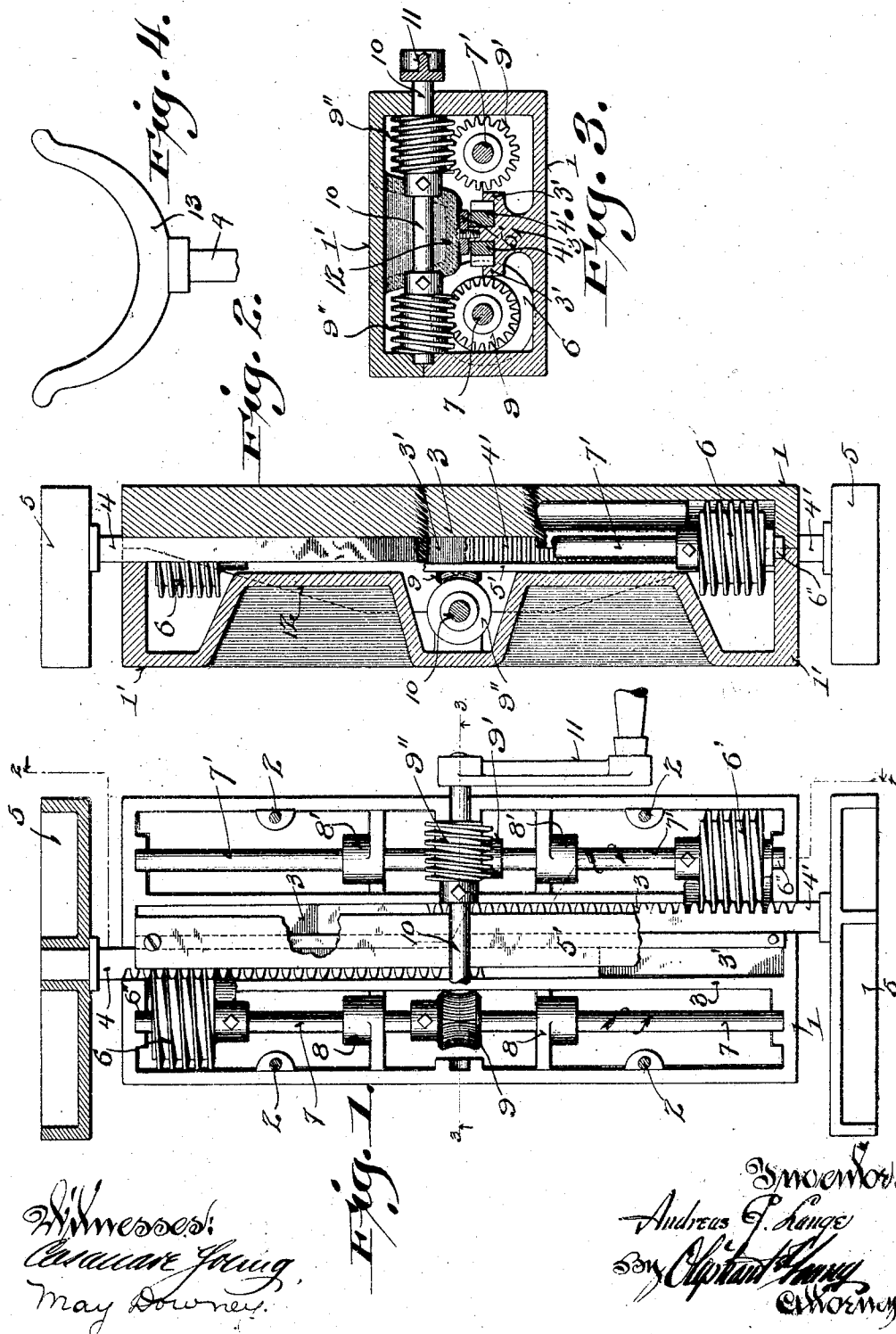


A. J. LANGE.
LIFTING JACK.
APPLICATION FILED JULY 22, 1911.

1,010,774.

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UNITED STATES PATENT OFFICE.

ANDREAS J. LANGE, OF RACINE, WISCONSIN.

LIFTING-JACK.

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To all whom it may concern:

Be it known that I, ANDREAS J. LANGE, a citizen of the United States, and resident of Racine, in the county of Racine and State of Wisconsin, have invented certain new and useful Improvements in Lifting-Jacks; and I do hereby declare that the following is a full, clear, and exact description thereof.

The object of my invention is to provide a simple, durable, powerful and efficient double-headed lifting-jack, the arrangement and construction being such that a pair of oppositely disposed housed and worm-driven rack-bars are expanded and contracted in opposite directions with relation to each other, whereby the combined lifting speed of said worm-driven rack-bars is increased, while at the same time the said rack-bars will hold the load at any point of expansion or contraction without the employment of dogs or analogous locking devices.

Another object of the invention is to provide means whereby the apparatus may be utilized as a vise.

With the above objects in view the invention consists in certain peculiarities of construction and combination of parts as set forth hereinafter with reference to the accompanying drawings and subsequently claimed.

In the drawings Figure 1 represents a face view of a lifting jack with a portion of its housing removed and having certain parts broken away and certain parts in section to more clearly illustrate structural features; Fig. 2, a longitudinal sectional view of the same, the section being indicated by line 2—2 of Fig. 1; Fig. 3, a cross-section of the lifting jack, the section being indicated by line 3—3 of Fig. 1, and Fig. 4, a detailed view of a modified form of a load-supporting foot adapted to be used as a substitute for that form of foot shown in Figs. 1 and 2.

Referring by characters to the drawings, 1, 1', represent longitudinally divided members of a rectangular gear-box or housing, the members being secured together by suitable bolts 2 which are in threaded engagement with apertured matched lugs with which each housing member is provided. Housing member 1 has a longitudinally arranged rail 3 that is provided with parallel channels 3' for the reception of slidable rack-bars 4, 4', the same being held to their

seats by engagement with notched recesses with which the end-walls of the housing members are provided. As best indicated by the partly dotted line in Fig. 2, the division line between the housing members intersects the rack-bars at a point where the end wall recesses of the housing members articulate and also intersects a journal that is formed by said housing members at an intermediate point, which journal is provided for the reception of a transverse power-shaft to be hereinafter described. One end of each rack-bar protrudes through the opposite end-wall of the housing, to each of which protruding ends there is secured a foot 5, the same as shown in Figs. 1 and 2, being in the form of ribbed rectangular plates having flat faces that are adapted to engage the corresponding flat faces of the housing end-walls, whereby said faces constitute vise-jaws. The rack-bars are further secured in their rail seats by a metallic strip 5' that is secured to the upper face of the rail intermediate of its channels by suitable screws.

The teeth of the rack-bars 4, 4' are faced in opposite directions and are each arranged to engage worms 6, 6', respectively the same being disposed adjacent to opposite ends of the housing and the rail 3 at this point is cut away to permit toothed engagement between said rack-bars and worms. Each worm is secured to a longitudinally disposed counter-shaft 7, 7', respectively, which shafts are mounted in pairs of intermediate journal-bearings 8, 8', 8'', that extend from cross-ribs of the housing member 1. One end of each shaft is journaled in a recess that is formed in the adjacent end-wall of the housing, the opposite end-wall of the housing being provided with similar recesses for the reception of nibs 6'' that extend from the worm 6 to thus form corresponding end journals to those just mentioned. By this arrangement of shaft journals it is apparent that the springing strain to which the counter-shafts are subjected is effectually resisted, the worms together with their shafts being arranged to rotate in opposite directions. Each counter-shaft also carries a centrally disposed worm-wheel 9, 9', the same being respectively meshed with right and left hand worms 9'' of a transversely arranged power-shaft 10, which power-shaft is journaled in bearings formed in the side-walls of the housing members at their divi-

sion line, one end of said shaft being extended beyond the housing and provided with a hand-crank 11, whereby the power is applied. To add further rigidity to the device, the housing member 1', which constitutes the cap member, is formed with alined longitudinal depressions 12 that impinge against the strut-retaining strip 5', whereby the same is relieved of undue strain, the ribs being spaced apart centrally of the housing to permit clearance therebetween for the power-shaft.

When the jack is to be used for lifting vehicles or the like, one of the flat rack-bar feet 5 is removed and a fork 13, as shown in Fig. 4, is substituted therefor, the fork being provided with a socketed boss for the reception of the end of the rack-bar 4. The foot 13 is particularly designed to conform to a vehicle wheel hub, axle, or other rounded member.

From the foregoing description it is apparent that the rack-bars being in the contracted position shown in Fig. 1 can be inserted under a load and when power is applied to shaft 10, the worm-gear connections between said rack-bars will cause the housing to climb upon strut 4', while at the same time strut 4 will travel outwardly with relation to the housing and thus exert a lifting power upon the load, it being understood that the lower rack-bar foot 5 is resting upon a resisting base, but should the jack be interposed between two loads, the rack-bar members would expand in opposite directions equally and thus spread the same apart. By this arrangement although the worm-gear will elevate one of the rack-bars at comparatively a low speed, it is evident, owing to the fact that the two rack-bars are moving in opposite directions that the lifting speed will be increased to comparatively the same speed as an ordinary type of jack. It is also apparent that, owing to the worm-gear connection between the rack-bars, the same will be held in their elevated positions when the lifting power is checked and thus locking dogs or the like are dispensed with.

It will also be observed that the oppositely disposed feet 5, 5', may be utilized as vise members in conjunction with each other or that either one of said feet may be utilized as a vise member in conjunction with the end-wall of the housing adjacent thereto and hence the general utility of the jack is increased.

While the worms 6, 6', are shown as having single threads, it is apparent that in manufacturing heavy duty jacks, a series of threads may be substituted therefor, whereby the breaking strain to which they are subjected is more effectually resisted.

I claim:

1. A lifting jack comprising a housing, parallel rack-bars slidably mounted in the housing each having an end protruding therethrough, longitudinally disposed counter-shafts journaled in the housing, a worm carried by each counter-shaft in juxtaposition to opposite ends of said housing for meshed engagement with the rack-bars, and a transversely arranged power-shaft in gear connection with the counter-shafts.

2. A lifting jack comprising a housing, parallel rack-bars mounted in the housing each having an end projecting therethrough, feet secured to the rack-bar ends, longitudinally disposed counter-shafts journaled in the housing, a worm carried by each counter-shaft in juxtaposition to opposite ends of said housing for meshed engagement with the respective rack-bars, a transversely arranged power-shaft journaled in the afore-said housing, worms carried by the power-shaft, and worm-wheels carried by the counter-shafts in meshed engagement with the power-shaft worms.

In testimony that I claim the foregoing I have hereunto set my hand at Milwaukee in the county of Milwaukee and State of Wisconsin in the presence of two witnesses.

ANDREAS J. LANGE.

Witnesses:

MARTIN, J. LANGE,
GEO. W. YOUNG.