

J. W. CROOKS.
DISH WASHING MACHINE.
APPLICATION FILED SEPT. 25, 1919.

2 SHEETS—SHEET 1.

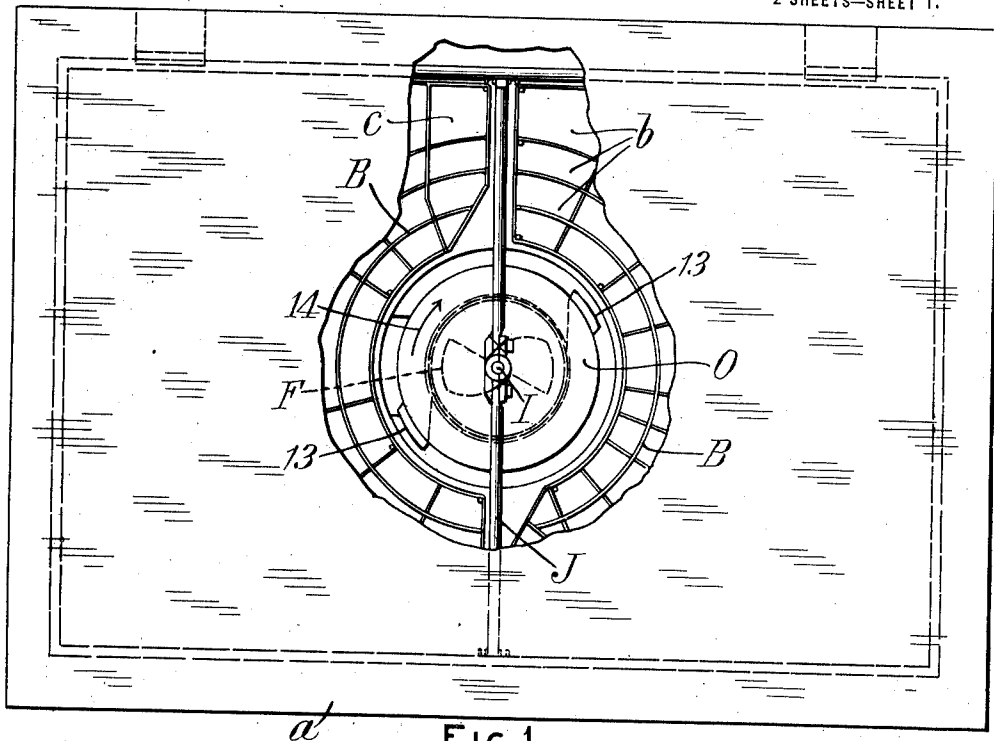


FIG. 1.

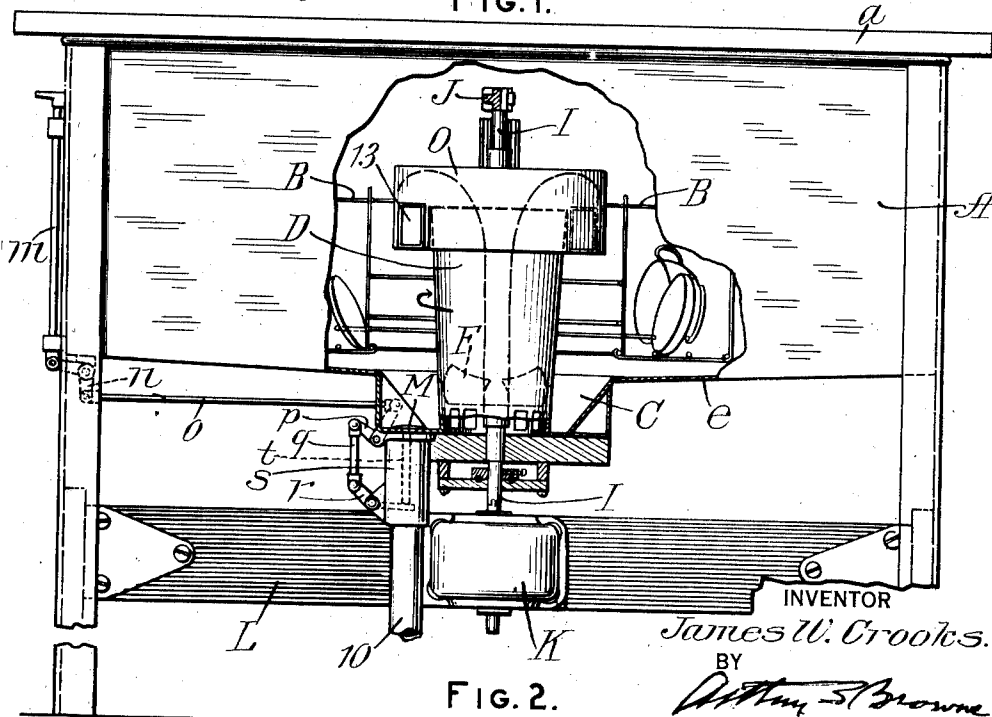


FIG. 2.

INVENTOR

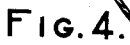
James W. Crooks.

BY

William S. Browne
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2 SHEETS--SHEET 2.



INVENTOR
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UNITED STATES PATENT OFFICE.

JAMES W. CROOKS, OF PELHAM, NEW YORK.

DISH-WASHING MACHINE.

1,385,203.

Specification of Letters Patent.

Patented July 19, 1921.

Application filed September 25, 1919. Serial No. 326,244.

To all whom it may concern:

Be it known that I, JAMES W. CROOKS, of Pelham, in the county of Westchester and State of New York, have invented certain new and useful Improvements in Dish-Washing Machines, of which the following is a specification.

This application is a companion to application for United States Letters Patent filed September 18, 1919, Serial No. 324,282. The present invention relates to the water elevator and distributor of a dishwashing machine particularly adapted for domestic use.

The improvements are illustrated in the accompanying drawings, wherein:

Figure 1, is a plan view of the machine, the cover being partly broken away. Fig. 2, is a side elevation of the machine, parts being broken away and in section. Fig. 3, is a cross section of the improved elevator and distributor in the plane indicated by the line 3—3 in Fig. 4. Fig. 4 is a top view of the elevator and distributor, partly in section in the plane indicated by the line 4—4 in Fig. 3. Fig. 5, is a detail section of one of the outlets in a plane indicated by the line 5—5 in Fig. 3. Fig. 6, is a detail section of the distributor in the plane indicated by the line 6—6 in Fig. 4.

Like the machine of the companion application, the tank A, is water tight and has a hinged cover *a*, which has a water tight fit upon the top of the tank and which can be swung up out of the way when necessary. The machine is of sufficient height to enable it to be used as a kitchen table when not in use as a dishwashing machine, and to this end is preferably constructed of galvanized iron or dairy tin with a wooden top, both the tank and the cover having a white, vitrified, enameled outer surface which is easily kept clean.

Within the tank A, are removable skeleton wire trays B, having pockets *b*, of varying sizes for the dishes and special pockets *c*, for the silverware (as shown in Fig. 1). The bottom *e*, of the tank is inclined from all directions toward a central well C, which in use is filled with water. The well C, has at one side an outlet communicating with a discharge pipe 10, and controlled by a valve M. This valve M, is hand-operated and is here shown controlled by the vertical

hand rod *m*, on the outside of the tank within easy reach, the lower end of which is connected by bell crank lever *n*, to a horizontal link *o*. The other end of the link *o*, is connected by a second bell crank lever *p*, and vertical link *q*, to a lever *r*, which extends through the valve casing *s*, and directly connects with the valve stem *t*, to open and close the valve. In all these respects, the present machine is similar to that of the aforesaid application.

The present improvement resides in a new water elevator and distributor which is shown in detail in Figs. 3 and 4. It comprises a stationary outer shell or casing D, which is frusto-conical in shape, increasing in diameter from bottom to top, being open at its top. Its lower end is within the well C, and has a series of inlet passages E, at its bottom which do not extend to the level of the top of the well, being, therefore, submerged when water is in the machine.

The water elevator comprises a rotary propeller having propeller blades F, of which two are shown, that number being adequate, near the lower end of the casing D, and just above the inlets E. These blades are of the proper contour to elevate or force the water upwardly within the casing D, and are just above the level of the top of the inlet passages E, and below the top of the well so that they pick up the water as it flows into the casing and elevate it within the casing D. The propeller blades are mounted on the lower end of a tube G, which at its upper end is attached to the upper end of a drive shaft I. The shaft I, is journaled at its upper end in a bearing on a rigid cross bar J (Fig. 2), secured to the sides of the tank A, beneath the cover *a*. The lower end of the shaft extends through the bottom of the well and is directly connected with the shaft of an electric motor K, which is of a type to be operated by current supplied from any ordinary light fixture. The motor K, is mounted upon a cross piece L, which constitutes a part of the supporting frame for the tank. In order that water may not leak upon the motor K, there is provided a vertical standpipe N, which extends within the central tube G, but is spaced therefrom as well as from the shaft I, so that the tube and shaft turn free of the standpipe. This standpipe

extends above the top of the well C, and above any needed water level in the machine.

At the upper end of the rotary tube G, is the rotary distributor O. The important features of the distributor are a deflector 11, and a trough 12, with apertures 13, serving as outlets for the water. The deflector 11, extends upwardly and outwardly from the tube G. It extends outwardly beyond the upper rim of the casing and thence downwardly. The contour of this flaring and arching deflector is such that the water elevated by the propeller is diverted outwardly and downwardly into the trough 12. The trough is annular and encircles the upper end of the casing D. The bottom *f*, of the trough is below the upper edge of the casing. It is connected to the outer wall *g* (Fig. 6) of the trough which depends from a top plate *h*. At the inner edge of the bottom *f*, an annular ring *i*, rises above the upper edge of the casing D, and constitutes the inner wall of the trough. This inner wall *i*, is close to the upper end of the casing so that leakage of water at this place is negligible. The outer wall of the trough has openings for the discharge of the water. Two such outlets 13, are shown at diametrically opposite points. The outlets are located sufficiently high to permit the discharge of the water in the upper part of the tank so that it will strike the upper edges of the upstanding dishes in the trays and flow down them. Back of each outlet, as shown in Fig. 5, is an inclined partition *j*, extending from the inner wall *i*, of the trough entirely across it and outwardly beyond the outer wall *g*. This partition inclines rearwardly with reference to the direction of rotation of the distributor, as shown by the arrow 14, in Fig. 4. Each tangential outlet 13 also has an upper plate or roof *k*, the floor of the trough constituting the floor of the outlet 13, and both the floor and the roof of the outlet extending beyond the outer wall *g*, as shown in Figs. 3 and 5, thus constituting with the outwardly extending partition *j*, a projecting nozzle. Each outlet roof *k*, extends outwardly from the top of the inner wall, so that each outlet is the full height of the trough.

To use the machine, the dishes, etc., are placed in the trays, the well is filled with washing fluid (water with soap or other detergent), the cover is closed, and the motor is started by turning on the electric current. The water is elevated by the propellers and discharged by the deflector into the apertured distributing trough. The upwardly enlarging stationary casing avoids back pressure on the propellers and choking. The water is whirled by the rotating trough and is discharged centrifugally and

tangentially through the outlets into the upper part of the tank. The water is vigorously showered upon the upper edges of the dishes throughout all parts of the tank, and flows down the dishes to the floor of the tank, and thence back to the well. The water is efficiently and rapidly circulated and three minutes suffices to clean the dishes thoroughly. The foul water is discharged through the valved outlet. Hot rinsing water is then introduced and a circulation thereof for two minutes suffices to rinse the dishes efficiently.

I claim—

1. A dishwashing machine having, in combination, a tank having a depressed central well; a stationary frusto-conical casing in the tank increasing in diameter from bottom to top, said casing having a series of water inlets in the bottom thereof communicating with the bottom of said well; a rotary shaft carrying within said casing an elevator consisting of elevating propeller blades located above the level of the inlets in said casing and below the top of the well; and a rotary distributor at the upper end of said shaft having a trough with outlets in its outer wall and a flaring and arched deflector which directs the elevated water into the trough, said trough encircling the upper end of the casing and having a partition inclined rearwardly with respect to the direction of rotation of the distributor extending across the trough back of each outlet and outwardly beyond the outer wall of said trough and a roof across the trough above each outlet likewise extending beyond the outer wall of said trough, and the bottom of the trough at each outlet also extending beyond the outer wall of the trough.

2. A dishwashing machine having, in combination, a tank; a frusto-conical casing within said tank increasing in diameter from bottom to top, said casing having water inlets communicating with the bottom of said tank; and a rotary water elevator and distributor, the elevator consisting of elevating propeller blades located near the bottom of said casing above the inlets, and the distributor comprising an outer trough encircling the top of said casing, an inner deflector which directs the elevated water to the trough, outlets in the outer wall of the trough, and a partition back of each outlet extending across the trough.

3. A dishwashing machine having, in combination, a dishholding tank; an upwardly expanding stationary casing within said tank communicating at its lower end with said tank and open at its top; and a rotary water elevator and distributor, the elevator consisting of an elevating propeller located near the bottom of said casing which forces the water upwardly through the cas-

ing, and a distributor comprising an outer trough at the top of said casing and receiving water therefrom, and having an outlet in its outer wall.

- 5 4. A dishwashing machine having, in combination, a dishholding tank; a stationary casing within said tank communicating at its lower end with said tank and open at its top; and a rotary water elevator and
10 distributor, the elevator consisting of an

elevating propeller located near the bottom of said casing which forces the water upwardly through the casing, and the distributor comprising a trough at the top of said casing of greater diameter than said casing and having a water discharging outlet.

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In witness whereof, I have hereunto signed my name.

JAMES W. CROOKS.