April 20, 1926. 1,581,502

K. K. WRIGHT

APPARATUS FOR RINSING AND STERILIZING CONTAINERS

Filed Nov. 14, 1922 3 Sheets-Sheet 1

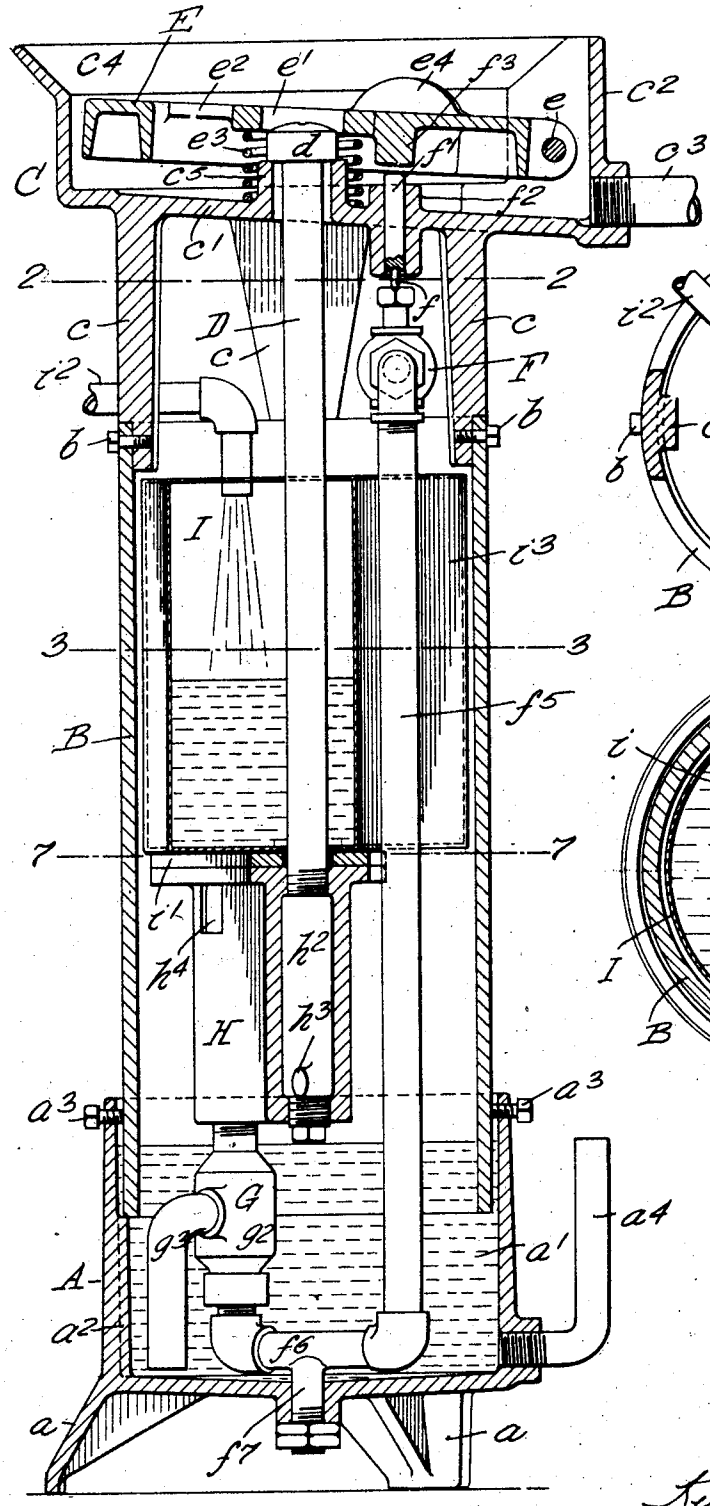


Fig. 1.

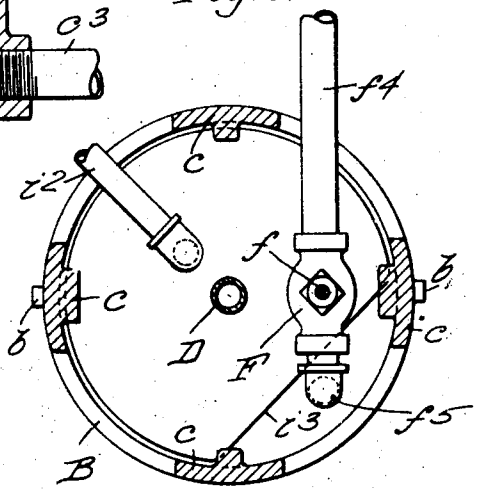


Fig. 2.

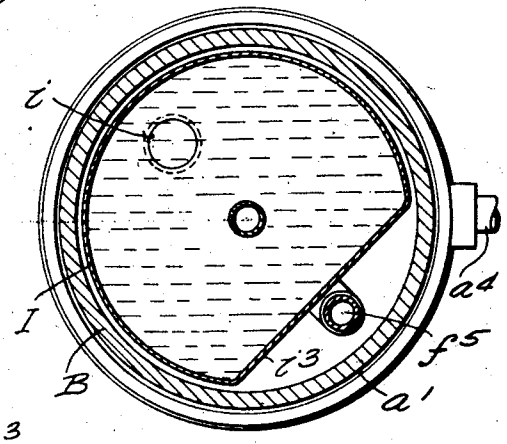


Fig. 3.

INVENTOR.
Kirk K. Wright,
by Parker & Rockwood.
ATTORNEYS.

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K. K. WRIGHT

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Fig. 4.

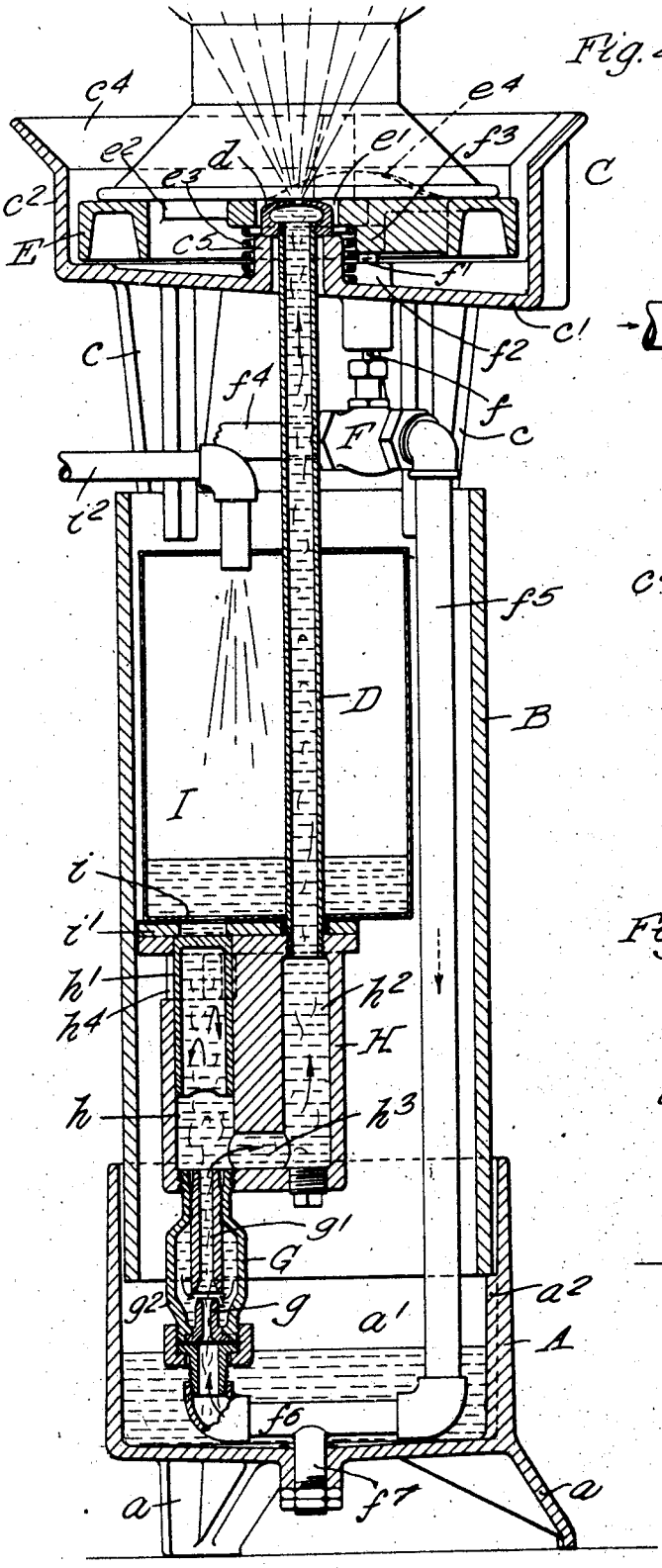
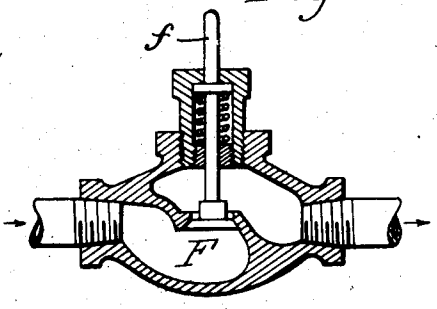


Fig. 4a



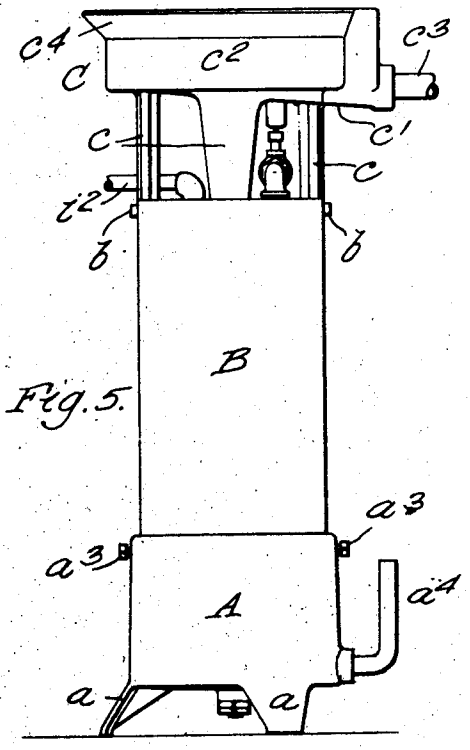


Fig. 5.

INVENTOR.
Kirk K. Wright
by Parker & Rochow.
ATTORNEYS.

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K. K. WRIGHT

APPARATUS FOR RINSING AND STERILIZING CONTAINERS

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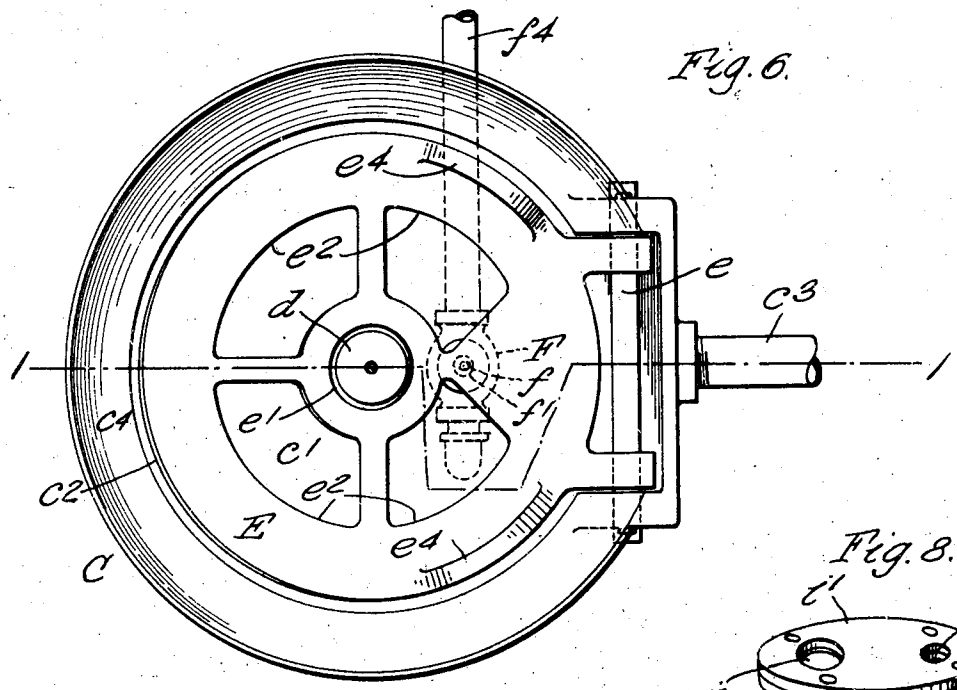


Fig. 6.

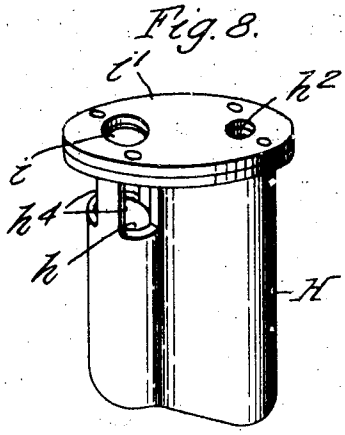


Fig. 8.

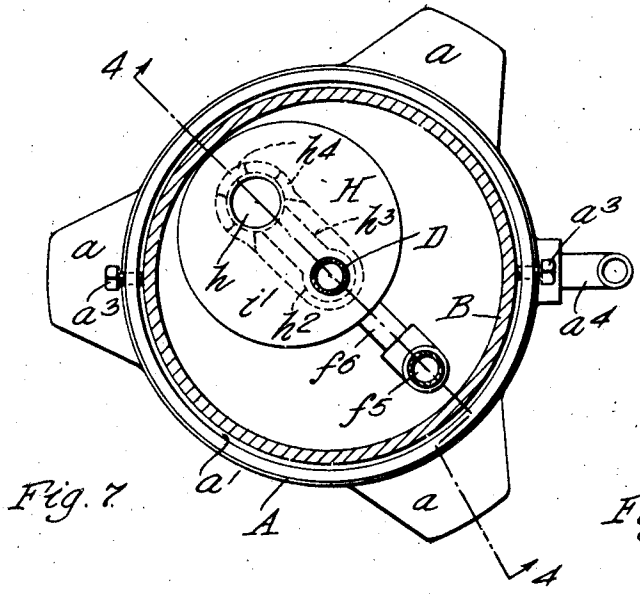


Fig. 7.

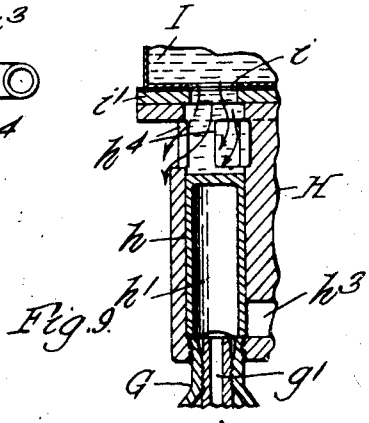


Fig. 9.

INVENTOR.
Kirk K. Wright
by Parker & Prochnow.
ATTORNEYS.

Patented Apr. 20, 1926. 1,581,502

UNITED STATES PATENT OFFICE.

KIRK K. WRIGHT, OF BUFFALO, NEW YORK, ASSIGNOR TO R. G. WRIGHT & CO., OF BUFFALO, NEW YORK.

APPARATUS FOR RINSING AND STERILIZING CONTAINERS.

Application filed November 14, 1922. Serial No. 600,908.

To all whom it may concern:

Be it known that I, KIRK K. WRIGHT, a citizen of the United States, residing at Buffalo, in the county of Erie and State of New York, have invented a new and useful Improvement in Apparatus for Rinsing and Sterilizing Containers, of which the following is a specification.

This invention relates to improvements in apparatus for rinsing and sterilizing milk cans or similar containers.

Devices have heretofore been used for rinsing and sterilizing containers of this kind, but these devices are so constructed that it is necessary for the operator to manipulate a valve or valves for first discharging the rinsing water into the container and then admitting steam or other sterilizing medium thereto. Devices of this kind, however, require the attention of an operator and also the operation of rinsing and sterilizing is dependent upon the judgment of the operator.

The objects of this invention are to provide a rinsing and sterilizing apparatus of this kind in which the placing of the can in an inverted position on the apparatus automatically causes a definite quantity of rinsing water to be discharged into the can and then subjects the can to the action of a sterilizing medium, such as steam, thereby making it unnecessary for the operator to manipulate any valves; also to provide a machine of this kind in which a fresh supply of water may be used for rinsing each can; also to improve the construction of devices of this kind in other respects hereinafter specified.

In the accompanying drawings:

Fig. 1 is a sectional elevation of a can rinsing and sterilizing apparatus embodying the invention, the section being taken on line 1—1, Fig. 6.

Figs. 2 and 3 are sectional plan views thereof on lines 2—2 and 3—3 respectively, Fig. 1.

Fig. 4 is a central sectional elevation thereof on line 4—4, Fig. 7, showing the parts in the positions which they occupy when a can is placed on the apparatus.

Fig. 4ª is a central sectional view of a steam valve used in connection with this apparatus.

Fig. 5 is a side elevation thereof on a reduced scale.

Fig. 6 is a top plan view thereof.

Fig. 7 is a sectional plan view thereof on line 7—7, Fig. 1.

Fig. 8 is a perspective view of a valve housing showing the same detached from the apparatus.

Fig. 9 is a fragmentary sectional elevation of the valve housing of the apparatus showing the water valve open to admit water to the lower reservoir.

Briefly stated, the device embodying the invention and shown in the accompanying drawing, includes a drain trough or table having a pivoted grid or support for the cans, which support is swung by the weight of the can into a position to actuate a valve to admit steam or other sterilizing medium under pressure to an ejector. This ejector is connected with a spray pipe adapted to direct sprays of rinsing and sterilizing media into the interior of the can and first ejects a quantity of rinsing water from a reservoir and passes the water through the spray pipe into the can for rinsing the same. After the water has been ejected from the reservoir, the steam itself passes through the ejector and spray pipe into the can and sterilizes the same. The pressure of the steam also operates a water valve for interrupting the supply of water to a reservoir and this valve is so arranged that when the steam is turned on by the placing of a can upon the apparatus, the water valve will be closed to interrupt the flow of water to the reservoir, and when the steam is turned off, the water valve opens to admit water to the lower reservoir.

The apparatus shown in the accompanying drawing includes a base A having suitable feet or legs a supporting the apparatus from the floor. The upper portion of the base is adapted to form a reservoir a' for the rinsing liquid to be discharged to the can, and the base also forms a support for a tubular frame member B. In the construction shown, the lower end of the tubular frame member extends into the reservoir a' of the base and the reservoir is provided with suitable supporting ribs or lugs a^2 on which the frame member B may rest and set screws a^3 are used to secure the frame member to

the base. The reservoir a' is preferably provided with an overflow discharge pipe a^4, that shown being connected to the bottom of the reservoir and extending upwardly to any desired height to discharge water from the reservoir extending above a predetermined level. This pipe is preferably so arranged that it may be swung about its connection with the reservoir to place the upper end of the pipe at different elevations so that the quantity of water in the lower reservoir may be regulated as desired. The upper end of the tubular frame member B is connected by means of screws b or the like with legs c of a drain trough or table C. These legs are, in the construction shown, formed integral with the trough which has an inclined bottom c' and side walls c^2 extending upwardly from the peripheral portion of the inclined bottom c'. The inclined bottom c' serves to drain the rinsing water toward one side of the trough from where it may be withdrawn by means of a pipe c^3. The upper portion of the wall of the trough preferably flares outwardly as shown at c^4, so as to guide the cans toward the center of the trough or table C. D represents a spray pipe for the rinsing and sterilizing media, the upper end of which has a discharge nozzle d which extends through a hole preferably centrally arranged in the inclined bottom c' of the drain trough and the bottom of the trough is preferably provided with an integral, upwardly extending, annular flange c^5 which surrounds the spray pipe D and prevents the rinsing water from passing through the central hole in the bottom into the lower portion of the apparatus, so that the rinsing water is used only once and does not contaminate fresh water supplied to the apparatus. Preferably the nozzle rests on the upper edge of the annular flange c^5.

The drain trough C is provided with a pivoted grid or can support E which is movable by the weight of the can so as to cause the apparatus to operate. This grid is, in the construction shown, pivoted at e in a recess in the annular wall c^2 of the drain trough and the grid is provided with a central aperture e' through which the discharge nozzle of the spray pipe D may pass and with other apertures e^2 through which the rinsing water may flow. The grid or support is normally held in an inclined position as shown in Fig. 1 by any suitable means, such for example as a coil spring e^3 arranged around the annular flange c^5. The spring e^3 is adapted to yield when the can is placed on the grid E and permits the grid to move into the position shown in Fig. 4 in which the upper surface thereof will be substantially horizontal. The grid is preferably provided with ears or lugs e^4 extending upwardly from the upper face of the grid and which serve as stops against which the edges or sides of the inverted cans may be placed to facilitate the positioning of the cans on the apparatus.

The downward movement of the can supporting grid E due to the weight of the can actuates a steam valve F which may be of any suitable or desired construction. As shown in the drawings, the steam valve F has a stem f on which rests a slidable pin f' which is guided in a boss f^2 preferably formed integral with the bottom a' of the drain trough. The upper end of this pin extends into operative relation to a lug or boss f^3 formed on the grid or support E so that when the grid is depressed by an inverted can resting thereon, the lug f^3 presses the pin f' downwardly to cause this valve to open. The steam valve is connected by means of a pipe f^4 to any suitable supply of steam. The steam after passing through the valve is discharged into a pipe f^5 which extends downwardly through the tubular body portion B and into the base of the apparatus, where this pipe connects with a pipe or conduit f^6 suitably secured by means of a projecting stud f^7 to the base of the apparatus. This pipe f^6 discharges the steam into an ejector G which may be of any suitable or well known construction. In the particular construction shown in the drawings, the ejector includes a steam nozzle g through which the steam passes from pipe f^6, and a discharge pipe g'. The steam nozzle g and discharge pipe g' are arranged in a housing g^2 in which a water inlet pipe g^3 terminates, the lower end of this pipe extending into proximity to the bottom of the rinsing water reservoir a'. Consequently, when this reservoir is filled with water, the housing g^2 of the ejector is also filled with water and when steam passes into the ejector through the steam nozzle g water and steam together are discharged through the dicharge pipe g' of the ejector, and water is supplied to the housing g^2 by means of the pipe g^3 from the bottom of the rinsing water reservoir a'. When the water has been withdrawn from the rinsing water reservoir a', the steam alone passes through the discharge pipe g'. An ejector of any other construction may be employed if desired.

In order to prevent a fresh supply of water from entering the reservoir a' while the steam is turned on and thus to ensure a steady supply of steam to the can during the sterilizing operation, the steam pressure is preferably utilized to actuate a valve for shutting off the supply of water to the reservoir a'. For this purpose, in the construction shown, the ejector G is connected with a water valve housing H so that the rinsing water and steam from the discharge

pipe of the ejector pass into the valve housing. This water valve housing may be of any suitable or desired construction, that shown including a pair of substantially cylindrical passages, one of these passages h forming a guide for a water valve h' and the other passage h^2 being connected with the spray pipe D. The two passages in the valve housing are joined by means of a connecting passage h^3 and the ejector preferably terminates in or is connected with the valve guide passage h of the valve housing.

The upper end of the valve guide passage h is connected with any desired source of supply of rinsing water, the valve passage in the construction shown being connected with a passage or conduit i of a supply or feed tank I for the rinsing water. This tank may be of any suitable or desired construction and preferably rests on a plate i' arranged at the top of the valve housing H. A water supply pipe i^2 discharges water into the supply tank I and a valve or other suitable means, not shown, is preferably provided for regulating the supply of water to the tank I. The valve guide passage h is also provided in its side near the upper portion thereof with openings or ports h^4 which are so arranged with reference to the valve h' that when the valve is in its lower position as indicated in Fig. 9, the water from the upper or supply tank I may flow rapidly through the passage i and openings or ports h^4 into the lower reservoir a'. The valve normally drops by gravity into the position shown in Fig. 9, but when the steam is turned on by the placing of a can upon the grid E, the pressure of steam causes the valve h' to rise in the valve guide passage h and seat against the plate i' and close the openings or ports h^4 and thus prevent the flow of water from the upper tank I into the lower reservoir a' while the steam is turned on. It is not intended to limit this invention to the form of water supply means shown, but it is preferred to use a supply tank since the pressure of water therein against the water valve is small, so that the valve may be made of large size to permit the water to flow quickly from the supply reservoir to the lower reservoir. The supply tank, in the construction shown, is substantially cylindrical in form except for a flat side i^3, which is provided for the purpose of affording room for the steam pipe f^5 to pass between the tank and the tubular frame member B.

In the operation of the apparatus, upon the placing of a can in an inverted position upon the grid or support E, the steam valve F is opened by the weight of the can, thus admitting steam to the ejector G. This causes water to be discharged from the ejector into the water valve housing H, which first causes the closing of the water valve h' and then causes water to be discharged through the spray pipe D into the can on the grid. The ejector withdraws the water from the lower reservoir and as soon as the supply of water in the lower reservoir is exhausted steam alone will pass upwardly through the ejector and spray pipe from which it is discharged into the can to sterlize the same. During the flow of steam into the can, the water valve h' is held in its closed position so that no water is admitted into the lower reservoir. This is an important feature since otherwise water would mix with the steam during the sterilizing operation of the apparatus which would reduce the temperature of the steam and thus interfere with the effective sterilization of the can. The apparatus is intended to be fed by hand by the operator who washes the cans. After a can has been washed it is placed upon the rinsing and sterilizing apparatus and the operator proceeds to wash another can. As soon as the next can is washed the operator removes the first can from the rinsing and sterilizing apparatus and places the second can thereon. During the interval that the first can is removed from the apparatus, the steam is turned off and the water valve h' moves into its lower position, thus permitting the charge of water from the supply tank I to discharge into the lower reservoir.

The apparatus has the advantages that none of the operator's time is taken in the manipulation of valves, since the mere placing of a can upon the grid E controls the operation of the valves. The amount of rinsing water to be discharged to the can can be readily controlled by adjusting the pipe a^4 as may be desired and after the can has been rinsed, the same is immediately sterilized. In dairies where the cans are washed one at a time, the time required for washing is sufficient to insure a thorough rinsing and sterilizing of the can on the grid E so that the judgment of the operator with reference to the time required for thoroughly sterilizing a can is not required. By using an ejector instead of otherwise using the steam pressure to force the water from the reservoir to the container, cold water can be used for rinsing, which in turn makes it possible to use fresh water for rinsing each container without requiring a large amount of fuel to heat the water.

The invention has been herein described and shown in the drawings as applied to rinsing and sterilizing milk cans, but it is not intended to limit the invention to such use, since it is obvious that the invention may be used in connection with cleansing containers of other kinds.

I claim as my invention:

1. In an apparatus for rinsing and sterilizing containers, the combination of a sup-

port for a container, a spray pipe for discharging rinsing and sterilizing media to said container, an ejector connected with said spray pipe, means for admitting steam to said ejector, and means for admitting a limited quantity of rinsing liquid to said ejector during the operation thereof whereby first rinsing liquid and then steam are discharged to the container.

2. In an apparatus for rinsing and sterilizing containers, the combination of a spray pipe adapted to discharge cold rinsing liquid and steam into a container, a reservoir for containing rinsing liquid under atmospheric pressure, an ejector connected with said reservoir for first drawing a quantity of rinsing liquid from said reservoir and discharging the same to said spray pipe, and then discharging steam to said spray pipe, and a valve for admitting steam to said ejector.

3. In an apparatus for rinsing and sterilizing containers, the combination of a reservoir adapted to contain a limited quantity of cold rinsing liquid, an ejector connected with said reservoir for first drawing the rinsing liquid by suction from said reservoir and discharging the same to a container, and then discharging steam to said container, and a valve for controlling the supply of steam to said ejector, whereby a single actuation of said valve causes the discharge of first rinsing liquid and then steam to said container.

4. In an apparatus for rinsing and sterilizing containers, the combination of a support for a container, a steam valve which is opened by the placing of a container on said support, a reservoir for cold rinsing water, and an ejector having a connection through which the steam is conducted from said valve and a connection with said water reservoir and which withdraws rinsing water by suction from said reservoir and discharges the same to said container and which discharges steam to the container when a predetermined quantity of rinsing water has been withdrawn from said reservoir.

5. In an apparatus for rinsing and sterilizing containers, the combination of a support for a container, a spray pipe for discharging rinsing and sterilizing media to said container, an ejector connected with said spray pipe, means for admitting a limited quantity of rinsing liquid to said ejector during the operation thereof whereby first rinsing liquid and then steam are discharged to the container, and means controlled by the placing of a container on said support for supplying steam to said ejector.

6. In an apparatus for rinsing and sterilizing containers, the combination of a steam operated ejector for discharging rinsing fluid and steam to a container, a reservoir for supplying rinsing fluid under substantially atmospheric pressure to said ejector, an overflow pipe on said reservoir which is adjustable for controlling the quantity of rinsing fluid to be supplied to said ejector, and means for controlling the supply of steam to said ejector.

7. In an apparatus for rinsing and sterilizing containers, the combination of a reservoir adapted to contain a definite quantity of rinsing fluid, a steam ejector for withdrawing rinsing fluid therefrom by suction and projecting the same at a container, means for supplying steam to said ejector to cause the same to first withdraw rinsing fluid from said reservoir and discharge the same at said container and then to discharge steam to the container, means for supplying rinsing fluid to said reservoir, and a valve positioned to be acted upon by steam and rinsing fluid discharged from said ejector to interrupt the supply of rinsing fluid to said reservoir during the operation of said ejector.

8. In an apparatus for rinsing and sterilizing containers, the combination of a reservoir adapted to contain a definite quantity of rinsing fluid, a steam ejector for withdrawing rinsing fluid therefrom by suction and projecting the same at a container, means for supplying steam to said ejector to cause the same to first withdraw rinsing fluid from said reservoir and discharge the same at the container and then to discharge steam at the container, a supply tank arranged above said reservoir and adapted to supply rinsing fluid thereto, a valve for controlling the flow of liquid from said supply tank to said reservoir, said valve being adapted to be closed by the pressure of the fluid discharged from said ejector.

9. In an apparatus for rinsing and sterilizing containers, the combination of a reservoir adapted to contain a definite quantity of rinsing fluid, a steam ejector for withdrawing rinsing fluid therefrom by suction and projecting the same at a container, means for supplying steam to said ejector to cause the same to first withdraw rinsing fluid from said reservoir and discharge the same at a container and then to discharge steam to the container, a supply tank arranged above said reservoir and adapted to supply rinsing fluid thereto, means for continuously discharging fresh cold rinsing fluid to said tank, a valve housing arranged below said tank and connected with the discharge end of said ejector, a valve in said valve housing adapted to interrupt the flow of liquid from said supply tank to said reservoir when said ejector discharges fluid to said valve housing.

10. In an apparatus for rinsing and sterilizing containers, the combination of a support for a container, a nozzle for discharging

rinsing and sterilizing fluids to the container, a supply tank to which a constant stream of rinsing fluid is supplied, a reservoir from which rinsing fluid is discharged to the container, connections between said tank and said reservoir to cause rinsing fluid to be rapidly admitted from said tank to said reservoir when no fluid is being discharged through said nozzle, and a discharge device which first supplies rinsing fluid from said reservoir to said nozzle to be discharged to the container and then discharges sterilizing fluid through said nozzle to said container.

KIRK K. WRIGHT.