(No Model.)

A. A. STROM.

LIFTING JACK.

No. 386,791. Patented July 24, 1888.

Fig. 1.

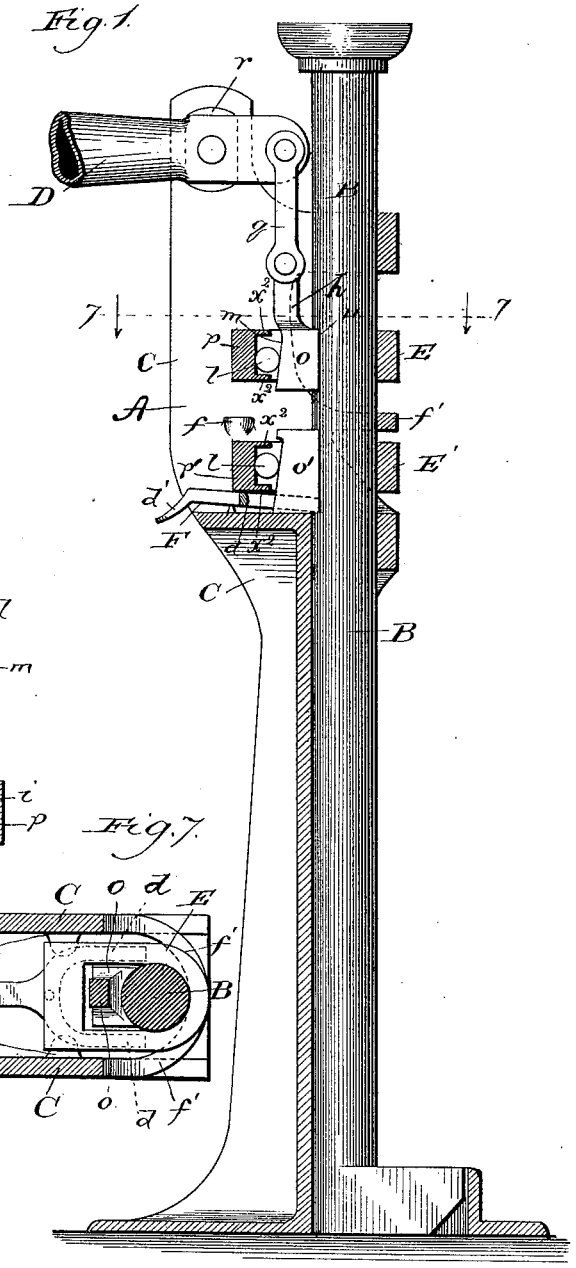


Fig. 2.

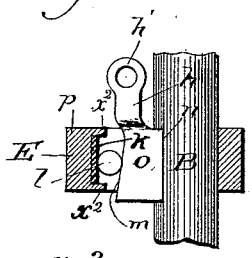


Fig. 3.

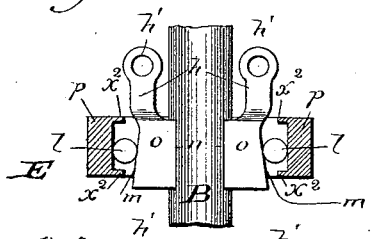


Fig. 4.

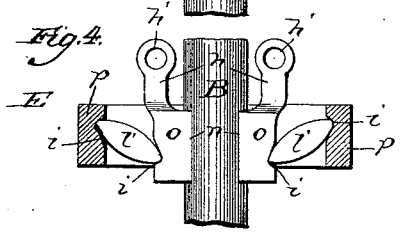


Fig. 5.

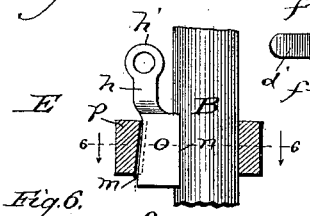


Fig. 6.

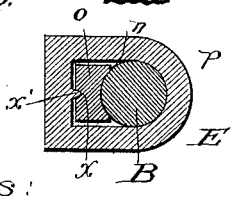
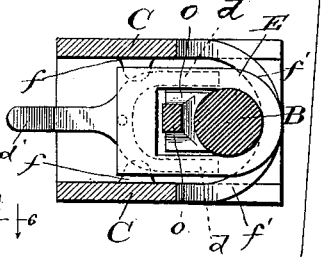


Fig. 7.



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UNITED STATES PATENT OFFICE.

AXEL A. STROM, OF AUSTIN, ILLINOIS.

LIFTING-JACK.

SPECIFICATION forming part of Letters Patent No. 386,791, dated July 24, 1888.

Application filed March 12, 1888. Serial No. 266,946. (No model.)

To all whom it may concern:

Be it known that I, AXEL A. STROM, a citizen of the United States, residing at Austin, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Lifting-Jacks, of which the following is a specification.

My improvement relates particularly to the friction-clutch portion of a lifting-jack for lifting and retaining in raised position until released the lifting-bar.

My object is to provide a lifting-jack the clutch portion of which shall be positive and reliable in its operation and involve simplicity of construction; and to this end it consists, broadly, in a clutch-box or collar on the lifting-bar, a wedge embraced between the lifting-bar and a side of the clutch-box or collar which it supports and carries and in which it is longitudinally movable, and a lever connected with the wedge and operating to move it lengthwise.

My invention further consists in the more specific construction of my improved device; and it still further consists in details of construction and combinations of parts.

In the drawings, Figure 1 shows a lifting-jack in sectional elevation provided with my improvement applied as a lifting-clutch and a retaining-clutch. Fig. 2 is a sectional view of the lifting-clutch device in a preferred form on a broken portion of a lifting-bar; Fig. 3, a similar view of substantially the same clutch, having parts duplicated; Fig. 4, a view similar to that presented in Fig. 3, showing a modification; Fig. 5, a view like that presented in Fig. 2, showing the clutch in its simplest form; Fig. 6, a section taken on the line 6 6 of Fig. 5, and viewed in the direction of the arrows; and Fig. 7 a sectional plan view on the line 7 7 of Fig. 1, showing the lifting-clutch and parts of its releasing-stops and part of the releasing-lever of the retaining-clutch in dotted lines.

A is a lifting-jack, the lifting-bar B (preferably round, as shown, but not necessarily) and standard portion C of which are of a common construction, and are therefore not herein described in detail.

In the upper part of the standard portion is a box, *r*, in which a lever, D, is fulcrumed, the short arm of which carries a pivotal link, *q*, which may be bifurcated toward opposite ends, where it is pivoted, respectively, to the lever and to the wedge hereinafter described; or, and preferably, two parallel links may be employed, (though only one is shown, owing to the nature of the view presented in Fig. 1,) one depending from each side of the lever. Both of the foregoing constructions are old in analogous positions in lifting-jacks, and detailed illustrations thereof are therefore not presented in the accompanying drawings.

E is the lifting-clutch comprising in its simplest form, as shown in Fig. 5, a box or collar, *p*, surrounding the lifting-bar, and a wedge, *o*, having a perpendicular side, *n*, preferably conforming to the shape of the lifting-bar, (and therefore shown concave in the drawings,) and an inclined opposite side, *m*, to be engaged by a corresponding inner side of the collar *p*, (see Fig. 5,) when the said side of the wedge should be provided with a shallow groove, *x*, Fig. 6, into which fits a tongue, *x'*, deeper than the groove (to avoid contact of the opposing surfaces of the wedge and collar) on the inner side of the collar, to reduce to the minimum the friction between the parts; or the clutch may be of the construction shown in Figs. 1 and 2, wherein a roller, *l*, is confined between the inclined surface of the wedge and the adjacent inner surface of the collar, which is then extended toward the lifting-bar horizontally at its upper and lower edges, as shown at x^2, to prevent the roller (which may be in the form of a cylinder or that of a ball) from escaping. If desired, especially to permit the clutch-box or collar to be composed of a metal too soft to withstand the pressure of the roller against its inner side, a bearing-surface may be provided in the form of a removable plate, *k*, of hard metal, as shown in Fig. 2, confined between the horizontal extensions or flanges x^2.

Still another form of the clutch is that shown in Fig. 4, wherein the roller and inclined surface of the wedge are supplanted by an inclined eccentric, *l'*, loosely confined between the wedge and inner adjacent side of the collar or clutch-box, and extending for the purpose into notches *i* in the respective parts.

If desired, the parts within the clutch-box or collar *p* may be duplicated, as shown in Figs. 3 and 4.

The wedge *o*, which is preferably extended

beyond the collar *p*, as shown, producing the extension *h*, having a ring or loop, *h'*, is connected with the short arm of the lever D through the medium of the link or links *q*. If the parts of the clutch within the clutch-box or collar be duplicated, as described, of course the links have to be duplicated accordingly and the lever adapted for connection with them in a common manner in lifting-jacks. In all cases the wedge carries and supports the clutch-box.

The operation is as follows: Downward pressure on the long arm of the lever D raises the wedge *o*, thereby narrowing the space between it and the adjacent inner side of the clutch-box, and thus causing the latter, (in the construction illustrated in Figs. 5 and 6,) or the eccentric *l'*, (in the construction presented in Fig. 4,) or the roller shown in the remaining figures to bind the wedge against the lifting-bar, the binding effect increasing according to the resistance, and the effect of thus raising the clutch and causing its binding function to be exerted is to raise the lifting-bar, (with its load.) When raised to the desired limit of the downward sweep of the lever D, the lifting-bar has to be supported while the lifting-clutch is lowered for a fresh grip, which lowering is permitted by the effectual release of the clutching function of the lifting-clutch, produced by the stoppage of the clutch-box in its downward movement by contact with the stops *f* and *f'*. The support of the lifting-bar is accomplished by a retaining-clutch, E', (preferably below the lifting-clutch, as shown, on the lifting-bar, and of substantially the same construction as the latter, or of any one of the constructions illustrated,) which, the wedge *o'* resting at its base in the standard, and being thus stationary, or practically so, binds against the bar by the friction of the latter in the normal downward tendency thereof, due to its gravity against the collar portion *p'*, (directly or indirectly,) whereby the latter is lowered on the wedge to produce the binding effect. To permit the lifting-bar to be lowered from any position to which it has been raised, the retaining-clutch E' has to be released from the bar, which is accomplished through the medium of a lever, F, fulcrumed or pivoted, as shown, on the standard, and having forked arms *d*, which extend below opposite sides of the collar of the clutch E', and an arm, *d'*, which projects beyond the standard. Downward pressure upon the end *d'* of the lever raises the collar portion of the clutch and releases the binding effect against the stationary wedge, whereby the lifting-bar is released to fall gradually or suddenly, depending upon whether it is controlled by a resisting power applied to the lever of the lifting-clutch or not.

What I claim as new, and desire to secure by Letters Patent, is—

1. In a lifting-jack, the combination of a clutch-box or collar on the lifting-bar, a wedge embraced between the lifting-bar and a side of the clutch-box or collar, which it supports and carries, and in which it is longitudinally movable, and a lever connected with the wedge and operating to move it lengthwise, substantially as described.

2. In a lifting-jack, the combination of a clutch-box or collar on the lifting-bar, a wedge embraced between the lifting-bar and a side of the clutch-box or collar, which it supports and carries, and in which it is longitudinally movable, and having a perpendicular surface against the lifting-bar, and an inclined surface opposing the said side of the clutch-box or collar, and a lever connected with the wedge and operating to move it lengthwise, substantially as described.

3. In a lifting-jack, the combination of a clutch-box or collar on the lifting-bar, a wedge longitudinally movable in and supporting and carrying the clutch-box or collar, and having a perpendicular surface against the lifting-bar and an opposite inclined surface, a roller confined between the inclined surface of the wedge and the adjacent side of the clutch-box or collar, and a lever connected with the wedge and operating to move it lengthwise, substantially as described.

4. In a lifting-jack, the combination of a clutch-box or collar, *p*, on the lifting-bar, and provided with a removable bearing, *k*, against one inner side, a wedge, *o*, longitudinally movable in and supporting and carrying the clutch-box or collar, and having a perpendicular surface against the lifting-bar and an opposite inclined surface, a roller, *l*, confined between the inclined surface of the wedge and operating to move it lengthwise, and a lever, D, connected with the wedge, substantially as described.

5. In a lifting-jack, the combination of a lifting-clutch, E, comprising a clutch-box or collar on the lifting-bar, and a wedge embraced between the lifting-bar and a side of the clutch-box or collar, in which it is longitudinally movable, a lever applied to the wedge, a stop for the lifting-clutch, a retaining-clutch comprising a clutch-box or collar on the lifting-bar, and a practically stationary wedge embraced between the lifting-bar and a side of the said clutch-box, and a lever, F, for the clutch-box or collar of the retaining-clutch on the stationary wedge to release the lifting-bar, substantially as described.

6. In a lifting-jack, the combination of a lifting-clutch, E, comprising a clutch-box or collar on the lifting-bar, a wedge longitudinally movable in the clutch-box or collar, and having a perpendicular surface against the lifting-bar and an opposite inclined surface, and a roller confined between the inclined surface of the wedge and the adjacent side of the clutch-box or collar, a lever, D, applied to the wedge and operating to move it lengthwise, a stop

for the lifting-clutch, a retaining-clutch, E', comprising a clutch-box or collar on the lifting-bar, a practically stationary wedge in the said clutch-box or collar, and having a perpendicular surface against the lifting-bar and an opposite inclined surface, and a roller confined between the inclined surface of the said wedge and the adjacent side of the clutch-box or collar, and a lever, F, for moving the clutch-box or collar of the retaining-clutch on the stationary wedge to release the lifting-bar, substantially as described.

AXEL A. STROM.

In presence of—
J. W. DYRENFORTH,
CHAS. E. GORTON.