2 Sheets--Sheet 1.

G. B. CALDWELL.

Machine for Manufacturing Vapor-Gas.

No. 164,422. Patented June 15, 1875.

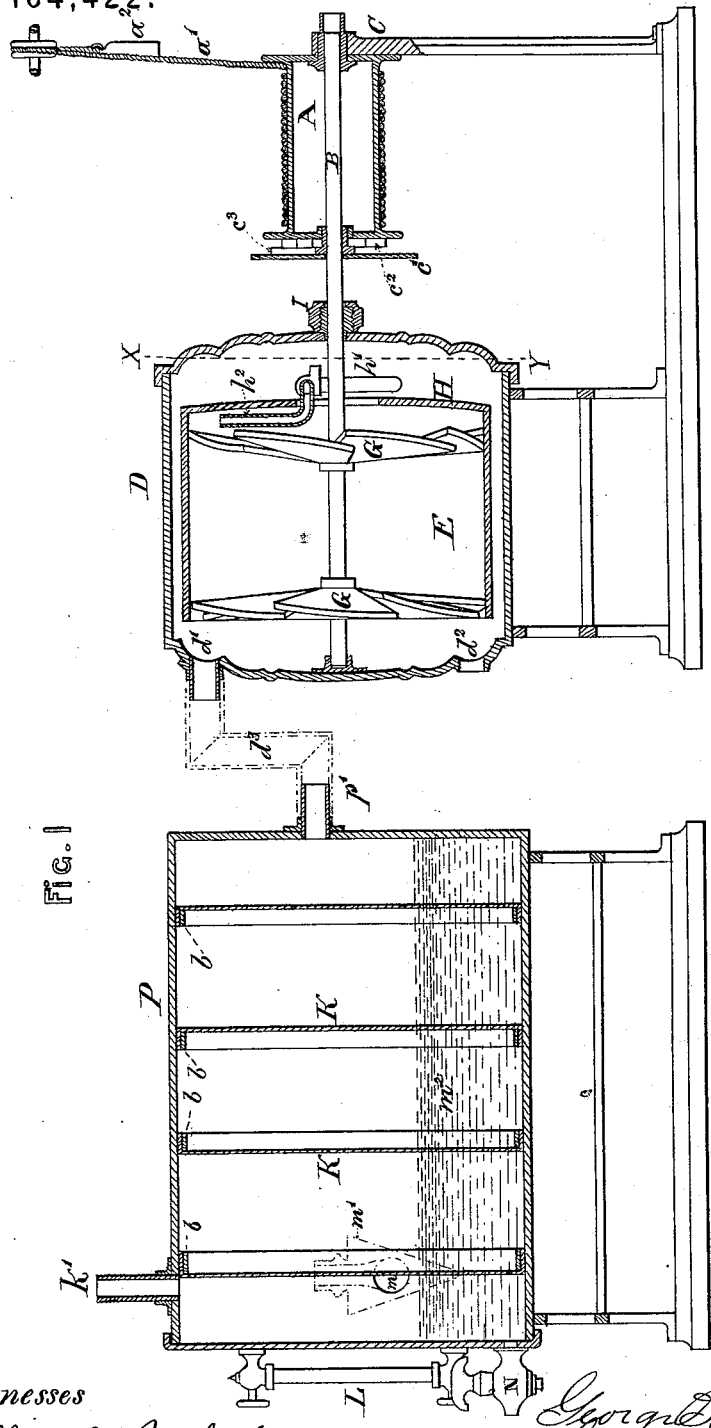

FIG. 1

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2 Sheets--Sheet 2.

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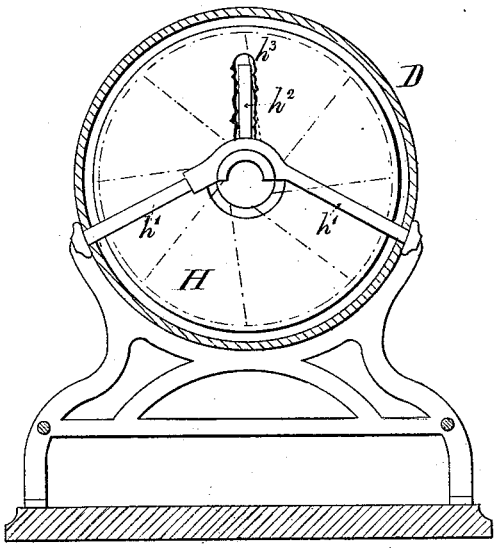
Fig. 2



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UNITED STATES PATENT OFFICE.

GEORGE B. CALDWELL, OF PHILADELPHIA, PENNSYLVANIA.

IMPROVEMENT IN MACHINES FOR MANUFACTURING VAPOR-GAS.

Specification forming part of Letters Patent No. **164,422**, dated June 15, 1875; application filed December 22, 1874.

To all whom it may concern:

Be it known that I, GEORGE B. CALDWELL, of Philadelphia, State of Pennsylvania, have invented certain new and useful Improvements in Machines for the Manufacture of Vapor-Gas; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the annexed drawings, making part hereof.

This invention has relation to machines for the manufacture of vapor-gas; and consists of a horizontal cylinder having a series of vertical absorbing fibrous surfaces, tightly drawn over and secured to metal hoops or rings, which fit closely against the interior surface of the cylinder, in connection with an air-forcing apparatus, the construction of which will be hereinafter described.

In the drawings, Figure 1 is a longitudinal sectional view of my whole apparatus; Fig. 2, a cross-section on the line X Y of Fig. 1.

A is the windlass or spool upon which is wound the weighted cord; a^1, the cord; a^2, the weight; B, the shaft; C, the leg or journal for supporting the outer end of the spool; c^1, the stop; c^2, the ratchet-wheel; c^3, the click; D, the air-cylinder and water-chamber; d^1, air-exit; d^2, the drain; d^3, connecting air-pipe; E, the water-space. G G are fan-disks, formed of overlapping sections of circular planes; H, the revolving fan-cylinder; h^1, air-entry pipe; h^2, continuation of the pipe h^1, to carry the air above the water-line, which is at point h^2; h^3, an opening, broken away to show pipe h^2 in Fig. 2; I, a stuffing-box to prevent the escape of water. K K are the upright absorption and evaporation surfaces or disks, secured to metallic rings *b*, which fit closely against the inner surface of the chamber P; L, the glass tube of the oil-gage. *m* is the oil-supply pipe; m^1, the funnel-mouth of the oil-supply pipe *m*. m^2 is the oil. N is the oil drain-cock; K′, a pipe for the exit of the gas; *p*′, a pipe for the entrance of air into chamber P.

The operation of my machine is as follows: The windlass A is wound up until weight a^2 is raised to its utmost height, opening d^2 having been closed, and chamber D having been filled with water up as high as the point h^2. The click or stop c^3 then prevents windlass A from rapidly revolving as the said click drops into the ratchet c^2, and is secured to the check or stop c^1, which in its turn is rigidly secured to the shaft B. The weight a^2 then begins gradually to descend, unwinding the rope from windlass A, and turning the shaft B, which latter revolves the fans G and fan-cylinder H. The water in water-space E prevents the fans from revolving rapidly, and keeps their motion steady and regular. The fan-flaps are so arranged that on emerging from the water the edges nearest to pipe h^2 cut the air coming from the pipe, and force it along between the surface of the water and the upper side of cylinder H, and finally out through the air-escape d^1 into chamber P. The fibrous surfaces K have in the meantime become thoroughly saturated with the oil m^2, into which they dip, by taking it up or absorbing it like lamp-wick. These surfaces are thin as well as fibrous, being flannel, cotton, linen, or some equivalent substance. The air which is forced by the fans into chamber P is forced in a steady and unwavering current through these fibrous surfaces, and in the passage takes up the vapor from the oil, which may be gasoline oil; in fact, the air vaporizes the oil, which vapor is highly inflammable, and is finally carried off with the air through escape-pipe K to the burner, where it is steadily consumed. The regularity and steadiness of the whole operation insure a uniform flame, and the effectual vaporization or volatilization of the oil secures its brilliancy. The advantages of having the fibrous surfaces tightly drawn over and secured to the hoops or rings *b* will be apparent from the fact that were they not so constructed and connected to the cylinder, but merely suspended from the top, the blast or current of air passing through would tend to throw them up out of contact with the oil, and retard the operation of vaporization; and, again, where a perforated plate is used, around which is placed a sheet of fibrous material, prevents the free circulation of air through the same, also necessitating the employment of an additional reservoir for the oil. The air-entry pipe h^1 is slanted, as shown in Fig. 2, to carry off any water which may form by condensation of vapor, or which may run or overflow into pipe h^2. The head H, Fig. 2, has an annular opening around its

axis, to permit the entry of pipe h^1 h^1, and still allow it to revolve on its said axis. The exit of pipe h^2 is isolated by the sides of the revolving cylinder and the water, to prevent the return of air which has been forced from it. The air would otherwise return through the opening around the axis named above.

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

The combination, with an air-forcing apparatus consisting of air-cylinder H, fans G, pipe h^1, and air-entry pipe h^2, of the horizontal cylinder P, provided with a series of vertical absorbing fibrous surfaces, K, the same being tightly drawn over and secured to metal hoops or rings *b*, fitting closely against the interior surface of the cylinder, substantially as and for the purpose set forth.

GEORGE B. CALDWELL.

Witnesses:
GEORGE E. BUCKLEY,
ALBERT E. ZACHERLE.