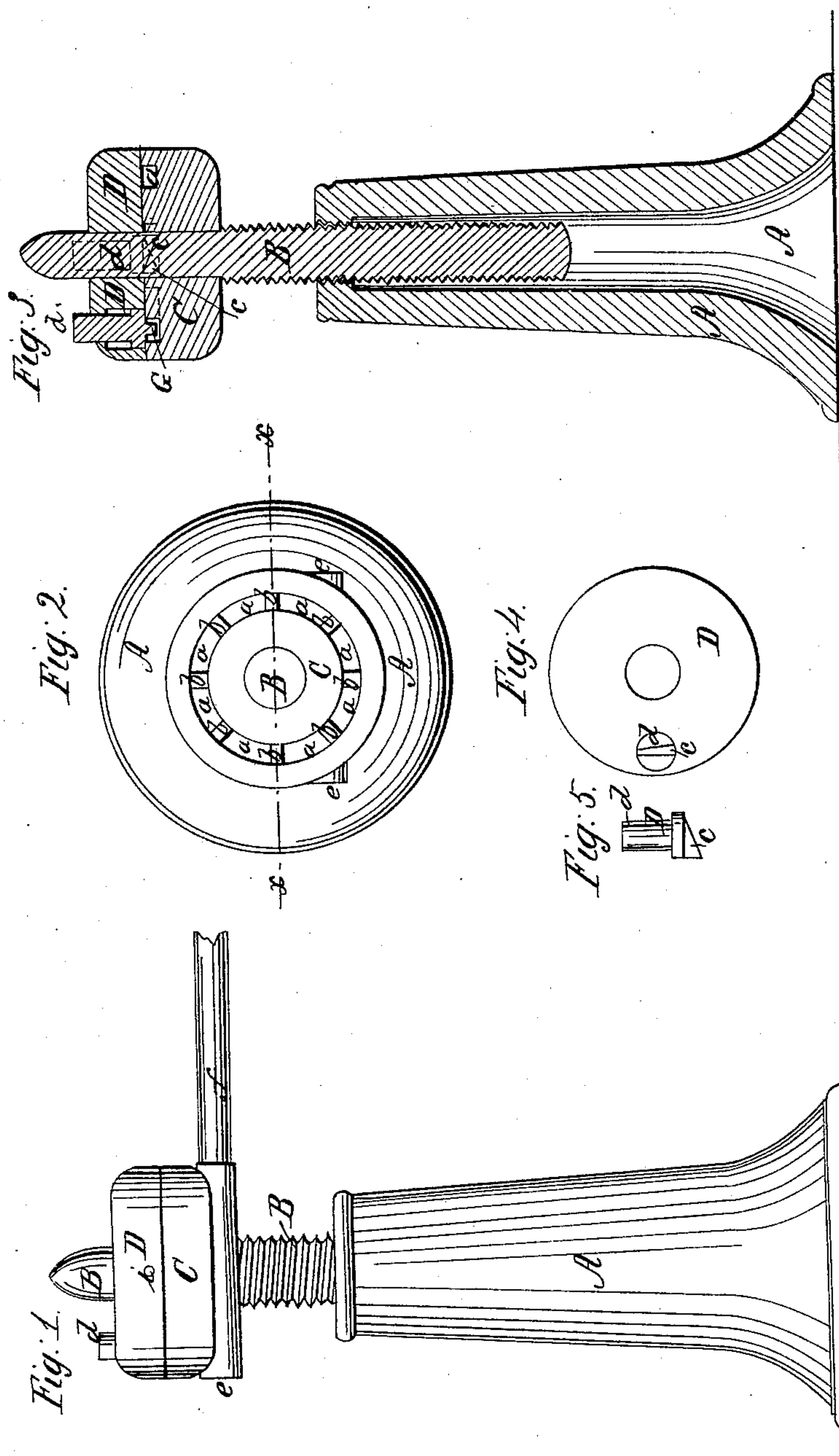


*L. J. Knowles,*

*Lifting Jack.*

*N<sup>o</sup> 18,592.*

*Patented Nov. 10, 1857.*





# UNITED STATES PATENT OFFICE.

LUCIUS J. KNOWLES, OF WARREN, MASSACHUSETTS.

## LIFTING-JACK.

Specification of Letters Patent No. 18,592, dated November 10, 1857.

*To all whom it may concern:*

Be it known that I, LUCIUS J. KNOWLES, of Warren, in the county of Worcester, in the State of Massachusetts, have invented a certain new and useful Improvement in Jack-Screws, of which the following is a full, clear, and exact description, reference being had to the accompanying drawing of the same, making a part of this specification, in which—

Figure 1, represents a side elevation of a lifting jack embracing my improvement; and Fig. 2 is a plan of the same with the screw head removed to show the interior face of the revolving lever collar; Fig. 3 represents a vertical section through the center of Fig. 1, at the line  $x x$  of Fig. 2; Fig. 4 represents a plan of the underside of the screwhead and clutch; and Fig. 5 a side elevation of the reversible drop clutch detached from the machine.

The object of my invention is threefold, first to enable the operator in raising or lowering a weight to effect his object without change of position; secondly to enable the operator either to raise or lower the weight without changing the position of the lever; and thirdly to enable him to pass his lever through the revolving collar by means of which the screw is operated in an easy and simple manner, for the purpose of facilitating its adjustment, to work in confined and awkward places, and also to obviate the necessity of passing the lever through the body of the screw, which would otherwise materially reduce its strength.

My improvement for these purposes consists in the arrangement and combination of a loose collar having a series of teeth formed on its inner face and arranged in a circle at regular distances apart, and mounted upon the neck of the lifting screw, with a disk or screw head properly secured to the outer end of the screw shank carrying a slide or drop clutch, by means of which, and the lever, motion is communicated to the screw without change of position to the operator.

To enable others skilled in the art to make, construct and use my invention I will now proceed to describe its parts in detail, reference being had to the accompanying drawing in which a tubular column or standard A is represented as having a screw thread cut on its upper end and inner periphery into which a screw shaft B takes. This column

is provided with a broad or flaring base for the purpose of giving to it an ample support for a ponderous weight. Upon the upper end of the screwshaft (B) and which for this purpose is left smooth, is mounted a loose collar (C) having a series of notches ( $a$ ) and teeth ( $b$ ) formed in a circle on its face (see Fig. 2.) These notches are of a width and length sufficient easily to receive the projection or tooth ( $c$ ) formed on the underside of a clutch ( $d$ ) working in a suitable opening formed in the screw head (D) which in this instance is secured to the screw shaft (B) by means of a bolt or pin ( $i$ ) passing through them. The clutch ( $d$ ) is so constructed as that it shall be capable of overriding the teeth of the collar when the latter is moved in one direction and of engaging with them when its motion is reversed, this being effected by forming the projection on its lower end which engages with the teeth of the collar with its front edge running in a line parallel with its shank, while its rear edge is set at an angle thereto as seen at Fig. 5, thus forming an inclined plane by means of which in the backward motion of the lever—it being free to rise and fall in the mortise formed in the screw head D)—it is made to override the teeth of the collar, but to engage therewith in its formed stroke, and by this means to rotate the disk to which the screw is attached thereby raising or lowering the screw head (D) according to the direction in which the inclined edge of the clutch is placed; and to facilitate which the shank of the clutch is made cylindrical and also to project above the outer surface of the disk (D) a sufficient distance to enable the operator to reverse its position whenever circumstances should require it.

A simple rule for the adjustment of the clutch is to turn its vertical edge in the opposite direction to that you wish the screw to turn, whether for raising or lowering it, so that if you have been elevating the screw, when you desire to lower it you have merely to reverse the position of the clutch by turning it around and then operate the collar (C) in the same manner as when raising it, and the desired result will be obtained, inasmuch as the clutch will operate on the opposite side of the teeth. The socket ( $e$ ) for the lever ( $f$ ) in this instance is cast or otherwise formed in the underside of the collar (C) on the outside of the mortise



formed for the reception of the screw shaft, but it may be formed if desired through the collar itself; this lever is of cylindrical shape and fits loosely into the socket so that it can  
 5 readily be passed through from one side to the other, and thus be adjusted to work in awkward or confined situations with great facility.

In operating this machine the lever (*f*)  
 10 is placed in the the socket (*e*) and the clutch (*d*) so adjusted as to cause the screw (*B*) to turn in the proper direction after which an oscillating motion is communicated to the collar (*C*) through the lever which act-  
 15 ing on its forward motion through one of its teeth (*b*) upon the vertical edge of the tooth (*e*) of the clutch (*d*) causes the screw head (*D*) to perform a partial revolution, while the next tooth in the backward motion of  
 20 the collar striking against the inclined edge of the clutch causes it to rise and drop on its other side, ready to be acted upon by it in the next forward motion of the collar and so on until the weight has been raised as  
 25 high as required; the clutch being merely, as before mentioned, reversed to lower it, the operation in both instances being the same.

As a general rule the number of teeth formed in the collar will be proportioned to 30 the length of stroke intended to be given to the lever. As for example if the lever is intended at every motion to move through an arc of a circle equal to the  $\frac{1}{8}$ th part of its circumference then there would be 8 35 teeth, or if the  $\frac{1}{12}$ th part of a circle 12, so that in the former case the screw would perform one eighth part of a revolution and in the latter but one twelfth, always providing that the operator maintained his original 40 position.

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

The loose collar (*C*) having a series of 45 teeth arranged upon its inner face in combination with a screw head (*D*) carrying a drop clutch, when arranged and operating in the manner and for the purposes substantially as described. 50

In testimony whereof I hereunto set my hand this 20th day of May A. D. 1857.

LUCIUS J. KNOWLES.

Witnesses:

JOHN W. CHADSEY,  
 M. K. WHIPPLE.