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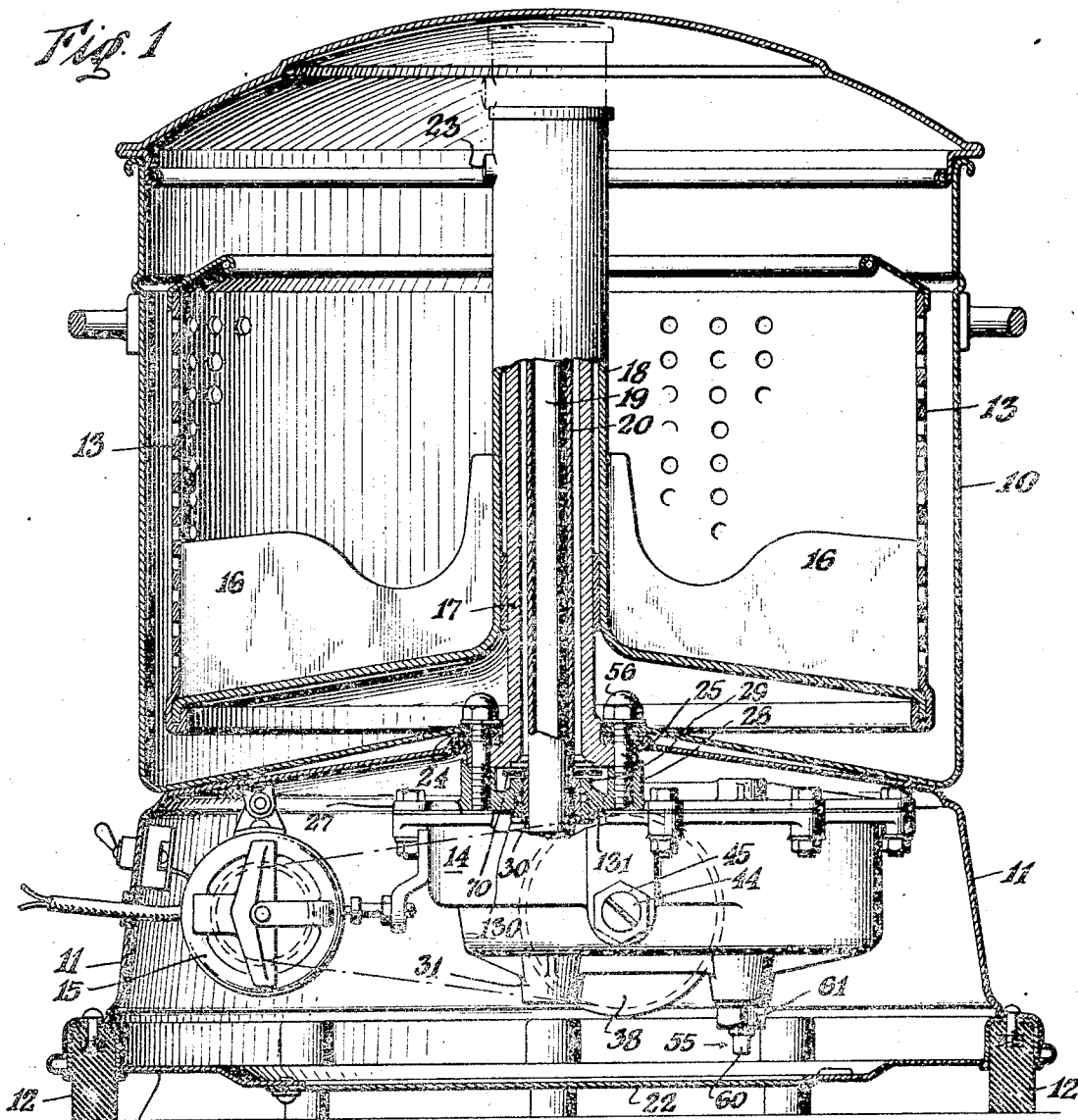
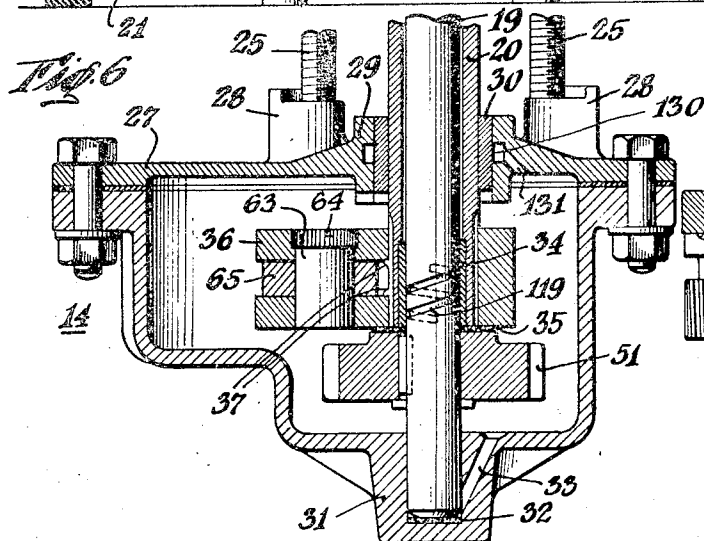
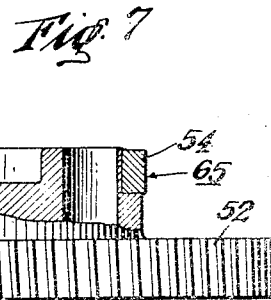
G. H. REAMA

1,957,978

GEARING FOR LAUNDRY MACHINES

Filed Sept. 26, 1932

3 Sheets-Sheet 1



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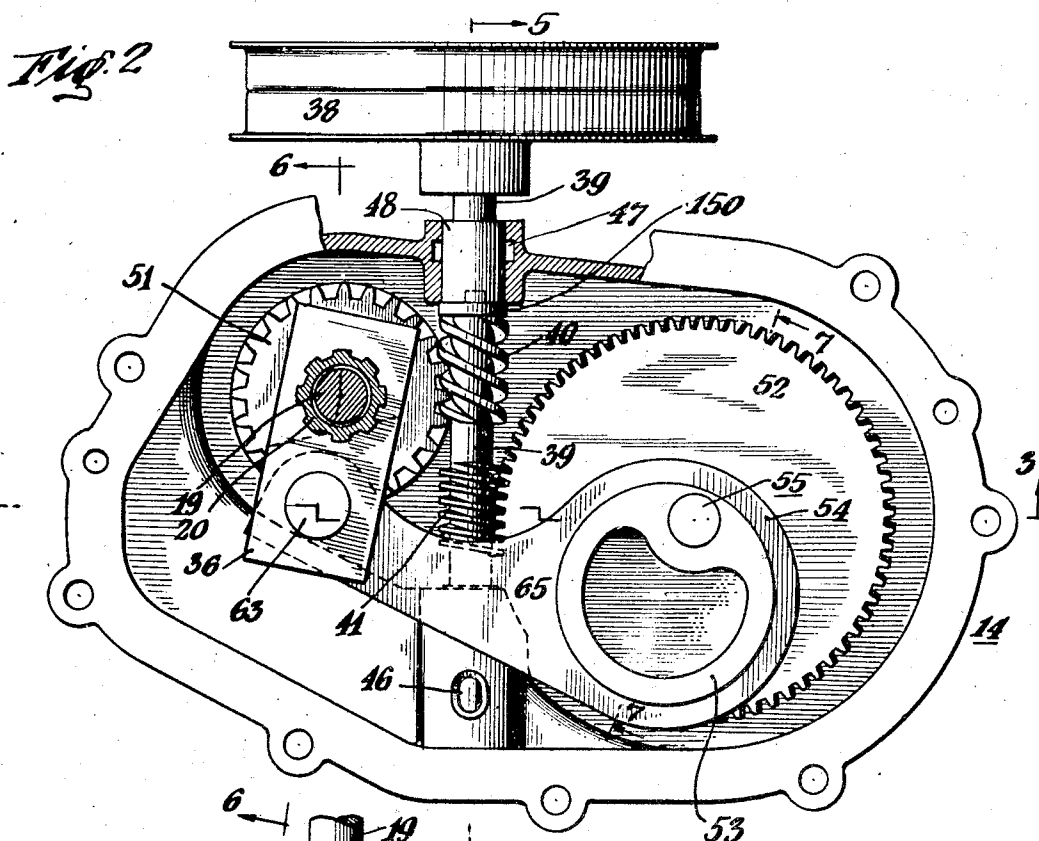
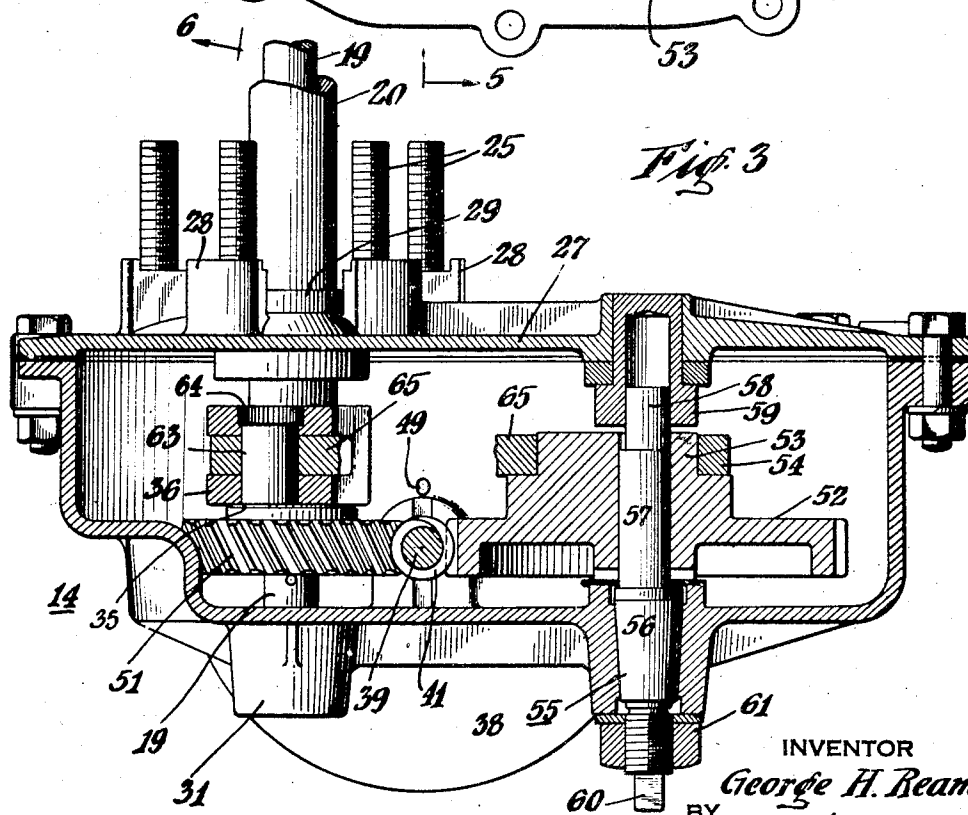
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Fig. 4

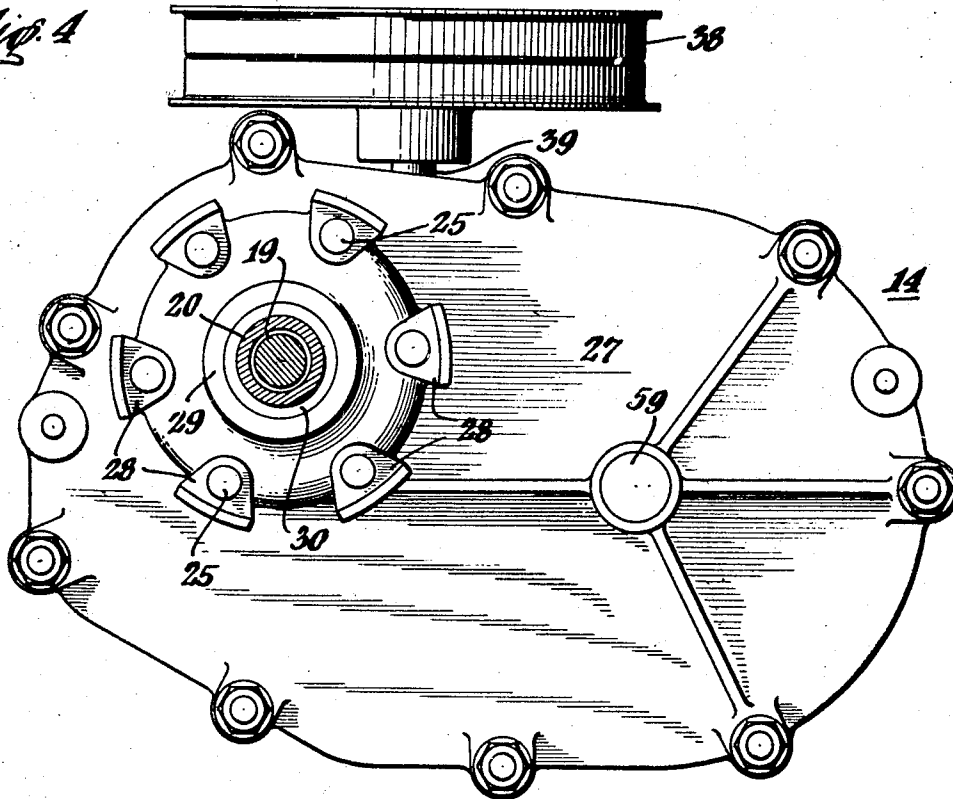
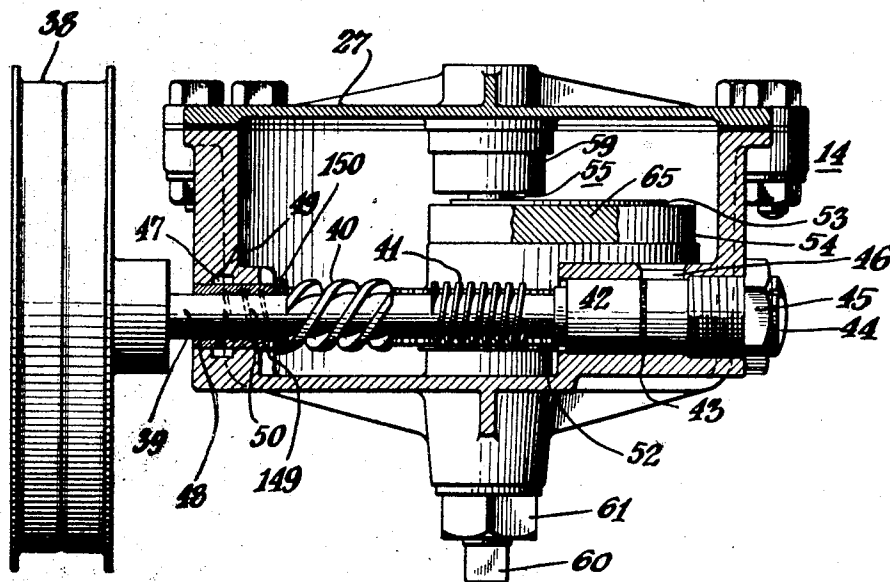


Fig. 5



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UNITED STATES PATENT OFFICE

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GEARING FOR LAUNDRY MACHINES

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Application September 26, 1932, Serial No. 634,845

10 Claims. (Cl. 74-75)

The invention relates in general to gearing, and more particularly to gearing for a washing machine of the centrifugal extracting type.

The gearing according to the invention is preferably used with a combined washing and drying machine having a foraminous clothes basket or receptacle having agitator blades therein and adapted to be oscillated for washing purposes and rotated continuously for the centrifugal drying operation. The clothes basket is preferably mounted upon a vertical pedestal within an outer tank and the pedestal preferably contains concentric drive shafts, one of which imparts the oscillatory washing motion to the receptacle and the other imparts the continuous drying motion to the receptacle.

According to a preferred form of the invention, the gearing for driving the concentric shafts is enclosed in a gear box disposed under the outer tank. This gearing may comprise a main drive shaft having a pair of worms, one of which directly drives the inner concentric shaft and the other of which drives an idle wheel. This idle wheel has an eccentric portion on which is mounted a link in such manner that the stud for the idle wheel may be supported at both ends.

The outer concentric shaft may have an oscillating arm secured thereto by a tapered spline arrangement. The oscillating arm may have a forked end receiving the drive link, the pin passing through the forked end and drive link being rigidly secured to the former.

The invention also consists in certain new and original features of construction and combinations of parts hereinafter set forth and claimed.

Although the novel features which are believed to be characteristic of this invention will be particularly pointed out in the claims appended hereto, the invention itself, as to its objects and advantages, and the manner in which it may be carried out, may be better understood by referring to the following description taken in connection with the accompanying drawings forming a part thereof, in which

Fig. 1 illustrates one form of washing machine with which the invention may be used;

Fig. 2 is a plan view of the gear box according to the invention, with the cover removed;

Fig. 3 is a section on the line 3-3 of Fig. 2;

Fig. 4 is a top plan view of the gear box detached from the machine; and

Figs. 5, 6 and 7, are sections on the lines 5-5, 6-6 and 7-7, respectively, of Fig. 2.

In the following description and in the claims,

various details will be identified by specific names for convenience, but they are intended to be as generic in their application as the art will permit.

Like reference characters denote like parts in the several figures of the drawings.

In the drawings accompanying and forming part of this specification, certain specific disclosure of the invention is made for purposes of explanation, but it will be understood that the details may be modified in various respects without departure from the broad aspect of the invention.

Referring now more particularly to the drawings, the type of washing machine shown for purposes of illustration, comprises a tank 10 resting upon a supporting skirt 11, which in turn is supported by rubber legs 12. Disposed within the tank 10 is a foraminous clothes basket 13 having a plurality of agitator blades 16 secured thereto. For driving the clothes basket, a gear box 14 is disposed under the bottom of the tank, as shown, being driven by electric motor 15. The skirt 11 forms a compartment to protect and hide both the gear box 14 and motor 15 and may be provided with a bottom plate 21 to which the giveable rubber legs 12 are secured. A removable door 22 may be provided to give access to the compartment formed by the skirt 11.

Extending up from the tank bottom is a tubular pedestal 17 around which fits the tubular hub 18 of the clothes basket 13. Within the pedestal 17 are concentric shafts 19 and 20 which are adapted to be selectively connected to the hub 18 by a clutch device, indicated in general by 23. This clutch arrangement is for the purpose of selectively imparting the washing and drying motions to the basket and is disclosed in detail in Dunham application Serial No. 318,177, filed November 9, 1928. It will be noted that the concentric shafts 19 and 20 extend down into the gear box 14 and are driven thereby as will be hereinafter explained.

Referring now more particularly to Figs. 2-7, the electric motor 15 drives pulley 38 through a suitable belt, the pulley 38 being mounted upon worm shaft 39. The shaft 39 supports worms 40 and 41 which drive respectively worm wheels 51 and 52. Worm wheel 51 is mounted directly upon the inner shaft 19 which is a high speed centrifugal extracting shaft. Worm wheel 41 drives idle wheel 52, which in turn drives eccentric, 53 driving link 65, pivoted to arm 36, which is connected to the tubular shaft 20 which is the oscillatory washing shaft.

The lower end of pedestal 17 is provided with

a fitting 24 which provides a seat for the bottom of tank 10 and for the top wall of skirt 11. The gear box 14 is secured to this fitting, as shown.

The gear box 14 is made up of a lower hollow body and a removable upper cover 27 connected thereto by the usual bolts. Secured to the cover 27 are a plurality of flanged bosses 28 which are centered upon the fitting 24 and in which are anchored studs 25. The studs 25 pass through the fitting 24 and through the bottom of the tank 10 and top of skirt 11, suitable gaskets being interposed, and all parts being clamped together by acorn nuts 56 to form a water tight connection.

To provide a bearing in the gear box cover 27 for tubular shaft 20, sleeve 29 and porous bushing 30 is provided (Fig. 6). An oil channel 130 is provided with duct 131 leading from the interior of the gear case. Splashed oil enters duct 131 into channel 130 and is absorbed into bushing 30 to lubricate shaft 20.

To journal inner shaft 19 in the gear box, tubular extension 31 is provided having a fibre washer 32 to take the end thrust. Oil hole 33 is provided to lubricate this bearing. Worm wheel 51 is suitably keyed and pinned on inner shaft 19, as shown, and operating arm 36 is fixedly secured to outer shaft 20, as shown. Bearing sleeve 34 is provided between shafts 19 and 20. Fibre washer 35 is located between arm 36 and gear 51. Shaft 19 is provided with a helical groove 119 to prevent rising of oil between shafts 19 and 20.

To provide an inexpensive and permanent connection between arm 36 and shaft 20, shaft 20 is provided with tapered splines which are similar to the tapered splines on the other end of the tubular shaft which are disclosed in the above mentioned copending application. The operating arm 36 is provided with a corresponding tapered recess and is driven onto the end of shaft 20. The splines on shaft 20 are then deformed or upset as at 37 to permanently lock the members 20 and 36 together. The forked end 36 provides space to give access to the splines to be upset.

Referring now to Figs. 2 and 5, the worm shaft 39 is provided with an enlarged journal portion 42 which rotates in a tubular part of the casing. Threaded into this tubular part is a set screw 44 having a lock nut 45. Fibre washer 43 is interposed between journal 42 and set screw 44 to take the end thrust of worms 40 and 41. Oil hole 46 is provided for lubricating this bearing.

The other end of the worm shaft 39 is journaled in porous bushing 48 mounted in the casing wall. A channel 47 is provided, fed by duct 49. Oil fed into channel 47 by duct 49 is absorbed into porous bushing 48, the interior of which has a helical oil groove 50. Oil is permitted to drain out of this bearing through slot 149 into the bottom of the gear box. Washer 150 is interposed between the end of this bearing and worm 40.

Thus the axial clearance of shaft 39 is easily adjusted by set screw 44, the end thrust upon the opposite end being taken by washer 150. Lock nut 45 locks set screw 44 in adjusted position after a proper end clearance has been given to shaft 39.

Referring now to Fig. 3, the idle worm wheel 52 is journaled upon a stud 55 supported at both ends. Stud 55 is provided with an upper portion 58 mounted in a sleeve 59 which may either form part of the cover 27 or be in the form of a separate sleeve, as indicated. Stud 55 is provided with a lower tapered portion 56 seating in a tapered part of the gear box and also has a threaded

end on which is threaded nut 61. The lower end is also provided with an oblong shaped projection 60. Located between portions 58 and 56, which are concentric, is an eccentric portion 57 on which the gear 52 is journaled. A fibre washer may be interposed between the gear 52 and the lower wall of the gear box, if desired.

Thus after unloosening nut 61 a wrench may be applied to part 60 and the clearance between worm 41 and worm wheel 52 may be adjusted, the oblong shape of member 60 indicating the position thereof. Tightening down on nut 61 clamps the tapered part 56 in its seat and holds the stud in permanent adjusted position.

Formed integral with the idle wheel 52 is an eccentric portion 53 on which rides a sheave 54 forming part of link 65 which is connected to arm 36 by pin 63. The link 65 is positioned in the forked end of arm 36 and pin 63 is provided with a knurled or roughened shoulder portion 64 which may be forced into its seat to tightly lock the pin 63 into the forked end of arm 36.

If desired, a washer 70 (Fig. 1) may be secured to outer shaft 20 and disposed within the space between fittings 24 and 28 to deflect clear of the machine any water which may accidentally leak down between pedestal 17 and tubular shaft 20, through the space between lugs 28. This space is also of advantage to release any oil which may accidentally creep up between bushing 30 and shaft 20 to prevent any chance of this oil working its way into the space for the clothes and washing liquid.

Thus a gearing arrangement is provided which is rugged in construction and inexpensive to manufacture and assemble. The pin 63 may be quickly positioned in the arm 36 by a simple drive fit. Similarly, the arm 36 may be quickly positioned on the shaft 20 by a simple drive fit, after which the splines may be upset.

The use of the eccentric 53 on idle wheel 52 permits the use of a stud which may be supported at both ends making a strong construction. The adjustment feature of the stud 57 permits the relation between worm 41 and worm wheel 52 to be adjusted with nicety. The provision of a forked end on the oscillating arm 36 provides support to the crank pin 63 at both ends and also operates to hold the link in position on the eccentric 53.

This application represents an improvement over the gearing construction disclosed in Dunham application Serial No. 315,365, filed October 27, 1928.

While certain novel features of the invention have been disclosed and are pointed out in the annexed claims, it will be understood that various omissions, substitutions and changes may be made by those skilled in the art without departing from the spirit of the invention.

What is claimed is:

1. In gearing for a washing machine or the like, a shaft, an operating arm on said shaft, said arm having a forked end, a link within said forked end, a crank pin secured to said forked end and passing through said link, a crank member, means for journaling said link on said crank member, said forked end holding said link in position on said crank member, said link being otherwise free to move axially of the crank member.

2. In gearing for a washing machine or the like, a shaft, an operating arm on said shaft, said arm having a forked end, a link within said forked end, a pivot pin having a roughened shoul-

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der, said forked end having a bore and an enlarged seat, said shoulder being driven in said seat with said pivot pin passing through said link and said bore, a crank member, and means for
5 journaling said link on said crank member.

3. In gearing for a washing machine or the like, a gear box, a stud supported at opposite ends, said stud having an eccentric bearing portion between said ends, a gear on said bearing
10 portion, a second gear in mesh therewith, said stud having a tapered portion, said gear box having a tapered seat receiving said tapered portion, said stud having a threaded end and a nut on
15 said threaded end to wedge said tapered portion against said tapered seat after said stud is adjusted to adjust the clearance between said gears.

4. In gearing for a washing machine or the like, a gear box, a shaft, said shaft having an eccentric bearing portion, a gear on said bearing
20 portion, a second gear in mesh therewith, said shaft having a tapered portion, said gear box having a tapered seat receiving said tapered portion, and means to wedge said tapered portion
25 against said tapered seat after said stud is adjusted to adjust the clearance between said gears.

5. In a washing machine, a shaft having a plurality of tapered splines, a crank arm having a bore with corresponding grooves and driven
30 on said splines, said crank arm having a slot, said splines being upset at a portion within said slot to form an abutment larger than said bore to lock said crank arm on said shaft axially, a
35 drive shaft, a link pivoted to said crank arm and means for driving said link from said drive shaft.

6. In a washing machine, a shaft having a plurality of splines, a crank arm having a bore with corresponding grooves and driven on said splines, said splines being deformed to form an abutment
40 larger than said bore to lock said crank arm on said shaft, a drive shaft, a link pivoted to said crank arm and means for driving said link from said drive shaft.

7. In a gear box for washing machines and the like, a drive shaft having a pair of worms thereon, worm wheels on opposite sides of said drive
45 shaft meshing said worms respectively, concentric inner and outer shafts journalled in said gear box, said inner shaft being secured to said first
50 worm wheel, an operating arm secured to said outer shaft, an eccentric secured to said second worm wheel, a link on said eccentric and con-

nected to said arm, a stud supported at opposite ends in said gear box and having an eccentric bearing portion on which said second worm wheel is journalled, said stud also having a tapered
80 portion fitting in a corresponding tapered portion in the wall of said gear box, and a nut for wedging said tapered portions together.

8. In a washing machine, a gear box having a hollow body and a cover therefor, said body having a bearing in the bottom thereof, said
85 cover having a second bearing in line with said first bearing, concentric inner and outer shafts, said inner shaft being journalled in said first bearing, said outer shaft being journalled in said second bearing, a bearing sleeve between and at
90 the lower end of said concentric shafts, an operating arm secured to said outer shaft, a first worm wheel secured to said inner shaft, a fibre washer between said arm and worm wheel, said
95 crank arm having its end forked, a crank pin secured in said forked end, a worm shaft journalled in said body and having worms thereon, an idle shaft on the opposite side of said worm shaft from said concentric shafts, said idle shaft being
100 supported both in the bottom of said body and in said cover, a second worm wheel on said idle shaft and having an eccentric portion, a link having a sheave on said eccentric portion and being journalled in said forked end, said worm wheels
105 meshing said worms.

9. In gearing for a washing machine or the like, a shaft, an operating arm on said shaft, a link, pivot means connecting said link and operating arm, a second shaft, an eccentric sheave
110 on said second shaft, said link having a strap journalled on said eccentric sheave, said pivot means holding said link in position on said eccentric sheave, said link being otherwise free to move axially of the eccentric sheave.

10. In gearing for a washing machine or the like, a vertical shaft, an operating arm on said shaft, a link, pivot means connecting said link and operating arm, a second vertical shaft, an eccentric sheave on said second vertical shaft, means for supporting said second vertical shaft
120 on opposite sides of said sheave, said sheave having an enlarged shoulder on its lower side, said link having a strap journalled on said sheave and resting against said shoulder, said pivot means preventing upward displacement of said link
125 from said sheave.

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