

J. H. BEEBEE.

APPARATUS FOR DRYING MOISTURE BEARING SUBSTANCES.

APPLICATION FILED AUG. 16, 1918.

1,295,259.

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2 SHEETS—SHEET 1.

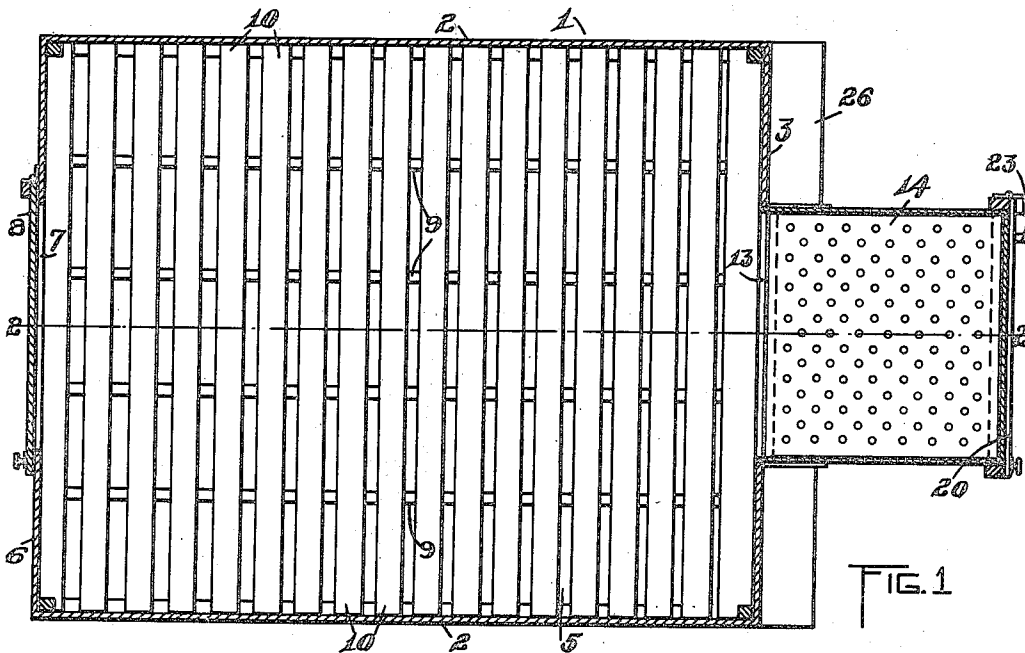


FIG. 1

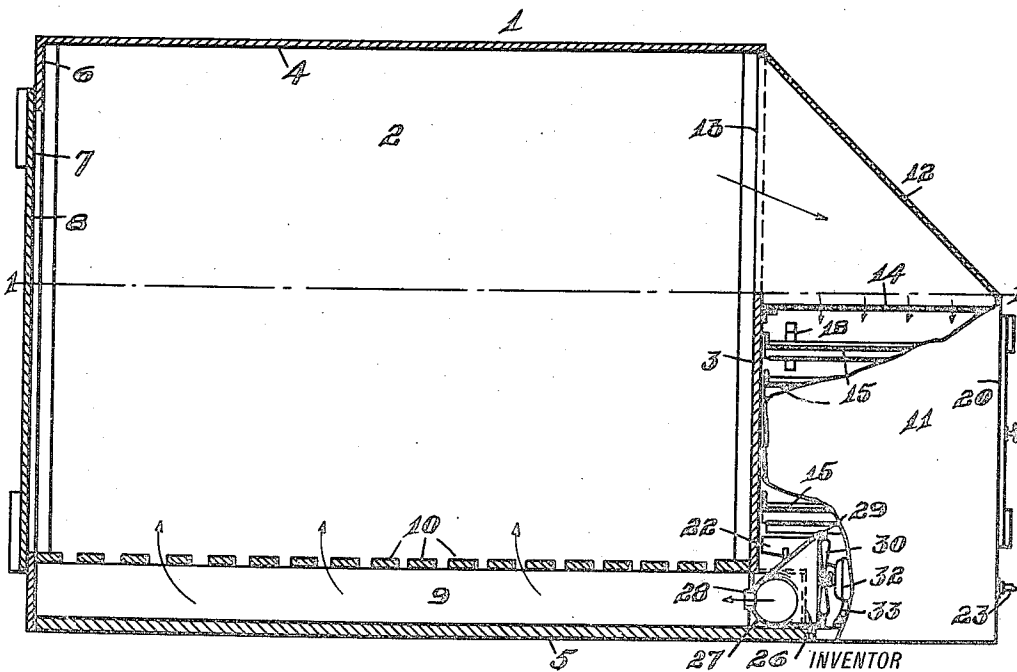


FIG. 2

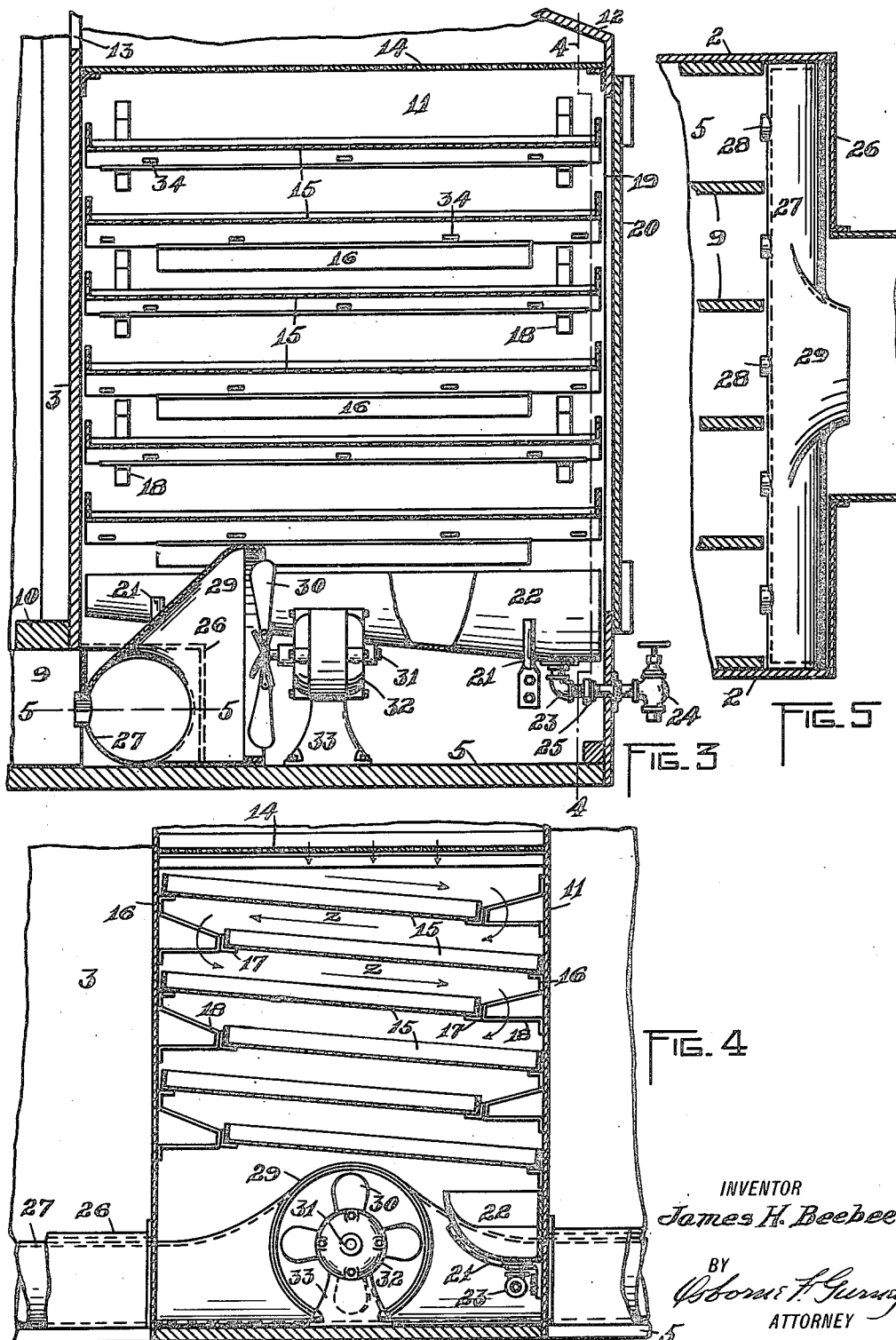
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APPARATUS FOR DRYING MOISTURE-BEARING SUBSTANCES.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, JAMES H. BEEBEE, a citizen of the United States, residing at Rochester, in the county of Monroe and State of New York, have invented a new and Improved Apparatus for Drying Moisture-Bearing Substances, of which the following is a specification.

My invention, while relating to methods of and means for drying fruit, vegetables, lumber or other like moisture bearing substances has more especial reference to devices for this purpose commonly known as air drying apparatus.

One of the objects of my present invention is to effect a thorough drying of substances such as above mentioned by placing them in an air tight inclosure and using the air within the inclosure repeatedly by keeping it in continuous circulation, the moisture absorbed from the fruit, vegetables or other substance being in turn removed from the air by directing the air currents over a suitable dehydrating material such as chlorid of calcium.

Another object of the invention is to provide an apparatus for accomplishing such first named object that is simple, practical and inexpensive in construction and that can be built in various shapes and sizes according to the particular purpose for which it is to be used.

And still another object of the invention is the provision within a comparatively small compartment of a large area over which to spread the dehydrating material.

These and other objects of the invention pertaining more especially to details of construction will be clearly set forth in the following description and particularly defined in the appended claims.

The accompanying drawings illustrating the invention are as follows:

Figure 1 is a horizontal sectional view of the apparatus taken along the line 1—1 of Fig. 2;

Fig. 2 is a part side elevation and part vertical sectional view taken along the line 2—2 of Fig. 1;

Fig. 3 is an enlarged vertical sectional view of the extension chamber also taken along the line 2—2 of Fig. 1;

Fig. 4 is a transverse vertical sectional

view taken along the line 4—4 of Fig. 3 but drawn to a smaller scale;

And, Fig. 5 is a transverse vertical sectional detail taken along the line 5—5 of Fig. 3 but with the air distributing tube shown in full.

Similar reference numerals refer to similar parts throughout the several views.

The numeral 1 represents a dry kiln which may be of any desired size according to the use for which it is intended and constructed of any suitable material. This kiln may also be of any preferred conformation although the one shown in the drawings as embodying my invention is rectangular and provided with side walls 2—2, a front wall 3, a top 4, a base 5 and a rear wall 6 having a door-way 7 normally closed by a swinging door 8. Supported on the base 5 are a plurality of longitudinally extending joists 9 which in turn support a flooring formed by transversely extending boards or slats 10 with spaces between them, these spaces gradually becoming wider toward the rear of the kiln or to the left with respect to Figs. 1 and 2. The floor thus formed has an air space beneath it and the boards being spaced farther apart toward the rear of the kiln permit a more equal distribution of the air currents as they are directed rearwardly between the several joists in the manner to be explained.

On the front of the kiln and preferably in the center thereof is an extension 11 provided with side and front walls and a rearwardly inclined top wall 12. This extension forms a chamber having communication with the kiln proper through an opening 13 in the upper portion of the front wall 3. Supported longitudinally within this extension just below the opening 13 is a perforated plate 14, while below the plate there are slidably and removably supported a plurality of trays or pans 15 arranged in staggered relation relative their side edges, see Fig. 4. These trays are supported upon angle bars 16 and 17, the bars 16 being secured to the side walls of the extension chamber 11 while the bars 17 are carried by brackets 18 secured to such side walls.

The trays 15 comprise receptacles for containing the moisture absorbing substance and by having a number of them there is provided, within a comparatively small com-

partment, a large area over which to spread this substance. They are also preferably supported on a slight incline and have perforations 34 along their lower edges permitting the substance, when such as chlorid of calcium is used, to be drained from one pan to another as it gradually becomes liquefied by the moisture absorbed through the air from the fruit, vegetables or other material being dried in the kiln. The front wall of the extension 11 is provided with an opening 19 for permitting removal of the several trays 15 but which is normally closed by a swinging door 20.

Removably supported on arms 21 secured to one of the side walls of the extension 11 is a receptacle 22 adapted to receive the liquid as it drops from the lowermost tray 15, and the contents of this receptacle are drained through a pipe connection 23 extending through the front wall of the extension chamber and provided with a stop valve 24. When the contents of the receptacle 22 has been drawn off into another receptacle, not shown, the latter can be placed on a stove and the water evaporated so that the material can be again placed in the trays for further use. The pipe connection 23 has a coupling 25 which when disconnected permits a removal of the receptacle 22 through the opening 19.

Extending transversely of the kiln at the forward end of the joists 9 and housed in a suitable casing 26 is an air distributing head comprising a tube 27 closed at its ends and having a number of alined apertures 28 for directing the air rearwardly between the several joists and under the floor boards 10, the apertures toward the end of the tube preferably being somewhat larger than those near the center for the purpose of obtaining a more equal distribution of the air. The tube 27 opens at its center into an enlarged lateral extension 29 at the forward end of which is a fan 30 supported on the shaft 31 of an electric motor 32 mounted upon a standard 33 secured to the base 5. This fan creates a continuous circulation of the same air over and over again by drawing it from the bottom of the extension chamber 11 and forcing it through the openings 28 in the distributing head 27 to the space beneath the flooring from whence it rises through the spaces between the floor boards 10, circulates through the kiln, passes through the opening 13 into the upper part of the extension chamber 11, then downwardly through the perforated plate 14 and back and forth in the direction of the arrows Z, Fig. 4, over the several trays 15 containing the dehydrating material and again into the distributing head 27.

It will thus be seen that the contents of the kiln are dried by using the same air continuously and that the moisture absorbed by

the air from the fruit, vegetables or other substances is removed therefrom by the dehydrating material as the air passes over the trays 15 and that the air is in a dry state when drawn by the fan into the distributing head 27. It will also be seen that as the dehydrating material becomes liquefied it can be drawn off and the material reclaimed for further use when the moisture has been evaporated.

From the foregoing description it is believed that the construction, purpose and manner of using the apparatus are sufficiently clear to call for no further explanation herein.

What I claim is:—

1. In an apparatus of the character and for the purpose described, the combination with a kiln of a partition through the kiln forming an air space and having apertures therein, a compartment having communication with said kiln, means supported within said compartment for containing a dehydrating material, and means, as a fan, intermediate said container and the said air space for maintaining a continuous circulation of the same air from the compartment into said air space, then through the kiln into the compartment and over the said container.

2. In an apparatus of the character and for the purpose described, the combination with a kiln of a partition through the kiln forming an air space and having apertures therein, a compartment having communication with said kiln, means supported within said compartment for containing a dehydrating material, such container being provided with a liquid discharge opening, and means, as a fan, intermediate said container and the said air space for maintaining a continuous circulation of the same air from the compartment into said air space, then through the kiln into the compartment and over the said container.

3. In an apparatus of the character and for the purpose described, the combination with a kiln of a partition through the kiln forming an air space and having apertures therein, a compartment having communication with said kiln, means supported within said compartment for containing a dehydrating material, such container being provided with a liquid discharge opening, means, as a fan, intermediate said container and the said air space for maintaining a continuous circulation of the same air from the compartment into said air space, then through the kiln into the compartment and over the said container, a drain for receiving the liquid discharged from said container and having communication with the atmosphere, and means for normally closing said drain.

4. In an apparatus of the character and for the purpose described, the combination

with a kiln of a compartment having communication therewith, and a plurality of trays having perforated bottoms and supported on an incline one above the other in the said compartment.

5 5. In an apparatus of the character and for the purpose described, the combination with a kiln of a compartment having communication therewith, a plurality of trays 10 having perforated bottoms and supported one above the other in the said compartment, a receptacle beneath the lowermost tray and pipe connections for draining the said receptacle.

15 6. In an apparatus of the character and for the purpose described, the combination with a kiln of a partition through the kiln forming an air space and having apertures therein, a compartment having communication with said kiln, a plurality of trays for 20 containing a dehydrating material supported one above the other in said compartment, an air distributing member, a fan for maintaining a continuous circulation of the same 25 air from said compartment through said distributing member into said air space then through the kiln into said compartment and over the said trays, and means for rotating the fan.

30 7. In an apparatus of the character and for the purpose described, the combination with a kiln of a partition through the kiln forming an air space and having apertures therein, a compartment having communication with said kiln, a plurality of trays for 35 containing a dehydrating material supported one above the other in said compartment and a perforated plate above said trays, an air distributing member, a fan for maintaining a continuous circulation of the same 40 air from said compartment through said distributing member into said air space then

through the kiln into said compartment through the said perforated plate and over the said trays, and means for rotating the 45 fan.

8. In an apparatus of the character and for the purpose described, the combination with a kiln of a floor in the kiln having an air space beneath it and apertures in the 50 floor, a compartment having communication with said kiln, a plurality of trays for containing a dehydrating material supported one above the other in the said compartment, an air distributing member, a fan 55 located in the said compartment beneath the lowermost of said trays for maintaining a continuous circulation of the same air from said compartment through said distributing member into said air space then through the 60 kiln into the said compartment and over the several trays, and means for rotating the fan.

9. In an apparatus of the character and for the purpose described, the combination 65 with a kiln of a floor in the kiln having an air space beneath it and apertures in the floor, a compartment having communication with said kiln, a plurality of trays for containing a dehydrating material having per- 70 forated bottoms and supported in the said compartment one above the other on an incline and in staggered relation, a receptacle beneath the lowermost tray, an air distributing member, a fan located in the said com- 75 partment beneath the lowermost tray for maintaining a continuous circulation of the same air from said compartment through said distributing member into said air space then through the kiln into the said compart- 80 ment and over the several trays, and means for rotating the fan.

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