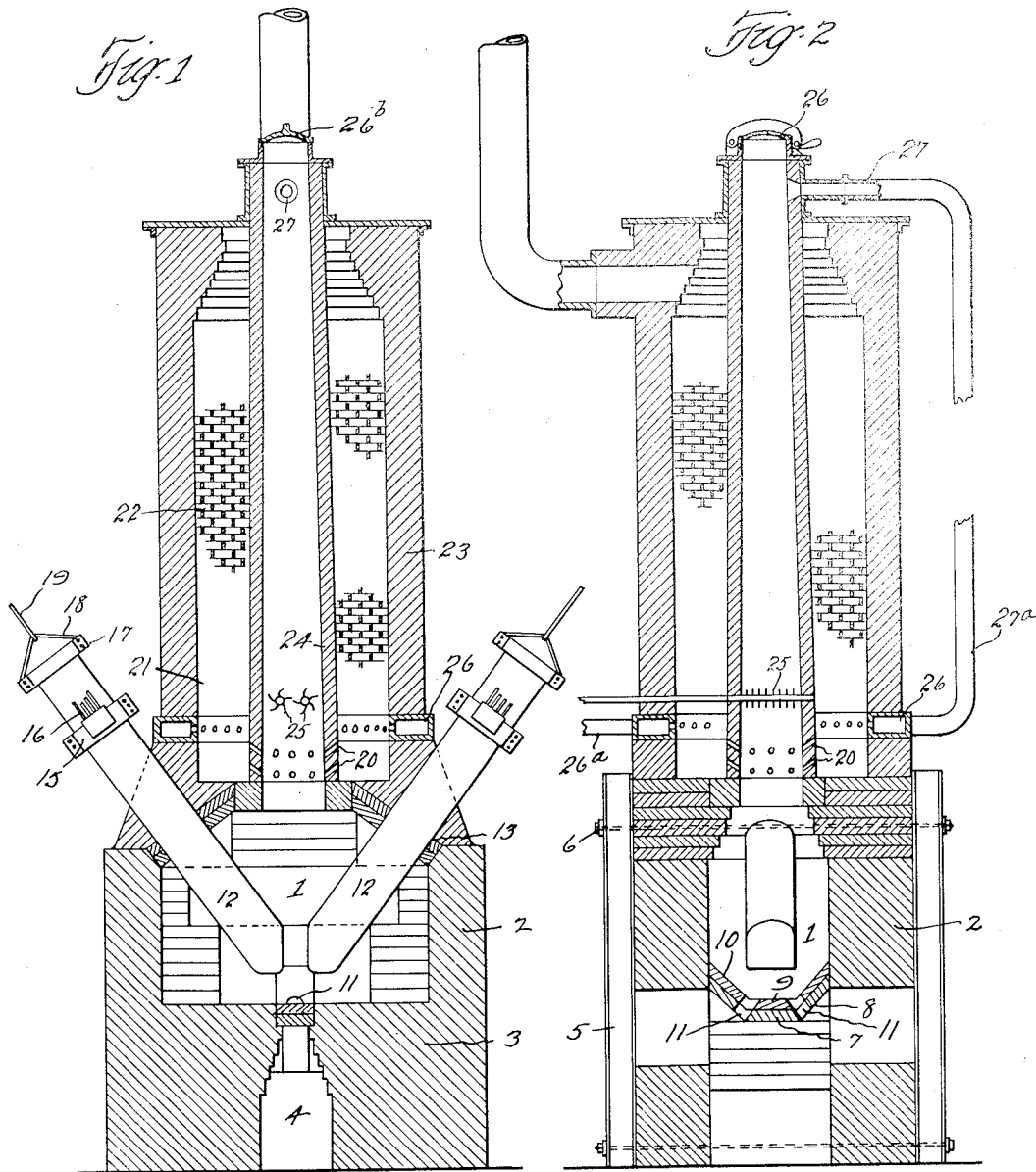


A. E. REID.  
 PROCESS FOR THE MANUFACTURE OF CARBIDE.  
 APPLICATION FILED OCT. 23, 1920.

1,434,451.

Patented Nov. 7, 1922.



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## UNITED STATES PATENT OFFICE.

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## PROCESS FOR THE MANUFACTURE OF CARBIDE.

Application filed October 23, 1920. Serial No. 419,140.

*To all whom it may concern:*

Be it known that I, ALLAN E. REID, a citizen of the United States, residing at Readsboro, in the county of Bennington and State of Vermont, have invented a certain new and useful Improvement in Processes for the Manufacture of Carbide, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings.

This invention relates to a continuous process for the preparation of material for the manufacture of carbide and for the production of carbide therefrom. The object of the invention is to provide a process whereby the preparation of such material and of the carbide may be accomplished with maximum efficiency and economy of operation. I realize the aforesaid process in and through the drawings forming part hereof, wherein Fig. 1 represents a vertical sectional view through a combined retort and carbide furnace; and Fig. 2 a view similar to Fig. 1 and taken at right angles thereto.

Describing the parts by reference characters, 1 denotes the chamber of a carbide furnace, such as shown in my application No. 369,403, filed March 27, 1920. The furnace chamber is formed within a casing 2, preferably of fire brick, and is provided with a thick base 3 having a carbide pit 4. The casing is shown as braced by suitable uprights 5, located near each corner, opposite braces being connected by stay bolts 6.

The bottom of the furnace chamber is provided with a hearth consisting of a base 7, preferably of cast iron and having inclined sides 8 extending upwardly from opposite ends of such bottom to the adjacent side walls of the casing. Within said hearth is a carbon lining, having a shape similar to that of the said base and also comprising a bottom 9, and inclined sides 10. The hearth is provided with a pair of outlet openings 11 for discharging molten carbide to the pit 4.

Projecting into the chamber 1 are the diagonally extending electrodes 12, each being mounted in a stuffing box 13 and each provided with a ring 15 having sockets for cables 16 and each being adjustably mounted in its stuffing box by means of a ring 17, a bail 18, and a cable 19.

At its upper end, the electric furnace is

provided with a plurality of small outlets 20 for the gases evolved through the carbide reaction (mainly CO), which gases are discharged into an annular flue 21 having checker work 22 therein, the flue being formed between an outer wall 23 of fire brick or similar material and an inner wall formed by a vertical retort 24 which may constitute in part an outlet flue from the carbide furnace and is shown as provided with the openings 20. The bottom of the retort proper is formed by a coke breaker 25 which may be operated continuously, thereby to discharge the coked material within the retort 24 into the top of the carbide furnace.

The retort may also be heated by means of a burner 26 and a gas supply pipe 26<sup>a</sup> for the purpose of coking the first charge for the furnace. This burner may also serve as occasion may require for igniting the gases discharged from the carbide furnace through the openings 20.

The retort will be charged with a mixture of cokable carbonaceous material (such as bituminous coal) and a metal oxy compound (such as limestone), the said compound having been preferably reduced to a fineness of about 40 mesh and the cokable material to a fineness of about 8 mesh and having been intimately mixed prior to charging the retort therewith. The retort will then be closed, as indicated at 26<sup>b</sup>. The mass of material in the retort will be subjected to the action of heat from the burner 26 until completely coked. As a result of the retorting operation, all the gases ordinarily obtained by the distillation of bituminous coal will be recovered and, in addition, a large quantity of additional gases due to the breaking up of the tarry constituents of such coal by reason of their contact with the finely divided heated glowing particles of limestone. The gas thus produced can be conducted through a suitable conduit 27 and thence through the appliances usually employed in gas plants for the treatment of gases. A pipe 27<sup>a</sup> may conduct gases from the holder (not shown) to the burner 26. Owing to the tendency of the coked mass to produce an aggregated mass or cake, the breaker 25 will probably be necessary in order to reduce the mass or cake thus formed to a size suitable for use in the electric furnace. The operation of charging the retort and of feeding the furnace therefrom may be

made substantially continuous, the furnace being charged from the top at frequent intervals by the operation of the breaker; and, after the furnace shall have been put into operation with the production and discharge of carbide, the gas resulting from the carbide reaction will serve to coke the material within the retort.

Having thus described my invention, what I claim is:

1. The process of making carbide and preparing material therefor which comprises coking a mixture of cokable carbonaceous material and a metal oxy-compound by means of burning gases produced by a carbide reaction occurring therebeneath, and feeding the coked mass thus produced to the zone of carbide reaction.

2. The continuous process of manufacturing carbide and material therefor which comprises coking by the heat of the carbide reaction a movable charge consisting of a mixture of cokable carbonaceous material and a metal oxy-compound while in transit to the zone of such reaction.

3. The continuous process of manufacturing carbide and preparing material therefor which comprises feeding to a zone of carbide reaction a charge consisting of a mixture of cokable carbonaceous material and a metal oxy-compound, coking such carbide material while in transit by the combustion of gas resulting from the carbide reaction, and removing the carbide from such zone of reaction substantially as speedily as formed.

4. The continuous process of manufacturing carbide and preparing material therefor which comprises feeding through a retort and to a zone of carbide reaction a charge consisting of a mixture of cokable carbonaceous material and a metal oxy-compound, coking the material while in transit through such retort, by the combustion of the gas resulting from the carbide reaction, and re-

moving the carbide from such zone of reaction substantially as speedily as formed.

5. The continuous process of manufacturing carbide and material therefor which comprises retorting by the heat of the carbide reaction a movable charge consisting of a mixture of cokable carbonaceous material and a metal oxy-compound while in transit to the zone of such reaction.

6. The process of making carbide and preparing material therefor which comprises coking a mixture of cokable carbonaceous material and a metal oxy-compound in transit through a retort by means of burning gases produced by a carbide reaction, and feeding the coked mass thus produced to the zone of such reaction.

7. The process of making carbide and preparing material therefor which comprises coking a mixture of bituminous coal and limestone by means of the burning gases produced by a carbide reaction occurring therebeneath, feeding the coked mass thus produced to the zone of carbide reaction, and subjecting the said mass to the action of electricity in said zone, thereby to convert the said mass into carbide.

8. The continuous process of making carbide and preparing material therefor which comprises feeding through a retort and to a zone of carbide reaction a charge consisting of a mixture of bituminous coal and limestone, coking the material while in transit through such retort by the combustion of gas resulting from the carbide reaction, subjecting the mass in said zone to the action of electricity, thereby to convert the mass into carbide, and removing the carbide from such zone of reaction substantially as speedily as formed.

In testimony whereof, I hereunto affix my signature.

ALLAN E. REID.