

(No Model.)

2 Sheets—Sheet 1.

C. A. YOUNG.

LIFTING JACK.

No. 262,717.

Patented Aug. 15, 1882.

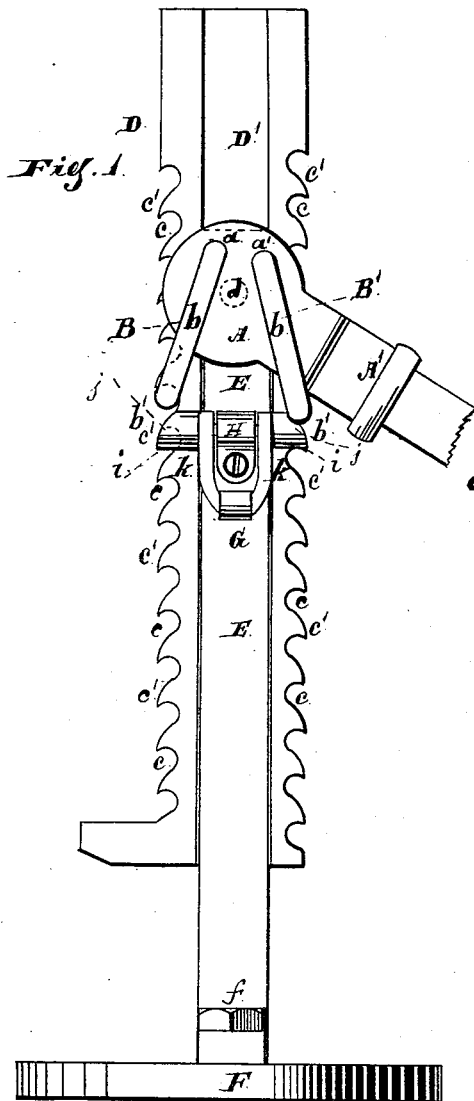


Fig. 2

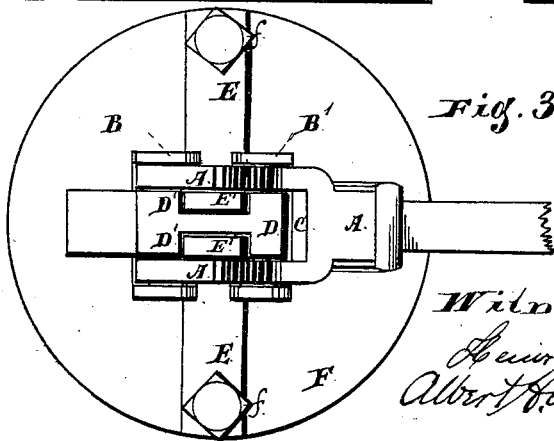
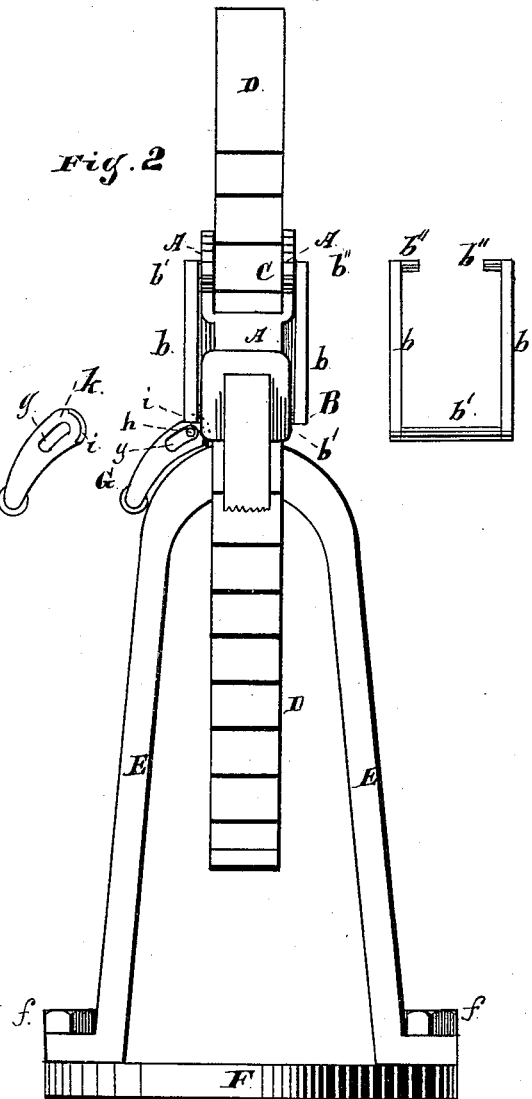


Fig. 3.

Inventor:  
Charles A. Young.  
By West & Bond  
His attys

Witnesses:  
Hiram L. Bruns.  
Albert H. Adams.

(No Model.)

2 Sheets—Sheet 2.

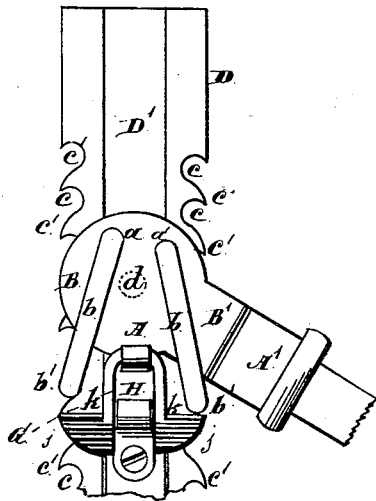
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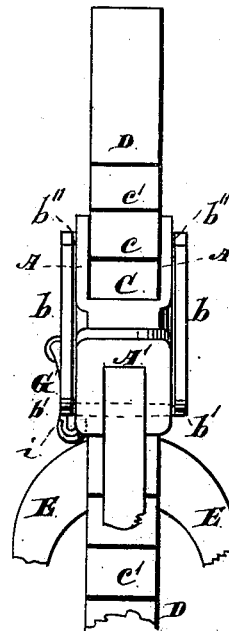
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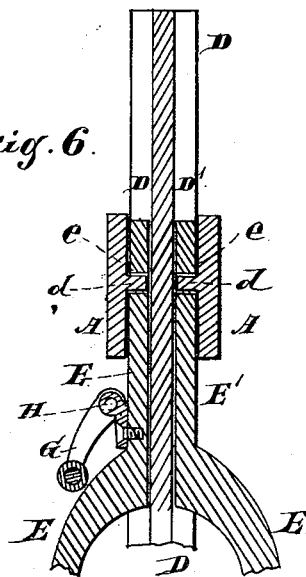
*Fig. 5.*



*Fig. 4.*



*Fig. 6.*



*Witnesses:*

*Henry J. Brown.*  
*Albert H. Adams.*

*Inventor:*

*Charles A. Young.*  
*By West & Bond.*  
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# UNITED STATES PATENT OFFICE.

CHARLES A. YOUNG, OF SIDNEY, NEBRASKA.

## LIFTING-JACK.

SPECIFICATION forming part of Letters Patent No. 262,717, dated August 15, 1882.

Application filed January 3, 1882. (No model.)

*To all whom it may concern:*

Be it known that I, CHARLES A. YOUNG, residing at Sidney, in the county of Cheyenne, and State of Nebraska, and a citizen of the United States, have invented a new and useful Improvement in Lifting-Jacks, of which the following is a full description, reference being had to the accompanying drawings, in which—

Figure 1 is a side elevation; Fig. 2, a front elevation; Fig. 3, a top or plan view; Fig. 4, a detail, being a front elevation of the head and links and a portion of the rack-bar and standards, showing the reversing-lever in position for the links to act and raise the rack-bar; Fig. 5, a detail, being a side elevation of the parts shown in Fig. 4; and Fig. 6, a detail in section, showing the upper ends of the standards, the rack-bar, and the manner of connecting the head with the standards.

The object of this invention is to construct a lifting-jack which shall be simple in its parts, strong and exceedingly powerful, and which shall also possess the feature of exerting the greatest lifting force with the least expenditure of power.

My invention consists essentially in the combination, with a lifting-jack having a lifting lever-head, of stirrups or links having their pivotal points arranged on opposite sides of a vertical line through the pivot of the lever-head, and above a horizontal line through the pivot of said lever-head.

My invention embraces other features of combination and arrangement, which will be fully hereinafter described, and set forth in the claim.

In the drawings, A represents the lifting-head; A', the shank or socket; B B', the lifting links or stirrups; C, the slot or opening in the head A for the passage of the rack-bar; D, the rack-bar; D', the recesses or grooves in the sides of the rack-bar; E, the standards or supports; F, the base-plate; G, the reversing arm or lever; H, the support for the arm or lever G; a a', openings in the head A for attaching the links B B'; b, the side bars of the links or stirrups; b', the end or cross bar; b'', the pivots or journals of the links or stirrups; c, the notches of the rack-bar; c', the curved face of the teeth forming the notches; d, the pivots or trunnions of the head A; e, the openings

in the standards or supports E for the reception of the pivots or trunnions d; f, the bolts attaching the standards or supports to the base-plate; g, the slot in the reversing-lever G; h, the pins for attaching the reversing-lever; i, the side projections or wings of the reversing arm or lever having the cam-faces; j k, the cam-faces.

The head A may be made of cast-iron or other suitable material which can be cast or formed into a circular shape, as shown, or any other suitable shape having a recess or opening, C. As shown, this head and the shank or socket portion A' are cast or formed in a single piece; but they may be cast in separate pieces secured together by bolts or otherwise, or the plates or disks forming the head might be each provided with a wing or extension having suitable openings for the passage of bolts between which the lever or handle could be placed and secured by the bolts. Each plate or disk forming the head on its inner face is provided with an inwardly-projecting circular boss or stud extending into the recess or opening C, and in line with each other, which form pivots or trunnions d, on which the head can turn. These studs or bosses may be cast with the plates or disks, or they may be independent pieces suitably secured to each plate or disk. The openings a a' are located near the outer edge or periphery of each plate or disk and on each side of a vertical line passing through the pivotal centers d and may extend entirely through the plate or only partly through, but are to be of sufficient depth to furnish a firm attachment for the links or stirrups.

The links or stirrups B B' are to be made of wrought-iron or other suitable material which will not bend or break easily under heavy strain, and in form they may be round, square, oval, or other shape. Each link or stirrup is formed, as shown, of a continuous piece of iron bent so as to have side bars, b, and an end bar, b', with inwardly projecting or turned ends at the open end of each side bar, which form the means for attaching the link or stirrup to the head, the ends b'' entering the openings a or a' for the respective links B B'.

The rack-bar D may be made of cast-iron or other suitable material which can be cast or otherwise formed into shape to have two faces or edges opposite each other, having thereon

openings or notches *c* formed by teeth or leaves having curves or inclined faces *c'*, and having on the remaining faces grooves or recesses *D'*, extending from end to end of the bar. The upper end of the rack-bar is to be provided with a cap or head (not shown) to form a rest or support for the object to be lifted, which head or support may be in the form of a plate or some other form adapted for the purpose.

The standards or supports *E* may be made of wrought-iron or other suitable material which will not bend or break easily under heavy pressure. The main or body portion of these standards or supports are inclined, as shown, so as to spread the lower ends apart and furnish a wide bearing, and their upper ends are curved or bent inward, and extend upward in a vertical or straight line, so as to form straight parallel portions *E'*, in each of which is an opening, *e*, corresponding in diameter to the diameter of the pivots or trunnions *d*, to receive such pivots or trunnions, and attach or connect the head *A* to the standards, so that it is free to turn on its connection. These ends *E'*, when the parts are together, come on opposite sides of the rack-bar *D* and fit into the groove or recess *D'*, the depth and width of the groove corresponding to the width and thickness of the ends *E'*, so as to present an even surface when the ends are in the grooves.

The base-plate *F* may be of cast-iron or other suitable material, and may be of a circular form, as shown, or of a square, rectangular, or other form having sufficient dimensions to furnish a bearing-surface to support the jack and prevent it from tipping easily in use. The supports or standards *E* *E'*, at their lower ends, are secured to this base *F* by means of bolts *f*, as shown, or in some other suitable manner.

The reversing arm or lever *G* may be made of cast-iron or other suitable material which can be cast or otherwise formed into a stirrup or yoke shape, having an open end, with side bars, and an end bar uniting the side bars, the side bars being so formed that the arm or lever can be turned up into the space between the links *B* *B'*, or turned down in contact, or nearly so, with the face of the standard *E*. Each side bar of this arm or lever is provided with a slot, *g*, to receive a pin or stud, *h*, on each end of a support or bracket, *H*, secured to the standard or support *E*. Each side bar of the arm or lever *G* at the open end is provided with an upwardly-projecting wing or leaf, *i*, the edge of which is formed into a cam, *j* *k*, the shape of which is such that when the arm or lever *G* is depressed the portion *j* of the cam will be in position for the lifting link or stirrup to come in contact therewith and throw the stirrup out, so that the end bar, *b'*, will disengage from the notch or opening *c* when the link has an upward movement, and when the lever or arm *G* is raised the portion *k* of each cam will be in position to allow each link to drop and engage with a notch or opening, *c*, when the links have an upward movement.

The bracket or support *H* may be made of cast-iron or other suitable material, having a main or body portion, with a suitable opening for the passage of the screw or other means for attaching the bracket to the standard or support *E*, the bracket or support having on each side lugs or projections which form pintles *h* to enter the slots *g*, and attach the arm or lever in position. These pintles *h* and the slots *g* secure the arm or lever *G* so that it can be thrown down to bring the cams on the wings or side extensions, *i*, into position to cause a disengagement of the links, or be raised to permit the engagement of such links on their upward movement.

The parts composing this jack are very simple in their construction, and at the same time, when put together, they form an apparatus which possesses the features of strength and great raising power. The parts are put together very easily and readily. The standards *E* *E* are bolted or otherwise securely fastened to the base, so as to be on opposite sides thereof and in line with each other, bringing their upper ends, *E'*, adjacent to and in line with each other. The head *A* is slipped over the ends *E'*, on the outside thereof, bringing the ends within the opening or slot *C*, and the pivots or trunnions *d* are inserted in the openings *e* of the ends *E'*, attaching the head to the standards or supports, so that it is free to turn on its pivots or trunnions. The rack-bar *D* is then inserted between the ends *E'*, the ends entering the grooves or recesses *D'* therefor on each face or side of the bar, the links *B* *B'* being thrown out or held out so that the rack-bar can descend quickly, although it can be made to descend, as hereinafter described, for lowering it after it has been raised. The links *B* *B'* are sprung into place or hung by inserting the turned-in ends *b''* into the respective openings *a* *a'* so that the links will hang on their respective sides of the rack-bar, and this operation may be performed either before or after the head *A* has been placed in the standards *E*.

The wings *i* of the reversing-lever have their faces *j* curved, so that when the arm or lever *G* is depressed this curved face *j* will coincide with the curve of the teeth on one side of the rack-bar, while the opposite wing will come over the depression on the opposite side of the rack-bar and cause the links to be non-acting in an upward direction, but retaining their hold in a downward direction, thereby lowering the rack-bar. The other face, *k*, of these wings is cut away, so that when the lever is raised this cut-away portion will be in position to allow the links to drop into position for engagement with the notches or recesses on opposite sides of the rack-bar alternately, thereby raising the bar by the upward movement of the link.

Figs. 4 and 5 show the reversing-lever in position for raising, and Figs. 1 and 2 show such lever in position for lowering.

In operation, when it is desired to use the jack for lifting purposes the reversing-lever is

thrown up into the position shown in Fig. 5, bringing the portion *k* of the wing *i* on each side adjacent to the face of the rack-bar, and in position to leave the teeth of the rack-bar open for the engagement therewith of the links, the link B dropping into the openings *c* successively on its side of the rack-bar, and the link B' dropping into the openings *c* successively on its side of the rack-bar, each link alternately engaging with its respective openings. The link B, in the form of construction shown, engages with the openings *c* on its side of the rack-bar at the terminus, or nearly so, of the upward movement of the actuating-lever, during which movement of the lever the link B' will be engaged with one of the openings *c* on its side of the rack-bar, and the link B' engages with the openings *c* on its side of the rack-bar at the terminus, or nearly so, of the downward movement of the actuating-lever, during which time the link B will be engaged with one of its openings *c*. As shown in Fig. 5, the actuating-lever is depressed and the link B' is passed into its opening or recess *c*, the link B having completed its upward movement and being in the opening or recess with which it was engaged in such movement, the rack-bar being shown partly raised by the previous movement of the actuating-lever. As the actuating-lever is raised the link B' will be carried up, raising the rack-bar by reason of the engagement of the cross-bar *b'* with the opening or recess *c*, and at the same time the link B will be lowered, the cross-bar *b'* thereof passing over the face *c'* of the next succeeding tooth or opening on that side, and when the upward movement ceases the link B' will have raised the rack-bar the distance of one tooth, and will be engaged with the tooth or opening with which it coacted, and the link B will have passed the end of the face *c'* of the succeeding tooth on that side and entered the next succeeding opening. The reverse movement of the actuating-lever causes the link B to have an upward movement, raising the rack-bar by reason of the engagement of the cross-bar *b'* of such link B with the opening or recess *c*, the link B' at the same time having a descending movement and passing over the face *c'* of the next succeeding tooth on that side, the links B and B' at the terminus of the reverse or downward movement of the actuating-lever being brought into the position shown in Fig. 5 in reference to the next succeeding tooth on the rack-bar. This alternate engaging of the links B B' with their respective teeth or notches raises the rack-bar the distance of two teeth or notches at each up-and-down stroke of the actuating-lever, and these movements can be continued until the rack-bar has been raised the desired extent. When it is desired to lower the rack-bar after it has been raised the reversing-lever G is lowered or brought into the position shown in Figs. 1 and 2, and the actuating-lever operated in the same manner as when elevating the rack-bar, but with a reverse effect, each link being made alternately to engage with

the preceding tooth or recess on its side, instead of with the succeeding, by the action of the cam-face *j* of the respective wings *i*, which act to disengage the links from their respective notches or teeth and allow them to pass into the next preceding notch or tooth.

As shown in Fig. 1, the actuating-lever is at the limit of its downward movement, the link B being engaged with its notch, and the link B' being disengaged from its notch by being thrown outward by the cam-face *j* of its wing *i*. As the lever is raised the link B will come in contact with the face *j* of its wing *i*, and be carried outward by the action of such face, and at the same time the link B' will drop back and pass over the face *c'* of the preceding tooth, so that at the termination of the upward movement of the lever the link B will be disengaged from its opening or tooth, and the link B' will be engaged with its opening or tooth, the result being the lowering of the rack-bar by the movements of the actuating-lever the distance of two teeth at each up-and-down movement of the lever, which movement can be continued until the rack-bar has been lowered. By this arrangement it will be seen that the same devices can be used for both raising and lowering the rack-bar by simply changing the position of the lever G, and other forms of devices than the wings *i*, having the faces *j k*, can be used for the purpose of reversing the movement of the rack-bar, so long as such devices will act to engage or disengage the links as required to produce the movement in either direction.

As shown, the links B act as lifting-links; but it is evident that by reversing their position and using a spring or other means to throw them into engagement with the teeth of the rack-bar they could be made pushing-links.

By arranging the links, as shown and described, on each side of a vertical line passing through the pivotal center of the carrying-head it will be seen that the arc of the circle which their upper ends describe does not extend but a short distance on either side, so that the links will act in a direct or nearly direct line; and it will also be seen that owing to the slight distance which the attached end of the link passes to one side of the center of motion but little power will be required to return or raise the link to its normal position, and at the same time the lifting power is increased by reason of the almost direct action of the link.

The distance of each lift can be varied by increasing or decreasing the diameter of the carrying-head and the distance between the teeth on the rack-bar, and arranging the links accordingly. The carrying-head being supported on pivots, and the links being located one on each side of a vertical line passing through the pivotal center of the head, it is obvious that the lowering of either link does not carry the upper end thereof but a short distance outside of the center of gravity, so that in order to return each link to its normal

position requires the exertion of but little force on the actuating-lever. When the links are hung as shown their lower ends will drop into position for use by the action of gravity, which  
5 tends to swing such lower ends inward in line with the pivot; but, if desired, springs might be used to insure the engagement.

In place of the openings *a a'*, pins or studs might be used, in which case the upper ends  
10 of the links *B B'* would be provided with eyes or openings to receive such pins.

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

The combination, with the standards, rack-bar, pivoted lever-head, and stirrups or links, 15 of the bracket or support *H*, projecting from one of the standards and having pins *h*, and the reversing arm or lever *G*, provided with wings *i*, cams *j k*, and slots *g*, by which said reversing-lever is adjustable upon the pins or 20 studs *h*, as and for the purpose set forth.

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Witnesses:

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EDGAR T. BOND.