

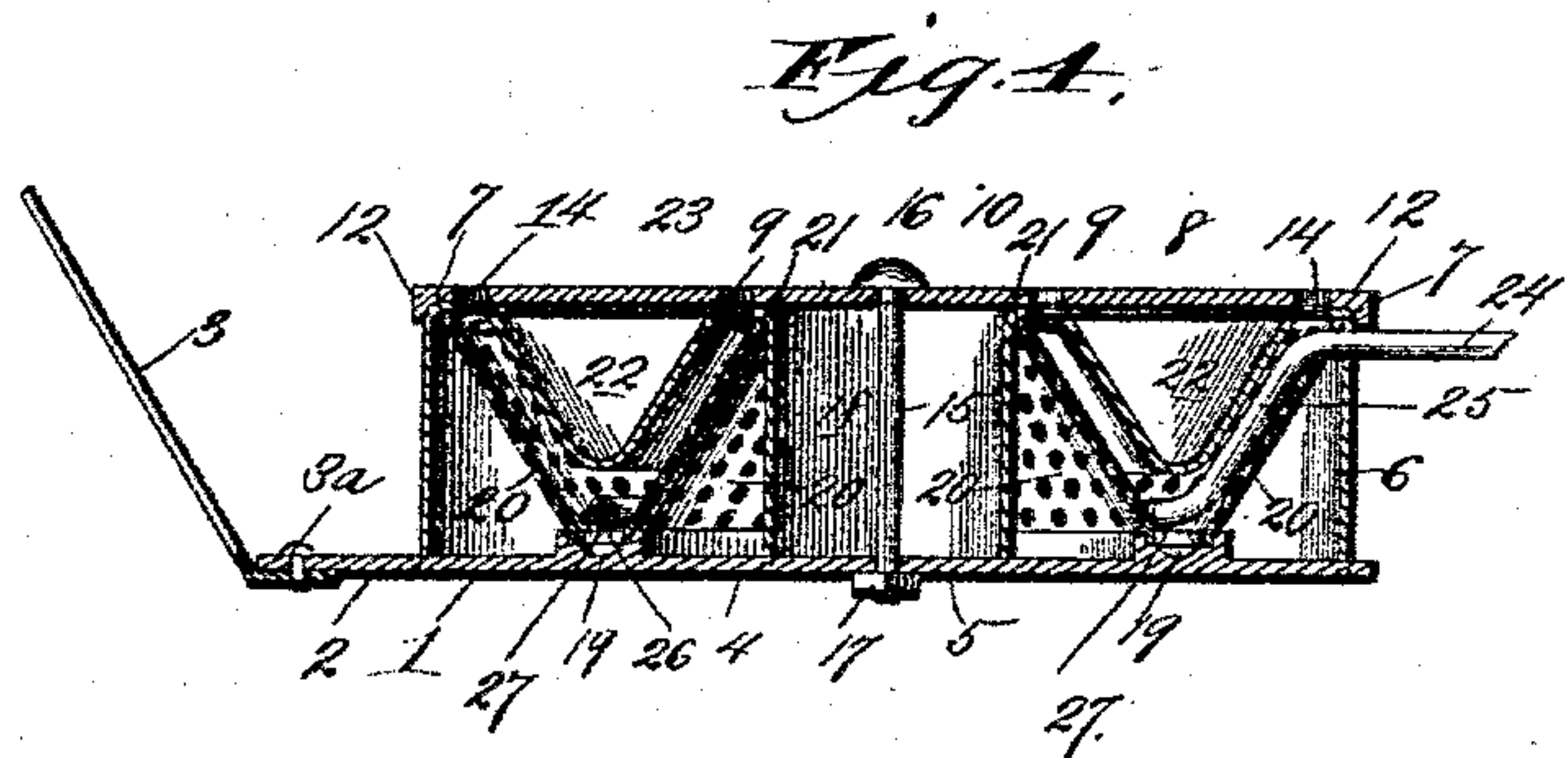
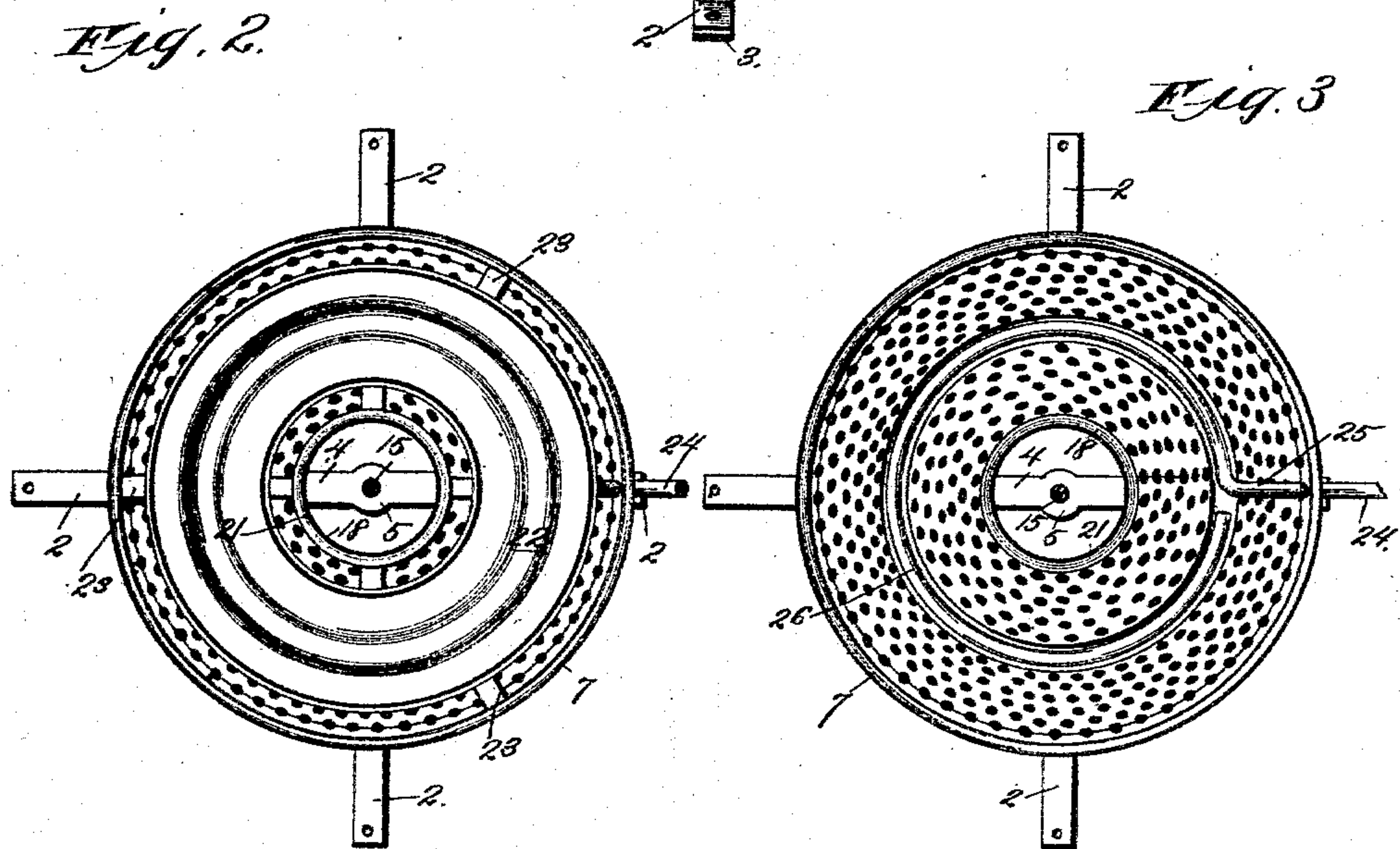
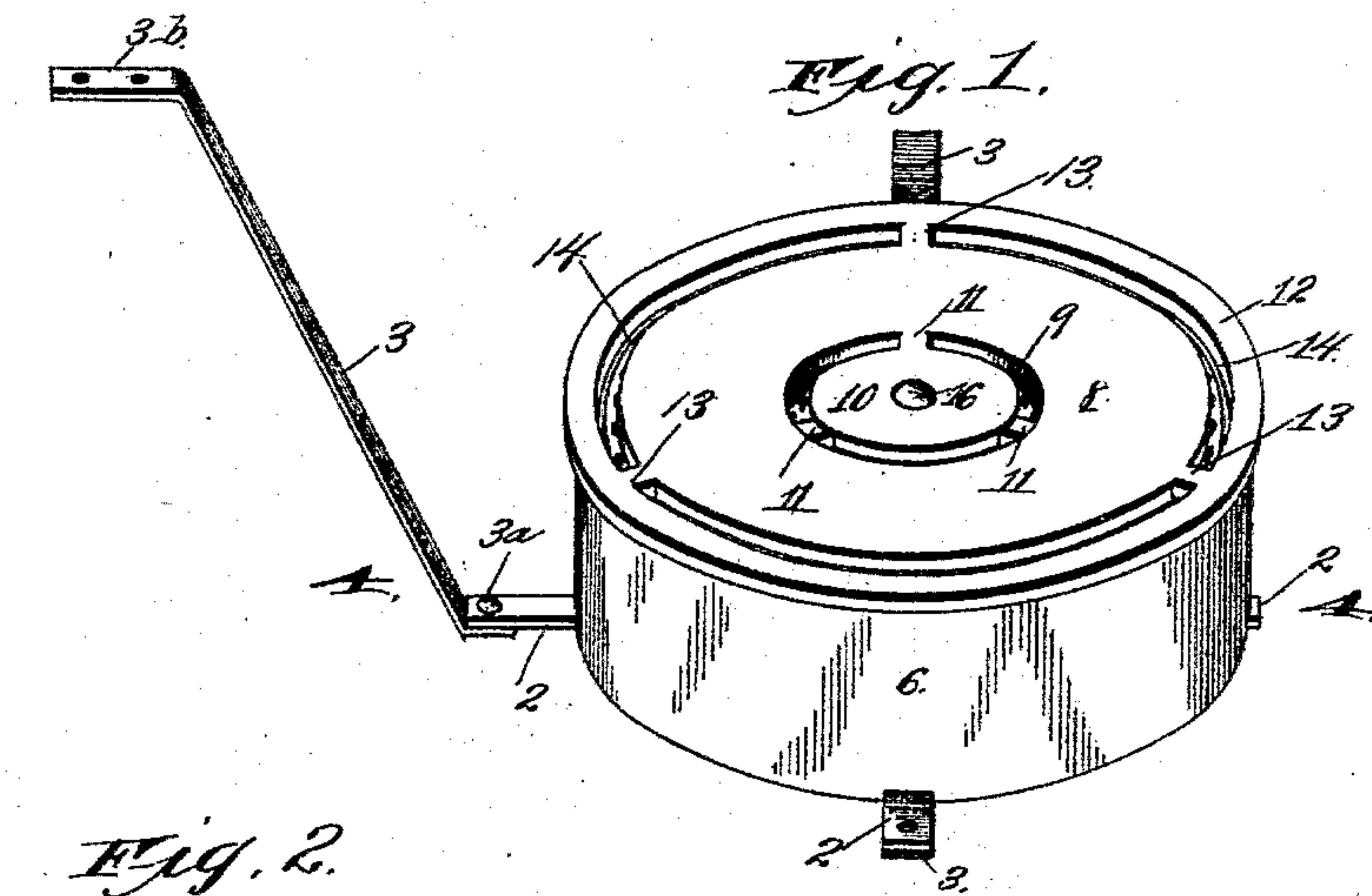
(No Model.)

2 Sheets—Sheet 1.

J. A. CHANDLER.
VAPOR BURNER.

No. 515,422.

Patented Feb. 27, 1894.



Witnesses:
Wm. P. Hooper
John L. Condon

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UNITED STATES PATENT OFFICE.

JOHN A. CHANDLER, OF KANSAS CITY, MISSOURI, ASSIGNOR OF ONE-HALF
TO NELLIE D. WATERS, OF SAME PLACE.

VAPOR-BURNER.

SPECIFICATION forming part of Letters Patent No. 515,422, dated February 27, 1894.

Application filed May 28, 1892. Serial No. 434,728. (No model.)

To all whom it may concern:

Be it known that I, JOHN A. CHANDLER, of Kansas City, Jackson county, Missouri, have invented certain new and useful Improvements in Vapor-Burners, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part hereof.

My invention relates to appliances for transforming inflammable liquids into combustible vapors and for burning the same, for heating, cooking, and various other purposes.

The objects of my invention are to produce a vapor-burner which shall be simple, strong, durable, compact, and inexpensive in construction, and also automatic and reliable and likewise perfectly safe in its vaporizing action.

A still further object of my invention is to produce a vapor-burner which shall, in addition to the advantages above enumerated, possess the maximum of vaporizing area together with compactness, and which shall directly vaporize the liquid fuel within its feed-pipe, and also thoroughly distribute the vapors throughout the combustion-surfaces of the burner.

To the above purposes my invention consists in certain peculiar and novel features of construction and arrangement, as hereinafter described and claimed.

In order that my invention may be fully understood, I will proceed to describe it with reference to the accompanying drawings, in which—

Figure 1 is a perspective view of a vapor-burner embodying my invention. Fig. 2 is a plan view of the same with the cap or top piece removed. Fig. 3 is a plan view of the same with its internal deflecting-plate removed. Fig. 4 is a transverse vertical section of the same, on the line 4—4 Fig. 1. Fig. 5 is a view similar to that of Fig. 4, but showing certain modifications of construction hereinafter described. Fig. 5^a is a detached perspective view of the covering-ring used in the burner shown in Fig. 5, the ring being viewed toward its under side. Fig. 6 is a view partly in side elevation and partly in transverse vertical section, of a burner having certain further modifications of construction. Fig. 6^a is

a detached perspective view of the covering-ring used in the burner shown in Fig. 6. Fig. 7 is a view similar to that of Fig. 6, but showing certain still further modifications of construction. Fig. 8 is a detached plan view of a modified form of the base used in the several forms of burners shown in the preceding figures.

Referring first to the construction shown in Figs. 1, 2, 3, and 4, and also in Fig. 8, 1 designates the base of the burner, this base being preferably in the form of a metal casting, and of circular shape, as shown. From four opposite points of this base 1 extend radially outward four horizontal lugs or arms 2, to which are riveted, as at 3^a, or otherwise suitably attached, the lower ends of a corresponding number of obliquely upward and outward extending bracket-arms 3; the upper ends of said bracket-arms being designed for attachment beneath the top-plate of a stove or other similar structure. Diametrically across this base 1 extends a straight bridge-piece or bar 4 which is preferably formed integrally with said base, and which, midway of its length, is preferably formed with a boss or enlargement 5, for a purpose to be hereinafter explained.

6 designates the outer wall or casing of the burner, this wall or casing being preferably of sheet-metal, and in any event of non-ferrous material. The said wall or casing 6 is shown in the figures above referred to, as of comparatively short or shallow form, and this is the preferred form, in this instance, since it permits the flames from the burner to approach closely to the utensil or surface of any kind which is to be heated. In any event the said outer wall or casing 6 is preferably of cylindrical form, as shown, and the upper margin 7 of the casing is preferably turned inward and downward, as shown, so as to receive the outer portion of the horizontal top-piece or cap 8 of the burner. This cap or top-piece is preferably in the form of a single metal casting, and its central or body portion is preferably of annular form, as shown, so that its outer margin is of correspondingly circular contour. Through the center of this top-piece or cap 8 is formed an opening 9, the margin of which is preferably of circular

form, and within this opening is located a center-piece 10 which is also preferably of disk-form; said counter-piece being of considerably less diameter than that of the opening 9, so as to leave preferably a circular space between the outer margin of the center-piece and the inner margin of the body-portion of the cap 8. The center-piece 10 is connected integrally to the cap 8 by any suitable number of radial arms 11, as shown, and concentric to the outer margin of the body-portion of the cap 8 is an external ring 12 which is integrally connected to the body-portion of the cap by any suitable number of integral radial arms, 13, as shown; the arrangement being such that an opening 14 which is preferably of circular form intervenes between the outer margin of the cap 8 and the inner margin of the ring 12. This cap 8 and its center-piece 10 and ring 12, are retained in proper position by a vertical through-bolt 15, the head 16 of which rests upon the top of the center-piece 10, and which extends downward through the center of the burner; the lower end of the bolt passing through the boss or enlargement 5 of the cross-piece 4 of the base, and a retaining-nut 17 being screwed upon the lower end of the bolt, as shown. A central vertical wall 18, preferably of cylindrical form, rests at its lower end upon the cross-piece 4 of the base 1, and the center-piece 10 of the cap rests upon the upper end of this center-wall; said wall corresponding in diameter with the center-piece 10, and said center wall being of non-foraminous material, for a purpose to be hereinafter explained.

19 designates a continuous trough or channel which is preferably of circular form, and which is also preferably of semi-circular form in cross-section, and said trough or channel is formed integrally upon the upper side of the base 1. The inner sides of the walls of this trough or channel 19 are rabbeted, as shown, to receive the lower edges or margins of two inclined foraminous walls; the inner one of said walls inclining upwardly and inwardly, and resting at its upper margin or edge beneath the outwardly turned upper edge 21 of the center wall 18, while the outer wall 20 inclines upwardly and outwardly, and rests at its upper margin beneath the inwardly turned upper edge 7 of the outer wall 6. It will thus be seen that the foraminous walls of the burner form together an annular and V-shaped passage or recess, the apex of which is covered by the trough 19 above described.

Interposed between the foraminous walls and occupying the V-shaped passage or recess of the burner is an annular and V-shaped non-foraminous casing 22 the bend or apex of which lies directly above and at some distance from the trough 19. The outer portion of this non-foraminous casing extends obliquely upward and outward and its upper margin lies beneath the outer margin of the body-portion of the cap 8, while the inner portion of said casing extends obliquely up-

ward and inward and its upper margin lies just beneath the inner margin of the body-portion of the cap 8. This casing is supported in its described position by any number of brackets 23 each of which is of approximately inverted L-shape; the outer arms of said brackets being riveted or otherwise suitably secured to the inner side of the casing, near its upper margin, and the inner extremities of said brackets abutting against the outer side of the foraminous wall 20, near the upper margin thereof. It will thus be seen that the non-foraminous casing 22 is removable, and it will also be understood, from the ensuing description, that the said non-foraminous casing 22 acts as a deflector for the products of combustion.

24 designates the feed-pipe of the burner, this pipe being presumably connected in suitable manner at its outer end to a suitable tank or reservoir for liquid fuel. The feed-pipe 25 passes laterally through the outer casing or wall 6, and also similarly through the outer foraminous wall 20, near the upper margin of the same, and is then bent downward, as at 25, so as to extend along the said outer foraminous wall 20. The lower portion 26 of this feed-pipe is bent into circular shape, so as to conform to the shape of the trough 19, and lies a slight distance above said trough, as shown. This pipe is perforated for the escape of the inflammable vapors, either only on its under side as shown, or else entirely throughout its body-portion, if so preferred.

Now, when the burner is to be used, a quantity of the oil or liquid fuel is first allowed to flow through the feed-pipe 24 and out through the perforations 27 upon the trough 19. A lighted match, or a flame from any other suitable source is now thrust upward through the bottom of the burner, or into the circular opening 9 or 14, and the liquid is ignited. In a few moments the oil or liquid fuel in the downwardly extending portion 25 and in the circular portion 26 of the feed-pipe 24 will begin to vaporize, by reason of the heat within the burner, and will flow as vapor downward through the pipe and out through its perforations; the vapor being mixed with air which flows upward through the open base of the burner and through the foraminous walls 20, and being instantly ignited. After the burner has been in operation for a moment, the vaporizing action described is continuous, and the flames resulting from the combustion rise in two circular portions through the openings 9 and 14 in the cap 8. It will be seen that the amount of surface presented by the downwardly extending portion 25 of the feed-pipe 24 is very extensive so that a copious vaporizing action occurs in said portions 25 and 26 of the feed-pipe 24. It will be further seen that the deflector-casing 22 serves to concentrate the heat within the burner and directs the flames outward through the openings 9 and 14.

I desire it to be further understood that

while I have shown and described the burner as of general circular or cylindrical form, it is to be of rectangular, polyangular, oval, spiral, or other similar forms, without departing from the essential spirit of my invention. Also that the base 1 may be formed with more than one circular portion, if preferred.

In Figs. 5 and 5^a, I have shown a burner which embodies the same essential principles of construction and operation as those above described, and which also embodies certain modifications of construction which I will now proceed to describe. In this instance, the casing 6, the cap 8, the foraminous walls 20, deflecting-casing 22, inner casing 18, and base 1 are of the same general form as above described, excepting that the casing 6, foraminous walls 20, deflector 22, and casing 18 are shown as higher than before. These parts may be of such height, and are preferably so, or they may be of less height, as in Figs. 1, 2, 3, and 4, if preferred. In this instance the base 1 is formed with a channel or trough 28 which is preferably rectangular in cross-section and into this trough or channel is inserted a circular covering-plate 29 which is concavo-convex in cross-section, and which is, furthermore, placed with its concave side downward, as shown. At its margins, the covering ring or plate 29 is formed with a number of small recesses 30 which permit of the escape of the vapors. The feed-pipe 24 enters the upper part of the outer wall or casing 6, and the outer foraminous wall 20, as before, and also extends obliquely downward and inward, as at 25, along the inner surface of said outer foraminous wall 20, as before. In this instance, however, the feed-pipe terminates at the lower end of the oblique portion 25; the lower end of said oblique portion being left open, and entering an opening 31 in the corresponding portion of the covering plate or ring 29. When the burner has been ignited the oil is vaporized in the oblique portion 25 of the feed-pipe, and the vapor flows out of the open end of the pipe and fills the space within the trough or channel 28 and beneath the covering ring or plate 29, and said vapor flows out of the openings 30, is mingled with air, and is ignited, so as to appear as flames which extend through the openings 9 and 14 in the cap 8.

In Figs. 6 and 6^a, a burner is shown which embodies the same essential features, and also certain further modifications of construction. In this instance, the trough 19 is used, and is of the form shown in Figs. 1, 2, 3, and 4. A flat foraminous covering ring or plate 32 is here used; and the lower open end of the feed-pipe enters the opening 31, as before. Thus an equally capacious space is formed within the trough for the vapors.

In Figs. 7 and 8, the trough 28 is used as shown in Figs. 1, 2, 3, 4, and 6, and the concavo-convex covering plate or ring 29, as shown in Fig. 5. But in this instance, the feed-pipe 24 is screwed into the outer end of

a channel 33 which is formed on the under side of the base 1, and which extends radially thereof, as shown. The inner end of this channel curves upwardly and communicates with the bottom of the trough 28. When the burner is in operation, the base 1 becomes heated, so that the oil is vaporized in the channel 33, and flows into and fills the trough or channel, and escapes through the covering ring or plate 29, as before.

It is to be understood that the statements as to the modifications of the general form of the burner from circular or cylindrical, to rectangular, spiral, oval, &c., made with reference to the structure shown in Figs. 1, 2, 3, and 4, are applicable also to the structures shown in Figs. 5, 5^a, 6, 6^a, and 7 and 8, and that in any event the burner is simple, strong, durable and compact in construction, and effective, automatic and perfectly safe in its operation.

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

1. A vapor-burner, comprising a base, an annular casing supported upon said base, and an annular inner casing also supported upon said base, and an annular trough upon said base and interposed between the inner and outer casings, annular foraminous walls rising divergently upward from the outer and inner margins of the trough, an oil supply pipe passing through the outer wall and communicating with the trough, and an annular deflector comprising upwardly diverging walls located between the foraminous walls and above the trough, substantially as set forth.

2. A vapor-burner, comprising a base, having a trough formed in its upper side, an annular vertical casing resting upon said base and surrounding the trough, an inner vertical casing surrounded by the trough and also resting upon the base, a pair of foraminous walls diverging upwardly from the inner and outer margins of the trough, and an annular deflector arranged between the foraminous walls and above the trough, and a top-plate placed upon the upper ends of the inner and outer casings, and an oil-pipe communicating with the trough, substantially as set forth.

3. A vapor-burner, comprising a base having a trough or channel in its upper side, a vertical casing surrounding said trough or channel and an inner vertical casing surrounded by said trough or channel, a pair of foraminous and annular walls diverging upward from opposite sides of said trough to the inner and outer casings, an annular deflector comprising upwardly diverging walls interposed between the divergent foraminous walls and above the trough, and a top-plate secured upon the upper ends of the inner and outer casings and having openings registering with the spaces between the foraminous walls and the annular deflector, substantially as set forth.

4. A vapor-burner, comprising a base, inner and outer annular casings resting upon said base, an annular trough formed in the upper side of the base and between the inner and
5 outer casings, and an annulus or ring resting upon the base and over the trough and having notches or recesses in its edges communicating with said trough, annular foraminous walls rising divergently from the inner and
10 outer margins of the trough, and an annular deflector arranged between said foraminous

walls and above the trough, and an oil-pipe passing through the outer casing and through the annulus or ring and communicating with the trough, substantially as set forth. 15

In testimony whereof I affix my signature in the presence of two witnesses.

JOHN A. CHANDLER.

Witnesses:

HARRIET E. PRICE,

JNO. L. CONDRON.