

Retort for Extracting Oil from Coal.

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UNITED STATES PATENT OFFICE.

J. McCUE AND W. B. McCUE, OF FREEPORT, PENNSYLVANIA.

IMPROVEMENT IN RETORTS FOR DISTILLING OILS FROM COAL.

Specification forming part of Letters Patent No. 21,143, dated August 10, 1858.

To all whom it may concern:

Be it known that we, J. McCUE and W. B. McCUE, of Freeport, in the county of Armstrong and State of Pennsylvania, have invented certain new and useful improvements in machines for the purpose of extracting the oleaginous matter from coal, shale, and other minerals by means of dry distillation; and we do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

The nature of our invention consists in constructing and operating cylindrical metallic retorts for the purpose of extracting the volatile products of coal, bituminous shale, and other minerals, in the manner that will be hereinafter described.

In order that those skilled in the art may construct and use our invention, we will proceed to describe its construction and operation.

In the annexed drawings, Figure 1 is a side elevation of the retort and the connecting-pipe, showing their connection with the furnace and the dust-receiver. Fig. 2 is a front view of the retort, showing the connection of the retort with the driving-wheel. Fig. 3 is a perspective view of the retort, showing its internal arrangement. Fig. 4 is a back view of the retort, showing three different positions of the connecting-pipe when the retort oscillates—two extreme and the central position.

In Fig. 1 A represents the furnace, which is constructed in any of the known ways.

B is a cylindrical metallic retort secured in this furnace. One end of this retort is provided with a central shaft, which has its bearing in the upright *g'*. The other end of the retort rests between small friction-wheels *o o*. (Seen in this figure and in Fig. 2.)

C is a shaft, which has its bearings in the uprights or sides of the frame *l l*. This shaft is provided with a handle and crank, H, and with two pulleys, D and E. Power may be applied by means either of the crank or the pulleys, as may be desired.

F is a wheel secured to one end of the shaft C.

G is a pitman connected to wheel F at one end, and is secured to a crank, *i*, at the other,

said crank *i* being attached to the retort. The pitman is secured to wheel F near its periphery, while the crank *i* is attached to the retort about half-way between its center and its periphery; but the length of the crank and the length of the pitman are so proportioned that when the wheel F revolves it imparts an oscillating motion instead of a revolving motion to the retort. We may employ other means of accomplishing the same end. *dd* represent a pipe which enters the end of the retort at a point above its center. The joint of this pipe, which connects to the retort, always stands at an angle with it, as is here represented, and always runs up so as to prevent the material from the retort entering and clogging it. This joint of the pipe is always so located that when the retort oscillates they do not turn down any more than is represented in the extreme position seen in Fig. 4. Should they by any arrangement turn down as the retort oscillated to a plane with the axis of the retort, and any dust or material be lodged in the pipe, it is very evident that when the pipe turns up to a central position, as seen in Fig. 4, the material will run or fall out of the pipe back into the retort, and thus clear itself.

The great difficulty with any retort which discharges at or through its axis is that the material or coal-dust will collect in the pipe, and thus stop it up and prevent the vapor from passing out. The pipe *dd* has a second and third joint, as seen here. The first joint turns up, the second turns down, and the third enters the dust-receiver I, and is so packed at the point where it enters the receiver that it will turn in it as it is compelled to turn by the motion of the retort without permitting the vapor to escape. The several joints of this pipe are secured together in any of the known ways, so that they may be taken apart and cleansed of any impurities which may accumulate in it.

The retort B, as will be seen in Fig. 4, is provided with three or more ribs on its bottom and sides within. The object of these ribs is to agitate the material and prevent its sliding on the bottom of the retort.

The material being hard and dry would in time wear the bottom and sides of the retort

very smooth, and then the material would slide around on the bottom of the retort and present only one surface to the action of the fire. By means of these ribs *h h h* the material is constantly mixed and agitated, and always presenting a varied surface to the action of the heat.

J represents a pipe, through which the vapor passes off for the purpose of condensing.

K represents an aperture through which the dust which collects in the receiver *I* may be removed. This aperture is stopped when not used for this purpose by means of a plug.

In the operation of this machine the ground or fine material is placed in the retort *B* through a door in the retort. This door is then closed. Motion being given to wheel *F*, an oscillating motion is communicated to the retort. The fire in the furnace passes over and around the retort and heats the material, and as it is heated the motion of the retort gives motion to the material, and thus keeps it constantly active. The vapor passes up into the pipe *d* and into the dust-receiver, where any dust is deposited which may pass up with it. It then passes on through pipe *J* and into the condensing-pipes, which are not here represented.

We are aware that there is a retort patented by Alter and Hill which revolves continuously. We are also aware of Gengembres' patent; but both of these we disclaim, as our retort obviates difficulties which both of these patents are subject to; but,

Having thus fully described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. The employment of the connecting-pipe *C*, located in the retort *B* in other than a central position, whereby we are enabled to conduct off the oleaginous products of the coal while the said retort partially revolves backward and forward on its axis, as is herein fully set forth.

2. Providing the retort *B* with the longitudinal ribs *d d d*, for the purpose of agitating the coal and preventing its sliding when the retort turns, as is herein fully described.

JOHN McCUE.
W. B. McCUE.

Witnesses:

C. M. ALEXANDER,
ALBERT L. SHEAR,
WILSON SPROULL,
WM. M. LOUTHER.