Dec. 9, 1924. 1,518,446

W. J. PHELPS

MEANS FOR FILLING CANS

Filed Dec. 30, 1920 2 Sheets-Sheet 1

Fig. 1.

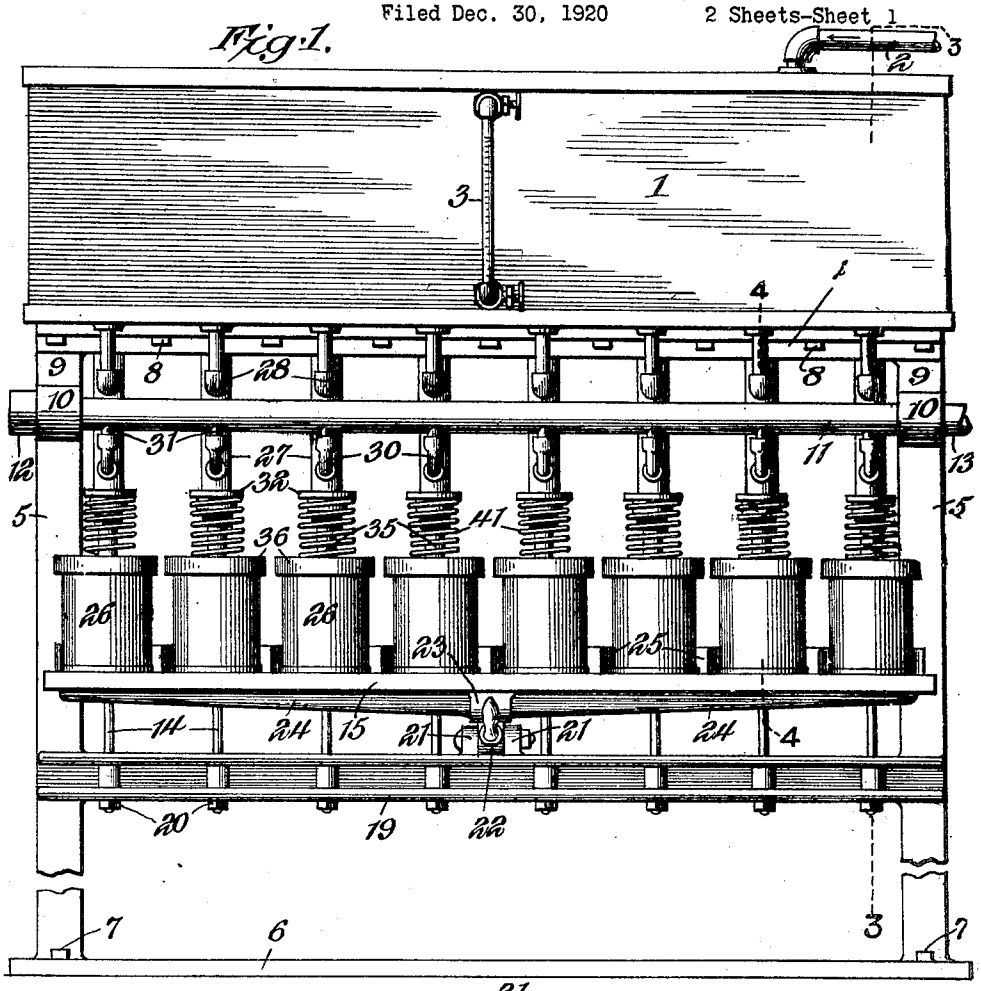
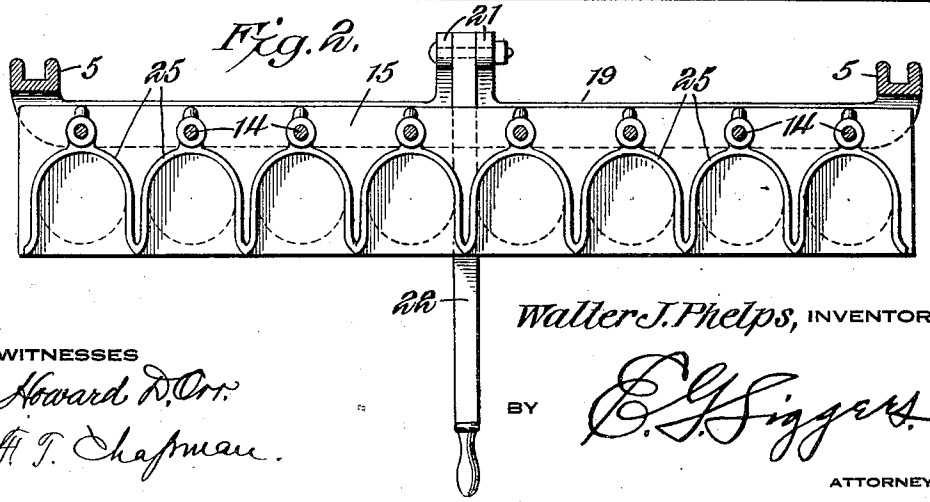


Fig. 2.



WITNESSES

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Fig. 4.

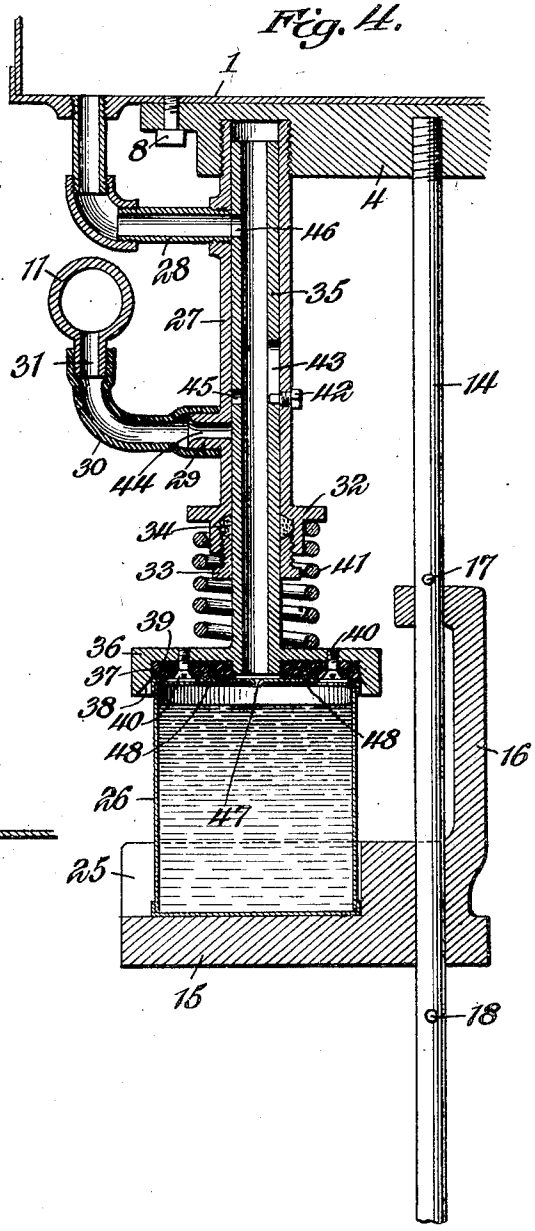


Fig. 3.

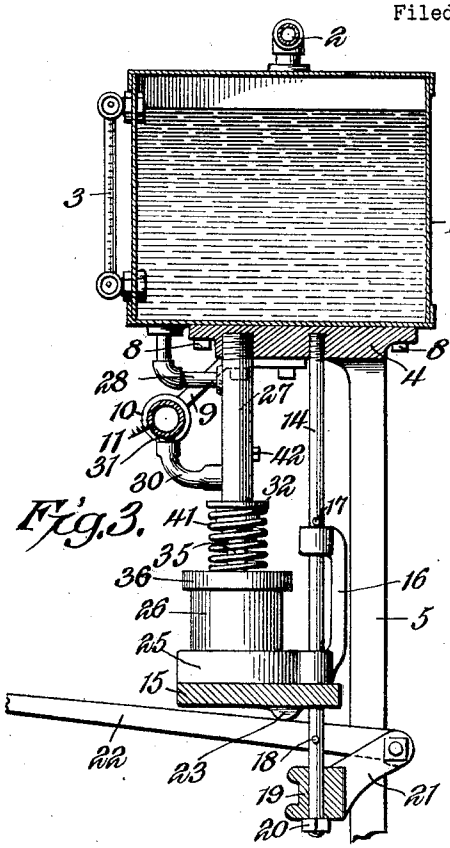
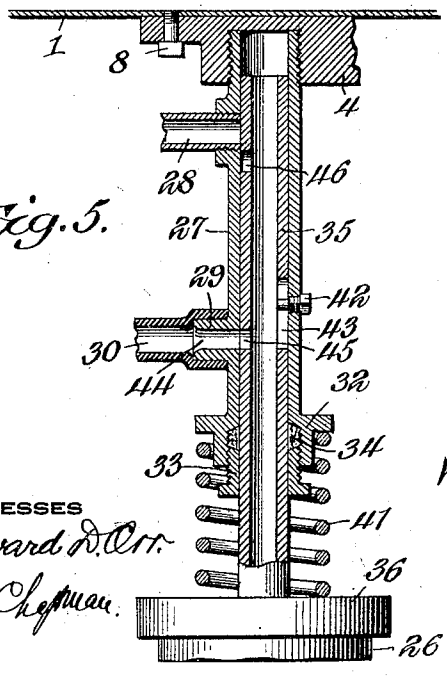


Fig. 5.



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UNITED STATES PATENT OFFICE.

WALTER J. PHELPS, OF BALTIMORE, MARYLAND.

MEANS FOR FILLING CANS.

Application filed December 30, 1920. Serial No. 433,996.

To all whom it may concern:

Be it known that I, WALTER J. PHELPS, a citizen of the United States, residing at Baltimore city, in the State of Maryland, have invented a new and useful Improvement in Means for Filling Cans, of which the following is a specification.

This invention has reference to machines for filling cans and is designed particularly though not exclusively for filling small cans with liquid fuel of high test, especially casing-head gasoline (gasoline ether), where the cans are provided with minute filling orifices, which have the advantages of being flame-proof and requiring but an extremely small quantity of solder for sealing the minute opening.

The invention will be best understood from a consideration of the following detailed description taken in connection with the accompanying drawings forming part of this specification, with the understanding, however, that the invention is not confined to any strict conformity with the showing in the drawings, but may be changed and modified so long as such changes and modifications mark no material departure from the salient features of the invention as expressed in the appended claims.

In the drawings:

Figure 1 is a front elevation of an apparatus embodying the invention.

Figure 2 is a plan view of a can supporting follower with certain parts associated therewith, shown in horizontal section.

Figure 3 is a section on the line 3—3 of Figure 1 with some portions shown in elevation.

Figure 4 is a section on the line 4—4 of Figure 1.

Figure 5 is a section in a plane similar to that of Figure 4, but omitting some parts and showing other parts in a different position from that seen in Figure 4.

Referring more specifically to the preferred embodiment of the invention shown by way of illustration in the drawings, there is shown a tank or reservoir 1 designed to contain a suitable quantity of gasoline, and provided with a supply pipe 2, by means of which gasoline may be fed into it, such gasoline being preferably of high test, such as is obtained from the casing heads of oil wells. Casing-head gasoline is particularly adapted for priming purposes, in connection with gasoline explosion engines, permitting the ready starting of the engines even in freezing weather, when ordinarily, with the low grade gasoline usually obtainable starting of gasoline engines is difficult or even impossible. The tank 1 is preferably provided with an ordinary sight gage 3 to permit an observer to ascertain what supply of gasoline the tank contains.

Upholding the tank 1, there is provided a support 4, which may be in the form of a plate carried at the ends by legs 5 rising from a base 6, with the latter secured, as by bolts 7, to a floor or other support, and the support 4 and tank 1 being secured together by bolts or screws 8, wherefore the whole structure is rigid.

In one form of the apparatus, the support 4, which is in the form of a head or plate, carries brackets 9 provided with eyes 10, in which the ends of a tube 11 are mounted, the tube being closed at one end 12 and at the other end having a continuation 13, which may be considered as leading to any suitable device capable of producing a vacuum such as a vacuum pump, not shown in the drawings.

Connected at the upper ends to the support or table 4, are spaced upright bars or rods 14 (Figs. 3 and 4) carrying a follower 15 having stems 16 along one side constituting guides embracing the rods 14, which not only extend through the stems but through the follower 15, so that the latter is guided steadily when moved up and down along the rods. In order to limit the movement of the follower, the rods 14, or some of them, are traversed by pins 17 and 18 respectively, above and below the stems 16 and follower 15.

Connected to the legs 5 is a cross bar 19, (Figs. 1 and 3) through which the several rods 14 pass, and the cross bar is secured to the rods 14 by nuts 20. At an intermediate portion of the length of the bar 19, are spaced ears 21 between which is pivoted a lever 22 extending beneath the follower 15, which latter is shown as provided with an abutment boss 23 engaged by the lever, so that an operator grasping the lever may raise the follower 15 or permit it to drop to an extent limited by the pins 17 and 18. The follower 15 has a strengthening web 24 (Fig. 1) on its under face, while its upper face is provided with a series of flanges 25 (Fig. 2) constituting can pockets open at the top and front, so that cans 26 may be

readily slipped into them with the cans resting upon the upper surface of the follower.

In front of the rods 14, are tubes 27, (Figs. 3 and 4) screwed or otherwise fast at the upper end in the under face of the support 4, and communicating with other tubes 28, in turn connected to the bottom of the reservoir 1. Each tube 27 is provided with a nipple 29 (Figs. 4 and 5) at a point lower than the tube 28, with the nipple 29 connected by still another tube 30 to a nipple 31, communicating with the pipe 11, there being as many nipples 31 and tube connections 30 as there are tubes 27.

At the lower end of each tube 27 there is formed a gland 32, entered by a packing nut 33, confining packing 34 in the gland 32. Within and slidable along the tube 27 is another tube 35, terminating at the lower end below the gland 32 in a clamp head 36 of such diameter as to receive the upper end of a can 26, when the latter is located in one of the pockets 25. In order that the can may be suitably centered by the head 36, the latter is provided with a bottom recess 37 having a beveled edge 38. Within the recess 37 there is secured a rubber or other flexible packing 39, held in the head 36 by screws 40 or otherwise. The pipe or tube 35 is urged in one direction by a helical spring 41 lodged against the gland 32 at one end and against the head 36 at the other end, and tending at all times to project the tube or pipe 35, the extent of the projection being limited by a stop screw 42, screwed through the pipe or tube 27 into an elongated slot 43 in the tube 35. The nipple 29 has a passage 44 therethrough and the pipe or tube 35 has a port 45 which may be brought into matching relation to the passage 44 so that the pipe 11 may be brought into communication with the interior of the tube 35. In addition to the port 45, the tube 35 has another port 46 movable to register with the tube 28. The cans 26 are preferably of small size, being about 2¼ inches high and a little less than 2¼ inches in diameter. The can before filling is sealed, except that through one head, constituting the upper head in the filling position, there is a minute opening preferably about twenty one-thousandths of an inch in diameter, without, however, confining the size of the opening to such dimensions. Fire insurance rules designate No. 16 wire mesh as being flame-resisting, that is, a flame will not carry through the openings found in such wire mesh, these openings being slightly larger than twenty one-thousandths of an inch, wherefore such size of opening has been adopted as fire-resisting. Practice has shown, however, that so mobile a liquid as gasoline and so mobile a fluid as air will readily pass through so minute an opening, and the cans will readily fill with gasoline at a pressure approximating a vacuum.

In Figure 4 of the drawings, the can 26 is shown as having a minute opening 47 through the center of the upper head and this head is, furthermore, provided with an outwardly directed bead 48, surrounding the opening.

Preparatory to placing a suitable number of cans 26 on the follower 15 in the pockets 25, the follower is dropped, by a manipulation of the handle 22, so that the space between the follower and the heads 36 is sufficient to admit the cans, and then the handle 22 is raised, thus lifting the follower and the cans thereon toward the heads 36. This operation compresses the several springs 41, as soon as the cans have been sufficiently raised and the beads 48 in the can then enter the packing or gaskets 39 in the several heads 36 to seal the cans temporarily. In this manner, the ports 45 in the tubes 35 are caused to travel by the passages 44, thus momentarily putting the tubes 35 into communication with the tube or pipe 11, in which vacuum conditions prevail. While the port 45 communicates but a short time with the pipe 11, it is sufficient, if the machine is properly designed to cause the air to be sucked out of the cans and then the vacuum pump is cut off from communication with the cans by further movement of the tube 35. As soon as a vacuum is established in the cans, and the vacuum pump has been cut off from the cans, the port 46 registers with the pipe 28 and the vacuum in the cans cause the indrawing of the gasoline from the tank 1 through the tube 35, and by way of the minute opening 47 into the cans. The pressure in the tank 1 being initially superior to the pressure within the cans, causes a rapid flow of gasoline through the minute orifices 47 into the cans and this flow continues so long as the pressure urging the gasoline to flow into the cans is superior to that within the cans. The result is that the flow of gasoline continues until the cans are nearly full, the parts being preferably so proportioned that the filling of the cans reaches a point to within about ¼ inch of the tops of the cans which takes about ten seconds in practice.

When the filling of the cans has been completed, the lever 22 is lowered, thus permitting the filled cans to drop away from the filling heads 36 and equilibrium of pressure is then established in the cans, so that they may be removed from the follower 15 and the minute hole 47 sealed by a drop of solder. Because of the very small dimensions of the minute hole or perforation 47, a minimum quantity of solder is employed in the sealing operation and there is no danger of any incandescent material, such as a spark, reaching the highly inflammable

contents of the can. The application of soldering heat to the can head at the minute perforation is over so circumscribed an area that the heat is insufficient to be in any wise dangerous, nor is the soldering heat sufficient to expand the air remaining in the can to an extent to cause the blowing out of the solder, wherefore the soldering is successfully performed, and there is no wastage from imperfect soldering, all of which has been demonstrated by actual experience.

In the foregoing description it is assumed that gasoline is the liquid which is to be filled into the cans, but the invention is capable of filling other liquids than gasoline into cans.

In another application, filed by me on even date herewith for a method of and means for filling liquids into cans, I have set forth the use of super-atmospheric pressure for filling cans with gasoline or the like.

What is claimed is:—

1. In a machine for filling liquids into cans, the combination of a liquid reservoir, and means for holding the can comprising a follower, a yieldable head for engaging a can held upon the follower, joint sealing means carried by the head to be engaged by the can, a pair of telescoping tubes, one of which carries the head, and the other has connections to the reservoir for supplying said tubes with the liquid, valve means controlled by the relative movement of said tubes, and vacuum means independent of the reservoir for exhausting air from the can through said tubes, said vacuum means being in communication with the can only when the reservoir is out of communication with the can.

2. In a machine for filling liquids into cans, the combination of a liquid reservoir, and means for holding the cans movable toward and from the reservoir, vacuum creating means, and a single valve element controlling communication of the can interiors with the vacuum source and the reservoir in alternation, said single valve element being operated by and upon the approach of the cans to the reservoir.

3. A can filling machine comprising a reservoir, a follower for supporting a can, manually controllable means for moving the follower, a pair of telescoping tubes, one of which has an elastically constrained head for engaging a can about an orifice therein, connections between the reservoir and the telescoping tubes, valve means, and means for exhausting air from the cans through the telescoping tubes, said tubes controlling the valve means by their relative movement, whereby the liquid feeding means and the air exhaust means act in alternation.

4. A can filling machine comprising a reservoir for gasoline, a follower beneath the reservoir, guide rods for the follower with the latter having a limited range of travel on the rods, manipulating means for the follower, telescoping tubes of which one is fixed and the other is slidable, a head for each pair of telescoping tubes constituting a clamp head for a can, yieldable means for each head for elastically clamping the can, connections between each pair of telescoping tubes and the gasoline reservoir, and means for exhausting air from each can through the telescoping tubes and the head, said telescoping tubes having valve means between the gasoline reservoir and the head and between air exhaust means and the head, said valve means operating in alternation.

5. A machine for filling cans or the like with liquids through small apertures in the cans, comprising a reservoir, can supporting means movable toward and from the reservoir, a liquid conduit leading from the reservoir, a source of vacuum, a slidably supported tube having a pair of ports adapted to serve as valves when the tube slides, one of said ports registering with the liquid conduit to permit liquid to flow from said conduit through said tube into the cans, the other port controlling communication between the vacuum source and the cans, said can supporting means moving the cans to actuate the slidable tube whereby the interiors of the cans are first exhausted of their air content and afterwards put in communication with the liquid supply.

6. A can filling machine adapted to fill cans having small orifices with volatile liquids, comprising a movable can rest or follower, a reservoir for the volatile liquid, means for moving the follower, a pipe communicating with the reservoir, a stationary tube supported below the reservoir and joined to said pipe, vacuum creating means joined to said tube at a point spaced from the point of juncture with the pipe, a sliding telescoping tube within the stationary tube and having valve ports in its wall so spaced and of such size that when the sliding tube is moved inwardly one port opens communication with the source of vacuum and then shuts off said communication, and the second port then opens communication with the pipe and stationary tube, a can-engaging and orifice sealing head secured upon the outer end of the slidable tube, and a spring interposed between the stationary and sliding tubes whereby the sliding tube is normally held in its outermost position, said spring forcing the head tightly against the can when the follower is moved toward the reservoir.

7. A can filling machine, comprising a movable can rest or follower, a reservoir for the liquid located above the follower, means for lifting the follower so as to approach said reservoir, a stationary tube vertically supported below the reservoir and joined there-

to, vacuum creating means also joined to said tube, a sliding telescoping tube within the stationary tube and having valve ports in its wall so arranged that when the sliding tube is moved upwardly, the sliding tube will be put in communication first with the source of vacuum alone and then will be put in communication with the reservoir alone, a can engaging head secured upon the lower end of the slidable tube, a spring interposed between the stationary and sliding tubes, whereby the sliding tube is normally held in its lowermost position, said spring forcing the head tightly against the can when the follower is raised, means for limiting the movement of the can support both toward and from the reservoir, and means for guiding the sliding tube and limiting its strokes in both directions.

In testimony, that I claim the foregoing as my own, I have hereto affixed my signature.

WALTER J. PHELPS.