

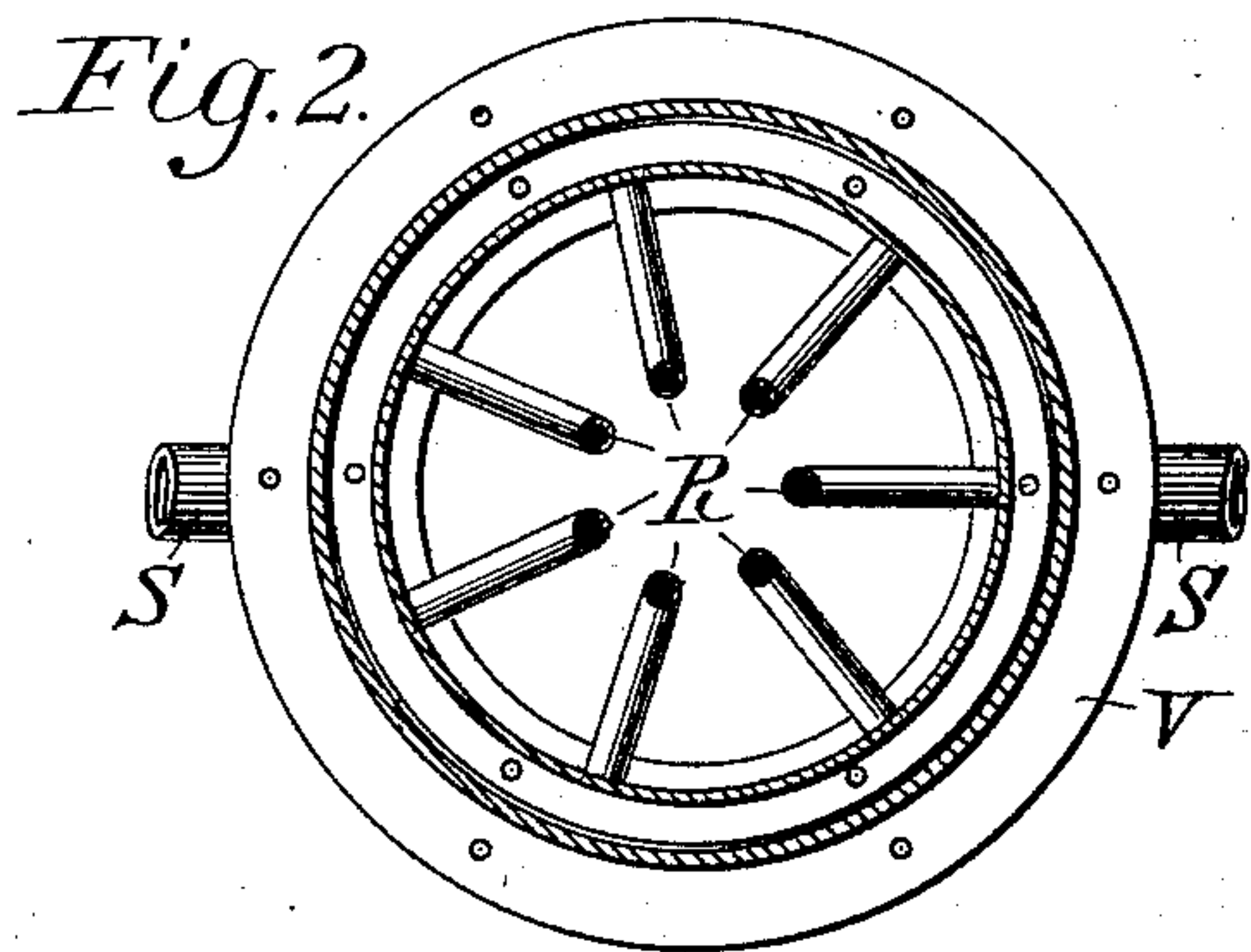
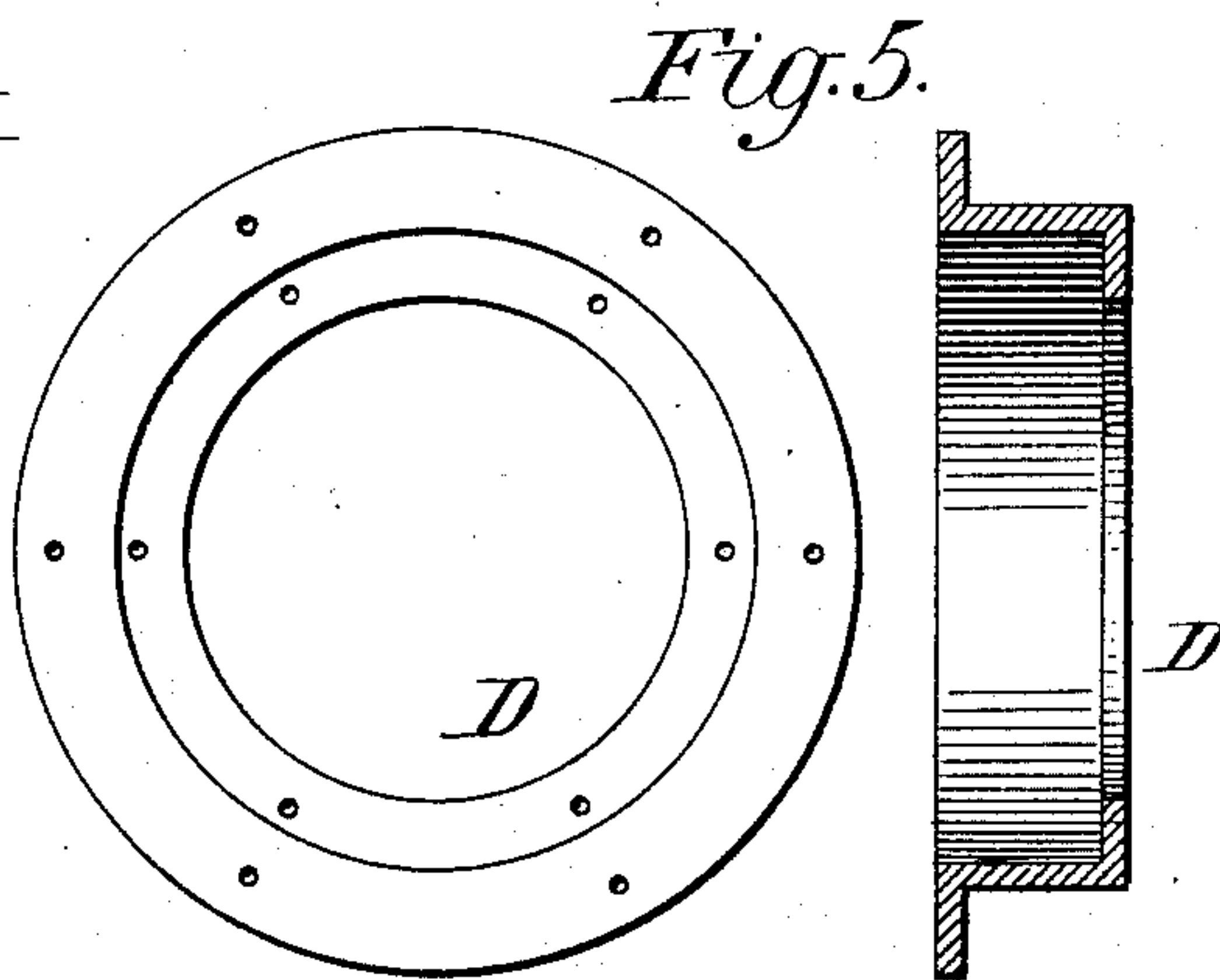
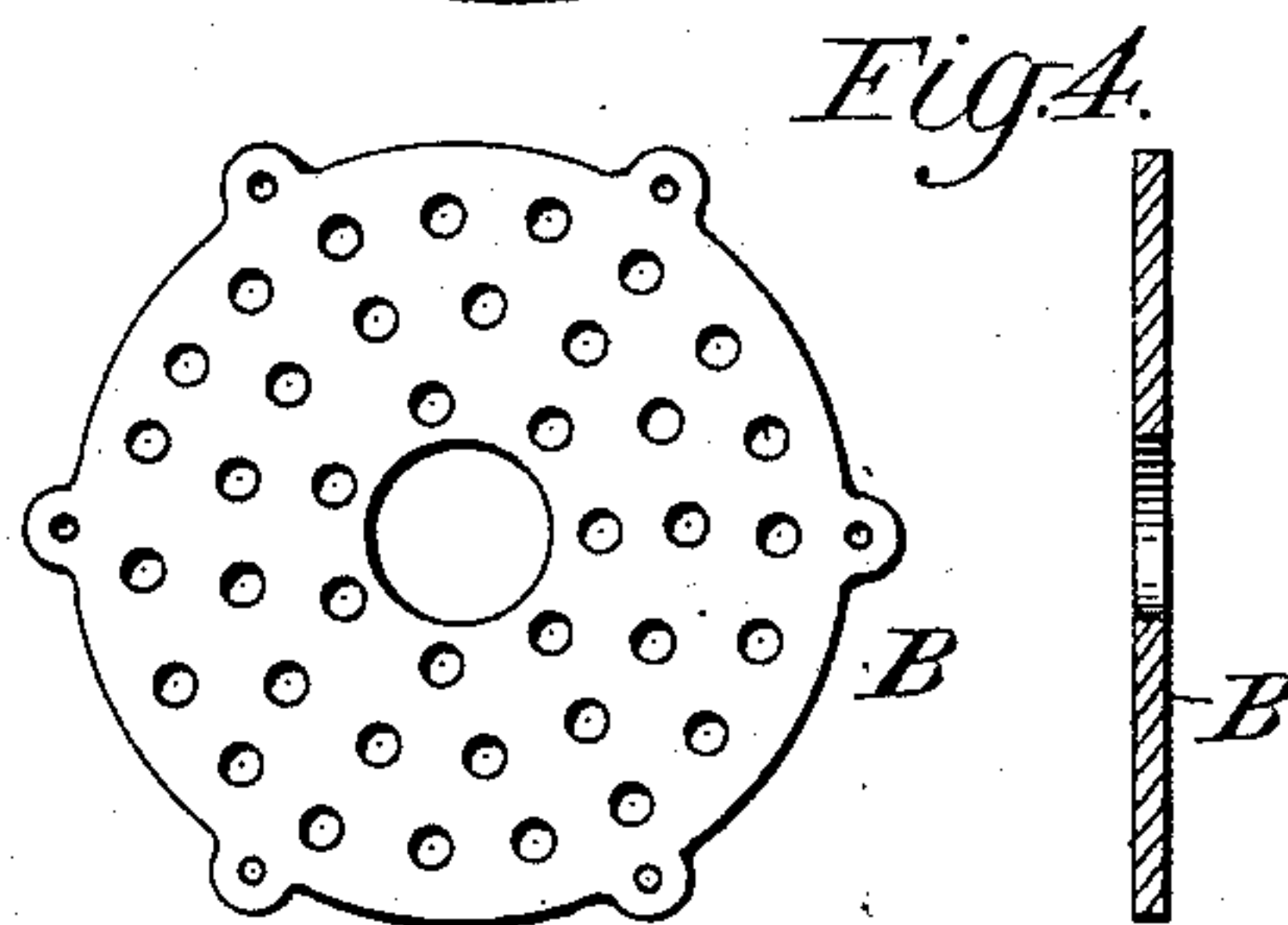
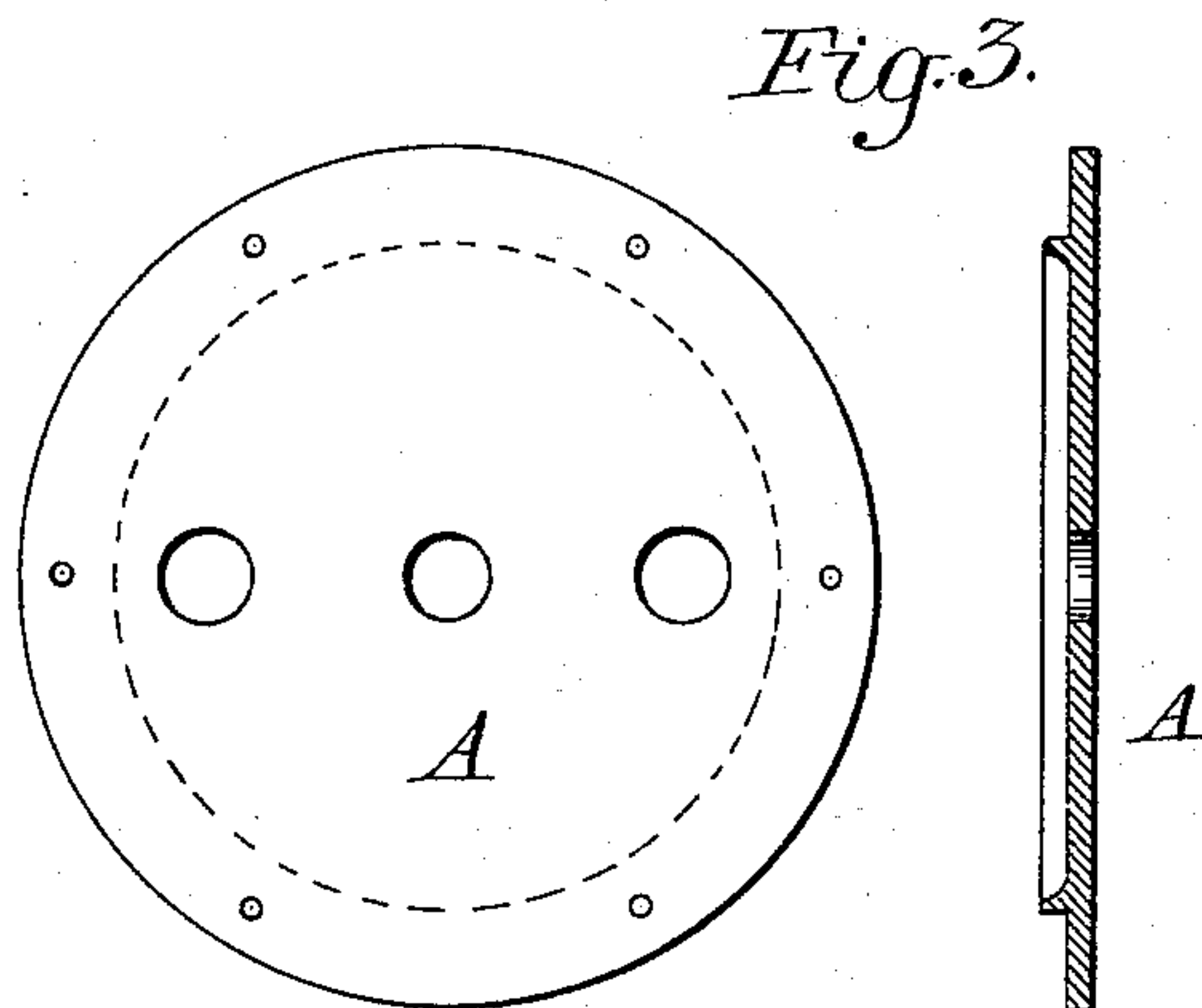
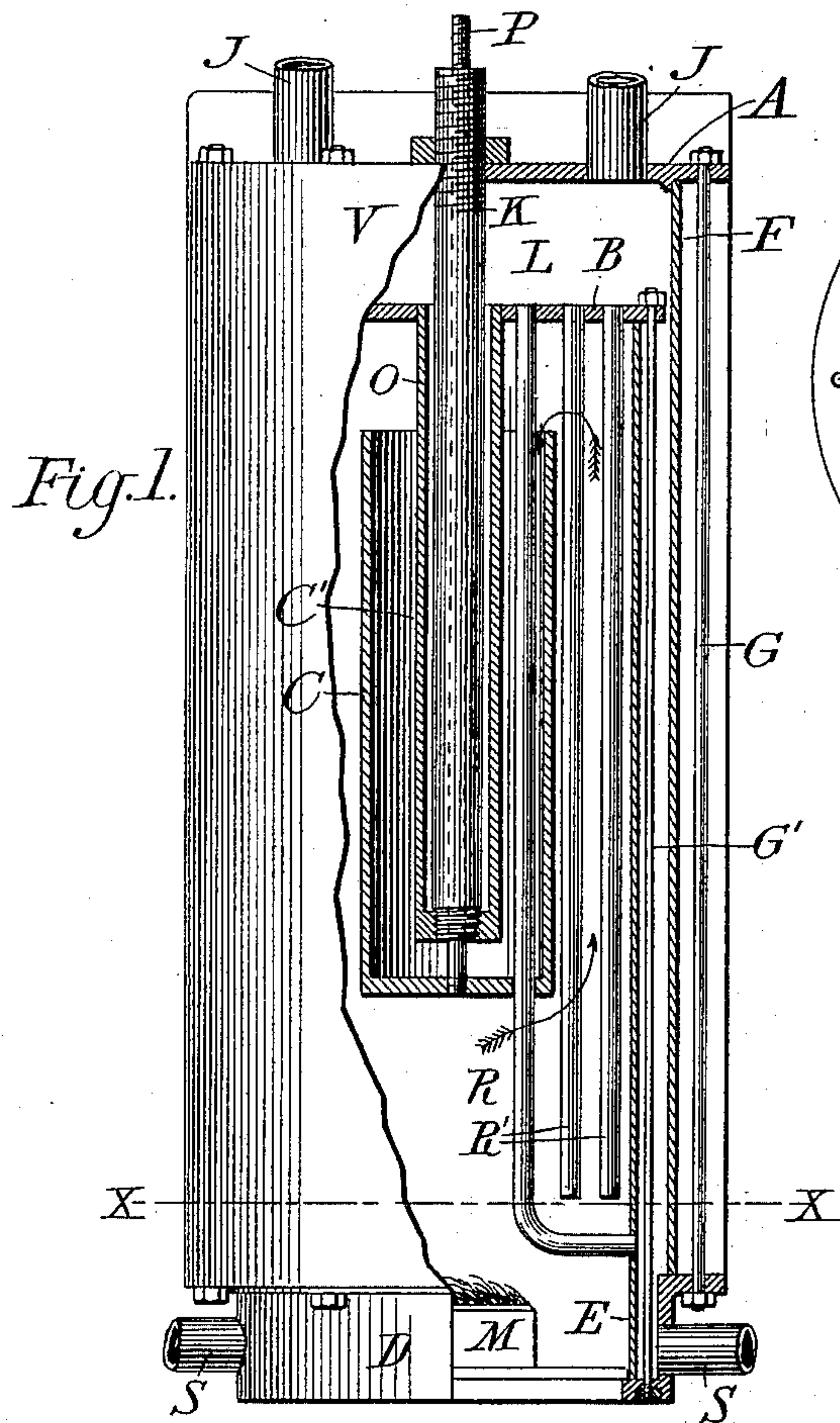
(No Model.)

2 Sheets—Sheet 1.

J. T. GRIMSHAW & J. E. KENISELL.
HOT WATER HEATER.

No. 596,498.

Patented Jan. 4, 1898.



Witnesses:
Chester E. Arnold
Charles L. Van Dant
Henry White

Inventors:
James T. Grimshaw
John E. Kenisell

(No Model.)

2 Sheets—Sheet 2.

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Fig. 6.

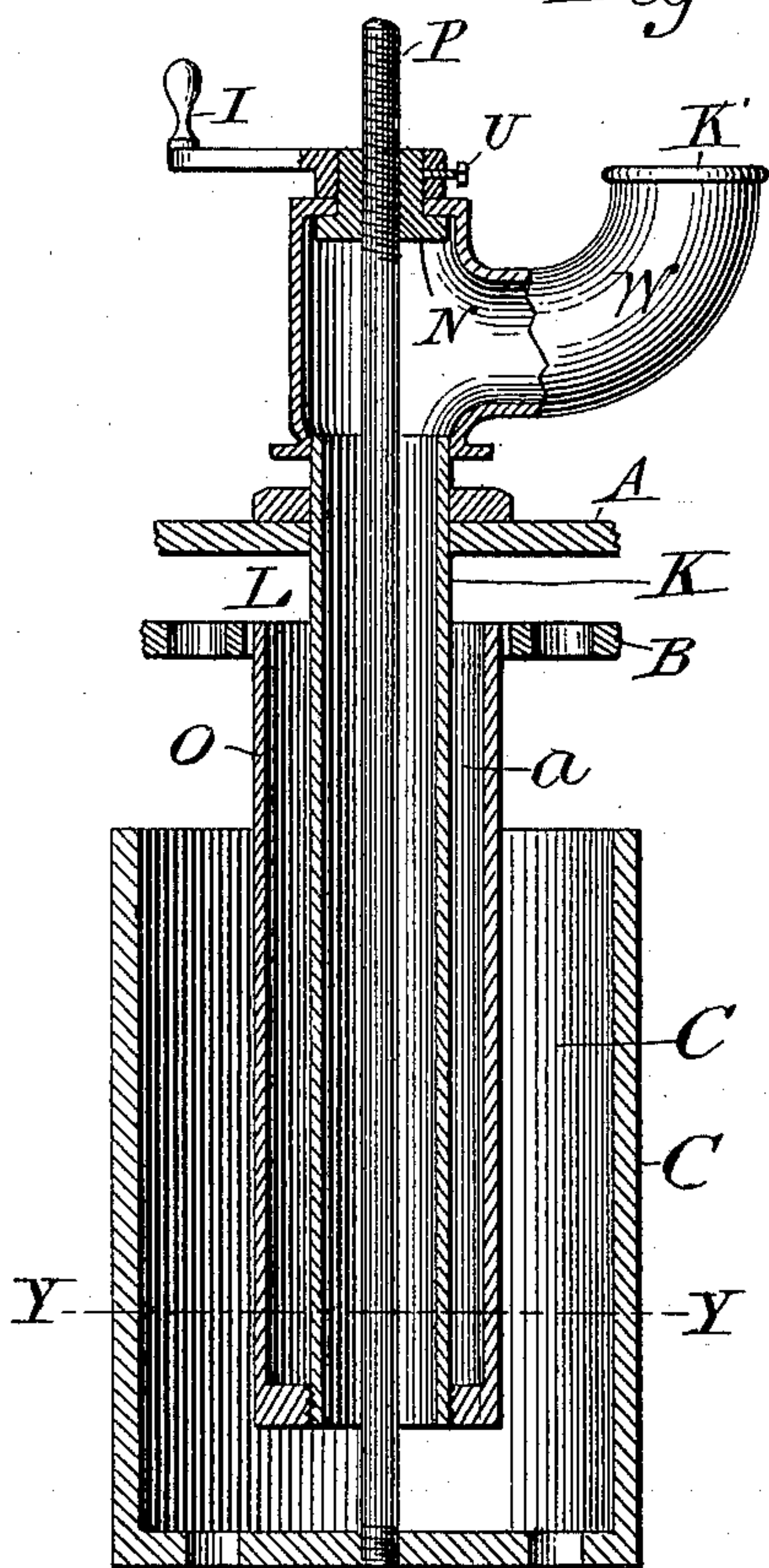


Fig. 8.

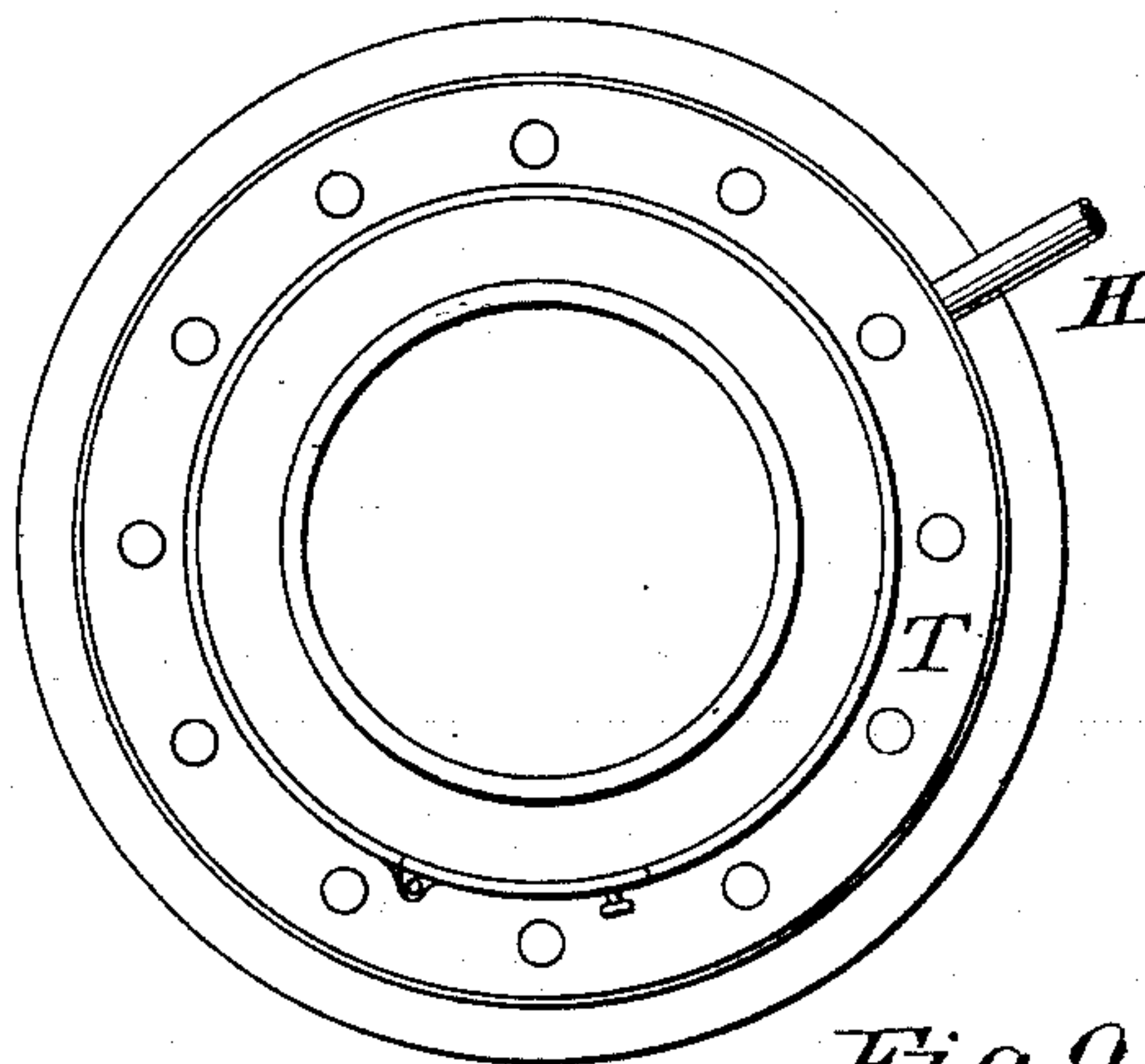
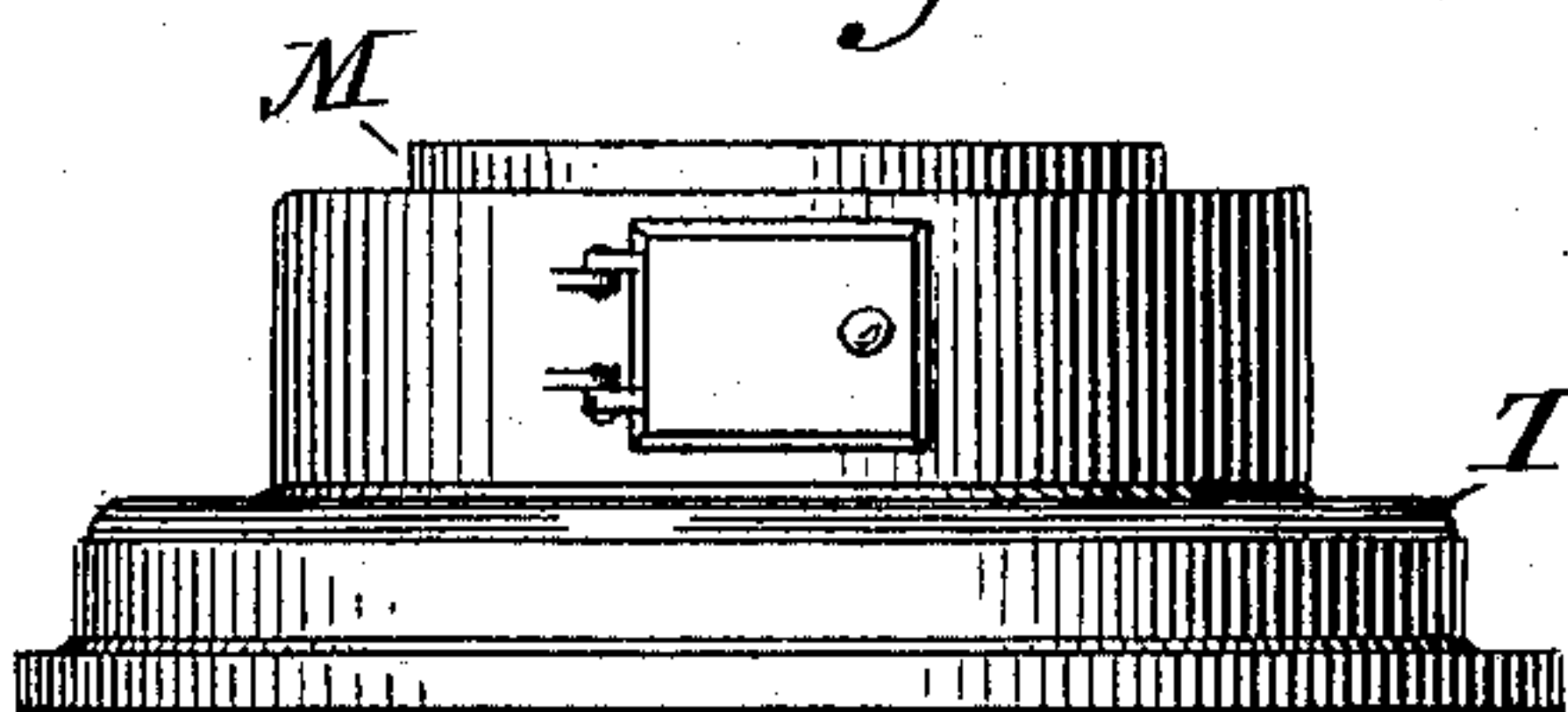


Fig. 9.

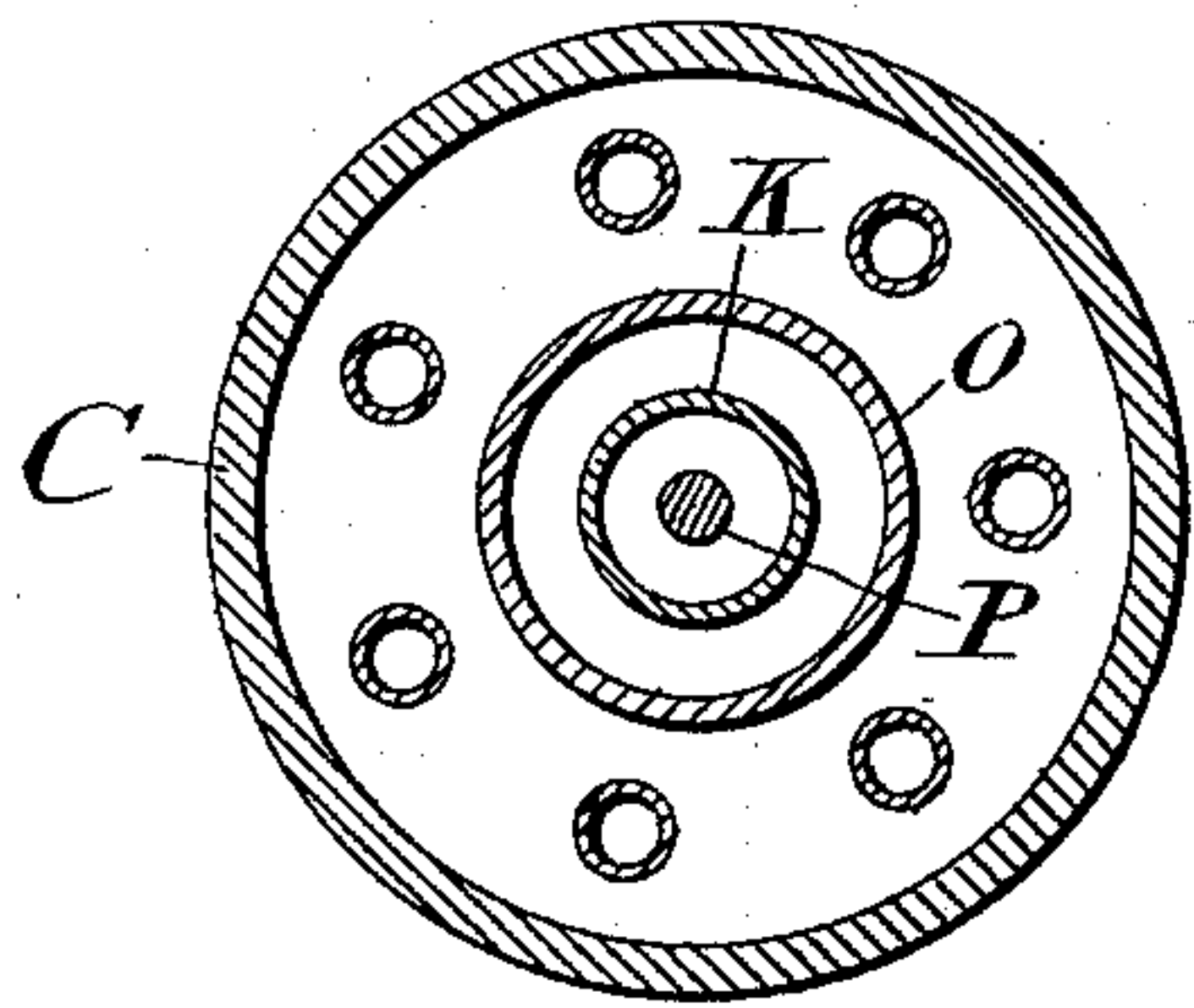


Fig. 7.

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UNITED STATES PATENT OFFICE.

JAMES T. GRIMSHAW AND JOHN E. KENISELL, OF DETROIT, MICHIGAN.

HOT-WATER HEATER.

SPECIFICATION forming part of Letters Patent No. 596,498, dated January 4, 1898.

Application filed February 1, 1897. Serial No. 621,523. (No model.)

To all whom it may concern:

Be it known that we, JAMES T. GRIMSHAW and JOHN E. KENISELL, citizens of the United States, residing at Detroit, in the county of Wayne and State of Michigan, have invented certain new and useful Improvements in Hot-Water Heaters, of which the following, taken in connection with the accompanying drawings, is a specification sufficiently full, clear, and accurate as to enable persons skilled in the art to make and use the same.

The object of our invention is the production of a heater which shall be very economical in the consumption of fuel, and thus have the capability of heating dwellings and other buildings at small cost, which shall not generate odors or produce soot, dust, &c., and which can be operated and kept in efficient working order with the least amount of labor and expense.

With this object in view our invention consists in a heater adapted for the use of ordinary city gas, gasolene, kerosene, or other liquid or gaseous substances as fuel.

It further consists in certain novelties of construction and combinations of parts hereinafter described and claimed.

On the figures of the drawings, which illustrate an example of the physical embodiment of our invention, like parts are designated by like letters of reference.

Figure 1 is a view in elevation of our heater, a part thereof being broken away to show the relative location of certain internal parts. Fig. 2 is a sectional plan view taken on line *xx* of Fig. 1. Fig. 3 shows plan and sectional views of the casting constituting the top of the heater. Fig. 4 shows plan and sectional views of the casting B. Fig. 5 illustrates in plan and section the bottom of the body of the heater. Fig. 6 is a view in sectional elevation, showing the parts hereinafter designated as the retard, the casting W, and the apparatus for raising and lowering the retard. Fig. 7 is a sectional plan view taken on line *yy* of Fig. 6. Fig. 8 is a view in elevation of the base-casting on which the heater is supported. Fig. 9 is a plan view of Fig. 8.

Referring to the drawings, E and F are two strong metallic cylinders, the former inside the latter, the space between them serving

when the several parts are united to contain water. The casting D of the shape shown fits the two cylinders at the bottom and the casting A fits the outer cylinder F at the top. The upper end of the cylinder E is closed by the casting B. Enveloping the entire heater is a casing V of sheet-iron, and the space between said casing and the cylinder F is filled with some material which is a non-conductor of heat. The cylinders E and F are securely held in contact with the castings D, A, and B by a series of rods G and G', the parts being so assembled that they can be taken apart by the removal of the nuts at the ends of the rods.

J J and S S are respectively the outgoing and return circulating-pipes of the heating system and which connect with suitable radiators at convenient points of the circuit. The number of circuits will of course depend upon the size of the heater and the requirements of the particular building or buildings to be warmed.

The vent-pipe K is secured within the casting A, as shown, a jam-nut being used to insure a tight joint. A tube O, which may be from one and a half to twice as large in diameter as the vent-pipe K, has its upper end fixed in the casting B and is open to the water-space L. This tube extends downwardly about two-thirds of the distance from the casting B to the burner M. The lower end of the tube, at first made closed, is drilled out and threaded to receive the lower end of the vent-pipe K, so that said pipe K may be in communication with the space C' within the retard.

The vent-pipe K at its upper end is joined to a casting W, which is provided with an opening K', and through which latter the products of combustion are discharged. It will be seen that as thus arranged the water-space is extended to the space between the pipe K and the tube O. Located in a circular row around the tube O and within the retard C are a number of water-circulating tubes R. The upper ends of these tubes are fixed in the casting B and communicate with the water-space L. The lower ends of the tubes pass loosely through holes in the bottom of the retard C, are then bent, as shown,

adjacent the burner M, and the extreme ends thereof fixed in the cylinder E, which brings them in communication with the water-space between E and F. It is obvious that the heated water will circulate upwardly through the tubes R from the space between E and F to the space L. The retard C is closed at the bottom, but open at the top to the combustion-chamber. A rod P has its lower end fixed in the center of the retard C and its upper end threaded to receive the nut N, as shown in Fig. 6. The nut has attached to it by a set-screw U the crank I. By turning the crank the rod, and with it the retard, can be raised and lowered. By this instrumentality the draft is very effectively controlled.

In the casting B and occupying the space between the retard C and cylinder E are tubes R', closed at their lower ends and open at the upper ends into the space L. The extreme ends of these tubes should just clear the horizontal portions of the tubes R where they join the cylinder E. The number of tubes R' will depend upon the desired capacity of the heater. However, as many should be used as is possible without excessively impairing the strength of the casting B.

The burner to be used in connection with our heater may be of any desired form and type. We have shown one, M, by way of example, provided with a base-casting T and with a pipe H for the introduction of suitable fuel.

Our heater may be used alone or several may be combined to form a battery.

If the building to be heated has no basement, the heater is set within a brick structure outside and the circulating-pipes, suitably covered by proper insulation, connected with the radiators by passing under the building and through the floor or floors. If the building has a basement, the heater may be placed in it and the vent K' connected with a chimney without any brickwork around it.

In some cases a small heater may be set in a room, inclosed on three sides and provided with suitable means for carrying off the gases generated by combustion.

From the foregoing it will be seen that we have produced a heater adapted for the burning of gas, oil, or other like fluid as fuel, which is so constructed that it can be easily taken apart and reunited, which is adapted by reason of the location of the tubes and water-spaces relative to the path of the products of combustion to utilize a great part of the heat, which can easily be regulated, and which will convey all the gases and odors generated by the combustion of the fuel outside the building in which the heater is located.

What we claim is—

1. The herein-described heater consisting of the outer and inner metallic cylinders, the casting D supporting both cylinders, the casting A closing the top of the outer cylinder, the casting B closing the top of the inner cyl-

inder, thereby forming a water-space between said castings A and B, the rods securing the cylinders and castings together, a retard, as C, and a vent-pipe for carrying off the products of combustion, in substance as set forth.

2. The combination with a heater having the two cylinders, three castings, rods, and tubes R, of a retard within which are located the tubes R, and a vent-pipe also located within the retard, in substance as set forth.

3. The combination in a heater, constructed substantially as described, of the cylinders, the castings for closing the ends of the cylinders, the water-circulating tubes R, communicating with the upper and lower water-spaces, the tubes R' closed at their lower ends, the retard, and the vent-pipe K located within the retard, in substance as set forth.

4. The combination with the heater, constructed substantially as described, of the retard C adapted to be raised and lowered, the vent-pipe K having its lower end located within the retard and its upper end passing through the water-space L, in substance as set forth.

5. The combination with the heater, constructed substantially as described, of the retard, the tube O located within the retard, and the vent-pipe K located within the tube O and extended upwardly through a water-space L, in substance as described.

6. The combination with the heater, constructed substantially as described, of the retard C supported by a rod P located within a vent-pipe K, said rod being provided at its top end with a nut, as N, and means for revolving the same to raise and lower the retard, in substance as set forth.

7. The combination with the heater, constructed substantially as described, of the retard adapted to be raised and lowered, the vent-pipe within the retard and provided at its upper end with the casting W having the opening K', in substance as set forth.

8. The combination with the heater, constructed substantially as described, of the outer and inner cylinders, the castings, the retard adapted to be raised and lowered, the water-circulating tubes R passing through the retard and communicating with the upper and lower water-spaces, the vent-pipe K, and the circulating-pipes for the system, the outgoing pipe leading from the water-space L and the return-pipe discharging into the space between the two cylinders, in substance as set forth.

9. The herein-described heater consisting of the cylinders, castings, rods, water-tubes R and R', the retard adapted to be raised and lowered, the tube O, the vent K, and the outgoing and return circulating-pipes J and S, in substance as set forth.

10. The combination in a heater, substantially as described, of the cylinders, castings, water-circulating tubes R passing through the retard C and extending through holes in the

bottom thereof, means for raising and lowering the retard, and a vent-pipe, as set forth.

11. The combination with the heater, constructed substantially as described, of the
5 retard, the tubes R passing through the retard, the tube O open at the top to the water-space L, the vent-pipe K having its lower end threaded and secured within the bottom of the

tube O, and means for raising and lowering the retard, substantially as and for the purpose set forth. 10

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Witnesses:

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