Oct. 28, 1941. L. S. WRIGHTSMAN 2,260,419

SAMPLE CONTAINER

Filed Jan. 11, 1940

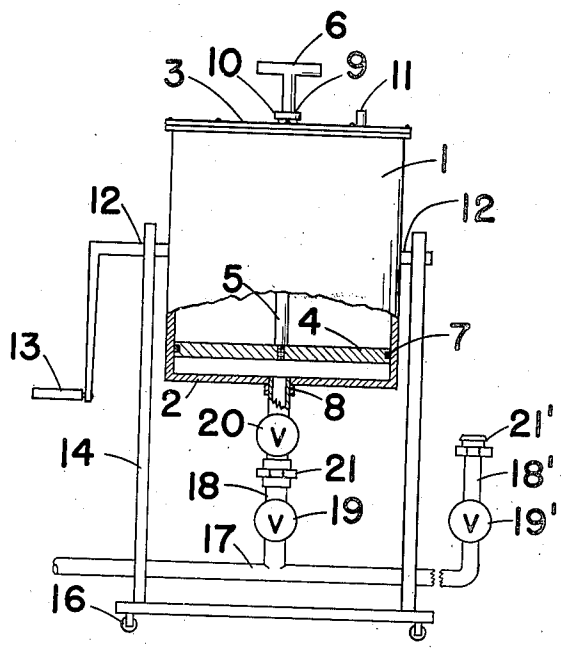

FIG. 1.

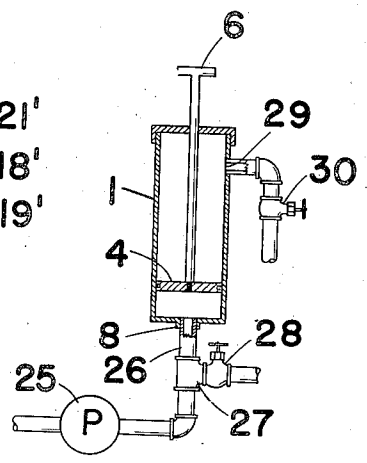

FIG. 3.

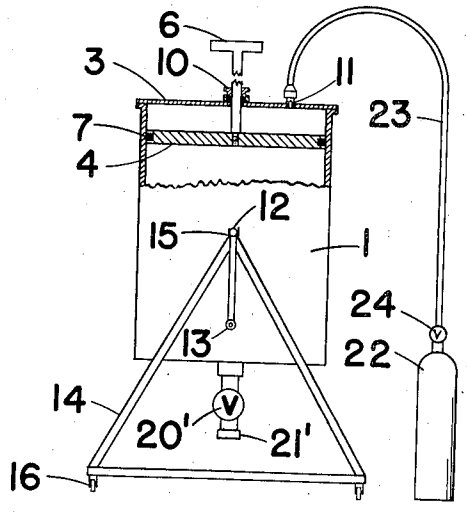

FIG. 2.

Laurence S. Wrightsman INVENTOR.

BY

P. L. Young ATTORNEY

Patented Oct. 28, 1941 2,260,419

UNITED STATES PATENT OFFICE

2,260,419

SAMPLE CONTAINER

Lawrence S. Wrightsman, Houston, Tex., assignor to Standard Oil Development Company, a corporation of Delaware

Application January 11, 1940, Serial No. 313,393

1 Claim. (Cl. 73—21)

The present invention relates to a device for retaining samples.

An object of the present invention is to produce a device for retaining samples of fluids without the loss of volatile constituents.

Another object of the invention is to produce a device in which samples of a fluid may be retained without loss of any of its constituents and without exposing it to contamination by another fluid during storage.

Other objects and advantages of the invention may be seen from reading the following description and by reference to the accompanying drawing which has like numerals designating like parts and in which

Fig. 1 is a front elevation partly in section of a modification of the device of the present invention attached to a suitable manifold for obtaining a sample;

Fig. 2 is a side elevation, partly in section, of a sample container like that shown in Fig. 1, but detached from the manifold, and having attached thereto a container of compressed gas to aid in emptying the sampling container; and

Fig. 3 is a cross-sectional view of another modification of the present invention attached to a constant displacement pump for taking samples.

Referring to Fig. 1 in detail, a cylindrical casing 1 is provided with a bottom 2 and cover 3. Fitting concentrically within the casing is a plunger 4 attached to a longitudinally extending rod 5 provided with a handle 6. Plunger 4 is provided with a gasket 7 made of suitable material, such as leather, "Duprene" or other similar material. The bottom 2 contains a central passage and fitting around this central passage and making a fluid-tight joint with bottom 2 is a coupling 8. The cover 3 is provided with a central opening 9 which allows the rod 6 to move longitudinally with respect to the casing. A stuffing gland 10 fitting around opening 9 of the cover provides a tight joint between the cover and rod 6 while allowing the rod longitudinal movement. Cover 3 is also pierced by a second hole which is provided with a coupling 11 for reasons which will hereafter appear.

Attached to a midpoint of casing 1 are laterally extending axles 12 one of which is provided with a suitable crank 13. A frame 14 is provided with journals 15 for receiving axles 12 and, in addition, is provided with suitable rollers 16 which allow the unit to roll along a surface. A conduit 17 connected to coupling 8 of the casing by means of a branch pipe 18 contains valves 19 and 20 and a union 21 between them. Conduit 17 is also provided with an additional branch pipe 18' which is suitably provided with a valve 19' and a portion of a union 21'.

In Fig. 2, a sampling container like that in Fig. 1 is shown disconnected from the manifold and connected to a metal container 22 by means of a flexible conduit 23 having within its length a valve 24. The bottom outlet of this container is controlled by valve 20' and positioned below this valve is a portion of union 21'.

In the modification shown by Fig. 3 the coupling 8 of the bottom of the container is connected to constant displacement pump 25 by means of conduit 26. A T 27 is placed in conduit 26 and controlling the opening from the T is a valve 28. In order to serve as an overflow for the sampling container an opening provided with a threaded coupling 29 is arranged in the upper end of the casing and attached thereto by means of a nipple and elbow is a valve 30.

The sampling containers shown in Figs. 1 and 2 are generally made with large capacities as, for example, from 4 to 20 gallons, and are generally used for taking samples over long periods of time, for example, 24 hours. When using such large sized containers, it is preferable to have at least two of them available with suitable means of attaching them to a manifold which is appropriately connected to the body of liquid to be sampled. Fluid is allowed to flow into one of the sampling containers until the desired size of sample is obtained and then the stream is diverted to the second sampler and the first container is emptied and then again attached to the manifold so that the process may be repeated.

The preferred method of emptying a large sampling container will be described in connection with Figs. 1 and 2 taken together. A full sampling container connected to branch pipe 18' by means of union 21' was removed from the line by closing valve 19' and breaking the connection at union 21'. The sampling container with its frame was then removed to one side in order to make it easier to withdraw the sample from the bottom outlet. Crank 13 was then used to give the container angular movement to stir the contents thereof to dissolve any gases which may have separated from the liquid while the sample was being collected and to mix the body of the fluid so that any portion thereof is a representative sample. Metal container 22 was then attached to coupling 11 at the top of the container by means of flexible conduit 23, and the desired amount of liquid withdrawn from the device by placing a transfer container below valve 20' and

opening valve 24 to allow the compressed gas to force plunger 4 downwardly and fluid out through valve 20'.

It will be evident that some other force may be used instead of compressed gas to cause plunger 4 to move downwardly in emptying the container. For example, an operator may push downwardly on handle 6 and force the sample out of the container. However, it will generally be found desirable in using large sample containers to force plunger 4 down by the use of fluid or mechanical pressure. On some occasions, it may be desirable to empty the container without any preliminary mixing and if this is desired the device may be emptied without disconnecting it from the manifold by attaching suitable outlets to branch pipes 18 and 18'.

The modification shown by Fig. 3 is particularly suitable for collecting smaller quantities of liquid, for example, from one quart to two gallons by using a constant displacement pump attached to a vessel containing the fluid to be sampled. The constant displacement pump removes fluid from the vessel at a constant rate and forces it into casing 1. As casing 1 receives the fluid the plunger 4 will be gradually pushed upwardly and since it is provided with a gasket any volatile material which may be in the sample will be retained within the chamber. When it is desired to remove the sample from the container, as for example, at the end of an hour or several hours, a transfer vessel may be placed beneath the opening of the valve 28 and the handle 6 pushed downwardly. In this manner the sample is quickly forced into the transfer container and then the valve 28 may be closed and another sample allowed to collect.

The opening 29 controlled by valve 30 at the upper end of the container in Fig. 3 may be used as an overflow to prevent the pressure from building up to excessive amounts if the container is not emptied according to schedule. Pump 25 is a constant displacement pump and under some conditions the pressure within the casing might build up an amount which would endanger the apparatus if suitable safety means were not provided. Valve 30 may be opened a sufficient amount to allow excess material to flow from the device in case it is not emptied before plunger 4 is pushed high enough to clear opening 29. While a simple hand valve has been shown in the drawing, it is evident that an automatic pressure releasing valve may be used for this device. It will be obvious that, if desired, this modification may be provided with trunnions to aid in the mixing of the sample and also that the pump may be dispensed with.

While I have shown preferred modifications of the present invention, it is obvious that various changes may be made therein without departing from the scope of the invention. For example, changes in the size and shape of the containers and in the method of attaching them to obtain samples may be made as desired. Any of the modifications shown may be attached to a vessel containing fluid or else attached to a pump which, in turn, is attached to a fluid container. It will also be evident that overflow valves may be attached or omitted from any modification of the apparatus. It is therefore my intention not to be limited by the specific modifications disclosed, but to claim my invention as broadly as the prior art permits.

I claim:

A sampling device suitable for connection to a fluid-carrying conduit comprising, in combination, a cylindrical casing, a pair of axles diametrically projecting from the walls of said casing, a crank handle attached to one of said axles, a frame resting on rollers provided with journals secured to said axles to allow angular movement of said casing, a plunger fitting slidingly within said casing, a seal arranged between said plunger and the interior wall of the casing, a closure secured to each end of said cylinder, passages through one of said closures, a rod projecting through one of said passages and attached to said plunger, a separable conduit provided with a valve on each side of the point of separation attached to the other closure and communicating with the interior of the casing.

LAWRENCE S. WRIGHTSMAN.