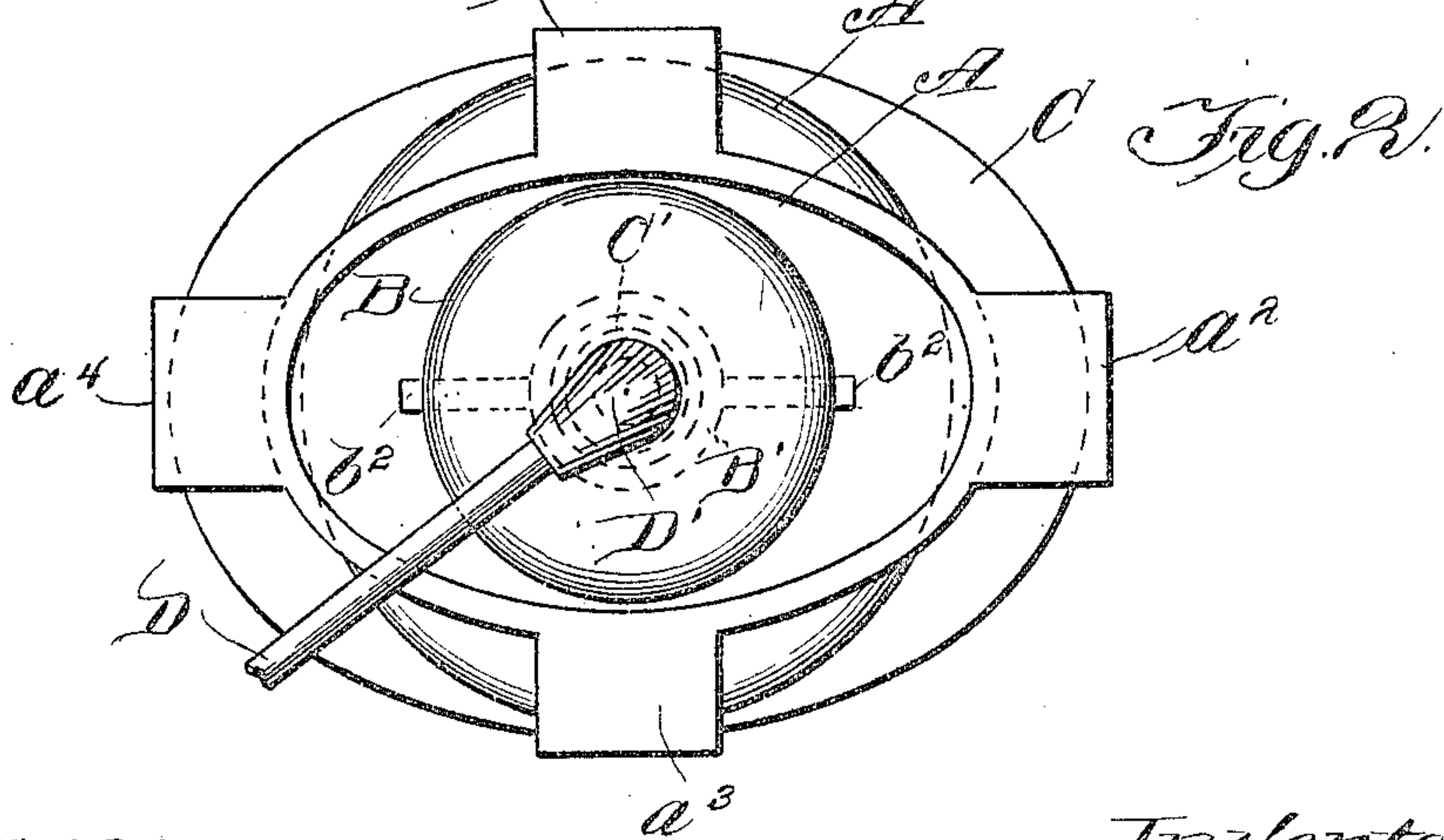
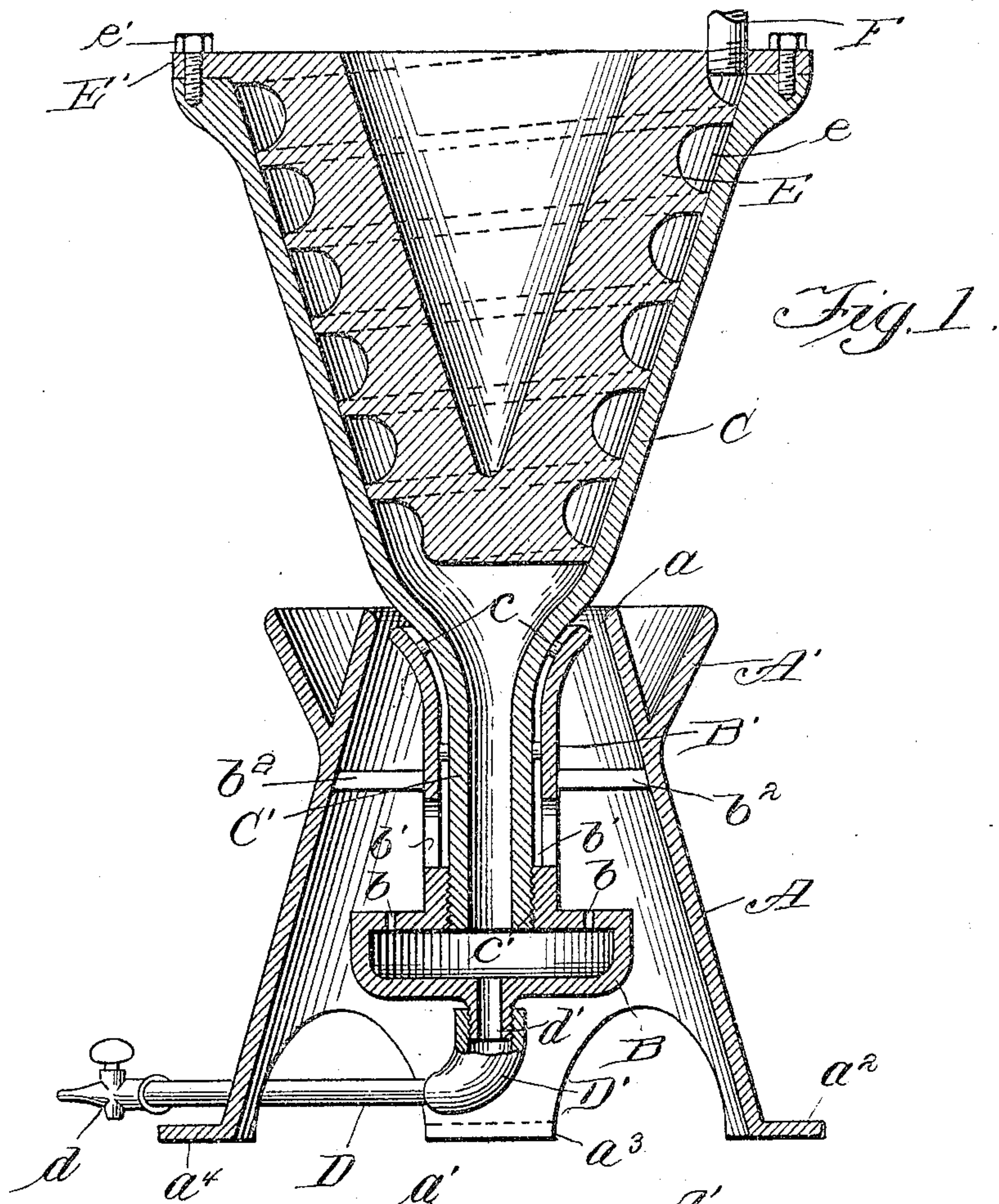


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PATENTED DEC. 26, 1905.

B. Q. P. FOSS.
HYDROCARBON BURNER.
APPLICATION FILED DEC. 9, 1903.



Witnesses:
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HYDROCARBON-BURNER.

No. 808,529.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, BENJAMIN Q. P. FOSS, a citizen of the United States, residing at San Jose, county of Santa Clara, State of California, have invented a certain new and useful Improvement in Hydrocarbon-Burners; and I declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification.

My invention relates in general to hydrocarbon-burners, and more particularly to a burner especially designed for burning low-grade crude oils.

It is well known that oil possesses many advantages as a fuel over coal in that it occupies comparatively small storage space prior to burning and leaves no ashes to be removed after being consumed. Prior to my invention, however, crude hydrocarbon-burners have usually been of the atomizer type, which are objectionable for a number of reasons—namely, power is required in addition to the mechanism itself to atomize the oil, disagreeable fumes are given off, offensive and oft-times poisonous yellow and black smoke results from the combustion, and dangerous explosions are of frequent occurrence.

The primary object of my invention is to provide a hydrocarbon-burner in which the combustion will be so complete as to be unattended by smoke or fumes and which will be free from any danger of explosion.

A further object of my invention is to provide a hydrocarbon-burner capable of efficiently burning a mixture of approximately two parts of crude oil and one part of water.

A still further object of my invention is to provide a hydrocarbon-burner of the character referred to which will be simple in construction, inexpensive in manufacture, and efficient in use.

My invention, generally described, consists in a burner, a conduit communicating with the burner through which liquid fuel is supplied, said conduit being located above the burner whereby the generated heat effects the vaporization of the fuel during its passage to the burner.

My invention will be more fully described

hereinafter with reference to the accompanying drawings, in which the same is illustrated in a convenient and practical manner, and in which—

Figure 1 is a vertical central sectional view, and Fig. 2 a plan view looking upwardly from beneath Fig. 1.

The same reference characters are used to designate the same parts in the two figures of the drawings.

A designates a base which is supported by a number of laterally-projecting feet a' , a^2 , a^3 and a^4 . The base A consists in a conical wall, preferably somewhat elliptical near its bottom and gradually diminishing in interior diameter toward its top, where it terminates, preferably, in a circle. Extending around the exterior of the base A, near the top thereof, is an outwardly-flaring flange A' , which, together with the adjacent portion of the base, forms a circular trough of V-shaped cross-section.

Located within the base A is the burner proper, B, which is provided with a series of holes b in its upper wall, through which the vaporized fuel passes, where it is ignited. The burner B is provided with an upwardly-projecting tubular portion B' , preferably flaring at its upper end and terminating adjacent to the upper end a of the base A, so as to form a protecting-cover for the lower tubular portion of the retort or chamber C to prevent the same from overheating and the consequent carbonization of the hydrocarbon. The burner B may be supported within the base A by any suitable means—such, for instance, as webs b^2 b^2 —which may conveniently be formed integrally with the base and upwardly-projecting tube B' of the burner.

Supported above the base A is a chamber C, preferably of inverted conical shape and elliptical in cross-section at its upper end. The chamber C terminates in a tube C' , projecting downwardly within the tube B' to the burner B. The lower end of the tube C' is exteriorly screw-threaded and engages interior screw-threads formed within the tube B' of the burner near its lower end. A series of lugs or bosses c are interposed between the inner surface of the tube B' and the outer surface of the tube C' , thereby forming a space through which the products of combustion may pass, communication with such

space being permitted by openings b' b' through the tube B' .

Located within the chamber C is a core E , the exterior surface of which conforms to the interior surface of the chamber. A spiral groove e is formed in the exterior surface of the core E and, together with the interior surface of the chamber C , forms a conduit through which fluid fuel is supplied to the burner. The core E is provided with a laterally-projecting flange E' at its top, which overlies and rests upon the upper edge of the chamber C . Any suitable fastening devices—such, for instance, as screws e' —extend through the flange E' into the wall of the chamber C , thereby securely retaining the core within the chamber. F designates a conduit communicating with the upper end of the spiral groove e , through which the liquid fuel is supplied.

The lower wall of the burner B is provided with a hollow downwardly-projecting boss d' , having exterior screw-threads which are engaged by a coupling D' , the latter communicating with a drain-pipe D . A petcock d is located at the outer end of the drain-pipe D and controls the passage-way therethrough.

The operation of my invention is as follows: The liquid fuel is supplied to the conduit F from any suitable source and flows through the spiral conduit e , formed between the exterior of the core and interior of the chamber C into the tube C' and thence into the burner B , from which it passes in the form of a vapor through the perforations b and is ignited. Prior to permitting liquid fuel to pass into the conduit F a liquid fuel is placed within the V-shaped trough formed between the exterior of the base A and the outwardly-flaring flange A' and ignited, so that immediately upon the fuel passing from the conduit F through the spiral conduit e it will be heated by the burning fuel in the V-shaped trough and vaporized before reaching the burner B . After the liquid fuel has been initially vaporized by the burning fuel in the trough the vaporization thereof will continue by reason of the heat from the burner passing upwardly through the passage-way between the top a of the base and the chamber C . Prior to permitting the liquid fuel to pass to the conduit F any accumulation of the liquid in the burner B is first drawn off through the petcock d .

While my apparatus is adapted to burn any grade of hydrocarbon, yet it is particularly adapted for burning crude hydrocarbon oil which has been previously mixed with water in approximately the proportions of two parts of oil to one of water. It has been found in practice that sea-water serves equally as well as fresh water to form a mixture with the crude oil for burning in my apparatus. The mixed water and oil is supplied to the spiral conduit e through the tube

F . The water and oil are mixed as they flow toward the pipe F in proper proportions.

My improved apparatus may be made in any desired size whereby it is adapted for use wherever it is necessary to generate heat either for power or heating purposes.

From the foregoing description it will be observed that I have invented an improved hydrocarbon-burner in which the liquid fuel is vaporized prior to passing to the burner proper by the heat generated by the burner itself and in which the liquid fuel flows to the burner by gravity, thereby avoiding the necessity of pressure or power of any sort to vaporize the fuel or force the same to the point where it is ignited.

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

1. In an apparatus for burning oil, the combination with a burner having an upwardly-projecting tube supported thereon, a chamber mounted above said burner having a depending tube located within said first tube and communicating with said burner, said chamber having a spiral passage-way leading therethrough and communicating at its lower end with said second tube, and a supply-conduit communicating with the upper end of said passage-way.

2. In an apparatus for burning oil, the combination with a burner having an upwardly-projecting tube supported thereon, a chamber mounted above said burner and having a depending tube located within said first tube and communicating with said burner, a core located within said chamber and having a spiral groove formed between its outer surface and the inner surface of said chamber, the lower end of said groove communicating with said second tube, and a supply-conduit communicating with the upper end of said groove.

3. In an apparatus for burning oil, the combination with a conical base, of a burner supported in said base, a tube projecting above and supported upon said burner and forming a passage-way between the same and the upper end of said base, a chamber mounted above said burner having a depending tube located within said first tube and communicating with said burner, said chamber having a spiral passage-way leading therethrough and communicating at its lower end with said tube, and a supply-conduit communicating with the upper end of said passage-way.

4. In an apparatus for burning oil, the combination with a conical base, of a burner supported within said base, a tube projecting above and supported upon said burner and forming a passage-way between the same and upper end of said base, a chamber mounted above said burner, a core located within said chamber and having a spiral groove formed

between its outer surface and the inner surface of said chamber, a tube depending from said chamber with which said groove communicates and located within said first tube, and a supply-conduit communicating with the upper end of said groove.

5. In an apparatus for burning oil, the combination with a burner having an upwardly-projecting tube supported thereon, a chamber mounted above said burner and having a tube located within said first tube and communicating with said burner, means for spacing said tubes apart, said first tube having openings therethrough communicating with said space, said chamber having a spiral passage-way leading through the same and communicating at its lower end with said second tube, and a supply-conduit communicating with the upper end of said passage-way.

6. In an apparatus for burning oil, the combination with a conical base, of a burner supported within said base, a tube projecting above and supported upon said burner and forming a passage-way between the same and the upper end of said base, a chamber mounted above said burner having a depending tube located within said first tube and communicating with said burner, means for spacing said tubes apart, said first tube having openings communicating with said space, a core located within said chamber and having a spiral groove formed between

its outer surface and the inner surface of said chamber, a fuel-supply conduit communicating with the upper end of said groove, the lower end of said groove being in communication with said second tube.

7. In an apparatus for burning oil, the combination with a hollow base, of a burner supported within said base, a tube projecting above and supported upon said burner and forming a passage-way between the same and the upper end of said base, a chamber mounted above said burner having a depending tube located within said first tube and communicating with said burner, means for spacing said tubes apart, said first tube having openings communicating with said space, a core located within said chamber and having a spiral groove formed between its outer surface and the inner surface of said chamber, a fuel-supply conduit communicating with the upper end of said groove, the lower end of said groove being in communication with said second tube, and a trough formed at the top of said base to receive oil for initially vaporizing the oil supplied to the burner.

In testimony whereof I sign this specification in the presence of two witnesses.

BENJAMIN Q. P. FOSS.

Witnesses:

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WM. A. SCHWARZE.