

No. 715,639.

Patented Dec. 9, 1902.

A. F. CHACE.
HYDROCARBON BURNER.
(Application filed Apr. 5, 1900.)

(No Model.)

FIG. 1.

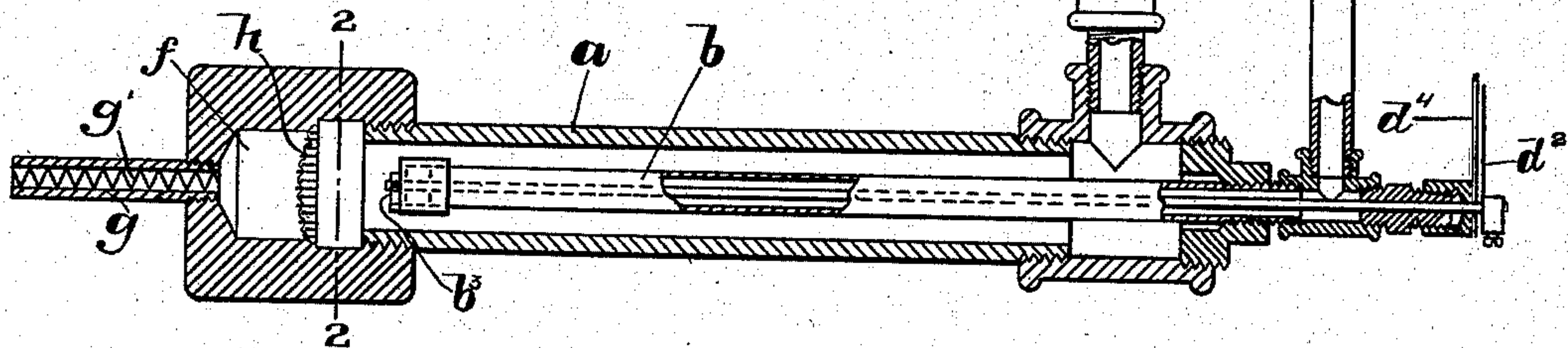
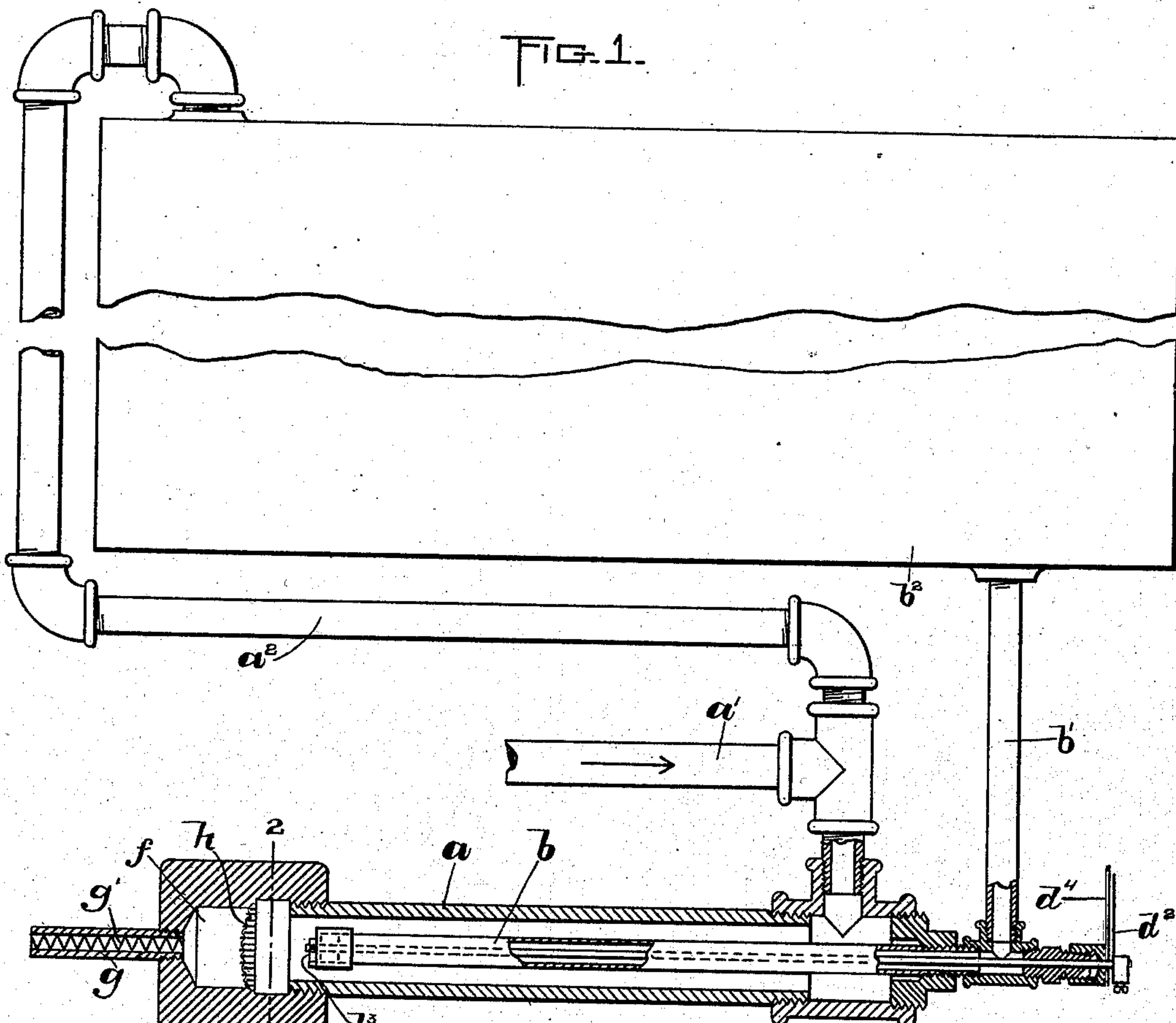


FIG. 2.

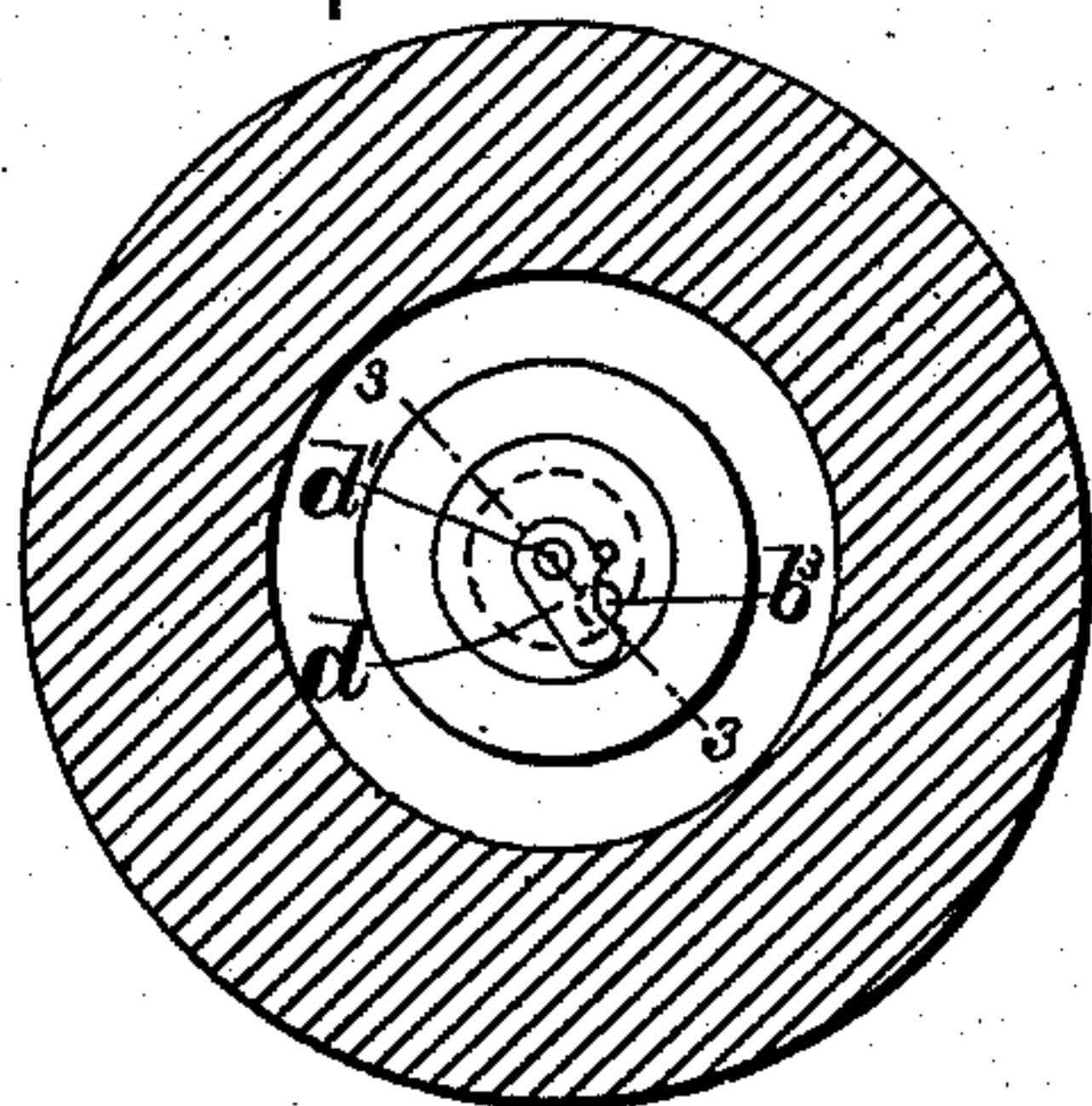


FIG. 3.

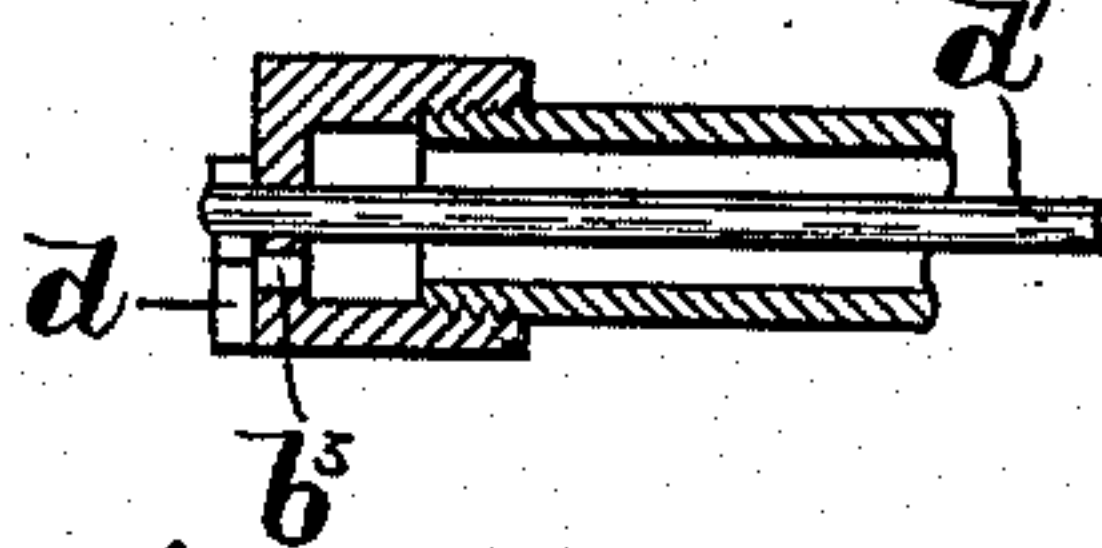
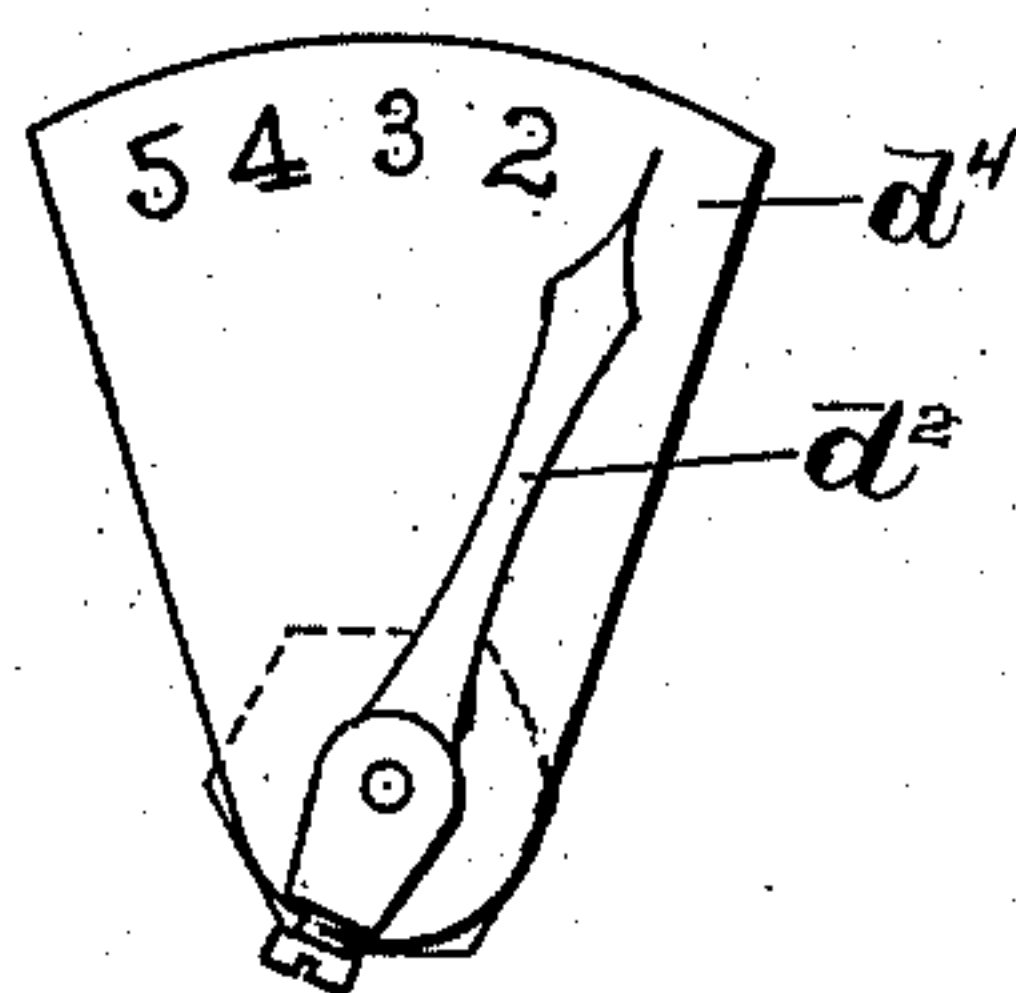


FIG. 4.



WITNESSES:

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UNITED STATES PATENT OFFICE.

ALBERT F. CHACE, OF BOSTON, MASSACHUSETTS, ASSIGNOR, BY DIRECT AND MESNE ASSIGNMENTS, TO THE UNITED STATES SMELTING AND GAS COMPANY, OF PORTLAND, MAINE, A CORPORATION OF MAINE.

HYDROCARBON-BURNER.

SPECIFICATION forming part of Letters Patent No. 715,639, dated December 9, 1902.

Application filed April 5, 1900. Serial No. 11,723. (No model.)

To all whom it may concern:

Be it known that I, ALBERT F. CHACE, of Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Hydrocarbon-Burners, of which the following is a specification.

This invention has for its object to provide a hydrocarbon-burner adapted to cause the combustion of liquid hydrocarbon in such manner as to produce a flame of intense heat; and it consists in the improvements which I will now proceed to describe and claim.

Of the accompanying drawings, forming a part of this specification, Figure 1 represents a sectional view of an apparatus embodying my invention, an oil-reservoir and the pipe connections hereinafter referred to being shown in side elevation. Fig. 2 represents a section on line 2 2 of Fig. 1. Fig. 3 represents a section on line 3 3 of Fig. 2. Fig. 4 represents an end elevation.

The same letters of reference indicate the same parts in all the figures.

In the drawings, *a* represents an air-conduit, which receives air through a supply-pipe *a'*, connected with a blower or other means for supplying air under pressure.

b represents an oil-conduit located within the air-conduit *a* and connected by a pipe *b'* with an oil-reservoir *b²*, which is preferably elevated above the conduit *b'* sufficiently to create pressure by gravitation on the oil in the conduit *b*. An air-supply pipe *a²*, connected with the source of supply which furnishes the conduit *a*, enters the upper portion of the tank *b²*, so that the oil in the tank is subjected to air-pressure. The oil-conduit *b* is provided with a contracted outlet *b³*, Figs. 2 and 3, which permits the oil to escape into the surrounding portion of the air-conduit *a*, the supply of oil being regulated by a valve *d*, which is affixed to the end of a rod *d'*, extending through the oil-conduit and having an arm or operating-finger *d²* at its rear end, whereby the valve may be adjusted to vary the operative size of the outlet *b³*. Adjacent to the finger *d²* is a fixed graduated plate *d³*, which enables the valve *d* to be adjusted, permitting the escape of any desired quan-

tity of oil. The air-conduit *a* is secured at one end to a chamber *f*, into which the oil is forced in an atomized condition by the air-blast. From the chamber *f* extends a burner-tube *g*, at the outer end of which the atomized oil is ignited.

h represents a partition of fine wire-gauze extending across the interior of the chamber *f* between the burner-tube *g* and the delivering ends of the air and oil conduits, said partition aiding in the subdivision or atomization of the oil and preventing the flame from the burner from striking back to the air and oil conduits *a* and *b*. Within the burner-tube *g* is a helical wire *g'*, which causes a further subdivision of the particles or atoms of oil.

It will be seen that the air supplied under pressure to the conduit *a* and to the oil-tank *b²* is equal in both and simultaneously causes a blast of air through the conduit *a*, around the oil-conduit *b*, and at the same time creates pressure in the tank *b²*, which, together with the elevation of said tank, causes the oil to flow from the outlet *b³* against the air-pressure that exists in the air-conduit and in the chamber *f* regardless of any variations in the latter. The blast of air attacks the drops of oil that escape from the opening *b³* and atomizes the oil, carrying it through the wire-gauze partition *h* and the burner-tube *g*, the result being a flame of intense heat at the outer end of said tube.

The chamber *f* may be considered as a part of the air-conduit. It is made in a separate piece detachably connected to the air-conduit for convenience of construction.

It will be observed that the chamber *f* is somewhat larger than the conduit *a*—that is, its internal diameter is equal to the external diameter of the conduit, and therefore larger than the interior of the conduit; but since a portion of the interior of the conduit is occupied by the oil-conduit the effective cross-sectional area of the conduit *a* is considerably less than the chamber *f*. This enlarged chamber receives the atomized oil direct from the valved outlet of the oil-conduit and permits said atomized oil to be spread out by the blast

and broken up by the reticulated screen, which is in said chamber, and therefore so close to the said valved outlet as to receive the oil directly therefrom, the oil having no opportunity to condense along the inner wall of the conduit or chamber.

I find that the described apparatus is capable of generating either a moderate degree of heat suitable for cooking or a much higher degree. I have with said apparatus attained a very high degree of heat capable of destroying refractory materials. The degree of heat is dependent on the adjustment of the valve.

I claim—

1. A hydrocarbon-burner comprising an air-conduit *a*, an enlarged chamber *f* detachably secured to one end of said conduit, a reticulated screen in said chamber, a burner-tube projecting from said chamber, and an oil-conduit within the air-conduit and having a valved outlet adjacent to the point of connection between the conduit *a* and chamber *f*, the conduit *a* and the burner-tube be-

ing connected to opposite sides of the enlarged chamber.

2. A hydrocarbon-burner comprising an air-conduit *a*, an enlarged chamber *f* detachably secured to one end of said conduit, a reticulated screen in said chamber, a burner-tube projecting from said chamber, the conduit *a* and the burner-tube being connected to opposite sides of the enlarged chamber, an oil-conduit *b* within the conduit *a* and having a capped outer end provided with a contracted outlet *b*³, a rod *d*' extending through conduit *b* and provided with a valve *d* affixed to its outer end said valve being adapted to control the outlet *b*³, means for oscillating the rod, and air and oil supply connections with the conduits *a* and *b* respectively.

In testimony whereof I have affixed my signature in presence of two witnesses.

ALBERT F. CHACE.

Witnesses:

C. F. BROWN,

A. D. HARRISON.