

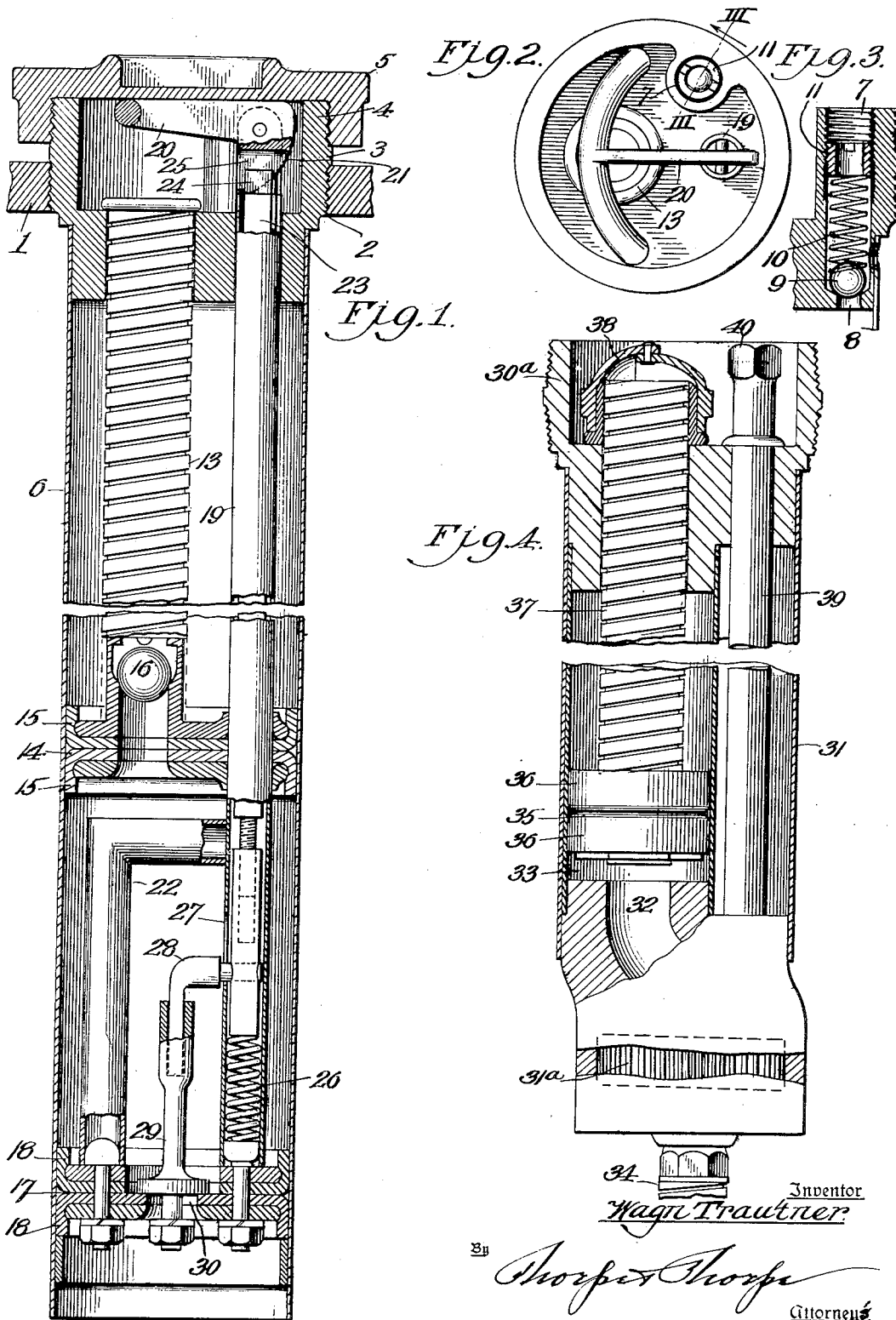
May 8, 1934.

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1,958,253

RETRACTIBLE DISCHARGE NOZZLE FOR PUMPS

Filed Feb. 13, 1933



UNITED STATES PATENT OFFICE

1,958,253

RETRACTIBLE DISCHARGE NOZZLE FOR PUMPS

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Application February 13, 1933, Serial No. 656,483

15 Claims. (Cl. 221—83)

This invention relates to dispensing pumps and is particularly adapted for use with lubricant container barrels or drums in which the lubricant is shipped or transported, as the objective of the invention is a concealed pump in which the entire mechanism, including the discharge tube or nozzle, is contained within a housing in the fluid container and is thereby protected against loss or injury.

Another object of the invention is to produce a pump construction which is convenient and readily accessible and may be used to discharge a measured quantity of oil either into a container or to the point of use without possibility of soiling the hands or clothes.

A further object of the invention is to produce a pump of the concealed type set forth, in which the discharge tube or spout is automatically withdrawn into or projected from the barrel or container, in accordance with predetermined operation of the pump mechanism.

Another object of the invention is to produce a disappearing discharge tube construction which is of flexible nature whereby it is possible for the operator to discharge measured quantities of fluid directly to the point of use, for example, directly into the crank case of an internal combustion engine.

A still further object of the invention is to produce a strong, durable, efficient and inexpensive mechanism of the character set forth; and in order that the invention may be fully understood, reference is to be had to the accompanying drawing, in which:—

Figure 1 is a central vertical section through a reciprocating pump embodying the invention.

Figure 2 is a top plan view of the pump with the sealing or closing cap removed.

Figure 3 is a section on the line III—III of Figure 2.

Figure 4 is a central vertical section through a rotary pump construction embodying the invention.

In the said drawing, where like reference characters identify corresponding parts in all of the figures, 1 indicates a fragment of a container such as a shipping drum for oil or the like, said drum being provided with the customary threaded opening 2 in one of its heads.

Threaded into the opening 2 is a casting 3, provided with a flange 4 for sealing engagement with the barrel head, and formed above the flange with a threaded portion receiving a screw cap or closure 5, when the container is being transported or shipped.

The casting or collar member 3 carries a pump barrel or compression chamber 6 of any desirable length, preferably extending to the bottom of the barrel if the end of the pump is not provided with a flexible pick up or intake member which automatically seeks the bottom of the barrel, as will hereinafter appear. The wall of the casting 3 is enlarged and is provided with a bore or passageway 7, normally closed at its upper end by the screw cap 5 to guard against loss or escape of oil into the upper part of the casting 3, said passageway leading into the container above the liquid level, and being provided with a branch passageway 8 leading into the upper part of the compression chamber 6. The passageway 8 is normally held closed against the admission of air by a ball valve 9 held down on its seat by a spring 10 adjusted by a sleeve 11 threaded within the upper end of the passageway 7. The ball valve is adapted to be unseated under certain conditions, as will hereinafter appear.

Extending through an opening in the casting 3 is a delivery tube or spout 13, which is preferably of flexible character, and of suitable length, not however equal to the length of the pump barrel or compression chamber. The bottom end of the discharge tube 13 is connected to a floating piston or partition 14 which is sealed against the pump barrel, in both directions, by means of suitable cup washers 15. Mounted in said delivery tube is a check valve 16 to prevent the entry of air into the compression chamber 6.

Mounted to reciprocate within the compression chamber 6 is a pump piston or plunger 17 sealed against the pump barrel, in both directions, by cup washers 18. Rigidly connected to the pump piston is a tube 19 passing up through the piston 14 and through an opening in the casting 3, and equipped at its upper end with a pivoted operating handle 20 having a cam 21. Said tube 19 is provided with a brace portion 22 rigid with the piston 17 so that said pump piston cannot twist or bind in the pump barrel 6.

The tube 19 contains an extensible rod 23 to allow for wear in a valve seat hereinafter mentioned, and has its upper end reduced to form a stud 24 received within a slot 25 in the face of the cam 21 to hold the extensible rod against rotating movement, said rod being elevated by means of a spring 26, when the cam is rotated to unlocked position as will hereinafter appear. Tapped into the lower section of the rod 23 and extending through a slot 27 in the tube 19, is a right angle guide and stop member 28 slidably received within a bore in the upper end of a check valve

29 closing a port 30 in the center of the piston 17, it being noted that when the cam is in the position shown in Figure 1, the valve 29 is held against opening movement.

5 The operation of this type of construction is substantially as follows: The discharge capacity of the pump on the up stroke of the piston 17, is in accordance with the length and diameter of the compression chamber or pump barrel. When
10 the pump is inserted into a container, the valve 29 is locked closed by the cam 21, and it will be evident that (no leaking occurring), the pump barrel and discharge tube will stand free of liquid. When it is desired to pump a quantity from the
15 container, the operator swings the handle 20 to release the rod 23 and then pulls upwardly on the handle to move the piston 17. This operation of the handle moves the cam 21 to release the rod 23 for operation by spring 26 to release the piston
20 valve 29; and the oil or liquid in the container will follow up into the pump barrel below the piston 17, as air will enter the drum through the vent or passage 7 above the liquid level. The upward pull on the pump piston 17 forces the
25 floating piston 14 upward through contact of the brace 22 with the underside of the floating piston. If the piston 17 is moved its full stroke, the piston 14 will contact with the casting 3 and the discharge tube 13 will be fully projected from its
30 housing. Upon the down stroke of the piston 17 caused by pressure on the handle 20, as valve 29 will immediately open, the floating piston 14 and the discharge tube 13 will remain at the top of the compression chamber 6, and the pump barrel will
35 be fully charged with oil entering port 30 under atmospheric pressure.

When the piston 17 has reached its limit of downward movement, the pump barrel or compression chamber will stand substantially filled
40 with liquid and upon the next up stroke of the piston, the entire charge of liquid will be discharged through the discharge tube 13, unseating the ball check valve 16 in such movement. If by chance any of the oil should work by the floating
45 piston 14, it will be discharged into the vent passage 7 by the unseating of the valve 9, and will then flow back into the container.

The described operations of the pump piston, with the valve 29 in unlocked position, will continue until the desired volume of lubricant or fluid
50 has been discharged. When the operator is through pumping, and prior to the last or final down stroke of the piston 17, he will throw the cam 21 and handle 20 to locked position to close
55 the piston valve 29. The operator will then push down on the handle, and as the ball valve 16 prevents the entry of air between the pump piston 17 and the floating piston 14, it will be obvious that air under atmospheric pressure entering
60 around the discharge tube 13, will force the floating piston 14 down into the pump barrel and result in the retraction or housing of the discharge tube or hose 13, the oil in the pump barrel being displaced back into the container.

The construction shown in Figure 4 is substantially the same in operation to that just described, except that a rotary pump is used and the mechanism of the floating piston is simplified.
70 This construction is illustrated with a manually operable valve for controlling the discharge tube instead of a ball check valve 16, but it is to be understood that both types of pumps will operate efficiently with either type of discharge control valve, manual or automatic, and that the dis-

charge pump barrel to be now described, may be employed with a reciprocating pump if desired.

In this type of construction, the casting 30a to be secured in the opening in the container, may be provided with a tubular or skeleton housing
80 or cage 31. The lower end of the cage 31 carries a rotary pump of any suitable character, such as a gear pump 31a, and the discharge side of said pump is provided with a discharge passageway 32 communicating with a tubular compression
85 chamber 33 suspended from the casting 30a, the intake side of the pump being preferably provided with a flexible intake line 34 as common in the art, which is weighted at its end to maintain contact with the bottom of the container.

Mounted for reciprocation within the tube 33 is a floating piston 35 equipped with gaskets 36 sealing same in both directions, and said piston carries a discharge tube 37, flexible by preference, equipped at its upper end with any suitable
95 type of manual control or discharge valve 38. Rotatably mounted with an opening in the casting 30a is a pump drive shaft 39, which may be provided with a head 40 for detachable engagement with a crank or other type of operating mechanism. With this construction, upon operation of the pump in the proper direction, oil will be compressed within the compression chamber 33, and the valve 38, being closed, the piston 35 and consequently the discharge tube 37, will be projected from the housing. When the discharge
105 tube has been projected to its limit, or any suitable distance according to the convenience of the operator, he will open the valve 38. The pump may now be operated to discharge any desired volume of liquid. When the operator has secured the desired quantity of oil or other liquid, he will close the valve 38 and will then operate the pump in the reverse direction, which will discharge any oil standing in the compression chamber back
115 into the barrel or container, and eventually will cause the piston 35 to withdraw into the compression chamber until the discharge tube 37 has been fully housed, as will be readily understood.

From the above description, it will be apparent that I have produced a concealed pump and discharge tube assembly possessing all of the features of advantage pointed out as desirable, and while I have described and illustrated certain
125 embodiments of the invention, it is to be understood that I reserve the right to all changes falling within the spirit of the invention and without the ambit of the prior art.

I claim:

1. In a pump, a compression chamber, a pump piston for compressing fluid in said chamber, means to actuate said piston, a floating fluid-actuated piston in said chamber, and a discharge tube carried by said floating piston.

2. In a pump, a compression chamber, a pump for supplying fluid to the compression chamber, a floating fluid-actuated piston in the compression chamber, and a discharge tube carried by said floating piston.

3. In a pump, a compression chamber, a reciprocating pump piston in said compression chamber, means to actuate said piston, a floating piston in said chamber, a discharge tube carried by said floating piston, a check valve in said tube to prevent air passing into the compression chamber and a manually controllable valve arranged to cooperate with the pump to induce a vacuous condition in the compression chamber.

4. In a pump, a compression chamber, a pump

for supplying fluid to the compression chamber, a floating piston in the compression chamber, a discharge tube carried by said floating piston, and a manually operated valve carried by said floating piston.

5 5. The combination of a container having an opening, a member detachably fitted in said opening and having a vent leading into the container, a pump suspended from and sustained by said member, and a discharge tube and apparatus associated with the pump and tube to selectively insure automatic movement of the tube in accordance with predetermined operation of the pump.

10 6. The combination of a container having an opening, a member detachably fitted into said opening and having a vent leading into the container, a compression chamber suspended from said member, a pump to force fluid into the compression chamber, a valve controlled passageway from the compression chamber to the vent, and a floating piston in the compression chamber intermediate the passageway and the pump.

15 7. In a pump, a compression chamber, a reciprocating pump piston in said compression chamber, a valve in said piston, means to actuate the piston, a floating piston in said chamber, a discharge tube carried by the floating piston, a valve controlling said discharge tube, and manually operable means to lock the valve in said piston against opening movement.

20 8. The combination in a pump having a pumping mechanism, of a compression chamber into and from which fluid may be forced by said pump mechanism, a floating piston in said compression chamber independent of the pump mechanism, a discharge tube connected to said floating piston, and a valve arranged to cooperate with the pump to induce a vacuous condition in the compression chamber.

25 9. The combination in a pump having a pumping mechanism, of a compression chamber into and from which fluid may be forced by said pump mechanism, a floating piston in said compression chamber independent of the pump mechanism, a discharge tube connected to said floating piston, and a valve in the piston arranged to cooperate with the pump to induce a vacuous condition in the compression chamber.

30 10. The combination in a pump having a pumping mechanism, of a compression chamber into and from which fluid may be forced by said pumping mechanism, a floating piston in said compression chamber independent of the pump mechanism, a discharge tube connected to said floating piston, and a valve in the discharge tube arranged to cooperate with the pump to induce a vacuous condition in the compression chamber.

11. The combination in a pump having a reciprocating pump piston, of a compression chamber within which said piston reciprocates, a floating piston in said compression chamber adapted to be moved in one direction by contact with the pump piston, a discharge tube connected to the floating piston, and a valve arranged to cooperate with the pump to induce a vacuous condition in the compression chamber.

12. The combination in a pump having a rotary pump mechanism, of a compression chamber into and from which fluid may be forced by said pump mechanism, a floating piston in said compression chamber independent of the pump mechanism, and a manually closable valve arranged to cooperate with the pump to induce a vacuous condition in the compression chamber.

13. In a barrel pump, a piston cylinder, a pumping piston in said cylinder, a rod extending exteriorly of the pump for actuating the piston, a floating piston in the cylinder independent of the pump piston and having sealing engagement in both directions with the cylinder and pump rod, and a valve in the pump piston arranged to cooperate with the pump to induce a vacuous condition in the compression chamber.

14. In a barrel pump, a piston cylinder, a pumping piston in said cylinder, a valve in said piston, a hollow pump rod extending exteriorly of the pump for actuating the piston, a manual control rod within the pump rod for maintaining the piston valve closed, a floating piston in the cylinder having sealing engagement with the cylinder and pump rod, a discharge tube connected to the floating piston, and a valve controlling the discharge tube.

15. In a barrel pump, a suspension cage, a double-acting rotary pump carried by said cage, a compression chamber connected with the outlet opening of the pump, a floating piston in said compression chamber, a discharge tube connected to the floating piston, and a manually closable valve in said tube arranged to cooperate with the pump to induce a vacuous condition in the compression chamber.

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