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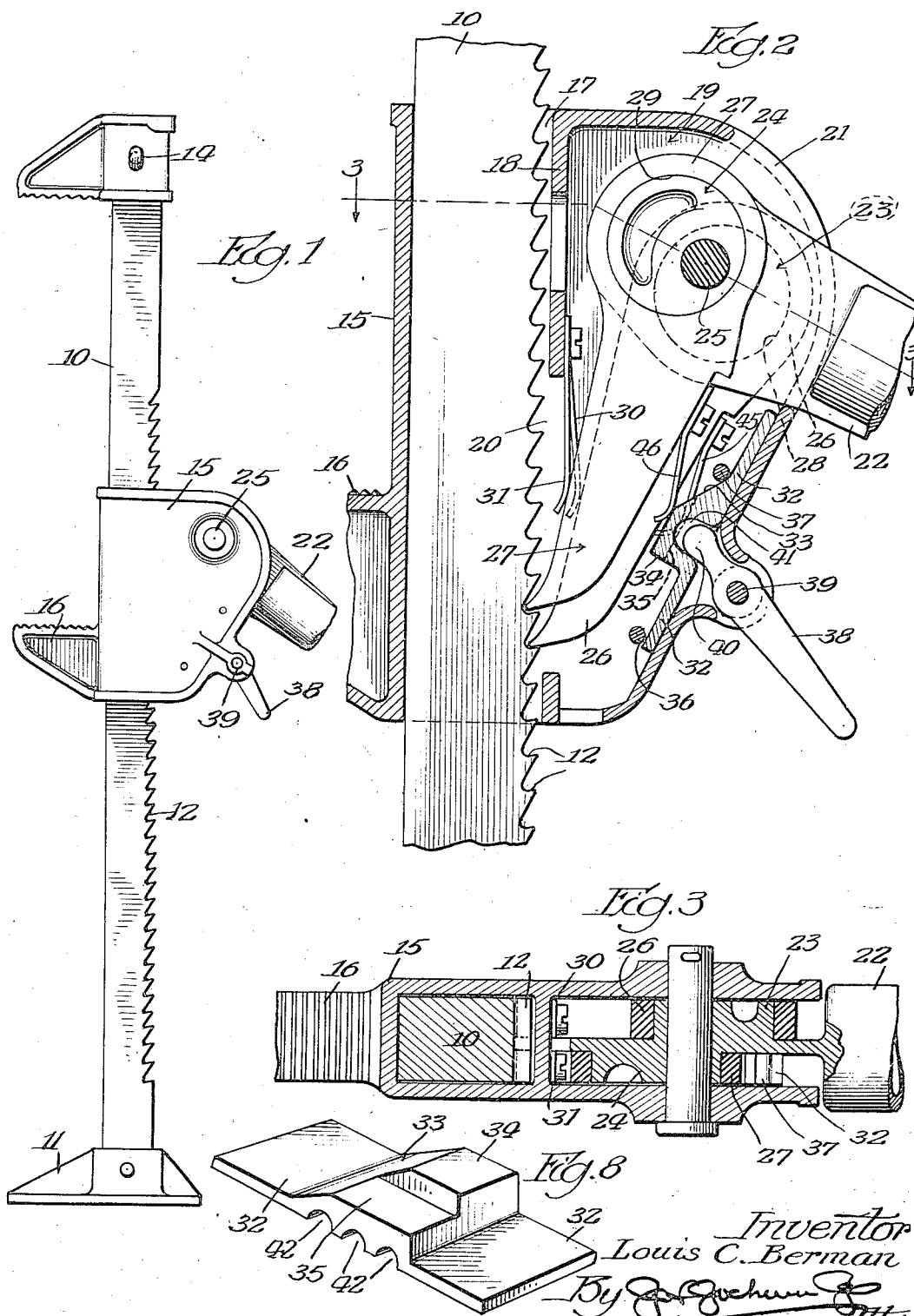
L. C. BERMAN

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LIFTING JACK

Filed Sept. 5, 1935

2 Sheets-Sheet 1



Inventor
Louis C. Berman
By *[Signature]*
Attorney

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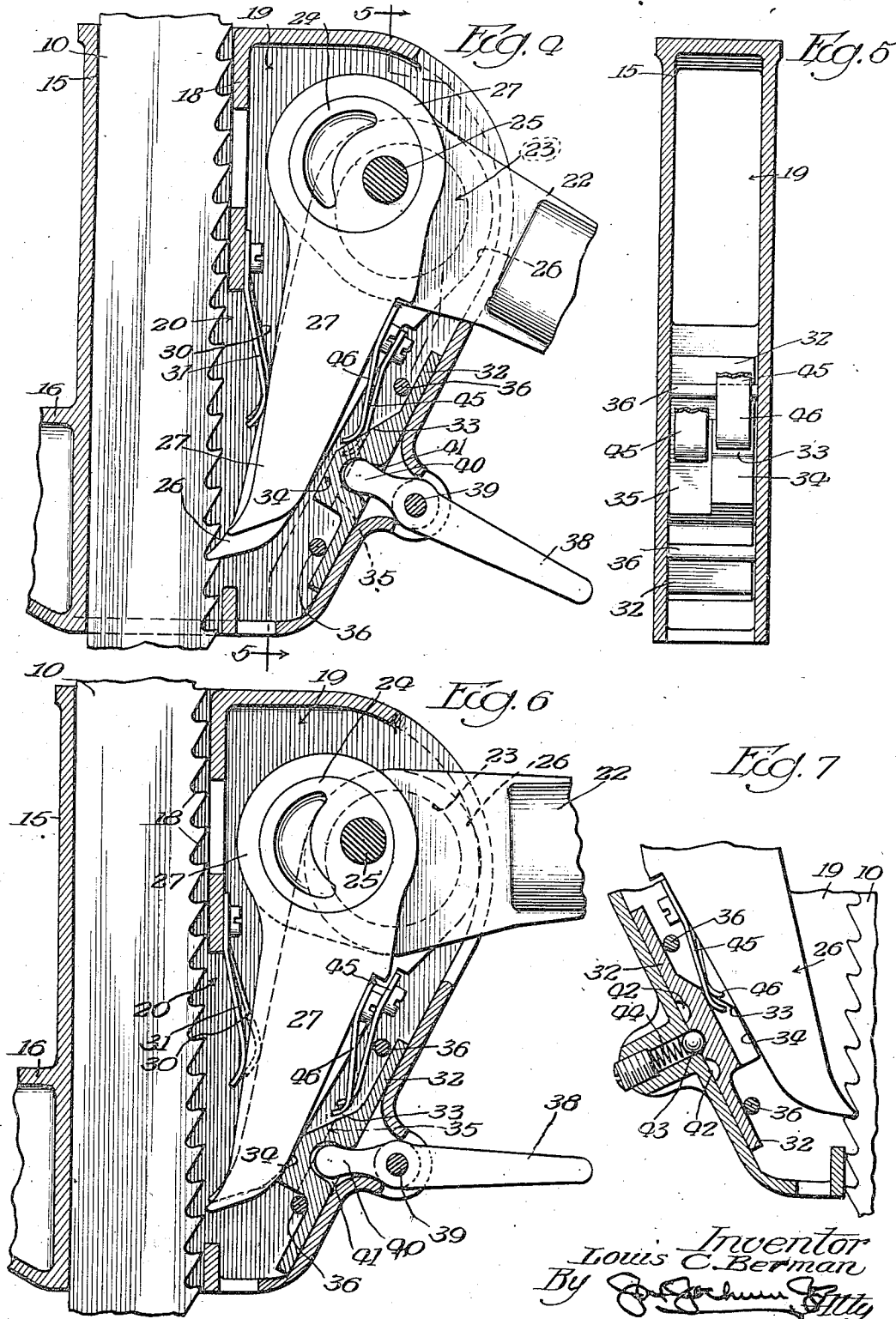
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UNITED STATES PATENT OFFICE

2,031,815

LIFTING JACK

Louis C. Berman, Chicago, Ill., assignor to Duplex Tool Co., Chicago, Ill., a corporation of Illinois

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16 Claims. (Cl. 254—110)

This invention relates to improvements in lifting jacks of the type employing a plurality of pawls or dogs, which by their operation lifts the load step by step, or lowers it in a like manner, according to the positioning of the actuating mechanism, and one of the objects of the invention is to provide improved means adapted to be set to control the actuation of the pawls or dogs. The said means is also operable to render both the pawls or dogs inoperative, so as to entirely release the load lifting member, so that the latter may be freely dropped or moved to the desired position.

A further object is to provide in a jack of this character improved means whereby the jack may be readily operated in any position thereof.

A further object is to provide an improved construction in which the pawls or dogs operate between opposed springs, and which springs serve to cause the pawls or dogs to be projected into and out of the teeth of the rack with which they co-operate.

A further object is to provide a lifting jack of this character which will be simple, durable, strong, compact and comparatively light in construction, effective and efficient in operation, and which may be manufactured at a comparatively low cost.

To the attainment of these ends and the accomplishment of other new and useful objects as will appear, the invention consists in the features of novelty in substantially the construction, combination and arrangement of the several parts hereinafter more fully described and claimed and shown in the accompanying drawings illustrating this invention and in which

Figure 1 is a side elevation of a lifting jack of this character constructed in accordance with the principles of this invention.

Figure 2 is a view partly in elevation and partly in vertical section and on an enlarged scale, showing the operating pawls and the load lifting member in the position which the parts will assume to cause the load lifting member to be raised step by step.

Figure 3 is a detail sectional view, with parts omitted, as taken on line 3—3, Figure 2.

Figure 4 is a view similar to Figure 2, showing the position the parts will assume so that the load lifting member may be lowered step by step.

Figure 5 is a detail sectional view taken on line 5—5, Figure 4, with parts omitted.

Figure 6 is a view similar to Figures 1 and 4, showing the position the parts will assume so as

to permit the load lifting member to be freely moved lengthwise of the standard.

Figure 7 is a detail sectional view of the controlling slide for controlling the operation of the pawls.

Figure 8 is a detail perspective view of the slide or controlling member for the pawls.

Referring more particularly to the drawings, the numeral 10 designates generally an upright or standard provided with a foot or base 11 and having teeth 12 arranged along one edge thereof.

Removably and reversibly secured to the upper end of the standard 10 is a head 13 which may be secured in position in any suitable manner, such as by means of a cotter pin 14.

The numeral 15 designates generally a load lifting member which is provided with a load engaging arm or bracket 16 formed integrally therewith. The member 15 may be constructed in any suitable manner and is shaped to provide a guideway 17 through which the upright or standard 10 moves. The guideway is preferably formed by one of the walls of the member 15 and a wall 18, which latter forms a part of a housing 19. The wall 18 is provided with an opening 20 of any suitable size to form communication between the guideway 17 and the interior of the housing 19, for a purpose to be set forth.

The housing 19 may be of any desired size and configuration and is provided with an opening 21 therethrough, through which an operating lever 22 operates.

Secured to the lever 22 are reversely arranged eccentrics 23—24 and the lever 22 is held in position for a rocking movement, by means of a shaft 25 which passes through the lever and the eccentrics and is journaled in the side walls of the housing 19.

The numerals 26 and 27 designate pawls which are provided respectively with openings 28—29 for the reception of the eccentrics 23—24, and the pawls are of such a length that they will be projected through the opening 20 in the wall 18 of the housing 19 to contact and cooperate with the teeth 12 on the upright or standard 10.

Secured to the wall 18 are springs 30—31 which engage and exert their stress against one of the edges of the respective pawls 26—27 and tend normally to move or eject the ends of the respective pawls out of engagement with the teeth 12 of the standard 10.

The numeral 32 designates generally a slide which is provided with an inclined surface 33 and surfaces 34—35, which latter are disposed at an angle to the inclined surface 33, and the

surfaces 34—35 are arranged in different horizontal planes with respect to the base of the slide 32.

The slide is mounted to move in the housing 19 and preferably rests against one wall of the housing, being held in position by means of pins or bars 36—37.

An operating lever 38 is pivotally mounted intermediate its ends as at 39 and is adapted to move the slide 32. To accomplish this, one end 40 of the lever operates in a recess 41 in the slide and the other end of the lever is positioned to be engaged by the operator, so that the slide may be moved to control the operation of the pawls 26 and 27. Notches 42 are provided in one face 15 of the slide and a spring pressed ball 43 encased within a housing 44 co-operates with the notches 42 for holding the slide 32 in its adjusted position.

Carried respectively by the pawls 26—27 are springs 45—46, preferably flat springs, and one end of each of the springs is separate from the respective pawls, the end of the spring 45 being disposed in the path of movement of the surfaces 33 and 35 of the slide 32, while the free end of the spring 46 is disposed in the path of movement 25 of the surfaces 33 and 34 to be contacted by such surfaces according to the position of the slide.

With the parts in the position shown in Figure 2, the surface 34 of the slide 32 will be disposed adjacent the free end of the spring 46, and the surface 35 of the slide 32 will be disposed adjacent the free end of the spring 45, and at the same time the pawls 26 and 27 will respectively be in contact with the free ends of the springs 30 and 31, with the result that when the operating lever 22 is oscillated about the pivot formed by the shaft 25, the eccentrics 23 and 24 will be oscillated and this will cause the pawls 26 and 27 to be moved upwardly and downwardly with respect 40 to the teeth of the standard 10, and the load lifting member 15 will be moved upwardly with respect to the standard 10 by a step by step movement, by reason of the fact that the free ends of the springs 45—46 will respectively move over and in contact with the surfaces 34 and 35 of the slide 32.

When it is desired to lower the load lifting member 15, the lever 38 is moved from the position shown in Figure 2 to the position shown in Figure 4, that is so that the free ends of the springs 45 and 46 will both move over the inclined surface 33 of the slide 32 when the operating lever is oscillated. This will cause an intermittent step of movement of the load supporting member 16 downwardly. By reason of the surface 35 of the slide 32 being in a lower plane than the surface 34 of the slide, space will be provided to permit the pawl 26 to move backwardly a sufficient distance to effect such movements. 60

In order to allow the load lifting member 15 to be moved freely lengthwise of the standard 10 and to render the pawls 26—27 inoperative with respect to the teeth 12 of the standard, the lever 38 is moved to the position shown in Figure 6 and the springs 30 and 31 will respectively move the pawls 26—27 backwardly so that the rear edges thereof will move respectively against the surfaces 35 and 34 of the slide 32.

The slide 32 is held in its adjusted position by the spring controlled ball 43.

With this construction each of the pawls operate between opposed springs that are disposed on opposite sides of the pawls and the springs serve as a means for projecting the ends 75

of the pawls into and out of contact or operative position with respect to the teeth 12 on the upright or standard.

With this improved construction it will be manifest that there will be provided a simple, comparatively light and compact structure, which may be turned into any position, that is, the jack may be operated with the standard 10 upright or in an inclined or horizontal position.

All of the operating mechanism is encased within the housing 19 and a minimum number of parts are employed, thereby simplifying the construction and materially reducing the cost of manufacture.

The direction of movement of the load lifting member 15 may be readily reversed at any time by simply shifting the lever 38 and the up and down movement of the load lifting member will be effected by the oscillation of the operating member 22.

While the preferred form of the invention has been herein shown and described, it is to be understood that various changes may be made in the details of construction and in the combination and arrangement of the several parts, within the scope of the claims, without departing from the spirit of this invention.

What is claimed as new is:—

1. A lifting jack embodying a standard provided with teeth, a load engaging member movable along the standard, a pair of alternately acting pawls carried by said load engaging member and co-operating with said teeth, opposed springs between which each of said pawls operate, a controlling and reversing slide adapted to act on said springs, means for actuating said slide, and means for yieldingly locking said slide in its adjusted position.

2. A lifting jack embodying a standard provided with teeth, a load engaging member movable along the standard, a pair of alternately acting pawls carried by said load engaging member and co-operating with said teeth, opposed springs between which each of said pawls operate, a controlling and reversing slide adapted to act on the springs on one side of the pawls for controlling the movement of the pawls in one direction, and means for actuating the slide.

3. A lifting jack embodying a standard provided with teeth, a load engaging member movable upon the standard, a plurality of pawls carried with said member, means for alternately reciprocating the pawls, means individual to the pawls for moving them into active position with respect to said teeth, means individual to the last said means for controlling their operation, and means also individual to the pawls for moving them into inactive position with respect to said teeth.

4. A lifting jack embodying a standard provided with teeth, a load engaging member movable upon the standard, a plurality of pawls carried with said member, means for alternately reciprocating the pawls, means individual to the pawls for moving them into active position with respect to said teeth, means individual to the last said means for controlling their operation to selectively reverse the action of the pawls or render the second recited means inactive, and means also individual to the pawls for moving them into inactive position with respect to said teeth.

5. A lifting jack embodying a standard provided with teeth, a load engaging member mov-

able upon the standard, a plurality of pawls carried with said member, means for alternately reciprocating the pawls, means individual to the pawls for moving them into active position with respect to said teeth, means individual to the last said means for controlling their operation, and means also individual to the pawls for moving them into inactive position with respect to said teeth, the second and fourth recited means embodying opposed resilient elements individual to the pawls and between which elements the respective pawls operate.

6. A lifting jack embodying a standard having teeth along one face, a load engaging member movable upon the standard, a shaft carried by said load engaging member, pawls carried by the shaft to engage the said teeth, means for causing the pawls to move in reverse directions when the shaft is oscillated, whereby the said member is moved upon the standard, a slide, springs connected with the pawls, means for moving the slide into the path of the springs, operating to force the pawls into the teeth of the work engaging member, and means for positioning said slide to render said pawls active to cause them upon the actuation of said shaft to selectively move said work engaging member by a step by step movement in either direction upon the standard.

7. A lifting jack embodying a standard having teeth along one face, a load engaging member movable upon the standard, a shaft carried by said load engaging member, pawls carried by the shaft to engage the said teeth, means for causing the pawls to move in reverse directions when the shaft is oscillated, whereby the said member is moved upon the standard, a slide, springs connected with the pawls, means for moving the slide into the path of the springs, operating to force the pawls into the teeth of the work engaging member, and means for positioning said slide to render said pawls active to cause them upon the actuation of said shaft to selectively move said work engaging member by a step by step movement in either direction upon the standard, said pawls being housed within the said load engaging member and disposed on the same side of said standard.

8. A lifting jack embodying a standard having teeth along one face, a load engaging member movable upon the standard, a shaft carried by said load engaging member, pawls carried by the shaft to engage the said teeth, means for causing the pawls to move in reverse directions when the shaft is oscillated, whereby the said member is moved upon the standard, a slide, springs connected with the pawls, means for moving the slide into the path of the springs, operating to force the pawls into the teeth of the work engaging member, and means for positioning said slide to render said pawls active to cause them upon the actuation of said shaft to selectively move said work engaging member by a step by step movement in either direction upon the standard, said shaft, pawls and slide being housed within and movable with said load engaging member.

9. A lifting jack embodying a standard provided with teeth, a load engaging member movable upon the standard, a shaft carried by said member, pawls carried by the shaft, means for causing the pawls to move in reverse direction when the shaft is oscillated, whereby said load engaging member will be moved by a step by step movement upon the standard, a slide carried by the said member, and means for positioning the slide to selectively render the pawls active to move

the said member in one direction or the other upon the standard, or to render the pawls inactive to permit the said member to slide freely upon the standard.

10. A lifting jack embodying a standard provided with teeth, a load engaging member movable upon the standard, a shaft carried by said member, pawls carried by the shaft, means for causing the pawls to move in reverse direction when the shaft is oscillated, whereby said load engaging member will be moved by a step by step movement upon the standard, a slide carried by the said member, and means for positioning the slide to selectively render the pawls active to move the said member in one direction or the other upon the standard, or to render the pawls inactive to permit the said member to slide freely upon the standard, the last recited means embodying a spring connected with each of the pawls and which springs contact and move over portions of said slide as the said shaft is oscillated.

11. A lifting jack embodying a standard provided with teeth, a load engaging member movable upon the standard, a shaft carried by said member, pawls carried by the shaft, means for causing the pawls to move in reverse direction when the shaft is oscillated, whereby said load engaging member will be moved by a step by step movement upon the standard, a slide carried by the said member, means for positioning the slide to selectively render the pawls active to move the said member in one direction or the other upon the standard, or to render the pawls inactive to permit the said member to slide freely upon the standard, and means releasably locking said slide in its adjusted position.

12. A lifting jack embodying a standard having rack teeth, a load engaging member movable upon the standard, a pair of alternately acting pawls carried by said member, a spring connected with each pawl for moving the pawls in engagement with the rack, a spring for each pawl for moving the pawl out of engagement with the rack, a member movably mounted upon the load engaging member with which the first said springs engage, and means for selectively positioning the last said member with respect to the first said springs, whereby upon actuation of the pawls the load engaging member will be moved by a step by step movement in a predetermined one of two directions upon the standard.

13. A lifting jack embodying a standard having rack teeth, a load engaging member movable upon the standard, a pair of alternately acting pawls carried by said member, a spring connected with each pawl for moving the pawls in engagement with the rack, a spring for each pawl for moving the pawl out of engagement with the rack, a member movably mounted upon the load engaging member with which the first said springs engage, and means for selectively positioning the last said member with respect to the first said springs, whereby upon actuation of the pawls the load engaging member will be moved by a step by step movement in a predetermined one of two directions upon the standard, the second recited member being also operable to render both of said pawls inactive to permit the load engaging member to slide freely upon the standard.

14. A lifting jack embodying a standard having rack teeth, a load engaging member movable upon the standard, a pair of alternately acting pawls carried by said member, a pair of oppositely acting springs between which each pawl operates, a

- member movably mounted upon said load engaging member to be contacted by one of the springs of each pawl, and means for moving the last said member to selectively cause the same to render the pawls active to move the load engaging member in one of two directions upon the standard, or to render the pawls inactive to permit the work engaging member to slide freely upon the standard.
15. A lifting jack embodying a standard having rack teeth, a load engaging member movable upon the standard, a pair of alternately acting pawls connected to an oscillatable shaft, a pair of springs for each of the pawls and between which the respective pawls operate, a reversing member movably mounted upon the work engaging member, means for positioning the reversing member with respect to one of the springs of each pawl to render the pawls active to move the work engaging member in a selected direction upon the standard, said reversing member embodying a base and being provided with an inclined surface and a plurality of surfaces arranged at an angle to the inclined surface and disposed in different horizontal planes with respect to the base of the reversing member, and means for releasably locking said reversing member in its adjusted position.

LOUIS C. BERMAN.