

No. 864,133.

PATENTED AUG. 20, 1907.

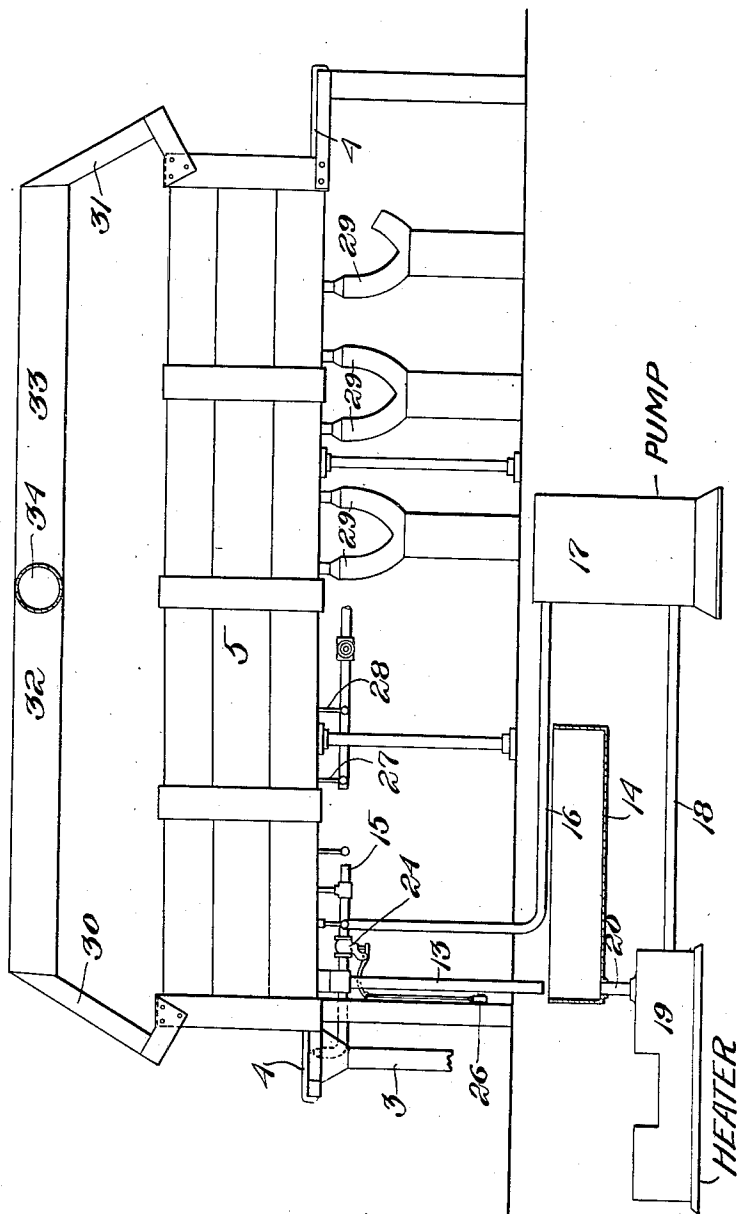
C. H. HOOD.

APPARATUS FOR CLEANING, STERILIZING, AND DRYING MILK CANS.

APPLICATION FILED OCT. 24, 1906.

4 SHEETS—SHEET 1.

Fig. 1.



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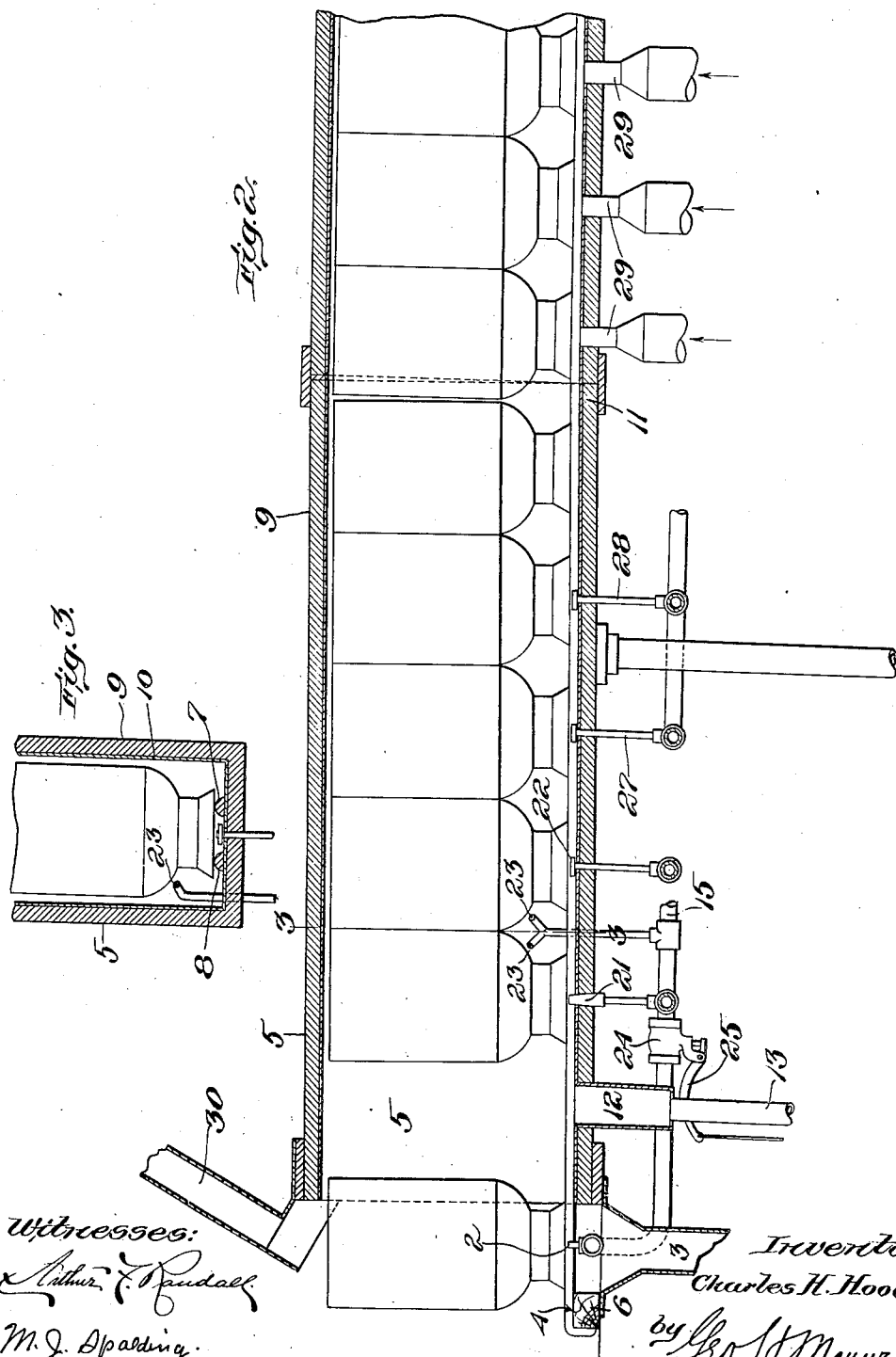
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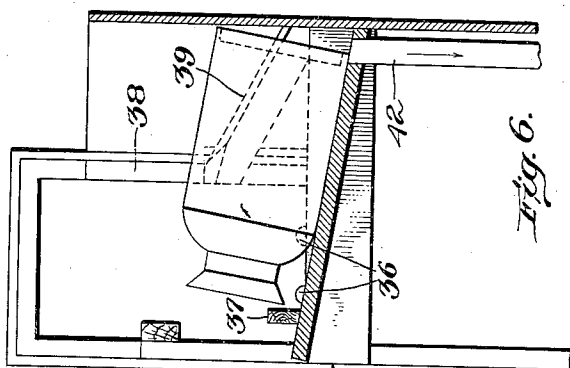


Fig. 6.

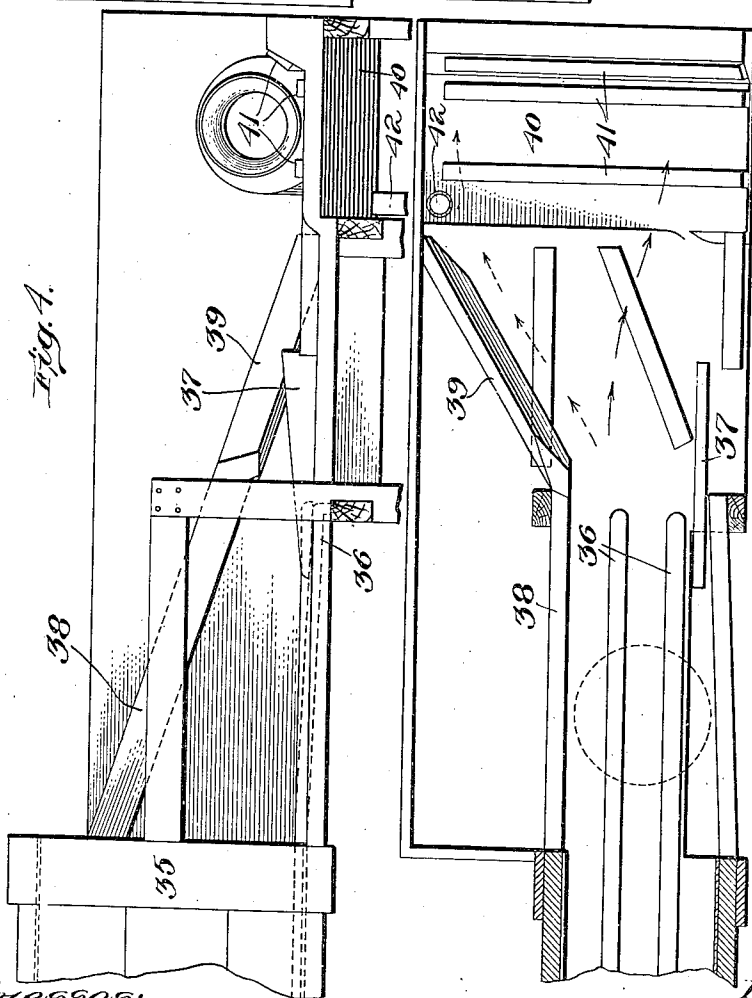


Fig. 4.

Fig. 5.

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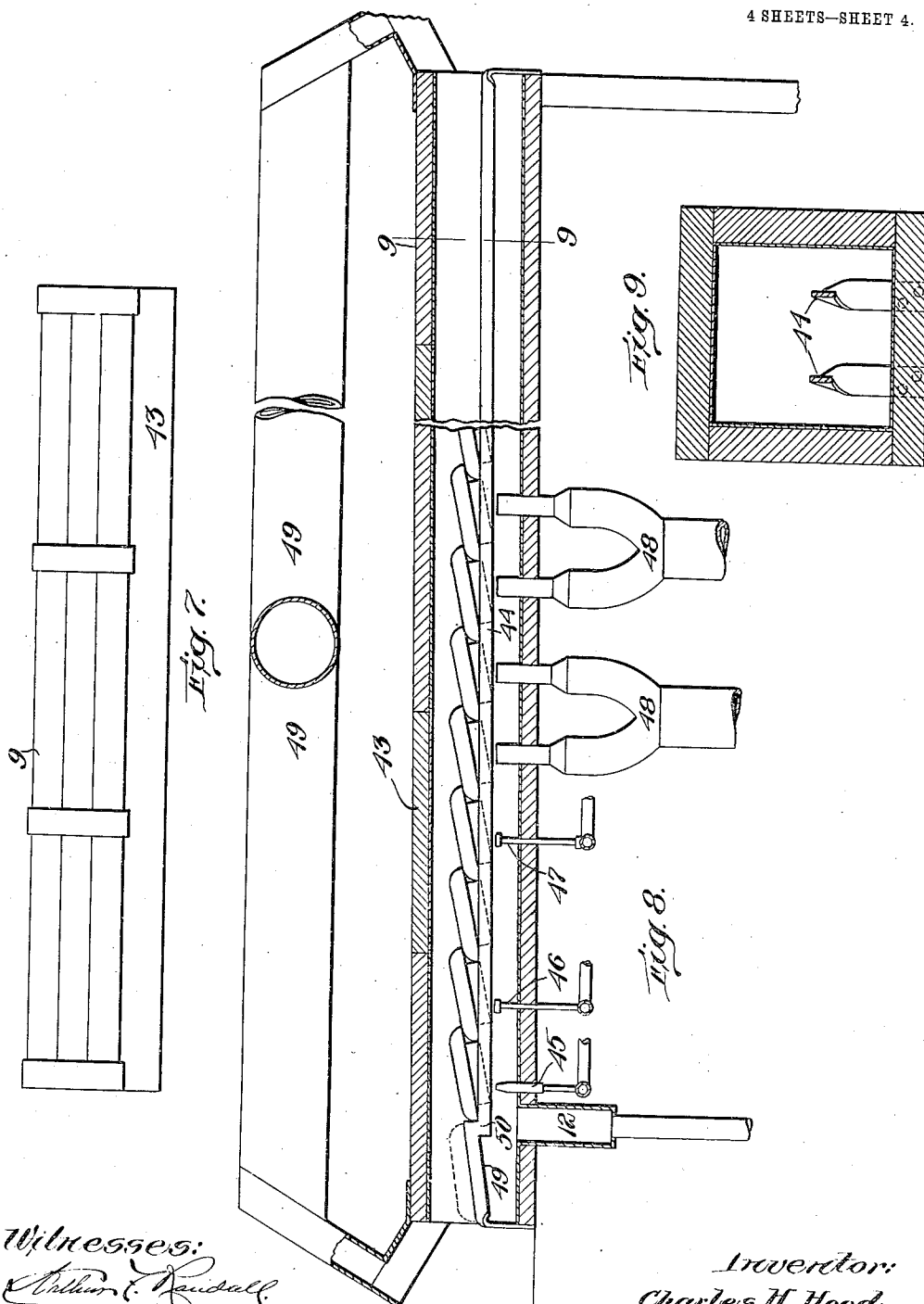
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UNITED STATES PATENT OFFICE.

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APPARATUS FOR CLEANING, STERILIZING, AND DRYING MILK-CANS.

No. 864,133.

Specification of Letters Patent.

Patented Aug. 20, 1907.

Application filed October 24, 1906. Serial No. 340,336.

To all whom it may concern:

Be it known that I, CHARLES H. HOOD, a citizen of United States, residing at Somerville, in the county of Middlesex and State of Massachusetts, have invented
5 an Improvement in Apparatus for Cleansing, Sterilizing, and Drying Large Milk-Cans, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

10 In my copending applications Ser. No. 303,643 and Ser. No. 340,335, I have presented certain features of my invention for treating milk cans, in which I have set forth my discovery as to using air and water in extremely large volume, whereby the washing and drying
15 of milk cans is simplified in an unexpected degree, the latter application containing features whereby the apparatus itself is shortened and simplified and the time and processes of treating the cans are reduced, and more accurate and uniform results produced.

20 The present case relates to apparatus for carrying out my invention for large cans as distinguished from the medium sized cans of my above-mentioned applications:

25 Certain features shown in my present application are set forth and claimed in my above mentioned application Ser. No. 303,643.

30 In the trade large milk cans of about five to fifteen gallons capacity are used for transporting milk in quantity from the dairy farm to the wholesaler in the city, and my present invention relates to this character of can. Such a can is very heavy and difficult to handle
35 in washing, and is very difficult to get dry and to keep clean and to keep from rusting. Yet it must be cleansed, sterilized, and dried with as much certainty and thoroughness as the smaller cans, or else the city
40 supply will be contaminated with bacteria, etc., notwithstanding that the smaller cans are properly treated.

45 Preferably the cans are subjected to the various operations at different points, being placed on tracks to be pushed over rinsing, washing, cleansing, sterilizing and drying means in the order already explained
50 in my above-mentioned application, my present apparatus however containing means whereby the large cans are maintained in proper position and treated with the large volumes of water, air, etc., to the best advantage, while the large cumbersome and awkward covers
55 thereof are similarly treated and passed along in convenient relation to the cans, so that the operators can handle them both in conjunction and maintain the proper progress of the cans and their covers through the apparatus, the cans being automatically delivered and turned up for inspection at the end of the apparatus at the point where the covers are delivered ready to be placed on the cans again from which they were taken
at the front end of the apparatus.

The constructional details of my invention, the man-

ner of using the apparatus, and further advantages thereof, will be pointed out in the course of the following description, taken in connection with the drawings, in which I have shown a preferred embodiment of the
60 invention.

In the drawings, Figure 1 is a side elevation of the apparatus, the cover-containing compartment being removed and the drip tank shown in section for convenience of illustration; Fig. 2 is an enlarged longitudinal sectional view of a portion of the apparatus
65 shown in Fig. 1; Fig. 3 is a cross-sectional view taken on the dotted line 3-3, Fig. 2; Fig. 4 is an enlarged view in side elevation of the outgoing end of the apparatus; Fig. 5 is a top plan view thereof, partly in section; Fig. 6 is a transverse sectional view of the parts
70 shown in Figs. 4 and 5 looking at the can of Fig. 4 toward the left; Fig. 7 is a plan view on a reduced scale of the apparatus showing the relation of all the parts to each other; Fig. 8 is an enlarged sectional view similar
75 to Fig. 2, showing the arrangement for the covers; and Fig. 9 is a transverse sectional view on the line 9-9, Fig. 8.

For convenience of illustration I have simply shown my invention as arranged for transmitting one row or
80 series of cans, inasmuch as these cans are so large and heavy that in usual plants it is found impracticable to provide compartments or passageways for more than one series. It is unnecessary to describe these cans, as they are commonly in use throughout the country,
85 being made of heavy iron tinned or galvanized and provided with reinforcing bands and shoulders for enduring the rough usage to which they are subjected in transportation.

My object is to apply to the can a series of treatments,
90 one after the other, and this is accomplished preferably by moving the can itself, although in the hereinafter contained claims I do not invariably restrict myself to having the spraying, etc., nozzles spaced apart and means provided for permitting the can to travel.

95 In the apparatus of the drawing, however, I provide on suitable supports 1, an inclosure or passageway, at the entrance of which is a rinsing nozzle 2 over a pipe 3 leading to the sewer. The track projects at 4 beyond a housing 5 for the passageway for the cans, said track being supported on a cross-timber or other means
100 6, so that the cans may be readily turned in inverted position on the projecting portion of the track. The track proper consists of opposite runways, herein shown as rounded rails 7, 8, secured to the bottom of the passageway so as to lift the heavy cans the proper distance from said bottom and reduce the friction of the moving cans thereon. The passageway is preferably constructed of planks or metal 9 and provided with
105 a metal lining 10, or it may be entirely constructed of iron so as to withstand the heavy usage to which it is subjected when loaded with the large cans. The

track and bottom of the passageway are inclined from an intermediate point 11, tipping forward sufficiently to cause the drippings from the cans to flow to the front of the apparatus, most of the drippings being caught by a catch basin 12 and thence delivered by a pipe 13 into a drip tank 14.

I have succeeded in effecting perfect cleansing of the cans by applying a hugh volume of cleansing fluid or water to the interior of the cans. A supply pipe 15 is connected by a pipe 16 to a force pump or pressure apparatus 17 connected by a pipe 18 to a heater 19 which receives its supply from a pipe 20 from the bottom of the tank 14. The suds, soda solution, or other cleansing fluid is prepared in the tank 14 and is thence forced in great volume to the pipe 15, having a direct discharge at a nozzle 21, which delivers the fluid in a hugh volume to the interior of the can as the latter halts over said nozzle. A second nozzle 22 delivers rinsing water from the city supply or other convenient source to the interior of the next preceding can. The nozzle 22 is provided with a spraying device, so that it acts to cleanse the can. Nozzles 23 wash the outsides of the can. The pipe 15 is shown as provided with a valve 24 operated by a lever 25 and stirrup or other foot operated means 26, so that thereby the operator may give an intermittent flow at the nozzle 3. This permits the operator to shut off the water while placing the cans in position, and also enables him to prevent the flow of water at said nozzle whenever a can is not present. This also, taken in connection with the shape of the nozzle, enables him to control the water so that he may give an impinging blow by means of the water, against any particular part of the can where he observes any lodged matter needing special treatment. The cans having been treated by the nozzles 3, 21, 22, are moved forward and come over steam or boiling-water nozzles 27, 28, which spray a sufficient volume of steam into the cans at high pressure so that when the cans are subsequently dried they are thoroughly sterilized.

At the outgoing end of the apparatus I provide air pipes 29 for forcing air for drying, preferably hot air, into the cans in huge volumes, and as said air escapes from the cans and is driven through the passageway it is sucked up by a suction apparatus operating through pipes 30, 31 at the opposite ends of the passageway, connected by pipes 32, 33 to a central pipe 34. As the cans escape at the outgoing end 35 of the apparatus, they are automatically tipped over gently and inverted at the right angle for proper inspection, the inner rail of the track being lower at 36, as shown clearly in dotted lines in Fig. 4, and an upwardly inclined track extension or block 37 being provided just beyond this lowered track portion, so that as the can reaches this point it is gently tipped over backward against a rail 38 and as it reaches the upwardly inclined forward end of the track extension 37 it engages a deflected portion 39 of said rail, with the result that the can at once tips further back and rolls downwardly, said track 38, 39 being inclined for this purpose, as shown in Fig. 4, and lands in an inclined pocket 40 provided with suitable supports 41, which retain it in proper position and permit it to be readily pulled out lengthwise by the operator. The pocket 40 is provided with a drain pipe 42 to dispose of any liquid that may possibly reach the

same from the main passageway or be dumped therein from the bottoms of the cans as they are turned over to inverted position. The cans, having been automatically turned up into the inclined position shown in the drawings, are quickly inspected.

At the right-hand side of the can passageway is a cover passageway 43, see Fig. 7, having a track 44, shown as made of stiff bar iron, see Fig. 9, and provided with a washing nozzle 45, cleansing or rinsing nozzle 46, sterilizing nozzle 47, drying pipes 48 and exhaust apparatus 49, substantially the same as already explained in connection with the can passageway. The cover passageway is so arranged that the operator as he takes up a dirty can, can place the can upon the adjacent track 4 and at the same time place the cover in the cover passageway, and when the operator at the opposite end of the apparatus inspects a sterilized and dried can, the outgoing end of the cover passageway is at his hand so that he can take therefrom a sterilized and dried cover and place it on the inspected can.

The covers of these large cans are heavy, and the overhanging top portions thereof are usually made double, so that the covers get battered and more or less out of shape, so that I have found it difficult to devise a suitable passageway for permitting them to be shoved through without pushing each other out of place and getting wedged, etc. I have found, however, that by overlapping the covers one on the other, as shown in Fig. 8, they move along smoothly on the two rails of the track, the rear edge of the flange of the cover hanging downwardly between the rails and serving to guide the cover to some extent while the overlapping of the top portion of one cover onto the rear side of the preceding cover helps still further to hold them in place. To accomplish this arrangement of the covers automatically I provide an inclined part 49 at the beginning of the track, connected by a jog 50 from the remaining straight portion of the track, so that thereby a following cover is caused to climb upwardly onto a preceding cover, and then when it reaches the jog 50 said following cover drops down into proper overlapped position for the remainder of its passage.

I do not herein claim the details of the cover cleaner and drier *per se*, the cover apparatus being contained in a separate divisional application.

In practice, the cans, notwithstanding their large size and heavy weight, can be handled rapidly, and cleansed, sterilized and dried thoroughly by my apparatus. First, the operator takes the cover from a can and places it in the cover passageway 43, and then inverts the can upon the projecting track 4 of the passageway 5. As soon as it is in position he depresses the foot lever 26, thereby opening the valve 24 and permitting a sharp blast of water to strike the inside surface of the can, instantly dislodging any matter which may have stuck against the can. The can is then as herein shown shoved forward over the constantly flowing stream of water, which pours in large volumes, from the jet 21, so that thereby the can is thoroughly and instantly washed with the soda solution or other washing fluid. It is then shoved along by the placing of succeeding cans in the passageway, and next halts over the spraying nozzle 22, where it is thoroughly rinsed. From this position it proceeds, step by step, to the steam nozzles, where it is thoroughly steamed

and sterilized, and thence to the drying nozzles 29, where huge volumes of air are forced rapidly under pressure into and around the cans, the air being further quickened in its movement by the exhaust apparatus 30—33, which also prevents the escape of the moisture-laden air into the room. Meanwhile the covers have been similarly placed in the passageway 43 at the side of the can passageway, and travel along the track smoothly and without wedging, being successively treated to large volumes of water and air, the same as the cans. As the cans reach the outgoing end of the apparatus, they ride along the incline and are gently and automatically turned over to roll down into the inclined position shown in Figs. 4 and 6, for easy inspection. The inspector finds no difficulty in simply rolling the can around in its receiving pocket 40, and as soon as inspected he grasps a sterilized and dried cover, which is ready at his hand for the purpose by reason of the construction and arrangement of the cover passageway next to the main passageway. Having placed the cover on the can, the latter is ready for shipment. The circulation of water is maintained through the parts 14, 20, 19, 18, 17, 16, 15, 13, the latter, as the water flows back from the passageway, discharging said water into the tank with sufficient force to keep the soda, soap or the like, stirred up and in proper solution.

The apparatus is so constructed that it needs practically no attention, as it keeps itself clean, the constant down-flow of water along the inclined surfaces of the passageways keeping the apparatus continually washed, while the discharge spout 3 serves to constantly remove a proper portion of the more or less soiled washing fluid from the supply, the same being renewed properly as the apparatus continues in use.

As already intimated, I wish it understood that I have not attempted herein to set forth the various embodiments of which my invention is capable, but have confined myself to an explanation of the preferred construction which I have found efficient for practical use in large milk depots.

Having described my invention, what I claim as new and desire to secure by Letters Patent is,

1. In an apparatus of the kind described, a passageway for receiving milk cans, means for cleaning and drying the milk cans as they pass through said passageway, and means adjacent the outgoing end of the passageway for automatically turning said cans one at a time to an oblique up-turned position facing across the direction of the passageway to enable the operator to inspect the interior of each can.

2. An apparatus for cleaning large metal milk cans, comprising a passageway having means extending lengthwise thereof for facilitating the passage of large milk cans, including a track for receiving a can in inverted position, means including a cut-off valve under the control of the operator for delivering an intermittent volume of rinsing water to the interior of said inverted can, means opening into said passageway for delivering a large volume of washing fluid under high pressure to the interior of the cans in succession, means for sterilizing the washed cans, and means for drying said sterilized cans.

3. An apparatus for cleansing large metal milk cans, comprising means for delivering a large volume of washing fluid under high pressure to the interior of the can, means for delivering a jet of washing fluid to the exterior of the can, means for thereafter rinsing the cans, means for thereafter sterilizing the cans, and means for finally delivering a huge volume of drying air under pressure to the interior of the can.

4. An apparatus for cleaning large metal milk cans, com-

prising a projecting track in position to receive a can in inverted position, a cleansing nozzle in position to deliver a jet of cleansing fluid to the interior of the can on said projecting track, a valve for controlling the delivery of said nozzle, manually operated means for opening said valve, a passageway from said tank, said track extending through said passageway for conveying the cans along the same, means for delivering a large volume of washing fluid to the interior of the cans as they pass along said passageway, means for thereafter cleansing the cans, means for subsequently sterilizing the cans, and means adjacent the outgoing end of the passageway for delivering large volumes of air into the cans as they pass along.

5. An apparatus for cleaning large metal milk cans, comprising a track in position to receive a can in inverted position, a cleansing nozzle projecting in position to deliver a jet of cleansing fluid to the interior of the can on said track, a valve for controlling the delivery of said nozzle, manually operated means for opening said valve, a passageway from said tank, said track extending through said passageway for conveying the cans along the same, means for delivering a large volume of washing fluid to the interior of the cans as they pass along said passageway, means for thereafter cleansing the cans, means for subsequently sterilizing the cans, and means adjacent the outgoing end of the passageway for delivering large volumes of air into the cans as they pass along, combined with suction apparatus for accelerating the passage of said air through and from the passageway.

6. An apparatus for cleaning large metal milk cans, comprising a closed passageway for large milk cans, having its forward end downwardly inclined and provided with a discharge basin, means for delivering into the cans as they pass through said passageway a large volume of washing fluid under high pressure, spraying means for thereafter spraying a large volume of cleansing fluid into said cans, means for thereafter delivering into said cans a large volume of sterilizing steam and water, and means for delivering a large volume of air under high pressure into and around the cans.

7. An apparatus for cleaning large metal milk cans, comprising an overhanging support to receive the cans in inverted position, a rinsing jet under the control of the operator for delivering a powerful stream of water to the interior of the cans, a passageway leading from said overhanging support for receiving the cans, means adjacent the front end of said passageway for delivering a large volume of heated washing fluid to the interior of the cans as they proceed through said passageway, means for rinsing said cans, means for delivering sterilizing steam thereafter to said cans in said passageway, and means for thereafter delivering huge volumes of air under high pressure to said cans as they pass toward the outgoing end of said passageway.

8. An apparatus for cleaning large metal milk cans, comprising a support to receive the cans in inverted position, a rinsing jet under the control of the operator for delivering a powerful stream of water to the interior of the cans, a passageway inclosing said support for receiving the cans, means adjacent the front end of said passageway for delivering a large volume of heated washing fluid to the interior of the cans as they proceed through said passageway, means for rinsing said cans, means for delivering sterilizing steam thereafter to said cans in said passageway, means for thereafter delivering huge volumes of air under high pressure to said cans as they pass toward the outgoing end of said passageway, said support being lower and inclined at its back side at the outgoing end of the passageway for automatically tipping the cans for inspection.

9. In an apparatus of the kind described, means for cleaning and drying milk cans means for delivering the cleaned milk cans in an inverted up-turned position, comprising means for raising one side of said cans, means for the opposite side of said cans to lean against, said latter means having a downwardly and laterally inclined portion for causing the cans to roll into a horizontal position, and a pocket at the lower end of said inclined portion having its bottom downwardly inclined toward the rear for supporting said cans in position to be inspected.

10. In an apparatus of the kind described, means for cleaning and drying large milk cans, means for automatically inverting the cans into position to be inspected, consisting of means for supporting the cans in inverted upright position, means for tipping said cans, means cooperating therewith for causing said cans to roll gradually downward into a horizontal position, and means for receiving the horizontal cans and automatically raising their open ends into an upwardly inclined position.
- 10 11. In an apparatus of the kind described, the combination with a main passageway for receiving large milk cans, preliminary washing means at the entrance end of said passageway, and an inspection means at the outgoing end of said passageway, of an auxiliary smaller passageway
15 located at one side of said main passageway, having its entrance end terminating at the entrance end of the main passageway and its outgoing end adjacent said inspection means, whereby the operator is enabled to place the cans in one passageway and the covers in said auxiliary passageway at the entrance thereof, and place the covers taken
20 from the outgoing end of said auxiliary passageway upon the cans at said inspection part of the apparatus, said auxiliary passageway having washing means for washing the covers, sterilizing means for sterilizing the covers, and drying means for drying the covers as they pass through said
25 passageway.
- In testimony whereof, I have signed my name to this specification, in the presence of two subscribing witnesses.
- CHARLES H. HOOD.
- Witnesses:
M. J. SPALDING,
EDWARD MAXWELL.