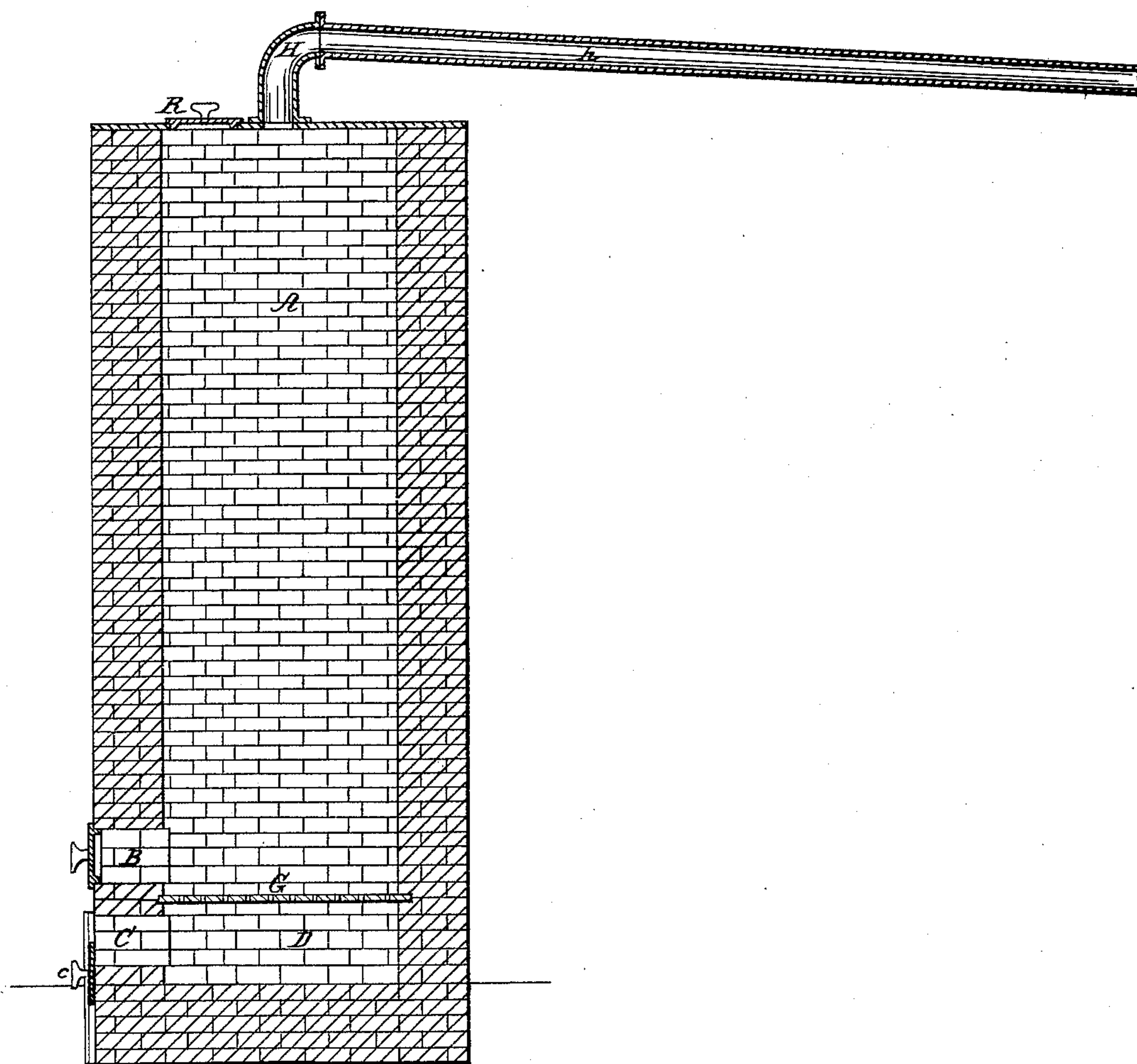


L. ATWOOD.

Oil Still.

No. 23,337.

Patented Mar. 29, 1859.



Witnesses:

W. H. Goodnow

John Burwood

Inventor:

Luther Atwood

UNITED STATES PATENT OFFICE.

LUTHER ATWOOD, OF BROOKLYN, NEW YORK.

IMPROVEMENT IN APPARATUS FOR DESTRUCTIVE DISTILLATION.

Specification forming part of Letters Patent No. 23,337, dated March 29, 1859.

To all whom it may concern:

Be it known that I, LUTHER ATWOOD, of Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Apparatus for Destructive Distillation and Carbonization, applicable to the distillation of wood, bones, bituminous coal, and other solid substances which maintain their figure during decomposition, and which yield liquid products at comparatively low temperatures; and I do hereby declare that the following is a full and exact description thereof, reference being had to the annexed drawing, and to the letters of reference thereon.

The nature of my invention consists in combining a vertical distilling tower or chamber, arranged so as to receive both the fuel and the substance operated on, with a condenser and a means of controlling or regulating the draft, by which the products of combustion of the fuel are circulated through the mass acted on, so that the process of decomposition can be carried on below a temperature that would effect combustion before the liquid and volatile products have been driven off by the heat, the whole apparatus being so arranged and combined as to use the current of products in its natural or upward direction; but more particularly to describe my invention, I will refer to the accompanying drawing, forming a part of this specification, and representing a vertical longitudinal section of the apparatus.

Letter A represents a vertical air-tight hollow cylinder of brick or other suitable material, which I call a "distilling-tower," provided near the bottom with a grate, G, below which is an ash-pit, D, and adjustable draft-passage C. Just above the grate is a man-hole and stopper, B, to be opened for the purpose of removing residue, but closed and luted during the operation. The top of the distilling-tower A is covered with an air-tight cover provided with an aperture, R, for charging, which is kept covered and luted during the operation.

h is a long thin sheet-metal pipe, the length of which may vary, say, from fifteen to fifty feet, according to the temperature of the at-

mosphere, and which performs the office of condenser, communicating with the distilling-tower by the elbow H.

When the apparatus is used in the open air, the elbow H may be made with a sleeve-joint, so that the pipe may be turned in a direction corresponding with the wind for the purpose of accommodating the draft, and also, for the same reason, additional adjustable openings into the ash-pit may be made at suitable distance from each other around the circumference of the tower, so that one or more can be opened in a favorable position, no matter in what direction the wind blows.

The size of the opening C may be adjusted or regulated by the sliding door or damper *c*, as shown in the drawing; or a taper plug or some loose bricks may be used, or any means of practically increasing or decreasing the volume of air passing to the fire.

The distilling-chamber in a practical apparatus may be from two to ten feet or more in diameter, there being no limit to the size except the practical difficulty of withdrawing residue, which may be overcome in part by additional discharging-apertures, similar to B, at suitable distances around the circumference of the distilling-tower.

In the use of the above-described apparatus I charge the distilling-tower through the aperture R, first, with a layer of small-sized pieces of coke or clear coal, and then fill it up with the wood, bones, or coal to be decomposed, and close the charging-aperture, luting the joints. I then ignite the coke with kindling-stuff thrown loosely into the ash-pit under the grate, or placed on the grate under the coke, the products of combustion passing upward through the mass acted on, gradually decomposing the same, the vapors and volatile products of decomposition escaping into the thin sheet-metal pipe *h*, where, by the cooling action of the surrounding air, the liquid products are condensed and flow out of the end of the pipe, it being sufficiently inclined toward the horizon to prevent the liquids from flowing back into the distilling-tower. By carefully regulating the draft the process can be carried on, as above described, so gradually and progressively that the mass

acted on will not be exposed to flame or fire until it is deprived of its volatile and liquid products and converted into coke.

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

The combination of the vertical distilling-tower A and appurtenances with the condenser h and the adjustable draft-passage c, or their

substantial equivalents, in combination, when arranged and combined, substantially as hereinbefore described, so as to use the current of heated products of combustion in its upward or natural direction.

LUTHER ATWOOD.

Witnesses:

W. H. GOODNOW,
JOHN M. STEARNS.