

(No Model.)

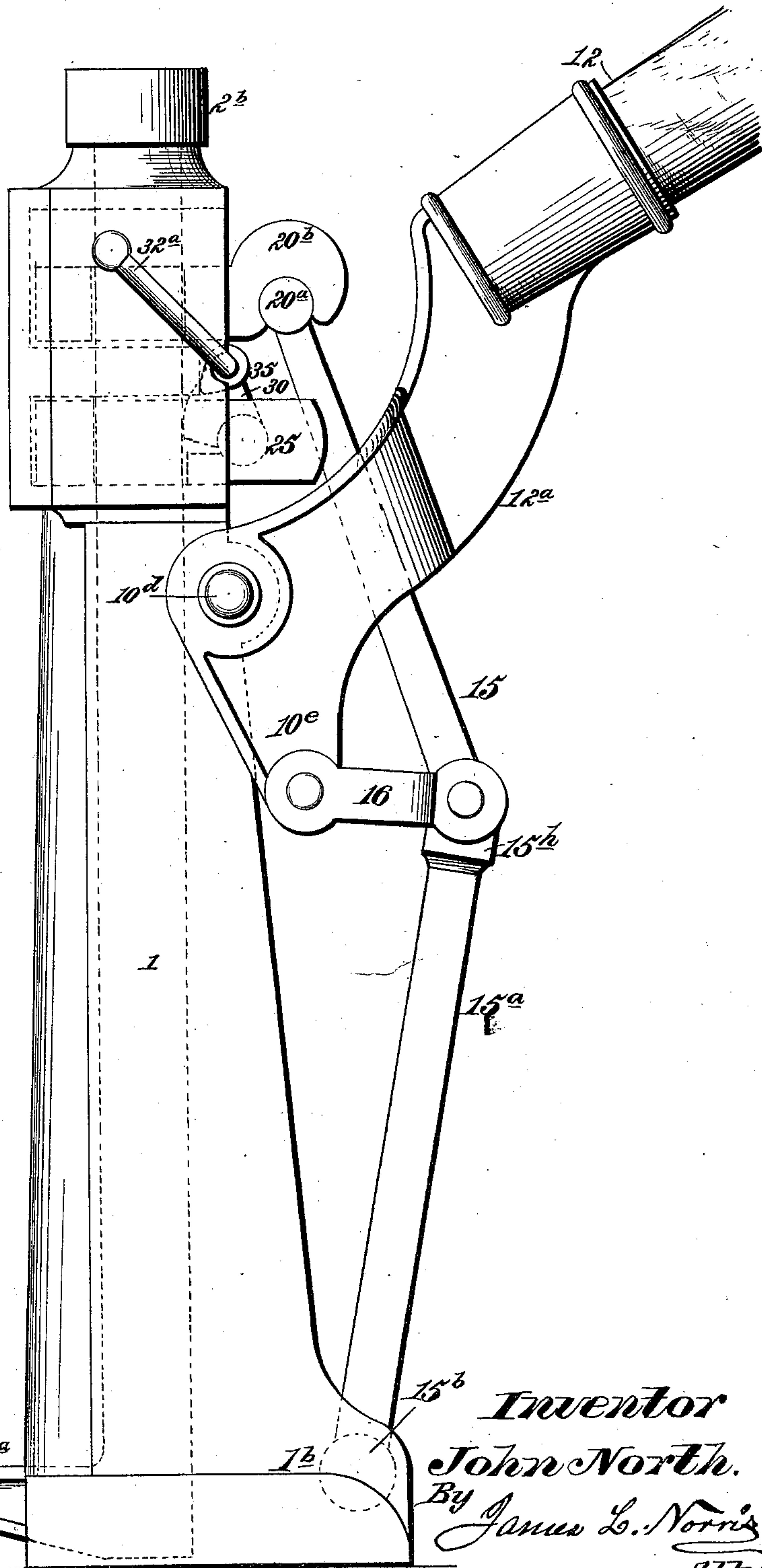
3 Sheets—Sheet 1.

J. NORTH.
LIFTING JACK.

No. 361,022.

Patented Apr. 12, 1887.

Fig. 1.



Witnesses.
Robert Connett.
Dennis Sumby.

Inventor
John North.
By James L. Norris.
Atty.

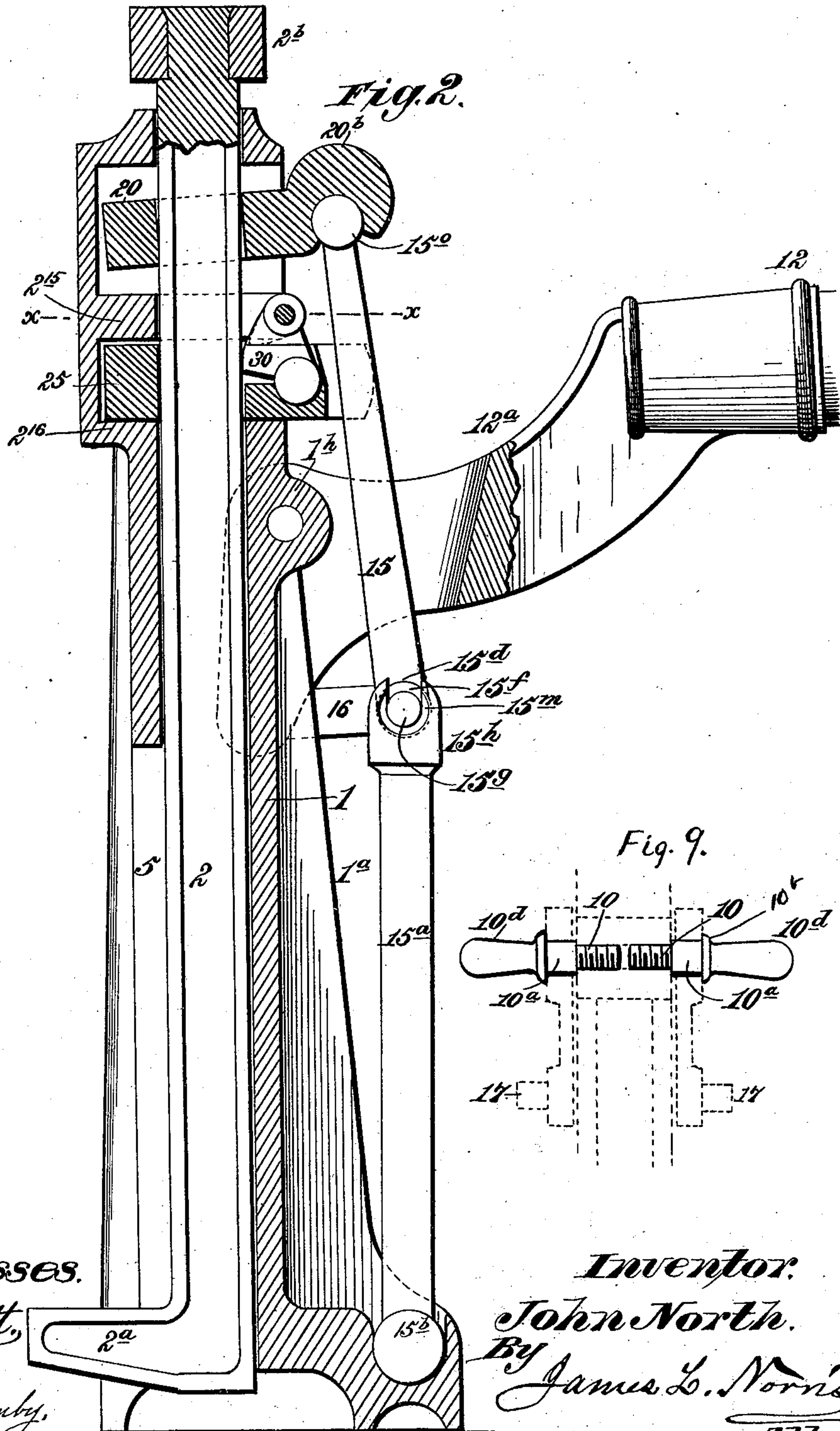
(No Model.)

3 Sheets—Sheet 2.

J. NORTH.
LIFTING JACK.

No. 361,022.

Patented Apr. 12, 1887.



Witnesses.
Robert Emmett,
Hennie Cumby,

Inventor:
John North.
By *James L. Norris,*
Atty

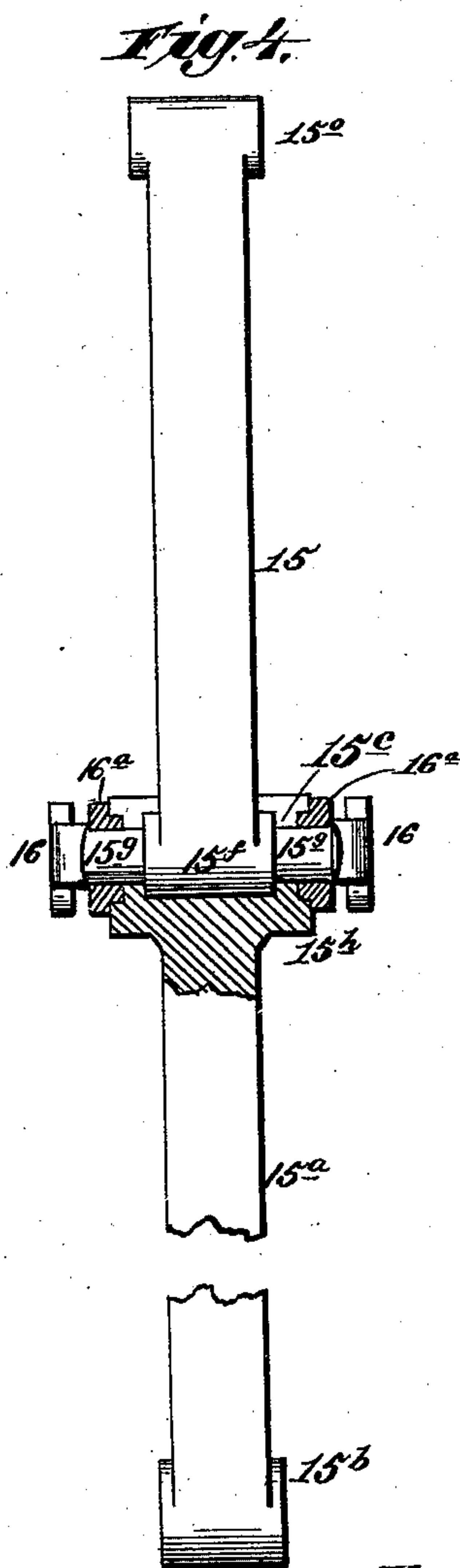
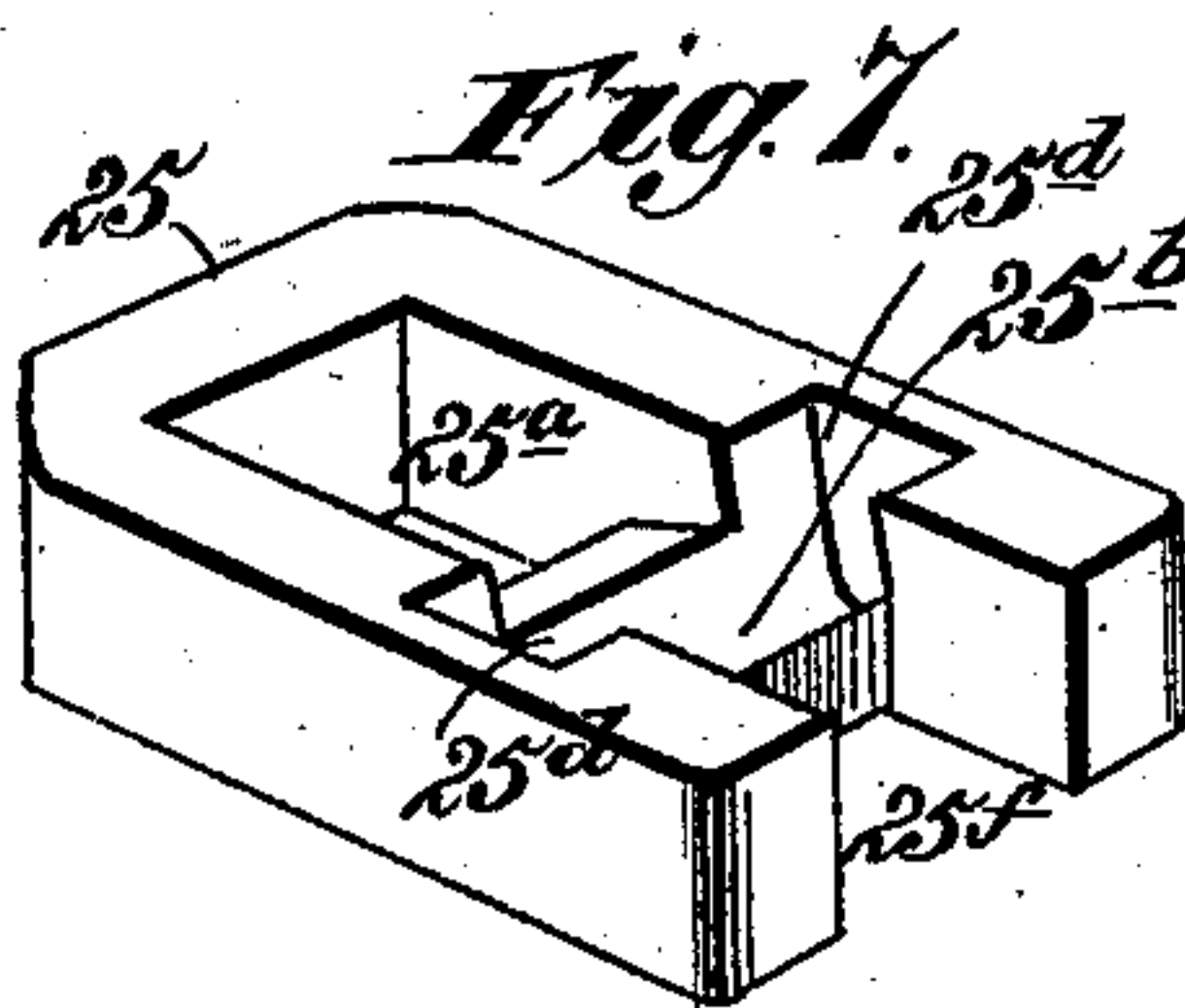
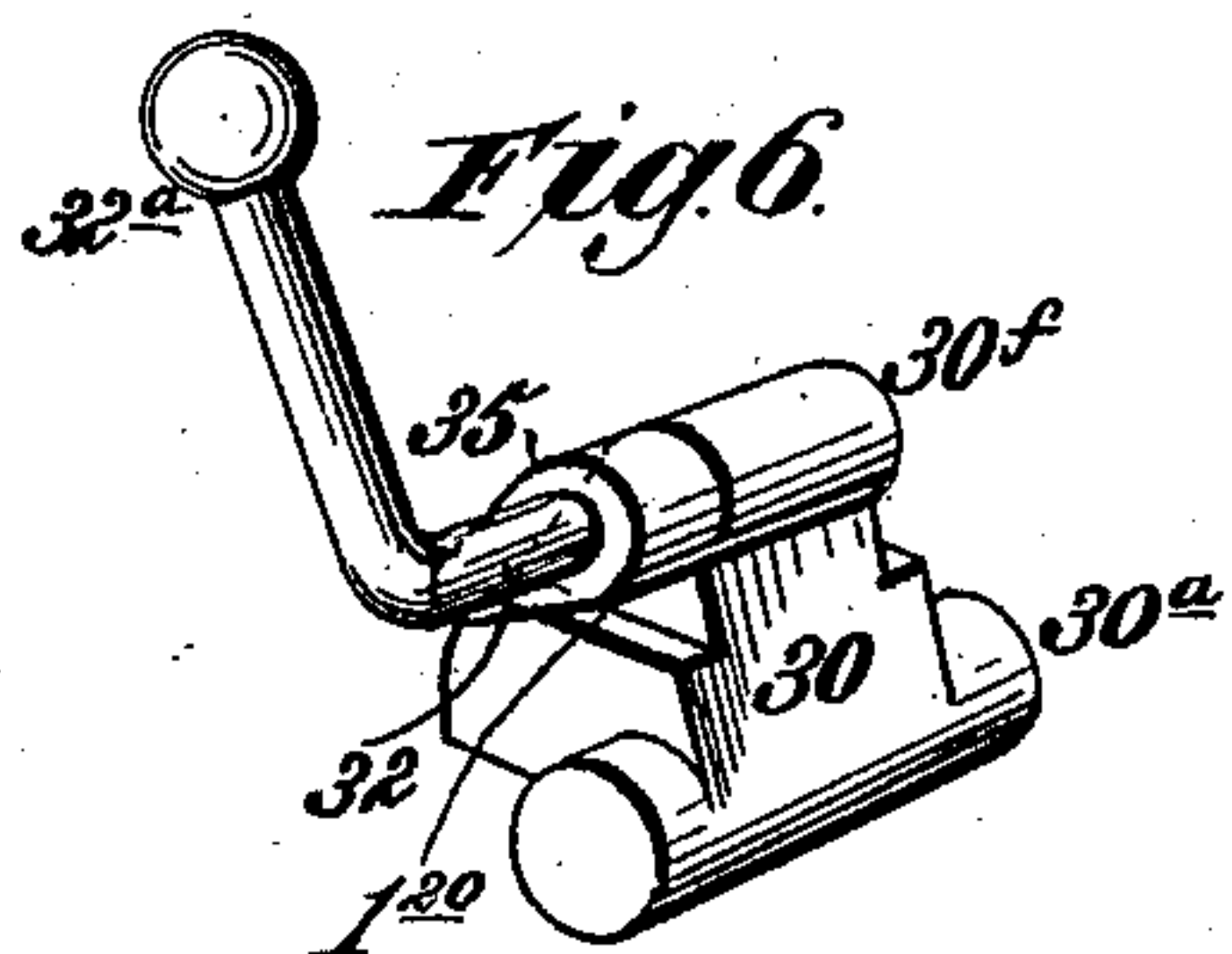
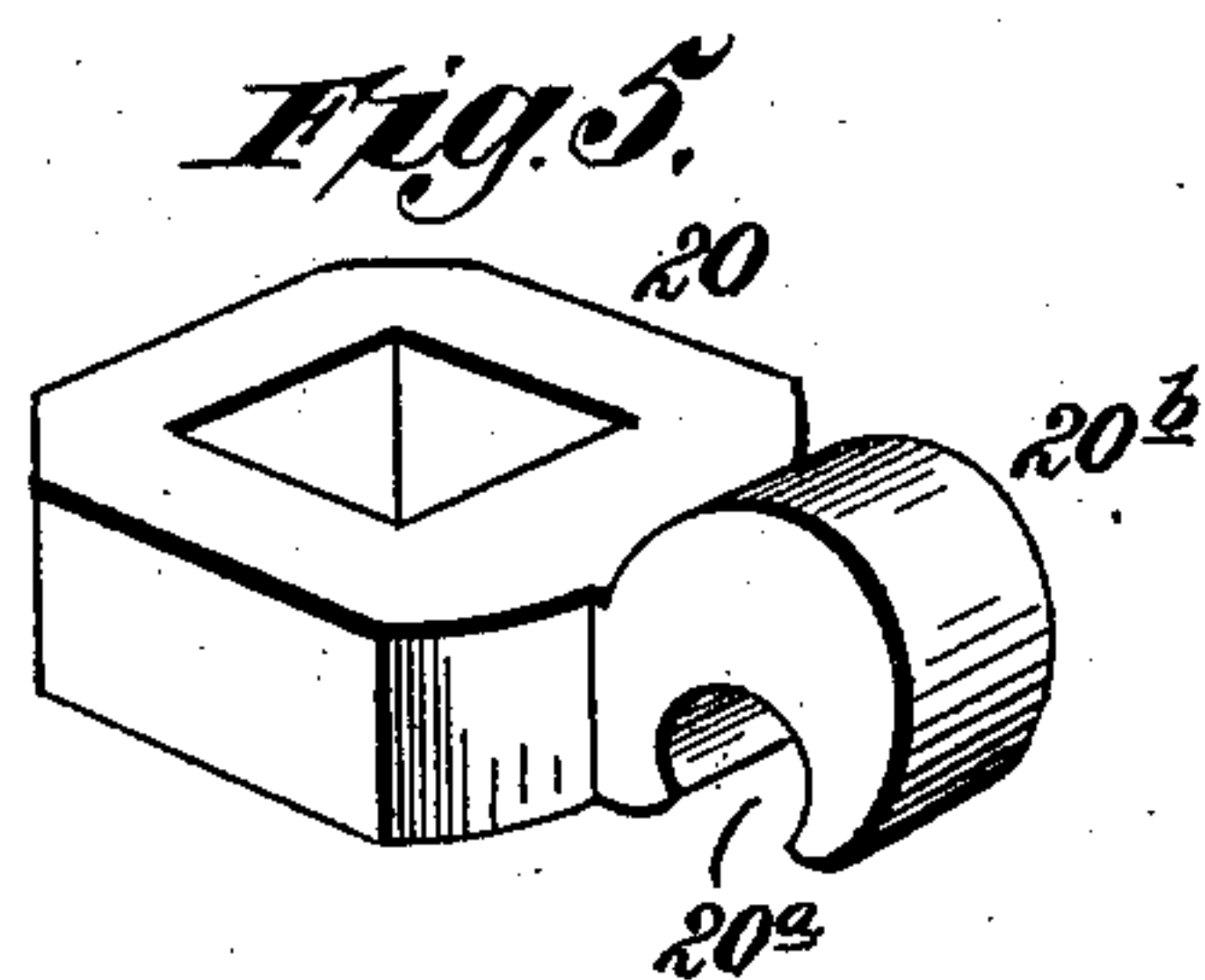
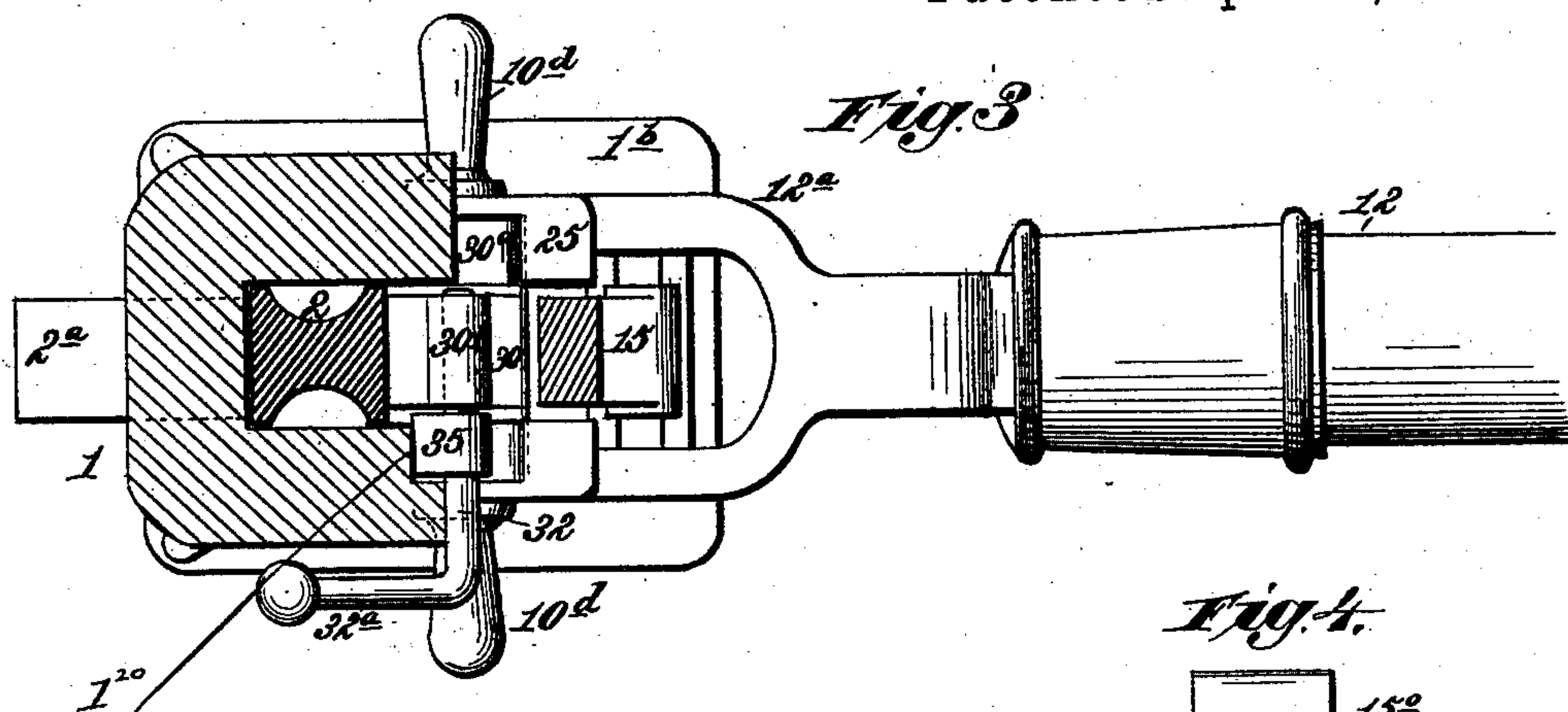
(No Model.)

3 Sheets—Sheet 3.

J. NORTH.
LIFTING JACK.

No. 361,022.

Patented Apr. 12, 1887.



Witnesses.
Robert Everett.
Dennis Lumby.

Inventor.
John North.
By *James L. Norris.*
Atty.

UNITED STATES PATENT OFFICE.

JOHN NORTH, OF MIDDLETOWN, CONNECTICUT.

LIFTING-JACK.

SPECIFICATION forming part of Letters Patent No. 361,022, dated April 12, 1887.

Application filed June 14, 1886. Serial No. 205,161. (No model.)

To all whom it may concern:

Be it known that I, JOHN NORTH, a citizen of the United States, residing at Middletown, in the county of Middlesex and State of Connecticut, have invented new and useful Improvements in Lifting-Jacks, of which the following is a specification.

The present invention relates to that class of lifting-jacks in which the lifting-bar is operated by a friction-pawl and lever; and its object is to provide a simple and effective construction and combination of devices, whereby a maximum degree of lifting force can be easily applied and the retention of the lifting-bar in its raised state insured, convenient means being also provided for gradually or quickly lowering the lifting-bar at the will of the operator.

To these ends the invention consists in the construction and combination of parts, which will be hereinafter more fully described, and then set forth in the claims.

In the accompanying drawings, Figure 1 is a side elevation of a lifting-jack embodying my improvements. Fig. 2 is a vertical section of the same. Fig. 3 is a horizontal section through the line *xx* of Fig. 2. Fig. 4 is a face view of the toggle-levers, showing the joint thereof in section. Fig. 5 is a detail perspective view of the lifting-pawl. Figs. 6 and 7 are views of the holding-cam and its seat. Fig. 8 is a detail view of one of the links for connecting the toggle-levers with the operating hand-lever. Fig. 9 is a detail view showing the combined handles and screws for pivoting the hand-lever to the frame.

The numeral 1 designates the frame of the jack. It comprises a standard, of cast metal, having a straight vertical opening for the passage of the lifting-bar 2. The front of the standard is devoid of any projections in the form of movable devices concerned in the operation of moving the lifting-bar, and hence the jack can be brought up close to objects and places difficult of access to jacks having devices in front which require manipulation by the operator.

The front of the standard is provided with a vertical slot, 5, which extends from the bottom upward to such a height as the lifting-bar is required to move. A foot-piece, 2^a, formed

at the bottom of the lifting-bar, projects through the slot in the standard and serves for making connection with the object to be raised. The foot-piece moves the distance of the length of the slot 5 and is arrested at the top of the latter. The lifting-bar carries a head, 2^b, at its upper end, which serves to receive the object to be raised and also prevents the lifting-bar from dropping out of the standard, it being understood that the head is larger than the opening through which the bar moves.

At the rear of the standard 1 are formed vertical strengthening-webs or flanges 1^a, and the base of the standard is extended into a horizontal plate, 1^b, in which is a semi-cylindrical cavity or seat, for the object hereinafter stated. A boss or enlargement, 1^b, formed near the top of the standard, has a screw-threaded socket in which the inner ends of two screws, 10, are fitted from opposite sides of such screw-socket. The screws have smooth or threadless portions 10^a on each side of the boss 1^b, which serve as bearings or fulcrums for the branched metal head 12^a of a hand-lever, 12. Collars or flanges 10^b on the screws 10 bear upon the outer faces of the lever-arms and hold the same against the boss 1^b, and beyond these flanges are formed handle-extensions 10^c, which serve as a medium for carrying the jack from place to place.

The lever head 12^a has a socket for the reception of a wooden lever, or else said lever is made in one part with the head. Downward extensions or cheeks 10^e constitute the shorter arm of the lever and are connected with a system of toggle-levers, 15 and 15^a, by means of links 16. The bottom toggle-lever, 15^a, has a circular head, 15^b, at its lower end, and this head is placed in the curved seat or cavity of the horizontal bottom plate of the standard. The upper end of the toggle-lever 15^a is widened to form a head, 15^b, and the latter has a cavity, 15^c, opening out through the end of the head. Slots 15^d, intersecting with this cavity, are formed in the ends of the head 15^b, as is clearly seen in Fig. 2. The bottom of the cavity 15^c is rounded or curved, and it forms a seat for a circular head, 15^e, on the lower end of the upper toggle-lever, 15. This head is introduced from the end of the head 15^b, and it has cylindrical extensions or trunnions 15^f, which pro-

ject through the slots 15^d and receive the links 16 that connect the toggle-levers with the hand-lever. The links 16 are of the shape clearly seen in Figs. 1 and 8—that is, they are each formed of a plate having a circular boss, 16^a, at one end. This boss is apertured for the passage of the extension 15^e of the head 15^f. Recesses or seats 15^m, formed in the sides of the upper head of the lower toggle-lever, receive said circular bosses 16^a, and the ends of the extensions or trunnions 15^e are riveted down upon the links, as is clearly seen in Fig. 4. The connection of the links with the toggle-levers is very firm and reliable, and no bolts or nuts are required to make the joint. The links are connected with the head of the hand-lever by means of lugs 17 on the side plates of such lever-head, which are headed down upon the links, as is seen in Fig. 1.

The top end of the upper toggle-lever is formed into a circular head, 15^o, which is received in a curved cavity or seat, 20^a, formed in an extension, 20^b, of a friction-pawl, 20. The head 15^o is introduced into the seat 20^a from the side thereof, and by making the curved cavity of the proper size the head cannot be drawn out therefrom by the rocking of the lever in its seat. The friction-pawl is made in the form of a block or plate, having a vertical opening which conforms to the shape of the lifting-bar, but is slightly larger than the latter, so as to permit it to be rocked or inclined, as is seen in Fig. 2. The friction-pawl 20 is arranged at the top of the standard 1, in a chamber formed by the cap-piece of the standard and a horizontal plate, 2¹⁵, extending from the front wall of the standard. Between this plate 2¹⁵ and the shoulder 2¹⁶ on the standard is another chamber, which is designed for the reception and support of a detachable block, 25, the construction of which is clearly seen in Fig. 7. This block 25 has a vertical opening, 25^a, for the passage of the lifting-bar, and at the side of this opening is formed a seat or cavity, 25^b, which has a curved bottom and side. Vertical grooves 25^d are made at the sides of this cavity 25^b, and intersect therewith. In rear of the cavity 25^b the block is open or has a vertical slot 25^f, through which passes the upper toggle-lever. The grooves 25^d extend downward from the top of the block, and, as clearly stated, they intersect with the cavity 25^b. Their purpose is to receive cylindrical gudgeons or trunnions 30^a, formed at the sides of a cam-shaped block, 30, which has its seat in the cavity 25^b, and works therein, with its cam surface impinging against the rear face of the lifting-bar. The trunnions 30^a are free to turn in the grooves 25^d, so that the cam-block can rock or turn, for the purpose hereinafter stated. An eye or tubular top, 30^f, of the block 30 receives a transverse pintle, 32, the end of which is turned at right angles to form a handle, 32^a, which is disposed at the side of the standard 1. The pintle, with its handle, is free to turn in the eye 30^f, and it also has fixed thereon a small cam, 35, which

is located in a recess in the standard 1, and bears against a shoulder, 1²⁰, thereon, as is seen in Fig. 3.

The operation of a lifting-jack constructed as above described is as follows, viz: The proper connection of the lifting-bar is made with the object to be raised, and then the hand-lever is alternately raised and lowered for the purpose of lowering the friction loop or pawl, to obtain a hold on the lifting-bar and raising the friction-pawl, together with the lifting-bar firmly caught thereon. In Fig. 2 it is seen that the friction-pawl is inclined so as to grip the lifting-bar by the top portion of the rear face of its opening and the bottom portion of the front face of said opening. When the hand-lever is depressed, the friction-pawl assumes the position just stated, and obviously the lifting-bar is raised by the straightening out of the toggle-levers. The presence of the latter tends to make the operation of lifting the bar with a weight thereon much easier than if they were absent, and hence I am enabled to lift heavy loads with greater facility and less work to the operator than can be done with jacks heretofore devised. While the hand-lever is being raised to lower the friction-pawl for a renewed grip, the cam-block, bearing upon the lifting-bar, serves to hold the latter firmly in position so that it cannot drop, it being evident that the cam presents its full working-face to the lifting-bar when the friction-pawl is released therefrom. As the lifting-bar moves upward by the action of the friction-pawl, the cam-head rocks in its seat and moves away from the lifting-bar, so as not to interfere with the upward movement of the latter. In order to allow the lifting-bar to be gradually lowered, it is only necessary to manipulate the holding-cam by its handle or crank and partly loosen it from the lifting-bar.

To facilitate the movement of the holding-cam and obviate the expenditure of much force in releasing it, partly or entirely, from the lifting-bar, I have provided the smaller cam, which, when the handle is turned, exerts a leverage upon the surface or shoulder on the standard of the jack, with which it is in contact. In such manner the holding-cam can be moved away from the lifting-bar without requiring too strong a pull on the handle of said cam.

It is obvious that when the holding-cam is entirely removed from the cam and the operating-lever raised the lifting-bar will quickly drop to its normal position.

Having thus described my invention, what I claim is—

1. The combination of the hollow standard, the lifting-bar, the hand-lever bifurcated at its inner end, pivoted to the standard, and provided with pendent extensions or cheeks, the toggle-levers, the upper one of which passes between the bifurcations at the inner end of the hand-lever, the link-connection between the pendent extensions or cheeks of the hand-lever and the toggle-levers, the friction-pawl ar-

ranged in a chamber at the upper end of the standard and connected with the upper toggle-lever, and a retaining device located in a chamber at the upper part of the standard, whereby the hand-lever and toggle-joints are all placed at the rear side of the standard, substantially as and for the purpose described.

2. The combination of the vertically-slotted hollow standard, the lifting-bar having a head or cap and a foot-piece movable in the vertical slot, the friction lifting-pawl and retaining-pawl, both located in chambers within the upper end of the standard, the hand-lever pivoted to the standard, and the toggle-levers, one of which extends vertically through the handle, said hand and toggle levers all arranged at one and the same side of the standard to thereby permit the foot-piece of the lifting-bar to operate without obstruction from the toggle-levers or hand-lever, substantially as described.

3. The combination of the hollow vertically-slotted standard having at its upper end two chambers separated by a horizontal plate, a lifting-bar having a foot-piece extending through and movable in the vertical slot, a friction lifting-pawl and a friction retaining-pawl located, respectively, in said chambers at opposite sides of the said plate, a hand-lever having a bifurcated inner end pivoted to the standard at the rear side opposite the vertical slot and provided with pendent cheek-pieces, and toggle-levers located at the rear side of the standard and the upper one extending between the bifurcations of the hand-lever and connected with the friction lifting-pawl, whereby the toggle-levers and hand-lever are all placed at one and the same side of the standard to avoid interfering with the movements of the lifting-bar and its foot-piece, substantially as described.

4. The combination of the friction lifting-pawl having a rear extension formed with a cylindrical socket extending from side to side, the upper toggle-lever formed with a cylindrical head fitting said socket, the supporting-

standard having its base-plate formed with a cylindrical socket, the lower toggle-lever having a cylindrical head arranged in the socket of the base-plate, the lifting-bar, and the hand-lever, said toggle-levers and hand-lever all being located at one and the same side of the standard, substantially as and for the purposes described.

5. In a lifting-jack, the combination of the toggle-lever having a head with side slots, a curved seat, and circular end recesses, the second toggle-lever having a circular head and trunnions, and the links having circular bosses, with the hand-lever, the supporting-standard, lifting-bar, and pawl for moving the latter connected with the upper toggle-lever, substantially as described.

6. In a lifting-jack, the combination of the cam-head having trunnions and an eye, the crank-handle fitted in the latter, and the block having a seat for the cam-head and recesses for the trunnions, with the supporting-standard, lifting-bar, and means for moving the latter, substantially as herein set forth.

7. In a lifting-jack, the combination of the holding-cam and the pintle with handle-extension journaled in said holding-cam and carrying a smaller cam, with the supporting-standard having a surface against which the smaller cam bears, the lifting-bar, and means for operating the lifting-bar, substantially as described.

8. In a lifting-jack, the combination of fulcrum pins or screws having handle-extensions with the supporting-standard having a screw-socket, the lifting-bar, the operating-levers, and means for connecting the same with the lifting-bar, substantially as described.

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

JOHN NORTH.

Witnesses:

JAMES L. NORRIS,
JOS. L. COOMBS.