

# UNITED STATES PATENT OFFICE.

HENRY WARDEN, OF HANNIBAL, MISSOURI.

## IMPROVEMENT IN PROCESSES FOR CANNING FOOD.

Specification forming part of Letters Patent No. **223,083**, dated December 30, 1879; application filed April 5, 1879.

*To all whom it may concern:*

Be it known that I, HENRY WARDEN, of Hannibal, Missouri, formerly of Philadelphia, Pennsylvania, have invented a new and useful Process for Canning Edibles, of which the following specification is a full, clear, and true description.

My invention relates to the art of manufacturing, as an article of commerce, cooked or preserved perishable substances, such as edibles and the like, packed into hermetically-sealed vessels.

Although my process is equally applicable to all perishable substances preserved or cooked in air-tight vessels, yet, for greater simplicity in this specification, I have described it applied to what is known as "compressed beef." Heretofore in the above manufacture it has been usual to first fill the can or vessel with meat, and then to solder a cap over the opening in the can, leaving a vent-hole in the cap. The can or vessel is then submitted to heat, applied by hot water, steam, or other convenient means, to expel through the vent-hole the superfluous water, air, or other injurious substances. The vent is then sealed, and the vessel submitted to a further heat, sufficient to insure the proper preservation of its contents.

When it is desired to compress the contents of the vessel—as, for instance, in putting up compressed beef—a flat-sided tin vessel is used. The venting expels part of the contents, as specified above, and when the can is cooled off the atmospheric pressure upon the outside of the can carries the flat sides inward and compresses the remaining contents. This compression, however, is limited in its range, and can never exceed the natural atmospheric pressure.

In my process, hereinafter described, I attain by artificial means any desired pressure, and in addition, by the same means, cool the can, vessel, or package in a more speedy manner than heretofore, while preserving the seams or thin sides of the can from injury by internal pressure. My process also enables the safe use of the thinnest metal known to commerce in the formation of the cans, which are, in consequence, easily opened by the consumer. It also effects a saving of solder, and conse-

quently the cheaper making of the joints or seams of the cans.

Heretofore it has been attempted, after subjecting the can and contents to the treatment first above described, and after closing the vent, to place the can so sealed in a retort, and to introduce steam into the retort under high heat and pressure, to complete the cooking action. The difficulty, however, heretofore encountered in the use of the above method has been to remove the can in safety from the retort without great loss of time, for, as will be readily understood, if the pressures upon the outside and inside of the can are equal, and the door of the retort is opened for the removal of the cans, the pressure is taken from the outside of the cans, rendering the inside pressure liable to burst or explode them, to obviate which bursting it has been necessary to keep the retort closed and allow a gradual cooling down, whereby, as stated, much time has been lost.

I am aware that retorts have been used for the purpose of cooking or preserving and of pressing meats or vegetables contained in cans by admitting thereto steam at proper pressures; but after the preserving and pressing are effected the cans are often found to be injuriously swollen or are burst by internal pressure when the retort is opened and the outside pressure on them removed.

By my process all the above-described disadvantages are obviated and many advantages, hereinafter described, are obtained.

My process consists substantially as follows: The first steps of the same are those usual in the art of preserving hermetically-sealed goods, and such as have been hereinbefore described. After the vent is closed the can or vessel is placed in a retort or other closed vessel, into which steam or other fluids at proper temperatures and pressures are introduced and maintained in order to effect the proper preservation of the contents. During the time the can or vessel is subjected to the above heat and pressure the pressure from the interior of the can is never greater than that upon the exterior thereof.

When the can or vessel is ready for removal from the retort or closed vessel, by reason of the contents having been sufficiently cooked



or preserved, I first reduce the temperature, but maintain the pressure in the retort, and I then obtain any pressure desired by pumping into the retort water or other cooling-fluids, to displace the steam or other hot fluids, at all times regulating the pressure given by the pump by attention to a gage affixed to the retort.

I also find that air can be substituted as a medium for keeping or augmenting the pressure while lowering the temperature, and I do not wish to confine myself to any particular fluid to be used, for the essence of my invention lies in first replacing the hot pressure by a cold pressure upon the outside of the can, which I effect by pumping in a cooling medium, and in then augmenting the pressure of the cooling medium on the outside of the can or vessel at will, thus first replacing the hot pressure by a cold pressure, and then augmenting the cold pressure to any desired degree, so as to compress the cans to any extent desirable, condensation meanwhile within the can or vessel relieving the internal pressure thereupon. I thereby produce rapid cooling of the can or vessel and inclosed contents while under pressure and previous to their removal from the retort. I am also enabled to cool cans or vessels with their contents more rapidly than before, and also to secure the use of my retort in less time than formerly for another lot of cans or vessels. I also by this process protect any weak portions or parts of a can or vessel from any injurious internal strain or rupture.

I am likewise enabled to secure the above results when cooking or preserving cans or vessels made with flat yielding sides or ends, or packages made from any yielding or flexible material. I am also enabled to forcibly compress the contents of the can to any desired degree beyond the degree of compression obtained by ordinary atmospheric pressure.

Having thus described my invention, I claim—

1. The improvement in the process of retorting canned edibles which consists in cooking filled and sealed cans in a retort under the pressure of a hot medium, in then cooling them under the pressure of a cooling medium while still in the retort, and in finally compressing them under an augmented pressure of said cooling medium, substantially for the purposes set forth.

2. The introduction into a retort containing edibles in cans, and in which steam or other hot fluid exists under pressure, of a cooling medium under any desired pressure greater than that of the hot fluid, so as to displace the steam or other hot fluid, for the purpose of lowering the temperature within and augmenting the pressure upon the cans, for the purposes set forth.

In testimony whereof I have hereunto signed my name this 25th day of March, A. D. 1879.

HENRY WARDEN.

In presence of—

JNO. E. THOMAS,  
JOSHUA P. RICHARDS.