

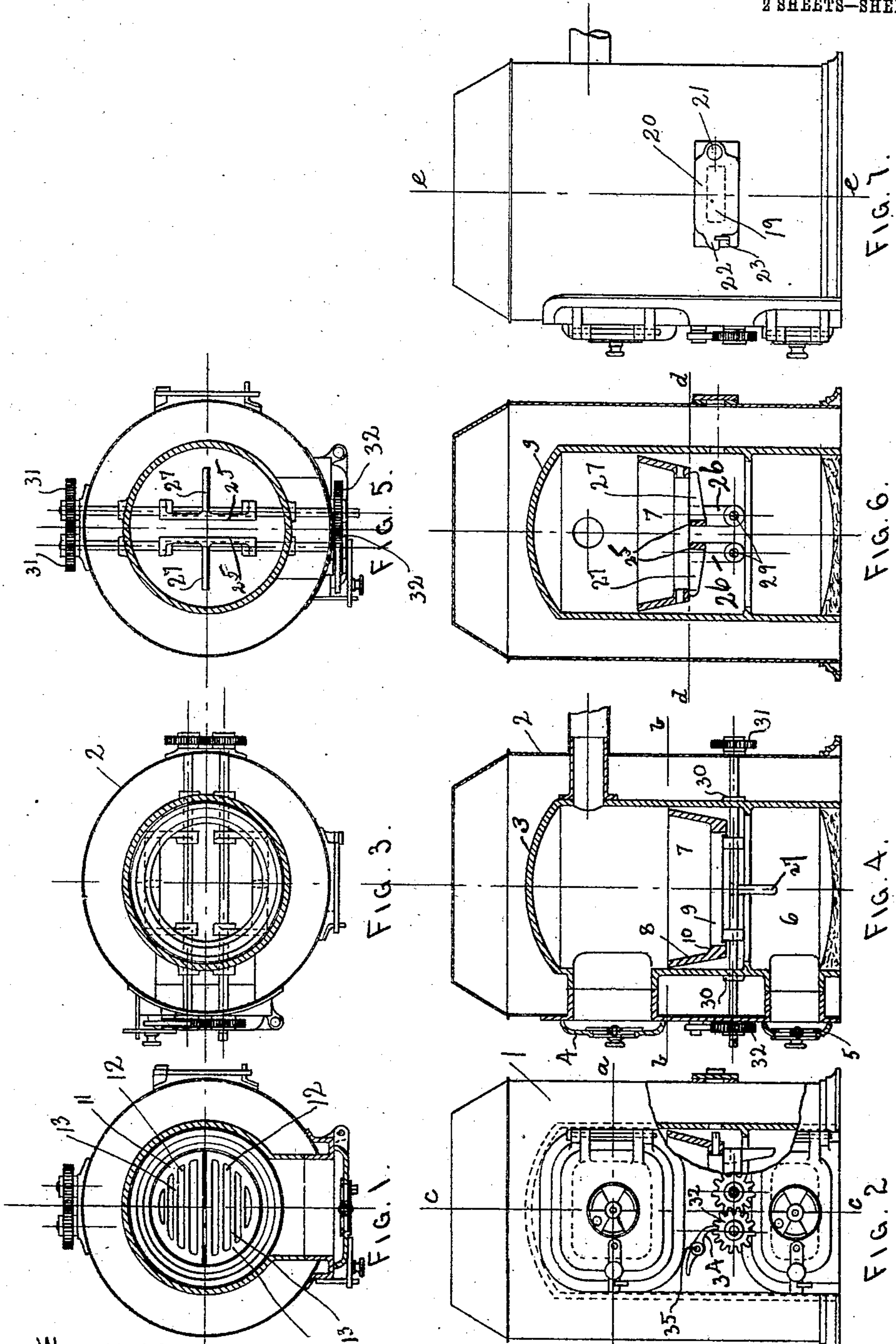
A. L. BAILEY & E. P. BROWNELL.
HEATER.

APPLICATION FILED JULY 18, 1907.

915,262.

Patented Mar. 16, 1909.

2 SHEETS—SHEET 1.



WITNESSES:

Hellen L. Freeman
Mary A. Kenney

INVENTORS:

Aldred L. Bailey
and Emerson P. Brownell,
By their Attorney,
Hart Anderson

A. L. BAILEY & E. P. BROWNELL.

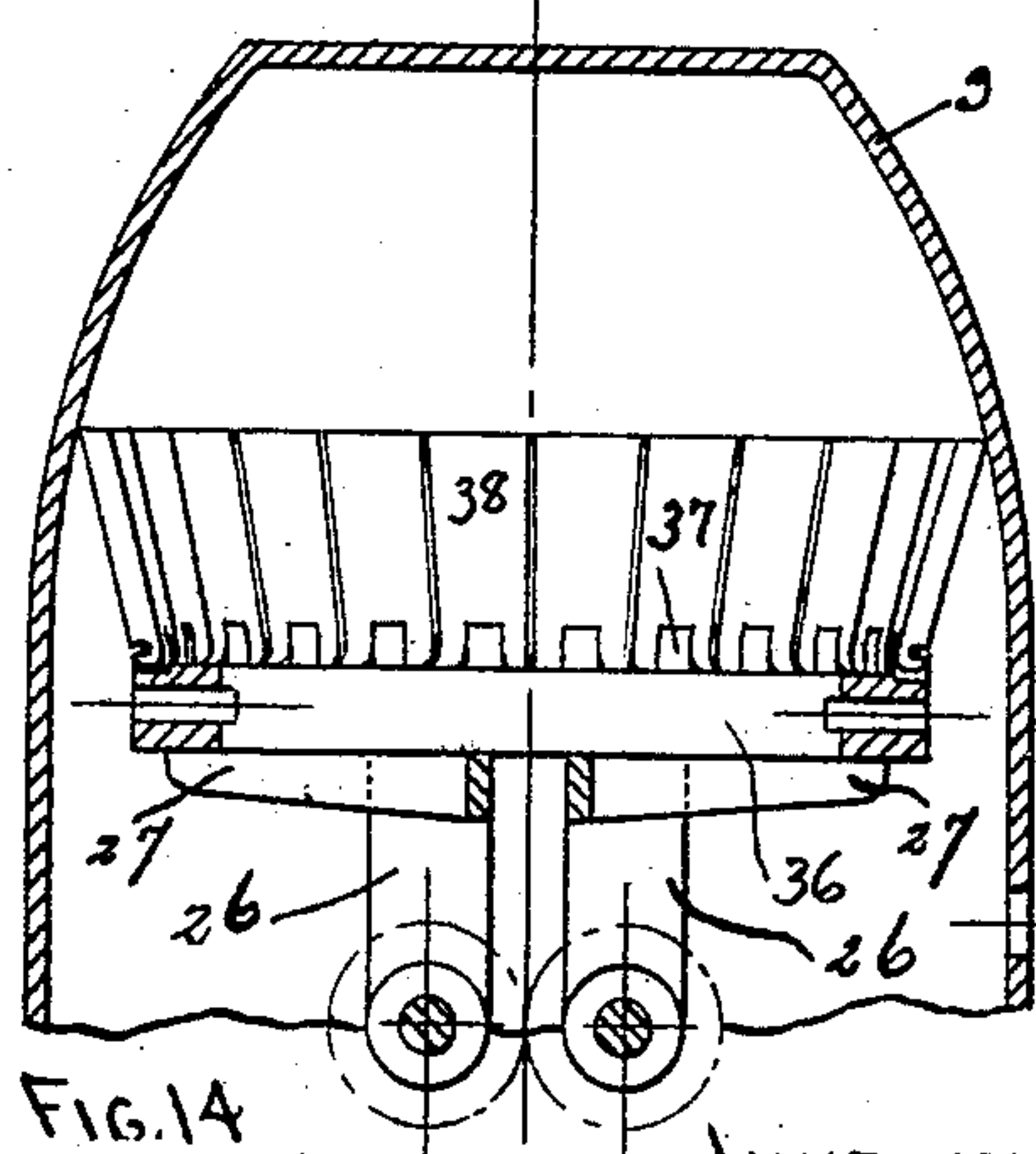
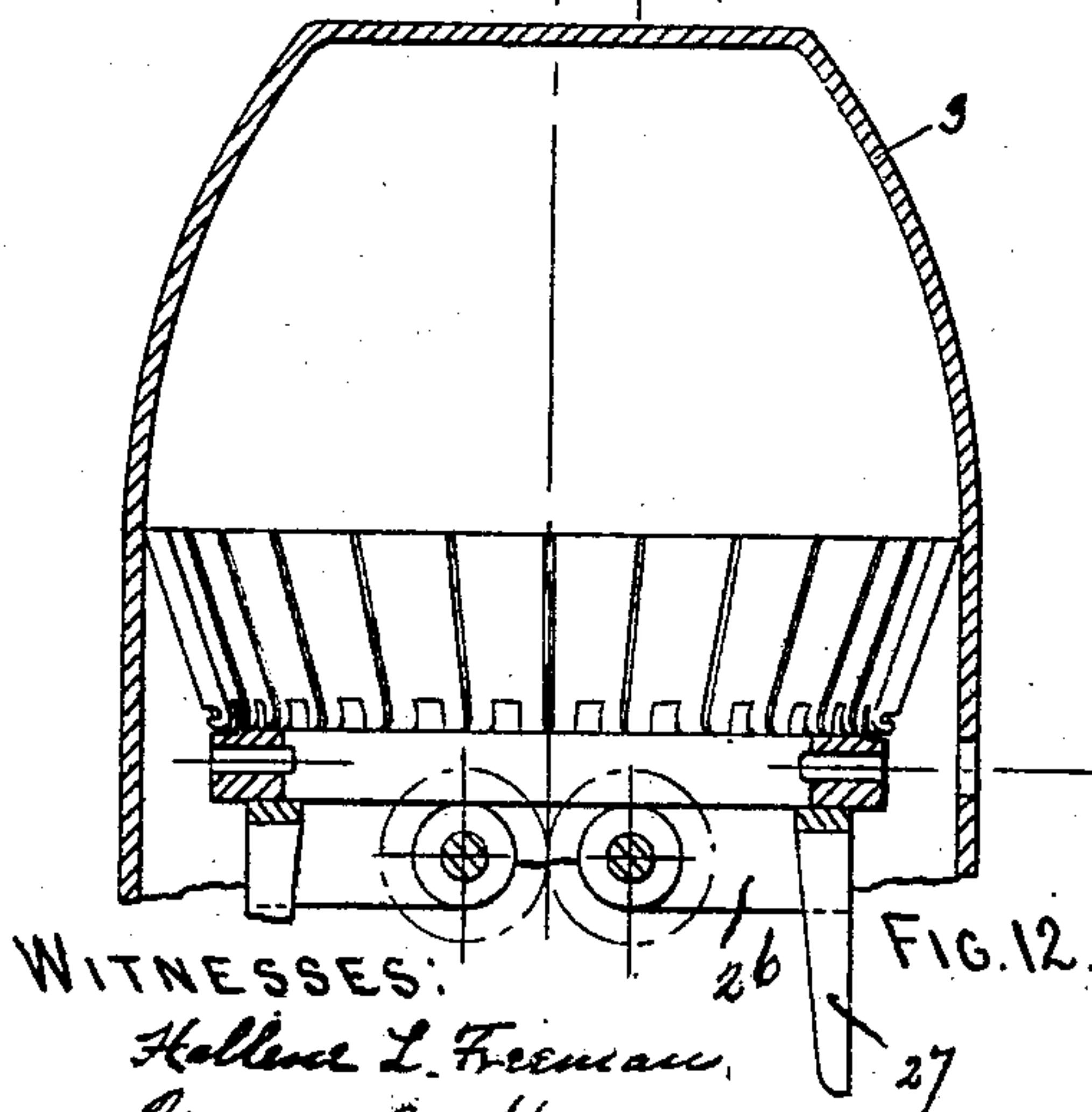
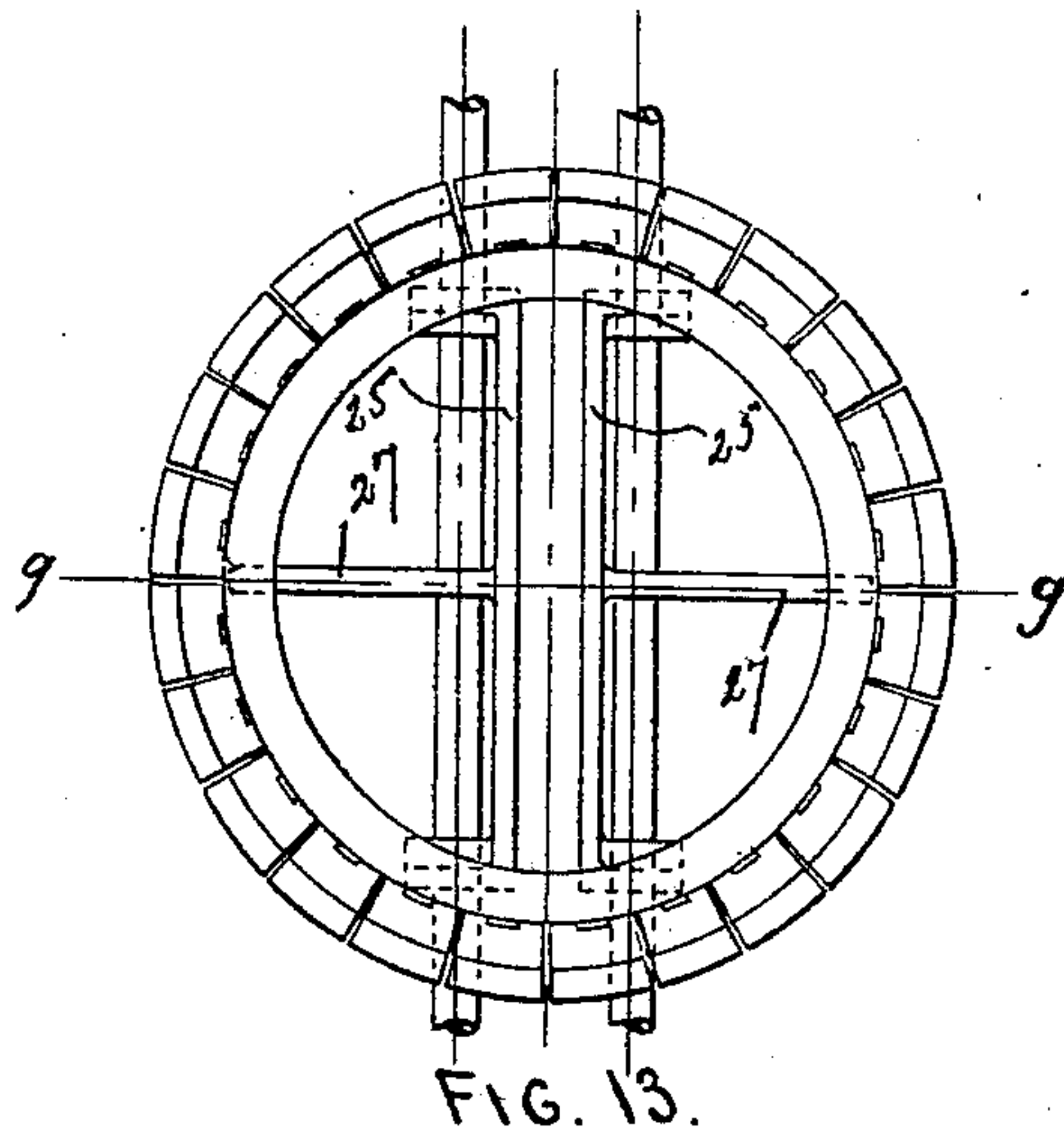
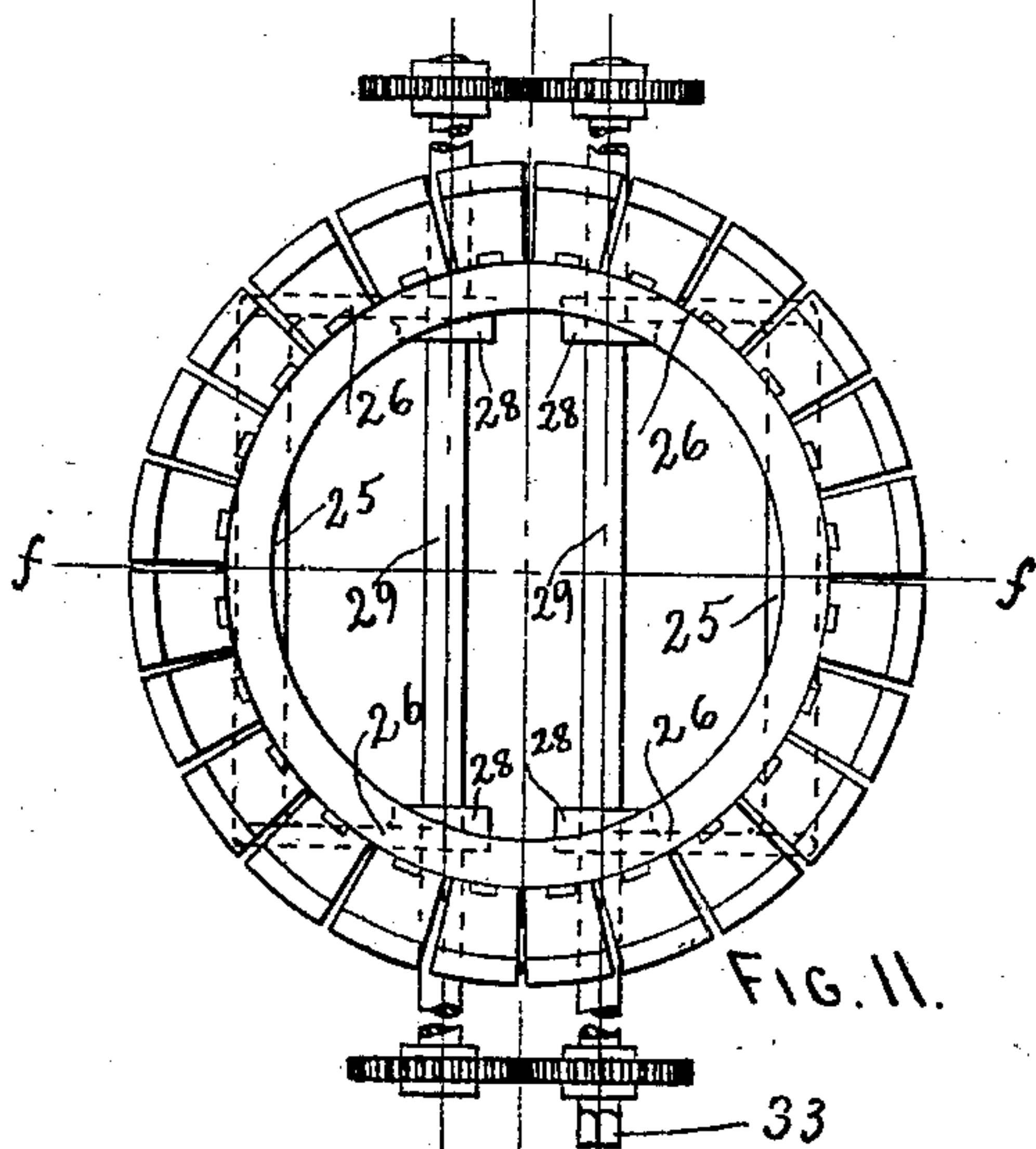
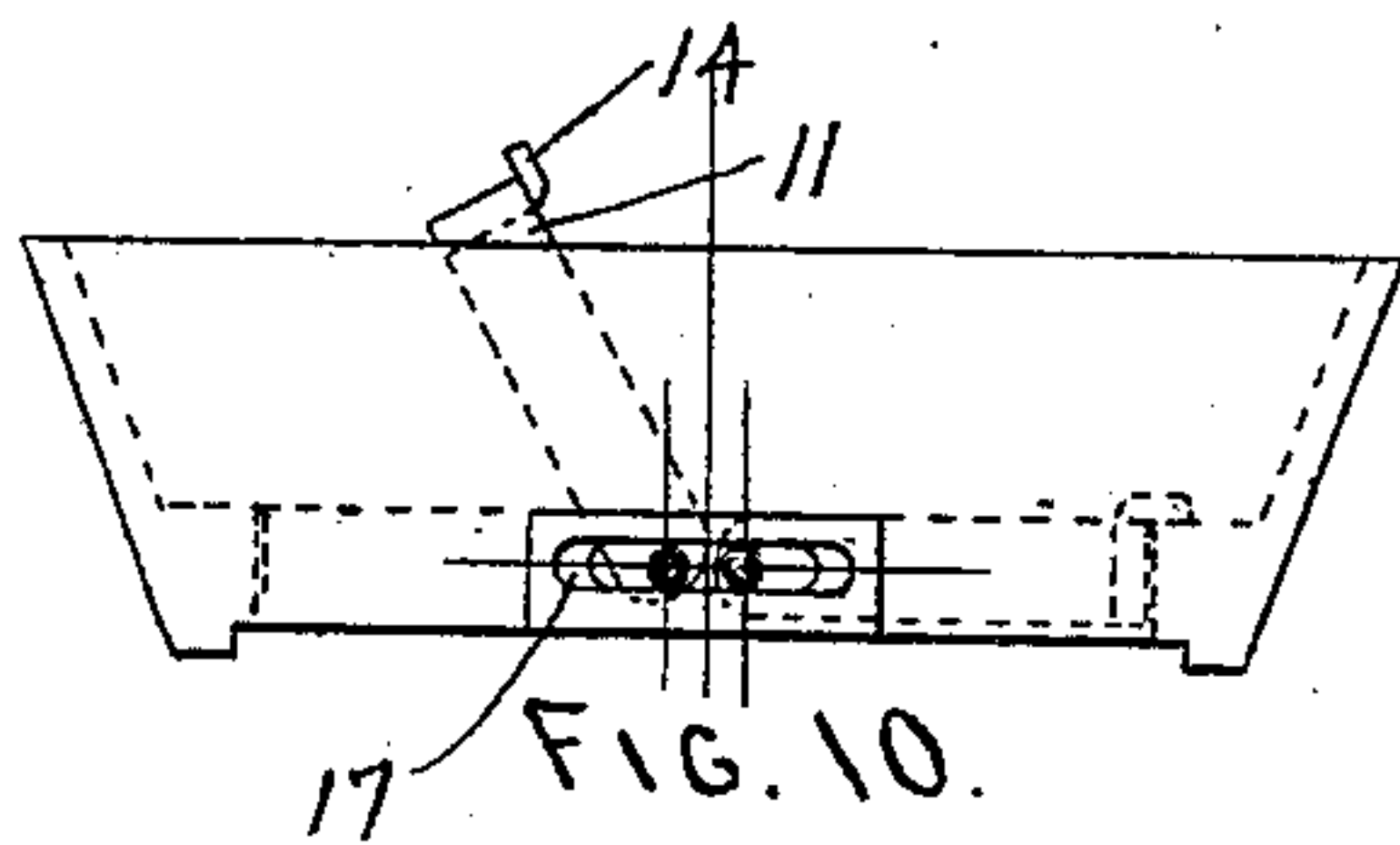
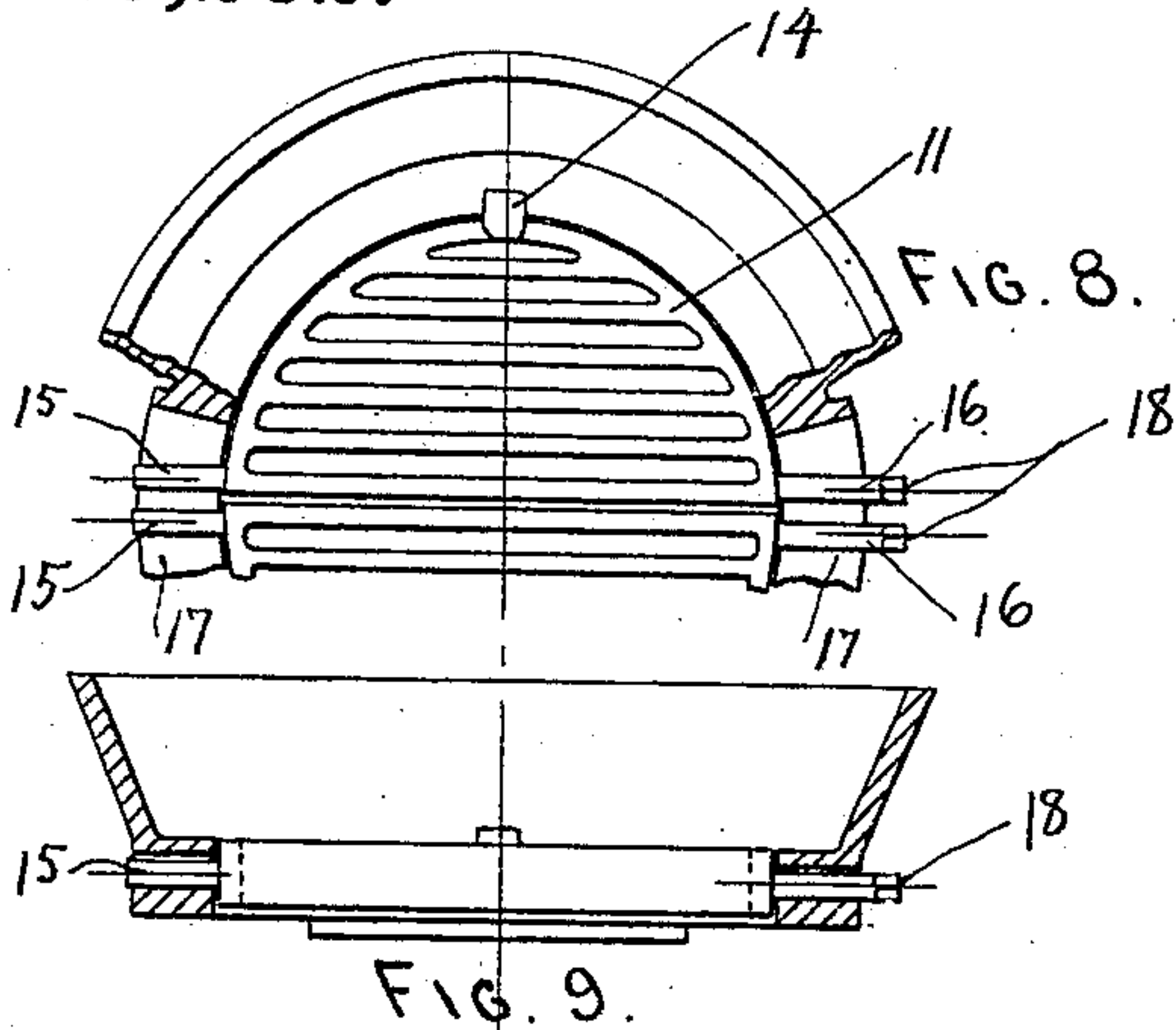
HEATER.

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2 SHEETS—SHEET 2.



WITNESSES:
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UNITED STATES PATENT OFFICE.

ALDEN L. BAILEY, OF ST. JOHNSBURY, VERMONT, AND EMERSON P. BROWNELL,
OF PAWTUCKET, RHODE ISLAND.

HEATER.

No. 915,262.

Specification of Letters Patent.

Patented March 16, 1909.

Application filed July 18, 1907. Serial No. 384,358.

To all whom it may concern:

Be it known that we, ALDEN L. BAILEY and EMERSON P. BROWNELL, of St. Johnsbury, county of Caledonia, State of Vermont, and Pawtucket, county of Providence, State of Rhode Island, respectively, citizens of the United States, have invented certain new and useful Improvements in Heaters; and we 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 make and use the same.

The present invention relates to improvements in heaters and more particularly to an improved fire box and grate for heaters.

The object of the present invention is to provide a heater with a fire box and grate so constructed and arranged that it may be adjusted vertically within the heater, thereby providing means whereby during the spring and fall, when a light fire may be desired, the grate may be elevated, thus reducing the coal capacity, and at the same time bring the fire nearer the radiating surfaces of the heater; while during the extreme cold weather the fire box and grate may be lowered to increase the coal capacity.

Another object of the present invention is to provide an improved grate so constructed and arranged that it may be readily agitated or shaken to remove the ashes and also tipped for the purpose of dumping.

Further objects will appear in connection with the following description of its construction, organization and mode of operation.

The present invention therefore consists of the devices and combinations of devices which will be hereinafter described and claimed.

The invention is illustrated in the accompanying drawings, in which:—Figure 1 is a top plan view in section taken on the line *a—*a**, in Fig. 2. Fig. 2 shows a front elevation partly in section. Fig. 3 is a top plan view in section taken on the line *b—*b**, in Fig. 4, the grate members being omitted. Fig. 4 shows a vertical section taken on the line *c—*c**, in Fig. 2, the grate members being omitted. Fig. 5 is a plan in section taken on the line *d—*d**, in Fig. 6. Fig. 6 shows a vertical section taken on the line *e—*e**, in Fig. 7, with the grate in elevated position. Fig. 7 is a side elevation of a hot air furnace embodying our invention. Fig. 8 shows a

plan, partly broken away of the fire box and grate removed from the furnace. Fig. 9 shows a cross section of the fire box and grate shown in Fig. 8. Fig. 10 shows a side elevation of the fire box and grate removed from the heater. Fig. 11 shows a top plan view of a modified form of fire box. Fig. 12 shows a vertical section through the dome of the heater and the fire box shown in Fig. 11 taken on the line *f—*f**, in Fig. 11. Fig. 13 shows a view similar to Fig. 11, with the fire-box elevated. Fig. 14 is a vertical section on the line *g—*g**, in Fig. 13.

Similar reference characters will be employed to designate corresponding parts.

Before proceeding to describe the construction, organization and mode of operation of our invention, we desire to state that it is applicable to any form of heater, either hot air, steam, or hot water, and in the drawing we have illustrated it as being applied to a furnace or hot air heater.

The furnace 1 may be of any usual ordinary construction, provided with an outer wall 2, and a heating or dome or fire chamber 3, having the usual door 4, leading to the fire chamber, and the door 5 opening into the ash pit 6.

Our improved fire box 7 in the form shown in Figs. 1 to 10 inclusive comprises a casting having a flaring wall 8 and a circular opening 9 in its base with the surrounding shoulder or flange 10. Pivotaly mounted within the fire box 7 and fitting the circular opening 9, are the grate members 11, the grate members 11 being preferably formed in semi-circular sections, and provided with spaced bars 13. These grate sections 11 may be pivotaly connected at their meeting edges if desired, but they are shown as disconnected and free to turn upwardly, each independent of the other. Each section will be provided with projecting lugs 14, arranged to rest upon the shoulder or flange 10, and each will be provided with the trunnions 15 and 16 arranged to fit into segmental slots 17 formed in the base of the fire box 7.

From the foregoing construction it will be observed that the grate members 11 may each be tipped independently of the other for the purpose of dumping the fire, and that they may be oscillated in a circular path by reason of the movement of the trunnions 15 and 16 within the segmental slots 17 for the purpose of agitating the grate in shaking

down the fire. The trunnions 16 will be provided with polygonal ends 18, or otherwise formed, whereby they may be engaged by a key or shaker which may be passed through the opening 19 in the furnace. Thus the grate members 11 may be tipped and oscillated from the outside of the furnace as is usual in such constructions. The opening 19 in the furnace will be covered by a door 20, pivotally mounted upon a stud 21, whereby it may be turned vertically to uncover the opening 19, and it will be preferably provided at its opposite end with a lug 22 arranged to engage a stop 23 to support the door 20 in closed position.

For the purpose of vertically adjusting the fire box and grate referred to there is provided a pair of co-acting elevating members which comprise substantially each a rectangular frame having side bars 25 and 29, and end bars 26 as shown in Fig. 11. The bars 29 are adjacently disposed and constitute the shafts by means of which said frames are turned to elevate the fire box. To the under side of each of the bars 25 and centrally disposed between the ends thereof is a depending auxiliary support or leg 27 as in Fig. 12, whose function is to support the fire box when the same has been elevated to its uppermost position, in which position said legs lie in a substantially horizontal plane. Figs. 1 and 12 show said supports in operative position; and Figs. 6 and 14 show them in operative position. The arms 26 are provided with the bearings 28 by means of which they are fastened to the shafts 29, which shafts are mounted to turn in suitable bearings 30 formed in the walls of the fire chamber, and which shafts extend to the outside of the wall or casing 2 of the furnace. Upon their outer ends the shafts are provided with mating gears 31 and 32; thus when one of the shafts is turned through the mating gears, a similar turning movement will be imparted to the other shaft, thus causing the elevating members to move in unison.

For the purpose of rotating the shafts 29 one of them, either at the front or at the back of the furnace, but preferably at the front, will be provided with a polygonal end 33, or otherwise formed to be engaged by a key or crank whereby the shafts may be rocked to elevate or lower the fire box and grate.

For the purpose of holding the fire box and grate in any desired elevation, there may be provided a pawl 34, pivoted at 35, to the front of the furnace and arranged to engage one of the gears 32, as shown in Fig. 2 of the drawing.

From the foregoing description it will be understood that in extremely cold weather when it is desired to have a large fire and to utilize the full capacity of the fire box and the fire chamber, the parts will be allowed to

remain in the position shown in Fig. 4; but when it is desired to have a smaller fire, the fire box and grate will be raised, as shown in Fig. 6, thus reducing the coal capacity, or it may be retained at any position intermediate the positions shown in Figs. 4 or 6. It will be further observed that if it is not desired to shake down the fire by the oscillating movement of the grate sections 11, as hereinbefore described, this result may be accomplished by rotating the shafts 29, thus imparting vertical reciprocations to the fire box, the resulting agitation causing the ashes to sift through the grate sections.

It may be desired in some cases, as where the walls of the dome or fire chamber taper as shown in Figs. 12 and 14, to make the wall of the fire box adjustable, and as shown in Figs. 11 to 14 inclusive, this result is accomplished by forming the bottom of the fire box in the shape of a ring or annulus 36, provided with the upwardly extending lugs 37, and forming the wall of the fire box of a number of segmental sections 38, pivotally mounted at their lower ends to the lugs 37, and thus by swinging the segmental sections 38 in or out as may be required, the wall of the fire box can be adjusted to the inner diameter of the dome or fire chamber. In other respects, except as herein noted, the construction shown in Figs. 11 to 14 inclusive is like that first described and will be mounted and operated in substantially the same manner.

Having described our invention we claim as new and desire to protect by Letters Patent of the United States:—

1. A heater provided with a fire box, independent supporting frames journaled thereunder and adapted to be moved to elevate said fire box, auxiliary supports depending from said frames, said auxiliary supports adapted to maintain said fire box in position when said frames have reached their uppermost position.

2. A heater provided with a fire box, independent supporting members journaled thereunder and adapted to be moved to elevate said fire box, auxiliary supports depending from said members, said auxiliary supports adapted to hold said fire-box when elevated to its uppermost position.

3. A heater provided with a fire box, independent elevating and supporting members journaled thereunder, said members adapted to normally lie in a horizontal plane, depending legs on said members, means for turning said members into vertical planes, to elevate said fire box and position said legs to hold the fire box in its elevated position.

4. In a heater the combination of a fire chamber having inwardly inclined walls, a fire box, and independent means for elevating said fire box, the walls of said fire box comprising hinged segmental plates, said

plates adapted to contact with the walls of said fire chamber and close inwardly during the elevation of said fire box.

5 In a heater the combination of a fire chamber having inwardly inclined walls, a fire box, and independent means for elevating said fire box, the walls of said fire box comprising hinged segmental plates arranged in substantially radial relation, said plates
10 adapted to contact with the walls of said fire chamber and close inwardly during the elevation of said fire box.

6. In a heater the combination of a fire chamber having inwardly inclined walls, a
15 fire box, and independent means for elevat-

ing said fire box, the walls of said fire box comprising segmental plates journaled at their lower ends and arranged in substantially radial relation, said plates adapted to contact with the walls of said fire chamber 20 and close inwardly during the elevation of said fire box.

In testimony whereof we affix our signatures, in presence of two witnesses.

ALDEN L. BAILEY.
EMERSON P. BROWNELL.

Witnesses:

HERBERT H. BROOKS,
GEORGE E. NICHOLAS.