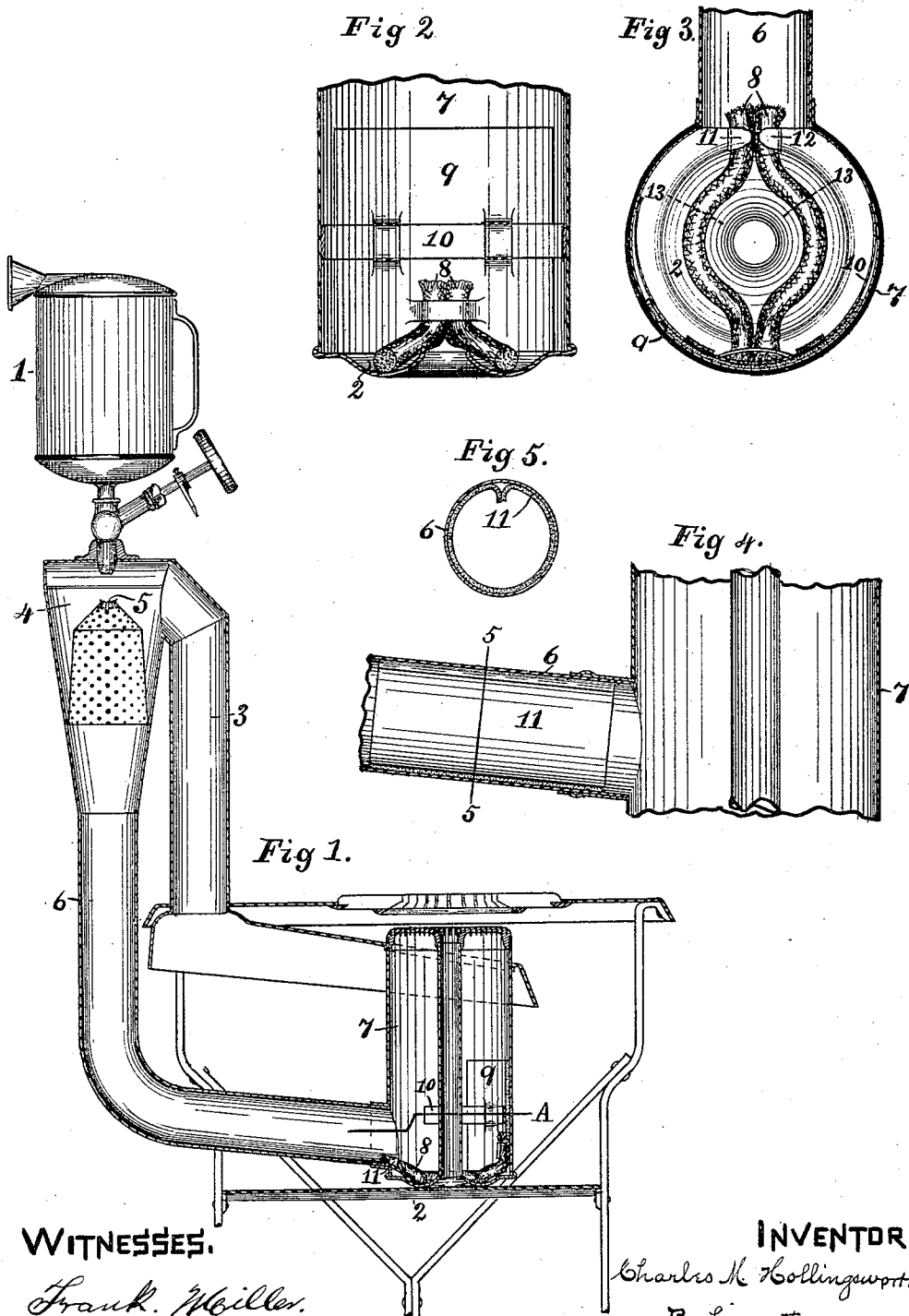


(No Model.)

C. M. HOLLINGSWORTH.
VAPOR STOVE.

No. 471,289.

Patented Mar. 22. 1892.



WITNESSES.

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CHARLES M. HOLLINGSWORTH, OF CLEVELAND, OHIO.

VAPOR-STOVE.

SPECIFICATION forming part of Letters Patent No. 471,289, dated March 22, 1892.

Application filed December 27, 1890. Serial No. 375,941. (No model.)

To all whom it may concern:

Be it known that I, CHARLES M. HOLLINGSWORTH, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Vapor-Stoves, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings.

My invention relates to the class of vapor-stoves which are first shown in my prior patent, No. 420,797, dated February 4, 1890, and subsequently shown in other patents granted to me. In stoves of this class the volatile liquid hydrocarbon is fed drop by drop into a vaporizing-chamber, where it spreads itself in a thin sheet on suitable evaporating-surfaces, which have a continuously-downward inclination for a considerable distance and generally until they enter the burner-shell. After these stoves have been burning for a little time the continued admission of a regular amount of the liquid hydrocarbon to the vaporizing-chamber, usually called the "normal feed," preserves a constant and suitable flame at the burner; but when it is desired to first light the burner, if the valve is opened only far enough to supply this normal feed a very considerable time must elapse before enough of the combustible vapor is formed to feed a burner-flame. To avoid this delay, the valve may be opened at first farther than is necessary to supply the normal feed and enough liquid admitted in a very short time to "flood" the evaporating-surfaces, after which the valve may be turned back to its position for supplying the normal feed. By thus "flooding" the evaporating-surfaces one is able to light the burner almost instantly; but when the surfaces have been flooded it is clear that all of the liquid may not, and in practice will not, be evaporated in the vaporizing-chamber or in the downwardly-inclined pipe which connects it with the burner-shell, and as a result a considerable quantity of the liquid will be discharged onto the bottom of the burner-shell, or the same result will follow an attempt to start the stove with the normal feed in a cold surrounding atmosphere. One result of this condition of things is that as the burners are practically constructed some of the liquid leaks through the joint at the

bottom of the burner, creates a disagreeable odor, and renders the operation of the burner somewhat dangerous. Another result is that the liquid which accumulates on the bottom of the burner-shell will evaporate slowly and irregularly, and the vapor formed thereby will not be thoroughly mixed with the vapor which enters the shell from the pipe 6. Moreover, all of the accumulated liquid may not be evaporated during the time it is desired to use the stove, and the stove will consequently continue to give off a disagreeable odor after the feed from the reservoir has been cut off and the burner-flame extinguished.

The object of my invention is to provide means whereby the evaporating-surfaces may be flooded, and the burner thereby lighted a very short time after the valve is opened without attendant dangerous and disagreeable features above pointed out.

Referring now to the drawings, Figure 1 is a sectional elevation of a stove containing my invention, the burner-shell being shown in vertical section. Fig. 2 is a vertical section of a fragment of the burner-shell, taken at right angles to that shown in Fig. 1. Fig. 3 is a horizontal section at the point indicated in Fig. 1 by the line A. Fig. 4 is a longitudinal vertical section of the lower section of the conducting-pipe, and Fig. 5 is a transverse section through said part of said pipe. The last two figures show a modified form of the invention which is shown in the first three figures.

A reservoir 1 of any approved construction is suitably supported above a vaporizing-chamber 4. A pipe 6 is connected at its upper end with the lower end of the vaporizing-chamber, and at its lower end with the lower part of the shell of the burner 7. The vaporizing-chamber 4, (below the air-inlet from the pipe 3,) the pipe 6, and the burner-shell form together a closed conduit, through which the mixed air and vapor flows by gravity to the burner-cap, through which it passes to be consumed.

5 represents a suitable evaporator arranged within the vaporizing-chamber and below the valve-controlled outlet of the reservoir 1. The liquid which is allowed to escape from the reservoir falls drop by drop onto this evaporator 5. The liquid spreads itself into thin

sheets upon the said evaporator, from which it flows onto the walls of the vaporizing-chamber, and from thence continuously downward on the interior walls of the pipe 6.

5 When the stove is operating properly under a normal feed, all of the liquid admitted to the vaporizing-chamber will generally be vaporized therein and in the conducting-pipe 6 and will mingle with the air which is admitted to the vaporizing-chamber through the pipe 3, and the combined mixture of air and vapor will fall by gravity, and will, through the closed conduit formed by the vaporizing-chamber 4, the pipe 6, and burner-shell 7, be delivered through the perforations in the burner-cap, at which point it is burned; but when to start the burner quickly the valve is opened wider than is necessary to furnish the normal feed, or in a cold surrounding atmosphere even with the normal feed, some of the hydrocarbon still in a liquid form will not be evaporated in the chamber 4 or pipe 6, but will be delivered into the burner-shell. The bottom of the burner-shell is therefore provided with an annular depression or gutter 2, and the lower part of the end of the pipe 6, over which the liquid flows, is extended over this gutter.

8 represents an absorbent material—for example, asbestos or cotton wicking—which lies upon the bottom of the burner-shell in the gutter 2 and extends around the central draft-tube to the opposite side of said burner-shell. One end of this wicking is fastened to the overhanging end of the pipe 6, and the other end is in absorbing connection with a strip of the absorbent material 9, which may be made of asbestos paper, carpet-paper, blotting-paper, or any other suitable material. This strip of absorbent paper is about half as high as the burner-shell and extends about half-way around said burner-shell and lies practically in contact with the interior walls thereof at a point directly opposite the infeed-opening.

10 represents a strip of spring metal, which passes through slits in the paper and operates to hold the paper against the walls of the burner-shell. Any of the liquid hydrocarbon which has flowed down to the lower end of the pipe 6 is absorbed by the wicking 8. When this is saturated, the liquid is still further absorbed by the absorbent paper 9. After the burner has once been lighted the valve, which had been opened wide to "flood" the evaporating-surfaces, is closed to the point where the liquid is fed at the normal rate to said chamber. Then as the flame continues at the burner-cap little by little the liquid which has been absorbed by the absorbent material, as before explained, is evaporated and mixed with the vapor which is passing to the burner-cap. The arrangement of the absorbent material against the interior wall of the burner-shell and at the point directly opposite the infeed-opening thereto is the best arrangement for producing the most sat-

isfactory results, because, first, the heat of the burner-shell will assist the evaporation of the liquid which has been absorbed by the strip 9, and, second, the combustible vapor which has been formed in the vaporizing-chamber and pipe 6 as it enters the burner-shell is projected across the chamber inclosed thereby against the paper 9, and the vapor produced by the evaporation of the liquid which has been absorbed by the said paper 9 is thoroughly mixed with the other vapor which has entered from the pipe 6.

In order to facilitate the connection of the wicking 8 with the pipe 6 the end of said pipe is provided with the integral lateral tongues 11 and 12, which are bent down onto the ends of the wicking, as shown. If desired, the wick 8 need not be connected with the pipe 6, but may be cut off at the points indicated by the lines 13. The two parts of the wick will lie in the gutter 2 and be connected, as before described, with the absorbent paper 9, whereby substantially the same result will be produced, or any equivalent of the wick might be employed to make the absorbing connection between the strip 9 and the surface on which the liquid is spread.

The modification of this invention (shown in Figs. 4 and 5) is designed particularly for ready application to vapor-stoves which have already been made and sold.

11 represents a tube made of asbestos paper, carpet-paper, or other suitable absorbent material. Its meeting edges are bent inward, as shown, whereby the paper tube is expanded and forced into contact with the pipe 6, into the lower end of which said paper tube is inserted. This paper tube will, like the other form of the invention, absorb so much of the hydrocarbon liquid as flows into contact with it by reason of the flooding of the surfaces, and will deliver this liquid up in the form of a vapor after the burner has been in operation a short time and the feed of liquid to the vaporizing-chamber has been reduced to the normal feed. This form of the invention, like that first described, is well adapted to cause the vapor produced by the evaporation of the liquid, which has been absorbed by the tube 11, to be thoroughly mixed with the vapor which descends the pipe 6.

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

1. In a vapor-stove, the combination of a vaporizing-chamber having an air-inlet in its upper end, means for admitting a volatile hydrocarbon liquid to said vaporizing-chamber and spreading it on suitable evaporating-surfaces inclosed therein, a conducting-pipe connected with the lower end of said vaporizing-chamber and forming with it a conduit, through which the vapor and unvolatilized liquid flows downward, a burner-shell connected with the lower end of said pipe and forming a continuation of said closed conduit, and an absorbent material inclosed with-

in said conduit and in absorbing connection with the surfaces onto which the unvolatilized liquid will flow, substantially as and for the purpose specified.

5 2. In a vapor-stove, the combination of a vaporizing-chamber having an air-inlet in its upper end, means for admitting a volatile hydrocarbon liquid into said chamber and spreading it on suitable evaporating-surfaces
10 inclosed therein, a conducting-pipe connected with the lower end of said vaporizing-chamber, a burner-shell connected with the lower end of said pipe, and a strip of absorbent material inclosed within the burner-shell and in
15 contact with its wall at a point opposite to that at which said shell is connected with said pipe and in absorbing connection with the surfaces onto which the unvolatilized liquid will flow, substantially as and for the purpose
20 specified.

3. In a vapor-stove, the combination of a vaporizing-chamber having an air-inlet in its upper end, means for admitting a volatile hydrocarbon liquid into said chamber and
25 spreading it on suitable evaporating-surfaces inclosed therein, a conducting-pipe connected with the lower end of said vaporizing-chamber, a burner-shell connected with the lower end of said pipe and having an annular gutter
30 in its lower end, said pipe having a tongue on its lower end, which extends into said burner-shell, a strip of absorbent material inclosed within the burner-shell and in contact with

its wall at a point opposite to the infeed-opening to said shell, and a wick lying in said
35 gutter and connected with said absorbent strip, substantially as and for the purpose specified.

4. In a vapor-stove, the combination of a vaporizing-chamber having an air-inlet in its
40 upper end, means for admitting a volatile hydrocarbon liquid into said chamber and spreading it over suitable evaporating-surfaces inclosed therein, a conducting-pipe connected with the lower end of said vaporizing-
45 chamber, a burner-shell with which the lower end of said pipe is connected and into which a tongue on the lower end of said pipe extends, said burner-shell having an annular gutter in its lower end, a strip of absorbent
50 material inclosed within the burner-shell and in contact with its wall at a point opposite to the infeed-opening to said burner-shell, a strip of spring metal adapted to hold said absorbent strip against the burner-shell, and a wick
55 lying in said gutter, having one end connected with said absorbent strip and having its other end connected with the end of said pipe by means of integral lateral tongues formed thereon, substantially as and for the purpose
60 specified.

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Witnesses:

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