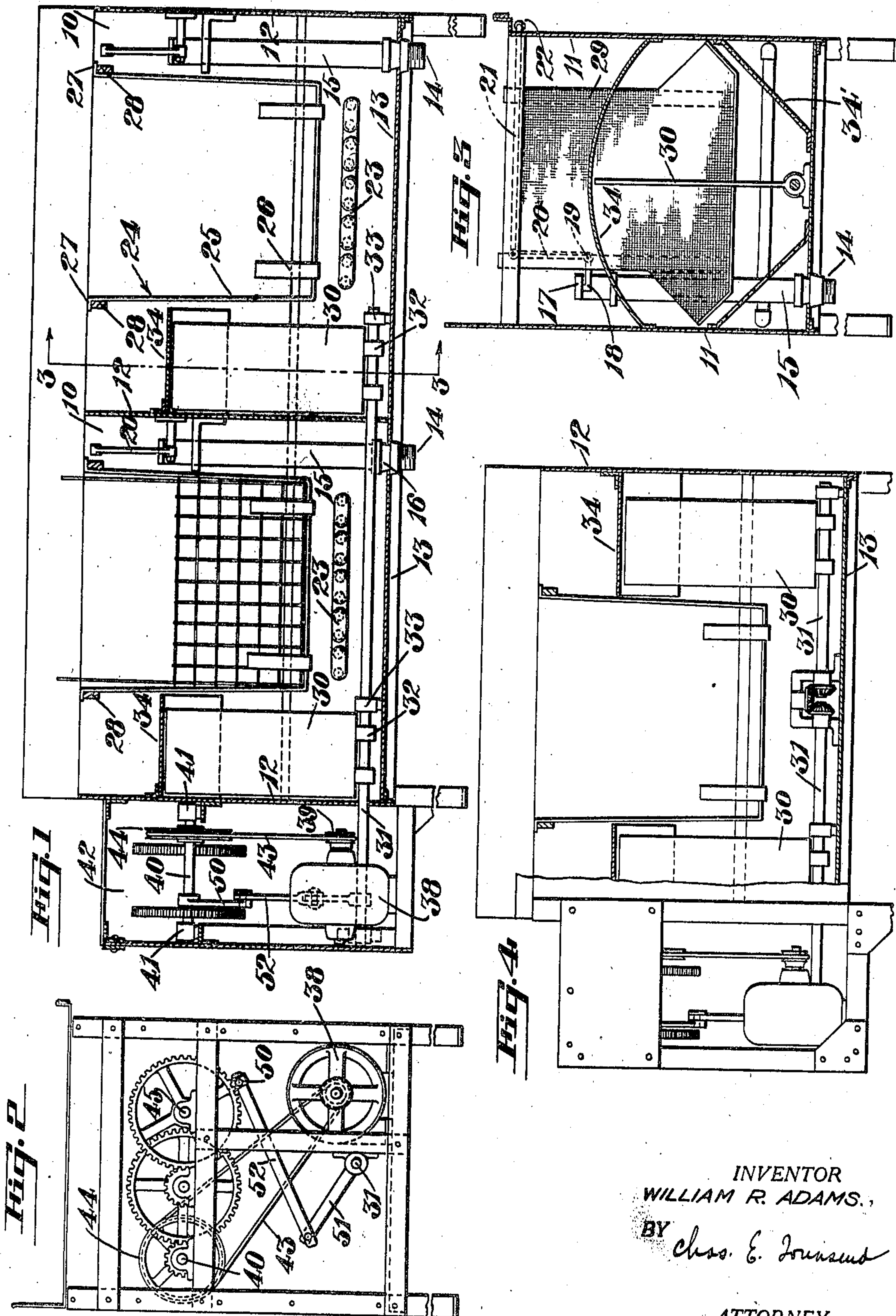


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W. R. ADAMS.  
DISHWASHING MACHINE.  
FILED JAN. 26, 1921.



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# UNITED STATES PATENT OFFICE.

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## DISHWASHING MACHINE.

Application filed January 26, 1921. Serial No. 439,927.

*To all whom it may concern:*

Be it known that I, WILLIAM R. ADAMS, a citizen of the United States, residing at San Francisco, in the county of San Francisco and State of California, have invented new and useful Improvements in Dishwashing Machines, of which the following is a specification.

This invention relates to a dish washing machine.

It is the principal object of the present invention to provide a machine mechanically adapted to wash dishes and like articles, which machine is equipped with means for thoroughly agitating water, and a cleaning solution within a vat, and thereby satisfactorily cleaning the articles to be washed, all of which operation takes place in a simple manner by means devoid of complex construction.

The present invention contemplates the use of a liquid container, within which a basket is removably disposed, said container being equipped with agitators, by which a circulation of a cleaning solution may be established through the basket and around articles supported therein.

The invention is illustrated by way of example in the accompanying drawings, in which:

Figure 1 is a view in vertical section and elevation, showing a form of the present invention, in which two compartments are employed.

Fig. 2 is a view in end elevation showing the driving mechanism required for the agitator blades.

Fig. 3 is a view in vertical section through the device shown in Fig. 1, as viewed on the lines 3—3.

Fig. 4 is another form of the invention, in which two agitator blades are used.

Referring more particularly to the drawings, 10 indicates compartments formed by side and end walls 11 and 12, respectively, and a bottom 13. In the form of the invention shown in Fig. 1, two of these compartments are made, while in the device disclosed in Fig. 4, one compartment is utilized. In either instance it is desirable to provide a drain pipe 14, through which the liquid contents of the compartments may be drained off, and which drain is fitted with a movable overflow pipe 15. This pipe is formed with

a conical bottom fitting 16, seating within a cone shaped cavity in the top of the drain 14. The upper end of the drain pipe 15 is equipped with a collar 17 by which the pipe may be lifted. This lifting action is produced by an arm 18, the end of which rests beneath the collar, and which arm is mounted upon a horizontal pivot 19. A vertical arm 20 is formed integral with the arm 19, and produces a bell crank. The upper free end of the bell crank is connected to a shifting lever 21, extending horizontally across the compartment, and fitted with an operating handle 22, by which it may be horizontally reciprocated, and the overflow pipe 15 raised or lowered. Water may be delivered to the containers from any suitable source of supply, it being preferable to maintain the water at a desirable temperature by a set of heating coils 23, disposed in the bottom of each of the containers.

Articles to be washed are removably supported within the containers by baskets 24. These baskets may be of any preferred form, although in the present instance they are shown as having vertical bars 25, supplemented by cross bars 26. The vertical bars are formed with out-turned flanges 27, adapted to overhang cross rails 28, by which the baskets are supported. In order to prevent the articles from falling from the ends of the baskets and into contact with the agitating machinery, screens 29 are provided and secured to the vertical bars 25.

The liquid used to cleanse the articles within the basket is adapted to be maintained in circulation by means of impellers 30. These impellers are in reality vertical blades, which are pivoted at their lower ends, and are adapted to oscillate from their pivotal axes to create a horizontal movement of the liquid. These blades are flat, and are secured to a drive shaft 31, by fittings 32. The drive shaft is rotatably supported in bearings 33 at the bottom of the dish washer and centrally thereof, so that an equal swinging movement of the blade each side of its center will substantially sweep entirely across the end of the compartment. In the form of the invention shown in Fig. 1, the blades are disposed at one end of the compartments, while in the device shown in Fig. 4, two blades are provided, preferably adapted to simultaneously operate in alternate directions. An



analysis of the action of the oscillating blades will show that their movement will not only create forced action, of the water away from the blades and through the basket 24, but will also produce a suction action on the opposite sides of the blades to cause a complete and continuous circulation of the liquid. In order to prevent the force of the movement 30 from being dissipated, arcuate deflectors 34 are secured to the ends of the compartments. These deflectors are struck from a radius substantially agreeing with the radial movement of the members and are, of course, disposed concentric to the swinging axes of the impellers.

In the form of the invention shown in Fig. 4 the impeller blades 30 are adapted to simultaneously swing in opposite directions. This is produced by providing two shafts 31, which are longitudinally aligned and are connected by a reversing gear at their adjacent ends. The structure may comprise gears 36 keyed on the shafts and both in mesh with the gear 37. It will be evident that rotation of one shaft in one direction will produce rotation of the other shaft in the opposite direction.

The shafts 31 may be driven by any suitable means, although a desirable driving mechanism is shown in Fig. 2. This comprises a motor 38 acting through a driving pulley 39 to operate a counter shaft 40, which shaft is rotatably supported in bearings 41, carried by suitable frame members within a compartment 42 at the end of the machine. A belt 43 is led around the pulley 39 and also around a pulley 44 on the counter shaft 40. A suitable train of gearing is driven from the counter shaft to actuate a crank shaft 45. This shaft carries a crank arm 50 connected with an oscillating arm 51 by a pitman rod 52. It will be evident therefore, that as the shaft 45 rotates the arm 51 will be oscillated, and after this arm is fixed to shaft 31 the impeller blades 30 will be given their proper movement.

In the operation of the present invention the compartments 10 are suitably filled with water, with which a desirable cleansing agent is mixed, and thereafter the articles to be cleaned are suspended in the water as supported by the removable baskets 24. When the motor is started the impeller blades will be swung and while forcing the water out of their path of travel, will at the same time be drawing water into the wake of the blade. The arcuate baffle member 34 will act to divert the water from its transverse travel to a path of travel longitudinally of the compartment and at right angles to the movement of the blades. This operation is continued until the articles are cleaned. When it is desired to empty the compartments, rods 21 are drawn to lift the drain pipe 15 and to allow

the water to drain out through the member 14. In order to create a proper circulation of water within the tank, both in a horizontal and vertical direction, angle plates 34' are disposed in the bottom of the tank, as more clearly shown in Fig. 3. These angle plates lie substantially parallel to the radial positions of the impeller blades 30, and will thus cause the water between the blades and the plates to be forcefully moved in a horizontal direction, thereafter striking the opposite end of the tank and rising. A rebound will then take place, and the water will be caused to pursue a horizontal course in the shape of the figure 8 while raising and lowering, thus insuring that the articles within the basket will be thoroughly washed.

It will thus be seen that the dish washing machine here disclosed is quite simple in its construction, not liable to require repair, and will efficiently operate to wash articles properly disposed therein.

While I have shown the preferred form of my invention, it will be understood that various changes might be made in the combination, construction and arrangement of parts by those skilled in the art, without departing from the spirit of the invention, as claimed.

Having thus described my invention, what I claim and desire to secure by Letters Patent is:

1. In a dish washing machine having a compartment containing liquid, an oscillating impeller blade disposed adjacent to one end of the compartment, and by which movement is imparted to the liquid, and means for diverting the liquid moved by the impeller to a path of travel at right angles to the path of travel of the impeller.

2. A dish washing machine comprising a liquid containing compartment, a basket suspended therein to support articles to be cleaned, a flat oscillating blade disposed at one end of the compartment and adapted to swing parallel to said end with the surface of the blade at right angles to its direction of movement, and an arcuate baffle plate secured to said end of the compartment and disposed concentric to the path of movement of the blade.

3. A dish washing machine comprising a liquid containing compartment, a basket suspended therein to support articles to be cleaned, a flat oscillating blade disposed at one end of the compartment and adapted to swing parallel to said end with the surface of the blade at right angles to its direction of movement, an arcuate baffle plate secured to said end of the compartment and disposed concentric to the path of movement of the blade, and angle plates disposed in the bottom of the tank and extending along opposite sides of said blade, and against which



the water may be forced by the impeller blade to cause it to move in a horizontal path of travel.

4. A dish washing machine comprising a dish washing compartment containing a cleansing liquid, a dish container suspended therein, a horizontal shaft extending there-through, vertically extending impeller blades secured to the shaft, means for imparting oscillating movement to the blades through the shaft, arcuate baffle plates adjacent the blades for diverting the liquid agitated by the blades through the dish container in two directions.

5. A dish washing machine comprising a rectangular liquid containing compartment, a foraminous dish container suspended therein, a horizontal shaft extending through the compartment along the bottom thereof, a vertically extending impeller blade secured to the shaft, means for rock-

ing the shaft and consequently oscillating the impeller blade, baffle plates positioned adjacent the blade for directing the agitated liquid through the dish container at right angles to the direction of travel of the oscillating blade.

6. A dish washing machine, including a motor container; an interior foraminous basket with means to support articles to be cleaned; flat oscillating blades fulcrumed at the lower ends and extending upwardly at the ends of the container; a fulcrum shaft extending beneath the basket and centrally divided; bevel pinions at the contiguous ends and a transverse engaging pinion; and mechanism by which the shaft and blades are caused to oscillate alternately in opposite directions and impel water through the basket.

WILLIAM R. ADAMS.