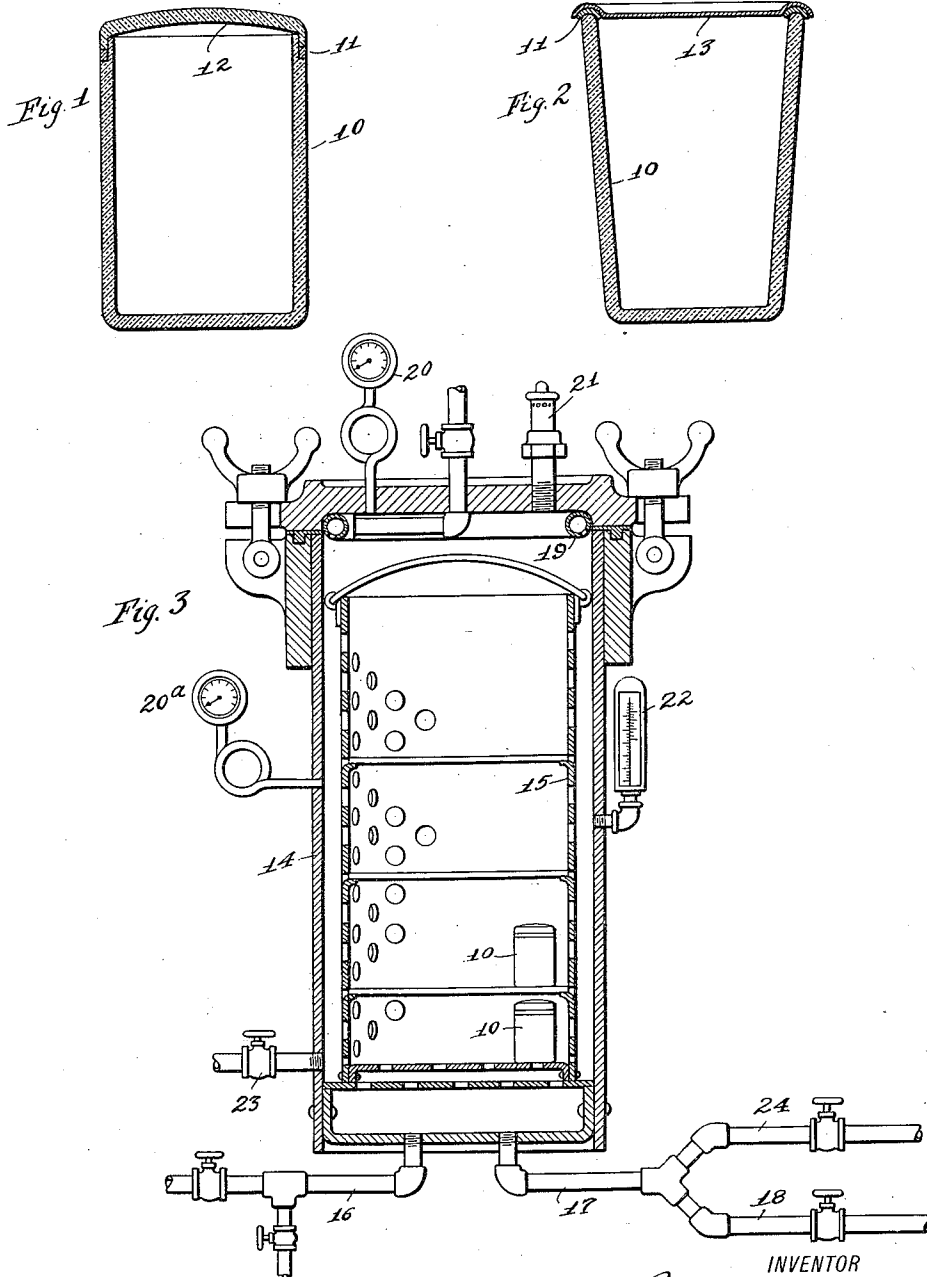


R. MAGRANE.
PROCESS OF PRESERVING.
APPLICATION FILED OCT. 28, 1915.

1,184,250.

Patented May 23, 1916.



INVENTOR

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PROCESS OF PRESERVING.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, ROBERT MAGRANE, a citizen of the United States, residing at New York, in the county of Queens and State of New York, have invented new and useful Improvements in Processes of Preserving, of which the following is a specification.

This invention relates to methods for preserving food and the like, and has particular reference to the processing of foodstuffs in glass receptacles or other forms of sealed containers.

The object of invention includes an improvement in the method of processing goods described in co-pending application of Luhrman and Magrane, filed March 10, 1915, Serial No. 13,517.

The improvement consists in forming a shorter and cheaper process adapted for use with a particular type of container. The process of this application and of the co-pending application referred to are alike, in that the goods to be processed are packed preferably in glass, whereby a better flavor is maintained, the keeping qualities of foodstuffs are increased, and a greater range of products may be packed than in the case where metals are used for containers; both processes are alike in having the goods packed in a vacuum so that the flavor is less impaired, and there is no oxidation and discoloration of the food at the sterilizing temperatures, or afterward; and both processes are also alike in using an excess or super-pressure during the sterilization of the packages, whereby there is always an excess of liquid, or gaseous, pressure on the outside of the container, this feature making possible the successful sealing of glass packages and eliminating a large percentage of the losses which occur in the breaking and blowing of the packages during sterilization.

Referring to the drawings: Figures 1 and 2 represent sectional elevations of typical forms of glass containers having top seals in which are placed the materials to be processed; and Fig. 3 is a sectional elevation partly diagrammatic, of a process retort and its various attachments, which are of use in carrying out the improved method.

The containers shown in Figs. 1 and 2, indicated at 10, are preferably of glass, and in the form of jars or tumblers. They are

provided with a suitable sealing gasket 11, while the cap 12 shown in Fig. 1 is of glass and the cap 13 of Fig. 2 is of metal, either form being adapted for use with the process.

The retort is shown at 14 and is provided with a basket or cage 15 to hold the packed containers 10. The retort is provided with a steam inlet 16 by which the temperature is regulated; the internal pressure of the retort is controlled by the admission of compressed air, preferably pre-heated, through inlet 17 and pipe 18, which connects with a suitable source. The rose 19 supplies water for cooling purposes. A steam gage is indicated at 20, a vacuum gage at 20^a, a safety valve at 21, a thermometer at 22, and a valve at 23, the latter serving as a blow-off valve and also as a valve for the admission of air into the retort. The inlet 17 also communicates with a pipe 24 which leads to a suitable exhaust pump for exhausting the air from the retort.

In the process described in the co-pending application referred to, the goods are packed in the containers which are then sealed under a vacuum and subsequently inserted into the retort where they are subjected simultaneously to a sterilizing temperature and to a suitable super-pressure formed in any suitable way, as by compressed air. This process requires vacuum machinery, or machines, which seal the closure to the container under a vacuum. By the present invention, these machines are eliminated, the handling of packages is cut down, the time of processing is shortened and the labor cost is reduced.

In the present process the goods are put into the containers 10 and the covers or closures are applied loosely to the container, forming a complete package which is left unsealed. The packages are then placed directly within the retort 14 and the retort is hermetically sealed. Communication between the retort and an exhaust means is made by opening the valve in passage 24, all other valves being closed. The opening of valve in passage 24 exhausts the air from the retort 14 and also exhausts the air from the packages as the closures lift under the expansion of the air within the containers, allowing the air to escape. When a high degree of vacuum is reached within the retort and the containers, the valve 24 is then

closed and the valve 23 of the air admission duct is opened. The pressure within the retort at once moves from zero up to atmospheric pressure, and this forces the closures down upon the containers so that a vacuum is maintained within the packages, each container being sealed by the atmospheric pressure operating upon its respective closure. The valve 23 is then closed, and the steam inlet pipe is opened to admit steam into the retort to furnish the required sterilizing temperature, and the valve in the pipe 18 controlling the source of compressed air is also opened so as to give the super-pressure required in the retort to prevent any lifting of the closures upon the containers, which would otherwise take place owing to the internal pressure generated within the containers by the sterilizing temperature. After the sterilization is completed, the steam supply is shut off, and water for cooling purposes is admitted through the rose 19, the pressure being maintained in the retort by the admission of compressed air through pipe 18, as may be required. As a pump which furnishes compressed air to the pipe 18 may also serve as an exhausting means in connection with the pipe 24, it is obvious that no extra appliances of any sort are necessary in the carrying out of this process. With the exception of the filling operation and the placing of the closures in position upon the containers, all of the work and manipulation required to seal and process the goods is done in the retort without disturbance of the packages.

As described, the vacuum in the retort is relieved by opening valve 23, admitting air until the retort is brought up to atmospheric pressure. This is the most economical and practical way of relieving the vacuum, but it is not a necessary step in the process, as the vacuum would also be relieved when the retort is placed in communication with the source of compressed air, as described.

The material may be sterilized by direct contact with heated water or steam, under pressure, or by heated air, or it may be done indirectly, the particular manner forms no part of the present invention. The super-pressure is a fluid pressure which may be transmitted by compressed air or other gas, or by water or other fluid, its characteristic being that at any given temperature, its pressure is greater than the pressure of saturated steam at the given temperature.

It is obvious that many modifications may be made in the improved method of preserving herein disclosed and the invention is not limited in its breadth and scope to the particular means herein shown and described.

I claim:

1. The method of preserving food which consists in packing the material in a con-

tainer, placing a closure adapted to seal the container when pressure is applied thereto, loosely upon the container, inserting the package into a retort, subjecting the container and contents to a vacuum and then to a sterilized heat, allowing them to cool, and maintaining meanwhile, during the heating and cooling operations, an exterior fluid pressure upon the container that is in excess of the pressure within the container.

2. The method of preserving food which consists in packing the material in a glass container, attaching a closure adapted to seal the container when pressure is applied thereto, loosely to the container, inserting the package in a retort, subjecting the container and contents to a vacuum and then to a sterilizing heat, allowing them to cool, and maintaining meanwhile, during the heating and cooling operations, an exterior fluid pressure upon the container that is in excess of the pressure within the container.

3. The method of preserving food which includes the packing of material in a container, placing a closure adapted to seal the container when pressure is applied thereto, loosely upon the container, inserting the package into a retort, subjecting the container and contents to a vacuum and then to a sterilizing heat, and maintaining during the heating operation an exterior fluid pressure upon the container that is in excess of the pressure within the container.

4. The method of preserving food which includes the packing of material in a container, placing a closure adapted to seal the container when pressure is applied thereto, loosely upon the container, inserting the package into a retort, subjecting the container and contents to a vacuum and then to a sterilizing temperature for an effective period and to a fluid pressure that is in excess of the pressure of saturated steam at the given temperature.

5. The method of preserving food which includes the packing of material in a container, placing a closure adapted to seal the container when pressure is applied thereto, upon the container, inserting the package into a retort, exhausting the air therefrom and then subjecting the container and material to a sterilizing heat and a fluid pressure that is in excess of the pressure inside the container.

6. The method of preserving food which includes the packing of material in a glass container, placing a closure adapted to seal the container when pressure is applied thereto, upon the container, inserting the package into a retort, subjecting the container and contents to a vacuum and then to the heating action of live steam under pressure in contact with the container, and maintaining an exterior fluid pressure upon

the container during the heating operation which is in excess of the pressure of the steam used to supply the heat.

7. The method of preserving food which consists in packing the material in a glass container, placing a closure adapted to seal the container when pressure is applied thereto, upon the container, inserting the package into a retort, subjecting the container to a vacuum and then directly to the action of steam at a sterilizing temperature, for a required period, and at the same time to an external fluid pressure, which has a greater pressure than the pressure of the steam at the sterilizing temperature, cooling the container by water, and maintaining the said external pressure of gas during the cooling.

8. The method of preserving food which consists in packing the material in a container, placing a closure adapted to seal the container when pressure is applied thereto, upon the container, inserting the package thus formed into a sealed retort, exhausting the air from the retort and container, creating and maintaining in the retort a given sterilizing temperature and a gaseous or liquid pressure in excess of the pressure within the container during the processing period.

9. The method of preserving food which consists in packing the material in a con-

tainer, placing a closure adapted to seal the container when pressure is applied thereto, upon the container, inserting the package thus formed into a sealed retort, exhausting the air from the retort and container, admitting air to the retort to restore atmospheric pressure therein while the container is thereby sealed by the atmospheric pressure upon the closure, creating and maintaining in the retort a given sterilizing temperature and a gaseous or liquid pressure in excess of the pressure within the container during the processing period.

10. The method of preserving food which consists in packing the material in a container, placing a closure adapted to seal the container when pressure is applied thereto, upon the container, inserting the package thus formed into a sealed retort, exhausting the air from the retort and container, admitting air to the retort to restore atmospheric pressure therein while the container is thereby sealed by the atmospheric pressure upon the closure, creating and maintaining in the retort a given sterilizing temperature and a gaseous or liquid pressure in excess of the pressure within the container during the processing period, passing a cooling fluid into the retort and maintaining the said gaseous or liquid pressure during the cooling operation.

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