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A. C. WOOD

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LIQUID ELEVATING DEVICE

Filed Oct. 6, 1928

Fig. 1.

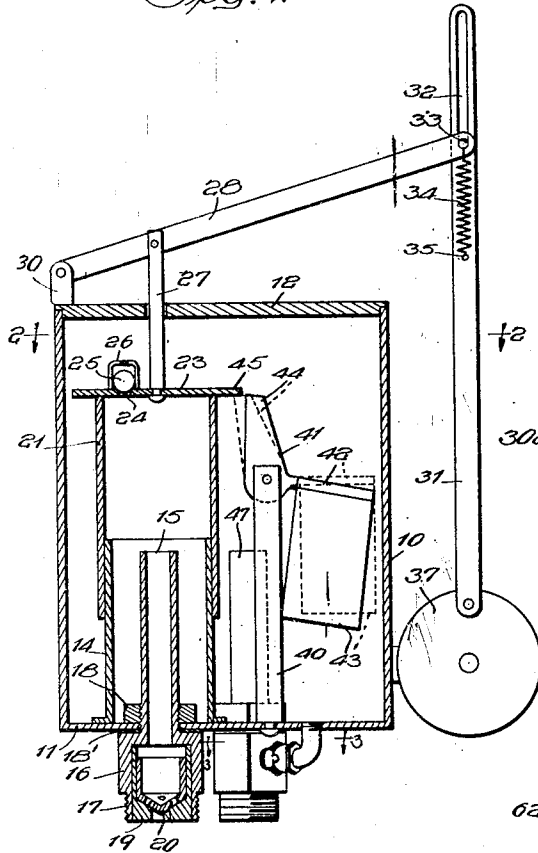


Fig. 3.

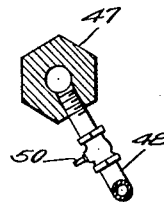


Fig. 5.

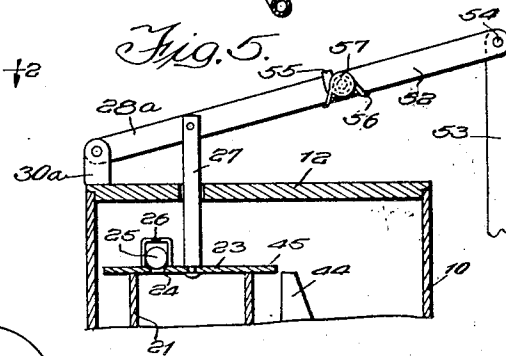


Fig. 4.

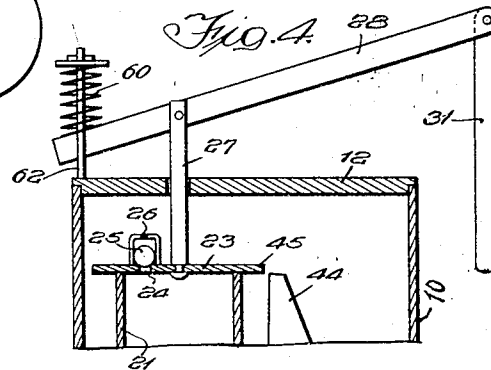
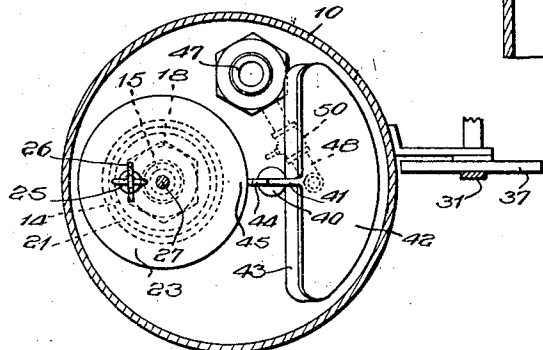


Fig. 2.



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LIQUID ELEVATING DEVICE

Application filed October 6, 1928. Serial No. 310,771.

My invention belongs to the general class of devices for elevating or conveying liquids and more particularly to an apparatus for conveying or supplying fluid or liquid to meet a required demand. The same is particularly adapted for drawing gasoline or like fluids from a supply tank and supplying the same to the carburetor of a combustion engine as required, but the same, however, may be used wherever found applicable. The invention has among its objects, the production of a simple, compact, inexpensive, reliable, efficient and satisfactory device of the kind described. It has particularly as an object the production of a pump suitable for elevating liquids, which pump is automatically rendered operative or inoperative or its action varied depending upon the amount of liquid required to meet the demand. It has particularly as an object the production of a device of the kind described that is free of complicated parts and which does not require fine adjustment. A feature of my invention is that it comprises a pump for elevating liquid into a receptacle, the plunger of this pump being automatically retained against reciprocation by means controlled by the liquid level within the receptacle when a predetermined quantity of liquid is in the receptacle.

Many other objects and advantages of the construction herein shown and described will be obvious to those skilled in the art from the disclosure herein given.

To this end my invention consists in the novel construction, arrangement and combination of parts herein shown and described, and more particularly pointed out in the claims.

Referring now to the drawings which illustrate certain preferred embodiments of my invention:

Fig. 1 shows a vertical sectional view through a device embodying my invention;

Fig. 2 is a sectional view taken on the line 2-2 of Fig. 1;

Fig. 3 is a sectional view taken on the line 3-3 of Fig. 1;

Fig. 4 is a vertical fragmentary sectional

view similar to Fig. 1, showing a modified feature of my invention, and

Fig. 5 is a sectional view similar to Fig. 4 showing still another embodiment of my invention.

Numeral 10 represents a casing or receptacle which may be cylindrical in shape and may have a bottom wall 11 and a top wall 12. Secured to the bottom wall within the receptacle 10 is a cylindrical shell 14 open at both ends and positioned over a circular aperture in the bottom wall 11. Threaded through this aperture is a tubular member 15 which is enlarged outside of the casing 10 as shown at 16 and exteriorly threaded as at 17 to facilitate the attachment of a conduit. A valve seat member 19 is disposed within the enlarged portion 16 and serves to seat a valve member 20 which is slidable therein. Suitable packing 18 and a gasket 18' are provided to render liquid-tight the opening in the wall 11 receiving the member 15.

A cylindrical member 21 closely envelops the cylindrical member 14 and is slidable thereover, serving in effect as a plunger. A plate 23 is secured to the top of the cylindrical member 21 and has an aperture 24 therein seating a ball valve 25, this valve being loosely retained by means of a wire cage 26.

Secured to the plate 23 is a rod 27 which is pivotally connected to lever 28. This lever is pivotally secured at one end to a bracket 30 and at its other end to a connecting rod 31. As will be clearly seen in Fig. 1, the connecting rod 31 is slotted as at 32 and the lever 28 carries at its end a pin 33 which slidably engages in the slot 32. A helical spring 34 is secured to the pin 33 and to a lug 35 on the connecting rod 31. The connecting rod 31 may be pivoted to any suitable crank 37 for reciprocating it and the lever 28, this crank being attached to the casing 10 by suitable means.

Secured to the bottom portion 11 of the casing 10 is a vertical support 40, the upper portion of which pivotally carries a bell crank lever 41. One arm 42 of the bell crank lever supports a float member 43, formed of cork or other light material, or comprising a hollow receptacle, or of any other desirable con-

struction; while the other arm 44 of the lever is disposed in such a manner that when the float is elevated to a desired point this arm will lie in the path of the projecting flange 45 of the plate 23, as shown dotted in Fig. 1.

A tubular member 47 passes through the bottom plate 11 and may be so designed as to facilitate the attachment of a conduit thereto outside of the casing 10. An auxiliary tubular member 48 communicates with the bottom of the casing 10 passing through the bottom plate 11 and lying substantially flush with the inner surface thereof and is connected to the portion of the tubular member 47 lying outside of the receptacle by means of a petcock 50.

The operation of the device above described is substantially as follows: The crank 37 will normally be connected with the operating parts of an internal combustion engine and will be rotated continuously, thus reciprocating the connecting rod 31, the lever 28, the rod 27, and the cylindrical member 21.

It will be seen that the cylindrical member 21 acts substantially as a plunger in cooperation with the stationary cylinder 14 and upon the upward movement of the cylindrical member 21 a vacuum will be created within both of these cylindrical members, thus drawing fuel past the valve 20, through the tubular member 15 and into the cylindrical members. Upon the downward movement of the cylindrical member 21 the valve 20 will be forced against its seat and any fluid within the cylindrical members, either gas or liquid, will be forced through the apertures 24, displacing the ball valve 25. When sufficient liquid has been drawn into the casing 10 to rise above the level of the tubular member 47 such liquid will pass out of the casing through the last mentioned tubular member and thence to the carburetor (not shown) of the engine. When a predetermined maximum quantity of liquid has been pumped into the casing 10 the float member 43 will be elevated on the bell crank lever 41 around its pivot thus moving the arm 44 into the path of the flange 45, as shown in dotted lines in Fig. 1. When the arm 44 is in this position, of course, the cylindrical member 21 will be retained in an elevated position and will not be permitted to reciprocate; hence the continued rotation of the crank 37 will result only in reciprocation of the connecting rod 31, the pin 33 merely sliding in the slot 32 against the tension of the spring 34. When, however, the liquid within the casing 10 has dropped beyond the given maximum, the float 43 will fall, thus removing the arm 44 from the path of the flange 45 and again permitting the cylindrical member 21 to reciprocate, and thus again pumping liquid into the casing.

The auxiliary tubular member 48 and petcock 50 are of particular value in case of an

emergency, as in cases where the supply of fuel is inadvertently exhausted. In such a case, it will be seen that the quantity of fuel disposed in the casing 10 below the level of the tubular member 47 may be utilized as a reserve.

The tubular member 15 is elevated above the level of the bottom member 11 in order that the air space within the member 14 may be reduced when the plunger is operating, and the pumping efficiency consequently increased.

Referring now to Fig. 4, it will be seen that in this embodiment the lever mechanism is slightly modified. In this case the connecting rod 31 is not slotted but is pivotally connected to the lever 28 which, as in the other embodiment, is pivotally connected to the rod 27. However, in this instance the lever 28 bears at one end against a helical spring 60 carried by a support 62 and when the cylindrical member 21 is reciprocating the lever 28 pivots against this helical spring 60. When, however, the cylindrical member is retained against reciprocation by the arm 44 the connecting rod 31 and lever 28 continue to reciprocate, the end of the lever 28 being resiliently urged against the spring 60.

In the embodiment shown in Figure 5 all of the parts are substantially similar to the corresponding parts shown in the other embodiments except that the yieldable connection between the plunger actuating mechanism and the plunger is somewhat modified. In this embodiment the rod 27 is directly connected to the cylindrical member 21 at one end and is pivoted at its other end to the lever 28a, this lever being pivotally connected to the bracket 30a. At the opposite end of the lever 28a is a pintle 57 upon which is pivoted a rod 52, a connecting rod 53 being pivoted to the rod 52 as at 54. It will be understood that the connecting rod 53 is connected to a crank or other suitable reciprocating mechanism (not shown). It will be noted that the end of the rod 52 is prolonged beyond the pintle 50 to form a lug 55 and that a coiled spring 56 is mounted about the lug and pintle 50 and so disposed that the downward movement of the connecting rod 53 and the rod 52 will be against the resilient resistance of the spring 56. Hence, when the liquid within the casing 10 is below the predetermined maximum level and the arm 44 is out of the path of the flange 45, reciprocation of the connecting rod 53 will be transmitted through the rod 52 and lever 28a to the plunger 21, thus pumping liquid into the device. When, however, the liquid has reached the predetermined maximum level and the float (not shown) has moved the arm 44 into the path of the flange 45, thus retaining the plunger 21 against reciprocation, downward movement of the connecting rod 53 will result merely in rotating the rod 52

about the pintle 50 and increasing the tension of the spring 56. Obviously, the spring will be of such a tension that the lever 28a and the rod 52 will be rotated substantially as a unit about the pivot on the bracket 30a when the plunger 21 is not retained.

Having thus described my invention, it is obvious that various immaterial modifications may be made in the same without departing from the spirit of my invention; hence I do not wish to be understood as limiting myself to the exact form, construction, arrangement and combination of parts herein shown and described, or uses mentioned.

What I claim as new and desire to secure by Letters Patent is:

1. In a device of the class described and in combination, a receptacle provided with an inlet and an outlet, a cylindrical member communicating with said inlet, a reciprocable tubular member operatively related to said cylindrical member for pumping fluid into said receptacle, a plate having a laterally extending flange secured to said tubular member, a valve in said plate, and means operatively related to said flange and controllable by the fluid level in said receptacle for retaining said tubular member against reciprocation when a predetermined quantity of fluid is in said receptacle.

2. In a device of the class described and in combination, a receptacle provided with an inlet and an outlet in the bottom thereof, a cylindrical member communicating with said inlet, a reciprocable tubular member surrounding said cylindrical member and operatively related thereto for pumping fluid into said receptacle, a plate having a laterally extending flange secured adjacent the top of said tubular member, a valve in said plate, means adapted to engage said flange and controllable by the fluid level in said receptacle for retaining said tubular member against reciprocation when a predetermined quantity of fluid is in said receptacle, a continuously operated driving member outside said receptacle, and means operatively connected to said plate and said driving member including a spring adapted to yield as said driving member is operated and when said fluid level controlled means is in engagement with said flange.

In testimony whereof, I have hereunto signed my name.

ANDREW C. WOOD.