Feb. 10, 1925. 1,526,151

J. R. KINNEY

LIFTING JACK

Filed Jan. 28, 1924

Fig. 1.

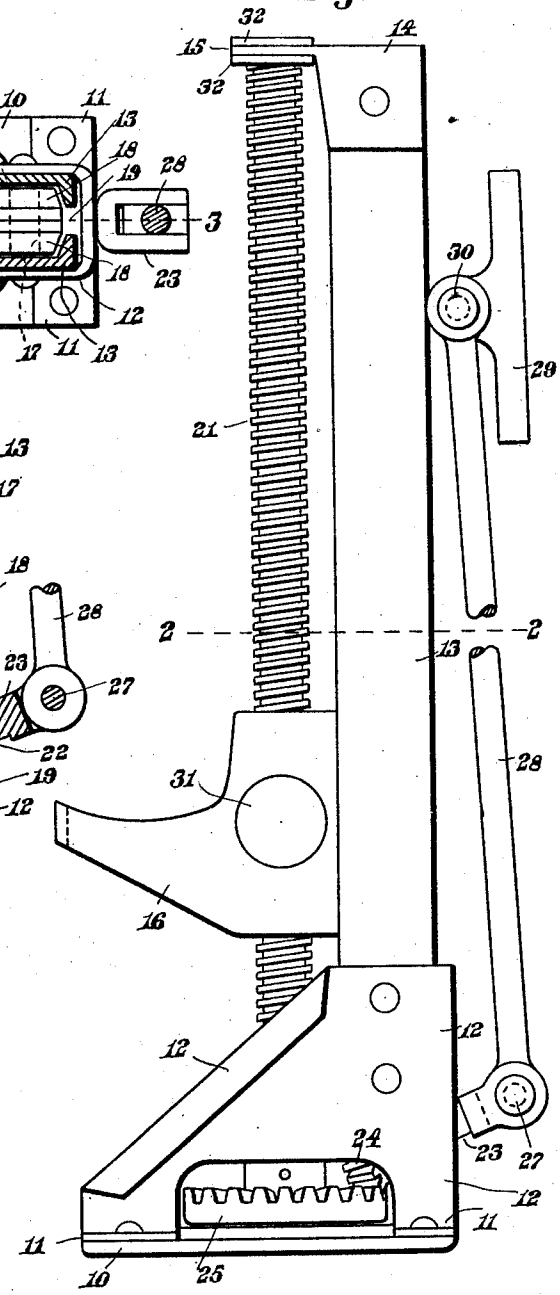


Fig. 2.

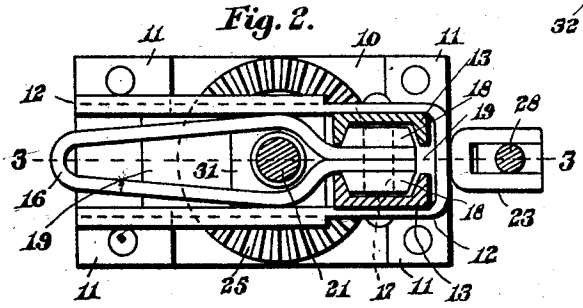


Fig. 3.

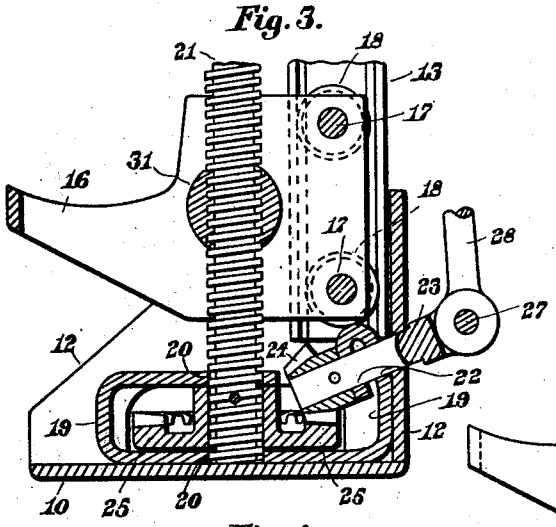


Fig. 4.

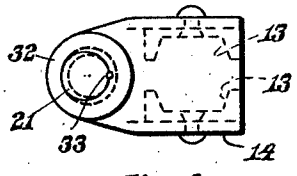
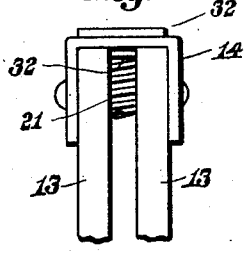


Fig. 5.



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UNITED STATES PATENT OFFICE.

JUSTUS R. KINNEY, OF JAMAICA PLAIN, MASSACHUSETTS.

LIFTING JACK.

Application filed January 28, 1924. Serial No. 688,927.

To all whom it may concern:

Be it known that I, JUSTUS R. KINNEY, a citizen of the United States of America, and a resident of Jamaica Plain, in the county of Suffolk, in the State of Massachusetts, have invented certain new and useful Improvements in Lifting Jacks, of which the following is a specification.

This invention relates to lifting jacks and particularly to devices of this character designed for use in connection with motor vehicles, the object of the invention being to provide a jack which may be cheaply but strongly constructed and in which the movable support thereof is capable of being lowered to a point adjacent the base thereby making it possible to place said support beneath the axle of the vehicle without difficulty whenever a tire becomes deflated or the car assumes an abnormally low position for any other cause.

The invention consists primarily of a base having an upwardly extending column on which is mounted a support movable lengthwise of the column by means of a rotatable screw coacting with a nut carried by said support, the driving mechanism of the screw all being mounted in said base.

The invention further consists of certain novel features of construction and arrangement of parts which will be understood readily by reference to the description of the drawings and to the claims to be hereinafter given.

For the purpose of illustrating the invention, one preferred form thereof is illustrated in the drawings, this form having been found to give satisfactory and reliable results although it is to be understood that the various instrumentalities of which the invention consists can be variously arranged and organized and the invention is not limited to the precise arrangement and organization of these instrumentalities as herein shown and described except as required by the scope of the appended claims.

Of the drawings:

Figure 1 represents an elevation of a lifting jack embodying the principles of the present invention.

Figure 2 represents a horizontal section of same on line 2, 2 on Fig. 1.

Figure 3 represents a vertical section of the lower part of same on line 3, 3 on Fig. 2, the lifting screw being shown in elevation.

Figure 4 represents a plan of the top of said jack, and

Figure 5 represents an elevation of the same.

Similar characters indicate like parts throughout the several figures of the drawings.

In the drawings 10 is a bottom plate to which are secured the flanges 11 of a U-shaped plate 12 the side walls of which are parallel with their ends inclined and turned downwardly in order to stiffen said side walls.

The bottom plate 10 and U-shaped plate 12 form the base of the lifting jack.

The side walls of said U-shaped plate 12 have secured to their inner faces the U-shaped members 13 which are oppositely disposed and extend upwardly from the base 10, 12.

These U-shaped members 13 are slightly spaced from each other and tied together at the top by the plate 14 having a lateral flange 15.

The two members 13 form a column on which the lifter or support 16 is adapted to be moved lengthwise.

This lifter or support 16 is formed of a bent plate separated in the form of a loop at one end while the opposite ends are in contact and positioned between the members 13.

The contacting ends of the support 16 have short cylindrical studs extending therethrough forming trunnions 17 on which are mounted the conical rollers 18 adapted to travel between the flanges of the U-shaped members 13.

When a load is on the support or lifter 16 the upper rollers 18 will bear against one flange and the lower rollers 18 against the opposite flange of the U-shaped members 13 thus permitting the support 16 to have free movement lengthwise of the members 13 when a load is being raised or lowered.

Secured to the bottom plate 10 and between the walls of the U-shaped plate 12 is a bent bar 19 formed in such a manner as to provide separated bearings 20 for a rotatable screw 21 and separated bearings 22 for an actuating shaft 23.

This actuating shaft 23 has secured

thereto a driving pinion 24 the teeth of which mesh with the teeth of the gear 25 secured to the screw 21 in any well known manner, such as by the pin 26 as shown in the drawings.

The gear 25 is disposed on the screw 21 between the bearings 20 and the pinion 24 is secured in any well known manner to the inner end of the actuating shaft 23.

The outer end of the actuating shaft 23 has hinged thereto at 27 an extension rod 28 which is adapted to be rotated by any suitable means.

One form of rotating device is shown in the drawings, viz: the handle 29 hinged to the outer end of the extension rod at 30.

When the jack is not in use the actuating extension rod 28 and handle 29 may be folded up against the column 13, 13 so as to occupy but little space all as shown in Fig. 1.

When the jack is to be used the extension rod 28 is moved into alinement with the actuating shaft 23 and the handle 29 is moved about its hinge pivot 30 until perpendicular to the rod 28. The actuating shaft 23 may be rotated then and this rotary movement will be imparted to the screw 21 through the pinion 24 and gear 25.

The screw 21 is spaced from the column 13, 13 and parallel thereto extending through the loop of the support or lifter 16.

The screw 21 also extends through the cylindrical nut 31 the opposite ends of which are mounted in cylindrical bearings in the oppositely disposed walls of the support or lifter 16 thereby permitting slight oscillation of said nut 31 in order to bring the threaded opening therein into alinement with the screw 21 when the various elements of the jack are being assembled.

The upper end of the screw 21 has a bearing in the lateral flange 15 of the tie plate 14 secured to the upper ends of the U-shaped member 13.

The screw 21 has secured thereto on opposite sides of the flange 15 the collars 32 which prevent end movement of said screw while permitting the free rotation thereof. The collars may be secured to the screw in any well known manner as by being threaded thereto and then having an indentation 33 formed therein to prevent the rotation of said collar 32 on the screw 21.

By means of the construction of jack herein shown and described, the lifter or support 16 may be lowered to such a point that it may be inserted readily beneath the axle of a car or some other part of the vehicle it is desired to raise.

It is not necessary to insert the body of the jack beneath the part to be raised, this body being always at one side of said part with the projecting portion of the support 16 extending beneath the element that it is desired to lift.

Heretofore most jacks used in connection with automobiles are so constructed that the body of the jack must be placed beneath the part to be raised and very often this is next to impossible to do when the tire has become wholly deflated and the space between the ground and the axle is less than the length of the jack.

In such cases a lifting jack must be so short in order to be inserted beneath the vehicle that when operated it would not lift the axle a sufficient distance to permit the removal of a punctured tire and installation of a new tire in its place.

This is particularly true where oversize tires are used and these difficulties will be increased greatly with the adoption of the very large sized tires known as balloon tires.

The lifting jack shown and described overcomes all these difficulties as its lifter may be lowered to a point very near the road and is capable of lifting the axle high enough to permit the replacing of tires of the largest size.

The screw actuating mechanism is all in the base of the jack where it may be operated easily.

It is believed the operation and many advantages of the invention will be apparent without further description.

Having thus described my invention, I claim:

1. In a lifting jack, a base; a column thereon; a revoluble screw spaced from and parallel with said column; means for rotating said screw; a support movable on said column; and a cylindrical nut for said screw mounted in bearings in said support.

2. In a lifting jack, a base; a column thereon; a revoluble screw spaced from and parallel with said column; means mounted in said base for rotating said screw; a support movable on said column; and a nut for said screw adapted to oscillate in bearings in said support.

3. In a lifting jack, a base having a U-shaped wall extending upwardly therefrom; a column thereon consisting of oppositely disposed U-shaped members secured at their lower ends to the opposite walls of said base; a tie plate at the upper ends of said members; a screw spaced from and parallel with said column; a gear in said base secured to said screw; driving means for said gear; a support movable lengthwise of said column provided with rollers positioned between the flanges of said U-shaped members; and a nut for said screw carried by said support.

4. In a lifting jack, a base having a U-shaped wall extending upwardly therefrom; a column thereon consisting of oppositely disposed U-shaped members each secured to a side wall of said U-shaped plate; a screw spaced from and parallel with said column; a gear in said base secured to said

screw; driving means for said gear; a support movable lengthwise of said column provided with conical rollers positioned between the flanges of said U-shaped members; and a nut for said screw carried by said support.

5. In a lifting jack, a base; a column thereon; a screw spaced from and parallel with said column; a gear in said base secured to said screw; driving means for said gear; a support movable lengthwise of said column consisting of a bent plate straddling said screw; and a nut for said screw mounted in bearings in the opposed sides of said support.

6. In a lifting jack, a base; a column thereon; a screw spaced from and parallel with said column; a gear in said base secured to said screw; driving means for said gear; a support movable lengthwise of said column consisting of a bent plate straddling said screw and provided with alined cylindrical bearings; and a cylindrical nut for said screw carried by said support with its opposite ends in said bearings.

7. In a lifting jack, a base; a column thereon consisting of oppositely disposed U-shaped members; a screw spaced from and parallel to said column; a gear in the base secured to said screw; driving means for said gear; a support movable lengthwise of said column consisting of a bent plate straddling said screw and having contacting ends between said U-shaped members; trunnions on said contacting ends; rollers on said trunnions movable between the flanges of said U-shaped members; and a nut for said screw carried by said support.

8. In a lifting jack, a bottom plate, a U-shaped plate secured thereon; a column secured to and extending upwardly from said U-shaped plate; a support movable lengthwise of said column; a nut carried thereby; a screw spaced from and parallel to said column extending through said nut; a gear secured to the lower end of said screw; a driving pinion therefor; a rotatable shaft to which said pinion is secured; and bearings within said U-shaped plate for said screw and rotatable shaft.

9. In a lifting jack, a bottom plate, a U-shaped plate secured thereon; a column secured to and extending upwardly from said U-shaped plate; a support movable lengthwise of said column; a nut carried thereby; a screw spaced from and parallel to said column extending through said nut; a gear secured to the lower end of said screw; a driving pinion therefor; a rotatable shaft to which said pinion is secured; and a bent bar between the walls of said U-shaped plate having bearings for said screw and rotatable shaft.

10. In a lifting jack, a base; a column thereon; a revoluble screw at one side of and parallel with said column; means for rotating said screw; a support movable lengthwise of said column; a nut for said screw carried by and adapted to oscillate in bearings formed in said support; and means at the upper end of said column for preventing end movement of said screw.

11. In a lifting jack, a base; a column thereon; a revoluble screw at one side of and parallel with said column; means for rotating said screw; a support movable lengthwise of said column; a nut for said screw carried by and adapted to oscillate in bearings formed in said support; and a flanged member at the upper end of said column having a laterally extending flange provided with a bearing for the upper end of said screw.

12. In a lifting jack, a base; a column secured thereto and extending upwardly therefrom; a revoluble screw at one side of and parallel with said column; means for rotating said screw; a support movable lengthwise of said column; a nut for said screw carried by and adapted to oscillate in bearings formed in said support; a member extending from the upper end of said column having a bearing for the upper end of said screw; and collars secured to said screw on opposite sides of said member for preventing end movement of said screw.

Signed by me at 746 Old South Bldg., Boston, Mass., this 26 day of January, 1924.

JUSTUS R. KINNEY.

Witnesses:

WALTER E. LOMBARD,

NATHAN C. LOMBARD.