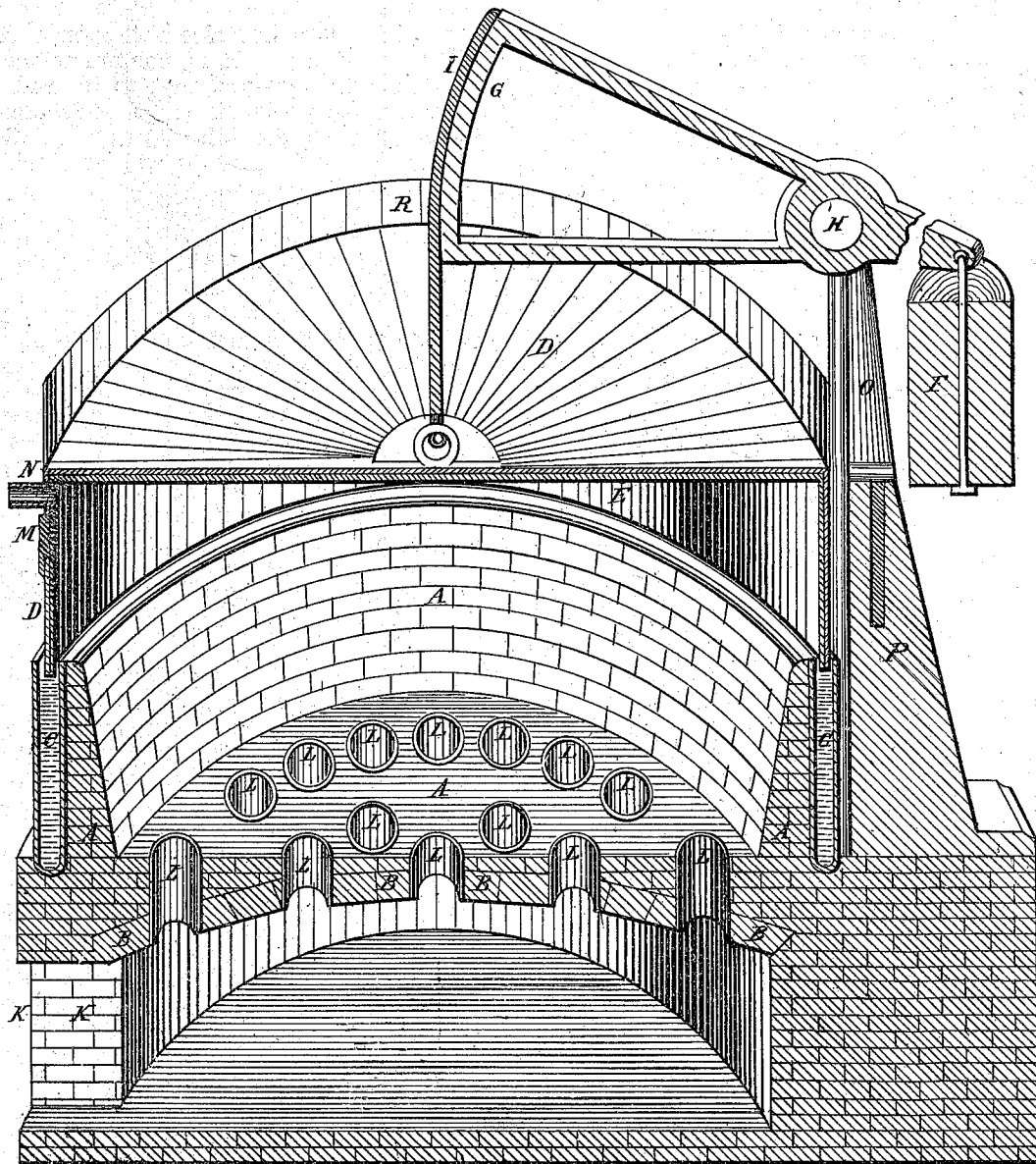


L. S. GOODRICH.

Improvement in Apparatus for the Manufacture of Charcoal.

No. 129,814.

Patented July 23, 1872.



Witnesses:

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UNITED STATES PATENT OFFICE.

LEVEN S. GOODRICH, OF WAVERLY, TENNESSEE.

IMPROVEMENT IN APPARATUS FOR THE MANUFACTURE OF CHARCOAL.

Specification forming part of Letters Patent No. 129,814, dated July 23, 1872.

SPECIFICATION.

To all whom it may concern:

Be it known that I, LEVEN S. GOODRICH, of Waverly, in the county of Humphreys and State of Tennessee, have invented a new and useful Apparatus for the Manufacture of Charcoal, of which the following is a specification:

Nature and Object.

The object of my invention is to produce an apparatus for the manufacture of charcoal which will save all the useful products arising from the distillation of the wood, and at the same time increase the quantity and improve the quality of charcoal produced from any given amount of wood. The nature of my invention consists in constructing a stationary kiln or furnace of any suitable size to contain about one-half the wood to make a desired charge, covering the said kiln with a telescopic bottomless holder, which reciprocates vertically in an annular chamber surrounding said kiln, provided with a suitable liquid for sealing the same, like that of an ordinary gas-holder. Said holder rises high enough to form a chamber between its top and the bottom of the kiln of sufficient dimensions to receive an amount of wood to make the desired charge, thus making up for the deficient capacity of the kiln itself, which is only designed to hold about half of said charge. At or near the top of said holder is situated a suitable number of doors, through which the kiln may be charged to avoid the necessity of removing the said holder for that purpose. Near these doors is situated a pipe or pipes for carrying off the products of distillation. The bottom of the kiln is provided with an arch, to which access may be had for regulating the air-supply, which enters the kiln through orifices in said arch, as hereafter described.

General Description.

With reference to the accompanying drawing, which represents a vertical section of the entire apparatus, A is a conical chamber, composed of fire-brick or other suitable non-conductor. B is an arch of similar material for supporting the same; and C is an annular chamber surrounding A, into which dips and freely reciprocates the bottom of D, which is a metallic drum or casing lined with E, a non-con-

ductor of heat, provided also at the top with a chamber or reservoir, R, for containing water, for two purposes—viz., first, to add sufficient weight to overcome the counter-balance F, which connects therewith by segment G and chain or rope I, (the said segment oscillates on fulcrum H;) second, to preserve the top of said D from the action of the heat. The support of fulcrum H is so arranged as to revolve, being provided with a pin extending from the upper portion O down into P, which supports the said O, as shown. By this means the holder D, after being raised from the chamber C, may be swung around out of the way to give free access to the kiln A. K is a passageway leading to the center of arch B, through which the operator can gain access for adjusting the dampers in orifices L, which regulate the flow of air to the kiln. M is a door situated in D, as shown, which may be opened or closed at pleasure. N is a pipe through which the gaseous and aqueous matter passes off, the same being located at or near the top of said D.

Operation.

Supposing the top of holder D to be raised high enough to form a chamber between it and the bottom of A to equal about double the amount of space contained in said A, and that said chamber is filled with wood, then M is closed, a fire is kindled at or near the center of A through the orifices L. The products of this combustion rise through the wood and pass off through the pipe N, through which, also, the products of distillation of the wood caused by said combustion pass off to a condenser or other apparatus for collecting the same. As the process goes on the wood shrinks by the loss of its volatile properties and of course sinks in the direction of the bottom of A. Now, it may here be seen that if the entire apparatus were stationary a space would be left at the top of the wood for the collection of a portion of the above-said volatile products, whereas in my apparatus this space is avoided by the top of D, which rests upon and follows the same until it occupies its least possible space in the form of charcoal, and may be kept more or less compact during the operation by the proper adjustment of the counter-balance F and the amount of water in reservoir R, and as said D reciprocates in the liquid

sealing the same all of the volatile products of the distillation are compelled to pass off through pipe or pipes N.

Having thus described the process of making the coal, the next important object is to discharge the kiln in order to aid the difficulty of exposing the coal to the weather while performing the operation. This, however, is dependent to some extent upon the precise construction of the apparatus. To accomplish this in the one already described the water is removed from reservoir R, when the counter-balance F overcomes the weight of D, which is then easily raised and swung around out of the way, giving free access to the kiln, or replaced in case of rainy or other bad weather which would be likely to injure the same, or it may be raised high enough to give access without swinging the same out of position. This is independent of the door M, which need not be brought into use.

It may be here stated that the kiln may be charged and discharged in various ways from that above mentioned, as, for instance, the bottom may be provided with a trap-door, through which the same may be accomplished, or a passage may be formed leading through the annular chamber C and kiln. It may also be stated that the air-supply may be arranged differently. The orifices L may be provided with pipes lead-

ing to the surface of the ground outside of the apparatus. In this way the arch B may be dispensed with, though the same is valuable, enabling the operator to observe more readily the operation at that point. Therefore,

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

1. The combination of the holder D and the annular chamber C with the stationary kiln A; substantially as and for the purpose above set forth.

2. The orifices L, in combination with arch B, situated at the bottom of the kiln A, with suitable dampers for regulating the air-supply thereto, for the purpose above described.

3. I finally claim the entire coal-producing apparatus above described, consisting of a stationary kiln, a reciprocating or movable cover provided with doors for charging the same with pipes for conveying away the distillate and the air-supply, as above specified, in combination with the counter-balance and reservoir in connection therewith, substantially as and for the purposes set forth.

LEVEN S. GOODRICH.

Witnesses:

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