

No. 630,163.

Patented Aug. 1, 1899.

C. C. BALL.
HEATER.

(Application filed Aug. 17, 1898.)

(No Model.)

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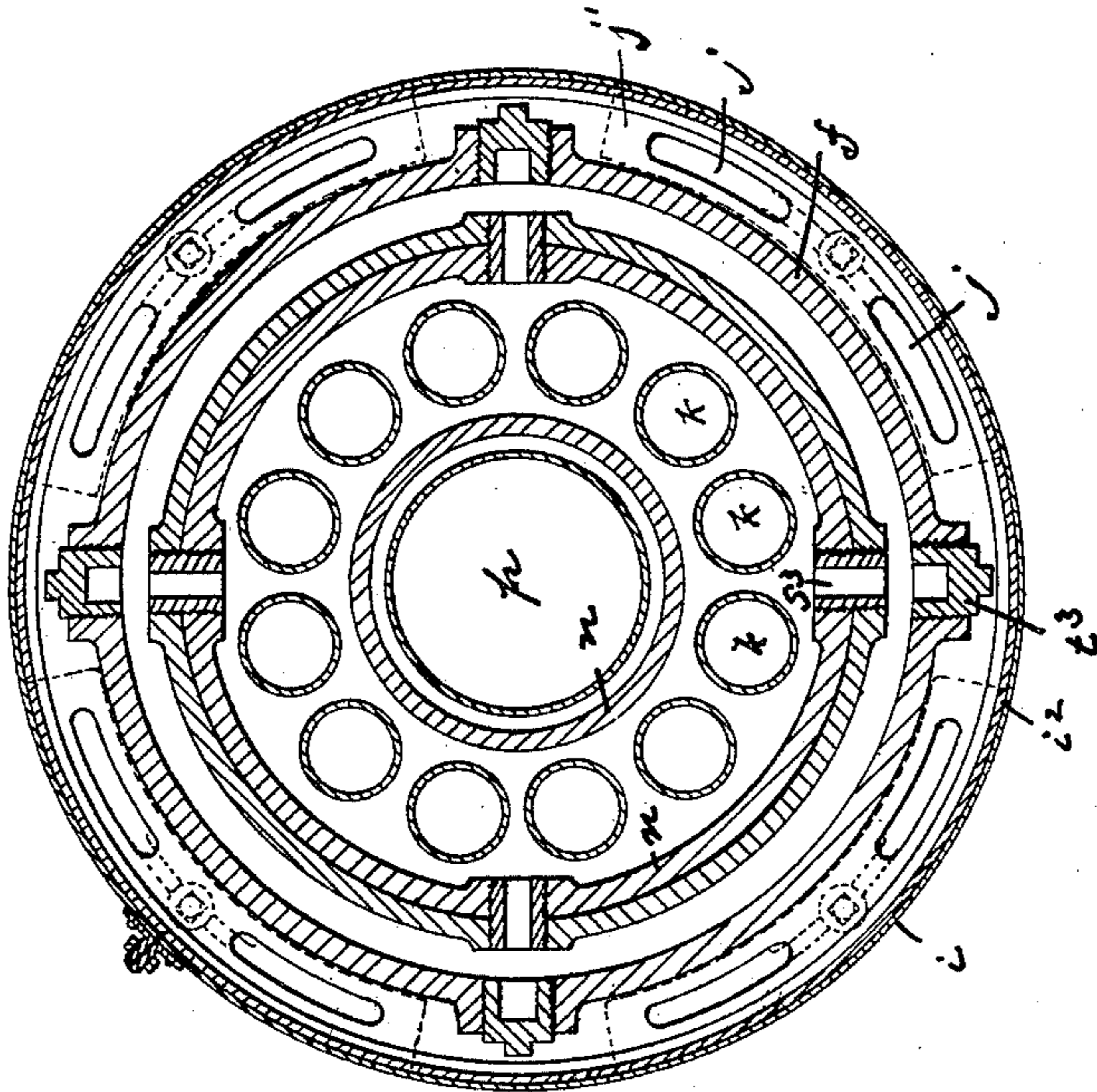
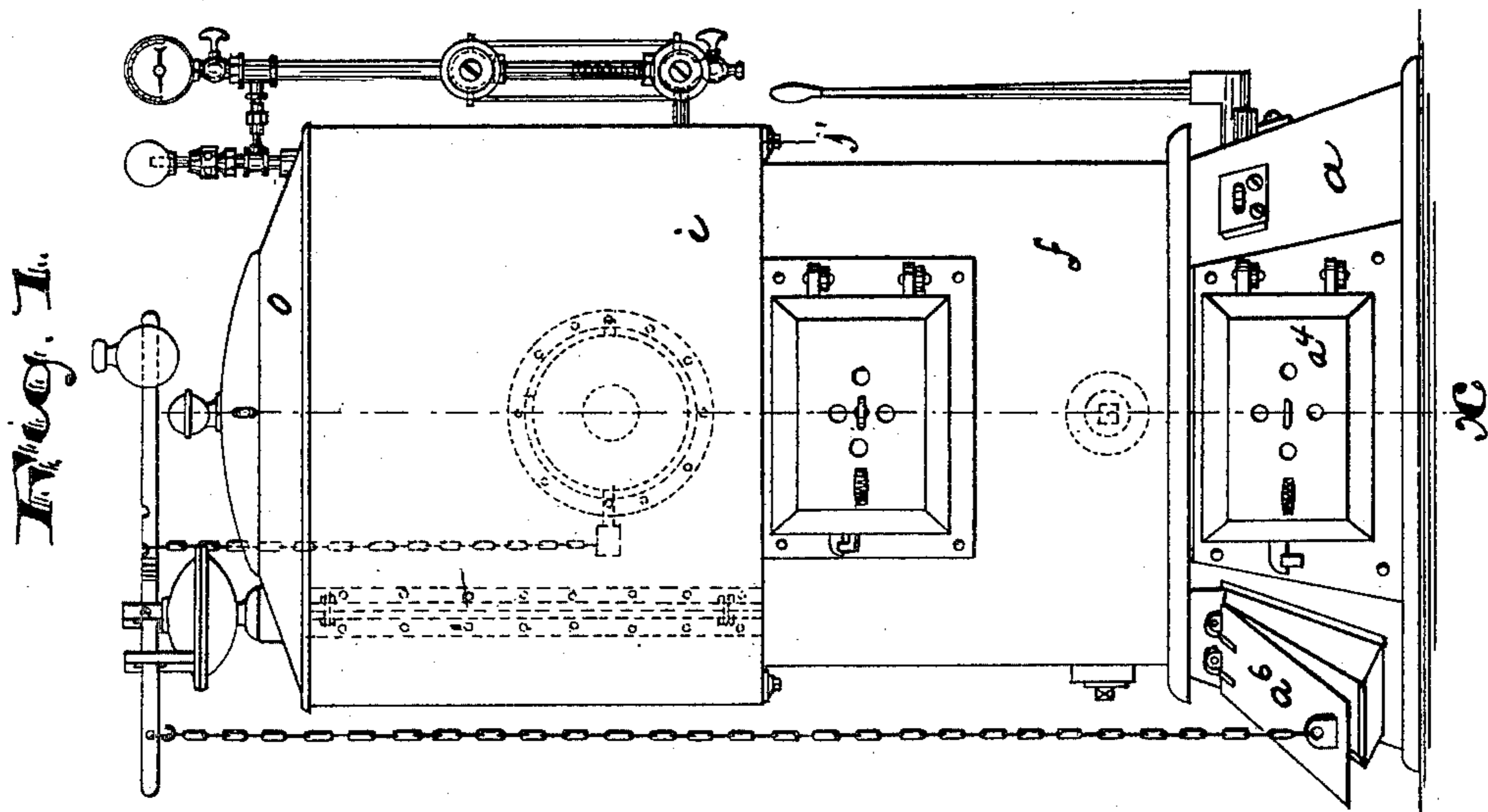


Fig. 2.



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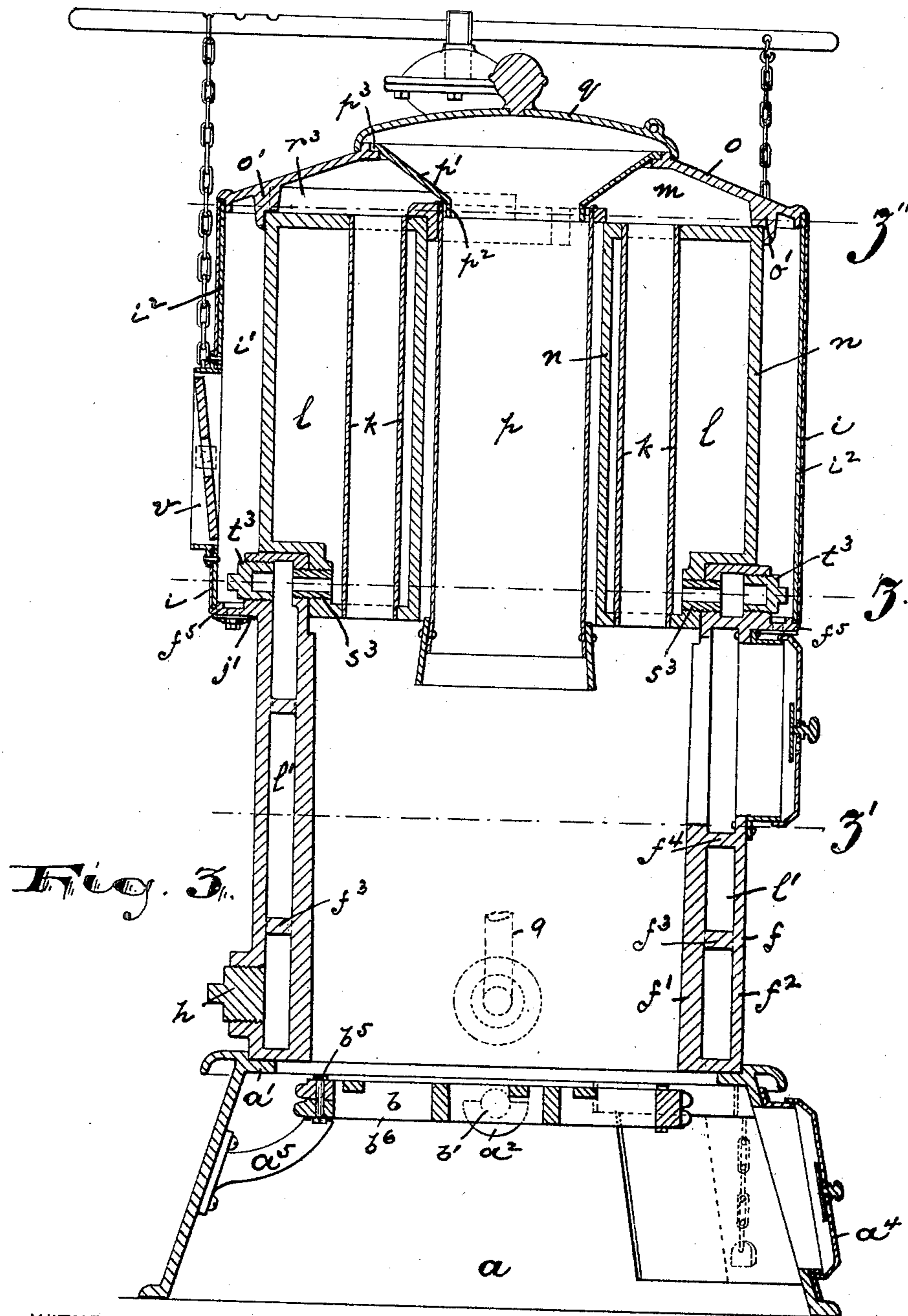
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Fig. 6.

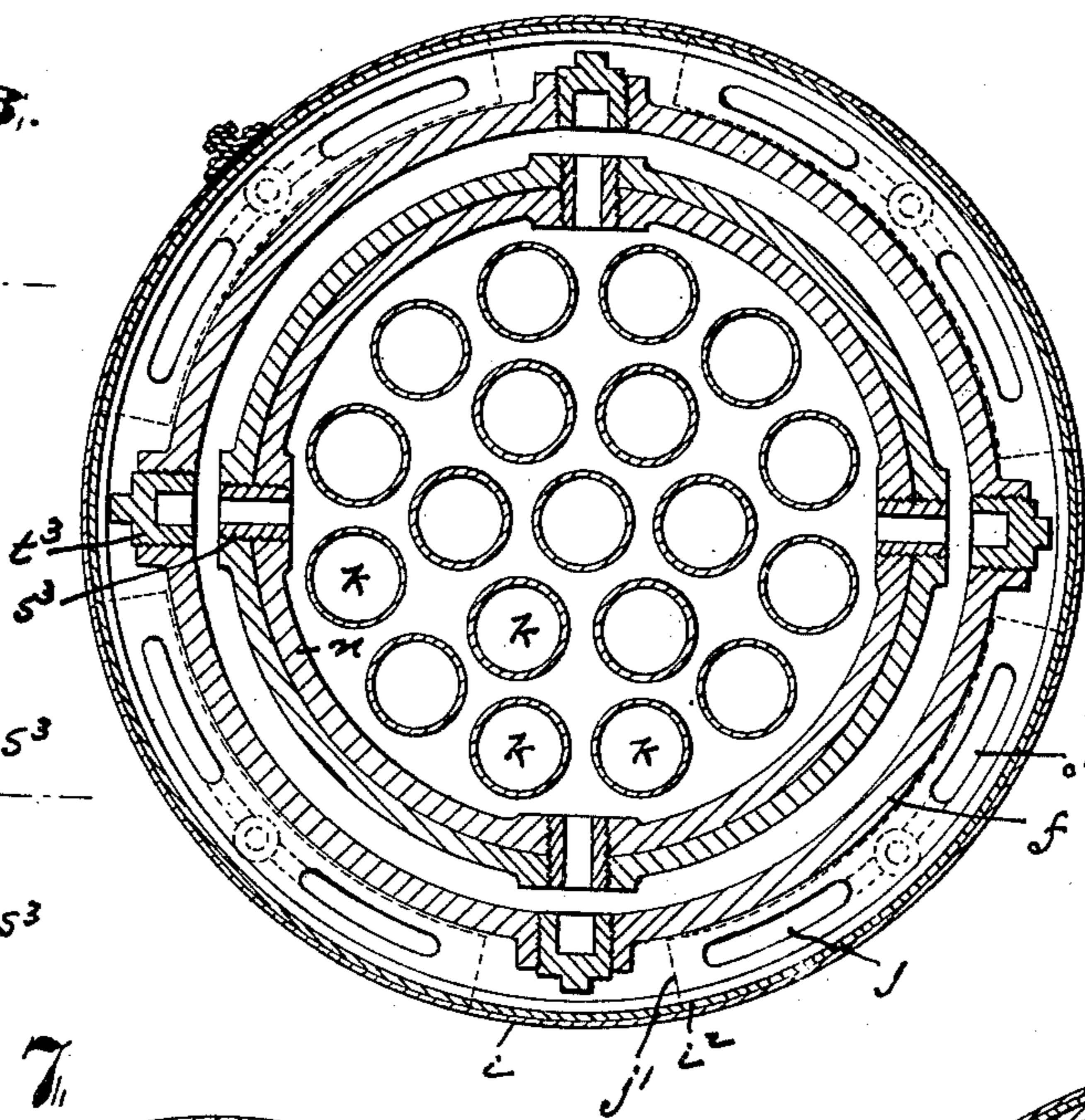
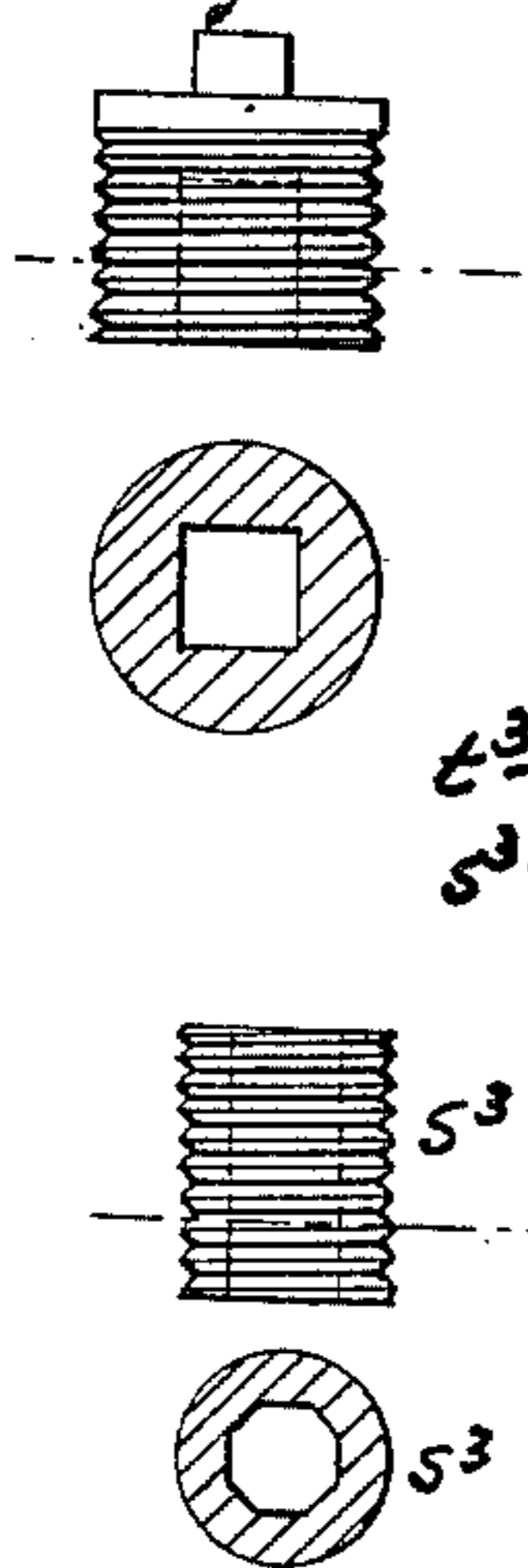


Fig. 6.

Fig. 7.

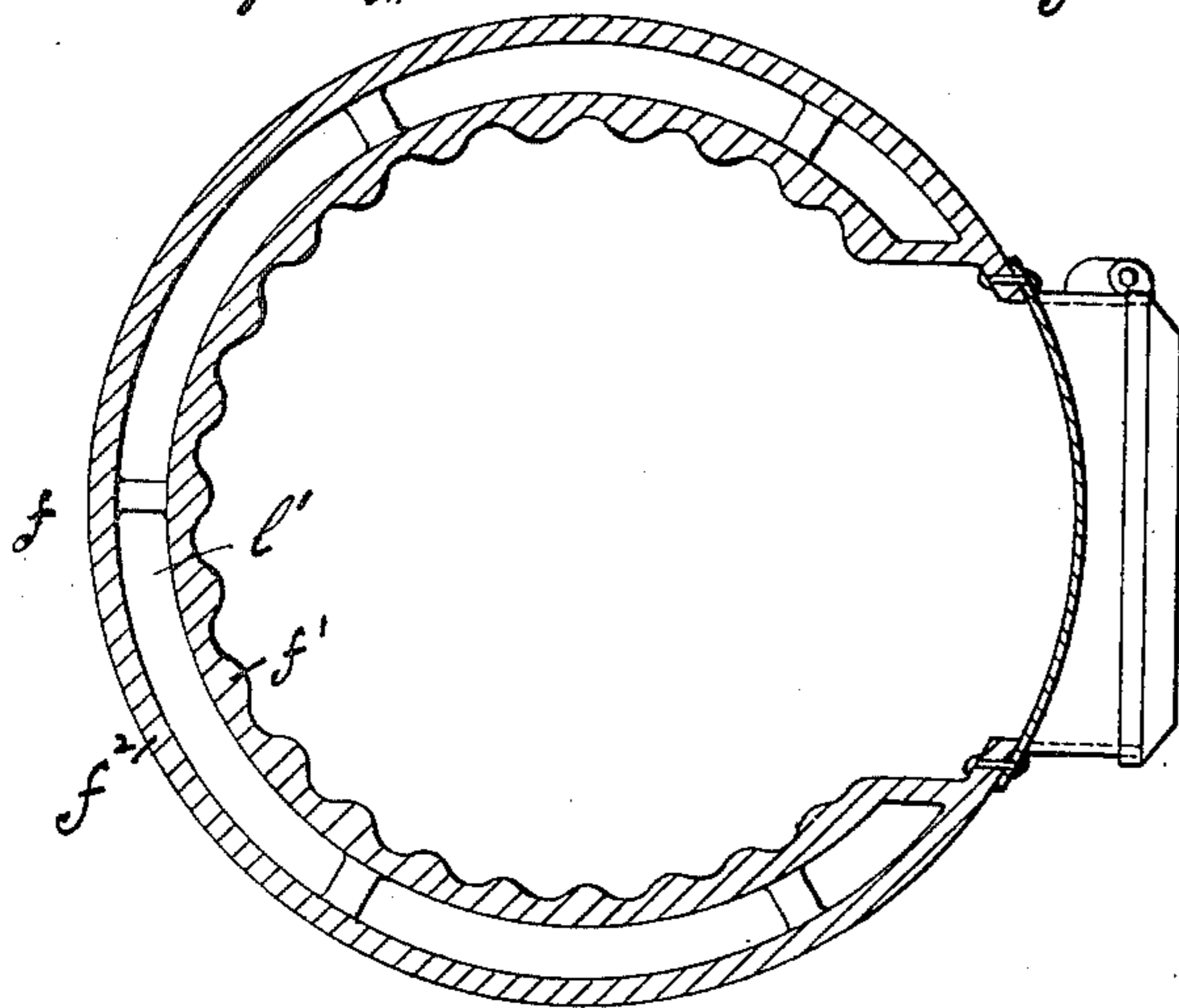


Fig. 4.

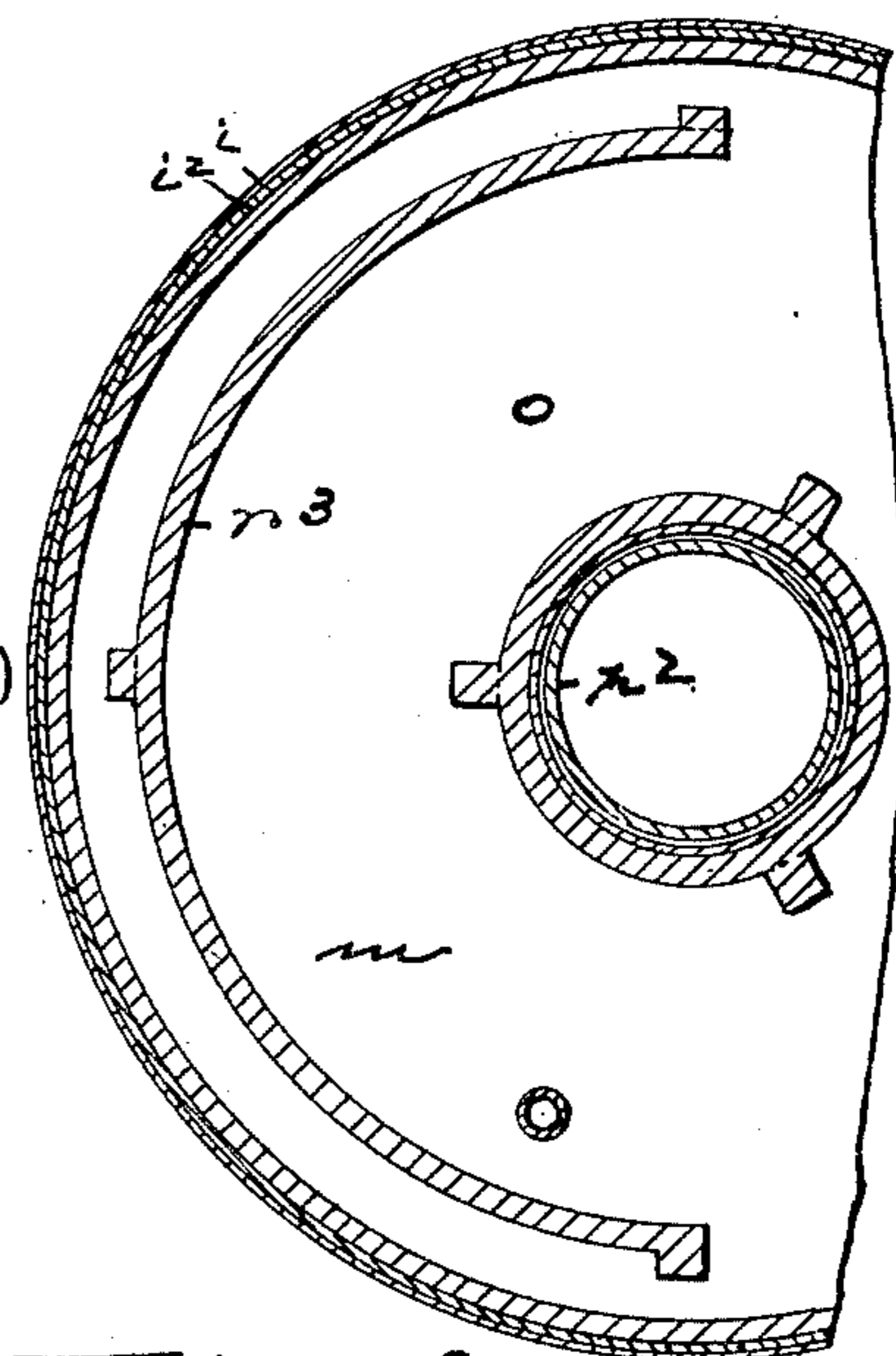


Fig. 5.

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UNITED STATES PATENT OFFICE.

CHARLES C. BALL, OF NEWARK, NEW JERSEY.

HEATER.

SPECIFICATION forming part of Letters Patent No. 630,163, dated August 1, 1899.

Application filed August 17, 1898. Serial No. 688,766. (No model.)

To all whom it may concern:

Be it known that I, CHARLES C. BALL, a citizen of the United States, residing at Newark, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Heaters; 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, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

The objects of this invention are to reduce the cost of construction of boilers, to facilitate the work of assembling the parts, to enable the connections to be made more perfectly, to facilitate and render more convenient the operations of dumping the ashes, and to secure other advantages and results, some of which may be referred to hereinafter in connection with the description of the working parts.

The invention consists in the improved furnace and in the arrangements and combinations of parts of the same, all substantially as will be hereinafter set forth and finally embraced in the clauses of the claim.

Referring to the accompanying drawings, in which like letters of reference indicate corresponding parts in each of the several views, Figure 1 is a front elevation of my improved furnace. Fig. 2 is a horizontal section taken on line z , Fig. 3. Fig. 3 is a central vertical section of my improved furnace, showing the relation of the various parts one to another, the section being taken on line x , Fig. 1. Fig. 4 is a horizontal section of the fire-box, taken on line z' , Fig. 3. Fig. 5 is a section of the upper part of the furnace, taken at line z'' , Fig. 3. Fig. 6 is a horizontal section similar to Fig. 2, showing a modification of construction. Figs. 7 and 8 are side elevations and sections in detail of a certain nipple and plug, the purposes of which will be hereinafter more fully described.

In said drawings, a indicates a base-casting which serves to form or inclose the ash-pit of the furnace. At the upper part of said casting are formed annular bearings a' for the fire-chamber section of the boiler, and beneath said annular bearings are opposite

grate-bearings, one of which, a^2 , is shown in Fig. 3.

The base-casting at the front is provided with a suitable door a^4 to permit the removal of the ashes and at the rear with a support or stay a^5 , by means of which the grate is prevented from dumping rearwardly. The base-casting may also be provided with a draft-regulator a^6 for automatic operation in connection with any suitable automatic draft-regulating devices.

Upon the seat a' of the base-casting a is arranged the fire-pit section f of the boiler. Said section consists of a hollow casting, the inner and outer shells f' f^2 of which are connected at suitable points by integral braces f^3 and around the coal-supply opening by a continued web f^4 . This section thus constitutes a portion of the boiler proper, the space l' between the outer and inner shells being filled with water. The said section is provided with a suitable supply-opening for water, which may be in connection with a supply-pipe g and with an exit-opening which may have a plug h , permitting the withdrawal of the water when desired.

At the upper end of the fire-chamber section of the boiler the same is outwardly flanged, as at f^5 , the outer edges of which flanges are provided with annular recesses or seats for the jacket i , which forms a heat-chamber i' , lined with asbestos i^2 or other non-conductor of heat. The said flange is perforated, as indicated at j in Figs. 2 and 6, the perforations being closed by plates j' , bolted in place and adapted to be removed to permit of the heat-chamber being cleaned.

Above the fire-box section is seated the upper section of the boiler. This comprises a cylinder n , having its ends perforated and provided with vertical tubes k , which extend through the hot-water chamber l and conduct the hot air from the fire-chamber to the upper hot-air chamber m .

Above the cylinder n is arranged the dome o , the said dome projecting downward at its periphery beyond the cylinder n and flanged to receive the upper edge of the jacket i . The cylinder may be provided either with tubes, as in Fig. 6, or with tubes and a central coal-storage magazine p , as in Figs. 2 and 3, said magazine being preferably provided

with a funnel p' and a cap q . The funnel in my construction is a separate piece from the magazine and is removable in its relation thereto and to the dome o , the lower edge of said funnel fitting said magazine, as at p^2 , and having at its upper edge a flange p^3 , which rests upon said dome. The funnel is thus readily removed from its place, a feature of novelty which facilitates the operation of cleaning the top of the boiler-section n . The dome o is supported upon the top of the boiler by lugs or projections o' , which hold the dome up from the boiler and provide a space between the dome and the top of the boiler to permit the flow of heated air from the hot-air chamber m downward to the outer hot-air chamber i' . From said chamber the hot air and products of combustion pass outward from the furnace, as at v , through suitable pipes in any ordinary manner. A semicircular flange r^3 , extending downward from the dome between the lugs o' at the back of the furnace, prevents the heated current from passing directly to the exit-passage v and obliges it to flow downward into the space i' at the front of the furnace and so around to the exit v .

The upper and lower sections of the boiler are fitted together, as shown in Figs. 1, 2, and 6, the upper section extending telescopically downward into the lower section, so that the hot-water chamber of the two sections overlap. Said sections are fastened together by hollow nipples s^3 , through which the water passes from the lower to the upper section. The passages in said hollow nipples are preferably angular when viewed endwise, as shown in Fig. 7, the octagonal shape being preferred, whereby a suitable wrench may be inserted to enable the nipple to be screwed into position. Opposite the opening for the nipples are formed in the outer shells of the lower section of the boiler openings permitting the entrance of the wrench, said openings being threaded and closed after the nipples are properly inserted by plugs t^3 .

The construction thus described enables the upper and lower sections of the boiler to be readily and conveniently secured together by the nipples s^3 , while the tubular form of said nipples allows free circulation of the water from one section to the other, all as will be understood.

Variations may be made from the exact construction shown without departing from the scope and spirit of my invention, and I do not wish to be limited by the descriptive terms used excepting so far as the state of the art may require.

Having thus described the invention, what I claim as new is—

1. A boiler comprising annular water-sections arranged end to end in a vertical position the lower section providing a central fire-chamber and the upper a central fuel-magazine, draft-flues extending upward through

the upper section, and said sections having their meeting ends overlapping sufficiently to receive horizontal hollow screws, and said screws, holding the sections together and permitting a passage of water from one to the other, substantially as set forth.

2. In a furnace-boiler, the combination with a lower section providing a central fire-chamber and having its walls made up of outer and inner shells with a water-space between, of an upper water-section extending vertically upward from said lower section and having its lower end fitting into the upper end of the lower section and horizontal nipples screwed through the contiguous outer wall of said upper section and inner shell of the lower section, said nipples being hollow to permit a passage of water from one section to the other, substantially as set forth.

3. The combination in a furnace-boiler of a lower section whose walls comprise outer and inner shells providing an annular water-space between, an upper cylindrical section adapted to contain water and having heat-flues extending upward therethrough, said upper section extending vertically upward from said lower section and fitting at its lower end into the lower section, tubular nipples passing through the wall of the upper section and inner shell of the lower section and holding the sections together while affording a passage for the water between, and plugs inserted in the outer shell of the lower section opposite said nipples and providing access thereto, substantially as set forth.

4. The combination in a boiler having a dome o , with a central opening and cover q , therefor, an upper section with flues k, k , and a central fuel-magazine p , of a funnel p' , leading to said magazine and having its lower end fitting into the top of said magazine and its upper edges lying in a recess at the margin of said central opening in the dome, substantially as set forth.

5. A boiler consisting of a lower section providing a central fire-chamber and an annular water-space, an upper section forming a water-space in communication with the said lower water-space, flues extending up through said upper section and a jacket i , surrounding said upper section at a distance therefrom and forming an air-space in communication with the flues, and an exit-passage at the lower part of said air-space, substantially as set forth.

6. The combination in a boiler of a lower water-section f , having at its upper end a flange f^5 , an upper water-section n , extending upward from the top of said lower section, a dome seated upon said upper section and having a peripheral flange, a jacket i , held by said flange f^5 , and peripheral flange and forming an air-chamber, the said dome being supported upon lugs and held up to form a draft-space between said dome and the edges of the upper section and a curved flange closing this

space at the back of the boiler whereby the heated air is caused to pass downward at the front of the boiler, substantially as set forth.

7. The combination in a boiler, of upper and lower annular water-sections, the lower edges of the upper section being outwardly recessed to receive the upper edges of the lower section and hollow nipples screwed through the contiguous walls of said ends, substantially as set forth.

8. The combination in a boiler of annular water-sections placed end to end, the edges of the end of one of said sections having an annular recess receiving the adjacent end of the next section and hollow nipples screwed through the contiguous walls of said sections, substantially as set forth.

9. The combination in a boiler of annular water-sections placed end to end, the edges of the end of one section having an annular recess receiving the adjacent end of the other section, hollow nipples screwed through the contiguous walls of said sections, and plugs inserted in the outer walls of the section opposite said nipples, and providing access thereto, substantially as set forth.

In testimony that I claim the foregoing I have hereunto set my hand this 27th day of June, 1898.

CHARLES C. BALL.

Witnesses:

CHARLES H. PELL,
C. B. PITNEY.