E. COOK.

LIFTING JACK.

APPLICATION FILED JAN. 20, 1909.

940,433.

Patented Nov. 16, 1909.

3 SHEETS—SHEET 1.

Fig. 2.

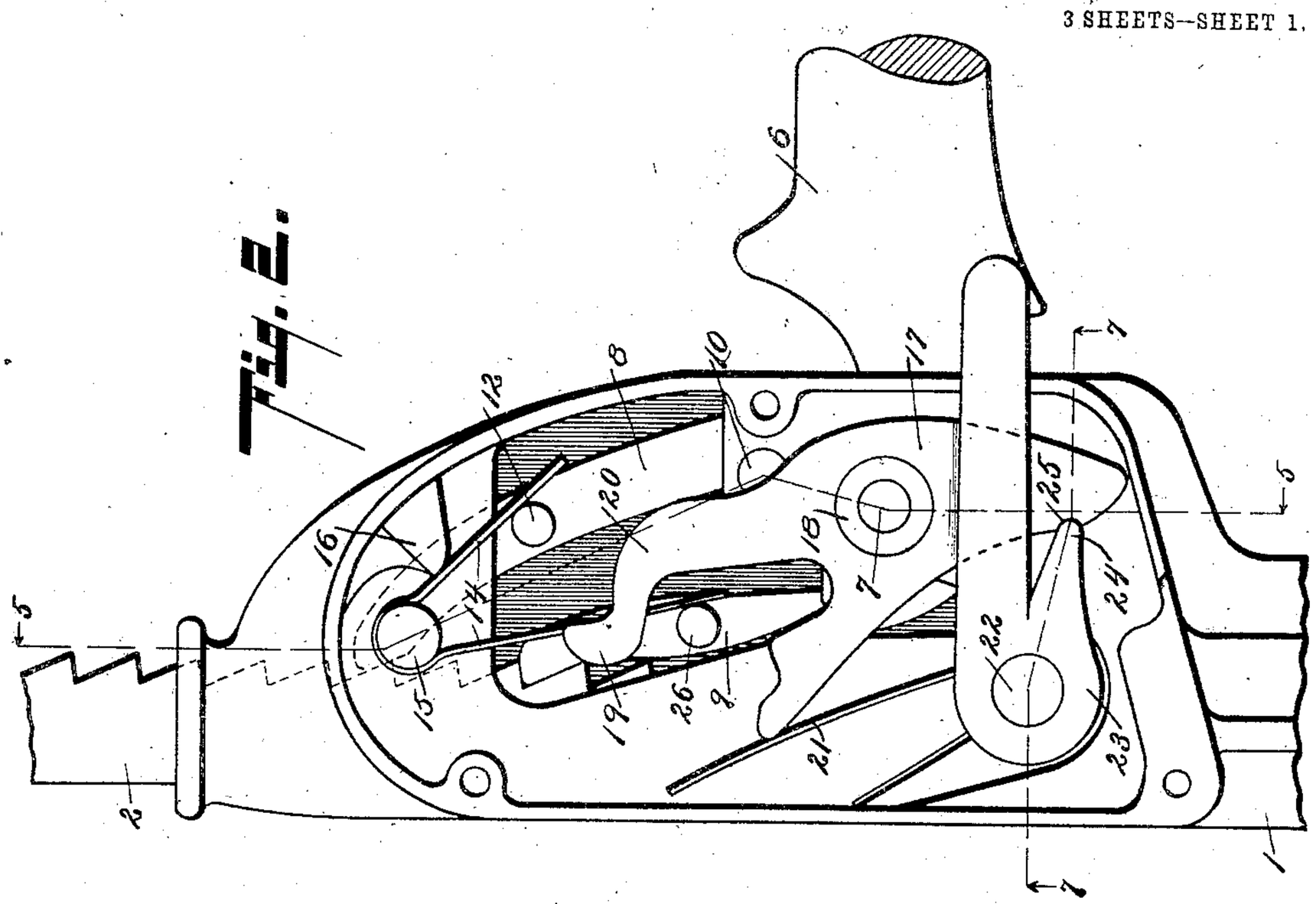
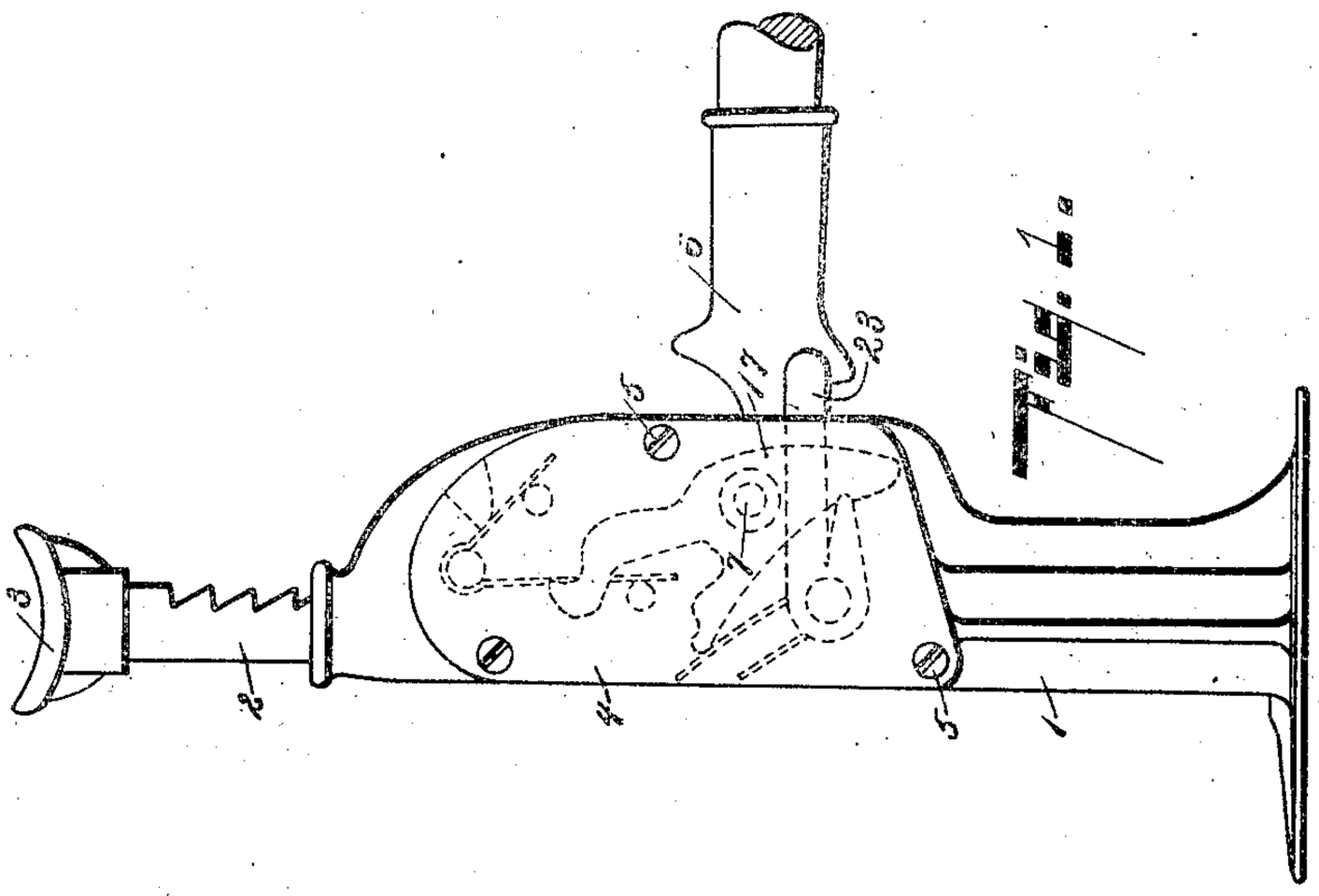


Fig. 1.



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3 SHEETS—SHEET 2.

Fig. 1.

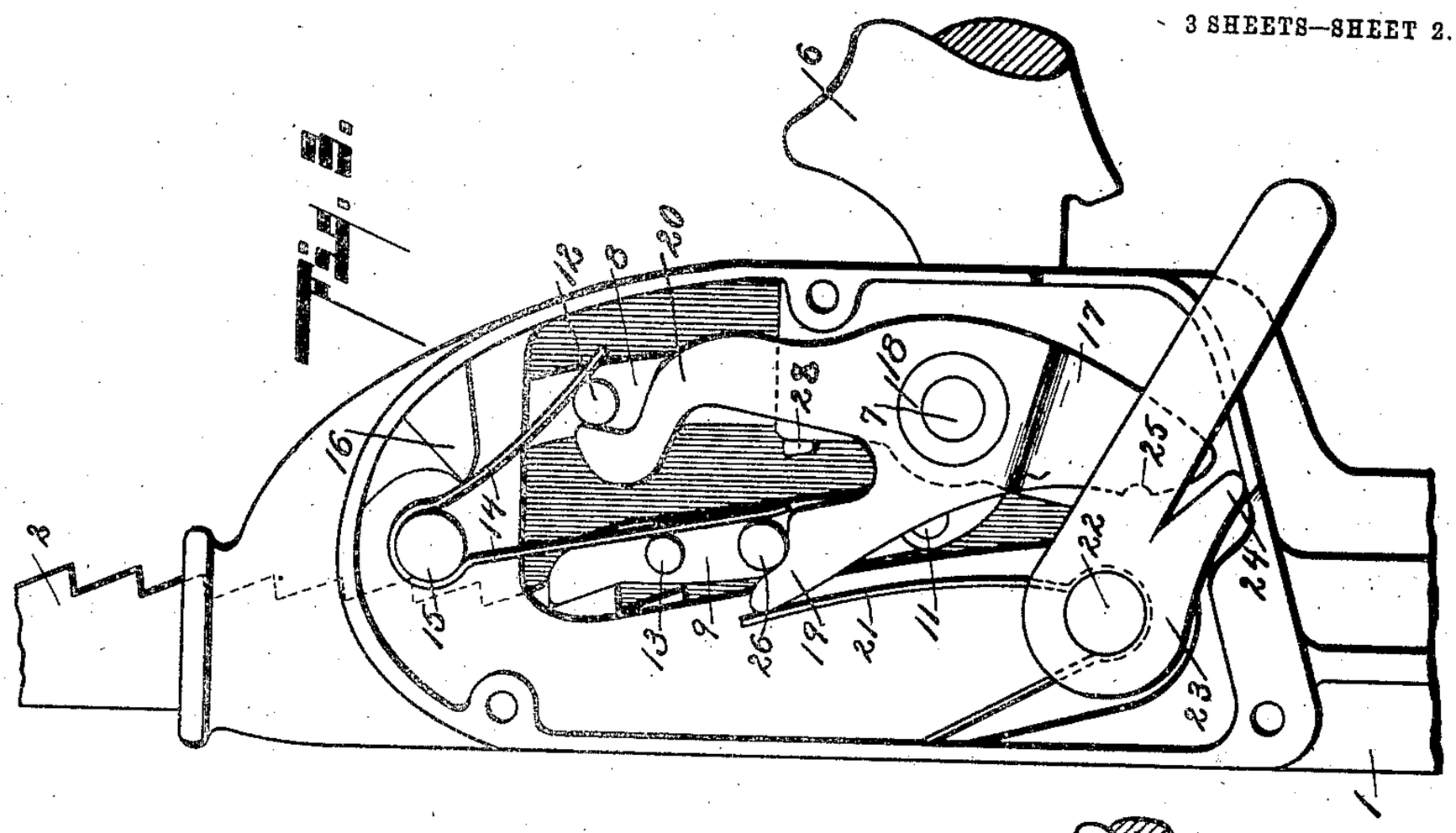


Fig. 2.

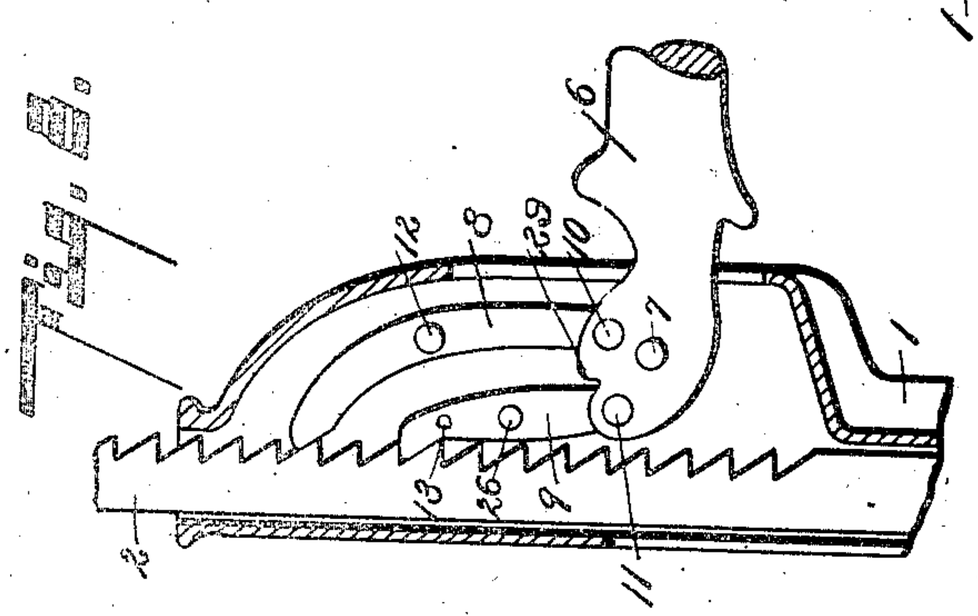
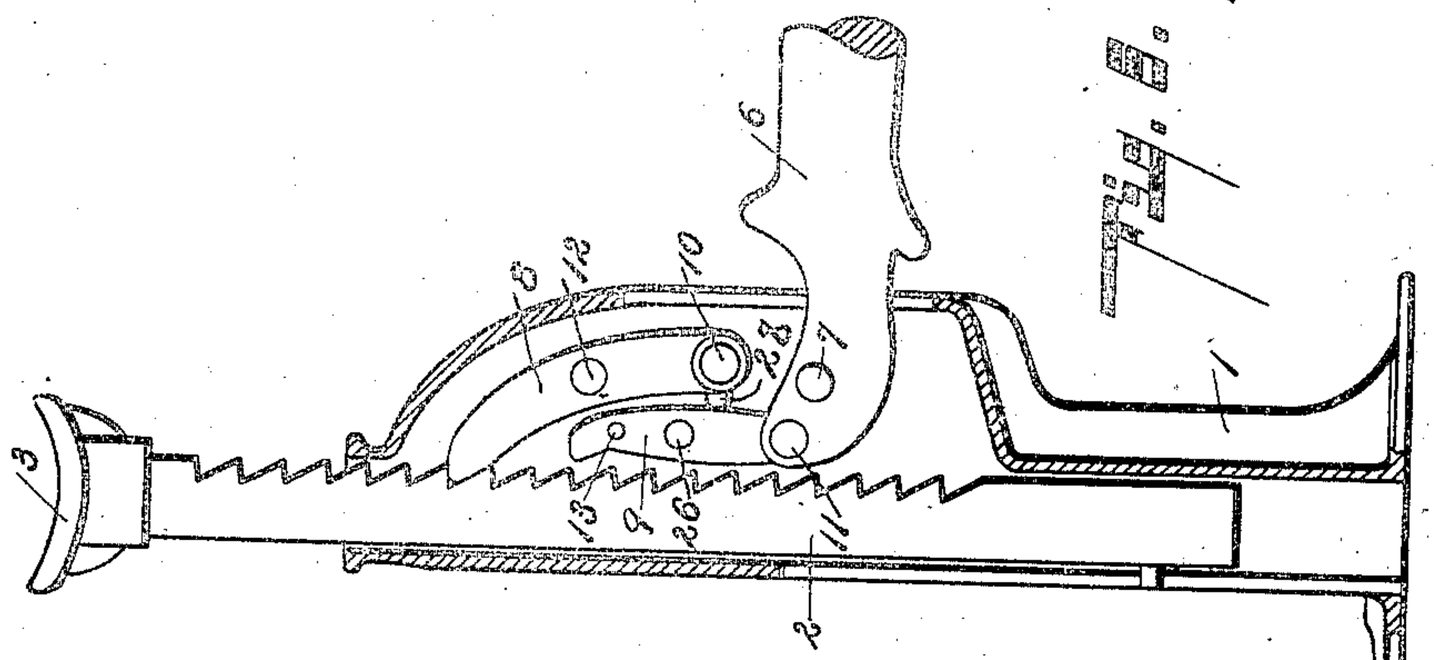


Fig. 3.



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3 SHEETS—SHEET 3.

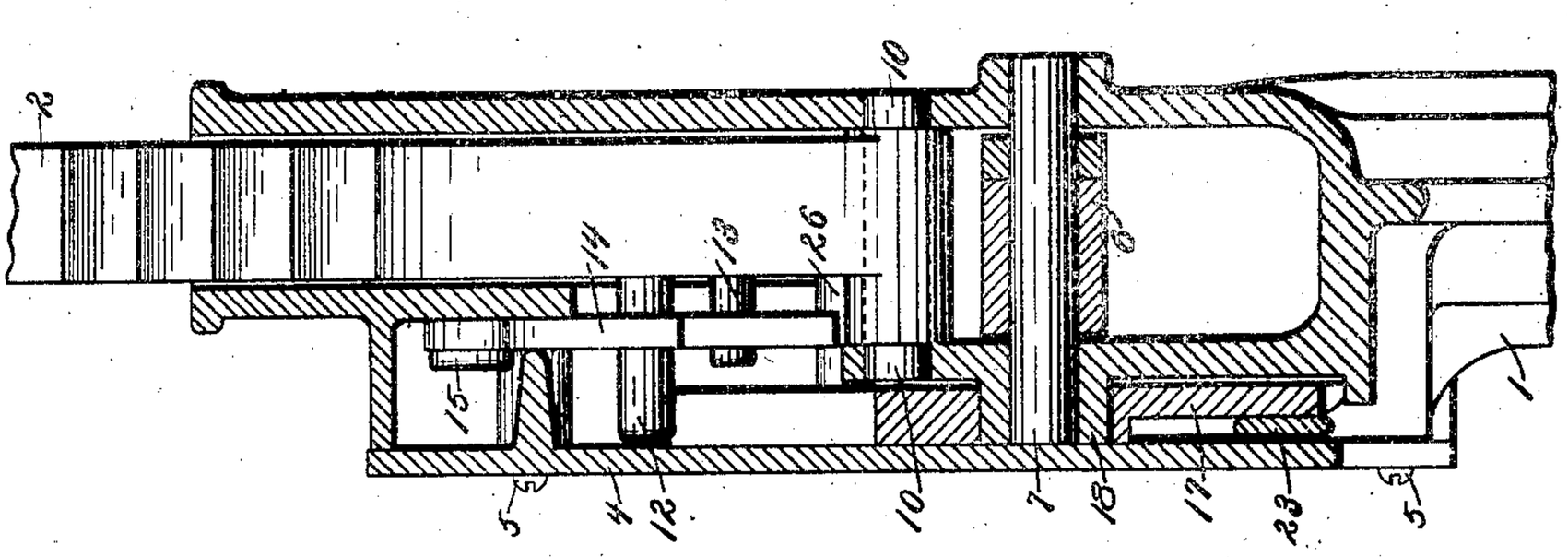

Fig. 5.

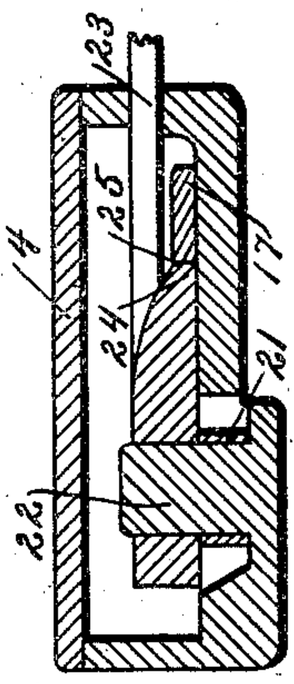

Fig. 7.

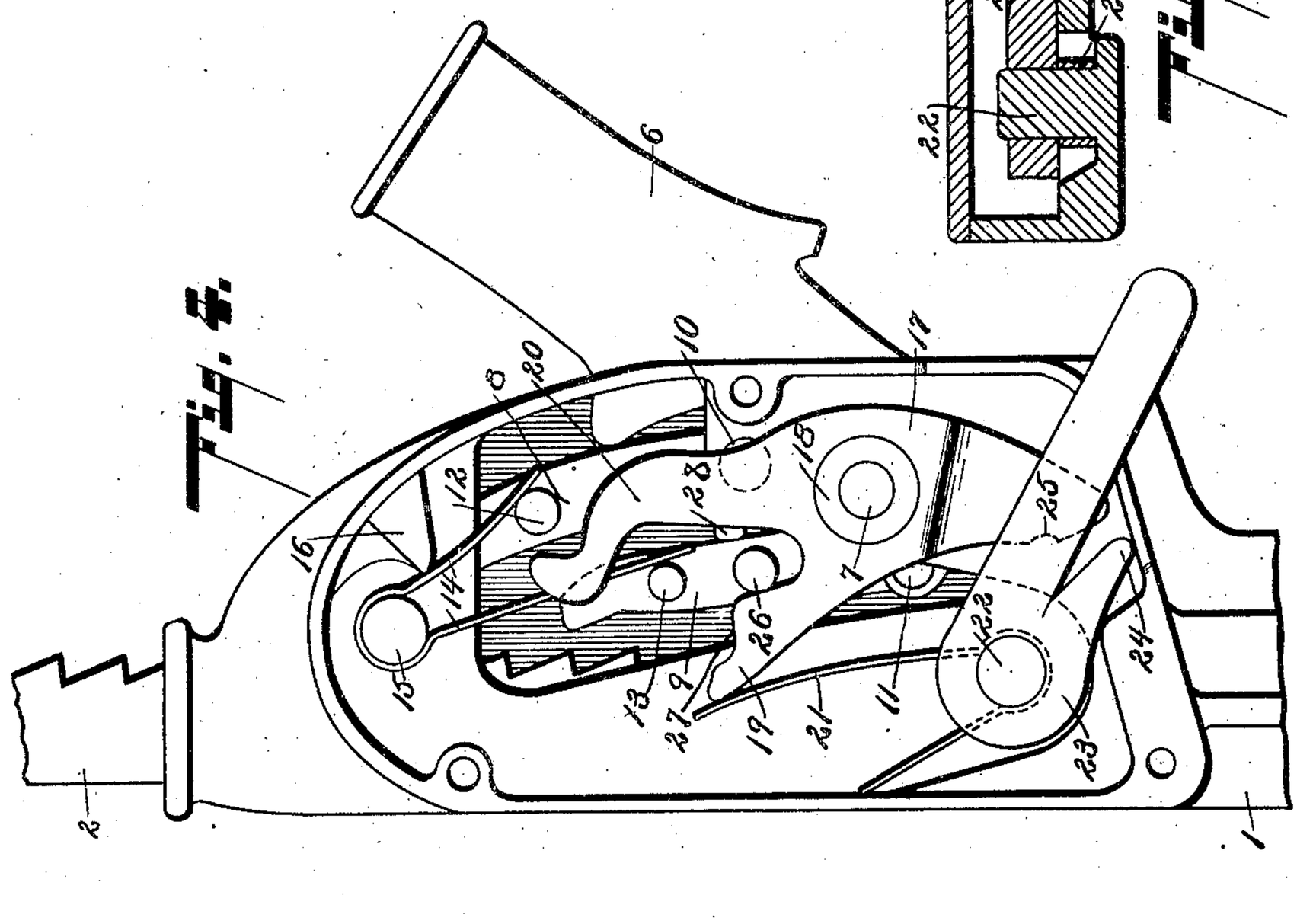

Fig. 4.

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UNITED STATES PATENT OFFICE.

EUGENE COOK, OF KALAMAZOO, MICHIGAN.

LIFTING-JACK.

940,433. Specification of Letters Patent. Patented Nov. 16, 1909.

Application filed January 20, 1909. Serial No. 473,324.

To all whom it may concern:

Be it known that I, EUGENE COOK, a citizen of the United States, residing at Kalamazoo, county of Kalamazoo, and State of Michigan, have invented certain new and useful Improvements in Lifting-Jacks, of which the following is a specification.

This invention relates to improvements in lifting jacks.

My invention relates particularly to the class of jacks shown in Letters Patent 891,523, dated June 23, 1908, issued to Clayton Butler and myself jointly, and is a modification, and in some respects, an improvement upon the structure there illustrated.

The main objects of this invention are: First, to provide an improved lifting jack which may be operated in any position. Second, to provide an improved lifting jack, the operative parts of which are very simple and economical to produce and are easily and quickly assembled, and at the same time to produce a jack which is very strong and durable.

Further objects, and objects relating to structural details, will definitely appear from the detailed description to follow.

I accomplish the objects of my invention by the devices and means described in the following specification.

The invention is clearly defined and pointed out in the claims.

A structure embodying the features of my invention is clearly illustrated in the accompanying drawing; forming a part of this specification, in which;

Figure 1. is a side elevation of a structure embodying the features of my invention, a portion only of the operating lever being shown. Fig. 2 is an enlarged detail view, with one of the side plates removed, the reversing plate being shown in its inoperative position. Fig. 3 is a corresponding view with the locking plate released and in its operative position. Fig. 4 is a corresponding view with the operating lever shown at the limit of its up-stroke, the inner pawl being released. Fig. 5 is an enlarged detail section, taken on a line corresponding to the broken line 5—5 of Fig. 2. Fig. 6 is a detail side elevation with the reversing member and the springs removed, the casing being shown in vertical section. Fig. 7 is an enlarged detail section, taken on a line corresponding to line 7—7 of Fig. 2. Fig. 8 is a detail side elevation of a structure embodying the features of my invention.

In the drawings, similar reference characters refer to similar parts throughout the several views, and the sectional views are taken looking in the direction of the little arrows at the ends of the section lines.

Referring to the drawings, the frame 1 is provided with a suitable way for the rack bar 2. The rack bar is provided with a head 3 at its upper end. The frame is preferably provided with a removable side plate 4. When this plate is removed, the frame is opened, so that the operating mechanism may be placed therein. The plate is detachably secured to the frame as by means of the screws 5. The operating lever 6 is mounted upon a suitable pivot as 7, arranged transversely of the frame. The pawls 8 and 9 are pivotally mounted, the pawl 9 being mounted upon the operating lever, and the pawl 8 being mounted upon the frame, pivots 10 and 11 being provided therefor.

In the modified construction shown in Fig. 8 both pawls are mounted upon the lever 6, the structure being what is generally designated as a double acting jack. The pawls are preferably provided with laterally projecting pins 12 and 13 which are preferably cast integrally with the pawls. The pawls are held yieldingly in engagement with the rack bar by means of springs, preferably a U-shaped spring, as 14, which is arranged in an inverted position, so that one of its arms engages a pin of each pawl. The spring 14 is preferably supported on a pin 15 projecting from the frame. This spring holds the pawl in engagement with the rack bar, so that the jack may be operated in any position, that is, on its side or in an inclined position. The spring is held in engagement with the pawls by the lug 16 on the frame. See Fig. 4.

To reverse the jack, that is, to adjust it so that it lowers the load when the lever is operated, I provide a reversing plate or member 17, which is preferably pivotally mounted on one of the bearings 18 for the lever pivot 7. This reversing member is provided with fingers 19 and 20 which are adapted to engage the pin 12 on the pawl 8, and the pin 13 on the pawl 9, thereby releasing first one and then the other pawl, when the lever is manipulated. The re-

versing member is actuated by the spring 21. This spring is preferably U-shaped and is mounted upon a pin 22, projecting from the frame. This pin, in the structure illustrated, is also adapted to serve as a pivot for the lever 23, by which the reversing member is locked out of its operative position, it being shown secured in its inoperative position in Fig. 2. The lever 23 is provided with an arm 24, adapted to engage a notch 25, in the reversing member.

The lever 23 is arranged through the frame so as to be engaged by the foot of the operator. As the operating lever 6 of the jack is operated, the pawls alternately engage and disengage, thereby raising or lowering the jack, raising it when the reversing member is in inoperative position, and lowering it when it is in its operative position. When the reversing member is in its operative position, the pin 26 on the pawl 9 engages the reversing member, the finger 19 of the reversing member being provided with a shoulder-like stop 27, with which the pin engages. On the downward movement of the pawl, which takes place on the upstroke of the lever, the pawl first holds the reversing member against the tension of its actuating spring, and as the pin 26 slips from the shoulder 27 the reversing member is released, so that the spring actuates the same to disengage the pawl. As the reversing plate is carried over on the down-stroke of the pawl 9, as described, and near the end of its movement, the pawl 8 is permitted to engage, see Fig. 4. On the up-stroke of the pawl 9, the reversing plate is permitted to yield when the pawl passes from the shoulder 27, the reversing plate then assuming the position shown in Fig. 3, allowing the pawl 9 to engage and disengage the pawl 8, the pawls being thus ultimately engaged and disengaged by the operation of the lever 6.

To prevent the tripping of both pawls at the same time, a stop 28 for the pawl 9 is provided and this is preferably in the form of a projection on the pawl 8, the stop being located substantially opposite the pivot 10 of the pawl, so that pressure thereon does not affect the operation of the pawl. By this arrangement of the parts, the structure is adapted to operate in any position, and may be quickly adjusted for elevating or reversing. The main advantage of the present construction over that of the Butler and Cook patent referred to is in structural details, and in the fact that an accurate adjustment of the springs is not necessary, that is, the relative strength of the springs, is not necessary to be accurately adjusted.

In the modified structure shown in Fig. 8, my improvement is adapted to a double acting jack, that is one in which both pawls are mounted on the lever so that the rack bar is moved on each stroke of the lever. The stop 29 for the pawl 9 is in this modification in the form of a shoulder on the lever head. The reversing plate is not illustrated in this figure as it is applied and arranged in substantially the same way as in the preferred construction illustrated.

My improved jack is very simple and economical in construction, and the parts may be assembled by an experienced workman. The parts are preferably held in position by the removable side plate substantially as is the case in the Butler and Cook patent referred to above. It is obvious, however, that other means might readily be employed.

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

1. In a lifting jack, the combination with the frame, of a rack bar; a pivoted lever; a pair of pawls having laterally projecting pins thereon, one of said pawls being pivotally mounted on said lever; a spring arranged to engage said pins on said pawls whereby they are held yieldingly in engagement with said rack; a pivotally-mounted reversing member; an actuating spring for said reversing member, said reversing member being provided with fingers arranged to engage said pins on said pawls, one of said fingers being provided with a pin-engaging shoulder whereby said reversing member is held against the tension of its actuating spring during a partial movement of the lever; a stop for the inner pawl arranged on the outer pawl substantially opposite its pivot; and means for holding said reversing member in its inoperative position.

2. In a lifting jack, the combination with the frame, of a rack bar; a pivoted lever; a pair of pawls having laterally projecting pins thereon, one of said pawls being pivotally mounted on said lever; a spring arranged to engage said pins on said pawls whereby they are held yieldingly in engagement with said rack; a pivotally-mounted reversing member; an actuating spring for said reversing member, said reversing member being provided with fingers arranged to engage said pins on said pawls, one of said fingers being provided with a pin-engaging shoulder whereby said reversing member is held against the tension of its actuating spring during a partial movement of the lever; a stop for the inner pawl; and means for holding said reversing member in its inoperative position.

3. In a lifting jack, the combination with the frame, of a rack bar; a pivoted lever; a pair of pawls having laterally projecting pins thereon, one of said pawls being pivotally mounted on said lever; a spring arranged to engage said pins on said pawls whereby they are held yieldingly in engagement with said rack; a pivotally-mounted

reversing member; an actuating spring for said reversing member, said reversing member being provided with fingers arranged to engage said pins on said pawls, one of said fingers being provided with a pin-engaging shoulder whereby said reversing member is held against the tension of its actuating spring during a partial movement of the lever; and means for holding said reversing member in its inoperative position.

4. In a lifting jack, the combination with the frame of a rack bar; a pivoted lever; a pair of pawls, one of said pawls being pivotally mounted on said lever; a spring arranged to engage said pawls whereby they are held yieldingly in engagement with said rack; a pivotally mounted reversing member; an actuating spring for said reversing member, said reversing member being arranged to engage said pawls, one of the pawls being adapted to hold said reversing member against the tension of its actuating spring during a partial movement of the lever; a stop for the inner pawl; and means for holding said reversing member in its inoperative position.

5. In a lifting jack, the combination with the frame of a rack bar; a pivoted lever; a pair of pawls, one of said pawls being pivotally mounted on said lever; a spring arranged to engage said pawls whereby they are held yieldingly in engagement with said rack; a pivotally mounted reversing member; an actuating spring for said reversing member, said reversing member being arranged to engage said pawls, one of the pawls being adapted to hold said reversing member against the tension of its actuating spring during a partial movement of the lever; and means for holding said reversing member in its inoperative position.

6. In a lifting jack, the combination with the frame, of a rack bar; a pair of alternately acting pawls; means for holding said pawls yieldingly in engagement with said rack; a pivotally mounted reversing member; an actuating spring for said reversing plate, said reversing member being adapted to alternately act on said pawls, one of the pawls being adapted to hold said reversing member against the tension of its actuating spring during a partial movement of the pawl; a stop for limiting the movement of the pawl acting on said reversing member; and means for holding said reversing member in its inoperative position.

7. In a lifting jack, the combination with the frame, of a rack bar; a pair of alternately acting pawls; means for holding said pawls yieldingly in engagement with said rack; a pivotally mounted reversing member; an actuating spring for said reversing plate, said reversing member being adapted to alternately act on said pawls, one of the pawls being adapted to hold said reversing member against the tension of its actuating spring during a partial movement of the pawl; and means for holding said reversing member in its inoperative position.

8. In a lifting jack, the combination with the frame, of a rack bar; a pivoted lever; a pair of pawls, one of said pawls being pivotally mounted on said lever; a spring arranged to engage said pawls whereby they are held yieldingly in engagement with said rack; a pivotally mounted reversing member arranged to alternately engage said pawls; an actuating spring therefor; and a stop for the inner pawl, arranged on the outer pawl substantially opposite its pivot.

9. In a lifting jack, the combination with the frame, of a rack bar; a pivoted lever; a pair of pawls, one of said pawls being pivotally mounted on said lever; a spring arranged to engage said pawls whereby they are held yieldingly in engagement with said rack; a pivotally mounted reversing member arranged to alternately engage said pawls; an actuating spring therefor; and a stop for the inner pawl.

10. In a lifting jack, the combination with the frame, of a rack bar; a pair of alternately acting pawls; means for holding said pawls yieldingly in engagement with said rack; a reversing member arranged to alternately act on said pawls; an actuating spring therefor; and a stop for preventing the engagement of said pawls when acted upon by said reversing member.

In witness whereof, I have hereunto set my hand and seal in the presence of two witnesses.

EUGENE COOK. [L. S.]

Witnesses:

CLORA ELLYN BRADEN,

JESSIE MCILVAINE.