

No. 637,868.

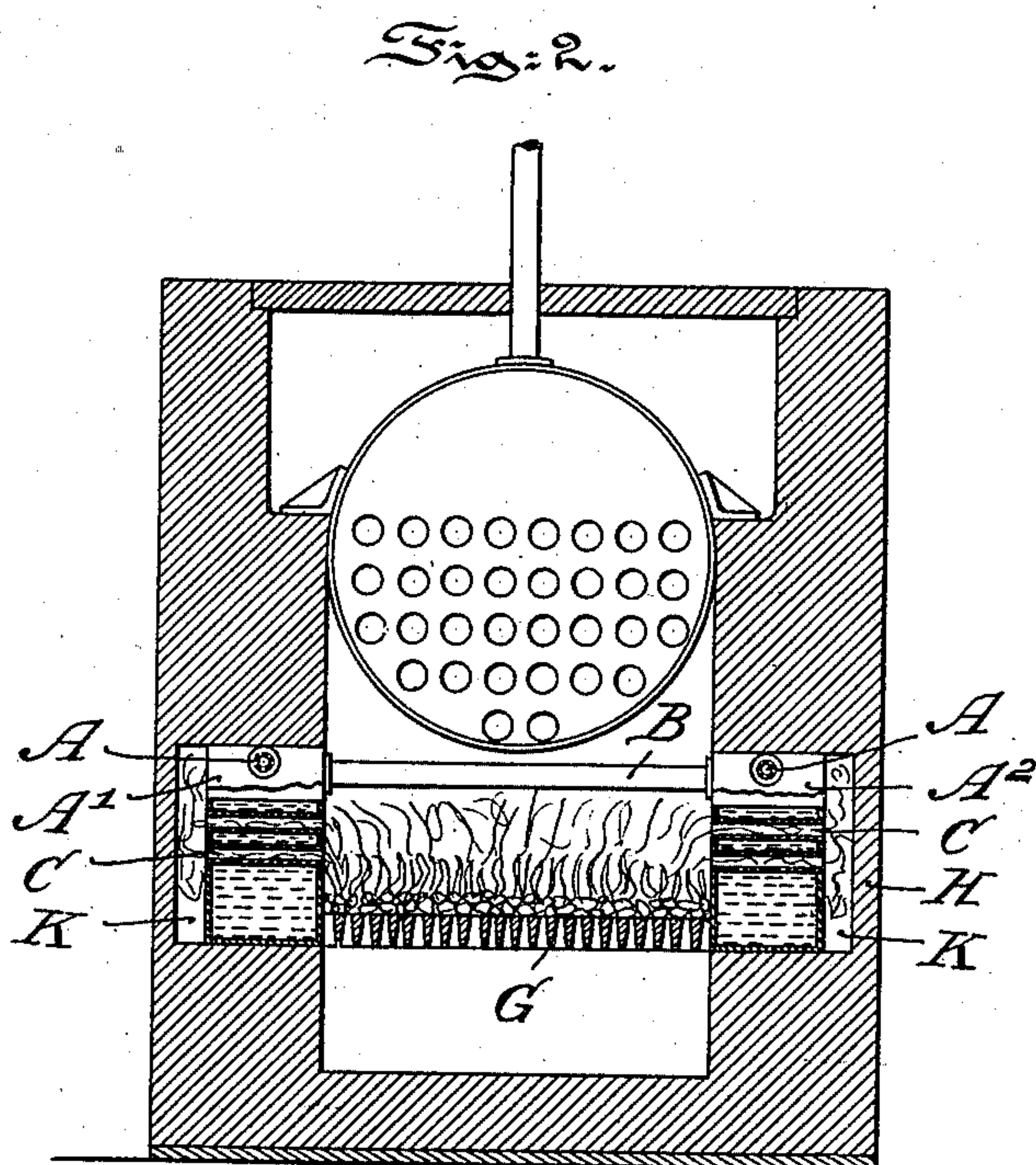
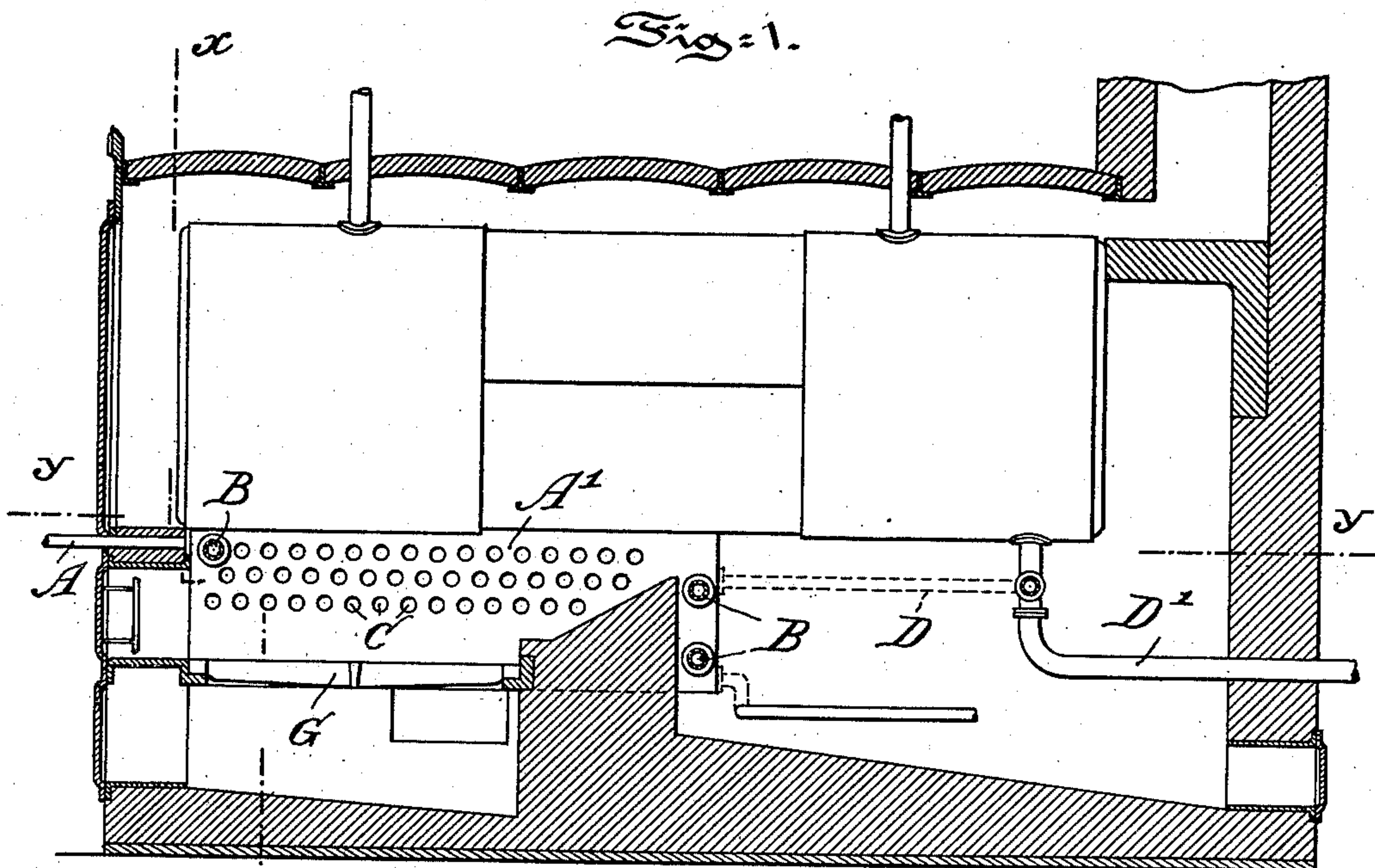
Patented Nov. 28, 1899.

D. HEFT.
WATER HEATER.

(Application filed June 22, 1899.)

(No Model.)

2 Sheets—Sheet 1.



Witnesses:

M. J. Getz
R. J. Abuthnot

Inventor:

Daniel Heft

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2 Sheets—Sheet 2.

Fig. 3.

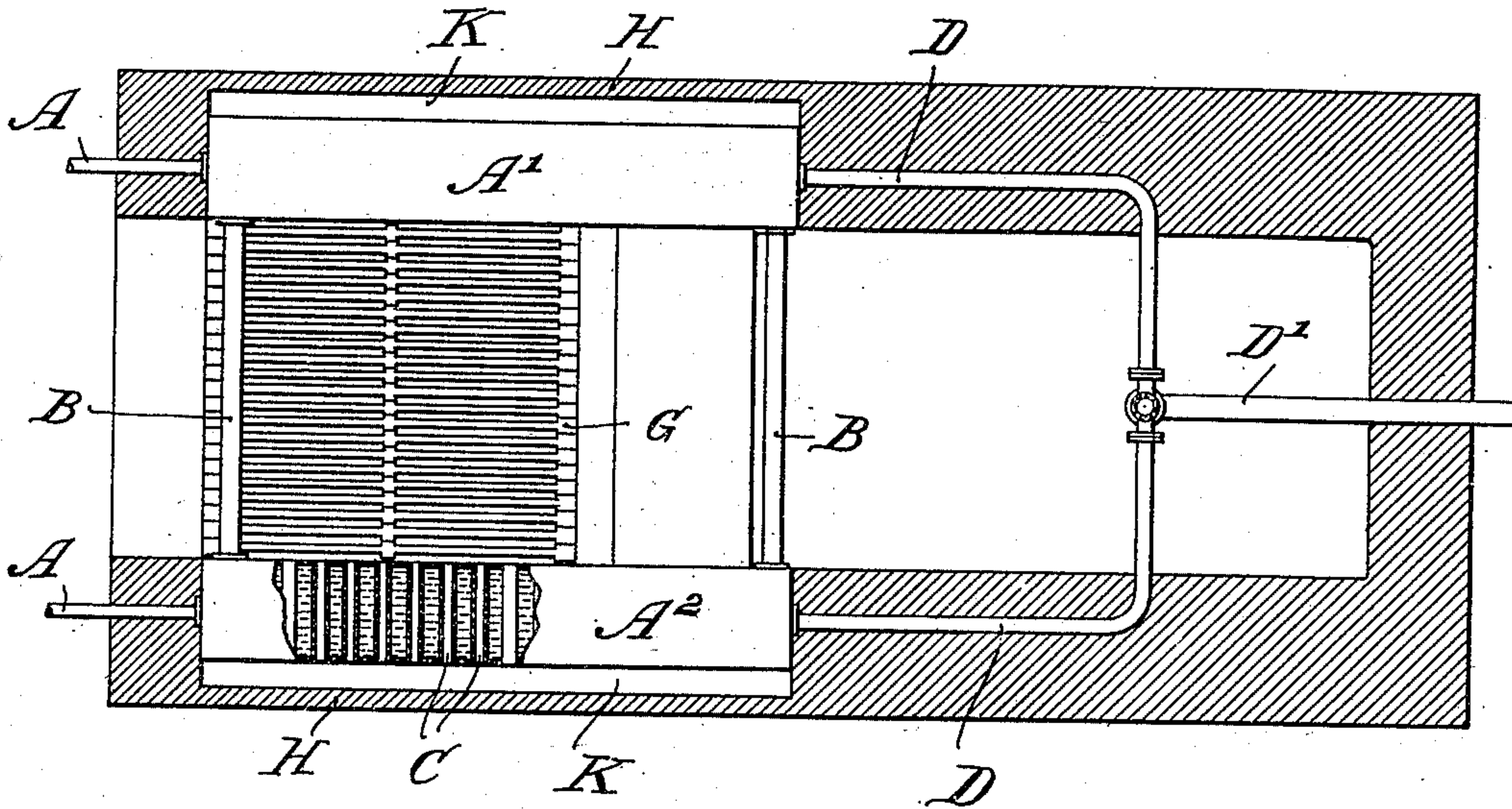
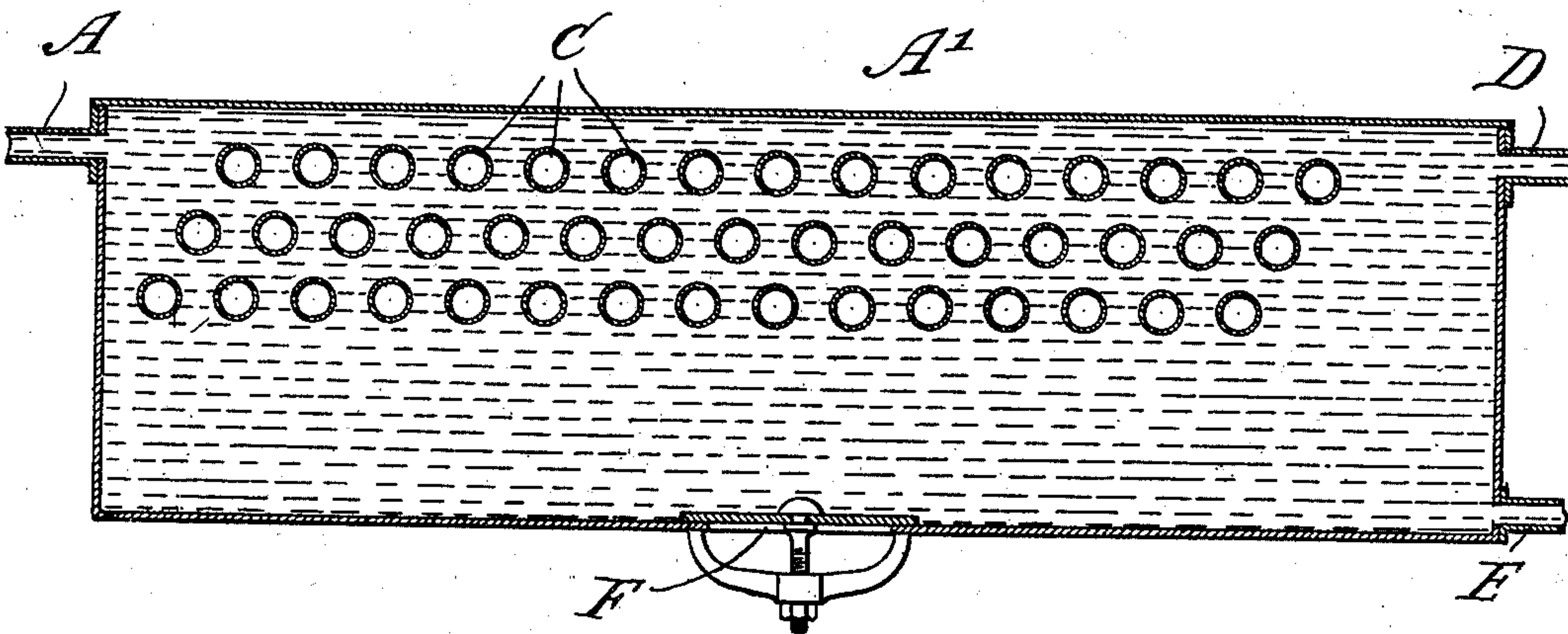


Fig. 4.



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UNITED STATES PATENT OFFICE.

DANIEL HEFT, OF PHILADELPHIA, PENNSYLVANIA.

WATER-HEATER.

SPECIFICATION forming part of Letters Patent No. 637,868, dated November 28, 1899.

Application filed June 22, 1899. Serial No. 721,505. (No model.)

To all whom it may concern:

Be it known that I, DANIEL HEFT, a citizen of the United States, residing at the city of Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Water-Heaters, of which the following is a specification.

My invention has relation to a heater for either feed-water of steam-boilers or for hot-water distribution, and in such connection it relates more particularly to the construction and arrangement of such a heater.

The principal object of my invention is to provide a heater for heating the feed-water of a steam-boiler and for analogous uses which shall be of comparatively simple construction and efficient in operation and which shall utilize the waste-heat units of a boiler or other furnace without taking up any space in the fire-box.

To this end my invention consists of two boxes or tanks arranged or set in the side walls of the fire-box of a furnace and extending from the front wall to the back of the bridge-wall, said boxes adapted to be filled with water and being traversed laterally by a series of tubes through which the fire-gases are adapted to pass by conducting the same through a chamber or flue arranged between said boxes or tanks and the walls of the fire-box.

The nature and scope of my invention will be more fully understood from the following description, taken in connection with the accompanying drawings, forming part hereof, in which—

Figure 1 is a longitudinal sectional view of a steam-boiler and furnace, illustrating in side elevation the water-heater embodying main features of my invention. Fig. 2 is a vertical transverse sectional view on the line $x x$ of Fig. 1. Fig. 3 is a horizontal sectional view taken on the line $y y$, one section of the water-heater being partly broken away; and Fig. 4 is an enlarged longitudinal sectional view of one section of the water-heater.

Referring to the drawings, A A represent the water-inlet pipes, each of which enters one section or box A' or A² of the water-heater proper. The boxes or sections A' or A² are

connected together by the circulation-pipes B B, arranged, preferably, at the rear and front ends of the heater and in line with each other. Each box or section A' or A² is arranged directly above the grate-bars G and along either side wall H of the fire-box H', being, however, separated from each side wall H by a chamber or flue K, communicating with the smoke-stack or main flue of the furnace by means hereinafter more fully described. Each box or section A' or A² is traversed by a series of tubes C C, through which the fire-gases are conducted from the fire-box H' to the flue K and from the same back into the fire-box. This construction results in the subjection of the water in the boxes or sections A' or A² to heat applied to both sides of said boxes as well as to the interior of the boxes, whereby the water is quickly heated to a very high temperature. Each box is provided with a feed or discharge pipe D, leading to a common discharge-pipe D', which conducts the heated water from both sections to the boiler or to the required point of delivery. Each section has for the purpose of cleansing a blow-off pipe E and for the purposes of cleansing and repairing a manhole or wash-out F, as illustrated in Fig. 4.

Having thus described the nature and object of my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a feed-water heater, a fire-box, a box or tank adapted to receive and discharge the feed-water, said box or tank being arranged at the side and within the walls of the fire-box, a flue or chamber formed between the tank and the side wall of the fire-box, and a series of tubes traversing the tank and adapted to lead the fire-gases from the fire-box through the tank into the flue or chamber and from the same back into the fire-box, substantially as and for the purposes described.

2. The combination with the fire-box of a furnace, of two boxes or tanks arranged at the sides and within the walls of the fire-box, flues or chambers formed by said side walls and tanks and a series of tubes traversing each box or tank and adapted to lead the fire-gases from the fire-box through each box

or section to the flue or chamber and from
thesame back into the fire-box, pipes adapted
to discharge water into the front end of each
box or section, circulating-pipes connecting
5 the two sections and a discharge-pipe leading
from both sections, substantially as and for
the purposes described.

In testimony whereof I have hereunto set
my signature in the presence of two subscrib-
ing witnesses.

DANIEL HEFT.

Witnesses:

M. GETZ,

R. T. ARBUTHNOT.