

O. P. DRAKE.

Carbureter.

No. 35,144.

Patented May 6, 1862.

Fig. 1.

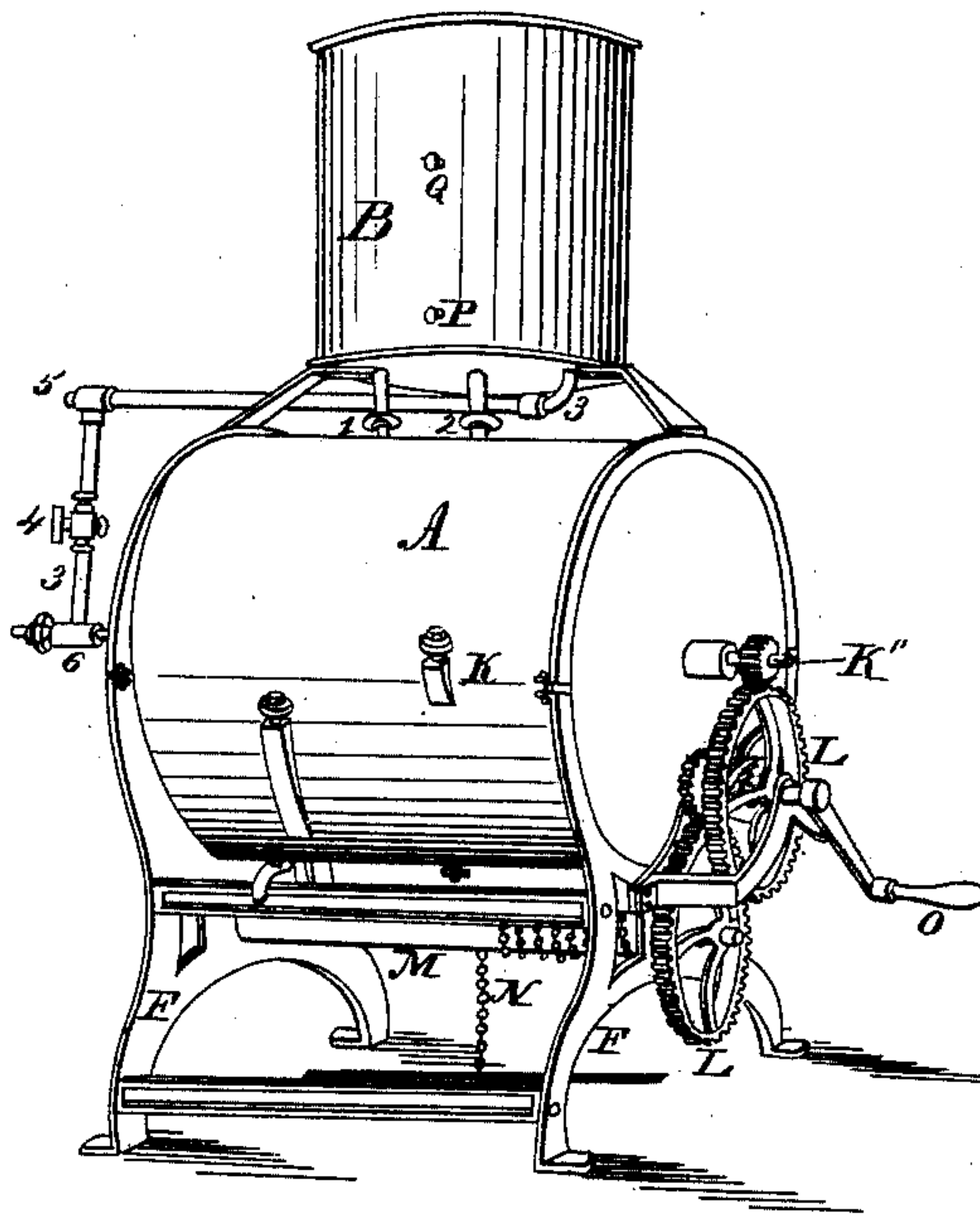
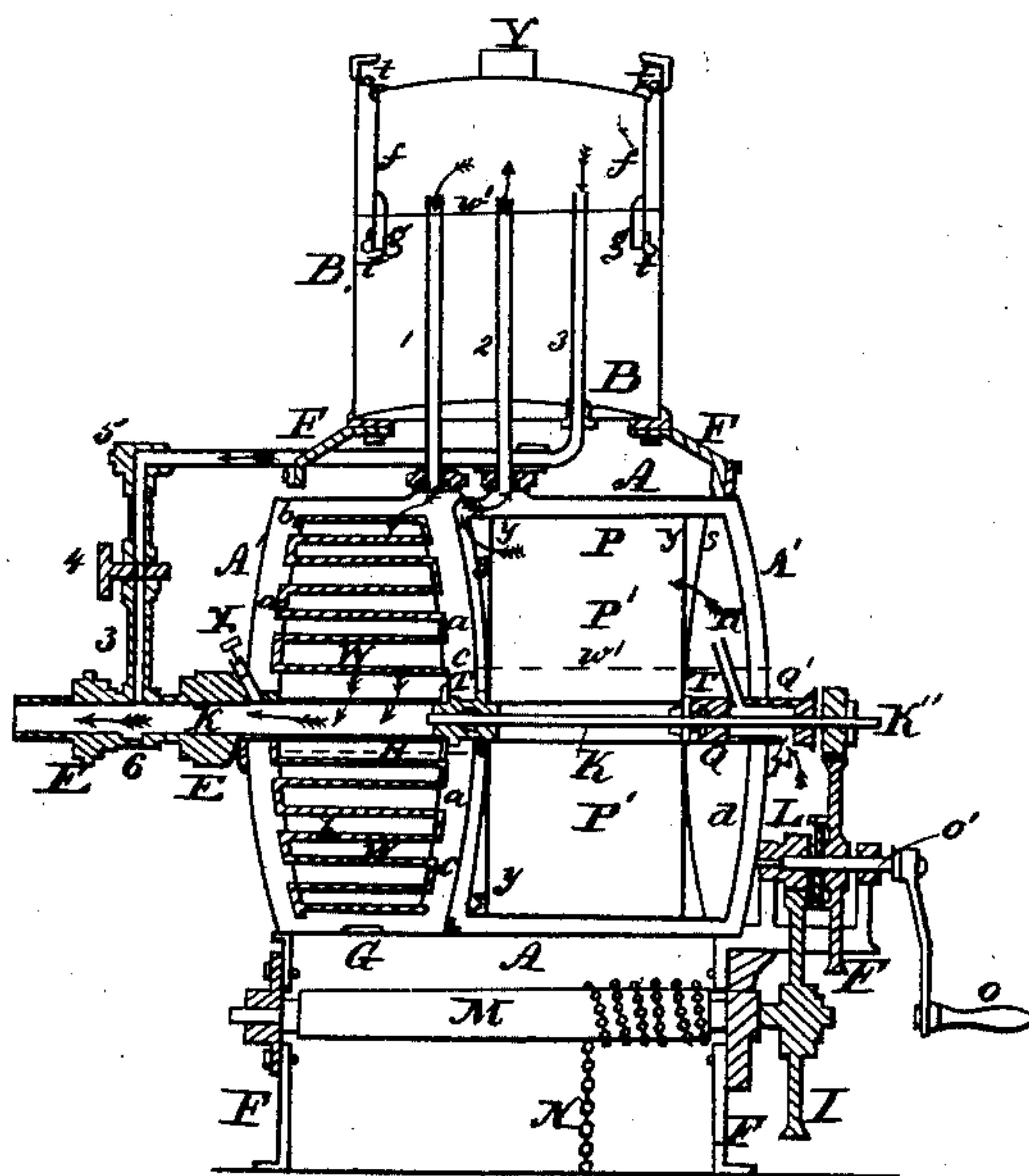


Fig. 2.



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IMPROVED APPARATUS FOR CARBURETING AIR.

Specification forming part of Letters Patent No. 35,144, dated May 6, 1862.

To all whom it may concern:

Be it known that I, OLIVER P. DRAKE, a citizen of the United States of America, and a resident of Boston, in the county of Suffolk and State of Massachusetts, have invented a new or Improved Apparatus for Vaporizing and Aerating a Liquid Hydrocarbon to be Burned for Illumination or for other Purposes; and I do hereby declare the same to be fully described in the following specification and represented in the accompanying drawings.

One of the products obtained from the distillation of petroleum and bituminous coals is a colorless liquid having an ethereal odor and being the lightest in specific gravity of all liquids known. By the automatic operation of my improved apparatus and without the application of artificial heat such a product may be readily converted into a dense gas and combined with a sufficient quantity of atmospheric air in order to produce, when on fire, a brilliant and luminous flame.

Of the said drawings, Figure 1 is a perspective elevation, and Fig. 2 a vertical and longitudinal section, of my said apparatus.

In the drawings, A represents a tight cylindrical or other proper shaped vessel, its ends being closed by two convex heads, A' A'. This vessel by the round disks c c' (of the same general form as the heads A' A') is divided into two chambers, of which the front one is the pump-chamber, and contains the revoluble air-pump drum P P, partially immersed in water, with which the said chamber is to be supplied as high as indicated by the dotted line w. The other chamber is to contain the liquid hydrocarbon and a revoluble generator, a a W W.

B is a vertical cylinder, closed at bottom and open at top. When in use, it should contain water as high as a vent-screw, or to the level of the dotted line w'. A regulator or aerometer, f f, is located in the vessel B, it being an inverted bell or cup having its lower edge dipping into the water some two or three inches, when the bell is at the extreme of its elevation within the said cylinder B.

The cylindrical water-tight vessels A and B are sustained by a frame, F F F F. A water-filling conduit, closed by a screw-cap and

opening into the air-pump chamber, is located, as shown at F' in Fig. 1, on the side of the vessel A and at height to indicate the level the water should stand in the pump. Another such filling-conduit, G, is placed on the said vessel and opening into the gas-chamber at the bottom thereof. I prefer to have it extend across the lower part of the gas-chamber to about three or four inches above the lowest point thereof, in order that a portion of the liquid hydrocarbon may remain in the conducting-tube after the chamber may have been supplied with it. This will prevent any escape of vapor from the chamber, while the conduit-cap may be removed for the purpose of enabling the chamber to be supplied with such fluid. The top of said conduit G should be located on the cylinder A just above the level which the liquid is to stand in the vaporizing-chamber.

I I, situated at the bottom of the vessel A, (see Fig. 1,) as well as P, projecting from the vessel B, are faucets or screw-stops used for drawing off the fluids from such vessels whenever it may be desirable to do so.

K is a shaft, which passes axially through the air-pump chamber or case and has its bearings affixed to the central parts of the head A' and disks c c. A small gear, K'', is fixed to the outer end of the said shaft K, the said shaft being carried through box-bearings T and Q'. This gear engages with a train of gears, L L, affixed to a weight-shaft, M, and a winding-shaft, O'. N is a chain having one end attached to the said shaft M. To this chain one or more iron weights should be affixed. The chain being wound on the shaft M, a crank, O, which is fitted to a square on the end of the winding-shaft O', is turned. The shaft O' may have a ratchet-wheel fixed to it, to engage with a pawl affixed to the large gear on the same shaft. In winding up the chain the shaft O' should turn freely in the large gear and the pawl should slip over the ratchet-wheel. The ratchet and pawl are shown at a' in Fig. 2.

To the central part of the said air-pump chamber a tubular inlet or air-box, Q, is attached and projects into the pump-chamber as well as outward from the head, as shown in Fig. 2. T is a water-tight stuffing-box af-

fixed to the inner end of the air-box, and Q' is a screw-cap bearing affixed to the outer end thereof. The bore of the tubular air-box has a diameter larger than that of the shaft K , in order to allow atmospheric air, which may enter an opening, r , made in the side of the tube Q' , to pass through an inlet or tube, R , and enter the case of the air-pump. The upper end of the tube R should project above the water-line of the pump-chamber.

As my air-pump drum (shown at $P P'$) is constructed similar to the drum used in a common wet-gas meter employed for measuring gas and is well known, I do not deem it necessary to give a definite description of this part of my apparatus, excepting that I would mention that I use the said drum for a different purpose and revolve the drum by mechanism instead of by the pressure of the gas. The drum is affixed to the shaft K , which goes through it axially, and while being revolved the drum, by its action with the water in its case, (the surface of such water being indicated by the dotted line w' in Fig. 2,) will force air in regular quantities into its case and from thence through the pipe 2 and into the aerometer. From the aerometer the air will pass by the pipe 1 down into the vaporizing-chamber, within which the revolving generator or vaporizer is placed. This vaporizer is made as follows—that is to say, it consists of two round convex plates, $a a$, fixed at their centers to the extremities of a hollow shaft or tube, K' . These disks should be capable of revolving on the said shaft, they being kept apart and in place by rods $h h$, arranged between them. Both plates, $a a a a$, are to be perforated with numerous holes arranged in concentric circles at equal distances apart. Through these holes strands $W W$, of cotton-wicking or other suitable fibrous material, are drawn and are laced from one disk to the other. When revolved with the plates on the hollow shaft, the strands will be saturated with a hydrocarbon liquid when contained in the vaporizing-case and standing at a level, nearly up to the shaft K' . That part of the hollow shaft K' which is between the plates $a a$ is perforated with holes, they being of sufficient number and capacity for the passage of gas or vapor into the said shaft by which it is to be conducted to the conduit, by which it is delivered to the places where it is to be burned.

There is a small tube leading from the bearing E of the shaft K' to the outside of the cylinder A , such tube being provided with a screw-stop, X . This tube is used for forcing grease into the packing of said bearing when required.

The regulator or aerometer bell, located within the vessel B , is represented at ff as a cylinder closed at top and open at the bottom and being somewhat smaller than the vessel B . $g g$ is an air-tight or annular chamber, extending around and within the open end of said bell. $t t t t$ are small wheels affixed to

the sides of said bell in order to prevent unnecessary friction while the bell may be moving vertically in the cylinder B . Y represents small weights used to regulate the pressure of said bell and to keep it in proper position while the machine may be in operation. The regulating tendency of this air-bell causes an even flowage of the gaseous or aerated vapor and a remarkably steady flame while it may be burning. The bottom of the bell, by dipping into the water in the cistern, closes the bell, and thus makes it air-tight. The air-chamber $g g$ serves to adjust the aerometer-bell to the varying number of burners that may be lighted at different times.

Air-conducting pipes 1 and 2 connect the air-pump and gas-chambers of the vessel A with the aerometer-bell ff . These pipes pass through the bottom of the vessel B , and are affixed thereto and extend a short distance above the water-line w' .

3 3 is another air-pipe connecting said aerometer-bell with the outlet-pipe K . 4 is a stop-cock in said pipe 3 3, and is for regulating the quantity of air to be let into the said outlet-pipe, in order that the said gaseous vapor may be suitably aerated. 5 is an elbow-joint at the angle of said pipe 3 3. This joint has an outlet stopped with a screw-plug, the object of this outlet being to connect an air conduit or pipe with the apparatus whereby air may be led to any joint where it may be desirable to mix it with a gaseous vapor-jet in a state of combustion. A very intense heat may be obtained by the admixture of gas and air under pressure and in combination, as above described, the same being useful for chemical, manufacturing, or culinary purposes or for heating apartments.

An apparatus constructed according to the above description will be found to be very effective in vaporizing and aerating a liquid hydrocarbon. When erected in a dwelling-house, some small closet centrally located and having a basement or cellar directly underneath should be selected for it, in which case the apparatus may be set on the floor or upon a platform in such closet. In either case the platform or floor should be level, or nearly so. An opening directly under the weight-shaft and lengthwise of it should be made through the floor of the closet in order to admit the chain N to pass down through it into the room below, a weight being subsequently attached to the lower end of the chain.

The main-burner conduit having been connected with the pipe K , the pump-chamber and the vessel B should next be supplied with water, after which the vaporizing-chamber should be supplied with the hydrocarbon fluid. Next, the chain N should be wound up by turning the crank O , after which the crank should be removed from the shaft O' . The pump will immediately commence to revolve.

The aerometer-bell will rise in the water of the vessel B . The air-pump and the vaporizer will revolve together, provided all the

parts and pipes are gas-tight and some one or more of the burner-jets are open, and will vaporize the liquid hydrocarbon and mix the vapor with air and will force them out of the burner-jets, the number of jets open regulating the motion of the movable parts of the apparatus. When all of them are closed, the machine will stop. The gas-vaporizing chamber can be supplied with the liquid at any time, whether the apparatus be in operation or not. So the chain also can be wound up without first extinguishing the lights.

I do not herein claim the combination of a gas-meter drum and case with an apparatus for vaporizing a liquid hydrocarbon, such meter wheel and case being to operate in such manner as to force air through the case of the vaporizer, such being described in a patent granted me on or about the 30th day of August, A. D. 1853.

I claim—

1. The combination, as well as the arrangement, of a vaporizer, an air-forcing apparatus,

and an aerometer, the whole being constructed to operate together substantially as described.

2. The above-specified arrangement of the vaporizer and the air-forcing apparatus, whereby the shaft of the rotary frame of the vaporizer may be connected to and put in motion by the shaft of the rotary drum of the air-forcing apparatus.

3. The air-inlet box Q, as made and applied to the case A and its shaft, and as provided with a pipe, R, to operate as specified.

4. The combination of the auxiliary air-pipe 3 3 with the aerometer and the vaporizing and aerating apparatus, substantially as described.

5. The combination of the annular air-vessel *g g* with the aerometer, when combined with a vaporizer and an aerating apparatus, as specified.

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Witnesses:

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