Oct. 31, 1933. C. F. McEWAN 1,932,593

CAN WASHING MACHINE

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Fig. 1.

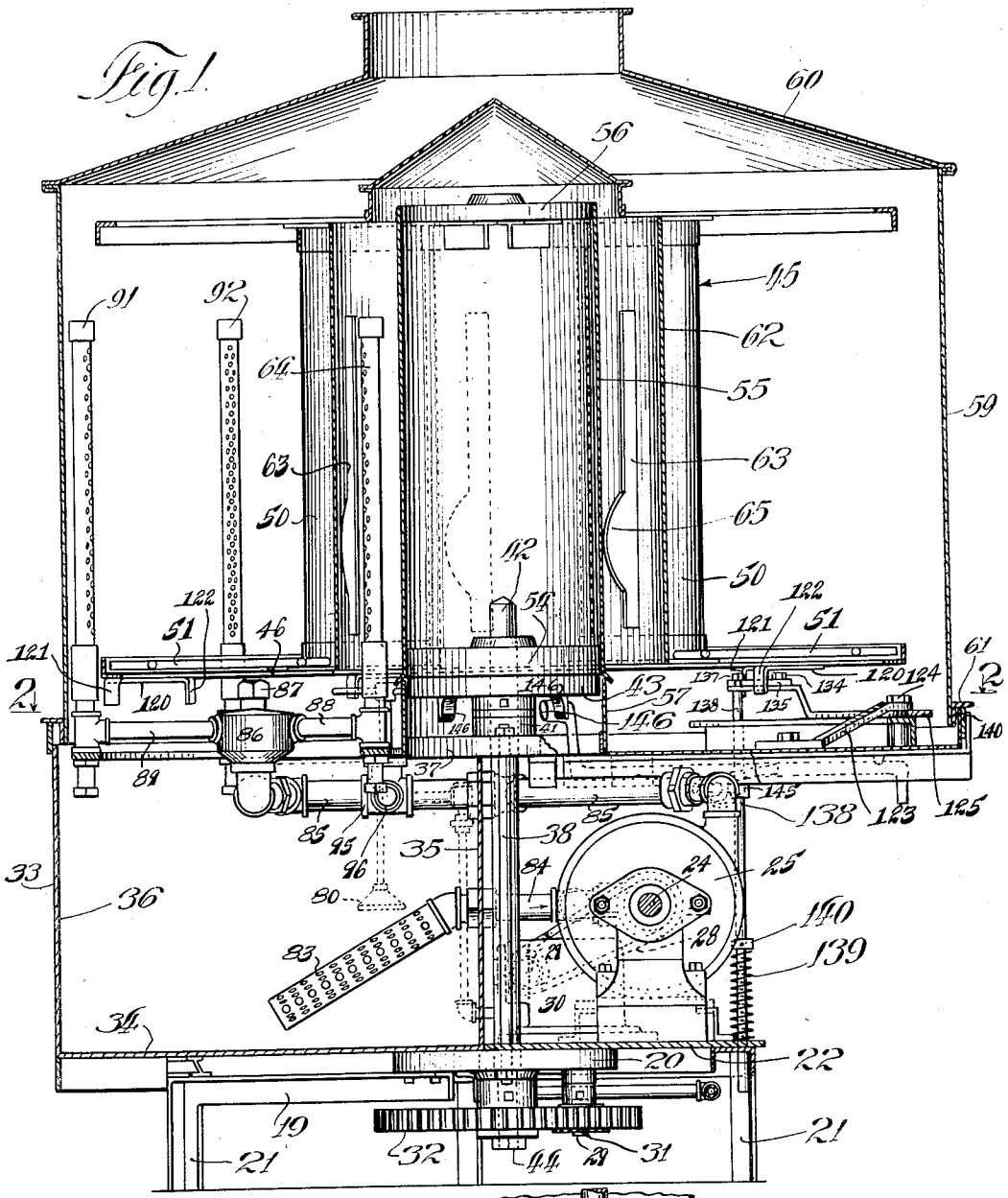
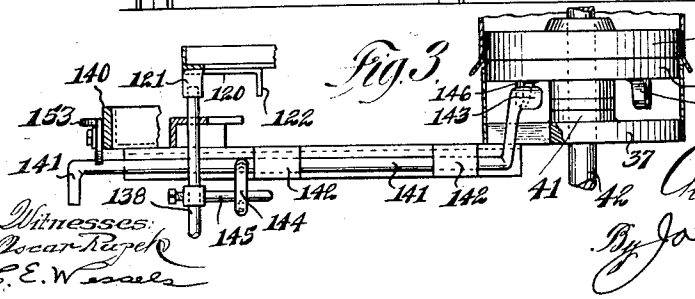


Fig. 3.



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CAN WASHING MACHINE

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Fig. 2.

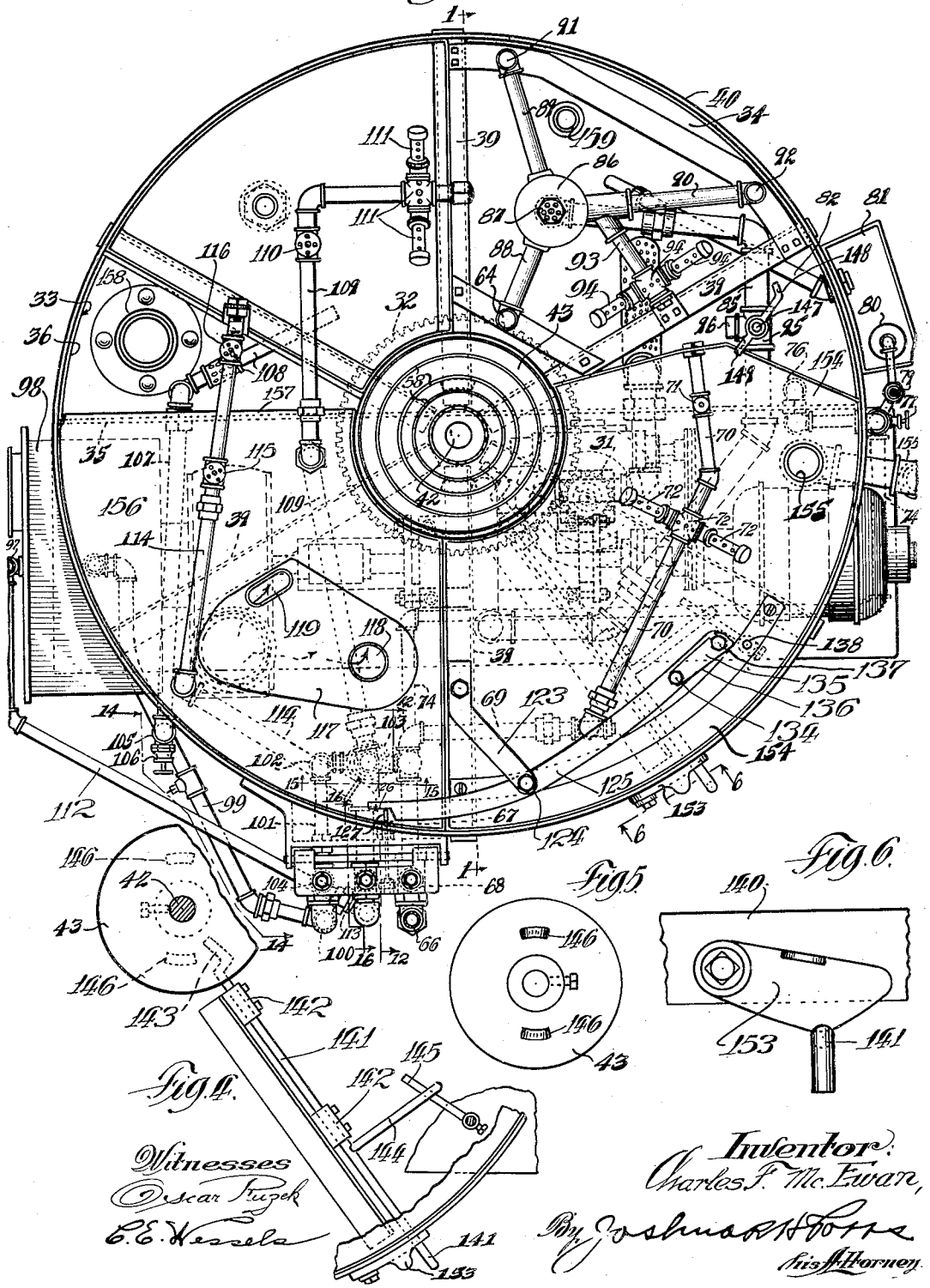


Fig. 4.

Fig. 5

Fig. 6.

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CAN WASHING MACHINE

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Fig. 7.

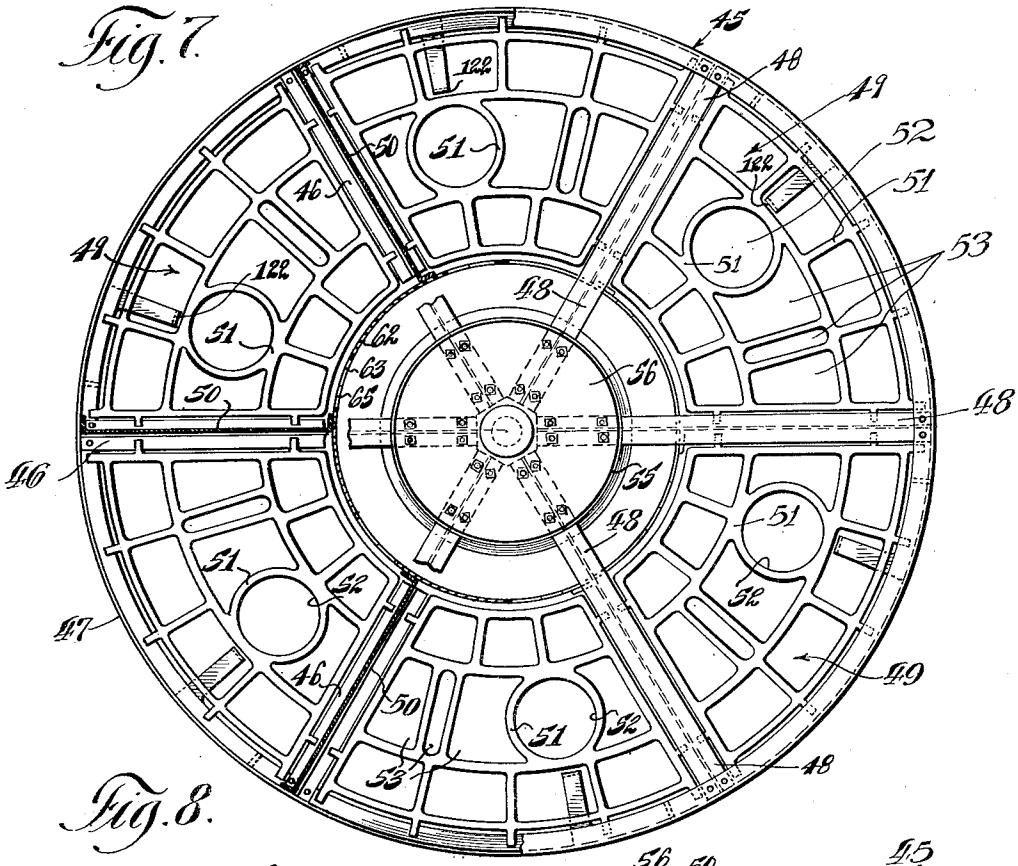
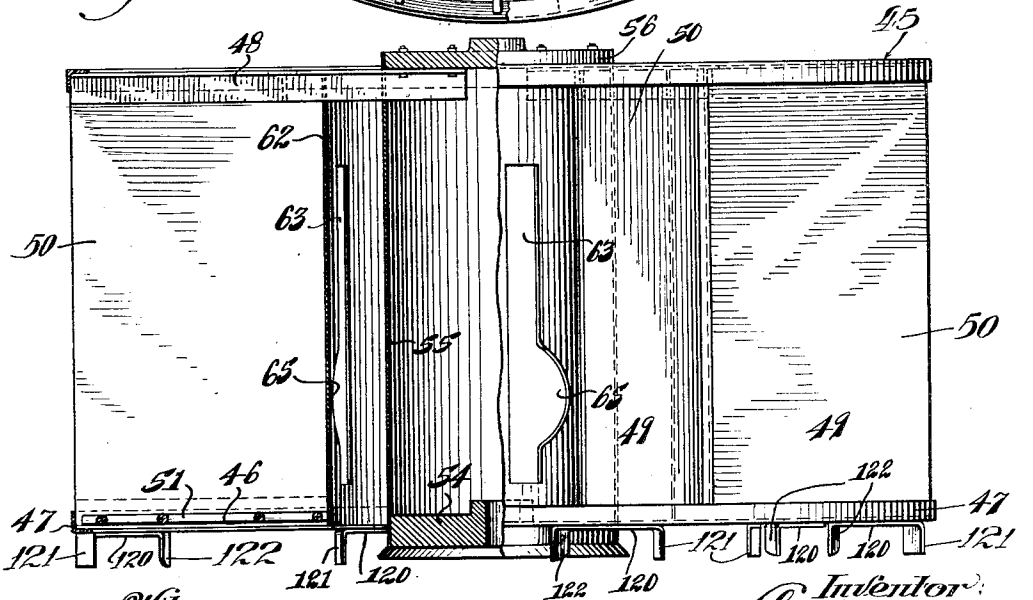


Fig. 8.



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CAN WASHING MACHINE

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Fig. 9

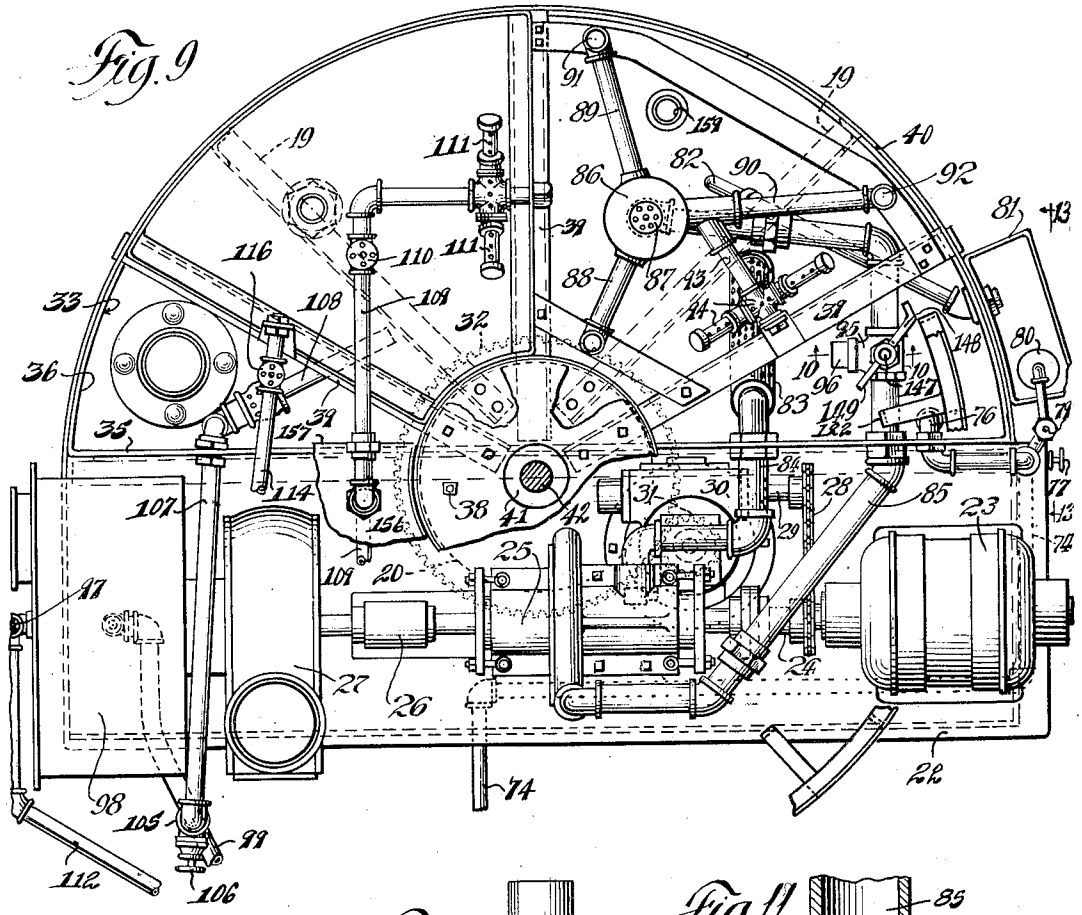


Fig. 10

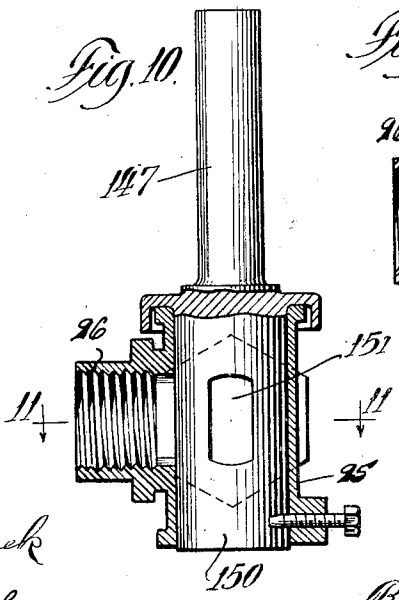
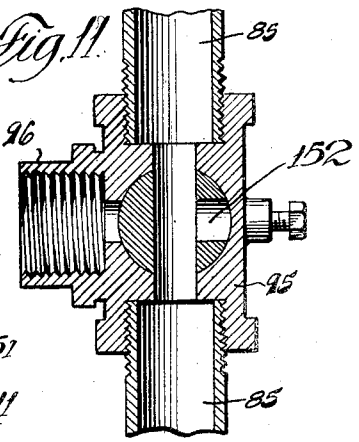


Fig. 11



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CAN WASHING MACHINE

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Fig. 12.

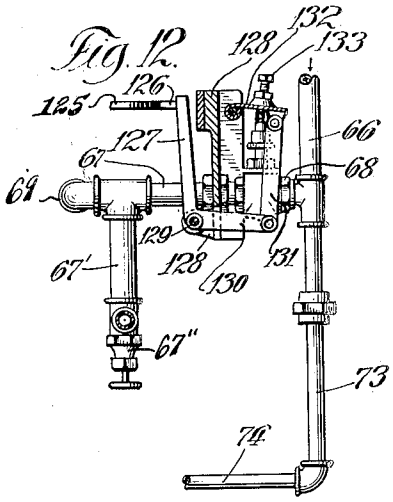


Fig. 14.

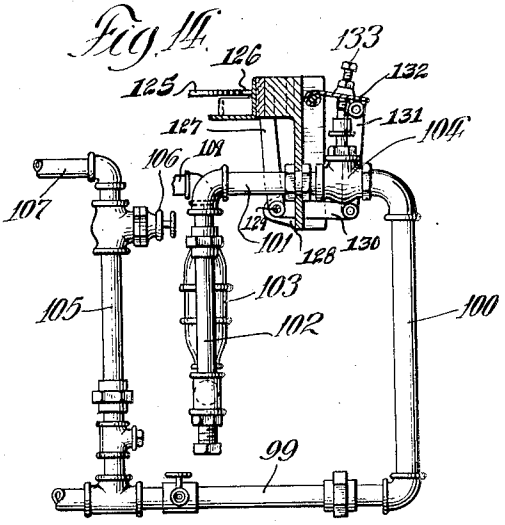


Fig. 16.

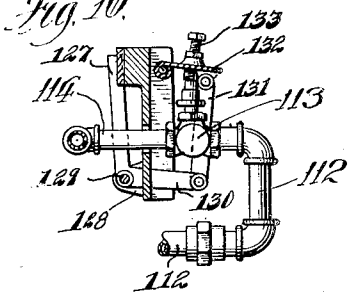


Fig. 15.

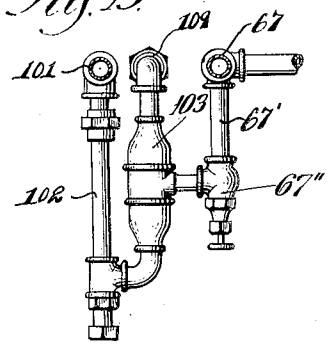
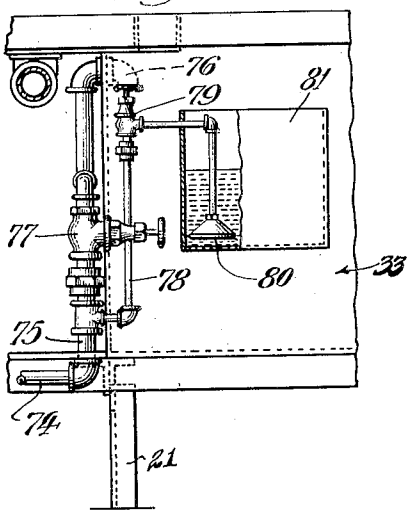


Fig. 13.



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UNITED STATES PATENT OFFICE

1,932,593

CAN WASHING MACHINE

Charles F. McEwan, Chicago, Ill., assignor to Harry D. Lathrop, Chicago, Ill.

Application December 27, 1929
Serial No. 416,964

4 Claims. (Cl. 141—7)

This invention relates to can washing machines of the type in which a plurality of cans of liquid containing receptacles are conveyed mechanically through the machine and successively subjected to a plurality of washing operations. An object of the invention is the production of a machine of this character, highly efficient and durable in use, and having novel mechanical constructions, operations and functions. A further object of the invention is the construction of the power driving mechanism in such manner that a plurality of power driving operations or functions are combined in a unitary structure employing but one driving motor. An additional object is the provision of a machine constructed and arranged to be automatic in its general operation, although incorporating a large number of divergent operations, all combining to produce a definite result.

Other objects will appear hereinafter.

The invention consists in the combinations and arrangements of parts hereinafter described and claimed.

The invention will be best understood by reference to the accompanying drawings forming a part of this specification, and in which:

Fig. 1 is a vertical sectional view, partly in elevation, of the machine;

Fig. 2 is a horizontal sectional view of the complete machine, taken substantially on the line 2—2 of Fig. 1;

Fig. 3 is an elevational view of the carriage releasing bar and cooperating mechanism, taken substantially on the line 3—3 of Fig. 2;

Fig. 4 is a plan view of the mechanism shown in Fig. 3;

Fig. 5 is a view of the bottom face of the drive disc;

Fig. 6 is a view of the release bar locking plate, taken substantially on the line 6—6 of Fig. 2;

Fig. 7 is a plan view of the traveling carriage adapted to support and convey the articles to be washed;

Fig. 8 is an elevational view, partly in section, of the carriage shown in Fig. 7;

Fig. 9 is a view similar to Fig. 2, with the upper carriage supporting structure and pans omitted;

Fig. 10 is a vertical sectional view of the soda solution relief valve, taken substantially on the line 10—10 of Fig. 9;

Fig. 11 is a plan view, taken substantially on the line 11—11 of Fig. 10;

Fig. 12 is a detail elevational view of the cold water valve control and connections, taken substantially on the line 12—12 of Fig. 2;

Fig. 13 is an elevational view of the soda solution dissolving mechanism, taken substantially on the line 13—13 of Fig. 9;

Fig. 14 is an elevational view of the valve operating mechanism for a steam supply line, taken substantially on the line 14—14 of Fig. 2;

Fig. 15 is a view of the steam and cold water mixing chamber to produce hot water, and pipe connections, taken substantially on the line 15—15 of Fig. 2; and

Fig. 16 is an elevational view of the steam sterilizing valve and connections, taken substantially on the line 16—16 of Fig. 2.

As illustrated in the drawings, the preferred embodiment of the machine comprises a base structure preferably composed of radially extending angle iron braces 19 connected to a centrally disposed circular plate 20 and supported by a plurality of legs 21. A transverse plate 22 is adapted to support the unitary driving mechanism for performing the various mechanical operations, which includes an electric motor 23 having a drive shaft 24. As shown in Fig. 9, drive shaft 24 is arranged to extend through and operate a cleansing solution pump 25, and continues through a bearing 26 for operative connection to hot air fan or blower 27. Keyed to shaft 24, adjacent motor 23, is a sprocket which carries sprocket chain 28 connected to a sprocket keyed to shaft 29 of a reduction gearing assembly 30, from which projects a downwardly extending drive shaft carrying drive pinion 31 arranged to mesh with drive gear 32, as shown in Fig. 1.

Disposed upon the supporting base structure is a semi-cylindrical cleansing solution receptacle or tank 33 having a bottom 34, a transverse inner wall 35, and a curved outer wall 36. Upon the upper portion of the supporting structure or base is a circular bearing plate 37, preferably connected to plate 20 by tie rods 38, and extending radially from plate 37 are a plurality of rib members 39, the outer extremities of which are upturned and welded to a circular band 40. Bearing plate 37, as shown in Fig. 1, has a reduced hub portion 41 having a cylindrical opening adapted to provide a bearing for vertically extending drive shaft 42, adjacent the upper end of which is keyed a circular driving disc 43, and the lower extremity of shaft 42 has driving engagement with gear 32 retained by nut 44.

The preferred embodiment of the apparatus disclosed is in the form of a rotary washing machine having a rotary can carriage 45 provided with lower radially extending angle brace members 46 connected at their outer ends to a circular

link 47, and upper radially extending braces or ribs 48. The carriage is divided into a plurality of can and cover receiving compartments 49, separated by vertical radially extending partitions 50, and each having a can and cover supporting grill or spider 51, each of which, as shown in Fig. 7, having an opening 52 adapted to register with the top of a can when placed in inverted position, and in order to register with spraying nozzles for the cover, as hereinafter described, openings 53 are provided for a cover to be placed adjacent the can.

Centrally disposed in the carriage 45 is a driven disc 54, the lower surface of which is adapted to frictionally engage the upper surface of driving disc 43, whereby the entire carriage is rotated by said frictional engagement through rotation of the disc 43 which rotates continuously while the machine is in operation, but this frictional engagement permits of periodical stoppage of the carriage for intermittent can washing operations as hereinafter described, and during such stationary or rest periods of the carriage, disc 43 slides upon disc 54 in its contact therewith. Disc 54 is provided with a centrally disposed opening through which shaft 42 extends and is adapted to rotate freely therein, and secured to the periphery of disc 54 is an imperforate cylindrical member 55, the upper extremity of which is welded or otherwise suitably secured to upper circular plate 56, to which in turn are connected the inner ends of radial rib braces 48. As shown in Fig. 1, the lower extremity of cylinder 55 is flared outwardly to clear a low cylindrical wall 57 secured to bearing plate 37, which construction and arrangement prevents the cleansing fluids from coming in contact with the driving mechanism. The upper surface of drive disc 43 is preferably provided with a plurality of circular oil grooves 58 to reduce wear.

Inasmuch as in the present embodiment a six-compartment carriage is provided, travel of the carriage is adapted to be arrested six times during a complete rotation thereof. During such periods the cans and covers are successively subjected to a cold water rinsing operation, a cleansing fluid wash, preferably by a soda solution, a hot water rinse, a steam sterilizing washing, and a hot air drying operation. At one station or rest a can and cover are removed and a can and cover to be washed placed upon the supporting grill. Superposed upon the stationary base structure is a cylindrical inclosing hood 59 having a conical cover 60 and preferably provided with a circular angle iron brace 61, the horizontal flange of which is adapted to rest upon band 40. Hood 59 entirely incloses the rotary carriage except for a door or opening disposed adjacent the loading and unloading station. Mounted upon the carriage 45 and adapted to form the inner partition of the compartments, is a cylindrical wall 62 provided with a vertical slot 63 for each compartment for successive registry with a vertically extending cleansing solution spray pipe 64, perforated to spray soda solution upon the adjacent exterior surface of a can. Pipe 64 preferably has a readily detachable connection, as by a bayonet slot joint, for example, and for access each vertical slot 63 has a cutaway portion 65.

The preliminary cold water rinse is received from cold water supply pipe 66 (see Fig. 12) having a branch pipe 67 in which is mounted control valve 68 of the push-stem type, adapted to be opened upon depression of the stem. Pipe 67 is connected by means of pipes 69 and 70 with a can spraying nozzle 71 adapted to register with an opening 52 in the carriage, and consequently, the mouth of a can in inverted position, and is also connected to cover spraying nozzles 72. A branch cold water supply pipe 73 leading from pipe 66 is connected by means of a transverse pipe 74 to pipe 75 which leads vertically to a discharging elbow 76 for maintaining the supply of water to the soda solution tank 33, the volume of supply being controlled by manually operated valve 77. Leading from pipe 75 is a small branch pipe 78 provided with manually operated valve 79 and adapted to supply cold water through a spray 80 disposed within receptacle 81 which contains soda. By this arrangement the soda is dissolved through the flow of water from spray 80 and the solution is carried from receptacle 81 through an overflow pipe 82 directly to the soda solution tank 33. In the present embodiment, the soda solution is pumped through a strainer 83 disposed within tank 33 through pipe 84 by means of pump 25 through supply pipe 85 to a distributor head 86 having a can interior spraying nozzle 87, pipe 88 which connects with vertically extending spray pipe 64, heretofore mentioned, and pipes 89 and 90 which connect with vertically extending perforated spray pipes 91 and 92, respectively, for spraying soda solution upon the exterior of a can. A branch pipe 93 is connected to cover spraying nozzles 94. Interposed in pipe 85, as shown in Fig. 9, is a relief valve 95 adapted to be operated through the medium of devices mounted upon the carriage, as hereinafter described. When the machine is in operation, the soda solution is continuously circulated by means of pump 25, and relief valve 95 is automatically operated as presently described for alternately directing fluid to the spraying nozzles and disconnecting communication to the spraying nozzles, and diverting the fluid through a short pipe connection 96 disposed above the tank 33 and adapted to return the solution thereto.

In the present machine, there are preferably two steam supply pipes. The first steam line is connected at 97 to the upper portion of a radiator 98, and after passing through said radiator is connected by means of a transverse pipe 99 and pipes 100, 101 and 102 to an injector water heater 103. The supply of steam to heater 103 is controlled by a push-stem valve 104 disposed in proximity to valve 68, as shown in Fig. 2. Cold water is supplied to the water heater 103 by branch pipe 67' leading from cold water pipe 67, and the volume of water to the heater regulated by valve 67''. Branching from steam pipe 99 is a vertical supply pipe 105 connected to hand operated control valve 106 and transverse pipe 107 to a discharge pipe 108 projecting within the soda solution in tank 33 for heating the solution to the desired temperature. The cold water supplied to the heater 103 is heated by the steam supply, and the hot water from said heater is conveyed through pipe 109 to can discharging nozzle 110 and cover discharging nozzles 111. Thus it will be seen that the hot water supply to these last mentioned nozzles is under the control of valves 68 and 104.

The second steam supply for a sterilizing bath is carried through supply pipe 112 to push-stem valve 113 and thence through pipe 114 to can discharging nozzle 116. The air supply for fan 27 is drawn into and heated by radiator 98, and is discharged into a distributor 117 having a can

registering opening 118 and a cover registering opening 119.

Mounted upon the underside of the carriage 45, adjacent the outer edge thereof, are a plurality of shoe members 120, preferably equal in number to the number of can and cover receiving compartments. Each shoe member 120 is provided with an outer depending lug 121 and an inner depending lug 122 disposed at a lesser radius. Pivotally mounted upon stationary bracket 123, as shown in Fig. 2, at 124, is a valve operating lever 125, one end of which is provided with a cutway portion 126 adapted to contact with arm 127 of a bell crank pivotally mounted on bracket 128 at 129 (see Fig. 12). The other arm 130 of said bell crank is pivoted to one end of link 131, the opposite end of which is pivotally connected at one edge of valve depressing plate 132, the opposite edge of which is pivoted to the upper portion of bracket 128. Adjacent the respective stems of valves 68, 104, and 113, is a set screw 133 threaded through plate 132 whereby to obtain a close adjustment in the valve stem operation. Pivotally mounted adjacent the opposite end of lever 125, at 134, is a cam plate 135 having an engaging surface 136 and adapted to be adjusted for regulating the swing of the lever by set screw 137. Mounted adjacent cam plate 135 is a vertically movable stop rod 138, normally maintained in elevated position by compression spring 139 disposed between collar 140 and plate 22, as shown in Fig. 1. In this position the upper extremity of rod 138 is in the path of the outer lug 121 of each shoe member 120. As shown in Figs. 3 and 4, a release bar 141 is mounted for rocking movement in brackets 142, and the inner end is provided with an offset portion 143 adapted normally to be maintained in the position shown in Fig. 1 by arm 144 mounted on bar 141, having contact with a laterally extending arm 145 mounted on rod 138. Offset portion 143 is normally disposed in the path of two depending cam members 146 mounted on the under surface of disc 43, as shown in Fig. 1, which are arranged diametrically opposite. Mounted on the upper end of stem 147 of the soda solution relief valve 95 is an operating arm having one portion 148 adapted to be successively engaged by each lug 121 of shoe members 120, and a second portion 149 adapted to be similarly and successively engaged by the respective lugs 122. The core 150 of valve 95 has a transverse port 151 which, in the positions shown in Figs. 9 and 10, offers communication directly to the spraying nozzles and pipes. Extending laterally from port 151 is a port 152, and when the valve stem is rotated in a clockwise direction from the positions shown in Figs. 9 and 11 by means of engagement of a lug 122 with portion 149, communication with the nozzles is closed and the soda solution supply is diverted through the short discharge pipe 96 for return to the tank. A locking plate 153 may be pivoted to the band 40, as shown in Fig. 6, for engagement in notches provided in bar 141. Disposed beneath the loading station, adjacent the hood door and extending beneath the cold water spraying nozzles 71 and 72, is a drain pan 154 having a suitable drain outlet 155, and similarly disposed beneath the steam sterilizing discharge nozzles 115 and 116 and extending beneath the hot air discharge openings 118 and 119, is a drain pan 156 having a downwardly inclined edge 157 adapted to drain the liquid from the condensed steam into tank 33. Tank 33 is provided with a suitable overflow drain 158, and may also be provided with a drain 159 in the bottom 38 for draining the entire contents of the tank.

From the foregoing description the general operation will be apparent, but in amplification, although the lower disc 43 is adapted to continuously rotate during operation of the machine, the traveling carriage is brought to rest upon each contact of a lug 121 with the upper extremity of rod 138, as shown in Fig. 1. The speed of the machine is regulated so that this rest period is of sufficient duration to permit a cleansed can and cover to be removed through the hood door and a can and cover inserted in a compartment for conveyance through the machine. Simultaneous with this intermittent halting of the carriage, the inner edge of the lug 121, which contacts with rod 138, is brought in sliding contact with cam plate 135, causing lever 125 to be swung so as to depress plate 132 and cause the opening of valves 68, 104 and 113, whereby during each rest period the cold water, hot water and steam supplies are opened and these cleansing fluids discharged through the respective nozzles. Also in this rest position the lug 121, immediately in advance of that in contact with rod 138, is in contact with arm portion 148 on valve 95, thus opening communication between the soda solution supply pipe 85 and the soda solution spraying devices. This rest period is maintained until a cam member 146 contacts with the offset portion 143 on release bar 141, whereupon rod 138 is depressed by engagement of arms 144 and 145, allowing the carriage to resume its travel by reason of the frictionally engaging discs. During the initial travel lug 122 of the shoe member 120 adjacent the relief valve 95 contacts with portion 149 of the soda solution relief valve 95, thus rotating the stem so as to divert the soda solution to the containing tank, and upon disengagement of the next following lug 121 with cam plate 135, valves 68, 104 and 113 are closed by compression springs within the valves. The travel continues until the next lug 122 contacts with stop rod 138, whereupon the operation is repeated. In the present embodiment of the machine the duration of the alternating travel or conveying periods is less than that of the washing periods, but it will be apparent to those skilled in the art that these alternating periods may be varied as desired. The invention is embodied in a machine, positive and automatic in operation, and utilizing but a single source of power, with the various mechanisms combined to produce the utmost efficiency in a machine of this character.

While I have illustrated and described the preferred form of construction for carrying my invention into effect, this is capable of variation and modification without departing from the spirit of the invention. I, therefore, do not wish to be limited to the precise details of construction set forth, but desire to avail myself of such variations and modifications as come within the scope of the appended claims.

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

1. A machine of the character described, comprising, in combination, a traveling carriage adapted to convey articles to be subjected to cleansing operations, said carriage provided with an inner wall and an outer wall, and a spray pipe disposed between said walls, one of said walls

provided with an opening for the discharge of cleansing solution from said spray pipe.

2. A machine of the character described, comprising, in combination, a traveling carriage adapted to convey articles to be subjected to cleansing operations, said carriage provided with an inner wall and an outer wall, a plurality of object receiving compartments; and a spray pipe disposed between said walls, one of said walls provided with an opening for the discharge of cleansing solution from said spray pipe.

3. A machine of the character described, comprising, in combination, a traveling carriage adapted to convey articles to be subjected to cleansing operations, said carriage being provided with an inner wall and an outer wall, a spray pipe disposed between said walls, pump means for supplying a cleansing fluid to said pipe, drive means for operating said carriage, and a power unit adapted to operate said pump and drive means, one of said carriage walls being provided with an opening for the discharge of cleansing solution from said spray pipe.

4. A machine of the character described, comprising, in combination, a traveling carriage adapted to convey articles, said carriage being provided with an inner wall and an outer wall, a conduit disposed between said walls and equipped with a discharge opening, pump means for supplying a fluid to said conduit, and driving means for operating said carriage, said carriage being provided with a plurality of object-receiving compartments and one of said carriage walls being provided with an opening for the discharge of said fluid from said conduit.

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