

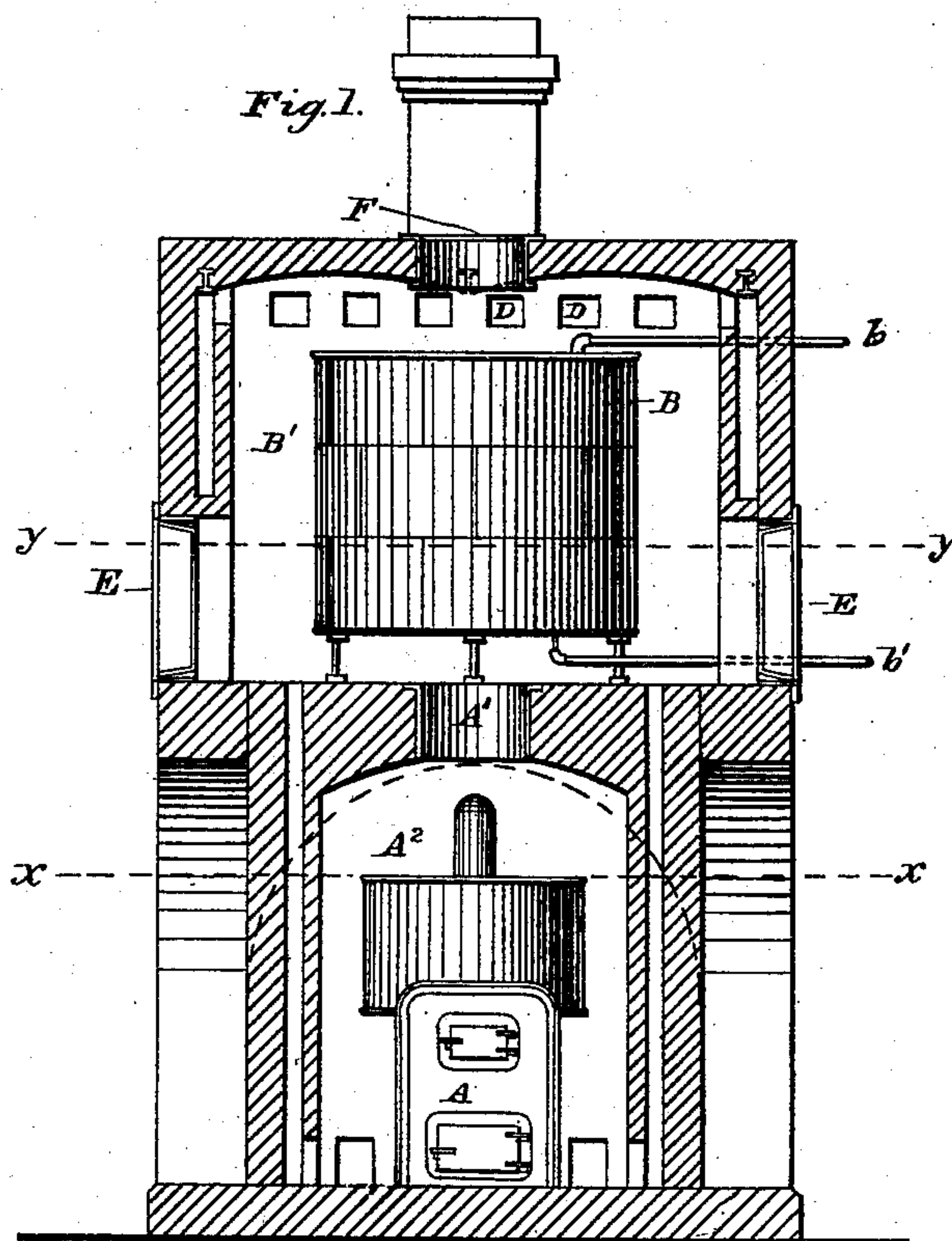
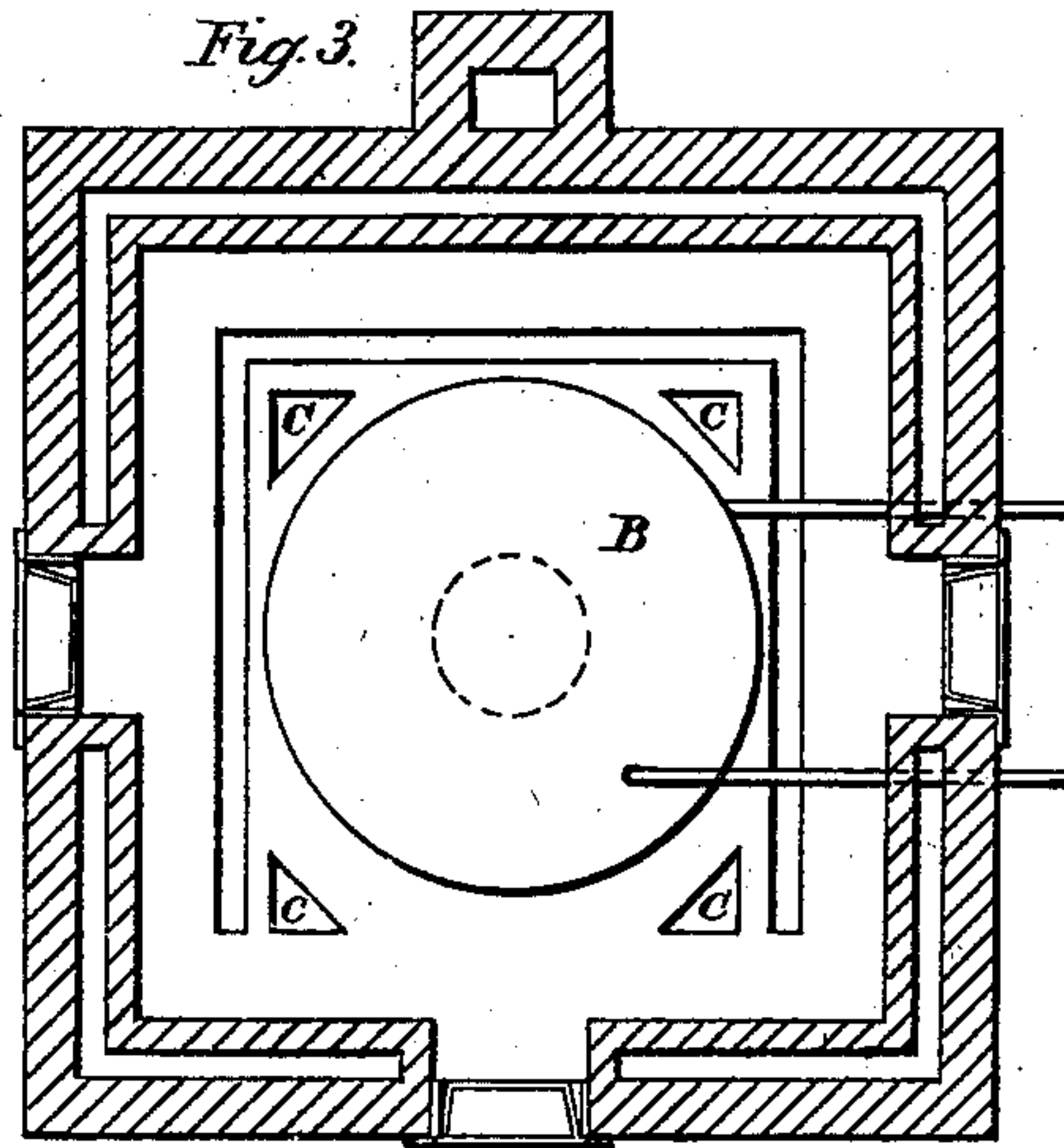
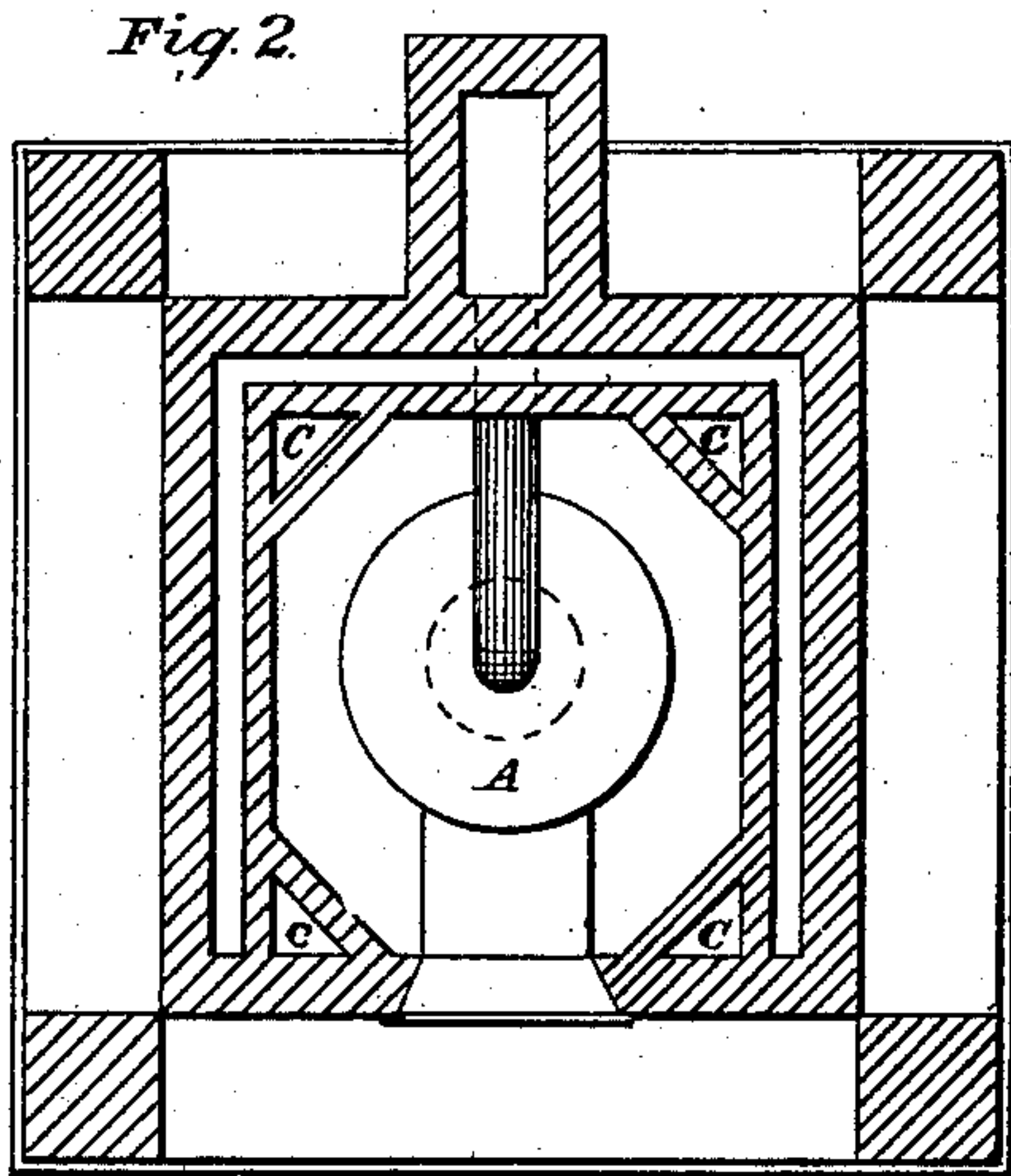
(No Model.)

R. C. CLARK & W. F. BEECHER.

PROCESS OF DISTILLING PETROLEUM.

No. 275,589.

Patented Apr. 10, 1883.



WITNESSES

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# UNITED STATES PATENT OFFICE.

ROLLIN C. CLARK AND WILLIAM F. BEECHER, OF CLEVELAND, OHIO.

## PROCESS OF DISTILLING PETROLEUM.

SPECIFICATION forming part of Letters Patent No. 275,589, dated April 10, 1883.

Application filed October 9, 1880. (No model.)

*To all whom it may concern:*

Be it known that we, ROLLIN C. CLARK and WILLIAM F. BEECHER, of Cleveland, in the county of Cuyahoga and State of Ohio, have  
5 invented certain new and useful Improvements in Apparatus for the Distillation of Petroleum; and we do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the  
10 art to which it pertains to make and use it, reference being had to the accompanying drawings, which form a part of this specification.

Our invention relates to an improvement in apparatus for distilling petroleum, the object  
15 being to produce an apparatus of this character which shall be adapted to the production of fine grades of distillates and residua, and with the expenditure of the minimum amount of heat.

20 With this object in view our invention consists essentially in an apparatus in which the still is completely submerged in a bath of uniformly-heated air.

Heretofore it has been customary to construct  
25 stills immediately over a fire-box, leaving sometimes a large part of the upper portion of the sides of the still exposed to the air; at other times incasing them as far as the top of the still, but leaving the top exposed; and still  
30 another mode of construction is that of incasing them to the top of the still and then throwing dirt or other non-conductor over the top of the still; but in every case it is necessary to heat the bottom of the still to a very high  
35 temperature in order to sufficiently heat the top of the still to volatilize the material contained in the still. In our improved apparatus the entire surface of the still is uniformly heated, and hence a lesser degree of heat suffices  
40 to carry on the distillation. Another advantage resulting from the use of our apparatus is that the amount of coke remaining in the still after the distillation is comparatively small. Again, our apparatus is especially  
45 adapted to the production of fine grades of residua suitable for medicinal and lubricating purposes, while on the other hand the residuum remaining in stills of the old types is often burned or scorched and discolored.

50 The apparatus herein shown and described is one illustration of an apparatus embodying

our invention; but we would have it understood that we do not confine ourselves to this particular construction.

In the drawings, Figure 1 is a vertical sectional view of a furnace constructed according  
55 to our invention, showing the still in elevation. Fig. 2 is a transverse sectional view of Fig. 1 through the line *x x*. Fig. 3 is a transverse sectional view of Fig. 1 through the line  
60 *y y*.

In the said drawings, A represents the furnace or heating apparatus, which may consist of any desired type or pattern.

B represents the still, which is situated preferably immediately over the furnace. This  
65 still B is provided with outlet-pipes *b* and *b'*, the former for the escape of the volatilized products of petroleum, while the pipe *b'* is adapted to draw off the residuum which may settle at  
70 the bottom of the still. This still should be provided with the ordinary man-hole upon its top, which of course during the process of distillation is closed.

The furnace A is placed in a room, as before  
75 stated, immediately beneath the still. This room is connected with that containing the still by an aperture or opening, A'. This furnace-room we prefer to construct with double  
80 walls, in order to make the same a better non-conductor, as shown in Fig. 1.

Communicating with the room B', in which the still is placed, are flues C. The object of these flues or passages is to return the air from  
85 the room B', after it has performed its office and becomes somewhat cool, to the furnace-room below. As shown in the drawings, these flues are situated in the corners of the chambers A<sup>2</sup> and B'.

The apertures D (shown in Fig. 1) are simply  
90 passages to the air-chamber between the inner and outer walls of the room B'.

E E and F are doors in the chamber B', the two former placed preferably upon the lower  
95 sides of the room and the latter immediately over the still.

Heretofore when it has been desired to remove the residuum from a still it has taken a  
considerable length of time for the still, surrounded, as it has been, by brick walls, to become sufficiently cool. In this construction  
100 the doors E E and F may be opened, the ap-



erture A' closed, when there will be a complete circulation of air about the still B, which will cool it very rapidly.

Having thus described the construction of our apparatus, its operation is as follows: The still B being supplied with the petroleum desired to be distilled, the doors E E and F of the chamber B' are closed tightly, the covering of the aperture A' removed, and the fires in the furnace A started. The heated air from the furnace A will pass through the aperture A' and soon fill the chamber B'. As it becomes cool it will return through the flues C C to the chamber A<sup>2</sup>, where it is again heated and again passes to the chamber B', as before. By these means the temperature of the room B' may be raised to any degree desired. After the petroleum in the still has been heated to the desired degree and distilled as closely as required the aperture A' may be covered and the doors E E and F opened, when the still B will rapidly cool and the residuum may be removed or the still cleaned thoroughly through the man-hole before referred to.

We are aware that it is not new to apply heated air to the exposed surfaces of retorts mounted in benches. We are also aware that it is not new to apply heated air to the bottoms and sides of stills, and to provide means for regulating the temperature of the air so applied. We do not therefore broadly claim the application of heated air to retorts and stills to effect distillation, our invention consisting in completely immersing the still in a bath of air heated to a uniform temperature, whereby we obtain superior distillates and re-

siduals and facilitate all operations of distillation.

Having thus described the construction and operation of our device for carrying out our process, what we claim is—

1. The combination, with a still located in a closed chamber and completely surrounded by air, of means to heat the air of said chamber, substantially as set forth.

2. The combination, with a still supported in a closed chamber so as to be entirely surrounded by air, and means to sustain the air in the chamber at a uniform temperature of desired degree, of a furnace arranged to heat the air of the said chamber, the caloric-current being entirely excluded therefrom, substantially as set forth.

3. The combination, with a structure embodying an upper and a lower chamber, communicating with each other through flues or passages, which convey heated air to the upper and return it cooled to the lower chamber, of a still located in the upper chamber and supported therein so as to be entirely surrounded by air, and a furnace located in the lower chamber, and means for excluding the caloric-current thereof from the upper chamber, substantially as set forth.

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

ROLLIN C. CLARK.

WILLIAM F. BEECHER.

Witnesses:

JNO. CROWELL, Jr.,

ALBERT E. LYNCH.