T. E. KOEHLER.

FRUIT EVAPORATOR.

APPLICATION FILED JULY 17, 1912.

1,075,981. Patented Oct. 14, 1913.

3 SHEETS—SHEET 1.

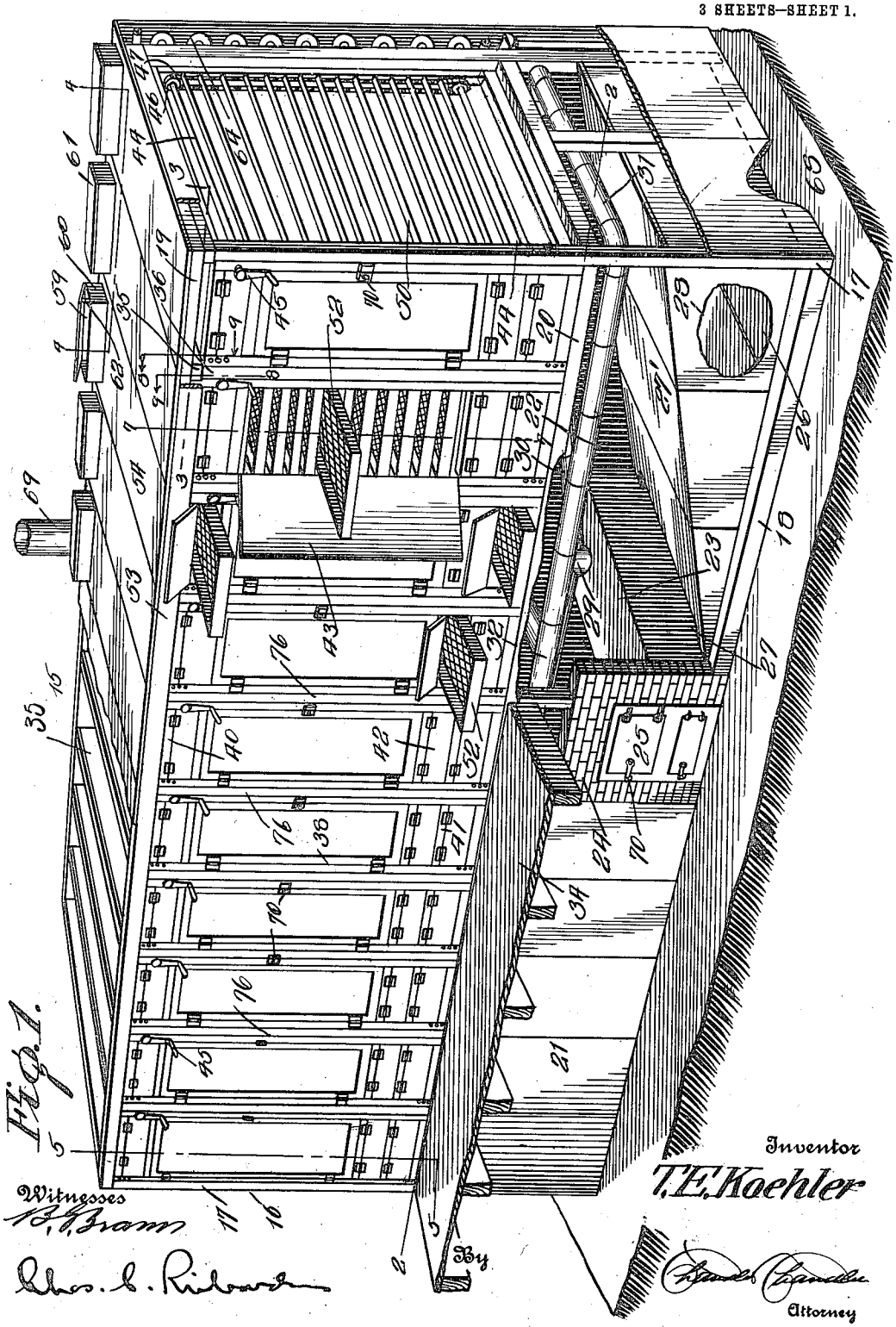


Fig. 1.

Witnesses

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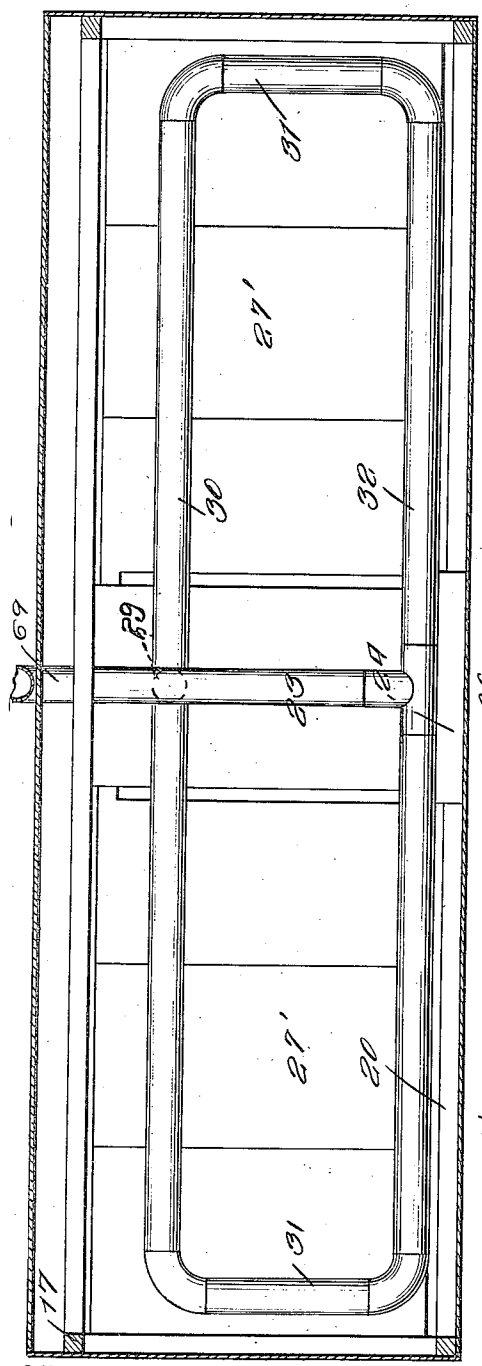



Fig. 2.

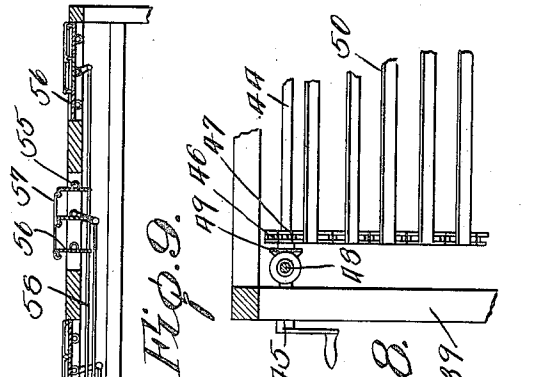



Fig. 3. Fig. 8.

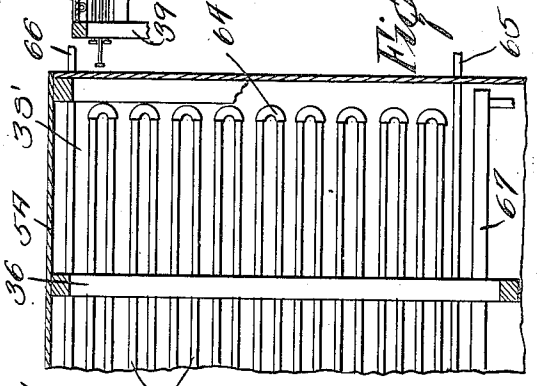
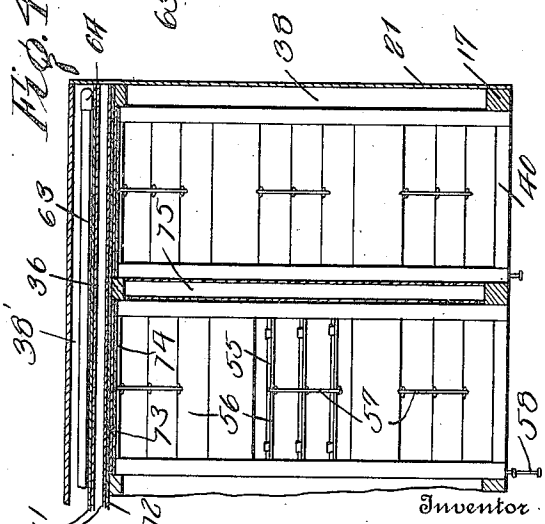



Fig. 4.




Witnesses

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3 SHEETS—SHEET 3.

Fig. 5.

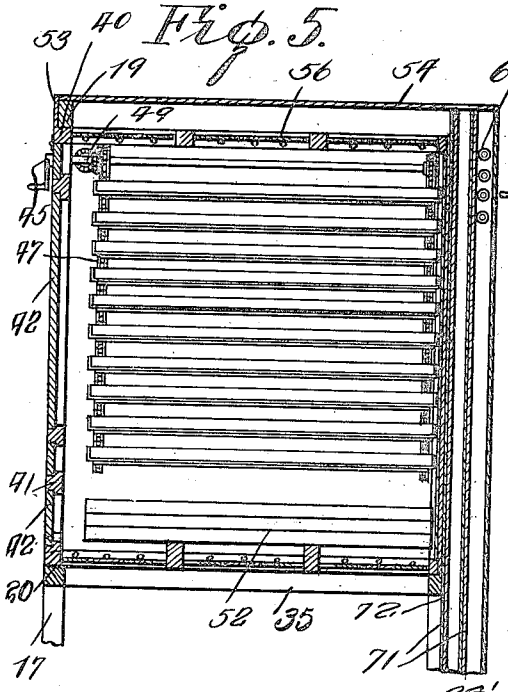



Fig. 6.

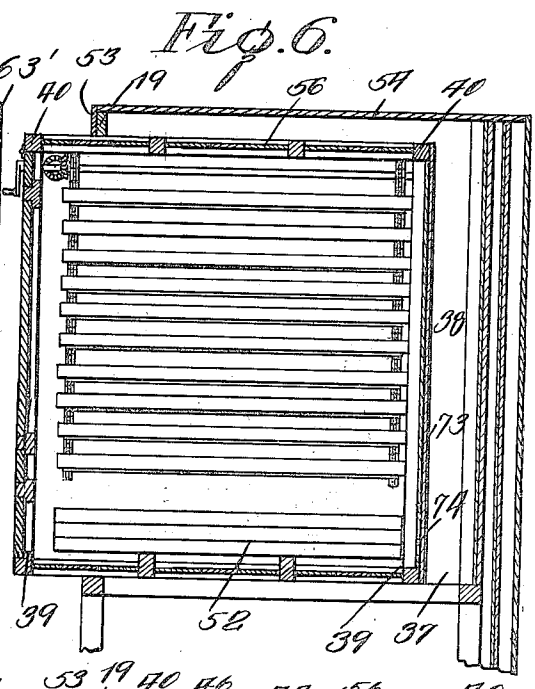



Fig. 7.

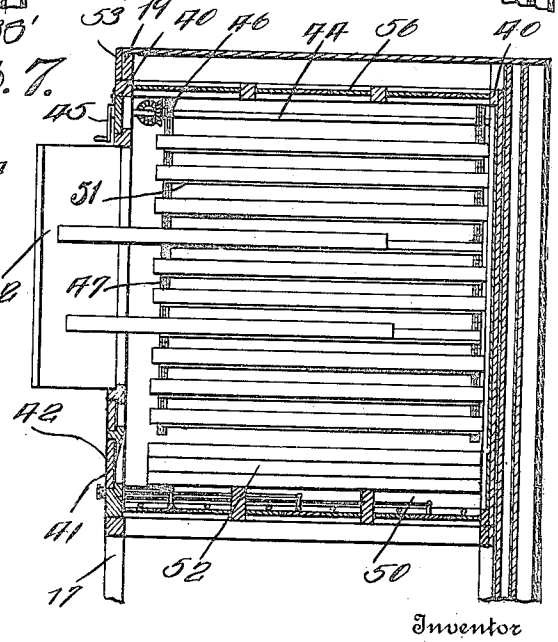
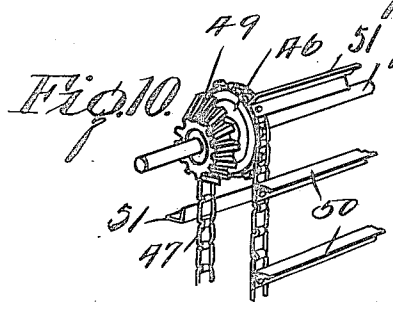



Fig. 10.




Witnesses

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# UNITED STATES PATENT OFFICE.

THEODORE E. KOEHLER, OF MOUNT ANGEL, OREGON.

## FRUIT-EVAPORATOR.

1,075,981. Specification of Letters Patent. Patented Oct. 14, 1913.

Application filed July 17, 1912. Serial No. 710,003.

*To all whom it may concern:*

Be it known that I, THEODORE E. KOEHLER, a citizen of the United States, residing at Mount Angel, in the county of Marion, State of Oregon, have invented certain new and useful Improvements in Fruit-Evaporators; and I 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.

This invention relates to new and useful improvements in a machine for evaporating fruit.

An object of this invention is the provision of a machine such as described which causes the condensation of moisture arising from fruit thereby preserving the food properties and the flavors.

A further object of this invention is the provision of a machine in which the air passes through the fruit and circulates back to the heating zone of the furnace from which it is again directed to the fruit, the said air in its passage being cooled and reheated.

Still another object of this invention is the provision of an apparatus of the above described type which employs the use of a plurality of dampers each consisting of independent, operable sections which may be swung to direct the heat to either the front intermediate or rear portions of the machine.

A fourth object of this invention is the provision of an apparatus of the nature above specified in which the fruit trays may be moved to and from the furnace or heating chamber, the same being supported by endless belts.

A further object of this invention is the provision of a condensing and evaporating apparatus which employs the use of a plurality of vertically movable trays, the said apparatus being provided with doors through which the trays may be inserted or removed and also a main door through which the contents of the trays can be inspected as desired.

A still further object of this invention is to improve and simplify devices of this character, rendering them comparatively simple and inexpensive to manufacture, reliable and efficient in use and readily operated.

With the above and other objects in view, this invention resides in the novel features of constructions, formations, combinations and arrangements of parts to be hereinafter more fully described, claimed and illustrated in the accompanying drawings, in which:

Figure 1 is a perspective view of my invention with parts broken away. Fig. 2 is a horizontal sectional view thereof taken on the line 2—2. Fig. 3 is a similar view taken on the line 3—3 of Fig. 1. Fig. 4 is a longitudinal sectional view taken on the line 4—4 of Fig. 1. Fig. 5 is a transverse sectional view taken on the line 5—5 of Fig. 1. Fig. 6 is a view similar to Fig. 5, but showing the sliding supporting frame moved outward in the main frame. Fig. 7 is a similar view taken on the line 7—7 of Fig. 1. Fig. 8 is an enlarged detailed sectional view taken on the line 8—8 of Fig. 1. Fig. 9 is a detailed sectional view taken on the line 9—9 of Fig. 1, and Fig. 10 is a fragmentary detail perspective view illustrating the method of supporting the trays.

Referring to the accompanying drawings by similar characters of reference throughout the several views, the numeral 15 designates generally my improved condensing and evaporating apparatus which consists of a frame 16 comprising opposite corner posts 17 connected at their lower ends by the lower rails 18 at their upper ends by the upper rails 19 and at points intermediate their ends by the intermediate rails 20.

The side end rails 18 and 20 are connected by a plurality of plates 21 which constitute an air compartment 22 in which is located a furnace 23 of any well known type or design and disposed with its front wall 24 exterior of the compartment 22 and equipped with the usual furnace doors 25.

The upper edges of the rails 18 are connected by a bottom 26 which extends to the opposite sides of the furnace base 27, while secured to this said base 27 above the bottom 26 is an inclined partition 27′ which is secured at its opposite end to the adjacent inner sides of the end plates 21 in spaced relation from the rails 18 and 20. One of these partitions 27′ is disposed upon each side of the furnace 23 and produce together with the bottom 26 and plates 21 inwardly tapering compartments 28 for a purpose to be later disclosed.

A heat supply pipe 29 extends from the

rear end of the furnace 23 and has connected to its upper extremity a pair of oppositely extending branch pipes 30 which extend longitudinally of the compartment 22 adjacent the rear wall thereof to the opposite ends thereof to which are connected transverse pipes 31 which are connected at their free ends by a longitudinal pipe 32 which runs the entire length of the compartment 22 in spaced parallel relation to the rails 20 and adjacent the front wall of the said compartment. From the pipe 32 extends the outlet pipe 69. By reference to Fig. 2 it will be seen that the course of flow is through the pipe 29 to the pipe 30 thence through the transverse pipes 31 to the pipe 32, thence to and through the outlet pipe or flue 69.

The usual flooring 34 extends horizontally from the rails 20, while connecting the said rails 20 and 19 are transverse parallel rafters 35 which are connected by spaced uprights 36 which produces a plurality of spaces or upper compartments 37 in which are located the slidable supporting frames 38, as shown in Fig. 6. Each of the slidable frames 38 consists of a plurality of spaced corner posts 39 connected at their opposite ends by the front side and rear bars 40 which holds them in their spaced relation relative to each other against any undesired displacement. The front and rear pair of posts 39 are connected at points in spaced relation from their ends by horizontal rails 41 to which are hingedly secured doors 42 while secured to one of the posts 39 between the inner of the rails 41 is a main door or closure 43.

Upper and lower spaced shafts 44 are journaled in the posts 39 in spaced relation to the opposite ends thereof while secured to one of the shafts 44 is an operating crank 45 by means of which the said shaft can be rotated, the shafts 44 upon the opposite sides of the supporting frame having keyed thereto sprocket wheels 46 which are connected by endless chain belts 47 and the upper of the shafts 44 being connected by shafts 48 and beveled pinions 49 serves upon the rotation of the crank 45 not only to rotate the shaft which supports the same but also each of the said shafts journaled in the frame, and in such manner that the shafts disposed at the opposite sides of the frame will be rotated in unison and in opposite directions. The chain belts 47 at like sides of the frame 38 are connected by angle bars 50, the same being arranged with the inner flanges thereof located in horizontal planes producing guides 51 for slidably receiving the fruit trays 52.

A plurality of longitudinal plates 53 are connected to the rails 19 and adjacent portions of the posts 17 and 36 and terminate with their edges flush with the upper edges of the frames 38, while connecting the upper edges of the rails 19 is a closure 54 which may be formed from any suitable material such as sheet metal or the like in one or more sections.

A plurality of rods 55 connect the opposite ends of the supporting frames 38 while pivotally connected to these rods 55 are a plurality of damper plates 56 which are connected in series by links 57. An operating rod 58 is connected to each series of damper plates 56 and projects through the casing providing a means whereby each series can be operated independently of the others.

It should be noted that the bars 55 are arranged in pairs above the shafts 44 and below the same which consequently arranges the plates 56 both above and below the trays 52.

The closure 54 is formed with a plurality of openings 59, each of which is disposed directly above the slidable supporting frames 38 and from the edges of these openings 59 extend housings 60 closed at their upper edges by plates 61 which may be retained by braces 62 in a partially opened position to permit a certain amount of the air to escape from the machine.

A plurality of horizontally disposed pipes 63 are secured in spaced parallel relation to each other in the cooling chamber 38′ at the rear ends of the frames 38, while the opposite edges of these pipes are alternately connected by return bends 64 which produce a continuous passage through the pipes 63, the end ones of which are connected to an inlet pipe 65 and an outlet pipe 66 by means of which a continuous supply of cold water may be retained therein. The cooling chamber 38′ in which the cold water coils or pipes are arranged is lined with heavy asbestos paper 71, while 72 is a board covering forming one side of the chamber and 73 is a similar board covering or facing on the adjacent back of the cabinet. The inside of the cabinet is lined with metallic sheeting as at 74. The dead air space of the cooling chamber is provided to prevent the hot air heating the cooling chamber as the moist air is only to pass through the top at the dampers and thence down the back of the cooling chamber and back to the heating zone of the furnace. Furthermore, there is a space 75 between each set of trays in which the hot air is confined, these vertical spaces being covered at the front by the strips 76 to form a radiator.

A trough 67 is secured below the lower of the pipes 63 and serves to convey the water caused by the condensation of the vapors arising from the fruit upon contact with the pipe 63 back to the heating zone of the furnace at the space between the base 68 of the apparatus and the bottom 26 which is disposed in spaced relation thereto.

The furnace 23 is equipped with the usual

outlet flue 69, while suitable locks 70 are employed to retain the doors in their closed positions.

The operation of the device is as follows: The trays 52 are filled with the fruit and are slid into engagement with the guides 51 through the doors 42, and when desired access may be had to these trays through the main door 43. It will be observed that any tray may be moved as desired upon the rotation of the crank 45 to and from the greatest intensity of heat which is located directly above the furnace 23 or adjacent the lower ends of the frames 38. This is necessary in evaporating fruits of different nature. It will be apparent that when the fruit becomes heated a certain amount of vapor will arise therefrom and contact with the pipes 63 through which the cold water is circulated. This obviously causes the condensation of the vapor which as before stated is conveyed back to the heating zone of the furnace, reheated and again circulated through the fruit contained within the trays 52. The compartments 28 serve to retain cooler air than located in the compartment 22 which assists in retaining the condensed vapor in liquid form until it reaches the heating zone of the furnace 23 and also in purifying the air contained within the compartment 22. The supply of air may be directed to any point within the frames 38 by the damper plates 56 while in order to regulate the intensity of the heat contained within the apparatus the closures 61 may be raised or lowered. It should be understood in this connection that various minor changes in the details of construction can be resorted to within the scope of the appended claims without departing from or sacrificing any of the advantages of the invention.

From the foregoing disclosures taken in connection with the accompanying drawings it will be manifest that a device of the nature described is provided which will fulfil all of the necessary requirements of such a device.

Having thus fully described this invention what I claim as new and desire to protect by Letters Patent, is:

1. A condenser and fruit evaporator comprising a frame having upper and lower compartments located therein, heating means disposed within the lower compartment, supporting frames slidable in the upper compartment, vertically movable trays supported within the supporting frames and means for vertically moving said trays.

2. The combination in a fruit evaporator and condenser of a frame having compartments provided therein, heating means for the lower of the compartments, said compartments being in communication, supporting frames slidable in the upper compartment, vertically movable trays mounted within the supporting frames, means for vertically moving the trays, dampers disposed adjacent the upper and lower ends of the supporting frames for controlling the passage of air therethrough and means for operating the damper.

3. The combination in a fruit evaporator and condenser, of a frame having upper and lower compartments disposed therein, heating means within said lower compartment, supporting frames slidable within the upper compartment, vertically movable trays mounted within the supporting frames, means for vertically moving the trays, dampers for controlling the passage of air through said frames, condensing pipes disposed within the upper compartment and means for conducting the condensed vapor back to the heating means to be revaporized.

4. The combination in a fruit evaporator and condenser of a frame having upper and lower compartments disposed therein, heating means within the lower of the compartments, supporting frames slidable in the upper compartment, endless belts mounted within the supporting frames, and vertically movable trays supported by the endless belts.

5. The combination in a fruit evaporator and condenser of a plurality of supporting frames, means for supplying heat thereto, shafts journaled in the frames, sprocket wheels keyed to said shafts, chains passing over said sprocket wheel, angle bars connecting said chains and forming guides, trays slidable upon said guides and means for rotating the shafts and moving the trays vertically within the frames.

6. The combination in a fruit evaporator and condenser of a frame having compartments located therein, fruit supporting means disposed within the upper compartment, a furnace disposed within the lower compartment, upwardly inclined heating pipes extending from the furnace, longitudinally of the lower compartment, transverse pipes connected to the upper ends of the inclined pipes and a longitudinally extending pipe connecting the free ends of the transverse pipes.

7. The combination in a fruit condenser and evaporator of a frame having an upper and a lower compartment disposed therein, said lower compartment being closed at its lower end by a base plate, a furnace base resting upon the base plate intermediate the ends of the lower compartment, a furnace disposed upon said furnace base, a bottom extending from the sides of the base to the ends of the compartment in spaced relation to the base plate, upwardly inclined plates extending from the furnace base to the ends

of the compartment and producing supplemental compartments, and condensing means disposed within the upper compartment.

8. The combination in a fruit vaporizer and condenser of a main frame having upper and lower compartments disposed therein, heating means within the lower compartment, supporting frames slidable within the upper compartment, vertically movable trays located within the supporting frames, said supporting frames being formed in their front walls with relatively large central openings whereby access may be had to the trays and at their ends with openings of less dimensions whereby the trays may be removed and replaced and closures for the said openings, means for vertically moving the trays.

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

THEODORE E. KOEHLER.

Witnesses:
P. F. KILIAN,
J. L. MUFFEMBIN.