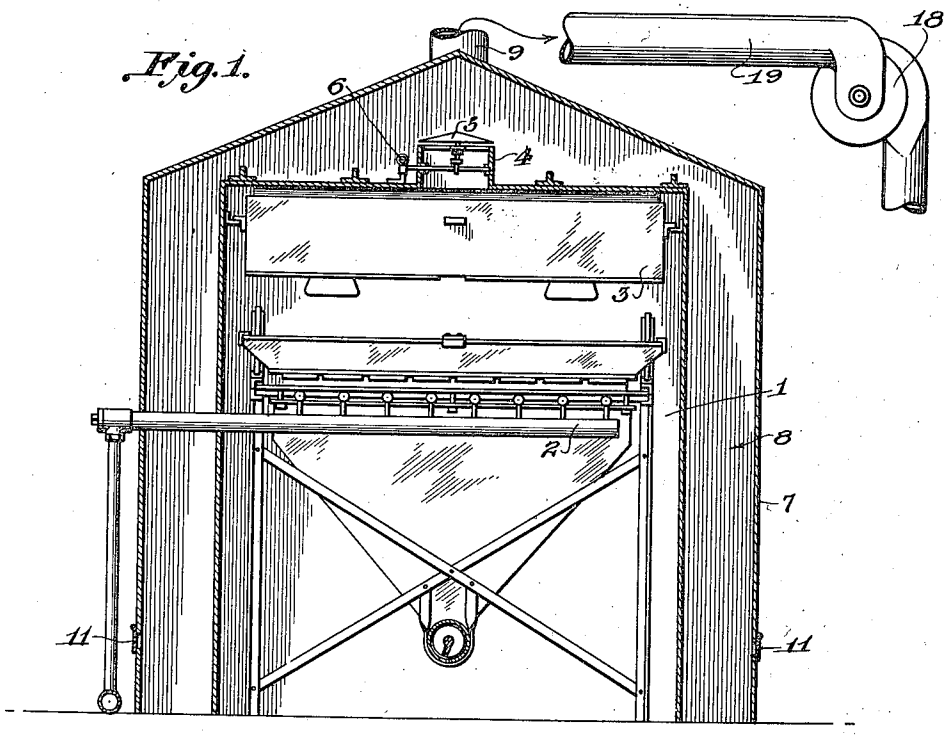
Aug. 9, 1927. 1,638,722

C. A. BARBOUR, JR

CARBON BLACK PRODUCING APPARATUS

Filed June 11, 1926

Fig. 1.



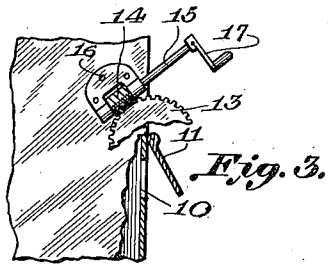
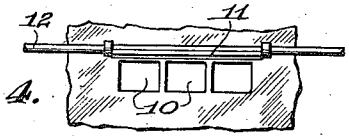


Fig. 3.

Fig. 4.



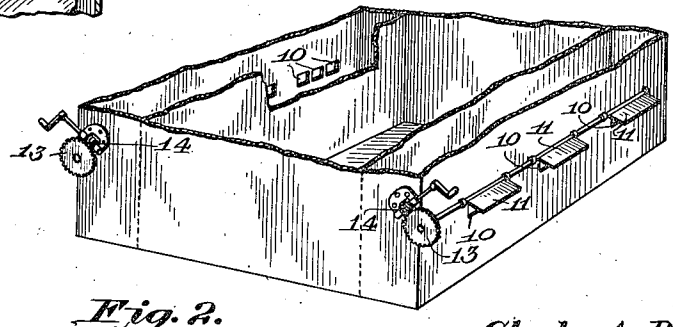


Fig. 2.

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UNITED STATES PATENT OFFICE.

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CARBON-BLACK-PRODUCING APPARATUS.

Application filed June 11, 1926. Serial No. 115,379.

This invention relates to improvements in carbon black producing apparatus and in general, to that type of apparatus described and claimed in my copending applications for United States Letters Patent Serial numbered 91,501 and 103,128, the invention having for an object to provide a novel arrangement of retort draft supply means, the retort being received in a main housing, certain of the walls of which are arranged in spaced relation to the corresponding retort walls, thereby providing air or draft ways adjacent or over the retort in order that a forced draft will be effected by the retort ventilators for maintaining an effectual circulation of combustion gases through the retort and hence, expedite the collection of carbon upon the depositing surfaces therein.

It is likewise an equally important object of the invention to provide the device with means for permitting of the regulation of draft through the ways between the retort and housing, that the circulation of the combustion gases in and through the retort may be accordingly controlled.

Other objects of the invention will be in part obvious and in part pointed out hereinafter.

In order that the invention and its mode of operation may be readily understood by those skilled in the art, I have in the accompanying illustrative drawings and in the detailed following description based thereupon, set out one possible embodiment of the invention.

In these drawings:

Figure 1 is a vertical transverse fragmentary section through the improved apparatus showing the arrangement of the retort within the housing,

Figure 2 is a fragmentary detail in perspective having parts thereof broken away and shown in section, illustrating the arrangement of the air or draft ways as between certain of the walls of the housing and the retort together with the air inlet means for the air or draft ways and the controlling devices therefor.

Figure 3 is a fragmentary detail, partly in section, illustrating the particular operating mechanism for the draft control devices and the relative arrangement of such draft control devices with respect to the air inlet openings, and

Figure 4 is a fragmentary detail, in elevation illustrating the formation of air inlet openings in the lower side walls of the retort housing together with the regulators or covers therefor.

Having more particular reference to the drawings in connection with which like characters of reference will designate corresponding parts throughout, the improved apparatus may be stated primarily, to comprise a closed retort indicated in its entirety by the numeral 1, wherein the pressure is less than atmospherical for effecting an imperfect combustion of the gases therein, said retort serving to house suitable burners 2, carbon depositing and collecting apparatus 3, and having ventilators 4 in the upper wall thereof, it being understood in this connection that the smother sheet or top of the retort 1, to provide these ventilators 4, is formed at intervals throughout its length with a plurality of upwardly disposed and opening sleeves adapted to have dampers or similar devices movably received therein, such dampers in turn being collectively operable by suitable mechanism generally indicated at this time by the numeral 6, whereby said dampers may be moved toward or from the open ends of the sleeves of their respective ventilators and thus regulate to the desired nicety, the passage of the combustion gases from the retort 1.

This retort 1 is received within a housing indicated in its entirety by the numeral 7, the side walls of said housing being so arranged with respect to the adjacent side walls of the retort 1 as to provide air or draft ways 8 therein, while the upper or top portion of said housing 7 is spaced with respect to the top of the retort 1 and communicates with a plurality of outlet pipes indicated by the numeral 9. In this connection, it is to be noted, that the opposite end walls of the housing 7 likewise serve as the end walls for the retort 1 and by consequence, it will be appreciated that no air or draft ways will be had as between the ends of the retort and the housing 7.

To create a draft through the air or draft ways 8, aforesaid, the lower portions of the opposite side walls of the housing 7 are formed with series of spaced air inlet openings 10, these openings being adapted to have cover plates or dampers 11 positioned adjacent thereto and cooperable with the same; said dampers upon the several sides of the housing 7 being fixedly mounted for

rotation upon supporting shafts 12 disposed longitudinally of the lower portions of said opposite sides of the housing 7 and having segmental gears 13 fixedly mounted upon certain of their ends adapted to be meshed with worm gears 14 mounted for rotation upon operating shafts 15 journaled in suitable bearing brackets 16 secured to adjacent portions of one end wall of said housing 7; crank handles or other suitable devices 17 being preferably fixedly mounted upon the free end extended extremities of the operating shafts 15 for an obvious purpose.

In this connection, it will be understood that any number of air inlet openings 10 may be formed in the lower portions of the opposite side walls of the housing 7 such as conditions or preference may dictate and similarly, that the number of regulating dampers 11 will be in accordance therewith.

The outlets 9, hereinbefore described, are preferably connected to an aspirator or similar device 18 mounted in the pipe or conduit extension 19 communicating with said outlets 9, whereby a forced draft will be set up as between those spaces represented by the draft ways 8 and the space above the smother sheet or top of the retort 1 and the corresponding portion of the housing 7.

From the foregoing, it will be understood and appreciated by workers skilled in the art that I have provided my improved carbon depositing and collecting apparatus with a means novel in that fashion that the same will effectually function to set up a forced draft by the ventilators 4 of the retort 1, in which a pressure less than atmospherical is maintained, such draft serving much in the fashion of a fluid piston with respect to the combustion gases burned at a reduced pressure within said retort 1. This influence of the forced draft by and over the open or partially opened ventilators 4, as may be well appreciated, will serve to effect proper and desirable stimulus or circulation of the combustion gases in and through the retort 1, thus expediting the depositing of carbon black upon the various depositing surfaces provided therefor in said retort 1, the residue combustion gases passing, under influence of this forced draft, from the various ventilators 4 from whence it is discharged into the outlets 9 and then delivered under influence of that force created by the aspirator 18 to other suitable treating apparatus whereby a further or greater yield of carbon black will be had from the remaining or tail gases.

It will be understood that the effect of the forced draft through the ways 8 and the space in the upper portion of the housing 7 may be varied as concerns its influence upon the combustion gases passing into and through the retort 1 by proper adjustment of the various dampers 5 hereinbefore described. Similarly, it will be understood that the extent of velocity of the forced draft through the said ways 8 and the space in the upper portion of the housing 7 may be regulated to the desired nicety by corresponding adjustment of the various regulating dampers 11 with respect to their particular air inlet openings 10; this adjustment, of course, being effected through the provision of the gearing 13 and 14 and the operating shafts 15 carrying their respective crank handles 17. Because of the mode of connection of the operating shafts 12 with the operating shafts 15, that is, through the gearing 13 and 14, it will be also understood that the various regulating dampers 11 will be caused to remain in their respective adjusted positions as concerns the adjacent air inlet openings 10 and consequently upon this, that the flow of air through said openings 10 into the air ways 8 will be uniform and of such velocity as will secure the desired results when passing by the ventilators 4 of the retort 1.

While I have herein offered a specific illustration of arrangement and mounting of air inlet openings 10 and regulating shafts 11 therefor, it will be understood that the relative arrangement and construction of these openings and their regulating means may be varied, for in some instances, it may be desirable that these air inlet openings shall be positioned in a different manner with respect to the side walls of the housing 7, that is, they may be raised or arranged at even lower points thereupon; likewise, that they may be arranged in relative vertical relationship rather than in horizontal relationship as shown in the particular embodiment selected for illustration herein. Therefore, it is manifest that the construction shown is capable of considerable modification and such modification as is within the scope of my claims I consider within the spirit of my invention.

I claim:

1. A carbon black producing apparatus comprising in combination a retort wherein the internal pressure is less than atmospherical, carbon producing and collecting means within said retort, a housing for said retort, certain of the walls and the top of said housing being spaced from the retort, inlet and outlet means provided said housing and arranged in spaced relation, and means for regulating the functioning of said inlet means.

2. A carbon black producing apparatus comprising in combination a retort wherein the internal pressure is less than atmospherical, a carbon producing and collecting means within said retort, a housing enveloping said retort, certain of the walls and the top of said housing being spaced from the retort, inlet and outlet means at remote points

in the housing and dampers cooperatively associated with said inlet openings.

3. A carbon black producing apparatus comprising in combination a retort wherein the internal pressure is less than atmospherical, a carbon producing and collecting means within said retort, a housing for the retort, said housing being arranged with respect to the retort whereby to provide draft ways between the side walls and the top thereof, ventilator means in the retort, and inlet and outlet means arranged at remote points in the housing.

4. A carbon black producing apparatus comprising in combination a retort wherein the internal pressure is less than atmospherical, a carbon producing and collecting means within said retort, a housing for the retort, a plurality of ventilators in the retort, certain of the walls and the top of said housing being spaced from the retort, and inlet and outlet means at remote points in the housing.

5. In combination, a retort wherein the internal pressure is less than atmospherical, a plurality of gaseous fuel burners in the retort, said burners being adapted to effect an imperfect combustion of fuel supplied thereto, a housing for the retort, certain of the walls and the top of said housing being spaced from the retort, and relatively spaced inlet and outlet means in the housing.

6. In combination, a retort wherein the internal pressure is less than atmospherical, a plurality of gaseous fuel burners within the retort adapted to effect an imperfect combustion of the fuel delivered thereto, said retort having a plurality of adjustable ventilators in the top thereof, a housing for the retort, certain of the walls of said housing being arranged to provide draft ways between the same and the adjacent walls of the retort, the top of said housing being spaced from the top of the retort, such space between the top of the housing and the retort communicating with said ways, and inlet and outlet means at relatively spaced points in the housing.

7. In combination, a retort wherein the internal pressure thereof is less than atmospherical, a housing for the retort, a plurality of adjustable ventilators in the top of said retort, the sides of certain of the walls of said housing and the top thereof being spaced with respect to adjacent portions of the retort whereby to provide draft ways about and over the same, and adjustable inlet and outlet means at spaced points in the housing.

8. In combination, a retort wherein the internal pressure thereof is less than atmospherical, gaseous fuel burners in the retort adapted to effect an imperfect combustion of fuel delivered thereto, a housing for the retort, draft ways between certain of the walls of said housing and said retort and between the respective tops thereof, ventilators in the upper portion of the retort, outlet means in the top of said housing, and collectively operable adjustable inlet means in the lower portions of certain of the walls of said housing, communicating with said ways.

9. In combination, a retort wherein the internal pressure thereof is less than atmospherical, gaseous fuel burners within the retort adapted to effect an imperfect combustion of fuel delivered thereto, a plurality of adjustable ventilators in the top of said retort, a housing receiving the retort having certain of the side walls of the same spaced from the adjacent side walls of said retort and the top thereof spaced from the top of said retort, outlet means communicating with the top of said housing, the lower portions of said side walls of the housing having a series of inlet openings therein, and collectively adjustable damper means cooperatively associated with said inlet openings.

10. In combination, a retort wherein the internal pressure thereof is less than atmospherical, gaseous fuel burners within the retort adapted to effect an imperfect combustion of fuel delivered thereto, a plurality of ventilators in the retort a housing receiving the retort and formed to provide air ways about and above the retort, outlet means communicating with the top of said housing, draft accelerating means communicating with said outlet means of the housing, the lower portions of said side walls of the housing having air inlet openings formed therein and collectively operable damper means mounted adjacent said air inlet openings.

11. In an apparatus for producing carbon black, the combination with a retort wherein a pressure less than atmospherical is maintained having an outlet, carbon depositing and collecting means within said retort and means for directing an exhaust influencing means by said outlet.

12. In an apparatus for producing carbon black, the combination with a retort having an outlet and wherein a reduced pressure is maintained, carbon depositing and collecting means within said retort and means for directing and exhaust influencing means by and beyond said outlet.

13. In an apparatus for producing carbon black, the combination with a retort having an outlet opening and wherein a reduced pressure is maintained, carbon depositing and collecting means within said retort and means for directing a fluid means by and beyond said outlet.

14. In an apparatus for producing carbon black, the combination with a retort having an outlet therein and wherein a pres-

sure less than atmospherical is maintained, carbon depositing and collecting means within said retort and fluid means controllable by said outlet adapted to serve as a stimulus to the less than atmospherical pressure within the retort.

15. In an apparatus for producing carbon black, the combination with a retort having an adjustable outlet and wherein a reduced pressure is maintained, carbon producing means within said retort and fluid means movable over and by said adjustable outlet adapted to serve as a stimulus to the reduced pressure within said retort.

16. In an apparatus for producing carbon black, a retort having an outlet and wherein a pressure less than atmospherical is maintained, carbon producing means within said retort a housing enveloping said retort, inlet and outlet means in the housing, and other means for creating a fluid current within said housing by and beyond the outlet of the retort whereby to act as a stimulus to the less than atmospherical pressure therein.

17. A carbon black producing apparatus comprising a closed retort having discharge openings within the top thereof, carbon producing and collecting means within said retort, heat insulating means about certain of the walls of said retort and means adapted to accelerate the spent gases from said retort and through said discharge openings.

18. A carbon black producing apparatus comprising a closed retort having discharge openings within the top thereof, carbon producing and collecting means within said retort, and an air circulating chamber about certain of the walls of said retort whereby the air circulating through said chambers will accelerate the passage of spent gases from said retort and through said discharge openings.

19. A carbon black producing apparatus comprising a closed retort having discharge openings within the top thereof, carbon producing and collecting means within said retort, vertically extending air chambers arranged upon the opposite sides of said retort, an air chamber extending over the top of said retort and communicating with said vertically extending air chambers, and an aspirator communicating with said chambers for causing the air to circulate therethrough and draw the spent gases through the discharge openings of said retort.

20. A carbon black producing apparatus comprising in combination a closed retort consisting of side walls and an upper wall having discharge openings therein, an air circulating chamber extending over certain of said side walls and said upper wall, carbon producing and collecting means within said retort whereby a major portion of the carbon may be recovered from the combustion gases formed therein, and a suction fan communicating with said chamber and the discharge openings for withdrawing the spent gases from the retort.

In witness whereof I have hereunto set my hand.

CLYDE A. BARBOUR, JR.