

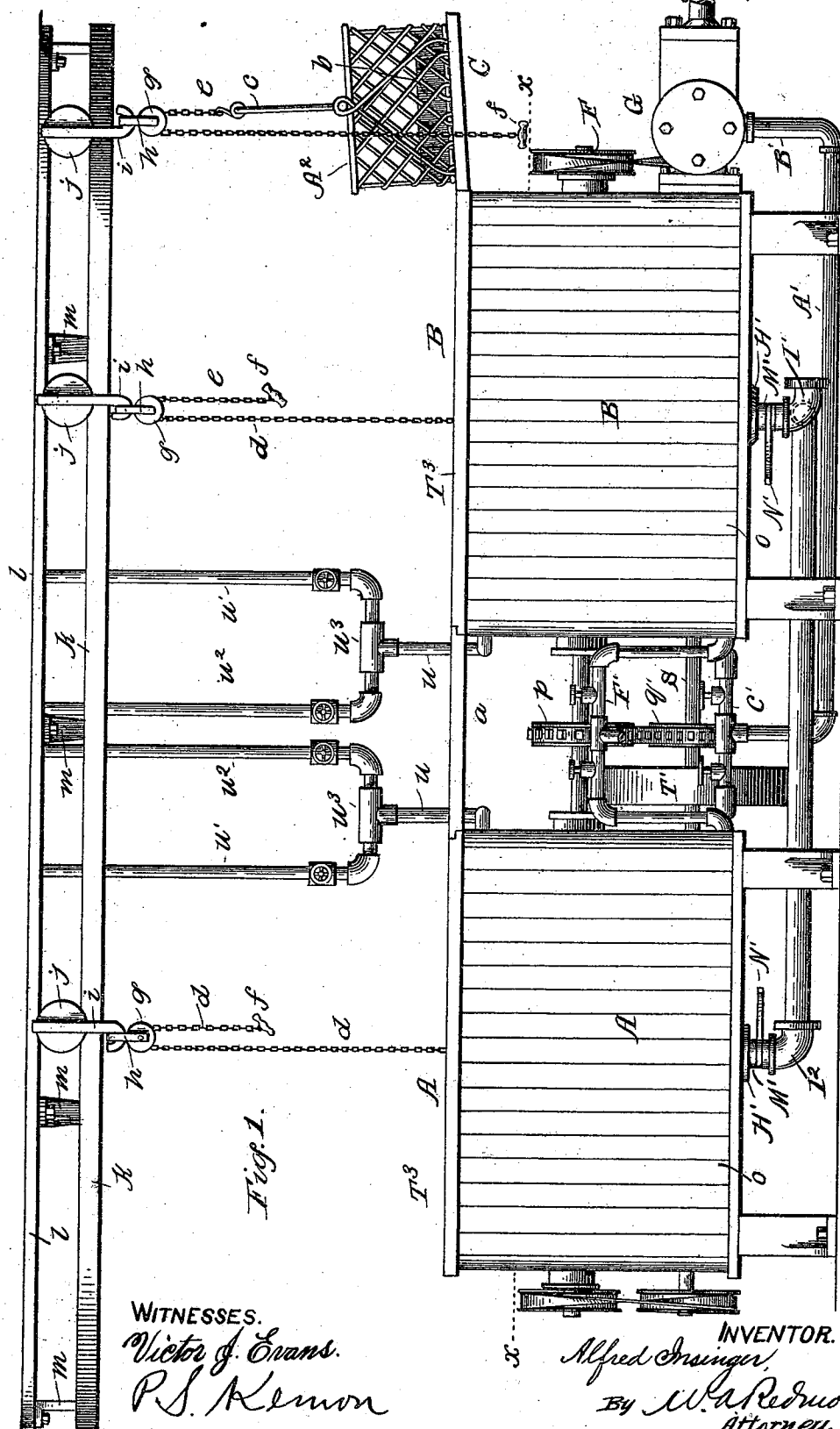
(No Model.)

5 Sheets—Sheet 1.

A. INSINGER.  
DISH CLEANER.

No. 501,347.

Patented July 11, 1893.



**WITNESSES.**

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P. S. Kenyon

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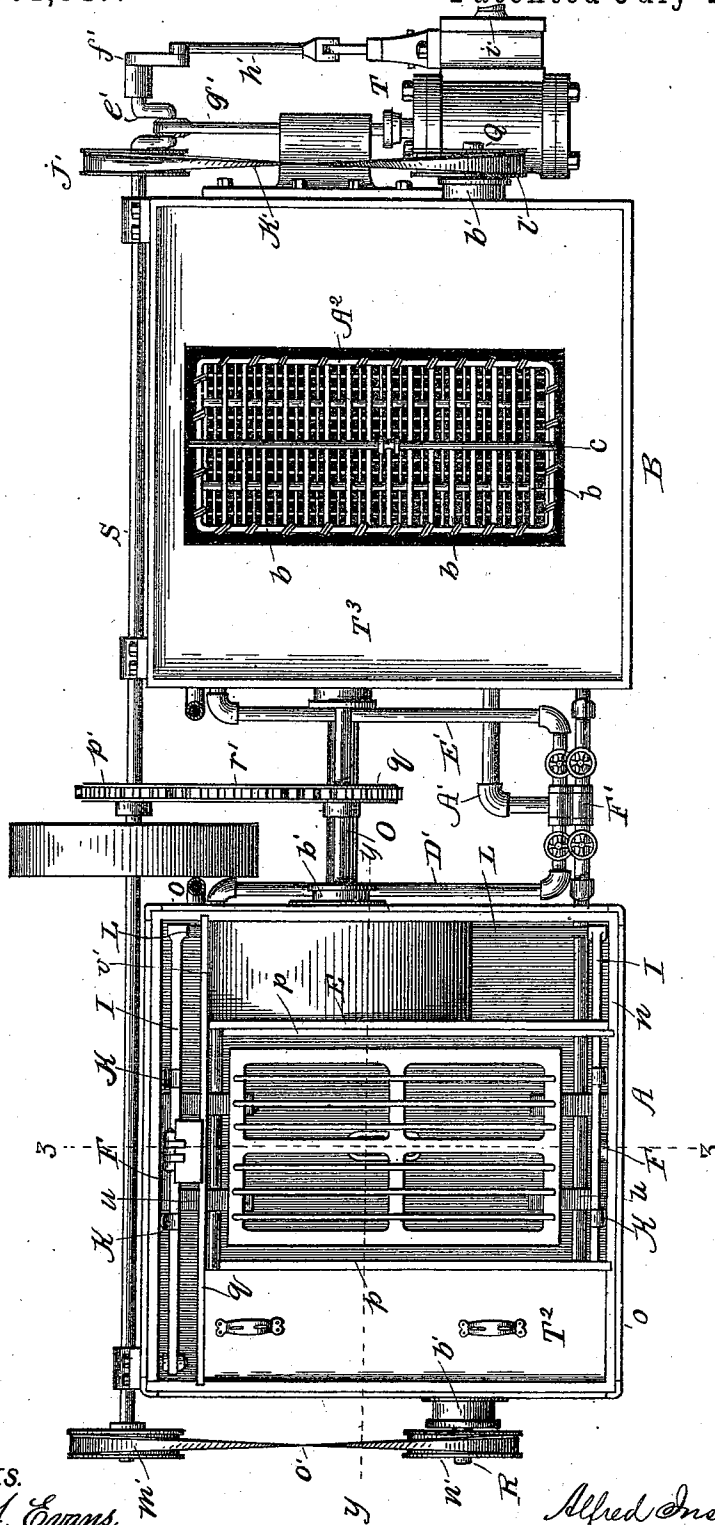
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Fig. 2.



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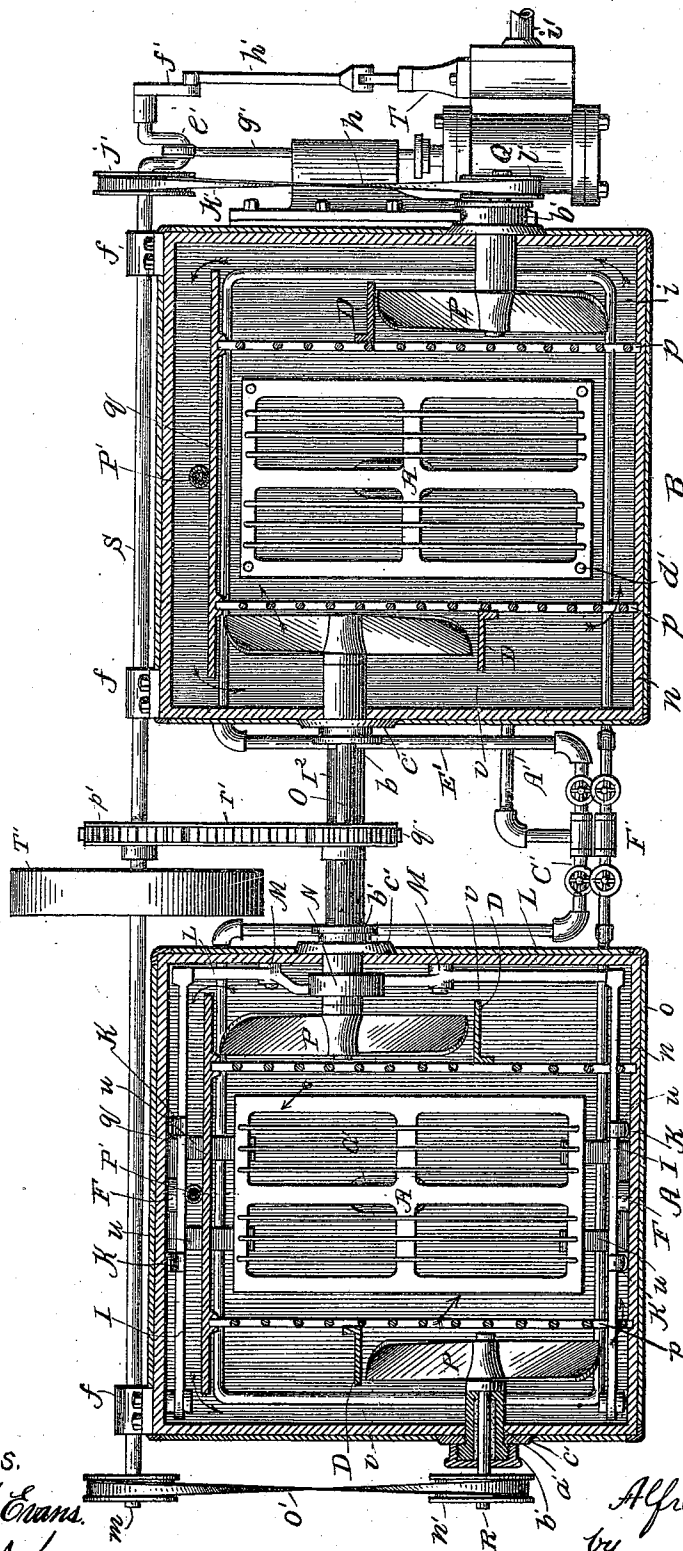
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Fig. 5.

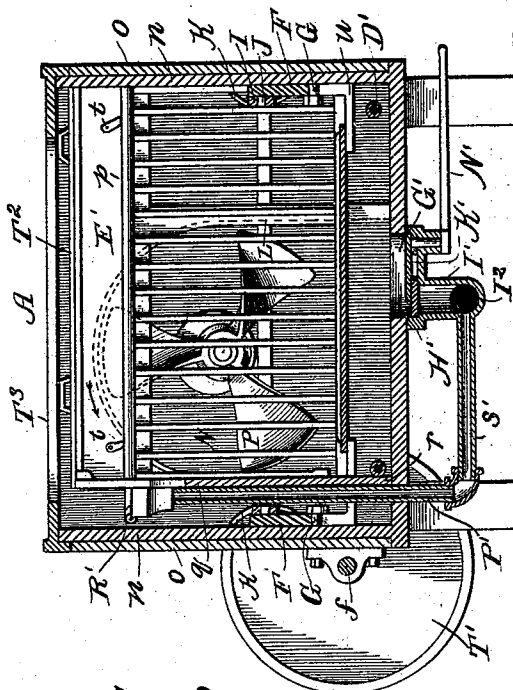
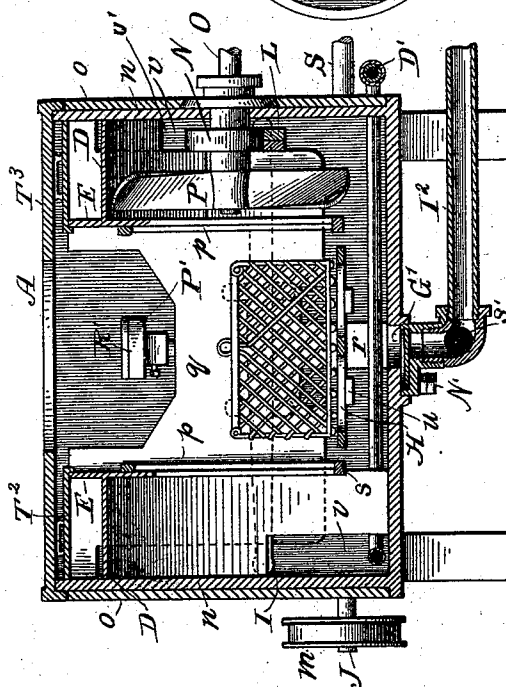


Fig. 4.



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(No Model.)

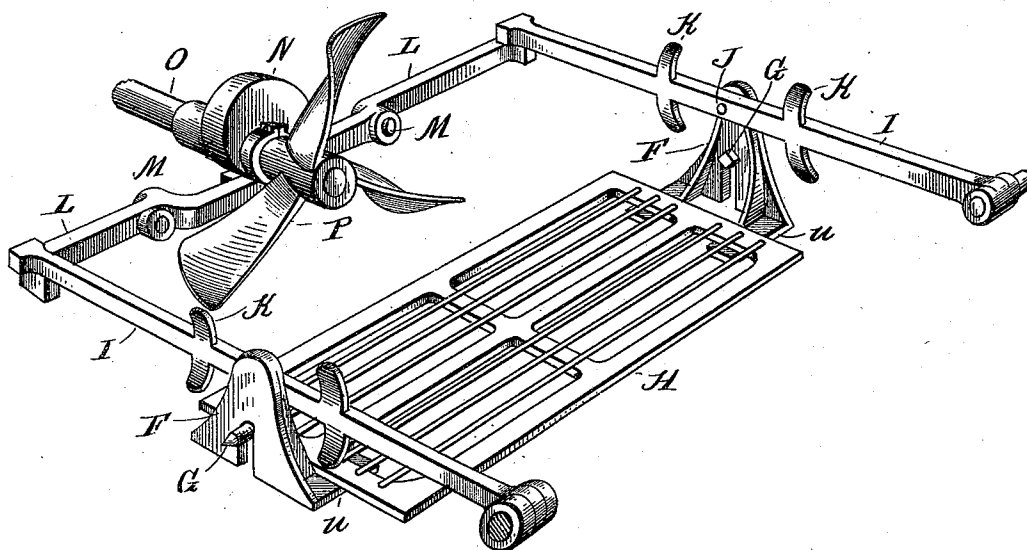
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A. INSINGER.  
DISH CLEANER.

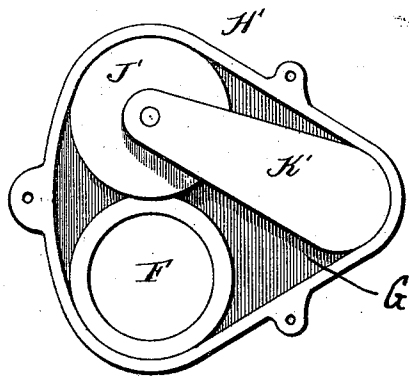
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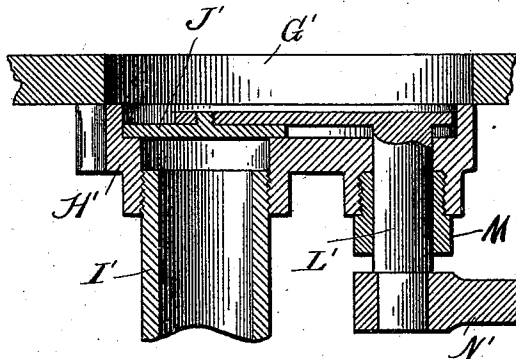
*Fig. 6.*



*Fig. 7.*



*Fig. 8.*



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# UNITED STATES PATENT OFFICE.

ALFRED INSINGER, OF PHILADELPHIA, PENNSYLVANIA.

## DISH-CLEANER.

SPECIFICATION forming part of Letters Patent No. 501,347, dated July 11, 1893.

Application filed September 22, 1892. Serial No. 446,617. (No model.)

*To all whom it may concern:*

Be it known that I, ALFRED INSINGER, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Dish-Washing Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates, generally, to dish washing machines, and particularly to that class of machines which are used in hotels, restaurants and the like places where dishes are to be washed hurriedly and in large quantities, and it has for its object to provide a machine by which the dishes may be expeditiously and thoroughly washed and rinsed in large quantities without liability of chipping or breaking the same during the operation, and it consists in the parts and combinations of parts hereinafter fully described and pointed out in the claims.

In the accompanying drawings forming a part of this specification Figure 1 is a side elevation of my improved machine as set up for operation; Fig. 2 a plan view of the machine, proper, with the top removed from the washing tank; Fig. 3 a longitudinal horizontal sectional view on the line  $x-x$ , Fig. 1; Fig. 4 a longitudinal vertical sectional view of the washing tank on the line  $y-y$ , Fig. 2; Fig. 5 a transverse vertical sectional view of the same on the line  $z-z$ , Fig. 2; Fig. 6 a detail perspective view of the basket platform of the washing tank and the means for operating the same; Fig. 7 a detail plan view of the valve for the drain pipe; and Fig. 8 a longitudinal sectional view of the same.

Similar letters refer to similar parts throughout the several views.

A represents the washing tank and B the rinsing tank of my improved machine, said tanks being arranged adjacent each other and connected by a removable board  $a$ , Fig. 1, which serves to protect the pipes and gearing arranged or located between the adjacent ends of the tanks from the drippings from the basket  $A^2$  containing the dishes during the transfer of the same from one tank to the other.

C is an inclined drip-board secured in any desired manner to the end of the rinsing tank on which the basket  $A^2$  rests or is supported after the dishes have been rinsed to permit of the water draining therefrom back into the rinsing tank, before removing the dishes therefrom. The basket  $A^2$  is formed, preferably, of galvanized iron wire arranged so as to leave interstices of such size as to permit of the water entering freely on all sides and the bottom, but any other suitable foraminous or reticulated material may be used to form the basket if desired. Within the basket a series of transverse upright partitions  $b$  is secured, between which the soiled dishes are set on edge in the basket, thereby preventing said dishes, during the agitation of the basket while cleansing the same, from being displaced or violently thrown or shaken about in the basket and against one another, thus reducing the liability of breaking and chipping the same during the operation of the machine.

The baskets  $A^2$  are each provided with a bail  $c$  by which they may be raised and lowered in the tanks and transferred from one to the other by means of a chain  $d$  having a hook  $e$  at one end and a handle  $f$  at the other, said chain passing over a grooved pulley  $g$  suspended by a hanger  $h$  from a hook  $i$  pivotally secured to a grooved wheel  $j$  supported on a semi-circular rail  $k$  and fitted to a semi-circular guide rail  $l$  arranged above said rail  $k$ . The rail  $l$  is secured to the ceiling of the room so that one-half thereof extends over the tanks of the machine or to a frame specially built therefor, and rail  $k$  is supported therefrom by hangers  $m$ . From the above description it will be understood that the baskets are first carried to the washing tank A, from the left hand side Fig. 1, and deposited therein and, when cleansed, are lifted thereout by the chains  $d$  and moved over to the rinsing tank B and there immersed and from this tank they are raised and moved onto the drip-board C and the surplus water drained therefrom back into the rinsing tank and when sufficiently drained the baskets are again moved on the rail  $k$  to a table and the dishes removed therefrom. It will be observed, therefore, that a large quantity of dishes may be cleansed in a short space of

time, as while one basket of dishes is being washed in the tank A another basket may be immersed in the rinsing tank and a third basket be resting on the drip-board, thus rendering the operation of cleansing the dishes, practically, continuous.

The tanks A and B are formed of an inner lining and bottom of sheet metal *n* and an outside covering of wood *o*, and a grid or grated frame *p* is arranged therein near each end of the respective tanks which extends from one side wall thereof to a vertical partition *q* arranged near the opposite side wall, said partition *q*, as best shown in Fig. 2, being let into the end walls of the tanks, and, as shown in Fig. 4, being supported by an extension *r* which rests on the bottom of the tanks. The ends of the grid *p* are let into or fitted in grooves formed in the partition *q* and the side walls of the frame, see Fig. 3, and rest at their lower ends on an offset, as at *s*, Fig. 4, formed on the edge of the curved partition or housing D and are held in place by turn buttons *t*, Fig. 5, pivotally secured to a partition E extending across the upper part of the tanks from one side wall to the partition *q*. The housing D extends partly across the tanks and from the partition E to the end walls of the tanks, and form the chambers within which the propellers, to be hereinafter described, operate.

As shown in Fig. 4, the curved partition rests at one side on the bottom of the tank, the other side of which terminates some distance above the bottom and against the partition *q*, as at *v'*, and said housing is cut away, as at *v*, on both sides to permit of the ready access of the water to the propellers. It will thus be seen that the water on which the propellers operate is confined within a limited space so that the propellers may force or throw the same in but one direction—outward and through the grid frame *p*, and that the water returning to the propellers to be again operated upon has ample space through which to find its way to the chambers at each end of the tank.

At each side of the washing tank a bracket F is mounted through a slot in its vertical arm on a headed pin G, said bracket being formed with two horizontal arms *u* projecting at right angles on which the ends of the grated platform H rest when in operative position. A lever I is pivoted at one end to the side walls of the tank A and at its center to a pin J projecting from and secured to the front face of the bracket, as best shown in Fig. 6. At each side of their central pivotal points the levers I are formed with curved projections K which extend vertically from the upper and lower edges of said levers and, bearing against the side walls of the tank, act as guides to retain the levers in their proper positions during their movement. At their free ends the levers I are somewhat enlarged and rest on the enlarged free ends of levers L which are pivoted, at M, to one end wall of

the tank the other ends of said levers L passing each other and extending under and in position to be struck by an eccentric N mounted on a shaft O, whereby said levers may be rocked on their pivots and the levers I swung thereby vertically, thus raising and lowering the brackets and imparting a rapid vertical movement to the platform H supported by said brackets.

On the platform H of the washing tank the basket A<sup>2</sup> containing the soiled dishes is supported during the operation of the machine and is carried up and down with said platform, the pins G on which the brackets F move insuring the direct vertical movement of the platform on a horizontal plane or level, so that there is no liability of the platform or the basket wobbling or turning to either side. This movement of the basket up and down in the water contained in the tank creates cross currents having a vertical tendency which, in connection with the horizontal currents created by the propellers, materially facilitates the cleansing of the dishes.

The propellers P are mounted on shafts O, Q and R, the two latter being stub shafts having their bearings, at the ends of the tanks A and B near one side, in water tight journal boxes consisting of a cylindrical box *a'* having an enlarged end formed with screw threads to receive a cap *b'* through which the shafts pass. The interior diameter of said boxes being greater than the diameter of the shafts permit of any suitable packing being arranged therein about the shafts, as shown in Fig. 3. A flange *c'* is cast with or secured to the boxes through which screws or bolts may be passed to secure the boxes to the metal walls of the tanks. The shaft O is arranged between the adjacent ends of the tanks and its ends project into said tanks, the eccentric N being suitably secured to that end of the shaft which extends into the washing tank.

The rinsing tank B is provided with housings and partitions and platform in all respects similar to that of tank A, but as its platform is not agitated during the operation of the machine it rests on or is secured to pins *d'* projecting from the bottom of said tank.

To one side of the tanks a horizontal shaft S is journaled in suitable bearings, said shaft projecting at each end beyond the ends of the tanks and having the cranks *e'* and *f'* formed on or secured thereto at one end. To the crank *e'* the end of a piston rod *g'* of an engine T is attached and to crank *f'* the stem *h'* of the valve rod of said engine is connected, the engine, for convenience sake, being mounted on the end of the rinsing tank and receiving its steam through a pipe *i'* from any suitable steam generating apparatus. A pulley *j'* is mounted on shaft S and is connected by a crossed belt *k'* to a similar pulley *l'* mounted on the end of shaft Q and imparts motion thereto in a direction opposite to that of the main shaft S and similar pulleys, *m'*, *n'*, are mounted, respectively, on the main

shaft and the shaft R of the tank A which are also connected by a crossed belt *o'* so that said shaft R is revolved in a direction opposite to that of shaft S. At about the center of the shaft S a sprocket wheel *p'* is mounted which is connected with a sprocket wheel *q'* mounted on the shaft O by a sprocket chain *r'* thereby imparting motion to said shaft O in the same direction as shaft S. A balance wheel *T'* is mounted centrally of the shaft. The result of this arrangement of the driving or operating mechanism is that the propellers, in each tank, are rotated in opposite directions and, as said propellers are arranged diagonally opposite each other in their respective tanks, currents of water are created which are forced across the tank diagonally, that is from the ends across the centers of the tanks toward the side walls as indicated by the arrows, Fig. 3, said currents, owing to the position of the propellers relative to each other, not conflicting or interfering with each other to any appreciable degree. It will be observed that the currents being forced through the grid frame are scattered somewhat and that they enter the basket through the interstices thereof with sufficient force and volume to disintegrate and dislodge any adhering particles of matter from the dishes.

The tanks are supplied with water through the pipes U which are connected to the main cold water pipes U' and hot water pipes U<sup>2</sup> by a T-coupling U<sup>3</sup> connecting said hot and cold water pipes, both of which are provided with valves to regulate the supply of water and lead to any desired source of supply. In order to maintain the water in the tanks at the degree of heat necessary to the proper cleansing of the dishes, I run a pipe A' from the exhaust pipe B' of the engine under the rinsing tank B to a pipe C' from which pipes D' and E' lead into the tanks A and B, near their bottoms, and extend around three sides of the same and, emerging therefrom at the sides opposite which they entered the same, are connected to an escape pipe F'. The pipes C' and F' are both provided with suitable valves so that the steam may be regulated and directed into either or both tanks and the escape of steam regulated as desired. In the bottoms of both tanks I form elongated openings G' through which the water may be discharged. To the bottoms of each of the tanks I secure a valve chest H' over said discharge opening (see Figs. 7 and 8), in any desired manner to which is connected one end of the discharge pipes I' and I<sup>2</sup>, for the rinsing tank and washing tank respectively and within the chest I seat a valve J' having an arm K' formed on the end of an upright stud L' which extends downwardly through an opening in the bottom of the chest, which is rendered water tight by a plug M', and has a lever N' connected to its lower end, said lever extending outwardly and into a position to be moved by the foot of the attendant to open or close the discharge openings. The discharge

pipe I<sup>2</sup> of the washing tank is connected with the discharge pipe I' of the rinsing tank and the latter pipe may empty into another pipe to convey the water to a sewer trap or other place of discharge. A vertical over-flow pipe P' provided with a hinged cover R' is arranged at one side of each tank and is connected with the discharge pipes I' and I<sup>2</sup> by pipes S' as best shown in Figs. 4 and 5. A cover T<sup>2</sup> is arranged over the chambers in which the propellers work to prevent the water from being thrown out of said chambers, and a cover T<sup>3</sup> having an opening formed centrally therein through which the baskets are passed is provided for each tank.

From the above description it will be understood that a circulation of water is created within the tanks, passing around the sides thereof and entering the chambers containing the propellers at the ends thereof through openings *v* and that the curved or twisted blades of the propellers lift the water and forcibly eject the same in continuous streams through the grid frame. Also it will be noticed that I utilize the exhaust steam from the engine to maintain the heat of the water in the tanks to the desired or necessary degree for thoroughly cleansing the dishes.

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

1. In a dish washing machine, the combination, of a washing tank, supports movably secured to the side walls of the tank, a platform resting on said supports, and means for imparting a vertical movement to said supports, substantially as described.

2. In a dish washing machine, the combination, of a washing tank, supports movably secured to the side walls of the tank, a platform resting on said supports, levers pivotally connected to said supports and to the walls of the tanks, and means for rocking said levers, substantially as described.

3. In a dish washing machine, the combination, of a washing tank, supports movably secured to the side walls of said tank, a platform resting on said supports, levers pivotally secured to said supports and to the side walls of the tank, and levers centrally pivoted to one side wall of the tank and bearing at one end against the free ends of said first named levers, and means for rocking said last named levers on their pivots, substantially as described.

4. In a dish washing machine, the combination, of a washing tank, slotted supports movably secured to the side walls of said tank, a platform carried by said supports, levers pivotally connected to said supports and to the walls of the tank, levers centrally pivoted to one end wall of the tank, and having one end connected to said first named levers, and an eccentric for depressing the last named levers at one end, substantially as described.

5. In a dish washing machine, the combination, of a washing tank, movable angled sup-

ports having a slot formed therein, a pin for supporting and guiding said supports, a platform carried by said supports, levers having guiding projections formed thereon pivotally attached to said supports and to the walls of the tank, levers centrally pivoted to one end wall of the tank and having one end bearing against the free ends of said first named levers, and an eccentric for depressing the other ends of the last named levers simultaneously, substantially as described.

6. In a dish washing machine, the combination, of a washing tank, vertically movable supports secured to the side walls of said tank, a platform carried by said supports, means for operating said supports, and means for forcing currents of water diagonally across said tank, substantially as described.

7. In a dish washing machine, the combination, of a washing tank, supports secured to the side walls of said tank, levers connected to said supports, means for rocking said levers to impart a vertical movement to said supports, and means for creating cur-

rents of water diagonally across said tanks, substantially as described.

8. In a dish washing machine, the combination, of a tank, having chambers at each end, propellers arranged in said chambers with their centers diagonally opposite each other, and means for imparting motion to said propellers in opposite directions, substantially as described.

9. In a dish washing machine, the combination, of a washing tank, propellers having their centers diagonally opposite each other in said tank, a platform arranged between said propellers, means for imparting simultaneous movement in opposite directions to said propellers and means for imparting a vertical movement to said platform, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

ALFRED INSINGER.

Witnesses:

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