April 29, 1924.

1,492,275

A. R. THOMPSON

EXHAUST BOX

Filed Jan. 22, 1923

4 Sheets-Sheet 1

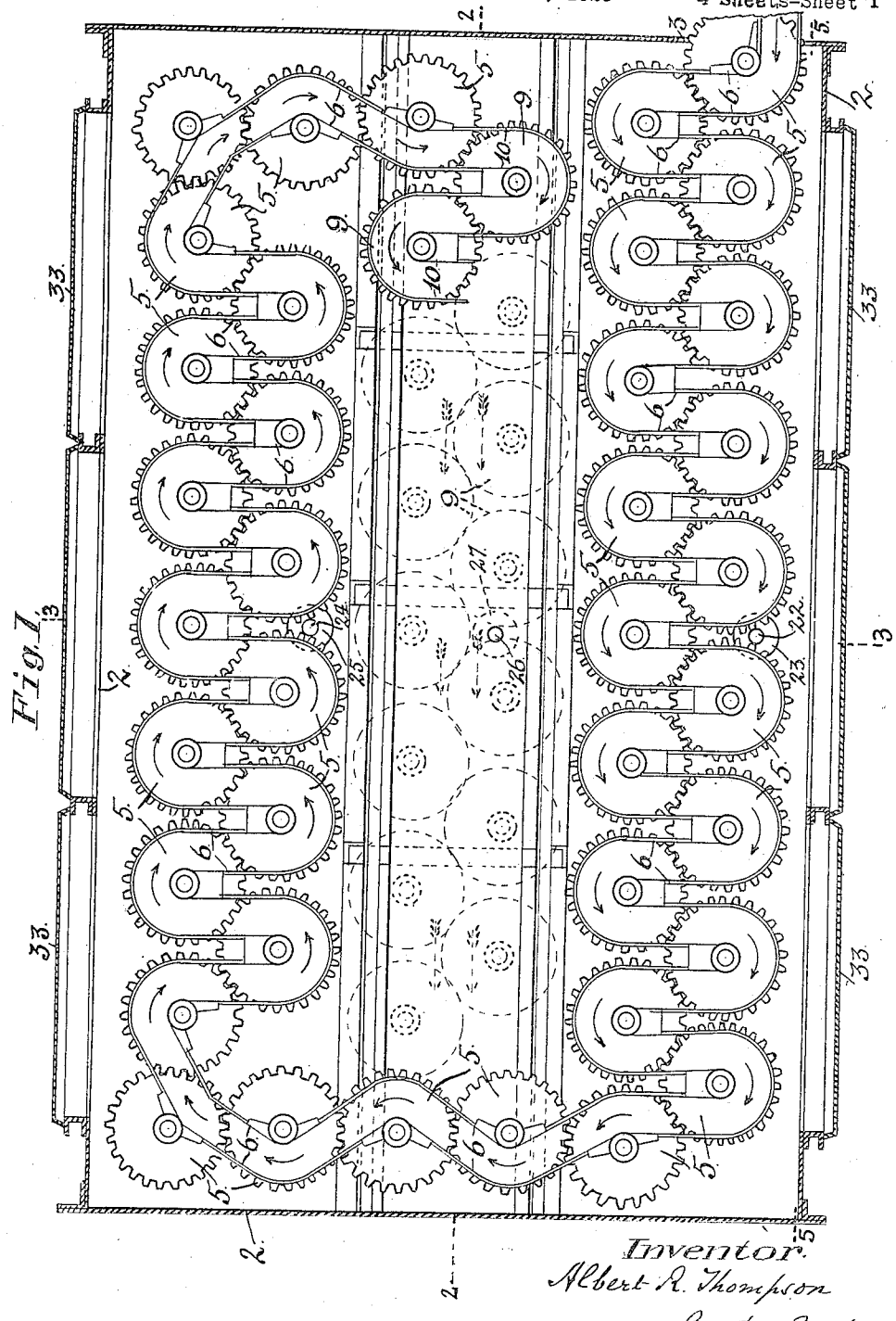


Fig. 1.

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4 Sheets-Sheet 2

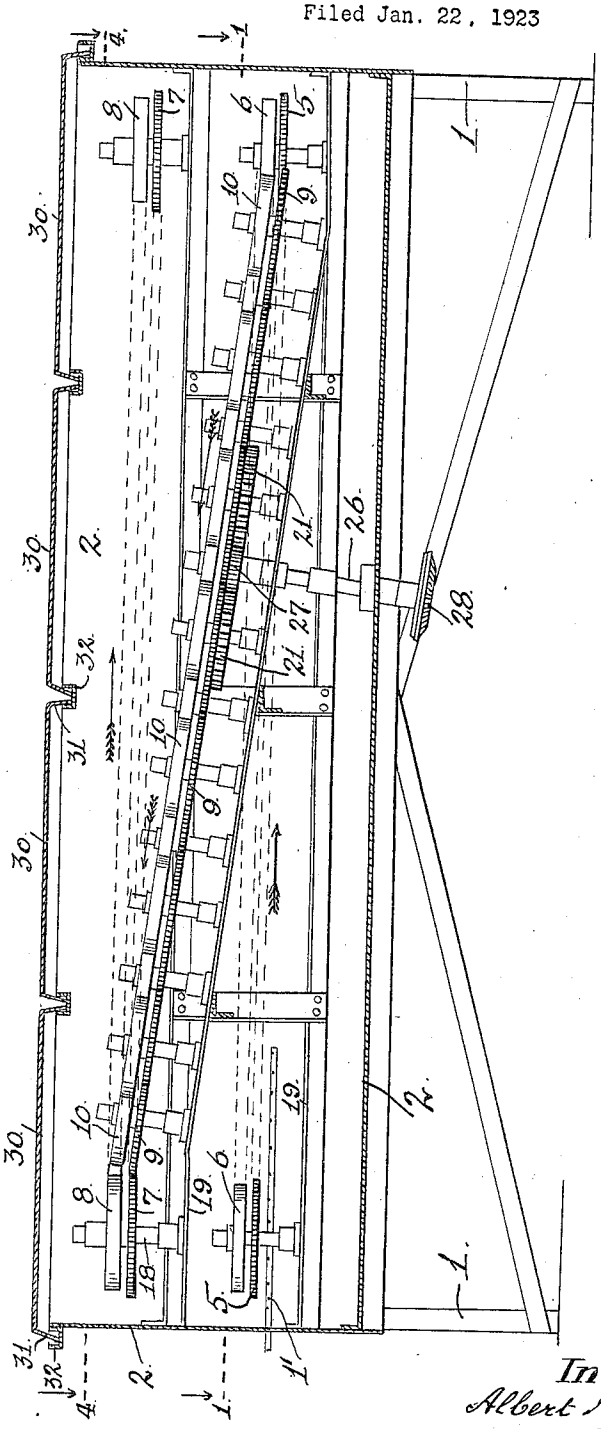


Fig. 2.

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4 Sheets-Sheet 3

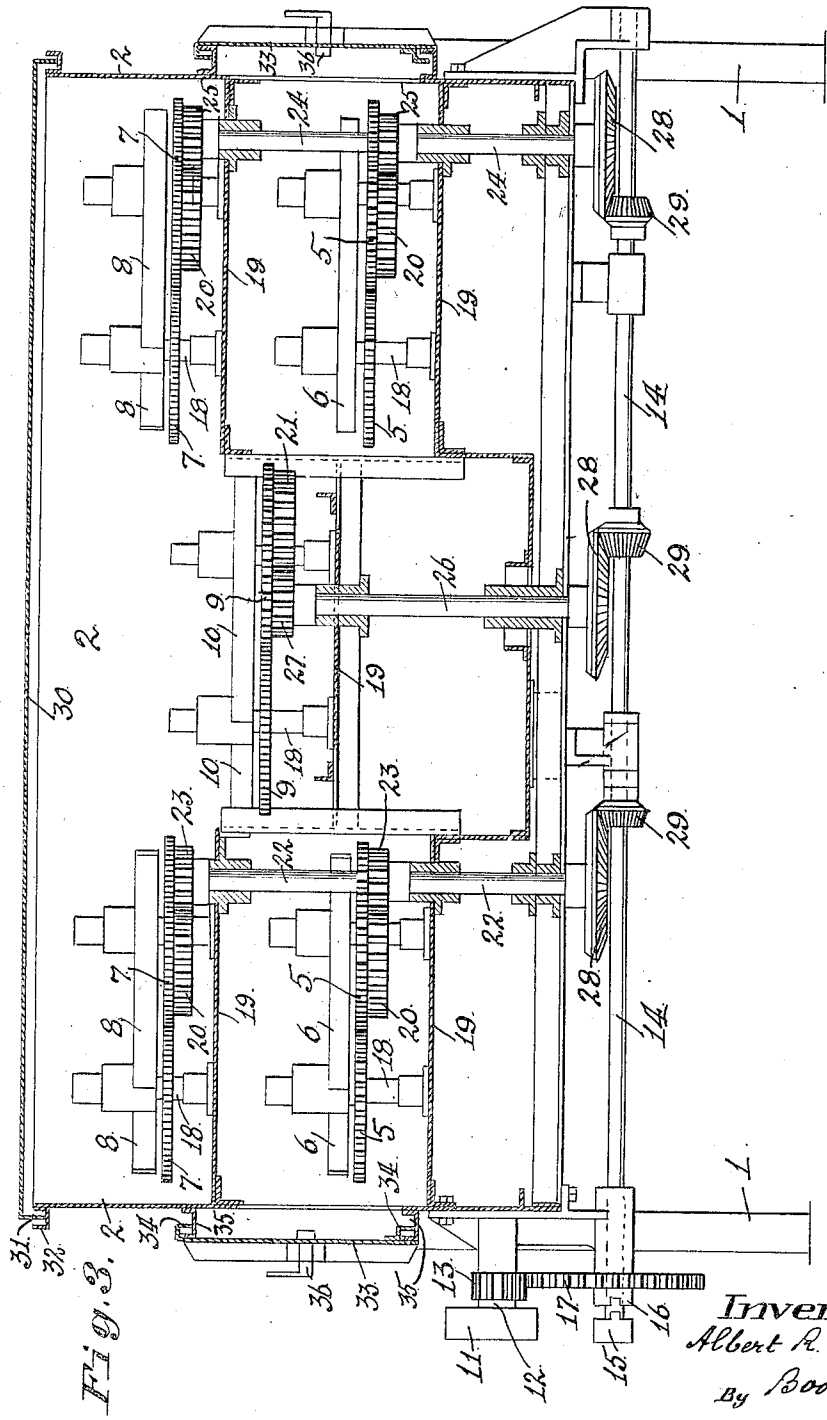


Fig. 3.

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Fig. 4.

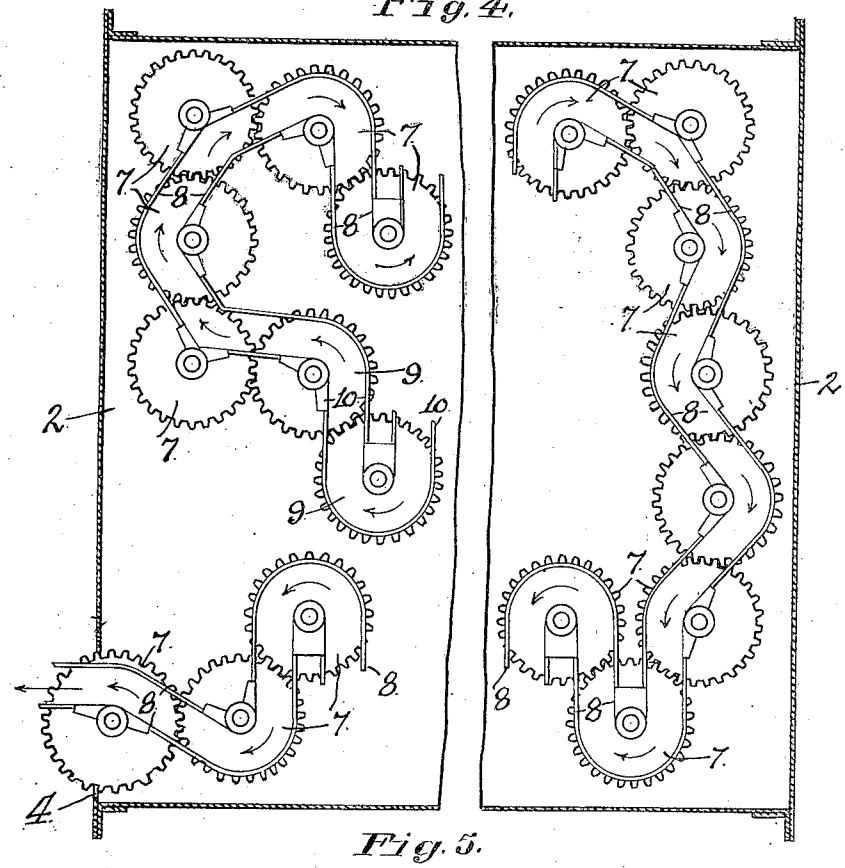
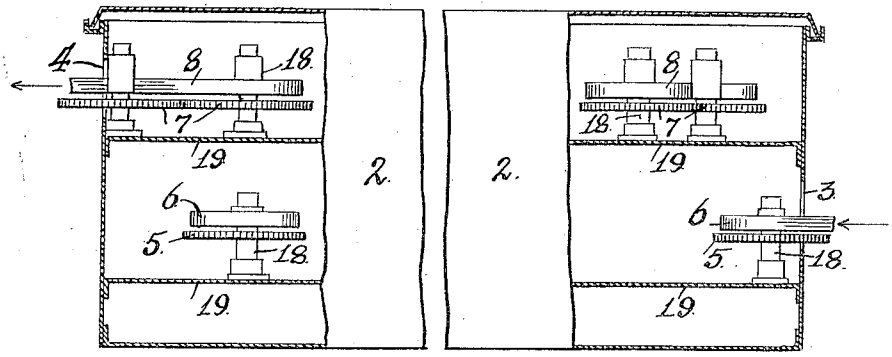


Fig. 5.



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UNITED STATES PATENT OFFICE.

ALBERT R. THOMPSON, OF SAN JOSE, CALIFORNIA, ASSIGNOR TO ANDERSON-BARNGROVER MFG. CO., OF SAN JOSE, CALIFORNIA, A CORPORATION OF CALIFORNIA.

EXHAUST BOX.

Application filed January 22, 1923. Serial No. 614,164.

To all whom it may concern:

Be it known that I, ALBERT R. THOMPSON, a citizen of the United States, residing at San Jose, in the county of Santa Clara and State of California, have invented certain new and useful Improvements in Exhaust Boxes, of which the following is a specification.

My invention relates to that class of machines or apparatus for the heat treatment of comestibles, in which the filled containers are caused to travel through the treating region by means of a conveyer composed of a plurality of revoluble, juxtaposed, interengaging disks adapted, in conjunction with directional guides, to transfer the containers from the surface of one disk to that of the next disk, the disks being variously relatively arranged to constitute a continuous path in which the containers are advanced through the heating box. Machines of this nature are commonly used for that treatment in the canning art known as the "first cook" and by reason of the effect sought are called exhaust-boxes. In these machines of the disk type, capacity is of great value. Regard, must, however, be had to available floor space, and since this is necessarily limited superficially, extreme width of the machine must be avoided. But if within reasonable limits height be taken advantage of, a machine extended in this direction may, in conjunction with a reasonable width, give a satisfactory capacity.

It is in connection with this idea that I have conceived and developed my present invention, with the result that I have made an exhaust box of the disk type, of great capacity and yet of practical dimensions.

The nature of my invention will be fully understood from the following description, and by reference to the accompanying drawings, in which—

Fig. 1 is a horizontal section through the box, taken on the line 1—1 of Fig. 2, immediately above the plane of the lower conveyer, the dotted disks in the middle indicating the transfer conveyer continuing to a higher plane.

Fig. 2 is a longitudinal vertical section on the line 2—2 of Fig. 1, the dotted lines indicating the continuance of the disks of the conveyers.

Fig. 3 is a cross section, enlarged, on the line 3—3 of Fig. 1.

Fig. 4 is a horizontal section, broken, taken on the line 4—4 of Fig. 2 above the upper conveyer.

Fig. 5 is a longitudinal, vertical partial section, broken, on the line 5—5 of Fig. 1, through the inlet and outlet, showing their disposition in different planes.

1 is a frame carrying the box or shell 2, which is heated by suitable means, usually by steam admitted through pipes, one of which, for illustration, I have indicated partially by 1′ in Fig. 2. The box at one end has an inlet 3, Figs. 1 and 5, and at the other end it has an outlet 4—Figs. 4 and 5. The inlet and the outlet are in different planes; in practice, the inlet being best in the lower plane and the outlet in the higher plane, as shown in Fig. 5.

Within the box, associated with and operating in the plane of the inlet, is a conveyer composed of revoluble, juxtaposed, interengaging disks 5 and overlying fixed rails 6 forming directional guides. The course of this lower conveyer is, as shown in Fig. 1, from the inlet 3 along and parallel with one side of the box to the other end; thence across and parallel with said end to the other side of the box; thence along and parallel with said other side to the first end of the box, and thence along and parallel with said first end to the middle thereof.

The relative arrangement of the disks and the directional guide rails, forming this conveyer may be varied in accordance with any of the well known forms of disk exhaust boxes of this class, or of a combination of them. For example, as here shown, the path of the containers may be to and fro over twin rows of disks, as shown in the side courses of the conveyer, and over a single straight row of disks as shown in the end courses. The arrangement here shown is deemed best as conserving space, consistent with an extensive can path and large can capacity.

Within the box, associated with and operating in the plane of the outlet is a second conveyer composed of revoluble, juxtaposed, interengaging disks 7 with directional guide rails 8. The course of this second conveyer, as seen in Fig. 4, is from the middle of the end of the box opposite to that end at which the first conveyer ceases, along and parallel with said opposite end to the far side of the box; thence along and parallel with said

far side to the other end of the box; thence along and parallel with said other end to the near side of the box; and thence along and parallel with said side to the outlet 4.

The relative arrangement of the disks in this second or upper level conveyer, with respect to its double and single rows, is the same as in the lower level conveyer.

A third or transfer conveyer within the box is composed of revoluble, juxtaposed, interengaging disks 9 with directional guides 10. This transfer conveyer preferably comprises a double or twin row of disks and it lies in the middle of the box, at an upward inclination, joining the end of the lower conveyer with the beginning of the upper conveyer, as seen in Fig. 2. If, now, the travel of a container through the box be traced, the arrangement of the conveyers will be better understood and appreciated. A container entering the box at the inlet 3, Fig. 1, passes in a zig-zag course between the twin rows of the lower conveyer, forwardly to the cross wise single row portion at the other end of the box, and over said portion to the other side, and thence back over the twin row portion of the conveyer to the first end and thence over the single row portion at said end to the middle of said end. At this point it passes to the beginning or lower end of the transfer conveyer, and up over said conveyer on a gradual incline to the beginning of the upper conveyer, Fig. 4. Passing then to said upper conveyer, it moves over to the far side of the box, and back along said far side to the first end; thence clear across said end to the near side and thence along said near side to the outlet 4 through which it is delivered. Fig. 4.

It will be seen that this arrangement of the several conveyers lends itself efficiently not only with respect to compactness and simplicity but also to the driving of the disks, as I shall now describe.

Power is led into the machine through a pulley 11 on a shaft 12 carrying a relatively wide faced pinion 13. Fig. 3. Across the machine, underlying the box, at about its middle is the single drive shaft 14, Fig. 3, one end of which carries a clutch 15. Slidably mounted on the shaft is the complemental clutch 16 which carries a gear 17 meshing with the pinion 13. Thus the drive shaft 14 is controllably operated.

The several disks of the conveyers are carried on suitably mounted spindles 18 supported by underlying plates 19, Fig. 3, which latter serve as floors to separate the planes or levels and to catch the drip from the containers. Certain disks of the side runs of both the lower and upper conveyers are provided with gears 20, Fig. 3, and certain disks of the inclined transfer conveyer are provided with gears 21. Figs. 2 and 3.

A vertically disposed shaft 22 passes up through the bottom of the box and is provided with pinions 23, which mesh with the gears 20 of the disks of the runs of both lower and upper conveyers on one side of the box. A similar shaft 24 provided with pinions 25 engages the gears 20 of the disks of the runs of said conveyers on the other side of the box.

A third shaft 26 provided with a pinion 27 engages the gears 21 of the disks of the transfer conveyer. All these shafts are best seen in Fig. 3. Each of these shafts 22, 24 and 26 is provided on its lower end with a bevel gear 28, and with these gears respectively mesh the several bevel pinions 29 on the single cross drive shaft 14. Fig. 3. The proper rotational direction of the disks is provided for by the relative engaging positions of the bevel gears and pinions 28 and 29, as seen in Fig. 3.

Disk-exhaust-boxes and the driving of the disks are now well known in the art and in practice; and in view of this I have not deemed it necessary to enter upon a more detailed description, the drawings herein being sufficient to indicate the point I seek to make, namely the adaptability of the plural deck box with its defined conveyer courses to the present constructive practice with regard to details of mounting and driving.

In order to afford access to the box and yet keep it substantially steam tight, I provide a plurality of covers 30 having flanges 31 which dip into water filled troughs 32 on the box. Fig. 2. Similarly on the sides of the box are fitted a plurality of doors 33 with flanges 34 entering water filled troughs 35. Clamping screws 36 tighten the doors in place. Figs. 1 and 3.

I claim:—

1. An exhaust-box comprising a shell having an inlet and an outlet in different planes; and conveyers within the shell, each conveyer comprising revoluble, juxtaposed disks, one of said conveyers being associated with and operating in the plane of the inlet to advance the containers therefrom, another of said conveyers being associated with and operating in the plane of the outlet to advance the containers thereto, and a third of said conveyers lying between the delivery end of the first conveyer and the receiving end of the second conveyer to transfer the containers from said first to said second conveyer.

2. An exhaust-box comprising a shell having an inlet and an outlet in different planes; and conveyers within the shell, each conveyer comprising revoluble, juxtaposed disks, one of said conveyers being associated with and operating in the plane of the inlet to advance containers therefrom, another of said conveyers being associated with and operating in the plane of the outlet to ad-

vance the containers thereto, and a third of said conveyers being in a plane inclined relatively to the other two conveyers and communicating at opposite ends of the shell with the delivery end of the first conveyer and the receiving end of the second conveyer to transfer the containers from said first to said second conveyer.

3. An exhaust-box comprising a shell having an inlet in one plane and an outlet in another plane; a series of revoluble, juxtaposed interengaging disks with directional guides within the shell forming a conveyer associated with and operating in the plane of the inlet to advance containers therefrom; a second series of revolubly, juxtaposed interengaging disks with directional guides, within the shell forming a conveyer associated with and operating in the plane of the outlet to advance the containers thereto; and a third series of revoluble, juxtaposed interengaging disks with directional guides, within the shell, forming a conveyer to transfer the containers from the first to the second series of disks.

4. An exhaust-box comprising a shell having an inlet in one plane and an outlet in another plane; a series of revoluble, juxtaposed interengaging disks with directional guides, within the shell forming a conveyer associated with and operating in the plane of the inlet, for advancing containers therefrom; a second series of revoluble, juxtaposed, interengaging disks with directional guides, within the shell forming a conveyer associated with and operating in the plane of the outlet, for advancing the containers thereto; and a third series of revoluble juxtaposed interengaging disks with directional guides, within the shell forming a conveyer operating in a plane inclined to planes of the other conveyers and joining said other conveyers at opposite ends of the shell to transfer the containers from the first to the second series of disks.

5. An exhaust-box comprising a shell having an inlet in a lower plane and an outlet in a higher plane; a row of revoluble, juxtaposed interengaging disks with directional guides, within the shell forming a substantially horizontally disposed conveyer associated with and operating in the plane of the inlet, for advancing containers therefrom; a second series of revoluble, juxtaposed interengaging disks with directional guides, within the shell forming a substantially horizontally disposed conveyer associated with and operating in the plane of the outlet for advancing the containers thereto; and a third series of revoluble juxtaposed, interengaging disks with directional guides, within the shell forming an inclined conveyer to transfer the containers from the first to the second series of disks.

6. An exhaust-box comprising a shell having in one plane an inlet in one end for containers, and in another plane in the opposite end an outlet therefor; a series of revoluble, juxtaposed, interengaging disks with directional guides, within the shell forming a conveyer associated with and operating in the plane of the inlet, for advancing the containers from said inlet, in a course parallel with the side of the shell, to the other end, thence parallel with said end to the other side of the shell, thence parallel with said other side to the first end, and thence parallel to said end to the middle thereof; a second series of revoluble, juxtaposed, interengaging disks with directional guides, within the shell, forming a conveyer associated with and operating in the plane of the outlet, for advancing the containers in a course from the middle of one end of the shell to one side, thence parallel with said side to the other end, thence parallel with said other end to the other side and thence parallel to said other side to the outlet; and a third series of revoluble juxtaposed, interengaging disks with directional guides within the shell forming a conveyer relatively inclined to the other conveyers to transfer the containers from the end of the first series of disks to the beginning of the second series thereof.

7. An exhaust-box comprising a shell having an inlet in one plane and an outlet in another plane; a series of revoluble juxtaposed, interengaging disks within the shell forming a conveyer associated with and operating in the plane of the inlet; a second series of revoluble, juxtaposed, interengaging disks within the shell forming a conveyer associated with and operating in the plane of the outlet, said conveyers being disposed in relatively corresponding superposed relation; a third series of revoluble, juxtaposed, interengaging disks within the shell, forming a transfer conveyer joining the other conveyers; a drive shaft common to the superposed conveyers; a drive shaft for the transfer conveyer and a rotatable main shaft common to said drive shafts.

8. An exhaust-box comprising a shell having in one plane an inlet in one end for containers, and in another plane in the opposite end an outlet therefor; a series of revoluble, juxtaposed, interengaging disks with directional guides, within the shell forming a conveyer associated with and operating in the plane of the inlet, for advancing the containers from said inlet, in a course parallel with the side of the shell, to the other end, thence parallel with said end to the other side of the shell, thence parallel with said other side to the first end, and thence parallel to said end to the middle thereof; a second series of revoluble, juxtaposed, interengaging disks with directional guides, within the shell, forming a

conveyer associated with and operating in the plane of the outlet, for advancing the containers in a course from the middle of one end of the shell to one side, thence parallel with said side to the other end, thence parallel with said other end to the other side and thence parallel to said other side to the outlet; a third series of revoluble juxtaposed, interengaging disks with directional guides within the shell forming a conveyer relatively inclined to the other conveyers to transfer the containers from the end of the first series of disks to the beginning of the second series thereof; drive shafts common to the respective side courses of both the first and second series of disks; a drive shaft for the third series of disks; and a rotatable main shaft common to all said drive shafts.

In testimony whereof I have signed my name to this specification.

ALBERT R. THOMPSON.