

No. 747,928.

PATENTED DEC. 29, 1903.

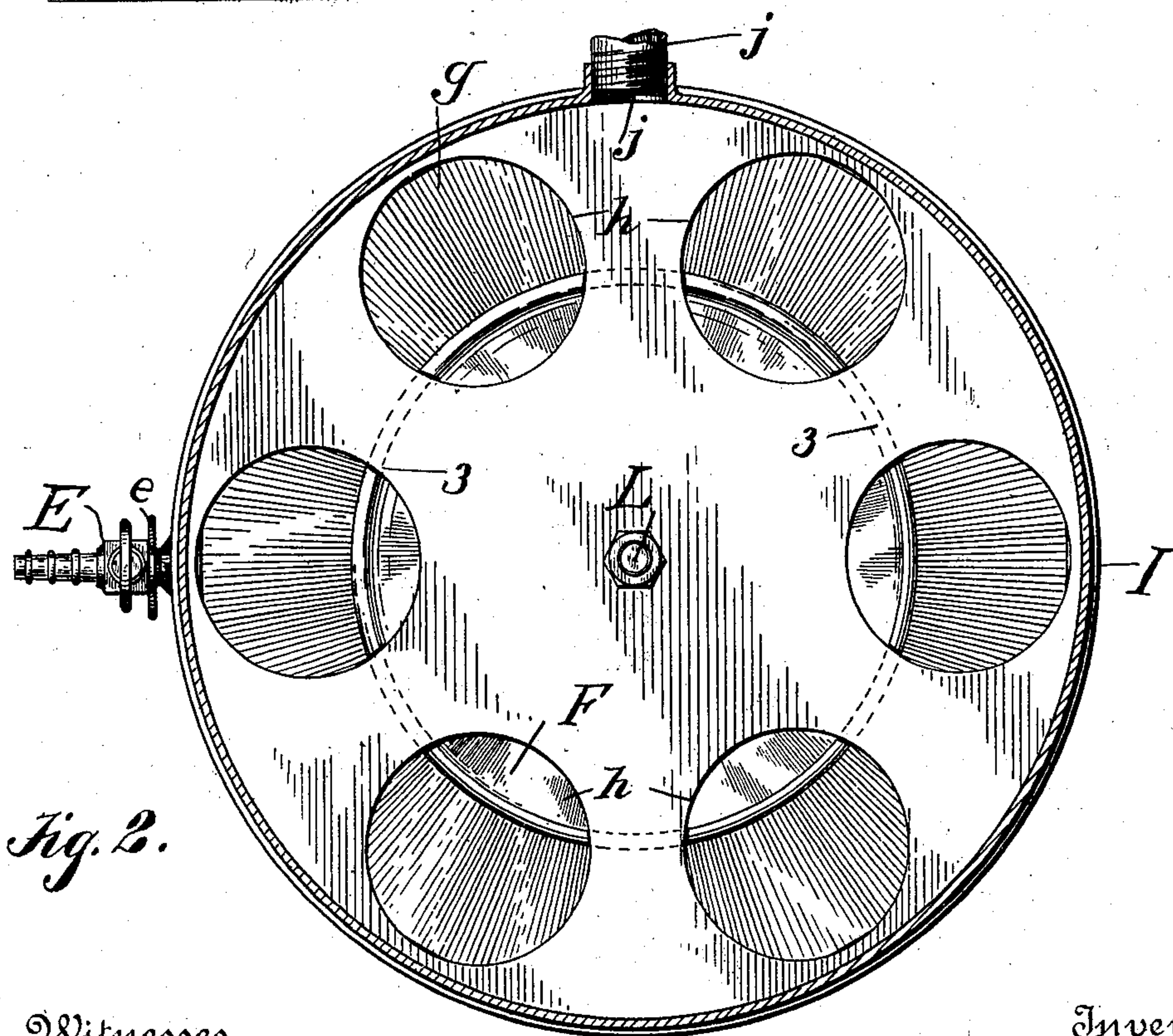
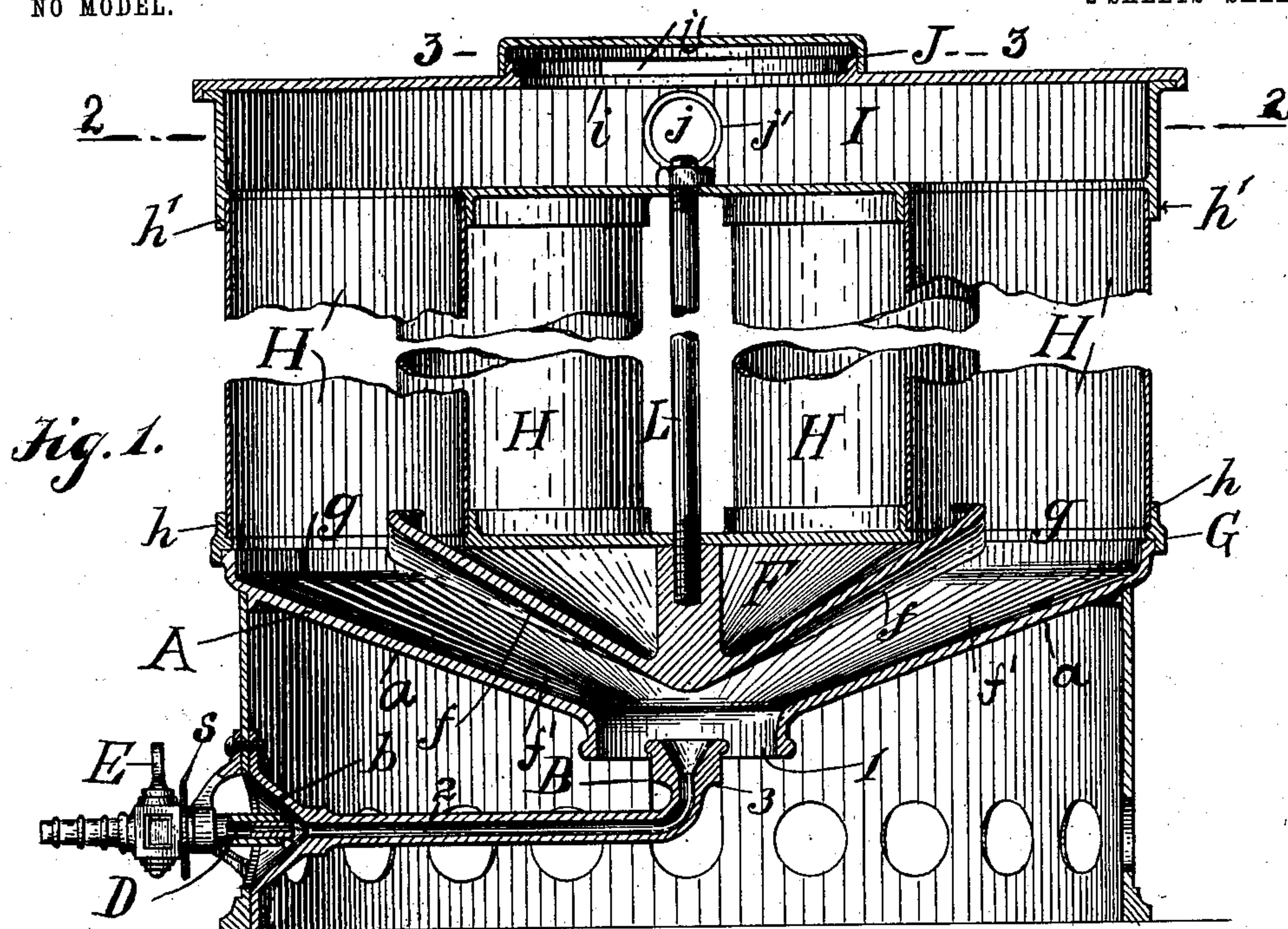
W. S. BECHTOLD & A. FABER DU FAUR, JR.

GAS HEATING STOVE OR FURNACE.

APPLICATION FILED NOV. 21, 1902.

NO MODEL.

2 SHEETS—SHEET 1.



Witnesses  
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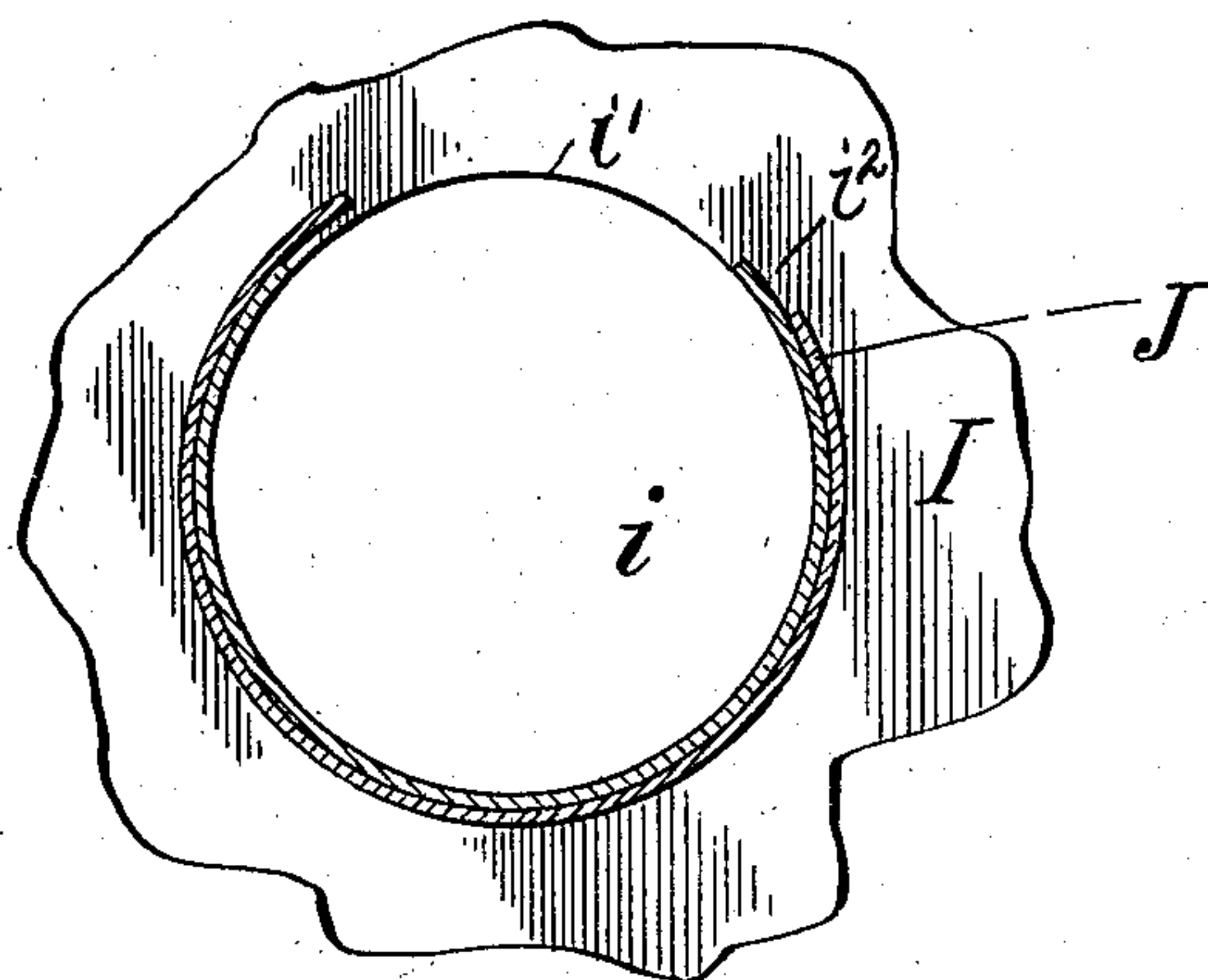
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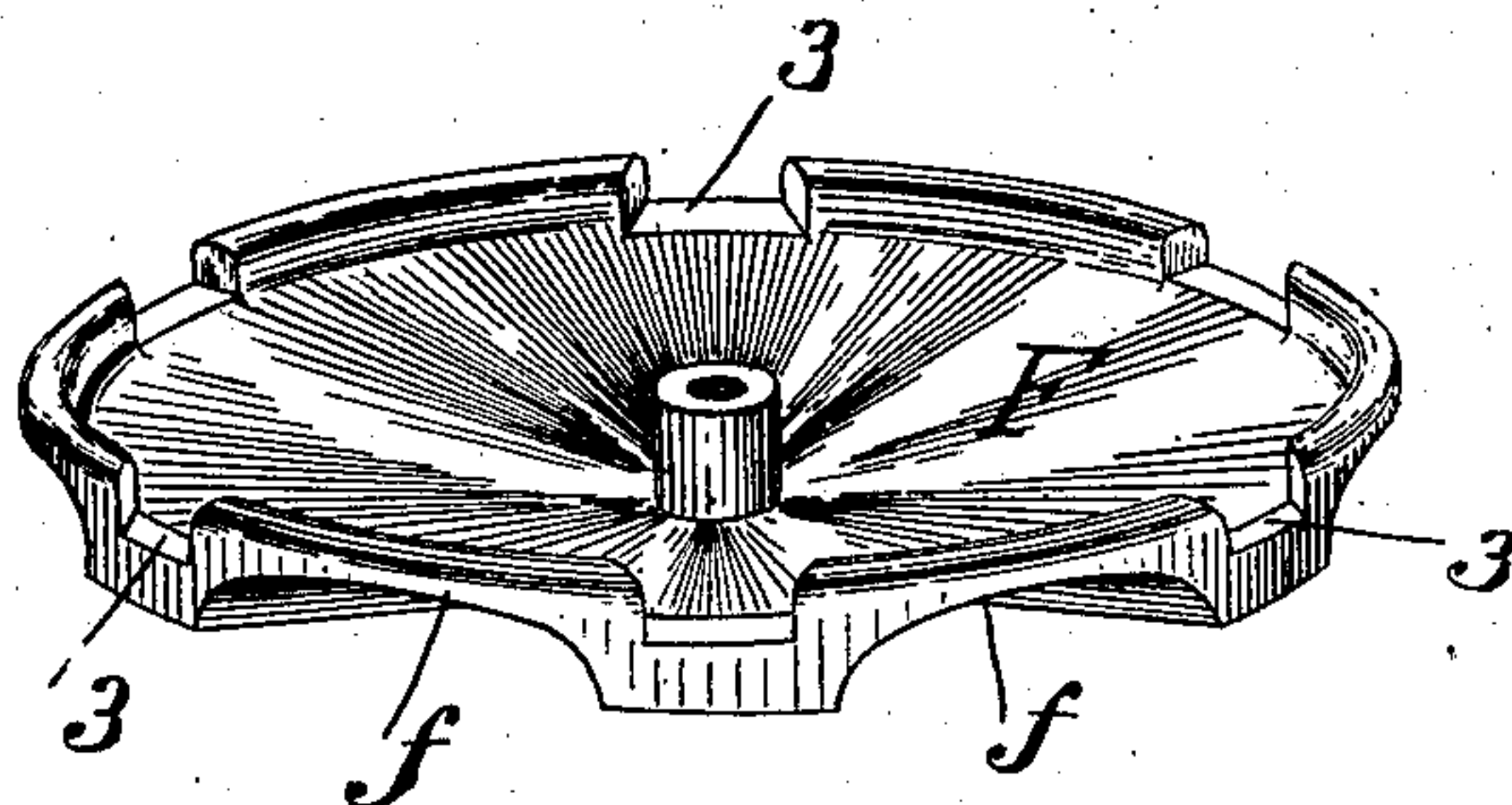
NO MODEL.

2 SHEETS—SHEET 2.

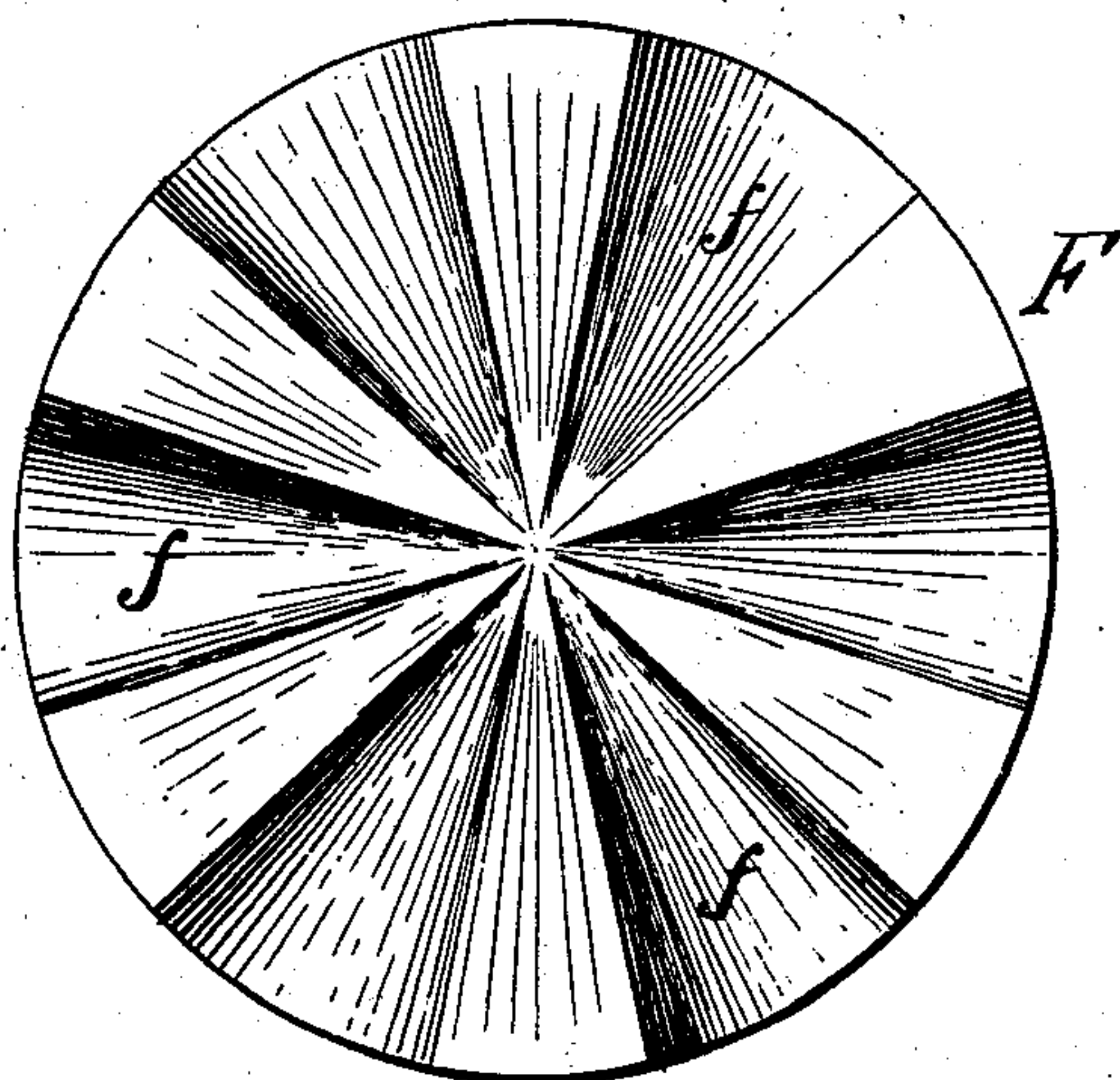
*Fig. 3.*



*Fig. 4.*



*Fig. 5.*



Witnesses  
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# UNITED STATES PATENT OFFICE.

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NEWARK, NEW JERSEY.

## GAS HEATING STOVE OR FURNACE.

SPECIFICATION forming part of Letters Patent No. 747,928, dated December 29, 1903.

Application filed November 21, 1902. Serial No. 132,250. (No model.)

*To all whom it may concern:*

Be it known that we, WILLIAM SIMON BECHTOLD and ADOLPH FABER DU FAUR, Jr., citizens of the United States, residing at Newark, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Gas Heating Stoves or Furnaces, of which the following is a specification.

Our invention has reference to improvements in gas heating stoves or apparatus of that class particularly adapted for heating individual rooms, and has for its objects, first, a proper and complete combustion of the gas; secondly, an improved distribution of the flame; thirdly, an improved presentation of radiating-surface; fourthly, the prevention of obnoxious gases entering the room, and, fifthly, the reduction of the running expenses in a marked degree.

With these objects in view our invention consists, essentially, in a gas heating stove or apparatus comprising a base and a spreader forming between them flame-channels increasing outwardly in width and depth and extending from a common point, a burner adapted to direct a flame toward the common point, a series of tubes adapted to receive the several jets, and a top chamber.

The nature of our invention will best be understood when described in connection with the accompanying drawings, in which—

Figure 1 represents a vertical central section of a heating-stove embodying our invention, part being broken away. Fig. 2 is a horizontal section on the line 2-2, Fig. 1. Fig. 3 is a horizontal section on the line 3-3, Fig. 1. Fig. 4 is a perspective view of the spreader. Fig. 5 is a bottom view of the spreader.

Similar letters and numerals of reference designate corresponding parts throughout the several views of the drawings.

Referring now to the drawings, the letter A designates the base of the stove, which, as shown, is preferably made in dish form with an upwardly-tapered bottom *a* and provided with a central opening 1 for the introduction of a central jet by means of the burner B, as well as the introduction of air around said burner. The burner B may be of any usual

type, although we prefer to use the specific construction herein shown, which consists of a bell *b*, secured to the legs or other support attached to the base A, a mixing-chamber 2, and nozzle 3, forming the flame-nozzle. In line with the mixing-chamber 2 is arranged a gas-nozzle D, which is connected with the gas-main either by the usual piping or by rubber hose in the usual manner. The gas-nozzle is provided with a tip having a perforation of small area for the passage of gas, and the flow of gas can be regulated by a cock E in the usual manner. The admission of air can be regulated by moving the gas-nozzle D in or out relative to the bell *b* by means of a hand-wheels or by any other usual means provided for this purpose.

In the base A is located a spreader F, which is preferably made in the form of a hollow cone having its apex in line with the jet issuing from the burner B and provided with a series of grooves *f*, tapering and increasing in width and depth outwardly from the apex of said spreader and forming, with the inner surface of the base A, a series of flame-channels *f'*, also increasing in width and depth outwardly from the apex of said spreader, the purpose of said flame-channels being to direct the flame with gradual lateral expansion outwardly toward and into a series of tubes H, the connection of which said tubes with said base will presently be described. It will be readily understood that flame-channels of the character described can also be formed by providing the base A with the same grooves *f* as described in connection with the spreader F or by providing both the base and the spreader with said grooves. In the former case the spreader could be made perfectly smooth. It will be noticed from the drawings that this spreader is made of considerable thickness, and consequently the lower surface of said spreader is heated to a relatively high temperature, heat being transmitted through a considerable thickness of metal to the upper surface or surfaces, which are exposed to the air of the room, and thereby kept at a considerably lower temperature, so as to prevent scorching, as in the ordinary heating-



stoves, where the air is exposed to very highly heated surfaces in proximity to the flame and in other parts of the stove.

The base A is closed at its top by plate G, 5 provided with a series of concentric openings *g* and with vertical flanges *h*, adapted for the reception of vertical radiating-tubes H. The tubes H have their upper ends entered into a chamber I, having suitable flanges *h'* for 10 this purpose, and which may be provided at its top with an opening *i*, closed by a suitable removable cap J. This chamber I has an exit or draft opening *j*, connected with the chimney or the exterior of the building by 15 means of a pipe *j'* in order to permit the escape of the obnoxious gaseous products of combustion. This draft connection is, however, not absolutely essential, as the stove will be just as effective without such draft connections; 20 but this draft connection prevents the escape of obnoxious gases into the room and renders the stove entirely odorless under all circumstances.

The top of the chamber I may be formed 25 with an opening *i'*, adapted to be controlled by the cap J, which is slotted circumferentially, as at *i''*, for the purpose of permitting air heated by the stove to enter the room, if so desired, or the cap may be removed and 30 shifted to an eccentric position for the same purpose or the cap may be entirely removed with but slight escape of noxious gases into the room in view of the chimney-draft.

As shown in Figs. 1 and 2, the spreader ex- 35 tends through the openings *g* in the top plate of the base A and into the radiating-tubes H, it being recessed, as at 3 3, at the proper intervals along its upper edge for this purpose, and consequently the spreader causes 40 the introduction of the flame into the individual tubes at any desired point, according to the diameter of said spreader.

In practice we prefer to introduce the flame 45 along a line inwardly from the center of the tubes, so as to obtain a substantially central jet in each tube.

In practice we firmly unite the spreader to the cover of the base and to the bottom of the upper chamber by a bolt L and a suitable 50 nut, although ordinary means may be employed for this purpose.

It will readily be understood that in the present construction for gas heating-stoves absolutely perfect combustion is obtained, 55 since the burner B, first, produces a substantially perfect Bunsen jet; secondly, the jet is spread comparatively flat and mixed with air drawn in through the opening 1 in the base; thirdly, a complete burning mixture is 60 formed in the tubes H and chamber I, and, fourthly, the heavier gaseous products of combustion are carried off through the pipe *j'*, thus producing an entirely sanitary stove.

While in the present instance we have 65 shown a circular stove, it is of course to be understood that the same principle can be

embodied in an elliptical stove, the spreader then being made elliptical in form, or the stove may be made rectangular either with a double or single row of tubes. The spreader 70 can then be correspondingly formed.

It is of course to be understood that we do not wish to restrict ourselves to the general construction of the heating-stove herein shown—that is to say, in so far as it relates 75 to the tubes, upper and lower chambers, and their particular connections—as our invention consists, essentially, in the means for spreading and directing the flames from a burner. 80

What we claim as new is—

1. A gas heating stove or apparatus comprising a base and a spreader forming between them flame-channels increasing outwardly in width and depth and extending 85 from a common point, a burner adapted to direct a flame toward the common point, vertical hollow radiating means adapted to receive the several jets, and a top chamber, substantially as described. 90

2. A gas heating stove or apparatus comprising a base and a spreader forming between them flame-channels increasing outwardly in width and depth and extending 95 from a common point, a burner adapted to direct a flame toward the common point, vertical hollow radiating means adapted to receive the several jets, a top chamber, a draft-opening from the stove, and an air-inlet in the base, substantially as described. 100

3. A gas heating stove or apparatus comprising a base and a spreader forming between them flame-channels increasing outwardly in width and depth and extending 105 from a common point, a burner adapted to direct a flame toward the common point, vertical hollow radiating means adapted to receive the several jets, and an air-inlet in the base adjacent to the nozzle of the burner, substantially as described. 110

4. A gas heating stove or apparatus comprising a base and a spreader forming between them flame-channels increasing outwardly in width and extending from a common point; said spreader being provided with 115 grooves diverging in width outwardly from the common point, a burner adapted to direct a flame toward the common point, vertical hollow radiating means adapted to receive the several jets, and a top chamber, substantially as described. 120

5. A gas heating stove or apparatus comprising a base, a spreader provided with grooves diverging in width and increasing in depth outwardly from a common point, a 125 burner adapted to direct the flame toward the common point, vertical, hollow radiating means adapted to receive the several jets from the spreader, and a top chamber, substantially as described. 130

6. A gas heating stove or apparatus comprising a base made in dish form, a conical



spreader provided with flame-channels radiating from a common point, a burner adapted to direct a flame toward the common point, a series of vertical tubes adapted to receive the  
5 corresponding portions of the divided jet, and a top chamber to which said tubes are attached, substantially as described.

7. A gas heating stove or apparatus comprising a base made in dish form, a conical  
10 spreader provided with flame-channels radiating from its apex and increasing outwardly in width and depth, a burner adapted to direct a flame toward the apex of the spreader, a series of vertical tubes adapted to receive  
15 the corresponding portions of the divided jet, a top chamber to which said tubes are attached, and an air-inlet in the base, adjacent to the nozzle of the burner, substantially as described.

20 8. A gas heating stove or apparatus, comprising a base made in dish form, a conical spreader provided with flame-channels radiating from its apex and increasing outwardly in width and depth, a burner adapted to direct a flame toward the apex of the spreader,  
25 a series of vertical tubes adapted to receive the corresponding portions of the divided jet, a top chamber to which said tubes are attached, an air-inlet in the base, adjacent to

the nozzle of the burner, and a draft-opening  
30 from the stove, substantially as described.

9. A gas heating stove or apparatus comprising a hollow base, a top chamber, a series of tubes connecting said base and said chamber, a spreader located within the base and  
35 having therein flame-channels, and said base having its exterior portions entering into said tubes, a burner adapted to direct a flame toward the spreader, and an air-inlet in said  
40 base, substantially as described.

10. In a heating-stove comprising a hollow base, an upper chamber, hollow radiating means connecting the base and chamber, a spreader having its body of material thickness and provided with channels for directing  
45 the flame toward the hollow radiating means between the base and chamber at different points, and means for directing a jet or flame against the spreader, substantially as described.  
50

In testimony whereof we have hereunto set our hands in the presence of two subscribing witnesses.

WILLIAM SIMON BECHTOLD.

ADOLPH FABER DU FAUR, JR.

Witnesses:

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JAMES W. MCELHINNEY.