J. NICHOLSON.

Retort.

No. 22,973. Patented Feb. 15, 1859.

Fig. 4

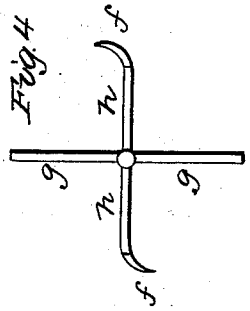

Fig. 2

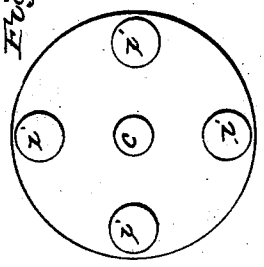

Fig. 3

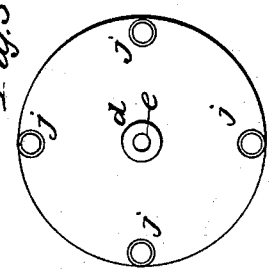

Fig. 5

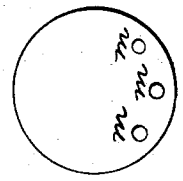

Fig. 1

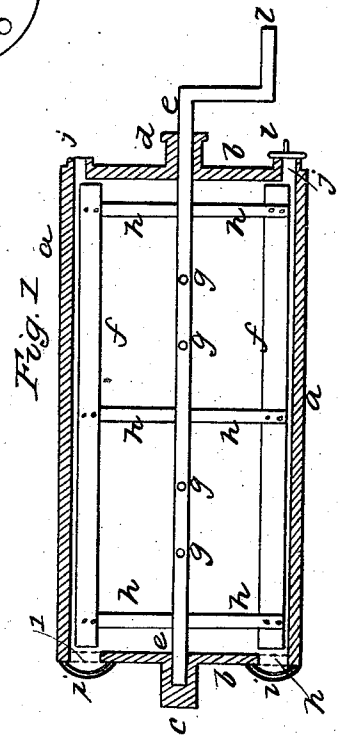

Fig. 6

Witnesses
James J. Johnston
J. B. Johnston

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UNITED STATES PATENT OFFICE.

JOHN NICHOLSON, OF ALLEGHENY, PENNSYLVANIA.

IMPROVEMENT IN RETORTS FOR DISTILLING OILS FROM COAL.

Specification forming part of Letters Patent No. **22,973**, dated February 15, 1859.

To all whom it may concern:

Be it known that I, JOHN NICHOLSON, of the city and county of Allegheny, in the State of Pennsylvania, have invented a new and useful Improvement in Retorts for Distilling Oil from Coal; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, similar letters referring to similar parts.

The nature of my invention consists in furnishing retorts for making oil from bituminous or other coal with a curved blade or blades on agitators, and also in an arrangement of the trunnions and the discharge and supply openings in connection with the arrangement of the exit-pipes for the passage of the oleaginous vapor, said arrangement being for the purpose of agitating the coal and bringing all parts of it in contact with the heat, and also for exposing different parts of the retort to the action of the fire.

To enable others skilled in the art to make and use my invention, I will proceed to describe its construction and operation.

In the accompanying drawings, Figure 1 is a cut or sectional view of the retort. Fig. 2 is the front end of the retort. Fig. 3 is the back end. Fig. 4 is a section of the shaft and agitators. Fig. 5 is an end view of a retort representing the end view of three shafts. Fig. 6 is a sectional view of a shaft representing the agitators arranged spirally around the shaft.

a is the cylinder of the retort.

b are the ends.

c and *d* are the trunnions for the retort and the plumber-blocks for the shaft *e*, which shaft is armed with agitators marked *g h f*. The trunnions *c* and *d* rest on suitable bearings. The arms or agitators *h* are furnished with a curved blade, *f*, which is plainly shown in Fig. 4.

j are the pipes for the passage of the oleaginous vapor. All of these pipes, with the exception of one, are furnished with caps *k*.

i are caps for closing the supply and discharge openings, which are marked 1 and 2 in Fig. 1. The pipes for the passage of the vapor and the discharge and supply openings are arranged opposite or in a line with each other, being so arranged that when an exit-pipe is open at the top of the back end of the retort a supply and discharge opening will be at the lower side of the front end. The opening in trunnion *d* should be made to fit closely around the shaft *e*, so as to prevent the escape of the vapor or fumes. This may be readily accomplished by the use in a stuffing-box of some suitable metallic packing—such as Babbitt metal, &c.

The operation of my machine is as follows: Having the parts arranged as represented in Fig. 1, I remove the cap *i* and place in the retort the desired quantity of coal or other matter through the opening 2. The cap is replaced and secured. The heat is applied to the retort in the usual manner. Power is applied to crank *l* of shaft *e*, the revolving of which will agitate the mass within the retort, bringing all parts of it in contact with the heat, thereby producing a perfect separation of all the oleaginous vapor from the coal or other matter in the retort.

The arrangement of the discharge and supply openings in connection with the trunnions and exit-openings *j* is such that when one side of the retort is weakened by the action of the fire another side may be exposed to it.

A number of shafts may be used and arranged as represented in Fig. 5, and marked *m*. I do not claim a revolving or oscillating retort; nor do I claim an Archimedean screw revolving inside of a retort, as such a device is found in the English patent of G. Bower; nor do I claim in general the use of a shaft armed with agitators within a retort; but

What I do claim as my invention, and desire to secure by Letters Patent of the United States, is—

1. The use of a curved blade or blades placed on the agitators or arms *h* of shaft *e*, for the purpose of agitating, lifting, mixing, and bringing all parts of the mass within the retort in contact with the heat, as herein described and set forth.

2. The arrangement near the outer edge of one end of a retort of four or more supply and discharge openings, and on the other end, near the outer edge, of four or more exit-pipes placed on a line with and opposite to the supply and discharge openings, as herein described, and for the purpose set forth.

JOHN NICHOLSON.

Witnesses:

JAS. B. JOHNSTON,

ALEXANDER HAYS.