

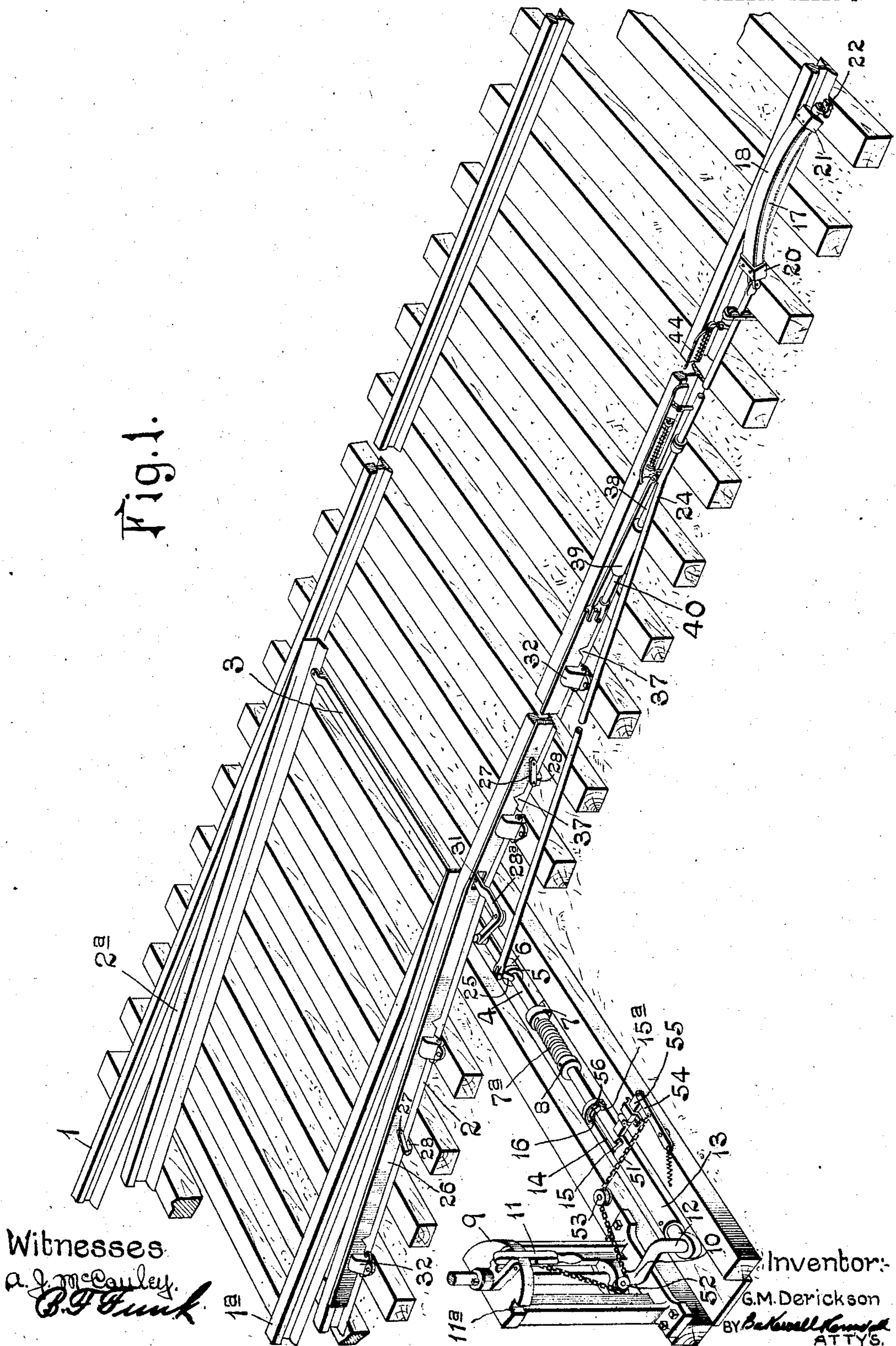
No. 785,158.

PATENTED MAR. 21, 1905.

G. M. DERICKSON.
SWITCH OPERATING MECHANISM.
APPLICATION FILED NOV. 25, 1904.

3 SHEETS—SHEET 1.

Fig. 1.



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3 SHEETS—SHEET 2.

Fig. 2.

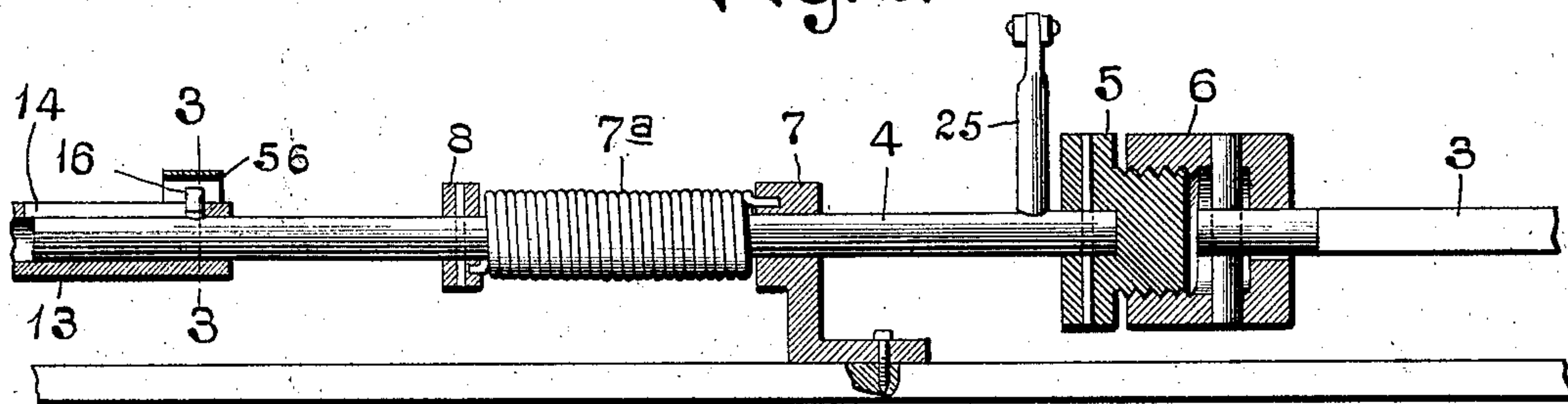


Fig. 3.

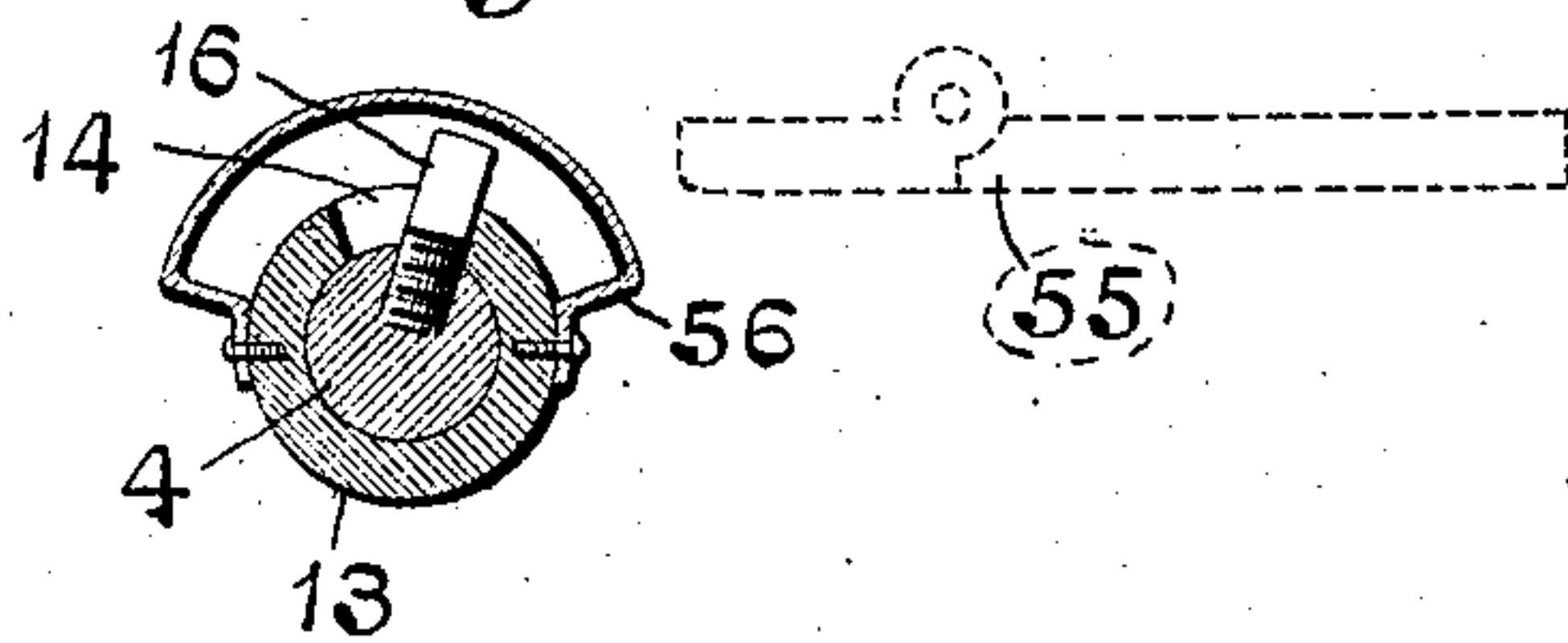


Fig. 4.

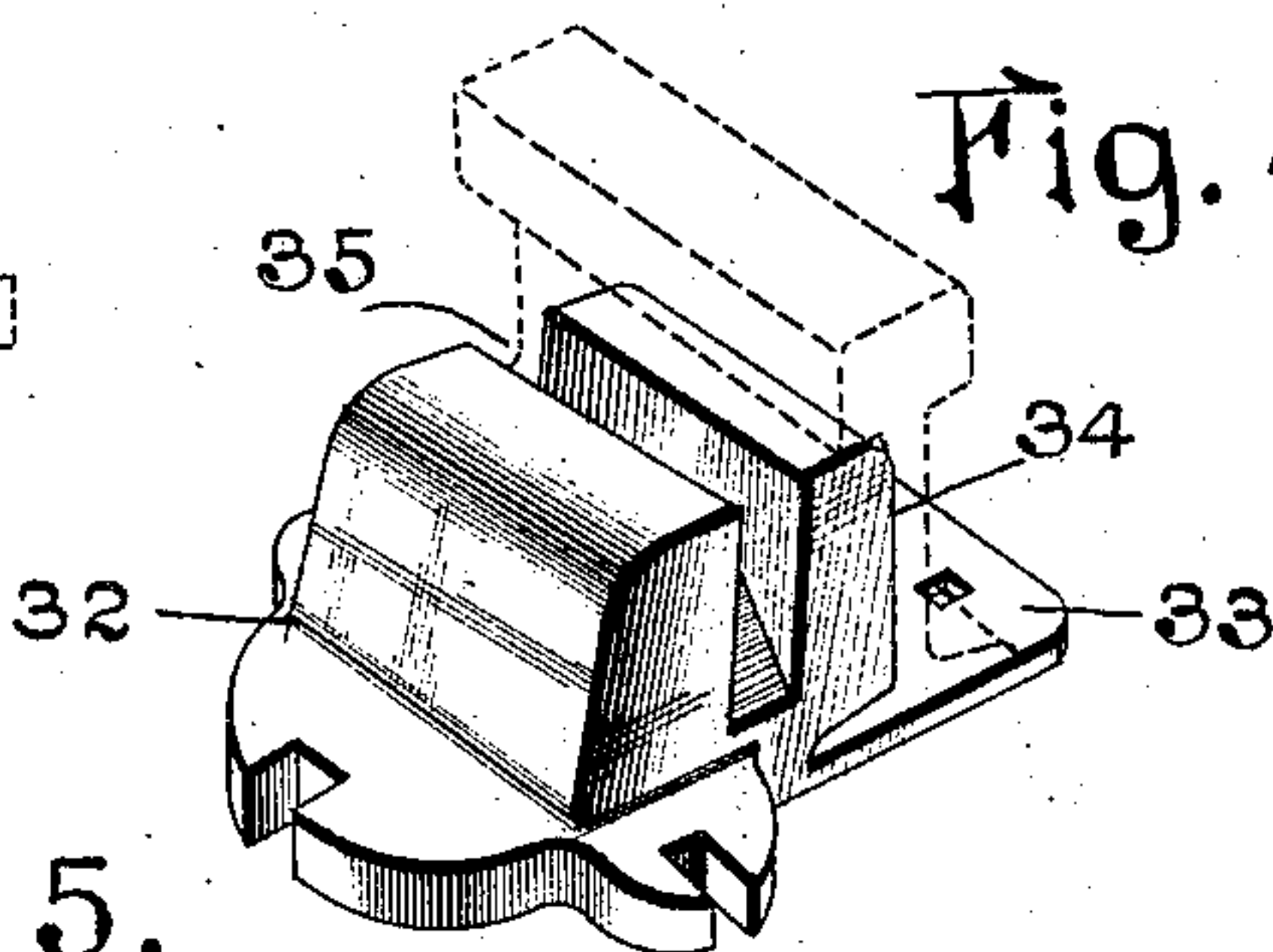
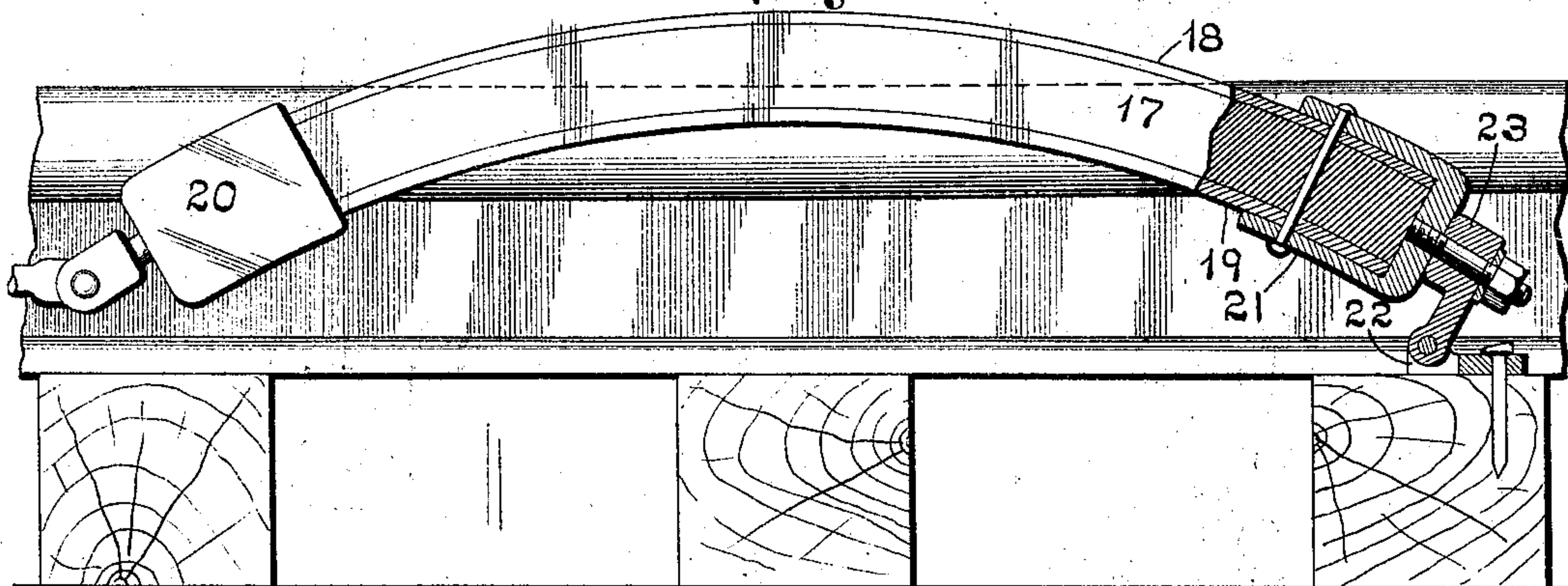


Fig. 5.



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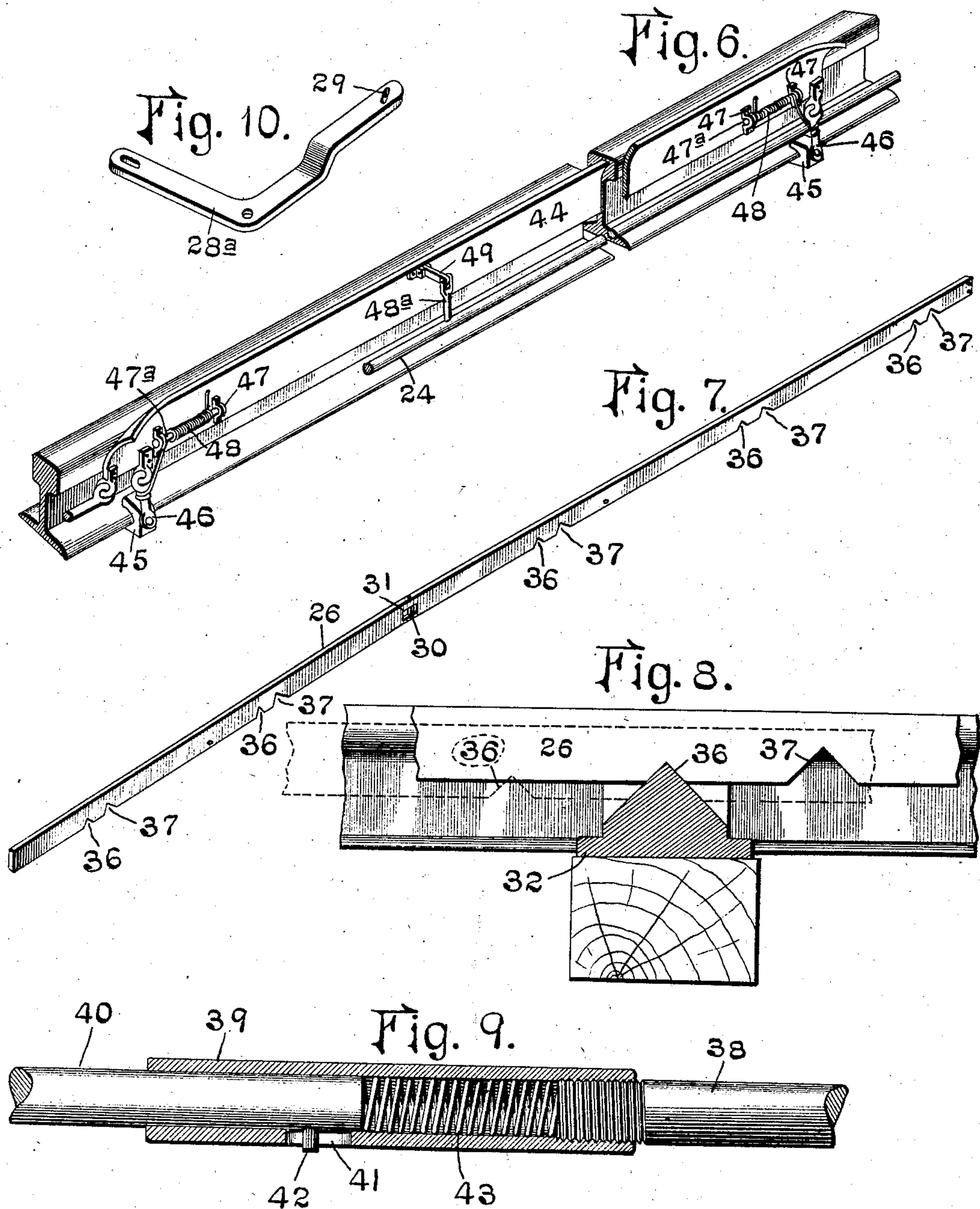
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SWITCH OPERATING MECHANISM.

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3 SHEETS—SHEET 3.



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UNITED STATES PATENT OFFICE.

GEORGE M. DERICKSON, OF ST. LOUIS, MISSOURI.

SWITCH-OPERATING MECHANISM.

SPECIFICATION forming part of Letters Patent No. 785,158, dated March 21, 1905.

Application filed November 25, 1904. Serial No. 234,192.

To all whom it may concern:

Be it known that I, GEORGE M. DERICKSON, a citizen of the United States, residing at St. Louis, Missouri, have invented a certain new and useful Improvement in Switch-Operating Mechanisms, of which the following is a full, clear, and exact description, 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, forming part of this specification, in which—

Figure 1 is a perspective view of a portion of the railroad-track, showing a portion of the siding or switch with my invention applied. Fig. 2 is a side elevational view of a portion of the switch-bar and the connector-bar, the connection between the switch-bar and connector-bar being shown in section. Fig. 3 is an enlarged cross-sectional view on the line 3 3 of Fig. 2. Fig. 4 is an enlarged detail perspective view of one of the combined rail chairs and braces for interlocking engagement with a protector-bar. Fig. 5 is an enlarged side elevational view, partly in section, of the trip. Fig. 6 is a perspective view of the device for preventing operation of the trip. Fig. 7 is a perspective view of the protector-bar. Fig. 8 is a fragmentary side elevation view of the protector-bar in position for interlocking engagement with the rail-brace. Fig. 9 is a view, partly in elevation and partly in section, of the yielding connection between the tripping-bar for the switch mechanism and the protector-bar; and Fig. 10 is a detail perspective view of the bell-crank lever for connecting the protector-bar to the switch-bar.

This invention relates to switch mechanisms for railways, and one of the objects thereof is to provide a switch mechanism which can be automatically operated to close an open switch, so as to prevent a train on the main track from entering the siding, of which the switch forms a part.

Another object of the invention is to provide means whereby the switch-points will be secured against spreading during the passage of the car or train from the main track onto the siding, or vice versa.

A still further object is to provide means

whereby the switch-points may be automatically locked against operation while the tripping mechanism is being set.

Another object is to provide means whereby the switch-points will be held against operation when a car-wheel is on one of the rails between the trip and one of the switch-points.

Other objects and advantages, as well as the novel details of construction, of my invention will be referred to more specifically hereinafter, it being understood that minor changes in the form, proportion, and details may be resorted to without departing from the spirit of the invention or sacrificing any of the advantages thereof.

In order to properly illustrate the application of my invention, I have shown a portion of the main track, including the rigid rail 1 and the switch-point 1^a. The siding includes the rigid rail 2 and the switch-point 2^a. The switch-points 1^a and 2^a are connected by a switch-bar 3.

4 designates the connecting-bar, which is rotatably connected to the switch-bar 3 by the head 5, rigid on said bar 4, and which loosely engages the socket 6, fixed on the bar 3. The bar 4 is supported by a bracket 7, through which said bar 4 projects, and spaced away a suitable distance from the bracket 7 is a collar 8, against which one end of an expansion-spring 7^a abuts, the opposite end of the spring abutting against the bracket 7, so the expansibility of the spring will have a tendency to cause the bar 4 to slide in the bracket 7, as will be more fully explained hereinafter.

At a suitable point to one side of the track is a switch-stand 9, having a vertical crank-shaft 10, adapted to be turned by the handle 11, which handle may be tripped into any one of a plurality of notches 11^a to hold the shaft against movement. The crank 12 of the shaft 10 is connected to the connecting-bar 4 by a sleeve 13, having a longitudinal slot 14 therein, at the respective ends of which are notches 15 and 15^a. The sleeve 13 surrounds the bar 4 for a portion of its length, and on the bar 4 is a right-angularly-projecting stud or lug 16, which is movable in the slot 14 and adapted to engage either of the notches 15 or 15^a.

At a point sufficiently distant from the switch-points, and preferably beside one of the main rails of the track, is a yielding switch-trip. In the form illustrated in the drawings this switch-trip is illustrated as comprising a core of rubber 17, having an upper and lower facing of metal, (designated by the numerals 18 and 19, respectively.) The ends of the trip are capped by the caps 20 and 21, the cap 21 being hinged to a plate 22 on one of the ties through the medium of the hinge member 23. This trip is illustrated as just described on account of the convenience in constructing it; but I would have it understood that I do not limit myself to this exact form, as it is apparent that there are other forms of yielding trips which may be utilized with more or less efficiency. The cap 20 of the trip is connected to a tripping-bar 24, which is secured to an arm 25 on the connecting-bar 4.

Arranged adjacent to the web of one of the rails (in this instance the rail 2) is what I term a "protector-bar," (designated by the reference-numeral 26.) This bar is supported in position by the links 27, having fixed pivotal connections with the castings 28, carried by the flange of the rail. The protector-bar is also connected to the switch-bar 3 by a bell-crank lever 28^a, the angle of the lever being pivoted to one side of the track, and the arm engaging the protector-bar having an inclined elongated slot 29, through which a pin 30 in the slot 31 of the bar engages.

Arranged on suitable ties and forming chairs for the rail 2 are the castings 32. These castings 32 have base-flanges 33, on which the flanges of the rail rest, and projecting from the flanges 33 are upstanding web-braces 34, which snugly hug the rail-webs and the contiguous portions of the tread and flanges of said rail. The brace 34 is provided with a longitudinally-disposed groove 35, in which is an angular interlocking rib, preferably of inverted-V shape, the point of which is adapted to engage with either series of notches 36 or 37 in the protector-bar 26.

The tripping-rod 24 is connected to the protector-bar by means of a yielding connection. (Illustrated in detail in Fig. 9.) This yielding connection comprises a branch rod 38, rigid with the rod 24 and having a threaded connection with a sleeve 39, loosely fitting over one end of the link-rod 40, pivotally connected to the protector-bar 26. The sleeve 39 is provided with a slot 41, engaged by a lug or projection 42 on the end of the link-rod 40, and interposed between the respective ends of the rod 38 and the link-rod 40 is an expansion-spring 43, inclosed by the sleeve 39 and having a tendency to exert pressure against the link-rod 40, so that the lug or projection 42 will normally be adjacent to the end of the slot remote from the rod 38. Hence it will be apparent that before the link-rod 40 may

be moved the sleeve 39 must travel a distance approximately equal to the length of the slot 41. Thus the blow on the trip will be absorbed by the spring to the extent that the link-rod 40 and the protector-bar 26 will not be actuated until the lug 16 on the rod 4 is thrown out of engagement with the notch 15^a to permit the switch to be closed. The lug or projection 16 is preferably rectangular in cross-section, and the notches are correspondingly formed, so as to prevent slipping. This lug 16, together with the cooperating part of the sleeve 13, constitutes a trigger mechanism whereby the switch may be permitted to close when the trip is operated.

Hinged at one side of the rail 2 is a device for moving the trip into inoperative position even though the mechanism is set to operate the switch. This device is illustrated as comprising a plate 44, connected to the castings 45 by the links 46. The brackets 47, carried by said device 44, support pins 47^a, around which are coiled springs 48, one end of each of which abuts against one face of the device 44, the opposite end of each spring being attached to one of the links 46, so that the tendency of the device 44 will be to rest against the side of the rail-tread. This device 44 is in the nature of a curved plate the upper edge of which extends slightly above the rail-tread and in such a position that it may be moved away therefrom through the medium of the treads of the wheels. The device 44 is connected to the rod 24 by means of the linked arms 48^a and 49 on the rod 24 and the plate 44, respectively. In order that that portion of the rod 24 which is attached to the trip may turn, I have provided a coupling 50, similar to the coupling shown in Fig. 3, for the connection between the bar 3 and the rod 4.

The operation of the device is as follows: It is to be assumed that the normal position of the mechanism herein described is with the switch closed, the parts being shown in Fig. 1 in the abnormal position, or with the parts set to operate the switch. Referring to Fig. 1, it will be assumed that a train or car has entered the siding on the rails 2 and that the switch has been left open through accident or otherwise. The next train coming toward the switch will operate the trip through the medium of the wheels of the first car or engine to push the rod 24, causing the connecting-bar 4 to turn, so that the trigger mechanism will be operated by throwing the lug 16 out of engagement with the notch 15^a. The expansion-spring 7^a will cause the rod 4 to slide through the bracket 7 and draw the switch-point 1^a against the rail 2 and the switch-point 2^a away from the rail 1. At the same time the protector-bar 26 will be moved from the position shown in Fig. 1, so that the second series of notches 37 will be caused to engage with the interlocking part of the rail chair and brace 32, and as this protector-bar is con-

5 nected to the switch-bar through the medium
 of the bell-crank lever spreading of the switch-
 points will be positively prevented. The
 movement imparted to the protector-bar 26
 will be an upwardly - swinging movement.
 This is due to the link connection between the
 10 castings on the flange of the rail 2 and the bar
 26. The peculiar construction of the slot-and-
 pin connection between the bell-crank lever
 and the protector-bar will permit this upward-
 swinging movement when the mechanism is
 operated. Suppose it is desired to again open
 the switch. The lug or projection 16, which
 15 will have entered the notch 15 when the switch
 was tripped, must be released from this notch
 15, and this is accomplished by raising the
 handle 11, which has a flexible connection
 with a releasing mechanism to one side of the
 20 sleeve 13. This flexible connection is illus-
 trated as comprising a chain 51, passing around
 the pulleys 52 and 53 and attached at one end
 to a pivoted spring-controlled lever 54, oper-
 ating a bolt 55, so that the end of said bolt
 25 will contact with the lug and move it out of
 the notch, whereby the sleeve may be re-
 tracted to cause the lug to engage in the notch
 15^a. In order to prevent the bolt from moving
 the lug out of the notch 15^a, I provide a bridge-
 30 piece 56, (see Fig. 3,) whereby the lug will be
 amply protected. If the switch is closed and
 it is desired to enter the siding, as soon as the
 first wheel of the train or car has passed be-
 yond the trip and between the trip and the
 switch-points the mechanism may be set, as
 35 shown in Fig. 1, so that the switch will be in its
 open position to permit the car or cars to pass
 into the siding. During the time that the first
 car is traveling from the trip to the switch-
 point a wheel will at all times be in contact with
 40 the plate 44, so that the outward movement
 which will be imparted thereto will also impart
 movement to the portion of the rod 24 imme-
 diately connected to the trip, so as to insure
 an outwardly-swinging movement of the trip,
 45 whereby it will be moved out of operative po-
 sition. Therefore it will be seen that the
 wheels following those on the first car cannot
 contact with the trip to operate the switch
 mechanism and close the switch. Movement
 50 of the switch-points will be prevented by the
 protector-bar 26, the first series of notches
 36 of which engage with the angular portion
 of the rail-braces, and owing to the peculiar
 connection between the protector-bar 25 and
 55 the switch-bar 3 it will be impossible for the
 switch-points to move unless the protector-bar
 26 swings up above the tread of the rail until
 the last car-wheel has passed into the siding
 beyond the switch-points. This is made pos-
 60 sible owing to the extreme length of the pro-
 tector-bar, which extends beyond the switch-
 points 1^a and beside the siding-rail 2.

From the foregoing it will be seen that
 after the first wheel has passed beyond the
 65 trip and between the trip and the switch-

points the switch may be set for automatic
 operation without fear of the switches being
 thrown by the train entering the siding at
 that time. The advantage of this will be ap-
 70 parent when it is understood that the trip
 must be located a considerable distance in ad-
 vance of the switch-points, so that by so ar-
 ranging the switch mechanism the entire
 mechanism can be set from the switch-stand
 before the first car of the train has really en-
 75 tered the siding, and it will be ready for auto-
 matic operation without further attention. If
 it is desired to enter the main track from the
 siding and then back down the track in a direc-
 tion remote from the trip, this can be done
 80 by setting the mechanism as shown in Fig. 1,
 and as the train passed onto the main track
 the wheels of the last car would contact with
 the trip to throw the switch, so that the train
 could proceed down the track without neces-
 85 sitating attention to the mechanism by the
 switchman or brakeman.

In setting the mechanism the lug or pro-
 jection 16 will be caused to positively engage
 in the notches 15 or 15^a in either the set or
 90 released positions on account of the tendency
 of the spring 7^a to uncoil, this being prevent-
 ed, of course, by the engagement of the lug
 16 with the slot 14.

It is obvious that any or all of the parts
 95 may be protected from the elements by a suit-
 able housing.

Having thus described the invention, what is
 claimed as new, and desired to be secured by
 Letters Patent, is—

1. A switch-operating mechanism having a
 switch-operating means, a longitudinally-ar-
 100 ranged bar located beside one of the rails and
 normally extending above the same for coop-
 erating with the car-wheel for temporarily
 rendering the tripping means inoperative, one
 105 edge of said bar being provided with notches,
 and means beneath the bar for engagement
 with the notches; substantially as described.

2. A switch-operating mechanism having a
 110 curved tripping means provided with an in-
 herent yielding tendency, said tripping means
 being distant from the switch-point and be-
 ing adapted to be depressed downwardly, and
 means for automatically rendering the trip-
 115 ping means inoperative when a car-wheel is
 on the rail between the tripping means and
 the switch-point; substantially as described.

3. A switch-operating mechanism having a
 yielding switch-tripping device alongside of
 120 one of the rails, said tripping device being bow-
 shaped and having an inherent yielding tend-
 ency, said tripping device being pivoted, and
 means for automatically moving said tripping
 125 device away from the side of the rail and out
 of operative position; substantially as de-
 scribed.

4. A switch-operating mechanism having a
 tripping means distant from the switch-point,
 a bar located beside a track-rail and normally
 130

extending above the same, said bar being operative for rendering said tripping means inoperative when a car-wheel is on the rail between the tripping means and the switch-point, and means for moving the tripping means away from the side of the rail to prevent operation thereof; substantially as described.

5. A switch mechanism including a transversely-slidable switch-bar, means for preventing movement of the switch-bar including a bar connected to the switch-bar and having a vertically-swinging movement, said bar having notches in its lower edge, and devices for engagement with the notches to temporarily prevent movement of said bar; substantially as described.

6. A switch mechanism including a transversely-slidable switch-bar, means for preventing movement of said bar including a bar connected to the switch-bar and having a longitudinal and vertical movement, said bar having notches in its lower edge, rail-braces, rails supported by said braces, and means on the braces for engagement with the notches in the bar; substantially as described.

7. A switch mechanism including a switch-bar, a trip for actuating the switch-bar, means for preventing movement of the switch-bar including a bar having notches in its lower edge, rail-braces, means on the rail-braces for engagement with the notches in the bar, and a device adjacent to the side of one of the track-rails and connected to the trip to move it outwardly in an inoperative position; substantially as described.

8. A switch mechanism including a transversely-slidable switch-bar, means for preventing movement of the switch-bar including a bar having notches in its lower edge, means beneath the second-named bar for engagement with the notches, and a yielding connection between the second-named bar and the trip; substantially as described.

9. A switch mechanism including a transversely-slidable switch-bar, a trip for actuating the switch-bar, a notched bar connected to the switch-bar and movable into two positions for alternately permitting and preventing movement of the switch-bar, and devices for interlocking engagement with the bar to hold it against movement in either of the two positions; substantially as described.

10. A switch mechanism including a transversely-slidable switch-bar, a trip for actuating the switch-bar, a notched bar connected to the switch-bar and movable into two positions for alternately permitting and preventing movement of the switch-bar, and devices for interlocking engagement with the bar to hold it against movement in either of the two positions, said devices comprising a casting having an inverted-V-shaped engaging portion; substantially as described.

11. A switch mechanism including a trans-

versely-slidable switch-bar, a trip for actuating the switch-bar, a notched bar connected to the switch-bar and movable into two positions for alternately permitting and preventing movement of the switch-bar, and devices for interlocking engagement with the bar to hold it against movement in either of the two positions, said devices comprising a casting having an angular portion; substantially as described.

12. A switch mechanism including a transversely-slidable switch-bar, a trip for actuating the switch-bar, means for preventing movement of the switch-bar including a bar connected to the switch-bar and to the trip, means for setting the switch mechanism after each operation, and an outwardly-movable device connected to the trip to move it to an inoperative position; substantially as described.

13. A switch mechanism including a transversely-slidable switch-bar, a trip for actuating the switch-bar, and an outwardly-movable device connected to the trip to move it to an inoperative position; substantially as described.

14. A switch mechanism including a tripping means remote from the switch-points, means for preventing actuation of the tripping means, said second-mentioned means extending from a point between the tripping means and the switch-points to a point beyond the switch-points, and an outwardly-movable device connected to the trip to move it to an inoperative position; substantially as described.

15. A switch mechanism including a tripping means remote from the switch-points, means for preventing actuation of the tripping means, said second-mentioned means comprising a bar, the edge of which is adapted to contact with a wheel on the rail and extending from a point between the tripping means and the switch-points to a point beyond the switch-points, and an outwardly-movable device connected to the trip to move it to an inoperative position; substantially as described.

16. A switch mechanism including a tripping means remote from the switch-points, and a bar for preventing actuation of the tripping means, said bar having notches on one edge, and notch-engaging devices below the bar, the upper edge of said bar being arranged to contact with a car-wheel; substantially as described.

17. A switch mechanism including a tripping means remote from the switch-points, and a bar having connections with the switch-points to prevent movement thereof, said bar being yieldingly connected to the trip; substantially as described.

18. A switch mechanism including a tripping means remote from the switch-points, a spring-actuated means for operating the switch-points, a trigger mechanism coöperat-

ing with the spring-actuated means and co-operating with the tripping means, and a resetting mechanism operable before the switch mechanism is set, to reset the trigger mechanism; substantially as described.

19. A switch mechanism including a spring-operated means for closing a switch, a trigger mechanism for throwing the spring-operated means, a switch-stand including a shaft connected to the trigger mechanism, a handle for operating the shaft, and a resetting mechanism connected to the handle and operable before the switch mechanism is set, to reset the trigger; substantially as described.

20. A switch mechanism including a spring-operated means for closing a switch, a trigger mechanism for throwing the spring-operated means, a switch-stand including a shaft connected to the trigger mechanism, a handle for operating the shaft, and a resetting mechanism operable before the switch mechanism is set, to reset the trigger mechanism, said resetting mechanism comprising a bolt, a lever and a flexible connection between the lever and the handle; substantially as described.

21. A switch mechanism including a spring-operated means for closing a switch, a trigger mechanism for throwing the spring-operated means, a switch-stand including a shaft connected to the trigger mechanism, a handle for operating the shaft, and a resetting mechanism operable before the switch mechanism is set, to reset the trigger mechanism, said resetting mechanism comprising a bolt, a spring-controlled lever and a flexible connection between said lever and the handle; substantially as described.

22. A switch-operating mechanism including a switch-point-moving bar, a rocking and longitudinally-slidable rod connected to said bar, and means for actuating said rod; substantially as described.

23. A switch-operating mechanism includ-

ing a switch-point-moving bar, a rocking and longitudinally-slidable, spring-pressed rod connected to said bar, and means for actuating said rod; substantially as described.

24. A switch-operating mechanism including a switch-point-moving bar, a rocking and longitudinally-slidable rod connected to said bar, means for actuating said rod, a notched and slotted sleeve surrounding a portion of said rod, means on the rod for preventing movement thereof with relation to the sleeve, and means for moving the rod in the sleeve; substantially as described.

25. A switch-operating mechanism including a switch-bar, a spring-pressed rod connected to the switch-bar and having rocking and longitudinal movements, a sleeve fitting over one end of the rod and having a longitudinal slot with terminal notches, a projection on the rod movable in the slot and engageable with either of the notches, an operating means connected to the sleeve, means contactable with the projection on the rod to disengage it from one of the notches, and a bridge-piece over the other notch; substantially as described.

26. A switch mechanism including a spring-pressed bar connected to the switch-points, a trigger mechanism for preventing operation of the spring-pressed bar, a trip for the trigger mechanism, a rod connecting the trip and trigger mechanism, a protector-bar for preventing movement of the switch in one position of the bar, and a yielding connection between the rod and the bar; substantially as described.

In testimony whereof I hereunto affix my signature, in the presence of two witnesses, this 22d day of November, 1904.

GEORGE M. DERICKSON.

Witnesses:

B. F. FUNK,

GEORGE BAKEWELL.