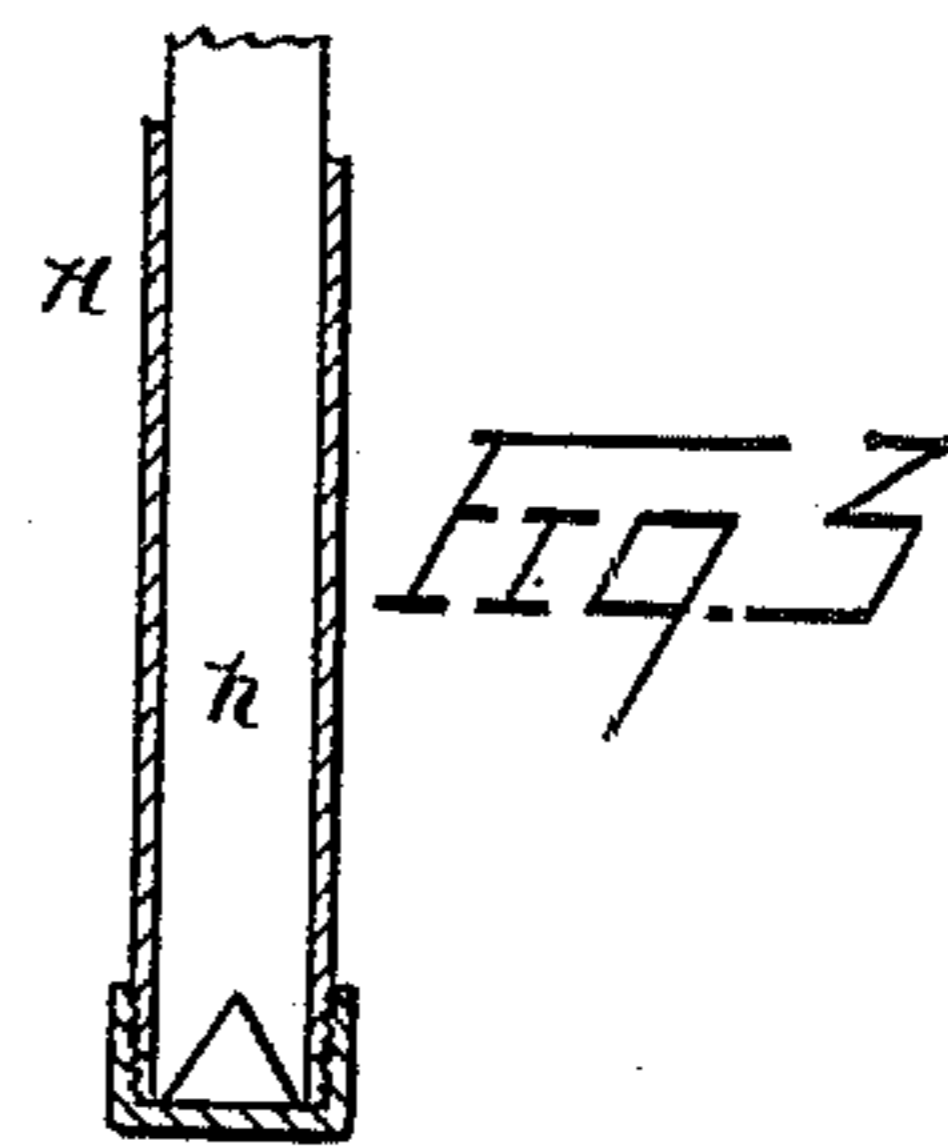
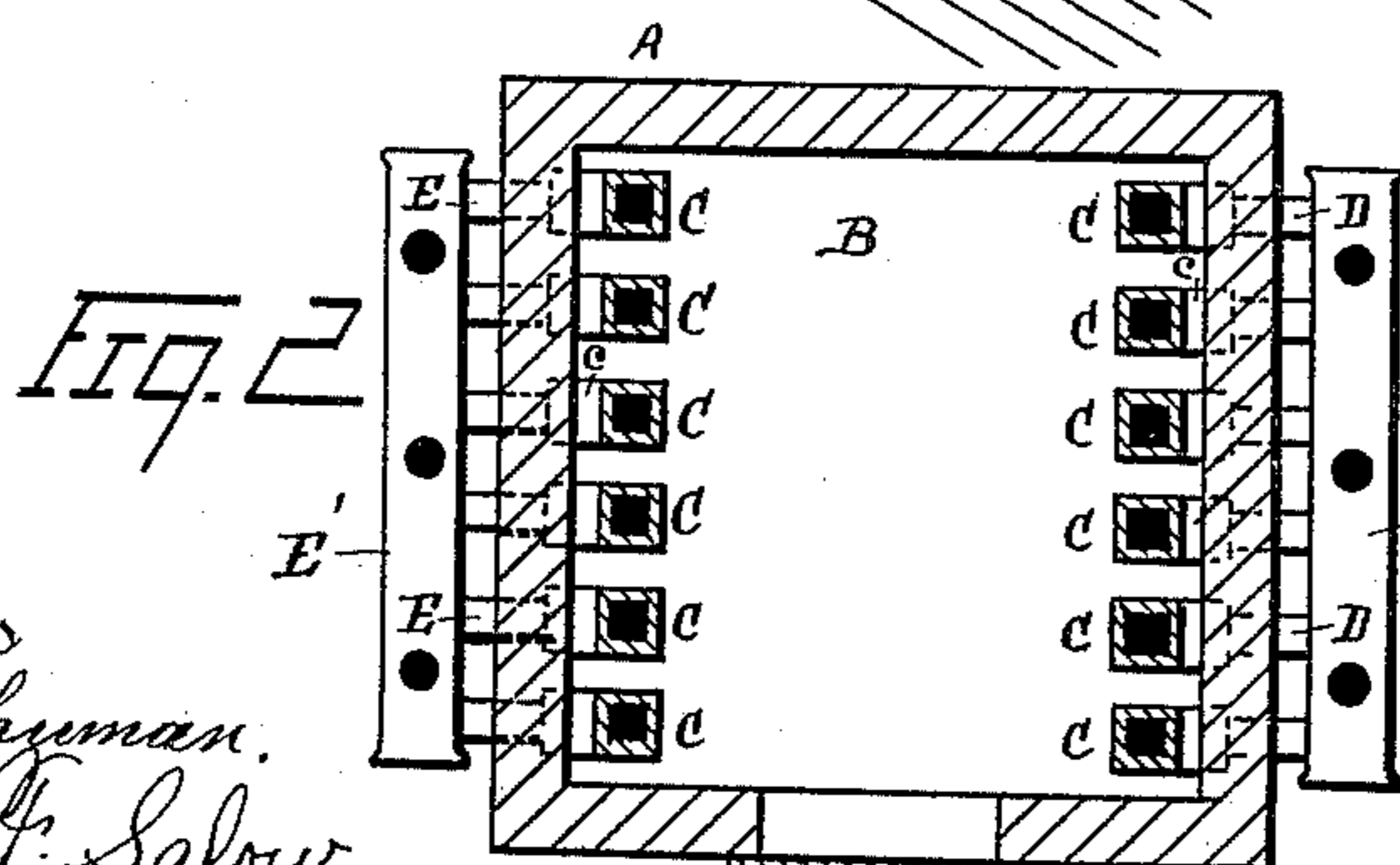
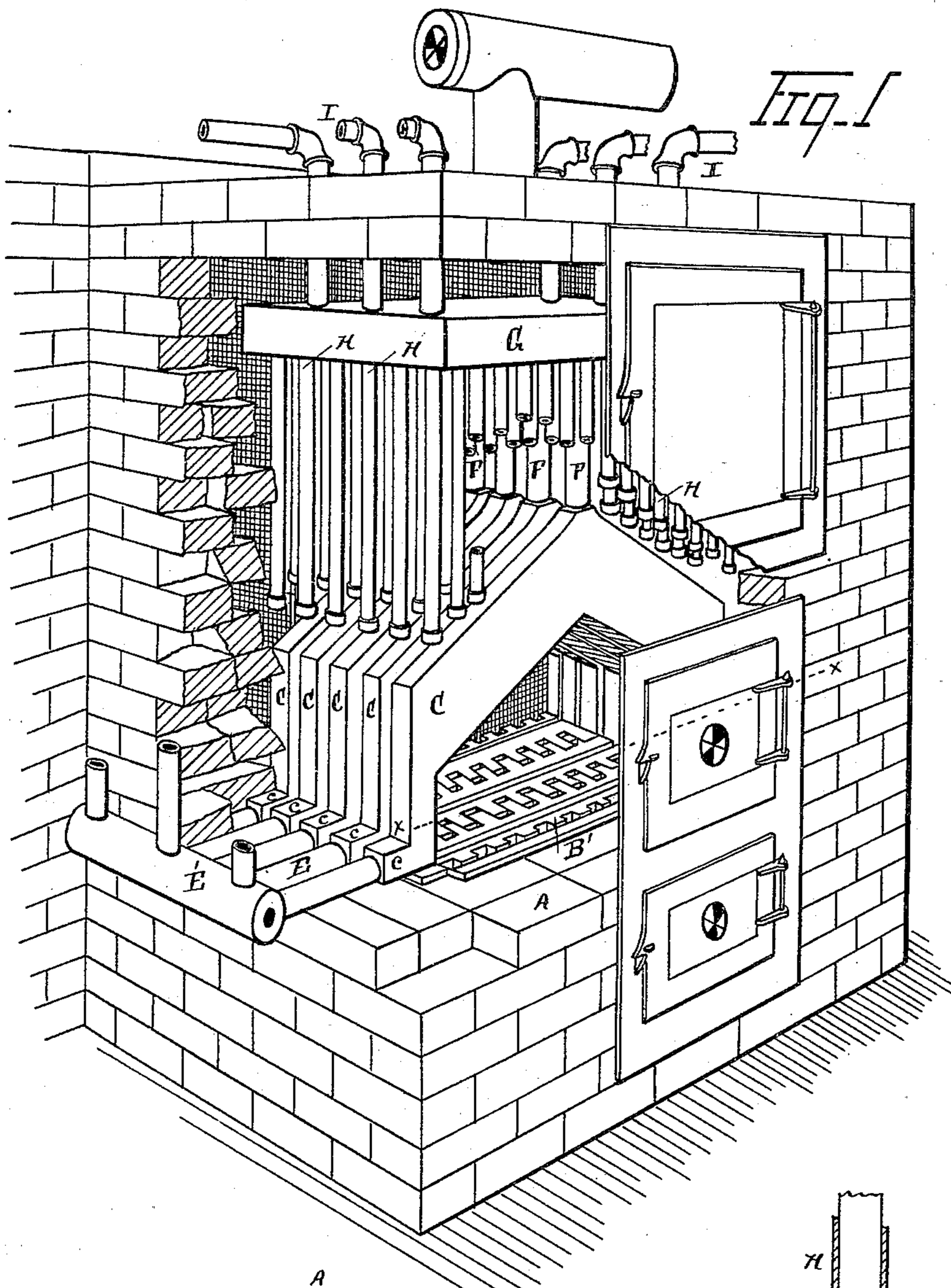


(No Model.)

T. G. G. MOUAT.
WATER HEATER.

No. 408,249.

Patented Aug. 6, 1889.



Witnesses
John G. Schuman.
Charles F. Salow.

Inventor
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UNITED STATES PATENT OFFICE.

THOMAS G. G. MOUAT, OF DETROIT, MICHIGAN.

WATER-HEATER.

SPECIFICATION forming part of Letters Patent No. 408,249, dated August 6, 1889.

Application filed March 15, 1889. Serial No. 303,391. (No model.)

To all whom it may concern:

Be it known that I, THOMAS G. G. MOUAT, a citizen of the United States, residing at Detroit, county of Wayne, State of Michigan, have invented a certain new and useful Improvement in Hot-Water Heaters; and I 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, reference being had to the accompanying drawings, which form a part of this specification.

My invention relates to a new and useful improvement in hot-water heaters; and it consists of the combinations of devices and appliances hereinafter described and claimed, and more particularly illustrated in the drawings submitted herewith, in which—

Figure 1 is a view in perspective illustrating my invention, and Fig. 2 is a horizontal section on the line $x x$. Fig. 3 is a sectional view of one of the drop-tubes.

A prominent object of my invention is to facilitate the heating of the water in a more effectual manner by so constructing my improved heater as to compel the water, both from the inlet and return pipes, to pass over the fuel-bed of the heater and receive the central heat of said fuel-bed, and to give the water a second heat in drop-tubes, whereby its heat may be greatly intensified.

My invention also contemplates other features of construction and arrangement, and all of which I carry out as follows:

A represents the inclosing-wall of the heater.

B is the combustion-chamber, and B' the grate. The wall of the heater is provided with the usual doors to the combustion-chamber and ash-pit. Within the combustion-chamber I locate a desired number of water-sections C, which may be made of suitable casting. These sections, as shown, are made with an apex intermediate of their extremities, being constructed with two horizontally-extended bases e , through which the inlet-pipes D are connected upon the one side and the return-pipes E on the other side, said pipes D and E leading, preferably, from headers D' and E', respectively. From their bases, as shown, said sections preferably rise vertically at the sides of the combustion-chamber

for a suitable distance, and thence from the top of the vertical arms of the sections inward, and preferably upward at an angle, forming an apex above the center of the fuel-bed, as shown. This construction of the sections, it is obvious, compels the flow of water into the heater to pass first through said sections over the fuel-bed to the center, receiving the intensest heat of the fire and the direct vertical heat in its passage from either side to the middle of the combustion-chamber. It will thus be seen that no connections whatever are made at the side of the furnace with the inlet and return pipes, except such as compel the water to traverse the combustion-chamber to the center from either direction.

At the center of the various sections pipes F lead upward to a water-chamber G, from which drop-pipes H, in any desired number, lead the water downward in the combustion-chamber, whereby it receives, as it were, a second heat. The drop-pipes I prefer to construct with an interior diaphragm h to cause an efficient circulation of the water through them. I do not, however, limit myself solely to this construction of the drop-pipes, as they may be formed in any suitable manner. The drop-pipes, it should be noted, do not communicate with the sections C. In this manner not a drop of water passes upward except as it passes to the center of the fire first of all, and then rises over the center of the fuel-bed to the chamber G, whence it circulates through the drop-pipes again and finds its exit to the rooms to be heated through the line-pipes I. In this way all liability of the water being taken upward through side connections without being properly heated is entirely avoided.

My improved heater furnishes a great amount of fire-surface, combining, as it does, the surfaces of the sections C and of the chamber G directly over the vertical heat of the fuel-bed and of the drop-tubes. The construction is simple and economical. Not only are the castings C readily made, but the chamber G and headers D' E' may also be cast, while the connecting-pipes and drop-tubes are also of simple construction. I prefer to construct the diaphragm h with a recessed extremity at its lower end, as shown at h' , a nipple H' being screwed upon the exterior of the lower

end of the tube. In this manner ample room is provided for the free circulation of the water in the drop-tubes.

5 The line-pipes I, I prefer to locate at the extreme edges of the chamber G, at the sides thereof, so as to compel the water to pass over the whole interior thereof and into the drop-tubes before it can pass therefrom. By so doing the water is held longer upon the fire, by
10 which it becomes more fully heated. The sections C also serve as a protection to the drop-tubes.

15 It is evident that various slight changes of construction might be resorted to in the mechanical construction of the several parts which I have described without materially departing from the spirit and scope of my in-

vention, and hence I do not wish to be limited strictly thereto.

What I claim as my invention is—

20 A hot-water heater consisting of a series of cross-sections C, extending over the fuel-bed, having inflow and return pipes communicating therewith, a water-chamber G, located over said sections, pipes F, leading from the
25 middle of said sections to said chamber, and drop-tubes leading downward from said chamber, substantially as set forth.

In testimony whereof I sign this specification in the presence of two witnesses.

THOMAS G. G. MOUAT.

Witnesses:

N. S. WRIGHT,

CHAS. F. SALOW.