

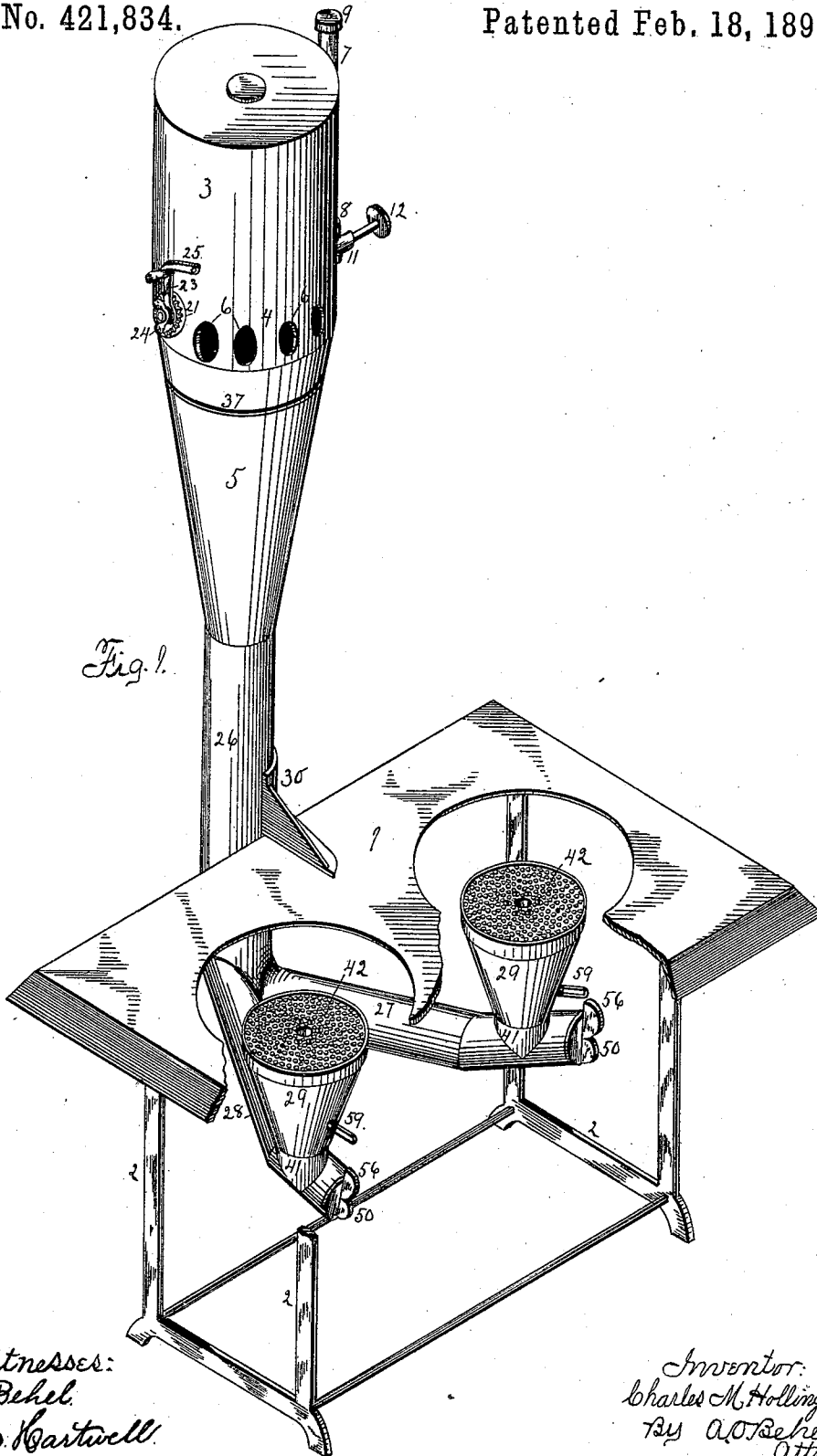
(No Model.)

2 Sheets—Sheet 1.

C. M. HOLLINGSWORTH.  
APPARATUS FOR VAPORIZING LIQUID HYDROCARBON AND SUPPLYING  
THE VAPOR TO BURNERS.

No. 421,834.

Patented Feb. 18, 1890.



Witnesses:  
E. Behel.  
V. B. Hartwell.

Inventor:  
Charles M. Hollingsworth  
By A. O. Behel.  
Atty.

(No Model.)

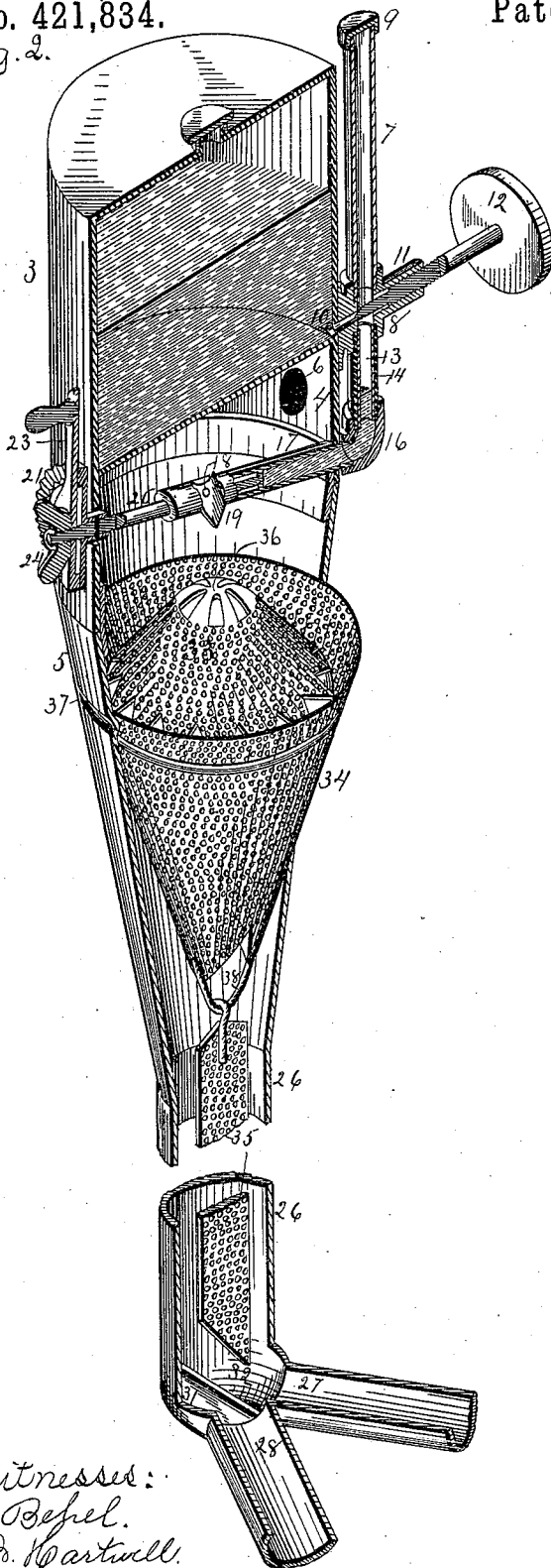
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Fig. 2.



Witnesses:  
E. Bebel.  
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Inventor:  
Charles M. Hollingsworth  
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# UNITED STATES PATENT OFFICE.

CHARLES M. HOLLINGSWORTH, OF ROCKFORD, ILLINOIS.

APPARATUS FOR VAPORIZING LIQUID HYDROCARBONS AND SUPPLYING THE VAPOR TO BURNERS.

SPECIFICATION forming part of Letters Patent No. 421,834, dated February 18, 1890.

Application filed November 12, 1888. Serial No. 290,586. (No model.)

*To all whom it may concern:*

Be it known that I, CHARLES M. HOLLINGSWORTH, a citizen of the United States, residing at Rockford, in the county of Winnebago and State of Illinois, have invented certain new and useful Improvements in Apparatus for Vaporizing Liquid Hydrocarbon and Supplying the Vapor to a Burner, of which the following is a specification.

My invention relates to the process of vaporizing liquid hydrocarbon and supplying the vapor to a burner, wherein a suitable feed of the liquid is spread upon an evaporating-surface freely exposed to the air within a vaporizing-chamber, and thereby vaporized as it is fed, and the mingled vapor and air are conveyed automatically to the burner by gravity; and my object is to produce an apparatus of suitable construction for making application and use of this process in vapor-stoves and other allied appliances in which gasoline-vapor may be used as fuel.

The apparatus comprises as essential parts an oil-reservoir, an oil-feed device, a vaporizing-chamber having an air-inlet and inclosing a suitable evaporating-surface, a conducting-tube, and a burner, to which may be added, if desired, a valve to the burner. The form and construction of these parts and the manner in which I connect them together to constitute the working apparatus may be illustrated by reference to the accompanying drawings, in which—

Figure 1 is an isometrical representation of a vapor-stove embodying my invention; and Fig. 2 is a vertical section in isometrical of the oil-reservoir, with the oil-feed device in connection therewith shown entire, and of the vaporizing-chamber, a main conducting-tube, and parts of two branch tubes, with an evaporator shown entire within the vaporizing-chamber and main tube.

As here represented, the oil-reservoir 3 is removably supported by a downward-projecting flange 4 upon the main walls 5 of the vaporizing-chamber, this flange and the bottom of the reservoir thus forming an upward extension and top or cover to said chamber. In this flange are located the air-inlets 6. By thus affixing to the reservoir the upper portion of the wall of the vaporizing-chamber this part is put into fixed relation with the

oil-feed device, a part of which enters within it, and it also serves as a supporting-foot to the reservoir when the reservoir is removed for filling; but, if desired, the oil-reservoir may be placed at any distance away from the vaporizing-chamber and above its level, and the oil carried to the chamber by a suitable pipe.

Attached to the reservoir is shown one form of oil-feed device that may be used, and which is constructed and operated as follows: At 13 is a glass gage secured in metal fittings, into which the oil may be fed from the reservoir by means of the valve 12, and when so fed its height in the gage determines and indicates to the eye the rate of flow from the drip-outlet 18, which has pipe-connection with the gage, the drip-orifice being adjusted to a suitable size by means of the valve 20. The specific features of this feed device are not herein claimed, but reserved for a future application.

The vaporizing-chamber I prefer to make funnel-shaped, as shown, tapering to the size at its lower end of the conducting-pipe 26, to which it is joined, and by which it is supported. As will hereinafter appear, this conducting-pipe may itself be made to serve as a supplementary part of the vaporizing-chamber.

Greater simplicity of operation may be secured by providing a separate vaporizing-chamber and conducting-tube for each burner of a stove having more than one burner, in which case the oil may be conducted to the several vaporizing-chambers from the same reservoir by means of suitable pipes.

Within the vaporizing-chamber and removably supported from its walls in the manner shown is a sectional evaporator 33, 34, and 35, mainly of perforated metal plate, the sections made separable, if desired. The receiving and essential section 33 is in form a broad hollow cone ending bluntly at the top in a horizontally-flattened drip-spot 36, the drip-spot being preferably imperforated. The oil will spread more evenly to all sides of the cone if a zone around the drip-spot and forming the deflection from it to the sides of the cone is divided into a number of narrow channels or distributing-arms, as shown in the drawings. Raised points or ridges in place

of the dividing-apertures shown would serve the same purpose.

In the composite or sectional evaporator shown in the drawings the receiving part 33 is represented as supported in place by contact with the funnel-shaped part 34; but the part 33 may be used independently of the other parts shown, in which case it is preferably supported in place by contact of its base with the walls of the vaporizing-chamber, and these walls below the line of contact may then serve as supplementary evaporating-surfaces, to which the oil may spread.

By suitably shaping the vaporizing-chamber itself, as by inclining and flattening it, the inner surface of its walls may be used as the sole evaporating-surface, but not so efficiently as a special evaporator properly placed within the vaporizing-chamber.

The middle section 34 of the evaporator shown in the drawings is funnel-shaped, and receives and supports the upper section within its top. It tapers more rapidly than the walls of the vaporizing-chamber, so that when it is placed in the vaporizing-chamber it comes into supporting contact with the walls of the latter around its upper edge only. The draining off of this section of any oil that may reach its lower end is facilitated by so shaping the end as to give a termination in one or more points.

In order that the middle section 34 of the evaporator may be the more readily placed and securely maintained in a concentric and vertical position within the vaporizing-chamber, a bead 37 may be turned or ledge-formed around the walls of the latter where the two surfaces come in contact, and a flange turned on the edge of this section to rest on this bead or ledge. For like reason a bead may be turned around the middle section through the points of contact with it of the upper section.

Any additional evaporating-surface that may be required may conveniently be provided in the form of the third section 35. (Shown in the drawings.) This is a plain strip of perforated metal plate suspended from a V-shaped wire or loop 38, attached to the lower end of the part 34, and it may be made to extend any desired distance down the conducting-pipe 26. For the two-burner arrangement here shown the lower end of this strip is beveled to give a drip-point at one side, so that any excess of oil that may drop from it, due to overfeed, will fall on one side only of the partition 31 shown, and follow the corresponding branch of the conducting-pipe to the vicinity of the burner which it supplies, and be vaporized by heat from the burner, the burner on that side being always used when only one is needed.

The evaporator and conducting-pipe operate as follows: As the oil drops onto the receiving top of the part 33 of the evaporator, it spreads downward over its surface, and is quickly vaporized and the vapor mixed with

the surrounding air. The mixture of vapor and air, being heavier than the external air, descends as it is formed through the conducting-pipe to the burners, the supply of air being constantly renewed through the air-inlet 6. Any oil that is not vaporized from the part 33 will be further exposed to the same air-current on the part 34, while some portion of it may descend to the part 35, and any final residuum of oil from the evaporator will, as already explained, run down one of the branch conducting-pipes to be vaporized by heat from the burner. By arranging and supporting the parts of the evaporator in the manner shown and described the oil in its downward course is prevented from coming into contact with the wall of the vaporizing-chamber or of the main conducting-pipe, and any cleaning that may be required will be mainly confined to the removable evaporator.

In order that either burner may be used alone in the two-burner construction shown in connection with a single vaporizing-chamber, each burner is provided with a rotating cut-off 50, inserted into the end of the branch conducting-tube on which the burner is placed. A cut-off or valve may also be desirable in some cases to close the outlet where each burner is supplied from a separate vaporizing-chamber.

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

1. The combination, in a vapor-stove or other heating appliance, of an elevated vaporizing-chamber having an air-inlet at its upper part and an air and vapor outlet at its lower part, a suitable evaporating-surface inclosed therein, an oil-reservoir above said chamber, an oil-feed device in connection with the reservoir, and a burner in communication with the outlet of the vaporizing-chamber, substantially as set forth.
2. The combination of an elevated vaporizing-chamber having an air-inlet at its upper part and an air and vapor-outlet at its lower part, a suitable evaporating-surface inclosed therein, an oil-reservoir above said chamber, an oil-feed device in connection with the reservoir, a burner in communication with the outlet of the vaporizing-chamber, and a valve to said burner, substantially as set forth.
3. In combination, an elevated vaporizing-chamber, an oil-reservoir supported above said chamber, a conducting-tube, a burner, and a conical evaporator of perforated metal plate placed within said chamber, substantially as set forth.
4. In combination, an elevated vaporizing-chamber, an oil-reservoir supported above said chamber, a conducting-tube, a burner, and a conical evaporator of perforated metal plate placed within said chamber, said conical evaporator having a horizontal flattened top, substantially as set forth.
5. In combination, an elevated vaporizing-

chamber, an oil-reservoir supported above  
said chamber, a conducting-tube, a burner,  
and a conical evaporator of perforated metal  
plate placed within said chamber, said conical  
5 evaporator having an imperforated top hori-  
zontally flattened in the center and divided  
in a ring around the center by apertures or  
raised points, substantially as set forth.

6. In combination, an elevated vaporizing-  
10 chamber, an oil-reservoir supported above  
said chamber, a conducting-pipe, a burner,  
and a sectional evaporator of perforated metal  
plate placed within said chamber, said  
evaporator consisting of an upper section  
15 conical in form and upright in position and  
a lower section conical in form and inverted  
in position, substantially as set forth.

7. In combination, an elevated vaporizing-  
chamber, a conducting-pipe leading verti-  
cally downward therefrom, an oil-reservoir 20  
supported above said chamber, a burner,  
and a sectional evaporator of perforated  
metal plate placed within said chamber and  
conducting-pipe, said evaporator consisting  
of an upper section conical in form and up- 25  
right in position, a middle section conical in  
form and inverted in position, and a lower  
section of plain rectilinear form suspended  
from the middle section, substantially as set  
forth.

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