

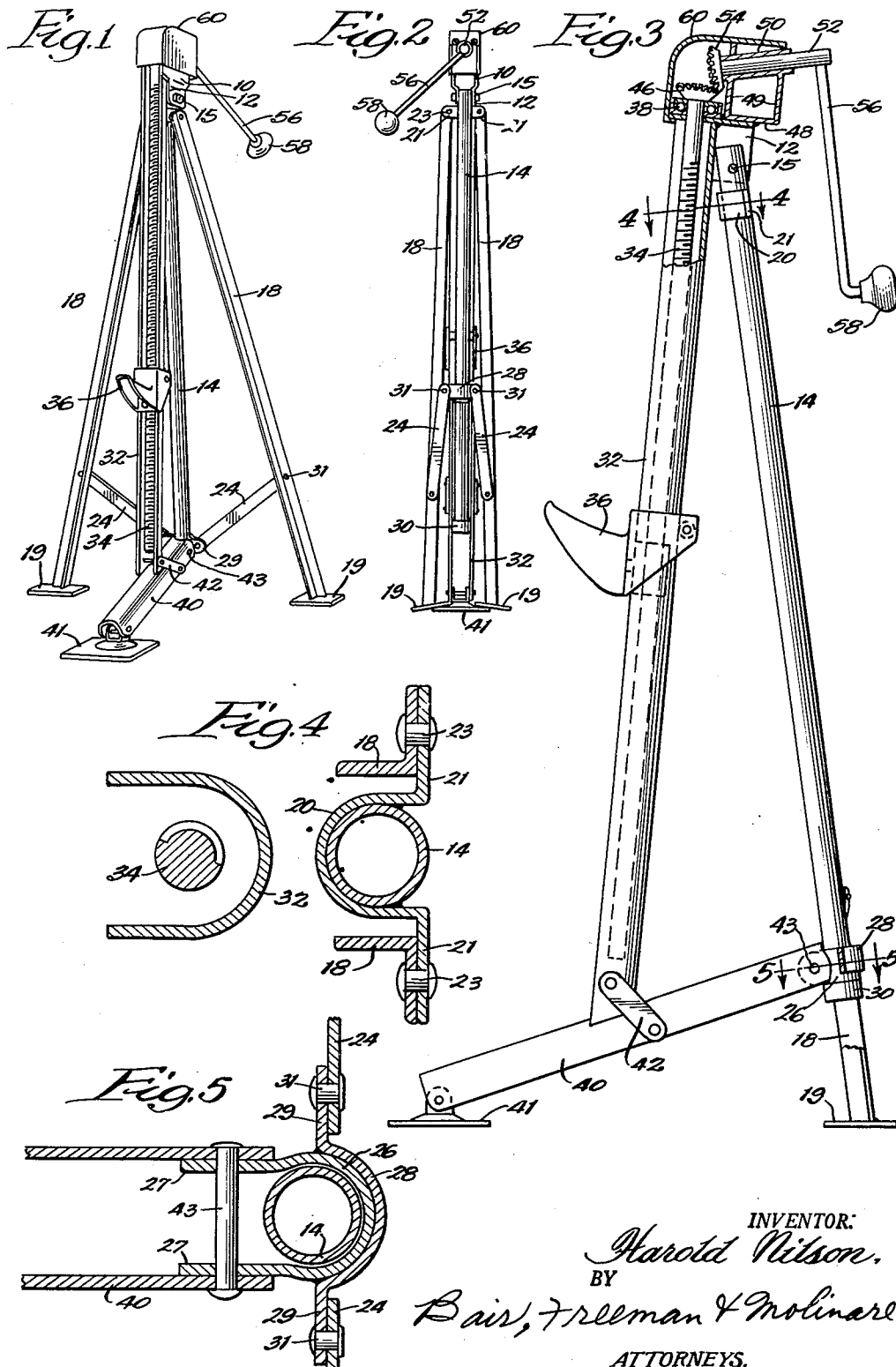
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AUTOMOBILE LIFTING JACK

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AUTOMOBILE LIFTING JACK

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4 Claims. (Cl. 254-103)

This invention relates to a bumper jack for automobiles and the like, and particularly to a novel supporting structure of the tripod type.

It is a primary object of the present invention to provide a collapsible supporting structure of the tripod type for an automobile bumper jack, wherein novel pivotal and sliding linkages are employed between various structural elements for providing an efficient construction of high strength and stability.

It is another object to provide simple and efficient mechanical linkage means between the various structural elements of a tripod bumper jack, wherein the path of movement of the jack lifting-hook may be positioned so as to very closely approach the vertical.

It is a further object to provide manual operating means of the rotating lever arm type for actuating the lifting hook drive means of a tripod type bumper jack, wherein such operating means has a path of rotation lying in a plane very closely approaching the vertical, while avoiding obstructive interference with all structural elements of the jack and with all adjacent portions of the automobile during the lifting operation.

It is still another object to provide a manually rotatable operating means for a tripod type bumper jack, wherein such means has a path of rotation lying in a near-vertical plane at the side of the jack structure opposite to the lifting-hook, thereby providing a convenient and easily accessible control means for effecting actuation of the lifting-hook from a point of safety remote from the adjacent portions of the automobile.

It is a still further object to provide a tripod type of supporting structure for the lifting-hook drive mechanism of a bumper jack, wherein such drive mechanism is pivotally secured at its lower end to a supporting cross-leg which provides means for positioning the drive mechanism, and thereby the path of movement of the lifting-hook, so as to very closely approach the vertical.

With these and other objects in view, my invention consists in the construction, arrangement and combination of the various parts of my automobile lifting jack whereby the objects contemplated are obtained as hereinafter more fully set forth, pointed out in my claims and illustrated in the accompanying drawing, wherein:

Figure 1 is a perspective view of a bumper jack constructed in accordance with the present invention seen from a direction looking toward the lifting-hook side of the structure.

Figure 2 is a side elevational view of a bumper jack seen from a direction looking toward the operating handle side of the structure, with the supporting leg elements in closely adjacent collapsed relation.

Figure 3 is a vertical sectional view taken centrally through the jack structure in its erected position, and showing additional elements partly broken away and in section.

Figure 4 is a sectional view taken in the direction 4-4 on Figure 3.

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Figure 5 is a fragmentary sectional view taken in the direction 5-5 on Figure 3.

Referring particularly to the drawing, I have shown a channel-shaped head plate 10 having a pair of downwardly depending ears 12 disposed in parallel relation to each other. A tubular center post 14 is pivotally secured to the head plate 10. The ears 12 are adapted to receive bolt means 15 extending through the upper end of post 14 so as to provide a pivotal interconnection between the elements 10 and 14.

A pair of side legs 18, having supporting foot portions 19, are pivotally secured at their upper ends to the tubular center post 14. A channel-shaped member 20, having outwardly extending ears 21, is attached to the upper end of post 14, as by welding, at a point below and closely adjacent the depending ears 12. The upper ends of the side legs 18 are pivotally secured to the ears 21 as by bolts 23, to effect interconnection between the elements 14 and 18.

A pair of arms 24 are pivotally secured at their one end to legs 18, at a point adjacent the lower portions of said legs. A channel-shaped collar 26, having an inner circularly curved surface of slightly greater than 180° extent, receives the tubular post 14 for axial sliding cooperation therewith, as best seen in Fig. 5. The collar 26 terminates at its free ends in a pair of laterally extending ears 27 disposed in parallel relation to each other. A channel member 28, having outwardly extending ears 29, is fixedly secured to the outer curved portion of the slidable collar 26, as by welding. The arms 24 are pivotally secured at their other end to the ears 29, as by bolts 31. The tubular center post 14 has an enlarged terminal end 30, providing a stop for longitudinal sliding movement of the post 14 within the collar 26.

It will be apparent that the legs 18 may be collapsed angularly inwardly into closely adjacent relation with the tubular center post 14. When so collapsed, the arms 24 are pivoted inwardly and upwardly as the collar 26 slides upwardly upon the tubular center post 14, as seen in Fig. 2.

A longitudinal channel guide 32 extends downwardly from the head plate 10. The guide 32 is fixedly secured, as by welding, at its upper end to the head plate 10, thereby providing a pivotal interconnection with the center post 14 through the elements 10, 12 and 15. An actuator screw 34 is received within the channel guide 32. The screw 34 effects longitudinal shiftable movement of a lifting-hook 36 of the type shown and described in detail in my co-pending application S. N. 329,420, filed January 2, 1953. A rotary collar and bearing assembly 38 supports the upper end of the screw 34 upon the head plate 10.

A U-shaped cross-leg 40, having a supporting foot portion 41 pivotally secured at its one end, is pivoted at its other end by means 43 to the ears 27 of collar 26.

A pair of straps 42 are each pivotally secured at their one end to the depending side portions of the U-shaped cross-leg 40, intermediate its ends. The lower end of the channel guide 32 is suitably contoured to provide full contacting engagement with the upper curved surface of the cross-leg 40 for support thereon. The straps 42 are each pivotally secured at their end to the sides of the channel guide 32.

In this manner, the lower end of the channel guide 32 is supported upon the inclined upper surface of the cross-leg 40 when the jack is erected, and is fixedly secured in position thereon by the straps 42.

The use of the pivoted cross-leg 40, secured at its one end by the slidable collar 26 to both the tubular center post 14 and the supporting legs 18, and providing one of the three supporting feet of the tripod construction at its other end, permits the operating mechanism and thereby

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the path of movement of the lifting-hook to be supported thereon intermediate its ends in a near-vertical position.

The screw 34 is provided with a bevel gear 46, positioned upon the collar and bearing assembly 38 at the upper end of the screw. A U-shaped supporting bracket 43 (see Fig. 3) is fixedly secured, as by welding, to the top surface of the head plate 10. Leg portions 49 of the bracket 43 extend upwardly from the head plate 10, and are suitably apertured to receive a tubular bearing sleeve 50 therethrough. The sleeve 50 is fixedly secured, as by welding, to the legs 49, and is downwardly inclined with respect to the screw 34. An axle 52 extends through the sleeve 50. The axle 52 is provided at its one end with a bevel gear 54, which cooperates in inter-meshing engagement with the bevel gear 46. A handle 56 is secured to the other end of the axle 52, and provides a lever arm at right angles to the axle 52. A freely rotatable gripping knob 58 is positioned upon a terminal right angle bend of the handle 56.

It will be apparent that the inclination of the axle 52 with respect to the screw 34 serves to position the right angle lever arm or handle 56 in outwardly spaced relation from the supporting legs 18, thereby avoiding obstructive interference therebetween when the handle 56 is rotated to effect actuation of the lifting-hook. This slight inclination of the axle 52 permits the operating handle for the near-vertical drive mechanism of the present construction to be positioned so as to provide a path of rotation lying in a plane which also is near-vertical, while avoiding obstructive interference with all of the adjacent structural elements of the jack. The manner in which I have positioned the operating handle, by means of the inclined axle and the cooperating bevel gears, also serves to avoid obstructive interference with all portions of the automobile, and permits the individual operator to maintain his hands at a point of safety remote from the operating parts.

The upper structural elements, comprising the bevel gears, bearings, and rotary axle are suitably lubricated and enclosed with a removable cover or housing 60.

Changes may be made in the construction and arrangement of the parts of my automobile lifting jack without departing from the real spirit and purpose of my invention, and it is my intention to cover by my claims any modified forms of structure or use of mechanical improvements which may be reasonably included within their scope.

I claim as my invention:

1. A load lifting jack comprising an elongated, generally channel-shaped support member, a head plate, said support member being rigidly secured at its upper end to said head plate, a bearing adjacent the upper end of said support member, a screw-threaded drive rod journaled in said bearing and disposed within said channel-shaped support member, a load lifting member threaded on said rod for longitudinal movement when said rod is rotated, an elongated support strut pivotally secured at its upper end to said head plate, a pair of side legs each pivotally secured at its upper end to said strut and having its lower end extending beyond said strut, a collar member longitudinally slidable upon said strut, and a pair of arms each pivotally secured at its one end to said collar and at its other end to said side legs, whereby said side legs can be swung outwardly from said strut, said arms extending upwardly from said side legs toward said collar when said side legs are in a collapsed position closely adjacent said strut, and said arms extending downwardly from said side legs toward said collar when said side legs are fully outwardly extended.

2. A load lifting jack comprising a head plate, an elongated, channel-shaped support member rigidly secured to said head plate, and extending downwardly therefrom, an

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elongated drive rod disposed within said channel-shaped support member and having a load lifting member operatively associated therewith for longitudinal movement, a cross-leg for supporting thereon the lower end of said channel-shaped member in a near-vertical position, connector means pivotally securing the lower end of said channel-shaped member to said cross-leg, an elongated support strut pivotally secured at its upper end to said head plate, a pair of side legs each pivotally secured at its upper end to said strut and having its lower end extending beyond said strut, a collar member longitudinally slidable upon said strut, a pair of arms pivotally interconnecting said side legs to said collar, said cross-leg being pivotally secured to said collar at its one end and providing a point of base support at its other end.

3. A load lifting jack of the tripod type, comprising a head plate, an elongated channel-shaped support member rigidly secured to said head plate and extending downwardly therefrom, an elongated drive rod disposed within said channel-shaped support member and having a load lifting member operatively associated therewith for longitudinal movement, an inclined cross-leg for supporting thereon intermediate its ends the lower end of said channel-shaped member whereby said channel-shaped member is disposed in a near-vertical position, connector means pivotally securing the lower end of said channel-shaped member to said cross-leg, an elongated support strut pivotally secured at its upper end to said head plate, a pair of side legs each pivotally secured at its upper end to said strut and providing a point of base support at its lower end below the end of said strut, a collar member longitudinally slidable upon said strut, a pair of arms pivotally interconnecting said side legs to said collar, said inclined cross-leg being pivotally secured to said collar at its upper end and providing a point of base support at its lower end.

4. A load lifting jack comprising a head plate, an elongated channel-shaped support member rigidly secured to said head plate and extending downwardly therefrom, an elongated screw disposed within said channel-shaped support member and having a load lifting member operatively associated therewith for longitudinal movement, a first bevel gear fixed to the upper end of said screw, an axle rotatably mounted on said head plate at a downward inclination with respect to said screw, a second bevel gear fixed to the inner end of said axle and meshed with said first gear, a crank secured to the outer end of said axle for turning said gears to rotate said screw and move said load lifting member thereon, a cross leg for supporting thereon the lower end of said channel-shaped member in a near-vertical position, connector means pivotally securing the lower end of said channel-shaped member to said cross leg, an elongated support strut pivotally secured at its upper end to said head plate, a pair of side legs each pivotally secured at its upper end to said strut and having its lower end extending beyond said strut to provide a base support, a collar member longitudinally slidable on said strut, a pair of arms pivotally interconnecting said side legs to said collar, said cross leg being pivotally secured to said collar at its one end and providing a point of base support at its other end.

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