

W. McH. ALSTON & I. E. HINDMAN.

LIFTING JACK.

APPLICATION FILED JAN. 26, 1915.

1,151,232.

Patented Aug. 24, 1915.

2 SHEETS—SHEET 1.

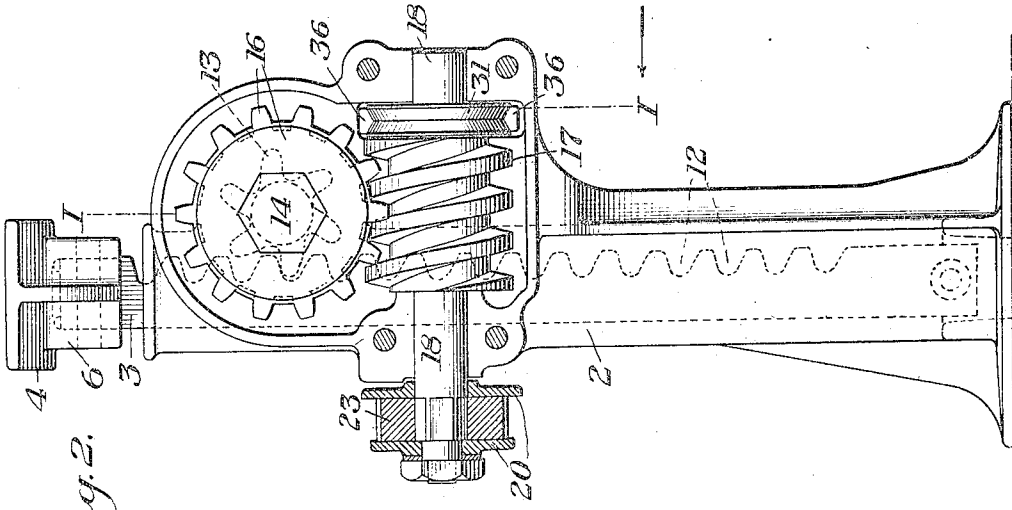


Fig. 2.

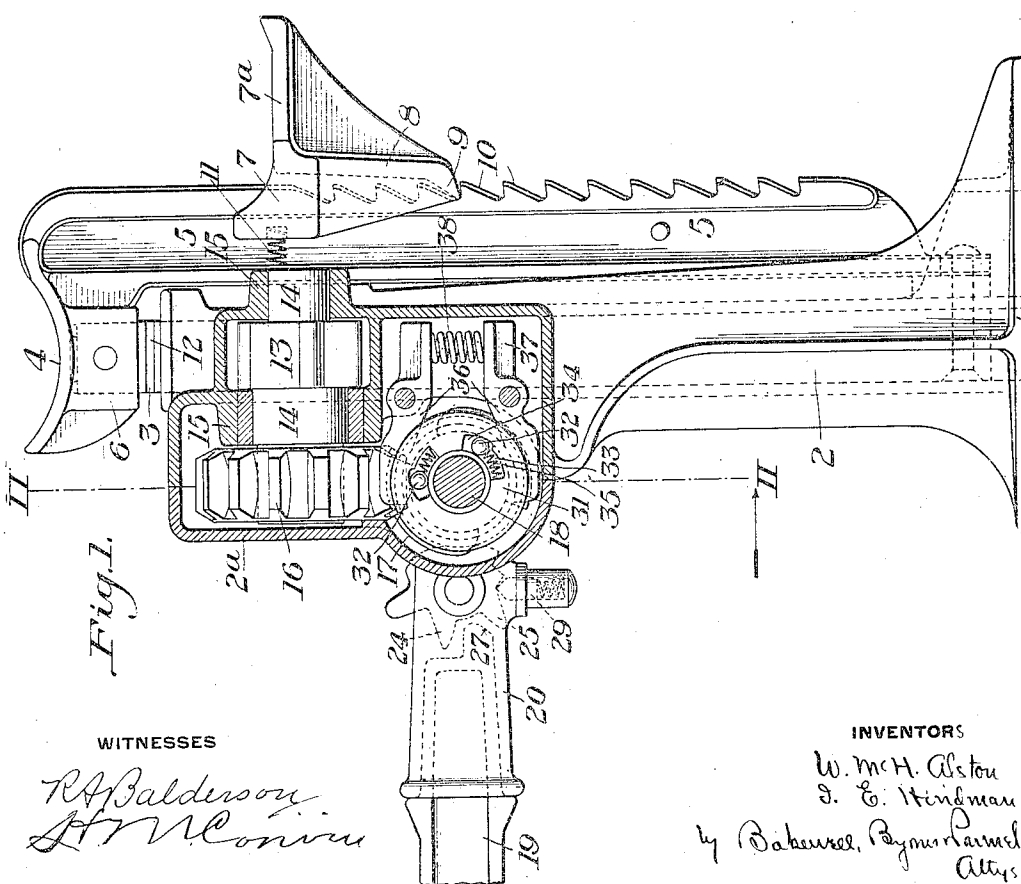


Fig. 1.

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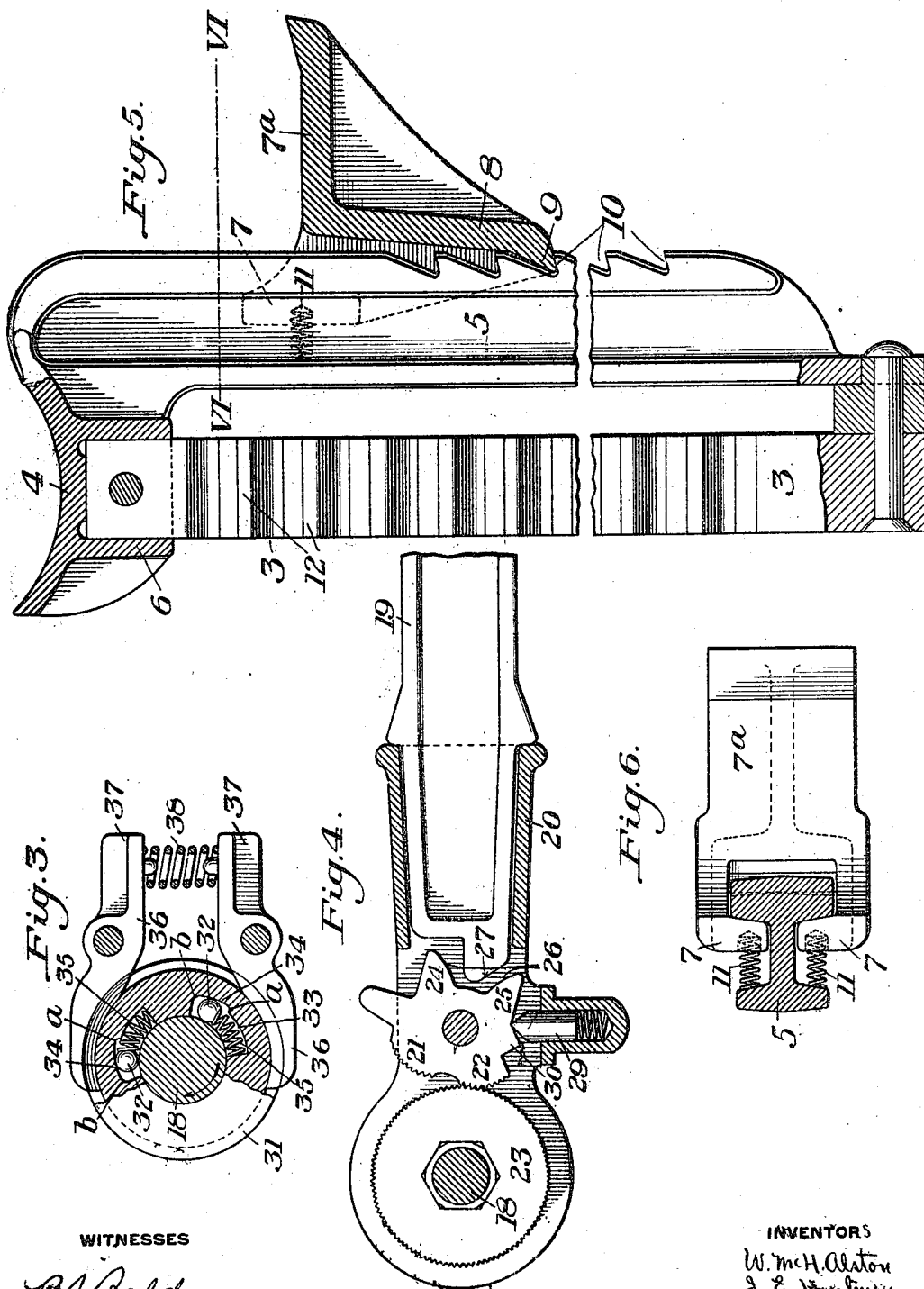
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UNITED STATES PATENT OFFICE.

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LIFTING-JACK.

1,151,232.

Specification of Letters Patent.

Patented Aug. 24, 1915.

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To all whom it may concern:

Be it known that we, WALTER McH. ALSTON and ISAIAH E. HINDMAN, both citizens of the United States, residing, respectively, at Ben Avon and Oakmont, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Lifting-Jacks, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a view partly in side elevation and partly in vertical section of a lifting jack embodying our invention. Fig. 2 is a view of the same partly in end elevation and partly in section, and with the cap plate removed, and Figs. 3, 4, 5 and 6 are sectional detail views of some of the jack parts, hereinafter more fully described.

Our invention has relation to lifting jacks and is designed to provide a simple, compact and effective arrangement of the gearing for actuating the lifting bar of the jack; also to provide braking means of novel and efficient character for controlling the lowering action of the jack; and also to provide a supplemental adjustable rest of convenient character.

The nature of our invention will be best understood by reference to the accompanying drawings in which we have shown the preferred embodiment thereof, and which will now be described, it being premised that various changes can be made in the details of construction and arrangement of the several parts without departing from the spirit and scope of our invention as set forth in the appended claims.

In these drawings the numeral 2 designates the frame of the jack which consists of a suitable base portion, a vertical hollow column portion, and an upper hollow casing portion for the actuating parts. This casing portion is formed in part by a removable cap plate 2^a.

3 designates the vertically movable lifting bar of the jack which carries the rest 4 at its upper end. In the preferred construction this rest 4 is formed in the shape of a lateral projection at the upper end of a vertical bar 5 which depends at one side of the

column portion of the frame 2, the lifting bar 3 being secured at its upper end in a socket portion 6 on the under side of the rest 4, and at its lower end to the lower end portion of the bar 5. The bar 5 is shown as in the form of an I-beam in cross section (see Fig. 6) and its outer flange is engaged and embraced by the jaw portions 7 of a supplemental adjustable rest 7^a. This rest has a depending web 8 formed with tooth portions 9 which are adapted to engage teeth 10 formed in the outer face of the outer flange of the bar 5. Springs 11 are shown interposed between the inner flange of said bar and the jaw portions 7 normally bias the supplemental rest to a position in which its teeth are firmly engaged with the teeth 10 to hold the rest in its desired position. These springs may, however, be omitted, since the weight of the rest will hold the teeth engaged. By pressing the upper portion of the supplemental rest inwardly against the action of the springs 11 it may be moved up or down into the desired adjustment. The lifting bar 3 is provided with rack teeth 12 on one face thereof. These teeth are engaged by a toothed pinion 13 on the horizontal shaft 14 journaled in suitable bearings 15 in the casing portion of the frame 2. Rigidly secured on one end portion of this shaft 14 is a worm wheel 16 which meshes with the teeth of a worm 17 carried by a horizontal actuating shaft 18 whose axis is at substantially right angles to the axis of the shaft 14. The shaft 18 may be actuated in any suitable manner, as by the hand lever 19. For purposes of illustration we have shown this lever and its actuating device as being of the specific form described and claimed in our copending application Serial No. 449 filed January 26, 1915, but it may be of any usual or desired character. In the form shown the bifurcated end portion of the lever socket 20 is loosely engaged with one end portion of the shaft 18 and has journaled thereon a rotary cam pawl having the two cam portions 21 and 22, either of which is adapted to engage the periphery of a wheel 23 fixed to the shaft 18. The contacting portions of this wheel and of the pawl are preferably toothed or serrated to prevent slippage.

The cam pawl also has the two teeth 24 and 25, each of which has a beveled surface 26 adapted to coact with a beveled surface 27 at the inner end of the detachable and reversible lever 19.

29 is a spring-pressed holding pin for the pawl. By inserting the lever in the socket in either one of its two reversed positions, its beveled surface 27 will coact with one of the beveled surfaces 26 to rotate the pawl so as to bring one or the other of the cam portions 21 or 22 into operative relation with the periphery of the wheel 23. The holding pin 29 by its coaction with the beveled faces of the pawl tooth 30 assists in throwing the pawl into the desired position, and also holds it in said position when thrown.

The operation of these parts is more particularly described in our said application, in which they are claimed.

While the pitch of the threads of the worm 17 may be sufficiently great to prevent the descent of the load, we do not rely upon this action, but prefer to provide brake mechanism of positive character since, if the pitch is such as to make the jack self-locking, its action is too slow to be practicable. This brake mechanism consists of a disk 31, which is loosely mounted on one end portion of the shaft 18, and is arranged to be clutched to said shaft in one direction of movement of the shaft, but to permit the shaft to turn freely in the other direction, through the action of suitable clutch members. These members are shown as consisting of balls or rollers 32, which contact with the periphery of the shaft and which are seated in openings 33 in the disk. Each of these openings has a cam wall 34, which is of decreasing radius from the point *a* to the point *b* (Fig. 3). These balls or rollers are normally pressed in the direction of the points *b* by means of the springs 35. When the shaft 18 is rotated in the direction of the arrow in Fig. 3, in raising the jack, these balls or rollers are carried by the shaft toward the points *a* where there is sufficient clearance to permit the shaft to turn freely. When, however, shaft 18 is rotated in the opposite direction, in lowering the jack, the clutch balls or rollers are carried toward the points *b* and cause a clutch engagement between the shaft, and the disk 31, whereby the disk is caused to rotate with the shaft.

36 designates two pivoted brake shoes having the extended lever arms 37, between which a spring 38 is interposed. This spring acts to force the brake shoes into frictional engagement with the periphery of the disk.

The advantages of our invention will be apparent to those familiar with jacks; since it provides a simply constructed and compact jack having a very effective arrange-

ment of actuating gearing, together with simple and powerful braking means.

We claim:

1. In a lifting jack, the combination with a jack frame and a lifting bar mounted to move vertically in said frame, of a shaft geared to the lifting bar, a worm wheel fixed to said shaft, a worm shaft at substantially right angles to the first named shaft, a worm rigidly mounted on the worm shaft and meshing with the worm wheel, means for actuating the worm shaft, a brake device on the last named shaft and an automatic clutch for connecting the brake device with the shaft, said clutch being inoperative when the worm shaft is operated in a direction to raise the lifting bar but operative in the reverse direction, substantially as described.

2. In a lifting jack, the combination with a jack frame and a lifting bar mounted to move vertically in said frame, of a shaft geared to the lifting bar, a worm wheel fixed to said shaft, a worm shaft at substantially right angles to the first named shaft, a worm on the worm shaft and meshing with the worm wheel, a pawl and ratchet device for actuating the worm shaft, and an oscillating lever handle for actuating the pawl and ratchet device, said lever being detachable and having means which, when inserted in its socket, contacts with the pawl and thereby reverses the action of the said pawl and ratchet device, substantially as described.

3. In a lifting jack, the combination with a jack frame and a lifting bar mounted to move vertically in said frame, of a shaft geared to the lifting bar, a worm wheel fixed to said shaft, a worm shaft at substantially right angles to the first named shaft, a worm on the worm shaft meshing with the worm wheel, means for actuating the worm shaft, a brake disk loosely mounted on the worm shaft, clutch means for connecting the brake disk with the shaft, said means being inoperative when the worm shaft is operated in a direction to raise the lifting bar but operative in the reverse direction, and friction means coöperating with said disk, substantially as described.

4. In a lifting jack, the combination with a jack frame and a lifting bar mounted to move vertically in said frame, of a shaft geared to the lifting bar, a worm wheel fixed to said shaft, a worm shaft at substantially right angles to the first named shaft, and a worm on the worm shaft meshing with the worm wheel, together with an automatic brake acting on the worm shaft, said brake being inoperative when said shaft is operated in a direction to raise the lifting bar but operative in the reverse direction, substantially as described.

5. A lifting jack, comprising a frame, a lifting bar mounted for vertical movement

in said frame, a shaft geared to said bar
and having a worm wheel fixed thereto, a
worm shaft having a worm meshing with
the worm wheel, a brake disk on the worm
5 shaft, a clutch connection between the worm
shaft and the brake disk, said connection
operating in one direction only, and spring-
pressed friction members engaging said disk
and extending back into a pocket of the

frame underneath the worm wheel shaft, 10
substantially as described.

In testimony whereof, we have hereunto
set our hands.

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Witnesses:

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