

Dec. 24, 1935.

J. F. WERDER

2,025,141

APPARATUS FOR FILLING METAL CONTAINERS

Filed March 9, 1931

2 Sheets-Sheet 1

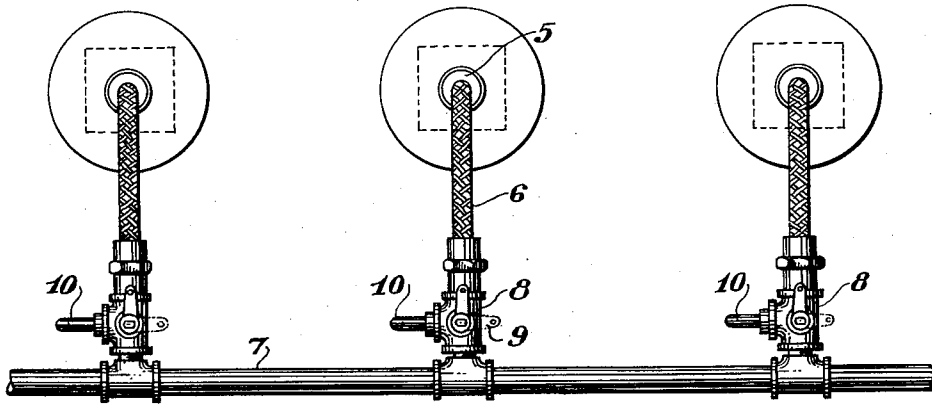


Fig. 1

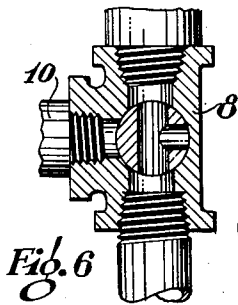


Fig. 6

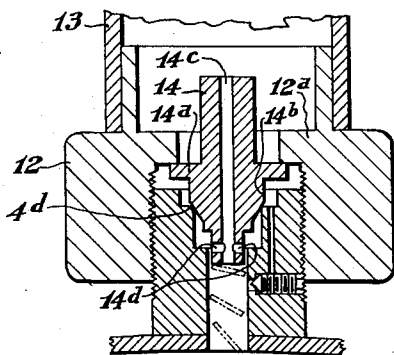


Fig. 4



Fig. 5

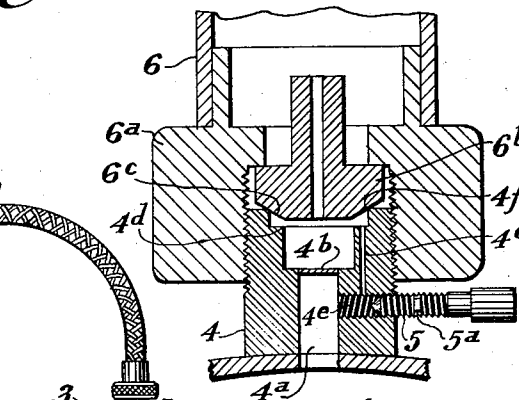


Fig. 3

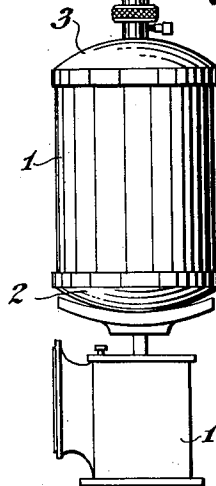


Fig. 2

INVENTOR
John F. Werder
BY *Milburn & Milburn*
ATTORNEYS

Dec. 24, 1935.

J. F. WERDER

2,025,141

APPARATUS FOR FILLING METAL CONTAINERS

Filed March 9, 1931

2 Sheets-Sheet 2

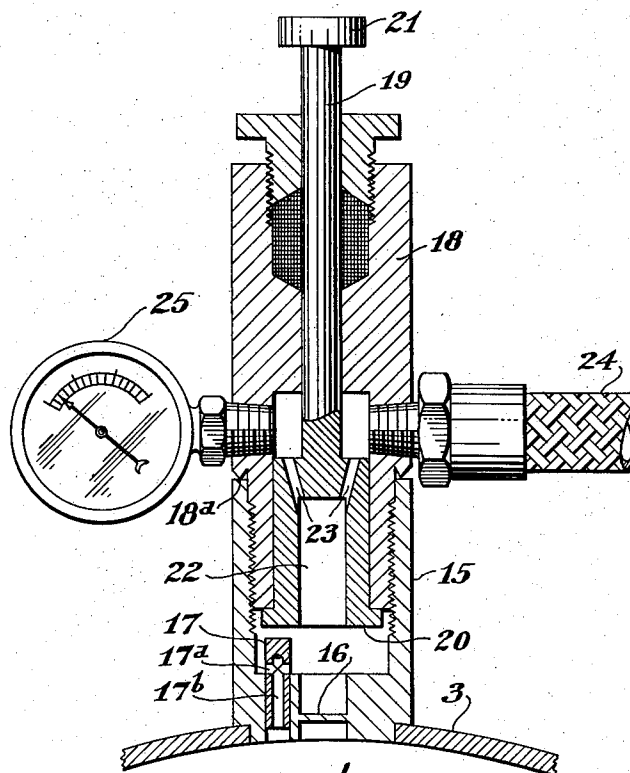


Fig. 7

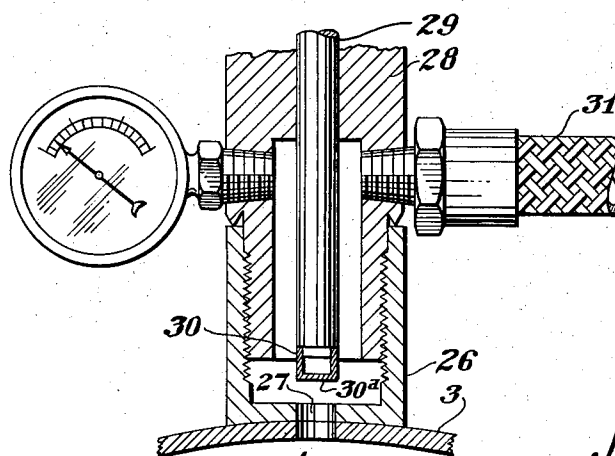


Fig. 8

INVENTOR.
John F. Werder

BY

Milburns & Milburns

ATTORNEYS

UNITED STATES PATENT OFFICE

2,025,141

APPARATUS FOR FILLING METAL CONTAINERS

John F. Werder, Lakewood, Ohio, assignor of one-half to Edmund Rogers, South Euclid, Ohio

Application March 9, 1931, Serial No. 521,229

12 Claims. (Cl. 221-74)

The present invention relates to an improved method and apparatus for filling containers with a gas-charged liquid and is especially adapted for use in connection with the filling of such containers with a gas-charged lubricant under sufficient pressure for complete discharge of the entire contents therefrom.

Although the present invention is herein disclosed in connection with a cylindrical form of metal container which is filled with a gas-charged lubricant, yet it is to be understood that the same principle of invention may be employed for other purposes, and that there may be devised various modifications without departing from the spirit of the present invention as herein set forth and claimed.

This application is a continuation in part of my co-pending application Serial No. 519,133, filed February 28, 1931. Whereas in the co-pending application referred to, there is disclosed an apparatus especially adapted for the filling of comparatively small containers, the form of invention herein disclosed applies especially to the charging of a larger size of container.

The object of this invention therefore consists in the provision of a simple and convenient form of apparatus for charging large-size containers with a fluid under pressure, together with correspondingly suitable discharging connection therefor.

Fig. 1 is a plan view of a part of my improved apparatus; Fig. 2 illustrates the manner of weighing the containers during the filling operation; Fig. 3 is a sectional view indicating the by-pass connection for the filling operation, together with the closure therefor; Fig. 4 is a sectional view illustrating the discharge connection for the container; Fig. 5 is a detail view of the closure plug for the by-pass; Fig. 6 is a detail view of the valve connection; Fig. 7 is a sectional view of a modified form of device; and Fig. 8 is a similar view of a still further modification.

The present form of container comprises the cylindrical body 1 and the end heads 2 and 3 which are soldered thereto. Upon one of the heads, there is attached the valve structure which comprises the casing 4 provided with screw-threads upon the outside thereof for attachment of the connecting means 5 upon the one end of the filling tube 6. The valve casing 4 has its main passage 4^a closed during the filling operation by means of the frangible seal 4^b. There is, however, provided a by-pass 4^c which communicates from the upper end of the valve casing 4 to the opening 4^d through the side of the valve

casing. The opening 4^d communicates with the main passage 4^a and thus there is afforded a means of communication between the tube 6, when attached to the valve casing, and the inside of the container during the filling operation. There is provided a screw-threaded plug 5 which is adapted for engagement in the screw-threaded opening 4^a and which is provided with a weakened portion 5^a so that the outer end portion thereof may be readily severed after screwing the same into position for closing the by-pass 4^c upon completion of the filling operation, as will more fully appear hereafter. The weakened portion 5^a is at such a point that when plug 5 closes the opening and the outer end portion thereof is severed, the remaining plug will be entirely within the opening, as indicated. The inner end of plug 5 is of conical form for line-contact engagement with the edge of the seat about the opening 4^d. The plug 5 and the seat 4^d may either or both be formed of semi-soft metal so as to ensure an effective seating engagement by deformation of the metal upon screwing the plug to closed position.

The container may be filled by connecting the valve casing 4 to the connecting member 6^a so as to afford communication through the tube 6 and the main supply line 7 which in turn is connected with the source of gas-charged liquid. Means may be provided for connecting any number of such containers to the same supply line for simultaneously charging the same to the point desired. During the filling operation, the conical surface 6^c of sealing member 6^b engages only the outer annular edge 4^e, so as to permit admission of liquid through member 6^b and by-pass 4^c. The member 6^a and the seat 4^e may either or both be formed of semi-soft metal so as to ensure an effective sealing engagement upon screwing the member 6^a into position. Each tube is provided with a valve control means 8 which upon proper manipulation thereof by means of the hand lever 9, may be caused to establish communication from the pipe line 7 through the valve to the tube 6 and the container. However, in order to obtain the proper quantity of oil or other liquid within the container, it may be necessary to relieve the container of a portion of the gas pressure during the filling operation and thereby permit a further entrance of the oil or other liquid within the container. Such release of gas from the container during the filling operation, is known as the process of "sniffing", and in the present form of apparatus, each container is provided with an individual valve con-

nection for "sniffing" the same independently of each other. When the valve is adjusted for such "sniffing" action, the supply connection from the pipe 7 to the tube 6 is temporarily closed and the tube 6 is afforded communication through the valve with the discharge pipe 10. Upon completion of the "sniffing" operation, the valve may be readjusted so as to close the discharge outlet and restore communication from the pipe line 7 to the filling tube 6.

In order to determine when the container has been filled to the proper degree, I place the same upon the scale 11, which is positioned in convenient proximity to each of the filling connections so that each container may be weighed without disconnecting it from its filling connection. This is made possible by the flexible form of tube 6 which is made of proper length for this purpose.

When the container has been filled to the proper point as indicated by the scale 11, the screw plug 5 will be brought to position to close the bypass 4^a, and the outer portion of the plug 5 will be severed from the inner end portion which remains as a permanent plug closure as indicated in Fig. 4. As above stated, the outer end of the screw plug closure just referred to, will be slightly within the outer end of the opening therefor so as not to cause an objectionable projection therebeyond.

The filled container is then ready for shipment and a screw cap may be applied to the threaded casing 4, if so desired, to protect the frangible seal 4^b. When it is desired to discharge the contents of the container 1, this may be done by means of the connection 12 which has screw thread engagement with the casing 4 and to which is connected the delivery tube 13 with a control valve of any suitable form upon the other end thereof. Associated with the connecting member 12 is the member 14 which has a reduced inner end portion adapted to be projected through the frangible seal 4^b and to thereby puncture or remove the same. This action is accomplished by means of the inwardly extending flange 12^a which is adapted to engage the shoulder 14^a and to force the same through the seal 4^b as the connecting member 12 is screwed into connection with the casing 4. As the member 14 is brought into such position, the outer tapered surface portion 14^b is adapted to engage the inner annular right angle edge 4^d which is provided upon the casing 4 and which cooperates with the tapered surface portion 14^b to provide an effective line-contact sealing engagement. The member 14 and the casing 4 may be either or both formed of semi-soft metal so as to permit such effective sealing engagement between these parts. Extending longitudinally throughout the entire length of the member 14 is the passage 14^c and there are provided also the transverse ports 14^d which communicate therewith. The reduced end portion of the member 14 is somewhat smaller than the opening 4^a into which it is projected upon rupturing the seal 4^b. Thus, there is provided a sufficient space between the inner end of the member 14 and the wall of the passage 4^a so as to insure discharge communication therethrough to the ports 14^d, thence to the passage 14^c in case the internal pressure should cause the ruptured disk 4^b to close the inner end of the passage 14^c and thereby prevent direct discharge therethrough. This means of communication through the discharge connection may be maintained so long as there remains any fluid in the

container and the actual discharge thereof from the tube 6 may be controlled by means of the nozzle at the other end thereof, as above referred to.

Thus, I have devised a comparatively simple and very efficient method and means for filling the comparatively large size of container with a gas-charged lubricant or other form of fluid, together with a convenient and efficient form of connection for discharge of the same.

Any number of containers can be filled simultaneously and they can be "sniffed" individually so as to ensure proper filling of each and every one. The containers may be readily connected to and disconnected from the filling apparatus, and their individual weight may be tested without disconnecting the same. Thus, the filling operation may be performed at a high rate of speed. At the same time, this apparatus can be operated by ordinary labor and at a comparatively low cost.

The filling and discharge connections herein provided are efficient without the employment of washers or gaskets or any other additional means, the contacts being of a metal-to-metal nature throughout.

In spite of the opaqueness of the metal containers, which precludes visual observation of the interior thereof, with the present invention it is possible to fill them with the proper quantity of oil or other liquid and with the proper degree of pressure. Also, the present invention permits the individual regulation of the pressure in the several containers, at all times and hence under all conditions of temperature, so that there may be obtained a uniform pressure in the containers regardless of any change in temperature.

The present improved method and apparatus are of a practical nature and do not require laboratory equipment or other tedious routine in order to obtain the results above outlined. Thus, it is possible to practice the present invention upon a scale of quantity production required to fill the demands of the market. The method of filling the containers with the lubricant which has already been charged with the gas, and in the manner herein set forth, permits the speed of operation which is necessary for practical purposes.

In the modified form of device illustrated in Fig. 7, the nozzle 15 is attached to the head 3 of the container and has a frangible seal 16 for discharge of the contents of the container when this seal is broken. The nozzle 15 has also a by-pass through which the container can be filled, this by-pass receiving the plug 17 which has the transverse ports 17^a and the longitudinal opening 17^b for communication through the by-pass when the plug 17 occupies the position indicated in Fig. 7. When the filling operation has been completed, the plug 17 will be driven into the by-pass so as to close the ports 17^a and thereby prevent passage therethrough. The outer end of the plug 17 will then be flush with the bottom of the inside of the nozzle 15.

The attachment 18 is threaded into the nozzle 15 and has a plunger 19 mounted therein with the head 20 and the outer end portion 21. The plunger 19 has a hollow central portion 22 and the channels 23 for affording communication from the upper part of the plunger chamber and the supply pipe or tube 24. The pressure gauge 25 also has connection with the upper part of the plunger chamber. The attachment 18 has line-contact at the point 18^a with the squared upper end of the nozzle 15, and either one or both of 75

these members may consist of semi-soft metal so as to ensure an effective sealing engagement.

With the parts in the position shown in Fig. 7, the container may be filled to the extent desired and the plug 17 may then be driven home by striking the outer end of the plunger. During the filling operation, the path of communication is from the tube 24, into the upper part of the plunger chamber, thence through the passages 23 into the opening 22 and the lower part of the plunger chamber which has communication through the parts 17^a and opening 17^b with the interior of the container.

When the container has been filled and closed in the manner just described, the attachment 18 is removed and may be connected to the nozzle of another container to be filled.

When it is desired to discharge the contents of the container, this may be done by breaking the seal with a separate puncturing means of any suitable form and the contents discharged in the ordinary manner directly from the nozzle, or there may be attached to the nozzle 15 a hose provided at its outer end with a valve and at its inner end with suitable means for either puncturing or removing the frangible seal 16.

In the form of device illustrated in Fig. 8, there is attached to the head 3 of the container the nozzle 26 having the single filling and discharge opening 27 which registers with a corresponding opening in the head 3. The attachment 28 has screw-thread engagement with the nozzle and supports the plunger 29 which is properly shaped upon its lower end to receive and support by frictional engagement the hollow plug member 30 having the frangible bottom portion 30^a to serve as a frangible seal. During the filling operation, the fluid may enter from the tube 31 into the chamber of the filling attachment and thence pass by the closure member 30 and enter through the opening in the container. Then when the filling operation is completed, the closure member 30 will be driven home into the opening and will be there retained by friction upon withdrawal of the plunger. When it is desired to use the contents of the container, this may be done by breaking the seal in the same manner as explained in connection with the form of device illustrated in Fig. 7. Readily disengageable means may be provided for holding the plungers 19 and 29 raised so as to prevent premature closing action.

The operations of filling, "sniffing", and weighing may be carried out in substantially the same manner in connection with the forms of attachments illustrated in Figs. 7 and 8 as in the first form of device and practically the same advantages are realized thereby as above pointed out. Also, corresponding forms of discharge connections may be provided for breaking the seals and discharging the contents from the containers shown in Figs. 7 and 8. Furthermore, in the forms of devices shown in Figs. 7 and 8, there is obtained a very direct and correct reading of the pressure because of the location of the by-pass or filling opening. Also the plug which closes the by-pass is housed within the nozzle member and precludes any danger of leak of pressure.

It is to be understood that the above nozzle attachments including the by-pass or filling opening and means for closing the same, may be employed also for exhausting a container so as to produce a vacuum therein for any purpose desired.

Other advantages flowing from the present disclosure will be apparent to those who are familiar

with the art to which the present invention relates.

What I claim is:

1. Apparatus for filling a container, comprising a seat member having a closure closing the main passage therethrough, and having a by-pass around said closure, means for closing said by-pass, said by-pass opening at its outer end at a point within said seat, and connecting means adapted for seating engagement with said seat and having supply communication with said by-pass for filling the container.

2. In apparatus of the class described, means for discharging the contents of a container, comprising a seat member having an edge form of seat, said seat member having also a frangible seal closing the main passage therethrough, and discharge connecting means provided with a passage and having a conical surface adapted for seating engagement with said seat so as to form a line-contact therewith, and having means for breaking said frangible seal so as to permit discharge of the contents of the container through said connecting means.

3. In combination, a container, comprising a seat member having inner and outer seats and a by-pass and having also a means closing the main passage therethrough and means for closing said by-pass, said by-pass opening at its outer end at a point between said seats, the outer seat of said seat member being adapted for engagement by connecting means for filling the container, and the inner seat of said seat member being adapted for engagement by connecting means for discharging the container, and said by-pass being adapted for supply communication with the connecting means during the filling operation.

4. In combination, a container, comprising a nozzle member having a closure, and said closure having associated therewith a by-pass within said nozzle, a closure plug for said by-pass, and a filling attachment provided with a passage and having means of releasable engagement with the nozzle, a plunger carried by said attachment and being positioned for contact with said plug, whereby the container may be filled and the by-pass closed.

5. In a device of the class described, means for filling or exhausting a container, said means comprising a seat member having a frangible seal closing the main passage therethrough and having associated therewith a by-pass around said seat, said seat member having a seat, said by-pass opening at its outer end at a point inside of said seat, means for closing said by-pass, and connecting means adapted for seating engagement with said seat and having communication with said by-pass for filling or exhausting the container therethrough.

6. In a device of the class described, a container having a nozzle, said nozzle having a closed mouth for the container, said mouth having associated therewith a by-pass around the same for admission of the liquid into the container, said nozzle being also provided with means for detachable connection of a filling tube or a discharge tube, and means for closing the by-pass upon completion of the filling operation.

7. In a device of the class described, a container having a nozzle, said nozzle having a closed mouth for the container, said mouth having associated therewith a by-pass around the same for admission of the liquid into the container, said nozzle being also provided with means for detachable connection of a filling tube, and

means independent of the said connecting means, for closing the by-pass upon completion of the filling operation.

8. In a device of the class described, a container having a nozzle, said nozzle having a seat and means closing the main passage there-through, said nozzle having a by-pass around said closure, and means for closing said by-pass, said by-pass opening at its outer end at a point within said seat, and said seat being adapted for engagement by a connecting means for supply communication through said by-pass.

9. In a device of the class described, a container having a nozzle, said nozzle having a seat member provided with inner and outer seats and a by-pass and having also a means closing the main passage therethrough, and means for closing said by-pass, said by-pass opening at its outer end at a point between said seats, and said outer and inner seats being adapted for seating engagement by connecting means for filling and discharging the container respectively, and said by-pass being adapted for supply communication with the connecting means during the filling operation.

10. In a device of the class described, a container having a nozzle having a closure, said

closure having associated therewith a by-pass within said nozzle, a closure plug for said by-pass, said nozzle having means for releasable engagement by a filling attachment, and said plug being adapted for contact by a plunger carried by the filling attachment, whereby the container may be filled and the by-pass closed.

11. In a device of the class described, a container having a nozzle, a frangible seal for closing the mouth opening through the nozzle, said seal having associated therewith a by-pass through which the container may be either filled or exhausted, and means applicable through the side of the nozzle for closing the by-pass upon completion of the filling or exhausting operation.

12. In a device of the class described, a container having a nozzle having a seat, a frangible seal closing the mouth opening through said nozzle and having associated therewith a by-pass around said seal, said by-pass opening at its outer end at a point inside of said seat, means for closing said by-pass, and said seat being adapted for engagement by connecting means for either filling or exhausting the container through said by-pass.

JOHN F. WERDER.