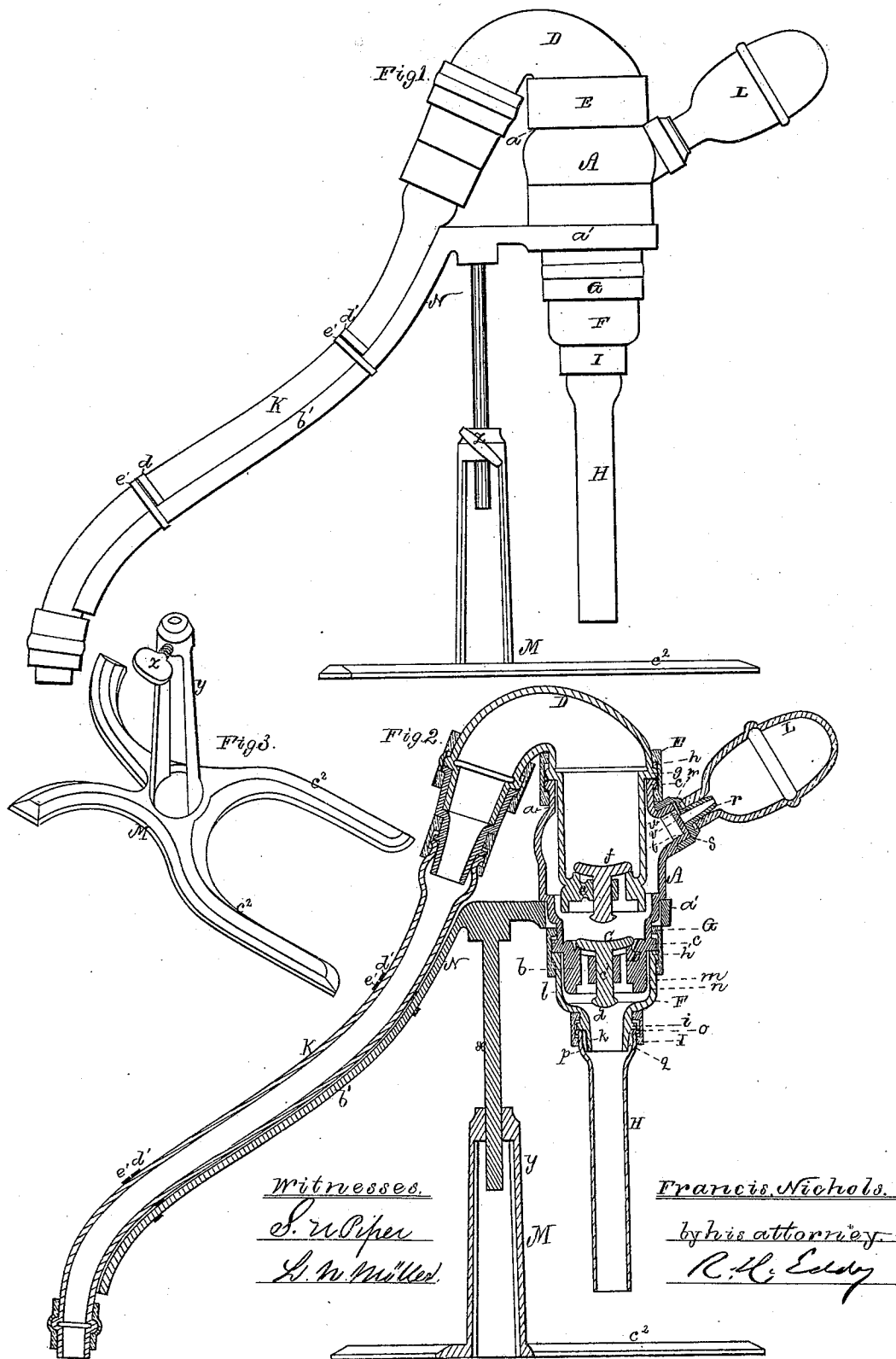


F. NICHOLS.
ACID SIPHON PUMP.

No. 175,489.

Patented March 28, 1876.



Witnesses.
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UNITED STATES PATENT OFFICE.

FRANCIS NICHOLS, OF NEW LONDON, CONNECTICUT.

IMPROVEMENT IN ACID SIPHON-PUMPS.

Specification forming part of Letters Patent No. **175,489**, dated March 28, 1876; application filed December 1, 1875.

To all whom it may concern:

Be it known that I, FRANCIS NICHOLS, of the city and county of New London and State of Connecticut, have invented certain new and useful Improvements in Acid Siphon-Pumps; and do hereby declare the same to be fully described in the following specification, and represented in the accompanying drawings, of which—

Figure 1 is a side elevation, and Fig. 2 a longitudinal section, of a combined siphon and pump embracing my invention, which invention has reference specially to the apparatus described and shown in the United States Patent No. 136,934, dated March 18, 1873, and granted to me.

In that apparatus the pump-body and its induct and educt additions were of glass, connected by rigid or inflexible joints. In my present pump, the connections of the pump-body and parts leading therefrom are made by rigid flanged necks and elastic flexile collars, whereby the parts are not only easier joined or separated, but rendered less liable to being broken, and they are also rendered capable of being repaired at less cost and inconvenience in case either should be accidentally broken.

Furthermore, I have provided the apparatus with a metallic stand or supporter of a peculiar construction, to enable it to be easily adjusted to a carboy, demijohn, or other vessel, from which it may be desirable to extract a liquid by such apparatus. I have also provided the induction and eduction tubes of the apparatus with peculiar joints, whereby their elastic flexile connections are protected by air in chambers from the acid or fluid drawn or forced through the joints. The glass body of the pump I also construct with a nipple-receiving neck, having a hole in its upper part, and the nipple for the elastic bulb I make with a cup or mouth-piece, to fit upon such neck, the whole being not only to enable the bulb to be easily removed from the nipple, in order to admit air to pass into the pump, to stop it from acting as a siphon, but to obtain a stronger support for the nipple.

In the drawings, A denotes the glass body of the pump, open at top and bottom, and there provided with necks *a b*, each of

which on its outer surface has a flange, *c*, extending from and around it. In the lower part of the body A is a valve-seat, B, provided with a valve, C, to open upward, such valve having a stem, *c'*, which goes down through the opening of the valve-seat, and is furnished with a head, *d*. The glass eduction-neck D, separate from the body A, extends down into the said body, and there terminates in a valve-seat, *e*, provided with a valve, *f*, to open upward. This neck has a flange, *g*, going around it, and projecting from it, to support it upon the top of the upper neck of the body A. Furthermore, the said body A and the said eduction neck are connected by means of an elastic tubular collar, E, of vulcanized india-rubber, arranged with them in manner as shown. This collar has a groove, *h*, extending around it, on its inner periphery, such groove being to receive and closely fit the contiguous flanges *c g*.

This collar E, as well as others, as hereinafter described, like it, by having the groove, operates differently from an elastic collar, without such a groove or its equivalent, as the groove, by embracing both flanges on their sides, as well as peripheries, operates to keep the collar in its normal position, whenever one of the parts held or enveloped by it may be drawn from or bent somewhat out of line with the other. It would answer the same purpose were the groove on the outside of the collar, as in such case the parts next it, being thicker, would close down against the sides of the flanges and produce like effects.

In order to connect an induct or a glass tube with the lower neck *b* of the body A, or an educt or glass tube with the outer end of the eduction-neck D, I make use of a tunnel-shaped glass mouth-piece, F, formed as shown, with flanges *h' i* at top and bottom, and with an auxiliary tubular neck or extension, *k*, projecting down from the main neck *l*, and having a diameter less than that of the said neck *l*. The lower neck *b* of the body A extends down within the mouth of the piece F, with an air-space, *m*, going around between the said neck and the inner surface of the mouth or cup *n*, the air in such space serving to keep the fluid from contact with an elastic collar, G, that couples the mouth-piece F to the body

A, the said collar being made like the collar E, hereinbefore described.

The induct glass tube H, flanged at top, as shown at *o*, and enlarged, as represented at *p*, receives the extension *k*, and is joined with the piece F by an elastic collar, I, applied to them, as shown, and made like the collar E, there being a space, *q*, around the extension, to hold air, to protect the collar from the acid or liquid.

The eduction-tube K is shown as applied to the neck D by means of devices like those described for connecting the induction-tube with the body A.

The india-rubber or elastic bulb for extracting air from the body A, in order for liquid to arise into such, is shown at L. It fits upon a tapering glass nipple, *r*, projecting from a cup, *s*, that receives and fits upon a cylindrical neck, *t*, projecting from the body A, and being closed at its outer end, except in having a hole, *u*, in the upper part of the closure *v*. Over this hole is, in the cup *s*, a passage or groove, *w*, leading from such hole to the bore of the nipple. This passage is essential only when the bottom of the nipple-cup *s* fits closely down upon the end of the neck.

The object of making the hole *u* in the upper part of the closure is to have it in its proper or highest position to prevent acid or fluid in the body A from being drawn into the bulb.

The nipple being without any flange on its outer end, enables the bulb to be easily removed in order to admit air to pass into the nipple, and thence into the body A, to estop the apparatus from acting as a siphon.

It will be seen that while it may be so acting, and it may be desirable to arrest the discharge of liquids, we have only to pull the bulb suddenly off the nipple, all of which is better than to have the bulb slide in a flanged tube provided with a hole on its side.

I have found that when the bulb is arranged in a cylindrical tube, with a hole in its side, and with a flange at its end, such bulb is liable at times to adhere to the tube, so as to render it difficult to slide the bulb thereon. The tapering nipple is therefore much better, as it enables the bulb to be easily detached. With the tapering nipple one bulb will answer for several pumps, it being better to keep it off, or nearly off, the nipple when the pump is not in use, as in such case it cannot get corroded and stuck upon the nipple.

The stand or supporter of the glass acid siphon-pump is represented as composed of two main parts, M N, the upper of which has a stem, *x*, projecting down from it into a post, *y*, of the lower part. There is to the

post *y* a clamp-screw, *z*, to act against the stem which is to slide freely within the post. The upper part N is composed of a ring, *a'*, and a long trough or channeled arm, *b'*, the two being arranged and connected as represented. The body A fits into and rests in the ring, and the eduction-pipe is placed in or rests in the arm. The base portion of the part M is perforated or forked, as shown at *c*² *c*², to receive the neck of a demijohn or carboy, or allow the passage of the induction-pipe into the vessel, such part M being shown in perspective view in Fig. 3.

From the above it will be seen that the upper part of the supporter can be adjusted to introduce the induction-pipe more or less vertically into the demijohn or vessel, as occasion may require. If desirable, elastic rings or bands *d' d' e' e'* may be used around the eduction-tube, and also around it and the arm or trough in which it rests, such being to hold them in connection, and to cushion the tube in the trough.

I claim as my invention in the glass acid siphon-pump as follows:

1. The combination of the grooved elastic collar E and the flanged eduction-neck D, all arranged and applied substantially as set forth.

2. The tunnel-shaped glass mouth-piece F, provided with the flanges *b' i* and the extension *k*, arranged as specified.

3. The combination of the grooved elastic collar with a flanged neck, as described, and a flanged tunnel-shaped mouth-piece, provided with the extension *k*, the whole being so that there may be around the extension and in the mouth-piece a space to hold air to insulate the collar from the fluid or acid, as specified.

4. The elastic collar E, thickened near its edges or grooved, substantially as set forth, for the purpose of receiving the flanges of the glass parts or necks embraced, or to be embraced, by such collar.

5. The improved tube-joint, consisting of the flanged necks and the elastic and grooved connection or collar applied thereto, as set forth.

6. The glass body A, provided with the nipple-receiving neck closed, and having a hole in the upper part of the closure, all as set forth.

7. The adjustable upper part of the stand, as composed of the ring and the troughed or channeled arm, arranged and connected as described.

8. The combination of the ring *a'*, troughed arm *b'*, and the stem or rod *x*, arranged and connected, as described, with the base M, provided with the clamp-screw *z*.

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Witnesses:

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