

J. F. COTTRELL.

HEATER.

APPLICATION FILED AUG. 8, 1908.

951,677.

Patented Mar. 8, 1910.

2 SHEETS—SHEET 1.

Fig. 1.

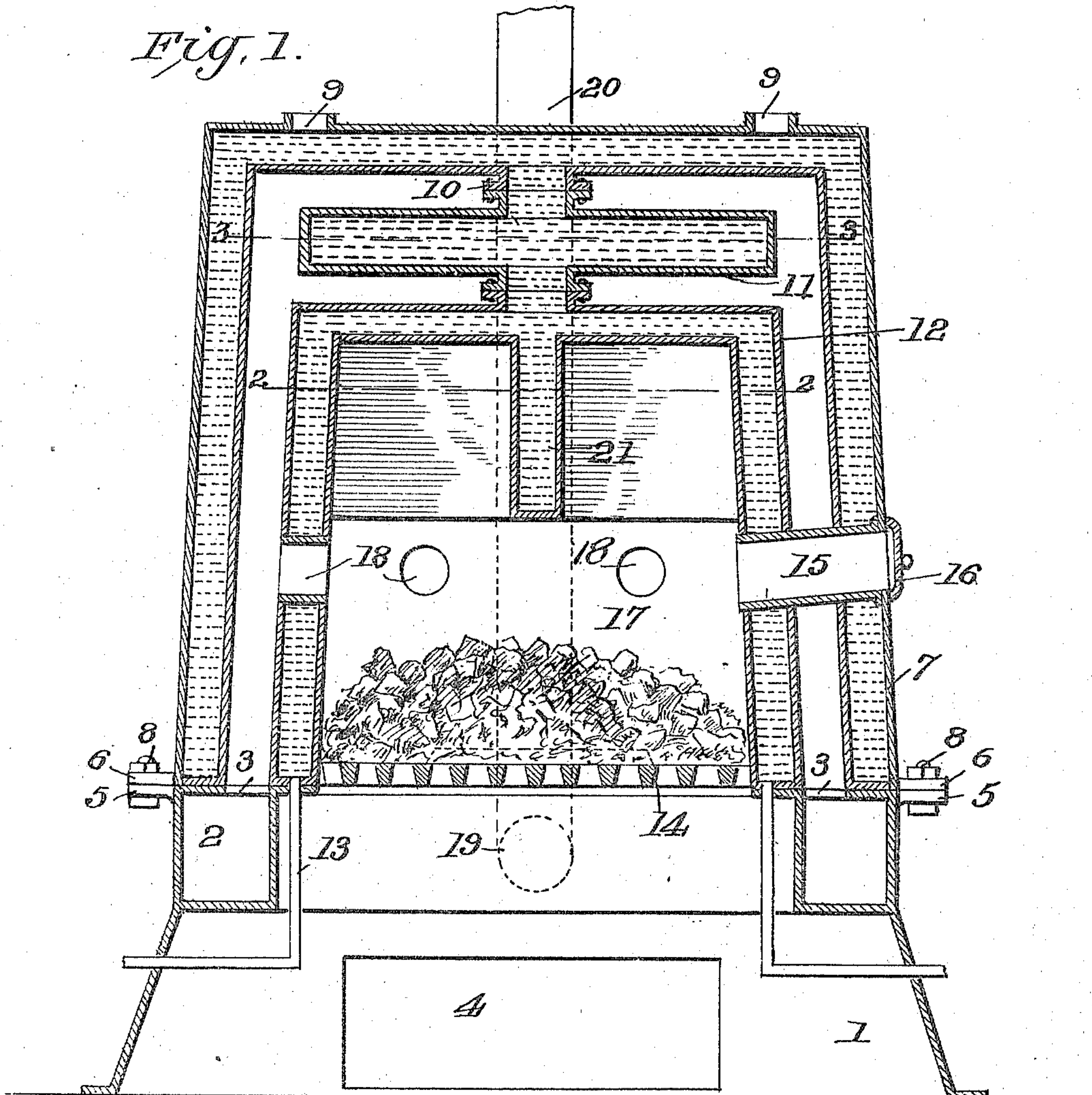
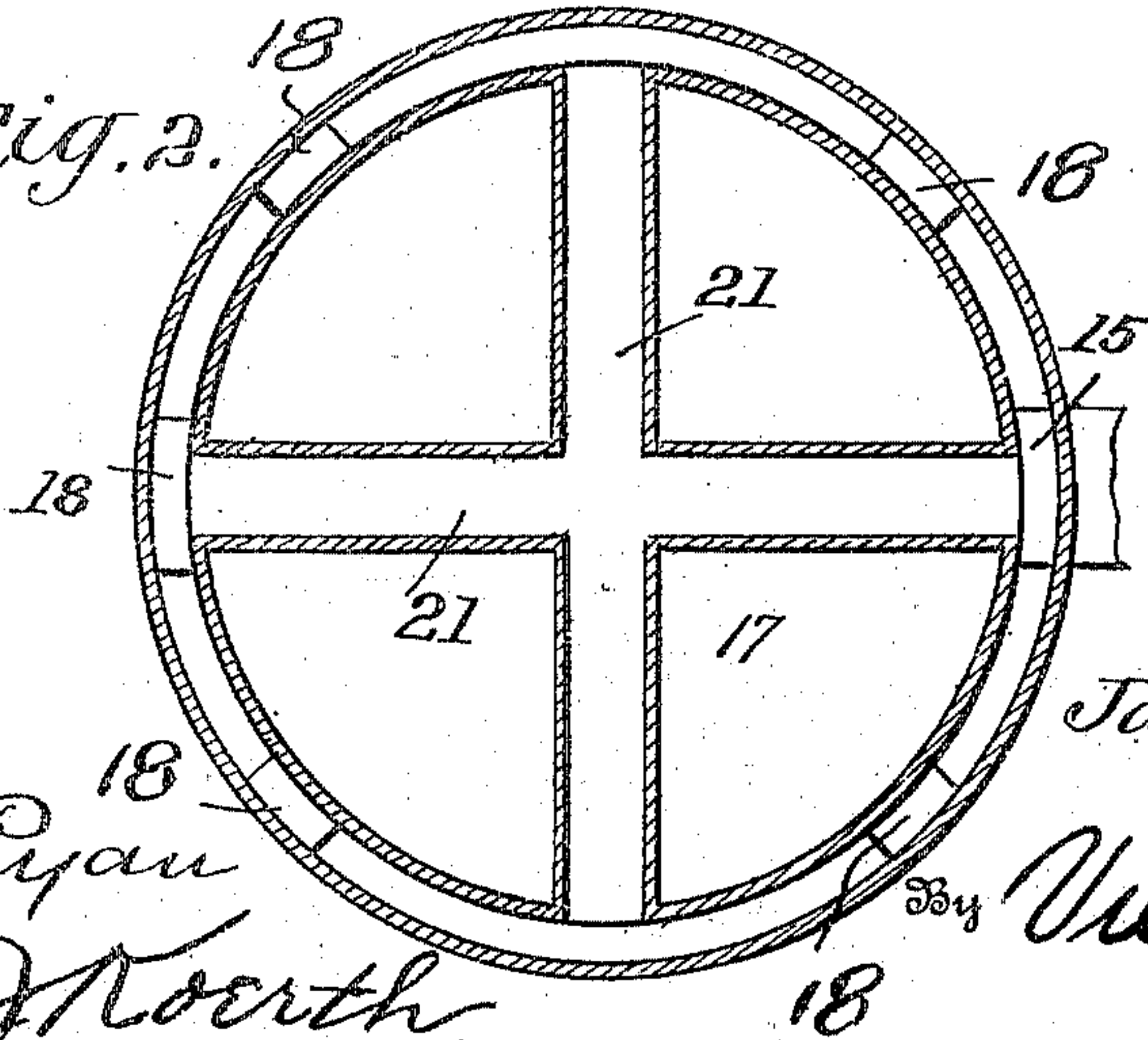


Fig. 2.



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2 SHEETS—SHEET 2.

Fig 3.

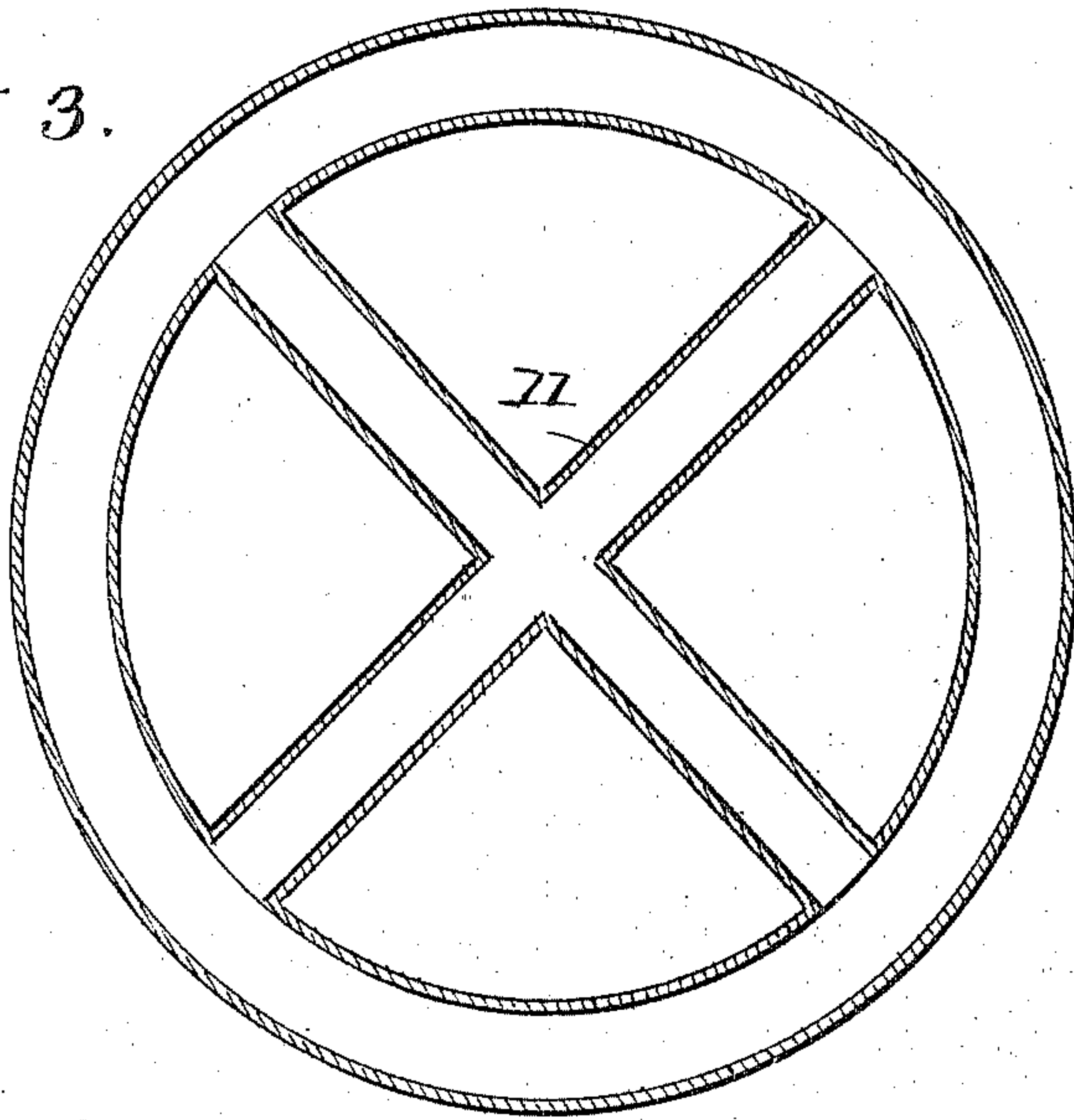
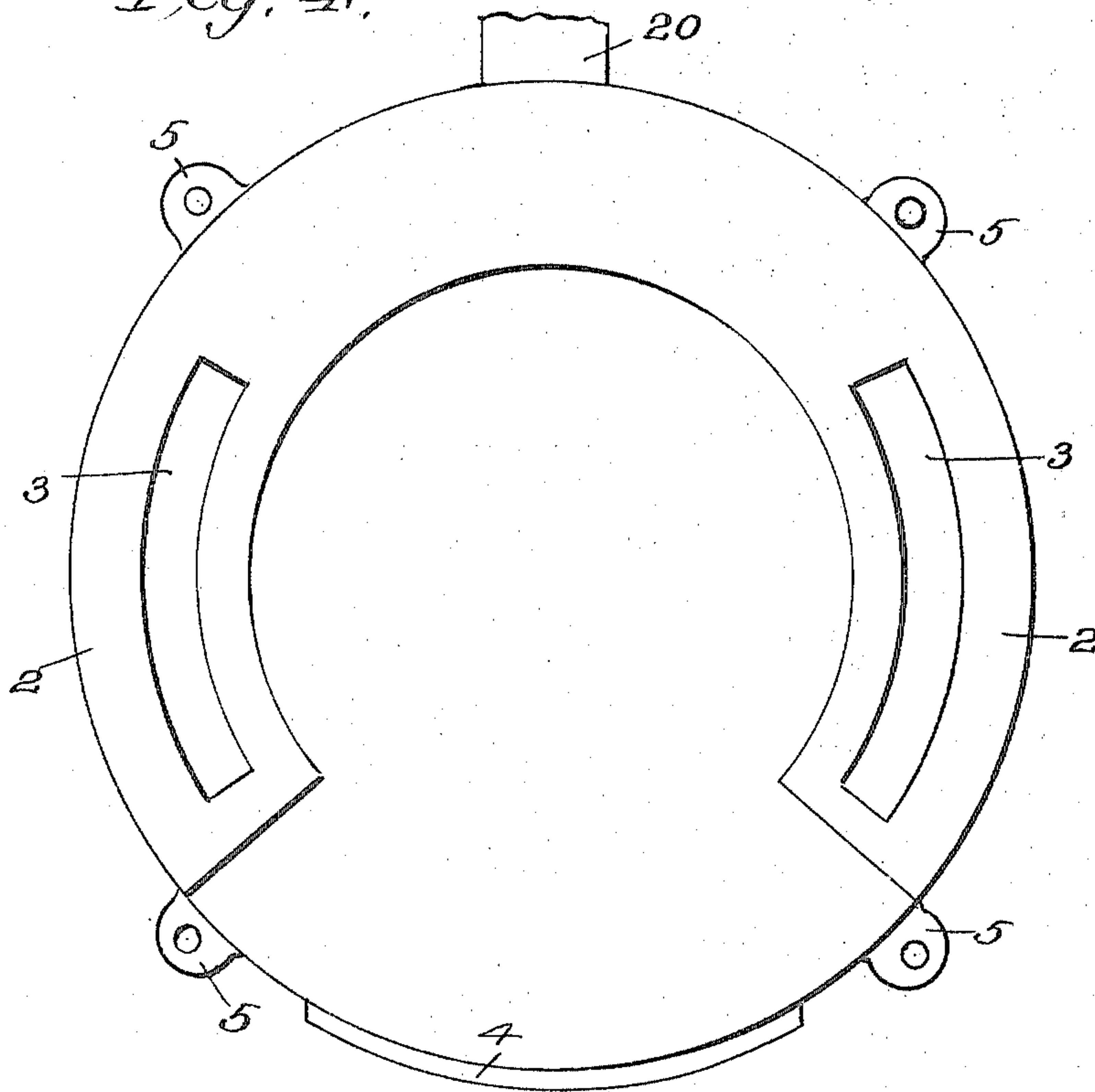


Fig. 4.



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# UNITED STATES PATENT OFFICE.

JAMES F. COTTRELL, OF EAST BOSTON, MASSACHUSETTS.

HEATER.

951,677.

Specification of Letters Patent.

Patented Mar. 8, 1910.

Application filed August 8, 1908. Serial No. 447,564.

*To all whom it may concern:*

Be it known that I, JAMES F. COTTRELL, a citizen of the United States, residing at East Boston, in the county of Suffolk and State of Massachusetts, have invented new and useful Improvements in Heaters, of which the following is a specification.

This invention relates to heaters, and more especially to hot water or steam heaters, and the object of the invention being to so construct the same that the hot gases and products of combustion will be caused to circulate so as to give off their heat and in circulating around an intermediate section or dome of a peculiar construction adapted for the reception of water so as to thoroughly heat the water in the intermediate section or dome as well as the water contained within the outer section surrounding the dome.

Another object of the invention is to provide an ash pit having a combustion chamber positioned immediately above the same, the ash pit being adapted for the reception of an intermediate section or dome of peculiar construction and an outer jacket surrounding the dome, the ash pit being provided with an upper box or flue communicating with the flue positioned between the inner and outer chambers, the construction being so arranged that the products of combustion pass between and surround the inner and outer sections and passed downward through the ash pit through a suitable outlet pipe, thereby thoroughly heating the inner and outer sections of the furnace.

A still further object of the invention is to provide a furnace with an ash pit having an upper box or flue extending entirely around its perimeter, and being provided with openings communicating between an outer jacket and an intermediate dome contained within the outer jacket, the said dome being provided with a centrally downwardly extending portion arranged at angles with the sides thereof and also having a smaller dome positioned between the top of the main dome and the top of the outer jacket, this intermediate dome or chamber being constructed of hollow arms arranged at different angles from the centrally downwardly extending portion of the main dome, whereby the products of combustion may have free access to the domes within the outer jacket and whereby the said products of combustion

may be free to circulate upwardly and to have access through a suitable pipe provided within the box or flue of the ash pit.

With these and other objects in view the invention resides in the novel construction and arrangement of parts hereinafter fully described and claimed.

In the accompanying drawing, Figure 1 is a vertical central longitudinal sectional view taken through a furnace in accordance with the present invention. Fig. 2 is a horizontal sectional view upon the line 2—2 of Fig. 1. Fig. 3 is a view upon the line 3—3 of Fig. 1. Fig. 4 is a top plan view of the ash pit, the remainder of the furnace being removed.

In the accompanying drawings, the numeral 1 designates the ash pit of the improved furnace. This ash pit 1 has its upper portion provided with a box or flue 2, extending around its entire perimeter. This box 2 has its upper wall provided with cut-away portions, as indicated by the numeral 3 and more clearly indicated in Fig. 4 of the drawings, the purpose of which will hereinafter be more fully described. The ash pit 1 is provided with the ordinary outlet door 4 and is also provided at its upper extremity with a plurality of spaced lugs or ears 5. These lugs 5 are each provided with a suitably disposed aperture and are adapted to coincide with similar ears or lugs 6 provided upon the outer jacket 7 of the furnace. This outer jacket 7 is of a size corresponding with the outer portion of the ash pit 1 upon which it is adapted to rest and at which it is secured through the medium of suitable retaining elements 8 engaging the perforations provided by the lugs 5 and 6. The jacket 7 comprises inner and outer spaced walls extending around its entire perimeter and at the top of the same as clearly illustrated in Fig. 1 of the drawings. The top of the jacket 7 has its upper wall provided with a plurality of steam or hot water outlets, as indicated by the numeral 9, while the inner or lower wall of the top portion of the jacket is provided with a centrally arranged depending flanged pipe member 10. This flanged member 10 is adapted to be secured to an intermediate dome section 11. This dome section 11 is constructed of a pair of radiating arms centrally intersecting themselves and communi-



cating with the jacket 7, as clearly illustrated in Fig. 2 of the drawings. The dome 11 is also provided with a downwardly extending flanged portion which is adapted to be secured to an upwardly projecting flanged pipe connected with the top of the dome proper of the furnace. This dome 12 is arranged in suitable spaced relation with regard to the outer jacket 7 and comprises a pair of downwardly extending walls adapted to be positioned upon the upper wall of the ash pit 1 and to rest upon the top wall provided by the box 2 thereof. The downwardly extending portion of the dome 12 has its outer wall positioned adjacent the inner wall of the box 2, while the inner wall of the jacket 7 is positioned adjacent the outer wall of the cutaway portions or flues 3 of the box 2, thus providing a space between the inner wall of the outer jacket and the outer wall of the dome 12 as well as providing a communication between these members and the box 2 of the ash pit. The lower portion of the dome 12 is provided with a suitable water outlet pipe 13, as clearly illustrated in Fig. 1 of the drawings.

Positioned upon the top of the ash pit 1 within the combustion chamber provided by the dome 12, is a suitable grate 14 which is adapted for the reception of the fuel by which the furnace is operated, a suitable mouth or chute 15 being provided between the jacket 7 and the dome 12, as clearly illustrated in Fig. 1 of the drawings, and said chute or opening is adapted to be normally closed by the door 16. The combustion chamber 17 is provided with a plurality of outlet openings 18 communicating between the jacket 7 and the domes 11 and 12 whereby the products of combustion have free access between these members and whereby the same is directed upwardly so that the water contained within the jacket and the domes is thoroughly heated before the said products of combustion are directed downwardly through the openings 3 within the box 2 of the ash pit 1, and thence through the opening 19 into the outlet pipe 20, as shown in Fig. 1 of the drawings.

Secured integrally to the dome 12 immediately above the chute 15 and openings 18 are the centrally arranged downwardly extending spaced walls or jackets 21. These walls or jackets 21 are adapted to extend downwardly at an angle to each other and to intersect each other as clearly illustrated in Fig. 2 of the drawings. It will be noted by reference to Figs. 2 and 3 of the drawings that the angularly extending members 11 and 21 of the intermediate and principal domes are arranged at a direct angle in relation to each other, and it will be noted by this arrangement that a greater amount of heating service is provided as the products

of combustion from the chamber 17 extend upwardly against the offset depending bosses or members 21 and thence through the openings 18 into contact with the arms or chambers provided by the intermediate dome or section 11.

While I have illustrated and described the preferred embodiment of the invention, it is to be understood that minor details of construction within the scope of the following claims may be resorted to without departing from or sacrificing any of the advantages of the invention.

I claim:—

1. In a furnace of the class set forth, an ash pit, an outer water jacket upon the ash pit, said outer jacket being provided with outlet openings, a central dome resting upon the ash pit in spaced relation with the outer jacket, an intermediate dome communicating with the main dome and the outer jacket, and an outlet for the products of combustion provided by the ash pit.

2. In a furnace of the class described, an ash pit, a box provided upon the upper portion of the ash pit and extending around the perimeter thereof, said box being provided with flues or openings, an outer water jacket positioned upon the box and being provided with outlets, an inner water dome positioned upon the top of the ash pit in spaced relation from the jacket, an intermediate dome or chamber connecting the main dome with the top of the water jacket, a grate resting upon the top of the ash pit within the main dome, a chute connecting the interior of the dome with the exterior of the furnace, said main dome being provided with openings communicating with the spaces between the dome and the jacket, and the box of the ash pit being provided with an opening for the outlets of the products of combustion.

3. In a heater of the character set forth, an ash pit, a box formed integrally with said ash pit and extending around the entire perimeter thereof, flue openings within the upper wall of the box, a water jacket, an inverted U-shaped structure upon the box of the ash pit, outlet openings for the jacket, an inner water dome comprising an inverted U-shaped member positioned upon the upper wall of the box of the ash pit in spaced relation with the outer jacket and communicating with the flues provided by the box of the ash pit, outlet pipes connected with the dome, a grate within the dome, a feed chute communicating with the grate, a plurality of openings communicating with the passage between the combustion chamber provided within the dome and the outer jacket, the said dome being provided with downwardly extending portions arranged at an angle and communicating with the sides

of the dome, an intermediate dome or chamber connecting the main dome with the top of the outer jacket, said chamber being provided with oppositely disposed arms arranged at a different angle from the downwardly projecting portions upon the interior of the main dome, and the box of the ash pit being provided with an opening

adapted to serve as an exit for the products of combustion. 10

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

JAMES F. COTTRELL.

Witnesses:

WILLIAM HENDERSON,

WILLIAM J. CAREY.