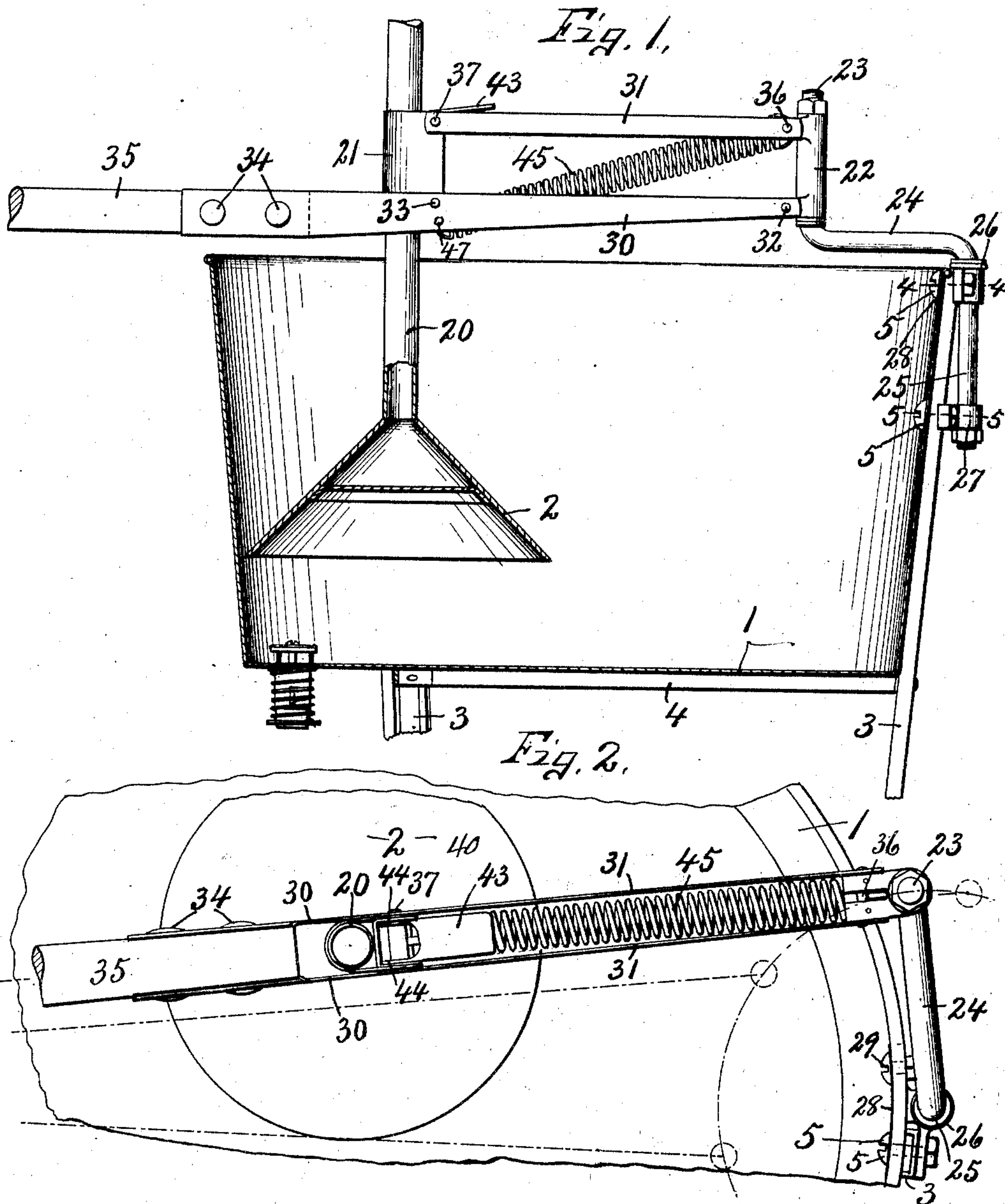


W. J. ZUILL.  
 WASHING MACHINE.  
 APPLICATION FILED OCT. 2, 1907.

927,918.

Patented July 13, 1909.  
 2 SHEETS—SHEET 1.



Witnesses.  
 Allen Williams  
 J. C. Thomas

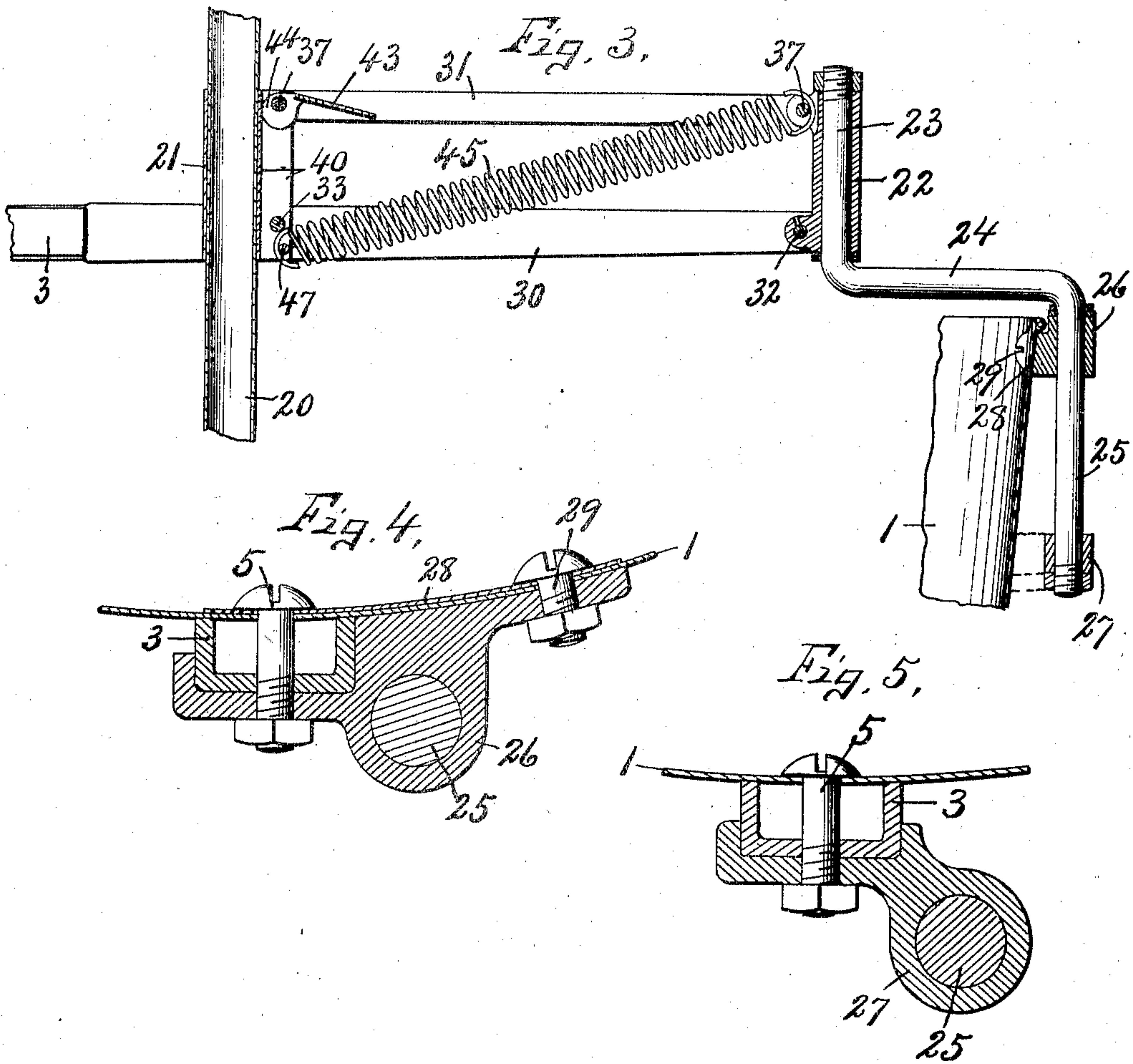
Inventor.  
 W. J. Zuill  
 By  
 Howard P. Brinson  
 Attorney.

W. J. ZUILL.  
WASHING MACHINE.  
APPLICATION FILED OCT. 2, 1907.

927,918.

Patented July 13, 1909.

2 SHEETS—SHEET 2.



Witnesses.  
Allen Williams  
J. O. Thomas

Inventor.  
W. J. Zuill  
By  
Howard P. Druden  
Attorney.



# UNITED STATES PATENT OFFICE.

WALTER J. ZUILL, OF SYRACUSE, NEW YORK.

## WASHING-MACHINE.

No. 927,918.

Specification of Letters Patent.

Patented July 13, 1909.

Application filed October 2, 1907. Serial No. 395,535.

*To all whom it may concern:*

Be it known that I, WALTER J. ZUILL, of Syracuse, in the county of Onondaga, in the State of New York, have invented new and useful Improvements in Washing-Machines, of which the following, taken in connection with the accompanying drawings, is a full, clear, and exact description.

This invention relates to certain improvements in washing machines of the class set forth in the patent to Dodge & Zuill, No. 645,464, March 13, 1900 in which a sheet metal tub is mounted upon a suitable tripod and adapted to receive a hollow conical sheet metal agitator or plunger capable of traversing the interior area of the tub and is also reciprocated vertically by the same actuating means and is also adjustable vertically upon its actuating mechanism.

In order to produce the desired vertical action and horizontal oscillatory swing of the agitator, a sleeve is journaled on one arm of a one-piece crank on the frame or tub of the machine, and is connected by a parallel link motion and a suitable retracting spring to the supporting head for the plunger, one of the links being provided with a suitable handle by which the plunger may be manipulated.

In my present invention I have sought to provide an eccentric clamping device for the plunger which is located between and protected more or less by the bars of the link motion and enables the plunger to be adjusted and clamped in any position thus permitting the use of a tubular plunger without perforating the same thereby reducing the weight of the operating parts.

Other objects and uses relating to specific parts of the washing machine will be brought out in the following description.

In the drawings:—Figure 1 is a transverse vertical sectional view of the upper portion of the washing machine showing the plunger and its operating mechanism in elevation and also showing the discharge valve, the lower portion of the legs of the tripod being broken away. Fig. 2 is a top plan of the mechanism seen in Fig. 1 showing the greater portion of the tub broken away. Fig. 3 is a longitudinal vertical sectional view through the plunger mechanism as seen in Fig. 1. Figs. 4 and 5 are enlarged detail sectional views taken respectively on lines 4—4 and 5—5, Fig. 1.

This washing machine comprises essentially a sheet metal tub —1—, a hollow conical sheet metal plunger —2—, a suitable actuating mechanism for reciprocating the agitator vertically and moving it horizontally throughout substantially the entire area of the interior of the tub.

The tub —1— is preferably mounted upon a suitable tripod consisting in this instance of upright legs or channel irons —3— and a horizontally disposed triangular frame —4— secured at its apexes to the legs —3— and extending under the bottom of the tub to form a support therefor, the channel irons or legs —3— being extended upwardly along the sides of the tub equi-distant apart and are secured thereto by suitable fastening means as bolts —5— which latter are usually arranged above the water line so as to avoid as far as practicable leakage in case the bolts are not snugly fitted in the apertures through which they pass.

The plunger —2— preferably consists of a hollow conical sheet metal shell having a tubular stem —20—, said plunger being movable vertically and horizontally by suitable mechanism hereinafter described and having its stem adjustable vertically within a U-shape sheet metal head —21—. This U-shape head —21— is connected by a parallel link motion to a tubular sleeve —22— which is journaled upon one of the upright arms —23— of a one-piece double crank arm the other arm —25— of said crank being journaled in suitable bearings —26— and —27—. These bearings are preferably made in the form of brackets secured in different horizontal planes one above the other to one of the supporting legs —3— for the tub —1—, as best shown in Figs. 4 and 5, each bracket being provided with a channel and opposed ribs for receiving and embracing the adjacent portion of the leg —3— where it is held in position by suitable clamping bolts —5—, the bracket —26— being additionally secured to the tub by an additional clamping bolt —29— and a reinforcing plate —28— which is interposed between the inner heads of the bolts and adjacent inner face of the tub.

The axes of the arms —22— and —25— of the crank are parallel but are offset or spaced apart a sufficient distance to give the desired sweep or horizontal movement to the plunger —2— so that the plunger can be



moved by its operating mechanism to traverse practically the entire area of the bottom of the tub.

The sleeve —22— and head —21— are disposed in parallel vertical planes and are connected at opposite sides of their axes by a lower pair of links —30— and an upper pair of oppositely disposed links —31—, the links —30— being pivoted at —32— to the sleeve —22— at one side of its axis and are also pivoted at —33— to opposite sides of the head —21—, said links —30— being extended some distance beyond the pivot —33— where they are united by rivets or bolts —34— to a handle —35—. This handle together with the opposed links —30— constitute an operating lever by means of which the plunger —2— may be reciprocated vertically and at the same time the crank arm —24— may be rotated about the axis of the upright arm —25— so as to shift the plunger —2— horizontally.

The upper links —31— are disposed in horizontal planes substantially parallel with the links —30— and side by side at opposite sides of the sleeve —22— and head —21— to which latter elements they are pivoted at —36— and —37— respectively thereby constituting together with the links —30— a parallel link motion connecting the head —21— to the sleeve —22— to establish a parallel vertical motion for the plunger —2— as the handle —35— is operated vertically.

By disposing the links of each set or pair at opposite sides of a plane drawn through the axes of the arms —23— and stem —20—, I practically eliminate any possibility of torsional strains upon the pivotal or journal bearings of different parts of the plunger operating mechanism and thereby materially increase the life of the machine.

The U-shape head —21— is closely fitted around three sides of the stem —20— while the other side is engaged by a yielding clamping plate —40— forming a part of the head and loosely secured thereto by the pivotal bolts —33— and —37— for the links —30— and —31— respectively, the apertures in the sides of the clamping plate —40— being slightly larger than the rivets which pass therethrough so as to allow a slight adjustment of the clamping head to and from the stem —20— of the plunger whereby said clamping head may be tightened and released by the cam lever —43—.

The links —30— and —31— of each pair are spaced apart vertically and laterally and between the plunger end of the links —31— is interposed a lever —43— which is preferably formed of sheet metal and is provided with opposite eccentric ears or bearings

—44— pivotally mounted upon the pin —37— and adapted to be brought into engagement with the plate —40— to spring the latter into frictional holding engagement with the tubular stem —20— and to permit the latter to be adjusted and clamped in any vertical position. This eccentric lever —43— is therefore practically concealed and protected between the adjacent ends of the links —31— which are spaced apart laterally a sufficient distance to permit the insertion of the hand or fingers of the operator for adjustment of the cam-lever in clamping or releasing the plunger in and from its adjusted position.

A coil spring —45— is interposed in a diagonal position between the links —30— and —31— of each set and has one end attached to the pivotal pin —36— of the links —31— while its other end is similarly attached to a separate pin —47— on the lower end of the head —21— said spring being tensioned to exert an upward pull or lift upon the head —21— and plunger —20— attached thereto so that the agitator —2— is normally held in its extreme up position.

What I claim is:

1. In a washing machine, a tub, a rock arm mounted on the tub, an upright sleeve journaled on the rock arm, a pair of links pivoted at one end to the upper portion of the sleeve, a separate pair of links pivoted at one end to the lower portion of the sleeve, a clamping head pivoted to and between the opposite ends of each pair of links, a plunger adjustable vertically in the head, and a cam lever pivoted to and between the links of one pair and coacting with said head to clamp the plunger in its adjusted position.

2. In a washing machine, a tub, a rock arm mounted on the tub, an upright sleeve journaled on the rock arm, a pair of links pivoted at one end to the upper portion of the sleeve, a separate pair of links pivoted at one end to the lower portion of the sleeve, a clamping head pivoted to and between the opposite ends of each pair of links, a plunger adjustable vertically in the head, and a cam lever pivoted to and between the links of one pair and coacting with said head to clamp the plunger in its adjusted position, and a tension spring connected to the upper end of the sleeve and to the lower end of said head for elevating the plunger.

In witness whereof I have hereunto set my hand this 27th day of September 1907.

WALTER J. ZUILL

Witnesses:

H. E. CHASE,  
C. M. McCORMACK.