

(No Model.)

4 Sheets—Sheet 1.

E. W. ANTHONY.  
HOT WATER HEATER.

No. 547,236.

Patented Oct. 1, 1895.

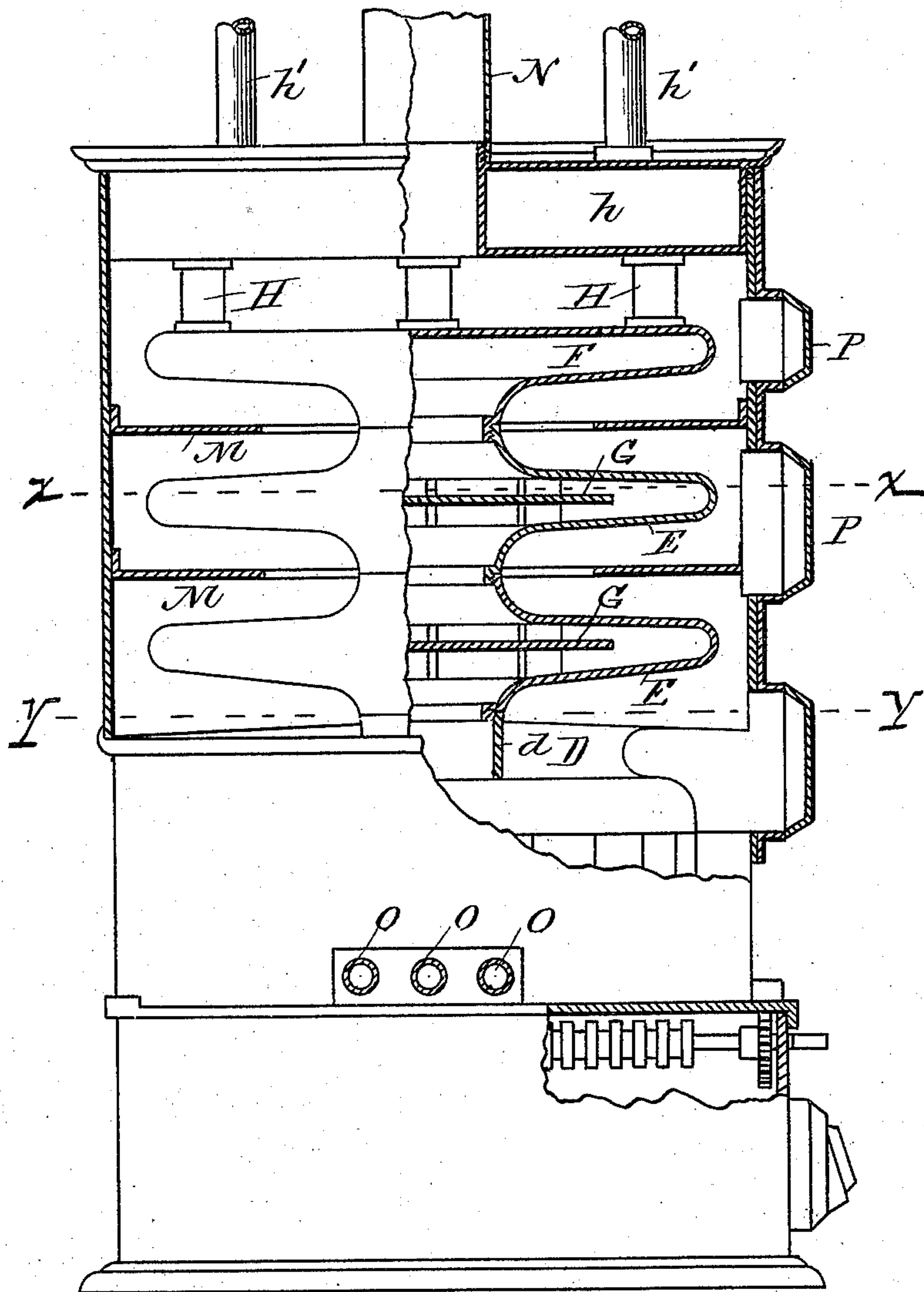


FIG. 1.

WITNESSES

J. W. Dolan.

E. L. Sherman.

INVENTOR

E. W. Anthony

by his Atty.

Clark & Hayward

(No Model.)

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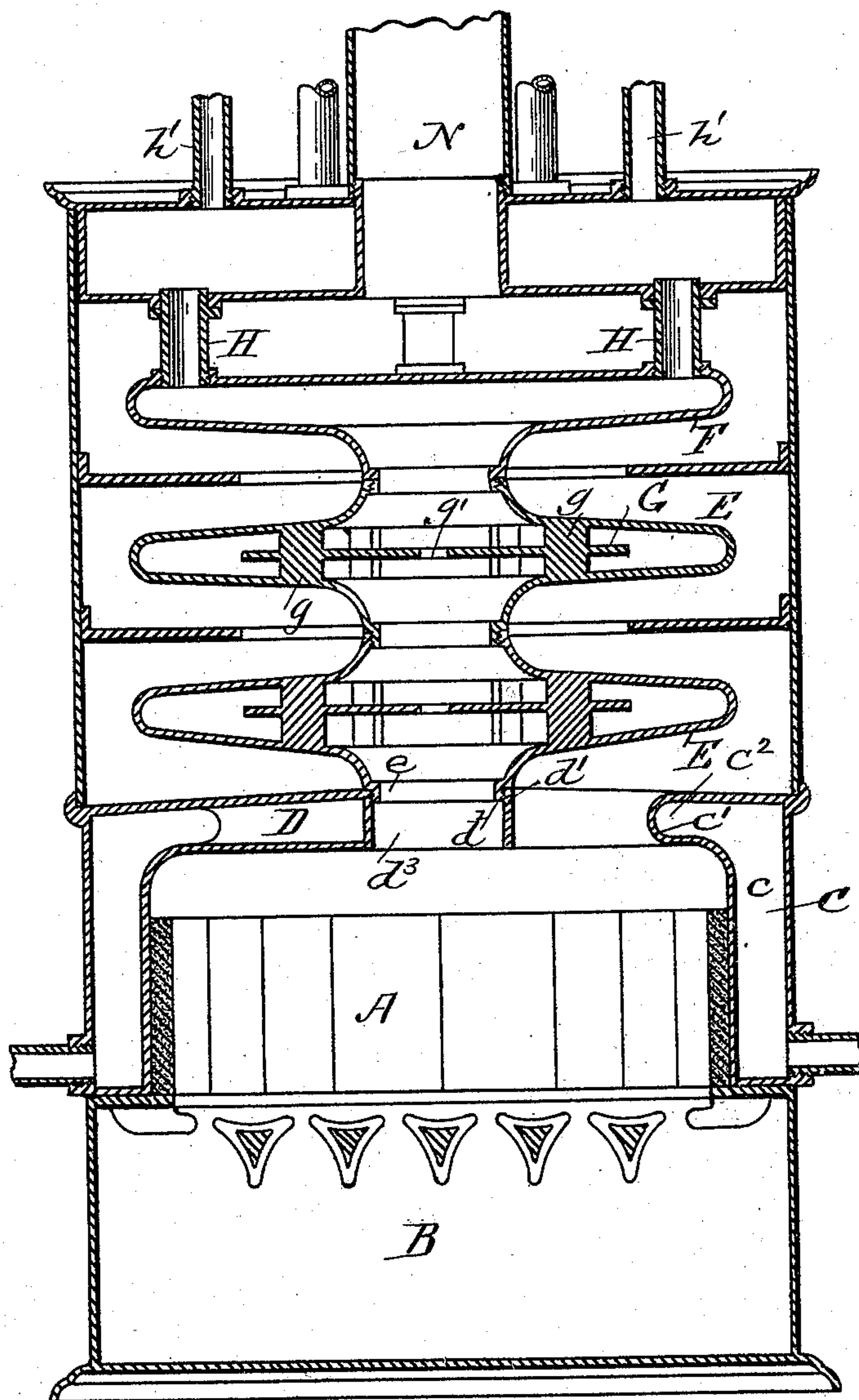


Fig. 2.

WITNESSES

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Charles & Raymond

(No Model.)

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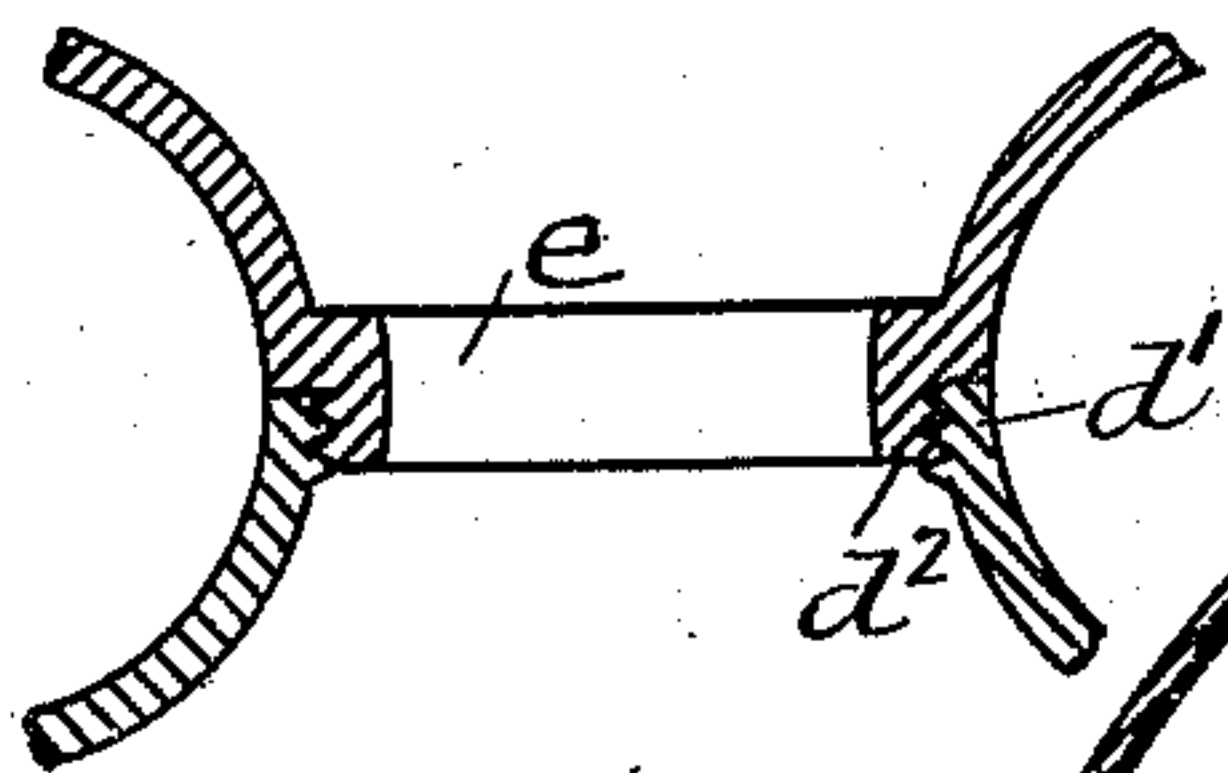


Fig. 5.

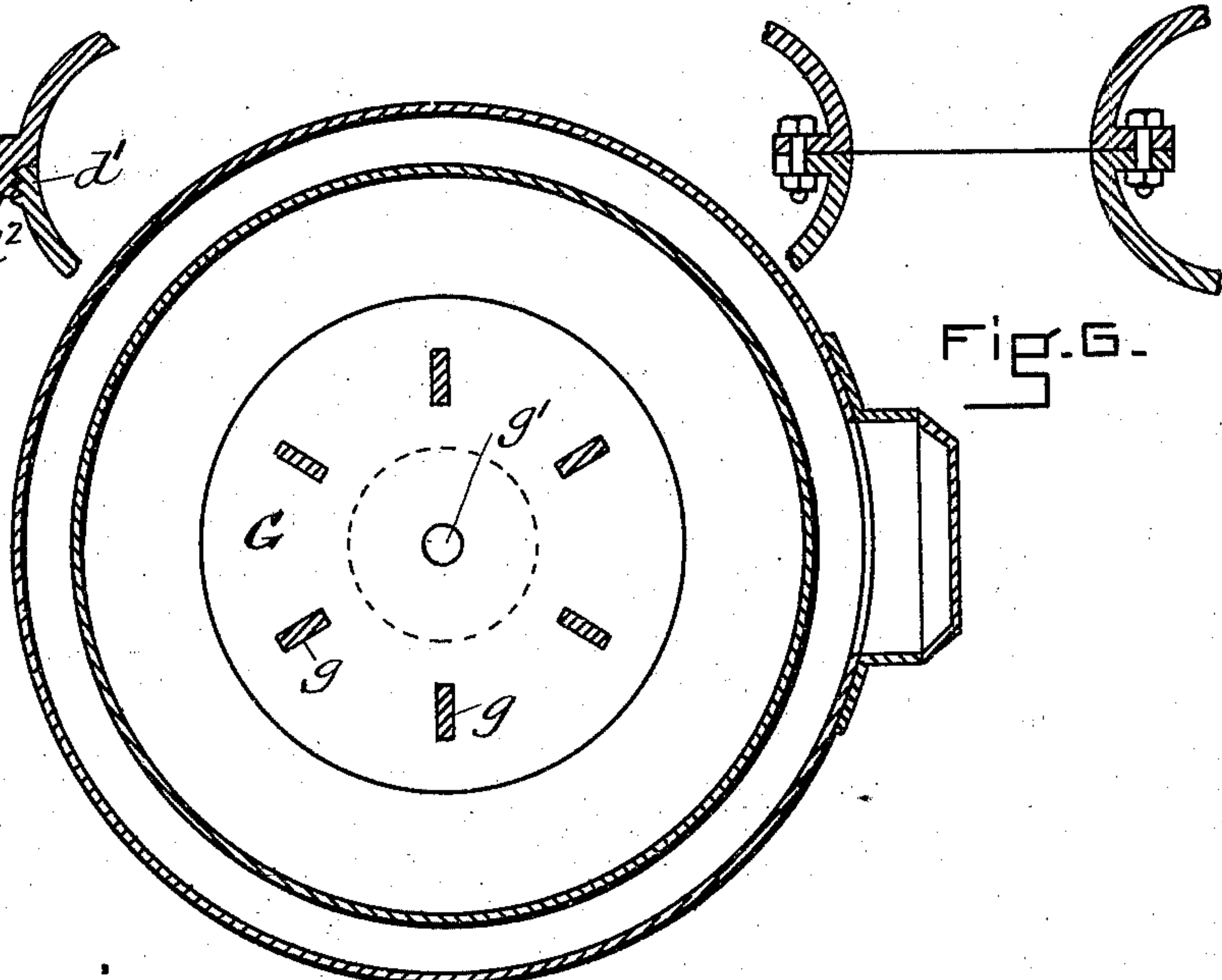


Fig. 6.

Fig. 3.

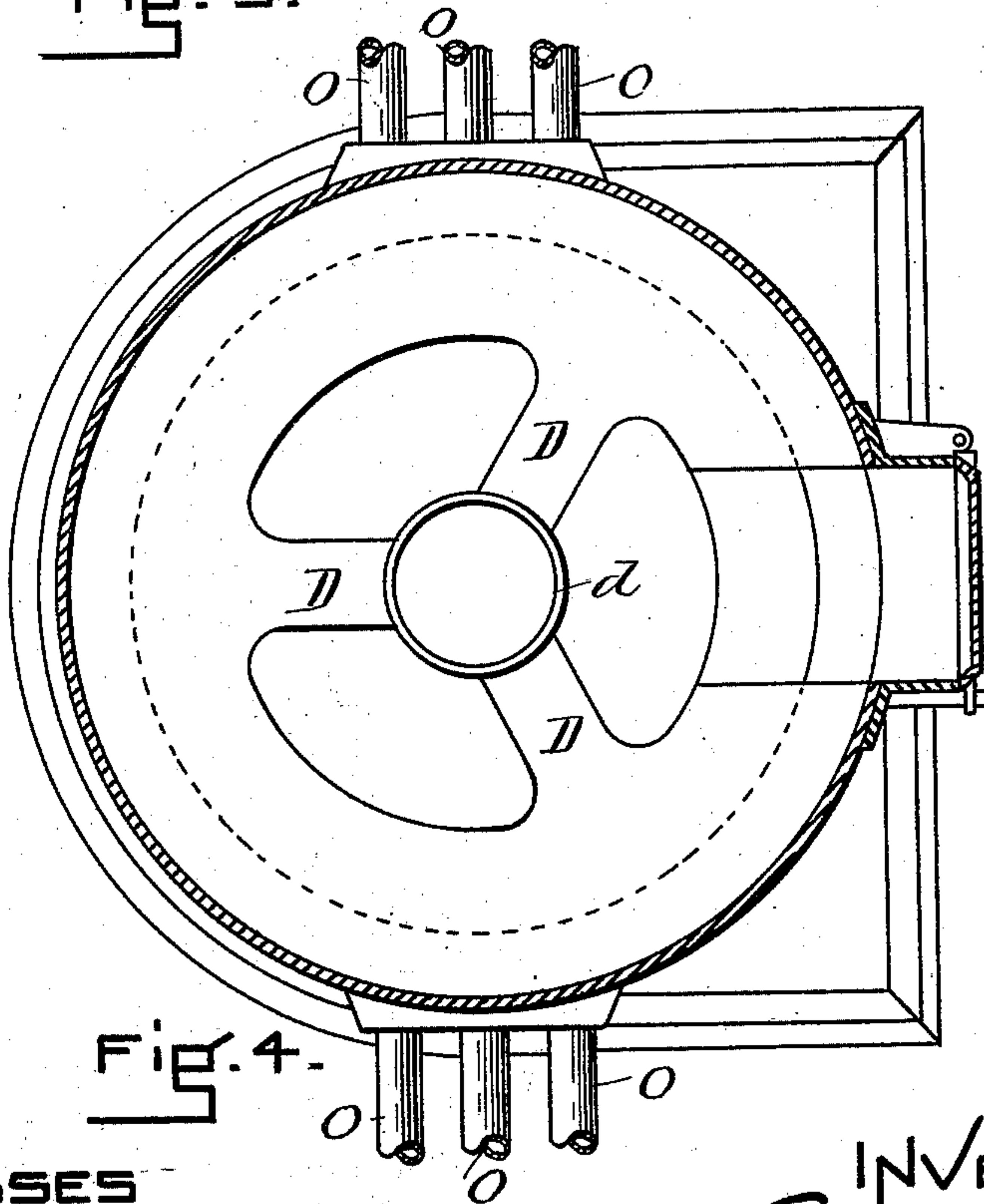


Fig. 4.

WITNESSES

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(No Model.)

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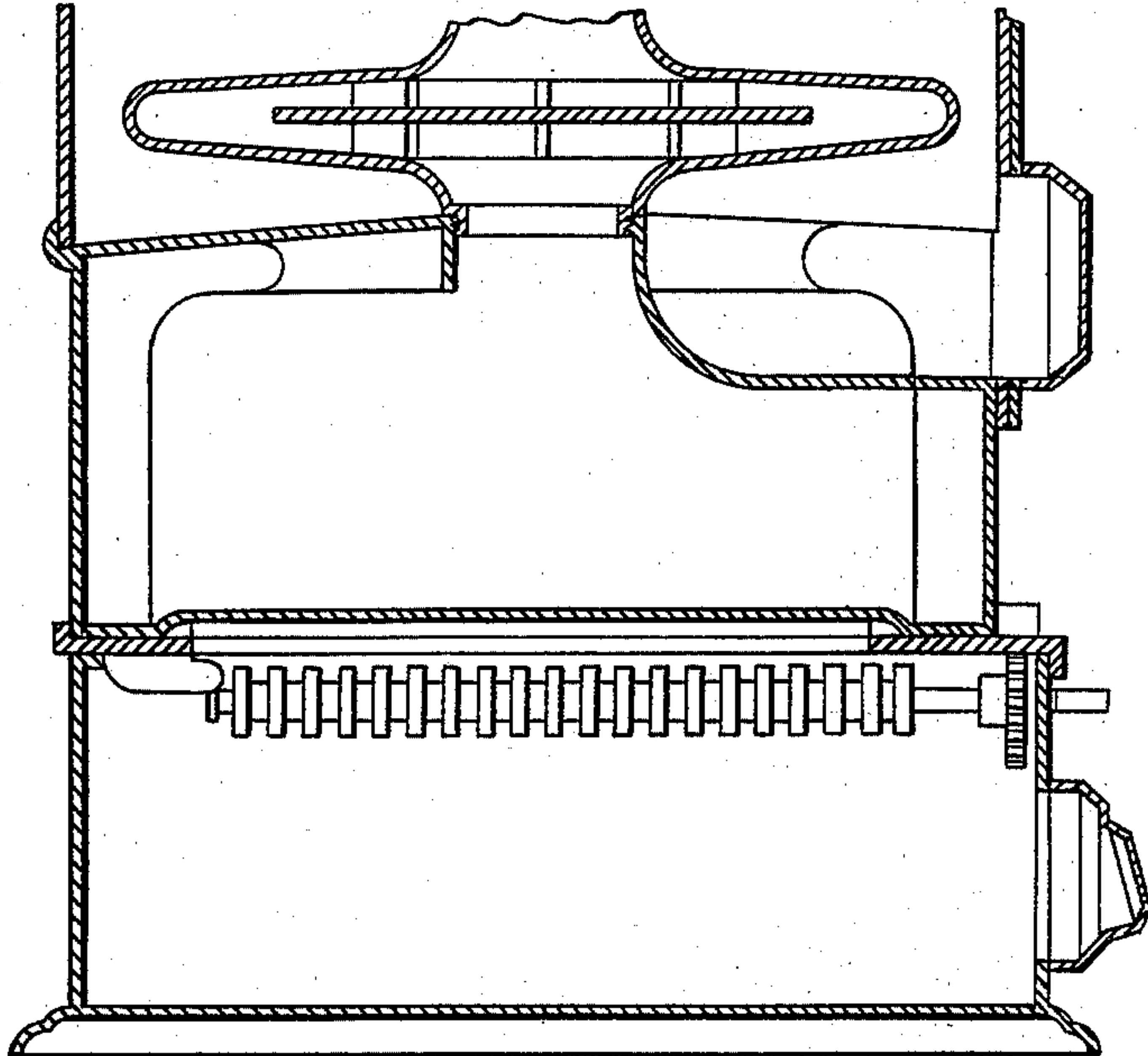
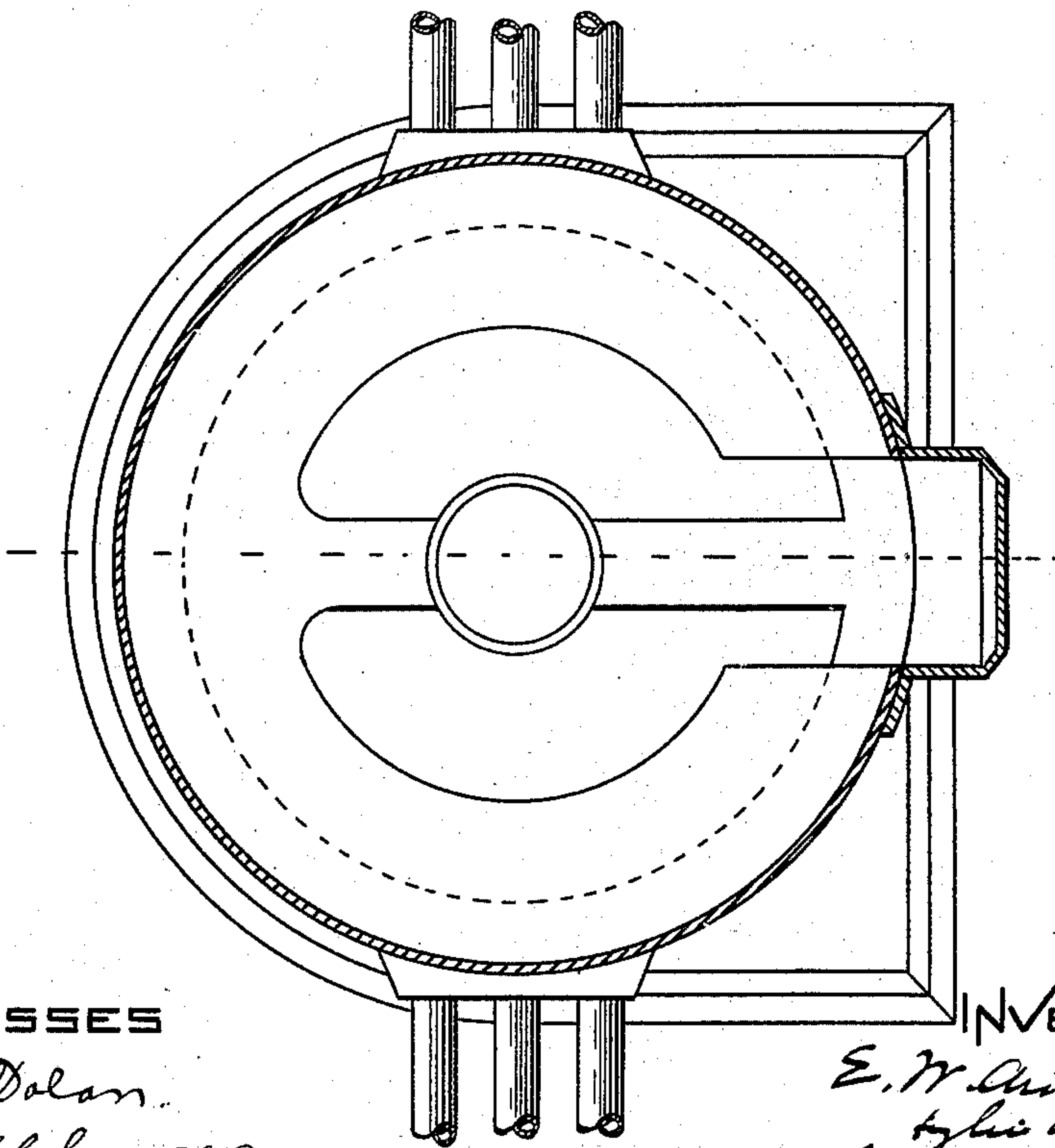


Fig. 7.



WITNESSES

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Fig. 8.



# UNITED STATES PATENT OFFICE.

EDGAR W. ANTHONY, OF BROOKLINE, ASSIGNOR TO THE SMITH & ANTHONY COMPANY, OF BOSTON, MASSACHUSETTS.

## HOT-WATER HEATER.

SPECIFICATION forming part of Letters Patent No. 547,236, dated October 1, 1895.

Application filed June 27, 1894. Serial No. 515,812. (No model.)

*To all whom it may concern:*

Be it known that I, EDGAR W. ANTHONY, a citizen of the United States, residing at Brookline, in the county of Norfolk and State of Massachusetts, have invented a new and useful Improvement in Hot-Water Heaters, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part of this specification, in explaining its nature.

The invention relates to a hot-water heater which is made or built up of a number of independent sections and which is capable of indefinite enlargement; and the object of the invention is to provide a type or form of hot-water chamber or heating-shell which shall be easy to mold, cheap to make, and which especially shall not be liable to crack in use from unequal expansion or any other of the causes to which such sections or shells are subjected.

It further relates to various details of construction and organization whereby cheapness of construction is obtained, combined with superior heating properties, and an economical use of fuel and heat permitted.

Referring to the drawings, Figure 1 is a view of my hot-water heater in elevation, a part of the casing being removed to show the portions in section behind it. Fig. 2 is a vertical central section of the heater upon the dotted line of Fig. 4. Fig. 3 is a view in horizontal section upon the dotted line  $xx$  of Fig. 1 and in plan of parts below said line. Fig. 4 is a view in horizontal section upon the dotted line  $yy$  of Fig. 1 and a plan view of parts below it. Figs. 5 and 6 are detail views, enlarged, to which reference is hereinafter made. Figs. 7 and 8 show a modification, which is hereinafter described.

A hot-water heater may be simply an instrumentality for heating solely by the circulation of hot water through heating-pipes, or it may combine this function with that of heating by hot air, and my invention is adapted to both forms or types of the apparatus, and in the drawings I have represented the invention as applied to the latter form.

A is the fire-pot, lined or not, as desired; B, the ash-pit. The fire-pot wall preferably is formed by a cast-metal shell C of cylindrical

form, which provides a water-heating chamber  $c$ , which extends around the fire-pot, and the shell also has at its top the inward-extending section  $c'$ , which overlaps the combustion-chamber to any desired degree and forms an extension  $c^2$  of the water-heating chamber C over the fire. In addition to this there extends over the fire-pot and at the base of the combustion-chamber a hollow support D. This support is preferably cast with the side or fire-pot wall and is in one or more parts, which extend to the central enlargement  $d$ . Its cavity is connected with or opens into the cavity of the remainder of the shell. The extension of this hollow support over the fire-pot provides, first, a support for the remaining sections E of the hot-water heater, and, second, an increased water-heating surface of very great consequence. To provide means by which these sections or the lowermost one may be secured to this cross-support and also for the proper circulation of the water, I have formed about the enlargement  $d$  an annular ring  $d'$ , which has the interior screw-thread  $d^2$ , and which surrounds the opening  $d^3$ , and the lowermost section E of the heating-sections is secured to the support by means of the sleeve  $e$ , which is preferably integral with it and which has an exterior screw-thread adapted to screw into the threaded ring  $d'$ .

As many of the sections E may be used as desired. In the drawings I have shown two and the upper section F. Each of the sections E has, in addition to the means for uniting it with the next section or part in order, which I prefer to be similar to the one described, (see Fig. 5,) although it may be by means of flanges bolted together, (see Fig. 6,) a shape which is circular in plan with central hubs, and the surfaces between the hubs and the outer edge are slightly tapering toward each other, and this forms a water-heating chamber which is cylindrical in shape and quite narrow or thin, excepting in the hub portions, and it provides a form of shell which can be readily cast and which will expand and contract uniformly when properly located in the combustion-chamber.

In order that the circulation through each shell may not be direct, there is placed in each



shell a diaphragm G, which extends across the hub portion into the narrow section of the chamber, so that water circulating through the chamber going in by the inlet is caused to flow laterally outwardly under the diaphragm and around its outer edge, then over it horizontally and upwardly to the outlet.

The diaphragm is held in place by suitable braces or feet *g*, and preferably there is a small hole *g'* at the center of the diaphragm for the purpose of preventing priming by a smaller quicker priming return circulation than that which is obtained by the main passage or channel. As many of these sections may be used as desired, one screwing into the other, as the section E screws into the support.

The section F is the distributing or upper section. It is of the same general shape as the sections E, so far as its under surface and hub are concerned. Its upper surface is preferably straight, and from it extend the outlet-pipes H. These may enter the chamber *h*, as represented in Fig. 1, from which the main distributing-pipes *h'* extend or not, as desired. I prefer that the chamber be used, as it may be cylindrical in shape, flat, and thin, and form the top of the combustion-chamber and receive a considerable heat which otherwise might be lost.

In order that the products of combustion may be directed against the walls of the sections E F, partial diaphragms or partitions M extend into the combustion-chamber between the sections and so that the products of combustion are caused to circulate outwardly and inwardly, following the surfaces of the sections E F to the escape-flue N.

O represents the inlet or return pipes and they open into the lower part of the water-heating space about the combustion-chamber.

The partitions M and the upper surfaces of

the sections E may be cleaned of soot, dust, and ashes through doors P in the casing.

In Figs. 6 and 7 I have represented the hollow support D as extending across the fire-pot chamber from back to front and as extending downward in the chamber to very near the grate. When this form of support is employed, its front section is formed, so as not to come into line with the feed-opening, or, rather, so that its upper surface shall be below the feed-opening, in order that access to the fire-pot upon each side of the support may be reached through the same feed-opening.

Having thus fully described my invention, I claim and desire to secure by Letters Patent of the United States—

1. In a hot water heater the combination of the hollow section D formed as described and one or more removable water sections E, the lowest one having the sleeve *e*, as and for the purposes described.

2. In a water heater the hollow section D having the enlargement *d* and the annular threaded ring *d'*, as and for the purposes described.

3. The combination in a water heater of the hollow casing C having the extension *c'* and the hollow section D, connected therewith and extending over the fire-pot, as and for the purposes described.

4. In a water heater, in combination with the base water heating section, the sections E shaped as described, the combustion chamber casing inclosing said sections and the partial partitions or flue plates M extending into the combustion chamber between the sections E, as and for the purposes described.

EDGAR W. ANTHONY.

Witnesses:

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J. M. DOLAN.