

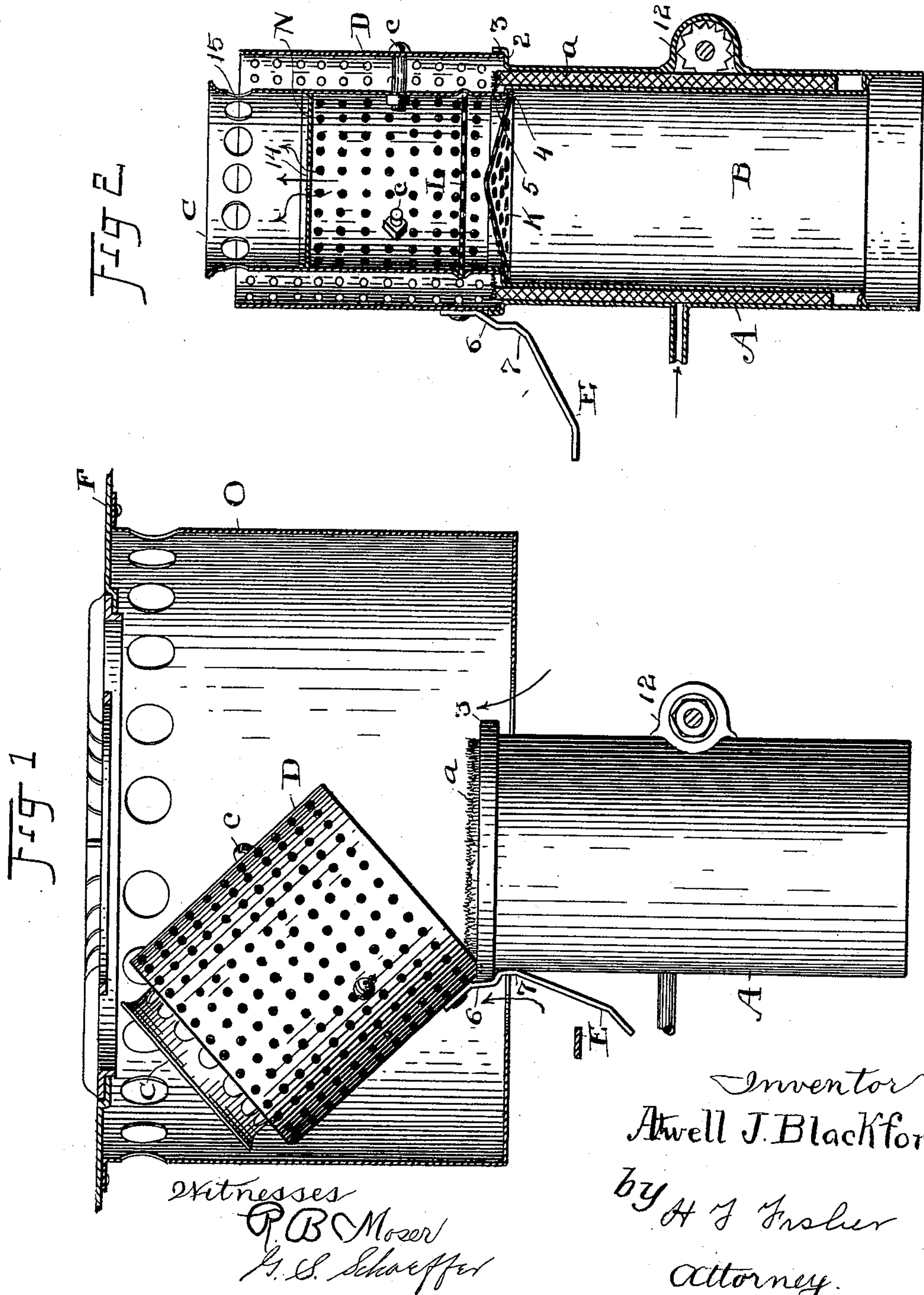
(No Model.)

2 Sheets—Sheet 1.

A. J. BLACKFORD.
HYDROCARBON BURNER.

No. 518,305.

Patented Apr. 17, 1894.



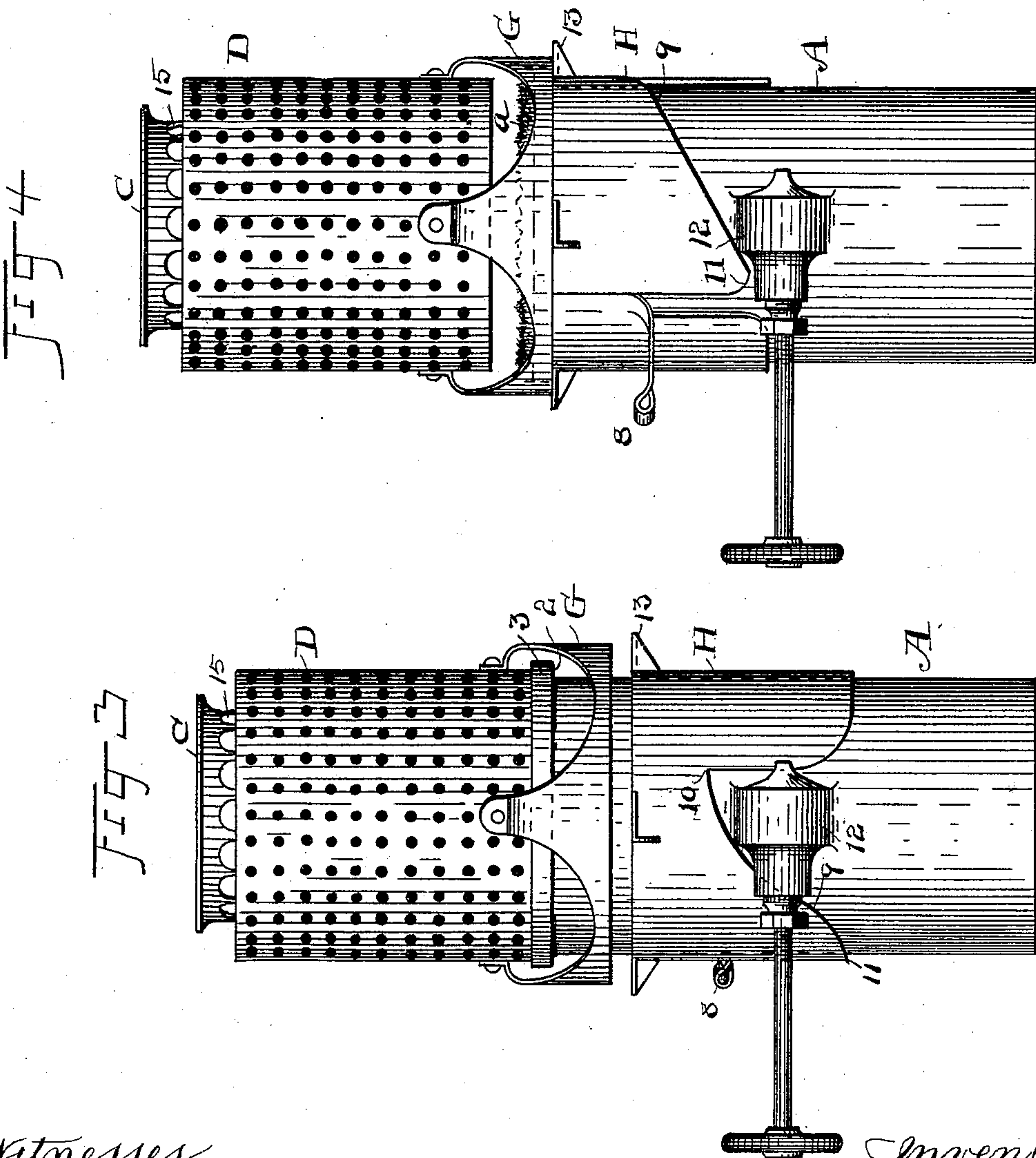
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Witnesses

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UNITED STATES PATENT OFFICE.

ATWELL J. BLACKFORD, OF MEDINA, OHIO, ASSIGNOR OF ONE-HALF TO THE
DURAND MANUFACTURING COMPANY, OF SAME PLACE.

HYDROCARBON-BURNER.

SPECIFICATION forming part of Letters Patent No. 518,305, dated April 17, 1894.

Application filed March 10, 1893. Serial No. 465,402. (No model.)

To all whom it may concern:

Be it known that I, ATWELL J. BLACKFORD, a citizen of the United States, residing at Medina, in the county of Medina and State of Ohio, have invented certain new and useful Improvements in Hydrocarbon-Burners; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to hydro-carbon burners of the variety in which a wick is used, substantially after the fashion of the Argand burner.

The invention consists in the several features of construction and combinations of parts, substantially as shown and described and particularly pointed out in the claims.

In the accompanying drawings, Figure 1 is a side elevation of the burner showing the combustion tubes in a tilted position, and a vertical central sectional elevation of the protecting drum or hood about the upper portion of the burner. Fig. 2 is a vertical central sectional elevation of the burner and combustion tubes, as they appear in use. Fig. 3 is a side elevation of a burner and burner tubes constructed as shown in Figs. 1 and 2, but showing modified means for raising said tubes from the burner to enable the burner to be lighted. Fig. 4 is a side elevation of the parts shown in Fig. 3, but with the tubes in a raised position for lighting. In Fig. 3 these tubes are down as in position for use.

The burner proper, which contains the wick, is made preferably of sheet metal and formed with the outer and inner walls A and B, respectively. Between these walls is a chamber for the wick *a*, and the usual or any approved means may be used for raising and lowering the wick, there being no invention in this particular part of the burner. There is, however, invention in the upper part thereof.

Usually in burners of this kind there is a tendency in the oil to flow some after the burner is extinguished, and I have found that if some provision be not made to prevent the overflow of oil from the wick after extinguishment occurs, it is liable to run down the outside or possibly the inside of the burner, and

at if all considerable in quantity to run upon the floor. This of course is both undesirable and offensive. I have, therefore, improved upon the burner as hitherto made, by forming a shoulder 2 and a vertical flange 3 on the top of the outer wall A, and a like shoulder 4 and a vertical flange or wall 5 on the inner wall B, so that a channel is formed, as it were, having its sides or walls apart from the wick and of sufficient height to prevent the overflow of oil just referred to. Whatever oil may escape from the wick after extinguishment of the flame is confined in this channel and will be taken up again by the wick and does not escape or become offensive in any way in or about the burner. Then a further function is performed by the walls 3 and 5, respectively, in that they provide a base or support for the perforated combustion tubes C and D. These tubes are fixed together, in this instance by short connecting bolts *c*, but of course other equivalent means of connecting said parts may be substituted for the bolts. Thus connected with one another, the said tubes are seated upon the shoulders 2 and 4, respectively, and within the walls 3 and 5, and the said tubes are free to be raised bodily from said seat. This construction makes it easy and convenient for replacing the tubes when they have been raised or removed, as for trimming the wick or for lighting the burner.

I have shown here two ways of raising the tubes for initial lighting. Thus in Figs. 1 and 2 is a peculiarly formed lever or handle E, fixed rigidly to the outer tube at its bottom and extending outwardly at its free end into convenient position to be reached by the attendant from the front of the stove. It will be noticed also that this handle is bent outward a slight distance at 6 from the tube B, and then downward and inward at 7 to form a shoulder and support for the said tubes when they are in a tilted position as seen in Fig. 1. This handle is shown in cross section by its side in Fig. 1, and it will be seen that it has just sufficient width to assist in balancing the tubes in this tilted position. Then when the burner has been lighted with a match or taper, or other convenient means, the tubes are tilted back into their working

position and the said lever thus constructed assists in guiding them to their seat forming a sort of hinge. It will of course be noticed that there is sufficient distance between the
 5 top F of the stove and the burner proper to permit the combustion tubes to be thus handled.

In Figs. 3 and 4, I show a modification of this construction. In these figures the arrangement is to raise the combustion tubes
 10 within vertical lines instead of tilting them, and here we have a skirting G extending around the outside of the burner and fixed rigidly at intervals to the outer tube D and
 15 apart therefrom and from the burner proper about as shown in said Figs. 3 and 4. Then I place upon the burner proper a sleeve or tube H, adapted to turn thereon and provided with a handle 8 to turn it. This sleeve or
 20 tube has an inclined or cam shaped edge 9, extending from the point 10, Fig. 3, around to the point 11, Fig. 4, and so inclined or formed and arranged that when the burner tubes are down upon their seat, the said cam
 25 or inclined edge will sustain the relation shown in Fig. 3 to the projection 12 upon the outer tube A. This swell or projection is used in this instance for convenience because it is necessary here to provide a chamber for
 30 the wick controlling mechanism. I might, however, as well provide a suitable projection elsewhere upon the said outer wall of the burner upon which the incline might ride and serve the same purpose.

At the upper edge of the sleeve or thimble
 35 H are lateral projections 13 at intervals to engage the skirting G and upon which it rests when lifted. These projections 13 might of course be substituted by a flange or its equivalent or an equivalent construction of the
 40 skirting and the said sleeve might be adopted and still be within the spirit of the invention. The exact means here shown need not of course be strictly followed to get the result
 45 desired, which is the raising and lowering of the combustion tubes.

Now, having the parts thus constructed and arranged the operator seizes the handle 8 and turns it to the right. This causes the inclined
 50 edge 9 to ride up on the projection 12, and in thus riding to carry the said sleeve H and the skirting and the combustion tubes upward to a position as seen in Fig. 4, where the combustion tubes are raised sufficiently above
 55 the wick to enable lighting to be effected. The inclination 9 is at sufficient angle to hold the parts in any position to which they may be turned, and the said parts may be supported as shown at Fig. 4, or at a less elevation if desired. Then when lighting has been
 60 effected the said parts are simply turned back to their proper place and the burner is lighted. It remains then for the attendant to control the flame just as in an ordinary lamp.

A further feature of the invention is found
 65 in the perforated diaphragm K within the

burner proper at its upper portion and about opposite the point of combustion. And in conjunction with this diaphragm is another
 70 perforated diaphragm L some short distance above the diaphragm K and supported within the inner tube C as shown, or in some equivalent way. The invention of the lower diaphragm is more particularly to prevent a
 75 rush of air up through the burner. It is found that with a diaphragm of this kind perforated for the passage of air, but yet serving as a damper or check to the flow of
 80 air, the burner itself is kept cool. There seems to be a quantity of cool air constantly present within the burner beneath said diaphragm and the effect upon the burner is wholly different from what it would be if this
 85 diaphragm were omitted, and there were a free flow of air through this space. The diaphragm L on the other hand is contributory in a measure to this result and is designed to prevent reflection downward of the heat of
 90 the burner. It will be noticed that an air space or chamber is thus formed between the two diaphragms K and L, and this likewise contributes to prevent the downward radiation of heat, so that with the said diaphragms
 95 and the said chamber I am enabled to keep the body of the burner about the wick absolutely cool however long the burner may be used, and this is esteemed a great advantage on many accounts. It will be noticed that
 100 the inner tube C has also within it a diaphragm N toward its upper portion, and that there is a central air passage 14 in this diaphragm or disk. Also that the said tube C is perforated beneath the said diaphragm N,
 105 but is whole above the same except about the top where there are large openings or holes 15. Now one of the results of this construction is the supply of a flame centrally about the top of the said burner tubes. If some
 110 provision of this kind were not made combustion would occur only in a ring, as it were, about the top of the combustion chamber, and there would be a dead cold spot in the middle of the ring. This I overcome by the
 115 construction shown and thus diffuse the flame and heat over the entire surface above the burner chamber. This occurs by reason of air flowing through the central hole 14, which
 120 this meets with products of combustion which flow inward from the combustion chamber through holes 15 into what may be termed a partial vacuum within the top of the inner combustion tube. The fresh heated air fed
 125 through the said hole 14 promotes and completes combustion in this central space.

In Fig. 1 a drum O is shown as connected
 130 with the top plate of the stove, and extending down so as to practically inclose the combustion portion of the burner. This drum is designed to protect the burner from adverse drafts or gusts of wind which are liable to materially disturb combustion. It is made
 135 sufficiently large not to interfere with the

movements of the burner tubes, and has an opening about the burner at its bottom and suitable and sufficient openings about its top to permit all the air necessary to supply combustion, but it is also sufficiently closed to prevent the burner from being disturbed from winds or breezes as noted. In a full sized burner the space between the perforated tubes is about three-eighths of an inch and equal all around. The perforations in the tubes should start directly at the bottom so as to promote a blue and odorless flame.

It will be noticed that the tubes may be turned or rotated on their seats, and this is done to adjust them to an equal flame all around the burner, providing the wick is not truly trimmed.

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

1. In an oil burner, the body of the burner constructed for a wick, the combustion tubes connected together and free to rotate on the burner, and a single projection on the outer tube forming a pivot on which to tilt said tubes to light the burner, and continued outwardly from the tubes to constitute a handle

for rotating said tubes, substantially as described.

2. The burner, and connected inner and outer perforated combustion tubes having a chamber between them, the inner tube being provided with a diaphragm in its upper end having a central air opening or passage and the said inner tube extending above the outer tube and having a series of large openings about its top above said diaphragm, said inner tube being imperforate between said diaphragm and said openings, substantially as described.

3. The burner described having a pair of perforated combustion walls and two perforated diaphragms spanning the interior of the burner and arranged respectively in about the plane of the base of flame and some distance above such base and forming a cooling and air collecting chamber between them, substantially as described.

Witness my hand to the foregoing specification this 22d day of February, 1893.

ATWELL J. BLACKFORD.

Witnesses:

E. O. PHILLIPS,
FRANK BERRY.