

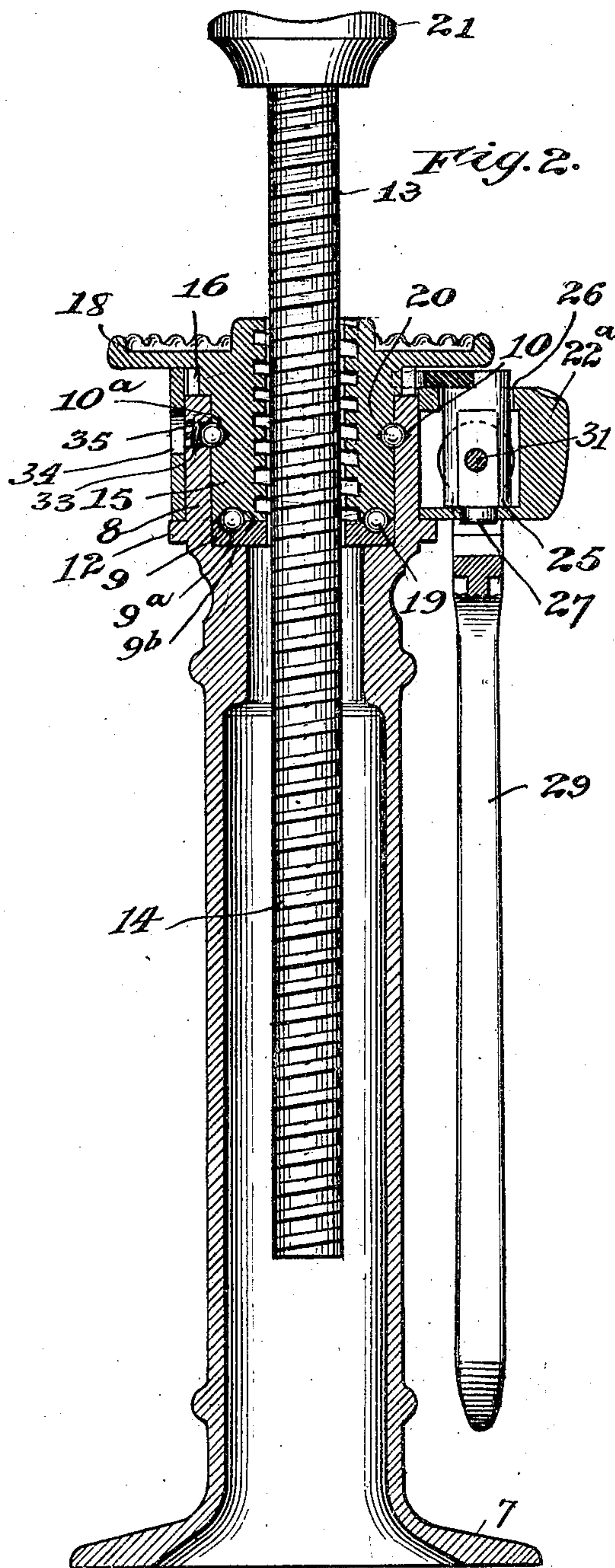
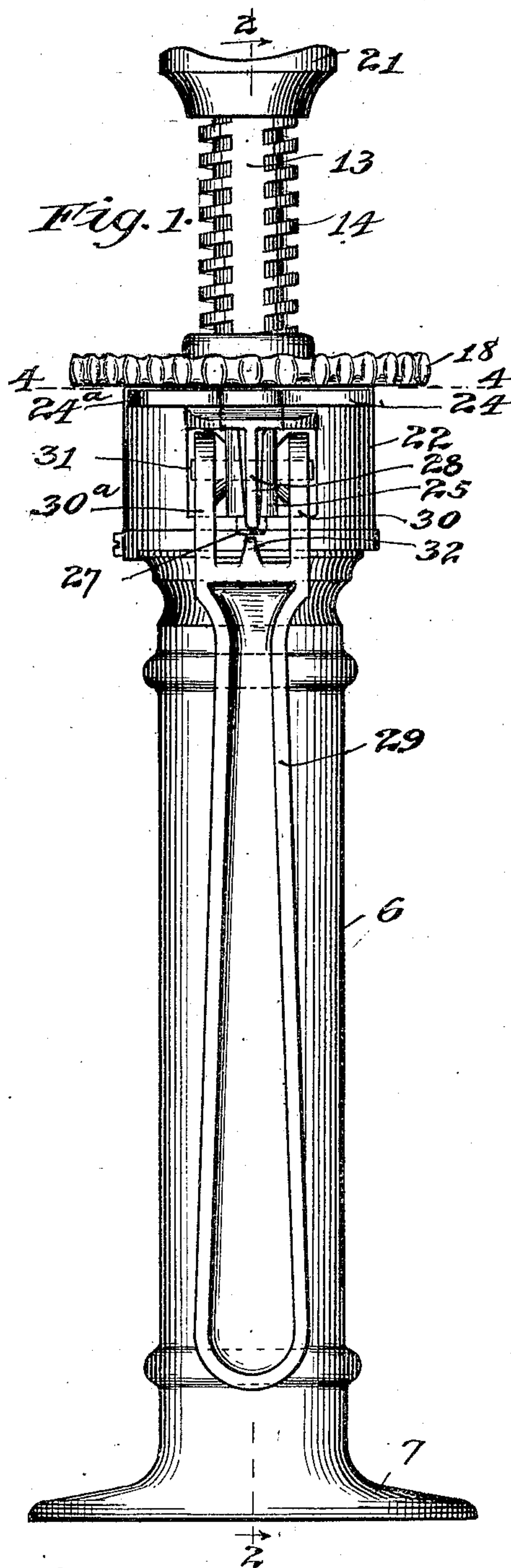
No. 877,386.

PATENTED JAN. 21, 1908.

E. W. TOPPING & T. V. PLICE.  
LIFTING JACK.

APPLICATION FILED MAY 6, 1907.

2 SHEETS—SHEET 1.



Witnesses,  
J. Mann  
James R. Offield.

Inventors  
Edward W. Topping  
Thomas V. Plice.  
By Offield, Towle and Luthicum.  
Attys.

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2 SHEETS—SHEET 2.

Fig. 3.

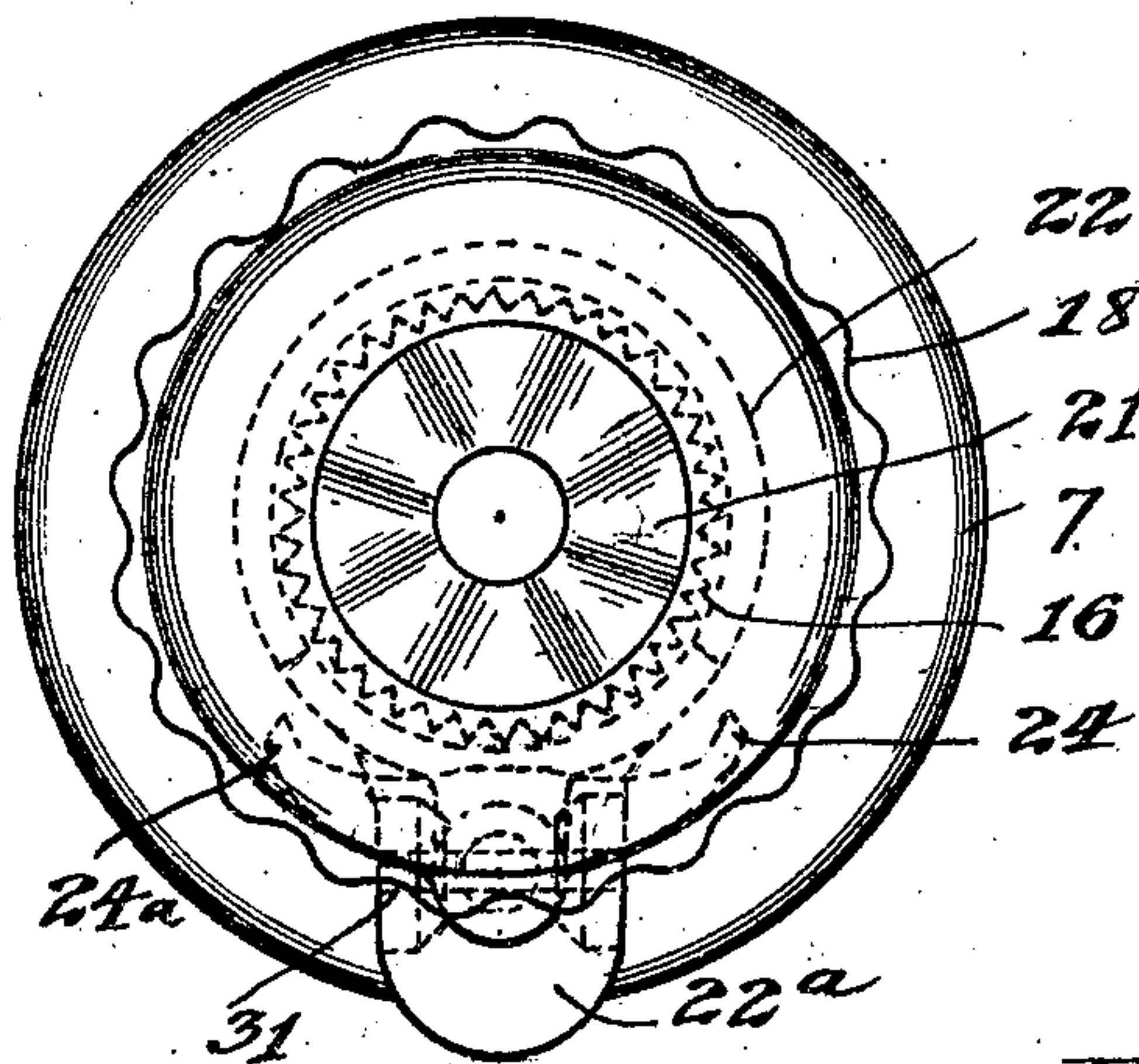


Fig. 4.

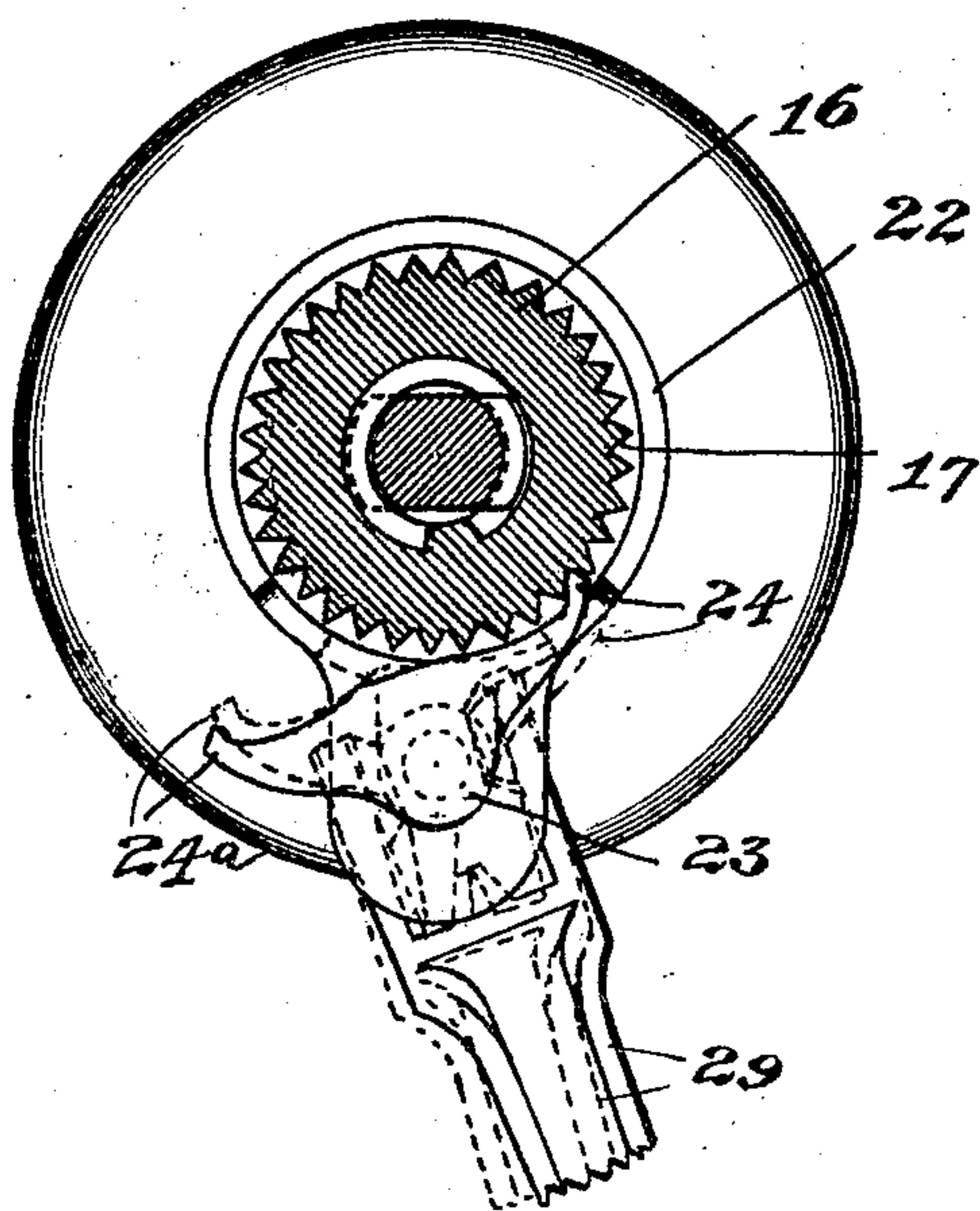
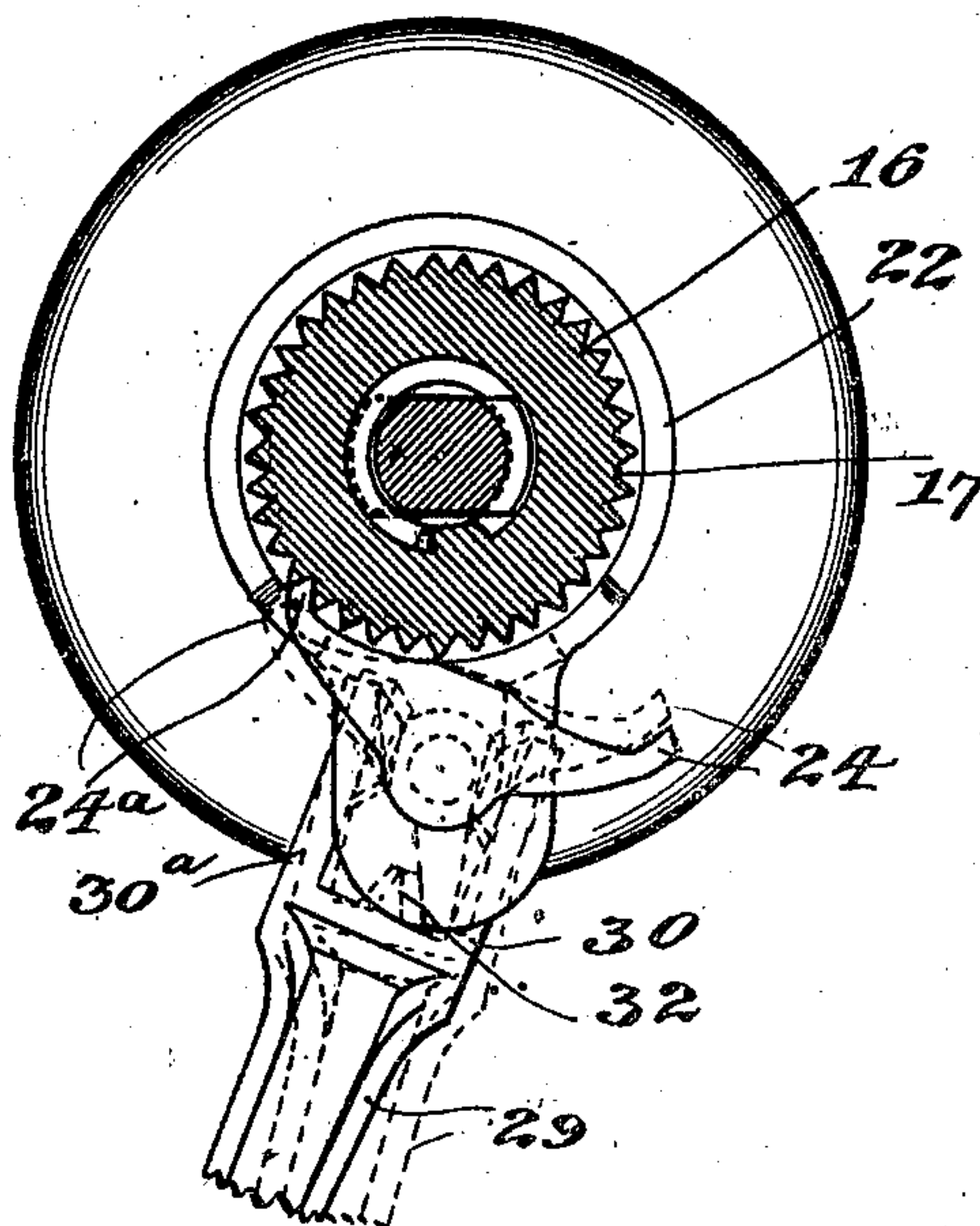


Fig. 5.



Witnesses,

J. S. Mann,

James R. Offield.

Inventors,

Edward W. Topping

Thomas V. Plice

By Offield, Towle and Lenthicum  
Attys.



# UNITED STATES PATENT OFFICE.

EDWARD W. TOPPING AND THOMAS V. PLICE, OF ASHLAND, OHIO, ASSIGNORS TO SAFETY  
DOOR HANGER CO., OF ASHLAND, OHIO.

## LIFTING-JACK.

No. 877,386.

Specification of Letters Patent.

Patented Jan. 21, 1908.

Application filed May 6, 1907. Serial No. 372,263.

*To all whom it may concern:*

Be it known that we, EDWARD W. TOPPING and THOMAS V. PLICE, both citizens of the United States, and residents of Ashland, in the county of Ashland and State of Ohio, have invented certain new and useful improvements in Lifting-Jacks, of which the following is a specification.

Our invention pertains to lifting jacks in general, but is especially adapted for use in connection with automobiles, and has for its main object the provision of a durable and powerful device wherein the parts are few in number and the friction between the parts is so reduced that heavy weights or bodies may be easily lifted.

Further advantages are in the means for reversing the direction of movement of the lifting-bar, and numerous other advantages will appear throughout the specification and drawings wherein,

Figure 1 is an elevation view of the invention. Fig. 2 is a vertical section on line 2—2 of Fig. 1. Fig. 3 is a top plan view of Fig. 1. Fig. 4 is a cross-section on line 4—4 of Fig. 1, and Fig. 5 is a view similar to Fig. 4 with the pawl in reversed position.

Referring now more specifically to the drawings, 6 is a standard, hollow in form and provided with a suitable base 7. The standard 6 has a bearing-box 8, that is preferably formed integral therewith, and at the bottom of said box is a hardened metal apertured plate 9 having an annular ball-bearing seat or race-way 9<sup>a</sup>, while the interior wall of said bearing-box is grooved to form a ball-bearing seat or race-way 10 disposed in a horizontal plane near the top thereof. The plate 9 has a central opening corresponding in form to the cross-section of the lifting-bar, for a purpose hereinafter described. A circumferential flange 12 surrounds the bearing-box 8. A lifting-bar 13 is threaded throughout its length, but is flattened on opposite sides so as to slide freely through the opening in the plate 9, by which it is held against rotation. Threaded upon the lifting-bar is a nut 15 having cooperating ball-bearing surfaces or race-ways 9<sup>b</sup> and 10<sup>a</sup>, and formed integral with the nut is a ratchet disk 16 which is provided with the usual ratchet teeth 17.

A hand wheel 18 is situated above the ratchet disk and affords a means for turning the nut to speedily raise or lower the lifting-bar when not under load. In the preferred

form of construction the nut, ratchet disk and hand wheel are all formed integral. The nut is rotatably seated within the bearing-box 8 so as to bring the aforementioned race-ways into register, and suitable ball-bearings 19 and 20 are provided. It is to be herein noted that 19 and 20 afford a ball-bearing support for the nut 15 to facilitate the turning thereof with slight friction and that the ball-bearings 20, when the parts are assembled, prevent the vertical movement of the nut relative to the standard. The lifting-bar is provided with a head 21 to afford a suitable surface to come in contact with the article to be lifted. As a further means for revolving the nut whereby the lifting-bar may be raised or lowered when under load we provide a collar 22 that surrounds the exterior of the bearing-box 8 resting on flange 12; and formed integral with the collar is a bracket 22<sup>a</sup> carrying a vertically pivoted horizontal pawl 23. The pawl is of the double-acting type, being provided at its opposite ends with two dogs 24 and 24<sup>a</sup>, and having a central vertical shank 25 that is rotatably mounted and has a bearing in an aperture 26 in the bracket 22<sup>a</sup> and is pivoted to the lower portion thereof, as shown at 27. The bracket is provided on its outer side with a fixed vertical guide 28, for a purpose that will be hereinafter described. As a means for moving the ratchet through the pawl, a handle 29 is provided having two ears 30 and 30<sup>a</sup> that have a bearing on either side of the shank 25 of the pawl, and are pivotally secured thereto by means of the horizontal pin 31. Centrally located upon the handle and intermediate of the two ears 30 and 30<sup>a</sup> is a prong 32 that is adapted to be moved on either side of the fixed guide 28 to rock the pawl and throw one or the other of the dogs into engagement with the ratchet teeth according to which side of the guide it engages.

The preferred manner of assembling the device is to first place the collar upon the bearing-box and then to drop the lifting-bar with the nut thereon into its proper position, having first placed the lower set of ball-bearings 19 within their seat. When the parts are in the position as just described, the ball-bearings 20 are dropped into place through an aperture 33 in the bearing-box and an aperture 34 in the collar, which apertures are adapted to be brought into register, whereupon a screw 35 confines the bearings against



escape. When the parts are assembled, as just described, the handle will hang in the vertical position as shown in Fig. 1 whereupon the pawl will be out of engagement with the ratchet teeth, as shown in Fig. 3; then by lifting the handle into a horizontal position, having the prong upon the left-hand side of the fixed guide 28, the pawl will assume a position as shown in Fig. 5 with the dog 24<sup>a</sup> engaging the ratchet, and by a movement of the handle to the left, as shown in Fig. 5, it will turn the nut 15, that is stationary vertically relative to the standard, thereby forcing the lifting-bar upward by reason of the threaded engagement of the lifting-bar and the nut. There is sufficient play or movement between the prong and the fixed guide to throw the pawl out of engagement with the teeth on the ratchet on the return swing of the handle so that when the handle has been moved to the left a sufficient distance, according to the position and convenience of the operator, the handle can be moved back a slight distance to bring the prong against the fixed guide whereupon, on the further return swing of the handle, the pawl will be thrown out of engagement and brought to a new position in engagement with the teeth. When the lifting-bar has been raised to the desired height and a reverse movement is desired to lower the bar under load, the handle is permitted to drop down a sufficient distance so that the prong may be moved upon the right side of the fixed guide, as viewed in Fig. 4, whereupon by a movement of the handle to the right the nut is rotated in the opposite direction, as just described, causing the lifting-bar to be moved downward. It can be thus readily seen that the raising or lowering of the lifting-bar is determined by a simple movement of the handle whereby the prong is brought upon one side or the other of the fixed guide.

From the foregoing description it will be seen that the entire weight of the body lifted comes upon the nut 15 which in turn is supported by the ball-bearings, and that the rotation of the nut is accomplished very easily for the reason that friction between the nut and the bearing-box is greatly reduced. It will be further seen in operating a jack of this character that the means for reversing the direction of movement of the lifting-bar is a matter of considerable importance, for the reason that the position in which a lifting jack is generally placed, especially in connection with a vehicle such as an automobile, necessarily confines the

movement of the lever or handle to small space.

We do not wish it understood that our invention is confined to the precise structure herein shown, as it is obvious that various changes and modifications may be made without departing from the spirit of the invention, and therefore without confining ourselves to the specific details of construction.

We claim:

1. In a lifting jack, the combination of a nut having a ratchet thereon, a lifting-bar having a threaded connection with said nut but non-rotatably confined therein, a double pawl carrying dogs adapted to have an engagement with said ratchet, a handle secured to said pawl for rotating said nut, and a guide for determining the engagement of one of the dogs of the double pawl with the ratchet as the handle is swung into operative position, substantially as described.

2. In a lifting jack, the combination of a standard, a nut rotatably confined within said standard and having a ratchet thereon, a lifting-bar having a threaded connection with said nut but non-rotatably confined therein, a collar rotatably mounted on said standard, a double pawl pivotally mounted on said collar and carrying dogs adapted to have an engagement with said ratchet, a handle secured to said pawl for rotating said nut, and means on said collar and handle for determining the engagement of one of the dogs of the double pawl with the ratchet as the handle is swung into operative position, substantially as described.

3. In a lifting jack, the combination of a standard, a nut rotatably confined within said standard and having a ratchet thereon, a lifting-bar having a threaded connection with said nut but non-rotatably confined therein, a collar rotatably mounted on said standard, a double pawl pivotally mounted on said collar and carrying dogs adapted to have an engagement with said ratchet, a handle secured to said pawl for rotating said nut, and a guide for determining the engagement of one of the dogs of the double pawl with the ratchet as the handle is swung into operative position, substantially as described.

EDWARD W. TOPPING.  
THOMAS V. PLICE.

Witnesses:

TENA MOORE,  
CHAS. J. KENNY.