

No. 754,661.

PATENTED MAR. 15, 1904.

A. MAEULEN.
OIL BURNER.

APPLICATION FILED JUNE 24, 1903.

NO MODEL.

2 SHEETS—SHEET 1.

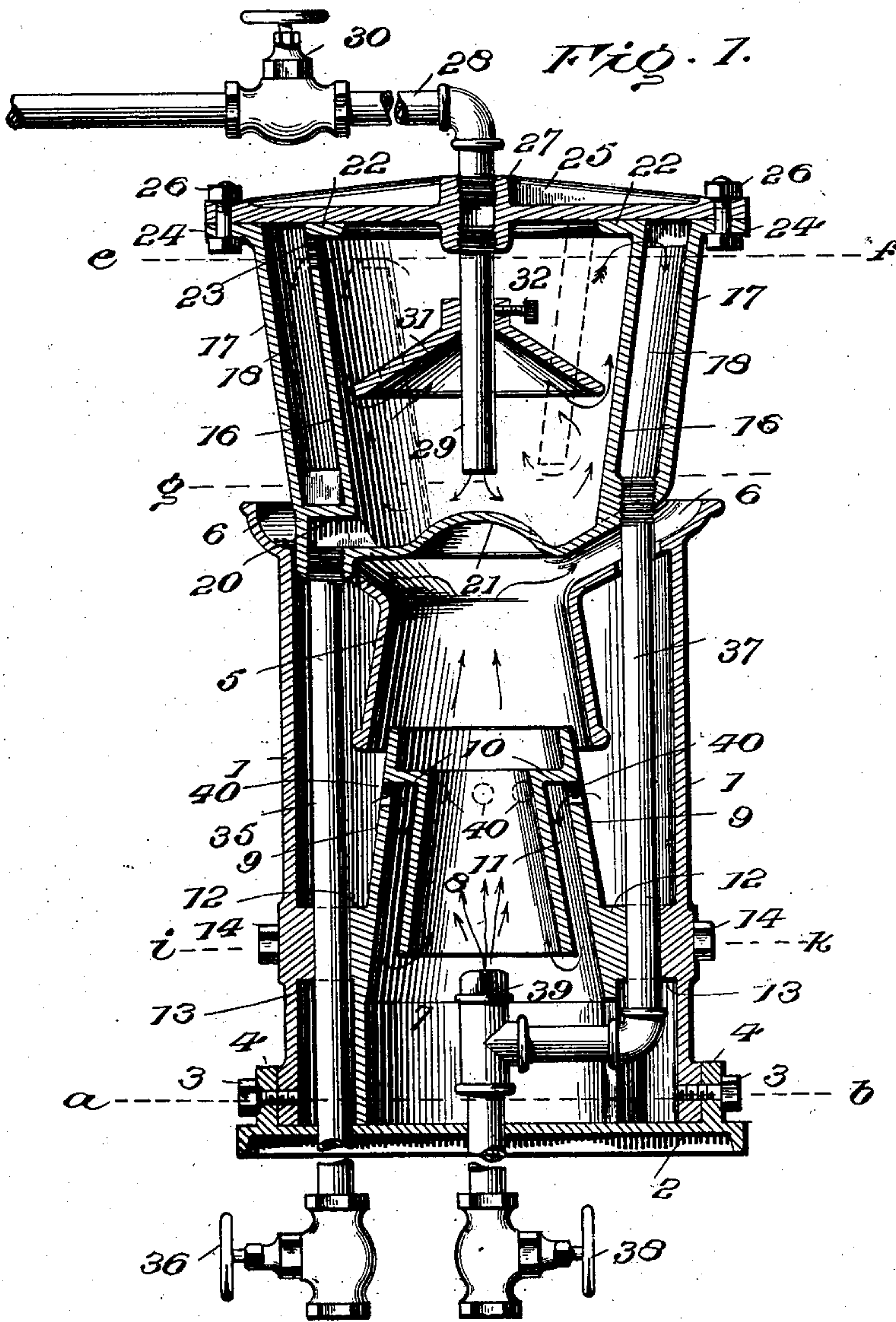
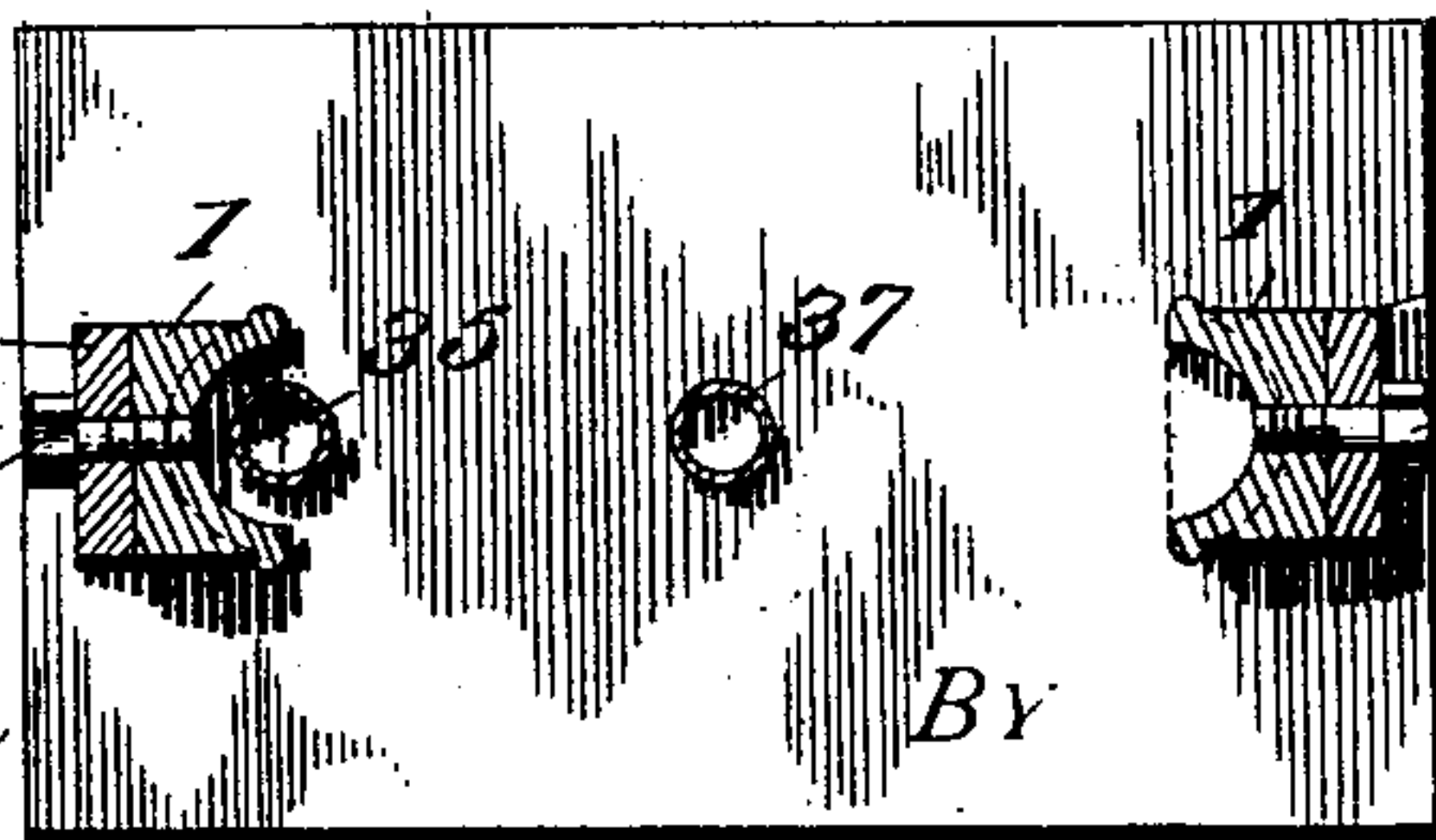


Fig. 2.



WITNESSES:

John J. ...
George Matthews

INVENTOR

Albert Maculeu

BY

John C. W. ... Attorney

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2 SHEETS—SHEET 2.

Fig. 3.

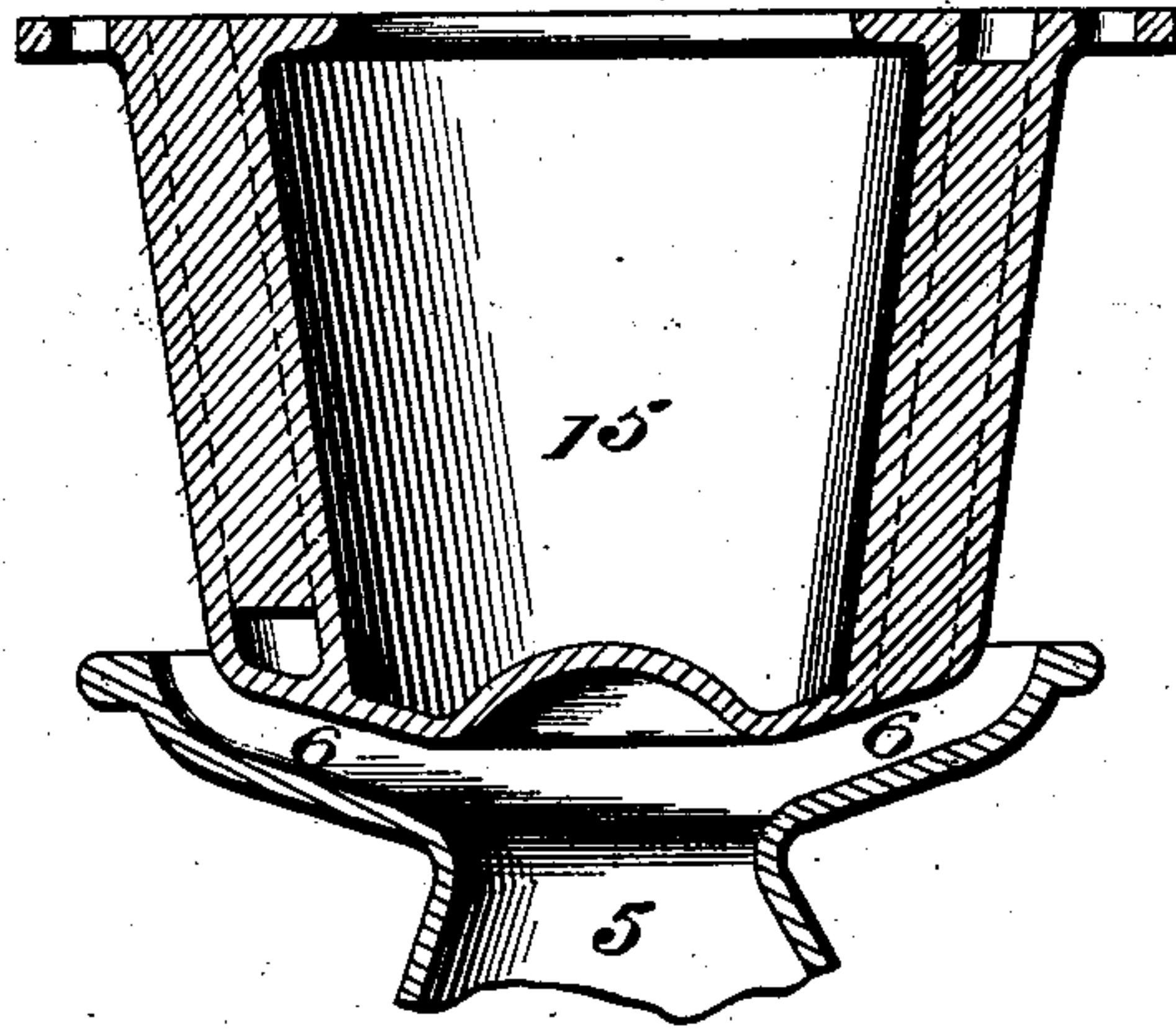


Fig. 4.

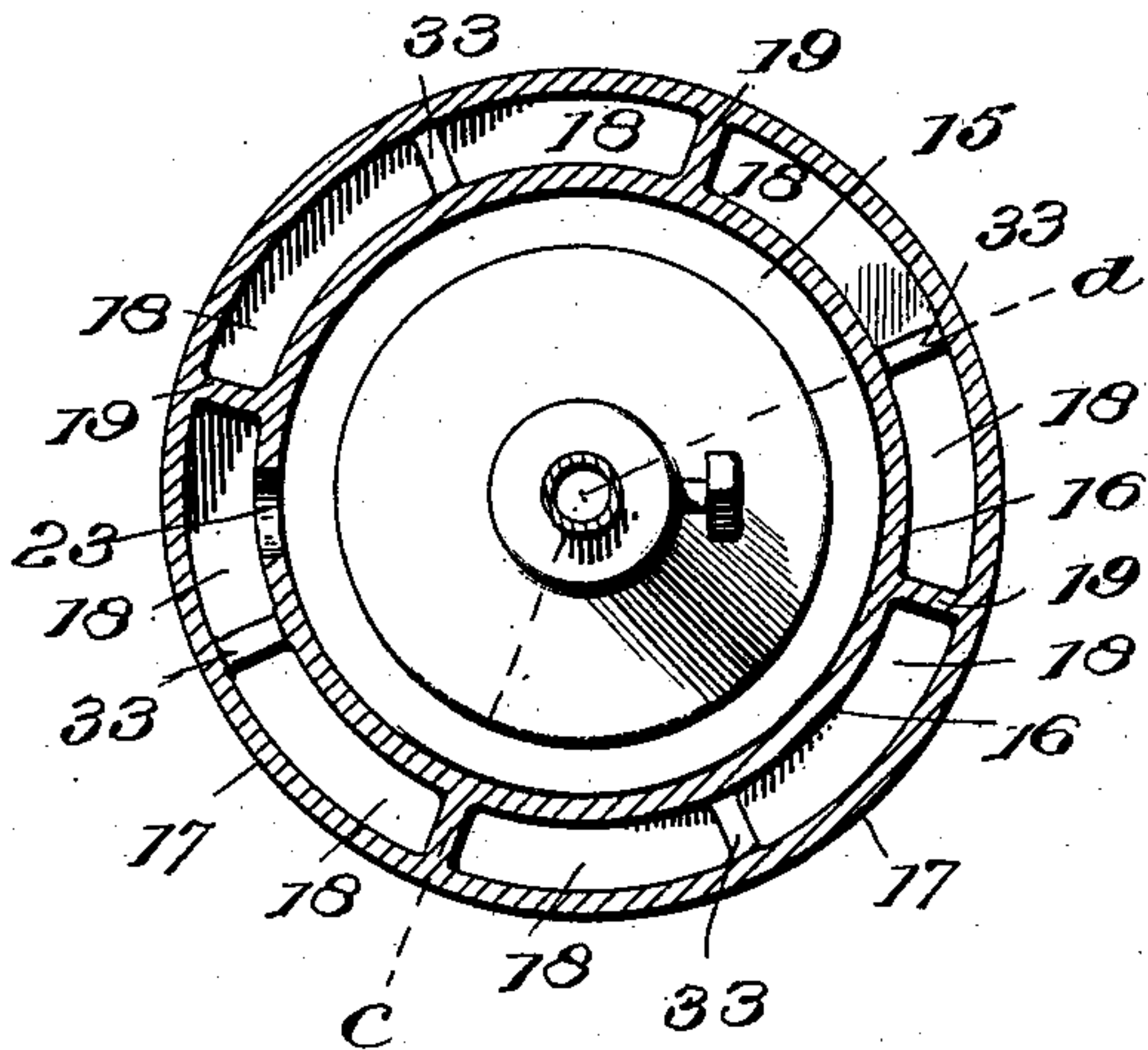


Fig. 5.

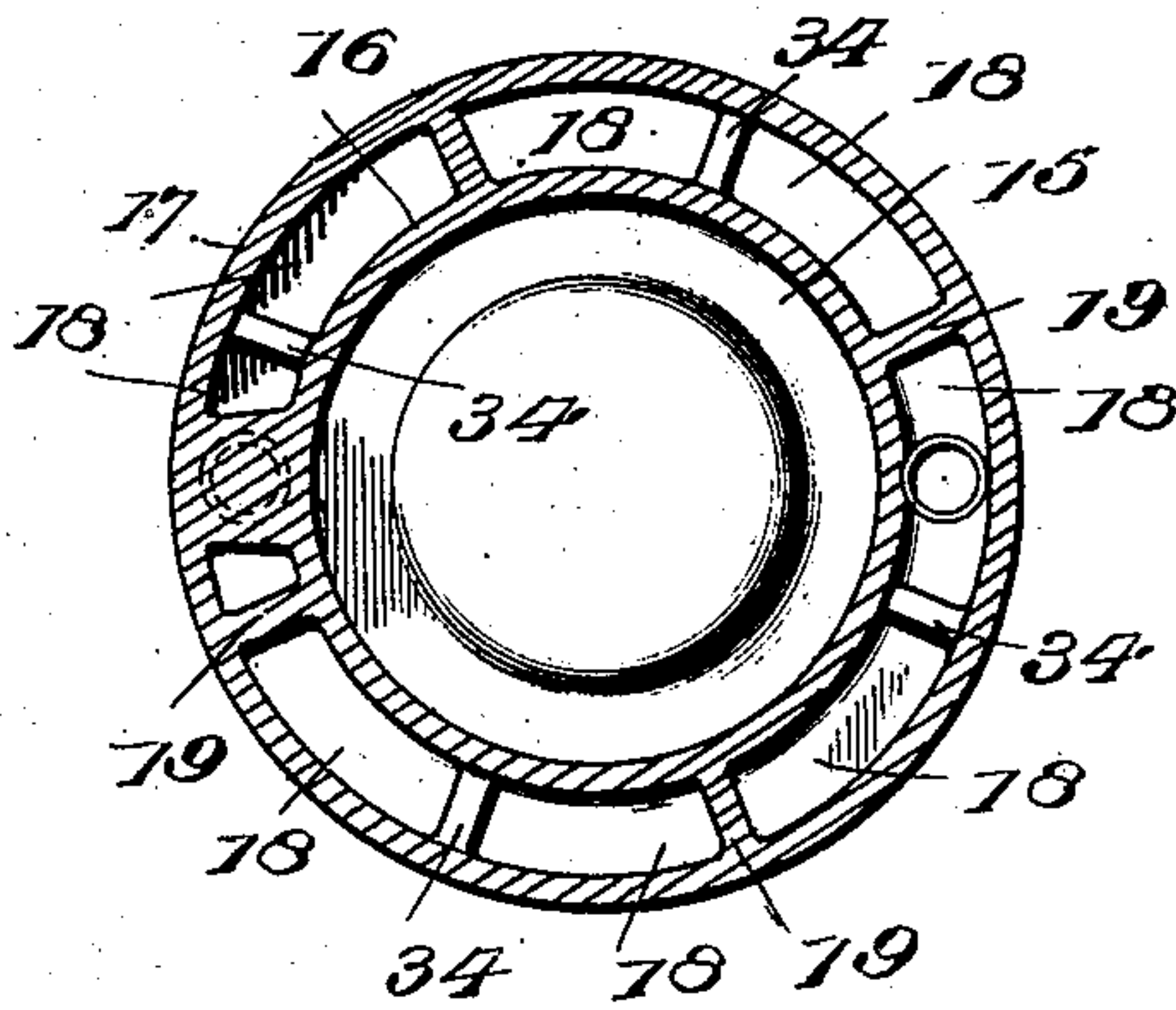
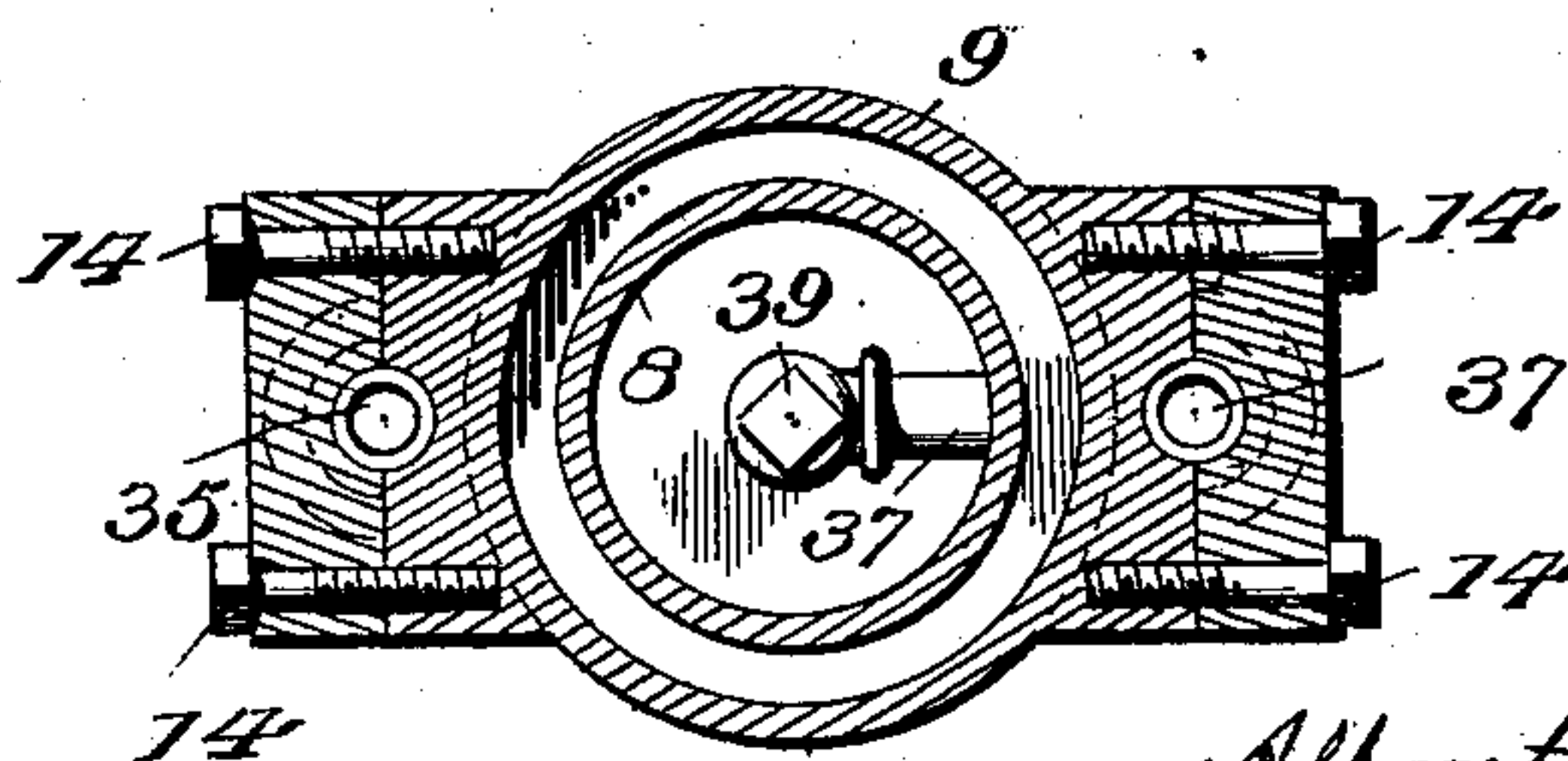


Fig. 6.



WITNESSES:

J. M. M. M.
Wm. M. M.

INVENTOR

Albert Maehlen

BY

J. M. M. M.

Attorney

UNITED STATES PATENT OFFICE.

ALBERT MAEULEN, OF DENVER, COLORADO.

OIL-BURNER.

SPECIFICATION forming part of Letters Patent No. 754,661, dated March 15, 1904.

Application filed June 24, 1903. Serial No. 162,920. (No model.)

To all whom it may concern:

Be it known that I, ALBERT MAEULEN, a citizen of the United States, residing at Denver, in the county of Arapahoe and State of Colorado, have invented certain new and useful Improvements in Oil-Burners; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to certain new and useful improvements in hydrocarbon-burners, and especially to that type designed to burn crude oil.

My invention has for its object to provide a burner which shall be comparatively simple and economic of construction, having its parts readily assembled and interchangeable when repairs become necessary, and which shall embody in its organization effective means for preventing the clogging of the generating-coil with the heavier constituent of the oil.

My invention also has for its object to provide for expeditious and effective cleaning of the several parts whenever necessary.

With these ends and objects in view my invention consists in the construction and arrangement of the several parts hereinafter and in detail explained, and particularly in the combination and arrangement with the coil for containing and conducting the gaseous products of a retort within which the crude oil is subjected to the action of heat.

In order that those skilled in the art to which my invention appertains may know how to make and use the same and fully appreciate its advantages, I will proceed to describe the construction and operation of my improved burner, referring by numerals to the accompanying drawings, in which—

Figure 1 is a central vertical section of one of my improved oil-burners with the supply and waste pipes and jet shown in elevation. Fig. 2 is a horizontal section taken on the line *a b* of Fig. 1. Fig. 3 is a vertical section on the line *c d* of Fig. 1. Fig. 4 is a horizontal section on the line *e f* of Fig. 1. Fig. 5 is a similar section on the line *g h* of Fig. 1, and Fig. 6 is a similar section on the line *i k* of Fig. 1.

Similar reference-numerals indicate like parts in the several figures of the drawings.

1 is the main frame, to the lower end of which is secured a base-plate 2 by means of screw-bolts 3, which pass through lugs 4, cast on the base-plate, and are threaded into the main frame, as clearly shown at Fig. 1.

5 is a concentrating-cone cast integral with the main frame and formed with flues or passages 6, as shown at Figs. 1 and 3.

7 is a primary mixing-cone cast with double concentric walls 8 and 9, joined near the upper end by an integral ring-flange 10, leaving a space 11 between the walls 8 and 9. The outer wall 9 extends below the base of the inner wall 8, and the lower portion of this wall 9 is straight and in parallelism with the main frame 1 and rests upon the base-plate 2. Lugs 12 are cast on opposite sides of the wall 9 and corresponding lugs 13 are cast on the frame 1, and the generating-cone is secured in position by screw-bolts 14 passing through the lugs 12, as shown at Figs. 1 and 6, passages being formed in the lugs 12 and 13 for conduit-pipes, hereinafter referred to.

The space between the concentric walls of this generating-cone communicates at the upper end with the atmospheric air on the outside, and hence as such air is drawn down to be commingled with the gas delivered by the jet, as will be hereinafter explained, said air is subjected to the action of the heat generated in the cone and is consequently delivered in a condition to be more readily affiliated and ignited with the gas.

15 is a hollow cast-iron retort in the form of an inverted frustum of a cone with concentric walls 16 and 17, having a circulating-space between them which is divided into vertical compartments or channels 18 by vertical partitions 19. The concentric walls are connected at the bottom and the space between the walls closed by a floor 20, and the lower end of the retort is closed by dome-shaped bottom 21, cast integral with the outer wall 17.

The inner wall 16 is formed at its upper extremity with a circumferential flange 22 and with a port or passage 23 leading into one of the vertical compartments 18, as clearly shown at Fig. 1.

The outer wall 17 is formed with a peripheral flange 24, to which is secured a cover or cap 25 by means of bolts 26. This cover or cap 25 makes a close fit upon the peripheral flange 22 of the inner wall 16 of the retort, as clearly shown.

The cover or cap 25 is formed with a central hub 27, having an axial passage internally threaded to receive the ends of a feed-pipe made in two sections 28 and 29. The outer section 28 connects with any suitable oil supply or reservoir and is provided with a controlling-valve 30.

A deflecting-cone 31 is secured by a screw 32 to the inner section 29 of the feed-pipe, as clearly shown at Fig. 1, and may be raised or lowered, according to the character of the oil supplied to the retort.

The vertical partitions 19 are formed alternately at the top and bottom with circulating passages or ports 33 and 34.

The retort 15 is seated in any suitable manner within the upper ends of the frame 1.

35 is a waste-pipe connected with a lateral channel leading from one side of the dome-shaped bottom 21 of the retort and extending vertically through the base-plate 2 and is provided with a valve or cock 36, and by means of said pipe any residuum within the retort may be withdrawn, or the retort may be flushed and cleaned in an obvious manner. 37 is a similar pipe provided with a cock or valve 38 and a vertical jet 39. The upper end of this pipe 37 is connected by a screw-thread with the bottom of the retort and communicates with the space between the walls 16 and 17 between two of the vertical partitions 19.

The outer wall 9 of the generating-cone with a series of air-inlet passages 40, is best shown in Fig. 1.

From the construction described it will be seen that aside from the supply-pipe and cleaning-pipes and their connections my improved burner consists practically of five castings—the frame 1, the base-plate 2, the primary mixing-cone 7, the retort 15, and the cap or cover 25—which are economic of construction and readily assembled, and that as all the parts are interchangeable repairs may be economically and expeditiously made.

Having described the construction and arrangement of the several parts of my improved burner, I will now describe its operation.

When the cock or valve 30 in the supply-pipe 28 is opened, oil is fed to the retort and is diffused over the dome-shaped bottom 21 thereof. The initial or starting heat is applied in any well-known manner under the retort, and the gases thus generated within the retort ascend and pass through the port 23 in the upper end of the inner wall 16 of the retort, thence downwardly in one of the vertical spaces 18 between the partitions 19, thence through the next partition at its bottom, thence upward and through the passage at the upper

end of the next partition, thence downward, and so on until it escapes through the pipe 37 and to the jet 39, where it is commingled with a suitable proportion of atmospheric air or oxygen drawn from the outside of the primary mixing-cone 7 through the radial ports or passages 40 and ignites to produce the continuous flame and heat, which is concentrated by the cone 5 and directed against the bottom 21 of the retort 15, the necessary draft to sustain the combustion occurring through the passages 6, all as clearly indicated by the various arrows in Fig. 1.

After extended use and if it becomes necessary to clean the retort 15 the valve or cock 30 in the supply-pipe 28 is closed and the cock or valve 36 in the waste or cleaning pipe 35 is opened, whereupon any heavy products or precipitates within the retort may be removed through the pipe 35, and if they be of such a character or density as not to flow by gravity through said pipe 35 the cover 25 may be removed and the retort flushed in an obvious manner.

Should it become necessary to withdraw any products of condensation from the space 18 between the concentric walls 16 and 17 of the retort, the valve or cock 38 is opened, thus establishing a free gravity-passage for the removal of the same.

The advantages of my improved gas-circulating chamber surrounding an interior retort over the ordinary coil-pipe will be readily appreciated, for with the latter construction the heavier products of the oil soon clog and close the circulating channel or coil and it becomes difficult, if not impossible, to clean the same and renders necessary the complete dismemberment of the burner and the substitution of a new coil, all of which is not only comparatively difficult, but involves great expense. Furthermore, my improved retort and surrounding gas-circulating devices are much more economical in original construction than the ordinary coil of pipe, and the heat generated by the jet is more effectively utilized to produce the generation of gas and husbanded and utilized to a much greater extent than can be the case with burners of ordinary construction.

Many changes may be made in the mere details of construction and designed without departing from the spirit or genus of my invention, which resides in the broad idea of an integral retort and gas circulating and expanding chamber with suitable connections for furnishing a supply of oil to the retort and conveying and mixing the generated gases and a suitable proportion of oxygen to a jet beneath the retort.

Having described the construction, operation, and advantages of my improved burner, what I claim as new, and desire to secure by Letters Patent, is—

1. In an oil-burner, a central retort and com-

communicating and surrounding circulating and expanding gas-chamber cast integral, in combination with an oil-supply pipe leading into the retort, and a heating-jet below the retort and in communication with the circulating and expanding gas-chamber, substantially as and for the purpose set forth.

2. In an oil-burner having a retort and surrounding gas circulating and expanding chamber cast integral, the gas-chamber communicating with the retort and divided into vertical compartments by vertical partitions having gas passages or ports, alternately at the top and bottom; means for supplying gas from the gas-chamber to a heating-jet and means for supplying oil to the retort, substantially as hereinbefore set forth.

3. In an oil-burner such as described, a retort and gas-circulating chamber cast integral and mounted in a supporting-frame; a frame and concentrating-cone cast integral; a generating-cone secured to the frame below the concentrating-cone; an oil-supply pipe communicating with the retort; a jet below the generating-cone and a gas-pipe connecting the jet and the gas-circulating chamber, substantially as and for the purpose set forth.

4. In an oil-burner such as described, a central retort and surrounding gas-circulating chamber cast integral and open at the top, in combination with a removable cap or cover adapted to close both the retort and gas-circulating chamber, and an oil-supply pipe passing through the cap or cover and into the retort, substantially as hereinbefore set forth.

5. In an oil-burner such as described, in combination with the retort and surrounding gas-chamber and the removable cap or cover and oil-supply pipe connected therewith and adapted to deliver oil upon the floor of the retort, a deflector adjustably secured to the oil-supply pipe within the retort, substantially as hereinbefore set forth.

6. In an oil-burner such as described, in combination with the retort and surrounding gas-chamber cast integral, a waste-pipe communicating with the bottom of the retort and provided with a valve or cock, whereby the precipitates within the retort may be withdrawn, substantially as hereinbefore set forth.

7. In an oil-burner such as described, in combination with the central retort and surrounding gas-chamber cast integral, a supporting-frame and concentrating-cone also cast integral, the concentrating-cone adapted to direct the products of combustion against the bottom of the retort and having a flue or flues between it and the retort and leading to the outside, substantially as hereinbefore set forth.

8. In an oil-burner such as described, in combination with the retort and surrounding gas-chamber mounted within a frame provided with a concentrating-cone below the retort; a generating-cone secured to the frame below the concentrating-cone; means for supplying oil to the retort; a jet below the generating-cone and means for supplying gas from the gas-chamber to the jet, substantially as set forth.

9. In an oil-burner such as described, the primary mixing-cone formed with concentric walls closed at the upper end and having an air-space between them, the outer wall having air-passages near the top thereof, whereby the entrained air is caused to travel downward and become heated before commingling with the gas delivered from the jet, substantially as hereinbefore set forth.

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

ALBERT MAEULEN.

Witnesses:

ARTHUR DALE,
G. A. BUCHANAN.