

H. AUSTIN.
LIFTING JACK.
APPLICATION FILED DEC. 5, 1910.

1,000,140.

Patented Aug. 8, 1911.

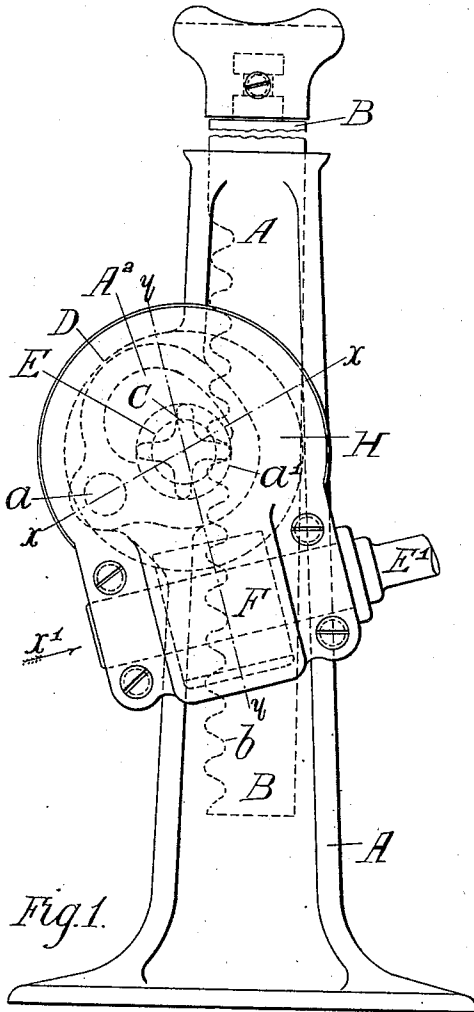


Fig. 1.

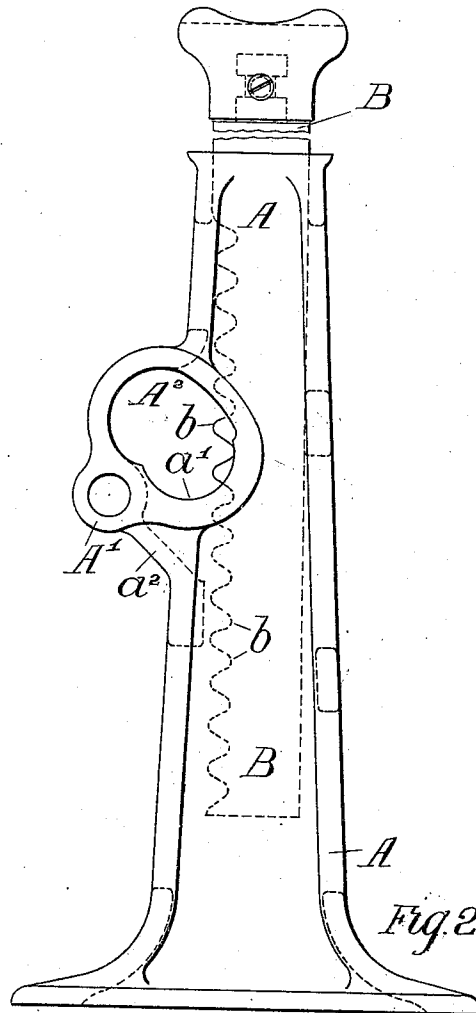


Fig. 2.

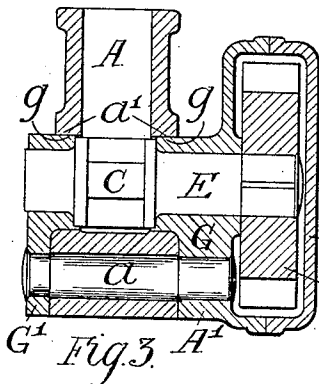


Fig. 3.

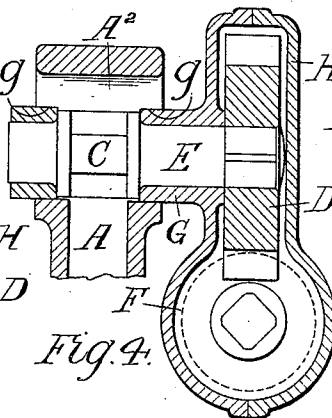


Fig. 4.

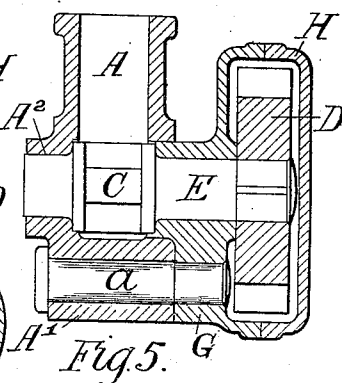


Fig. 5.

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LIFTING-JACK.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, HERBERT AUSTIN, a subject of the King of Great Britain, and resident of Bromsgrove, England, engineer, have invented certain new and useful Improvements in Lifting-Jacks, of which the following is a specification.

This invention relates to the type of lifting jack in which the lifting bar may be raised directly by hand, when the jack is unloaded, to save the time which would be required to lift such bar through the medium of the gear in bringing it up to a load to be lifted, and may then be raised through the medium of the gear, and in which the lifting bar may, when the jack is unloaded, be allowed to drop and thereby avoid the necessity of winding it down by hand; and the invention has for its object improved means by which the direct lifting and the dropping of the bar are provided for.

Broadly describing the invention, the pinion which directly gears with the rack of the lifting bar, and the mechanism by which it is operated by hand in raising and lowering a weight, are carried in such manner that the pinion may be readily moved out of gear with the rack without disturbing the normal relation of such pinion to such mechanism.

Describing an application of the invention in general terms, the pinion which directly gears with the rack of the lifting bar is adapted to be moved, at will, out of gear with the rack, and such pinion and a worm-wheel which is rigid therewith, are maintained in such manner in relation to a worm which gears with the worm-wheel and is rotated by the handle, that the pinion may be moved out of gear with the rack without altering the relative positions of the worm-wheel and worm, whereby the worm is always fully in gear with the worm-wheel.

In carrying out the application of the invention described in general terms in the last preceding paragraph, a frame or housing which carries the pinion and worm-wheel and the worm, is pivoted to the main pillar or standard of the jack, the pivot axis being in such position in relation to the common axis of the pinion and worm-wheel that, if the frame is tilted in one direction, it moves the pinion out of gear with the rack, or if the lifting bar is raised directly by hand, without the frame being first tilted to move the pinion out of gear

with the rack, the frame tilts under the action of the rack against the pinion and allows the pinion to be thus moved out of gear with the rack.

In order that the invention may be clearly understood, I will now describe a practical application of the same, and also a modification thereof, by reference to the drawings herewith, of which:—

Figure 1 is a side elevation of a lifting jack constructed according to the invention. Fig. 2 is a view corresponding to Fig. 1, with the gearing omitted by means of which the lifting bar is operated in raising and lowering a weight. Fig. 3 is a sectional plan view taken in the inclined plane indicated by line $x x$ of Fig. 1. Fig. 4 is a sectional view taken in the plane indicated by line $y y$ of Fig. 1, as seen looking in the direction of the arrow x^1 , and Fig. 5 is a view, corresponding to Fig. 3, showing a modification of the invention.

Referring first to the invention as illustrated by Figs. 1 to 4 inclusive, A is the standard or pillar, B the lifting bar having the usual rack teeth b along one edge, C the pinion which gears with the rack teeth b , D the worm-wheel which is carried by the spindle E of the pinion C, F the worm which gears with the worm-wheel D, and E^1 the spindle which carries the worm and which is turned by a suitable handle, all these features corresponding substantially to those ordinarily employed with this type of jack. In lieu, however, of the spindle E being carried by fixed bearings of the standard A as in the ordinary jack, it is carried in bearings which are formed in the inner ends of arms G G^1 , of which the outer ends are pivoted to a lug A^1 , which is rigid with the standard A, by means of a pin a , the arms being at opposite sides, respectively, of the lug, and the arm G carries also the bearings of the spindle E^1 . Normally, the inner ends of the arms G G^1 rest upon a support which is rigid with the standard A, and thus resist the downward force of the pinion C when the same is supporting a weight which is carried by the bar B; but clearance is provided which allows the arms G G^1 to be turned up sufficiently about the pivot axis of the pin a to clear the pinion from the teeth b of the bar B. The arms G G^1 are turned up, to clear the pinion from the teeth b , by lifting up the spindle E^1 at the end thereof where it is operated by the han-

dle. The bar B will then drop unless it was already in its lowest position, or may be raised directly by hand to any desired height, after which, in either case, the pinion C will become reengaged therewith if the spindle E¹ is allowed to fall or lower into its normal position, and then the jack can be operated through the medium of the gear in the usual manner. Conveniently, the arms G and G¹ are each formed with a sidewise boss *g* which projects into a slotted opening A² of the standard A, the lower end *a*¹ of each slot being formed semi-circular and allowing the corresponding boss *g* to fit down therein, and the portion of each slot which is upward of the lower end being somewhat enlarged in width, as shown, and terminating in a semi-circular upper end; and it is preferred that the upper ends of the slots shall be continuous with one another across the front of the standard thus, together with a portion *a*² of the standard A which inclines down from the boss A¹ into the front of the standard, boxing in the pinion C which is in position between the two arms G G¹. The worm-wheel D and the worm F are inclosed within a box H divided into halves of which the inner half is formed integral with the arm G and of which the outer half is removable, and the bearings for the spindle E¹ are formed, each of them, half within the portion of the box H which is integral with the arm G and half within the outer or removable half of the box. It is preferred to rivet the arms G and G¹ rigidly to the pin *a*, so that they may be rigid with one another.

The modified form of the invention shown by Fig. 5 differs from the form thereof shown by the other views, simply in that the arm G¹ is omitted and in lieu thereof the end of the spindle which has previously been shown as carried in the arm G¹ rests directly, when down, in the bottom of the corresponding slot A², the bottom of this slot being adapted to allow such end of the spindle to fit down therein. The spindle E is thus, when lifted, journaled entirely in the arm G.

Having fully described my invention, what I claim and desire to secure by Letters Patent, is:—

1. In a lifting jack, a standard or column, a toothed lifting bar, a toothed pinion adapted to gear with the teeth of said bar, mechanism revoluble about a different axis to that of said pinion for operating said pinion from a suitable handle, a frame carrying said pinion and said mechanism and itself movably mounted in relation to the standard

or column and adapted to be moved in a direction to move said pinion out of gear with said teeth of the lifting bar, for the purpose set forth.

2. In a lifting jack, a standard or column, a toothed lifting bar, a toothed pinion adapted to gear with the teeth of said bar, mechanism revoluble about a different axis to that of said pinion for operating said pinion from a suitable handle, a frame carrying said pinion and said mechanism and itself pivoted to the standard or column and adapted to be turned in a direction to move said pinion out of gear with said teeth of the lifting bar, for the purpose set forth.

3. In a lifting jack, a standard or column, a toothed lifting bar, a pinion adapted to gear with the teeth of said bar, a worm wheel mounted rigidly in relation to said pinion and having a common axis therewith, a worm gearing with said worm wheel, a frame carrying said pinion, worm wheel, and worm, and itself movably mounted in relation to the standard or column and adapted to be moved in a direction to move said pinion out of gear with said teeth of the lifting bar, for the purpose set forth.

4. In a lifting jack, a standard or column, a toothed lifting bar, a pinion adapted to gear with the teeth of said bar, a worm wheel mounted rigidly in relation to said pinion and having a common axis therewith, a worm gearing with said worm wheel, a frame carrying said pinion, worm wheel, and worm, and itself pivoted to the standard or column and adapted to be turned in a direction to move said pinion out of gear with said teeth of the lifting bar, for the purpose set forth.

5. In a lifting jack, a standard, a toothed lifting bar guided for movement along the standard, and means for moving said bar endwise including a frame supported upon the standard and movable toward and from the lifting bar, a pinion rotatable on the frame and engageable with the toothed lifting bar to move the same, and gearing operable to rotate the pinion, said lifting bar when moved endwise in one direction being operable to move said frame and disengage the pinion thereon from the toothed lifting bar.

In witness whereof I have hereunto signed my name this 21st day of November 1910, in the presence of two subscribing witnesses.

HERBERT AUSTIN.

Witnesses:

WILLIAM R. HANCOX,
REGINALD MALLARD.