

959,324.

P. A. EMANUEL.
GAS MAKING APPARATUS.
APPLICATION FILED AUG. 2, 1909.

Patented May 24, 1910.

2 SHEETS—SHEET 1.

Fig. 1.

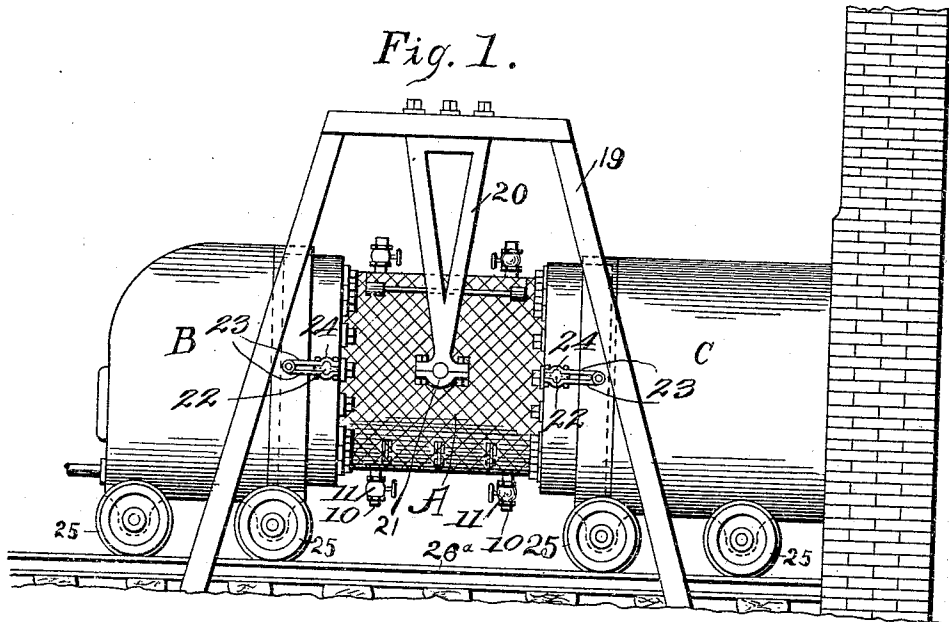
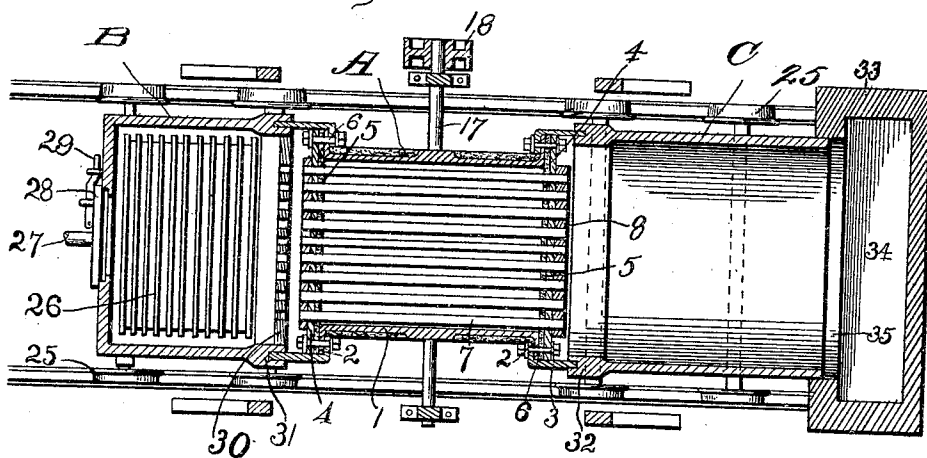


Fig. 2.



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Fig. 3.

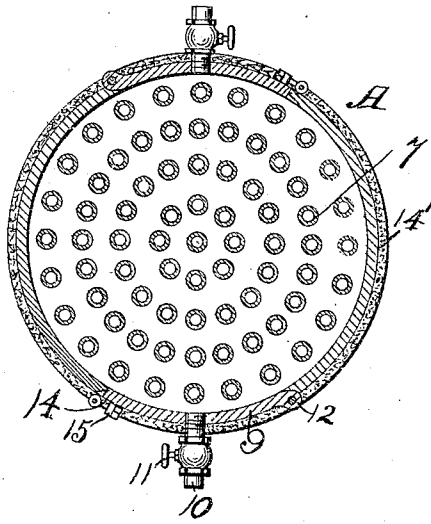


Fig. 5.

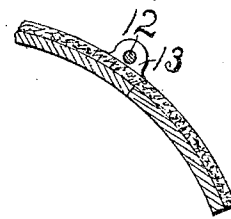
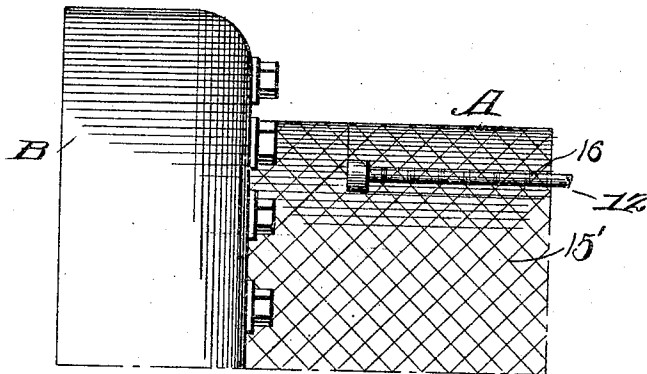


Fig. 4.



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UNITED STATES PATENT OFFICE.

PHILIP A. EMANUEL, OF AIKEN, SOUTH CAROLINA.

GAS-MAKING APPARATUS.

959,324.

Specification of Letters Patent.

Patented May 24, 1910.

Application filed August 2, 1909. Serial No. 510,887.

To all whom it may concern:

Be it known that I, PHILIP A. EMANUEL, a citizen of the United States, residing at Aiken, in the county of Aiken and State of South Carolina, have invented certain new and useful Improvements in Gas-Making Apparatus; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to improvements in distillation apparatus, and is a specific improvement over my former Patent, No. 922,407, dated May 18, 1909.

The special improvements over my prior patent include the provision of a perforated plate so arranged as to prevent the coal or other fuel from getting from the furnace into the retort, the provision of an asbestos covering held in place by a wire netting around the retort itself, and the arrangement of the entire apparatus and suspending means, so that the apparatus may be moved bodily from one part of the plant to the other.

This invention is particularly adapted for making gas for fuel or lighting purposes from coals, oils, resins, or similar products, and for the treatment of all kinds of clays, bauxite, corundum, and similar ores, and in fact, is of general application in the process of making soda, a double sulfate of soda and alum, silica, aluminum fluorid, metallic sodium, aluminum, gas, coke, gas retort carbon, and for many other purposes.

The object of my invention is to provide a simple apparatus, suitable for these purposes, which may be used as desired, and the retort of which may be rotated whenever necessary, and the whole, or any part, of the apparatus conveyed to any portion of the plant for further operations.

With these objects in view, my invention consists in the construction and combinations of parts as hereinafter described and claimed.

In the accompanying drawings—Figure 1 is a side elevation showing my invention. Fig. 2 is a horizontal cross section thereof. Fig. 3 is a cross section through the retort. Fig. 4 is a side elevation on a larger scale, showing part of the retort and part of the furnace, and Fig. 5 is a partial section showing part of the retort and the manner of securing the wire netting thereon.

Referring to the drawings, A represents the retort, B the furnace portion, and C the portion connecting the retort with the smoke stack.

The retort is composed of a cylindrical body portion 1, having at each end an extended portion 2, forming a ridge on which the portion 3 is bolted. The part 3 is cylindrical, and open at both ends, but having one end bent inwardly to embrace the portion 2, both ends of the retort being exactly similar.

4 represents a perforated plate fitting tightly against the end of the retort, a suitable packing 5 of asbestos or similar material being used if desired. Bolts 6 pass through the bent-in end of the part 3 through the part 2 and through the plate 4, uniting the whole firmly together.

7 represent tubes which pass through the end plates 4, the ends of which are secured in perforations in the plate 8, secured to the plate 4.

At the top and bottom the retort is provided with curved doors 9, hinged thereto, and with two pipes 10, each provided with a cock, such as 11, screwed into the cover. Each of the doors is mounted on a rod 12, in ears 13, projecting from the body of the retort, and on the retort are mounted swinging bolts 14, adapted to swing down behind projections 15 on the cover, thus firmly locking the covers in position. Any desired means, however, may be adopted for fastening the covers to the retort. The top and bottom covers are precisely similar.

14' represents a layer of asbestos, or similar refractory material, placed over the outer side of the retort, including the covers, and held in place by the wire netting 15', the ends of said netting opposite the cover portion being secured to the rods 12 by having the ends of the wires wrapped around it, as shown at 16.

The retort is thickened at the center, and from these thickened portions run shafts 17, one of which is provided with a pulley 18, to which power may be applied to rotate the retort, as hereinafter described. Ordinarily, the retort is suspended from a triangular frame 19, by means of depending supports 20 therefrom, terminating in bearings 21, engaging the rods 17. When it is desired to move the retort, the lower half of each bearing is removed.

To hold the parts A, B and C firmly

bound together, in case the bearings 20 are moved, I provide stout outwardly-extending brackets 22, near the center of the outside of the parts 3. These brackets are firmly fastened to the parts 3 by being bolted thereto, or made integral therewith, and have their parts curved outwardly for engagement with the latches hereinafter mentioned. With each of the brackets 22 a pivoted latch is adapted to engage, two of these latches being pivotally mounted on the part B, and two on the part C. Each latch 23 has its end curved, as shown at 24, to pass down around the corresponding bracket 22, so that when the latches are in the position shown in Fig. 1, the parts A, B and C are prevented from longitudinal movement, except as a whole, being firmly locked together, with the ends of the parts 3 fitting into corresponding grooves in the parts B and C. To the parts B and C are attached wheels 25, in the usual manner, which are adapted to run on tracks 26^a, so that the whole apparatus, consisting of the parts A, B and C may be moved as a whole from one part of the plant to another, the latches being in the position shown in Fig. 1, or whereby when the latches 23 are thrown up, the parts B and C may be separated from the retort A, whereupon the latter may be rotated by means of power applied to the pulley 18 for a purpose hereinafter described. The part B is the furnace portion, and is provided with a grate 26, pipe 27 for the admission of gaseous or liquid fuel, and door 28, provided with a latch 29. Of course, any desired form of fuel could be used in the part B. The rear end of the part B is closed by a perforated plate 30, the perforations being located opposite the tubes 7 in the retort A. Around this perforated plate, the rear open end of the part B is thickened, as shown at 31, and is provided with a circular groove, into which groove the part 3 carried by the retort is adapted to fit. The part C simply serves to carry the waste products of combustion after they have passed through the tubes 7 of the retort into the chimney. It consists of a flue, preferably cylindrical in form, having one end thickened, as shown at 32, said thickened end having a groove therein for the reception of the part 3 on one end of the retort A.

33 represents a chimney, and 34 the flue thereof.

35 represents a cylindrical opening, into which the open end of the part C is adapted to telescope. This arrangement is adopted so that the parts B and C may be moved along the track out of engagement with the retort A, leaving the latter free to rotate.

The operation is as follows:—The apparatus being in the position shown in Fig. 1, if it is desired to make gas, coke, and gas

retort carbon, for example, the upper door of the retort is opened and a suitable charge of soft coal introduced into the interior of said retort into the space between the pipes 7. The upper door is then firmly closed, and connections made between the discharge pipes 10 at the top of the retort leading to the gasometer, or to any place where gas is to be used. A fire is then started in the furnace B, and the hot products of combustion pass through the tubes 7, distilling the coal in the retort A, the gases passing out through the discharge pipes 10. After this operation has been continued for a sufficient time, to distil about half of the coal, the latches 23 are disengaged from the brackets 22, and the parts B and C moved along the track 26 out of contact with the retort A. All the cocks in the pipes 10 being closed, the upper pipes are disconnected from the pipes leading to the gasometer, and by means of power applied to the pulley 18, the retort is rotated 180°. The parts B and C are then brought back into connection with the retort A, and the latches 23 moved down into the position shown in Fig. 1. The pipes at the top of the retort are then connected to the gas delivery pipes, and the cocks therein opened. The distillation process is then carried on to its close, and at the end the upper pipes are disconnected from the gas delivery pipes, and both the upper and lower doors are opened. By means of iron rods, the coke between the pipe 7 is forced down, out through the lower door, leaving the pipes 7, and in fact the whole interior of the retort, coated with an even layer of gas carbon.

The fact that the whole interior of the retort, including the pipes, is coated with an even layer of gas carbon, makes the retort highly useful in the production of soda, for example, in which it is necessary that the substances under treatment should be subjected to the action of carbon under heat, and in which it is desirable that the retort should be frequently rotated.

I do not restrict myself to the use of the apparatus described in making gas, coke, and gas retort carbon, as it is useful for many other purposes, and in fact is of general application.

I claim:—

In a distillation apparatus, the combination of a furnace, a retort, a smoke stack, connecting means between said retort and said smoke stack, said retort being cylindrical and provided with end plates, having tubes passing therethrough, and also with covers and valved pipes connected to said covers, a layer of asbestos covering said retort and with wire netting securing the same in place, said furnace being provided with a perforated plate, the perforations in which are in line with the tubes of the retort, said

furnace and said connecting means being
provided with wheels and with means for
firmly attaching the retort to said furnace
and to connecting means, whereby said ap-
5 paratus may be moved bodily from one part
of the plant to another on a track, and means
located outside of said track for centrally
supporting said retort when disconnected

from said furnace and said connecting
means, substantially as described. 10

In testimony whereof, I affix my signa-
ture, in presence of two witnesses.

PHILIP A. EMANUEL.

Witnesses:

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