H. BUDD.

GEAR SHIFTING MECHANISM.

APPLICATION FILED JUNE 16, 1917.

1,370,947.

Patented Mar. 8, 1921.

3 SHEETS—SHEET 1.

Fig. I.

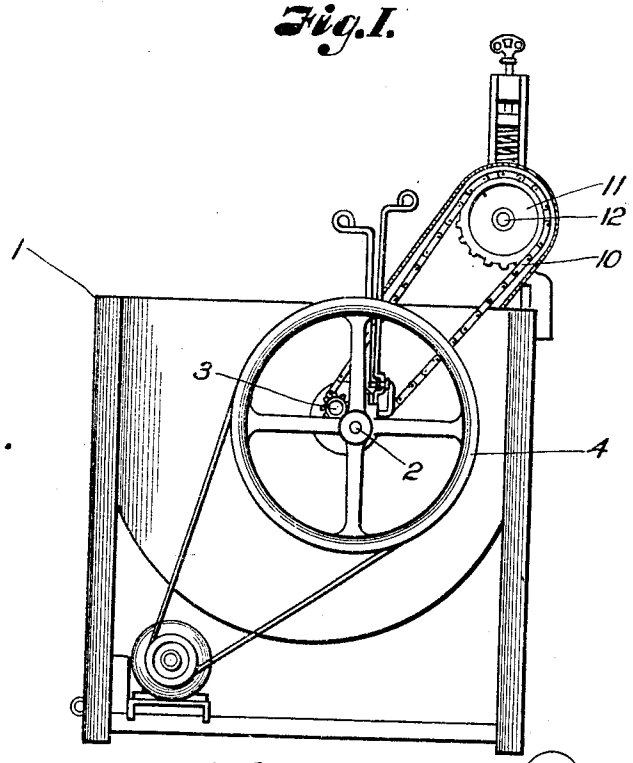
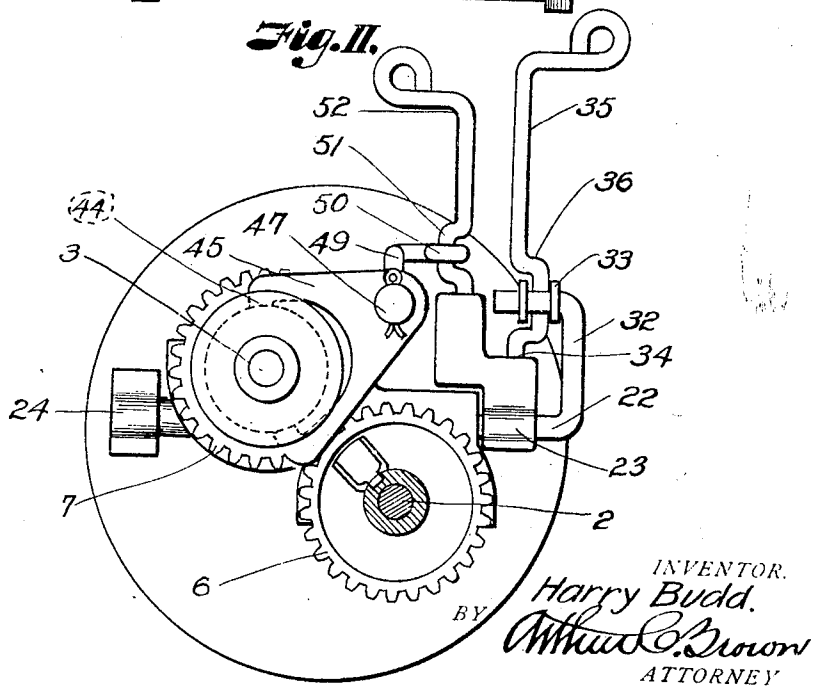


Fig. II.



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3 SHEETS—SHEET 2.

Fig. III.

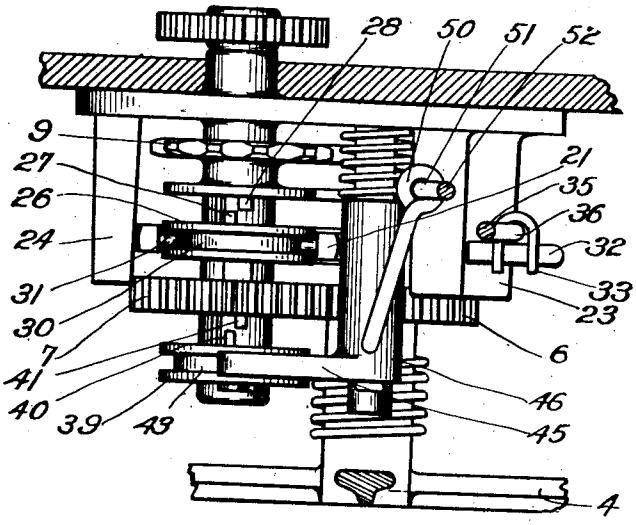
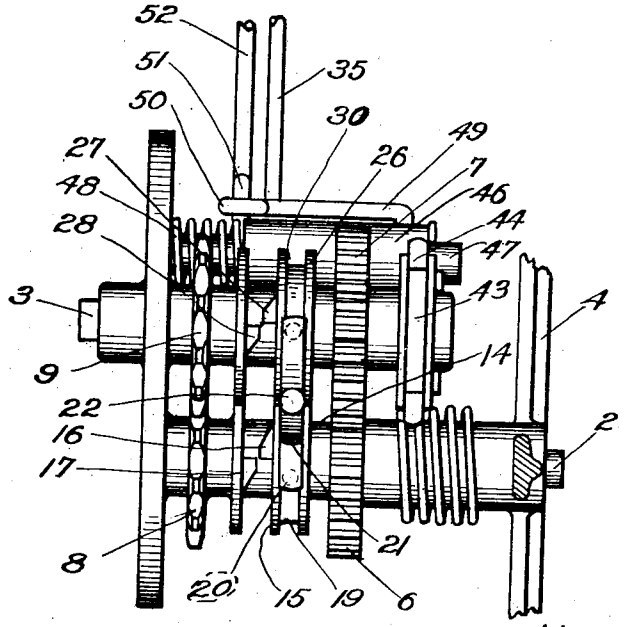


Fig. IV.



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3 SHEETS—SHEET 3.

Fig. VI.

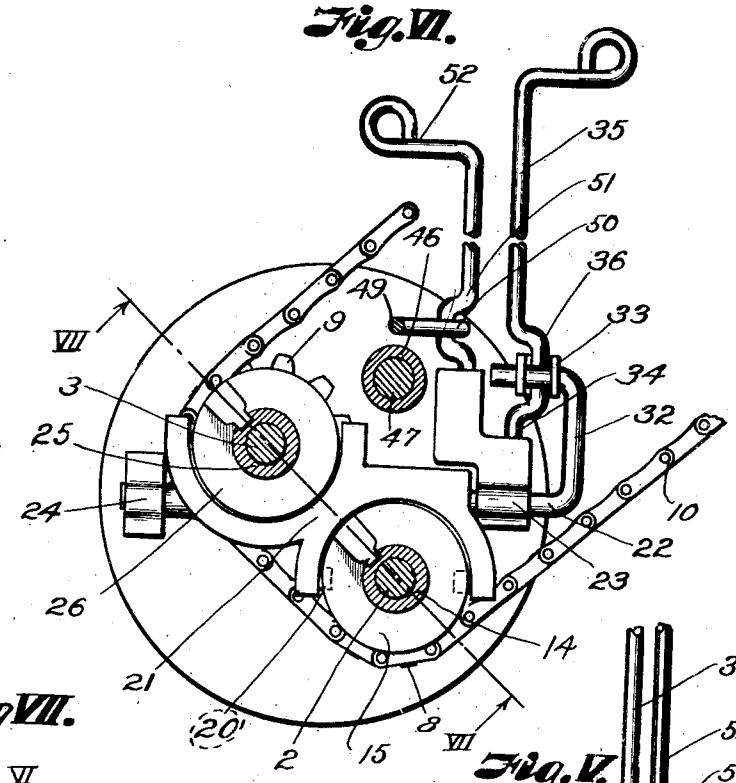


Fig. VII.

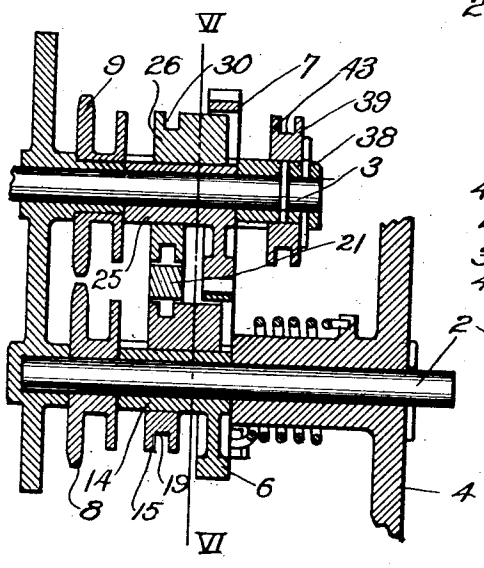
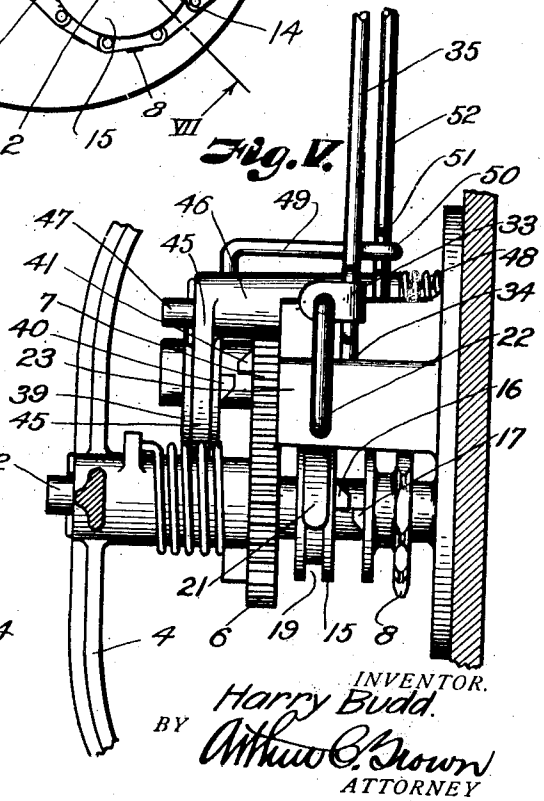


Fig. V.



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UNITED STATES PATENT OFFICE.

HARRY BUDD, OF INDEPENDENCE, KANSAS.

GEAR-SHIFTING MECHANISM.

1,370,947. Specification of Letters Patent. Patented Mar. 8, 1921.

Application filed June 16, 1917. Serial No. 175,224.

To all whom it may concern:

Be it known that I, HARRY BUDD, a citizen of the United States, residing at Independence, in the county of Montgomery and State of Kansas, have invented certain new and useful Improvements in Gear-Shifting Mechanism; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

My invention relates to gear shifting mechanism and has particular reference, although not necessarily limited, to a gear shifting mechanism for use in connection with driving gearing of the type illustrated in my copending application, Serial Number 795,660.

More especially the invention is adapted for use in connection with washing machines wherein a wringer is operable in conjunction with a rotating cylinder to effect movement of the wringer in either direction during forward movement of the cylinder.

It is the object of the present invention to provide mechanism for shifting the gearing whereby a drive belt operable from either of two axial points may be controlled as, for instance, from the shaft or a washing cylinder or counter shaft in order to determine the direction of the travel of the belt, and, consequently, the direction of travel of a wringer operable thereby.

In accomplishing this object I have provided improved details of structure, the preferred forms of which are illustrated in the accompanying drawings, wherein:—

Figure I is a side elevation of the type of washing machine hereinbefore mentioned, illustrating the use of my gear mechanism.

Fig. II is an enlarged elevation of a part of the gearing and the gear shifting mechanism.

Fig. III is a plan view of the same.

Fig. IV is a front end view of the same.

Fig. V is a rear end view of the same.

Fig. VI is an elevation on the line VI—VI, Fig. VII.

Fig. VII is a section on the line VII—VII, Fig. VI.

Referring more in detail to the drawings:

1 designates a machine operable by a gearing with which my shifting mechanism is employed, and here shown to comprise a power or drive shaft 2 and a working or driven shaft 3, upon which the gearing controlled by the shifting mechanism is mounted. This gearing will be described as briefly as possible to give an understanding of the construction and operation of the shifting mechanism although the gearing itself is not claimed as a part of the present invention.

Fixed on the power shaft 2 is a driving element 4, and rotatable on the power and working shafts 2—3 are meshing gear wheels 6—7; the gear wheel 6 being connected with the driving element 4 to effect constant rotation of both gear wheels when the driving element is in operation.

Also rotatably mounted on each of the shafts 2—3 is a transmission member 8—9, here shown to comprise an ordinary sprocket wheel, and run over both of said sprocket wheels is a single chain belt 10 that is trained over a sprocket wheel 11 on the wringer shaft 12.

Keyed on the hub 14 of the gear wheel 6 is a clutch wheel 15 having a boss 16 thereon adapted for abutment against a boss 17 on the sprocket wheel 8 on the same shaft, so that when the clutch member is in operative position the sprocket wheel 8 will be driven upon actuation of the driving member 4.

The clutch wheel 15 has a peripheral groove 19, and projecting loosely into said groove at opposite sides of the wheel are heads 20 of a shipper lever 21 that is fixed on a shaft 22 rotatably mounted in bearings 23—24 suitably mounted on the machine to which the gearing is applied.

Also slidably mounted on the hub 25 of the gear wheel 7 on the driven shaft is a clutch member 26, having a boss 27 thereon adapted for abutment against a boss 28 on the sprocket wheel 9, so that when the clutch member is in operative position the sprocket wheel 9 will be rotated. The bosses 16—17 on the driving shaft parts are arranged reversely to those on the driven shaft parts for the reason that as one shaft is driven through a direct gear connection with the other, the rotation of the shafts is in opposite directions and the operative facings of

the bosses must therefore be reversed to effect the operative and driving contact desired.

The clutch member 26 is also provided with a peripheral groove 30, and projecting into said grooves are heads 31 on the lever 21 heretofore mentioned, whereby when the shaft 22 is rocked the clutch members 15 and 26 are operated synchronously. The effective portions of the lever 21 are, however, arranged at opposite sides of its axis so that the clutch members are moved in opposite directions upon any movement of the shaft 22. The shaft 22 is upturned and provided with a crank arm 32 that carries a yoke 33 above a seat 34 that is preferably formed integral with the shaft bearing 23.

Rotatably mounted in the seat 34 is a handle 35 having a crank part 36 movable in the yoke 33 and having a sufficiently close fit therein to prevent lost motion; the handle part comprising the body portion and handle proper 36 whereby the shift bar may be turned to rock the shaft 22 in either direction.

With this arrangement, the handle bar is normally maintained in intermediate or neutral position, wherein both of the clutch members are out of connection with the relative sprocket wheels. When the handle 36 is turned in one direction, however, the shaft 22 is rocked and moves one of the clutch members toward its sprocket wheel to effect connection between said sprocket wheel and the gear wheel on the same shaft.

As soon as this connection is made, assuming the machine is in operation, the sprocket wheel revolves and through the chain belt drives the wringer in the direction of movement of the shaft to which the sprocket wheel is fixed; the sprocket wheel on the other shaft running idly to obviate interference with the driving travel of the belt. If the handle had been moved in the opposite direction the shipper member on the other shaft would have been moved to effect driving connection with the other sprocket wheel, resulting in the travel of the belt and wringer in the opposite direction. By making the operating mechanism for both clutch members integral and mounting them for simultaneous reverse operation as described, it is apparent that whenever one of the clutch members is moved to operating position, the other is positively moved away from operative position, thereby making it impossible to throw both sprocket wheels into driving operation at the same time as might be the case if separate levers were used.

As it is desirable at times to use the part connected with the driven shaft 3 without utilizing the part driven from the driving belt, I provide transmission to such part that is controlled independently of the belt control. This transmission comprises the shaft 3. Fixed to said shaft is a sleeve 38. Slidably keyed on sleeve 38 is a clutch member 39 having a boss 40 thereon adapted for engagement with the boss 41 on the gear wheel 7 so that when the clutch member 39 is in operative position it may be driven from the gear wheel on the washing cylinder without operating the wringer. The clutch member 39 has a peripheral groove 43, and projecting into said groove are the heads 44 of a shipper lever 45 formed integrally with a sleeve 46 that is slidably mounted on a stub shaft 47, and yieldingly urged outwardly to retain the clutch member 39 out of coöperative relation with the gear wheel 7 by a spring 48 that surrounds the stub shaft and bears against the end of the sleeve 46.

Pivotally mounted on the sleeve 46 is a rod 49 having an eye member 50 connected with the crank 51 of a rod 52; one end of which is pivotally mounted in the seat 53 preferably formed as an extension of the bearing 23 and having a handle part 54, whereby the crank may be operated to shift the sleeve 46.

In using the shifting mechanism, assuming the parts to be constructed and assembled as described, and for illustration applied to a washing machine of a cylinder type having a reversible wringer, the clutch members for the wringer belt and washing cylinder are automatically retained in idle position. Should it be desired to operate the cylinder without the wringer the crank member 52 is turned to draw the clutch member 39 into engagement with the gear wheel on the driven shaft, and may be retained in operative position by passing the crank slightly beyond center. If it is desired to run the wringer forwardly the other crank member 35 is then turned clockwise to throw the clutch member 26 into operative engagement with the sprocket wheel 9 on the cylinder shaft; the same movement throwing the lower clutch member away from its sprocket wheel to avoid interference. The wringer is then moved forwardly simultaneously with the actuation of the washing cylinder.

If it is desired to reverse the wringer the crank member 35 is turned contra-clockwise and position of the clutch member 15—26 reversed to drive the wringer belt from the sprocket wheel on the driving or power shaft.

It is apparent that with this construction there is no possibility of both sprocket wheels being in driving connection at the same time and, consequently, the possibility of locking the wheels and damaging the mechanism is obviated.

Having thus described my invention, what I claim as new therein, and desire to secure by Letters-Patent, is:—

1. The combination with a driving shaft and a driven shaft, intermeshing gears fixed on the respective shafts, sprockets loose on the respective shafts, clutch members on the respective shafts and movable into and out of clutching engagement with the respective sprockets, said clutch members having peripheral grooves and a clutch shifter having oppositely disposed, semi-circular groove-engaging portions, of means for swinging the shifter about its axis to move the clutch members in opposite directions, a rock shaft upon which the shifter is mounted, a crank on said rock shaft, a rotatable manually-operable shaft, and a connection between the crank and the manually operable shaft.

2. The combination with a driving shaft and a driven shaft, intermeshing gears fixed on the respective shafts, sprockets loose on the respective shafts, clutch members on the respective shafts and movable into and out of clutching engagement with the respective sprockets, said clutch members having peripheral grooves and a clutch shifter having oppositely disposed, semi-circular groove-engaging portions, of means for swinging the shifter about its axis to move the clutch members in opposite directions, a rock shaft upon which the shifter is mounted, a crank on said rock shaft, a rotatable manually-operable shaft, and a yoke connection between the crank and the manually operable shaft.

3. The combination with a driving shaft and a driven shaft, intermeshing gears fixed on the respective shafts, sprockets loose on the respective shafts, clutch members on the respective shafts and movable into and out of clutching engagement with the respective sprockets, said clutch members each having a peripheral groove and a clutch shifter having oppositely disposed, semi-circular groove-engaging portions, of means for swinging the shifter about its axis to move the clutch members in opposite directions, a rock shaft upon which the shifter is mounted, a crank on said rock shaft, a rotatable, manually-operable shaft, and a yoke connection between the crank and the manually operable shaft, the manually operable shaft having an offset portion received by the yoke whereby rotation of said shaft will move the crank in one direction and rotation of said shaft in an opposite direction will move the crank in another direction.

In testimony whereof I affix my signature.

HARRY BUDD.