

(No Model.)

2 Sheets—Sheet 1.

B. G. DEVOE.
HYDROCARBON BURNER.

No. 445,692.

Patented Feb. 3, 1891.

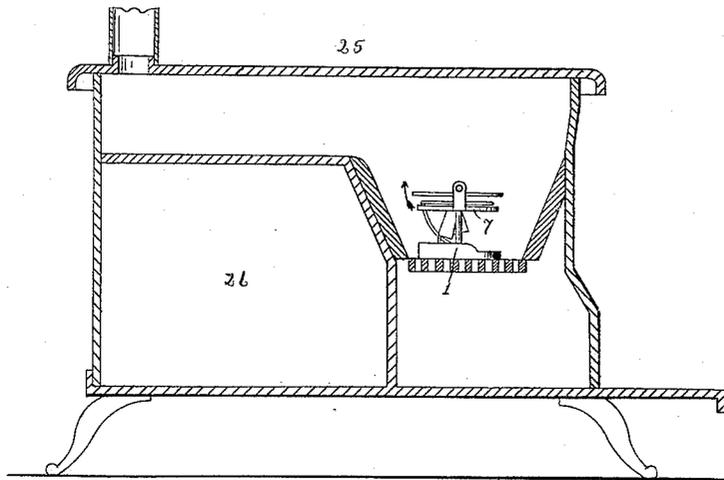


Fig. 1

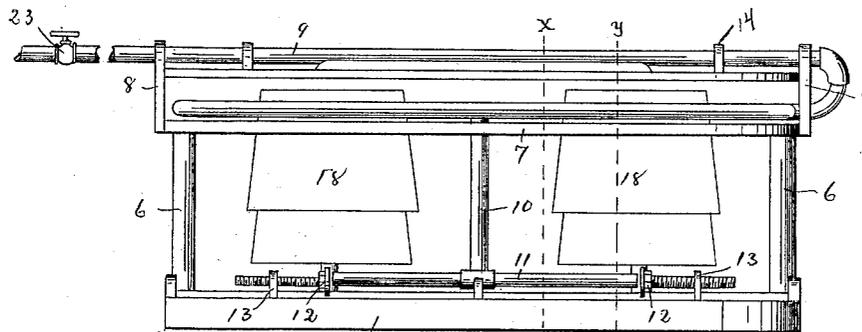


Fig. 2

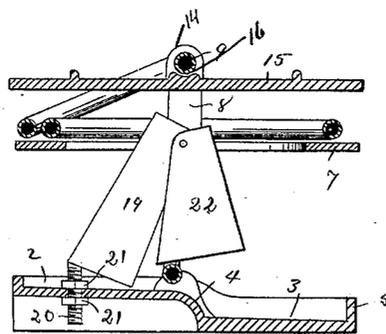


Fig. 3

WITNESSES

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INVENTOR

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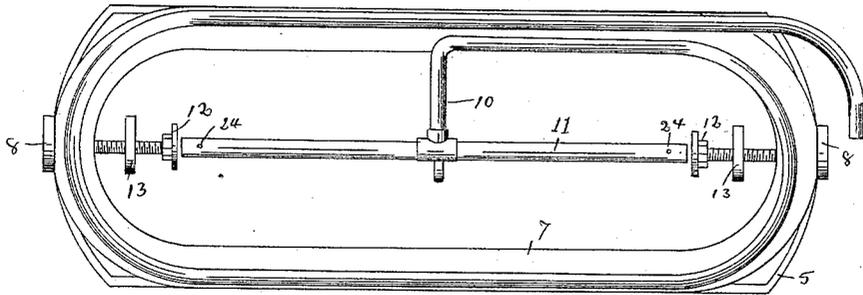


Fig. 4.

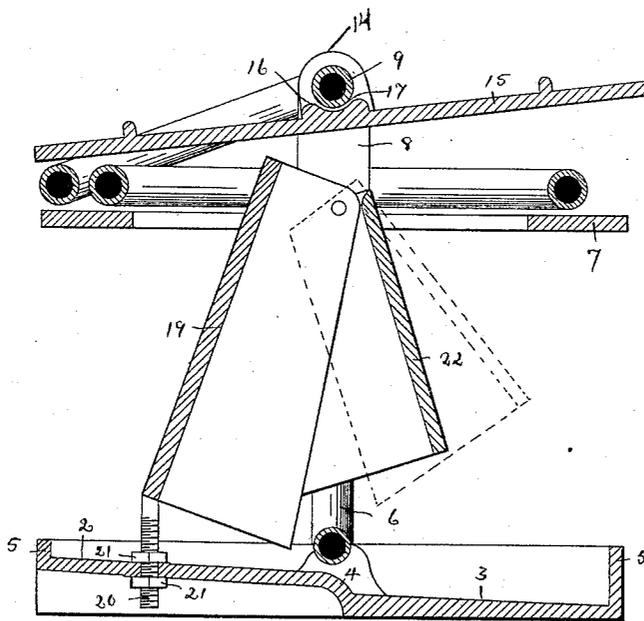


Fig. 5.

WITNESSES

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UNITED STATES PATENT OFFICE.

BENJAMIN G. DEVOE, OF LIMA, OHIO.

HYDROCARBON-BURNER.

SPECIFICATION forming part of Letters Patent No. 445,692, dated February 3, 1891.

Application filed July 14, 1890. Serial No. 358,690. (No model.)

To all whom it may concern:

Be it known that I, BENJAMIN G. DEVOE, of Lima, in the county of Allen and State of Ohio, have invented certain new and useful
5 Improvements in Hydrocarbon-Burners; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use
10 the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form part of this specification.

This invention relates to hydrocarbon-burners.

The object of the invention is to produce a device which will rapidly generate a fixed gas from crude petroleum or its distillates and at the same time consume the heavier hydrocarbons, such as tar, paraffine, &c., whereby the resulting gas will be pure and free from those elements which are most objectionable in an oil gas. A further object is to produce mechanism to be used in conjunction
25 with the burner for increasing or diminishing the heating power of the same, so that one burner may be advantageously employed for a number of purposes. A further object is to produce a hydrocarbon-burner which will
30 generate a large quantity of gas with but a small consumption of oil. A final object is to produce a hydrocarbon-burner which shall be simple of construction, efficient and durable in use, and which may be manufactured
35 at a nominal figure.

With these objects in view the invention consists in providing a deflector adapted to deflect the products of combustion, an oil-supply pipe arranged in such relation to the
40 deflector that the flames therefrom will contact directly with the pipe, and thus vaporize the oil therein, and a mixer adapted to supply atmospheric air to the vapor thus produced in suitable quantities, whereby the ad-
45 mixed vapor and air will combine to form a gas of great heating power.

The invention further consists in providing an adjustable deflector adapted to deflect the products of combustion in any desired direction, an oil-supply pipe contiguous to the
50 deflector and arranged in the path of the travel of the said products to vaporize the oil within

the pipe, and an adjustable mixer adapted to feed the requisite quantity of oxygen to the vapor, and thus produce a gas of varying
55 heating power.

The invention further consists in producing a concentrating device adapted to concentrate the oil at a desired point for the elimination therefrom of the heavier hydrocarbons
60 previous to the formation of a gas, whereby coking and consequent stoppage of the supply-pipe will be prevented.

The invention further consists in the various novel details of construction of a hydro-
65 carbon-burner, as will be hereinafter fully described and claimed.

In the accompanying drawings, forming part of this specification, and in which like numerals of reference indicate corresponding
70 parts, I have illustrated a device embodying the essential features of my invention.

In the drawings, Figure 1 is a longitudinal sectional view of a stove, showing my improved burner placed therein. Fig. 2 is a side
75 elevation. Fig. 3 is a transverse sectional view taken on the line *xx* of Fig. 2. Fig. 4 is a top plan view with a portion of the mechanism removed, showing the oil-supply pipe; and Fig. 5 is an enlarged transverse sectional
80 view taken on the line *yy* of Fig. 2.

Referring to the drawings, 1 designates the base of the device, which from its function I will designate as a "concentrating-pan," consisting of two inclined portions 2 and 3, which
85 are arranged one above the other at any desired height and are connected by means of a curved portion 4. This pan is preferably rectangular in shape, and is bounded at its end and sides by upward-extending flanges 5.
90 Supported upon the pan by means of uprights 6 is a hollow supporting-frame 7, provided with upward-extending ears 8, through which passes the supply-pipe 9, as shown in Figs. 3 and 5. This supply-pipe is constructed of a
95 convoluted pipe which is coiled upon itself once or oftener, if desired, and is bent downward, as shown at 10, and connects with a jet-pipe 11, arranged directly over the concentrating-pan. Each end of the jet-pipe 11 is
100 left open and is adapted to be closed, if desired, by means of screw-valves 12, working in standards 13 upon the said pan. Immediately above the frame 7 and pivoted upon the

supply-pipe by means of ears 14 is the deflector 15, which is provided preferably centrally and longitudinally of its length with a groove 16, between which and the supply-pipe is formed a space 17, the function of which will be described farther on.

Upon the concentrating-pan is mounted the mixer 18, constructed of a stationary portion 19, which is held in place upon the said pan by means of a screw 20, formed integral with the portion and nuts 21, and a movable portion 22 pivoted to the said stationary portion. These two parts are constructed preferably rectangular in form and are wider at the base than at the top, as clearly showd in Figs. 3 and 5.

Having thus fully described the different parts of my device, I will explain the manner of its operation: The oil is first fed to the supply-pipe 9 through a cock 23 and flows to the jet-pipe 11, and escapes to the concentrating-pan, where it is ignited. The flame from the same passes up through the mixer 18 and contacts with the under side of the deflector 15, around which it passes to the top of the same, and thus contacts with the supply-pipe, thereby serving to vaporize the oil therein, the flame not passing over the top of the said pipe alone, but under the same through the space 17, thus thoroughly heating the entire surface of the pipe.

As will be clearly seen by reference to Figs. 3 and 5, the supply-pipe does not contact with either the supporting-plate 7 or the deflector 15, and it thus follows that the flame from the burning oil also contacts with the entire surface of the pipe arranged between these two portions. As soon as the heat is sufficiently intense to vaporize the oil the gas escapes through openings 24 in the jet-pipe 11 and escapes up through the mixers, which are so arranged as to supply the requisite amount of oxygen to produce the desired degree of heat and against the deflector in the manner described, the residuum passing out of the ends of the jet-pipe and into the concentrating-pan, where it is consumed. Where an intense heat is desired, the mixer is opened, as shown in dotted lines in Fig. 5, which position of parts generates a large draft and causes a mixed gas and oxygen to escape with great force through the mouth of the mixer and against the deflector, around which latter the flame curls in a solid sheet of flame. In order to appreciate the adjustable feature of the deflector, attention is called to Fig. 1, in which the burner is shown mounted in a stove 25. Supposing that the oven 26 contains an article of food to be cooked and the attendant discovers that the heat from the burner is escaping up the chimney, it will only be necessary in order to remedy this defect to tilt the deflector in the direction indicated by the arrow, when the full body of heat will be brought to play upon the oven, and thus expedite the cooking, the reverse adjustment of the deflector causing but a mini-

imum amount of heat to be brought to bear upon the oven.

Although I have shown in this instance two mixers in operation, I would distinctly have it understood that I do not limit myself to that number, as in some instances I may employ but one and in other instances two or more.

By means of the peculiar construction of the concentrating-pan, which by reason of its double inclined surfaces causes all the oil to flow to one place, all of the heavier hydrocarbons, such as parraffine, tar, &c., are thoroughly eliminated from the oil in starting an initial fire, and as the concentrating-pan is kept highly heated it follows that the residuum in the supply-pipe will escape through the open ends of the jet-pipe 11, thus keeping the supply-pipe thoroughly cleansed and preventing coating or coking of the same, which is a source of great annoyance in this class of burners. Moreover, by having the mixer made adjustable, so that the volume of oxygen can be increased or diminished at will, the heating capacity of the burner can be regulated as desired.

In the foregoing description I have described the device as it operates in burning crude petroleum; but when refined oil is employed the valves on the jet-pipe 11 are closed and the gas escapes through the openings 24.

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

1. In a hydrocarbon-burner, a concentrating-pan having a double-incline bottom, an open-ended jet-pipe having suitable jet-orifices, said pipe being shorter than the pan and located horizontally over it, and a supply-pipe located above and communicating with the jet-pipe, for the purposes set forth.

2. In a hydrocarbon-burner, a pan having a double-incline bottom, an open-ended jet-pipe having suitable jet-orifices, said pipe being shorter than the pan and located horizontally over it, valves for closing the ends of the jet-pipe when desired, and a supply-pipe located above and communicating with the jet-pipe, for the purposes set forth.

3. In a hydrocarbon-burner, a concentrating-pan, an open-ended jet-pipe having suitable jet-orifices located horizontally over said pan, a frame supported by the pan, a supply-pipe supported by said frame and communicating with the jet-pipe, a tilting deflector suspended from the supply-pipe, and a mixer located between the jet-pipe and deflector, for the purposes set forth.

4. In a hydrocarbon-burner, a pan having a double-incline bottom, an open-ended jet-pipe having jet-orifices in its upper side, said pipe being shorter than the pan and located over it, a frame supported by the pan, a supply-pipe supported by said frame and communicating with the jet-pipe, a tilting deflector between the supply-pipe and jet-pipe, and an adjustable mixer between the jet-pipe

and deflector, as set forth, and for the purposes stated.

5 In a hydrocarbon-burner, a pan having a double-incline bottom, an open-ended jet-pipe having jet-orifices in its upper side, said pipe being shorter than the pan and located over it, valves for closing the ends of the jet-pipe when desired, a frame supported by the pan, a supply-pipe supported by said frame
10 and communicating with the jet-pipe, a deflector having pivotal connection with the

supply-pipe, and an adjustable mixer supported by the pan, all as described, and for the purposes set forth.

In testimony that I claim the foregoing as
my own I affix my signature in presence of
two witnesses. 15

BENJAMIN G. DEVOE.

Witnesses:

WILLIAM WEBSTER,
R. M. ELLIOTT.