Jan. 2, 1923.

1,440,530.

W. J. CONLON ET AL.

DRIVING MECHANISM FOR WASHING MACHINES.

FILED MAR. 16, 1916.

3 SHEETS--SHEET 1.

Fig. 1

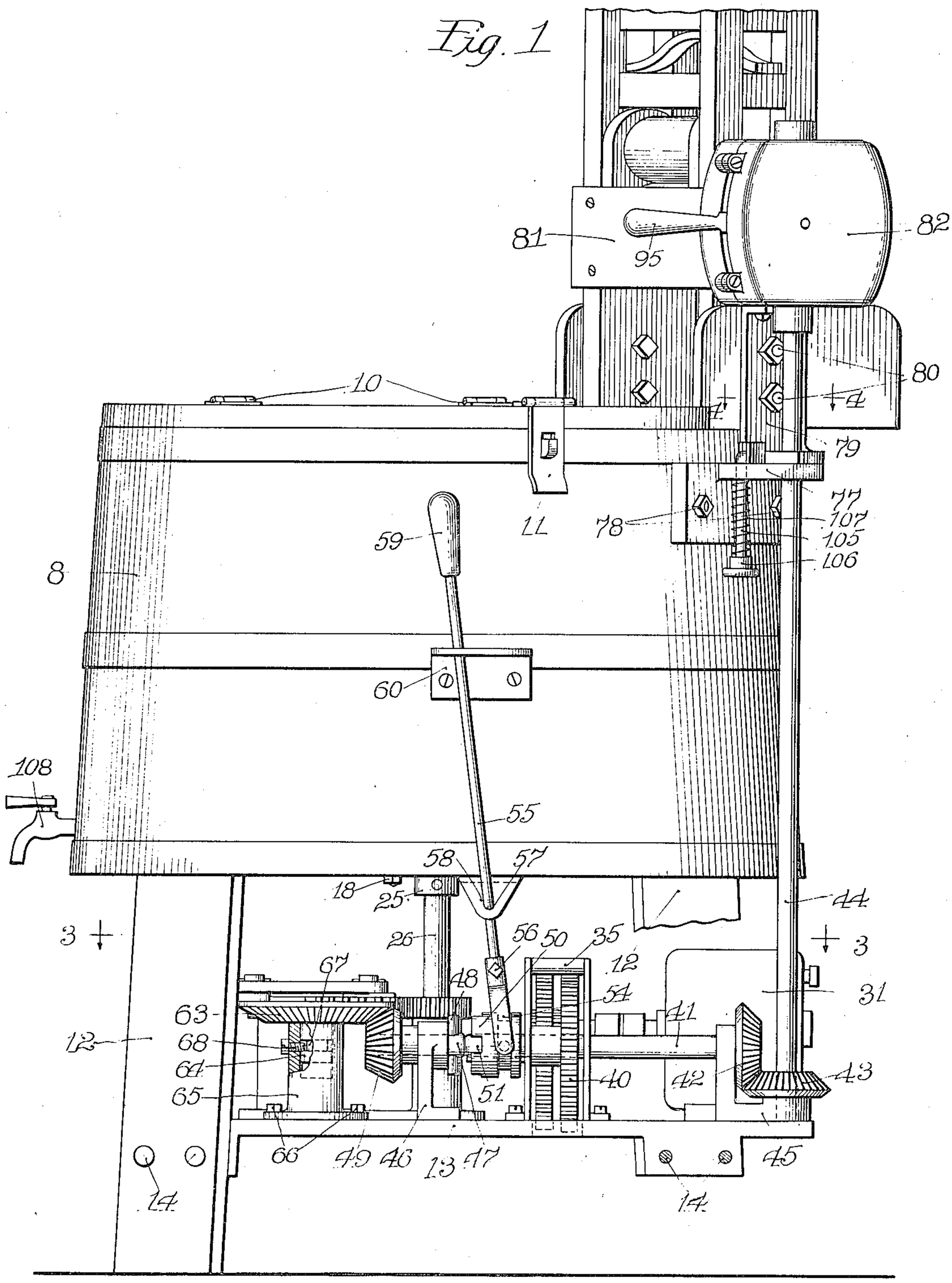

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Fig. 2

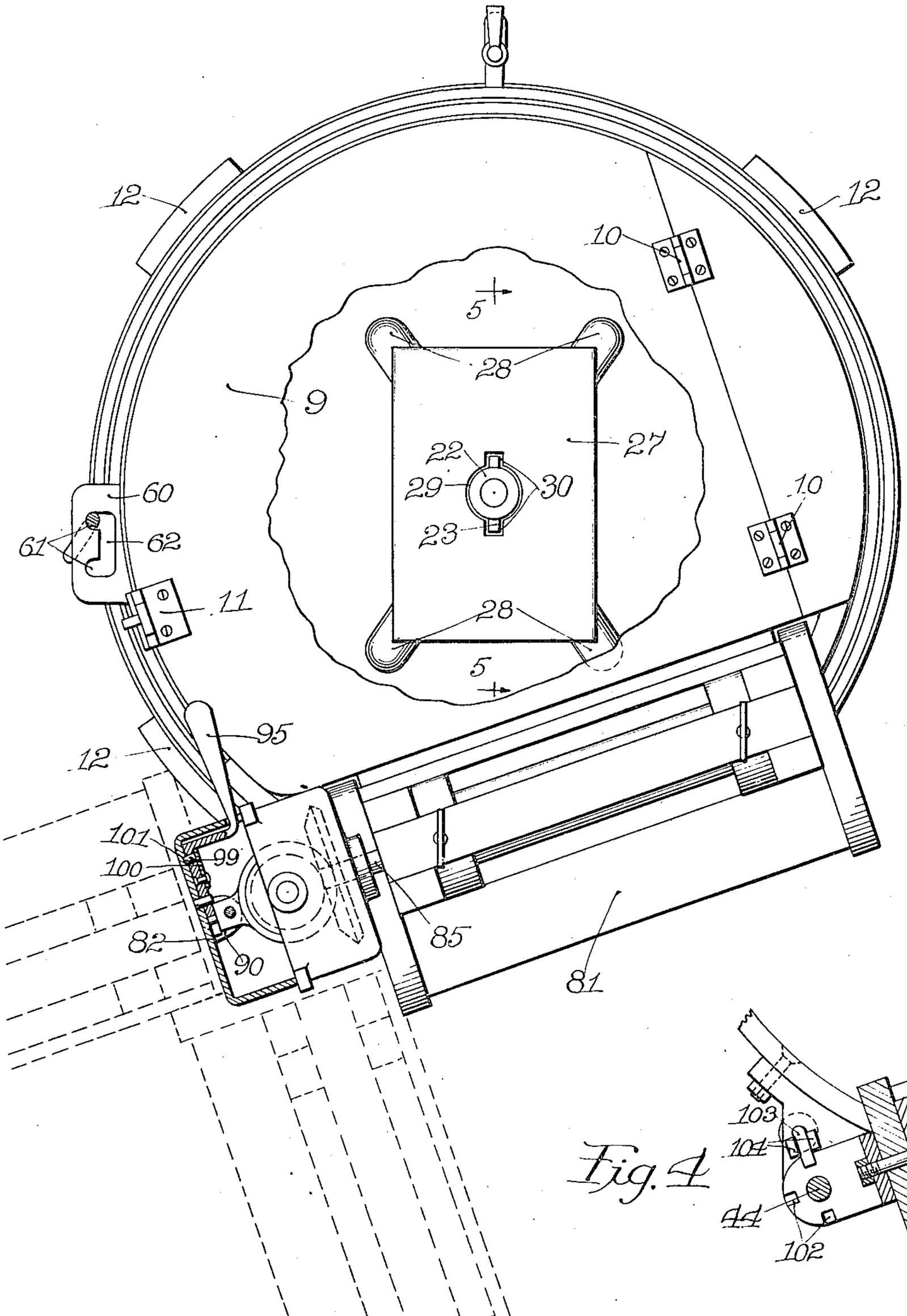

Fig. 4

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Fig. 3

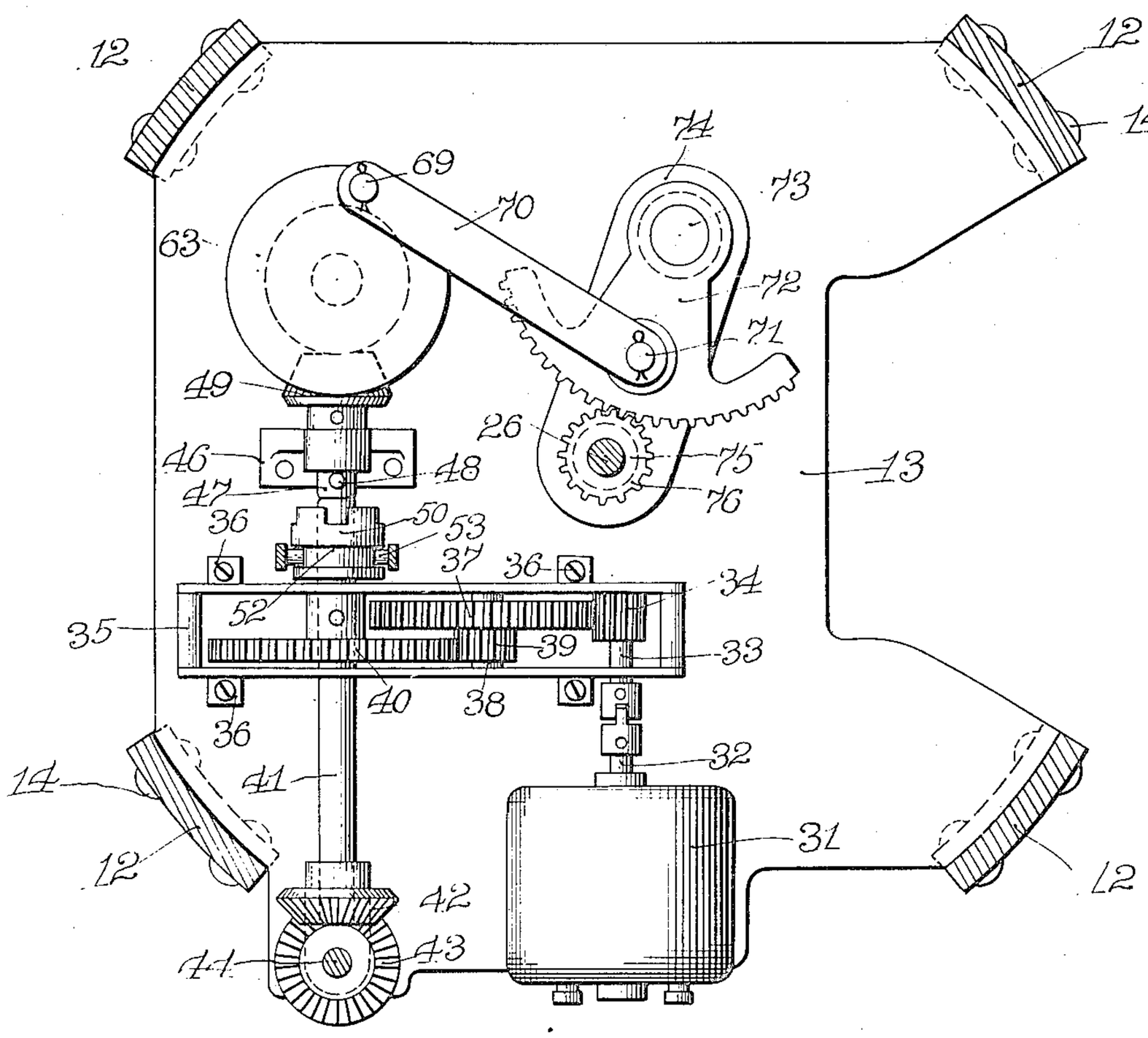
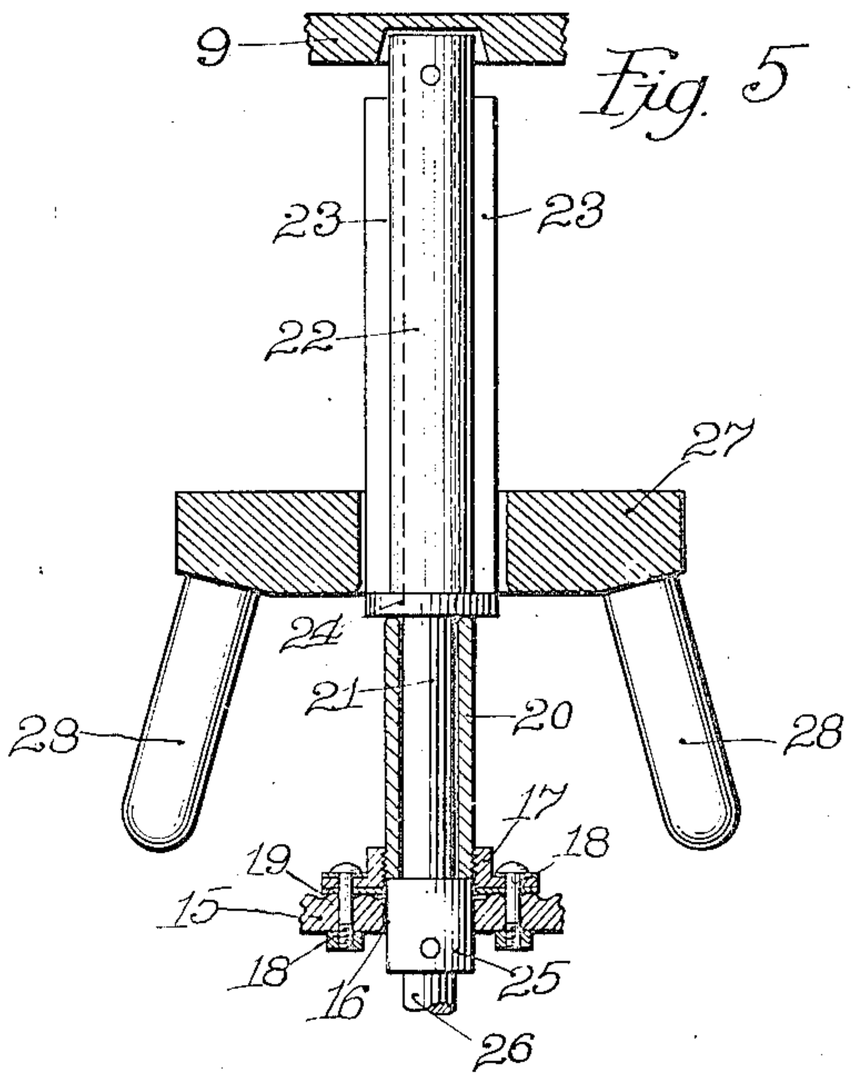


Fig. 5



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Patented Jan. 2, 1923. 1,440,530

UNITED STATES PATENT OFFICE.

WALTER J. CONLON AND WILLIAM F. MORAN, OF CHICAGO, ILLINOIS, ASSIGNORS TO CONLON ELECTRIC WASHER CO., INC., OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

DRIVING MECHANISM FOR WASHING MACHINES.

Application filed March 16, 1916. Serial No. 84,539.

To all whom it may concern:

Be it known that we, WALTER J. CONLON, and WILLIAM F. MORAN, citizens of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Driving Mechanism for Washing Machines, of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

Our invention relates to washing machines, and is directed particularly toward that type of machine commonly known as a "Dolly" washer.

Although it will appear that certain features of our invention may be employed whether the machine is power driven or hand driven, it is pertinent here to state that we are especially concerned with the power driven machine and certain other features of our invention are therefore exclusively concerned with the power drive.

The features of our invention, made the subject-matter of the appended claims, have been created with the primary purposes of simplicity and economy in structure and ease of operation, and, as this description proceeds, it will be seen that the various elements co-operate with each other to secure these desired results.

In accordance with our invention, we combine and locate the operating mechanism upon a shelf supported above the floor and below the tub from the legs which support the tub, and the tub itself is burdened with no mechanism other than the essential "Dolly" on its inside. In addition to this arrangement and disposition of the operating mechanisms, it will be seen that certain features of such mechanisms are new in and of themselves, and some of the appended claims have been drawn accordingly.

The foregoing is intended to assist those skilled in the art in comprehending our invention and in distinguishing, from what follows, between what is old and what is new, and other features, not mentioned above, which are novel, will be pointed out from time to time as the description proceeds.

In the accompanying drawings—

Figure 1 is an elevational view of the entire machine, one of the legs being removed in order to reveal the construction otherwise hidden by it;

Figure 2 is a plan view of the machine, parts being broken away and shown in section in order to reveal the structure clearly;

Figure 3 is a horizontal sectional view taken on the plane of the line 3—3 of Figure 1 and looking in the direction indicated by the arrows;

Figure 4 is a horizontal sectional view taken on the plane of the line 4—4 of Figure 1 and looking in the direction indicated by the arrows; and

Figure 5 is a vertical sectional view taken on the plane of the line 5—5 of Figure 2 and looking in the direction indicated by the arrows.

In these drawings it will be seen that the usual circular tub is illustrated at 8. The cover 9 therefor is hinged at 10—10 and may be held closed by means of a hasp 11.

The tub 8 is supported upon legs 12—12 and a shelf 13 is secured to the legs by means of bolts 14—14 this shelf being disposed below the tub and above the floor.

As illustrated particularly in Figure 5, the base 15 of the tub 8 is provided with a central opening 16 which, upon the top side of the base, is surrounded by a flange member 17 secured in place by means of bolts 18—18, a washer 19 being disposed between the flange member and the base, as illustrated. A tube 20 is screwed into the flange member 17 and the "Dolly" shaft 21 passed through the opening 16, through the flange member 17, and through the tube 20, this "Dolly" shaft extending upwardly to the cover 9. A sleeve 22 is secured to the upper end of the "Dolly" shaft and this sleeve carries the keys 23—23 and the flange 24, this flange resting upon the top of the tube 20. A union 25 connects the "Dolly" shaft 21 with the driven shaft 26 which will be referred to again later. The "Dolly" is illustrated at 27 and it will be seen to comprise a rectangular board having a "prong" 28 extending downwardly and radially from each corner thereof. The board 27 is provided with a central opening 29 which is supplemented by the key slots 30—30 so that the "Dolly" may be slipped over the sleeve 22, adjustably as to height, and made to rotate therewith. The "Dolly" is adapted to rest upon the clothes and may occupy any position throughout the

length of the sleeve 22 depending upon the amount of clothes in the tub.

As best shown in Figures 1 and 3, an electric motor 31 is mounted upon the shelf 13, the shaft 32 of this motor being connected with the shaft 33 of a pinion 34, which shaft is kept in a rectangular framework 35 secured to the shelf 13 by means of screws 36—36. The pinion 34 meshes with a gear 37 upon a shaft 38 also journaled in this framework, the shaft 38 also carrying a pinion 39 which meshes with a gear 40 secured to the shaft 41. The shaft 41 is also journaled in the framework 35 and extends beyond both sides of said framework. On one side the shaft 41 terminates in a beveled gear 42 which meshes with a bevel gear 43 mounted upon a shaft 44, an L-shaped bearing member 45 providing the bearing for the shaft 44 and also providing an additional bearing for the shaft 41, as clearly shown in Figure 1. Reference will be made to the shaft 44 later.

Upon the other side of the framework 35 a bearing member 46 is secured upon the shelf 13, this bearing member carrying the stub shaft 47 provided with a cross pin 48 on one side of the bearing member and with a bevel gear 49 on the other side thereof, the stub shaft being thus held against longitudinal displacement. The shaft 47, as thus mounted, is disposed in axial alignment with the shaft 41 which, as will be seen, abuts the stub shaft. Upon that portion of the shaft 41 between the rectangular framework 35 and the stub shaft 47, a clutch collar 50 is provided, the clutch slots 51—51 of this clutch collar being adapted to co-operate with the cross pin 48 when the clutch collar is moved to the left (Figure 1) thus operatively joining the shafts 41 and 47.

The clutch collar 50 is provided with the annular groove 52 with which one or more pins 53 on the yoke 54 co-operate, this yoke being secured to the lower end of a control lever 55 by means of a set screw 56. The control lever is pivoted at 57 in a bracket 58 secured to the tub 8 and the upper end of the control lever extends to a point where it may be conveniently reached by the operator of the machine where it is provided with a handle 59. The control lever 55 passes through a catch plate 60 which is secured to the side of the tub, this catch plate having the locking slots 61—61 in which the control lever may engage itself, the passage of the control lever from one of these slots to the other being through the joining slot 62. It will be seen that the pivoting of the control lever 55 is secured by means of an offset at 57 and the arrangement is such that the natural resiliency of the rod 55 tends to hold it in one or the other of the catch slots 61—61.

The bevel gear 49 meshes with a bevel gear 63 carried upon a stub shaft 64 which, in turn, is set in the bearing 65 secured to the shelf 13 by means of bolts 66—66. The stub shaft 64 is provided with an annular groove 67 into which the end of a screw 68, passing through the member 65, is adapted to extend thus retaining the stub shaft within the bearing but permitting it to rotate.

Upon the top of the bevel gear 63 a crank pin 69 is provided and a connecting member 70 operatively connects this crank pin 69 with a crank pin 71 upon a gear segment 72 mounted upon a shaft 73 set in a bearing member 74 secured to the top of the shelf 13. The bearing member 74 also carries a journal box 75 into which the lower end of the driven shaft 26 extends. A pinion 76 is secured to the driven shaft 26 and meshes with the teeth on the segment, 72. It will now be seen that rotation of the bevel gear 63 results in the oscillating movement of the segment 72 resulting in the operation of the driven shaft 26, a few times in one direction, then a few times in the opposite direction and so on. It will be remembered that this shaft 26 is operatively connected with the "Dolly". It will also be kept in mind that when the handle 59 of the control lever is thrown over to the right (Figure 1) the clutch collar 50 is thrown over to the left so as to connect operatively the shaft 41 and the gear 49. In this way the driving shaft 32 of the electric motor is operatively mechanically connected with the "Dolly" to secure the operation above pointed out. It will be clear that when the control lever is in the position shown in Figure 1, the chain of parts between the electrical motor and the "Dolly" is broken at the clutch and the motor therefore merely idles so far as the "Dolly" is concerned.

The shaft 44 extends upwardly through a corresponding opening in a bracket 77 which is secured to the side of the tub 8 by means of bolts 78—78. An L-shaped bracket 79 rests on top of the bracket 77 and is pivotally mounted on the shaft 44. The vertical member of the bracket 79 has secured thereto, by means of bolts 80—80, a wringer frame 81 in which the usual wringer mechanism is mounted. The shaft 44 extends upwardly into the control box 82, which is carried with the framework 81 of the wringer.

This control box encloses a construction of reversing gearing for driving the wringer rolls in either direction, which reversing gearing forms no part of the present invention and will not be described. Suffice it to say that the throwing of a control lever 95 to either side of a neutral horizontal position operates to drive the wringer rolls in either direction from power derived from the shaft 44.

90 designates one of two lugs between

which a guide rod for guiding the clutch shifting element extends. The control lever 95 is normally held in its inoperative or neutral position by means of a snap pin 99 carried upon a spring 100, this snap pin being adapted to engage in a recess 101 in the face of the wall of the gear casing.

As shown in Figure 4, the end of the horizontal portion of the bracket 79 is semicircular with the center of the shaft 44 as its center. It will also be seen that this semicircular part of the bracket 79 is provided with three peripheral notches 102, 102 in any of which a locking member 103 may engage. This locking member sets between two lugs 104, 104 and has a downwardly extending stem 105 passing through the horizontal member of the brackets 77. A head 106 provided with the lower end of the stem 105 and a spring 107 is disposed between the under side of the horizontal member of the bracket 77 and the top of the head 106, this spring tending to move the locking member 103 downwardly. It will thus be seen, depending upon which of the notches 102 the locking member engages in, that the wringer may be locked in any of three positions.

One of these positions is that shown in full line in Figure 2 where it is disposed close to and in front of the tub; the second position is that at right angles to the first position and the third position is that in line with the first position but on the opposite side of the pivot.

Due to the inherent friction of the gears as compared with that of the wringer swinging upon its pivot, the wringer itself, when released by raising the locking member 103 out of the notches 102, will swing with the shaft 44, assuming the clutch collar to be in one or the other of its engaging positions. The engagement of the wringer framework with the side of the tub limits the movement thereof. It will be seen that in whichever position the swinging wringer is placed, it is held there positively for proper operation as a wringer so that it may operate in that way for the purpose intended whether it is adjacent the tub 8, as illustrated in Figure 2 in full line, or in either of its other positions which may be adapted for wringing clothes from one or more auxiliary tubs. If desired, the locking member 103 may be raised to such a point as to rest upon the lugs 104 thus keeping it entirely out of engagement with the horizontal portion of the brackets 79. On the other hand, if the locking member 103 rests upon the top of the horizontal portion of the bracket 79, it will automatically snap into place due to the action of the spring 107 when the wringer is swung to the proper position to register with one of the notches 102.

The tub 8 may be provided with the faucet 108 for the removal of water therefrom. We have shown a rectangular "Dolly" of oblong shape, this being preferable to the circular "Dolly" for the reason that it overcomes the tendency for the clothes to be drawn toward the "Dolly" post, tending rather to throw the clothes outwardly toward the sides of the tub.

We claim:

1. In a washing machine, the combination with a supporting structure supporting a tub and having a shelf mounted below said tub, of an electric motor mounted on said shelf, a driven shaft extending horizontally above said shelf, reduction gearing connecting said electric motor with said driven shaft, a stub shaft mounted in axial alignment with said driven shaft, a clutch for operatively connecting said driven shaft with said stub shaft, a beveled pinion on said stub shaft, a beveled gear pivoted on a vertical axis between said shelf and the tub, said beveled gear meshing with said beveled pinion, a horizontally swinging segmental gear pivoted between said shelf and the tub, a link connecting said beveled gear with said segmental gear, a shaft extending up through the bottom of the tub, a gear on said shaft meshing with said segmental gear, an operating lever for said clutch, said operating lever extending up along side of the tub, and means on said tub for holding said operating lever in its operative and inoperative positions.

2. In a washing machine, a bearing, a shaft extending through said bearing, a beveled gear wheel on said shaft on one side of said bearing, a cross pin carried by said shaft on the other side of said bearing, said beveled gear wheel and said cross pin confining said shaft in said bearing, driven means mechanically connected with said beveled gear wheel, a driving shaft in axial alignment with said first named shaft, and a clutch member on said driving shaft adapted to be moved onto said first named shaft to cooperate with said cross pin.

3. In a washing machine, the combination with a supporting structure for supporting a tub and having a shelf mounted below said tub, of a prime mover on said shelf, a frame on said shelf, a reduction gearing carried in said frame, one shaft of said reduction gearing being operatively connected with said prime mover, a divided shaft driven by said reduction gearing, a sliding collar on one portion of said divided shaft provided with a recess, a plurality of projections on the remaining portion of said shaft for operatively engaging in the recesses in said collar, an oscillating shaft projecting upwardly through the bottom of the tub, an oscillating gear mounted between said tub and said shaft, a pinion mounted on said oscillating shaft and meshing with said

oscillating gear, and means comprising a crank and link for connecting said divided shaft with said oscillating gear.

4. In combination, a motor, reduction gearing connected to said motor, a driven shaft associated with said gearing, a bearing, a short shaft therein substantially in alignment with the driven shaft, a gear on said short shaft arranged on one side of said bearing, a transverse pin on the opposite side of said bearing extending through said short shaft, and a clutch collar on the driven shaft provided with recesses adapted to engage said pin.

5. In a washing machine, the combination with a supporting structure for supporting a tub and having a shelf mounted below said tub, of an electric motor on said shelf, a gearing frame on said shelf comprising two side plates, a driving shaft journaled in said side plates, said driving shaft being connected to said electric motor, a driven shaft and an intermediate shaft journaled in said side plates, a gear on said intermediate shaft and a gear on said driven shaft, a pinion on said driving shaft between said side plates meshing with the gear on said intermediate shaft, a pinion on said intermediate shaft driven by said latter gear, said latter pinion meshing with the gear on said driven shaft, a bearing support on said shaft, a stub shaft journaled in said bearing support in alignment with said driven shaft, a clutch collar mounted on said driven shaft adapted to engage with clutch means on said stub shaft, a beveled pinion on said stub shaft, a beveled gear mounted on a vertical axis on said shelf, said beveled pinion meshing with said beveled gear, a segmental gear pivoted on a vertical axis between said shelf and the bottom of said tub, a link connecting said beveled gear with said segmental gear, a vertical shaft extending up through the bottom of said tub, and a pinion on said vertical shaft meshing with said segmental gear.

In witness whereof, we hereunto subscribe our names this 14th day of March, A. D. 1916.

WALTER J. CONLON.
WILLIAM F. MORAN.