

B. APPEL & S. S. GOLDMAN.
 VAPOR BURNER.
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995,107.

Patented June 13, 1911.

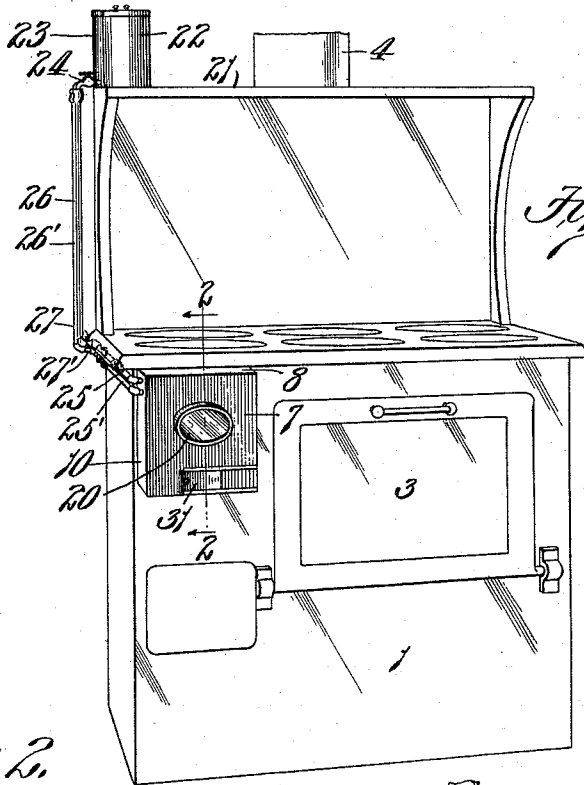


Fig. 1.

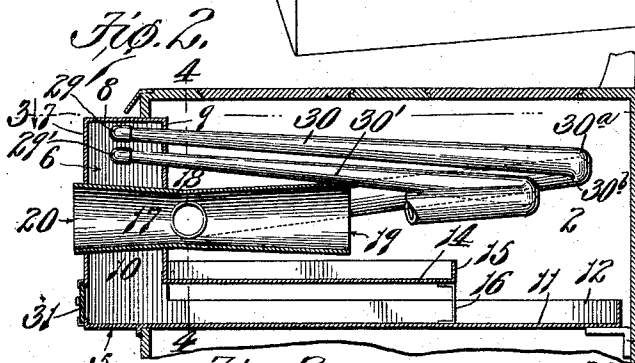


Fig. 2.

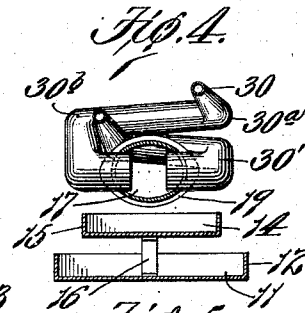


Fig. 4.

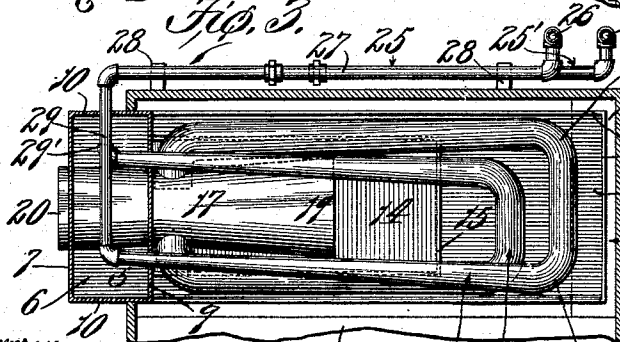
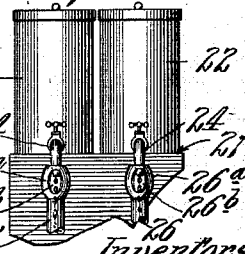


Fig. 3.

Fig. 5.



Witnesses:
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UNITED STATES PATENT OFFICE.

BENJAMIN APPEL AND SAMUEL S. GOLDMAN, OF ST. LOUIS, MISSOURI.

VAPOR-BURNER.

995,107.

Specification of Letters Patent. Patented June 13, 1911.

Application filed August 11, 1910. Serial No. 576,739.

To all whom it may concern:

Be it known that we, BENJAMIN APPEL and SAMUEL S. GOLDMAN, citizens of the United States, residing at the city of St. Louis, State of Missouri, have jointly invented a certain new and useful Vapor-Burner, of which the following is a specification, reference being had to the accompanying drawings, forming a part hereof, in which—

Figure 1 is a perspective view of a stove embodying our new burner; Fig. 2 is a vertical sectional view, somewhat enlarged, on the line 2—2, Fig. 1; Fig. 3 is a horizontal sectional view, also somewhat enlarged, on the line 3—3, Fig. 2; Fig. 4 is a sectional view on the line 4—4, Fig. 2; and Fig. 5 is an elevational view of the fluid-supply cans and of a small portion of the supply-pipes leading therefrom.

This invention relates to certain new and useful improvements in vapor-burners.

We have discovered, briefly stated, that the vapors or gases obtained by vaporizing crude-oil or other hydro-carbon and a suitable mixture or fluid having combustible elements or ingredients, when properly combined, mixed, or intermingled together and with air and ignited, will produce an intensely hot, practically odorless and smokeless flame.

The objects of our present invention are to provide a burner which is simple in construction, which may be manufactured at comparatively cheap cost, and which is especially adapted for use in connection with, or for carrying into practical and successful operation, our said discovery or process briefly above stated.

With these objects in view, our invention resides in the novel construction of the several parts of our burner and in the novel arrangement and combination of the same, all as will hereinafter be described and afterward pointed out in the claims.

In the drawings, wherein like reference numerals refer to like parts throughout the several views, 1 indicates a stove of any ordinary or approved construction, having a fire-box 2, an oven 3, and a flue or chimney 4. Arranged in said fire-box 2 is what might be called the casing 5 of the burner. This casing 5 comprises a portion 6 adapted to fit in the forward end of said fire-box 2 and having a front wall 7, a top wall 8, a rear wall 9, and side walls 10, said front wall 7

being preferably a short distance forwardly from the front of said stove 1, see particularly Figs. 2 and 3; a bottom pan 11 having upturned side portions or flanges 12, the bottom of said pan forming substantially the bottom of casing 5, being integral with or otherwise suitably connected to said front wall 7 and side walls 10 and resting, near its forward end, on the frame or front of said stove and at its rear end preferably on an angle-bracket 13 secured to the rear of said stove; and a warming or coil-temperature-raising pan 14 also having upturned side portions or flanges 15, the bottom of said pan forming substantially a rearward extension of said rear wall 9, being integral with or otherwise suitably connected thereto. At its rear end, pan 14 is preferably supported by means of a suitable bracket 16 resting on or secured to said pan 11. 17 indicates what might be called the air-feeding and vapor-mixing-chamber of the burner. This chamber or portion 17 is preferably an open-ended tubular member, somewhat elliptical in end elevation, and is supported in proper position by said portion 6 of casing 5, see particularly Figs. 2 and 3, said chamber extending through said casing-portion 6 and preferably some distance rearwardly beyond said rear wall 9 thereof and over said pan 14, as shown. This chamber or portion 17, where the vapor-supply pipes, hereinafter described, lead therinto is preferably somewhat reduced in diameter, as at 18, and flares, or the diameter thereof is gradually increased, both outwardly and inwardly from said point of reduced diameter, as shown particularly in Fig. 2, the discharge-end 19 of said chamber or portion 17 being preferably of slightly greater diameter than the air-inlet-end 20 thereof. Arranged at any suitable point above, as on a shelf 21 forming part of said stove 1, are suitable receptacles or cans 22 and 23, can 22 being, say, for the crude-oil or other hydro-carbon and can 23 being, say, for the mixture or fluid having combustible elements or ingredients. Each of said cans is provided with a suitable faucet 24, and leading, respectively, from said cans to said chamber or portion 17 are pipes 25 and 25'. Pipes 25 and 25' are substantially similar in construction and comprise, respectively, vertically-disposed portions 26 and 26', portions 27 and 27' suitably supported, as by brackets 28, on the side of said stove 1 and inclining downwardly from

the rear to the front of said stove, portions 29 and 29' leading into said portion 6 of casing 5, and coiled or bent portions or vaporization chambers 30 and 30' leading into opposite sides of said chamber or portion 17 at a point between the air-inlet end 20 and said discharge-end 19 thereof and preferably at said point 18 of reduced diameter thereof. Said vertically-disposed portions 26 and 26', at their upper ends, preferably surround the outlet-ends of said faucets 24 and are each preferably provided with a bulging portion 26^a cut away, as at 26^b, whereby the flow of fluid from said cans may be readily seen. Said portion 29 of pipe 25 inclines slightly downwardly from said portion 27 and extends from said portion 27 into and through said portion 6 of casing 5 above said chamber or portion 17 to a point preferably slightly therebeyond. Said portion 30 extends from said portion 29 through said rear wall 9 of portion 6 of casing 5 to a point near the rear end of said fire-box 2, where it is then bent, as at 30^a, to extend across said fire-box, and then again bent, as at 30^b, to extend forwardly through said fire-box to said point 18 of chamber 17, said portion 30 being of gradually increasing diameter, for purposes hereinafter appearing, from said portion 29 to said chamber 17 and having a gradual downward incline from said portion 29 to said chamber 17. Said portion 29' of pipe 25' likewise inclines slightly downwardly from said portion 27' and extends from said portion 27' into and through said portion 6 of casing 5 to a point close to said chamber 17; and said portion 30', which is similar to said portion 30 and similarly bent or coiled in said fire-box 2 over said warming-pan 14, leads from said portion 29' to said chamber 17, entering said chamber 17 at said point 18 of reduced diameter and preferably directly opposite the discharge-end of said portion 30.

For the fluid hereinbefore referred to having combustible elements or ingredients, we have heretofore used, and prefer to use, a mixture comprising water, alcohol, camphor, and rosin, in the proportions approximately of one-quarter pint alcohol, one ounce camphor, and one ounce rosin to a gallon of water. These proportions, however, may be varied, as required, under varying conditions and size of burner. For the hydrocarbon, we have heretofore used, and prefer to use, as before stated, crude-oil. It is to be understood, however, that other hydrocarbons and other fluids or mixtures might be used equally well with our burner.

In operation, the said cans 22 and 23 being supplied, respectively, with the hydrocarbon, preferably crude-oil, and the fluid or mixture having combustible elements or ingredients, preferably the mixture stated, the vaporization-chambers or portions 30

and 30' are first raised to vaporizing temperature. This may be accomplished in several ways, but we prefer to do so by first turning faucet 24 of can 22 and allowing the crude-oil to flow in a fine stream from said can 22 through said pipe 25 and chamber or portion 17 into said warming-pan, where it is ignited, this burning oil gradually raising said vaporization-chambers or coiled or bent portions 30 and 30' and the discharge or vapor-mixing portion 19 of chamber 17 to vaporizing temperature. When the said portions 30 and 30' and the discharge or vapor-mixing portion 19 of said chamber 17 have thus been raised to the required temperature, the said fluid or mixture is also allowed to flow from said can 23 through said pipe 25' to said chamber 17; but, now, as said oil and fluid pass through said coiled portions 30 and 30', respectively, the same will be vaporized, and the vapors or gases therefrom on entering the chamber 17 will mix or intermingle together and with the air supplied by or entering through air-inlet end 20 of said chamber and burn in an intensely hot, practically odorless and smokeless flame, this flame spreading over the fire-box 2 and oven 3 and under the top of said stove and around said bent or coiled portions 30 and 30', maintaining said portions at the required vaporizing temperature. The said pipes 25 and 25' being downwardly inclined throughout their length, as described, the oil and fluid will not settle in and clog up said pipes, whereby a constant gravity flow of oil and fluid is obtained and a steady flame or fire secured. By gradually increasing the diameter of said portions 30 and 30', as before stated, the oil and fluid, on being vaporized, are permitted freely to expand, whereby, on entering said chamber 17, the said vapors or gases more readily and quickly intermingle and mix together and with the air, which latter said chamber is especially adapted to plentifully supply or feed through its open inlet-end 20, substantially perfect combustion and an intensely hot, vitalized flame being obtained. We have found that said portions 30 and 30' can be raised to proper vaporizing temperature in a very short time and a hot fire quickly started; and, as will be obvious, when the flow of oil and fluid is stopped, the fire will quickly and automatically, so to speak, burn itself out.

Our burner is comparatively simple in construction, and is positive, reliable, and economic in operation, the cost of maintenance thereof being at a minimum.

A door 31 may be slidably or otherwise arranged in said portion 6 of casing 5 through which access may be had into said casing whenever necessary.

While we have herein shown and described our burner in connection with a

stove, yet it is to be understood that our burner is equally well adapted for use in connection with boilers, furnaces, and other analogous purposes, and that minor changes in the arrangement, construction, and combination of the several parts of our burner might be made and substituted for those herein shown and described without departing from the nature and principle of our invention.

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

1. A burner comprising an open-ended tubular air-feeding and vapor-mixing chamber reduced in diameter at a point between its ends, and supply-pipes having coiled fluid-vaporizing portions of gradually increasing diameter leading into said chamber on opposite sides thereof at said point of reduced diameter, said coiled portions extending above and beyond the discharge-end of said chamber; substantially as described.

2. A burner comprising a casing provided with a warming-pan, an air-feeding and vapor-mixing chamber provided with an air-inlet-opening and an open discharge-end supported in said casing above said pan, and supply-pipes having coiled fluid vaporizing portions leading into said chamber between said air-inlet opening and said discharge-end, said coiled portions of said pipes being above said pan and extending beyond said discharge end of said chamber; substantially as described.

3. A burner comprising a casing provided with a warming-pan, an air-feeding and vapor-mixing chamber provided with an air-inlet opening and an open discharge-end sup-

ported in said casing above said pan, and supply-pipes having coiled fluid-vaporizing portions of gradually increasing diameter above said pan leading into said chamber on opposite sides thereof and between said air-inlet opening and said discharge-end; substantially as described.

4. A burner comprising a casing provided with a warming-pan, a tubular air-feeding and vapor-mixing chamber provided with an air-inlet opening and an open discharge-end supported in said casing above said pan, and supply-pipes having coiled fluid-vaporizing portions of gradually increasing diameter above said pan and extending beyond the discharge-end of said chamber leading into said chamber on opposite sides thereof and between said air-inlet opening and said discharge-end; substantially as described.

5. A burner comprising a casing provided with a warming-pan, an open-ended tubular air-feeding and vapor-mixing chamber supported in said casing above said pan, said chamber being reduced in diameter at a point between its opposite open ends, and supply-pipes having coiled fluid-vaporizing portions of gradually increasing diameter above said pan and extending beyond the discharge-end of said chamber leading into said chamber on opposite sides thereof at said point of reduced diameter; substantially as described.

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

BENJAMIN APPEL.
SAMUEL S. GOLDMAN.

Witnesses:

HUGO V. BURGARD,
CAROLINE L. WEBER.