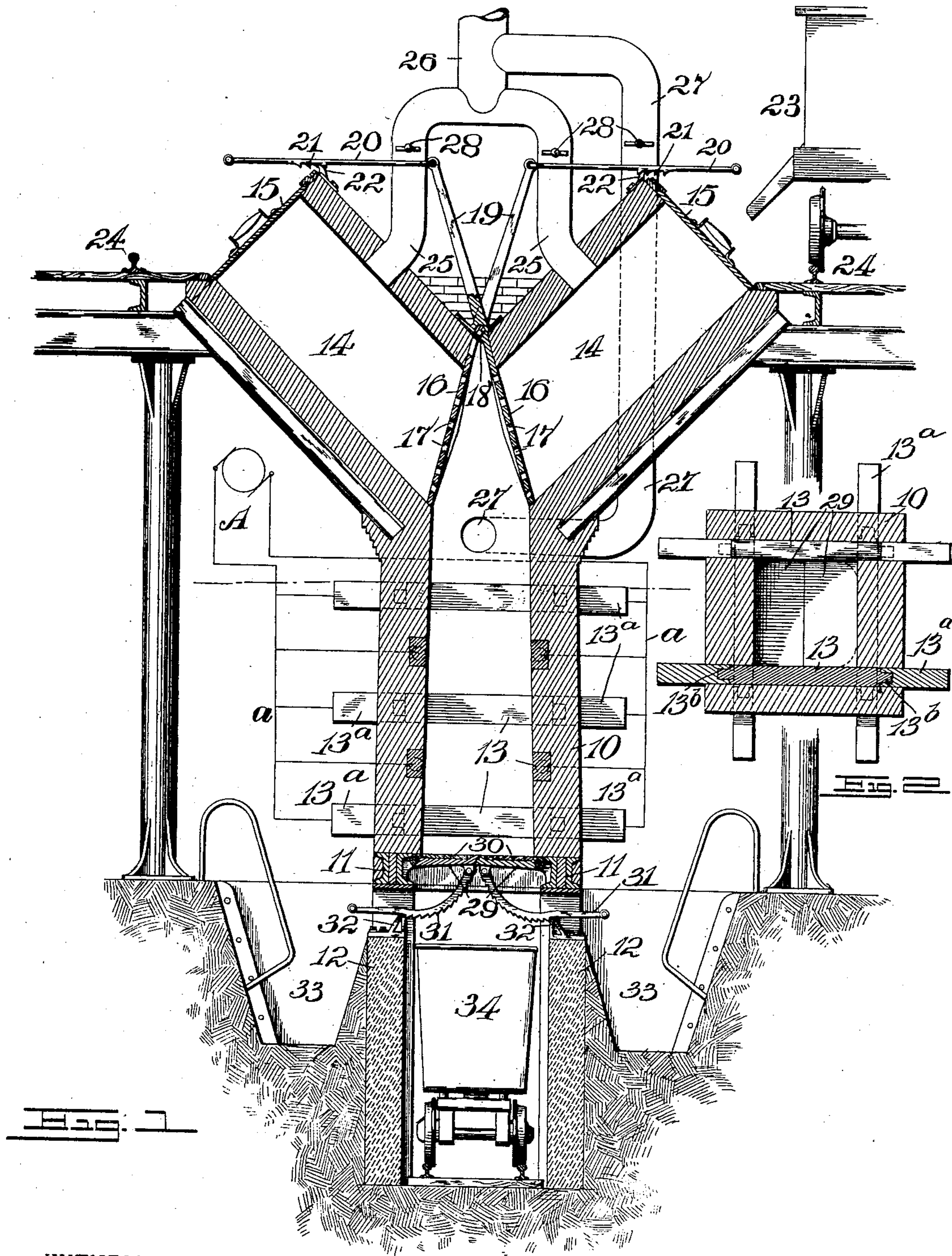


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M. R. CONLEY.
ELECTRIC COKE OVEN.
APPLICATION FILED SEPT. 8, 1903.

NO MODEL.



WITNESSES:

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MICHAEL R. CONLEY, OF NEW YORK, N. Y.

ELECTRIC COKE-OVEN.

SPECIFICATION forming part of Letters Patent No. 763,368, dated June 28, 1904.

Application filed September 8, 1903. Serial No. 172,211. (No model.)

To all whom it may concern:

Be it known that I, MICHAEL R. CONLEY, of New York, in the county of Kings and State of New York, have invented a new and Improved Electric Coke-Oven, of which the following is a full, clear, and exact description.

My invention relates to improvements in that class of apparatus which is used in the manufacture of coke. Usually the coke is manufactured by treating it in a closed oven by the application of heat applied externally to the oven for a sufficient period to drive out the gases of the coal. I have found that by introducing electric resistance-plates into the oven lining or interior as a means of heating the oven and coal I can eliminate the gases and produce coke much quicker than by ordinary means. I have also found that I can utilize the initial heat and the liberated gases to partially gasify subsequent coal charges for the main oven, so that when the first charge has been turned to coke a partially-treated charge can be easily substituted for it.

The object of my invention is to produce a coke-oven in which coal may be easily placed and from which the coke can be as easily discharged, to produce an economical and convenient means of applying great heat direct to the charge, avoiding the necessity of heating the exterior of the oven, to provide means for suitably controlling the gases liberated from the coal, to provide an efficient system of charging-retorts, which shall be heated by the escaping heat and gas and which will partly gasify the coal to be treated, and in general to produce a practical interiorly-heated electrical coke-oven which will make coke quicker and cheaper than it can be done by processes heretofore employed.

With these ends in view my invention consists of an electric coke-oven the construction and arrangement of which will be hereinafter described and the novel features claimed.

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

Figure 1 is a central vertical section of an oven embodying my invention, with the necessary accessories to conveniently work it; and Fig. 2 is a detail horizontal section showing the arrangement of the heating plates or bars.

The main oven 10 is made of non-conducting material—such, for instance, as fire-clay or fire-brick—and is in the form of a stack rectangular in cross-section. I make the oven slightly larger at the bottom than at the top, so that while the coke naturally shrinks a little from the oven sides still there can be no difficulty in dropping the charge through the oven-bottom when desired. The main oven is supported on suitable sills 11 and subfoundations 12; but obviously this feature is not novel and can be changed at will.

The oven is heated by means of the electric resistance plates or bars 13, which are let into the oven-walls on the inner side and are preferably flush with the wall; but if anything they should be sunk a little, so as to make certain that the charge does not catch on them in any way. I have shown these resistance-plates staggered in pairs—that is to say, two opposite plates are on one plane, but the several bars are on different horizontal planes and on different sides of the oven. Obviously the plates might be continued around the wall; but this arrangement is very effective, as when the plates or bars are heated white hot they will each radiate the heat into the oven, and the successive radiations at different planes not only cause the charge to be quickly heated, but the heating effect is further augmented and maintained from the fact that the adjacent oven-walls become hot also. Moreover, I find that by having the resistance-plates backed by a non-conductor, as shown, the heat is deflected inward, so as to act to the best advantage on the charge. As to the composition of these plates, I have found that one of the best compositions is made from fire-clay and carbon, there being about fifteen or twenty per cent. carbon to eighty-five to eighty per cent. fire-clay. This composition when subjected to a powerful current quickly be-

comes incandescent. I do not, however, limit the invention to such a composition, nor do I claim the composition, and any suitable resisting material can be substituted for that shown.

The terminals 13^a of the resistance-plates 13 project outward beyond the oven-walls, and these terminals are included in an electric circuit *a*, connected with a suitable generator
 10 A. The terminals 13^a are better conductors than the resistance-plates 13, so that they will remain cool under the influence of the current. To prevent sparking, there must be a very close union between the terminals and the resistance-plates 13, and I have shown a mor-
 15 tise-and-tenon joint 13^b, and to make the union still better a cement of molasses or hydrocarbon can be used.

The invention is fed from plural retorts 14,
 20 two being shown, which are each adapted to contain the charge for the oven and which are inclined in relation to the oven delivering into the same from the top. Each retort 14 has a suitable closure 15 at the top, and the inner
 25 and lower end is closed by a swinging plate 16, having numerous perforations 17 for the passage of gas, and the plate is hinged at the top, as shown at 18, and controlled by an upwardly-extending lever 19, the latter connect-
 30 ing with an elongated handle 20, having teeth 21 to engage a catch 22 at the top of the oven-wall. Each handle 20 extends outward to a point where it can be conveniently grasped and worked, and by means of it the plate 16
 35 may be opened or closed and can be fastened by engaging the teeth 21 with the catch 22. In practice the retorts would generally be filled from a car 23, running on a track 24,
 40 and the track is made to extend adjacent to each retort 14.

Gas-pipes 25 open from the retorts 14 and deliver to the stack 26, and a gas-pipe 27 also extends from the upper part of the main oven 10 to the stack 26, the several pipes being
 45 controlled by dampers 28, so that the gas may be directed through either or all the pipes, as desired; but generally the pipe 27 would be kept closed, and the hot gases and heat from the main oven thus rise through the retorts,
 50 heating and partly gasifying the coal therein. The advantage of the retorts and the partial gasification will be seen from the description of the way the oven is operated.

In starting the operation the main oven and
 55 both retorts are filled. When the coal in the oven is coked, the coke is dropped, and the oven is then filled from one of the retorts 14. This retort is again immediately refilled, and when the oven is a second time emptied it is
 60 filled next from the second retort. After this the retorts are alternately used to charge the oven, and it will be seen that each time the coal in the retort will have been subjected

to a considerable heat for a sufficient period to partly gasify it.

The bottom of the oven 10 is closed by the
 65 downwardly-swinging doors 29, which are hinged at their outer edges and are covered by a protective lining 30, of fire-clay or similar material. The doors are operated by
 70 curved levers 31, which have teeth on the under side adapted to engage the catches 32. The levers 31 can be worked from the working pits 33, into which the operators can descend. Obviously the charge can be dropped
 75 in any convenient receptacle; but usually a car 34 will be provided, in which the hot coke can be carried away to be quenched.

It will be readily seen from the foregoing description that my improved oven works
 80 very rapidly. It will be also very economical, for besides the saving in time I find that practically one-half of the gas produced is sufficient to run a gas-engine, which will generate the electric current to supply the heat.
 85 It will also be understood that the gas can be treated in any of the usual ways to save any of the by-products which it carries.

In the foregoing description I have set forth an arrangement of resistance-plates which I
 90 consider best adapted for the purpose; but obviously these resistances may be differently arranged without affecting the principle of the invention, the essential feature of which
 95 is to provide resistance at such points as may be necessary on the oven's interior to properly heat it and its contents.

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

1. A coke-oven, comprising a body of non-conducting material, and electric resistance-plates arranged in the inner wall of the body, the plates being in opposed pairs and the several pairs being on different horizontal planes,
 105 whereby a series of heating zones are produced.

2. A coke-oven, comprising a body of non-conducting material, electric resistance-plates
 110 arranged in the inner wall of the body, the plates being in opposed pairs and at different heights within the body, whereby a series of heating zones are produced, and a bottom closure constructed so as to open the entire oven-bottom.

3. A coke-oven of non-conducting material open at the top and provided with swinging doors at the bottom which open the full big-
 115 ness of the oven, and electric resistance-plates held in the inner wall of the oven to heat it, the entire height of the oven being left clear and unobstructed.

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Witnesses:

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