I. E. HINDMAN.

JACK.

APPLICATION FILED NOV. 7, 1912.

1,093,269.

Patented Apr. 14, 1914.

2 SHEETS—SHEET 1.

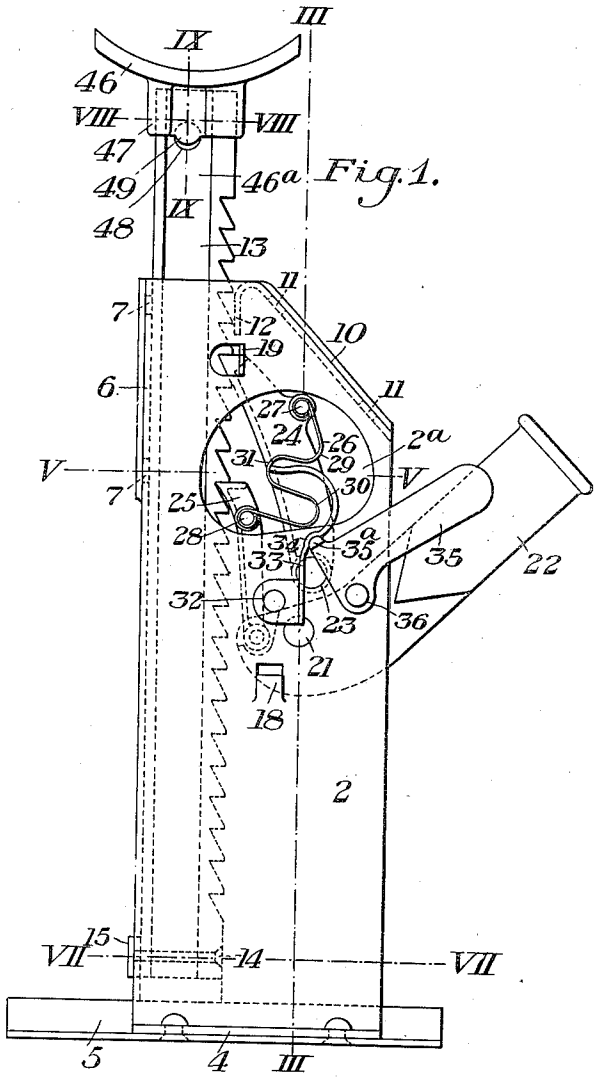


Fig. 1.

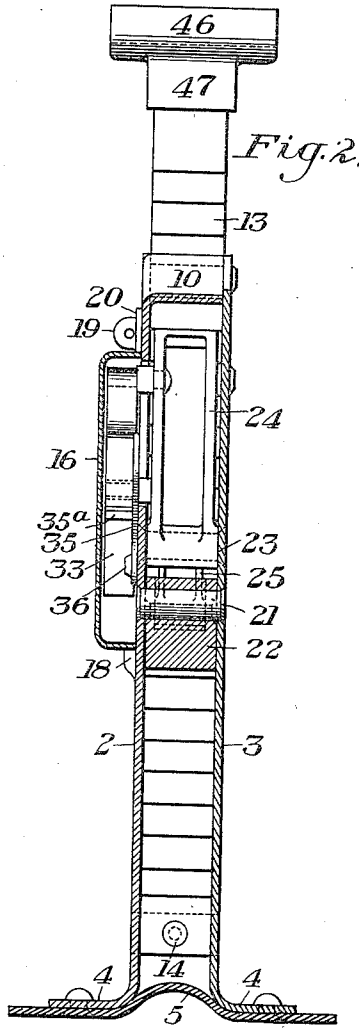


Fig. 2.

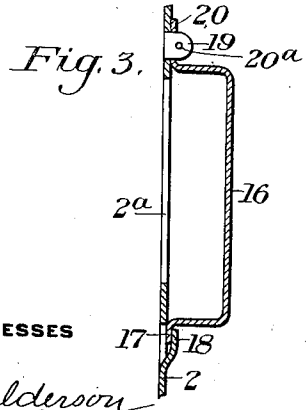


Fig. 3.

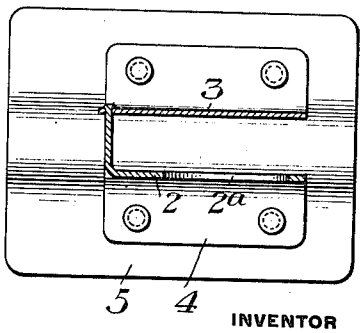


Fig. 4.

WITNESSES

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2 SHEETS-SHEET 2.

Fig. 5.

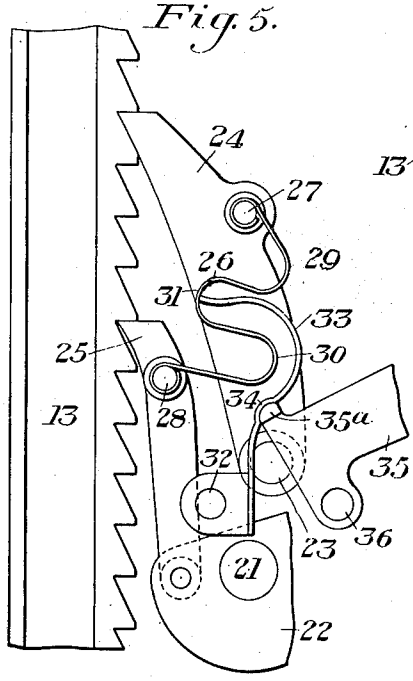


Fig. 6.

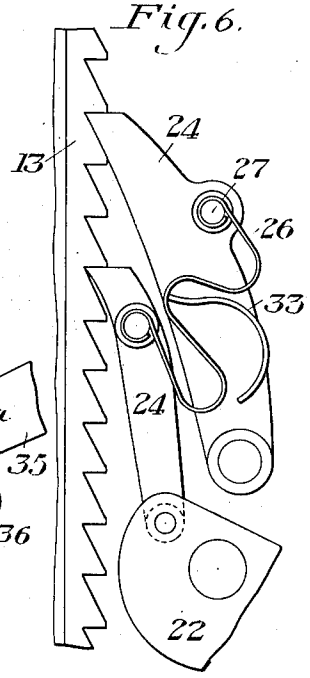


Fig. 7.

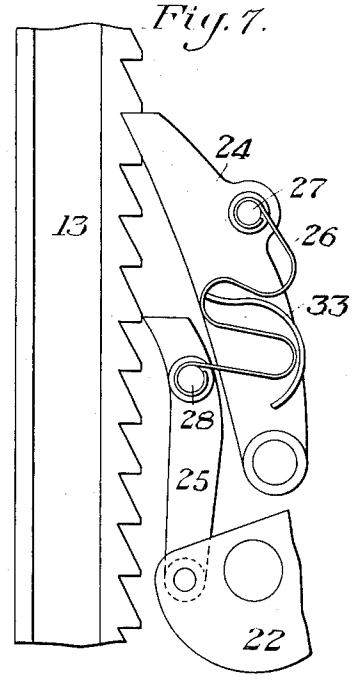


Fig. 8.

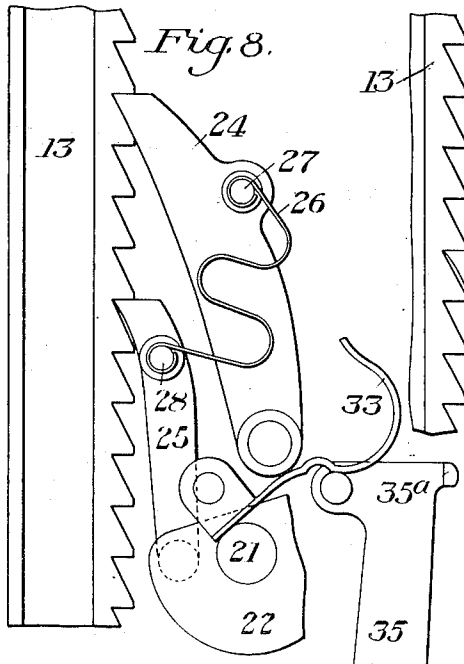


Fig. 9.

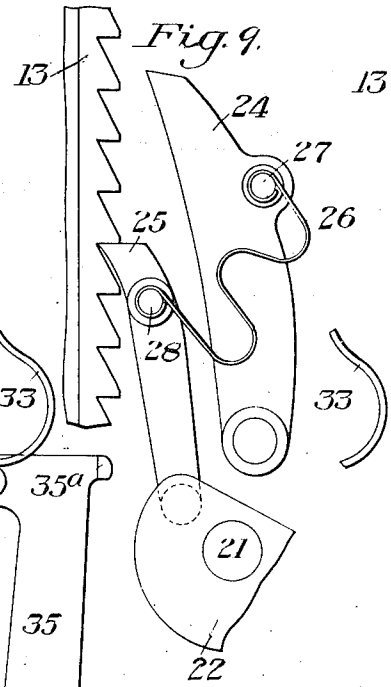
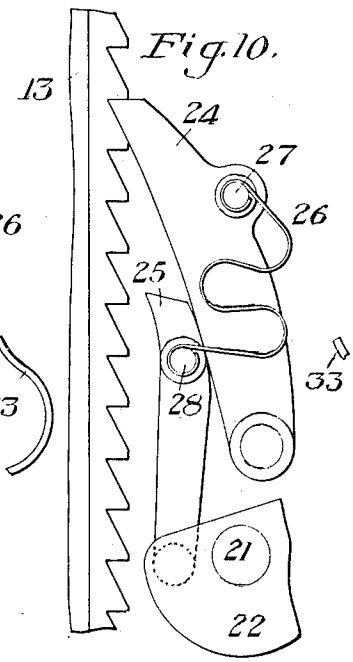


Fig. 10.



WITNESSES

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UNITED STATES PATENT OFFICE.

ISAIAH E. HINDMAN, OF CRAFTON, PENNSYLVANIA, ASSIGNOR TO THE DUFF MANUFACTURING COMPANY, OF PITTSBURGH, PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA.

JACK.

1,093,269. Specification of Letters Patent. Patented Apr. 14, 1914.

Application filed November 7, 1912. Serial No. 729,978.

To all whom it may concern:

Be it known that I, ISAIAH E. HINDMAN, a resident of Crafton, Allegheny county, Pennsylvania, have invented a new and useful Improvement in Jacks, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a side elevation of the jack with the cap removed; Fig. 2 is a sectional view on the line III—III of Fig. 1; Fig. 3 is a detail sectional view showing the cap secured to the side portion of the frame; Fig. 4 is a sectional view of the frame on the line V—V of Fig. 1; Figs. 5 to 10, inclusive, are detail side elevations of the pawls and portions of the rack bar, showing the pawls in the various positions during the raising and lowering of the lifting or rack bar.

This invention relates to lifting jacks of the ratchet type, and is designed to provide a construction which can be cheaply made and assembled.

A further object of my invention is, to provide operating mechanism of simple and efficient character in which a single spring is arranged to control both pawls in both the raising and lowering movements of the jack.

Another object of my invention is, to provide a novel form of actuating spring, together with means coöperating therewith, whereby the spring may be given the required different actions in raising and lowering the load.

The precise nature of my invention will be best understood by reference to the accompanying drawings, which will now be described, it being premised, however, that various changes may be made in the details of construction and arrangement of the several parts, without departing from the spirit and scope of my invention, as defined in the appended claims.

Referring to the accompanying drawings, the numerals 2 and 3 designate the sheet metal side members of the jack frame. The lower ends of these side members are provided with laterally extending feet 4, which are secured to a base plate 5. The side member 3 is provided with two rectangular openings along one of its longitudinal edges, and is also provided with two similar openings along its inclined top portion. The side member 2 is provided with a laterally extending front member 6 at its upper end, having two rectangular projections 7, which extend through two of the openings in the side member 3. The top of the jack at the rear of the lifting bar is closed by means of a laterally extending member 10 on the side member 2, which is provided with projections 11, extending through rectangular openings in the member 2. Formed integrally with the top 10 and extending downwardly therefrom is a projection 12 which extends within the casing and forms a bearing for the rear portion of a lifting bar 13. The front portion of the lifting bar engages the extension 6 on the side 2, and also the inwardly turned flanges 6^a on the members 2 and 3, these parts constituting means to prevent the lifting bar from moving outwardly in a forward direction. The flanges 6^a also form stiffening ribs for the frame.

Connected to the lower end of the lifting bar 13 by means of a rivet 14 is a flanged plate 15, the flanges of which engage the flanges 6^a of the members 2 and 3, and thereby hold the lifting bar against rearward movement. The flanged plate is also arranged to engage the lower edge of the front member 6 at the limit of the upper movement, the engagement of these parts forming a stop.

The side member 2 is provided with a lateral opening 2^a, closed by a removable casing or cap 16, provided with a downwardly extending projection 17.

18 and 19 are nibs which are struck outwardly from the side member 2.

The cap is provided with an upwardly extending projection 20, having an opening for the reception of the nib 19; and is placed in position by first engaging the projection 18 with the projection 17 on the casing; the cap is then moved inwardly at the top, so that the nib 19 passes through the opening in the projection 20 on the cap, and is secured by means of a cotter pin 20^a passing through an opening in the nib 19.

Pivotally mounted at 21 in bearings in the side members 2 and 3, is a socket lever 22; and pivotally mounted at 23 in bearings in the side members 2 and 3, is a retaining pawl 24. The socket lever 22 has pivoted thereto a lifting pawl 25.

26 designates a leaf spring, one end of which is looped around a pin 27 on the re-

taining pawl, while the other end is looped about a pin 28 on the lifting pawl. This spring is provided with two outwardly extending bends 29 and 30 adjacent to the pins 27 and 28 respectively, and is also provided with an inwardly extending bend 31 between the pins 29 and 30. Pivotally mounted at 32 on the member 2 is a lever 33, which is provided with an indent 34.

35 is a shifting and locking lever for the lever 33, pivoted at 36 to the side member 2. This lever 35 is provided with a projection 35ª, which is arranged to engage the curved portion of the lever 33 when shifting the lever to the position shown in Fig. 10, and to then engage the indent 34 to retain the lever 33 in its shifted position.

The parts are assembled by first placing the operating members in proper position with relation to the member 2 or 3, the other member being then inserted in place so that the rectangular projections on the extensions 6 and 10 extend through the openings in the member 3. These projections are then peened over, or riveted, to secure the two members to each other. The side members 2 and 3 are then secured to the base 5.

Assuming the parts to be in the position shown in Fig. 5, in which the socket lever has been raised to lower the lifting pawl 25, and the load is held by the retaining pawl 24:—The socket lever is now lowered to raise the lifting pawl to move the member 13 a distance slightly greater than the length of one tooth; and as soon as the retaining pawl passes the next tooth from that which it engages in Fig. 10, the upper portion of the spring 26 will move the pawl under said tooth to retain the load. (See Fig. 6). The socket lever is then raised to lower the lifting pawl, (see Fig. 7), and as soon as said lifting pawl passes the next tooth, the lower portion of the spring 26 will move the pawl under the tooth for the next raising movement, as shown in Fig. 5. This step-by-step motion is repeated until the load has been lifted to a predetermined point. When it is desired to lower the load, the lever 35 is shifted to permit the lever 33 to assume the idle position shown in Figs. 8, 9 and 10, so that the spring 26 is freed therefrom and merely engages the pins 27 and 28 on the pawls 24 and 25, respectively.

With the parts in the position shown in Fig. 8, the load has just been stopped by the retaining pawl, and the pawl 25 has not been fully relieved; but any further upward movement of the lever 22 will move the pawl 25 downwardly from the tooth on the bar 13. As soon at it has cleared said tooth, the spring 26, which is now under slight tension, will pull said pawl 25 to the position shown in Fig. 10. The socket lever is now lowered, which raises the lifting pawl; and during its upward movement, the pins 27 and 28 are moved toward each other, thereby placing the spring 26 under compression and forcing the pawl 25 under the third tooth below the tooth engaged by the holding pawl. As soon as it engages said tooth, any further movement thereof will relieve the load from the lifting pawl, and the spring 26 being now under compression, the holding pawl 24 will be moved outwardly, as shown in Fig. 9. When the socket lever is then raised to lower the load by means of the pawl 25, the pawl 24 will be drawn inwardly by means of the spring 26, and will engage the fourth tooth above the tooth engaged by the pawl 25, to support the load after the bar 13 has been moved downwardly the distance of one tooth. This operation is repeated until the load has been lowered to a predetermined point.

It will be observed that with the spring controlling member 33 in the position which it occupies in raising the load as shown in Figs. 5, 6 and 7, the spring in fact becomes two separate springs, the bearing of its central loop against the member 33 becoming a fixed and neutral point, and each end portion of the spring acting as a separate spring. When, however, the controlling member 33 is moved to the position shown in Figs. 8, 9 and 10, the entire spring acts as a single spring.

The advantages of my invention result, first, from the provision of a sheet metal frame construction, which can be cheaply constructed and assembled; second, from the provision of a novel form of actuating mechanism whereby a single spring is made to control the action of both pawls in both raising and lowering the load; and, third, from the employment of a spring and means coöperating therewith whereby the spring acts as two separate springs in raising the load and as a single spring in lowering the load.

Certain novel features herein shown and described form the subject matter of a divisional application, Serial No. 729,978 filed March 10, 1913.

I claim:

1. A jack having a lifting pawl, a holding pawl, and a spring connected to both pawls and alternately placed under compression and tension by the operating movements of the pawls in lowering the load, and a movable device arranged to engage said spring to cause each end of the spring to act independent of the other when raising the load; substantially as described.

2. A jack having a lifting bar, a pivoted lever connected to the frame of the jack, a lifting pawl pivotally connected to said lever, a holding pawl pivoted to the frame of the jack, a leaf spring having a central loop connected to the pawls, said spring being arranged to be alternately placed in compres-

sion and tension during the movement of the pawls in lowering the lifting bar to alternately withdraw the pawls from the lifting bar and to move them into engagement therewith, and a control device arranged to engage the central portion of the spring within the recess to permit each end of the spring to act independently of the other when raising the lifting bar; substantially as described.

3. A jack having a lifting pawl, a holding pawl, a single leaf spring connecting the two pawls and alternately placed in compression and tension by the operating movement of the pawls when lowering a load, and a lever for changing the action of said spring, so that said spring will move both pawls in the same direction when raising a load; substantially as described.

4. In a single-acting jack, the combination with a frame and a socket lever pivoted thereto, of a lifting pawl pivoted to the socket lever, a holding pawl pivoted to the frame, and a leaf spring connected to said pawls which is alternately placed under compression and tension by the operating movement of the pawls in lowering the load, and a shifting lever for engaging the spring at approximately its central portion to reverse the action of the pawls to lower the load; substantially as described.

5. A lifting jack having a lifting pawl, a holding pawl, a single-leaf spring connecting the two pawls and alternately placed under compression and tension by the operating movement of the pawls when lowering the load, said spring having a loop at its intermediate portion, and a lever for engaging the spring within the loop to change the action of the spring so that the spring will move both pawls in the same direction when raising a load; substantially as described.

6. A jack having a lifting pawl, a holding pawl, and a single spring pivotally connected at its ends to the two pawls, said spring having a central loop, and means for engaging the central loop to permit each end of the spring to act independent of the other when raising the load: substantially as described.

7. A lifting jack having a lifting pawl, a holding pawl, and a single spring pivotally connected at its ends to the two pawls, said spring being arranged to act alternately in compression and tension from end to end when lowering the load, and means for engaging said spring to permit each end to act independent of the other when raising the load; substantially as described.

In testimony whereof, I have hereunto set my hand.

ISAIAH E. HINDMAN.

Witnesses:
JESSE B. HELLER,
H. M. CORWIN.