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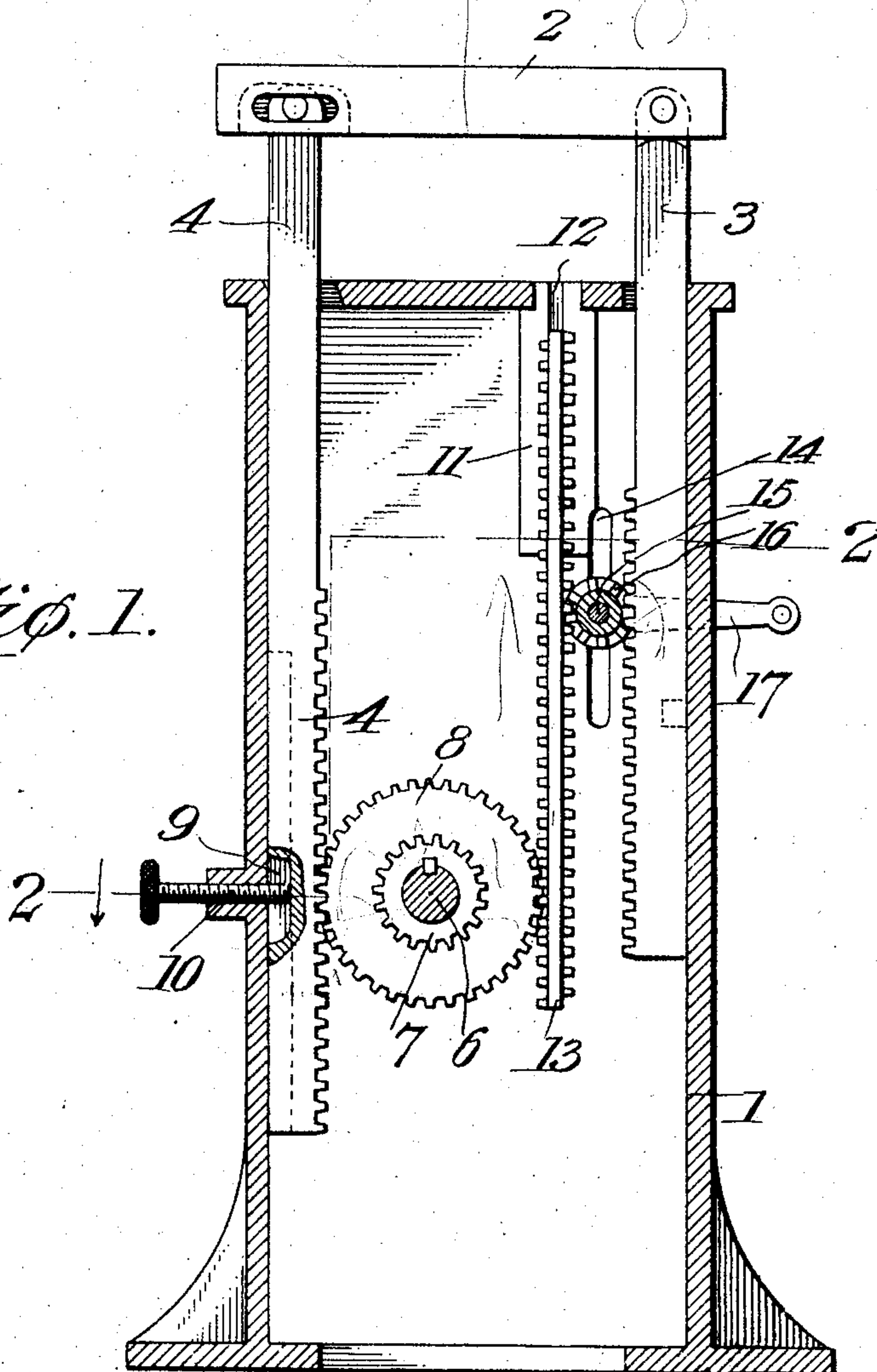
W. A. JOHNSTON.

LIFTING JACK.

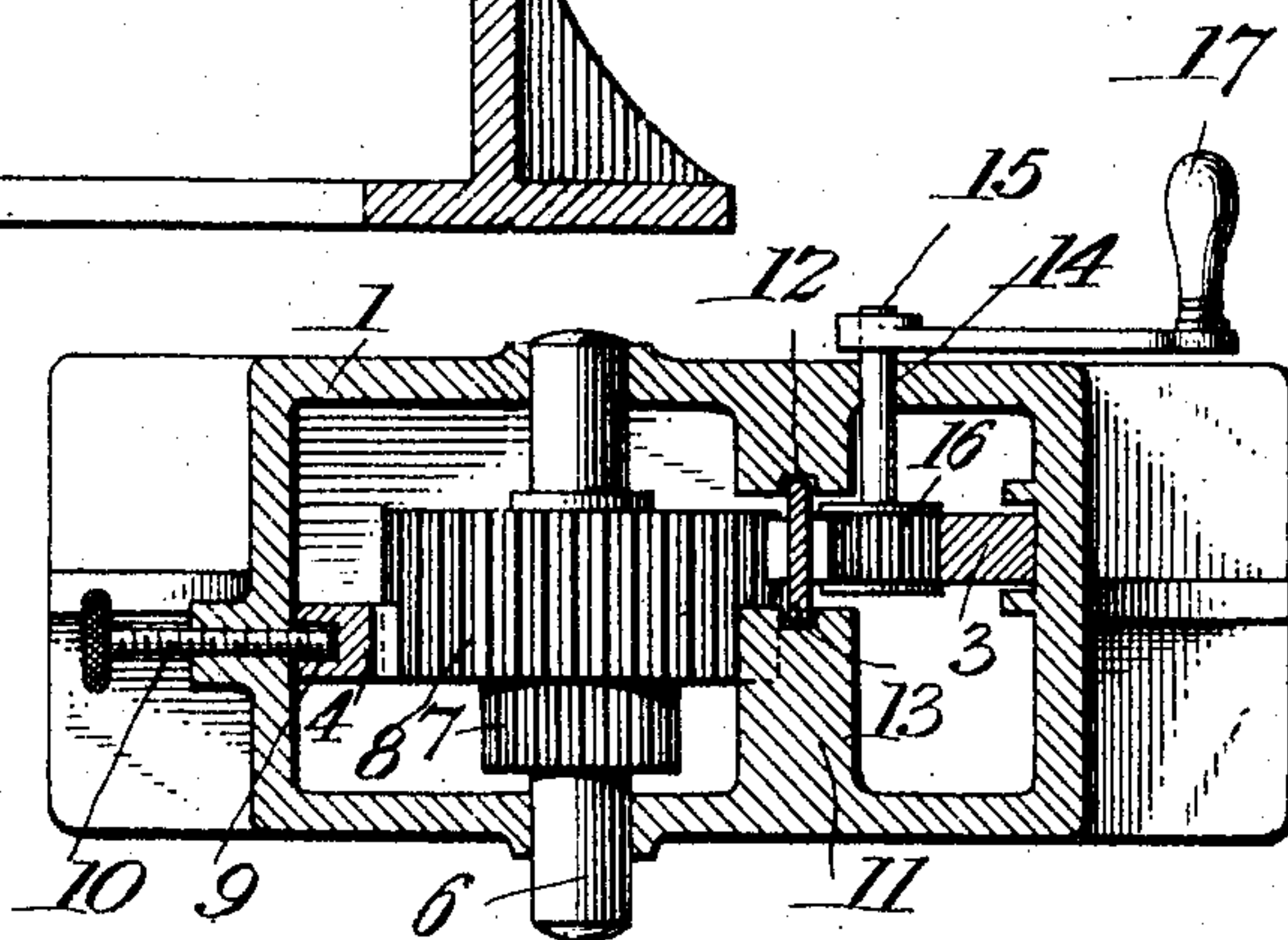
APPLICATION FILED OCT. 26, 1903.

NO MODEL.

*Fig. 1.*



*Fig. 2.*



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# UNITED STATES PATENT OFFICE.

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## LIFTING-JACK.

SPECIFICATION forming part of Letters Patent No. 768,182, dated August 23, 1904.

Application filed October 26, 1903. Serial No. 178,591. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM A. JOHNSTON, a citizen of the United States, residing at Rural Retreat, in the county of Wythe and State of Virginia, have invented a new and useful Lifting-Jack, of which the following is a specification.

This invention relates to certain improvements in lifting-jacks, and has for its principal object to provide an improved form of mechanical jack in which heavy loads may be raised with comparatively slight exertion on the part of the operator.

A further object of the invention is to construct a jack in which the lifting force is applied to the load-carrying platform at a plurality of points, the jack being in a measure self-balancing, so that a heavy load applied at one point will tend to elevate the platform at the other point of connection with the elevating means.

A still further object of the invention is to provide a jack in which a load-carrying platform is connected mechanically to an elevating means, the platform being so arranged that a heavy load at one side of the platform will exert force through suitable leverage, preferably in the form of gears, in such manner that it may exercise a lifting force on the opposite side of the platform and on the load itself.

A still further object of the invention is to construct a mechanically-actuated jack in which the load-receiving platform automatically balances itself to the load and in which manual force may be transmitted through suitable gearing connections to exert lifting force at all points of connection between the elevating mechanism and the platform.

With these and other objects in view, as will hereinafter appear more fully, the invention consists in the novel construction and arrangement of parts hereinafter described, illustrated in the accompanying drawings, and particularly pointed out in the appended claims, it being understood that various changes in the form, proportions, size, and

minor details of the structure may be made without departing from the spirit or sacrificing any of the advantages of the invention. 50

In the accompanying drawings, Figure 1 is a longitudinal sectional elevation of a lifting-jack constructed in accordance with the invention. Fig. 2 is a sectional plan view of the same on the line 2 2 of Fig. 1. 55

Similar numerals of reference are employed to indicate corresponding parts throughout both figures of the drawings.

The operating parts of the mechanism are arranged within a suitable casing or frame 1, which may be of any desired size in accordance with the character of the work to be performed. 60

The lifting-table 2 is carried by two rack-bars 3 and 4, that are arranged in suitable guides near the opposite sides of the casing and extend upward through suitable openings in the top thereof. The connection between the platform and the rack-bars is pivotal in order that the platform may tilt to accommodate itself to the load, the connection between the rack 4 of the platform being so arranged as to permit of considerable lateral play of the platform. 65

In the lower portion of the casing are suitable bearings for the reception of a transversely-disposed shaft 6, carrying a pinion 7, and the gear 8, which are secured to each other and adjustable longitudinally of the shaft. The rack-bar 4 meshes with the gear-wheel 8 under normal conditions; but when the load is excessive and it is desired to increase the leverage force on the platform the gear and pinion are shifted lengthwise of the shaft until the pinion 7 is opposite the rack 4. The lower portion of the rack 4 is provided with a vertical slot 9, into which extends a screw 10; adapted to a threaded opening in the frame or casing, and by turning this screw the rack may be forced in the direction of the shaft until its teeth intermesh with those of the pinion 7, and this movement is permitted by the connection between the upper end of the rack-bar and the platform. 70 75 80 85 90



The casing is provided with a pair of inwardly-extending ribs 11, provided with guiding-grooves 12, into which extend the opposite sides of a double rack-bar 13, one set of  
5 teeth of said rack-bar intermeshing with the teeth of the gear 8 at all times and without regard to the position to which the gear may be adjusted, the width of the gear being sufficient to maintain the parts in operative re-  
10 lation when the gear and pinion are adjusted to bring the latter in mesh with the rack-bar 4.

At one side of the casing is a vertically-disposed slot 14, through which extends a floating shaft 15, carrying a pinion 16, the teeth  
15 of which intermesh with those of a rack-bar 3 and with one of the sets of teeth on the double rack-bar 13. That end of the shaft 15 which extends through the slot is provided with a handled operating-crank 17, which may  
20 be turned manually in order to apply lifting force to the platform. The lifting power is exerted by turning the crank 17, and this acts through the floating gear to elevate the rack 3 and depress the rack 13. As the rack 13  
25 moves downward it turns the gear 8, and upward movement of the latter on the opposite side elevates the rack-bar 4, and as the surface speed of all of the gears and pinions is equal the lifting power applied to the two racks will  
30 be uniform. If it is desired to increase the leverage force, the gear 7 and pinion 8 are shifted lengthwise of shaft 6 until the pinion 7 is opposite the rack-bar 4. The latter is then forced inward by means of screw 10 un-  
35 til its teeth intermesh with those of the pinion, while the gear still remains in mesh with the rack-bar 13. When the floating gear is turned, the downward stress on rack-bar 13 will exercise a lifting force on the rack-bar 4  
40 proportionate to the length of the levers represented by the radii of the pinion 7 and gear 8, while the floating gear will gradually descend, so that the racks 3 and 4 will be elevated at the same speed.

45 A lifting-jack constructed in accordance with this invention may be employed for the purpose of lifting loads of any character, and the size of the platform, the gears, and frame may be altered in accordance with the char-  
50 acter of the work to be performed without departing from the invention.

Having thus described the invention, what is claimed is—

1. In a lifting-jack, a load-receiving plat-  
55 form, a pair of rack-bars connected thereto,

and means including a floating gear, for connecting the rack-bars to each other.

2. In a lifting-jack, a load-receiving platform, a pair of rack-bars connected thereto, an intermediate double rack, and gears con- 60 necting the several racks in series.

3. In a lifting-jack, a load-receiving platform, a pair of rack-bars connected thereto, a double rack-bar, a floating gear connecting one of the platform-bars to the double rack- 65 bar, and a second gear connecting the double rack-bar to the second platform-bar.

4. In a lifting-jack, a load-receiving platform, a pair of rack-bars connected thereto, a double rack-bar, a floating gear connecting 70 the double rack-bar to one of the platform-bars, an operating-crank connected to the floating gear, and a second gear connecting the double rack-bar to the second platform-bar.

5. In a lifting-jack, a load-receiving plat- 75 form, a pair of rack-bars pivotally connected thereto, an intermediate double rack-bar, a floating gear connecting one of the pivoted racks to the double rack, a shaft, a gear and pinion adjustable longitudinally of the shaft, 80 the gear-wheel being in mesh with the double rack, and means for adjusting the second rack-bar to intermesh with either the gear or the pinion.

6. In a lifting-jack, a frame having a ver- 85 tically-disposed slot, an operating-shaft extending therethrough and provided with a crank, a gear mounted on the shaft, a pair of spaced ribs extending inward from opposite sides of the frame and provided with guiding- 90 grooves, a double rack-bar adapted to said grooves and intermeshing with said gear, a rack-bar intermeshing with the gear, a load-receiving platform to which said rack-bar is pivotally connected, a second rack-bar also 95 pivotally connected to the platform, a shaft, a gear and pinion mounted on the shaft and adjustable longitudinally thereof, said gear being in mesh with the double rack-bar, and a screw for adjusting the second rack-bar in 100 position to engage either the longitudinally-adjustable gear or the pinion.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

WILLIAM A. JOHNSTON.

Witnesses:

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J. ROSS COLHOUN.