

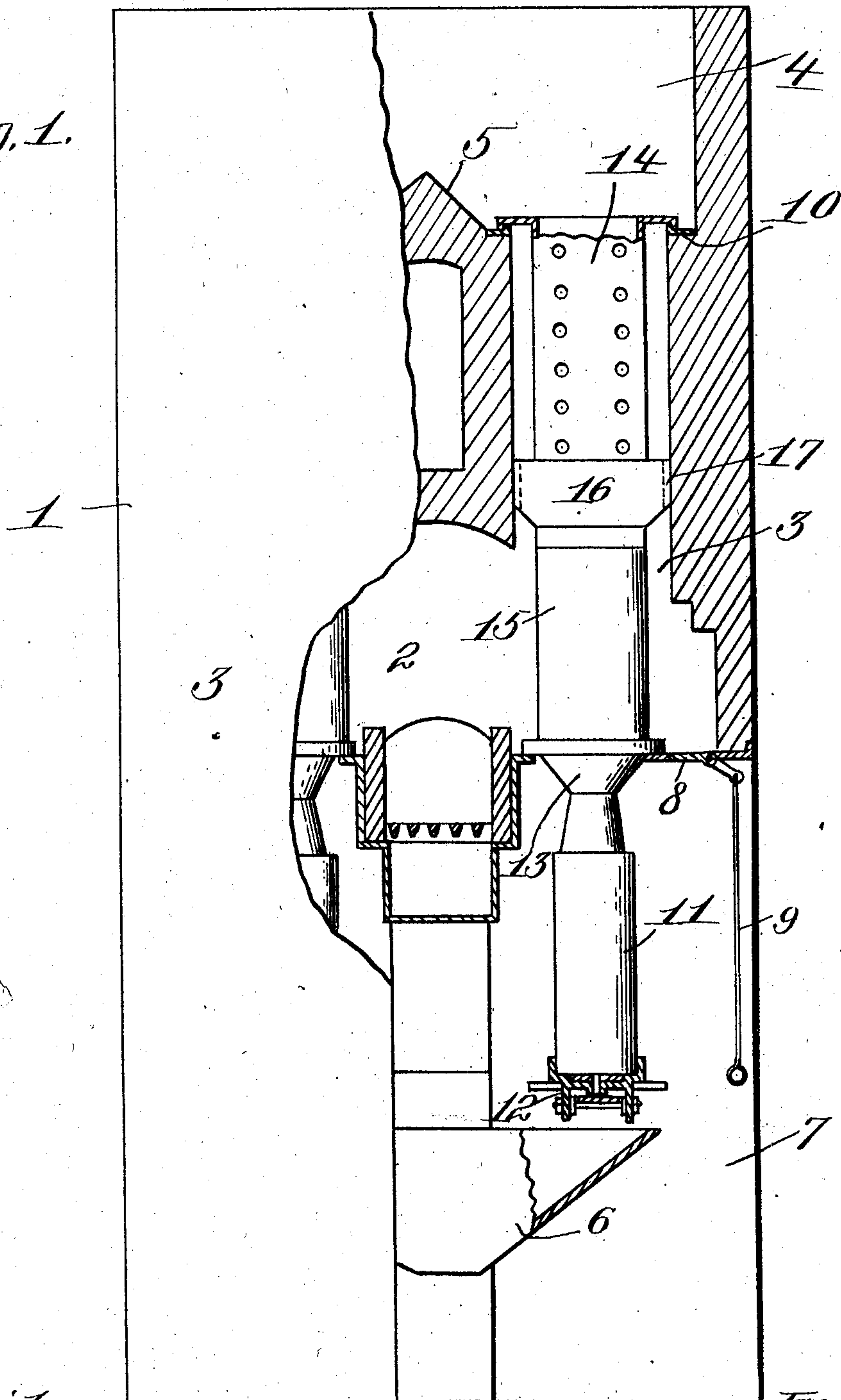
No. 796,304.

PATENTED AUG. 1, 1905.

B. EBA.  
BONE BLACK KILN.  
APPLICATION FILED APR. 4, 1905.

2 SHEETS—SHEET 1.

*Fig. 1.*

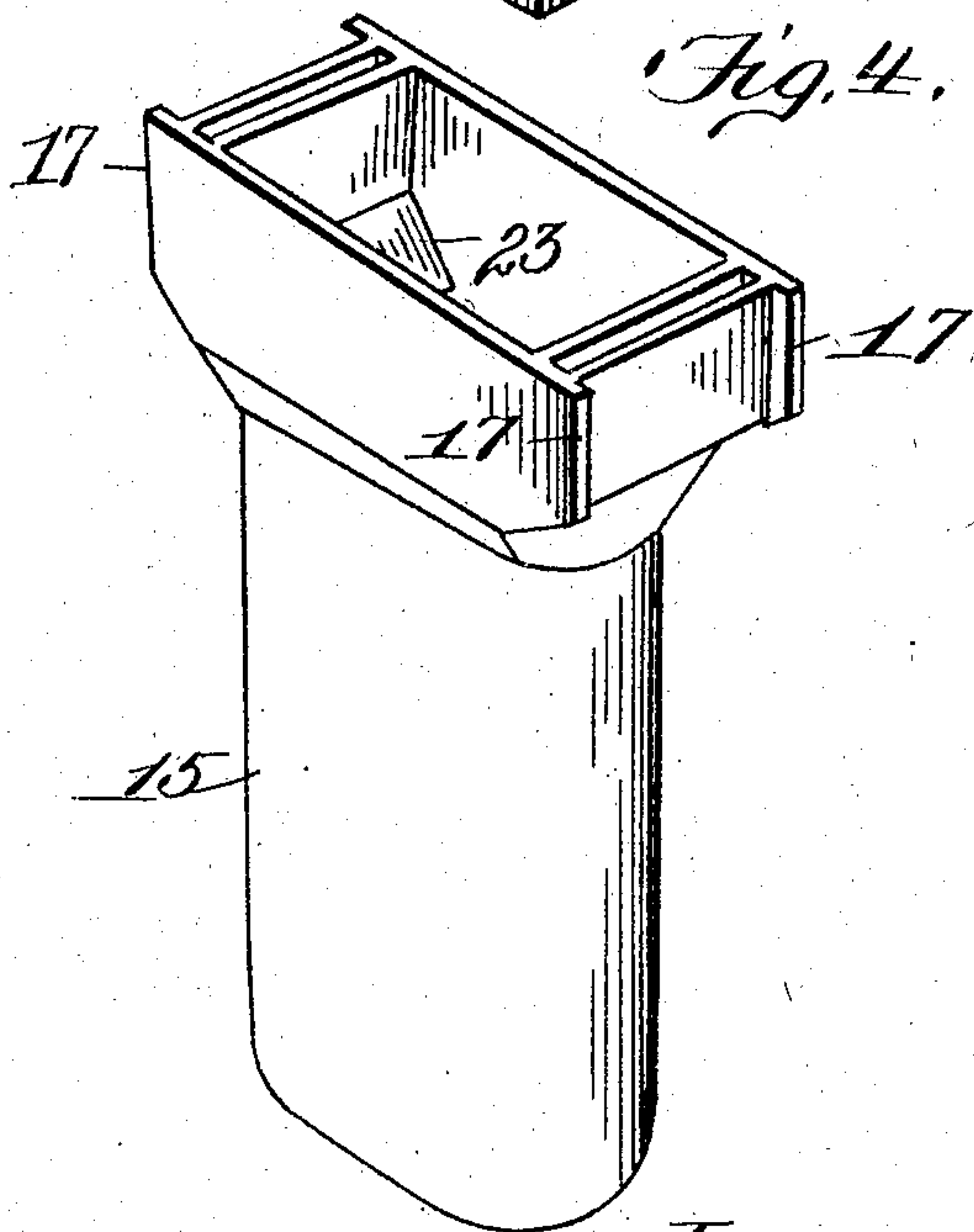
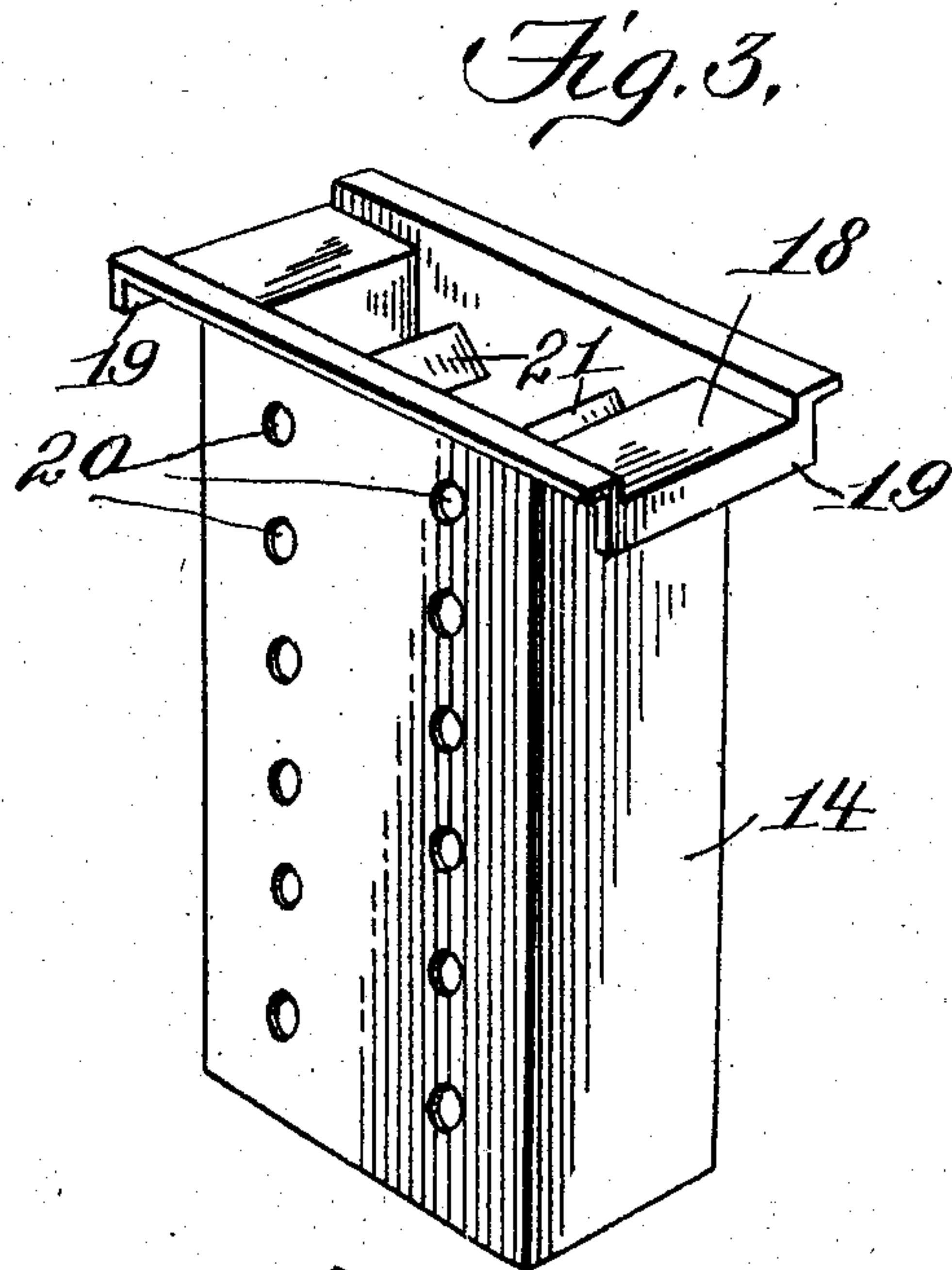
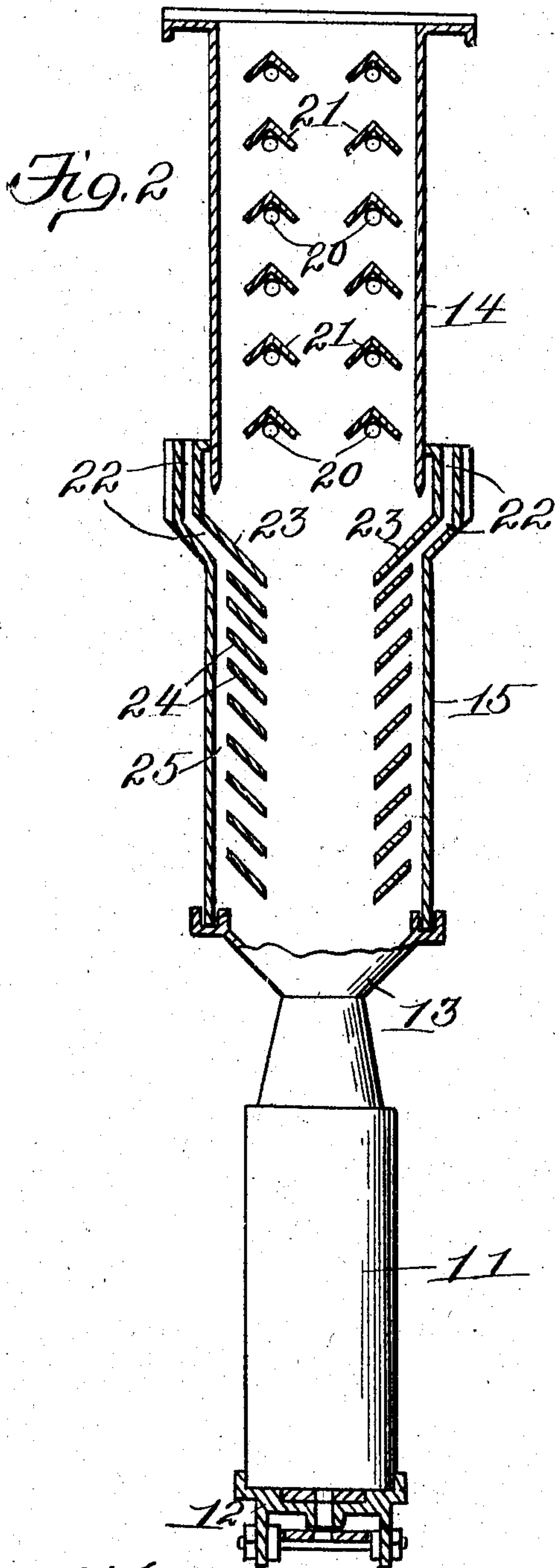


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2 SHEETS—SHEET 2.



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# UNITED STATES PATENT OFFICE.

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## BONE-BLACK KILN.

No. 796,304.

Specification of Letters Patent.

Patented Aug. 1, 1905.

Application filed April 4, 1905. Serial No. 253,904.

*To all whom it may concern:*

Be it known that I, BERNHARDT EBA, a citizen of the United States, residing at Warren, in the county of Warren and State of Pennsylvania, have invented new and useful Improvements in Bone-Black Kilns, of which the following is a specification.

This invention relates to an apparatus or kiln for revivifying bone-black and other materials, and has particular reference to a retort having a simplified and economic structure.

The retort embodying the features of the invention is made up of sections capable of being readily assembled or disassociated and provided with openings and outlet-passages for the escape or liberation of gases and other like substances generated by heating and passing off from the bone-black or other material treated for utilization as fuel and also to reduce the pressure in the retort to a minimum.

The invention consists also in the details of construction and arrangement of the several parts, which will be more fully hereinafter set forth.

In the drawings, Figure 1 is an end sectional elevation of an apparatus or kiln, showing the improved retort structure. Fig. 2 is a transverse vertical section through the retort, the latter being applied to a cooling-chamber having controlling-valve mechanism, also partially in section. Fig. 3 is a detail perspective view of the upper section of the improved retort. Fig. 4 is a detail perspective view of the lower section of the retort.

Similar numerals of reference indicate corresponding parts in the several views.

The numeral 1 designates a kiln or apparatus composed mainly of a brick or analogous structure and having a furnace or fireplace 2 provided with a suitable grate, ash-pit, and means for feeding fuel and controlling the draft thereof. Communicating with the furnace or fireplace 2 are opposite chambers 3; but in some instances only one chamber may be used, and the operation of the retort is not dependent for its success on the number of chambers that may be embodied in the kiln structure. At the upper extremity of the kiln structure is a hopper or feed-chamber 4, provided with a bottom centrally-located deflecting-bridge 5, and in the lower portion of the kiln is a receiving-hopper 6, accessible by means of an opening 7. The bottom of the chamber 3 in each instance is rendered accessible for various purposes by a hinged gate or door 8, operative to open and close the

same through the medium of a suitable rod 9, depending in reaching distance of an operator. The bottom of each chamber 3 consists of a metal plate or analogous device suitably supported and having openings therein at regular intervals for projection downwardly there-through of portions of the retorts. The chambers 3 open through the bottom of the feeding-chamber 4 and are marginally surrounded by angular plates 10. Depending from the bottom of each chamber are cooling-chambers 11, having lower valve mechanism 12 common to all the chambers and rendered practically continuous with the retort by hopper-shaped couplings or unions 13. The valve mechanism 12 will by preference be similar to that disclosed in my application, filed April 4, 1905, Serial No. 253,903; but it will be understood that any suitable mechanism for controlling the outlet of the feeding-chambers may be used. The cooling-chambers are held suspended over the receiving-hopper 6, and from the latter the revivified bone-black or other material may be transferred to other points in suitable receptacles.

The improved retort embodying the salient features of the present invention is composed of an upper section 14 and a lower section 15, the sections being readily separable, and the lower section 15 nearest the greatest heat-point may be reversed to prolong its service and render it more durable. By reversing the lower section 15 burning out of the portion thereof nearest the greatest heat will be obviated, and the life of the retort is increased to about double the time as compared to the ordinary stationary retort or one incapable of reversal. A number of the retorts may be disposed in the chamber 3 or in each of the latter chambers, or in some instances only a single retort may be used in a small kiln structure. All of the retorts are similar in form and structure, and their diameter throughout the greater portion of their length is materially less than that of the chamber in which they are disposed to provide a space between the same and the walls of said chamber. The upper end of the coupling or union 13 forms a seat or assembling means for the lower end of the lower section 15, and the latter section has its upper end 16 enlarged to receive the lower end of the upper section 14, which is snugly fitted therein. The opposite terminals of the upper end 16 of the section 15 are formed or provided with flanges 17 at opposite sides, which bear against the adja-



cent walls of the chamber 3 to establish communicating passages between the upper and lower portions of said chamber unoccupied by the retort. The upper end of the section 14 has a hanger or support 18, which is suitably flanged to insure feed of the material to be treated in the upper open end of said section, and at opposite ends the hanger or support 18 has depending flanges 19 to fit over the angular margin-plate 10 around the upper terminal of the chamber 3. Where a number of these retorts are used in the chamber 3, which is the usual custom, the hangers or supports 18 of the end retorts will be provided at one side with side hanging flanges similar to the flanges 19, and said side hanging flanges will be fitted over the end portions of the margin-plate 10. To close the intervening spaces between the upper portions of the retorts, suitable bridge-strips will be used, as in usual constructions of this character, the object of said bridge-strips being to form tight joints between the retorts and prevent the bone-black or other material from passing down between said retorts. The essential feature of the invention, however, is the interior construction of the sections 14 and 15, the section 14 having a plurality of openings 20 in the opposite side thereof, which are shielded by triangular guards 21, preferably extending transversely across the interior of the section. The enlarged upper end 16 of the section 15 is formed with end outlet-passages 22, which are shielded by downwardly and inwardly inclined guards 23, and below these guards 23, at regular intervals, are a plurality of downwardly and inwardly inclined deflectors 24, having their outer ends terminating inwardly from the end walls of the section 15 to form passages 25, which merge into or communicate with the passages 22. The deflectors 24 are regularly spaced apart, and the openings therebetween communicating with the passages, as set forth, as well as said passages and the openings 20 in the upper section 14, permit the gases and other like substance liberated from the bone-black or other material treated by the action of heat to pass out of the retort into the chamber 3 and circulate downwardly to the fireplace or furnace, where they are consumed as fuel and assist in heating the retort. This operation results in a material saving in the use of ordinary fuel in the furnace. The bone-black or other material to be treated when passing downwardly through the retort is prevented from escaping into the chamber 3 in the upper section 14 by the guards 21, and the deflectors 24 in the lower section 15 likewise obstruct any tendency of the bone-black or other material moving upwardly into and through the passages, and, furthermore, the guards 23 and deflectors 24 cause the bone-black or other material in the lower section to be directed toward the center of the latter

with material advantage in the revivifying operation.

This improved form of retort is intended for use in the cheaper grades of kilns and to replace the more complex and expensive retorts employed in high-grade kilns.

It will be understood that suitable metal will be used in the formation of the retort, as well as the cooling-chambers and couplings or unions 13. It will also be understood that the bone-black or other material after passing through the retort and subjected to the action of intense heat for revivifying purposes will pass downwardly into the cooling-chambers and from the latter at a proper time be discharged into the receiving-hopper 6. The products of combustion from the furnace or fireplace and other unconsumed gas or substance will be conveyed to a suitable stack in the usual manner.

Having thus described the invention, what is claimed is—

1. A retort for revivifying bone-black and other material composed of upper and lower sections, the upper section having openings in the sides interiorly shielded by angular guards disposed thereover.

2. A retort for the purpose set forth, having upper and lower sections, the upper section being fitted into the lower section, and opposite passages formed in the lower section adjacent to opposite ends of the latter and opening out through the top of the section.

3. A retort composed of upper and lower sections, the lower section having an upper enlarged end to receive the lower extremity of the upper section, said enlarged end of the lower section having passages adjacent to opposite walls and opening through the upper terminal thereof.

4. A retort for the purpose set forth, composed of upper and lower sections, the upper section being fitted into the lower section and having side openings with interior angular guards thereover, and the lower section having passages opening through the upper end thereof and also provided with interiorly-located downwardly-inclined spaced deflectors having their outer ends terminating inwardly at a distance from the adjacent walls of the section.

5. A retort for the purpose set forth composed of upper and lower sections, the upper section having openings in the sides interiorly shielded by guards disposed thereover.

6. A retort for the purpose set forth, having intermediate upwardly-opening passages adjacent to opposite walls having an outlet solely through the top of the retort, combined with a kiln having a chamber in which said retort is disposed, the passage means communicating with the chamber.

7. A retort for the purpose set forth, having openings in the upper portion thereof and



provided with interiorly-located guards over the said openings and also oppositely-disposed passages combined with a kiln having a chamber in which said retort is disposed, the openings and passages communicating with the chamber.

8. A retort for the purpose set forth, having an intermediate upwardly-opening passage means, and a plurality of openings in the upper portion thereof interiorly shielded by guards, combined with a kiln having a chamber in which the retort is disposed, the passage means and openings communicating with the chamber.

9. A retort for the purpose set forth, composed of upper and lower separable sections, the lower section being reversible and having

passages opening through the top thereof at opposite points, the upper section having a plurality of openings in the sides of the same and interiorly guarded, combined with a kiln having a fireplace and a chamber in communication with said fireplace, the retort being disposed in the chamber and the passages and openings thereof communicating with the latter.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

BERNHARDT EBA.

Witnesses:

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GEO. W. REA.