

(No Model.)

2 Sheets—Sheet 1.

E. W. FELLOWES.
HYDROCARBON BURNER.

No. 401,021.

Patented Apr. 9, 1889.

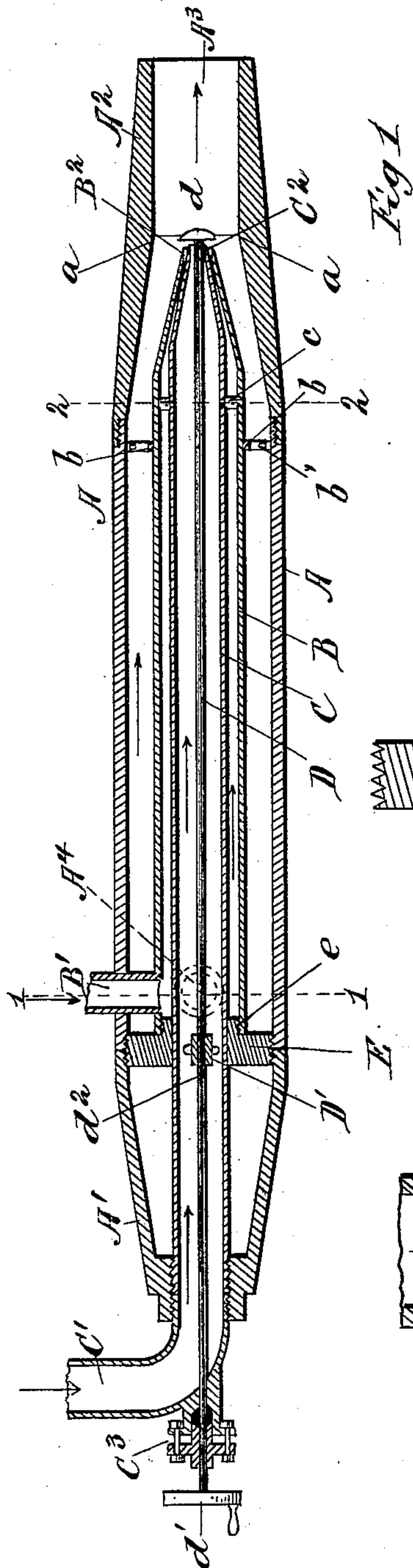


Fig 1

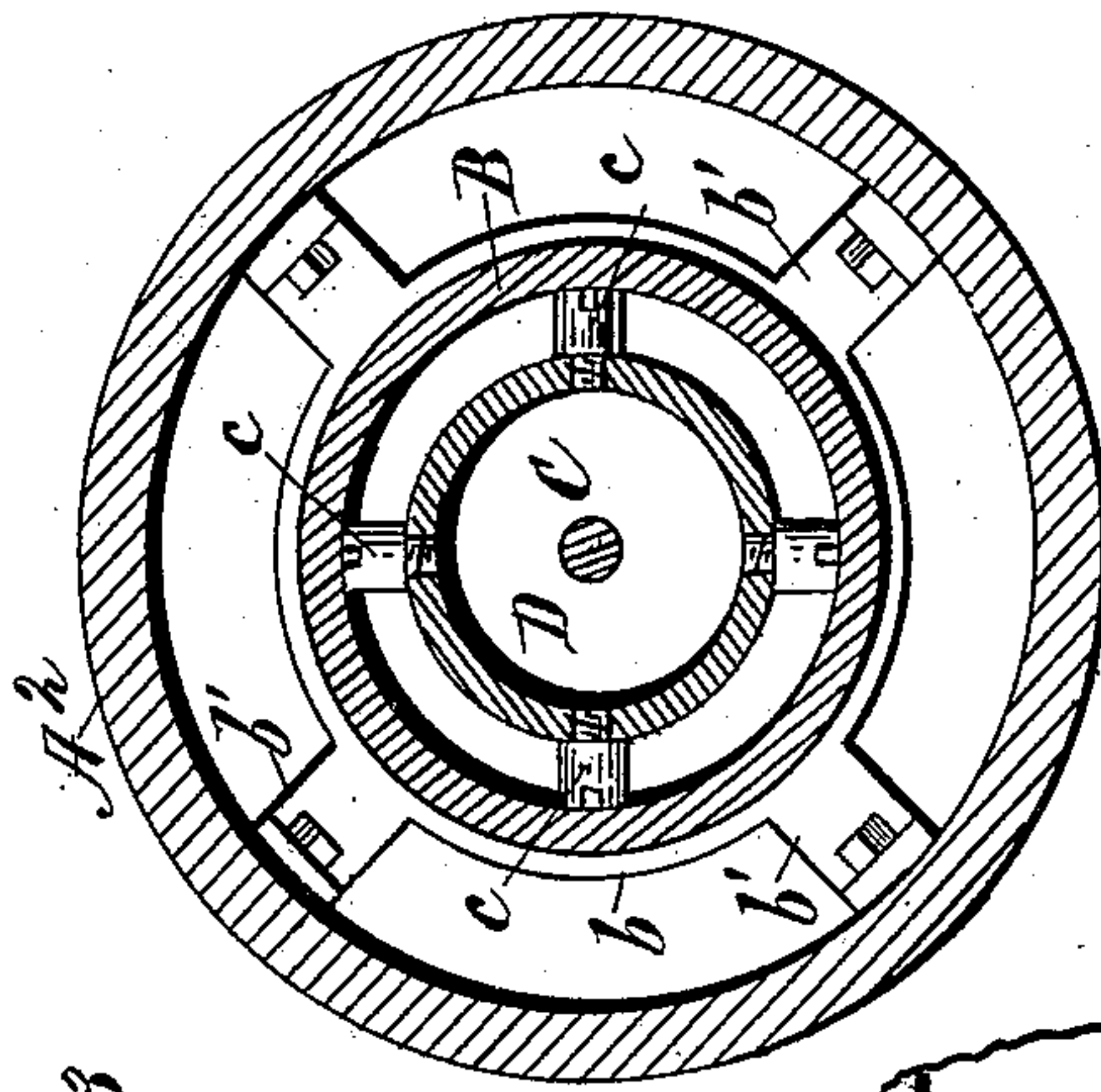


Fig 3

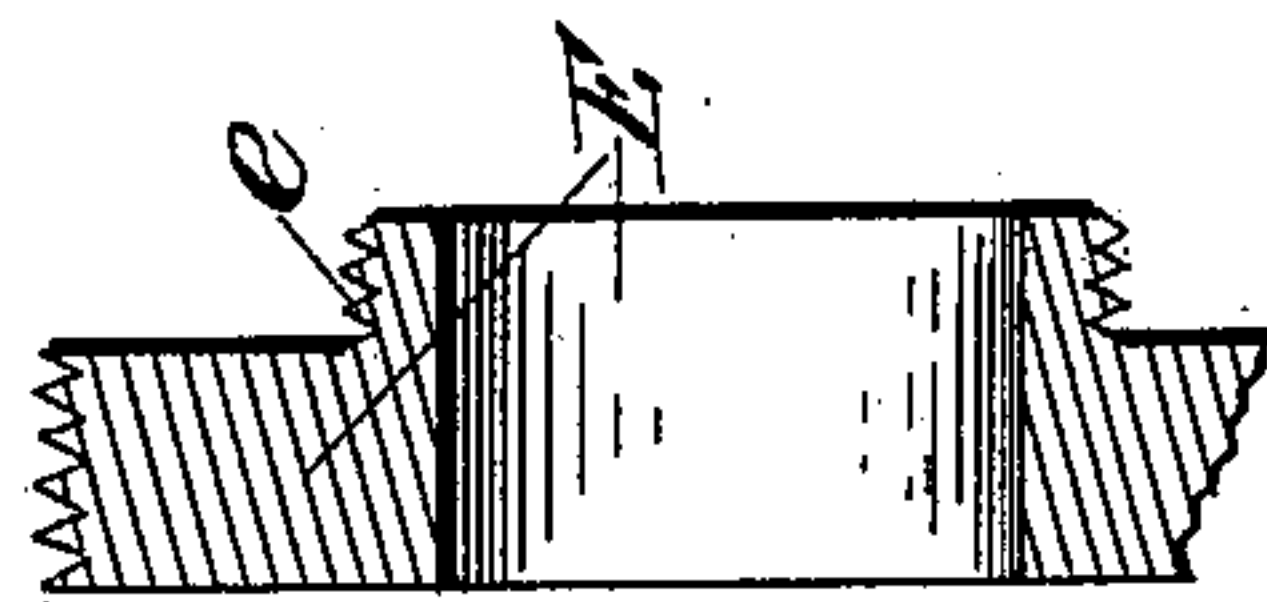


Fig 6

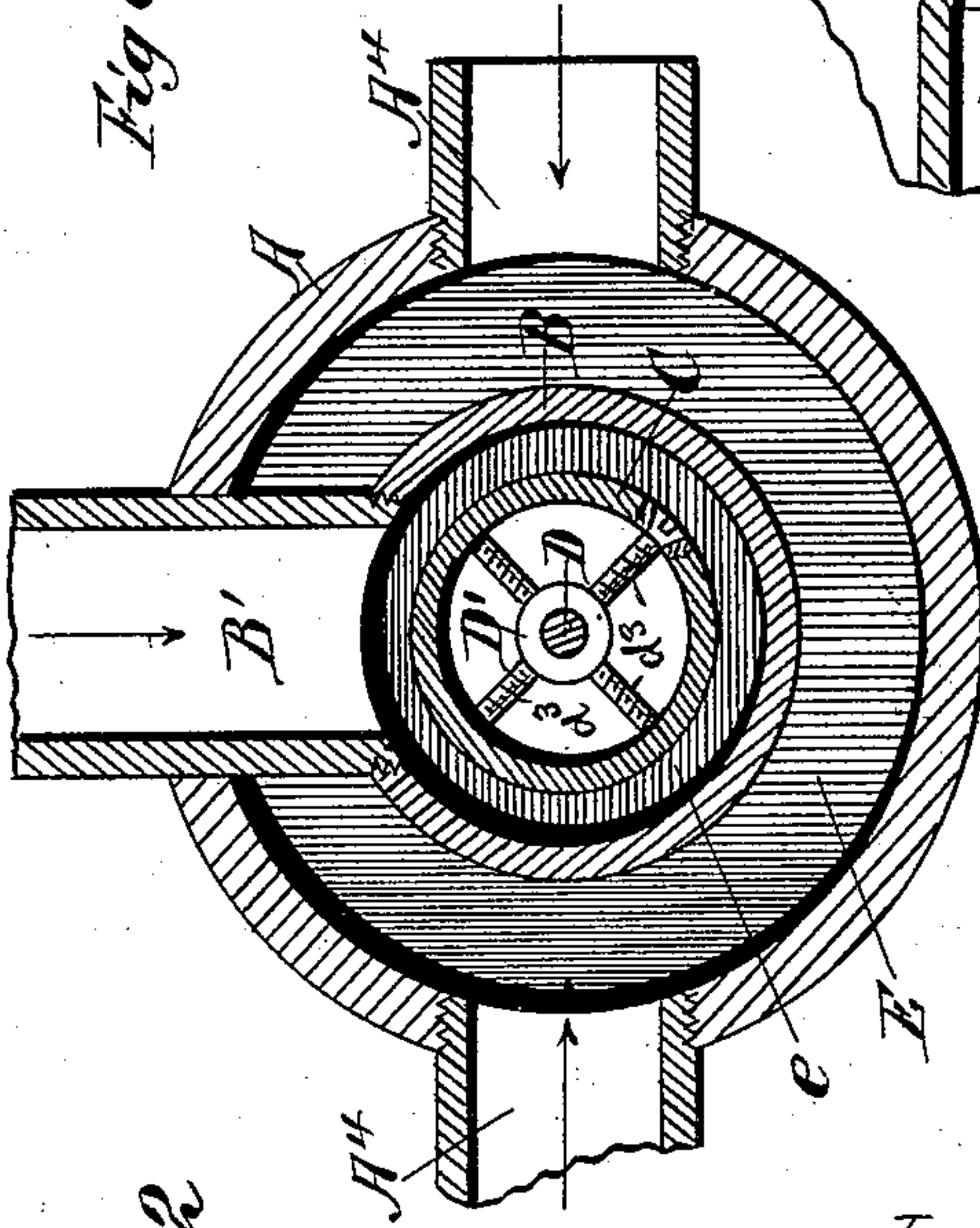


Fig 2



Fig 5

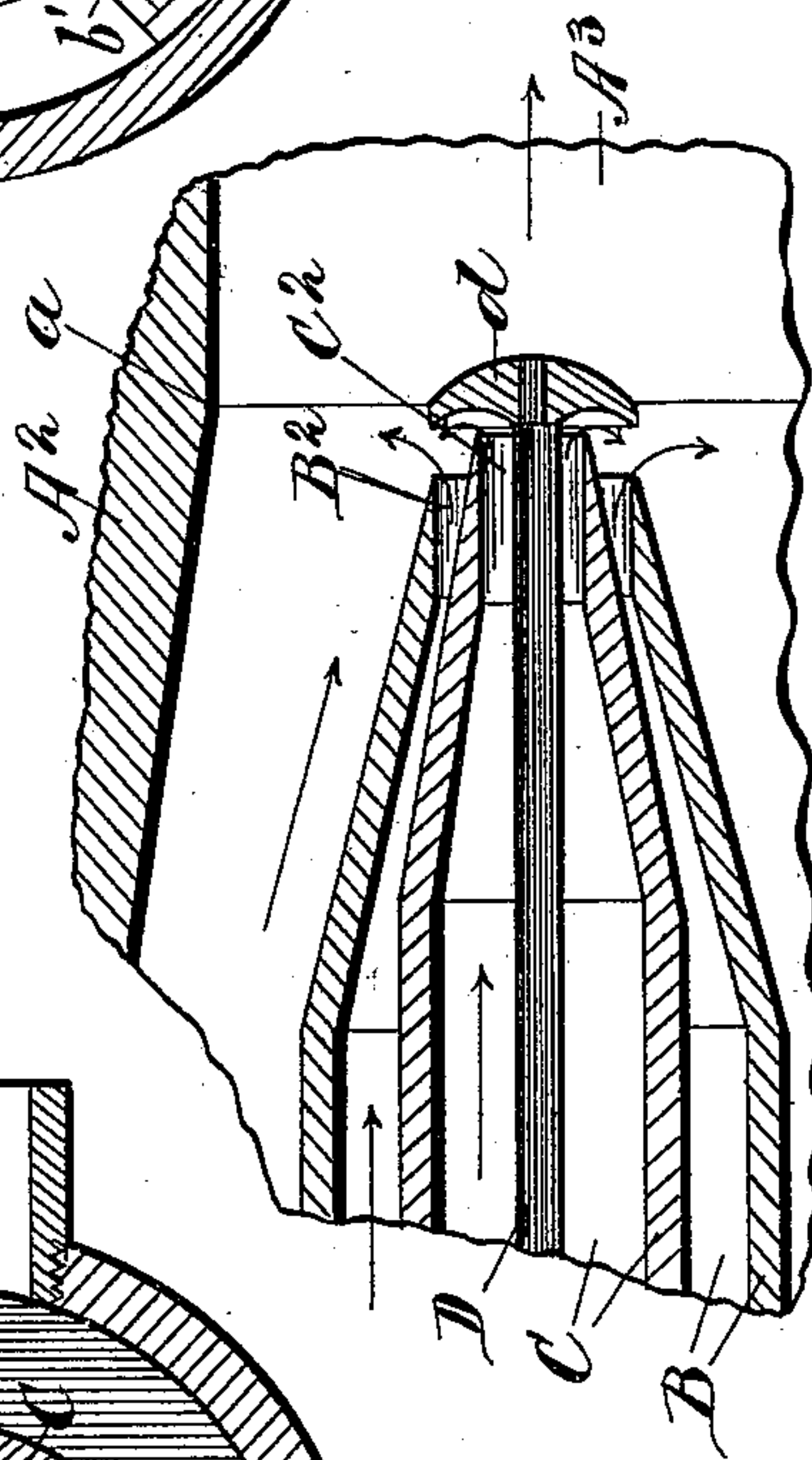


Fig 4

Witnesses,
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Giles Hubbard

Inventor,
Ernest W. Fellowes.
By Ernest G. Fellowes
Atty.

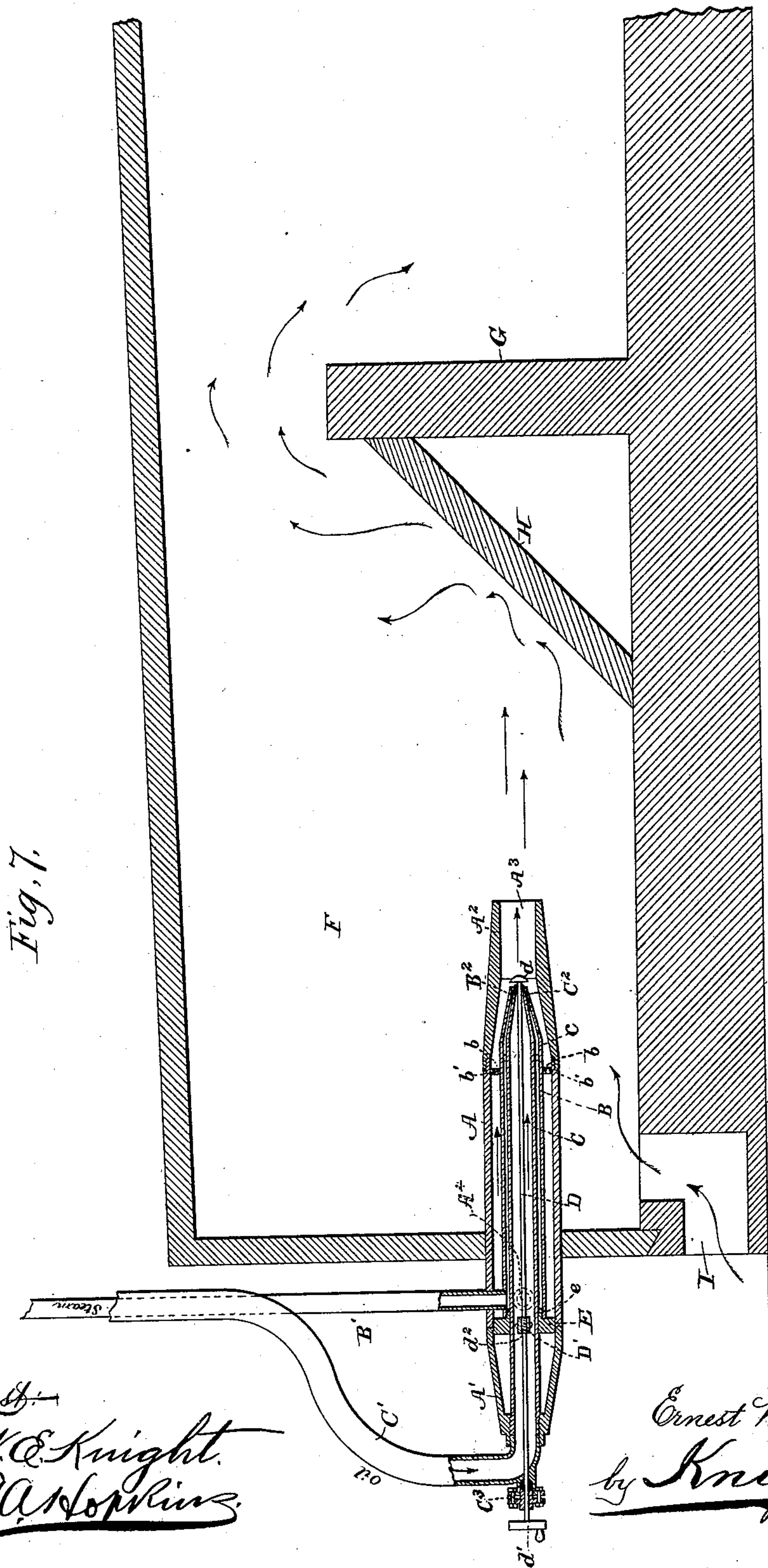
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2 Sheets—Sheet 2.

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No. 401,021.

Patented Apr. 9, 1889.



Attest:

W. E. Knight.
f. A. Hopkins

Inventor:

Ernest W. Fellowes
by Knight Bros
attys.

UNITED STATES PATENT OFFICE.

ERNEST W. FELLOWES, OF SOUTH CHICAGO, ILLINOIS, ASSIGNOR TO ERNEST T. FELLOWES, OF NEW YORK, N. Y.

HYDROCARBON-BURNER.

SPECIFICATION forming part of Letters Patent No. 401,021, dated April 9, 1889.

Application filed March 26, 1888. Serial No. 268,578. (No model.)

To all whom it may concern:

Be it known that I, ERNEST W. FELLOWES, a citizen of the United States, residing at South Chicago, in the county of Cook and State of Illinois, have invented new and useful Improvements in Hydrocarbon-Burners, of which the following is a specification, reference being had to the accompanying drawings, in which—

Figure 1 is a vertical longitudinal section of the said burner. Fig. 2 is a cross-section of the same, taken on the line 1 1 in Fig. 1. Fig. 3 is a cross-section of the same, taken on the line 2 2 in Fig. 1. Fig. 4 is a detail sectional view of the front part of my burner. Fig. 5 is an elevation of the deflecting-shield in the same, and Fig. 6 is a detail section of the dividing-partition in the same. Figs. 2 to 6 represent their respective parts on an enlarged scale. Fig. 7 is a view showing my improved burner in connection with the usual form of furnace, such furnace and burner being in vertical longitudinal section.

Like letters refer to like parts in all the figures of the drawings.

My invention relates to hydrocarbon-burners, and has for its object to provide a means of using crude petroleum-oil as fuel for heating retorts and furnaces wherein metal or ore is to be melted; and to this end my invention consists in certain novel features which I will now proceed to describe, and will then specify in the claims.

In the drawings, A represents the air-pipe; A', the rear section of the same; A², its front section; A³, its outlet, and A⁴ represents air-inlets on opposite sides of A.

a represents a thickening in the wall of the section A², whereby A² is strengthened at the points where the heat is greatest, and the air is deflected toward the outlet of the pipe C.

B is the steam-pipe, and B' its inlet from the steam-boiler. The former is cone-shaped at its front end, as shown in Figs. 1 and 4.

b is a ring fitting around the steam-pipe B, and having the four lugs or legs b' projecting outward far enough to reach the pipe A, to which they are fastened by screws passing through their ears or feet. Thus the pipe B is held concentrically within the pipe A.

C is the oil-pipe, C' its inlet from the oil-reservoir, and C² its outlet. The pipe C is also cone-shaped at its front end, as shown in Fig. 4.

c c c c are lugs terminating in screws, which are inserted in screw-threaded holes prepared for them in the pipe C, as shown in Fig. 3, which lugs rest against the inner walls of the pipe B, and support the pipe C concentrically within it.

C³ is a stuffing-box attached to the rear of the pipe C.

D is a rod passing through the whole length of the pipe C, and having on its front end the shield d and on its rear end the hand-wheel d'.

d² represents a screw-thread cut in the rod D for the reception of a nut, D', having four screw-threaded sockets. Screws d³, equal in length, pass through the pipe C into these sockets. The rod D passes through above the nut D' and through the stuffing-box C³, the central horizontal line of which is coincident with the like line passing through the nut D'; hence the rod D is held concentrically within the pipe C, and is capable of longitudinal reciprocation at will by turning the hand-wheel d'.

E represents a circular partition, upon the periphery of which are screwed the sections A and A', which meet and make a tight joint. This partition has a centrally-located boss, e, upon which the pipe B is screwed. This partition is disposed directly over the heads of the four screws d³, whereby leakage of oil through the screw-holes is prevented.

The front end of the section A is externally screw-threaded, and the section A² is internally screw-threaded at its rear end, and these sections are thus joined to each other. I have two objects in making the air-pipe in sections: first, economy; it can be made thus more cheaply than if cast in one piece, and, second, to enable one to take it apart and examine its interior if it gets out of order. The pipes B and C are beveled at B² and C², to facilitate the flow of steam and oil.

I will now proceed to show how my invention is to be utilized.

When the above-described mechanism is in

use, the pipe C' is connected with a reservoir containing oil, which reservoir is placed at a sufficient height above the burner to produce the needed pressure at the outlet C². The pipe B is connected with a steam-boiler, and a retort is placed at the outlet of the burner. The pipe A is always open at A⁴ to admit air. Now admit steam into the pipe B, and this, converging near its outlet, compresses the steam, and thus increases its expansive force, so that when it reaches the oil at C² it will dash the oil against the shield *d* with such force as to produce a spray of oil vapor-like in its tenuity, which may therefore be readily ignited. Ignition having taken place, the air within the section A² becomes greatly rarefied and a powerful draft of air toward the retort is established. The velocity of this draft is further increased by the force of the steam; hence a high temperature is attained more quickly and any given degree of heat is secured at less expense for fuel by means of my burner than by any other like appliance now in use.

A further advantage consists in the regulation of the atomization of the oil by means of the rod D in the pipe C, and the prevention by the same means of the flowing of a solid column of oil into the fire-box. The flow of oil in the pipe C is further regulated by the well-known device of needle-valves.

F is the fire-box of the furnace, having the bridge-wall G and deflector H, for the purposes well understood, and the air-port I for supplying the desired draft. The oil-pipe may be turned backward until it meets the steam-pipe, whence the two run side by side, and thus the steam-pipe is permitted to impart a certain degree of its heat to the oil.

It will of course be understood that I do not limit myself to the form of furnace which I have described, but that the burner may be applied to any form of furnace where a hydrocarbon-burner is applicable.

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

1. In a hydrocarbon-burner, the combina-

tion of the partition E, screw-threaded on its periphery and having an aperture therein, the sections of pipe A A', having their ends internally screw-threaded and meeting upon said partition, a screw-threaded boss surrounding the aperture in said partition, the steam-pipe B, screwed upon said boss, and the oil-pipe fitted hermetically within the said aperture and located concentrically within the pipe B, as set forth.

2. In a hydrocarbon-burner, the combination, with the perforated partition having peripheral screw-threads, of the cylindrical section of pipe A, having its ends interiorly and exteriorly screw-threaded, respectively, the conical section A², screwed upon one end of section A, and the other end of section A and an interiorly-threaded section, A', having their ends meeting upon said partition, the oil-pipe passing through said partition, a screw-threaded boss on said partition surrounding said oil-pipe, and the steam-pipe screwed upon said boss, as set forth.

3. In a hydrocarbon-burner, the combination, with the concentrically-arranged air, steam, and oil pipes, of a converging nozzle on said air-pipe and a thickened medium in the said nozzle of the air-pipe, located even with the outlets of the steam and oil pipes, substantially as set forth.

4. In a hydrocarbon-burner, the combination, with the steam and oil pipes arranged concentrically one within the other, of a stuffing-box on the end of the oil-pipe, a rod passing through said stuffing-box and oil-pipe, and having a screw-threaded portion and carrying the shield *d* at one end, a screw-threaded nut on said rod, having screw-threaded sockets, screws *d*³, passing through the oil-pipe into said sockets, and the partition E, arranged over the heads of said screws *d*³, for retaining them in place, as set forth.

ERNEST W. FELLOWES.

Witnesses:

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JAMES W. THORP.