

No. 724,781.

PATENTED APR. 7, 1903.

W. S. BEALE.  
STOVE OR FURNACE.

APPLICATION FILED FEB. 19, 1902.

NO MODEL.

2 SHEETS—SHEET 1.

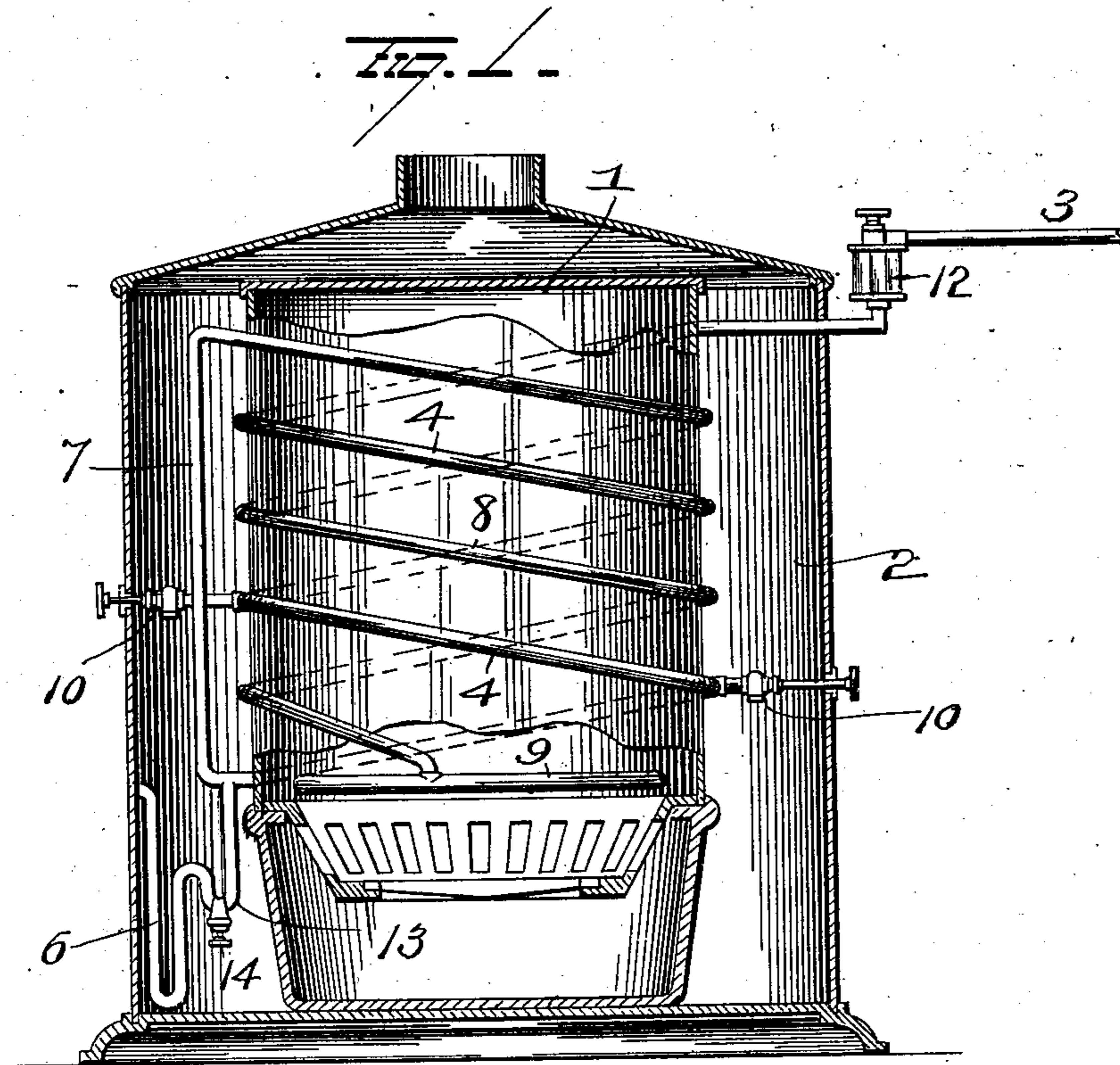
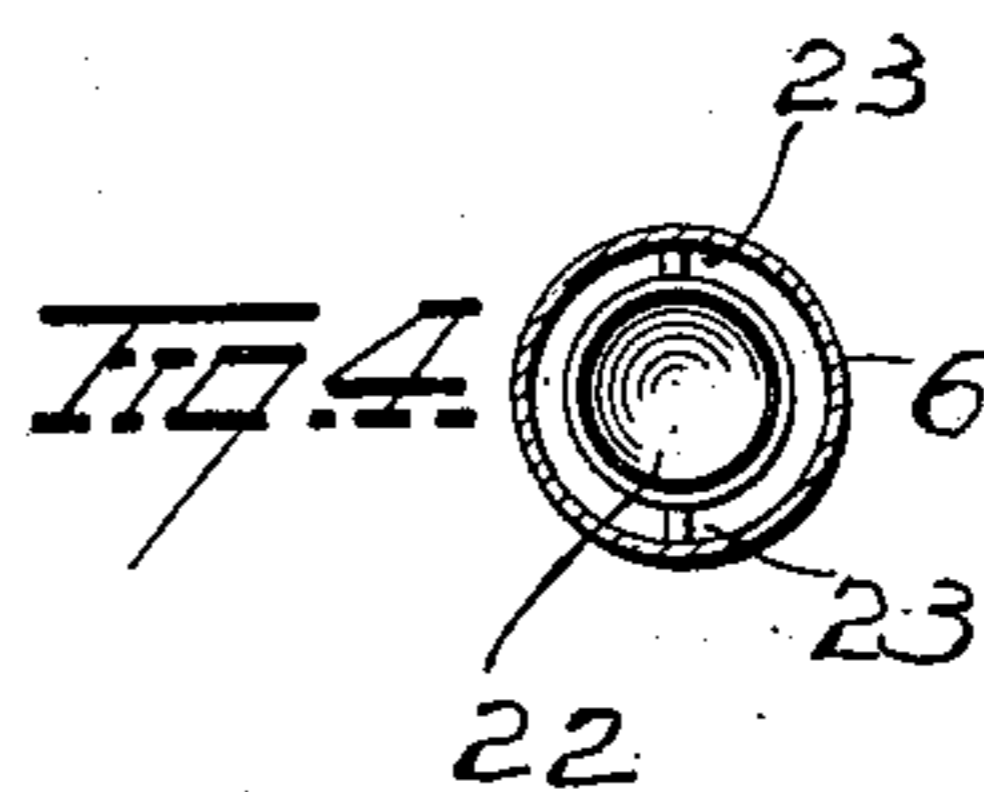
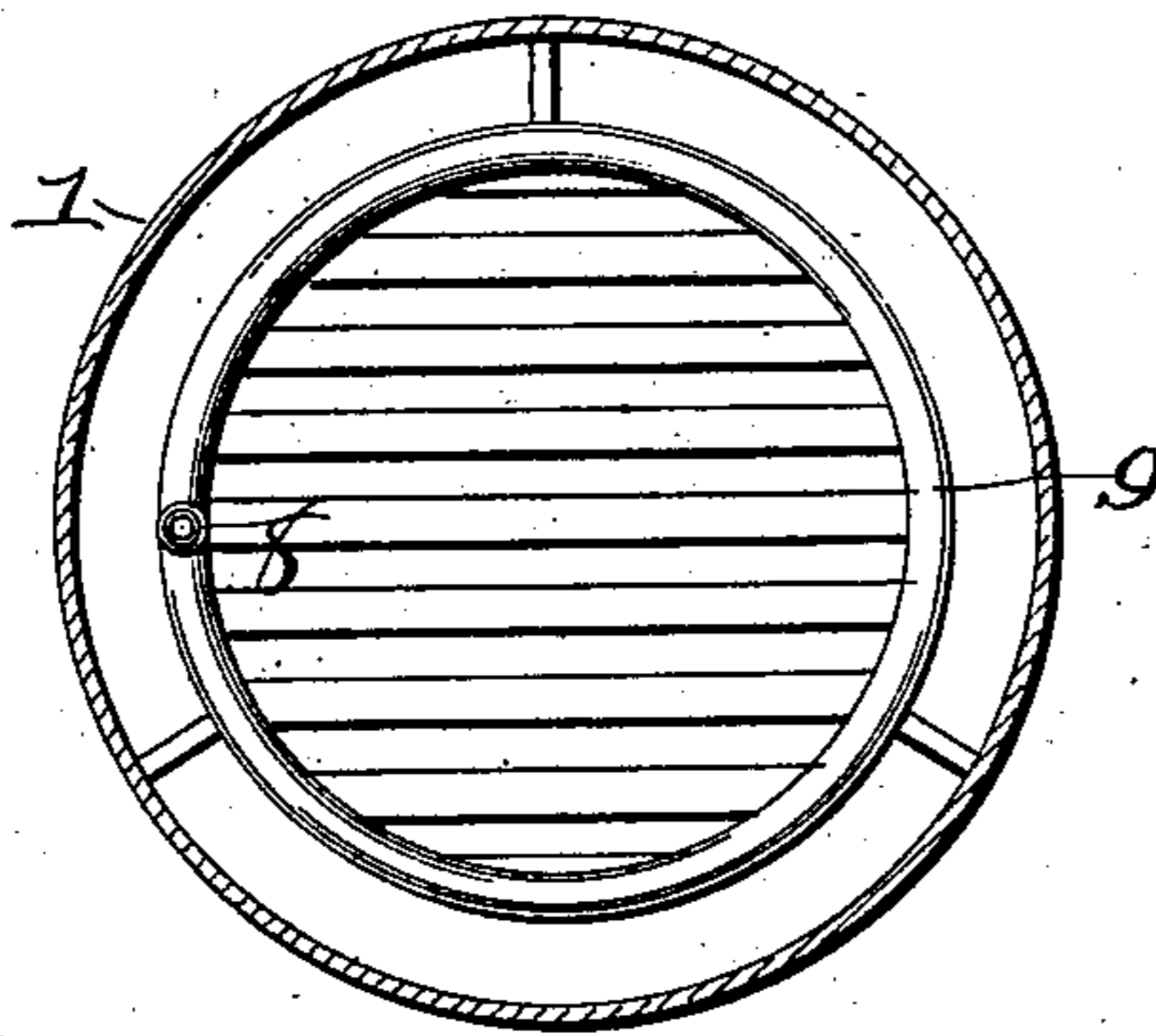
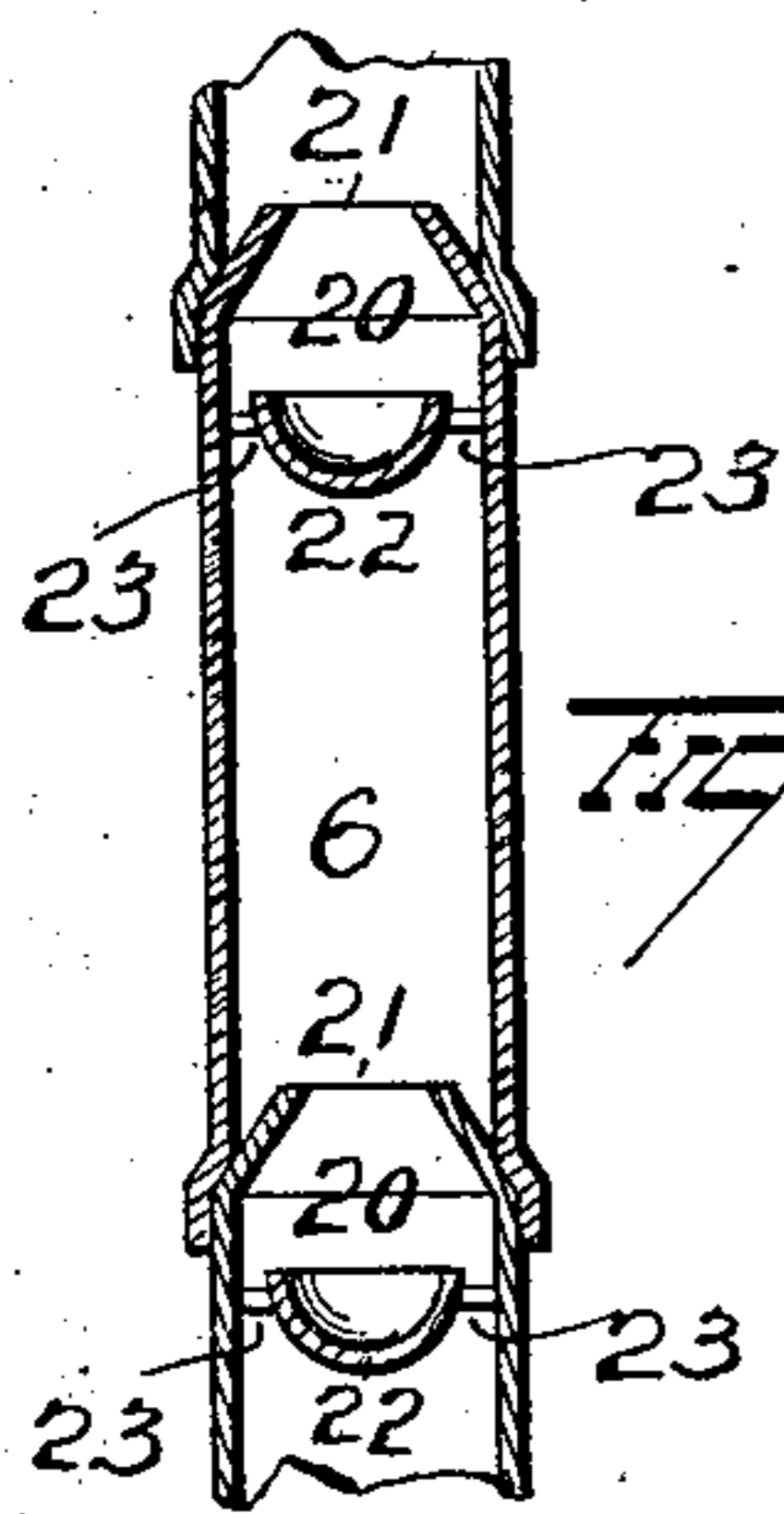


Fig. 2.



WITNESSES  
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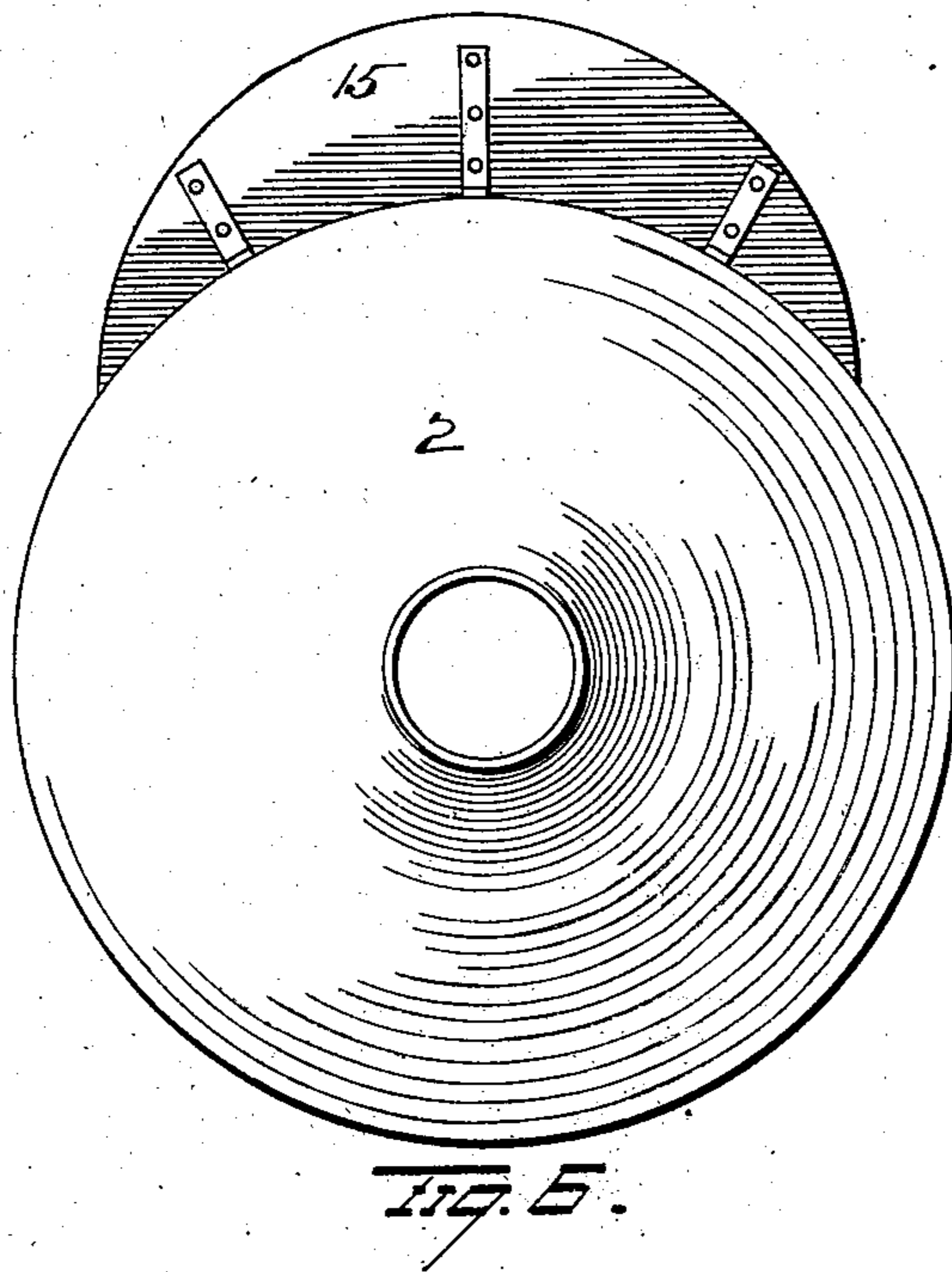
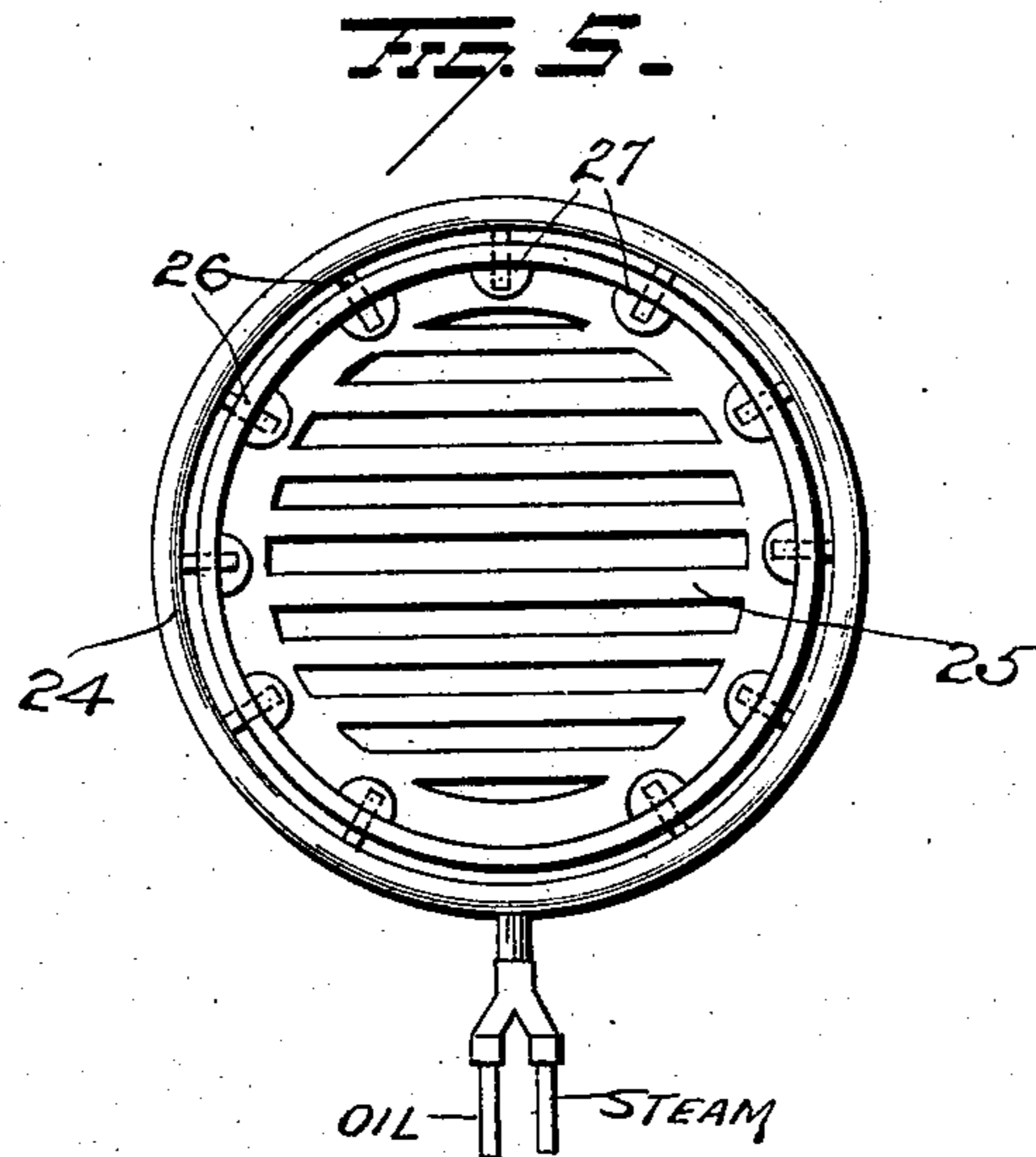
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WITNESSES

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INVENTOR

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# UNITED STATES PATENT OFFICE.

WILLIAM S. BEALE, OF TERRE HAUTE, INDIANA, ASSIGNOR OF ONE-HALF  
TO B. F. DAY, OF TERRE HAUTE, INDIANA.

## STOVE OR FURNACE.

SPECIFICATION forming part of Letters Patent No. 724,781, dated April 7, 1903.

Application filed February 19, 1902. Serial No. 94,765. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM S. BEALE, a resident of Terre Haute, in the county of Vigo and State of Indiana, have invented certain  
5 new and useful Improvements in Stoves or Furnaces; 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  
10 make and use the same.

My invention relates to an improvement in stoves and furnaces, and more particularly to improved means for generating, superheating, and burning steam in stoves and fur-  
15 naces, the object of the invention being to provide means of this character whose operation will be continuous and which will be extremely simple in construction, comparatively cheap to manufacture and use, and  
20 whose operation will be perfect and result in a great saving of fuel, as well as improve the healthfulness of the heat furnished.

With this object in view the invention consists in certain novel features of construction  
25 and combinations and arrangements of parts, as will be more fully hereinafter described, and pointed out in the claims.

In the accompanying drawings, Figure 1 is a view in section illustrating my improve-  
30 ments. Figs. 2, 3, and 4 are views illustrating the various details of construction, and Figs. 5 and 6 are views of modifications.

1 represents an ordinary hot-air furnace, the air-heating chamber being located be-  
35 tween the furnace proper or combustion-chamber 1 and the inclosing casing 2, and a suitable grate is provided in the lower portion of the combustion-chamber.

It is to be understood that the particular  
40 form of furnace shown in the drawings is not essential, as any known form of furnace might be provided with my improvements.

3 represents a water-supply pipe which is adapted to supply water (preferably hot wa-  
45 ter) to a pipe 4, which latter enters the air-heating chamber, near the top thereof, and coils about the combustion-chamber to near the bottom thereof, when it projects outward and is provided with a drip-pipe 6, as shown.  
50 With the pipe 4, near the entrance to drip-pipe 6, a vertical pipe 7 communicates and

connects with a superheating-coil 8 around the combustion-chamber, and the latter (the pipe 8) projects at its lower end into the com-  
bustion-chamber and connects with a circular  
55 perforated discharge-pipe 9 for directing the superheated steam into the fuel to be burned therewith.

While I have described the pipes 4, 7, and 8 as separate pipes, they may constitute but  
60 one continuous pipe, if desired.

In pipe 4 at suitable points valves 10 may be provided for discharging live steam into the hot-air space to moisten the air and pre-  
vent the injury to buildings and furniture  
65 caused by excessively-dry heat. At the junction of the coil 4 and water-supply pipe 3 a suitable valve and gage 12 of any approved construction may be provided.

The drip-pipe 6, above referred to, is con-  
70 nected with the lower end of coil 4 by means of a sediment-trap 13 to collect the sediment, and said trap is provided with a valve 14 to permit the cleaning thereof. This pipe 6 is adapted to carry off all water which is not  
75 generated into steam during its passage through coil 4, and in order to prevent the pressure of steam blowing through pipe 6 I provide a series of reducers 20 in said drip-  
80 pipe. These reducers each comprise a cone 21, open at its apex and having a cup 22 below the same supported on suitable lugs or shoulders 23 to permit the overflow of water around the outer edge of the cup, but resist  
85 the steam-pressure and prevent blowing through the drip-pipe.

Instead of connecting the coil 4 with a supply-pipe I might provide a reservoir 15 and so shape the same as to be located in close  
90 proximity to or inside the furnace to effectually heat the water, as shown in Fig. 6, and suitable safety-valves and the like may be provided to avoid all danger.

Various other forms of water-supply may be employed, as the particular source of sup-  
95 ply is immaterial. I might also provide other means for directing the superheated steam into the fuel. For instance, as shown in Fig. 5, I might provide a circular discharge-pipe  
100 24 outside the fire-pot 25 and provide the pipe 24 with outlet-spouts 26, projecting through the fire-pot, and locate on the latter over the

spouts 26 shields or protectors 27 to prevent interference with the discharge of superheated steam due to the collection of ashes or clinkers over the spouts.

5 Various other changes might be resorted to in the general form and arrangement of the several parts described without departing from my invention, and hence I would have it understood that I do not wish to limit my-  
10 self to the precise details set forth, but consider myself at liberty to make such slight changes and alterations as fairly fall within the spirit and scope of my invention.

Having fully described my invention, what  
15 I claim as new, and desire to secure by Letters Patent, is—

1. The combination with a combustion-chamber, of a coiled pipe encircling the same approximately from end to end thereof, means  
20 for supplying water to one end of said coil, a superheating-coil also encircling the combustion-chamber approximately from end to end thereof and communicating at one end with the other end of the water-coil, and means  
25 for discharging superheated steam from the superheating-coil into the combustion-chamber.

2. The combination with a combustion-chamber, of a coiled pipe encircling the same,  
30 means for supplying water to the cooler end of said pipe, a superheating-pipe also encircling the combustion-chamber, a pipe connecting the hotter end of the water-pipe with the cooler end of superheating-coil, and means  
35 communicating with the hotter end of the superheating-coil for discharging superheated steam into the combustion-chamber.

3. The combination with a fire-box and a vertical combustion-chamber over the same,  
40 of a water-coil encircling the combustion-chamber, a water-pipe communicating with the upper end of said water-coil, a superheating-coil encircling the combustion-chamber, a pipe connecting the lower end of the water-coil with the upper end of the superheating-coil and means communicating with the lower  
45 end of the superheating-coil for discharging superheated steam into the lower end of the combustion-chamber.

4. The combination with a combustion-chamber, of a coil of pipe encircling the same, means for supplying water to said coil, a superheating-coil also encircling the combustion-chamber and communicating with the  
50 outlet end of the first-mentioned coil, and a water-discharge pipe communicating with said coils in proximity to their juncture.

5. The combination with a combustion-chamber, of a coil of pipe in which to generate steam, another coil of pipe communicating with the first-mentioned coil and in which  
60 to superheat the steam, and a water-discharge pipe communicating with said coils in proximity to their juncture.

6. The combination with a combustion-chamber, of a pipe in which to generate steam, another pipe communicating with the first-mentioned pipe and in which the steam is superheated, both of said pipes encircling the combustion-chamber, a water-drip pipe communicating with said pipes in proximity to  
65 their juncture, means in said drip for preventing the escape of steam therethrough and means for projecting steam from the superheating-pipe into said combustion-chamber.  
70

7. The combination with a combustion-chamber, of a pipe encircling the same in which to generate steam, another pipe encircling the combustion-chamber and communicating with the first-mentioned pipe and in  
80 which the steam is superheated, a drip-pipe communicating with said pipes in proximity to their juncture for permitting the escape of water and a circular perforated pipe communicating with the outlet of the superheating-pipe for discharging the superheated steam  
85 into the combustion-chamber.

8. The combination with a combustion-chamber, and a shell inclosing the same and forming a hot-air chamber, of a coil of pipe  
90 encircling said chamber in which to generate steam, another coil of pipe communicating with the first-mentioned pipe and in which the steam is superheated, a drip-pipe communicating with said pipes in proximity to their  
95 juncture to permit the escape of water, a sediment chamber or trap in said drip-pipe, and valves in the first-mentioned pipe for discharging steam into the hot-air chamber.

9. In a furnace, the combination with a combustion-chamber and a shell inclosing the same and forming a hot-air chamber, of a coil of pipe within said hot-air chamber and encircling the combustion-chamber, and means  
100 connected with said pipe for discharging fluid into said hot-air chamber.  
105

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

WILLIAM S. BEALE.

Witnesses:

L. F. BROWNOLD,  
L. BURGET.