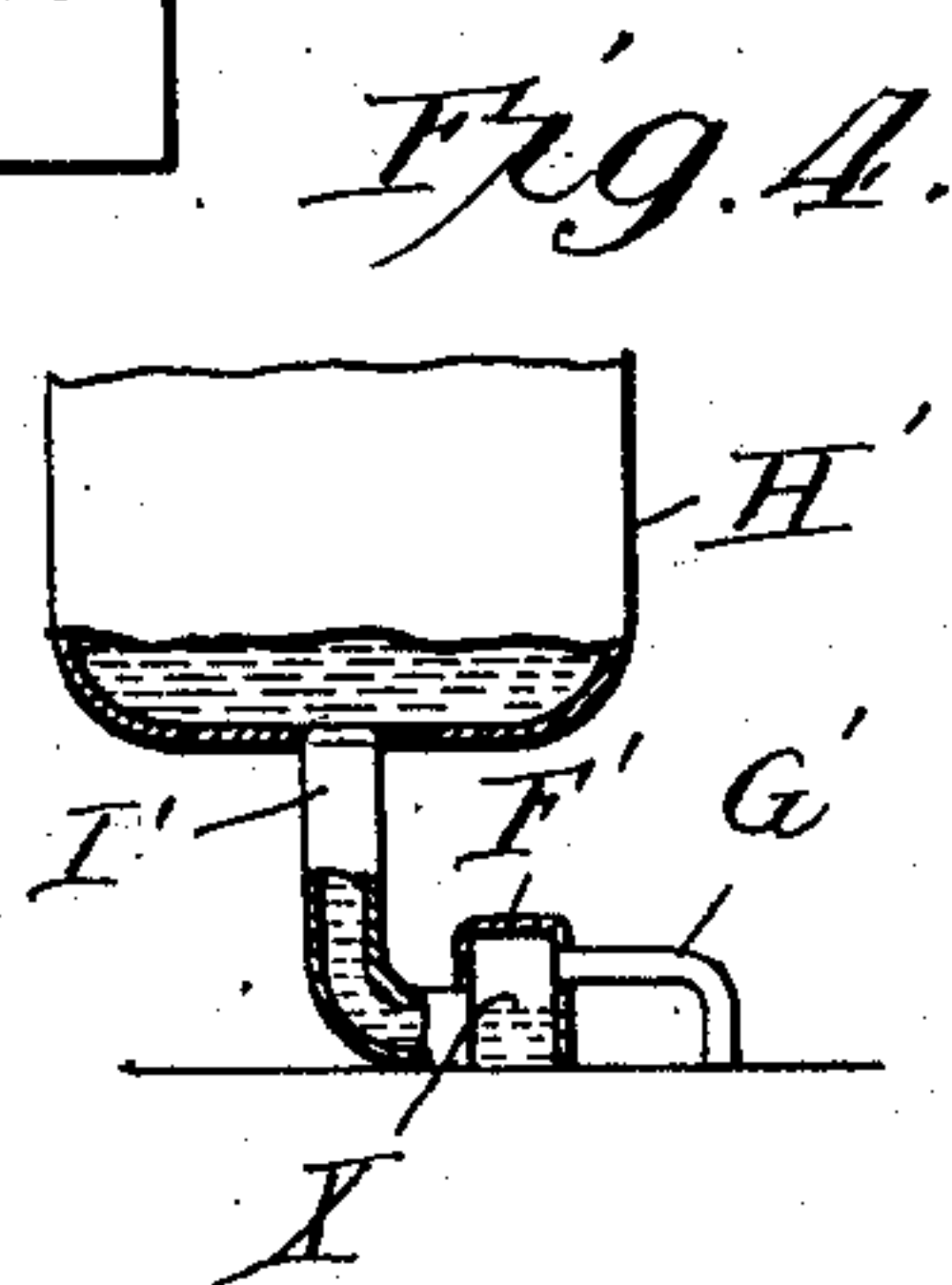
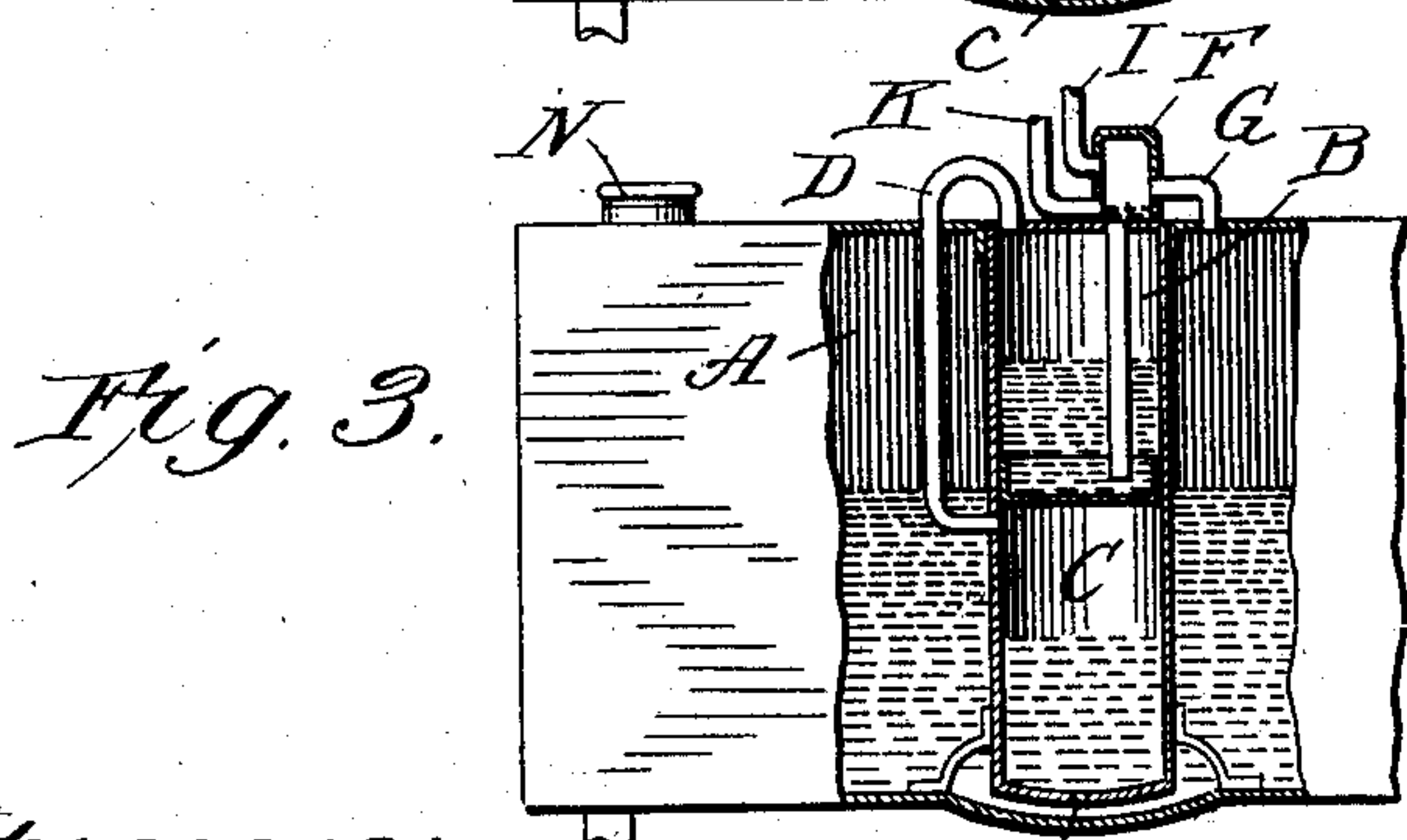
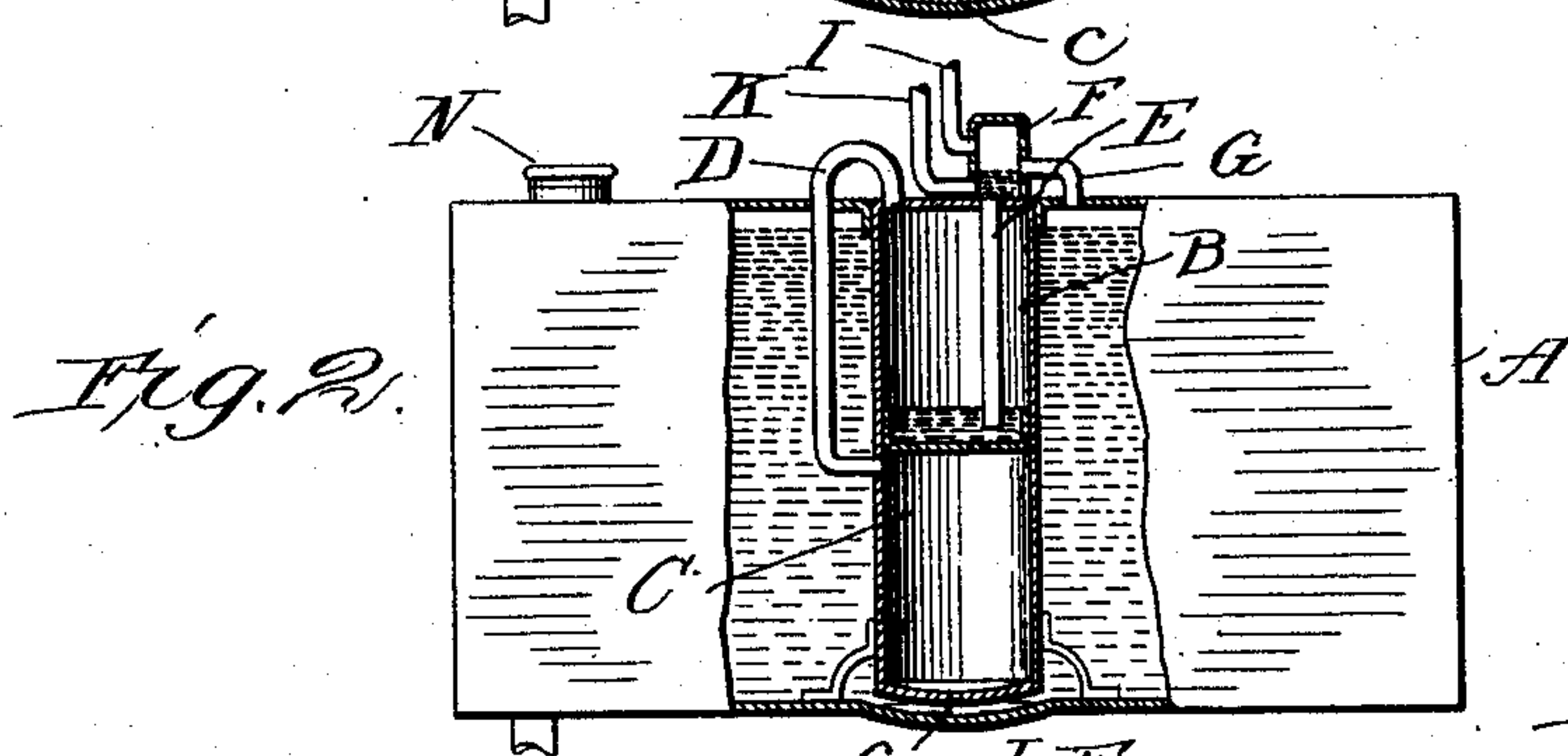
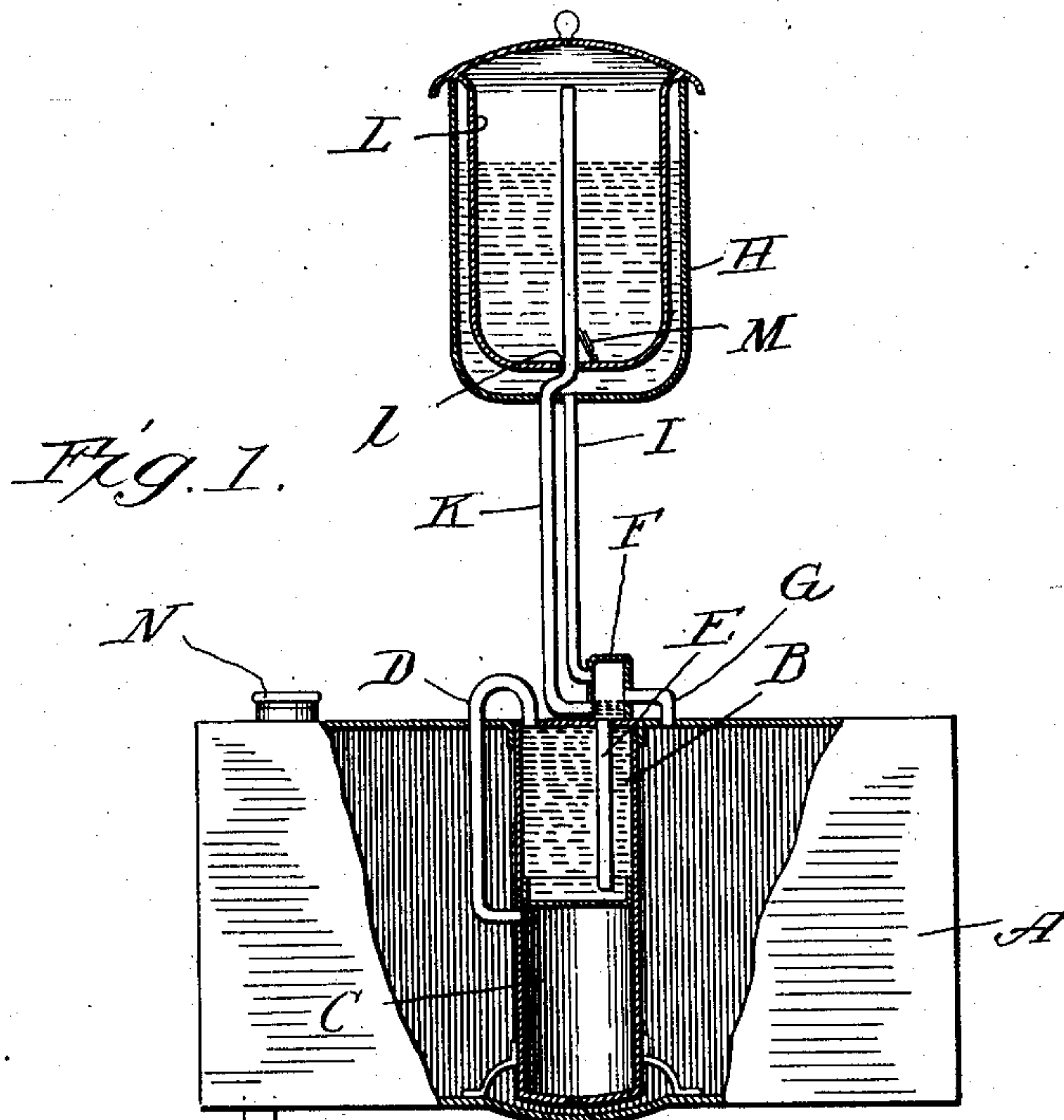


F. PURDY.  
 APPARATUS FOR MIXING AND CONTAINING LIQUIDS.  
 APPLICATION FILED NOV. 22, 1909.

992,802.

Patented May 23, 1911.



Witnesses:  
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*attys*



# UNITED STATES PATENT OFFICE.

FREDERICK PURDY, OF KENOSHA, WISCONSIN, ASSIGNOR TO THOMAS B. JEFFERY, OF KENOSHA, WISCONSIN.

APPARATUS FOR MIXING AND CONTAINING LIQUIDS.

992,802.

Specification of Letters Patent.

Patented May 23, 1911.

Application filed November 22, 1909. Serial No. 529,259.

*To all whom it may concern:*

Be it known that I, FREDERICK PURDY, a citizen of the United States, residing at Kenosha, county of Kenosha, State of Wisconsin, have invented a certain new and useful Improvement in Apparatus for Mixing and Containing Liquids, and declare the following to be a full, clear, and exact description of the same, such as will enable others skilled in the art to which it pertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification.

My invention has for its object to provide a simple and novel apparatus whereby two liquids may be automatically mixed in predetermined proportions regardless of the quantities in which one of said liquids is supplied.

The various features of novelty whereby my invention is characterized will hereinafter be pointed out with particularity in the claims; but, for a full understanding of my invention and of its object and advantages, reference may be had to the following detailed description taken in connection with the accompanying drawing, wherein:

Figure 1 is a view partly in section and partly in side elevation, showing one form of my improved apparatus, the condition being that wherein one of the liquids has been supplied and before the introduction of the other liquid; Fig. 2 is a view similar to Fig. 1, showing the condition after the second liquid has been supplied; Fig. 3 is a view similar to Figs. 1 and 2, showing the condition after a portion of the mixture has been withdrawn; and Fig. 4 is a fragmentary view partly in side elevation and partly in section showing a modification.

In my application, Serial No. 529,258, filed on even date herewith, I have disclosed a novel form of apparatus for automatically mixing together in predetermined proportions two liquids and thereafter maintaining the proper proportion in the mixture upon withdrawal of the mixture and replenishment of one of the liquids in whole or in part; the invention being particularly applicable to mixing a lubricating oil with a liquid fuel, such as gasoline, without being limited to these particular liquids. The present invention relates to the same art and has to do particularly with the supply

of one of the liquids when and in the quantities desired.

Referring to the drawing, A represents a main reservoir for containing one of the liquids, to which I shall hereafter refer as gasoline.

B is an auxiliary reservoir for containing the second liquid, to which I shall hereafter refer as oil.

C is a closed chamber which opens into the main reservoir adjacent to the bottom thereof through an opening *c*. The auxiliary reservoir is closed at the top and communicates with the chamber through a conduit D, which passes from the top of the auxiliary reservoir to the top of the chamber.

E is a tube which extends from the top of the auxiliary reservoir toward the bottom where it opens into the auxiliary reservoir.

F is a hood into which the upper end of the tube E opens, and G is an overflow pipe leading from the hood into the main reservoir.

H is a vessel which communicates with the hood through a tube I.

K is an air tube which opens into the hood at a lower level than the tube I and extends upwardly through the bottom of the vessel.

L is a supply tank detachably supported within the vessel H and having an outlet *l* in the bottom thereof.

M is a valve adapted to close the outlet *l* when free to do so, as long as the tank occupies its normal upright position. The parts are so proportioned that when the tank is placed in position, the end of the air tube strikes the valve and opens it, the upper end of the tube finally entering the top of the tank.

Assuming that the supply tank is full of oil and the main and auxiliary reservoirs are empty: As soon as the supply tank is placed in position oil flows through the outlet *l*, through the tube I and thence through the hood F and the tube E into the oil reservoir. The air in the reservoir will be expelled through the conduit D and through the air chamber. The oil which flows out of the supply tank will be replaced by air which flows upwardly through the air pipe K. The flow of oil into the auxiliary reservoir will continue until the reservoir is full



and the oil has reached a level in the hood which will seal the end of the air pipe. Since air can no longer flow into the supply tank, no oil will flow therefrom. The  
 5 overflow pipe G is placed at a somewhat higher level than the lower end of the air pipe so that the end of the air pipe will be sealed before oil can begin to overflow into the main reservoir. The condition is now  
 10 that illustrated in Fig. 1.

When the gasoline is poured into the main reservoir through the inlet N it begins to flow into the lower end of the closed chamber and forces the air upwardly into  
 15 the top of the auxiliary reservoir, displacing some of the oil in the reservoir and forcing it upwardly through the tube E, hood F and overflow pipe G. This discharge of the oil from the auxiliary reservoir continues  
 20 as the gasoline rises in the main reservoir until, when the main reservoir is full, the auxiliary reservoir will have been emptied to a point adjacent to the lower end of the tube E. This condition is illustrated in Fig.  
 25 2. During the filling of the main reservoir, the oil in the hood has remained at or above the level which will effect the sealing of the mouth of the air pipe so that no more oil is supplied to the auxiliary reservoir after it  
 30 has become filled. As soon as withdrawal of the mixture from the main reservoir begins, lowering the liquid level in the main reservoir, the head of the oil above the oil level in the reservoir becomes too great to  
 35 be supported by the head of the mixture in the main reservoir and consequently there is a backflow of oil through the tube E and into the reservoir. This backflow continues until a state of equilibrium is reached and  
 40 as soon as it has become sufficient to uncover the mouth of the air pipe, oil will again flow from the supply tank. As the main reservoir is emptied, the backflow of oil in the auxiliary reservoir continues, the supply  
 45 port being intermittently opened and closed until finally, when the main reservoir has become empty, the auxiliary reservoir will again be full, as shown in Fig. 1.

The supply tank is preferably made much  
 50 larger than the auxiliary reservoir so that it will afford a sufficient supply of oil to give the desired proportion between the oil and the gasoline during several fillings of the main reservoir. It will be seen that af-  
 55 ter the main reservoir has been partially emptied it may again be filled without destroying the relation between the oil and the gasoline in the mixture for, whenever gasoline is poured into the main reservoir,  
 60 there will be a proper amount of oil transferred from the auxiliary reservoir to maintain the desired proportion between the oil and gasoline in the main reservoir.

In the arrangement shown, I have illus-  
 65 trated an apparatus wherein the pressure-

transmitting agent between the gasoline and the oil in the auxiliary reservoir is confined air; but it will, of course, be understood that any other suitable agent may be substituted for the air. I have also shown  
 70 the auxiliary reservoir placed directly above the closed chamber but it will, of course, be understood that this is simply a matter of choice and not of the essence of my invention. The closed chamber is so propor-  
 75 tioned that its volume is approximately equal to the volume of the oil which it is desired to mix with a quantity of gasoline which will approximately fill the main reservoir so that when the main reservoir is  
 80 full the gasoline will rise within the closed chamber to the top thereof, making it possible for a head of oil equal to the difference in the heights of the oil columns within and without the closed chamber to be main-  
 85 tained above the level of the oil in the auxiliary reservoir regardless of the actual height of the gasoline in the main reservoir.

In Fig. 4 I have shown a modification wherein the air and the oil flow through the  
 90 same pipe between the auxiliary reservoir and the oil tank. The pipe I<sup>1</sup> which leads from the bottom of the vessel H<sup>1</sup> is shorter and also larger in diameter than the pipe I in the other form. The mouth of this pipe  
 95 is below the inlet to the overflow pipe G<sup>1</sup>. As long as the level X of the liquid in the hood F<sup>1</sup> does not rise above the top of the mouth of the pipe I<sup>1</sup>, air will pass upwardly through this pipe so as to displace oil in  
 100 the supply tank. Consequently when the oil level drops in the conduit so as to make an addition necessary, oil will flow from the supply tank although not as freely as in the  
 105 other arrangement.

While I have described in detail only a single form of my invention, I do not desire to be limited to this particular form, but intend to cover all constructions and ar-  
 110 rangements of parts which fall within the terms employed in the definitions of my invention constituting the appended claims.

What I claim is:

1. In an apparatus of the character described, a main reservoir, an auxiliary reser-  
 115 voir, a conduit leading from the interior of the auxiliary reservoir and opening into the main reservoir, means for automatically and progressively displacing liquid in the aux-  
 120 iliary reservoir and forcing it into the main reservoir as liquid is poured into the main reservoir, a tank for containing liquid and an air pipe and a liquid supply pipe leading from said tank to said conduit, the air pipe  
 125 opening into the said conduit at a point below the outlet from the conduit into the main reservoir.

2. In an apparatus of the character described, a main reservoir, a closed auxiliary  
 reservoir, a chamber communicating at its 130



lower end with the bottom of the main reservoir, a pressure-transmitting agent between said chamber and the auxiliary reservoir, a discharge conduit extending downwardly  
5 from the top of the auxiliary reservoir and communicating with the interior thereof at a point considerably below the top, a supply tank, an air pipe and a supply pipe extending from said tank and connected with  
10 said conduit, and an overflow pipe leading from the conduit at a point above the mouth of the air pipe and opening into the main reservoir.

3. In an apparatus of the character described, a main reservoir, a closed auxiliary reservoir, a closed chamber communicating at its lower end with the bottom of the main reservoir, a pipe connecting the top of said chamber with the top of said auxiliary reservoir,  
15 a discharge conduit extending downwardly from the top of the auxiliary reservoir and communicating with the interior thereof at a point considerably below the top, a supply tank, a pipe extending from  
20 said tank and opening into said conduit, and an overflow pipe to the main reservoir leading from said conduit at a point above the mouth of the pipe leading from said tank.

4. In an apparatus of the character described, a main reservoir, an auxiliary reservoir, a conduit leading from the interior of the auxiliary reservoir and opening into the main reservoir, means for automatically and progressively displacing liquid in the auxiliary reservoir and forcing it into the  
35 main reservoir as liquid is poured into the main reservoir, a tank for containing liquid, and a pipe extending from the said tank and opening into the conduit at a point below the outlet from the conduit into the  
40 main reservoir.

In testimony whereof, I sign this specification in the presence of two witnesses.

FREDERICK PURDY.

Witnesses:

WM. F. FREUDENREICH,  
BRICEUS SWEET.

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Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."

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