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Patented Jan. 8, 1901.

W. F. MYERS, J. L. SOUTH & J. M. ROBERTS.
VAPOR BURNER FOR COOKING OR HEATING STOVES.

(Application filed May 31, 1900.)

(No Model.)

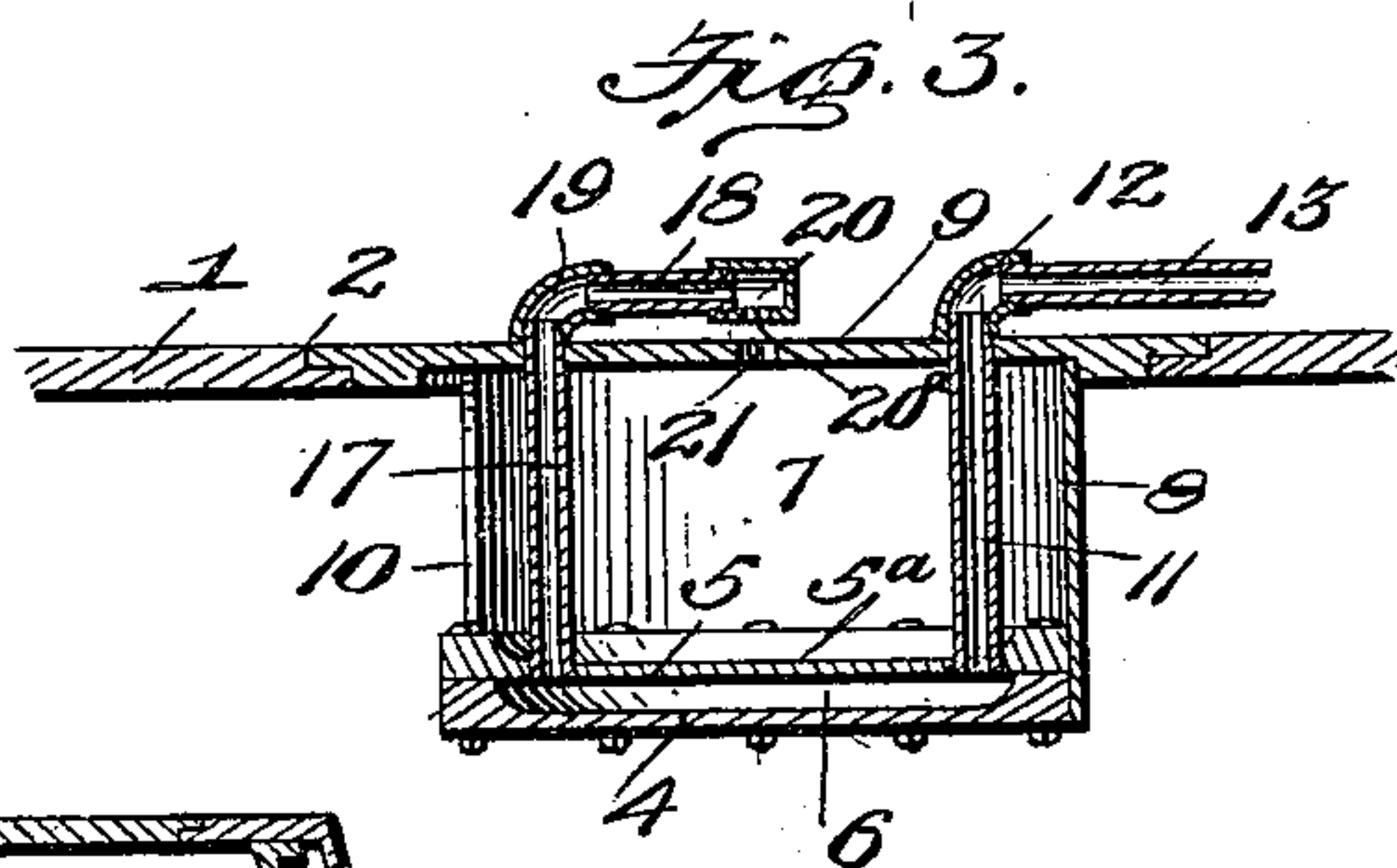
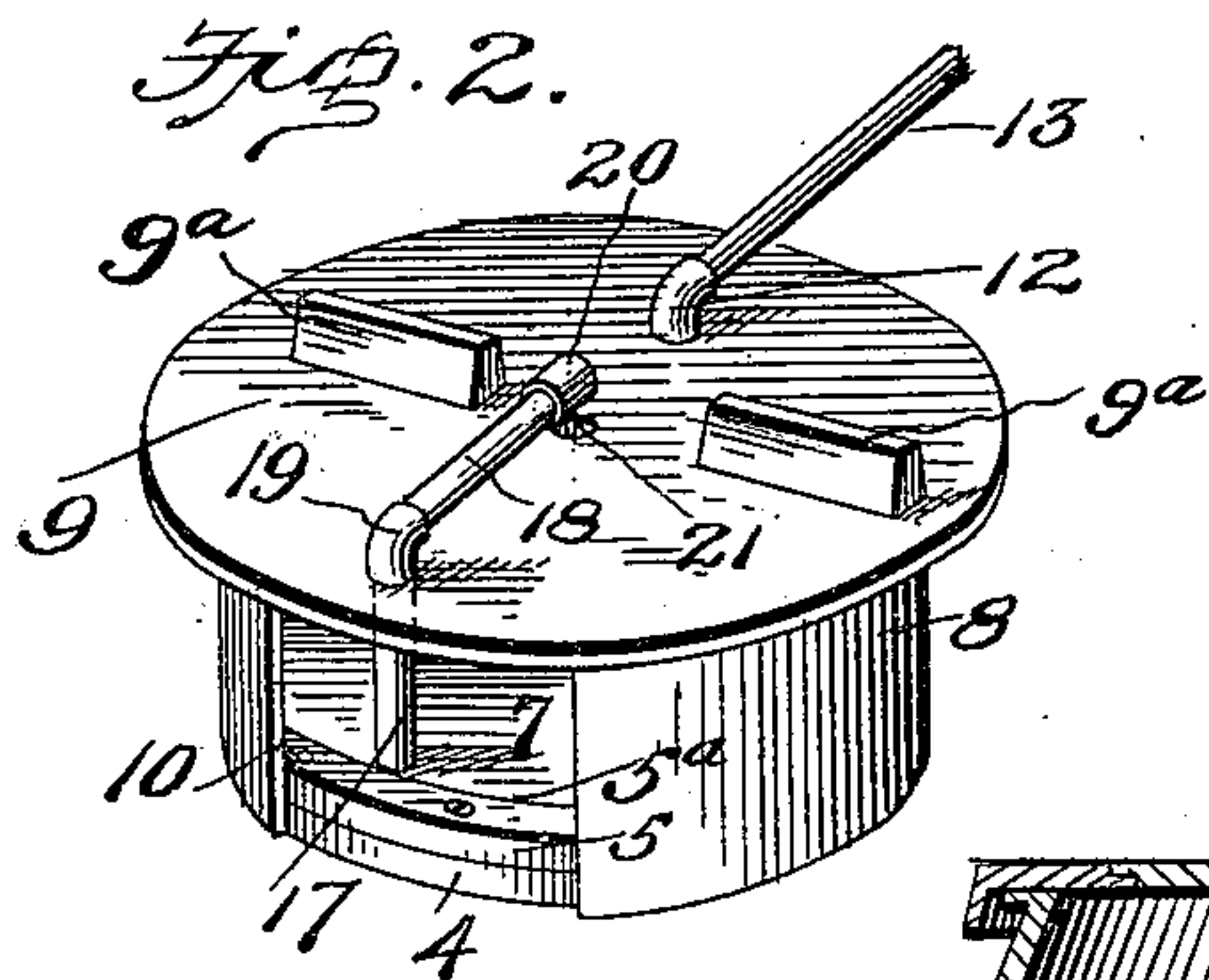
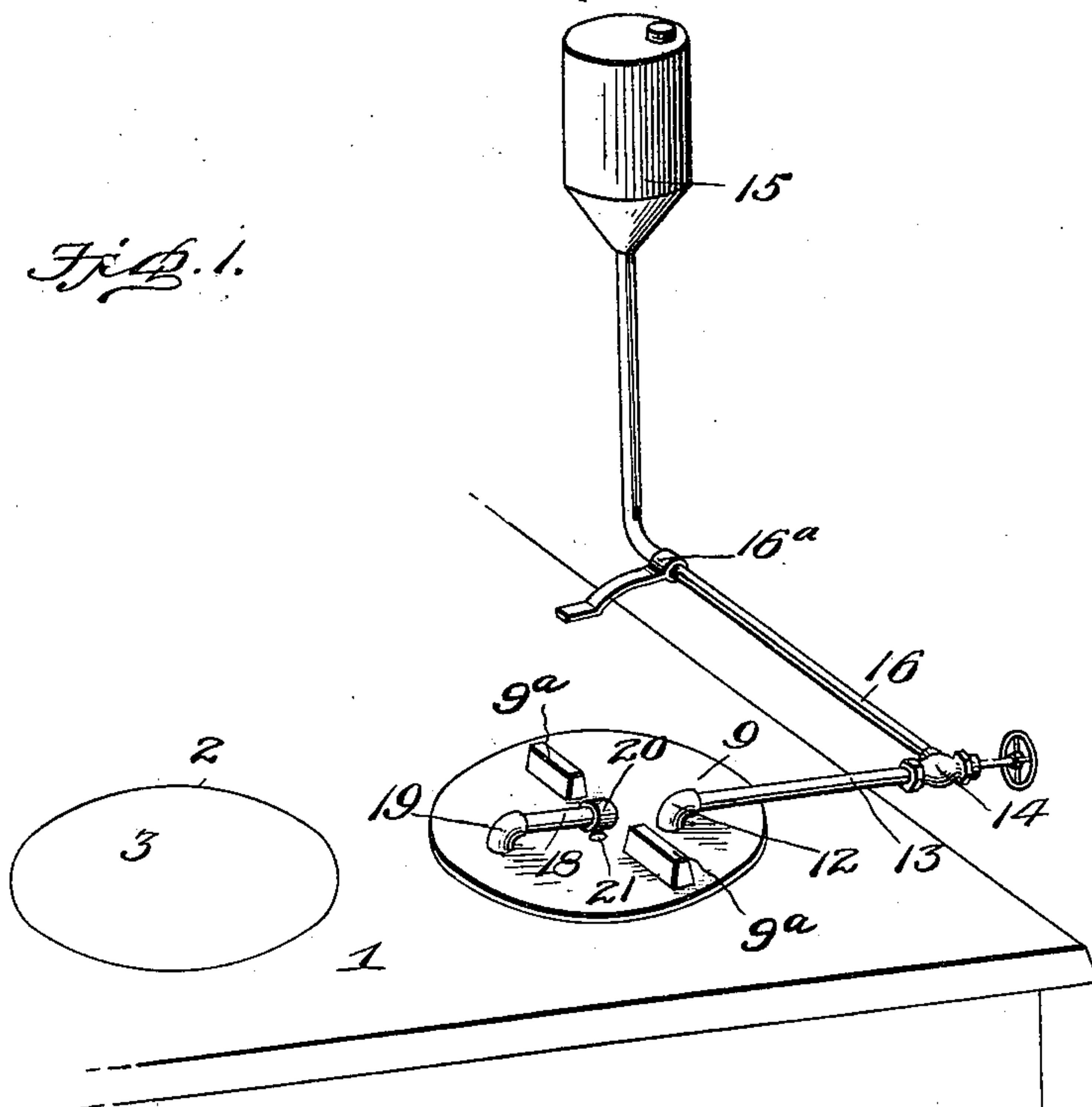
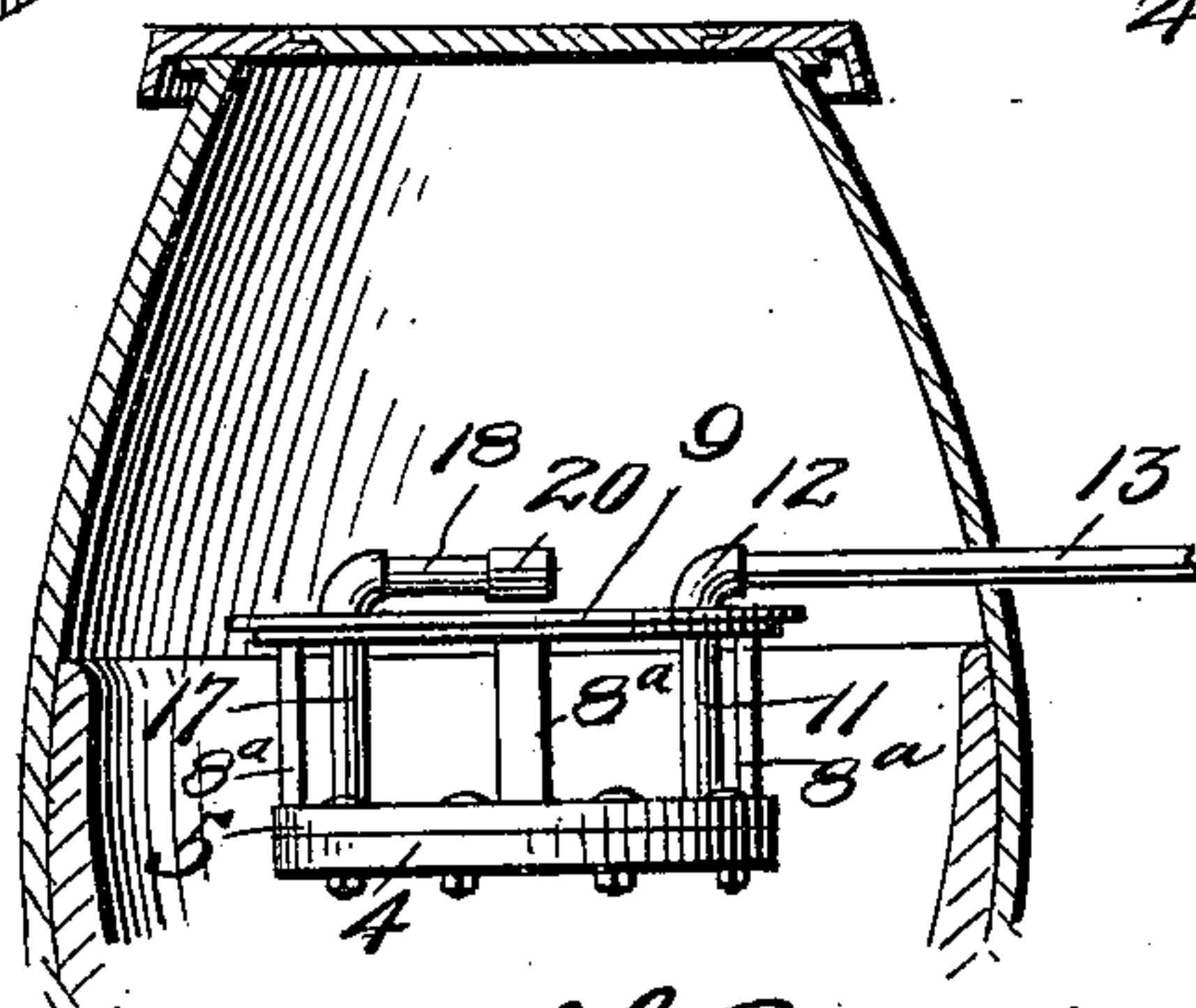


Fig. 4.



Witnesses

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UNITED STATES PATENT OFFICE.

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VAPOR-BURNER FOR COOKING OR HEATING STOVES.

SPECIFICATION forming part of Letters Patent No. 665,454, dated January 8, 1901.

Application filed May 31, 1900. Serial No. 18,573. (No model.)

To all whom it may concern:

Be it known that we, WILLIAM F. MYERS, JACOB L. SOUTH, and JOHN M. ROBERTS, citizens of the United States, residing at Terre Haute, in the county of Vigo and State of Indiana, have invented certain new and useful Improvements in Vapor-Burners for Cooking or Heating Stoves; and we do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

Our invention relates to certain new and useful improvements in vapor generators and burners, and particularly to devices of this character adapted for use in connection with heating and cooking stoves.

One object of the invention is to provide a generator and burner which is simple, cheap, and durable in construction and designed to burn kerosene and other heavy hydrocarbon oils in an efficient manner and without clogging.

A further object of the invention is to provide a construction whereby the vaporized oil is injected from the exterior into the combustion-chamber, so as to entrain therewith a large proportion of pure air, and thereby reduce the amount of oil necessary for consumption.

With these and other minor objects in view the invention consists of certain novel features of construction, combination, and arrangement of parts, as will be hereinafter more fully described, and particularly pointed out in the appended claims.

In the accompanying drawings, Figure 1 is a perspective view of the top plate of an ordinary cooking-stove, showing the application of the invention thereto. Fig. 2 is a perspective view of the burner detached. Fig. 3 is a vertical section through the top plate of the stove and burner. Fig. 4 is a perspective view of a modified form of burner.

The numeral 1 in the drawings designates the top plate of an ordinary cooking-stove having, as usual, one or more pot-holes 2, adapted to be closed by removable covers 3. The generator and burner is adapted to fit within one of the said pot-holes and to rest upon the surrounding ledge thereof and comprises a pair

of bottom plates 4 and 5, spaced apart to form a shallow generating-chamber 6, in which the hydrocarbon oil is vaporized preliminary to its introduction into the combustion-chamber. The uppermost plate 5 of this bottom pair of plates constitutes the bottom of the combustion-chamber 7, which is of greater depth than said generating-chamber and has its side wall formed by a nearly-circular band 8 and its top by a plate 9, resting upon the upper edge of said band, the parts being connected in any approved manner. The space between the ends of the band or side wall 8 forms an opening 10, through which the flame from the combustion-chamber passes into the fire-box of the stove. The top surface of the plate 5 is dished to form a cup 5^a, in which the oil is initially ignited to start the burner.

An induction tube or pipe 11 extends vertically through the top plate 9 and through the combustion-chamber 7 into the generating-chamber 6 at the side of the burner opposite said flame-opening 10, and the upper outwardly-projecting end of this tube is connected by an elbow 12 with a hydrocarbon-supply pipe 13, having a valve 14 therein controlling the flow of oil from an elevated tank or reservoir 15. The oil passes from the tank to the said supply-pipe through an elbow-pipe 16, the horizontal branch of which is provided with a rest or support 16^a to bear upon the top plate of the stove and sustain the weight of the tank. The tank may be arranged at the rear of the stove, as shown, or at a point remote therefrom, as desired. Passing also through the top plate 9, combustion-chamber 7, and plate 5 into the generating-chamber 6 is a vertical eduction tube or pipe 17, which is arranged adjacent to the side of the burner in which the flame-opening 10 is located and diametrically opposite the induction tube or pipe 11. This eduction tube or pipe conveys the vapor from the generating-chamber to a gas-tube 18, extending horizontally above and projecting inwardly toward the center of the top plate 9 and connected at its outer end to said eduction-tube by an elbow 19. Upon the inner end of said gas-tube is removably mounted an injector 20, consisting of a cap having a discharge-opening 20^a in its bottom located in line with a

feed-opening 21 in the central portion of the top plate 9.

In operation oil is admitted into the vaporizing-chamber 6 through the tube 11 by opening the valve 14 and allowed to flow until a sufficient quantity for ignition enters the combustion-chamber through the pipe 17, gas-tube 18, and openings 20^a 21 and fills the cup 5^a, when the valve is closed to cut off the supply of oil. The oil thus supplied to the combustion-chamber is then ignited and allowed to burn and the burner becomes highly heated, and an automatic generation of the oil in the chamber 6 ensues. The valve 14 is then opened to admit oil into the generating-chamber, and the vapor flows outward from the latter through the pipe 17 and enters the gas-tube 18 and injector 20, from which it discharges and passes into the combustion-chamber 7 through the openings 20^a 21 and is consumed. The vapor on thus being injected into the combustion-chamber from the exterior of the burner and stove entrains with it a large quantity of pure air, which produces a much hotter flame and reduces the quantity of vapor necessary for combustion far below that required in burners in which air is admixed with the vapor on the interior of the stove or allowed to be drawn down on the flame, so that a larger proportion of air and a smaller proportion of vapor are burned. The flame passes out from the combustion-chamber into the fire-box of the stove and heats the latter and in its passage heats the tube 11, which is thus adapted to act as a superheater to prevent condensation of the outgoing vapor. The top plate 9 may be provided, as shown, with one or more ribs or lugs 9^a to support a cooking vessel, and in order to simplify and cheapen the construction and reduce weight we have disposed the pipes 13 and 18 at right angles to and on opposite sides of and on a line between said ribs or lugs to adapt said pipes to serve in conjunction with the lugs as supports for the vessel, and to thus perform a double function.

In Fig. 4 we have shown a modified form of stove adapted for use in connection with heating-stoves. In this form of device three or more legs 8^a are substituted for the wall 8 in order to allow the flame to project from all sides. In use the burner is arranged in the fire-bowl of the stove and the supply-pipe entered through an opening drilled in the wall of the bowl.

We are aware that it has heretofore been proposed to employ a vapor generator and burner having a bottom combustion-chamber and superposed generating-chamber, with oil and gas induction and eduction pipes extending upwardly through the combustion-chamber and into the generating-chamber, said gas-eduction pipe being provided at its lower end with a discharge-port located in line with a vertical air-tube to effect a commingling of the vapor with air prior to its introduction into the combustion-chamber.

The advantages of our construction and arrangement of the parts over the above-described structure are as follows: By locating the generating-chamber at bottom we provide for the direct impinging of the flame against the top plate 9, which adapts the device to be set into the pot-hole of a stove, so that cooking may be carried out thereon while the stove is at the same time being heated. This construction also permits us to make the connection with the oil-supply pipe above and wholly exteriorly of the stove, thereby obviating the necessity of mutilating the body of the stove by drilling holes therein for passage of the oil-supply pipe or pipes and rendering the operation of the heater much safer and less subject to explosions, as the oil in the supply-pipe is not heated to an objectionable degree, as it would be if the supply-pipe were inclosed in the heated stove-body. Furthermore, a smaller-sized supply-tank may be used in connection with a burner of a given size, as the oil may be fed in as thin a stream as desired to the burner, and it is not necessary to always keep the pipe and induction-tube full up to the level of the top of said tube to supply the burner with oil, as in the prior construction referred to, which is objectionable for the reason that explosions are liable to occur upon the slightest clogging and it is difficult to discharge the oil when the burner is removed from the stove for any purpose. It is also advisable to feed the oil in as thin a stream as possible in order to permit of a large deposit of the carbon before the vapor is generated and passes into the vapor-eduction tube, and our construction enables this to be done in an effective manner. The location of the discharge-port above the burner is of great advantage, as it obviates all liability of any liquid hydrocarbon passing out into the eduction-tube with the vapor, as is liable to occur in a burner having a downfeed of the vapor. By employing a flame-opening at the side the eduction-tube and top plate are always maintained at a high heat, the eduction-tube being constantly enveloped in a broad sheet of flame, which effectually prevents condensation of the vapor passing there-through. The flame-opening also permits of the passage of the flame into the fire-box of the stove, and thus causes it to perform double duty. Again, by feeding the vapor from above down into the combustion-chamber a larger proportion of oxygen is entrained with the vapor and a hotter flame produced, as the air is not devitalized nor the oxygen consumed by heat or flames on the interior of the stove, as would be the case if an upfeed were employed. It will thus be seen that our improved burner embodies desirable advantages due to its peculiar construction alone and not obtainable by a reversal of the parts.

Having thus fully described our invention, what we claim, and desire to secure by Letters Patent, is—

1. A vapor burner and generator, compris-

ing in its construction an oil-supply pipe, a pair of spaced bottom plates forming a shallow generating-chamber, a top plate provided with a central air and gas inlet opening and supported above said bottom plates to form with the upper plate of the bottom pair of plates an intermediate combustion-chamber having a flame-passage, supporting-lugs on the top plate on opposite sides of said gas-inlet opening, an oil-induction tube connected to the oil-supply pipe and extending downwardly through the top plate and upper plate of said pair of bottom plates into the generating-chamber, a vapor-eduction tube extending upwardly from the generating-chamber and through the said upper plate of the bottom pair of plates and the top plate at the diametrically opposite side from the oil-induction tube and in line with the flame-passage and serving also as a superheater, a gas-pipe projecting horizontally from the upper end of the vapor-eduction tube toward said air and gas inlet opening, said gas-pipe and oil-supply pipe being located on opposite sides of the gas-inlet opening at right angles to the supporting-lugs and forming therewith supports for a cooking vessel, and a cap upon the inner end of said gas-pipe and provided with

a discharge-opening in its bottom in line with the air and gas inlet opening, whereby air is entrained with the entering gas into the combustion-chamber, substantially as set forth. 30

2. A vapor burner and generator having a base generating-chamber and a superposed combustion-chamber, said combustion-chamber having an air-inlet at its top, lugs upon the top of the combustion-chamber, an oil-supply pipe leading to the generating-chamber, and a gas-eduction pipe leading from said chamber and arranged to discharge the gas or vapor from above through said air-inlet down into said combustion-chamber, said oil-supply and gas-eduction pipes entering through the top plate of the combustion-chamber and being arranged at right angles to the lugs to form therewith supports for a cooking vessel, substantially as set forth. 35 40 45

In testimony whereof we have hereunto set our hands in presence of two subscribing witnesses.

WILLIAM F. MYERS.

J. L. SOUTH.

J. M. ROBERTS.

Witnesses:

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