

March 31, 1931.

W. L. LINDGREN

1,798,428

DISHWASHING MACHINE

Filed Dec. 5, 1928

5 Sheets-Sheet 1

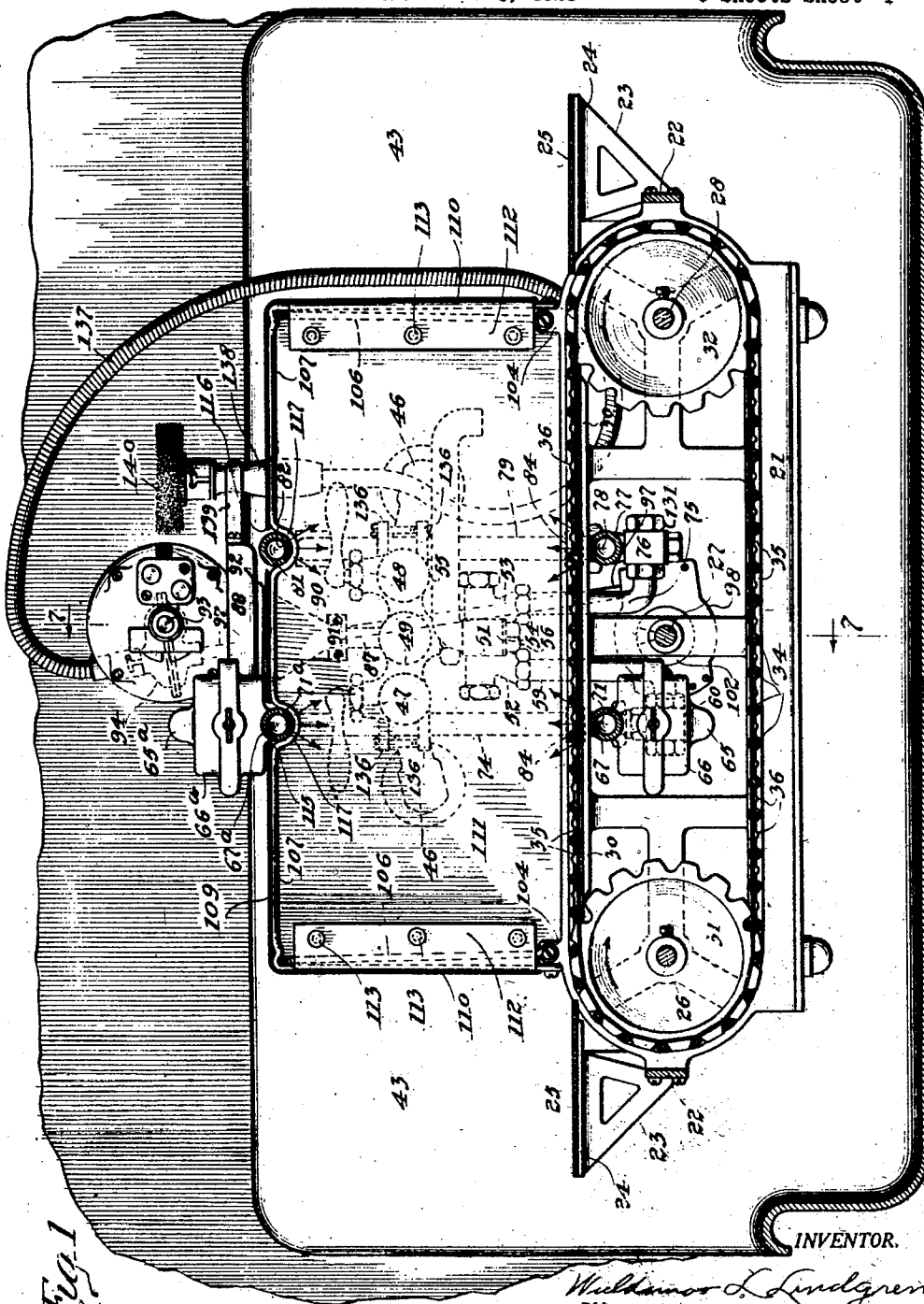


Fig. 1

INVENTOR.

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March 31, 1931.

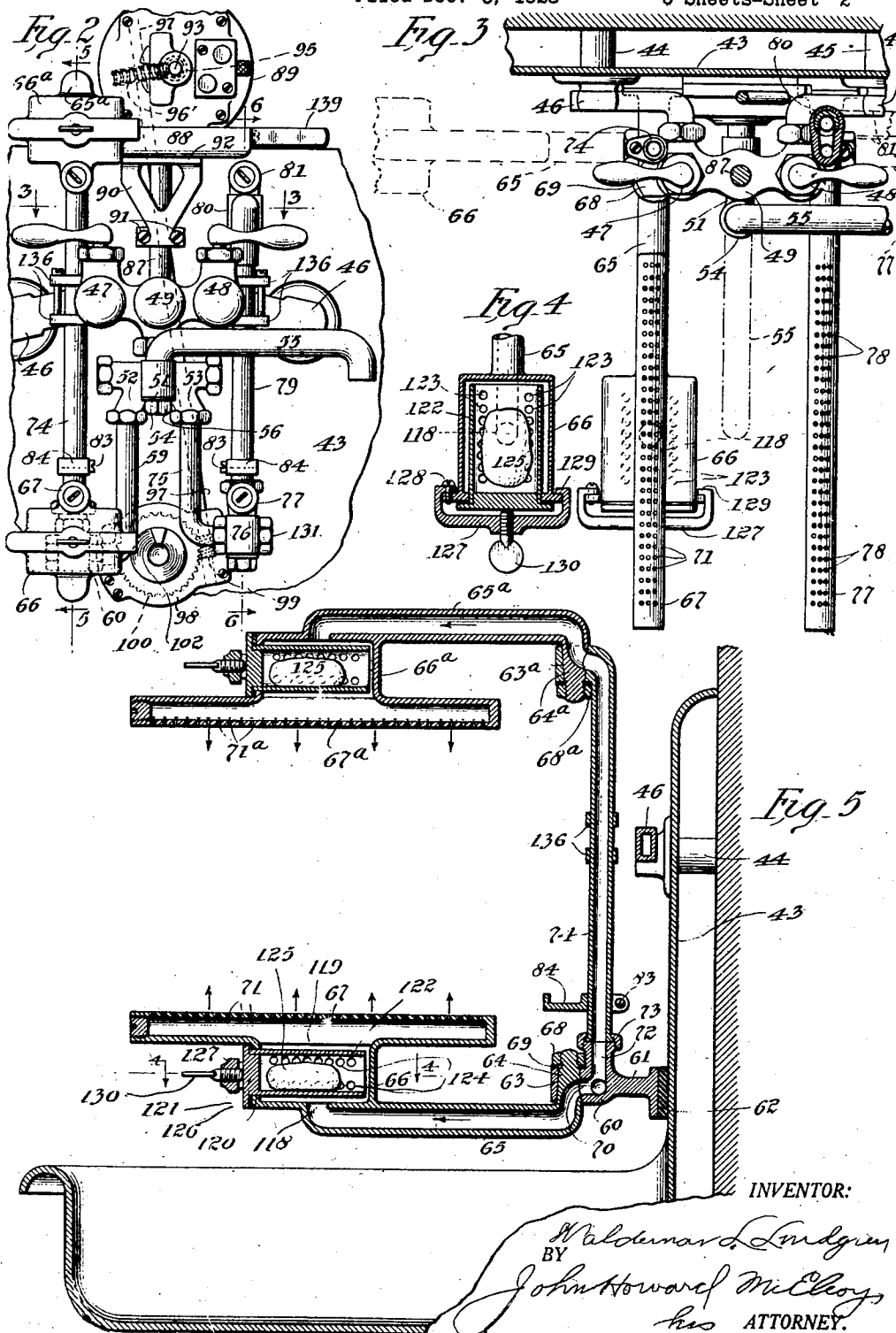
W. L. LINDGREN

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DISHWASHING MACHINE

Filed Dec. 5, 1928

5 Sheets-Sheet 2



INVENTOR:

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March 31, 1931.

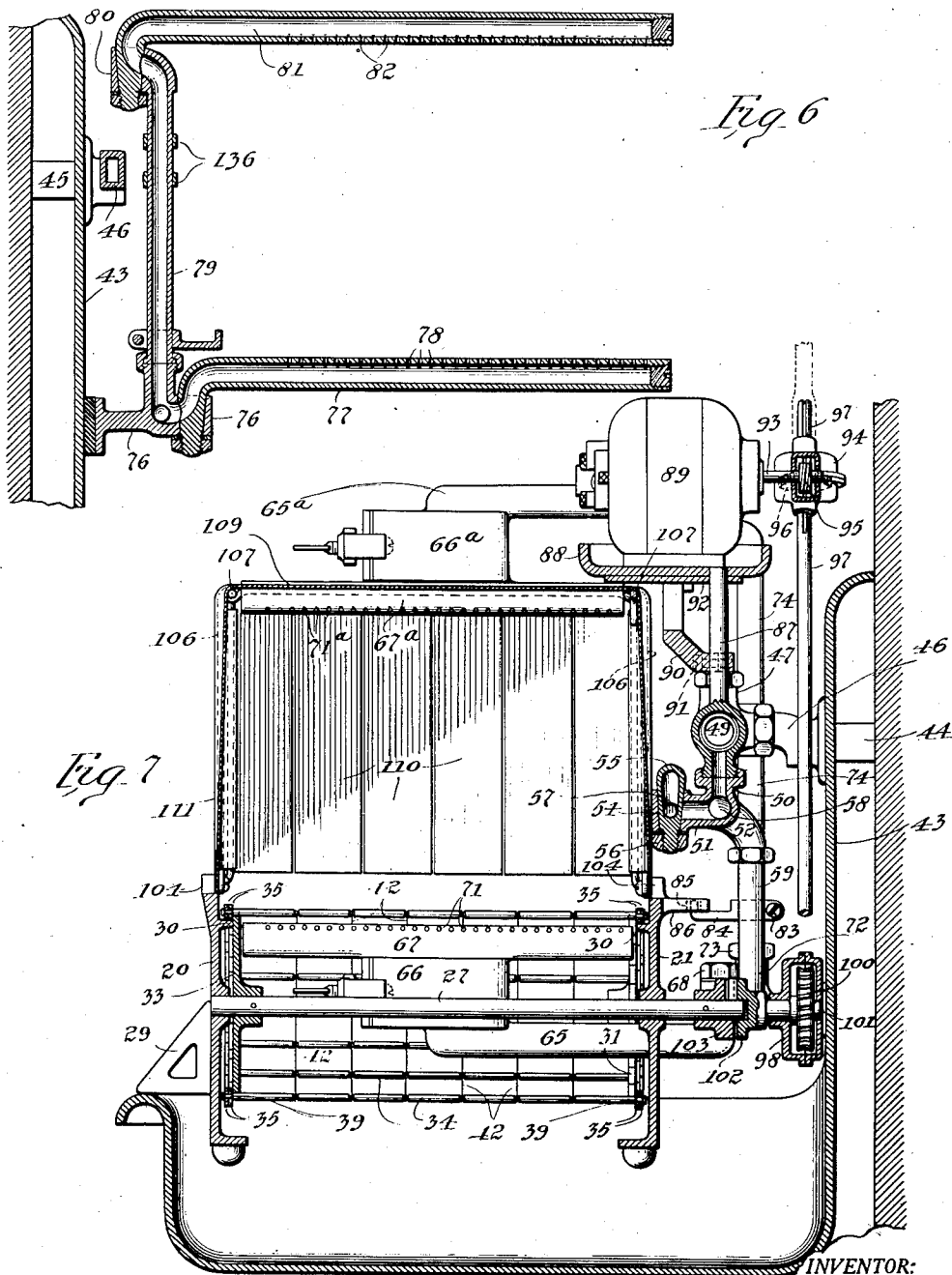
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DISHWASHING MACHINE

Filed Dec. 5, 1928

5 Sheets-Sheet 3



INVENTOR:

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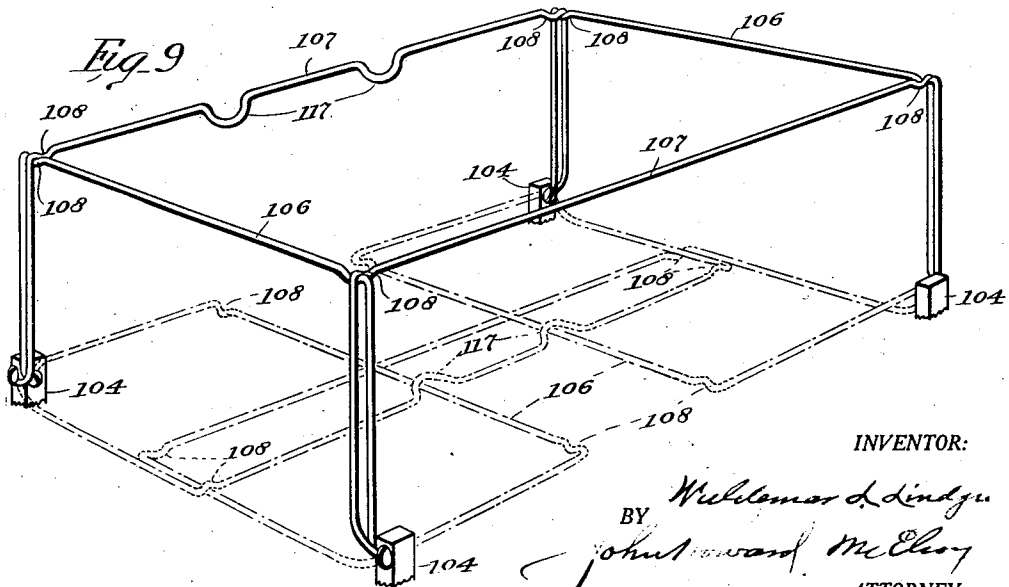
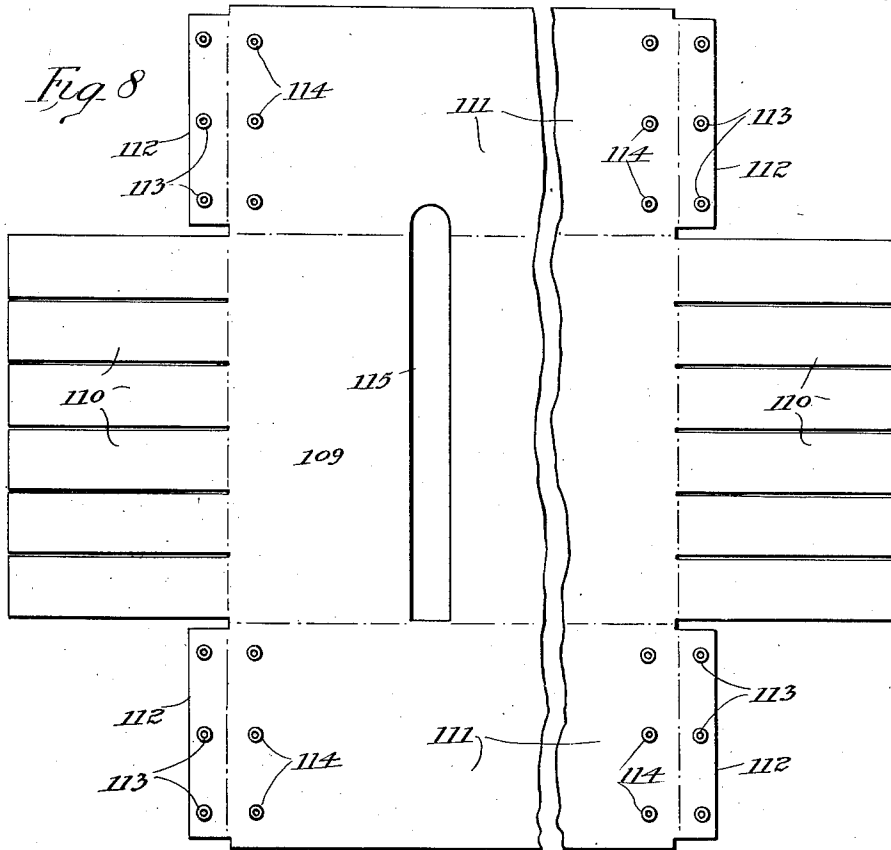
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DISHWASHING MACHINE

Filed Dec. 5, 1928

5 Sheets-Sheet 4



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DISHWASHING MACHINE

Filed Dec. 5, 1928

5 Sheets-Sheet 5

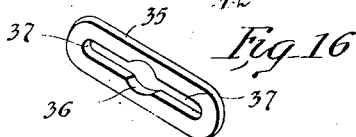
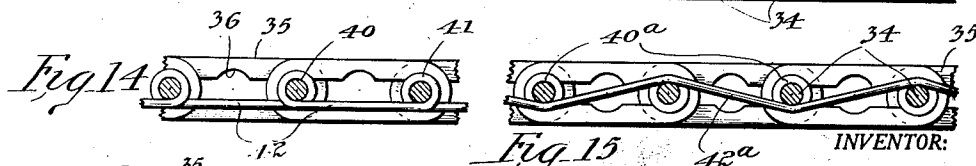
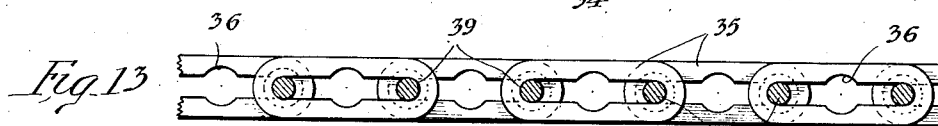
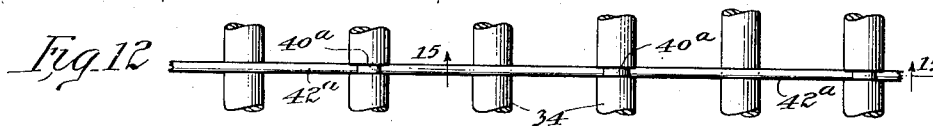
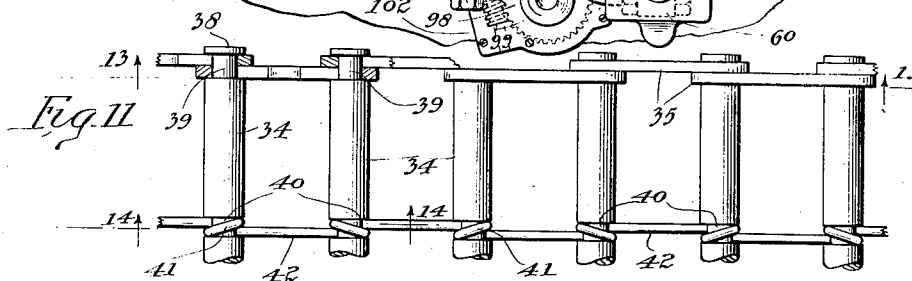
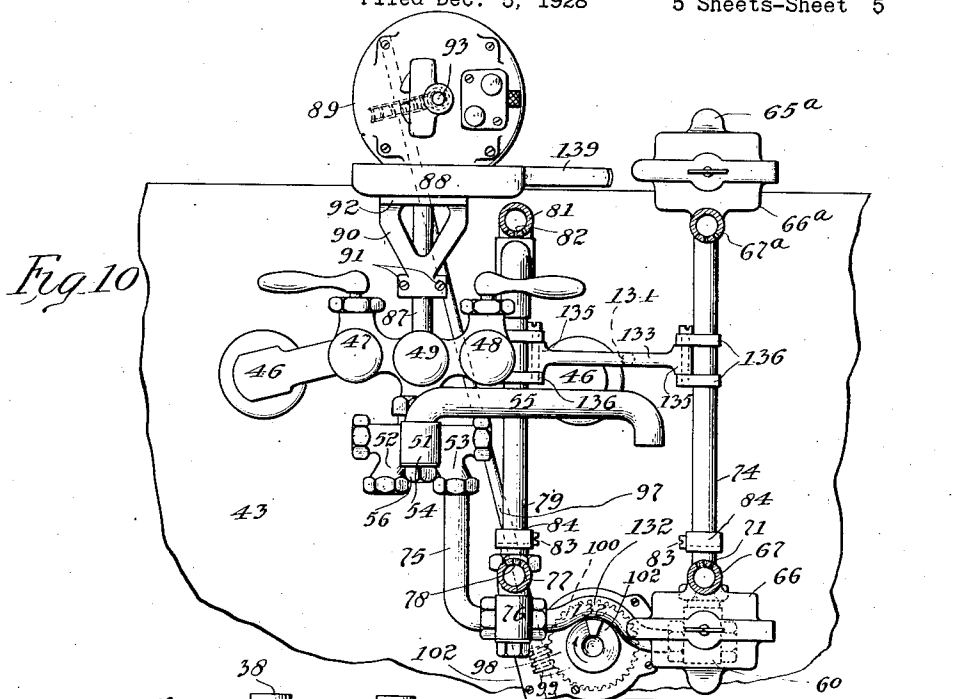


Fig. 15

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UNITED STATES PATENT OFFICE

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JOHN E. ERICSSON, OF CHICAGO, ILLINOIS

DISHWASHING MACHINE

Application filed December 5, 1928. Serial No. 323,876.

My invention is concerned with portable dish washers adapted to be used in a kitchen sink, or some similar place, and more especially with such a dish-washer as is adapted to be removed from the sink without disconnecting therefrom the spray pipes and connections by which water is supplied to the dish-washer.

To this end, it consists of a portable and detachable conveyor carrying the gearing by which it is operated to carry dishes slowly through it, together with the spray pipes by which the soapy water and rinsing water are furnished permanently connected to the sink faucet, and swiveled so that they can be swung parallel to and adjacent the back wall of the sink so as to be out of the way and leave it free for ordinary use.

It is further concerned with such a dish-washer in which an electric motor for operating it is permanently secured above the faucet, where it can remain in place when the conveyor mechanism of the dish-washer is removed, and be used to drive a flexible shaft which can have various kinds of brushes and rotating scrapers secured thereto to be used in cleaning, scouring and polishing pots and pans and kitchenware generally.

It is further concerned with such a dish-washer that has its connections so designed that they can be adjusted and arranged to place the conveyor mechanism of the dish-washer either in the center, or to either side of the center, as may be necessary with different styles of sinks.

To these ends, it embodies certain novel elements and combinations of elements, all of which will be hereinafter fully described, and the novel features thereof particularly pointed out in the claims.

To illustrate my invention, I annex hereto five sheets of drawings, in which the same reference characters are used to designate identical parts in all the figures, of which,—

Fig. 1 is a central longitudinal vertical section through the conveyor of my improved dish-washer as mounted in the center of a sink;

Fig. 2 is a front elevation of the motor,

spray pipes and connections, with the conveyor removed from the front of them;

Fig. 3 is a horizontal section on the line 3—3 of Fig. 2;

Fig. 4 is a horizontal section through a soap box, on the line 4—4 of Fig. 5;

Fig. 5 is a central vertical section through the soapy-water sprays in the position they occupy when in use, but with the conveyor omitted, on the line 5—5, Fig. 2;

Fig. 6 is a similar view of the rinsing-water spray pipes, on line 6—6, Fig. 2;

Fig. 7 is a central vertical section on the line 7—7 of Fig. 1;

Fig. 8 is a plan view of the flexible cover for the conveyor removed and spread out, with a portion thereof broken out;

Fig. 9 is a perspective view of the collapsible wire frame by which the cover shown in Fig. 8 is supported;

Fig. 10 is a view similar to Fig. 2, but showing the connections made for a sink where the conveyor has to be set to the right of the center thereof;

Fig. 11 is a top plan view of a portion of a conveyor belt;

Fig. 12 is a portion of the conveyor belt illustrating a slight modification from that shown in Fig. 11;

Figs. 13 and 14 are vertical sections on the lines 13—13 and 14—14, respectively, of Fig. 11;

Fig. 15 is a similar section on the line 15—15 of Fig. 12; and

Fig. 16 is a perspective view of one of the links of which the conveyor-belt chain is preferably composed.

As seen in Figs. 1 and 7, the conveyor portion of the apparatus is mounted in a frame consisting of two side castings 20 and 21, of the general design shown in Fig. 1, and connected at their ends by the cross pieces 22, which may have the brackets 23 at each end, on which the supporting plates 24 are mounted, these plates being preferably covered with rubber mats 25 to prevent the dishes slipping when they are delivered onto said mats. The two side pieces 20 and 21 have three shafts 26, 27 and 28 journaled in suitable bearings therein, and the side frame

20 is also provided with the bracket 29 adapted to rest on the front edge of the sink when the conveyor mechanism is in place. The side frames 20 and 21 are provided near their upper edge with the horizontal inwardly projecting flanges 30, which serve to support the conveyor chains during their upper run. These conveyor chains, the preferable details of which, in their preferred form, are shown in Figs. 11 to 16, are in effect sprocket chains which cooperate with the pair of sprocket wheels 31, secured on the shaft 26 just inside of the side frames, and 32, similarly secured on the shaft 28 in the same location, and the single driving sprocket-wheel 33, shown only in Fig. 7, which is secured on the shaft 27 just inside of the frame 20. The conveyor chain or belt is preferably made up of a series of rods 34 which are connected together at their ends by the links 35, which are preferably constructed as best shown in Fig. 16, where it will be seen that each link has the enlarged central portion 36 of the elongated aperture 37, through which central portion the end 38 of the rod 34 may enter and then the link be secured in place by shifting it to the position shown in Figs. 11, 13 and 14, where the reduced portions or annular channels 39 of the rods 34 pass to the ends of the slots 37. With this construction, it will be obvious that in case a link is broken it can be readily replaced, or the chain can be lengthened or shortened if occasion requires.

In order to hold articles such as knives, forks and spoons on the conveyor, I preferably form at equal distances from the ends thereof a series of annular channels 40 about which is wrapped a loop 41 of the endless connecting wires 42, which extend around the entire length of the conveyor belt or chain. As a modification of the same, I may employ the narrower annular channel 40^a, shown in Fig. 12, and merely pass the wires 42^a alternately above and below the rods, as seen in Figs. 12 and 15.

If the shaft 27 be rotated slowly, it will be obvious that dishes, etc., placed on the upper run thereof, by first placing them on the mats 25 and then shoving them onto the belt or chain, will be carried slowly across the apparatus and subjected to the action of the spraying mechanism to be now described.

Referring now more especially to Figs. 1 to 7, inclusive, the back wall of the sink 43 will have passing through it the pipes 44 and 45 for the hot and cold water, and on their outer ends will be provided the customary connections 46 leading to the hot and cold water cocks 47 and 48, which are connected with the mixer 49 in the customary manner. The lower end of this mixer 49 has screwed thereon, as best seen in Fig. 7, the connection 50, which has three arms 51, 52 and 53 leading horizontally from the lower end thereof.

The arm 51 has at its outer end the tapered valve sleeve 54, in which is mounted the tapered downwardly-projecting end of the discharge pipe 55, which is held in place therein by the nut 56. This tapered end of the pipe 55 has the single outlet 57 therein located so that, when the pipe 55 is turned parallel to the rear wall of the sink, the water from the mixer cannot enter the pipe 55, but is shut off. When the pipe 55 is turned out at right angles to the rear wall of the sink, then the outlet 57 is in register with the outlet in the valve seat 54, and the water can be delivered to the sink in the customary manner.

The arm 52 has the passage 58 (see Fig. 7) leading from the connection 50, and the lower end of the arm 52 is connected by a pipe 59 with the adjacent side of the connection 60 (see Figs. 2 and 5), which has the rearwardly-projecting base member 61 furnished with a rubber block 62 secured to the rear side thereof and against the rear wall of the sink 43. The connection 60 also has the tapered valve seat 63, with which co-operates the tapered valve end 64 of the pipe 65 connected to the soap box 66 of the lower spray pipe 67. The valve end 64 is held in place by a nut 68 and a suitable packing washer 69, and its outlet is so located relative to the outlet 70 of the connection 60 that when the spray pipe 65 stands out at right angles to the rear wall of the sink 43 the water delivered thereto can flow out through the pipe 65, soap box 66 and spray pipe 67, to be thrown upwardly through the perforations 71 thereof to spray the under side of the dishes carried thereover by the conveyor. When the pipe 65 is turned parallel to the rear wall of the sink, as indicated in dotted lines in Fig. 3, then the water is shut off from the spray pipe and the sink can be used in the ordinary manner. The upwardly-projecting arm 72 of the connection 60 has secured thereon, by a nut 73, the pipe 74, which terminates at its upper end in the tapered valve seat 63^a, which co-operates with the tapered valve end 64^a of the supply pipe 65^a, which is held in place by the nut 68^a. The soap box 66^a and spray pipe 67^a are similar to the lower ones except that they are reversed in position, so that the water escaping through the perforations 71^a falls downward on the tops of the dishes passing beneath the same.

The arm 53 has an outlet similar to the outlet 58, and has connected therewith the downwardly-extending pipe 75, similar to the pipe 59 but somewhat shorter, and with its lower end turned in the opposite direction to enter the side of the connection 76, similar to the connection 60, and having the rinsing spray pipe 77 journaled therein and corresponding to the pipe 65 plus the pipe 71, and having the perforations 78 in its upper side, the soap box being omitted for this spraying

member inasmuch as it furnishes clear water for rinsing purposes. This connection 76 has the pipe 79, similar to the pipe 74, extending upwardly therefrom and secured thereto in the same manner, and terminating at its upper end in the tapered valve-seat portion 80 in which the top spray pipe 81 has its valve end mounted in the same manner as the spray pipe 65^a, except that the valve-seat portion is directed rearwardly, instead of forwardly. The upper rinsing spray pipe 81 has perforations 82 on its under side, and it will be obvious that when the pipes 77 and 81 are projected at right angles to the sink 43, they will spray water upwardly and downwardly upon the dishes passing between them, and likewise that when they are turned parallel to the rear wall of the sink, the water supply thereto will be shut off.

The pipes 74 and 79 have secured thereon by set screws 83, the bracket arms 84 having the upwardly-turned ends which fit into recesses 85 formed in the outer ends of the brackets 86 projecting rearwardly from the top of the side frame 21 to support that side of the conveyor mechanism, the other side being supported by the bracket 29, as seen in Fig. 7. The mixer 49 has projecting upwardly from the center of its upper side the rod 87, on the upper end of which is secured, in either one of two apertures, the dish 88 ordinarily used as a soap dish. To brace this dish 88 so that it may form an adequate support for the small electric motor 89 placed therein, I add the bracket 90, the lower end of which has a vertically-extending aperture through which the rod 87 passes, said lower end being split and the two parts secured together by the screws 91, seen in Fig. 2. The upper part of the bracket 90 preferably forks, as seen in Fig. 2, and has at its upper end the horizontal plate-like portion 92, upon which the under side of the dish 88 rests. This motor has the rear end of its armature shaft 93 extending into a casing 94 and provided with a worm 95 which meshes with a worm gear-wheel 96, seen in dotted lines in Fig. 2, which is journaled in the casing 94 and is splined on the shaft 97, which extends downwardly to the gear casing 98, which it enters, and where it is provided with the worm 99, seen in Fig. 2, which meshes with the worm gear-wheel 100 secured on the stub shaft 101 journaled in said casing, and having at its outer end the clutch member 102 which is adapted to engage with the clutch member 103 secured on the inner end of the shaft 27, so that when the conveyor mechanism is in place and the motor is operating, the rapid rotation of its armature shaft will, through the reduction gearing described, rotate the shaft 27 slowly, so that the conveyor chain or belt will pass slowly between the spray members.

As there will necessarily be water splat-

tered from off of the dishes, I preferably provide a cover which will confine the water to the inside of the apparatus and to the sink. For this purpose, I provide on the ends of the side plates the four upwardly-projecting lugs 104, and on each of said lugs I pivot the adjacent ends of two of the four wire bails 106 and 107, the transverse bails being numbered 106, and the longitudinal bails numbered 107. These bails have formed in their corners the humps 108, so that when the bails are swung up from the position shown in dotted lines in Fig. 9 to the full-line position, the humps on the bails engaging the humps on the meeting bails will lock the frame yieldingly in the erected position. When the bails are thus erected, I place on them the flexible cover 109, which is preferably made of a rubber cloth, and is of the shape shown in Fig. 8. The ends 110 which hang down over the bails 106 at the ends are slit, as shown, so that they will offer no substantial resistance to the dishes being shoved into the apparatus and being removed therefrom. The parts 111 constituting the sides of the cover have at their ends the extensions 112, which are adapted to be lapped around the adjacent vertical portions of the bails and caught by reason of the sockets 113 of the fasteners engaging the projecting supports 114 thereof, it being understood that these fasteners are of the ordinary glove-fastener construction. This cover will be provided with an elongated slot 115 for the spray 67^a, and a similar slot 116, seen only in Fig. 1, for the spray pipe 81. In order to accommodate these spray pipes, the rear bail 107 is provided with two curved portions 117, which the spray pipes engage, as clearly shown in Fig. 1.

The soap box 66 has the opening 118 from the pipe 65 in its bottom, and the elongated opening 119 in its top to the spray pipe 67. The outer end has the rectangular opening 120, which is closed by the end 121 of the soap holder, which consists of said end piece having a seat thereon for the tubular holder 122, rectangular in cross section and provided on its top and bottom sides, near the edges, with rows of perforations 123, and likewise on its sides, near their edges, with similar rows of perforations 124. A cake of soap 125 is placed in the holder, and it is shoved in place, with the rubber gasket 126 interposed between the flanged end of the member 121 and the adjacent edge of the opening, the connection being made water-tight by means of the yoke 127 pivoted at one end by the screw 128 to a flange on the soap box 66, while the hook 129 on the other end of the yoke engages the corresponding flange on the other side of the soap box 66. When the parts are in place, the screw 130 threaded through the yoke is turned to tighten the parts and securely clamp the holder proper in place. When the water

rushes through the holder, the perforations 123 and 124 confine its flow so that it operates uniformly on the entire surface of the cake of soap 125, which is gradually consumed during the operation of the dish-washer.

In the illustrations of my invention heretofore considered, the conveyor mechanism has been mounted centrally of the sink, with the faucet in the center. As some sinks have the faucets nearer one end than the other, and as a consequence it may be necessary sometimes to mount the conveyor to one side, rather than centrally, of the faucets, I can in that case arrange the connections as shown in Fig. 10, where the rinsing spray-pipe connections are the same as before, except that the side of the connection 76 opposite to the pipe 75, instead of being closed by a plug 131, as illustrated in Fig. 2, has the curved pipe 132 leading therefrom and entering the connection 60 of the lower soapy-water spray member, which is now transposed to the other side from where it was before. The arm 52 will be closed by a plug to take the place of the pipe 59, now omitted. To brace the two vertical pipes 74 and 79, I provide the cross piece 133 having the rearwardly-projecting arm 134 (indicated only in dotted lines in Fig. 10), and extending back to the rear wall of the sink, which it may penetrate, if desired. At its ends, the cross piece 133 has the two heads 135, through which pass the screws securing said heads to the clips 136 secured on said tubes. These clips are left on the pipes 74 and 79 in the central location, as seen in Fig. 2, but in that case have no function except that of providing "preparedness" for the changed adjustment. With this arrangement, the single source of water must first supply the rinsing water, after which the soapy water supply may pass on through the pipe 132.

As the conveyor must now move in the opposite direction on account of the change in the relative location of the soapy and rinsing water spray pipes, the gear casing 98 must be swung around so that the worm 99 will engage the opposite side of the worm gear wheel 100, so that the conveyor will move in the opposite direction without reversing the direction of rotation of the motor, which is not ordinarily practicable. With this arrangement also, the dish 88 is preferably shifted to the other position permitted by the use of the other of the two holes therein with which the upper end of the rod 87 may co-operate.

If the conveyor is to be shifted to the left of the position shown in Fig. 2, then the arm 53 is closed by a plug, and the pipe 75 is shifted to the arm 52, and its lower end, turned in the opposite direction, is connected to the opposite side of the connection 76 from what it was before, and the pipe 132 connected to the side of the connection 76 to which the pipe 75 was connected in the other arrangements. The pipe 132 is connected at

its outer end to the opposite side of the connection 60, but the position of the gear casing 98 is not changed from that shown in Fig. 2, since the spray pipes will now have the same relative positions as they had in the arrangement shown in Fig. 2, and the direction of movement of the conveyor chain or belt does not have to be changed to get the proper application of the soapy water ahead of the rinsing water.

To the upper end of the shaft 97, I may removably connect a flexible shaft 137, which may be removed when the dish-washer is to be operated, and replaced when it is not. On the other end of the flexible shaft, I mount a non-rotating handle 138, which, when not in use, may be caught in the spring clip 139 secured to the adjacent end of the dish 88. I have shown a rotary brush 140 as removably connected to the end of the rotary flexible shaft 137, and I contemplate supplying the outfit with various kinds of rotary brushes, scrapers, polishers, etc., which can be interchangeably used on the flexible shaft as they may be needed for cleaning, scouring and polishing the various kitchen or table utensils. When the dish-washer is in use, the brushes, etc., will be removed, and the flexible shaft 137 may be allowed to rotate idly in the handle 138 held in the spring clip 139.

While I have herein shown and described a novel rotating scouring brush and motor associated with a kitchen sink, I do not herein claim the same generically, reserving the generic claims for a divisional application.

While I have shown and described my invention as embodied in the forms which I at present consider best adapted to carry out its purposes, it will be understood that it is capable of modifications, and that I do not desire to be limited in the interpretation of the following claims except as may be necessitated by the state of the prior art.

What I claim as new, and desire to secure by Letters Patent of the United States, is:

1. In a dish-washing machine, the combination with a portable frame-work, of a skeleton carrier mounted for movement therein, a sink in which the frame-work is placed, a spray member to spray water on the carrier, connections from the sink water supply to the spray member, a motor mounted on the sink, and gearing from the motor to the carrier including a separable clutch so that the frame-work and carrier can be removed, leaving the motor in an operative position.

2. In a dish-washing machine, the combination with a portable frame-work, of a skeleton carrier mounted for movement therein, a sink in which the frame-work is placed, a spray member to spray water on the carrier, connections from the sink water supply to the spray member, a motor mounted on the sink, and gearing from the motor to the carrier

including a separable clutch so that the frame-work and carrier can be removed, leaving the motor in an operative position, said gearing including a worm on the armature shaft, a worm wheel with which the worm meshes, and a shaft extending downwardly from the worm wheel and operatively connected through said clutch to the carrier.

3. In a dish-washing machine, the combination with a portable frame-work, of a skeleton carrier mounted for movement therein, a sink in which the frame-work is placed, a spray member to spray water on the carrier, connections from the sink water supply to the spray member, a motor mounted on the sink, and gearing from the motor to the carrier such that the frame-work and carrier can be removed, leaving the motor in an operative position, said gearing including a worm on the armature shaft, a worm wheel with which the worm meshes and a shaft extending downwardly from the worm wheel, a second worm on the lower end of the downwardly extending shaft, a second worm gear wheel with which the second worm meshes, a shaft to which the second worm wheel is secured, a clutch member on said last mentioned shaft, and a separable clutch member cooperating with the first clutch member and operatively connected to the carrier.

4. In a dish-washing machine, the combination with a portable frame-work, of a skeleton carrier mounted for movement therein, a sink in which the frame-work is placed, a spray member to spray water on the carrier, connections from the sink water supply to the spray member, a motor mounted on the sink, and gearing from the motor to the carrier such that the frame-work and carrier can be removed, leaving the motor in an operative position, said gearing including a worm on the armature shaft, a worm wheel with which the worm meshes and a shaft extending downwardly from the worm wheel, a second worm on the lower end of the downwardly extending shaft, a second worm gear wheel with which the second worm meshes, a shaft to which the second worm gear wheel is secured, a clutch member on said last mentioned shaft, a separable clutch member cooperating with the first clutch member, a horizontal shaft journaled in the frame-work, on the inner end of which the separable clutch member is secured, and a gear member carried by the horizontal shaft driving the carrier.

5. In a dish-washing machine, the combination with a frame-work, of a carrier mounted for movement therein, a sink provided with a mixer removably receiving the frame-work, a pair of spray members having soap holding mechanisms associated therewith, a second pair of spray members without soap holding mechanisms, each of said pairs of spray members being so located as to spray the top and

under sides of the portion of the carrier on which the dishes are placed, and connections from the mixer of the sink to said pairs of spray members, the connections to one of said spray members comprising a vertical pipe connected at its upper end to the mixer and having an elbow in its lower end, a connection for said lower end, and a pipe leading to one of the spray members swiveled in said connection.

6. In a dish-washing machine, the combination with a frame-work, of a carrier mounted for movement therein, a sink provided with a mixer removably receiving the frame-work, a pair of spray members having soap holding mechanisms associated therewith, a second pair of spray members without soap holding mechanisms, each of said pairs of spray members being so located as to spray the top and under sides of the portion of the carrier on which the dishes are placed, and connections from the mixer of the sink to said pairs of spray members, the connections to two of the spray members comprising a vertical pipe connected at its upper end to the mixer and having an elbow in its lower end, a connection for said lower end, a pipe leading to one of said spray members swiveled in said connection, an intermediate pipe leading from said connection, a second connection on the other end of said intermediate pipe, and a pipe leading to the other of the spray members swiveled in the last mentioned connection.

7. In a dish-washing machine, the combination with a frame-work, of a carrier mounted for movement therein, a sink provided with a mixer removably receiving the frame-work, a pair of spray members having soap holding mechanisms associated therewith, a second pair of spray members without soap holding mechanisms, each of said pairs of spray members being so located as to spray the top and the undersides of the portion of the carrier on which the dishes are placed, and connections from the mixer of the sink to said pairs of spray members, the connections to two of the spray members comprising a pair of vertical pipes each connected at its upper end to the mixer and each having an elbow in its lower end, a connection for each of said lower ends, and a pair of pipes leading to each of the two spray members swiveled in each of said lower end connections.

In witness whereof, I have hereunto set my hand, this 1st day of December, 1928.

WALDEMAR L. LINDGREN.