

No. 626,745.

Patented June 13, 1899.

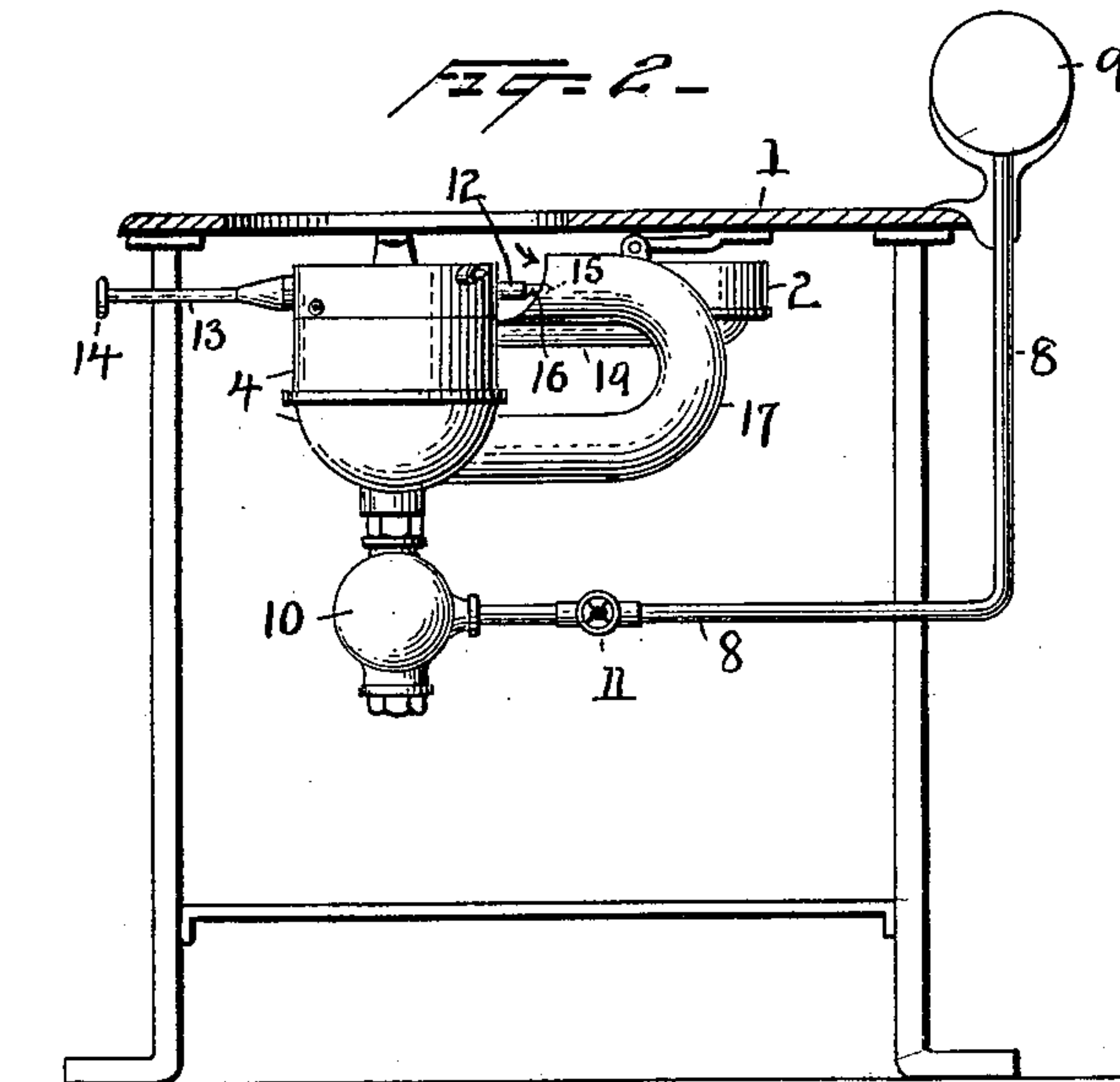
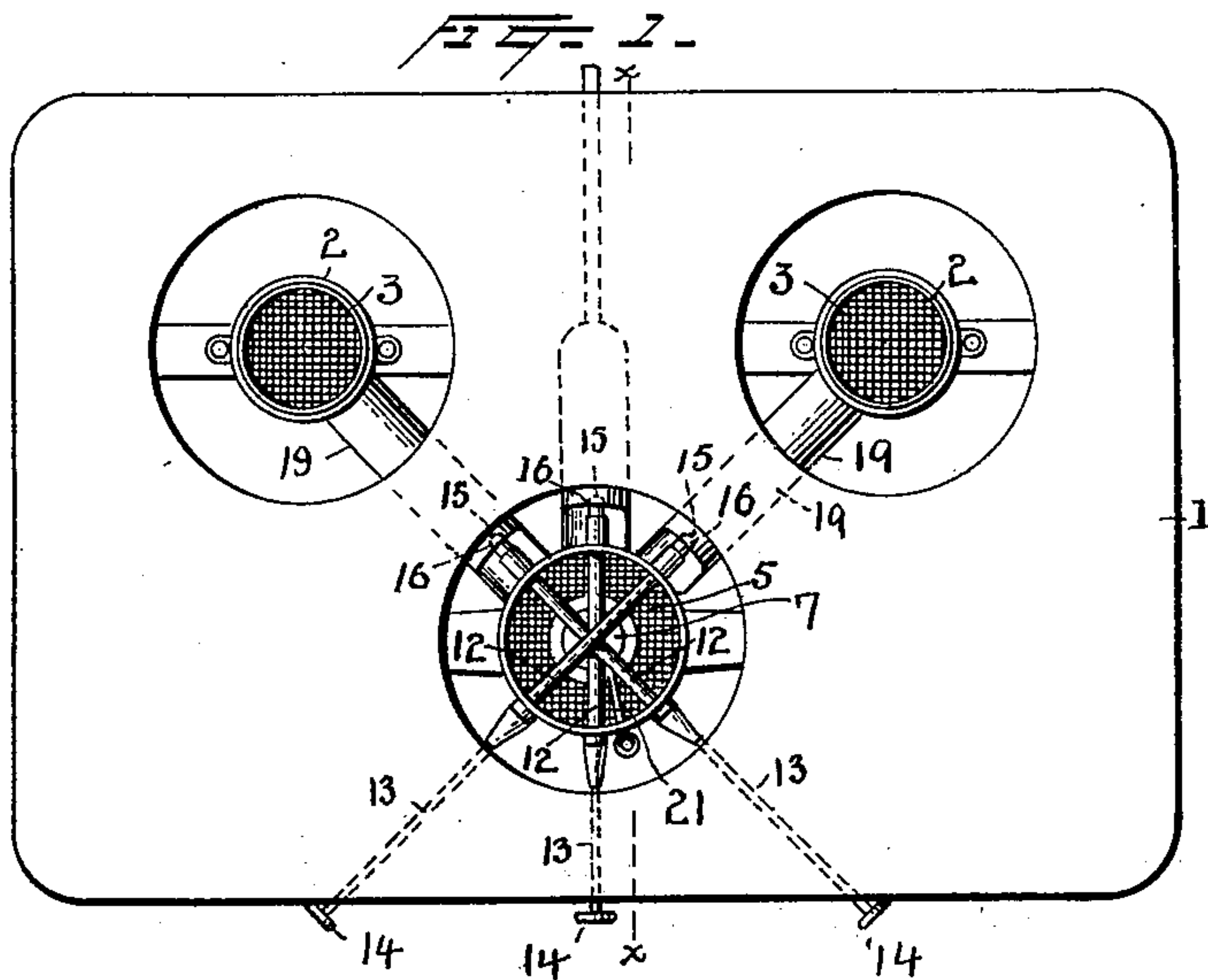
G. W. WOODWARD, J. W. DUNN & R. ROBERTSON.

VAPOR BURNER AND STOVE.

(Application filed Mar. 5, 1898.)

(No Model.)

2 Sheets—Sheet 1.



WITNESSES:

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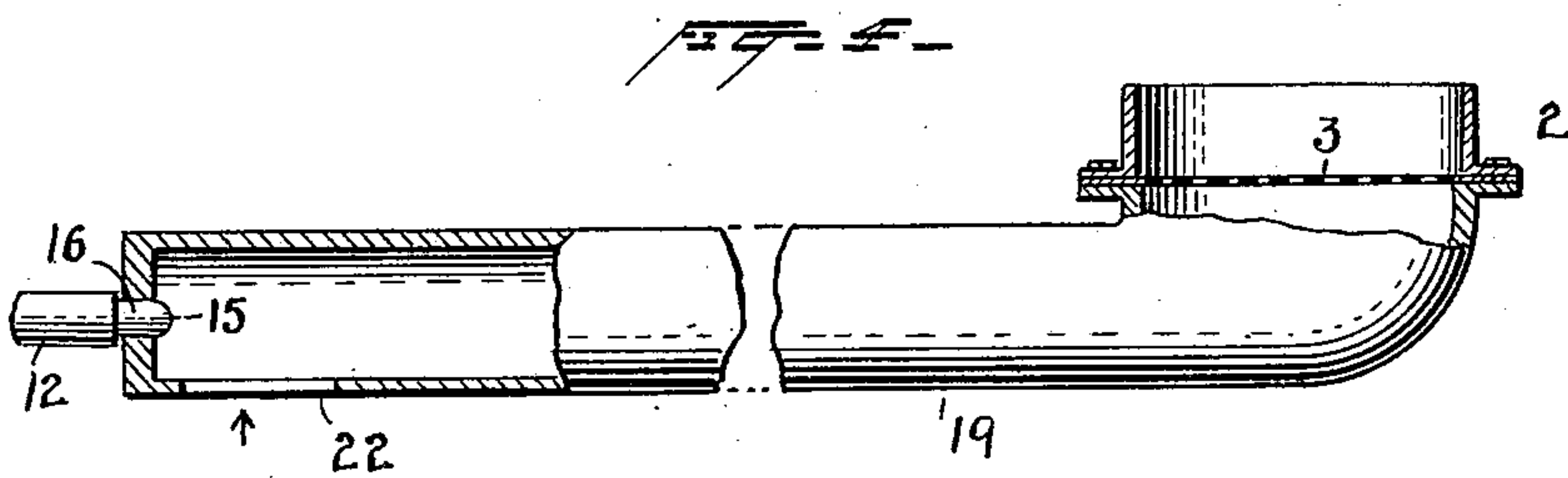
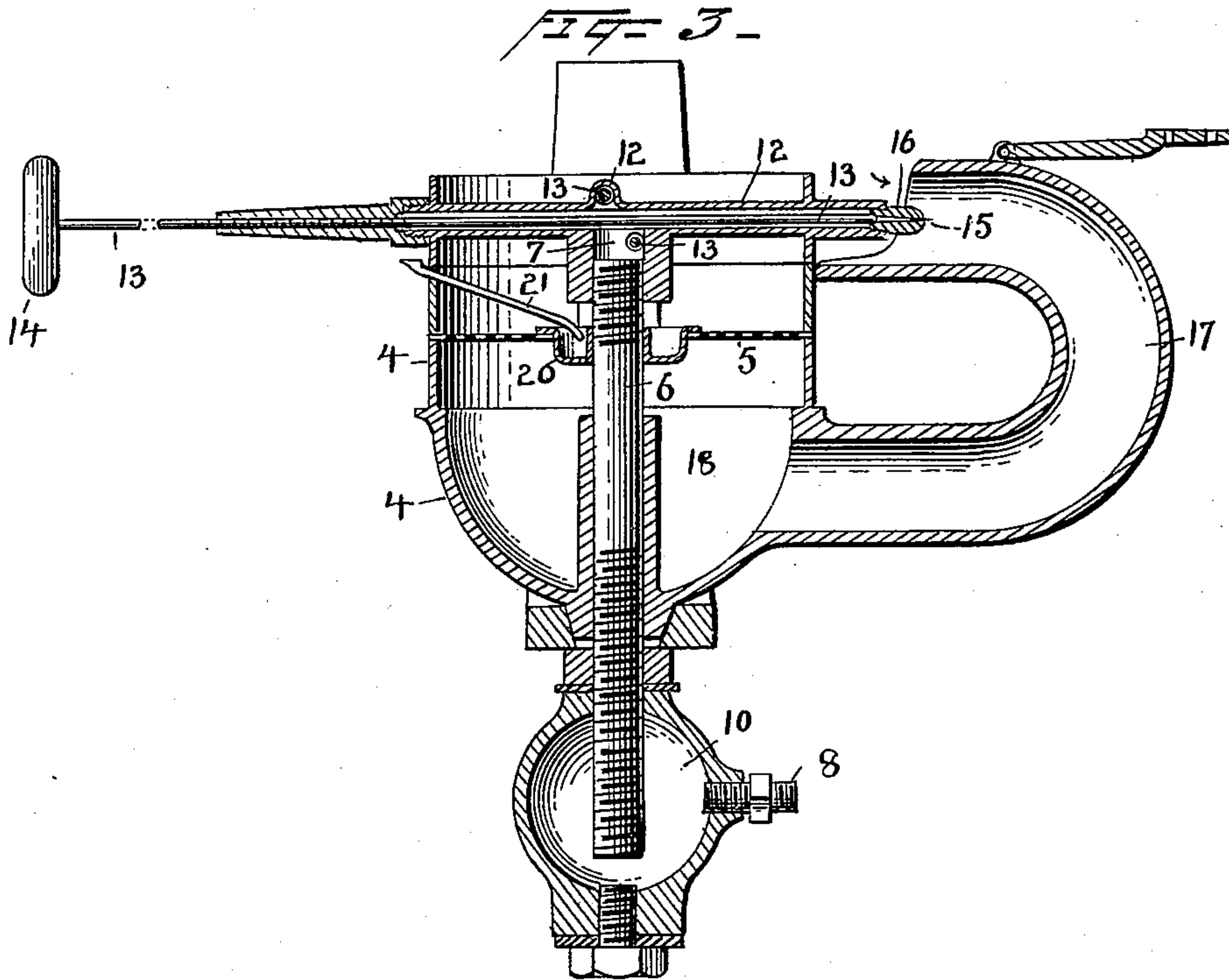
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UNITED STATES PATENT OFFICE.

GEORGE W. WOODWARD, OF EAST ORANGE, NEW JERSEY, AND JOHN W. DUNN AND RODERICK ROBERTSON, OF NEW YORK, N. Y.

VAPOR BURNER AND STOVE.

SPECIFICATION forming part of Letters Patent No. 626,745, dated June 13, 1899.

Application filed March 5, 1898. Serial No. 672,651. (No model.)

To all whom it may concern:

Be it known that we, GEORGE W. WOODWARD, a resident of East Orange, in the county of Essex and State of New Jersey, and JOHN W. DUNN and RODERICK ROBERTSON, residents of New York city, county and State of New York, citizens of the United States, have invented a new and useful Improvement in Vapor Burners and Stoves, of which the following is a specification.

Our invention relates to vapor burners and stoves in which a generating-burner is constantly employed, while the stove is in operation, to vaporize the oil in the retort in connection with one or more burners fed with vapor from the retort. Its object is to improve and simplify the construction of such stoves, to furnish more adequate means for vaporizing the oil, simpler, more compact, and more convenient means for conveying the vapor from the retort to the burners without unnecessary loss of heat while being thus conveyed, and means which enable the burners to be increased in number and improved in arrangement, also to prevent the liability to "back lighting," so called, common in vapor-stoves of the general character of the stove described herein, and also to furnish simple and efficient means for the preliminary lighting of the stove.

It consists of the devices herein shown, described, and pointed out in the claims at the end of this specification.

The drawings accompanying this specification show the preferred form of our improved device, in which similar letters in the different figures represent corresponding parts.

Figure 1 is a plan of our improved stove with parts of the retort removed to more fully show the needle-pipes; Fig. 2, a side elevation; Fig. 3, a vertical section on the lines xx of Fig. 1; and Fig. 4 is a detailed view of a pipe running to one of the burners, showing our preferred form for mixing air with vapor on its way to the burner.

The present invention is an improvement on the vapor-stove shown and described in Patent No. 370,486, issued September 27, 1887, to S. T. McDougall and Julia H. Jordan for a vapor and steam burner. In the stove of that

patent the pipes through which the needle-spindles run which control the supply of vapor to the burners do not run through the retort, but are at one side of the retort at some distance from it and are connected to it by pipes running from the retort to the said needle-spindle pipes at right angles to the latter. In such a construction the vapor which is to be burned at the burners has first to traverse a comparatively long and broken path turning at right angles from one pipe into another. In practice this has been found objectionable in that there is a tendency toward an unnecessary and harmful cooling of the vapor. There is a further objection to this construction in that in practice only two burners can be employed upon a stove.

We have discovered that if the pipes, containing needle-spindles, that supply vapor to the burners are made to run through the retort and from thence directly to the burner the vapor is carried by a much shorter path to the place where it is to be burned, it is not unduly cooled in this passage, the retort acts more efficiently in vaporizing the oil, and any number of burners within reasonable limits can be used upon a single stove and in any desired form or arrangement.

We will now proceed to describe the preferred form of our improved device shown in the drawings.

1 is the top plate of the stove, and 2 2 are burners, each provided with the usual perforated wire-netting 3.

4 are the circular walls surrounding the generating-burner 5, (the latter likewise provided with perforated wire-netting,) the oil-retort pipe 6, and the retort 7.

8 is an oil-pipe for conducting oil from the oil-reservoir 9 to the globular chamber 10. The valve 11 in pipe 8 controls the supply of oil. The retort-pipe 6 opens into the lower part of the globular chamber 10 and from thence runs upward into the retort 7.

12 12 are three needle-pipes, through each one of which runs a needle-spindle 13, provided at one end with a thumb-piece 14 and at the other end with a needle-point 15. The needle-point is adapted to fit snugly into a correspondingly-shaped orifice in the valve-

seat piece 16, screwed into the end of needle-pipe 12, the needle-point and the orifice in the needle-valve-seat piece 16 constituting a needle-valve. By turning thumb-piece 14 one way or the other this valve is opened or closed. The valve of the middle needle-pipe opens directly opposite supply-pipe 17, which leads to the chamber 18 of the generating-burner 5 and supplies mingled vapor and air for that burner. The valves of the other needle-pipes are opposite the opening of supply-pipes 19, which lead to burners 2 2 and supply them with mingled vapor and air. In the form of stove shown in Figs. 1, 2, and 3 the upper part of each of the pipes 17 and 19 is cut away at the top, as shown in Figs. 2 and 3, to permit air to flow in and mingle with the vapor as it passes through the tubes to insure more perfect combustion at the burning-point.

The needle-pipes 12 pass through the retort, as shown in Figs. 1 and 3, and open into the retort, forming part of the retort at such points. The retort proper or part of the apparatus in which the oil is vaporized consists, therefore, of the part designated as 7 in the drawings and also the contiguous open parts of the needle-pipes and also of a portion of the upper part of the oil-retort pipe 6. Our improved device for lighting the stove consists of a circular trough 20, formed around and supported by the oil-retort pipe 6 and burner 5 and a supply-pipe 21, opening into the trough and running through the wall 4 and having, preferably, a funnel shape at the top, all as shown in Fig. 3. When it is desired to light the stove, alcohol is poured into the funnel of pipe 21, and this alcohol is lighted in the trough 20.

The operation of our improved device is as follows: Valve 11 in oil-pipe 8 is turned and oil is permitted to flow until it rises up into and fills the retort. Then alcohol is poured through pipe 21 into trough 20 and is lighted. This produces a sufficient amount of heat to vaporize the oil in the upper part of the retort. Thumb-piece 14 on the middle needle-pipe is turned so as to open the valve at the other end of the middle pipe. Vapor immediately passes into supply-pipe 17, is mingled with air there, and the two pass into chamber 18 and are lighted and burn at burner 5. This burner heats the retort and keeps up a constant vaporization of the oil sufficient to supply the burners of the stove. This burner for convenience is called the "generating-burner" and is preferably kept burning during the entire operation of the stove. The other thumb-pieces 14 are then turned and vapor issues at the opposite end of each of the needle-pipes, passes into and through supply-pipes 19, where it is similarly mixed with air, and is consumed at the burners 2. In this way a constant vaporization of the oil is maintained and a continuous supply is furnished to each of the burners and to the generat-

ing-burner itself. As needle-pipes 12 pass through the retort itself they are kept heated, and as they and their connecting supply-pipes proceed directly to the burners the vapor loses little heat and is in the best condition for consumption when it reaches the burner. In addition to this the arrangement of needle-pipes crossing one another through the retort enables us to use any reasonable number of burners in a single stove and to arrange them in a convenient manner.

While in our preferred arrangement the needle-pipes are arranged to cross one another, this crossing is not absolutely essential. As long as the needle-pipes pass through the retort the benefits of this part of our invention will be realized, although not to the fullest extent unless they cross one another.

Where the air to be mingled with the vapor in the supply-pipe of a burner enters the supply-pipe at or in close proximity to the mouth of the needle-valve, there is danger of back lighting, or, in other words, danger that the mingled air and vapor at this point may be lighted by the flame from the generating-burner. In order to overcome this defect, we have in our preferred supply-pipe, as shown in Fig. 4, arranged to have the needle-valve discharge directly into the supply-pipe with no connection at that point between the supply-pipe and the outer air, and to provide further on in the supply-pipe, and preferably on the lower side thereof, an opening or openings 22 for the entrance of air. This prevents any back lighting and at the same time thoroughly mingles the vapor with the air.

In case of any excessive pressure of the vapor in the retort or oil-retort pipe 6 vapor can collect in the upper part of chamber 10 and be compressed there, in that way tending to prevent any inconvenient results that might arise from such excessive pressure.

The arrangement of chamber 10 in the line of the pipe connections between oil-reservoir 9 and retort 7 with oil-retort pipe 6, leading out from the lower part of the chamber, tends to prevent any vapor which is forced backward through pipe 6 from reaching and bubbling into the oil-reservoir, an occurrence which is always objectionable and inconvenient.

What we claim as new, and desire to secure by Letters Patent, is—

1. In a vapor-stove, the combination with a retort, a generating-burner for vaporizing oil therein, a supply-pipe for supplying commingled vapor from the retort and air to the generating-burner, a needle-pipe running through and opening into said retort and adapted to discharge vapor into said supply-pipe and a valve for controlling such discharge, of another burner also fed by vapor from the retort, a supply-pipe for supplying commingled vapor from the retort and air to such burner, a needle-pipe running through and opening into said retort and adapted to discharge vapor into said supply-pipe and

a valve for controlling such discharge, substantially as set forth.

2. In a vapor-stove, the combination with a retort, a generating-burner for vaporizing oil therein, a supply-pipe for supplying commingled vapor from the retort and air to the generating-burner, a needle-pipe running through and opening into said retort and adapted to discharge vapor into said supply-pipe, a needle-spindle running through said needle-pipe and forming a valve for controlling such discharge, of another burner also fed by vapor from the retort, a supply-pipe for supplying commingled vapor from the retort and air to such other burner, a needle-pipe running through and opening into said retort and adapted to discharge vapor into said last-mentioned supply-pipe, a needle-spindle running through said last-mentioned needle-pipe and forming a valve for controlling such discharge, substantially as set forth.

3. In a vapor-stove, the combination with a retort, a generating-burner for vaporizing oil therein, a supply-pipe for supplying commingled vapor from the retort and air to the generating-burner, a needle-pipe running through and opening into said retort and adapted to discharge vapor into said supply-pipe, a needle-spindle running through said needle-pipe and forming a valve for controlling such discharge, of other burners also fed by vapor from the retort, a supply-pipe for each burner adapted to supply commingled vapor from the retort and air to such burner, needle-pipes, one for each burner, running through and opening into the retort and crossing each other and the needle-pipe for supplying the generating-burner, and adapted to discharge vapor into the supply-pipes for the said burners, needle-spindles running through said needle-pipes and forming valves for controlling the discharge into said supply-pipes, substantially as set forth.

4. In a vapor-stove, the combination with a retort, means for supplying oil thereto, a generating-burner for vaporizing oil therein, a supply-pipe for supplying commingled vapor from the retort and air to the generating-burner, an opening in the supply-pipe for admitting air thereto, a needle-pipe running through and opening into said retort and adapted to discharge vapor into said supply-pipe, a movable needle-spindle running

through said needle-pipe and provided at one end with a needle-valve, a seat for the needle-valve, whereby upon operating the needle-spindle the valve will be closed or be opened to discharge vapor into the supply-pipe, of another burner also fed by vapor from the retort, a supply-pipe for supplying commingled vapor from the retort and air to such burner, an opening in such supply-pipe for admitting air thereto, a needle-pipe running through and opening into said retort and adapted to discharge vapor into said supply-pipe, a movable needle-spindle running through said needle-pipe, provided at one end with a needle-valve, a seat for the needle-spindle the valve will be closed or be opened to discharge vapor into the supply-pipe for the burner, substantially as set forth.

5. The combination in a vapor-stove, with a retort and a generating-burner for vaporizing the oil therein, of a pipe connected with the retort, a valve therein for regulating the supply of vapor, a supply-pipe for feeding vapor to a second burner into which the first-mentioned pipe opens directly, and into which the vapor is discharged through the valve, the said supply-pipe being contracted or closed upon said first-mentioned pipe so as to prevent the entrance of air into the pipe at that point, and an aperture in the under side of the supply-pipe directly in front of the opening of the first-mentioned pipe so as to prevent back lighting from the flame of the generating-burner, substantially as set forth.

6. In a vapor-stove, in combination with a retort, a plurality of burners and a plurality of commingling-tubes, one for each burner, a plurality of needle-pipes, one for each burner, opening into and forming part of the retort and at the same time forming parts of the various needle-valves for controlling the discharge of vapor into the various commingling-tubes.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

GEORGE W. WOODWARD.

JOHN W. DUNN.

RODERICK ROBERTSON.

Witnesses:

CHARLES F. DAVIES,
THOMAS A. MACK.