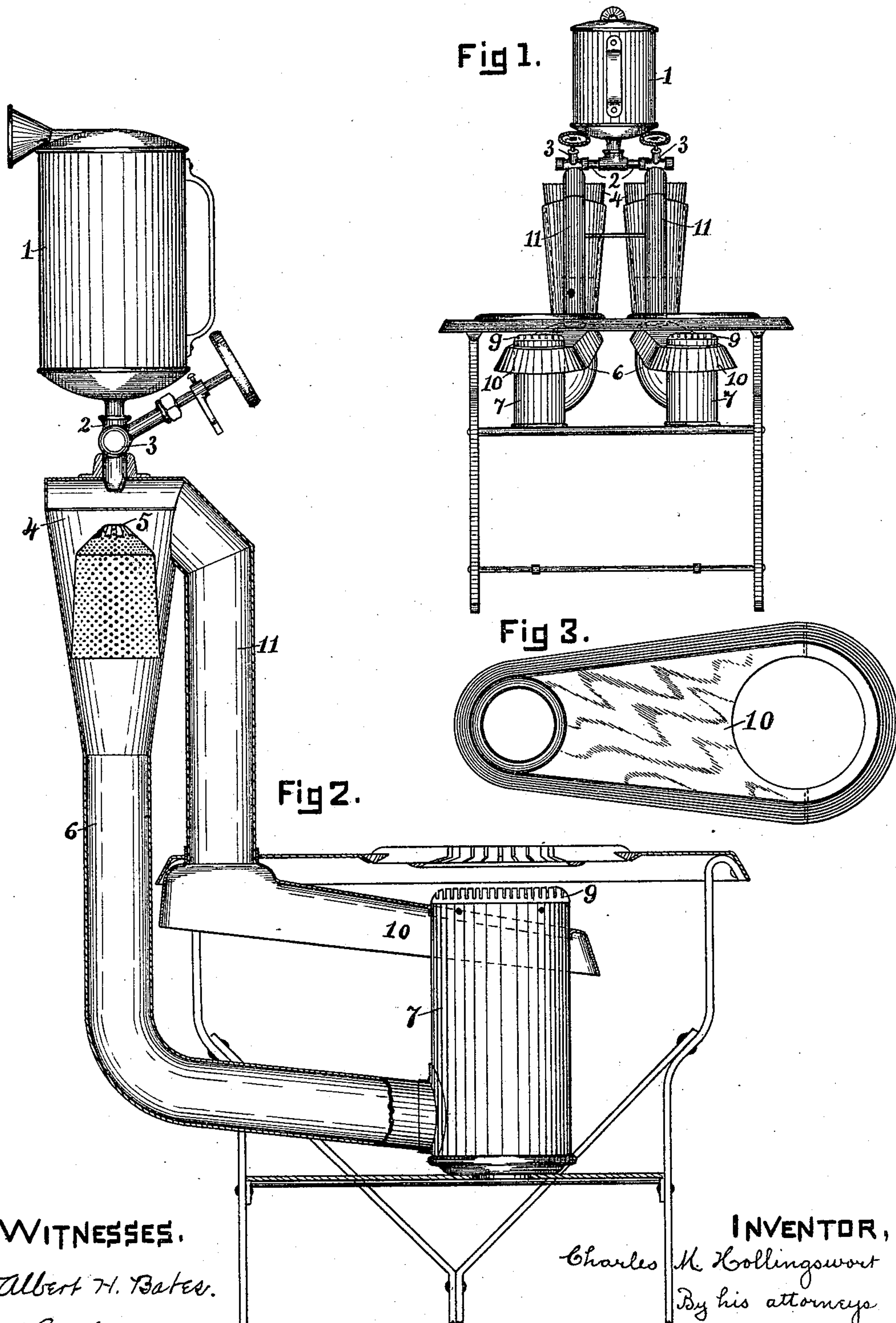


(No Model.)

C. M. HOLLINGSWORTH.  
VAPOR STOVE.

No. 490,655.

Patented Jan. 31, 1893.



WITNESSES.

Albert H. Bates.

Frank Miller.

INVENTOR,

Charles M. Hollingsworth

By his attorneys

Watson & Thurston



# UNITED STATES PATENT OFFICE.

CHARLES M. HOLLINGSWORTH, OF CLEVELAND, OHIO.

## VAPOR-STOVE.

SPECIFICATION forming part of Letters Patent No. 490,655, dated January 31, 1893.

Application filed June 16, 1890. Serial No. 355,644. (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 a certain new and useful Improvement in Vapor-Stoves, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings.

This improvement is designed to be applied to the form of gravity carbureting apparatuses which is shown in my prior patents No. 420,797, dated February 4, 1890 and No. 421,834, dated February 18, 1890, and consists in combining with such an apparatus means for introducing warm air, free from the products of combustion, into the vaporizing chamber, for the purpose of facilitating the complete vaporization of the liquid hydro-carbon.

In the accompanying drawings, Figure 1 is a front elevation of my improved device, as applied to use in a vapor stove. Fig. 2 is a vertical, central section through the carburetor and the device for supplying warm air thereto. Fig. 3 is a top view of a warm air hood, to be more particularly described hereinafter.

I will now proceed to describe in detail the embodiment of my invention, which is illustrated in the drawings.

A reservoir 1, of any approved construction, is suitably supported above the vaporizing chamber 4. Suitable pipes 2, connect the reservoir to the vaporizing chamber, and the amount of liquid which flows therethrough is regulated by a suitable valve 3. The vaporizing chamber 4 is, except for the inlet and outlet openings hereinafter described, completely inclosed.

At 5 is represented an evaporator, on which the feed of liquid from the reservoir is received and spread.

From the vaporizing chamber 4, a pipe 6, for conducting away the mixture of vapor and air, which is formed by the exposure of the liquid, leads downward and laterally to the lower part of the shell of the burner 7.

Placed around the burner shell and below the slotted cap 9 (at which point the combustion takes place), is a warm air hood 10, leading to the back part of the stove frame, whence an air inlet pipe rises to the upper part of the

vaporizing chamber with which it freely communicates, as shown, said pipe having no other upward vent or delivery orifice. The warm air hood 10 is in the form of a broad, inverted trough, with an aperture in its top or roof, at one end, of proper size to admit of its being slipped in a close fit over the body of the burner, and it is given an upward inclination from the burner to the other end where it communicates with and delivers into the air inlet pipe 11. This hood may be made more readily detachable from the burner by constructing it in the form indicated by the dotted lines in Fig. 3, whereby it only partially encircles the burner, but its efficiency would be impaired in some degree by this construction. In either case the whole of the open under side of the hood serves as a mouth or infeed for air to be taken up by the pipe 11; but practically, after the burner has become heated, the inflow of air will take place mainly at that end of the hood which is around or contiguous to the burner.

It is evident that in operating this whole apparatus the process of vaporization must be started and sustained for a sufficient time to establish a flame at the burner without the aid of heated air. When, in starting, a suitable feed of liquid is delivered on the apex of the evaporator and spreads downward over its surfaces, the chilled mixture of vapor and air, which is formed, immediately passes downward by its weight in a delivering current through the pipe 6, which downward current causes an influx of fresh air to the vaporizing chamber in an upward current through the pipe 11. The air thus drawn in can have at first only the general temperature of the room or the surrounding atmosphere, but, after the flame is established, the body of the burner and the warm air hood both become indirectly heated therefrom, and a current of air, heated by contact with their surfaces, is initiated and maintained, passing up the inclined roof of the hood into the pipe 11, and thence to the evaporating chamber. In thus introducing warm air into the vaporizing chamber, through the pipe 11, it is not believed that any increase or acceleration of the current within the chamber 4 or pipe 6 is effected, due merely to the buoyancy or levity of the air passing upward through the pipe



11, for, in proportion as the temperature of the air in the pipe 11 is raised, tending to accelerate the circulation therein, the temperature of the commingled vapor and air in the chamber 4 and the pipe 6 is also raised, tending to retard the circulation therein, but by the use of warmed air, precipitation of moisture on the evaporating surfaces is prevented, and the vaporization is completed at a somewhat higher level. And I find that these advantages more than balance the disadvantage due to the frictional retardation offered by the pipe 11 to the influx of the air to the vaporizing chamber. In the construction which I have shown and described, the air taken up by the pipe 11, gets its heat by convection from the body of the burner and from the warm air hood itself, these parts of the apparatus being heated in part by radiation from the flame, as it spreads itself out against any object to be heated on the grate, and, in part, by conduction and radiation from the burner cap 9.

By placing the warm air hood about the body of the burner below the cap or point of combustion, pure air only, free from the gaseous or vaporous products of combustion of the flame, and having thus about the normal atmospheric percentage of free oxygen, is taken into the hood and fed to the vaporizing chamber. This is obviously a very im-

portant condition to a useful application of this device, or, of any other device intended for a like purpose, since the perfect combustion of the vapor with the best heating effects must depend largely upon the relative amount of fresh air, or free oxygen, which is mingled with it before it issues from the burner.

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

The combination of a closed vaporizing chamber, and suitable means for delivering thereinto a regulated supply of liquid hydrocarbon, a conducting pipe extending downward and laterally from said chamber, and a metallic burner shell in communication with the lower end of said pipe, with an inverted hood entirely open on its under side, which at one end is adjacent to the burner shell and is in contact therewith below the burner cap, and from this end inclines upward toward the other end, and a pipe connected with said other end and extending therefrom upward and connected with the upper part of the vaporizing chamber, substantially as set forth.

CHARLES M. HOLLINGSWORTH.

Witnesses:

E. L. THURSTON,  
ALBERT H. BATES.