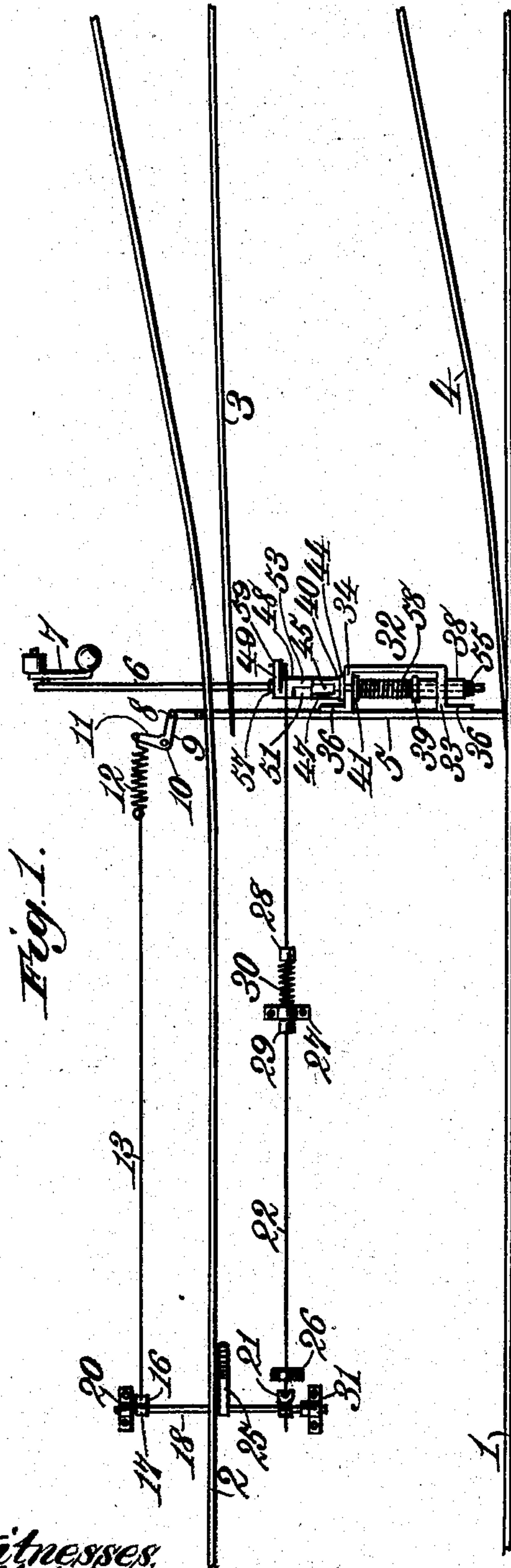


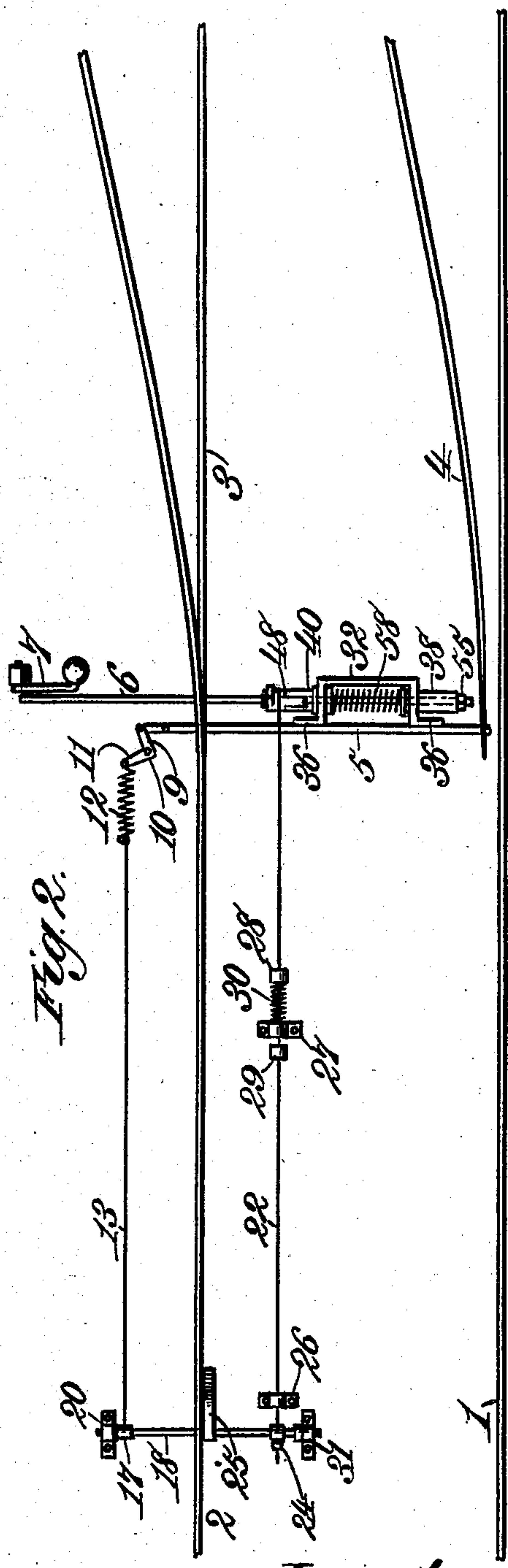
901,089.

J. N. FOWLER.
SWITCH THROWING MECHANISM.
APPLICATION FILED JAN. 8, 1908.

Patented Oct. 13, 1908.
2 SHEETS—SHEET 1.



Witnesses:
Robert G. Smith.
J. B. Keeler

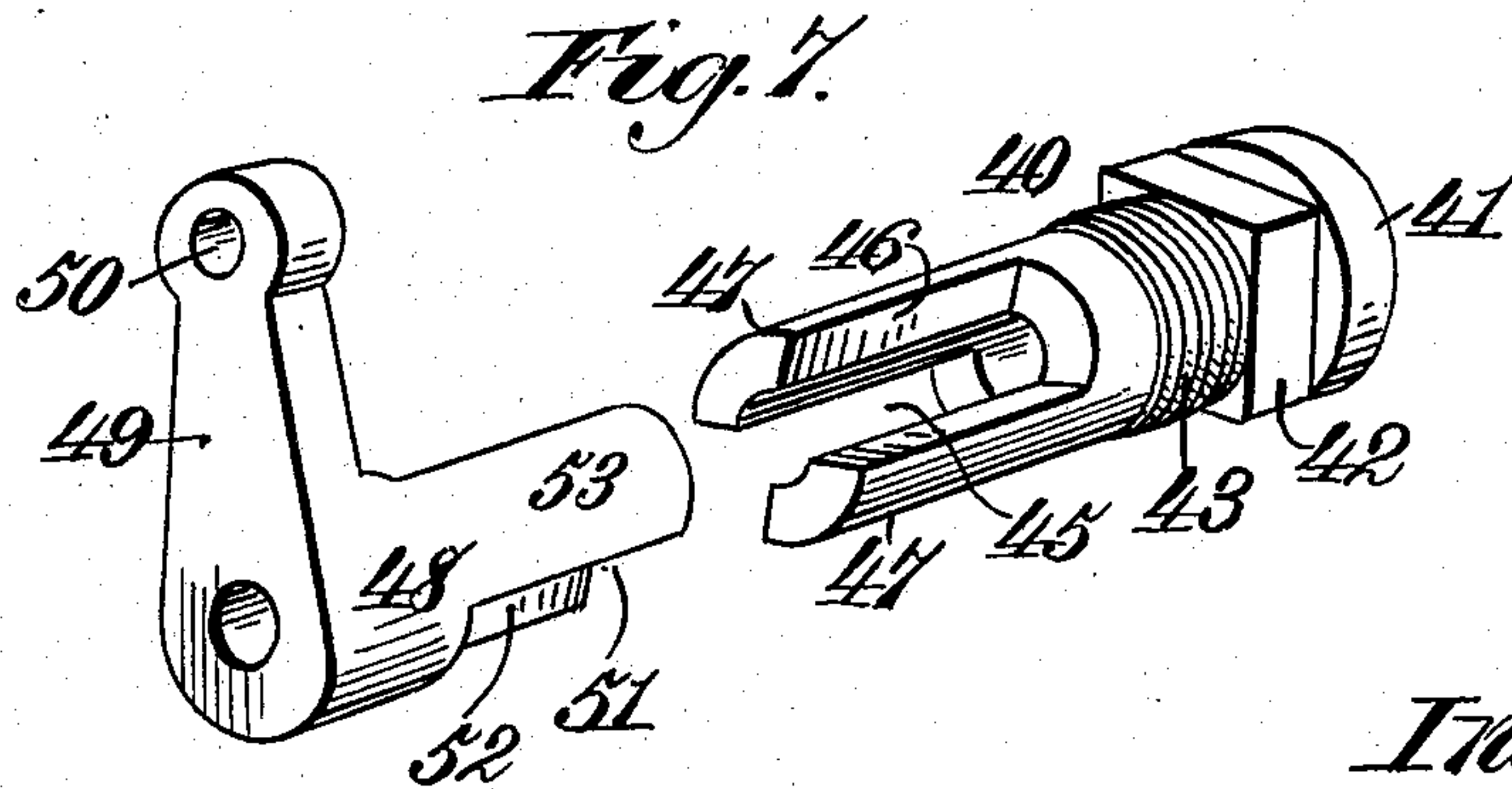
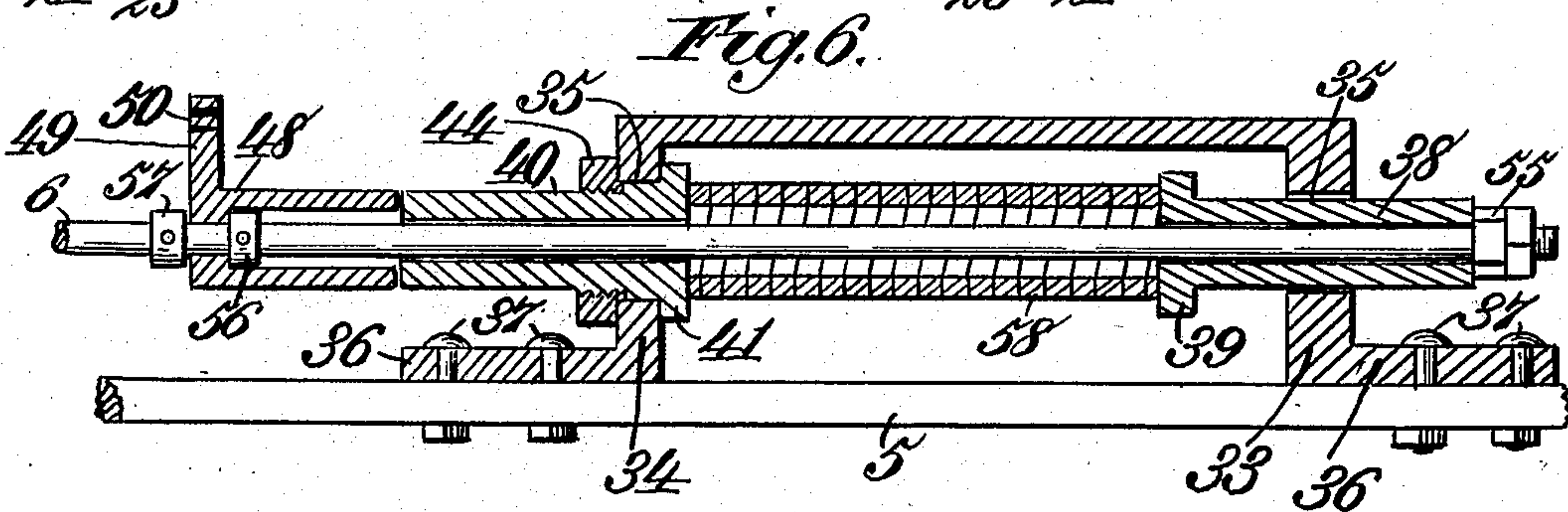
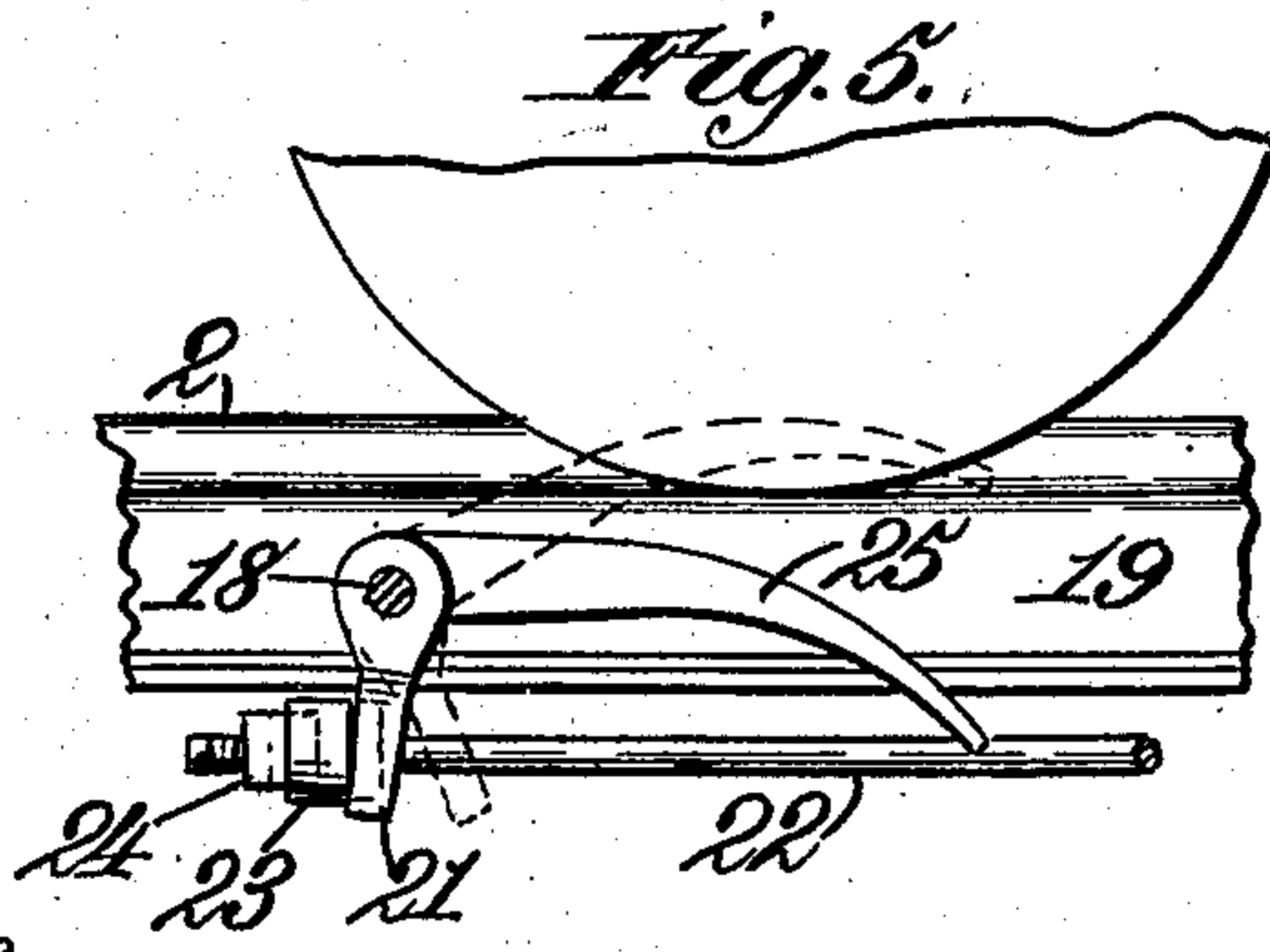
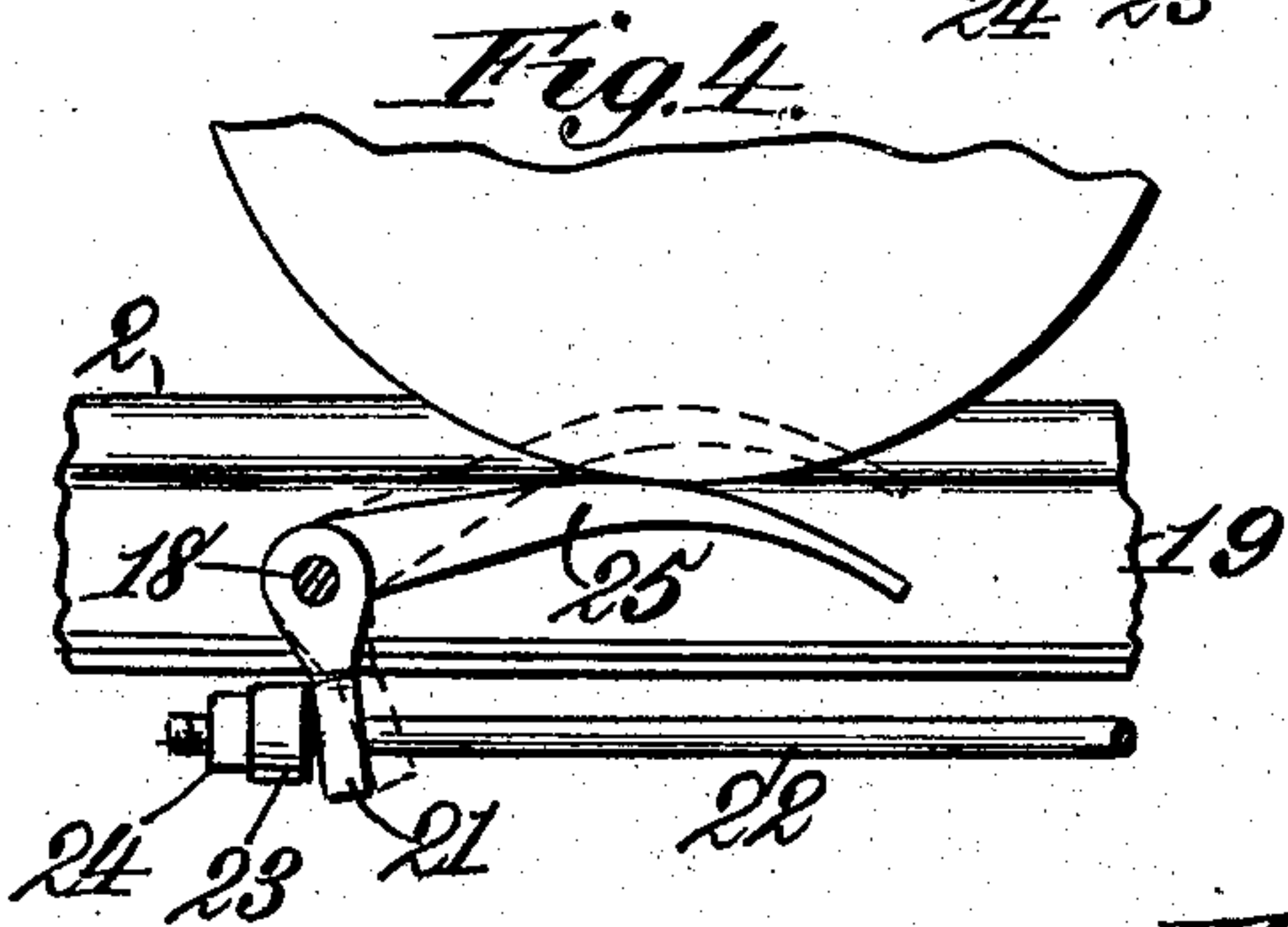
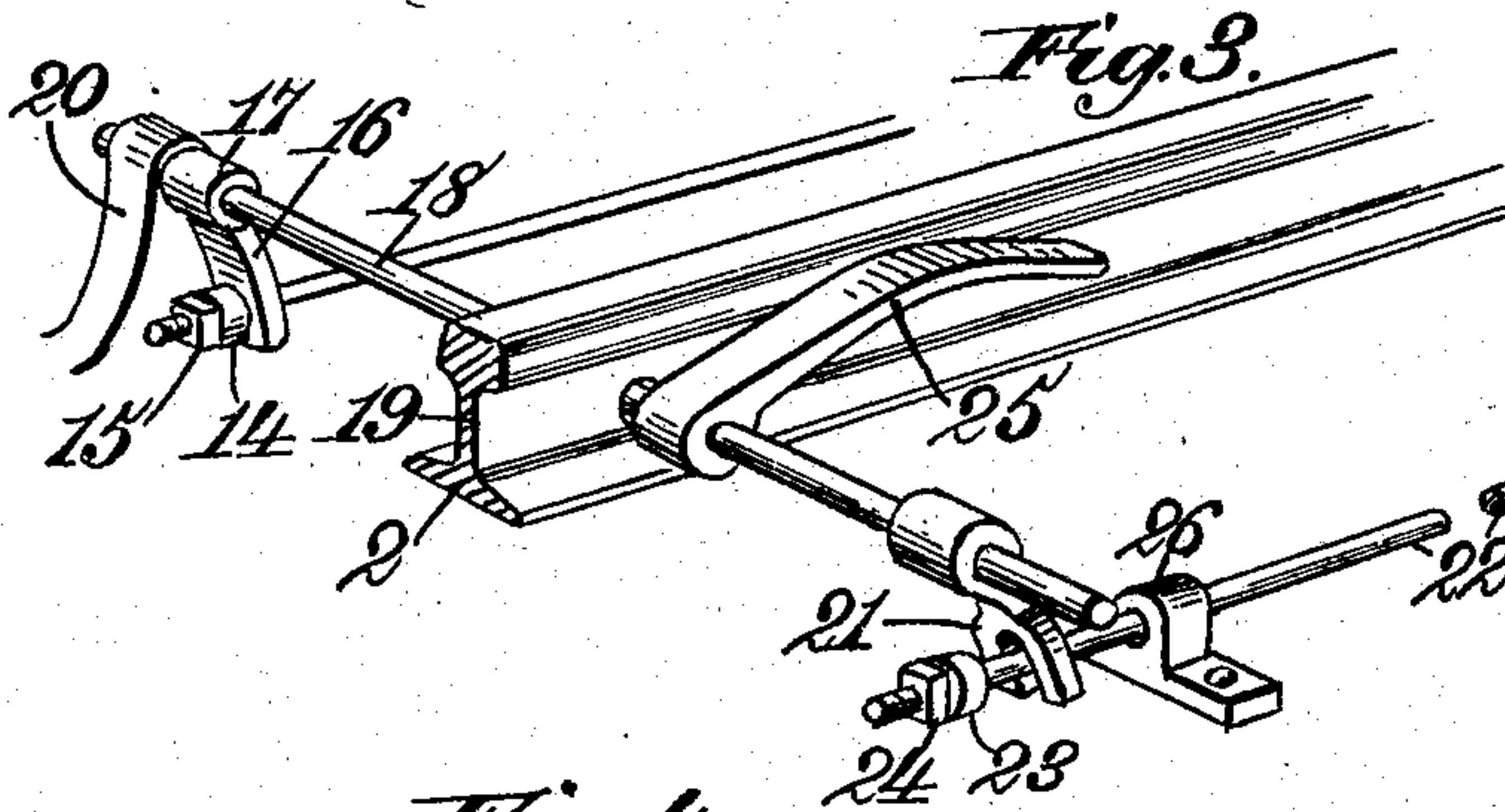


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Witnesses.
 Robert Smith.
 J. B. Keeler.

Inventor.
 James N. Fowler.
 By James L. Norris.
 Atty.

UNITED STATES PATENT OFFICE.

JAMES N. FOWLER, OF WASHINGTON, DISTRICT OF COLUMBIA, ASSIGNOR OF ONE-HALF TO JOSEPH WALDO, OF WASHINGTON, DISTRICT OF COLUMBIA.

SWITCH-THROWING MECHANISM.

No. 901,089.

Specification of Letters Patent.

Patented Oct. 13, 1908.

Application filed January 8, 1908. Serial No. 409,849.

To all whom it may concern:

Be it known that I, JAMES N. FOWLER, a citizen of the United States, residing at Washington, in the District of Columbia, have invented new and useful Improvements in Switch-Throwing Mechanism, of which the following is a specification.

This invention relates to switch mechanism for railways, and one of the objects thereof is to provide a switch mechanism in the manner as hereinafter set forth and cooperating and attached to the switch bar and which can be automatically operated to close the switch so as to prevent a train on the main track from entering the siding of which the switch forms a part.

A further object of the invention is to provide a switch throwing mechanism in a manner as hereinafter set forth which cooperates with the switch bar and comprising means actuated by the flange of a car or locomotive wheel when the car or locomotive is traveling at or above a predetermined rate of speed, whereby the switch bar will be shifted, carrying therewith a switch tongue so as to close the switch to prevent the car or locomotive on a main track from entering the siding of which the switch tongue forms a part.

Further objects of the invention are to provide a switch throwing mechanism which shall be simple in its construction, automatic in its operation, strong, durable, efficient in its use, readily set up with respect to the switch bar and inexpensive to manufacture.

With the foregoing and other objects in view, the invention consists in the novel construction, combination and arrangement of parts hereinafter more specifically described and illustrated in the accompanying drawings wherein is shown the preferred embodiment of the invention, but it is to be understood that changes, variations and modifications can be resorted to which come within the scope of the claims hereunto appended.

In describing the invention in detail, reference is had to the accompanying drawings in which:—

Figure 1 is a plan showing the adaptation of the switch throwing mechanism in connection with the switch tongue, the switch being open. Fig. 2 is a view similar to Fig. 1 with the switch closed. Fig. 3 is a perspective view, showing the trip arm adapted to be engaged by the flange of the car or locomotive wheel and actuated whereby the

mechanism will be released and the switch bar shifted, thereby closing the switch. Fig. 4 is a view of the trip arm showing the position it assumes when the car or locomotive is traveling below a predetermined rate of speed so that the mechanism will not be operated and the car or locomotive can be run on the siding. Fig. 5 is a view similar to Fig. 4, showing the position the trip arm assumes when the car or locomotive is traveling at or above a predetermined rate of speed whereby the mechanism is released and the switch tongue shifted to close the switch. Fig. 6 is a longitudinal sectional view of the throwing mechanism for the switch bar. Fig. 7 is a detail in perspective of the clutch forming a part of the switch bar throwing mechanism.

Referring to the drawings in detail, 1, 2 denote the rails of the main track; 3, 4 denote the switch rails; 5 the switch throwing bar which engages with the switch rails 3, 4; 6 denotes the switch throwing lever and 7 the switch stand.

The switch rails' throwing bar 5 extends to one side of the main rail 2 and has pivotally connected to its projecting end as at 8 one arm 9 of a bell crank lever. The bell crank lever is pivoted on a suitable support as at 10 and has its other arm 11 attached to one end of a cushioning spring 12. The other end of the spring 12 is attached to one end of a pulling bar 13 while the other end of the said pulling bar 13 carries a stop 14 secured in position by a nut 15. Straddling the pulling bar 13 in close proximity to the stop 14 is an actuating arm 16 for the said pulling bar 13, the arm 16 being formed integral with the collar 17 fixed to a rock shaft 18 which extends through the web portion 19 of the main rail 2. The outer end of the rock shaft 18 is journaled in the support 20. The inner end of the rock shaft 18 carries a depending forked shifting arm 21 for actuating and releasing the bar 22. The forked end of the arm 21 straddles the bar 22 in close proximity to one end thereof. That end of the bar 22 which is positioned in close proximity to the forked arm 21 carries a stop 23 secured in position by a nut 24. Fixed to the rock shaft 18 is an upwardly extending beveled trip arm 25 which projects in the path of the flange of the wheel of the car or engine and is adapted to be engaged by the flange of the wheel and depressed, the flange riding up one inclined

side of the trip arm 25 and then clear of the same. The construction of the trip arm 25 is such that that side which is first engaged by the flange of the wheel is of greater length 5 than the other side of the arm and the trip arm 25 is furthermore so designed that unless the car or engine is traveling at or above a predetermined rate of speed so that a sharp blow will be imparted to the trip arm, the free 10 end of the trip arm will not be lowered to a sufficient extent so as to rock the shaft 18 in a manner as to actuate the pulling bar 13 and the releasing bar 22 to such an extent as to release the throwing mechanism and the shifting of the bar 5. It is essential that the trip 15 arm be set up in the manner as stated so as to allow a train to enter a siding or switch if it is desired without causing the actuation of the switch throwing mechanism. If the train is 20 traveling below the predetermined rate of speed, the arm 21 will be pivoted to the position shown in Fig. 4, which is not of sufficient extent to cause the actuation of the bars 13 and 22.

25 The releasing bar 22 is slidably mounted in the bearing brackets 26, 27 arranged between the main rails 1 and 2 and the said bar 22 carries a pair of fixed collars 28, 29. Interposed between the bracket 27 and the collar 28 is an expansible spring 30, the function 30 of which is to have a constant tendency to return the bar 22 to its normal position. When the bar 22 is actuated by the forked arm 21, the spring 30 will be brought under a 35 state of compression so that when the bar 22 is released, the spring 30 will tend to cause the bar 22 to assume its normal position. The collar 28 constitutes an abutment for one end of the spring 30 while the collar 29 constitutes a stop for limiting the expansive action of the spring 30, the stop 29 being adapted 40 to engage the bracket 27 when the rod 22 is shifted through the medium of the spring 30. The spring 30 also constitutes a cushion 45 for the movement in one direction of the releasing bar 22. A bearing bracket 31 is provided for the inner end of the rock shaft 18, the bracket 31 being arranged in close proximity to the bracket 26.

50 The switch bar throwing mechanism which is normally locked but when released will actuate the switch bar transversely of the track bed and carry the switch rails 3 4 therewith to close the switch consists of a 55 yoke-shaped member 32 having the arms 33, 34 thereof each provided with an opening 35. Each of the arms 33, 34 is furthermore provided with a laterally extending flange 36 which are secured to the switch throwing bar 60 5 by the hold-fast devices 37. Extending through the opening 35 in the arm 33 is a sleeve 38 having its inner end terminating in an annular flange 39, the diameter of the sleeve 38 with respect to the opening 35 of 65 the arm 33 being such that the sleeve 38 can

slide through the said opening when occasion so requires. Fixed in the opening 35 of the arm 34 is a sleeve 40, constituting one member of a clutch. The said sleeve 40 has 70 its inner end formed with a laterally extending flange 41 which abuts against the inner face of the arm 34, is further provided with a square portion 42 which seats in the opening 35 in the arm 34 so that the sleeve 40 will not turn, and a screw-threaded portion 43 75 which receives the clamping nut 44, whereby the said sleeve 40 is fixedly secured to the arm 34 and the said sleeve is further provided with a series of slots 45, having beveled walls 46, the said slots 45 forming a series of 80 fingers 47. The other member of the clutch which associates with the sleeve 40 is indicated by the reference character 48 and consists of a cylindrical body portion having a crank arm 49 formed integral therewith, the 85 said arm having its free end provided with an opening 50. The member 48 is formed with a series of slots 51 having beveled walls 52, said slots forming a series of beveled fingers 53. The slots 45 in the sleeve 40 constitute 90 sockets to receive the fingers 53 while the slots 51 in the member 48 constitute sockets to receive the fingers 47. Extending through the member 48 and sleeves 40 and 38 is the switch throwing lever 6, the lever 95 projecting from the sleeve 38 and the member 48. That end which projects from the sleeve 38 carries a pair of clamping nuts 55 and the lever 6 is provided with a stop collar 56 positioned within the member 48 and the 100 said lever 54 is furthermore provided with a stop collar 57 positioned exteriorly of the member 48. By such an arrangement the member 48 is fixed from longitudinal movement upon the lever 34 and will move with 105 said lever when the latter is shifted. Surrounding the lever 6 and interposed between the flanges 39 and 41 is a closely coiled expansion spring 58, the body of the spring being substantially square in cross section so 110 that the coils will closely abut and furthermore so that when the spring is under a state of tension the switch throwing mechanism, lever 6 and bar 5 will be substantially solid. The crank arm 49 is connected to the releasing 115 bar 22 as at 59.

The normal position of the parts is as that shown in Fig. 1, the spring 58 being under a state of tension, the member 48 having its fingers 53 abutting against the fingers 47 of 120 the sleeve 40. If the trip arm 25 receives a blow from the flange of the wheel of a passing train so as to cause the arm 25 to assume the position shown in Fig. 5, the releasing bar 22 will be pulled in a direction away from the 125 switch bar 5 owing to the rocking of the shaft 18. The same action will be had with respect to the bar 13, the spring 12 compensating for any quick movement of the pull crank lever which is connected to the bar 5. When 130

the releasing bar 22 is shifted in the direction stated, such movement of the bar 22 will be had against the action of the spring 30. When the bar 22 is shifted in the direction
 5 stated, it will rock or rather turn the sleeve upon the switch throwing lever 6 and allow the fingers 53 to pass into the notches 45 of the sleeve 40 and the fingers 47 to pass into the notches 51 of the member 48, the throwing
 10 spring 58 will be released, which exerting its force upon the sleeve 40 will shift the yoke 32, the latter in turn shifting the bar 5, the bar 5 being also assisted in its shifting movement through the action of the bar 13 rock-
 15 ing the bell crank lever. When the member 48 is shifted with respect to the sleeve 40 so that they can inter-engage, as clearly shown in Fig. 2, the parts will assume the position shown in Fig. 2 and the switch rails will be
 20 thrown as will be evident. The parts will remain in the position shown in Fig. 2 until manually shifted through the operation of the switch stand and throwing lever 6. In this particular, it will be stated that the
 25 lever 6 is actuated, which will carry the member 48 therewith, causing a disengagement of the fingers 47 and 53. The shifting of the member 48 in the manner as stated will be had against the expansive force of the
 30 spring 30 so that when the fingers 53 are clear of the fingers 47, the member 48 will be turned on the lever 6, the movement of the releasing bar 22 when turning the member 48 being limited by the stop 29. At the limit of
 35 the turning movement of the member 48 through the action of the expansive force of the spring 30, the fingers 47, 53 will be caused to assume an abutting position with respect to each other, as clearly shown in Fig. 1. No
 40 movement of the switch bar 5 and switch rails 3, 4 will be had during the resetting of the parts in a manner as just referred to. This will be evident as the direction in which the lever 6 is moved to re-set the parts is such
 45 as to close the switch. The parts having been brought to the position just stated, the lever 6 is shifted in the opposite direction which causes a compression of the spring 58 between the flanges 39 and 41 owing to the
 50 fact that when the lever 6 is thrown in the opposite direction, it will cause the bar 5 to move transversely in a direction towards the main rail 1. The yoke 32 sliding upon the sleeve 38 will owing to the flange 41 cause a
 55 compression of the spring 58 between the flanges 39 and 41.

What I claim is:—

1. A switch throwing device comprising a normally locked actuating mechanism for a
 60 switch throwing bar, a rock shaft, means operated by the rock shaft for releasing said mechanism, and means connected with the rock shaft and extending in the path of the flange of a wheel and adapted when the wheel
 65 is traveling at or above a predetermined rate

of speed to actuate the rock shaft to an extent to operate the releasing means.

2. A switch throwing device comprising a normally locked actuating mechanism for a
 70 switch throwing bar, a rock shaft, means operated by the rock shaft for releasing said mechanism, means connected with the rock shaft and extending in the path of the flange of the wheel and adapted when the wheel is traveling at or above a predetermined rate of speed
 75 to actuate the rock shaft to an extent to operate the releasing means, and connections between the rock shaft and the switch throwing bar, whereby the movement of said bar to throw the switch is facilitated when the
 80 throwing mechanism is released.

3. A switch throwing device comprising the combination with a switch throwing bar, of an actuating mechanism for said bar embodying an expansive element, said mechanism
 85 fixedly connected to the bar and positioned between the rails of the track, locking means for normally maintaining said expansive element under a state of compression, a rock shaft, means operatively connected with
 90 said rock shaft and with said locking means for operating the latter when the rock shaft is operated, thereby releasing the expansive element and causing the actuation of said bar, means carried by the rock shaft and
 95 adapted to extend in the path of a flange of a wheel and adapted to be engaged and actuated by the flange of the wheel when the latter is traveling at or above a predetermined rate of speed, whereby the rock shaft is
 100 moved to an extent to operate the means to release the locking means.

4. A switch throwing device comprising the combination with a switch throwing bar, of an actuating mechanism for said bar embodying an expansive element, said mechanism
 105 fixedly connected to the bar and positioned between the rails of the track, locking means for normally maintaining said expansive element under a state of compression, a rock shaft, means operatively connected with
 110 said rock shaft and with said locking means for operating the latter when the rock shaft is operated thereby releasing the expansive element and causing the actuation of said bar, means carried by the rock shaft and adapted
 115 to extend in the path of a flange of a wheel and adapted to be engaged and actuated by the flange of the wheel when the latter is traveling at or above a predetermined rate of speed whereby the rock shaft is moved to an
 120 extent to operate the means to release the locking means, and a pulling mechanism operatively connected with the rock shaft and with said bar to facilitate the shifting movement of the latter to throw the switch when the expansive element is released.

5. A switch throwing mechanism comprising the combination with a switch throwing
 130 bar and the switch rails engaged thereby, of a

switch throwing lever, a yoke fixed to the bar, a pair of sleeves upon the lever, said yoke slidably mounted upon one of said sleeves and fixed to the other, an expansible spring interposed between the sleeves and surrounding the lever, a shiftable member mounted upon and carried with the lever and adapted to engage one of said sleeves thereby retaining said spring under a state of compression, said sleeve and that sleeve with which it cooperates provided with means whereby said spring can be released, a rock shaft, an actuating connection between the rock shaft and the switch throwing bar, an actuating connection between said member and said shaft, and means carried by the shaft and adapted to be engaged by the flange of the wheel for rocking the shaft.

6. A switch throwing device comprising a normally locked actuating mechanism for a switch throwing bar positioned between the rails of a main track, a rock shaft extending between the rails of the main track, means operated by the rock shaft for releasing said mechanism and carrying a stop device whereby the operation of said means is limited, and means carried by the rock shaft and arranged between the rails of the main track and extending in the path of the flange of a wheel and adapted when the wheel is traveling at or above a predetermined rate of speed to actuate the rock shaft to an extent whereby the said releasing means is operated to release the actuating mechanism.

7. A switch throwing device comprising the combination with a switch throwing bar engaging switch rails, a normally locked actuating mechanism for shifting said bar thereby closing the switch, a rock shaft, an operative connection between the rock shaft and said mechanism for releasing the latter when the rock shaft is shifted in one direction, and means connected with the rock shaft and extending in the path of the flange of a wheel and adapted when the wheel is traveling at or above a predetermined rate of speed to shift the rock shaft to an extent to actuate said operative connection.

8. A switch throwing device comprising the combination with a switch throwing bar

engaging switch rails, a normally locked actuating mechanism for shifting said bar, thereby closing the switch, a rock shaft, an operative connection between the rock shaft and said mechanism for releasing the latter when the rock shaft is shifted in one direction, means connected with the rock shaft and extending in the path of the flange of a wheel and adapted when the wheel is traveling at or above a predetermined rate of speed to shift the rock shaft to an extent to actuate said operative connection, and a switch throwing lever for shifting the switch rails independently of the actuating mechanism and for restoring said actuating mechanism to its normal position and to open the switch.

9. In a switch throwing device, the combination with a switch throwing lever and a switch throwing bar, of a normally locked actuating mechanism for the bar connected thereto and mounted upon said lever and embodying an expansive member for shifting the bar to close the switch when said mechanism is released, and means operated by the flange of the wheel for releasing said mechanism when the wheel is traveling at or above a predetermined rate of speed.

10. In a switch throwing device, the combination with a switch throwing lever and a switch throwing bar, of a normally locked actuating mechanism for the bar connected thereto and mounted upon said lever and embodying an expansive member for shifting the bar to close the switch when said mechanism is released, means operated by the flange of the wheel for releasing said mechanism when the wheel is traveling at or above a predetermined rate of speed, and means whereby said mechanism is returned to normal position by said lever for opening the switch.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

JAMES N. FOWLER.

Witnesses:

CHAS. S. HYER,
N. LOUIS BOGAN.