

H. E. BORGER & A. S. ATKINS.
 MEANS FOR AUTOMATICALLY PRODUCING AND UTILIZING AIR PRESSURE.
 APPLICATION FILED MAY 24, 1907.

980,916.

Patented Jan. 10, 1911.

2 SHEETS-SHEET 1.

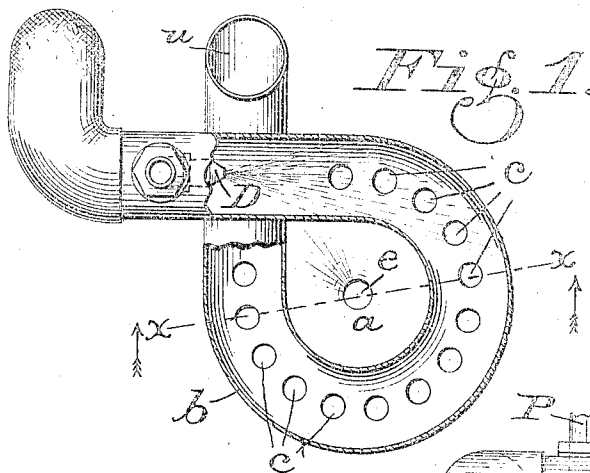


Fig. 1.

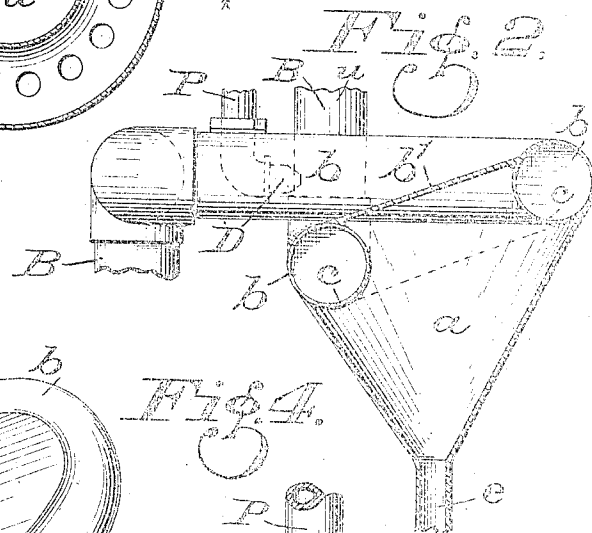


Fig. 2.

Fig. 3.

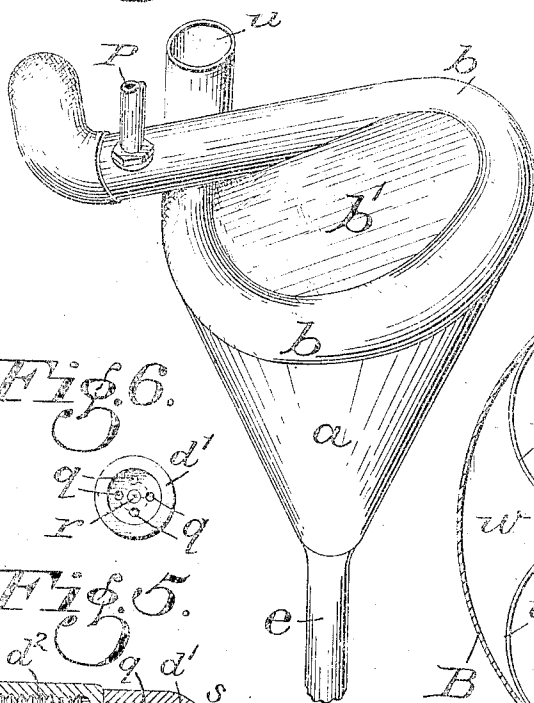


Fig. 4.

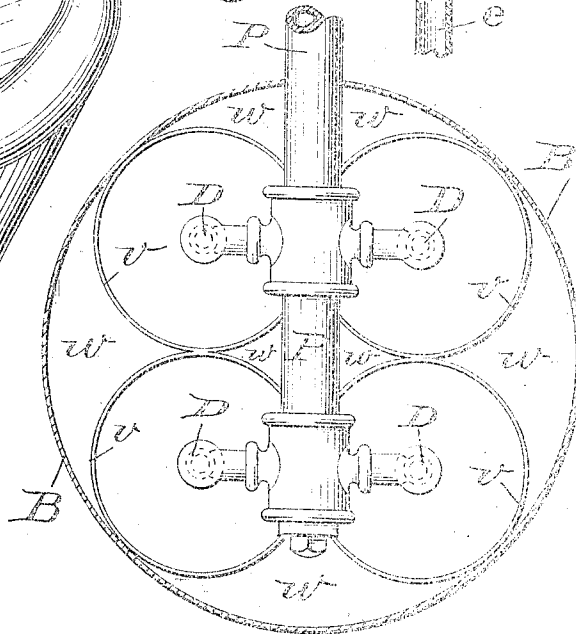
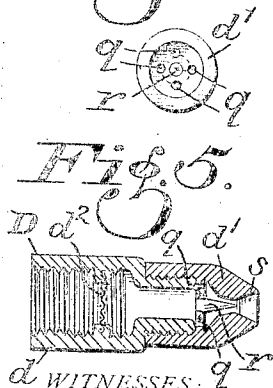


Fig. 5.



WITNESSES:

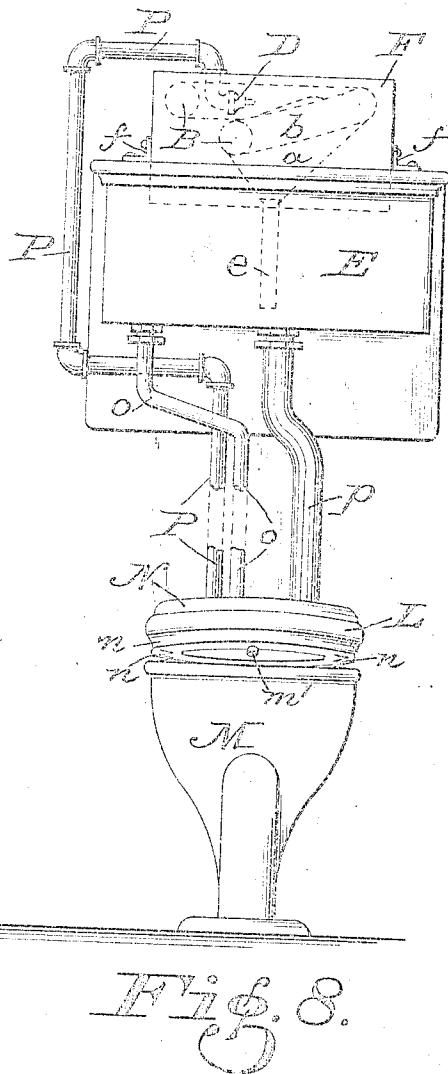
Lewis J. Burkle
 Charles F. Griffith

INVENTORS:

Henry C. Borger & Albert S. Atkins,
 BY
 Frank M. Burnham
 ATTORNEY.

980,916.

2 SHEETS--SHEET 2.



Lewis J. Burkle
Charles F. Wiffert

INVENTORS:
Henry C. Boyer and Albert E. Atkins,
BY
Frank M. Burnham
ATTORNEY.

UNITED STATES PATENT OFFICE.

HENRY E. BORGER, OF DAYTON, OHIO, AND ALBERT S. ATKINS, OF EAST ST. LOUIS, ILLINOIS.

MEANS FOR AUTOMATICALLY PRODUCING AND UTILIZING AIR-PRESSURE.

980,916.

Specification of Letters Patent.

Patented Jan. 10, 1911.

Application filed May 24, 1907. Serial No. 375,402.

To all whom it may concern:

Be it known that we, (1) HENRY E. BORGER and (2) ALBERT S. ATKINS, citizens of the United States, residing at (1) Dayton and (2) East St. Louis, in the counties of (1) Montgomery and (2) St. Clair and States of (1) Ohio and (2) Illinois have invented certain new and useful Improvements in Means for Automatically Producing and Utilizing Air-Pressures; and we 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, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

Our present invention relates to "means for automatically producing and utilizing air pressures", or what may be termed a hydraulic draft producer; and while we have, as the best method of illustrating and bringing out the practical application of our invention; herein set forth in part of the illustrations and description; our device as applied to a water-closet for the ventilation, purification and sanitation of the same, for which purpose it is more particularly designed and intended:—yet its use is not, however, limited to water-closets alone, but is susceptible of being used to equal advantage by being connected with any device wherein the air may be hydraulically utilized for obtaining a pneumatic pressure, as it is obvious and will become quite apparent from the following description,—that among some of the many uses for which our invention can be employed, may be mentioned the following, to wit:—ventilation: boiler-draft: refrigeration: purification of foul air or the destruction of injurious gases in chemical works; also the absorption by means of the moisture from the water, of all impure odors or dangerous gases generally; increasing the humidity of the air, or cooling warm dry air; and the condensation of vapors.

Some of the principal objects of our said invention consist in providing a device of this nature, which will, through a hydraulic means, produce a pneumatic pressure greater at the outlet than at the inlet, whereby a suction power is created at the inlet which

will gain sufficient force or power, so that when it passes from or is ejected from the outlet, is susceptible of utilization for various purposes. Also to provide a device as above referred to, which is simple in construction; composed of few parts; inexpensive in cost of manufacture; very efficient in its results; and yet one which may—with slight changes of adaption—be used as an attachment in connection with various classes of devices.

Our invention consists essentially,—referring briefly and in general terms to the construction of our device covering the same,—of a funnel-shaped body portion; a water or supply pipe and novel spraying nozzle; an inlet; and an outlet; and the very peculiar and novel arrangement, construction and combination of these several parts, as will be hereinafter more specifically described in detail, and set forth in the subjoined claims in accordance with the statutes in such cases made and provided therefor.

Referring to the accompanying drawings constituting a formal part of this specification, and wherein the same letters of reference are employed to indicate or point out the same parts wherever occurring throughout the several views, and for the purposes of illustrating the practical application of our invention:—Figure 1, is a plan view partially broken away and in section, showing the interior of the device: Fig. 2, is a side view partially in section,—taken on line *x—x* of Fig. 1: Fig. 3, is a perspective view of same; and Fig. 4, is an end view showing one form or manner of employing a number or group of nozzles, where it is desired to create a stronger draft than ordinarily, or increase the power of same beyond that furnished by a single nozzle: Fig. 5, is a longitudinal sectional view of the novel spraying nozzle; and Fig. 6, is a plan view of the inner face of the mouth-piece of said nozzle as shown in Fig. 5: Fig. 7, is a side elevation of a water-closet showing our draft-producer in dotted lines, when connected thereto and in operative position; and Fig. 8, is a front elevation of the water-closet and draft-producer connected thereto as shown in Fig. 7.

In describing our said invention specifically, and referring in detail to the various

parts or elements of construction which in combination make up our means for automatically producing and utilizing air pressure as shown throughout the several views of the drawings, and indicated or pointed out by means of the letters of reference aforesaid; *a* indicates the body of the draft-producer,—which is perfectly funnel-shaped and provided or formed in with the spiral portion *b* of the pneumatic escape-pipe B, having the closed air-tight top *b*¹; the numerous openings or ports *c* in said spiral, allowing of the drainage of the water as it sweeps in a spiral stream from spraying nozzle D, to pass therefrom down body *a* and off through the end or waste-water pipe *e*, into flush tank E—as will be more fully and clearly described hereinafter.

In Figs. 7 and 8, we have shown our device as connected with or attached to a water-closet for the purpose of purification and ventilation, in which connection said device is shown in dotted lines resting in an inclosing casing or box F on top of and connected in any suitable manner as at *f*, to flush-tank E,—and if so desired said draft-producer may have the space around it in said inclosing casing or box, packed with saw-dust,—wool,—or other like suitable material—for the purpose of deadening all loud and disagreeable noise if any,—which may be caused by suction or action of the water under pressure, which first comes from the water main or source of supply up through the service pipe to supply-pipe *g*—provided with an ordinary shut-off valve *g*¹,—into the offset or connection *g*²,—when valve *h* is raised or opened by means of its stem *h*¹, connected by link *i* to lever *k*, fulcrumed at *l* and projecting from closet-seat L, of an ordinary form of closet-hopper or bowl M; when lid N is raised, and seat is depressed and rests down upon said bowl;—while the air-chamber *m* connected to bottom of said seat—but slightly smaller—so that it will hang or extend inside of, but just below the top edge of the bowl or hopper;—as will be fully described hereinafter;—by reason of a person's weight upon said seat when occupied said seat is provided at the front with an ordinary rubber stop *m*¹ for preventing any jar when depressed; also on each side with a spring support *n* of ordinary construction for keeping said seat raised, and thereby closing valve *h* when the closet is not being operated. Most of these parts of the closet just referred to, are of ordinary and well known construction, and therefore need no detailed description or illustration.

Supply-pipe *g*, extends beyond offset *g*² in tank-pipe *o* to flush-tank E and supplies said tank with water in the ordinary and well-known manner, while flush-pipe *p* extends down from said tank and communi-

cates with the hopper or bowl, and flushes the same after each operation of said closet in the ordinary and well known manner.

When valve *h* is raised, by reason of seat L being depressed—as heretofore described,—the water which by reason of its pressure has rushed from supply-pipe *g* into offset or connection *g*², will now continue uninterruptedly on its course into and up branch-pipe P to spraying-nozzle D: which is securely supported within pneumatic escape-pipe B, near the beginning of the spiral-portion *b*—of said pipe or inlet of the device, as is more fully and particularly shown in Figs. 1 and 2. Said spraying nozzle D as is clearly shown in Figs. 5 and 6, is constructed with a screw-threaded sleeve *d* formed with an ordinary bearing shoulder and screw-threaded end, by which it is tightly but detachably connected to the screw-threaded socket of the mouth-piece *d*¹: said sleeve being provided with a strainer or sieve *d*² for keeping the water free of all grit, dirt or sediment, which would otherwise clog and stop up the mouth-piece of said nozzle as said water rushes through the small orifices or perforations *g* in inner face of said mouth piece, and be spread by pointed projection or prong *r*; and as it passes out of tapered mouth-piece *s* will be thrown in a spray of sufficient force, so that as it strikes the walls of spiral portion *b*, will pass through ports or drainage openings *c*, down the funnel-shaped body *a* and out of waste-pipe *e* into said flush tank,—as heretofore fully and clearly described;—thus creating a suction power of sufficient force to draw or suck all air up pneumatic escape-pipe B, from its inlet; which communicates with air-chamber *m*—(see Fig. 7);—when said seat is depressed as heretofore referred to; and all offensive, foul and impure air will pass up through the numerous openings *t* encircling air-chamber *m*—which is intended to be the same shape as the closet-seat—and can be readily attached, not alone to the closet seat of new closets of various forms, but also to the seat of any form or style of closet already in use,—as well as the other parts of our system:—said foul and impure air will now pass around and besucked therefrom into said pneumatic escape pipe which communicates therewith, and thence rapidly up the same into spiral portion *b*, when said foul air will pass in a spiral form and be partially cleansed and purified by the spraying of the water from nozzle D, and will pass thence up and out of the outlet *u* and in practice be carried off outside the building. It will of course be quite obvious and therefore readily understood that when the closet seat is depressed and water is passing from said nozzle down into the flush tank—as already clearly explained—and said tank

is not being operated and flushing the hopper; all extra amount of water thus entering into said tank beyond its capacity, will readily pass off through the usual over-flow pipe with which said tank is provided—in the ordinary and well known manner.

Whenever our spraying nozzle is found not to be sufficient to create a strong or powerful suction enough for the purpose desired, a number of nozzles may be employed, as illustrated in Fig. 4, in which instance the power has been increased four times by simply employing four nozzles D instead of one—said nozzles being arranged in a group and connected to a water pipe P, and each one being located in a separate compartment formed by a short sleeve *v*, for guiding or directing its spray as discharged therefrom; and the entire group or number of nozzles being encircled and inclosed by a large pneumatic pipe B—at a point near or about where the spiral portion begins;—the space at the outer end of said sleeves, between each of them and the pneumatic pipe, being closed and made air tight by a plate *w*.

Having now fully and clearly illustrated and described our device:—we claim as our invention:—

1. In a hydraulic draft producer, the combination of an inverted cone-shaped body having a hollow spiral provided with a drainage means and having ports; means

for creating a suction disposed within said spiral; an inlet to said spiral; and an outlet to said spiral.

2. The combination in a means for automatically producing and utilizing air pressure, of a funnel-shaped body; a hollow spiral provided with small openings connected with said body; an air-inlet to said spiral; a spraying nozzle adapted to receive water and resting in said spiral; and an outlet or escape to said spiral; substantially as described.

3. In a hydraulic draft producer, the combination of an inverted cone-shaped body; a spiral pipe provided with a drainage means and connected to said body; an inlet to said spiral-pipe; a spraying nozzle resting within said spiral-pipe; and an outlet from said spiral-pipe; all substantially in the manner and for the purposes described.

In testimony whereof, we affix our signatures, in presence of two witnesses.

HENRY E. BORGER.
ALBERT S. ATKINS.

Witnesses to the signature of Henry E. Borger:

THOS. J. PERRIN,
JAMES R. LOCKE.

Witnesses to the signature of Albert S. Atkins:

LLOYD H. DIXON,
L. WINKLER.