

(No Model.)

W. WALTON.

BURNER FOR STEAM BOILER HEATING APPARATUS.

No. 386,568.

Patented July 24, 1888.

Fig. 1.

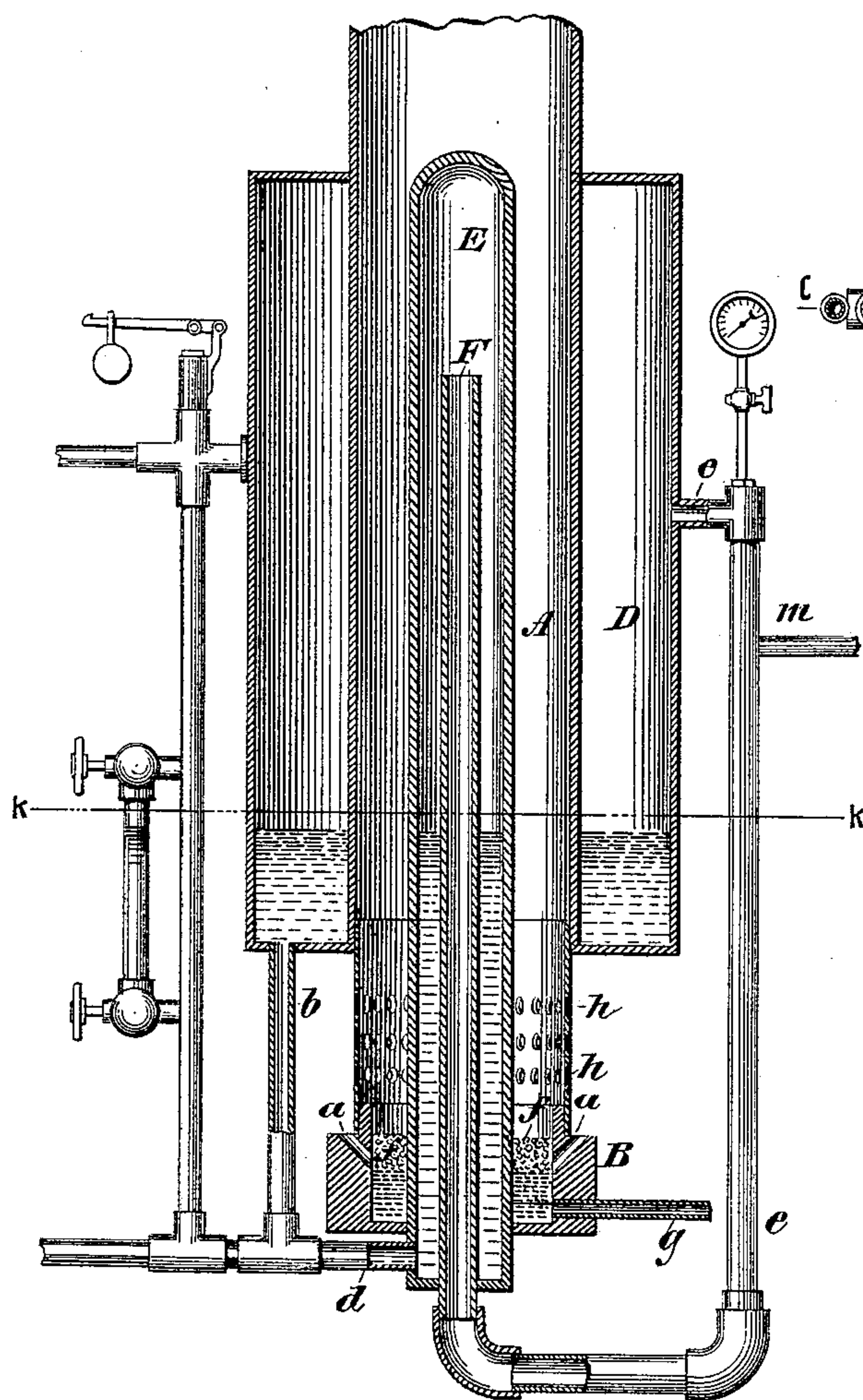


Fig. 2.

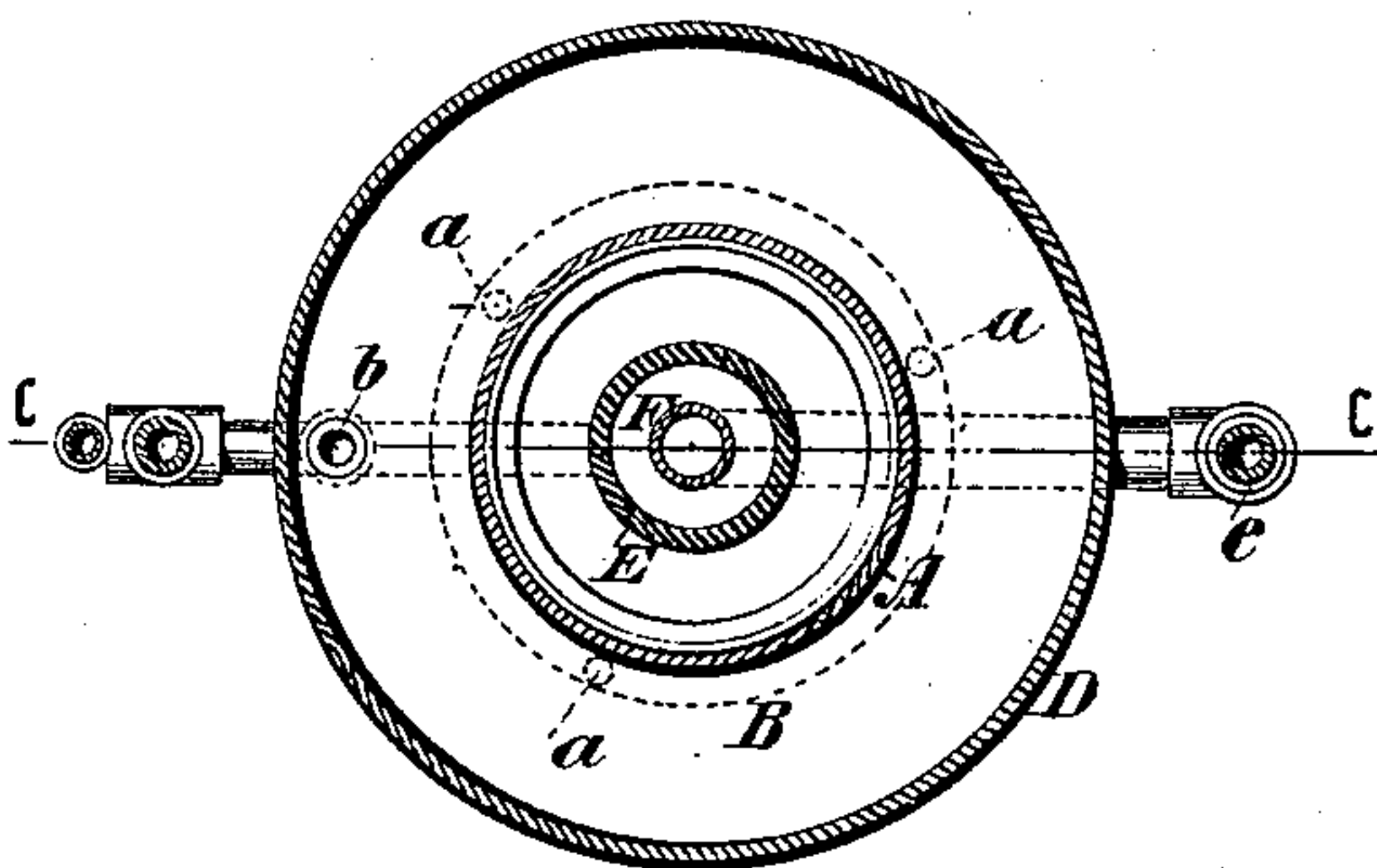
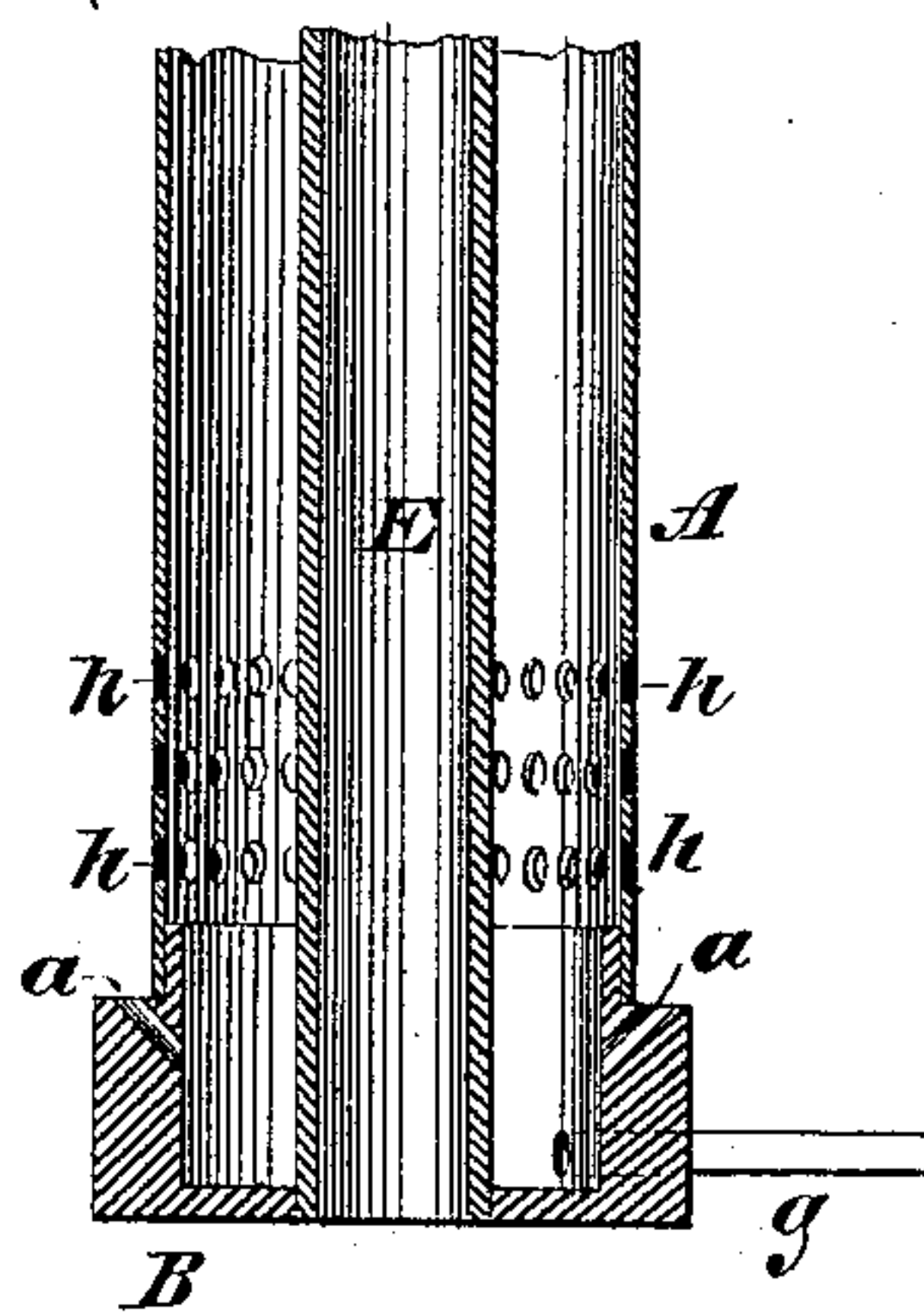


Fig. 3.



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BURNER FOR STEAM-BOILER HEATING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 386,568, dated July 24, 1888.

Application filed April 14, 1887. Serial No. 234,772. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM WALTON, of Brooklyn, Kings county, New York, have invented an Improved Burner for Steam-Boiler Heating Apparatus, &c., of which the following is a full, clear, and exact description.

The object of my invention is to produce a burner which will convert a liquid hydrocarbon into gas without combustion, and also burn the gas as converted in the presence of air to produce heat.

The invention consists in a chamber arranged in the bottom of a draft-flue filled with porous stone or the like, into which chamber hydrocarbon or petroleum-oil is conducted and flashed into gas without combustion to produce gaseous hydrocarbon. Above the chamber in the draft-flue are air-inlets to allow air to mix with the gas to permit of its burning in the flue.

The invention also consists in a boiler or chamber surrounding the draft-flue adapted to contain water or air and in details of construction, as will be hereinafter more fully set forth.

Reference is to be had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a vertical section of my invention taken on line *c c*, Fig. 2. Fig. 2 is a horizontal section taken on line *k k*, Fig. 1; and Fig. 3 is a vertical section of a modification of my invention.

A in the drawings is a draft-flue, at the lower part of which is the flashing-chamber B. Said chamber is provided with small air-inlets *a*. The draft-flue A is surrounded by the boiler or jacket D, which may be supplied with water through the pipe *b* from any suitable source. Projecting through the chamber B and into flue A is a pipe, E, which may be supplied with water from pipe *d*. A pipe, F, projects into the pipe E to carry off steam generated therein. The pipe F also connects by the branch *e* with boiler D to carry away the steam generated therein, as more fully hereinafter set forth.

In the bottom of chamber B is placed a quantity of porous stone, *f*, preferably fire-brick, which receives the hydrocarbon or petroleum-

oil passed into the chamber B through the pipe *g*. Above the chamber B in the flue A are a series openings or air-holes, *h*.

This generator and burner operates as follows: Oil is first let into the chamber B through pipe *g* until it reaches nearly up to the inlet *a*, thoroughly saturating the porous stones *f* or their equivalent. A taper or match is then passed into an inlet, *a*, which immediately ignites the oil in the chamber, which flashes up causing an intense heat, and heating the chamber B and stones *f*. As the oil keeps entering the chamber B and strikes the heated stones and chamber-walls, gas will be immediately generated by the flashing of the oil on the heated stones and heated walls of the chamber; but as there is very little or practically no air in the chamber the oil will not burn in it. The gas generated by this means passes up the flue A until it mingles while still very hot with the air entering apertures *h*, where it will immediately ignite, and the flame will then strike the pipe E in jets from apertures *h*, similar to those from a blow-pipe, and will also pass up the flue A, heating the same and the water in the boiler or pipes adjoining same, thereby generating steam, which will pass off through the pipes F, *e*, and *m*, in any convenient manner. With this burner it will be seen that the gas does not burn in the flue A below the apertures *h*, and also that it is generated without combustion of the oil, the heated stones and chamber producing it from the oil. Either one of the boilers D or E could be dispensed with, if desired; or they may be differently arranged from the manner shown, if desired.

In place of heating water, air may be heated in a central pipe, E, passed through the flue A, as shown in the modification, Fig. 3, or a jacket open at bottom or top may surround the flue A for heating air; or, if desired, an air-heater and a water-heater may be used at one time in connection with the flue A.

In place of apertures *h*, air may be supplied to the flue A through a system of tubes or ducts.

If desired, a grate might be substituted for the porous stones in chamber B without departing from the spirit of my invention.

It will be seen that the combined area or number of the air-inlets *a* to the chamber B is quite small as compared with the area of the air-inlets *h* to the flue A. Only three or four
5 holes, *a*, are shown, while the total area of the apertures *h* is much larger. In other words, the chamber B does not get a sufficient supply of air to support combustion of its contents,
10 just enough being supplied to keep the contents heated and to cause the most of the oil to be flashed into combustible gas. Two or more chambers, D, flues A, and pipes may be arranged in series and suitably connected, if desired.

15 Having now described my invention, what I claim is—

1. The converting-chamber B, having air-inlets *a* and oil-inlet *g*, in combination with

the flue A, having air-openings *h*, the air-inlets *a* being of less area than the air-inlets *h*, 20 substantially as herein shown and described.

2. The flue A, having air-inlets *h*, and flashing-chamber B, having air-inlets *a* and oil-inlets *g*, in combination with the pipe E within flue A, substantially as described. 25

3. The combination, of the flue A, having air-inlets *h*, converting-chamber B, having air-inlets *a* and oil-inlet *g*, boiler D, surrounding flue A, pipe E within flue A, and pipe F within the pipe E, and means, substantially 30 as described, for supplying the boilers with water, as set forth.

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Witnesses:

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