

No. 765,816.

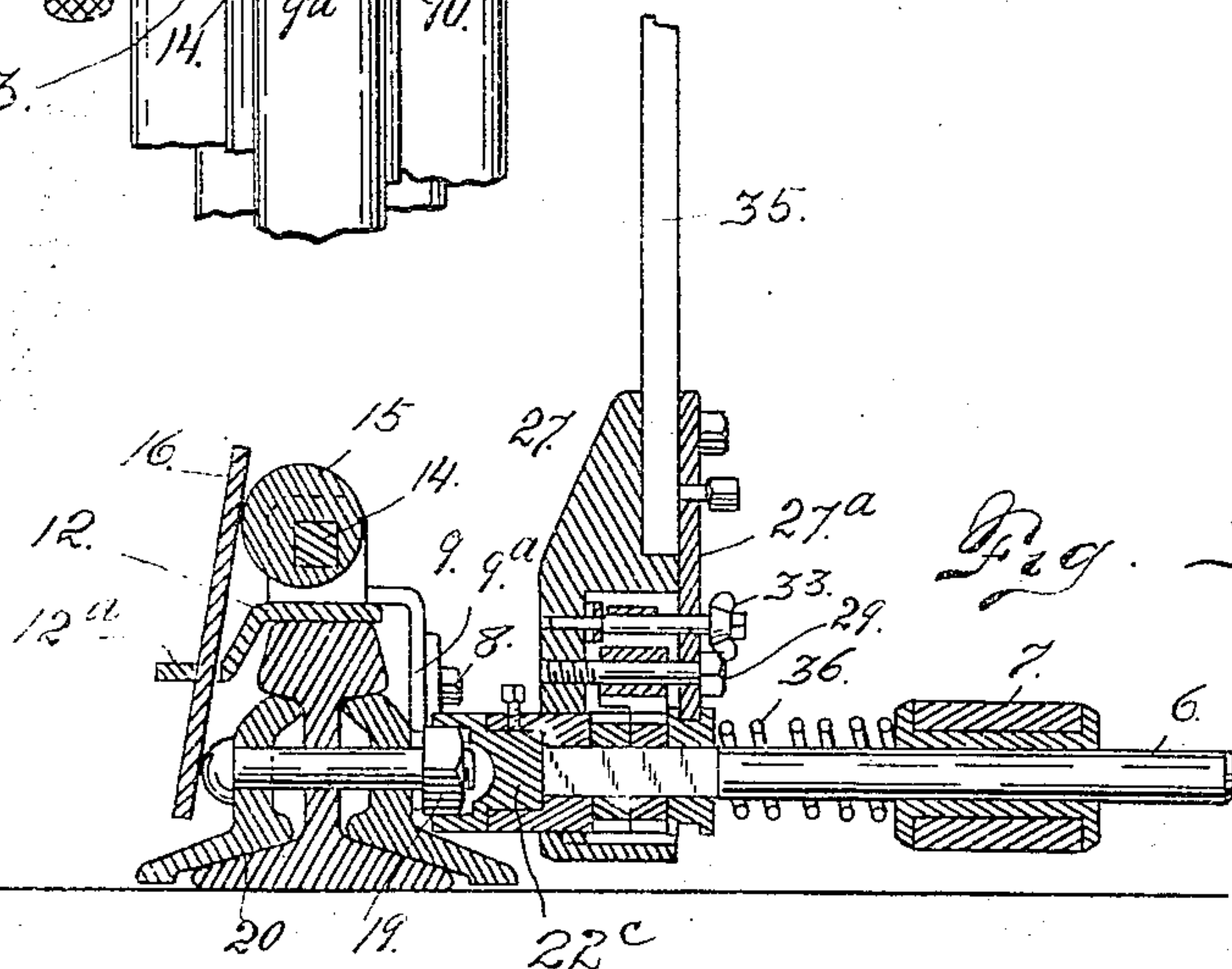
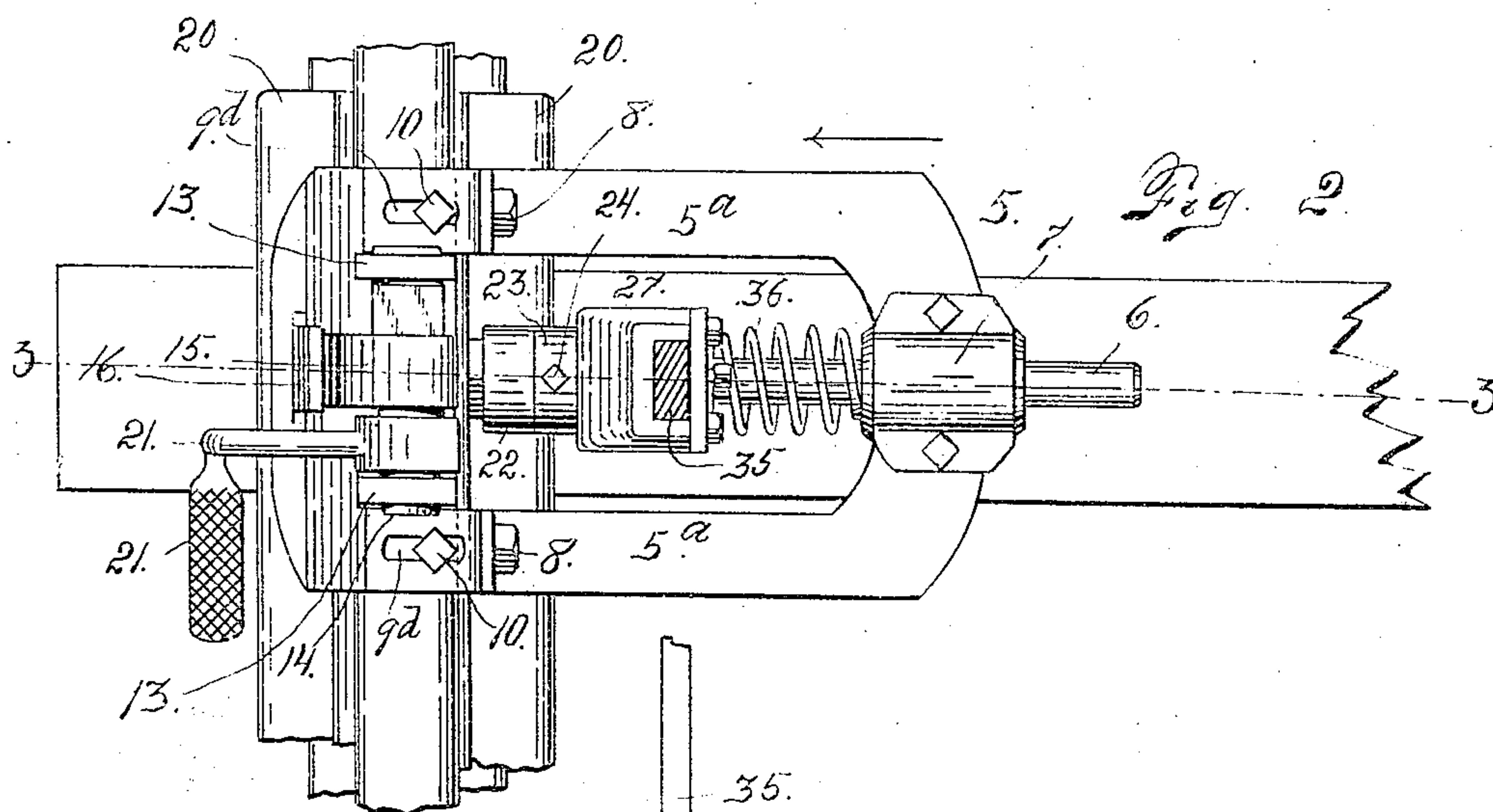
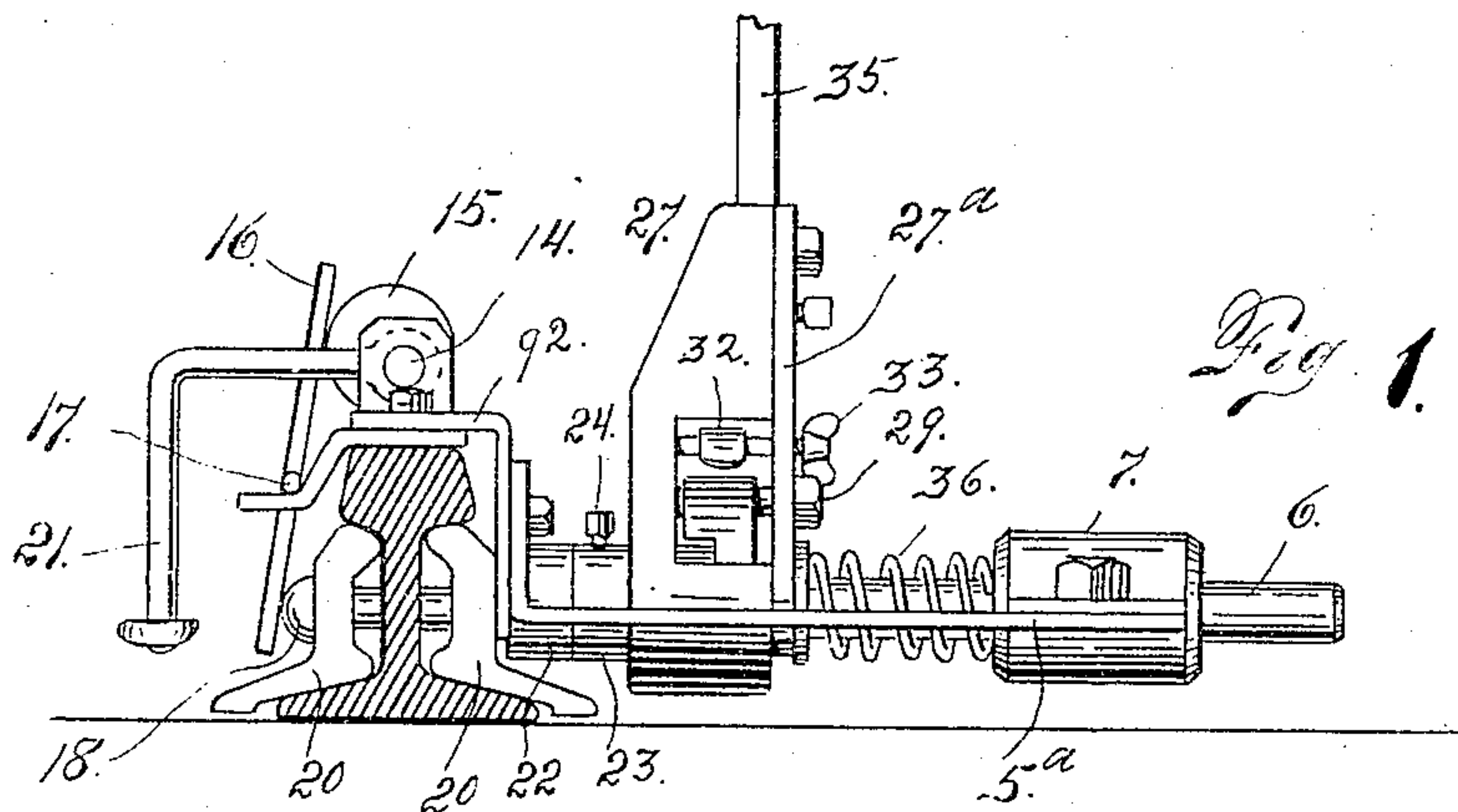
PATENTED JULY 26, 1904.

C. J. COULTER.
RATCHET WRENCH.

APPLICATION FILED SEPT. 3, 1903.

NO MODEL.

2 SHEETS—SHEET 1.



Witnesses
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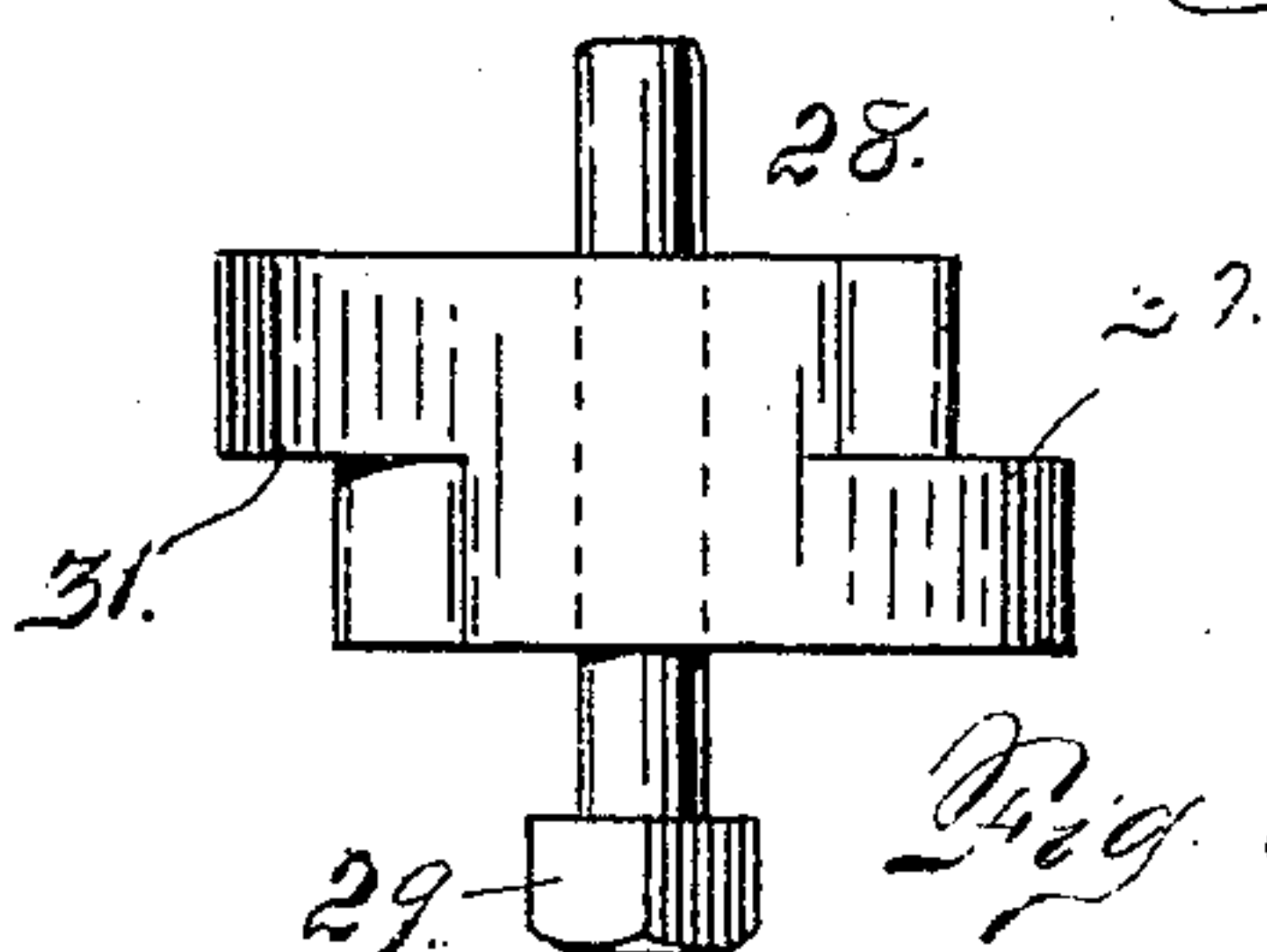
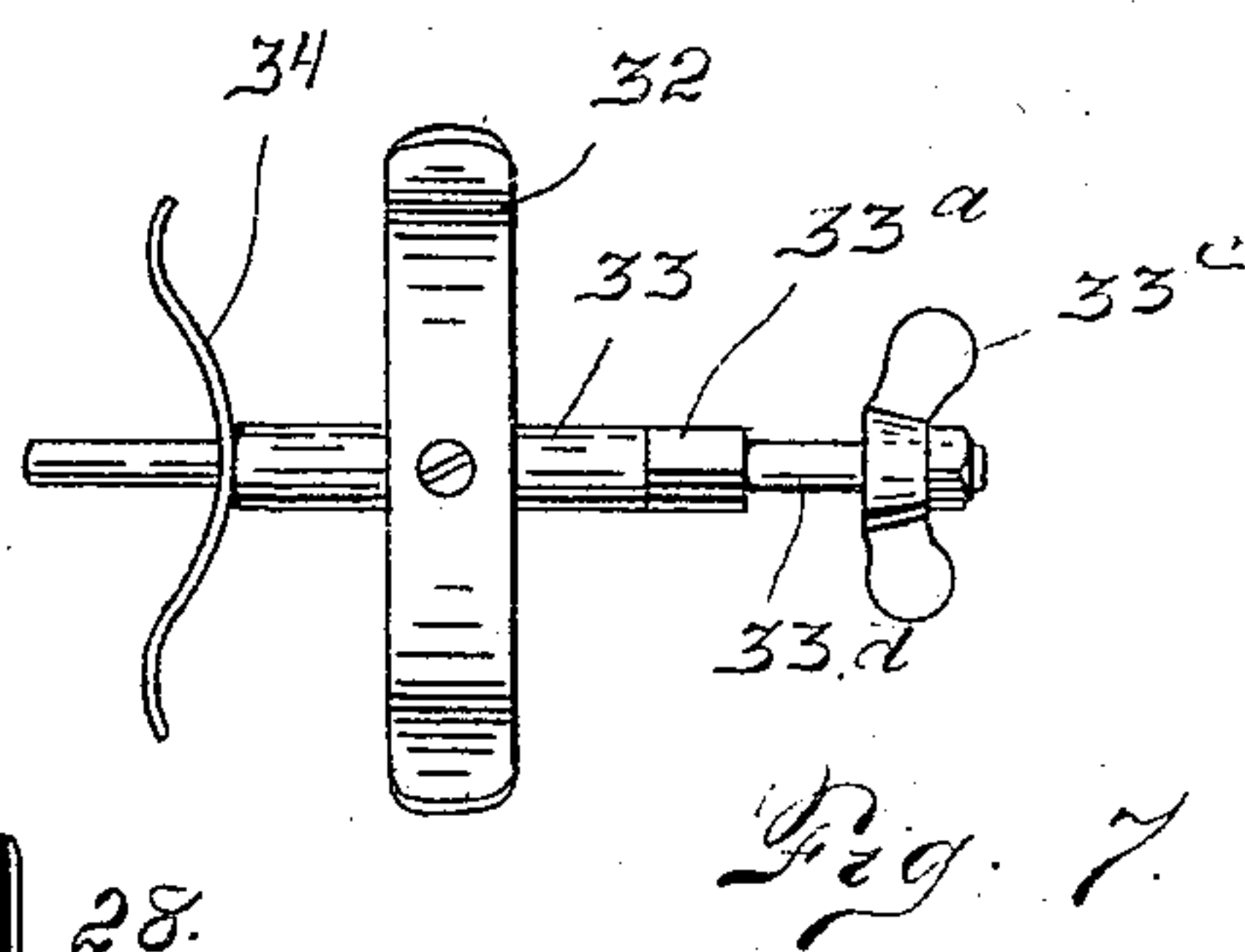
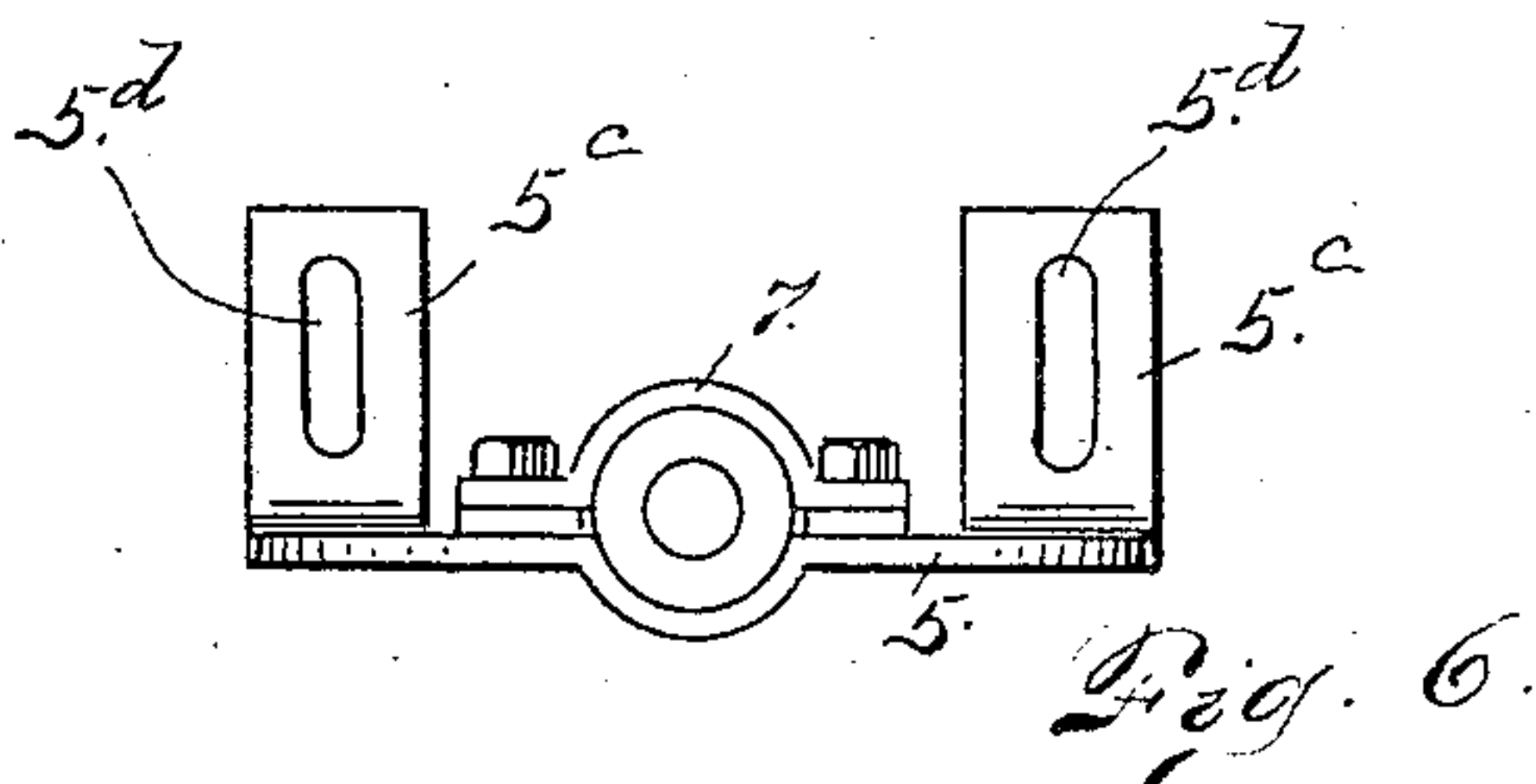
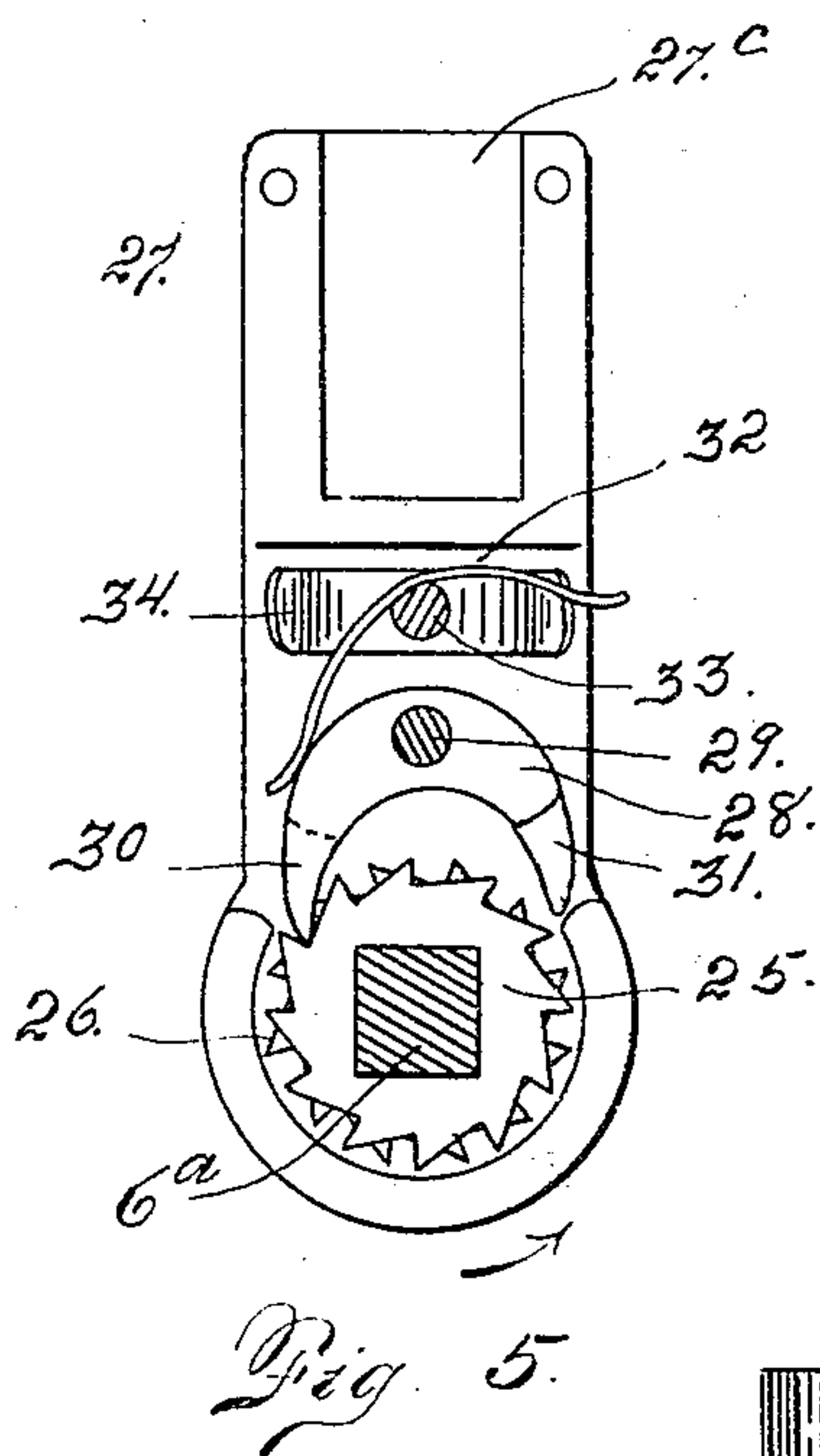
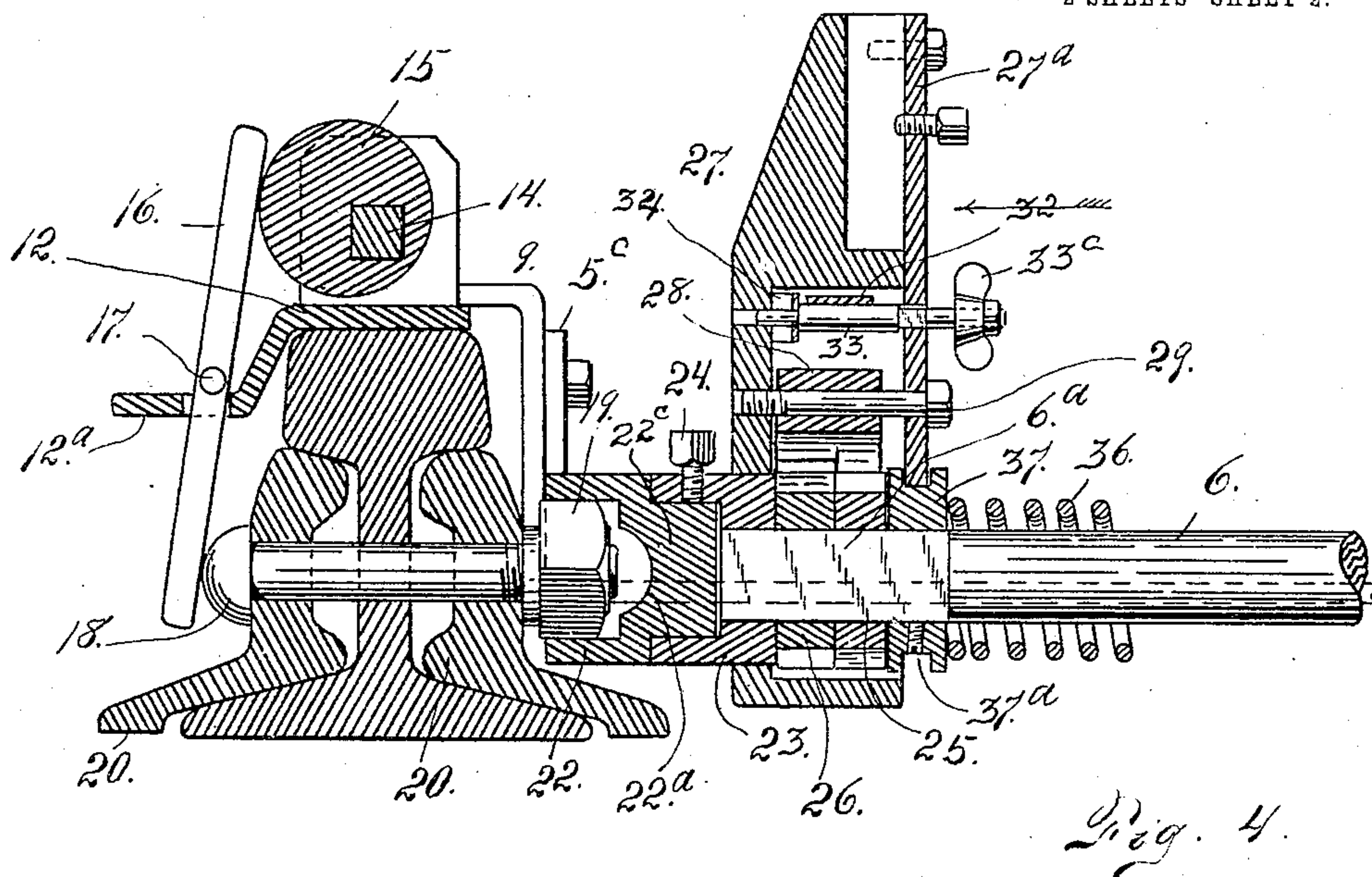
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Dena Nelson.

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UNITED STATES PATENT OFFICE.

CHARLES J. COULTER, OF DENVER, COLORADO.

RATCHET-WRENCH.

SPECIFICATION forming part of Letters Patent No. 765,816, dated July 26, 1904.

Application filed September 3, 1903. Serial No. 171,829. (No model.)

To all whom it may concern:

Be it known that I, CHARLES J. COULTER, a citizen of the United States of America, residing in the city and county of Denver and State of Colorado, have invented certain new and useful Improvements in Ratchet-Wrenches; and I do 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, reference being had to the accompanying drawings, and to the figures of reference marked thereon, which form a part of this specification.

My invention relates to improvements in wrenches of the class adapted to clamp and hold the parts to be connected by the bolts during the operation of applying and removing the nuts.

The invention is well adapted for use in connection with railroad-rail joints in which fish-plates are employed, and it will be described in connection with this use in this application, though it must be understood that it may be employed in other relations and that its use is not limited to any particular or special construction.

My object is to provide an apparatus of this class which shall be simple in construction, economical in cost, reliable, durable, and efficient in use; and to these ends the invention consists of the features, arrangements, and combinations hereinafter described and claimed, all of which will be fully understood by reference to the accompanying drawings, in which is illustrated an embodiment thereof.

In the drawings, Figure 1 is a side elevation of my improved device applied to a railroad-rail joint. Fig. 2 is a top or plan view of the same. Fig. 3 is a section taken on the line 3-3, Fig. 2. Fig. 4 is a similar view, the parts being shown on a larger scale. Fig. 5 is a view looking in the direction of the arrow in Fig. 4, the detachable plate being removed from the ratchet-case to expose the dog and ratchets. Fig. 6 is an end view of the frame in which the operating-shaft is journaled. Fig. 7 is a detail view showing the spindle and spring for controlling the position of the ratchet-engaging dog. Fig. 8 is a top view

in detail of the dog, shown on a scale somewhat enlarged.

The same reference characters indicate the same parts in all the views.

Let the numeral 5 designate a yoke-shaped frame in which the operating-shaft is journaled, as shown at 7. The arms 5^a of this frame are turned upwardly at their extremities remote from the bearing 7. These up-turned extremities 5^c extend at right angles to the body of the frame and are provided with vertical slots 5^d, through which are passed stud-bolts 8, which are threaded in the vertical arms 9^a of angle-pieces 9. These slots permit vertical adjustment of the angle-pieces, whereby the device may be adapted for use with rails of different height. The horizontal parts 9^c of the angle-pieces are slotted to receive stud-bolts 10, which are threaded in the housing-plate 12. These bolts 10 connect the angle-pieces 9 with the housing and hold the parts in operative relation. The slots 9^d permit lateral adjustment to adapt the device for use with rails having treads of varying width. When the device is in use, the housing-plate rests directly on the tread of the rail, the latter forming a support for the device when in use.

Between the slotted angle-pieces 9 the housing-plate is provided with two upwardly-projecting parts 13, in which is journaled a shaft 14, provided with an eccentric cam 15, adapted to act on a lever-like clamping-plate 16, which passes through an opening formed in a projecting part 12^a of the housing, whereby the plate is fulcrumed on the housing. This plate is provided with a pin 17, which limits its downward movement. The lower part of the plate engages the head of the bolt 18 to which the nut 19 is to be applied or from which it is to be removed by the use of my improved device. As shown in the drawings, this bolt passes through fish-plates 20 of the rail-joint and also through the web of the rail. The cam-shaft 16 may be operated by a foot-lever 21, one extremity of which is made fast to the said shaft.

The operating-shaft 6 has both a rotary and sliding or longitudinal movement in the jour-

nal-box 7. To the inner extremity of this shaft is made fast a cup 22, whose recess or socket is shaped to fit the nut to be operated. This nut-cup is preferably detachably connected with the shaft, so that one may be taken off and another substituted as often as it may be found necessary in operating on nuts of varying size. As shown in the drawings, the cup 22 is provided with a short shank 22^c, which enters a socket formed in a part 23, which is secured to the operating-shaft 6 in any suitable manner. As shown in the drawings, the part 23 is provided with an opening polygonal in shape, preferably square, and is driven upon the squared part 6^a of the shaft 6, whereby the part 23 is virtually made a part of the operating-shaft. The nut-cup 22 is connected with the shaft by passing a set-bolt 24 through the part 23 and into or against the shank 22^c. By virtue of this construction the nut-cup may be readily removed and another one substituted therefor by simply releasing and tightening the set-bolt 24.

Applied to the squared part 6^a of the shaft 6 are two ratchets 25 and 26, whose teeth are oppositely disposed. These ratchets are made fast to the shaft 6 and are inclosed or partly surrounded by a casing 27, carrying a dog 28, pivotally mounted on a bolt 29, inserted in the casing. The dog 28 is adapted to rock upon the bolt 29, and it is provided with parts 30 and 31, which occupy positions above the respective ratchets 25 and 26. When it is desired to turn the operating-shaft in one direction, the dog 28 is thrown into engagement with one of the ratchets 25 or 26, as may be desired. When it is desired to turn the shaft in the opposite direction, the dog is rocked upon its pivot, whereby its operating extremity is disengaged from the ratchet previously acted on and thrown into engagement with the ratchet whose teeth are oppositely disposed, whereby the turning of the shaft in either direction may be accomplished by first setting the dog to engage the proper ratchet and then turning the shaft in the proper direction. The dog 28 is so constructed and arranged that it will only engage one ratchet at a time, and when the part 30 or 31 is in engagement with one ratchet the other corresponding part is raised to release the other ratchet. The dog is held in position to engage either ratchet by a bow-shaped leaf-spring 32, whose central portion is secured to a spindle 33, which is journaled in the casing 27, but actuated longitudinally by a spring 34, whereby the squared portion of the spindle 33^a is made to engage a socket of corresponding shape in the removable plate 27^a of the casing, whereby the spindle is normally locked in the adjusted position. The part 33^a of the spindle may have any desired number of sides so long as it is polygonal in shape. Between the part 33^a of the spindle and the thumb-nut 33^c is a cylindrical part 33^d of suffi-

cient length to permit the squared part 33 to be moved from its socket in the plate 27^a by inward movement against the spring 34. Hence when it is desired to change the position of the spring 32 for the purpose of changing the position of the dog 28 the spindle is moved longitudinally by pressing the thumb-nut 33^c inwardly against the spring 34, whereby the latter is made to yield sufficiently to permit the turning of the spindle and the proper adjustment of the spring 32, as heretofore described. As soon as the spring is adjusted and the inward force applied to the thumb-nut released the recoil of the spring 34 will return the polygonal part 33^a of the spindle to the counterpart socket in the plate 27^a and again lock the spindle and the spring 32 in the desired position, thus securely locking the dog in engagement with either ratchet, as desired.

The upper part of the casing 27 is provided with a socket 27^c, open at the top, to receive a handle or lever-arm 35, whereby the ratchet-case may be manipulated for the purpose of turning the operating-shaft 6 in either direction, as desired. The shaft 6 being longitudinally movable in the bearing 7, as heretofore stated, is held in position to cause the nut-cup 22 to engage the nut 19 by a coil-spring 36, surrounding the shaft and bearing against a collar 37, fast thereon and centrally grooved, as shown at 37^a, to engage the lower edge of the casing-plate 27^a. The extremity of the spring 36 remote from the fast collar 37 engages the bearing or journal-box 7 of the frame, and the tension of the spring is regulated to produce the aforesaid result.

From the foregoing description it is believed that the use and operation of my improved device will be readily understood. Assuming that it is desired to tighten a nut 19 on a bolt 18 passing through the web of the rail and fish-plates 20 on opposite sides, the device is applied to the rail and the parts adjacent and engaging the rail properly adjusted with reference to the height and tread of the rail by virtue of the construction heretofore explained. Before applying the device to the rail, however, the bolt 18 should be inserted and the nut applied with the fingers sufficiently to cause it to remain in position. Then as my improved device is applied and the nut-cup slipped over the nut the dog 28 is adjusted to engage the ratchet 25 or 26, depending on which is constructed to turn the shaft 6 in the proper direction for tightening the nut as the ratchet-case is operated. The lever-arm 35 is then moved back and forth, each movement in one direction giving the shaft 6 a partial rotation, the latter in turn imparting a corresponding movement to the nut. It is evident that the movement of the ratchet-case in one direction causes the dog to slip over the teeth and ratchet, while the movement in the opposite direction causes

the dog to engage the teeth in such a manner as to impart a partial rotation to the shaft, the degree of the said rotary movement depending upon the movement of the lever-arm

5 35. After the nut 22 is tightened if it should be desired to loosen or unscrew the same it would only be necessary to reverse the position of the dog 28, whereby it is disengaged from the one ratchet and made to engage the other
10 ratchet. Then by the same movement of the lever-arm 35 the nut would be loosened or unscrewed on the bolt, the only difference in the operation of the ratchet-case being that the nut would be turned when the lever-arm 35
15 is moved in a direction the reverse of the direction of movement which turns the nut during the tightening operation.

Before beginning the nut-tightening operation, as heretofore explained, the cam-shaft
20 16 should be turned sufficiently to force the upper extremity of the lever-like clamping-plate 16 outwardly, whereby its lower extremity is forced inwardly toward and against the bolt 18, whereby the parts to be connected
25 are forced and clamped tightly together and held securely in place during the manipulation of the nut.

Attention is called to the fact that the nut-holding cup 22 is provided with a recess 22^a
30 to receive the adjacent extremity of the bolt as a nut is screwed down thereon.

Having thus described my invention, what I claim is—

1. In a wrench of the class described, the
35 combination with a suitable frame, of an operating-shaft journaled therein and provided with a nut-cup, a double ratchet fast on the shaft and having teeth oppositely disposed, a ratchet-case loose on the shaft, a rocking dog
40 mounted in the ratchet-case, a spindle mounted on the case above the dog and having a part polygonal in cross-section and adapted to fit a counterpart opening in a part of the case, whereby the spindle is locked against rotation,
45 the said spindle being longitudinally movable to disengage the polygonal portion of the spindle from the case to permit the spindle to rotate, and a bow-shaped spring mounted on the said spindle when properly adjusted and
50 adapted to hold the dog in engagement with either ratchet as desired.

2. The combination with a suitable frame, of an operating-shaft journaled therein and provided with a nut-cup at one extremity, a
55 ratchet fast on the shaft and having teeth oppositely disposed forming two ratchet zones located side by side, a case loosely mounted on the shaft and inclosing the ratchet, a rocking dog mounted in the case and having its ex-
60 tremities constructed to engage the respective ratchet zones, a spindle mounted on the case above the dog and having a part polygonal in cross-section and adapted to fit a counterpart opening in a part of the case, whereby the spin-

dle is locked against rotation, the said spindle 65 being longitudinally movable to disengage the polygonal portion of the spindle from the case to permit the spindle to rotate, a spring connected with the spindle to normally hold its polygonal part in engagement with its open- 70 ing in the case, a bow-shaped spring mounted on the spindle and adjustable to hold the dog in engagement with either ratchet as may be desired.

3. The combination with a suitable frame, 75 of an operating-shaft journaled therein and provided with a nut-cup, a ratchet fast on the shaft and having two sets of oppositely-disposed teeth, a case loose on the shaft and inclosing the ratchet, a dog centrally mounted 80 in the case and having its extremities adapted to engage the respective ratchets, a spring pivotally mounted on the case and adapted to be thrown to engagement with either end of the dog whereby the latter may be held in en- 85 gagement with either ratchet as desired, and means connected with the frame and engaging the parts to be bolted together, the said means being vertically and laterally adjust- 90 able to adapt the same for use with articles of varying height and width.

4. In a wrench of the class described, the combination of a suitable frame, having up- turned extremities provided with slots, angle- pieces connected with the upturned extremi- 95 ties of the frame by passing stud-bolts through the slots of the upturned frame ends and threading the said bolts in the angle- pieces, a housing-plate applied to the hori- 100 zontal parts of the angle-pieces, the said horizontal parts being slotted and the housing-plate being connected therewith by passing stud-bolts through the slots of the angle- pieces, an operating-shaft journaled in the 105 frame and provided with a nut-cup at one extremity, and suitable means mounted on the shaft for rotating the latter.

5. The combination with a suitable frame, means connected therewith for engaging the parts to be bolted together, a lever-like clamp- 110 ing-plate connected with the said means, a cam-shaft for operating said plate, an operating-shaft journaled in the frame, a nut-cup detachably connected with the same, and a 115 ratchet mechanism applied to the shaft whereby the same may be rotated, substantially as described.

6. The combination with a suitable frame, a housing adjustably connected with the frame and adapted to pass over the parts to be con- 120 nected, projections extending upwardly from the housing, a shaft journaled in said projections and provided with a cam, a lever-like clamping-plate fulcrumed in the housing and located to be acted on by the cam of the shaft, 125 whereby the parts to be bolted together may be forced into close proximity and tightly held, an operating-shaft journaled in the

frame, means for rotating the shaft, and a nut-cup connected with one extremity of the shaft.

7. The combination with a suitable frame and means for holding the parts to be bolted together, of a shaft journaled in the frame and provided with a nut-cup at one extremity, two ratchets made fast to the shaft and whose teeth are oppositely disposed, a ratchet-case applied to the shaft, a dog mounted in the ratchet-case and having a rocking movement whereby it may be thrown from one ratchet to the other according as it is necessary to turn the nut in the one direction or the other by the movement of the shaft, and a bow-shaped spring mounted in the ratchet-case in proximity to the dog and adapted to be thrown to engagement with either extremity thereof according as it is desired that the dog shall engage the one ratchet or the other.

8. The combination with a suitable frame and means connected therewith for holding the parts to be connected in suitable proximity to each other, two ratchets fast on the shaft and having oppositely-disposed teeth, a ratchet-case mounted on the shaft, a dog mounted to rock in said case whereby it may be made to engage the one ratchet or the other as desired, a spindle connected with the case, and a spring made fast to the spindle and projecting in opposite directions therefrom, the spring being located in such proximity to the dog that the latter may be locked in either position of adjustment by causing the spring to engage the dog on the one or the other side of its axis.

9. In a wrench of the class described, the combination of a suitable frame, and means for holding the parts to be bolted together in suitable proximity, of a shaft journaled in the frame and provided with a nut-engaging device at one extremity, a collar mounted on the shaft, a coil-spring located between the collar of the shaft and the journal-box of the frame whereby the shaft is held in yielding engagement with the nut, and ratchet mechanism mounted on the shaft for operating the same, substantially as described.

10. In a ratchet of the class described, the combination with a suitable frame, of a shaft mounted to rotate therein and provided with a nut-engaging part at one extremity, a ratchet mounted on the shaft and having oppositely-disposed teeth, a case loose on the shaft and

inclosing the ratchet, a dog having ratchet-engaging extremities lying in the planes of the respective ratchet zones, the said dog being centrally pivoted to rock in the case whereby it may be made to engage either ratchet at will, and a spring centrally pivoted in the case in proximity to the dog and adapted to hold the latter in engagement with either ratchet zone, whereby the shaft may be rotated for the purpose of turning the latter in either direction.

11. The combination with a suitable frame of a shaft journaled therein and provided with a nut-engaging part at one extremity, two ratchets made fast upon the shaft and having oppositely-disposed teeth, a casing mounted on the shaft in the zone of the ratchets, a dog mounted in said case and having a rocking movement whereby it may be made to engage either ratchet as desired, and a spindle also journaled in the casing and provided with a leaf-spring made fast thereto and extending therefrom in opposite directions whereby it may be made to act on the dog to cause the latter to engage either ratchet as desired, and suitable means for automatically locking the spindle in either position of adjustment.

12. The combination with a suitable frame provided with means for engaging and holding the parts to be connected in the proper position, said means being adjustable to adapt the device for use with articles of varying sizes, a shaft journaled in the frame and provided with a nut-engaging part at one extremity, ratchets mounted on the shaft and having oppositely-disposed teeth, a casing applied to the shaft in the zone of the ratchets, a dog mounted in the casing and having a rocking movement whereby it may be made to engage either ratchet as desired, a spring mounted in the casing, a spindle with which the spring is connected, whereby the spring may be thrown to engage the dog on either side of its axis, and a lever-arm connected with the casing for operating the latter, substantially as described.

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

CHARLES J. COULTER.

Witnesses:

A. J. O'BRIEN,
DENA NELSON.