

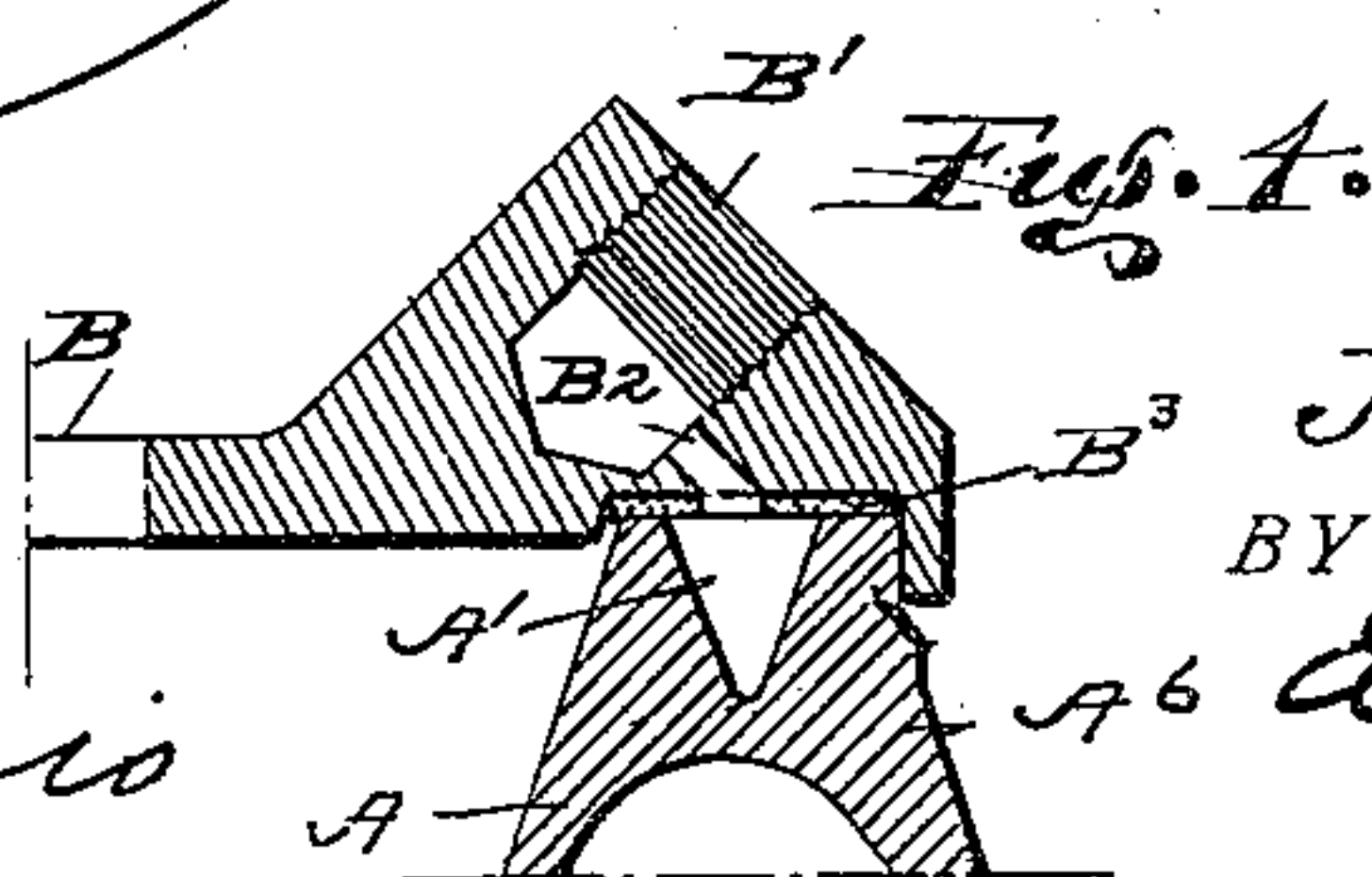
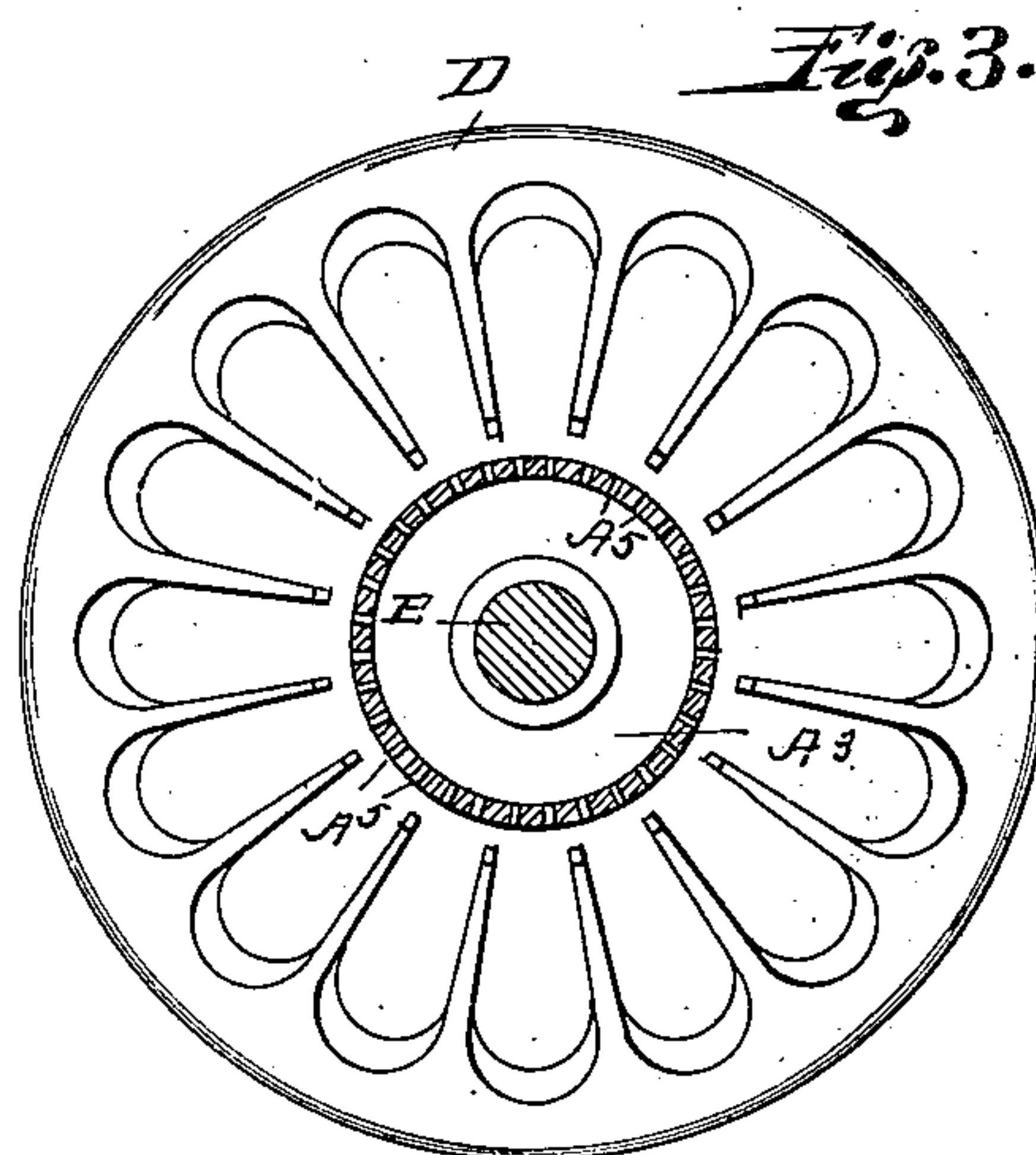
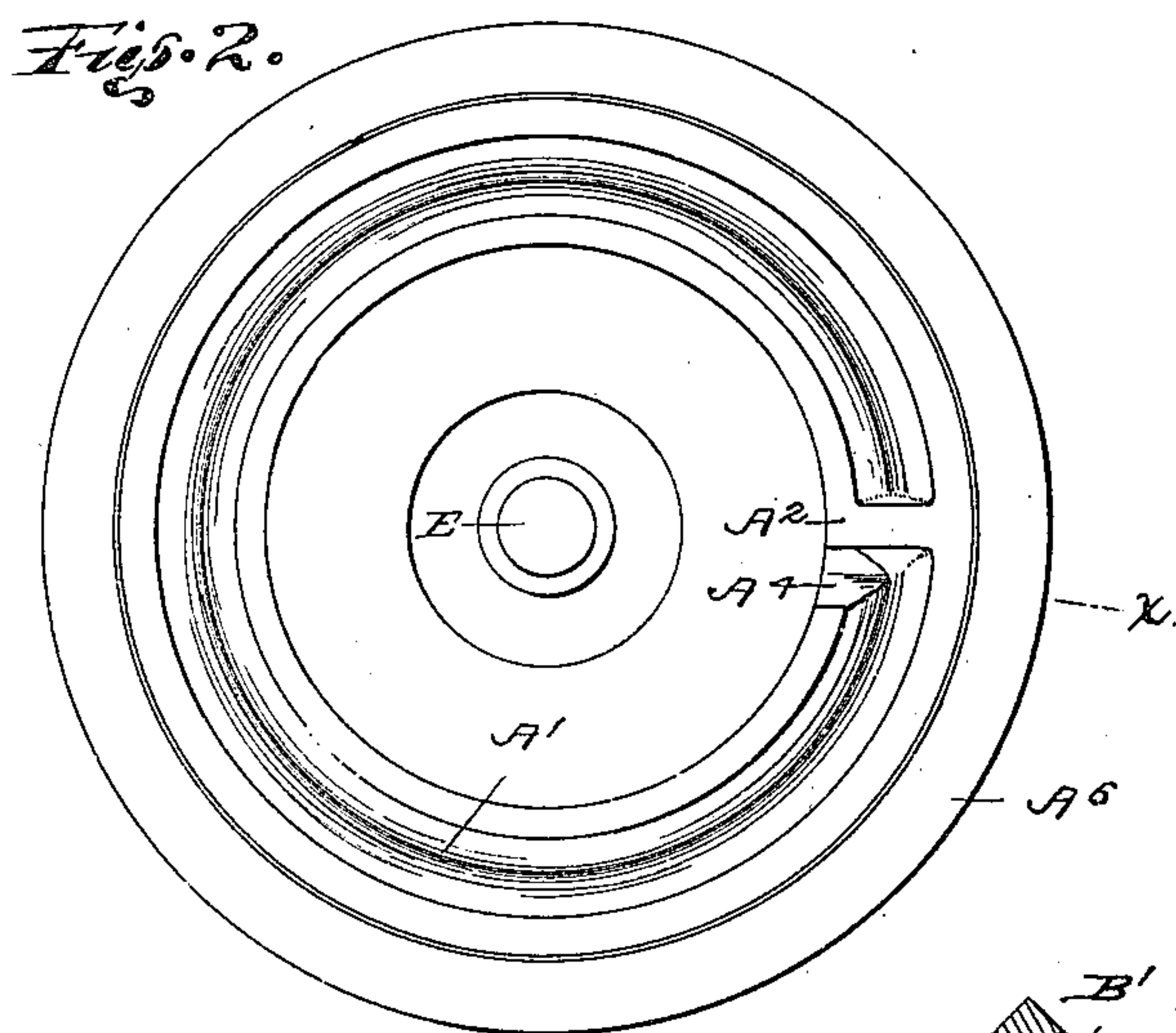
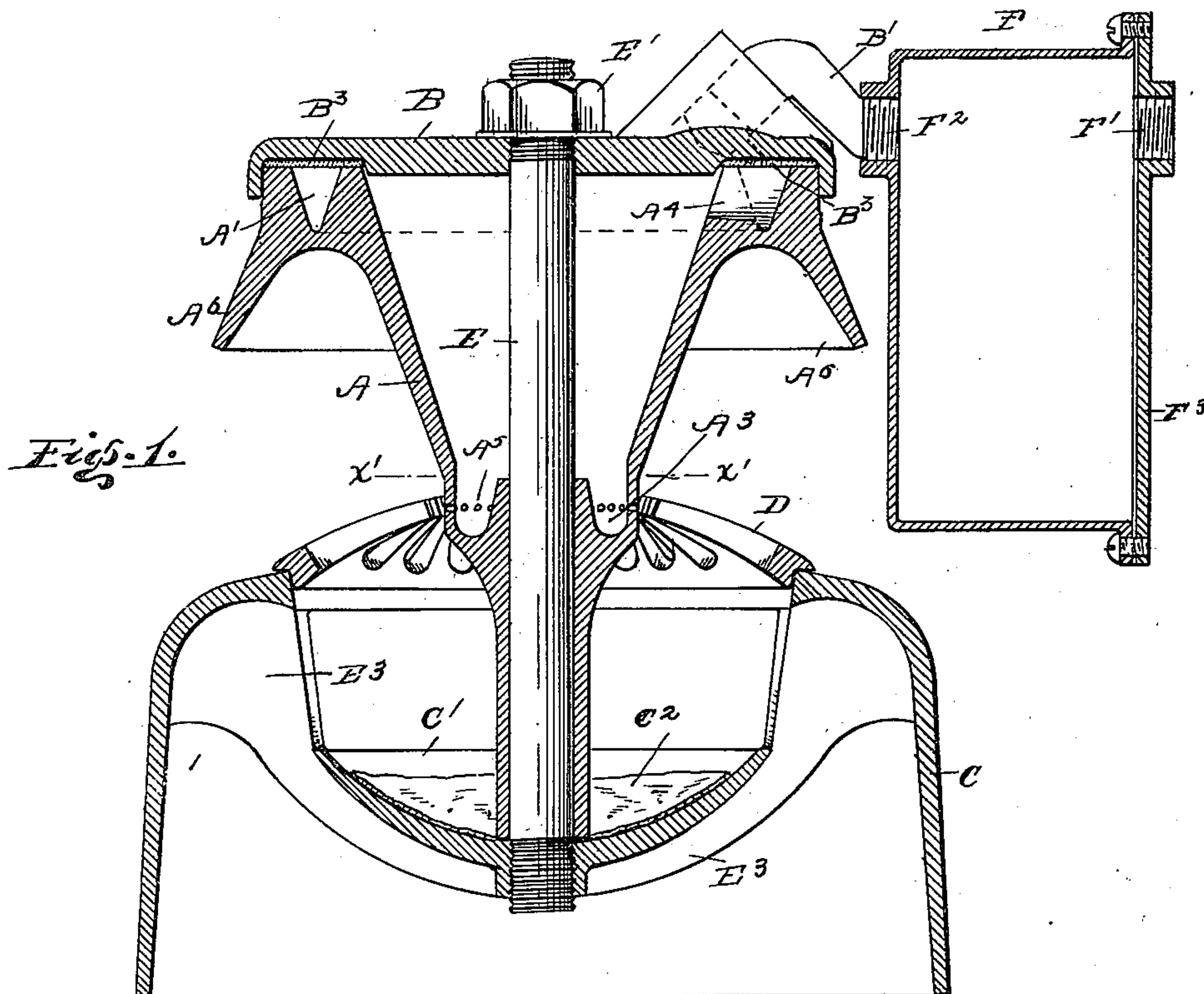
No. 667,641.

Patented Feb. 5, 1901.

J. D. WILLIAMSON.
HYDROCARBON BURNER.

(Application filed Aug. 7, 1900.)

(No Model.)



WITNESSES:

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JAMES D. WILLIAMSON, OF SAN FRANCISCO, CALIFORNIA.

HYDROCARBON-BURNER.

SPECIFICATION forming part of Letters Patent No. 667,641, dated February 5, 1901.

Application filed August 7, 1900. Serial No. 26,190. (No model.)

To all whom it may concern:

Be it known that I, JAMES D. WILLIAMSON, a citizen of Canada, residing at 122 Turk street, in the city and county of San Francisco, in the State of California, have invented certain new and useful Improvements in Hydrocarbon-Burners; and I do hereby declare the following to be a full, clear, and exact description of said invention, such as will enable others skilled in the art to which it most nearly appertains to make, use, and practice the same.

This invention relates to improvements in hydrocarbon-burners, and particularly to that class wherein the hydrocarbon is vaporized before combustion.

The burner illustrated herein is destined particularly for operation in the fire-box of cooking stoves or ranges as a substitute for coal or wood.

In the drawings, Figure 1 is a vertical cross-section of the present burner and the vapor-generator used therewith, the section of the burner being taken on the plane of the line $x x$ of Fig. 2. Fig. 2 is a plan view from above of the burner with the top removed. Fig. 3 is a plan view from above below the line $x' x'$ of Fig. 1. Fig. 4 is a vertical cross-section of a portion of the burner, showing the method of introducing the hydrocarbon thereto.

In the description, with reference to the drawings, distinguishing letters of reference will be given to the major parts of the structure, to which common letters a numeral will be added to distinguish the minor parts of each group.

The retort will be distinguished by letter A, the lid therefor by the letter B, the air-chamber by the letter C, the air-mixer by the letter D, the tie-bolt connecting the various parts together by the letter E, and the vapor-generator by the letter F.

The burner is particularly adapted to the burning of kerosene and will be described in connection therewith. The oil is introduced into the burner by gravitation through the pipe B', connecting by the passage B² with the annular channel A' of the retort A. The oil is introduced behind the wall A² of the channel A', and travels the entire circuit of the channel A' before entering the

vaporizing-retort A. When starting up with the whole apparatus cold, the oil will not vaporize. Preliminary heating of the retort A is provided for by letting the oil overflow into the cup C', having the absorbent wick C² therein, and lighting it. When the retort A has become sufficiently heated, the oil-feed may be regulated to give the desired amount of flame. Presuming the retort to be sufficiently heated, the oil is fed into the channel A' and is converted into a wet vapor in traveling around same to the entrance A⁴ to the vaporizing-retort A, wherein it is converted into a dry vapor and ignited at the exit-holes A⁵. From the exit-holes A⁵ the flame travels upward, striking under the overhanging flange A⁶, and is thrown downward and outward thereby. The channel A' being situated directly over the apex of the angle formed by the flange A⁶ is kept hot. The flame traveling up the side of the retort A keeps it hot and insures the proper vaporizing of the hydrocarbon.

In placing the burners in the fire-box of a stove or under similar condition the air-chamber C is permitted to rest on the grate-bars, the space between and around the burners being closed by fire-clay in any suitable manner to compel the air drawn into the stove to pass up through the air-chamber C and mix with the flames at the holes A⁵. The mixer D is provided to "split" up the air and cause it to mix more thoroughly with the flame to insure the maximum of heat from the combustion of the hydrocarbon.

The best results are obtained from the burner when same is so confined that an artificial draft is caused through the air-chamber C.

Hitherto in endeavoring to supplant coal or wood in cooking-stoves burners of various types have been used in which a large flame is created to reach around the oven, as does the coal-flame. These have been found expensive, sooty, and undesirable, whereas I depend on heating all the air passing into the stove with the minimum of flame and no soot.

Burners constructed in accordance with this invention have proved their ability to handle all the hydrocarbons from gasolene to coal-oils containing an average proportion of bitu-

men or base products. It is in handling the lower-grade oils that the generator F is used. This consists of a hollow box or chamber having its inlet F¹ and outlet F² near the top.

5 The generator-outlet F² is connected to the pipe B' close enough to the burner to receive sufficient heat therefrom to cause the vaporization of the oil before passing into the channel A', leaving the base matter of the oil
10 in the generator F, which may be cleaned by removing the cover F³. Under ordinary conditions the generator F is unnecessary, the base products being trapped in the bottom of the channel A' or in the pocket A³ below the
15 openings A⁵ in the retort A, where such products as sand or other non-combustibles may be removed by removing the lid B.

Any number of these burners may be operated in multiple by connecting the inlets B'
20 to a common supply-pipe.

In assembling the parts the tie-bolt E is screwed into the center of the cup C', which is supported within the air-chamber C by the cross-web E³, the air-mixer D is placed in position, the retort A is slipped onto the bolt E,
25 resting on the bottom of the cup C', the asbestos packing B³ is placed in position over the channel A', and the lid B and the other parts are maintained in their relative positions by the nut E' on the bolt E, screwed against the
30 lid. In adjusting the lid B care should be used to adjust the passage B², to empty into the channel A', at the extreme end removed from the entry A⁴ into the retort A.

35 Having thus described this invention, it is claimed—

1. In a hydrocarbon-burner, the combination of a retort having ignition-holes near its bottom; upwardly-extending, overhanging
40 walls, having an outwardly-extending annular flange near the top thereof; an annular channel situated above the said annular flange; a transverse wall across said channel, an opening from said channel near said transverse wall, into the retort; means for introducing hydrocarbon fluids into said annular
45 channel; a cup situated within an air-chamber beneath the retort; an air-mixing member consisting of a ring having members extending inwardly between the ignition-holes in the retort; a vapor-generator situated within the heat zone of the burner, consisting of a hollow chamber having inlet and outlet openings communicating with the burner and
50 base of supply respectively substantially as described.

2. In a hydrocarbon-burner the combination of a retort, having an annular channel

formed around its upper edge, an opening in said channel communicating with the retort; 60 an outwardly-extending annular flange near the top of the retort; ignition-holes near the bottom of the retort; means for directing a draft of air into contact with the flame of the burner substantially as described. 65

3. A retort for hydrocarbon-burners, consisting of an inverted-cone-shaped chamber with upwardly-extending, overhanging walls, having an outwardly-extending annular flange near the top thereof; an annular channel 70 formed around the top of the retort, a transverse wall in said channel; means for introducing hydrocarbon fluids into the channel on one side of the transverse wall therein; and providing for the escape of the said hydrocarbon fluids into the retort on the opposite side of said transverse wall; ignition-holes 75 near the bottom of said retort substantially as described.

4. In a hydrocarbon-burner, a retort having a side wall, a downwardly-extending flange upon said wall, there being provided a channel for the fluid above the apex of the opening between said wall and said flange, and a burner below said flange whereby the 80 heat is directed between said wall and said flange, there being provided a passage for the fluid between said channel and said burner; substantially as described. 85

5. In a hydrocarbon-burner, a retort having an outwardly-flaring wall, a downwardly-extending flange upon said wall, there being provided a channel for the fluid above the apex of the opening between said wall and said flange, and a burner below said flange 90 whereby the heat is directed between said wall and said flange, there being provided a passage for the fluid between said channel and said burner; substantially as described. 95

6. In a hydrocarbon-burner, a supporting base member having an opening through the top thereof, a retort supported upon said base member and extending through said opening, said retort having flame-openings in its side walls, and a member resting upon said base 100 member and having inwardly-extending fingers which lie adjacent said flame-openings for breaking up air flowing to the flame; substantially as described. 105

In testimony whereof I have hereunto set my hand this 28th day of July, 1900. 110

JAMES D. WILLIAMSON.

Witnesses:

BALDWIN VALE,
ARTHUR HOUGH.