

No. 688,617.

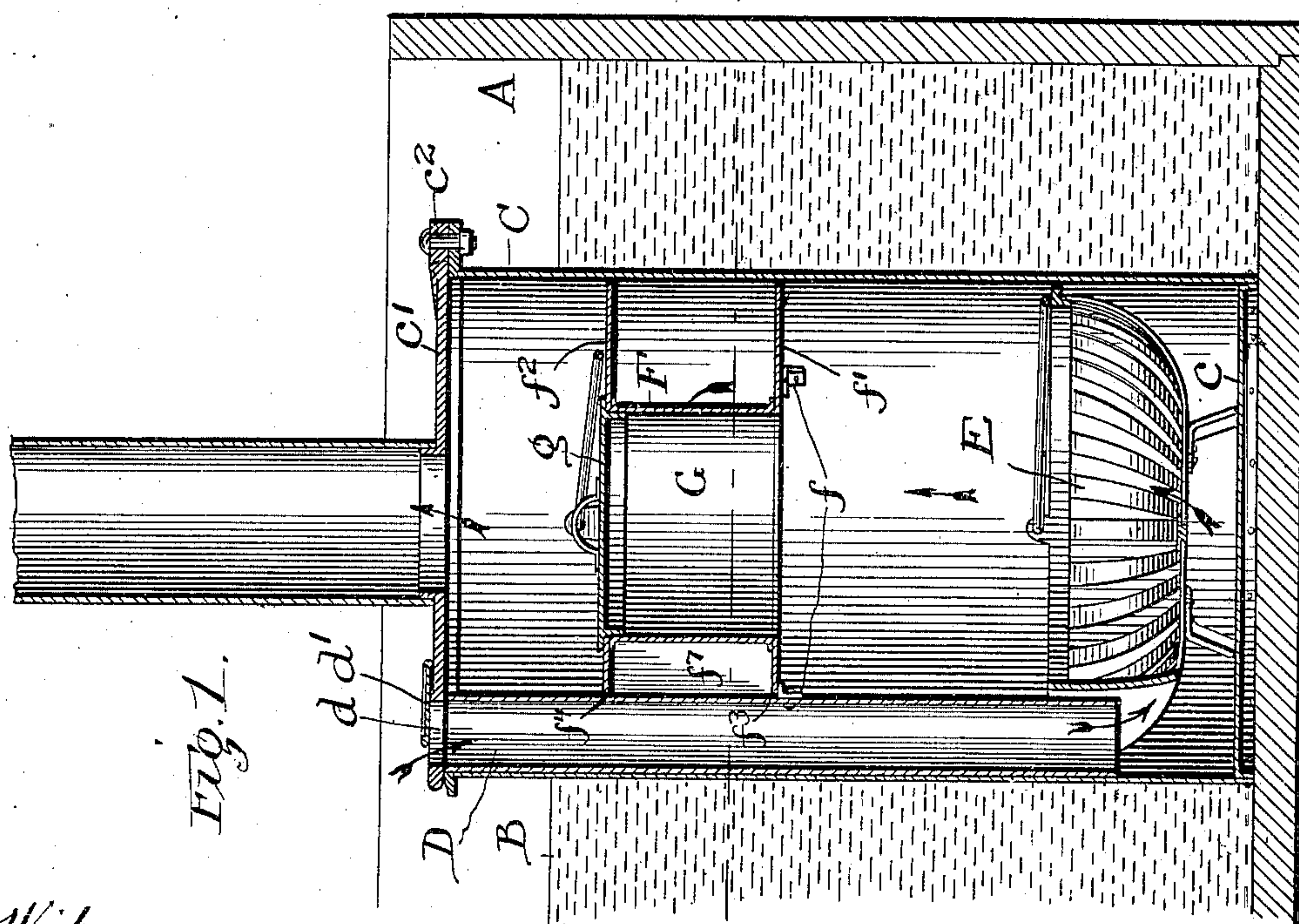
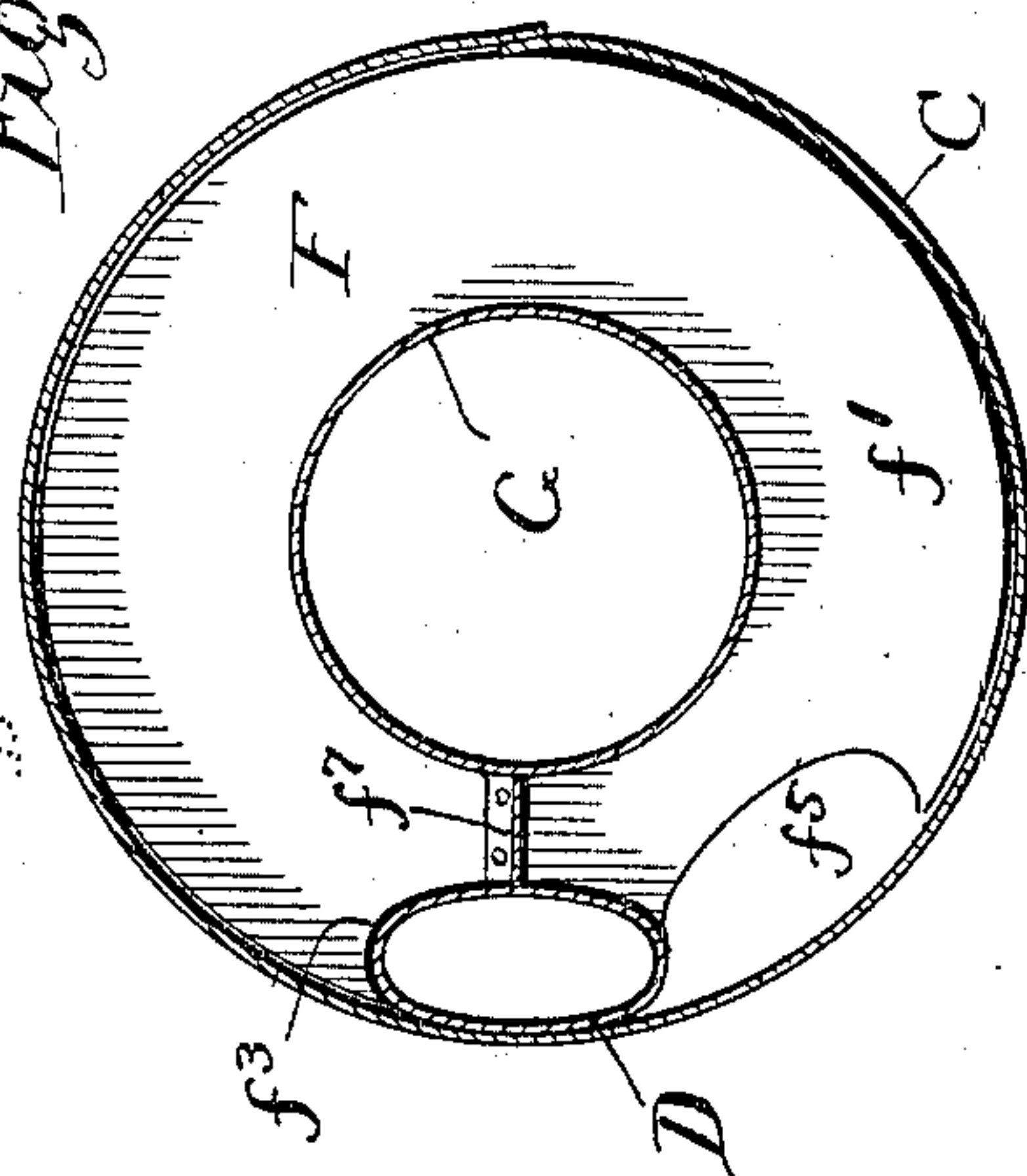
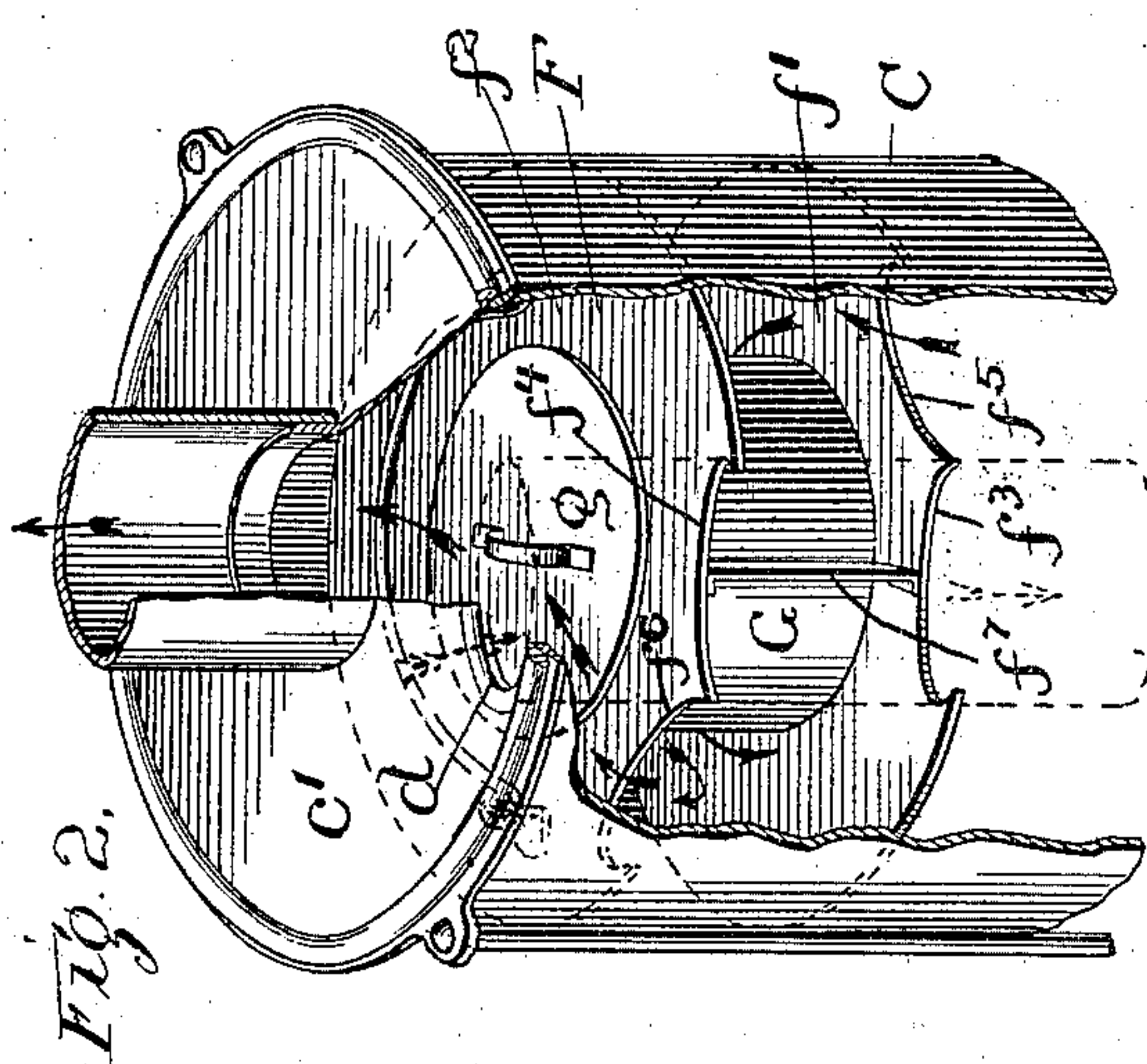
Patented Dec. 10, 1901.

H. L. FERRIS.

TANK HEATER.

(Application filed July 5, 1901.)

(No Model.)



Witnesses:
 Blake B. Bee
 Eugene Norton.

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Inventor,
Henry L. Ferris
by Messrs. Pitman & Bates.
Attys.

UNITED STATES PATENT OFFICE.

HENRY L. FERRIS, OF HARVARD, ILLINOIS, ASSIGNOR TO THE FIRM OF HUNT, HELM, FERRIS & COMPANY, COMPOSED OF CHARLES E. HUNT, NATHAN B. HELM, HENRY L. FERRIS, AND ELZO B. HUNT, OF HARVARD, ILLINOIS.

TANK-HEATER.

SPECIFICATION forming part of Letters Patent No. 688,617, dated December 10, 1901.

Application filed July 5, 1901. Serial No. 67,090. (No model.)

To all whom it may concern:

Be it known that I, HENRY L. FERRIS, a citizen of the United States of America, residing at Harvard, in the county of McHenry and State of Illinois, have invented certain new and useful Improvements in Tank-Heaters, of which the following is a specification.

My invention relates to certain improvements in tank-heaters designed to economize fuel without loss of heat, the purpose being to confine the heat within the portion of the heater in contact with the water and to prevent the escape of the same through the pipe or by radiation through the top of the heater.

To such end the invention consists in certain features of novelty, which will appear from the following description and be clearly defined in the appended claims.

In the drawings, Figure 1 is a vertical diametrical section showing the interior construction. Fig. 2 is a broken perspective also showing the interior and relative arrangement of the parts and the passage of the air-current therethrough, and Fig. 3 is a horizontal section in line 3 3 of Fig. 1.

Referring to the drawings, A represents a tank, and B the water therein, for the purpose of illustrating the position of the heater.

C is the outer shell of the heater, *c* the bottom thereof, shown as rigidly fastened to the shell, and *c'* the top, pivoted to the shell at *c*² and horizontally movable about said pivot to uncover the top of the shell.

D is a pipe registering with an opening *d* in the top, when the top is closed to form a passage for cold air down to a lower portion of the heater. An ordinary pivoted cover *d'* provides means for limiting or closing the opening of this passage, which is known as the "cold-air draft." A basket E, of ordinary construction, is seen in the lower portion of the heater, in which a fire may be built and by means of which the fire may be taken out when desired. Part way up on the inside of the shell are brackets *f*, supporting a double diaphragm F, made up of the bottom *f'* and the top *f*², both cut away at *f*³ *f*⁴ to accommodate the cold-draft pipe D and cut away on opposite sides of said draft-pipe at *f*⁵ *f*⁶, so as to open communication between the in-

terior of the diaphragm and the lower and upper portions of the heater, respectively. A vertical partition *f*⁷ between the openings *f*⁵ *f*⁶ cuts off direct communication, compelling the products of combustion to pass around the interior of the diaphragm in their upward escape. In the construction here shown, which is preferable, a vertical pipe G, secured to the top and bottom of the diaphragm, affords a direct communication between the lower and upper portions of the heater, except when closed by a cover *g*. (Seen in position in Fig. 2.) This cover is removed for feeding the fire and also in starting to increase the draft of the heater. The entire diaphragm may be lifted directly out of the top of the heater to remove the basket below. After the fire is well started the cover *g* is closed and the draft is sufficiently checked by the tortuous passage of the smoke through the diaphragm to prevent waste of heat and of fuel.

More or less variation is possible in the specific construction, and for that reason I do not limit myself thereto.

I claim as new and desire to secure by Letters Patent—

1. The combination with the shell of a tank-heater, of a diaphragm comprising substantially top and bottom plates, a pipe connecting them and dividing the diaphragm into two passage-ways, and a partition in one of the passage-ways, the lower plate being formed with an opening on one side of the partition and the upper plate with an opening on the other side thereof; substantially as described.

2. The combination with the shell of a tank-heater, and a draft-pipe leading to the bottom thereof, of a suitably-supported diaphragm comprising substantially top and bottom plates, a tubular passage extending through said plates, an annular passage around said tubular passage, a partition in the annular passage, and openings in the top and bottom plates offset with respect to each other and on the opposite sides of the partition; substantially as described.

3. The combination with the shell of a tank-heater and a draft-pipe leading to the bottom of the same, of a suitably-supported dia-

phragm comprising substantially top and bottom plates, an annular passage between said plates and having openings, f^3 , f^4 , to accommodate the draft-pipe and openings, f^6 , f^5 , in the top and bottom plates respectively on opposite sides of the draft-pipe and a partition between the openings, f^6 , f^5 ; substantially as described.

4. The combination with the shell of a tank-heater, of a diaphragm comprising suitable top and bottom plates supported therein, a pipe connecting said plates and forming a central passage and an annular passage around

the same, a removable cover for said central passage, a partition in said annular passage, and openings in the top and bottom plates respectively, on opposite sides of said partition; substantially as described.

In witness whereof I have hereunto set my hand, at Harvard, in the county of McHenry and State of Illinois, this 22d day of June, A. D. 1901.

HENRY L. FERRIS.

Witnesses:

BLAKE B. BELL,
L. EUGENE NORTON.