No. 640,234. Patented Jan. 2, 1900.

F. W. SMITH.

RETORT FOR STERILIZING OR COOKING GOODS.

(Application filed July 23, 1898.)

(No Model.) 2 Sheets—Sheet 1.

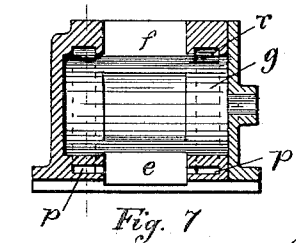


Fig. 7

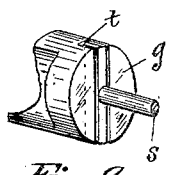


Fig. 9

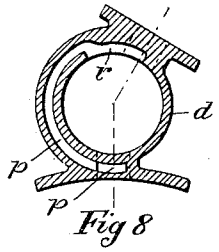


Fig 8

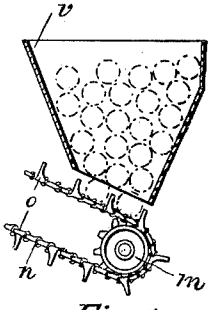


Fig. 10

Fig. 1

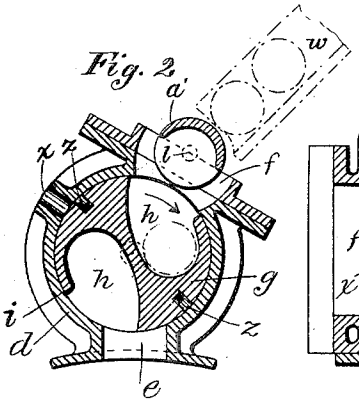


Fig. 2

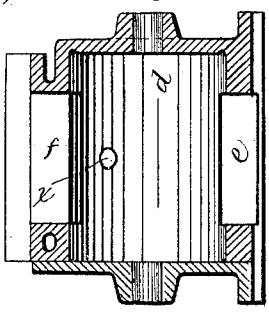


Fig. 3

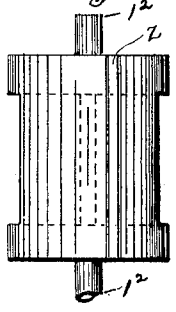


Fig. 4

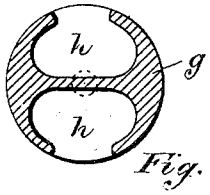


Fig. 5

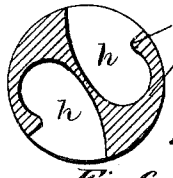


Fig. 6

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M. C. Lithy.

Inventor.
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by Geo. E. Bird.
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No. 640,234. Patented Jan. 2, 1900.

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RETORT FOR STERILIZING OR COOKING GOODS.

(Application filed July 23, 1898.)

(No Model.) 2 Sheets--Sheet 2.

Fig. 12

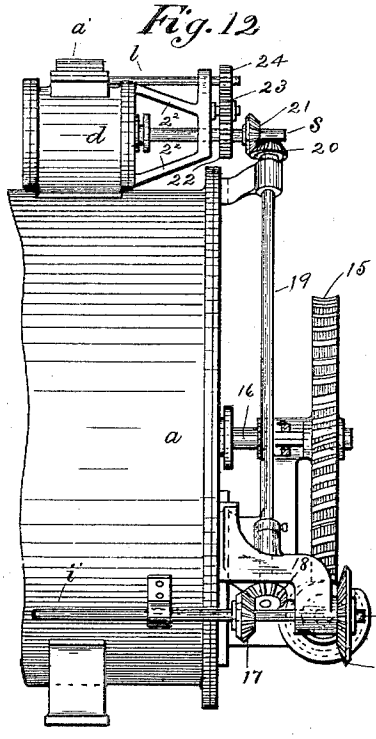
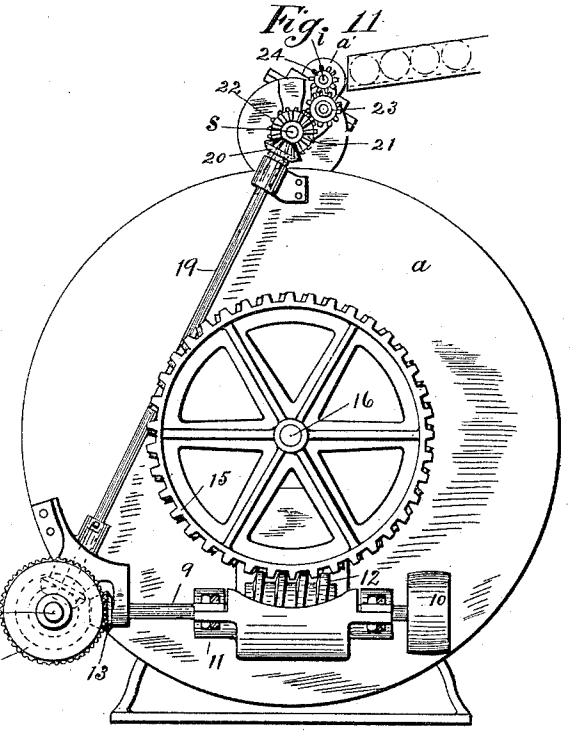


Fig. 11



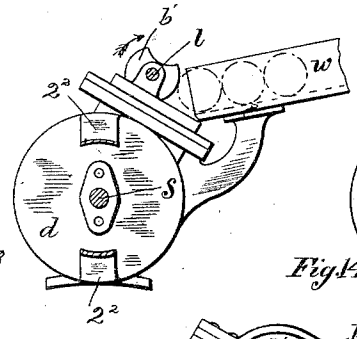


Fig. 13

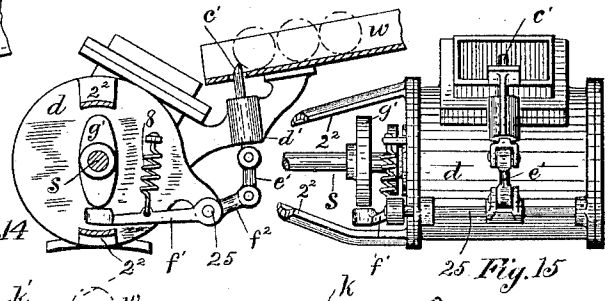


Fig. 14 Fig. 15

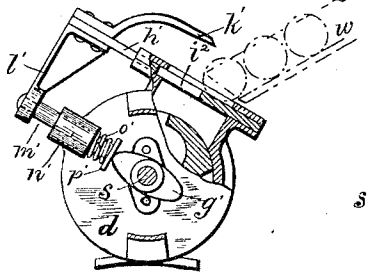


Fig. 16

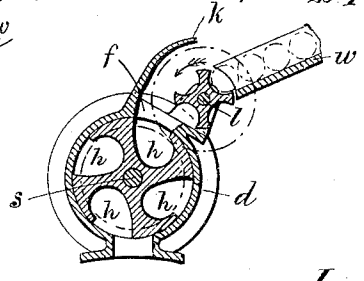


Fig. 17

Witnesses:
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A. C. Behrend.

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per Jas. E. Bird
Atty.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

FRANK W. SMITH, OF PORTLAND, MAINE, ASSIGNOR OF ONE-HALF TO FREDERICK O. CONANT, OF SAME PLACE.

RETORT FOR STERILIZING OR COOKING GOODS.

SPECIFICATION forming part of Letters Patent No. 640,234, dated January 2, 1900.

Application filed July 23, 1898. Serial No. 686,651. (No model.)

To all whom it may concern:

Be it known that I, FRANK W. SMITH, a citizen of the United States, residing at Portland, in the county of Cumberland and State of Maine, have invented certain new and useful Improvements in Retorts for Sterilizing or Cooking Goods; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to retorts for sterilizing or cooking goods inclosed in cans or other packages, and comprises an improvement in the valve by which without escape of the steam or heat from the retort the cans are introduced therein and withdrawn therefrom and an improvement in the means of feeding the cans to the inlet-valve and receiving them from the outlet-valve. The improvement in the valve consists in the novel construction of the pockets therein, whereby by reason of the external wall thereof and the lip upon the end of the latter the cans or packages are prevented from coming into contact with the casing of the valve. The roughening of the casing with consequent impairment of the efficiency and tightness of the valve is thus avoided.

In the drawings, Figure 1 is an end view of the retort, parts of the frame being broken out to show the revolving frame or cylinder, the valves being shown in vertical section. Fig. 2 is a vertical section of the valve and seat with substitute for the equalizing device and a modification of the feed; Fig. 3, a vertical section of the valve-seat. Fig. 4 is a top plan of the valve. Fig. 5 is a vertical section of a modification of the valve. Fig. 6 is a vertical section of the valve shown in Fig. 2; Fig. 7, a vertical section of the valve-seat with side elevation of the valve; Fig. 8, a vertical section of the same; Fig. 9, a detail showing the method of connecting the valve-stem with the valve; Fig. 10, a detail showing a portion of the feed and hopper. Fig. 11 is an end view of the retort, showing the operating mechanism. Fig. 12 is a side elevation of the end of the retort, showing the operating mechanism. Fig. 13 is an end view of a modification of the valve-seat and feed. Fig. 14 is an end view of the valve-seat and modification of the feed, the latter being operated by a cam and lever. Fig. 15 is a side elevation of the valve-seat shown in Fig. 14. Fig. 16 is an end view of a further modification of the feeding device. Fig. 17 is a transverse vertical section of a modification of the valve and feeding device.

Referring to the drawings, *a* is the outer or inclosing cylinder of the retort. *b* is the inner rotating cylinder, supported upon the shaft 16, which is journaled at either end of the cylinder *a*, and *c c* the devices whereby the cans or packages may be held upon the surface of the cylinder *b*.

In Fig. 1, *d* is the valve seat or casing, which is a cylinder having an opening *e* at the bottom, communicating with the retort or cylin- *a*, and an opening *f* of substantially the same size near the top. Upon this cylinder or seat *d*, at the upper edge of the opening *f*, may be secured the screen *k*. Within the valve-seat is the rotary valve *g*, having pockets *h h* situated upon the opposite sides of the valve. These pockets are elliptical in shape, the internal surface of the wall of the lower portion thereof being substantially concentric with the circumference of the valve *g*. There is thus formed an external wall on the recess or pocket, which may be shortened or lengthened and which may terminate in a lip *i*, (see Fig. 6,) which may be increased or diminished in size. I do not, however, restrict myself to two openings, as the number may be increased, as seen in Fig. 17, where four openings are shown. The valve *g* may be mounted upon the shaft *s*, which is journaled in the ends of the casing *d*, or it may be provided with trunnions l^2 l^2, as shown in Fig. 4. Near the opening *f* is placed the sprocket-wheel *m*, which, by an endless chain *n*, having fingers *o o*, is connected with a similar sprocket-wheel *m*. (See Fig. 10.) Above this may be placed a hopper *v*, which is also shown in Fig. 10. Beneath the shaft 16, across the outside of the end of the cylinder *a*, is placed in suitable journals the shaft 9. This shaft is provided at one end with a pulley 10 with a worm 12 and at the other end with the beveled gear 13, which matches with the beveled gear 14 on the shaft *i'*, which shaft also carries the

miter 17. On the shaft 16 is the gear 15, which matches with the worm 12. The miter 17 matches with a similar miter 18 on the shaft 19, which extends diagonally upward to the upper part of the cylinder *a* and which has upon its upper end a miter 20, which matches with the miter 21 upon the shaft *s*.

The discharging-port comprises a casing and valve like those of the inlet-port and operated by similar mechanism actuated by the shaft *l'*; but the outlet-port *f* of the casing connects with a pipe or tube 7, beneath which is the tank 1. The pipe 7 extends below the level of the top of the sides of the tank. Within the tank are the sprocket-wheels 2 2, provided with the endless chain 3, which at regular intervals has the bosses or projections 4 4. The tank is supplied with an inlet-pipe 5 and an outlet 6.

In order to equalize the pressure upon the valve *g*, the casing or seat *d* may be provided with an annular space *p* at either end, as shown in Fig. 7, (see also Fig. 8,) extending from the side of the opening or inlet *e* around one side of the seat *d* to near the top, where the interior walls cease. When such annular spaces are used, the shaft or valve-stem *s* may be connected with the valve *g* in the manner shown in Fig. 9. The end of the valve *g* is provided with a rectangular slot *t*, while the valve-stem has upon the end a rectangular piece of slightly less width than the slot *t*, and the trunnion upon the other end is dispensed with. If the valve is provided with trunnions, as shown in Figs. 3 and 4, in order that the valve may be rendered tight the packing *z z* should be used, which may be of asbestos or of metal. If metallic, it is made effective by the use of springs in the ordinary manner.

The feeding device already described may be modified, as shown in Figs. 2 and 13 to 17, inclusive. It consists of a chute *w* sufficiently large to permit the passage of one can at a time, beneath the end of which may be placed a cup-shaped cam *a'* or cylinder with a cup-shaped opening. This cylinder is rotated upon the shaft *l*, which is provided with the spur 24, matching with the spur 23, which in turn matches with the spur 22 on the shaft *s*. There may be substituted for the cup-shaped cam already described, and shown in Fig. 2, the cylinder *b'*. (Shown in Fig. 13.) This cylinder is rotated upon the shaft 26; but instead of being located over the center of the opening *f* it is placed at the upper edge thereof and not beneath, but at about the level of the opening of the chute *w*. It is provided with a circular depression on the side, as shown in Fig. 13. In Fig. 14 is shown a further modification of the feed. The cylinders *a'* and *b'* may be dispensed with and their places supplied by the finger *c'*, which extends upward slightly above the bottom of the chute *w*. This is held in a boss *d'*, below which it is pivotally connected with the arm *e'*, the other end of which is in turn pivoted to the lever f^2, the lower end of which is rigidly connected with the shaft 25. On the end of the shaft 25 is rigidly fixed the lever *f'*, which is provided with a flat disk at its free end, while a coil-spring 8 extends from its center to the point above it on the end of the casing. The shaft *s* is provided with a cam *g'*. (See Fig. 14.) A modification of the device last described is shown in Fig. 16. The opening *f* is surmounted by a frame provided with grooves, in which there is a plate *h'*, having an opening i^2 sufficient to admit the entrance of a can. The upper end of the plate *h'* is provided with a bent plate *k'*, while on the under side of the plate *h'* is a bracket *l'*. To this bracket is bolted the rod *m'*, which is provided with a boss *n'*, the lower end of the rod *m'* being provided with a coil-spring *o'*, surmounted by a disk *p'*, while the shaft *s* is provided with a cam *g'*, as shown in Fig. 14. In Fig. 17 is shown a modification of the valve *g*, it being provided with four pockets. When the valve has this number of pockets, the feeding device may be modified, as shown in Fig. 17, the shaft *l* being provided with a disk having four semicircular sides for the reception of the cans. The valves already described having two pockets may admit of modification, as shown in Fig. 6, where the elliptical opening is more elongated than shown in Fig. 1, and the lip *i* is made more reentrant. The pockets in the valve, as hereinbefore described, are designed for use when the valve *g* is rotated in one direction only; but as it may be desired to so construct the pocket that the valve may be rotated in either direction, this is accomplished, as shown in Fig. 5, by providing pockets of equal dimensions and of equal length on either side of the center.

The mechanism operating the feeding device, the valves, and the inner cylinder should be so timed that the cans or packages will be delivered at the instant when the recess or pocket *h* is directly beneath the opening *f* in the casing or in the cylinder, as the case may be, thus protecting the surface of the valves from abrasion by the cans.

The operation of the device, it is believed, will be readily perceived. Power being applied to the pulley 10, the cans or packages are placed within the fingers *o o* of the chain *n* either by hand or else are fed upon the chain through the medium of the hopper *v*, the sprocket *m* being operated by the shaft *l*. The cans are then carried over the wheel *m*. As the valve *g* revolves the screen *k* assists to direct the cans into the pockets. The can having been received within the pocket *h* is held within it by the external wall of the pocket and lip *i*, so that contact with the side of the valve-seat is avoided, and as the valve revolves the can is dropped from the pocket onto the cylinder *b* within the holding devices *c c*, the cylinder *b* being in the meantime in rotation. After the can has thus been delivered the steam which has escaped into

the pocket while passing the opening *e* escapes through the opening *x*. As the pressure of the steam within the cylinder *a* has a tendency to raise or elevate the valve within the seat, provision is made by the device shown in Figs. 7 and 8 for equalizing the steam-pressure, the pressure of the steam through the apertures *r* opening upon the tops of the ends of the valves being about equal to that exercised upon the lower side through the opening *e*. To permit and facilitate the equalization of the steam-pressure in this way, the valve-stem is constructed as described, the construction allowing the requisite play. The wall, which terminates in the lip *i*, and the lip *i* may be increased in length and size, respectively, (see Fig. 6,) when the lip *i* is employed, the purpose being to retain the can longer in the pocket, as might be desired should the opening *e* be placed to the left of the position shown in the inlet-valve of Fig. 1 or for any other reason. After the can or package has passed through the retort it passes through the opening *a* at the exit and falls into the pocket *h*, wherein by rotation of the valve it is delivered through the tube 7 into the tank 1, which by means of the pipes 5 and 6 is kept filled with an even supply of cold water, onto the conveyer, consisting of the sprockets and chains, whereby it is carried to the required point. The cans or packages are thus immediately cooled and upon issuing from the tank are at once ready to be handled.

It is believed that the operation of the modification of the feeding device will be readily perceived. In that shown in Fig. 2 the cans are delivered into the cup-shaped orifice or recess of the cylinder *a'*, whence they are delivered within the pockets *h* as the cylinder *a'* rotates. In the device shown in Fig. 13 the cans as they roll down the chute impinge against the surface of the cylinder *b'*, which rotates against the periphery of the can until the latter enters the circular recess in the side of the cylinder *b'*, when it is carried by the rotation of the cylinder *b'* into the pocket *h*, the next can being held meantime upon the chute by the periphery of the cylinder. The operation of the devices shown in Figs. 14, 15, and 16, it is believed, is equally obvious. The fingers *c'* and *k'*, respectively, hold back the cans in the chute *w* until such time as they will roll from the chute directly into the pocket *h* without impinging upon the periphery of the valve *g*. In that shown in Fig. 14 the finger *i'* is alternately raised by the cam *g'* and is alternately depressed by the spring 8. The operation of the latter causes the finger *c'* to be depressed, so as to allow the can which rests against it to roll into the pocket *h*. In the device shown in Fig. 16 the can rests upon the plate *h'* until such time as the pocket *h* is ready for its reception, when the cam *g'* passes by the disk *o'*, permitting the plate *h'* to be forced downward by the spring *o'*, which at the same time carries the opening i^2 beneath the lower can in the chute and at the same time inserts the plate *k'* between the lowest can and that next above it, thus holding the other cans in the chute *w* in position while the lowest can drops into the pocket *h*.

What I claim is—

1. In an apparatus for sterilizing or cooking goods, the combination with a retort provided with an inlet-opening; a steam-tight valve-casing mounted over said inlet-opening, and said casing having an opening communicating therewith, and a feed-opening; a steam-tight rotary valve provided with pockets, mounted in said casing; and a relief-passage in said casing communicating with the surface of the valve; substantially as described.

2. In an apparatus for sterilizing or cooking goods, the combination with a retort provided with outlet and inlet openings; a steam-tight valve-casing mounted over said inlet-opening, and said valve-casing having an opening communicating therewith, and a feed-opening; a steam-tight rotary valve provided with pockets, mounted in said casing; a relief-passage in said casing communicating with the surface of the valve; and a steam-tight valve at the discharge-opening of the retort; substantially as described.

3. In combination with a cooker having an inlet and an outlet, a valve with pockets in a casing located at each, said casing having channels therein at each end connected at one side with said inlet or outlet and at the opposite side opening upon the surface of said valve, substantially as described.

4. The combination of a discharging-valve and a tank external thereto, said tank being provided with a conveyer and a water-supply, said conveyer being adapted to receive the can or packages discharged by said valve whereby such cans or packages may be cooled as they are conveyed away, substantially as described.

5. The combination of a casing having a rotary valve with pockets thereunder, a feeding-table adapted to discharge cans and other packages into said pockets, a finger adapted to reciprocate through the bottom of said table and a cam and lever operating said finger, substantially as described.

6. The combination of a casing; a rotary valve with pockets, mounted therein; a feeding-table; a feed-regulating device arranged to reciprocate across the path of travel of the articles, permitting the delivery of the articles singly; and a cam operating said feed-regulating device; substantially as described.

7. In an apparatus for sterilizing or cooking goods, the combination with a steam-tight casing having a feed and a delivery opening; of a rotary steam-tight valve mounted in said casing; said valve having pockets provided with concave outer lips and openings arranged to allow said pockets to come successively into communication with the de-

livery-opening in the casing in advance of communication with the feed-opening; substantially as described.

8. The combination of the valve-casing provided with feed and delivery openings, of the rotary steam-tight valve mounted therein and provided with pockets having overhanging concave lips, and a relief-opening in said casing communicating with the surface of the valve; substantially as described.

9. The combination of the valve-casing provided with feed and delivery openings, of the rotary steam-tight valve mounted therein and provided with pockets having overhanging concave lips, a relief-opening in said casing communicating with the surface of the valve, and packing-strips on said valve between the openings to said pockets; substantially as described.

10. In an apparatus of the character described, a reversible feed-valve in the form of a cylinder provided with pockets, each having an opening upon the periphery of the valve and curved lips at opposite sides of said opening; substantially as described.

In testimony that I claim the foregoing as my invention I have hereunto set my hand this 21st day of July, A. D. 1898.

FRANK W. SMITH.

In presence of—

GEO. E. BIRD,

A. C. BERRY.