(No Model.)

R. M. SKILES.

EVAPORATOR AND HEATER.

No. 259,933. Patented June 20, 1882.

Fig. 5.

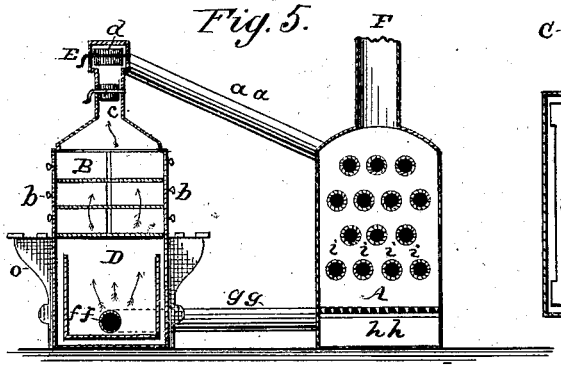


Fig. 3.

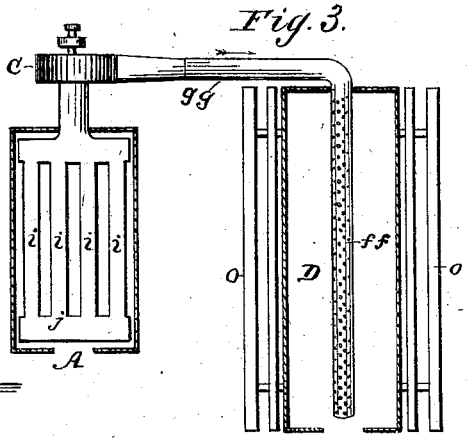


Fig. 1.

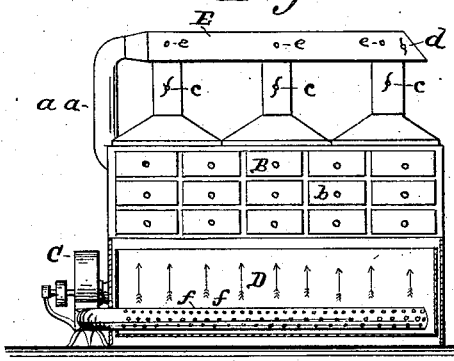


Fig. 4

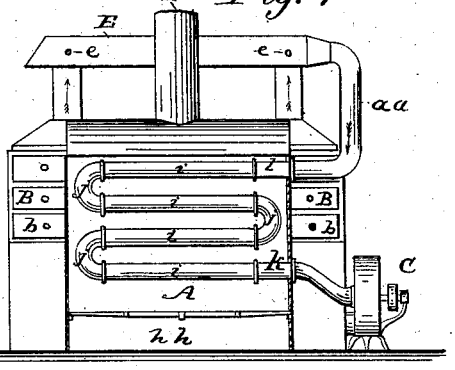
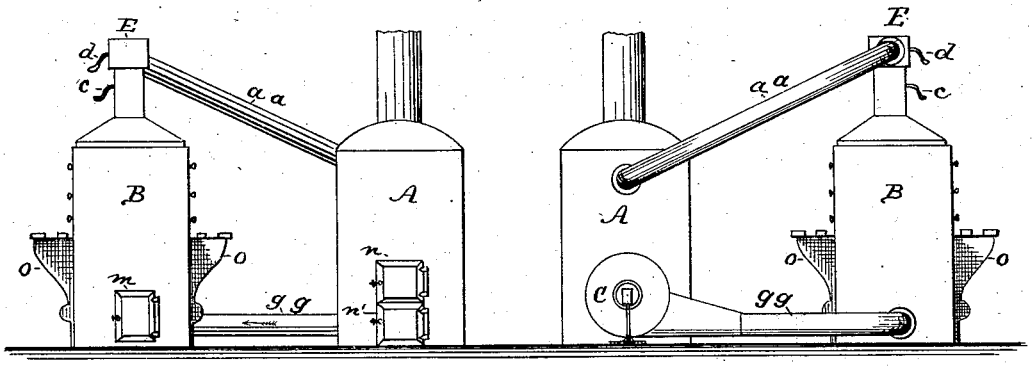


Fig. 2



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UNITED STATES PATENT OFFICE.

ROBERT M. SKILES, OF DAVENPORT, IOWA.

EVAPORATOR AND HEATER.

SPECIFICATION forming part of Letters Patent No. 259,933, dated June 20, 1882.

Application filed September 9, 1881. (No model.)

To all whom it may concern:

Be it known that I, ROBERT M. SKILES, of Davenport, in the county of Scott and State of Iowa, have invented a new and useful Improvement in Driers and Heaters, of which the following is a full, clear, and exact description, reference being had to the annexed drawings, forming part of this specification.

This invention relates to driers and heaters for drying corn, fruit, vegetables, malt, grain, and other stuffs used for food by man or beast, and for heating dwelling-houses and other buildings.

In the accompanying drawings, Figure 1 is a side elevation of the drier, partly in section. Fig. 2 represents end elevations of the drier and heater. Fig. 3 is a ground plan of the drier and heater. Fig. 4 is a side elevation of the drier and heater, showing the heater in section; and Fig. 5 is a vertical cross-section of the drier and heater.

Similar letters indicate similar parts throughout the several views.

The heater A is provided with a chamber of brick or iron, in which is placed a furnace and a grating, *h h*, for holding the fuel. Above the grating are arranged four banks of air-pipes, *i*, which are connected together in pairs by means of elbows *j*, to form a sinuous air-flue. The pipes *i* are so placed in the heater that the pipes of one bank shall be directly over the spaces between the pipes of another bank, so that the pipes shall be exposed to upward currents of heated air and gases from the furnace. The pipes *i* communicate at the top by means of a coupling, *l*, with the inclined pipe *a a*, extending from the heater to the chamber E, through which cold air is supplied to the heater.

The chamber E is supported above the drier B by means of flues *c*, which convey the moistened and cooling air from the drier back to the heater to be reheated. The necessary current for this purpose is established by means of the exhaust-fan C, which is connected with the pipes *i* at the bottom by means of a suitable pipe and coupling, *k*, and with the heat-reservoir D of the drier by means of a horizontal pipe, *g g*.

The hot-air reservoir D, which is located under the drier, is constructed of brick, sheet-iron, or lath and plaster, and is provided with a perforated pipe, *f f*, in its bottom, which connects with the pipe *g g* and receives the hot air from the heater.

The pipe *f f* may be made in sections like stove-pipe, and the sections may have a greater or less number of perforations, according to the amount of heat required in different parts of the drier. The hot air, escaping through the perforations of pipe *f f*, passes upward through the cloth or wire bottoms of the drawers *b b* of the drier in which the material to be dried is placed, and thence up the flues *c*, where it mingles with the cold air entering at *d* into the chamber E, and thus is carried back through the pipe *a a* into the heater.

The flues *c* and the chamber E are provided with dampers for regulating the draft, and the chamber E is provided with holes *e* to allow the moisture to escape. The heater is provided with doors *n n'*, leading to the furnace and ash-pan, and the heat-reservoir D is provided with a door, *m*, through which a man may enter for the purpose of adjusting the pipe *f f*, or for making repairs when necessary.

The tables or platforms *o o* are designed for the use of the attendant in removing and replacing the drawers.

With this construction a continuous circulation of air is kept up, carrying off the moisture and supplying dry hot air to the material being dried. At the same time as the heated air is returned to the heater, instead of being discharged into the open air, no portion of the heat is lost.

The elbows *j* and couplings *k* and *l* may be made larger than the pipes *i*, in order that they may serve as drums in which the air shall be successively mingled as it descends to the fan, and the temperature of the air in each of the pipes *i* thus rendered uniform.

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

1. The combination of the heater A and drier B, arranged side by side, the sinuous air-flue, formed of pipes *i*, having inclined feed-pipe *a a*, fan C, and discharge-pipe *g g*, and the perforated distributing-pipe *f f* and drier B, having

flues *c* and chamber E, for discharging moisture and supplying fresh air to the feed-pipe, substantially as shown and described.

2. The combination, with the heater A and its air-conducting pipes, of the drier B, having upright flues *c* arranged at intervals apart, and the chamber E, having opening *d* for the admission of cold air and holes *e* for the escape of moisture, substantially as shown and described.

ROBERT M. SKILES.

Witnesses:
J. J. DOLAN,
H. MCALISTER.