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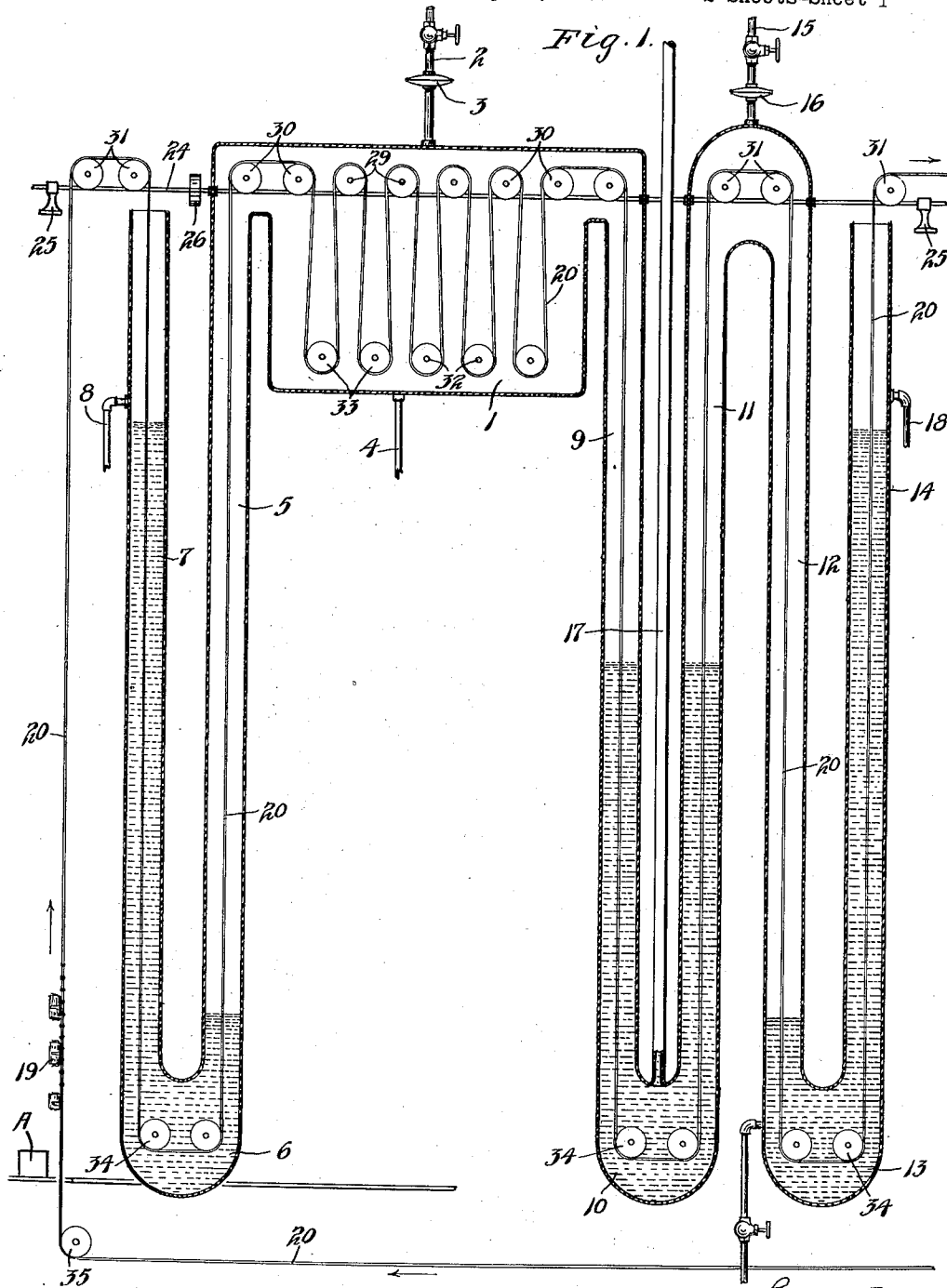
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1,584,397

METHOD AND APPARATUS FOR COOKING CANNED GOODS

Filed July 17, 1922

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

Fig. 2.

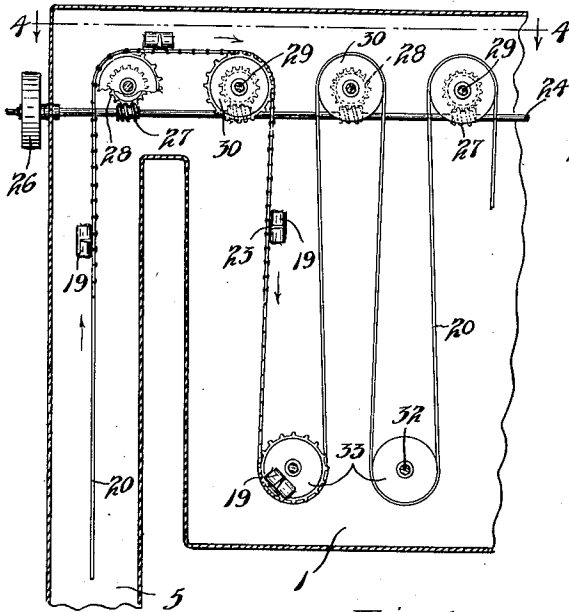


Fig. 3.

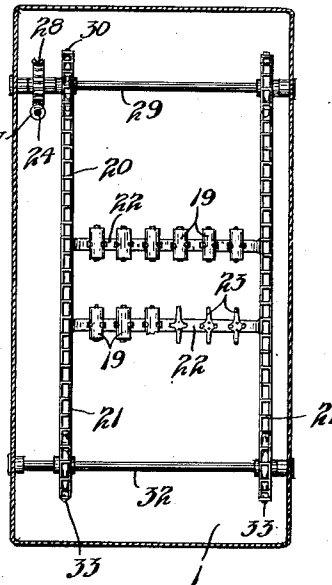


Fig. 4.

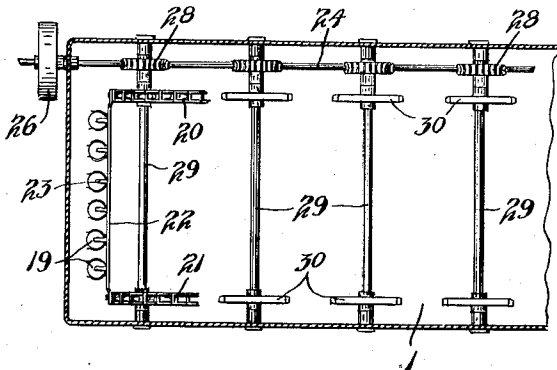


Fig. 5.

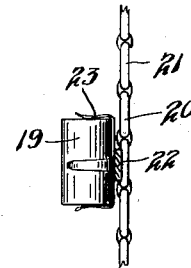
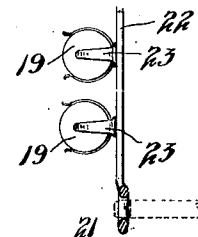


Fig. 6.



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UNITED STATES PATENT OFFICE.

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METHOD AND APPARATUS FOR COOKING CANNED GOODS.

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This invention relates to a method and apparatus for handling or cooking canned goods or for handling and cooking articles to be treated in a steam retort. In the cooking of such articles heretofore where steam retorts have been used it has been necessary to open the retort for the purpose of charging or discharging the same. Such opening results in the loss of steam pressure which must again be restored after the retort is charged. It has also been difficult to maintain a uniform pressure or to attain the same for like periods so that it very frequently happens that one batch of goods is cooked too much or is insufficiently cooked. Such charging and re-charging of the retort also interferes with the constant progression of the articles through the factory.

It is an object of this invention, therefore, to provide a method and apparatus by which canned goods or other articles to be treated in the retort can be continuously progressed therethrough without opening or closing the retort.

It is a further object to provide such an apparatus comprising a retort provided with a liquid seal through which the articles are passed to and from the retort without breaking the seal.

It is still another object of the invention to provide a means comprising the retort and the liquid seal connected thereto, together with a cooling device through which the articles are passed after leaving the retort.

It is still another object of the invention to provide a method of handling such articles by continuously progressing the same through the retort and the seal thereof while maintaining a uniform pressure in the retort.

These and other objects and advantages of the invention will be fully set forth in the following description made in connection with the accompanying drawings in which like reference characters refer to the same parts throughout the different views, and in which

Fig. 1 is a somewhat diagrammatic view of the apparatus in vertical section;

Fig. 2 is a partial longitudinal vertical section through one end of the retort;

Fig. 3 is a transverse vertical section through the retort;

Fig. 4 is a horizontal section through the retort taken on the line 4-4 of Fig. 2, Figs. 2, 3 and 4 being shown on an enlarged scale;

Fig. 5 is a partial view in side elevation of the conveyor used; and

Fig. 6 is a partial plan view of the conveyor used, Figs. 5 and 6 being on a still more enlarged scale.

Referring to the drawings, a retort designated as 1 is shown adapted to contain steam under pressure, for which purpose the same is provided with a steam supply pipe 2 having a suitable controlling valve therein and also provided with a pressure regulator 3. A drain pipe in the retort is illustrated as 4. The retort 1 is shown as connected at its left hand end, as seen in Fig. 1, with one leg 5 of U-shaped conduit 6, the other leg of which is designated as 7. Said conduit is adapted to contain a liquid such as water or other liquid, and the leg 7 is provided adjacent its upper open end with an overflow pipe 8. The other end of the retort 1 is connected to one leg 9 of a similar U-shaped conduit 10, the other leg of which is shown as 11. This conduit is also adapted to contain water or other liquid, as shown in Fig. 1. The leg 11 is shown as connected at its upper end with the leg 12 of another U-shaped conduit 13 having its other leg designated as 14. The upper portion of legs 11 and 12 are arranged to contain air under pressure and are shown as provided with a valve controlled inlet pipe 15 and a pressure regulating device 16. The conduit 10 is provided with an overflow pipe 17 connected intermediate the legs 9 and 11, which pipe will be extended a considerable distance upward above the retort 1. The leg 14 of the conduit 13 is provided adjacent its upper end with an overflow pipe 18.

The retort 1 will, as stated, contain steam under pressure and the pressure of this steam which will pass into the leg 5 will force the liquid in conduit 6 upward in the leg 7, as shown in Fig. 1, the weight of the column of liquid in leg 7 above the level of liquid in leg 5 counterbalancing the steam pressure in leg 5. It is desired to have a cooling means for the cans of material as they come from the retort and for this purpose the conduit 13 is provided with liquid therefor. As the cooling liquid could not be in contact with the other liquid in conduit 10 which is in contact with the steam, a separating medium of air or gas is used in the legs 11 and 12. This air or gas will form an insulating medium be-

tween the hot water and leg 11 and the cooler water in leg 12. Compressed air is charged into the legs 11 and 12 and this air will be maintained under substantially the same pressure as the steam in retort 1. The pressure in these chambers is maintained constant by the pressure regulators 3 and 16 which will be of any standard and well known type for maintaining a uniform pressure. The water in legs 9 and 11 will thus be under substantially the same pressure and the level of the water in these legs will be substantially the same. The pressure in the leg 12 will be balanced by the column of water or liquid in leg 14 extending above the level of the liquid in leg 12. By this arrangement the hot water in leg 11 will be effectively separated and insulated by the air or gas in legs 11 and 12 from the cooler water in conduit 13. A conveyor 20 is provided which will be of the endless type composed of chains or other flexible members and this conveyor is arranged to carry the cans 19 of vegetables, fruit, meat, or other substance which it is desired to cook or treat in the retort 1. A conveyor 20 is shown as comprising chain links 21 pivotally connected, certain of which links are connected by cross members 22 provided with can holding clips 23. The members or strips 22 are illustrated as capable of holding six cans between the pair of chains 21 but it is obvious that this number may be varied, as desired. A shaft 24 is arranged at the top of the apparatus supported in bearings in the end of retort 1 and in suitable supporting brackets 25, which shaft is provided with a driving pulley 26 adjacent the retort and is provided with a plurality of worm gears 27 meshing with worm wheel gears 28 carried on shafts 29 which support the chain driving sprockets 30 and 31. The sprockets 31 are disposed at the top of the conduits 6, 10 and 13, so as to guide the conveyor 20 vertically in alignment with and parallel thereto. Shafts 32 are also mounted in the retort carrying idle sprocket wheels 33 and other idle sprocket wheels 34 are mounted adjacent the bottom of the conduits 6, 10 and 13, and another idle sprocket 35 is mounted at one side of the conduit 6 in alignment with one of the sprockets 31. As shown in Fig. 1, the conveyor 20 has a lower horizontal run and then passes over sprocket 35 vertically to one of the sprockets 31, then downwardly through the leg 7 over the sprockets 34 in conduit 6 and then vertically into the retort 1 and over the sprockets 30. The conveyor then makes a circuitous up and down movement through the retort 1 passing successively over sprockets 30 and 33, being driven by the sprockets 30. The conveyor then passes over two of the sprockets 30 shown at the right of the conveyor in Fig.

1, passes vertically downward through leg 9, over sprockets 34 and vertically upward through leg 11, thence over sprockets 31 and vertically downward in leg 12. The conveyor then passes over sprockets 34 in the bottom of conduit 13 and upwardly over the driving sprocket 31 shown as at the right in Fig. 1, from whence it will travel to a suitable storage place or warehouse and be returned by suitable guiding sprockets, not shown, in the lower horizontal run shown in Fig. 1.

In operation, the retort will be charged with steam under pressure and the legs 11 and 12 with the air or gas under pressure and the liquid will take the position substantially as shown in Fig. 1. As there will be some condensation of steam, the overflow pipes 8 and 18 are provided which will be suitably positioned adjacent the upper end of the legs of the conduits to which they are attached. The legs of conduits 6, 10 and 13 will be of sufficient height to accommodate columns of water or other liquid sufficiently to balance the steam pressure in retort 1. Such pressure is usually approximately ten pounds and a cooking pressure is rarely used exceeding twenty pounds per square inch. As stated, the steam and air will be maintained under substantially the same pressure by the pressure regulators 3 and 16. The overflow pipe 17 will be of sufficient height for the column of water therein to balance the pressure of water in conduit 10. The cans of material or articles to be treated will be sealed by hand or suitable machinery and will be loaded onto the conveyor by hand or suitable machinery at a point such as designated as A in Fig. 1. The pulley 26 now being driven, the conveyor will move continuously through the conduit 6, through the retort 1, through conduit 10 and out through conduit 13. The cans will thus be carried into the retort 1 without breaking the seal of the retort and will pass out of the retort without breaking the seal thereof. By this means, a constant and uniform pressure of steam may be maintained in retort 1 and it will be unnecessary to open the retort and drop this pressure of steam or to be successively heating the retort and raising the pressure therein to the desired point. The conditions in the retort can be ascertained at any time by suitable instruments and, if desired, a portion of the retort may be made transparent to observe the actions of the apparatus therein. As the cans come from the retort as heretofore used, the ends thereof are usually bulged, owing to steam being generated within the same and it is desirable to cool the cans before the same are stored. The bulging effect noted is caused by the pressure of steam on the inside of the can in excess of the pressure on the outside of the can. When the cans are in the retort

the pressure of the steam in the retort balances the pressure generated on the inside of the cans so that the cans are maintained in normal shape. In the apparatus herein

described, the pressure in the retort is maintained on the can while the same passes through the leg 9 and also while the same passes through the legs 11 and 12 of the conduits 10 and 13. When the can leaves the liquid in leg 11 it immediately begins to cool and is still under the external pressure as the pressure of air or gas is maintained in the legs 11 and 12. The can is thus preliminarily cooled in its passage through this air and is further cooled by passing through the liquid in the conduit 13. It will be noted that the can will still be under the external pressure while in the liquid at the bottom of the conduit 13. The run of the conveyor between the sprockets 34 in the latter conduit can, of course, be made as long as desired and the can thus progressed through the cooled liquid until the same is sufficiently cooled and the pressure on the sides thereof entirely relieved. The can then passes upwardly through the leg 14 and the external pressure on the same will be gradually lessened and the can will emerge from the liquid in its leg nicely cooled and in normal shape and without stress thereon. The can is thus cooled while under external pressure which is an important and novel part of applicant's process.

As stated, the conveyor 20 will carry the cooked cans to a suitable storing place or warehouse where they will be unloaded. It will be apparent that by varying the steam pressure the temperature in retort 1, and driving the conveyor 20 at suitable speed, that a uniform cooking of the material can be obtained which can be regulated to a nicety. When such articles as peas, corn, or other vegetables are placed in the ordinary retort and cooked in a sealed can there is always considerable liquid present and the said material tends to settle and remain at one end of the can. This often results in an uneven cooking throughout the can. By holding the cans, as shown, and progressing the conveyor up and down in the retort the material is moved about in the can and the heat will have ample opportunity to efficiently permeate and uniformly cook the same.

From the above description it is seen that applicant has provided an extremely simple and efficient means for handling articles to be treated or handling and cooking canned material. By such means the material can be constantly progressed through the factory and the retort and cooking operation greatly speeded up and facilitated.

It will, of course, be understood that various changes may be made in the form, details and arrangement of apparatus and in the steps of the method without departing

from the scope of applicant's invention, which, generally stated, consists in the matter shown and described and set forth in the appended claims.

What is claimed is:

1. A cooking apparatus having in combination, a retort adapted to contain a heated fluid medium under pressure, a U-shaped conduit having one of its legs connected to one end of said retort, a U-shaped conduit having one of its legs connected to the other end of said retort, and a U-shaped conduit having one of its legs connected to the other leg of said second mentioned conduit, the connected legs of said last mentioned two conduits adapted to contain cool fluid under pressure in the upper portions and all of said conduits containing liquid.

2. The structure set forth in claim 1, and pressure regulators for said retort and for said connected legs of the last two mentioned conduits.

3. The method of handling and cooking material in sealed containers which consists in maintaining a constant pressure of steam in a retort, placing said containers on a conveyor and continuously progressing said conveyor into, through and out of said retort without varying the pressure of said heated fluid medium therein, and progressing said conveyor through a cooling conduit in which pressure is also maintained and then through a cooling liquid medium in the travel through which the pressure on the exterior of the container is gradually reduced.

4. The method of handling and cooking articles which consists in progressing the same through a chamber containing steam under pressure, maintaining said pressure on said articles while subsequently progressing the same through a water seal and a cooling gaseous medium and then progressing the same through a cooling liquid medium and gradually reducing the pressure thereon while passing through said latter medium.

5. A cooking apparatus having in combination, a retort for containing steam under pressure, means for holding a column of water at one end of said retort, which column is supported by the pressure of steam in said retort and forms a water seal therefor, means for holding a similar column of water at the opposite end of said retort which also forms a water seal, a chamber for containing cool fluid under pressure separated from said retort by said last mentioned water seal, means for holding a column of water at the other end of said chamber, which column is supported by the pressure of fluid in said chamber, and forms a water seal therefor, and means for carrying a container through said water seals and said retort and chamber.

6. The method of cooking canned material

which consists in progressing the cans containing said material through a water seal at one end of a retort containing steam under pressure, through said retort, through a water seal at the opposite end of said retort into a cooling chamber containing cool fluid under pressure separated from said retort by said last mentioned water seal, through said cooling chamber and through a water seal at the opposite end thereof, whereby the contents of the can are cooled while pressure is maintained on the exterior thereof.

7. A device for handling and cooking articles for canned material having in combination, a retort adapted to contain steam under pressure, a liquid seal at one end thereof, a chamber adjacent said retort adapted

to contain a cooling gas, a liquid seal between said chambers, a cooling liquid seal for said latter chamber and a conveyor adapted to move through said retort and chamber and through said seals for conveying articles to be cooked therethrough.

8. The method of handling and cooking articles which consists in progressing the same through a liquid seal and into a retort containing steam under pressure and in continuing said progression through a liquid seal into a chamber containing cool air under pressure and then continuing said progression through a liquid seal in which the pressure is gradually reduced.

In testimony whereof I affix my signature.

SHERMAN H. PAXTON.