Oct. 10, 1939. J. MULLER 2,175,303

PORTABLE FILLING DEVICE

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Fig. 1

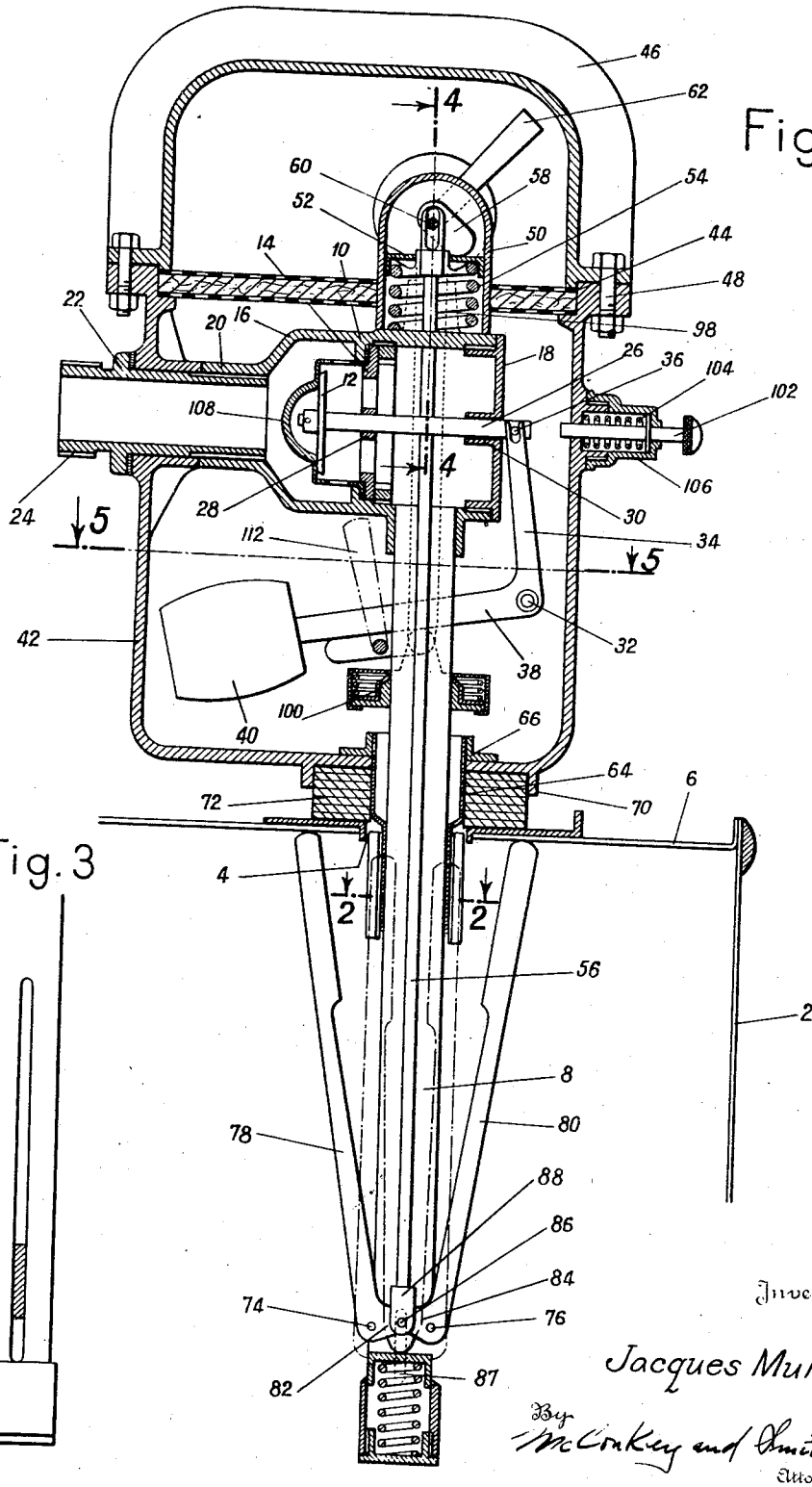


Fig. 3

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Fig.5

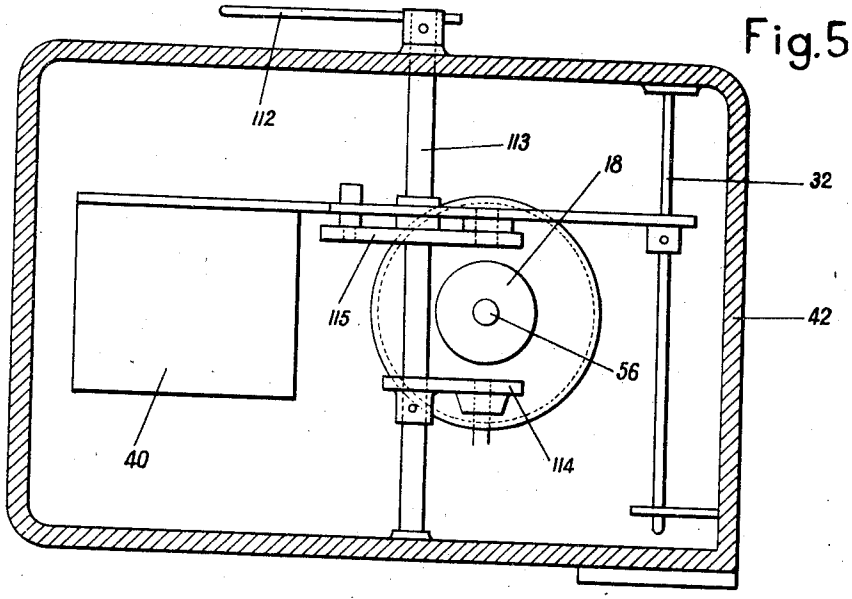


Fig.2

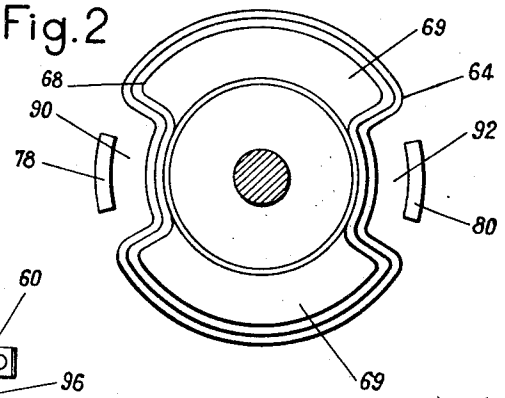


Fig. 4

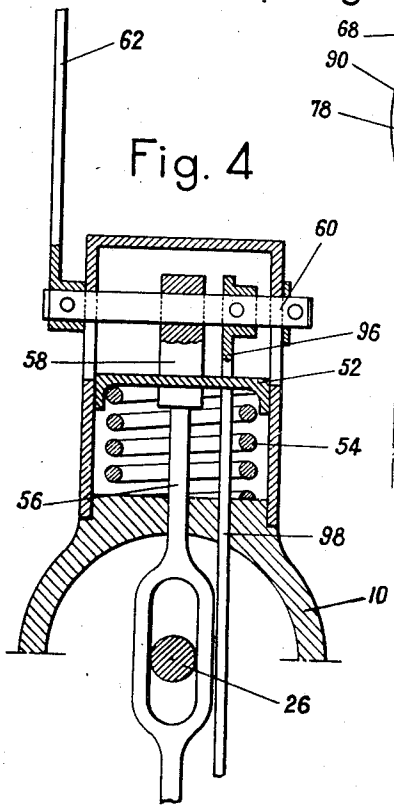


Fig.6

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UNITED STATES PATENT OFFICE

2,175,303

PORTABLE FILLING DEVICE

Jacques Muller, La Garenne-Colombes, France

Application January 5, 1938, Serial No. 183,519
In France January 6, 1937

1 Claim. (Cl. 226—120)

The present invention relates to automatic devices for filling of reservoirs, tanks, containers and the like, and particularly to a filling device constructed as a portable unit adapted to be affixed to the reservoir, tank or container to be filled and to be removed therefrom when the filling operation has been completed.

One object of the invention is to provide a portable filling device having a feed pipe adapted to project into an opening or bung in the container which is to be supplied with the liquid, the feed pipe forming a portion of a portable unit consisting of a control valve and means for the opening and closing theroef, which unit may be affixed to the container during the filling operation and removed therefrom when the desired level of liquid in the container has been obtained.

Another object is to provide a filling device which may be adapted to openings or bungs which differ in size and which may be applied to such openings or bungs and easily and quickly secured thereto and removed therefrom.

Another object of the invention is to provide in conjunction with a filling device of the type indicated, means effective to seal the opening or bung, regardless of its size, during the filling operation.

A further object of the invention is to provide in conjunction with a filling device having a feed pipe adapted to extend into the container, means for affixing the filling device to the container during the filling operation, consisting of locking means adapted to be inserted into the container and subsequently released to cooperate with the interior of the wall of the container to positively fix the filling device in place during the filling operation.

Still another object of the invention is to provide in conjunction with the filling device, adjustable means depending into the container, through the intermediary of which a control valve controlling the flow through the feed pipe will be closed when any desired level of liquid in the container to which the adjusting means has been set, will have been attained.

Still another object of the invention is to provide means for positively closing the feed pipe control valve when the desired level in the container is reached, whereby premature closing of the control valve due to the dynamic effect of the flowing liquid is avoided and whereby failure of operation of the control valve due to friction, seizing, choking or other causes incident to the flow of liquid through the feed pipe is also avoided.

Still another object of the invention is to provide in a portable filling device, a float chamber disposed above the level of liquid to be obtained in the container to be filled, to which chamber, when the desired level has been attained, liquid from the container is introduced to operate a float or similar means by which the control valve is closed.

A further object of the invention is to provide in a portable filling device provided with a float chamber, means for sealing the float chamber to prevent the escape of liquid therefrom prior to the removal of the unit from the container which has been filled.

Still another object of the invention is to provide in conjunction with means for positively closing a control valve, an arrangement of the control valve, whereby it is subjected to the dynamic action of the flowing liquid tending to close the valve only after the closing operation has been inaugurated by the float means.

A still further object of the invention is to provide an arrangement whereby, when the locking means by which the filling unit is affixed to the container is released, the control valve will be closed and the float chamber will be sealed to preclude the escape of liquid therefrom.

Other objects and desirable characteristics of the invention will appear from the following text when taken in conjunction with the accompanying drawings showing one embodiment of the invention. It is to be borne in mind that the drawings and the particular embodiment shown are to be considered merely by way of examples and not as limitative of the scope of the invention.

In the drawings,

Figure 1 is a vertical section through the portable filling unit;

Figure 2 is a section at 2—2 on Figure 1;

Figure 3 is a lateral view of the lower portion of Figure 1;

Figure 4 is a partial section at 4—4 on Figure 1;

Figure 5 is a section at 5—5 on Figure 1;

Figure 6 illustrates the magnetic gauge.

Referring to the drawings, 2 designates the reservoir, tank or container which is desired to be filled to a certain predetermined level. The container is provided with an opening or bung 4 in the upper wall 6 thereof. A feed pipe 8, the end of which is adapted to be inserted through the bung into the container, is fixedly connected at its upper end to a valve casing 10 adapted

to house therein a valve 12 which may be of the plate type having a seat 14, with which the plate cooperates. The valve casing 10 may be constructed in any desired manner, such as from a cylindrical casting 16, the end of which is adapted to be closed by a closure plate 18 fixed to the casing in any desired manner. The casting comprises a reduced cylindrical portion 20 extending laterally thereof, in which is adapted to engage a fitting 22, to which a hose connection may be made through a bayonet or other joint 24 to a source of liquid.

The valve 12 is provided with a stem 26 guided at 28 in the valve seat 14 and slidably arranged within a stuffing box or bearing 30 in the cover plate 18. The stem projects through the cover plate 18 to the exterior of the valve casing and a bell crank pivoted at 32 has one arm 34 pivotally connected at 36 to the valve stem 26 and a second arm 38 to which is attached a float 40. The valve casing, bell crank and float are disposed within a chamber 42 closed at its upper end by a vapor condenser 44 suitably affixed thereto in any desired manner and is further provided with a strap or hand-hold 46 connected to the chamber as by bolts 48, by which the chamber and the elements heretofore described as well as certain others which will be described hereinafter may be transported. Affixed to the valve housing 16 and extending upwardly therefrom through the condenser 44 is a bell 50 having a piston 52 slidable therein, urged upwardly by a spring 54, the lower end of which takes support upon the valve housing 16, the upper end of which engages directly the piston 52.

A rod 56, the purpose of which will appear hereinafter, is connected to the piston 40 in any desired manner and a cam 58 pivoted at 60 in the bell 50 is operatively connected to a hand operated lever 62. It will be clear that the spring 54 urges the piston 52 continually upwardly and consequently tends to move upwardly the rod 56. It will be evident that when the lever 62 is operated about the pivot 60 in a clockwise direction, the cam 58 abuts the piston 52 and urges it downwardly against the pressure of the spring 54, the downward movement of the piston likewise effecting downward movement of the rod 56.

The upper part 64 of a casing partially encompassing the feed pipe 8 extends through an opening in the base of the chamber 42 and is fixed to the chamber in any desired manner as through a collar 66. The lower part 68 of the casing has a sliding or telescopic connection with the upper part 64 so that the projection of the casing into the container may be adjusted to a desired liquid level to be obtained as will hereinafter appear. Communication is provided between container 2 and chamber 42 through the passage 69 left between the casing and the exterior of feed pipe 8. Exterior of the chamber 42 and surrounding the casing part 64 is provided a ring flange 70 forming a basin with the chamber wall and provided therein is a plastic joint 72 encompassing the casing and adapted to butt against the wall 6 of the container 2 about the bung 4 and provide an effective seal.

The feed pipe 8 near its lower end is provided with pivots 74, 76 on which are mounted legs 78, 80 comprising lateral arms 82, 84. Arms 82 and 84 are pivoted by a pivot 86 slidable in slot 87 to a clevis 88 affixed to rod 56. It will be obvious that when the rod 56 is moved upwardly, the legs 78, 80 will be swung outwardly away from the casing 72 and feed pipe 8 and that when the rod 56 is moved downwardly the legs will be swung about pivots 74, 76 towards the casing and feed pipe. If the unit is forcibly urged against the container 2 after insertion of the feed pipe and casing through the bung, it will be obvious that plastic joint 72 will be compressed. Now when the legs 78, 80 are swung outwardly to locking position and subsequently downward pressure on the unit released, the plastic joint 72 moves the unit upwardly to press the ends of legs 78, 80 against the internal surface of the wall 6 of the container 2 thereby fixing the unit firmly to the container.

As more precisely illustrated in Figure 2, the casing is provided with depressions 90, 92 adapted to receive the legs 78, 80, so that when the legs are moved into the depressions, the housing 64 and with it the filling unit, may be removed from the container or inserted therein.

A second cam 96 likewise journalled at 60 and disposed along side of conduit in another plane from that of the cam 58 is also adapted to be operated by the lever 62. Cam 96 is adapted to lower or to permit to move upwardly a second rod 98 to the lower end of which rod is suitably fixed a closure 100. When the lever 62 is displaced to force rod 98 downwardly through the intermediary of cam 96, the closure 100 is moved to seal the opening provided between the upper end of the housing 62 and the sides of the feed pipe 8. Thus it will be seen that the closure 100 is adapted for operation conjointly with the rod 56 and its associated legs 78, 80, since the latter move in response to displacement of lever 62, as does closure 100; but in order to provide for movement of closure 100 independently of 56, 78 and 80, whenever desired (as for example, during transfer from one location to another) there is a second lever 112 connecting with closure 100 in the manner hereinafter described.

Disposed upon the exterior of the wall of the chamber 42 to the right in Figure 1 of the valve stem 26 and co-axially therewith is a plunger 102 urged outwardly by a spring 104 disposed within a housing 106 affixed in any desired manner on the chamber wall. The plunger 102 when moved inwardly or to the left in Figure 1 against the pressure of spring 106 engages the end of the valve stem 26 to move the valve 12 off its seat and thus open the valve.

Referring particularly to the valve 12, it is to be noted that it is provided with a protecting cage 108 having lateral openings 110 therein, the cage and valve being disposed co-axially with respect to the fitting 22, with the result that the cage precludes the valve in complete open position from being subjected to the dynamic force of the liquid entering the valve chamber 16 through the fitting 22. A lever 112 disposed exterior to chamber 42 is operatively connected through shaft 113 journalled in the walls of the chamber to a lever 114, one end of which is pivoted to the rod 98, by which the seal 100 is actuated. The shaft 113 also carries fixed thereto a lever 115 operatively connected to the arm 38 which carries the float 40.

It may be seen that when the lever 112 is displaced in a counter clockwise direction, the rod 98 will be moved downwardly to apply the seal 100 to the upper end of the casing 64, whilst the arm 38 will be operated upon by lever 115, and caused to swing about its pivot 32 to thus effect movement of the control valve 12 to the right in Figure 1 to close the valve. The disposition of the elements just described is such that when

the plunger 102 is moved inwardly to open the control valve 12, arm 38 of the bell crank will operate the lever 114 to raise the seal 100, and thus establish communication between the chamber 42 and the container 2. Thus it will be seen that valve 12 may be opened, also that it may be closed, independently of the presence or absence of liquid in the float chamber, whenever such independent operation is desired (as, for example, during transfer from one location to another).

The device may be completed by a gauge of the magnetic type illustrated in Figure 6. A magnet 116 fixed on the pivot 32 of the bell crank acts in a well known manner upon an indicator or pointer 118 provided with a suitable dial and housing as is well known. Furthermore, if desired, a glass cover plate may be provided on one side of the chamber 42 or any further arrangement made, whereby the operation of the float 40 within the chamber may be observed.

The operation of the device is as follows: Let it be assumed that the telescopic housing 64—68 has been adjusted for a desired level to which the container 2 is to be filled, and further that the lever 62 has been rotated clockwise, so as to displace the cam 58 about pivot 60 and urge downwardly against the pressure of spring 54 the piston 52 and rod 56 to move the legs 78, 80 towards and into the openings 90, 92 provided in the casing 64. Thereafter, the feed pipe 8 and casing 64—68 are inserted through the bung of the container, the unit pressed downwardly to compress plastic joint 70, and then the lever 62 is operated, so as to permit the spring 54 to move the piston 52 and rod 56 upwardly to swing the legs 78, 80 out of and away from the openings 90, 92. Downward pressure on the unit is now released, whereupon the joint 72 moves the unit upwardly and the legs 78, 80 take support against the interior surface of the wall 6 of the container 2.

The valve 12 being open, liquid is introduced through the fitting 22 and passes into the container. When the liquid in the container reaches the level determined by the adjustment of the telescopic casing 64, the pressure of the gas remaining in the container 2 causes the liquid to mount through the communication 69 provided between the casing 64 and the exterior of the feed pipe 8 into the chamber 42. It is to be noted that until this time, the passage 69 between the casing and the feed pipe served as a passage for atmospheric air which was permitted to rise into the chamber 42. When the liquid mounts in the chamber 42, it acts on the float 40 and displaces the bell crank about pivot 32 to close, through the intermediary of arm 34 and valve stem 28 the control valve 12. In this connection, it is to be noted that valve 12 is closed by the positive action of the float and shortly after the commencement of the closing operation, the positive action of the float is aided by the dynamic action of the liquid flow which is permitted to come into play when the valve 12 has moved out of the protection of the cage 108.

When the filling operation is terminated and the valve 12 closed, the lever 62 is moved in a clockwise direction for the purpose of lowering the rod 56 and moving the legs 78, 80 into the depressions 90, 92 provided therefor, and thus completely within the plane of the exterior of the casing 64. At the same time, the second cam 96 acts through the intermediary of the rod 98 on the seal 100 and moves it down to close the communication between the chamber 42 and the container along the outside of feed pipe 8.

The filling unit may now be removed from the filled container and disposed on another container to be supplied with liquid, whereupon after insertion of the casing 64 and feed pipe 8, the fixation of the unit to the second container is effected as hereinbefore described and the seal 100 raised, so as to establish communication between chamber 42 and the new container, whereupon the liquid contained in the chamber flows into container No. 2.

It is thus seen that the device provides for the rapid and facile filling of containers permitting an ensemble of simultaneous movements or operations for the purpose of avoiding the loss of liquid, even in case of false or incorrect maneuvering of the device. Furthermore, the unit is readily fixed to and removed from a container to be filled and also permits adjustment, whereby any desired level of liquid in the container is obtained.

It is obvious that the embodiment of the device such as it has been described and illustrated may undergo changes or modifications without removing it from the scope of the invention which is to be determined only by the following claim.

What is claimed is:

In a device for filling a container having an opening through one wall thereof, a portable filling unit consisting of a supply pipe adapted to project through the opening into the container, an extensible casing adjustable to the level to which the container is to be filled extending through said opening into the container, sealing means closing the joint between the casing and wall, a chamber communicating through the casing with the container and disposed above the level of liquid therein, a valve controlling the flow through the pipe, means in the chamber adapted to actuate the valve when the liquid level is attained, for which the casing has been adjusted, means for interrupting communication between the chamber and container, means for holding the unit in place during the filling operation and manually operated means adapted to release said holding means and simultaneously actuate the means for interrupting the communication between the chamber and container.

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