March 26, 1935. J. H. CLARK 1,995,636

WASHING APPARATUS

Filed June 14, 1933

Fig. 1.

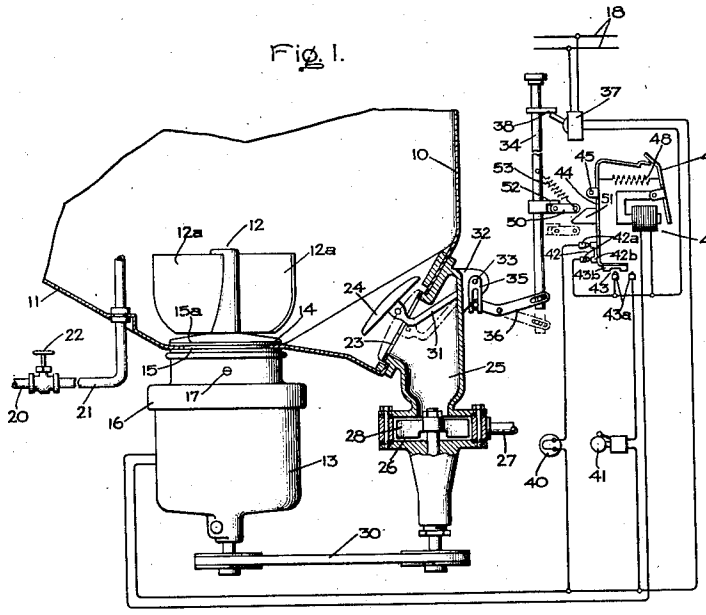



Fig. 4.

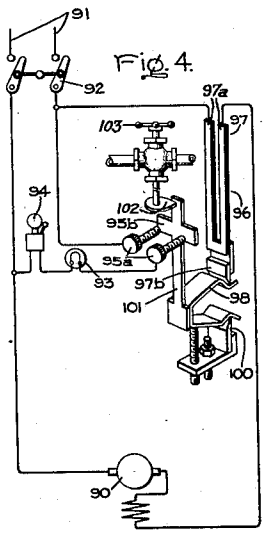



Fig. 2.

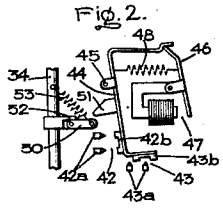
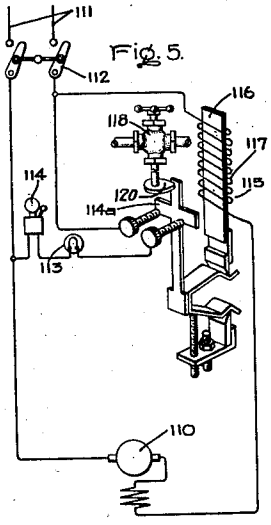



Fig. 3.




Fig. 5.




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by

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# UNITED STATES PATENT OFFICE

1,995,636

## WASHING APPARATUS

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Application June 14, 1933, Serial No. 675,663

12 Claims. (Cl. 177—311)

This invention relates to washing apparatus, more particularly to dishwashing apparatus, and has for its object the provision in apparatus of this character of improved means for giving a signal to warn the attendant when a predetermined quantity of fluid has been supplied to the washing chamber or vat.

While not limited thereto, the invention has particular application to dishwashing apparatus wherein a cleansing fluid, such as water, is circulated in the washing vat through dish-supporting racks by means of suitable power driven means, such as a motor driven impeller.

In accordance with the invention, a suitable signal device, such as an incandescent lamp is provided for the dishwashing apparatus; if desired, this lamp may be accompanied by an electromagnetically operated bell. Suitable means are provided for controlling the signal means in accordance with a condition of operation of the fluid circulating means, which condition changes as the quantity of fluid in the vat changes, so that the signal device is caused to give an indication when a predetermined quantity of fluid has accumulated in the vat.

In one form of the invention, a suitable electromagnetic device responsive to the magnitude of the armature current of the motor that operates the fluid circulating means is provided to control the signal means to give an indication when the armature current of the motor attains a predetermined magnitude, i. e., when a predetermined quantity of fluid has accumulated in the vat.

In one form of the invention, this electromagnetic device is conditioned to effect the control of the signal means by the operation of the drain valve of the vat to its closed position. In this form, the electromagnetic device is operably associated with the drain valve operating means so that it is conditioned to control the signal means when the operating means moves the drain valve to its closed position.

In another form, the electromagnetic device is operably associated with the fluid supply controlling means provided for the vat so that when this means is operated to allow fluid to flow to the vat, the device is rendered effective to control the signal means in accordance with the magnitude of the armature current of the fluid circulating motor.

In still another form of the invention, the signal means is controlled by means of a temperature responsive device that is heated in accordance with the magnitude of the armature current of the motor.

For a more complete understanding of the invention, reference should be had to the accompanying drawing in which Fig. 1 is a fragmentary elevation of dishwashing apparatus embodying the invention, portions being shown in section so as to illustrate certain structural details; Fig. 2 is a diagrammatic view of a portion of the mechanism of Fig. 1, but in a different operative condition; Fig. 3 is a fragmentary elevation of dishwashing apparatus embodying a modified form of the invention, portions being shown in section so as to illustrate certain structural details; Fig. 4 is a diagrammatic view illustrating still a further modified form of the invention; and Fig. 5 is a view similar to Fig. 4, but illustrating certain elements of the mechanism of Fig. 4 in modified form.

Referring more particularly to Fig. 1, the invention in one form is shown in connection with dishwashing apparatus comprising an upright cylindrical washing chamber or vat 10 for receiving dishes and like utensils to be cleansed, and also some suitable washing fluid, such as hot cleansing water. The vat 10 is provided with an inverted frusto-conical bottom wall 11, preferably formed integrally with the side walls of the vat. While the vat together with its bottom wall may be made of any suitable material, these members preferably will be formed of some suitable metal, such as a rust resisting steel, which preferably will be plated or enameled.

It will be understood that suitable open-work trays or baskets (not shown) will be provided in the vat for supporting the dishes, silverware, and other utensils to be washed. Since the specific structure of these trays forms no part of the present invention, it has been deemed unnecessary to illustrate them. These trays preferably will be so arranged that they may be lifted out of the vat so that they may be loaded and unloaded in or out of the vat as is most convenient.

It will also be understood that the vat 10 will be provided with a suitable supporting framework structure (not shown) so as to be held in a substantially vertical position and at a convenient height.

In the lower portion of the vat 10 and preferably arranged so as to be substantially embraced by the bottom wall 11 is an impeller 12. This impeller is driven by a suitable electric motor 13 arranged on the exterior of the vat beneath its bottom wall 11.

The impeller 12 is provided with blades 12a

which may have any suitable shape, the important feature being that the blades be given a shape such that cleansing fluid supplied to the vat and allowed to accumulate in the lower portion thereof will be thrown or hurled upwardly and outwardly in an efficient manner through the dish-supporting trays or baskets by the rotary motion of the impeller. The impeller will be formed from some suitable material, such as cast aluminum or pressed steel.

The bottom wall 11 of the vat is provided with a centrally arranged circular opening 14 for receiving a circular bushing 15. This bushing, as shown, is provided with a head or flange 15*a* which rests on a ledge surrounding the opening 14 and formed from the material of the bottom wall. The bushing extends downwardly through the opening 14. Supported on this portion extending from the vat is a suitable frame 16, secured to the bushing in any suitable manner, as by means of a plurality of circumferentially spaced set screws 17. The motor 13 is secured to the frame by means of suitable screw fastening means (not shown). The motor is supported so that its shaft rotates substantially in the central vertical axis of the vat. It will be understood that the motor shaft will be passed into the vat through an aperture provided for it in the center of the bushing 15, and that it will be connected with the impeller 12 in any suitable manner.

The motor 13 may be any suitable electric motor and is supplied from a suitable source of electrical supply 18.

In order to supply the vat 10 with a cleansing fluid, a source of supply 20 of the particular desired cleansing fluid is provided. For example, if the desired cleansing fluid be water, the source of supply 20 will be a supply of water, preferably heated. A conduit 21 connects the source of supply 20 with the vat, this conduit 21, as shown, communicating with the vat through its lower wall 11. The conduit 21 may merely enter the vat so as to conduct the supply of cleansing fluid to it, or it may communicate with a suitable reaction spray device, such as that described and claimed in my copending application, Serial No. 653,243, filed January 24, 1933, and assigned to the same assignee as this invention.

A suitable manually operable valve 22 is provided in the conduits 20, 21 controlling the flow of fluid from the supply source to the vat.

Arranged in the lowermost portion of the bottom wall 11 of the vat is a drain port 23 which is provided with a drain valve 24. The drain port 23 communicates with a drain chamber 25, which, as shown, communicates with the intake of a suitable pump 26. The discharge of this pump is in fluid communication with a conduit 27. This conduit 27 may lead to any suitable drain. For example, it may lead to the ordinary kitchen sink, or it may communicate with the drain fixture of the sink. The impeller 28 of this pump is mechanically connected to be driven by the fluid circulating motor 13 through a belt drive 30. The pump, of course, may be located in the axis of the motor shaft, and have a direct connection with the shaft.

The drain valve 24 is carried on a lever 31 which is pivotally mounted in brackets 32 arranged on the exterior of the drain housing 25; as shown, the lever is mounted on a suitable shaft 33 which in turn is carried by the brackets 32.

The valve 24 is operated between its open and closed positions by means of an operating rod 34 which is arranged to move vertically, and which is mechanically connected with the shaft 33 to operate the valve by means of a crank arm 35 rigidly secured to the shaft and a pivoted lever 36 pivotally connected with the crank arm and with the lower end of the rod 34, as clearly shown in Fig. 1. The lever 36 is mechanically connected with the crank arm 35 and also with the rod 34 through pin and slot connections, as is clearly shown in Fig. 1, because the lever 36 rotates on an arc, whereas the rod 34 moves in a straight line, and the crank arm 35 and the lever 36, as shown, rotate on different centers. It will be observed that when the rod 34 is depressed the valve 24 will be moved to its closed position, whereas when the rod 34 is elevated the valve 24 will be opened. It will be understood that the rod 34 will extend to any convenient point from which the attendant can grasp it to operate the valve to its open and closed positions.

The rod 34 also functions to control the energization of the fluid circulating motor 13. For this purpose, a suitable switch 37 is arranged in the energizing circuit of the motor between the supply source 18 and the motor, as clearly shown in Fig. 1. The rod 34 carries an abutment 38 arranged to engage the switch when the rod is depressed to close the drain valve so as to move the switch to its position to close the energizing circuit for the motor 13. It will be understood that when the rod 34 is depressed to close the drain valve that the abutment 38 will ride over the switch 37 to the under-side thereof so that when the rod is elevated to open the drain valve the switch will be returned to its position shown in Fig. 1 to deenergize the impeller driving motor 13.

As previously pointed out, an important feature of this invention is the provision of suitable signal means for giving an indication when a predetermined quantity of water has been supplied to the vat. For this purpose, a suitable incandescent lamp 40 is provided. This incandescent lamp 40 may be accompanied by a suitable electromagnetically operated bell 41, or the bell alone may be used, if this arrangement is preferred. The energizing circuits for these electroresponsive devices are controlled by means of a pair of switches 42 and 43, respectively, comprising fixed contacts 42*a* and 43*a* respectively and bridging contacts 42*b* and 43*b* respectively.

The bridging contacts 42*b* and 43*b* are carried by a switch arm 44 pivotally mounted on a suitable pin 45. The switch arm is arranged to be locked in an open position, as shown in Fig. 2 by means of a latch 46 which constitutes the armature of an electromagnetic device 47. The switch arm 44 and the armature 46 are biased in opposite directions by means of a tension spring 48 arranged to bias the switch arm 44 in a clockwise direction, as viewed in Fig. 1, and to bias the armature 46 in a counter-clockwise direction. By reason of this arrangement, when the armature 46 is attracted by its operating coil, the switch arm 44 will be released to move to its position closing the switch 42 so as to complete an energizing circuit for the incandescent lamp 40, as shown in Fig. 1. This circuit may be traced from the lower conductor of the supply source 18 through the switch 37 and thence through the switch 42 and the incandescent lamp 40 to the upper conductor of the supply source. In moving to its position to close the switch 42, the switch arm 44 will cause the bridg-

ing contact 43*b* to make wiping contact with the contacts 43*a* controlling the bell 41 so that the bell will be temporarily energized to give an indication when the switch arm 44 is released.

The electromagnetic device 47 is energized in accordance with the magnitude of the armature current of the impeller driving motor 13. As shown, its operating coil is connected directly in this armature circuit which circuit may be traced from the lower conductor of the supply source 18 through the switch 37, through the operating coil of the electromagnet and thence to one side of the motor and from the other side to the upper conductor of the supply source 18.

The electromagnetic device 47 is conditioned to effect the above-described control of the signal devices 40 and 41 by means of the operating mechanism provided for the drain valve 24. For this purpose, the operating rod 34 for the drain valve is provided with a latch 50 which is arranged to engage an abutment 51 carried on the switch arm 44 so that when the rod 34 is depressed to close the drain valve the latch will engage the abutment to move the switch arm 44 from its position shown in Fig. 1 to its position shown in Fig. 2 where it is locked in this position by means of the armature 46. The valve operating rod 34 may be elevated from its depressed position without effecting any controlling action on the switch arm 44 because the latch, as shown, is mounted to move freely in a clockwise direction; the latch, however, bears against an abutment 52 carried by the valve operating rod so that in effect it constitutes a rigid member when the rod 34 is depressed so that it will engage the abutment 51, as described above. The latch is biased against the stop 52 by means of a suitable tension spring 53.

Assuming that the various elements are in their respective operating positions shown in Fig. 1, the operation of the washing apparatus is as follows:

Assuming that the dishes and utensils to be washed have been placed within the washing vat, the valve operating rod 34 will be depressed so as to effect the closure of the drain valve 24. This operation of the valve operating rod 34, as previously described, will condition the electromagnetic device 47 to effect a subsequent control of the signal devices 40 and 41 to give an indication when a predetermined quantity of water has been supplied to the vat. The depression of the valve rod 34 will also effect the energization of the impeller driving motor 13 by closing the switch 37. The impeller driving motor 13 will, therefore, operate to drive the impeller 12 and also the pump 26.

Then the valve 22 in the fluid supply conduits 20, 21 will be opened so as to allow fluid to flow into the vat.

As the water flows into the vat, it will impose an increasing load upon the impeller 12 and hence, upon the impeller driving motor 13. By reason of this increasing load, the armature current for the motor 13 will gradually increase. Eventually, when a predetermined quantity of water has accumulated within the vat the armature current of the motor 13 will attain such a magnitude that it will energize the operating coil of the electromagnetic device 47 sufficiently to attract the armature 46. This operation, as previously described, will release the switch arm 44, which thereupon will move to a controlling position to close the switch 42 to effect the energization of the incandescent lamp 40. This will constitute a visible signal to the attendant that a sufficient quantity of water has been supplied to the vat; the attendant thereupon will close the fluid supply valve 22. The switch arm 44 when moving to energize the incandescent lamp 40 will energize the bell 41 for a brief interval so as to provide an audible signal indicating that the proper quantity of water has been supplied. The lamp 40, however, will remain energized as long thereafter as the apparatus is operating, that is, as long as the motor 13 is energized.

Under these conditions, the impeller 12 will engage the water supplied to the vat so as to hurl it upwardly and outwardly through the dish-supporting racks in the vat to effect a thorough washing action on the dishes supported in them.

When the washing operation has been completed, the valve rod 34 will be elevated to a position sufficiently high to open the drain valve 24 but not sufficiently high to operate the switch 37 to deenergize the impeller motor 13. This operation will allow the soiled fluid within the vat to flow through the discharge pump 26 which will operate to withdraw all the soiled fluid from the vat and force it into the drain conduit 27. Then the rod 34 may be elevated so as to operate the switch 37 to deenergize the impeller driving motor 13.

In Fig. 3 a modified form of the invention is shown wherein the control means for the signal devices is conditioned to effect their control to give an indication when a predetermined quantity of water has been supplied to the vat by means of a control means provided for the fluid supply source.

As shown in Fig. 3, the vat 60 is provided with a suitable source of fluid supply 61 which is controlled by means of a suitable manually operable valve 62. The fluid supply source 61 communicates with the vat through a conduit 63 connected with the supply source through the valve 62. Within the lower portion of the vat is arranged a suitable impeller 64 which is driven by means of an electric motor 65 supported by the bottom wall 66 of the vat. In the lower portion of the vat is arranged a drain port 67 which is controlled by a valve 68. The valve 68 is operated by means of a suitable manually operable rod 70. The drain port 67 communicates with the intake of a discharge pump 71 which is operably connected to be driven by the impeller operating motor 65 through a belt drive 72. The operating motor 65 is controlled by means of a suitable switch 73 which is operated by the drain valve operating rod 70 and which is interposed between the motor and its supply source 74.

The arrangements of the vat 60, the impeller 64, its operating motor 65, the drain port 67, the drain valve 68 and its operating mechanism 70, and also the pump 71, are arranged in substantially the same fashion as are the corresponding elements of Fig. 1.

In the washing apparatus of Fig. 3, the signal means comprises an incandescent lamp 74 which, as before, may be accompanied by a suitable electromagnetically operated bell 75.

The lamp 74 and bell 75 are controlled by means of switches 76 and 77 respectively which in turn are controlled by means of an electromagnetic device 78. The switches 76 and 77 of the electromagnetic device 78 are arranged in substantially the same fashion as are the corresponding elements of Fig. 1. Thus, these switches are controlled by means of a pivotally mounted switch arm 80 which cooperates with the armature 81 of the electromagnetic device 78

so as to be locked in a position wherein both switches will be opened.

The switch arm 80 is moved to this position where it is latched by the armature 81 by means of the fluid supply controlling means 62. For this purpose, the valve 62 is provided with a shaft 82 operably associated with the valve so as to be rotated with it. This shaft 82 carries a cam 83 which cooperates with an abutment 84 carried on the switch arm 80 so that when the valve 62 is operated to open the fluid supply to provide for the admission of fluid to the vat, the switch arm 80 will be moved to a position to open both switches 76 and 77 and in which position it will be latched by the armature 81.

The operating coil of the electromagnetic device 78 is connected in series with the armature circuit of the motor 65.

In the operation of this form of the invention, it will be understood that when it is desired to wash dishes, the valve rod 70 will be depressed to close the drain valve 68 and the fluid supply valve 62 will be opened to allow fluid to flow to the vat. These operations will effect the closure of the switch 73 so as to effect the energization of the motor 65, and also will condition the electromagnetic device 78 to effect a subsequent control of the signal devices 74 and 75 to give a signal when the armature current of the motor attains a predetermined high value.

When a predetermined quantity of water has been supplied to the vat, the armature current of the motor 65 will attain a magnitude sufficiently high to effect the energization of the electromagnetic device 78 to attract its armature 81. This operation will release the switch arm 80, which thereupon will move to its position shown in Fig. 3 so as to effect the energization of the incandescent lamp 74. In moving to this position it will temporarily energize the bell 75. These devices, therefore, will provide both audible and visible signals to the attendant that the proper quantity of water has been supplied to the vat, whereupon the attendant will operate the valve 62 to shut off the water supply.

It will be understood that when the valve 62 is operated to allow water to flow to the vat, the cam 83 during the first part of the opening movement of the valve will function, as previously described, to latch the switch arm 80 in its open switch position, but that it will be moved from the line of movement of the abutment 84 upon further opening movement of the valve so as to allow the switch arm 80 to move subsequently to its switch closing position when the latch 81 is released. When the valve 62 is returned to its closed position, the cam 83 will operate the contacts 76 and 77 to deenergize the devices 74 and 75.

In Fig. 4 still another modified form of the invention is disclosed. In this form of the invention, the signal devices are controlled by means of a suitable temperature responsive device which is heated in accordance with the magnitude of the armature current of the impeller driving motor.

As shown in Fig. 4, the impeller driving motor 90 is provided with a suitable source of electrical supply 91. A controlling switch 92 is provided in the connections between this source and the motor.

The signal means of this form of the invention comprise an incandescent lamp 93 and an electromagnetically operated bell 94. These signal devices are arranged to be energized from the supply source 91, and their energization is controlled by means of a suitable switch, including fixed contacts 95*a* and a bridging contact 95*b* cooperating therewith. The bridging contact 95*b* is controlled by means of a temperature responsive device 96 which, as previously pointed out, is heated in accordance with the magnitude of the armature current of the motor 90.

Any suitable temperature responsive means may be provided for this purpose, but preferably, a temperature responsive device will be used such as described and claimed in the United States patent to A. H. Simmons No. 1,743,073, dated January 7, 1930. This temperature control device comprises a suitable thermostat 97, shown as a bimetallic bar made of two strips of metal having dissimilar temperature coefficients of expansion, such as brass and steel, these two strips being securely welded or brazed together lengthwise. The ends 97*a* of the thermostat 97 are rigidly secured to a suitable supporting base (not shown), while the other end 97*b* is free to move laterally in response to changes in temperature. Bearing on this free end 97*b* of the thermostat is a resilient member 98 arranged to move the thermostat quickly between its controlling positions. The member 98, as shown, has a substantially U-shape, one arm of the U bearing on the free end 97*b*, while its other arm bears on a fixed pivot bearing 100. The base of the spring 98 carries an actuating arm 101 for the bridging contact 95*b* which, as shown, is carried directly by the actuating arm 101.

When the thermostatic bar 97 is cold the spring 98 will hold the bar in such a position that the switch contact 95*b* will be open, whereas when the temperature of the bar 97 attains a predetermined high value the bar will be moved to close the switch contacts 95*a* and 95*b*.

It will be understood that the switch actuating arm 101 will be moved quickly between its controlling positions by the operation of the U-shaped spring member bearing on the bimetallic bar 97.

The bimetallic bar 97 is connected in series with the armature circuit of the motor 90, as clearly shown in Fig. 4. The bar 97 preferably will be given the shape of an elongated U so as to provide a relatively long path for the armature current in the bimetallic bar.

In the operation of this form, it will be understood that when the drain valve for the dishwasher has been closed and the fluid supply has been turned on, the load imposed on the motor 90 in driving the fluid circulating means for the washing apparatus will gradually increase as the water continues to flow into the vat. Eventually, when a predetermined quantity of water has been supplied to the vat, the armature current will have increased to such a value that the temperature in the bimetallic bar 97 will be sufficiently high to actuate the switch contact 95*b* to its closed position. This operation effects the energization of the incandescent lamp 93 and the bell 94 which thereupon will operate to warn the attendant that the proper amount of water has been supplied. These devices may remain energized thereafter as long as the motor 90 is operating.

However, in this form of the invention, I prefer that the signals be deenergized when the attendant shuts off the water supply to the vat. To accomplish this, I provide a cam 102 arranged to be actuated to engage the arm 101 to open the switch contact 95*b* when the valve 103, control-

ling the flow of water to the vat, is operated to shut off the water supply. As shown in Fig. 4, the cam 102 is directly connected with the valve 103 so as to be operated when the valve is operated. It will be understood that the cam 102 will be so arranged that when the valve 103 is operated to its open position to allow water to flow to the vat, the cam will not interfere with the operation of the fixed contact 95*b* to its closed position. However, when the valve is operated to shut off the supply of water, the cam 102 will engage the switch arm to open the energizing circuit for the signal devices 93 and 94.

In Fig. 5 a modified form of the temperature control means is disclosed.

In Fig. 5, the motor 110 for driving the fluid circulating means is energized from a suitable source of electrical supply 111 through a suitable controlling switch 112. Signal devices comprising an incandescent lamp 113 and an electromagnetically operated bell 114 are provided and are energized from the supply source 111. The energization of these devices is controlled by means of a switch 114*a* controlled by a temperature responsive device 115 which has practically identically the same construction as the temperature responsive device 96 of Fig. 4, with the exception of the bimetallic bar. Whereas the bimetallic bar 97 of Fig. 4 is arranged to be connected in series with the armature circuit of the motor so as to be heated in accordance with the magnitude of the armature current, the bimetallic bar 116 of Fig. 5 is not connected in the armature circuit, but is heated by a separate heating means. This heating means comprises a heating coil 117 which is connected in series with the armature circuit of the motor. The heating coil 117, as shown, is in thermal relation with the bimetallic bar 116. It may be coiled about the bar, as shown in Fig. 5, or it may be arranged in a position adjacent to it so as to apply heat to the bar.

In the operation in this form of the invention, when a predetermined quantity of water has been supplied to the vat and the motor 110 is operating, the heating element 117 will apply a sufficient quantity of heat to the bimetallic bar 116 to operate it to close the switch 114*a* so as to effect the energization of the signal devices 113 and 114. These devices may remain energized until the switch 112 is opened.

However, here again it is preferable to open the energizing circuit for the signal devices 113 and 114 when the attendant operates the valve 118 to shut off the water supply to the vat. For this purpose, a cam 120, similar to the cam 102 of Fig. 4, is provided. This cam, as shown, is operated by the valve 118 so that when the valve is moved to shut off the water flow to the vat, the cam will engage the switch 114*a* to actuate it to open the energizing circuits for the lamp 113 and the bell 114.

While I have shown particular embodiments of my invention, it will be understood, of course, that I do not wish to be limited thereto since many modifications may be made, and I, therefore, contemplate by the appended claims to cover any such modifications as fall within the true spirit and scope of my invention.

What I claim as new and desire to secure by Letters Patent of the United States is:

1. Dishwashing apparatus comprising a vat, means for supplying cleansing fluid to said vat, means in said vat for circulating said cleansing fluid, a motor for operating said fluid circulating means, said fluid circulating means imposing a load on said motor varying with the quantity of fluid in said vat, an electroresponsive signal device arranged to give a signal when energized, an energizing circuit for said signal device, a switch controlling said energizing circuit and means connected in the armature circuit of said motor so as to respond to the magnitude of the armature current thereof, which current varies as the load on said motor varies, controlling said switch so as to effect the energization of said signal device to give an indication when said armature current attains a predetermined magnitude in response to a predetermined quantity of fluid in said vat.

2. Dishwashing apparatus comprising a vat, means for supplying fluid to said vat, power means for circulating said fluid in said vat, the load on said power means varying with the quantity of fluid in said vat, a drain valve for said vat, means for operating said drain valve, a signal device, control means for said signal device having an active position and an inactive position, means including a part of said drain valve operating means for moving said control means to its inactive position, and means responsive to a predetermined load imposed on said power means for causing movement of said control means to its active position to actuate said signal device to give an indication.

3. Dishwashing apparatus comprising a vat, means for supplying fluid to said vat, means in said vat for circulating said fluid, a motor for operating said fluid circulating means, said fluid circulating means imposing a load on said motor varying with the quantity of fluid in said vat, a drain valve for said vat, means for operating said drain valve, an electroresponsive signal device, an energizing circuit for said signal device, control means for said energizing circuit having an active position and an inactive position, means including a part of said drain valve operating means for causing movement of said control means to its inactive position when said drain valve is closed, and means responsive to a predetermined load on said motor for causing movement of said control means to its active position to energize said energizing circuit and thereby said signal device.

4. Dishwashing apparatus comprising a vat, a conduit communicating with said vat, a valve controlling said conduit, means for operating said valve, fluid circulating means in said vat, the load imposed on said fluid circulating means varying with the quantity of fluid in said vat, a signal device, control means for said signal device having an active position and an inactive position, means including a part of said valve operating means for causing movement of said control means to its inactive position and means responsive to a predetermined load on said fluid circulating means for causing movement of said control means to its active position to actuate said signal device.

5. Dishwashing apparatus comprising a vat, a fluid supply conduit communicating with said vat, valve means controlling said conduit, means for operating said valve means, fluid circulating means in said vat, a motor for operating said fluid circulating means, the load imposed on said motor varying with the quantity of fluid in said vat, a signal device, control means for said signal device having an active position and an inactive position, means responsive to a predetermined armature current of said motor for caus-

ing movement of said control means from its inactive to its active position to actuate said signal device and means including a part of said valve operating means for causing movement of said control means to its inactive position when said valve operating means is actuated to open said fluid supply circuit.

6. Dishwashing apparatus comprising a vat, means for supplying fluid to said vat, fluid circulating means in said vat, a motor for operating said fluid circulating means, the load imposed on said motor increasing as the quantity of fluid in said vat increases, a signal device, and a temperature responsive device arranged to be heated in accordance with the magnitude of the armature current of said motor, which current increases as the load imposed on said motor increases, controlling said signal device to give an indication when said current attains a predetermined magnitude.

7. Mechanical dishwashing apparatus comprising a vat, means for supplying a cleansing fluid to said vat, fluid circulating means in said vat, power means for driving said fluid circulating means and means for indicating when a predetermined quantity of fluid has been supplied to said vat comprising a signal device, control means for said signal device having a normally inactive condition, and an active condition in which said signal device is operated, and means responsive to a condition of operation of said power means that varies as the quantity of fluid in said vat is changed for effecting said active condition in said control means when a predetermined quantity of fluid has been supplied to said vat.

8. Mechanical dishwashing apparatus comprising a vat, means for supplying cleansing fluid to said vat, a fluid circulating impeller in said vat, an electric motor for driving said impeller, the armature current of said motor varying with the quantity of fluid in said vat, a signal device, an electromagnetic device controlling the operation of said signal device to give an indication when said electromagnetic device has been energized to a predetermined degree and an energizing circuit for said electromagnetic device connected in the armature circuit of said motor controlling the energization of said electromagnetic device to energize said device to said predetermined degree to cause said signal device to give an indication only when said armature current attains a predetermined magnitude, whereby said signal means indicates when a predetermined quantity of fluid has been supplied to said vat.

9. Dishwashing apparatus comprising a vat, a conduit communicating with said vat, a valve controlling said conduit, fluid circulating means in said vat, an electric motor for operating said fluid circulating means, the load imposed on said motor increasing as the quantity of fluid in said vat increases, an electroresponsive signal device, a temperature responsive device having an inactive position and an active position in which latter position it energizes the signal device, said temperature responsive device being connected in the armature circuit of said motor so as to assume its active position upon the attainment of a predetermined load upon the motor and means responsive to the operation of said valve to a fluid controlling position to move said temperature responsive device to its inactive position.

10. Dishwashing apparatus comprising a vat, fluid circulating means in said vat, a motor for driving said fluid circulating means, the load imposed on said motor varying as the quantity of fluid in said vat varies, means for supplying a cleansing fluid to said vat, an electric signal device, a switch controlling the energization of said signal device so that when said switch is closed said device functions to give an indication, a latch for locking said switch in its open position, and an electroresponsive device connected in the armature circuit of said motor so as to respond to the armature current of said motor for releasing said latch to permit said switch to close when said armature current attains a predetermined magnitude.

11. Dishwashing apparatus comprising a vat, fluid circulating means in said vat, a motor for driving said fluid circulating means, the load imposed on said motor varying as the quantity of fluid in said vat varies, a fluid conduit connected with said vat, a valve controlling said conduit, means for operating said valve, an electroresponsive signal device arranged when energized to give an indication, a switch controlling the energization of said signal device so that when said switch is closed said device is energized to give an indication, a latch for locking said switch in its open position, an electromagnetic device connected in the armature circuit of said motor so as to respond to the armature current of said motor for releasing said latch to permit said switch to close when said armature current attains a predetermined magnitude, and means operated by said valve operating means for operating said switch to its open position where it is locked by said latch when said valve is operated to a predetermined fluid controlling position.

12. Dishwashing apparatus comprising a vat, means controlling the supply of fluid in said vat, power means for circulating fluid in said vat, the load on said power means varying with the quantity of fluid in said vat, a signal device, control means for said signal device having an active and an inactive position, means including a part of said fluid supply controlling means for moving said control means to its inactive position, and means responsive to a predetermined load on said power means for causing movement of said control means to its active position to actuate said signal device.

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