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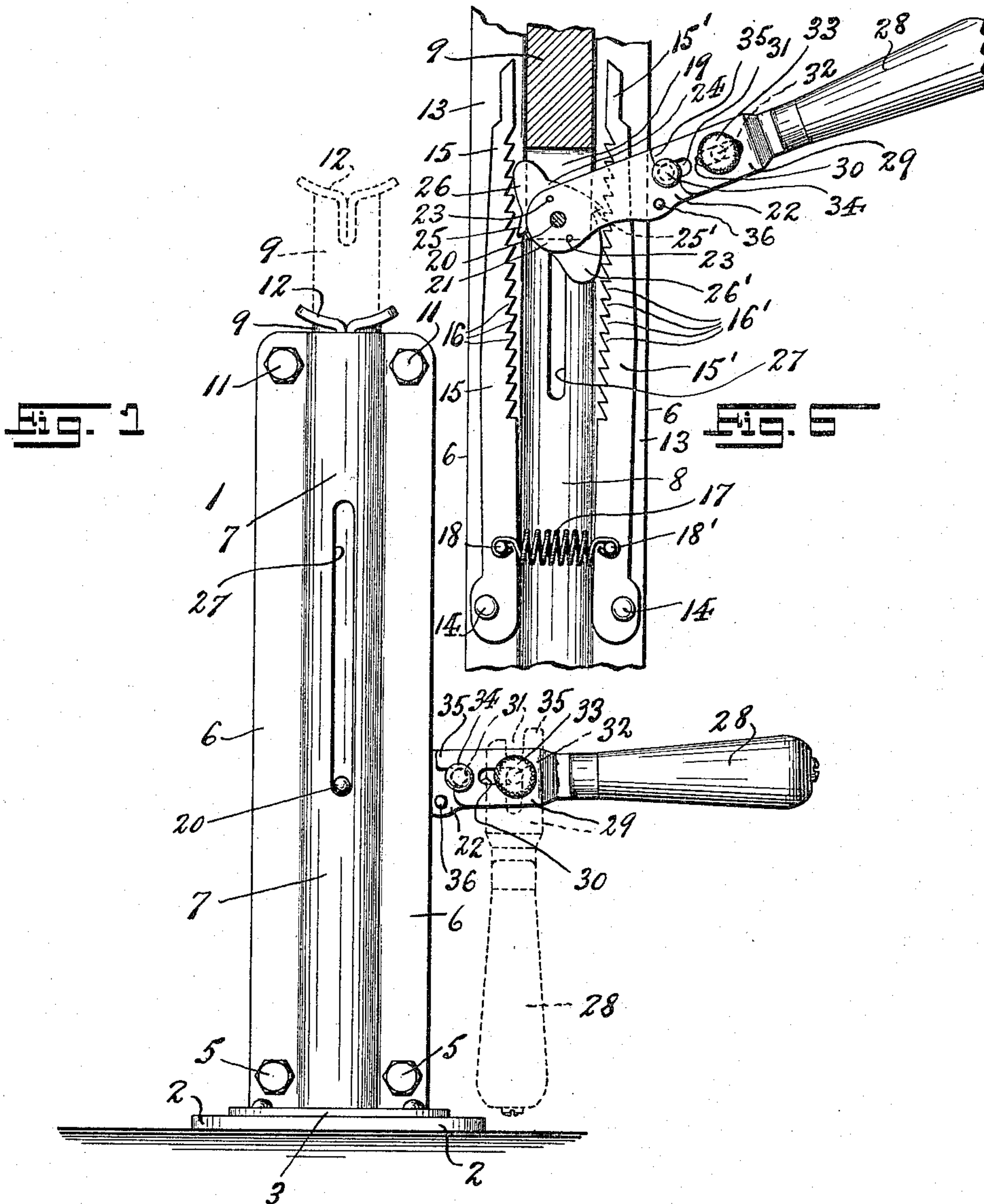
L. I. DARBY,  
LIFTING JACK.

APPLICATION FILED APR. 1, 1915.

1,155,049.

Patented Sept. 28, 1915.

2 SHEETS—SHEET 1.



WITNESSES:

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INVENTOR

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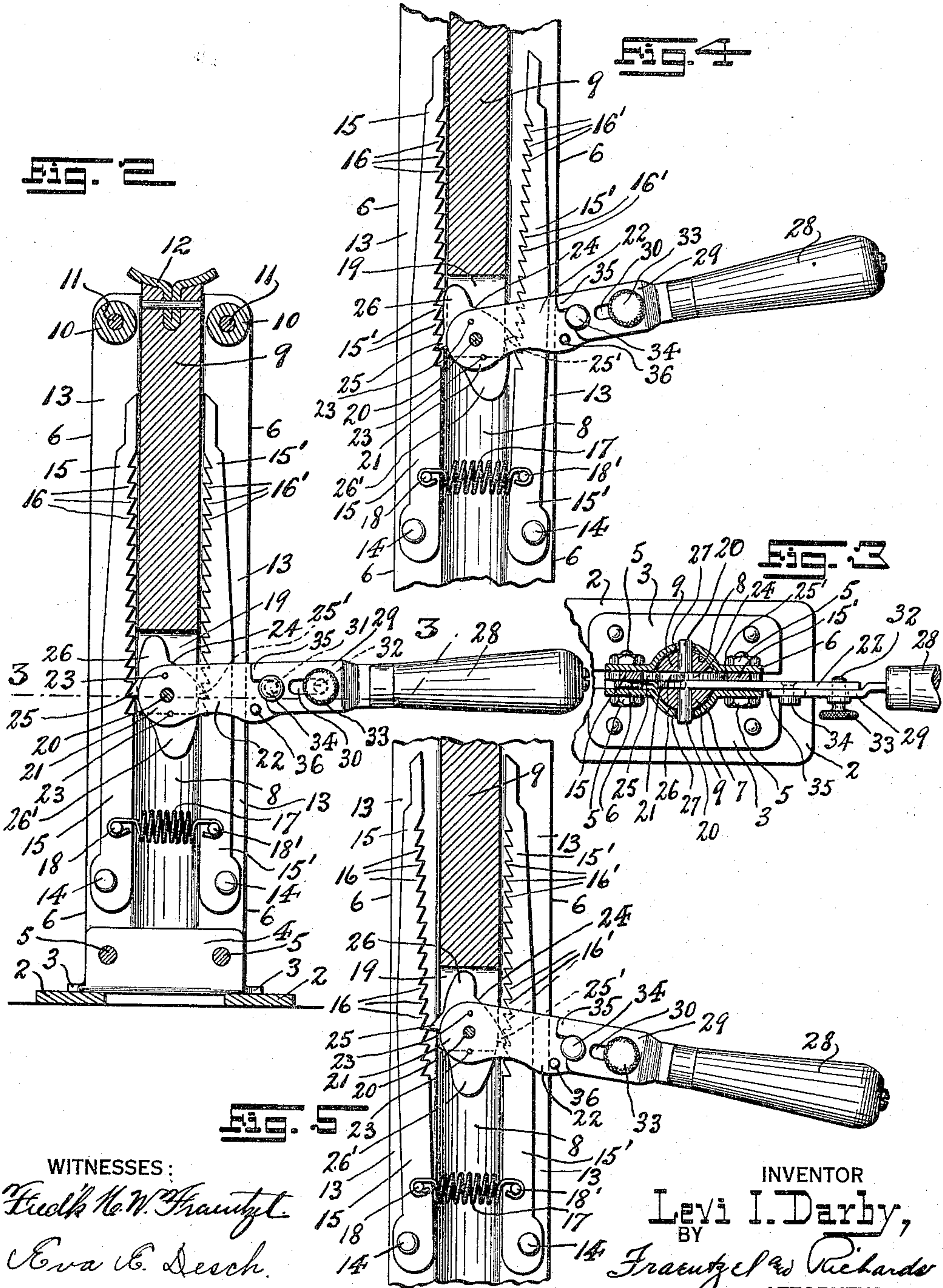
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WITNESSES:  
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## UNITED STATES PATENT OFFICE.

LEVI I. DARBY, OF NEWARK, NEW JERSEY.

## LIFTING-JACK.

1,155,049.

Specification of Letters Patent.

Patented Sept. 28, 1915.

Application filed April 1, 1915. Serial No. 18,440.

*To all whom it may concern:*

Be it known that I, LEVI I. DARBY, a citizen of the United States, residing at Newark, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Lifting-Jacks; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to characters of reference marked thereon, which form a part of this specification.

The present invention relates, generally, to improvements in lifting-jacks; and the invention refers, more particularly, to an improved construction of lifting-jack of the lever type adapted for general service, and particularly adapted for use as an automobile jack.

The invention has for its principal object to provide a very simple, cheap and efficient construction of jack adapted to operate easily and quickly in lifting heavy weights and to securely support the weight lifted thereby; and a further object of the invention is to provide in connection with the lifting mechanism a quick acting easily operated means whereby the said lifting mechanism may be released from operative relation to the elevator-member or lift-stem so that the latter may be quickly lowered or returned from its lifting or supporting position to its normally lowered position.

The invention has for a further object to provide in connection with the novel lifting jack mechanism a permanently secured or attached operating lever, which may be folded out of the way when not in use so as to economize storage room required by the jack, but at the same time avoiding the inconvenience and risk of loss entailed in the use of separable or detachable operating levers generally used in connection with the lever type of lifting jack.

Other objects of the present invention, not at this time more particularly enumerated, will be clearly understood from the following detailed description of the said invention.

With the various objects of the present invention in view, the said invention consists, primarily, in the novel construction of lifting-jack hereinafter set forth; and, furthermore, this invention consists in the novel

arrangements and combinations of the various devices and parts, as well as in the details of the construction of the same all of which will be presently more fully described, and then finally embodied in the claims which are appended to and which form an essential part of this specification.

The invention is clearly illustrated in the accompanying drawings, in which:—

Figure 1 is a side elevation of the novel construction of lifting jack made according to and embodying the principles of the present invention. Fig. 2 is a vertical longitudinal section of the same. Fig. 3 is a horizontal cross section of the same taken on line 3—3 in said Fig. 2 looking downward, the lever-member and parts connected therewith being shown in elevation. Fig. 4 is a detail vertical longitudinal section, similar to that shown in said Fig. 2, but illustrating the operation of the lifting mechanism under an upward oscillation of the lever-member; Fig. 5 is a similar view illustrating the operation of the lifting mechanism under a downward oscillation of the lever-member; and Fig. 6 is a similar view illustrating the operation of the releasing means whereby the lifting mechanism is released or disengaged from lifting or supporting relation to the elevator-member or lift-stem so that the latter may be lowered and thus returned to normal initial position.

Similar characters of reference are employed in all of the hereinabove described views to illustrate corresponding parts.

Referring now to the said drawings the reference character 1 indicates a complete lifting jack, made according to and embodying the principles of the present invention, the same comprising a base-member 2 to which is riveted, or otherwise secured, the flanges 3 of a pair of uprights 4, the latter being registered together face to face. Connected to the outer faces of said uprights 4, by means of bolts 5, or any other suitable fastening means, are a pair of casing-plates 6 formed in their central longitudinal portions with outwardly bowed or channeled portions 7 which, when registered together provide an interior centrally disposed and longitudinally extending slideway 8, in which is slidably disposed the longitudinally movable elevator-member or lift-stem 9. Located between said casing-plates 6, adjacent to their upper ends, are a pair of spacing collars or blocks 10, through which



pass the bolts 11, or other suitable fastening means, by means of which the upper ends of said casing-plates are rigidly secured together and properly spaced apart. The upper end of said elevator-member or lift-stem 9 projects outwardly from the upper end of said slideway 8 formed between the said casing-plates 6, and suitably secured to this exterior end of said elevator-member or lift-stem 9 is a suitably formed seat-portion 12. The said casing-plates 6, when secured together in the manner above described, are arranged to provide an intervening space 13. Pivoted on the fulcrum pins 14, adjacent to the lower end of one of said casing-plates 6, so as to be located at each side of said slideway 8 and within the space 13, are a pair of upwardly extending check or stop-bars 15 and 15', the same being provided at their inner marginal edges, respectively, with a series of ratchet-teeth or serrations 16 and 16'. The said check or stop-bars 15 and 15' are caused to normally move toward each other, and toward the slideway 8 by means of an interconnecting pull-spring 17, the respective ends of which are connected with the respective anchor-pins 18 and 18' of the respective check or stop-bars 15 and 15'.

The lower or inner end of said elevator-member or lift-stem 9 is bifurcated to provide a transversely extending receiving socket or slot 19. Extending through said lower or inner end of said elevator-member or lift-stem 9, at right angles to said receiving socket or slot 19 so as to extend transversely therethrough, is a cross-pin 20. Journaled upon said cross-pin 20 within said receiving socket or slot 19 is the pivot-end 21 of an outwardly extending lever-member 22, which passes over the check or stop-bar 15' and through said space 13, so that the same issues exteriorly from between the casing-plates 6. Secured to said pivot-end 21 of said lever-member 22, by means of rivets 23, or so as to form an integral part thereof if desired, is an oscillatable lift-dog 24, provided at one side with an outwardly projecting tooth 25 adapted to cooperate with the ratchet-teeth or serrations 16 of said check or stop-bar 15, and provided at the opposite side with an outwardly projecting tooth 25' adapted to cooperate with the ratchet-teeth or serrations 16' of said check or stop-bar 15'. Said lift-dog 24 is further provided at its upper end with an upwardly extending releasing cam 26 adapted to engage and operate said check or stop-bar 15, and at its lower end with a downwardly extending releasing-cam 26' adapted to engage and operate said check or stop-bar 15'.

Each casing-plate 6 is provided with a suitably disposed longitudinally extending slot 27. The outer and opposite ends of said cross-pin 20 project into and ride in

the respective slots 27 of the respective casing-plates 6, and by their engagement therein not only serving as stops limiting the upward and downward movement of said elevator-member or lift-stem 9, but also serving to prevent any turning of the latter on its longitudinal axis which might result in disarranging the proper relation of the lift-dog 24 with the respective check or stop-bars 15 and 15'.

Connected with the exterior end of said lever-member 22 is a handle-member 28, the same being coupled thereto by means of a coupling-plate 29 to which said handle-member 28 is rigidly secured. Said coupling-plate 29 is provided with a slot 30, and at its end is further provided with a notch 31. Passing through said slot 30 and screwing into said lever-member 22 is the shank of a lock-screw 32 provided with a knurled head or finger-piece 33. Connected rigidly with said lever-member 22 is an outwardly extending lug 34. When the handle-member 28 is desired to be operatively related to the lever-member 22, the same is aligned therewith and pushed forward until the notch 31 of said coupling-plate is brought into straddling engagement with said lug 34, whereupon the lock-screw 32 is tightened up, thus binding said coupling-plate 29 against withdrawal from engagement with said lug 34. As thus arranged any oscillation of the handle-member 28 up and down is readily transmitted to the lever-member 22. After the handle-member 28 is thus related to the lever-member 22, the latter may be oscillated to operate the jack. An upward oscillation or swing of the lever-member 22 rocks the lift-dog 24 in one direction so that its tooth 25 in engagement with one of the ratchet-teeth or serrations 16 of the check or stop-bar 15 operates as a fulcrum point for the lever-member, thus causing the opposite tooth 25' to be swung upwardly. In thus moving upward the tooth 25' is forced into engagement with the inclined surface of the ratchet-tooth or serration 16' of the check or stop-bar 15' immediately above it, forcing the latter to swing outwardly against the tension of the pull-spring 17, until the said next ratchet-tooth or serration 16' registers with the tooth 25', whereupon the pull-spring 17 pulls the check or stop-bar 15' back to normal position with said next ratchet-tooth or serration 16' registered beneath the tooth 25'. This operation transmits an upward lift to the cross-pin 20 which is imparted also to the elevator-member or lift-stem 9 to which the cross-pin is connected, consequently raising the elevator-member or lift-stem one step. (The above described operations are more particularly illustrated in Fig. 4 of the accompanying drawings.) A downward oscillation or swing of the lever-member 22 rocks



the lift-dog 24 in the opposite direction so that its tooth 25' in engagement with one of the ratchet-teeth or serrations 16' of the check or stop-bar 15' operates as a fulcrum point for the lever-member, thus causing the opposite tooth 25 to be swung upwardly. In thus moving upward the tooth 25 is forced into engagement with the inclined surface of the ratchet-tooth or serration 16 of the check or stop-bar 15 immediately above it, forcing the latter to swing outwardly against the tension of the pull-spring 17, until the said next above ratchet-tooth or serration 16, or the second above, registers with the tooth 25, whereupon the pull-spring 17 pulls the check or stop-bar 15 back to normal position with said next or second above ratchet-tooth or serration 16 registered beneath the tooth 25. This operation transmits another upward lift to the cross-pin 20 which is also imparted to the elevator-member or lift-stem 9 to which the cross-pin is connected, consequently producing another step in the upward lifting movement of said elevator-member or lift-stem 9. (The above described operations are more particularly illustrated in Fig. 5 of the accompanying drawings.)

In the above described manner the up and down oscillation of the lever-member produces a progressive step by step upward lifting movement of the elevator-member or lift-stem 9 to any point within the limits of its maximum upward travel. When the coupling-plate 29 is operatively arranged to aline the handle-member 28 with the lever-member 22, the free upper end of its bifurcated portion provides a stop-member 35, which when the lever-member 22 is swung upward limits its upward movement by engaging the edge of one of the casing-plates 6, so that the lever-member cannot be swung so far as to disengage the pivoting tooth 25 from proper engagement with the ratchet-teeth or serrations 16 of the check or stop-bar 15, and said lever-member 22 is further provided with a rigid or fixed stop-member 36, projecting outwardly therefrom, which when the lever-member 22 is swung downward limits its downward movement by engaging the edge of one of the casing-plates 6, so that the lever-member cannot be swung so far as to disengage the pivoting tooth 25' from proper engagement with the ratchet-teeth or serrations 16' of the check or stop-bar 15'.

After the lifting jack has been operated to lift the elevator-member or lift-stem 9 to the desired point, and it is desired to release the latter from its lifted or supporting position and lower the same to normal initial position, such result may be accomplished as follows: The lock-screw 32 is loosened and the handle-member 28 and

its coupling-plate 29 are drawn outwardly to remove said stop-member 35 from operative position, but said handle-member 28 and coupling-plate 29 are not drawn out so far as to disengage the handle-member from operative connection with said lever-member 22. After the stop-member 35 is thus removed, the lever-member 22 may be swung upward beyond the limits of its normal swing when operating the lifting mechanism, and such additional upward movement oscillates or turns said lift-dog 24 so as to carry said upwardly extending releasing-cam 26 in outwardly pressing engagement with said check or stop-bar 15, and said downwardly extending releasing-cam 26' in outwardly pressing engagement with said check or stop-bar 15'. This operation moves apart the respective check or stop-bars 15 and 15' against the tension of the pull-spring 17, and removes the respective ratchet-teeth or serrations 16 and 16' of the same from the path of downward movement of said respective teeth 25 and 25' of the lift-dog 24, thus removing all obstruction to the descent of the elevator-member or lift-stem 9 in the slide-way 8, so that the same may readily drop back to normal initial or lowered position. (This above described operation is clearly illustrated more particularly in Fig. 6 of the accompanying drawings.)

When it is desired to pack or store away the lifting-jack, the outwardly extending handle-member 28 may be folded down parallel to the body of the jack by loosening the lock-screw 32, and drawing outward the handle-member to disengage the notch 31 of the coupling-plate 29 from the lug 34, thus permitting the coupling-plate and handle-member to pivot on the lock-screw 32, and thus swing downward against the body of the jack. (All of which is shown by the dotted representation of the handle-member and coupling-plate illustrated in Fig. 1 of the accompanying drawings.) Thus it will be readily understood that the jack may be compacted to store away in a comparatively small space.

One of the advantages of the novel construction of lifting-jack as above described, and not previously mentioned, is that same may be constructed of sheet-metal, when made in the smaller sizes, and thus may be easily and cheaply manufactured by die and stamping operations.

I am aware that some changes may be made in the various arrangements and combinations of the various devices and parts, as well as in the details of the construction thereof, without departing from the scope of my present invention. Hence, I do not limit my invention to the exact arrangements and combinations of the said parts as described in the foregoing specification, nor do



I confine myself to the exact details of the construction of the same as shown in the accompanying drawings.

I claim:—

1. In a lifting-jack a casing, a lift-stem slidably supported in said casing, a lift-dog pivoted to the lower end of said lift-stem having a tooth projecting from each side thereof, a lever-member for oscillating said lift-dog, a pair of pivoted check-bars mounted within said casing so as to permit said lift stem to move between the same and provided at their inner marginal edges with a series of ratchet-teeth between which said lift-dog is arranged so that its oppositely extending teeth cooperate with the ratchet-teeth of said respective check-bars, an inter-connecting pull-spring for moving said check-bars normally toward and in contact with said lift-dog, and said lift-dog being further provided with an upwardly and a downwardly extending releasing-cam adapted respectively to remove said respective teeth of said lift-dog when said releasing-cams are carried into engagement with said check-bars by an additional or abnormal swing or oscillation of said lever-member.

2. In a lifting-jack a casing, a lift-stem slidably supported in said casing, a lift-dog pivoted to the lower end of said lift-stem having a tooth projecting from each side thereof, a lever-member for oscillating said lift-dog, a pair of pivoted check-bars mounted within said casing so as to permit said lift-stems to move between the same and provided at their inner marginal edges with a series of ratchet-teeth between which said lift-dog is arranged so that its oppositely extending teeth cooperate with the ratchet-teeth of said respective check-bars, an inter-connecting pull-spring for moving said check-bars normally toward and in contact with said lift-dog, said lift-dog being further provided with an upwardly and a downwardly extending releasing-cam adapted respectively to remove said respective check-bars from operative relation to the teeth of said lift-dog when said releasing-cams are carried into engagement with said check-bars by an additional or abnormal swing or oscillation of said lever-member, a fixed-member for limiting the normal oscillation of said lever-member in one direction, and a removable stop-member for limiting the normal oscillation of said lever-member in the opposite direction, but permitting when removed an abnormal oscillation of said lever-member for the operation thereby of said releasing-cams.

3. In a lifting-jack a casing, a lift-stem slidably supported in said casing, a lift-dog pivoted to the lower end of said lift-stem having a tooth projecting from each side thereof, a lever-member for oscillating said

lift-dog, a pair of pivoted check-bars mounted within said casing so as to permit said lift-stem to move between the same and provided at their inner marginal edges with a series of ratchet-teeth between which said lift-dog is arranged so that its oppositely extending teeth cooperate with the ratchet-teeth of said respective check-bars, an inter-connecting pull-spring for moving said check-bars normally toward and in contact with said lift-dog, and means for limiting the upward and downward movement of said lift-stem.

4. In a lifting-jack a casing, a lift-stem slidably supported in said casing, a lift-dog pivoted to the lower end of said lift-stem having a tooth projecting from each side thereof, a lever-member for oscillating said lift-dog, a pair of pivoted check-bars mounted within said casing so as to permit said lift-stem to move between the same and provided at their inner marginal edges with a series of ratchet-teeth between which said lift-dog is arranged so that its oppositely extending teeth cooperate with the ratchet-teeth of said respective check-bars, an inter-connecting pull-spring for moving said check-bars normally toward and in contact with said lift-dog, said lift-dog being further provided with an upwardly and downwardly extending releasing-cam adapted respectively to remove said respective check-bars from operative relation to the teeth of said lift-dog when said releasing-cams are carried into engagement with said check-bars by an additional or abnormal swing or oscillation of said lever-member, and means for limiting the upward and downward movement of said lift-stem.

5. In a lifting-jack a casing, a lift-stem slidably supported in said casing, a lift-dog pivoted to the lower end of said lift-stem having a tooth projecting from each side thereof, a lever-member for oscillating said lift-dog, a pair of pivoted check-bars mounted within said casing so as to permit said lift-stem to move between the same and provided at their inner marginal edges with a series of ratchet-teeth between which said lift-dog is arranged so that its oppositely extending teeth cooperate with the ratchet-teeth of said respective check-bars, an inter-connecting pull-spring for moving said check-bars normally toward and in contact with said lift-dog, said lift-dog being further provided with an upwardly and a downwardly extending releasing-cam adapted respectively to remove said respective check-bars from operative relation to the teeth of said lift-dog when said releasing-cams are carried into engagement with said check-bars by an additional or abnormal swing or oscillation of said lever-member, a fixed stop-member for limiting the normal oscillation of said lever-member in one di-



rection, and a removable stop-member for limiting the normal oscillation of said lever-member in the opposite direction, but permitting when removed an abnormal oscillation of said lever-member for the operation thereby of said releasing-cams, and means for limiting the upward and downward movement of said lift-stem.

In testimony, that I claim the invention set forth above I have hereunto set my hand 10 this 30th day of March, 1915.

LEVI I. DARBY.

Witnesses:

FRED'K C. FRAENTZEL,  
FRED'K H. W. FRAENTZEL.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."