(No Model.)

G. R. MOORE.

OIL BURNER.

No. 428,759. Patented May 27, 1890.

FIG. 1.

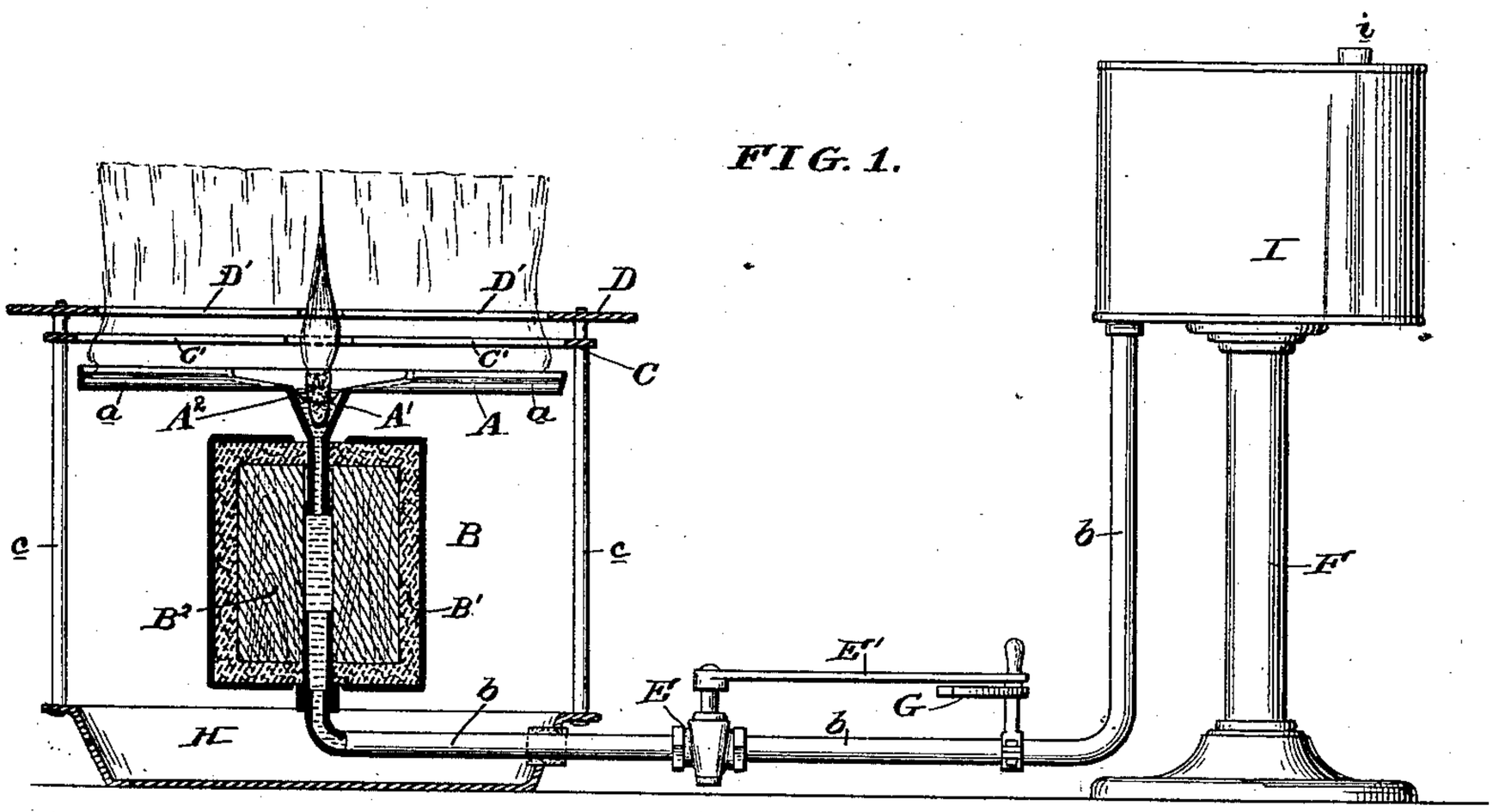


FIG. 4.

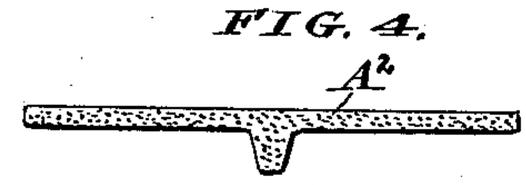


FIG. 2.

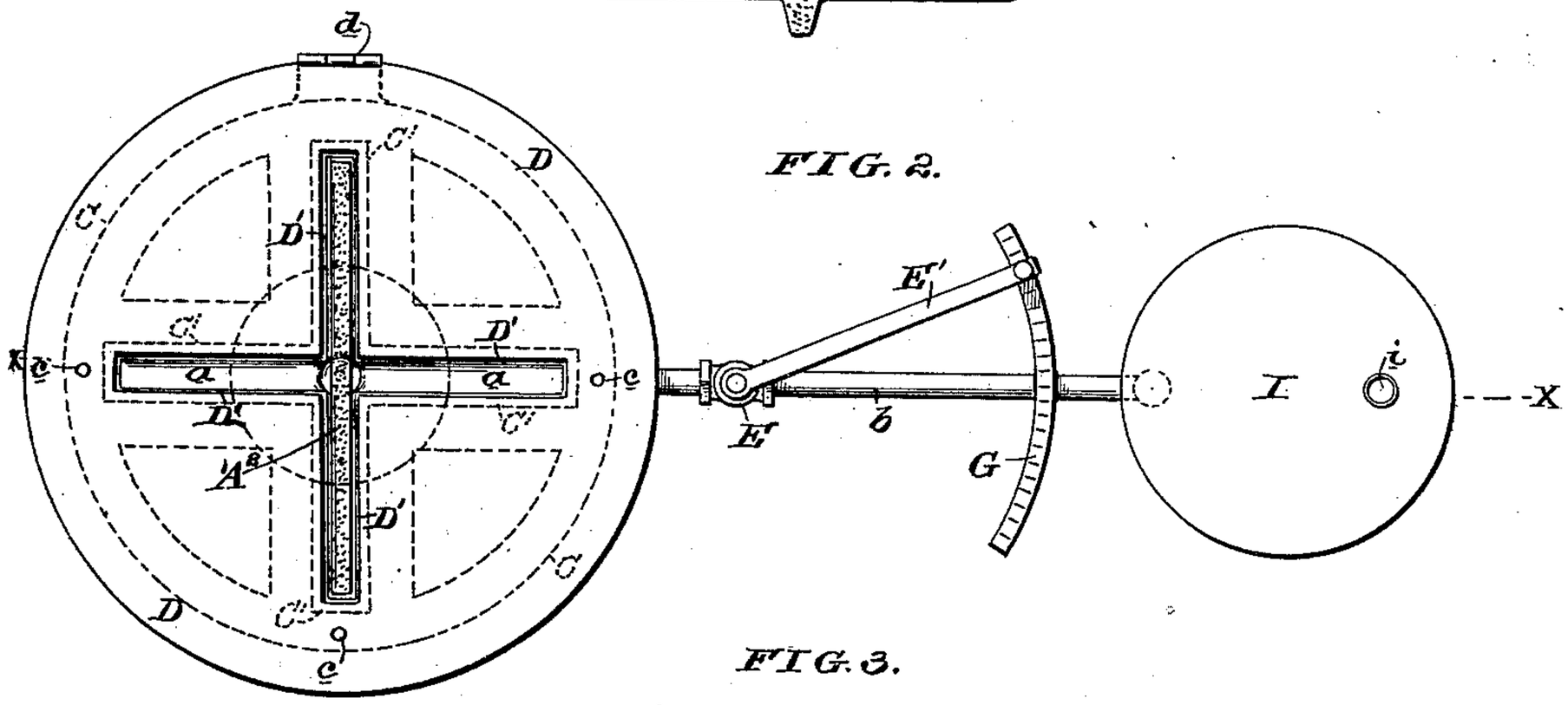
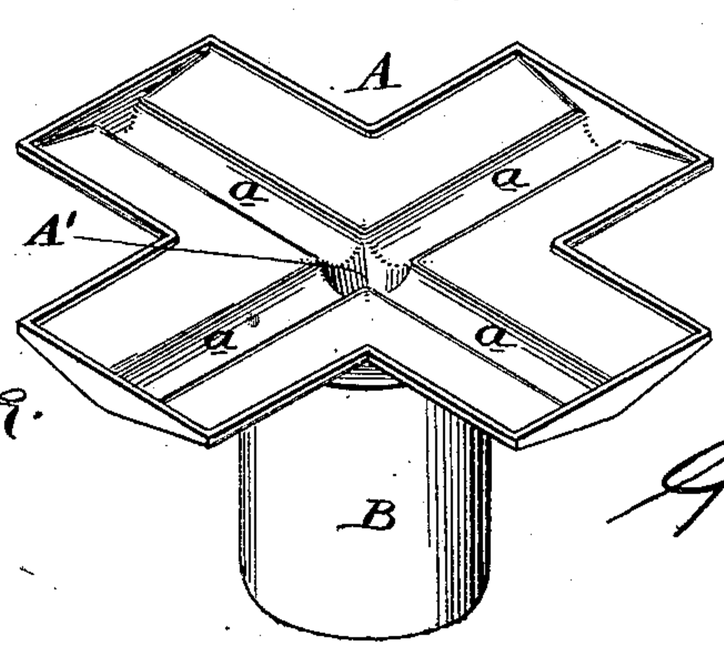


FIG. 3.



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OIL-BURNER.

SPECIFICATION forming part of Letters Patent No. 428,759, dated May 27, 1890.

Application filed May 25, 1889. Serial No. 312,131. (No model.)

To all whom it may concern:

Be it known that I, GEORGE RODNEY MOORE, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented new and useful Improvements in Oil-Burners, of which the following is a specification.

The object of my invention is to provide facilities for burning oil without wicks in a manner similar to what is now done with the use of them, and, as I think, with better results and more conveniently. I provide these facilities in mechanisms illustrated in the accompanying drawings, and forming a part of this specification, in which—

Figure 1 is a vertical transverse section drawn on the line *x x*, Fig. 2. It shows my oil-burner in communication with an ordinary oil-tank. Fig. 2 is a plan view. Fig. 3 shows the burner and the insulator-section of the oil-pipe in perspective. Fig. 4 shows in perspective the lighter.

Similar letters refer to similar parts in all the views.

A is the burner; *a a*, shallow grooves in the top face of the burner. The burner may be shaped at pleasure, in circular form or any other desirable figure. The width of face of the burner and the width and depth of the groove in the same may be varied considerably, if desired.

A′ is the evaporating-boiler, to be of any desired size, shape, and depth, provided it expands upwardly, so as to avoid the confinement of heated oil, by which explosive action would be produced. The name "boiler" is given to the central part of the burner because of a function it performs, bringing heat, though downward, from its top, where it receives it from the burning oil. The oil boils in it, though below the flame. The flame is the first and the heat of the boiler the final cause of the boiling. The boiler being funnel-shaped or expanding in dimensions upwardly, and the oil coming in at its lowest and smallest part, if the boiler is very hot evaporation or boiling of the oil takes place at once in its lowest part, and the vapor or invisible fluid rises to the top of the boiler, where it burns in a steady and continuous flame with nothing visible immediately below it; but if it is cold the oil rises to its top and is there evaporated and burns in a flame quite near the oil, which flame imparts heat to the boiler and causes the oil to boil at a lower and still lower point, and so in self-adjusting proportions between the top and bottom of the boiler its own temperature determines the elevation of the oil in it before evaporation. The grooved arms of the burner out from the boiler are essential to its full capacity of giving a wide flame, but not essential to its simple working. When the oil is turned by the heat of its own flame into invisible fluid, it is easily conducted along the grooves in the burner by means of the deflector with aligning openings above the grooved arms, so that a flame many times wider than the top of the boiler is obtained by extending out one or more grooved arms from it in whatever horizontal direction may be desired; but the boiler itself may be used as a burner, as shown, or it may be made so flat and wide at the top as to do service without any extension of arms and grooves.

A² is the lighter, made of such shape as to lie in the evaporator or grooves of the burner, though it need not strictly fit either of them.

B is the insulator-section of the oil-pipe, which may be omitted where the oil-pipe is long enough and small enough to effect a sufficient insulation from the heat of the burner without it.

b b is an oil-pipe.

B′ is an outside casing of plaster-of-paris within a metal casing and over the wood oil-tube. These outside casings may be omitted where the joints are made sufficiently tight in the wood without them.

B² is the wood section of oil-pipe, which insulates the metal parts of the oil-pipe inserted in it.

C is a horizontal air-deflector located just above the burner; *c c*, supports for the deflector.

C′ represents cut-out openings for the flame.

D is also an air-deflector placed a little above deflector C.

d is a hinge connecting the deflectors to one of their supports.

D' represents cut-out openings for the flame.

E is the valve for controlling the flow of oil from the tank to the burner.

E' is the manual-lever for operating the valve.

F is the supporting-column for the oil-tank,

G is an index-register to guide in controlling the flow of oil through the valves.

H is a catch-pan for any accidental overflow.

I is the oil-tank; *i*, supply-stopper.

Regarding the practical operation of this burner it will be readily seen that the upwardly expanding or enlarging of the evaporating-boiler ending with the burner is what constitutes its capacity, when in use, for self-adjustment to its own changes of temperature. When the lighter is first ignited, while the burner and oil are both cold, the oil will be seen at the top surface of the burner, from which it retires as the burner becomes heated until its inward flow is quickly evaporated at the very bottom of this funnel-shaped evaporator. Hence the manufacturer will adjust the size and depth of the evaporating-boiler to the requirements of heat or light he has in view.

It will be seen that the oil-passage from the tank to its delivery in the burner is not continuously a metal tube, but that one section is wood. A little below the burner insulates it from the metal pipe beyond. It will also be seen that the outlet from the tubing into the evaporator is very small; also, that the evaporating-bowl itself is quite small and will hold but little oil from overspreading into the grooves upon the face of the burner; also, that the use of the cock to fix the degree of oil-flow is precisely the same as the use of like valves in the burning of gas.

The lighter is not an absolute necessity to the operation of the burner. When the oil is lighted in any other way, the burner will perform its function; nevertheless the lighter is very important to the completeness of the whole device. There need not be a lighter to each branch of the burner. From the evaporator the flame will spread to all the oilways.

It will be seen that two horizontal deflectors are shown just above the top of the burner. These deflectors, by heating the air and delaying its upward current while impinging upon the flame as it starts upward from the oil, greatly improve the combustion in thoroughness. Let it be noticed that these deflectors have no metallic connection to the oil-pipe whereby heat can be conducted back to the tank. The conduction of heat from the burner and its adjuncts back to the oil-tank is at all points guarded against by effectual insulation. Still if it should be desired to pass the oil-pipe through a water-tank on its way to the burner it may be done.

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

1. The combination of the burner A, provided with the evaporating-boiler A' and a groove or grooves *a* leading therefrom, the lighter A^2, made of fibrous material and adapted to fit in boiler A' or in a groove therefrom, and an oil-conveying pipe leading to said boiler, substantially as described.

2. The combination of the burner provided with the evaporating-boiler and a groove or grooves leading therefrom and the oil-conveying pipe, a section of which is made of wood, substantially as described.

3. The combination of the burner provided with an evaporating-boiler and a groove or grooves leading therefrom, the lighter A^2, and the oil-conveying pipe leading to said boiler, provided with controlling-valve E, substantially as described.

4. The combination of the burner provided with the evaporating-boiler and a groove or grooves leading therefrom with horizontal deflectors having aligning openings arranged over grooves in the burners, the openings in the upper deflector being smaller than those in the lower one, substantially as described.

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