Dec. 16, 1930. H. KRAUSE 1,785,352

CAN WASHING MACHINE

Filed March 8, 1928 4 Sheets-Sheet 1

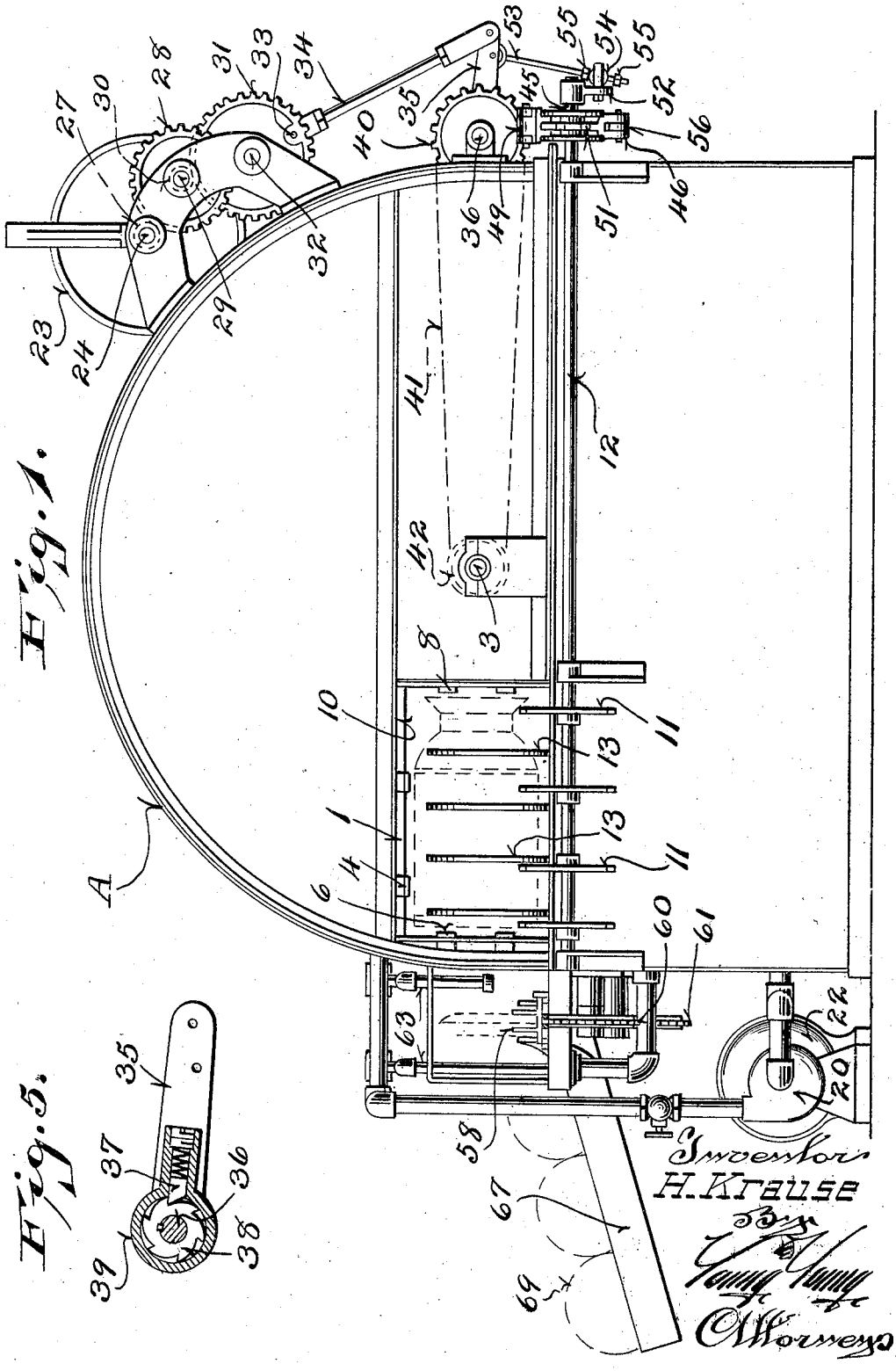


Fig. 1.

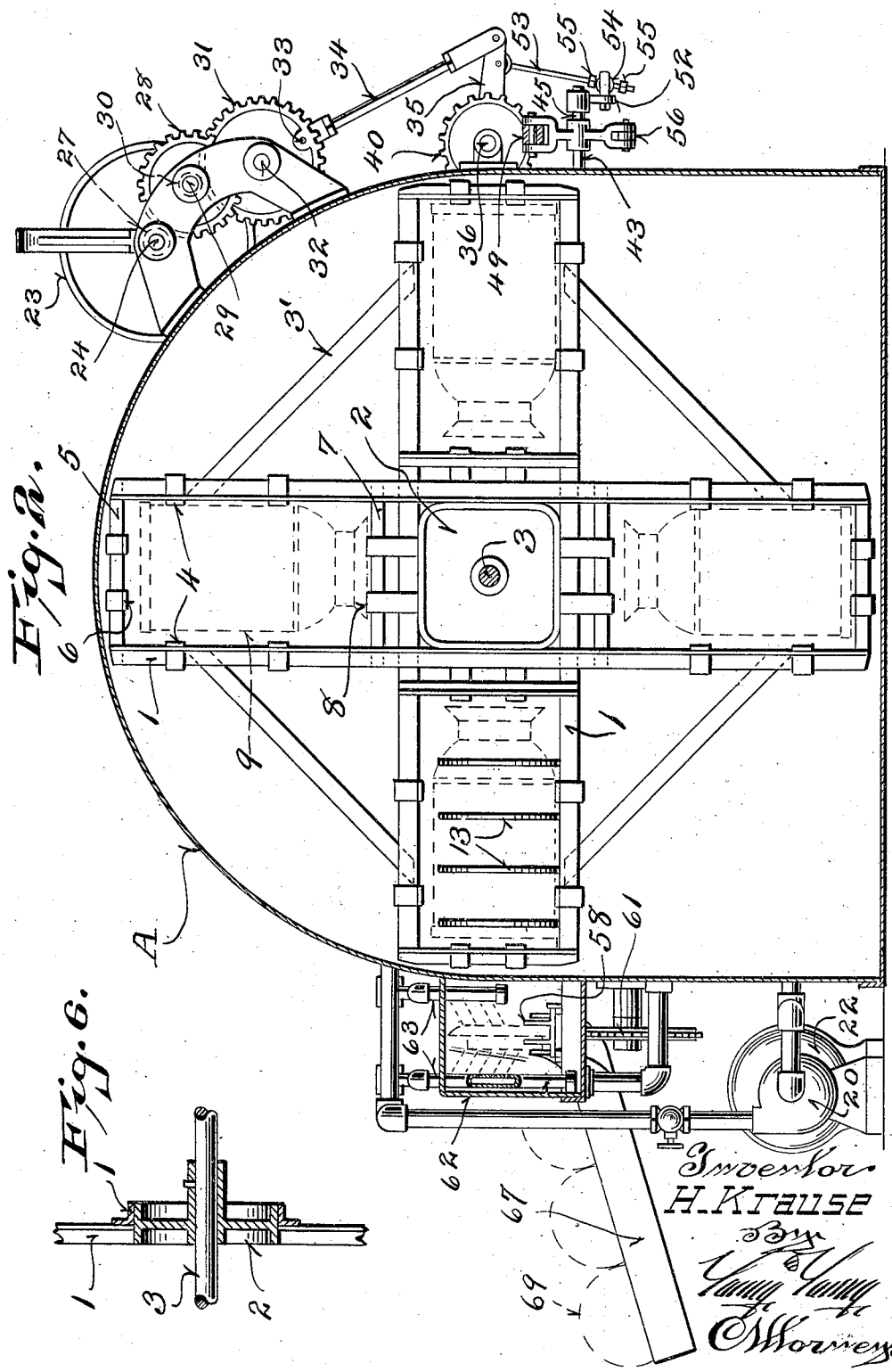
Fig. 5.

Inventor
H. Krause
By
Attorneys

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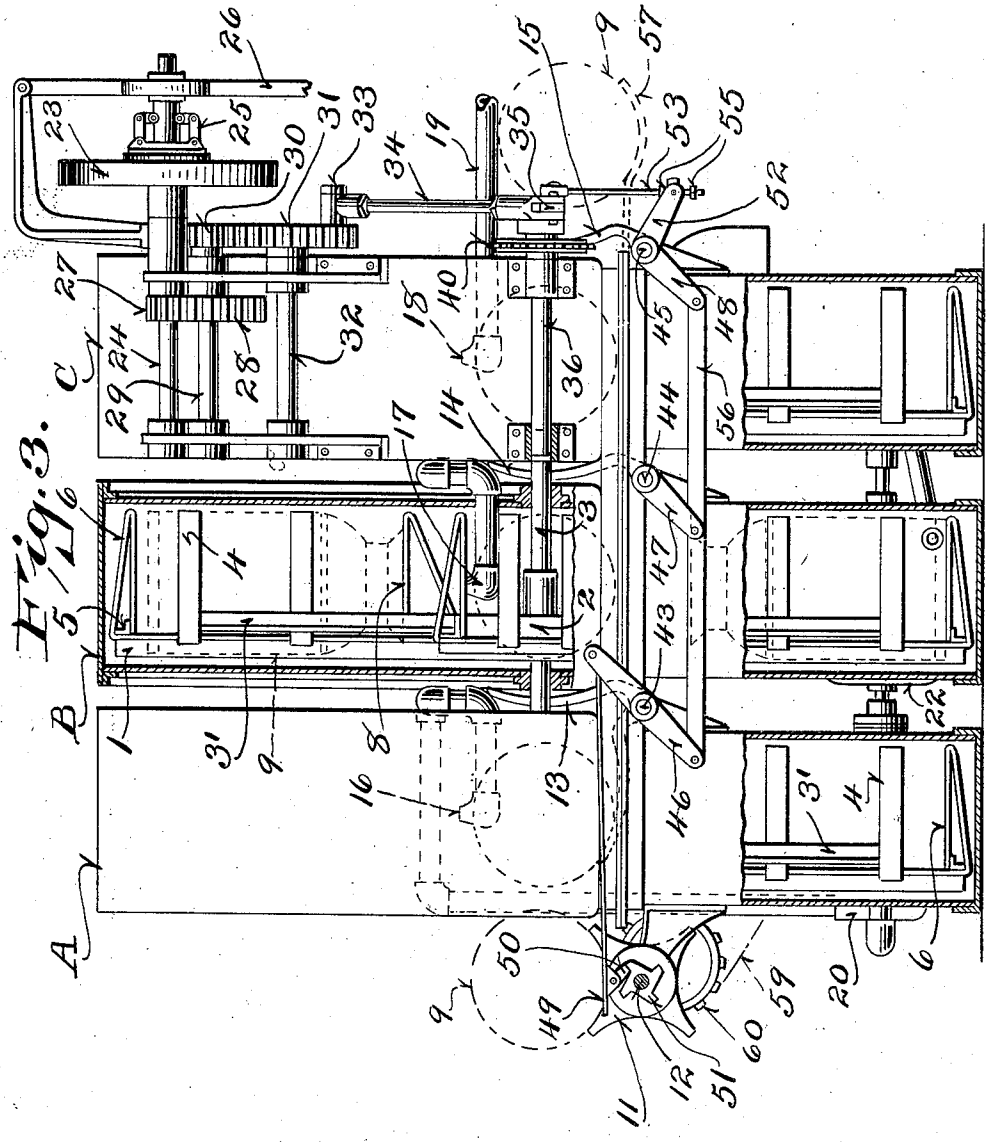


Fig. 3.

Inventor:
H. Krause
By
Attorneys

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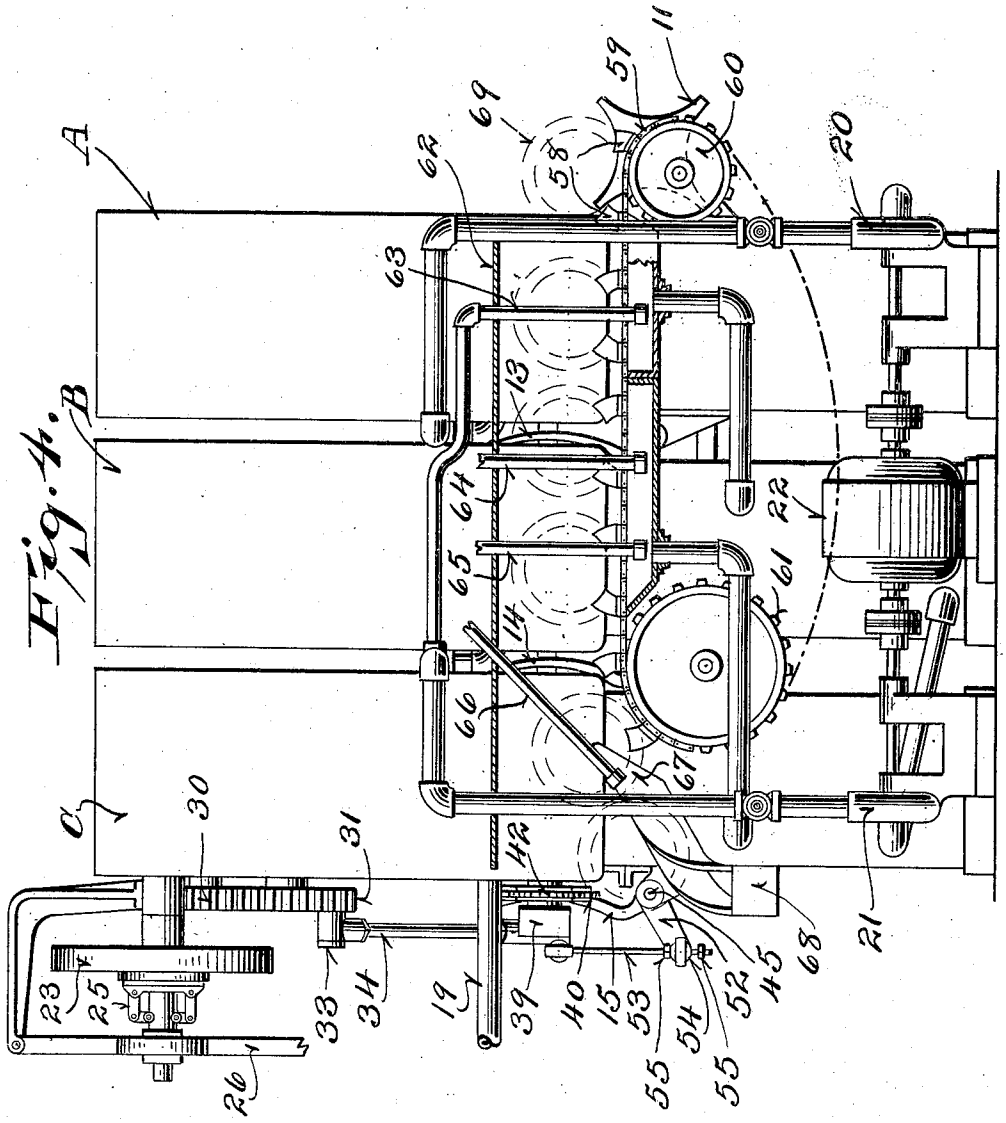


Fig. 4.

Inventor
H. KRAUSE
By
Attorneys

Patented Dec. 16, 1930 1,785,352

UNITED STATES PATENT OFFICE

HERMANN KRAUSE, OF MENOMONEE FALLS, WISCONSIN, ASSIGNOR TO STOUT MANUFACTURING COMPANY, OF MENOMONEE FALLS, WISCONSIN, A CORPORATION OF WISCONSIN

CAN-WASHING MACHINE

Application filed March 8, 1928. Serial No. 260,160.

This invention relates to can washing machines.

In washing cans, particularly milk cans, it has been found that these cans are frequently difficult to clean, as they have adhering matter both outside and inside, and as their restricted neck portions make it difficult for the operator to thoroughly clean them. It is well known that these cans are placed on railway station platforms, are sometimes set directly upon the ground in muddy localities, and also are frequently left uncovered after use, so that they are frequently very dirty and difficult to clean.

This invention has for its objects the provision of a machine for washing the milk cans thoroughly in a manner to dislodge any adhering material and subsequently completely sterilize the can both inside and outside in a highly effective and novel manner.

Further objects of this invention are to provide a can washing machine which not only sprays the cans, but also quickly submerges them so that the water rushes into the can in a violent manner and causes innumerable swirls and eddies in the can, thus insuring a complete and thorough washing of the can.

Further objects are to provide a machine which is adapted to simultaneously handle a large number of cans and so arranged that while one can is passing through one solution and one spray, another can is being operated upon in another solution, and so on, for any required number of treatments, the machine being so constructed that adequate time for draining is allowed between each of the soaking or rinsing operations without however in any way slowing up the operation of the machine, as the cans are continuously received by, and discharged from, the machine while others are being operated upon.

Further objects are to provide a machine which is adapted to wash the tops of the cans while the cans themselves are being cleaned, and which is so constructed that the tops may be passed in a continuous manner through the machine.

Further objects are to provide a machine in which a plurality of rotary cages are provided for receiving a plurality of cans and to provide mechanism for removing the cans successively from one cage, and successively passing the cans to and from other cages.

Further objects are to provide a very compact machine which although handling a large number of cans simultaneously, nevertheless occupies a very small space.

An embodiment of the invention is shown in the accompanying drawings in which:

Figure 1 is a front view of the machine;

Figure 2 is a view corresponding to Figure 1 with a portion of the casing sectioned off;

Figure 3 is a side view of the machine with portions cut away and in section;

Figure 4 is a side view of the machine taken from the opposite side shown in Figure 3 and with parts in section;

Figure 5 is a detail partly in section showing a portion of the mechanism;

Figure 6 is a sectional view through the hubs of one of the rotary frames.

Referring to the drawings, it will be seen that the machine comprises three main casings, A, B, and C. These casings, as is apparent from an examination of Figures 1 and 2, are formed with a curved upper portion preferably semi-circular, and with a rectangular bottom portion. The rectangular bottom portion of each casing is adapted to contain a liquid into which the cans are passed.

Within each of the casings, a rotary frame is positioned and is composed of a plurality of angle irons 1 which are rigidly secured to a hub 2, as brought out most clearly in Figures 2, 3, and 6. The hubs 2 are each rigidly mounted upon a main shaft 3 extending through the machine. The angle irons 1 form side bars for the rotary frames and are braced in any suitable manner as, for example, by means of the diagonal braces 3′ (see Figure 2). Further, each of the angle irons or bars is provided with projecting fingers 4 (see Figure 3) which are composed of folded metal strips, as indicated, and which are rigidly secured to these angle irons.

In addition to the structure thus far disclosed, the angle irons 1 are joined at their ends by means of cross members 5. These

cross members are similarly provided with projecting fingers 6 (see Figures 2 and 3). Adjacent the hub and spaced therefrom, there are other cross members 7 which are provided with fingers 8. The fingers are spaced apart a sufficient distance to loosely receive the cans indicated by dotted lines and by the reference character 9.

The front casing A is provided with an opening 10 through which the cans are received and similar openings are provided in the successive casings.

The cans are received upon star wheels 11 rigidly mounted upon a feeding shaft 12. This feeding shaft is given a quarter turn for each movement by mechanism hereinafter described. The star wheels thus form feeding members by means of which the cans are fed into the first compartment A. They are received in the rotary frame in a horizontal portion thereof, as is obvious from Figures 1 and 3. After the cans have passed through the solution contained in the compartment A, which may for instance be a pre-rinsing solution of any suitable type, that is to say, after the rotary frames have executed one complete revolution, the horizontally disposed can is discharged by means of fingers 13 (see Figure 3) into the next compartment and received by the horizontal portion of the frame in such compartment. In this compartment, the cans are passed through an alkaline or washing solution and after the frame has completed a revolution, the can is discharged from the compartment B into the compartment C by means of the fingers 14 (see Figure 3). After the cans have completed their trip through the hot water carried within the compartment C, they are removed from such compartment by means of the fingers 15, as shown in Figure 3, and are adapted to be lifted from the machine. If desired, the cans may be treated with a blast of hot air by any suitable means, not shown.

It is to be noted also that each compartment, A, B, and C, is provided with spraying means for spraying the interior of the can while the can is in vertical position. The spraying means may consist of the nozzles 16, 17, and 18, respectively, as shown in Figure 3.

The machine is so constructed that each of the rotary frames is completely filled with cans, and at the cessation of a quarter turn, the cans are quickly moved from one compartment to the next and a new can entered into the compartment A, and a completely cleaned can discharged from the compartment C. In this way, the machine operates upon a large number of cans simultaneously, although one can is fed into and one can is removed from the machine for each quarter revolution of the rotary frames.

Any suitable solution may be employed for any of the compartments. However, it may be found advantageous to employ scalding water in the compartment C and to furnish steam from any suitable source, as by means of the pipe 19 to the nozzle 18. An alkaline solution may be employed in the compartment B and a plain water pre-rinsing solution may be employed in the compartment A. The nozzle 17 is adapted to spray the alkaline solution into the interior of the can when it is in vertical position in the compartment B and the nozzle 16 is adapted to spray the pre-rinsing water or rinsing water into the interior of the can in vertical position in compartment A. These nozzles are supplied by means of pumps 20 and 21 (see Figure 4), such pumps being fed from the compartments A and B and being driven in any suitable manner as, for example, by means of the electric motor 22.

The driving mechanism for the machine as thus far described, may consist of any suitable power transmitting mechanism as, for example, the pulley 23 (see Figures 1 and 3) which is adapted to be rigidly connected to the shaft 24 by means of the clutch 25, such clutch being controlled by the hand lever 26 (see Figure 3). The shaft 24 carries a small pinion 27 which meshes with a gear 28 mounted on a jack shaft 29. The jack shaft 29 is provided with a pinion 30 which meshes with a gear 31 carried by the crank shaft 32. The crank may be formed by means of a pin or bolt 33 carried by the gear 31, as shown in Figure 3. This crank is connected by means of an adjustable pitman 34 with a lever 35 carried by a short rock shaft 36 (see Figures 1 and 3).

The lever 35 is loosely carried upon the rock shaft 36 and is provided with a spring pressed pawl 37 (see Figure 5). This pawl cooperates with a ratchet wheel 38 rigidly mounted upon the shaft 36 and housed within a casing 39 forming a portion of the lever 35. Thus, the rock shaft 36 is given a step by step rotary motion as the crank 33 rotates. This shaft 36 rigidly carries a sprocket wheel 40 (see Figure 1) which is connected by means of a chain 41 with a small sprocket wheel 42 rigidly carried by the main shaft 3. The ratio of the sprocket wheels 40 and 42 is such that for each complete motion of the rocking lever 35, the main shaft 3 is given a quarter turn. The parts of the machine are so related that the cans come to rest in the position indicated in Figure 2 for each quarter turn.

The mechanism for operating the fingers 13, 14, and 15 may consist of rock shafts 43, 44, and 45 (see Figure 3) upon which levers 46, 47, and 48 are rigidly mounted. The lever 46 extends above the rock shaft 43 and its upwardly projecting end is connected by means of a link 49 with a pawl 50. The pawl 50 engages a four tooth ratchet wheel 51 rigidly carried by the feeding shaft 12.

Further, it is to be noted that the rock shaft 45 carries an additional outwardly projecting lever 52 (see Figures 1 and 3) which is connected by means of a pitman or rod 53 with the lever 35. In view of the fact that the axis about which the levers 35 and 52 rock are at right angles, it is apparent that some means must be provided for permitting this connection by means of the pitman 53, as described above. The upper end of the pitman 53 may have a ball and socket joint connection with the lever 35 and the lower end of the pitman 53 may slide loosely through a spherical ball 54 supported from the lever 52. Further, the stroke of the pitman is greater than the stroke of the lever 52. It is preferable to provide a pair of spaced stops 55 upon the pitman 53 and upon opposite sides of the ball 54. In addition to this, this construction insures a very quick motion for the feed shaft 12 for each quarter turn.

It is to be noted that the levers 46, 47 and 48 (see Figure 3) are connected by means of the connecting rod 56 so that they are all simultaneously rocked and consequently simultaneous operation of the feeding shaft 12 and of the fingers 13, 14, and 15, is secured. If desired, the machine may be provided with outwardly projecting curved arms 57 (see Figure 3) to receive the discharged can. The operator lifts the discharged can from these fingers after each operation. Obviously, other means of receiving the discharged cans can be provided without departing from the spirit of this invention. The operator is merely required to place upon the star wheels 11 one can at a time and thereafter the machine feeds this can in at the appropriate time and the fingers 13, 14, and 15 operate to pass cans from one compartment to the next and to discharge one can from the last compartment. After the cans have been passed from one compartment to the other, the fingers 13, 14 and 15 will return to their operative positions during the time the frames are rotating so that when the vertical successive compartment is disposed in a horizontal position, the fingers will be beneath the cans in these compartments, finger 13 being shown in dotted lines in their operative position, so that the cans can be again moved forwardly as previously described.

It is apparent that if the operator fails to place a can upon the feed star wheels that no damage is done to the machine. In addition to this, it is impossible with this construction to simultaneously feed two cans into the machine at any one time. Thus, it is impossible to damage the machine by carelessness on the part of the operator.

The machine is also adapted to handle the can tops simultaneously with the cans, and these can tops are received between feet 58 of a continuous belt 59, such belt being carried by the sprocket wheels 60 and 61, and being driven in any suitable manner. The can tops pass through a compartment 62 (see Figure 4) and pass by the sprays formed in the pipes 63, 64, 65, and 66. The pipe 63 is fed with an alkaline solution from the pump 21. The pipe 64 is supplied with hot water from any suitable source. The pipe 65 is sprayed with steam from any suitable source and the pipe 66 is supplied with hot air from any suitable source adapted to dry the can tops. The can tops are received from the continuous conveyor 59 by means of the curved discharge trough 67. This curved discharge trough is provided with a closed end 68 against which the can tops roll, and by means of which they are held until removed by the operator. The operator can easily lift the can tops 69 from this discharge trough.

Further than this, in view of the fact that the conveyor projects beyond the machine (see the right hand side of Figure 4) it is also an easy matter for the operator to place the can tops upon the conveyor.

It will be seen that a novel form of can washing machine has been provided by this invention which is composed of a relatively small number of parts, which is easy to operate, which is substantially fool-proof, and which will secure a thorough and adequate washing of the cans.

Although the invention has been described in considerable detail, such description is intended as illustrative rather than limiting as the invention may be variously embodied and as the scope of such invention is to be determined as claimed.

I claim:

A can washing machine comprising a plurality of compartments adjacent to each other, a driven shaft extending substantially horizontally through said compartments, means for imparting rotation to said shaft at predetermined intervals, a rotary frame mounted on the shaft in each of said compartments, means for depositing cans on said frame in the end compartments at the feed end of the machine, means for moving cans from the frame in one compartment to the frame in the next succeeding compartment during the periods of rest of said frames, substantially horizontal fingers carried by each frame and positioned in pairs at each side and at each end of the cans carried by each frame for supporting the cans in said frame, and means for discharging the cans from the frame in the end compartment at the discharge end of the machine.

In testimony that I claim the foregoing I have hereunto set my hand at Menomonee Falls, in the county of Waukesha and State of Wisconsin,

HERMANN KRAUSE.