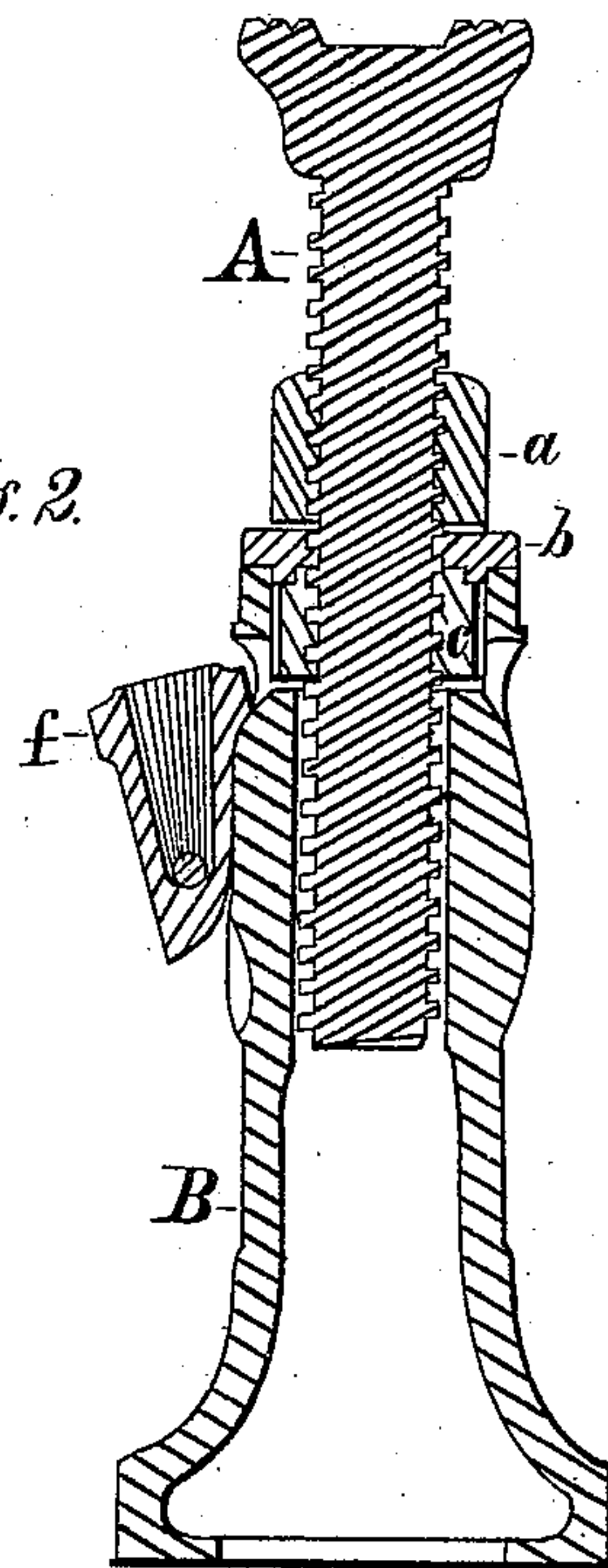
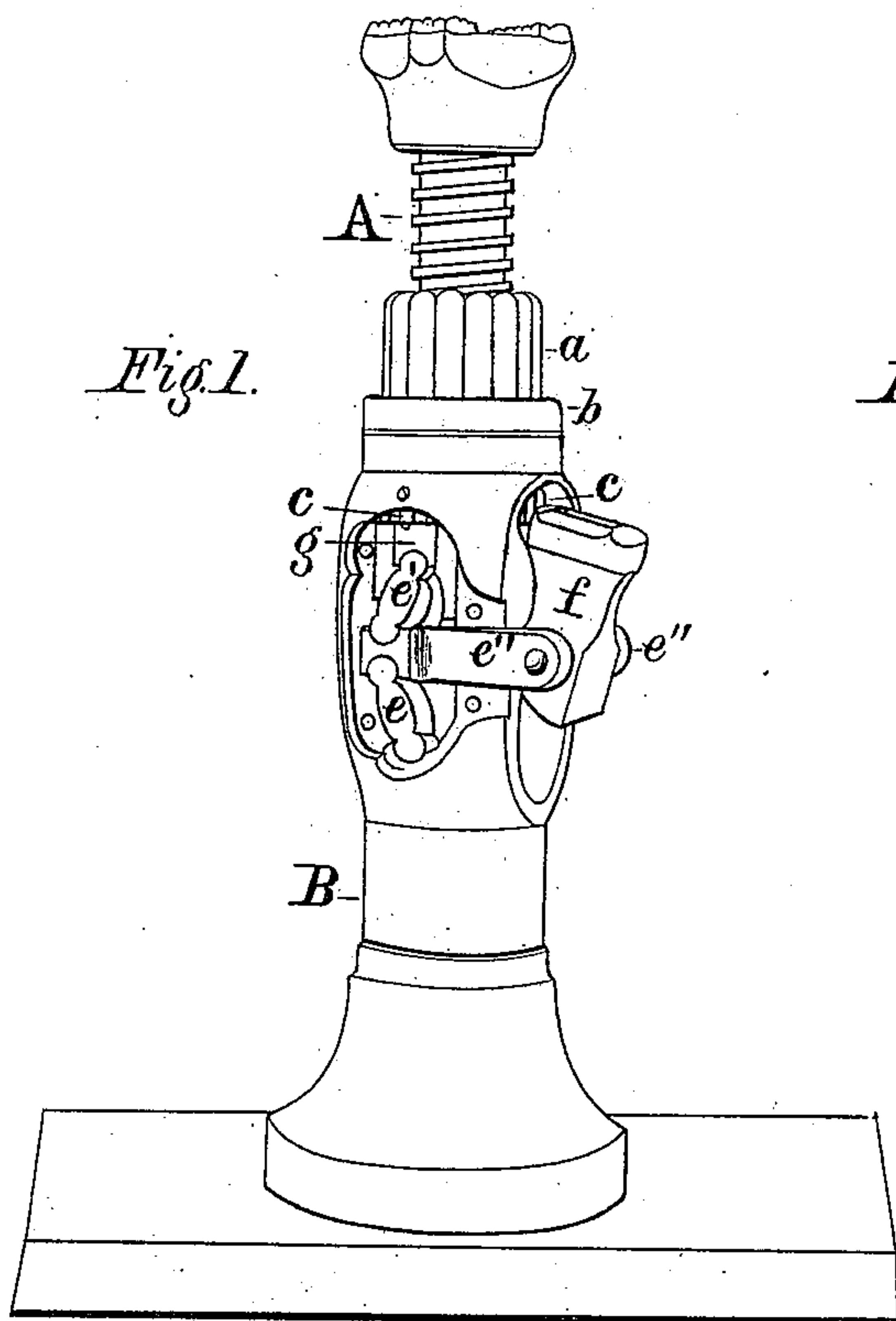


(No Model.)

J. STATE.
Lifting-Jack.

No. 228,285.

Patented June 1, 1880.



Attest.

John State
F. H. Penfield

Inventor.

John State.
By B. C. Converse, Atty

UNITED STATES PATENT OFFICE.

JOHN STATE, OF SPRINGFIELD, OHIO, ASSIGNOR TO FERDINAND STATE,
OF SAME PLACE.

LIFTING-JACK.

SPECIFICATION forming part of Letters Patent No. 228,285, dated June 1, 1880.

Application filed March 5, 1880. (No model.)

To all whom it may concern:

Be it known that I, JOHN STATE, of the city of Springfield, in the county of Clarke and State of Ohio, have invented a new and useful Improvement in Lifting-Jacks, of which the following is a specification.

My invention relates to improvements in lifting-jacks in which two pairs of toggle-levers operate in conjunction with the screw.

The object of my invention is, primarily, to lift the heaviest weight with the least power; second, to operate the jack with the least amount of frictional resistance; third, to retain the load lifted at any height without endangering in the least the strength or safety of the lifting mechanism. I attain these objects by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a perspective view of my improved lifting-jack with one of the cap-plates over the working parts, on one side, removed. Fig. 2 is a vertical longitudinal section through the center of the machine, including the socket end of its hand-lever.

Similar letters of reference indicate similar parts in the views.

A is the screw; *a*, a heavy fluted top nut, which, when the weight is lifted, is screwed down upon the cap *b*, the latter resting upon the top of the body B. *c* is the lower nut under cap *b*. *e* and *e'* are toggle-levers formed with circular ends. Their central ends operate in grooves cut in the inside ends of the links or levers *e''*, of which there are two, one on each side, and connected at their outer ends by a bolt, upon which the socket end of the hand-lever *f* is pivoted, between them. The point end of this lever is eccentric to its pivot or fulcrum, its periphery being extended farthest from the same toward the end of the throw of the lever as the toggles are drawn to their vertical position. For this purpose its under surface is rounded toward the point. This form also lessens the friction of the contacting surfaces of the lever and the body of the jack.

The top ends of the toggle-levers *e'* operate in a groove or semicircular slot cut in the lower ends of the sliding blocks *g*, which are fitted to slide up and down vertically as the

toggle-levers are operated. The lower ends of these toggle-levers operate in a semicircular notch in the inside ends of the links or pull-levers *e''*, while the lower toggle-lever, *e*, has its top end operating in a semicircular notch, also in the inside end of the links *e''*, and its lower ends in a similar notch cut in the body of the jack at the lower part of the opening seen in Fig. 1, giving a solid fulcrum-point of resistance. The slide-blocks *g* move in ways, also cut in the body B at the upper part of the opening.

The screw A is non-rotating, being elevated wholly by the system of levers shown.

f has a socket for the insertion of the hand-lever, as seen in Fig. 2, which also shows the position of the pivot-bolt extending through it.

To operate the jack, lever *f* is thrown up, as shown in Fig. 1, and at the same time it is pushed against the body, forcing the inside ends of toggle-levers *e e'*, by links *e''*, back to an angle, as seen in the figure. This movement allows blocks *g* to fall by their own gravity. Nut *c* is now turned down until it touches blocks *g*, leaving a space between it and cap *b* equal to the height of the lift. Power being applied to lever *f* as it is forced down, the toggle-levers straighten to a vertical line, the screw A, with its top nut, *a*, and lifting-nut *c*, being lifted, as seen in Fig. 2, to a distance equal to the throw of the toggle-levers. After this movement the top or holding nut *a* is turned down on the screw till it rests upon the cap *b*, and the same operation repeated as before.

The operative parts are all removable to facilitate cleaning or repairs.

I claim as my improvement—

1. In a lifting-jack, the following elements, viz: a non-rotating screw, a top or holding nut, a removable cap on which said nut rests in sustaining the weight lifted, a lower or lifting nut under said cap, following blocks or lifters under the lifting-nut, a series of toggle-and-link or pull levers pivoted and connected therewith, as shown, and an eccentric or cam-headed lever pivoted between the outer ends of said links or pull-levers, for operating said lifting mechanism, as hereinbefore specified.

2. In a lifting-jack, the combination, with a

non-rotating screw having a top or holding
nut, a lower or lifting nut, and a removable
cap for sustaining the weight lifted interposed
between the latter, of lifting-blocks which may
5 be moved freely in a vertical direction under
said lifting-nut, operated by two pairs of tog-
gle-levers connected by links with a cam-ended
hand-lever, as hereinbefore set forth.

10 3. In a lifting-jack, the combination, with
the body B and non-rotating screw A, having
nuts *a* and *c* and the interposed removable
cap *b*, of a series of lifting-blocks, *g*, toggle-
levers *e* and *e'*, links *e''*, and the cam-ended
socket-piece *f*, pivoted between the outer ends

of the latter, whereby, as the mechanism is 15
operated, the lift is increased toward the end
of the stroke, as hereinbefore set forth.

4. The non-rotating screw A, having the two
nuts *a* and *c* and the interposed removable
cap *b*, in combination with lifting-blocks hav- 20
ing vertical movements when operated by the
series of levers specified, for the purpose set
forth.

JOHN STATE.

Attest:

B. C. CONVERSE,
B. A. ORMSBEE.