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METHOD FOR PRESERVATION OF SOLID FOOD
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Fig. 1

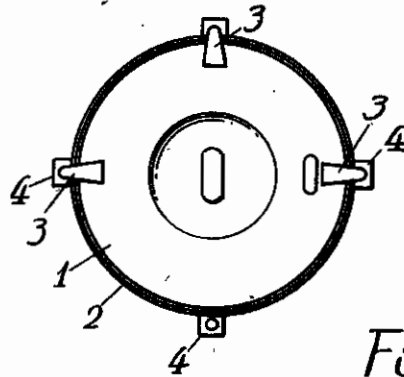
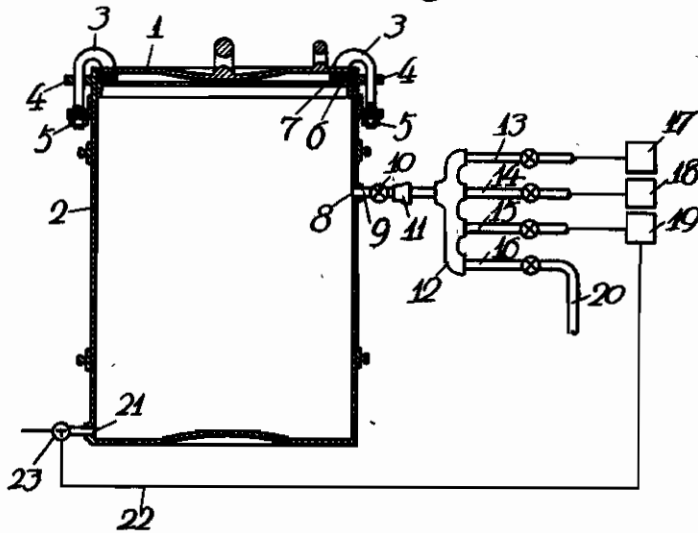


Fig. 2



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METHOD FOR PRESERVATION OF SOLID FOOD

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This invention relates to improvements in a method of food preservation and particularly to a packing method of solid food in a can of a large volume. The main object of this invention is to preserve a large mass of food in a can with a good sterilized condition.

When a food is preserved in a can, it is customarily sterilized by heat, keeping the packed can in a room with heating means for a certain length of time in accordance with the kinds of canned food and the volume of can. On account of this latter reason, the volume of a can cannot be so large, because, if the can has a large volume the inner portion of the food cannot be subjected to the heat of a sufficiently high for perfect sterilization, otherwise the outer portion of the food in the can is spoiled by too high or too long time heating. This is the principal reason that the volume of a can for sterilized good is restricted to a small one as one pound or thereabout, so that the cost of can and of working per unit volume of preserved food is high.

According to this invention some hundred or thousand pounds of food can be packed in one can in a good sterilized condition, and even a tank car for railway or other traffic can be prepared.

The can to be used to carry out this invention consists of a can body having a large volume and a removable lid for the body which can be airtightly fitted to the open end of the body and temporarily connected thereto by means of a tightening device or solder. Either of the body or the lid provides a hole, through which air is driven out and steam is supplied in the can, and the hole can be plugged at will.

Referring to the drawing, Figure 1 is a plan view of a can and Figure 2 is a sectional elevation thereof accompanying with an arrangement for packing. In the drawing, the lid 1 can be fitted to the open end of the can body 2 by means of a proper tightening device, which, according to the drawing, consists of bolts 3 with a hooked head which are loosely held on brackets 4 equidistantly provided on the periphery of the open end and nuts 5. The lid is forced to an inner flange 6 of the body with a packing ring 7 when the nuts 5 are screwed on the bolts. There is a hole 8 on the body to which a short pipe 9 with a stop valve 10 and a joint 11 is screwed up. A header 12 for pipes is connected to the joint, and pipes 13, 14, 15 and 18 are connected to a vacuum pump 17, a steam boiler 18, a boiling pan 19 and an exhaust pipe 20, respectively.

Another hole 21 is provided at the bottom of

the can, and is connected to the boiling pan 17 by means of a pipe 22. A three way cock 23 provided in the pipe 22 allows the can open to exhaust, if required.

In carrying out this invention, it is absolutely necessary to put the food in the can without liquid, and the food must be such one that a pretty clearance is left between each piece. On account of this reason, it should be understood that liquid, powdered, paste-like or plastic foods cannot be treated by this present invention. Fish or flesh should be cut into a large mass, say one to ten pounds, and is lightly boiled before it is placed in the can, whereby the outer part of the mass becomes hard so that the clearance around it is easily sustained.

When the required quantity of the food cake is placed in the can, the lid is placed on the open end of the body, and is closely fitted thereto by means of the tightening device. The bottom hole of the can is now closed and the interior of the can is connected to the vacuum pump 17 through the pipe 18, so that the interior of the can becomes partial vacuum. Next, the pipe is closed and the interior of the can is connected to the steam boiler 18 through the pipe 14. Steam is sent to the can for a proper length of time according to the kind of food and the size of the cake placed in the can. While steam is sent to the can, the bottom hole is open so as to take out the drain produced in the can.

If the drain contains valuable extract, it is sent to the boiling pan, and after sterilized, it is returned to the can when the sterilization of the can is finished.

According to this invention each food cake in a can is directly subjected to steam, so that sterilization of each cake is made in an equal condition independent of the volume of the can used.

Further in this invention the food is subjected to steam accompanying with no liquid, which however is considered heretofore indispensable as heat transmitting agent when a can is heated from outside. If liquid would be heated with cakes according to this invention, the sterilization would require a longer time than that when cakes only are heated, because the liquid prevents steam from direct contact with the food and much more heat is required for heating the liquid in the can.

In case solid food accompanys liquid matter, they are separated at first, and the solid portion only is placed in the can, and the liquid matter is taken to the boiling pan, thus the solid portion

and the liquid matter being separately sterilized by heat.

When the food in the can is perfectly sterilized the steam pipe is closed and the liquid and the extract placed in the boiling pan which have been also sterilized by boiling, are sent to the can. The pipes 9 and 22 are now removed from the can before the internal pressure of the can is still higher than the atmospheric one, and the holes 8 and 21 are airtightly plugged up. In order to quickly lower the internal pressure of the can before the pipes are removed, the exhaust pipe 20 may be opened so that the steam flows out from the can.

If the volume of the can is very large, or sufficient clearance around each cake cannot be expected, or the cake is of collapsible nature, it is advisable that some separators are inserted in

the can when the food is placed in it. Such separators are held in the can until the food is taken out for use, therefore the material for the separator must be that which does not spoil the food nor is spoiled by the food during in stock.

The can of course must stand against the pressure of steam for sterilization and the partial vacuum produced in the closed can after cooled. For this purpose, the can body and lid may be strengthened by ribs, bands and other re-enforcing means.

This invention is favorably applicable to preservation of a large quantity of fish or flesh which is consumed at a time by a large number of men or in a market just as they are preserved by refrigeration.

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