Dec. 1, 1964 R. S. GRAAFSMA ETAL 3,159,381

LIFTING JACK

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Fig. 1.

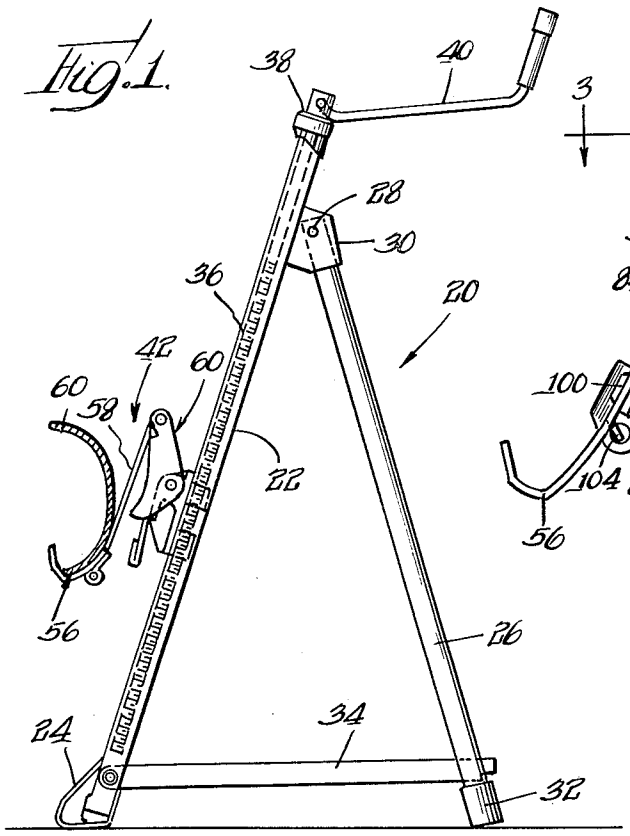


Fig. 2.

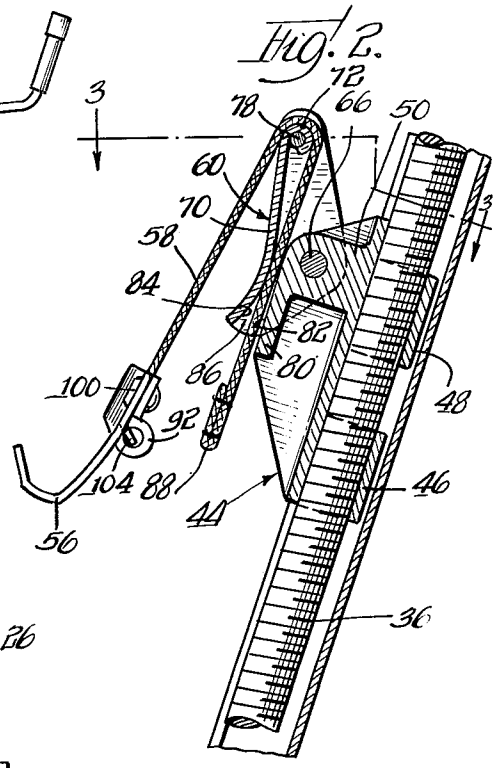


Fig. 4.

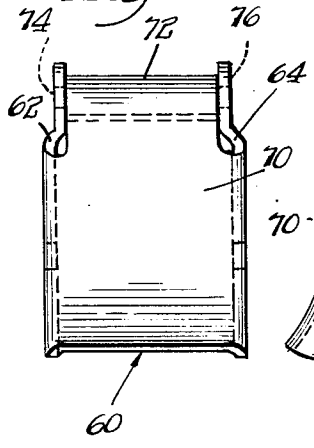


Fig. 5.

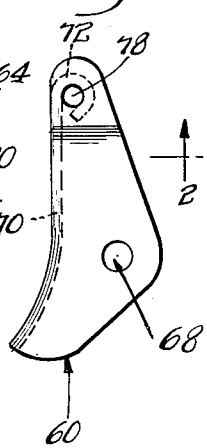
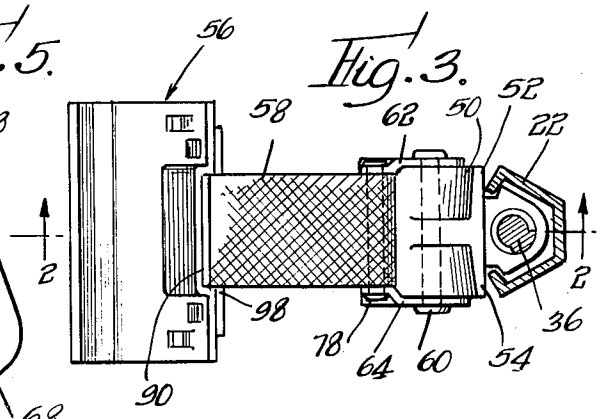


Fig. 3.



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Fig. 6.

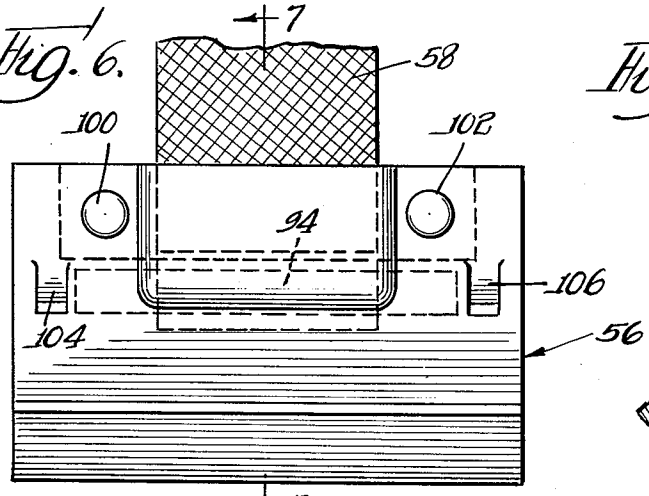


Fig. 7.

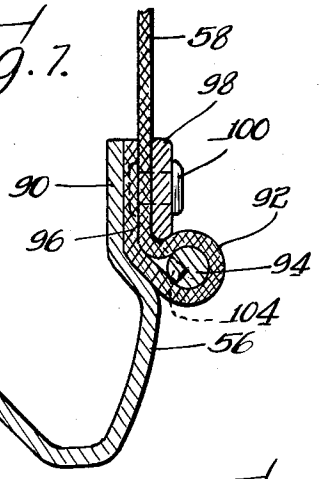


Fig. 8.

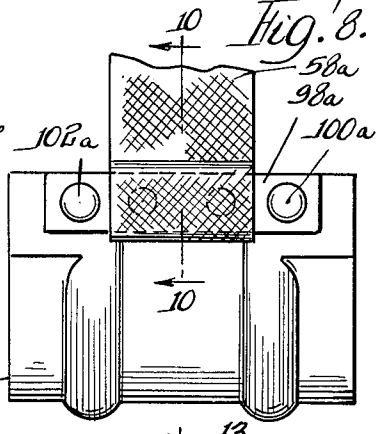


Fig. 9.

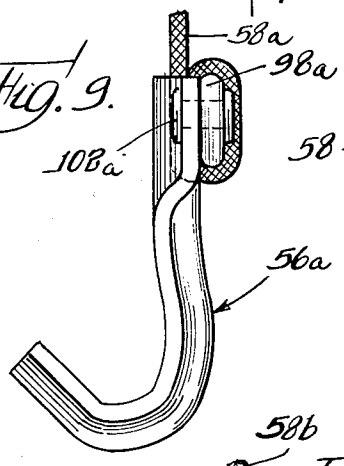


Fig. 10.

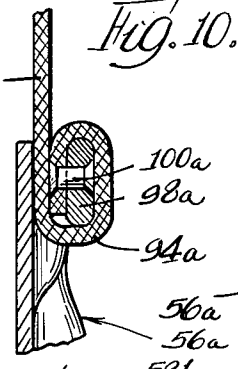


Fig. 12.

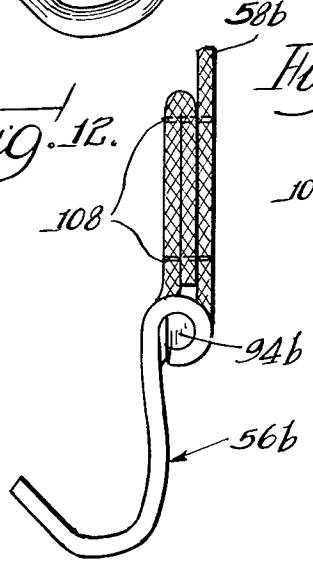


Fig. 13.

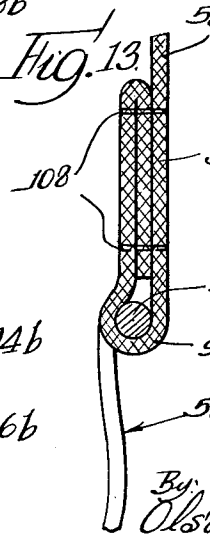
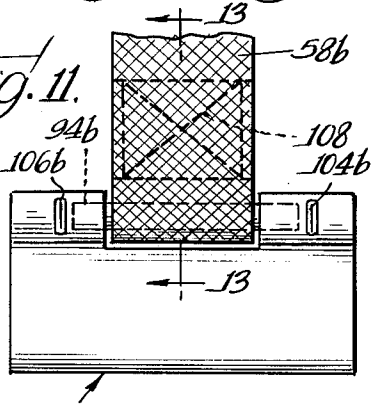


Fig. 11.



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LIFTING JACK

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4 Claims. (Cl. 254—100)

The present invention relates to a novel lifting jack, and more specifically to a novel jack structure especially suitable for engagement with an automobile bumper or the like.

As will be understood, the bumpers which are presently provided on modern automobiles vary widely in size and shape. As a result it has heretofore been difficult to provide a bumper type jack with a load rest or bumper engaging element which is suitable for use in association with all of the different bumpers. Furthermore as a result of poor fits and other reasons, certain heretofore proposed jack structures have caused marring or scratching of the bumpers.

It is an important object of the present invention to provide a novel bumper jack structure which is adaptable for use with different bumpers regardless of size or shape of the bumpers.

Still another important object of the present invention is to provide a novel bumper jack structure which is constructed so as to minimize any possibility of marring or scratching of a bumper in connection with which the jack is used.

A further object of the present invention is to provide a novel jack structure of the above-described type which is of relatively simple and economical construction.

Other objects and advantages of the present invention will become apparent from the following description and the accompanying drawings wherein:

FIG. 1 is a side elevational view showing a bumper jack incorporating features of the present invention associated with an automobile bumper;

FIG. 2 is an enlarged fragmentary partial sectional view taken along line 2—2 in FIG. 3;

FIG. 3 is a sectional view taken generally along lines 3—3 in FIG. 2;

FIG. 4 is a front elevational view of one element of the load rest structure constructed in accordance with the present invention;

FIG. 5 is a side elevational view of the element shown in FIG. 4;

FIG. 6 is a fragmentary front elevational view of the portion of applicant's novel load rest structure shown in FIG. 7;

FIG. 7 is a sectional view taken along lines 7—7 in FIG. 6;

FIG. 8 is a back elevational view showing another modified form of the present invention;

FIG. 9 is a side elevational view of the structure shown in FIG. 8;

FIG. 10 is an enlarged fragmentary sectional view taken along line 10—10 in FIG. 8;

FIG. 11 is a back elevational view similar to FIG. 8 but shows another embodiment of the present invention;

FIG. 12 is a side elevational view of the structure shown in FIG. 11; and

FIG. 13 is an enlarged fragmentary sectional view taken along lines 13—13 in FIG. 11.

Referring now more specifically to the drawings wherein like parts are designated by the same numerals throughout the various figures, a lifting jack 20 incorporating features of the present invention is shown in its entirety in FIG. 1. The jack 20 comprises an upstanding but preferably rearwardly inclined channel-shaped leg or strut 22 having a laterally extending stabilizing foot 24 fixed to its lower end. The strut 22 is adapted to be supported in its upright but rearwardly inclined position by a leg 26 having its upper end pivotally connected as at 28 to a bracket 30 fixed to an upper end portion of the strut 22. A laterally extending stabilizing foot 32 is also preferably secured to the lower end of the leg 26. A pivoted brace member 34 extends between lower end portions of the strut 22 and the leg 26 for limiting spreading of these lower end portions.

The jack structure 20 is provided with an elongated screw rod 36 extending within the channel-shaped strut 22 as shown in FIGS. 1, 2 and 3. The screw rod is preferably supported at its upper end by a bearing unit 38 mounted on the upper end of the strut 22 so that the rod depends from the bearing unit and supports the load of an automobile in tension. A handle member 40 is connected with the upper end of the screw rod for enabling an operator to turn the rod for raising and lowering the load.

In accordance with a feature of the present invention the jack structure 20 is provided with a novel bumper engaging means or load supporting unit 42 which is not only adaptable to all sizes and shapes of bumpers, but which also minimizes and substantially eliminates any possibility of objectionable scratching or marring of the bumpers. The load lifting unit 42 comprises an elongated nut member 44 preferably having axially spaced internally threaded tubular portions 46 and 48 receiving the screw rod 36. As shown best in FIGS. 2 and 3, the nut portions 46 and 48 are disposed within the channel-shaped strut 22. The nut member 44 further includes a lug portion 50 which projects forwardly through the open front face of the channel-shaped strut 22. The lug portion 50 includes laterally extending flange sections 52 and 54 providing bearing surfaces adapted to engage and ride on the forward edges of the channel-shaped strut.

The load lifting unit 42 is constructed, as previously indicated, so as to be adaptable to any size or shape of bumper and so as to avoid scratching or marring the bumper. This is accomplished by providing the load lifting unit 42 with a relatively short hook member 56 which is attached to one end of a strap 58 in a manner which will be described more in detail below. As indicated in FIG. 1, the hook member 56 is adapted to engage under the lower edge of a bumper 60 but does not extend to any appreciable extent along the side of the bumper and therefore it does not have to be constructed for accommodating any irregularities in the shape of the bumper. The strap 58, does, however, extend upwardly along the side of the bumper and this strap is constructed from a webbing or fabric of cotton or nylon or other strong, preferably non-metallic material. The fabric strap 58 is, of course, flexible whereby it is adapted to yield in response to and conform to any changes in the shape of the bumper. At the same time the fabric strap is sufficiently soft as compared with the bumper so as to avoid marring or scratching the bumper.

The strap 58 is detachably and adjustably connected with the load lifting nut member 44 in a manner such that the length of the strap available for engagement with a bumper may be easily changed for accommodating bumpers of different widths. More specifically, the load lifting unit 42 is provided with a strap supporting and clamp member 60 which may be easily and economically stamped or otherwise formed from sheet metal. The member 60 includes opposite side sections 62 and 64 which embrace opposite sides of the lug portion 50 and are pivotally connected thereto by a pin 66.

The pin 66 extends through apertures 68 and the side portions of 62 and 64 which apertures are located slightly below the vertical center of the generally upstanding member 60. The side sections 62 and 64 are joined by

a relatively wide bight portion 70 having an upper marginal portion curled to provide a tubular section 72 in alignment with apertures 74 and 76 through end portions of the side sections 62 and 64. A pin 78 extends through the apertures 74 and 76 and the tubular section 72 for strengthening and supporting the tubular section. As shown thus in FIGS. 2 and 5, the bight portion 70 extends substantially straight downwardly from the tubular section 72 to a position slightly below the vertical center of the member 60 and adjacent to but laterally offset from the apertures 68 whereupon the bight portion gradually flares laterally outwardly away from the aperture 68.

The lug portion of the load lifting nut member 44 includes a downwardly extending section 80 adjacent the pivot pin 66 which section 80 provides a clamping surface 82 disposed in opposing relationship to a clamping surface 84 provided by the bight portion 70. When the member 60 is mounted on the pin 66 as shown best in FIG. 2, a restricted throat 86 is provided between and defined by the clamping surfaces 82 and 84.

The strap member 58 is detachably and adjustably supported by extending an end portion of the strap member over the looped or tubular section 72 and then downwardly through the throat 86 as shown best in FIG. 2. When the member 60 is not supporting a load, it may be easily manually pivoted in a clockwise direction as viewed in FIG. 2 so that the clamping surface 84 of the bight portion 70 will be moved away from the clamping surface 82 for opening the throat 86 and facilitating insertion of the end of the strap and/or adjustment of a desired length of the strap through the throat. However when a load is placed on the hook member 56, the member 60 is caused to pivot in a counterclockwise direction toward the position shown in FIG. 2 so that the clamping surface 84 along the lower end portion of the bight section 70 is urged toward the clamping surface 82 and the strap or web member is pinched therebetween. This pinching or clamping action securely retains the strap against slipping through the throat as long as the load is being supported. Preferably an end portion 88 of the strap is thickened or doubled so as to prevent the strap from inadvertently slipping upwardly through the throat when the load is removed from the hook member 56.

The strap 58 is secured to the hook member 56 in a manner so as to resist loosening and at the same time so as to minimize any possibility of tearing the strap. This connection is shown best in FIGS. 6 and 7. More specifically, the hook member 56 is stamped or otherwise formed to provide a recess 90 having a width and depth corresponding to the width and thickness of the strap. An end portion of the strap is looped as at 92 around a rod 94 and positioned so that an end section 96 is disposed within the recess 90. A bar 98 is clamped against the double thickness of the strap behind the recess 90 and is secured in position by rivets 100 and 102 which extend through the hook member 56 at opposite sides of the recess 90. Tabs 104 and 106 are struck from opposite end portions of the hook member 56 for overlying opposite ends of the rod 94 and thereby retaining the rod within the looped section 92 of the strap.

FIGS. 8–10 show a slightly modified form of the present invention in which the structure is identical to the entire jack structure described above with the exception of the means for connecting the strap to the hook member. Thus elements shown in FIGS. 8–10 which correspond to those described above are indicated by the

same reference numerals with the suffix *a* added. This embodiment is simplified in that the above mentioned rod 94 is omitted and the strap 58*a* is looped around the bar 98*a*, which bar is then clamped and riveted against the load lifting hook member 56*a*.

FIGS. 11–13 show another slightly modified form of the present invention wherein elements corresponding to those described above are identified by the same reference numerals with the suffix *b* added. In this embodiment, the strap is looped around the rod 94*b* as in the first described embodiment. However in this embodiment the strap is then folded so as to provide a triple thickness and the several thicknesses are secured together by stitches 108 arranged in a rectangular and crossing pattern as shown best in FIG. 11.

While preferred embodiments of the present invention have been shown and described herein, it is obvious that many structural details may be changed without departing from the spirit and scope of the appended claims.

The invention is claimed as follows:

1. A lifting jack comprising an upstanding elongated member, a load lifting element mounted for movement along said upstanding member and presenting an outwardly facing clamping surface, a clamping member assembled with said element, means pivotally connecting said clamping member to said element for movement about a predetermined axis, said clamping member presenting a second surface in opposing relationship with respect to said first mentioned clamping surface, said clamping member including a section located above said axis, and means for engaging and retaining a workpiece including an elongated flexible fabric strap extending over said section of said clamping member, said strap having a first end portion extending downwardly from said section for engagement with a workpiece and a second end portion extending downwardly from said section between said clamping surfaces, said second end portion being secured between said clamping surfaces.

2. A structure, as defined in claim 1, wherein said means for engaging and retaining said workpiece comprises a rigid hook member connected with said first end portion of said strap.

3. A lifting jack, as defined in claim 1, wherein said clamping member comprises spaced apart side portions embracing said load lifting element and a bight portion joining said side portions, said bight portion providing said second surface and being curved toward and away from said first surface and providing a restricted throat beneath the pivotal connection between said clamping member and said load lifting element, said bight portion having an upper marginal section separated from said side portions and rolled between the side portions, said fabric strap extending over said roller marginal section.

4. A lifting jack, as defined in claim 3, which includes a rod extending between and secured to said side portions and within and supporting said rolled marginal section.

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