

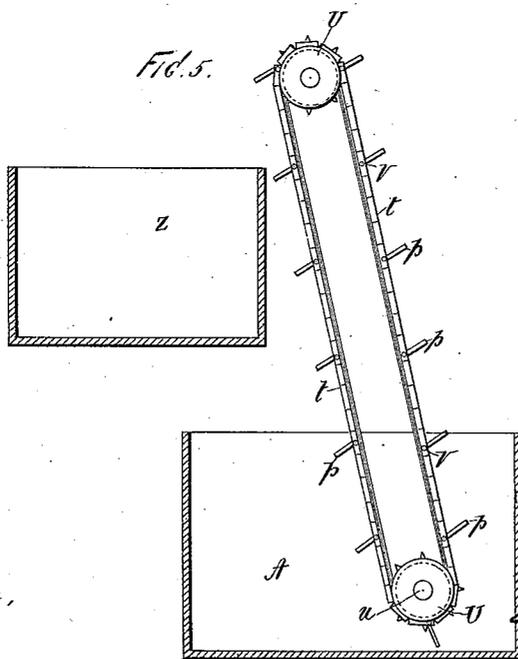
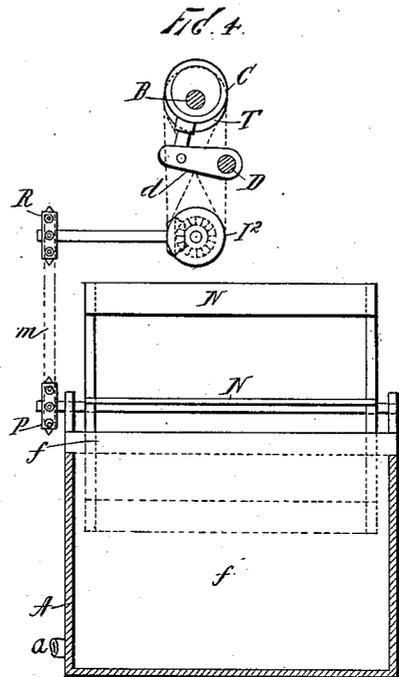
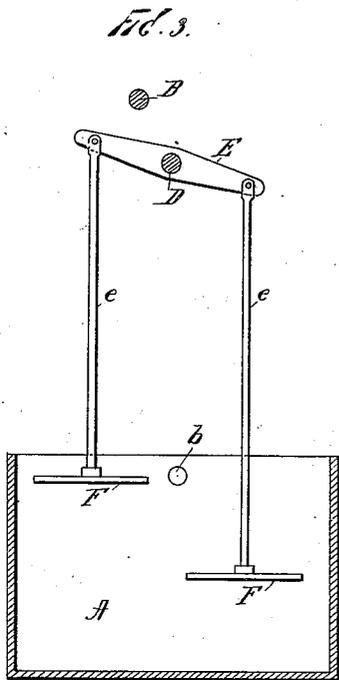
(No Model.)

2 Sheets—Sheet 2.

J. POPPING.
WASHING MACHINE.

No. 512,484.

Patented Jan. 9, 1894.



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UNITED STATES PATENT OFFICE.

JOSEPH POPPING, OF NEW YORK, N. Y.

WASHING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 512,484, dated January 9, 1894.

Application filed January 6, 1893. Serial No. 457,439. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH POPPING, a citizen of the United States, residing in the city of New York, in the county and State of New York, have invented certain new and useful Improvements in Washing-Machines, of which the following is a specification.

The object of my invention is to produce a machine or apparatus whereby any kind or character of material or substance which is buoyant or which will float, such as fat, fatty or greasy substances, fibrous material, &c., may be readily and effectually washed, cleansed and purified.

In the accompanying drawings, forming a part hereof: Figure 1 is a side view in elevation of a machine or apparatus which embodies my invention. Fig. 2 is a sectional top or plan view of the machine or apparatus shown in Fig. 1 taken through line $x-x$ of Fig. 1. Fig. 3 represents a transverse section taken through line $y-y$ of Fig. 1 looking to the right. Fig. 4 represents a transverse section taken through line $w-w$ of Fig. 1 looking to the left; and Fig. 5 represents a transverse section taken through the line $z-z$, Fig. 1, and also shows in section another tank or receptacle that may be used therewith.

Referring to the drawings A is a tank, tub, trough or other receptacle constructed of any suitable material and of any convenient shape and dimensions, located where desired, and this tank is designed to be filled or partially filled with water or other washing, cleansing or purifying fluid or compound which enters the tank through the inlet pipe a which is connected with said tank at any convenient point thereof, and to obtain a continuous change of water or other fluid that may be placed in said tank or receptacle I provide said tank with an outlet or overflow b which may also be located at any suitable point or place therein. Above this tank, or at any other convenient position with relation thereto is arranged a revolving shaft B connected with suitable power or driving mechanism, by means of which said shaft B is rotated, and to this shaft B is connected an eccentric C, clearly shown in Fig. 4, and which eccentric is also connected with a shaft D whereby the shaft D is given a rocking motion for the purpose to be hereinafter explained; the eccen-

tric consists of a wheel or drum, the shaft B passing therethrough eccentric therewith but securely fastened thereto, and from this wheel projects an arm c to the other end of which arm is connected a link d , through the other end of which link passes the shaft D, and as the shaft B rotates, it will rotate the wheel of the eccentric, which will describe an ellipse moving the link up and down by its eccentric revolution and giving to the shaft D a corresponding motion in partial rotation, oscillating first one side and then the other, or the rocking motion stated, as will be readily understood.

To the shaft D is connected one or more walking beams or cross-arms E, E', E^2, E^3 and to the ends of these walking beams are connected vertical rods e, e', e^2, e^3 , and to the free or lower end of each of said vertical rods are attached horizontal arms F, F', F^2, F^3 , and these walking beams, vertical rods and horizontal arms comprise vertically and alternately operating or oscillating beaters or stampers which are actuated by the eccentric C and shaft D whereby the water or other fluid in the receptacle A is beaten or stamped and agitated, since as will be seen from Fig. 3, these dashers or beaters are constructed to plunge into the water or other fluid in the tank A for a considerable depth, to the bottom if desired, according to the stroke of the walking beam, whereby as such dashers or beaters strike the water and plunge therein and rise therefrom, the water is agitated to a considerable degree and with considerable force.

The tank A may be divided into as many compartments as desired, according to the character of the material intended to be washed and cleansed, or for any other reason necessary or desirable, the tank in the drawings being divided into two compartments G and G' by a partition f located near one end of the tank as shown in the drawings, Fig. 1, and two of the dashers of the four shown in the drawings are so located as to operate in each compartment whereby the material to be washed is partially washed in one compartment and taken therefrom automatically or by hand and put into the adjoining compartment and again washed as will be readily understood.

In the drawings I have illustrated a machine or apparatus which is designed to wash fat or fatty substances, and such fatty substances are placed first into the compartment G of the tank A and washed therein to any desired extent, being beaten by the dashers therein and the several particles of the entire mass striking or rubbing with considerable force against one another, and the water or other fluid therein being agitated by such dashers the fatty substances or fat are considerably washed in such compartment by the water and by the attrition of the several separate particles. After such material has been washed in the compartment G, which compartment it is of course to be understood may be separate and distinct from the tank A, that is to say, may comprise a separate and distinct tank, it is taken by hand or automatically and run or placed into the adjoining compartment G' which may, as stated, be a tank separate and distinct from the compartment G, and the material in the compartment G' is subjected to subsequent washing in the manner described with the compartment G, in both of which cases the material will be thoroughly washed and cleansed by the beaters, consequent agitation of the water and the striking of the beaters onto the material and the attrition of the several particles, and when the material has been thoroughly washed and cleansed it may be removed from the compartment G' either by hand or automatically and subjected to additional washing, purifying or such subsequent manipulation or treatment as may be desired.

It sometimes happens that the material to be washed is in large pieces and that it is desirable at some stage of the washing process to cut or reduce it to smaller pieces. For such purpose the upper surface of the partition *f* forms a convenient flat table upon which this operation may be performed by machinery or by hand. As the material is washed the dirt washed therefrom, or the greater part thereof, will fall to the bottom of the tank A, and such tank is thoroughly cleaned when desired and as often as is necessary by drawing the water or fluid therefrom and removing the deposited dirt, and in order to conveniently remove the washed material, it is preferable that it should be forced to one end of the tank or made to move or travel so that it will gather in mass at one end of the tank, so that it can be removed therefrom in large quantities, and for this purpose I connect with the tank one or more, or a series of paddle-wheels N or wheels having other suitable devices adapted to rotate in the fluid in such tank, two of such paddle-wheels being shown in the drawings both located in the compartment G', and as these paddle-wheels rotate the water is circulated in one direction according to the direction of their rotation, and whereby the material travels in the same direction as the water or fluid to

one end or the other of the tank when it can be readily removed in large quantities for further treatment or manipulation. It may also be necessary to change the direction of the circulation of the water so that after all the material has been forced or has traveled from one end of the tank to the other by virtue of the circulation in that direction of the washing water or fluid, to run the material to the opposite end of the tank for further washing as in its travel from one end of the tank to the other it is more thoroughly cleansed by the water through the operation of the dashers and the beaters and by attrition as before explained, and to accomplish this purpose I connect with my paddles or with the driving mechanism thereof, means for changing the direction of their rotation, and in the drawings O are shafts supported in suitable bearings on each side of the tank, and which shafts support or to each shaft is connected a paddle-wheel proper, whereby as the shaft rotates the paddle-wheel will be rotated, and to one end of each shaft O is connected a sprocket-wheel P adapted to connect with a corresponding sprocket wheel R by means of a chain or link-belt *m*, see Fig. 1, and to one face of the sprocket wheel R is connected a bevel-gear, not shown, adapted to engage with a corresponding bevel-gear *n*, fastened to a shaft S, which shaft is adapted to rotate in order to rotate the gear *n* and with it the sprocket wheel R, thereby rotating the sprocket wheel P by means of the belt *m*, thereby communicating motion to the paddle-wheel, as will be readily understood. The shaft S is rotated by the driving shaft B which shafts are geared together by suitable pulley and belt connections and in the drawings, see Fig. 1, I have shown a drum T connected with the shaft B and three pulleys I, I', I², connected with the shaft S or a "tight-pulley," as it is called, the pulley I' being loosely placed on the shaft S, or a "loose-pulley" as it is called, and the pulley I² being securely attached to the shaft S or also a "tight-pulley," and these pulleys I, I', I² are adapted to engage with or to be geared to the drum T by means of the straight-belt *q* and a twisted belt *r*, whereby the direction of the rotation of the paddle-wheels may be changed; that is to say, when the straight-belt *q* engages with the tight-pulley I² and the drum T, the twisted belt *r* will engage with the "loose-pulley" I' and the drum T, the motion being communicated to the paddle-wheels in one direction by means of the "tight-pulley" I² and the straight-belt *q*, and when it is desired to change the rotation of the paddles, the belts are shifted by a suitable belt-shifter (not shown) so as to bring the twisted belt *r* into engagement with the "tight-pulley" I and the drum T and the straight-belt *q* into engagement with the "loose-pulley" I' and the drum T whereby motion will be communicated to the paddles

or paddle-wheels by means of the "tight-pulley" I' and aforesaid twisted belt *r* but in an opposite direction to that in which it was rotated before as will be readily understood.

5 After the material has been suitably and sufficiently washed and cleansed or purified, as the case may be, it may be removed or lifted in any suitable manner and conveyed from the receptacle A or the compartment G' thereof also in any suitable manner to another tank or receptacle, or to any other place for subsequent manipulation or further treatment, as melting, cutting, &c., and in the drawings, see Figs. 1 and 5, I have illustrated one means
15 for automatically removing the washed material from the tank A, which consists of an endless belt or a pair of endless belts, preferably link or chain belts *t* connected together by cross-bars V arranged at any suitable or convenient distances apart throughout the length of such belts, and which cross-bars have a number of projections or teeth *p* thereon, such cross-bars V and projections or teeth *p* comprising separate rakes; instead of
20 the teeth or projections *p*, other suitable lifting devices can be attached to the belts *t* within the purview of my invention.

Motion is communicated to the belts *t* by means of the sprocket wheels U, U, the lower
30 of which sprocket wheels being connected with a shaft *u* held in suitable bearings on one side, near the lower end of the tank A, and the upper sprocket wheel being connected with the driving shaft B. As will be seen in
35 Figs. 1 and 5, these movable belts are adapted to travel through the water or other fluid in the tank A and to a considerable depth therein, and as one side of the belt plunges into the water the projections or teeth *p* on the
40 cross-bars V point downwardly toward the water and enter therein, and as they pass around the lower sprocket wheels going up on the other side and through the water or other fluid they will pick up the washed material at that
45 end of the tank and as they emerge from the water or other fluid these teeth will be on an upward inclination with the washed material resting thereon, and as they pass over the upper sprocket wheels U, they will tilt in their
50 downward motion whereby the washed material will slip from the rakes and fall into an adjoining receptacle Z or any other place to be conveyed therefrom for subsequent manipulation or treatment, as before stated.

I do not limit my invention to the cleaning 55 or washing of a material with water, since the fluid which may be placed in the washing tank may contain chemicals or compounds whereby not only will the material be washed and cleansed but also purified, or otherwise
60 treated if desired; nor do I limit my invention to its use with any kind of material, nor to the particular relative arrangement of parts and devices shown and described for carrying out my invention, nor to the particular
65 construction of such parts and devices, but

What I do claim as my invention, and desire to secure by Letters Patent, is—

1. In a washing machine the combination with a tank or receptacle for holding fluid, of
70 a rotating device for circulating the fluid in said tank, and a vertically operating dasher or beater for agitating the fluid in said tank or receptacle, substantially as and for the purpose set forth.

2. In a washing machine the combination with a tank or receptacle adapted to hold fluid of a rotating device adapted to rotate in
75 said tank or receptacle for circulating the fluid therein and thereby forcing or moving the material in said tank in one direction or the other according to the direction of the rotation of such rotating devices, and means
80 for changing the direction of the rotation of such rotating devices to change the direction of the motion or travel of the material in said tank, substantially as and for the purpose set forth.

3. In a washing machine the combination with a tank or receptacle for holding fluid, of
90 a pair of reciprocating dashers or beaters operated by an oscillating bar or walking-beam actuated by an eccentric connected with suitable driving mechanism, a rotating device adapted to revolve in said tank to circulate
95 the fluid therein and means for changing the direction of the rotation of such rotating devices in order to change the direction of the movement or travel of the material in said tank, substantially as and for the purpose set
100 forth.

This specification signed and witnessed this 20th day of December, A. D. 1892.

JOSEPH POPPING.

In presence of—
ALFRED W. KIDDLE,
MARY GIBSON.