

(No Model.)

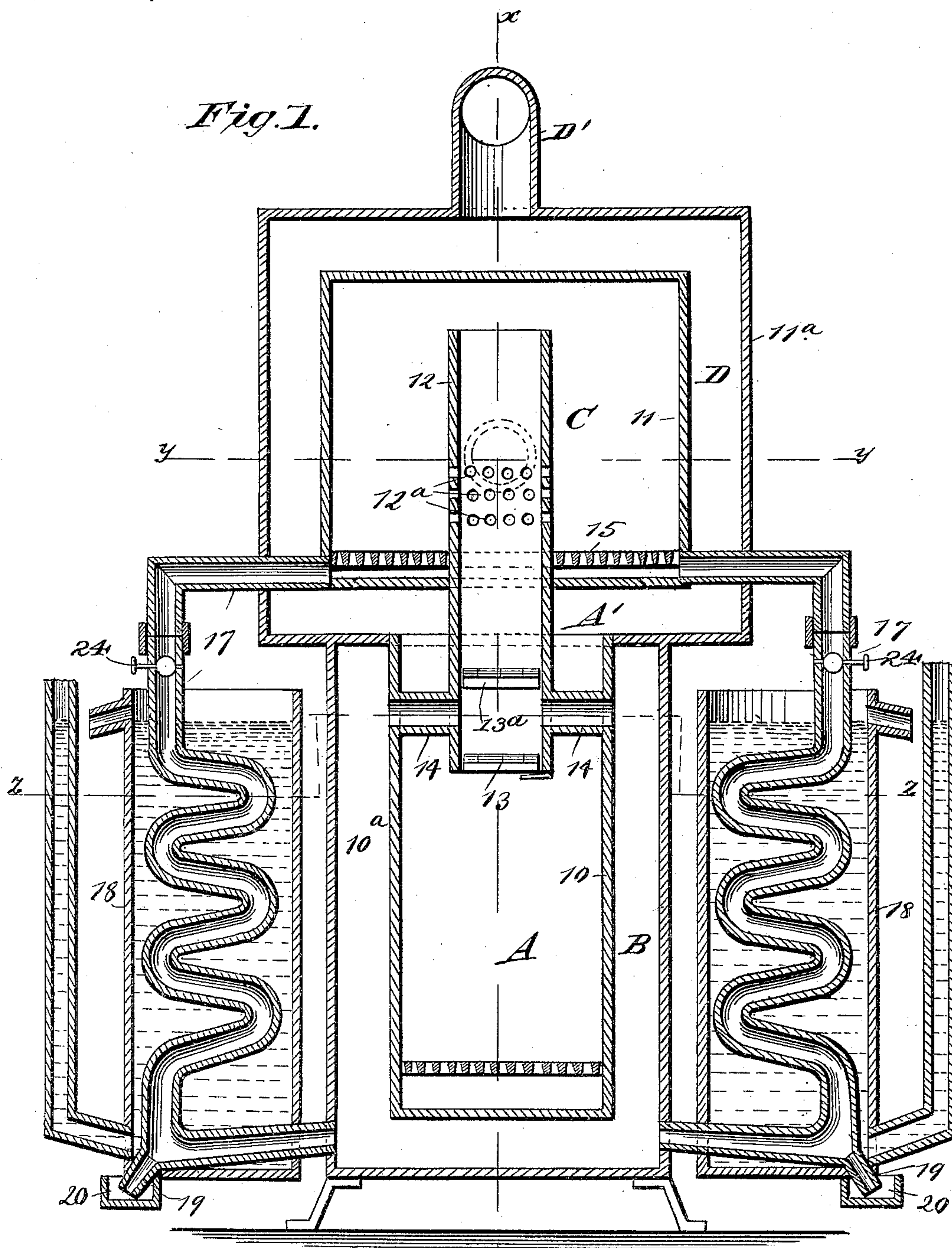
3 Sheets—Sheet 1.

J. SCHERFFIUS.  
CHARCOAL APPARATUS.

No. 409,873.

Patented Aug. 27, 1889.

*Fig. 1.*



WITNESSES:

*Phil. C. Dieterich.*

*C. Sedgwick.*

INVENTOR

*J. Scherffius*

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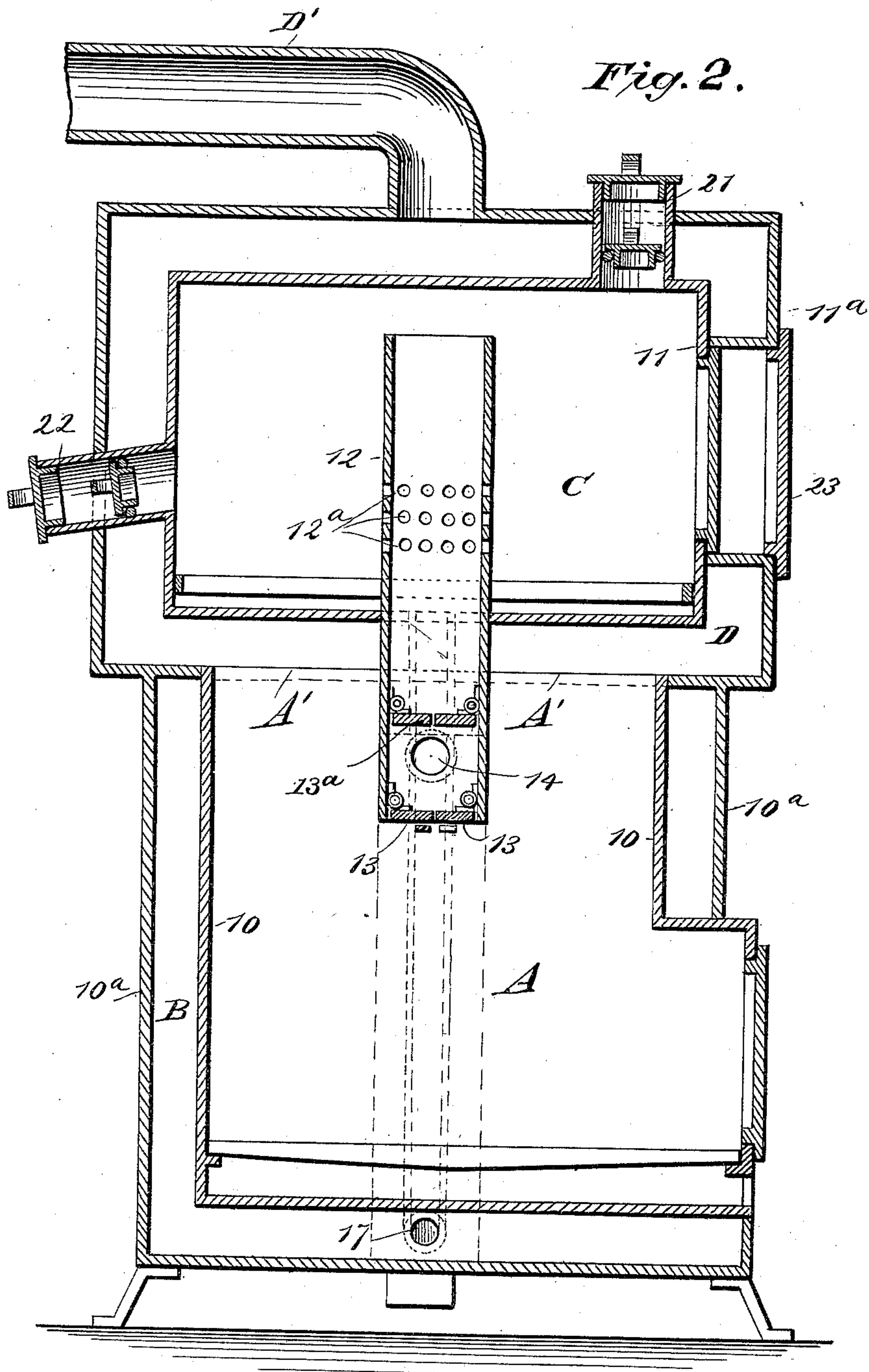
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*Phil. C. Dirterich.*  
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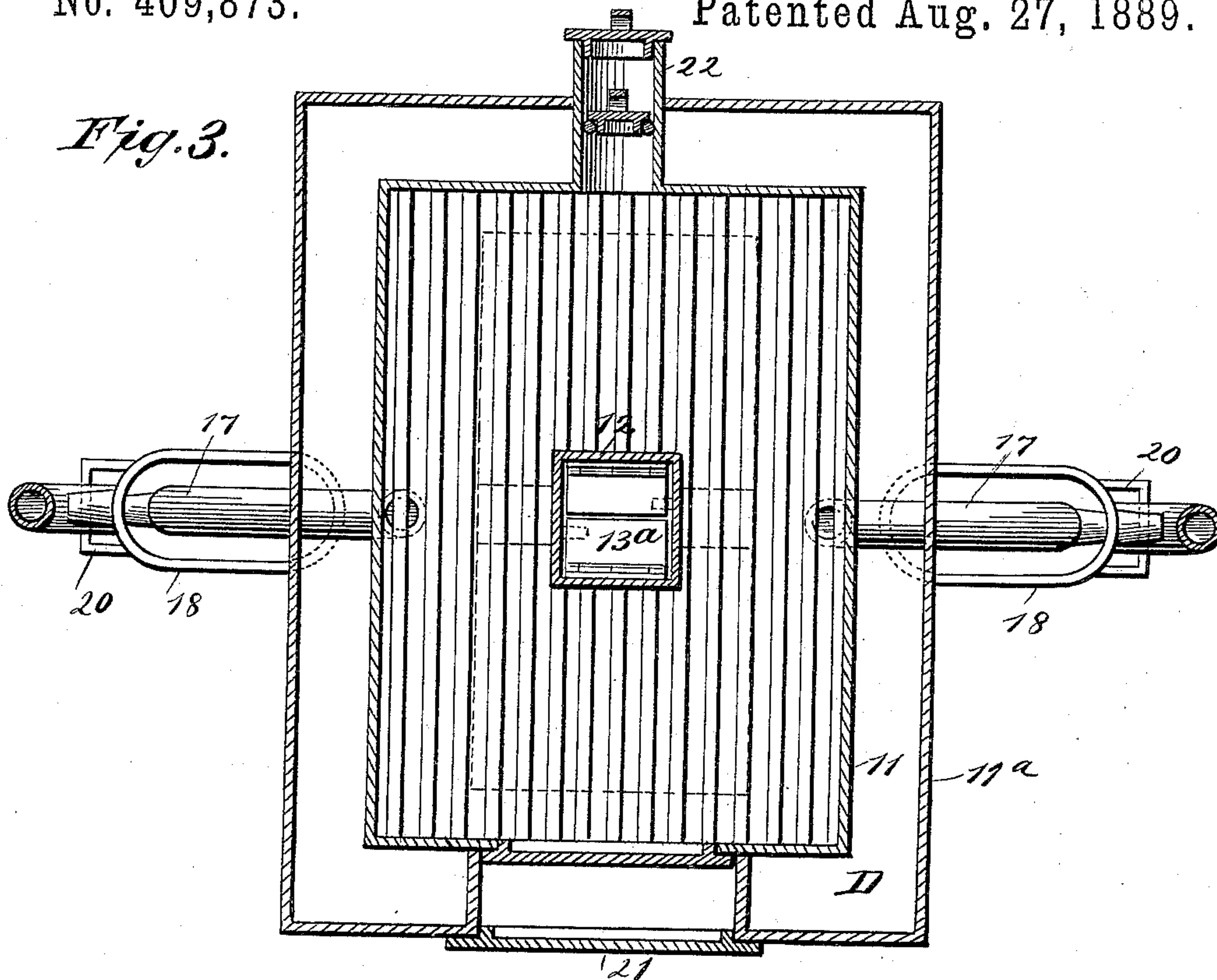
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J. SCHERFFIUS.  
CHARCOAL APPARATUS.

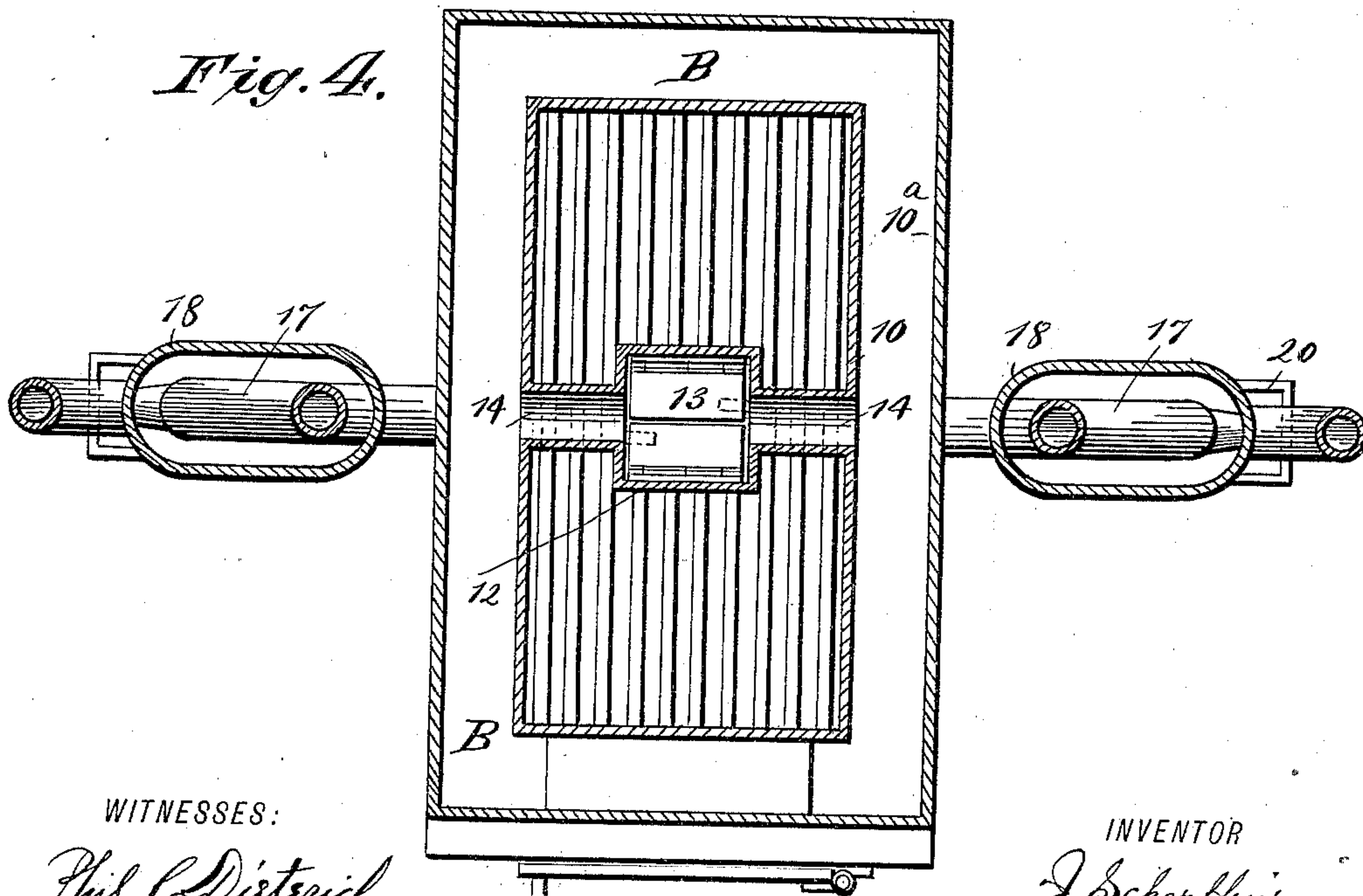
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*Fig. 3.*



*Fig. 4.*



WITNESSES:

*Phil. C. Dieterich.*  
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# UNITED STATES PATENT OFFICE.

JACOB SCHERFFIUS, OF WINONA, MINNESOTA.

## CHARCOAL APPARATUS.

SPECIFICATION forming part of Letters Patent No. 409,873, dated August 27, 1889.

Application filed April 6, 1889. Serial No. 306,155. (No model.)

*To all whom it may concern:*

Be it known that I, JACOB SCHERFFIUS, of Winona, in the county of Winona and State of Minnesota, have invented a new and Improved Charcoal Apparatus, of which the following is a full, clear, and exact description.

The invention consists in the novel details of construction and combination of parts hereinafter described and claimed, whereby a charcoal apparatus of increased efficiency is produced.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar figures of reference indicate corresponding parts in all the views.

Figures 1 and 2 are central vertical sectional elevations of my improved apparatus, the views being taken at right angles to each other. Fig. 3 is a horizontal section on line *y y*, Fig. 1; and Fig. 4 is a horizontal section on line *z z*, Fig. 1.

The invention is an improvement on the apparatus for which Letters Patent No. 387,817 were granted to me August 14, 1888.

In the drawings, A represents the fire-chamber, the case 10 of which is inclosed by a second case 10<sup>a</sup>, the two forming an intervening chamber B. Above the fire-chamber is supported the case 11 of charring-chamber C, which case 11 is also surrounded by a second case 11<sup>a</sup>, the two forming an intervening chamber D. The fire-chamber A is open at two sides of its top, as at A', and is thus in direct communication with chamber D, through which the products of combustion from fire-chamber A pass, thus heating the charring-chamber C and escaping from chamber D through escape-pipe or chimney D'. A pipe 12 extends from near the top of the fire-chamber A to near the top of the charring-chamber C, and is perforated within the latter, as at 12<sup>a</sup>, its lower end being closed by dampers 13 13<sup>a</sup>, that may be opened or closed, as desired, to establish or cut off communication between the fire-chamber and charring-chamber and between the latter and the chamber B. The chamber B, that is formed by the inner and outer casings of the fire-chamber, is in communication with the charring-chamber C through the pipe 12, said pipe 12 and the

chamber B being in communication through the horizontal tubes or pipes 14.

The charring-chamber is provided with a suitable grate 15, below which there extend from said chamber at opposite sides the condensing-pipes 17 17, which pass down through water-tanks 18 and enter the chamber B near the bottom. The pipes 17 are detachable from the apparatus, and are provided with dampers 17<sup>a</sup> and with discharging-nozzles 19, for delivering the products of condensation into troughs 20, the water in which forms a seal for said nozzles, preventing entrance of atmospheric air thereto, as fully explained in my patent above referred to. The inner case 11 of charring-chamber C is provided with pipes 21 22 at the top and side thereof, respectively, each provided with covers, the pipes 21 being for the introduction of the wood and the pipes 22 for the removal of the charcoal; or the wood to be charred may be introduced through any suitable gate or door, as 23.

In operation, the charring-chamber having been charged with wood and the fire in the fire-chamber started, the products of combustion from the latter pass through chamber D, heating the charring-chamber, and out through the smoke-exit D', the damper 13 being closed and dampers 13<sup>a</sup> and 24 being open. The moisture from the wood then passes into the condensing-pipes 17, the condensed products escaping through the nozzles 19, and the cooled air entering the chamber B at the bottom and passing through pipes 14 and 12 into the charring-chamber, where further moisture is taken up, the moist air again passing through the condensing-pipes 17, and so on continuously until the charring of the wood is completed. During the charring process, except when the fire is first started, the damper 13 in pipe 12 is also opened to the desired extent, and combustible gases escaping from the wood descend to the lower end of said pipe and are consumed, and the heat at said open end further heats the incoming air from the horizontal pipes, sending it to the charring-chamber in a highly-heated condition. The first flame from the burning gas is blue and burns as described above. When



the color of the flame changes from blue to white, or as soon thereafter as may be determined by the operator, the damper 13<sup>a</sup> in pipe 12 may be closed, so that the temperature in  
5 the charring-chamber C may not be so high as to injure the charcoal, and when the charcoal is sufficiently charred the dampers 24 are also closed, thus shutting off the supply of  
10 gas from the chamber C, and when the gas ceases to burn the damper 13 is also closed to completely seal the chamber C, and in order to more rapidly cool the chamber C and the charcoal therein I then open the dampers 13<sup>a</sup>  
15 and 24, the damper 13 being closed, thus allowing the heated air to circulate through the condensers and be more rapidly cooled.

An excess of heat is developed in my improved apparatus above described, and this I can utilize for the production of power by conducting off the heated and combustible gases.

The apparatus is also applicable for calcining acetate of lime.

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

1. In apparatus of the character described, the combination of the fire-chamber and

the charring or calcining chamber, each being formed by a jacketed inclosing-case forming chambers surrounding the same, the  
30 chamber surrounding the fire-chamber being in communication with the charring-chamber, and the fire-chamber being in communication with the charring-chamber through a damped connecting-pipe, and also in communication with the chamber surrounding the  
35 charring-chamber, substantially as described.

2. The combination, with fire and charring chambers, of a damped pipe extending from the former into the latter, chambers surrounding both the fire and charring chambers, communication being established between the  
40 fire-chamber and the chamber surrounding the charring-chamber and between the latter and the chamber surrounding the fire-chamber, and condensing-pipes connecting the  
45 charring-chamber and the chamber surrounding the fire-chamber, substantially as described.

JACOB SCHERFFIUS.

Witnesses:

J. N. MAYBURY,  
D. E. VANCE.