

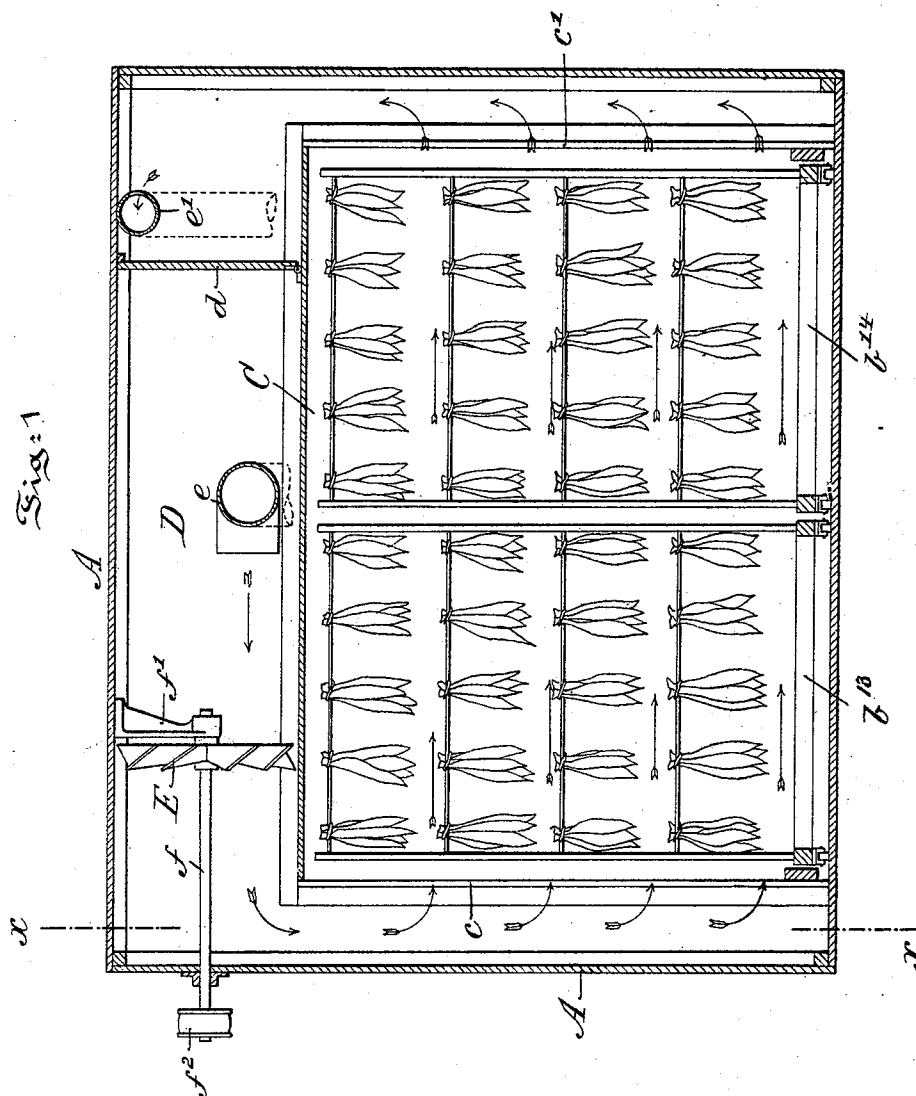
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7 Sheets—Sheet 1.

J. K. PROCTOR.
APPARATUS FOR MECHANICALLY CREATING AND MAINTAINING
HUMID ATMOSPHERE.

No. 568,491.

Patented Sept. 29, 1896.



Witnesses:
Thomas M. Smith.
Richard C. Maxwell.

Inventor:
Josiah K. Proctor,
By J. Walter Singlass
Attorney.

(No Model.)

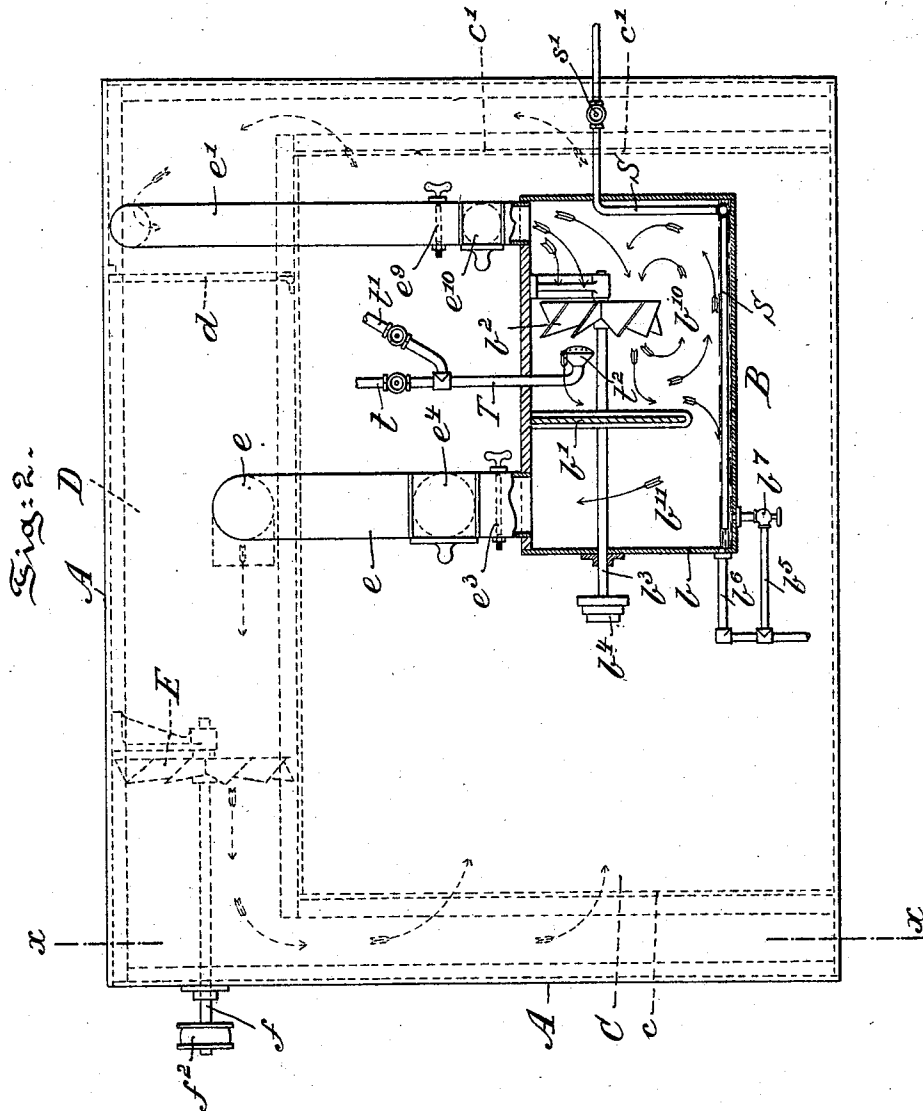
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(No Model.)

7 Sheets—Sheet 3.

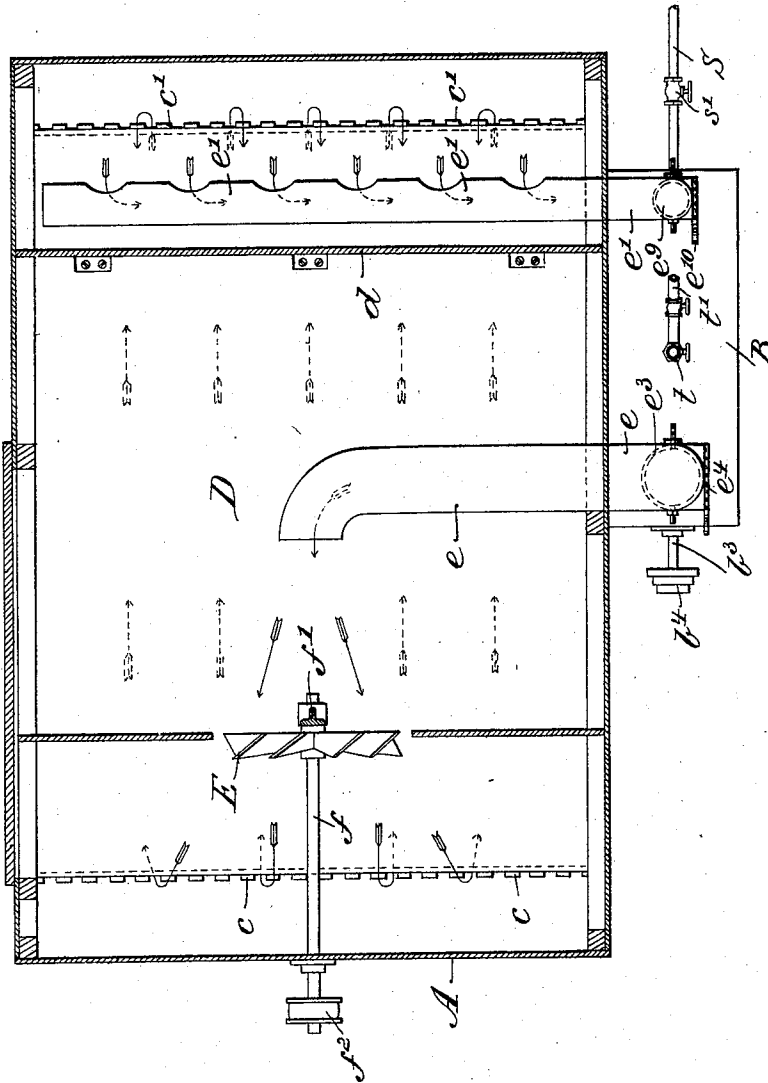
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Fig. 3.



Witnesses:

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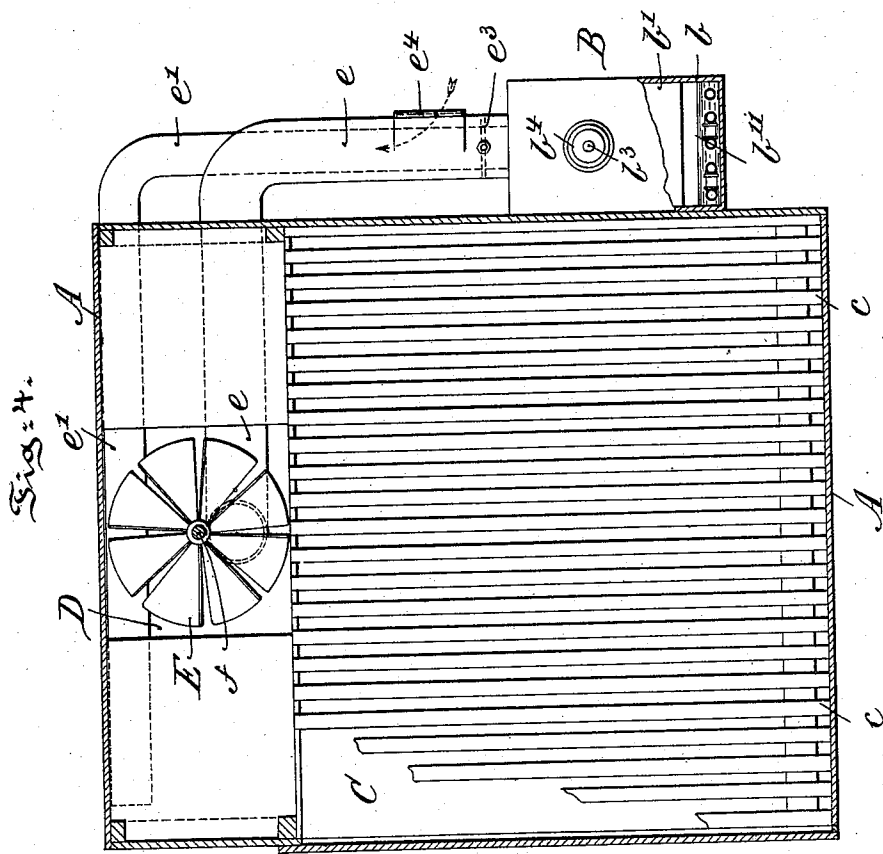
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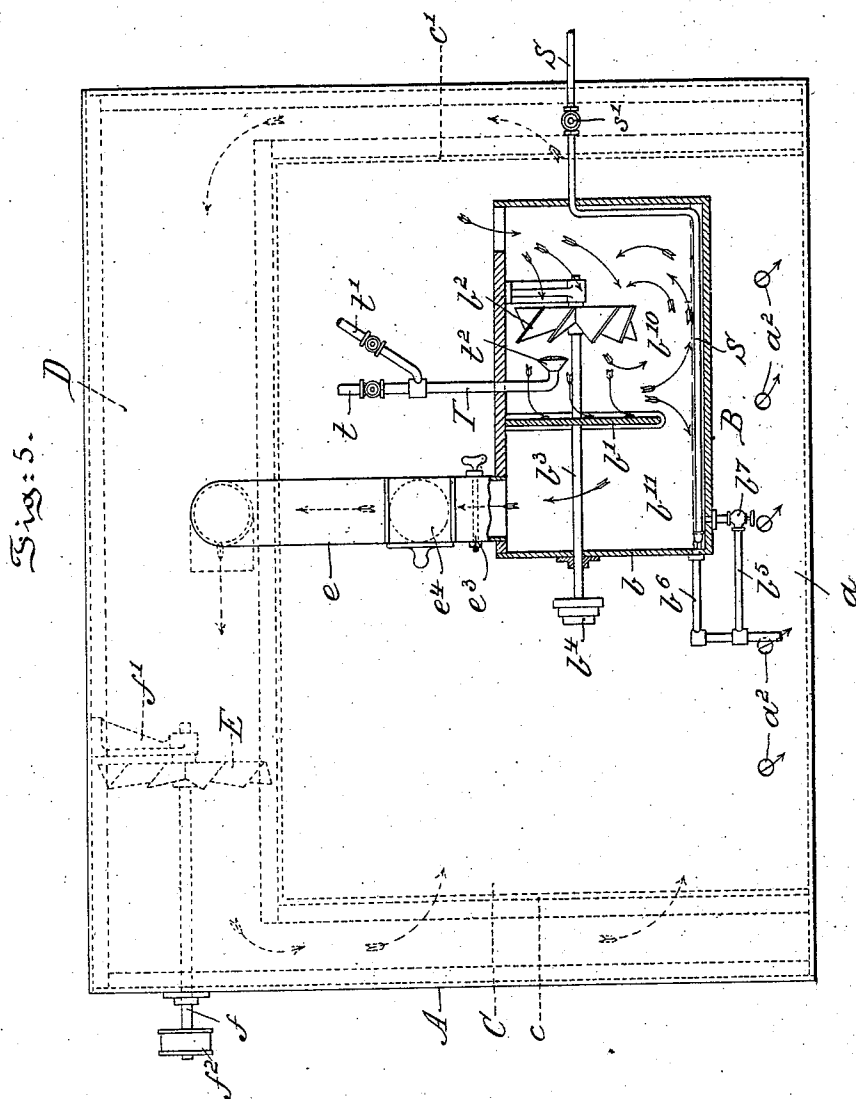
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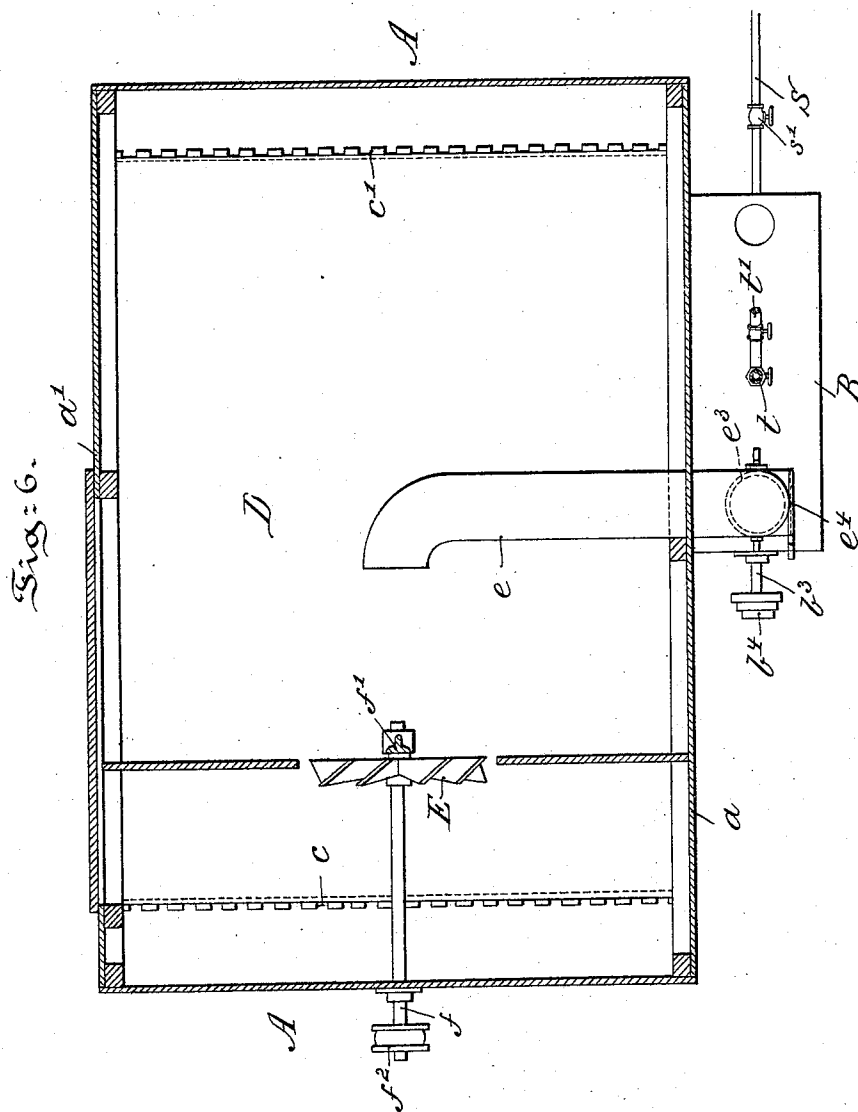
Witnesses
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7 Sheets—Sheet 6.

APPARATUS FOR MECHANICALLY CREATING AND MAINTAINING HUMID ATMOSPHERE.

Patented Sept. 29, 1896.



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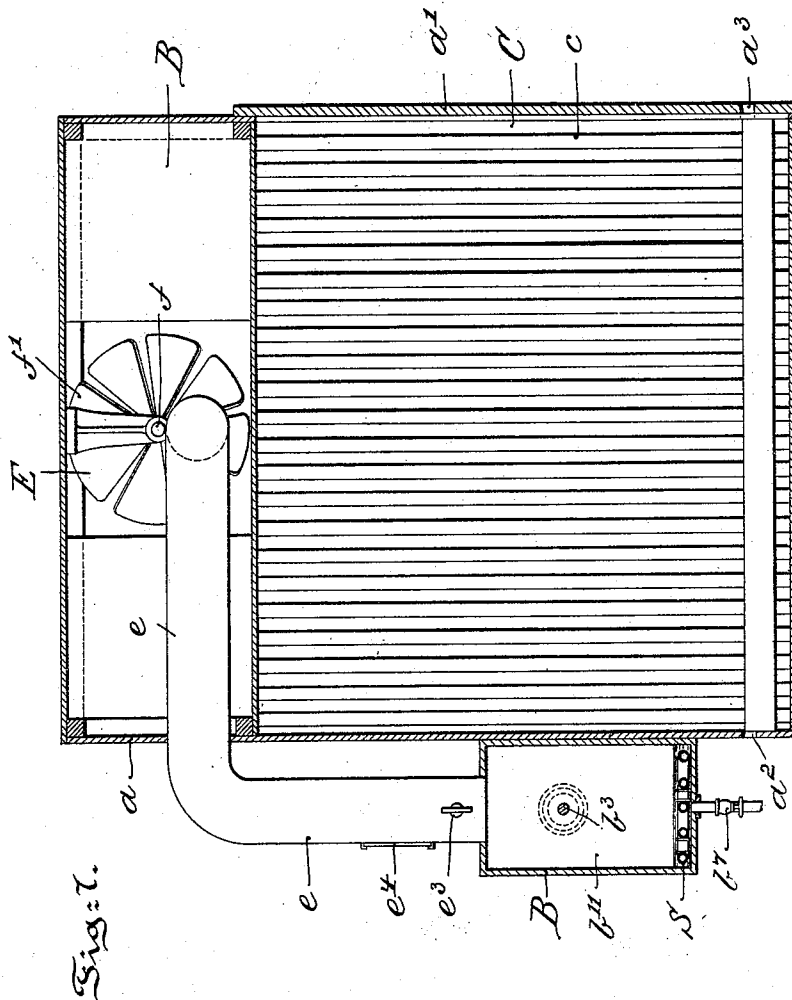
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Patented Sept. 29, 1896.



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UNITED STATES PATENT OFFICE.

JOSIAH K. PROCTOR, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO THE PHILADELPHIA TEXTILE MACHINERY COMPANY, OF SAME PLACE.

APPARATUS FOR MECHANICALLY CREATING AND MAINTAINING HUMID ATMOSPHERE.

SPECIFICATION forming part of Letters Patent No. 568,491, dated September 29, 1896.

Application filed December 16, 1895. Serial No. 572,237. (No model.)

To all whom it may concern:

Be it known that I, JOSIAH K. PROCTOR, a citizen of the United States, residing at the city of Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Apparatus for Dampening Tobacco and other Materials, of which the following is a specification.

My invention has relation to an apparatus for mechanically creating in a structure a humid atmosphere and supplying therefrom and maintaining the same uniform within an inclosure, structure, or building.

The principal objects of my invention are, first, to provide, in conjunction with an inclosure, structure, or building and means for creating a continuous recirculation of air therethrough, an independent structure and means for creating therein a constant current of humid atmosphere, and also means for supplying the current of humid atmosphere thus created to the continuous recirculating current in the first inclosure; second, to provide, in conjunction with an inclosure, structure, or building in which a constant recirculation of air is maintained, an independent structure in which a constant current of humid atmosphere is maintained and means for diverting a portion of the recirculating current to said independent structure, mixing the same with revived air, and supplying the mixture to the constant recirculating current in the first structure; and, third, to provide, in conjunction with an inclosure, structure, or building through which a constant circulation of air is maintained, an independent structure provided with humidizing means through which all or a portion of the current passing through the first inclosure may be diverted at will to be first humidized and tempered and thereafter supplied to the first structure.

My invention consists of an apparatus for mechanically creating in a structure a humid atmosphere and supplying and maintaining such atmosphere uniform in the utilization thereof, as hereinafter described and claimed.

The nature and scope of my invention will be more fully understood from the following description, taken in connection with the

accompanying drawings, forming part hereof, and in which—

Figure 1 is a vertical central section through an inclosure or structure adapted for the ordering of tobacco, showing features of my invention. Fig. 2 is a view in side elevation of the inclosure or structure of Fig. 1, and in central section the separate humidizing appliance, with the means for conveying the humid atmosphere therefrom to an inclosure or structure by suitable means, the structure or inclosure adapted to contain tobacco or other materials to be conditioned by the presence of such an atmosphere therein. Fig. 3 is a top or plan view of an apparatus embodying features of my invention in one form thereof with the upper portion of the same removed. Fig. 4 is a vertical cross-sectional view on the line *xx* of Figs. 1 and 2. Fig. 5 is a view in side elevation of a building or structure and in central section the humidizing appliance, showing a modified form of the structure or building for conditioning tobacco or other materials therein by means of a continuous recirculating current augmented by a current of humid revived air from the humidizing structure, the excess thereby created being liberated from the lower portion of the structure or building. Fig. 6 is a top or plan view of the modified form of the building or structure illustrated in Fig. 5 with the upper portion removed, and Fig. 7 is a central sectional view of the building or structure of Fig. 6.

Referring to the drawings, A represents the structure or building within which the operations are conducted, and having in connection therewith the separate humidizing appliance B for mixing or thoroughly commingling vapor of air and water, to be hereinafter fully explained.

Within the inclosure A is provided an internal compartment C for the reception of racks *b*¹³ and *b*¹⁴ for supporting tobacco to be treated or fibrous or other materials to be subjected to the influence of a moist air or the like, as illustrated in Fig. 1, and represented as supported by portable trucks for readily permitting of the introduction and removal of the materials into and from the inclosure or building A. The end walls *c* and

c' of the internal compartment C are provided with perforations or openings to afford free and uniform ingress and egress of humid air into and from the compartment C.

5 E is a large suction-fan mounted in the compartment D, above the compartment C, on a shaft f , and supported by a hanger f' at one end and at the other in one of the walls of the structure A, as illustrated in Fig. 1 of the drawings. On the outer end thereof is provided a pulley f^2 , Figs. 1 and 2, for the reception of a belt (not shown) for imparting motion to the shaft f , and hence required rotary motion to the suction-fan E for drawing and forcing the humid air in the direction of the arrows, as indicated in Figs. 1 and 2, to and through the compartment C, to be presently more fully explained.

d is a hinged door or cut-off located in the upper part of the compartment D, between the wall of the building A and top of the compartment C, which is controlled by suitable means to permit of the opening and closing thereof. This door is adapted to regulate the quantity of air circulating and recirculating to and through the compartments D and C, and when wholly closed it prevents a continuous recirculation through the said compartments and brings the humidizing appliance in the path of the circulating current for a purpose to be hereinafter fully explained.

The air is forced when the cut-off door d is closed, as indicated in Figs. 1 and 2, in the direction of the arrows, to and through said compartment C and then directly through the conduit e' of the separate humidizing appliance B for effecting revivification and tempering of the air or the charging of the same with moisture before it is again presented as a uniformly mixed and tempered atmosphere through the conduit e of said appliance into the compartment D, and, by means of the suction-fan E, through the compartments D and C, and again through the openings of the conduit e' into the appliance B for rehumidizing the same, and so on continuously. When, however, the door d is wholly opened or omitted, a constant recirculation of air takes place through the compartments D and C, more or less of the current being diverted by a fan b^2 through the rehumidizing appliance B.

The rehumidizing appliance B consists of an oblong structure b , located outside of the building A. This appliance is provided therein with a baffle or dash plate b' and a fan or series of fans b^2 , mounted upon a shaft b^3 , actuated by means of a pulley b^4 and a belt from any suitable source of power. (Not shown.) In the bottom of the structure b is provided a water-level through the pipes b^5 and b^6 , the former being provided with a stop or regulating cock b^7 , as illustrated in Figs. 2 and 5.

65 S is a steam-coil extending around the body of water established in the structure b , for heating the water so as to create a mist, and

which is provided with a stop-cock s' , as clearly illustrated in Figs. 2 and 5.

t and t' represent the water and steam unions with the pipe T, terminating in a rose atomizer or sprayer t^2 , adjacent to one face of the fan b^2 in the appliance B. This rehumidizing appliance B is divided into practically two chambers by a baffle or dash plate b' . In these chambers, by means of a fan or series of fans b^2 , air and water are churned and commingled to cause an intimate admixture of the vapor of the same therein. Any want of uniformity in such churning of the water and air is presented to the baffle or dash plate b' , which liberates any surplus therefrom, and it falls in a downward direction into the bottom of the appliance B, and the uniformly mixed or commingled vaporized air mechanically created within this appliance in the right-hand chamber b^{10} passes in the direction of the arrow through the left-hand chamber b^{11} , into and through the conduit e , to the building A. The conduit e is provided with a cut-off e^3 , and a rotatable or other type of slide e^4 , which, when open, admits air from the outside into the same. This is highly desirable in some instances in the treatment of certain materials, such as tobacco, for producing the required humid atmosphere for delivery to the compartment C, wherein, by absorption, such materials undergoing treatment therein by taking up the moisture of the air are brought to a different state or condition from what they were when first introduced into the compartment C.

e' is an inlet-conduit provided with a cut-off e^9 and with a rotatable or other suitable type of slide e^{10} . The latter, when open, affords means for admitting air from the outside or other source into the same. The pipe e' and door d may in such instance be dispensed with, as illustrated in Figs. 6 and 7, and the outside air only admitted to the rehumidizing appliance B by the provision of an opening directly in one of the walls thereof, in a manner to be hereinafter fully explained.

The cut-off e^9 is provided so that the flow and pressure of air upon the materials undergoing treatment in the compartment C may be under perfect regulation, or, on the other hand, when the cut-off d is open, to afford a variable circulation and recirculation through the compartments C and D, and also permitting of the revivification or rehumidizing of the air in the appliance B for presenting always a uniform and properly-tempered atmosphere with its required quota of humidity to the materials undergoing treatment in the compartment C. The conduit e' , when used, is preferably provided with openings, as indicated in Fig. 3, to aid in the uniform ingress of the air from the inclosure for revivification and prior to presenting the uniformly mixed and tempered humid atmosphere to and through said appliance and the conduit e , which is drawn as well as forced, by means of the suction-fan E, into and

through the compartment C, continuously or otherwise, as requirements demand, considered with respect to the position of the hinged door *d* in the compartment D of the apparatus.

In Fig. 5 the door *d* in the compartment C is dispensed with, and the structure of this view is such as that only circulation through the building among the matter or materials to be influenced by the humid atmosphere is effected, because of the provision of the series of openings *a*² and *a*³ in the walls of the building A. The building being under suction-pressure by reason of the location therein of the fan E, and the escape of air, deprived of its moisture or a portion thereof, will be through the two series of openings *a*² and *a*³. The humidizing appliance illustrated in this view is the same as that shown in Fig. 2 and operates in substantially the same manner as therein, with the exception that in said Fig. 2 the construction and arrangement of the appliance B and the building A are such as that circulation and recirculation of the humid atmosphere is continuous or intermittently permitted according to the position of the door *d* in the compartment C of the building A.

In the structure or building A of Figs. 5, 6, and 7 are provided, in each of the walls *a* and *a'* thereof, at or near the bottom, a series of small openings *a*² and *a*³ for the egress of air therefrom after presentation to matter or materials therein for receiving the whole or a portion of the moisture thereof, such atmosphere being supplied thereto from the humidizing appliance B, hereinbefore fully described. In Figs. 6 and 7 the pipe *e'* is dispensed with and air is supplied to the appliance B by the provision of an opening in the side or end wall or in the top thereof, as illustrated in Fig. 6, but in other respects the apparatus of Figs. 6 and 7 is the same as hereinbefore described, and illustrated in Figs. 1, 2, 3, and 4 of the drawings.

It may be here remarked that when the apparatus hereinbefore described is employed for the dampening or ordering of tobacco it requires that it be brought into intimate contact with moist air to impart flexibility thereto, and in order that it may be done uniformly, and that the moisture may be supplied in the desired quantity and uniformly, the apparatus must pass the air uniformly through the tobacco and be capable of keeping that air at a desired point of humidity and temperature and of altering said humidity and temperature at the will of the operator. Otherwise the tobacco may be allowed to take too much moisture and as a consequence spoil in the hogshead.

I am aware that air has been recirculated within an inclosure such as I describe for the purpose of bringing it in intimate contact with materials, and I am also aware that an appliance has been introduced into the inclosure to supply water in one form or another

to the air during its recirculation through the chambers thereof. I am also aware that rooms have been supplied with damp air from a separate inclosure and that this air has been returned to be again dampened after use, but these methods taken separately are all open to objections.

When the moisture is supplied by apparatus in the inclosure where used, it is difficult to produce the moisture at the temperature required without either spraying water, with the danger of wetting the tobacco, or else going to considerable expense for an apparatus for cooling the air.

When the moist air is supplied from a separate inclosure adapted for spraying steam or water, it is difficult to pass it in sufficient volume and with uniformity through the tobacco in the second inclosure without supplying great fan-power and a large pipe connection to circulate a great body of air alternately from one inclosure to the other.

By my apparatus the air may, if desired, be either kept in continual circulation in the ordering-room by a separate fan located therein and made entirely independent of the moistening or cooling appliance so far as uniform contact of the air with the tobacco is concerned, or said appliance may be brought directly into the path of the recirculating current. The moistening and cooling appliance is designed to supply just enough air previously prepared to the ordering-room to keep it at the desired temperature and humidity. In other words, my apparatus impels much more air through the tobacco than the tobacco-room receives from the air moistener and temperer.

Again, in apparatus hitherto employed to dampen materials where the moisture was supplied through the medium of air from a separate inclosure the recirculation of air through the materials was derived from the same source as the moist air, and hence if a valve were closed to stop the supply of moist air from the dampening-chamber the same act would stop recirculation of air through the materials. This is not the case in my apparatus as described, as it can be readily seen that by means of valves located in the pipes the air-passage from the moistening-chamber can be stopped and recirculation of the air through the passages of the tobacco-inclosure be thereby permitted, so as to uniformly order or dampen the same without additional moisture being added from the humidizing appliance closed by the said valves.

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

1. An apparatus of the character described, comprising an inclosure wherein tobacco or other matter is placed, means for creating a continuous recirculation of air therethrough, an independent structure, means for creating a constant current of humid atmosphere in said structure, and means for supplying the

current of humid atmosphere thus created to the recirculating air in the inclosure, substantially as and for the purposes described.

2. An apparatus of the character described, comprising an inclosure wherein tobacco or other matter is placed, means for maintaining a constant recirculation of air therein, an independent structure, means for creating a constant current of humid revived atmosphere therein, and means for diverting a portion of the recirculating air from the inclosure to the structure, mixing the same with the current of humid atmosphere and supplying the mixture to the recirculating current in the inclosure, substantially as and for the purposes described.

3. An apparatus of the character described, comprising an inclosure wherein tobacco or other matter is placed, means for circulating air therethrough, an independent structure, humidizing means located therein, and means whereby all or a portion of the air circulating through the inclosure may be diverted at will to the independent structure to be humidized and tempered and thereafter returned to the inclosure, substantially as and for the purposes described.

4. An apparatus of the character described, consisting of an inclosure wherein tobacco is placed and containing internal communicating compartments and a fan therein to recirculate the air therein and through the tobacco, in combination with an independent second inclosure provided with an air moistening and tempering device, a fan and pipe connections arranged so that some of the recirculating air in the first inclosure may be continually diverted from the first inclosure, passed through the air moistening and tempering device in the second inclosure and resupplied to the first inclosure, and a valve to control the flow of air in the pipe connecting the inclosures, substantially as and for the purposes described.

5. An apparatus of the character described, consisting of an inclosure wherein tobacco is placed and containing internal communicating compartments and a fan therein to recirculate the air therein and through the tobacco,

in combination with an independent second inclosure provided with an air moistening and tempering device, a fan and pipe connections arranged so that some of the recirculating air in the first inclosure may be continually diverted from the first to the second inclosure humidized therein, mixed with revived air and returned to the first inclosure, and valves located in the pipes to regulate the flow of air in the pipes connecting the inclosures, substantially as and for the purposes described.

6. In an apparatus of the character described, the combination of an inclosure wherein tobacco or other matter is placed and means for creating a circulating current of air therein, with an independent humidizing appliance provided with an internal baffle-plate, dividing the appliance into two chambers, means for supplying air and water to one of said chambers, a fan adapted to thoroughly mix the air and water in said chamber, and an outlet leading from the other chamber to the inclosure, all arranged so that the mixed air and water is drawn from the appliance in a properly-conditioned and humid current and supplied to the circulating current in the inclosure, substantially as and for the purposes described.

7. In an apparatus of the character described, the combination of an inclosure wherein tobacco or other matter is placed and means for creating a circulating current of air therein, with an independent humidizing appliance provided with an internal baffle-plate, means for mixing and churning air and water or steam on one side of said baffle-plate, and means for supplying properly-conditioned humid atmosphere from the other side of said baffle-plate to the inclosure to augment the circulating current therein, substantially as and for the purposes described.

In testimony whereof I have hereunto set my signature in the presence of two subscribing witnesses.

JOSHIAH K. PROCTOR.

Witnesses:

J. WALTER DOUGLASS,
THOMAS M. SMITH.