Dec. 3, 1940. S. H. BROOKS 2,223,598

SAMPLING CAN

Filed March 24, 1939 2 Sheets-Sheet 1

Fig. 1.

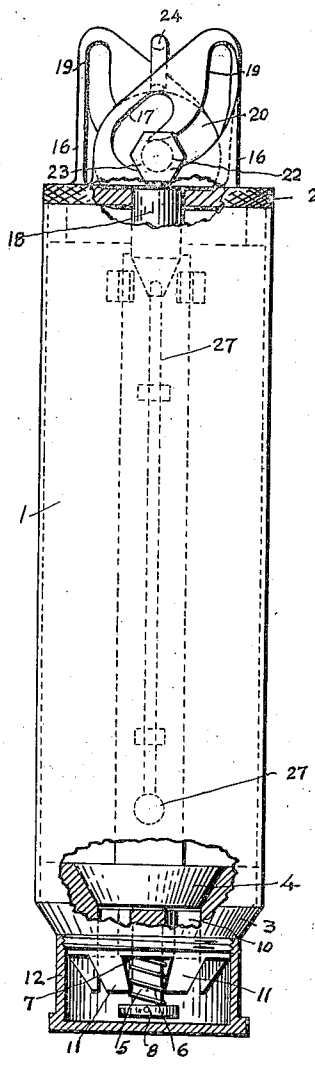


Fig. 2.

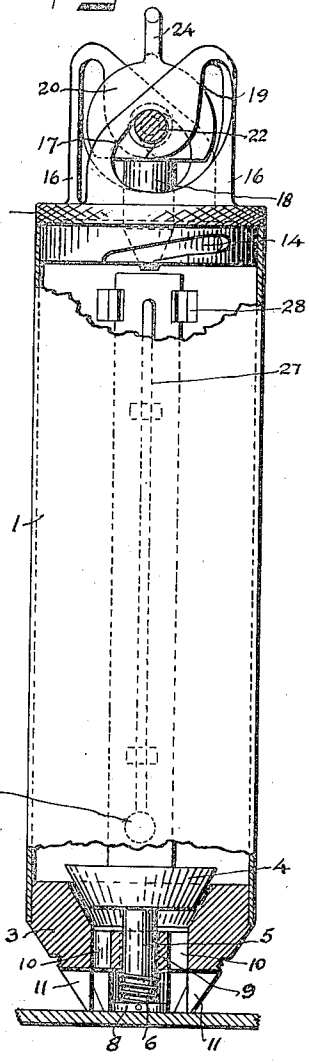
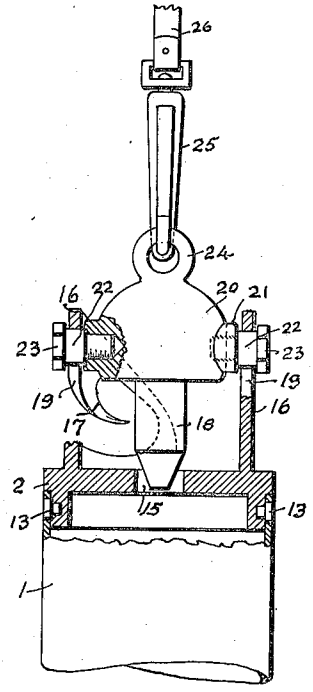


Fig. 3.



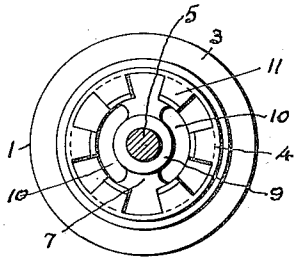


Fig. 4.

Stephen H. Brooks INVENTOR.

BY N. S. Amstutz

ATTORNEY.

Dec. 3, 1940. S. H. BROOKS 2,223,598

SAMPLING CAN

Filed March 24, 1939 2 Sheets-Sheet 2

Fig. 5.

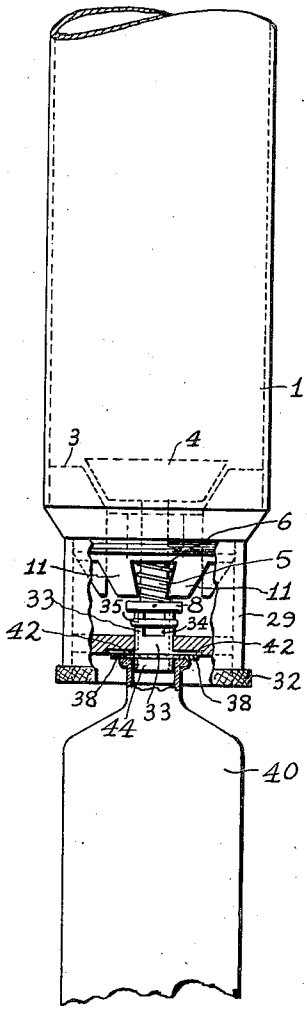


Fig. 6.

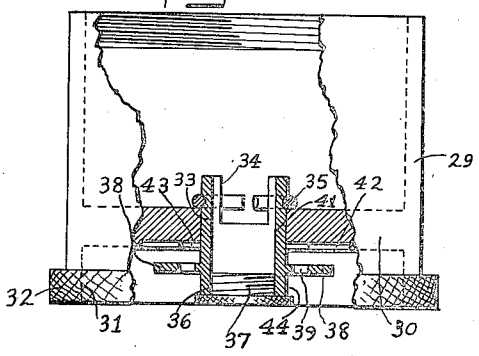


Fig. 7.

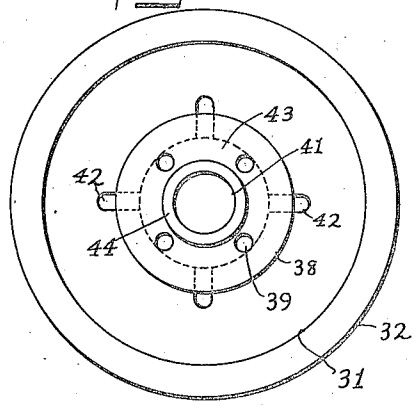
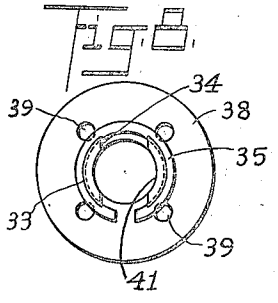


Fig. 8.



Stephen H. Brooks INVENTOR.

BY H. S. Anstutz

ATTORNEY.

Patented Dec. 3, 1940 2,223,598

UNITED STATES PATENT OFFICE

2,223,598

SAMPLING CAN

Stephen H. Brooks, New York, N. Y.

Application March 24, 1939, Serial No. 264,025

3 Claims. (Cl. 137—18)

My invention relates to improvements in sampling cans and it more especially comprises the features referred to in the accompanying claims.

An object of the invention is to provide an all-around-purpose sampling can that will enable a sampler to secure samples of the contents of a tank at the top level, at the bottom level and at any desired point between the extremes; and that also, in addition to securing the desired sample, the temperature of the sample is determinable at the same time.

With these and related objects in view I illustrate in the accompanying drawings such an instance of adaptation as will disclose the broad features of the invention without limiting myself to the specific details shown thereon and described herein.

Fig. 1 is a side elevation partly in section of the can unsuspended, and closed at top and bottom.

Fig. 2 is a side elevation partly in section of Fig. 1 showing the can suspended, closed at the top and open at the bottom.

Fig. 3 is a front elevation, partly in section showing the can open at the top.

Fig. 4 is a bottom plan of the lower end.

Fig. 5 is an enlarged elevation partly in section showing the opening of the valve in the bottom of the can throughout the presence of the sampling bottle.

Fig. 6 is an enlarged elevation in section of the cap shown in Fig. 5.

Fig. 7 is a bottom plan view of Fig. 6.

Fig. 8 is a top plan view of the valve releasing means positioned in the cap.

In the actual production and use of my sampling can I may employ whatever alternatives or equivalents that the exigencies of varying conditions may demand without departing from the broad spirit of the invention.

The sampling can may be made of a brass or other non-corroding metal tube 1. It has a removable top 2 and a bottom 3. The bottom includes a valve 4 that has a stem 5 which is held normally closed by reason of a spring 6 on the stem 5. The spring abuts the valve casing cross member 7 and a collar 8 on the stem. The stem 5 has movement in the cross member bearing 9. On each side of the cross member openings 10 are formed. These openings serve as ports for the entrance of liquid when the valve 4 is open. The portion 3 has depending protective fingers 11. A safety cap 12 encloses the bottom 3 when it is not to be used to secure a sample of liquid from the tank at the lowest point of the tank.

The top 2 is attached to the tube by means of internal radial pins 13 which enter inclined grooves 14 formed on the outer face of the base of this upper or top member. An opening 15 is formed to admit liquid at the top of the sampling well when the opening is unobstructed.

This top member 2 has two upstanding projections 16 which are each provided with two curved slots. The short slot 17 limits the position of the closure 18 in relation to the opening 15, maintaining the opening closed. The long curved slot 19 limits the extreme upward movement of the closure stem 18 when it is raised to free the opening 15 to admit liquid to the can 1.

The closure stem 18 is slightly tapered at its lower end to lead it into the opening 15. At its upper end an hemispherical enlargement 20 is formed. This has two side bosses 21 into which the threaded end of the shoulder screws enter. The enlarged portions 22 are positioned in slots 17 or 19. These screws have heads 23 which prevent the enlargement 20 becoming disconnected from the slots 17 and 19. The enlargement 20 at its topmost surface has an eye 24 formed for the attachment of a snap 25 swiveled to the end of a strong flat tape line 26 which is attached to any desired form of winding device secured to the tank top (not shown).

After the can has been lowered into the liquid to any desired depth, noted from the indications on the tape line, at which a sample is to be taken a sudden slackening and a quick jerk of the tape line will bring the screws 22 into the long slot 19 thus uncovering the opening 15 and admitting liquid from the desired level. When sufficient time has elapsed to fill the can there is no need for specially closing it.

A thermometer 27 is secured on the inside of the tube 1 by spring clips 28 in any desired manner. It supplies definite temperature data from any level of the tank contents.

The operation of my sampling can is very simple through the cooperation of a rapid closing gate valve in a pipe extension on the top of a tank. This has side openings above the valve through which the can is passed and secured to the free end of the tape line. The tape line is wound on the axle of a winch which is controlled by an outside crank. These features relating especially to gas tight tanks are not shown herein as they constitute a separate invention. They are however described in an application, Serial No. 245,124, filed on December 12, 1938. Suffice

it to say the inherent mechanism of the sampling can and its operation is not limited to the exclusive use in gas tight tanks.

Sampling cans have been used in the oil industry for taking samples of tank contents in various ways by inefficient means of one primitive type or another. It is most important to obtain a sample of oil at any exact given depth of the tank because a tank having a given depth of oil in it which has remained at this level without any movement for a period of six months will probably have become stratified to such an extent that differences of specific gravity will be found at the five, ten, fifteen, twenty, twenty-five foot and other levels. In the oncoming use of pressure tanks this matter of stratification is very important. It is so important that samplers operated by means of two strings, as has been in vogue, is entirely inadequate and impractical.

The cooperative use of a thermometer with my sampling can is a great advantage over prior existing temperature reading devices. In ordinarily taking the temperature of the contents of a tank the thermometer is lowered into the tank and submerged in the oil. Should a forty-foot tank have only fifteen feet of oil in it by the time an unprotected thermometer is raised through the twenty-five feet of gas vapor space, which, under summer conditions may have a temperature as high as 200 degrees Fahrenheit will show a resulting temperature that is many degrees higher than the temperature of the oil in the bottom portion of the tank. With my combined sampling can such discrepancies cannot arise because the thermometer used is inside of the can in direct contact with the actual sample of oil brought to the top of the tank.

Should a graduated sample be desired the top **2** is swung into a tight fit on the tube **1**, the tape line snap **25** is attached to the eye **24** of the enlargement **20** of the closure stem **18** and the can, in this position, is lowered into the tank and the oil regardless of its gravity permits the slow filling of the can in its downward progress, thus securing an average sample of the tank's contents.

In case a sample is desired at any given level the closure stem **18** may be manually operated to change the position of screws **22** from slot **19** to the slot **17** so as to thus close the opening **15**. The sampler finding the can at the desired point slacks the tape quickly for two or three inches, and immediately recatches it. In this condition, the can, being empty, it has considerable buoyancy and practically no weight, the effect of the sudden slack of the tape allows the ball **20** and its stem **18** to drop to its lowest position, when a sudden pull on the tape will raise it to its highest position so as to let oil flow through the opening **15** to fill the can. A continued upward pull of the tape will bring the can to the top of the tank for observation.

The cooperative action of the curved interconnecting slots **17** and **19** is such that a movement of the pivot screws **22** up and down in such slots will automatically reverse the position of the screws, that is, when the screws **22** drop in slot **17** to the lowest point the next pull upward on **20** will bring the screws to the top of the slot **19** leaving the opening **15** open to receive the desired sample.

When samples of the contents of tanks which are of high gravity gasoline under high vapor pressure of ten to twenty pounds, are to be taken from the tank to be of service they must be transferred from the sampling can to sampling bottles.

In ordinary practice the contents of large sampling cans are usually poured into sampling bottles by removal of the top of the can. This procedure causes the loss of a considerable part of the very light portions of the high gravity gasoline to evaporate into the air.

To avoid this loss the expedient shown in Figs. 5 to 8, is used. By means of this attachment to the bottom of the can, instead of the cap **12** shown in Fig. **1**, the highly volatile gasoline may be removed from the tank **1** directly into a sampling bottle from the bottom of the can instead of pouring it out from the open top of the can.

A supplemental cap **29** is screwed on the bottom of the can instead of the cap **12**. This cap has a partition **30**, a bottom recess **31**, and a knurled rim **32**. A central hole is formed in the partition **30** in which a stem **33** is free to move by gravity. This stem at its upper end is slotted at **34** and an annular groove is formed on its outer surface to receive a split ring **35**. At the lower end of the stem **33**, it is threaded internally at **36** to receive a plug **37**.

About midway of the length of the stem **33** a thin enlargement **38** is formed. It has openings **39** which are the same in number as the radial grooves **42** formed on the under face of the partition **30**. The split ring **35** on the stem **33** rests against the upper face of the partition **30**, which prevents the accidental removal or loss of the stem.

The highly volatile contents of the can are removed as follows. The cap **29** is screwed onto the bottom of a full can and the plug **37** is removed from the bottom end of the stem **33**, the stem resting in its lowest position. The projection **44** is placed into the open neck of the sampling bottle **40**, and the bottle is then moved upward against the enlargement **38**. This causes the upper end of the stem **33** to engage the enlargement **8** of the valve stem **5**. A further upward movement of the bottle until the enlargement **38** engages the underside of the partition **30**, will open the valve **4** so that the contents of the can will flow through the opening **41** of the stem **33** into the sampling bottle, thus insuring that the highly volatile gasoline is removed from the sampling can without any evaporation losses. The radial grooves **42** and the concentric groove **43**, associated with the openings **39** of the disk **38** permit air to escape from the bottle.

Gasoline will flow freely from the can **1** into the bottle **40** by reason of the slot **34** of the stem **33** forming a free passage into the opening **41** of the stem. If the slot **34** were not formed then the upper end of the stem **33** engaging the underside of the enlargement **8** of the valve stem **5** would prevent the passage of gasoline.

What I claim is:

1. A sampling can containing highly volatile liquid having a spring-pressed valve at the lower end of the can, a removable cap to be attached and detached from the bottom end of the can below the spring-pressed valve, a partition in the cap, a hollow stem subject to gravity having movement in an opening in the partition adapted to engage the spring pressed valve in the bottom end of the can, a stem for such valve, and means for raising the valve when a sample bottle is pressed against the gravity stem.

2. A sampling can comprising a gravity inlet valve at the top of the can, a spring pressed closure valve at the bottom end, a cap having

a partition therein, a gravity tube movable in the partition, a notched upper end of the tube, an annular flange around the tube having air vent holes therein, said tube serving to move the spring-pressed closure valve upward into an open position through the tube being raised when a sampling bottle is pressed against it whereby any highly volatile liquid in the can is transferred to the bottle without the loss of vapor while the sampling bottle is being filled and on the withdrawal of the bottle the parts are restored to their former position.

3. A sampling can comprising a tube, a gravity inlet valve at the top, a spring pressed closure valve at the bottom, a screw cap for the top of the can in which the gravity inlet valve is operative, a pair of upstanding projections having reversed curved slots therein, a pin extending from each side of the gravity valve entering into the slots of the projections and an eye on the gravity valve for suspending the entire tube from a measuring tape.

STEPHEN H. BROOKS.