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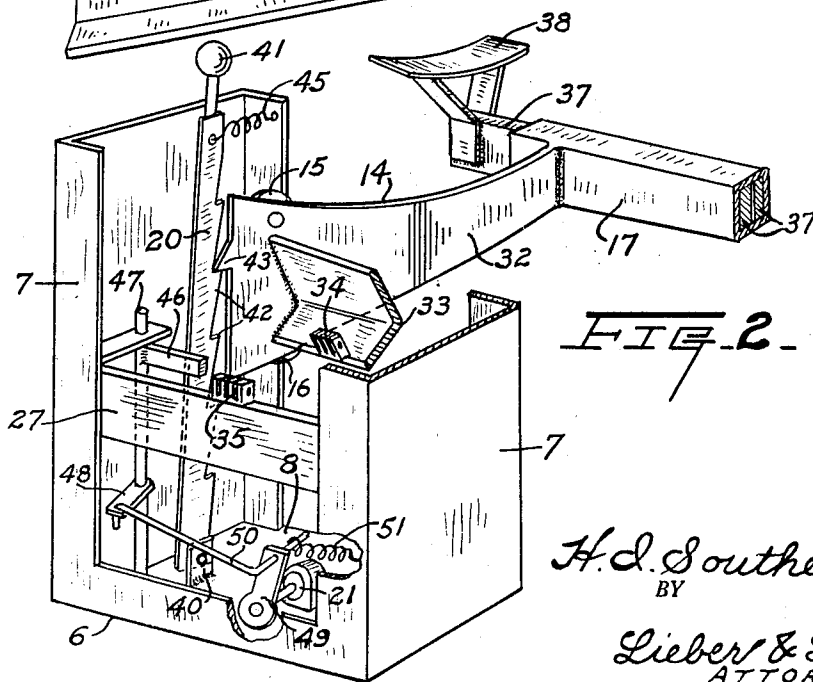
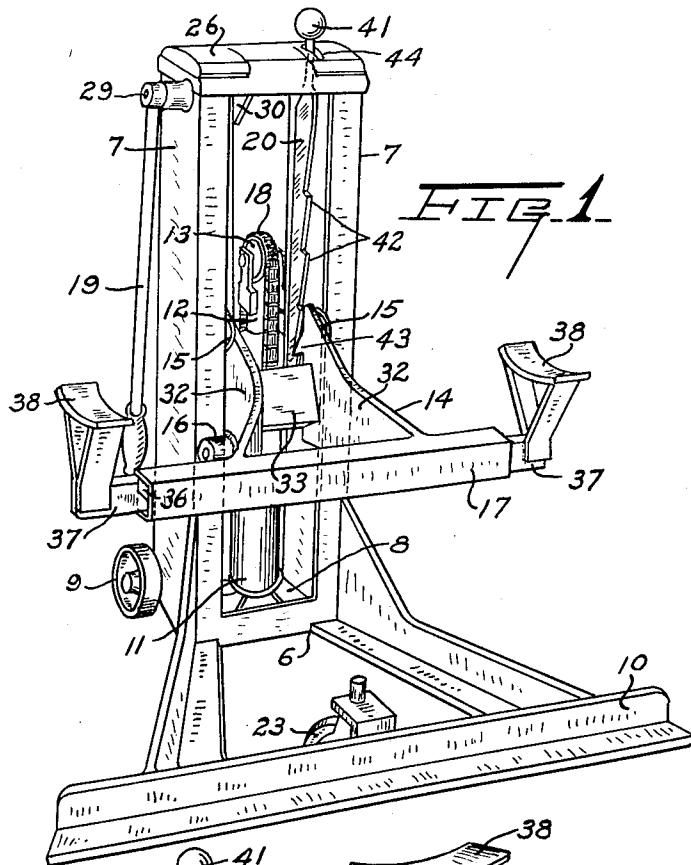
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2,867,409

SERVICE JACK

Filed Sept. 15, 1954

2 Sheets-Sheet 1



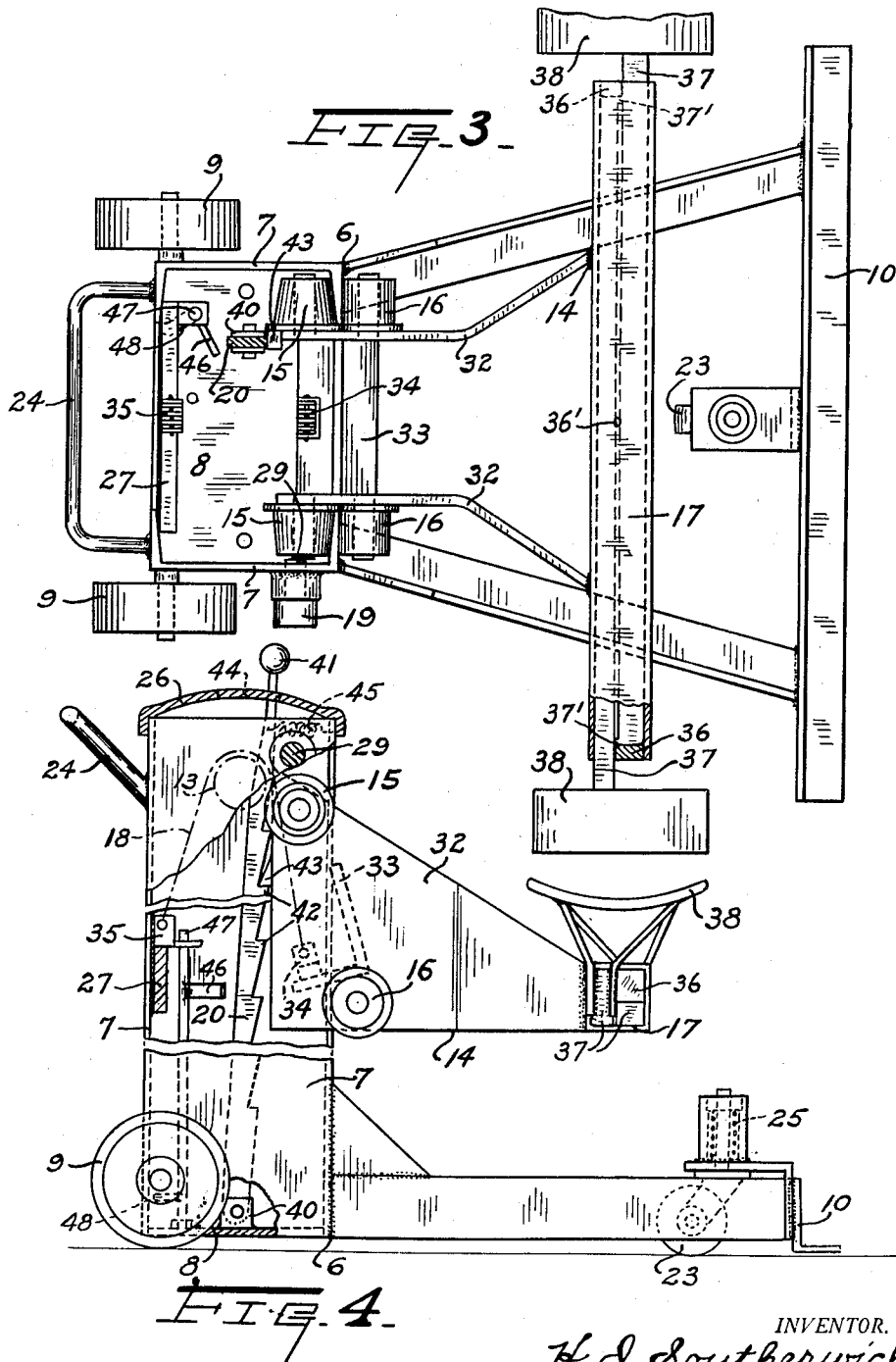
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2 Sheets-Sheet 2



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1

2,867,409

SERVICE JACK

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3 Claims. (Cl. 254—2)

The present invention relates generally to improvements in the art of lifting and lowering heavy loads, and relates more specifically to improvements in the construction and operation of service jacks especially adapted to lift vehicles or parts thereof.

The primary object of my invention is to provide an improved jack assemblage for lifting and lowering relatively heavy articles such as vehicles, and which is simple but durable in construction and highly efficient in operation.

In modern automobiles and light trucks the construction of the bodies is such that it is extremely difficult to gain access to the wheels and under carriages even with the aid of the ordinary swinging lever service jacks. Perhaps the most convenient manner of gaining such free access is to lift the body of such a vehicle without necessarily elevating the chassis or frame, and while this may be accomplished with an ordinary high lift bumper jack such procedure is extremely slow, tedious and dangerous. It has therefore been heretofore proposed to provide a so-called "one-end" bumper jack equipped with a special high lift hydraulic hoist cooperating with spaced saddles adapted to coast with vehicle bumpers at widely separated localities, but these prior devices are relatively objectionable for various reasons.

The prior "one-end" bumper jacks besides being costly to construct due to the use of special long stroke hydraulic hoists, are also relatively bulky and interfere with access to the trunk compartment when applied to the rear bumper of an automobile. Then too, these prior jack assemblages are rather difficult to apply to diverse types of bumpers, and to manipulate so as to insure quick and safe action. The prior bumper jacks are moreover cumbersome to move, and embody parts which must be removed when not in use thus introducing danger of loss of such parts.

It is therefore an important object of the present invention to provide an improved one-end bumper jack for automobiles and light trucks, which obviates all of the objectionable features of the prior jacks of this type, and which is compact and has dangerous movable parts well concealed so as to make it safely but effectively operable.

Another important object of this invention is to provide an improved bumper lift which is exceptionally strong and powerful and dependable in operation, as well as being rapidly applicable to various styles of vehicle bumpers.

A further important object of the invention is to provide a speedy high lift jack assemblage which may be produced at low cost from standard structural steel, and also embodies a standard compact hydraulic lifting and lowering unit having relatively short stroke.

Still another important object of my invention is to provide a readily transportable bumper jack for automobiles, which avoids obstruction to trunk access when applied to

2

the rear vehicle bumper, and all parts of which are permanently attached to the unit when not in use.

An additional important object of my present invention is to provide an improved safety rig for preventing accidental lowering of a jack while loaded, and which automatically cooperates with the jack lowering mechanism when released.

Another important object of the present invention is to provide a well proportioned and attractive service jack unit the functioning of which can be safely and plainly viewed by an operator so as to insure accurate performance, and which may be applied and manipulated by a novice.

These and other more specific objects and advantages of the invention will be apparent from the following detailed description from which it may be noted that the gist of the improvement is the provision of a one-end vehicle bumper lift embodying a three wheel mounted portable chassis having upstanding parallel rigid guideways rigidly attached to an extensive base reaching forwardly of the guideways, a cantilever load carrier having one end guided by rollers and movable along the guideways while its opposite free end extends forwardly over the chassis base and is provided with laterally spaced and adjustable bumper engaging saddles, a hydraulic jack mounted upon the chassis and having a plunger movable between the guideways, a flexible element having its medial portion cooperable with the moveable jack plunger while its opposite ends are fastened to the chassis and load carrier respectively, and a safety lever pivotally secured to the chassis and being alternately cooperable with the load carrier to prevent accidental descent thereof while loaded and with the relief valve of the jack to effect lowering of the carrier.

A clear conception of the several features constituting the present improvement and of the construction and operation of a typical one-end hydraulic bumper jack unit embodying the invention, may be had by referring to the drawings accompanying and forming a part of this specification wherein like reference characters designate the same or similar parts in the various views.

Fig. 1 is a true photographic perspective view of a typical one-end hydraulic jack unit built in accordance with the invention and showing the holding lever in active position;

Fig. 2 is a fragmentary somewhat enlarged and shortened rear perspective view of a similar jack assemblage, showing the details of construction of the safety holding lever and its connections with load carrier and with the lifting jack release valve;

Fig. 3 is a top view of the same one-end jack unit with the hydraulic jack omitted; and

Fig. 4 is a part sectional and fragmentary side elevation of the assemblage shown in Fig. 3, with portions broken away and omitted to more clearly reveal internal structure of the portable unit.

While the invention has been shown and described herein as having been embodied in a hydraulic jack unit especially adapted for use as a one-end or bumper service jack for automobiles, it is not the intent to unnecessarily restrict the use of the improved features to such an assemblage; and it is also contemplated that descriptive terms employed herein be given the broadest possible interpretation consistent with the disclosure.

Referring to the drawings, the improved mobile hydraulic jack unit shown therein, comprises in general a portable chassis 6 having a pair of rigid parallel upstanding channels or guideways 7 mounted upon a sturdy base 8 which is provided at one end with a pair of coaxial wheels 9 and at its opposite end with a transverse angle beam 10; a hydraulic jack 11 resting upon

the chassis base 8 and having a plunger member 12 movable between the guideways 7 and provided at its upper end with a roller 13; a cantilever load supporting elevator or carrier 14 guided by inner and outer rollers 15, 16 respectively, for movement along the channel guideways 7 and being provided at its overhung end remote from these guideways with a transverse box beam 17 disposed above and parallel to the angle beam 10; a flexible element such as a chain 18 having one end secured to the chassis 6 and its opposite end secured to the carrier 14 while its medial portion engages the plunger roller 13; an oscillatory pump operating handle 19 operatively connected to the liquid pump of the jack 11; and a safety lever 20 swingably suspended from the chassis base 8 and being alternately cooperable with the load carrier 14 to positively prevent lowering thereof, and with the release valve 21 of the jack 11 to effect lowering of the load carrier 14.

The chassis 6 may be sturdily fabricated from structural steel bars and plates welded or otherwise rigidly united, and the guideways 7 may be formed of standard channel stock while the reaction beam 10 may be formed of standard angle stock of sufficient length to provide an extensive support for the unit. In order to facilitate transportation of the jack assemblage from place to place, a caster wheel 23 is provided at the medial portion of the reaction bar 10 and a transverse grip bar 24 is also provided near the upper ends of the channel guides 7; and the caster wheel 23 is adapted to be forced downwardly by a spring 25 when the jack is unloaded so as to lift the angle beam 10 away from the ground, see Figs. 3 and 4. The caster wheel 23 thus cooperates with the two aligned wheels 9 to provide a three point mobile support for the unloaded jack; and besides the grip bar 24, the upstanding guideways 7 are also stiffened by a removable cap 26 and by a transverse fixed plate 27 thus producing a rigid L-shaped chassis assembly.

The hydraulic jack 11 may be of any of the well known conventional types having an oil supply reservoir, a reciprocable pump for transferring oil from the reservoir to the plunger displacement chamber to elevate the plunger, and a release or by-pass valve for returning the oil from the plunger displacement chamber to the supply reservoir. A typical jack of this type is shown in Brumder Patent No. 2,238,968, granted April 22, 1941, and such a conventional jack 11 may be mounted centrally upon the chassis base 8 so that its plunger 12 and the roller 13 carried by the upper plunger end will reciprocate midway between the channel guideways 7 and will probably cooperate with the medial portion of the flexible chain element 18. The oscillatory handle 19 for actuating the pump of the hydraulic jack 11 is mounted upon a pivot 29 journaled in the upper portion of one of the guideways 7 and the inner end of which has a crank 30 secured thereto. The swinging extremity of the crank 30 is connected by a connecting rod with the piston of the jack pump which may be of any well-known type such as shown in the above identified Brumder patent, so that oscillation of the handle 19 will cause the jack plunger 12 to rise.

The cantilever load supporting elevator or carrier 14 and its box beam 17 may also be fabricated from structural steel, and the reaction rollers 15, 16 are journaled upon pins secured to the vertically widened inner ends of the opposite side plates 32 of the carrier 14 which are also rigidly united by means of a horizontal L-shaped bridge plate 33, see Figs 1 to 4 inclusive. The mid-portion of this bridge plate 33 has a cleat 34 mounted thereon for detachable attachment to one end of the chain 18, and the opposite end of this chain is likewise attachable to a similar cleat 35 secured to the mid-portion of the transverse guideway reinforcing plate 27. The rollers 15, 16 are spaced apart vertically a considerable distance, and the upper axially aligned pair of rollers 15 coact with the inner surfaces of the adjacent parallel flanges of the

channel guideways 7, while the lower axially aligned rollers 16 coact with the outer surfaces of these same flanges, thus providing an effective anti-friction connection between the cantilever elevator 14 and the chassis 6.

The transverse tubular box beam 17 which is rigidly attached to the free ends of the elevator side plates 32, is of considerable length having substantially square transverse hollow cross-section and being provided at its opposite ends with torsion blocks 36 which absorb twisting stresses. Snugly slidably confined within the hollow beam 17 is a pair of overlapping supports 37 each carrying a saddle 38 at its outer end, and these saddles 38 are formed for disposition beneath and for lifting engagement with a load such as the bumpers or frames of automobiles and trucks of various types. The saddles 38 may be adjusted to different positions relative to the adjacent ends of the beam 17 in order to accommodate bumpers of various lengths and to provide maximum stability for the portion of the vehicle being lifted, and the elongated supports 37 for the saddles 38 are relatively slidable to effect such adjustment and are stopped by the blocks 36 and by a pin 36' coacting with lateral projections 37'.

The safety lever 20 is swingly supported at its lower extremity from ears 40 secured to the chassis base 8, and its upper extremity is provided with a manipulating knob 41 while its medial portion has a series of elevator holding teeth 42 formed thereon and with which a latch 43 formed integral with one of the side plates 32 of the carrier 14 is cooperable to positively prevent lowering of the elevator, as shown in Figs. 1, 2 and 4. The upper portion of the lever 20 extends through a slot 44 formed in the cap 26 and this lever is constantly urged to swing toward the latch 43 by a spring 45 connecting its upper portion with the adjacent guideway 7. The medial portion of the holding lever 20 is adapted to engage an arm 46 secured to an upright pivot shaft 47 mounted on the chassis 6 when the lever is swung away from the latch 43, and this pivot shaft 47 has another arm 48 near its lower end connected to a lever 49 secured to the actuating stem of the release valve 21 by means of a connecting rod 50 which is constantly urged in a clockwise direction as viewed in Fig. 2, by a spring 51 so as to close the valve 21 when the arm 46 is free.

When the improved bumper service jack unit has been constructed and assembled as above described, the elevator or load carrier 14 may be dropped into its extreme lowermost position when not in use, by merely swinging the holding lever 20 away from the latch 43 on the carrier, whereupon the spring 25 associated with the caster wheel 23 will elevate the chassis beam 10 away from the ground and will enable the entire unit to be transported from place to place upon the three wheels 9, 23. The saddles 38 may be readily adjusted so as to properly coact with the bumper of the vehicle to which the jack assemblage is to be applied, and after these saddles 38 have been carefully positioned below the bumper with the jack 11 preferably located approximately in the central vertical longitudinal plane of the vehicle, the lever 20 should be released and the handle 19 may be oscillated to raise the plunger 12 and to thereby lift the load carrier 14 so as to cause the saddles 38 to elevate the vehicle body while simultaneously lowering the chassis beam 10 into firm contact with the ground or floor against the action of the spring 25.

During such lifting of the vehicle body, the rigid latch 43 formed on the carrier 14 rides over the successive projections or teeth 42 on the holding lever and when sufficient lifting of the vehicle has been effected, and the handle 19 is released, the jack 11 will ordinarily hold the elevator in fixed elevated position until the release valve 21 is operated. However, if any leakage occurs in the jack, tending to cause the load to drop, then the latch 43 will drop into engagement with the nearest lower tooth 42 of the lever 20, and this lever

will thereafter positively maintain the vehicle elevated until the holding lever is released. It is to be noted that when the vehicle or load is being elevated, the chain 18 rides over the plunger roller 13 and the reaction rollers 15, 16 ride along the opposite sides of the adjacent channel flanges with minimum friction loss; and when the load is being raised and held in elevated position, the rollers 15, 16 effectively support the cantilever elevator at all times.

When the jack unit is thus applied to the bumper of an automobile or truck, the body may be lifted high enough so as to permit free access to the wheels and undercarriage; and if it is desired to lower the load, it is only necessary to swing the lever 20 out of engagement with the latch 43 and against the arm 46 so as to rotate the pivot shaft 47 in a clockwise direction as viewed in Fig. 2. This rotation of the pivot shaft causes the arm 48 to swing the lever 49 through the connecting rod 50 and against the action of the spring 51, sufficiently to open the jack release or by-pass valve 21, thereby permitting the liquid to escape from the plunger displacement chamber of the jack into the liquid supply reservoir. As soon as the carrier 14 has been lowered sufficiently to entirely release the load, the spring 25 quickly becomes effective to raise the chassis beam 10 from the ground and to thereby restore the caster wheel to active condition.

From the foregoing detailed description it will be apparent that the present invention in fact provides a portable service jack especially adapted to cooperate with the bumpers of a vehicle to lift the body without necessarily elevating the vehicle chassis or frame, and which is simple, compact and durable in construction, as well as being rapidly and safely transportable and manipulable. By utilizing a standard hydraulic jack 11 having its plunger 12 cooperable through a roller 13 and a flexible element 18 with the load elevator 14, the cost of production is reduced to a minimum and the resultant assemblage is relatively low in overall height and does not interfere with access to the vehicle trunk or hood when applied to the rear and front bumpers respectively of an automobile. The improved safety lever 20 performs the dual function of holding the elevated load and of controlling the lowering of the hydraulic jack plunger 12; and the provision of the manipulating handle 19 which is permanently attached to the jack unit and therefore eliminates possible loss or misplacement of loose parts, also enables the operator to clearly observe the functioning of the jack 11 and of the load carrier 14 without danger. The handle 24 also facilitates convenient transportation and positioning of the unit so as to cause the saddles 38 to most effectively engage the load, and since the more delicate and dangerous movable parts are housed between the sturdy channel beams 7 the mechanism is safely operable. The provision of the torsion blocks 36 within the tubular beam 17 is also important since they eliminate possible twisting of this beam due to the off-setting of the adjustable saddle supports 37, and the improved jack assemblage is applicable to loads other than automobile bodies and frames and has proven highly satisfactory and successful in actual use.

It should be understood that it is not desired to limit this invention to the exact details of construction and operation of the service jack specifically shown and described herein, since various modifications within the scope of the appended claims may occur to persons skilled in the art.

I claim:

1. A portable jack assemblage comprising, a transportable chassis having thereon upstanding parallel guideways, an hydraulic lift mounted upon said chassis and having a load lifting plunger movable upwardly between said guideways and also having a pump for raising and a release valve for effecting lowering of the plunger, a load carrier guided for movement along said guideways,

a flexible element having one end secured to said chassis and its opposite end secured to said carrier while its medial portion is movably cooperable with the upper end of said plunger to vary the elevation of the carrier relative to the chassis, a pump operating handle mounted upon one of said guideways and being operatively connected with said pump to effect raising of said plunger and said carrier, and a load holding lever mounted upon said chassis and being directly cooperable with said carrier to sustain the load, said lever being swingable independently of said pump operating handle to release the load and being formed for cooperation with said release valve to effect lowering of said plunger and carrier when the lever is swung into load releasing position.

2. A portable jack assemblage comprising, a transportable chassis having thereon upstanding parallel guideways, an hydraulic lift mounted upon said chassis and having a load lifting plunger movable upwardly between said guideways and also having a pump for raising and a release valve for effecting lowering of the plunger, a load carrier guided for movement along said guideways and having thereon a latch, a flexible element having one end secured to said chassis and its opposite end secured to said carrier while its medial portion is movably cooperable with the upper end of said plunger to vary the elevation of the carrier relative to the chassis, a pump operating handle fulcrumed upon one of said guideways and being operatively connected with said pump to effect raising of said plunger and carrier, and a load holding lever fulcrumed upon said chassis and having thereon a series of teeth cooperable with said carrier latch to positively sustain the load in various elevated positions when the lifting force acting upon said plunger fails, said lever being swingable to release the load and being formed for cooperation with said release valve to effect lowering of said plunger and carrier when the lever is swung into load releasing position.

3. A portable jack assemblage comprising, a transportable chassis having thereon upstanding parallel guideways, an hydraulic lift mounted upon said chassis and having a load lifting plunger movable upwardly between said guideways and also having a pump for raising and a release valve for effecting lowering of the plunger, a load carrier guided for movement along said guideways and having thereon a latch, a flexible element having one end secured to said chassis and its opposite end secured to said carrier while its medial portion is movably cooperable with the upper end of said plunger to vary the elevation of the carrier relative to the chassis, a pump operating handle fulcrumed upon one of said guideways and being operatively connected with said pump to effect raising of said plunger and carrier, a load holding lever fulcrumed upon said chassis and being manipulable independently of said pump operating handle, said lever having thereon a series of teeth cooperable with said carrier latch to positively sustain the load in various elevated positions when the lifting force acting upon said plunger fails and being formed for cooperation with said release valve to effect lowering of said plunger and carrier when the lever teeth are detached from said latch, and means for constantly resiliently urging said teeth toward said latch.

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