

UNITED STATES PATENT OFFICE.

JOSEPH HEMINGWAY, OF SPEARFISH, SOUTH DAKOTA, ASSIGNOR TO THE
UNIVERSAL FUEL COMPANY, OF CHICAGO, ILLINOIS.

PROCESS OF MAKING COKE.

SPECIFICATION forming part of Letters Patent No. 637,255, dated November 21, 1899.

Application filed October 16, 1899. Serial No. 733,749. (No specimens.)

To all whom it may concern:

Be it known that I, JOSEPH HEMINGWAY, a citizen of the United States, residing at Spearfish, Lawrence county, South Dakota, have
5 invented certain new and useful Improvements in Processes of Making Coke, of which the following is a specification.

The object of my invention is more particularly to devise a method of treating sulfurous
10 coals and coals that have heretofore been regarded as non-cokable for commercial purposes, so that they can be coked in quantity and at a reasonable expense and so that the coke secured will be of a superior quality and
15 applicable for all the uses to which good qualities of coke are now applied; and my invention also has for its object improving and expediting the coking of coals now coked by the ordinary processes; and my process consists in the operations and modes of procedure hereinafter described and claimed.

In the drawings, Figure 1 represents a plan view of a convenient form of coking plant to carry out my process, with the coking-ovens
25 shown in section taken on line 1 of Fig. 2. Fig. 2 is a side elevation. Fig. 3 is a longitudinal sectional elevation of the blast-heating furnace; and Fig. 4 is a vertical section of a coking-oven, showing the movement and
30 circulation of the gases.

In describing the process or mode of procedure that I have found from months of actual work in coking sulfurous coals and coals that are generally regarded as non-cokable
35 for commercial purposes and coals that are coked according to the present methods to be the best and the most successful I desire to say at the start that I do not intend in this application to attach special importance to the peculiarities of construction of the coking plant which I use, so long as it is adapted for carrying out my process.

The oven A—and when I say “oven” I mean to include as well a plurality of ovens—
45 in which the coal is inclosed or confined may be and preferably is as to its interior of the ordinary beehive construction. It should, however, whatever the form of its construction, be built of materials capable of standing
50 ing great intensities of heat. The most refractory or durable quality of fire-brick should

therefore be employed for the interior lining of the coking-oven. This necessity grows out of the fact that in my process or mode of procedure I raise the temperature in the coking-oven to a point two or three thousand degrees above what is ordinarily employed in the coking operation as generally practiced at the present time. This temperature reaches, I should say, in many cases a point exceeding 4,000° Fahrenheit. Under the high temperature employed by me I secure not only rapid generation and evolution of the gases contained in the coal, but a breaking up and disintegration of their elements and a conversion of the volatile carbons into a fixed form, so that they are deposited upon the coke in large quantities and form constituents of and substantial additions to the coke product. This increase in the quantity of fixed carbon is not secured by the methods of coking in general use, where the temperature is insufficient to effect the separation of the constituents of the gases and the conversion of the volatile carbons into fixed form.

To secure the increased temperature employed by me, I have found it necessary to provide a blast heated outside of the coking-oven itself—an extraneously-heated blast. As a convenient means of heating the blast a furnace B may be employed, having an auxiliary arrangement of open brickwork C, preferably inclosed in the same wall that incloses the furnace. The open brickwork may be constructed of fire-brick and in the usual way. It operates to preserve equality in the temperature of the blast and is intended to be heated and maintained at as high a temperature as the blast driven through and in contact with the mass of burning fuel. In the heating-furnace I have represented a bed of coal, which may of course be as large and deep as the requirements of the case may seem to render expedient or desirable. The blast is furnished by any convenient fan or force blower D, driven by any suitable motor E, operated by electricity, steam, or other preferred means. The air furnished by the blower is, preferably, primarily conveyed into a reservoir or accumulator D' and from thence through a pipe *d* to the furnace. After the air has passed through the burning fuel it is

