

H. LEMP.
STARTER FOR HYDROCARBON BURNERS.
APPLICATION FILED MAY 25, 1906.

1,056,697.

Patented Mar. 18, 1913.

Fig. 1.

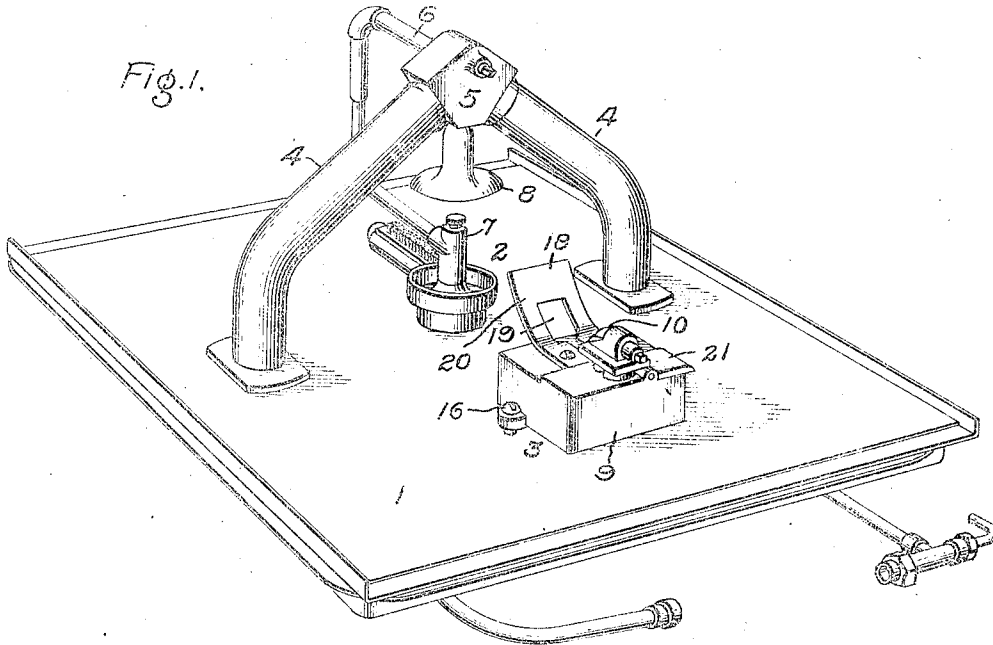


Fig. 2.

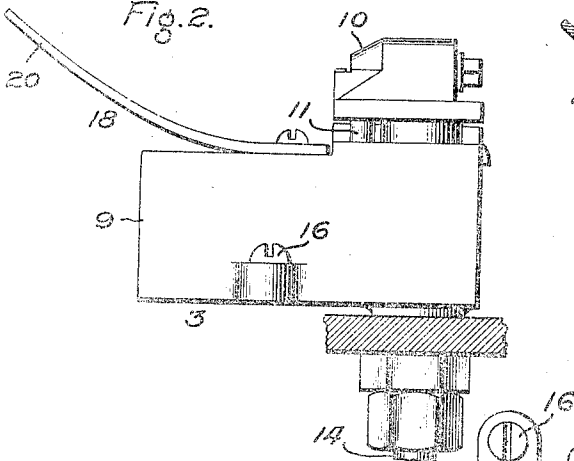


Fig. 3.

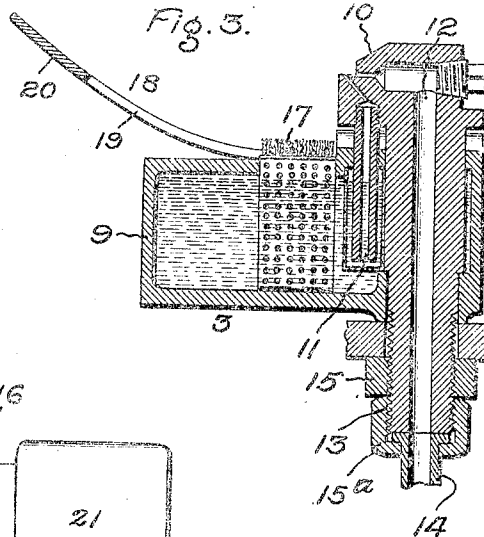
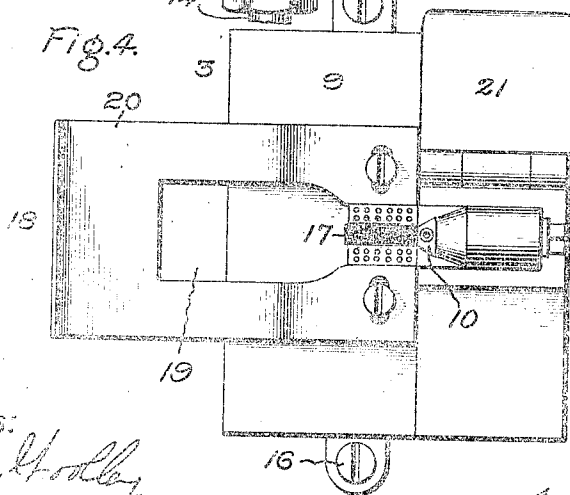


Fig. 4.



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UNITED STATES PATENT OFFICE.

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STARTER FOR HYDROCARBON-BURNERS.

1,056,697.

Specification of Letters Patent.

Patented Mar. 18, 1913.

Application filed May 25, 1906. Serial No. 318,727.

To all whom it may concern:

Be it known that I, HERMANN LEMP, a citizen of the United States, residing at Lynn, county of Essex, State of Massachusetts, have invented certain new and useful Improvements in Starters for Hydrocarbon-Burners, of which the following is a specification.

The present invention relates to burner starters designed more especially for use in connection with a burner of the type comprising a vaporizer for vaporizing liquid fuel, a nozzle for discharging a jet of fuel vapor received from the vaporizer, and a baffle plate against which the jet is directed to distribute it outwardly to mix the vapor with air before ignition takes place.

The invention has for its object the provision of a starting device of the atomizer type capable of quickly starting the burner into operation with a small expenditure of fuel.

In carrying out the invention, I arrange the starter or atomizer adjacent the burner with its nozzle directed toward it. Located in front of the nozzle of the starter is a deflector so constructed as to divide the flame into two or more distinct parts and direct them against different members of the burner, as for instance, one part against the vaporizer and another part against the nozzle. In this manner, with an atomizer of given capacity, the starting flame can be utilized to the best advantage to heat the parts most effective in generating vapor for initial starting, without heating other less effective portions of the burner, thus avoiding waste of energy.

In the accompanying drawing, which illustrates one of the embodiments of the invention, Figure 1 is a perspective view of a burner and its starter; Fig. 2 is a side elevation of the starter or atomizer; Fig. 3 is a central vertical section; and Fig. 4 is a plan view of the starter.

Referring to the drawing, 1 designates a supporting plate that serves as the base of the combustion chamber in which the burner is located. Supported on the base plate is the burner 2 and the starter 3 therefor. The burner comprises a vaporizer having two branches or conduits 4, receiving liquid from a suitable source of supply, inclined toward each other and connected by a head 5. Extending from the head is a connection

6 that receives vapor from the vaporizer and conveys it to the nozzle 7. Situated above the nozzle and in close proximity to the opening thereof is a baffle plate 8. The vapor jet from the nozzle impinges on this plate which deflects and distributes it before ignition occurs, so as to mix with the vapor sufficient air to produce an intense blue flame. After the burner is once started it generates its own vapor automatically and operates as long as fuel is supplied to it. The fuel enters at the bottom of each branch of the vaporizer, is vaporized before reaching the head, and while passing through the connection 6 the vapor becomes highly superheated.

The starter 3 is located centrally in front of the burner and arranged to direct its flame toward the same. The starter comprises a vessel 9 containing liquid fuel which may be introduced through an opening covered by a hinged lid 21. This vessel is attached to the base plate by screws or other means, and carries a spraying nozzle 10. The nozzle is provided with a fuel passage 11 and a passage 12 for air or other suitable fluid. The latter passage is preferably formed in the body of the nozzle, while the passage 11 may be that of a tube secured to the body of the nozzle and communicating at its upper end with a passage in the nozzle. The lower end of the tube extends into the vessel and receives liquid fuel therefrom. The nozzle extends through the top and bottom of the vessel and is secured in place therein by the thread 13 engaging the nut 15. The same thread serves to attach the air supply pipe 14 to the nozzle by means of the nut 15^a and to secure the vessel to the base plate by means of the nut 15, in addition to the screws 16. The discharge ends of the passages 11 and 12 are abruptly reduced, so as to give to the air and fuel a high velocity of discharge. The outlet ends are so arranged that the air from the passage 12 passes over the end of the fuel passage, draws fuel therefrom and sprays it in the direction of the burner. Located in front of the nozzle 10 is a wick 17 extending into and receiving fuel from the vessel 9. The wick flame ignites the atomized fuel.

The nozzle of the starter is arranged to direct the center of its flame against the burner nozzle. In order to heat the vaporizer and the burner nozzle at the same time

without employing an atomizer of such dimensions as to produce a flame having a body large enough to envelop both the vaporizer and the nozzle, a deflector 18 is arranged intermediate the spray nozzle and the burner to divide the flame and deflect a part of it against the vaporizer while another part passes to the burner nozzle. By this arrangement a flame of minimum volume is used to the best advantage, heating only the essential parts of the burner. The heat being thus concentrated, the burner is started in a short time. The deflector comprises a piece of sheet metal, preferably supported on the vessel of the starter so as to be removable therewith, and is provided with an opening 19 through which passes that part of the flame which heats the nozzle of the burner. The remaining portion of the flame impinges on the part 20 of the deflector which deflects it toward and upon the vaporizer.

When starting the burner, the operation is as follows: The vessel 9 of the starter is filled with liquid fuel and the wick 17 is lighted. The valve controlling the supply of compressed air or other atomizing fluid is then opened, whereupon the air discharging over the outlet of the passage 11 draws up fuel through the latter and atomizes it. This atomized fuel is immediately ignited by the flame of the wick. The flame thus produced impinges on the nozzle and the vaporizer of the burner as already described and highly heats them so as to generate vapor for starting the burner. As the vapor is generated and discharged from the main burner nozzle it is ignited by the flame from the starter. After this condition is attained the burner is self-supporting and the starter flame can be extinguished.

In accordance with the provisions of the patent statutes I have described the principle of operation of my invention, together with the apparatus which I now consider to represent the best embodiment thereof; but I desire to have it understood that the apparatus shown is only illustrative and that the invention can be carried out by other means.

What I claim as new and desire to secure by Letters Patent of the United States, is—

1. A burner including a vaporizer, in combination with a starting device for producing a flame for heating up the burner, and means which divides the flame from the device and deflects a portion of it against the vaporizer, the remainder of the flame acting upon another portion of the burner.

2. A burner comprising a vaporizer and a nozzle arranged substantially in a common plane, in combination with a starting device for producing a flame for heating up the burner, said device directing its flame toward said vaporizer and nozzle and trans-

versely to the plane thereof, and means located intermediate the device and said vaporizer and nozzle which divides the starting flame so that one portion of it impinges upon the vaporizer and another portion upon the nozzle of the burner.

3. A burner having a vaporizer and a nozzle, in combination with a starting device therefor comprising a fuel-discharging nozzle for heating up the burner, and a device arranged in front of the last named nozzle which divides the flame therefrom into separate streams which impinge upon the vaporizer and the burner nozzle respectively.

4. A burner including a vaporizer and a nozzle receiving vapor therefrom, in combination with a starting nozzle discharging a flame upon the burner nozzle, and a deflector arranged in front of the nozzle which directs a portion of the flame away from the burner nozzle and upon the vaporizer, there being an opening in the deflector opposite the starting nozzle through which a portion of the flame passes and impinges on the burner nozzle.

5. A burner comprising two vaporizing conduits joined at their discharge ends, a nozzle located between the conduits, and a connection between the discharge ends of the conduits and the nozzle, in combination with a starting nozzle discharging a flame upon the burner nozzle, and a deflector arranged in front of the starting nozzle which directs a portion of the flame away from the burner nozzle and upon the conduits near their point of union.

6. A burner comprising a vaporizer, a nozzle connected therewith, and a base plate supporting the vaporizer, in combination with a fuel atomizer supported on the base plate opposite the nozzle and vaporizer, and a deflector arranged intermediate the burner and atomizer which causes the flame from the latter to impinge partly upon the vaporizer and partly upon the nozzle.

7. A burner comprising a vaporizer, a nozzle connected therewith, and a base plate supporting the vaporizer, in combination with a fuel atomizer removably supported on the base plate, and a deflector carried by the atomizer and removable therewith which directs part of the flame from the atomizer upon the vaporizer, the remainder impinging upon the nozzle of the burner.

8. The combination of a burner comprising a vaporizer and a nozzle connected therewith, a containing vessel, a starting nozzle provided with two passages, one of which communicates with the vessel and the other with a source of air supply and delivers air therefrom to atomize liquid fuel conveyed through the first passage from the vessel, means for igniting the atomized fuel which is located in the path of the

stream of fuel discharged from the starting nozzle, and a deflector arranged transversely of the path of the flame adjacent the starting nozzle which deflects a part of the flame and directs it against the vaporizer, said deflector being provided with an opening through which another portion of the flame passes to impinge on the burner nozzle.

9. In a starting device for a burner having a vaporizer and a nozzle, the combination of a flame producing nozzle with a deflector adjacent said nozzle, said deflector having a curved portion to direct the flame against the vaporizer, and an opening through which the flame is directed to the burner nozzle.

10. A hydro-carbon burner comprising two upwardly extending vaporizing conduits, a head joining the upper ends of the conduits, a nozzle located centrally between the conduits below the head, and a pipe

leading from the head to the nozzle, in combination with a starter for the burner having an atomizing nozzle located opposite the conduits and the burner nozzle, and a fixed, upwardly curved deflector plate adjacent the starter nozzle and between it and the burner provided with an opening through which a portion of the starting flame passes to impinge on the burner nozzle, another portion of the flame being directed upwardly by the curved portion of the plate against the conduits and the head to vaporize the fuel on its way to the burner nozzle.

In witness whereof, I have hereunto set my hand this seventeenth day of May, 1906.

HERMANN LEMP.

Witnesses:

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ALEX. F. MACDONALD.