A. Barbarin.

Carburetor,

No. 96,073, Patented Oct. 26, 1869.

Fig. 4.

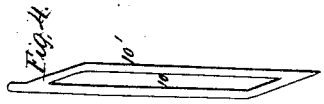


Fig. 3.

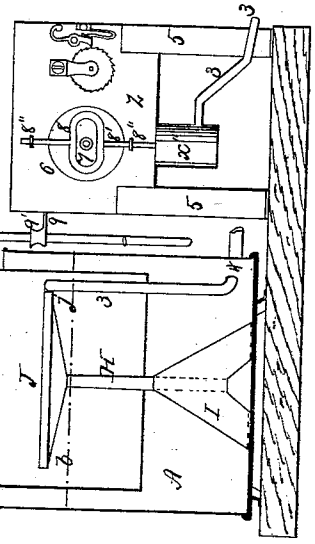


Fig. 6.

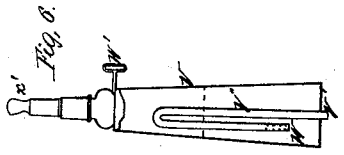


Fig. 2.

Fig. 5.

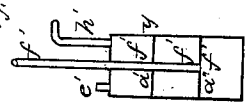
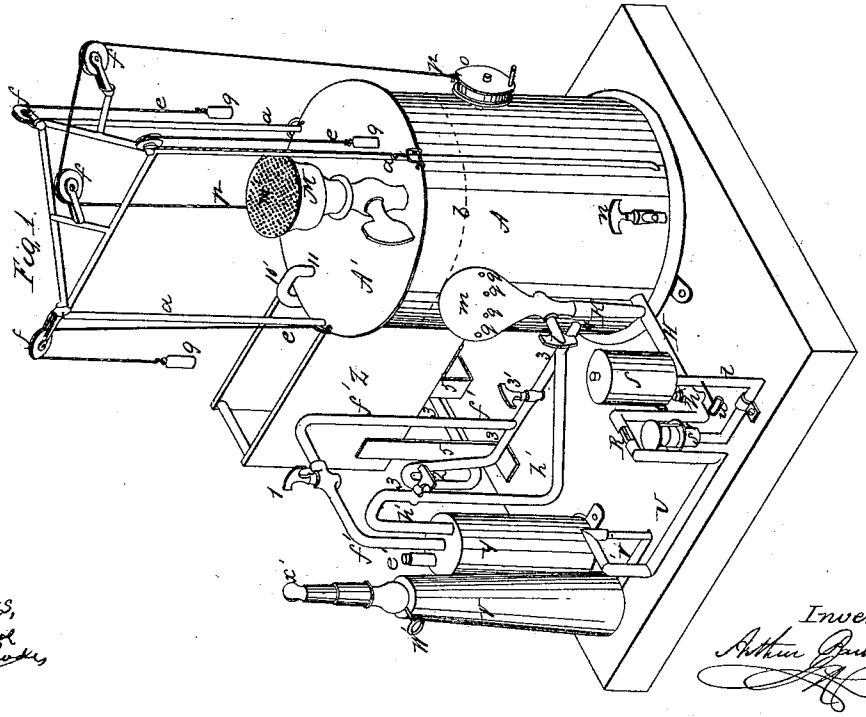


Fig. 1.



Witnesses,
H. C. Fenking
Rufus R. Rhodes

Inventor
Arthur Barbarin

United States Patent Office.

ARTHUR BARBARIN, OF NEW ORLEANS, LOUISIANA.

Letters Patent No. 96,073, *dated October* 26, 1869.

IMPROVED MACHINE FOR CARBURETTING ATMOSPHERIC AIR.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that I, ARTHUR BARBARIN, of the city of New Orleans, State of Louisiana, have invented a certain new and useful Improvement in Machines for Carburetting Atmospheric Air; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the annexed drawing, making a part of this specification.

My invention consists principally in certain mechanical improvements, by which ordinary gas-holders can be instantly charged to their full containing-capacity with atmospheric air, without the use of pumps or other ordinary equivalent appliances; but

It also consists of a means to start automatically a mechanism by which the holders can be automatically refilled when they shall become nearly exhausted, and which, when this is effected, will instantly stop the operation of the said mechanism, however often the exigency of the occasion may require the refilling of the holder, without the aid or even presence of any person whatsoever.

Furthermore, my invention consists of a means by which the air is carburetted only at the very moment before it is to be used, and in just sufficient volume to supply the burners in actual use.

This latter characteristic of my invention effectually prevents all possible chance of accident from an accumulated supply of highly inflammable gas, either from the occurrence of a fire, or in consequence of a leak in the holder or recipient of the same; but

My invention will be better understood by referring to the drawings, on which it is shown in a complete form, as when ready for use, at one of the figures, while at the other figures it is explained by separate views of important parts of it, in a detached condition.

A is an ordinary metallic or other water-tank or cistern, to contain water or other liquid up to the dotted line *b*.

A′ is a metallic or other bell or gas-holder, secured and supported above and within the tank A by means of vertical pillars *a a a*, ropes or chains *e e e*, pulleys *f f f*, and weights *g g g*, as shown, in such manner as to have its lower end or mouth continually immersed below the upper surface of the liquid in the tank when in use, to prevent the escape of the compressed air in that direction.

H is the main pipe, through which the discharge of the air is effected from the bell or holder A′ whenever the stop-cock *h* is open.

This pipe, as will be seen at Figure 2, runs directly into the tank A, above the water-line *b*, and is provided with an upper opening, J, expanded in the form of a funnel, so as to present a larger surface for the more regular exit of the compressed air through said main pipe, when the stop-cock *h* is open, under the action of the bell A′, as it descends.

I is a support of that portion of the main pipe H that is within the tank, and which, in order to facilitate the rapid ascent of the bell, is comparatively larger than any other section of the same.

K is a branch tube connecting with the main pipe H, outside the tank, and having the same diameter as the enlarged interior section of the said main pipe to which I have just referred.

This branch tube or pipe K is provided with a hollow metallic head, *m*, perforations *q q q*, and stop-cock *l*, and is connected to the larger outside section or part of main pipe H, in order to subserve the purpose of economy, and to dispense with the supplemental longer pipes, provided with stop-cocks or valves which, under a different arrangement, it might become necessary to apply to the tank to accomplish the desired object; but while I do not consider their employment requisite in the practice of my invention, I reserve the right to use other pipes, with proper valves or stop-cocks, if for any reason I shall consider such use desirable.

M is a large stop-cock, provided with an upwardly-projecting gauged funnel-shaped opening, *m′*, which may be applied anywhere on the top of the bell A′, through which air is admitted into said bell whenever it (the stop-cock) is open, and the bell is raised by means of the crank *o′*, rope or chain *p p′*, and drum O.

As soon as this stop-cock M is opened and the elevation of the bell begins, the water in the tank A performs the function of a piston with follower, and hence creates a vacuum which causes the air to rush in and fill the bell as rapidly as it ascends.

If an ordinary conical valve, hinged and adjusted in any suitable manner, be placed on the inside surface of the top of the bell A′, so as to open inwardly, with proper appliances for securing it in position, the operation of raising the bell will be still simpler, since it will only be necessary, in that case, to revolve the drum and lift the bell to fill it, by means of the natural pressure of the atmosphere, which will be brought into development by the vacuum induced by the elevation of the bell above the surface of the water. But if the tube K, with its stop-cock *l*, or other equivalent device, be employed without a stop-cock, M, or any other opening through the top of the bell A′, and the stop-cock *l* be turned open to permit the bell to be lifted, the operation is reversed, for in this case it is the bell which, with the assistance of the water, acts as a piston to create the suction requisite to fill it with air, and not the water, but the filling will be as rapid as in the first case; and if the stop-cock M, on the top of the bell A, or the equivalent of that cock, be used to operate in combination or conjunction with the pipe K, and its appliances, the diameter of these openings

may be reduced to the size of that of one valve, if desirable, and the charging of the bell with air will be equally as rapid as by the separate use of either of the two first-described devices. Consequently, I reserve the right to use both or only one of the said induction-pipes or openings, as circumstances may require.

n is a faucet to discharge the water from the metal or other water-tank A.

R marks three or more small tubes, connecting, as shown, with the same main pipe H, and its continuation U, so as to form part of the same.

These small tubes are designed to divide the large stream of air from the holder into small columns, in order that the same may be more effectively and rapidly heated, and dried by one or more vapor-burners S′ during very cold, rainy, or foggy weather, in order that the temperature of the air, before passing into the carburetting-liquid, may be raised and equalized, to produce the same degree of illuminating-power in the light or lights at all times, without reference to the temperature of the outside air or the character of the hydrocarbon-liquid that is employed.

S′ is a vapor-burner that is placed beneath the divisional tubes R, to heat the same when required, and which is supplied with gasoline to produce the vapor from the recipient or tank S, through the conduit-pipe *t*, when the stop-cock *u* is turned open.

U is a continuation of the main pipe H, from the said divisional pipes R, and connecting with the end *v′* of the siphon-formed tube *v″*, which passes into the hollow oil-tight lamp-post V, (see Figure 6,) in such manner that the interior perforated end *w* of said tube shall be immersed in the hydrocarbon contained in the said lamp-post, and hence conduct the air from the holder through the said hydrocarbon, and thus carburet or convert it into illuminating-gas to be used as wanted, through the agency of the stop-cock *w′*, the point of ignition being at *x′*.

The continuation or section of the pipe H, marked on the drawings by the letter U, may obviously be connected with any other recipient for the hydrocarbon, and produce the same result as in the case of a lamp-post, and, indeed, to any other apparatus in which a supply of air is required to produce any other results.

Y is a carburetter, provided with two perforated diaphragms, *a′ a″*, as shown at Figure 5, *e′* being the aperture through which the liquid is poured into the same, and *f′ f′ f′* the air-supply pipe, which is provided with a stop-cock, 1, and is connected with the tube 3, and, by means of that tube, to the force-pump *x″*, that is attached to the clock-work Z, seen at Figure 3, for the purpose hereinafter described.

h′ is the eduction-pipe from the carburetter, which is provided with a stop-cock, 2, and is connected, as shown at Figure 1, to the tube 3, which, entering the tank A at 4, rises perpendicularly above the surface of the water contained therein, and connects, at *j′*, to the edge (being soldered thereto) of the funnel J, (see fig. 2,) and then, by a sudden flexure downwardly, passes below the upper surface of the water to a sufficient depth to prevent the compressed air in the holder from forcing the water that is in the tank through this pipe, and itself (the air) from escaping through the same.

3′ is a stop-cock in the tube 3.

5 5, shown at fig. 3, are the supports of the clock-work Z, and 6, a rotary wheel of the clock, on which is secured a pin or crank, 7, to operate the piston of the pump *x″*, through the agency of the eccentric 8 and the shaft 8′, the same being held in position by eye-bolts 8″ 8″.

9 (see fig. 3) is a trigger, connected with the fly-wheel of the clock-mechanism, arranged in such a manner upon the clock-frame, that its bow-shaped projecting head 9′ is always confined inside the elongated slot 10 in the correspondingly-formed eccentric 10′, (see Figure 4,) which is secured in a vertical position on the top of the bell, at 11, or in such a manner that it starts or stops the operation of the clock-work, or of the piston of the pump, as the case may be, as I shall hereafter more particularly point out.

Having described the manner in which the several parts of my invention are connected together, I proceed now to indicate the mode in which it can be applied to different uses.

When a supply of air is to be carburetted, for a few hours' consumption only, and the number of burners to be lighted is limited, and the room assigned for the apparatus will admit one that is large enough to contain the necessary quantity of air to supply the burners for the given time, an aerometer, constructed as herein described, with or without vapor-burner S′, may be employed without any other appendages; but if the room assigned to the apparatus is of limited dimension, and a large number of burners is to be lighted, or if, after practical experiment, an apparatus of any given capacity should prove insufficient to supply the necessary quantum of carburetted air for the given or required time, it would be obviously necessary to use my supplementary mechanical arrangements for automatically refilling the holder A′ as often as the original supply therein shall be exhausted, in order to keep the lights continuously up or burning, and to obviate the necessity of having a watchman or other person in attendance, to perform the work of replenishment by hand.

In such cases, however, the carburetter Y, the pipes *f′ f′ f′* and *h′ h′*, must not be connected to the tube 3 3, and the continuation section U of the main pipe H, instead of being connected with the lamp-post V, as before described, must be connected to the carburetter Y, through the pipes *f′ f′ f′*, so that the eduction-pipe *h′ h′*, instead of being connected to the tube 3, as shown on the drawings, must be connected to the main pipe of the gas-burners, to supply them with gas when wanted.

But should it be desirable to supply the holder A′ with gas instead of air, automatically, then the pipes *f′ f′ f′* and *h′ h′* must remain connected to the carburetter Y and the tube 3 3, as shown on the drawings, to operate as hereinafter described.

When the first supply of air put in the holder A′ is used without the self-charging mechanism, or other equivalent appliance, the stop-cock M, on top of the bell A′, and the stop-cock *l* in tube K, when employed conjointly, must be opened. Any convenient means may be employed to do this.

The drum O is then revolved, by means of the crank *o′*, to raise the bell, through the medium of the ropes *p*, which causes the air to rush through the valve M and the tube K, into the bell, as the same rises upwardly.

If, when the bell attains its greatest point of elevation, these valves are, automatically or otherwise, closed, and the bell be allowed to descend, by its own weight, into the water of the tank, the air therein contained will be at once compressed between the surface of the water and the top of the bell, from thence to be distributed through the carburetter for making gas, or to any other apparatus requiring a constant stream of air, which stream may be regulated, or divided into smaller streams, if desired.

But when it becomes necessary to refill the air-holder with air, by automatic action, without disturbing the current of air escaping through the main pipe H, then the clock-work and eccentric 8, driven by a weight, are employed, in connection with the force-pump *x″*, to force it in, through the pipe 3, which leads into the tank, to serve as a conduit for the same.

In that case the stop-cocks 1 and 2 of the carbu-

retter Y, when connected to the tube 3, as shown on the drawing, are closed, and the stop-cock 3′, which, it will be observed, is located between the pipes *f* and *h*′, is opened, so that when the bell is nearly down, and before its supply of air is exhausted, the upper part of its vertical eccentric 10, fig. 4, impinges against one side of the bow-shaped trigger 9 of the mechanism, and releases its fly-wheel, which at once puts the air-pump in motion, and refills the holder with air that is driven into it through the tube 3. As the holder has attained to a fixed or certain point of elevation, the lower part of the same eccentric comes into contact with the reverse side of the trigger, and throws its pin in the path of the fly-wheel, and thus stops its further rotation until the descent of the bell renews the operation just above described, and so on indefinitely, or until the clock-work ceases to operate.

Should it, however, be desired, automatically, to fill the reservoir with gas instead of air, then the stop-cock 3′ must be closed, and the stop-cocks 1 and 2 opened, to allow the air, under the action of the pump, to pass through the carburetter Y before entering the reservoir.

Instead of employing the mechanism I have described to operate the force-pump, I may sometimes use a steam-engine to do it, whilst replenishing the bell A′, particularly in such localities where such engines are already in use during the night-time.

Under some conditions I may use a hand-pump, in connection with my apparatus, and duplicate certain parts of the latter, if I deem proper.

Having thus described my invention,

What I claim, and desire to secure by Letters Patent, is—

1. The combination of the supplementary tube K, stop-cock *l*, and perforations *q q q*, as described, and stop-cock M, with a metal air or ordinary gas-holder, A′, and its water-tank A, in the manner herein stated, and for the purposes set forth, whether said stop-cocks *l* and M, or equivalents, be used in conjunction with each other, or separately, as specified.

2. The combination of the pipe *v*′, provided with the perforated end *w*, the post V, provided with chamber *v*″, and the burner *x*′, arranged and operating substantially as set forth.

3. The combination of the funnel-shaped opening J of the pipe H, with an air or gas-holder, as shown upon the drawings, for the purpose set forth.

4. The combination of the pipes H and K, cocks *h* and *l*, carburetter Y, air-holder A′, and tank A, operating as set forth.

5. In combination with an apparatus for carburetting atmospheric air, the pipe H V, connected by intermediate pipes R, heated by burners S′, substantially as and for the purpose set forth.

6. The divisional pipes R, to connect the main pipe H to its continuation U, upon any part of the same, between the air-holder and the carburetter, for the purposes set forth.

7. The combination of vapor or other burners S′, with the divisional pipes R of the main pipe H, and continuation U, as herein described, for the purposes set forth.

8. The peculiar-shaped eccentric or cams 10′, fig. 4.

ARTHUR BARBARIN.

Witnesses:

H. N. JENKINS,

RUFUS R. RHODES.