J. C. FLEMING.

HYGIENIC DRIER.

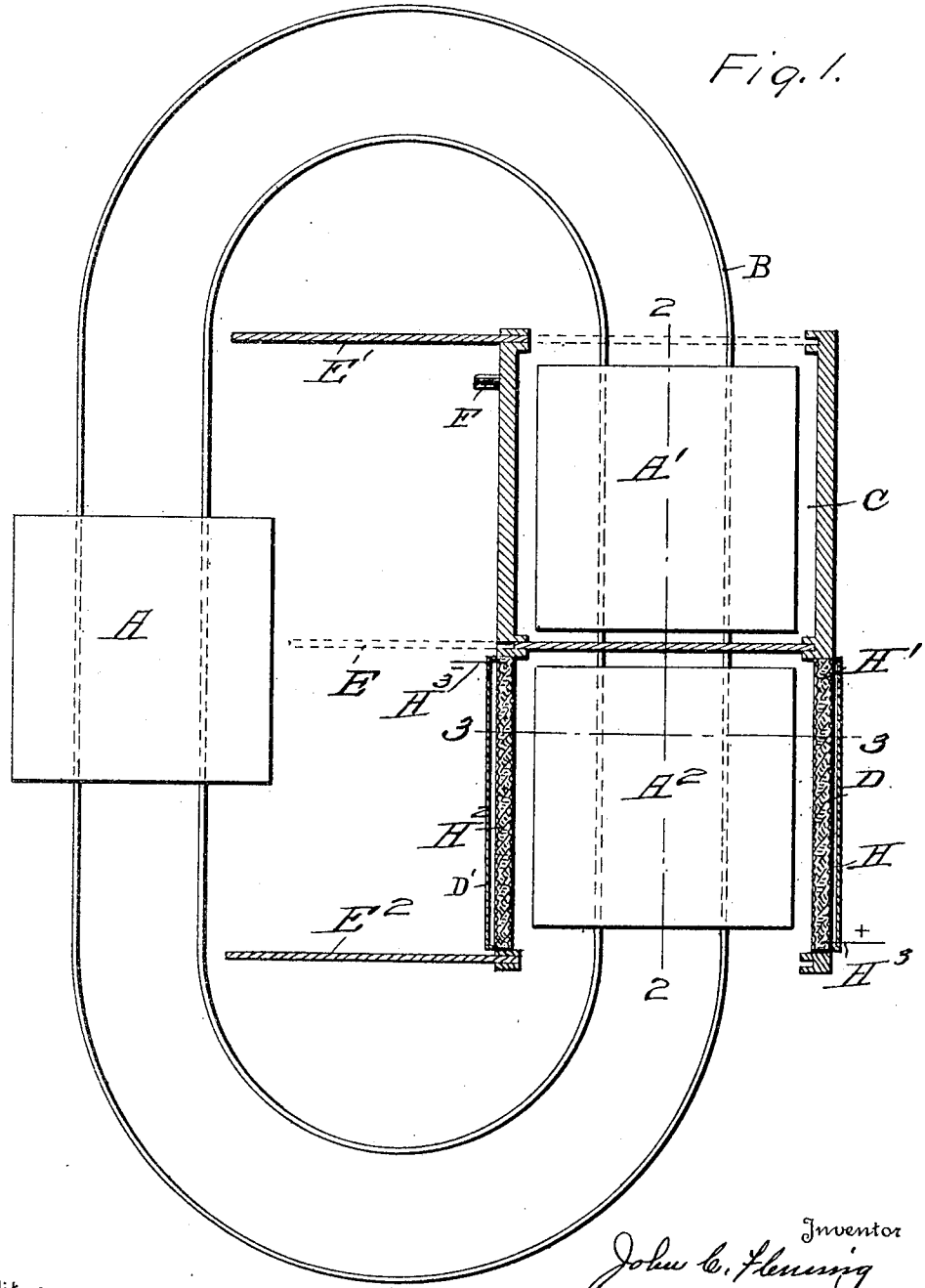
APPLICATION FILED MAY 20, 1914.

1,207,011.

Patented Dec. 5, 1916.

3 SHEETS—SHEET 1.

Fig. 1.



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Witnesses

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3 SHEETS—SHEET 2.

Fig. 2.

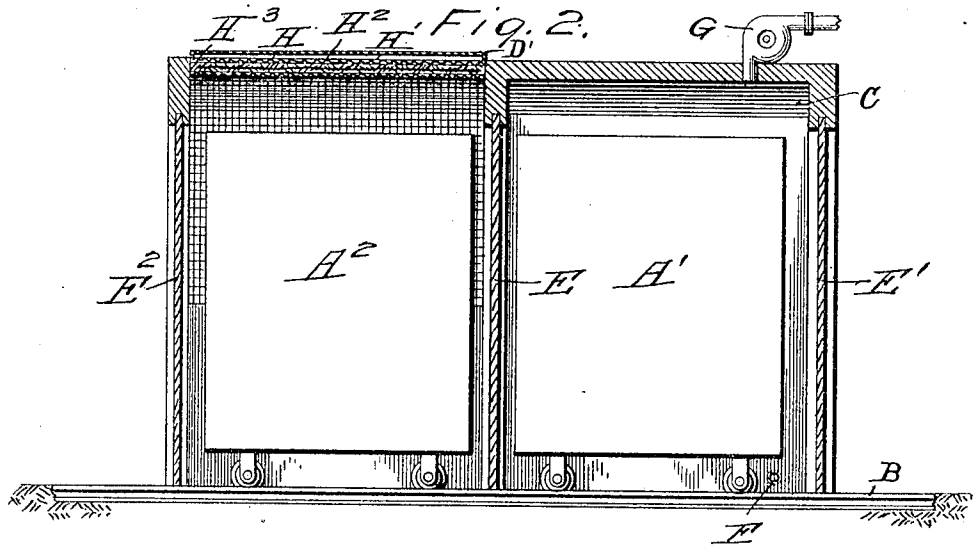
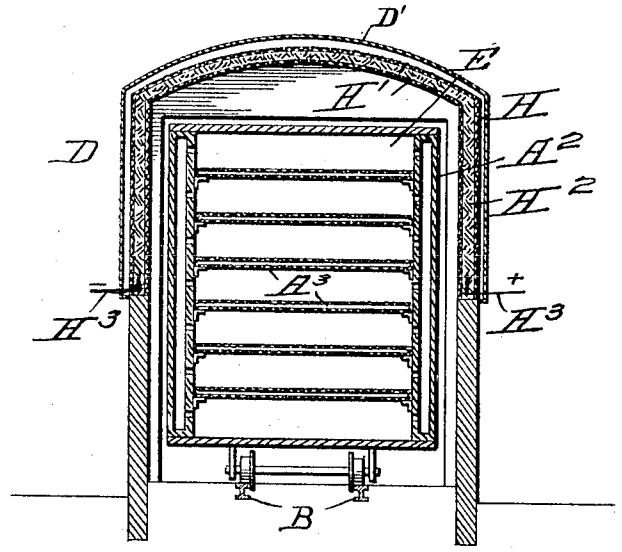


Fig. 3.



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3 SHEETS—SHEET 3.

Fig. 4.

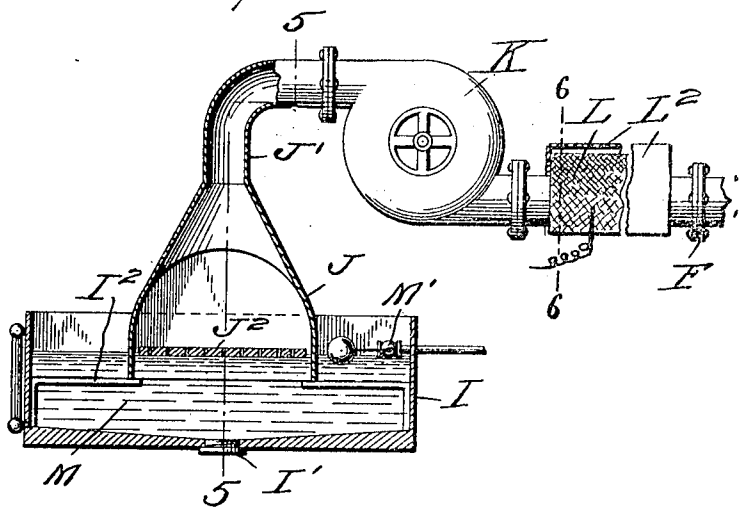


Fig. 5.

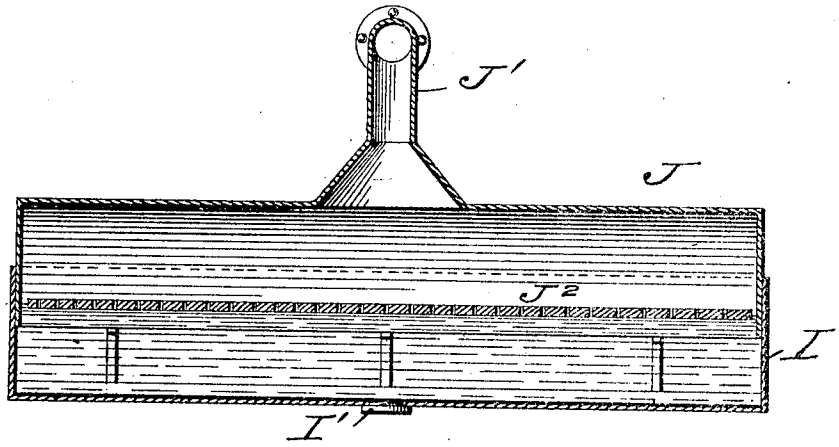
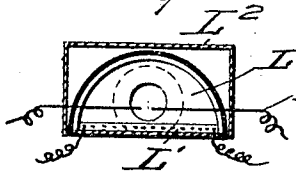


Fig. 6.



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UNITED STATES PATENT OFFICE.

JOHN C. FLEMING, OF NORWOOD, MASSACHUSETTS.

HYGIENIC DRIER.

1,207,011. Specification of Letters Patent. Patented Dec. 5, 1916.

Application filed May 20, 1914. Serial No. 839,838.

To all whom it may concern:

Be it known that I, JOHN C. FLEMING, a citizen of the United States, residing at Norwood, in the county of Norfolk and State of Massachusetts, have invented certain new and useful Improvements in Hygienic Driers, of which the following is a specification, reference being had therein to the accompanying drawing.

The object of this invention is to dry materials, of various kinds, conveniently and rapidly, and especially those where it is important to use pure air and leave the product in approximately pure and aseptic condition. To these ends, the material is placed upon a suitable wheeled support, moved into a closed chamber through which is forced pure dry air, heated, cooled or electrically treated, as circumstances may require, then removed into a second closed chamber having absorbent charcoal walls arranged to be internally heated when desired, and finally advanced out of the second chamber.

In the accompanying drawings, which are largely diagrammatic, Figure 1 is a plan view of the main part of the drying apparatus, the upper portion of certain treating chambers being removed, Fig. 2 is a section on the line 2—2, Fig. 1. Fig. 3 is a section on the line 3—3, Fig. 1. Fig. 4 is a side elevation, partly in section, of devices for treating air before using it for drying. Fig. 5 is a section on the line 5—5, Fig. 4. Fig. 6 is a section on the line 6—6, Fig. 4.

In these figures, A, A′, A^2 are duplicate open cradles or cars provided with foraminous, removable shelves A^3, Fig. 3, and with wheels to run upon an endless track B, and C, D are adjacent treating chambers separated by a sliding door E and each closed at the opposite end when desired by a sliding door E′, E^2 so that the two chambers can be separated at will and either or both can be fully closed at will. Air is introduced into the first compartment C through a conduit F and withdrawn therefrom by an air pump or the like G. The upper portion of the walls of the compartment D are composed of spaced parallel sheets H, H′, of netting or the like confining an intermediate body H^2 of charcoal, and in this body is embedded an electric heating wire H^3. This chamber is preferably provided with a removable casing or jacket D′.

The air delivered into the chamber C through the conduit F is treated by apparatus shown in Figs. 4, 5, 6, where I represents a liquid container the bottom of which slopes to a central discharge opening I′. Supported on brackets I^2 in this container is a central downwardly open receiver J, narrower than the container and preferably extending from end to end thereof. From the middle of this receiver rises a pipe J′ which leads to an air pump K from which a pipe leads into a chamber L containing an electric heater L′, and from this chamber the pipe F leads to the chamber C. A suitable liquid M supplied through a float valve M′, without novelty, fills the container I to a point at some distance above the brackets I^2 and forms a liquid seal around the receiver J, and fitting loosely within the latter is a perforated float J^2. The upper wall of the chamber L is preferably of cloth or the like and the whole is inclosed by a cover L^2. Into this chamber lead electrical conductors L^3 adapted to give a strong electrical spark in the contained air.

In operation, when cool air is desired, material to be dried is placed upon the shelves, conveniently when the car is in the position of the car A, Fig. 1, and this car is then moved into the chamber C. The doors E, E′ are then closed and the pumps K and G are put into action. The pump K exhausting air from the receiver J, atmospheric air passes down into the liquid alongside the latter, thence upward through the perforations in all parts of the float, then through the chamber L and conduit F into the chamber C. From this latter chamber it is drawn by the pump G, taking with it moisture and any other emanations from the material upon the shelves A^3. The air is thus washed by the liquid, which may be water impregnated with suitable chemicals, in some instances carbonate of potash being used, and is purified by the chemicals employed. Whenever desired it is further purified and sterilized by the electrical discharge in the chamber L. When this treatment has been continued for a suitable length of time, the pumps are stopped, the door E^2 is closed, the door E is opened, the car is moved into the compartment D, and the door E is again closed, after which a second car is introduced into the chamber C to be at once treated in its turn. Meantime, the first car, in the chamber D, is gradually restored to its normal or initial temperature so that there may be no condensation or

"sweating" when the treated material is finally passed out of the chamber and exposed to normal atmosphere. During the time the car remains in the chamber D, any vapor or gases escaping from the material are absorbed by the charcoal wall, and this wall is quickly and thoroughly dried at any time by passing current through the heating conductors H^3. When heat is desired in the drying, the heater L′ is put into action, and, if desired, the chamber D is heated by means of the heating wire H^3, but otherwise the operation is that already described. The same apparatus is thus obviously adapted for use under a great variety of conditions and for treating widely differing material, even when sterilizing is essential.

What I claim is:

1. The method of drying and sterilizing material which consists in subjecting the material, in a closed chamber, to the action of drying sterilized air at a temperature widely different from that of the atmosphere and subsequently protecting it from the free atmosphere until its temperature is restored approximately to that of the atmosphere, in a chamber having vapor and gas absorbing walls.

2. The method of drying materials and rendering them aseptic which consists in subjecting portions of the same to the action of drying sterilized air at a temperature far from normal atmospheric temperature, and then holding them in a relatively small closed chamber in the presence of material adapted to absorb aeroform emanations, until the temperature becomes approximately that of surrounding free atmosphere.

3. The combination with a closed chamber adapted to receive material to be operated upon, of means for creating a current of air through the chamber until the interior of the chamber differs widely in temperature from the free surrounding air, means for at will heating the entering air current, means for supporting material in the chamber and whereon the material may be removed from said chamber, and means for protecting the material from free air during such removal and until it assumes substantially the temperature of the surrounding free atmosphere.

4. In apparatus of the class described, the combination with a closed chamber and means for washing the air to be used in drying the material, a conduit delivering the washed air into said chamber, means for at will heating the air passing in the conduit, and means for subjecting the air in the conduit to the action of strong electric sparks.

5. A drying apparatus comprising a normally closed drying chamber, means for washing, chemically purifying, electrically sterilizing by high tension electric discharges, and at will heating atmospheric air, a conduit for delivering the treated air in said chamber, and means for forcibly ejecting air from the chamber.

6. The combination with a chamber adapted to serve as a closed drying chamber, of a chamber adapted to serve as a closed chamber for changing the temperature of drying material from a different temperature to that of the external atmosphere, means for at will opening communication between the chambers to allow material to pass from one to the other, means for sterilizing air, introducing it into the first chamber and discharging it therefrom outside the apparatus, and means for constantly removing from the interior of the second chamber gases and vapors escaping from the material therein.

In testimony whereof I affix my signature in presence of two witnesses.

JOHN C. FLEMING.

Witnesses:
JAMES L. CRAWFORD,
CHAS. LINKINS.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents. Washington, D. C."