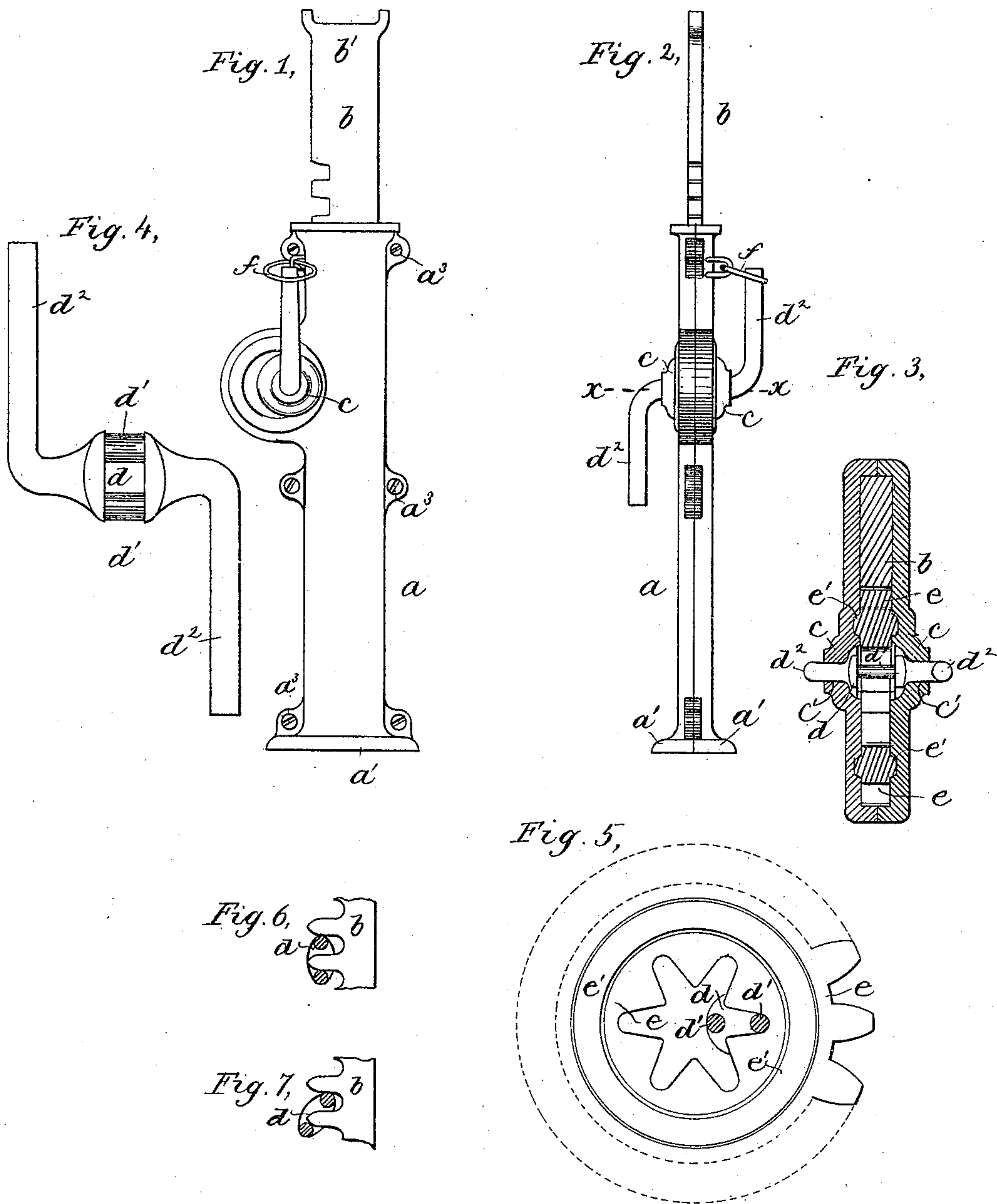


(No Model.)

M. G. CRANE.  
LIFTING JACK.

No. 355,866.

Patented Jan. 11, 1887.



Witnesses.  
J. J. Maloney  
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Att'y.



# UNITED STATES PATENT OFFICE.

MOSES G. CRANE, OF NEWTON, MASSACHUSETTS.

## LIFTING-JACK.

SPECIFICATION forming part of Letters Patent No. 355,866, dated January 11, 1887.

Application filed June 14, 1886. Serial No. 205,105. (No model.)

*To all whom it may concern:*

Be it known that I MOSES G. CRANE, of Newton, county of Middlesex, State of Massachusetts, have invented an Improvement in Lifting-Jacks, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

The object of my invention, relating to lifting-jacks, is to produce a compact, efficient, and inexpensive jack, all the parts of which may be of cast metal, and of such simple construction that they may be put together just as they come from the mold.

The jack consists, essentially, of a hollow upright made of two castings, which may be fastened together by screws or rivets, and which, when thus fastened, form a guide for a rack-bar contained within them. The said castings of the upright are also provided with openings and recesses, which form the bearings for a pinion or trundle having but two pins which co-operates with the rack-bar, and is provided with cranks or handles at the outside of the upright, by which the trundle may be turned. The trundle may either engage the teeth of the rack directly, or may engage an intermediate gear that meshes with the rack and turns in a recess in the upright. The handles of the trundle are so made that they will pass through the openings that form the bearing for the trundle, and the complete apparatus thus consists of but four or five pieces—namely, the rack, the trundle, with its crank-arms, the intermediate gear, if used, and the two portions of the upright and suitable fastenings—such as screws or rivets—to fasten the two portions of the upright together in order to complete the apparatus. The trundle with two pins co-operates with the rack-bar or intermediate gear in such a manner that in two positions in its rotation it locks the rack-bar, preventing the same from sinking under the weight of the carriage supported upon it; and, if desired, an additional fastening device may be employed to prevent the trundle from being accidentally turned from its locking position while the carriage is supported on the jack.

Figure 1 is a side elevation of a lifting-jack embodying this invention; Fig. 2, a front elevation thereof; Fig. 3, a horizontal section

on line *x x*, Fig. 2, on a larger scale; Fig. 4, a side elevation of the trundle and its crank-arms; Fig. 5, a detail of the actuating-trundle and intermediate gear; and Figs. 6 and 7, details showing a modification in which the trundle meshes directly with the rack-bar.

The jack is composed of an upright, *a*, consisting of two pieces, which, when fastened together, form a guide for a rack, *b*, having a suitable seat, *b'*, at its upper end, to receive the axle of the carriage or other article to be lifted. The upright *a* is provided with flanges *a'* at its lower end, making a base which affords sufficient bearing on the ground.

The pieces of the upright are provided with sockets or recesses *c*, having openings *c'*, which sockets and openings form a bearing for an actuating-trundle, *d*, having two pins or teeth, *d'*, which co-operate with the rack *b*, the journals of the said trundle being extended and turned in the opposite directions to form handles *d''*, by which the trundle may be turned to actuate the rack. The said handles *d''* will pass through the openings *c'* in the upright, which, when its parts are fastened together by suitable fastenings—such as rivets or screws *a''*—will form the bearing for the trundle, as well as the guide for the rack *b*, and the shape and character of the parts are such that when made of ordinary castings they will operate properly when put together without finish, thus making the apparatus very inexpensive.

The trundle *d* may actuate the rack-bar *b* through the intervention of an intermediate gear, *e*, having external teeth meshing with those of the rack-bar, and internal teeth or projections engaged by the pins of the trundle, as best shown in Fig. 5. The gear *e* is shown as provided with annular lateral projections or ribs *e'*, entering corresponding grooves in the upright *a*, as shown in Fig. 3, which afford a bearing for the gear in its rotary movement.

If desired, the intermediate gear, *e*, may be omitted and the trundle engaged directly with the teeth of the rack-bar, as shown in Figs. 6 and 7, in which case the teeth of the rack-bar have to be properly shaped to co-operate with the trundle, as shown.

The action of the trundle, having but two pins in connection with the internal teeth of the gear *e*, or with the teeth of the rack when



the said gear is omitted, is such that in two positions in its rotation, as illustrated in Fig. 6, the teeth of the rack or gear bear directly in line with the axis of rotation of the trundle, which is thus at a dead-center, as it were, with relation to the endwise pressure on the rack, so that the latter is locked, or will not tend to turn the trundle and let down the weight supported upon it. In making a half-turn from the position shown in Fig. 6 the trundle moves the rack or gear for the distance of one tooth, meshing with the trundle, and then locks the same again, it being shown in Fig. 7 in the position occupied while raising or lowering the rack, which may thus be raised by successive steps corresponding with the half-rotations of the trundle, and will remain supported after each upward movement without requiring a ratchet and pawl or equivalent device for sustaining it, as is necessary when an ordinary rack and pinion are used.

It will be seen that the two pins of the trundle have to have an open space between them, through which the co-operating teeth project, as shown in Fig. 6, and that a trundle of this character cannot be made with the pins or teeth connected with the center of the hub, like a pinion of usual construction.

If desired, a holding device (shown as a ring,  $f$ , upon the side of the upright) may be used to engage one of the actuating-arms  $d^2$ , and thus prevent the trundle from being accidentally turned from its locked-position and permitting the rack to descend, although such holding device is not necessary for the proper operation of the jack.

If desired, additional gearing may be employed to multiply the power transmitted from the actuating-trundle to the rack.

I claim—

1. A lifting-jack composed of an upright made in two parts, containing a guide-passage and bearing sockets or openings, combined with a rack longitudinally movable in the said guide-passage, and an actuating-trundle having two pins only, with an open space between them, and provided with crank-arms supported in the bearing-opening of the upright and co-operating with the rack, as described, whereby the said trundle is locked against back-pressure on the rack at two points in its rotary movement, substantially as described.

2. The combination of the upright and rack longitudinally movable therein with a gear meshing with said rack, and an actuating-trundle having two pins only, with an open space between them, co-operating with the said gear, substantially as described.

3. The combination of the upright and rack-bar longitudinally movable therein with an actuating-trundle having two pins only, with an open space between them, co-operating with said rack-bar and provided with crank-arms, and a fastening device co-operating therewith, substantially as and for the purpose described.

4. In a lifting-jack, the combination of the rack-bar with an actuating-trundle having two pins only diametrically opposite one another, having an open space between them, and crank arms or handles made integral with the said trundle, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

MOSES G. CRANE.

Witnesses:

JOS. P. LIVERMORE,  
JAS. J. MALONEY.