

No. 760,351.

PATENTED MAY 17, 1904.

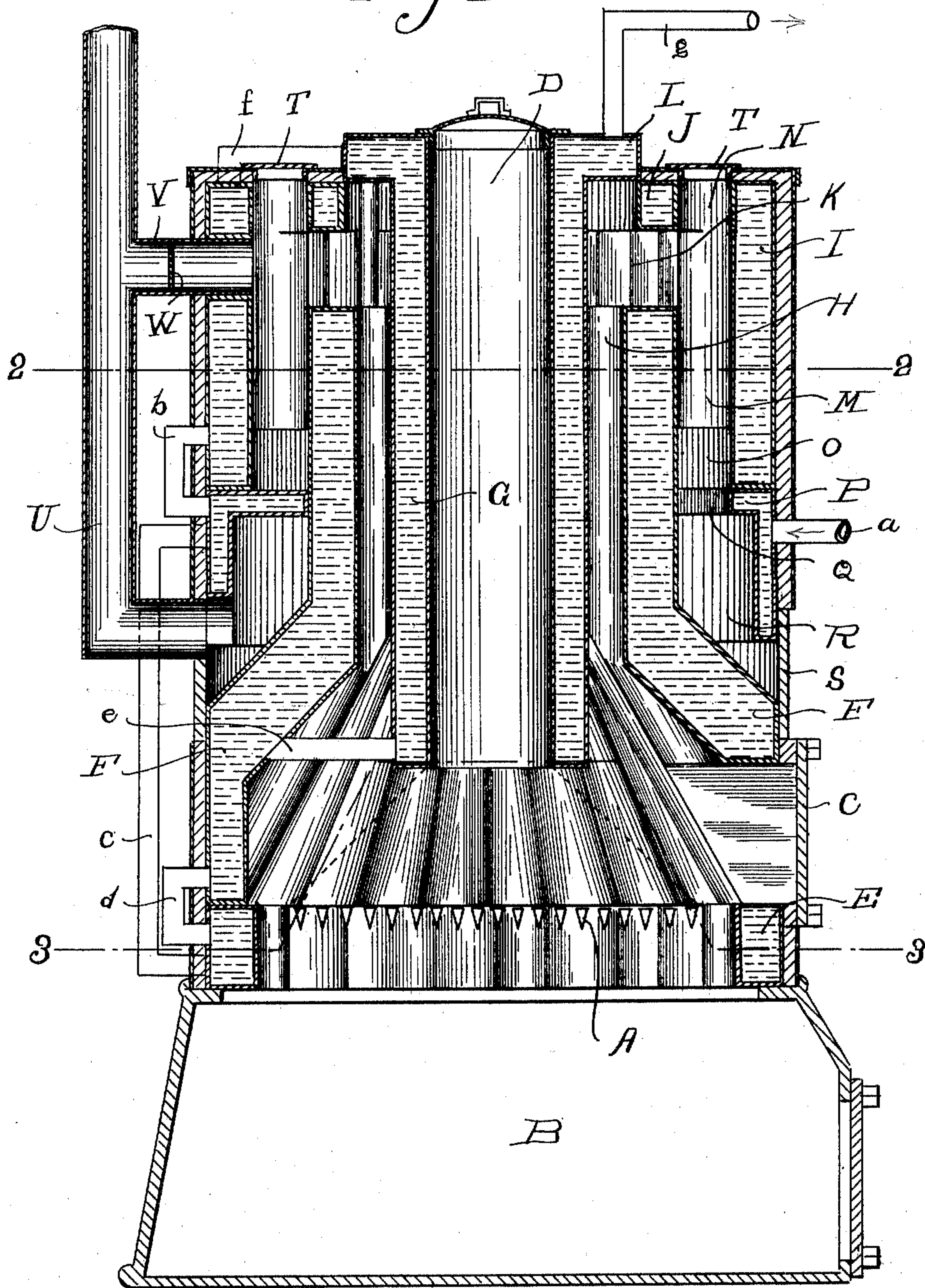
M. SCHAACK.
WATER HEATER.

APPLICATION FILED SEPT. 21, 1903.

NO MODEL.

2 SHEETS—SHEET 1.

Fig. 1.



Witnesses:

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F. Schlottfeld

Inventor:

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By Rudolph M. [Signature]
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2 SHEETS—SHEET 2.

Fig. 2.

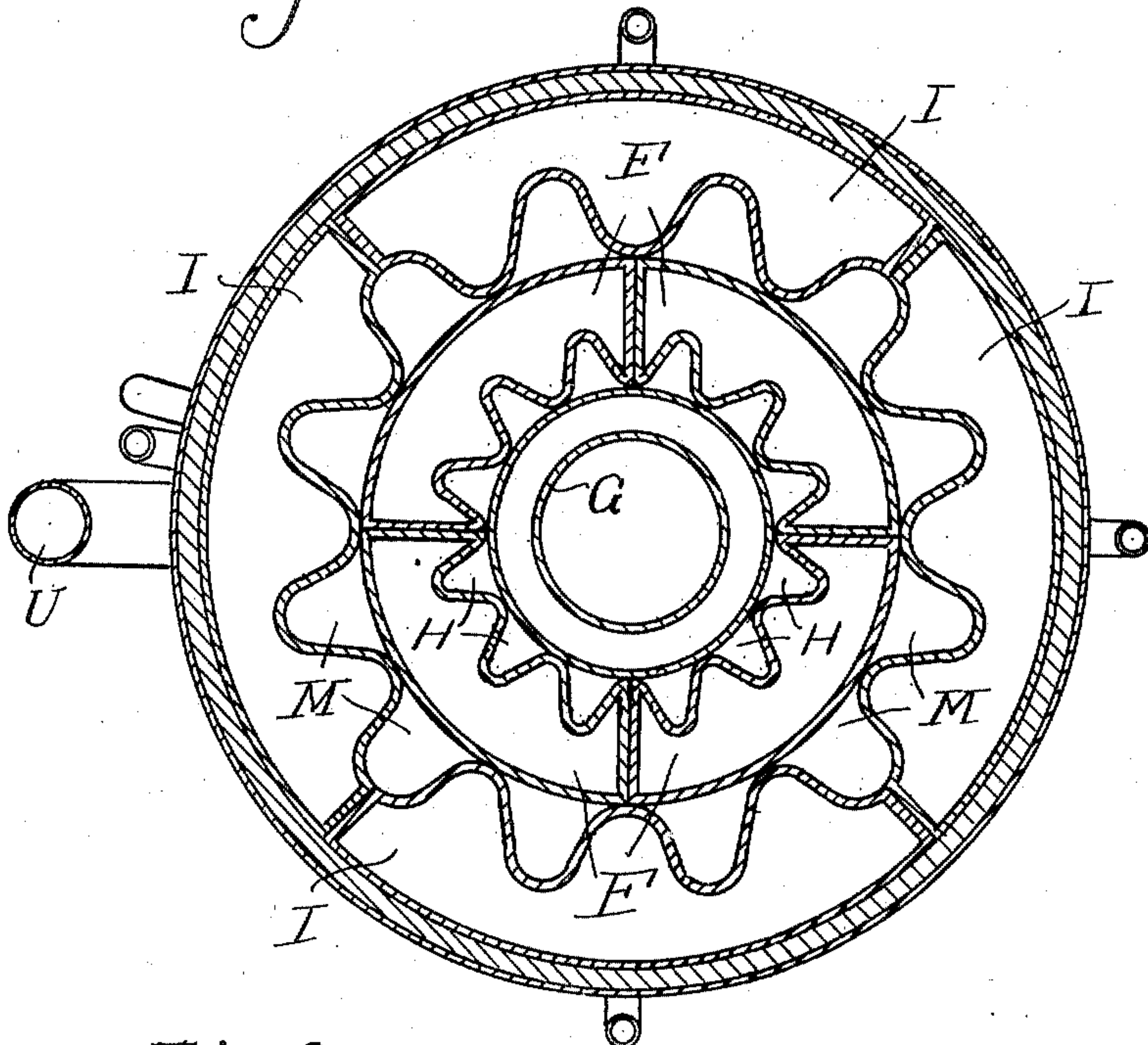
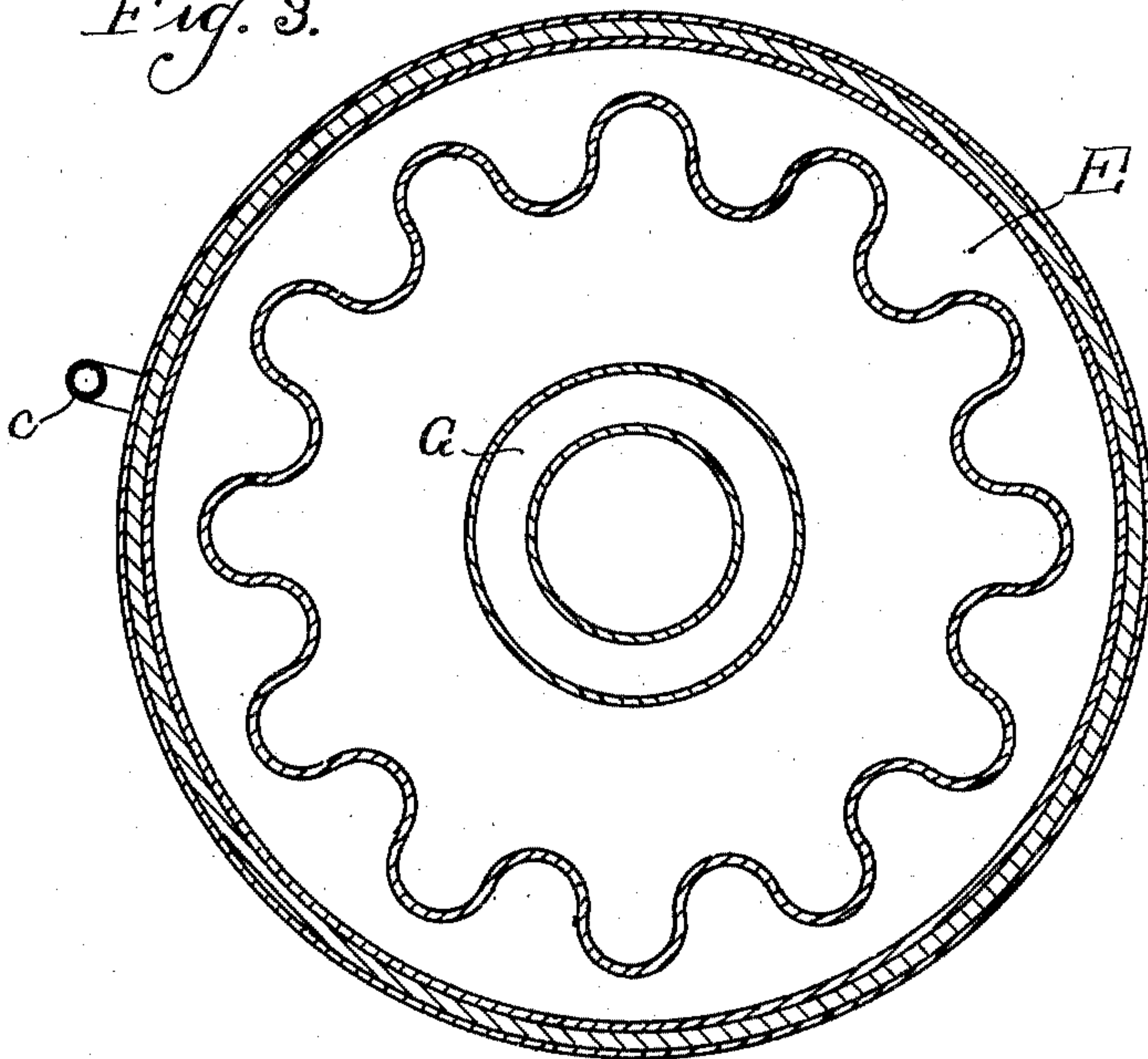


Fig. 3.



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UNITED STATES PATENT OFFICE.

MICHEL SCHAAK, OF CHICAGO, ILLINOIS.

WATER-HEATER.

SPECIFICATION forming part of Letters Patent No. 760,351, dated May 17, 1904.

Application filed September 21, 1903. Serial No. 174,059. (No model.)

To all whom it may concern:

Be it known that I, MICHEL SCHAAK, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Water-Heaters; and I 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.

My invention relates to a novel construction in a water-heater, the object being to provide a simple and efficient device of this character in which all heat is absorbed by the water; and it consists in the features of construction and combinations of parts hereinafter fully described and claimed.

In the accompanying drawings, illustrating my invention, Figure 1 is a central vertical section of a heater constructed in accordance with my invention. Figs. 2 and 3 are transverse sections of same on the lines 2 2 and 3 3, respectively, of Fig. 1.

Referring now to said drawings, A indicates the grate, and B the ash-pit, of the heater, said grate being fed either through the fire-door C or through the central self-feeding chamber D. Said grate A is suitably supported, preferably on a level with the upper end of an annular water-chamber E, which is supported on the base or ash-pit B. Resting upon said water-chamber E is an annular water-chamber F, composed of four quarter-sections and which is of larger diameter at its lower end than at its upper end and longitudinally corrugated on its inner surface, the lower end being rendered flaring or funnel-shaped. Extending centrally through said annular water-chamber F is the annular water-chamber G, the central opening D of which forms the self-feeding coal-chamber. The said chamber G is snugly fitted, so that the inner ends of the corrugations of the upper portion of the chamber F lie in contact therewith, thereby forming a series of vertical flues H in the interstices between said corrugations. Supported above and around said chamber F is a fourth annular water-chamber I, which consists of a cylindrical vessel composed of four quarter-sections and vertically corrugated on

its inner face, while at its upper end it is provided with an annular inward extension J, overlapping the chamber F, so that between the upper end of the latter and said annular extension J an annular flue K is formed. The said chamber G is provided at its upper end with an outwardly-extending annular extension L, which projects over and rests upon the said extension J of the chamber I. The corrugations of the said chamber I lie in contact at their inner ends with the outer wall of the upper portion of the chamber F, thereby forming vertical flues M. In said annular extension J, I provide openings N, communicating with said flues M and through which the latter are cleaned. The said corrugations of said chamber I terminate at a point above the lower end of the latter, so as to leave a free annular space or flue O between said chambers F and I and above an annular water-chamber P below said chamber and surrounding the chamber F, said chamber P being cylindrical and provided at its upper end with an annular inward extension, the latter being provided with a vertical recess Q at one point, which forms a flue for the passage of gases from the flue O to the annular flue R below said annular extension of said chamber P and above the enlarged lower end of the chamber F. The chamber P does not rest upon the said enlarged lower end of the chamber F, so that an annular opening is left between the former and the latter, which is closed by a ring S. Covers T are provided for the openings N to prevent the escape of the fire-gases through the same.

A vertical chimney-flue U is connected at its lower end with the annular flue O and also with the annular flue K, the latter connection being effected by a pipe V, provided with a damper W and passing through a radial opening in the chamber I.

Water is introduced into said heater through the pipe a, entering the chamber P, and from the latter is distributed to the remaining water-chambers, said chamber P being connected with each of the sections of the chamber I by means of pipes b and with the lowermost annular water-chamber E by means of the pipe c. Said water-chamber E is connected with the lower end of each of the quarter-

sections of the water-chamber F by means of pipes *d*, and each of said sections of said chamber F is connected by horizontal pipes *e* with the lower end of the chamber G and by means of pipes *f* with the upper annular extension L of said chamber G, and the latter is connected, by means of pipes *g*, with the service-pipes of the building.

In operation my device is as follows: The products of combustion pass upwardly through the flues H to the annular flue K and if the damper W is open will pass thence directly into the chimney-flue U, said damper being opened only when starting the fire in order to promote good combustion. Upon closing said damper W said products of combustion will pass downwardly through the flues M to the annular flue O, thence through the recess Q, which is located at a point diametrically opposite the chimney-flue, to the flue R, and thence into said chimney-flue.

The surfaces of the main water-chambers are corrugated to increase the heating-surface.

The chamber P may be termed a "feed-water" heater, for the reason that the water therein contained absorbs only the little heat remaining in the products of combustion and is then distributed to the remaining water-chambers.

By forming the larger annular water-chambers of a plurality of sections I am enabled to build the heater more cheaply by reason of the greater ease of casting such sections, and transportation and setting up of the heater is also rendered far more easy by reason of the lighter weight, and consequent comparative ease of handling, of all parts and the fact that the same can be easily brought into the building without the necessity of enlarging the entrance for this purpose.

This heater has also proved very efficient, inasmuch as all heat of the products of combustion is utilized and no waste occasioned.

I claim as my invention—

1. A water-heater comprising a furnace, a main annular water-chamber above and around said furnace having a flaring lower end portion and cylindrical upper end portion, concentric water-chambers disposed inwardly and outwardly of the cylindrical portion of said main water-chambers, vertical corrugations on the walls of said water-chambers lying practically in contact with the walls of the adjacent water-chambers, the interstices between said corrugations forming vertical flues on opposite sides of said water-chamber, an annular flue above the latter communicating with said vertical flues, connection between the outermost vertical flues and a chimney-flue at the lower ends of said vertical flues, and water connections between said various water-chambers, substantially as described.

2. In a water-heater, the combination with a furnace and a main annular water-chamber

above and around said furnace, of an annular water-chamber fitting within said main water-chamber, the central passage of the latter forming a fuel-feed chamber for said furnace, vertical flues between said main and inner water-chambers, an annular flue above said main water-chamber, an annular water-chamber surrounding said main water-chamber, vertical flues between said last-named water-chamber, a lower annular flue with which said last-named vertical flues connect, connections between said lower and upper annular flues and a chimney-flue, and a damper interposed in the upper connection.

3. In a water-heater, the combination with a furnace and a main annular water-chamber above and around said furnace, of an annular water-chamber fitting within said main water-chamber, the central passage of the latter forming a fuel-feed chamber for said furnace, vertical flues between said main and inner water-chambers, an annular flue above said main water-chamber, an annular water-chamber surrounding said main water-chamber, vertical flues between said last-named water-chambers, a lower annular flue with which said last-named vertical flues connect, an annular water-chamber below last-named annular flue, a third annular flue above said last-named water-chamber, an opening through the latter connecting said lower annular flues, connections between the lowermost and uppermost annular flues and a chimney-flue, and a damper interposed in the connection between said uppermost annular flue and said chimney-flue.

4. In a water-heater, the combination with a heating chamber or furnace, of a plurality of concentrically-disposed water-chambers connected with each other, said water-chambers having corrugations in their walls the interstices of which form vertical flues, annular flues connecting with said vertical flues and with a chimney-flue, and a damper interposed in one of said connections.

5. In a water-heater, the combination with a heating chamber or furnace, of a main annular water-chamber surrounding said furnace and extending above the same, a plurality of concentrically-disposed water-chambers inwardly and outwardly of said main water-chamber, corrugations in the walls of said water-chambers adapted to divide the annular spaces between the same into parallel vertical flues, an annular flue above said main water-chamber adapted to receive the products of combustion from the inner vertical flues, connection between said annular flue and a chimney, a second annular flue below surrounding said main water-chamber between its ends and communication with said first-named annular flue through the outer series of vertical flues, and connection between said last-named annular flue and said chimney-flue.

6. In a water-heater, the combination with a heating chamber or furnace, of a main an-

nular water-chamber surrounding said furnace and extending above the same, a plurality of concentrically-disposed water-chambers inwardly and outwardly of said main water-chamber, corrugations in the walls of said
5 water-chambers adapted to divide the annular spaces between the same into parallel vertical flues, an annular flue above said main water-chamber adapted to receive the products of
10 combustion from the inner vertical flues, connection between said annular flue and a chimney, a second annular flue below surrounding said main water-chamber between its ends and communication with said first-named an-
15 nular flue through the outer series of vertical

flues, a third annular flue below said second flue, a water-chamber interposed between said flues, an opening through said water-chamber connecting said flues at one point, and connection between said lowermost annular flue 20 and said chimney at a point diametrically opposite said opening through said last-named water-chamber.

In testimony whereof I affix my signature in presence of two witnesses.

MICHEL SCHAACK.

Witnesses:

RUDOLPH WM. LOTZ,
F. SCHLOTFELD.