UNITED STATES PATENT OFFICE.

HENRY M. PIERCE, OF NASHVILLE, TENNESSEE.

PROCESS OF MANUFACTURING COKE.

SPECIFICATION forming part of Letters Patent No. 318,497, dated May 26, 1885.

Application filed July 31, 1884. (No specimens.)

To all whom it may concern:

Be it known that I, HENRY M. PIERCE, a citizen of the United States, residing at Nashville, in the county of Davidson, in the State of Tennessee, have invented certain new and useful Improvements in the Process of Manufacturing Coke; and I hereby declare the following to be a full, clear, and exact description of the same.

My present invention relates to that method of manufacturing coke most commonly followed in this country—that is to say, by the use of ovens, and firing the charge above, so that the coking proceeds from above downward. As now practiced, ovens of a conical or mound shape, some ten feet in diameter at the base, having a charging-hole above and a door at the base for withdrawing the coke, are employed. The ovens are charged with about one hundred bushels or four tons of the coal, which rises to about the top of the door, or somewhat lower, while the large space above the charge is occupied only by the gases evolved from the coal. The charge is fired at the top, and a portion of the top layer is consumed in heating the oven and its charge to incandescence or a red heat, so as to disengage the volatile vapors and gases, which, rising into the vacant space in the upper part of the oven, are ignited, and by the heat developed maintain the heat of the oven at the coking-point until the process is complete without any material consumption of the remaining portion of the charge. When the coking process is complete, the temperature in the upper part of the oven is very high, and will maintain a coking heat for a very long time, if no means of reducing it is employed; consequently it is customary to put out the fire in the oven and cool the charge by injecting water, so that the charge of coke can be speedily drawn.

The object of my present invention is to utilize this surplus heat and the surplus gases remaining in the upper or vacant part of the oven after the usual charge has been coked by the usual or downwardly-progressing method; and to this end it consists in superadding or combining with the first or downward coking process a second and subsequent charge or charges, which shall commence at or near the completion of the coking of the first charge.

In carrying out my invention I make use of the ordinary coking-oven or any coking-ovens adapted to be operated in like manner thereto, charge the same with an ordinary amount of coal, which shall occupy the lower third (more or less) of the oven, fire the charge at the top, and permit the coking process to proceed until near completion. At this stage I charge into the oven a fresh layer of coal, and thereafter from time to time, or continuously, additional layers, one upon another, continuing this procedure until the oven is full, when it can be closed and allowed to cool; or refrigerated gases, which are non-supporters of combustion, may be passed through the oven to reduce the temperature to the point at which the charge of coke can be drawn; or water may be employed to cool the charge, as now customary.

The increased yield of the oven will more than compensate for the loss of time, while the retardation of the process in the final coking steps of the first charge will result in a better product.

I am aware of the patent granted November 9, 1875, to H. Aitken, No. 169,756, wherein, after the coking of an initial charge by downward progression within a kiln having a drop-bottom, the latter is lowered and a second charge superimposed upon the first. In the Aitken kiln, each time that the floor is lowered for the reception of a new charge a large amount of cold air is necessarily admitted to fill the space formerly occupied by the preceding charge. This influx of air lowers the temperature of the gases below the coking-point, and frequently gives rise to explosions of a dangerous character. In my process the amount of air admitted with the successive new charges is inconsiderable, and the hot gases suffer no appreciable diminution in temperature from it. Their heat is expended, therefore, wholly in coking the new charges, each one of which occupies a portion of the space originally filled by the gases themselves, and is permeated by and brought into intimate contact with said gases. The various charges, moreover, remaining within the kiln until the end of the operation, the coking proceeds more slowly, insuring a better and more homogeneous quality of product.

Having thus set forth the nature, operation,

and advantages of my invention, what I claim, and desire to secure by Letters Patent, is—

In the art of manufacturing coke, the method of conducting the furnace operation and increasing its yield, which consists in partially filling the oven with an initial charge and coking the same by downward progression; then, while such charge remains stationary within the oven, and near the end of the said coking operation, filling the oven to a further height by an additional charge, thereby retarding the coking of the initial charge, coking the second charge, and proceeding in like manner, the coking going on progressively until the oven is filled, substantially as described.

In testimony whereof I have affixed my signature, in presence of two witnesses, this 28th day of July, 1884.

HENRY M. PIERCE.

Witnesses:
R. W. BAGOT,
STEWART CHURCH.