

No. 608,564.

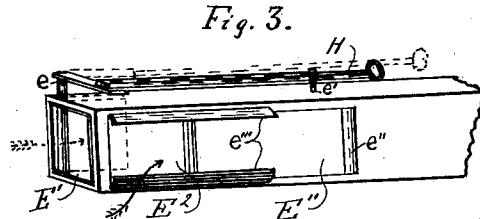
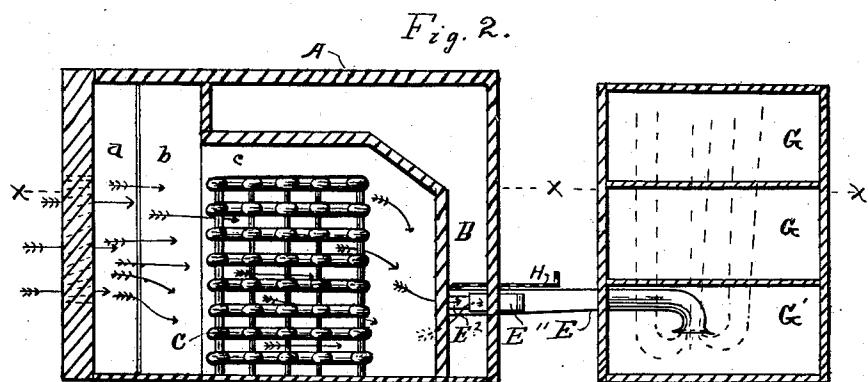
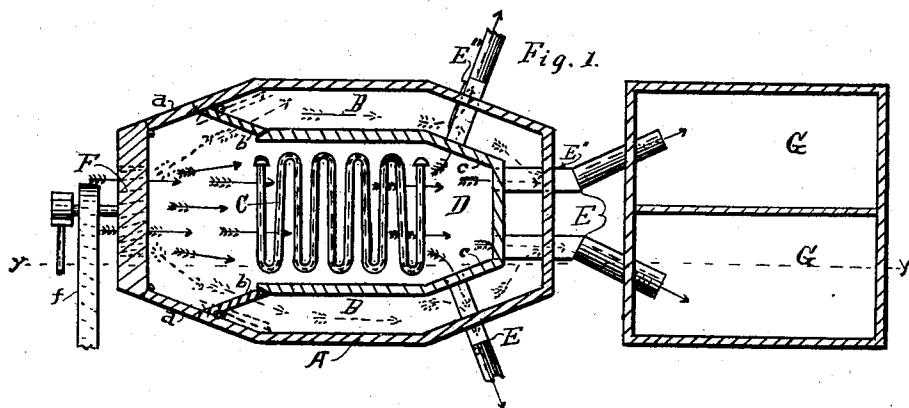
Patented Aug. 2, 1898.

C. C. BARBOUR.

HEATING AND DRYING SYSTEM.

(Application filed May 21, 1897.)

(No Model.)



Witnesses.

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# UNITED STATES PATENT OFFICE.

CHARLES C. BARBOUR, OF GRAND RAPIDS, MICHIGAN, ASSIGNOR OF ONE-FOURTH TO NATHAN E. STAPLES, OF CADILLAC, MICHIGAN.

## HEATING AND DRYING SYSTEM.

SPECIFICATION forming part of Letters Patent No. 608,564, dated August 2, 1898.

Application filed May 21, 1897. Serial No. 637,638. (No model.)

To all whom it may concern:

Be it known that I, CHARLES C. BARBOUR, a citizen of the United States, residing at Grand Rapids, in the county of Kent and State of Michigan, have invented certain new and useful Improvements in Heating and Drying Systems, of which the following is a specification.

My invention relates particularly to improvements in appliances for drying leather at tanneries; and its objects are, first, to dispense with one-half of the piping necessary in the usual manner of conveying warm and cold air to the drying-room in the process of tempering the circulating air when in the process of drying the leather, and, second, to provide for forcing the air into the drying-room at a single temperature and at the exact temperature desired.

I attain these results by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a sectional plan of my device on the line  $xx$  of Fig. 2, showing the relative positions of its several parts. Fig. 2 is a sectional elevation of my device on the line  $yy$  of Fig. 1; and Fig. 3 is an enlarged perspective view of my air-conductor tubes, showing their construction and operation

30 within the walls of my main air-reservoir.

Similar letters refer to similar parts throughout the several views.

The main air-chamber A is designed to be inclosed and made air-tight on all sides, top and bottom, except at the front end, where it is left open for the reception of the rotary fan F, which is so arranged in the usual manner that its rapid revolutions force air into and through the chamber and into and through

40 the conductor-pipes E, as indicated by the arrows in Fig. 1.

C represents a steam-coil around the pipes of which the air in its passage from the fan to the conductor-pipes passes and is thoroughly heated. This coil is placed within an inner chamber, which is open at the front end, but is closed at the back end to form a hot-air chamber D, where the air, heated to the desired temperature, is compressed suffi-

50 ciently to cause a free full flow through the conductor-pipes when the gates E' are open.

I prefer that the outer or discharge end of my conductor-pipes open downward, as shown in the basement G' in Fig. 2, whence the air rises by its natural buoyancy to the drying-chambers G, as indicated by the arrows and their corresponding dotted lines.

Thus far I have simply described the hot-air circulation as usually applied. I construct my air-chamber in two compartments. The one compartment contains the steam-coil C and hot-air chamber D, as hereinbefore described, and the outer compartment B surrounds it on three sides, as shown in Figs. 1 and 2, and acts a double purpose—first, as an air-chamber to prevent the cooling of the air in the chamber D, and, second, as a passage-way for cold air from the fan F to the cold-air gates E<sup>2</sup> in the sides of the pipes E. I provide the pipes E with two sets of gates, (shown more fully in Fig. 3,) E' being hinged into the end of the pipes in position to be actuated by the lever e and rod H to be opened and closed, as indicated by the dotted lines, so that hot air from the chamber D can be allowed to pass through the pipe freely or may be entirely shut off from flowing through, as desired. This gate is designed exclusively for the regulation of the flow of hot air from the hot-air chamber to the drying-rooms. The outer or cold-air chamber B may be entirely shut off from the hot-air chamber by the gates b, as shown in Fig. 1, when nothing but hot air can reach the conductor-pipes; but if it is desired that cold air be allowed to commingle with the hot air in the pipes to reduce its temperature these gates may be opened, as indicated by the dotted lines, and a portion of the inflowing cold air will escape therethrough, as indicated by the dotted arrows, when the opening of the gate E<sup>2</sup> by sliding the cover E'' from over it will allow this air to enter the pipes E and commingle with the hot air therein and reduce its temperature. The degree of temperature is controlled by the amount of opening left at the respective gates. Thus if the gate E'' is left open to the full capacity and the gate E' is closed only cold air can enter the pipe. On the contrary, if the gate E' is entirely open and the other closed only hot air can enter, and if each is partially open both hot and cold

air will enter and commingle in the pipe, so that the air will be reduced to a single and uniform temperature upon entering the drying-room. It may be objected that the same result can be obtained by raising or lowering the temperature of the coil C. This will work perfectly if only one drying-room is used; but where several rooms are used, as is almost invariably the case in tanneries, and different temperatures are desired in different rooms, I find mine the only really available plan to successfully accomplish the desired results, as the separate-pipe plan requires twice as much piping and throws two currents of air into the room at different temperatures, to say nothing of requiring a fan for each the hot and the cold air.

The call for this class of driers arises from the peculiar nature of leather. One day it will require, say, 90° of heat; the next day 100° or 110°; the next, 140°, and after that a gradual falling of temperature. Each separate room may require a different temperature, and each temperature should be uniform and unitary.

e' indicates a pivoted support for the rod II. e'' is a rolled handpiece for manipulating the slide E'' to open or close the gate E'. f is the belt that drives the fan, and c is the dividing-wall between the hot and cold air chambers. I provide for access to and from the air-chambers by gates or doors a.

The doors b may be left open, if desired, and the flow of air through the pipes regulated by the gates E' and E'', but not so satisfactorily.

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

1. In a drying system, an air-fan placed in the wall of an air-chamber or room, an air-chamber back of said fan, a heating-coil back of said air-chamber, a hot-air chamber back of said coil, cold-air chambers adjacent to said hot-air chamber and coil, gates to open or close between the cold-air chamber and the chamber back of the fan; air-pipes passing from the hot-air chamber through the cold-air chamber and to the drying-rooms, a gate opening from each pipe to the hot-air chamber and one to the cold-air chamber arranged to be opened and closed simultaneously or alternately and to any degree desired, substantially as and for the purpose set forth.

2. In a heating and drying system, the combination of a cold-air chamber, a hot-air chamber arranged within the cold-air chamber, said chambers having a common air-inlet, a steam-coil situated within the hot-air chamber, air-distributing pipes communicating with both of the air-chambers, means for controlling the flow of air from each of the air-chambers to the distributing-pipes, and means for causing the flow of air through the apparatus, substantially as described.

Signed at Grand Rapids, Michigan, May 17, 1897.

CHARLES C. BARBOUR.

In presence of—

ANDREW ALLGIER,  
ITHEL J. CILLEY.