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WASHING MACHINE.

APPLICATION FILED JUNE 23, 1919.

1,354,613.

Patented Oct. 5, 1920.

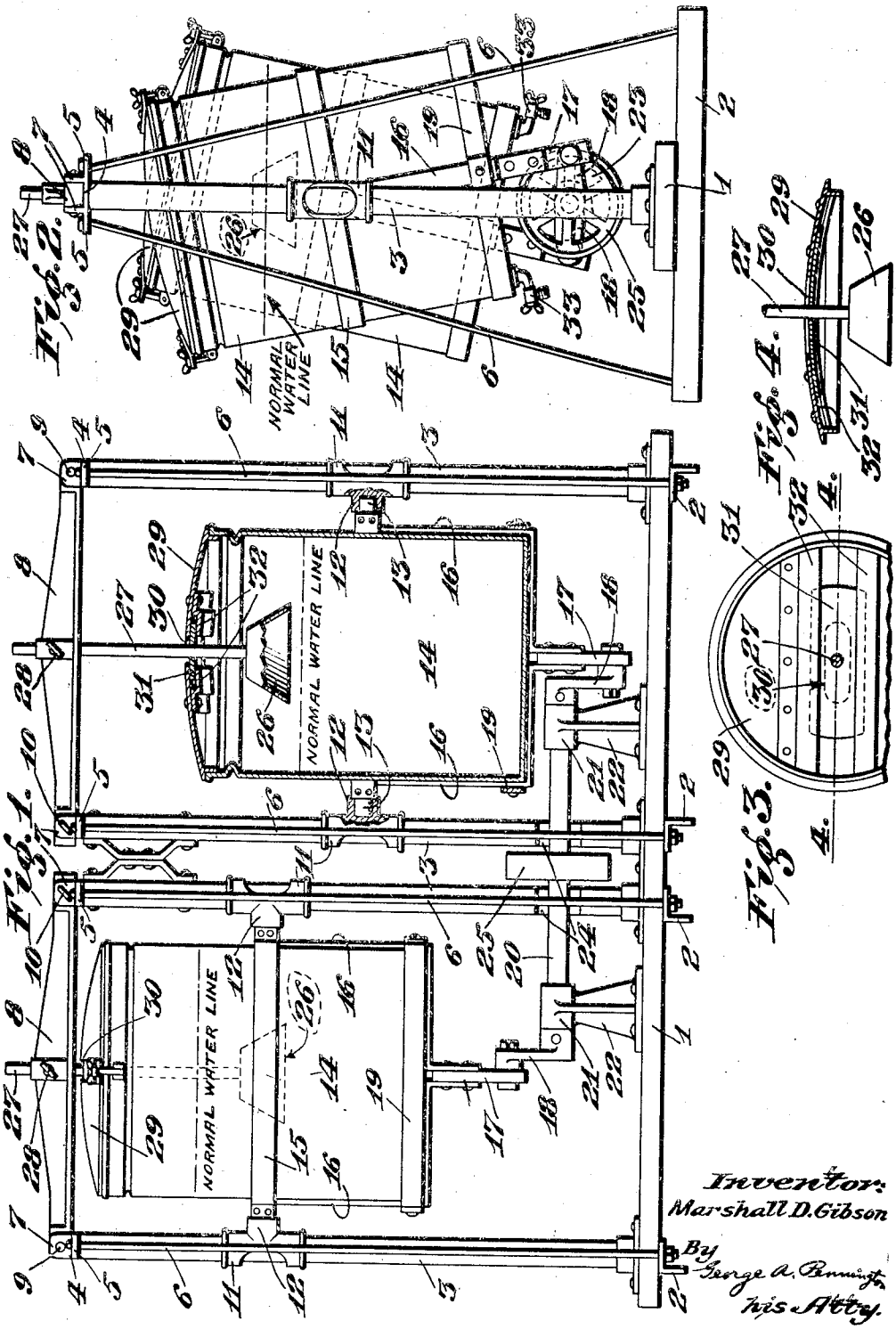



Fig. 2.

Fig. 4.

Fig. 5.

Fig. 1.

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# UNITED STATES PATENT OFFICE.

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## WASHING-MACHINE.

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Application filed June 23, 1919. Serial No. 306,158.

*To all whom it may concern:*

Be it known that I, MARSHALL D. GIBSON, a citizen of the United States, residing in the city of Webster Groves, in the county of St. Louis and State of Missouri, have invented a new and useful Improvement in Washing-Machines, of which the following is a specification.

This invention relates to washing machines. It has for its objects to secure high efficiency in a machine of simple structure and requiring but little power to operate, and to attain certain advantages as will more fully appear in the following description.

The invention consists essentially in a novel construction and arrangement in a machine of this character, whereby the articles, regardless of size and bulk, are subjected to a beating and suction action while being agitated and circulated in the water. It further consists in a novel arrangement of two or more separate receptacles or containers operating under the same power in opposed and counterbalanced relation to each other. And still further in the parts and combinations and arrangements of parts hereinafter described and set forth in the appended claims.

In the accompanying drawing illustrating a practical embodiment of the invention,—

Figure 1 is a view partly in side elevation and partly in vertical section, showing the relative positions of the coöperating parts when one of the receptacles or containers is in uppermost position and the other is in lowermost position;

Fig. 2 is an end elevation showing the relative positions of the receptacles or containers when the cranks are on the horizontal quarter;

Fig. 3 is a fragmentary view, looking at the inside of the cover for the receptacle or container; and

Fig. 4 is a section of the cover taken on or about the line 4—4 of Fig. 3.

Referring now to the drawing, the numeral 1 designates the base-board or plate of the supporting frame. This member, as shown, is mounted on cross-footing members 2, and extending upward therefrom are parallel guide posts or columns 3. At the tops of the posts or columns 3 are cap-pieces 4 having oppositely extending horizontal ears or lugs 5 for the attachment of the upper ends of stay rods 6 whose lower ends are attached to the cross-footing members 2. The cap-pieces 4 also have upstanding spaced parallel ears or lugs 7 between which are received the end portions of cross members or yokes 8 respectively spanning a cooperating pair of the posts or columns 3. Preferably, the cross members or yokes 8 are hinged at their outer ends to the ears or lugs 7 of the corresponding cap-pieces, as at 9, while their inner end portions are detachably secured to the corresponding cap-pieces by removable pins or bolts 10, so that said members 8 may be swung over as will be later described.

On the posts or columns 3 are slidable sleeves 11 having bearings 12 for the reception of trunnions 13 of receptacles or containers 14. As shown, these trunnions 13 are attached to or are a part of bands 15 extending around the receptacles or containers, and extending downward therefrom are straps 16 which are carried under the receptacles or containers and thence turned downward in spaced parallel relation to each other so as to receive between and have attached to them the connecting bars 17 for the cranks 18 to be presently described. A second band 19 is carried about the lower end portion of each of the receptacles or containers and secured to the respective straps 16, thereby completing substantial holding frames.

The cranks 18 are set in diametrically opposite relation to each other so that the two receptacles or containers operate in opposed counterbalancing relation. That is, so that one is going down while the other is going up. It may be here stated, however, that in the event the machine comprises but a single receptacle or container, the same may be counterbalanced by suitable springs, and, preferably, coiled about the posts or columns 3 to bear against the lower ends of the slidable sleeves 11 as shown and described in a pending application of mine.

As shown in the accompanying drawing, the cranks 18 are fixed on the ends of a shaft 20 which is journaled in bearings 21 on pedestals 22 extending up from the base-board or plate 1, and to make clearance for said shaft the two inner posts or columns 3 are offset, as at 23 (see Fig. 2) to provide recesses 24 (see Fig. 1). This shaft may be

driven in any suitable manner. As shown, it has a pulley 25 thereon for the application of a belt connection with any suitable motor (not shown) which, obviously, may be located on the frame of the machine or at a place remote therefrom, as may be desirable. So, too, the shaft may be connected to the motor by any suitable spur or worm gearing, if so desired.

From the foregoing it is readily apparent that as the shaft 20 is rotated the receptacles or containers 14 have imparted to them a combined endwise reciprocation and oscillation. Consequently, a body of water with articles therein to be washed is correspondingly agitated and thrown from end to end and with rotative motion in the receptacles or containers, and with a force which will vary according to the length of the crank and the speed at which the receptacle or container is operated.

The above noted action has been found to be quite effective in a washing machine, and if a sufficiently high speed is maintained in operating the machine the cleansing of the articles may be satisfactorily accomplished in due time. It has been demonstrated, however, that the cleansing is accomplished in a short space of time and at a much slower speed in operation, by combining the action above described with a beating and suction appliance. To that end, therefore, an abutment, preferably an inverted cup, is positioned in the receptacle or container so as to be immersed when the latter is in a raised position, but being out of the water or above the normal water level in the lowermost position of the receptacle or container. Consequently, as the receptacle or container rises the water and the articles therein are first thrown forcibly against the abutment or cup, and as the latter is immersed and the receptacle or container moves downward, the relation of the abutment or cup is changed with respect to the receptacle or container so that the article which may happen to be in engagement with the abutment or cup is released on the opposite side of the longitudinal axis of the receptacle or container, and in consequence of which the articles are thoroughly agitated and circulated, so that on each stroke a different part of an article or a different article is brought into contact with the abutment or cup. In this way every article is eventually acted upon, and by the impact initially against the abutment or cup and also by the suction of the partial vacuum created in the cup, dirt and soil are speedily eliminated from the articles.

The inverted cup, as shown, and designated by the numeral 26, is fixed on the lower end of a rod 27 which has a vertical adjustment through the yoke 8 and is held in its adjusted position by a set-screw 28. In this way the cup may be set at any desired altitude, but which is usually determined by the normal water line or level in the receptacle or container and the quantity or bulk of the articles to be washed.

To permit of the rocking or oscillatory movement of the receptacle or container on its trunnions without interference of the stationary rod 27, the cover 29 of the receptacle or container is provided with an elongated slot 30 extending at right angles to the axis of the trunnions; and to keep the water from splashing out through the slot, a plate 31 is slidably mounted in guide-ways 32 on the inside of the cover so as to overlap said slot throughout the complete oscillatory movement, said plate having a central aperture through which the rod 27 is slidably fitted.

Suitable drain cocks 33 are provided at the bottoms of the receptacles or containers (see Fig. 2). Access may be conveniently gained to the interior of the receptacles or containers by merely removing the pins or bolts 10 and swinging the yokes 8 over on their hinges 9 and carrying with them the rods 27 with the cups 26 and covers 29 thereon.

As hereinbefore stated, the invention comprehends broadly the combination of the reciprocatory and oscillatory actuation of the receptacle or container with an abutment or beater therein, and, preferably, though without being limited thereto, a vacuum cup. It further includes the counterbalancing of the receptacle or container, and is applicable to a machine comprising either a single receptacle or container or two or more thereof operating from a common crank shaft, whereby to minimize the motive power. Nor is it limited to the specific construction and arrangement shown in the drawing.

What is claimed is:

1. In a washing machine, a receptacle having a combined vertical reciprocation and transverse oscillation, and an abutment element supported in said receptacle in detached relation thereto.

2. In a washing machine, a receptacle having a combined vertical reciprocation and transverse oscillation, and an abutment element supported in said receptacle in detached relation thereto and being positioned coincident with the median vertical axis thereof.

3. In a washing machine, a receptacle having a combined vertical reciprocation and transverse oscillation, and a vertically adjustable abutment element supported in said receptacle in detached relation thereto and being positioned coincident with the median vertical axis thereof.

4. In a washing machine, a receptacle having a combined vertical reciprocation and transverse oscillation, and an abutment element comprising an inverted cup supported in said receptacle in detached relation

thereto and being positioned coincident with the median vertical axis thereof.

5. In a washing machine, a supporting frame, a multiplicity of receptacles operating on said frame with a combined vertical reciprocation and transverse oscillation, and a crank-shaft for actuating said receptacles, the cranks of said shaft being set with relation to each other so that the one receptacle counterbalances the other.

6. In a washing machine, a supporting frame, a multiplicity of receptacles operating on said frame with a combined vertical reciprocation and transverse oscillation, abutment elements supported on said frame and being disposed in said receptacles in detached relation thereto and coinciding with the median vertical axes thereof, and means for actuating said receptacles in sequential counterbalancing relation to each other.

7. In a washing machine, a supporting frame including parallel columns, a receptacle having trunnion bearings slidable on said columns, a crank operatively connected to said receptacle whereby to impart to the latter a combined vertical reciprocation and transverse oscillation on said columns, a yoke supported on the upper end portions of said columns, and an abutment element comprising an inverted cup depending from said yoke and being disposed coincidently with the median vertical axis of said receptacle.

Signed at St. Louis, Missouri, this 11th day of June, 1919.

MARSHALL D. GIBSON.