

UNITED STATES PATENT OFFICE.

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JACK.

No. 891,579.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, BURT C. WILLIAMS, a citizen of the United States of America, residing at Detroit, in the county of Wayne and State of Michigan, have invented certain new and useful Improvements in Jacks, of which the following is a specification, reference being had therein to the accompanying drawings.

10 This invention relates to lifting jacks of the ratchet lever type, and especially to a construction wherein there is self releasing means by which a load may be gradually lowered as well as raised, without special
15 adjustment by the operator.

The invention consists in the matters hereinafter set forth, and more particularly pointed out in the appended claims.

20 In the drawings, Figure 1 is a view in side elevation of a lifting jack that embodies the principal features of the invention, showing the parts as engaged when lifting a load. Fig. 2 is a view of the operating parts as engaged when lowering a load, and Fig. 3 is a
25 transverse section on the line $x-x$ of Fig. 1.

Referring to the drawings, 1 represents an upright, substantially rectangular pedestal, preferably of metal, ribbed and flanged for strength and lightness, and provided with an
30 enlarged base or foot 2. A standard 3 longitudinally reciprocable in the pedestal, rests on or is carried by an oscillatory lever 4 which extends through longitudinal guide slots 5 in the pedestal, and is centered therein
35 by a cross-pin 6 which engages longitudinal grooves 7 in the pedestal. Oppositely disposed depending pawls 8 are pivoted on the lever on either side of the pedestal to engage parallel ratchet racks 9, formed on or se-
40 cured to the margins of the pedestal. A spring 10 in tension between the lower ends of the pawls holds them in engagement with the ratchets, so that rocking of the lever raises the standard with a step-by-step
45 movement.

To obtain retrograde movement of the standard, auxiliary shifting springs 11 and 12 are each secured by pivot arms 13 and 14 to the lever 4 between the pawls and are held in
50 compression against the pawls in opposition to the spring 10. A suitable link and lever connection 15, pivoted to an arm 16 carried by the cross-pin 6 in its slot 7, articulates the spring arms so that lateral motion of a stud
55 17 on the connection causes them to con-

verge or diverge. The stud has a friction roller 18 which travels in a vertical cam path 19 channeled in or formed on the proximate face of the pedestal. This path is a broad groove which is divided longitudinally for a
60 portion of its length by a thin rib 20 which has oppositely oblique spring arms 21 and 22 at each end so disposed that they close by the roller 18 when the latter passes them.

The auxiliary springs and their connections are so adjusted that when the roller is in the inner branch of the cam path as in Fig. 1, the main spring overcomes the auxiliaries, and holds the pawls in engagement with the
65 ratchets for upward movement when the lever is oscillated. When the cam roller has reached the point just before it passes above the cam spring, if the right hand pawl is the pivot and the left hand lever is being raised, the roller forces its way by the cam spring
70 which snaps in by it and the pawl on the left presses into the ratchet rack provided the operator does not allow the pawl to catch the tooth above it, but does not settle into the shoulder of the tooth below it until the lever
75 on the left starts to descend. As soon as this happens the curved end of the spring wedges the roller out, forces the pawl off the rack, so that the pawls are further apart than the distance between the pitch lines of the
80 two racks. Consequently the oscillation of the lever on one pawl causes the free pawl to miss the tooth directly opposite the engaged tooth, but to seat itself on the next lower tooth, as it describes a descending arc whose
85 center is the pivot center of the other pawl. This movement is repeated by the other pawl, so that the lever lowers the standard by a step-by-step movement until the lower cam spring 22 reverses the relation of the
90 pawl springs and the upward movement recommences. Thus repeated oscillations of the lever cause the standard to alternately rise and fall through a space determined by the length of the central cam path rib and
95 its position on the pedestal. Accordingly, the cam path 19 is elongated and the rib 20 adjustably secured in the central slot 23 by a set-screw 24 or the like, while the lever cross-pin 6 is provided with a thumb-nut 25
100 or like clamping means. Thus the upward movement may be extended by momentarily clamping the lever as the pawl stud approaches the upper cam spring arm, and sliding the cam rib up and refastening it. 110

Similarly the downward movement may be extended. Thus the jack can be run up or down to accommodate different work. When once adjusted thus to the load, oscillation of the lever throws the load onto the jack and then, if continued, releases the jack, without special effort of the operator. The load is never dropped, but is firmly supported while being lowered.

It is evident that the reversing cam path may be formed on the interior face of the pedestal and the spring arms and connections housed within the pedestal if desired.

Removable extension handles may be inserted in sockets in the ends of the lever, and the other usual accessories provided.

One of the features of the invention is the positive spring action of the pawls so that they do not depend on gravity and consequently may be operated when the jack is inclined or horizontal. Another feature is the self-releasing of the pawls so that the load is raised by the oscillation of the lever, held rigid by stopping the lever, and then lowered by repeating the oscillation without other adjustment.

Obviously the details of construction may be varied without departing from the spirit of the invention, and I do not care to limit myself to any particular form or arrangement of parts.

What I claim as my invention is:—

1. A lifting jack comprising a pedestal, a standard movable therein, an oscillatory member operating the standard, having an intermittent movement longitudinally of the pedestal, and automatic means adapted to periodically reverse the direction of the intermittent motion of said oscillatory member in the pedestal.

2. A lifting jack comprising a pedestal, a standard movable therein, a member operating the standard, oscillatory on a fulcrum which it automatically shifts longitudinally along the pedestal, and automatic means on the pedestal adapted to periodically reverse the direction of motion of the fulcrum on the pedestal.

3. A lifting jack comprising a pedestal, a standard movable therein, a member operating the standard, oscillatory on a fulcrum which it automatically shifts longitudinally along the pedestal, and automatic means on the pedestal adapted to periodically reverse the direction of motion of the fulcrum on the pedestal, longitudinally adjustable on the pedestal.

4. A lifting jack comprising a pedestal, a standard movable therein, a member operating the standard, oscillatory on a fulcrum which it automatically shifts longitudinally along the pedestal by a step-by-step movement, and automatic means on the pedestal adapted to periodically reverse the direction of motion of the fulcrum on the pedestal, longitudinally adjustable on the pedestal.

5. A lifting jack comprising a pedestal, a standard movable therein, a lever operating the standard, oscillatory on a fulcrum which it automatically shifts along the pedestal, and automatic means on the pedestal adapted to periodically reverse the direction of motion of the fulcrum on the pedestal.

6. A lifting jack comprising a pedestal, a standard movable therein, a lever operating the standard, oscillatory on a fulcrum which it automatically shifts by a step-by-step movement along the pedestal, and automatic means on the pedestal adapted to periodically reverse the direction of motion of the fulcrum on the pedestal, longitudinally adjustable on the pedestal.

7. A lifting jack comprising a pedestal, a standard longitudinally movable therein, oppositely disposed racks on the pedestal, a lever operating the standard, oscillatory in the pedestal, opposite fulcrum pawls on the lever engaging the racks, and means on the pedestal adapted to periodically move the pawls farther apart than the pitch lines of the racks.

8. A lifting jack comprising a pedestal, a standard longitudinally movable therein, parallel oppositely disposed ratchet racks on the pedestal, a lever operating the standard, oscillatory in the pedestal, opposite fulcrum pawls on the lever, in spring pressed yielding engagement with the racks, spring arms on the lever adapted to spread the pawls farther apart than the pitch lines of the racks, and automatic means on the pedestal adapted to periodically throw said arms into operative engagement with the pawls.

9. A lifting jack comprising a pedestal, a standard longitudinally movable therein, parallel, spaced, oppositely disposed ratchet racks on the pedestal, a lever operating the standard, oscillatory in the pedestal, oppositely disposed fulcrum pawls pivoted on the lever, in spring pressed yielding engagement with the racks, spring arms pivoted on the lever adapted to spread the pawls farther apart than the pitch lines of the racks, spreading means articulating the arms, and means on the pedestal adapted to periodically operate the spreading means.

10. A lifting jack comprising a pedestal, a standard longitudinally movable therein, parallel, spaced, oppositely disposed ratchet racks on the pedestal, a lever operating the standard, oscillatory in the pedestal, oppositely disposed fulcrum pawls pivoted on the lever, in spring-pressed yielding engagement with the racks, spring arms pivoted on the lever adapted to spread the pawls farther apart than the pitch lines of the racks, link and lever connections articulating the arms adapted to spread them and a cam path on the pedestal adapted to engage and to periodically operate the said connections.

11. A lifting jack comprising a pedestal, a

standard longitudinally movable therein, parallel, spaced, oppositely disposed ratchet racks on the pedestal, a lever operating the standard, oscillatory in the pedestal, oppositely disposed fulcrum pawls pivoted on the lever, in spring-pressed, yielding engagement with the racks, spring arms pivoted on the lever adapted to spread the pawls farther apart than the pitch lines of the racks, link and lever connections articulating the arms adapted to spread them, a cam on the connections and a cam path on the pedestal adapted to engage and to periodically operate the said cam.

12. A lifting jack comprising a pedestal, a standard longitudinally movable therein, parallel, spaced, oppositely disposed ratchet racks on the pedestal, a lever operating the standard, oscillatory in the pedestal, oppositely disposed fulcrum pawls pivoted on the lever, in spring pressed yielding engagement with the racks, cam operated spring arms pivoted on the lever adapted to spread the pawls farther apart than the pitch lines of the racks, and a cam path on the pedestal consisting of a groove, a longitudinal central rib adjustably secured therein, and oppositely inclined cam spring arms secured to the ends of the rib lying in the groove, operatively engaging the spring arms.

13. A lifting jack comprising a pedestal, a standard longitudinally movable therein, a lever oscillatory in a longitudinal guide slot in the pedestal, centered by a cross pin movable in longitudinal grooves in the pedestal, opposite, longitudinally disposed parallel ratchet racks on the pedestal, oppositely disposed fulcrum pawls pivoted on the lever, a spring member adapted to yieldingly maintain the pawls in engagement with the racks, a pair of oppositely disposed spring arms pivoted to the lever, adapted to spread the

pawls farther apart than the pitch lines of the racks, lever and link connections between the arms, adapted to force them apart, a cam roll on the connections, and a cam path on the pedestal operatively engaging the roll, adapted to be shifted longitudinally on the pedestal.

14. A lifting jack comprising a substantially rectangular hollow pedestal, parallel longitudinal guide slots therein, a lever extending transversely through the guide slots, centered by a cross pin engaging parallel longitudinal grooves in the pedestal wall, a pair of oppositely disposed upwardly releasing ratchet racks secured in spaced relation on the pedestal, parallel to the pin grooves, oppositely disposed fulcrum pawls each pivoted on the lever in operative relation to a rack, a spring adapted to yieldingly maintain the pawls in operative relation to the rack, spring arms pivoted to the lever adapted to spread the pawls farther apart than the pitch lines of the racks, link and lever connections, articulated to the pawls, pivoted on the crosspin, adapted to spread the spring arms simultaneously on the connections, a cam path consisting of a straight, longitudinally disposed channel in the pedestal face adjacent the pawl lever, a longitudinal central rib in the channel adjustable therein, and oppositely inclined spring arms each secured at one end to an end of the rib, adapted to alternately move the roll from side to side of the channel around the end of the rib.

In testimony whereof I affix my signature in presence of two witnesses.

BURT C. WILLIAMS.

Witnesses:

C. R. STICKNEY,
A. M. DORR.