Oct. 27, 1925.

1,559,098.

A. C. HOPKINS

LIFTING JACK

Filed Nov. 6, 1924

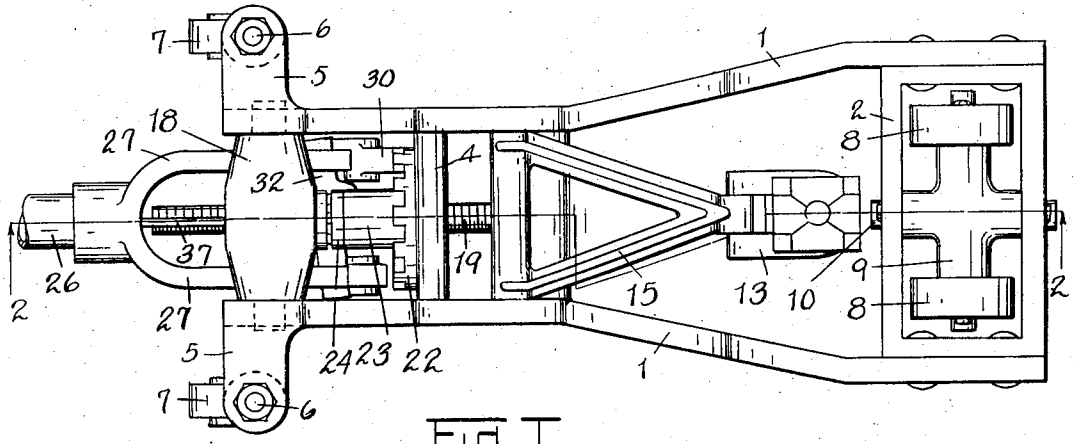


Fig. I.

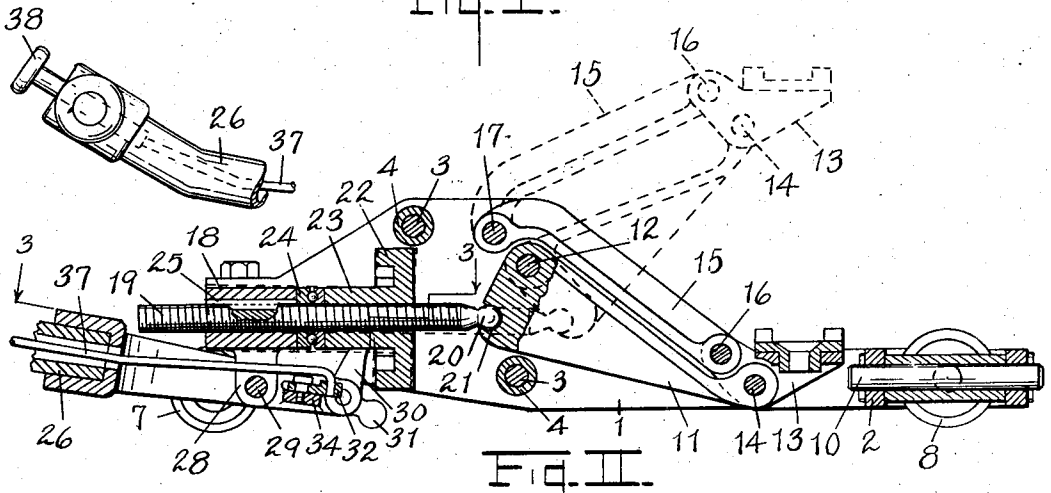


Fig. II.

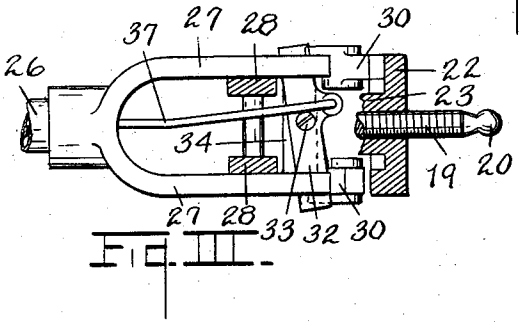


Fig. III.

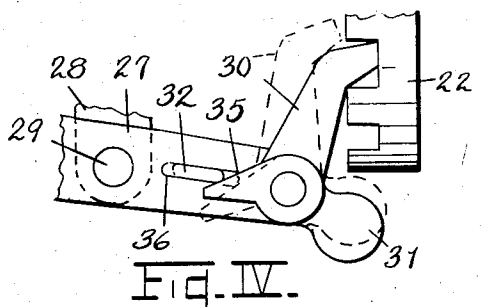


Fig. IV.

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UNITED STATES PATENT OFFICE.

ARTHUR C. HOPKINS, OF NILES, MICHIGAN, ASSIGNOR TO NATIONAL STANDARD COMPANY, OF NILES, MICHIGAN.

LIFTING JACK.

Application filed November 6, 1924. Serial No. 748,104.

To all whom it may concern:

Be it known that I, ARTHUR C. HOPKINS, a citizen of the United States, residing at Niles, county of Berrien, State of Michigan, have invented certain new and useful Improvements in Lifting Jacks, of which the following is a specification.

This invention relates to improvements in lifting jacks.

The main objects of this invention are:

First, to provide an improved lifting jack in which the frame is so constructed and the wheels so arranged that strain upon the wheels is minimized and a three-point support for the load provided.

Second, to provide in a lifting jack an improved lifting means which is very powerful.

Third, to provide in a lifting jack an improved actuating means for the lifting member.

Objects relating to details and economies of construction and operation will definitely appear from the detailed description to follow.

I accomplish the objects of my invention by the devices and means described in the following specification. The invention is clearly defined and pointed out in the claims.

A structure which is a preferred embodiment of my invention is clearly illustrated in the accompanying drawing, forming a part of this application, in which:

Fig. I is a plan view of my improved lifting jack with the actuating lever, which also constitutes a handle, partially broken away.

Fig. II is a longitudinal section on a line corresponding to the broken line 2—2 of Fig. I, the lifting member being shown in its lowered position by full lines and in elevated position by dotted lines.

Fig. III is a fragmentary view partially in section on a line corresponding to line 3—3 of Fig. II.

Fig. IV is an enlarged detail side elevation of the inner end of the actuating lever, showing the relation of the pawls mounted thereon to the driving ratchet, the pawls being shown in engagement by full lines and in disengaged position by dotted lines.

In the drawing similar reference characters refer to similar parts throughout the several views, and the sectional views are taken looking in the direction of the little arrows at the ends of the section lines.

Referring to the drawing, the frame of the embodiment illustrated comprises a pair of side members 1 having parallel portions at its front and rear ends and forwardly diverging portions between the parallel portions.

At the front end of the frame is a frame-like cross member 2 disposed between and rigidly secured to the side members. The side members are further connected by the cross rods 3 disposed through the spreaders 4. At their rear ends the side members are provided with lateral arms 5. The standards 6 of the caster wheels 7 are secured to these arms.

The front wheels 8 are mounted on an axle 9 which is mounted within the front cross member 2 of the frame by means of the longitudinally and centrally disposed pivot 10.

The frame has a three-point support, the front wheels adjusting themselves to any unevenness in the floor or ground and the frame is relieved of any undue strains.

The actuating lever 11 is supported by the pivot 12 between the side members of the frame so as to collapse between the same, as shown in Fig. II, or to be swung to elevated position as desired.

The head member or saddle 13 is pivotally mounted on the lifting lever at 14 and supported in its upright position throughout the throw of the lever by means of the link 15 which is pivoted to the head member at 16 and to the frame at 17. The pivots 14 and 16 and 12 and 17 respectively are so arranged in relation to each other that the link is in parallel relation to the lifting lever.

At the rear end of the frame, I journal a support 18 for the screw 19, the support being journaled so that it has a rocking movement between the frame side members. The screw 19 has a spherical head 20 at its front end engaging a socket 21 in the lifting lever 11, the socket being disposed below the lever pivot 12 which constitutes the fulcrum for the lever, the screw being the power applying means.

On this screw is a ratchet wheel 22 having a hub 23 of considerable length in threaded engagement with the screw. A thrust bearing 24 is interposed between the

support 18 and the screw. The screw is engaged by a spline 25 on the support 18.

The ratchet is driven from the actuating lever 26 which is forked at 27 and pivoted at 28 to the depending ears 29 on the support 18. Each arm of the lever carries a pawl 30, the pawls being adapted to act on the ratchet on opposite sides of the screw. The pawls are provided with weights 31 which tend to hold them in engagement with the ratchet wheel. To selectively disengage the pawls, I provide a pawl disengaging member 32 which is pivoted at 33 on the cross piece 34 extending between the arms of the lever, this control member 32 being adapted to engage the arms 35 on the pawls and when engaged therewith, support the pawls in inoperative position as shown by dotted lines in Fig. IV. The ends of the control member 32 are disposed through slots 36 in the arms of the lever.

An adjusting rod 37 for the pawl control member 32 is arranged through the handle of the actuating lever 26 and provided with a finger piece 38.

With this arrangement of parts, I provide a frame which is adapted to support loads without undue strain upon the frame. The power or actuating means may be easily operated to raise or lower the jack and is very powerful.

I have illustrated and described my improvements in a simple and practical embodiment. I have not attempted to illustrate certain modifications and adaptations which I contemplate as I believe the disclosure made will enable those skilled in the art to embody or adapt my improvements as may be desired.

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

1. In a lifting jack, the combination of a frame comprising side members having parallel portions at their front and rear ends and intermediate forwardly diverging portions, said side members having laterally projecting arms at their rear ends, caster wheels mounted on said arms, a frame-like cross member disposed between the front parallel portions of said side members, an axle pivotally mounted on said cross member, the pivot for said axle being disposed centrally and longitudinally of the frame, wheels on said axle, a lifting lever pivotally mounted between the rear parallel portions of said frame side members to project forwardly and adapted to collapse between the same, a head member pivotally mounted on said lifting lever, a head supporting link pivotally mounted between said side members and pivotally connected to said head member in parallel relation to said lifting lever whereby the head member is supported in upright position throughout the throw of the lifting lever, a screw support journaled between the rear ends of said side members for rocking movement, an actuating screw mounted on said support to engage said lifting lever below its pivot, a driving member disposed in front of said screw support and having a threaded engagement with said screw, and means for rotating said driving member in either direction.

2. In a lifting jack, the combination of a frame comprising side members, caster wheels at the rear ends of said side members, a cross member disposed between the front ends of said side members, an axle pivotally mounted on said cross member, the pivot for said axle being disposed centrally and longitudinally of the frame, wheels on said axle, a lifting lever pivotally mounted between the rear ends of said frame side members to project forwardly and adapted to collapse between the same, a head member pivotally mounted on said lifting lever, a head supporting link pivotally mounted between said side members and pivotally connected to said head member in parallel relation to said lifting lever whereby the head member is supported in upright position throughout the throw of the lifting lever, a screw support journaled between the rear ends of said side members for rocking movement, an actuating screw mounted on said support to engage said lifting lever below its pivot, a driving member disposed in front of said screw support and having a threaded engagement with said screw, and means for rotating said driving member in either direction.

3. In a lifting jack, the combination of a frame comprising side members having parallel portions at their front and rear ends and intermediate forwardly diverging portions, said side members having laterally projecting arms at their rear ends, caster wheels mounted on said arms, a frame-like cross member disposed between the front parallel portions of said side members, an axle pivotally mounted on said cross member, the pivot for said axle being disposed centrally and longitudinally of the frame, wheels on said axle, a lifting lever pivotally mounted between the rear parallel portions of said frame side members to project forwardly and adapted to collapse between the same, a head member pivotally mounted on said lifting lever, a head supporting link pivotally mounted between said side members and pivotally connected to said head member in parallel relation to said lifting lever whereby the head member is supported in upright position throughout the throw of the lifting lever, and means for actuating said lever.

4. In a lifting jack, the combination of a frame comprising side members, caster wheels at the rear ends of said side members,

a cross member disposed between the front ends of said side members, an axle pivotally mounted on said cross member, the pivot for said axle being disposed centrally and longitudinally of the frame, wheels on said axle, a lifting lever pivotally mounted between the rear ends of said frame side members to project forwardly and adapted to collapse between the same, a head member pivotally mounted on said lifting lever, a head supporting link pivotally mounted between said side members and pivotally connected to said head member in parallel relation to said lifting lever whereby the head member is supported in upright position throughout the throw of the lifting lever, and means for actuating said lever.

5. In a lifting jack, the combination of a frame comprising side members having parallel portions at their front and rear ends and intermediate forwardly diverging portions, said side members having laterally projecting arms at their rear ends, caster wheels mounted on said arms, a frame-like cross member disposed between the front parallel portions of said side members, an axle pivotally mounted on said cross member, the pivot for said axle being disposed centrally and longitudinally of the frame, wheels on said axle, and lifting means mounted on said frame.

6. In a lifting jack, the combination of a frame, a lifting lever pivotally mounted on said frame, a head member pivotally mounted on said lifting lever, a head supporting link pivotally mounted on said frame and pivotally connected to said head member in parallel relation to said lifting lever whereby the head member is supported in upright position throughout the throw of the lifting lever, a screw support on said frame, an actuating screw mounted on said support to coact with said lifting lever, a driving member for said screw having a threaded engagement therewith, and means for rotating said driving member in either direction.

7. In a lifting jack, the combination of a frame, a lifting lever pivotally mounted on said frame, a screw-support on said frame, an actuating screw mounted on said support to coact with said lifting lever, a driving member for said screw having a threaded engagement therewith, and means for rotating said driving member in either direction.

8. In a lifting jack, the combination of a frame comprising horizontally disposed spaced side members, a lifting lever pivotally mounted between said side members to collapse between the same, an actuating screw support journaled between the side members for rocking movement, an actuating screw disposed horizontally through said support and engaging the said lifting lever below its pivot, a driving ratchet having threaded engagement with said screw, a thrust bearing between said driving lever and said screw support, a forked actuating lever pivotally mounted on the under side of said support, a pair of pawls mounted on the arms of said actuating lever to coact with said ratchet on opposite sides of its axis, a pawl control member pivotally mounted on said actuating lever, the arms of said lever having slots therein to receive said control member, said pawls having arms projecting rearwardly to be engaged by said control member whereby the control member may be adjusted to disengage either pawl, and a rod for adjusting said pawl control member disposed longitudinally through said actuating lever.

9. In a lifting jack, the combination of a frame comprising horizontally disposed spaced side members, a lifting lever pivotally mounted between said side members to collapse between the same, an actuating screw support journaled between the side members for rocking movement, an actuating screw disposed horizontally through said support and engaging the said lifting lever below its pivot, a driving ratchet having threaded engagement with said screw, a thrust bearing between said driving lever and said screw support, an actuating lever pivotally mounted on the underside of said support, a pair of pawls mounted on said actuating lever to coact with said ratchet on opposite sides of its axis, and means for supporting either of said pawls in inoperative position.

10. In a lifting jack, the combination of a frame comprising horizontally disposed spaced side members, a lifting lever pivotally mounted between said side members to collapse between the same, a head member pivotally mounted on said lifting lever, a head supporting link pivotally mounted between said side members and pivotally connected to said head member in parallel relation to said lifting lever whereby the head is maintained in upright position throughout the stroke of the lifting lever, an actuating screw support journaled between the side members for rocking movement, an actuating screw disposed horizontally through said support and engaging the said lifting lever below its pivot, a driving ratchet having threaded engagement with said screw, a thrust bearing between said driving lever and said screw support, an actuating lever pivotally mounted on the under side of said support, a pair of pawls mounted on said actuating lever to coact with said ratchet on opposite sides of its axis, and means for supporting either of said pawls in inoperative position.

11. In a lifting jack, the combination of a frame comprising horizontally disposed spaced side members, a lifting lever pivot-

ally mounted between said side members to collapse between the same, an actuating screw support journaled between the side members for rocking movement, and an actuating screw disposed horizontally through said support and engaging the said lifting lever below its pivot.

12. In a lifting jack, the combination of a frame, a lifting lever pivotally mounted on said frame, a head member pivotally mounted on said lifting lever, a head supporting link pivotally mounted between said side members and pivotally connected to said head member in parallel relation to said lifting lever whereby the head is maintained in upright position throughout the stroke of the lifting lever, an actuating screw mounted on said frame to coact with said lifting lever, a driving ratchet having threaded engagement with said screw, an actuating lever pivotally mounted on said frame, a pair of pawls mounted on said actuating lever to coact with said ratchet on opposite sides of its axis, and a pawl control member adapted to disengage either of said pawls.

13. In a lifting jack, the combination of a frame, a lifting lever pivotally mounted on said frame, an actuating screw mounted on said frame to coact with said lifting lever, a driving ratchet having threaded engagement with said screw, an actuating lever pivotally mounted on said frame, a pair of pawls mounted on said actuating lever to coact with said ratchet on opposite sides of its axis, and a pawl control member adapted to disengage either of said pawls.

14. In a lifting jack, the combination of a frame, a lifting lever pivotally mounted on said frame, a head member pivotally mounted on said lifting lever, a head supporting link pivotally mounted on said frame and pivotally connected to said head member in parallel relation to said lifting lever whereby the head is maintained in upright position throughout the stroke of the lifting lever, and an actuating screw mounted on said frame to coact with said lifting lever.

In witness whereof I have hereunto set my hand.

ARTHUR C. HOPKINS.