H. C. PRIVETT.

CONTINUOUS EXHAUST BOX FOR PRESERVE CONTAINING CANS.

APPLICATION FILED MAY 13, 1914.

1,226,592.

Patented May 15, 1917.

5 SHEETS—SHEET 1.

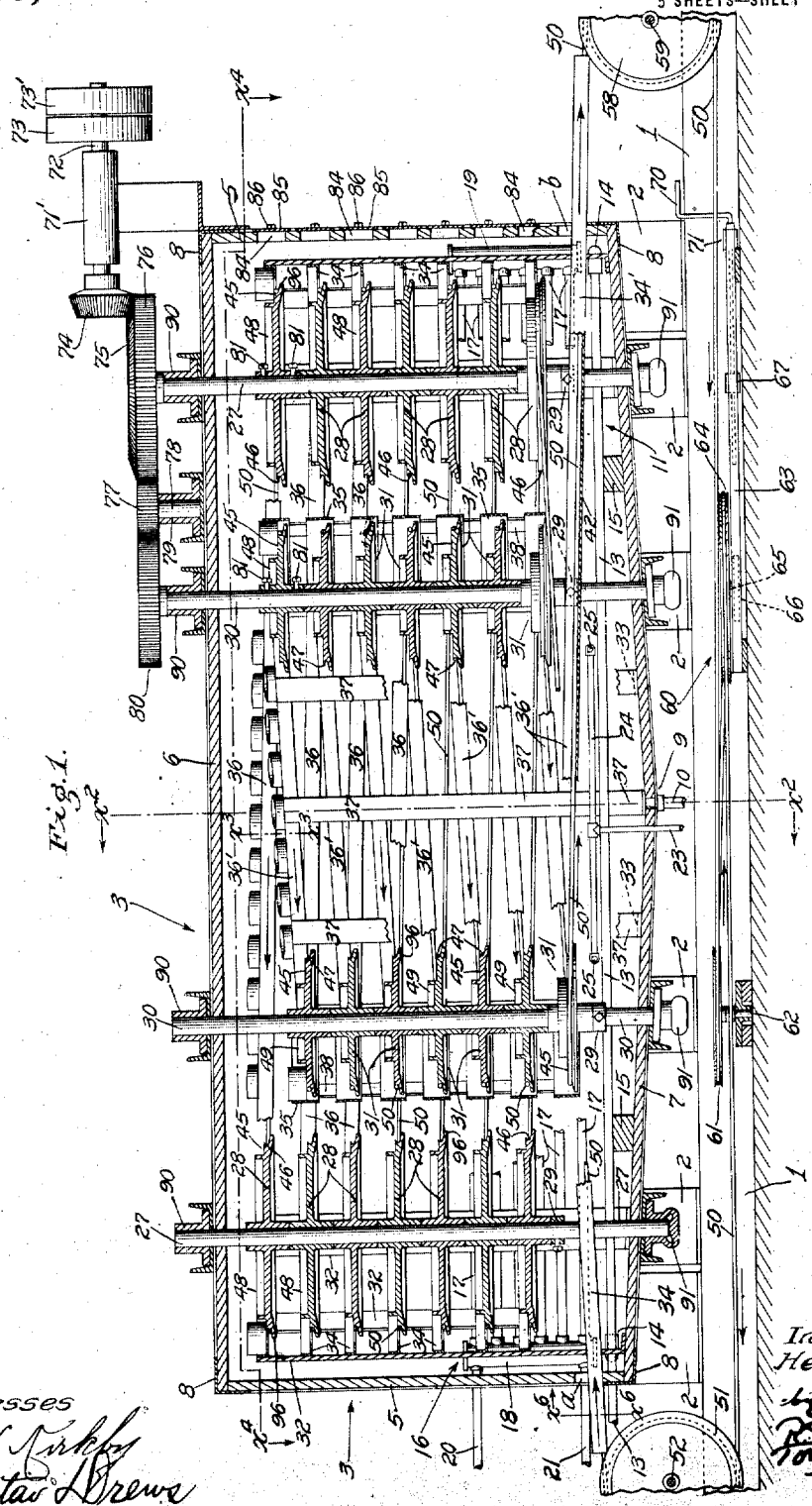


Fig. 1.

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5 SHEETS—SHEET 2.

Fig. 2.

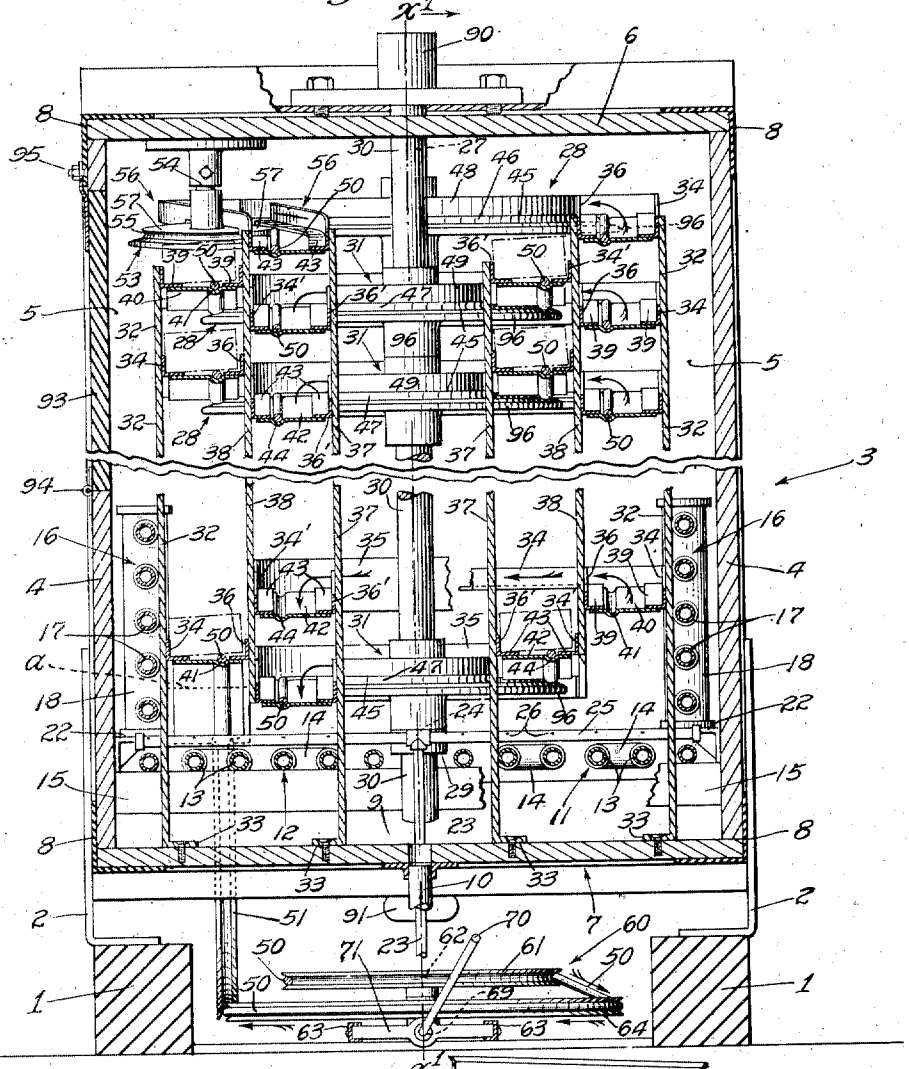
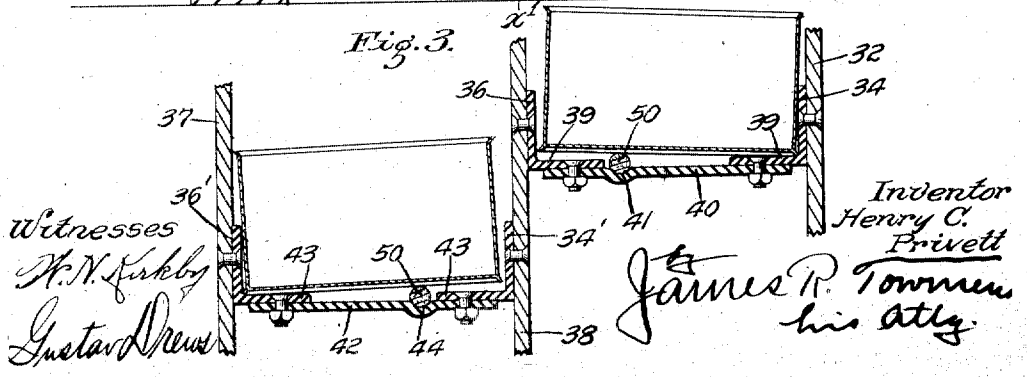


Fig. 3.



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5 SHEETS—SHEET 3.

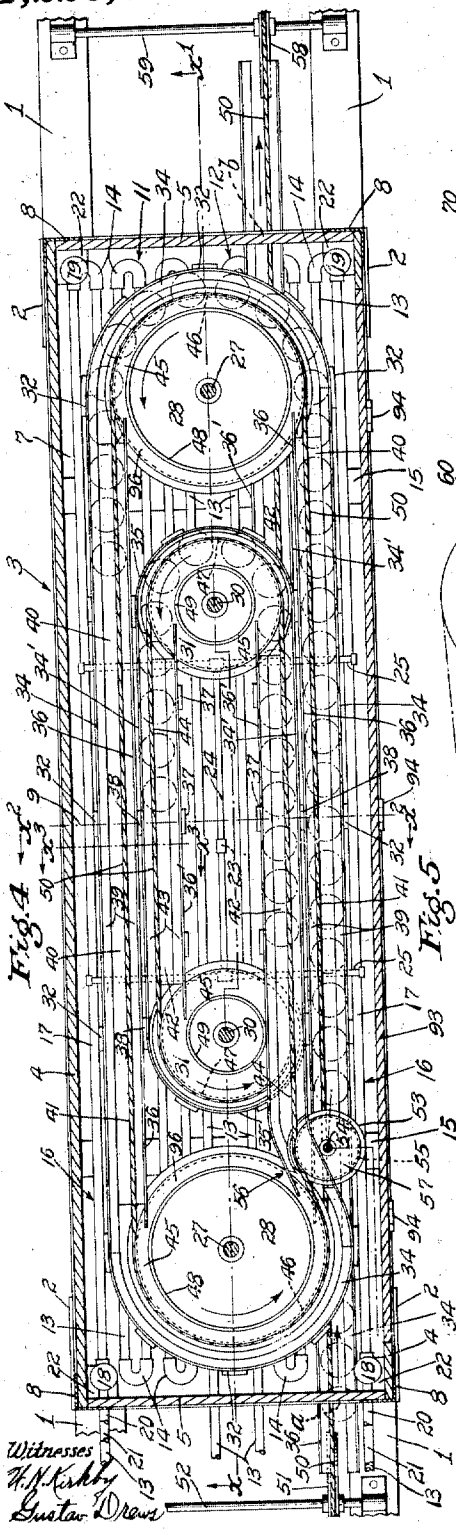


Fig. 4.

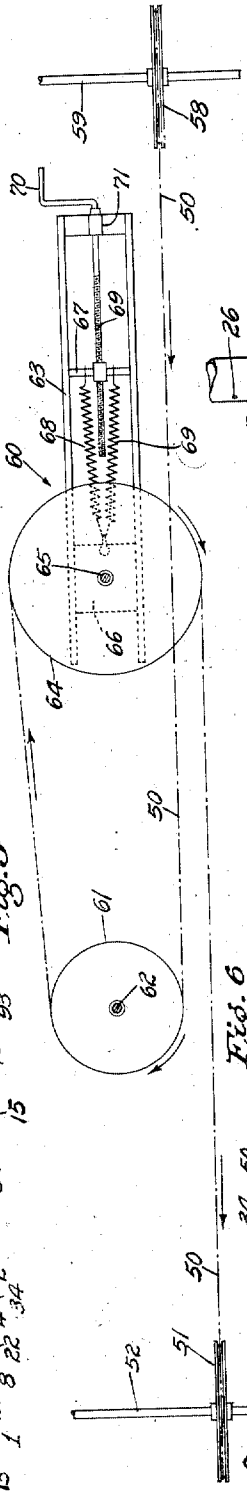


Fig. 5.

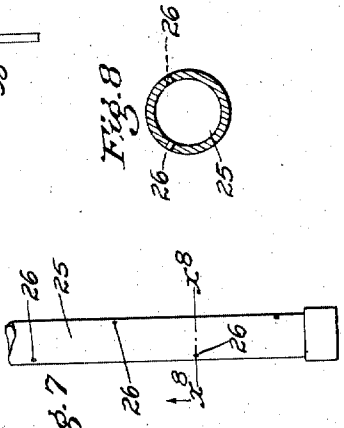


Fig. 7.

Fig. 8.

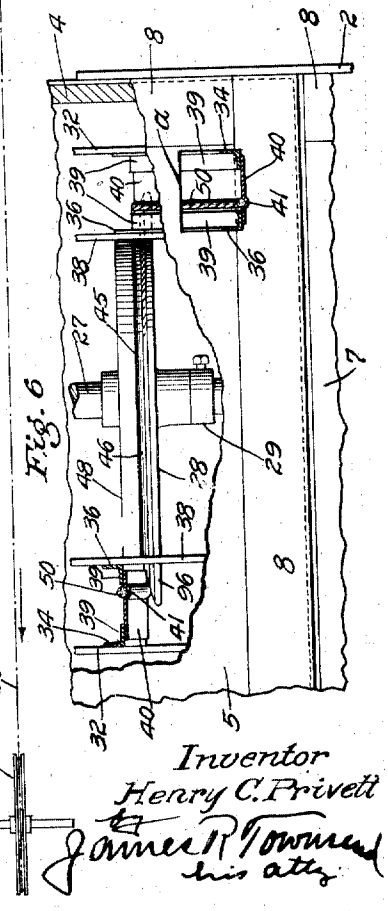


Fig. 6.

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5 SHEETS—SHEET 4.

Fig. 9

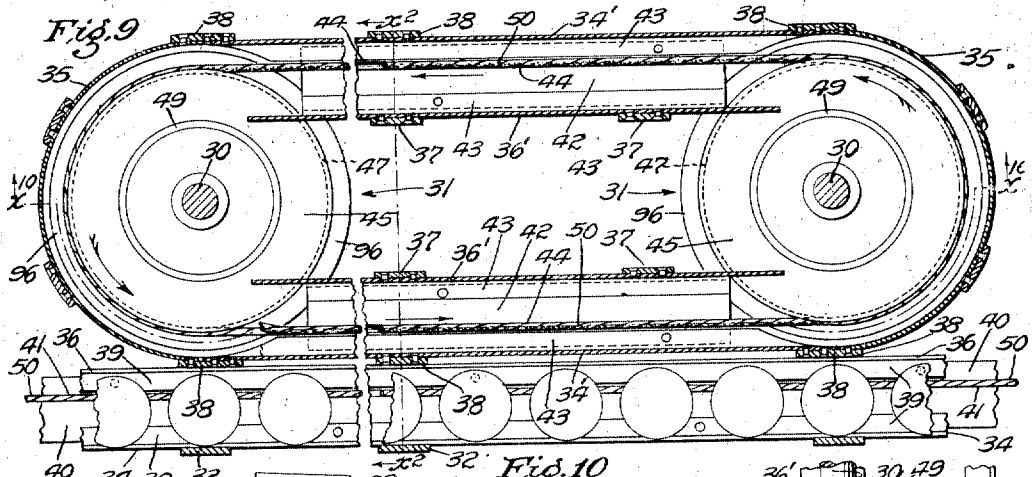


Fig. 10

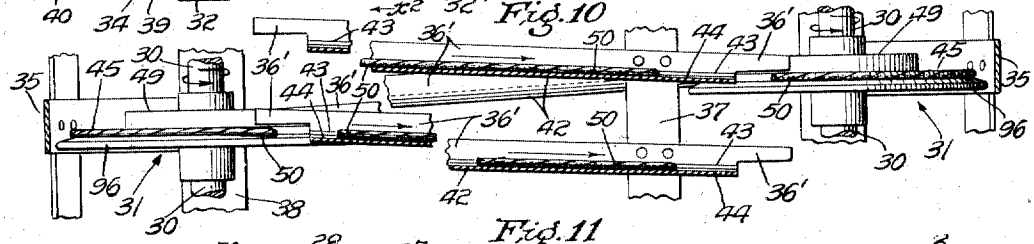


Fig. 11

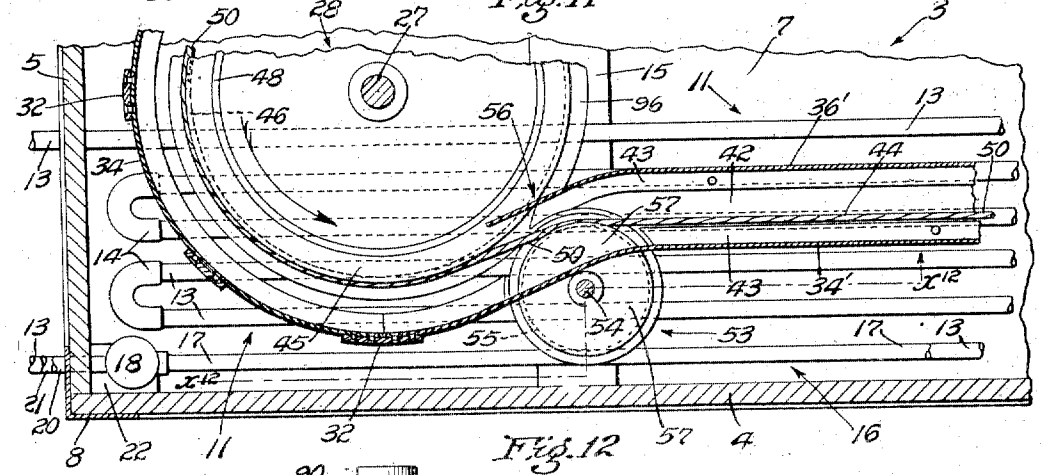
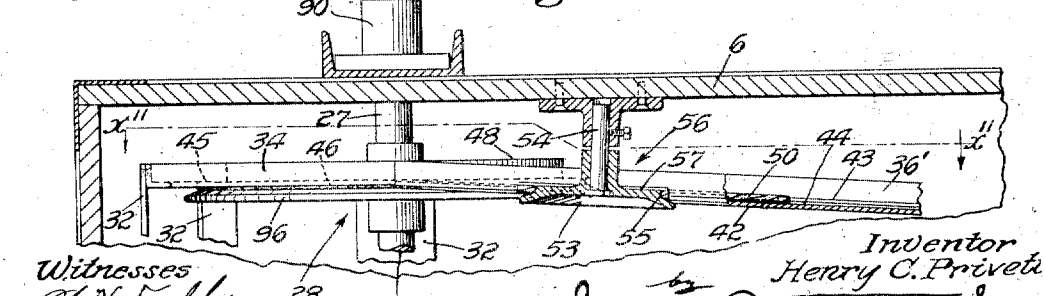


Fig. 12



Witnesses
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5 SHEETS—SHEET 5.

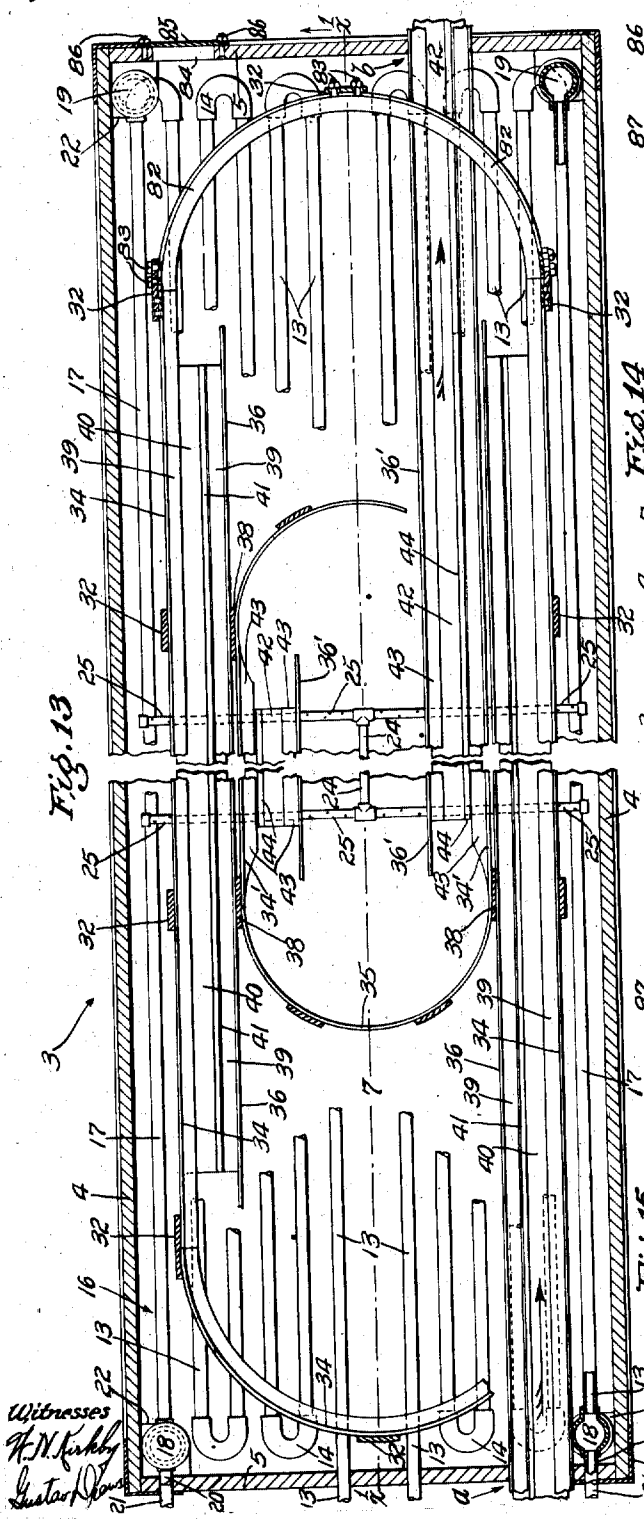


Fig. 13

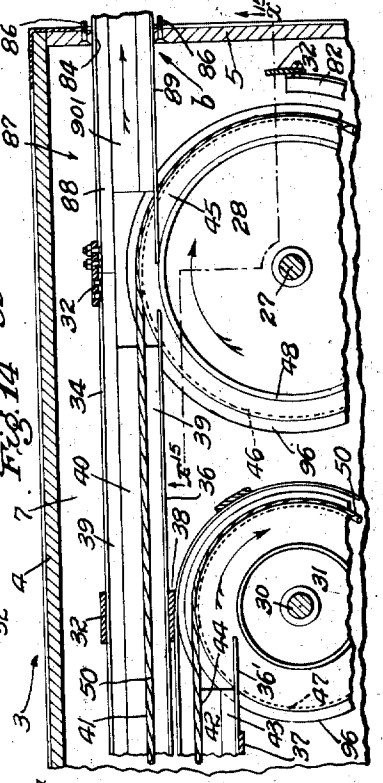


Fig. 14

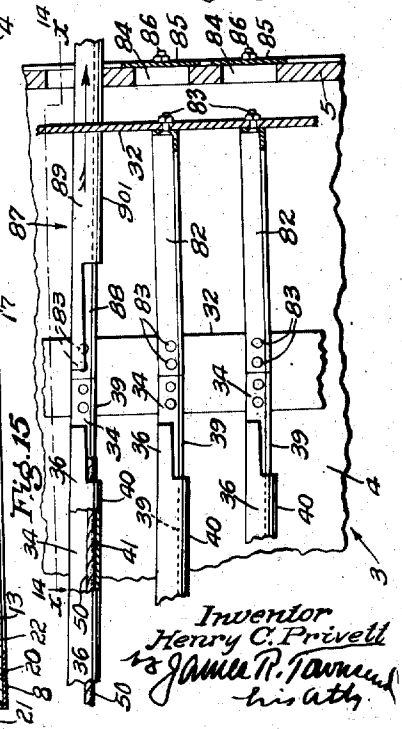


Fig. 15

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UNITED STATES PATENT OFFICE.

HENRY CLAUDE PRIVETT, OF LONG BEACH, CALIFORNIA.

CONTINUOUS EXHAUST-BOX FOR PRESERVE-CONTAINING CANS.

1,226,592. Specification of Letters Patent. Patented May 15, 1917.

Application filed May 13, 1914. Serial No. 838,393.

To all whom it may concern:

Be it known that I, HENRY CLAUDE PRIVETT, a citizen of the United States, residing at Long Beach, in the county of Los Angeles and State of California, have invented a certain new and useful Continuous Exhaust-Box for Preserve-Containing Cans, of which the following is a specification.

This invention relates to apparatus to be used for exhausting the air and other gases from cans which contain preserves such as fish, meats, fruits and the like, preparatory to sealing such cans.

An object of the invention is to provide an exhaust-box that will convey cans before being sealed at such a speed through the exhaust-box that the cans will simultaneously be properly exhausted and fed out so that they may be taken up and sealed upon leaving the exhaust-box without retarding their movement upon exit from the exhaust-box.

Other objects of the invention are to provide an exhauster whereby a large number of cans may be subject to the exhausting process simultaneously; and to provide an arrangement whereby the cans will be automatically fed through the apparatus and out again into position ready for sealing.

Another object of the invention is to provide an exhauster which can be quickly adjusted to subject the cans for a shorter or longer period of exhaustion as required. To this end switches and openings are provided by means of which the cans can be conveyed out of the exhauster at different predetermined periods before going the full length of the conveyer.

Still other objects of the invention are to provide an efficient means for heating the cans while passing through the exhaust-box; to provide means whereby steam is thoroughly distributed throughout the interior of the exhaust-box; and to provide an arrangement in which the space of the exhaust-box will be used to the greatest advantage so that there is practically no idle space.

To these ends a chest is provided to be heated by steam, and to be supplied with steam for the exhausting process, said chest having an entrance and an exit, a series of winding tracks forming one continuous path, into the entrance, through the chest and out at the exit, and a conveyer traveling over such continuous path to move along the articles on said path.

It is understood that various changes in the construction may be made to suit the convenience or judgment of the manufacturer. As, for instance, as at present it is deemed preferable to use a wire cable as means of conveying or propelling the cans through the exhaust-box but it is understood that a malleable iron or other chain cable of suitable design may be substituted for the wire cable, suitable provision being made for its accommodation in the sheaves and guides.

The sizes of the various parts are proportioned to the size of the cans to be handled and the wire cable for handling cans of approximately 4 inches in diameter, by 2¼ inches deep, may be $\frac{5}{16}$ inch diameter more or less to secure the most satisfactory operation.

These and other features, capabilities and advantages of the invention will appear from the subjoined detail description of one specific embodiment of the invention.

The accompanying drawings illustrate the invention.

Figure 1 is a fragmental longitudinal section of the improved exhauster taken partly on mid line x^1—x^1, of Figs. 2, 4 and 13.

Fig. 2 is an enlarged fragmental transverse section of the same taken on the line x^2—x^2 of Figs. 1, 4 and 9.

Fig. 3 is an enlarged fragmental sectional detail of the adjacent inner and outer tracks taken on the line x^3—x^3, Figs. 1 and 4.

Fig. 4 is a plan section viewed from irregular line x^4—x^4, Fig. 1.

Fig. 5 is a diagrammatic plan view of the take-up.

Fig. 6 is a fragmental broken view showing the opening indicated at x^6—x^6 of Fig. 1.

Fig. 7 is an enlarged fragmental detail of the steam distributer.

Fig. 8 is a cross-section of the steam distributer on the line x^8—x^8, Fig.

Fig. 9 is a broken sectional plan of the inner track, with sheaves and cable in place, a portion of one side of the outer track being also shown.

Fig. 10 is a broken fragmental detail elevation of a portion of the inner track and sheaves viewed from line x^{10}—x^{10}, Fig. 9.

Fig. 11 is a fragmental plan showing a portion of the outer track and the arrangement of transfer viewed from line x^{11}—x^{11}, Fig. 12.

Fig. 12 is a fragmental sectional elevation showing a portion of the outer track together with the arrangement of transfer viewed from irregular line x^{12}—x^{12} of Fig. 11.

Fig. 13 is a fragmental plan section of the exhauster omitting the sheaves and illustrating the beginning and end of the track. An auxiliary opening together with a form of removable sheave turn is also shown at the right of the figure.

Fig. 14 is a fragmental plan section showing an arrangement of switch applied to the outer track of the exhauster. In this view the conveyer is shown as traveling in the opposite direction.

Fig. 15 is a fragmental sectional elevation viewed from irregular line x^{15}—x^{15} of Fig. 14 and showing a switch in position.

In the embodiment shown two parallel stringers 1 spaced apart are provided on which are secured angular plates 2 which serve as standards to support the steam chest 3 at a distance above the floor. The steam chest is of substantial construction having side walls 4, end walls 5 and roof 6 and a floor 7 composed of wood, the meeting ends of the adjacent walls, roof and floor being reinforced by angle plates 8 secured over such meeting ends. The floor 7 gradually bulges downward toward its middle 9 to facilitate drainage, a drain pipe 10 being provided for this purpose.

A temperature of about 212° F. is maintained in the steam chest by means of groups of steam heating pipes. At the floor there are provided two groups 11 and 12 which together cover the entire floor with a web of steam pipes, each group being composed of a series of parallel pipes 13 connected by elbows 14 to form a continuous steam passage, which groups of pipes are supported by transverse stringers 15. Along each of the side walls 4 is arranged another group 16 of steam pipes composed of a series of parallel pipes 17 connected at their ends to headers 18 and 19, the upper end of the header 18 being connected with an intake pipe 20 and the lower end with the return pipe 21, the headers 18 and 19 being supported by corner plates 22 secured to the side walls 4.

There is also provided an arrangement whereby steam may be passed into the steam chest for treating the food stuffs passed through the chest, this being accomplished by passing a steam pipe 23 through the floor 7 as shown in Figs. 1 and 2, the pipe 23 being connected at a short distance above the floor to the connecting pipe 24 of an H-shaped pipe system, the two parallel pipes 25 of such system being provided with perforations 26 in their upper surface, the perforations 26 of each pipe 25 being arranged in a staggered line as shown in Fig. 7, so that the steam jets out of the pipes in two angular directions, whereby it is very efficiently distributed throughout the chest 3.

The winding tracks comprising slightly inclined stationary guide-ways have sheaves at their bends or turns, which sheaves form the inner walls of the tracks at such bends. In the present instance there are provided near each end of the steam chest 3 a vertical shaft 27 on which are mounted sheaves 28, one on top of the other, seven being shown, which are supported at a distance from the floor 7 of the chest by means of collars 29. Inwardly of each of the shafts 27 and substantially in a line therewith are provided two other vertical shafts 30, each having seven sheaves 31 mounted on them. The sheaves 31 are of less diameter than the sheaves 28. Bearings 90 at the top and thrust bearings 91 at the bottom support the shafts 27 and 30 in alinement.

Inwardly of each of the pipe systems 16 and also near each of the end walls 5 are provided a number of legs 32 in one continuous line having feet 33 which are secured to the floor 7. To the inside of these legs 32 are secured the outer walls of the outer winding track consisting of angle irons 34, the vertical legs of which are secured to the legs 32 while the horizontal legs of such angle irons extend inwardly. This angle iron section 34 of the guide-way it will be seen begins at the entrance of the chest at the lower left side, extends longitudinally in a slightly upward direction until it approaches the lowermost sheave 28 on the shaft 27, then extends around the sheave 28, extends longitudinally back toward the entrance of the steam chest in a slightly upward direction until it approaches the lowermost sheave on the other shaft 27 and so on, until said section makes its uppermost turn, where it meets the upper end of a corresponding section 34′ of the descending winding track which extends downward in a winding manner similarly to the outer winding track around the sheaves 31, except that the outer walls around the sheaves are merely curved plates 35 without horizontal legs.

The inner wall of the outer winding track consists of angle-iron sections 36 having vertical legs and horizontal legs pointing outwardly, said angle-irons 36 only extending from sheave to sheave. The angle-irons 36′ of the inner track are supported by a parallel row of legs 37 having similar feet 33 secured to the floor of the steam chest, the vertical legs of the angle-irons 36′ being fastened to these legs 37. To support the angle-irons 36 of the outer track and the angle-irons 34′ of the inner track there are provided a plurality of vertical strips 38 between the two sets of angle-irons to the opposite sides of which such angle-irons are fastened, a strip being fastened to adjacent

tracks that are above one another. To the lower faces of the horizontal legs 39, 39 of the angle-irons 34 and 36, are fastened cable-supporting plates 40 which extend between successive sheaves and are each provided with a cable-receiving groove 41 near its inner wall. The inner tracks are similarly provided with cable-supporting plates 42 fastened to the lower faces of the horizontal legs 43, 43 of the angle-irons 34′, 36′, which legs extend from sheave to sheave and are each provided with a cable-receiving groove 44 near its outer wall.

The sheaves 28 and 31 as clearly illustrated in Figs. 1, 2 and 4 are each provided with a platform 96 which is the extension of the lower edge of the peripheral cable-receiving grooves 46, 47. On the upper face 45 of the sheaves 28 there are provided circular crowns 48 which are the continuation of the inner walls of the outer tracks. On the upper faces of the sheaves 31 there are provided circular crowns 49 which are the continuation of the inner walls of the inner tracks. It will be seen that the crowns 48 are less removed from the outer edges of the sheaves 28 in proportion than the crowns 49 are removed from the outer edges of the sheaves 31. Similarly, it will be seen that the vertical legs of the angle-irons 34 are less removed from the outer edges of the sheaves 28 than the curved plates 35 are removed from the outer edges of the sheaves 31, the curved plates 35 not having any horizontal legs. The reason for this is so that the crowns 48 and 49 will be spaced apart equal distance from the adjacent outer walls of the tracks respectively. The arrangement of the crowns 49 on the inner sheaves serves to save space.

The conveyer in the present instance is shown as a continuous wire cable 50 which passes over a sheave 51 mounted on a horizontal shaft 52 below the entrance *a* of the steam chest, then passes into the entrance of the steam chest and into the grooves 41 of the outer tracks, then around the grooves 46 of the sheaves 28 until it reaches the uppermost turn of the outer track where it is transferred to the inner track. This is accomplished by means of an idler 53 mounted on a stub shaft 54 fastened to the roof 6 which idler has its groove 55 extending into the outer side of the slanting track limb 56 which connects the outer and inner tracks at the top, the cable 50 actuating the idler 53 and the cans riding over the upper face 57 of the idler and being carried thereby instead of by the cable. From this point the cable passes into the cable-receiving grooves 44 of the plates 42, then around the sheaves 31 and out at the lower right-exit *b* of the steam chest where it is passed over an idler 58 mounted on a horizontal shaft 59 to the right of the exit and below the steam chest, and then back to the idler 51 at the entrance to the steam chest.

To take up the slack in the cable, a take-up 60 is provided to engage the cable below the steam chest when it passes from one idler 58 to the other idler 51.

The take-up comprises an idle pulley 61 that is mounted on a fixed shaft 62 and a frame 63 having a pulley 64 mounted on a shaft 65 journaled in a block 66 which is slidably mounted in the frame 63, the block 66 being connected to a cross-piece 67 by springs 68, the cross-piece 67 also being slidably mounted in the frame, see Fig. 5. The cross-piece 67 engages the screw-threaded rod 69 of the crank 70 which is fixed but rotatably mounted in the cross-piece 71. The cable 50, as illustrated in Fig. 5, before passing from the idler 58 to the idler 51, is wound around the pulleys 61 and 64. As the cable becomes slack, the crank 70 is turned to draw the pulley 64 away from the pulley 61 by means of which the cable will again become taut. Of course, when the crank 70 has come to the limit of its movement, a piece may be taken out of the cable, and the take-up re-set into operative position.

To drive the conveyer the following novel mechanism is provided. On the side of the steam chest is mounted a bearing 71′ for the shaft 72, on one end of which may be secured tight and loose pulleys 73 and 73′. On the other end of a bevel gear 74 is secured which meshes with a bevel gear 75 mounted on shaft 27. Below the bevel gear 75 a spur gear 76 is fixed which is in mesh with a pinion 77 fixed to a stub shaft 78 rotatably mounted in a bearing 79 fixed to the roof 6. The pinion 77 is in mesh with a spur gear 80 secured to shaft 30. Preferably only the uppermost of the sheaves 28 and 31 are fastened at one side to rotate with their respective shafts, in the present instance, set screws 81 being provided for each of them. This facilitates maintaining the cable under substantially the same tension while it passes through the steam chest.

Different food stuffs require different durations of time within which to exhaust. For this purpose, switches are provided, and openings in the side of the chest by means of which the food stuffs may be passed out before reaching the bottom of the exhauster. For very short periods of exhaustion, the food stuffs would not need to be conveyed around the inner track at all, but passed off from the outer track. On the other hand if the period of exhaustion equals more than the time required to pass around one winding track, it would only be necessary to reverse the cable as shown in Fig. 14 so that the food stuffs were conveyed through the inner winding track first, and then passed off the outer winding track

through switches at whatever altitude desired. Further flexibility of duration of exhaust is secured by varying the speed of the cable, which may be accomplished by altering the speed of driving motive power or by other means. One form of such a switch and opening is illustrated in Figs. 14 and 15 in which the semi-circular section of the curved angle-iron 34 around the sheaves 28 is removed, and removable curved angle-irons 82 are substituted therefor to register with the adjoining angle-irons 34 and secured to the legs 32 by means of bolts 83, so that these curved angle-irons may be easily removed when desired.

In the end wall 5 a series of auxiliary exits comprising openings 84 are provided, one opposite each level of track, these openings being provided with plates 85 to serve as closures for the openings when the openings are not used, the plates being secured in place by means of bolts 86. When it is desired to switch the food stuffs from a certain level of track, a plate 85 of the opening 84 of that level of track is removed, then the removable angle-iron 82 removed, and a switch track 87 or auxiliary guideway slipped into place. The switch track or auxiliary guide-way is composed of side rails 88 and 89 and a floor 901, the floor 901 not extending the full length of the side rails 88 and 89, so that the side rail 89 may project over the platform of the sheaves 28 and the rail 88 may project and extend alongside of the vertical leg of the angle-iron 34 to be there secured in place to the leg 62 by the bolts 83. The other end of the switch track will rest on the lower edge of the door of the opening 84.

From the foregoing it is clear that the cans to be exhausted and before being sealed will be fed into the exhauster at either the left hand lower opening *a* or the right hand lower opening *b* according to the direction of the cable, the cans setting on end, and that the cable will engage the bottoms of the cans and draw them along through the exhauster. When the cans are on the outside track they will incline outwardly as the cable is nearer the inside than the outside of the track which is desirable so that all the cans incline to the same side. When the cans are traveling in the inner track, the cable being nearer the outside than the inside, the cans will incline to the inside.

When the food stuffs, being conveyed through the exhauster, require oil to be mixed with them, such oil overflowing from the cans will lubricate the track. When food stuffs which have no oil mixed with them are carried by the conveyer, other lubrication will, of course, be provided if found necessary. The cable-receiving grooves 44 in the plate 42 are adapted to hold the oil in position to lubricate the cable.

In order to gain access to the steam chest for the purpose of repair and the like a door 93 is provided extending practically the entire length of one of the side walls 4, the door being hinged at its bottom by means of hinges 94, and hung in place at the top when in closed position by suitable fastening means such as the bolt arrangement 95.

It is obvious that various changes and modifications may be made to the details of construction without departing from the general scope of the invention.

I claim:

1. A continuous exhauster comprising a steam chest, two winding guide-ways arranged one inside the other, sheaves at turns in the guide-ways, and a cable traveling on the sheaves along the guide-ways to carry cans, said guide-ways and sheaves being in the chest, and means to supply steam to the interior of the chest.

2. A continuous exhauster comprising a steam chest an ascending winding guide-way, a descending winding guide-way, said guide-ways forming one continuous path, a cable traveling along the guide-ways to carry cans along the guide-ways, and means for transferring cans from the ascending guide-way to the descending guide-way at their meeting ends, said means comprising an idler the upper face of which is engaged by the cans when leaving the ascending guide-way to pass onto the descending guide-way, said guide-ways and traveling means being in the chest, and means to supply steam to the interior of the chest.

3. A continuous exhauster comprising a steam chest an ascending winding guide-way, a descending winding guide-way arranged inside of the ascending winding guide-way, said guide-ways forming one continuous path, a cable traveling in the guide-ways to carry cans along the guide-ways, and means for transferring cans from the ascending guide-way inward to the descending guide-way, said means comprising an idler the upper face of which is engaged by the cans when leaving the ascending guide-way to pass onto the descending guide-way positioned inside of the ascending guide-way; said guide-ways and traveling means being in the chest, and means to supply steam to the interior of the chest.

4. A continuous exhauster comprising a steam chest an outer winding guide-way, an inner winding guide-way, said guide-ways forming one continuous path, a cable traveling in the guide-ways to carry cans along the guide-ways, and means for switching off the cans at any predetermined point along the guide-ways; said guide-ways being in the chest, and means to supply steam to the interior of the chest.

5. A continuous exhauster comprising a steam chest an outer winding guide-way, an

inner winding guide-way, said guide-ways forming one continuous path, a cable traveling in the guide-ways to carry cans along the guide-ways, and means for switching off the cans at any predetermined point along the guide-ways, said means comprising an auxiliary guide-way inserted into and at the turn of the outer winding guide-way, said auxiliary guide-way directing the cans out of the exhauster; said guide-ways being in the chest, and means to supply steam to the interior of the chest.

6. A continuous exhauster comprising a steam chest an outer winding guide-way, an inner winding guide-way, said guide-ways forming one continuous path, side rails for said guide-ways, sheaves at the turns of said guide-ways, a cable traveling in the guide-ways and around the sheaves to carry cans along the guide-ways, and means for switching off the cans at any predetermined point along the guide-ways, said means comprising an auxiliary guide-way inserted into and at the turns of the outer winding guide-way, said auxiliary guide-way directing the cans away from the sheaves at such turns and out of the exhauster; said guide-ways and sheaves being in the chest, and means to supply steam to the interior of the chest.

7. A continuous exhauster comprising a steam chest a winding guide-way having an entrance at one end of the guide-way and an exit at the other end of the guide-way, sheaves at the turns of said guide-way, a cable traveling in the guide-way and around the sheaves to carry cans along the guide-way, and means for switching off the cans at any predetermined point along the guide-way, said means comprising auxiliary exits formed in the exhauster and adjacent the turns of said winding guide-way, and an auxiliary guide-way inserted into and at the turn of the winding guide-way so as to extend over and be supported in one of the auxiliary exits, so as to direct the cans from the winding guide-way in a direction out of the auxiliary exit; said guide-ways and sheaves being in the chest, and means to supply steam to the interior of the chest.

8. A continuous exhauster comprising a steam chest a winding guide-way having an entrance at one end of the guide-way and an exit at the other end of the guide-way, side rails on said guide-way, a cable traveling in the guide-way to carry cans along the guide-way, and means for switching off the cans at any predetermined point in the guide-way, said means comprising auxiliary exits formed in the exhauster adjacent the turns of said winding guide-way and an auxiliary guide-way inserted into and at the turn of the winding guide-way displacing one of the said side rails, and extending over and being supported in one of the auxiliary exits so as to direct the cans from the winding guide-way in a direction out of the auxiliary exit; said guide-ways being in the chest, and means to supply steam to the interior of the chest.

In testimony whereof, I have hereunto set my hand at Los Angeles, California, this 2nd day of May, 1904.

HENRY CLAUDE PRIVETT.

In presence of—

JAMES R. TOWNSEND,

J. M. WILLARD.