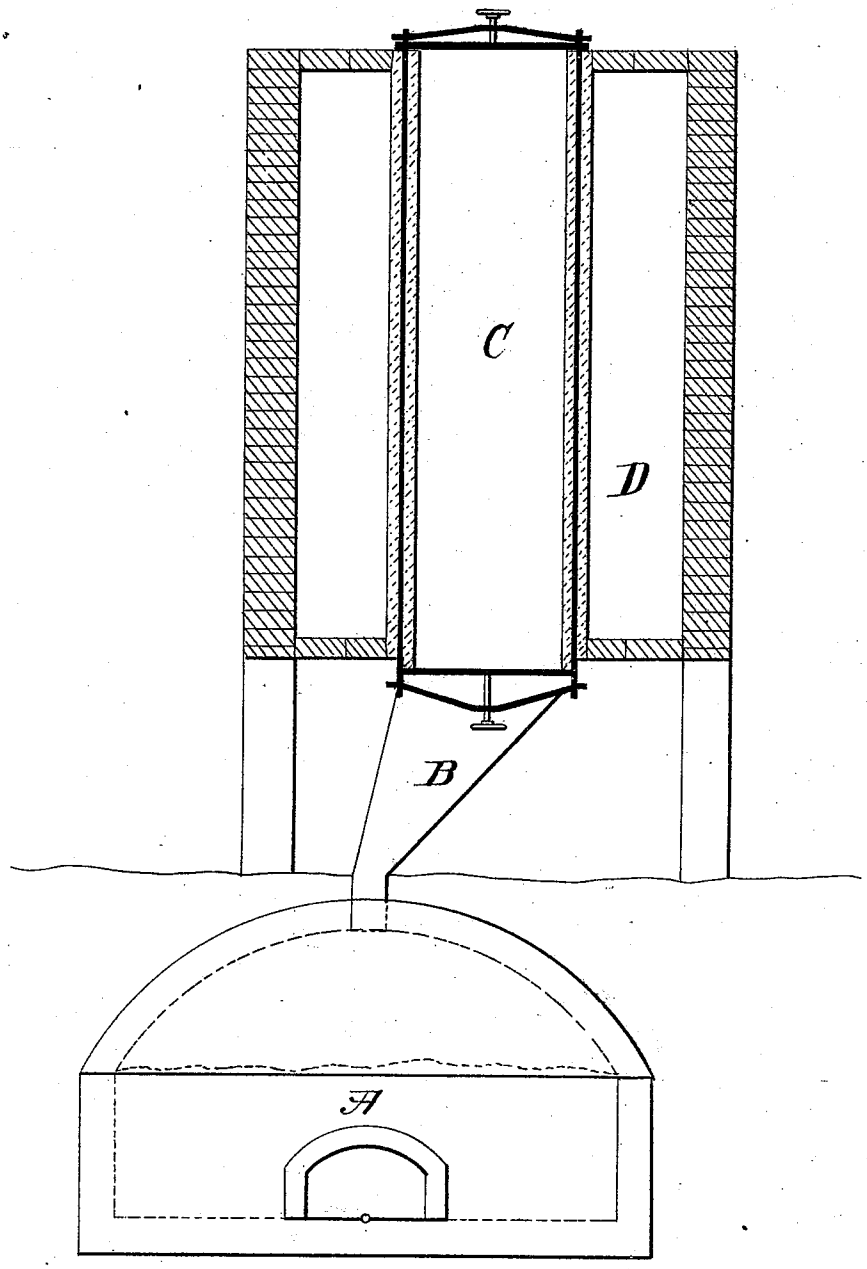
(No Model.)

G. C. HEWETT.

PROCESS OF MAKING COKE.

No. 511,334. Patented Dec. 26, 1893.



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PROCESS OF MAKING COKE.

SPECIFICATION forming part of Letters Patent No. 511,334, dated December 26, 1893.

Application filed December 29, 1891. Serial No. 416,426. No specimens.)

To all whom it may concern:

Be it known that I, GEORGE C. HEWETT, a citizen of the United States, residing at Washington, in the District of Columbia, have invented certain new and useful Improvements in Processes of Making Coke; 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 the manufacture of coke from coals that do not yield a coke suitable for metallurgical purposes by any process so far discovered. In the coking of the so called dry coals and lignites the coke obtained is never strong and coherent. It sometimes retains the original form of the coal but is frequently in the form of a powder.

In the ordinary process of coking as applied to coals, which are suitable for that process, and produce a hard, strong and cellular coke, the coal becomes semifused and soft, or cakes, in the early stages of the operation, when gases are being evolved freely, and it is this evolution of gas in the soft mass that gives the proper cellular structure to the coke. On the other hand, when a dry coal or lignite is heated, as in the ordinary process of coking, there is no softening of the mass of coal during the evolution of the gases, and no true coke is formed. Many processes have been proposed for making coke from non coking coals. I have discovered that the failure of all previous processes when applied to dry coals and lignites is due to the premature evolution of gases during the heating, and that there is consequently no opportunity for the coal to cake. I have also discovered that, by retarding the evolution of gas when the coal is first heated, changes take place in the constitution of the coal, which allow it to cake, and a good quality of coke can be produced from a coal that would otherwise yield no coke.

My invention therefore consists in bringing about certain changes in the constitution of dry coals and lignites, or non coking coals, by heating them at a low temperature under pressure, and thereby giving them the property of caking in the ordinary coking operation, and then coking them by the ordinary process.

In carrying out my invention the coal is first comminuted to a suitable degree of fineness, and then subjected to a gentle heat under pressure greater than twenty-four inches of water. The degree of heat and pressure used, and also the length of time the heating is continued will vary with different coals. After the coal has been heated sufficiently to bring about the proper changes the coking operation is continued by any one of the ordinary processes. When operating upon dry coals and lignites, the product formed will be much superior to that produced from the same coal by any other known process.

In some cases the preliminary heating under pressure may be secured in the same chamber that is used for the coking operation proper, but in others it will be necessary to carry out the separate steps of the process in separate chambers. In the latter case the coal may be passed through a bricking machine to consolidate the powder into blocks before charging into the oven.

When operating upon some coals the presence of certain already formed bituminous matters greatly facilitates the preparation of the coal for the actual coking in which case it is better to mix the proper amount of tar or similar body with the fine coal previous to the preliminary heating. When operating upon the coal obtained from the thirty-two inch seam at the head of Moen-Copi Wash in Arizona, for instance, I grind the coal to one-eighth inch mesh and then heat it in a closed chamber to a low red heat, about 700° Fahrenheit. During this heating a pressure of about ten pounds is produced. At the end of twenty minutes the chamber is opened and the heat raised, and the coking continued as in the ordinary manner, obtaining a good coke, while the heating of this coal, as in the ordinary coking operation, yields only a loose powder.

In the drawing, which represents a section of an apparatus suitable for carrying out my

invention, A is an ordinary bee-hive coke oven, B is a chute to convey the treated coal from the pressure heater C to the bee-hive oven, and D is a combustion chamber in which the gases from the bee-hive oven are burned to maintain the proper temperature in C. In operating this device the comminuted coal is first charged into C, which is then closed, and a safety valve, not shown, set at the proper pressure. Gas from the preceding charge is burned in D, and heats the coal in C. When properly heated C is opened, and its contents discharged into A by the chute B. In A the ordinary coking operation is carried on, and the gases developed are drawn into D, by channels not shown, and supply the heat for the treatment of the following charge. Other means of heating the chamber C may be employed, but the waste gases from the bee-hive oven will be the most economical fuel to employ.

In the coking process as ordinarily carried out the gases are allowed to pass away freely and the pressure does not rise above twenty-four inches of water.

From the foregoing it will be seen that my improved process of coking consists of two distinct steps, in the first of which the coal is heated under pressure and the development of gas is retarded, and in the second the coal is heated without pressure and the gases are allowed to pass away freely.

What I claim as new and valuable is—

1. The process of making coke which consists in first heating comminuted coal at a low temperature under pressure greater than twenty-four inches of water, and then subjecting the thus prepared coal to a higher temperature and drawing off the volatile matters as in the ordinary coking operation, substantially as described.

2. The process of making coke which consists in charging comminuted coal into a suitable closed chamber, heating the coal in the chamber at a low temperature under pressure, removing the treated coal to another chamber, and coking by the ordinary process, substantially as described.

3. The process of making coke which consists in heating comminuted coal at a low temperature under pressure, consolidating the thus treated coal into lumps, charging the lumps into an oven and coking by the ordinary process, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

GEORGE C. HEWETT.

Witnesses:

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