

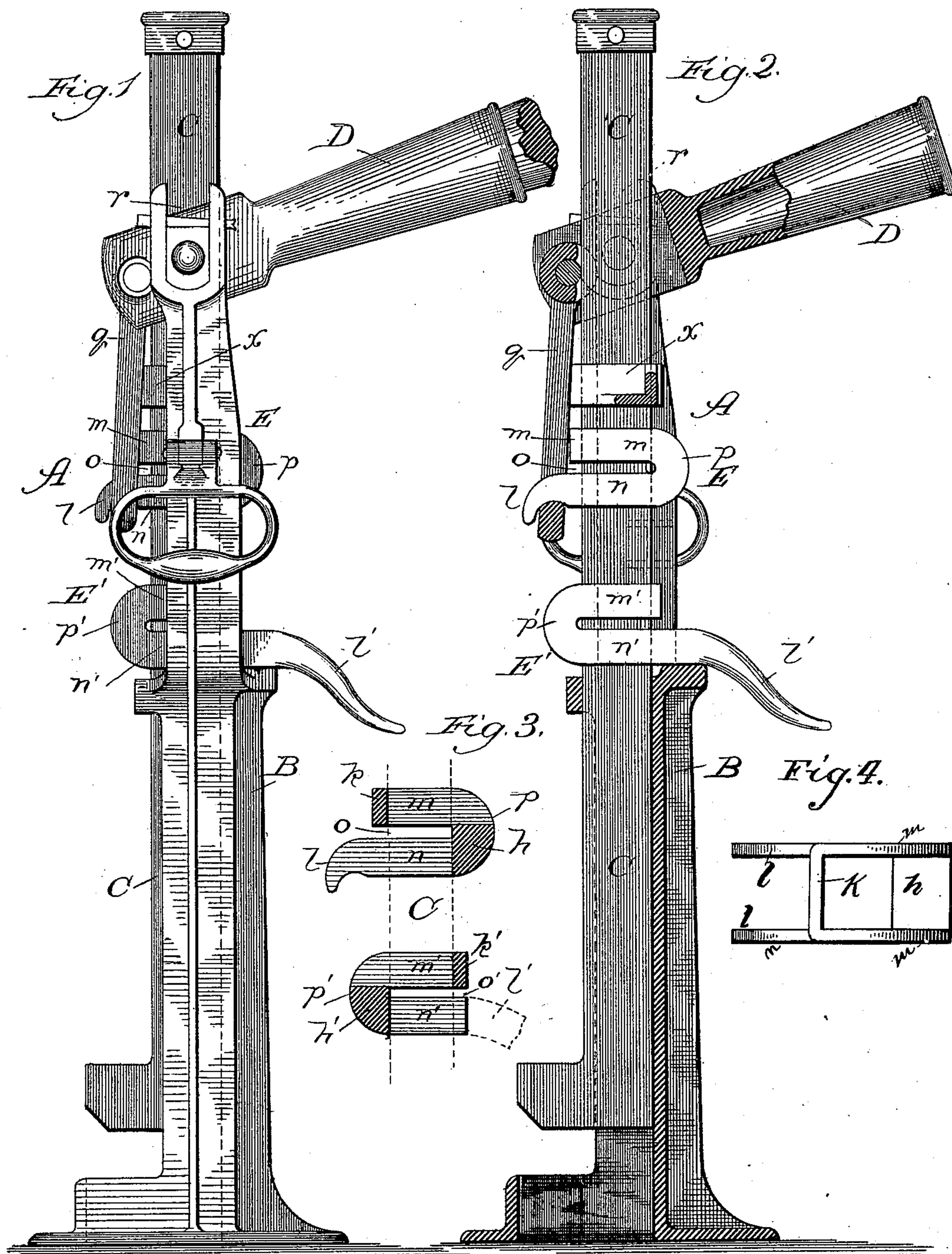
(No Model.)

A. A. STROM.

LIFTING JACK.

No. 395,928.

Patented Jan. 8, 1889.



Witnesses:

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UNITED STATES PATENT OFFICE.

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LIFTING-JACK.

SPECIFICATION forming part of Letters Patent No. 395,928, dated January 8, 1889.

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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 invention relates to the class of lifting-jacks provided with friction-clutch devices, one for performing the function of gripping the lifting-bar by actuating a lever connected with the clutch to raise the bar and the other that of supporting the lifting-bar in the position to which it has been raised by the lifting-clutch. The principle of operation of the friction-clutch in the class of lifting-jacks to which my improvement relates is that of gripping the lifting-bar by binding it on opposite sides between two surfaces. A common device for producing the desired binding effect, and upon which particularly my present invention is designed to afford an improvement, is a friction-clutch surrounding the lifting-bar and actuated to produce the binding effect by tipping it slightly from a horizontal position, whereby the opposite sides of the clutch adjacent to the bar are forced against the latter, respectively, toward their upper and lower edges and in contrary directions. To accomplish this result, the clutch is provided with a projection extending from one of its sides and from the upper portion thereof away from the lifting-bar, at which the power (exerted from a lever to the lifting-clutch and from a suitable stop for the retaining-clutch) is applied to tip the clutch. This projection may not be of undue length, but, on the contrary, must be quite short, in order that the power for actuating the clutch may be exerted as closely as possible to the lifting-bar, thereby to permit the transverse dimensions of the lifting-jack to be reduced to the minimum, and which is of the first importance, to avoid the possibility of exerting too great a leverage on the clutch, which would tend to cause bending of the bar in producing against it the binding effect. Furthermore, the leverage being exerted at the side of the clutch from which the projection referred to extends, the binding power is produced, as it were, by pressing against the ad-

jacent side of the lifting-bar the upper portion of the inner surface of the clutch, and thereby also pressing the opposite lower portion of the inner surface against the opposite side of the bar. Thus the force of the gripping effect is not so great and positive with the exertion of a given power as if the binding were produced by pulling the gripping-surfaces of the clutch against the respectively adjacent surfaces of the lifting-bar.

The principal objects of my improvement are to provide means whereby the most effectual binding of the clutch against the lifting-bar may be produced with the least exertion of power and to afford a construction of friction-clutch by means of which the greatest possible leverage capable of being exerted as close as possible to the lifting-bar may be attained with the shortest possible gripping-surface or "grip," the latter, preferably, to afford the least or no space between the lower edge of the binding-surface on one side of the clutch and the upper edge of that on the opposite side thereof, in order to avoid having any length or any material length of lifting-bar between the adjacent extremities of the binding-surfaces, which would, in proportion to the length of bar between such surfaces, render liable bending of the bar with the strain exerted.

My invention consists in the construction of the friction-clutch device in a lifting-jack, comprising, broadly, a bar extending across the lifting-bar, cross-bars extending from opposite ends of the said bar across opposite sides of the lifting-bar, and a handle rigidly connected or integral with and extending from one of the cross-bars at one side of the lifting-bar toward the opposite side thereof; and it further consists in the more specific construction and in combinations of parts.

In the drawings, Figure 1 shows in side elevation a lifting-jack having a portion of the handle of the operating-lever for lifting broken away, and provided with my improved clutch device applied both as a lifting-clutch and as a retaining-clutch. Fig. 2 shows in sectional elevation the same as is presented to view in Fig. 1. Fig. 3 shows in section the lifting and retaining clutches in their respective positions on a lifting-bar, the latter being indi-

eated by dotted lines; and Fig. 4 shows a plan view of the clutch.

A is the lifting-jack, which as to all its parts, except the clutch portion, may involve any of the known constructions to which my improved clutch device is applicable, that shown being the one illustrated and described in Letters Patent of the United States No. 388,156, granted to me on the 21st day of August, 1888, and involving the standard portion B, lifting-bar C, bifurcated lever D, fulcrumed at opposite sides of its bifurcated portion in recesses r in the upper ends of the expanded part of the standard, links q , pivotally connected at their upper ends with the short arm of the lever and serving to connect the lever with the lifting-clutch device, and a guide-collar, x , for the bar C, the collar x being merely a web connecting the two sides of the expanded portion of the standard and having a central opening for the lifting-bar, like the guide-collar in various well-known forms of lifting-jacks, wherein it performs the same function of a guide surrounding the lifting-bar toward the upper end of the standard.

E is my improved lifting-clutch, and E' the retaining-clutch, each of which involves substantially the same construction, though, as I wish it clearly to be understood, either may be employed for its purpose in a lifting-jack with any other suitable clutch—that is, I may use my improved lifting-clutch with any other suitable retaining-clutch, and vice versa; hence I do not herein limit myself to the employment of my improved form of clutch to both purposes in the same jack.

The preferred construction of the lifting-clutch E involves, as shown, two bars, p , on opposite sides of the lifting-bar, each of the U shape shown, whereby a space, o , is provided between the two integral or rigidly-connected parts n and m , and with one part, n , longer than the other companion part, m , and provided at its extremity with a lip forming a handle, l . The parts m of the two bars p are joined at their adjacent extremities by a cross-bar, k , while the parts n are connected to one side of the cross-bar k at the bases of the U-shaped bars by a cross-bar, h . The space vertically between the cross-bars k and h is sufficiently wide to admit the lifting-bar, and it is preferred, though not essential, that the adjacent upper and lower edges of the cross-bars shall be on the same plane, as shown, which plane, with the clutch in its normal position on the bar C, is a horizontal plane. The links q are pivotally connected at their lower ends with the lip forming the handle portion l by being hooked into the latter. By lowering the long arm of the lever D the clutch E is tipped from the handle portion l , thereby pulling the cross-bar h against one side of the lifting-bar and the cross-bar k against the opposite side thereof, thus binding the bar C between the cross-bars and causing it to be lifted by the power applied at the operating-lever D. If the lower and upper

edges, respectively, of the two cross-bars k and h be on the same horizontal plane, as shown, there is no danger of the lifting-bar being bent by the binding strain exerted by the tilting of the clutch, which is an advantage over having the said edges of the cross-bars k and h on different horizontal planes, as they may be, since the liability to bend the bar increases with distance between the horizontal planes coinciding with the lower and upper edges of the respective cross-bars. By having the parts n extend from the rear cross-bar or bearing, h , and connected with the lever D on the side of the lifting-bar having the bearing k , as shown, or near the same, a much longer leverage is obtained than if the handle portion at which to connect the clutch with the operating-lever were merely in the form of a projection from the bearing k , whereby the gripping or binding effect would be produced by the pushing force hereinbefore referred to.

While the construction and form of the clutch E are preferably as described, the form may be changed without thereby departing from my invention, the important feature of which is to obtain the long leverage by extending the handle portion of the clutch from the bearing or cross bar on one side of the lifting-bar to or toward the opposite side of the lifting-bar. Thus an entire side, mnl , may be omitted, leaving the clutch formed of only one side mnl and end portions, k and h , or the bearing-bar h may be loosely supported or journaled in its position on the clutch instead of being integral therewith, as shown, when it may have the form of the roller, or the part or parts n may extend short of the side of the lifting-bar at which the cross-bar k is located instead of extending beyond the same, as illustrated. These changes are so obvious that it is not considered necessary to illustrate them.

The retaining-clutch E' comprises a construction (as shown or as stated to be changeable) very similar to the clutch E, inasmuch as it involves parts m' and n' like the parts m and n and separated by a space, o' , and cross or bearing bars h' and k' like the bars h and k . The handle portion l' on the parts n' may be longer than the handle portion or lips l , to extend over and be fulcrumed at the outer edge of the base of the expanded portion of the standard, and thus afford means for releasing the gripping effect of the retaining-clutch on the lifting-bar. The clutch E', as will be seen, is adjusted upon the lifting-bar in a manner to cause the handle portion l' to extend in a direction contrary to that in which the lips l extend.

The tendency of the clutch E' is to tip from the supported handle portion l' toward the opposite side, both by its own weight and by that of the lifting-bar and load on the latter, whereby it binds the bar, as in the case of the clutch E. By pressing downward upon the handle the clutch E' is forced to a horizontal

position, thereby releasing its holding effect upon the bar.

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

5 1. In a lifting-jack, the combination, with the standard and lifting-bar, of a friction-clutch having a bar extending across the lifting-bar, cross-bars extending from opposite ends of said bar across opposite sides of the
10 lifting-bar, and a handle rigidly connected or integral with and extending from one of said cross-bars at one side of the lifting-bar toward the opposite side of the latter, substantially as described.

15 2. In a lifting-jack, the combination, with the standard, lifting-bar, and operating-lever, of a friction-clutch, E, having a U-shaped bar, *p*, composed of rigidly-connected or integral bars *m* and *n*, a cross-bar, *k*, extending
20 from the bar *m* across one side of the lifting-bar, and a cross-bar, *h*, extending across the opposite side of the lifting-bar, and a handle portion, *l*, on the bar *n*, connected by a suitable link-connection with the operating-lever
25 D, substantially as described.

3. In a lifting-jack, the combination, with the standard, lifting-bar, and operating-lever, of a lifting-clutch, E, comprising two U-shaped bars, *p*, embracing the lifting-bar and each
30 composed of the rigidly-connected or integral bars *m* and *n*, a cross-bar, *k*, connecting corresponding ends of the bars *m* at one side of the lifting-bar, a cross-bar, *h*, extending between the bars *p* across the opposite side of
35 the lifting-bar, and a handle portion, *l*, forming extensions of the bars *n*, connected by a suitable link-connection with the operating-lever D, and a suitable retaining-clutch, substantially as described.

40 4. In a lifting-jack, the combination, with the standard, lifting-bar, and operating-lever, of a lifting-clutch, E, comprising two U-shaped bars, *p*, embracing the lifting-bar and each composed of the rigidly-connected or integral
45 bars *m* and *n*, a cross-bar, *k*, connecting corresponding ends of the bars *m* at one side of the lifting-bar, a cross-bar, *h*, extending between the bars *p* across the opposite side of the lifting-bar, and handles *l*, forming extensions
50 of the bars *n*, extending beyond the side of the lifting-bar at which the cross-bar *k* is

provided, and connected by a suitable link-connection with the short end of the operating-lever D, and a suitable releasing-clutch, substantially as described.

55 5. In a lifting-jack, the combination, with the standard, lifting-bar, and operating-lever, of a suitable lifting-clutch and a retaining-clutch, E', having a U-shaped bar, *p'*, composed of rigidly-connected or integral bars
60 *m'* and *n'*, a cross-bar, *k'*, extending from the bar *m'* across one side of the lifting-bar, and a cross-bar, *h'*, extending across the opposite side of the lifting-bar, and a handle portion, *l'*, on the bar *n*, at which the clutch is supported on the standard, substantially as described.

6. In a lifting-jack, the combination, with the standard, lifting-bar, and operating-lever, of a suitable lifting-clutch and a retaining-clutch comprising two U-shaped bars, *p'*, embracing the lifting-bar and each composed of
70 the rigidly-connected or integral bars *m'* and *n'*, a cross-bar, *k'*, connecting corresponding ends of the bars *m'* at one side of the lifting-bar, a cross-bar, *h'*, extending between the bars *p'* across the opposite side of the lifting-bar, and a handle portion, *l'*, forming extensions of the bars *n'*, and at which the retaining-clutch is supported on the standard, substantially as described.

7. In a lifting-jack, the combination, with the standard, lifting-bar, and operating-lever, of a suitable lifting-clutch and a retaining-clutch, E', comprising two U-shaped bars, *p'*, embracing the lifting-bar and each composed of
85 the rigidly-connected or integral bars *m'* and *n'*, a cross-bar, *k'*, connecting corresponding ends of the bars *m'* at one side of the lifting-bar, a cross-bar, *h'*, extending between the bars *p'* across the opposite side of the lifting-bar, and handles *l'*, forming extensions of the bars *n'*, extending beyond the side of the lifting-bar at which the cross-bar *k'* is provided, and affording a lever for releasing
95 the retaining-clutch at which it is supported on the standard, substantially as described.

AXEL A. STROM.

In presence of—

J. W. DYRENFORTH,
M. J. BOWERS.