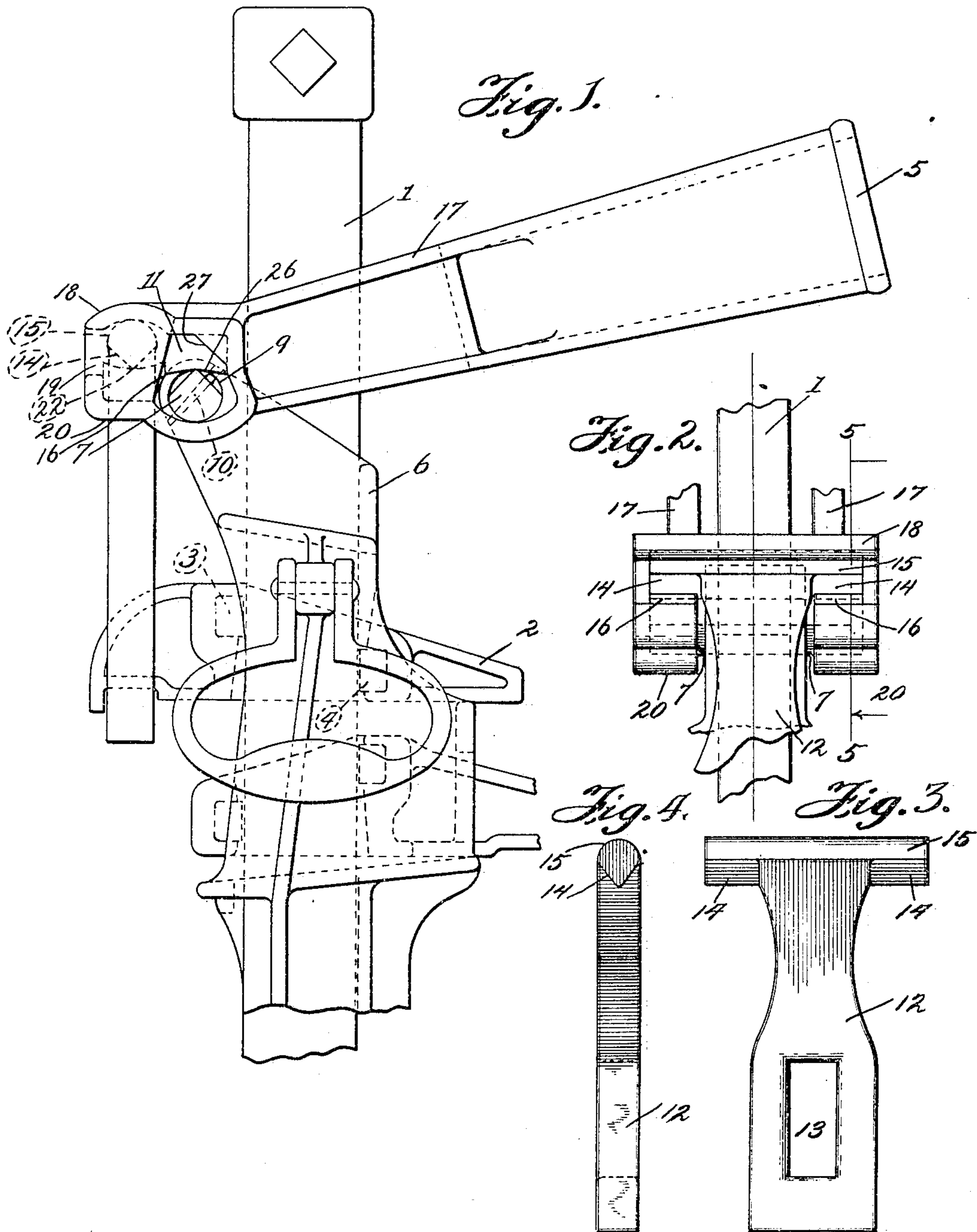


No. 787,995.

PATENTED APR. 25, 1905.

A. L. STANFORD.  
LIFTING JACK.  
APPLICATION FILED NOV. 23, 1904.

2 SHEETS—SHEET 1.



Witnesses:  
G. A. Perry  
J. B. Weir

Inventor:  
A. L. Stanford  
by Elliott & Hooper  
Attys

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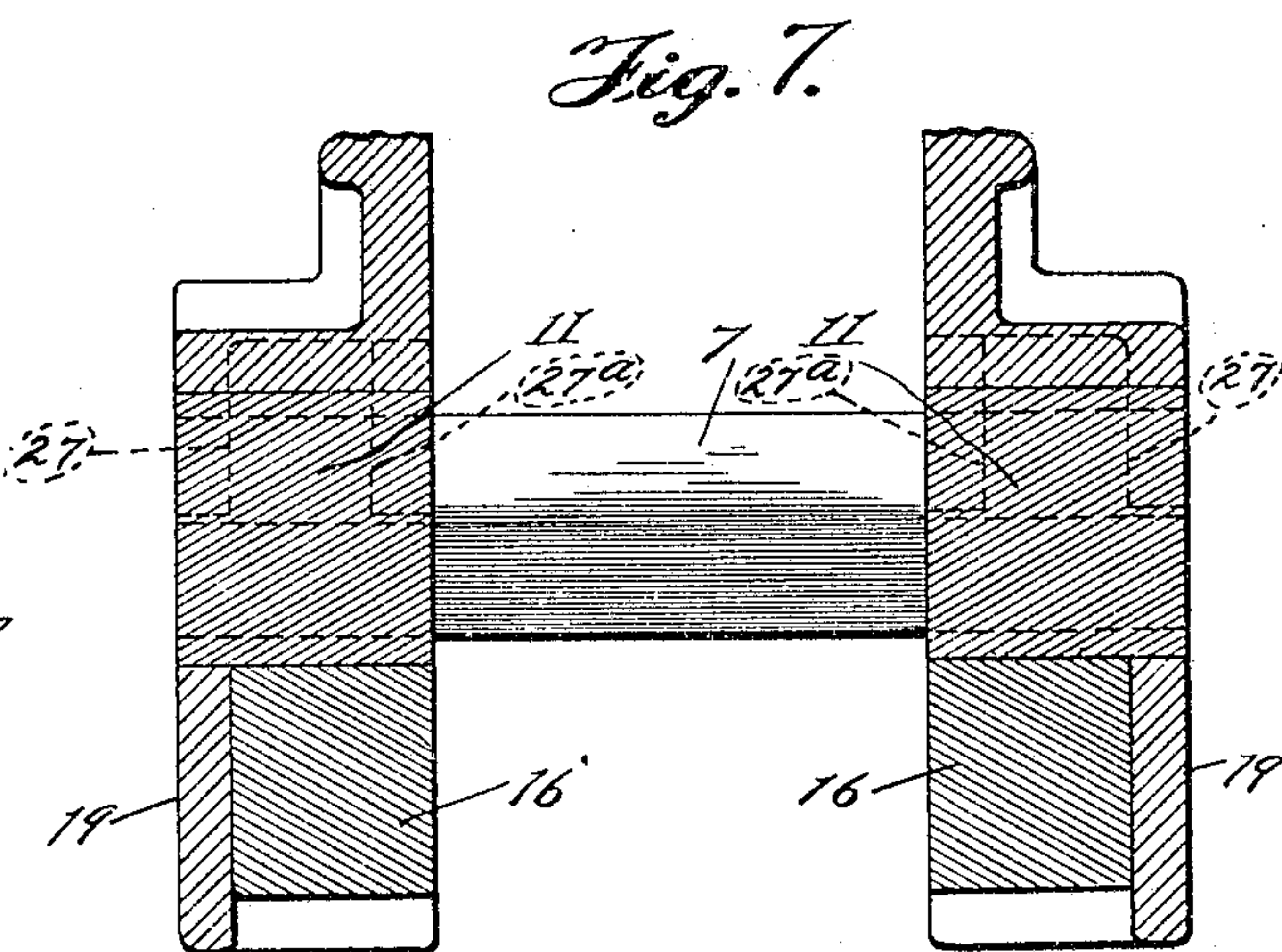
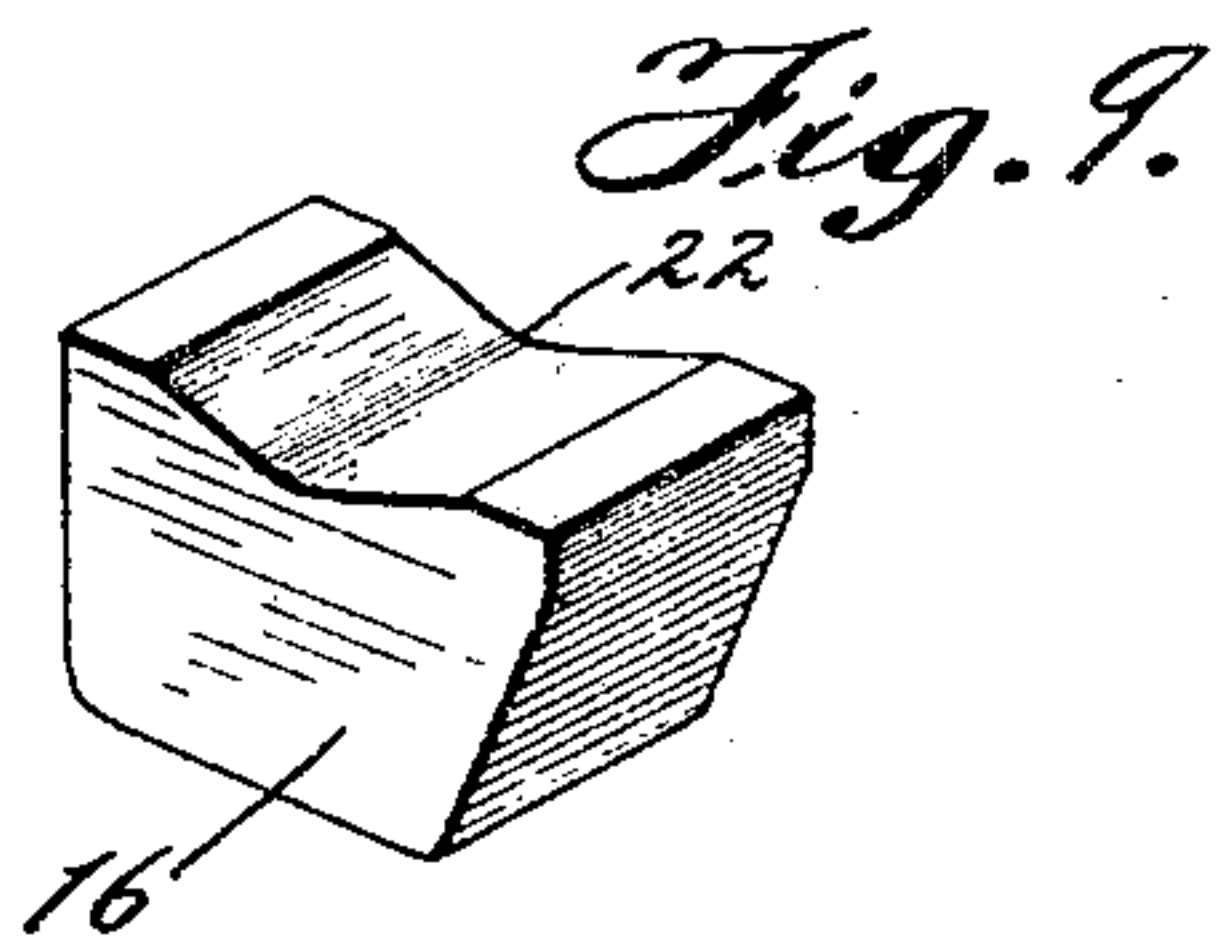
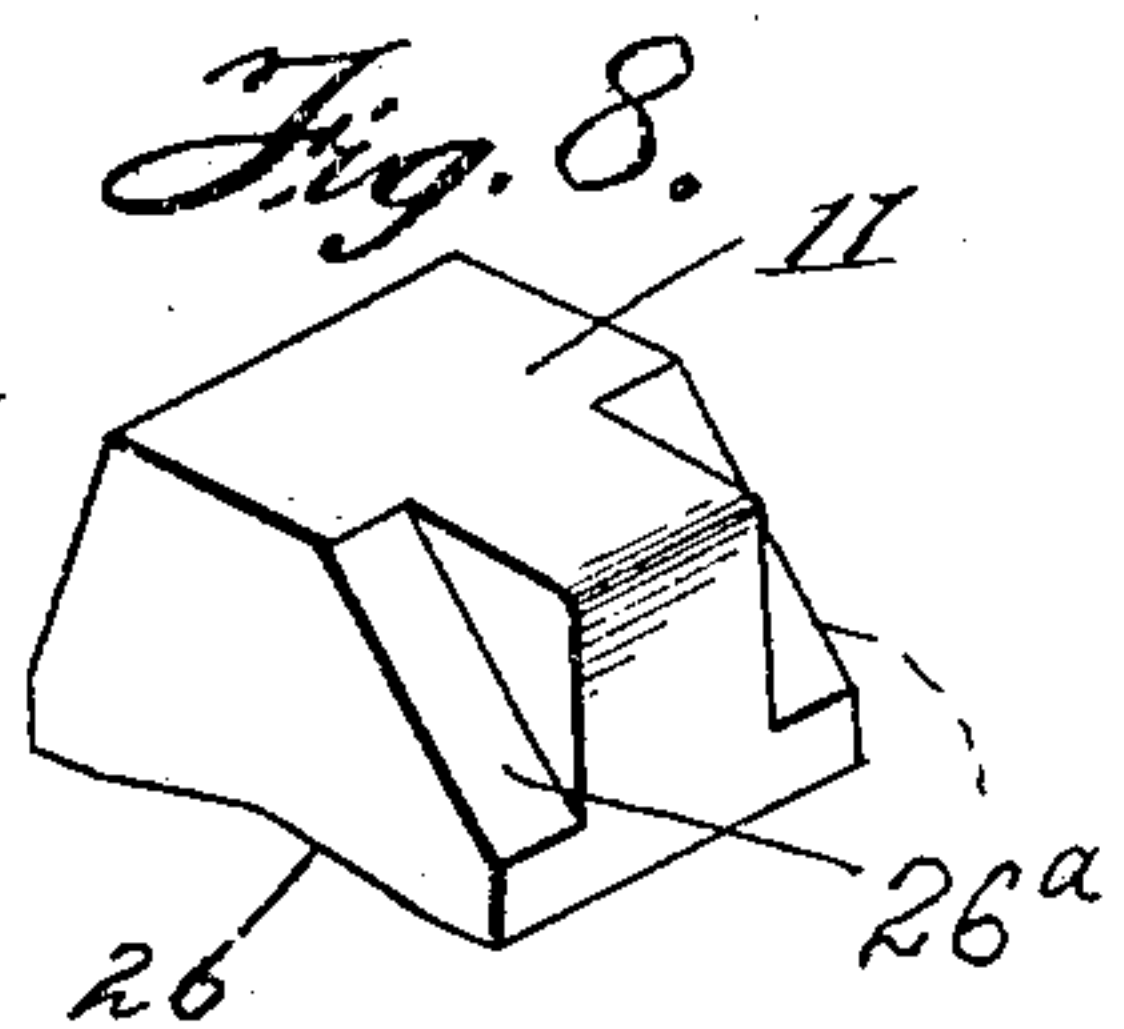
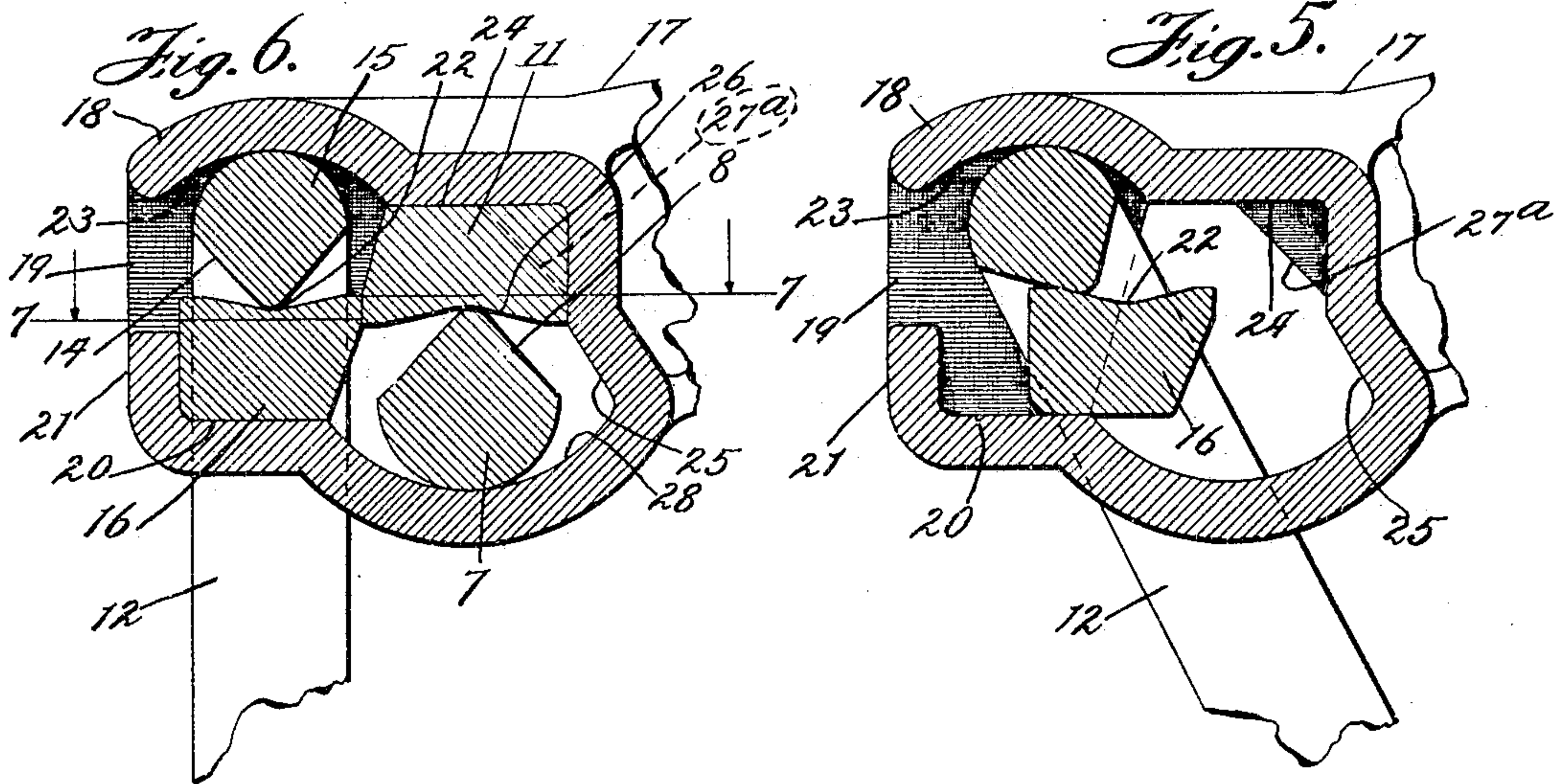
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2 SHEETS—SHEET 2.



Witnesses:

*Wm. D. Perry*  
*J. B. Wei*

Inventor:

*A. L. Stanford*  
*by C. L. Stanford*



## UNITED STATES PATENT OFFICE.

ARTHUR L. STANFORD, OF CHICAGO, ILLINOIS.

## LIFTING-JACK.

SPECIFICATION forming part of Letters Patent No. 787,995, dated April 25, 1905.

Application filed November 23, 1904. Serial No. 233,933.

*To all whom it may concern:*

Be it known that I, ARTHUR L. STANFORD, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Lifting-Jacks, of which the following is a full, clear, and exact specification.

My invention relates more particularly to that class of lifting-jacks which depend for the operation of the lifting-bar upon the oscillation of a lever having its fulcrum situated on the frame-standard; and the invention has for its primary object to provide an improved and efficient construction for materially reducing the wear and friction of such fulcrum and of the parts with which the lever coöperates in raising or lowering the lifting-bar.

The invention consists in certain features of novelty in the construction, combination, and arrangement of parts whereby the said object and certain other objects hereinafter appearing are attained, and which features will first be described with reference to the accompanying drawings and then more particularly pointed out in the claims.

In the said drawings, Figure 1 is a side elevation of the upper portion of the lifting-jack embodying my improvements. Fig. 2 is a front elevation of one end of the lever and the hanger. Fig. 3 is a detail front view of the hanger. Fig. 4 is an edge view thereof. Fig. 5 is an enlarged vertical section taken on the line 5 5, Fig. 2, showing the manner of assembling the parts. Fig. 6 is a similar section showing the parts assembled. Fig. 7 is a plan section taken in different planes on the line 7 7, Fig. 6. Fig. 8 is a perspective view of the fulcrum-pin, and Fig. 9 is a perspective view of one of the bearing-blocks.

These improvements in this exemplification of the invention are shown in connection with the type of lifting-jack which is described and claimed in my former United States patent, No. 730,580, issued June 9, 1903, to which reference may be had if desired for an understanding of the elements shown herein that constitute no part of this

invention. In that form of jack the lifting-bar 1 is raised and lowered by a lever or grip 2, having two hardened gripping-blocks 3 4, which engage opposite sides of the lifting-bar 1 and cause the same to be raised or lowered as the lever 2 is oscillated or moved up and down at one end. The present invention is concerned solely with the means for thus oscillating the lever 2 through the agency of the usual main operating-lever 5. Ordinarily in lifting-jacks of this type the frame 6 of the jack is provided with a fulcrum on which the operating-lever 5 is supported, and in my present invention such fulcrum is constituted by a bar or pin 7, which is preferably made separate from the frame 6, so that it may be formed of hardened steel or other suitable material. The upper side of the fulcrum-pin 7 is provided with a V shape or knife edge 8 to reduce the friction of the parts supported thereon, and the pin is attached to the frame 6 preferably by being driven through the same, the frame being formed with a circular aperture 9 in each side for its reception, and the pin is held against rotary movement in these apertures by a dowel or taper pin 10, driven through the frame, and the fulcrum-pin 7. The operating-lever 5 is supported on the fulcrum-pin 7 by means of two bearing-blocks 11, one at each end of the pin, and the motion of the operating-lever is imparted to the lever 2 by a hanger 12, having an aperture or link 13, through which the end of lever 2 projects, and also having two knife-edge bearings 14 formed on the cross-bar 15 at its upper end. This cross-bar 15 is supported upon two bearing-blocks 16, arranged one at each end thereof, so that when the lever 5 is oscillated the blocks 11 will rock upon the fulcrum-pin 7 and the knife-edges 14 will rock upon the blocks 16, and as these bearing-blocks 11 16 are formed separately from the lever 5 they, together with the pin 7 and cross-bar 15, may be composed of tool-steel or other hardened material, and consequently the wear and friction occasioned by these movements will be reduced to the minimum.

The lever 5 is formed with two arms or side portions 17, which straddle the lifting-bar 1



and the frame 6, and these two arms or side portions are connected together at their forward ends and at the top by a cross bar or web 18, and at the sides they are formed with downwardly-extending webs 19, which carry seats 20 for the lower bearing-blocks 16, the outer sides of these seats 20 being formed with upwardly-extending lips 21, which prevent the outward movement of the blocks 16, while the inward movement of said blocks is prevented by the blocks 11, against which they abut, as shown in Fig. 6. These side webs 19 and seats 20 are arranged a sufficient distance apart, as shown in Figs. 2 and 7, to allow for the introduction and oscillation of the hanger 12, whose pin or cross-bar 15 is inserted transversely over the lips 21 and under the outer edge of the cross-web 18. The lower end of the hanger 12 is then pushed inwardly toward the lifting-bar of the jack, as shown in Fig. 5, until the knife-edges 14 are sufficiently elevated to allow the bearing-blocks 16 to be introduced thereunder from the inner side, as shown in Fig. 5, until the V depression 22 of said blocks is centered under the knife-edges, whereupon by advancing the knife-edges and the bearing-blocks together they may be eventually brought into the position shown in Fig. 6, where the bearing-blocks will be rigidly held against lateral movement by the flanges 21 on one side and the bearing-blocks 11 on the other side and against vertical movement by the knife-edges 14. The hanger 12 itself, with its cross-bar 15, is held against independent vertical movement in the lever 5 by the under side of the cross-web 18; but in order that the cross-bar 15 may rock with relation to the blocks 16 the under side of said cross-web 18 is struck on an arc 23 from the center of oscillation of the knife-edges 14 and in a radius equal to the vertical diameter of the cross-bar 15, so that the top of the cross-bar will remain in contact with or in close propinquity to the under side of the cross-web 18 during such oscillation.

At the lower end of each of the arms 17 is formed a seat or socket 24, one for each of the upper bearing-blocks 11, which latter are inverted or reversed with respect to the block 16, and which blocks 11 are inserted in the seats 24 after the blocks 16 are put in place and before the pin 7 is driven into the frame, so that after the pin is driven the blocks 11 will be held against lateral movement in one direction by the blocks 16 and in the other direction by the seats 24, while they will be held against vertical movement by the knife-edge 8 of the fulcrum-pin. The sides of the arms 17 where the blocks 11 and pin 7 are located, however, are not housed in or formed with a downwardly-extending web, as the web 19, but are formed with an opening 25 at both sides of the frame 6, so that the blocks 11 may be introduced from the

outside after the blocks 16 have been put in place and the bar 1 and frame 6 have been inserted through or between the arms 17, the fulcrum-pin 7 being then driven from the side through one of the openings 25, as before explained, with its knife-edge resting at the apex of the V-shape depression 26 in the blocks 11. In order, however, that the blocks 11 may not be displaced longitudinally of the pin 7, the sides of the seats 24 are formed with lips or flanges 27 27<sup>a</sup> in the corners, which project over the blocks 11 sufficiently to hold them in place, but do not interfere with their introduction, the blocks being rabbeted, as shown at 26<sup>a</sup>, to receive such flanges.

When the lever 5 is oscillated, the blocks 11 will rock on the knife-edge of the fulcrum-pin 7, and in order that the arms 17 may thus move with relation to the pin 7 without danger of the blocks 11 losing their proper position upon the knife-edge of said pin each of the arms 17 at the lower side of the opening 25 is formed with a curved guard 28, which, like the guard 23, is struck on an arc from the oscillating center of the blocks 11 and their length of radius equal to the vertical diameter of the pin 7, so as to remain practically or substantially in contact with the lower side of the pin 7 while allowing the arms 17 the requisite freedom of movement.

With a jack thus constructed it will be seen that the friction and wear is reduced to a minimum and the necessity of lubricant, the presence of which is very objectionable, especially on this type of jack, is entirely obviated, while the ability to place the bearings very close together in a cast-iron lever without detracting from the durability renders the jack powerful, efficient, and inexpensive. Having thus described my invention, what I claim as new therein, and desire to secure by Letters Patent, is—

1. In a lifting-jack the combination of a frame, a lifting-bar, an operating-lever for raising said bar operatively connected therewith, a fulcrum for supporting the lever upon the frame, a bearing with which the fulcrum engages and a curved guard moving with the lever and struck on an arc from the point of contact between the fulcrum and said bearing for holding the fulcrum and bearing together.

2. In a lifting-jack the combination of a frame, a lifting-bar, a lever fulcrumed on the frame, an operative connection between the lever and the said bar for raising the bar, comprising a bearing and a hanger engaging the bearing, said bearing and hanger being connected one with the lever and the other with the bar and adapted to rock one upon the other, and a curved guard for holding the hanger and bearing in contact, struck on an arc from the point of contact between said hanger and bearing.



3. In a lifting-jack the combination of a frame, a lifting-bar, a lever for operating said bar, a fulcrum for the lever, a bearing for said fulcrum, a curved guard for holding the bearing and fulcrum together struck on an arc from the point of contact between said bearing and fulcrum, an operative connection between said bar and lever comprising a bearing reversed with respect to said first bearing and a support engaging said second bearing whereby the oscillation of the lever will be imparted to the said bar through the intermediary of the second bearing and said support, and a curved guard for holding said second bearing and support in contact, struck on an arc from the last-said point of contact and reversed with respect to said first guard.

4. In a lifting-jack the combination of a frame, a lifting-bar, an operating-lever, a knife-edge fulcrum for the lever, a bearing-block having a depression for receiving the edge of said fulcrum, a curved guard engaging the fulcrum on the side opposite said bearing-block, and an operative connection between the lever and the said bar for raising the latter.

5. In a lifting-jack the combination of a frame, a lifting-bar, an operating-lever, a knife-edge fulcrum on the frame for the lever, a hanger having a knife-edge support for connecting the lever with the bar, said knife-edges being inverted with respect to each other, and bearing-blocks removably seated in the lever and engaging said edges respectively.

6. In a lifting-jack the combination of a frame, a lifting-bar, an operating-lever, two independent bearing-blocks removably seated in said lever, and arranged one against the other whereby they will mutually guard against their displacement, a fulcrum for the

lever against which one of said blocks engages, and an operative connection between the said bar and the lever comprising a support engaging with the other of said blocks and adapted to rock thereon.

7. In a lifting-jack the combination of a frame, a lifting-bar, an operating-lever, fulcrumed on said frame and having seats for independent bearing-blocks, independent bearing-blocks adapted to be inserted into said seats and having depressed surfaces, an operative connection between the lever and the said bar comprising a knife-edge support adapted to engage in said depressed surfaces, and means for holding said support from moving directly away from said bearing-block, the latter said means, said support and bearing-block being so proportioned that the knife-edge of the support may be turned to one side above the top of the bearing-block and the bearing-block inserted thereunder when it is thus elevated, and means for holding the bearing-block from moving in the direction opposite that in which it is inserted into its seat.

8. In a lifting-jack the combination of a frame, a lifting-bar an operating-lever operatively connected with the said bar for raising it, and having two arms embracing the frame and provided with apertures in their sides, bearing-blocks seated in the upper sides of said apertures, flanges projecting downwardly, partially over the ends of said bearing-blocks for holding them in place, and a fulcrum-pin passing through said apertures and frame and supporting said blocks.

ARTHUR L. STANFORD.

Witnesses:

F. A. HOPKINS,  
M. B. ALLSTADT.