

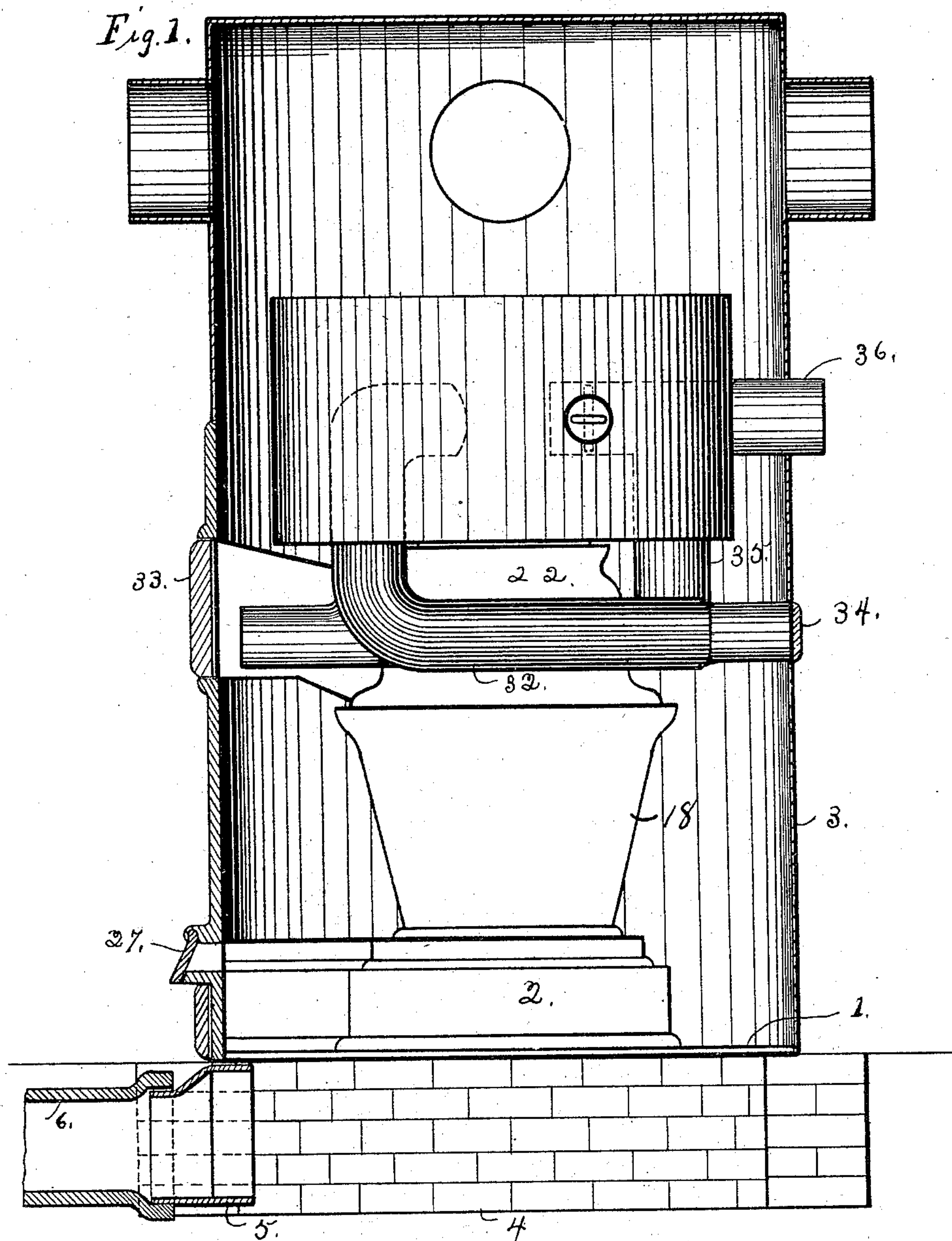
(No Model.)

4 Sheets—Sheet 1.

L. S. PFOUTS.
HOT AIR FURNACE.

No. 570,430.

Patented Oct. 27, 1896.



WITNESSES:
Joan S. Pfouts
J. A. Jeffers

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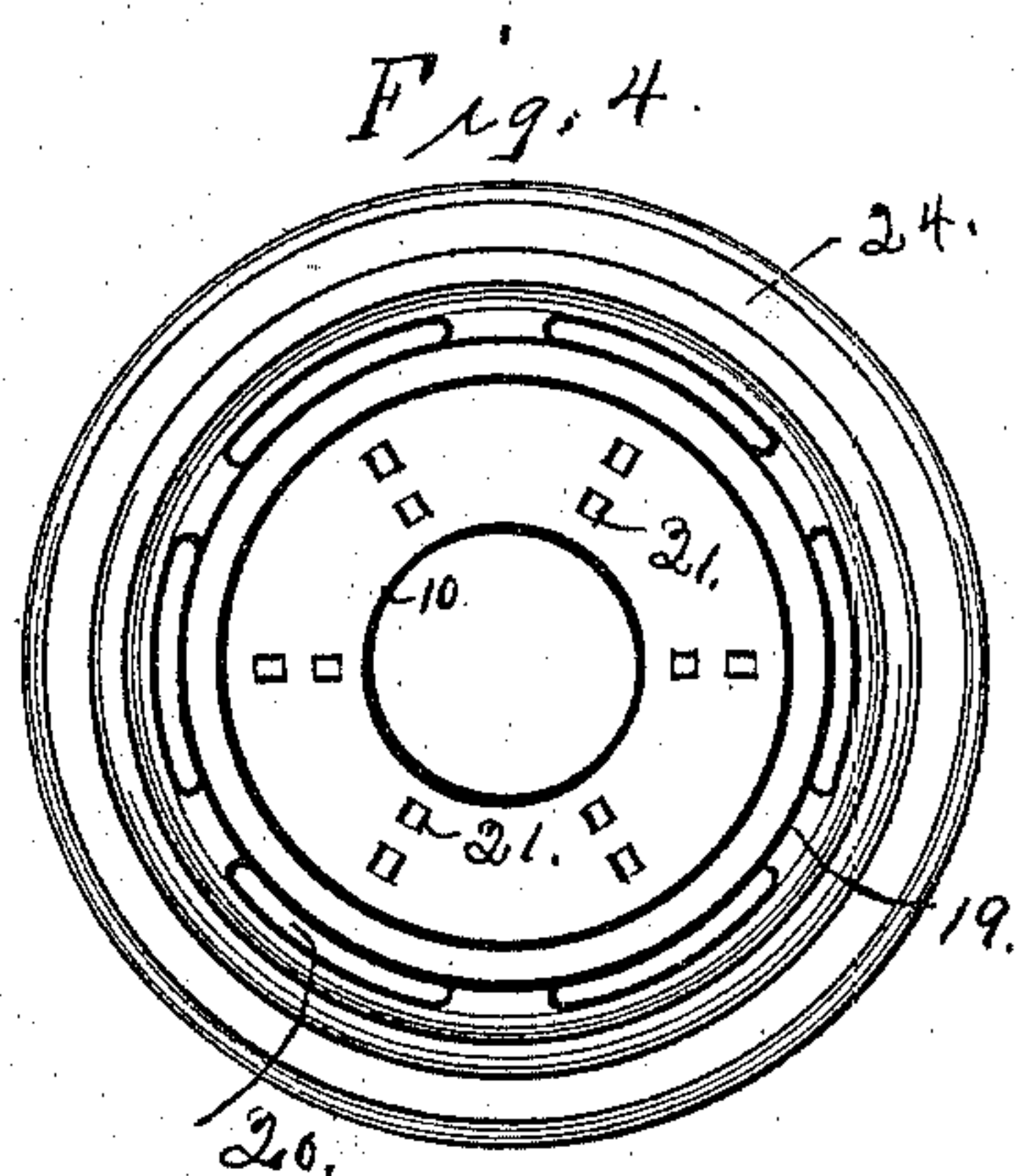
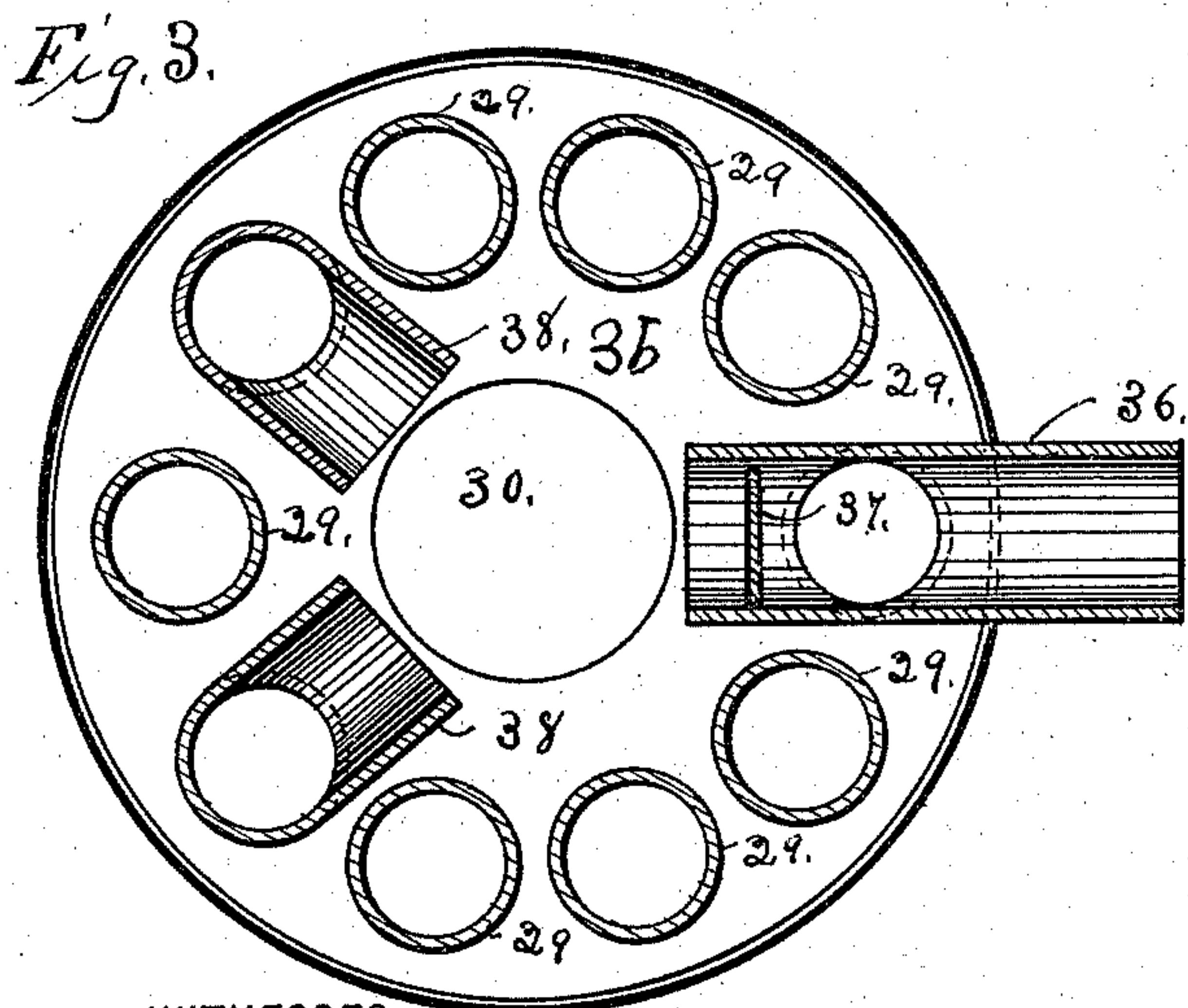
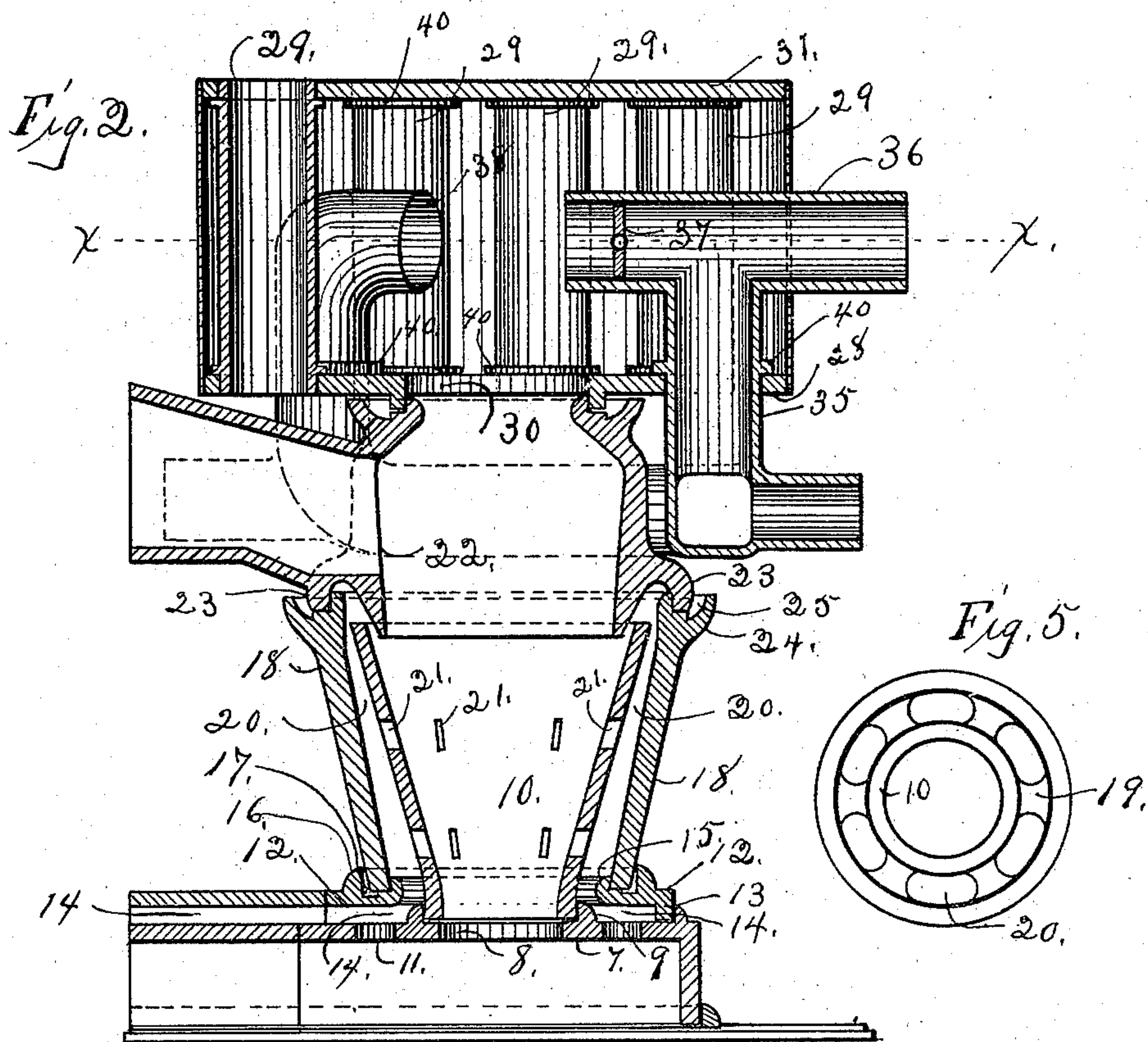
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Fig. 6.

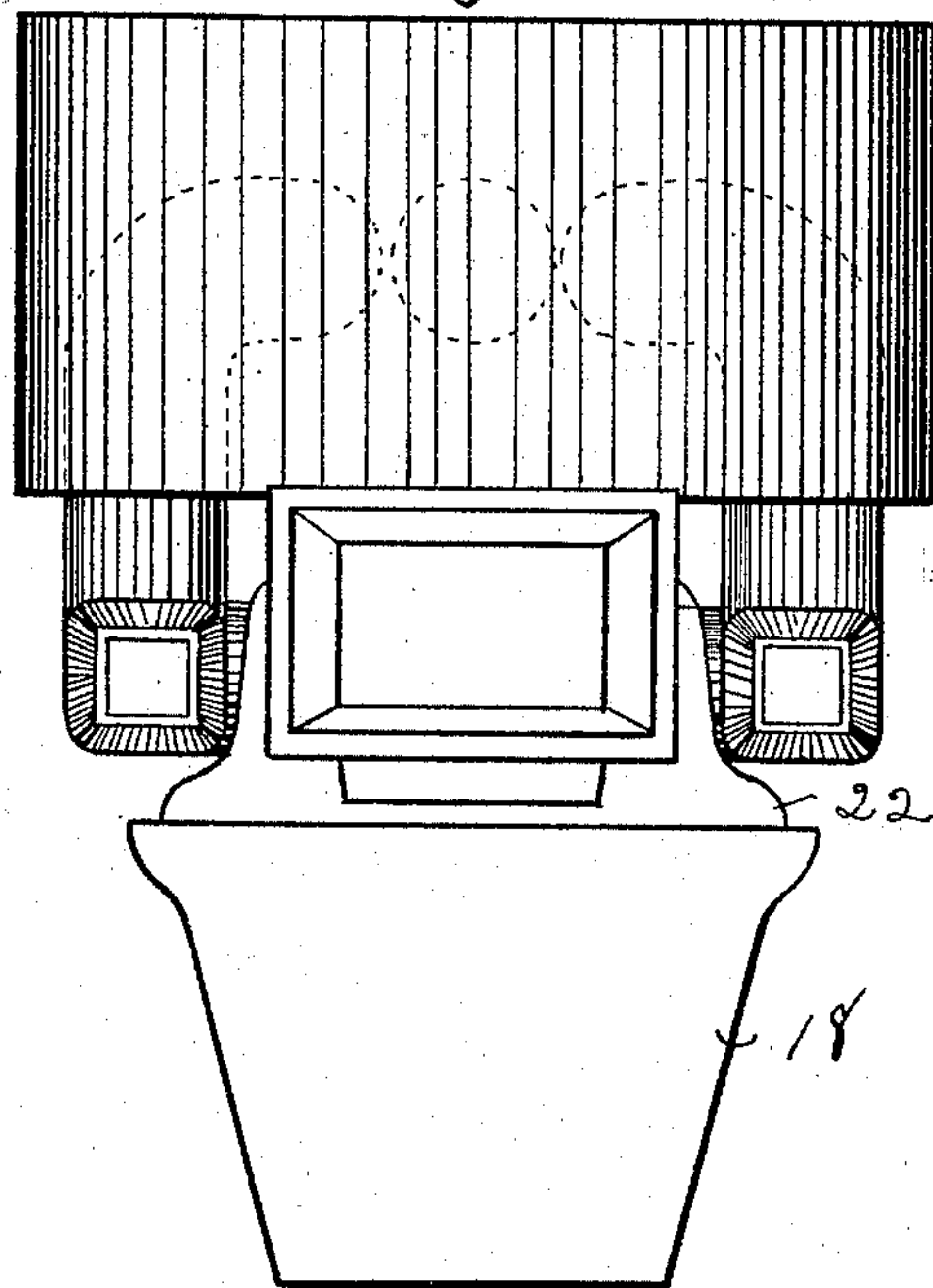
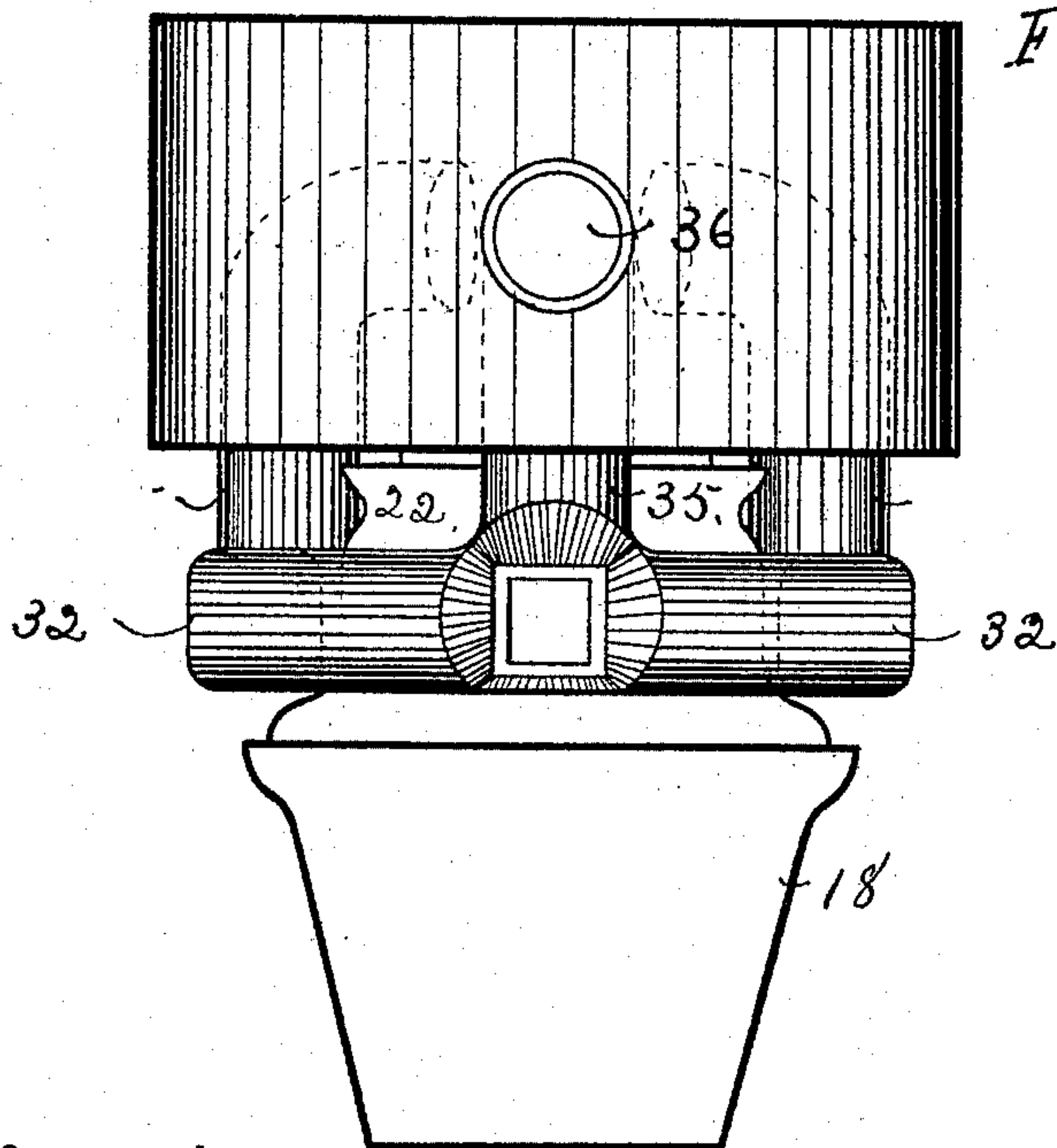


Fig. 7.



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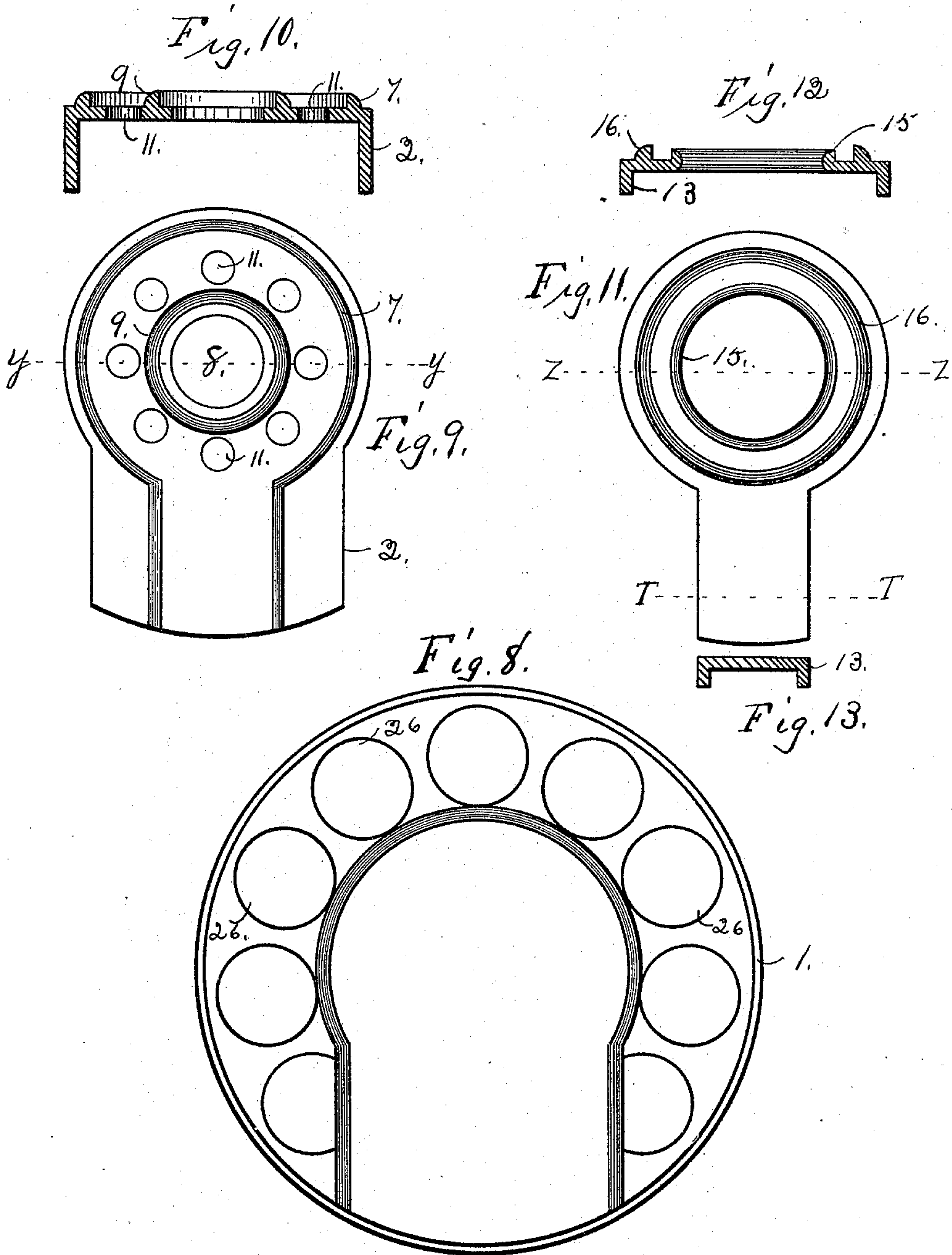
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L. S. PFOUTS.
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No. 570,430.

Patented Oct. 27, 1896.



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UNITED STATES PATENT OFFICE.

LEROY S. PFOUTS, OF CANTON, OHIO, ASSIGNOR TO FRANK M. WYANT, OF
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HOT-AIR FURNACE.

SPECIFICATION forming part of Letters Patent No. 570,430, dated October 27, 1896.

Application filed February 29, 1896. Serial No. 581,412. (No model.)

To all whom it may concern:

Be it known that I, LEROY S. PFOUTS, a citizen of the United States, residing at Canton, in the county of Stark and State of Ohio, have invented certain new and useful Improvements in Hot-Air Furnaces; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the annexed drawings, making a part of this specification, and to the figures of reference marked thereon, in which—

Figure 1 is a side elevation of the furnace, showing a longitudinal section of the jacket or casing, also showing a horizontal section of the cold-air conduit leading up into the jacket. Fig. 2 is a vertical section of the furnace, showing the different parts of the furnace properly assembled. Fig. 3 is a transverse section through line *xx*, Fig. 3. Fig. 4 is a top view of the fire-pot. Fig. 5 is a view showing the bottom or lower end of the pot. Fig. 6 is a front elevation of the fire-pot, showing the radiating-drum and the secondary radiating-tubes properly located. Fig. 7 is a rear elevation of the fire-pot, radiating-drum, and secondary radiating-tubes. Fig. 8 is a top view of the base. Fig. 9 is a top view of the upper plate forming the top and sides of the ash-chamber. Fig. 10 is a transverse section through line *YY*, Fig. 9. Fig. 11 is a top view of the base for supporting the outer section or portion of the fire-pot, also showing the cold-air conduit leading to the fuel-combustion chamber or fire-pot. Fig. 12 is a transverse section through line *ZZ*, Fig. 11. Fig. 13 is a transverse section through line *TT*, Fig. 11.

The present invention has relation to hot-air furnaces; and it consists in the different parts and combination of parts hereinafter described, and particularly pointed out in the claims.

Similar figures of reference indicate like parts in all the figures of the drawings.

In the accompanying drawings, 1 represents the base of the furnace upon which the ash-chamber 2 is located, and is formed of a size to correspond with the size of the furnace designed to be constructed. The base 1 also forms a support for the jacket or casing 3,

which jacket or casing surrounds the different parts of the furnace, and is constructed in the ordinary manner, reference being had to properly attaching the different parts belonging thereto. Below the base 1 is located the cold-air chamber 4, which chamber is preferably constructed of brick or like material, and forms a proper foundation for the furnace. To one side of the cold-air chamber 4 is located the flange 5, which flange forms a means for properly connecting the cold-air conduit 6, which cold-air conduit is preferably located below the floor of the cellar or basement in which the furnace proper is located, said conduit being located below the surface for the purpose of preventing dust and gas from entering the jacket 3 to be carried into the different compartments of the building to be heated.

The top of the ash-chamber 2 is provided with the plate 7, which plate forms an integral part of the ash-chamber proper. The plate 7 is provided with the central opening 8, which is to be provided with any suitable grate; but inasmuch as the grate proper forms no particular part of the present invention it is omitted. The plate 7 is provided with the annular flange 9, which annular flange is for the purpose of receiving the bottom or lower end of the inner section of the fire-pot 10, substantially as shown in Fig. 2. The plate 7 is also provided with any desired number of apertures 11, which apertures are arranged substantially as shown in Figs. 2 and 9. Directly above the plate 7 is located the plate 12, which plate is provided with the flanges 13, said flanges being for the purpose of forming the space or chamber 14 between the plates 7 and 12. The plate 12 is also provided with the annular flanges 15 and 16, which flanges are for the purpose of forming the groove 17, which groove receives the bottom or lower end of the outer section 18 of the fire-pot proper, which fire-pot consists of the two sections 10 and 18, one located within the other, as shown in Fig. 2.

The outer and inner sections of the fire-pot proper are held or connected together by means of the ribs 19, which ribs form the vertical spaces 20, which spaces increase in length as they extend upward and decrease in width,

thereby providing a better draft to the fire-pot or combustion-chamber.

For the purpose of allowing air to enter the fire-pot or fuel-chamber, the inner section 10 is provided with any desired number of openings, such as 21, which openings may be arranged substantially as shown in Figs. 2 and 4.

Directly above the fire-pot proper is located the dome 22, which dome is provided at its lower portion with the outwardly and downwardly curved flange 23, which flange is for the purpose of supporting the dome by means of the bottom or lower edge of said flange resting on the top or upper portion of the outer section 18 of the fire-pot. For the purpose hereinafter described the bottom or lower portion of the dome 22 is extended for a short distance into the top or upper end of the inner section 10 of the fire-pot, substantially as illustrated in Fig. 2. For the purpose of providing an air and dust tight joint between the section 18 and the dome 22 the top or upper end of the section 18 is provided with the outwardly and upwardly curved flange 24, which curved flange forms a space, such as 25, for the reception of melted lead or like material, thereby forming a perfectly-tight joint.

It will be understood that all of the different parts of the furnace proper may be connected together in substantially the same manner, thereby producing a completed furnace that will be air and dust tight, thereby preventing dust and dirt from entering the rooms designed and calculated to be heated. For the purpose of conveying air into the jacket 3 without having the same mingled with dust and gas or other contaminating elements the base-plate 1 is provided with a series of apertures, such as 26, which apertures are located within the jacket 3 and communicate with the cold-air chamber 4 and the conduit 6, which conduit, as above described, is located below the floor or surface of the cellar or basement.

When it is desired to admit air into the fire-pot for the purpose of aiding combustion, the door 27 is opened, thereby allowing air to pass upward between the sections 10 and 18 and find its way into the fire-pot by passing through the aperture 21 and over the top of the section 10. It will be understood that as the air extends upward between the sections 10 and 18 it will become heated, thereby producing more rapid combustion. Upon the top or upper end of the dome 22 is located the plate 28, which plate forms the bottom of the radiating-drum proper.

To the plate 28 is attached the open-ended tubes 29, which tubes are located and arranged substantially as shown in the drawings, and as shown they are located around the central opening 30. To the top or upper ends of the tubes 29 is attached the plate 31, which plate forms the top of the radiating-drum. Below the radiating-drum is located the secondary radiating drum or tube, which radiating-drum surrounds the dome 22, ex-

cept at the front side of said dome, which front side is provided with ordinary doors common to all furnaces, which doors are for the usual purpose, one of said doors being indicated by the number 33. The ends of the secondary radiating drum or tube are to be closed by means of suitable removable plates or doors, which are attached in any convenient and well-known manner to the ends of said secondary radiating drum or tube, and are to be removed or opened when it is desired to clean the secondary radiating drum or tube 32. For the purpose of cleaning the rear portion of the secondary radiating drum or tube 32, the door 34 is provided, which when opened exposes the rear portion of said drum or tube 32.

To the drum 32 and upon the rear portion thereof is attached the tube 35, which tube extends upward and into the radiating-drum, and is provided at its top or upper end with the horizontal tube 36, which horizontal tube 36 leads into the chimney. The horizontal tube 36 is provided with the damper 37, which damper is located substantially as shown in Fig. 2, which damper when closed causes the heat to pass downward through the pipes 38, said pipes being connected at their bottom or lower ends to the secondary radiating-drum 32. For the purpose of better conducting the heat to the secondary radiating-drum 32 the tubes or pipes 38 are bent or curved inward, so as to bring their open ends when closed proximately to the central opening 30, thereby bringing them in proper position to conduct the heat to the secondary radiating-drum 32.

Another object and purpose of bending or curving the upper ends of the tubes or pipes 38 is to remove the intense heat before it reaches the vertical sides of the radiating-drum. In the drawings I have shown two tubes 38, but it will be understood that a greater number may be employed. The object and purpose of providing plurality of tubes such as 38 is to divide the heat and conduct it to the radiating drum or tube at different points.

For the purpose of supporting the secondary radiating drum or tube 32, the tube 35 and the tubes 38 are provided with the collars 40, which collars rest upon the top or upper side of the lower plate 28, said collars being securely attached to said pipes.

It will be understood that by my peculiar arrangement and formation of the fire-pot or fuel-chamber the inner section 10 will not be liable to be burned out or injured by excessive heat, inasmuch as the air-spaces 20 surround said inner section. The object and purpose of extending the dome 22 into the top or upper end of the fire-pot 10 and admitting air into the top or upper end of said section 10 after it has become heated is to bring the heated air into proper position to cause perfect combustion of the smoke, soot, and gases arising from the flames in the fuel-pot.

The apertures 21 are for the purpose of feeding a sufficient amount of air for proper combustion in the bottom or lower portion of the fire-pot 10.

5 The air-passages formed between the fire-pot sections 10 and 18 are formed wide at their bottom or lower ends and tapered toward the top or upper ends of said air-passages, said passages tapering diametrically. 10 For the purpose of providing a narrow and long opening at the top or upper ends of the air-passages and between the fire-pot sections, the length of the openings increase circumferentially toward the top or upper end, 15 thereby providing a series of long narrow air-passages which substantially surround the entire periphery of the upper ends of the fire-pot sections. By this arrangement I am enabled to introduce into the top or upper 20 end of the fire-pot a thin volume of air.

It will be understood that the radiating-drum into which the pipes 38 are extended must necessarily become heated before the heat will pass downward through the pipes 25 38, inasmuch as heat has a natural tendency to move upward, and hence when the down draft-pipes 38 are located near the casing the intense heat coming into the radiating-drum must be carried into close proximity with the 30 casing, which has a tendency to rapidly disintegrate the casing, which is usually formed of thin sheet metal; but by bending or curving the upper ends of the pipes or tubes 38 inward or away from the casing the bent ends 35 of said tubes are carried away from the casing and at the same time provide a better downdraft.

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

1. The combination of the base-plate 1, provided with a series of apertures located between the outer periphery of the fire-pot and the outer casing of the heater, a cold-air conduit located below the floor, a fire-pot consisting of the sections 10, and 18, located one 45 within the other, and apertures located in the flange supporting the outer section of the fire-pot and between the outer and inner sections 50 of the fire-pot, a chamber located below the

base or flange supporting the outer section of the fire-pot, and a dome located upon the outer section of the fire-pot and supported to form a space between the upper end of the inner section of the fire-pot and the lower end of the 55 dome, substantially as and for the purpose specified.

2. The combination of a base supporting a fire-pot, the fire-pot consisting of the sections 10, and 18, located one within the other, the 60 outer section extended upward beyond the inner section, apertures formed through the walls of the inner section, and air-passages formed between the outer and inner sections of the fire-pot, said passages formed tapering 65 from their bottom or lower ends to their top or upper ends, and a dome located above the top or upper end of the inner section, substantially as and for the purpose specified.

3. The combination of a base supporting a 70 fire-pot, the fire-pot consisting of inner and outer sections, air-passages located between the sections, said air-passages formed tapering radially from their bottom or lower ends to their top or upper ends, and circumferen- 75 tially tapering from their upper ends to their bottom or lower ends, substantially as and for the purpose specified.

4. The combination of a fire-pot, a dome located above the fire-pot, a radiating-drum 80 located above the dome, a secondary radiating drum or pipe located below the radiating-drum, the pipe 36, located upon the top or upper end of a pipe communicating with the 85 secondary radiating-pipe, and pipes 38, connected at their bottom or lower ends to the secondary radiating-pipe and extended upward and into the radiating-drum, and their top or upper ends bent or curved inward, hav- 90 ing vertical open ends above the opening in the top of the dome, substantially as and for the purpose specified.

In testimony that I claim the above I have hereunto subscribed my name in the presence two witnesses.

LEROY S. PFOUTS.

Witnesses:

JOAN S. PFOUTS,
F. W. BOND.