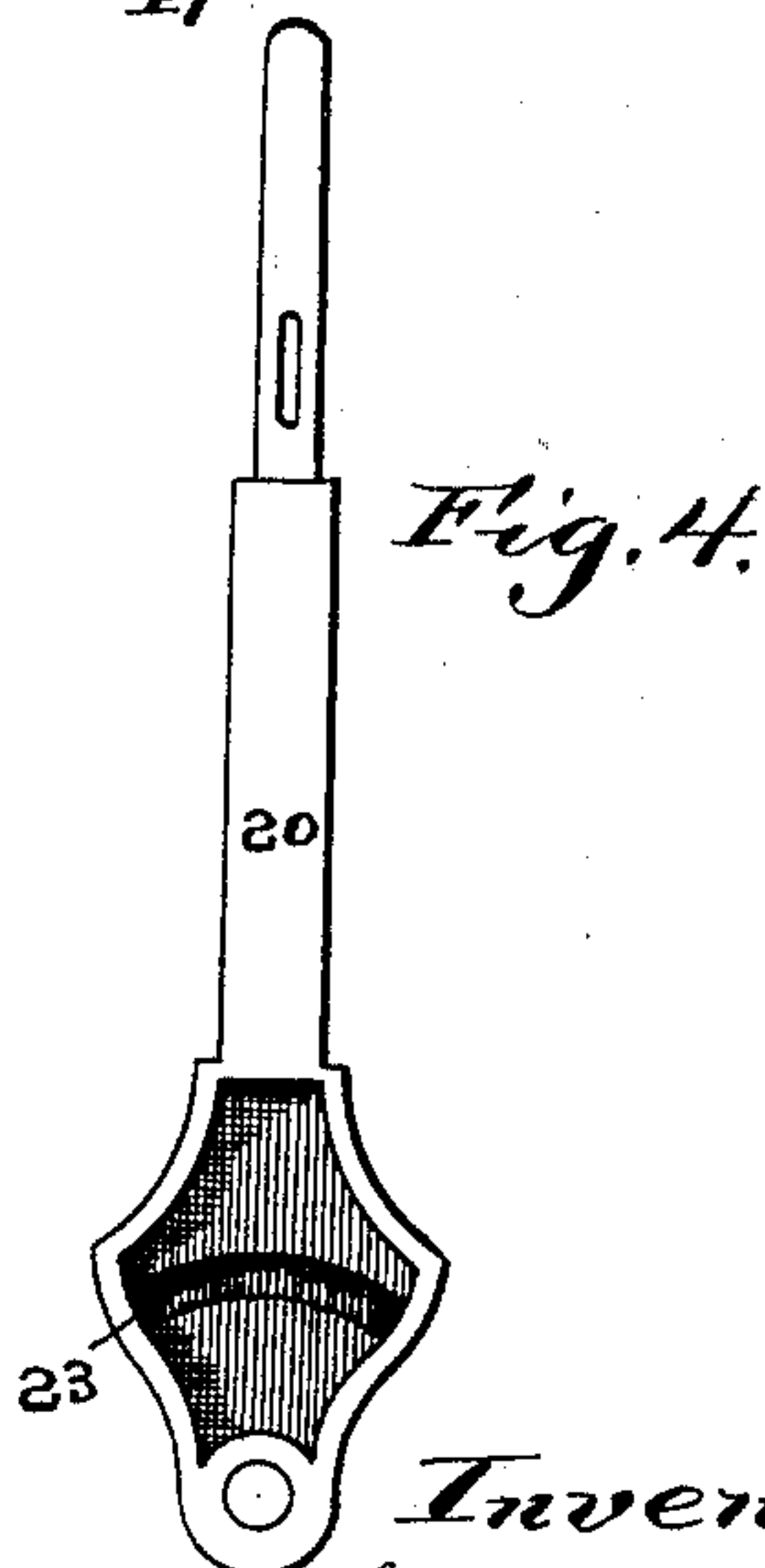
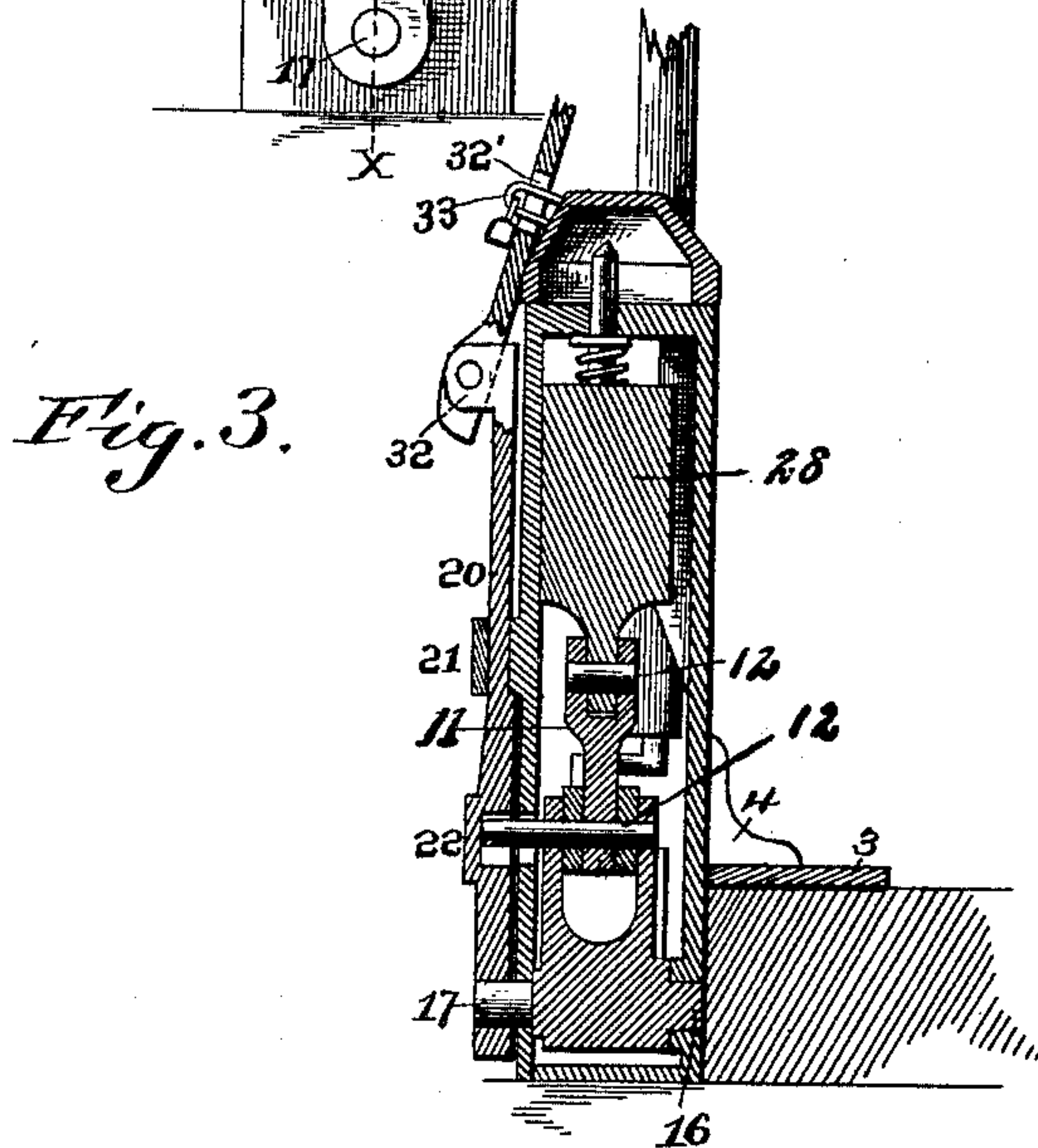
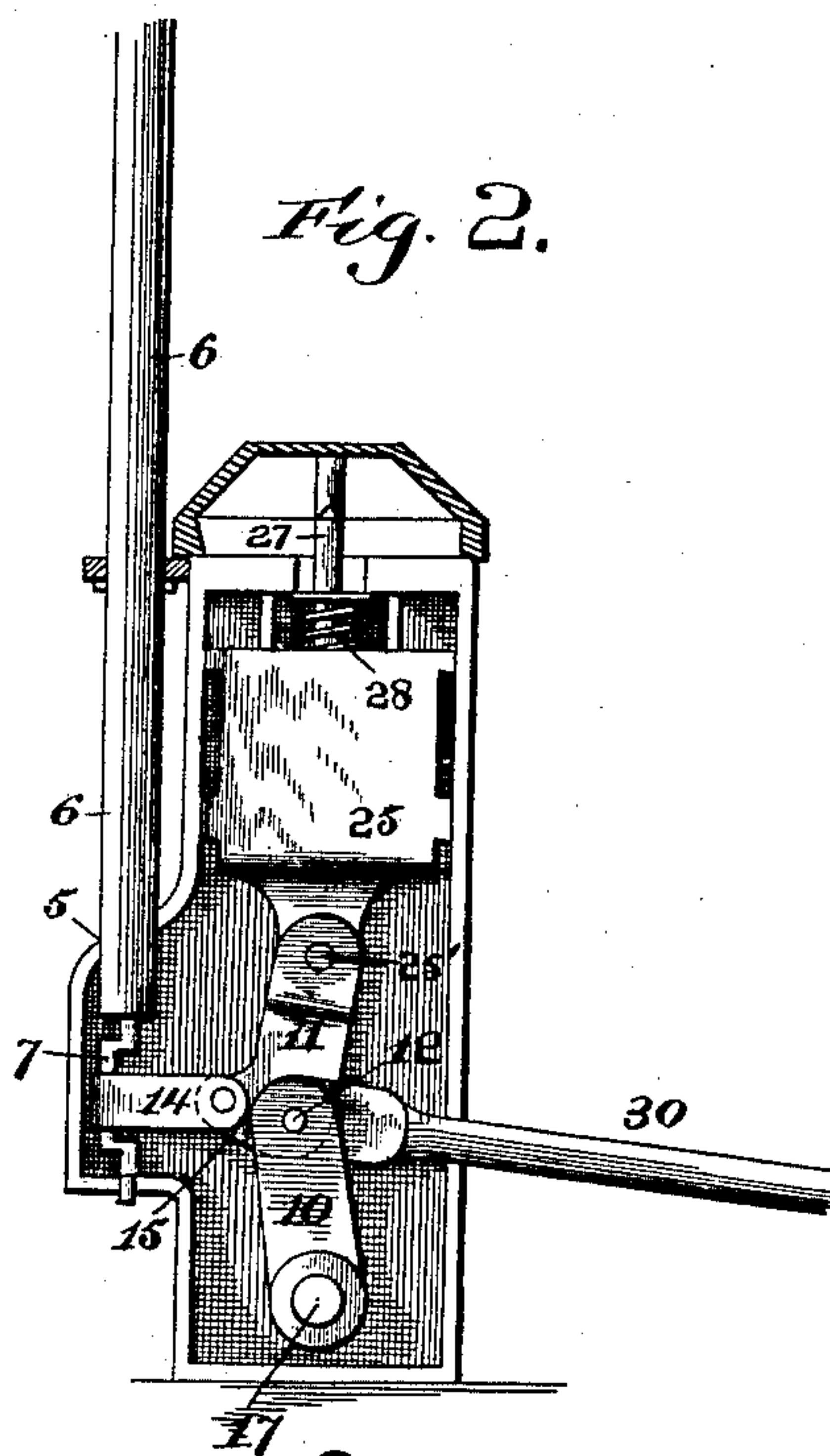
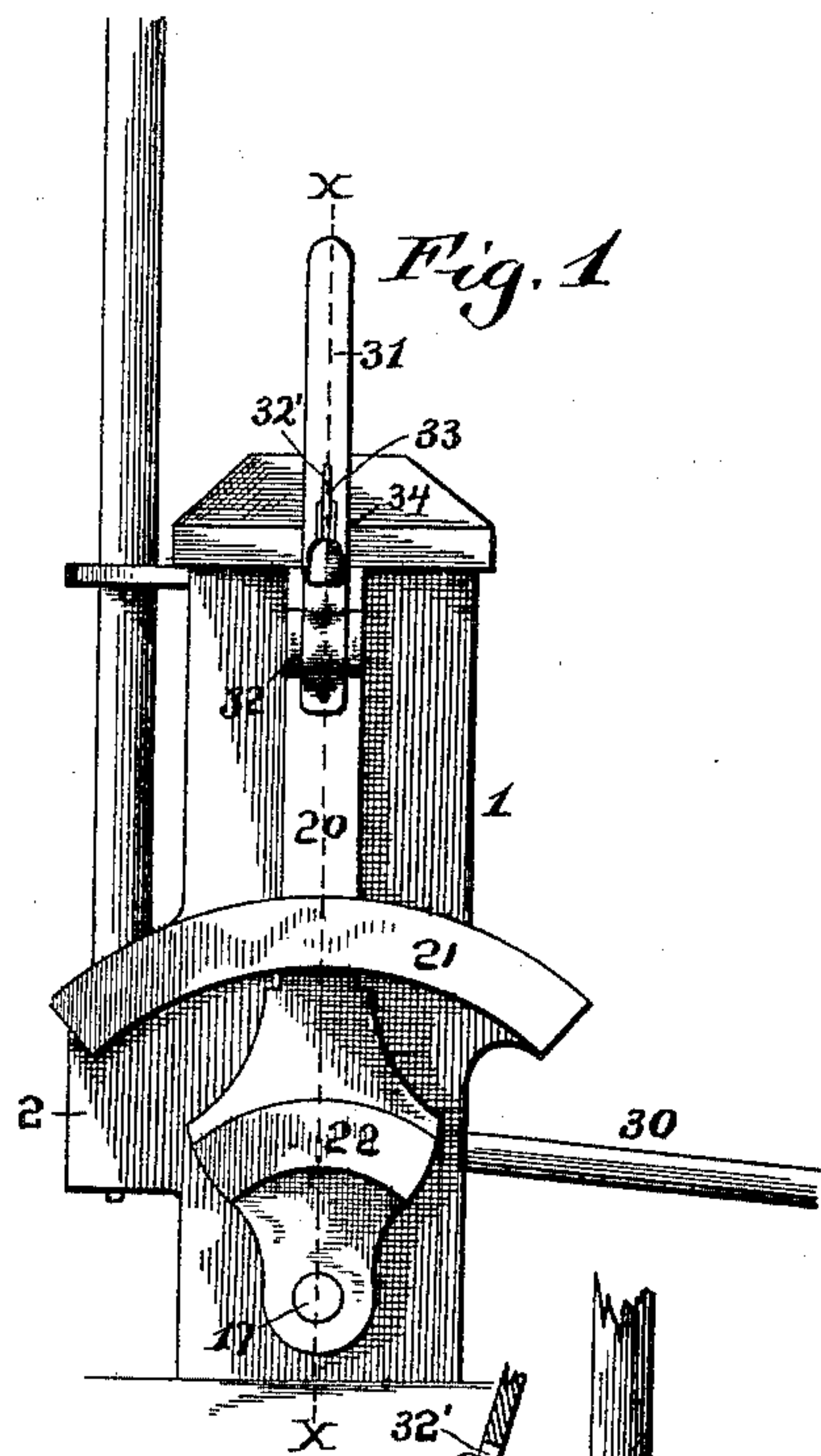


(No Model.)

N. W. BOYD.
AUTOMATIC SWITCH STAND.

No. 435,728.

Patented Sept. 2, 1890.



Witnesses:
J. B. McGraw.
W. D. Burkhart

Inventor:
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By his Attorneys,
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UNITED STATES PATENT OFFICE.

NATHANIEL W. BOYD, OF CARLISLE, PENNSYLVANIA.

AUTOMATIC SWITCH-STAND.

SPECIFICATION forming part of Letters Patent No. 435,728, dated September 2, 1890.

Application filed April 24, 1890. Serial No. 349,241. (No model.)

To all whom it may concern:

Be it known that I, NATHANIEL W. BOYD, a citizen of the United States, and a resident of Carlisle, in the county of Cumberland and State of Pennsylvania, have invented certain new and useful Improvements in Automatic Switch-Stands; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to an automatic switch-stand for use in connection with a point-rail switch; and the object of my invention is to provide efficient and simple means for locking the switch-lever to prevent manual interference or manipulation of the switch, and at the same time enable the signal to be operated from the track when the switch is moved or shifted by an engine passing over the same.

With these and other ends in view my invention consists in the combination of a signal staff or rod, a toggle-joint having a link-connection with the signal-staff to turn or move the same on its axis for a limited distance, a counterpoise in the form of a weight or spring for confining the toggle-joint in its adjusted positions, a rod connecting the toggle-joint with the point-rail of a switch, and a lever having a pin-and-slot connection with the toggle-joint, so as to operate the joint and signal-staff when it is shifted and adapted to be locked in place to the signal-stand, the pin-and-slot connection between the toggle-joint and the switch-lever being such that the joint can be moved the required distance to turn the signal shaft or staff by the connecting-rod between said toggle-joint and the switch when the movable rail thereof is operated by a passing engine.

My invention further consists in the novel combination of devices and peculiar construction and arrangement of parts, as will be hereinafter more fully described, and particularly pointed out in the claims.

To enable others to more readily understand my invention, I have illustrated the same in the accompanying drawings, in which—

Figure I is an elevation of an automatic switch-signal constructed in accordance with my invention. Fig. II is an elevation of the interior of the apparatus with one side plate

of the stand and the switch-lever removed. Fig. III is a vertical transverse sectional view through the stand on the plane indicated by the line *xx* of Fig. I. Fig. IV is a detail view of the switch-lever viewed from the inner side or face thereof.

Like numerals of reference denote corresponding parts in all the figures of the drawings, referring to which—

1 designates the shell or casing of the switch-stand embodying my invention. Near its lower part the stand shell or case 1 is enlarged, as at 2, and at the enlarged part I provide a horizontal flange or plate 3, which is cast integral with the shell or case 1 and is strengthened by braces 4, also integral with the shell or case and the flange 3. The shell or case is firmly secured to one end of a tie of the railway-track by means of spikes, which are driven through suitable apertures in the horizontal flange or plate and into the tie, as is obvious.

In the laterally-extending enlarged part 2 of the shell or stand is provided a vertical opening 5, through which passes the vertical signal staff or shaft 6, which carries at its upper end a semaphore or other suitable signal. (Not shown.) The lower end of the signal staff or shaft is journaled or stepped in a suitable bearing in the enlarged portion of the case or shell, and said signal-shaft has a crank 7, made integral with it at a suitable point intermediate of its length and within the case or shell 1.

10 11 designate a toggle-joint, the members of which are pivoted together at their inner ends, as at 12; and this toggle-joint is connected to the signal-staff by means of a link 14, one end of which link embraces the crank 7 of the signal-staff, and the other end of said link is connected to a lug 15, formed on the inner end of one member of the toggle-joint. The free end of the member 10 of the toggle-joint is formed with two trunnions 16 17, which trunnions are journaled or fitted in the sides of the stand or shell 1, and one of the trunnions (the trunnion 17) is extended or projected beyond the case or shell to form the support or fulcrum of the switch-lever 20, which has its lower end fitted loosely on the extended end of said trunnion 17. This switch-lever is fitted closely against one side

of the stand 1, and it is guided in its movements by a segmental guide or arch 21, which is made or cast integral with one side of the stand. Below the arched guide 21 a segmental slot 22 is formed in the side or wall of the case 1, and through this slot passes the pivot 12, which connects the members 10 11 of the toggle-joint together, said pivot being extended at one end beyond and through the slot in the case 1 and fitting in a segmental recess 23, formed on the inner face of the switch-lever 20, said segmental recess 23 being of such length that the pivot 12 can have the necessary play in the recess when the lever is locked in a vertical upright position and the signal is operated automatically by an engine passing over the point-rail of a switch. The members of the toggle-joint normally lie at an angle to or out of line with each other, and they are held in these positions by a counterpoise, which prevents the toggle-joint from moving, except when the lever is shifted or the point-rail of the switch is operated by a passing engine. This counterpoise may be in the form of a weight or spring, and in the accompanying drawings I have shown both a weight and spring; but it is evident that either one or the other, or both, may be employed at pleasure. The weight 25 is arranged within the case or shell 1 and above the toggle-joint, said weight being pivotally connected at 25' to the upper member 11 of the toggle-joint, and being guided within the case or shell 1 by suitable flanges and ways 26, as shown.

To the upper end of the sliding weight 25 is secured a vertical stem 27, which passes through and is guided in an aperture in the top or cap of the case or shell, and around this stem is placed a coiled spring 28, which assists the weight in confining or locking the toggle-joint in place when the members of said joint are out of line with each other, as shown.

30 designates the connecting-rod intermediate of the toggle-joint and the movable rail of a point-rail switch, (I have not deemed it necessary to illustrate this switch, as it is of the form well known to those skilled in the art to which my invention relates,) and the rod 30 is connected to said rail in the ordinary way. The upper end of the lever carries a hand-piece 31, which is arranged between and pivoted to flanges 32, which are cast integral with the switch-lever, and this hand-piece has a slot 32', which is adapted to receive a staple 33, fixed to the cap or top of the switch-stand. This cap is recessed at 34 to receive the hand-piece, which is pivoted to the switch-lever so that it can be forced toward and into the recess in the cap, and when said hand-piece is in this position and receives the staple on the stand the hasp of a padlock can be passed through the staple, whereby the switch-lever and the hand-piece can be locked in place.

The operation of my invention is as follows: To throw the switch by the lever 20, the pad-

lock is removed and the hand-piece grasped to move the lever in the desired direction. As soon as the lever has moved a short distance one end wall or terminal of the segmental recess therein comes in contact with the protruding end of the pivot 12, which pivot is moved by the lever so as to throw the toggle-joint to and beyond its center, thus moving the switch-rod and the point or movable rails to which said rod is connected. To lock the switch-lever, it is turned to a vertical position, the hand-piece forced into the notch or recess to cause the staple to pass through the slot in the hand-piece, and the padlock or other locking contrivance adjusted to lock the lever in place, and thus prevent manual manipulation or interference with the switch. When the switch-rod is pulled or moved by the movable or point rails of a switch which are operated by a passing engine, the toggle-joint is moved, the pin 12 thereof rides in the segmental recess in the switch-lever, and the crank 7 is turned to adjust the signal staff or shaft to display the required signal.

The apparatus is efficient and reliable in operation, simple, and cheap.

I am aware that modifications in the form and proportion of parts and details of construction of the mechanisms herein shown and described as an embodiment of my invention can be made without departing from the spirit or sacrificing the advantages of my invention, and I therefore reserve the right to make such changes and modifications as fall within the scope of my invention.

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In an automatic switch-stand substantially as described, the combination of a vertical signal-staff, a switch-rod, a toggle-joint connected both to the switch-rod and the signal-staff to turn the latter axially as said toggle-joint is operated, a counterpoise for normally confining or locking the toggle-joint against movement, except that which may be imparted thereto by a switch-lever or the switch-rod, and a switch-lever connected with the toggle-joint and capable of a limited movement without affecting the position of said toggle-joint, for the purpose described.

2. In an automatic switch-stand, the combination of a cranked signal-staff, a switch-rod, the toggle-joint having the switch-rod connected thereto and linked to the signal-staff to turn the latter, a counterpoise which locks the toggle-joint normally against movement, a switch-lever connected with the toggle-joint substantially in the manner described and capable of a limited movement without affecting the position of said joint, and means for locking the switch-lever in place, substantially as described.

3. In an automatic switch-stand, the combination, with a signal-staff and a switch-rod, of a toggle-joint connected with said rod and the staff to turn the latter a limited distance,

a counterpoise connected with said toggle-joint, and a switch-lever having a pin-and-slot connection with the toggle-joint to permit said joint and the signal-staff to be moved the required distance by the switch-rod when said switch-lever is confined or locked in place, as and for the purpose described.

4. In an automatic switch-stand, the combination of a signal-staff having a crank, a switch-rod, a toggle-joint having the switch-rod connected thereto and linked to the crank of the signal-staff, a counterpoise connected with the toggle-joint, and a switch-lever having a pin-and-slot connection with the toggle-joint, substantially as described, for the purpose set forth.

5. In an automatic switch-stand, the combination of a cranked signal-staff, the toggle-joint linked to said signal-staff and having the central pivot 12, a switch-rod, a slotted switch-lever that receives the trunnion of the toggle-joint, and a counterpoise connected to the toggle-joint, substantially as described.

6. In an automatic switch-stand, the combination of a signal-staff, the toggle-joint linked

centrally to said signal-staff to turn the same, a counterpoise arranged above the toggle-joint and pivotally connected to one of the members of said joint, the guides in which the counterpoise is confined, the switch-rod connected to the toggle-joint, and the switch-lever independently connected with said joint in the manner and for the purpose described.

7. In an automatic switch-stand, the combination of a cranked signal-staff, a toggle-joint linked to said staff and having the extended trunnions 12 17, a switch-rod connected to the toggle-joint, a counterpoise also connected with the toggle-joint, and a switch-lever fulcrumed on the trunnion 17 of the toggle-joint and having the segmental recess which receives the trunnion or pivot 12 of said joint, all arranged and combined substantially as described, for the purpose set forth.

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

NATHANIEL W. BOYD.

Witnesses:

JOSEPH R. EDSON,
JOS. FORREST.