

(No Model.)

D. F. MORGAN.  
SECTIONAL BOILER.

No. 365,402.

Patented June 28, 1887.

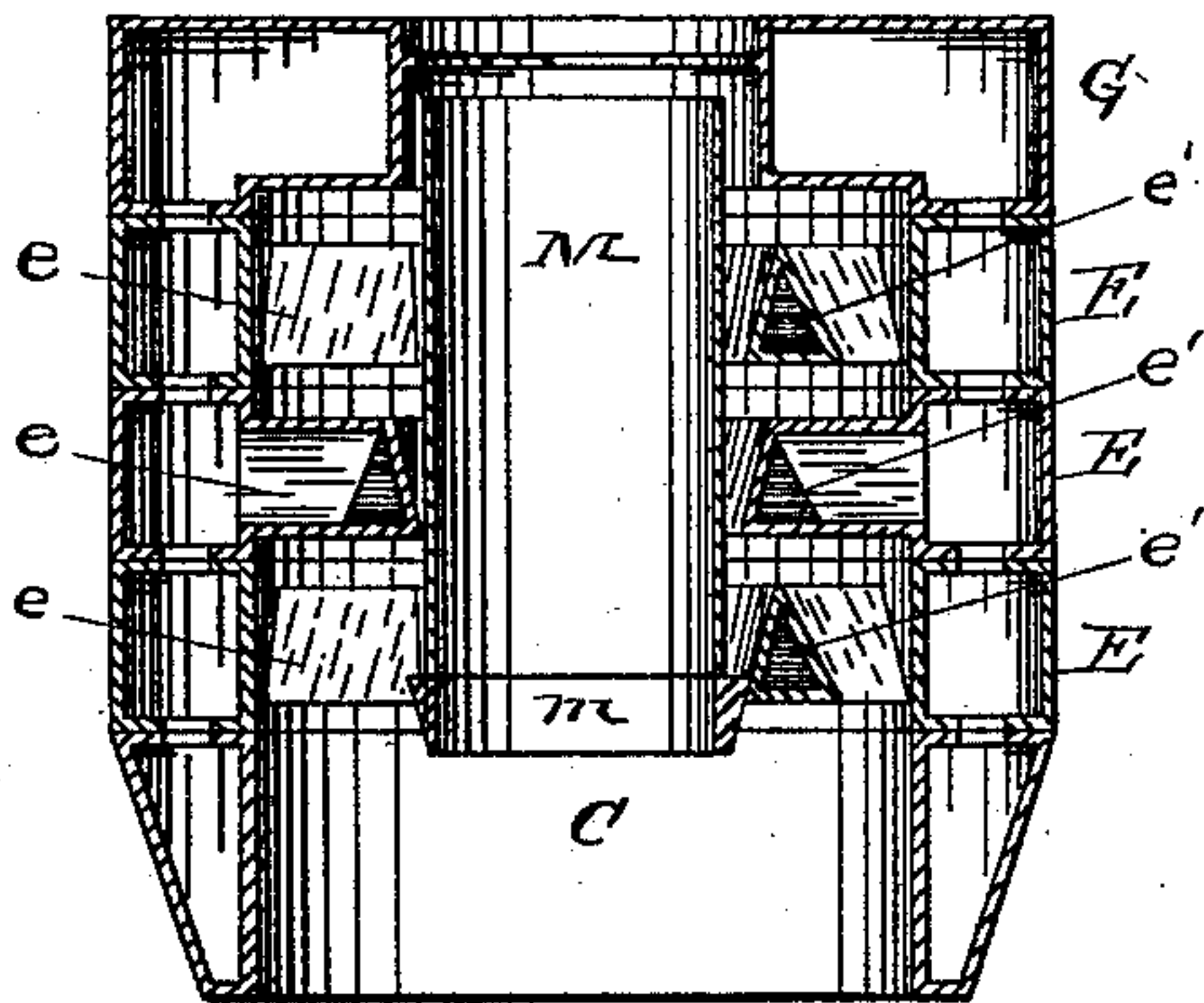


Fig. 3.

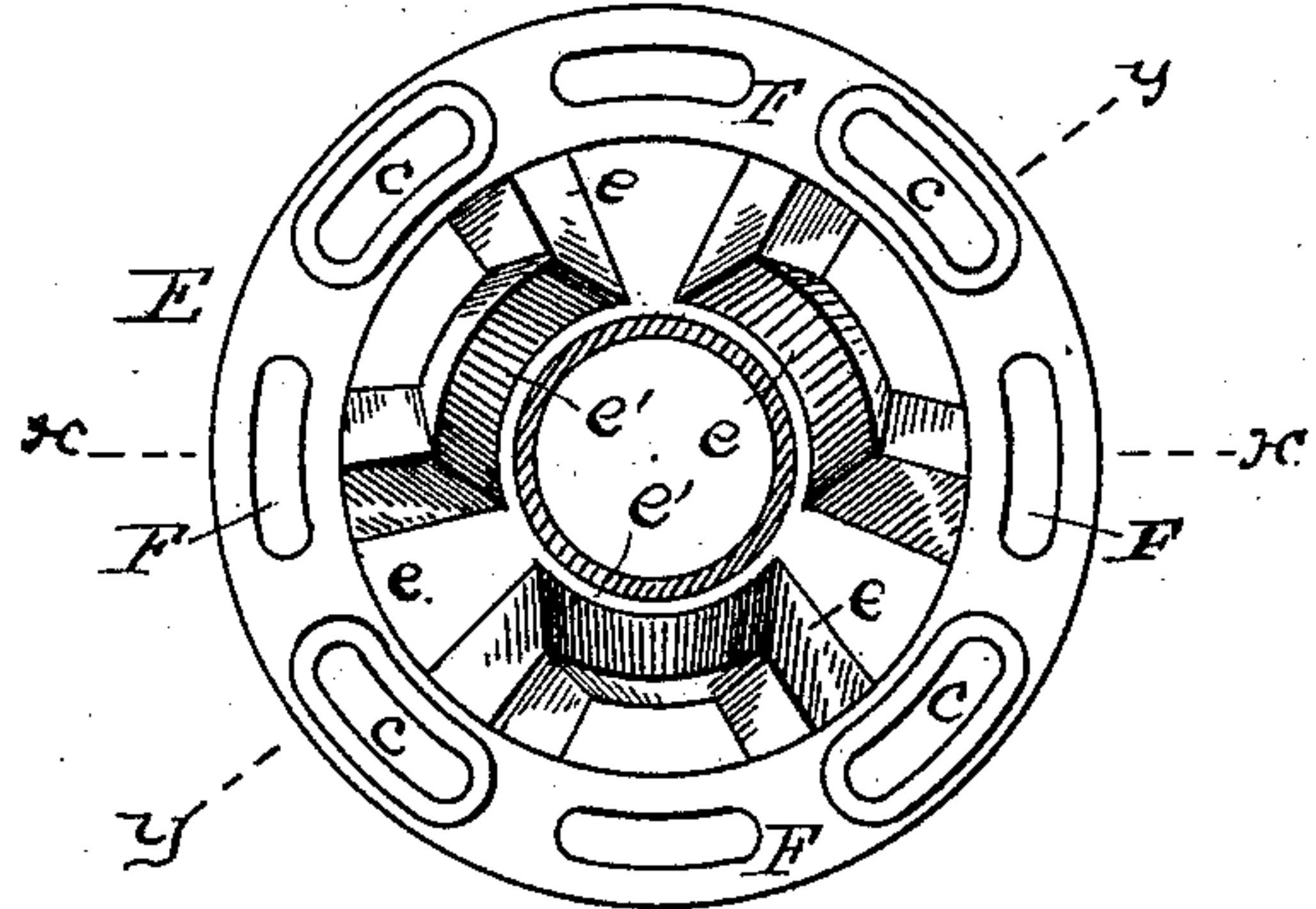


Fig. 4.

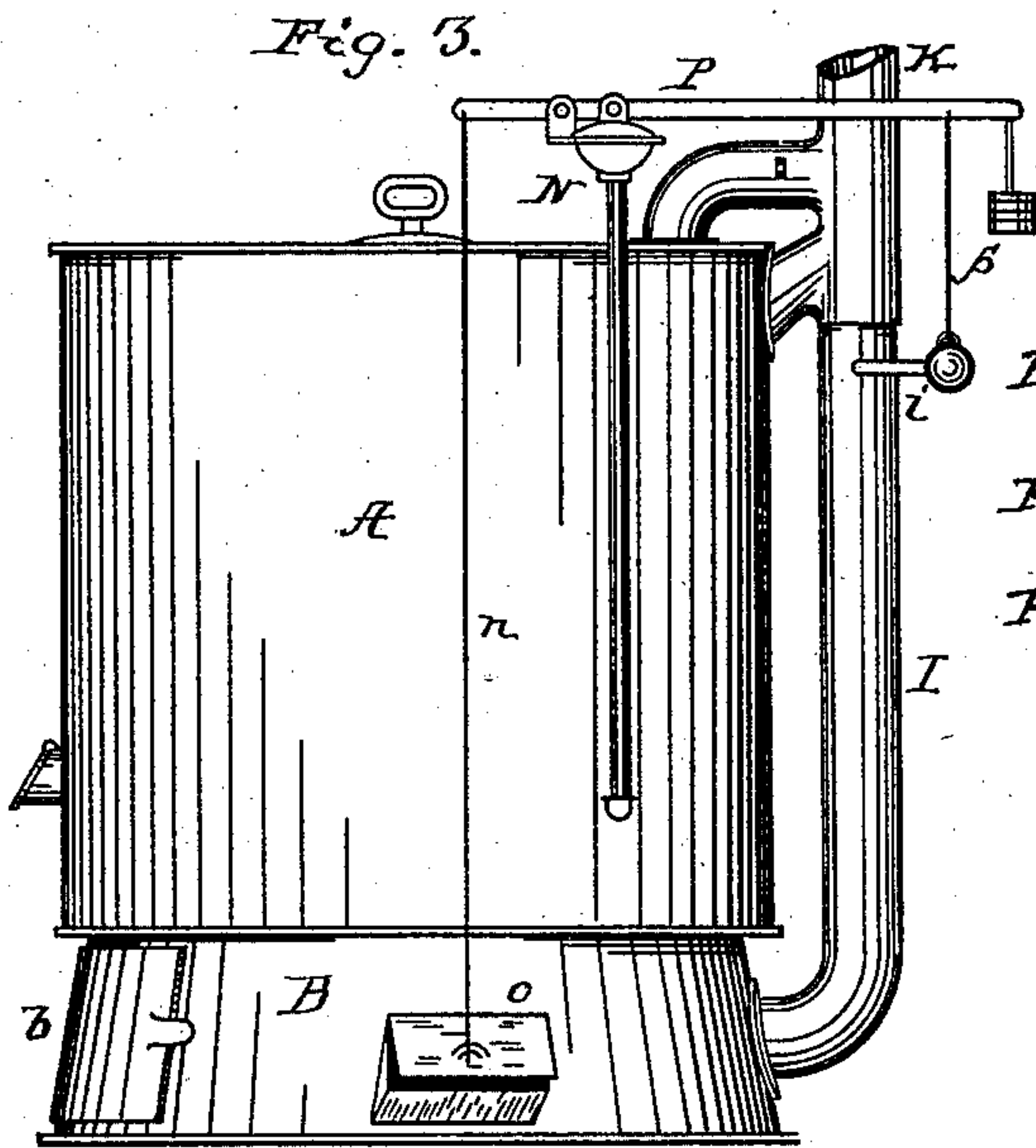


Fig. 1.

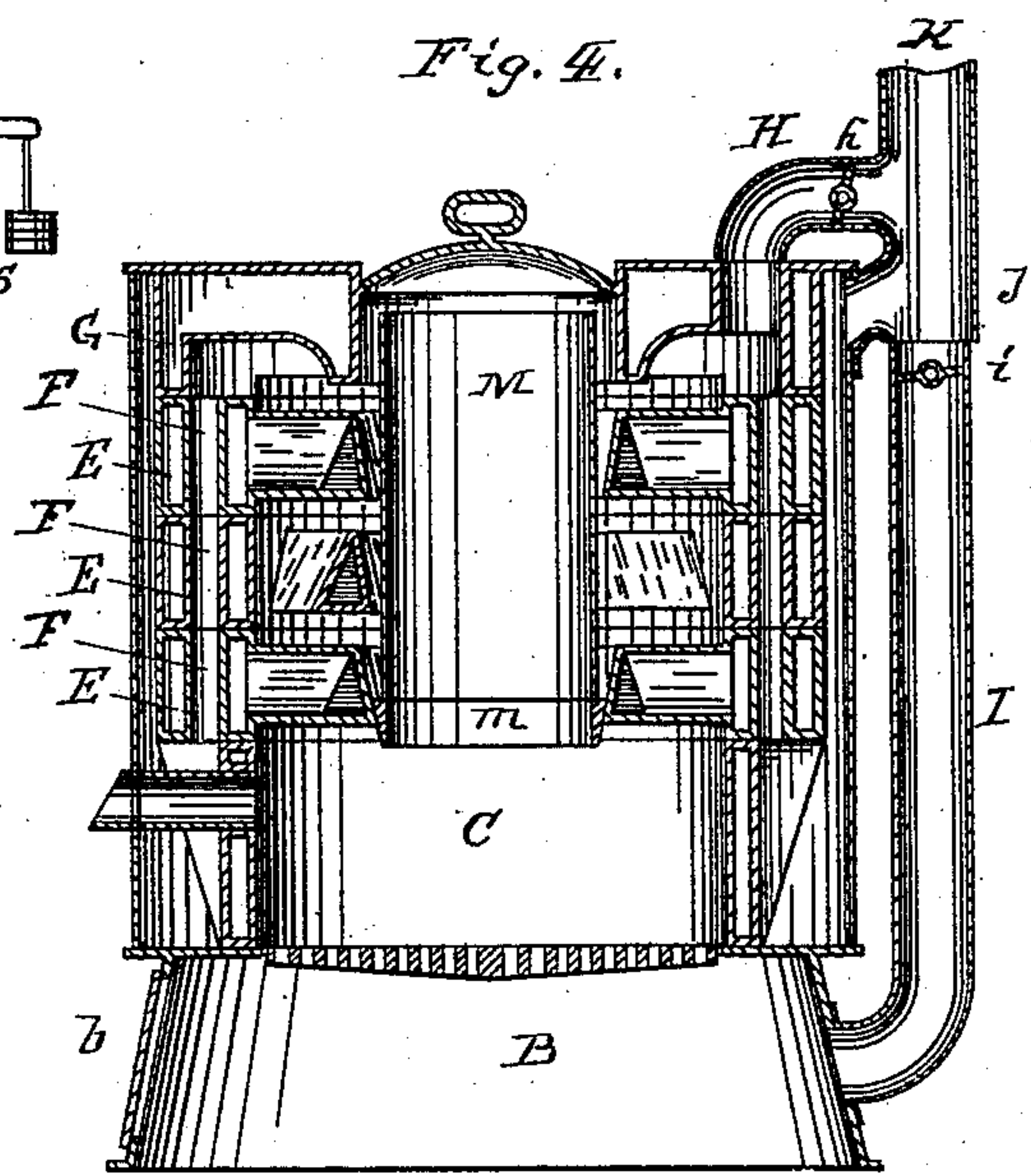


Fig. 2.

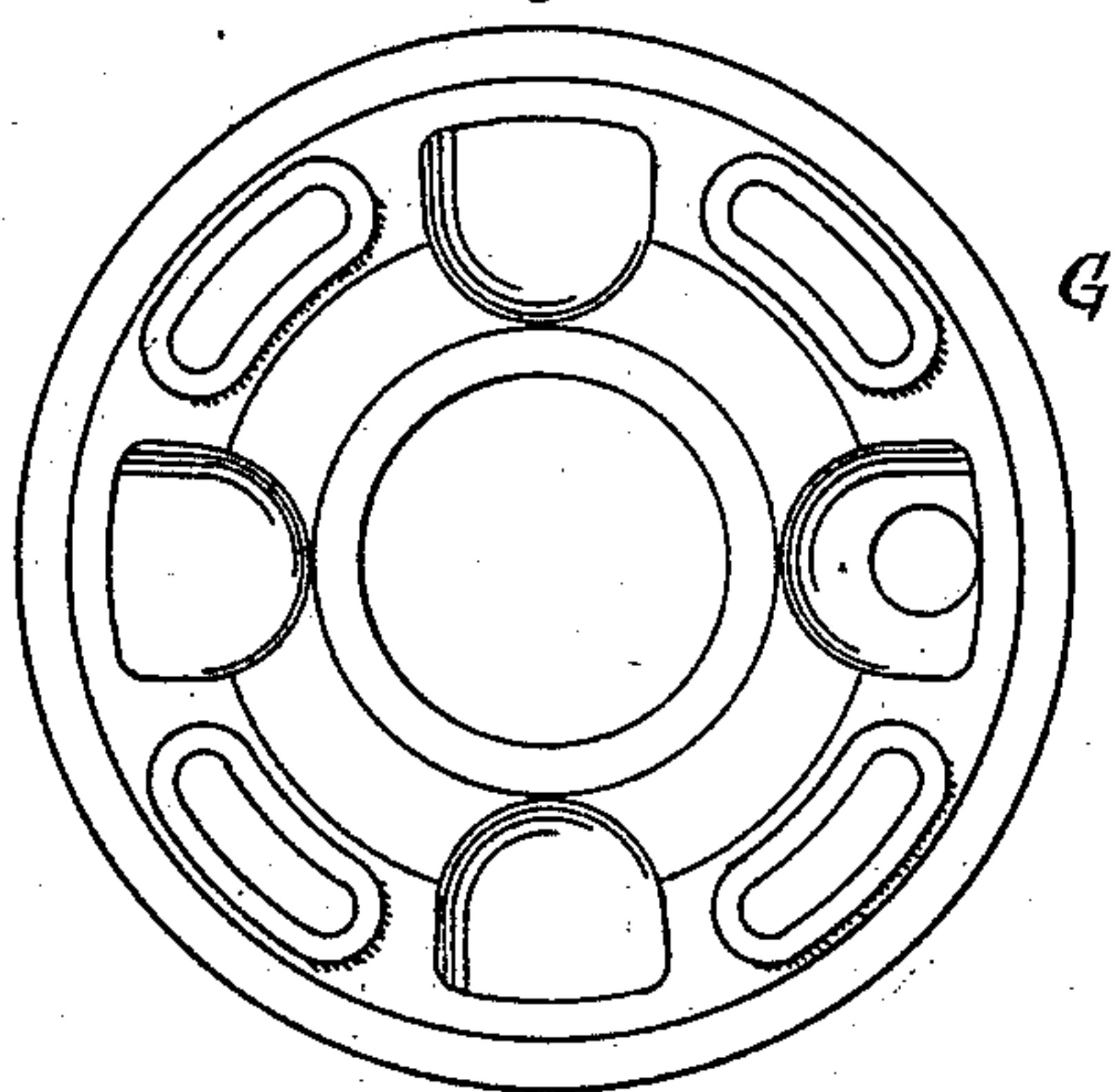


Fig. 5.

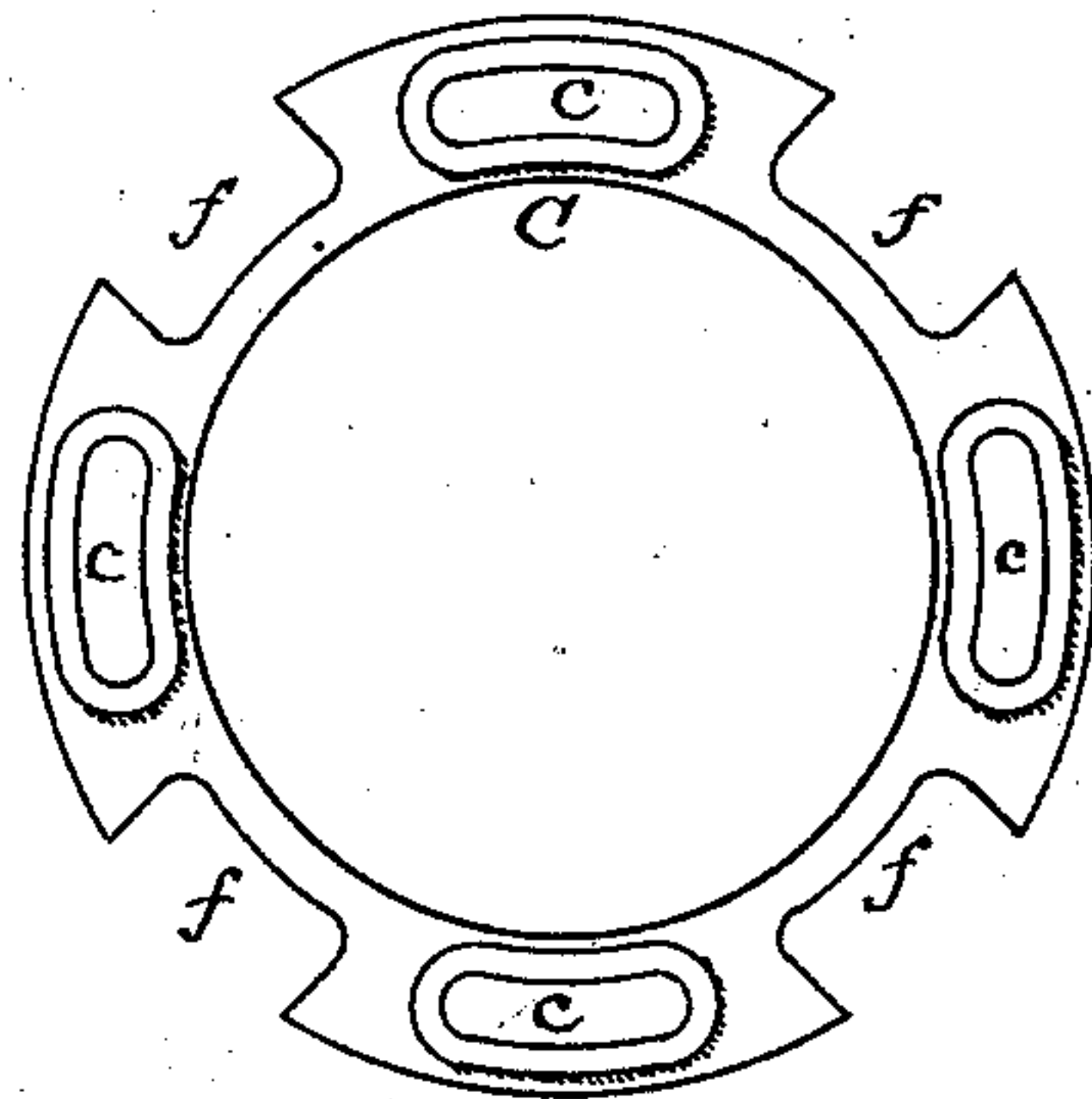


Fig. 6.

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by *C. P. Humphrey*  
att'y.



# UNITED STATES PATENT OFFICE.

DOCTOR F. MORGAN, OF AKRON, OHIO.

## SECTIONAL BOILER.

SPECIFICATION forming part of Letters Patent No. 365,402, dated June 28, 1887.

Application filed April 23, 1887. Serial No. 235,917. (No model.)

*To all whom it may concern:*

Be it known that I, DOCTOR F. MORGAN, a citizen of the United States, and a resident of the city of Akron, in the county of Summit and State of Ohio, have invented a new and useful Improvement in Sectional Cast-Iron Boilers, of which the following is a specification.

My invention has relation to improvements in cast-iron sectional boilers for heating purposes.

The objects of my invention are to increase the heating-surface, to prevent the accumulation of soot and ashes on the parts which project into the updraft-space, and, by means of a removable magazine, to permit all parts of the updraft to be easily cleaned, to remove the dust and gases from the ash-pit, and to provide a damper which, in addition to the ordinary dampers, shall be actuated by the changes of steam-pressure.

My invention consists of the devices illustrated in the accompanying drawings, as hereinafter described and claimed.

In the accompanying drawings, Figure 1 is an elevation of a complete boiler embodying my improvements; Fig. 2, a vertical central section of the same at the line *xx* of Fig. 4; Fig. 3, a similar view of the water-sections at the line *yy* of Fig. 4; Fig. 4, a plan of one of the intermediate water-sections; Fig. 5, an inverted plan of the top section, and Fig. 6 a plan of the lower section.

The entire boiler, aside from the draft-regulating attachments and case, consists of a base, B, which constitutes the ash-box, and has a door, *b*, for removing ashes, and a damper, *o*. Upon this base rests the fire-pot C, which is a hollow cylindrical ring having water-ports *c*, which register with the ports in the next upper section, and spaces *f* opposite the flues in said section. Above the fire-pot are a number of sections, E, each consisting of a hollow ring having flues F and water-ports *c*. From the inner face of each ring project pairs of hollow arms *e*, the inner ends of each pair united by a tube, *e'*, concentric with the section, and integral with the arms. The arms *e* and tubes *e'* are triangular in cross-section, one angle being upward, which prevents an accumulation of soot and ashes being retained thereon, and are narrower vertically than the sections

from which they project, so that a space exists between the arms of contiguous sections, thereby not only affording additional heating-surface for the updraft, but enabling them to be readily cleaned from adhering particles of soot and ashes.

In building up the boiler each section E is so arranged that the arms *e* alternate vertically with those of contiguous sections. Above the sections E is a top section, G, substantially the same as those in boilers of this class, and which needs no explanation. The whole is inclosed in a case, A, and has the ordinary direct and downdraft flues, H J, (the former having the gate *h*,) connecting with the main up-take-flue K.

The magazine consists of a tapering cast-iron ring, *m*, which rests on the tubes *e'* of the lower section, E, with a channel in its upper face, and a hollow cylinder, M, preferably of sheet metal, which rests in said channel, and is supported laterally by the tubes *e'* of the upper sections and registers with the feed-hole in the section G. The cylinder M is removable, and thus permits the inner parts of the section-rings to be cleaned.

The boiler is provided with the common draft-regulating valve, N, and with the lever P, which, by the rod *n*, operates the damper *o*.

Between and connecting the ash-pit B and flue K is a flue, I, with a valve, *i*. When the valve *i* is open, the flue I operates to remove dust and gases from the ash-pit into the up-take K. The valve has an arm connected with the lever P by the rod *p*, by which arrangement the valve *i* is operated by the valve N, and opened as the damper *o* is closed, thereby drawing away any air that may leak or otherwise enter the ash-pit, and preventing it from passing through the fire.

I claim—

1. The combination, in a cast-iron section for heating-boilers consisting of a hollow ring having water-openings in each horizontal face and flues passing through it, of a series of pairs of hollow arms, triangular in cross-section, projecting from its inner face, the inner ends of each pair being united by a tube, triangular in cross-section, concentric with the section, substantially as shown, and for the purpose specified.

2. In a cast-iron sectional boiler, the com-

5 bination of a number of water-sections, each consisting of a hollow ring having flues and water-openings which register with corresponding flues and water-openings in contiguous sections, and a series of pairs of hollow arms, triangular in cross-section, which project from the inner face of a ring, and segmental tubes, triangular in cross-section, which unite the ends of each pair of arms, substantially as shown, and for the purpose specified.

10 3. In a cast-iron sectional boiler, the combination, with a series of sections each consisting of an outer ring and a series of inner segments, of a magazine consisting of a cast-iron ring supported by the segments of the section above the fire-pot, and a hollow cylin-

der which unites with said ring and registers with the feed-opening in the upper section.

4. In a heating-boiler, the combination, with a flue which connects the ash-pit with the uptake-flue and gate therein, of a steam-pressure valve which opens said gate as the steam-pressure increases, all constructed and arranged substantially as shown, and for the purpose specified.

25 In testimony that I claim the foregoing I have hereunto set my hand.

DOCTOR F. MORGAN.

Witnesses:

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