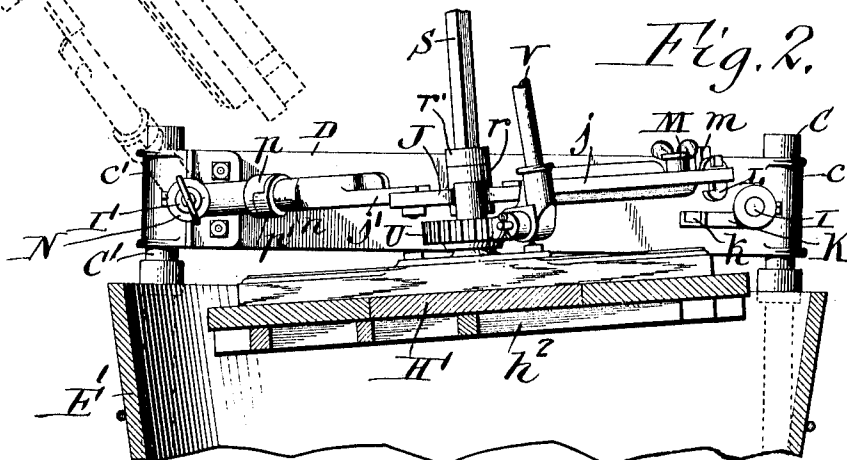
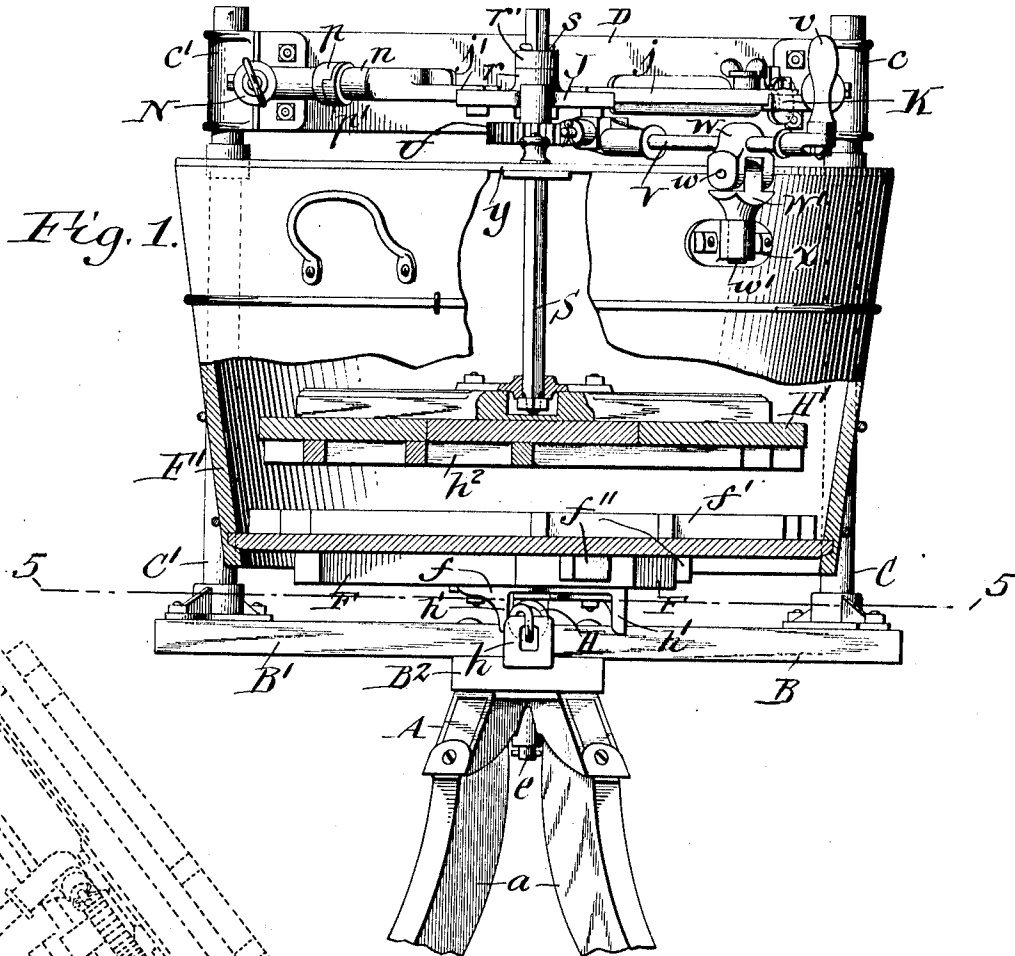


F. H. WIARD.
WASHING MACHINE.
APPLICATION FILED SEPT. 10, 1909.

969,823.

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3 SHEETS—SHEET 1.



Witnesses:
Richard Soumel
John H. Shoemaker

Inventor
F. H. Wiard
by *Super & Topp*
Attorneys.

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3 SHEETS—SHEET 2.

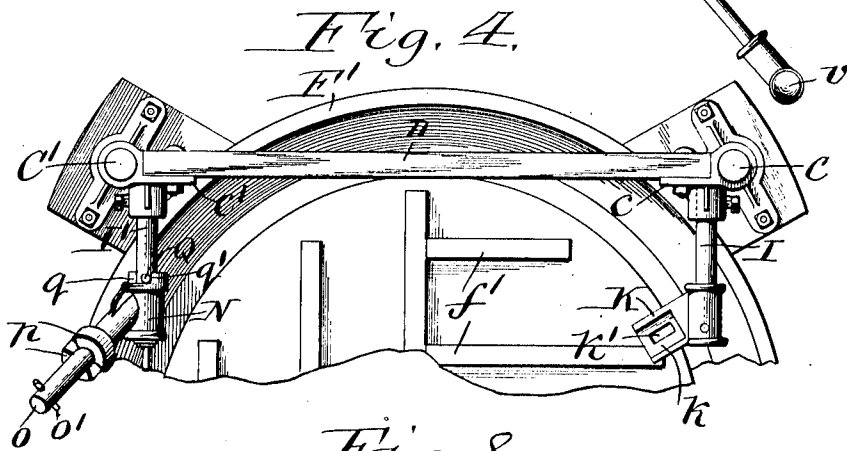
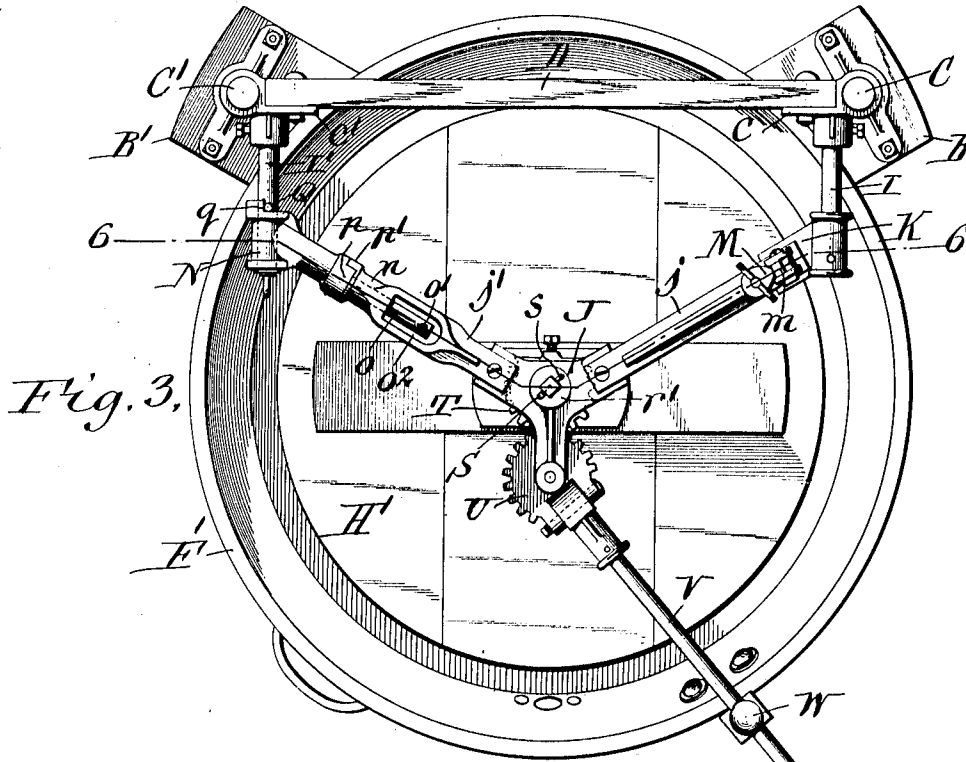
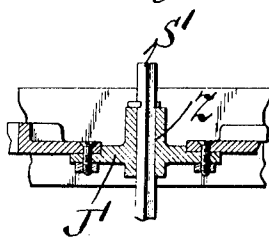


Fig. 8.



Witnesses:
 Richard Sommer
 John H. Shoemaker

Inventor
 F. H. Wiard
 by Geyer & Popp
 Attorneys.

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3 SHEETS—SHEET 3.

Fig. 5.

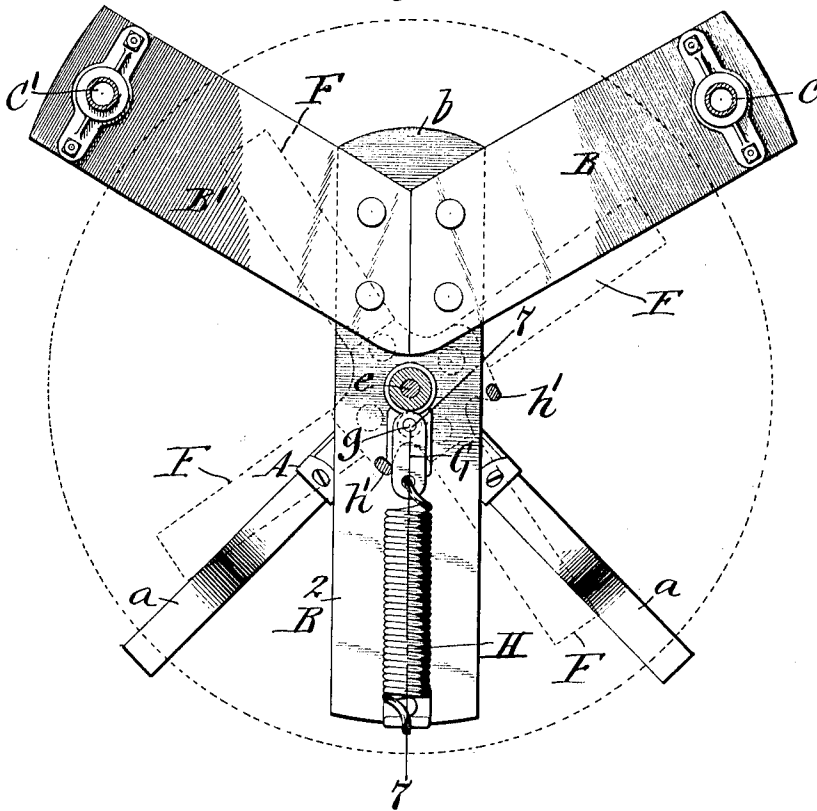


Fig. 6.

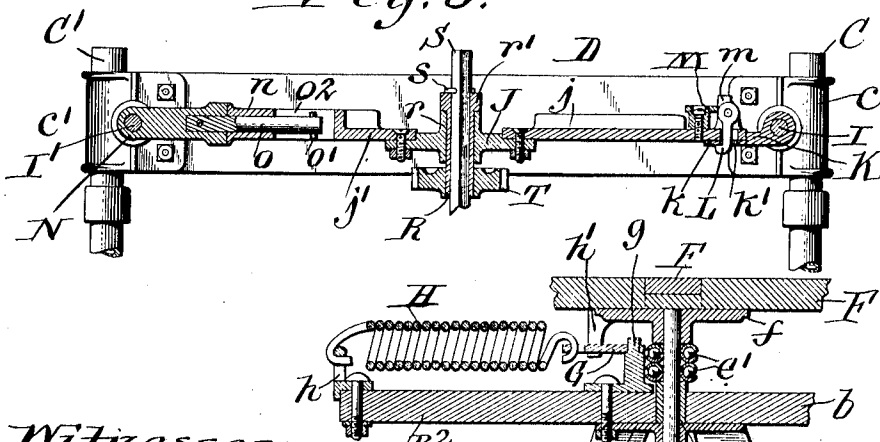


Fig. 7.



Witnesses:
 Richard Sommer
 John H. Shoemaker.

Inventor
 F. H. Wiard
 by Leyer & Foltz
 Attorneys.

UNITED STATES PATENT OFFICE.

FREDERICK H. WIARD, OF AVON, NEW YORK.

WASHING-MACHINE.

969,823.

Specification of Letters Patent. Patented Sept. 13, 1910.

Application filed September 10, 1909. Serial No. 517,002.

To all whom it may concern:

Be it known that I, FREDERICK H. WIARD, a citizen of the United States, residing at Avon, in the county of Livingston and State of New York, have invented a new and useful Improvement in Washing-Machines, of which the following is a specification.

This invention relates to that class of washing machines which comprise a rotatable tub provided on the underside of its bottom with rubbing cleats and a separate rubbing disk arranged within the tub and provided on its underside with rubbing cleats adapted to cooperate with those of the tub.

It is the object of my invention to provide a washing machine of this character having superior means for supporting the rubbing disk so as to hold it reliably in position while operating the machine and also permit of conveniently opening the machine preparatory to wringing the clothes without liability of dripping water on the floor, and to provide improved means for permitting the machine to be operated conveniently and with a minimum expenditure of power.

In the accompanying drawings consisting of three sheets: Figure 1 is a front elevation of the machine, partly in section, showing the position of the parts when the machine is in use. Fig. 2 is a fragmentary vertical section, showing some of the parts in the position which they occupy while removing the rubbing disk from the tub. Fig. 3 is a top plan view of the machine in its working condition but with the cover removed. Fig. 4 is a fragmentary top plan view of the machine showing the rubbing disk and associated parts removed. Fig. 5 is a fragmentary horizontal section on line 5—5, Fig. 1. Fig. 6 is a fragmentary vertical transverse section on line 6—6, Fig. 3. Fig. 7 is a fragmentary vertical section on line 7—7, Fig. 5. Fig. 8 is a fragmentary vertical section showing a modification of one feature of my invention.

Similar letters of reference indicate corresponding parts throughout the several views.

The main frame of this washing machine may be variously constructed, but as shown in the drawings, the same preferably consists of a spider or head A secured to the upper ends of a plurality of legs *a*. On the upper side of the spider is mounted a platform which preferably has three arms B, B¹, B² radiating substantially equidistant

from the spider. Two upright posts or standards C, C¹ rise from the outer ends of the platform arms B, B¹, and on the upper ends of the latter are mounted brackets *c*, *c*¹ to which a board D is secured at its opposite ends. The board D is adapted to support the wringer which is used for wringing out the clothes after the same have been washed in this machine.

The platform is preferably constructed of a plate or bar which extends across the spider and forms a long arm B² at one end and a shelf *b* at its opposite end, and two bars secured at their inner ends to the upper side of this shelf and forming short arms B, B¹.

Centrally on the spider is a bearing E in which is journaled an upright shaft or spindle *e*. At its upper end this shaft carries a head *f* to the upper side of which are secured two supporting bars F which cross each other at right angles. Between the underside of the head *f* and the upper end of the bearing E a ball-bearing *e*¹ of any suitable construction is preferably interposed so as to reduce the wear of the parts at this point and cause the machine to operate more easily.

The wash tub F¹ having rubbing cleats *f*¹ on its bottom rests with its underside on top of the supporting bars F and is held against lateral displacement thereon by any suitable means but preferably by engaging the ends of the supporting bars with the inner side of the lower edge or rim of the tub. The wash tub and the supporting arms are compelled to turn together, preferably by means of two coupling blocks *f*¹¹ secured to the underside of the tub and engaging with opposite sides of one of the supporting arms.

Upon oscillating the wash tub, the return movement in either direction is assisted by means of a return device which preferably comprises a horizontally swinging or rocking return arm G pivoted at its inner end on top of a post *g* arranged on the platform adjacent to the pivot of the tub, a return spring H connected at its inner end to the outer free end of the return arm while its outer end is secured to a bracket or loop *h* at the outer end of the platform arm B², and a pair of lugs *h*¹ depending from the underside of the head *f* on opposite sides of the return arm.

Upon turning the tub in one direction, one of the return lugs *h*¹ engages one side of the return arm and deflects the spring H in that

direction, so that the resilience of this spring operates to start or assist in the return movement of the tub when the same reaches the end of its oscillation in that direction. Upon moving the tub in the opposite direction, the other return lug h^1 engages with the opposite side of the return arm and strains the return spring, so that the latter operates to assist the return of the tub when the same reaches the end of its oscillating movement in the opposite direction. The return lugs h^1 are spaced apart so that there is a clearance or slack between the return lugs and the return arm, thereby causing the central part of the stroke of the tub to be dead relative to the return spring and causing the latter to be strained only during the end portions of the oscillating movement of the tub.

One form of my improved means for supporting the rubbing disk is shown in Figs. 1, 2, 3, 4 and 6 and is constructed as follows: Projecting forwardly from the brackets at opposite ends of the wringer board are two horizontal parallel supporting stems or rods I, I^1 which overhang the rear part of the tub and disk. H^1 represents the rubbing disk arranged in the tub and provided on its underside with rubbing cleats h^2 . Above the rubbing disk is arranged a yoke which preferably comprises a central hub J and two arms j, j^1 diverging rearwardly from the hub so that the yoke as a whole has substantially the form of the letter V. One of these arms, preferably the right-hand one j , is detachably connected with the right-hand rod I while the other arm is connected with the other or left-hand rod I^1 in such manner that the yoke is capable of a bodily movement toward and from the supporting rod I^1 and also a swiveling motion relatively to the same to facilitate the introduction of the rubbing disk into the tub and the removal of the same therefrom. The detachable connection between the right hand arm j of the yoke and the right-hand rod I may be variously constructed, the means for this purpose shown in the drawings being preferred and comprising a wing K secured to the front end of the rod I and having an upwardly-opening seat or socket k which receives the outer end of the right yoke-arm j and an opening k^1 in the bottom of said seat or socket, a depending-hook L pivoted to swing vertically on the outer end of the right arm j and adapted to pass downwardly through the opening k^1 of the wing K and engage its bill with the underside of this wing, and a rotatable cam M pivoted to swing horizontally on the upper side of the right arm j and adapted to engage with a tail m projecting upwardly from the hook above the pivot thereof. Preparatory to connecting the arm j with the wing, the cam M is so turned as to present its low face to the tail m in which position of the parts the

hook is free to pass downwardly through the opening of the wing and the end of the arm may enter the socket of the same. After the parts have been thus assembled, the cam M is turned so as to engage its high face with the tail of the hook, thereby causing the latter to swing with its bill against the underside of the wing and thereby lock the yoke and wing together, as shown in Fig. 6. The preferred means for obtaining the combined bodily sliding and swiveling movement of the yoke relative to the left rod j^1 which are shown in the drawings, comprise a swivel sleeve N turning on the left-hand supporting rod I^1 and provided with a guide rod o arranged at an angle to the supporting rod I^1 and sliding in a clutch sleeve n at the rear end of the left-hand yoke-arm j^1 , a pin o^1 arranged on the front end of the guide rod o and adapted to engage with the rear end of a slot o^2 in the left-hand yoke-arm j^1 for limiting the separating movement of the yoke relative to the guide rod o , cooperating locking or clutch jaws p, p^1 arranged on the opposing parts of the swivel and clutch sleeves, and stop shoulders q, q^1 formed on the rear end of the swivel sleeve N and adapted to engage alternately with opposite sides of a stop pin or lug Q on the left-hand supporting rod I^1 . R represents a bearing sleeve journaled in an upright position in a bearing r formed in the hub of the yoke and provided at its upper end with an enlargement or shoulder r^1 whereby the same engages the upper end of said bearing. S represents an upright shaft or rod secured at its lower end to the upper side of the rubbing disk in any suitable way and connected with the bearing sleeve R in such a manner that the shaft is compelled to turn with the sleeve but is free to move vertically relatively thereto. This connection between the upright shaft and the bearing sleeve is preferably effected by making the shaft square or of other prismatic form in cross section and engaging the same with a correspondingly-shaped opening extending axially through the bearing sleeve. The downward movement of the rubbing disk and its shaft is limited by means of a cotter or pin s extending through the square shaft and adapted to engage with the upper end of the bearing sleeve. The axis of the rubbing disk is vertically in line with the axis of the tub, so that these parts rotate concentrically relatively to each other.

Various means may be provided for producing a vibrating or oscillating movement of the rubbing disk and its shaft, the means shown in the drawings being preferred and constructed as follows: Below the hub J of the yoke the bearing sleeve R has secured thereto a driven gear segment T which meshes with a driving gear segment U piv-

oted on the hub of the yoke at one side of the axis of the bearing sleeve and preferably in front of the same. On its front side the outer gear segment U has pivotally connected therewith an operating rod or lever V which is capable of swinging vertically relative to the outer gear segment and is provided at its outer end with an upwardly projecting handle *v* for manipulating this lever. The central part of this operating lever slides laterally through the upper section W of a coupling which latter is pivoted by means of a horizontal transverse pin *w* to a lower coupling section W¹. The lower end of the last-mentioned section is provided with a depending pivot pin *w*¹ which turns in a socket X secured to the outer side of the wash tub.

Y represents a diametrically divided cover which is adapted to fit over the top of the wash tub and which is provided with an opening for the reception of the upright shaft of the rubbing disk in the usual manner.

During the operation of washing a batch of clothes, the operator merely moves the operating lever back and forth by means of the handle *v* during which movement the tub is oscillated by reason of the coupling between the same and the operating lever, and the rubbing disk is oscillated owing to the gear connection between the operating lever and the shaft of the rubbing disk, but the movement of the tub and disk are always in opposite directions. During the rocking movement of the operating lever the same slides back and forth through the upper section W of the coupling between the lever and the tub owing to the pivots of the lever and tub being out of line or eccentric relatively to each other. When it is desired to expose the top of the tub preparatory to taking out the clothes and wringing the same through a wringer mounted on the wringer-board, the cover sections are first removed and then the operating lever is lifted so as to disengage the pin *w*¹ of the lower coupling section from the socket *x* on the tub. Then the cam M is turned so as to unlock the right yoke-arm *j* from the wing and then the rubbing disk is lifted together with its shaft until the disk is close to the underside of the gearing. The yoke and disk are now raised together a sufficient distance to disengage the right arm *j* from the socket of the wing, as shown in Fig. 2. After the yoke and disk have reached the last-mentioned position, these parts are moved obliquely forward away from the left-hand rod I¹ a sufficient distance to disengage the clutch jaws of the left yoke arm *j*¹ from those of the swivel sleeve, thereby permitting the rear parts of the yoke and rubbing disk to be tilted downwardly a sufficient distance to enable the rubbing disk

to swing bodily upward with the yoke without striking the wing. After the rubbing disk has cleared the wing, the same together with the yoke may be again turned back into the position in which the clutch jaws of the left yoke-arm *j*¹ are again opposite the spaces between the clutch jaws of the swivel sleeve and upon reaching this position the yoke together with the rubbing disk may be again pushed obliquely backward on the swivel guide rod until the clutch jaws of the yoke are again in engagement with those of the swivel sleeve. When the parts are in the last-mentioned position, the rubbing disk, yoke, swivel sleeve and associated parts may be swung upwardly and laterally into an inclined position in which the underside of the rubbing disk faces upwardly and its lower edge overhangs the space within the wash tub, as shown by dotted lines in Fig. 2, thereby uncovering the opening at the upper end of the wash tub but permitting the water dripping from the rubbing disk to fall into the tub instead of on the floor. The rubbing disk, yoke and associated parts, are held in this inclined position by gravity, the movement in this direction being limited by the lower or rear shoulder *q*¹ on the swivel sleeve engaging with the inner side of the stop pin Q on the supporting rod I¹. When it is desired to wash another batch of clothes the rubbing disk, yoke, operating lever and associated parts are again returned to their normal position, the parts being manipulated for this purpose reversely to the manner and in the order above described for opening up the machine preparatory to wringing the clothes.

In the construction of my improved washing machine shown in Figs. 1, 2, 3 and 6, both the tub and the rubbing disk receive an oscillatory movement. If desired, the rubbing disk may remain stationary while the tub oscillates during the washing operation. Such an organization of the machine is shown in Fig. 8 and in this construction the hand operating lever, the gearing between this lever and the rubbing disk and the pivotal support for the rubbing disk are omitted and instead of the same the tub is oscillated by any suitable means and the upright shaft or stem S¹ of the rubbing disk engages slidingly with the correspondingly-shaped opening Z in the hub J¹ of the yoke, so as to permit of raising and lowering the rubbing disk for opening or closing the machine but preventing the rubbing disk from turning.

It will thus be apparent that my improved means for supporting the rubbing disk so as to permit of conveniently inserting the same into the tub, removing the same from the tub and supporting the same in a position to deliver its drippings into the tub, are equally applicable to a machine in which

the rubbing disk is either held stationary relatively to the tub or is capable of oscillation.

I claim as my invention:

5 1. A washing machine comprising a stationary support, an oscillating tub pivotally mounted on said stationary support, and means for assisting the return of the tub in either direction comprising a rocking arm pivoted on said support at one side of the pivot of the tub, a spring connecting the free end of said arm with said support, and lugs arranged on the tub and adapted to engage with opposite sides of the return arm.

2. A washing machine comprising a stationary frame, a platform arranged on top of said frame, a rotatable support pivoted on the frame, a tub removably seated on said support, and a return device comprising a rock arm pivoted on said platform at one side of the pivot of the tub support, a spring connecting the free end of said arm with said platform and lugs arranged on the tub and adapted to engage with opposite sides of said arm.

3. A washing machine comprising a rotatable tub, a rubbing disk arranged in said tub, a frame on which said tub is pivoted and having a support which overhangs said tub and disk, a yoke on which said disk is mounted, and means whereby said yoke is capable of a sliding and a swiveling movement relatively to said support comprising a swivel sleeve which is pivoted on said support and on which said yoke slides.

4. A washing machine comprising a rotatable tub, a rubbing disk arranged in said tub, a frame on which said tub is pivoted and having a support which overhangs said tub and disk, a yoke on which said disk is mounted, and means whereby said yoke is capable of a sliding and a swiveling movement relatively to said support comprising a swivel sleeve which is pivoted on said support and which has a guide rod and a guide sleeve forming part of the yoke and sliding on said rod.

5. A washing machine comprising a rotatable tub, a rubbing disk arranged in said tub, a frame on which said tub is pivoted and having a support which overhangs said tub and disk, a yoke on which said disk is mounted, and means whereby said yoke is capable of sliding and a swiveling movement relatively to said support comprising a swivel sleeve which is pivoted on said support and which has a guide rod, a guide sleeve forming part of the yoke and sliding on said rod and cooperating locking jaws arranged on the opposing parts of said guide sleeve and swivel sleeve.

6. A washing machine comprising a ro-

tatable tub, a rubbing disk arranged in said tub, a frame on which said tub is pivoted and having a support which overhangs said tub and disk, a yoke on which said disk is mounted, and means whereby said yoke is capable of a sliding and a swiveling movement relatively to said support comprising a swivel sleeve which is pivoted on said support and on which said yoke slides, and means for limiting the rotary movement of said sleeve on said support.

7. A washing machine comprising a rotatable tub, a rubbing disk arranged in said tub, a frame on which said tub is pivoted and having a support which overhangs said tub and disk, a yoke on which said disk is mounted, and means for pivotally mounting said yoke on said support comprising a sleeve carrying said yoke and pivoted on said support and means for limiting the rotary movement of said sleeve on said support comprising a pin arranged on said support, and stop lugs or shoulders arranged on said sleeve and adapted to engage with opposite sides of said pin.

8. A washing machine comprising an oscillating tub, a disk oscillating in the tub, a frame on which said tub is pivoted and which has a support overhanging said tub and carrying said disk, and means for actuating said tub and disk comprising a driven gear segment operatively connected with said disk, a driving gear segment pivoted on said support and meshing with said driven gear segment, a lever pivoted on said driving gear segment to swing vertically and a sliding connection between said lever and tub.

9. A washing machine comprising an oscillating tub, a disk oscillating in the tub, a frame on which said tub is pivoted and which has a support overhanging said tub and carrying said disk, and means for actuating said tub and disk comprising a driven gear segment operatively connected with said disk, a driving gear segment pivoted on said support and meshing with said driven gear segment, a lever connected with said driving gear segment, and a connection between said lever and tub comprising an upper coupling section through which said lever slides lengthwise, a lower coupling section pivotally connected with the upper coupling section and provided with a pivot pin, and a socket on said tub which receives said pivot pin.

Witness my hand this 2nd day of September, 1909.

FREDERICK H. WIARD.

Witnesses:

STANLEY G. BIRD,
LEWIS GUSTAFSON.