

No. 607,706.

C. M. RICHARDSON.
HEATING DRUM.

Patented July 19, 1898.

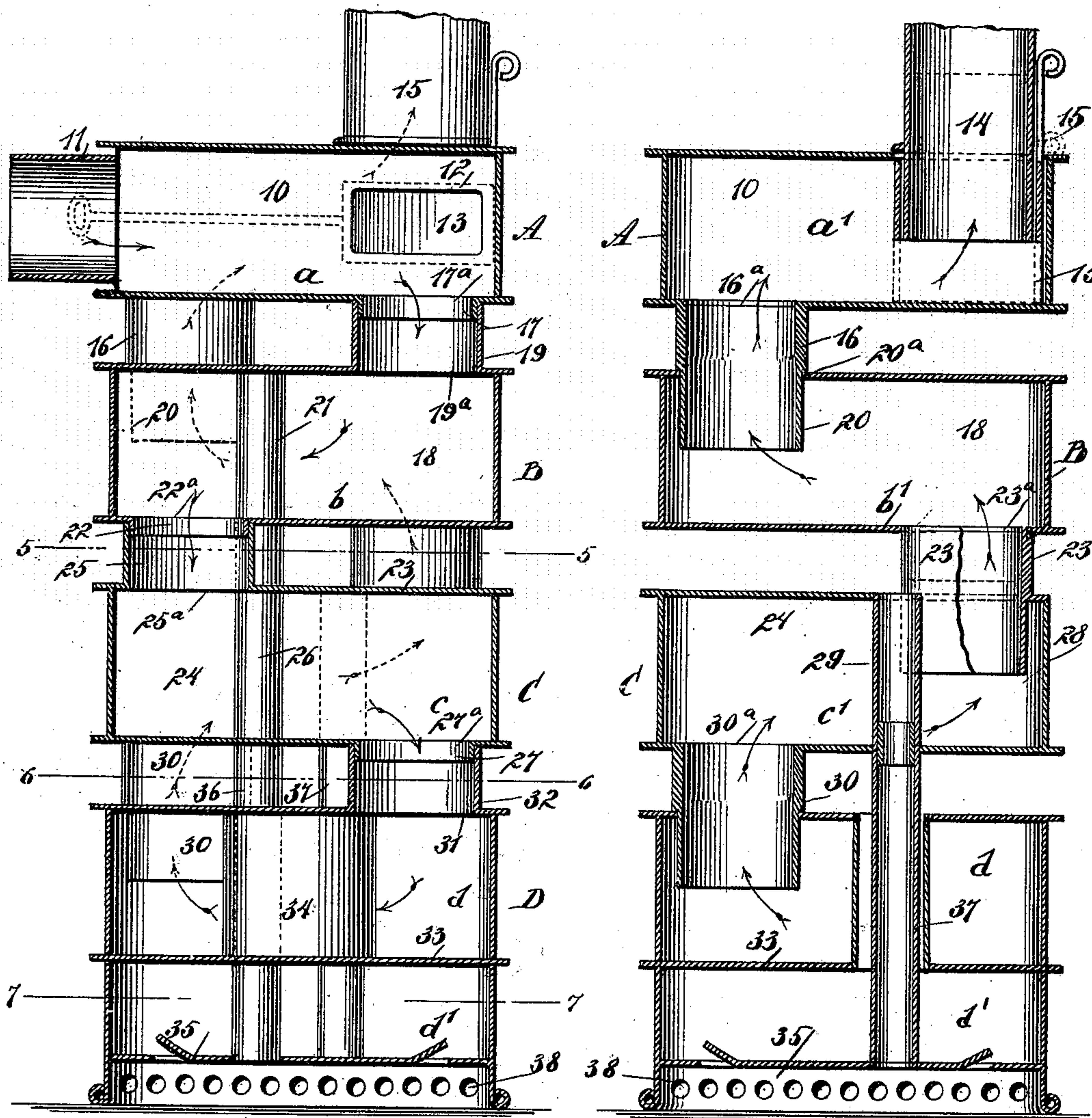
(Application filed Nov. 19, 1897.)

(No Model.)

2 Sheets—Sheet 1.

Fig. 1.

Fig. 2.



WITNESSES:

William P. Goebel.
[Signature]

INVENTOR

C. M. Richardson.

BY

[Signature]

ATTORNEYS.

No. 607,706.

C. M. RICHARDSON.
HEATING DRUM.

Patented July 19, 1898.

(No Model.)

(Application filed Nov. 19, 1897.)

2 Sheets—Sheet 2.

Fig. 3.

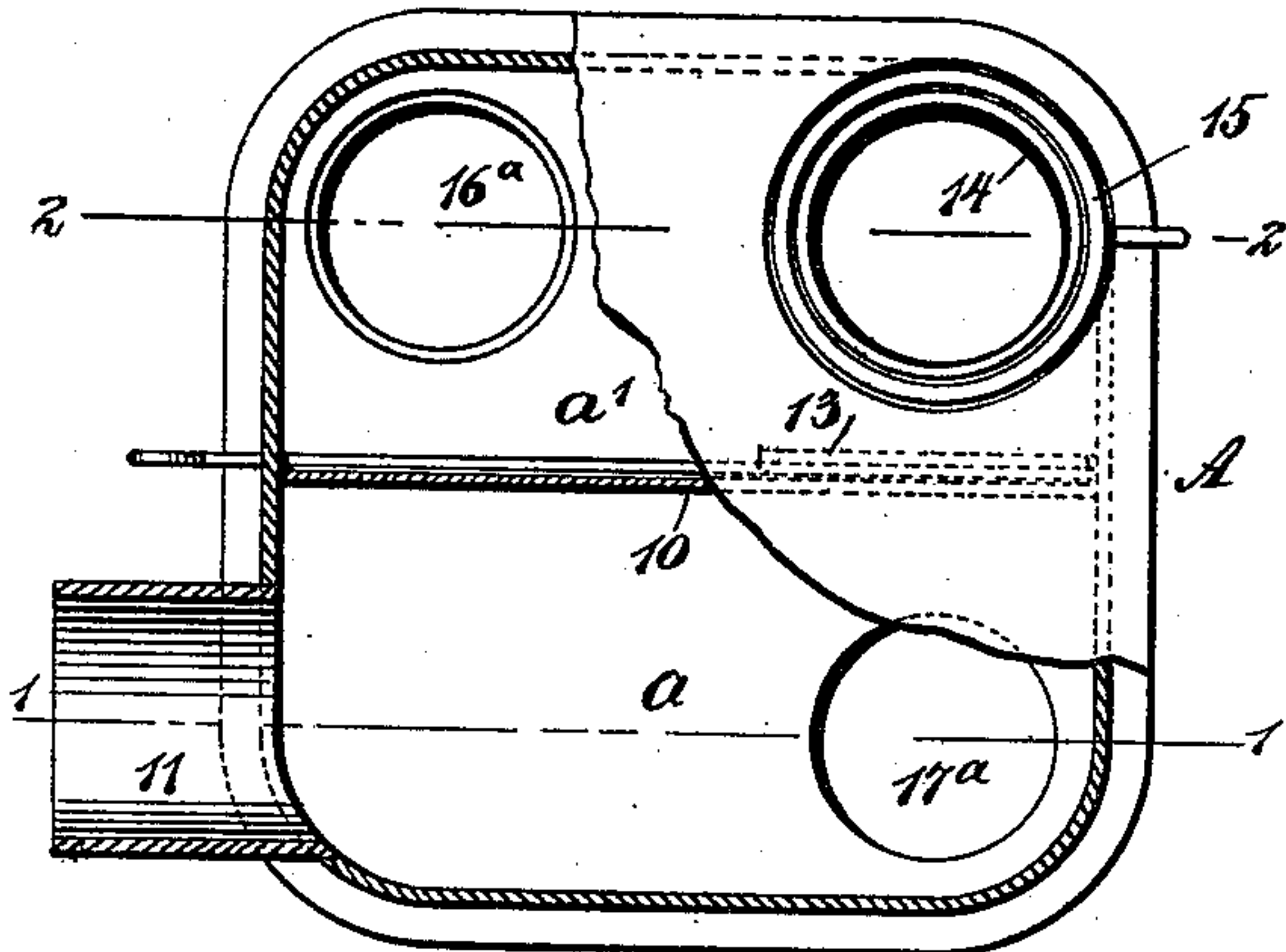


Fig. 4.

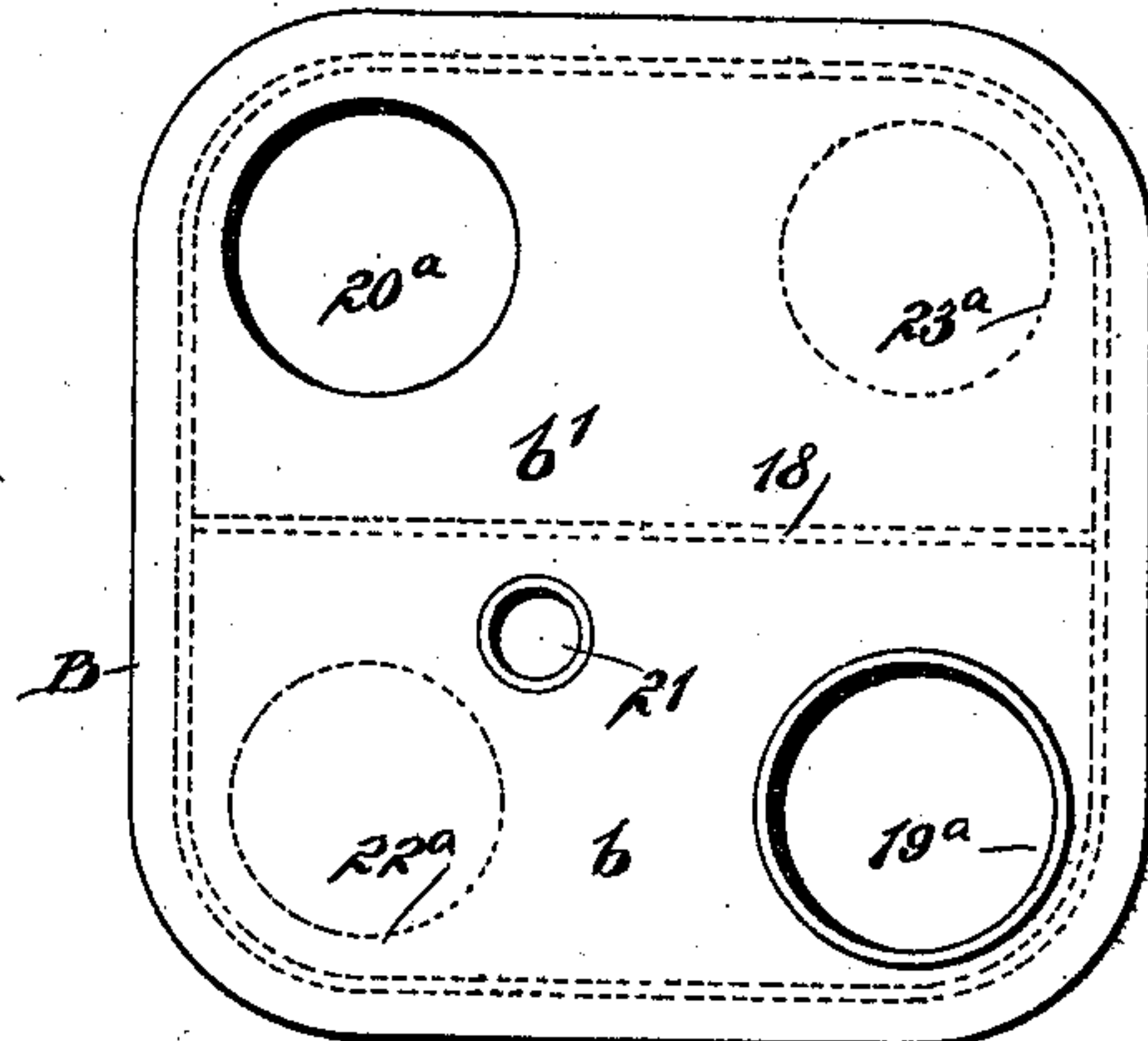


Fig. 5.

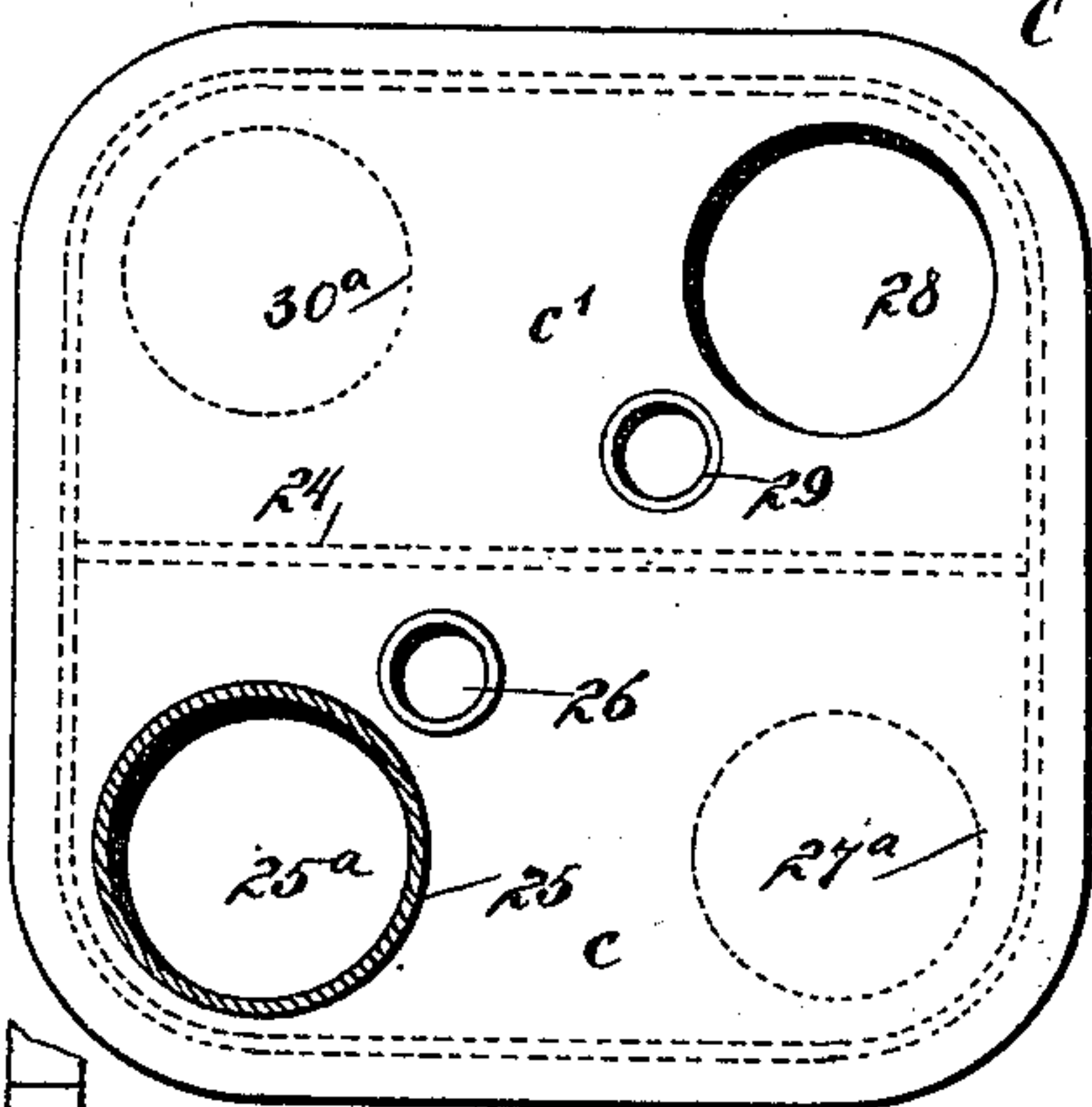


Fig. 6.

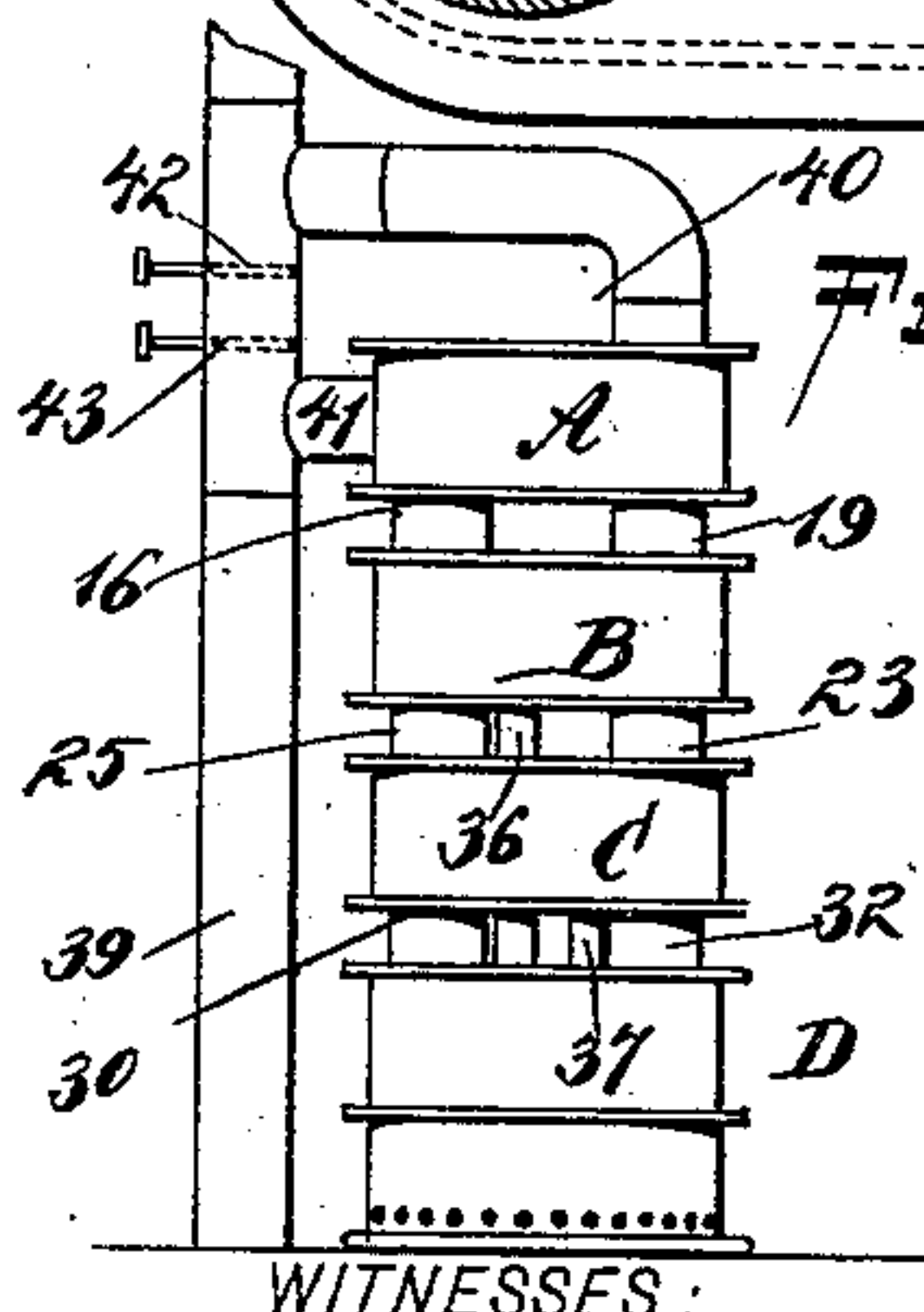
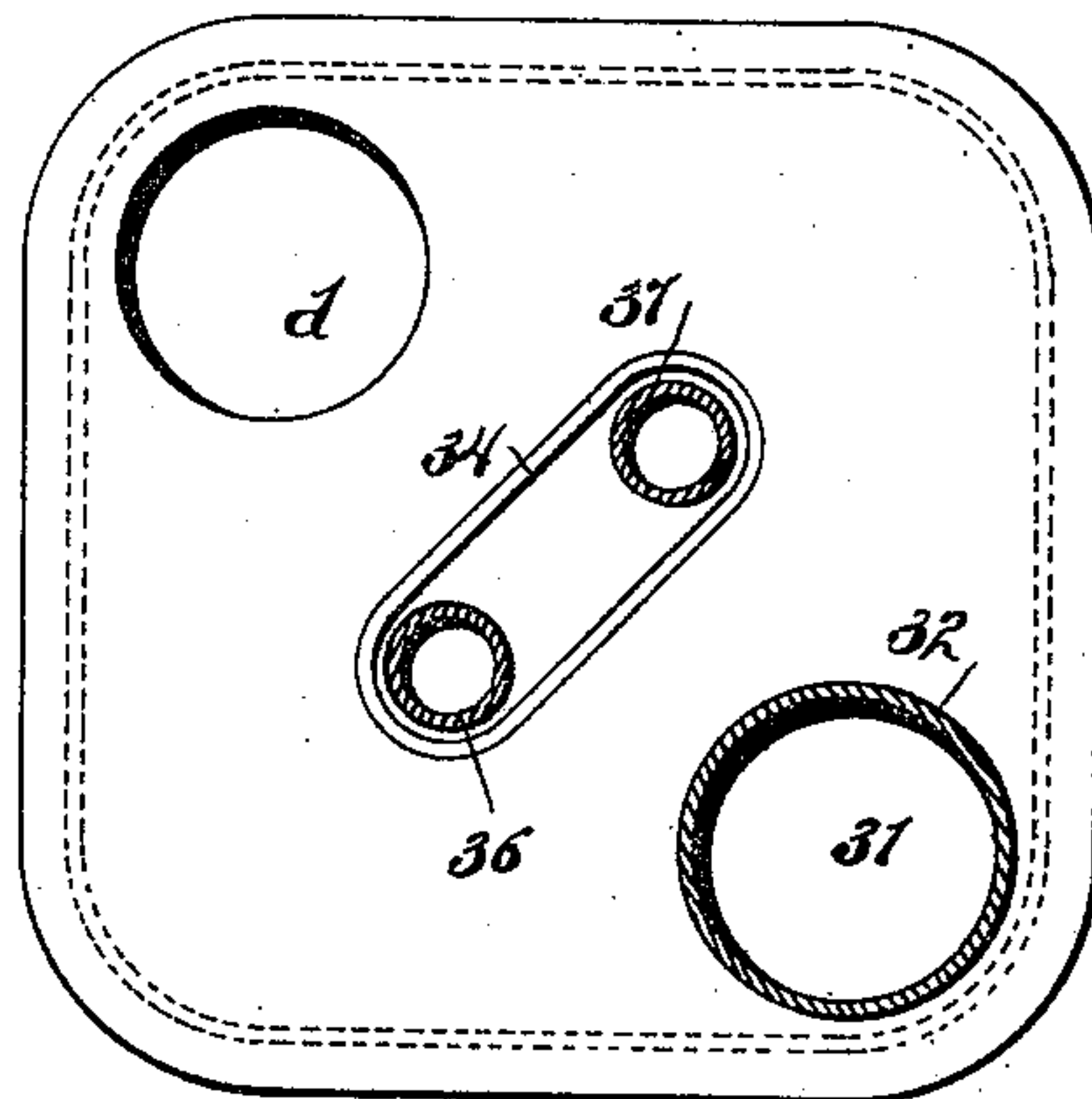
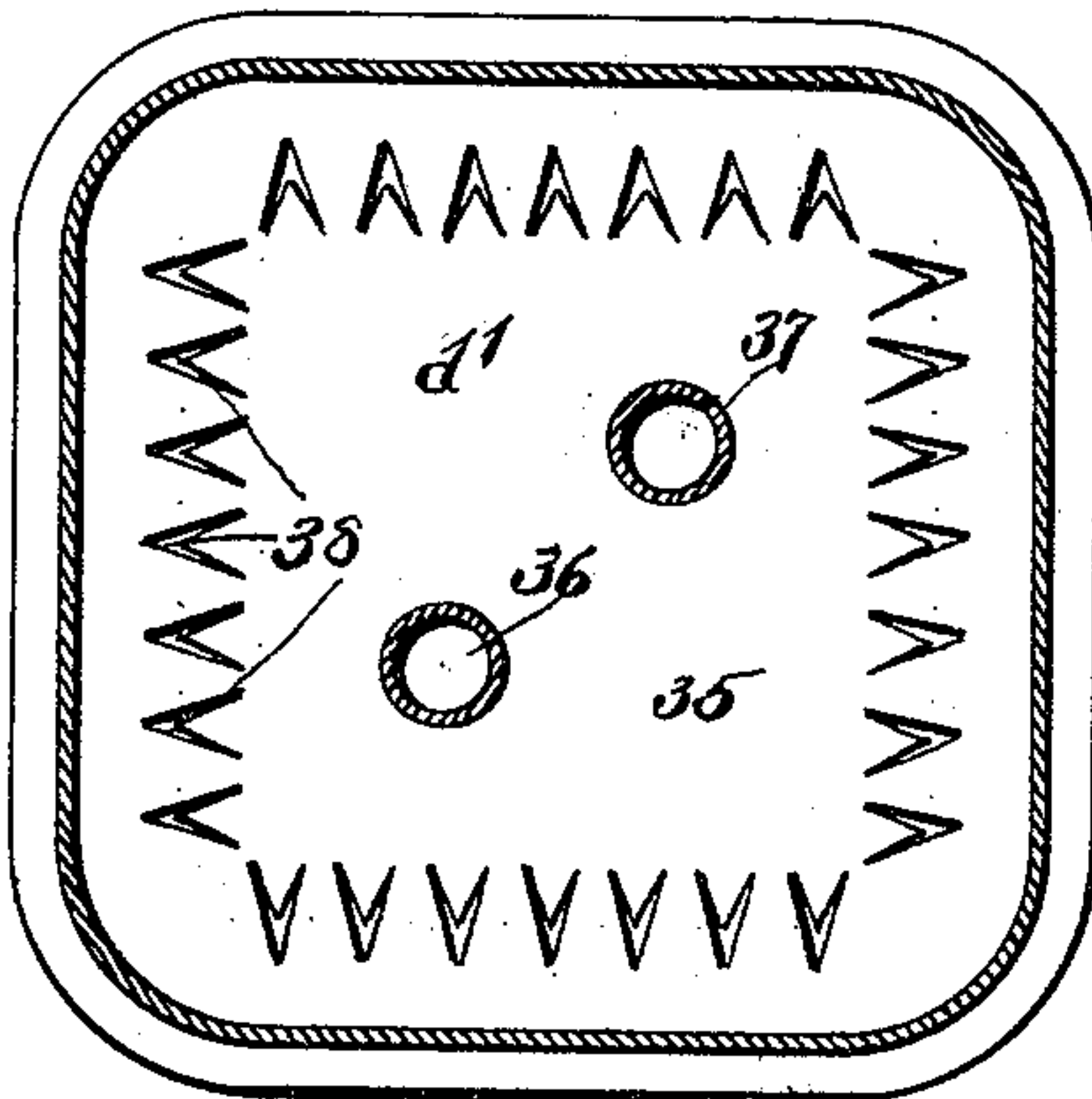


Fig. 8.

Fig. 7.



WITNESSES:
William P. Goebel.
J. H. Acker.

INVENTOR
C. M. Richardson.
BY *Mum*
ATTORNEYS.

UNITED STATES PATENT OFFICE.

CLAYTON MILLARD RICHARDSON, OF TORONTO, CANADA.

HEATING-DRUM.

SPECIFICATION forming part of Letters Patent No. 607,706, dated July 19, 1898.

Application filed November 19, 1897. Serial No. 659,131. (No model.)

To all whom it may concern:

Be it known that I, CLAYTON MILLARD RICHARDSON, of the city of Toronto, in the county of York, Province of Ontario, formerly of Winnipeg, in the county of Selkirk, Province of Manitoba, Dominion of Canada, have invented a new and Improved Heating-Drum, of which the following is a full, clear, and exact description.

10 My invention relates to an improvement in heating-drums, and has for its object to provide a device capable of being used in the same apartment with a stove, furnace, or other heater or in an apartment removed therefrom, the drum being so constructed that it may be large or small, as desired, and where-
15 by also the drum will afford a maximum of heat and without interfering with the draft of the heater to any appreciable extent.

20 A further object of the invention is to construct the heating-drum in sections, which sections may be expeditiously disconnected or assembled, enabling the various sections to be readily cleaned or repaired when neces-
25 sary.

A further object of the invention is to so construct the drum that radiant heat will be obtained from the waste products of combustion, and in addition the waste products
30 of combustion will be made to heat flues or pipes through which fresh air constantly passes.

The invention consists in the novel construction and combination of the several
35 parts, as will be hereinafter fully set forth, and pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indi-
40 cate corresponding parts in all the figures.

Figure 1 is a vertical section through the drum, taken on the line 1 1 of Fig. 3. Fig. 2 is a vertical section through the drum, taken parallel with the section shown in Fig. 1 on
45 the line 2 2 of Fig. 3. Fig. 3 is a plan view of the drum, a portion of the top of the upper section being broken away. Fig. 4 is a plan view of the second section of the drum. Fig. 5 is a transverse section on the line 5 5
50 of Fig. 1. Fig. 6 is a transverse section on the line 6 6 of Fig. 1. Fig. 7 is a transverse section on the line 7 7 of Fig. 1; and Fig. 8

is a side elevation of the improved heating-drum, illustrating the manner of connecting the same with a straight pipe. 55

The drum may be made of any number of sections. In the drawings four sections are shown as connected together, designated, respectively, as A, B, C, and D.

The upper section A of the drum is divided 60 into two compartments *a* and *a'* by a central vertical partition 10, and a pipe 11, adapted for connection with the heater or other source of heat-supply, leads into the compartment *a*. An opening 12 is made in the partition 65 10, which opening is normally closed by a valve or a damper 13, usually mounted to slide on the partition and provided with a handle which extends out through said section of the drum. An offtake-pipe 14 for the 70 waste products of combustion is carried through the top of the section A into the compartment *a'* of the same, and the offtake-pipe 14 is surrounded by a second pipe 15, which is in the nature of a cut-off valve, being pro- 75 vided with a suitable handle, and when it is desired to retain the products of combustion in the drum this cut-off valve is carried downward to an engagement with the bottom of the upper section, as shown in dotted lines in 80 Fig. 2. In the bottom of the compartment *a*, at the corner farthest removed from the inlet-pipe 11, an opening 17^a is made, surrounded by a collar 17, and in the corner of the compartment *a'* diagonally opposite the cor- 85 ner in which the opening 17^a is made an opening 16^a is produced in the bottom of the said compartment *a'*, as shown in Fig. 2, which is surrounded by a collar 16.

The second section B of the drum is pro- 90 vided with a vertical central partition 18, dividing the said section into two compartments *b* and *b'*. In the top of the compartment *b* an opening 19^a is made, surrounded by a collar 19, adapted to fit around the collar 17 of 95 the compartment *a* of the upper drum-section, and in the top of the compartment *b'* of the second drum-section an opening 20^a is made, in which a sleeve 20 is secured, the sleeve being adapted to enter the collar 16^a 100 of the upper drum-section, establishing communication with the compartment *a'* of the same. An air-pipe 21 is passed through the second drum-section from the top through the

bottom, and in the bottom of the compartment *b* of the second drum-section an opening 22^a is made, surrounded by a collar 22, and a similar opening 23^a is made in the bottom of the compartment *b'* of the second drum-section, surrounded by a collar 23, preferably made in two diameters.

The third drum-section C is divided by a partition 24 into two compartments *c* and *c'*. In the top of the compartment C an opening 25^a is made, surrounded by a collar 25, which is passed over the collar 22 of the next section above, and a pipe 26 extends through the compartment *c* from top to bottom, connecting with the pipe 21 of the second drum-section B. In the bottom of the compartment *c* of the third drum-section, at the corner diagonally opposite to that in which the opening 25^a is made, an opening 27^a is produced, surrounded by a collar 27, as shown in Fig. 1, and in the top of the compartment *c'* an opening 28 is made, which receives the sleeve or collar 23, projected downward from the second drum-section B, as shown in Fig. 2. A second air-pipe 29 is made to pass through this compartment *c'*, and in the bottom of the third drum-section C an opening 30^a is made, surrounded by a downwardly-extending collar 30, which collar is in two diameters, being similarly made to the collar or sleeve 23.

The lower drum-section D is divided into an upper compartment *d* and a lower compartment *d'* by a horizontal partition 33. In the top of the upper compartment *d* an opening 31 is made, surrounded by a collar 32, which receives the collar 27 of the third drum-section C, and a jacket 34, which is in the nature of a vertical partition, extends through an opening in the top of the compartment *d* through the partition 33. Two pipes 36 and 37 are carried from the bottom 35 upward through the jacket 34 and beyond the top of the lower section D to a connection, respectively, with the pipes 26 and 29 of the third drum-section C. The pipes 36 and 37 are open at the bottom and the top. The bottom 35 of the lower compartment *d'* is provided with a number of apertures or openings 38.

In operation the products of combustion enter the compartment *a* of the upper section of the drum, pass down through the openings 17^a and 19^a into the compartment *b* of the second section, thence through the openings 25^a and 22^a into the compartment *c* of the third section, and through the openings 27 and 31 into the upper compartment *d* of the lower drum-section. The products of combustion then pass up through the collar 30, which enters the compartment *d*, and the products of combustion will ascend through the opening 30^a into the compartment *c'* of the third drum-section, then through the opening 23^a into the compartment *b'* of the second drum-section and through the openings 20^a and 16^a in the compartment *a'* of the upper drum-section, and from thence out through the offtake-pipe 14. The hot air in its circuit through the

drums heats the air-pipes, and consequently the air passing through these pipes and finding an exit through these sections will also become heated. Furthermore, the fresh air that is admitted into the lower drum-section is heated in the jacket 34 and escapes into the room in all directions at the top of this section.

The pipes 15, 20, 23, and 30, extending, as shown, down into the sections of the drum, form pockets at their inner ends, which absolutely prevent the hottest of the products of combustion from passing into the flue.

In Fig. 8 I have shown a means of connecting the heating-drum with a straight supply-pipe 39, accomplished by what I term a "double" T. One lateral member 40 of the said T connects with the outlet-pipe 14 of the drum, and the other lateral member 41 of the double T enters the intake or receiving portion of the upper drum-section A. Two dampers 42 and 43 are located between the two lateral members 40 and 41. The dampers are principally intended to direct the products of combustion into the heater. Both dampers are solid and when closed a dead-air space is between them, effectually preventing the heat from passing from the supply-pipe to the flue.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. In a heating-drum, the combination, with a series of sections, and means, substantially as described, for introducing heat into the upper section of the drum and conducting it to the lower sections, of return-pipes for the heated air and connecting said sections, each return-pipe from an upper section extending within the next lower section, forming a pocket, and an outlet-pipe having a pocket-section within the upper drum-section, as specified.

2. A heating-drum comprising a series of compartments arranged one above the other and connected together, the compartments with the exception of the lower compartment being divided into subcompartments by vertical partitions, one of which is provided with a valve, the lower compartment being provided with a partition extending only partially across the same, substantially as described.

3. A heating-drum comprising a series of compartments one above the other and connected together, the compartments being divided into subcompartments by vertical partitions with the exception of the lower compartment, and air-pipes extending through the lower compartment and through the next compartment above, said air-pipes having their outlets between compartments so as to discharge heated air under the bottom of compartments, substantially as described.

4. A heating-drum comprising a series of detachable sections, each section with the exception of the lower section being divided into compartments by vertical partitions, corre-

sponding compartments of the divided sections being connected, all of the compartments being connected with the lower section, a cut-off valve for the outlet of the drum, and
5 a direct-draft valve in the partition of the upper drum-section, substantially as described.

5. The combination, with a drum comprising a series of connected sections, one above the other and provided with spaces between
10 sections, one of said sections having an inlet for products of combustion and a flue connection, of flues arranged for the passage of air, each flue passing through sundry of the sections, the flue-outlets being between sec-
15 tions of the drum, for the purpose specified.

6. A heating-drum comprising a series of compartments, one above the other and connected together, the compartments being divided into subcompartments by means of
20 vertical partitions except the lower compartment in which the partition is horizontal, the lower subcompartment having air-vents, air-pipes extending from the bottom of the drum through various compartments, having out-
25 lets between the compartments, and a tubular partition or jacket extending through the upper subcompartment of the lower compartment, substantially as described.

7. A heating-drum, comprising a series of
30 sections, means for introducing heat into the upper section and conducting it to the lower sections, and return-pipes for the heated air and connecting said sections, each return-pipe from an upper section extending down-

wardly into the next lower section, forming a 35 pocket, substantially as described.

8. A heating-drum, comprising a series of superposed connected sections, and air-flues each extending through the lower compart-
40 ment and through the next compartment above, substantially as described.

9. A heating-drum, comprising a series of superposed connected sections, and air-flues each extending through the lower compart-
45 ment and through the next compartment above, said flues terminating between different compartments so as to discharge heated air at different heights, substantially as described.

10. A heating-drum, comprising a series of 50 superposed connected sections, a tubular partition or jacket located in the lower section, and air-flues extending upwardly through said jacket, substantially as described.

11. A heating-drum, comprising a series of 55 superposed connected sections, the lower section being provided with a partition dividing it into an upper and a lower subcompartment, a tubular partition or jacket located in the upper subcompartment, and air-flues ex- 60 tending upwardly through the lower subcompartment and through said jacket, substantially as described.

CLAYTON MILLARD RICHARDSON.

Witnesses:

GEORGINA L. WINNEFRITH,
WESLEY W. SNELL.