No. 678,072. Patented July 9, 1901.

E. P. & E. M. LAWRENCE.

DRIER.

(Application filed Oct. 22, 1900.)

(No Model.)

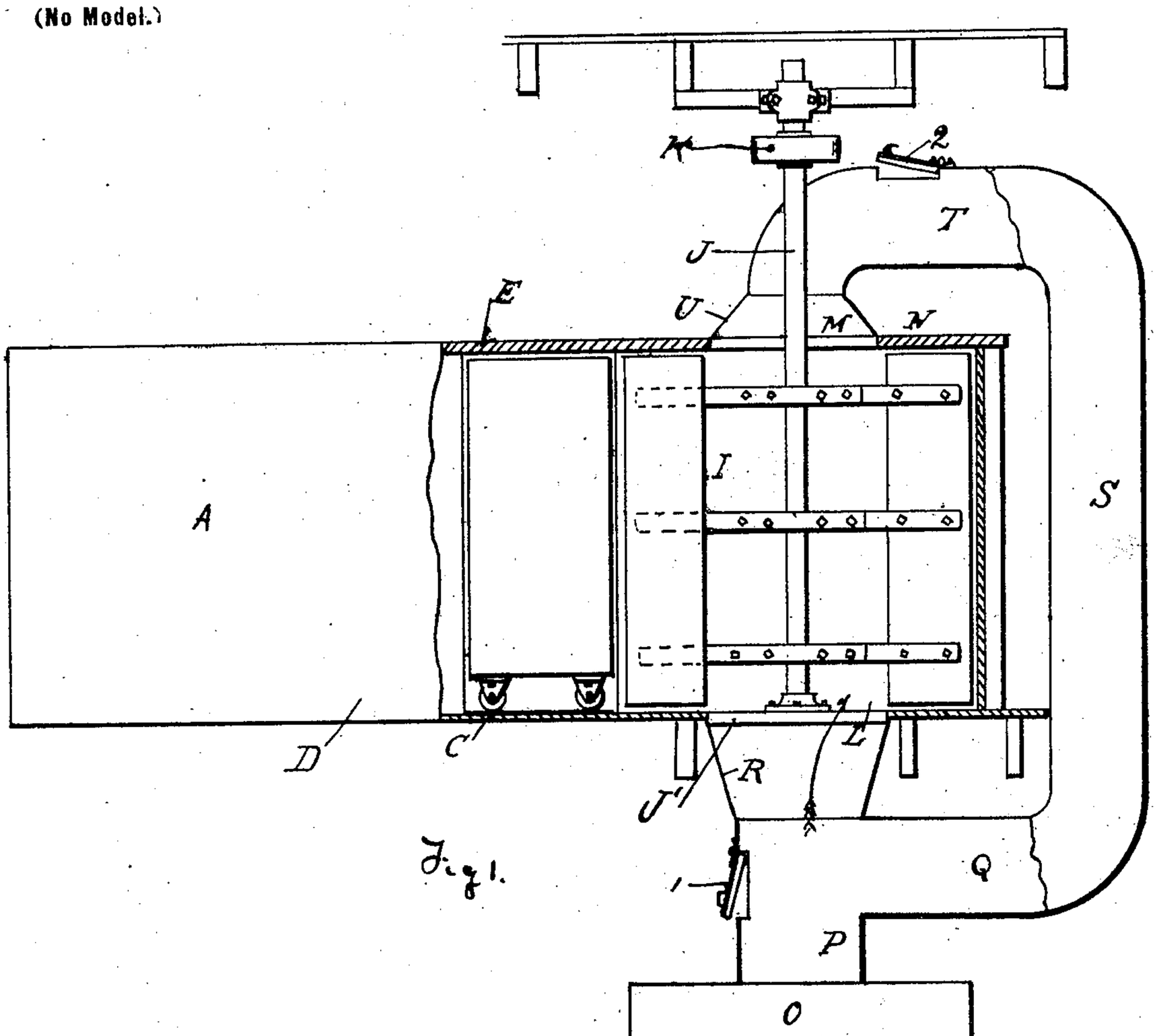

Fig 1.

Fig 2

Witnesses.
H. C. Shaw
Marion Richards.

Inventors.
Elvin P. Lawrence
and
Edwin M. Lawrence
by
Varnum Kellogg
Attorneys.

UNITED STATES PATENT OFFICE.

ELIAS P. LAWRENCE AND EDWARD M. LAWRENCE, OF LUBEC, MAINE.

DRIER.

SPECIFICATION forming part of Letters Patent No. 678,072, dated July 9, 1901.

Application filed October 22, 1900. Serial No. 33,803. (No model.)

To all whom it may concern:

Be it known that we, ELIAS P. LAWRENCE and EDWARD M. LAWRENCE, citizens of the United States, residing at Lubec, in the county of Washington and State of Maine, have invented certain new and useful Improvements in Driers; and we do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

Our invention relates to improvements in driers for fish, meat, fruit, or vegetables; and it consists especially in means for conducting a draft of hot air into a cylinder both from below and above and of distributing it among the articles to be dried, so that said articles, whether at the top or bottom of their containing cases, may be uniformly dried.

To this end it consists of a suitable hot-air-supplying apparatus, a drying-chamber for containing the articles to be dried, means for forcing the air through cases or cars containing the articles in the drying-chamber, means for causing said articles to be easily and readily brought in the way of the drying-draft, and means for causing the hot air to be evenly distributed among all the articles in the drying-chamber.

In the drawings herewith accompanying and forming a part of this application, Figure 1 is an elevation of our improved device, partly in section. Fig. 2 is a top plan view showing the arrangement of fans in the blower, the drying-chamber, and a car for containing the goods to be dried in position.

Similar characters of reference refer to like parts.

In said drawings, A represents a suitable drying-chamber, having an opening B at one end for the reception of cars or trays. Said chamber is provided with a floor C, side walls D, and roof E. Made into one of the walls of said chamber is a sliding door F, the purpose of which will be hereinafter more fully set forth. Said drying-chamber is provided with an opening G, extending into a cylinder H, in which is mounted a revolving fan or blower I. Said blower may be mounted upon a shaft J, carrying a pulley K on one end, from which may be run a belt or other means for imparting motion to the blower, the other end being stepped on a suitable support J', running across the bottom of the cylinder H. The bottom of said cylinder is open, as seen at L, for the admission of heated air from the bottom, and also it has an opening M at the top N, through which hot air may be fed into it from above.

O represents any suitable means for supplying hot air. We preferably use a furnace having a large heating-surface, the object being to cause as much hot air to be generated as possible. Running from the top of said furnace is a funnel P, having an elbow Q therein. Said funnel P is also provided with a flaring or hopper-shaped opening R, which joins the bottom of the cylinder H and serves to carry a current of hot air underneath the cylinder containing the rotary fans. The elbow Q joins the funnel P at some distance below the funnel-shaped opening R and extends thence upward and outside of the cylinder containing the rotary fan I, as seen at S, and is provided, further, with an offset T, carrying also a downwardly-extending funnel-shaped opening U, which tends to direct the hot air coming up through said funnel and pipe down upon and into the cylinder containing the rotary fan from above. Said chamber is provided with a stop V to prevent the cars or trays containing the articles to be dried from being placed too closely to the rotary fan, so as to interfere with its motion or cause the same to be broken. We also provide doors 1 and 2 to regulate the temperature of the air coming from the heater into the cylinder.

The operation of our improved device is as follows: The hot air is generated from the furnace O, and a portion thereof thence passes, by means of the pipes P, up through the opening R through the open bottom L of the cylinder. Another portion of the hot air from the furnace O passes through pipes P and Q outside of the cylinder and is directed down into the cylinder H by means of the funnel-shaped opening U. The fan is set in motion in any suitable manner. This causes the hot air to be taken both from the bottom and from the top of the cylinder and distributed through the opening G upon the articles contained in the drying-chamber, the result of this being that the hot air is distributed more

evenly throughout the drying-chamber both from the top and bottom, causing the articles to be more thoroughly, uniformly, and quickly dried than if the hot air were only taken from the bottom. After the car or crate containing the articles nearest the blower have been thoroughly dried the door F is opened and the car withdrawn, a new car being pushed in from the end. The cars or trays may be provided with perforated bottoms, as shown at 3, so as to permit the hot air driven into the drying-chamber to thoroughly circulate about the articles to be dried.

The efficacy of our improved device depends upon the fact that we distribute the hot air evenly throughout the drying-chamber, the same amount of dry air being driven in at the top as at the bottom. If the hot air were admitted to the cylinder from the bottom only, the revolving blower would take the same before it had an opportunity of rising any great distance in said cylinder and would throw it off through the opening F, but at the bottom, thus giving a direct drying-blast to only the bottom of the trays or cases, while in the case of admitting the hot air both at the top and bottom the air is taken by the blower from the upper as well as the lower portion of the cylinder and distributed evenly both over the top and bottom layers in the trays or cars. Should the air become too heated, so as to dry the articles too quickly, we regulate the same by opening the doors 1 and 2, either separately or together. By this means we can keep a current of air heated to the required temperature constantly circulating into the cylinder.

The advantages of our improved invention are that it is simple, easily constructed, and very effective in its working, the time required to dry articles being a great deal less than when the heat is distributed only from the bottom.

Having thus described our invention and its use, we claim—

1. In a drier, in combination, a drying-chamber, one end thereof opening into a vertical cylinder, said cylinder having openings at the top and bottom thereof, a source of hot-air supply, means for conducting said hot air from its source into the cylinder both at the top and bottom, means for forcing said air into the drying-chamber, said drying-chamber being provided with separate openings for the admission and withdrawal of articles to be dried and means for regulating the temperature of the air on its way from the source to the cylinder.

2. In a drier, in combination, a drying-chamber one end thereof opening into a vertical cylinder having openings in the top and bottom, a source of hot-air supply, means for conducting the hot air into the bottom of said cylinder through openings therein, means for conducting hot air down into the top of said cylinder, said last-named conductor extending upwardly from said hot-air supply and outside of the cylinder, a revoluble fan mounted in said cylinder for forcing the hot air into the drying-chamber, the drying-chamber being provided with separate openings for the admission and withdrawal of articles to be dried and means in the conductor at its top and bottom for regulating the temperature of the air on its way from its source to the cylinder.

3. In a drier, in combination, a drying-chamber, one end thereof opening into a vertical cylinder, said cylinder having openings in the top and bottom thereof, a source of hot-air supply, means for conducting said hot air from its source into the cylinder both at the top and bottom, means for forcing said current into the drying-chamber, said drying-chamber being provided with separate openings for the admission and withdrawal of articles to be dried and means for regulating the temperature of the air on its way to the cylinder, said hot-air conductor being provided with funnel-shaped openings at the top and bottom for the more direct guidance of the hot air into the cylinder.

In testimony whereof we affix our signatures, in presence of two witnesses, this 9th day of October, 1900.

ELIAS P. LAWRENCE.
EDWARD M. LAWRENCE.

Witnesses:
MILLARD REYNOLDS,
FRANK H. WISWELL.