

No. 699,053.

Patented Apr. 29, 1902.

R. WITTY.
HYDROCARBON BURNER.

(Application filed Oct. 10, 1901.)

(No Model.)

2 Sheets—Sheet 1.

Fig. 1.

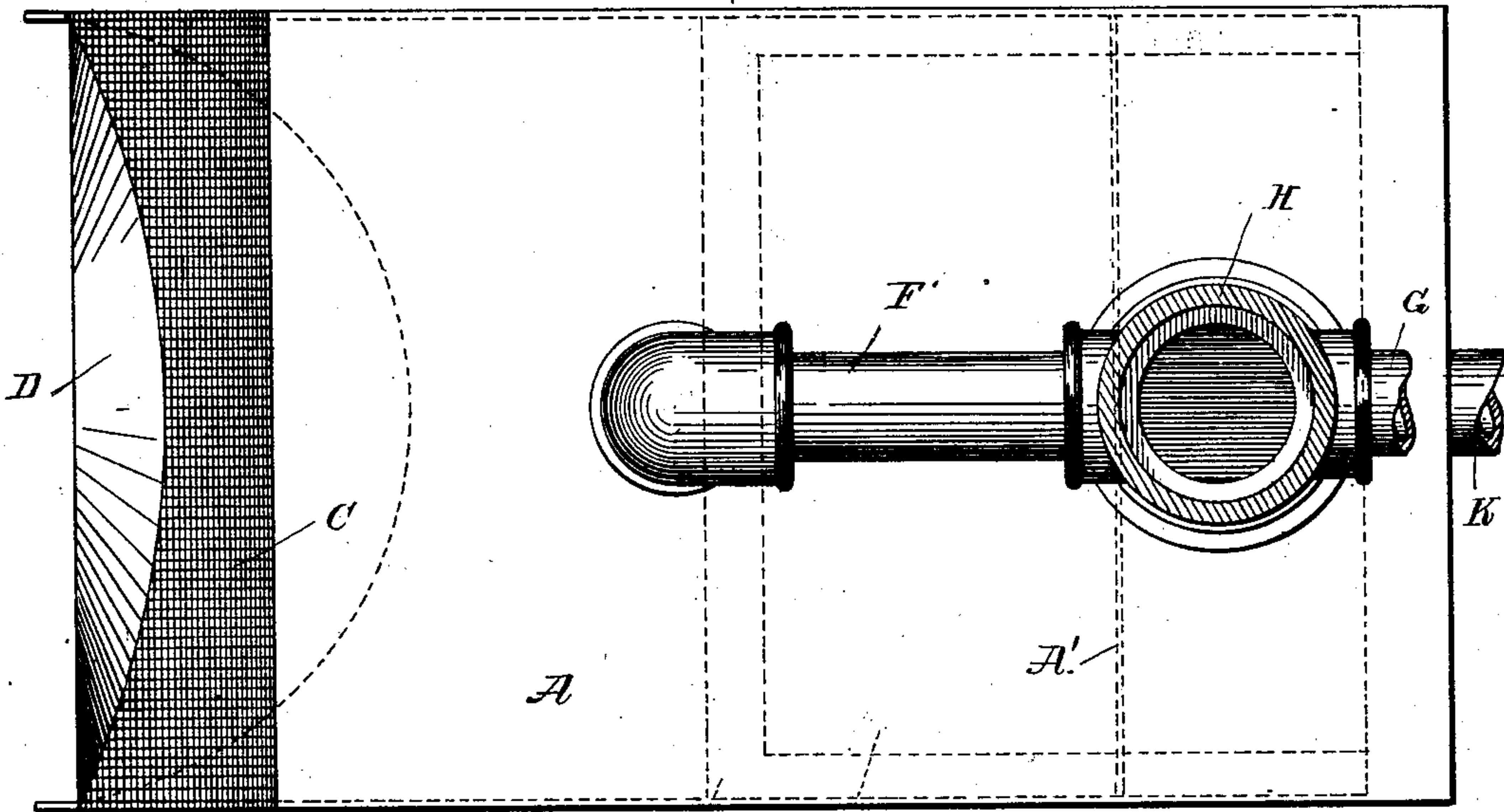
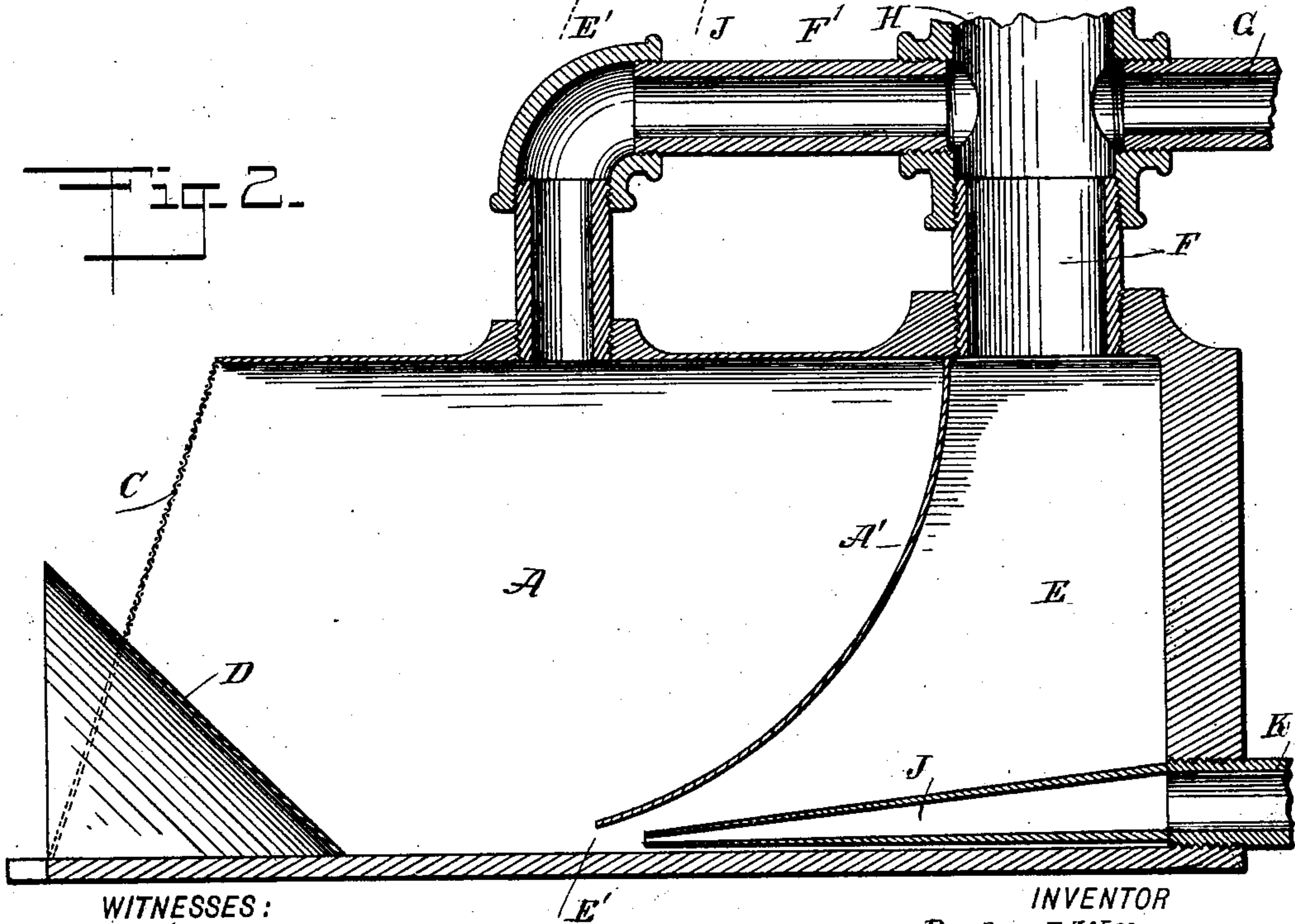


Fig. 2.



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2 Sheets—Sheet 2.

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Fig. 3.

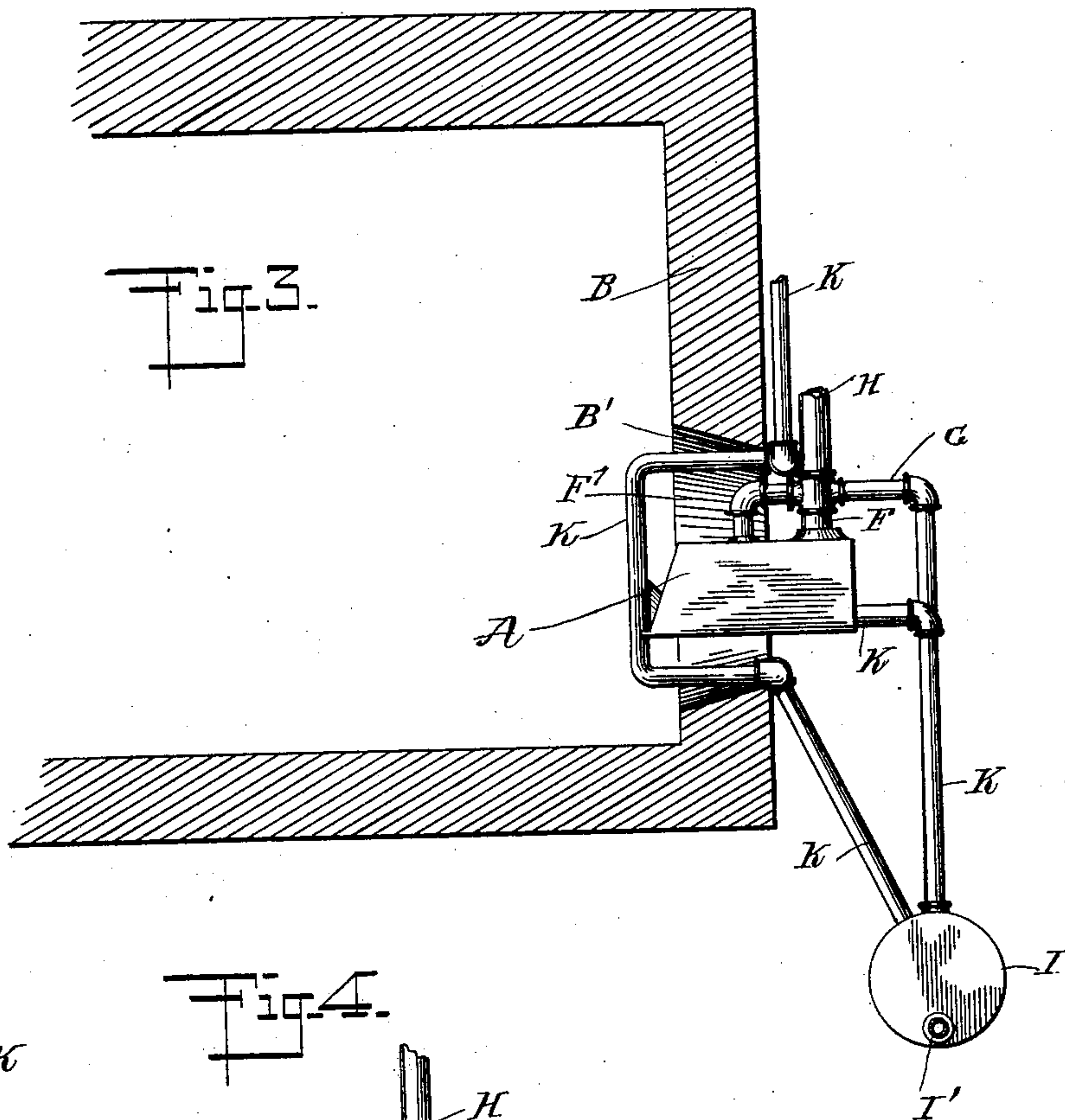
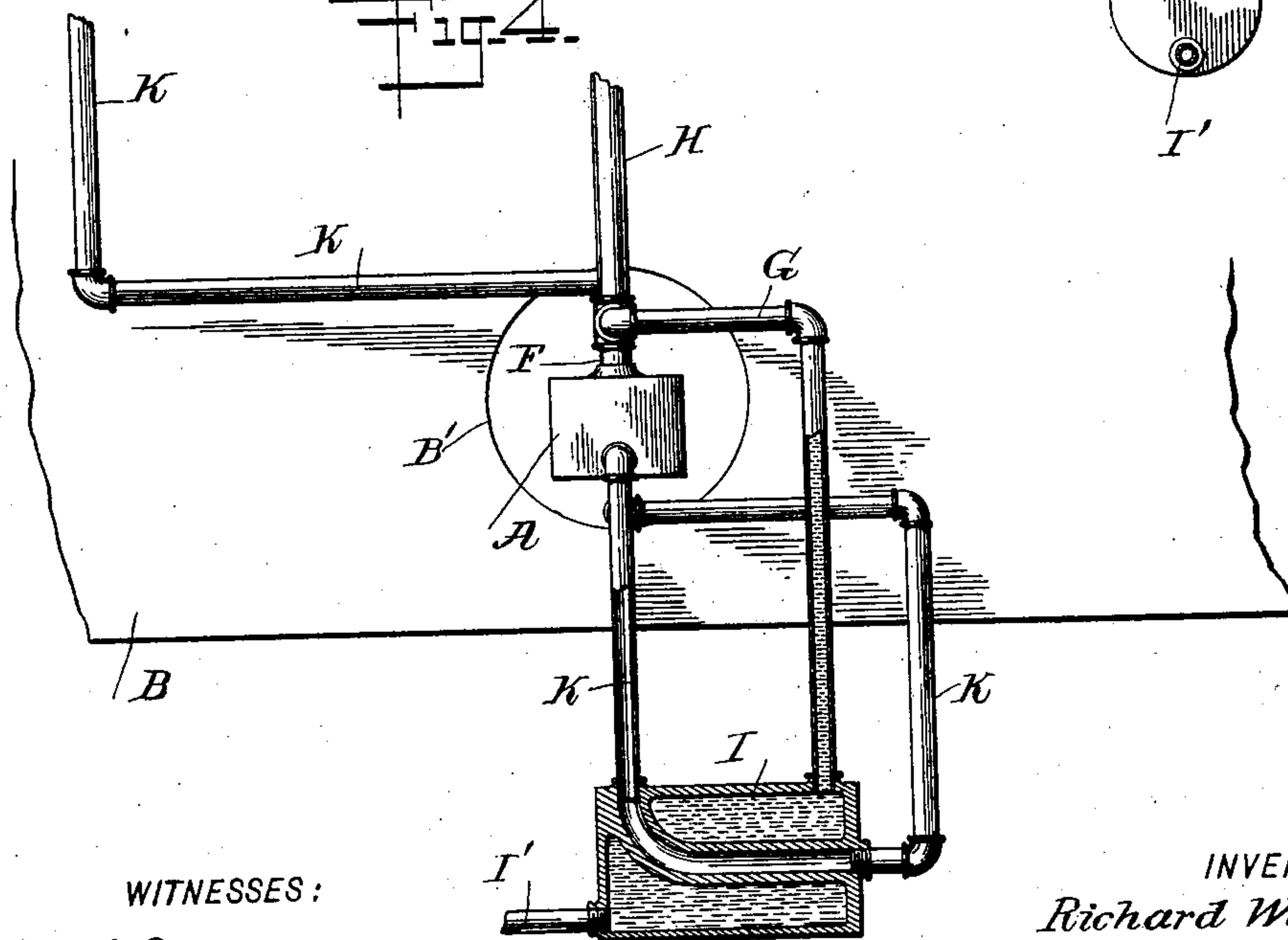


Fig. 4.



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UNITED STATES PATENT OFFICE.

RICHARD WITTY, OF SAN BERNARDINO, CALIFORNIA.

HYDROCARBON-BURNER.

SPECIFICATION forming part of Letters Patent No. 699,053, dated April 29, 1902.

Application filed October 10, 1901. Serial No. 78,201. (No model.)

To all whom it may concern:

Be it known that I, RICHARD WITTY, a citizen of the United States, and a resident of San Bernardino, in the county of San Bernardino and State of California, have invented a new and Improved Hydrocarbon-Burner, of which the following is a full, clear, and exact description.

The object of the invention is to provide a new and improved hydrocarbon-burner, which is simple and durable in construction, very effective when in use, and more especially designed for use in steam-boilers and the like to quickly and economically generate steam.

The invention consists of novel features and parts and combinations of the same, as will be fully described hereinafter and then pointed out in the claims.

A practical embodiment of the invention is represented in the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the views.

Figure 1 is a plan view of the burner proper. Fig. 2 is a longitudinal sectional elevation of the same. Fig. 3 is a reduced side elevation of the improvement as applied to the fire-box of a boiler, and Fig. 4 is a front elevation of the same with parts in section.

The improved hydrocarbon-burner consists, essentially, of a casing A, extending in an opening B', arranged in the front wall of the fire-box of the furnace B, and the said casing A has its inner end open and preferably covered with a netting or screen C for minutely dividing the mixture of air, gas, and steam passing from the casing through the screen into the fire-box to be burned therein, thereby heating the furnace and generating the steam. In the open end of the casing A, and preferably at the bottom thereof, is arranged a deflector D for guiding the mixture of air, gas, and steam in an upward direction through the screen C and into the fire-box.

In the closed end of the burner-casing A is arranged a transversely-extending partition A', extending from the top of the casing downward to within a short distance from the bottom of the casing, as plainly indicated in Fig.

2, the partition also reaching from side to side of the casing to form a chamber E, into which passes a mixture of air and gas, and this mixture is ejected through the nozzle E', formed at the forward end of the chamber E, between the bottom of the casing and the said partition A'. Into the top of the chamber E leads a pipe F, connected with an oil-supply pipe G and with an air-supply pipe H, the latter opening into the atmosphere and the pipe G connecting with an oil-supply vessel I, having a pipe I', connected with a reservoir or tank containing a large quantity of oil. In the bottom of the chamber E extends a steam-nozzle J, reaching with its outlet to within a short distance of the outlet of the nozzle E', so that steam passing through the steam-nozzle J passes into and through the nozzle E' to create a suction in the chamber E, and thereby draw the mixture of air and oil through the nozzle E' into the forward end of the casing A, the air, gas, and steam becoming thoroughly mixed, and the mixture finally passes through the screen C into the fire-box to be burned therein. The nozzle J is connected with a steam-supply pipe K, extending from the steam-compartment of the boiler or other suitable source of steam-supply, the said pipe K extending in front of the discharge end of the casing A within the fire-box, so that the burning fuel comes in contact with the pipe, and thereby superheats the steam passing through the pipe. The steam-supply pipe K then extends through the opening B' and through the oil vessel I to heat the oil contained therein and to cause the said oil to quickly vaporize previous to its entrance into the chamber E. The pipe K after leaving the vessel I connects with the nozzle J, so that superheated steam passes through the nozzle J to mix with the oil and air, as previously described. A branch pipe F' leads from the pipe F into the casing in front of the partition A', so that a mixture of air and gas can pass into the casing to reinforce the mixture of gas, air, and steam previous to igniting the same.

From the foregoing it is evident that when the burner is in use the steam in the pipe K is superheated by the burning fuel and the superheated steam is conducted through the

oil vessel I previous to its discharge at the nozzle J. It will be seen that by the arrangement described the highly-heated steam, oil, and air are not only highly heated, but are

5 thoroughly mixed to form a very effective combustible mixture to insure a quick and economical generation of steam in the boiler.

Having thus described my invention, I claim as new and desire to secure by Letters

10 Patent—

1. In a hydrocarbon-burner, a casing having front and rear chambers communicating with each other at the bottom, the front chamber having an open front end, an air and oil

15 supply leading into the rear chamber at the bottom thereof, and a steam-supply leading into the rear chamber and discharging opposite the opening establishing communication between the said chambers, as set forth.

20 2. In a hydrocarbon-burner, a casing having the front and rear chambers communicating with each other at the bottom, the front chamber having an open front end, an air and oil supply leading into the rear chamber, an

25 oil-supply vessel, and a steam-supply extending in front of the casing, thence through the oil-supply vessel and provided with a nozzle extending into the rear chamber opposite the opening establishing communication between

30 the chambers, as set forth.

3. A hydrocarbon-burner, comprising a casing divided into two chambers, the front chamber having its front end open, and the rear one provided with a nozzle at its bottom,

35 a steam-nozzle in the rear chamber opposite the first-named nozzle, an oil-supply for the rear chamber, an air-supply for the said rear chamber, a steam-supply connected with the said steam-nozzle and passing through the oil-

40 supply for heating the oil; and means for superheating the steam in the steam-supply previous to its passage through the oil-supply vessel and previous to its entrance into the burner, as set forth.

45 4. A hydrocarbon-burner, comprising a casing open at one end and having a transverse partition forming an oil and air chamber in the closed end thereof, said chamber being formed with a discharge-nozzle extending to-

50 ward the open end of the casing at or near the bottom thereof, and a steam-nozzle in the said oil and air chamber and having its out-

let close to the said discharge-nozzle of the said chamber, as set forth.

5. A hydrocarbon-burner, comprising a cas- 55
ing open at one end, an oil and air chamber in the closed end of the said casing and formed with a discharge-nozzle extending toward the open end of the casing at or near the bottom thereof, a steam-nozzle in the said oil and air 60
chamber and having its outlet close to the said discharge-nozzle of the said chamber, a pipe opening into the said oil and air chamber, to conduct air and gas into the chamber, and a branch pipe leading from the said first- 65
named pipe, for conducting air and gas into the casing in front of the said chamber, as set forth.

6. A hydrocarbon-burner, comprising a cas- 70
ing open at one end, and having a transverse partition forming an oil and air chamber in the closed end thereof, said chamber being formed with a discharge-nozzle extending toward the open end of the casing at or near the bottom thereof, a steam-nozzle in the said 75
oil and air chamber and having its outlet close to the said discharge-nozzle of the said chamber, and a deflector in the open end of the casing and in advance of the said nozzles, to guide the mixture of air, gas and steam in 80
an upward direction through the open end of the burner-casing, as set forth.

7. A hydrocarbon-burner, comprising a cas- 85
ing open at one end, an oil and air chamber in the closed end of the said casing and formed with a discharge-nozzle extending toward the open end of the casing at or near the bottom thereof, a steam-nozzle in the said oil and air chamber and having its outlet closed to the said discharge-nozzle of the said chamber, 90
a deflector in the open end of the casing and in advance of the said nozzles, to guide the mixture of air, gas and steam in an upward direction through the open end of the burner-casing, and a burner-screen extending over 95
the open end of the said casing, as set forth.

In testimony whereof I have signed my name to this specification in the presence of two witnesses.

RICHARD WITTY.

Witnesses:

DENNIS POWELL,
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