Feb. 28, 1933. E. H. STEEDMAN 1,899,534

AUTOMOBILE LIFT

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Fig. 1.

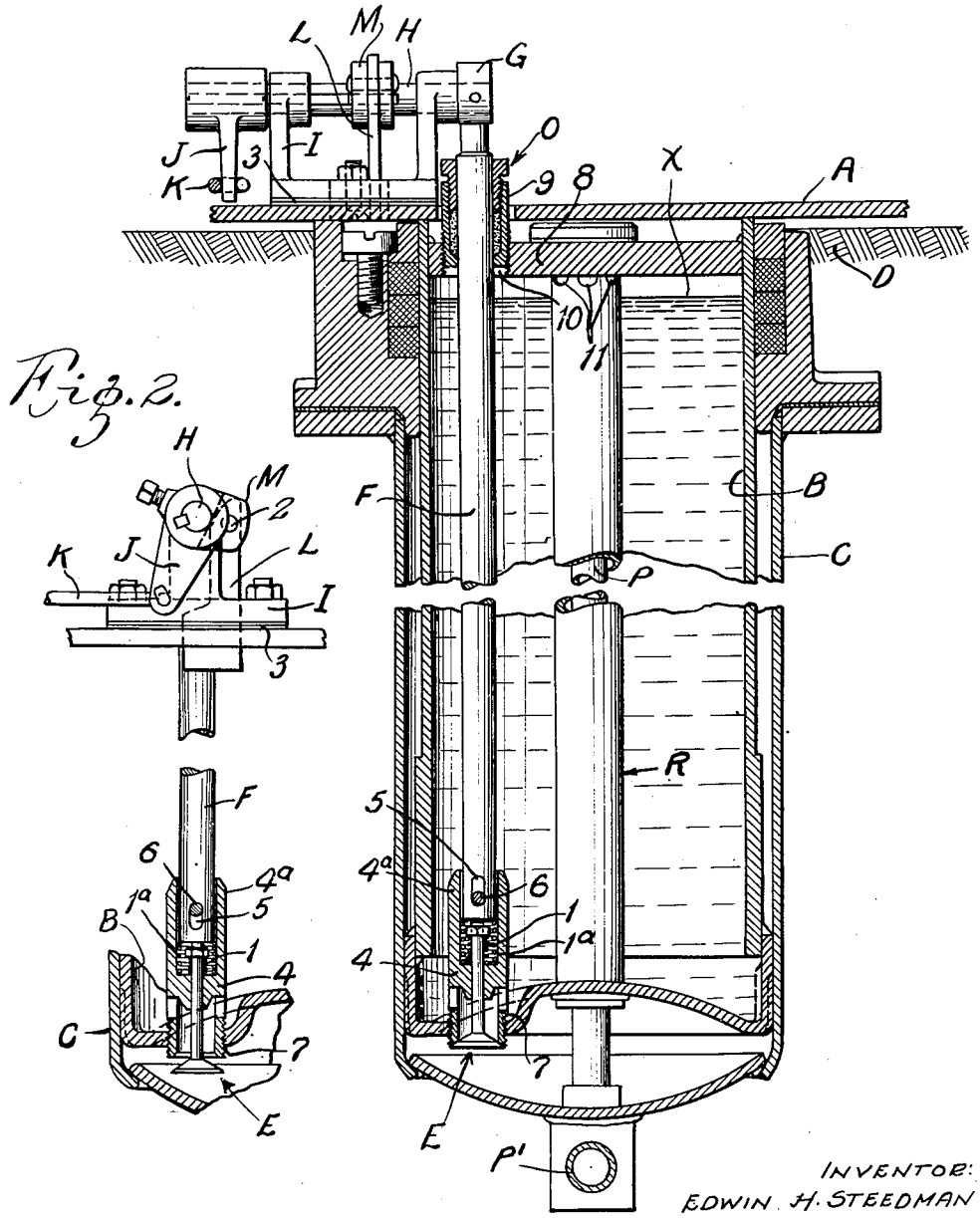


Fig. 2.

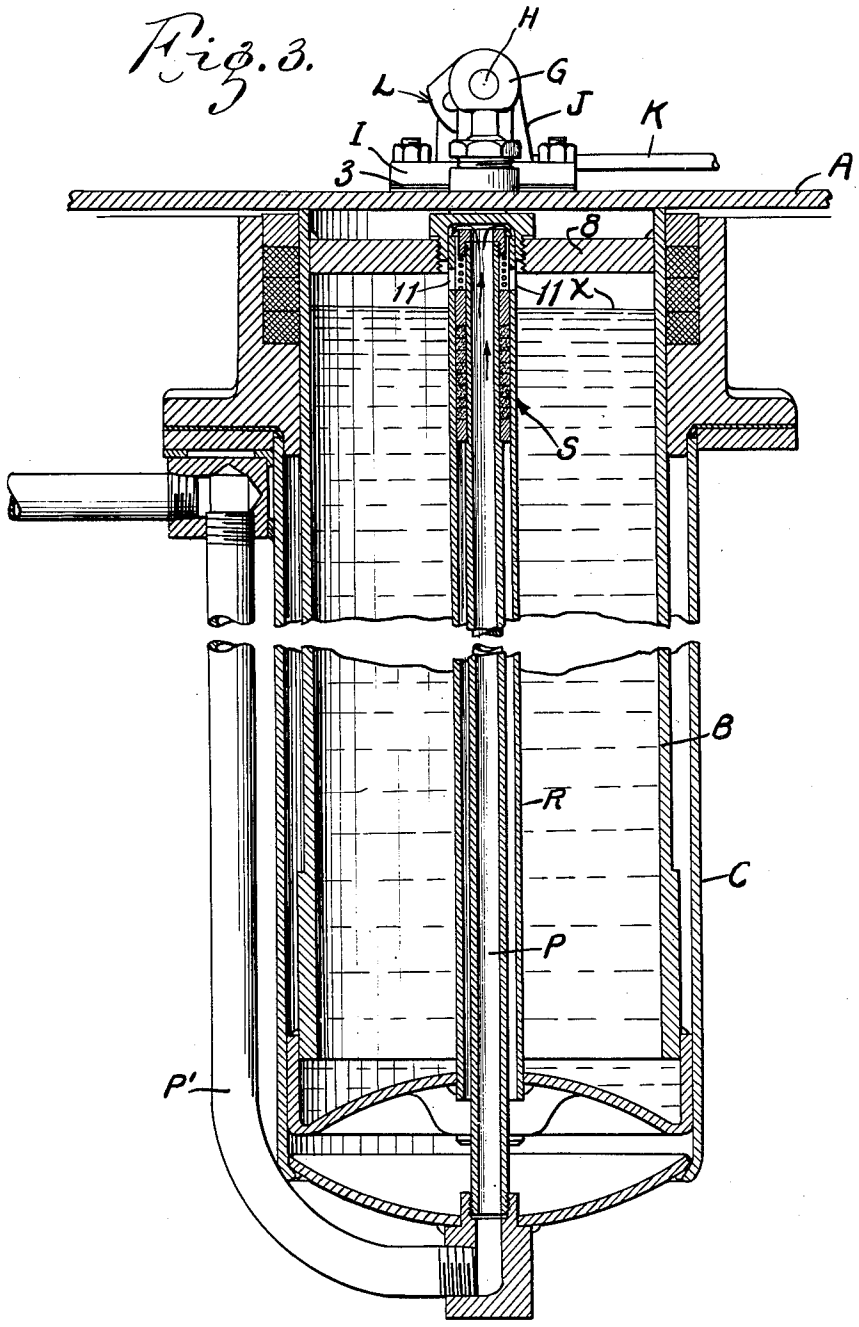
INVENTOR:
EDWIN H. STEEDMAN
BY Bakewell & Church
ATTORNEYS.

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AUTOMOBILE LIFT

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Fig. 3.



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Fig. 4.

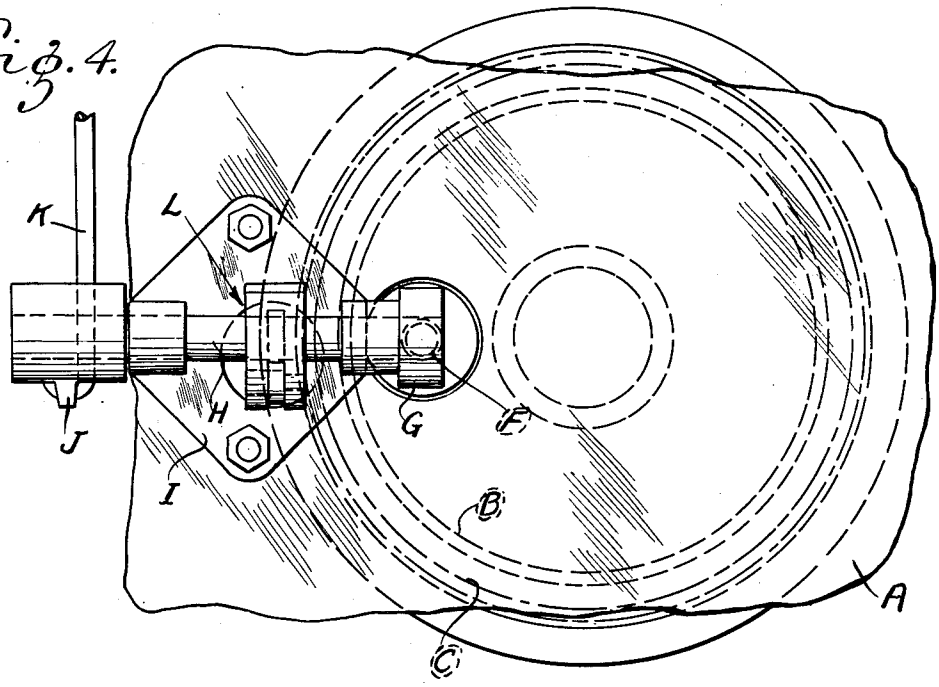


Fig. 5.

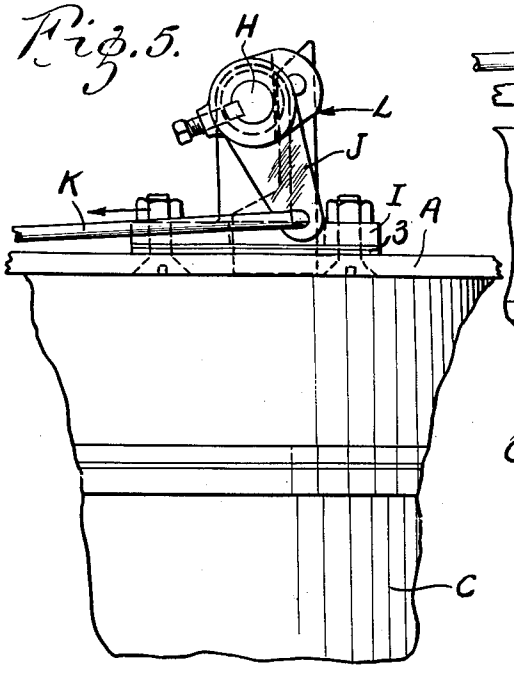
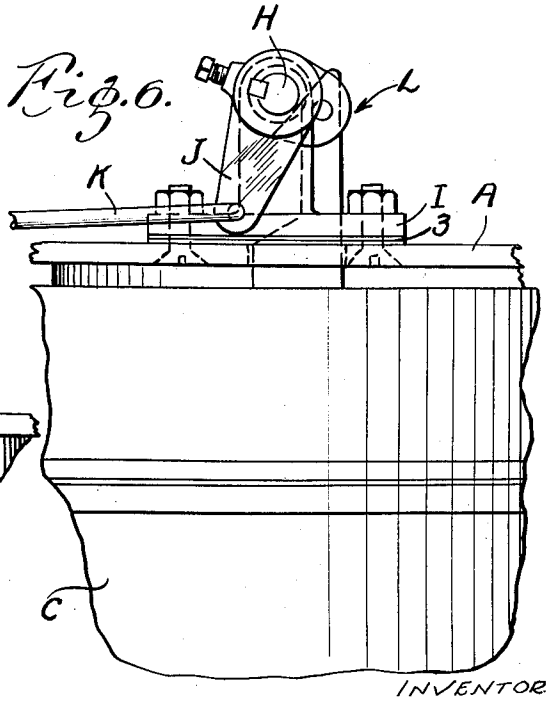


Fig. 6.



INVENTOR
EDWIN H. STEEDMAN

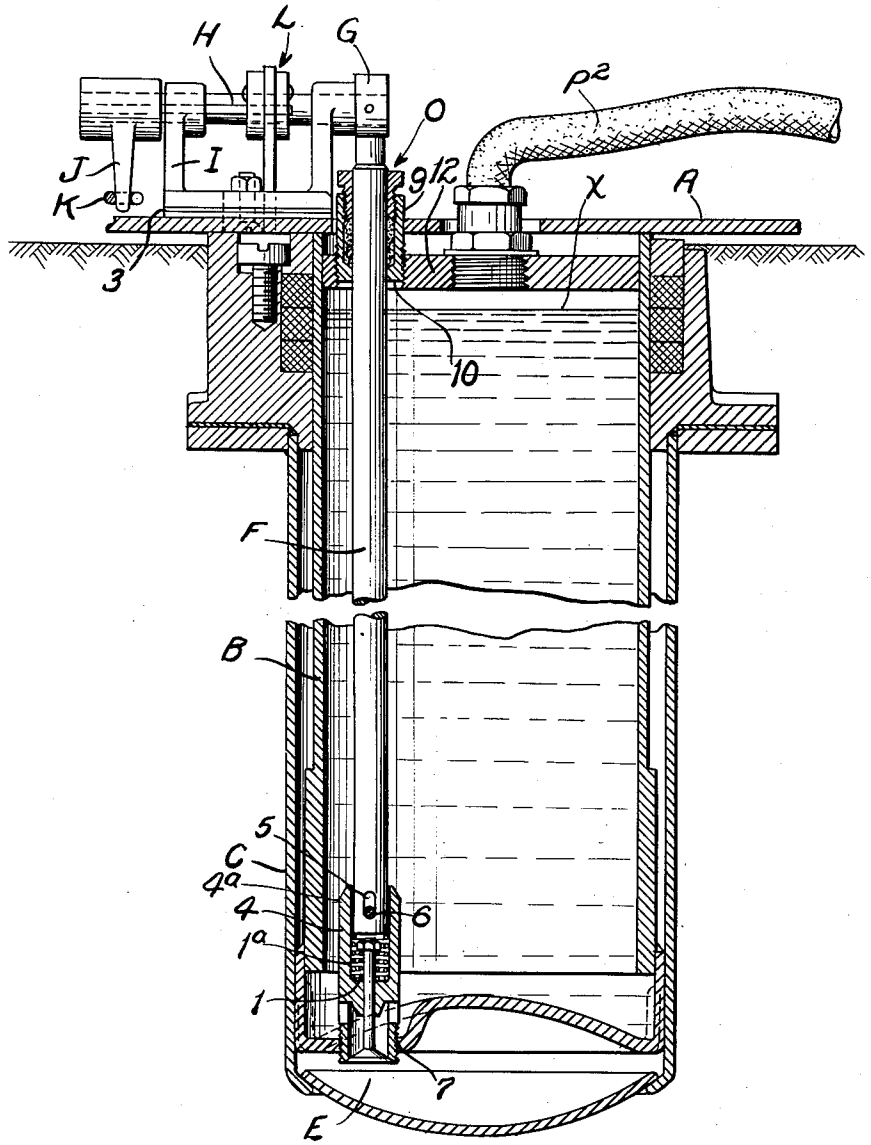
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AUTOMOBILE LIFT

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Fig. 7.



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AUTOMOBILE LIFT

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Fig. 8.

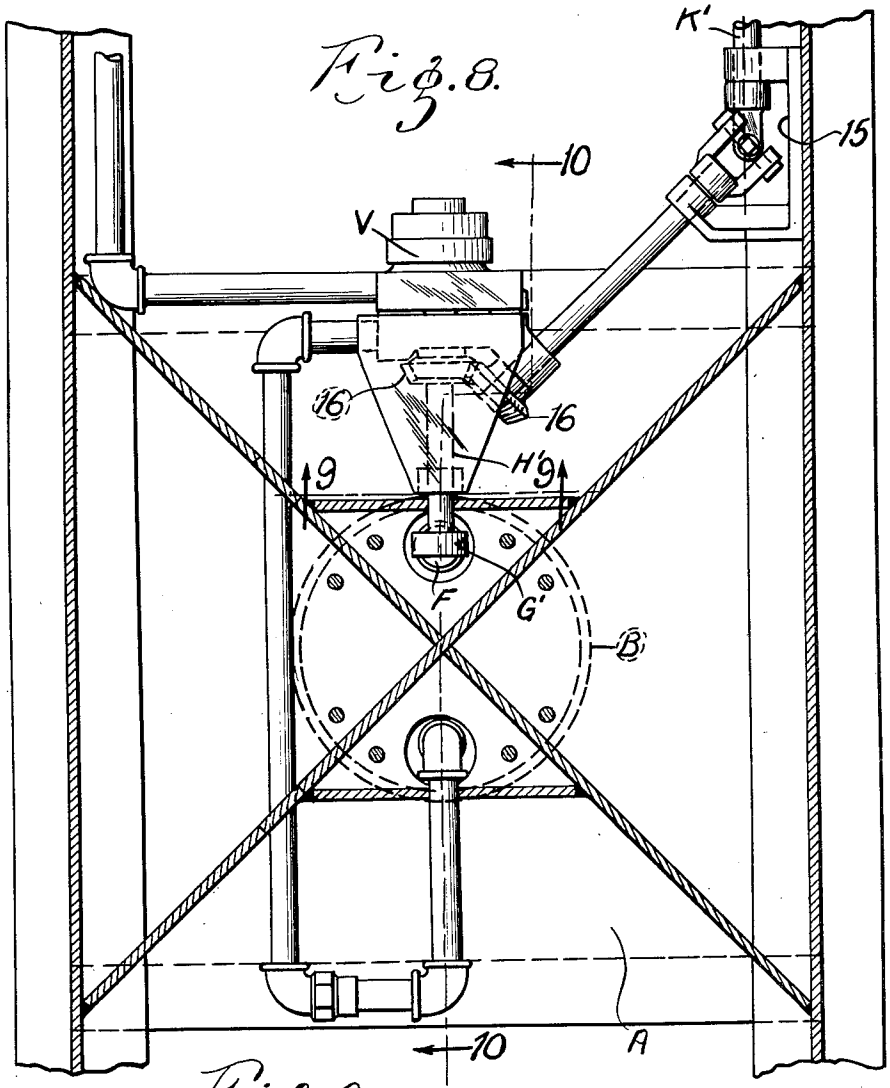
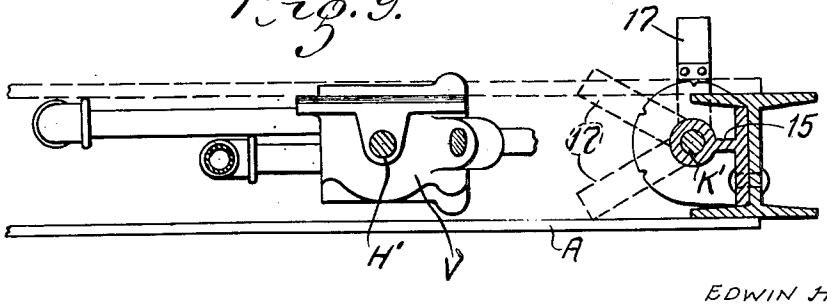


Fig. 9.



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AUTOMOBILE LIFT

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Fig. 10.

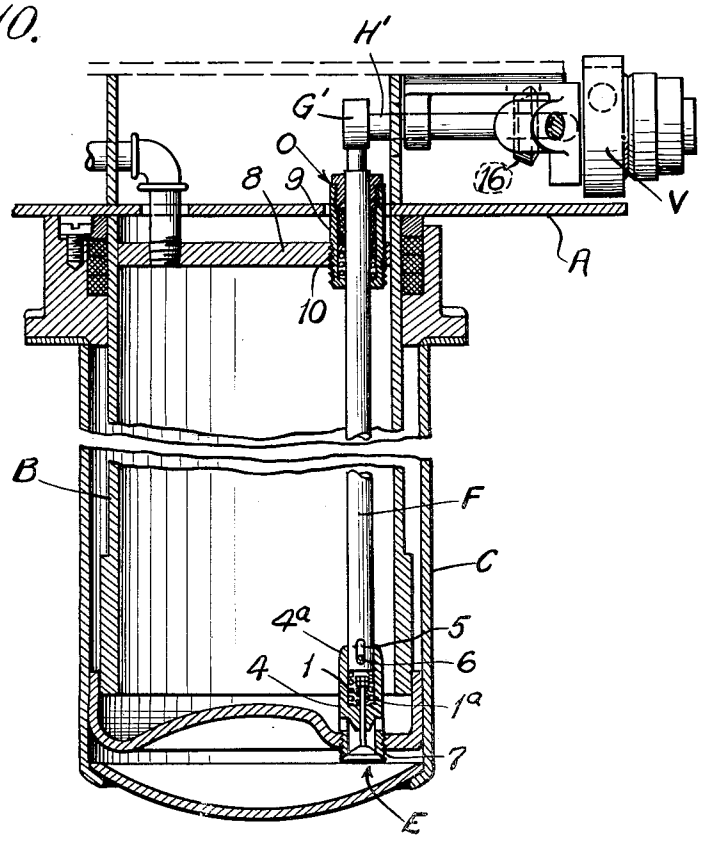


Fig. 11.

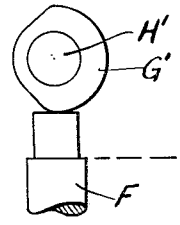


Fig. 12.

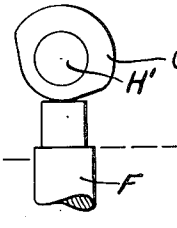
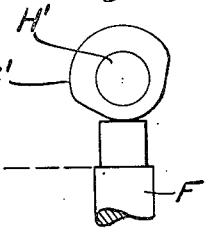


Fig. 13.



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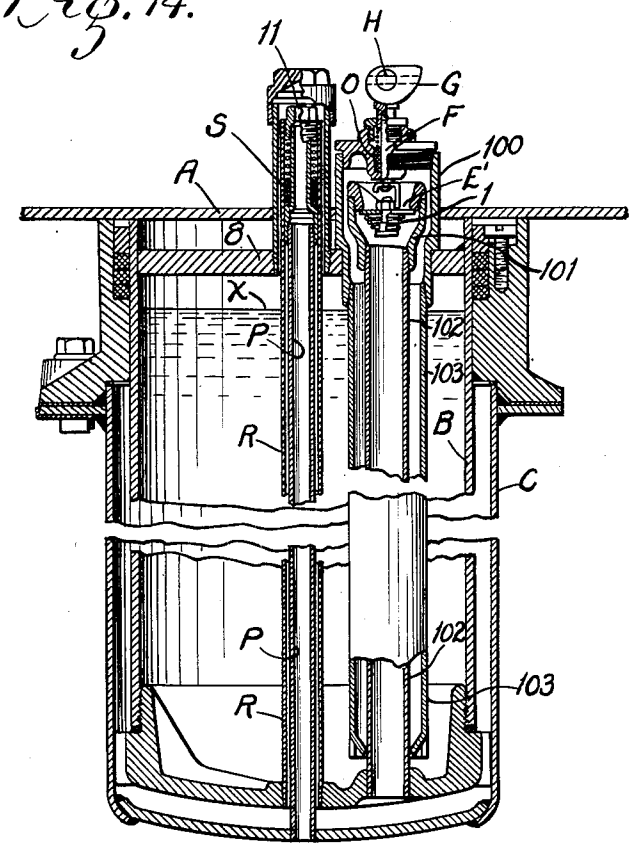
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AUTOMOBILE LIFT

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Fig. 14.



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Patented Feb. 28, 1933 1,899,534

UNITED STATES PATENT OFFICE

EDWIN H. STEEDMAN, OF ST. LOUIS, MISSOURI, ASSIGNOR TO CURTIS MANUFACTURING COMPANY, OF WELLSTON, MISSOURI, A CORPORATION OF MISSOURI

AUTOMOBILE LIFT

Application filed May 5, 1930. Serial No. 449,847.

This invention relates to automobile lifts of the kind in which the platform or chassis engaging portion of the lift is connected to the upper end of a piston which operates in a vertically-disposed cylinder arranged beneath the platform, and particularly, automobile lifts of the type in which compressed air or a similar gaseous medium is used in conjunction with oil or a similar incompressible liquid to operate the piston of the lift.

One object of my invention is to provide an automobile lift of the general type mentioned, that is equipped with a hollow piston which is used as a holder or storage receptacle for the liquid medium used to support or sustain the piston in an elevated position, and also equipped with a valve for positively trapping and preventing circulation of said liquid medium when it is desired to hold the piston at rest in an elevated position, thereby producing a safe and compact automobile lift that is inexpensive to build, that is easy to ship and install and which can be maintained in operative condition with minimum trouble and expense.

Another object is to provide an automobile lift of the particular type mentioned, whose hollow piston is provided with a valve structure, comprising a valve element and a coacting seal that can be easily removed for inspection, repair or replacement without the necessity of withdrawing the piston from its cylinder.

And still another object is to provide an automobile lift of the hydro-pneumatic type, in which the operating mechanism for a valve that governs or assists in governing the downward movement of the platform, is of such design that it is impossible for said valve to assume a condition or position that will result in the platform dropping accidentally or moving downwardly at a time when it should be adequately supported in a raised or partially raised position, thereby producing an automobile lift that is safe, reliable and not dependent for its safety on careful attention or skill on the part of the operator in charge of the lift. Other objects and desirable features of my invention will be hereinafter pointed out.

Figure 1 of the drawings is a vertical sectional view of the piston and cylinder of an automobile lift embodying one form of my invention, showing a valve in the lower end of the piston arranged in its closed position.

Figure 2 is a fragmentary sectional view of the lift illustrated in Figure 1, showing the valve in the piston held in its open position by the valve operating mechanism which is ready to act to automatically close said valve during the downward movement of the platform.

Figure 3 is a vertical sectional view similar to Figure 1, taken at approximately right angles to Figure 1.

Figure 4 is a fragmentary top plan view of the platform of the lift, shown in Figure 1, illustrating certain of the members or parts of the operating mechanism for the valve in the lower end of the piston.

Figure 5 is a fragmentary side elevational view, illustrating the position which the parts of said valve operating mechanism assume when said valve is in its closed position.

Figure 6 is a view similar to Figure 5, illustrating said valve operating mechanism shifted so as to hold the lowering valve in its open position, and thus cause the platform to descend.

Figure 7 is a vertical sectional view, illustrating a lift that is equipped with a hose or similar flexible conduit, for admitting the compressed air or other gaseous operating medium to the hollow piston of the lift to raise the platform.

Figure 8 is a horizontal sectional view of a lift embodying my invention and equipped with the operating mechanism that I prefer to use for actuating and controlling the lowering valve in the inner end of the piston, said valve operating mechanism being shown in top plan.

Figure 9 is a fragmentary vertical transverse sectional view of the platform, taken on the line 9—9 of Figure 8, looking in the direction indicated by the arrows, certain parts being omitted for the sake of clarity.

Figure 10 is a vertical sectional view, taken on the line 10—10 of Figure 8.

Figures 11, 12 and 13 are detail views, illustrating the different positions of the cam that actuates the rod which holds the lowering valve in its open position; and

Figure 14 is a vertical longitudinal sectional view, illustrating the lowering valve arranged in an easily accessible position above the top of the piston.

In the accompanying drawings which illustrate the two forms of my invention, A designates the upwardly-movable platform or other chassis engaging device of an automobile lift of the type in which the platform is connected to the upper end of a piston B that reciprocates in a vertically-disposed cylinder C set in the ground or in a base D of concrete or other suitable material located beneath the platform. The piston B is hollow and is adapted to hold oil or some other suitable incompressible liquid x which is forced out of the piston and into the space between the lower end of the piston and the bottom of the cylinder C, by admitting compressed air or some other suitable gaseous operating medium to the interior of the piston B above the level of the oil in the piston. As shown in Figure 1, a valve E is mounted in the lower end of the piston B, so as to positively trap the oil in the cylinder when it is desired to hold the platform A stationary, and also govern the passage of the oil from the cylinder back into the piston in the operation of lowering the platform. Various types or kinds of valves may be used to establish and cut off communication between the interior of the piston B and the lower end of the cylinder C, so long as the valve is of such design that it may seat or close tightly and thus positively prevent the oil from returning to the hollow piston when it is desired to hold the platform at rest in an elevated position. I prefer to use a check valve E that is normally held seated by a spring 1, which is of such tension that when the oil in the piston B is subjected to a certain approximate pressure, produced by admitting compressed air or the like to the upper end portion of the piston to raise the piston, said valve will open automatically, and thus permit the oil to pass from the piston into the cylinder, and when the supply of compressed air to the upper end portion of the piston is cut off or interrupted, said valve E will close automatically, and thus positively trap a body of oil in the cylinder C, which body of oil will sustain the piston and hold it stationary in its raised position. The lowering of the platform A or downward movement of the piston B is effected by exhausting the gaseous operating medium from the hollow piston, simultaneously moving the valve E into its open position, shown in Figure 2, and maintaining said valve in its open position, so as to permit the oil in the cylinder C to return to the hollow piston B, under the force which the piston exerts on said oil, the piston moving downwardly as the oil in the cylinder C flows upwardly into the hollow piston B.

For convenience I will refer to the valve E as the "lowering valve," as said valve governs or assists in governing the downward movement of the platform. Various kinds of mechanisms may be used to actuate or control the valve E, so long as said mechanism is designed so as to prevent said valve from assuming a condition or position that might result in the platform of the lift dropping accidentally or moving downwardly at a time when it should be adequately supported in a raised or partially raised position. One type of valve operating mechanism that is highly practicable is a mechanism of such design that the valve E cannot remain locked in its open position when the gaseous operating medium is being supplied to the hollow piston to raise the platform A of the lift, thereby eliminating the possibility of the platform dropping or moving downwardly when the supply of the gaseous operating medium to the piston is cut off, or in the event of loss or dissipation of the gaseous operating medium from any cause when the platform is in a raised or partially raised condition. I have herein illustrated two forms of mechanisms for operating, actuating or controlling the lowering valve E. The valve operating mechanism used in the lift shown in Figures 1 to 7, inclusive, is intended to be actuated manually by the operator in charge of the lift to open the valve E to cause the platform to move downwardly, and said valve operating mechanism is so constructed that it will be restored automatically to its normal or inactive position, at about the time the platform reaches its extreme lower position, in the event the operator fails to manually restore said operating mechanism to close the valve E, after the platform has been lowered, thereby insuring that the valve E will function properly the next time the platform is raised by admitting the gaseous operating medium to the upper end portion of the piston. This is a very desirable characteristic of an automobile lift, as it eliminates the possibility of the platform A dropping accidentally or failing to remain in its raised position when the supply of the gaseous operating medium to the piston B is interrupted or fails at a time when the platform is in a raised or partially raised condition. Said valve operating mechanism comprises a vertically-disposed rod F arranged inside of the hollow piston B in such a way that the upper end portion of said rod is located outside of the piston, preferably above the platform A, and the lower end of said rod is held in longitudinal alignment with the stem of the valve E and in such rela-

tion with same that a downward thrust of the rod F unseats the valve E. A cam G that co-acts with the upper end of the rod F is connected to a horizontally-disposed rock shaft H that is mounted in a bearing I on the platform A, said rock shaft being provided at its outer end with an arm J to which is connected an operating rod or link K that leads to one end of the platform or to any other point remote from the cylinder. When the operating link K is moved in the direction indicated by the arrow in Figure 5 the cam G will be moved into the position shown in Figure 2, thereby causing the rod F to engage the stem of the valve E and move said valve downwardly into its open position against the force of the actuating spring 1 which closed said valve. When the operating link K is moved in the reverse direction the cam G will be restored to its normal inactive position, shown in Figure 3, and the rod F will move upwardly, due to the upward thrust which the spring 1ª shown in Figures 1 and 2 exerts on the rod F, the said spring 1ª having sufficient force or power to overcome the friction of the packing that surrounds the upper portion of the rod F and move said rod upwardly, when the cam G is set to permit such movement of the rod F.

In order to prevent the valve E from remaining open or in such a condition that it will permit the incompressible liquid in the cylinder to return to the hollow piston when the supply of the gaseous operating medium to the piston B is cut off in the operation of raising the platform, or in the event of loss or dissipation of the gaseous operating medium from any cause when the platform is in its raised position, I have constructed the operating mechanism for the valve E in such a way that said operating mechanism will be restored automatically to its normal inactive condition during the latter part of the downward movement of the platform, thereby insuring the valve E being in a closed condition at the time the gaseous operating medium is again admitted to the piston B to raise the platform. In the form of my invention shown in Figures 1 to 7 the means used to effect the automatic return of the valve operating mechanism consists of a tripping device L pivotally attached at 2 to an arm M on the rock shaft H and so proportioned and arranged that the lower end of said tripping device will project downwardly slightly from the underside of the platform A when the operating mechanism for the valve E is in such a condition as to hold said valve E open. Accordingly, when the operating link K is moved to unseat the valve E, during the operation of lowering the platform, the tripping device L will be rendered operative, as shown in Figure 2. Thereafter, during the downward movement of the platform A, the lower end of the tripping device L will come in contact with the base D at about the time the platform A reaches its extreme lower position, whereupon the rock shaft H will be restored to its normal inactive condition by the thrust which the tripping device L exerts on said rock shaft during the continued downward movement of the platform after the lower end of the tripping device L has contacted with the base D or any other suitable kind of stationary abutment arranged beneath the platform. When the cam G is restored to its normal inactive condition, due to the return movement of the rock shaft H, as above described, the valve E will seat automatically under the influence of its spring 1, and the rod F will be restored to its normal raised position by the spring 1ª. Various means may be employed for effecting or facilitating the adjustment of the valve operating mechanism so as to insure the valve E closing at or about the time the platform A reaches the end of its downward stroke or reaches its lowermost position, but I prefer to arrange a plurality of shims 3 between the top face of the platform A and the base piece of the bearing I in which the rock shaft H is mounted so as to permit the lower end of the tripping device L to be raised or lowered relatively to the base D or other stationary abutment with which said tripping device co-acts to automatically restore the valve operating mechanism to its normal inactive condition.

As previously stated, the lowering valve, consists of a valve structure comprising a valve element E and a co-acting seat, that can be removed from the upper end of the cylinder, without withdrawing the piston B from its cylinder C, thereby enabling the valve and its seat to be easily inspected, repaired or replaced. This highly desirable result may be attained by arranging the valve E at the lower end of the piston B in a cage 4 provided with a seat for the valve, and having a tubular portion 4ª which receives and acts as a guide for the lower end portion of the rod F, and forming an elongated hole 5 in the lower end portion of the rod F that receives a transversely-disposed pin 6 carried by the tubular portion 4ª of the valve cage. Due to the fact that the upper end of the rod F is accessible from the top side of the platform A, said rod can be turned or rotated, and due to the fact that the rod F is connected by a cross pin 6 with the cage 4 of the valve E, rotary movement from the rod F is imparted to the cage of the valve E. Consequently, the valve cage 4 may be provided with an externally screw-threaded portion 7 that can be screwed into and out of an internally threaded hole in the lower end of the piston D by manipulating the exposed upper end portion of the rod F, located at the top of the cylinder.

The upper end 8 of the piston B is pro-

vided with a stuffing box designated as an entirety by the reference character O through which the rod F passes, the body portion 9 of said stuffing box being of slightly greater diameter than the cage of the check valve E and being removably mounted in a hole 10 in the upper end 8 of the piston, the body portion 9 of the stuffing box being externally screw-threaded so that it can be easily connected to and disconnected from the upper end 8 of the piston. After the stuffing box O has been removed, the entire assembly of the check valve E may be withdrawn from the piston through the hole 10 in the upper end 8 of the piston, this, of course, being made possible by reason of the fact that said valve assembly is attached to the lower end of the rod F.

It is immaterial what means is used to conduct the operating medium into the upper end portion of the hollow piston B. In the form of my invention shown in Figures 1 and 3 the cylinder C is provided with a stationary, centrally-disposed supply pipe P that projects upwardly from the bottom end wall of the cylinder and which terminates at or adjacent the upper end of the piston when the piston is in its lowered position. The piston B is provided with a tubular portion R that surrounds the supply pipe P and a stuffing box S is arranged at the upper end of the supply pipe C, so as to produce and maintain a tight joint between said supply pipe and the tubular portion of the piston that surrounds same. The lower end of the supply pipe P is connected by means of a conduit P′ with a suitable source of supply of compressed air, and inlet ports 11 are formed in the tubular portion R of the piston adjacent the upper end of the piston so as to permit air to pass from the supply pipe P into the hollow piston above the level of the liquid in said piston, as indicated by the arrows in Figure 3. In Figure 7 a flexible supply pipe P^2 is connected to the upper end 12 of the piston B for admitting a gaseous operating medium to the interior of said piston above the level of the liquid therein. In the lift above described I have not illustrated the valve that is used to admit and exhaust the gaseous operating medium to and from the hollow piston, as any suitable or preferred kind of valve mechanism may be used for this purpose.

In Figures 8 to 13 I have illustrated an automobile lift constructed in accordance with my invention, but equipped with an operating mechanism for the lowering valve E that operates on a different principle from the valve operating mechanism shown in Figures 1 to 7. This is the type of valve mechanism that I prefer to use and it is so designed that the "air valve" which governs the admission and exhaust of the gaseous operating medium to and from the hollow piston B of the lift is connected with or combined with the operating mechanism for the lowering valve E in such a way that a change in the position of the air valve automatically effects a change in the position of a cam G′ that forms part of the operating mechanism for the valve E, the said cam G′ being combined or connected with the control element of the air valve in such a way that when said control element is moved into a position to exhaust the gaseous operating medium from the piston B, the valve E will be moved into its open position. In all other positions of the control element of the air valve the cam G′ remains in its normal or inactive position.

The particular type or kind of mechanism that is employed to actuate or control the lowering valve E is immaterial and it is also immaterial what means is employed to cause said mechanism to act in unison with the air valve. In Figures 8 to 13 I have illustrated the operating mechanism for the valve E as comprising a vertically-disposed rod F of the kind used in the other form of my invention previously described, and a cam G′ which actuates and controls the position of the rod F. The cam G′ is connected to a horizontally-disposed rock shaft H′ on the platform A of the lift, and said rock shaft is directly connected with the movable control element of the air valve V that governs the admission and exhaust of the gaseous operating medium to and from the hollow piston B of the lift. The air valve V may be of any suitable or preferred type and any suitable kind of conduits may be used to deliver air to said valve from a source of supply, and to connect the casing of the valve with the hollow piston of the lift in such a way that said valve may be used to supply air to the piston and exhaust air from the piston. The valve operating mechanism comprises a manually-operable shaft K′ that is rockably mounted in bearings 15 on the platform A of the lift, and said operating device K′ is connected by means of a gearing 16, shown in Figure 8, with the rock shaft H′ previously mentioned, that carries the cam G′ and the control element of the air valve V, said shaft K′ having a handle 17 which the operator in charge of the lift moves into different positions to raise and lower the platform. When the handle 17 is moved into one position, which I will refer to as the "up" position (shown in full lines in Figure 9), air will be admitted to the hollow piston above the level of the liquid therein, and the cam G′ will be moved into such a position (see Figure 13) that it does not exert pressure on the rod F, thereby causing the operating mechanism for the valve E to remain in its normal or inactive position. After the platform of the lift has moved upwardly to the desired height or level, the handle 17 of the air valve is moved into what I will refer to as its "stop" position (the in-

termediate position shown in Figure 9), so as to cut off the admission of air to the hollow piston, trap the air in said piston, and thus cause the platform to come to rest and be securely supported by the incompressible liquid trapped in the space between the head of the cylinder and the inner end of the piston. The movement of the control element of the air valve V, produced by shifting of the handle 17 into its "stop" position, effects a change in the position of the cam G', but said cam is so shaped that in this position of the air valve, namely, the stop position, the cam G' will not exert pressure on the rod (see Figure 12). Consequently, the rod F will remain in its raised position, and the valve E in the lower end of the piston will remain seated. To lower the platform, the operator turns the handle 17 of the air valve into a position which I will refer to as the "down" position, so as to exhaust the gaseous operating medium from the hollow piston B and rock the shaft H' in a direction to cause the cam G' to exert downward pressure on the rod F, as shown in Figure 11, and open the valve E. So long as the handle 17 of the air valve remains in this position, to wit, the "down" position, the valve E will remain open, but as soon as the handle 17 is moved to "stop" position, or moved to "up" position, so as to cause air to be admitted to the hollow piston, the cam G' will be automatically restored to its normal or inactive position, wherein it will not exert pressure on the rod F or interfere in any way with the seating of the valve E. It will thus be seen that with a valve mechanism of the construction described, no independent act of the operator in charge of the lift is required to restore said mechanism after said mechanism has acted to open the valve E, due to the fact that said mechanism is combined with the air valve so as to act in unison with same, and act in such a way that it will be impossible for the operating mechanism of the valve E to hold said valve open at a time when such a condition of said valve might result in the platform dropping or moving downwardly at a time when it should be firmly supported.

While it is preferable to arrange the lowering valve in the lower end of the piston, as previously described, this is not essential, so long as said valve is mounted in such a manner that it can be inspected, repaired or replaced without withdrawing the piston from the cylinder. Therefore, in Figure 14 I have illustrated another form of my invention, wherein the lowering valve is arranged in an easily accessible position at the upper end of the piston. In Figure 14 the lowering valve is designated by the reference character E', but the other parts of the structure that correspond to the parts of the structure shown in Figure 1 have been designated by the same reference characters used in Figures 1 and 2. In Figure 14 the stuffing box O that surrounds the rod F used to unseat the lowering valve E', is carried by a casting 100, mounted on the head 8 of the piston B, and projecting upwardly through the platform A. The cage 101 of the lowering valve is attached to the upper end of a vertically-disposed pipe 102 whose lower end is attached to and terminates in the outside face of the bottom of the piston, and the casting 100 that surrounds the valve cage is attached to a pipe 103 arranged in concentric relation with the pipe 102 and extending downwardly nearly to the bottom of the piston, as shown clearly in Figure 14.

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

1. An automobile lift, comprising an upwardly-movable platform or chassis engaging portion, a cylinder having a head at its lower end, a piston in said cylinder for sustaining said platform, constructed so as to serve as a holder for an incompressible liquid means for forcing said liquid from said piston into the space between the inner end of the piston and the head of the cylinder so as to raise said platform, and a valve structure for trapping said liquid in said space consisting of a valve element and a co-acting seat, mounted so as to be removable from the upper end of the cylinder, without withdrawing the piston from the cylinder.

2. An automobile lift, comprising an upwardly-movable platform or chassis engaging portion, a cylinder having a head at its lower end, a piston in said cylinder for sustaining said platform, constructed so as to serve as a holder for an incompressible liquid, means for forcing said liquid from said piston into the space between the inner end of the piston and the head of the cylinder so as to raise said platform, and a valve structure for causing said liquid to be positively trapped in said space to hold the platform at rest in a raised position, or returned to the interior of the piston to permit the platform to move downwardly, comprising a valve element and a co-acting seat, constructed so as to be removable from the upper end of the cylinder.

3. An automobile lift, comprising an upwardly-movable platform or chassis engaging portion, a cylinder, a piston in said cylinder for sustaining said platform, constructed so as to serve as a holder for an incompressible liquid, means for forcing said liquid from the piston into the cylinder, an automatic valve arranged adjacent the inner end of said piston, constructed so as to automatically seat or close tightly and thus positively trap the liquid in the cylinder when said liquid forcing means ceases operating, thereby safely holding the platform in its raised position, and an independent means

for opening said valve and holding it unseated.

4. An automobile lift, comprising an upwardly-movable platform or chassis engaging portion, a cylinder, a piston in said cylinder for sustaining said platform, constructed so as to serve as a holder for an incompressible liquid, means for forcing said liquid from the piston into the cylinder, a valve on said piston, constructed so as to seat or close tightly and thus positively trap the liquid in the cylinder when said liquid forcing means ceases operating thereby holding the platform in its raised position, a seat for said valve removably mounted in the piston, and means for enabling said valve and valve seat to be installed or removed without withdrawing the piston from the cylinder.

5. An automobile lift, comprising an upwardly-movable platform or chassis engaging portion, a cylinder, a piston in said cylinder for sustaining said platform, constructed so as to serve as a holder for an incompressible liquid, means for forcing said liquid from the piston into the cylinder, a valve arranged adjacent the inner end of said piston constructed so as to automatically seat or close tightly and thus positively trap the liquid in the cylinder when said liquid forcing means ceases operating, thereby holding the platform in its raised position, a seat for said valve removably mounted in the piston, and means operable from the top of the piston for installing and removing said valve and valve seat.

6. An automobile lift, comprising an upwardly-movable platform or chassis engaging portion, a cylinder, a piston in said cylinder for sustaining said platform, constructed so as to serve as a holder for an incompressible liquid, means for forcing said liquid from the piston into the cylinder, a valve arranged adjacent the inner end of said piston, constructed so as to seat or close tightly and thus positively trap the liquid in the cylinder and safely hold the platform in its raised position, and an operating device for holding said valve open, combined with said valve in such a way that said device may also be used to install or remove said valve while the piston is positioned in the cylinder.

7. An automobile lift, comprising an upwardly-movable platform or chassis engaging portion, a cylinder, a piston in said cylinder for sustaining said platform, constructed so as to serve as a holder for an incompressible liquid, means for forcing said liquid from the piston into the cylinder, a valve arranged adjacent the inner end of said piston, constructed so as to seat or close tightly and thus positively trap the liquid in the cylinder and safely hold the platform in its raised position, a cage for said valve removably mounted in the inner end of the piston, an operating device for said valve accessible from the platform, and means for enabling said operating device to be used to install and remove said cage without disassembling the piston or withdrawing the piston from the cylinder.

8. An automobile lift, comprising an upwardly-movable platform or chassis engaging portion, a cylinder, a piston in said cylinder for sustaining said platform, constructed so as to serve as a holder for an incompressible liquid, means for forcing said liquid from the piston into the cylinder, a valve arranged adjacent the inner end of said piston, constructed so as to seat or close tightly and thus positively trap the liquid in the cylinder and safely hold the platform in its raised position, a cage for said valve screwed into the inner end of the piston, an actuating device accessible from the platform and holding said valve open, and a slot and pin connection between said actuating device and valve cage for transmitting rotary motion from said device to said cage.

9. An automobile lift, comprising an upwardly-movable platform or chassis engaging portion, a cylinder, a hollow piston in said cylinder for sustaining said platform, adapted to hold an incompressible liquid, means for introducing a gaseous operating medium into the piston above the level of the liquid therein to raise the piston and force liquid from the piston into the cylinder, an automatic valve on said piston, adapted to seat automatically and trap the liquid in the cylinder when the supply of the gaseous operating medium to the piston is interrupted, and an operating mechanism for said valve capable of being actuated from a point remote from the cylinder, to hold the valve open.

10. An automobile lift, comprising an upwardly-movable platform or chassis engaging portion, a cylinder, a hollow piston in said cylinder for sustaining said platform, adapted to hold an incompressible liquid, means for introducing a gaseous operating medium into the piston above the level of the liquid therein to raise the platform and force said liquid into the cylinder, a valve on said piston that cuts off communication between the cylinder and the interior of the piston when said valve is closed, an operating mechanism for opening said valve to permit the liquid to return to the piston and thus cause the platform to descend, and means for insuring that said valve operating mechanism will be in an inactive or inoperative position when the gaseous operating medium is admitted to the piston to raise the platform.

11. An automobile lift, comprising an upwardly-movable platform or chassis engaging portion, a cylinder, a hollow piston in said cylinder for sustaining said platform, adapted to hold an incompressible liquid,

means for introducing a gaseous operating medium into the piston above the level of the liquid therein to force liquid from the piston into the cylinder to raise the piston, a valve on said piston for positively trapping the liquid in the cylinder, an operating mechanism for opening said valve and holding it in an open position so as to permit the liquid to pass from the cylinder back into the piston and thus cause the piston to descend, said operating mechanism being capable of being actuated from a point remote from the cylinder, and means for automatically restoring said valve operating mechanism to an inactive position during the descent of the piston.

12. An automobile lift, comprising an upwardly-movable platform or chassis engaging portion, a cylinder, a hollow piston in said cylinder for sustaining said platform, adapted to hold an incompressible liquid, a lowering valve on said piston arranged for establishing and positively cutting off communication between the cylinder and the interior of the piston, a valve mechanism for admitting and exhausting a gaseous operating medium to and from the piston above the level of the liquid therein, and means for causing said lowering valve to open when the valve mechanism is actuated to exhaust the gaseous medium from the piston and to close automatically and remain seated when said valve mechanism is actuated to cut off the supply of gaseous medium to the piston or trap said medium in the piston.

13. An automobile lift, comprising an upwardly-movable platform or chassis engaging portion, a cylinder, a hollow piston in said cylinder for sustaining said platform, adapted to hold an incompressible liquid, a lowering valve on said piston for establishing and positively cutting off communication between the cylinder and the interior of the piston, a valve mechanism for admitting and exhausting a gaseous operating medium to and from the piston above the level of the liquid therein, and an actuating mechanism for said lowering valve operatively connected with the valve mechanism for the gaseous medium and constructed so that the lowering valve will be held open when the gaseous medium is being exhausted from the piston and will be held closed when said gaseous medium is being supplied to the piston or trapped in the piston.

14. An automobile lift, comprising an upwardly-movable platform or chassis engaging portion, a cylinder, a hollow piston in said cylinder for sustaining said platform, adapted to hold an incompressible liquid, a lowering valve mounted on said piston for establishing and cutting off communication between the cylinder and the interior of the piston, a manually-operable valve mechanism for admitting and exhausting a gaseous operating medium to and from the piston above the level of the liquid therein to raise, lower or hold the piston at rest in an elevated position, and an actuating mechanism for said lowering valve operatively connected with the valve mechanism for the gaseous medium, and constructed so as to hold the lowering valve open when the gaseous medium is being exhausted from the piston and to permit said lowering valve to seat and remain seated when said valve mechanism is operated to raise the platform or hold it at rest in an elevated position.

15. An automobile lift, comprising an upwardly-movable platform or chassis engaging portion, a cylinder, a hollow piston in said cylinder for sustaining said platform, adapted to hold an incompressible liquid, a lowering valve on said piston for establishing and positively cutting off communication between the cylinder and the interior of the piston, an actuating device for said lowering valve operable from the outer end of the piston, an operating member for moving and controlling the position of said actuating device, and a valve mechanism for admitting and exhausting the gaseous operating medium to and from the piston combined with said operating member in such a way that it will be impossible for said lowering valve to remain open when it should be seated.

16. An automobile lift, comprising an upwardly-movable platform or chassis engaging portion, a cylinder, a hollow piston in said cylinder for sustaining said platform, adapted to hold an incompressible liquid, means for admitting and exhausting a gaseous medium to and from said piston above the level of the liquid therein, to cause the liquid to enter the cylinder to raise the platform and to return from the cylinder to the piston to lower the platform, a lowering valve on said piston for establishing and positively cutting off communication between the cylinder and the interior of the piston, an actuating rod for said lowering valve operable from the top side of the platform, a cam for moving and governing the position of said rod, and an operating means for said cam combined with the control means for the gaseous medium and constructed so that the actuating rod for the lowering valve will be held in a position to permit said valve to remain seated when the gaseous medium is admitted to the piston to raise the platform.

17. An automobile lift, comprising an upwardly-movable platform or chassis engaging portion, a cylinder, a hollow piston in said cylinder for sustaining said platform, constructed so as to hold an incompressible liquid and adapted to have a gaseous medium admitted to and exhausted from the interior of the piston to raise and lower the platform, a lowering valve on the piston, an operating mechanism for opening said lowering valve and holding it unseated, and means for auto-

matically restoring said operating mechanism to its normal or inactive position when the platform has nearly reached its fully depressed position in the event the operator in charge of the lift has failed to manually restore said operating mechanism to its normal inactive position.

18. An automobile lift, comprising an upwardly-movable platform or chassis engaging portion, a cylinder, a hollow piston in said cylinder for sustaining said platform, constructed so as to hold an incompressible liquid and adapted to have a gaseous medium admitted to and exhausted from the interior of the piston to raise and lower the platform, a lowering valve on the piston arranged adjacent the inner end of same, a manually-actuated mechanism for opening said lowering valve and holding it unseated, and an element forming part of said operating mechanism and arranged so that the final movement of the platform as it reaches its fully depressed position causes said element to exert pressure on said operating mechanism in a direction to prevent said mechanism from holding the lowering valve open.

EDWIN H. STEEDMAN.