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PATENTED OCT. 31, 1905.

G. O. BJORNEBY & A. O. BRAGER.

SELF LOCKING LEVER.

APPLICATION FILED APR. 19, 1905.

2 SHEETS—SHEET 1

FIG. 1.

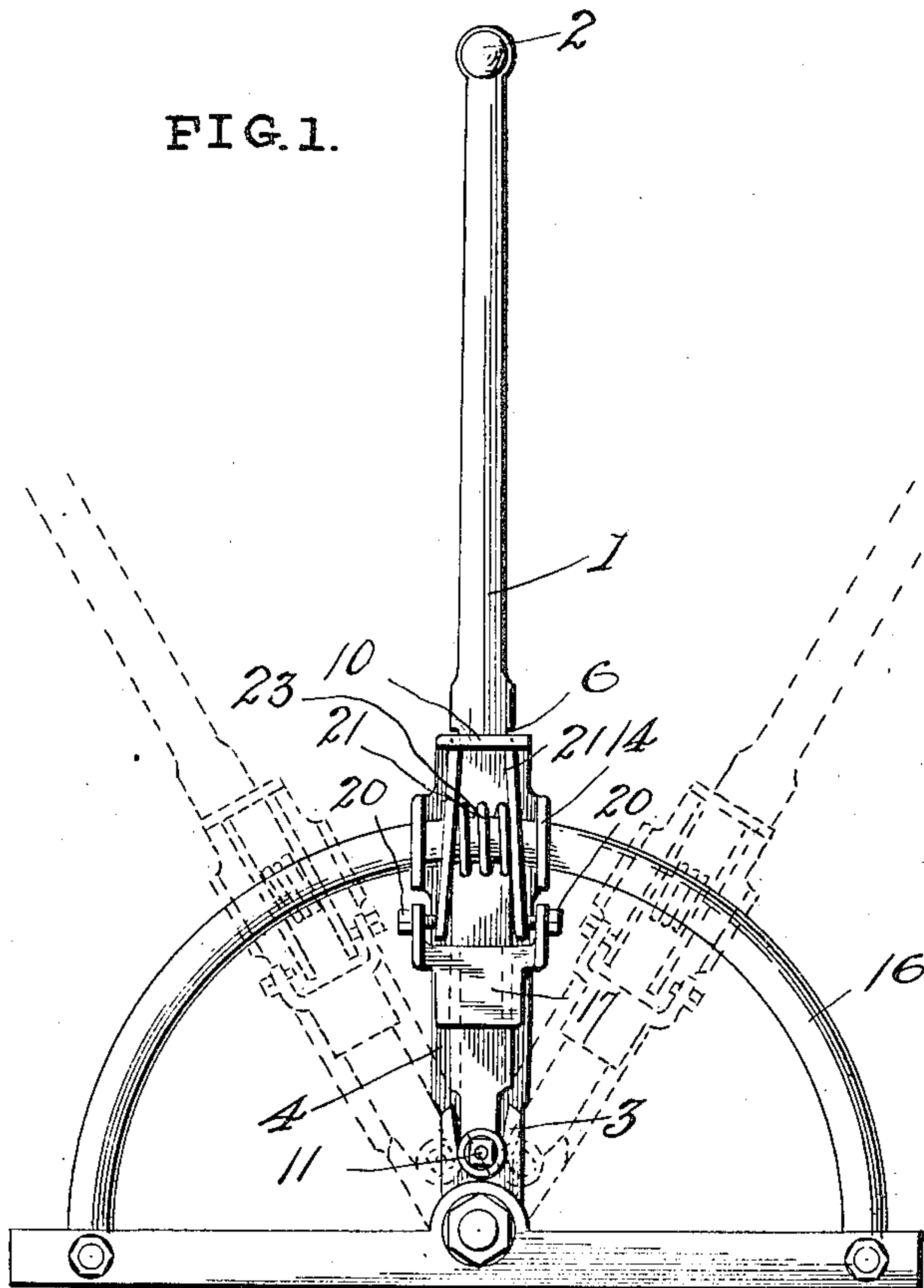


FIG. 2.

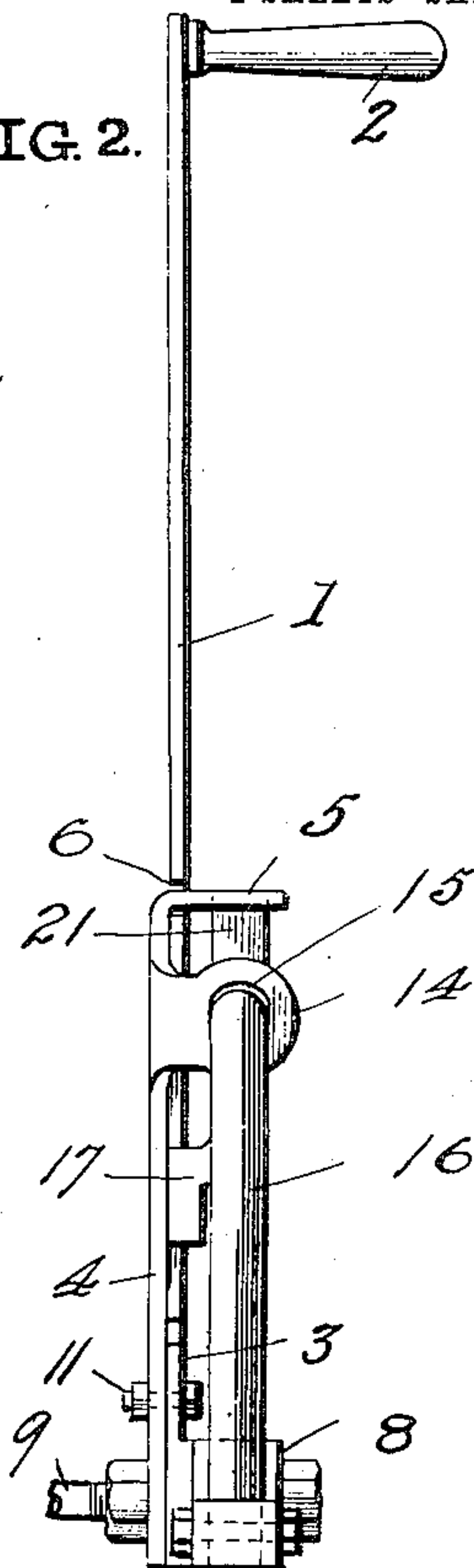


FIG. 4.

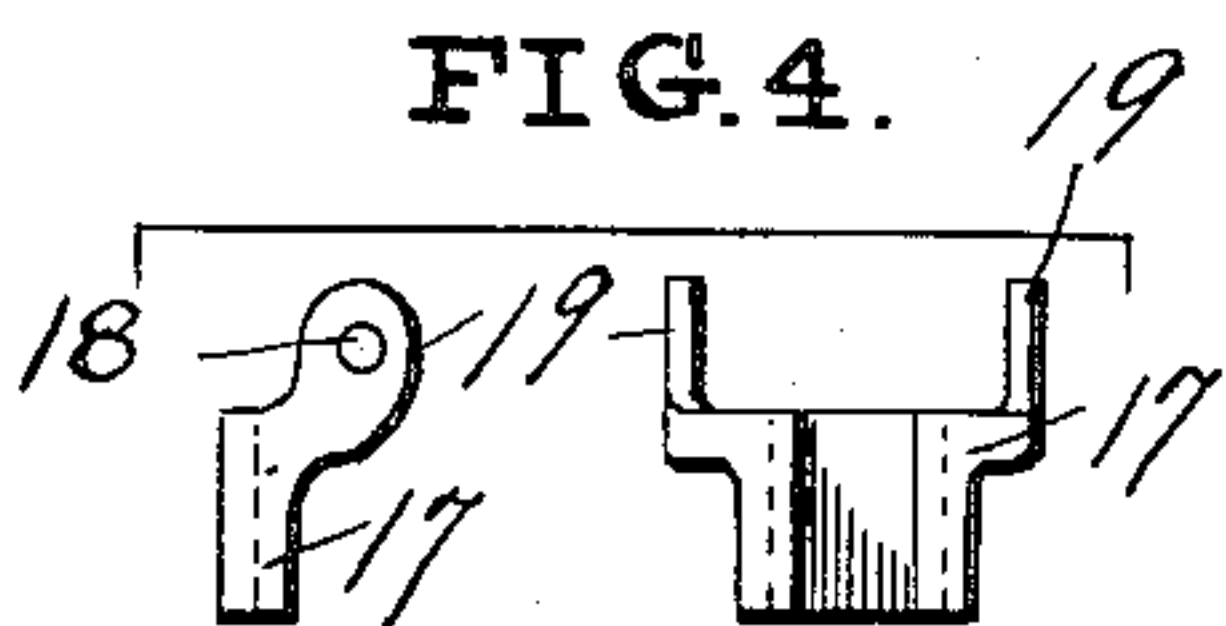


FIG. 3.

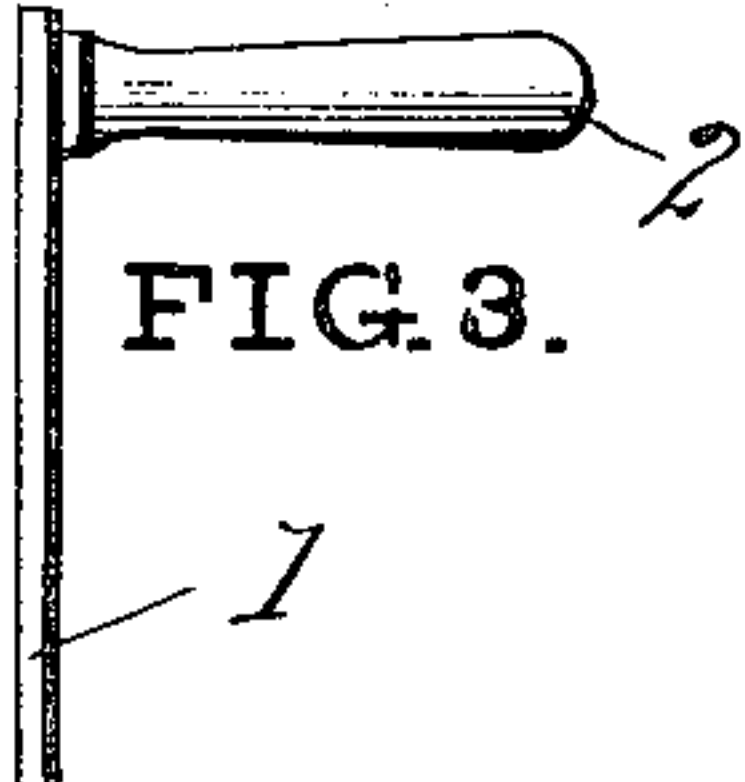


FIG. 5.

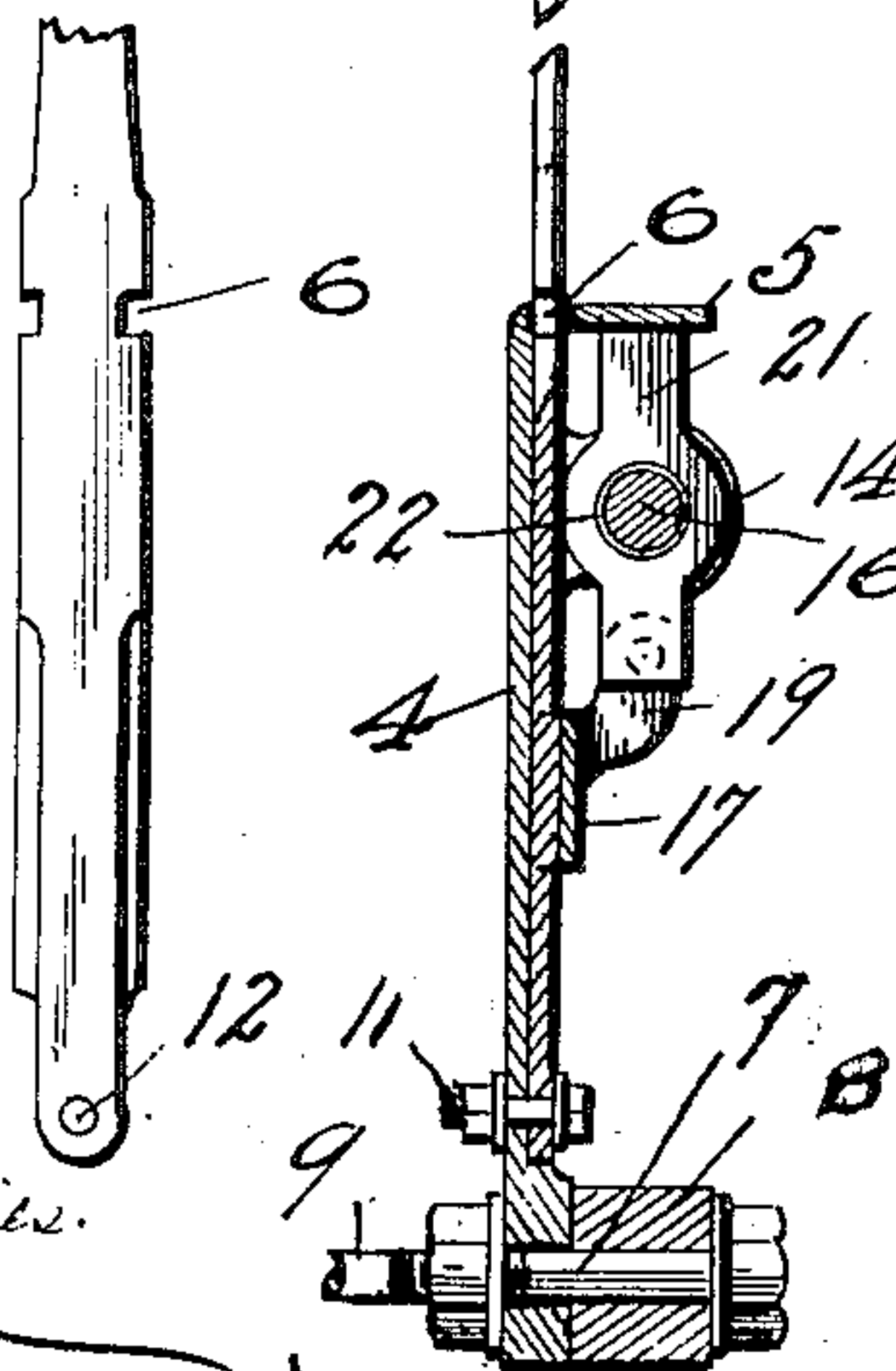


FIG. 7.

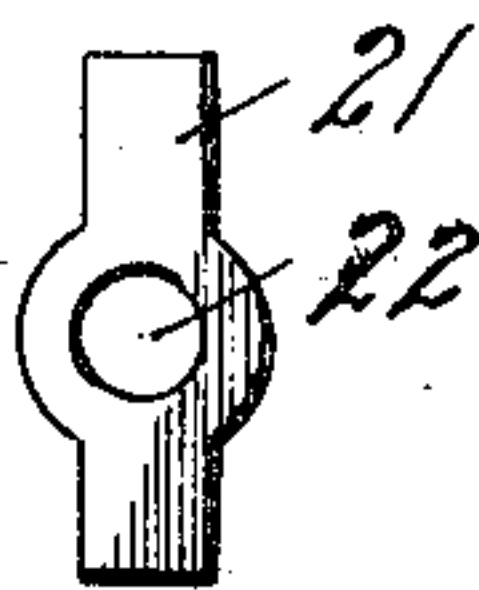
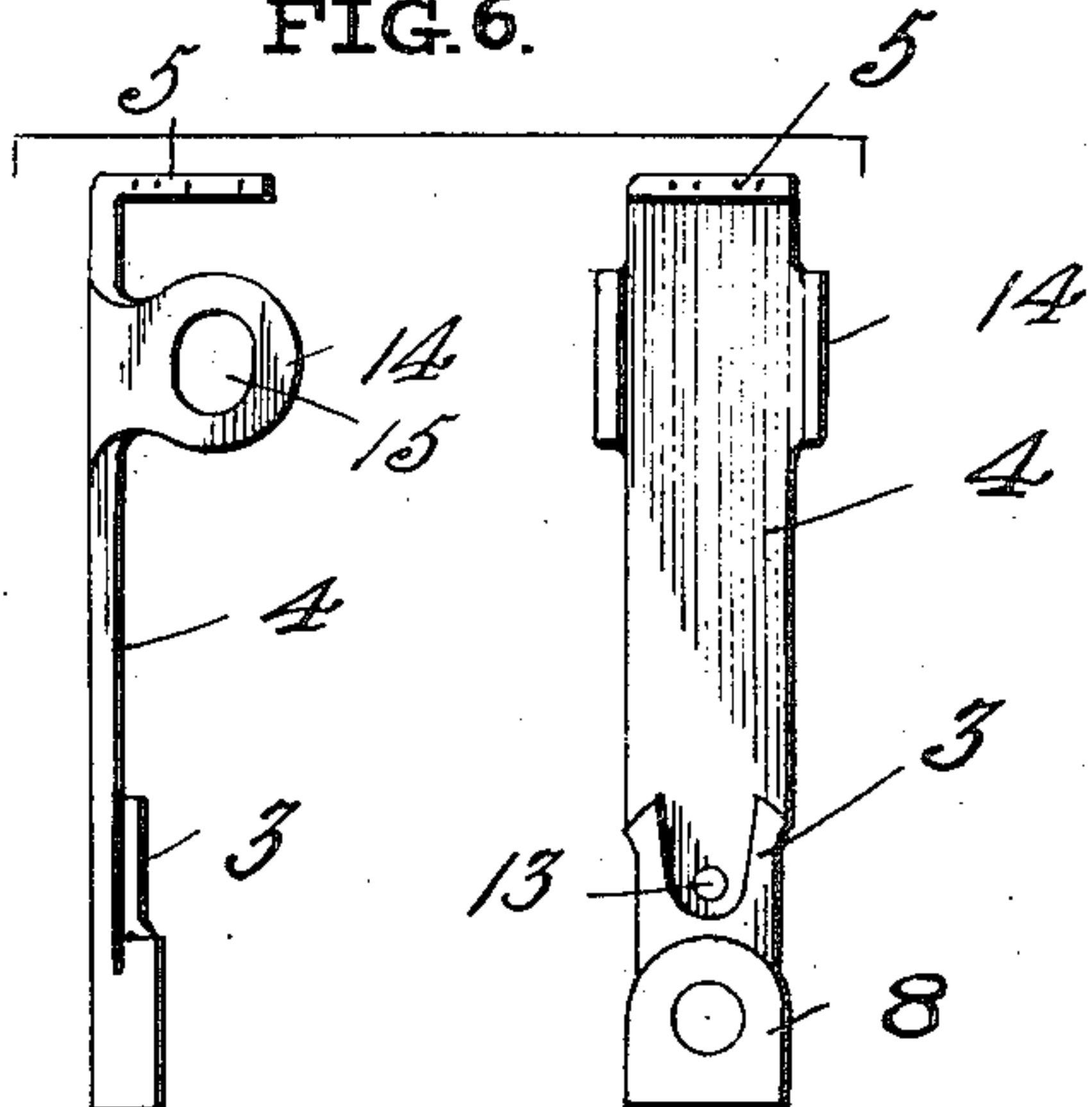


FIG. 6.



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2 SHEETS—SHEET 2.

FIG. 8.

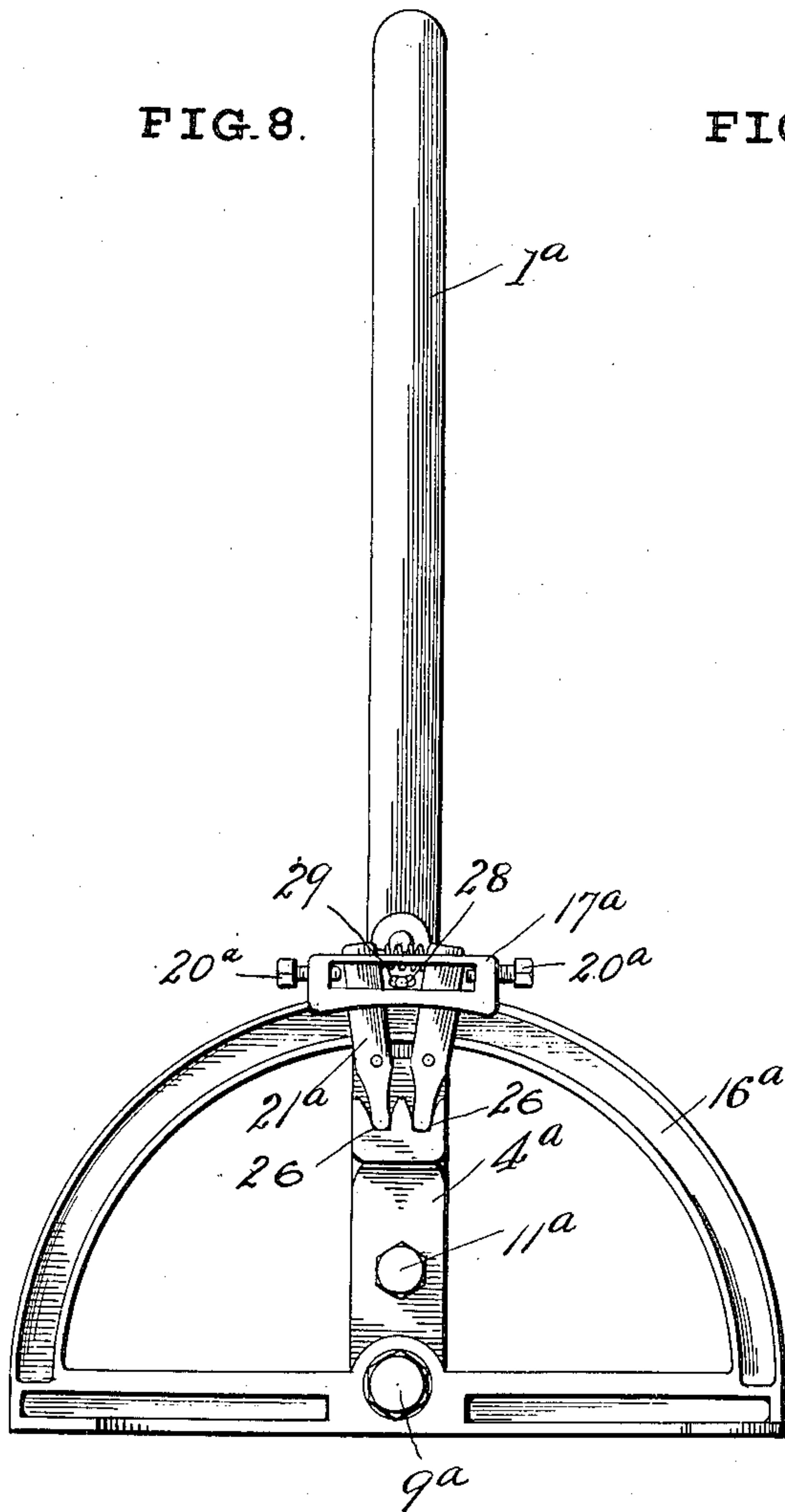


FIG. 9.

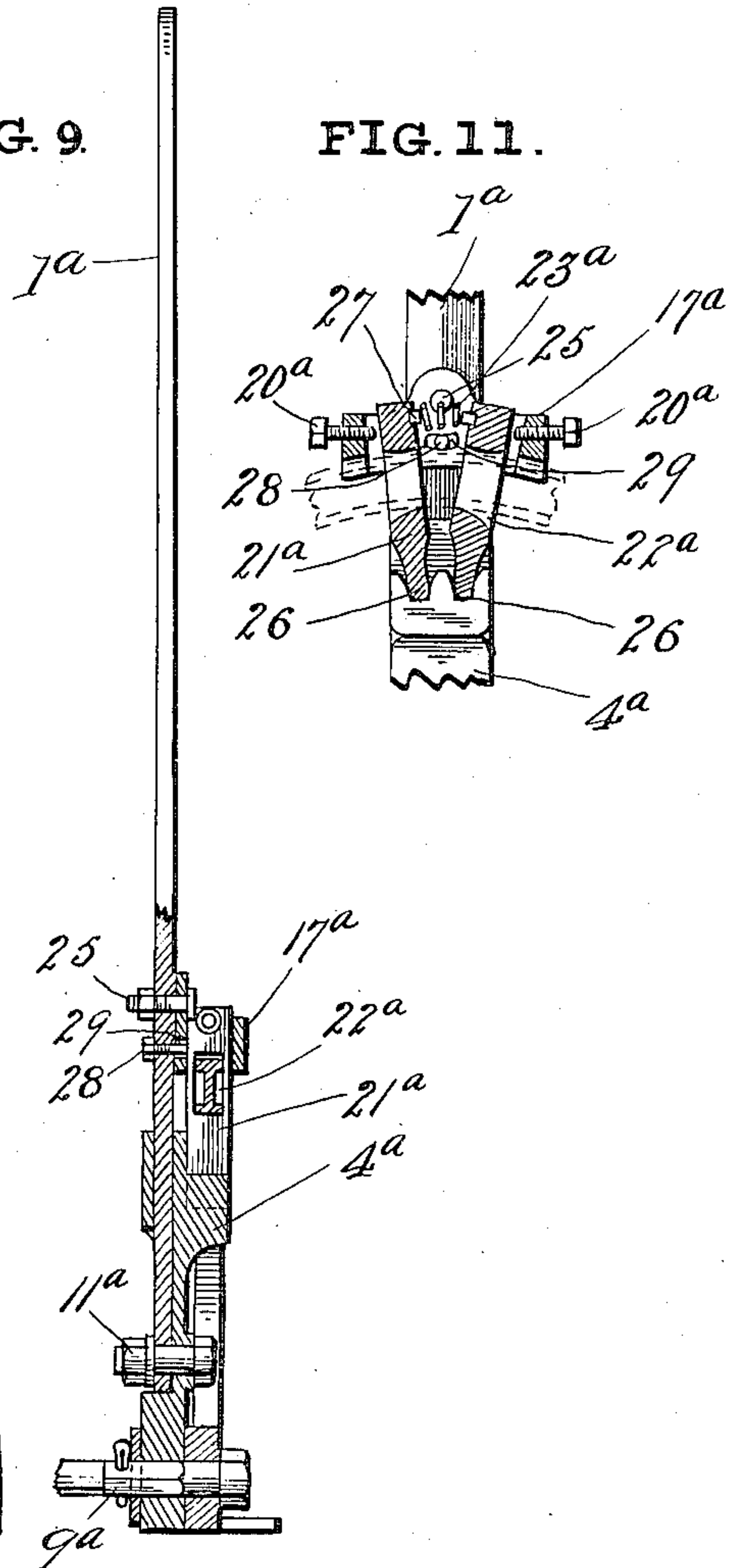


FIG. 11.

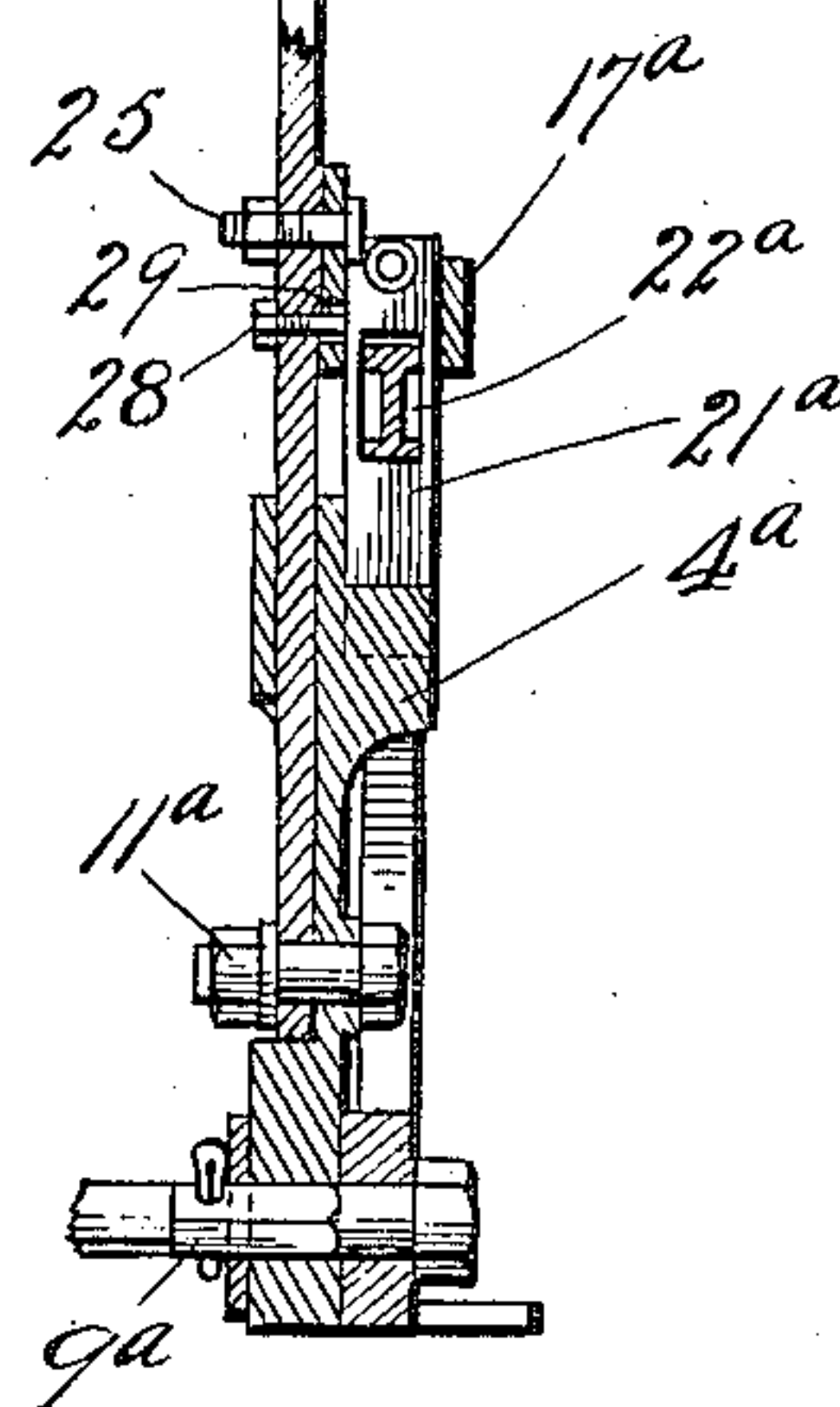
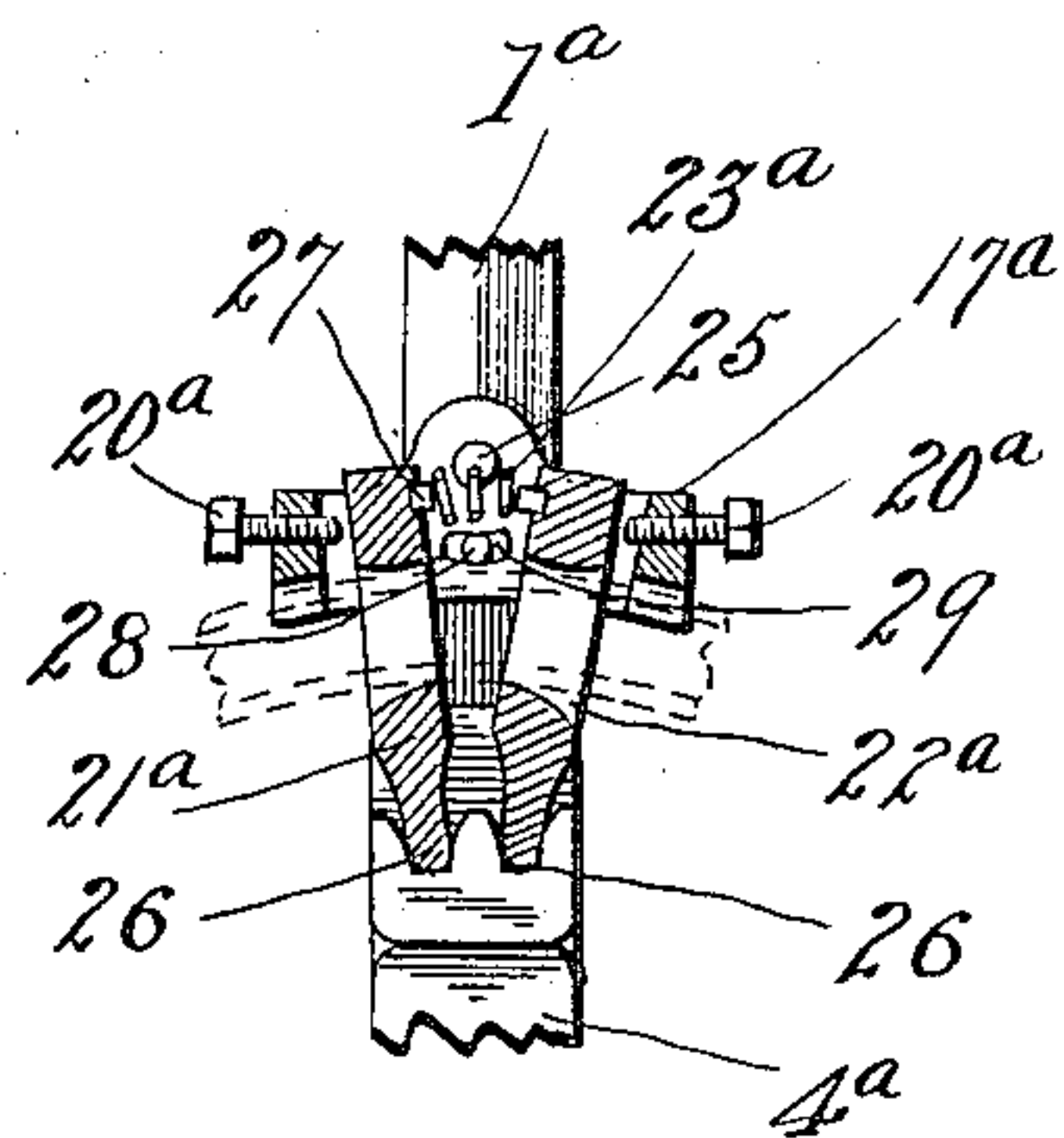


FIG. 12.

FIG. 13. FIG. 14.

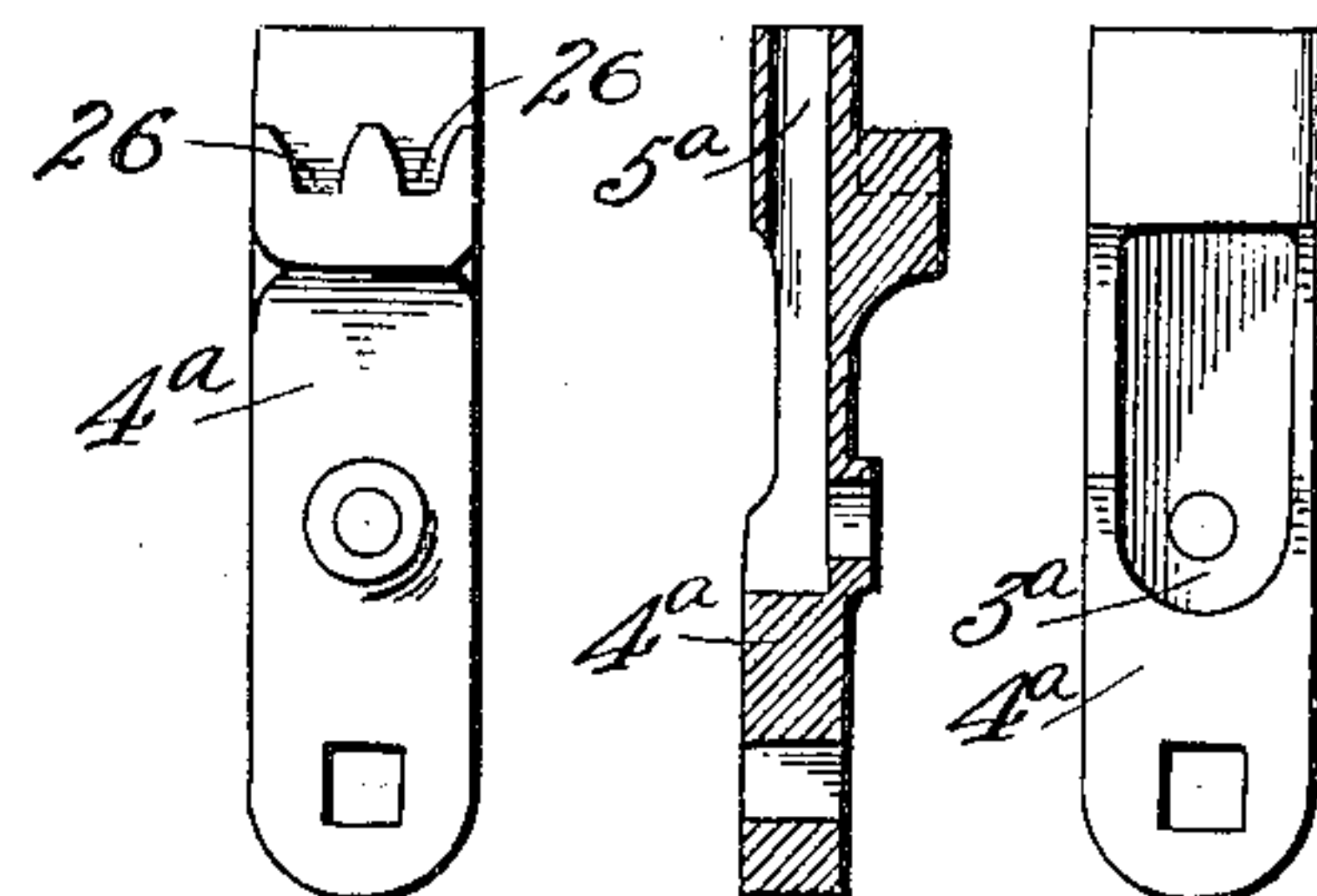
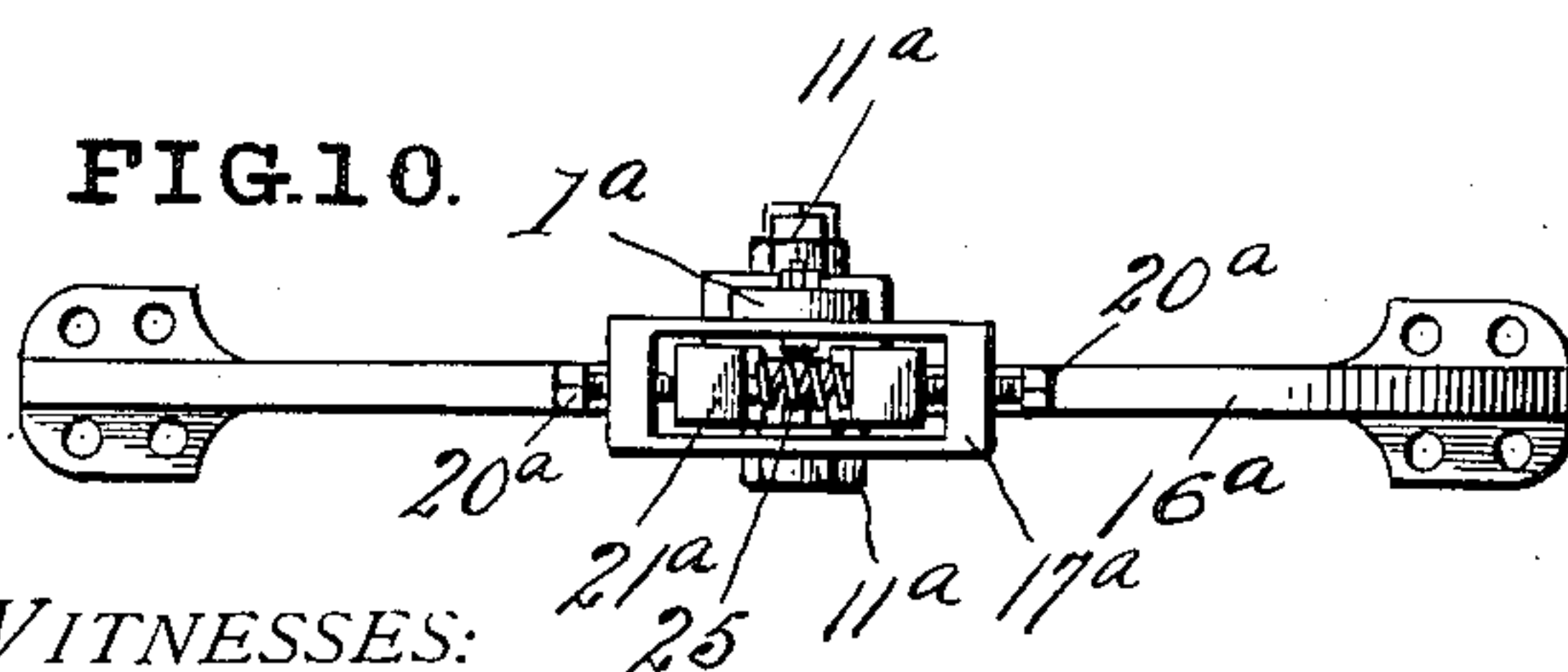


FIG. 10.



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SELF-LOCKING LEVER.

No. 803,046.

Specification of Letters Patent.

Patented Oct. 31, 1905.

Application filed April 19, 1905. Serial No. 256,361.

To all whom it may concern:

Be it known that we, GEORGE O. BJORNEBY and ALBERT O. BRAGER, citizens of the United States, residing in Fertile township, in the county of Walsh and State of North Dakota, have invented certain new and useful Improvements in Self-Locking Levers, of which the following is a specification.

This invention relates to self-locking levers, particularly levers of the class commonly employed to operate throttle-valves, reversing mechanism, and the like.

The object of the invention is to provide a lever of the class mentioned with means whereby it may be automatically locked in any position in which it is placed or set and automatically unlocked by the application of pressure to the handle of the said lever in either direction of its motion.

Another object of this invention is to provide a lever of the character mentioned which is capable of a more exact adjustment than the levers heretofore employed.

A further object of the invention is to avoid the necessity of using a hand-operated pawl or like device in connection with a rack or similar locking mechanism to hold the lever in any position in which it is placed or set.

With these and other objects in view the present invention consists in the combination and arrangement of parts, as will be hereinafter more fully described, shown in the accompanying drawings, and particularly pointed out in the appended claims.

In the drawings, Figure 1 is a side elevation of our improved automatic lever, showing in full lines the position of the clutching or locking mechanism when the lever is at rest and locked and in dotted lines the position of the said mechanism when pressure is applied to the handle of the lever tending to move it to the right or to the left. Fig. 2 is an end elevation, and Fig. 3 a central vertical section, through the lever at right angles to Fig. 1. Fig. 4 is a detail front and side elevation of a yoke for supporting screws or nuts for engaging the clutching or locking plates. Fig. 5 is a detail front elevation of the lower end of the lever-rod. Fig. 6 is a detail front and side elevation of an auxiliary member for supporting the clutch or locking plates, and Fig. 7 is a detail of one of the clutch or locking plates. Figs. 8 and

9 are views in elevation and vertical section of a modified form of my invention. Fig. 10 is a plan view of the said modification. Fig. 11 is a detail sectional view of the clutch mechanism employed in the modified form. Fig. 12 is a detail front view of the support for the clamping-plates. Fig. 13 is a detail vertical section of the said support, and Fig. 14 is a detail rear view of the same.

Like numerals of reference designate corresponding parts throughout the several views.

In its preferred embodiment our improved lever consists of a rod 1, provided at one end with a handle 2 and at its other end engaged within the socket 3 of an auxiliary member 4, pivoted at 7 to the frame or lever support 8 and operatively connected with the valve or reversing shaft 9 or other rod or link to be adjustably secured in any desired position. The lever-rod passes through an opening 10, corresponding approximately in shape to that of the lever-rod which is provided in the offset portion 5 of the said auxiliary member. The lever-rod is provided with notches or indentations 6 at the point where it engages the sides of the opening 10, thereby permitting the said lever-rod to have some motion or play within the opening 10, as illustrated in dotted lines in Fig. 1.

The lever-rod 1 may be pivotally secured to the auxiliary member 4, as by a bolt or pin 11 passing through openings 12 and 13 in the lever-rod and auxiliary member, respectively, or the said rod may be held in operative relation with the auxiliary member solely by its engagement, as above described, with the socket 3 and the offset portion 5.

Attached to the auxiliary member 4 are outstanding guides or ears 14, having openings 15 therethrough, which surround an arch-rod or semicircle 16.

Attached to the auxiliary member 4, between the lower end thereof and the offset portion 5, is a yoke 17, having openings 18 in the outstanding arms 19. Within these openings are secured set-screws 20 or other preferably adjustable abutting pins or stops extending toward each other from the said arms. Between the pins or screws 20 are located clutch or clamping members in the form of lock-plates 21, each having an opening 22, through which passes arch-rod or semicircle 16. The lock or clutch plates 21

are pivotally or somewhat loosely connected with the offset portion 5 of the auxiliary member 4, preferably by passing into or through openings therein which correspond approximately in shape to a cross-section taken through the said plates near one end thereof, as illustrated in Figs. 1 and 3. The openings 22 in the lock-plates 21 preferably correspond approximately in shape to a cross-section of the arch-bar or semicircle 16, the parts being essentially so proportioned that when the said lock-plates are approximately perpendicular to the arch-rod at the point of engagement therewith the said plates can be freely moved along the rod; but when the direction of the lock-plates relative to that of the arch-rod departs materially from a perpendicular the edges of the openings 22 in the lock-plates engage the arch-rod and lock the plates positively against movement in the direction in which the pivoted or confined end of the plates slants. In our construction we employ two lock-plates oppositely slanted, so that the lever is normally positively locked against movement in either direction.

Around the arch-rod 16 and between the oppositely-slanted plates 21 we place a spiral spring 23 to insure the lock-plates maintaining a position in which they are normally locked against movement.

The set-screws or stops 20 are so placed or adjusted that they normally exercise little or no pressure upon the lock-plates 21; but upon movement of the lever-rod in either direction the pin located on the opposite side of the lever to that in which it is moved engages the lock-plate, which would otherwise prevent such movement, and releases it from locking engagement with the arch-bar by bringing it into a position perpendicular or more nearly perpendicular to the arch-bar at the point of engagement than that which it occupies normally. Movement in the opposite direction similarly releases the other locking-plate and permits of the reversed movement of the lever. When the lever is brought to rest and pressure tending to move the same withdrawn, the spring 23 instantly and automatically forces the plates 21 into locking engagement with the arch-rod, and no movement of the shaft 9 or of a rod or link adapted to be adjusted by the lever is possible.

In the modified form of our invention (shown in Figs. 8, 9, and 10) 1^a designates a lever-rod whose lower end is engaged within the socket 3^a of an auxiliary member 4^a. The rod 1^a is preferably pivotally connected with the member 4^a by means of a bolt or pin 11^a. The member 4^a is operatively connected with the shaft 9^a or other rod or link to be adjustably secured in any desired position. The upper end of the auxiliary member 4^a has the form of a yoke 5^a, having an oblong opening 10^a therein corresponding approximately in shape with but somewhat

longer than the greater width of the rod 1^a, which passes therethrough. This additional length permits the lever-rod to have some motion or play within the opening 10. Pivotally mounted upon the rod 1^a by means of the bolt or pin 25 is a yoke 17^a, surrounding the upper and free ends of two lock or clutch plates 21^a, mounted to frictionally engage the arch-rod or semicircle 16^a, passing through openings 22^a therein. The pivotal motion of the yoke 17^a is limited by the stop 28 within the elongated opening 29. The lower ends of the lock or clutch plates are supported within sockets 26, and their upper ends are held apart by the spring 23^a, supported by studs 27, as shown. The plates 21^a are normally held in frictional engagement with the arch-bar or semicircle 16^a, so that the device is locked against movement in either direction. Mounted upon each end of the yoke 17^a are abutting pieces or screws 20^a, which extend toward each other and normally exert no pressure upon the plates 21^a. Upon the movement of the lever-rod 1^a in either direction one of these abutting pins engages the lock or clutch plate, which normally serves to prevent movement of the lever-rod in that direction and releases such plate from locking engagement with the arch-rod or semicircle 16^a, as has been fully described in connection with the action of lock or clutch plates 16.

Having thus described our invention, what we claim, and desire to secure by Letters Patent, is—

1. In an article of the character described, means for positively locking an element in a desired adjusted position, said means comprising a plurality of apertured locking-plates loosely retained in proximity to each other at one end, an arch-bar passing through the apertures in said plates, a spring disposed between the said plates tending to press the same apart and into locking engagement with the arch-bar, each of said plates serving to lock the device against movement in one direction of its motion, and means for releasing the said locking engagement, substantially as described.

2. In a device of the character described, means for positively locking an element in a desired adjusted position, said means comprising a plurality of apertured locking-plates loosely secured in proximity to each other at one end and normally slanting away from each other toward their other or free ends, an arch-bar passing through apertures in the said plates, a spring disposed between the said plates tending to positively force the same away from each other and into locking engagement with the arch-bar, each of the said plates serving to lock the device against movement in one direction of its motion and means for releasing the said locking engagement.

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3. In a device of the character described, an arch-bar, means for positively locking an element in a desired adjusted position, said means comprising a plurality of slotted locking-plates engaging the arch-bar adjacent the slots, each of said plates serving to lock the said device against movement in one direction of its motion, and means operated by a movement of the handle of the lever for releasing said locking-plates from the said locking engagement.

4. In a device of the character described, a rigid element, means for positively locking an element in a desired adjusted position, said means comprising a plurality of slotted locking-plates normally in locking engagement with the rigid element, said locking-plates being loosely secured in proximity to each other at one end, and means for engagement with the free ends of said locking-plates to release the said locking engagement with the rigid element upon the application of pressure to the handle of the said device in either direction of its motion.

5. In a device of the character described, an arch-bar and a locking or clutch plate for engagement therewith, said plate being freely movable along the said arch-bar when said plate occupies a position approximately perpendicular to the said arch-bar at its point of engagement therewith, means for normally retaining said locking-plate out of such per-

pendicular relation and in locking engagement with the arch-bar and means disposed and arranged to abut against the said locking-plate to bring the same into an approximately perpendicular relation to the said arch-bar thereby releasing the said locking engagement.

6. In a device of the character described, an arch-bar, means for positively locking an element in the desired adjusted position, said means comprising a plurality of perforated locking-plates engaging the arch-bar, each of said plates serving to lock the said device against movement in one direction of its motion and means for releasing the said plates from locking engagement with said arch-bar.

7. In an article of the character described, an arch-bar, apertured locking-plates through which the said arch-bar passes and means for normally holding the said plates in locking engagement with the said arch-bar and an abutting element actuated by movement of the handle of the said device for releasing the locking engagement of the locking-plates with the said arch-bar.

In testimony whereof we affix our signatures in presence of two witnesses.

GEORGE O. BJORNEBY.
ALBERT O. BRAGER.

Witnesses:

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M. M. HUGHES.