W. DONALDSON.

LIFTING JACK.

No. 183,652. Patented Oct. 24, 1876.

Fig. 1

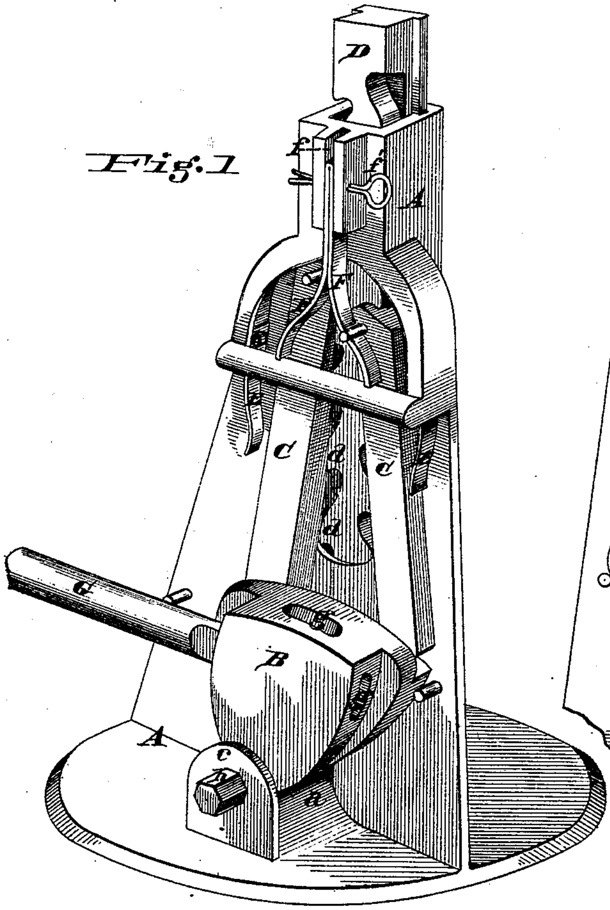


Fig. 2

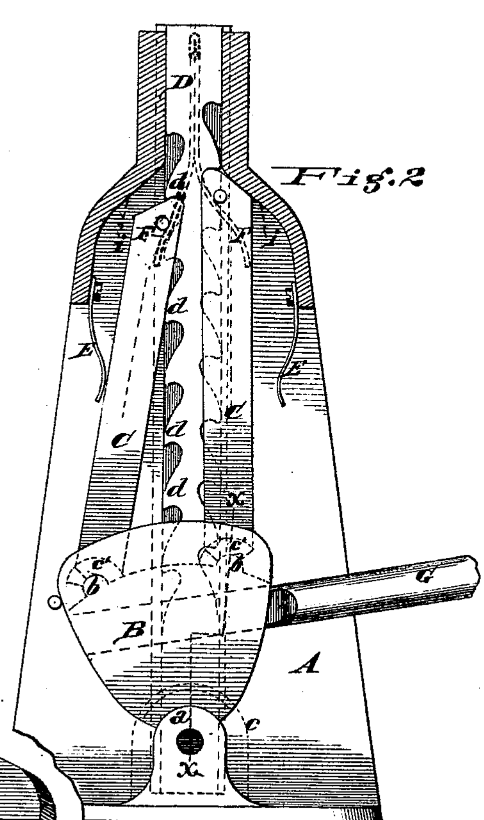
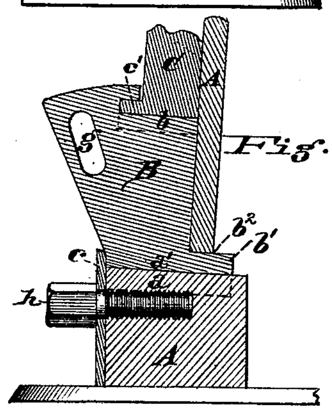


Fig. 3



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WILLIAM DONALDSON, OF CINCINNATI, OHIO.

IMPROVEMENT IN LIFTING-JACKS.

Specification forming part of Letters Patent No. **183,652**, dated October 24, 1876; application filed August 23, 1876.

To all whom it may concern:

Be it known that I, WILLIAM DONALDSON, of Cincinnati, Hamilton county, State of Ohio, have invented an Improvement in Lifting-Jacks, of which the following is a specification:

My invention relates to a class of machines or implements used for lifting weights expeditiously; and has for its objects the construction of such a device that will give to the load a continuous movement upward or downward, as the case may be, when in use; that, by its certain construction, will admit of the use of the least amount of material and "fitting up" and consequent economy in manufacture; and that will secure the best possible application of the power communicated. And my invention consists, in the first part, in a new and novel device for applying the power, which I do through a pair of alternating toggles, and in such a manner as to utilize more fully than heretofore the power applied.

My invention also consists in a device for automatically lowering the load or weight, (which operation is quite as important as raising,) and accomplishes this by means of a pair of springs, so arranged as to alternately throw the pawls out of contact with the rack-bar, and a pair of inclines, so arranged as to positively guide the disengaged pawl into the proper notch or tooth in the rack-bar.

My invention further consists in the manner of connecting the working parts together, and holding them all in place.

A is the base or standard, cast in one piece, the bearing *a*, for the fulcrum B to vibrate on, being, preferably, formed with a chill, which insures accuracy, makes a good surface, and saves labor. B is what I term the "vibrating fulcrum," having a concaved bearing, *a'*, on the bottom to fit the bearing *a* on the standard, and having on its upper face two semicircular raised bearings, *b b*, cast there to receive the lower ends of the pawls C C. C C are the pawls, whose upper convex ends are made to fit the concaved teeth or notches of the rack-bar D, and whose lower ends are made concave to fit the bearings *b b* on the vibrating fulcrum B. D is the rack or lifting bar, provided with teeth or notches *d*, made concave, and placed alternately on opposite sides of the bar. E E are light springs, so placed as to assist the pawls C C into place. F F are two springs fastened together, and made to be moved up and down in the groove or channel *f*, and to be held in place by the split pin *f'*. As situated in Fig. 1 they are inoperative, but when raised, as shown by dotted lines, Fig. 2, they will act on the pawls C C alternately, causing the pawls to fly back out of contact with the rack-bar, so that the load or weight will be lowered. Inclines *i i* are arranged to act in conjunction with the beveled ends of the pawls C C, for the purpose of positively guiding the pawls into the teeth or notches of the rack-bar D. G is the lever for operating, and it may be used on either side or top of the vibrating fulcrum B, as occasion may require, by introducing it into any of the openings *g g*. A cap or washer, *c*, held in place by screw *h*, is for the purpose of holding the fulcrum and pawls together and to the standard A, as will be seen in Fig. 3. The lower bearing of the vibrating fulcrum B has a projecting lip, b^1, concentric with the bearings, which lip enters into a semicircular groove or opening, b^2, in the standard A. The object of this lip is to hold the fulcrum in place. The lower ends of the pawls C C have similar lips fitting into similar grooves around the bearings *b b*, which lips are for the double purpose of keeping the pawls in place and insuring their proper movement.

Operation: The operation is simple and easily understood, being simply (for raising) to insert the lever G in the fulcrum B where most convenient, and work the fulcrum back and forth, which causes the pawls to lower and rise, carrying the rack-bar D continually upward to a certain limit. In order to lower the bar D the springs F F must be moved up in the groove *f* to the position shown in Fig. 2 by dotted lines, when, on proceeding as before, the pins on the pawls will engage the springs alternately, and as one of the pawls is lowered, the spring co-operating with it is straightened out, it being unable while the weight is resting on the pawl to throw it out of contact with the tooth of the rack-bar; but when the pawl upon the opposite side engages the rack-bar and sustains the weight, the first pawl, being released from the pressure of the rack-bar, is thrown out by the reaction of the

spring, and, ascending, is again forced, by the spring E and the inclined surface *i*, into contact with the rack-bar, and, sustaining the weight, allows the other pawl to be thrown out in the same manner.

I am aware that lifting-jacks have been made operating with double pawls alternately on either side of a double rack-bar, and I do not wish to be understood as claiming either the double rack-bar or double pawls as part of my invention; but, believing myself to be the first to invent and operate a lifting-jack by means of a vibrating fulcrum operating in such a manner as to form a toggle system of the pawls and fulcrum, which toggle system can, in operation, approach a dead-center or neutralized position, and support the load directly from the ground,

I therefore claim—

1. The standard A, having the bearing *a*, with semicircular groove b^2 connected therewith, for the purpose described and set forth.

2. The vibrating fulcrum B, having bearing *a'*, provided with lip b^1, semicircular bearings *b b* and openings *g g*, all arranged substantially in the manner described, and for the purpose specified.

3. The pawls C C, having concaved ends, provided with lip *c'*, for the purpose specified and set forth.

4. The combination, substantially as specified, of the vibrating fulcrum, the rack-bar, the pawls, and the adjustable springs F F, adapted to be brought into action in lowering the weight.

5. The combination of the standard A, vibrating fulcrum B, pawls C C, rack-bar D, cap *c*, and springs E E, operating substantially as described, and for the purpose set forth.

In testimony of which invention I hereunto set my hand.

WILLIAM DONALDSON.

Witnesses:

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