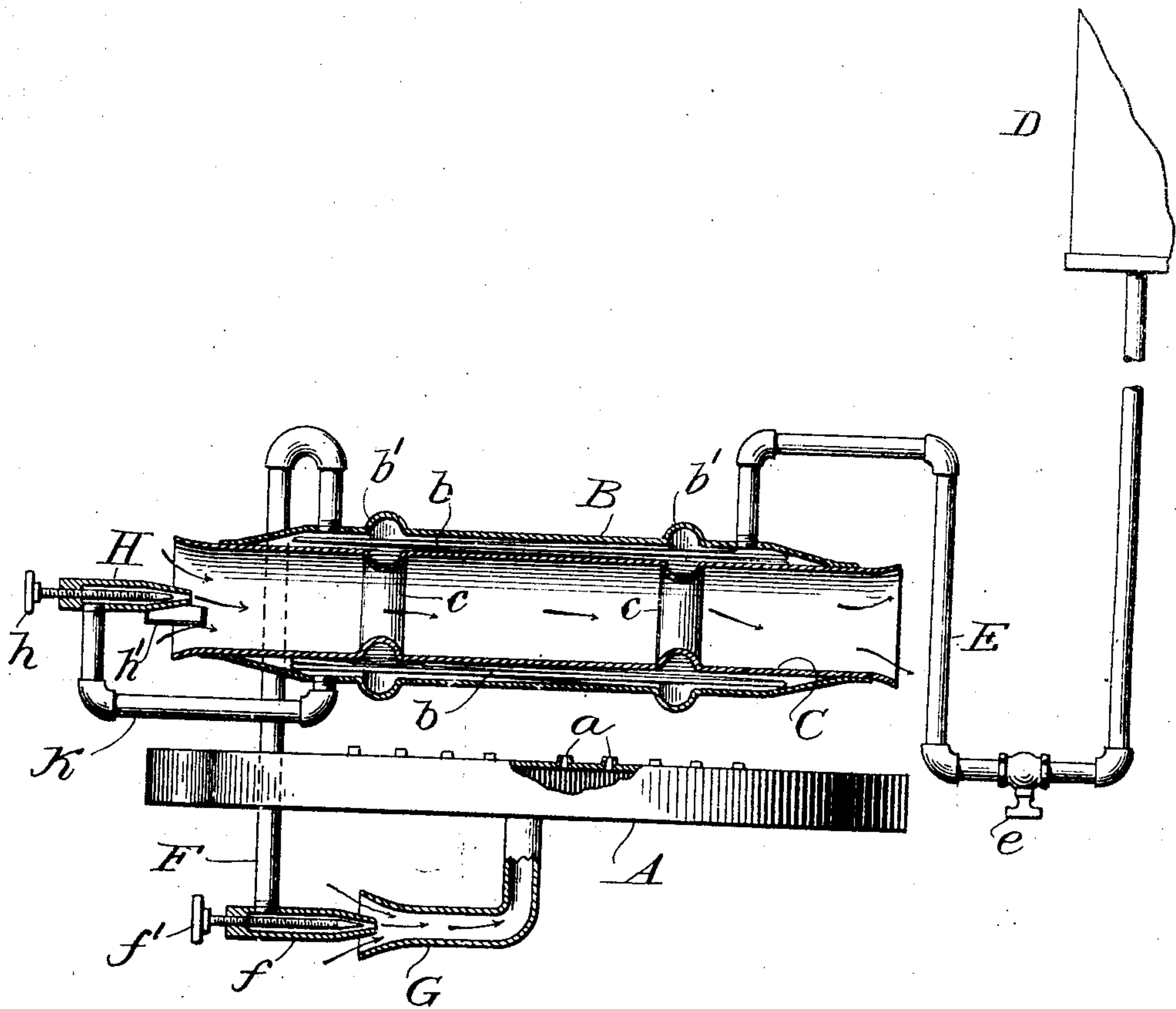


No. 785,902.

PATENTED MAR. 28, 1905.

H. J. MARKS.
VAPOR BURNER.
APPLICATION FILED MAR. 12, 1903.



Witnesses
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UNITED STATES PATENT OFFICE.

HARRY J. MARKS, OF NEW YORK, N. Y.

VAPOR-BURNER.

SPECIFICATION forming part of Letters Patent No. 785,902, dated March 28, 1905.

Application filed March 12, 1903. Serial No. 147,395.

To all whom it may concern:

Be it known that I, HARRY J. MARKS, a citizen of the United States, residing at New York, N. Y., have invented certain new and useful Improvements in Vapor-Burners, of which the following is a clear, full, and exact description.

My invention relates to a vapor-burner—that is, a burner which consumes a vaporized liquid fuel; and my object is to improve the construction of the same, particularly with reference to a simple and effective apparatus for quickly starting the generation of the vapor.

My invention will be defined in the claims. The drawing shows a side elevation, partly in section, of the preferred embodiment of my invention.

In the embodiment of my invention shown in the drawing, and which embodiment I prefer to use, A is a burner which consumes a vaporized liquid fuel. This burner is preferably a round hollow body perforated with a number of perforations *a*.

B is a vapor-generating casing having a hole therethrough. This hole is preferably formed by a tube C extending through the casing and is preferably open at both ends, as shown. The proportions of the parts may obviously be varied; but I have found that a casing one and one-half inches in diameter with a tube one inch in diameter operates successfully. A tank D and pipe E form one embodiment of means for feeding a liquid fuel into said casing. A pipe F, provided with a nozzle *f* and a valve *f'*, and a pipe G, open at one end and connected with the burner, form a means for leading the vaporized fuel to the burner A.

H is a torch, preferably in the form of a burner-nozzle, having a valve *h* and directed into the tube C—that is, so that the flame from the torch will pass into the tube. A pipe K, leading from casing B, may be provided to supply fuel to said torch.

The casing B is preferably located directly over the burner A, and the space between the casing and the enclosed tube C may be filled with some material which will aid in vaporizing the fuel. I have found that metal wires

answer well for this purpose. The casing B may have its ends drawn down upon and brazed to said tube C, if desired, and both may be corrugated, as at *b'* and *c*.

When it is desired to start the generation of vapor, the valve *h* is opened and the liquid or vapor issuing therefrom is lighted. *h'* is a pan for holding the liquid. The flame and heat will pass through tube C, which will thus be highly heated, and the fuel in the casing will be vaporized, the metal wires assisting in such vaporization. The vapor generated may be fed to the burner A by opening valve *f'*, and the heat from the burner A will continue the vaporization of the fuel in the casing whether the torch H is continued in operation or is extinguished. I have found that even with kerosene as the liquid fuel the initial generation of vapor by my apparatus is so rapid that I have been able to start the burner A in full operation in one minute from the time the torch H was lighted, although kerosene requires a much greater degree of heat for its vaporization than does gasoline. As soon as vapor begins to be generated in the left-hand end of casing B the vapor passes to and out of the torch, and the flame therefrom shoots through the entire length of tube C, highly heating the same. I preferably lead pipe E across the front of and close to the other open end of tube C, as shown, so that the flame and heat issuing from the tube will strike against said pipe and give a prior heating to the fuel before it arrives at casing B. Air will enter the open end of tube C and mix with the vapor issuing from nozzle *f*.

I am aware that many variations from the foregoing construction may be made without departing from the spirit of my invention as claimed, and I therefore do not desire to be limited to the embodiment heretofore described and illustrated.

What I claim is

1. In combination, a vapor-burner head having a broad upper face arranged substantially horizontally and provided with a plurality of perforations in said face, a tube arranged substantially horizontally above and close to said burner-head, a vaporizing-casing upon said tube, means to feed a liquid fuel into said cas-

ing, a torch directed into said tube, means to supply fuel to said torch, and means to lead vaporized fuel from said casing to said burner.

2. In combination, a vapor-burner head having a broad upper face arranged substantially horizontally and provided with a plurality of perforations in said face, a tube arranged substantially horizontally above and close to said burner-head, a vaporizing-casing upon and surrounding said tube, means to feed a liquid fuel into said casing, a torch directed into said tube, means to supply fuel from said casing to said torch, and means to lead vaporized fuel from said casing to said burner.

3. In combination, a vapor-burner head having a broad upper face arranged substantially horizontally and provided with a plurality of perforations in said face, a tube lying substantially horizontally close to and above said burner, a vaporizing-casing upon and surrounding said tube, means to feed a liquid fuel into said casing, a torch directed into said tube, means to supply fuel to said torch, and means to lead vaporized fuel from said casing to said burner.

4. In combination, a vapor-burner head having a broad upper face arranged substantially horizontally and provided with a plurality of perforations in said face, a tube open at both ends and lying substantially horizontally close to and above said burner, a vaporizing-casing upon and surrounding said tube, means to feed a liquid fuel into said casing and in part located in front of one end of said tube, a torch directed into the other end of said tube, a pipe extending from said casing to said torch to supply fuel thereto, and a pipe leading from said casing to said burner to supply vaporized fuel thereto, said pipe having an opening therein to admit air thereto.

5. In combination, a vapor-burner, a tube open at both ends and located above said burner, an elongated vaporizing-casing upon and surrounding said tube, metallic wires located in said casing between the interior of said casing and the exterior of said tube and adapted to assist in vaporizing the fuel, a fuel-tank and means to lead a liquid fuel from

said tank into said casing, said pipe passing in front of one of the open ends of said tube, a torch-nozzle directed into the other end of said tube and adapted to cause a flame to pass into said tube, a pipe connected with said casing and leading to said torch to supply fuel thereto, and a pipe leading from said casing to said burner and having an opening therein to admit air thereto.

6. A vaporizer for liquid hydrocarbons comprising a central tube, a tube about said central tube of sufficient size to form an annular passage, said tubes at their ends being worked into contact with each other to form a closed annular chamber, one of said tubes having peripheral corrugations forming a yielding section to accommodate unequal expansions of the two tubes.

7. A vaporizer for liquid hydrocarbons comprising a central tube, a tube about said central tube of sufficient size to form an annular passage, said tubes at their ends being joined to form an annular passage, one of said tubes having peripheral corrugations compensating for unequal expansion of the two tubes.

8. In combination, a vapor-burner, a vaporizer consisting of an annular tubular casing extending across the face of the burner and having a central through-passage, means for supplying a liquid hydrocarbon to the annular space in said vaporizer, means for conveying the gas generated by said vaporizer to the burner, and a pilot burner or torch discharging into the central opening in said vaporizer.

9. The combination of a main burner, a vaporizer above and substantially parallel to said burner, said vaporizer being composed of inner and outer tubes spaced apart to form a vaporizing-channel, means to conduct vaporized fuel from said vaporizer to said burner, a torch directed into said inner tube, and means to supply fuel to said torch.

Signed at New York, N. Y., this 9th day of March, 1903.

HARRY J. MARKS.

Witnesses:

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