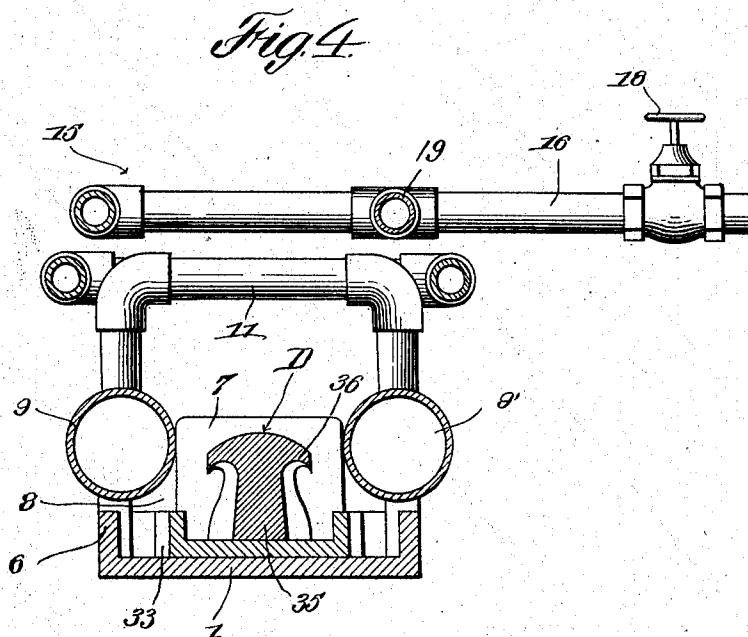
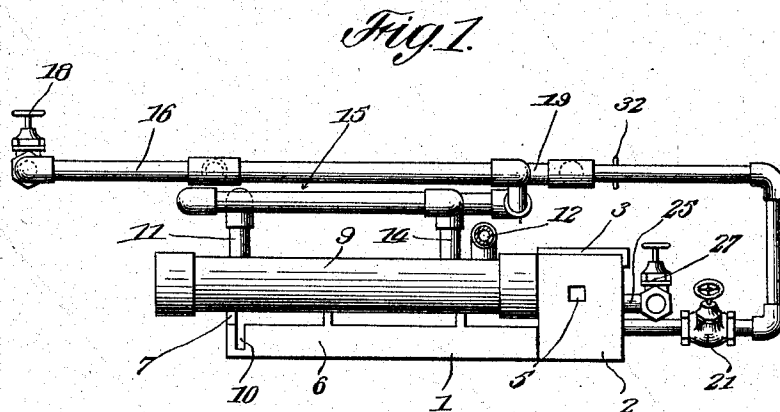


1,038,734.

O. J. EFFENBECK.
HYDROCARBON BURNER.
APPLICATION FILED OCT. 28, 1911.

Patented Sept. 17, 1912.
3 SHEETS—SHEET 1.



Witnesses

J. H. Crawford
Wm. B. Bagger

Inventor
Otis J. Effenbeck

Victor J. Evans
Attorney

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3 SHEETS—SHEET 2.

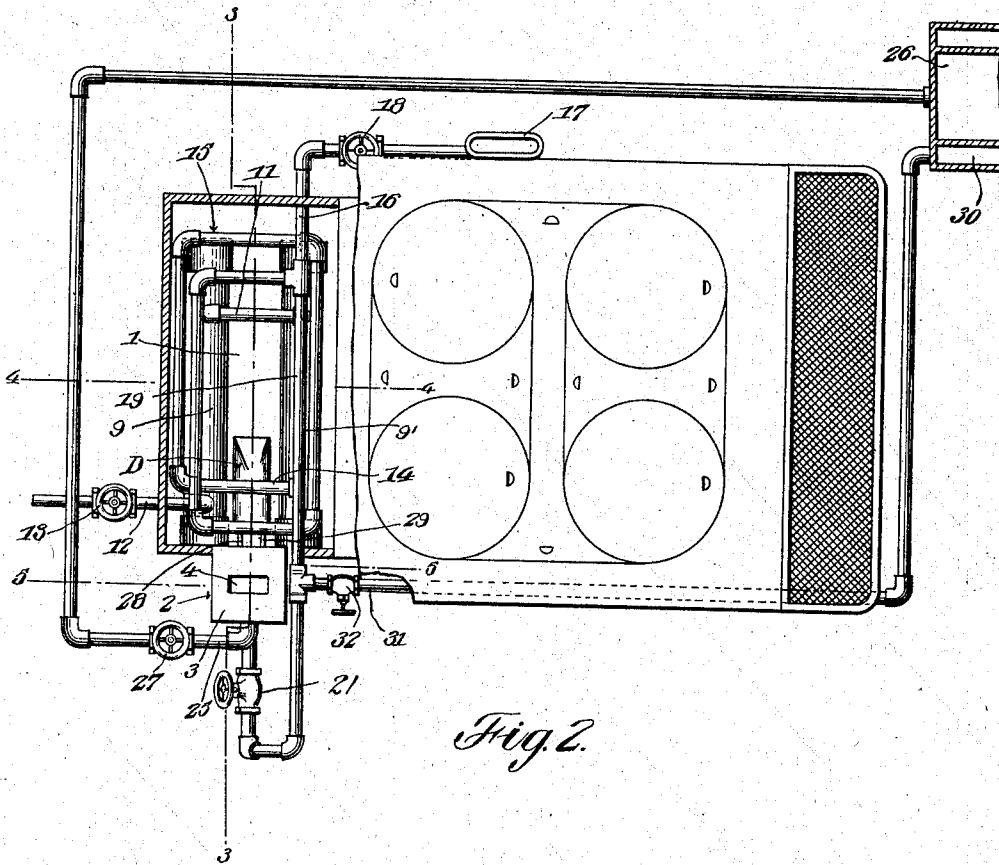


Fig. 2.

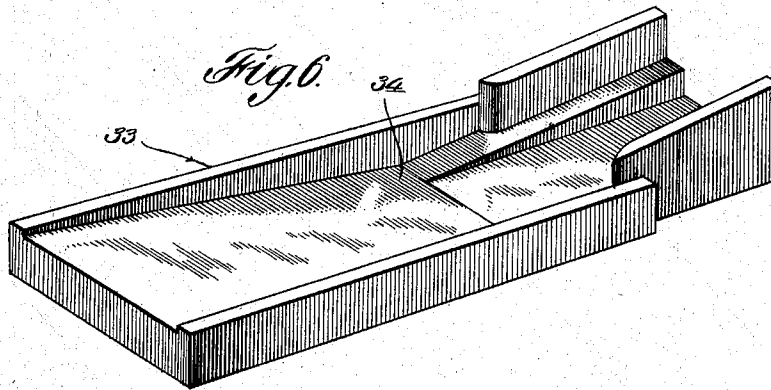


Fig. 6.

Witnesses

J. H. Crawford,
Wm. Raper.

Inventor
Otis J. Effenbeck.

By Victor J. Evans
Attorney

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O. J. EFFENBECK.
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3 SHEETS—SHEET 3.

Fig. 3.

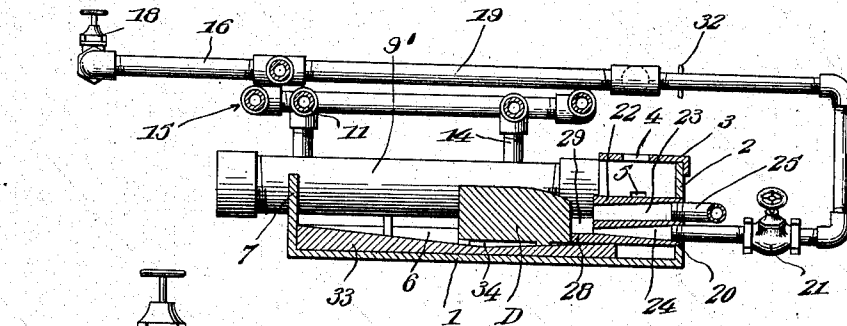


Fig. 5.

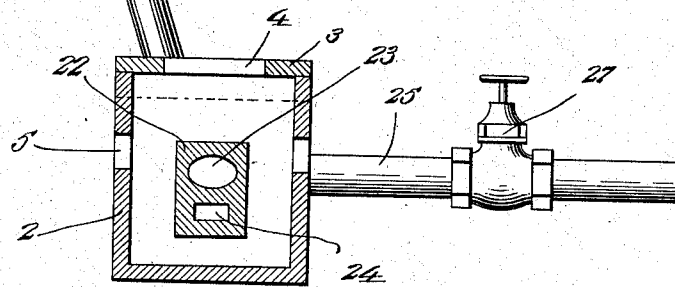
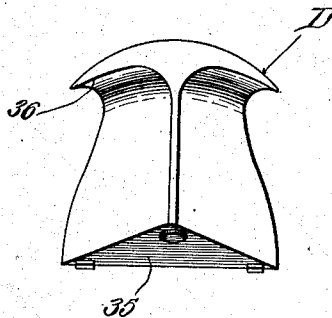


Fig. 7.



Witnesses
J. H. Crawford
Wm. B. Bagger

Inventor
Otis J. Effenbeck

By Victor J. Evans
Attorney

UNITED STATES PATENT OFFICE.

OTIS J. EFFENBECK, OF STOCKTON, CALIFORNIA.

HYDROCARBON-BURNER.

1,038,734.

Specification of Letters Patent.

Patented Sept. 17, 1912.

Application filed October 28, 1911. Serial No. 657,247.

To all whom it may concern:

Be it known that I, OTIS J. EFFENBECK, a citizen of the United States, residing at Stockton, in the county of San Joaquin and State of California, have invented new and useful Improvements in Hydrocarbon-Burners, of which the following is a specification.

This invention relates to hydrocarbon burners, and the prime object of the invention is to produce a simple and effective burner which may be readily applied to and used in connection with heating as well as cooking stoves of ordinary construction.

A further object of the invention is to produce a simple and improved hydrocarbon burner in which the hydrocarbon shall be atomized by a jet of superheated steam supplied from a coil which is heated by the action of the burner.

Further objects of the invention are to simplify and improve the general construction and operation of a burner of the character described.

With these and other ends in view which will readily appear as the nature of the invention is better understood, the same consists in the improved construction and novel arrangement and combination of parts which will hereinafter be fully described and particularly pointed out in the claims.

In the accompanying drawings has been illustrated a simple and preferred form of the invention, it being, however, understood that no limitation is necessarily made to the precise structural details therein exhibited, but that changes, alterations and modifications within the scope of the claims may be resorted to when desired.

In the drawings,—Figure 1 is a side elevation of a burner constructed in accordance with the invention. Fig. 2 is a top plan view showing the same applied to a cooking stove in position for operation, parts of the stove casing being broken away. Fig. 3 is a longitudinal vertical sectional view taken on the line 3—3 in Fig. 2. Fig. 4 is a transverse sectional view taken on the line 4—4 in Fig. 2. Fig. 5 is a transverse sectional view taken on the line 5—5 in Fig. 2. Fig. 6 is a perspective detail view of the drip pan. Fig. 7 is a perspective detail view of the flame spreader.

Corresponding parts in the several figures are denoted by like characters of reference.

A base or supporting member consisting

of a flat pan 1 is provided at its front end with a rectangular casing 2 having a removable lid 3 provided with an air inlet 4. The sides of the casing 2 may also be provided with air inlets 5. The base plate or supporting member 1 is adapted in practice to rest upon the grate of an ordinary cooking or heating stove, and the casing 2 is adapted to project through the door opening or through a special opening provided in the front wall of the stove casing, the rear of the casing 2 being open so as to communicate with the interior of the fire box.

The base member 1 is provided with relatively low flanges 6 at the side edges and with a relatively high flange 7 at the rear edge thereof, said flange 7 being provided with notches or recesses 8 forming offsets upon which two boiler members 9, 9' are supported, one at each side, said boiler members being also partly supported upon the side flanges 6, being thereby elevated above the bottom of the base member 1. The side flanges 6 are provided near their rear ends with notches 10 for the passage of products of combustion. The boiler members are connected together near their rear ends by means of a connecting pipe 11. One of the boiler members, 9, is equipped with a feed pipe 12 having a valve 13 through which water may be fed or supplied to the boilers, it being understood that an injector or pump of any well known kind may be used when desired. A steam pipe 14 is connected with the other boiler member, 9', said steam pipe or exit pipe being coiled to form any desired number of convolutions 15. One of said convolutions has an extension 16 communicating with the flue 17 which constitutes an exit for the products of combustion, said pipe 16 being equipped with a valve 18 for the purpose of regulating the escape of steam therethrough in order to provide a forced draft in the flue 17. A branch pipe 19 is provided which extends through an opening 20 in the front of the casing 2, said pipe 19 being provided with a valve 21 to regulate the escape of steam therethrough. The pipe 19 supports the burner nozzle 22 which is provided with upper and lower longitudinal channels 23 and 24, the latter constituting a steam passage which communicates with the pipe 19. The channel 23 is connected with a feed pipe 25 through which the liquid fuel is supplied from a suitable tank or reservoir 26,

said pipe being provided with a valve 27; whereby the supply may be regulated. The nozzle 24 is provided with a rearwardly extending lip 28 having side flanges 29, said lip and side flanges combining to constitute a deflector for the steam issuing through the channel 24. Said lip also serves to receive the hydrocarbon as it issues through the channel 23, enabling it to be readily ignited by means of a torch of suitable construction which may be introduced through the aperture 4 in the lid 3, or by temporarily detaching said lid. The tank or reservoir 26 is preferably surrounded by a steam jacket 30 communicating through a pipe 31 having a valve 32 with the steam pipe 19, thus enabling live steam to be introduced into the jacket 30 for the purpose of heating the hydrocarbon contained in the tank or reservoir before conveying the latter to the burner.

Supported upon the base plate 1 directly in rear of the burner nozzle is a flanged tray 33, the bottom of which slants downwardly to a point intermediate the two ends of said tray, thus forming a well 34 for the reception of any overflow of oil. Supported upon the bottom of the tray 33 is a flame divider or deflector D consisting of a wedge-shaped body 35 having overhanging flanges 36. This divider or deflector is supported upon the tray 33 directly in rear of the burner nozzle with the apex of the wedge facing said nozzle, so that the flame issuing from the latter will be divided and deflected in the direction of the two boiler members 9 and 9', thoroughly heating the latter for the purpose of vaporizing the water contained therein. This divider or deflector constitutes the essential feature of the invention, without which the flame would be liable to expend its greatest energy in an upward direction toward the top of the fire box, while by the use of said divider or deflector the flame is deflected beneath the overhanging flanges 36 in the direction of the two longitudinally disposed boiler members which are thus subjected to the initial heating, while the flame projected at the sides and ends of said flanges will impinge upon the steam coils, thereby superheating the steam.

In the use of this invention a small quantity of oil is permitted to escape through the channel 23 of the burner nozzle upon the lip 28 of said nozzle, whence it overflows upon the tray 33 where it settles in the well 34. The oil may be ignited by means of a suitable torch, and the boiler members, as well as the steam coil, will quickly become heated sufficiently to develop steam. The valves 21 and 27 may now be opened to permit the oil and steam to pass through the channels 23 and 24 of the nozzle. The oil, by gravity, will drop in a thin sheet adja-

cent to the inner end of the channel 24 where it is subjected to the action of steam and atomized to form a highly inflammable vapor which is ignited by the initial blaze and projected against the divider or deflector, the intensity of the flame being regulated by the proper manipulation of the valves.

If desired, the steam valve 18 may be opened to induce a forced draft, and the valve 32 may likewise be opened to admit steam to the jacket surrounding the fuel tank. In this manner an intensely hot fire may be maintained at a very moderate expense.

Having thus described the invention, what is claimed as new, is:—

1. In a hydrocarbon burner, a base plate having a forwardly extending casing, said casing being open at the rear and provided with a detachable lid having an air inlet, and said base plate having at its rear end an upstanding flange provided with notches at the sides thereof, suitably connected boiler members supported upon the base plate and engaging the notches in the upstanding flange of the latter, being thereby spaced apart, a pipe connecting the boiler members, a feed pipe connected with one of the boiler members, a steam pipe connected with the other boiler member and including a coil arranged above the boiler members, said coil having a valved terminal and a valved branch extending through the front wall of the casing at the front end of the base plate, a nozzle carried by said pipe and having an upper and a lower channel, the latter communicating with the steam pipe, and an oil pipe communicating with the upper channel of the nozzle and having a regulating valve.

2. In a hydrocarbon burner, a base plate having side flanges and a rear end flange, the latter being provided with notches at the sides thereof, said base plate being also provided with a forwardly extending casing which is open at the rear, two boiler members supported upon the side flanges and in the recesses of the rear flange of the base plate, a pipe connecting the boiler members, a feed pipe connected with one boiler member, a steam discharge pipe connected with the other boiler member, said steam pipe being provided with a valved branch extending through the front wall of the casing at the front end of the base plate, a nozzle within said casing connected with the valved branch of the steam pipe, an oil feed pipe connected with the nozzle, an oil tray supported upon the base plate adjacent to the nozzle, and a wedge-shaped deflector supported upon said tray and having overhanging flanges at the sides thereof to divide the flame and to direct it against the boiler member.

3. In a hydrocarbon burner, the combina-

tion with a nozzle, and means for supplying steam and oil to said nozzle, including two suitably supported connected and spaced boiler members, of a wedge-shaped deflector arranged intermediate the boiler members with its apex facing the nozzle, said deflector being provided with overhanging flanges at the upper sides thereof.

4. In a hydrocarbon burner, a base plate having a forwardly extending casing, an oil tray supported upon the base plate and having its bottom inclined to form a well, a wedge-shaped deflector supported upon the tray and having overhanging flanges, a burner nozzle within the casing, two boiler members suitably connected and spaced and supported upon the base member, a steam

coil connected with one of the boiler members and arranged above the said boiler members, said steam coil having a valved branch connected with the nozzle, means for supplying oil to the nozzle, and a wedge-shaped deflector supported upon the bottom of the oil tray adjacent to the discharge end of the nozzle and intermediate the boiler members, said deflector being provided with overhanging flanges at the upper side edges thereof.

In testimony whereof I affix my signature in presence of two witnesses.

OTIS J. EFFENBECK.

Witnesses:

A. H. TUTCHINGS,
JAMES TUTCHINGS.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."