April 19, 1966 T. H. NOREN ETAL 3,246,938

MECHANISM FOR HOLDING DISHWASHING MACHINE DOOR CLOSED AND FOR RAISING DOOR

Filed Nov. 18, 1963 4 Sheets-Sheet 1

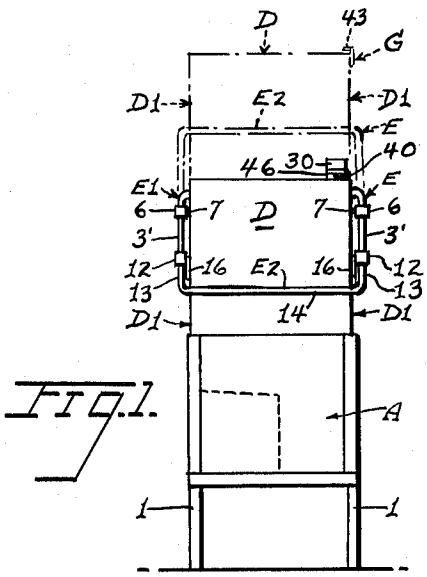

FIG. 1.

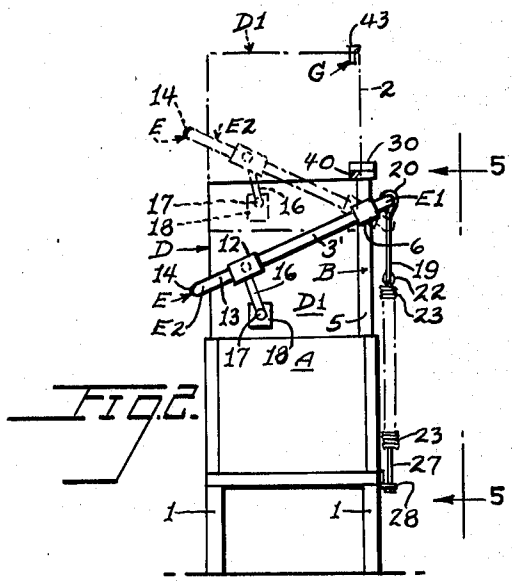

FIG. 2.

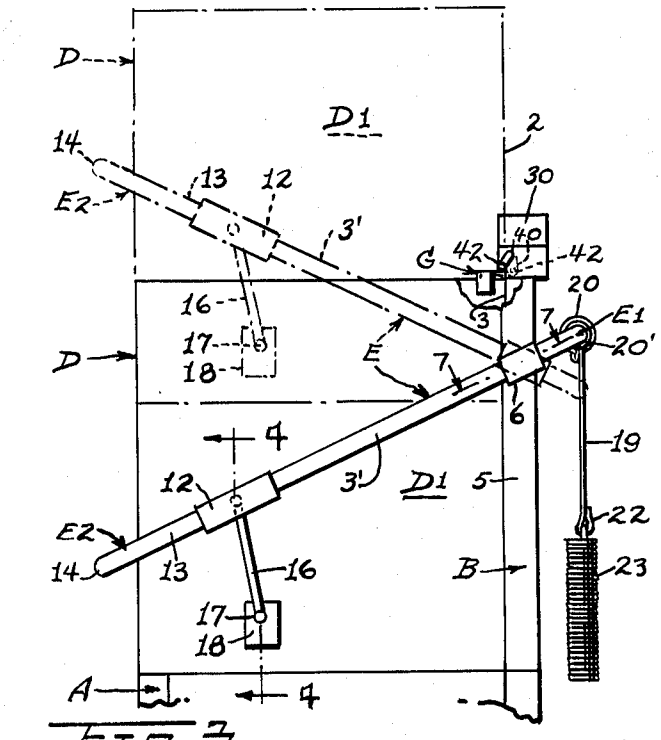

FIG. 3.

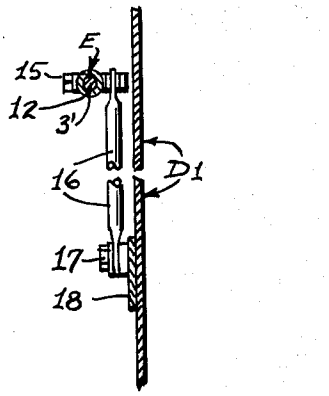

FIG. 4.

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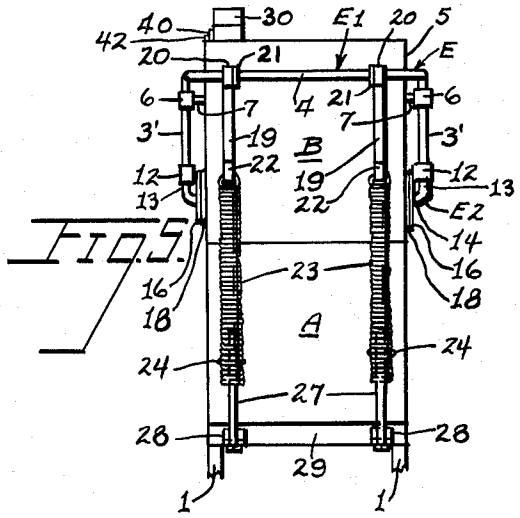

FIG. 5.

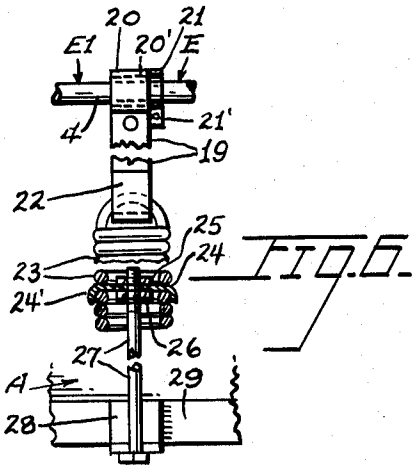

FIG. 6.

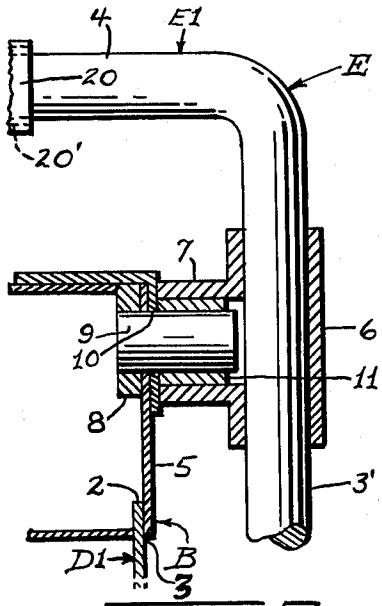

FIG. 7.

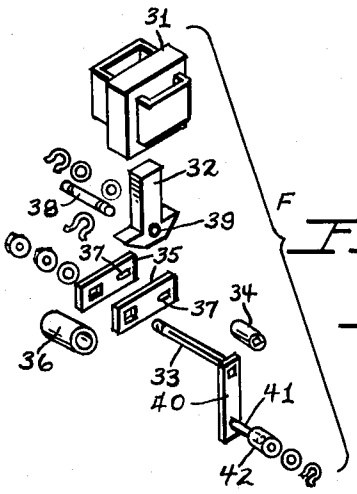

FIG. 11.

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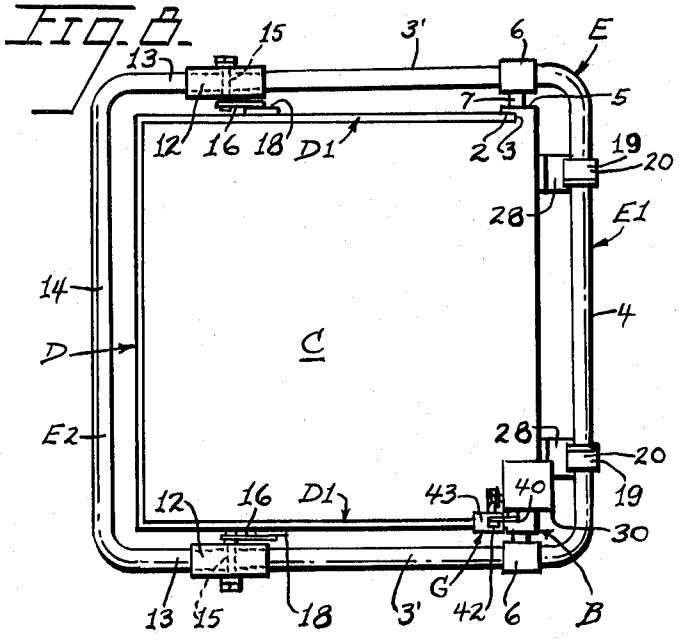
FIG. 8.



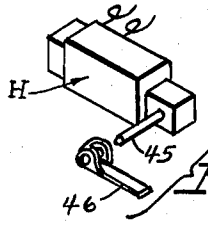


FIG. 12.

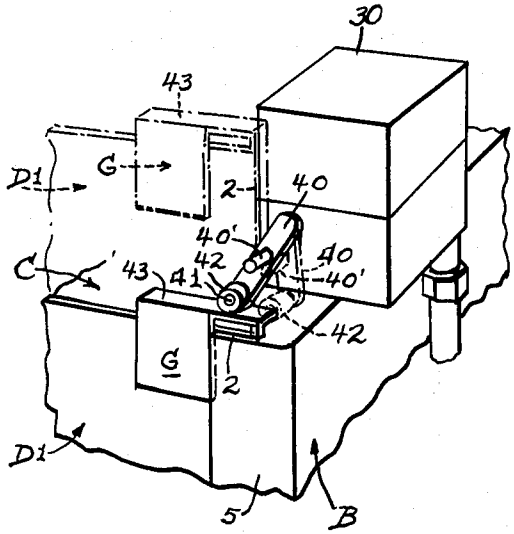
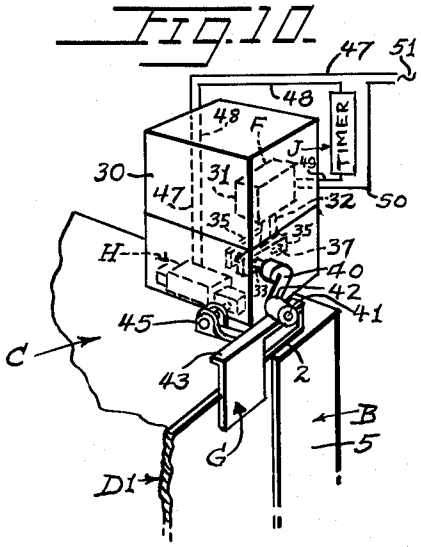


FIG. 9.

FIG. 10.



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Filed Nov. 18, 1963 4 Sheets-Sheet 4

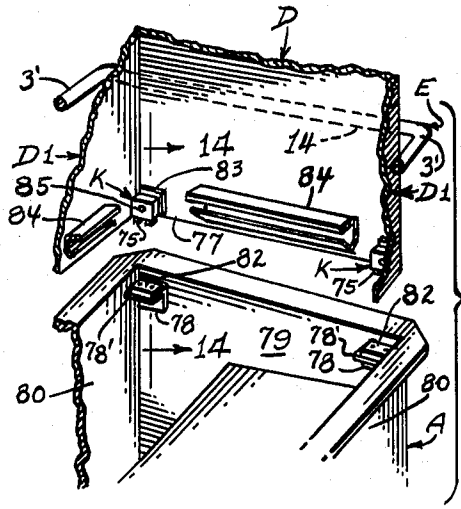

FIG. 13.

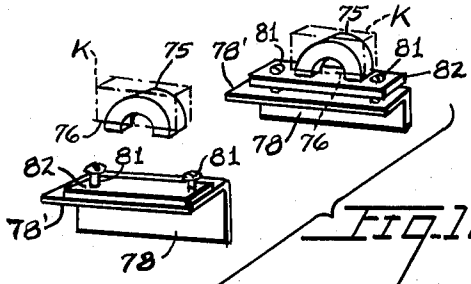

FIG. 16.

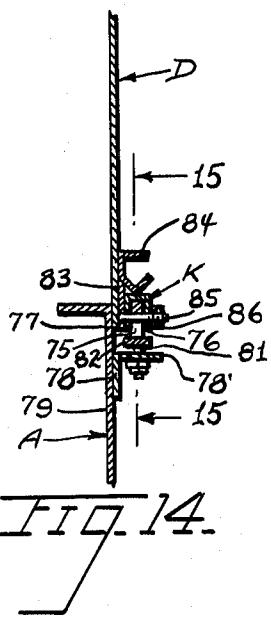

FIG. 14.

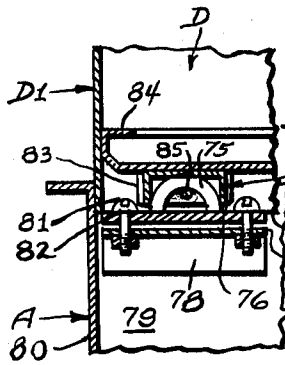

FIG. 15.

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United States Patent Office

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MECHANISM FOR HOLDING DISHWASHING MACHINE DOOR CLOSED AND FOR RAISING DOOR

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Filed Nov. 18, 1963, Ser. No. 324,510

5 Claims. (Cl. 312—223)

The present invention relates to improvements in a mechanism for holding dishwashing machine door closed and for raising door, and it consists in the combination, construction and arrangement of parts as hereinafter described and claimed.

An object of our invention is to provide a mechanism of the type described that is especially designed to be used in commercial dishwashing machines and it will save the time of the operator. All he needs to do is to place a rack of dishes in the machine and close the machine door. In one form of our invention the closing of the door will cause the mechanism to automatically lock the door in closed position and hold it closed until the entire washing and rinsing cycles of the machine are completed. At the completion of these cycles, the mechanism will automatically release the door from locked position and will raise the door into open position without any aid being necessary from the operator.

In a modified form of our invention, we make use of permanent magnets for holding the dishwashing machine door in closed position when once the operator closes the door. At the end of the dishwashing and rinsing cycles, the operator initially lifts the door to release the hold of the magnets and then the door-raising mechanism will do the rest in raising the door into open position and will hold the door open until the operator again closes it.

In both forms of our invention, the mechanism for raising the door into open position is the same. This mechanism includes a lever, rectangular in form that encloses the dishwashing machine. The rectangular-shaped lever has parallel side bars that are pivotally secured to the sides of the dishwasher frame and links are pivotally connected to these side bars and to the side doors of the dishwasher. The lever also has a front bar or handle that extends across the front of the dishwasher and has its ends connected to the side bars of the lever. The lever has a rear bar that extends across the rear of the machine and coiled springs are connected to this rear bar and continuously exert a force sufficient to move the rear bar downwardly and swing the side bars about their aligned pivots to cause these side bars to lift the links and raise the doors into open position. This will occur as soon as the door is unlocked by a mechanism actuated at the end of the washing and rinsing cycles. The springs continue to have sufficient force to hold the doors in open position until the operator again closes the doors by moving the front handle portion of the lever downwardly. When a wrap-around door is used, the side doors are interconnetced by a front door portion to form a three-sided door that is raised and lowered as a unit. When the wrap-around door is raised, it will open the two sides and front of the machine simultaneously. The omission of the two front corner posts of the machine will permit it to be used for "straight through operation" or "corner operation" in the washing of dishes. When magnets are used for holding the door closed, no door unlocking mechanism is used in the machine.

The pivoting of the side bars of the rectangularly-shaped lever to the sides of the machine is such as to cause the rear bar of the lever to move the same distance below the aligned pivot lever-supporting points when the door is opened as it moves above the pivot points when the door is closed. The same holds true for the front handle

portion of the lever. This handle will move the same distance above the pivot points of the lever when the door is opened as it moves below the pivot points when the door is closed.

Other objects and advantages will appear as the specification continues. The novel features of the invention will be set forth in the appended claims.

Drawings

For a better understanding of our invention, reference should be made to the accompanying drawings, forming part of this specification in which:

FIGURE 1 is a front elevation of a dishwashing machine, on a small scale, showing our automatic door-opening mechanism operatively applied thereto. The door is shown in open position by dot-dash lines and the lever for closing the door is swung into the raised dot-dash line position by coil springs during the opening of the door.

FIGURE 2 is a side elevation of FIGURE 1 and also illustrates the door and lever in raised position by the dot-dash lines.

FIGURE 3 is a partial side elevation on a larger scale and illustrates both the door and lever in raised position by dot-dash lines.

FIGURE 4 is an enlarged vertical section taken along the line 4—4 of FIGURE 3 and shows one of the two links pivotally connected at one end to the lever and pivotally connected at its other end to the door.

FIGURE 5 is a rear view on a smaller scale than FIGURE 4 and shows the rear portion of the dishwasher when looking in the direction of the arrows 5—5 of FIGURE 2 and illustrates the adjustable spring mechanism for constantly exerting a force on the lever for swinging the lever and raising the door into open position and for yieldingly maintaining the door in open position.

FIGURE 6 is an enlarged detail, partly in section, of one of the coil springs and associate mechanism for yieldingly urging the lever at all times in a direction for raising the door and holding it in open position.

FIGURE 7 is an enlarged sectional view taken along the line 7—7 of FIGURE 3 and illustrates one of the pivotal connections between the side bar of ethe rectangular-shaped lever and the side of the dishwasher.

FIGURE 8 is a top plan view of FIGURE 3 and illustrates the three-sided wrap-around door with its two side door portions pivotally connected by links to the two side bars of the rectangular lever.

FIGURE 9 is an enlarged perspective view of one top corner of the dishwasher and illustrates the door-locking mechanism for holding the wrap-around door in closed position until the machine has completed its wash and rinse cycles.

FIGURE 10 is a perspective view of the same top corner as shown in FIGURE 9, but when looking at the door-locking mechanism from a different angle and showing the door-locking mechanism and the limit switch by dotted lines.

FIGURE 11 is an exploded view in isometric showing of the parts going to make up the door-locking mechanism.

FIGURE 12 is an exploded view in isometric showing of the parts going to make up the limit switch that is closed by the door when the door is moved into closed position.

FIGURE 13 is an inside perspective view of a portion of a dishwasher with the cover raised a slight distance above the tank and illustrating a modified form of magnetic means for holding the cover in closed position when the cover is manually closed. The cover-opening means illustrated in FIGURES 1 to 8 inclusive is the same means

used in FIGURE 13 for continuously yieldingly urging the cover into open position.

FIGURE 14 is a vertical section taken along the line 14—14 of FIGURE 13 and shows the cover in closed position.

FIGURE 15 is a vertical section taken along the line 15—15 of FIGURE 14 and shows the cover in closed position.

FIGURE 16 are isomeric views of one of the magnets and keeper, one view showing the magnet separated from the keeper and the other view showing the magnet contacting the keeper.

While we have shown only the preferred forms of our invention, it should be understood that various changes, or modifications, may be made within the scope of the annexed claims without departing from the spirit thereof.

Detailed description

In carrying out our invention we show a dishwasher in FIGURES 1 to 10 inclusive. The dishwasher comprises a tank indicated generally at A which is mounted on legs, see FIGURE 1. A back member B rises vertically from the top and rear of the tank A, see FIGURE 2, and supports a hood, indicated generally at C in FIGURE 8. A three-sided or wrap-around door D normally closes the space between the top of the tank A and the hood. The dishwasher is not provided with front corner posts extending between the tank and the hood and therefore when the wrap-around door D is in raised position, the entire front and sides of the machine between the tank top and the hood are open and free. This permits the dishwasher to be used for a straight through dish-washing operation or a corner operation.

A top plan view of the wrap-around door D shows it to be C-shaped as in FIGURE 8 and the vertical end edges 2 of the side door members D1 are slidably received in parallel door guide grooves 3 provided in the back member B, see also FIGURES 9 and 10. It is possible to have Teflon inserts, not shown, mounted in the door guide grooves 3 for making the movement of the door D more easy to perform.

Before describing the door-raising means it is best to state that the dishwasher has upper and lower revolving wash arms, not shown, and has a lower revolving rinse arm, not shown. The washing and rinsing cycles of the machine are automatically carried out during the operation of the machine. We will describe later how the closing of the door D will automatically start the operation of the machine. A spring mechanism, described hereinafter in detail, continually exerts a lifting yielding force on the door to raise it. We will also describe how the door is secured in closed position by a door-locking means when once the door is manually closed and this door-locking means will free the door automatically only at the completion of the washing and rinsing cycles. The freeing of the door will permit the spring mechanism to open the door and hold it in open position. All the operator therefore needs to do is to place the dishes in a basket and move the basket into the dishwashing and rinsing compartment and then manually close the door. The machine does the rest and at the end of the washing and rinsing cycles the door will be automatically opened and will remain open.

The mechanism for opening the door will now be described. A door-closing lever E is in the shape of a rectangle that entirely encircles the dishwasher as clearly shown in the top plan view of FIGURE 8. The lever is formed of two C-shaped portions that face each other. The rear portion E1 has parallel side arms 3'—3' and an interconnecting portion 4 for the side arms. Each side arm 3' is pivotally connected to a side 5 of the back member B, and we have ilustrated one of these pivotal connections in the enlarged sectional view of FIGURE 7. Each side arm 3' is received in a hollow T-member 6. The hollow stem 7 of the T-member 6 extends toward

the side 5 of the back member B. A plate 8 is mounted in the interior of the hollow back member B and is secured in place by any suitable fastening means such as bolts, not shown. A pivot pin 9 has one end inserted in an opening in the plate 8 and is welded to the plate. The other end of the pin projects through an opening 10 in the side 5 and extends beyond the side so as to be rotatably received in the hollow cylindrical stem 7 of the T-member 6. A Teflon bearing sleeve 11 is carried by the stem 7 and rotates on the pin 9 when the side arm 3' is swung.

The ends of the side arms 3'—3' are received in sleeves 12—12, see FIGURE 8. The front portion E2 of the rectangular lever E has parallel side arms 13—13 that are interconnected by a transversely extending front handle portion 14. The ends of the side arms 13—13 are received in the sleeves 12—12. FIGURES 4 and 8 show bolts 15 extending transversely through the sleeves 12—12 and being pivotally connected to link 16—16. The bolts 15 extend between the spaced apart ends 3'—3' and 13—13 of the rear portion E1 and the front portion E2 of the lever E. The links 16—16 have their other ends pivotally connected to bolts 17—17 that are carried by plates 18—18, see FIGURE 4. The plates 18—18 in turn are secured to the side door members D1—D1 of the wrap around door D by welding or other suitable fastening means. The pivot pins 9 are disposed above the bottom of the hood C so that when the door-actuating lever E has its front handle portion raised into open position for opening the door D, the front portion E2 and the side arms 3'—3' will extend above the space between the hood and the tank A and keep this space entirely clear for free movement of dish racks.

It will be seen from this construction that when the front handle portion 14 of the rectangular lever E is raised from the full to the dot-dash line positions in FIGURES 1, 2 and 3, the links 16—16 will raise the door D into open position. As the handle portion 14 is moved upwardly, the rear interconnecting portion 4 of the lever E will be swung downwardly. We make use of this downward movement of the rear portion 4 for yieldingly urging the door D into open position at all times.

In FIGURE 5 the rear of the dishwasher is shown on a smaller scale than FIGURES 3 and 4 and the rear interconnecting portion 4 for the lever E is shown extending transversely across the rear of the machine. We provide a spring mechanism that will continually exert a downward yielding force on the rear portion 4 that is sufficient to lift the wrap around door D into open position and hold it there until manual force is used for closing the door. A pair of straps 19—19 have their upper ends bent into cylindrical portions 20—20 that receive Teflon sleeve inserts 20', see FIGURE 3. The inserts are mounted on the rear portion 4 of the lever E and act as bearings for permitting the cylindrical portions 20—20 to rock on the rear portion 4. Clamps 21—21, see FIGURE 5, are mounted on the portion 4 and bear against the cylindrical portions 20—20 for holding the latter in spaced apart relation. The clamps are adjustably secured to the portion 4 by screws 21', see FIGURE 6.

The lower ends of the straps 19—19 are formed into hooks 22—22 that are connected to the upper ends of the coil springs 23—23. A transversely-extending bracket 24, see FIGURE 6, is placed between any two adjacent coils in the lower end of the spring. The curved ends 24' of the bracket receive the adjacent coil and prevent any transverse movement between the bracket and the spring. The bracket has a central bolt-receiving opening therein and a nut 25 is welded to the top of the bracket 24 and has its threaded opening aligned with the opening in the bracket. A washer 26 is welded to the underside of the bracket 24 and has its opening aligned with the openings in the bracket and nut 25. A bolt 27 has its threaded end adjustably received in the threaded bore of

the nut 25. The shank of the bolt is also received in a slot in an angle bracket 28 and the bracket in turn is welded to the bottom rear rail 29 of the tank A, as shown in FIGURE 6.

Two spring mechanisms are used and exert a sufficient downward pull on the rear portion 4 of the door-opening lever E to move the door D upwardly as soon as the door is freed and to hold the door in open position. Adjustment can be made by sliding the bracket 24 between any two adjacent loops or coils in the springs 23. Fine adjustment can be effected by rotating the bolts 27 in the nuts 25 to vary the tension of the springs 23.

We will now describe the time-controlled mechanism for holding the door D in closed position when once it has been manually closed by the operator moving the front handle 14 of the lever E downwardly. FIGURES 9, 10 and 11 illustrate a housing 30 placed on top of the dishwashing machine hood C, and positioned at the rear and near to one corner of the machine. The housing 30 encloses a door-release solenoid 31 of a doorfreeing mechanism illustrated in an exploded view at F, in FIGURE 11, and in a perspective view in FIGURE 10. An armature 32 is movable vertically in the solenoid and is raised when the solenoid is energized.

A square shaft 33, see FIGURE 11, is mounted in a bearing 34, and this bearing is mounted in the wall of the housing 30. A pair of arms 35 have square openings for receiving the square shaft 33. The arms 35 are spaced apart by a spacing sleeve 36 which in turn is mounted on the square shaft 33. The free ends of the arms 35 have elongated openings 37 for receiving a pin 38. The pin 38 is also received in the opening 39 in the armature 32. The portion of the square shaft 33 that projects beyond the wall of the housing 30 is connected to an arm 40. The free end of the arm 40 has a stub shaft 41 that rotatably receives a roller 42.

Both FIGURES 9 and 10 show the roller 42 of the arm 40 bearing against the flanged top 43 of a door stop plate G. This plate G is welded or otherwise secured to one of the side door portions D1. When the door D is closed, the top flange 43 of the door stop G will be positioned under the roller 42 and will permit the arm 40 to swing from the dot-dash line position in FIGURE 9, into the full line position in the same figure. The weight of the armature 32 is sufficient, when the solenoid 31 is not energized, to move downwardly and swing the arms 35 to rotate the square shaft 33 and swing the arm 40 to the left as shown in FIGURE 9. The armature 32 is limited in its downward movement and will hold the arm 40 against any further clockwise movement when the arm reaches the full line position in FIGURE 9. Any other type of stop, not shown, could be used for preventing further clockwise movement of the arm 40 beyond the full line position shown in FIGURE 9. FIGURE 11 shows all of the parts used in the door release mechanism F, but only the main elements have been mentioned. FIGURE 9 shows the arm 40 provided with a handle 40' for manually swinging the arm if desired.

The door D is held closed by the roller 42 until the solenoid 31 is momentarily energized and will lift the armature 32 to swing the arm 40 and roller 42 to the dot-dash line position. This momentary swinging of the roller 42 is sufficient to move the roller off from the flange 32 and to free the door stop G. The spring mechanism 23 will immediately move the rear portion 4 of the lever E downwardly to swing the lever about is pivots 9 and swing the sleeves 12 upwardly to lift the door D by means of the links 16. As soon as the door D starts upward, the side portion D1 of the door that carries the stop plate G will have its vertical edge 2 engage with the roller 42 to hold it and the arm 40 in the dot-dash line position of FIGURE 9. The springs 23 will raise the door D into full open position as shown by the dot-dash lines in FIGURES 1, 2 and 3. The simple electrical circuit for momentarily energizing the solenoid 31 will be explained hereinafter.

We also make use of a limit switch indicated generally at H in FIGURES 10 and 12. This switch is actuated by a rockable shaft 45 and a switch arm 46, shown separated in FIGURE 12, but operatively connected together in FIGURE 10. The switch H is mounted in the housing 30 and the shaft 45 extends through the housing wall. The switch arm 46 is mounted on the end of the shaft 45 that projects beyond the housing. FIGURE 10 shows the shaft 45 extending at right angles to the square shaft 33. The free end of the switch arm 46 lies in the path of the flange 43 of the door stop G, and when the door D is manually closed, the side door portion D1 will move the door stop G downwardly and cause the flange 43 to strike the end of the switch arm 46 and swing the arm downwardly to rock the shaft 45 and close the switch H. When the door D is again raised and the flange 43 is lifted above the switch arm 46, a spring, not shown, in the switch H will rock the shaft 45 and swing the switch arm 46 counterclockwise in FIGURE 10 so as to open the switch H. Any other yielding means may be used for urging the arm 46 in a counterclockwise direction in FIGURE 10.

A simple wiring diagram is shown in FIGURE 10. A wire 47 leads from a source of A.C. current to the limit switch H. Another wire 48 leads from the limit switch to a timer J, that forms a part of the electrical wiring system, not shown, of the automatic dishwasher shown in FIGURES 1, 2, 3, 5 and 8. From the timer J, a wire 49 leads to the solenoid 31 and then a wire 50 leads from the solenoid back to the source of current. When the door D is manually closed, the switch arm 46 will be actuated by the flange 43 to close the switch H and start the timer J actuating. The timer has a return wire, not shown, that leads back to the source of current 51 so that the initial closing of the switch H will not necessarily cause a current to flow at once through the wires 49 and 50 to momentarily energize the solenoid 31. The solenoid 31 is only momentarily energized at the end of the washing and rinsing cycles of the dishwasher.

The dishwasher shown in FIGURES 1, 2 and 3 is actually being commercialized and the wiring system used in the machine is fairly complicated. There is no need in the present case to illustrate and describe the entire wiring system. Only the limit switch H and the timer J are shown plus a simple wiring circuit. The timer J among other things controls the washing and rinsing cycles and there is no need to describe these. At the end of the rinsing cycle there is a dwell period for permitting the water from the rising head to flow back into the tank. The timer will then complete a momentary circuit through the solenoid 31 for energizing it a sufficient length of time to raise the armature 32 and free the roller 42 from the flange 43. The door D will immediately be raised by the springs 23 and the edge 2 of the side door portion D1 will engage with the roller 42, see FIGURES 3 and 9, and will hold the roller in the dot-dash line position so long as the door remains open. The raising of the door D also opens the switch H and the entire machine ceases operating. The limit switch H when opened also stops either the washing or rinsing cycles so in case the door D should be opened accidentally during the operation of the machine, no water would be thrown out by the washing or rinsing arms.

In FIGURES 13 to 16 we show a slightly modified form of the device. The automatic dishwashing machine shown in these figures is the same as that shown in FIGURES 1 to 8 inclusive. The lever E and springs 23 for opening the door D, are also the same and therefore like parts will be given like reference numerals. Instead of the door lock mechanism shown in FIGURES 10 and 11, we disclose magnets and keepers for holding the door closed after the door is manually closed.

FIGURE 13 shows interior portions of the tank A

and door D. The door D has two non-magnetic housings K mounted on the inside of the door and adjacent to the corners where the front door portion connects with the side door portions D1. The housings are open at their bottoms and receive horse shoe permanent magnets 75. The housings K, in FIGURE 16, are shown in phantom by dot-dash lines in order to illustrate clearly the horse shoe magnets 75. The legs of the magnets project a slight distance below the lower edge 76 of the housing K. The lower edges 76 of the housings K preferably lie in the same plane as the lower edge 77 of the door D.

The tank A has two non-magnetic angle-shaped brackets 78 disposed directly below the horse shoe magnets 75 and secured to the inner surface of the front wall 78 of the tank and adjacent to the side walls 80. The brackets 78 have horizontal shelves 78' that receive the threaded shanks of metal bolts 81. A metal keeper 82 has openings for slidably receiving the shanks of the bolts 81. The keeper 82 rests on the supporting shelf 78' of the bracket 78 when the door D is raised above the tank A as shown in the left hand lower figure of FIGURE 16 and in FIGURE 13. When the door D is closed, the ends of the horse shoe magnets 75 will attract the metal keepers 82 and will lift them on the shanks of the bolts 81 until the keepers bear against the undersides of the heads of the screws as shown in the right hand figure of FIGURE 16.

In FIGURES 14, and 15, the cover D is shown in closed position with respect to the tank A. Note that the lower edge 77 of the cover enters the top of the tank. The magnet-receiving housings K are mounted on plates 83, which in turn are welded to the inner surface of the front door portion D. A splash water-receiving and reinforcing trough 84 extends across the inner surface of the front door wall D and the upper edges of the plates 83 are also welded to this trough. Each plate 83 has a stud 85 welded thereto and the stud projects through two aligned openings in the housing K. FIGURES 14 and 15 show the studs 85 holding the horse shoe magnets 75 in the housings. Nuts 86 are threaded upon the studs for aiding in holding the housings in place. If desired the housings K need not be welded to the plates 83, but can be held in place by the studs 85 and nuts 86.

The operation of this form of the invention is somewhat the same as the first mentioned form. The magnets 75 when contacting with the metal keepers 82 exert sufficient magnetic force to hold the door D in closed position when once the door is manually closed by forcing the handle 14 downwardly. The magnetic attraction between the magnets 75 and keepers 82 can be broken by the operator lifting upwardly on the handle 14. This is done at the end of the washing and rinsing cycles.

As soon as the magnetic attraction is broken by the manually initial lifting of the door D, the springs 23 will take over and pull downwardly on the rear portion 4 of the lever E and will swing the side bars 3'—3' of the lever about the pivot pins 9 to lift the door D and hold it in open position. No further description of this form of the device need be given.

We claim:

1. In a dishwashing machine having a tank with a vertically extending back member formed with side portions and a hood carried by said back member in spaced parallel relation to said tank to define a dishwashing and rinsing space with a vertically movable door providing access to said space, the combination of a lever encircling said machine and pivotally connected to said side portions, links connected to said lever and door for raising and lowering said door upon the pivotal movement of said lever, a housing supported upon said hood, a timer mechanism supported on said housing and connected to a source

of current for controlling the operation of the washing and rinsing cycles, a rotatable shaft carried by said housing and projecting therefrom, a depending arm affixed to said shaft, a roller carried by said arm for engagement with said door contemporaneous with said shaft remaining stationary to retain the door in a closed position during the operation of the machine, electrical means mounted in said housing and engaged with said shaft to rotate same and move the roller out of engagement with said door, said timer mechanism connected to said electrical means, spring means connected to the portion of said lever that extends across said back member and to said tank for exerting a continuous downward force on said portion of the lever to lift said door into open position and retain same therein subsequent to said timer mechanism actuating said electrical means.

2. In a dishwashing machine having a tank with a vertically extending back member provided with side portions and a hood carried by said back member in spaced parallel relation to said tank to define a clear and unobstructed dishwashing and rinsing space with a vertically movable three-sided door providing access to said space, the combination of a lever encircling said machine and pivotally connected at diametrically opposite points to said side portions at a point above said hood, said lever being maintained at all times in spaced relation to said door and back member by its pivotal connections to said side portions, links connected to said lever and door for raising and lowering same upon the pivotal movement of said lever, spring means connected to the portion of said lever that extends across said back member and to said tank for exerting a continuous downward force on said portion of the lever to lift said door into open position and retain same therein, a shaft mounted on said hood, a depending arm affixed to an end of said shaft, a roller carried by said arm for engaging the upper portion of said door when same is in its lowered position for retaining the door against the action of said springs, and means connected to said shaft for rotating same to pivot said arm and move said roller out of engagement with said door to permit said springs to raise said door.

3. In a dishwashing machine according to claim 2 wherein said shaft is mounted in a housing supported on said hood, a solenoid connected to said shaft for rotating same to move said roller out of engagement with the door upon the energization of the solenoid and the completion of the washing and rinsing cycles of the machine, a timer mechanism mounted on said housing and connected to a source of current, said solenoid connected to said timer and a limit switch carried by said housing and engaged by said door upon being manually closed to actuate said timer and start the washing and rinsing cycles.

4. The combination as set forth in claim 2 and in which an edge portion of said three-sided door engages said roller when said door is raised by said springs to retain said roller and shaft in a non-locking position.

5. The combination as set forth in claim 3 wherein said means connected to said shaft includes a solenoid armature connected to said shaft to rotate same upon the deeenergization of said solenoid for moving said roller into engagement with the upper portion of said door.

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