March 13, 1934. F. ACKERMAN 1,951,118

LIFTING APPARATUS

Original Filed June 29, 1931

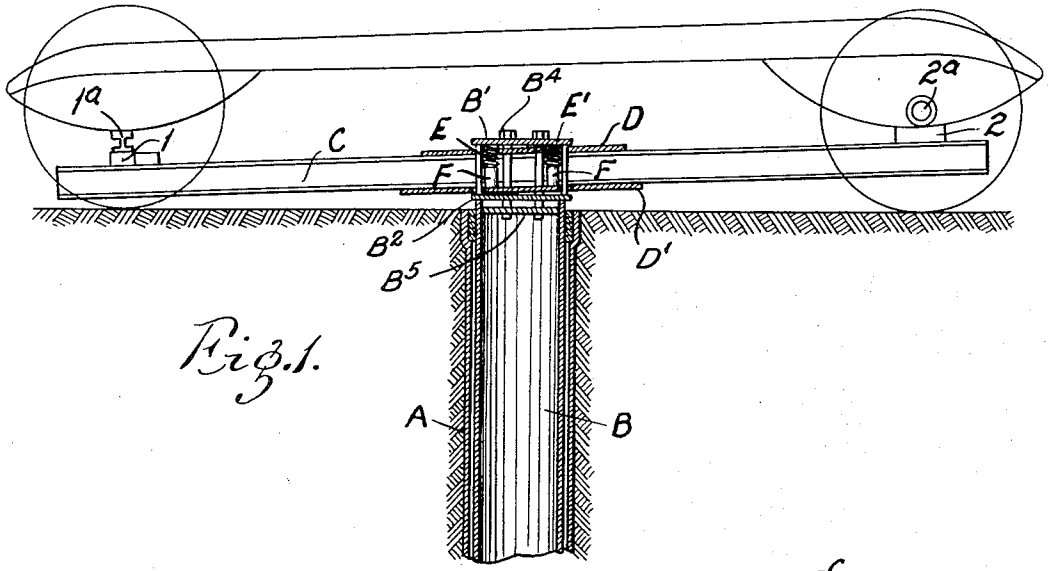


Fig. 1.

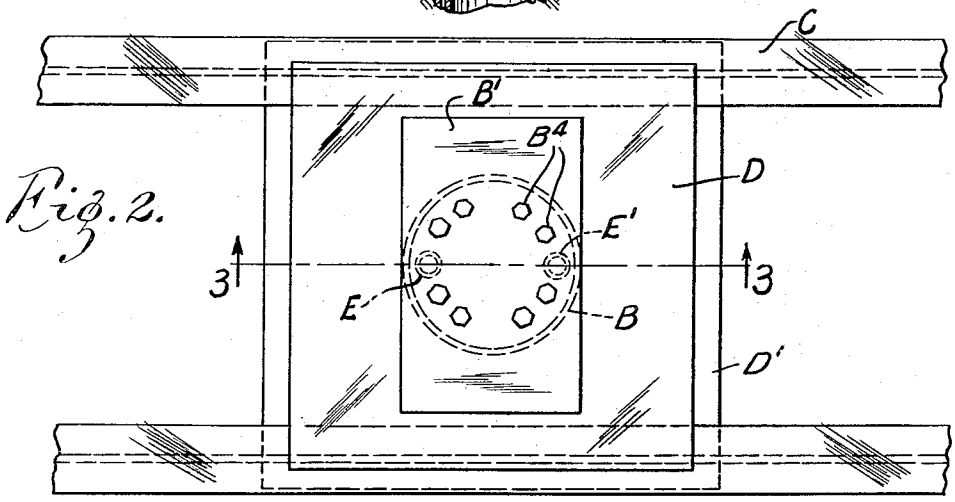


Fig. 2.

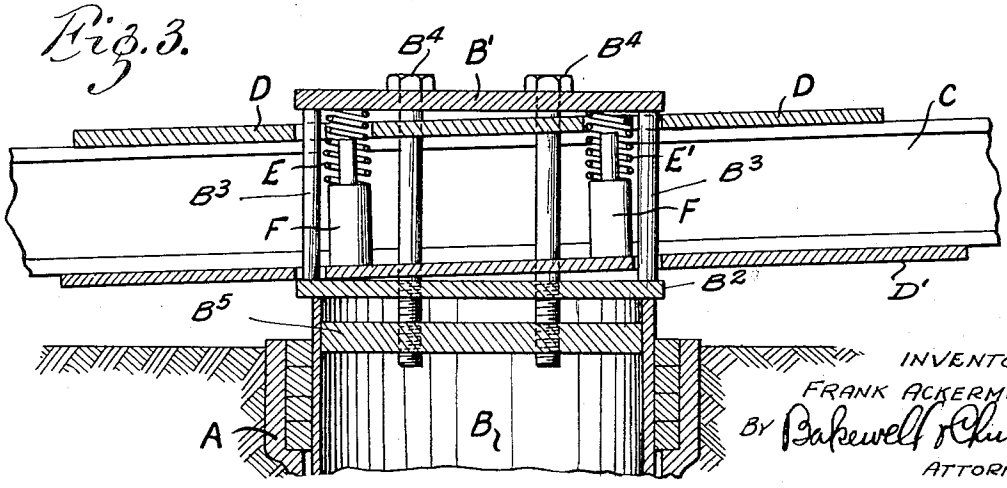


Fig. 3.

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LIFTING APPARATUS

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Original application June 29, 1931, Serial No. 547,529, now Patent No. 1,941,240, dated December 26, 1933. Divided and this application June 9, 1933, Serial No. 675,012

3 Claims. (Cl. 254—93)

This invention relates to hydraulic elevators and other lifting apparatus of the kind that comprise a platform or other supporting structure carried by a vertically-disposed, reciprocating piston or plunger, my present application being a division of my application Serial No. 547,529, filed June 29, 1931, now Patent 1,941,240, Dec. 26, 1933.

My invention relates particularly to lifting apparatus of the type in which the platform is pivotally mounted or rockably mounted on the piston, and the main object of my invention is to provide a novel means for eliminating undue teetering, rocking or tilting of the platform relatively to the piston, and maintaining the platform in a substantially level or horizontal position when the piston is being raised and lowered. I have herein illustrated my invention embodied in a lifting apparatus that is intended to be used primarily for sustaining a vehicle in an elevated position while the chassis of the vehicle is being inspected or worked on, and I prefer to use a resilient means, such as a spring or springs, to prevent undue teetering of the platform and tend to hold the platform in a level position. However, I wish it to be understood that the particular purpose for which the apparatus is used is immaterial, and that any suitable means may be used to restore the platform or prevent undue tilting of same, without departing from the spirit of my invention.

In my improved lifting apparatus the platform or supporting structure of the apparatus will cant or tilt slightly relatively to the piston, in the operation of raising a vehicle, in the event the axle supporting means at one end of the platform engages its co-operating axle before the other axle supporting means at the opposite end of the platform has engaged its axle, thereby effectively preventing the piston from being subjected to a thrust tending to cause it to bind in its cylinder, and the resilient means or equivalent means that is used to prevent undue teetering of the platform, will restore or tend to restore the platform to its normal horizontal or level position after both axles of the vehicle have been engaged by the axle supports on the platform. During the continued upward movement of the piston the said means effectively prevents the platform from teetering or rocking unduly. In the operation of lowering a vehicle the platform cants or tilts sufficiently relatively to the piston, after one pair of wheels of the vehicle have come in contact with the ground, to prevent the unequal load on the platform causing the piston to be subjected to an excessive side strain, resulting in the piston binding in its cylinder.

Figure 1 of the drawing is a vertical sectional view of a lifting apparatus constructed in accordance with my present invention.

Figure 2 is a fragmentary top plan view of the apparatus shown in Figure 1; and

Figure 3 is an enlarged vertical sectional view, taken on the line 3—3 of Figure 2.

In Figure 1 of the drawing A designates a vertically-disposed cylinder set in the ground, in a floor or in any other suitable base, and provided with a vertically-movable piston B that is adapted to be moved upwardly and downwardly so as to raise and lower a load sustained by the piston. A platform or supporting structure C of any preferred design or construction, is mounted upon the upper end of the piston B. If the apparatus is intended to be used primarily for sustaining a vehicle in an elevated position while the chassis of the vehicle is being inspected or worked on, the platform will be provided at one end with a suitable axle supporting means 1 that is adapted to cooperate with one axle of the vehicle that is to be raised, for example, the front axle 1^a of the vehicle, and provided at its opposite end with a suitable axle supporting means 2 that is adapted to co-operate with the rear axle 2^a of the vehicle.

The platform C is mounted on the piston B in such a manner that said platform is capable of canting, tilting or rocking slightly relatively to the piston, under certain conditions, and springs or an equivalent means is combined with said piston and platform so as to restore or tend to restore the platform to its normal or approximately normal position and prevent it from teetering or rocking unduly during the vertical movement of the piston. The platform C may be mounted on the piston B in any suitable way that will permit the platform to have a slight rocking movement relatively to the piston, and the springs or equivalent means, previously referred to, may be constructed and arranged in various ways without departing from the spirit of my invention. In the form of my invention herein illustrated the piston B is provided at its upper end with a rigid head piece constructed so as to receive a bearing portion at the center of the platform C, said head piece and bearing portion being so proportioned and constructed that the platform will be securely mounted upon the piston, but will be capable of tilting or rocking slightly about a horizontal axis, and thus assume an angular position with relation to the piston, as shown in Figures 1 and 3. The center bearing portion just re-

ferred to may be constructed in various ways, but it is herein illustrated as being composed of a top plate D connected to the upper side of the platform C and a parallel bottom plate D' connected to the underside of the platform. The rigid head piece on the piston may also be constructed in various ways, but it is preferably composed of a top plate B', a bottom plate B^2 maintained in spaced relationship with the top plate B' by spacers B^3, and a plurality of bolts B^4 which extend through the plates B' and B^2 and are screwed into a horizontally disposed plate B^5 set into the upper end portion of the piston and rigidly connected to same. The resilient means, previously referred to, that is relied upon to restore or tend to restore the platform after it has rocked or tilted, consists of spring E and E' arranged in front of and at the rear of the axis of movement of the platform, and preferably interposed between the cap piece or plate B' of the head piece on the piston, and spring seats or abutments F rigidly fastened to the bottom plate D' of the centrally-disposed bearing portion of the platform that is embraced by the head piece B' of the piston. Obviously, said springs may be combined in various ways with the central bearing portion of the platform and with the head piece of the piston, without departing from the spirit of my invention. The holes in the plates D and D' through which the spacers B^3 and bolts B^4 pass are made large enough to provide ample clearance for said spacers and bolts.

During the operation of raising an automobile or motor truck, the axle supporting means at one end of the platform C, usually the means 1, will engage its co-operating axle before the other axle supporting means 2 at the opposite end of the platform has engaged its co-operating axle, thereby causing the platform to tilt or assume an angular position with relation to the piston, the springs E and E' being of such tension as to permit such movement of the platform. The continued upward movement of the piston causes the axle supporting means 2 at the other end of the platform to engage its co-operating axle, as shown in Figure 1, but during the slight interval of time between the engagement of the means 1 with its axle and the engagement of the means 2 with its axle, no excessive side thrust will be exerted on the piston. As the piston continues to move upwardly, the spring E' which was compressed by the tilting action of the platform, expands and returns or tends to return the platform to its normal position, and thereafter, both springs E and E' function to prevent the platform from teetering or rocking abnormally during the remainder of the upward travel of the piston. When the vehicle is being lowered, one pair of wheels of the vehicle, usually the rear wheels, come in contact with the ground before the front wheels strike the ground, and as soon as the weight or load on the platform becomes unbalanced, due, of course, to the engagement of one pair of wheels with the ground, the platform will tilt or rock, and thus prevent the piston from being subjected to a side thrust or force tending to cause it to bind in its cylinder.

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

1. An automobile lift, comprising a vertically-movable piston arranged in a vertically-disposed cylinder, a relatively long platform arranged above said piston and constructed so as to engage an automobile chassis at points located at opposite sides of the longitudinal axis of said cylinder, a bearing portion at the center of said platform comprising substantially horizontally-disposed surfaces at the top and bottom sides of the platform, and a rigid head piece on said piston embracing said bearing portion and comprising top and bottom plates arranged in opposed relationship to the substantially horizontally-disposed surfaces of said bearing portion, said bearing portion being so proportioned with relation to said head piece that the platform is capable of a slight rocking or tilting movement relatively to said piston.

2. An automobile lift, comprising a vertically-movable piston arranged in a vertically-disposed cylinder, a relatively long platform arranged above said piston and constructed so as to engage an automobile chassis at points located at opposite sides of the longitudinal axis of said cylinder, a bearing portion at the center of said platform, a head piece on said piston provided with substantially horizontally-disposed, spaced parts that are arranged in opposed relation to the top and bottom surfaces of said bearing portion, said bearing portion being so proportioned with relation to said head piece that the platform is capable of a slight rocking or tilting movement relatively to said piston, and springs interposed between said bearing portion and said head piece, at opposite sides of the axis of movement of the platform, for causing the platform to be normally maintained in a substantially level position.

3. An automobile lift, comprising a vertically-movable piston arranged in a vertically-disposed cylinder, a relatively long platform arranged above said piston and constructed so as to engage an automobile chassis at points located at opposite sides of the longitudinal axis of said cylinder, a bearing portion at the center of said platform comprising parallel top and bottom plates connected to the platform, a rigid head piece on the piston embracing the bearing portion on the platform and comprising parallel top and bottom plates arranged in opposed relation to the top and bottom plates of said bearing portion, said bearing portion and head piece being proportioned so as to permit the platform to rock or tilt slightly relatively to the piston, and means combined with said head piece and bearing portion to normally maintain the platform in a substantially level position.

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