Feb. 14, 1933. R. W. THOMAS 1,897,166

CUSTOMER'S EQUIPMENT FOR STORING, PROTECTING, AND DISPENSING LIQUEFIED GAS

Filed Jan. 31, 1930 2 Sheets-Sheet 1

FIG. 1.

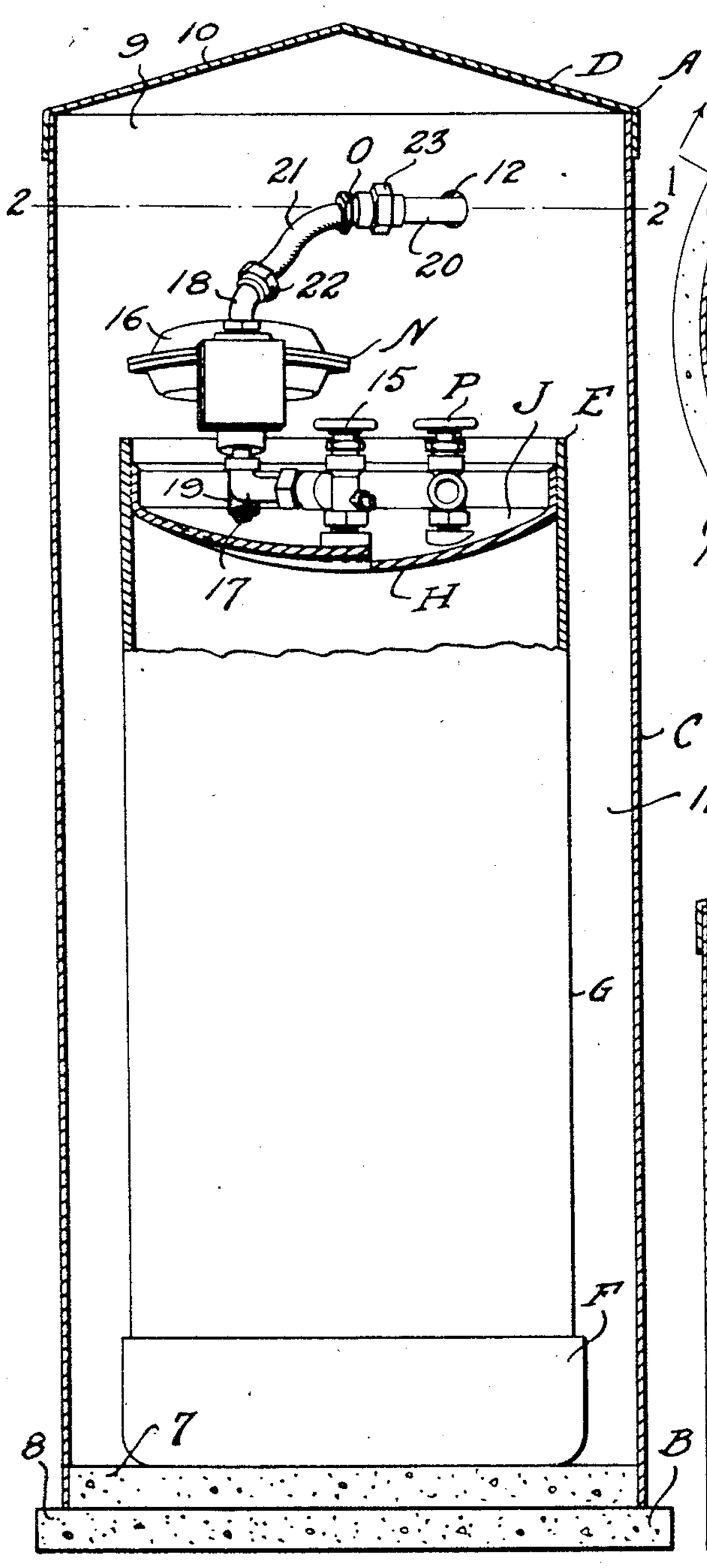

FIG. 2.

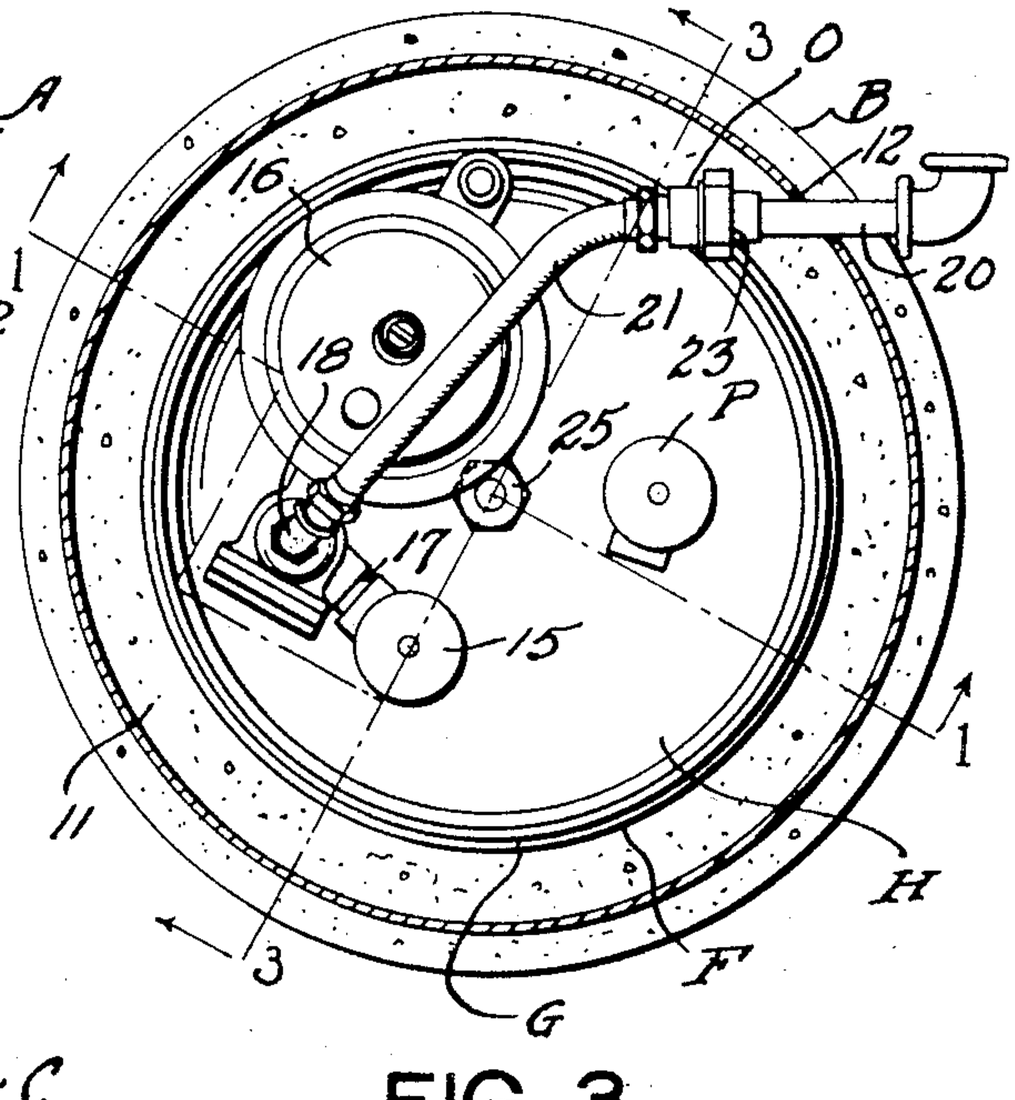

FIG. 3.

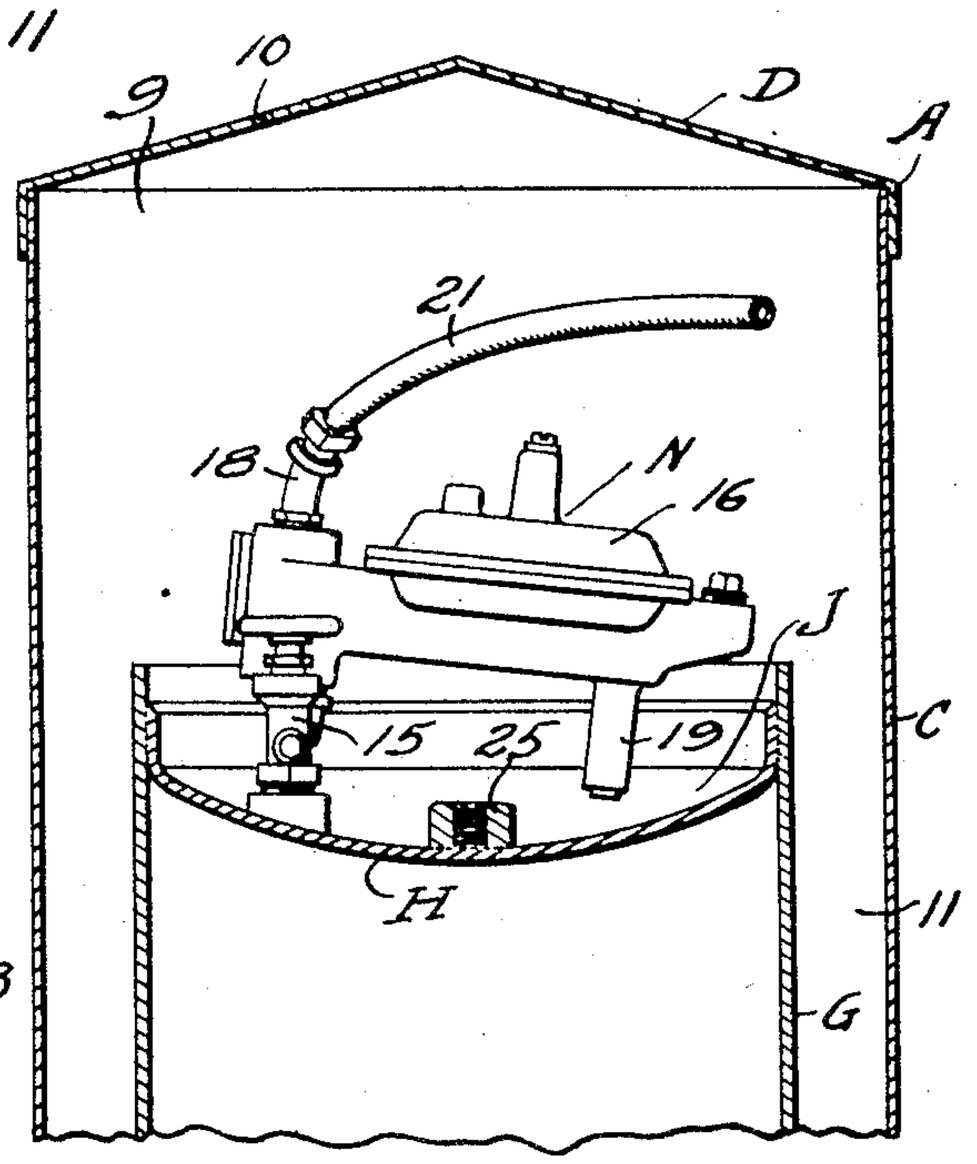

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FIG. 4.

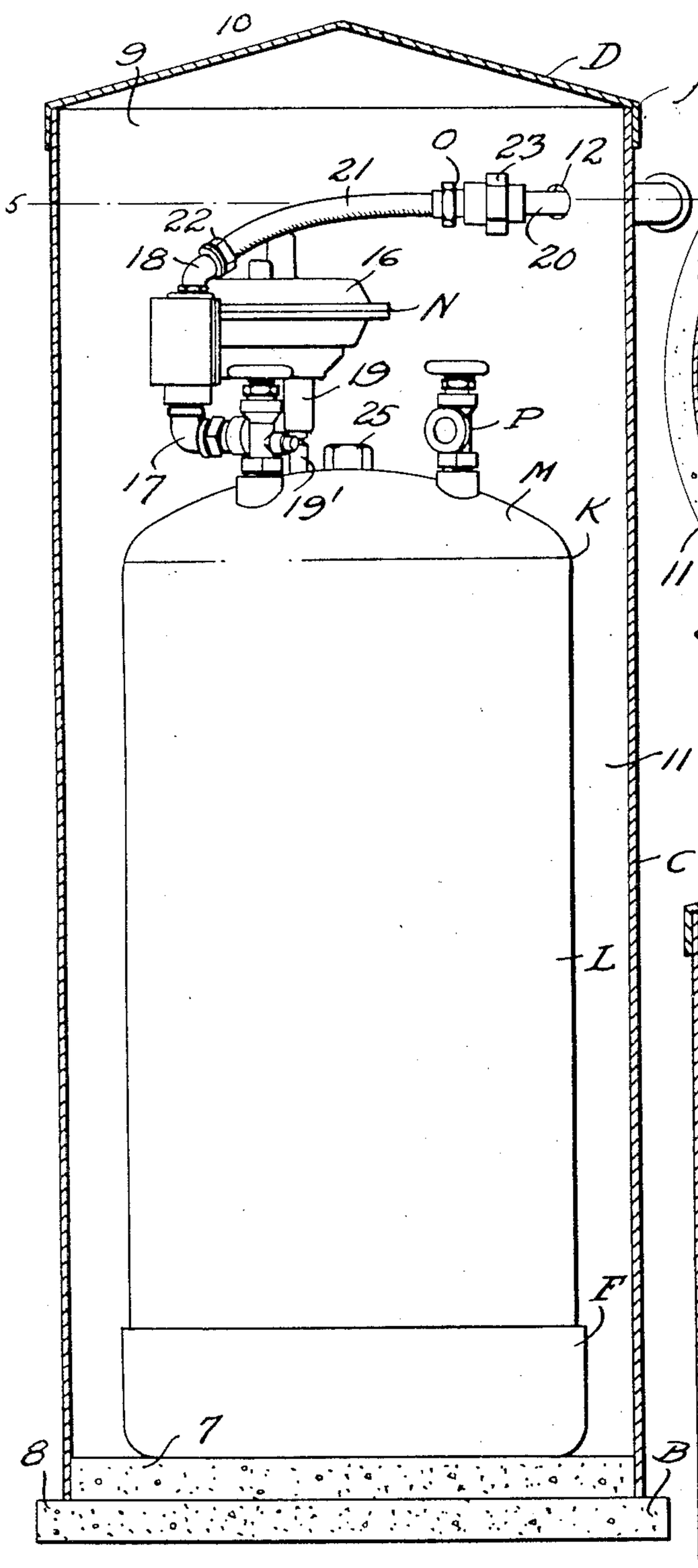


FIG. 5.

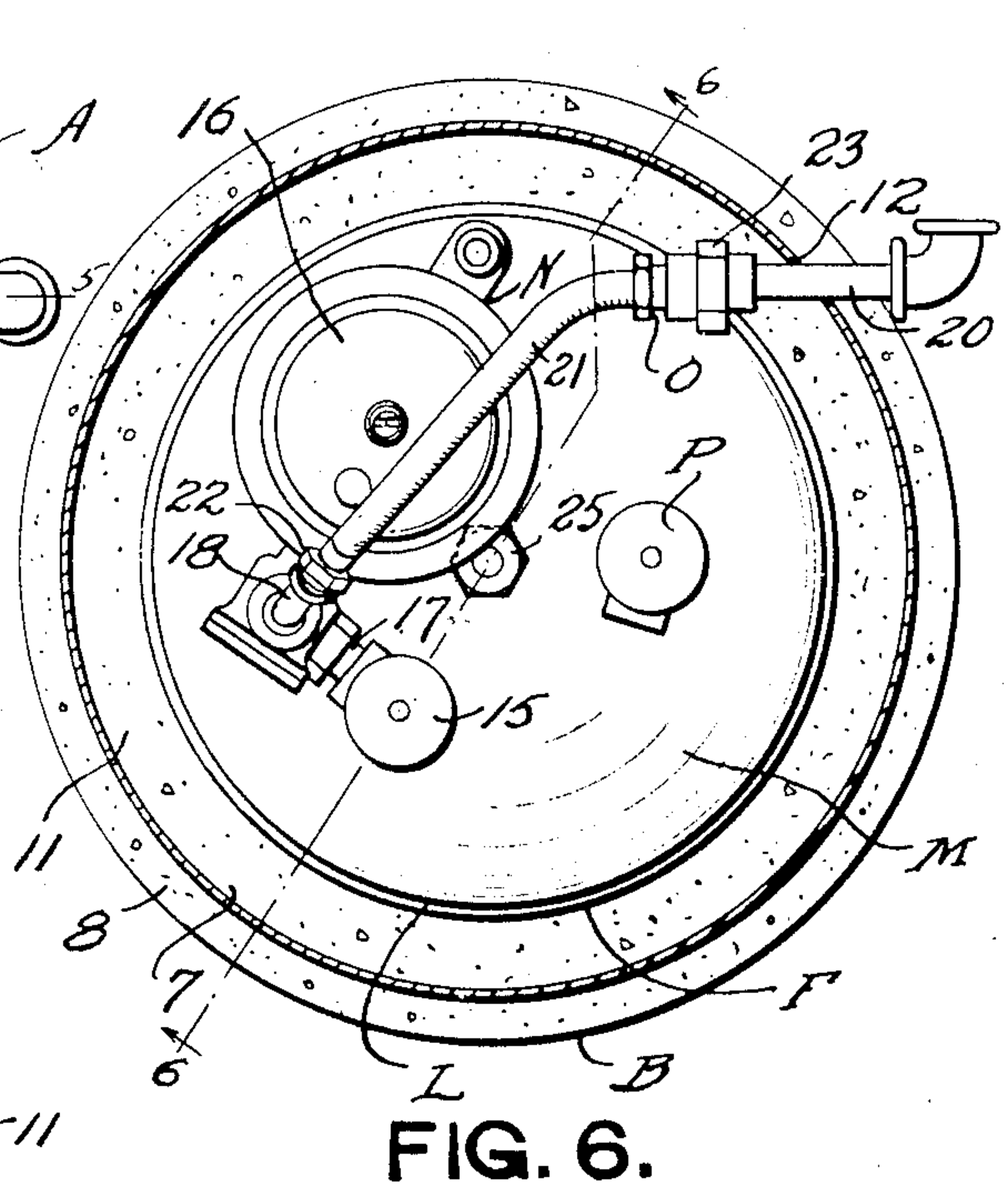
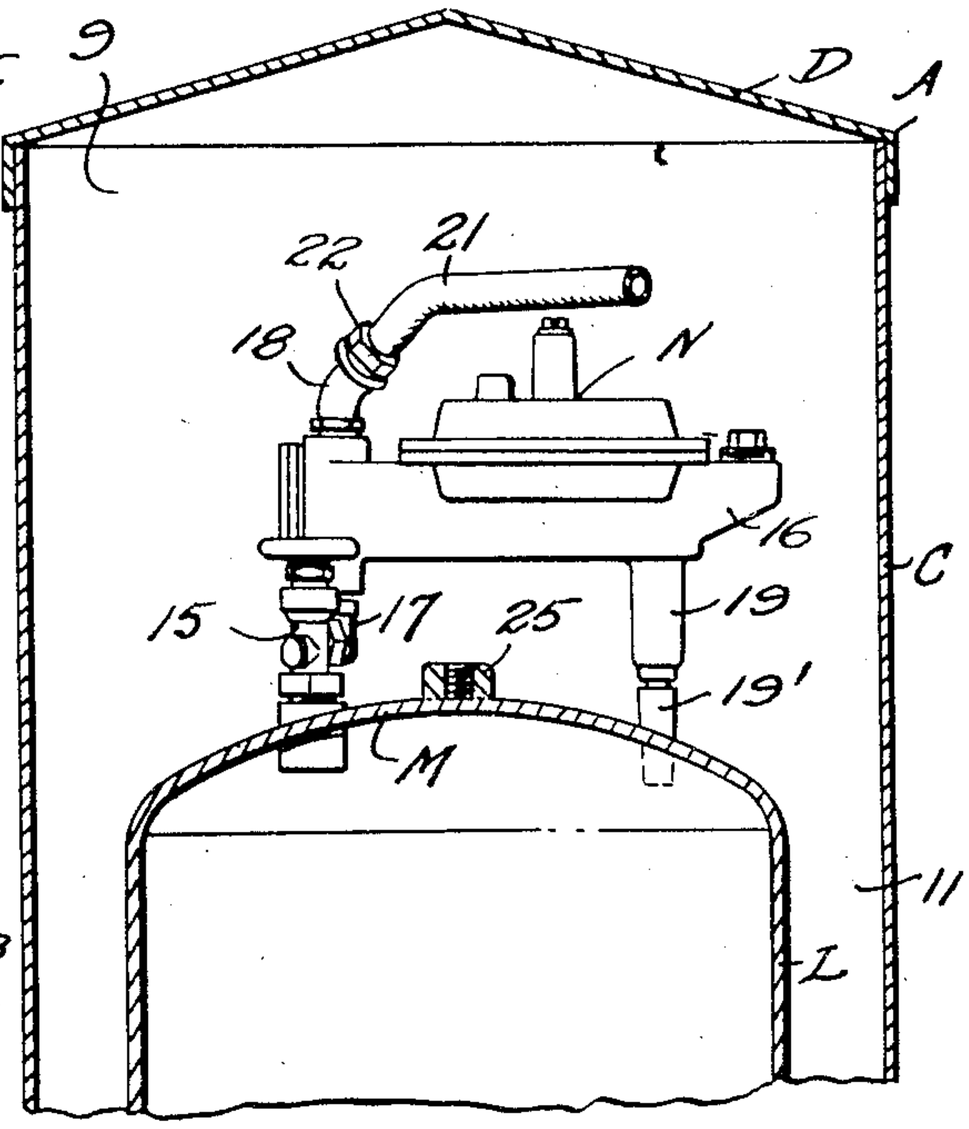


FIG. 6.



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UNITED STATES PATENT OFFICE

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CUSTOMER'S EQUIPMENT FOR STORING, PROTECTING, AND DISPENSING LIQUEFIED GAS

Application filed January 31, 1930. Serial No. 425,022.

The present invention relates to equipment adapted to be installed on customers' premises for storing and dispensing petroleum gas in liquid phase, such as propane, under superatmospheric pressure, but which changes to a gas or vapor phase when its pressure is reduced to a certain extent.

It is the practice to provide supplies of liquefied gas of this character for customers by what is generally known as the "two-drum" and "one drum" systems. The former includes a cabinet or housing located on the premises of the customer and containing two drums or cylinders suitable for storing and dispensing liquefied gas, only one of which is ordinarily drawn from at one time, the other being normally in reserve and to be drawn from when a drum becomes empty. When empty it is removed and another substantially filled is substituted. According to the "one drum" system a cabinet or housing containing one drum or cylinder suitable for the purpose, is provided on the customers' premises, the supply of liquefied gas being replenished from time to time without removing the drum from the premises. The advantages of the "one drum" system are to be found in low investment requirements, economics in distribution and increased convenience to the customer. This periodic charging of the drum or cylinder on the premises of the customer is accomplished by the use of tank delivery trucks, and the transactions between the distributor and customer are very much like those between the distributor of manufactured gas piped from the place of manufacture to the customer's domestic equipment such as those devices for cooking, heating and lighting, in that the customer may be billed from time to time for so much of the product as he has used between calls by the service man. Thus the customer is not required to make a large outlay at various times as is the usual practice where a completely filled substitute drum is furnished for one which has been emptied by the customer's use.

An important factor from an economical standpoint of the "one drum" system is low cost of assembly and installation of the equipment on the premises of the customer, and the expeditious periodical servicing of customers. The drums are usually weighed to determine the quantity of liquefied gas which has been used and suitable equipment for this purpose is disclosed in application for Letters Patent of Paul S. Endacott, filed July 27, 1929, Serial Number 381,503. It is one of the principal objects of the present invention to provide equipment which may be quickly assembled, and which when assembled facilitates the procedure of weighing the drums and inspection by the service men while covering their routes.

This is in part accomplished by supporting on the drums such accessories as excess pressure release devices and pressure regulating and reducing valves for control of the egress of the gaseous vapor from the drums, instead of on or by the cabinets, and in part by the placing of these accessories well within the planes of the lateral walls of the drums, so that the cabinets may be placed or removed over the drums while the latter rest in upright position on their bases and without injury to such accessories.

Other objects and advantages of the invention will appear in the following detailed description, taken in connection with the accompanying drawings, forming a part of this specification and in which drawings:

Figure 1 is a view partly in elevation and partly in vertical section on the line 1—1 of Figure 2 of customers' equipment.

Figure 2 is a horizontal sectional view on the line 2—2 of Figure 1.

Figure 3 is a fragmentary section on substantially the line 3—3 of Figure 2 looking in the direction of the arrows.

Figure 4 is a view similar to Figure 1 but showing a modified form of drum.

Figure 5 is a sectional view on the line 5—5 of Figure 4.

Figure 6 is a sectional view on the line 6—6 of Figure 5 looking in the direction of the arrows.

In the drawings, A designates a cabinet or housing including a base B, main body part C carried by the base, and a cover D for the body part.

In Figures 1, 2 and 3, E is a drum, preferably cylindrical in shape, comprising a base portion F, main body portion or lateral wall G, and a top wall H which bulges inwardly as shown in Figures 1 and 3 and is preferably welded to the wall G providing a cavity J.

In Figures 4, 5 and 6, K is a modified form of drum having a main body portion or lateral wall L provided with an integral outwardly bulging top wall M.

Suitable means N are shown for controlling the egress of gaseous vapor from the drums E and K and service conduit lines O associated with means N. Ingress of the liquefied gas at the drum may be had thru valve P.

In the examples shown, the cabinet A differs only slightly from what is shown in application for Letters Patent filed by Paul S. Endacott, May 26, 1928, Serial Number 280,745, on Customers' apparatus for storing and dispensing liquid gas, in that the base B has a reduced portion 7 laterally engaging the interior surface of main body part C, the latter being preferably cylindrical in shape and resting upon the wider portion 8 of the base. The body part C has a mouth 9 or open upper portion, normally closed by a cover D which may be moved so as to expose the interior cavity 11 of the cabinet. An opening 12 is provided in the main body part C, adjacent the mouth 9 for a purpose to be subsequently set forth. The upper portion 10 of the cover may be dome or cone-shaped so as to readily shed rain water.

The means N for controlling the egress of gaseous vapors from the drums may comprise outlet valve 15 and a pressure reducing and regulating device 16 in communication with valve 15 as by fittings 17, the devices 16 having an outlet 18 in communication with the aforesaid service conduit line O.

The service conduit line O comprises a rigid section 20 and a flexible section 21, the former extending into the cavity 11 as thru opening 12, and the latter having connection with the outlet 18 at the low pressure side of the pressure reducing and regulating device 16, as by a coupling 22. The sections 20 and 21 may be conveniently joined in fluid conducting relation by a union 23.

The valve P serves as suitable means for the introduction of the liquefied gas into the drum and this may be accomplished by the method for distributing liquefied gas disclosed in application for Letters Patent of Paul S. Endacott filed May 26, 1928, Serial Number 280,746, in which is disclosed the idea of determining the quantity of liquefied gas used by the customer, by lifting the drum from the base and the use of scales. To facilitate the weighing operation the heads H and M may have welded or otherwise secured at their centers screw threaded socket members 25 for the reception of a hook, not shown in the drawings, more fully disclosed in application for Letters Patent filed by me for liquid gas containers, October 8, 1929, Serial Number 398,239.

The devices 15 and 16, and the valves P are preferably carried by the top walls of the drums so that they are within the plane of the lateral wall of their respective drum thus making it possible to assemble the drum on the base B and particularly the pressure reducing and regulating device 16 in place before the main body part C of the cabinet is slipped into place in embracing relation to the drum and its accessories, without liability of damaging the latter. After these parts have been assembled, the rigid section of the service conduit line may be connected to the pressure reducing and regulating device 16 by the flexible section 21 in a manner that when valve 15 is opened, the service conduit line is subjected to a considerably reduced pressure over that which normally exists in the drum.

The preferred arrangement is to dispose this flexible section 21 uppermost, that is, so that it will extend over the inlet valve P, the outlet valve 15, and the device 16, where it may be readily inspected by the service man each time he weighs the drum and its contents, or replenishes the supply of liquefied gas in the drum.

It is to be observed that the procedure in weighing may be accomplished without disturbing the rigid section 20 of the service conduit line, this section in practice being secured to some rigid object, such as the building containing the heating, cooking and/or lighting fixture to be supplied with gas from this equipment.

In the form shown in Figures 1, 2 and 3 the valves for inlet and egress of the petroleum product are mainly disposed in the cavity J and the mercury seal or other safety device 19 carried by the pressure reducing and regulating device 16 may rest upon the top wall H as shown more particularly in Figure 3 but it is to be understood that various other arrangements may be provided at the upper portion of the drum without departing from the spirit of the invention as defined in the appended claims. For instance, in Figures 4, 5 and 6, where there is no such cavity as is shown in Figures 1, 2 and 3, the mercury seal 19 or safety device may be supported on a

leg 19′ shown more particularly in Figure 6.

I claim:

1. Customer's equipment for dispensing an inflammable liquefied gas comprising, a portable drum for the liquefied gas under superatmospheric pressure, a pressure regulator rigid with the drum and in communication therewith so as to emit the contents of the drum from the regulator at reduced pressure and in a gaseous phase changed form, a cabinet enclosing said drum and pressure regulator and spaced laterally therefrom so that the drum and its contents may be lifted while in the cabinet for weighing purposes, and a service conduit line including a flexible section in said cabinet operatively connected to the outlet of said pressure regulator and a rigid section connected to said flexible section, and extending thru said cabinet, so that the flexible section is subjected to a considerably lower pressure than the drum and so that the drum may be lifted for weighing purposes while in the cabinet and while said cabinet and rigid section of the service conduit line remain stationary.

2. Customer's equipment for dispensing an inflammable liquefied gas comprising, a portable elongated upright drum for the liquefied gas under superatmospheric pressure, a pressure regulator rigid with the drum at the upper end portion thereof and in communication with the drum so as to emit the contents thereof from the regulator at reduced pressure and in gaseous phase changed form, a cabinet enclosing said drum, including a main body part and a movable cover at its top, and a service conduit line including a flexible section operatively connected to the outlet of said pressure regulator and a rigid section connected to said flexible section and extending thru the main body part of the housing, so that the flexible section is subjected to a considerably lower pressure than the drum and so that the drum may be lifted for weighing purposes while in the cabinet and while said cabinet and rigid section of the service conduit line remain stationary.

3. In customer's equipment for dispensing an inflammable liquefied gas, the combination of an upright cylindrical drum for the liquefied gas under superatmospheric pressure; devices carried directly by the upper end of said drum and wholly within the plane of the lateral wall of the drum, for controlling the egress, and reducing and regulating the pressure of the gaseous vapors from the drum; a cabinet enclosing said drum and devices including a base upon which the drum rests in an upright position, a cylindrical main body portion carried by said base encircling the drum and devices and having an open top, said main body portion separable from the base so that it together with the drum may be pushed over and rolled on the ground, and a movable cover for the top of said main body portion; and a service conduit line including a rigid section extending through the main body portion of the cabinet and a flexible section in the cabinet operatively connecting said rigid section and devices whereby gaseous vapor may be conducted from the latter to the former, and whereby the drum may be lifted for weighing purposes while in the cabinet and while said rigid section and main body portion of the cabinet remain stationary.

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