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CLOSURE FOR SHIPPING CONTAINERS.

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Fig. 1

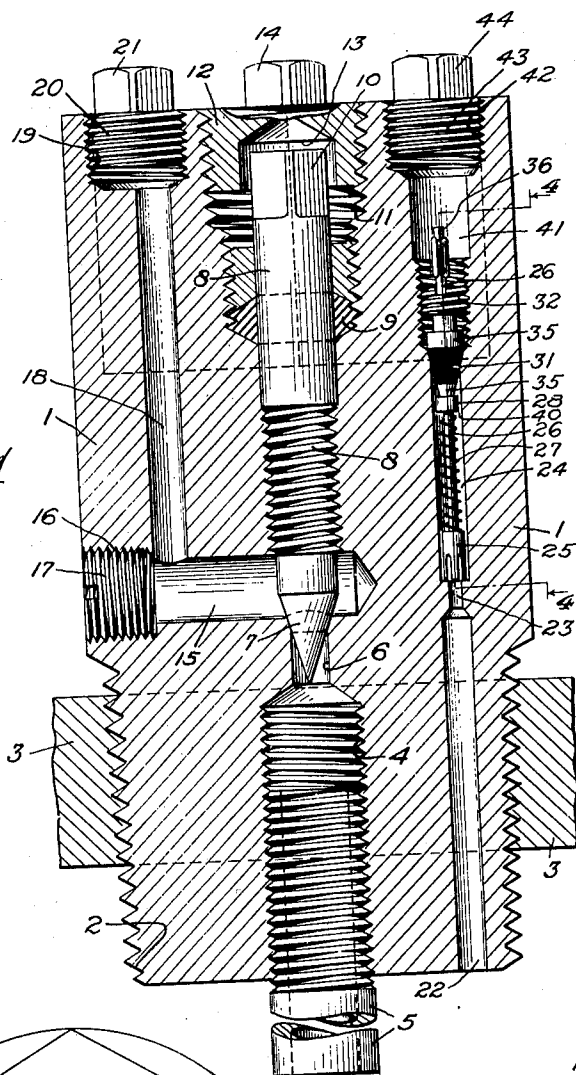
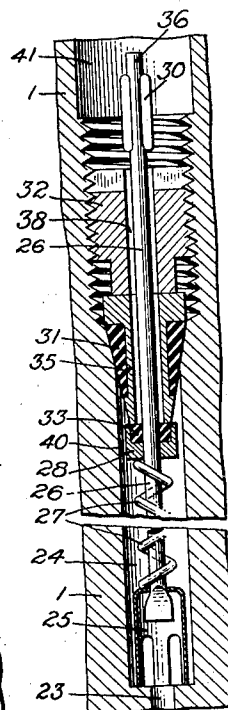


Fig. 4

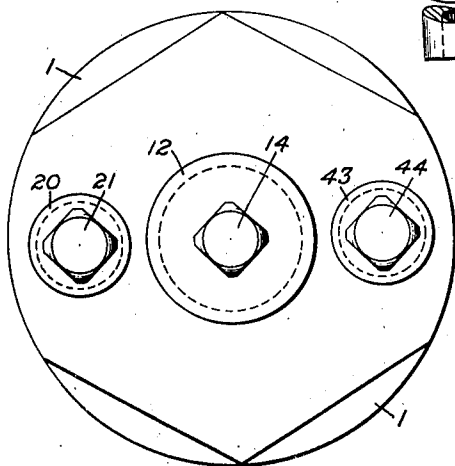


Fig. 2

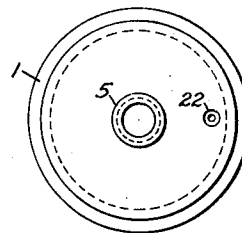


Fig. 3

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CLOSURE FOR SHIPPING CONTAINERS.

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This invention relates to closures for shipping containers adapted to hold volatile and other liquids and has for its object to provide a closure which will be simple in construction, comparatively inexpensive to manufacture and more efficient in use than those heretofore proposed.

With these and other objects in view the invention consists in the novel details of construction and combinations of parts more fully hereinafter disclosed and particularly pointed out in the claims.

Referring to the accompanying drawings forming a part of this specification in which like numerals designate like parts in all the views:—

Figure 1 is a sectional view of a plug closure made in accordance with this invention;

Figure 2 is a plan view of the parts shown in Figure 1;

Figure 3 is a bottom plan view on a reduced scale of the parts shown in Figure 1; and

Figure 4 is a sectional view taken on the line 4—4 of Figure 1, illustrating the air inlet valve.

In order that the precise invention may be the more clearly understood it is said: As is well known there are numerous chemical compounds whose boiling points lie between the maximum and minimum temperatures that are met with in shipping said compounds to various places in the world.

That is, when these compounds are shipped in the usual steel bottles or containers their contents may at one point or place be a liquid due to the atmospheric temperature at that place, while in another part of the world the normal atmospheric temperature may be such that the contents of the container will be a gas. Or even if the container be stored in a single place the changes of temperature may be such that at one season of the year the contents of the steel bottle will be a liquid while at another season of the year, the contents will be partially liquid or entirely gaseous. Many of these compounds are extremely poisonous. Some of them involve fire hazards and therefore, it is very desirable indeed to use a complex form of closure such as that disclosed in this application for any apparatus that holds the same, or that is to be used on a shipping container that transports the same.

For example, carbon oxy-chloride or phosgene boils under atmospheric pressure at say 8.2° C. Under seasonable temperature changes in our northern latitudes this material may be kept in a container with almost any simple closure but in the summer time, under the high temperatures prevailing it must be kept under several atmospheres pressure to prevent boiling. A similar material is found in ethylchloride having a boiling point under atmospheric pressure of 19.5° C. This material in the winter time in our northern latitudes is a liquid showing no pressure in the container, whereas in the summer time it develops a very considerable pressure in a closed container.

Many similar materials are today common articles of commerce and when they are shipped the ordinary containers heretofore employed are found to give a great deal of trouble as will be apparent from the foregoing. That is, it is a common practice to close the ordinary steel shipping containers with a plug having a single pass-valve such for example as that used in the handling of compressed oxygen or nitrogen. With such a closure, however, the class of materials above discussed could not be satisfactorily handled because it would be impossible to discharge a liquid from such a steel bottle through a single pass-valve in case the external temperature was below the boiling point, as would often be the case in practice. On the other hand, if the external temperature was above the boiling point such a single-pass-valve would discharge gas only at the rate at which the liquid boiled in the cylinder and this rate in turn would be dependent on the rate at which heat flows into the boiling liquid. These factors being inconstant it is evident that such closures give a great deal of trouble when employed with the class of chemicals above mentioned.

In carrying out this invention, however, I avoid all of the foregoing objections by providing the structure now to be disclosed. 1 is any suitable metal plug provided with the screw threaded portion 2 adapted to fit the bottle 3 only a small portion of which is shown, and said plug is provided with the screw threaded opening 4 into which is fitted the pipe 5, which preferably extends down below the surface of the liquid in the bottle or near the bottom thereof.

Said opening 4 terminates in the passage

6 controlled by the needle valve 7 provided with the screw threaded stem 8, a portion of which passes through the packing 9, and the upper end of which terminates in the squared portion 10. The packing 9 is enclosed in the tapered screw threaded opening 11 into which fits the screw threaded screw closing plug 12 provided with the hollowed out portion 13 into which the squared end 10 of the plug enters. Said plug closure 12 is provided with a squared member 14 to facilitate the removal of the same from the main body portion 1. Disposed at an angle to the passage 6 is the second exit passage 15 which terminates in an enlarged screw threaded opening 16 which is normally closed by the screw threaded plug 17 as shown. Leading from the exit passage 15 out through the top of the plug closure 1 is a third exit passage 18 terminating in an enlarged opening 19 which is closed by the screw threaded plug 20 having the squared end 21 as shown. Said plug closure is further provided with a passage 22 having a reduced portion 23 and an enlarged portion 24 in which is located the apertured head 25 rigid with the stem 26 surrounded by the spring 27 operating against the collar 28 fixed on the stem 26. As best shown in Fig. 4, the stem 26 terminates in an enlarged head 30 and passes upwardly through the collar 28, through the plug 31, preferably made of a resilient material and through the screw threaded plug member 32 as shown. The said collar 28 is provided with a member 33 affording a valve seat while the cushion member 31 is associated with a metal member 35, the lower end of which constitutes a valve contacting with said seat 33. The entire structure is such that should one exert pressure on the extreme end 36 of the stem 26, the spring 27 will be compressed through the action of the collar 28 and the valve seat 33 will be lowered from the valve 35 whereupon air may freely enter the passage 38 extending down through the members 32 and 35, and as said collar 28 does not fit the passage 24 air may pass freely through the passage 40 between the rim of said collar 28 and the walls of the passage 24. Said passage 24 is further enlarged as at 41 near the upper end of the stem 26 and it is still further provided with a screw threaded enlargement 42 at its extreme end which enlargement is closed by the screw threaded plug 43 provided with the squared portion 44 as illustrated.

The operation of this improved plug closure for shipping containers will be readily understood from the foregoing but may be briefly summarized as follows:

The enlarged screw threaded opening 19 is made of a size to readily receive a pipe or other means of conveying fluid or gas out of the container 3 and the operator un-

screws the plug 20 and fits any suitable conveying pipe, not shown, to said enlargement 19, as will be readily understood. He further unscrews the plug 12 so as to expose the squared end 10 of the valve stem 8. If the contents of the bottle 3 are in a gaseous condition and under pressure the needle valve 7 is now opened to any extent desired so that the pressure in the bottle will force the liquid up through the pipe 5 into the passage 6, into the passage 15, through the passage 18, and into the exit pipe not shown, which is screwed into the said chamber 19.

Of course, if the contents of the bottle 3 are entirely in a gaseous condition the gas will flow along the same path and out the exit pipe as will be readily understood. On the other hand, if the contents of the bottle are not under pressure or are in a liquid condition, then the operator unscrews the plug 43 and screws into the enlarged chamber 42 a pressure pipe not shown. Air under pressure being supplied through said last named pipe it will pass down through the passage 38 and exert its pressure on the valve seat 33 which will be depressed against the compression of the spring 27 and thus pass on down through the passage 40 into the passage 24, and into the steel bottle 3.

The pressure of this air or other gas on the liquid contents of the bottle will force said contents up through the pipe 5 and through the passages 6, 15 and 18 out of the exit pipe in the manner above disclosed.

It will thus be seen that when steel shipping bottles or other containers are provided with a closure of this kind, the liquid contents can be readily, speedily and safely handled no matter what may be the normal temperature of the climate in which they are found, or rather no matter what may be the physical condition of the contents. That is, the contents of these bottles are handled with equal facility whether they be liquid, gaseous, or liquid and gaseous, which is a result heretofore not attainable, in so far as I am aware.

It is obvious that those skilled in the art may vary the details of construction as well as the arrangement of parts without departing from the spirit of the invention, and therefore, I do not wish to be limited to the above disclosure except as may be required by the claims.

What is claimed is:—

1. In a vessel containing volatile liquids, the combination of a closure provided with an exit passage; a valve controlling said passage; means at the extreme end of said passage for receiving an exit pipe; and means to facilitate the introduction of air under pressure into said vessel; said valve and the outer end of said passage being located at the top of said closure.

2. In a vessel adapted to contain volatile liquids the combination of a closure provided with an exit passage; an adjustable valve controlling said passage; a plug normally closing the extreme outer end of said passage; means associated with said extreme outer end to facilitate the connection of a delivery pipe to said passage; and means comprising a valved passage to facilitate the introduction of air under pressure into said vessel; said valves and the outer ends of said passages being located at the top of said closure.

3. In a vessel adapted to contain volatile liquids the combination of a closure provided with an exit passage; an adjustable valve provided with an operating stem controlling said passage; a plug normally closing the extreme outer end of said passage; means associated with said extreme outer end to facilitate the connection of a delivery pipe to said passage; a pipe joined to the inner end of said passage for receiving the fluid forced from said vessel; and means comprising a valved passage to facilitate the introduction of air under pressure into said vessel; said operating stem and the outer ends of said passages being located at the top of said closure.

4. In a closure for vessels adapted to hold volatile liquids, the combination of a body portion provided with an exit passage; a valve adapted to control said passage; a stem for operating said valve; means for protecting said stem from injury when not in use; means for normally closing the extreme outer end of said passage; means associated with said outer passage end to

facilitate the joining of an exit pipe thereto; and means for admitting air under pressure to the interior of said vessels comprising a spring controlled valve and a passage controlled by said valve.

5. A plug closure for vessels containing volatile liquids provided with an exit passage and an air inlet passage; an adjustable valve having a stem terminating below the top surface of said plug for controlling said exit passage; a plug to protect the outer end of said valve stem; means associated with the outer end of said exit passage to facilitate the joining of a delivery pipe thereto; means associated with the outer end of the air inlet passage to facilitate the joining of an air pressure pipe thereto; and a check valve in said inlet passage adapted to permit air under pressure to pass the same.

6. A plug closure for vessels containing volatile liquids provided with an exit passage and an air inlet passage; an adjustable valve having a stem terminating below the top surface of said plug for controlling said exit passage; a plug to protect the outer end of said valve stem; means associated with the outer end of said exit passage to facilitate the joining of a delivery pipe thereto; means associated with the outer end of the air inlet passage to facilitate the joining of an air pressure pipe thereto; and a check valve in said inlet passage adapted to permit air under pressure to pass the same; the outer end of said valve stem and the outer ends of said passages being located at the top of said closure.

In testimony whereof I affix my signature.

KENNETH F. COOPER.