July 20, 1926. 1,593,217

M. B. LUCKER

DOUBLE LIFT JACK

Filed July 20, 1925

Fig. 1.

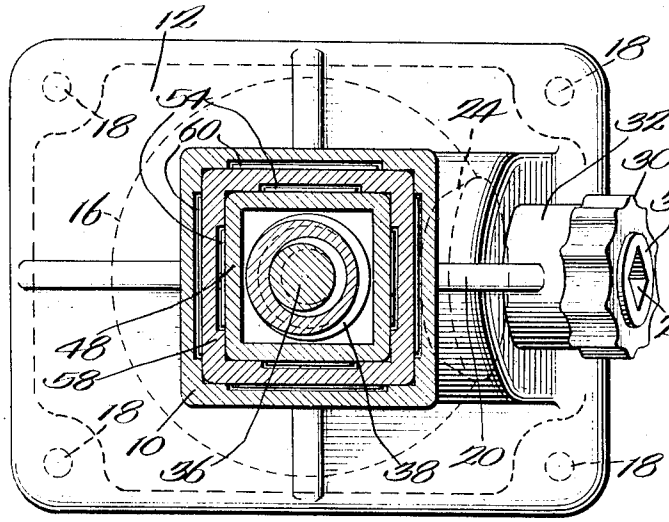


Fig. 3

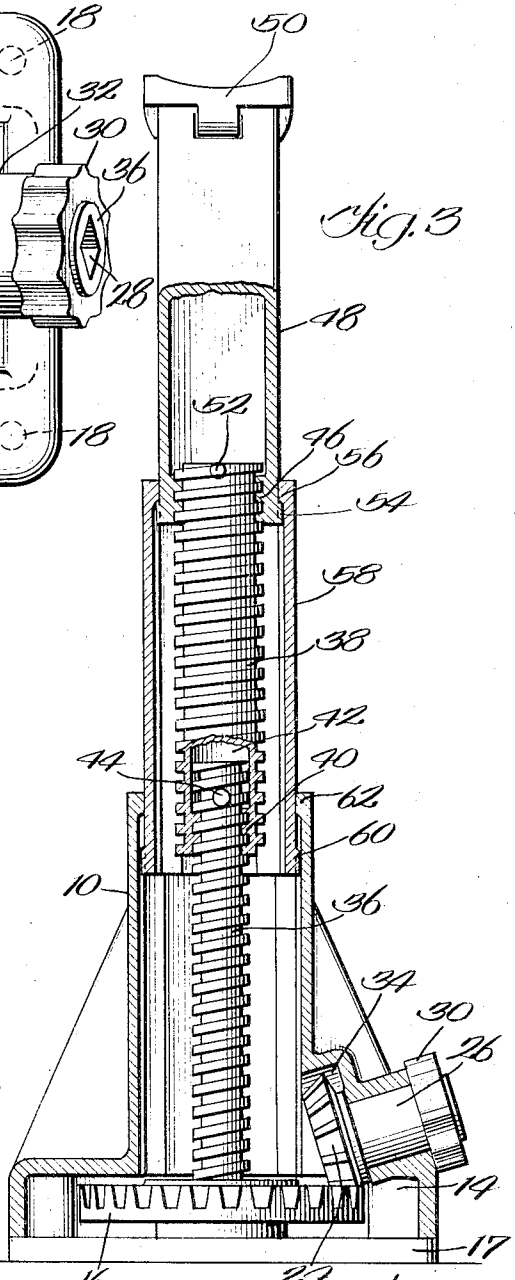
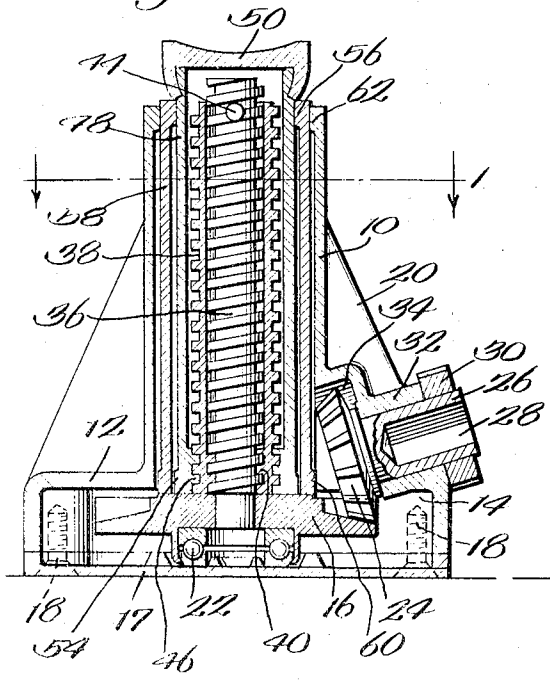


Fig. 2.



Inventor:
Millard B. Lucker
By Cheever & Cox Attys.

Patented July 20, 1926. 1,593,217

UNITED STATES PATENT OFFICE.

MILLARD B. LUCKER, OF BENTON HARBOR, MICHIGAN, ASSIGNOR TO AUTO SPECIALTIES MFG. CO., OF SAN FRANCISCO, CALIFORNIA, A CORPORATION OF CALIFORNIA.

DOUBLE-LIFT JACK.

Application filed July 20, 1925. Serial No. 44,818. REISSUED

This invention relates to lifting jacks for heavy loads and particularly to those of the double lift type which can be collapsed into an extremely small compass for transportation and storage in an automobile or the like.

The invention consists in mechanism for attaining the foregoing and other objects hereinafter more fully set forth in the specification and claims.

Referring to the drawings in which like numerals refer to the same parts throughout the several views:

Figure 1 is a plan view taken in section on the line 1—1 of Figure 2.

Figure 2 is a central, sectional side elevation of the mechanism of Figure 1, showing the parts in collapsed position.

Figure 3 is a view similar to Figure 1, showing the jack extended to its maximum load carrying capacity.

In the preferred form of the mechanism, shown in the drawings, a retaining base is provided comprising an upstanding, hollow portion 10 open at its top and communicating at its bottom with a horizontal case member 12, having in it a recess 14 for the reception of the main driving gear 16 of the jack. The gear chamber 14 is closed by a bottom plate 17 detachably secured in place as shown by any suitable means as, for instance, the screws 18. The two base portions 10 and 12 are braced at four points 90° apart by cast webs 20 of conventional form with the result that the case as a whole is amply able to withstand all load strains which may be imposed upon it.

Horizontal gear 16, heretofore referred to, is journaled in chamber 14 on bottom plate 17 by any conventional form of anti-friction mechanism, specifically ball-bearing devices 22 of Figure 2 of the drawings. Beveled gear 16 is driven by a beveled pinion 24 intermeshing with it, so placed that its hub 26 extends outside the base at a convenient angle to be engaged by a suitable driving instrument. The driving instrument may be either a long auger-like handle, having its lower, non-circular end fitable into a non-circular socket 28 in the shaft 26, or it may be a suitable tool applied to irregular surfaced wheel or gear 30, rigidly secured to the outside of shaft 26. Shaft 26 is journaled in a suitable bearing 32 formed in the exterior of the case. Pinion 24 rotates in a recessed chamber 34, provided for it at one side of the base, and in communication with chamber 14, heretofore described, all as clearly appears in Figure 2.

Horizontal gear 16 is rigidly secured by any suitable means, not detailed in the drawings, to a short, comparatively small lifting screw 36. Fitting over screw 36 and in screw threaded engagement therewith is a second, larger screw 38, screw threaded inside and out. The internal threads 40 formed upon the lower end of screw member 38 extend only a short distance into the interior chamber 42 of said screw member. Screw 36 is provided with a transverse pin 44 above the screw threads 40 of screw member 38 which engages the tops of the screw threads 40 if the screw 38 is moved any higher than shown in the position of Figure 3, with the result that rotation of screw 36 cannot drive large screw member 38 off from the top of said screw member 36.

In similar manner, the external screw threads of screw member 38 operatively engage internal screw threads 46 extending for a short distance into the lower end of the upper rectangular slide or load engaging member 48 of the jack which latter terminates at its upper end in the load engaging block 50 of conventional form, and similarly, the upper end of screw 38 is equipped with a transverse, horizontal pin 52 which engages the upper end of load carrying internal screw threads 46 on slide 48 to prevent the slide being accidentally removed from large screw 38.

The lower external surface of load carrying slide 48 is equipped with a protruding flange 54 which is in turn engageable with an internal flange on an intermediate hollow slide member 58, said latter member being slidably engaged in the upstanding portion 10 of the base. In similar manner, the lower end of the slide member 58 has an external flange 60 engageable with an internal flange 62 on the upper end of the upstanding portion 10 of the base.

The result of the construction described is that engagement of flanges 60 and 62 prevents slide 58 being lifted upwardly out of

case 10, and the engagement of flanges 54 and 56 prevents the lifting of upper slide 48 out of intermediate slide 58.

It may be explained at this point that when it is necessary to separate the parts 10—58 and 48, it is accomplished by first removing the plate 17 and then withdrawing the entire lifting mechanism out through the bottom of the case mechanism in quite obvious manner.

In the operation of the jack, assume the parts are in the position of Figure 2 and that the operating tool for rotating shaft 26 has been applied. Rotation of this shaft in the proper direction, depending on the character of the threads of the jack, results first in the movement of the smaller or inside screw 36—this because it is rigidly attached to gear 16 which is in mesh with pinion 24, rigid on shaft 26. As this screw 36 turns, it forces interfitting screw threads 40 on large screw 38 to travel up screw 36 until such time as the upper ends of the screw threads engage pin 44. When this engagement takes place and screw 36 is further rotated, it carries large screw 38 with it thereby necessarily rotating that screw and thus forcing screw threads 46 on upper slide 48 to travel up the outside threads of screw 38. This movement takes place until the threads on the inside of upper slide 48 encounter pin 52 whereupon further movement is prevented and the jack has reached its maximum vertical position. Rotating shaft 26 and pinion 24 in the opposite direction from that which was used in elevating the jack, results in the return of the parts from fully extended position of Figure 3 to contracted position of Figure 2.

Attention is called to the fact that the entire load is carried upon the screws and not by the vertically disposed case member 10 and the intermediate slide 58, thereby insuring free, easy operation of the device.

In actual practice, the mechanism has been found most efficient and satisfactory, displacing numerous prior devices heretofore in the market.

The use of the non-circular, specifically rectangular members 48—58 and 10 telescopically interfitting has advantages particularly when the jack is without load on the member 50. However, any cross sectional parts including circle may be used without departing from the broad principle of the invention.

The members 44 and 52 are described as "pins" and may be, obviously, protruding members of other character as, for instance, welded stops, without departing from the invention.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:

1. A jack comprising a hollow base having a vertical extension open at its top, a plurality of slidably telescoping members projectable and retractable from and into said extension, a screw device mounted within the base for projecting and detracting said members, said device having direct connection solely with the innermost member whereby the latter is initially projected independently of the remainder of said members, means operable by continued projection of the innermost member beyond a predetermined point to successively project the remainder of the members, and means for limiting the projection of the outermost member with respect to said extension.

2. A jack comprising a hollow base having a vertical extension open at its top, a plurality of slidably telescoping members projectable and retractable from and into said extension, a screw device mounted within the base for projecting and retracting said members, said device having direct connection solely with the innermost member whereby the latter is initially projected independently of the remainder of said members, means separate from the screw device operable by continued projection of the innermost member beyond a predetermined point to successively project the remainder of the members, and means for limiting the projection of the outermost member with respect to said extension.

3. A jack comprising a hollow base having a vertical extension open at its top, a plurality of slidably telescoping members projectable and retractable from and into said extension, a screw device mounted within the base for projecting and retracting said members, said device having direct connection solely with the innermost member whereby the latter is initially projected independently of the remainder of said members, cooperating stops on adjacent members whereby continued projection of the innermost member beyond a predetermined point will successively project the remainder of the members, and means for limiting the projection of the outermost member with respect to said extension.

In witness whereof, I have hereunto subscribed my name.

MILLARD B. LUCKER.