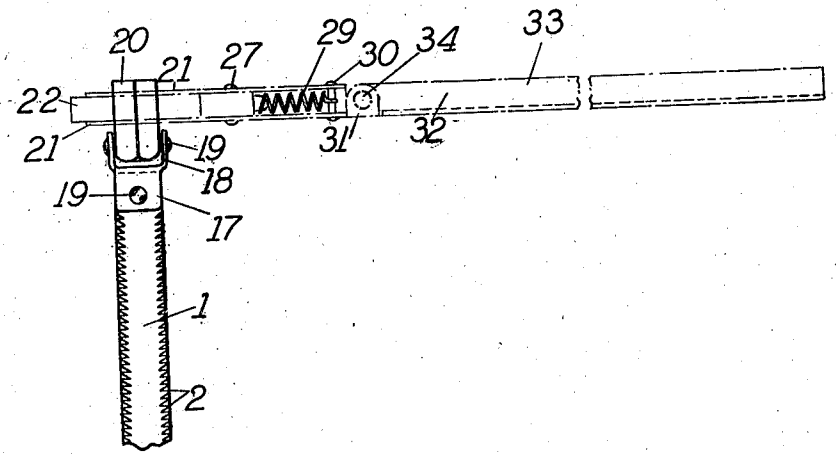
Sept. 13, 1938. C. B. WOODWORTH 2,129,806

LIFTING JACK

Filed March 19, 1937 2 Sheets-Sheet 1



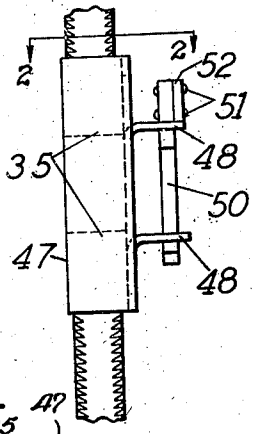


Fig. 9.

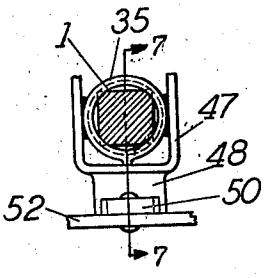


Fig 2

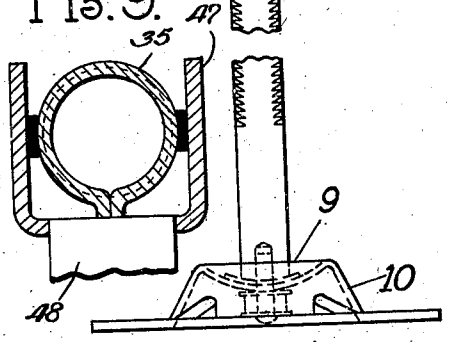


Fig. 1

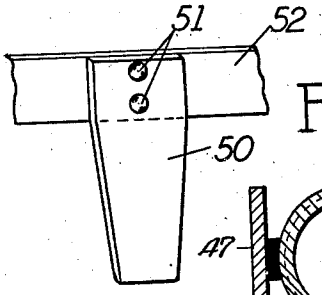


Fig. 3.

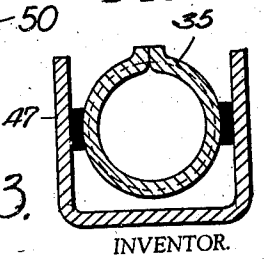


Fig. 10.

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LIFTING JACK

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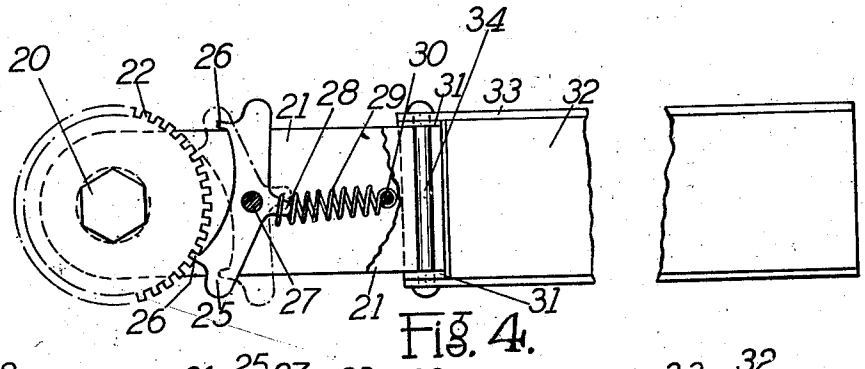


Fig. 4.

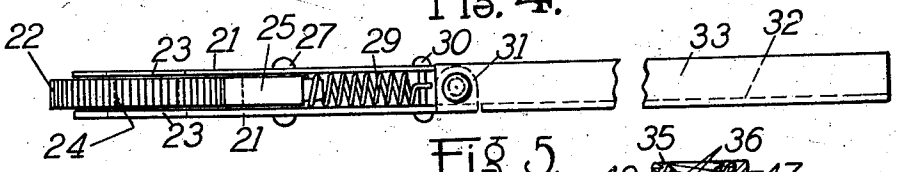


Fig. 5.

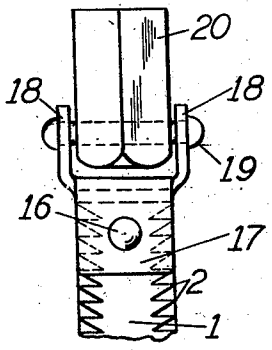


Fig. 6.

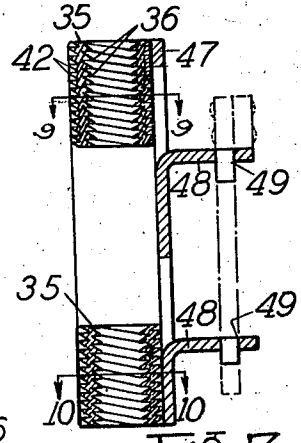


Fig. 7.

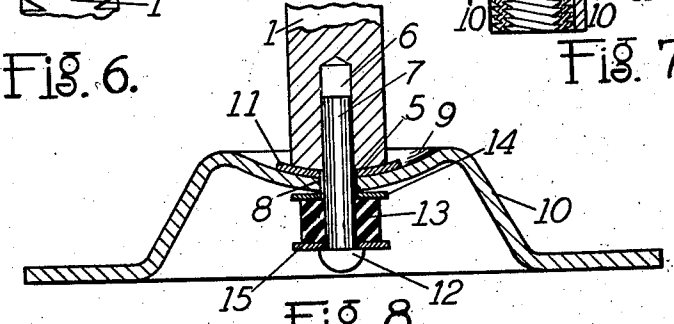


Fig. 8.

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Patented Sept. 13, 1938

2,129,806

UNITED STATES PATENT OFFICE

2,129,806

LIFTING JACK

Charles B. Woodworth, Port Dickinson, N. Y.

Application March 19, 1937, Serial No. 131,770

5 Claims. (Cl. 254—101)

My invention relates to a lifting jack, and particularly to that type which is adapted to be used in connection with the bumpers or other easily accessible parts of an automobile whereby the same may be raised from the ground.

The primary object of my invention is to provide a jack which is simple in construction, of few parts, economical to manufacture, and easy to operate.

One important feature of my invention comprises a multi-sided screw shaft distinguished from the common circular type of screw shaft, upon which the lifting sleeve travels. More particularly in connection with this feature of the invention, I have provided a screw shaft provided with flat sides and corners, such as a square, hexagonal or other multi-sided configuration on which the screw threads for the lifting sleeve are pressed into the corner of the shaft.

Another important object and feature of my invention lies in the provision of a novel lifting sleeve. This method involves the pressing of a flat piece of metal into circular form and forming threads simultaneously with the pressing operations which enables the lifting sleeve to readily travel up and down the screw shaft as the latter is rotated.

Still another object of my invention lies in the provision of reinforcing means for the formed lifting sleeve and the provision thereon of means by which the part of the car to be raised is engaged.

Another object of my invention lies in the provision of a novel and efficient means for securing the end of the screw shaft to the supporting base.

A further object of my invention lies in the provision of a simple and practical rotating member for the upper end of the screw shaft including also a tool cooperating therewith by means of which the shaft may be quickly and easily rotated.

A still further object of my invention lies in the provision of a novel form of engaging member carried by the lifting sleeve for engaging the automobile part to be lifted.

Referring now to the figures of the accompanying drawings forming a part of this application and wherein like reference numerals indicate like parts:

Figure 1 is a side view of my improved lifting jack in operative position and showing the operating tool in effective position.

Figure 2 is a cross sectional view taken along the line 2—2 of Figure 1.

Figure 3 is a detail perspective view of the lifting element which is applied to the lifting sleeve.

Figure 4 is a plan view of the operating tool for the screw shaft.

Figure 5 is a side view thereof.

Figure 6 is a detail view of the upper end of the screw shaft with the turning means thereon.

Figure 7 is a detail vertical sectional view of the lifting sleeve.

Figure 8 is a detail sectional view of the base and attaching means for the lower end of the screw shaft.

Figure 9 is a detail sectional view of the upper portion of the lifting sleeve showing the reinforcement thereof, taken on the line 9—9 of Figure 7.

Figure 10 is a similar view taken on the line 10—10 of Figure 7.

The reference character 1 refers generally to the screw shaft which, in the form shown, is square in cross section although it is to be clearly understood that any other multi-sided form may be used if desired.

This screw shaft is provided at its corners with screw threads 2 for the greater portion of the length of the shaft.

In forming the threads in the screw shaft 1 I preferably use relatively short die members 3 and form the threads therein on a portion only of the length of the shaft at a time, shifting the shaft in the die members after each forming operation until the necessary length of threading on the shaft is provided. This eliminates the necessity for threading dies 3 of the full length of the threaded portion of the shaft—which is generally two or three feet in length—and also eliminates the necessity for apparatus for providing the necessary pressure for dies of such length.

The lower end of the screw shaft 1 is formed on a slight radius as shown at 5 in Figure 9 and is provided centrally with a recess 6 adapted to receive with a tight driving fit a pin 7 projecting through an opening 8 provided through the center of the concave shaped top 9 of the supporting base 10. Between the lower end of the shaft 1 and the top 9 of the base there is provided a hardened steel or bronze washer 11 also provided with a central opening through which the pin 7 passes.

The pin 7 projects substantially below the top 9 of the base and is provided on its end with a head 12. Between the head 12 and the underside of the top 9 I dispose a rubber gasket or washer 13 of substantial thickness. Disposed between

the gasket 13 and the underside of the top 9 is a washer 14 and disposed between the underside of the gasket 13 and the head 12 is a washer 15 to prevent the gasket from being forced out over the head of the pin 7.

This gasket 13 provides a resiliency for the mounting of the screw shaft upon the base, whereby such shaft may tilt at a considerable angle without pulling the shaft from the base or distorting or bending the shaft or base. This is desirable in use of the lifting jack to accommodate the same to different conditions of ground support or other conditions which require the shaft to function at an angle to its normal vertical position.

The upper end of the screw shaft 1 is threaded to its extreme end in order to permit the lifting sleeve hereinafter described to be threaded thereon. Thereafter the upper end of the screw shaft has pivotally secured thereto as by rivet or pin 16 oppositely disposed parallel downwardly extending flanges 17 of a bracket overlying the upper end of the screw shaft. This bracket is also provided on its sides opposite the flanges 17 with upwardly projecting supporting parallel flanges 18 between which extends a pivot pin 19 pivotally supporting the lower end of an upwardly projecting turning member 20 of square, hexagonal, or other multi-sided configuration adapted to receive a suitable tool whereby the shaft 1 will be rotated. There is thus provided for the upper end of the screw shaft 1 a universally jointed means for rotating the shaft. Its flexibility as regards pivoting in both directions with respect to the shaft simplifies the operation of the turning tool in connection therewith and accommodates many conditions of actual use wherein there may be interference of headlights, license plates, etc. in the turning of the shaft.

I have also provided a novel means for rotating the shaft 1 in cooperation with the turning member 20 comprising a tool having at one end spaced parallel supporting plates 21 (see Figures 5 and 6) between which is disposed a rotatable ratchet wheel 22 suitably journaled between such plates. The plates 21 are provided with aligned circular openings 23 and the ratchet wheel 22 is provided centrally and in alignment with the openings 23 with an opening 24 of a configuration similar to the multi-sided turning member 20 whereby upon rotation of the ratchet wheel, the member 20 and the shaft 1 may be rotated.

Pivotally mounted between the plates 21 and adjacent the ratchet wheel 22 is a pawl 25 provided with teeth 26 at either end for engagement with the teeth of the ratchet wheel 22. This pawl 25 is pivoted as at 27 and on its rear side and in alignment with the pivot 27 it is provided with a projecting member 28 engaging with one end of a coil spring 29, the opposite end of which is secured to a pin 30 provided between the plates 21. Depending upon the direction in which it is desired to rotate the ratchet wheel 22, the pawl 25 is rocked on its pivot by the operator to bring one or the other of the teeth 26 into engagement with the ratchet wheel and in such position the turning of the plates 21 carrying these parts results in the pawl turning the ratchet wheel 22 in one direction and permits the return of the plates 21 to the original turning point by means of the engaged tooth 26 riding idly over the teeth 22 on such return movement. Thus the turning tool can be turned a limited amount, depending upon the conditions under which it is being operated adjacent the parts of the automobile without the necessity of making a complete rotation.

If desired the turning tool may be permanently secured to the turning member 20 and form an integral part of the lifting jack. In order to provide ample leverage for the turning tool and a convenient handle for operating the same and to provide for taking up the least amount of space necessary when the tool is provided as a part of the jack or when the same is left in position on the jack, I have provided the rear ends of the plates 21 with side flanges 31 and I have also provided a handle member 32 provided at its sides with flanges 33 adapted to engage with the flanges 31 on their outer surfaces, and a pivot pin 34 is provided extending through both the flanges 31 and 33 whereby to provide a hinge for the handle portion 32. Thus the handle member 32 may be pivoted upwardly or downwardly to best accommodate the conditions under which the jack is being used and when not in use, the handle member 32 is hinged downwardly alongside the shaft 1 for convenience.

The lifting device for engaging the bumper or other part of the automobile by means of which the car is to be raised, comprises an internally threaded sleeve 35, the threads of which are adapted to engage in screwing action with the threads 2 of the shaft 1. That is, the internal threads 36 of this lifting sleeve should have their under surfaces horizontal and their upper surfaces inclined. (See Figure 8.)

The sleeve 35 is formed also by a pressing operation and from a flat piece of metal (see Figure 10) which by suitable means to be described is formed into a circular sleeve and provided with the threads 36 pressed thereinto.

In constructing the lifting sleeve or member for actual use on the shaft 1, two of the sleeves formed as just described, are provided in spaced relation and are secured together by welding into a casing member 47 which substantially encloses said sleeves. This casing is provided on one side with two parallel outwardly projecting lips 48 (see Figure 8) which may be formed by cutting and bending the material of the casing 47 outwardly. It is to be noted, particularly with reference to Figures 12 and 13, that the securing of the casing 47 to the sleeves 35 is done in a manner to bring the lips 48 of the casing opposite the seam or welded abutting edges of the lower sleeves 35 and adjacent the seam or welded abutting edges of the upper sleeve 35. This is for the purpose of bringing the load to be lifted by the lips 48 more directly upon the unseamed or unfastened portion of the sleeves.

The lips 48 are provided adjacent their outer ends with tapered openings 49 adapted to receive the tapered stem 50 of a lifting lug suitably secured as at 51 to a bumper bar 52 or other fixed portion of the automobile.

Obviously, if desired, the lips 49 may be otherwise formed, as in hook formation, to engage the bumper bar or other element in the usual manner.

It will thus be seen that I have provided a simplified easily operable lifting jack of the type now made necessary by present day automobile construction wherein the bumper bar or other easily accessible part of the car is engaged and with which a substantial lift is necessary in order to raise the wheels from the ground, including many novel features of construction and operation as well as the method of forming economically and easily certain essential parts of the jack.

It will be understood, of course, that changes

may be made in details of construction and arrangement of parts without departing from the spirit and scope of my invention. I do not limit myself, therefore, to the exact form herein shown and described other than by the appended claims.

I claim:

1. A lifting jack comprising a screw shaft and a lifting member thereon, a base to which the lower end of said shaft is secured, resilient means for securing said end to said base whereby said shaft may be tilted with respect to said base without distortion thereof, said connecting means comprising a headed pin having a tight driven fit in said shaft and projecting below said base, and a resilient member between the head of said pin and said base.

2. A lifting jack comprising a screw shaft having a universally pivoted member thereon by which the shaft is turned, and a lifting nut on said shaft comprising formed threaded members secured together in spaced relation, said members comprising threaded formed metal pieces having their free edges secured together and having said secured edges disposed opposite the points of greatest load on said nut.

3. A lifting jack comprising a screw shaft having a pivoted member thereon by which the shaft is turned, and a lifting nut on said shaft comprising formed threaded members secured together in spaced relation, said members comprising threaded formed metal pieces having their free edges secured together and having said secured edges disposed opposite the points of greatest load on said nut.

4. A lifting jack comprising a screw shaft and a lifting member thereon, a base to which the lower end of said shaft is secured, means for securing said end to said base whereby said shaft may be tilted with respect to said base without distortion thereof, said connecting means comprising a headed pin having a tight driven fit in said shaft and projecting below said base.

5. A lifting jack comprising a multiple sided screw shaft of solid metal having a pivot member thereon by which the shaft is turned and a lifting nut on said shaft comprising threaded members secured together in spaced relation, said members comprising threaded formed metal pieces having their free edges secured together and having said secured edges disposed opposite the points of greatest load on said nut.

CHARLES B. WOODWORTH.