

No. 756,202.

PATENTED APR. 5, 1904.

R. BARRETT.
RADIATOR.

APPLICATION FILED DEC. 4, 1903.

NO MODEL.

2 SHEETS—SHEET 1.

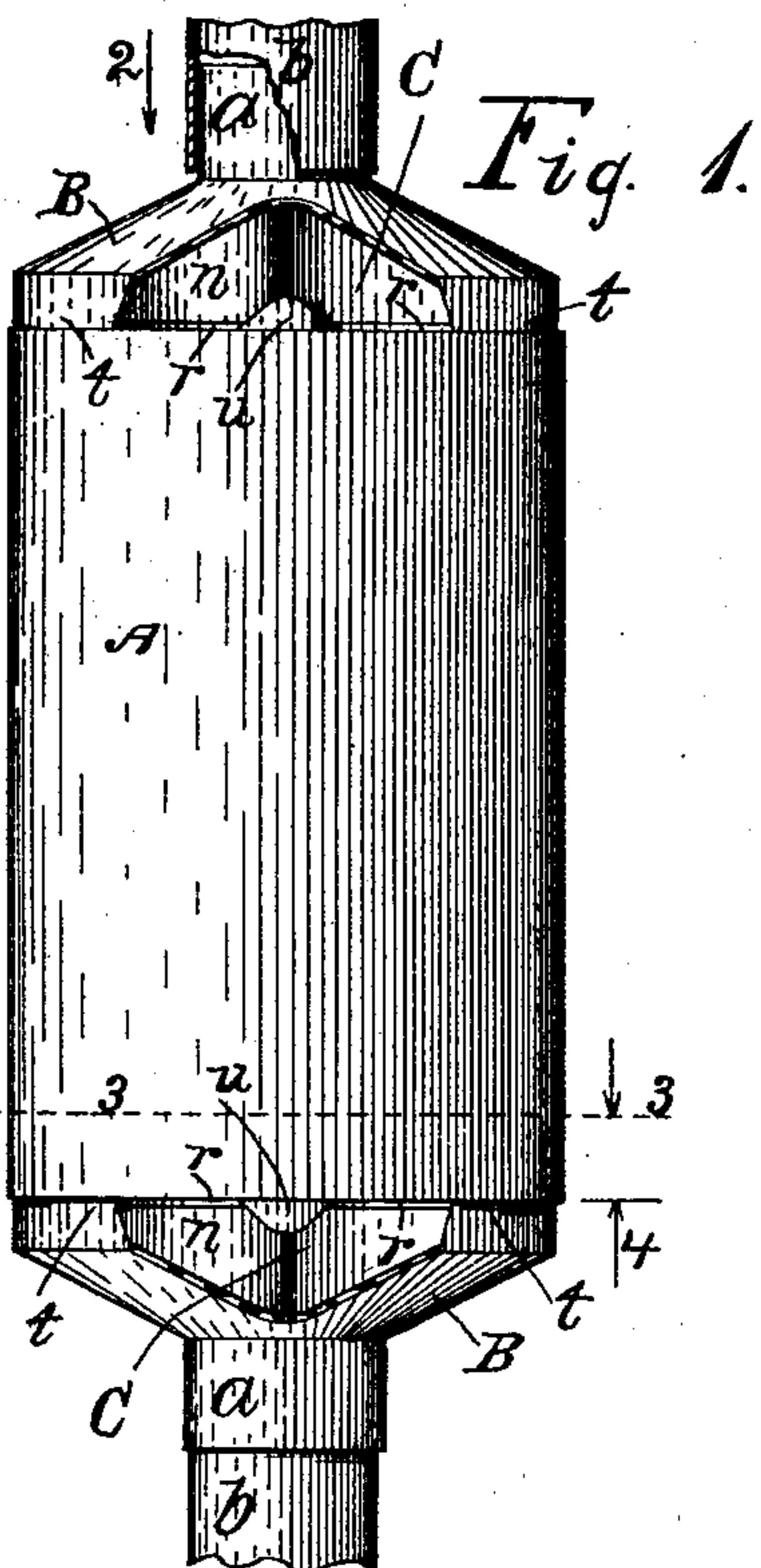


Fig. 1.

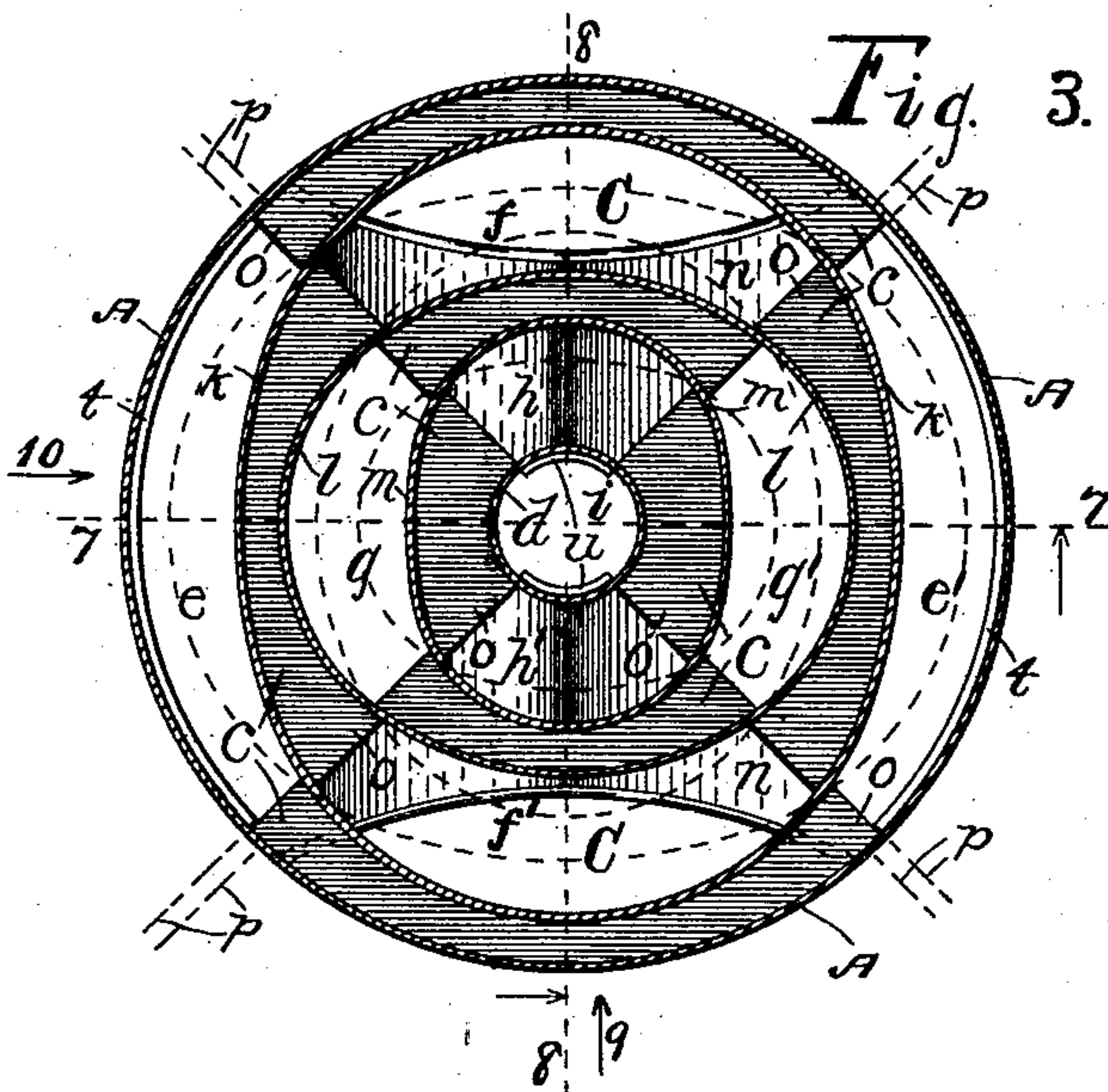


Fig. 3.

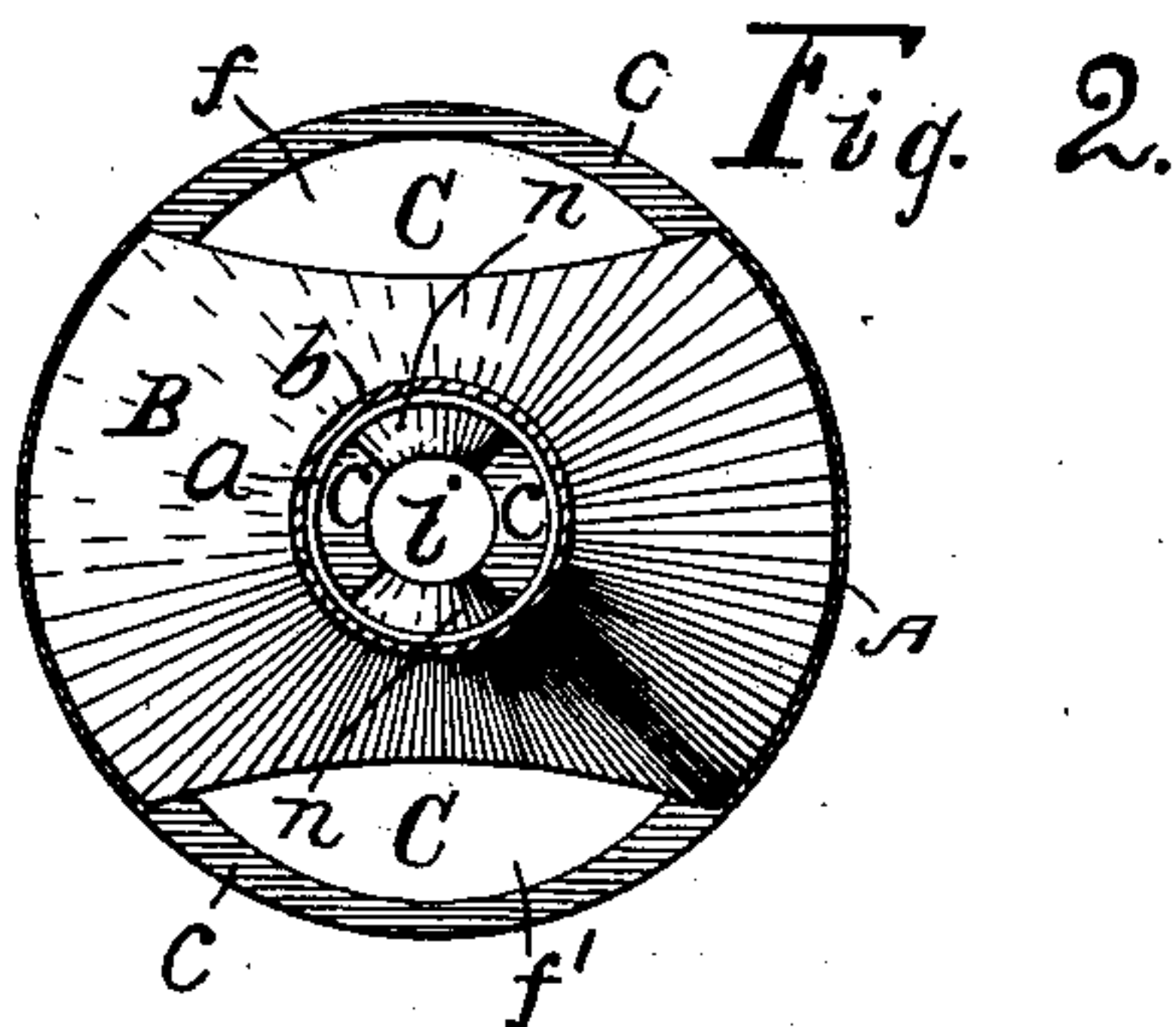


Fig. 2.

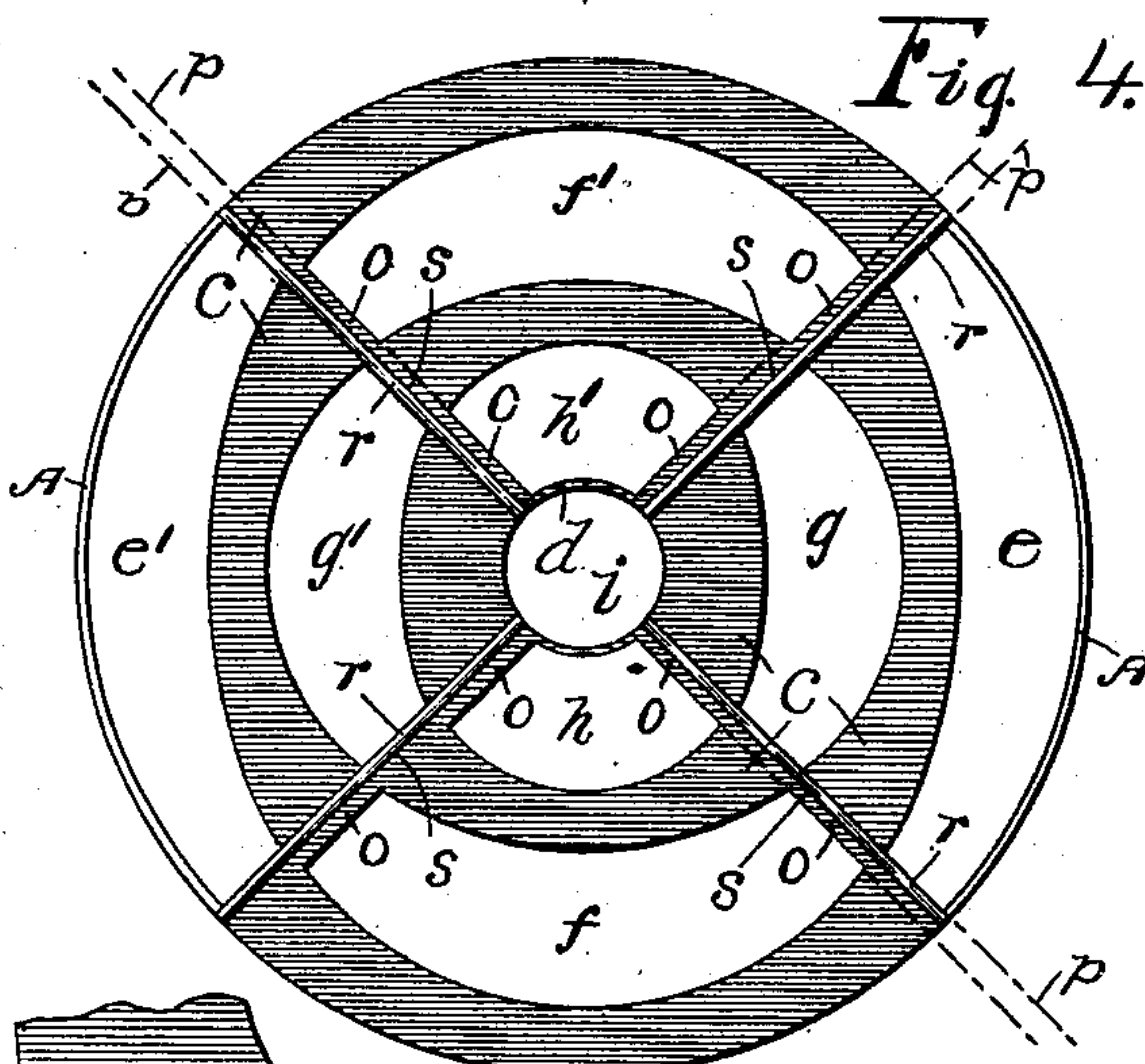


Fig. 4.

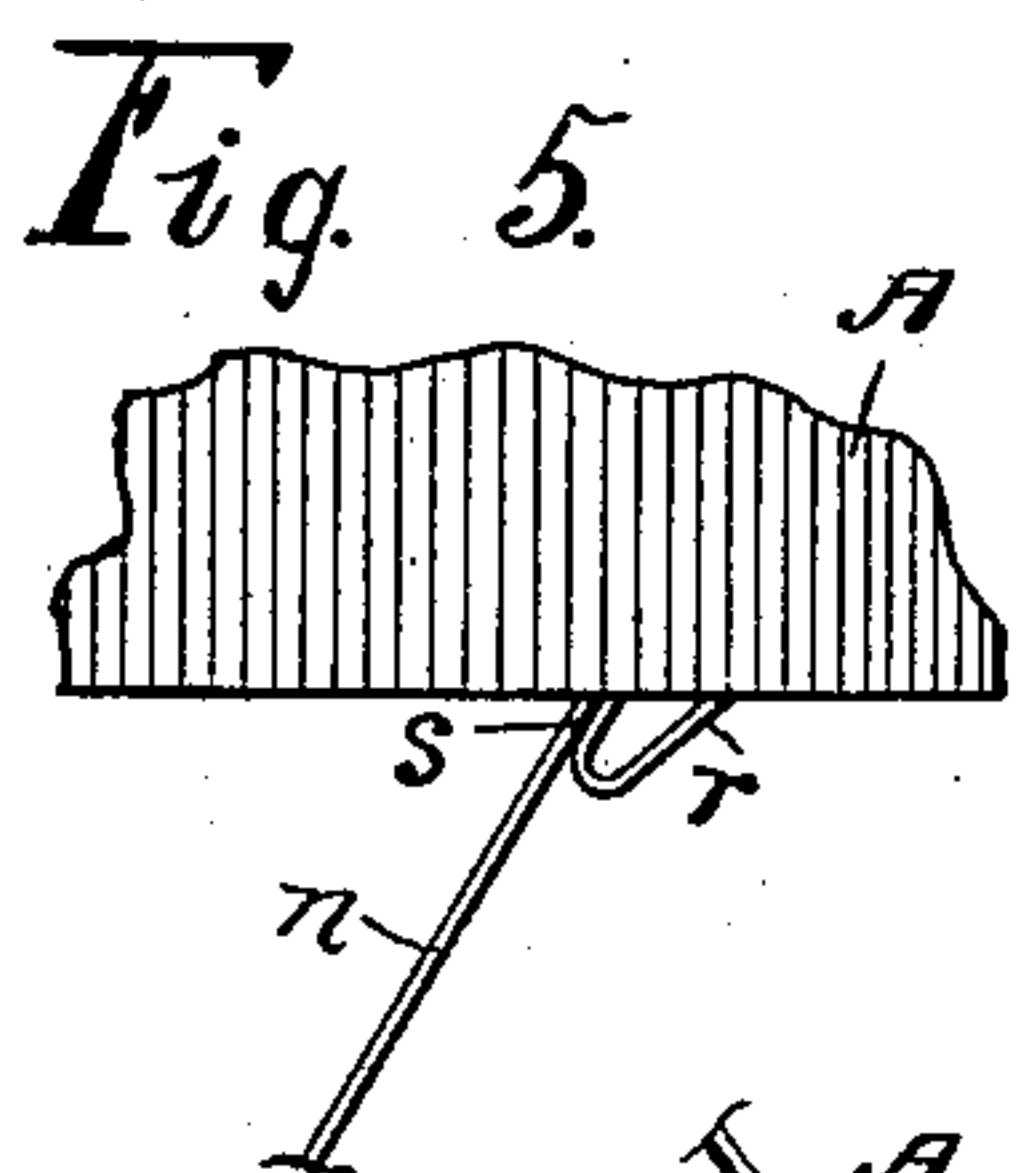


Fig. 5.

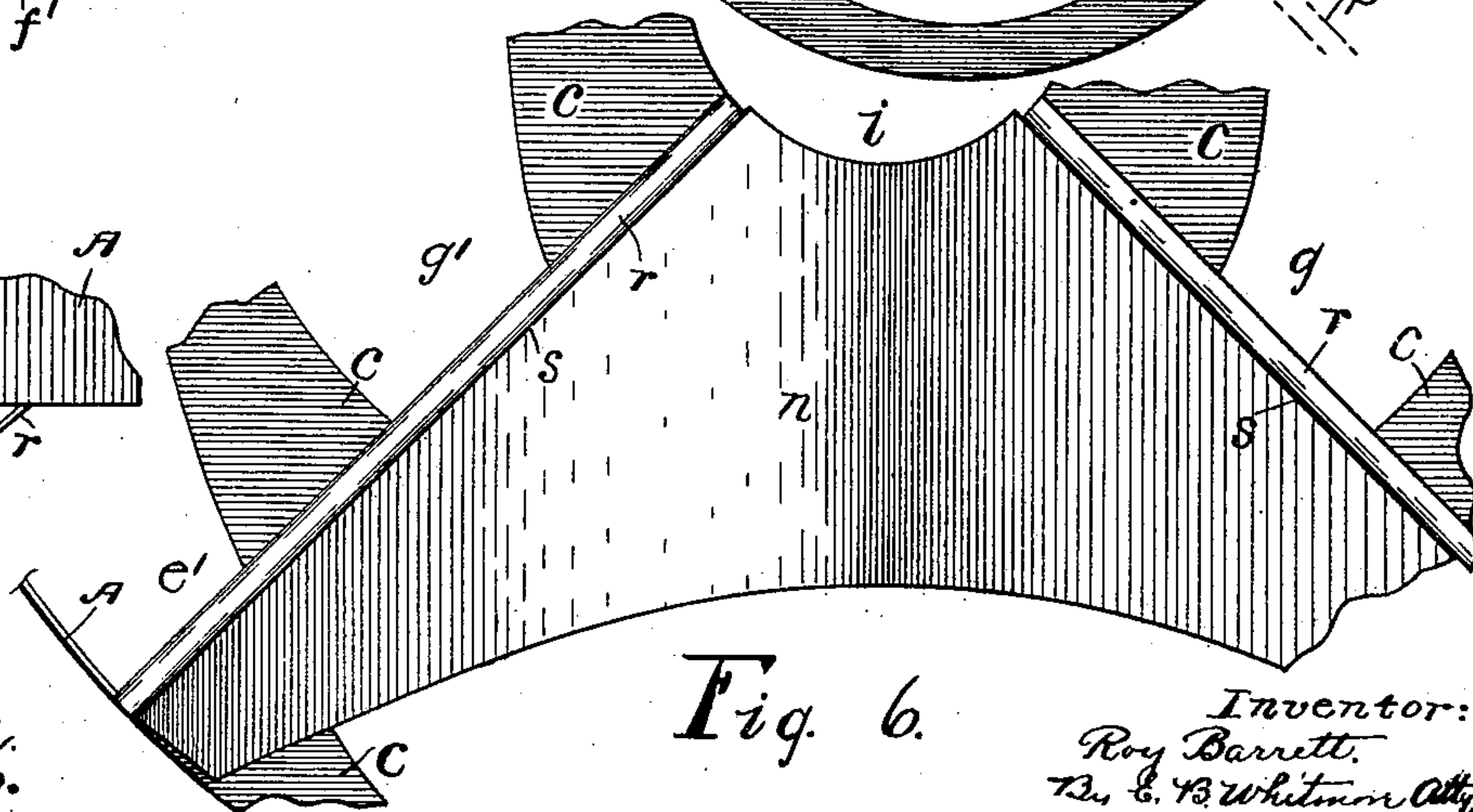


Fig. 6.

Attest:
M.B. Smith.
J. H. DeGo.

Inventor:
Roy Barrett.
By E. B. Whitman Atty.

No. 756,202.

PATENTED APR. 5, 1904.

R. BARRETT.
RADIATOR.

APPLICATION FILED DEC. 4, 1903.

NO MODEL.

2 SHEETS—SHEET 2.

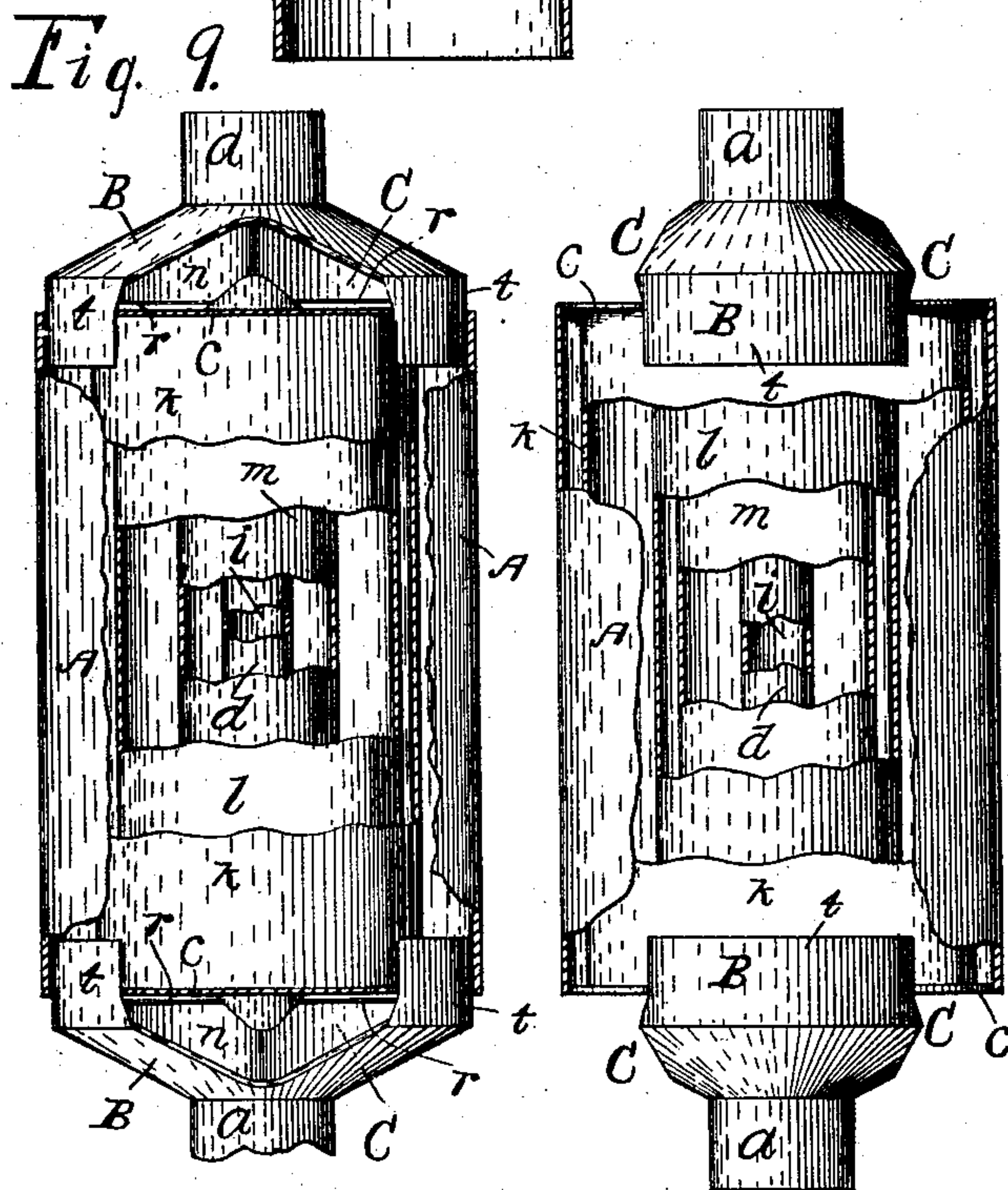
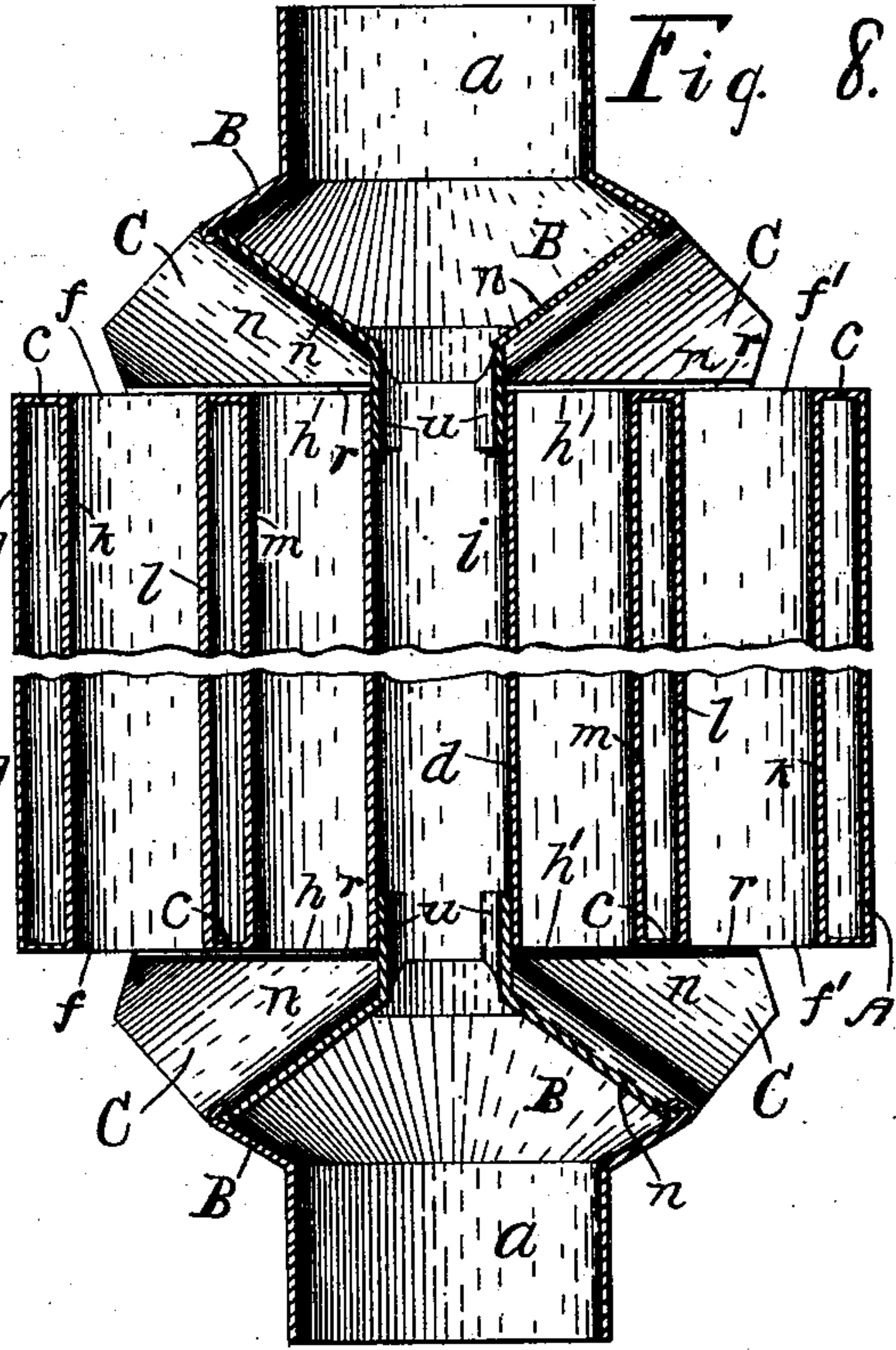
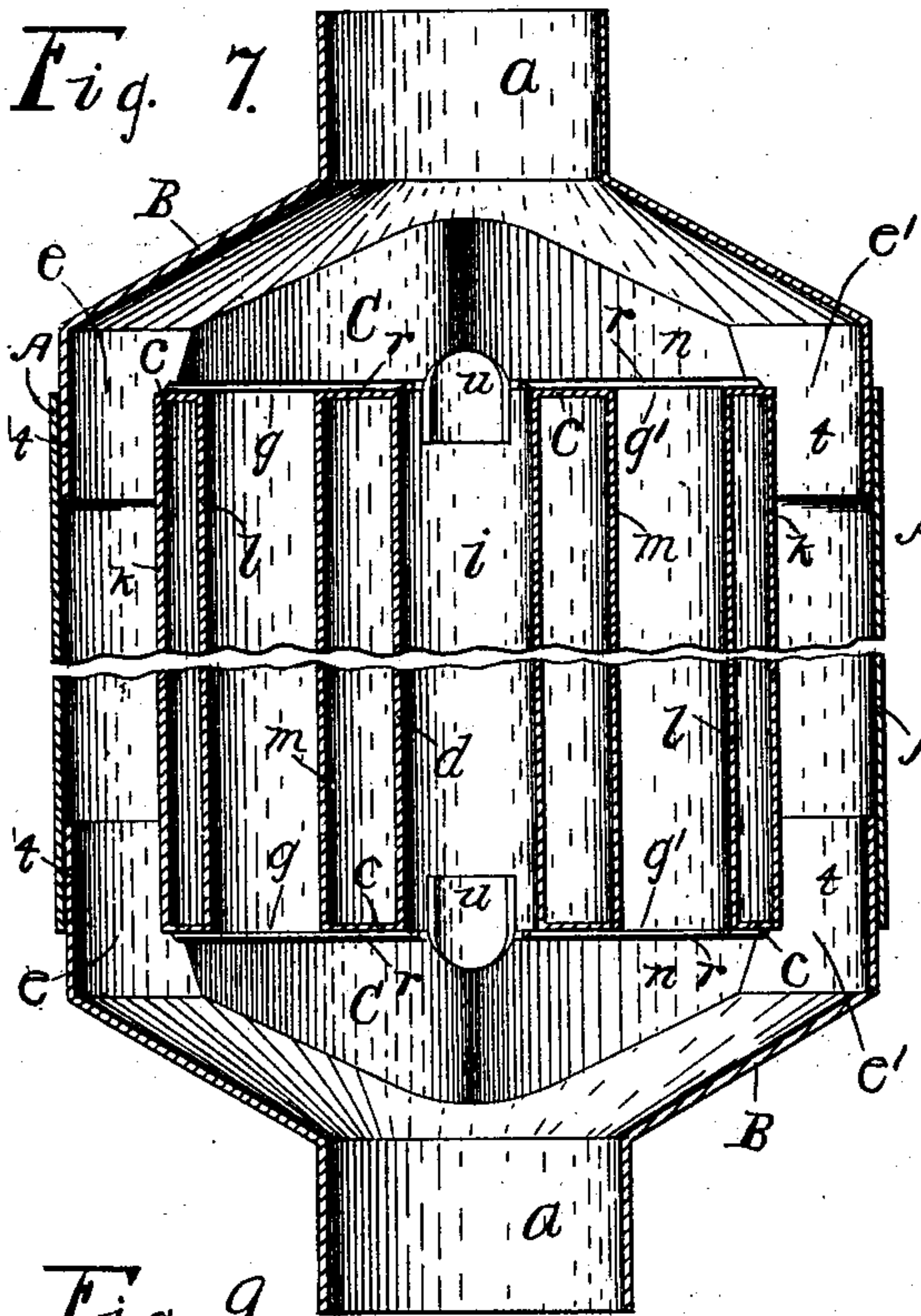
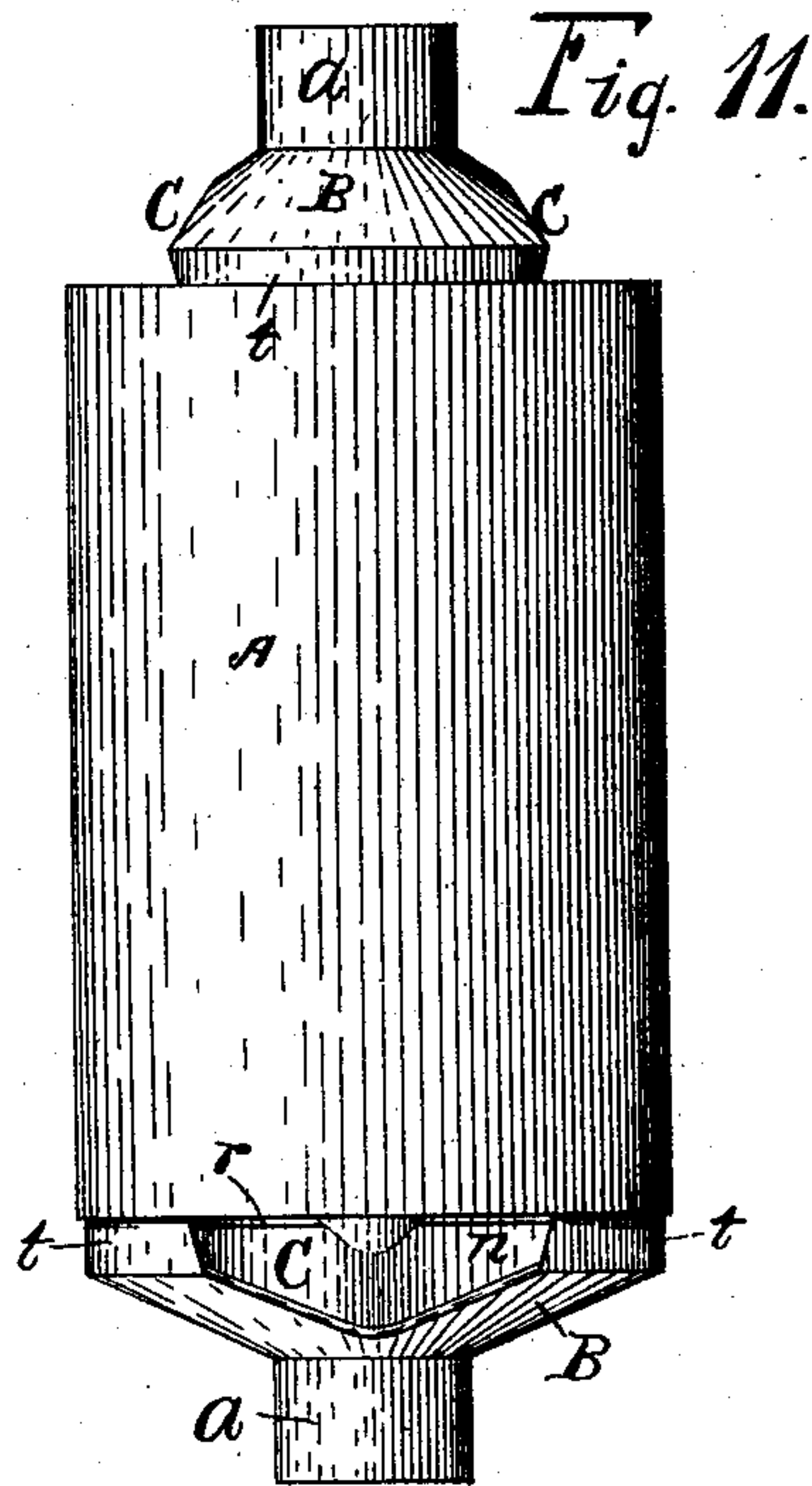


Fig. 10.



Attest:
M.B. Smith
J. H. Devo.

Inventor:
Roy Barrett.
By E. T. Whitmore, Atty.

UNITED STATES PATENT OFFICE.

ROY BARRETT, OF PALMYRA, NEW YORK.

RADIATOR.

SPECIFICATION forming part of Letters Patent No. 756,202, dated April 5, 1904.

Application filed December 4, 1903. Serial No. 183,726. (No model.)

To all whom it may concern:

Be it known that I, ROY BARRETT, of Palmyra, in the county of Wayne and State of New York, have invented a new and useful Improvement in Radiators, which improvement is fully set forth in the following specification and shown in the accompanying drawings.

My invention is a radiator designed more particularly to be used in connection with the pipe leading from an ordinary stove in common use. This radiator may also be similarly used over a gas-stove or an oil-stove, the main object of the invention being to produce a heat-radiating device to be used in connection with any ordinary source of heat to save and utilize a portion of the heat that ordinarily escapes with the smoke at the chimney.

Another object of the invention is to arrange the smoke flues or passages and the air-passages one within another and alternate them, so that the air-passages shall be inclosed or surrounded by the smoke-passages.

A further object of the invention is to form the smoke and the air passages or drums oval in cross-section and alternate their major and minor transverse axes to better take advantage of the ascending heated currents in the smoke-passages.

Other objects and advantages of the invention will be brought out and made to appear in the following specification and particularly pointed out in the appended claims, reference being had to the accompanying drawings, forming a part of this specification.

Figure 1 is a side elevation of the radiator, with parts of connected stovepipe, parts being broken away. Fig. 2 is an end view seen as indicated by arrow 2 in Fig. 1. Fig. 3 is a transverse section of the device as on the dotted line 3 3 in Fig. 1. Fig. 4 is a view of the under surface of the lower perforated end plate or floor of the drums seen as indicated by arrow 4 in Fig. 1. Fig. 5 is a view of a part of the main drum at the end of a radial rib of the lower end plate, showing the manner of holding a cavity-partition. Fig. 6 is a plan of a partition and associated parts of the end plate, parts being broken away. Fig. 7 is a central longitudinal section of the de-

vice on the dotted line 7 7 in Fig. 3, parts at the middle being broken out to shorten the figure. Fig. 8 is a central longitudinal section of the radiator on the dotted line 8 8 in Fig. 3, parts at the middle being broken away. Fig. 9 is a side elevation of the radiator seen in the direction indicated by arrow 9 in Fig. 3, parts being vertically and centrally sectioned and many parts broken away to uncover inner parts. Fig. 10 is a side elevation of the device seen as indicated by arrow 10 in Fig. 3, parts being vertically and centrally sectioned and many parts broken away. Fig. 11 is a side elevation of the radiator, showing the heads placed crisscross, as when the flues or drums are given spiral forms, or twisted through a one-fourth revolution, parts being broken away. Figs. 3 to 8, inclusive, are drawn to various scales larger than that of Figs. 1, 2, 9, and 11.

Referring to the parts shown, A is a main cylindrical inclosing drum, preferably of sheet metal, and B B conical heads covering the ends of the drum A. Both heads are alike and commonly made of thin cast-iron having flanges *t*, Figs. 3, 7, 9, and 10, extending into the ends of the drum. These heads are also formed with reduced cylindrical collars or parts *a a* extending in opposite directions to connect with sections of the stovepipe *b b*, the device as a whole constituting an integral part of the passage for smoke leading from the stove to the chimney. The main drum A is formed with rigid perforated end plates or floors *c c*, (shown in plan in Figs. 3 and 4,) connected by a central tube *d*, rigid with both end plates. Each end plate is formed with a series of curved openings *e e'*, *f f'*, *g g'*, *h h'* and a central circular opening *i*, the openings, except the central one, being formed regularly in four equal sectors of the circular end plate, two in each sector, as shown.

A series of oval minor drums *k l m* of different sizes are placed one within another within the main drum A, extending between and rigid with the end plates *c c* common to all, the vertical spaces within and between the several drums and within the tube *d* constituting passages for the smoke from the stove

and for currents of air, as will be described farther on. The major drum A and the minor oval drums *k l m* are coaxial, the minor drums being alternated as to their relative positions one with another—that is to say, the major transverse axis of any minor drum corresponds with the minor axis of the adjacent drum, all said transverse axes of the oval drums intersecting at right angles at the common axial line of the body of drums. The above-mentioned perforations in the end plates *c c* open into the interiors of the several drums, as shown, there being two similar and opposite openings at either end of each drum and also two similar and opposite sections of the end plates *c c*.

The heads B B of the radiator are cut away on opposite sides, as appears in Fig. 2, and formed with recesses or cavities C, Figs. 1, 7, 8, and 9, extending inwardly under and above the respective end plates *c c* to the central tube *d*, but not communicating with the interior of the tube. These inwardly-reaching peripheral cavities are each limited inwardly by an inclined curved partition or wall *n*, having a flange or part *u* reaching into the adjacent end of the tube *d* as a means of holding the partition in place. These partitions, four in number, fit at their edges the adjacent parts of the heads B B and of the end plates *c c* and prevent communication between the cavities and the interiors of the hollow heads B B. The cavities C are respectively under and above the parts of the respective end plates pierced by the openings *f*, *h*, *h'*, and *f'*, Figs. 2, 3, and 4, and have free communication through said openings with the interiors of the minor drums *k m*. By this means continuous passages for currents of air are formed from the two lower cavities C C upward through said drums and outward through the corresponding upper cavities C C.

The heated smoke moving upward from the stove through the pipe *b* primarily enters the lower head B, passing thence into the drums A *l* and the central tube *d* to become again united in the upper head B and the pipe *b* to move onward out at the chimney. By this arrangement of the drums one within another it will be seen that the air-passages in the drums *k m* are alternated with the smoke and heat passages in the drums A *l* and the central tube *d*, either air-passage being thus between heated inclosing walls, one on either side. This causes the air in the drums *k m* to become heated and currents to flow upward through the said drums or air-passages, the air entering the lower end of the radiator through the cavities C C cold and issuing warm from the upper end through the cavities C C, being heated during its upward passage.

It will be seen by viewing Figs. 3 and 4 that the sections or parts of the end plates *c c* at the ends of the drums overlap as to radial lines drawn near their adjacent ends. The ends of the openings in the end plates falling short of

said lines leave four narrow radial strips *o* of the plates lying between the dot-and-dash lines *p p*. These radial strips serve to cover the adjacent straight edges of the partitions *n* of the cavities C in the heads B. Along these radial strips on the upper side of the upper end plate and on the under side of the lower end plate are secured longitudinally bent or folded metal ribs *r*, Figs. 4 to 9, inclusive, one edge or side *s* of each rib being radial. Against these opposing sides *s s* of adjacent ribs the edges of the partitions *n* are abutted and secured, as appears in Figs. 5 and 6, each partition covering a sector between two ribs, as shown. The ends of the openings *e e'* and *g g'* in the end plates terminate at the sides of the respective ribs *r* opposite the partitions *n*.

In constructing these radiators it is sometimes desirable to give the minor drums spiral forms or twist each of them through a one-fourth revolution, bringing the two heads B B in positions to cross each other, as appears in Fig. 11. This is a variation of the construction of the radiator that falls within the scope of my invention and is a matter of judgment in the construction of these radiators when to be used under different conditions.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. A radiator consisting of a main inclosing drum, and heads covering the ends of the drum, the drum having perforated floors or end plates, a series of minor drums within the main drum and connected with the end plates, the drums all being oval in cross-section and being one within another and all coaxial and the smoke and air passages being one within another and alternately arranged.

2. A radiator consisting of a main inclosing drum, and heads for the ends of the drum, the drum having perforated end plates, a series of minor drums within the main drum and all coaxial, the minor drums being oval in cross-section with the major axis of each crossing the minor axis of the adjacent drum, and a central tube within the inner drum.

3. A radiator consisting of a main inclosing drum, and heads for the ends of the drum, said drum having perforated end plates, a series of minor drums within the main drum and connected with the end plates, the drums being oval in cross-section and differing in size and all coaxial, the air-passages being alternated with the smoke-passages, the heads for the drums having peripheral cavities communicating with perforations in the end plates of the drum, and passages for smoke through the drums.

4. A radiator consisting of a series of drums one within another, heads covering the drums and formed with reduced terminals for piping, the drums being oval in cross-section and alternately arranged and constituting passages for air and for smoke through the radiator,

the air - passages being alternated with the smoke-passages, and a central tube for smoke within the inner drum.

5 5. A radiator consisting of a series of drums one within another, heads covering the drums and formed with reduced terminals or collars, the drums constituting passages for air and for smoke through the radiator, the air-passages being alternated with the smoke-passages, and a central tube for smoke within the inner drum, the heads for the drums having cavities constituting passages for air into and out of the interiors of the air-drums.

15 6. A radiator consisting of a series of drums one within another, heads covering the drums

and formed with reduced terminals for piping, the drums constituting alternated passages for air and smoke through the radiator, and a central tube for smoke, the heads for the drums having cavities at their sides opening into alternated drums, and partitions dividing the cavities from the interiors of the heads. 20

In witness whereof I have hereunto set my hand, this 28th day of November, 1903, in the presence of two subscribing witnesses.

ROY BARRETT.

Witnesses:

ENOS B. WHITMORE,
MINNIE SMITH.