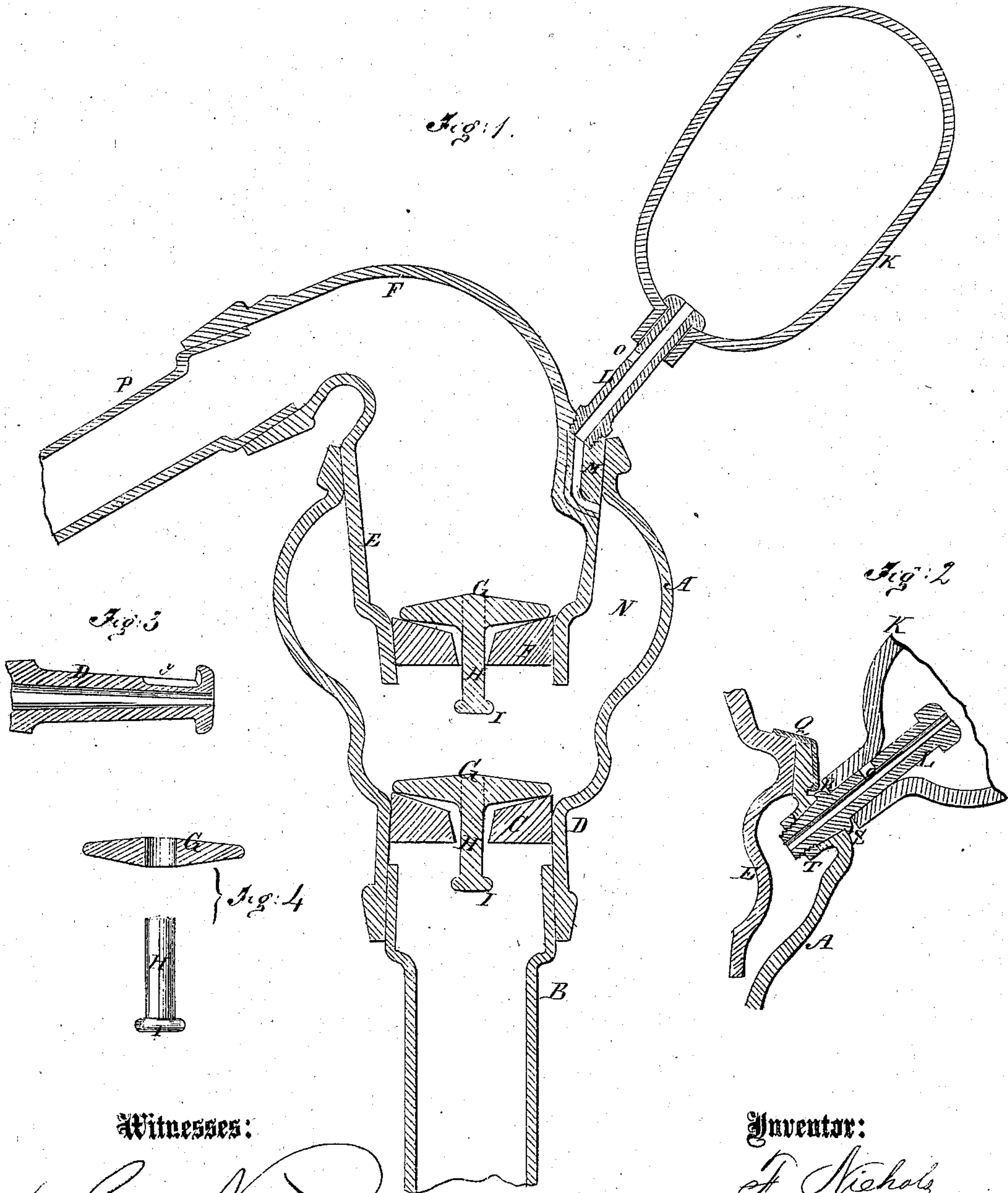


F. NICHOLS.

Acid-Pumps.

No. 136,934.

Patented March 18, 1873.



Witnesses:

Chas. Nida.
C. Sedgwick

PER

Inventor:

F. Nichols
Munn & Co.
Attorneys.

UNITED STATES PATENT OFFICE.

FRANCIS NICHOLS, OF NEW LONDON, CONNECTICUT.

IMPROVEMENT IN ACID-PUMPS.

Specification forming part of Letters Patent No. 136,934, dated March 18, 1873.

To all whom it may concern:

Be it known that I, FRANCIS NICHOLS, of New London, in the county of New London and State of Connecticut, have invented a new and Improved Acid-Pump, of which the following is a specification:

My invention consists of a glass acid-pump, which is also converted into a siphon by the application of an extension tube to the nozzle, in which pump action is produced by the compression and rarefaction of air in a chamber between the valves, the air being compressed in the chamber by a hollow collapsible bulb, and rarefied by expanding into the bulb again. The apparatus is also useful for measuring the liquids at the same time, by having the bulb constructed to deliver a given quantity by each operation. The bulb is so contrived with relation to the compression-chamber of the pump that it is not exposed to destructive acids. It is designed for corrosive liquids, such as all the stronger acids (except fluoric); also sensitive liquids, as solutions of nitrate of silver; volatile liquids, as aqua ammonia, chloroform, &c., can be handled without injury to them, and without passing through the bulb. It is also adapted for drawing wines, liquors, &c., and for general use in the chemical laboratory.

Figure 1 is a sectional elevation of my improved pump and siphon. Fig. 2 is a section of a modified plan of connecting the collapsible bulb to the pump. Fig. 3 is a modified arrangement of the tube for connecting the collapsible bulb, and Fig. 4 represents an alternative mode of constructing the valves.

A represents a large glass bulb, with a large opening at the top and bottom; at the lower end it is connected by a ground joint with a suction-pipe, B, and it has a glass valve-seat, C, fitted and connected in the upper end of the neck D; at the upper end it is connected by a ground and cemented joint with the enlarged end E of a nozzle, F, which projects considerably into said bulb A, and has a glass valve-seat, F, fitted in it at the lower end. These joints may be baked together permanently by vitrifying and making a glazing of softer glass applied them. G represents the glass disks resting on the top of the seats, and they are prevented from rising too high by a small

stem, H, of glass, extending down through the central hole of the seat, and upset or enlarged at the end I, after being passed through the seat, by heating and flattening them, or winding on a heated piece; or the stem with a head formed on it may be fitted by a ground and cemented joint in a hole in the disk made wholly or partly through it, as indicated in Fig. 4. K represents a collapsible bulb of India rubber for compressing and rarefying the air; it is connected to the glass bulb A by a short metal tube, L, which screws into a little block, M, of metal or other substance, cemented in a socket in the side of the base E of the nozzle, and having a hole through it coinciding with the hole of the tube, and opening into the chamber N. The nozzle of the bulb is fitted on this tube so as to slide along it, and a hole, O, is made in the tube to be uncovered when the bulb is moved upward to admit air for destroying the siphonic action for which the pump is adapted, by the application of the extension P of the nozzle. The bulb is shoved down along the tube over this vent when the pump is to be worked.

I propose in some cases to make the nozzle of glass, and shape it as represented in Figs. 2 and 3. An angle-band, Q, of metal may be fitted on and turned under at the lower edge, as at R, to bind the parts A and E securely together, and in such case I will have the tube L fitted in a hole through the bulb A, with a shoulder, S, on the outside, and a nut, T, on the inside. I will also secure it by a ground or cemented joint, and around this hole I will have an extension or short tube, X, on the inner surface of bulb A, to afford ample surface to make a strong joint. This projection will be formed on a stud projecting from the inner surface of the mold in which the bulb A is formed, over which the glass will be blown, and afterward cut off at the inner end to make the opening through, to insure the fitting of the bulb-nozzle in the tube D. I will make the latter tapered, and if I choose I will use a groove, Y, instead of hole, so as to let the air escape.

To operate the pump the bulb is compressed by hand, by which the air in it is forced into the chamber N, and an equal quantity forced out of it through the upper valve; then the bulb is allowed to ex-

pand, which so rarefies the air in the chamber N that it fills from below to a certain extent by atmospheric pressure; then the bulb is collapsed again, and this time a quantity of the liquid will be forced out through the upper valve in case the liquid has filled the chamber above the lower end of the projection E of the nozzle; otherwise the air will escape and leave the liquid, in case it is heavier than the air. It is on that account that the nozzle is extended down into the bulb A. In some cases it will be found desirable to have a check-valve in the lower end of the tube B, particularly in pumping from barrels and other vessels, where it is desirable to frequently shift the pump from one to another.

I propose to use the pump for measuring soda-sirups, for which it is especially useful. For use as a siphon the apparatus will be very useful, on account of the facility with which the siphonic action can be set up by the pump.

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

1. An acid-pump consisting of the chambered bulb A, valves G, collapsible bulb K, and pipe-connections B F, combined substantially as specified.

2. The arrangement of the bulb K on the tube L to slide over the hole O and back, substantially as specified.

3. The angle-band Q provided with a lip, R, and applied to the parts A and E for connecting the same, as specified.

4. The nozzle E F projecting downward into the enlarged chamber of the bulb A, below the suction-pipe L, and provided with a downwardly-seated valve, as shown and described.

FRANCIS NICHOLS.

Witnesses:

JOHN R. BOLLES,
WM. C. CRUMP.