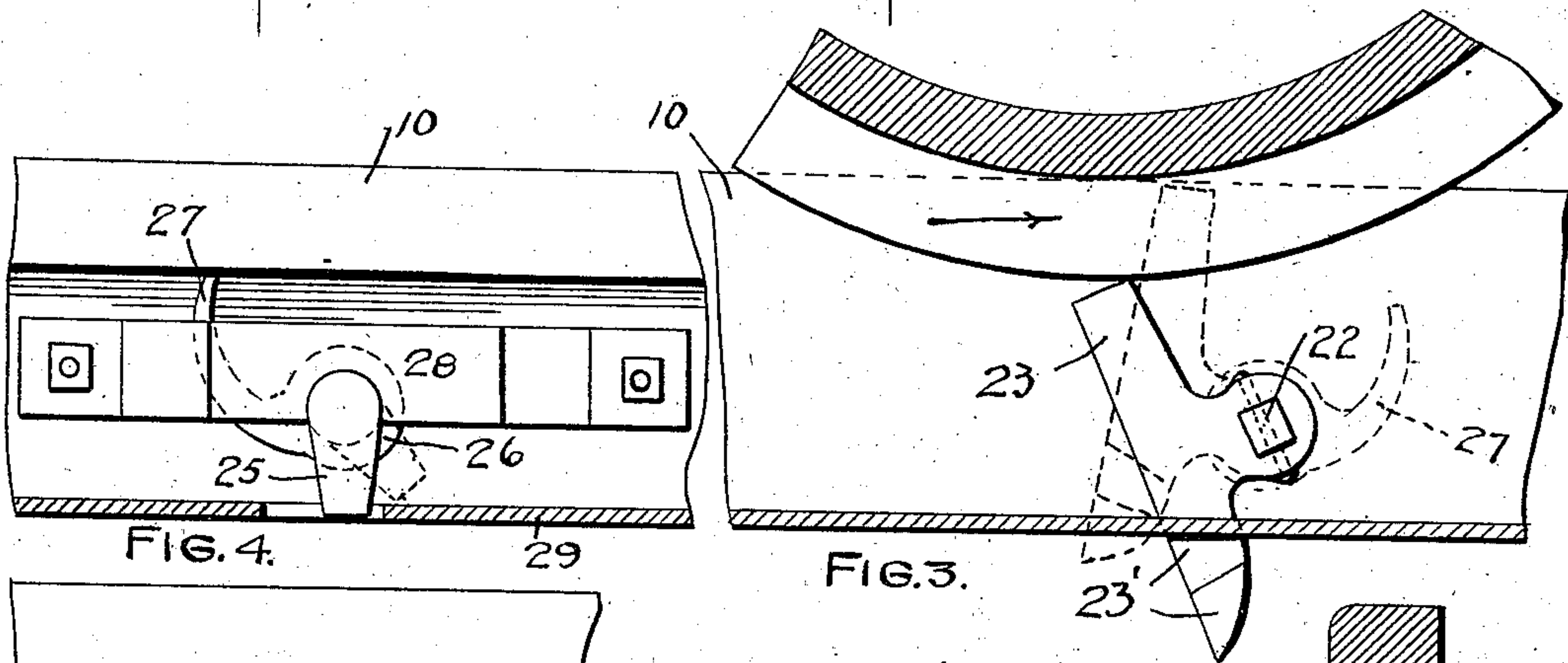
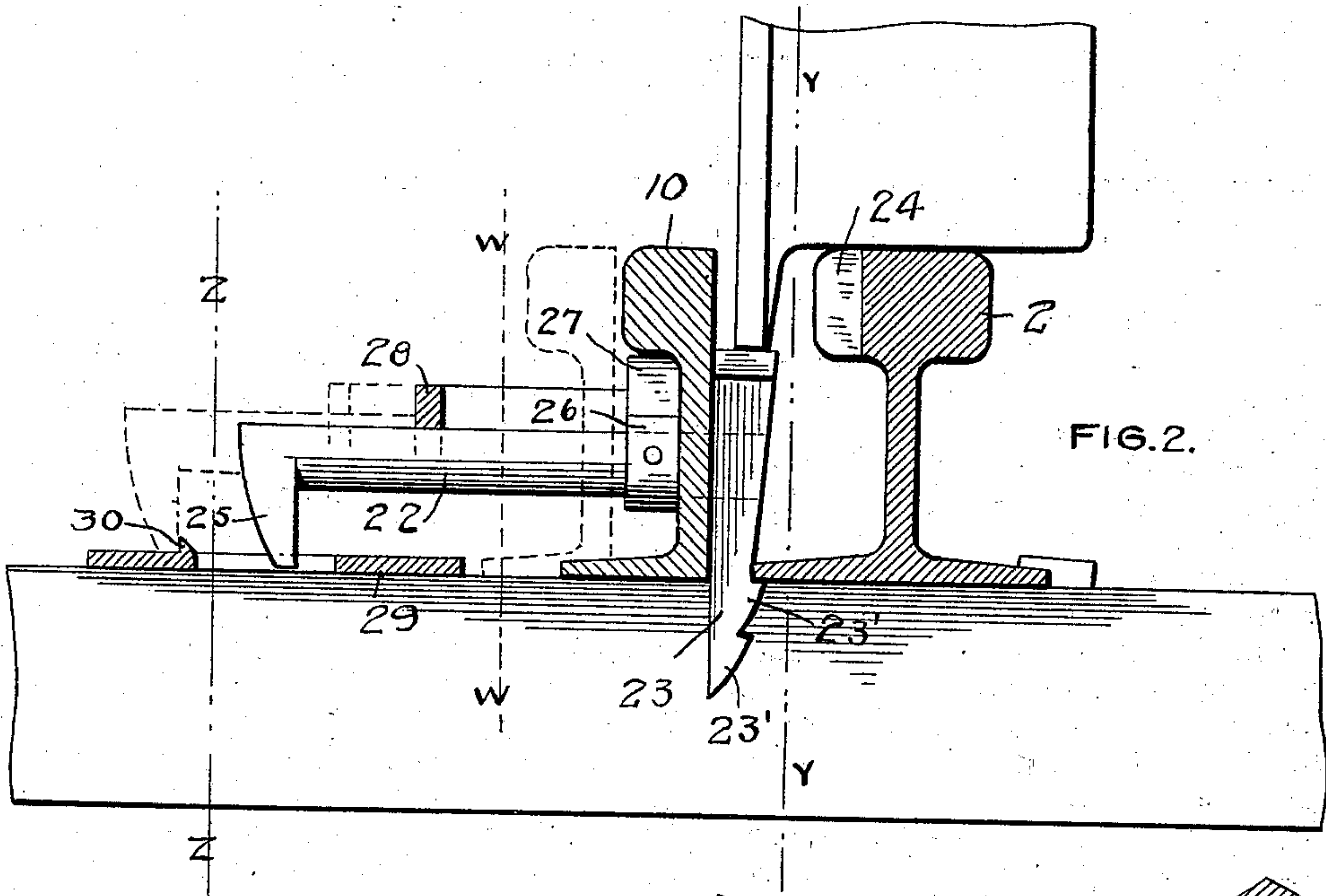
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FIG. 7.

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UNITED STATES PATENT OFFICE.

LOUIS DUNN, OF MINNEAPOLIS, MINNESOTA.

SAFETY DEVICE FOR POINT-SWITCHES.

SPECIFICATION forming part of Letters Patent No. 698,108, dated April 22, 1902.

Application filed December 14, 1900. Serial No. 39,829. (No model.)

To all whom it may concern:

Be it known that I, LOUIS DUNN, of the city of Minneapolis, county of Hennepin, State of Minnesota, have invented certain new and useful Improvements in Safety Devices for Point-Switches, of which the following is a specification.

This invention relates to improvements in safety devices to be used in connection with a point or split switch to prevent derailment of trains running toward the points of the switch when the switch is in a neutral or partially-open position; and the invention relates particularly to improvements in the safety device for point-switches for which Letters Patent No. 524,273 were issued to me on the 7th day of August, 1894.

The object of my present invention is to simplify the construction of the safety device shown and described in my former patent.

To this end the invention consists generally in the constructions and combinations hereinafter described, and particularly pointed out in the claims.

In the accompanying drawings, forming part of this specification, Figure 1 is a plan view of a point-switch constructed in accordance with my invention. Fig. 2 is a detail section on line *x x* of Fig. 1, showing the means for locking the points in a neutral position by the passage of a truck. Fig. 3 is a detail section on line *y y* of Fig. 2. Fig. 4 is a detail section on line *z z* of Fig. 2. Fig. 5 is a detail section on line *w w* of Fig. 2. Fig. 6 is a detail section of the spring mechanism for holding the side-track point away from the side-track position. Fig. 7 is a detail section of the point-rails and the slotted bridle-rod connecting them.

In the drawings, 3 and 4 represent the rails of the main track, and 6 and 7 the corresponding rails of the side track. These rails are fixed in the usual manner and converge toward each other in the usual way.

2 and 5 represent the outer or stock rails. The rail 2 is in line with the outer rail 3 of the main track, and the rail 5 forms a continuation of the outer rail 7 of the side track.

10 and 11 represent the movable points, arranged in the usual manner and connected together by the head-rod 16 and by the slotted bridle-rod or tie-bar 12. When the points

are in position with the point 11 against the side of the rail 5, the switch will be set for the main track and will direct a train passing toward the points along on the main track. When the point 10 is against the side of the stock-rail 2, the switch will be set for the side track and will direct a train passing toward the points onto the side track.

As stated in my former patent, as point-switches are usually constructed, when the switch is partially open or is in a neutral position, such as shown in Fig. 1 of the drawings, a train passing toward the points will not be directed onto either the main track or the side track, but the flanges of the wheels will pass outside of both of the points and will drop down between the points and the stock-rails, and the train will thus be derailed. There are many ways in which the points may get into this neutral position. For instance, the head-rod or the rod connecting the head-rod with the switch-stand may become broken and the points be accidentally displaced, some foreign substance, such as a broken bolt or other piece of metal or a stone or piece of ice, may get between one of the points and the stock-rail and prevent the switch from being completely thrown, or the switch may be left partially open by design by persons intending to derail the trains. In any event, where a point or split switch of the usual construction is used whenever the switch is left in this position and a train passes along the track toward the points it will inevitably be thrown from the track. By the construction of my former patent, hereinbefore referred to, I prevented the derailing of the train under these circumstances and provided means to bring the train back upon the main track whenever the switch stood in a neutral position and a train traveled on the track toward the points of the switch. By my present construction I secure the same result with somewhat-simpler mechanism. As here constructed, the point 11 has no means of preventing lateral movement on the ties toward the point 10 between the point where it is connected to the head-rod 16 and the point where it is joined to the main rail 4. The main rail 4 also has no spike or other means of preventing lateral movement toward the other main rail 3 for some distance

beyond where the point 11 is spliced to it. There is, therefore, no means of preventing a lateral flexing or bending of the point 11 and the end portion of the main rail 4 between the head-rod 16 and the point where the main rail is secured to the ties by the spikes 4'. Upon the outside of the point 11 and end portion of the main rail 4 I provide the filling strip or piece 13, which is adapted to receive and support the flanges of the wheels passing between the point 11 and the stock-rail 5. That part of the filling-piece that is against the side of the point 11 is level on its upper surface, so as not to interfere with the flanges of the wheels moving on the side track when the switch is set for the side track. The succeeding portion of the filling-piece 13 is inclined and rises to the level of the upper surface of the main rail 4, where it is provided with a substantially level portion at the same height as the top of the main rail 4.

The point 11 is connected to the point 10 by means of the bridle-rod or tie-bar 12. This bar is provided with a slot 12', by means of which it is connected to the point 11, (see Fig. 7,) and this slot permits lateral movement of the point toward the other point 10 without bending or breaking the bar 12. A row of spikes 10' is arranged inside of the point 10 and in such position as to form a solid lateral bearing for said point to positively limit the movement of said point inward or toward the other point. When the switch is set for the main track, the base of the point 10 is brought against the spike 10', which limits the inward movement of said point.

A diagonal rail 14 is arranged, as shown in Fig. 1, between the rail 6 and the main rail 3. In my present construction I do not use any filling-piece between the rails 3 and 6 or between the rail 2 and the point 10; but I arrange said rail and point so that when the inside of the flange of a wheel is brought against the outside of the point 10 the tread of the wheel will still be resting on the surface of the rail 2. In other words, if the wheels at the opposite side of the truck pass outside of the point 11 the flanges on the wheels that are traveling on the rail 2 will encounter the outer surface of the point 10, while the treads of the wheels are still supported on the top of the rail 2, and as the point 10 is limited in its lateral movement and as the distance between the outer surface of the point 10 and the inner surface of the rail 2, when the point is at the limit of its inward movement, is less than the thickness of an ordinary car-wheel it follows that even if the switch is set at a neutral point it will be impossible for the wheels that are traveling on the rail 2 to leave that rail and drop into the space between the rail and the point. As the distance between the outer surface of the point 10 and the outer surface of the point 11, except for a short distance at or near the free ends thereof, is greater than the dis-

tance from the inside of one car-wheel to the inside of the other wheel on the same axle, it follows that if a car is traveling toward the points of the switch and if said switch is in a neutral position, as shown in Fig. 1 of the drawings, that the portion of the point 11 next to the rail 4 and the end portion of the rail 4 must be compressed or forced toward the rails 2 and 3 as the truck travels along, with the inner surface of the flange of one wheel against the outer surface of the point 10 and the inner surface of the flange of the opposite wheel against the outer surface of the point 11. As the ends of the points are held at a fixed distance by the head-rod 16 and as the point 10 is held from inward lateral movement by the spikes 10', it follows that the portion of the point 11 and the main rail 4 between the head-rod 16 and the spikes 4' must be bent or flexed slightly toward the opposite point or rail in order to permit the truck to travel along with the flanges of the wheels between the points and the rails 2 and 5. This inward flexing or bending of the point and end portion of the rail 4 may be accomplished without any injury to said parts, and the slotted connection between the tie-rods 12 and the point 11 permits an inward lateral movement of the point 11 and the end portion of the rail 4 without injury to said tie-rod. With the device here shown, if the points are for any reason left in a neutral position, such as shown in Fig. 1 of the drawings, and a train travels along the track toward the points the flanges of the wheels will enter the spaces between the points and the stock-rails 2 and 5. The flanges of those wheels that enter the space between the point 10 and the rail 2 will cause the point 10 to be brought firmly against the spikes 10', which will prevent further lateral movement of said point; but the wheels traveling on the rail 2 cannot leave said rail, as when the inner surface of the flange of each rail is against the outer surface of the point 10 there will be sufficient portion of the tread of the wheel resting upon the rail 2 to cause said wheels to be supported on said rail. The portion of the point 11 and rail 4 between the head-rod 16 and the spikes 4' will be inwardly bent or flexed by the pressure of the inside surface of the wheel-flange upon the outer surface of said point and rail. This compression will force the point 10 firmly against the spikes 10', beyond which its movement will be prevented, while the opposite point 11 and portion of the rail 4 will be flexed inward far enough so that the distance between the outer surfaces of said points and rail will be equal to the distance from the inside of one wheel to the inside of the opposite wheel on the same axle. This will cause the flanges of the wheels that are between the point 11 and the rail 5 to travel upon the filling-piece 13, which will raise the wheels on that side to the top of the rail 4, and when the inner surfaces of the flanges of the wheels at the

opposite side of the truck come in contact with the diagonal rail 14 the wheels on that side, which, as before explained, will have remained on the rail 2 and will have traveled 5 onto the main rail 3, will be crowded farther onto said rail, and the flanges of the other wheels will ride over the top of the rail 4 and drop inside of said rail, thus bringing the train back onto the main track.

10 I also prefer to provide means for normally holding the side-track points out of position to connect with the side track. For this purpose I provide a suitable cylinder 16', which is firmly secured in position upon one of the 15 ties in proximity to the point 10. A spring 17 is arranged within this cylinder, with a disk or follower 18, and a rod or bolt 19 passes through said follower and through the spring 17 and through the point 10, to which it is connected by means of the nuts 20. The tension of this spring tends to move the point 10 away from the rail 2, and therefore to prevent the switch from being in position for the side track, except when it is intentionally set therefor. 25 At all other times the spring device will move the point 10 away from the stock-rail 2, and a train traveling toward the points will either pass along on the main track or its trucks will pass between the stock-rails and 30 the points and will then be brought back onto the main track by the safety devices hereinbefore described.

It will be noted that when the points are in a neutral position and a train is traveling on 35 the track toward the points the means already described will cause the wheels that pass into the spaces between the points and the stock-rails to be brought back onto the main rails. If, however, the head-rod 16 or 40 the connecting-rod between the points and the stand should be broken or if the stand should be turned so as to partially open the switch, the pressure of the train against the points would tend to move the points so as 45 to cause them to connect with the side track, in which case one or more of the trucks or one or more of the cars having passed over the safety device and gone back on the main track the other trucks or cars would be directed by the points onto the side track. This 50 would either throw the train from the track or injure the cars or the track. For the purpose of preventing this I provide a locking device which will prevent the point 10 from moving against the stock-rail 2 as soon as one 55 wheel has passed along the space between the point 10 and the rail 2. As before stated, the spring-actuated device connected to the point 10 will automatically throw the switch into 60 position upon the main track if there is no obstruction to the movement of the point, and the device which I will now proceed to describe will as soon as a single wheel has passed along the space between the point 10 and the 65 stock-rail 2 prevent the point 10 from being moved against the stock-rail 2 and will automatically lock the switch in position for

the main track should the points be moved into position to set the switch for the main track by the passage of a train in the opposite direction. For this purpose I provide in 70 connection with the point 10 a short axle 22, which passes through a hole in said point and is adapted to turn or oscillate in its bearing. This axle carries upon its end between the 75 point 10 and the stock-rail a short wedge-shaped bar 23, that I term a "plunger." This plunger is secured to the end of the axle 22, as shown in Fig. 3, and is provided with a wedge-shaped lower end having the offsets or shoulders 23'. When in its normal position, the 80 upper end of the plunger stands substantially flush with the upper surface of the point 10, as indicated by dotted lines in Fig. 3, and a notch 24 is cut in the stock-rail 2 85 to receive the head of the plunger when the switch is set for the side track. The inner end of the axle 22 is formed with a hook or lug 25, and just inside of the point 10 is a stop-collar 26, provided with a lug 27. A 90 strap 28, secured to the inside of the point, passes over the axle 22 and partially surrounds said axle and forms a partial bearing therefor. A slotted plate 29 is arranged below the axle 22, being secured upon the ties, 95 and is provided at the inner edge of its slot with a lip or projection 30. When in normal position, the plunger 23 will stand in the position indicated by dotted lines in Fig. 3, and the hook 25 will occupy the position indicated 100 by dotted lines in Fig. 4. Any tendency of the axle to turn so as to depress the plunger is prevented by the lower part of the hook 25 coming in contact with the surface of the plate 29 at one side of the slot. The lug 27 105 on the stop-collar will at this time be in engagement with the base of the point or rail, thereby preventing the top of the plunger from being brought above the top of the rail. Should, however, the points be in neutral position, as shown in Fig. 1 of the drawings, 110 the flange of a wheel passing into the space between the point 10 and the stock-wheel 2, as illustrated in Figs. 2 and 3 of the drawings, will encounter the head of the plunger 115 and will force it downward, thereby turning the axle so as to bring the plunger into the position shown in Fig. 2 and shown by full lines in Fig. 3. As the lower corner of the hook 25, as shown by dotted lines in Fig. 4, 120 rests upon the surface of the plate 29, adjacent to the slot in said plate, when the plunger is in its elevated position, thereby holding said plunger in such elevated position, it is evident that in order to depress the plunger 125 the hook 25 must clear the edge of the plate. The strap or brace 28 prevents the end of the axle from rising when the plunger is depressed; but as there is no weight at this time on the point 10 said point will rise 130 slightly, carrying the axle 22 with it, and thereby permitting the lower end of the hook 25 to slip over the edge of the plate into the slot in said plate. The parts will now stand

in the position shown by the full lines in Fig. 2, and it will be seen that it will now be impossible for the point 10 to be moved against the stock-rail 2, and hence it will be impossible for the switch to be set for the side track while the train is passing. With the hook 25 in the position shown in full lines in Figs. 2 and 4 of the drawings, should the points be moved so as to set the switch for the main track, which will be done by the passage of a train in the opposite direction, the hook 25 will be brought into the position indicated by dotted lines in Fig. 2, and will then engage the lip 30 on the plate 29, and thereby lock the switch to the main track.

I do not limit myself to the details of construction herein shown and described, as it will be evident that the same may be varied in many particulars without departing from my invention.

I claim as my invention—

1. In a switch, the combination, with the movable points, of a filling-piece secured to the outer side of one of said points, and means independent of said point for limiting the lateral movement of the other point, substantially as described.
2. In a switch, the combination, with the movable points, arranged to permit the wheels to pass outside of both points when the switch is partially open or in the neutral position, of a filling-piece secured to the outside of one point and adapted to receive and support the flanges of the wheel, and means independent of said point for limiting the lateral movement of the other point, whereby the wheels on that side of the track are kept in position upon the rail, for the purpose set forth.
3. The combination, with the stock-rails, and the rails of the main and the side tracks, of the movable points, one of said movable points being provided with a filling-piece secured to its outer side and rigid means independent of said point for limiting the lateral movement of the other point, and means for guiding the wheels back onto the main track, for the purpose set forth.
4. The combination, with the rails of the main and side tracks, of the movable points arranged to permit the wheels to pass outside of both points when the switch is partially open or in a neutral position, and means permitting one of said points to be flexed laterally toward the other point upon the passage of a train when the switch is partially open, for the purpose set forth.
5. The combination, with the rails of the main and side tracks, of the movable points arranged to permit the wheels to pass outside of both points when the switch is partially open, or in a neutral position, means limit-

ing the inward lateral movement of one of said points, and means permitting an inward or lateral flexing of the other point, for the purpose set forth.

6. The combination, with the rail 2, of the movable point 10 provided with the axle 22, carrying the plunger 23, and the stop-collar 26, for the purpose set forth.

7. The combination, with the rail 2, of the movable point 10, provided with the axle 22 having the hook 25, and the plunger 23, for the purpose set forth.

8. The combination, with the rail, 2, of the movable point 10, provided with the axle 22, having a suitable hook 25, and the slotted plate 29 provided with the lip 30, for the purpose set forth.

9. The combination, with the movable point 10, of the cylinder 16', provided with the spring 17, the follower 18 and the bolt or rod 19 extending through said follower and spring and connecting with the point 10, said spring being adapted to move said point away from the rail of the main track or out of side-track position, substantially as described.

10. The combination, with the movable points and the rigid head-rod, of the slotted bridle-rod connecting said points, for the purpose set forth.

11. The combination, with the rails of the main and side tracks, of a movable switch-point adapted, when brought against one of the main rails, to connect said rail with the adjacent side-track rail and means, connected with said point and adapted to normally hold said point out of contact with said main rail and in a neutral position, for the purpose set forth.

12. The combination, with the rails of the main and side tracks of the movable switch-points and means for holding the side-track point out of engagement with the main-track rail and in a neutral position.

13. The combination, with the stock-rails 2 and 5, of the movable points 10 and 11 and means for holding the point 10 normally out of engagement with the stock-rail 2 and in a neutral position, for the purpose set forth.

14. The combination, with the stock-rails 2 and 5 of the movable points 10 and 11 and a spring device connected with the point 10, and adapted to hold said point normally out of engagement with the stock-rail 2 and in a neutral position, for the purpose set forth.

In witness whereof I have hereunto set my hand this 8th day of December, 1900.

LOUIS DUNN.

In presence of—

RICHARD PAUL,
M. E. GOOLEY.