

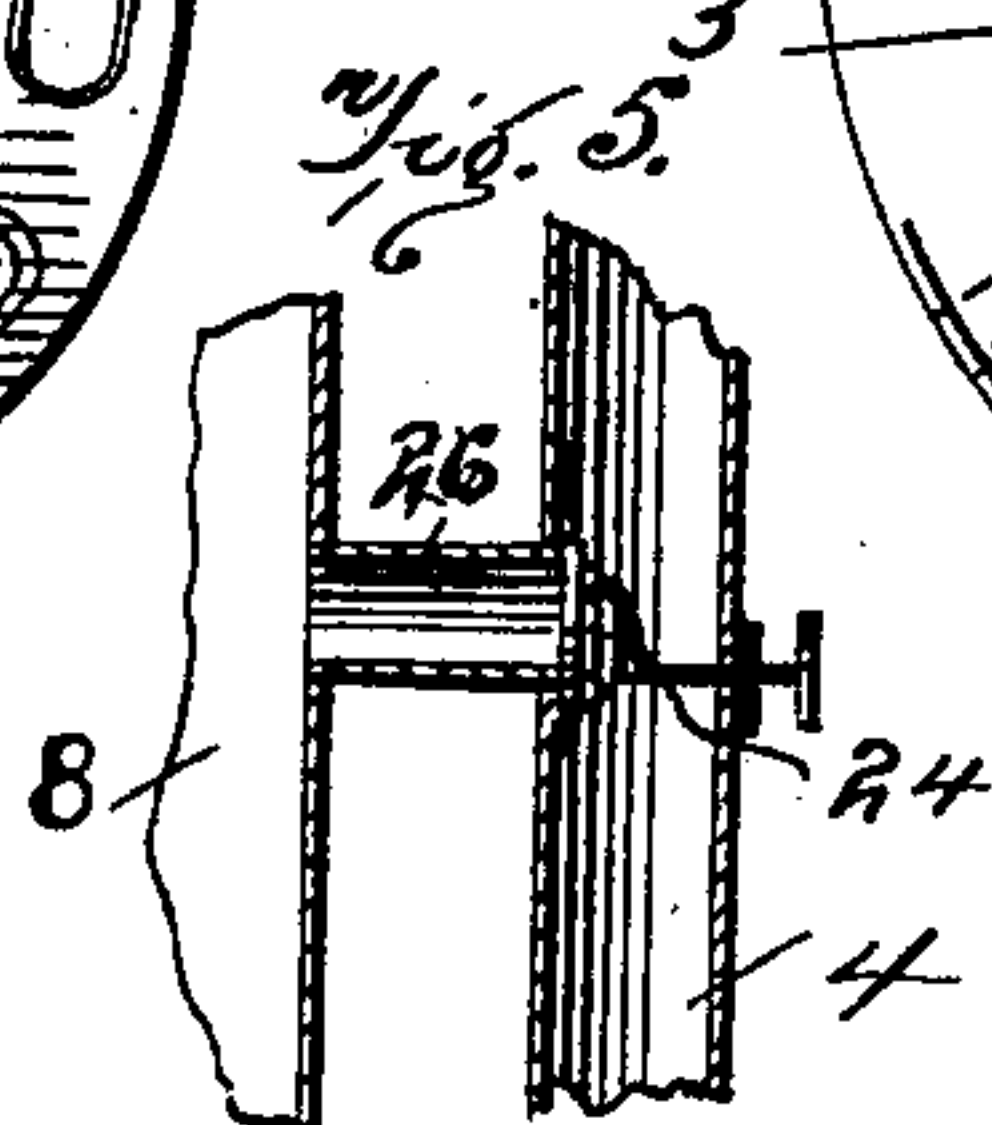
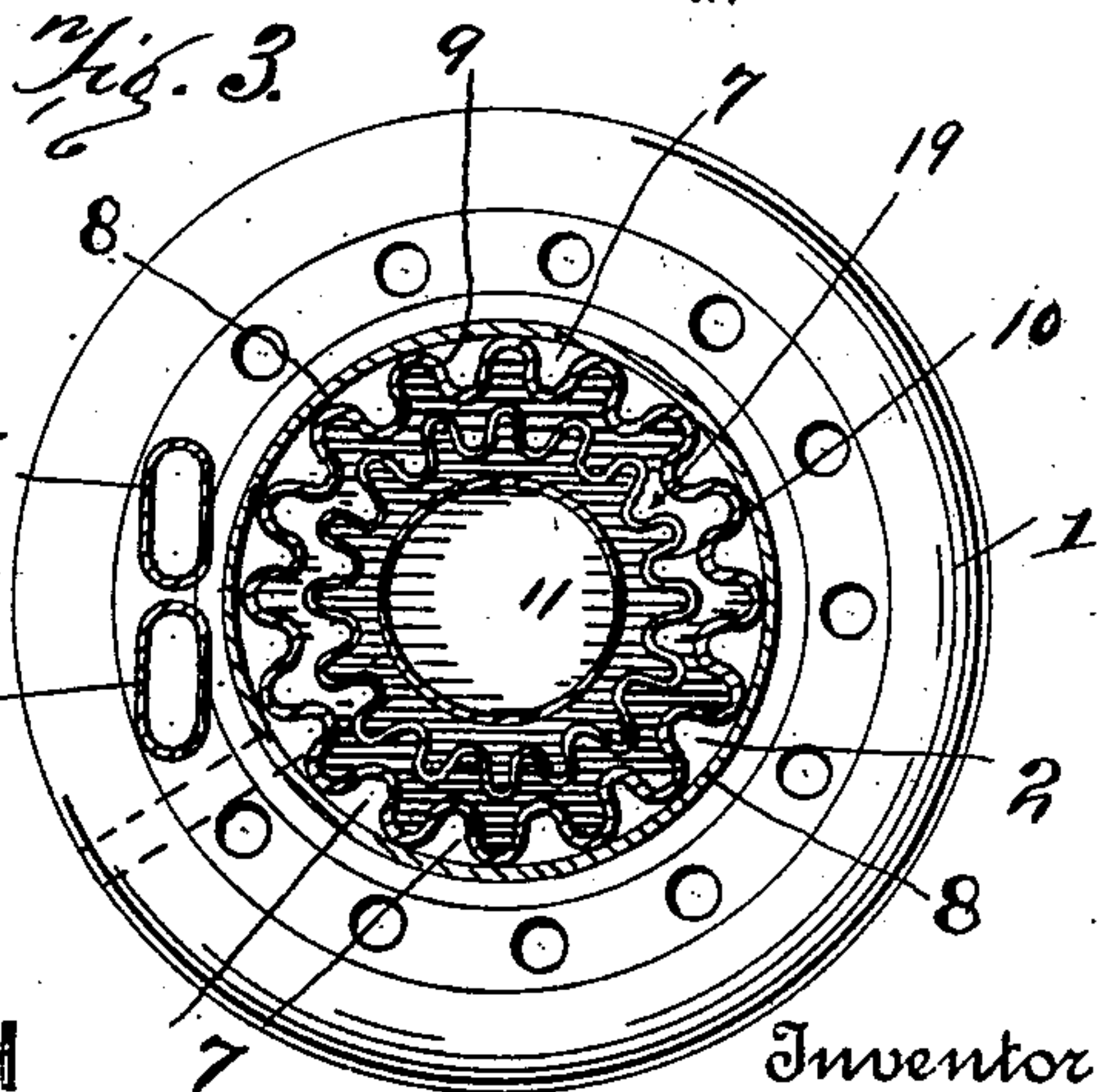
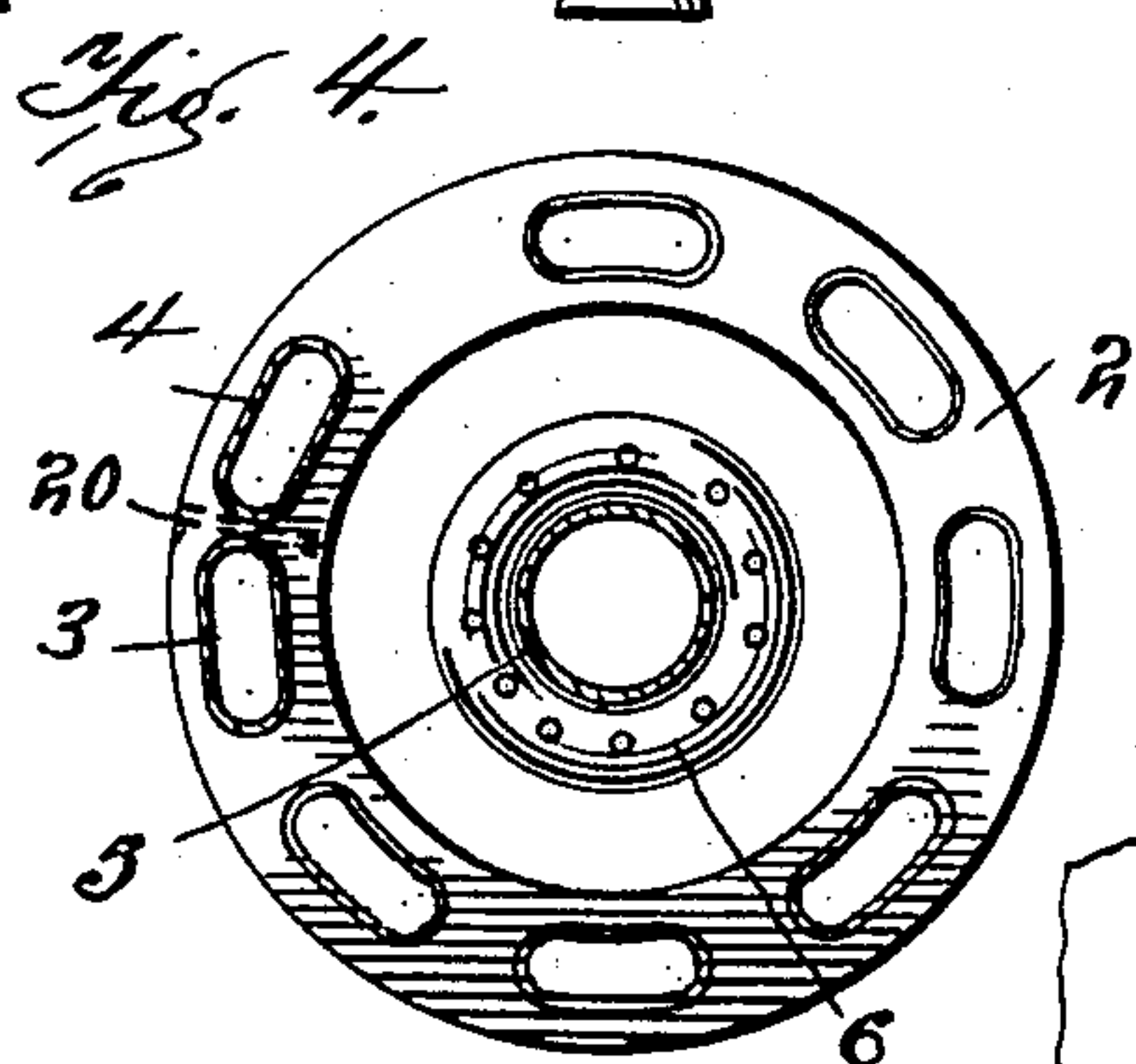
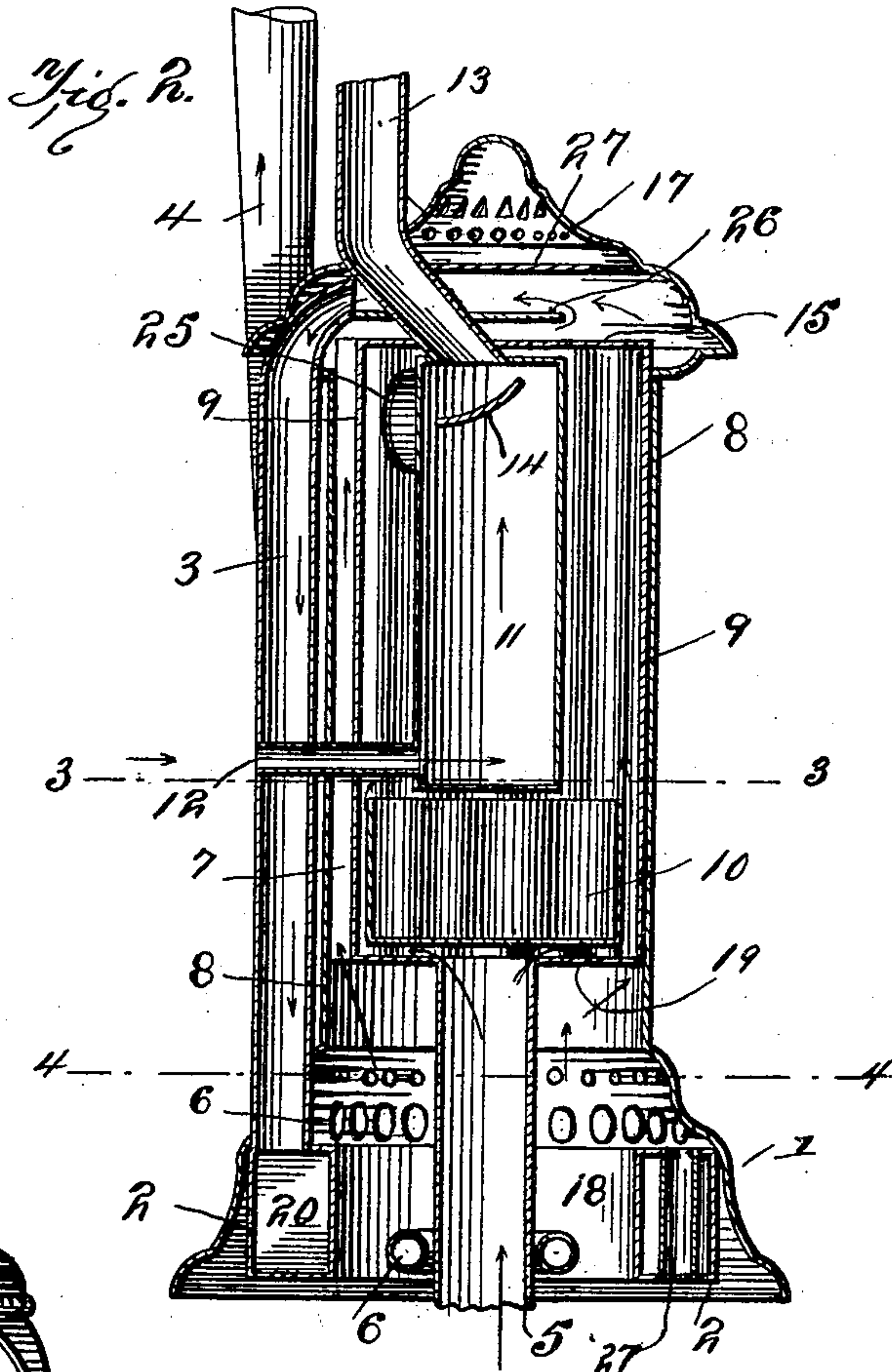
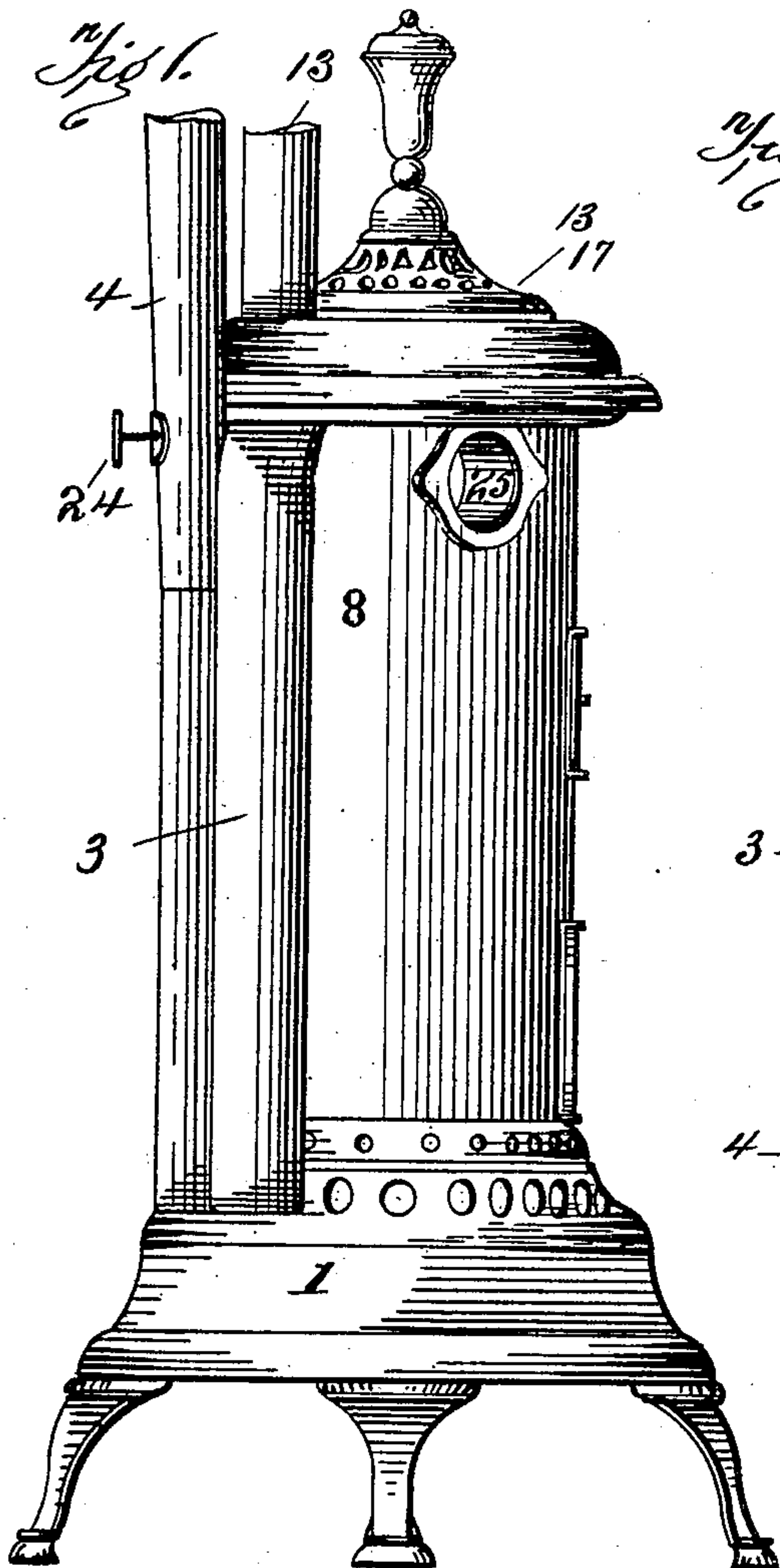
No. 680,123.

Patented Aug. 6, 1901.

B. B. CHRISTIE.  
HEATING STOVE OR FURNACE.

(Application filed Oct. 2, 1900.)

(No Model.)



Witnesses  
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# UNITED STATES PATENT OFFICE.

BENJAMIN B. CHRISTIE, OF DAYTON, OHIO.

## HEATING STOVE OR FURNACE.

**SPECIFICATION** forming part of Letters Patent No. 680,123, dated August 6, 1901.

Application filed October 2, 1900. Serial No. 31,779. (No model.)

*To all whom it may concern:*

Be it known that I, BENJAMIN B. CHRISTIE, residing at Dayton, in the county of Montgomery and State of Ohio, have invented certain new and useful Improvements in Heating Stoves or Furnaces, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to stoves in which heat is developed by the combustion of gas. The same construction applies to furnaces for heating purposes.

The object of the invention is to produce a heating stove or furnace of a simple construction and of large heating capacity with small consumption of gas or similar combustible.

Figure 1 is a side elevation of a heating-stove according to this invention. Fig. 2 is a vertical central section of the same. Fig. 3 is a cross-section about on line 3 3, Fig. 2; and Fig. 4 is a section on line 4 4. Fig. 5 is a detail section of parts for effecting initial draft.

The numeral 1 indicates the base of the stove. Around this base there is a ring-drum 2, which receives a down-flue 3, and after passing around the base of the stove communicates with flue 4, the ring-drum 2 being divided by a partition 20, so that heated air or products of combustion entering the ring at 3 must pass around and out at 4. The flue 4 is connected with the top of the stove by a short pipe 26, connecting to shell 8, and a damper 24 in this pipe is opened to give initial draft. When this damper is closed, the draft is down, around the ring, and then up. Oval pipes 27 in the ring-drum permit air to pass up through the ring, and so become heated.

A cold-air-supply pipe *z* enters the base of the stove from any outside space. A burner-ring 6 surrounds this air-pipe.

When the burner 6 is ignited, the heated products of combustion pass up the flue or passage 7. This passage 7 is between the ring or hollow cylinder 8 and a corrugated or sinuous ring 9, the corrugations being parallel to the axis of the cylinder, the drum approximating a cylindrical inner lining and producing, in effect, a series of connected passages between the sheet-metal walls 8 and 9. The products of combustion thus moving up in the passage 7 are in contact with the outer

cylindrical shell 8 of the stove and with the sinuous shell 9. The heat radiates outwardly from the shell 8 and inwardly from the corrugated tube or shell 9. A horizontal ring or deflector 19 above the burner shuts off the products of combustion from the space inside sinuous ring 9. The heated products of combustion from the rear part of the stove come under deflector-plate 26, which extends about two-thirds of the way across the top of the shell. Turning back over said plate 26 and under plate 27 in a heat-collecting chamber the products of combustion pass down flue 3, and so to ring-drum 2. Cold air from pipe 5 enters inside the drum 9 and becomes heated as it rises therein. Inside the shell 9 there is a shallow metal deflector-pan 10. This deflector in general has outer corrugations corresponding in number and position to those of shell 9, but smaller. The deflector 10 is of no great height, but has a closed flat bottom above the air-pipe 5. Air rising in pipe 5 is turned outward and up between the corrugated surfaces 9 and 10, so that the cold air is broken up and brought quite close to the heated and fluted or sinuous plate or ring 9.

Above deflector-plate 10 and inside sinuous shell 9 there is shown a small drum 11, of cylindrical form, closed at the bottom, but communicating with cold or warmed air through inflow-pipe 12. An escape-pipe 13 leads from the top of the drum 11, a deflector 14 shielding the bottom of pipe 13 from too great or direct updraft. The pipes 12 and 13 may terminate with the shell of the stove, and thus produce merely a hot-air circulation, or pipe 13 may lead to a heating-register in an upper room. The sinuous ring or fluted cylinder 9 has a top 15. Cold air rising through pipe 5 becomes well heated when the stove is in operation and escapes from tubes 25 near the top of the shell, which tubes are connected to the inside of the shell 9.

The stove may be largely or entirely of sheet metal, except that deflector 10 is preferably a metallic casting.

The air to sustain combustion rises in chamber 18, between the ring-drum 2 and pipe 5. The base 1 covers the ring-drum and gives symmetry to the structure.

Any usual means for supplying gas or hy-



drocarbon may be employed. Burner 6 is merely exemplary, and it should be understood that any well-known form of burner may be employed.

5 It will thus be seen that there is an up circulation of air through the pipes 27 of the ring-drum, an up circulation through pipe 5 and out at 25, an up circulation of heated products of combustion inside shell 8 and  
10 down and around the ring-drum and to the chimney, and an air circulation through drum 11, and so to the register, if desirable.

What I claim is—

1. In a heating-stove, a burner, a base hav-  
15 ing a ring-drum within the same, said ring-drum divided by a vertical partition, a down-flue leading from the upper chamber of the stove to said ring-drum at one side of said vertical partition, and an up-flue leading  
20 away from said flue at the other side of the partition, vertical pipes or passages through such ring-drum and openings through the stove-shell above the same, and an open-bottomed passage through the center of the  
25 ring-drum, for the passage of air to the burner, all arranged and combined substantially as described.

2. In a heating-stove, a central cold-air-supply pipe at the base, a burner-ring surround-  
30 ing this air-pipe, within an open-bottomed chamber, and a ring-drum around said chamber, inlet and outlet flues to said ring-drum, an annular heating-passage extending upward above the ring-burner and communicat-  
35 ing at the top with the inlet-flue of the ring-drum, and a drum within the annular heat-

ing-passage, receiving the cold-air-supply pipe, and having an escape-pipe leading from the top thereof, substantially as described.

3. In a heater as described, the combina- 40  
tion of a ring-burner, up-passages therefrom consisting of a fluted or corrugated drum within a tubular drum, a cold-air passage within the ring-burner, a deflector above the same serving to spread the entering cold air 45  
against the fluted drum, and a separate drum within the so-deflected currents, substantially as described.

4. In a heater, a vertically-fluted drum and means for heating the outside of said fluted 50  
surface, a cold-air pipe entering the bottom of said drum and a flat deflector above said pipe, and a vertically-fluted shell corresponding to the fluting of the drum, rising from the edge of said deflector, whereby the ris- 55  
ing air is compelled to enter the fluted drum and the fluted deflector, substantially as described.

5. In a heater, the combination of the ring-burner, the up-passages therefrom in form 60  
of spaces between a cylindrical and a corrugated drum, and a cold-air passage through the burner leading to a corrugated deflector within the corrugated drum, substantially as described. 65

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

BENJAMIN B. CHRISTIE.

Witnesses:

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W. P. BOYER.