

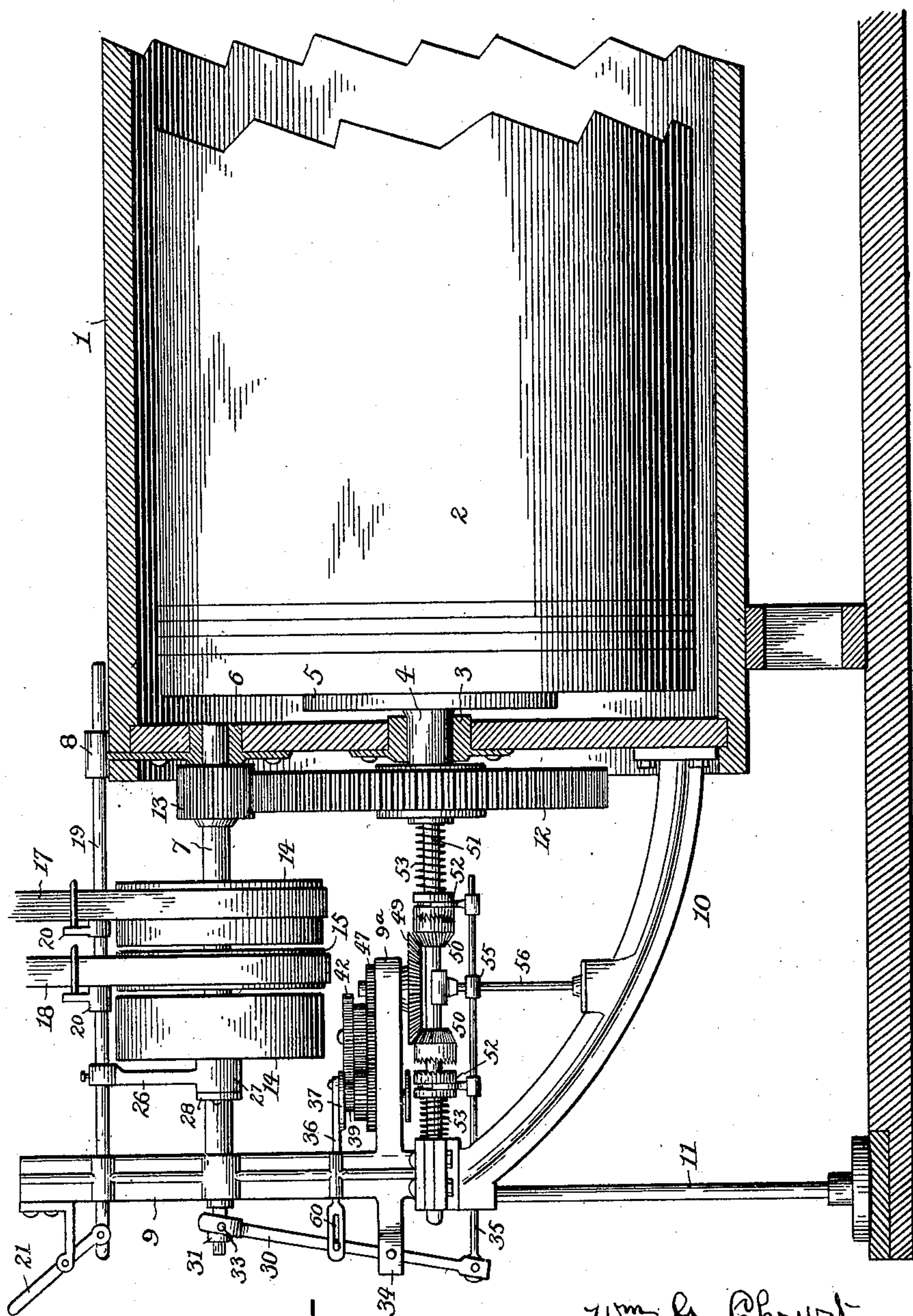
No. 861,951.

PATENTED JULY 30, 1907.

W. G. CHRYST.
OPERATING MECHANISM FOR WASHING MACHINES.

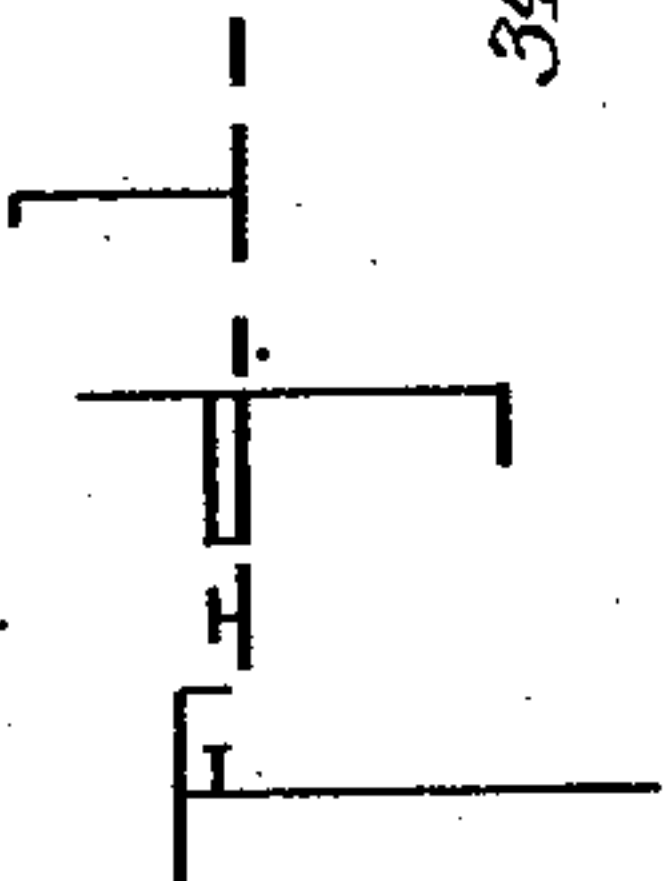
APPLICATION FILED OCT. 8, 1906.

2 SHEETS—SHEET 1.



Witnesses:

R. G. Beall.
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Wm. G. Chryst,

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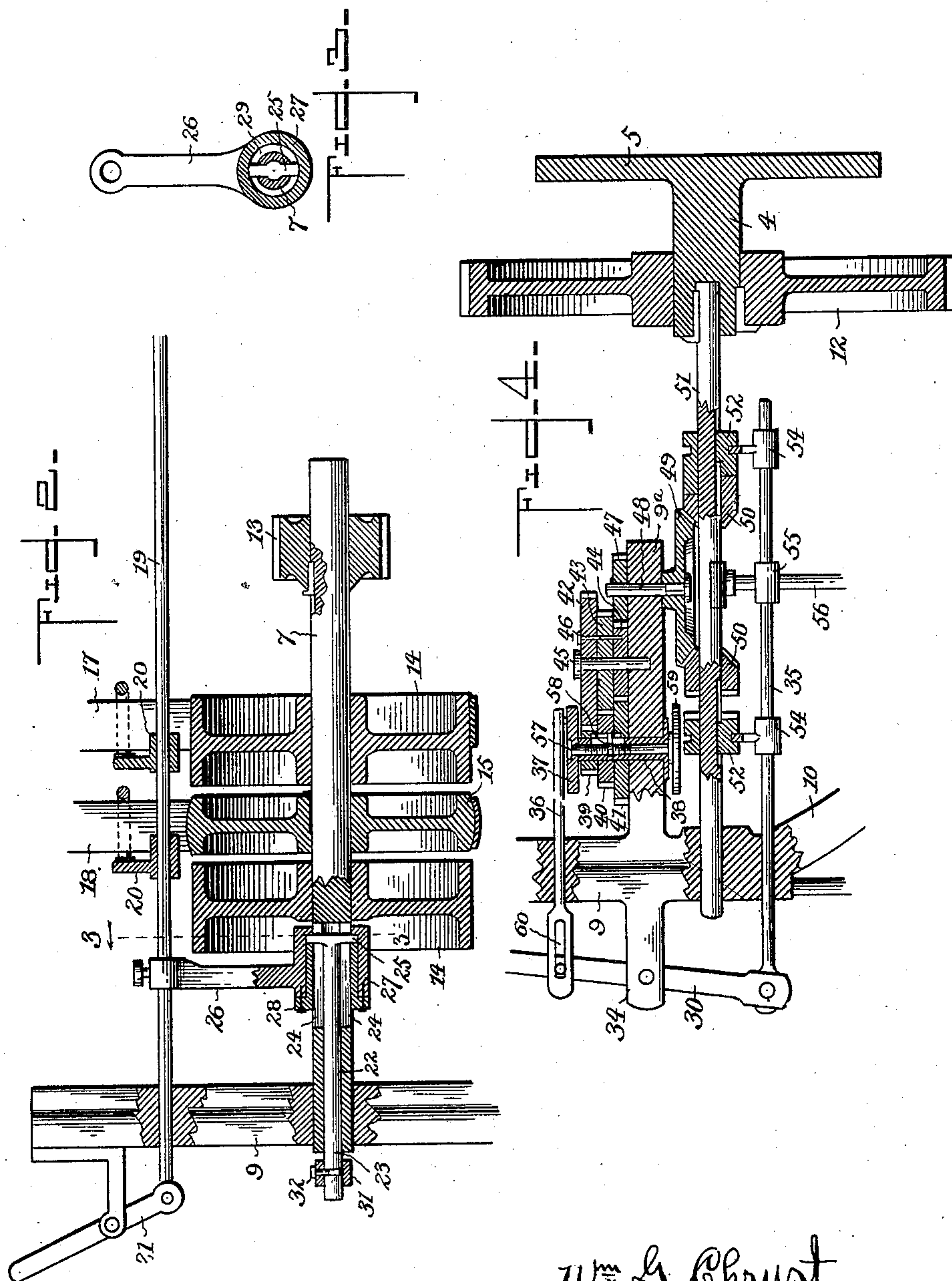
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UNITED STATES PATENT OFFICE.

WILLIAM G. CHRYST, OF PHILADELPHIA, PENNSYLVANIA.

OPERATING MECHANISM FOR WASHING-MACHINES.

No. 861,951.

Specification of Letters Patent.

Patented July 30, 1907.

Application filed October 8, 1906. Serial No. 338,000.

To all whom it may concern:

Be it known that I, WILLIAM G. CHRYST, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain Improvements in Operating Mechanism for Washing-Machines, &c., of which the following is a full and complete specification.

This invention is an improvement in operating mechanism for washing machines and other apparatus which are adapted to be driven by an oscillating rotary motion imparted to the cylinder or drum in which the clothes or other articles to be acted upon are placed.

The primary object of the invention is to provide a driving mechanism for various uses which is entirely automatic in its operation to reverse the rotation of the cylinder or drum at regular intervals so as to agitate the contents of such cylinder or drum in an even and regular manner.

A further object of the invention is to provide a simple and convenient means for adjusting the automatic devices whereby the number of rotations imparted to the cylinder or drum in each direction of its movement may be changed at will.

Other objects and advantages of the invention will appear in the following specifications, and what I claim as new and desire to protect by Letters-Patent is more particularly set forth in the appended claims.

In the accompanying drawings, which form a part of this specification: Figure 1 is a side elevation, showing the application of my invention. Fig. 2 is an enlarged detail sectional view through the shaft carrying the belt-pulleys, and showing the belt-shifter. Fig. 3 is a transverse sectional view on the line 3—3 of Fig. 2. Fig. 4 is an enlarged detail sectional view illustrating the automatic devices for operating the belt-shifter, and showing the means for regulating such automatic devices.

Like numerals of reference indicate like parts in all the figures of the drawings.

In Fig. 1 of the drawings I have shown my invention as applied to a washing machine, in which 1 is the outer casing or cylinder, and 2 the inner cylinder or drum; and these parts may be of any approved construction and may be adapted for other purposes than that of washing clothes, my present invention consisting in the particular mechanism for imparting to the inner cylinder or drum 2 an oscillating rotary motion.

In my prior application for patent filed September 11th, 1905, bearing Serial Number 277,991, I have shown and described a particular form of drum or washing machine which is especially adapted for use in connection with the driving mechanism herein shown and claimed.

The head of the stationary cylinder or casing 1 is provided centrally with a bearing-box 3, in which is journaled a gudgeon or stub-shaft 4, secured by disk 5 to the

adjacent end of the inner cylinder or drum 2, and a second bearing-box, as 6, is also secured to the head of the casing to form the bearing for one end of the main driving shaft 7, the upper attaching plate of said last mentioned bearing being extended through the top of the casing to support a sleeve 8, in which slides the belt-shifting rod hereinafter referred to.

As an outer support for the driving mechanism I provide a vertical standard 9, connected to a curved arm 10 extending from the casing 1, said supporting-frame 9 and 10 being braced by means of a vertical rod 11. The standard 9 is provided with bearings for the shafts and rods forming parts of the driving mechanism.

Fixedly mounted on the outer end of the stub-shaft 4 is a large gearwheel 12, which is in mesh with a pinion 13 on the main driving shaft 7, the latter being supported at one end in the bearing-box 6 and at its other end in the standard 9, and carries the loose pulleys 14 14 and the fixed pulley 15, the latter being located intermediate the loose pulleys. Over these pulleys pass the driving belts 17 and 18, which are oppositely driven so as to turn the driving-shaft in either direction according to which belt is shifted on to the fixed pulley 15. For the purpose of causing the belts to shift more quickly from the loose pulleys to the fixed or fast pulley the latter is slightly larger in diameter than said loose pulleys, the periphery being curved transversely as shown more clearly in Fig. 2 of the drawings.

The belt-shifter comprises the usual sliding-rod 19, carrying the belt-guides 20, and slidable in the standard 9 and sleeve 8, and provided at its outer end with a lever 21 for manually operating the same, and though this belt-shifter may be manually operated by the aforesaid lever it is preferably operated automatically by the devices which I shall now proceed to describe.

The main driving shaft 7 is provided for a portion of its outer end with a central bore 22, in which slides a rod 23 projecting beyond the outer end of said shaft, and at the inner end of the bore opposite slots 24 are formed in the shaft in which travels a cross-head 25 formed on the inner end of the rod. This sliding-rod 23 is connected to the sliding-rod 19 of the belt-shifter by means of a vertical arm 26, the hub of which latter is formed in two parts, 27 and 28, which encircle the shaft 7, the part or section 28 of said hub being in the form of a flanged sleeve fitting into the part or section 27 and forming an internal annular recess 29 (Fig. 3) in which the ends of the cross-head 25 project so as to move the arm 26 back and forth correspondingly with the movement of the sliding-rod 23. It will be understood, of course, that this rod 23 turns with the driving-shaft, and in order to connect the operating lever of the automatic devices therewith said rod has a collar 31 on its outer end with a screw 32 engaging a peripheral

recess in the rod, the collar being provided with pins or trunnions 33 which are engaged by the operating-lever 30.

The operating lever 30 is pivoted near its lower end 5 in an arm 34 projecting outward from the standard 9, and below said arm is connected to a slide-rod 35, hereinafter referred to. Above the arm the lever is connected to a pitman-rod 36, extending through the standard 9 from a pitman-wheel 37, the latter being 10 fixed to the upper end of a tube 38 supported in an arm 9^a of the standard and extending loosely through a set of three different size gearwheels 39, 40 and 41, which are in mesh with companion gearwheels 42, 43 and 44 15 mounted to rotate in unison on a vertical post 45 and connected together by a pin 46. The gearwheel 44 of the last mentioned series is in mesh with a pinion 47 fixed on a vertical shaft 48, to the lower end of which latter is fixed a bevel-gearwheel 49 in mesh with the clutch-members 50 secured upon a shaft 51. This 20 shaft 51 is keyed at one end to the stub-shaft 4 so as to rotate therewith, and is journaled at its outer end in the standard 9. The other clutch-member 52 is in slidable engagement with the shaft 51, and is engaged by a spring 53, which acts to move said clutch-member 25 towards its companion member. The sliding clutch-members 52 are connected to the slide-rod 35 by yokes 54, so that the idle clutch will be moved out of engagement by the operating lever 30, and thus prevented from "clicking", and said slide-rod 35 is supported in a bearing 55 at the upper end of a vertical 30 rod 56 rising from the curved arm 10, said vertical rod 56 also serving to support the intermediate portion of the shaft 51. It will be understood that the springs 53 serve merely to move the clutch-members 52 towards their companion members with relation to the yokes, and so as to compensate for any wear that may occur between the yokes and clutch-members.

It will be understood that the gearwheels 39, 40 and 41 are loosely mounted on the tube 38, and being in 40 mesh with the companion gears 42, 43 and 44 will be turned thereby at different speeds, and, therefore, in order to connect either one of said gearwheels 39, 40 or 41 with the pitman-wheel 37 a screw-threaded rod 57 is mounted to freely turn in the tube 38, and has threaded 45 thereon a collar 58 with a finger which passes through a vertical slot in one side of the tube to engage a recess in any one of the aforesaid gearwheels. When this finger is in engagement with one of the gearwheels said gear-wheel is then fixed or fast to the tube and turns the pit- 50 man-wheel at a rate of speed corresponding with that particular gearwheel, the others being loose on the tube to turn idly and not interfere with the working gear-wheel. The screw-threaded rod 57 is provided with a handwheel 59 for convenience in turning the same.

55 The connection of the operating lever 30 with the pitman-rod 36 is by means of a slot 60 in the latter, which permits of a quick throw of the lever at near the end of each stroke of the pitman-rod.

The operation of the driving mechanism is as follows. 60 Supposing the several instrumentalities to be in the positions shown in Fig. 1 of the drawings, with the belt 18 driving the fast pulley to the right. This motion will be imparted to the pinion 13, which being in mesh with the gearwheel 12 turns the drum 2 and also the shaft 51, 65 and the latter being connected to the bevel-gearwheel

49 will turn the pitman-wheel through the intermediate gear until said pitman-wheel operating the pitman-rod 36 throws the lever 30, which by means of the sliding-rod 23 and vertical arm 26 shifts the belt 18 from the fast pulley and the belt 17 on to said pulley, and as the 70 last mentioned belt is crossed to run the fast pulley and its shaft in an opposite direction from the belt 18 the rotation of the drum will be reversed. Obviously, when the lever 30 is shifted from one position to the other it will throw one of the clutches, the idle one, out 75 of operation so that it will not "click", it being understood that the intermeshing teeth of one clutch are disposed opposite to those of the other, and that said clutches being at opposite sides of the gearwheel 49 turns the same in opposite directions, according to 80 which clutch is in engagement therewith.

By regulating the gearing between the shaft 51 and the pitman-wheel 37 the number of rotations imparted to the drum in each direction may be changed.

As will be readily seen the entire operation is auto- 85 matic, and after the machine is started a regular and even oscillating rotary motion will be imparted to the drum so as to regularly and evenly agitate the contents of said drum.

Of course the machine may be stopped at any time 90 by manipulating the hand-lever 21 to shift the belts so that both of them will be located on the loose pulleys 14.

Having described my invention I do not wish to be limited to the precise construction and arrangement herein shown and described, as obviously minor 95 changes may be made in the gearing and connections without sacrificing any of the advantages of the invention, and all within the spirit and scope of my claims.

Having thus described my invention, I claim:

1. In an operating mechanism for washing machines, 100 etc. the combination with a driven element a gearwheel connected thereto, a driving-shaft, a pinion thereon in mesh with the aforesaid gearwheel, and two loose pulleys and an intermediate fast pulley on said driving-shaft over which the oppositely moving driving-belts pass, of a belt- 105 shifter for moving the belts, a pivoted lever for throwing the belt-shifter back and forth, and means for operating the lever from the gearwheel on the driven element, said means comprising a shaft rotated by the gearwheel, a pitman-wheel intermediate gearing between said pitman-wheel and shaft, and a pitman-rod connecting the pitman-wheel to the operating lever and slotted for such latter connection, substantially as shown and described.

2. In an operating mechanism for washing machines, etc., the combination with a driven element a gearwheel 115 connected thereto, a driving-shaft, a pinion thereon in mesh with the gearwheel, and the two loose and intermediate fast pulleys on the driving-shaft, over which pulleys the oppositely driven belts pass, of a belt-shifter, a pivoted lever connected thereto, and means for operating the lever comprising a shaft rotated by the gearwheel, a pitman-wheel, a rod connecting the pitman-wheel to the lever, two sets of intermeshing gearwheels interposed between said shaft and pitman-wheel, one set of said gears being loose 120 on the shaft of the pitman-wheel, and means for connecting any one of said gears to said shaft, substantially as shown and described.

3. In an operating mechanism for washing machines, etc., the combination with a driven element a gearwheel 130 connected thereto, a driving-shaft, a pinion thereon in mesh with the gearwheel, and the two loose pulleys and intermediate fast pulley over which the oppositely-driven belts pass, of a belt-shifter for moving the belts, a pivoted lever for operating the belt-shifter, and means for operating the lever comprising a driven shaft, a pitman-wheel, 135 a rod connecting the pitman-wheel to the lever, two sets of intermeshing gearwheels, one set being connected to-

gether and geared to the driven shaft and the other set being loosely mounted on the shaft of the pitman-wheel, and means for connecting any one of the last mentioned set of gearwheels to its shaft, substantially as shown and described.

4. In an operating mechanism for washing machines, etc., the combination with a driven element, a gearwheel connected thereto, a driving-shaft, a pinion thereon in mesh with the gearwheel, and two loose pulleys and intermediate fast pulley over which the oppositely-driven belts pass, of a belt-shifter consisting of a sliding rod with belt-guides, a pivoted lever for operating the belt-shifter, and means for operating the lever comprising a driven shaft, a pitman-wheel, a rod connecting the pitman-wheel to the lever, two sets of intermeshing gear-wheels one set being connected together and geared to the driven shaft, a tube connected to the pitman-wheel on which the other set of gearwheels is loosely mounted, said latter gearwheels having recesses adjoining said tube, a threaded rod working loosely in the tube, and a collar threaded on the rod within the tube and having a finger projecting through a vertical slot in the latter to engage the recesses in the gearwheels, substantially as herein shown and described.

5. In an operating mechanism for washing machines, etc., the combination with a driven element a gearwheel connected thereto, a driving-shaft, a pinion thereon in mesh with the gearwheel, and two loose pulleys and an intermediate fast pulley over which the oppositely-driven belts pass, of a belt-shifter consisting of a sliding-rod with belt guides, a pivoted lever for operating the belt-shifter, and means for operating the lever comprising a driven shaft, a pitman-wheel, a rod connecting the pitman-wheel to the lever, two opposite clutches on the driven shaft, a gearwheel in mesh with said clutches, two sets of intermeshing gearwheels interposed between the aforesaid gearwheel and the pitman-wheel one set being connected together and geared to the gearwheel, a tube connected to the pitman-wheel and on which the other set of gearwheels is loosely mounted, said latter gearwheels having recesses adjoining said tube, a threaded rod working loosely in the tube, and a collar threaded on the rod within the tube and having a finger projecting through a vertical slot in the latter to engage the recesses in the gearwheels; together with a rod connected to the lever and to the sliding members of the clutches to move the same out of engagement alternately, substantially as herein shown and described.

6. In an operating mechanism for washing machines, etc., the combination with a driven element a gearwheel

attached thereto, a driving-shaft, a pinion thereon in mesh with the gearwheel, and two loose pulleys and an intermediate fast pulley over which the oppositely-driven belts pass, the driving-shaft having a bore with opposite slots at the inner end of said bore, of a rod slidable in the bore of the shaft and having a cross-head projecting through the slots, an arm having a hub with a flange at one end embracing the shaft and a flanged sleeve secured in said hub to provide with the flange an internal annular recess in which the ends of the cross-head travel, a pivoted lever connected to the slide-rod, and a belt shifting rod with guides connected to the arm; together with means for automatically operating the lever comprising a driven shaft, a pitman-wheel, a rod connecting the pitman-wheel to the lever, and gearing between the driven shaft and pitman-wheel, substantially as herein shown and described.

7. In an operating mechanism for washing machines, etc., the combination with a driven element a gearwheel attached thereto, a driving-shaft, a pinion thereon in mesh with the gearwheel, and two loose pulleys and an intermediate fast pulley over which the oppositely-driven belts pass, the driving shaft having a bore with slots through opposite sides of the shaft at the inner end of said bore, of a rod slidable in the bore of the shaft and having a cross-head projecting through the slots, and an arm having a hub with a flange at one end embracing the shaft and a flanged sleeve secured in said hub to provide with the flange an internal annular recess in which the ends of the cross-head travel; a pivoted lever connected to the slide-rod, and a belt shifting rod connected to the arm and provided with the usual belt-guides; together with means for operating the lever comprising a driven-shaft, gears on the driven-shaft and mechanism to clutch them alternately thereto, a gearwheel in mesh with said gears, a pitman-wheel, a rod connecting the pitman-wheel to the operating-lever, and two sets of intermeshing gearwheels interposed between the aforesaid gearwheel and pitman-wheel one set being connected together and geared to the gearwheel a tube connected to the pitman-wheel and on which the other set of gearwheels is loosely mounted, and means for connecting any one of the last mentioned gearwheels to the tube, substantially as herein shown and described.

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

WILLIAM G. CHRYST.

Witnesses:

ALBERT SEAFRIED,
ALEX. COLVILLE.