No. 695,613. Patented Mar. 18, 1902.

# J. E. LAMBERT.

## AIR PUMP.

(Application filed Aug. 26, 1901.)

(No Model.)

Fig. 1.

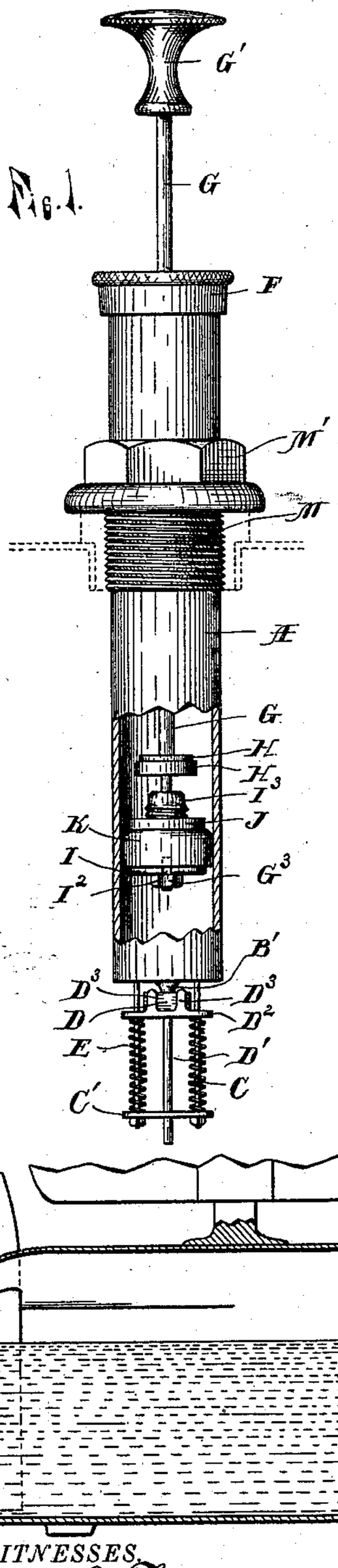



Fig. 4.

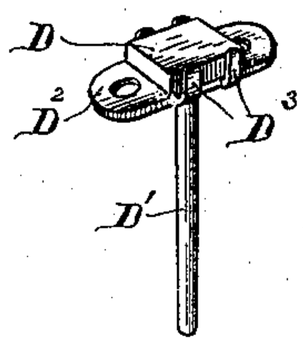



Fig. 5.

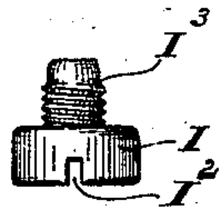



Fig. 6.

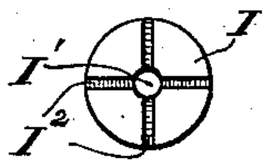
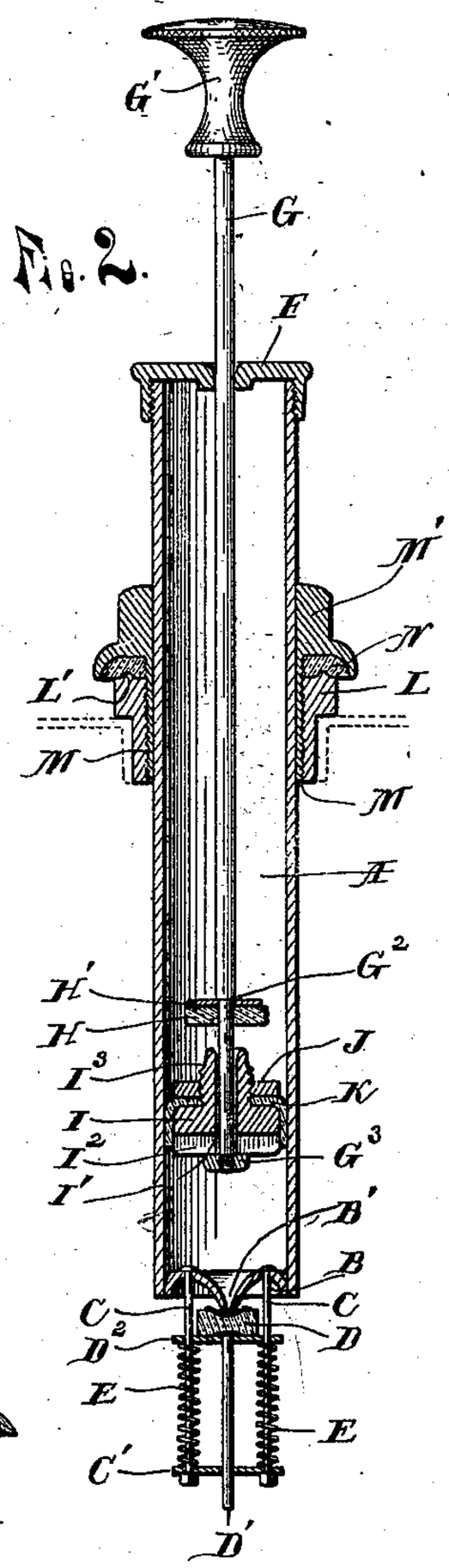



Fig. 2.



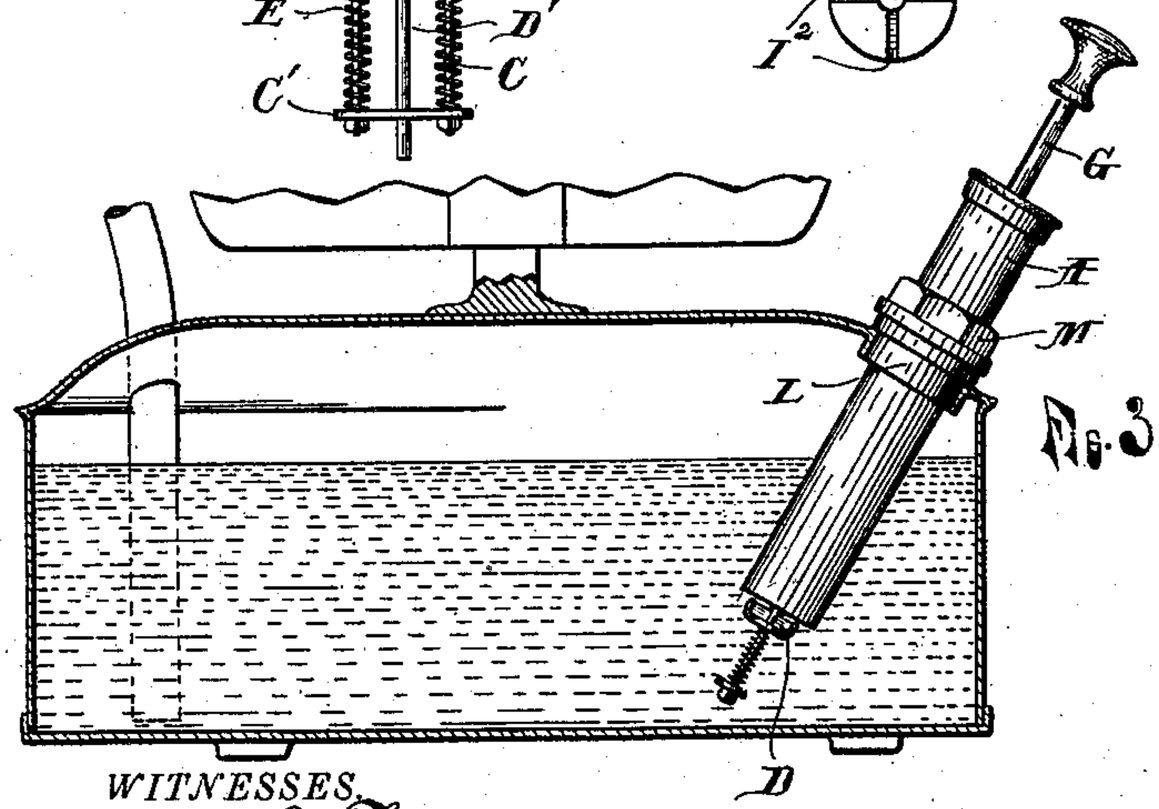




Fig. 3.

WITNESSES.

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# UNITED STATES PATENT OFFICE.

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## AIR-PUMP.

SPECIFICATION forming part of Letters Patent No. 695,613, dated March 18, 1902.

Application filed August 26, 1901. Serial No. 73,239. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN E. LAMBERT, a citizen of the United States of America, residing at Detroit, in the county of Wayne and State of Michigan, have invented certain new and useful Improvements in Air-Pumps, of which the following is a specification, reference being had therein to the accompanying drawings.

My invention relates to improvements in air-pumps, and more especially to that class of air-pumps used to put air-pressure in gasolene-tanks for the purpose of forcing the gasolene therefrom, and it is especially adapted for use in connection with the tank of a plumber's portable furnace.

The objects of my invention are to provide a pump adapted to project within the tank, with its lower or discharge end submerged by the gasolene, with a valve which will effectually prevent the gasolene from being forced past the submerged valve by reason of the air-pressure in the tank; to provide said pump with an intake-valve which has no small movable part to get out of order or become clogged; to provide means for securing the pump within the tank, which will effectually prevent the gasolene from oozing out around the pump and make an air-tight joint, and to provide certain other new and useful features, all of which are hereinafter more fully described, and particularly pointed out in the claims, reference being had to the accompanying drawings, in which—

Figure 1 is a side elevation of a device embodying my invention with part of the cylinder broken away to show the piston-head. Fig. 2 is a vertical section of the same through the axis thereof. Fig. 3 is a detail showing the pump secured within the tank, said tank being shown in section. Fig. 4 is an enlarged detail showing the discharge-valve and its stem in perspective. Fig. 5 is a detail showing the piston-head in side elevation. Fig. 6 is a plan view of the lower end of the same.

As shown in the drawings, A is the cylinder of the pump, consisting of a tube of suitable size closed at its lower end by a head B, formed with an outwardly-projecting axial nipple B′, conically formed both externally and internally and having a small discharge-opening at its apex. To the head B and at each side of the nipple are secured the guide-rods C, which rods extend downward and are connected at their lower ends by a guide-bar C′, which is provided with an opening in which the valve-stem D′ of the valve D is guided. Said valve D consists of a block of cork or other suitable yielding material secured to the guide-bar $D^2$ by suitable ears $D^3$, formed integral therewith and turned up to engage the sides of said block and hold the same thereon, said bar $D^2$ being formed with openings to receive the guide-rods C and engaged by springs E, sleeved on said rods to hold said block in contact with the nipple B′ and close the discharge-opening. The opposite end of the cylinder A is closed by a screw-cap F, provided with an axial opening in which the piston-rod G is freely movable, the outer end of said rod being provided with a handle G′ and its inner end reduced in size to form a shoulder $G^2$, against which the disk H′ abuts, said disk serving as a backing for the valve H.

I is the piston-head, having an axial opening I′ of larger diameter than the diameter of the reduced end of the piston-rod, upon which the said head is free to move longitudinally, and provided with diametrical grooves $I^2$, extending at right angles to each other to form air-passages to the opening I′. On the upper end of the piston-head I is a boss $I^3$, provided with a reduced upper end to engage the valve H and externally screw-threaded to engage a binding-nut J, which nut engages the leather packing K and holds the same in place, said packing being folded down over the upper angle of the piston-head and in engagement with the side thereof. A nut $G^3$ on the inner end of the piston-rod engages the piston-head and holds the said head on rod.

To secure the pump to the tank, I solder an internally-screw-threaded ring L in an opening in the top of the tank, and on the cylinder A, intermediate its ends, is brazed or otherwise secured the externally-screw-threaded sleeve M, having the hexagonal head M′, which head is formed at its lower end with a ring-cap to receive the packing-ring N, and a ridge L′ on the upper end of the ring L is adapted to engage said packing when the sleeve M is screwed into said ring and be embedded into said packing to exclude the pos-

sibility of any gasolene being forced through the joint by the great pressure within the tank and to make the same absolutely air-tight.

When the piston-rod is being pulled out, as shown in the drawings, the air in the upper end of the cylinder passes by the valve H, through the opening I′ in the head and through the grooves $I^2$ beneath the nut $G^3$, but when an inward movement is given to said rod the air in the lower end of said cylinder lifts the piston-head, thus bringing the upper end of the boss $I^3$ in contact with the valve H and closing the air passage or opening I′ around the piston-rod. A further inward movement of the piston draws air into the upper end of the cylinder through the opening in the cap F, and the air in the lower end thereof is compressed until the pressure becomes great enough to force the valve D from its seat against the action of the air-pressure and gasolene inside the tank and also of the springs E.

At times a heavy pressure is maintained in the tank and if the ordinary form of valve were used gasolene would be forced past it, the same being constantly submerged and would soon become clogged and inoperative. By providing a block of cork to engage the apex of the conical nipple said nipple becomes embedded in the cork and the guides and springs effectually guide and hold it to its seat, so that no oil can possibly ooze through, and the great pressure of air required to force the valve from its seat cleans it of all obstruction, the conical shape of the nipple also tending to prevent clogging.

What I claim as my invention is—

1. In an air-pump for the purpose described, in combination with the cylinder and piston thereof, a conical discharge-nipple, and a valve to engage the outer end of said nipple consisting of a block of yielding material, guides for said block, and springs to engage said guides and force the block against the discharge end of the said nipple whereby the said nipple becomes embedded in said block.

2. In an air-pump, in combination with the cylinder and piston thereof, a conical nipple formed at one end of said cylinder, guide-rods secured at one end to the cylinder and connected at their opposite ends by a guide-bar, a valve consisting of a block of yielding material adapted to engage and close the nipple, a guide-bar movable longitudinally on said guide-rods and provided with ears to engage and hold said valve-block, a valve-stem to guide said valve, and springs sleeved on said guide-rods and engaging said bars to hold said valve against said nipple.

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

JOHN E. LAMBERT.

Witnesses:

LEWIS E. FLANDERS,

JOSEPH A. NOELKE.