(No Model.)

H. R. SEARLE.

Drying Apparatus.

No. 239,678. Patented April 5, 1881.

Fig. 1.

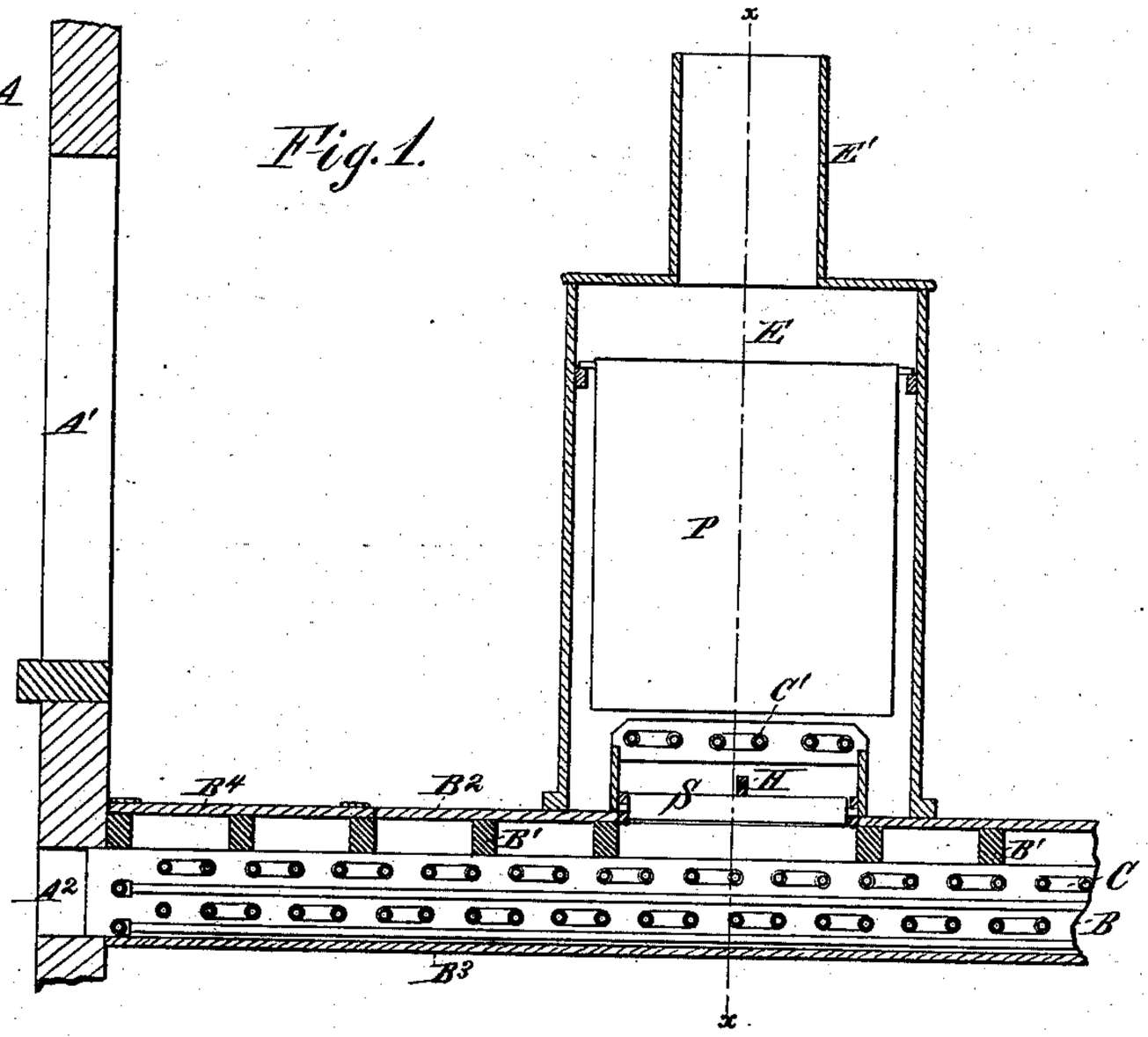
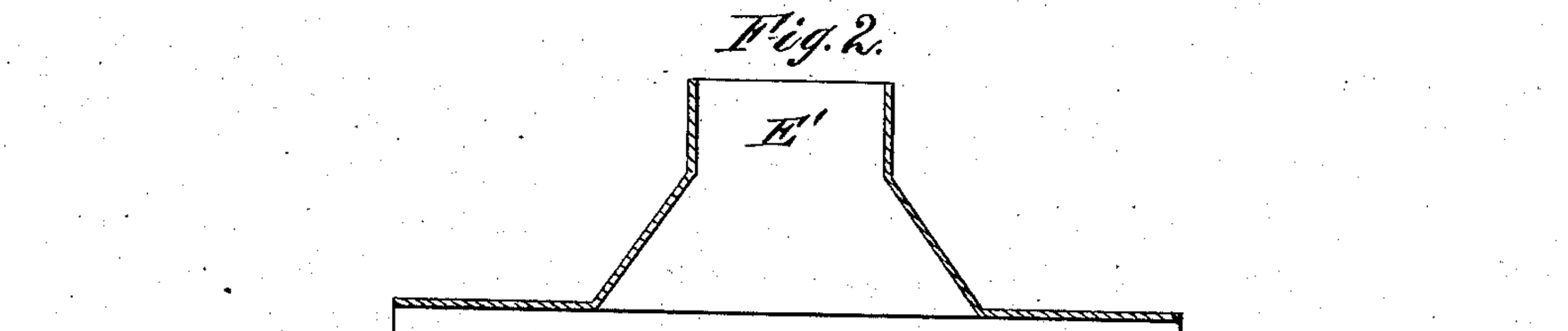


Fig. 2.



Witnesses:
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UNITED STATES PATENT OFFICE.

HENRY R. SEARLE, OF WASHINGTON, DISTRICT OF COLUMBIA, ASSIGNOR OF ONE-HALF TO CYRUS BUTLER, OF NEW YORK, N. Y.

DRYING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 239,678, dated April 5, 1881.

Application filed January 15, 1881. (No model.)

To all whom it may concern:

Be it known that I, HENRY R. SEARLE, of Washington, District of Columbia, have invented certain new and useful Improvements in Drying Apparatus, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

My invention has special relation to that class of devices employed in drying various substances or articles; but for the purpose of illustrating my improved method, the same is shown as employed in wall-paper printing. My improvement greatly economizes space, utilizing much that has heretofore been wasted, thereby enabling me to reduce the cost of construction and operation of wall-paper factories, and greatly increasing the ease and speed with which the paper may be printed; and my improved device involves certain methods and peculiarities of construction and operation, all of which will be hereinafter first fully described, and then pointed out in the claims.

In the drawings, Figure 1 is a vertical sectional view of a portion of one floor or story of an apartment of a building and the drying portion of a wall-paper machine constructed in accordance with my improvements; and Fig. 2 is a vertical sectional view of the same at line *x x* of Fig. 1 and at right angles therewith.

Like letters of reference indicate corresponding parts in both the figures.

Heretofore in printing wall-paper it has been necessary to employ a large amount of space (usually about three hundred feet in length) at the end of each printing-machine, to hang and carry the paper in after passing through the printing-rollers, for the purpose of thoroughly and carefully drying the same before it was in fit condition to be again printed upon or formed into rolls and prepared for sale and shipment. By my improved device I am enabled to completely dry the paper in forty feet of space, thereby permitting the use of a much larger number of machines in small compass, consequently reducing the cost of producing the completed paper.

A is the side wall of a building or apartment, with the perforation A′ for a window.

B B are the floor-joists, located in the usual manner. Upon the joists are cross-pieces B′ B′, to which the floor B^2 is nailed.

B^3 is the ceiling upon the under side of the floor-joists, constructed of the usual lath and plaster, or of matched boards tightly jointed, as may be preferred. By the use of the cross-pieces B′ it will be seen that the spaces between the joists have free communication with each other, thereby forming the space between the floor and ceiling into a reservoir for the air to be used in drying. If preferred, only the space between two of the joists may be employed. A^2 is a perforation cut through the wall upon a level with the floor-joists, thereby giving free access for external air, the number of such perforations being as great as required, and the admission of air regulated in any approved manner. I prefer to locate these perforations or openings beneath the windows, as shown, for by placing them in this position they do not in any way weaken the supporting-walls of the building.

In the spaces between the joists I place the steam-coils C, using as many as are necessary to dry and heat the air admitted beneath the floor. It is advisable to maintain this heat at a uniform temperature of about 70°. It will therefore be seen that it is only necessary to use the coils C in cold or damp weather, and the heat usually employed is so slight that there is no danger from fire in locating the pipes in close proximity to the joists, floor, and ceiling. If required, a fire-proof box may be constructed for the coil. For convenience in reaching the coil C trap-doors may be placed at suitable intervals in the floor, as shown at B^4.

E is a drying-box, constructed of any suitable material, of the requisite height, width, and length to contain the paper P as carried from the printing-rollers in the usual manner, the same being looped over the carrying-slats, as shown, or run flat, as may be required. The floor is removed beneath the drying-box, and regulating-slats S, hinged to a bar, H, are located in the opening, for the purpose of regulating the flow of air from beneath the floor. C′ is a steam-coil located over the opening in the floor, said coil being so arranged that any desired degree of heat may be given to the air admitted.

E′ is a flue or passage leading from the top

of box E to the external atmosphere, and should be carried to such a height as to rapidly carry off the heated air charged with moisture from the paper. When several machines are employed I locate them about a central flue or passage, the same serving to create the necessary draft and carry off the moisture from all the drying-boxes.

I am aware that reservoirs for heating air to be used in drying paper have been heretofore employed, with ducts to convey the air to the drying-boxes; but by the method used a free and proper circulation could not be maintained, rendering the device inoperative; but by my improved device objections of this nature are overcome, the air being admitted dry at a uniform temperature, and in such volume as to cause no disturbance of the paper hanging therein. The air being further heated to any required degree, it not only rises rapidly through the space between the hanging loops of paper, reaching all parts thereof uniformly, but by reason of the addition of the flue over the drying-box it quickly makes its exit therefrom, carrying with it a large quantity of moisture and giving place to fresh dry air.

Heretofore in printing wall-paper it has been usual to pass the paper over uncovered steam-pipes which warm the entire room where the work is performed; but when a quantity of paper is being dried the whole atmosphere of the room becomes charged with moisture, greatly retarding the drying of the paper, and requiring a very large space to complete the operation. The atmosphere is also charged with disagreeable odors from the sizing and coloring-matter used, which is very unpleasant, if not injurious to health. By the use of my improved apparatus all these objections are obviated, and the atmosphere of the room is rendered dry and pure. It will thus be seen that my improved device admirably answers the various uses and purposes for which it is intended.

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

1. In a drying apparatus, the combination, with an air-reservoir located beneath the floor and occupying the space between the joists and between the floor and ceiling, of a drying-box having a supplemental heating-coil therein and a draft-flue thereabove, substantially as shown and described.

2. In a drying apparatus, the combination, with a building wherein the spaces between the joists and between the floor and ceiling form an air-reservoir, said reservoir containing a heating device, of a drying-box communicating with said reservoir, said box having a flue thereabove and a heating device located therein, substantially as shown and described.

3. In a drying apparatus, the joists B, cross-pieces B′, steam-coils C, ceiling B^3, floor B^2, inlet A^2, slats S, rod H, steam-coil C′, drying-box E, and flue E′, the whole combined and arranged to operate substantially as shown and described.

In testimony that I claim the foregoing I have hereunto set my hand in the presence of two witnesses.

HENRY R. SEARLE.

Witnesses:
F. W. HANAFORD,
A. M. PIERCE.