March 3, 1953 M. B. LUCKER 2,630,295

AUTOMOBILE JACK

Filed Dec. 3, 1948

Fig. 1.

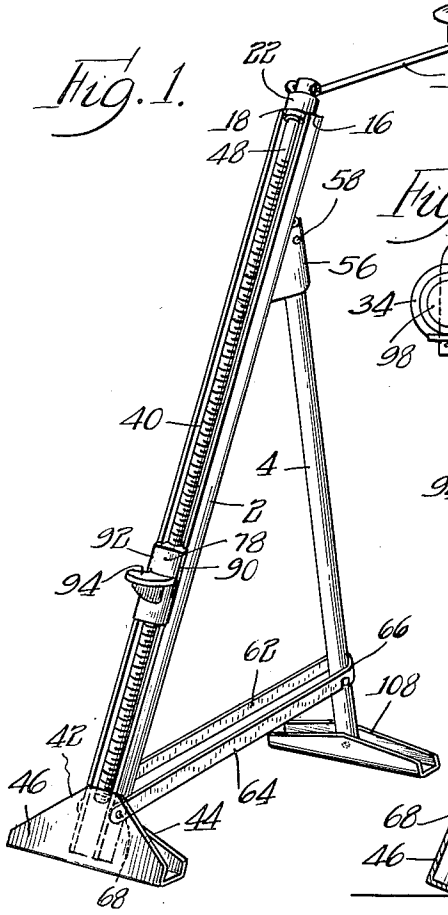


Fig. 2.

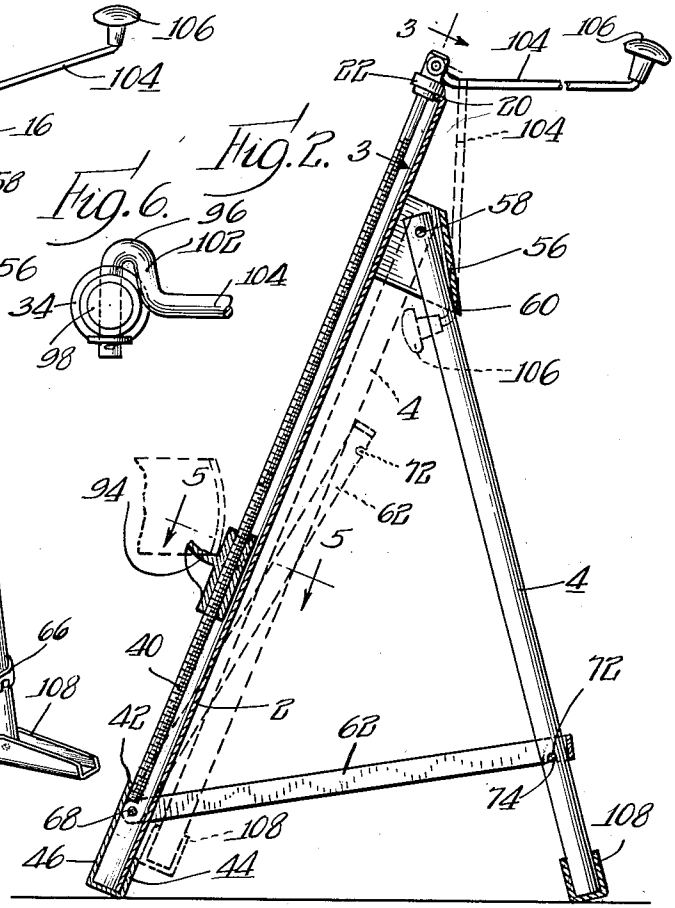


Fig. 6.

Fig. 3.

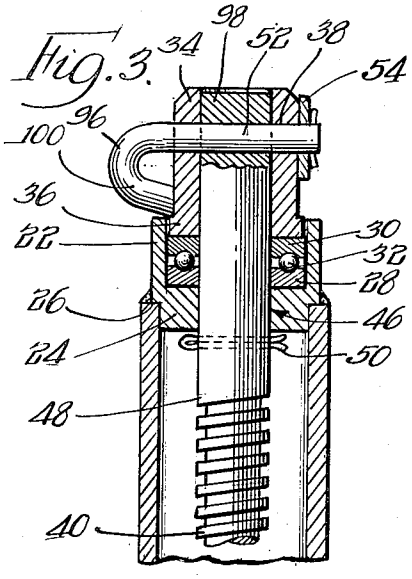
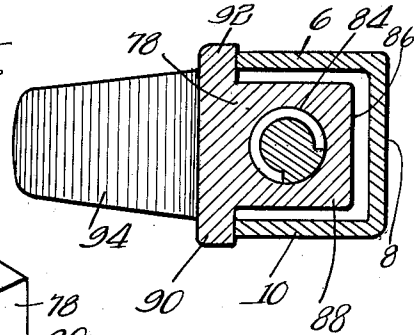


Fig. 5.



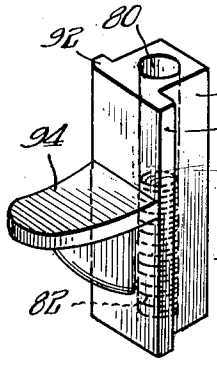


Fig. 4.

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AUTOMOBILE JACK

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7 Claims. (Cl. 254—99)

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This invention relates to jacks and particularly to bumper jacks for automobiles, trucks and the like.

Among the objects of this invention are to provide a bumper jack including a pair of legs pivoted together substantially at their upper ends and pivotal between open, load lifting position and traveling position; to provide such a jack wherein the front leg is channel-shaped and is provided with forwardly exposed free front edges acting as bearing surfaces for the load lifting member to remove strain from the actuating screw, the actuating screw being relatively weak structurally; to provide a load lifting member having a substantial longitudinal length better to resist bending and twisting forces without binding, the longitudinal screw receiving bore in said load lifting member being threaded through only a portion of its length to maintain friction with the screw at a minimum; and to provide improved means for mounting the screw in the channel-shaped forward leg.

These and other objects of the invention will be apparent from a perusal of the following specification when taken in connection with the accompany drawing, wherein:

Figure 1 is a perspective view of my improved jack in open position;

Figure 2 is a partial side sectional view showing the jack in open position and the bumper bracket engaged by the load carrying member;

Figure 3 is a section taken on the line 3—3 of Figure 2;

Figure 4 is a perspective view of the load carrying block and the load carrying lip;

Figure 5 is a section taken on the line 5—5 of Figure 3; and

Figure 6 is a top view of the rotatable screw and the manner in which the handle is disposed at substantially right angles thereto as shown in Figures 1 and 2, looking down on the top of the screw to show the manner in which the inner end of the handle is bent so as to rest on the top of the ball bearing bracket welded to the top of the channel leg.

Referring now to the drawings in detail, the jack comprises in essence two legs 2 and 4. The first leg is preferably formed as a channel iron having the sides 6, 8 and 10, leaving a forward wall 12 and an opposed forward wall 14. These wall members run the entire length of the forward leg 2. The rear leg 4 is preferably formed as a tube. The forward leg 2 is designed as a housing for a load lifting screw which is rotatably mounted on the channel to protect the

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operator in handling the jack. To the top of the jack as at 16, 18 and 20 the upper end of the channel leg is welded to a shell-like collar or bearing 22. This weld extends completely around on all three sides of the channel member 2, it being understood that the channel member 2 is open at the front for its entire length. This ring collar 22 is provided with a portion 24 of narrower diameter than the upper portion so as to fit snugly within the upper open end of the channel leg 2, and form a stop for the uppermost travel of the load lifting block. In addition the collar 22 is provided with a shoulder 26 to rest on the upper end of the three sides of the leg 2 to which it is welded as hereinbefore set forth, whereby the collar 22 is rigidly welded in position to the top of the channel leg 2. The collar member 22 is provided interiorly as a circular seat providing a recess for upper and lower ball bearing races 28 and 30 within which rest the usual ball members 32. A relatively long cylindrical thimble 34 rests upon the upper race 30. The lower portion of this thimble 34 is provided with an enlarged diameter as at 36, which portion 36 is in spaced relation from the inner wall of the ring-like collar 22 because this thimble 34 is a rotatable member. This rotatable member 34 is provided with a cross bore 38.

A relatively long screw rod 40 is housed within the channel member 2. Its function is to raise and lower the load lifting member hereinafter set forth. The lower end of this screw rod is retained behind the front wall 42 of the front foot for the member 2 but is otherwise free. This front foot comprises a piece of sheet steel bent into preferably trough-shaped form, the front portion 42 of the foot being relatively higher than the rear wall 44, and the upper edge of the upper portion overlies the bottom end of the screw rod 40 whereby to hold it within the channel of leg 2. This shoe 46 is preferably angularly disposed at the bottom so as to tend to dig into the ground, thereby to give the front leg of the jack a good grip or purchase on the ground. It is welded to the rear wall portion 8 of the jack and also to the lower portions of the front edges 12 and 14 of the jack, as shown. The upper end of the screw rod projects through an opening 46 in the thimble member 22 and from the point 48 this screw rod is unthreaded. It is provided with an opening through which a cotter pin 50 passes, so that the screw rod cannot rise above the bottom end of the thimble member 22. The unthreaded portion of the screw rod passes upwardly through the ball bearing

member and also upwardly through the upward shell 34 and is provided with an opening which registers with the holes 36 in the shell member 34 so as to receive the inner shank 52 of a handle. The extreme end of the handle is provided with an opening through which a cotter pin 54 passes whereby this shank of the handle assembles the upper end of the screw rod to the rotatable thimble or shell 34. It is understood, of course, that the shell 34 is rotatably mounted upon the ball bearing members for free rotation relatively to the shell 22. By this means the screw cannot move longitudinally of the housing but is free to rotate relatively to the housing when the handle is turned.

Welded at its free ends to the rear wall portions 6 and 10 of the front channel leg 2 is a metal bracket 56. It is formed of a piece of sheet metal folded upon itself with its free ends spaced and welded to the rear wall of the channel leg 2. The bracket is provided with registering openings at its upper end through which a pivot pin 58 passes for pivotally connecting the leg 4 to the upper end of this bracket, the pin going through the upper end of this tube 4, and the outside end of the pin being peened over in the manner well known in the art. The bottom end 60 of this bracket forms a stop to limit the outward swinging movement of the leg 4 with respect to the channel member 2 while permitting the member to move inwardly and snugly against the leg 2.

Means is provided for maintaining the legs 2 and 4 in open extended position as shown in Figures 1 and 4, and this comprises a relatively long U-shaped metal strap 62 and 64 having a looped end 66. The ends of the legs 62 and 64 are pivoted as at 68, to the lower walls 6 and 10 of the front channel member. The rear end of the loop-shaped member is provided with a circular slot 72 which engages a pin 74 which passes through the lower portion of the leg 4 so that when the strap member 62—64 is engaged over the pin, it will rigidly hold the two legs in open position. At the same time the two members 62 and 64 being pivoted to the front walls 6 and 10 of the longitudinal bar provide means for rigidifying the lower end of the leg to prevent any possible twisting of this leg during the load lifting operation.

The load lifting member itself comprises a relatively long block 78 carrying a longitudinal bore 80 a portion only of which, preferably the lower portion 82, is threaded, the upper portion remaining unthreaded and preferably of such diameter as to bear on the threads of the screw. This block is provided with the sides 84, 86 and 88, all of which are preferably disposed in spaced relation from the inner walls of the channel leg 8. In addition, the load lifting block 78 is provided with two outstanding lugs or flanges 90 and 92 which engage and slide upon the front edges 12 and 14 of the leg 2. If desired the outer rear walls of these lugs 90 may have rearwardly extending lugs which overlie the outer walls 6 and 10 of the leg 2 so as to assist in preventing tipping. It is thought that these outer, rearwardly extending lugs on the shoulders 90 and 92 are not necessary, but they may be utilized if deemed necessary. The front wall of the block 78 carries the load lifting saddle or tongue 94 which due to the fact that the channel member 2 and the rod carried thereby are positioned in rearwardly, upwardly inclined position when the jack is open, positions the saddle member 94 in upwardly inclined position so that it will engage and hold the bumper bracket or bumper readily on this load lifting member. It will be noted that the lugs 90 and 92 overlie the front edges 12 and 14 of the channel member 2 the entire length of the block 78, thereby permitting a sliding engagement of this block or load carrying member along the front edges 12 and 14 of the front leg as the block 78 is moved along by the screw upon rotation of the screw.

The handle member from the shank portion 52 thereof is bent in the manner shown at 96 in a sort of gooseneck arrangement so that it passes outwardly of the upper portion 98 of the screw rod and thence is turned downwardly as at 100 and thence somewhat horizontally as at 102 around the outer wall of the rotatable thimble 34. From this point the handle extends somewhat outwardly in direction as shown in Figure 2 so that it becomes an outstanding crank whereby the screw rod may be turned in desired direction to either raise or lower the load. Alternatively the rod may be swung downwardly into the position shown in dotted lines with the handle portion thereof 104 lying relatively close to the bracket 56 and with the knob 106 disposed inside thereof whereby to lie in closely compactly folded position when the jack is ready for collapsing and folding into the position shown in dotted lines in Figure 2. The handle construction and operation is to form subject matter of a divisional application.

It will thus be appreciated that I have provided a very simple construction of jack wherein the forward, upwardly, rearwardly inclined leg 2 is constructed to guide the load lifting block during the raising of the load and in it there is housed the longitudinally extending screw or load lifting member. This screw is provided with means for turning it from its upper end. There is also provided novel threaded construction between the longitudinally slidable block and its screw. I have also provided the foldable strap means such as 62, pivotally connected to the forward strut 2 and arranged to hold the jack legs in upwardly extended position. I have provided the bottom of the leg 4 with a cross foot 108 made welded to the bottom of this tubular member 4 and adapted to lie crosswise so as to prevent easy sidewise tipping of the jack. The legs 2 and 4 serve to hold the jack in rigid open position and by having the leg 2 extending rearwardly and upwardly when a load is to be raised, the load lifting member 94 may be inserted under the bumper bracket, and the handle rotated to lift the load upwardly. With this type of jack it is preferred to release the brake so that the car may adjust itself to the upward rearward travel of the load lifting member 94 with relation to the screw 40 and the leg 2. During this operation the rear leg 4 and the cross strap 64 form a rigid brace for the front leg to hold it in upright position and any tendency for the jack to tip forwardly or backwardly is overcome by this arrangement of the two upwardly inclined, pivoted together legs. It is understood that in turning the screw 40 by means of the handle the threaded connection with the longitudinal block 74 will cause the block to move longitudinally of the screw 40 and since the screw turns and the block cannot turn because of its engagement with the front edges 12 and 14 of the leg 2, the block will move longitudinally to lift the load.

It is apparent that many widely different embodiments of this invention may be made without departing from the spirit and scope thereof,

and therefore it is not intended to be limited except as indicated in the appended claims.

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

1. A lifting jack comprising front and rear legs, means for pivotally connecting said legs together adjacent their upper ends whereby the legs may be folded into substantial parallelism for storage or may be shifted relatively into mutually inclined operative position with their lower ends spaced apart, said front leg being channel-shaped to provide forwardly extending side walls having forwardly exposed, relatively narrow bearing edges and a rear wall portion, a screw rod disposed longitudinally within the side walls of the channel-shaped front leg, means for mounting the upper end of the screw rod and turning the same, the lower end of said screw rod being loosely disposed, a stabilizing foot for said front leg having portions extending laterally of the front leg and having an upwardly extending front wall portion overlying the side walls of the channel-shaped front leg and also overlying the adjacent lower free end of the screw rod to prevent the same from being displaced out of the channel, and a load lifting block threadedly engaging said screw rod for movement thereof along the length of said front leg and having means directly engaging the forwardly exposed bearing edges of the side walls of the channel-shaped front leg for preventing turning of the said lifting block with respect to the screw rod and for eliminating bending moments on the said screw rod.

2. An automobile lifting jack, comprising an elongated strut, means supporting said strut in a generally upstanding position, a screw rod rotatably mounted on said strut and extending generally longitudinally thereof, means for turning said screw rod, a load lifting block which is relatively long as compared with the diameter of said screw rod, said block having a bore substantially co-extensive with its length through which bore said screw rod extends, a portion only of the internal surface of said bore being threaded for threadedly engaging said screw rod and the remainder of the internal surface of said bore forming an elongated bearing between said screw and said block for reducing binding of the block on said screw.

3. An automobile bumper jack, comprising an elongated strut having opposed sides and an integral back wall disposed to provide a generally U-shaped cross section and having forwardly exposed relatively narrow longitudinal free edges bounding an elongated frontal opening, means for supporting said U-shaped strut in an upstanding position, an elongated screw of relatively small diameter as compared to interior cross sectional dimensions of the U-shaped strut, thrust bearing means at the upper end of the U-shaped strut for rotatably and pendantly supporting said screw with the screw positioned substantially completely within the U-shaped strut and with the lower end of the screw free for lateral movement relative to the U-shaped strut, means connected with the upper end of the screw for turning the screw, load lifting means, said load lifting means including a screw engaging member disposed within said U-shaped strut and threadedly engaging said screw and movable longitudinally of the screw upon rotation of the screw, said screw engaging member having transverse cross sectional dimensions less than the interior cross sectional dimension of said U-shaped strut to permit movement of said load transmitting means laterally from side to side and from front to back of the U-shaped strut, plate means rigidly carried by, and extending laterally in opposite directions from said screw engaging member and overlying said free edges for engagement with the free edges, said plate means also extending for a substantial distance longitudinally of said U-shaped strut to cover a substantial portion of said frontal opening of the U-shaped strut and a bumper engaging member extending forwardly of said plate means and below the upper end of said plate means so that the portion of the plate means above the bumper engaging member prevents foreign objects from entering the U-shaped strut.

4. An automobile bumper jack, comprising an elongated strut consisting of opposed side walls and an integral back wall disposed to provide a generally U-shaped cross section and having forwardly exposed relatively narrow longitudinal free edges, means including a support leg for supporting said U-shaped strut in a generally upstanding operative position inclined from the vertical, means pivotally connecting said U-shaped strut and said support leg adjacent their upper ends so that said strut and leg may be folded together or may be opened, an elongated screw of relatively small diameter as compared to interior cross sectional dimensions of said U-shaped strut, said screw being mounted within said U-shaped strut, thrust bearing means adjacent the upper end of said U-shaped strut for rotatably and pendantly supporting said screw while maintaining said screw from movement longitudinally of said U-shaped strut, the lower end of said screw being loosely disposed within said U-shaped strut and movable laterally relative thereto, load lifting means, said load lifting means including a screw engaging member disposed within said U-shaped strut and threadedly engaging said screw and movable longitudinally of said screw upon rotation of the screw, said screw engaging member having exterior transverse cross sectional dimensions less than the interior cross sectional dimensions of said U-shaped strut to permit movement of said load transmitting means laterally from side to side and from front to back of the U-shaped strut, a pair of elongated flange means rigidly mounted on and movable with said screw engaging member and extending outwardly in opposite directions from said screw engaging member and overlying said free edges of the U-shaped strut and extending laterally beyond said opposite sides of the U-shaped strut for holding said load transmitting member from turning relative to said screw and for maintaining said screw engaging member substantially out of frictional contact with the inner surfaces of the back wall of said U-shaped strut regardless of the position of the screw engaging member relative to the opposite side walls of the U-shaped strut, a load engaging member rigidly connected to said screw engaging member and extending forwardly of said U-shaped strut, and actuating means connected with the upper end portion of said screw for turning the screw.

5. An automobile bumper jack, comprising an elongated strut having a generally U-shaped cross section and having forwardly exposed free narrow longitudinal edges, a hollow housing mounted adjacent the upper end of said U-shaped strut and projecting rearwardly therefrom, said housing having a rear wall disposed at an angle to the longitudinal axis of said U-

shaped strut, a leg for supporting said U-shaped strut in a generally upright position, said leg having the upper end thereof disposed within said housing, means for pivotally mounting the upper end of said leg within said housing so that said U-shaped strut and said leg may be folded one against the other for storage or for permitting said U-shaped strut and said leg to be spread apart at their bottoms, means for releasably and rigidly maintaining said U-shaped strut and said leg spread apart, an elongated screw of relatively small diameter disposed longitudinally within said U-shaped strut, means for rotatably and pendantly supporting said screw adjacent the upper end of said screw, the lower end of said screw being freely disposed for lateral movement relative to said U-shaped strut, a load lifting block threadedly mounted on said screw for movement therealong upon rotation of the screw, means connected with the upper end of the screw for rotating the screw, said load lifting block having exterior dimensions less than interior dimensions of said U-shaped strut to permit movement of said load lifting block transversely of said U-shaped strut, projection means rigidly mounted on said load lifting block and extending for engagement only with said narrow free edges of said U-shaped strut to transmit any transverse forces directly to said strut and to maintain said load lifting block substantially out of contact with inner surfaces of the U-shaped strut, and load engaging means carried by said load lifting block and projecting laterally from said U-shaped strut.

6. An automobile lifting jack, comprising an elongated strut having a generally channel-shaped cross section, means for supporting said strut in a generally upstanding position, a screw rod rotatably mounted at its upper end within said strut and extending generally longitudinally of the strut, means for turning said screw rod, a relatively long load lifting block, said load lifting block having a bore receiving said screw rod, which bore is relatively long as compared with the diameter of said screw rod, a portion only of the internal surface of said bore being threaded for threadedly engaging said screw rod,

and another portion of the internal surface of said bore providing a bearing between said screw rod and said load lifting block for reducing binding of the load lifting block on said screw rod.

7. An automobile bumper jack, comprising an elongated strut having a generally U-shaped cross section, a leg for supporting said U-shaped strut in a generally upstanding position, means for pivotally connecting upper end portions of said channel-shaped strut and said leg, an elongated screw rod of relatively small diameter disposed longitudinally within said strut, means for rotatably and pendantly mounting said screw rod adjacent an upper end on said strut, means connected with an upper end of said screw rod for rotating the screw rod, a relatively long load lifting block, said load lifting block having a bore receiving said screw rod, which bore is relatively long as compared with the diameter of said screw rod, a portion only of the internal surface of said bore being threaded for threadedly engaging said screw rod, and another portion of the internal surface of said bore providing a bearing between said screw rod and said load lifting block for reducing binding of the load lifting block on said screw rod, and a load engaging element carried by said load lifting block and extending laterally outwardly from said U-shaped strut.

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