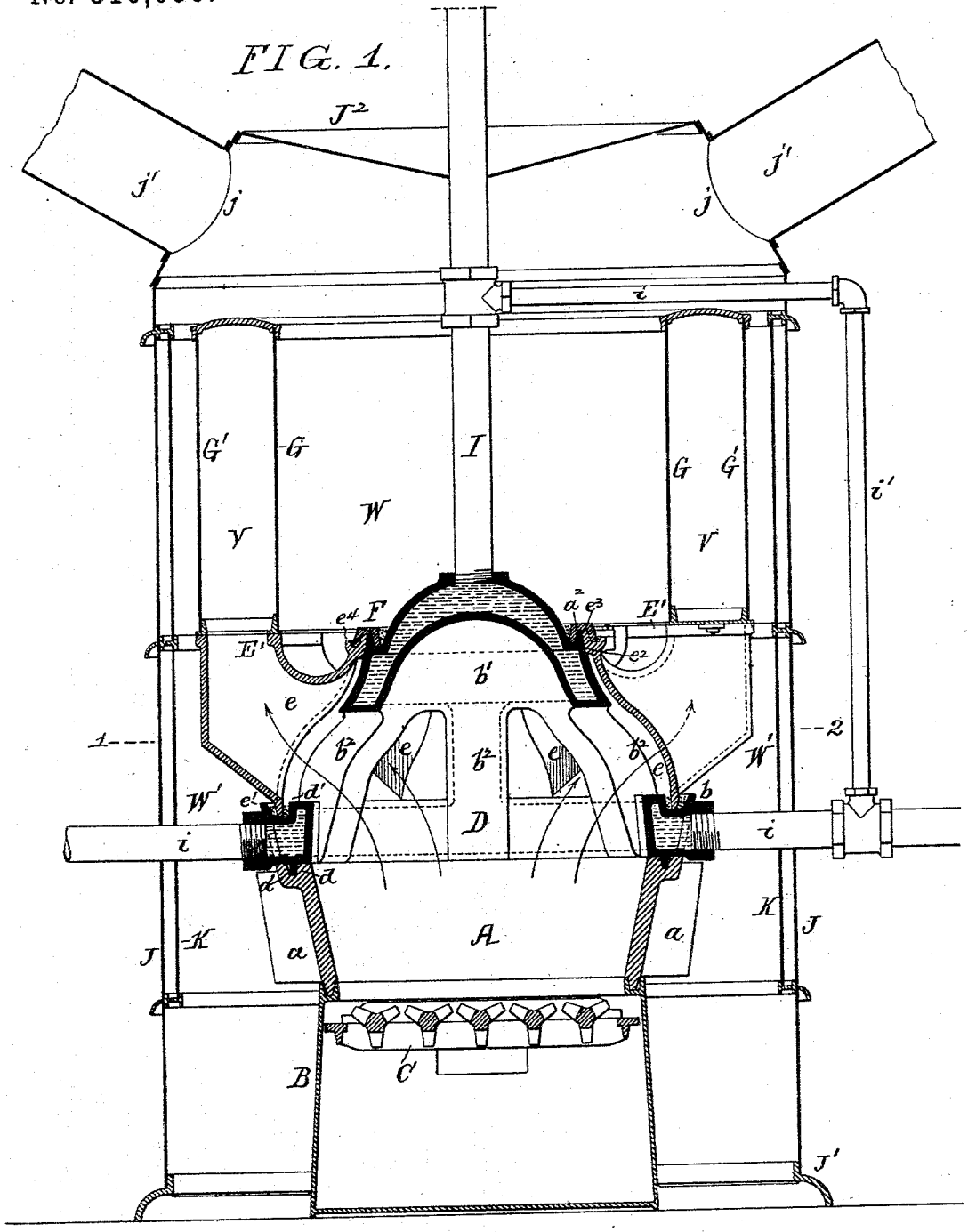
(No Model.) 3 Sheets—Sheet 1.

A. C. MOTT.

COMBINED HOT AIR AND HOT WATER HEATER.

No. 516,059. Patented Mar. 6, 1894.

FIG. 1.



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WASHINGTON, D. C.

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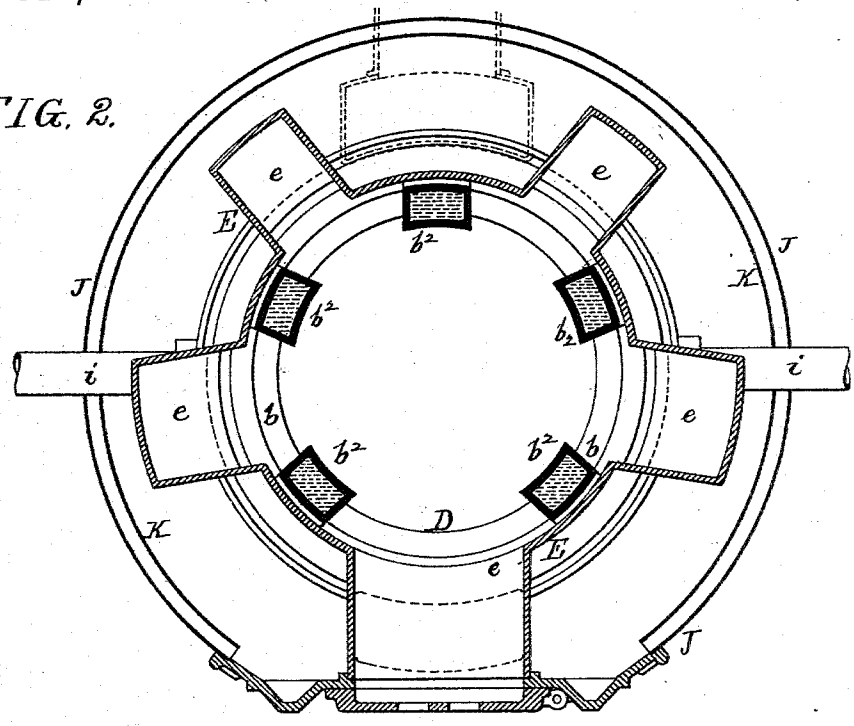
FIG. 2.



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COMBINED HOT AIR AND HOT WATER HEATER.

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FIG. 3.

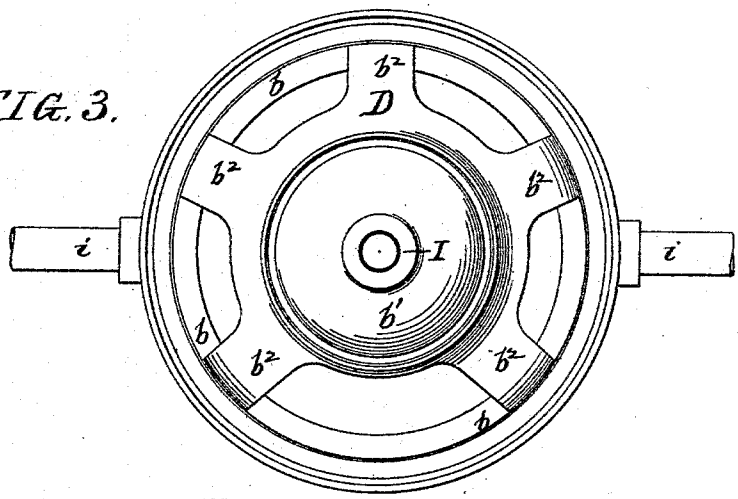


FIG. 4.

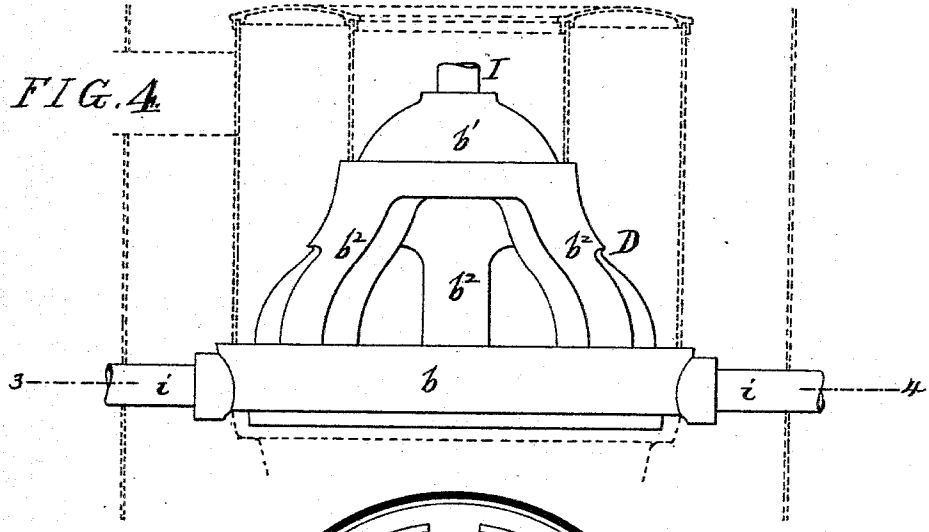
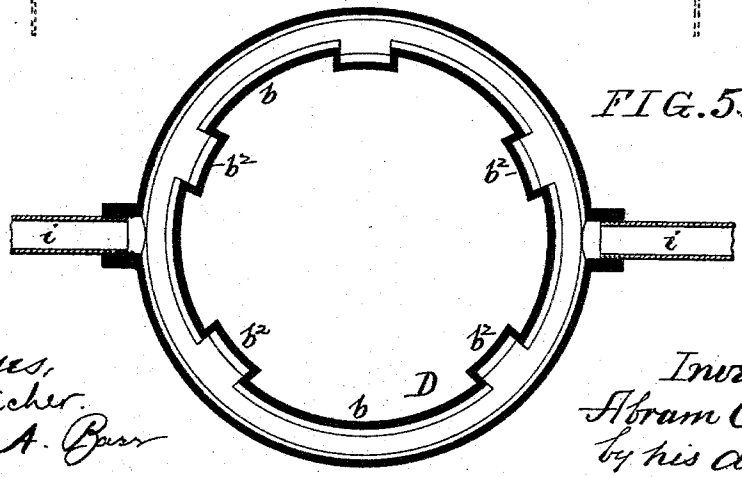


FIG. 5.



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UNITED STATES PATENT OFFICE.

ABRAM C. MOTT, OF PHILADELPHIA, PENNSYLVANIA.

COMBINED HOT-AIR AND HOT-WATER HEATER.

SPECIFICATION forming part of Letters Patent No. 516,059, dated March 6, 1894.

Application filed May 5, 1893. Serial No. 473,082. (No model.)

To all whom it may concern:

Be it known that I, ABRAM C. MOTT, a citizen of the United States, residing in Philadelphia, Pennsylvania, have invented certain Improvements in a Combined Hot-Air and Hot-Water Heater, of which the following is a specification.

The object of my invention is to construct a combined water and air heating furnace in such a manner that the water connections are not within the combustion chamber and in which the water section is made in one piece and adapted to fit inside a crab, the crab and water section being so formed that they can be mounted independently of each other as required.

In the accompanying drawings:—Figure 1, is a sectional elevation illustrating my combined water and air heating furnace. Fig. 2, is a sectional plan on the line 1—2, Fig. 1. Fig. 3, is a plan view of the water section. Fig. 4, is a side view of the same; and Fig. 5, is a sectional plan on the line 3—4, Fig. 4.

A is the fire pot made in the present instance of cast metal having radiating wings *a*, the lower edge of the fire pot is seated in the supporting frame B in which is mounted the grate C.

In the upper surface of the fire pot A is an annular groove *a'* and mounted on the fire pot is the water section D having an annular rib *d* which enters the groove *a'*. The water section D is composed of the annular base ring *b*, dome *b'* and connecting necks b^2; these necks are so spaced as to rest between the flues *e* in the crab E which is mounted outside of and upon the water section. The rib *e* of the crab entering a groove *e'* in the base ring of the water section, as clearly shown in Fig. 1. The dome *b'* of the water section is less in diameter than the ring, as shown, so that the ring, dome and connecting necks can be cast in one piece in a simple mold. The crab fits snugly against the dome of the water section at e^2 and the rib e^3 of the crab and the rib d^2 on the dome are held together by a grooved ring F between which and the dome is placed gas proof packing; this packing is also placed between the ring and an outer annular rib e^3 on the crab. Gas proof backing is also placed within the grooves *a'* and *e'*, so that the air heating chamber W W' will be entirely free from gas. Upon the upper ring E' of the crab are mounted the inner and outer drums G G' and the flues *e* communicate with the space V between the drums, and this space V communicates with the smoke flue so that the products of combustion pass from the fire pot through the flues *e* in the crab, through the space V between the drums to the smoke flue. Suitable deflectors may be placed in the space V to deflect the products of combustion in their passage through the furnace.

The water inlet pipes *i*, *i* are connected to the base ring of the water section B at the outside, the connection being made in the hot air chamber W', I make two connections one on one side of the furnace and the other on the other, so that the water may be distributed more readily, but it will be understood that one connection may be used.

The outlet pipe I is screwed into the top of the dome, the joint being made in the hot air chamber W and neither the inlet or outlet pipes pass through the combustion chamber or smoke flue; the outlet pipe passing through the top of the furnace as clearly shown in Fig. 1. In some instances I provide a circulating pipe *i'* forming a communication between the outlet and inlet pipes.

The outer casing J is of the ordinary construction mounted upon a suitable base ring J' and having a suitable top J^2 in which are the openings *j* connecting with the hot air pipes *j'*. On the inside of this casing J is a second casing K extending between the base of the fire pot and the upper portion of the drums G, G', this additional casing prevents the radiation of heat in the cellar.

I can substitute drums, as shown by dotted lines in Fig. 5, for the crab without departing from my invention.

It will be seen by the above description that a dealer can set up either an air heater or a combined air and water heater by keeping in stock simply two sizes of fire pots avoiding the necessity of keeping two complete sets of heaters one hot air set and the other a combined set, as is now the case.

By making the water section in one casting all joints in the combustion chamber are avoided. In water heaters made up in sections the joints are subjected usually to the direct action of the products of combustion

consequently they are likely to soon burn out and leak and have to be repaired, entailing large expense upon the owner.

I claim as my invention—

1. The combination in a combined water and air heating furnace, of the fire pot, the water section forming the dome of the combustion chamber, a casing surrounding the central portion of the water section so that inlet and outlet pipes can be connected to the water section below and above the casing and extending outside of the combustion chamber and whereby the products of combustion can gain access to both sides of the central portion of the water section, substantially as described.

2. The combination in a combined water and air heating furnace, of the fire pot, the water section mounted thereon comprising a ring and dome, a crab resting upon the ring of said water section and surrounding the dome, said water section having flues and drums mounted upon the crab, the inlet and outlet of the water section being outside the combustion chamber, substantially as described.

3. The combination in a combined hot water and hot air heater, of the fire pot, the crab, with a hot water section comprising a ring and dome, the ring being mounted between the crab and the fire pot, and the dome extending through the crab, substantially as described.

4. A water section for heating furnaces cast in one piece and consisting of a dome, base ring and connecting necks, the diameter of the dome being less than the inner diameter of the ring so that the water section can be cast in a single mold, substantially as described.

5. In a combined water and air heating furnace, the combination of the fire pot, the hot water section composed of the base ring, dome and connecting necks, the said ring being mounted upon the fire pot, the dome being smaller in diameter than the base ring and connected thereto by the necks, a crab mounted on the base ring and adapted to fit snugly against the sides of the dome, said dome extending through the crab, and drums mounted on the crab, substantially as described.

6. The combination of the fire pot, a water section mounted thereon composed of the base ring, dome and connecting necks, flues between the necks for the products of combustion, a crab mounted upon the water section and having flues aligning with the flues in the water section, the dome of the water section passing through the crab, and drums mounted upon said crab, the space between the drums connecting with the flues, said drums forming inner and outer heating chambers, the inlet connections to the water section being in the outer heating chamber and the outlet connections being in the inner heating chamber, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

ABRAM C. MOTT.

Witnesses:

FRANK E. BECHTOLD,

JAMES F. HAGEN.