F. G. HAAS & H. B. COLESTOCK.

WASHING MACHINE.

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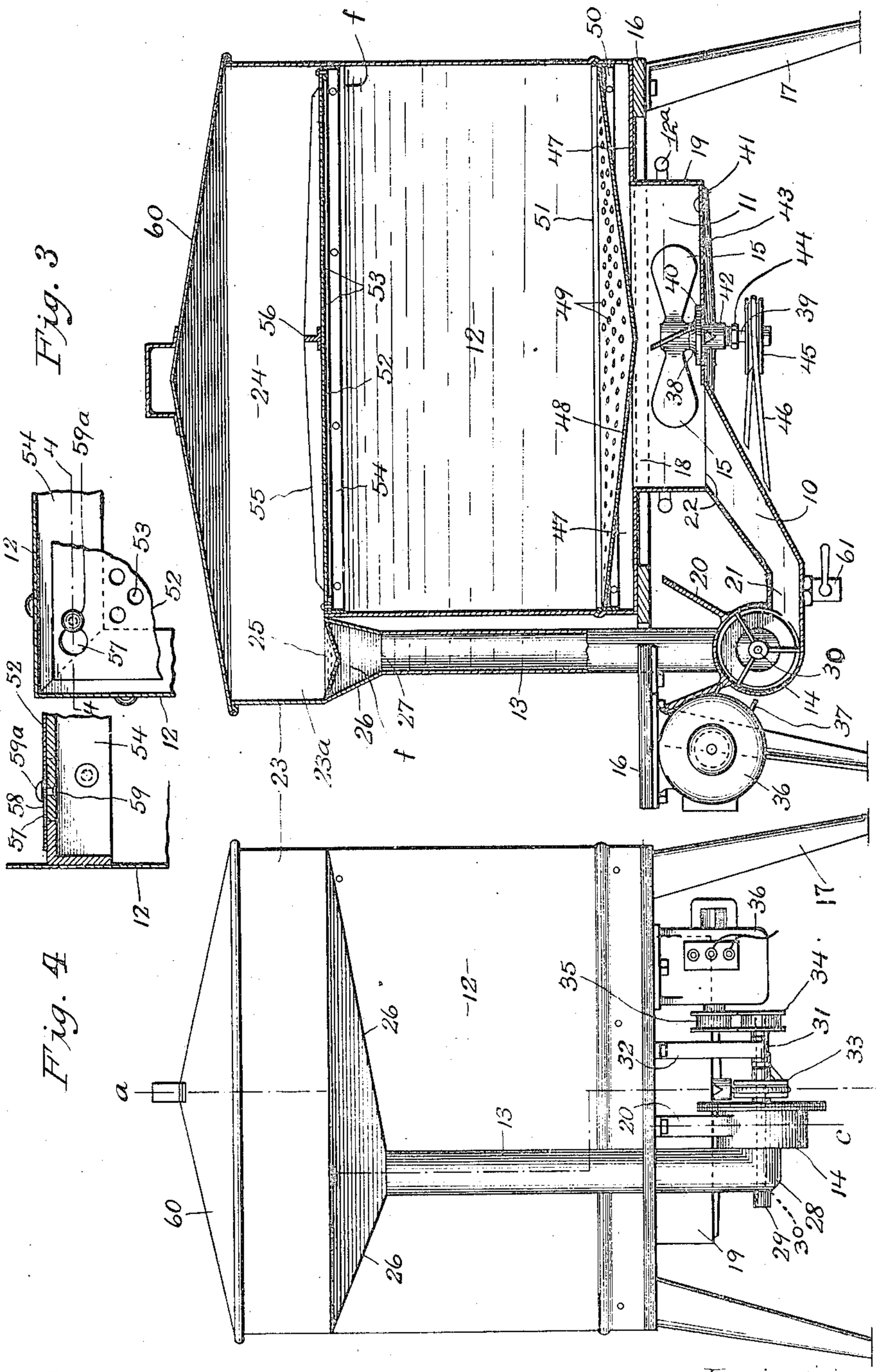

Fig. 3

Fig. 2

Fig. 4

Fig. 1

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WASHING-MACHINE.

1,167,357. Specification of Letters Patent. Patented Jan. 4, 1916.

Application filed July 15, 1914. Serial No. 851,067.

To all whom it may concern:

Be it known that we, FERDINAND G. HAAS and HARRY B. COLESTOCK, citizens of the United States, residing at St. Paul, in Ramsey county, in the State of Minnesota, have invented new and useful Improvements in Washing-Machines, of which the following is a specification.

This invention relates to stationary-tub washing machines, for washing clothing, linens, and other fabrics.

The chief objects of the invention are, to provide a washing machine having no moving parts in contact with the articles being washed; to obviate undue wear and tear of said articles; to provide a washer in which the cleansing is performed entirely by the action of currents of water, containing any desired cleansing agent such as soap; to aerate the articles undergoing the cleansing process, and to provide a washer that employs no gearing or mechanical movement other than continuous rotation of the pump and impeller, therefore one that is simple and not likely to require readjustment or repair.

This machine is preferably operated by a motor, and it is so shown in the accompanying drawings, in which:

Figure 1 is an end elevation of our washing machine provided with an electric driving motor, one belt being omitted to show the pulleys; Fig. 2 is an irregular vertical section thereof taken on the line *a*—*a* and *c* of Fig 1, also showing the motor and its support; Fig. 3 is a detail plan view of one corner of the upper removable screen showing one of its fastening devices; Fig. 4 is a section on a line 4—4 of Fig. 3.

In order that the operation may be understood at once, we will state that the water or washing fluid is continuously circulated through an endless conduit comprising a tube 10, a sub-chamber 11, a tub 12 and a down-tube 13: the water being driven by a pump 14 aided by an impeller 15 and passing upwardly through the tub.

The numeral 16 denotes a wooden base supported by legs 17. A square tub 12 rests on said base. As shown, the tub is constructed of sheet metal and has a large central opening 18 in its bottom. Fitted to said opening is a sheet metal box 19 which is preferably square in plan.

A small centrifugal pump 14 has hangers 20 secured to the base 16. The delivery spout 21 of said pump is connected through an upwardly inclined throat 10 with an opening 22 in the bottom of the sub-chamber 11.

The uppermost portion 23 of the tub 12 contains an overflow chamber 24 and is formed with an overhanging portion 23ª the shape of which will be clearly perceived from Figs. 1 and 2. The bottom of the portion 23ª consists of a slightly dished strainer 25. Permanently connected with the edges of the strainer 25 are the upper edges of a hopper-shaped spout 26 having in its bottom a circular opening 27 which communicates with the upper end of a vertical tube 13 that extends through a hole in the base 16 and connects with the intake side of the pump 14 through an elbow 28. The elbow 28 is provided with a bearing 29 for the pump shaft 30, the other bearing 31 of which has a hanger 32 secured to the base 16. On said shaft 30 are the pulleys 33 and 34, the pulley 34 being driven from the pulley 35 of the motor 36 by a belt 37 which is necessarily shown as broken away on Fig. 2. The pulley 33 is in alinement with the center of the sub-chamber 11 as shown on Fig. 1. In the center of the bottom of the sub-chamber 11 is a bearing 38 for a vertical shaft 39. The bearing 38 comprises a flanged base 40, fastened to a plate 41 with screws, and a packing box 42 provided with integral radial stiffening arms 43 secured to the plate bottom 41. A screw gland 44 is fitted on the shaft 39 and enters the internally threaded box 42. The shaft 39 carries a grooved pulley 45 in horizontal alinement with the pump shaft 30, and is connected by a round belt 46 with the grooved pulley 33 on said shaft.

Fixedly mounted on the vertical shaft 39 and resting on the bearing 38 is an impeller 15, shown as comprising four inclined blades which are adapted to drive the water upwardly and impart a spiral movement thereto when rotated in the right direction by the motor.

Near the bottom proper 47 of the tub 12

is a removable false bottom 48 made of foraminous material, preferably sheet metal having perforations 49. The plate 48, slightly inclined from all directions toward the center, is adapted to equalize the upward movement of the water in all portions of the tub and prevent excessive centrifugal movement of the same as it leaves the impeller. Said plate rests upon angle bars 50 riveted to the walls of the tub and is held down positively by a wire or wires 51 sprung into grooves rolled in the tub walls. Said wire or wires are detachable to permit removal of the perforated bottom 48 should such removal become necessary.

The tub proper is separated from the overflow chamber 24 by a sheet metal cover 52 having perforations 53 equal in area to those in the lower plate 48. The cover 52 rests on angle-bars 54 and may be provided with stiffening arms 55 that also form a handle at 56. As the cover 52 is subject to upward pressure during operation of the machine, we provide said cover with keepers for holding it down. Our preferred form of keeper is shown in detail in Figs. 3 and 4. A keyhole-shaped opening 57 is punched in each corner of the cover, and also at intermediate points, not shown. The narrow portions 57[a] of said openings all point in the same direction. For each keyhole opening a shouldered rivet 59 is provided in the angle-bar 54, the upper head 59[a] of the rivet passing easily through the circular part of the opening 57 and its neck entering the narrow part of said opening. To fasten the cover 52 in place it is only necessary to register the openings 57 over the heads 59[a] and then slide the cover horizontally so that the head 59[a] bears upon the imperforate portion of the cover.

During the operation of the machine the top of the overflow-chamber 24 is closed by a lid 60.

The bottom of the throat 10 (Fig. 2) is provided with a suitable drain cock 61 which is normally closed.

A gas burner 12[a] is arranged beneath the tub 12 to heat the water therein contained.

Operation: The tub is filled with water or whatever washing fluid is employed, up to about the line *f* on Fig. 2. The water will of course fill the sub-chamber 11, passages 10 and 13, and the pump 14. The articles to be washed are placed in the tub, with soap if desired, and the cover plate 52 is laid on the bars 54 and fastened thereto. The lid 60 is placed on the chamber walls 24 and the electric motor 36 started. The pump now displaces the water in the down-tube 13, driving it into the sub-chamber 11, thence into the tub 12, thus causing water level therein to rise and overflow the chamber 23[a]. This overflowing water passes by gravity through the down-tube 13. The upward pressure of the water in the tub 12 is augmented by the rapidly moving impeller 15, which stirs the clothing by moving the water spirally upward. The rotary pump 14 collects quantities of air from the down-tube 13 and mixes the same with the water as it is forced through the tub. The movements of the water and air through the clothes, which are held down by the perforated cover 52, result in thoroughly cleansing and aerating them in a short time, as I have proven by actual trial. The strainer 25 catches any lint that may pass up through the cover 52 during the washing and prevents the same from reaching the interior of the pump 14 where it might clog the blades thereof. After the removal of the washed articles and the discharge of the water by opening the cock 61 any soap and lint which may have adhered to the strainer 25 may be easily removed.

It will now be apparent that this washer possesses the feature of advantage herein above claimed. Many modifications in construction and arrangement could be made, within the scope of our invention, and all rights thereto are reserved.

Having described our invention, what we claim as new and desire to protect by Letters Patent, is:

1. A washing machine comprising a tub having a bottom proper with a large opening therein, lateral walls extending downwardly from said opening, a bottom to said walls, an impeller housed between said walls, a perforated bottom plate in the tub above said opening, a pump adjacent said impeller, a tube connecting the outlet of said pump with the chamber inclosed by said walls, a spout connecting the upper portion of the tub with the intake of said pump, and a strainer at the upper end of said spout.

2. A washing machine comprising a tub having a lateral chamber projecting from its upper portion, said chamber having an outlet in the bottom; the bottom proper of said tub being formed with a large aperture therein, a foraminous false bottom positioned above said bottom proper, a pump, a conduit from said pump to said large aperture and a conduit from said lateral chamber outlet to the intake of said pump.

3. In a washing machine, a box, a vertical shaft bearing secured to the bottom thereof, the lower end of said bearing being provided with a packing box and gland, a rotary shaft passing through said bearing and gland, an impeller on said shaft within said box, a belt-pulley on said shaft below said gland, a rotary pump, a tube connecting the outlet of said pump with an opening in said box, said pump comprising a shaft and two

pulleys thereon, one of said pulleys being adapted to receive a belt for driving said impeller pulley and the other to be driven from a motor, a tub, and means for passing water through the tub from said impeller box and thence to the intake of the pump.

In testimony whereof, we have signed our names to this specification in the presence of two subscribing witnesses.

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Witnesses:
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