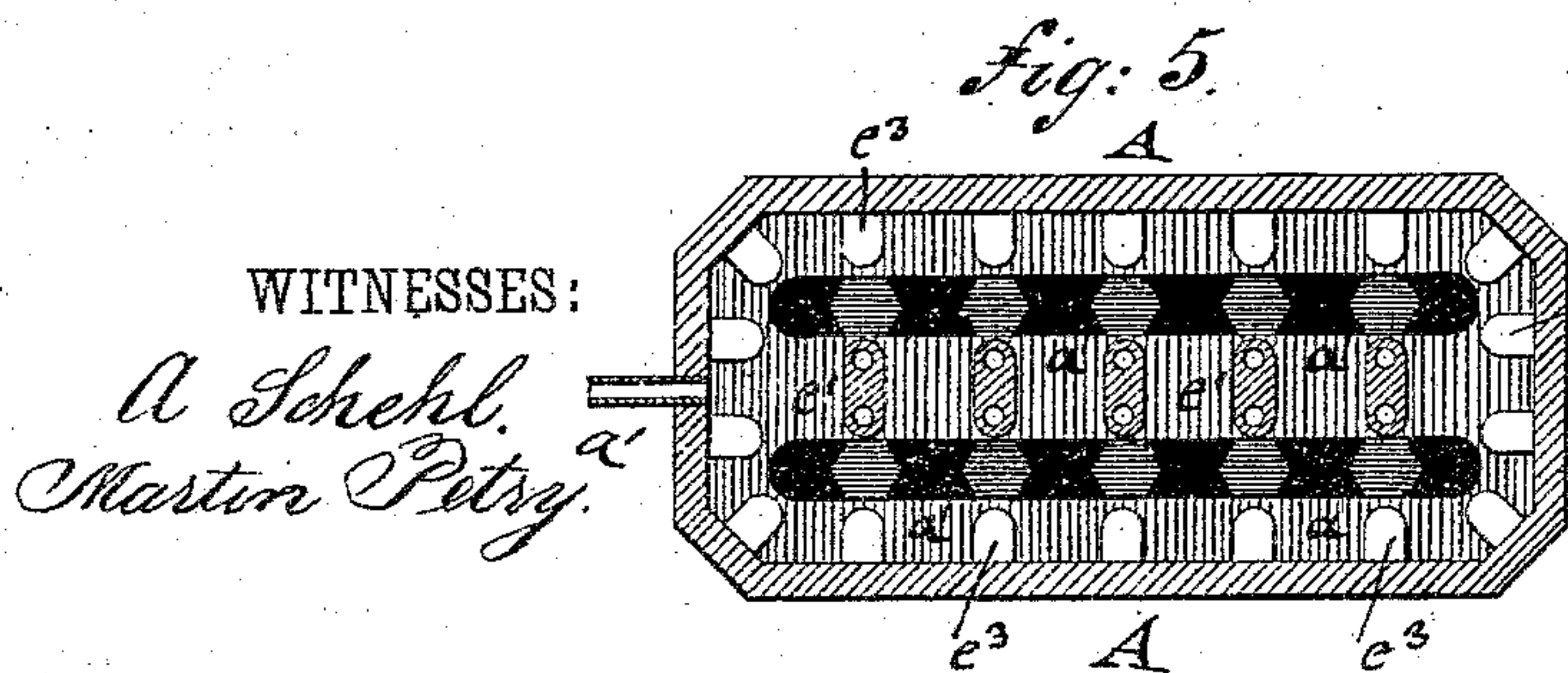
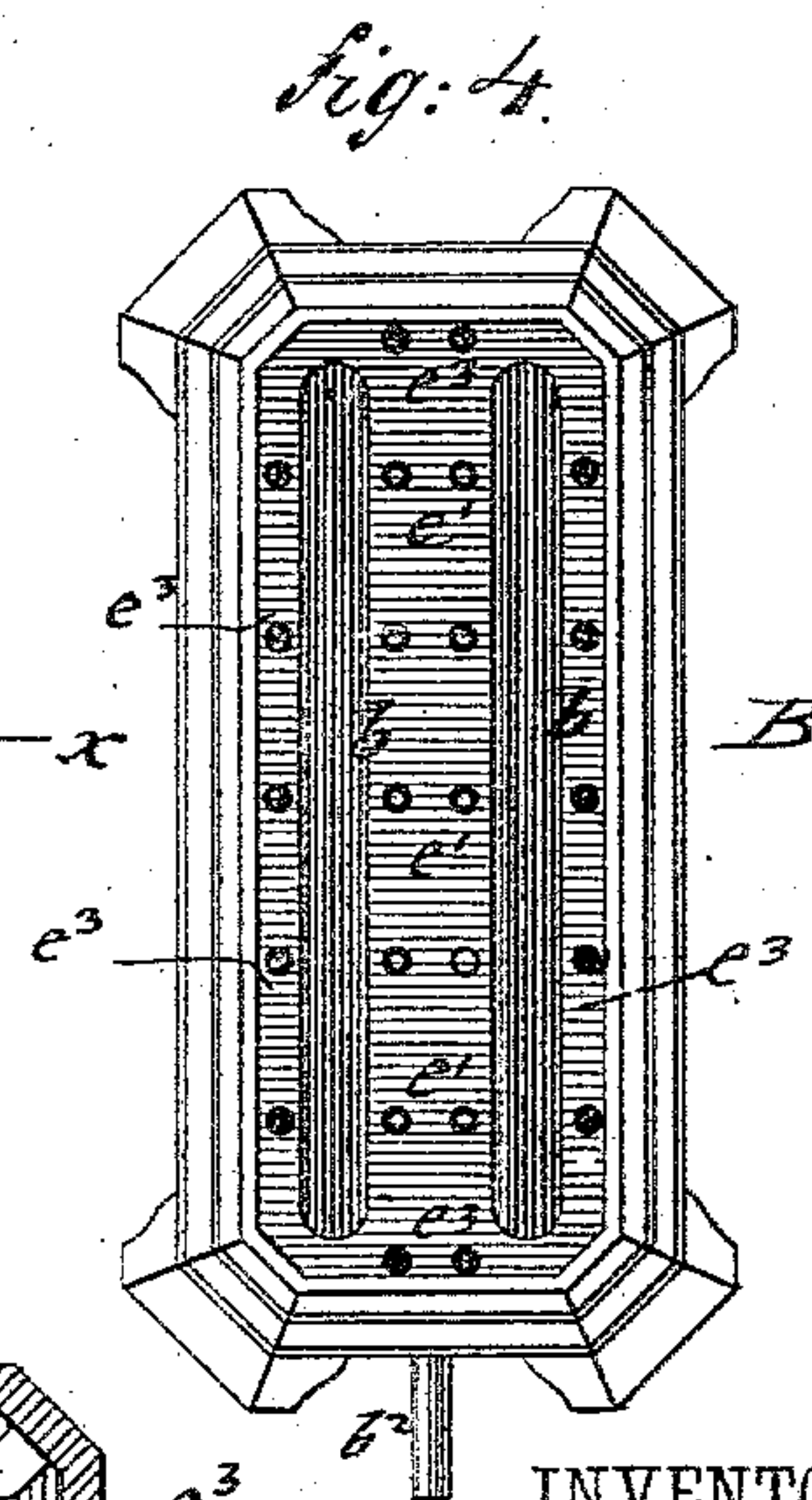
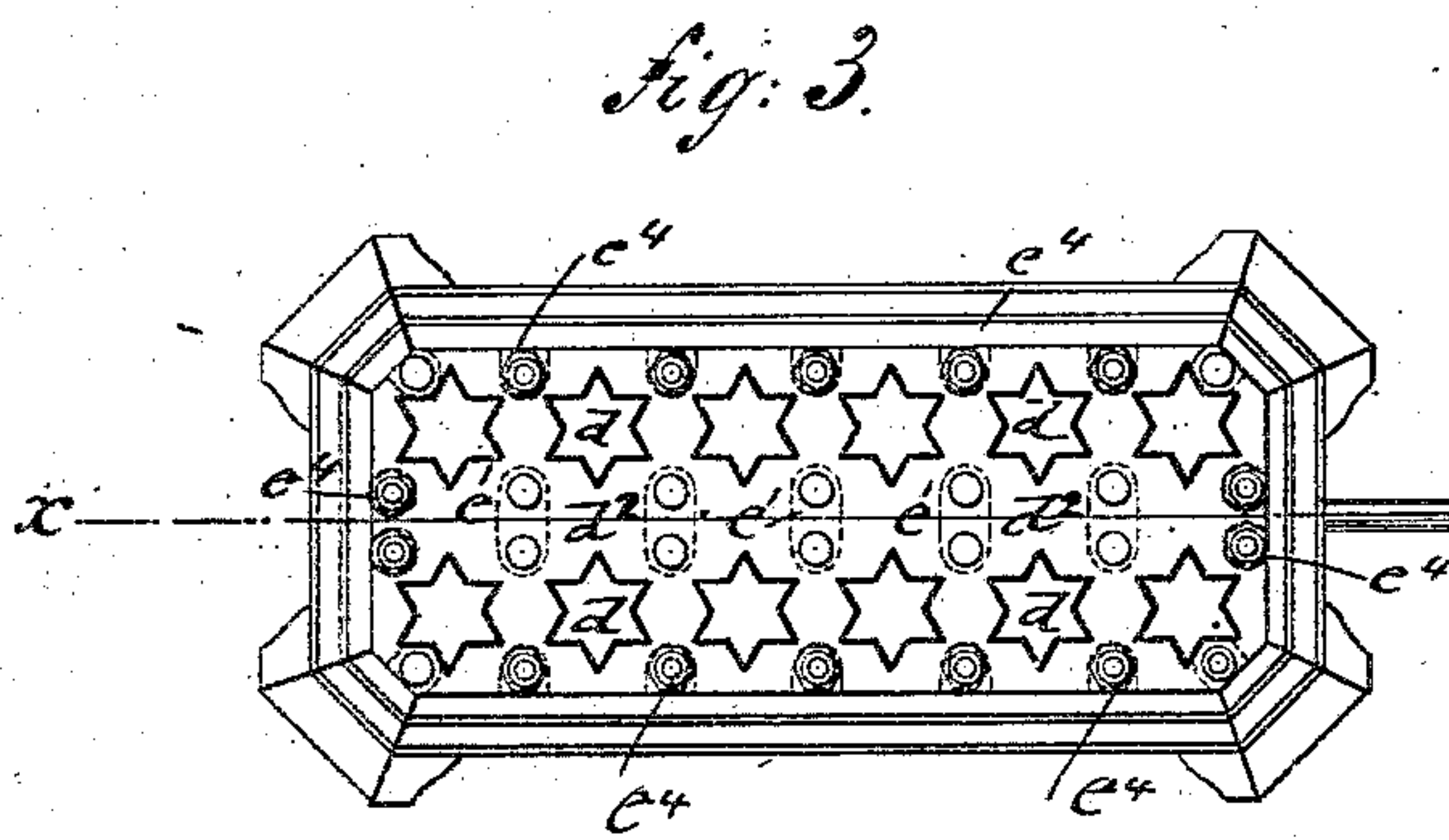
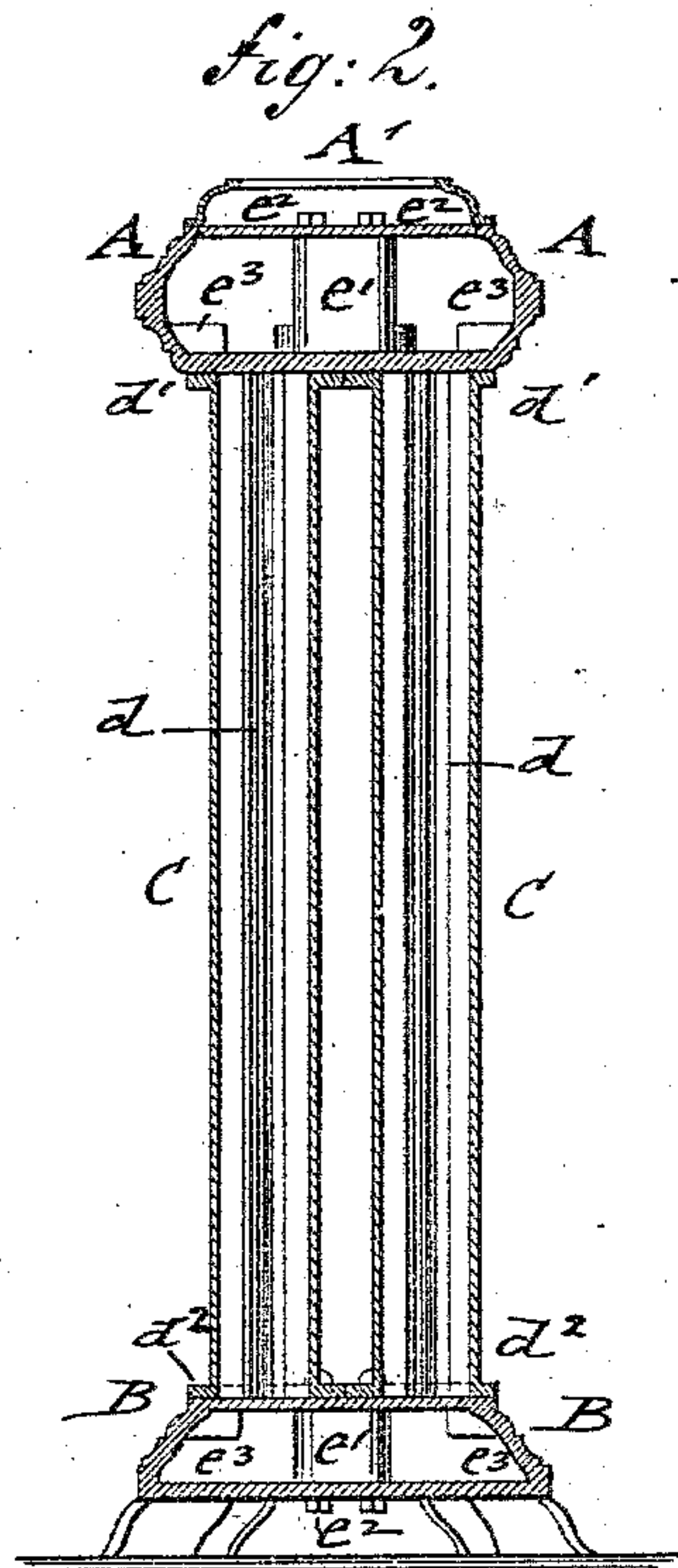
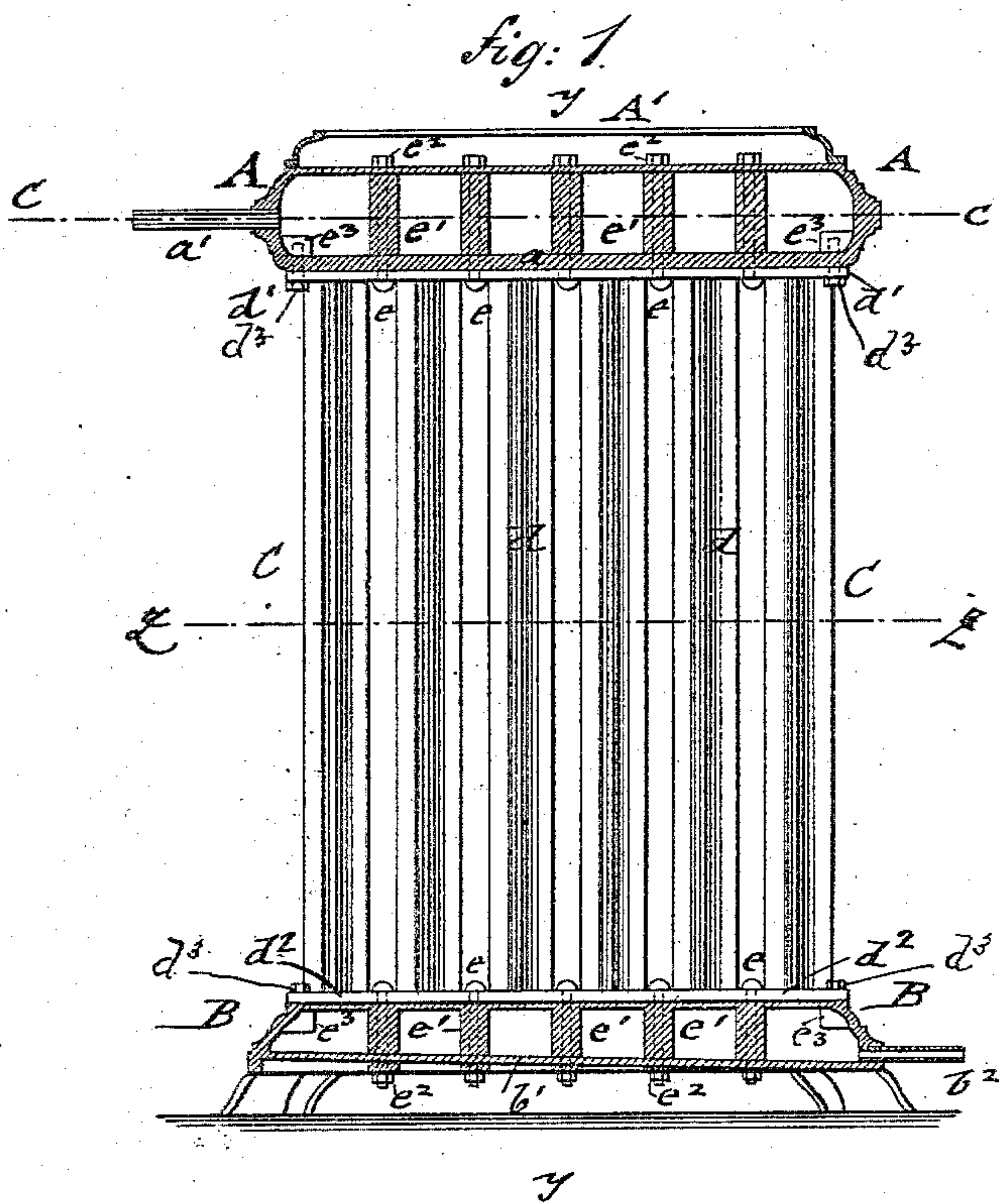


(No Model.)

R. BRASS & J. CHAPMAN.  
STEAM RADIATOR.

No. 295,343.

Patented Mar. 18, 1884.



WITNESSES:

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BY

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# UNITED STATES PATENT OFFICE.

ROBERT BRASS AND JOHN CHAPMAN, OF BROOKLYN, NEW YORK.

## STEAM-RADIATOR.

SPECIFICATION forming part of Letters Patent No. 295,343, dated March 18, 1884.

Application filed June 9, 1883. (No model.)

*To all whom it may concern:*

Be it known that we, ROBERT BRASS and JOHN CHAPMAN, both of Brooklyn, in the county of Kings and State of New York, have  
5 invented certain new and useful Improvements in Steam-Radiators, of which the following is a specification.

This invention has reference to improvements in that class of steam-radiators which  
10 are made entirely of cast-iron, and in which the steam enters at the top of the radiator, while the water of condensation is collected and discharged at the bottom of the same; and the invention consists of a steam-radiator made of  
15 three parts, a cast-iron top chamber, a middle portion composed of circulating-pipes, and of top and bottom flanges cast integral therewith, and of a bottom chamber having an inclined bottom, the top and bottom chambers having  
20 interior side and center lugs, to which the flanges of the middle portion are secured by screw-bolts.

In the accompanying drawings, Figure 1 represents a vertical longitudinal section on line  
25  $x x$ , Fig. 3, of our improved steam-radiator. Fig. 2 is a vertical transverse section of the same on line  $y y$ , Fig. 1. Fig. 3 is a horizontal section on line  $z z$ , Fig. 1; Fig. 4, a plan of the bottom chamber, shown as detached; and Fig.  
30 5 is a horizontal section of the top chamber on line  $c c$ , Fig. 1.

Similar letters of reference indicate corresponding parts.

A in the drawings represents a cast-iron top  
35 chamber, which is provided with longitudinal bottom openings,  $a a$ , and at one end with a steam-inlet pipe,  $a'$ . A perforated ornamental top plate,  $A'$ , is placed on the top of the chamber A, so as to prevent contact with the heated  
40 surface of the same.

B is a bottom chamber, which is also made of cast-iron, and provided with longitudinal top openings,  $b b$ , an inclined bottom,  $b'$ , and a discharge-pipe,  $b^2$ , for the water of condensa-  
45 tion, at the lowermost part of the bottom  $b'$ . The top chamber, A, is connected with the bottom chamber, B, by one or more intermediate castings, C, each of which consists of a row of circulating-pipes,  $d d$ , which are made of star-  
50 shaped or other suitable cross-section, so that a large radiating-surface is obtained. Each

row of pipes C is provided at the upper and lower ends with flanges  $d' d^2$ , respectively, which are cast integral with the body of the circulating-pipes C, so as to serve as a direct  
55 means of connection between the top and bottom chambers. The contact-faces of the flanges  $d' d^2$  of the intermediate casting, C, as well as the adjoining faces of the top and bottom chambers, A and B, are planed or smoothly ground  
60 off, whereby they fit exactly to each other, they being furthermore packed by an intermediate layer of lead or other suitable packing, so as to prevent the escape of steam. The flanges  
65  $d' d^2$  of the circulating-pipes  $d d$  are secured to the face-plates of the top and bottom chambers by screw-bolts  $d^3$ . For this purpose the top and bottom chambers are provided with interior projecting lugs,  $e^3 e^3$ , cast integral with the  
70 chambers at the side walls of the same. Screw-holes are drilled through the face-plates of said chambers and into the lugs  $e^3$ , but not entirely through the same, but of sufficient depth, so that the screw-bolts can firmly take hold of the  
75 same. The flanges  $d' d^2$  are perforated for the passage of the fastening-bolts. When the radiator is to be constructed with more than one  
80 row of circulating-pipes, the top and bottom chambers are further cast with center lugs,  $e' e'$ , extending transversely between the longitudinal openings  $a a$  and  $b b$  of said chambers. These lugs serve also to strengthen the face-plates of the chambers A and B, as they have  
85 to be made wider when several rows of circulating-pipes are to be used. Through the lugs  $e' e'$  and top and bottom plates of the chambers A and B are drilled holes—one at each end of the lugs—also corresponding holes in the flanges  
90  $d' d^2$ . The top chamber, A, is first connected to the intermediate castings, C C, by being placed in inverted position. The castings C are placed thereon, and the screw-bolts  $e e$  then dropped, with their threaded shanks downward, through  
95 the holes of the flanges and center lugs, and then screwed tight by nuts  $e^2$ . The bottom chamber, B, is then connected in the same manner with the castings C, which are placed in upright position on the bottom chamber. The screw-bolts of the side lugs are next screwed  
100 in, and thus a rigid connection of the main parts of the radiator obtained, in which all the screw-bolts engage solid portions of the cham-



bers without giving exit to the steam, so that leakage resulting from untightness of the parts is entirely obviated. As the main parts composing the radiator are made of cast-iron, a radiator of cheap construction that emits the heat quickly and effectively is obtained.

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

10 1. A steam-radiator composed of a top chamber having bottom openings, an intermediate casting or castings, each composed of a row of circulating-pipes having top and bottom flanges cast integral therewith, a bottom chamber having openings at the upper part, and means whereby the top and bottom chambers are connected to the flanges of the intermediate casting or castings, substantially as and for the purpose set forth.

20 2. The combination, in a steam-radiator, of the top and bottom chambers, A and B, having openings *a a* and *b b*, and interior projecting lugs, *e e*, cast integral with said chambers, an intermediate casting, C, composed of a row of circulating-pipes, *d d*, and top and bottom flanges, *d' d'*, cast integral therewith, said top and bottom chambers being connected to the flanges of the intermediate circulating-pipes by screw-bolts that take into the interior lugs of the chambers, substantially as set forth.

30 3. The combination of top and bottom chambers, A and B, having openings *a a* and *b b*, and interior side and center lugs, *e' e'*, intermediate castings, C C, each composed of a row of circu-

lating-pipes, *d d*, and of top and bottom flanges, *d' d'*, and screw-bolts *e' e'*, that connect the flanges of the castings with the lugs of the top and bottom chambers, substantially as set forth.

4. In a steam-radiator, the combination of the top and bottom chambers, A and B, having longitudinal openings, interior and partly-perforated side lugs cast integral with the walls of the chambers, and the intermediate castings, C C, each composed of a row of pipes having top and bottom flanges, substantially as described.

5. In a steam-radiator, the top and bottom chambers, A B, having openings *a a* and *b b*, interior and partly-perforated side lugs and perforated center lugs, said side and center lugs being cast integral with the body of said chambers, substantially as described.

6. In a steam-radiator, the combination of the top chamber, A, provided with longitudinal openings in its bottom, the steam-inlet pipe *a'*, lugs *c' c'*, partly-perforated castings C C, nuts *c''*, the top plate, A, and the bottom chamber, B, provided with lugs *c' c'* and discharging-pipe.

In testimony that we claim the foregoing as our invention we have signed our names in presence of two subscribing witnesses.

ROBERT BRASS.  
JOHN CHAPMAN.

Witnesses:

PAUL GOEPEL,  
SIDNEY MANN.