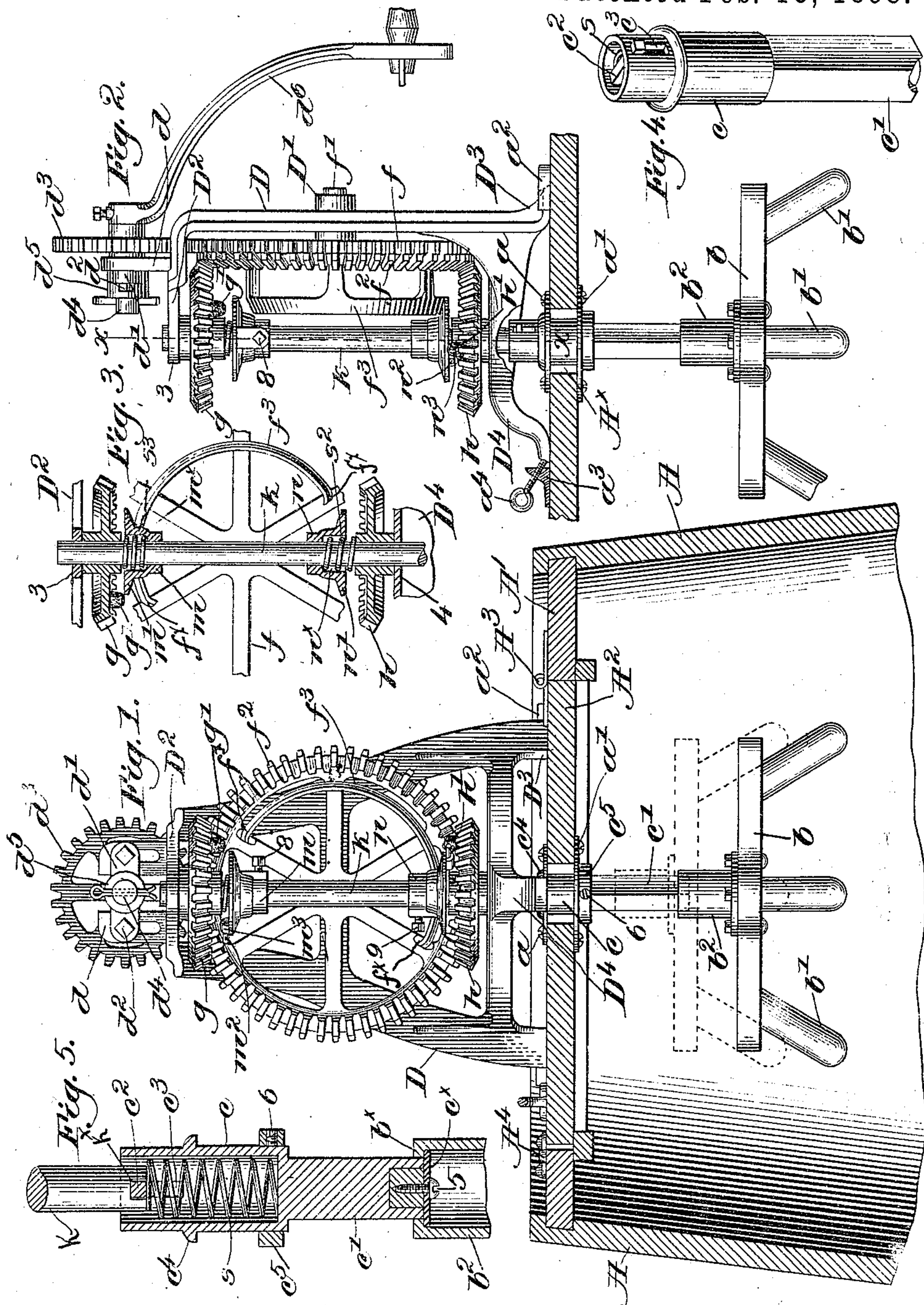


(No Model.)

A. WEBBER.
WASHING MACHINE.

No. 599,029.

Patented Feb. 15, 1898.



Witnesses:

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UNITED STATES PATENT OFFICE.

ALEXANDER WEBBER, OF WINTHROP, MASSACHUSETTS.

WASHING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 599,029, dated February 15, 1898.

Application filed April 16, 1896. Serial No. 587,766. (No model.)

To all whom it may concern:

Be it known that I, ALEXANDER WEBBER, of Winthrop, county of Suffolk, State of Massachusetts, have invented an Improvement in Washing-Machines, of which the following description, in connection with the accompanying drawings, is a specification, like letters and figures on the drawings representing like parts.

This invention relates to clothes-washing machines which comprise, essentially, a tub or vat in which the clothes are to be washed, a rotatable stirrer therein, and mechanism for operating the stirrer preferably first in one direction and then in the other direction, my present invention having for its object the production of a convenient, effective, and easily-operated washing-machine of the general class referred to and being an improvement in various particulars over the washing-machine forming the subject-matter of United States Patent No. 551,915, granted to me December 24, 1895.

The stirrer-operating mechanism is bodily removable from the tub and is of novel construction designed to give the greatest effectiveness combined with ease of manipulation, as in the great majority of cases washing-machines are operated by women.

A novel and highly-useful form of stirrer also forms a part of my invention, and the means for instantly connecting or disconnecting the stirrer and its operating mechanism are simple and effective.

Various other features of my invention will be hereinafter described in the specification and pointed out in the claims.

Figure 1 is a front elevation, with the tub in section and broken out to save space, of a washing-machine embodying my invention. Fig. 2 is a right-hand side elevation of the stirrer and its operating mechanism. Fig. 3 is a vertical sectional view of the stirrer-operating mechanism, taken on the line xx , Fig. 2. Fig. 4 is a perspective view, enlarged, of the upper end of the stirrer-shaft and coupling. Fig. 5 is an enlarged sectional view thereof broken off at its lower end, and Fig. 6 is a partial detail in elevation showing a slight modification in construction of part of the clutching mechanism to be referred to.

Referring to Fig. 1, the tub A, of any suit-

able construction, is provided with a cover A' and an aperture for the admission and withdrawal of the clothes and normally closed by a lid A², preferably hinged at A³ and having a button or catch A⁴. The lid has an opening A^x, herein shown as crossed by annular plates a a' , secured to the outer and inner sides of the lid, respectively, and forming bearings to support the stirrer and its shaft, which depend therefrom within the tub.

The stirrer is shown as a horizontal frame b , preferably of wood and having its arms provided with depending blades or fingers b' , the stirrer having secured to its upper side a long hub b^2 of metal, the interior of the hub and a hole in the frame b being made square or polygonal to receive the correspondingly-shaped lower end c' of the stirrer-shaft.

Referring to Fig. 5, it will be seen that the hub has an inturned flange b^x , and a retaining-plate c^x is secured, as by a screw 5, to the end of the stirrer-shaft, so that the stirrer may move up and down thereon (see dotted lines, Fig. 1) without exposing the shaft below the stirrer. This is a very valuable and important feature, as the clothes are prevented from being wound about the stirrer-shaft and torn or strained, while the vertical movement of the stirrer enables it to adapt itself to the quantity of clothes in the tub.

If the stirrer is made entirely of wood, it will float on the water in the tub, and in such case if there should be a greater depth of water present than the depth of the mass of clothes the stirrer might not engage the latter at all; but by the addition of the metal hub to the stirrer, as herein provided, the weight of the stirrer is increased to such an extent that it will normally sink in the water to the level of and engage the clothing, no matter whether the latter is large or small in amount.

As shown in Figs. 1, 2, and 4, the upper end of the stirrer-shaft is made cylindrical at c and hollow to receive a spring s , Fig. 5, said spring bearing at its upper end against a transverse slide member c^2 , guided in vertical slots c^3 . An annular shoulder c^4 on the part c of the shaft below the slots c^3 rests on the bearing a , while a collar c^5 is held on the shaft below and adjacent the bearing a' by a suitable set-screw 6, so that by removing the

latter and the retaining-plate c^x the stirrer-shaft may be withdrawn when desired.

The stirrer-operating mechanism is mounted on a bracket D , of suitable shape, having a bearing D^1 , an overhanging arm D^2 , feet D^3 , and a forwardly-extended foot D^4 , the feet D^3 being adapted to enter socket-pieces a^2 on the lid A^2 , while an open socket a^3 receives the foot D^4 , as clearly shown in Fig. 2, a screw or thumb nut a^4 bearing against the foot and holding the operating mechanism firmly in place.

Longitudinally-slotted ears d form a part of the top of the bracket, and a cross-head d' is adjustably secured thereto by bolts d^2 nearer to or farther from the overhanging arm D^2 , which is transversely slotted or made open to accommodate a gear d^3 , fast on a crank-shaft d^4 , mounted in a bearing d^5 on the cross-head, said shaft having a suitable handle-arm d^6 .

A large driving-gear f , meshing with the gear d^3 , is mounted on a stud f' , rotatable in the bearing D^1 , said driving-gear having on its face a bevel-gear f^2 in mesh with two smaller bevel-gears g and h , rotatably mounted on a shaft k , longitudinally movable and rotatable in bearings 3 4 in the overhanging arm D^2 and the foot D^4 of the bracket, Figs. 1, 2, and 3.

The lower end of the shaft k is longitudinally notched or recessed at k^x , Fig. 5, to engage the slide member c^2 of the stirrer-shaft, making a detachable coupling or connection between the operating and stirrer shafts k and c , which automatically couples and uncouples upon application or removal of the operating mechanism to the tub A , the springs retaining the slide member c^2 in engagement with the shaft k as the latter is moved longitudinally, as will be described.

By rotation of the driving-gear f^2 the gears g and h will be rotated in opposite directions, said gears forming part of a clutch mechanism.

Like collars or sleeves m and n are mounted on the shaft k and held rigidly thereto by means of set-screws 8 9, engaging the shaft, said collars being provided with oppositely-beveled annular flanges m' n' , respectively.

The hub of gear h rests against the bearing 4, and the collar n is hollowed out at n^x to receive a spring s^2 , surrounding the shaft k between the collar and the upper end of the hub of the gear h , to retain the latter seated. Collar m is similarly recessed at m^x to receive a spring s^3 between the collar and the hub of the gear g , maintaining the latter against the under side of the bearing 3.

The gears are provided on their inner faces with projections g' h' , respectively, preferably covered with rubber or non-metallic material, to be engaged singly by pins m^2 or n^2 on their adjacent collars m and n , said pins being sometimes provided with rolls, one of which, as m^3 , is shown in Fig. 6 mounted on the outer end of the pin m^2 to reduce friction.

It will be obvious that if one collar is brought into engagement with its adjacent

gear and the other collar held from engagement with its gear the shaft k will be rotated in one direction, and when the position of the collars is reversed the shaft will be rotated in the opposite direction, the stirrer coupled to said shaft partaking of such rotation. The collars thus act as movable members of a clutch mechanism to control the direction of rotation of the actuating-shaft k .

A cam-surface f^3 is suitably mounted to rotate with a gear f , the main portion of the cam being a circular arc, the extremities dropping toward the center at f^x , Figs. 1 and 3. Rotation of the gear f causes the flange of first one and then the other collar to engage the portions f^x of the cam f^3 and then the circular portion, so that when the collar m is moved, as in Fig. 3, into engagement with its gear g the longitudinal movement of the shaft k will withdraw the collar n from engagement with its gear h , and vice versa, as in Figs. 1 and 2. The circular portion of cam f^3 maintains the engaged collar in operative engagement with its cooperating gear throughout its extent. One collar is disengaged from its gear just as the other collar is brought into engagement with its gear, so that there is no jump or jar of the mechanism as the shaft k is rotated first in one and then in the other direction. The yielding projections g' and h' aid in avoiding shock and reduce the noise to a minimum, while the antifriction-rolls m^3 n^3 reduce the power required to operate the clutch mechanism.

The entire operating mechanism may be instantly removed bodily from the tub A by loosening the screw a^4 .

By putting a larger or smaller gear on the crank-shaft d^4 in place of gear d^3 the speed may be increased or decreased, but with consequent increase or decrease in the power necessary to be applied to the crank-shaft.

Obviously the acting mechanism may be operated when the shaft k is not in vertical position, as herein shown, for any other desired position for said mechanism may be employed without departing from the scope of my invention.

Having fully described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In a washing-machine, a tub, its cover, a stirrer-shaft rotatably suspended therefrom, a stirrer within the tub having depending arms or fingers, a hub on its upper side provided at its upper end with an intumed flange, the stirrer-shaft entering said hub, and a retaining-plate secured to the lower end of the said shaft, said plate being larger than the opening in the flange and adapted to move longitudinally within the hub, the hub of the stirrer being of such length as to at all times conceal the lower end of the stirrer, substantially as described.

2. In a washing-machine, a tub provided with a cover, a rotatable shaft suspended therefrom and having a tubular longitudi-

nally-slotted upper end, a sliding spring-controlled coupling member movable in and guided by said slots, and a vertically and freely movable stirrer on and rotatable with
5 said shaft within the tub, combined with actuating mechanism, including a rotatable longitudinally-movable actuating-shaft, and a cooperating coupling member at its lower end, to engage the sliding member and remain in
10 engagement therewith during longitudinal movement of said actuating-shaft, substantially as described.

3. A stirrer-operating mechanism for washing-machines, comprising a longitudinally-
15 movable, rotatable shaft having two gears rotatable thereon in opposite directions, a common gear in mesh with said two gears and adapted to be rotated, clutch members fast on said shaft, to cooperate with the gears
20 thereon alternately, and connections actuated by the common gear and between it and the shaft, to move the latter longitudinally and bring one of the clutch members into engagement with its adjacent gear before complete
25 disengagement of the other clutch member and its gear, substantially as described.

4. A stirrer-operating mechanism for washing-machines, comprising a longitudinally-
movable, rotatable shaft, two gears freely ro-
30 tatable thereon in opposite directions, an intermediate gear in mesh with said two gears, clutch members fast on said shaft and each

provided with a projection to cooperate alternately with projections on the adjacent loose
gears; a spring between each of said gears 35
and clutch members, and means controlled by rotation of the common gear to move the shaft longitudinally to thereby bring either of the clutch members into engagement with its adjacent gear before complete disengage- 40
ment of the other clutch member and gear, substantially as described.

5. A stirrer-operating mechanism for washing-machines, comprising a longitudinally-
movable, rotatable shaft having two gears 45
rotatable thereon in opposite directions, each gear having a yielding non-metallic projection on its inner face, a common gear in mesh with and to rotate said gears, pins movable with said shaft and each provided with a roll, 50
to cooperate with the projections on the gears alternately, and means actuated by the intermediate gear to move the shaft longitudinally and bring one of the rolls into engagement with the projection on the adjacent gear be- 55
fore complete disengagement of the other roll and projection, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

ALEXANDER WEBBER.

Witnesses:

JOHN C. EDWARDS,
AUGUSTA E. DEAN.