H. L. STALEY.

WASHING MACHINE AGITATOR.

APPLICATION FILED JAN. 29, 1913.

1,155,107. Patented Sept. 28, 1915.

Fig. 1.

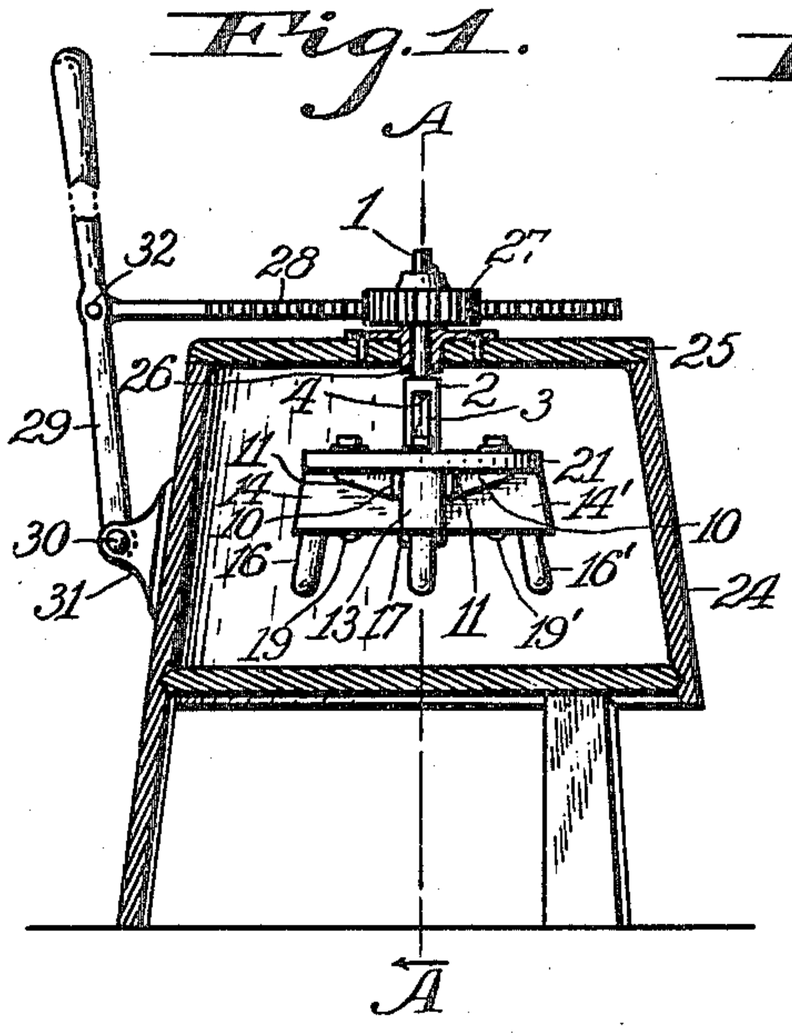


Fig. 2.

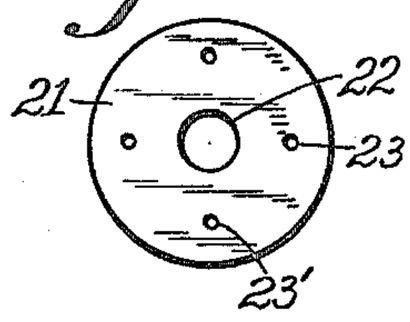


Fig. 3.

Fig. 4.

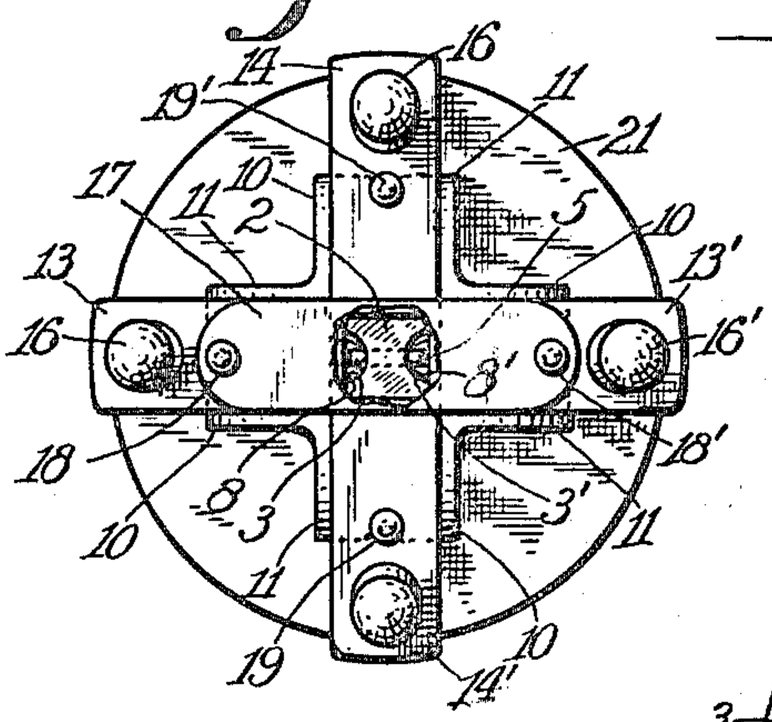


Fig. 5.

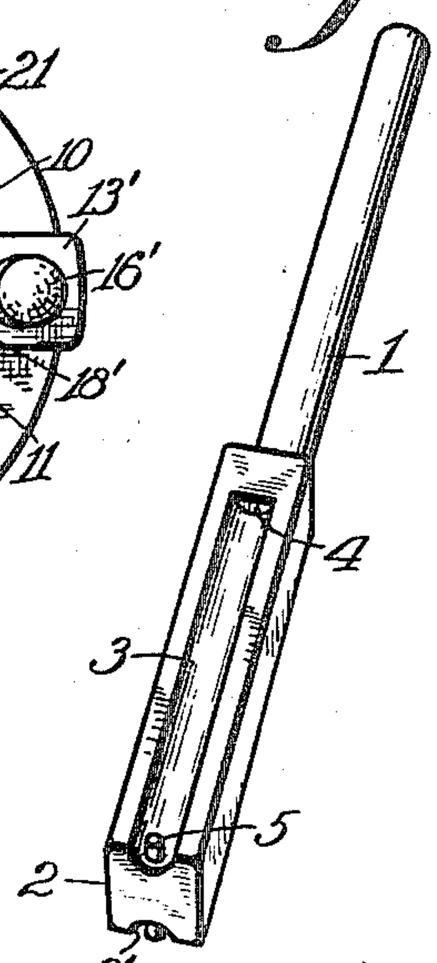


Fig. 6.

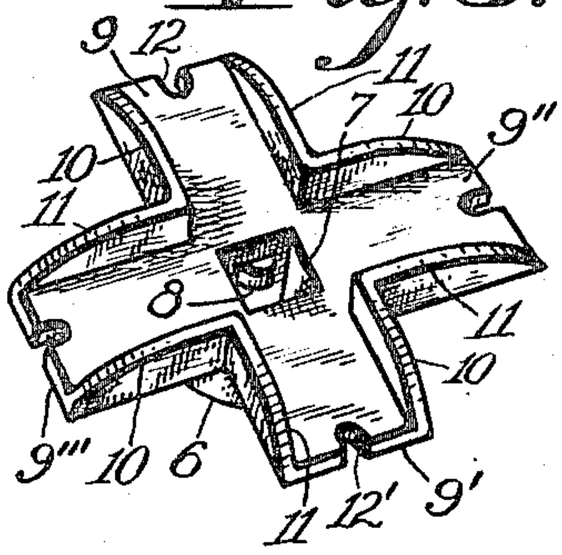
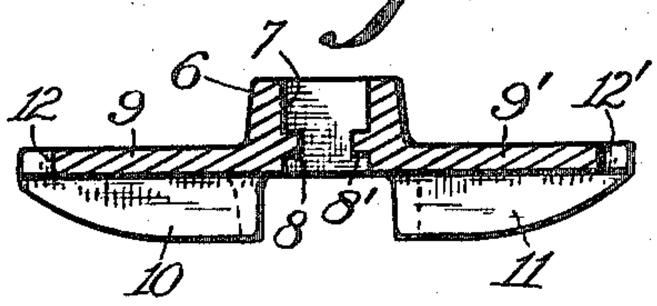


Fig. 7.



WITNESSES:

J. H. Gardner.

M. J. Ridpath.

INVENTOR:

Harrison L. Staley.

BY

E. T. Silvius.

ATTORNEY.

UNITED STATES PATENT OFFICE.

HARRISON L. STALEY, OF MARTINSVILLE, INDIANA.

WASHING-MACHINE AGITATOR.

1,155,107. Specification of Letters Patent. Patented Sept. 28, 1915.

Application filed January 29, 1913. Serial No. 744,832.

To all whom it may concern:

Be it known that I, HARRISON L. STALEY, a citizen of the United States, residing at Martinsville, in the county of Morgan and State of Indiana, have invented a new and useful Washing-Machine Agitator, of which the following is a specification, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon.

This invention relates to a washing machine appliance that is known as an agitator, a rubber, or a "dolly" and designed to be used in a tub or similar vessel for agitating the washing liquid and the articles to be cleansed, by rotary-oscillatory motion, the invention having reference more particularly to various features of construction of the agitator and its operating and controlling shaft.

An object of the invention is to provide an improved agitator for washing machines that shall be so constructed as to most effectually cause centrifugal motion of the washing liquid during the washing operation, a particular object being to provide an agitator which shall prevent the washing liquid from escaping upward while being agitated to produce gyratory and centrifugal motion of the liquid.

A further object of the invention is to provide an agitator that shall be adapted to be cheaply produced and readily repaired when partially worn out and which shall be durable and economical in use.

With the above mentioned and other objects in view, the invention consists in a rotary-oscillatory agitator having wings for producing centrifugal motion of the washing fluid and provided with webs for preventing the flow of the liquid upward and over the tops of the wings, the invention consisting further in certain novel features of construction in agitators for washing machines, and in the parts and combinations and arrangements of parts, as hereinafter particularly described and claimed.

Referring to the drawings, Figure 1 is a vertical central section of a washing machine tub to which the improved agitator is applied and provided with suitable operating mechanism; Fig. 2, a top plan of the web part of the agitator; Fig. 3, a vertical sectional view of the agitator approximately on the line A A in Fig. 1; Fig. 4, an inverted plan view of the agitator partially broken away; Fig. 5, a perspective view of the operating and controlling shaft of the agitator; Fig. 6, a perspective view of the hub portion of the agitator; and Fig. 7, a central section of the hub portion on an enlarged scale.

Similar reference characters throughout the several figures of the drawings indicate corresponding elements or features of construction herein referred to.

As preferably constructed, a suitable vertical operating shaft is provided which comprises a cylindrical upper portion 1 adapted to be rotatably supported and a lower guide portion 2 that is square in cross-section and has two longitudinal grooves 3 and 3′ in two opposite sides thereof respectively, the grooves extending from the lower end of the shaft upward a suitable distance so as to form stop shoulders 4 and 4′ at the upper ends of the grooves. When the structure is completed, a stop pin 5 is tightly secured in the lower end portion of the shaft transversely thereof and extends into the two grooves. An agitator hub 6 is provided which has a squared aperture 7 therein to receive the squared portion of the shaft, the hub being mounted on the shaft to slide thereon and in operation is turned by the shaft, the hub having two stop projections 8 and 8′ on the inner side of the wall thereof that extend into the grooves 3 and 3′ respectively and may be moved into contact either with the shoulders 4 and 4′ respectively or with the end portions of the pin 5. The hub has four identically shaped horizontal arms 9, 9′, 9″, 9‴ thereon that are plate-like in form and extend radially from the hub, and each arm has two flanges 10 and 11 on opposite edges thereof, the flange 10 of one arm being formed integrally with the flange 11 of the adjacent arm, and when the hub is in normal position the flanges extend downward from the arms. The end of each arm has a slot 12 or 12′ therein to receive a retaining bolt.

A suitable number of agitator wings or blades are provided and suitably secured to the arms of the hub, four wings preferably being employed so that two wings 13 and 13′ are formed integrally of one piece of wood and two similar wings 14 and 14′ are formed integrally of another piece of wood, the two pieces of wood being suitably recessed and crossed at their middle portions,

the middle portion of one piece having a squared hole 15 therein, the middle portion of the companion piece having a similar hole 15′ therein to receive the squared portion 2 of the operating shaft, the relative proportions being such as to permit the shaft to project slightly downward through the hole 15′ to permit the insertion of the stop pin 5. The several wings or blades are provided respectively with a downwardly projecting finger 16 or 16′ for moving the clothes or fabric to and fro in the tub as is customary. A tie-plate 17 is placed against the under side of the wooden piece that forms the two wings 13 and 13′ and closes the hole 15′, the plate having two retaining bolts 18 and 18′ that extend through the two wings and upward through the two slots 12 and 12′ respectively of two of the arms of the hub, two similar bolts 19 and 19′ being placed in the remaining two wings so as to extend upward through the slots of the remaining two arms. The normal upper sides or tops of the wings have recesses 20 to receive the arms of the hub.

The webs of the agitator wings or blades may be variously provided and preferably are produced by means of a disk 21 having a central aperture 22 therein that receives the hub 6, the disk being placed upon the arms of the hub and extending onto the end portions of the several wings or blades and fixedly secured by means of the retaining bolts which obviously are provided with nuts and heads, the disk having holes 23 or 23′ through which the bolts extend.

The disk, as will be seen, serves to web the upper portion of the wings or blades, the latter being reinforced by the flanges 10 and 11 so as to firmly fix them relative to the hub.

The vessel in which the agitator is mounted may be variously constructed and may suitably comprise a tub 24 provided with a cover 25 in the middle portion of which a journal box 26 is secured that rotatably supports the cylindrical portion 1 of the operating shaft, and supports also a toothed gear wheel 27 which is secured to the shaft and serves as a collar to hold up the shaft in normal position. The gear wheel is rotatably moved forward or backward by a suitably guided rack bar 28 and a lever 29, the latter being connected by means of a pivot 30 to a jaw 31 secured to the tub, the lever being connected by means of a pivot 32 to the rack bar. The operating gearing obviously may be of various construction, the agitator being designed for use in various types of washing machines.

In practical use, the gearing is actuated so as to impart rotary-oscillatory motion to the operating shaft of the agitator. The wings or blades and the fingers thereof bear down upon the clothes or fabrics and transmit their motion thereto and in the operations may move up or down relative to the guide portion of the operating shaft. The to and fro movement of the wings or blades cause the washing fluid to be forced outward toward the wall of the tub and unless restrained or confined, the water would be forced upward and escape over the tops of the wings more easily than to be forced centrifugally and through the fabrics, the liquid, however, in the present case being confined by the webbing of the wings so that the liquid is most efficacious in performing the cleansing operations.

Having thus described the invention, what is claimed as new is:—

1. In a washing machine agitator, the combination of a circular disk, a hub inserted in the disk and extending from the normal lower side thereof, arms fixed on the hub and extending against the lower side of said disk, wings seated on the lower side of the arms respectively, the outer portion of the arms being in contact with the lower side of said disk, and a plurality of bolts extending through said disk and also through the wings respectively, the bolts rigidly securing the wings and the disk to the arms.

2. In a washing machine agitator, the combination of a circular disk, a hub inserted in the disk and extending from the normal lower side thereof, arms fixed on the hub and extending against the lower side of the disk, each arm having an opening therein, wings seated on the lower side of the arms respectively, the upper side of each wing being recessed, the recess receiving the adjacent arm, the outer upper portions of the arms being in contact with said disk, and a plurality of bolts extending through said disk and also through said wings respectively and through the openings of said arms respectively, said bolts rigidly securing said wings and said disk to said arms and said wings directly to said disk.

3. In a washing machine agitator, the combination of a circular disk, a hub inserted in the normal lower side of the disk, four arms fixed on the hub and having each a slot in its end, the upper sides of the arms extending against the lower side of said disk, two pieces of wood that are recessed and crossed at their middle portions and forming four wings, the normal upper sides of the wings being recessed, each recess receiving an arm, the outer upper portions of the wings extending against the lower side of said disk, the middle portion of each piece forming said wings having each a hole therein, two bolts extending through said disk and the said slots in two of said arms and also through two of said wings and rigidly securing the disk and the wings to the arms, a shaft extending movably through said hub and said holes, a tie-plate seated on the

lower side of the middle portion of the lower one of said pieces and onto the wings formed thereby, said tie-plate extending across said holes and being movable by said wings into contact with the lower end of said shaft, and two bolts extending through said disk and the said slots in the adjacent two of said arms and also through said tie-plate and the adjacent wings and rigidly securing the said several parts together.

4. In a washing machine agitator, the combination with a hub having an aperture therein, a lug in the aperture fixed on the wall of the hub, and arms on the hub, of a shaft extending movably in the aperture, there being a groove in one side of the shaft receiving the lug, a pin inserted transversely in said shaft and extending into the groove to be engaged by said lugs, wings secured to said arms, and a tie-plate secured to said wings and extending opposite the end of said shaft to be moved by the arms into contact with the end of said shaft.

5. In a washing machine agitator, an element comprising an externally cylindrical hub, there being a squared aperture extending through the hub, four flat arms on the normal lower end of the hub, the end of each arm having a recess therein, two lugs on the inner side of the hub extending into the aperture relatively near to but not immediately at the lower end of the hub, and a plurality of flanges on the lower sides of the arms respectively, the flanges being on the opposite sides of the arms from the hub.

In testimony whereof, I affix my signature in presence of two witnesses.

HARRISON L. STALEY.

Witnesses:
COASON S. PARRISH,
B. R. ELDRIDGE.