

C. A. HYVER'S
IMPROVED PETROLEUM GAS BURNER

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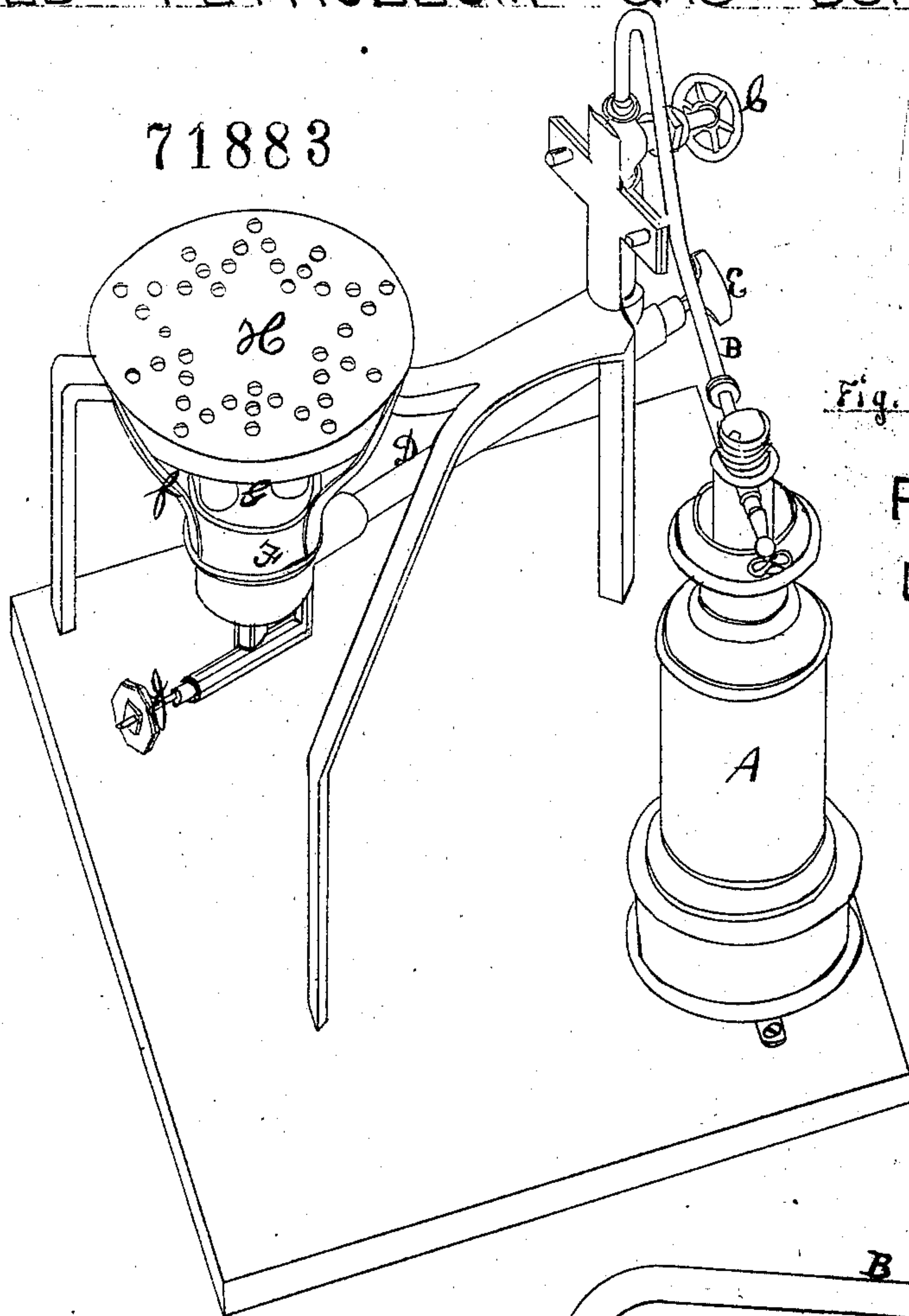


Fig. 1.

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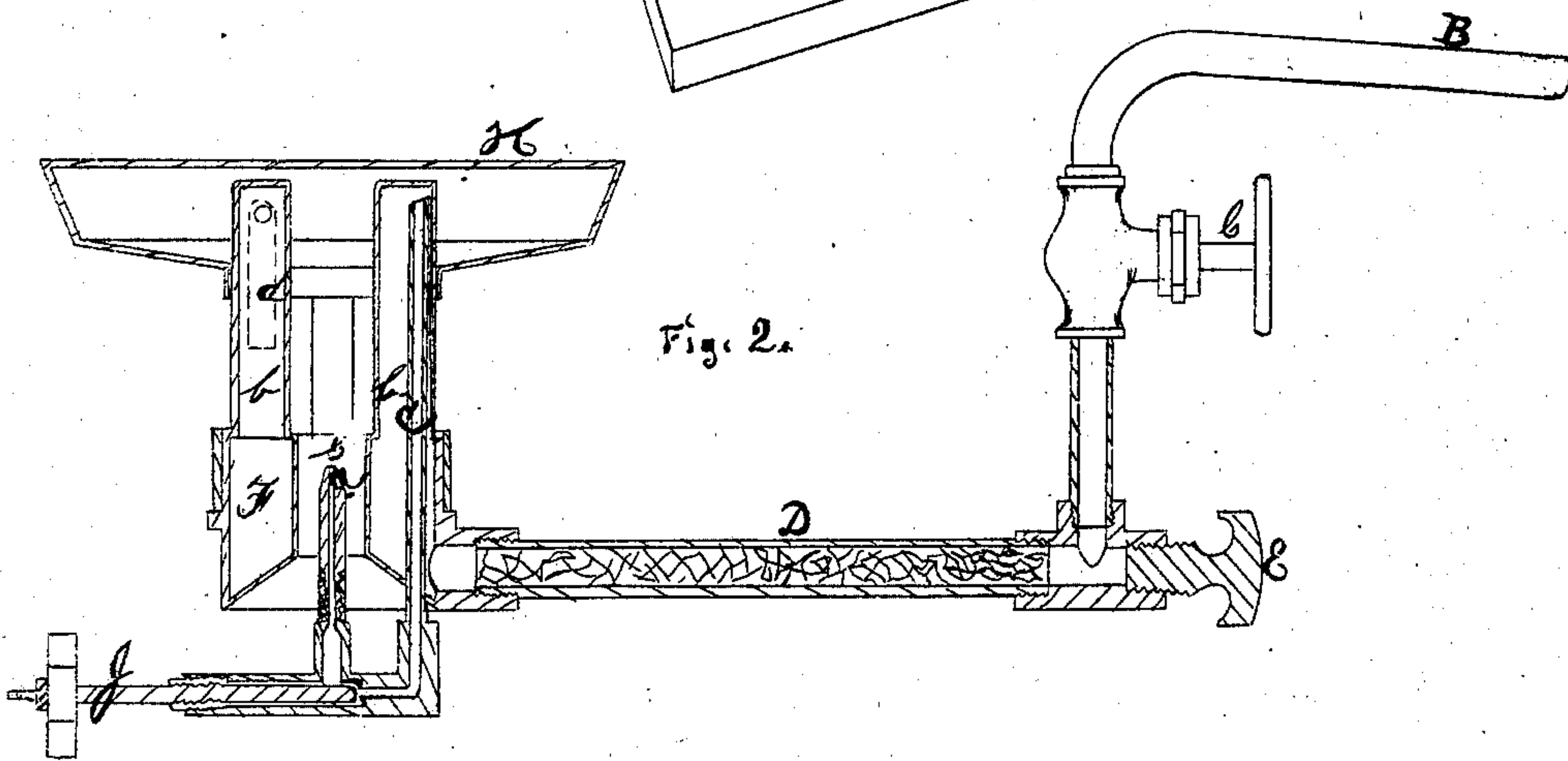


Fig. 2.

WITNESSES.

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Letters Patent No. 71,883, dated December 10, 1867.

PETROLEUM-GAS BURNER.

The Schedule referred to in these Letters Patent and making part of the same.

TO ALL WHOM IT MAY CONCERN:

Be it known that I, G. A. HYVER, of the city of New Orleans, parish of Orleans, and State of Louisiana, have invented a certain new and useful smprovement in Petroleum-Gas Burners; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the annexed drawings, making a part of this specification, in which—

Figure 1 is a perspective view of my improvement as when ready for use, and

Figure 2 a sectional view of the same.

In the creation of my invention, my object has been to produce a burner that will neither leak nor make the disagreeable hissing noise that is a characteristic of all other burners of which I have any knowledge, whilst at the same time there is a combustion of every particle of the gas, a greater intensity of heat, and a superior quality of gas for illuminating purposes resulting from its action than obtains in the use of any other burner with which I have any acquaintance.

To accomplish these important ends, I combine mechanical and chemical agencies, which, separately considered, that is to say, as independent substantive devices or parts, may not, perhaps, be all new, in a novel arrangement, which is so ordered that each part co-operates with all the others to produce the desired objects.

But my invention will be better understood by referring to the drawings.

At fig. 1, A represents an ordinary retort, to contain the oil for the supply of the burner. This retort, it will be understood, is elevated somewhat above the burner, in order that the supply of oil will be regular and unfailling. B is a supply-pipe, leading from the retort A, and C a stop-cock or revolving valve, by means of which the pipe B may be closed or opened. The pipe B is connected to pipe D by a tight screw-joint, which is filled with charcoal that has been broken into small pieces to allow of its introduction, as is shown clearly at fig. 2. At each end of the pipe D are removable wire-lattice or perforated thin-plate diaphragms, to prevent the escape of the charcoal. The oil, in passing through the charcoal in pipe D, is carburetted to a greater or less degree, and hence the illuminating properties of the gas that is evolved from it are improved in a corresponding ratio. In fact, the chemical action of the charcoal, when the oil comes into contact with it, is to produce a slight evolution of gas from the latter, which, to some extent, is charged with carbon spirit, and is, therefore, superior as an illuminating-gas to the gas that is produced simply by the oil. The pipe D leads into an annular chamber, F, that surrounds a circular opening, G, for a slight space above the nipple or gas-jet *a*, and it is provided with a cock, E, that is so fitted into the end of the said pipe that it can be withdrawn whenever it is necessary to renew the charcoal or to clean the pipe. The chamber F leads, at its top, into two or more pipes, *b*, which, being closed at their tops, prevent the oil from escaping, whilst at the same time they allow it to rise considerably above the top of the concentric chamber F in the form of small columns, in such close proximity to the flame, when the burner is in operation, as to be much more rapidly volatilized than if it were confined within said chamber F. The cup-furnace or retort H is more than double the size of any other that is known to me, and, it will be seen, is so formed as to concentrate the gas or flame whilst at the same time diffusing it over a very extended circular space. The top of this cup-furnace is perforated with small holes in the shape of a star, with two additional holes between every two points of the star, as seen at fig. 1, so as to leave unperforated a very considerable space in the centre thereof. The bottom of this cup-furnace has one circular central opening, for the admission of the gas and the pipes *b*. This furnace H is sustained in position by a suitable metallic frame, *f*, and it will be seen at fig. 2 that, when in position over the chamber F, the under-surface of its top comes almost into direct contact with the upper ends of the pipes *b*, thus securing a complete envelopment of a considerable portion of said pipes in the flame of the burning gas whenever the burner is in operation, and a consequent more rapid generation of gas within the same. Within one of the pipes *b* is firmly secured the gas-pipe *c*. This pipe is open at its upper end, which reaches almost to the top of the pipe *b* in which it is inserted. Passing down the pipe *b* into and through the chamber F, the pipe *c*, a little below the bottom of said chamber, turns at right angles, as shown at fig. 2, and terminates a little beyond or outside a line drawn down the external surface of the said chamber F. At a point in the pipe *c* precisely under the centre of the open space within the chamber F is inserted the gas-jet *a*, which projects upwardly very nearly to the top of the chamber F, as may be clearly seen at fig. 2. In the lower or outside end of pipe *c* is inserted

a screw-valve, J, to regulate the flow of gas through the jet *a*, so that the flame and heat may be increased or diminished, at the pleasure of the operator. In another of the pipes *b*, near the top thereof, is inserted a pipe, *d*, (see dotted lines at fig. 2,) to which a gas-jet may be attached to afford a light for illuminating purposes when the burner is used at night, thus rendering it unnecessary to have other lights for such purpose; or a flexible tube of India rubber, or other suitable material, may be connected to the pipe *d* by the usual method of attachment, so that the light may be conducted to any point to which it may be desired to take it.

The operation of my invention is as follows, to wit: The retort A being filled with oil, and the stop-cock C opened, the oil flows into pipe D, and through the filling of broken charcoal into the annular or concentric chamber F, until said chamber is not quite half full. Heat is now applied to the chamber F, by means of an alcoholic or other suitable lamp, until the gas thus created from the oil flows through pipe *c*, and begins to issue from the orifice of jet *a*, and ignition of the same can be effected. This process will not usually require more than one or two minutes of time. The moment ignition of the escaping gas occurs, the flame, ascending through the central opening at the bottom of the cup-furnace H, and impinging against the unperforated central portion of the top of said furnace, underneath the same, is deflected outwardly in every direction, and hence instantly envelopes the upper ends of pipes *b*, heats the same, as well as the gas contained in them, and thus effects a purification of the same, and thoroughly dries it, as well as causes its more rapid issue from the jet *a*. In a very few seconds, provided the valve J be so turned as to allow a full flow of gas from jet *a*, the heat becomes so intense as to make the cup-furnace H red hot, and the combustion of the gas now escaping in flame from every perforation in the top of the furnace so complete that not the slightest smell can be detected.

The perfect combustion of all the gas is further proven by the absence of all stain or discoloration in the object with which the flame comes into contact. The flame of the burning gas not only surrounds the upper ends of the pipes *b*, but it also, in its ascent into the furnace H, and before it enters the same, imparts heat laterally to the interior surface or wall of the chamber F, as well as to the pipes *b* below the bottom of the furnace H; hence the generation of gas in a very little while after the burner has been lighted becomes wonderfully rapid, and the volume poured forth from jet *a* amounts, probably, to two or three times the quantity that can be made to issue from any other burner now in use, or that has ever been made.

If it be desired to check the flow of the gas, and thus to reduce the heat, the valve J, it will be remembered, presents an effectual and ready means of doing it. In fact, by means of this valve, as has been already stated, the heat can be regulated and controlled at whatever degree the person who manages the burner may desire.

The points of merit which chiefly distinguish my burner are these: It has no leakage; it requires no conical rings or cross-wires, which always interfere with or prevent a regular retention of heat; it effects a perfect combustion of all the gas that is created, and, by slipping over the jet *a* a small metallic sleeve, (which is not shown on the drawings,) it burns without the hissing noise made by the escaping gas that obtains in every other burner, so far as my information and knowledge extends, that has ever been devised; and, finally, it contains a means of economizing the gas, so that no more need ever be used than is absolutely required. There are yet other important advantages that obtain in the use of my burner which are so obvious, upon the slightest examination and inspection, that I do not deem it necessary specially to point them out.

Having thus described my improvement, as well as its mode of operation, what I claim, and desire to secure by Letters Patent, is—

1. The combination of the pipe D, when filled with finely-broken charcoal, with the concentric or annular chamber F, the latter being provided with pipes, *b*, extending upwardly into the cup-furnace or heat-retort H, as and for the purpose substantially as set forth.
2. The combination of the pipe D, when filled with finely-broken charcoal, the concentric or annular chamber F, pipes *b*, and pipe *d*, with the gas-pipe *c*, when the latter is provided with the valve J for regulating the flow of gas, as and for the purpose described.
3. The gas-pipe *c*, when constructed and arranged with relation to the chamber F and one of the pipes *b*, as described, in combination with the valve J, for the purpose set forth.
4. The combination of the concentric or annular chamber F and pipes *b* with the cup-furnace or heat-retort H, when the latter is constructed as described, and shown upon the drawings, and occupies the relation to the former herein set forth, for the purpose set forth.
5. The pipe *d*, in combination with one of the pipes *b*, for the purpose of affording a light for illuminating purposes, as herein described.

Witnesses:

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DUNCAN G. CAMPBELL.

G. A. HYVER.