

No. 684,660.

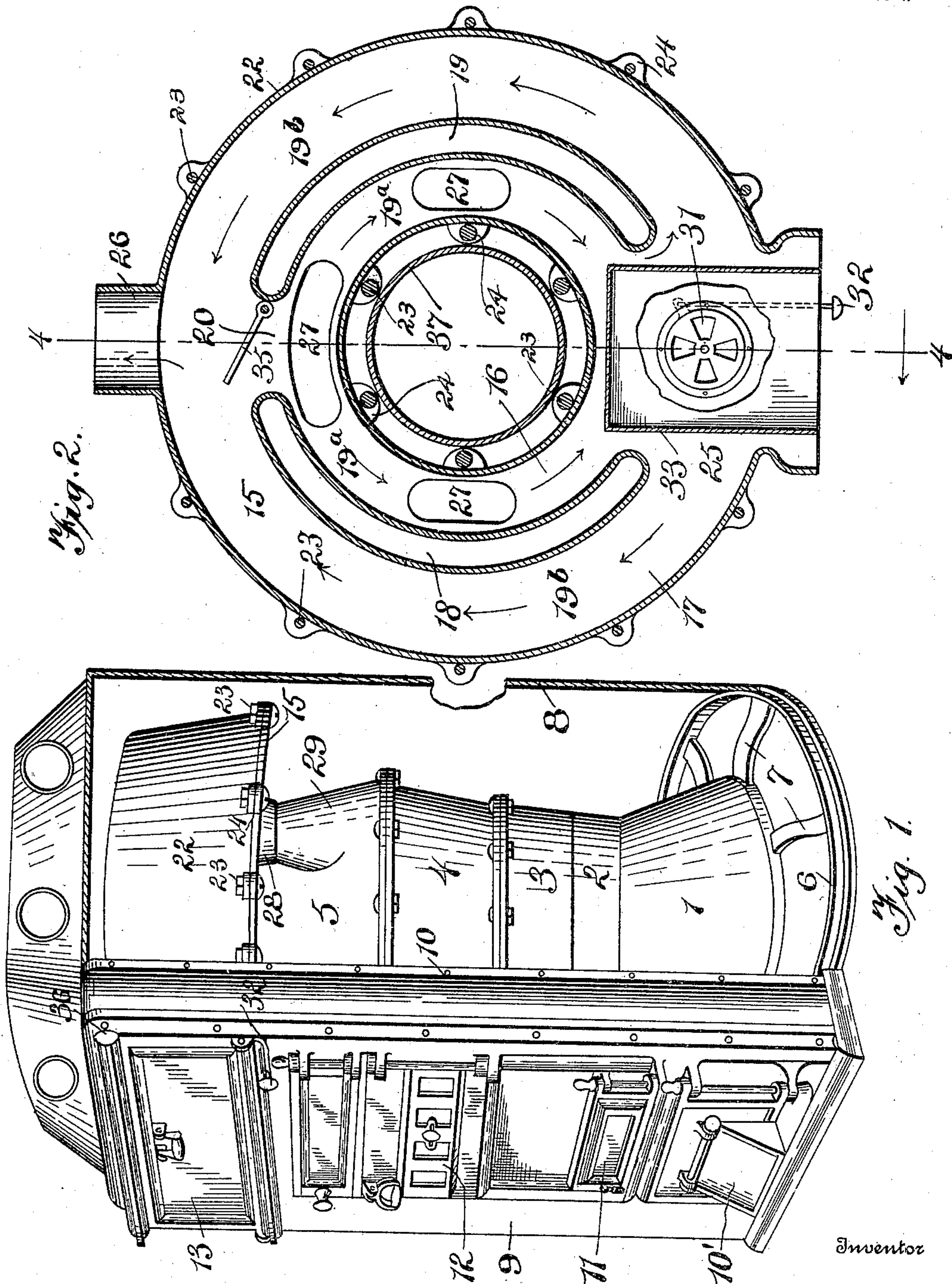
Patented Oct. 15, 1901.

H. L. WINGERT.  
HOT AIR FURNACE.

(Application filed June 8, 1901.)

(No Model.)

2 Sheets—Sheet 1.



Witnesses

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HOT AIR FURNACE.

(Application filed June 3, 1901.)

(No Model.)

2 Sheets—Sheet 2.

Fig. 3.

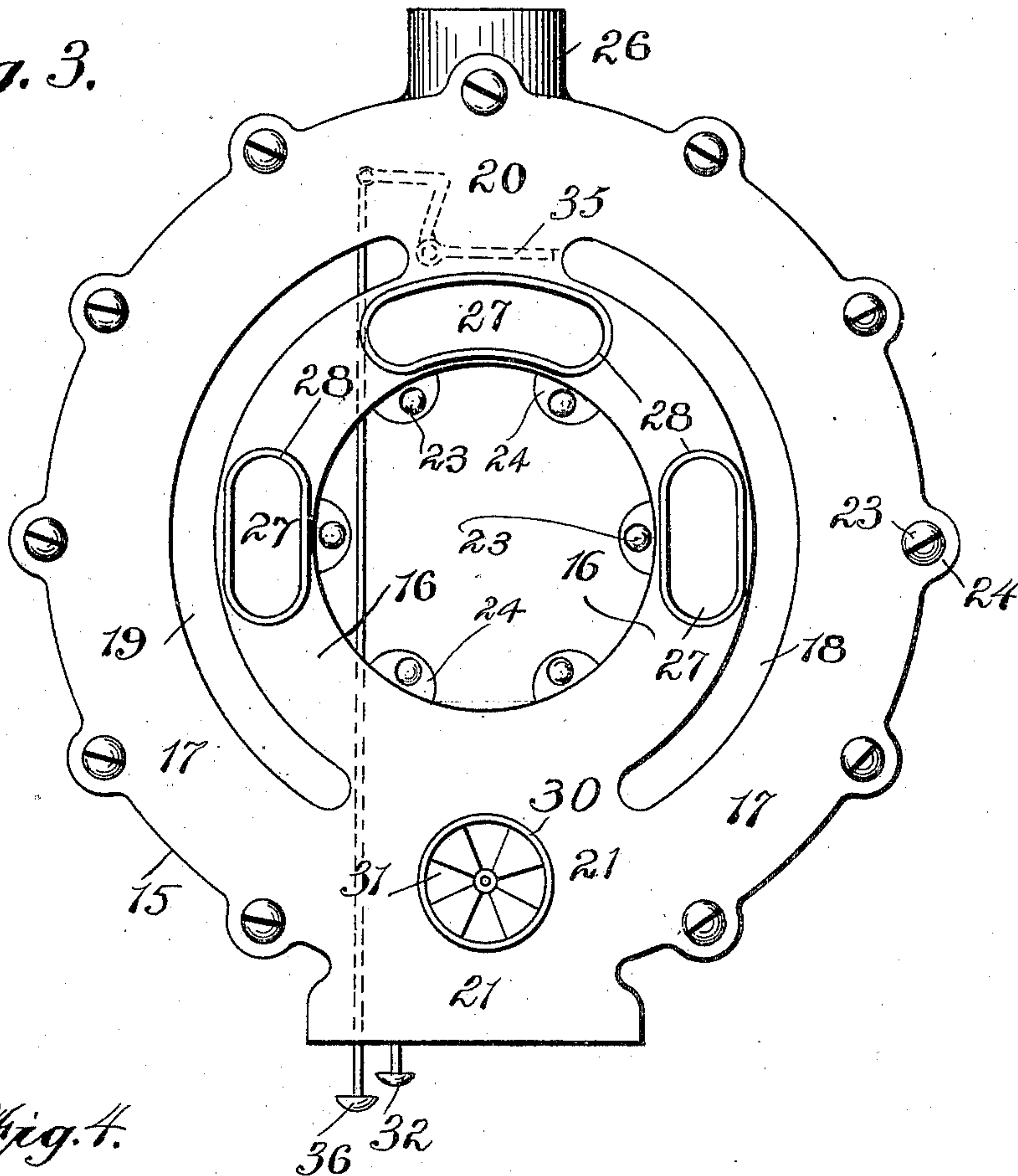
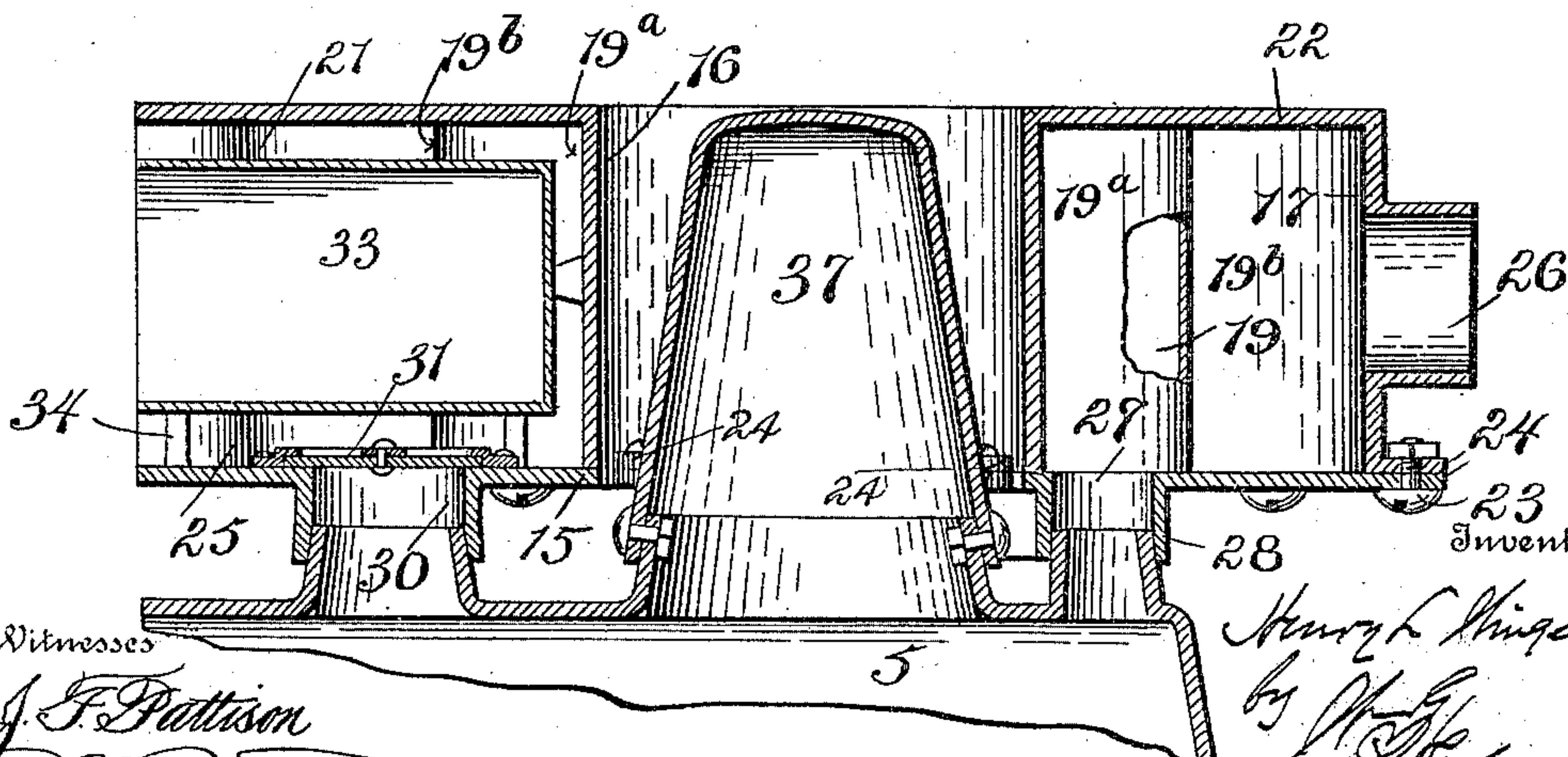


Fig. 4.



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# UNITED STATES PATENT OFFICE.

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## HOT-AIR FURNACE.

SPECIFICATION forming part of Letters Patent No. 684,660, dated October 15, 1901.

Application filed June 3, 1901. Serial No. 62,926. (No model.)

*To all whom it may concern:*

Be it known that I, HENRY L. WINGERT, a citizen of the United States, residing at Montpelier, in the county of Williams and State of Ohio, have invented certain new and useful Improvements in Hot-Air Furnaces; and I do 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 the figures of reference marked thereon, which form a part of this specification.

My invention relates to hot-air furnaces; and it has for its object to provide an improved construction of radiator of a peculiar construction, whereby the products of combustion will be received from the fire-pot or fuel-chamber at three different points in one of the radiators and so located that the products of combustion will be taken from next to the sides of the fire-pot and delivered into the first radiator at given points, whereby unequal contraction and expansion and breaking of the joints of the radiator will be prevented and a greater radiating-surface afforded, the first radiator which receives the products of combustion from the fire-pot being circular in form and at its front ends delivering into an enlarged space or chamber, from whence the products of combustion will pass into the front ends of a second circular radiator and thence to the rear of said radiator and then out of the same into the smoke-pipe, said second radiator communicating with the inner circular radiator at the rear by a connecting-neck, in which will be located a damper, so as to have a direct draft from the inner circular radiator to the smoke-flue when said damper is open, the enlarged chamber at the front connecting ends of the two radiators constituting a chamber to receive an oven and being provided in its bottom with an opening encircled by a collar, so as to connect at that point with the fire-pot, said opening being provided with a damper, so as to open or cut off communication, as desired, between the oven-chamber and the fire-pot.

To the accomplishment of the foregoing and such other objects as may hereinafter appear the invention consists in the construc-

tion and in the relative arrangement of parts hereinafter particularly described and then sought to be clearly defined by the claims, reference being had to the accompanying drawings, forming a part hereof, and in which—

Figure 1 is a perspective view with the side of the furnace-casing broken away. Fig. 2 is a section through the radiator. Fig. 3 is a bottom plan view of the radiator, and Fig. 4 is a sectional view taken on the line 4 4 of Fig. 2.

In the drawings the numeral 1 designates the ash-pit, upon which is mounted the fire-pot or combustion-chamber composed of the several sections 2, 3, 4, and 5, mounted one upon the other and preferably of the general shape illustrated, the ash-pit 1 being connected with the casing-ring 6 by the radiating ribs 7, the spaces between which are open, so that the cold air entering below the ash-pit may pass up between the outside casing 8 of the furnace and the ash-pit and fire-pot.

The front of the furnace is composed of a plate 9 and a frame 10, the front plate and frame being made separate and bolted together, and the frame also having the furnace-casing 8 bolted thereto. The front plate of the furnace will be provided with a draft-door 10, a clinker-door 11, a two-part or double fuel-door 12, and a door 13, which will open into the enlarged chamber or oven-chamber at the front of the radiators, hereinafter to be described, so as to enable an oven to be placed in and removed from said enlarged chamber or oven-chamber and so as to permit the radiators to be cleaned out when necessary, said door 13 being hinged to a frame 14, which will be bolted to the front plate 9 of the furnace.

My improved radiator, of which a bottom plan view is shown in Fig. 4 of the drawings, consists of a bottom plate 15, composed of an inner and an outer concentric part 16 and 17, respectively, between which are the semicircular or curved slots or openings 18 and 19, the inner concentric part 16 being connected at its rear to the outer concentric part 17 by a neck 20, the forward ends of the concentric parts 16 and 17 being connected together by an enlarged portion 21. The plate 15 is surmounted by a shell 22, corresponding in form



to the plate 15, and at its base bolted to the plate by bolts 23, passing through corresponding lugs 24, formed on the plate 15 and at the base of the shell 22. The base-plate and the shell, formed and united as specified, form an inner and an outer concentric radiator communicating with each other at the rear at the neck 20 and at the front by the enlarged chamber 25, the enlarged front portion bearing against the front plate of the furnace where the door 13 is located and the outer radiator being provided at its rear with a laterally-extending collar 26, with which the smoke-flue will connect, and the two radiators will be separated from each other at opposite sides by the spaces formed by semicircular openings 18 and 19. The inner radiator will be provided at its base with openings 27 in the bottom plate 17, two of said openings being located opposite to each other and the third opening between the other two, and each of said openings will be formed with a collar 28, which will fit around a smoke-flue 29, extending up from the side wall of the upper part of the fire-pot, the fire-pot being provided with three of said flues, corresponding to the three openings formed in the bottom of the inner radiator. By this arrangement the smoke will pass from the fire-pot at the three points indicated and deliver at such points into the inner radiator. This arrangement of flues will prevent undue expansion and contraction of the radiators, owing to the equal distribution of the products of combustion, and will thus prevent breakage in the joints of the radiator, which, if it should occur, would permit escape of the smoke into the hot-air chamber. The portion of the plate 15 which forms the bottom to the oven-chamber 25 is provided with an opening 30, which communicates with the fire-pot through a flue communicating at that point with the fire-pot, and this opening 30 is formed with a damper 31, preferably of the form illustrated and actuated from the front of the furnace by a damper-rod 32. By opening this damper the products of combustion may be permitted to enter directly into the oven-chamber 25 and around the oven 33, located in said oven-chamber, which oven may rest upon supports 34, which will hold it above the damper 31. When the damper is closed, the chamber will be heated solely by the products of combustion entering the same from the inner radiator on their way into the outer radiator.

A damper 35 of any approved pattern will be located in the opening at the neck 20, where the two concentric radiators communicate with each other at the rear, which damper will be actuated by damper-rod 36, extending to and through the front plate of the furnace. By closing this damper the products entering the inner circular radiator at the three points of its communication with the fire-pot will pass through said radiator toward the front and then enter the oven-

chamber and pass from the same into the outer concentric radiator, and thence backward and out through the smoke-escape flue. If a direct draft is to be created, the damper 35 is opened and then the products of combustion will pass from the rear of the inner radiator and direct to the smoke-escape flue.

By the construction of radiator described I not only deliver the products of combustion into the inner chamber, so as to prevent injurious contraction or expansion, but I also obtain the maximum amount of radiating-surface in the minimum of space, and I further provide for the passage of cold air up through the circular spaces between the inner and outer radiators and also between the inner wall of the inner radiator and the wall of the dome 37 to the fire-pot, thus more thoroughly and evenly heating the air from the large radiating-surface thus provided. The circular form of the radiators also tends to impart greater strength to the radiator and to afford a better circulation to the products of combustion and at the same time provide for a very large radiating-surface.

Having described my invention and set forth its merits, what I claim is—

1. In a furnace, the combination with the fire-pot, of the inner and the outer circular-shaped concentric radiators communicating with each other at the rear by a damper-controlled opening and at the front through an enlarged chamber provided with a door for access thereto, the inner and outer radiators being separated from each other by semicircular-shaped air-spaces, smoke-flues extending from the side walls of the fire-pot and opening into the bottom of the inner radiator at points opposite to each other and at an intermediate point adjacent to the point where the two radiators communicate with each other at the rear, the outside radiator being closed to communication with the fire-pot except through the inner radiator, and a dome to the fire-pot extended up into the space surrounded by the inner radiator and spaced from the inner wall of said radiator, substantially as described.

2. In a furnace, the combination with the fire-pot, of the inner and the outer circular-shaped concentric radiators communicating with each other at the rear by a damper-controlled opening and at the front through an enlarged chamber provided with a door for access thereto, the inner and outer radiators being separated from each other by semicircular-shaped air-spaces, smoke-flues leading from the fire-pot and discharging through the bottom of the inner radiator, and a valve-controlled smoke-flue discharging from the fire-pot into the enlarged chamber at the front of the concentric radiators, substantially as described.

3. A furnace-radiator composed of two circular-shaped concentric chambers separated from each other by semicircular-shaped air-spaces, the inner chamber communicating



with the outer chamber at the rear through  
a neck connecting the two chambers and both  
of the chambers communicating with each  
other at the front through an enlarged oven-  
5 chamber, the oven - chamber being formed  
with an opening in its bottom for the admis-  
sion of products of combustion and the inner  
chamber being provided with three openings  
in its bottom for the admission of products  
10 of combustion, two of said openings being at  
opposite sides of the chamber and the third

opening being between said two said open-  
ings and next to the opening through which  
the two chambers communicate with each  
other at the rear, substantially as described. 15

In testimony whereof I affix my signature  
in presence of two witnesses.

HENRY L. WINGERT.

Witnesses:

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H. F. TAYLOR.