Sept. 8, 1936. G. K. PARSONS 2,053,531

WASHING MACHINE

Filed April 14, 1931 5 Sheets-Sheet 1

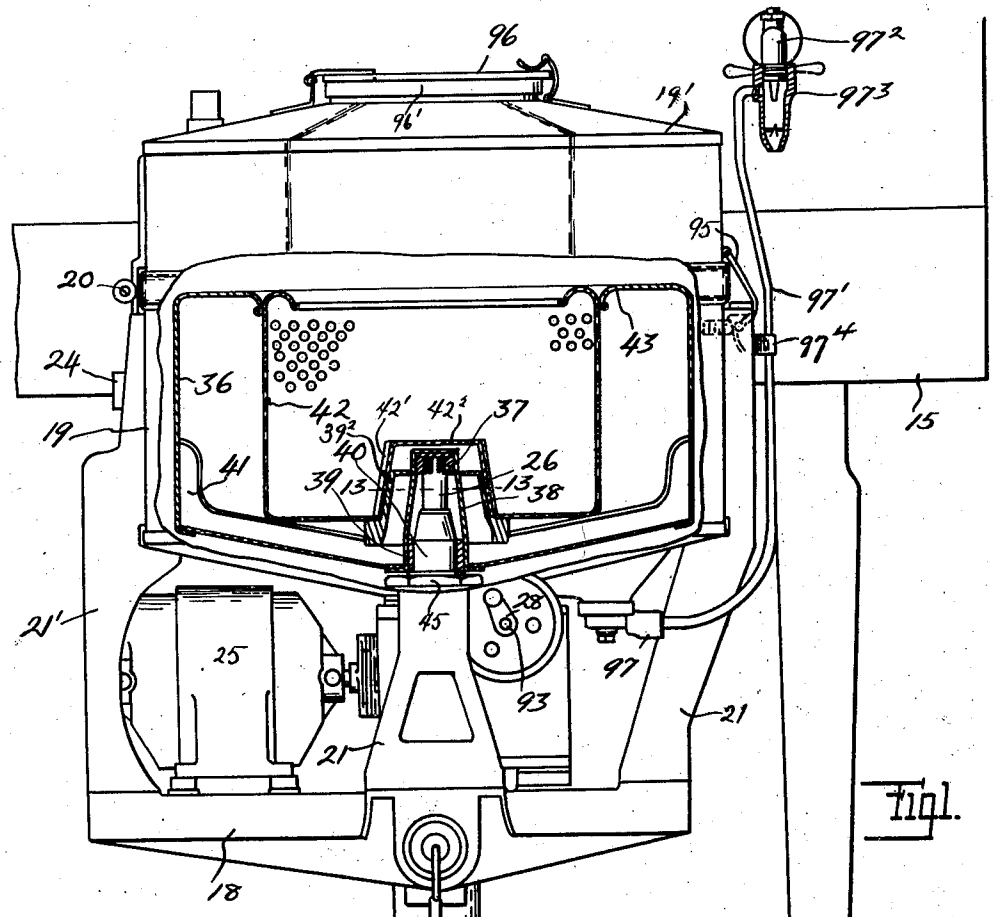
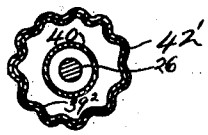


Fig. 1.

Fig. 13.



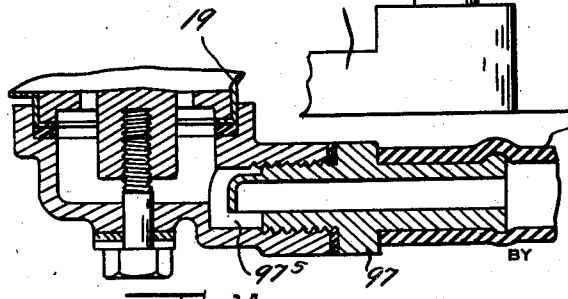


Fig. 14.

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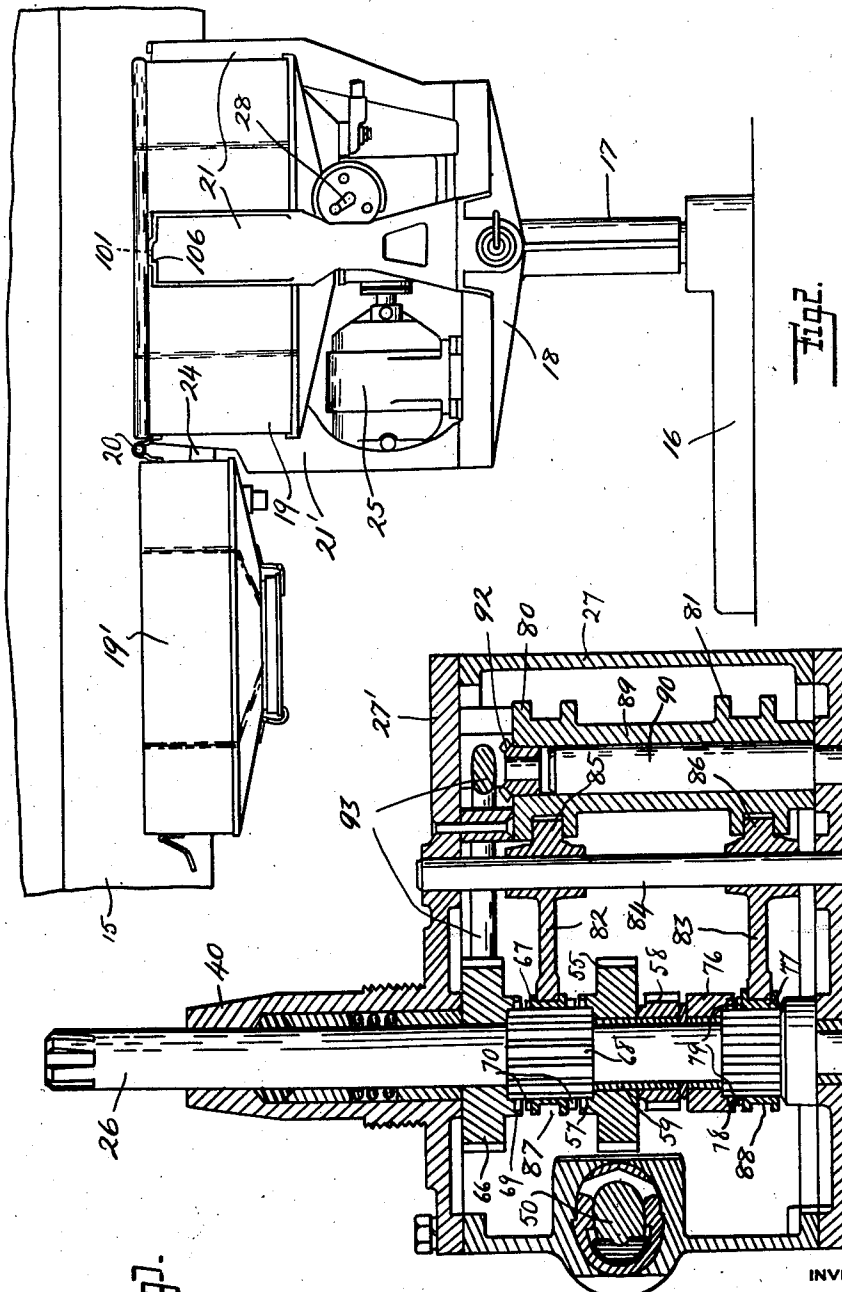


Fig. 2.

Fig. 1.

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WASHING MACHINE

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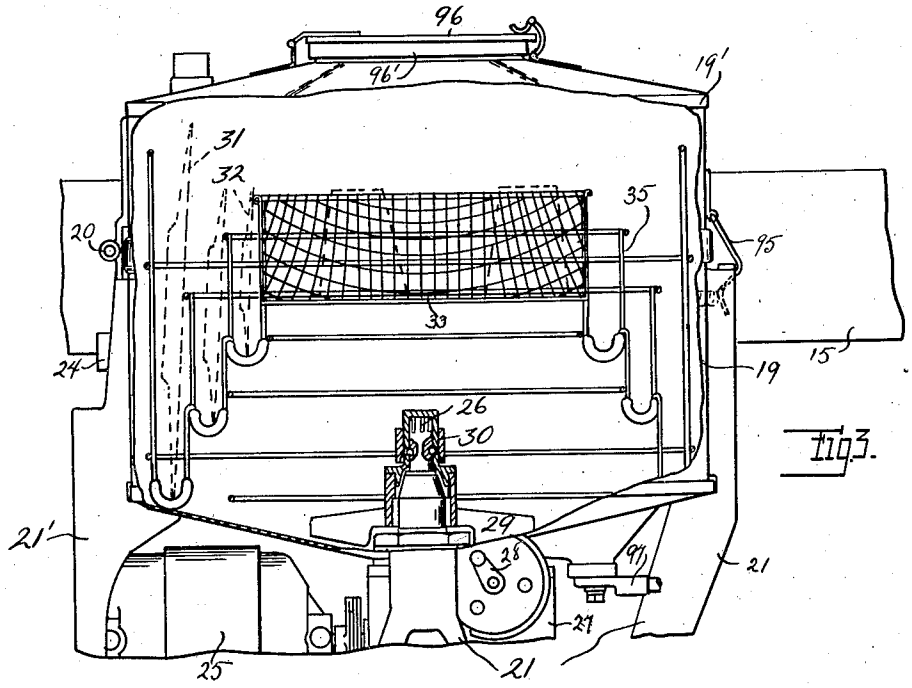


Fig. 3.

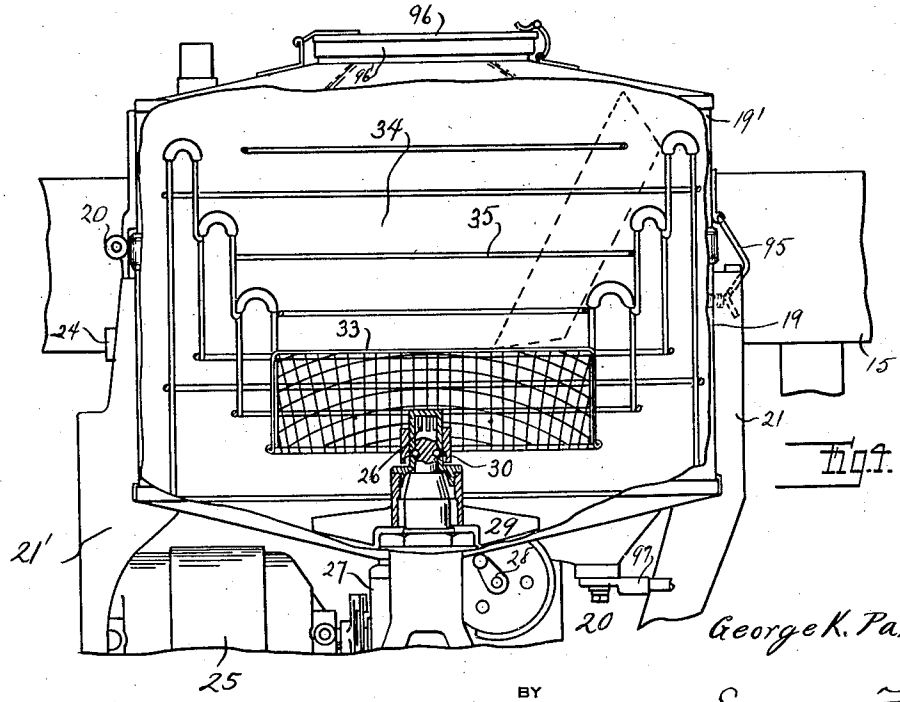


Fig. 4.

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Fig. 5.

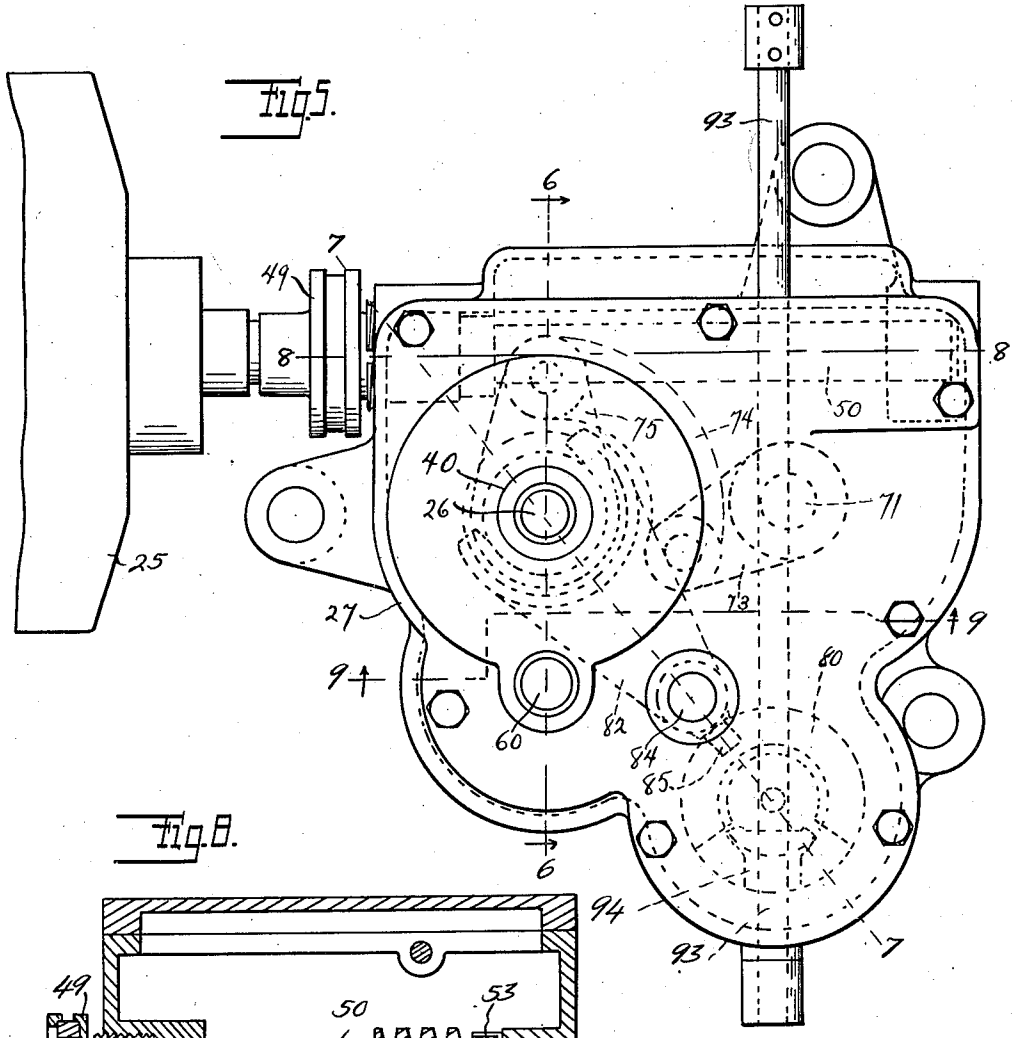
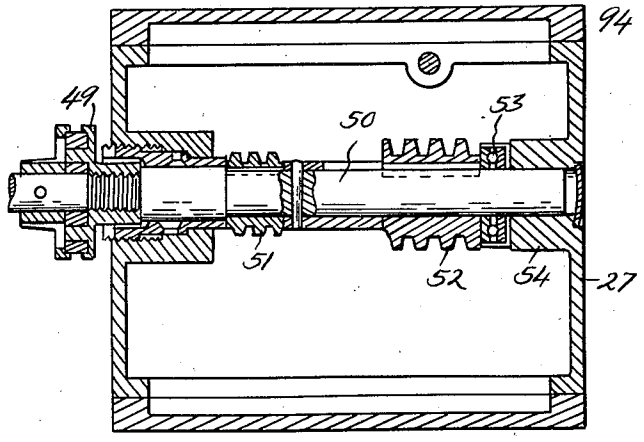


Fig. 8.



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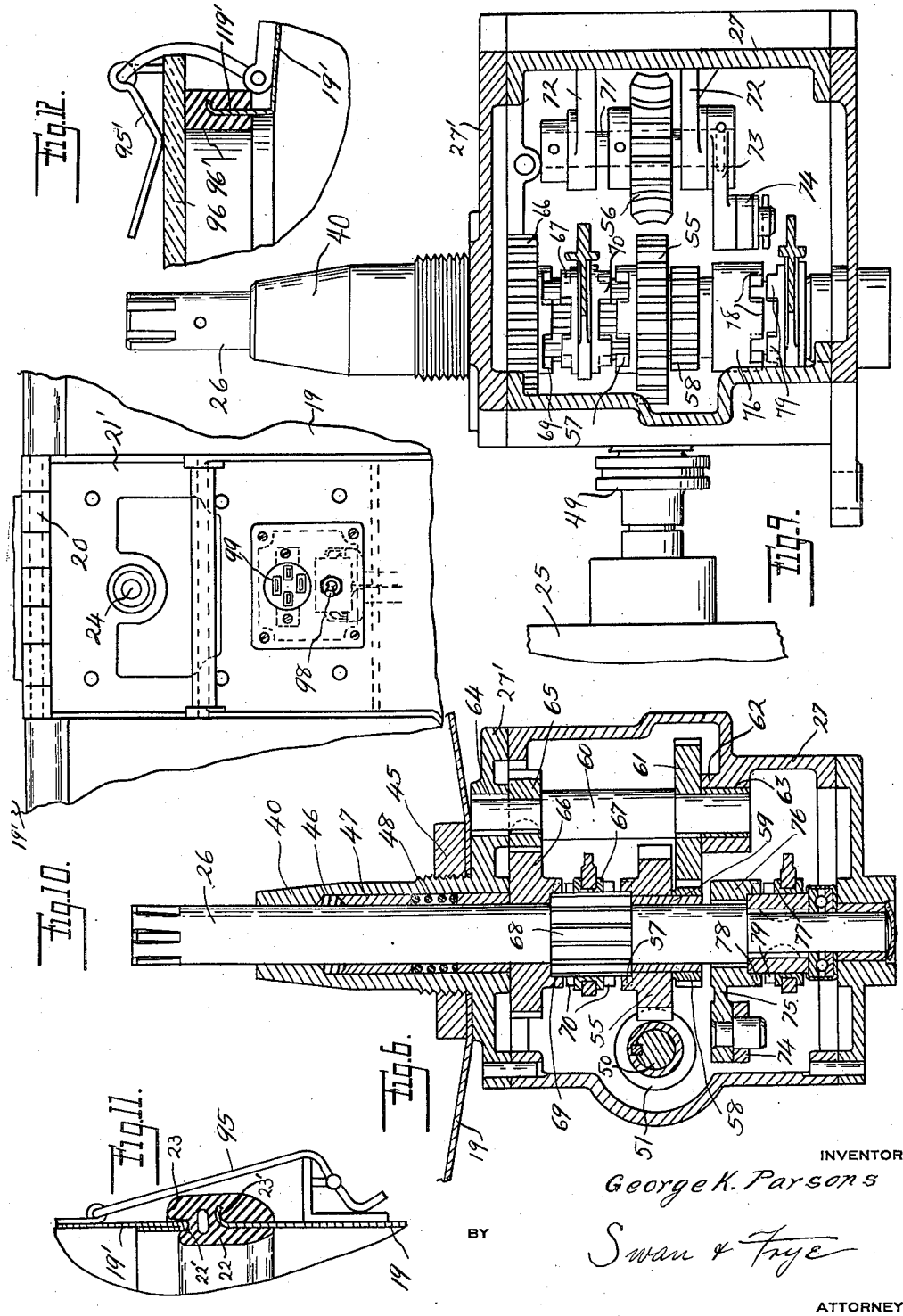


Fig. 12.

Fig. 9.

Fig. 10.

Fig. 6.

Fig. 11.

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Patented Sept. 8, 1936 2,053,531

UNITED STATES PATENT OFFICE

2,053,531

WASHING MACHINE

George K. Parsons, Detroit, Mich., assignor to Unitor Corporation, Detroit, Mich., a corporation of Michigan

Application April 14, 1931, Serial No. 530,117

2 Claims. (Cl. 68—18)

This invention relates to washing machines, and particularly to those of the smaller sizes designed principally for home use. The invention has for one of its objects provision of a machine for efficiently washing either clothes or dishes and the like, and in which water used in clothes-washing cannot contact surfaces used when the machine is functioning as a dishwasher, and vice versa.

Another object of this invention lies in incorporating in such a machine means for washing vegetables, or pots and pans and the like, by means of the dish-washing apparatus.

Another object of this invention is the provision of such a machine having a single driving shaft, controllable by means of a transmission to rotate the shaft at varying speeds, or to oscillate the same, at the will of the operator.

Another object of this invention is the provision of such a washing-machine mounted upon a foldable standard of the type described in my co-pending application, Serial Number 530,116, filed on the fourteenth day of April, 1931, so that, if desired, it may be arranged beneath the sink in a kitchen, in a manner rendering it conveniently accessible when desired, but out of the way when not in use.

A further object of this invention is the provision of such a convertible washing machine having an operating shaft from which the motivating and other parts are easily removable and replaceable at will to permit substitution of other attachments in their place.

Other objects and advantages will be apparent from the following description, wherein reference is made to the accompanying drawings illustrating a preferred embodiment of my invention and wherein similar reference numerals designate similar parts throughout the several views.

In the drawings:

Figure 1 is a side view, partly in elevation and partly in section, of my improved washing machine showing the clothes-washing apparatus installed therein.

Figure 2 is a side elevational view of my improved washing machine showing the lid in opened position.

Figure 3 is a side view showing the tub portion of my machine in detail cross section, and showing the dish-washing apparatus installed therein.

Figure 4 is a similar detail view showing the machine arranged for washing vegetables or the like, or for washing pots, pans and other relatively large objects.

Figure 5 is a top plan view of the transmission which I preferably employ for controlling the movement of the drive shaft.

Figure 6 is a vertical sectional view thereof taken substantially on the line 6—6 of Figure 5.

Figure 7 is a vertical sectional view taken substantially on the line 7—7 of Figure 5.

Figure 8 is a similar sectional view taken substantially on the line 8—8 of Figure 5.

Figure 9 is a similar sectional view taken substantially on the line 9—9 of Figure 5.

Figure 10 is a fragmentary side elevational view of the machine taken at right angles to Figures 1 through 4, showing the construction of one of the supporting legs, and the members carried thereby.

Figure 11 is an enlarged detail sectional view taken substantially vertically through the meeting edges of the cover and tub portions of my machine.

Figure 12 is a similar detail sectional view showing the constructions of the meeting portions of the main cover and the hatch therein.

Figure 13 is a fragmentary detail sectional view taken substantially on the line 13—13 of Figure 1, and

Figure 14 is a detail longitudinal sectional view of the portion of my improved draining means which is attached to the tub.

Referring now to the drawings, reference character 15 designates a sink, which is shown merely for the purpose of indicating a typical manner of installing in a home my improved convertible machine. The sub-base 16 is affixed to the floor beneath the sink, and the standard 17 carried by the sub-base may be of the type described in my co-pending application, Serial Number 530,116, filed on the fourteenth day of April, 1931, which is so constructed as to enable folding the standard, in the manner therein disclosed, to swing the machine beneath the sink and out of the way when desired. In view of the disclosure there made, the standard is not herein again described.

To the supporting member 18 carried by the base, legs 21—21' are affixed to support a tub 19. As shown in the drawings, the legs may extend upwardly to a point adjacent the top of the tub, and the tub may be secured thereto in any suitable fashion, as by spot welding.

The upper extremities of the diametrically opposite legs 21 are each provided with an upwardly projecting portion 106 in which an aperture 101 is formed, (note Figure 2). The projection and aperture are adapted to cooperate with a supporting cross-bar (not shown) by means of

which I contemplate affixing certain attachments to my improved washing machine, as shown and described in my co-pending applications, Serial Numbers 530,120 and 530,118, both filed on the fourteenth day of April, 1931.

Extending the legs in the manner shown up the sides of the tub also adds rigidity to the assembly and enables affixing the cover-supporting hinge **20** to one of them (**21'**) as shown in Figures 1, 2, 3, 4, and 5, making for stronger construction. The leg **21'** may also carry a control switch **98** for the motor, and an electrical socket or plug receptacle **99**, which also may be controlled by the switch **98**, and from which additional electrical power may be taken, as by an extension cord, to operate attachments which may be applied to the machine, or for any other purpose. The shape of the tub and of the cover are clearly shown in the drawings. They may be either round or polygonal in cross section, being shown as octagonal and a water-tight juncture is provided between them when the lid is closed by the gasket **22**, which carries a ledge **22'** upon which the lower edge of the cover seats, and an upstanding wall **23** around the outside, as shown in Figure 11. The top of the tub is outwardly flared, as at **23'**, and the gasket is correspondingly slotted, as there shown, and then slipped over the flared edge. The flare prevents the natural contractive force exerted by the somewhat stretched resilient rubber from pulling the top of the gasket inwardly when the lid is raised. A rubber bumper **24** may be secured to the leg **21'**, as shown in Figures 1, 2, 3, 4 and 5, to prevent injury to the cover or tub when the cover is thrown back to the position shown in Figure 2.

Carried by the supporting member **18** is an electric motor **25**, which serves as a source of power and enables actuation of the drive shaft **26** for the washing apparatus, through a transmission, which is also positioned beneath the tub, and the housing of which is designated **27**. A control or shifting lever **28** enables so adjusting the transmission as to drive the shaft **26** either at relatively low or at relatively high speed, or to oscillate the same, at will. The transmission will hereafter be described in more detail.

When it is desired to wash dishes or the like in my machine, the inner arrangement of parts is preferably as shown in Figure 3. Reference character **29** indicates an impeller in the form of a screw, which is rigidly but removably affixed to the shaft **26**, and which is contoured to throw water contained in the tub upwardly and outwardly in all directions when revolving with sufficient speed. Any suitable means, such as a ball chuck **30**, may be used to removably affix the impeller to the shaft **26**. The upper extremity of the shaft is splined, and below the splines depressions are formed in the shaft within which the balls are adapted to engage, as shown in Figure 3. For dish-washing purposes relatively only a small amount of water is placed in the machine. The impeller is rotated at high speed and the water is thrown violently in all directions and impinges against whatever may lie in its path. Dishes **31—32** may be supported in an open mesh rack **35** in positions to be engaged by the water, as shown in Figure 3. The rack may be formed of wire protected at desired points by relatively soft rubber guards to protect the dishes against chipping, or relatively resilient wire may be employed, in which case no rubber guards may be needed. The rack may be provided with a horizontal platform portion **33** upon which cups, glasses, and the like may be placed, as shown. The details of construction of the rack I preferably employ are disclosed in my co-pending application, Serial Number 530,119, filed on the fourteenth day of April, 1931, and it need not be here again described, further than is necessary to make clear the principles of operation of this machine. It will be seen that upon reversing the tray to the position shown in Figure 4, a relatively large open space **34**, exists above the platform **33**, within which may be placed vegetables or objects desired to be washed for which a larger receptacle is desired than is provided when the rack is positioned as shown in Figure 3.

When the impeller **29** and rack **35** are removed, the inner clothes-washing tub **36** may be positioned upon the main shaft **26** within the tub **19**. The tub **36** is formed with a splined bushing **37** adapted to engage the splined extremity of the shaft **26**, so that the tub **36** may be rotated or oscillated thereby. The tub **36** is maintained in upright position by the elongated sleeve portion **38** which extends downwardly and carries a bearing portion **39** engaging the nipple or boss **40**. Agitators in the form of baffles **41** are positioned within the tub **36**, being affixed to the bottom and sides thereof as shown in Figure 1. The spinner member **42** is normally not positioned within the tub **36** while clothes are being washed, and during the clothes-washing operation the transmission is preferably adjusted by means of a lever **28** to rock the shaft **26** and thus oscillate the tub **36** and baffles **41**, which agitate the water within the tub to force it through the clothes. The top of the tub **36** is bent over as shown at **43** to prevent water from splashing out of the clothes-washing tub, and to engage the upper outside edge of the spinner **42** when the same is positioned within the tub **36**, as shown in Figure 1. The purpose of the spinner is to dry the clothes. Accordingly they are placed in it and the spinner positioned within the clothes-washing tub, after the water has been poured from the tub. The driving engagement between the tub **36** and the spinner **42**, to enable rotating the latter upon spinning the tub, is furnished by corrugations **42'** formed in the boss portion 42^2 of the spinner, which is formed to fit about the boss portion 39^2 of the inner tub, as shown in Figures 1 and 13. The portion 39^2 of the tub **36** is similarly corrugated, as is best shown in Figure 13. In centrifugally drying the clothes the shaft **26** is driven at high speed and the inner tub **36** and spinner **42** rotated as a unit. The spinner is perforated, as shown, and the water in the clothes is thrown outwardly through the perforations into the tub **36**, in which it is retained.

The shaft **26** may be supported by and journaled in the transmission housing **27**, as shown in Figures 5, 6, 7, 8, and 9, extending from the top of the housing through the elongated bearing boss **40**, which passes through a suitable aperture in the bottom of the tub, a tight-sealing engagement being formed between it and the bottom of the tub and the transmission housing by the nut **45**, as shown in Figure 6. Stuffing **46** seals the aperture in the boss **40**, through which the shaft **26** passes, to prevent seepage of water along the shaft and into the transmission housing. An automatic take-up sleeve **47** is provided to constantly tighten the packing under the influence of the compression spring **48**.

Obviously, as to the transmission, the shaft **26**

is the driven shaft, the driving shaft, which is driven by the motor 25 through the coupling 49, being designated 50, and journaled in the transmission housing 27, as shown in Figure 8. To the shaft 50 are fixedly secured worms 51 and 52. A ball bearing 53 may be interposed between the worm 52 and the bearing boss 54, to take the thrust imposed upon the shaft by the worms. The worms 51 and 52 drive worm wheels 55 and 56. The worm wheel 55 is rotatable but not movable longitudinally upon the driven shaft 26 and carries crown clutch teeth 57 extending laterally from one side, as shown in Figure 9.

The pinion 58 is also secured to and turns as a unit with the worm wheel 55. The worm wheel 55, clutch teeth 57, and pinion 58 may be formed integrally if desired, or, as shown in Figure 6, the pinion 58 may be rigidly secured to the worm wheel 55 by affixing both worm wheel and pinion to a bushing 59, which turns freely on the shaft 26. The pinion 58 drives a counter shaft 60 through the gear 61 fast thereon. My preferred manner of journaling the counter shaft in the housing is shown in Figure 6, an internal extension 62 furnishing a support for the lower bearing 63 while the upper bearing 64 is carried by the upper wall or cover 27' of the housing. Fast on the counter shaft adjacent its upper extremity is the pinion 65 which drives a gear 66 which is loose on the shaft 26. Both of the gears 55 and 66, while free to rotate with respect to, are not longitudinally movable upon the shaft 26. It will thus be seen that the pinions 58—65 and gears 61—66 constitute a system of reduction gearing and that the gear 66 may be driven at reduced speed through the counter shaft. So if the gear 55 were made fast upon the shaft 26 while the gear 66 remained loose, the shaft 26 would be driven at relatively high speed by the motor, while if gear 55 remained loose on the shaft 26 and gear 66 were affixed thereto, the shaft 26 would be driven at reduced speed through the reduction gearing. Attachment and release of the gears 55 and 66 with respect to the shaft 26 is accomplished by the slidable clutch member 67 which is slidably feathered on a splined portion 68 of the shaft 26 between the gears. The gear 66 also carries clutch teeth 69 similar but oppositely disposed to the teeth 57, and the slidable clutch member is formed with outwardly projecting teeth 70 upon each side, so that upon being slid in either direction a sufficient distance, one set of teeth will engage those of one of the gears 55—66 to rigidly secure that gear with respect to the shaft and enable driving the latter by the gear through the clutch member 67 and splines 68. The clutch member 67 is of such size that its teeth upon one side are disengaged before those upon the other can engage the other gear.

To enable rocking of the shaft 26, the worm 52 carried by the driving shaft 50 constantly drives the worm wheel 56, which is fast upon the stub shaft 71 journaled in brackets 72 carried by the housing 27 and projecting into the interior thereof, as shown in Figure 9. One extremity of the shaft 71, here shown as the lower, carries the crank 73, to which is pivoted the link or pitman 74. The other end of the pitman is pivoted to another crank 75, carried by the sleeve 76. The sleeve is carried by and normally free to rotate with respect to the shaft 26, but not to move longitudinally thereon, and may be made fast on the shaft when desired by means of the slidable clutch 77 having teeth 79 formed thereon to cooperate with teeth 78 carried by the end of the sleeve; the operation of these members being similar to that of the clutch 67 and gears 55—66. The radius of the crank 73 is, of course, less than that of the crank 75.

Shifting of the clutch members 67 and 77 is accomplished by means of cylinder cams 80 and 81, which actuate shifting arms 82 and 83, slidable upon the rod 84, which traverses the housing. The followers 85 and 86 are carried by and integral with the shifting members, and the ends of the arms 82 and 83 are formed as yokes which engage suitable circumferential slots 87 and 88 in the surfaces of the clutch members to enable movement thereof upon sliding the shifting rods. As shown in Figure 7 the cams 80 and 81 may be formed as a unit, and both integral with the sleeve 89, which is rotatable upon a supporting rod 90 rigidly mounted in the housing, as by being driven into an aperture in the boss 91. To enable turning the sleeve 89, and consequently the cams 80 and 81, a miter gear 92 is carried by the end of the sleeve. As shown in Figure 7 it may be secured thereto by having its cylindrical portion tightly driven into the axial aperture of the sleeve 89, or if desired it may be cast integrally therewith. An operating shaft 93 journaled in the housing, as is best shown in Figure 5, carries another miter gear 94 pinned or otherwise suitably secured thereto for cooperating with the gear 92 to turn the cams.

The operating shaft 93 extends outwardly from the transmission housing to a point adjacent one of the supporting legs 21, where it carries the controlling lever 28. Any suitable means may be employed for yieldably maintaining the control lever at desired positions. The tracks of the cams 80 and 81 are so contoured that in one position of the control handle 28 the clutch member 67 is slid to a position securing gear 66 to the shaft, and in another position of the control handle the clutch is moved to a position in which it secures gear 55 thereto. At both of these positions of the clutch member 67, the clutch 77 is maintained in retracted position away from the sleeve 76. In another position to which the control handle, and consequently the cams may be turned, the clutch 67 is in the middle or neutral position and so both of the gears 66 and 55 are loose upon the shaft 26, while the clutch 77 has moved toward the sleeve 76 until their crown teeth are engaged, at which time the shaft 26 may be rocked by the pitman 74, which is oscillated by rotation of the crank 73.

The cover 19' of the tub may be secured in closed position by means of any suitable clamp or clamps, as 95, and a smaller cover or hatch 96 may be provided in the main cover to enable reaching the interior of the machine without opening the larger cover. The smaller cover may be formed of transparent material, such as glass, if desired, and the upstanding neck 119' carried by the cover, against which it closes, may be equipped with a rubber or other suitable beading, designated 96', similar to the bead 23 carried by the meeting edges of the main cover and tub, (note Figure 12), but formed with a flat top. The clamp 95' which is utilized to secure the hatch 96 in closed position will be seen to be so formed as to require no aperturing of the cover at its clamped edge, which is advantageous if glass is used, even though the same be laminated or otherwise reenforced.

Any suitable emptying means may be provided for draining the tub. I preferably secure the member 97 to the bottom of the tub, and pro-

vide an outlet thereinto from the tub through which the water in the tub may flow or be drawn. For drawing the water through the outlet member **97** a hose, as **97'** may be coupled thereto, and to the extremity of the hose any suitable device may be affixed for coupling to a water faucet (**97²**), which is capable of exerting a suction effect upon the hose by tending to create a partial vacuum therein when water flows under pressure from the faucet. Many such draining devices are now on the market, and the same forms no part of my invention. In its simplest form it may comprise a casing, as **97³** affixable to the water faucet as shown in Figure 1, and having a Venturi section therein into which a jet is projected by the running water from the faucet when it is turned on, and adjacent which venturi the outlet from the draining hose **97'** is placed. Thus in order to drain the tub **19** it is merely necessary to couple the member **97³** to the faucet and turn on the water. When not in use the draining hose may be secured to the side of the tub in any suitable manner, as by means of the clip **97⁴**. The outlet member **97** may be provided with a sump, as **97⁵** into which the inlet to the hose extends, as shown in Figure 14. This prevents the drawing of air through the hose until the tub is entirely emptied and nothing remains but the very small amount of water in the sump. It will be seen that tube **36** may be emptied either manually by removing and tipping it, or the hose **97'** may be uncoupled from drain element **97** and dropped into the inner tub **36** to enable extracting the water by means of drain device **97³**.

It will be seen that in order to operate the machine as a dish-washer it is merely necessary to insert the dishwashing parts previously described, and to shift the transmission (if necessary) so that the impeller may be driven at the high speed. The oscillating movement is employed for actuating the tub **36** and baffles **31** during the clothes-washing operation, while the spinner **42** is usually also driven at the high speed, although the low speed may be used if desired; and the different speeds may also be used to drive other attachments which may be coupled to the shaft **26**, some of which are shown in my co-pending application, Serial Number 530,120, filed on the fourteenth day of April, 1931.

As shown in Figure 10, the supporting leg **21'**, which carries the lid hinge may also carry the control switch (**98**) for the motor, and the electrical outlet or plug receptacle **99** which may serve as a source of additional electrical power when desired, as for certain attachments for the machine, (which form no part of this invention) or for any other desired use. I preferably control the outlet **99** by the same switch **98** which controls the motor, in order that all electrically energized suits may be turned on or off at the same time by means of the single switch.

While it will be apparent that the illustrated embodiments of my invention herein disclosed is well calculated to adequately fulfill the objects and advantages primarily stated, it is to be understood that the invention is susceptible to variation, modification and change within the spirit and scope of the subjoined claims.

What I claim is:

1. In a convertible dish and clothes washing machine, an outer tub, driving means extending thereinto, an imperforate inner tub removably mounted in the outer tub and having an inwardly overhanging upper guarding rim, and a centrifugal drying member of lesser diameter than the inner tub removably mounted in said inner tub and perforated below and snugly engaging the inner edge of said rim and actuable by said driving means, the drying member being shaped to prevent passage of water over its rim, and being drivable simultaneously with said inner tub, whereby upon whirling the drying member, water therein is thrown into and retained in the inner tub through the perforations in the drying member.

2. In a convertible dish and clothes washing machine, an outer tub, driving means extending therethrough, an imperforate inner tub removably mounted in the outer tub and having an inwardly overhanging upper guarding rim, and a centrifugal perforate drying member removably mounted in the inner tub, said drying member and inner tub being simultaneously actuable by said driving means, and said drying member snugly engaging the edge of said overhanging rim, all of the perforations of said drying member being below said overhanging edge, whereby upon whirling the drying member water therein is thrown into and retained in the inner tub, while the latter serves to protect the outer tub against being contacted by such water.

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