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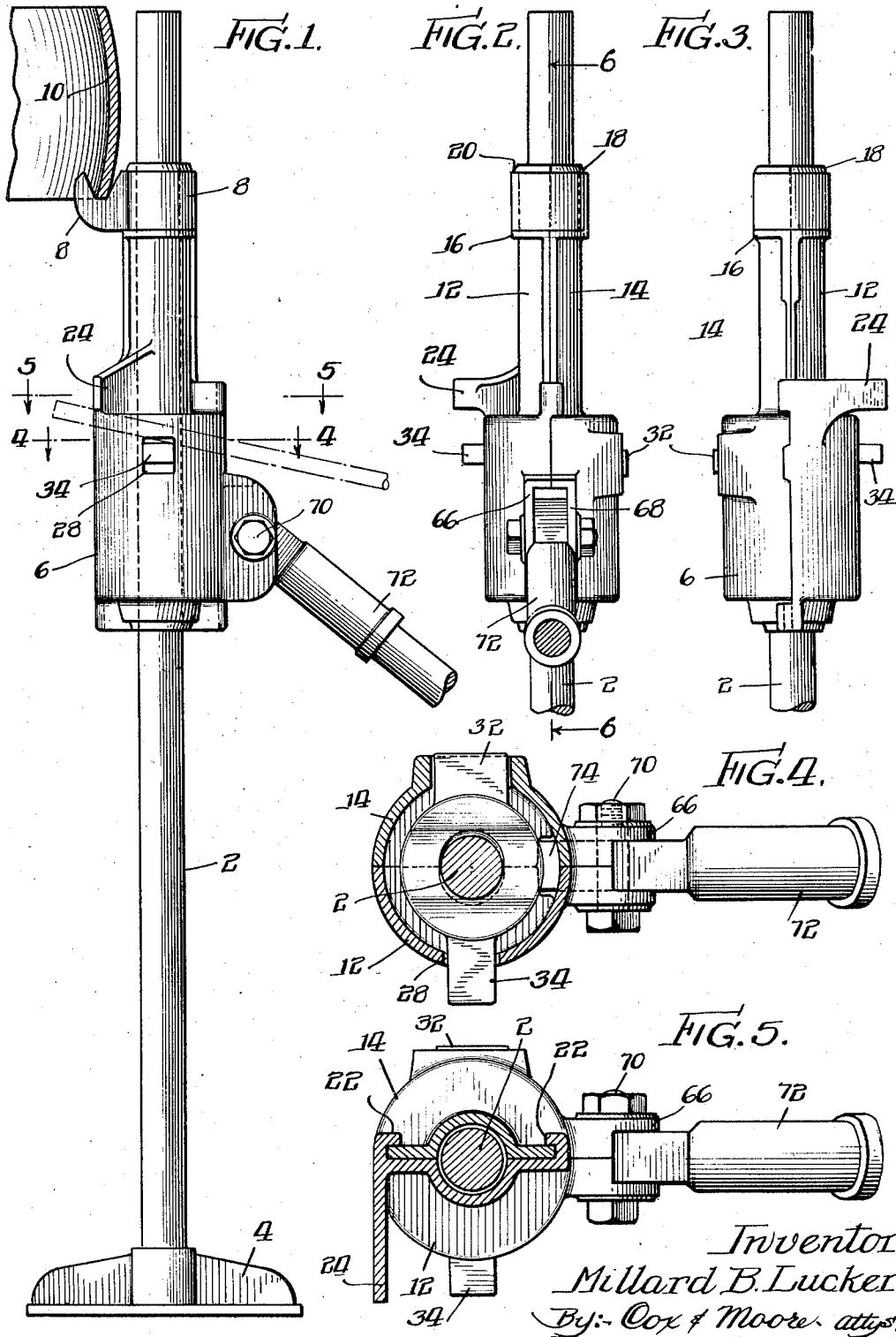
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LIFTING JACK

Filed Nov. 7, 1936

2 Sheets-Sheet 1



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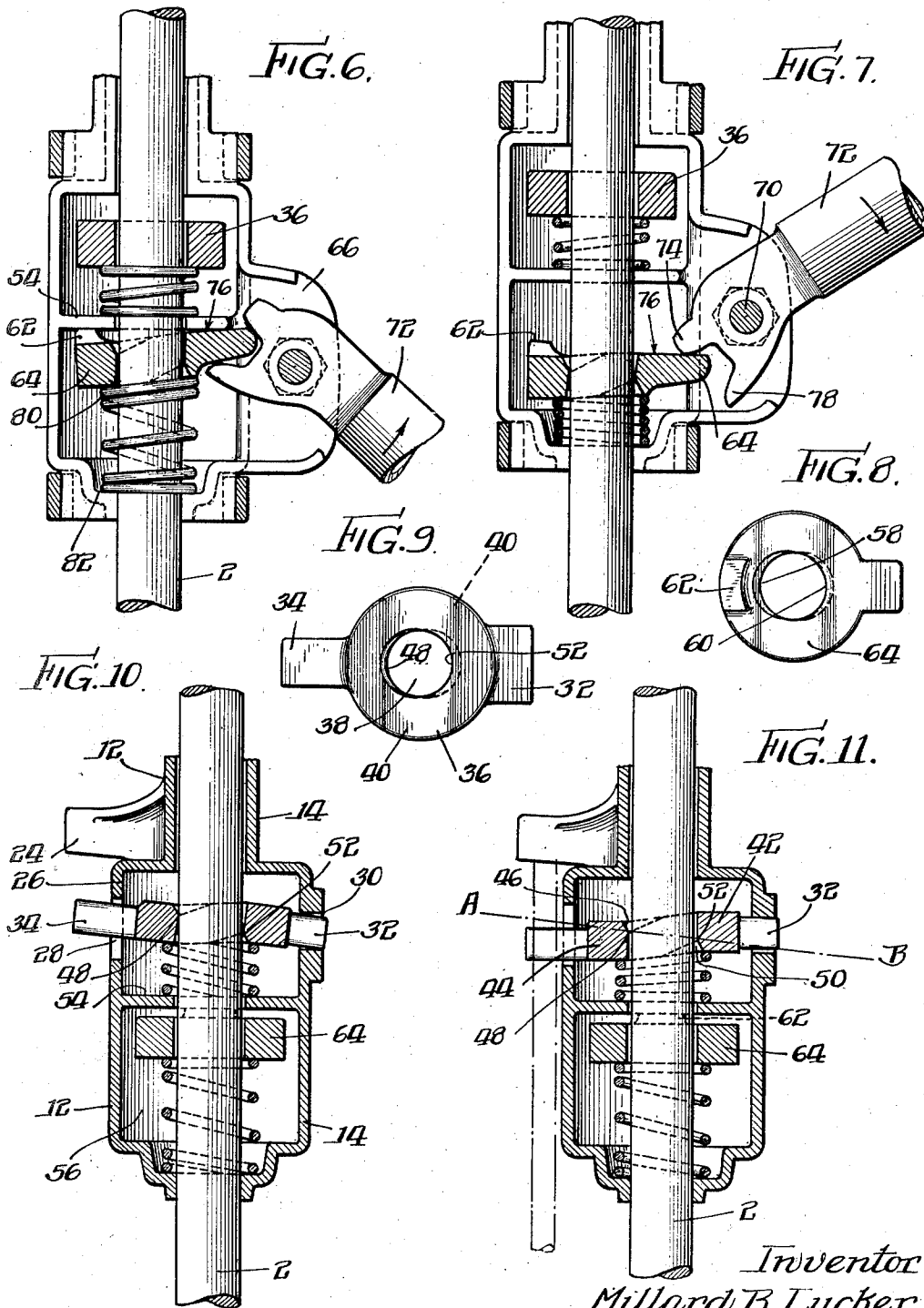
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2 Sheets-Sheet 2



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UNITED STATES PATENT OFFICE

2,227,395

LIFTING JACK

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Application November 7, 1936, Serial No. 109,727

2 Claims. (Cl. 254—106)

This invention relates to lifting jacks of the frictional collar type, especially adapted for use with automotive vehicles, trailers, and the like. The type of jack with which this invention is concerned is a construction wherein a substantially elongated tube or bar having a base portion is adapted to rest upon the ground or floor and up and down which a housing carrying a saddle to engage the part to be lifted is adjustably operated by means of a lever pivoted on the housing and wherein the housing encloses two clamping members adapted to grip the rod and which clamping members are adapted to be shifted to biased and unbiased position relatively to the rod to grip and/or to release the same, one of said clamping member being manually operated by said pivoted lever for shifting the housing and saddle support vertically to lift the article and the other clamping member being adapted automatically to grip the rod and hold the housing in position on the rod during the alternate shifting movement of the lever-operated clamp.

Among the objects of my invention are to provide a lifting jack of the foregoing character embodying a simple type of housing slidably mounted on and relatively to the rod which is adapted to enclose the lifting and holding clamps, the pivoted lever for actuating the lifting clamp and the coil springs cooperating with both the lifting and holding clamps, the arrangement being such as to expedite construction, quick assembly, and ease of operation; to provide a mechanism of economical construction having a quick assembly and of extremely efficient operation; and to provide a jack embodying these and other qualities, functions, and characteristics not herein specifically mentioned.

Referring now to the drawings in detail:

Figure 1 is a front elevation of one type of my improved jack;

Figure 2 is a right side elevation of the upper portion thereof;

Figure 3 is a left side elevation corresponding to Figure 2;

Figure 4 is a plan section view taken on line 4—4 of Figure 1;

Figure 5 is a sectional view taken on line 5—5 of Figure 1;

Figure 6 is a vertical sectional view taken on line 6—6 of Figure 2;

Figure 7 is a sectional view showing the jack in raised position;

Figure 8 is a plan view of a lifting collar;

Figure 9 is a plan view of a holding collar; and

Figures 10 and 11 are views partly in section of the jack being lowered.

In general, the jack comprises an upright rod or tube 2 having a base 4 along which a housing 6 is adapted to be slid. The housing 6 carries a saddle or work support 8 which in the present instance is shown as supporting a bumper 10 of an automobile. The work support 8 is formed on a ring which overlies housing portions 12 and 14 of the housing 6, these portions having collars 16 forming a seat for the reception of the ring 8. The upper portions 18 and 20 of the collars 14 and 12 are peened or bent over to hold the ring 8 in position while permitting it to move angularly with respect to the rod 2 to support bumpers in various positions relative to the rod 2. The two portions of the housing 12 and 14 are adapted to be held in interfitting relation by means of peened-over flanges 22, as shown in Figure 5, whereby a completely assembled jack is provided.

Referring in detail to the housing, the upper portion 12 thereof is provided with an outstanding lug 24 and a housing proper portion 26 having an opening 28 and an opposite opening 30 which is formed in the other half portion of the housing. These openings are in registration diametrically across the housing and into one of them rests a lug 32 of the holding clamp, the opposite opening 28 having projected therefrom the release lug 34 of the holding clamp. This holding clamp 36, as shown clearly in Figure 9, is in the form of an annulus or collar having a central opening 38 and opposed flat portions 40. It will be noted from an inspection of Figure 11 particularly that a part of the clamp such as 42 is bent out of the plane of the other portion 44 and that the upper face of the clamp directly at the opening 38 is beveled as at 46 to provide a semi-circular countersunk seat providing a gripping jaw 48 of the circular formation that extends part-way in crescent shape formation around the inner wall of the bore. Similarly the underside of the opposed face of the clamp is beveled or countersunk as at 50 to provide a gripping jaw 52 of crescent shape formation, the arrangement being such that an imaginary line A—B, drawn through the jaws 48 and 52, will lie at an angle to the longitudinal axis of the rod 2, such angle being somewhat off a right-angle. In some instances it may be a right-angle. I prefer to make the angle substantially four degrees less than a right angle.

Means is provided for holding this holding clamp in normally biased position relative to the rod 2 and to this end a coil spring encircles the

rod 2 and takes against inwardly extending ledges 54 forming integral parts of the housing sections 12 and 14 and provided with an opening through which the rod 2 may freely pass. The upper portion of this coil spring takes against the underside of the clamp whereby normally to project it upwardly and since the lug 32 is in the opening 30, the holding clamp lug will be forced upwardly at a normal inclination with respect to the rod 2 whereby to cause the gripping jaws 48 and 50 to grip against the rod 2 and hold the housing in vertical position with respect thereto.

The housings 12 and 14 below the partition plates 54 are formed to provide a lower chamber 56 which encloses the lifting clamp shown in detail in Fig. 8. The gripping jaws 58 and 60 of the lifting clamp or collar are formed identically as are the jaws of the holding clamp and for similar reasons. This lifting clamp is provided, however, with an upstanding lug 62 on its upper face which is adapted to normally contact the underface of the partition members 54 for purposes hereinafter specified and that portion of the lifting clamp diametrically opposite the lug 62, shown in Figure 7 as at 64, is formed as an outstanding lug adapted to pass through an opening in the walls of the housing and project into a laterally extending housing formed by parallel side plates 66 and 68. These side plates are provided with registering openings forming a bearing for cross pin 70 upon which the operating lever 72 is pivoted. The inner portion of this lever is provided with a prong or lug 74 adapted to bear upon the upper face 76 of the lifting clamp and provided with a prong or lug 78 adapted to engage the under face of the lug 64, as shown clearly in Figure 6. In addition, a coil spring 80 is disposed within this lower housing 56 about the rod 2, the lower portion of this spring engaging a bottom wall portion 82 of this housing and the upper portion of the spring engaging the under face of the lifting clamp 64 whereby normally to force it upwardly.

The housings are assembled about the rod, clamps, and springs, and the edges thereof peened to integrally unite the housings. Prior to this the operating lever 72 has been placed within the opening in the housing 66 with the lug 74 and 78 above and below the projecting portions of the operating clamp so that the assembly is complete.

In the operation of my improved device, an upward movement in a counterclockwise direction of the operating lever 72 causes the lug 74 to press downwardly upon the operating clamp 64 whereby to compress the spring 80. The initial movement of the lever in this direction first shifts the jaws of the operating clamp to a biased or inclined position relative to the rod to cause the jaws to grip the rod. Inasmuch as these jaw portions are relatively close together despite the rugged thickness of the clamp, they will quickly bite into and grip the rod. This gripping function is accomplished with but a slight upward movement of the lifting lever. The remainder of the pivotal movement of the lifting lever then causes the lever and the clamp reactively to operate upon the stationary upright rod or tube 2 so that the housing as a whole is lifted vertically causing the saddle correspondingly to lift the work 10. Lever 72 is then released and the spring 80 tends to shift the operating clamp upwardly from position, shown in Figure 7, to position shown in Figure 6. During this movement, however, the operating lever is operated clock-

wise and the clamp 64 is positively actuated by the lug 78 engaging the underside of the operating clamp 64 and moving it up. This positive means for moving the clamp upwardly is provided so as to overcome any tendency of the clamp to stick despite the action of the spring 80 due to rust, dirt, or other foreign matter getting onto the rod and tending to prevent action of the clamp.

At the conclusion of the lifting movement of the operating lever as hereinbefore described, during the lifting movement of the housing due to the operating movement of the lever 72, the holding clamp 36 is normally in biased position and grips the rod. It is arranged to prevent downward movement of the housing relatively to the rod but will permit free upward movement of the housing relatively to the rod. Therefore, the holding clamp will permit the lifting clamp to actuate the housing upwardly relatively to the rod. Upon the completion of the lifting movement, the holding clamp automatically comes into place to hold the housing at the position to which it has been lifted by the lifting clamp so that upon reversed downward movement or clockwise movement of the lifting lever 72, the housing and work are held in raised position and the lifting lever is reciprocated downwardly carrying the operating clamp upwardly whereby upon a second upward movement of the operating lever, the operating clamp is again operated to repeat the cycle of operation.

When it is desired to lower the jack, the operator inserts the end of a bar, as shown in dotted lines in Figure 1, under the laterally extending lug 24 and rests it upon the lug 34 projecting out through the opening 28 of the casing and presses down on the free end of the lever. This causes a depression of the lug 34 causing the normally cammed holding clamp 36 to be lowered and positioned at right angles to the rod whereby to permit the housing automatically to lower on the rod and the work 10 to be lowered. This movement would be gradual because as soon as the housing lowers to the position of the outer end of the bar, the lowering action will cease and it will then be necessary to press down on the bar still further to continue the lowering action. In other words, the lowering action does not take place suddenly and does not permit the load to jump downwardly on the rod 2, but is always under the instant and constant control of the operator and depends upon his maintaining pressure on the release bar as the housing descends. The minute the pressure is relieved, the dropping of the load 10 ceases.

It will be noted that by reason of the lug 62 forming a pivotal portion against the underside of the partition 54, a pivotal movement for the actuating clamp 64 is provided by means of an operating lever 72 and by reason of a lug 32 being mounted in the opening 30 of the housing, a similar pivotal mounting for the holding clamp 36 is provided.

It will be appreciated that a very economical jack is provided, capable of efficient operation and one which is cheaply made, quickly assembled, and which will stand hard usage. The jack may be raised to upper position simply by grasping the body of the housing and holding the rod 2 stationary by lifting up on the housing, the housing will slide freely upon the rod 2 but will remain in any vertically slid position. Thereafter, by simply operating the lever 72, the jack is quickly raised and each operation on the jack

will carry it up a distance of about three quarters of an inch upon each upward movement of the jack lever.

It will be noted that by making the actuating and holding collars or clamps in the manner disclosed, I am enabled to retain the thickness of the metal of each one of these clamps, the same being made of wrought metal casting or otherwise. This effect is produced both by bending the portions 42 and 44 slightly out of a common plane and likewise by chamfering, beveling, or countersinking the inner circumferential walls of the bore on opposite sides of the clamp along a somewhat extended zone, substantially along half the inner circumferential wall of the bore of the clamp, the countersink bringing the biting edges 48 and 52 toward each other so that an imaginary line passing therethrough will be substantially perpendicular to the longitudinal axis of the rod 2. I preferably arrange this line about four degrees off the perpendicular to the longitudinal axis of the rod 2 as I have found out this is the most effective work angle. By bringing these biting or gripping edges close together, in short, by bringing them closer to a line passing transversely through the longitudinal axis of this clamp, said line being perpendicular to the longitudinal axis of the rod 2, these biting portions will very quickly grip the rod upon the preliminary pivotal movement of the clamp relatively to the rod. In this way, I secure this effect without sacrificing the strength inherent in the thickness of the clamp as distinguished from a construction wherein the clamp will be made from a very thin piece of stock and furthermore, I am enabled to secure this ruggedness without bending the gripping portions of a clamp considerably out of a common plane.

The claims of this case are directed more particularly to the housing construction, other features of the structure disclosed but not claimed herein being claimed in applicant's copending applications including applications, Serial No. 43,752, filed October 5, 1935; Serial No. 74,969, filed April 17, 1936; and Serial No. 101,693, filed September 21, 1936.

It is obvious that various changes may be made

in the specific embodiment of the invention set forth for purposes of illustration without departing from the spirit of the invention. The invention is accordingly not to be limited to the precise embodiment shown and described, but only as indicated in the following claims.

What I claim as new and desire to secure by Letters Patent of the United States is:

1. A lifting jack comprising an upstanding shaft, a load lifting housing comprising a pair of horizontally separable body members, one of said members having a marginal fastening element thereon peened over a portion of the other member whereby to secure said members together, a pair of chambers within said housing through which the shaft is adapted to project, a holding clamp arranged within one of said chambers, a lifting clamp arranged within the other of said chambers, and a spring arranged within each of said chambers surrounding the shaft and bearing at one end against a wall of its chamber and at the other end against a clamp.

2. A jack comprising an elongated support, a housing formed of a pair of housing members having openings therethrough effecting a close fit around said elongated support but spaced therefrom, said housing members having outstanding projections providing a slot, a lever pivoted in said outstanding projections for operation through said slot, said housing members having inwardly extending registering partition portions provided with registering recesses whereby to provide a partition within the housing through which the elongated support will freely pass, said housing members also being provided with interengaging flanges adapted to be peened over to hold the housing members in position, a work support carried by the housing, clamps in said housing on opposite sides of the partition, and spring members surrounding said elongated support, one of said spring members taking against the partition and one of said clamps and another of said spring members taking against the housing and against the other clamp, one of said clamps having operative connection with said lever for operation thereby.

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