J. H. WICKES.

Drier for Cotton, Wool, &c.

No. 211,821. Patented Jan. 28, 1879.

Fig. 1.

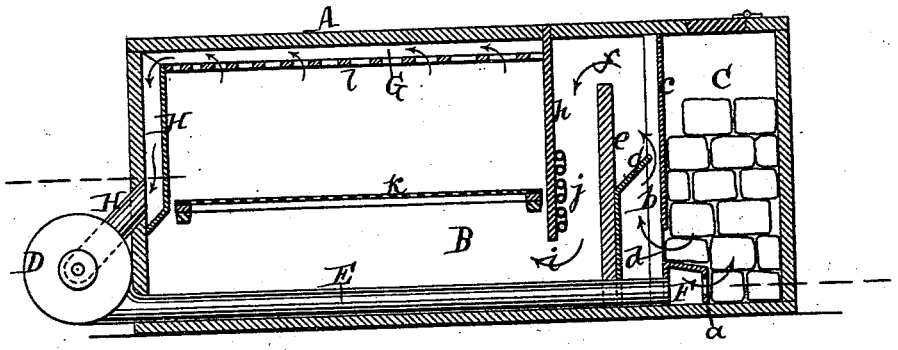
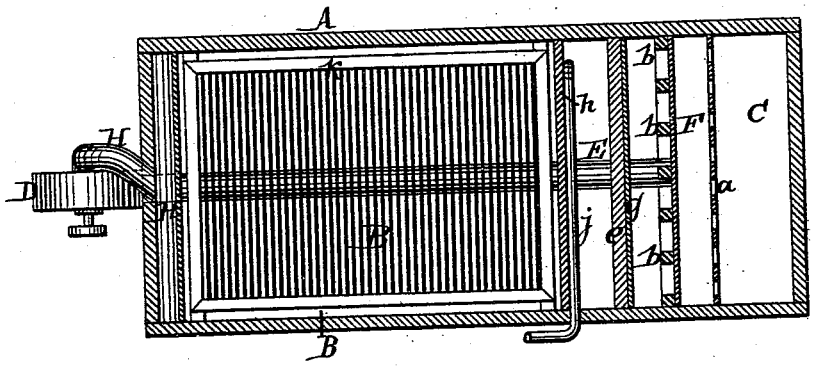


Fig. 2.



Witnesses.

Chas. Wahlers.

Otto Hupfeland.

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Van Santvoord & Hauff

UNITED STATES PATENT OFFICE.

JAMES H. WICKES, OF CHICAGO, ILLINOIS.

IMPROVEMENT IN DRIERS FOR COTTON, WOOL, &c.

Specification forming part of Letters Patent No. **211,821**, dated January 28, 1879; application filed December 11, 1878.

To all whom it may concern:

Be it known that I, JAMES H. WICKES, of Chicago, in the county of Cook and State of Illinois, have invented a new and Improved Drying Apparatus for Cotton, Wool, and other Materials, which invention is fully set forth in the following specification, reference being had to the accompanying drawings, in which—

Figure 1 represents a longitudinal vertical section. Fig. 2 is a horizontal section.

Similar letters indicate corresponding parts.

This invention consists in the combination, in a drying apparatus for wool, cotton, and other materials, of an ice-chamber, an air-distributer adapted to divide the incoming volume of air into numerous jets, which enter the ice-chamber, an air suction and forcing device, a condenser, and a drying-room provided with a device for evenly distributing the flow of air therethrough, so that a continuous current of air is caused to circulate through the drying-room, and so that said air, in its passage through the ice-chamber, is cooled and deprived of a portion of its moisture, while another portion of the moisture mixed with the air is absorbed by the condenser, and then the temperature of the air is raised, so as to increase its capacity to absorb moisture, and the dry warm air is finally brought in contact with the materials to be dried. The dry warm air is caused to enter the drying-room near its bottom, and to escape through a false perforated ceiling, so that it comes in close contact with the material distributed through the drying-room, and said material is dried uniformly.

In the drawings, the letter A designates a room, which contains the drying-chamber B and the ice-chamber C. On the outside of the drying-chamber is situated a fan-blower, D, or any other equivalent apparatus for producing an artificial current of air. The discharge-spout of this fan-blower connects by a pipe or conduit, E, with an air-distributer, F, which is situated in the ice-chamber, and consists of a box provided with a foraminous plate, *a*, through the small openings of which the air is divided into a large number of jets, which pass up through the ice in the ice-chamber. The inner side of this ice-chamber is formed of a series of posts or joists, *b*, to the inner surface of which is firmly secured a metal plate, *c*, which extends down to within a short distance from the top of the air-distributer, leaving an opening, *d*, for the escape of the air.

At a small distance from the joists *b* rises a partition, *e*, leaving a space, *f*, between its top edge and the ceiling of the room A. To this partition is secured a deflector, *g*, which throws the air escaping from the ice-chamber against the cold metallic plate *c*. In its passage through the ice the air is cooled and deprived of a portion of its moisture, and as the air escapes from the ice-chamber and is thrown in contact with the metal plate *c* it is deprived of another portion of its moisture, so that it passes off over the partition *e* in a comparatively dry and cold state. By the combined action of the deflector and of the metal plate a sort of condenser is produced, which serves to condense a large portion of the moisture contained in the air. If desired, the form of this condenser can be changed.

Between the partition *e* and the drying-chamber B is another partition, *h*, which extends down from the ceiling, leaving an open space, *i*, between its lower edge and the bottom of the room. Close to this partition *h* is situated a heating-coil, *j*, and as the dry and cold air descends between the partitions *e* and *h* its temperature is raised and its capability to absorb moisture is materially increased. The warm dry air then passes beneath the partition *h* into the drying-chamber, in contact with the material to be dried, and back to the fan-blower.

The material to be dried is either spread on open screens or shelves *k*, or it is distributed throughout said drying-chamber in any suitable manner to allow the warm dry air to pass freely through the same. In order to cause said air to pass uniformly through the drying-chamber, a false ceiling, *l*, is provided, which is perforated with a number of apertures leading into an air-chamber, G, which connects, by a trunk, H, with the suction-opening of the fan-blower.

When the fan-blower is set in motion a current of air is created, which passes through the air-distributer into the ice-box, thence up on one and down on the opposite side of the partition *e*, and after having been deprived of its moisture and then warmed by contact

with the heating-coil, the warm dry air passes up through the material to be dried into the air-chamber G, and thence back to the fan-blower.

The temperature to which the air is raised can be easily regulated by suitable valves; and since the air in its passage through the ice and through the condenser is deprived of a large quantity of its moisture, and by raising its temperature its capability to absorb moisture is increased, said air, when brought in contact with the material in the drying-chamber, rapidly absorbs moisture, and the operation of drying wool, cotton, or other materials can be effected in a comparatively short time, and without raising the temperature of the air to an injurious degree.

What I claim as new, and desire to secure by Letters Patent, is—

1. The combination, in a drying apparatus for wool, cotton, and other materials, of an ice-chamber, an air-distributer adapted to divide the incoming volume of air into numerous jets, which enter the ice-chamber, an air suction and forcing apparatus, a device for condensing the moisture of the air, and a heater and a drying-chamber provided with a device for evenly distributing the flow of air therethrough, all constructed and adapted to operate substantially as set forth.

2. The combination, with the drying-chamber, the ice-chamber, the heater, and the air suction and forcing device, of a partition extending down near to the bottom of the drying-chamber, and of an air-chamber which is separated from the drying-chamber by a perforated false ceiling and communicates with the air-suction device, substantially as and for the purpose shown and described.

3. The combination, with the ice-chamber, the air suction and forcing device, the heater, and the drying-chamber, of a deflector and a plate of sheet metal which is in direct contact with the ice, all constructed and adapted to operate substantially as set forth.

In testimony that I claim the foregoing I have hereunto set my hand and seal this 10th day of December, 1878.

JAMES H. WICKES. [L. S.]

Witnesses:

W. HAUFF,

E. F. KASTENHUBER.