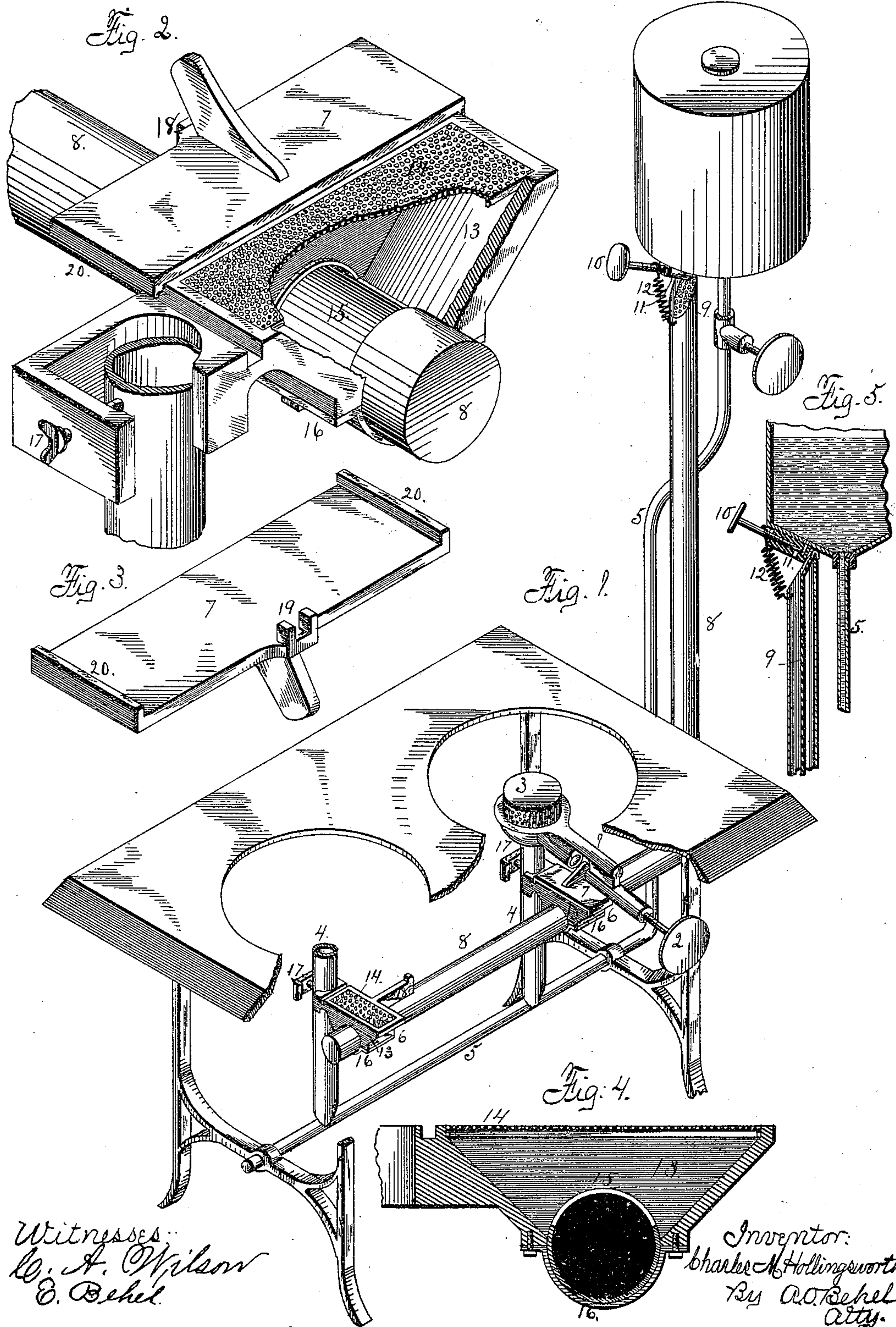


(No Model.)

C. M. HOLLINGSWORTH.  
STARTER FOR VAPOR STOVES.

No. 451,050.

Patented Apr. 28, 1891.



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# UNITED STATES PATENT OFFICE.

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## STARTER FOR VAPOR-STOVES.

SPECIFICATION forming part of Letters Patent No. 451,050, dated April 28, 1891.

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*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 Starters for Vapor-Stoves, of which the following is a specification.

This invention pertains to the preliminary heating of the generator required in starting it in any form of hydrocarbon-vapor stoves in which the liquid hydrocarbon is vaporized under pressure within a metallic generator by applying heat to the same and in which the generator after it is started is kept hot by a burner placed in contact or heating combination with it which is supplied with vapor from the generator itself.

My improvement consists in substituting for the drip-cup and its use a convenient and efficient device for the preliminary heating of the generator without the production of soot or smoke operated by the evaporation-gravitation process of vaporizing and consuming a liquid hydrocarbon, which I have described and claimed as my invention in Patent No. 420,797, dated February 4, 1890. By simply exposing to the air a portion of the liquid hydrocarbon spread over an evaporating-surface within an elevated chamber, into the upper end of which air is freely admitted, and from which a conducting-pipe leads downward to a sub-burner placed under the generator to be heated, this sub-burner is supplied at once with the requisite mixture of vapor and air for producing a blue and smokeless flame. The volatile oil is fed onto the evaporator from a reservoir supported above it, and when thus exposed rapidly evaporates into the air which comes in contact with it, and the inflammable gaseous mixture thus produced having a greater specific gravity than the external air is carried by its own weight down the conducting-pipe and discharged through the sub-burner.

For further description reference will be made to the accompanying drawings, in which—

Figure 1 is an isometrical representation of a two-burner vapor-stove with my attachment in place. Fig. 2 is an isometrical representation of a sub-burner, showing its connection

with a vapor-supply pipe. Fig. 3 is an isometrical representation of a sliding cut-off used in connection with the sub-burner. Fig. 4 is a vertical section of a sub-burner. Fig. 5 is a vertical central section of the ordinary elevated tank and a part of the stand-pipe of the stove, together with the upper parts of the starting attachment.

For convenience in description the ordinary burners of the stove will be referred to as "service-burners" to distinguish them from the sub-burner of the starting attachment.

The vapor-stove represented in Fig. 1 for the purpose of showing the construction and manner of using my starting attachment is a common form of two-burner stoves with an elevated tank and with separate or individual generators, each of which requires separate preliminary heating before the service-burner, which it supplies, and which afterward maintains its heat, can be used. In the representation one of the generators 1, its jet-valve 2, and its service-burner 3 are shown in place, supported by the stand-pipe 4, rising from the common oil-supply pipe 5. The other stand-pipe is shown with the generator and burner removed from it, and the top of the stove is also broken away to expose to view the parts beneath. The drip-cups underneath the generator, with which stoves of this form are commonly provided, are here replaced by the sub-burner 6 of my starting attachment.

The several parts of the two-burner attachment shown in Fig. 1 are the two sub-burners 6, each provided with a cut-off cover 7, the L-shaped pipe 8, the evaporator of perforated sheet metal 9, suspended within the upper end of this pipe, the oil-feed device 10 11, attached to the bottom of the reservoir, by means of which oil is fed onto the evaporator while the attachment is in use, and the spring-hook 12, to hold the top of the pipe in place.

The upright part of the L-shaped pipe 8 serves as an evaporating-chamber, while the whole pipe acts as an air and vapor conductor, by which the gaseous mixture is conveyed as it is formed to the sub-burners. The upper end of this pipe is beveled, in order that the rate of feed of oil to the evaporator may be seen and properly regulated.

The evaporator 9, consisting of a strip of



perforated metal plate nearly equal in width to the diameter of the pipe, has a bend near its upper end, thus affording a sloping or inclined surface, onto which the oil is allowed to drop. It is supported in its place by hooking its tapered end over the large side of the upper end of the pipe 8.

In the oil-feed device the screw-down valve 10 opens and closes a zigzag outlet from the reservoir through the valve-bearing piece 11, which is so soldered to the bottom of the reservoir, and the oil when running drops from the lower corner of this bearing-piece to the evaporator. The sub-burner 6 consists, essentially, of a broad burner-cup and a perforated top plate, which closely fits into the top of the cup. The walls of this cup around its open bottom are so shaped as to closely fit to and half embrace the conducting-pipe 8 about a vapor and air outlet 15 from it to the sub-burners, and the sub-burner is secured in its position on the conducting-pipe by means of a band 16, passing under the pipe and having its ends on opposite sides made fast to the burner-cup. (See Figs. 2 and 4.)

As a means of supporting the whole attachment and holding the sub-burners in place, each sub-burner is provided with a set-screw clamp 17 at one end, by which it is fastened to the stand-pipe of the generator to which it belongs, and the clamps are so shaped with an open side as to admit of the easy removal of the whole attachment from the stove.

By providing cut-offs to the sub-burners either one can be used alone while the other is closed. The use of a cut-off also obviates the necessity of waiting for the flame of the sub-burner to expire of itself after the oil-feed is turned off preparatory to the lighting of the service-burner. Beside other advantages, a cut-off placed on top of the sub-burner serves as a cover to prevent any liquid which may overflow from vessels on the stove from entering the sub-burner. The sub-burner is provided on one side with a projecting arm and stop 18, to arrest and support the cut-off 7 when it is drawn back. The stop on the cut-off 19 arrests its motion in closing it, while this and the flanges at its ends 20 serve to guide it to its place.

In applying my starting attachment to vapor-stoves generally, which requires some sort of special device for heating the generator, the number of sub-burners used would be determined in each case by the number of generators to be heated, and the form of the sub-burner and manner of attaching it would be adapted in each case to the form of the generator to be heated and the relative positions of it and other adjacent parts of the stove.

In the accompanying drawings I have represented the manner of combining my starting device with the other parts of my stove in which the requisite pressure upon the contents of the generator is secured by means of an elevated oil-reservoir, the oil-supply for the

starter being obtained in the manner shown and described from this reservoir.

For stoves in which pneumatic pressure is employed in operating the generator the starting attachment would require a reservoir of its own placed above its evaporating-chamber. In any case the starting device when thus made complete in itself could be more conveniently attached to stoves after they have left the hands of the manufacturer than when made to be used in connection with the general reservoir of the stove.

In operating this starting device the cut off cover 7 to the sub-burner 6 is first drawn back, and the oil-feed valve 10 is thus opened, allowing the oil to drop onto the perforated evaporator 9, whence it rapidly evaporates into the air that is within the L-shaped pipe 8, the mixture of air and vapor being carried by its own weight down the pipe to be lighted at a sub-burner. After the generator 1 has been thoroughly heated by the flame of the sub-burner the oil-feed valve 10 is closed, and a moment later the cut-off 7 to the sub-burner is closed, the jet-valve 2 of the generator opened, and the service-burner 3 lighted, the action of the generator when started being kept up by heat from the service-burner placed in contact with it and which it supplies with vapor. When it is desired, both generators—or more than two if the stove has more—may be started in this way at the same time.

I claim as my invention—

1. In a vapor-stove, the combination, with a combined vapor generator and burner, an elevated oil-reservoir, and an oil-supply pipe connecting the generator and reservoir, of an oil-feeding device, an elevated evaporating-chamber below said reservoir having an air-inlet in its upper part, a conducting-pipe leading downward and laterally from the lower part of said chamber and forming an outlet therefrom, and a sub-burner in communication with said conducting-pipe and located underneath said combined vapor generator and burner, substantially as set forth.

2. In a vapor-stove, the combination, with a combined vapor generator and burner, an elevated oil-reservoir, and an oil-supply pipe connecting the generator and reservoir, of an oil-feeding device, an elevated evaporating-chamber below said reservoir having an air-inlet in its upper part, a conducting-pipe leading downward and laterally from the lower part of said chamber and forming the outlet therefrom, a sub-burner in communication with said conducting-pipe and located underneath the combined vapor generator and burner, and a cut-off to said sub-burner, substantially as set forth.

3. In a vapor-stove, the combination, with a combined vapor generator and burner, an elevated oil-reservoir, and an oil-supply pipe connecting the generator and reservoir, of an oil-feeding device, an elevated evaporating-chamber below said reservoir having an air-



inlet in its upper part, an evaporator placed within said chamber, a conducting-pipe leading downward and laterally from the lower part of said chamber and forming the outlet therefrom, and a sub-burner in communication with said conducting-pipe and located underneath said combined vapor generator and burner, substantially as set forth.

4. In a vapor-stove, the combination, with a combined vapor generator and burner, an elevated oil-reservoir, and an oil-supply pipe connecting the generator and reservoir, of an oil-feeding device, an elevated evaporating-chamber below said reservoir having an air-inlet in its upper part, an evaporator placed within said chamber, a conducting-pipe leading downward and laterally from the lower part of said chamber and forming the outlet therefrom, a sub-burner in communication with said conducting-pipe and located underneath said combined vapor generator and burner, and a cut-off to said sub-burner, substantially as set forth.

5. In a vapor-stove, the combination, with a combined vapor generator and burner, an elevated oil-reservoir, an oil-supply pipe connecting said generator and reservoir, and a stand-pipe, of an oil-feeding device, an elevated evaporating-chamber below said reservoir having an air-inlet in its upper part and an air and vapor outlet at its lower part, and a sub-burner in communication with the evaporating-chamber, said sub-burner located underneath the combined vapor generator and burner and supported by said stand-pipe, substantially as set forth.

6. In a vapor-stove, the combination, with a combined vapor generator and burner, an elevated oil-reservoir, an oil-supply pipe connecting said generator and reservoir, and a stand-pipe, of an oil-feeding device, an elevated evaporating-chamber below said reser-

voir having an air-inlet in its upper part and an air and vapor outlet at its lower part, and a sub-burner in communication with the evaporating-chamber, said sub-burner being located underneath the combined generator and burner and provided with an open-sided screw-clamp, whereby it is removably attached to the stand-pipe, substantially as set forth.

7. In a vapor-stove, the combination, with a combined vapor generator and burner, an elevated oil-reservoir, and an oil-supply pipe connecting said generator and reservoir, of an oil-feeding device, an elevated evaporating-chamber having an air-inlet in its upper part and an air and vapor outlet at its lower part, and a sub-burner in communication with said chamber and located underneath said combined vapor generator and burner, said sub-burner consisting, essentially, of a burner-cup with a perforated top, substantially as set forth.

8. In a vapor-stove, the combination, with a combined vapor generator and burner, an elevated oil-reservoir, and an oil-supply pipe connecting said generator and reservoir, of an oil-feeding device, an elevated evaporating-chamber having an air-inlet in its upper part, a conducting-pipe extending downward and laterally from the lower part of said chamber, a sub-burner in communication with said conducting-pipe, said sub-burner being located underneath said combined vapor-generator and burner and having a perforated top, and a cut-off to said sub-burner, said cut-off being in the form of a close-fitting cover to the perforated top of the sub-burner, substantially as set forth.

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Witnesses:

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