

Sept. 29, 1931.

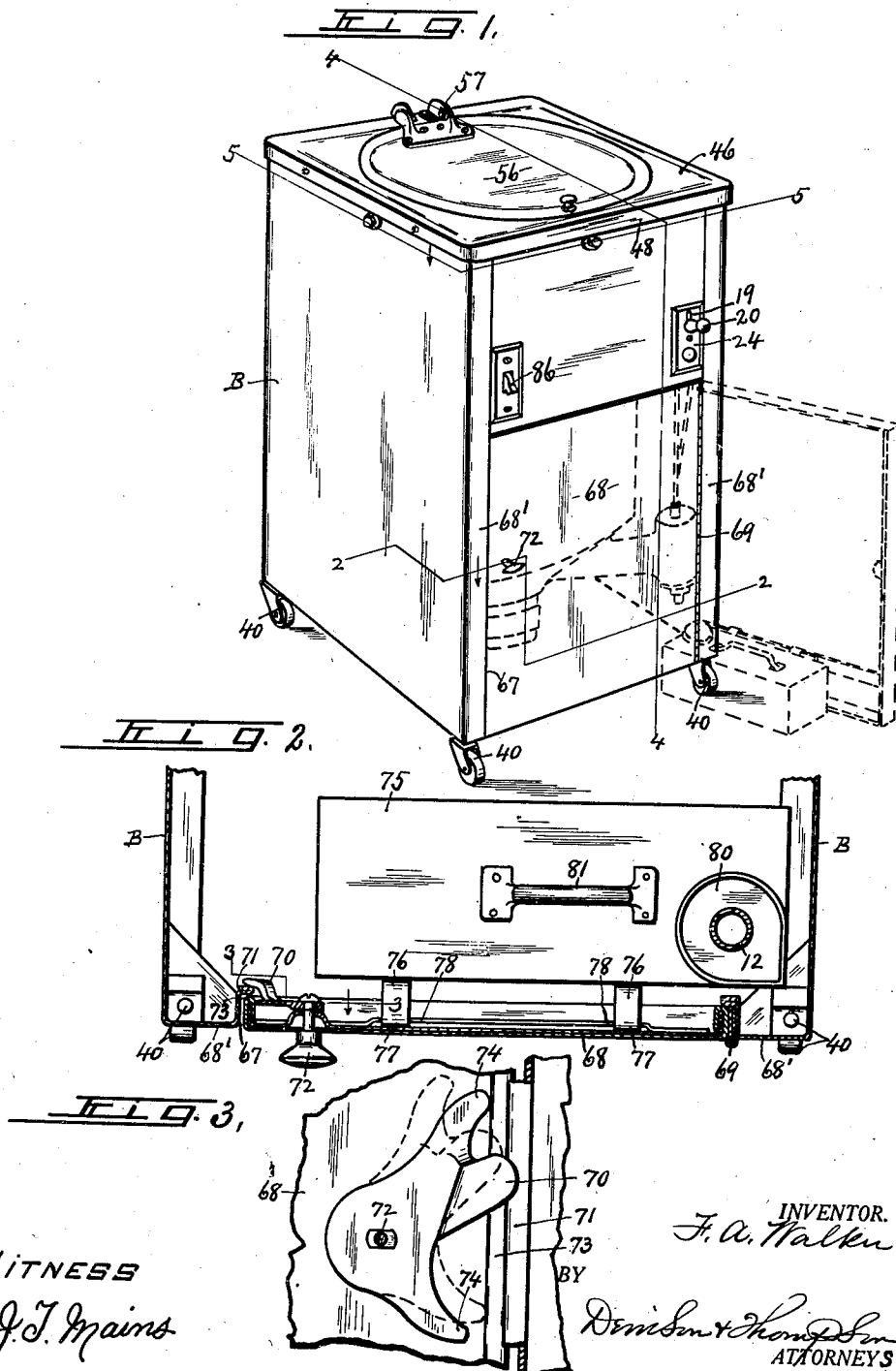
F. A. WALKER

1,825,033

COMBINED MECHANICAL DISHWASHER AND CABINET THEREFOR

Filed Dec. 7, 1929

4 Sheets-Sheet 1



Sept. 29, 1931.

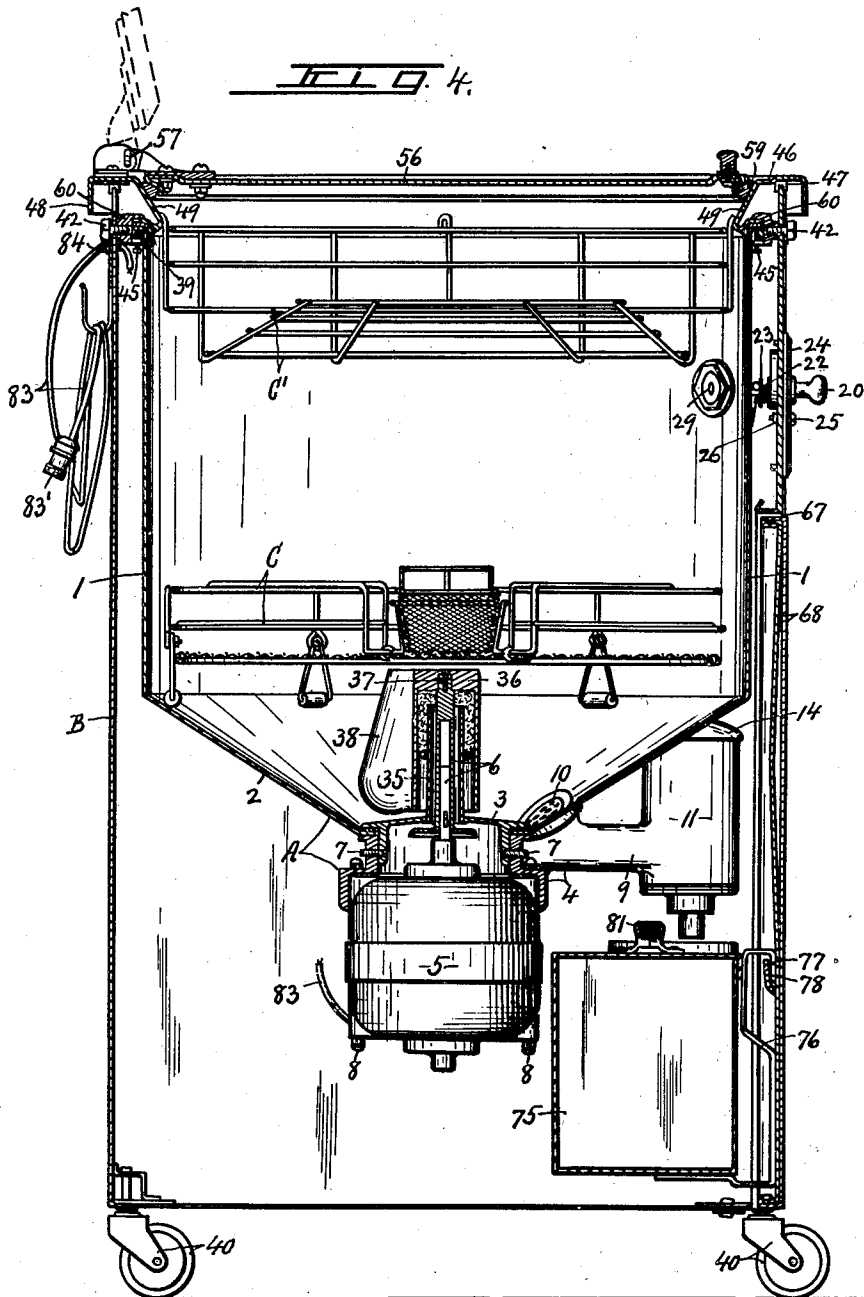
F. A. WALKER

1,825,033

COMBINED MECHANICAL DISHWASHER AND CABINET THEREFOR

Filed Dec. 7, 1929

4 Sheets-Sheet 2



WITNESS

J. J. Mains

BY

Denison & Thompson
ATTORNEYS

INVENTOR.

F. A. Walker

Sept. 29, 1931.

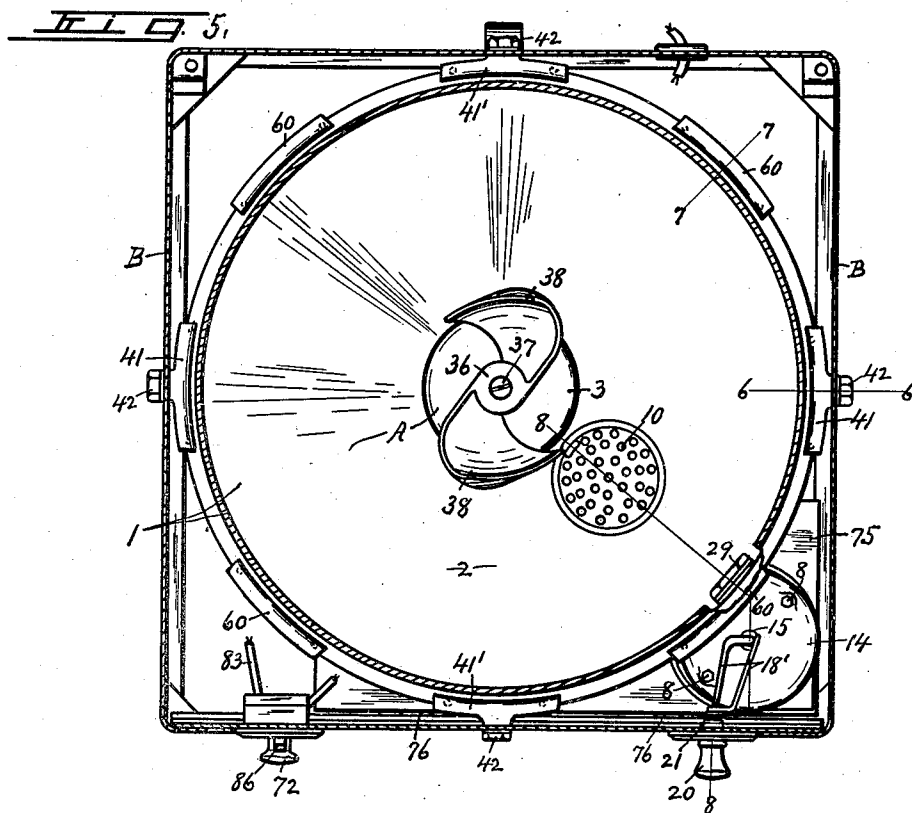
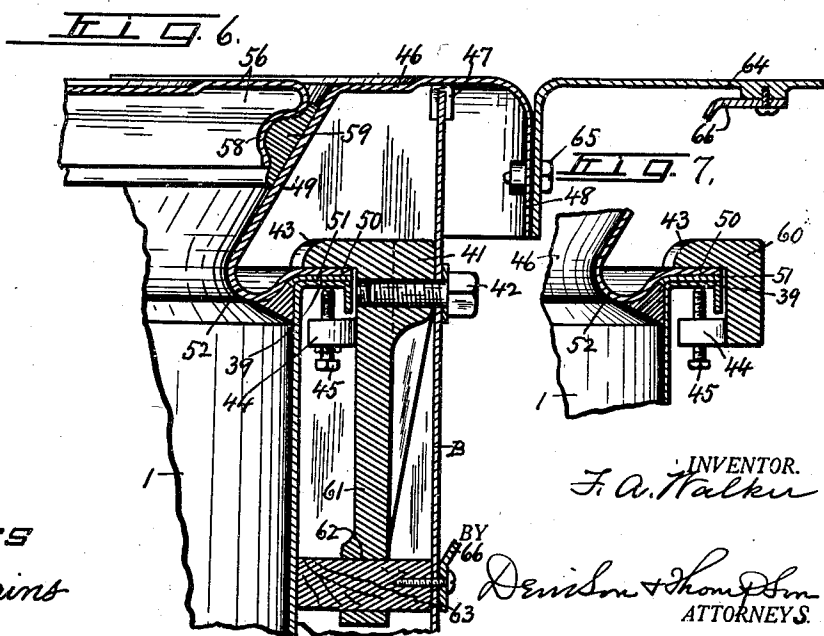
F. A. WALKER

1,825,033

COMBINED MECHANICAL DISHWASHER AND CABINET THEREFOR

Filed Dec. 7, 1929

4 Sheets-Sheet 3



WITNESS

J. T. Mains

INVENTOR.
F. A. Walker

BY
Denison & Thompson
ATTORNEYS.

Sept. 29, 1931.

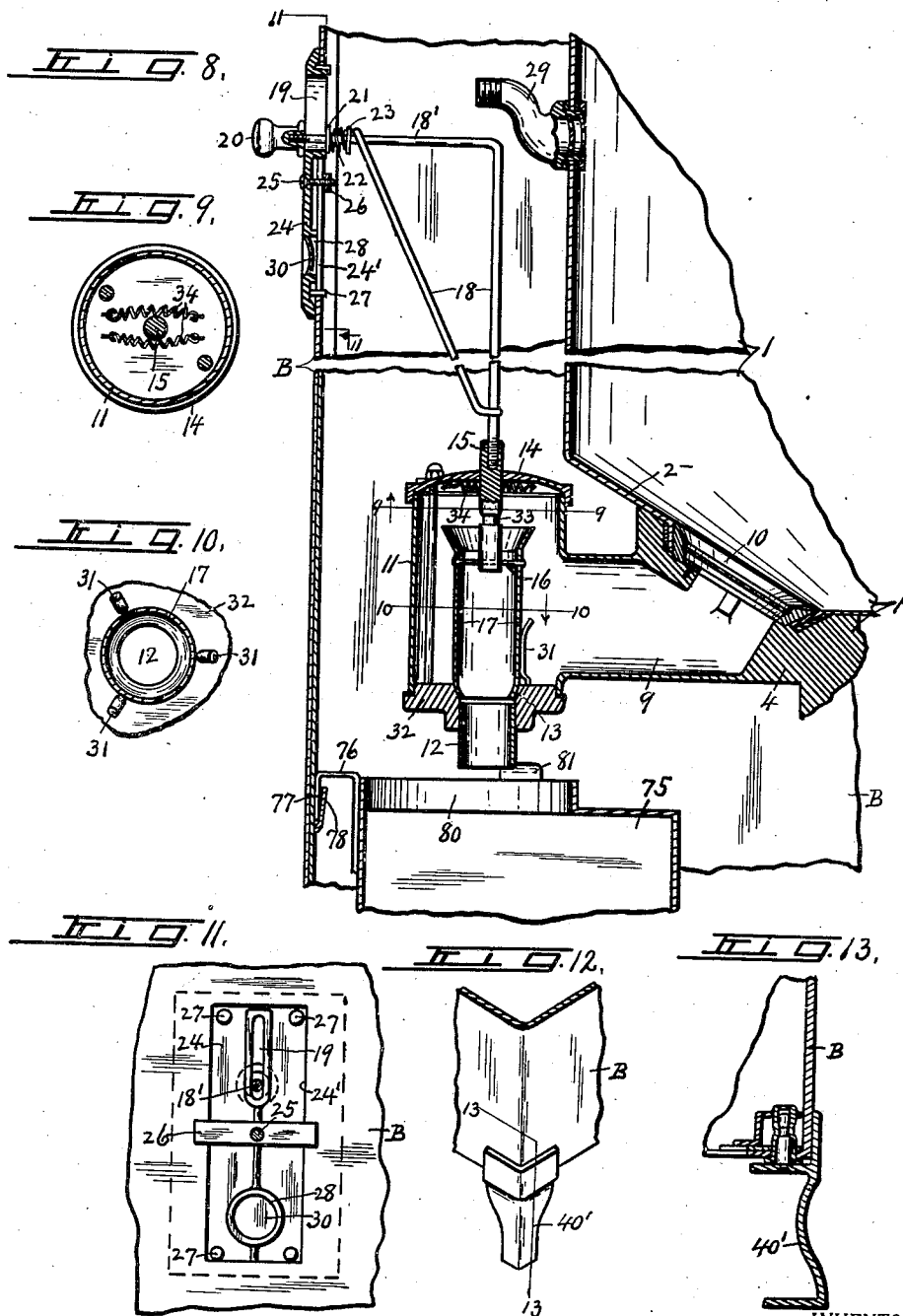
F. A. WALKER

1,825,033

COMBINED MECHANICAL DISHWASHER AND CABINET THEREFOR

Filed Dec. 7, 1929

4 Sheets-Sheet 4



WITNESS

J. J. Mains

BY

Demetrius & Thomas Son
ATTORNEYS

INVENTOR.
F. A. Walker

UNITED STATES PATENT OFFICE

FORREST A. WALKER, OF SYRACUSE, NEW YORK, ASSIGNOR TO WALKER DISHWASHER CORPORATION, OF CHICAGO, ILLINOIS, A CORPORATION OF DELAWARE

COMBINED MECHANICAL DISHWASHER AND CABINET THEREFOR

Application filed December 7, 1929. Serial No. 412,532.

This invention relates to a combined mechanical dishwasher and cabinet therefor and refers more particularly to the construction of the cabinet and to the means for supporting and concealing the mechanical dishwasher therein and to other more or less important adjuncts associated with both of the elements for increasing the efficiency and convenience of the combination as a whole.

These mechanical dishwashers exclusive of cabinets are used extensively in the kitchens of homes, hotels, restaurants, boarding-houses and the like and necessarily involve the use of moving parts which are usually driven by an electric motor, thereby introducing certain dangers in the operation of the machine by inexperienced or careless users in addition to the fact that the appearance of the machine as commonly used frequently clashes with the other fixtures or furnishings of the room, and the main object of the present invention is to support the machine within and upon a suitable cabinet or housing of pleasing appearance and capable of not only protecting the user against injury by any of the moving parts or electric current, but also of protecting the various parts of the machine against injurious contact with external objects.

Another object is to enable the mechanical dishwasher and cabinet to be easily and quickly assembled, one within the other, without material alteration of any of the parts of the mechanical dishwasher, thus permitting the latter to be used in the usual way independently of the cabinet when desired.

Another object is to permit the use of the combined mechanical dishwasher and cabinet in suburban and other places where soil pipe drainage is inaccessible.

Other objects and uses relating to specific parts of the apparatus will be brought out in the following description.

In the drawings:

Figure 1 is a perspective view of a combined mechanical dishwasher and enclosing cabinet therefor, the door of the cabinet and parts mounted thereon being shown by dotted lines in its opening position.

Figure 2 is an enlarged horizontal sec-

tional view taken in the plane of line 2—2, Figure 1.

Figure 3 is an enlarged inner face view of the detail lock and release mechanism for the door taken in the plane of line 3—3, Figure 2.

Figure 4 is an enlarged vertical sectional view of the same machine taken in the plane of line 4—4, Figure 1.

Figure 5 is an enlarged horizontal sectional view taken in the plane of line 5—5, Figure 1.

Figure 6 is an enlarged detail sectional view taken in the plane of line 6—6, Figure 5, showing more particularly the means for supporting the mechanical dishwasher within the cabinet or housing.

Figure 7 is an enlarged detail sectional view taken in the plane of line 7—7, Figure 5.

Figure 8 is an enlarged vertical sectional view partly broken away, taken in the plane of line 8—8, Figure 5.

Figures 9 and 10 are detail horizontal sectional views taken respectively in the planes of lines 9—9 and 10—10, Figure 8.

Figure 11 is a detail vertical sectional view taken in the plane of line 11—11, Figure 8.

Figure 12 is an enlarged detail perspective view, partly in section, of one of the lower corners of the cabinet showing a modified form of supporting leg therefor.

Figure 13 is an enlarged vertical sectional view taken in the plane of line 13—13, Figure 12.

As illustrated this apparatus comprises a mechanical dishwasher unit—A—and a cabinet or housing—B—within and upon which the mechanical dishwasher is supported and concealed. The mechanical dishwasher comprises an upright cylindrical vat—1—having a frusto-conical bottom—2—provided with an opening in its apex for receiving a bushing—3—upon which is mounted a motor-supporting frame—4—carrying an electric motor—5—having its armature shaft—6—co-axial with the axis of the vat and extended through a central opening in the bushing—3—.

The bushing—3—is flanged against the

upper face of the walls of the opening through which it extends while the adjacent portion of the frame —4— surrounds the pendant extension of the bushing and engages the underside of said walls and is provided with radial clamping screws —7— for engaging the pendant extension of the bushing and thereby firmly clamping said bushing and adjacent portion of the frame —4— against the lower and upper faces respectively of the walls of the opening in which the bushing is mounted, thereby forming a water-tight joint at the opening.

The portion of the frame —4— surrounding the pendant extension of the bushing —3— is provided with a socket for receiving the upper end of the motor —5— which is secured to the overlying portion of the frame —4— by clamping screws or bolts —8— as shown in Figure 4.

The frame —4— is provided with a hollow lateral extension —9— communicating with a drainage outlet —10— in the bottom of the vat —1— close to but at one side of the opening in which the bushing —3— is mounted. This hollow lateral extension —9—, Figure 8, constitutes a drainage conduit which terminates at its outer end in an upright cylindrical shell or standpipe —11— having a drainage opening —12— in its lower end surrounded by a valve seat —13—.

The upper end of the cylindrical portion —11— is provided with a cap section —14— having a central opening therein coaxial with the drainage outlet —12— for receiving a valve operating member —15—, shown more clearly in Figure 8.

The valve operating member —15— is movable vertically in the central opening in the top section —14— and has its lower end pivotally connected at —16— to the interior of an upright tubular valve —17— which in turn has its lower end tapered and movable into and out of engagement with the valve seat —13— for closing and opening the drainage outlet —12—.

This tubular valve —17— extends some distance above the level of the outlet —10— and is open at the top to form an overflow passage for the liquid which may be introduced into the vat, thereby regulating the level of said liquid irrespective of the amount which may be introduced into the vat.

The operating member —15— is provided with an upward extension —18— having a lateral offset —18'— for extension outwardly through a vertically elongated slot —19— in the corresponding side of the cabinet —B— and is provided at its outer end with a handle —20— by which the valve —17— may be opened and closed.

The inner end of the handle —20— is slidably engaged with the outer face of the side walls of the opening —19— while the inner face of the same walls is engaged by a

washer —21— which is movable axially of and upon the offset portion —18'— as shown in Figure 8.

An additional washer —23— is secured to the offset portion —18'— in spaced relation to the washer —21— to form an end abutment for the adjacent end of a coil spring —22— having its other end engaged with a washer —21— to cause frictional engagement of said washer with the adjacent face of the cabinet —B— to frictionally hold the valve and its operating means in their adjusted positions.

As shown more clearly in Figures 8 and 11 the vertically elongated slot —19— is formed in a separate plate —24— which is secured in an opening —24'— in the adjacent side wall of the cabinet —B— by means of a bolt —25— and clamping bar —26—, Figure 11, said plate being held against turning about the axis of the bolt —25— by studs —27— projecting inwardly therefrom near the side walls of the opening as shown in Figure 11.

This plate —24— is also provided with an opening —28— for receiving a water supply pipe (not shown) adapted to be connected to a water inlet nozzle —29— leading to the interior of the vat —1— some distance above the level of the overflow valve —17—, said opening —28— being normally closed by a removable plug —30—, Figure 8.

The lower end of the overflow valve —17— is guided in its vertical movement by a series of, in this instance three, upright resilient guide members —31— which are secured to the bottom section —32— of the cylindrical portion —11— of the drainage outlet —9— to extend upwardly therefrom as shown in Figures 8 and 10.

The valve operating member —15— is provided intermediate its ends with an annular groove —33— movable into and out of engagement with a pair of opposed coil springs —34— which are secured to the underside of the cap section —14— and tensioned to engage opposite faces of the stem —15— for frictionally holding the valve and its operating means in an open position when the groove —33— is registered with the springs.

The bushing —3— in the bottom of the vat —1— is provided with a central tubular post —35— extending upwardly therefrom some distance above the level of the top of the overflow valve —17— and therefore above the level of the water in the vat to prevent leakage of the water from the vat downwardly along the motor shaft —6—, the connection between the tubular post —35— and bushing —3— being permanent and water tight to avoid the use of stuffing boxes which are always subject to leakage.

The motor shaft —6— extends from the underside upwardly through and above the tubular post —35— for receiving and sup-

porting an impeller hub —36— having its upper end secured to said shaft by means of a clamping screw —37— and its lower end hollow to extend downwardly around the tubular post in spaced relation thereto, said hub being provided with opposite projecting impeller plates —38— adapted to circulate the water upwardly and circumferentially when the impeller is rotated by the motor —5—.

The tubular post —35— is also arranged in spaced relation to the motor shaft —6— to avoid frictional engagement therewith so that the impeller may be supported entirely by and upon the upper end of the shaft which in turn is journaled in the motor case.

In apparatus of this character it is desirable to conserve the use of water and also the electric current both of which are usually furnished at meter rates and for this purpose are limited to the capacity of the motor and impeller by means of the overflow valve —17—, the motor and impeller being selected to produce the most efficient circulation of the water upwardly through the openwork trays as —C— and —C'— and dishes which may be placed therein.

In other words the volume of water is limited to the power capacity of the motor which in turn is limited to the volume of water required for efficient and thorough washing of the dishes so that the volume of water and power capacity of the motor may be said to be in substantial balance while the spacing of the tubular post —35— from the motor shaft and from the hub of the impeller clearly reduces the frictional resistance to the operation of the motor and permits the use of a motor of relatively small power capacity and at the same time the extension of the tubular post —35— above the top of the overflow valve —17— automatically prevents any liability of leakage of the water from the vat over the top of the post and downwardly along the motor shaft irrespective of the amount of water which may be introduced into the vat through the inlet nozzle —29— or otherwise.

The lower tray —C— is supported upon the marginal edges of the conical bottom —2— of the vat while the upper tray —C— is supported upon the top section of the cabinet —B— in a manner hereinafter described, the upper marginal edge of said vat being provided with an outturned marginal flange —39— for reinforcing and other purposes hereinafter described.

The spray nozzle —29— is secured in an opening in the adjacent side of the vat —1— some distance above the level of the overflow valve —17— and preferably between the lower and upper trays —C— and —C'— and is arranged to spray the inflowing water inwardly, upwardly and downwardly through said trays and against the dishes therein for

rinsing purposes in addition to its main function of supplying the necessary volume of water to the interior of the vat to be circulated upwardly and circumferentially by the impeller blades —38— as the impeller is rotated.

Cabinet

The cabinet —B— preferably comprises a sheet metal shell which is substantially rectangular in top plan and of sufficient size to entirely enclose, conceal and support the mechanical dishwasher previously described.

As illustrated the cabinet is substantially square in top plan and of somewhat greater cross-sectional area than that of the vat so as to leave a clear open space between the marginal portions of the vat and side walls of the cabinet which preferably extend some distance above and below the corresponding ends of the mechanical dishwasher as shown more clearly in Figure 4, said cabinet being supported upon casters —40— near the corners thereof as shown in Figure 4, but obviously may be supported upon legs —40'— as shown in Figures 12 and 13, without departing from the spirit of the invention.

These casters —40— and legs —40'— are provided with similar means for attaching them to the bottom of the cabinet and are preferably of the removable type so that they may be interchanged if desired.

The means for supporting the mechanical dishwasher within the cabinet comprises a pair of diametrically opposite hangers —41— and an additional pair of diametrically opposite hangers —41'— arranged in a plane at right angles to the hangers —41—, said hangers being secured by clamping bolts —42— to the inner faces of the corresponding sides of the cabinet substantially midway between the corners thereof as shown more clearly in Figures 5 and 6, and provided with inwardly projecting vertically spaced flanges —43— and —44— to form intervening spaces for receiving the adjacent portions of the marginal flange —39— on the upper end of the vat —1— as shown more clearly in Figure 6.

The lower flanges —44— are provided with threaded apertures for receiving a corresponding number of clamping bolts —45— which engage the underside of the adjacent portions of the marginal flange —39— of the vat for supporting said vat and other parts mounted thereon in an upright position within the cabinet —B— as shown more clearly in Figure 6.

A rectangular cap plate or section —46— is supported upon the upper marginal edge of the cabinet —B— through the medium of interposed rubber or equivalent buffers —47—, Figure 6, said cap ring being provided with an outer downturned marginal flange —48— extending around the upper end of the up-

right portion of the cabinet —B— in spaced relation thereto for reinforcing and finishing purposes.

This cap plate is also provided with an inner downwardly and inwardly inclined frusto-conical flange —49— which is circular in top plan and has its lower edge extending into the upper end of the vat —1— and provided with an upwardly and outwardly projecting marginal flange —50— extending into the spaces between the flanges —43— and —44— or rather between the marginal flange —39— of the vat —1— and upper flanges —43— to rest upon said marginal flange —39— through the medium of a rubber or equivalent gasket —51—, Figure 6.

The lower edge of the frusto-conical flange —49— is united to the marginal flange —50— by a beaded portion —52— which projects into the upper end of the vat and serves to deflect the upwardly circulating water inwardly away from the joint between the flanges —39— and —50—.

This frusto-conical flange 49 also serves as a means for supporting the upper marginal edge of the upper tray —C'— and a suitable lid —56— which, as shown in Figure 1, is hinged at —57— to one side of the cap section —46— to swing to and from its closed position.

This lid —56— is preferably made of sheet metal and is provided with a downturned marginal flange —58— of concavo-convex cross-section for receiving and retaining a packing-ring —59— of rubber or other suitable material which conforms to the contour of the inner face of the frusto-conical flange —49— as shown in Figure 6, to form a water tight joint therewith when the lid is closed.

The flanges —39— and —50— together with the intervening gasket —51— are also clamped together by a plurality of in this instance four, clamping members —60— arranged opposite the corners of the cabinet and substantially midway between the vat supporting members —41— and —41'— as shown more clearly in Figures 5 and 7, the clamping members —60— being somewhat similar to the members —41— and —41'— except that they are not secured to the cabinet but are provided with the vertically spaced flanges —43— and —44— and clamping screws —45— similar to those previously described.

Two of the diametrically opposite vat supporting members as —41— are provided with pendant extensions —61— having openings —62— for receiving spacing blocks —63— which engage adjacent portions of the upright walls of the vat —1— and cabinet —B— to hold the vat against lateral vibration when the mechanical dishwasher is in operation.

If desired a shelf —64— may be attached to one side of the cabinet —B— by one or more bolts —65— in which case the shelf would be additionally supported by a brace —66— hav-

ing one end secured to the underside of the shelf as shown in Figure 6, and its other end secured to the cabinet adjacent the spacing block —63— which then serves to prevent buckling of the adjacent portion of the cabinet by any ordinary weight which may be carried by the shelf.

One side of the cabinet is provided with an opening —67— extending from a plane just below the plate —24— to the bottom of the cabinet between upright corner flanges —68'— of said cabinet and normally closed by a door —68—, said door being hinged at —69— along one of its upright edges and having its opposite edge provided with a locking member —70— movable into and out of engagement with a keeper —71— on the adjacent flange —68'— as shown more clearly in Figures 2 and 3.

The locking member —70— is provided with a handle —72— journaled in an opening in the adjacent portion of the door by which it may be moved to and from its locking position, said locking member being provided with stops —74— at opposite sides of its pivot for engaging an inwardly projecting part 73 of the door frame and thereby limiting the movement of the locking member in opposite directions and incidentally reducing the liability of contact of the locking member with the adjacent portion of the cabinet when the door is opened and closed.

When the apparatus is used in places where drainage conditions are inaccessible suitable means is provided for receiving the drainage water from the vat —1— and for this purpose a receptacle —75— is removably mounted upon the inner side of the door —68— to move therewith.

This receptacle is preferably rectangular and elongated laterally and is provided at its outer side with a pair of upright straps —76— secured thereto in horizontally spaced relation and having their upper ends provided with outwardly and downwardly turned flanges —77— adapted to enter a corresponding number of loops —78— which are fastened to the inner face of the door as shown in Figures 2, 4 and 8.

The top of the receptacle —75— is provided with an opening —80— adapted to register with the lower end of the drainage outlet —12— when the receptacle is in operative position upon the door and the door is closed to permit the drainage of the water from the vat through the outlet —12— and into the receptacle —75— when the overflow valve —17— is open.

The receptacle —75— is of sufficient capacity to receive the volume of water commonly used for dishwashing purposes and is provided with a handle —81— by which it may be removed from the door when the latter is open and emptied when desired.

Current may be supplied to the motor from

any available source through the medium of a cable —83— which is passed through a bushing —84— in the upper portion of one side of the cabinet and is provided with an electric plug —83'—adapted to be connected to any available electric socket (not shown) the motor circuit being provided with a suitable switch having an operating member —86— in one side of the cabinet above the door —68— as shown in Figure 1.

The main parts of the apparatus are preferably assembled in an inverted position. That is the cap plate —46— is placed flatwise in an inverted position upon a floor or equivalent support after which the vat —1— is inverted and placed endwise upon the gasket —51— on the flange —50—. The clamping members —41—, —41'— and —60— are then placed in operative position upon the flanges —39— and —50— and the latter firmly clamped together by tightening the clamping screws —45—.

The spacing blocks —63— are then placed in the openings —62— on the pendant arms —61— of the clamping members —41— after which the jacket or cabinet —B— is inverted and placed in position with its lower edge resting in the buffers —47— on the cap plate —46—.

The bolts —42— are then inserted through their respective openings in the cabinet —B— and engaged in the threaded sockets in the corresponding clamping members —41— and —41'— thereby firmly locking the cabinet to said clamping members which in turn had been previously locked to the overlapping flanges —39— and —50— of the vat —1— and cap section —46—.

The cabinet with the vat securely fastened therein is then brought to its normal upright position after which the bushing —3—, motor-supporting frame —4—, motor —5— and impeller hub —36— may be assembled in the manner previously described, it being understood that the motor and its supporting frame —4— may be placed in operative position through the door opening —67— when the door —68— is opened. The lid —56— may then be opened to permit the trays —C— and —C'— to be placed in operative position within the vat.

While the door —68— is still open the receptacle —75— may be placed in operative position thereon so that when the door is closed the inlet —80— of the receptacle will be registered with the drainage outlet —12—, the apparatus being then ready for operation.

The requisite amount of water may be supplied to the interior of the vat by any means, preferably by connecting the inlet nozzle —29— with a source of water supply.

As soon as the water in the vat rises to the level of the top of the overflow valve —17— it will flow therethrough and through the drainage pipe —12— into the receptacle

—75— without regard to any additional quantity of water which may be permitted to flow into the vat, it being understood that the connection of the tubular post —35— with the bottom section —3— of the vat will automatically prevent leakage of the water over the top of the post by reason of the fact that it extends above the level of the overflow.

When the dishes are placed within the trays —C— and —C'— and the lid —56— is closed the rotation of the impeller by means of the motor —5— will cause the water to be circulated upwardly and circumferentially through the openwork dish-supporting trays and against the dishes therein.

This operation is continued until the dishes are thoroughly cleansed after which the valve —17— may be opened by the lifting of the handle —20— to allow the soiled water to drain from the outlet —10— into the receptacle —75— which, when the door —68— is opened, may be easily removed and emptied and then replaced for a repetition of the operation just described after the door —68— with the receptacle —75— thereon have been returned to their normal positions.

When the dishes are thoroughly washed fresh clean water may be introduced through the spray nozzle —29— for rinsing the dishes while still in the trays —C— and —C'—, this rinsing water also serving to clean the interior of the vat and other parts connected thereto by simply allowing the valve —17— to remain open for the free flow of the rinsing water into the receptacle —75—.

The trays with the dishes thereon may remain in place until thoroughly dry and then removed for storing the dishes in their usual places.

What I claim is:—

1. The combination with a dishwasher having a cylindrical vat for receiving the washing fluid and dishes to be washed, said vat having its upper end provided with an out-turned flange, of an enclosing cabinet therefor, clamping members bolted to the cabinet in circumferentially spaced relation and provided with adjustable means for engaging the underside of the flange and supporting the entire dishwasher.

2. The combination with a dishwasher having a cylindrical vat for receiving the washing fluid and dishes to be washed, said vat having its upper end provided with an out-turned marginal flange, of an enclosing cabinet therefor, a plate supported upon the cabinet and provided with a flange overhanging the flange on the vat, and means for clamping the flanges together whereby the dishwasher is at least partially supported by the plate.

3. The combination with a dishwasher having a cylindrical vat for receiving the washing fluid and dishes to be washed, said vat having its upper end provided with an out-turned marginal flange, of an enclosing cab-

inet therefor, a cap plate supported upon the upper end of the cabinet and provided with a downwardly tapered frusto-conical wall having an out-turned flange overhanging the flange of the vat, means for clamping said flanges together, and a lid hinged to the cap to move into and out of engagement with said wall.

4. The combination with a dishwasher having a vat for receiving the dishes and washing fluid, an upright casing surrounding the vat, means on the casing for supporting the vat thereon, a cap-plate supported on the upper end of the casing, and additional means on the cap-plate for additionally supporting the vat.

5. The combination with a dishwasher having a vat for receiving the dishes and washing fluid, said vat having its upper end provided with an out-turned flanged, of a casing surrounding the vat, a cap-section supported on the upper end of the casing and provided with a flange overlying the flange of the vat, means for clamping said flanges together, and means for securing the clamping means to the casing.

6. The combination with a dishwasher having a vat for receiving the dishes and washing fluid, said vat having its upper end provided with an out-turned flange, of a casing surrounding the vat, a cap-section supported upon the upper end of said casing and provided with a downwardly tapered frusto-conical wall having an out-turned flange overlying the flange of the vat, devices for clamping said flanges together, means for securing said devices to the casing, and a lid hinged to the cap-section to swing into and out of engagement with said wall.

7. The combination with a dishwasher having a vat for receiving the dishes and washing fluid, said vat having a drainage outlet, a casing surrounding the vat and provided with a door in one side, means for supporting the vat within and upon the casing, and a receptacle mounted on the door to move therewith into and out of registration with the drainage outlet to receive the drainage therefrom.

In witness whereof I have hereunto set my hand this 27th day of November, 1929.

FORREST A. WALKER.

55

60

65