H. REHAK.

HYDRAULIC CARRIAGE LIFTING JACK.

APPLICATION FILED APR. 10, 1922.

1,420,146. Patented June 20, 1922.

Fig. 1

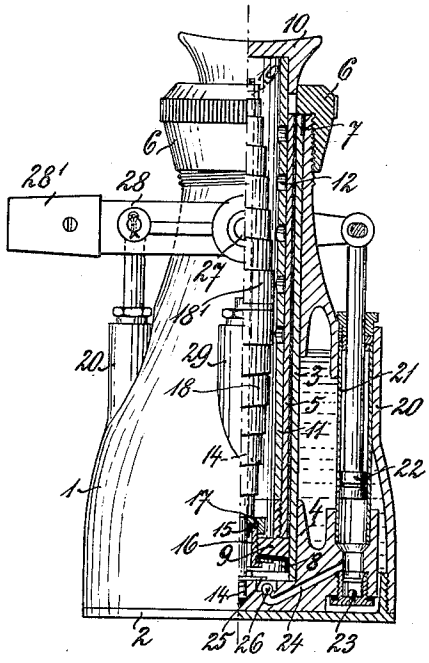


Fig. 2

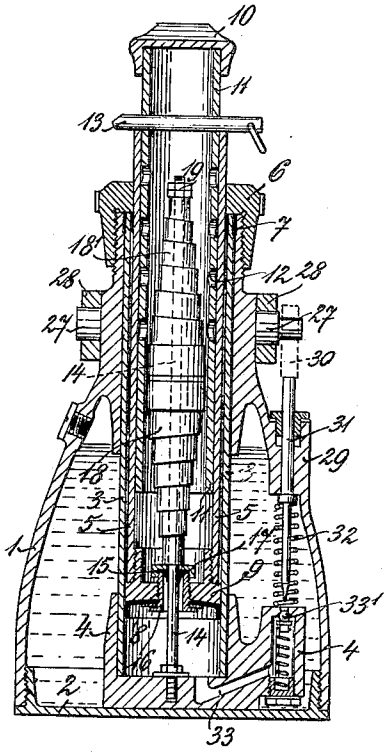
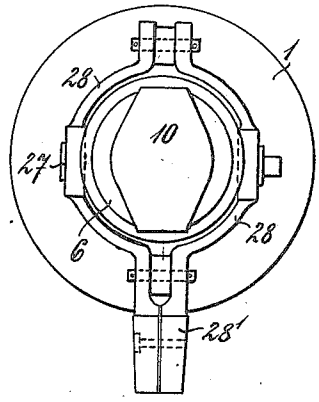


Fig. 3



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HYDRAULIC CARRIAGE-LIFTING JACK.

1,420,146. Specification of Letters Patent. Patented June 20, 1922.

Application filed April 10, 1922. Serial No. 551,273.

To all whom it may concern:

Be it known that I, HANS REHAK, a citizen of the Austrian Republic, residing at Vienna, Austria, have invented certain new and useful Improvements in Hydraulic Carriage-Lifting Jacks (for which I have filed application in Austria, Jan. 15, 1920), of which the following is a specification.

This invention relates to a carriage lifting jack, more especially designed for motor cars, the base of which is so constructed and arranged as to form a pressure liquid receptacle and to contain the pressure and relief arrangements. The invention consists more particularly in the formation and arrangement of the springs which effect the return of the lifting piston, which arrangement has not hitherto been employed in small lifting appliances which are designed to be carried in the carriage, and in which only a limited space is available.

In accordance with this invention one or two spiral band springs, conically wound, are employed which at the lower ends engage a projection or shoulder on the lifting piston and at the top engage an abutment which is carried by a rod passing through the spring and anchored on the casing of the carriage jack.

By the arrangement of the conical band springs, which permit compression down to the level of the outermost spring coil, a fairly long stroke of the piston is possible notwithstanding the compactness of the device and the action of the spring is very powerful. The peculiar method of supporting the springs within the lifting piston very materially facilitates the mounting of the said springs.

In order that the invention may be better understood drawings are appended showing one example of the carriage jack according to this invention:—

Figs. 1 and 2 show longitudinal sections thereof, taken at an angle of 90° to each other,

Fig. 3 is a plan view.

Referring to the accompanying drawings 1 indicates the outer case which is in the form of a bottle shaped hollow body, provided at the lower end with a screw threaded closure 2 forming a base and which body forms a receptacle for the liquid, oil, glycerine or the like.

Secured in the neck of the hollow body 1, in any suitable manner, is a steel tube 3 the lower end of which is packed in a casing 4 resting on the bottom 2. Arranged so as to be displaceable in the cylinder 3 is the operating piston which consists of a tube 5 for which packing is provided at the upper end indicated by 7 held by a sleeve nut 6 and which packing is inserted in the upper end of the cylinder 3, provided at the lower end with a plug 9 which plug carries a cup-leather or the like 8, and which tube forms the piston. Inserted in the piston tube 5, so as to be displaceable therein, is a tube 11 carrying a head 10 which is provided with transverse holes 12 designed to permit the adjustment of the piston rod 11 for which purpose a pin 13 is provided designed to be inserted in tube 11 as shown in Fig. 2.

The plug 9 is provided with a central opening through which passes a rod 14 screwed at the lower end into the casing 4 and which rod extends upwards, being packed against the entry of liquid by a cup-leather 15. The leather 15 is clamped between a sleeve 16 screwed into the plug 9 and a sleeve nut 17 screwed upon the sleeve. Two oppositely disposed conically wound flat springs 18, 18′ encircle the rod 14, disposed with their base surfaces resting against each other, the lower end of spring 18 resting on the sleeve nut 17.

Lock nuts 19 are provided upon the upper end of rod 14 which forms an abutment for the spring 18′ as soon as the springs are compressed by the ascending piston.

The hollow body 1 has two lateral extensions 20 in which are tightly inserted two tubular bodies such as 21 each of which contain a piston such as 22. The lower end of the cylinders 21 are inserted in lateral extensions of the casing 4. Below each cylinder 21 there is a suction valve 23 preferably in the form of a ball valve so that it will work even should the pressure liquid contain solid impurities.

Each pump cylinder is connected with the interior of the lifting cylinder 3 by a channel such as 24 at the inner ends of which are two pressure valves such as 26, held against displacement by a bar 25, and which valves are also preferably in the form of ball valves. The pressure piston 22 is actuated by a forked lever 28, pivoting around two gudgeons 27 supported by the hollow body 1, and provided with a suitable extension upon its extended end 28′.

29 indicates a third extension formed in

the hollow body 1, in which extension there is provided a pin 31 displaceable in a downward direction by a lever 30, by overcoming the resistance of a spring 32, which pin can act against the relief valve 33' which is connected with the interior of the cylinder 3 by the channel 33, on opening which valve the pressure medium flows back from the cylinder 3 into the hollow body.

On opening the valve 33' the springs 18, 18', which were compressed on the upward motion of the pressure piston 5, are relieved and the pressure piston 9 thus always returns to its lowermost position even if no load is acting upon it, so that therefore the head 10 of the lifting jack can be withdrawn without difficulty from beneath the load.

Claims.

1. A carriage jack comprising a casing, a liquid receptacle in said casing, pumps in said casing, a hand lever for operating said pumps, a cylinder in said casing, a ram in said cylinder, springs opposing the outward movement of the ram and disposed within said ram, and a relief valve for said cylinder.

2. A carriage jack comprising a casing open at one end, a closure for said casing, an enlargement in the casing designed to form a liquid receptacle, pumps disposed in said enlargement, a hand lever for operating said pumps pivotally mounted on said casing, a cylinder in said casing, a hollow ram in said cylinder, springs opposing the outward movement of the ram and disposed within said ram and a relief valve for the cylinder.

3. A carriage jack comprising a casing open at one end, a closure for said casing, an enlargement in the casing designed to form a liquid receptacle, a body secured to said closure, an extension on said body, a central recess in said body, a tube secured at one end in said recess and at the other end in the casing, a ram comprising a tube slidable within said first tube, a head secured to the inner end of said tube, packing on said head, a tube slidable within said ram, perforations in said tube, a pin to engage said perforations and the outer end of the ram, a rod centrally disposed within said ram and passing through the head at the inner end thereof, said rod being screwed at one end into the body supporting the lower end of the ram, a nut upon the opposite end of said rod, pumps disposed in the enlargement of the jack case, a hand lever for operating said pumps pivotally mounted on said casing, springs opposing the outward movement of the ram and disposed within the said ram, and a relief valve for the cylinder.

4. A carriage jack comprising a casing open at one end, a closure for said casing, an enlargement in the casing designed to form a liquid receptacle, a body secured to said closure, an extension on said body, a central recess in said body, a tube secured at one end in said recess and at the other end in the casing, a ram comprising a tube slidable within said first tube, a head secured to the inner end of said tube, packing on said head, a tube slidable within said ram, perforations in said tube, a pin to engage said perforations and the outer end of the ram, a rod centrally disposed within said ram and passing through the head at the inner end thereof, said rod being screwed at one end into the body supporting the lower end of the ram, a nut upon the opposite end of said rod, a spring on said rod between the body and the nut, pumps disposed in the enlargement of the jack case, lateral extensions upon the body supported by the closure for the case, passages running through said extensions, pumps comprising tubes secured at their inner ends in said passages and supported at their other ends by the jack casing, pistons in said tubes, a hand lever pivoted upon the jack casing for operating said pistons, foot valves for permitting the passage of the liquid to the pumps, other valves permitting the passage of the liquid to the ram cylinder, a relief valve permitting the passage of the liquid from the ram cylinder back to the liquid container.

5. A carriage jack comprising a casing open at one end, a closure for said casing, an enlargement in the casing designed to form a liquid receptacle, a body secured to said closure, an extension on said body, a central recess in said body, a tube secured at one end in said recess and at the other end in the casing, a ram comprising a tube slidable within said first tube, a head secured to the inner end of said tube, packing on said head, a tube slidable within said ram, perforations in said tube, a pin to engage said perforations and the outer end of the ram, a rod centrally disposed within said ram and passing through the head at the inner end thereof, said rod being screwed at one end into the body supporting the lower end of the ram, a nut upon the opposite end of said rod, a spring on said rod between said body and the nut, pumps disposed in the enlargement of the jack case, lateral extensions upon the body supported by the closure for the case, passages running through said extensions, pumps comprising tubes secured at their inner ends in said passages and supported at their other ends by the jack casing, pistons in said tubes, a hand lever pivoted upon the jack casing for operating said pistons, foot valves for permitting the passage of the liquid to the pumps, other valves permitting the passage of the liquid to the ram cylinder, a second lever mounted upon one of the pivots for the hand lever, a spring pressed rod disposed beneath said second

lever, a valve controlling the passage of the liquid from the ram cylinder to the liquid receptacle and operated by the rod.

6. A hydraulic lifting jack for motor cars, comprising a casing; a liquid receptacle in said casing; pumps in said casing; a cylinder in said casing; a ram in said cylinder provided with springs for opposing the outward movement of said ram; and a relief valve for said cylinder.

In testimony whereof I affix my signature.

HANS REHAK.

Witnesses:
RUDOLPH MESTIAN,
HERBERT FURREG.