

J. PROMENSHENKEL & R. FREEMAN.

FURNACE.

APPLICATION FILED MAY 3, 1909.

973,879.

Patented Oct. 25, 1910.

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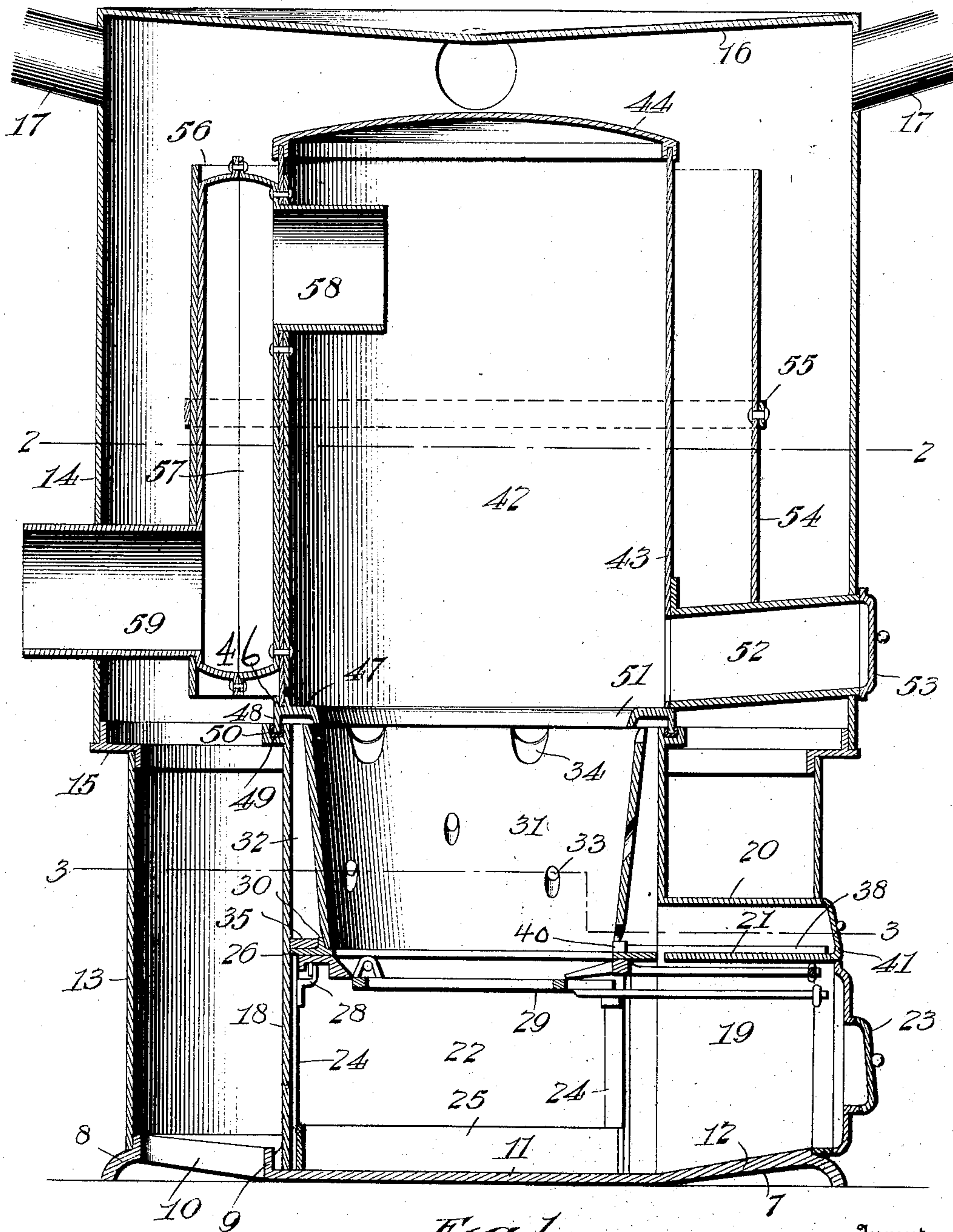


Fig. 1.

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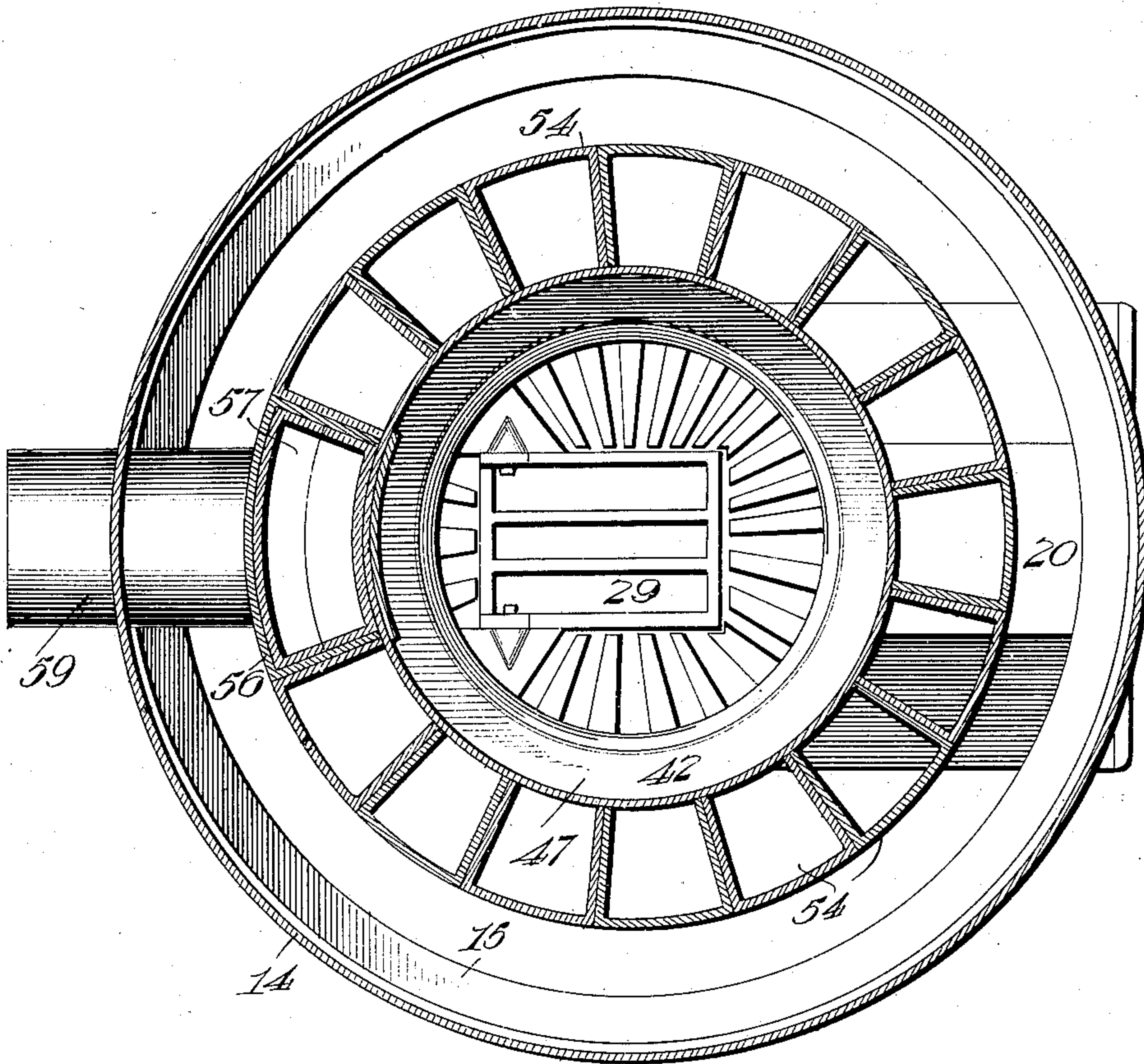
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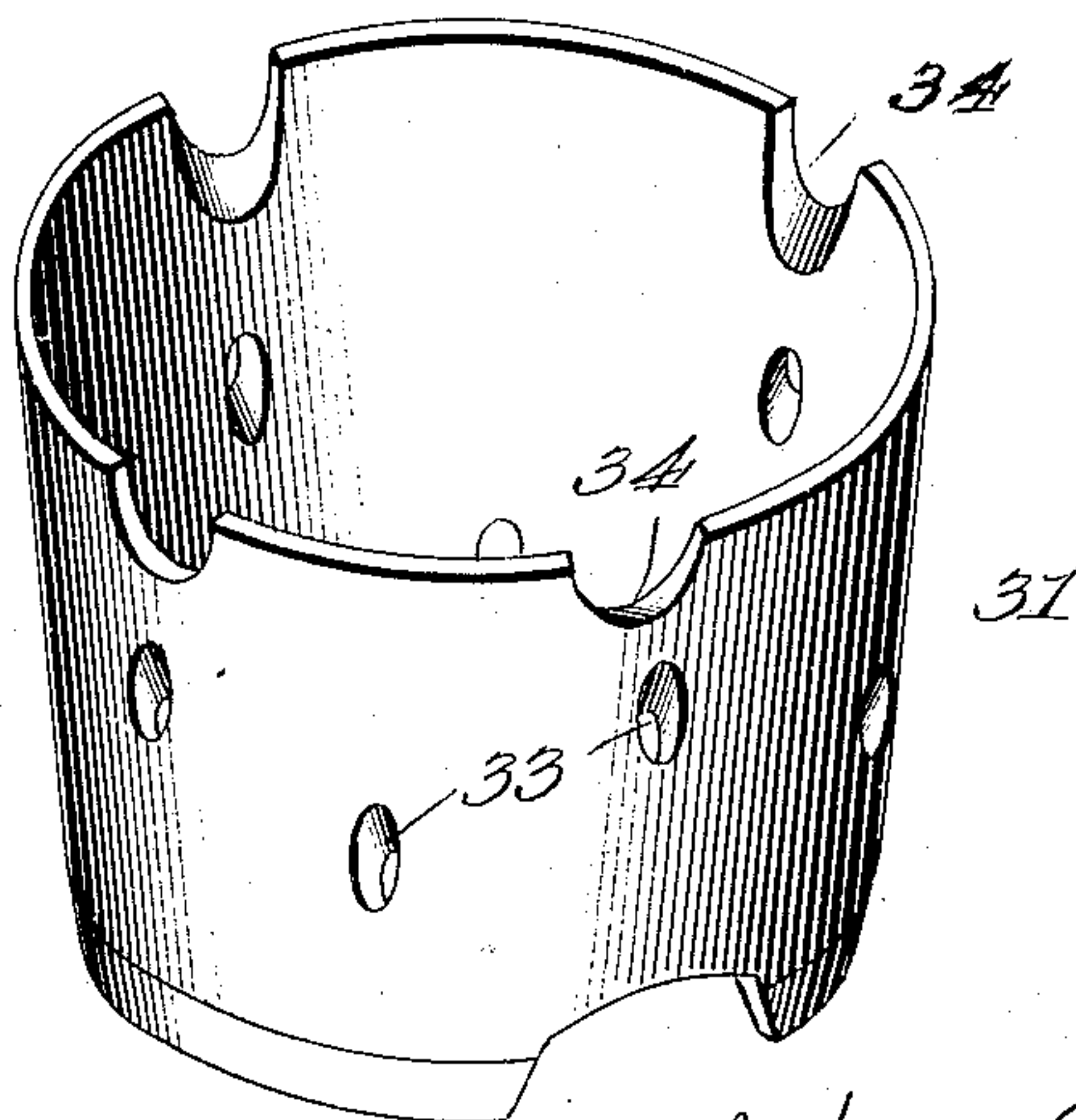
3 SHEETS—SHEET 2.

973,879.

*Fig. 2.*



*Fig. 4.*



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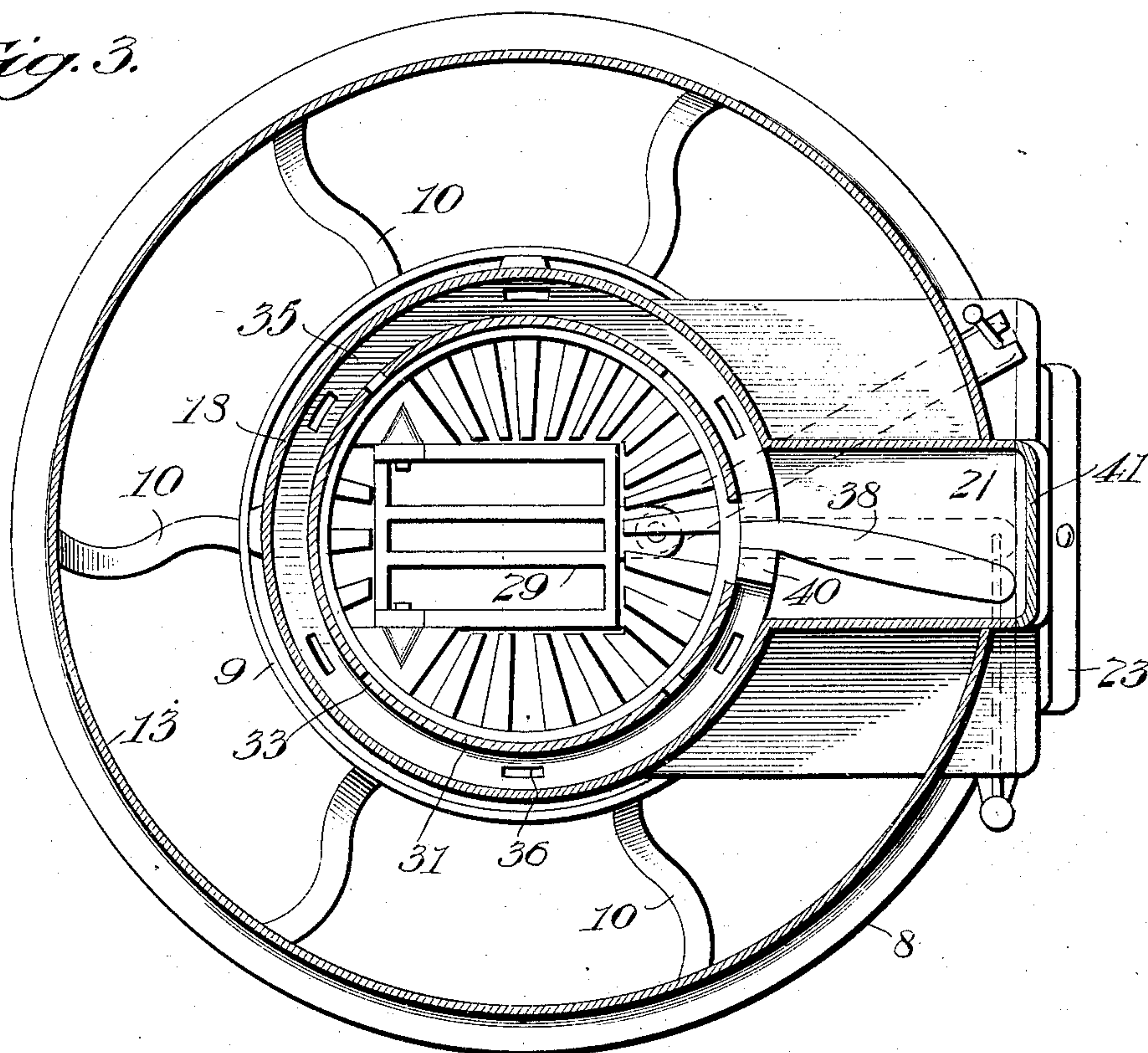
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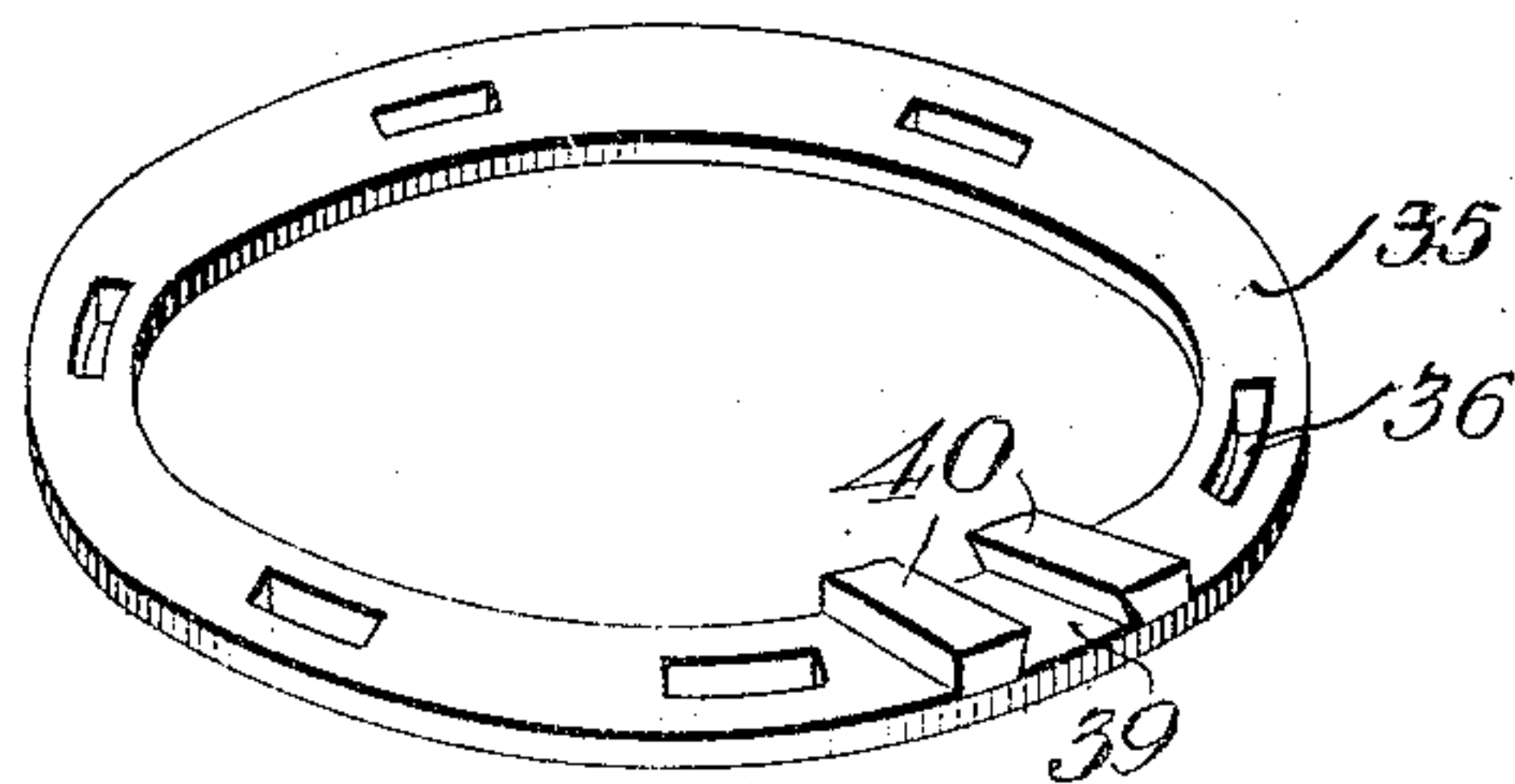
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3 SHEETS—SHEET 3.

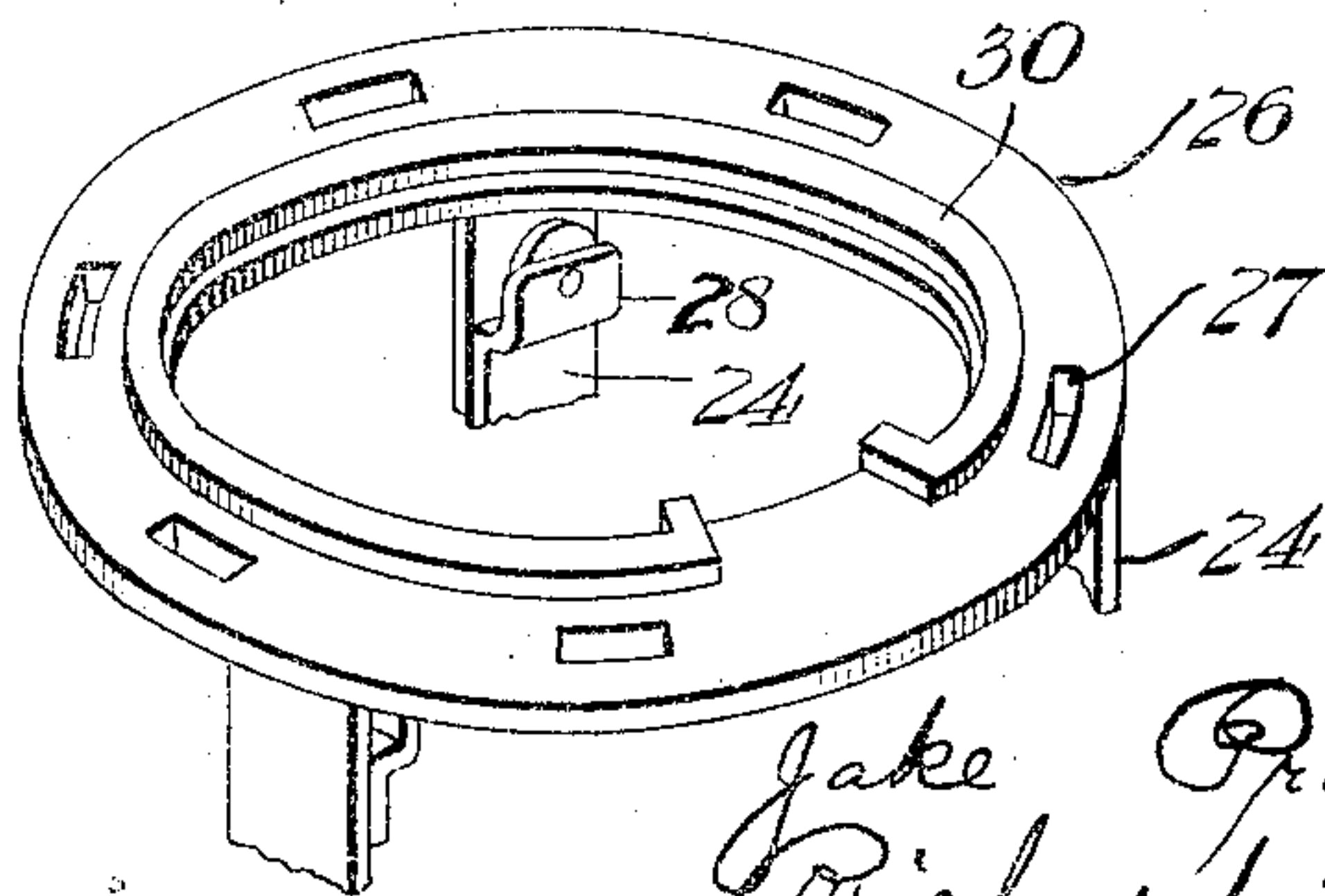
*Fig. 3.*



*Fig. 5.*



*Fig. 6.*



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# UNITED STATES PATENT OFFICE.

JAKE PROMENSHENKEL AND RICHARD FREEMAN, OF CRESTLINE, OHIO.

## FURNACE.

973,879.

Specification of Letters Patent.

Patented Oct. 25, 1910.

Application filed May 3, 1909. Serial No. 493,531.

*To all whom it may concern:*

Be it known that we, JAKE PROMENSHENKEL and RICHARD FREEMAN, citizens of the United States, residing at Crestline, in the county of Crawford and State of Ohio, have invented certain new and useful Improvements in Furnaces, of which the following is a specification.

This invention relates more particularly to hot air furnaces, and one of the primary objects is to provide a novel, simple and practical structure, in which various kinds of fuel can be burned and very perfect combustion secured, the drafts being controlled according to the fuel employed.

A further and important object is to provide a structure, in which the fire pot is free and is relieved of the weight of superposed parts so that it can freely expand and contract, thus obviating to a very material degree the danger of cracking and breaking such fire pot.

Another object is to provide a structure in which the air is brought into intimate contact with the heat-radiating walls of the furnace, so that a high degree of heat is imparted to such air.

The preferred embodiment of the invention is illustrated in the accompanying drawings, wherein:—

Figure 1 is a vertical sectional view through the furnace. Figs. 2 and 3 are respectively horizontal sectional views on the line 2—2 and 3—3 of Fig. 1. Fig. 4 is a detail perspective view of the fire pot preferably employed. Fig. 5 is a detail perspective view of the draft-controlling ring. Fig. 6 is a similar view of the upper portion of the grate and fire pot support.

Similar reference numerals designate corresponding parts in all the figures of the drawings.

In the embodiment illustrated, a base is employed, which is in the form of an open frame, comprising an outer ring 8, an inner ring 9 connected by suitable webs 10, and a bottom 11, which is formed within the central ring, and has an extension 12, said bottom 11 constituting the bottom of the ash pit. Mounted on the base 7 is an outer casing comprising a lower section 13 and an upper section 14, the latter being preferably of greater diameter than the former, and being mounted thereon by means of a ring 15. The upper section 14 has a suitable top 16, and leading from said

section are the usual hot-air conducting pipes 17.

Arranged within the lower portion of the outer casing, and mounted on the base, is a jacket 18, preferably of sheet steel and having on one side, an extension 19 provided with a top 20 and an intermediate horizontal partition 21. The lower portion of the extension, below the partition 21, affords access to the interior of the lower portion of the jacket, which portion constitutes an ash pit 22, the opening being controlled by a door 23. A combined grate and fire pot support is arranged within the lower portion of the jacket and is mounted on the base entirely independent thereof. This support comprises suitable standards 24 preferably connected at their lower ends by a partial circular band 25, and carrying on their upper ends, a supporting ring 26, which as shown more particularly in Fig. 6, has openings 27 therethrough. The standards are provided with brackets 28, in which is detachably mounted a suitable grate 29. The supporting ring 26, has contiguous to its inner margin an upstanding rib 30, and supported on said ring, inside the rib, is a downwardly tapered fire pot 31, which is arranged within the upper portion of the jacket 18, and is disposed in spaced relation thereto, forming an air chamber 32. The walls of the fire pot are provided with openings 33, which communicate with the air chamber 32 and preferably inclined downwardly.

While the fire pot 31 is represented by the drawings as one solid structure, yet it will be understood that the same may be made sectional to adapt it to various commercial requirements.

It will be observed that the upper edge of the fire pot is also provided with notches 34, and the openings and notches permit the passage of air from the chamber 32 to the interior of the fire pot. Air is admitted to said chamber 32, through the openings 27, in the supporting ring, and the passage of air through said openings 27 is controlled by a rotatable ring 35 mounted on the ring 26 and having openings 36 therethrough that are movable into and out of register with the openings 27. For the purpose of rotating the ring 35, a handle bar 38 is employed that is located in the space between the partition 21 and the top 20 of the jacket extension. The inner end of this handle



bar is dovetailed and engages in the dovetailed socket 39 formed by a pair of up-standing ribs 40 on the upper face of the ring 35. It is believed that this structure

5 will be clear by reference to Figs. 3 and 5. The outer end of the space or chamber, in which the handle bar 38 is located, and which may, therefore, be properly denominated the handle-bar chamber, is normally closed by a door 41, and by opening said 10 door, it will be obvious that the handle 38 can be grasped and moved in either direction, thus partially rotating the ring 35. When it is desired to burn slack or inferior 15 grades of coal, then an extra supply of draft is required, which by leaving open said door 41, will be admitted to the chamber 32, through the space between the partition 21 and the top 20 of the jacket extension 19.

20 Arranged above the fire pot and supported on the jacket 18, entirely independent of said fire pot, is a combustion chamber 42 having a cylindrical side wall 43, and a top 44. The lower edge of the cylindrical side 25 wall is mounted in the annular groove 46 of a ring or flange 47 having a downturned rib 48 that engages in an annular groove 49, formed in the upper edge of the jacket 18. This groove may be packed with asbestos 30 or other insulating material. The flange or ring 47 extends inwardly over the upper edge of the fire pot 31, and is downturned, as shown at 51, being preferably spaced from the fire pot.

35 A chute 52 extends from the outer casing to the lower portion of the combustion chamber, and constitutes means for introducing the fuel to the fire. The outer end of this chute is closed by a suitable door 53. 40 Surrounding the cylindrical wall 43 of the combustion chamber, and disposed in spaced relation to the upper section 14 of the outer casing, is a series of vertical open-ended air-heating tubes 54. Said tubes are disposed 45 side by side and each has three walls, leaving an open inner side that is closed by the cylindrical wall 43, as clearly evident by reference to Fig. 2. The tubes are held in place upon the cylindrical wall by a clamp- 50 ing ring 55 surrounding the same. One of these tubes, as 56, is considerably larger than the others, and receives therein an upright smoke-conducting casing 57, preferably formed of sections and having an 55 upper smoke inlet 58 that extends into the combustion chamber and a lower projecting nipple 59 that extends through the outer casing, and constitutes a smoke pipe coupling.

60 With this structure, it will be noted that the upper members of the furnace are mounted on and supported by the jacket 18 so that no weight comes upon the fire pot, and said fire pot, being free, can expand and 65 contract freely. The arrangement of the

parts moreover is such that air can enter the fire pot at different points from the chamber 32, and thus complete combustion is secured. The amount of air admitted is controlled by rotating the ring 35 to move 70 the openings 36 and 27 into or out of alignment, and also to shake ashes out of the chamber 32, which may accumulate therein through said openings into the ash pit. This particular arrangement is important, 75 for it permits the successful burning of different kinds and grades of fuel. The air circulating or heating tubes 54 maintain the rising currents of air in intimate contact 80 with the highly heated wall 43 of the combustion chamber, and thus insure the proper heating of said air prior to its passage through the pipes 17.

From the foregoing, it is thought that the construction, operation and many advantages 85 of the herein described invention will be apparent to those skilled in the art without further description, and it will be understood that various changes in the size, shape, proportion and minor details of construction, may be resorted to without departing 90 from the spirit or sacrificing any of the advantages of the invention.

Having thus fully described our invention, what we claim as new, and desire to 95 secure by Letters Patent, is:

1. In a furnace, the combination of a base, a jacket supported thereon, a grate-support located in the jacket and arranged on the 100 base independently of said jacket and extending from the base upward in the jacket to an intermediate point in the height of the jacket; said grate support having an apertured ring at its upper end and also having 105 brackets slightly below said end, a grate mounted on said brackets, a fire pot mounted on the inner portion of the apertured ring and separated by an annular intervening space from the jacket and having openings in 110 its side wall, a combustion chamber supported on the jacket independently of the fire pot and arranged above said fire pot, and a rotatable draft-controlling ring mounted on the support ring and having apertures 115 adapted to register with those of the latter.

2. In a furnace, the combination of a base, a jacket mounted on the base and having an opening in one side of its lower portion and a groove in its upper edge and also having, 120 above said opening, a lateral handle-bar chamber that is open at its inner and outer ends, and a door normally closing the outer end of said chamber, a grate-support located in the jacket and arranged on the base inde- 125 pendently of said jacket and extending from the base upward to an intermediate point in the height of the jacket; said grate support having an apertured ring at its upper end and also having brackets slightly below said 130 end, a grate mounted on said brackets, a fire



pot mounted on the inner portion of the  
apertured ring and separated by an annular  
intervening space from the jacket and hav-  
ing openings in its side wall; said annular  
5 space being in communication with said  
handle-bar chamber, a combustion chamber  
having its lower edge seated in the groove of  
the jacket and also having a portion dis-  
posed above the upper end of said annular  
10 space and over the fire-pot, and a rotatable  
draft controlling ring mounted on the sup-  
port ring and having apertures adapted to

register with those of the latter and also  
having means, located opposite the handle-  
bar chamber for the connection of a handle- 15  
bar.

In testimony whereof we affix our signa-  
tures in presence of two witnesses.

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Witnesses:

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ALFRED ROBERTS.