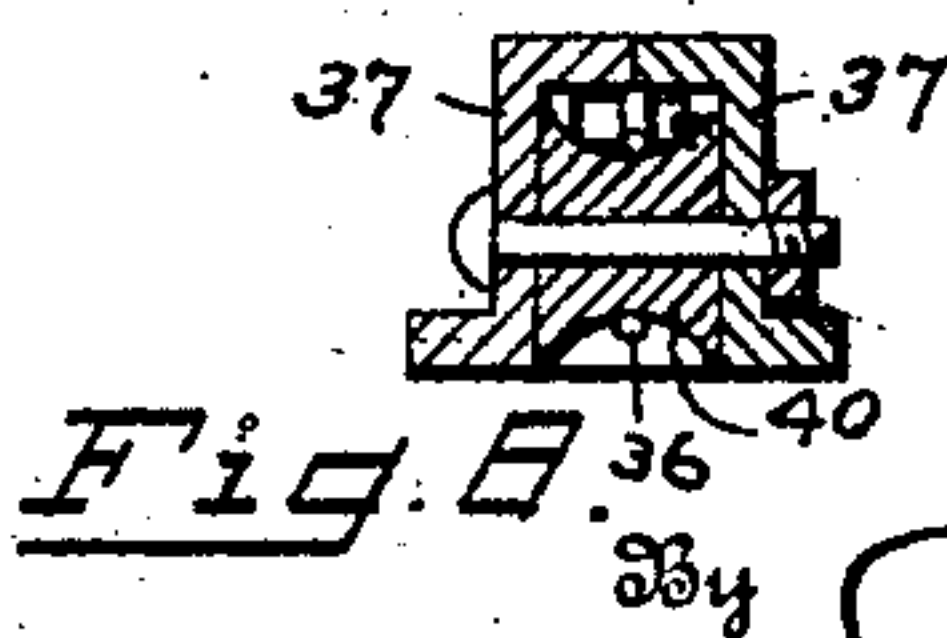
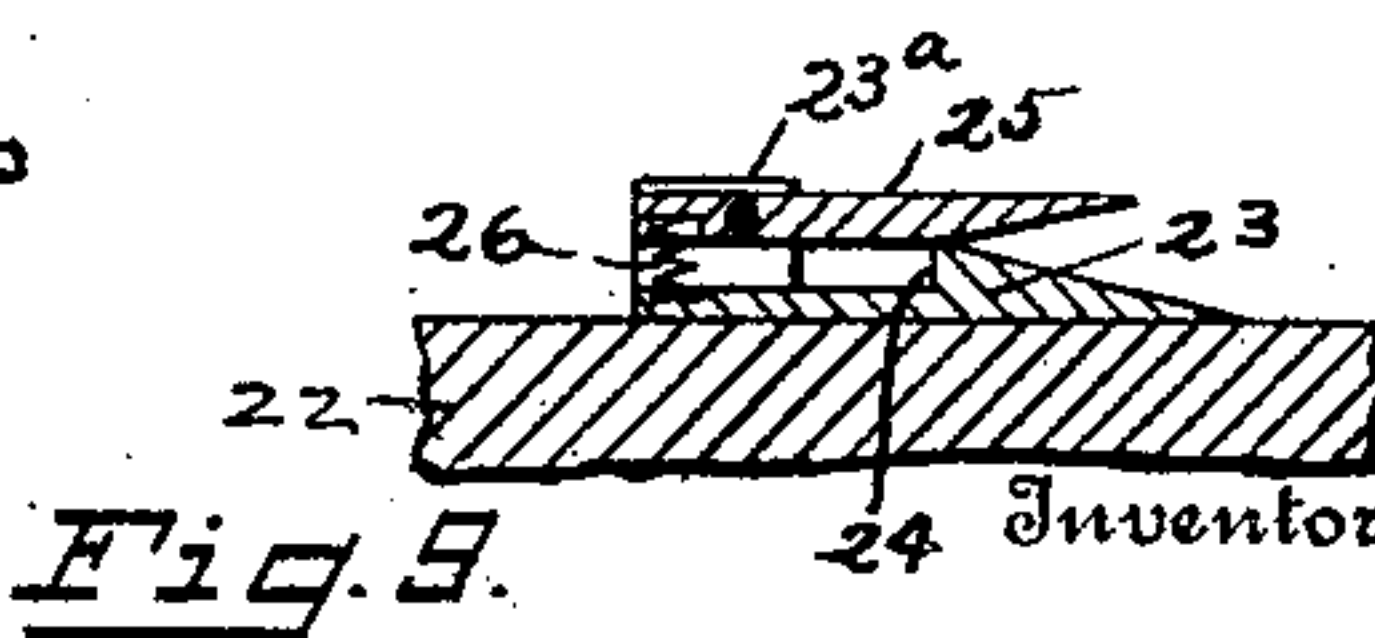
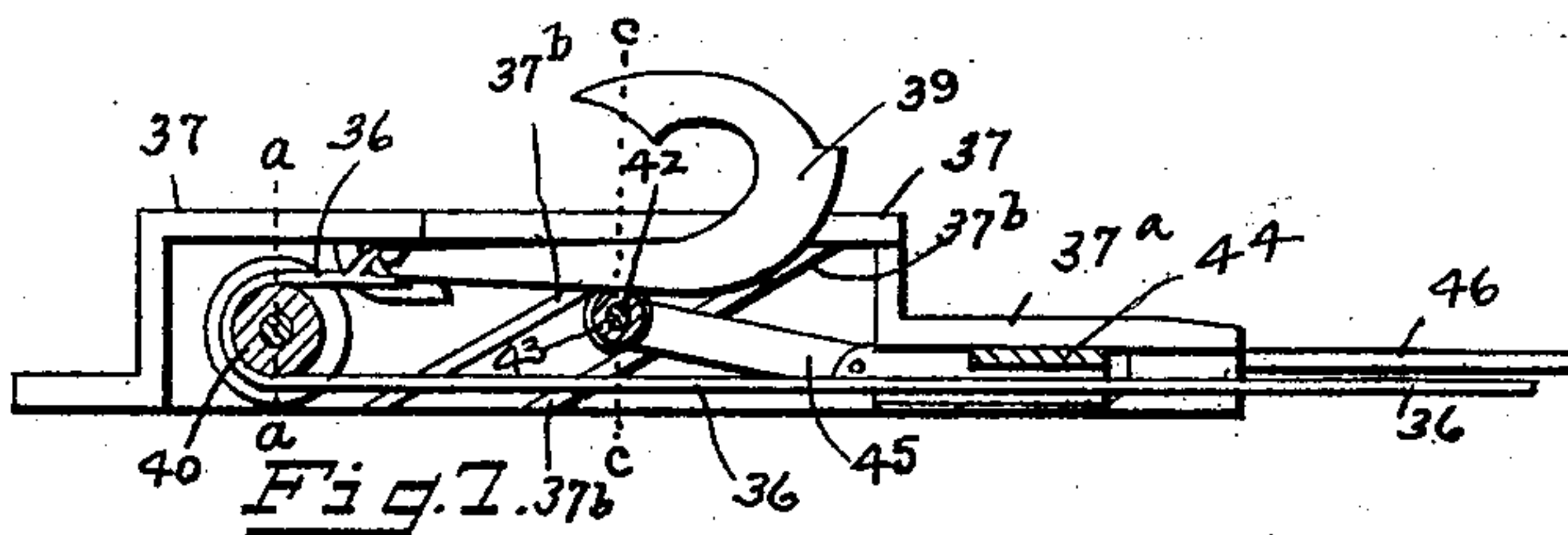
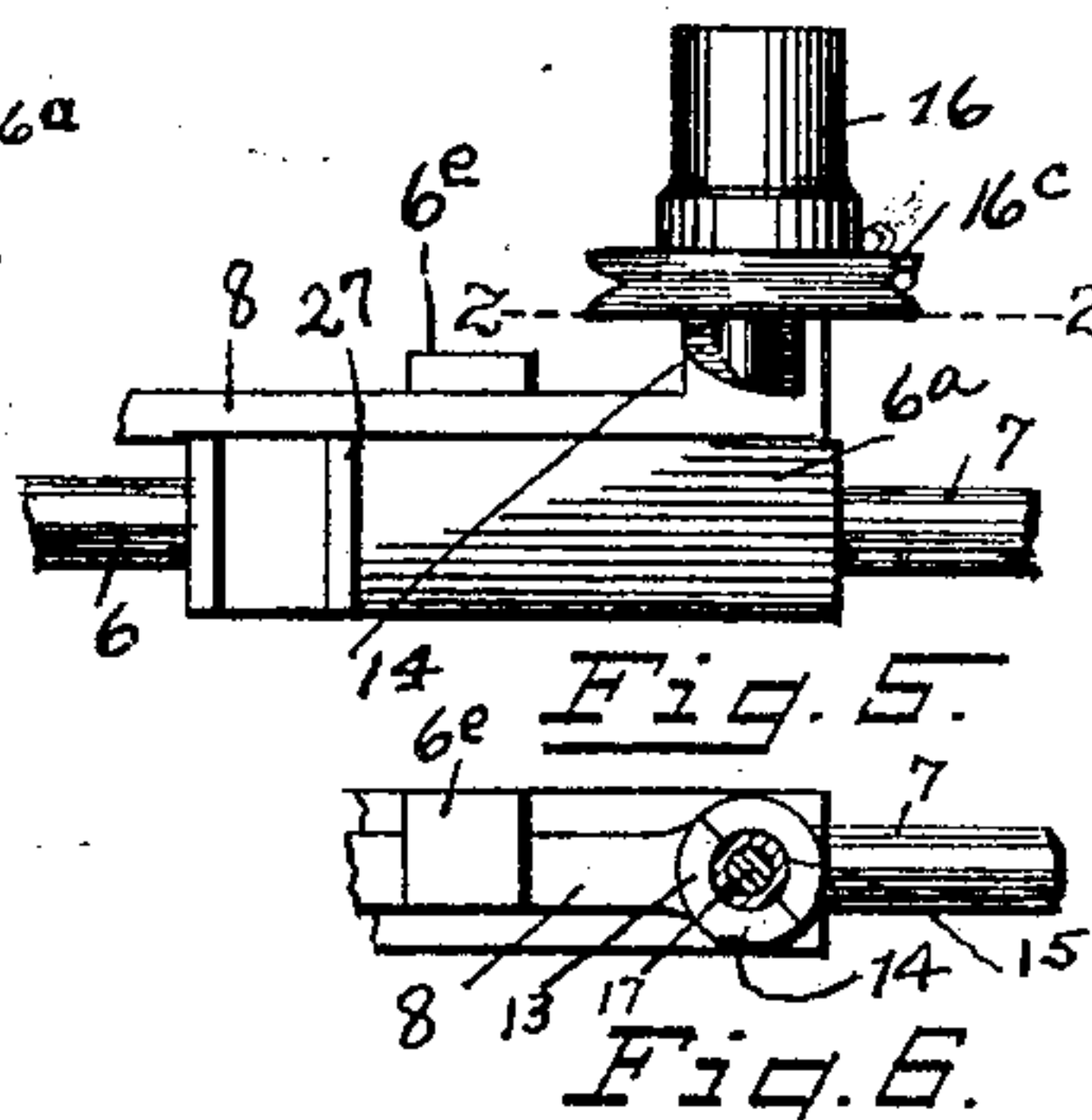
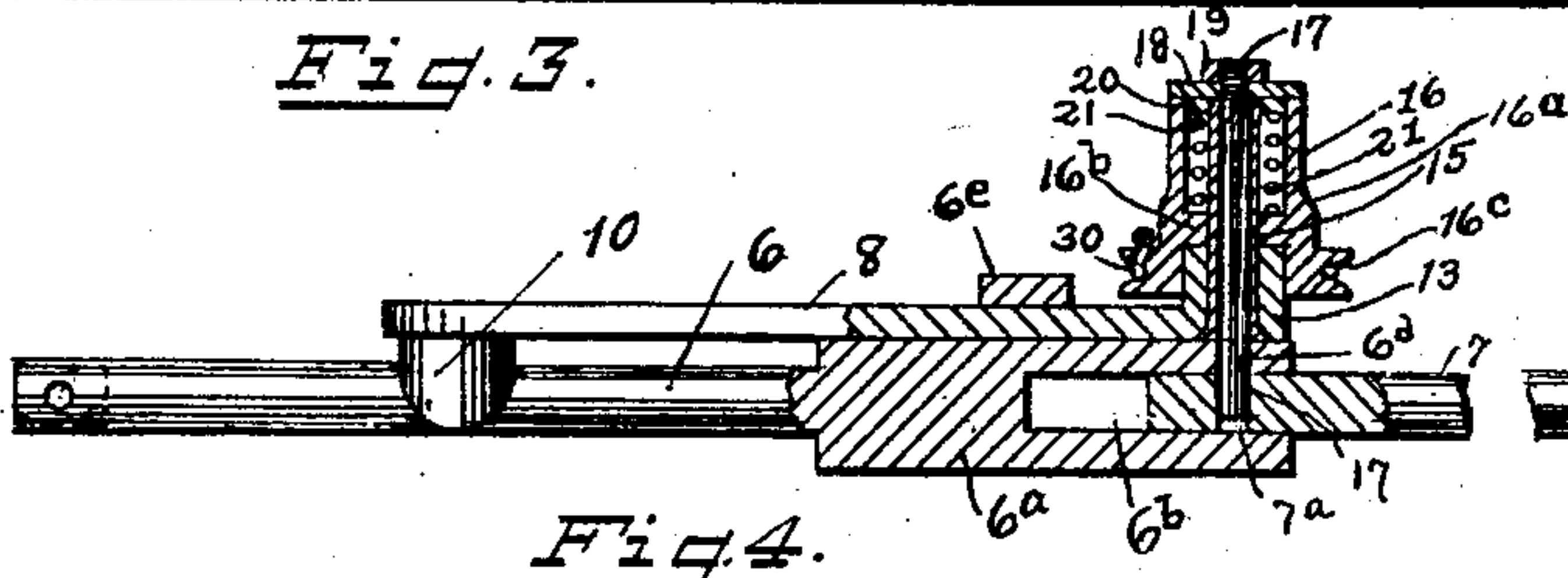
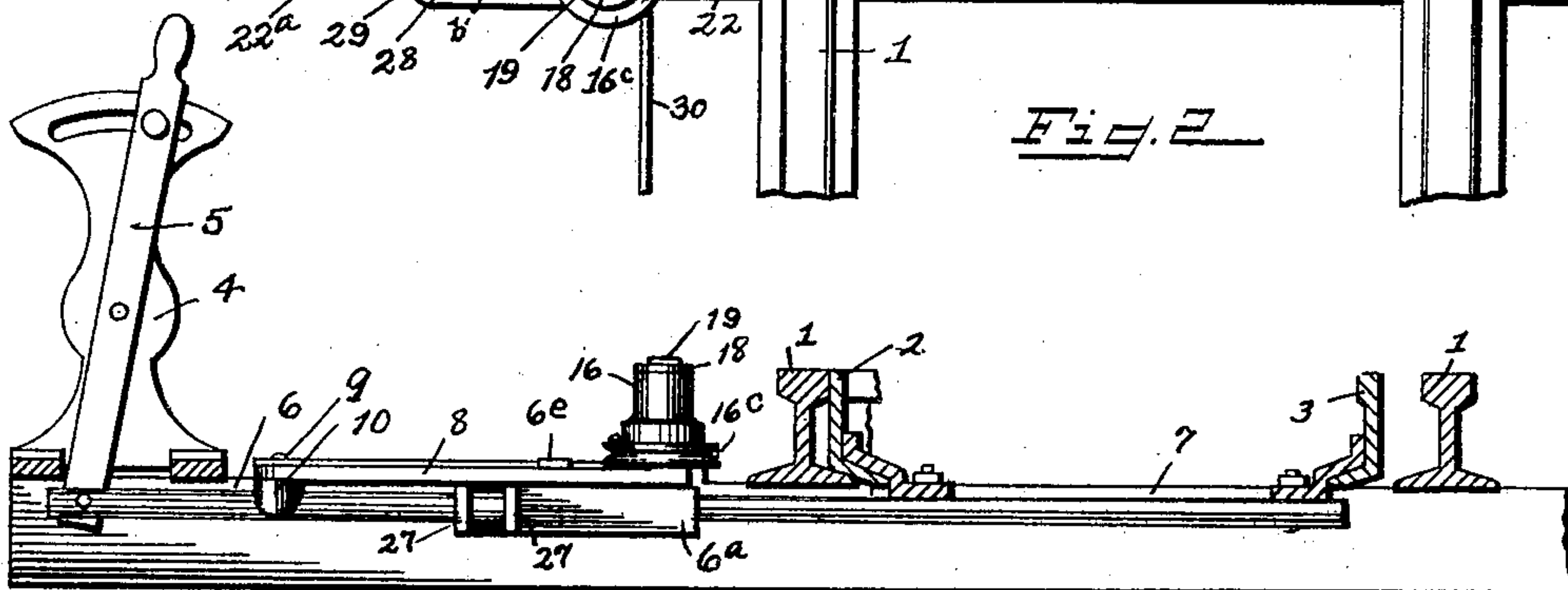
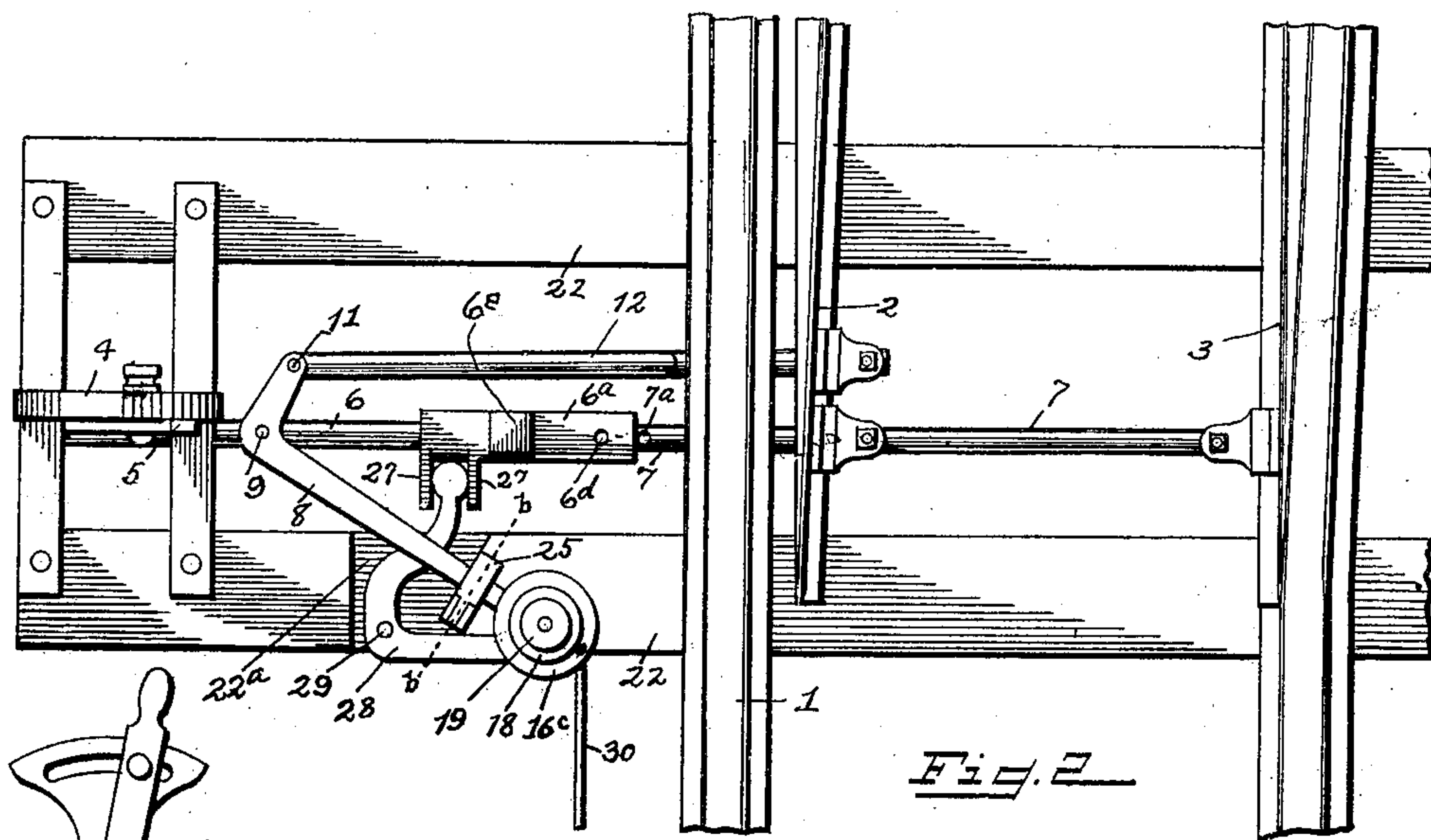


J. P. BLACKWOOD.
RAILWAY SWITCH OPERATING MECHANISM.
APPLICATION FILED JUNE 16, 1908.

923,803.

Patented June 8, 1909.

2 SHEETS—SHEET 2.



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RAILWAY-SWITCH-OPERATING MECHANISM.

No. 923,803.

Specification of Letters Patent.

Patented June 8, 1909.

Application filed June 16, 1908. Serial No. 438,706.

To all whom it may concern:

Be it known that I, JOHN P. BLACKWOOD, a citizen of the United States, residing at Athens, in the county of Athens and State of Ohio, have invented certain new and useful Improvements in Railway-Switch-Operating Mechanism, of which the following is a specification.

My invention relates to the improvement of switch operating mechanism and the objects of my invention are to provide improved means for locking the switch rails of a railway track in an open or closed position; to provide improved means for automatically closing a switch by the approach of a train; to provide improved means for resetting the switch and its operating mechanism by hand and to produce other improvements the details of which will be more fully pointed out hereinafter. These objects I accomplish in the manner illustrated in the accompanying drawings, in which—

Figure 1 is a plan view of a section of railway showing my improved switch operating mechanism in position for operation, Fig. 1^a is a horizontal longitudinal section of a cable clamping member which I employ in the manner hereinafter described and which is shown in plan in Fig. 1 of the drawing, Fig. 2 is a plan view of portions of the track and switch rails showing the position of the switch rail operating mechanism when the main track is cleared, Fig. 3 is a sectional view on line *x—x* of Fig. 1, Fig. 4 is an enlarged view partly in section and partly in side elevation of the locking mechanism, Fig. 5 is a side elevation of the switch rod locking device showing the position of the parts when the locking pin is raised, Fig. 6 is a transverse section on line *z—z* of Fig. 5, Fig. 7 is a central longitudinal section through the trip mechanism, Fig. 8 is a transverse section on line *a—a* of Fig. 7, Fig. 9 is an enlarged section on line *b—b* of Fig. 2, Fig. 10 is a transverse section on line *c—c* of Fig. 7, and Fig. 11 is a detail view in perspective of a yoke-shaped body which I employ in the manner herein-
after described.

Similar numerals refer to similar parts throughout the several views.

1 represent the main track rails of a rail-

way and 2 and 3 the tapering switch rails thereof which may be of the usual construction and arrangement. At the side of the track, I provide a suitable form of upright switch stand 4 having a pivoted operating lever 5. With the lower end of this lever is pivotally connected one end of a switch rod section 6, said switch rod section having its inner end portion formed with a squared enlargement 6^a which enlarged portion is provided with an end socket 6^b.

7 represents a switch connecting and operating rod section, the outer end of which is adapted as shown more clearly in Fig. 4 of the drawing, to be inserted and held in the socket 6^b of the rod 6.

8 represents an angular lever which at the junction of these arms is pivoted, as shown at 9, to a boss 10 which rises from the upper side of the switch rod section 6. The shorter arm of the lever 8 is pivoted at 11 to the outer end of a switch operating rod 12, the latter extending, as shown, beneath one of the main track rails 1 and being suitably connected with the switch rail 2. The longer arm of the lever 8 is adapted when the switch rail 2 is closed against the main track rail, to lie beneath a keeper projection 6^c on the upper side of the rod enlargement 6^a and the outer end portion of said lever arm is provided, as shown more clearly in Fig. 4 of the drawing, with an upright tubular termination 13 and this tubular member has its upper end spirally inclined or recessed as indicated at 14 in Figs. 5 and 6 of the drawing. Fixed within the tubular boss or projection 13 is the lower portion of a vertical tube member 15 which rises above said projection 13.

16 represents a cap-like locking member which comprises a casing body 16^a having an internal horizontal partition 16^b near its lower end and having formed on its outer side and lower end portion a pulley or sheave wheel 16^c. The casing thus formed is adapted, as shown, to surround the tube member 15, the lower side of the partition 16^b bearing upon the spirally inclined upper surface of the boss 13. Through the tube 15 passes a locking pin 17, this locking pin being adapted, as shown, to extend downward through an opening 6^d in the upper portion of the rod enlargement 6^a, thence

into a vertical opening 7^a in the outer end portion of the rod 7. The pin 17 has its upper threaded end passing through a disk 18 which forms a top for the cap body 16, said threaded pin end having a nut 19
 5 screwed on its outer end. In the upper end of the casing 16^a and against the underside of the cap plate 18 is a follower 20 between which and the upper side of the partition 16^b is provided a coiled spring 21, which exerts
 10 an upward pressure on the cap body 16.

Upon an extension of one of the railway ties 22, I provide a lever engaging device or catch, which comprises a fixed plate 23 having a transverse upper side shoulder 24
 15 from which said plate inclines forwardly and downwardly. The hook-like plate thus formed has its outer end formed with upwardly projecting parallel lugs 23^a between which is pivoted the rear portion of a catch member 25, the outer end portion of which
 20 has its underside inclined upwardly as shown more clearly in Fig. 9 of the drawing. The member 25 in rear of its inclined portion, normally bears upon the upper side of the plate shoulder 24 in which position the
 25 member 25 is held by means of a suitable spring 26 which is interposed between the rear portions of said members.

In forming the enlarged portion 6^a of the rod 6, I provide said enlarged rod portion with two laterally projecting ears 27 within
 30 which is inserted the rounded extremity of one arm of a bell crank lever 28, said lever being pivoted at 29 within an upper side recess 22^a of said tie extension. As shown
 35 more clearly in Figs. 1 and 2 of the drawing, the rod section 7, is suitably connected with the switch rail 2 from which it is extended to and connected with the switch
 40 rail 3.

With one side of the sheave wheel is connected one end of a flexible cable 30 which is adapted to wind on said wheel and which
 45 extends therefrom in the direction of the length of the track. The outer end of the cable 30 is connected with one end of a wire yoke 31 which is surrounded by a coiled spring 32 the outer end of said spring being
 50 engaged by the outturned ends of the yoke arms and the opposite end thereof being engaged by the outturned ends of a yoke 33 which extends within the yoke 31. The outer end of the internal yoke member 33 engages
 55 a hook or coupling link 34 which in turn engages one end of a cable coupling or clamping member 35. The cable clamp comprises two elongated sections such as are indicated at 35^a, the rear portions of which
 60 are, as shown more clearly in Fig. 1^a of the drawing, riveted together. Each of the sections 35^a has its outer end portion enlarged to form two clamping jaws 35^b, and the terminal portion of each of said jaws is so
 65 inclined on its inner face as to produce a

flaring mouth 35^c. The inner surfaces of the enlarged portions of the sections 35^a are recessed as indicated at 35^d, this recess being adapted to receive and engage an enlargement 36^a on the end of a section of cable 36
 70 which is adapted to be embraced between the jaws 35^b.

Secured upon tie extensions adjacent to one of the main track rails at a suitable distance from the switch operating mechanism,
 75 I provide a trip housing which preferably consists of two oblong housing sections 37, the forward portion of which as indicated at 37^a, is formed with a reduced extension projecting through a slotted opening 38 in the
 80 upper side of the housing 37 is the rearwardly turned forward end of a trip hook or trigger 39. Within the housing, the longer arm of the trip hook is connected at its rear end with the rear end of the cable 36
 85 which passes about a pulley or grooved wheel 40 journaled between the sides of the sections 37, and thence extends forwardly through the reduced portion of the housing and terminates in the end enlargement 36^a
 90 which is engaged by the jaws 35^b as hereinbefore described.

On the inner surfaces of the side walls of the housing sections 37 are formed parallel and opposing ribs 37^b which incline rearwardly and downwardly, forming a channel
 95 or run-way for guide wheels 41 on the ends of a transverse shaft 42 which shaft carries a central roller 43 upon which the underside of the trip body 39 bears. In the reduced portion 37^a of the housing, I provide a yoke-shaped member 44 (see Figs. 11 and 4)
 100 which is slidably mounted in said housing extension and which has its rearwardly extending arms, pivotally connected with the parallel bars of a link 45, the rear ends of which are pivoted on the shaft 42. With the yoke 44 is connected one end of a rod 46
 105 which extends outward through an opening in the housing extension 37^a and is connected with the outer arm of the angular lever 28.

In order to describe the operation of my invention, we will assume that the parts are in the position indicated in Fig. 1 of the drawing, that is, with the switch in the open
 115 position or in position for returning a train from the main track on to the side track rails, in which position the longer arm of the lever 8, will extend beneath the keeper projection 6^c and the cap 16 is in its lowered or
 120 locked position. Assuming that a train is approaching the trip in the direction of the arrow indicated in Fig. 1, and that the pilot or engine of said train is provided with a suitable projection, said projection will come
 125 into contact with the hook termination of the trip or trigger 39, resulting in pulling said trigger forward with such force as to unwind the previously coiled cable 30 from the sheave wheel 16^c, which unwinding ac-
 130

tion not only operates to rotate the cap 16 and thereby raise it on the spiral incline of the tubular projection 13 until the pin 17 is out of engagement with the rod 7, but to pull the longer arm of the lever 8 outward until said lever arm enters the catch formed by the members 23 and 25 and drops into engagement with the shoulder 24 thereof. In this operation it will be observed that not only is the rod 7 released, but that a longitudinal movement is imparted to the rod 12, which results in moving the switch rail 2 out of contact with the adjacent main track rail and in moving the switch rail 3 into contact with the opposite main track rail, thus providing a clear main trackway for the train. The pull on the cable 36 is continued, however, until the flaring jaws 35^b come into contact with the end of the reduced portion 37^a of the trip housing and are spread apart thereby sufficiently to provide a disengagement of the enlargement 36^a of the cable 36 and the jaw members 35^b. It is obvious that the spring connection heretofore described between the coupling hook 34 and cable 30 will serve to cushion the connected parts against the effects of a shock or sudden jar which might otherwise be occasioned by the contact of the locomotive projection with the trip when said locomotive is running at a comparatively high rate of speed.

It is obvious that the switch rails and trip may be reset after the passage of a train, to the positions shown in Fig. 1 of the drawing, by first disengaging the arm of the lever 8 from the latch 23, then releasing the switch lever 5 and moving the upper end of the latter outward, resulting in an inward movement of the rod 6 until the opening 7^a in the rod 7 is again beneath the opening 6^a of the enlargement 6^a and also resulting in the longer arm of the lever 8 swinging until the pin 17 is free and permitted to drop through the opening 6^a into the opening 7^a. The switch lever 5 may now be moved to throw the switch rod 6 outward resulting in the desired coiling of the cable 30 on the sheave wheel 16^c, after which the cable 36 may be connected with the clamping jaws of the clamp 35^a. The last described movement of the switch lever also results in the drawing of the rods 12 and 7 and 6 outward and in a closing of the switch rail 2 against the adjacent rail 1. In this operation it is obvious that the outward movement of the enlargement 6^a of the rod 6, will result in such swinging movement of the angular lever 28 as to cause through the rod 46 an inward sliding movement of the yoke 44 and a consequent upward movement of the wheels 41 and shaft 43, thereby raising the hook termination of the trigger 39 into position for again contacting with a projection of a locomotive pilot.

From the construction and operation described, it will be seen that reliable and effective means are provided for automatically closing the switch which may have been left open through carelessness, thereby averting a possible accident.

It will be observed that the switch locking and controlling mechanism which I have shown and described, is located on what may be termed the left-hand side of the track and it is obvious that for use on the opposite side of the track, a similar mechanism might be employed, the only difference in operation required being that the switch rail 3 be forced away from the main track rail instead of drawn toward the latter. As will be readily understood the only difference in construction required for this purpose, would be the reversal of the lever 8.

What I claim, is:

1. In a switch operating mechanism, the combination with railway track and switch rails, of a switch rod, a switch rail connecting rod, a locking device detachably connecting said rods, a bell crank lever connected with said locking device and pivoted to said switch rod, a second switch rod connecting one of said switch rails with said bell crank lever, a trip adjacent to the railway track, and connections between said trip and said rod locking device whereby contact with said trip releases said locking device and moves said bell crank lever on its pivot.

2. In a switch operating mechanism, the combination with railway track and switch rails, of a switch rod, a switch rail connecting rod, a locking device detachably connecting said rods, a bell crank lever connected with said locking device and pivoted to said switch rod, a second switch rod connecting one of said switch rails with said bell crank lever, a trip adjacent to the railway track, connections between said trip and said rod locking device whereby contact with said trip releases said locking device and moves said bell crank lever on said pivot, and a catch adapted to engage said bell crank lever at the completion of the movement of the latter.

3. In a switch operating mechanism, the combination with a railway track and switch rails, of a switch operating rod, a switch connecting rod connected with one of the switch rails, a bell crank lever pivoted to said switch rod and to said switch connecting rod, a vertically movable locking pin controlled by said bell crank lever and adapted to couple said switch and connecting rod sections, a trip adjacent to the main track rail adapted to contact with a projection of a locomotive, and connections between said trip and said switch rod section lock whereby a contact with said trip results in a raising of the locking pin and the forcing of said bell crank lever outward, and

means for latching said bell crank in its outward position.

4. In a switch operating mechanism, the combination with main track and switch rails, a switch stand and lever, detachably connected switch rod sections one of which is connected with one of the switch rails, and a locking mechanism for locking said switch rods in position, of a trip adjacent to the main track rails adapted to be operated by a passing train, and connections between said trip and said switch rod locking mechanism whereby an operation of the trip will result in releasing said locking mechanism and moving the switch rails to the closed position, said trip comprising a horizontally movable member, a support for said member, inclined ways in which said support travels and a connection between said horizontally movable member and said locking mechanism.

5. In a switch operating mechanism, the combination with main track and switch rails, a switch stand and lever, detachably connected switch rod sections one of which is connected with one of the switch rails and a locking mechanism for locking said switch rods in position, of a trip adjacent to the main track rails adapted to be operated by a passing train, connections between said trip and said switch rod locking mechanism whereby an operation of the trip will result in releasing said locking mechanism and moving the switch rails to the closed position, said trip comprising a horizontally movable member, a support for said member, inclined ways in which said support travels, and a connection between said horizontally movable member and said locking mechanism, a bell crank lever actuated from one of said switch rod sections, and a connection between the last named bell crank lever and the movable support.

6. In a switch operating mechanism, the combination with railway track and switch rails, of a pivoted bell crank lever, a connection between one arm of said bell crank lever and one of the switch rails, a rotative member mounted upon the other arm of said bell crank lever, a locking member adapted to be elevated during the rotation of said rotative member, and a cable connected to said rotative member and adapted when drawn upon, to rotate said member and elevate the locking member to release the bell crank lever and then to impart bodily movement to said bell crank lever to move the switch rail.

7. In a switch operating mechanism, the combination with railway track and switch rails, of a pivoted bell crank lever, a connection between one arm of said bell crank lever and one of the switch rails, a rotative member mounted upon the other arm of said bell

crank lever, a locking member adapted to be elevated during the rotation of said rotative member, a cable connected to said rotative member and adapted when drawn upon, to rotate said member and elevate the locking member to release the bell crank lever and then to impart bodily movement to said bell crank lever to move the switch rail, a manually operable rod, and a locking rod, said locking member serving to connect said rods.

8. A trip for railway switches comprising a horizontally movable member, a casing in which said member is mounted, a sheave mounted in said casing, a cable passing over said sheave, one end of said cable being connected to the switch actuating mechanism and the opposite end of said cable being connected to the horizontally moving member, a support for said horizontally moving member, inclined ways carried by the casing in which said support travels, a yoke, and a link connecting said yoke with said support.

9. In a switch operating mechanism, the combination with main track and switch rails, a switch stand and lever, detachably connected switch rod sections, one of which is connected with one of the switch rails and a locking mechanism for locking said switch rods in position, of a trip adjacent to the main track rails adapted to be operated by a passing train, connections between said trip and said switch rod, locking mechanism whereby an operation of the trip will result in releasing said locking mechanism and moving the switch rails to the closed position, said trip comprising a horizontally movable member, a support for said member, inclined ways in which said support travels and a connection between said horizontally movable member and said locking mechanism, a bell crank lever actuated from one of said switch rod sections, a connection between the last named bell crank lever and the movable support, and means for locking said bell crank lever at its outward limit of movement.

10. In a switch operating mechanism, the combination with main track and switch rails, a switch stand and lever, detachably connected switch rod sections, one of which is connected with one of the switch rails and a locking mechanism for locking said switch rods in position, of a trip adjacent to the main track rails adapted to be operated by a passing train, connections between said trip and said switch rod locking mechanism whereby an operation of the trip will result in releasing said locking mechanism and moving the switch rails to the closed position, said trip comprising a horizontally movable member, a support for said member, inclined ways in which said support travels and a connection between said horizontally

movable member and said locking mechanism, a bell crank lever actuated from one of said switch rod sections, a connection between the last named bell crank lever and
5 the movable support, and means for locking said bell crank lever at its outward limit of movement, said means comprising jaws between which said lever moves, one of said

jaws having a shoulder adapted to engage said lever.

In testimony whereof I affix my signature
in presence of two witnesses.

JOHN P. BLACKWOOD.

Witnesses:

E. B. CLARKE,

R. L. WOODWORTH.