No. 663,160. Patented Dec. 4, 1900.

J. S. DUNLAP.

ALCOHOL STOVE.

(Application filed Nov. 13, 1899.)

(No Model.)

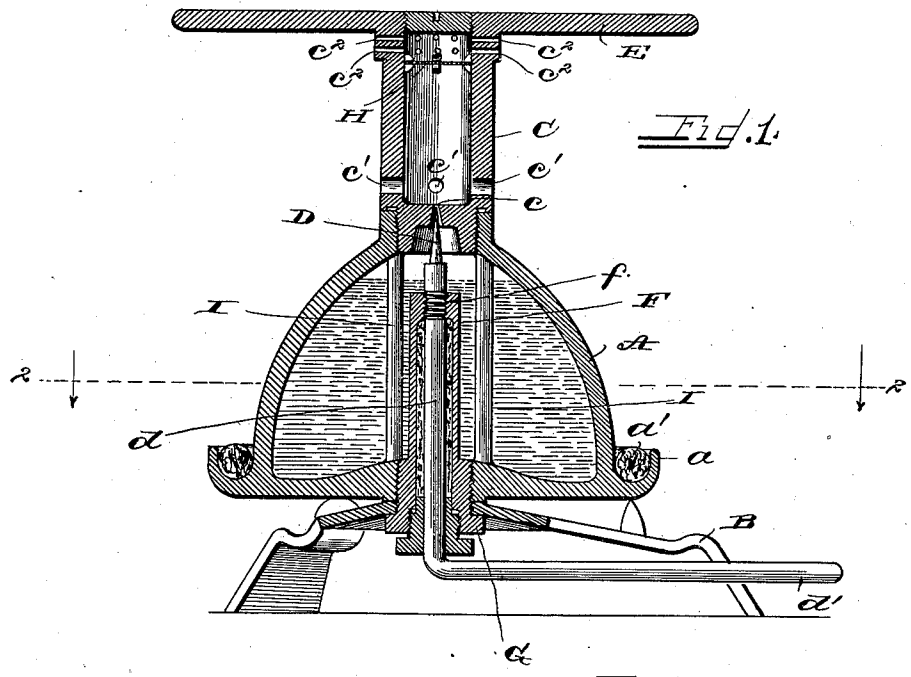
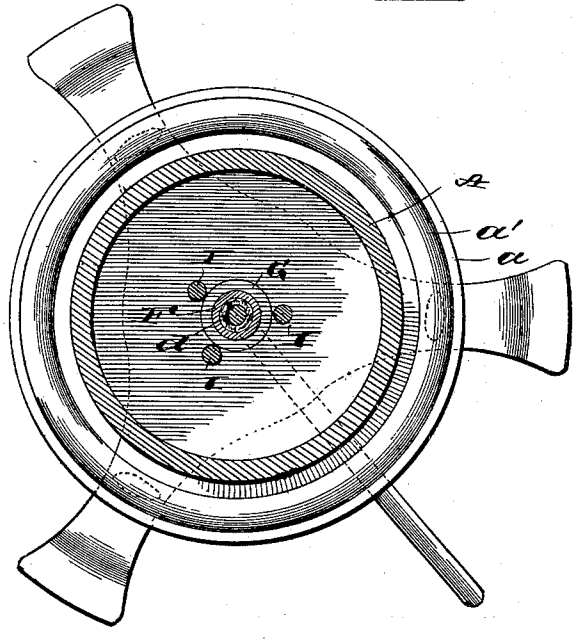


Fig. 1.

Fig. 2.



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UNITED STATES PATENT OFFICE.

JOHN S. DUNLAP, OF CHICAGO, ILLINOIS.

ALCOHOL-STOVE.

SPECIFICATION forming part of Letters Patent No. 663,160, dated December 4, 1900.

Application filed November 13, 1899. Serial No. 736,849. (No model.)

To all whom it may concern:

Be it known that I, JOHN S. DUNLAP, a citizen of the United States of America, residing at Chicago, county of Cook, and State of Illinois, (and whose post-office address is said Chicago,) have invented certain new and useful Improvements in Alcohol-Stoves, of which the following is a description.

Referring to the accompanying drawings, wherein like reference-letters indicate like or corresponding parts, Figure 1 is a central vertical section of my device, and Fig. 2 is a horizontal section of the same in line 2 2 of Fig. 1.

My invention belongs to that class of devices known as "vapor-burners," and has for its object the simple and economical generation and combustion of alcoholic vapors for the generation of heat.

To this end it consists of the novel construction and combination of parts herein shown and described, and more particularly pointed out in the claims.

In the drawings, A represents a reservoir, and B the supports for the same.

C is a mixing-chamber connected with the reservoir by a port *c*, controlled by a suitable valve D. The mixing-chamber is provided with ducts or apertures *c' c'*, through which air is admitted and commingled with the alcoholic vapors.

E is a supporting-plate forming a part of and supported by the part C, upon which any vessel or utensil to be heated may be placed. Near the top of the chamber C is a series of apertures or ports c^2 c^2, proportioned and arranged to conduct the mingled vapor and air in a suitable manner to be ignited and burned, the flame contacting with and heating the plate E. Means are provided for preliminarily heating the reservoir to start the vaporizing of the alcohol. In the preferred form a trough *a* is constructed upon the reservoir A, at or near its base, in which a small quantity of alcohol or its equivalent may be ignited for this purpose. I prefer to position a wick *a'*, of asbestos or equivalent material, within the trough to more perfectly perform the preliminary heating and to prevent the accidental spilling of the alcohol placed in the trough. The valve D may be arranged and controlled in any suitable manner. As shown, the valve-rod *d* is supported in position by the guiding-sleeve F, which is inserted from and secured to the bottom of the reservoir. A stuffing-box G is provided to prevent leaking. A screw-threaded connection between the valve-rod *d* and the sleeve F, as at *f*, provides for controlling the valve and the stove by manipulation of the valve-handle *d'*. To provide for a more thorough mixing of the vapor and air, I prefer to place one or more foraminated screens or sieves H within the chamber C, between the air-ducts *c'* and the igniting-ports c^2, as shown.

It is found in practice that when the valve is closed, after the stove has been burning some time, the rapid vaporizing of the alcohol continues for a time, causing comparatively heavy pressure within the reservoir. It is important, therefore, to provide against distortion of the reservoir from this cause and the consequent improper operation or leaking of the valve. The general form of the reservoir should be such as to provide against side pressure, and means should also be provided to prevent the distortion of the bottom of the reservoir. For the latter purpose I form stay-rods I, preferably integral with the reservoir and arranged to extend from the bottom to the top of the same, thus securely tying the two parts together and effectively preventing the distortion, and thus dispensing with the excessive weight of material necessary if such rods are not used.

The mode of operation is apparent. The reservoir being charged with alcohol a small quantity of the same or its equivalent is placed in the trough *a* and ignited. The heat communicated to the alcohol within causes it to begin to vaporize, which vapor upon opening the valve D escapes by the duct *c* into the mixing-chamber C, where it is thoroughly commingled with sufficient air admitted through the ducts or apertures *c' c'* to secure perfect combustion. Passing upward the commingled vapor and air passes through the igniting-ports c^2 c^2, directing the flame upon the plate E. The material within the trough *a* is quickly exhausted, after which, by reason of the proportions of the several parts, sufficient heat is conducted from the heating-plate and mixing-chamber to the res-

ervoir to continue the vaporizing process. The flame is extinguished by closing the duct *c* by means of the valve D.

The arrangement and proportions of the several parts is important, as a too-rapid vaporization of the alcohol not only interferes with the effective operation of the stove, but sometimes extinguishes the flame, while when too slow the flame is also extinguished or is of such quality as not to be effective.

I am aware of the patent to C. Hoppe for a vapor-stove, No. 631,792, dated August 29, 1899, and do not claim the invention therein set forth.

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

1. A vapor-stove comprising the following elements in combination: a substantially dome-shaped reservoir, a mixing-chamber above the same and communicating therewith by means of a duct, a valve carried by the bottom of the reservoir and movable toward and from the said duct, and stay-rods connecting the top and bottom of the reservoir whereby the latter is prevented from expanding and causing an improper operation of the valve, substantially as described.

2. A vapor-stove comprising the following elements in combination, a reservoir, a mixing-chamber secured to the reservoir-top, a valve-guide extending through the reservoir-base into the reservoir and having within the reservoir a screw-thread, and a valve extending up through said valve-guide and having a screw-thread coöperating with said thread on the valve-guide, said valve controlling a port leading from the reservoir to the mixing-chamber, substantially as described.

3. A vapor-stove comprising the following elements in combination, a reservoir having a screw-threaded opening in the top and a screw-threaded opening in the bottom, a mixing-chamber above the reservoir and having a screw-threaded plug screwed into said opening in the reservoir-top, and also having a port connecting with the reservoir, a valve-guide screwed into said opening in the reservoir-bottom, and a valve working in said valve-guide and controlling said port, substantially as described.

4. A vapor-burner comprising a reservoir, a mixing-chamber secured to said reservoir-top, a valve-guide extending through the reservoir-base into the reservoir, a support for the reservoir held in place by said valve-guide, and a valve in said guide for controlling a port connecting the mixing-chamber and reservoir, substantially as described.

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