

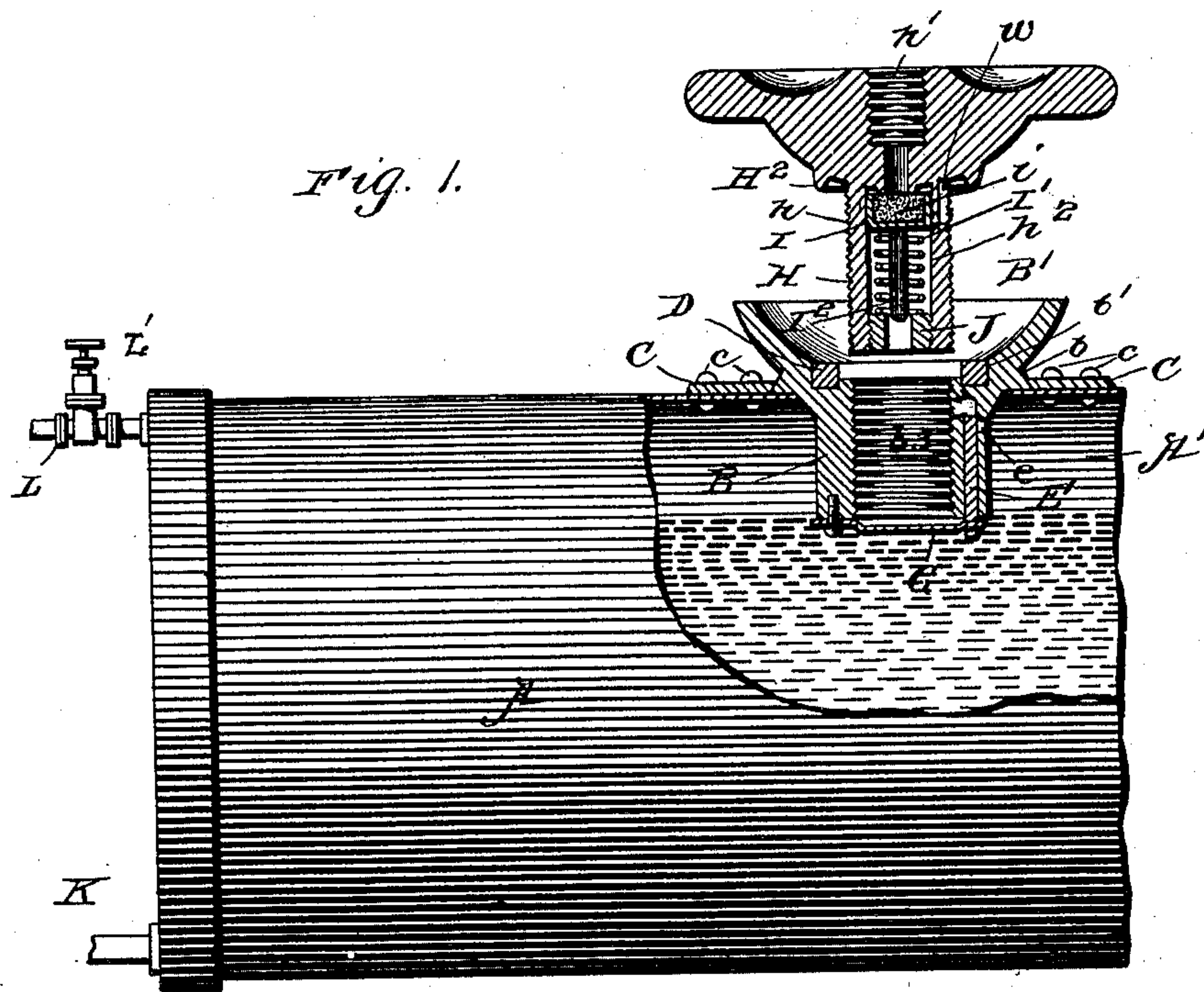
No. 688,256.

Patented Dec. 3, 1901.

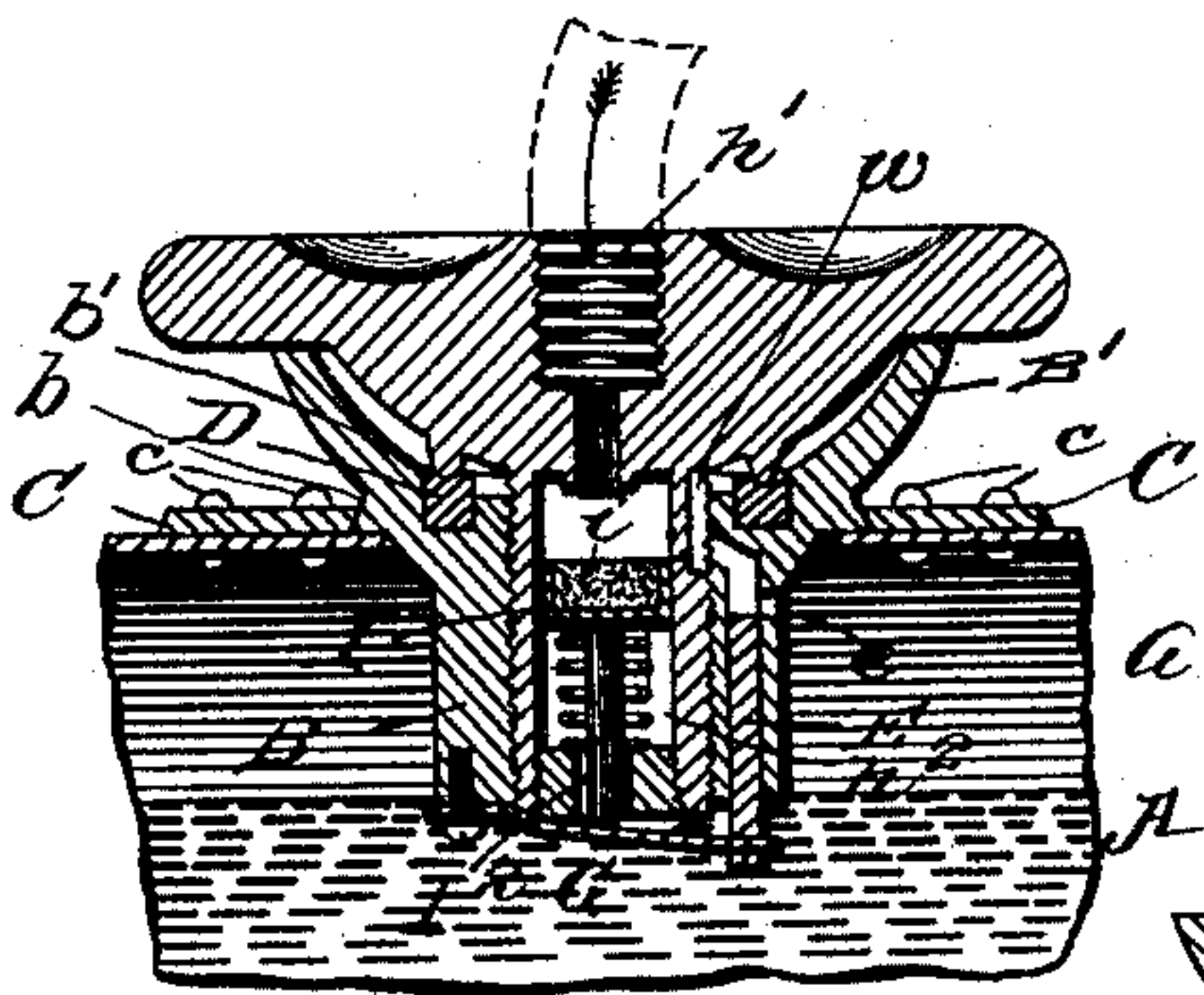
W. MITCHELL.  
TANK FOR VAPOR BURNERS.

(Application filed Oct. 13, 1900.)

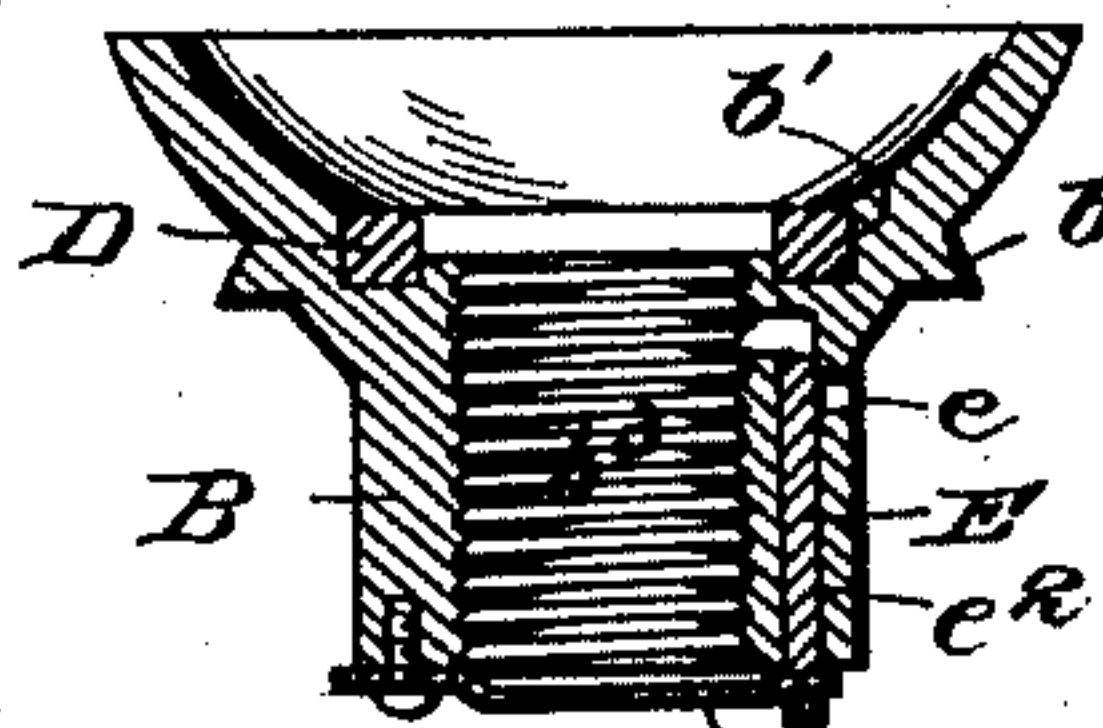
(No Model.)



*Fig. 2.*



*Fig. 3.*



WITNESSES  
*Florence Hieser,*  
*R. P. Herriek.*

*Willis Mitchell* INVENTOR  
*by W. H. Babcock*  
Attorney



# UNITED STATES PATENT OFFICE.

WILLIS MITCHELL, OF MALDEN, MASSACHUSETTS, ASSIGNOR TO THE  
MITCHELL GAS GENERATOR AND BURNER COMPANY, OF BOSTON,  
MASSACHUSETTS.

## TANK FOR VAPOR-BURNERS.

SPECIFICATION forming part of Letters Patent No. 688,256, dated December 3, 1901.

Application filed October 13, 1900. Serial No. 33,008. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIS MITCHELL, a citizen of the United States, residing at Malden, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Tanks for Vapor-Burners; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to hydrocarbon-vapor burners for steam-boilers and other places where quick and steady heat is required. It is especially intended for automobiles, although not by any means confined thereto.

The said invention consists in certain improvements in the tank or reservoir for supplying the burner and in the means for supplying said tank with liquid and retaining the latter except as supplied to the burner, while allowing an independent supply of vapor to an auxiliary burner and the escape of air.

The aforesaid improvements will be hereinafter more particularly set forth and claimed.

In the accompanying drawings, Figure 1 represents a vertical longitudinal section through the tank and auxiliary devices with screw-plug slightly detached. Fig. 2 represents a detail view of the inlet-tube, the screw-plug being in its place and the air-vent open; and Fig. 3 represents a detail view of the inlet-tube alone, the screw-plug having been removed.

A designates the tank or receptacle for gasoline or other inflammable volatile liquid and is provided with a liquid-outlet tube K near its bottom, which will also serve to allow the return of gas or vapor under pressure, as well as with an outlet-tube L for vapor near its top, said tube L being opened or closed at will by a valve L'. The gasoline is supplied through an inlet-tube B of considerable diameter extending down through the top of the same a sufficient distance to insure an air and vapor space A' of considerable dimensions above the surface of the liquid when the tank is fully charged. The upper end of this tube is flared out to form a bowl or cup B' above the said tank. At the junction of this bowl to the cylindrical body of the tube an external annular flange or shoulder b is

formed, which has a horizontal lower face resting on the top of said tank and a downwardly and outwardly beveled peripheral face adapted to be overlapped by a corresponding face of the inner edge of an annular fastening-plate C, which is secured to the top of said tank by rivets c. The inner face of the said bowl at the junction of the said tube therewith is provided with an annular recess b', which receives a packing-ring D. A doubly-bent air vent or passage e, having approximately the shape of the letter Z, extends through the walls of said inlet-tube at its upper end. A continuation e<sup>2</sup> of the vertical part of this angular air vent or passage extends down through the wall of the said tube to the lower end thereof, and a valve E of rod or pin form is arranged in this extension so as to be movable up or down for closing or opening the said vent. This valve or rod is mounted on the free end of a spring G, which extends across the said tube, being attached at its other end to the bottom thereof. The said tube is internally screw-threaded at b<sup>3</sup> to receive the external screw-threads h of the stem of a screw-plug H, the top of which is expanded to form a cap, resting upon the top of the said bowl B' when the said screw-plug is in its lowest position. The plug H is cut away at w on the outside near the upper end of its stem, forming a passage or outlet that registers with the air-vent e when the plug is nearly screwed home. This screw-plug is tubular, the upper end of its bore being enlarged and screw-threaded at h' for the attachment of a coupling, through which air may be forced into the interior of the said tank. The lower part of the said bore is also enlarged, forming an elongated chamber h<sup>2</sup>, within which works a valve I in the form of an open box containing cork packing i and normally forced by a spring I', which surrounds the stem I<sup>2</sup> of said valve, against the material of the said plug at the top of the said chamber h<sup>2</sup>, so as to prevent the inflow of air. A screw J, having a central bore to receive loosely the stem aforesaid, engages with internal screw-threads at the lower end of the stem of the said screw-plug and serves to adjust the resistance of the said spring by being screwed up or down more or less. When air is forced in, overcom-



ing the resistance of the said valve I and its spring I', it passes down between the valve-stem I<sup>2</sup> and the wall of the bore of screw J or through holes in the latter and presses on the surface of the gasolene or other liquid fuel in the tank. If the joint between the cap of the screw-plug and the inlet-tube be imperfect, as will sometimes happen by the wear of packing D or carelessness in screwing home the said plug, there will be danger of the said liquid being forced by an excess of such pressure up between the screw-plug and inlet-tube and out between the cap and inlet-tube over the top of the tank, where it may ignite and will certainly be an inconvenience at least. The vent e permits the air to escape from space A' between the screw-plug and inlet-tube whenever the air-pressure within the tank is great enough to threaten such overflow, thus relieving such pressure and preventing leakage. This lessening of pressure will also tend to extinguish the burner supplied by said tank, thus giving notice of an imperfect joint. The removal or partial unscrewing of the screw-plug allows the spring G to restore valve E to its normal position, closing the said vent.

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. A reservoir for liquid fuel provided with an inlet-tube extending down through the top within the reservoir when the latter is in position for use, for the purpose of leaving an air-space A', the said tube being also provided with an air-vent through its side communicating with the said space, a valve adapted to close the said vent when in its highest position and open it when in its lowest, a plug adapted to fit into the said inlet-tube and provided with a cut-away part registering with the said vent when the plug is nearly in position and means for lowering or raising the said valve when the said plug is moved home in the said tube or withdrawn therefrom substantially as set forth.

2. A reservoir for liquid fuel provided with an internally-screw-threaded inlet-tube ex-

tending down through the top within the reservoir when the latter is in position for use, for the purpose of leaving an air-space A', the upper end of the said tube forming a bowl above the said reservoir and also being provided with an air-vent below the said bowl, in combination with a screw-plug adapted to turn into the said inlet-tube and provided near its upper end with a cut-away portion which is arranged to register with the said air-vent when the said plug is nearly screwed home, a valve adapted to close the said vent when in its highest position and open it when in its lowest and means for lowering or raising the said valve when the screw-plug is turned home in the said tube or withdrawn therefrom substantially as set forth.

3. A gasolene-tank provided with an internally-screw-threaded inlet-tube extending down through the top within the tank for the purpose of leaving an air-space above the level of the lower end of the said tube, and provided with an air-vent near its upper end, a valve adapted to close the said vent when in its highest position and open it when in its lowest, a spring supporting the said valve and a closing device for the said inlet, adapted to bear against the said spring when in position of closure, thereby lowering the said valve to open the said vent substantially as set forth.

4. A gasolene-tank provided with an internally-screw-threaded inlet-tube extending down within the same and having an air-vent near its upper end in combination with an externally-screw-threaded tubular plug for the purpose of allowing the escape of air and a spring-pressed adjustable air-inlet valve arranged within the said bore substantially as set forth.

In testimony whereof I affix my signature in presence of two witnesses.

WILLIS MITCHELL.

Witnesses:

OTIS EDDY,  
FRED JOY.