

No. 684,666.

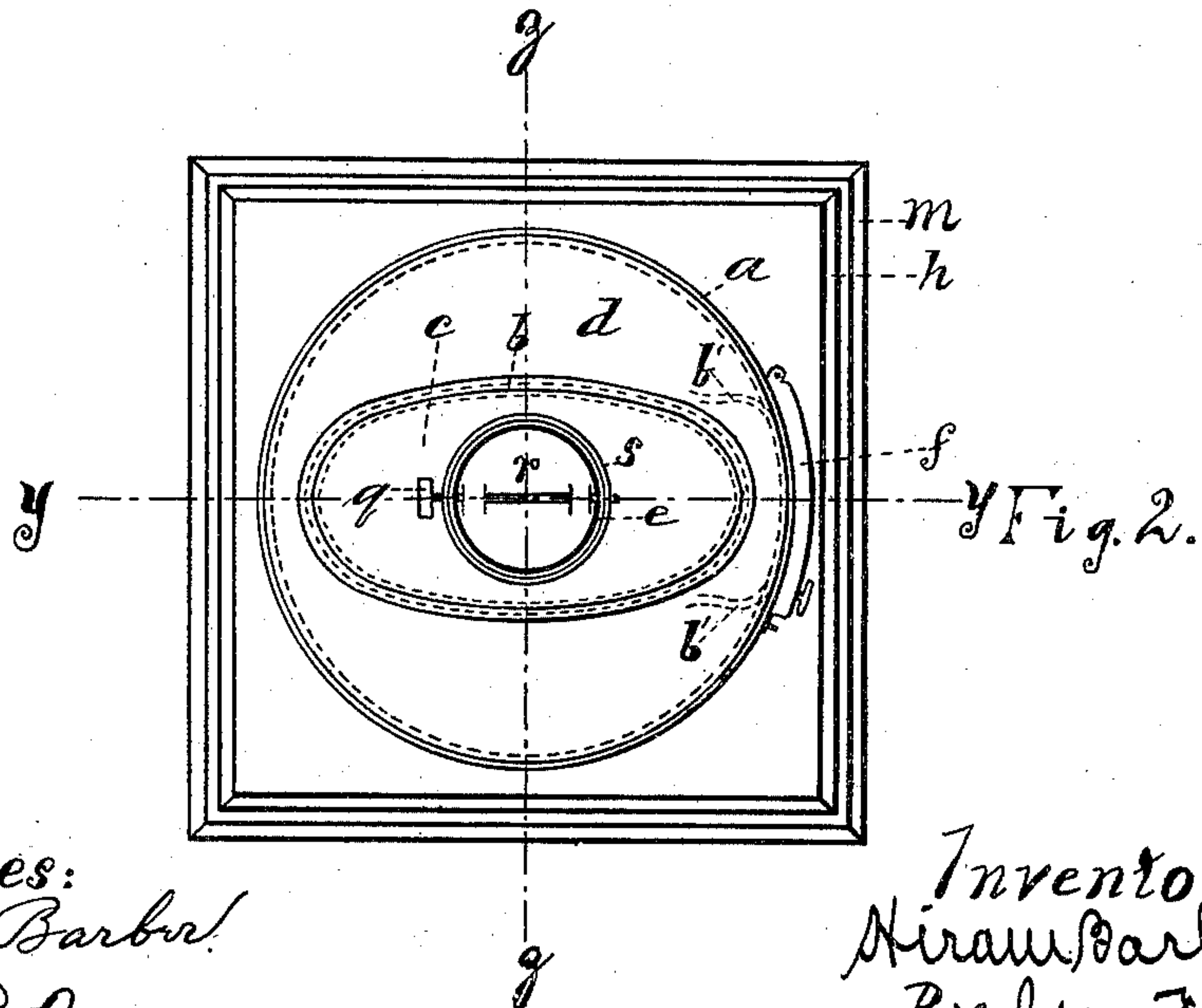
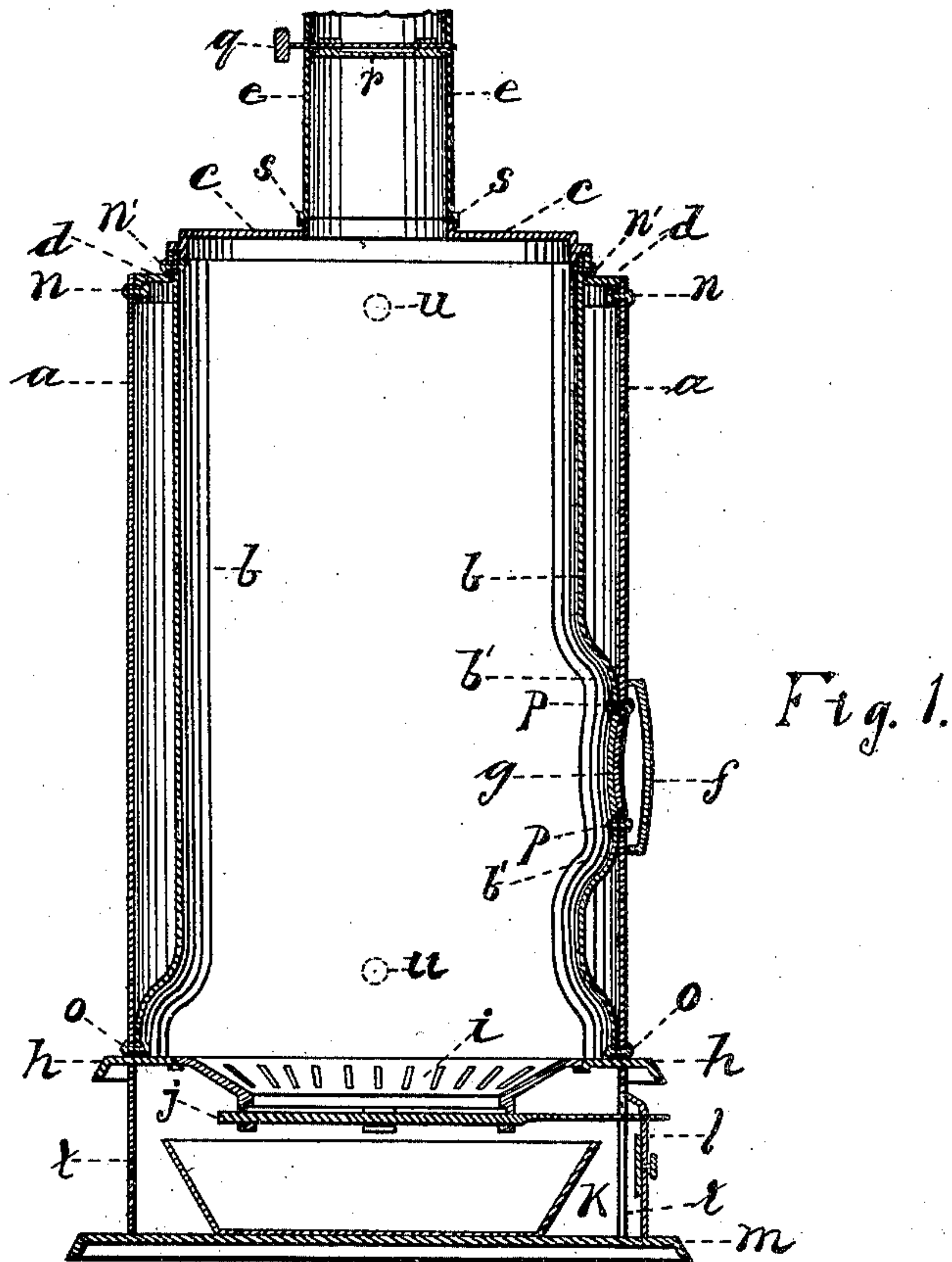
Patented Oct. 15, 1901.

H. BARBER.  
WATER HEATER.

(Application filed Jan. 30, 1901.)

(No Model.)

2 Sheets—Sheet 1.



Witnesses:  
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WATER HEATER.

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2 Sheets—Sheet 2.

(No Model.)

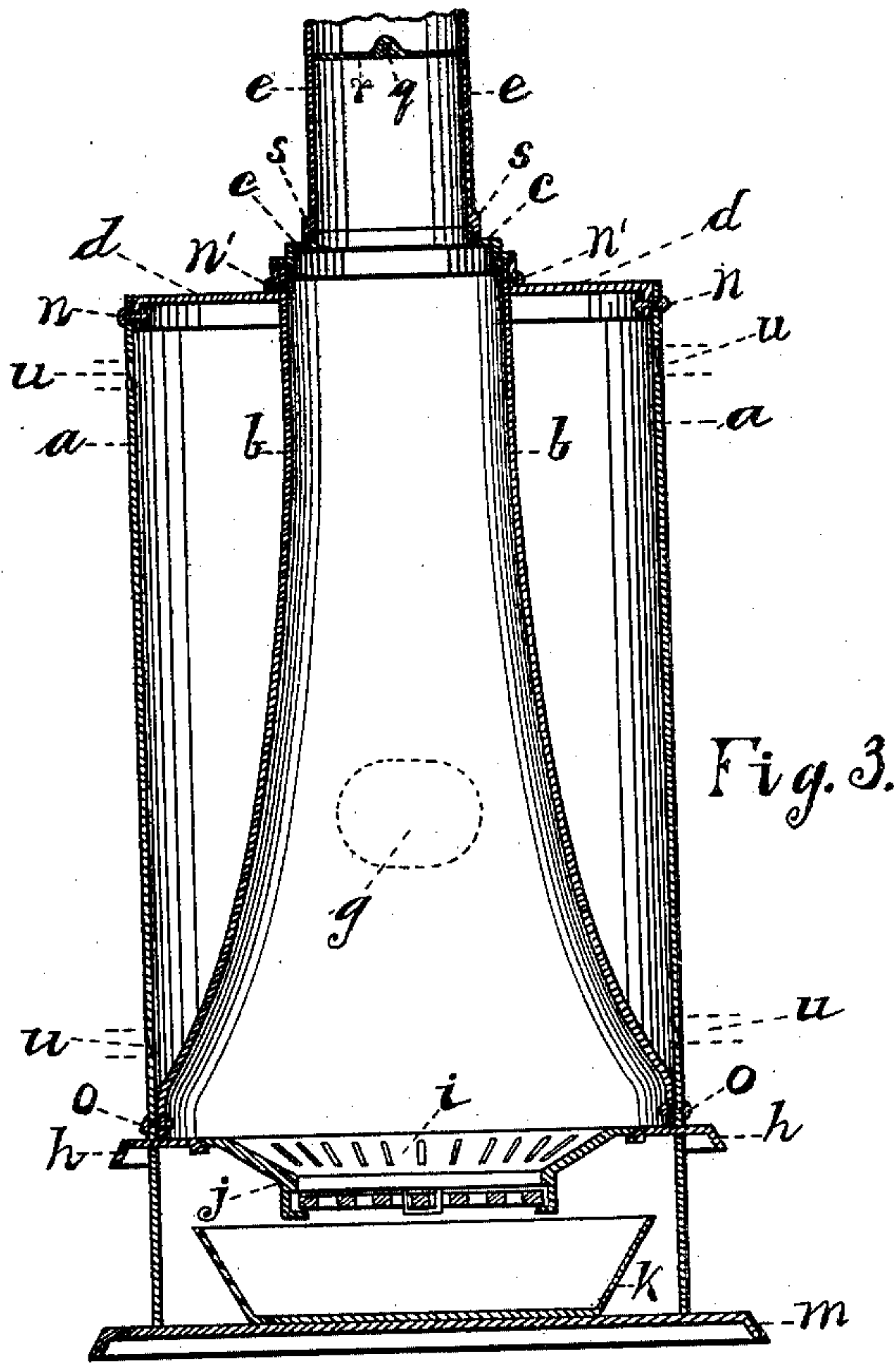


Fig. 3.

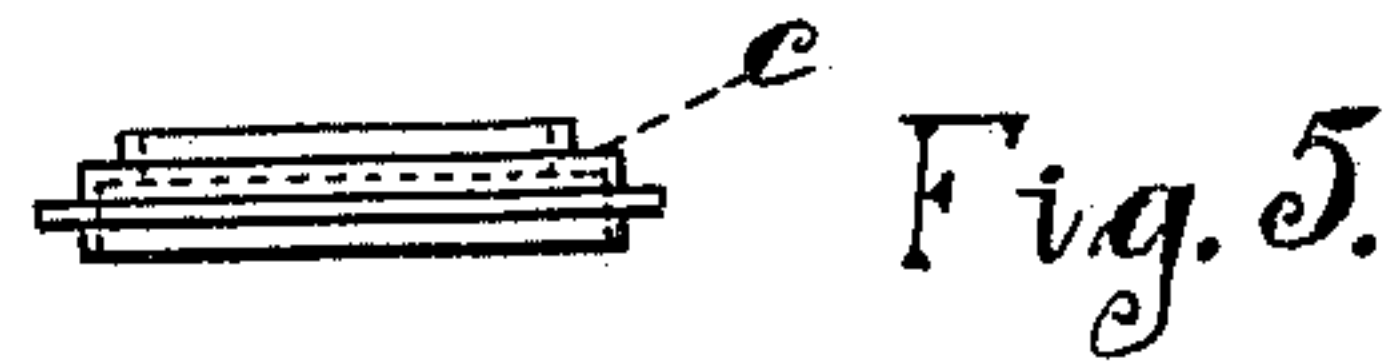


Fig. 5.



Fig. 6.

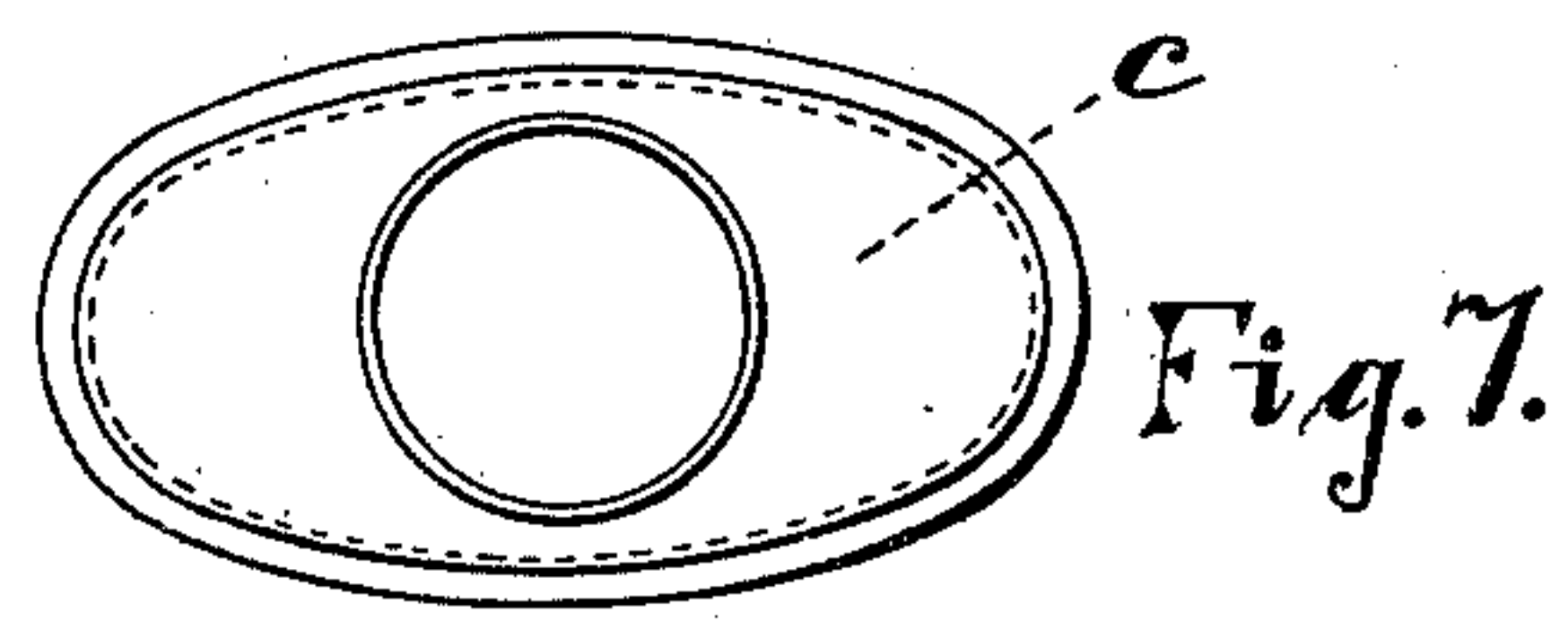


Fig. 7.

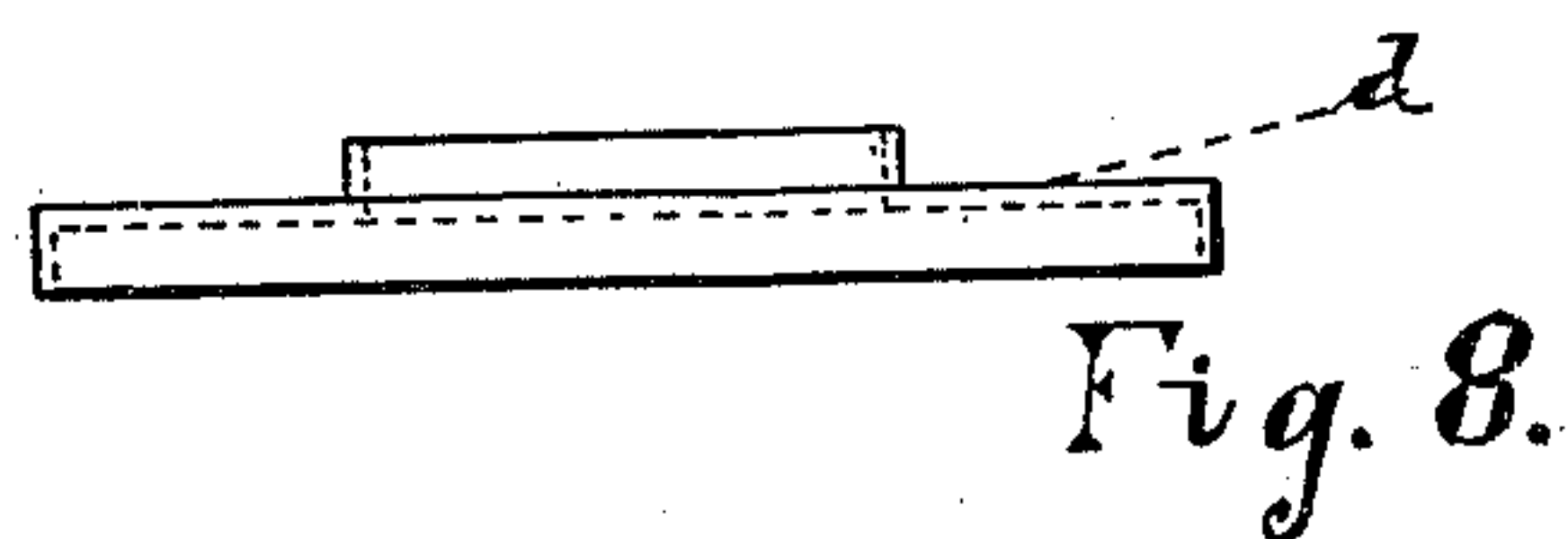


Fig. 8.

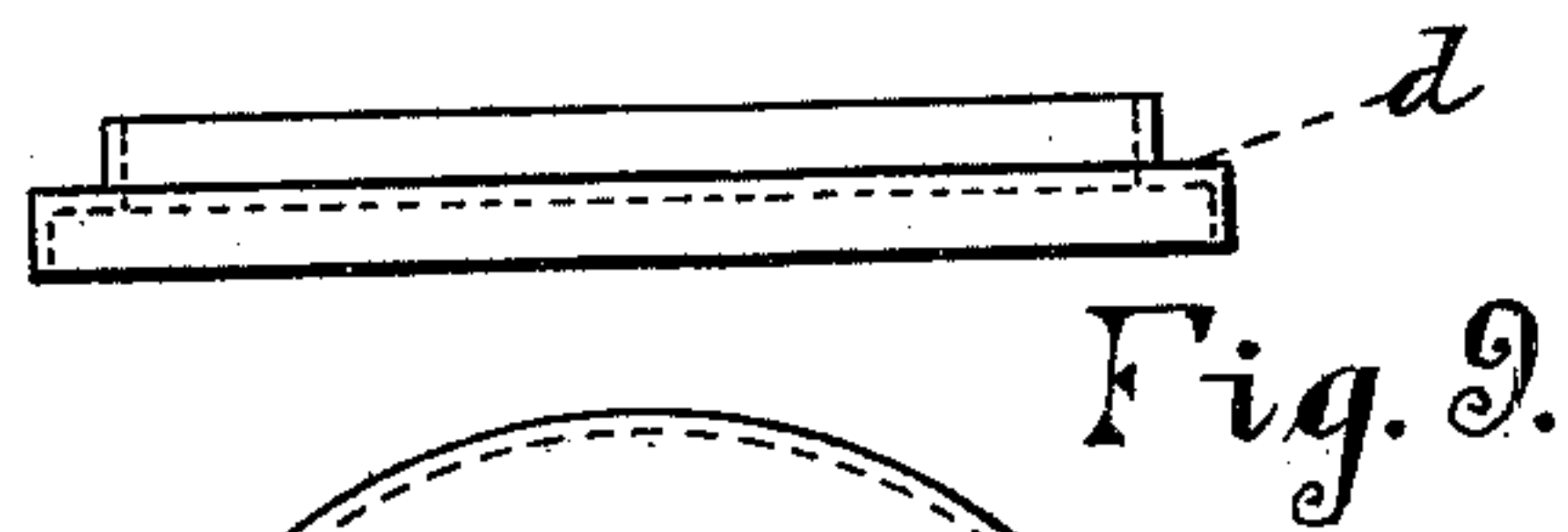


Fig. 9.

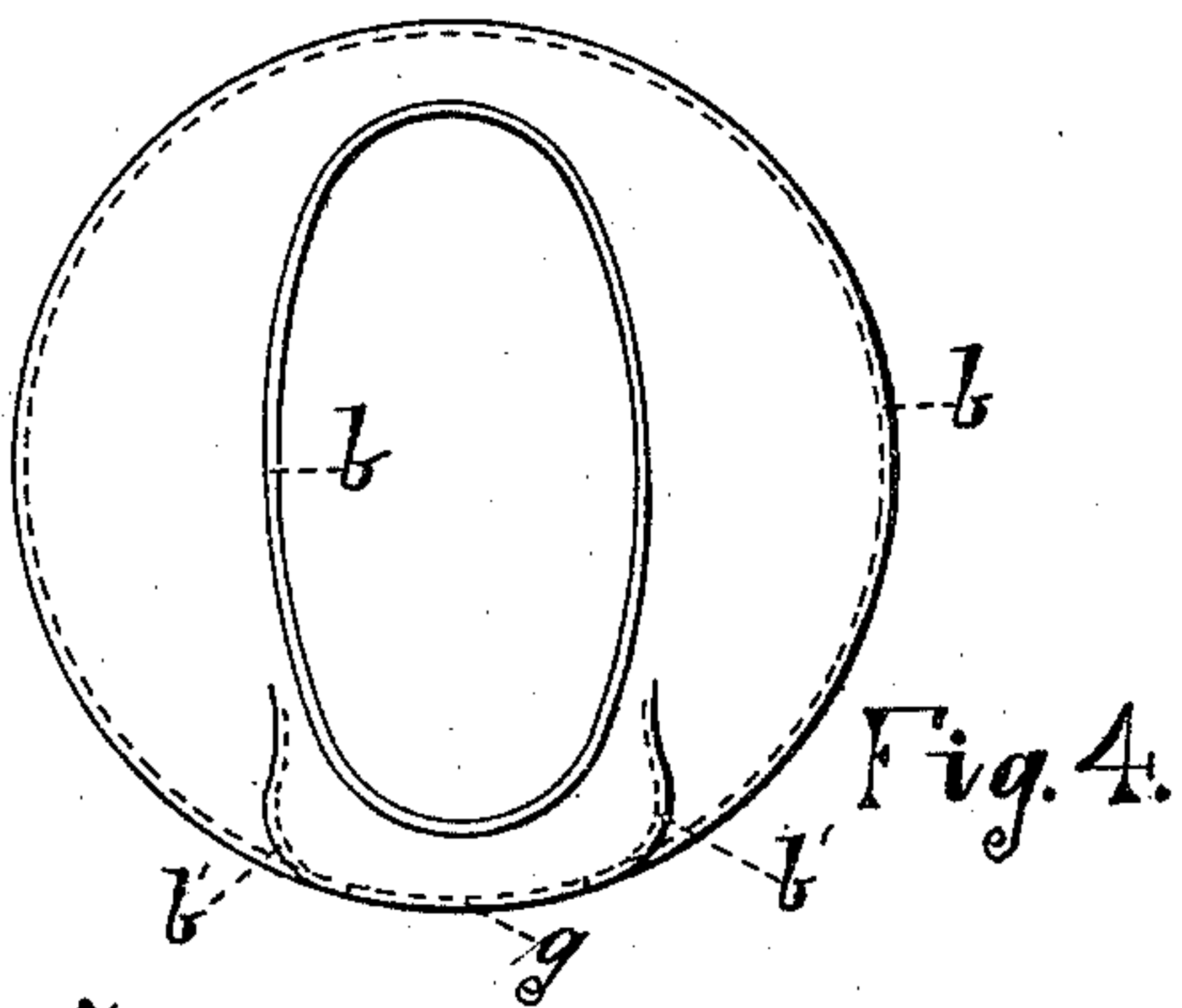


Fig. 4.

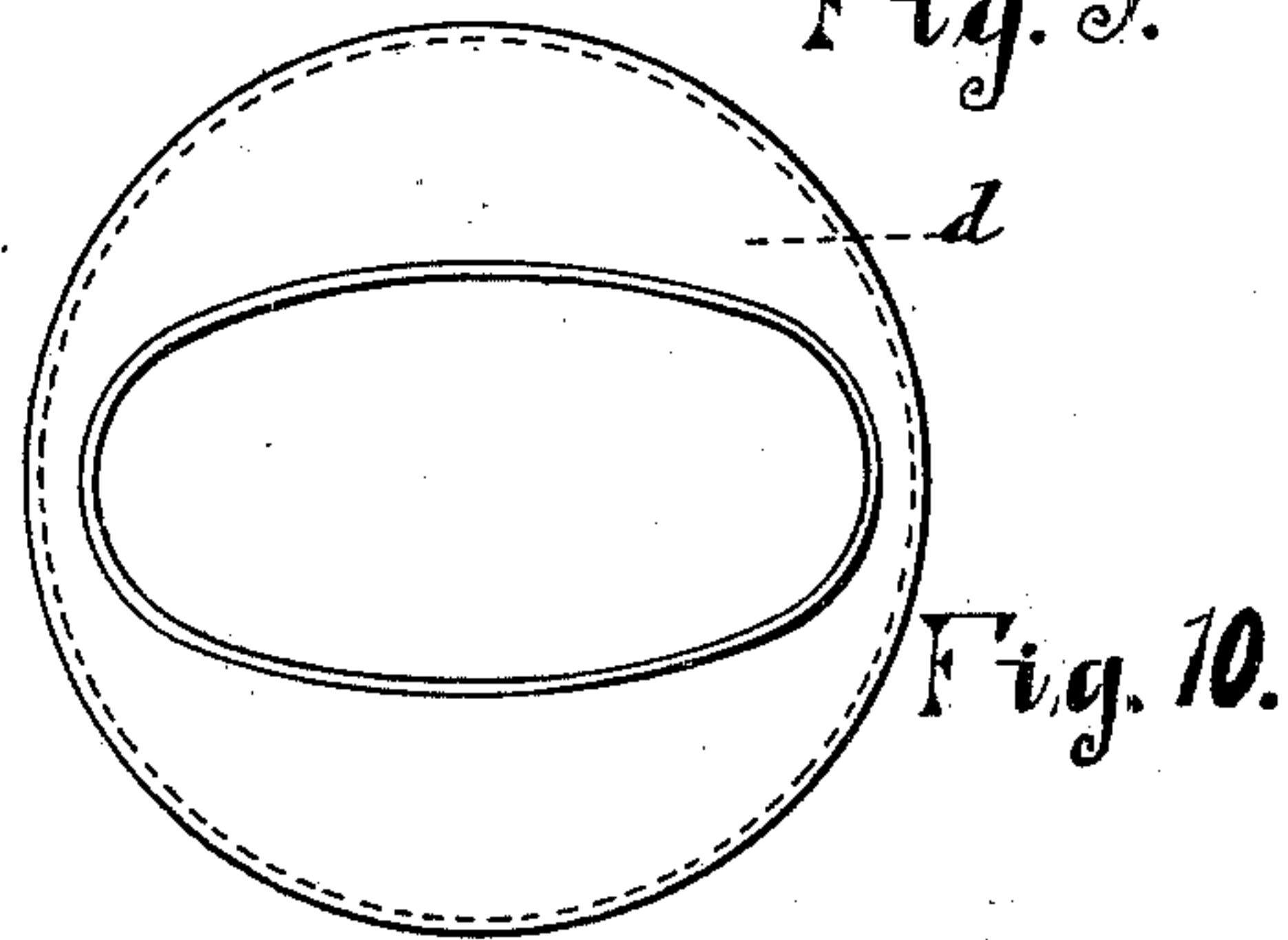


Fig. 10.

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# UNITED STATES PATENT OFFICE.

HIRAM BARBER, OF CHICAGO, ILLINOIS.

## WATER-HEATER.

SPECIFICATION forming part of Letters Patent No. 684,666, dated October 15, 1901.

Application filed January 30, 1901. Serial No. 45,360. (No model.)

*To all whom it may concern:*

Be it known that I, HIRAM BARBER, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have  
5 invented a new and useful Water-Heater, of which the following is a specification.

My invention relates to improvements in water-heaters in which an outer shell encloses an inner cone-like shell and in which  
10 the annular space between the shells is the water-receptacle and the interior of the cone-like shell is the fire-box and fuel-magazine, the objects being to provide the greatest possible heating capacity by aptly distributing  
15 the contact between the water and the interior cone and to facilitate the insertion of a door, as hereinafter set forth. I attain these objects by the mechanism illustrated in the accompanying drawings, in which—

20 Figure 1 is a longitudinal section through the broken line *y y*. Fig. 2 is a plan view. Fig. 3 is a longitudinal section through the broken line *z z*. Fig. 4 is a plan of the inner shell. Fig. 5 is a longitudinal detail of  
25 the elliptical bushing. Fig. 6 is a transverse detail of same. Fig. 7 is a plan view of Figs. 5 and 6. Fig. 8 is a longitudinal detail of the semi-elliptical bushing. Fig. 9 is a transverse detail of same. Fig. 10 is a plan view of Figs.  
30 8 and 9.

In detail, *a* is the outer shell, and *b* is the inner cone, which at the base are secured together by means of the rivets *o*, making a water-tight joint. At the top the shell *a* is  
35 secured to the outer portion of the bushing *d* (shown in Figs. 8, 9, and 10) by means of rivets *n*, making a water-tight joint. At the top the inner cone is secured to the inner portion of the bushing *d* (shown in Figs. 8, 9,  
40 and 10) by means of rivets *n'*, making a water-tight joint. At one side is provided corresponding openings *g* through both the outer and inner shells, by means whereof access is had to the interior of the inner shell. By  
45 flaring out the edge *b'* of the opening in the shell *b* to contact with the edge of the opening in the outer shell the shells are readily secured together by means of the rivets *p*. *f* is the door over said opening *g*. Any other  
50 suitable means may be employed as a substitute for the rivets *n*, *n'*, *o*, and *p* to secure water-tight joints. The annular space be-

tween said outer shell *a* and said inner cone *b* forms the water-receptacle.

*c* is the bushing (shown in Figs. 5, 6, and 7) 55 which fits snugly into the upper end of the cone *b* and is adapted to retain the exit-pipe *e* by means of the collar *s*.

*r* is an ordinary damper and is operated by means of the handle *q*. 60

*i* is the fire-pot, which rests upon the annular flange *h*, and *j* is the grate.

*m* is the base which supports the shell *t*, forming an ash-chamber, which contains the ash-pan *k* and is provided with the door *l*. 65

The outer shell *a* is provided with ports *u u u u*, which are adapted to receive pipe connections.

As above indicated, the particular utility or advantage to be derived from the elliptical 70 form of the upper section of the inner shell is that the walls of the outer and inner shells may thus be made substantially parallel with each other on the perpendicular line passing through the longer diameter of the elliptical 75 opening in the bushing *d* and may also be brought into any desired proximity on this line with each other, and it is obvious that when thus brought into immediate proximity there is such a thinning out of the annular 80 column of water as to secure the most rapid heating thereof practicable along the line of such proximity, and it is also obvious that such proximity of the walls of the outer and 85 inner shells is calculated to simplify the construction of the opening for the door and to overcome the difficulties hitherto encountered in the manufacture of water-heaters when the inner-shell is truly conical. In such cases the wall of the inner shell is liable to be 90 drawn so far away from the wall of the outer shell at the upper margin of the opening for the door that it has been found necessary to insert a wedge-shaped block, provided with a suitable opening, between the inner and 95 outer shells and to make use of long rivets to hold the work together, or to draw out the metal of the inner shell around the margin of the opening to such an extent as to render the same liable to crack during the process 100 of riveting.

Having thus described the character of my improvement in water-heaters, its object, purpose, and the method of constructing the



same, what I claim as my invention, and for which I seek Letters Patent, is—

1. In water-heaters, the combination with an outer shell, of an inner shell which fills the  
5 bore of the outer shell at the base and converges to an elliptical formation at the top, the perpendicular of said inner shell at the vertice of said elliptic being parallel with the wall of said outer casing, and means for secur-  
10 ing said shells together, so as to provide an annular water-tight chamber between said shells, such chamber being provided with water-ports substantially as described.

2. In water-heaters, the combination with  
15 an outer shell, of an inner shell which fills the barrel of the outer shell at the base and converges to an elliptical formation at the top, the perpendicular of said inner shell at the vertice of said elliptic being parallel with the  
20 wall of said outer casing, means for securing said shells together so as to provide an annular water-tight chamber between said shells,

such chamber being provided with water-ports, and a door leading through the outer shell to the interior of the inner shell at the  
25 vertice of said elliptic, substantially as described.

3. A water-heater comprising a grate and above it two telescoped shells which are her-  
metically sealed at both ends so as to provide  
30 an annular water-chamber between them, the upper portion of said inner shell being elliptical in form and the wall thereof being flared out at a vertice of said elliptic to contact with said outer shell and provided with a door at  
35 the place of said contact, substantially as described.

Witness my hand this 25th day of January,  
A. D. 1901.

HIRAM BARBER.

Witnesses:

JOSEPH L. BERMAN,  
CAMERON BARBER.