

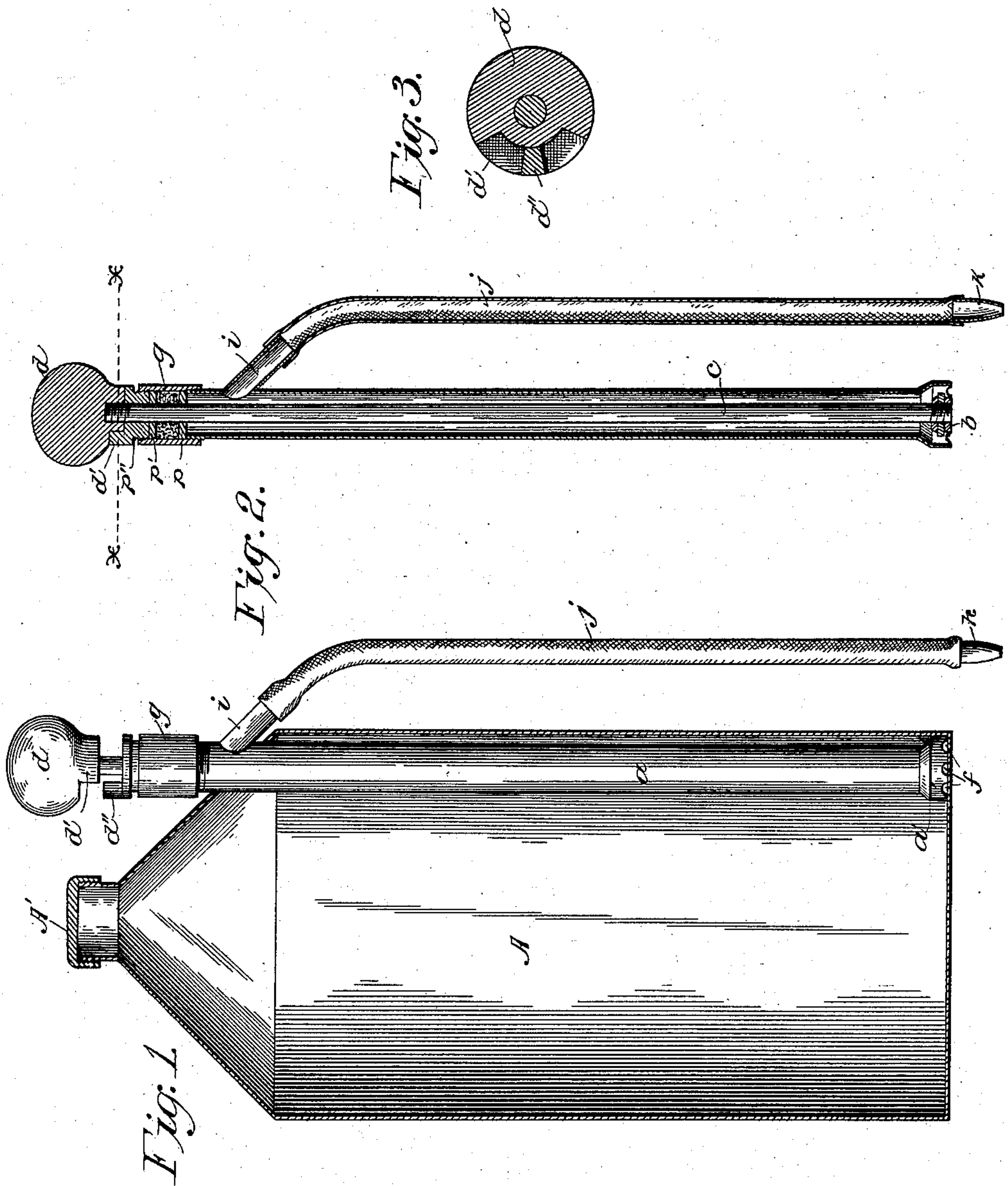
(No Model.)

F. H. GILE.

SIPHON.

No. 384,251.

Patented June 12, 1888.



Witnesses.  
H. S. Rohrer.  
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# UNITED STATES PATENT OFFICE.

FRED H. GILE, OF ALFRED, MAINE.

## SIPHON.

SPECIFICATION forming part of Letters Patent No. 384,251, dated June 12, 1888.

Application filed July 8, 1887. Serial No. 243,772. (No model.)

*To all whom it may concern:*

Be it known that I, FRED H. GILE, a resident of Alfred, in the county of York and State of Maine, have invented certain new and useful Improvements in Siphons; 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 pertains to make and use the same.

My invention relates to improvements in siphons, and is fully described and explained in this specification and shown in the accompanying drawings, in which—

Figure 1 is a view partly in vertical section and partly in side elevation of a can provided with my improved siphon. Fig. 2 is a vertical section of the siphon, and Fig. 3 is a horizontal section through the line  $xx$ , Fig. 2.

In these views,  $A$  is a can or vessel of any ordinary construction, which may be provided with a cap or other cover,  $A'$ , and  $a$  is a tube of suitable diameter inserted in the can, and either detachable therefrom or permanently secured therein. The lower end of the tube  $a$ , which rests preferably on the bottom of the can, is formed with an enlargement,  $a'$ , for the purposes hereinafter set forth, and has in its lower margin a series of openings,  $f$ , adapted to admit liquid from the body of the can to the interior of the tube, and the upper end of the tube terminates in a stuffing-box, which may have any desired construction, but preferably that illustrated in the drawings, in which  $g$  is a thimble of larger diameter than the tube  $a$ .

$p p'$  are two circular plates separated by a space adapted to be filled by any suitable packing, and  $p''$  is a plug screwed into the top of the thimble  $g$  and adapted to press together the plates  $p p'$ , and thus to compress the packing between them.

A plunger-rod,  $c$ , provided with a suitable knob or handle,  $d$ , passes downward through the stuffing-box, and carries at its lower end a valveless plunger,  $b$ , consisting preferably of two nuts screwed upon the end of the rod and a layer of elastic packing lying between and compressed by the nuts. A branch tube,  $i$ , opens from the tube  $a$ , at a point near its upper end, but at a sufficient distance below the stuffing-box to permit the plunger  $b$  to lie be-

tween the stuffing-box and the opening of the branch tube when drawn upward to its highest limit of motion. A discharge-pipe,  $j$ , preferably elastic and detachable, is attached to the branch tube  $i$ , and is of such length that its lower end is below the bottom of the tube  $a$ . This discharge-pipe terminates in a contracted tip,  $k$ , which may be either formed directly on the discharge-pipe or attached to it, as shown, the open end of the tip being of less diameter than that of the discharge-pipe.

The operation of the device as thus far described is as follows: If the plunger  $b$  be depressed to the bottom of the tube  $a$ , as shown in Fig. 2, the liquid in the body of the can passes through the openings  $f$  at the bottom of the tube and upward through the space between the periphery of the plunger and the inner surface of the enlarged portion of the tube and fills the tube to the height of the liquid in the body of the can. If, now, the plunger be raised, it acts as a bucket, lifting the liquid already in the tube and pouring it out through the branch tube  $i$  and the discharge-pipe  $j$ . At the same time that the plunger acts as a bucket with reference to the liquid above it in the tube, it acts as a pump with reference to the liquid below it, and draws up after it a column of liquid, which fills the tube  $a$ . When the plunger in its upward course passes the opening of the branch tube  $i$ , the discharge-pipe is already filled by the liquid which has been lifted through the action of the plunger as a bucket, and the body of the tube  $a$  is filled with the liquid which has been raised by the plunger as a pump. The two branches  $aj$  of the siphon being thus filled, an upward current is established, and this current continues until the level of the liquid in the can is lowered to the highest points of the openings  $f$ , or, in other words, until substantially all the liquid in the can has been drawn out. If it be desired to interrupt the flow of liquid at any time, it is only necessary to press the plunger downward below the opening of the branch tube  $i$  when the tube  $a$  is closed and the flow necessarily ceases, and if the depression of the plunger be sufficiently continued the liquid in the discharge-pipe  $j$  is drawn from it and into the space in the tube  $a$  above the plunger.



I have found in practice that the use of the contracted tip at the end of the discharge-pipe is essential to the perfect operation of the device in this respect, since if the diameter of the end of the discharge-pipe be the same as that of the body of it a portion of the liquid in the discharge-pipe will remain therein after the depression of the plunger and will presently drip from the end of the pipe, whereas if the contracted tip be used the liquid in the discharge-pipe can be wholly withdrawn into the tube *a*, and all drip is effectually prevented. When the plunger has been sufficiently depressed to draw the liquid from the discharge-pipe into the tube, this liquid may be retained in the space above the plunger any desired length of time, provided the plunger be not depressed into the enlarged space at the bottom of the tube, and this retention of the liquid is very desirable, since it insures the presence in the space above the plunger of sufficient liquid to fill the discharge-pipe, no matter how little liquid there may be in the body of the can.

In order to prevent the accidental depression of the plunger to the enlarged space at the bottom of the tube, I have found it advisable to provide a stop so arranged that in ordinary use the plunger will always remain above the enlarged portion of the tube. This stop may have any desired construction; but I prefer that illustrated in the drawings, in which *d''* is a lug projecting upward from the stuffing-box, and *d'* is a corresponding recess in the lower face of the knob *d*. When the knob is in the position illustrated in the drawings, it may be depressed until the lug *d''* enters the recess *d'*, when the plunger will lie in the enlarged space at the bottom of the tube *a*. If the knob be rotated sufficiently, however, the recess *d'* reaches such a position as not to register with the lug *d''*, and it is therefore impossible with the knob in its new position to depress the plunger sufficiently to reach the enlarged space referred to. The recess *d'* may have any desired angular extent not less than that of the lug *d''*; but I prefer to form it substantially as shown in order that no great accuracy may be required in so adjusting the position of the knob as to have the recess register with the lug and receive it when the knob is depressed. It is evident that by means of this device, which adds nothing whatever to the cost of construction of the siphon, the accidental depression of the plunger into the enlarged space at the bottom of the tube *a* is effectually prevented, and the liquid withdrawn from the discharge-pipe may be retained in the space above the plunger until such time as the siphon is again brought into use.

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

1. In a siphon, the combination, with a valveless tube having at its lower end an enlargement formed substantially as described, a discharge-pipe near its upper end, and a suitable packing at its top, of a valveless plunger fitting in said tube, and a plunger-rod passing through said packing and adapted to raise the plunger to the space in the tube above the discharge-pipe and to depress it into the enlargement at the bottom of said tube, substantially as and for the purpose set forth.

2. In a siphon, the combination, with a tube having an enlargement at its lower end, a discharge-pipe near its upper end, and a suitable packing at its top, of a valveless plunger fitting in said tube, a plunger-rod passing through said packing and adapted to raise the plunger to the space in the tube above the discharge-pipe and to depress it into the enlargement at the bottom of the tube, and a stop adapted to limit the downward motion of the plunger-rod and thus to prevent the depression of the plunger into said enlargement, substantially as and for the purpose set forth.

3. In a siphon, the combination, with a tube having a suitable packing at its upper end, of a discharge-pipe opening from the tube at a point below the packing and terminating in a contracted tip, substantially as described, a valveless plunger fitting in said tube, and a plunger-rod passing through the packing and adapted to depress the plunger to the bottom of the tube and to raise it to the space in the tube above the opening of said discharge-pipe, substantially as and for the purpose set forth.

4. The combination, with the tube *a*, having the enlargement *a'* and opening *f* at its lower end, the stuffing-box at its upper end, and the discharge-pipe *i j*, opening from it at a point below the stuffing-box, of the plunger lying within the tube, the plunger-rod passing through the packing and adapted to raise and lower the plunger, the knob *d*, fastened to the top of the plunger-rod and formed with the recess *d'*, and the lug *d''*, projecting upward from the top of the tube and adapted to enter the recess *d'* upon the depression of the knob when the same is in one position, but to prevent the complete depression of the knob when it is rotated to a different position, substantially as and for the purpose set forth.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

FRED H. GILE.

Witnesses:

THOS. E. WOODS,  
ROBT. H. WILES.