

(No Model.)

H. M. YOUNG.

VAPOR STOVE.

No. 373,573.

Patented Nov. 22, 1887.

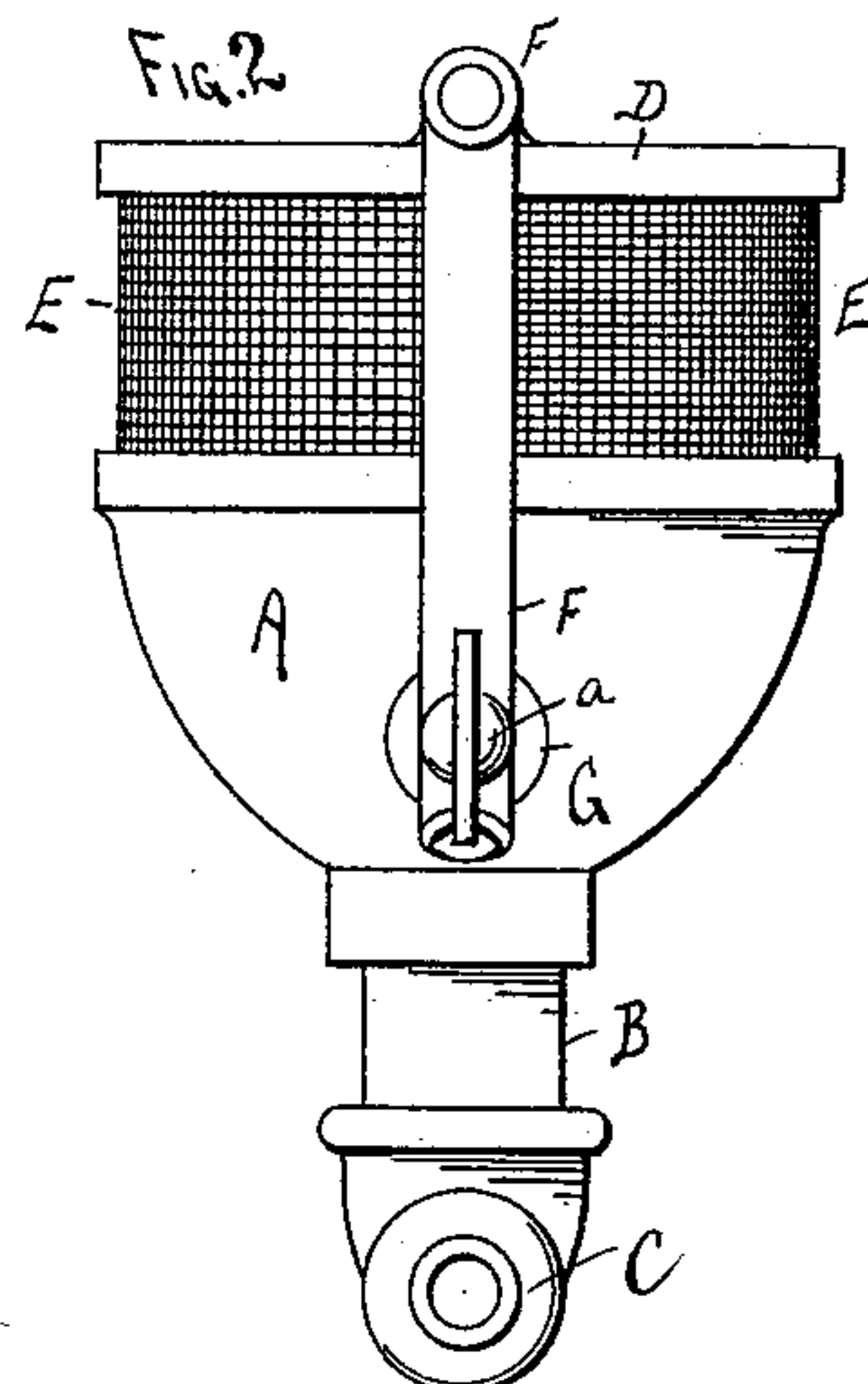
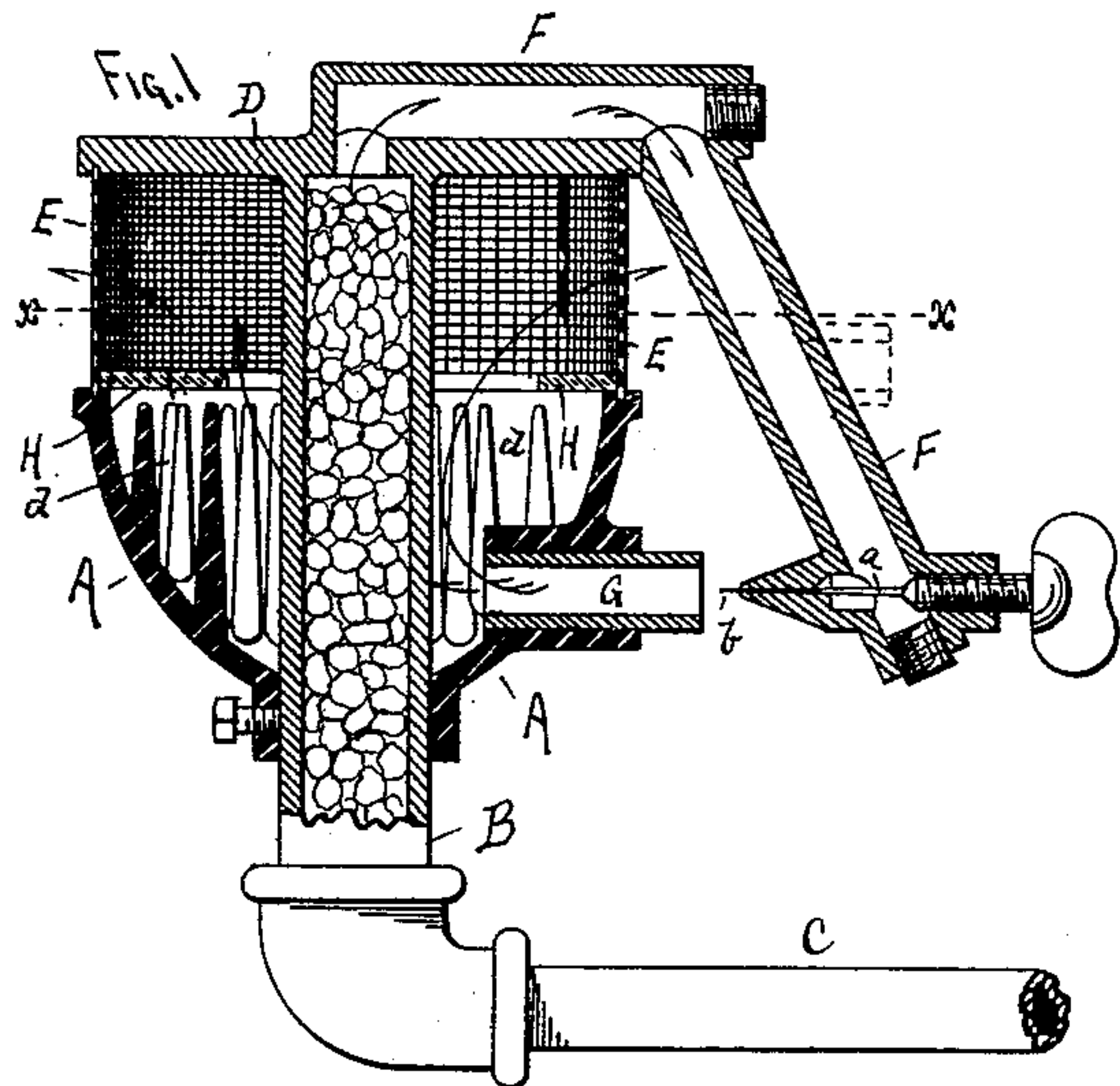


Fig. 3

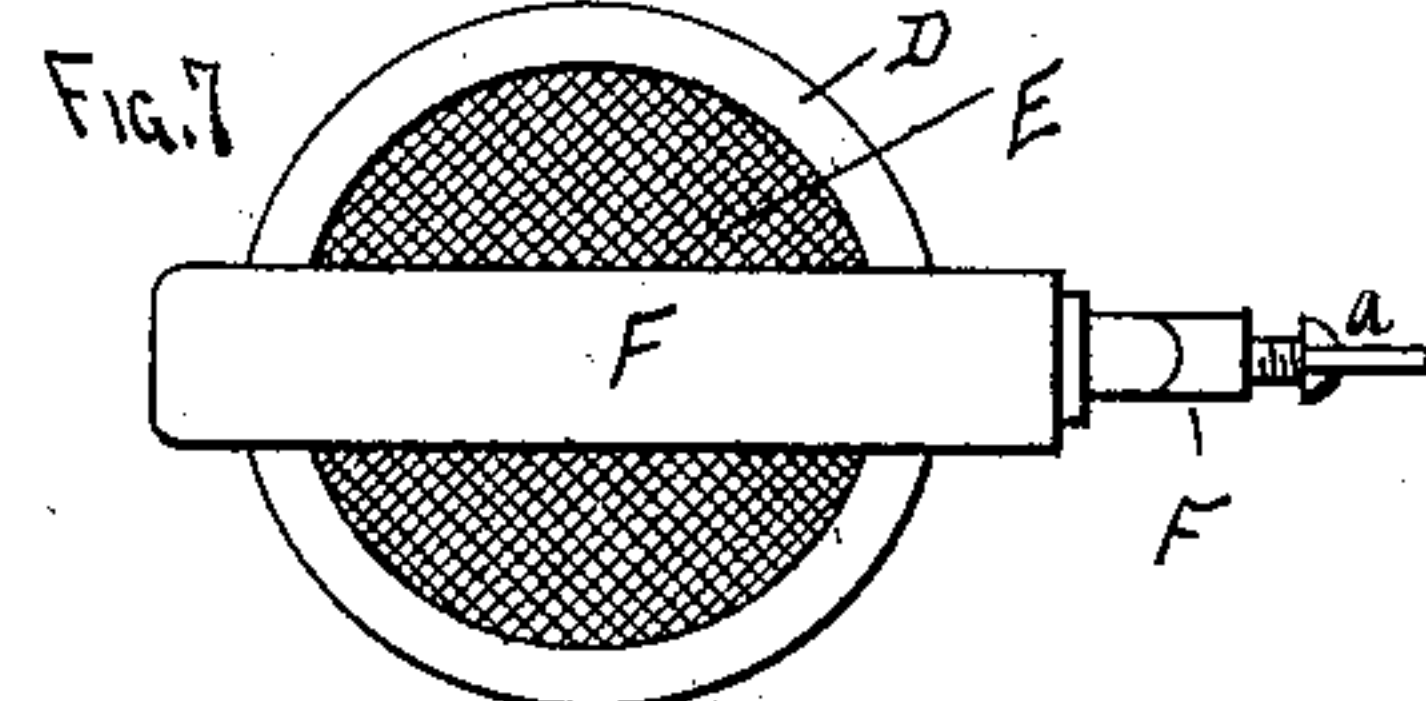
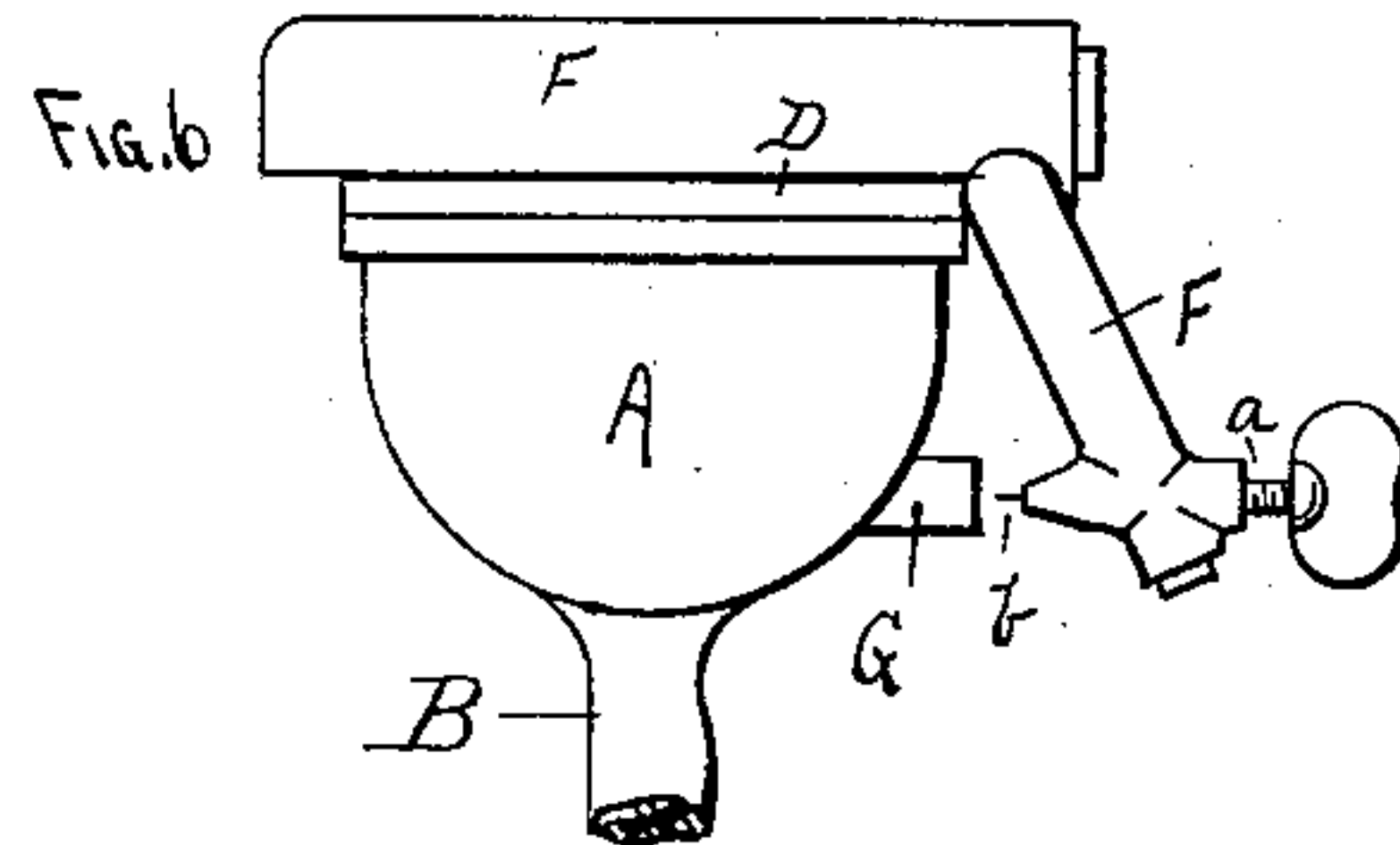
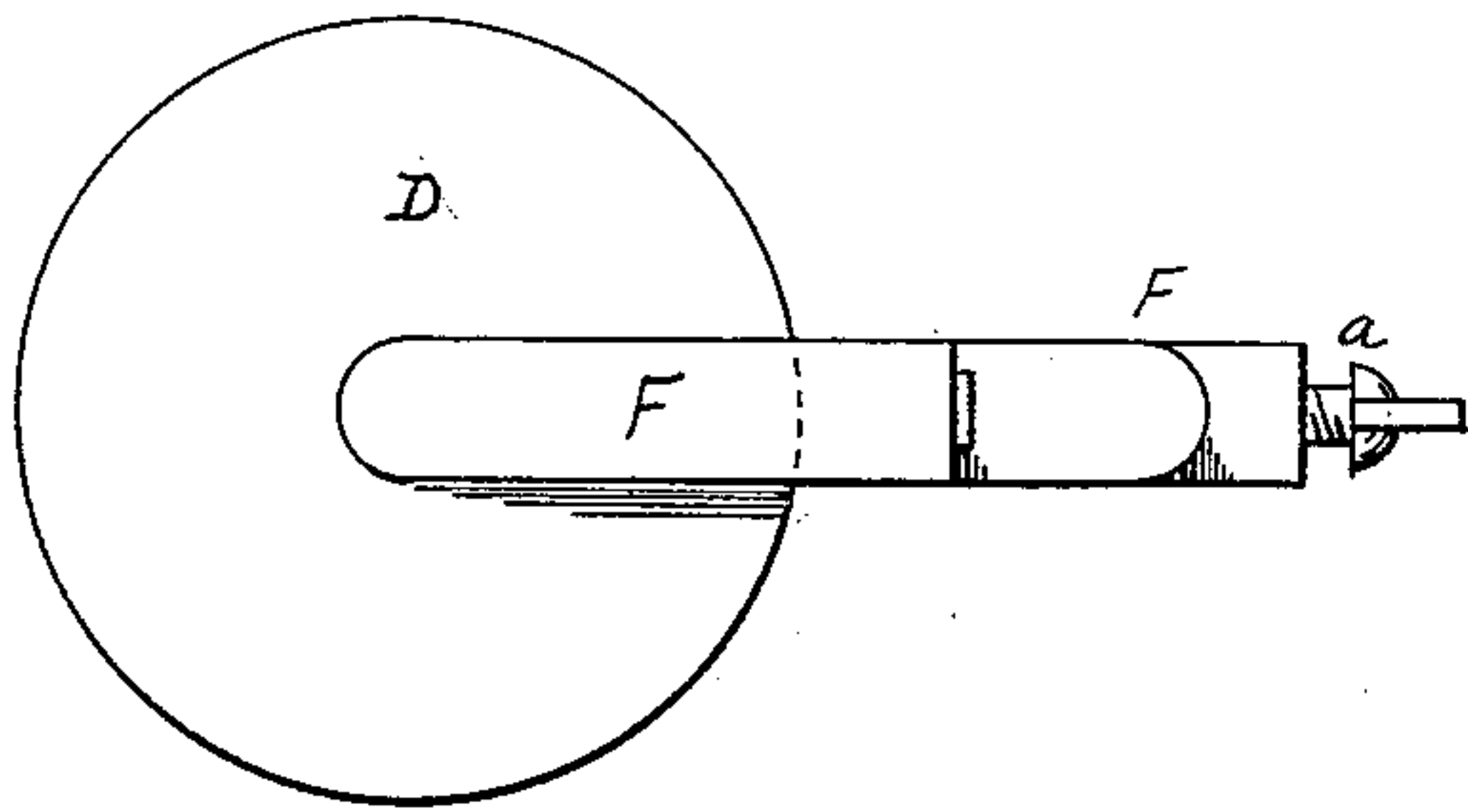
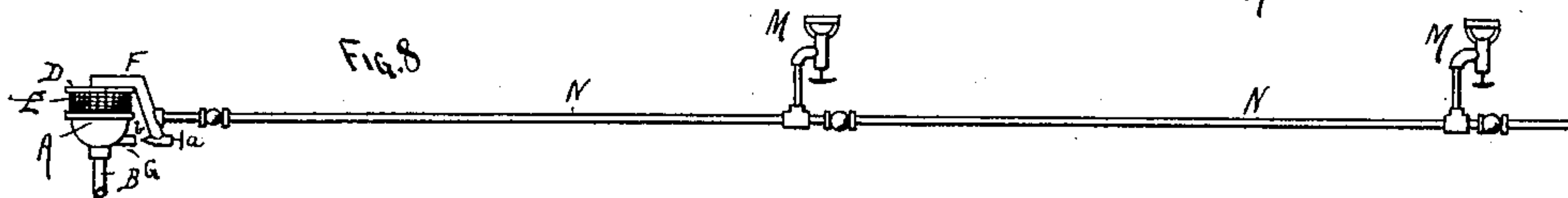
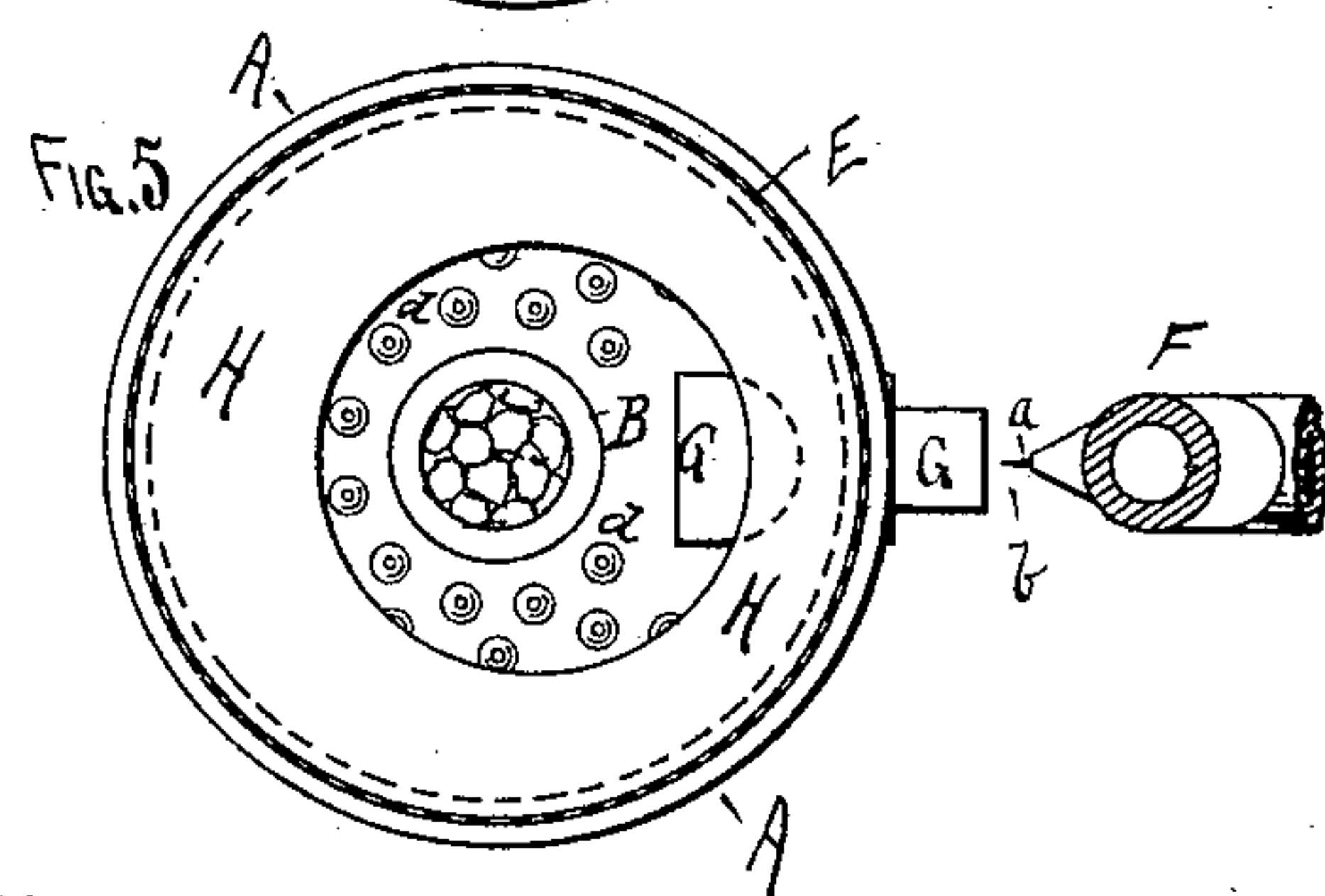
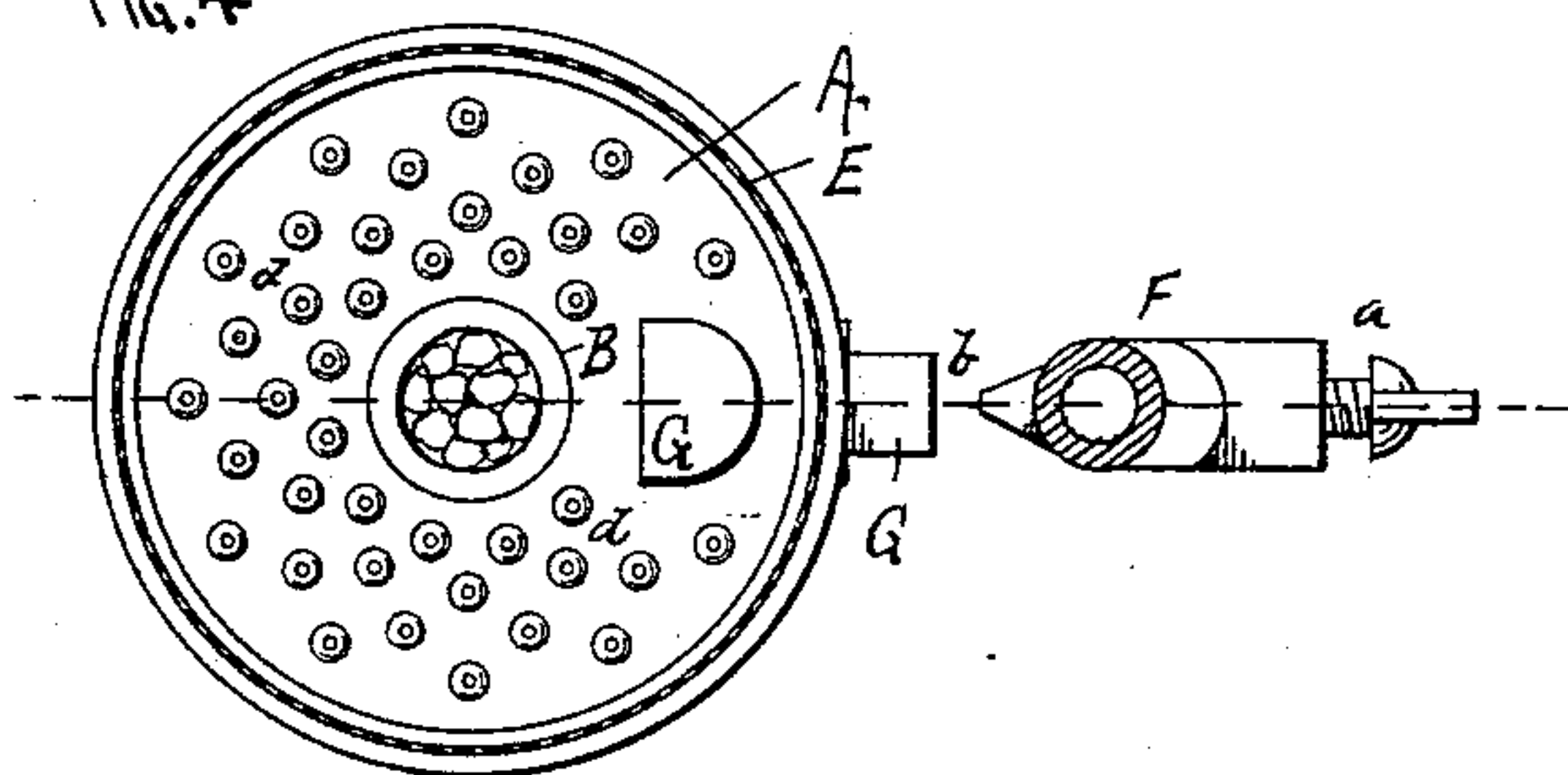


Fig. 4



WITNESSES.

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UNITED STATES PATENT OFFICE.

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VAPOR-STOVE.

SPECIFICATION forming part of Letters Patent No. 373,573, dated November 22, 1887.

Application filed October 4, 1887. Serial No. 251,433. (No model.)

To all whom it may concern:

Be it known that I, HENRY MASON YOUNG, a citizen of the United States, residing at Minneapolis, in the county of Hennepin and State of Minnesota, have invented certain new and useful Improvements in Vapor-Stoves, of which the following is a specification.

This invention relates to vaporizers and burners for utilizing hydrocarbon or other non-smoke-producing substances; and it consists in the improved construction and combination or arrangement of parts whereby the liquid hydrocarbon is vaporized before it comes in contact with the flame of the burner, as herein-
after disclosed in the description, drawings, and claims.

In the drawings, wherein the same letters of reference indicate the same or corresponding parts, Figure 1 represents a sectional elevation of my improved vaporizer and burner; Fig. 2, a side elevation of the same on the "feed side;" Fig. 3, a plan view of the same; Fig. 4, a horizontal section on the line X X of Fig. 1; Fig. 5, a similar view with the equalizing-plate in position; Fig. 6, a side elevation, and Fig. 7 a reduced plan view, of a vaporizer and burner, showing a slight modification in construction; and Fig. 8, a reduced view illustrating the manner in which two or more burners may be supplied from one vaporizer.

In the drawings, A represents the cup-shaped superheating-chamber of the burner, down through which a large tube or conduit, B, is inserted, the main supply-pipe C for the liquid hydrocarbon being connected onto the lower end of said tube or conduit. The tube or conduit B, the top or head disk D, and the angularly-arranged pipe F are formed in one piece and of suitable size for the requirements of the vaporizer and burner. The upper edge of the superheating-chamber A and the outer rim of the head-disk D are united by a ring of perforated metal, E, as shown.

F represents a small tube passing partly over the top of the head-disk D, and communicating with the interior of the tube B. It extends downward to a point opposite the lower part of the superheating-chamber A, and is there provided with a needle-valve, a. The discharge-point b of said needle-valve is opposite the open end of the tube or opening G, leading into the interior of the chamber A.

The space between the outer end of the tube or opening G and the discharge-point b of the needle-valve permits the entrance of the necessary supply of oxygen to mix with the vaporized hydrocarbon, so as to produce the intensity of heat required.

The interior of the superheating-chamber A is supplied with spurs or pins d, against which the inflowing vapor impinges and is caused to be retarded and whirled about and thoroughly commingled with the oxygen which is admitted through the tube or opening G. In this condition the air and vapor pass upward, and are ignited as they pass through the perforated metal ring E.

The interior of the tube or conduit B is filled with small pebbles or other similar obstructions for retarding the flow of the liquid or semi-vaporized hydrocarbon and holding it for a longer period in contact with the heated parts of the burner, so as to assist in the vaporization.

The construction of the vaporizer and burner shown in Figs. 6 and 7 of the drawings is only a modification of that shown in the other figures in so far as the perforated metal ring is dispensed with, and instead a perforated horizontal metal plate is employed, as plainly shown in plan in Fig. 7.

The tubes B and F being in close proximity to the flame of the burner and heated thereby to a high temperature, the liquid hydrocarbon will be completely vaporized while passing through them, and will then pass through the needle-valve a with great force and carry with it into the tube or opening G and chamber A a sufficient amount of the outer atmosphere to cause perfect combustion. The chamber A is also highly heated by the flame and heat from the burner, so that it serves as a superheater for increasing the temperature of the vapor and oxygen which pass upward into the space beneath the head-disk D, out through the meshes of the perforated metal ring, and is there ignited and burns with great intensity, the superheating of the vapor greatly increasing the intensity of the heat, and thus the power of the burner is largely augmented.

By superheating the vapor a much less quantity of the liquid hydrocarbon is required to produce the same effect than when other forms of burners are employed, the heating power of

the vapor being increased in proportion to the raising of its temperature.

As the vapor enters the superheating chamber A with great force, it passes to the side opposite the tube or opening G, and thus the upward flow is greater on that side of the chamber which is farthest from the entering-point; hence, to prevent this inequality of distribution from affecting the uniform operation of the burner, I place over the upper end of the superheating-chamber an open plate, H, the opening therein being eccentric to its periphery, so that the widest portion of said plate will come above the point opposite the inner end of the tube or opening G. In other words, the greatest area of the plate will be above the point where the strongest upward flow of the vapor occurs, and thus will operate to retard said upward flow and cause the vapor to pass in a uniform sheet through all parts of the perforated ring. This plate not only serves to retard and perfectly distribute the vapor, but retains it for a longer period within the superheating-chamber, thereby still further increasing its temperature; also, as before stated, the studs or pins *d* serve an important function in this respect, as they retard the inflowing vapor and retain it for a longer period in the superheating-chamber than would be possible without them. These studs or pins are therefore a very important feature of this invention; also, in addition to the advantage just named, they, by becoming highly heated, increase to the extent of their bulk the heating surface of the superheating-chamber.

The superheating chamber A may be formed large enough to vaporize a greater quantity of hydrocarbon than is required for consumption by its own burner; so, therefore, a number of auxiliary burners, M, may be connected to it and receive their supply of vapor therefrom, as shown in Fig. 8. The connection of the piping N for the burners M may be made at any desired point, either from the pipe F, as in Fig. 8, or from some part of the chamber A, as required.

Having thus fully described my invention, what I claim as new is—

1. A hydrocarbon vaporizer and burner comprising a superheating-chamber provided with studs or pins, a vaporizing tube or conduit for liquid hydrocarbon, provided with internal obstructions and passing vertically through said chamber, and communicating with the interior thereof at one side, near its lower end, whereby said liquid hydrocarbon is vaporized and superheated before combustion takes place, substantially as and for the purpose set forth.

2. A hydrocarbon vaporizer and burner comprising a superheating-chamber provided with studs or pins, a tube or conduit passing vertically through said chamber and having

internal obstructions, and communicating with the interior of said chamber at one side, near its lower end, and the perforated metal arranged above said chamber, substantially as and for the purpose set forth.

3. A hydrocarbon vaporizer and burner comprising the tube or conduit B, in which the liquid hydrocarbon is vaporized, the feed-pipe F, provided with the needle-valve *a*, the perforated metal ring E, and the superheating-chamber A, provided with the tube or opening G and the internal studs or pins, *d*, whereby the inflowing vapor and oxygen are thoroughly commingled and the heating-surface of the chamber increased, substantially as described.

4. A hydrocarbon vaporizer and burner comprising a superheating-chamber, A, a tube or conduit, B, passing vertically through said chamber and conveying the vaporized hydrocarbon thereto near its lower end, and a retarding-plate, H, at or near the upper end of said chamber, formed with an eccentric opening, whereby the superheated vapor is caused to pass from said chamber from all sides uniformly, substantially as set forth.

5. A hydrocarbon vaporizer and burner comprising a superheating-chamber, A, a tube or conduit, B, passing vertically through said chamber and conveying the vaporized hydrocarbon thereto near its lower end, a retarding-plate, H, at or near the upper end of said chamber, formed with an eccentric opening, and the perforated metal ring E, substantially as described.

6. The combination, in a hydrocarbon vaporizer and burner, of a superheated chamber, A, having studs or pins *d* and inlet-opening G, with the integrally-formed tube or conduit B, the head-disk D, and feed-pipe F, the needle-valve *a* in said feed-pipe opposite said inlet-opening, and the perforated metal connection between said chamber and the outer air, substantially as set forth.

7. The combination, in a hydrocarbon vaporizer and burner, of a superheating-chamber having an opening near its lower end and interior studs or pins, a tube or conduit passing through said chamber, a feed-pipe, a retarding-plate having an eccentric opening, a perforated metal ring, and one or more auxiliary burners connected to said vaporizers and burners, whereby a supply of vapor may be furnished to any number of burners, substantially as set forth.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

HENRY MASON YOUNG.

Witnesses:

C. N. WOODWARD,
H. S. WEBSTER.