

No. 705,422.

Patented July 22, 1902.

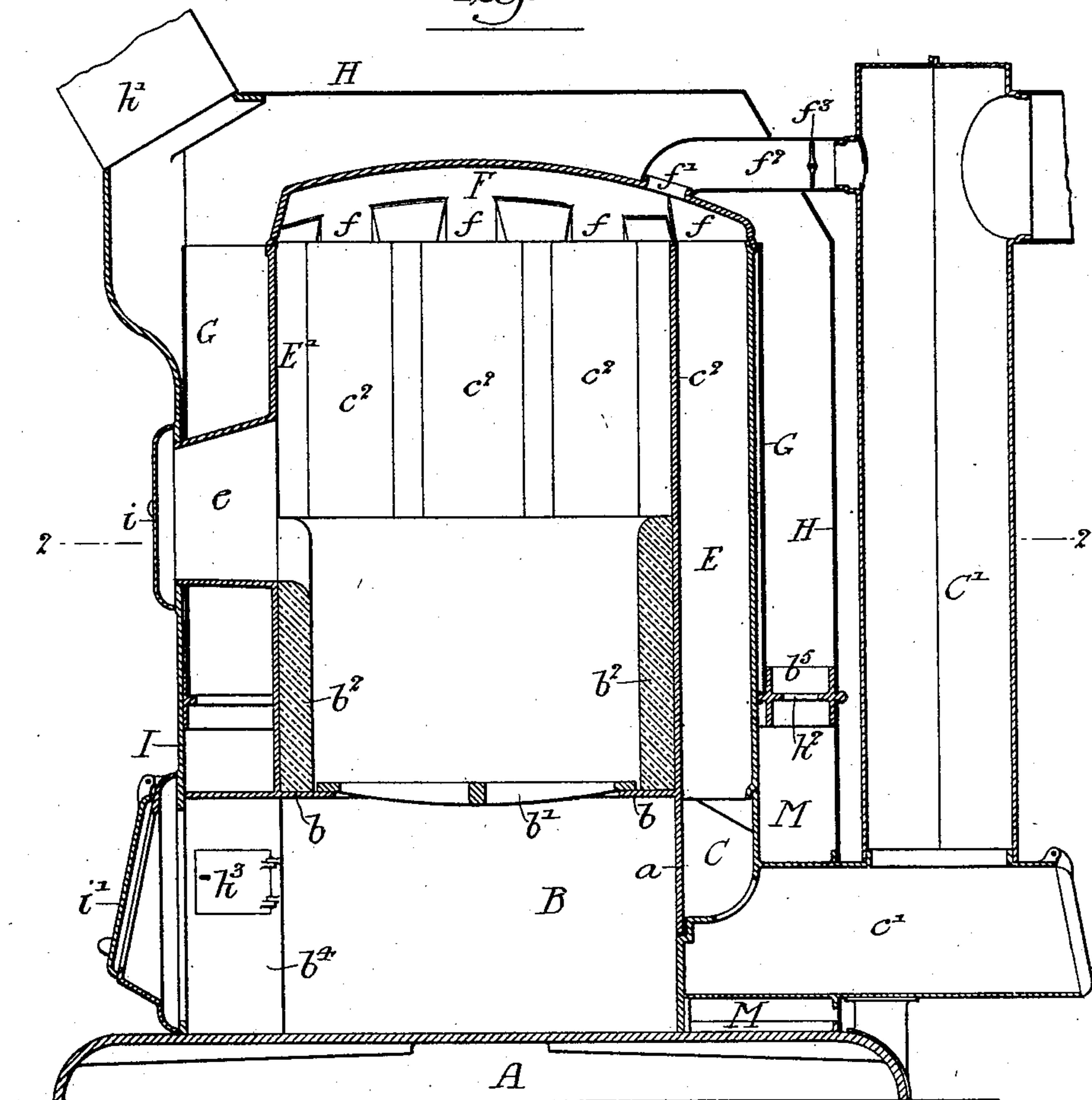
M. B. MOORE & G. W. LEDDON.
HOT AIR HEATER.

(Application filed Mar. 15, 1902.)

(No Model.)

3 Sheets—Sheet 1.

Fig. 1.



Witnesses:-

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Titus H. Irons.

Inventors:

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George W. Leddor,

by their Attorneys:

Howson & Howson

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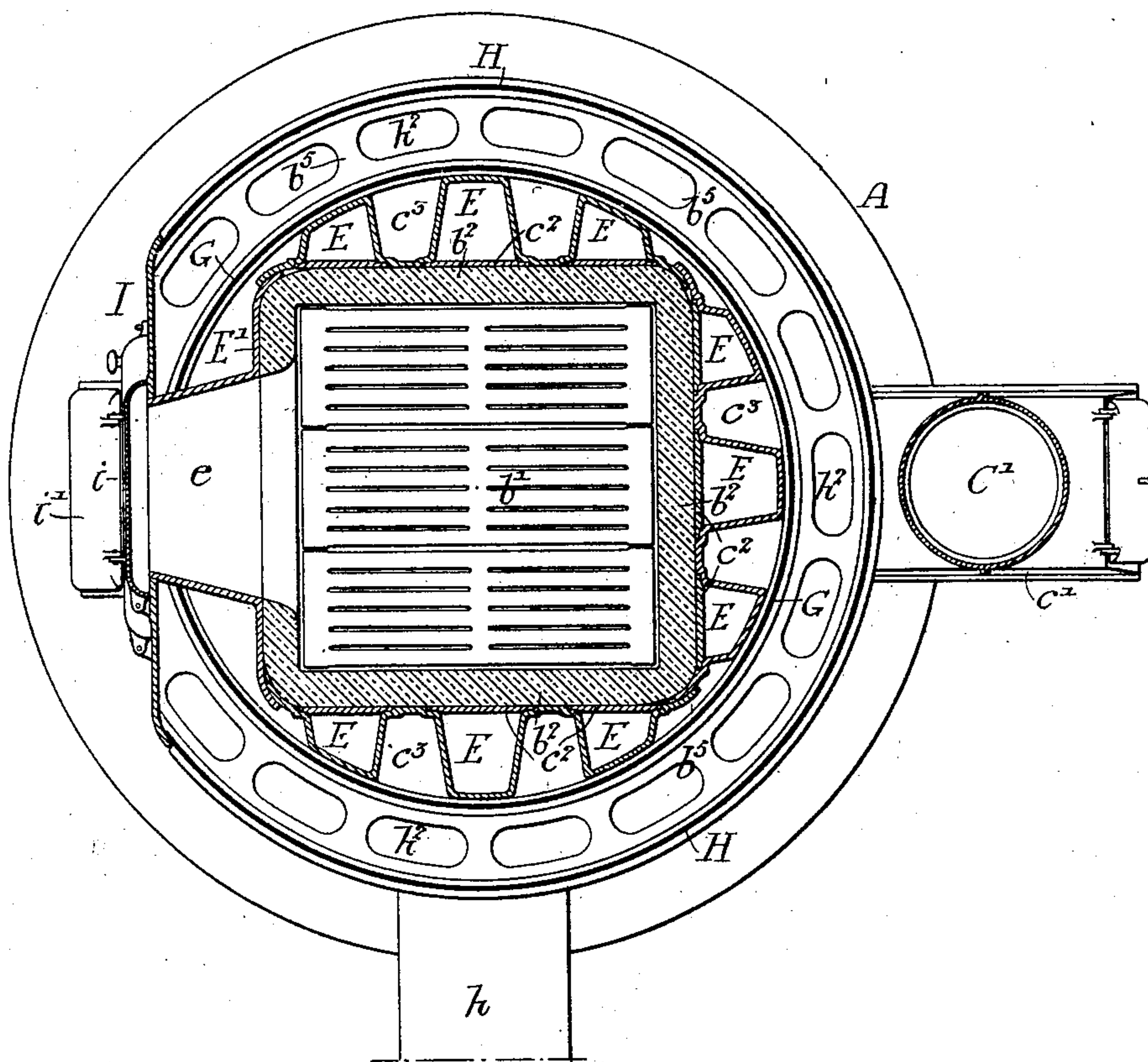
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(Application filed Mar. 15, 1902.)

(No Model.)

3 Sheets—Sheet 2.

Fig. 2.



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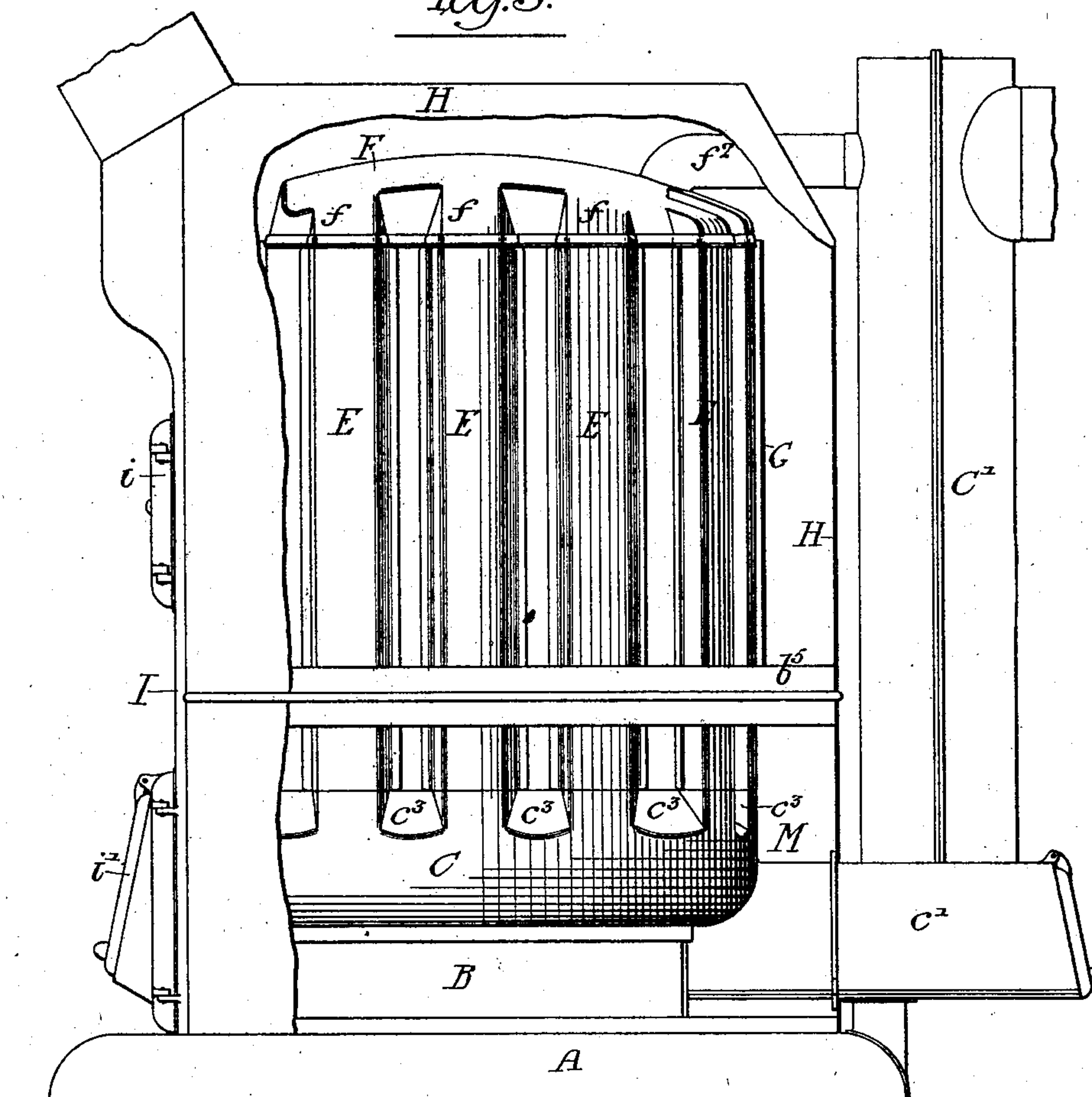
HOT AIR HEATER.

(Application filed Mar. 15, 1902.)

(No Model.)

3 Sheets—Sheet 3.

Fig. 3.



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UNITED STATES PATENT OFFICE.

MOSES B. MOORE, OF PENNINGTON, NEW JERSEY, AND GEORGE W. LEDDON, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNORS TO THE PENNINGTON FOUNDRY AND HEATER COMPANY, OF PENNINGTON, NEW JERSEY, A CORPORATION OF NEW JERSEY.

HOT-AIR HEATER.

SPECIFICATION forming part of Letters Patent No. 705,422, dated July 22, 1902.

Application filed March 15, 1902. Serial No. 98,372. (No model.)

To all whom it may concern:

Be it known that we, MOSES B. MOORE, residing in Pennington, New Jersey, and GEORGE W. LEDDON, residing at Philadelphia, Pennsylvania, citizens of the United States, have invented certain Improvements in Hot-Air Heaters, of which the following is a specification.

Our invention has for its object the provision of a hot-air furnace which shall be of a simple construction, efficient in action, and easy to operate. This object we attain as hereinafter set forth, reference being had to the accompanying drawings, in which—

Figure 1 is a vertical sectional view of our improved furnace. Fig. 2 is a horizontal sectional view on the line 2 2, Fig. 1; and Fig. 3 is an outside view of the innermost casing, portions of the outer casing being removed for the clearer illustration of said inner casing.

In the above drawings, A is the circular base of the heater, preferably of cast-iron, upon which is a rectangular ash-box B, its back plate being shown in section in Fig. 1 at *a*, and carried by and preferably formed integral with the sides of the ash-box is a plate *b*, extending inwardly around the top edge thereof and forming the support for the fire-brick lining *b*² and the grate *b*¹, a rectangular opening being formed in the front of the ash-box and a frame *b*⁴ extending forwardly around said opening and forming a doorway thereinto.

Preferably made integral with the ash-box and running around its back and two sides is a smoke-flue C, connecting with the smoke pipe or stack C' at the back of the heater through a horizontal pipe *c*, said flue extending around the ash-box B, its forward ends finally intersecting the frame *b*⁴, which forms the entrance into the ash-pit and is provided with doors *h*³, whereby access may be had to the interior of said flue.

Resting upon the top surface of the smoke-flue C are three corrugated sections E, forming the back and two sides of the fire-box of the heater, the front being formed by a flat plate E', provided with a projecting ex-

tension *e*, forming a box-like frame of rectangular section which serves as the fuel-doorway.

The top of the smoke-flue C is formed with a number of openings, corresponding in outline to the outline of the corrugations of the side and back sections E, which rest upon said flue, and there are a number of plates *c*² suitably fastened to the fronts of these corrugations and extending to the top of the sections E. There are thus formed flues which are in communication with the interior of the smoke-flue C at each side and at the back of the fire-box.

A cover or dome section F is provided, which rests directly upon and corresponds in outline to the three side and back sections E and the front section E' of the heater, its sides and back being made corrugated, and thereby forming entrance-ways or openings *f* to the vertical flues formed by the plates *c*² and the corrugations in the side and back sections E. This dome-section is confined to the rectangular fire-box in any suitable manner, and there is an opening *f*¹ in its top surface, to which is connected a pipe *f*², communicating with the main smoke-stack C', there being a damper *f*³ for controlling the passage of the products of combustion through said pipe.

We preferably form the ash-box, the sections of the fire-box, and the dome above described of cast-iron.

Closely surrounding the casing formed by the sections of the fire-box is a second casing G, of galvanized iron, this casing being carried by a ring *b*⁵ and extending to the same height as that of the sections E. It is to be understood that the top surface of the smoke-flue C has in it a number of depressions at *c*³, as shown in Fig. 3, and inasmuch as the casing G does not extend below the level of the top of the smoke-box *c*¹ these depressions *c*³ form a number of entrances or openings into the vertical passage-ways formed by the outwardly-opening corrugations of the sections E and the said casing G.

The third and outermost casing H of the

heater rests upon the base-piece A and ring b^5 and completely envelops the parts heretofore described. Hence there is formed between the casing and the sides of the ash-box
 5 an inclosed space M, which serves as a reservoir for cold air. A pipe h from a suitable source of cold-air supply enters this space at the side of the heater, as shown, and one or more pipes, as h' , at the top of the casing H
 10 conduct the heated air from the casing to any desired points of distribution. It will be seen that the ring b^5 extends outwardly to the casing H and is perforated, as at h^2 , to allow air to circulate between the casings G and H.

15 In the front of the heater an ornamental plate I is preferably let into the outside casing H, being provided with fire and ash doors i and i' , which suitably fit over the projecting doorways e and b^3 from the section E' and the
 20 ash-box B, respectively.

When lighting the fire in the furnace or when rapid combustion is desired, the damper f^3 is opened and the hot gases rising at the top of the inside casing E E' pass into
 25 the stack C' through the short pipe f^2 . Ordinarily, however, this damper f^3 is closed, and the heated gas after rising to the top of the interior casing enters the openings $f f$ and passes down through the flues formed in
 30 the corrugated portions of the side and back sections E. From these the hot gas enters the horizontal smoke-flue C and passing backwardly toward the rear of the heater enters the base of the stack C' through the pipe c' .

35 The downflowing gas through the corrugations of the sections E, as well as the direct heat from the fire on the parts of the corrugated sections between the plates c^2 , heats the air between the casing G and the said
 40 corrugated sections, causing it to rise and draw additional air from the reservoir around the ash-box through the openings formed by the depressions c^3 in the smoke-flue C and between the latter and the bottom of the cas-
 45 ing G. By the provision of the air-reservoir around the exterior of the ash-pit there is always a large volume of cold air ready to be drawn up into contact with the heated portions of the corrugated rectangular casing,
 50 thus allowing the said air to be quickly heated and discharged.

By making the sections E similar they will be interchangeable, there being thus required a minimum number of patterns when manu-
 55 facturing various parts of the heater.

We claim as our invention—

1. The combination in a hot-air furnace, of a rectangular fire-box having sides formed of corrugations of different sizes, a cover for the

same, a smoke-flue, a substantially circular 60 casing closely surrounding the fire-box the external contour of the corrugated sides of the fire-box conforming to the shape of said casing and forming air-passages therewith, a
 65 stack connected with the smoke-flue, and a third casing surrounding the whole, the same having an inlet and an outlet for air to be used for heating, substantially as described.

2. The combination of a casing of polygo- 70 nal section having corrugations upon its sides, the same forming alternate smoke and air passages, a conduit communicating with said smoke-passages, certain of said corrugations being of different size and shape from the others and arranged so that the casing as a
 75 whole is of substantially cylindrical form, with a second casing also of cylindrical form closely surrounding the first casing and its corrugations, substantially as described.

3. In a hot-air furnace, the combination of 80 a fire-box having corrugated sides, a cover therefor having corrugated edges, plates covering certain of the corrugations in the sides of said fire-box and thereby forming flues, the corrugations of the cover registering with the
 85 corrugations of the fire-box and providing openings therein, a smoke-stack a smoke-flue extending around the lower part of the said fire-box and connected to passages therein, a second casing around the fire-box form- 90 ing air-passages with certain others of the corrugations of the same and a third casing surrounding the whole and provided with an inlet for cold air and an outlet for the heated air, substantially as described. 95

4. In a hot-air furnace, the combination of an ash-box, a smoke-flue extending around the top thereof, a single casing having cor- 100 rugated sides forming the fire-box and a cover supported by said fire-box, certain of the corrugations being constructed to form smoke-passages, the same being in communication with the interior of the casing and with the smoke-flue, a stack connected to said flue, a
 105 second casing surrounding the fire-box and forming air-passages with certain others of the corrugations of the sides thereof and a third casing surrounding the whole and hav- 110 ing an inlet and an outlet for the air, substantially as described.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

MOSES B. MOORE.
 GEO. W. LEDDON.

Witnesses:

JOHN C. EGE,
 OLIVER B. GRAY.