Oct. 13, 1942. J. H. GORDON, JR 2,298,289

COATING MACHINE

Filed Aug. 27, 1940 3 Sheets-Sheet 1

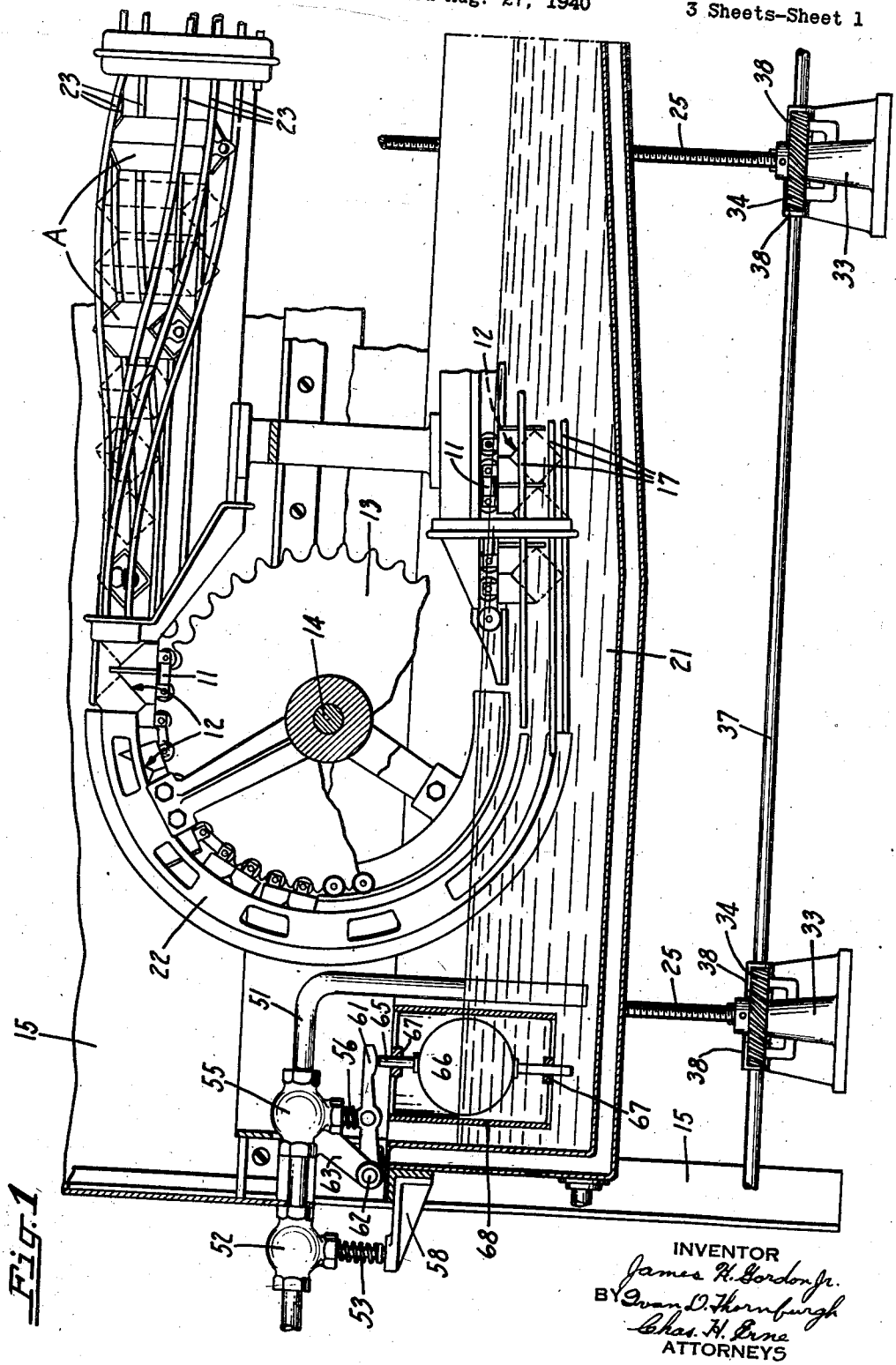


Fig. 1

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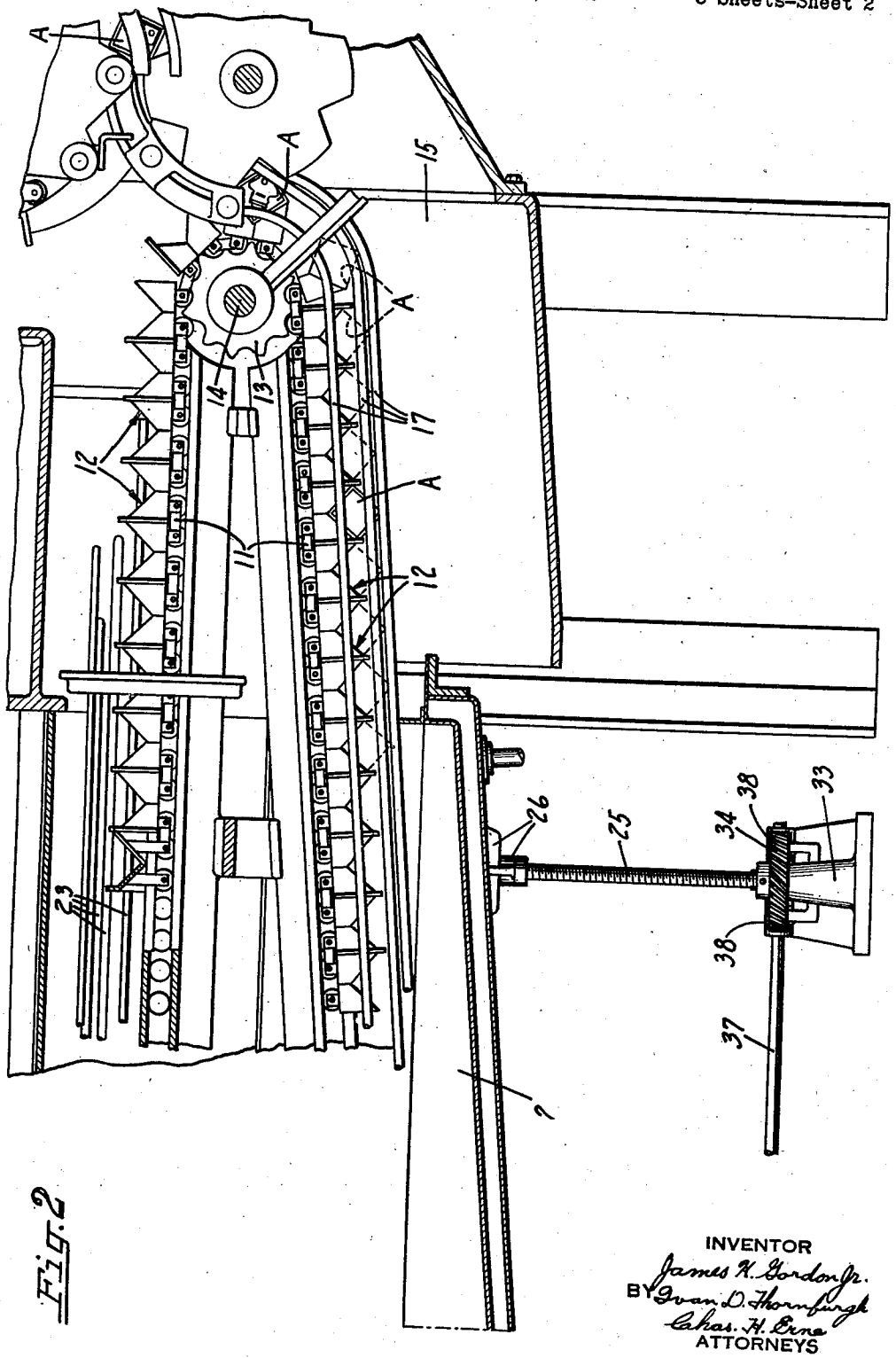


Fig. 2

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Fig. 3

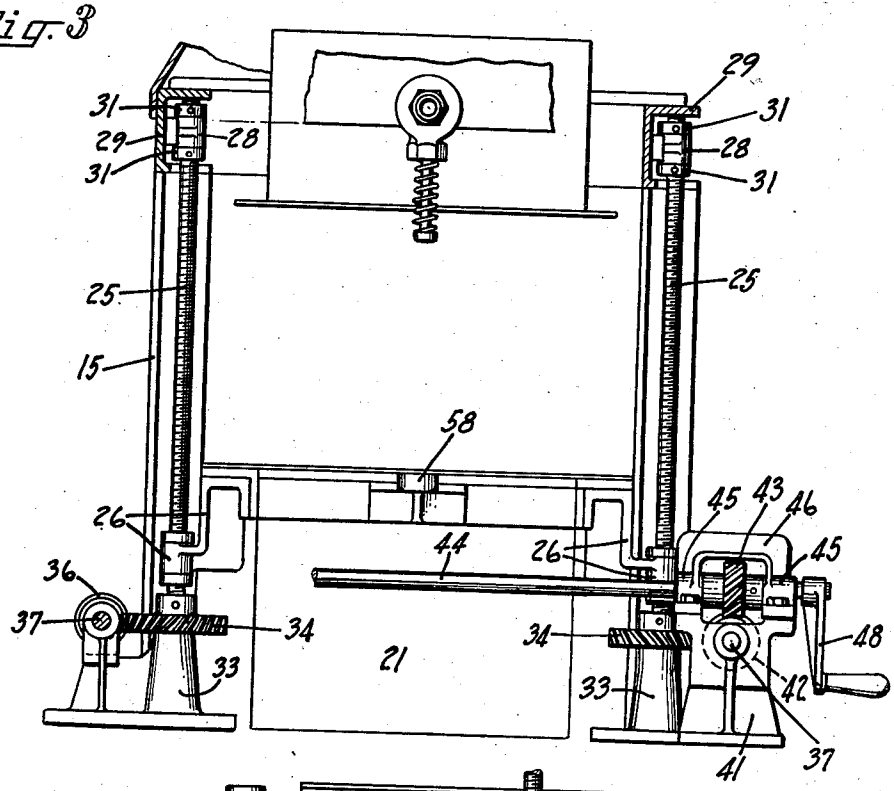
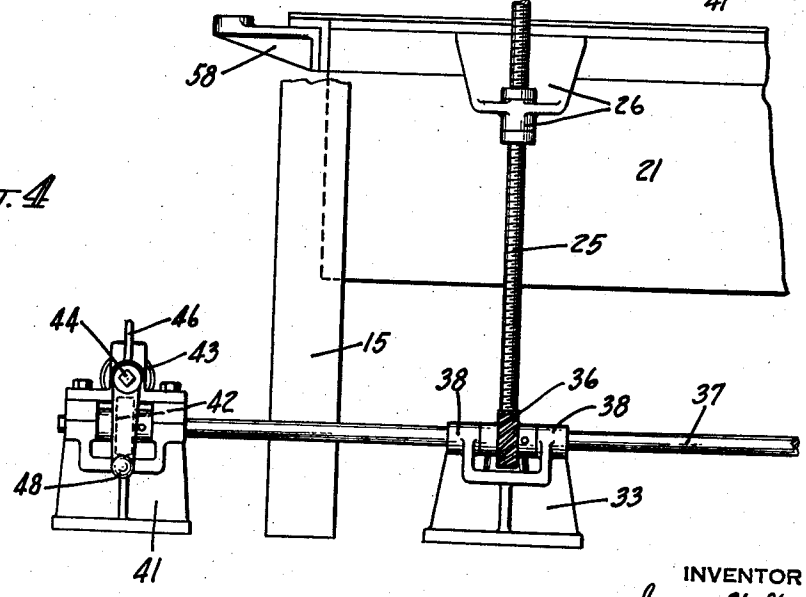


Fig. 4



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UNITED STATES PATENT OFFICE

2,298,289

COATING MACHINE

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Application August 27, 1940, Serial No. 354,416

7 Claims. (Cl. 91—46)

The present invention relates to coating machines of the character in which fibre containers to be coated are immersed in a bath of liquid coating material contained in a tank and has particular reference to shifting the tank into and out of place in the machine so that the tank may be readily cleaned when desired.

In coating machines of considerable size the immersion tank which holds the coating material sometimes extends for twenty five or thirty feet along the machine. Such tanks are of considerable weight and are usually of a permanently built-in character. However, where it is necessary to frequently clean the tank this built-in feature is sometimes a disadvantage in that it is difficult to clean around the conveyor and other parts of the machine which are usually located in the tank.

The instant invention contemplates overcoming this difficulty by providing an elevator mechanism for the tank so that it may be readily lowered and spaced away from the machine parts located therein for cleaning and may be returned again with ease.

An object therefore of the invention is the provision in a coating machine having a tank which holds the coating material of devices which allows for the tank being readily lowered away from its normal position in the machine so that it will be clear of machine parts located in the tank and thus will be free to facilitate cleaning of the tank.

Another object is the provision of liquid cut-off devices in such a machine in which the coating material in the tank is maintained at a constant level so that the flow of the coating material into the tank will be automatically cut off when the tank is lowered away from its normal operating position in the machine.

Numerous other objects and advantages of the invention will be apparent as it is better understood from the following description, which, taken in connection with the accompanying drawings, discloses a preferred embodiment thereof.

Referring to the drawings:

Figure 1 is a longitudinal section through one end of a coating machine embodying the instant invention, with parts broken away;

Fig. 2 is a similar view of the opposite end of the machine, with parts broken away;

Fig. 3 is an end elevation of the machine as viewed from the left in Fig. 1, with parts broken away and parts shown in section; and

Fig. 4 is a fragmentary side elevation as viewed from the right in Fig. 3, with parts broken away.

As a preferred embodiment of the instant invention the drawings illustrate principal parts of a coating machine in which rectangular fibre milk containers A of the character disclosed in United States Patent 2,085,979, issued July 6, 1937, to J. M. Hothersall, are coated exteriorly and interiorly with a coating of paraffin wax.

In such a machine the containers are carried along a predetermined path of travel in a horizontal position on an endless chain conveyor 11 (Figs. 1 and 2) having carrier pockets 12 in which the containers are located. The conveyor operates over a pair of spaced sprockets 13 which are located one at each end of the machine and which are mounted on shafts 14 journaled in suitable bearings formed in a structural steel frame 15 which constitutes the main frame of the machine. One of the shafts 14 is the driving shaft and this may be rotated in any suitable manner in time with the other moving parts of the machine.

The containers A first move with the conveyor 11 along its lower run while guide rails 17 disposed adjacent the conveyor retain the containers in their pockets 12. Along this run the conveyor carries the containers down into a tank or reservoir 21 which contains the liquid coating material and thus immerses the containers so that their walls are entirely covered with the coating both exteriorly and interiorly.

After immersion the containers are carried up out of the reservoir, around the sprocket 13 shown in Fig. 1 and thence along the upper run of the conveyor. Guide rails 22, 23 disposed adjacent the sprocket and the upper run of the conveyor retain the containers in their pockets 12 at such a time. In traveling along this run of the conveyor the containers are rocked in their pockets to drain the excess coating material. This is preferably effected by twists in the guide rails 23. When the coated and drained containers arrive adjacent the sprocket 13 in Fig. 2 they are discharged for further treatment.

In order to facilitate cleaning of the tank when such is necessary the tank 21 is supported on a plurality of vertically disposed elevator screws 25 which are located at spaced intervals along both longitudinal sides of the tank so that the tank may be readily lowered away from its normal operating position. These screws are threaded into bearing nut brackets 26 which are bolted onto the tank. The upper ends of the screws are not threaded and are carried in bearings 28 which are secured to longitudinal beams

29 which form a part of the machine main frame 15. Collars 31 pinned to the screws on each side of the bearings 28 hold the screws against displacement from the bearings.

The lower ends of the elevator screws 25 are carried in stationary bearing blocks 33 which may rest on the floor or on a base of the machine. These ends of the screws carry helical gears 34 which are pinned to the screws and which rest on top of the bearing blocks 33. The gears mesh with helical pinions 36 which are carried on and keyed to operating shafts 37 which extend the full length of the tank. There are two of these operating shafts located one on each side of the tank and they are carried in bearings 38 formed as a part of the bearing blocks 33. There are two bearings 38 in each bearing block and they straddle the helical pinions 36 for each elevator screw 25 so that the pinions will be held against displacement along the shafts.

The outer ends of the shafts 37 as shown in Fig. 4 are carried in bearing brackets 41. There is one of these brackets for each shaft. Within the brackets the shafts carry helical gears 42 which mesh with similar gears 43 keyed to the outer ends of a cross shaft 44. The ends of this cross shaft are carried in bearings 45 formed in a yoke 46 bolted to the bearing brackets 41. One end of the shaft is formed with a square section for the reception of a crank handle 48.

Hence by manually turning the crank handle 48, the cross shaft 44 is rotated and this through the meshing helical gears 42, 43 rotates both of the operating shafts 37 in unison. Rotation of the operating shafts 37 revolves the elevator screws 25 and this causes the bearing nut brackets 26, which are secured to the tank 21, to travel along the length of the screw. Hence when the crank handle 48 is actuated in the proper direction the tank 21 may be lowered from its normal operating position shown in Figs. 1, 2 and 4 to a position adjacent the floor as shown in Fig. 3. In this lowered position the tank is clear and free of the conveyor parts which normally operate within it and thus the tank as well as the conveyor and other parts may be cleaned readily and without difficulty and without interfering with the other parts of the machine.

The coating material in the tank 21 when the latter is in its normal operating position, is introduced into the tank by way of an inlet pipe 51 (Fig. 1) and is maintained at a constant level by a regulator device. The inlet pipe leads from any suitable source of supply of the coating material. Control of the flow of coating material through the pipe is effected by a normally closed cut-off valve 52 having a spring held valve stem 53 and a normally open flow control valve 55 having a spring held valve stem 56. These valves are connected into the inlet pipe line.

The normally closed valve 52 is held open while the tank is in normal operating position by a bracket 58 which is secured to the end of the tank. This bracket engages the valve stem 53 and holds it up against the resistance of its spring. The open valve thereby permits the coating material to flow through the pipe 51 to the valve 55.

The valve stem 56 of the valve 55 is connected to an operating arm 61 having one end mounted on a pivot pin 62 carried in a lug 63 on the valve. The opposite end of the operating arm extends above and is normally engaged by the upper end of a rod 65 which carries a float 66 disposed in the coating material in the tank. The rod is carried in a pair of spaced bearings 67 formed in a shell bracket 68 secured to the inside of the tank.

Hence as the level of the coating material in the tank rises and falls, the float 66 rises and falls with it and thus moves the float rod 65 up or down, as the case may be, within its bearings 67. When the rod moves up it pushes the valve operating arm 61 upwardly and this shifts the valve stem 56 against the resistance of its spring and closes the valve 55 and cuts off the flow of the coating material into the tank.

When the float rod 65 moves down with the float 66 it recedes from the valve operating arm 61 and the spring on the valve stem thus pushes the stem downwardly and thus opens the valve to permit the coating material to flow into the tank and thereby bring the level of the material up to its normal predetermined height. In this manner the coating material in the tank is maintained at a constant predetermined level.

When the tank 21 is lowered for cleaning as hereinbefore explained, the float 66 moves down with the tank and this permits the valve 55 to open to its full extent. The flow of coating material into the tank however, is immediately cut off by the valve 52 so that the tank will be prevented from being flooded. This is brought about by the bracket 58 which also moves down with the tank and thus moves away from the valve stem 53. This permits the spring on the valve stem to shift the valve stem and close the valve 52. The flow of coating material is thereby cut off until the tank is again raised into its normal operating position as shown in Fig. 1.

It is thought that the invention and many of its attendant advantages will be understood from the foregoing description, and it will be apparent that various changes may be made in the form, construction and arrangement of the parts without departing from the spirit and scope of the invention or sacrificing all of its material advantages, the form hereinbefore described being merely a preferred embodiment thereof.

I claim:

1. In a machine for coating fibre containers, the combination of a tank for retaining liquid coating material, elements for introducing the coating material in a flowing stream into the tank, devices for shifting the tank into and out of operative position to facilitate cleaning of the tank and other parts, and means for cutting off the flow of the coating material into the tank when the latter is shifted out of operative position, said means being actuated by movement of said tank from operative to inoperative position.

2. In a machine for coating fibre containers, the combination of a tank for retaining liquid coating material, elements for introducing the coating material in a flowing stream into the tank, regulator instrumentalities controlling the flow of the coating material into the tank for maintaining it at a constant level in the tank, devices for shifting the tank into and out of operative position to facilitate cleaning of the tank, and means for cutting off the flow of the coating material into the tank when the latter is shifted out of operative position, said means being actuated by movement of said tank from operative to inoperative position.

3. In a machine for coating fibre containers, the combination of a tank for retaining liquid coating material, an inlet pipe for introducing the coating material into the tank in a flowing

stream, a cut-off valve in said inlet pipe, devices for shifting the tank into and out of operative position to facilitate cleaning of the tank and adjacent parts, and means connected with said tank for holding said valve open when the tank is in operative position and for effecting closure of said valve when the tank is shifted out of operative position.

4. In a machine for coating fibre containers, the combination of a tank for retaining liquid coating material, an inlet pipe for introducing the coating material into the tank in a flowing stream, a cut-off valve in said inlet pipe, a flow control valve also in said inlet pipe, a float in said tank for opening and closing said control valve to maintain a predetermined level of coating material in the tank, devices for shifting the tank into and out of operative position, and means connected with said tank for holding said cut-off valve open so that the control valve will function when the tank is in operative position and for effecting closure of said cut-off valve to render said control valve ineffective when the tank is shifted out of operative position.

5. In a coating machine, the combination of a tank for retaining liquid coating material, a conduit for introducing coating material into said tank, a valve in said conduit to open or close same, means for shifting said tank into and out of operative position, and means associated with said valve whereby the same is closed when said tank is shifted from operative to inoperative position.

6. In a coating machine, the combination of a tank for retaining liquid coating material, a conduit for introducing coating material into said tank, a valve in said conduit to open or close same, means for shifting said tank into and out of operative position, and means associated with said valve whereby the same is closed when said tank is shifted from operative to inoperative position, a second valve in said conduit and a constant liquid level means connected to said second valve.

7. In a coating machine, the combination of a tank for retaining liquid coating material, a conduit for introducing coating material into said tank, a valve in said conduit to open or close same, means for shifting said tank into and out of operative position, and means associated with said valve whereby the same is closed when said tank is shifted from operative to inoperative position, a second valve in said conduit and a constant liquid level means connected to said second valve, both of said valves and said constant level means being supported in a stationary position, whereby said tank may be easily cleaned when moved to inoperative position.

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