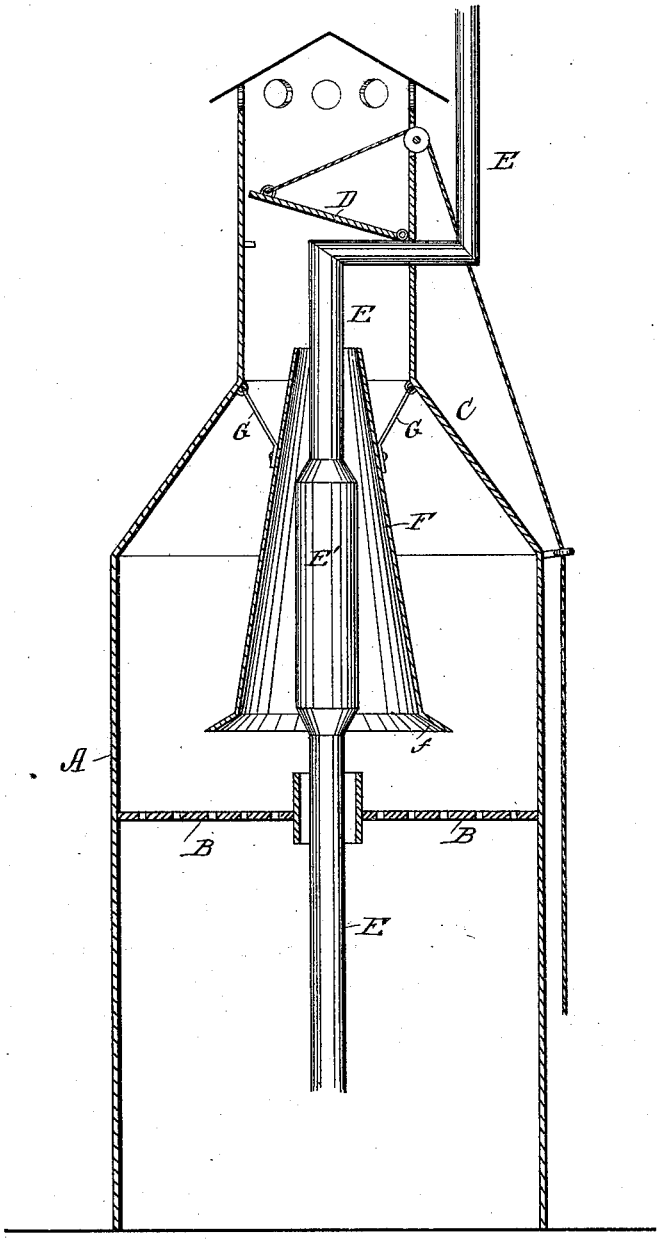
(No Model.)

W. S. PLUMMER.

HOP DRIER.

No. 345,647. Patented July 13, 1886.



WITNESSES:

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HOP-DRIER.

SPECIFICATION forming part of Letters Patent No. 345,647, dated July 13, 1886.

Application filed September 28, 1885. Serial No. 178,462. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM S. PLUMMER, a citizen of the United States, residing at Leavenworth, in the county of Leavenworth and State of Kansas, have invented a new and useful Improvement in Drying Attachments for Hop-Kilns, of which the following is a description.

My invention is an improved drying attachment for hop-kilns, and relates particularly to that class of drying apparatus in which suction is created above the material to be treated, in order to draw air up through said material, and thereby quickly dry the mass.

The invention has for an object to provide simple, economical, and easily-adjusted devices by which to facilitate the creation of such vacuum; and it consists in certain novel constructions, combinations, and arrangements of parts, as will be described, and pointed out in the claims.

In the drawing is represented a vertical section of a hop-kiln provided with my improved drying attachment.

The kiln-casing A and the hop-floor B may be of the ordinary construction. The casing is formed at its top with an exhaust-flue, C, preferably tapered, as shown, and in the top of which may be supported the valve or door D, used in bleaching the hops. A tube or pipe, E, connects at its lower end with a suitable heating apparatus, and extends up through the floor B, and thence up within the hop-chamber to a point slightly below the door D, where it bends laterally outward through the casing. Except for the door D, which might be omitted, as far as the drying of the hops is concerned, the heating-tube might be extended vertically up through the dome or cover of the case, the lateral bend, as shown, being for the purpose of avoiding the door, as will be seen. The opening through which the heating-tube passes through the drying-floor is usually made larger than the tube, to avoid burning the floor. The heating-tube for the greater part of its length within the hop-chamber is preferably enlarged diametrically at E', so as to expose a larger radiating-surface, and to a certain extent retard the passage of the heat, so it will have a greater effect on the hop-chamber. By means of this tube it will be seen the heat radiated by the flue warms the air, which passes up from the drying-chamber with a rush, producing a suction, which draws the air up rapidly through the hops and extracts the moisture therefrom.

While the described construction will give good results, I prefer in connection therewith to use the tubular concentrator F, placed over the heating-tube within the hop-chamber, and having its lower end located slightly above the hops and its upper end terminating approximately at the top of the hop-chamber, as will be seen. While this construction may be made cylindrical, it is preferably formed a tapering tube gradually flaring or enlarging toward its lower end, and it is also preferably provided at such end with a trumpet or bell shaped mouth, *f*. The tapering form of the concentrator operates to condense the heat in the upper end thereof, increasing its tensity and force, as will be understood. The opposite ends of the concentrator are open, so that it draws the air directly up through it from below, as well as from around it, by the formation of the vacuum at the top of the concentrator and at the lower end or neck of the vertical contracted portion of the exhaust-flue. This concentrator may be suspended by hangers G from the walls of the casing, or may be rigidly connected by fixed hanger-bars to such casing, or, where desired, to the heating-tube, as will be understood.

In operation, it will be seen the heat of the tube is concentrated within tube F, and rushes out of the top thereof and affects the air within the hop-chamber mainly at the top thereof, producing a vacuum below, into which the air rises upward and draws the moisture from the hops.

The invention is simple, and greatly facilitates the treatment of the hops by the rapid extraction of the moisture.

It will be understood that instead of the heating-pipe, as shown, a gas or lamp jet might be arranged to heat the air within the tubular concentrator without departing from the broad features of my invention; but I prefer the construction as shown and before described, whereby a portion of the air in the drying-chamber is heated to a degree above the remaining portion, and, passing up with a rush, serves to draw up such remaining portion, as before described.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The combination, with the hop drying chamber having a discharge, of a heating-tube extended within said chamber and a tubular concentrator encircling said tube, and having its upper end opening substantially into said discharge and made of less diameter than the same, and having its lower end opening into the hop-chamber, all arranged substantially as set forth, whereby the increased force and speed of the air passing up through the concentrator will operate to draw the air up into the discharge from all sides of such concentrator, substantially as set forth.

2. The combination, in a hop-kiln, with the drying-chamber having a discharge, of a tubular concentrator supported in said chamber, and having its upper end opening substantially into such discharge and its lower end opening into the hop-chamber, and a heating apparatus, substantially as described, whereby heat may be supplied within said concentrator, substantially as and for the purposes specified.

3. In a hop-kiln, the combination of the drying-chamber having a discharge, a tube extended into said chamber, and the concentrator made conical in form, enlarging toward its lower end, said concentrator opening at its upper end into the hop-chamber discharge, and having its lower end opening into the drying-chamber, substantially as set forth.

WILLIAM S. PLUMMER.

Witnesses:

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