No Model.)

5 Sheets—Sheet 1.

E. H. ALVORD.

DISH CLEANER.

No. 536,254. Patented Mar. 26, 1895.

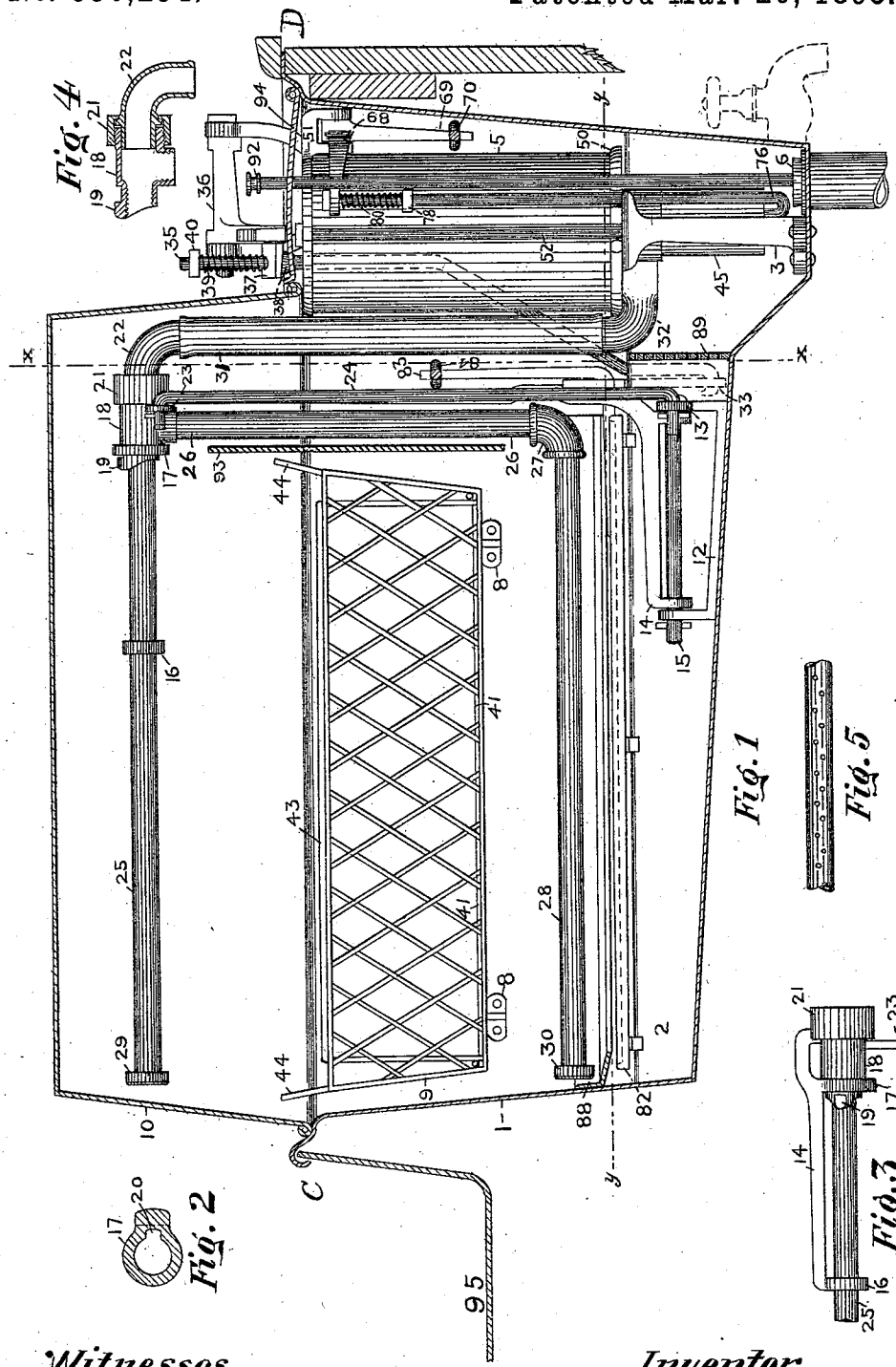

Fig. 1

Fig. 5

Fig. 3

Fig. 2

Witnesses
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(No Model.) 5 Sheets—Sheet 2.

E. H. ALVORD.

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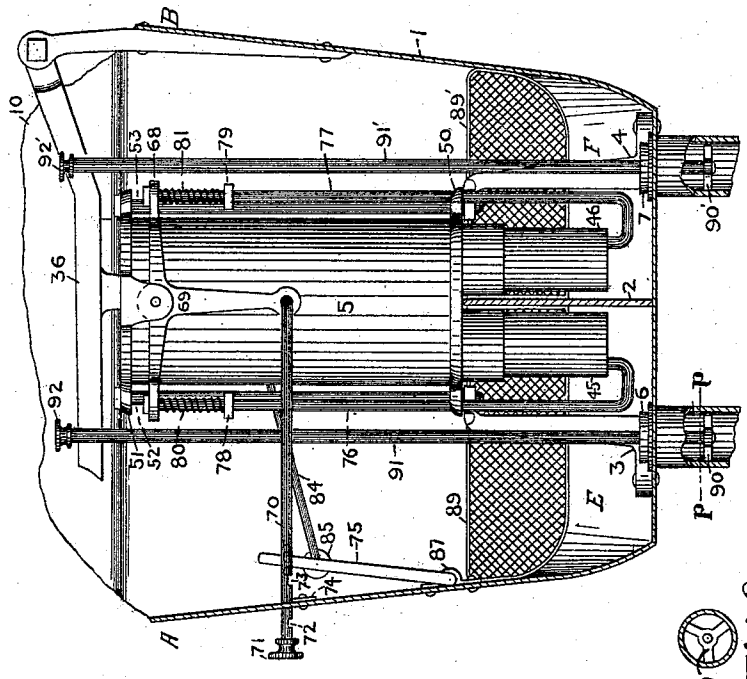

Fig. 7

Fig. 8

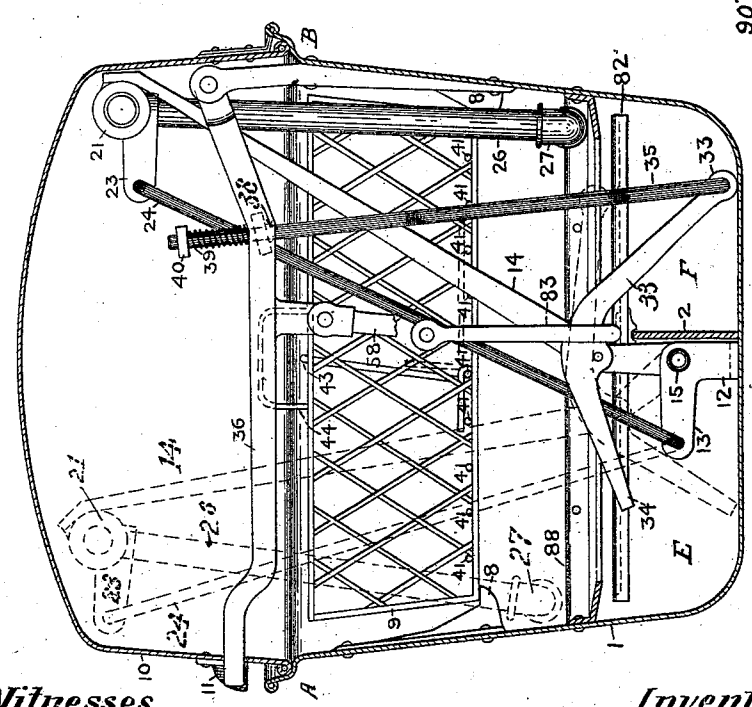

Fig. 6

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(No Model.)

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E. H. ALVORD.

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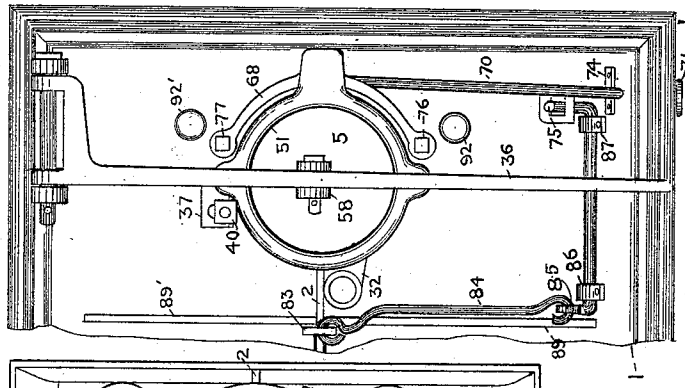

Fig. 10

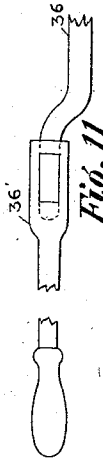

Fig. 11

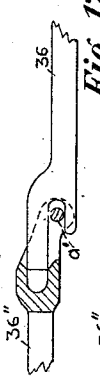

Fig. 12

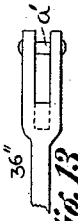

Fig. 13

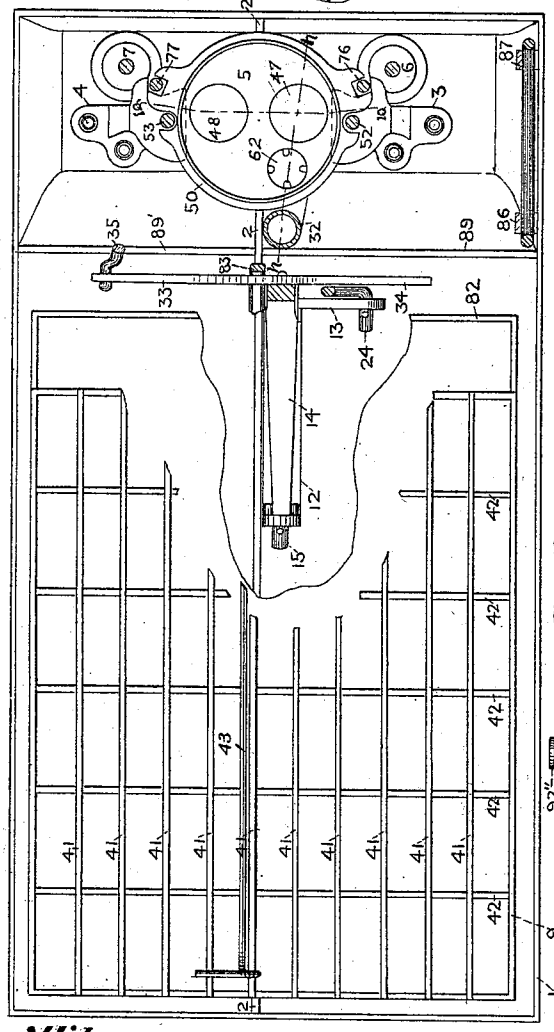

Fig. 9

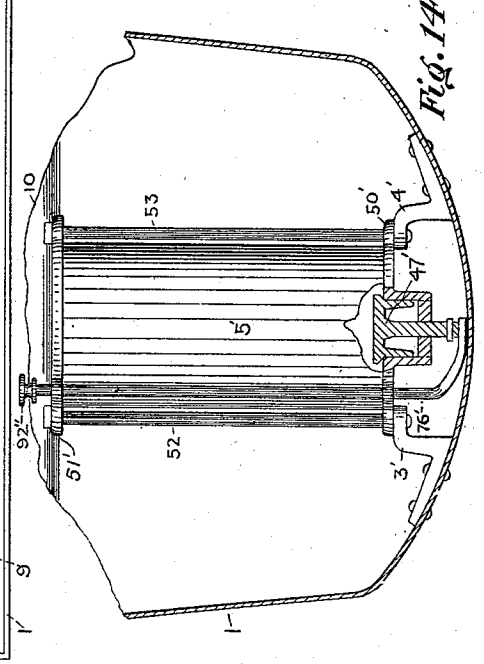

Fig. 14

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5 Sheets—Sheet 4.

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DISH CLEANER.

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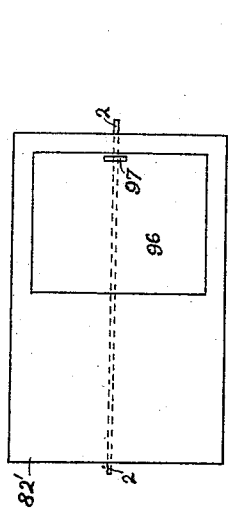

Fig. 19.

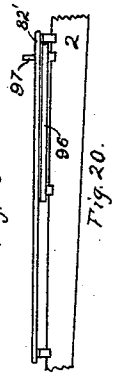

Fig. 20.

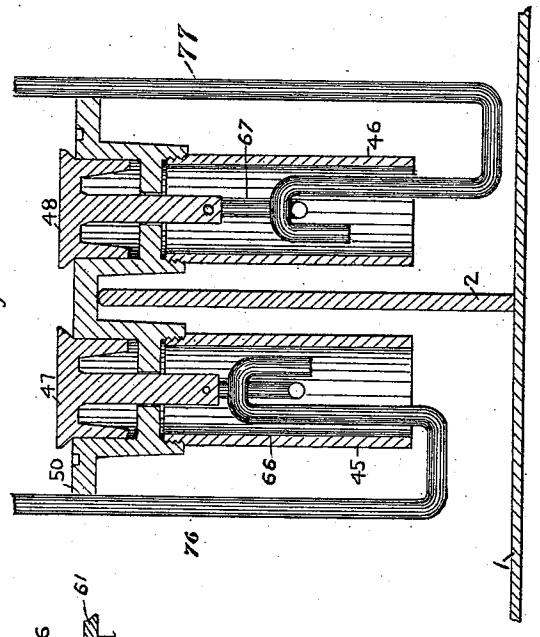

Fig. 16.

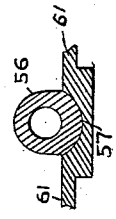

Fig. 17.

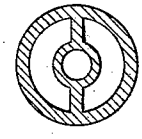

Fig. 18.

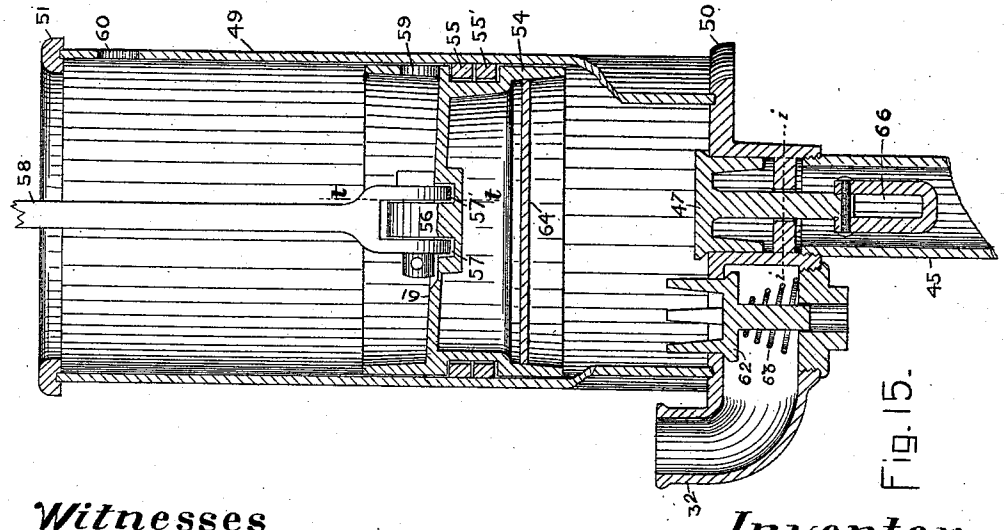

Fig. 15.

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5 Sheets—Sheet 5.

E. H. ALVORD.

DISH CLEANER.

No. 536,254. Patented Mar. 26, 1895.

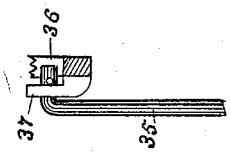

Fig. 23.

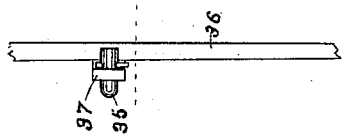

Fig. 22.

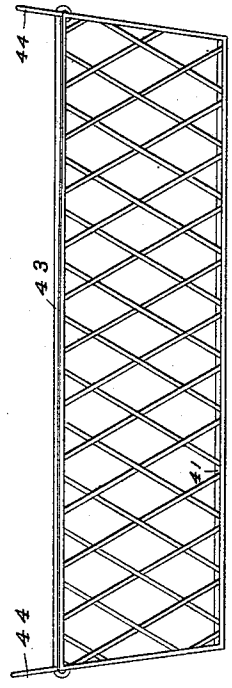

Fig. 24.

Fig. 25.

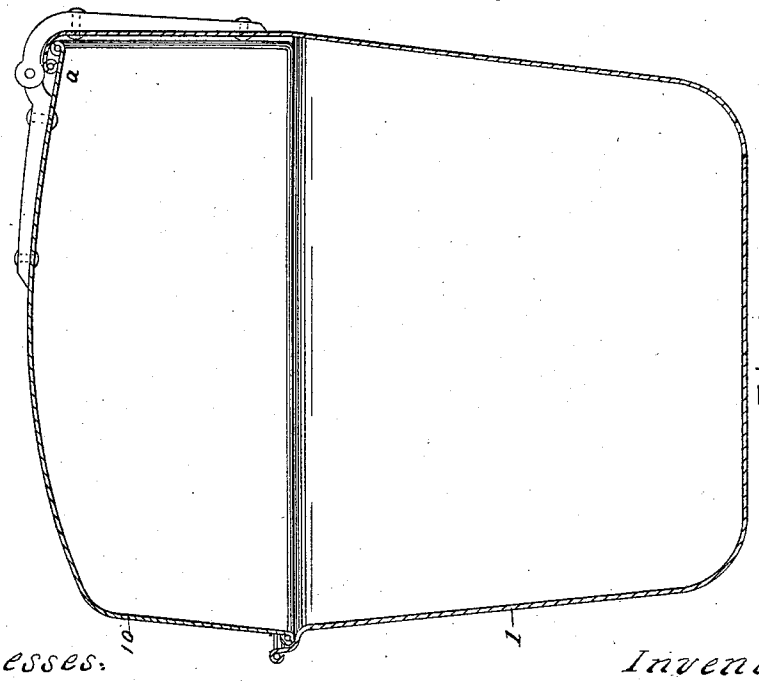

Fig. 21.

Witnesses:
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V. Gotchett.

Inventor.
E. H. Alvord,
by Chas. F. Whittlesey,
his attorney in fact.

UNITED STATES PATENT OFFICE.

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DISH-CLEANER.

SPECIFICATION forming part of Letters Patent No. 536,254, dated March 26, 1895.

Application filed August 30, 1892. Renewed August 10, 1894. Serial No. 519,963. (No model.)

To all whom it may concern:

Be it known that I, ELISHA HENRY ALVORD, a citizen of the United States, residing at Pialschie, in the county of King and State of Washington, have invented certain new and useful Improvements in Washing-Machines, of which the following is a specification, reference being had to the accompanying drawings, wherein similar letters and numerals of reference in the different figures indicate corresponding parts.

My invention relates to machines for washing dishes, vegetables and other articles, in which jets or streams of suds or clear water are forced into baskets holding the articles to be washed, by means of swinging sprinkling-pipes operated by peculiar pumping and intervening mechanism; and it consists in the peculiar arrangement and construction of parts united to facilitate the washing or cleansing process, as well as in the combination of parts constituting the pipe-mechanism and the pumping mechanism.

In the drawings Figure 1 is a side view of my machine, one side of the case being removed—also showing a longitudinal sectional view of the cover. Fig. 2 is a cross sectional view of lug 17. Fig. 3 is a plan view of the upper portion of carrying-arm 14, and its connections. Fig. 4 is a longitudinal sectional view of the swivel. Fig. 5 shows the perforations of a portion of my sprinkling-pipes. Fig. 6 is a cross sectional view of my machine cut through on the broken lines *x x*, of Fig. 1, exhibiting also pump-handle 36, and its connections as shown. Fig. 7 is an end view of the pump and its parts—(end of case removed). Fig. 8 is a cross sectional view of guide-guard 90, cut through on broken line *p p* of Fig. 7. Fig. 9 is a plan view of my machine and its parts cut through on broken line *y y* of Fig. 1—a portion of the tilting-plate being removed—showing parts below—also showing bottom of the wire-basket. Fig. 10 is a plan view of the pump end of my machine—covers 10 and 94 being removed—exhibiting portions of the pump and its connections. Figs. 11, 12 and 13 are detail views presenting different forms of the pump-handle. Fig. 14 is an end view of a modified pump and case, and parts of the pump. Fig. 15 is a sectional view of the lower portion of the pump cut through on broken line *h h* of Fig. 9, and a central sectional view of the upper portion of the pump and its parts. Fig. 16 is a cross sectional view of the lower portion of the pump, cut through on broken line *g g* of Fig. 9, exhibiting the inlet-valves and rod-connections. Fig. 17 is a cross sectional view of lug 56 and depressions 57 and 57′, cut through on broken line *t t* of Fig. 15. Fig. 18 is a cross sectional view of a portion of the valve-case, cut through on broken line *i i* of Fig. 15. Figs. 19 and 20 show a modified form of my tilting-plate. Fig. 21 shows a modified form of the case and cover in which the hinge is placed above and at one side of the cover. Figs. 22 and 23 show rod 35 connected directly with lug 37. Figs. 24 and 25 show the manner in which rod 43 is connected when fastened permanently to the basket.

In the drawings, 1 is a wooden or metallic case for holding the wash-waters, shaped as shown in Figs. 1, 6 and 7, of the drawings, having its bottom sloping toward one end. A depression at the lower end serves to catch and hold the water. Over this depression and drawing its water therefrom, is mounted the pump 5. The lower part of this case is divided longitudinally into two compartments E and F by a vertical partition 2. Above this partition and resting upon two stands 3 and 4 is the pump 5, with mechanism for operating the same. The plugs 6 and 7 (or faucets, as shown in position by dotted lines in Fig. 1) are used both to retain and to liberate the water.

The upper portion of case 1 is curved outward as shown at A and B or C and D, to receive the cover 10 in such manner as to prevent the escape of water. There are four brackets marked 8 fastened to the sides of the case—three of them showing in the drawings—upon which rests a wire basket 9, within which may be placed dishes, vegetables or any articles to be washed.

10 is a cover for the said case, with a handle 11. It may be hinged as shown in Fig. 6, or may be made otherwise removable as will be hereinafter described.

The case may be supported on legs attached thereto, or it may be permanently built in the

kitchen as are sinks—either alone or in combination with a sink, see Fig. 1—95 being a portion of a sink in combination with the washing machine. When permanently built in, should there not be room sufficient for the cover to open, if hinged in the usual way, it may be removed by hand, or it may be opened with hinge in position as shown in Fig. 21 of the drawings—in which instance the back of the case 1 extends upward, being bent and shaped as shown, and the back of cover 10 is removed and the edge is shaped as shown in said Fig. 21. The hinges are then placed at or near the junction of the edge of the cover and upward extension, as at *a* of case 1.

12 is a bracket riveted to the bottom of the case, forming the pivot for the lever 14 and having a horizontally extending arm 13 at one end.

14 is a carrying or swinging arm pivoted to the bracket 12 by a bolt 15. The lateral extension of the upper end of this carrying arm has two lugs 16 and 17. (See Fig. 3.) Through lug 17 passes one end of a T 18 made with a lug 19 to hold lug 17 in place. Lug 17 has a side opening 20 shown in Fig. 2, which will not coincide with lug 19 in their regular movements, but will permit of their disengagement when turned so as to coincide. Cap 21 screws on the opposite end of the T 18, holding swivel-elbow 22 in place, as shown in cross section of the same in Fig. 4. From T 18 extends an arm 23, and guide-rod 24 connects arm 23 with the arm 13 attached to the bottom of the case. Through lug 16 passes a sprinkling-pipe 25, which is perforated on its under side as shown in Fig. 5. Pipes 25 and 26 are screwed to T 18, and an elbow 27 is fastened to the lower end of pipe 26, to which elbow is attached a sprinkling-pipe 28, similar to pipe 25 but perforated on its upper side.

29 and 30 are caps to close the ends respectively of pipes 25 and 28.

A flexible pipe 31 (either of rubber cloth or otherwise) connects swivel-elbow 22 to the elbow-extension 32 of pump 5. To the lower end of carrying-arm 14 is secured a lever 33 with a projection 34. This projection and the lower end of lever 33 strike the bottom of case 1, and limit the swing of carrying-arm 14. Rod 35 connects lever 33 with pump-handle 36 by means of lug 37.

Now it will be seen that when lever 33 is raised by pump-handle 36, the upper end of carrying-arm 14 will be carried over toward the side A of case 1, and with it both sprinkling-pipes 25 and 28 (as shown by dotted lines in Fig. 6 of the drawings); and when lever 33 is being depressed, the upper end of arm 14 will be carried toward the side B of case 1, and also with it the said sprinkling-pipes. Guide-rod 24 is of such length that pipe 28 will be carried from side to side simultaneously with pipe 25. The pipe 31, being flexible and connected with swivel-elbow 22, its upper end will readily pass from side to side. When water is placed in case 1 and the pump-handle 36 is raised, the pump fills and the discharging pipes swing to side A. When the said handle is being lowered, the water is forced up the flexible pipe 31 into pipe 25 and down pipe 26 into pipe 28 and discharges itself out of the sprinkling-pipes from above and below through the perforations and against the dishes or other articles in the wire-basket. Should any of the perforations in pipes 25 and 28 become clogged, remove caps 29 and 30 and force water through them. This action will clear such pipes. Rod 35 may be connected directly to lug 37 on pump-handle 36 as shown in Figs. 22 and 23 of the drawings, or it may be provided with a collar 38 and a coiled spring 39 pressing against lug 37 of pump-handle 36 and nut 40, as shown in Figs. 1 and 6 of the drawings. This coiled spring keeps the pump-handle against collar 38. Rod 35, collar 38, coiled spring 39, and lug 37 of pump-handle 36 are so adjusted that lever 33 will reach its highest point before pump-handle 36 is at its extreme height. Coiled spring 39 yields while pump-handle 36 is farther raised. Now pump-handle 36 must return to collar 38 before the sprinkling-pipe 28 begins to swing to side B. It is intended that this lowering of the pump-handle to collar 38 will be sufficient to cause the pump 5 to fill sprinkling pipes 25 and 28 before the swinging motion begins, so that all the dishes in the basket will be sprayed alike. This basket 9 is made thus: The wires 41 are placed on the upper side of the cross-wires 42 which form the bottom of the basket. Plates and similar dishes are placed in the basket in the following manner: The first row leans against either side of the basket with the dishes' lower edges resting upon wires 41, and between wires 42—that is, wires 42 determine the space between the lower edges of each row of plates or dishes. The upper portions of each succeeding row of plates lean against the succeeding one. A stationary wire 43′, as shown in Figs. 24 and 25, extending across the upper portion of the basket at any position between the sides of said basket, or a wire 43, shown in Figs. 1 and 6 of the drawings, shaped as shown being bent at each end, engages with a wire of the bottom of the basket forming a hinge so that this wire will swing upon the bottom of the basket only in the direction shown by dotted lines in Fig. 6—but when in position for holding plates, the lower part of each end rests against the bottom of the basket so as to resist the pressure of the plates. Cups and such dishes are placed on the bottom of the basket, their openings downward.

It is contemplated that each machine should have as many baskets as are required to hold all the dishes or other articles to be washed on each occasion.

44 are the handles of the basket.

45 and 46 are two short suction pipes extending down into the depression of case 1, one on each side of partition 2. At the upper

end of these suction pipes are the inlet-valves 47 and 48.

In Fig. 15 of the drawings 49 is the pump-cylinder, held between the base 50 and cap 51 by two rods 52 and 53 screwed into the stands 3 and 4 which also hold the pump into position, as shown in the drawings.

54 is a plunger provided with packing-rings 55 and 55′ or any other packing common to pumps. This plunger has lug 56, and the depressions 57 and 57′ for receiving connecting rod 58 which is attached at the upper end to the handle 36.

59 is a hole through the side of the upper portion of the plunger; and 60 is a similar hole in cylinder 49 at such a distance from cap 51 that when plunger 54 is at its highest position, the two holes 59 and 60 coincide, and allow all water that passes by the plunger to find exit. The diaphragm 61 slopes toward hole 59 to facilitate the exit of water.

62 is the outlet-valve of the pump, with coiled spring 63 for holding the same closed. A round piece of plate-metal 64 is soldered to the sides of the plunger forming an air-chamber between it and the diaphragm 61. This metallic head is placed at such a distance from the lower end of the plunger that when such plunger is pressed to its lowest position, the said plate presses the outlet-valve 62, opening it sufficiently to allow the passage of water—and at the same time, this head allows space for the partial opening of the inlet-valves 47 and 48, thus permitting the exit of the water from both pump and pipes.

For opening the inlet-valves the following mechanism is employed: As seen in Figs. 1, 7, 10 and 16 of the drawings, the lower ends of valves 47 and 48 terminate in slots 66 and 67 formed as shown in Fig. 15. To cap 51 is pivoted a rocker-arm 68, having arm 69 extending downward. One end of shifting-rod 70 is secured to arm 69. Its other end passes through case 1 and terminates in a handle 71. Rod 70 is provided with two notches 72 and 73 which engage in a cross-piece or case-catch 74. Thus rod 70 may be held in position at either notch. Rod 70 also engages arm 75 as shown. The valve-controlling rods 76 and 77, bent as shown, connect the ends of rocker-arm 68 with inlet-valves 47 and 48, the upper ends of these controlling rods having shoulders 78 and 79, above which shoulders are coiled springs 80 and 81 pressing against the ends of rocker-arm 68. When the rocker-arm is in the intermediate position shown in Fig. 7 of the drawings, both of the inlet-valves 47 and 48 are free to be raised. If the shifting-rod be moved to the right so as to engage the notch 72 with the catch 74, then the inlet-valve 47 is prevented from opening, and the water is drawn through the inlet-valve 48. If the shifting rod be pushed still farther to the right the spring 80 will yield, and the controlling rod 77 will lift the inlet-valve 48 from its seat. If, at the same time, the plunger is at its lowest point, it will hold open the outlet-valve 62, and the water contained in the pipes and pump will escape into compartment F. By moving the shifting rod similarly in the opposite direction, the other inlet valve will be opened, and the water will escape to the opposite side of the partition, or compartment E. Thus one pump may be made to use both washing and rinsing water.

82 is a flat tilting-plate poised (as shown) on partition 2. To it is riveted an arm 83 connected with arm 85 by rod 84. Arms 75 and 85 move in the same direction—both being in fact parts of one and the same rod bent upward at each end and hinged at 86, 87, as shown. Above tilting-plate 82 and fastened to case 1 are guards 88, extending along that portion of case 1 abreast of tilting-plate 82 and across the end farthest away from the pump. These guards cause all water coming near and upon the sides and end co-extensive with their width to fall on the said tilting-plate. Now, when shifting-rod 70 is pressed toward side A, the pump will use water from compartment E, and will tilt plate 82 so that all water will return into compartment E; and when rod 70 is pressed in the opposite direction, the opposite result is obtained. This tilting-plate 82 may be so constructed that that part of it nearest the carrying-arm 14 will slide toward the end of case 1 farthest away from the pump and under the remaining part of the said tilting-plate—as shown in Figs. 19 and 20 of the drawings in which 82′ is the tilting-plate having a sliding part 96, 97 being the handle to said sliding part or plate—thus uncovering a portion of both washing and rinsing water, permitting one to use the washer as a sink or dish-pan for dishes or articles not convenient to wash in the machine. 89 is a thin piece of perforated sheet-metal or wire to strain the water as it passes to the pump.

90 and 90′ are guide-guards to keep plugs 6 and 7 in place when rods 91 and 91′ are raised and lowered. These rods have handles 92 and 92′, as shown. A metallic piece may be fastened to the sides of case 1 extending from one side to the other in position as shown by dotted line 93 in Fig. 1, to prevent water from falling into the uncovered portions of compartments E and F.

94 is a cover for that portion of the machine not covered by cover 10.

To operate my machine, place a sufficient quantity of water in case 1—suds on one side (side E) of the partition 2, and rinsing water on the other side (side F); put a basket of dishes or other articles to be washed in the machine; move rod 70 so that notch 73 engages catch 74; operate the pump-handle until the dishes, &c., are cleansed. While pump-handle 36 is at its lowest position, remove rod 70 from catch 74 and press farther toward side A. All suds from pump and pipes will return into side E. Now, place rod 70 so that notch 72 engages catch 74, thus making the pump use water from side F; work pump-

handle 36 two or three strokes, and the dishes, &c., are rinsed. Disengage rod 70, and press farther toward side B. This action returns all rinsing water from pump and pipes into the side F. Remove basket thus rinsed and place in the case another basket for cleansing, and proceed as before, and so on.

A rectangular tray with handle at each end may be used to place the wire-basket upon while filling the said basket with dishes, &c., and carrying the same to and fro to catch any particles dropping from the dishes, &c.

The pump-handle 36 may be in one part, or for convenience it may be made in two parts as shown in Figs. 11, 12 and 13 of the drawings. Fig. 11 shows when the handle-portion 36′ contains a receptacle within which passes the free end of pump-handle 36. Figs. 12 and 13 show another means of connection, in which handle-end 36″ consists of two jaws with a receptacle at one end and a bolt *a′* at the other which engages handle 36, as shown.

Fig. 14 of the drawings is a modification of my machine, in which partition 2, tilting-plate 82 and guards 8 are removed from case 1, and case 1 holds but one kind of water. Pump 5′ of the said Fig. 14 has but one inlet-valve 47′—and rod 76′ is fashioned and bent as shown so that by lifting handle 92″ of said rod 76′, the valve 47′ is raised. The outlet-valve of pump 5′ is constructed like that exhibited in pump 5. In this modification, one plug or faucet is used. To wash dishes, &c.—employing my modification—put suds into case 1 and place in a basket of dishes or other things; operate the pump-handle until cleansed; remove the basket and put in another basket, and wash, and so on until all are washed. Draw off water from case 1 and from pump 5′ and pipes by lowering pump-handle to its lowest point, and raise rod 76′—then put rinsing water into the case, and rinse each basket in turn.

Having thus fully described my invention, what I claim as novel herein, and desire to secure by Letters Patent from the United States, is as follows:

1. In washing machines the combination with a case partitioned as shown, a wire-basket and a pump, sprinkling pipes connected thereto, and an operating lever therefor, of mechanism operated by the pump-handle—whereby such pipes are carried to and fro from one side of the case to the other side, and a tilting-plate and means connecting such tilting-plate with the valve-controlling mechanism, all substantially as and for the purposes herein set forth.

2. In washing machines, the combination with a case of a wire-basket and a pump with operating lever, two sprinkling-pipes, the swinging and the sprinkling mechanism of the pipes, and means connecting them with the pump-handle whereby such pipes are carried to and fro from one side of the case to the other side, one pipe sprinkling the wire-basket from above and the other from below, all substantially as and for the purposes herein set forth.

3. In washing machines the combination with the case containing two separate compartments for different waters and a pumping and a cleansing mechanism, of a tilting-plate poised on the case-partition, and connected by suitable means with the pump—one part of said tilting-plate adapted to slide under another part to uncover a portion of both compartments of the case at the same time, substantially as described.

4. In washing machines a wire basket for holding dishes and other articles to be washed, having for its bottom an inner set of parallel wires superimposed on an outer set of cross-wires, and an adjustably fixed wire extending across the basket about on the same plane with its top, adapted for plates to lean against with their lower edges on the bottom web of wires, substantially as shown.

5. A removable basket for dish-washing machines composed of wire and having a wire extending longitudinally of the same on an approximate level with its upper edge, said wire being bent downward near the ends of the basket and around a wire of the bottom of the same and terminating in a short horizontal arm which permits the wire to lie upon the bottom of the basket and limits its motion to approximately a quadrant, substantially as herein set forth.

6. In washing machines in combination a tilting-plate poised on the case-partition, an upright arm, a connecting rod, a connected arm working in bearings, and the operating arm of the shifting mechanism of a pump engaged by such connected arm, substantially as shown.

7. In washing machines the combination with the holder for the articles to be washed of the sprinkling-pipes above and below the holder, mechanism for swinging them back and forth and maintaining them in approximately parallel positions at all times, a pump, and a flexible connection from the pump to the sprinkling-pipes, all substantially as herein shown.

8. In washing machines in combination with a holder for the articles to be washed, two connected sprinkling pipes—an upper and a lower pipe—a carrying arm connected to the upper pipe and pivoted to a bracket or shoulder of the case-bottom and having a projection, a pump-handle engaged to such projection by a connecting rod, and such connecting rod, a guide rod uniting an arm of this shoulder with an arm of a T into which the upper pipe is secured, this pipe-T of the upper pipe, a swivel elbow-extension connected to this pipe-T and a flexible feed pipe attached to this swivel elbow and connected to a pump, all substantially as herein set forth.

9. In washing machines operated by pumps the swinging mechanism for the sprinkling-pipes consisting of a carrying-arm attached to a pipe-T of one sprinkling-pipe and hav-

ing lugs connected to such sprinkling pipe, and pivoted to a shoulder or bracket fixed to the case-bottom, a rod connecting a projection of the carrying-arm with the pump-handle, a pipe uniting such pipe-T to the lower one of the sprinkling-pipes by an elbow, a guide-rod connecting an arm of such pipe-T to an arm of the case-shoulder, a swivel pipe-elbow operating in the pipe-T and a flexible feed-pipe united to such pipe-elbow, all substantially as shown.

10. In washing machines the combination with a case and a force pump of a notched operating-arm engageable with a catch or cross-piece on the case, a rocker-arm pivoted to the pump-cap provided with a downward arm which the operating-arm engages, two bent rods, each rod connecting an end of the rocker-arm with an inlet-valve of the pump—such rods provided with shoulders between which and the rocker-arm work coiled springs—and such inlet-valves, all substantially as and to effect the purposes herein set forth.

11. In washing machines in combination with a case and a force-pump, a notched shifting-rod, a rocker-arm pivoted to the pump cap and provided with a downward arm which the shifting-rod engages, two bent rods provided with shoulders, coiled springs operating around said rods between said shoulders and the rocker-arm, two inlet-valves of the pump connected by such bent rods to the ends of the rocker-arm, a pump-handle and the means operating it against the outlet-valve of the pump, and such outlet-valve provided with a coiled spring, all substantially as and to effect the purposes herein expressed.

12. In washing machines in combination with the dish holding and sprinkling mechanism, a pump cylinder and piston of a check-valve in its exit passage having a projection against which the piston presses when at the lowest point of its stroke, in such manner as to open such check-valve, and simultaneously allow space for the partial opening of the inlet valves of the pump, all substantially as and for the purposes herein expressed.

13. In a machine for washing dishes and other articles the combination with a case containing two separate compartments for different waters of a pump and sprinkling-mechanism, said pump having a suction-pipe for each water-compartment, a gravity-closing valve for each pipe, a slot in each valve-stem, rods engaging therewith and connected to opposite ends of a lever, whereby one valve may be held to its seat while the other is permitted to open, substantially as set forth.

14. In a machine for washing dishes and other articles, the combination with holding and sprinkling mechanisms and two tanks or receptacles for different waters, of a pump having two inlet valves, and mechanism for alternately holding either valve closed to regulate the source of supply, substantially as herein set forth.

15. In washing machines for dishes and other articles, the combination with holding and sprinkling mechanisms and two tanks or receptacles for holding different waters, of a pump having two inlet valves and an outlet valve and mechanism for alternately opening either inlet valve to let the contained waters return to its tank, as herein shown.

16. In a machine for washing dishes and other articles the combination with holding and sprinkling mechanisms and two tanks or receptacles for holding different waters of two inlet valves and an outlet valve and mechanism which will alternately hold either inlet valve closed to regulate the source of supply, and may be operated to open alternately either inlet valve to let the contained waters return to its tank substantially as herein shown.

17. In a machine for washing dishes and other articles the combination with the case containing two separate compartments for different waters, of a pump and sprinkling mechanism, said pump having a suction-pipe for each water-compartment, a gravity-closing valve in each pipe, a slot in each valve-stem, rods engaging therewith and connected to opposite ends of a lever, and a spring interposed to make a yielding connection in one direction whereby one valve may be held to its seat while the other is permitted to open or by a further motion may be opened, and an outlet-valve having an inward projection which may be engaged by the piston to open the same whereby an open passage may be made from the sprinkling-pipes and pump to the case, substantially as herein set forth.

In testimony that I claim the foregoing I have hereto set my hand, this 18th day of August, 1892, in the presence of two witnesses.

ELISHA HENRY ALVORD.

Witnesses:
C. S. REED,
M. K. KING.