W. R. WALKER.

DISH WASHER.

APPLICATION FILED JUNE 29, 1914.

1,259,939.

Patented Mar. 19, 1918.

2 SHEETS—SHEET 1.

Fig. 1.

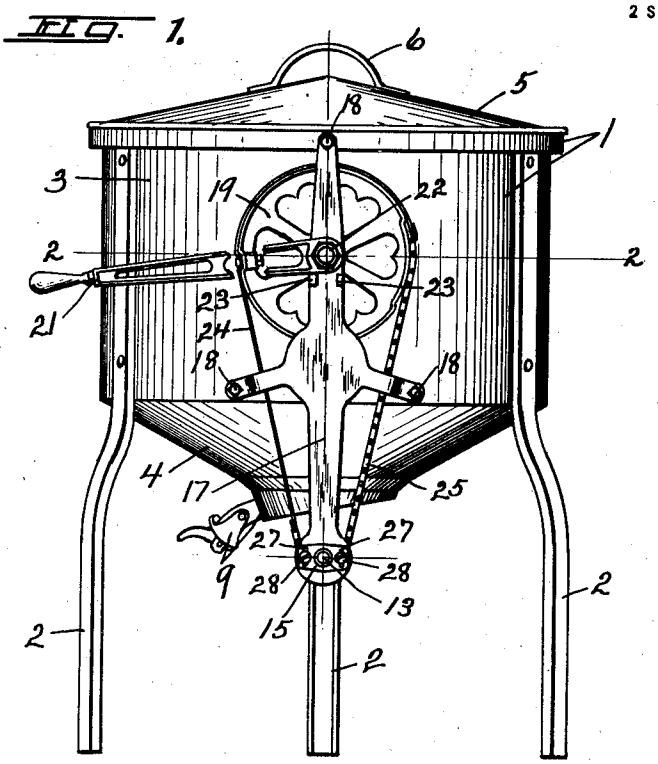
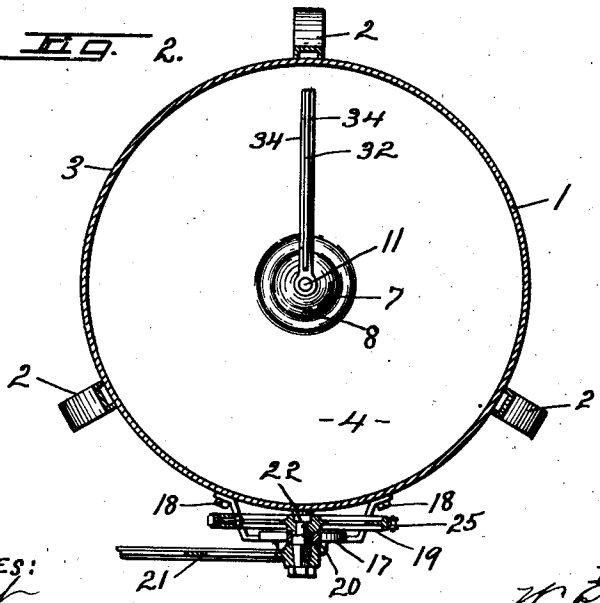


Fig. 2.



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2 SHEETS—SHEET 2.

FIG. 3.

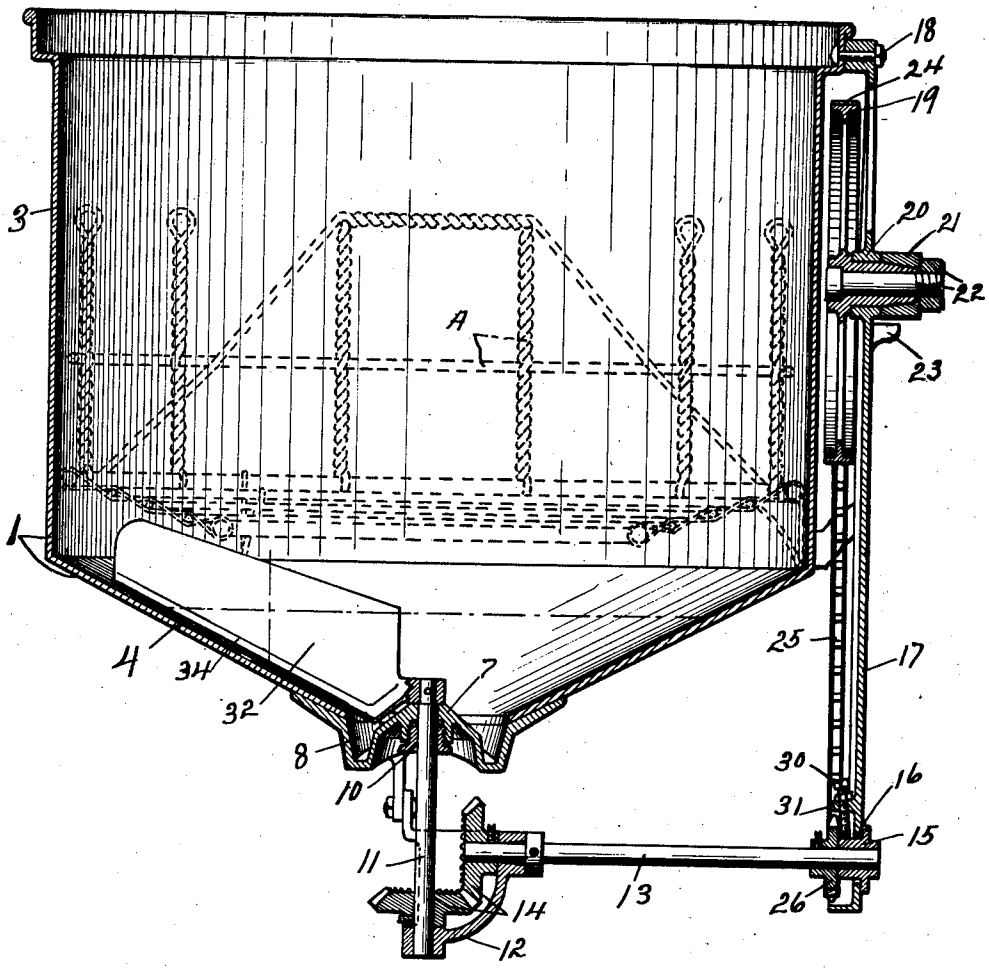


FIG. 4.

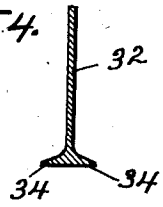
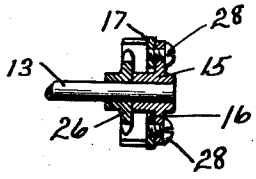


FIG. 5



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UNITED STATES PATENT OFFICE.

WILLARD R. WALKER, OF SYRACUSE, NEW YORK.

DISH-WASHER.

1,259,939. Specification of Letters Patent. Patented Mar. 19, 1918.

Application filed June 29, 1914. Serial No. 847,965.

To all whom it may concern:

Be it known that I, WILLARD R. WALKER, a citizen of the United States of America, and a resident of Syracuse, in the county of Onondaga, in the State of New York, have invented new and useful Improvements in Dish-Washers, of which the following, taken in connection with the accompanying drawings, is a full, clear, and exact description.

This invention relates to certain improvements in mechanical dish washers of the class set forth in my pending applications Nos. 749,133 (filed February 18, 1913), 776,678 (filed June 30, 1913) and 811,720 (filed January 12, 1914) except that it refers more particularly to a hand-operated rotary dasher adapted to be revolved in reverse directions one or more revolutions at a time.

The main object is to impart to a relatively shallow body of water an upward whirling centrifugal motion and to suddenly reverse this motion so as to obtain a maximum and more or less irregular splash of the water between and across the dishes or other utensils which are usually carried by open-work baskets or trays similar to those shown in my pending application No. 776,678.

Another object is to construct and associate the bottom of the vat and dasher-blade in such manner as to cause an upward splashing of the water through the dish-supporting trays or baskets and to the top of the vat as the dasher-blade is rotated in either direction.

Another object is to impart to the dasher a relatively high speed of rotation through one or more complete revolutions by the movement of the operating member through a comparatively short arc.

A still further object is to make the portion of the dasher-blade nearest its axis of rotation of greater vertical width or height than its outer end so as to act upon a relatively larger volume of water in displacing it from the center outwardly under centrifugal force, thus permitting the use of a comparatively shallow body of water in the apex of the cone bottom with the assurance that it will be agitated and distributed throughout the whole interior capacity of the tank with the employment of a comparatively low degree of power.

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

In the drawings—

Figure 1 is a side elevation of a mechanical dish washer embodying the various features of my invention.

Fig. 2 is a horizontal sectional view through the vat taken on line 2—2, Fig. 1.

Fig. 3 is an enlarged longitudinal vertical sectional view of the upper portion of the machine omitting the supporting legs.

Fig. 4 is an enlarged detail sectional view of the dasher-blade.

Fig. 5 is a horizontal sectional view through the outer end of the bracket carrying the counter-shaft, showing more particularly the adjustable bearing for said shaft.

This machine comprises a covered vat or tank —1— having supporting legs —2— in the form of a tripod and consisting of a cylindrical main body —3— having an inverted cone bottom —4— and a conical top or cover —5— which, in this instance, is removable and for this purpose is provided with a handle —6—.

The apex of the cone bottom —4— is truncated and provided with a raised cone center —7— and a depressed annular channel —8— surrounding the raised center —7—, the bottom of the channel —8— being inclined from one side toward the diametrically opposite side where it is provided with a suitable outlet or drainage faucet —9— of the gate-type.

The raised center —7— of the bottom —4— is provided with a gland —10— forming an upper bearing for an upright shaft —11— having its lower end journaled in a bracket —12— which is secured to and depends from the bottom of the vat.

This bracket —12— also forms a support for the inner end of a horizontal counter-shaft —13— which is geared to the upright shaft —11— by bevel-gears —14—.

This counter-shaft —13— is located some distance below the bottom of the vat —1— and extends radially relatively thereto, its outer end being journaled in a bearing —15— which is adjustably mounted in a vertically elongated opening —16— in the lower end of an upright bracket —17—, the latter being secured by bolts —18— to the adjacent side of the vat —1—.

A relatively large band-wheel —19— is journaled in a bearing —20— on the upright bracket —17— between said bracket

and the adjacent side of the vat, the hub of the wheel —19— being extended outwardly some distance beyond the outer face of the bracket —17— and is tapered for receiving an operating handle or lever —21— which is tightly fitted upon the tapered portion of the hub and is held in operative position by a suitable clamping bolt —22—.

The arc of movement of the lever —21— and wheel —19— is limited to approximately a half circle by means of stop shoulders —23— on the bracket —17— just below the hub of the lever as shown more clearly in Figs. 1 and 3.

This wheel —19— is connected by a strap —24— and chain —25— to a relatively smaller sprocket wheel —26— on the outer end of the counter-shaft —13—, the ratio of the wheels —19— and —26— being, in this instance approximately five to one, so that the movement of the lever —21— through an arc of 180° will revolve the shaft —11— and dasher-blade secured thereto approximately two and one-half complete revolutions or more than a complete revolution at each movement of the lever through an arc of a quarter of a circle.

The lever is shown in its normal position in Fig. 1 and when in that position, the strap —24— extends around the upper half of the wheel —19— while the chain extends around the lower half of the sprocket wheel —26—, thereby avoiding the necessity of cutting sprocket teeth on the larger wheels and permitting the use of a relatively short length of chain in effecting a positive drive of the counter-shaft —13— and dasher-supporting shaft —11— in reverse directions.

The bearing —15— is provided with slotted bolt holes —27— for receiving clamping bolts —28— by which the bearing may be adjusted vertically and held in its adjusted position, this adjustment being effected by means of a set screw —30— which is engaged in an apertured lug —31— on the inner side of the bracket —17— as shown more clearly in Fig. 3, the object of this adjustment being to tighten the belt or release it for removal if necessary.

A dasher-blade —32— is secured to the upper end of the upright shaft —11— within the vat —1— and close to the bottom thereof and is preferably arranged edgewise vertically relatively to said bottom so as to extend radially from the shaft —11— across the channel —8— and upwardly along the inclined bottom a distance greater than one-half the radius of said bottom so as to act upon the entire body of washing fluid which may be placed in the bottom of the vat.

The lower edge of the blade —32— is provided with laterally flaring flanges —34— projecting equal distances from the center of the main body and of substantially the same flare so as to effect an upward movement of the water as the blade is rotated in reverse directions, the lower edge of said blade being inclined upwardly and laterally at the same angle as the bottom of the vat in close proximity thereto, leaving just sufficient clearance to avoid friction with said bottom.

The inner ends of these flanges —34— at the inner sides of the channel —8— are deflected upwardly to conform to the upper face of the conical center portion —7— and at the same time operate to assist in forcing the washing fluid at the center radially and outwardly and also upwardly.

The inner end of the blade —32— is of greater vertical height than its outer end so as to act more effectively upon the relatively deep body of water at the center to force the same outwardly as the blade is rotated, it being understood that the body of water usually employed, and indicated by the dotted lines in Fig. 3, is relatively shallow so that its normal level is some distance below the upper edge of the outer end of the blade.

It is now clear that when the blade is rotated at the relatively high speed intended, the upward inclination of the bottom of the tank and blade, together with the flaring wings or flanges —34— at the bottom of said blade will impart to the water an upward whirling movement of sufficient force to reach the top of the vat, thereby passing between and across any plates which may be held edgewise in the basket as —A— and returning by its own gravity between and across the dishes to the bottom of the tank.

It is also evident that if the direction of movement of the blade is suddenly reversed after the water has been impelled under a whirling motion, the sudden stoppage of such whirling motion will cause the water to splash higher and with greater force between and across the dishes which may be held in the trays and, after repeating this movement a few times, the dishes will be thoroughly freed from accumulations, it being understood that the first cleansing fluid contains more or less soap or other grease solvent and that after the first cleansing, this fluid may be drawn off and a similar quantity of clean hot or cold water may be introduced and agitated in the manner described to finally cleanse the dishes which, when the agitation ceases, are left in the trays to dry, the body of water being below the trays.

What I claim is:

In a mechanical dish washer, the combination of a vat having the central portion of its bottom provided with an annular channel and a raised conical portion surrounded by said channel, an upright shaft journaled in the apex of said raised portion,

an impeller blade secured to said shaft within the vat and having its lower edge provided with oppositely projecting flanges traveling close to the bottom of the vat and having their ends nearest the center inclined upwardly along the incline of the central conical portion of the bottom.

In witness whereof I have hereunto set my hand this 27th day of June, 1914.

WILLARD R. WALKER.

Witnesses:
H. E. CHASE,
EVA E. GREENLEAF.