A. F. VICTOR.

GEARING FOR WASHING MACHINES.

APPLICATION FILED APR. 16, 1908.

916,068.

Patented Mar. 23, 1909.

2 SHEETS—SHEET 1.

Fig. 5.

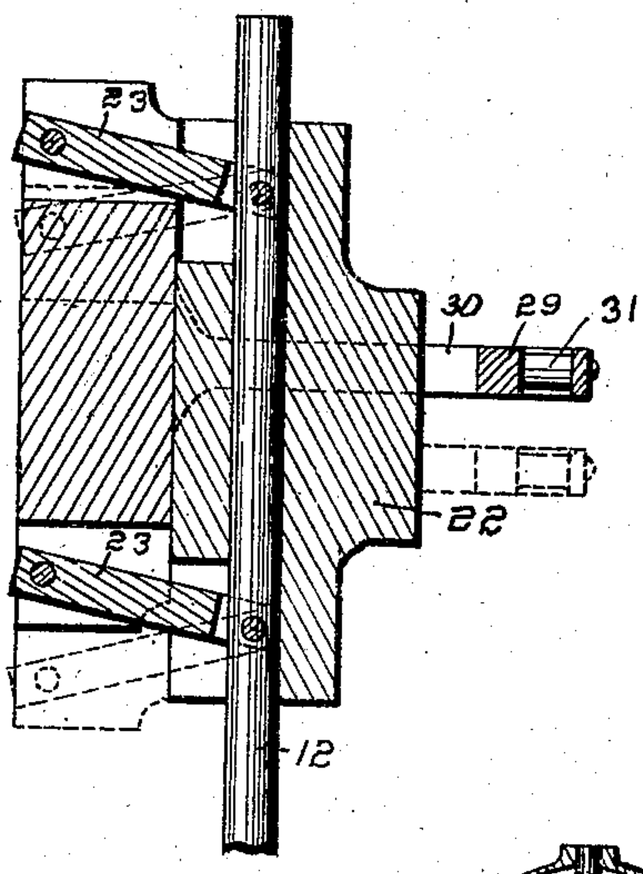
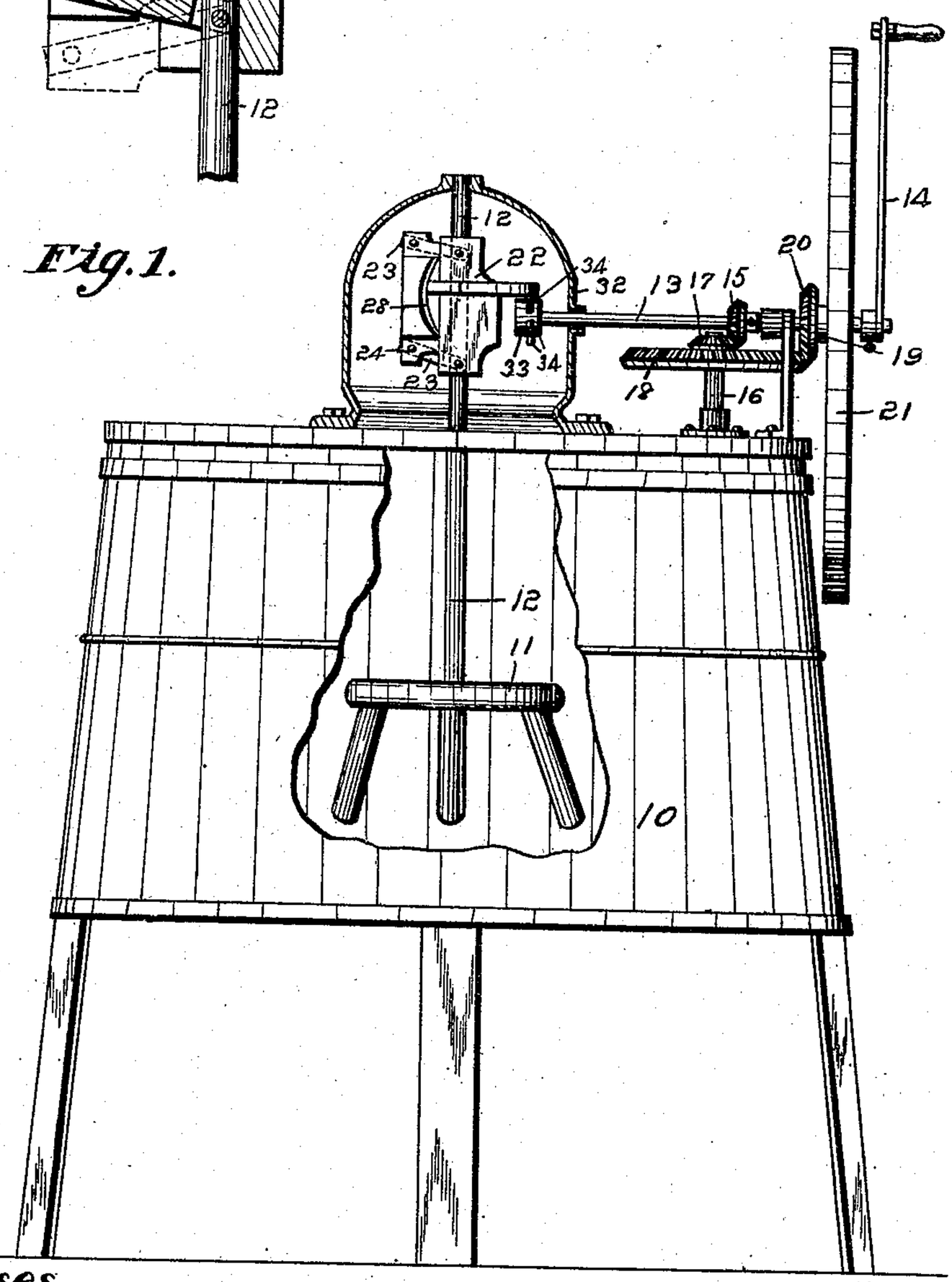


Fig. 1.



Witnesses.

F. C. Dahlberg.

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Inventor.

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2 SHEETS—SHEET 2.

Fig. 3.

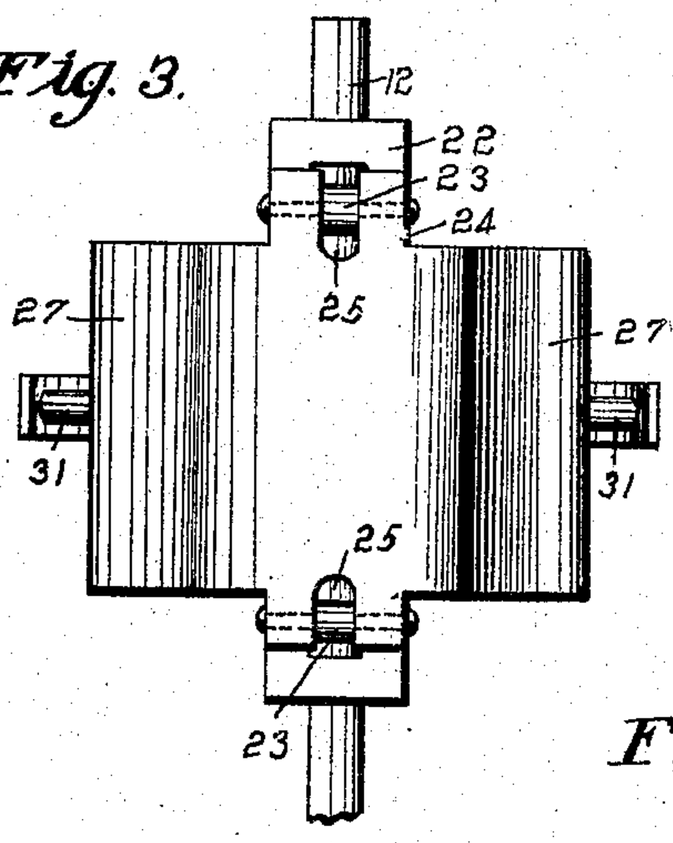


Fig. 4.

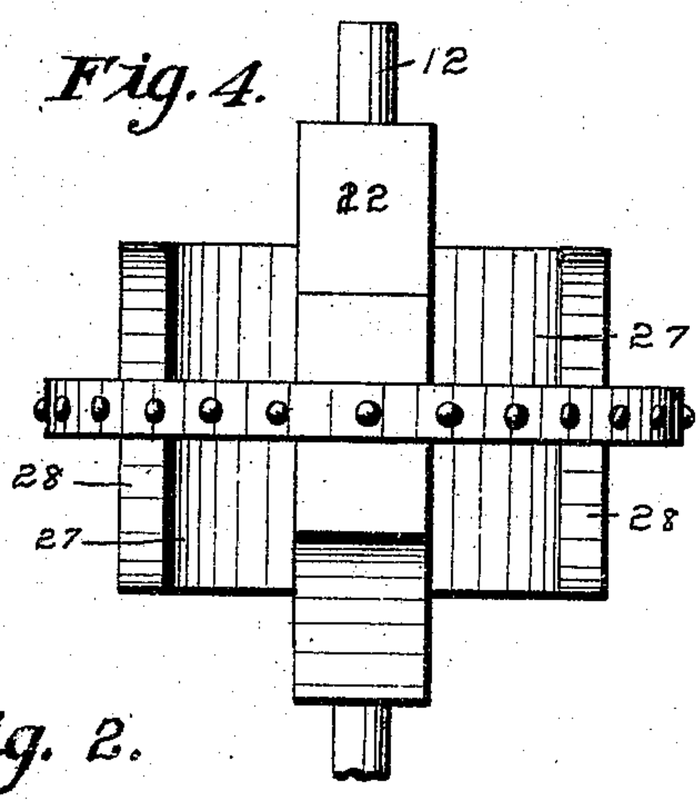
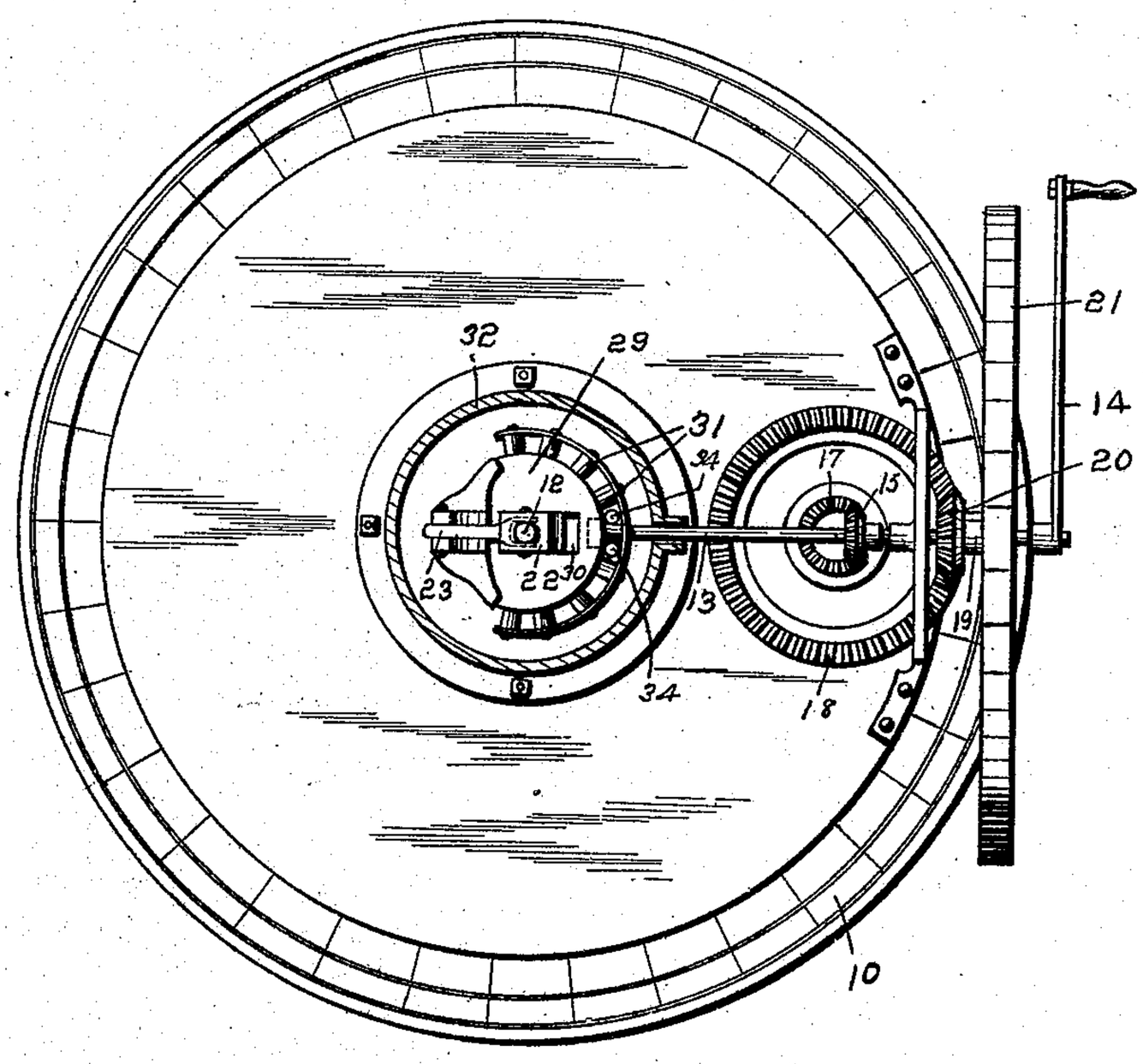


Fig. 2.



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Inventor:

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UNITED STATES PATENT OFFICE.

ALEXANDER FERDINAND VICTOR, OF ELMIRA, NEW YORK.

GEARING FOR WASHING-MACHINES.

No. 916,068. Specification of Letters Patent. Patented March 23, 1909.

Application filed April 16, 1908. Serial No. 427,406.

To all whom it may concern:

Be it known that I, ALEXANDER F. VICTOR, a subject of the King of Sweden, residing at Elmira, in the county of Chemung and State of New York, have invented a new and useful Gearing for Washing-Machines, of which the following is a specification.

The object of my invention is to provide a gearing for washing machines and similar devices, of simple, durable and inexpensive construction, designed to impart an alternating rotary motion to the agitator shaft, and a continuous rotary motion at an increased rate of speed to a balance wheel, whereby the balance wheel will aid in maintaining the motion of the agitator shaft after the operator ceases to apply power to the gearing device.

More specifically it is my object to provide means for converting the continuous rotary motion of the driving shaft to an alternating rotary motion of the agitator shaft, which means will operate smoothly and evenly and with a minimum of applied power.

My invention consists in the construction, arrangement and combination of the various parts of the device, whereby the objects contemplated are attained, as hereinafter more fully set forth, pointed out in my claims and illustrated in the accompanying drawings, in which—

Figure 1 shows a side elevation of a washing machine provided with my improved gearing device, part of the inclosing casing and part of the tub body being broken away. Fig. 2 shows a top or plan view of same, the gear casing being shown in section. Fig. 3 shows an enlarged detail view of a part of the gearing device for transmitting an alternating rotary motion to the agitator shaft. Fig. 4 shows a similar view of the same device taken from the opposite side, and Fig. 5 shows a sectional view taken on a vertical central line through Fig. 3.

Referring to the accompanying drawings, I have used the reference numeral 10 to indicate the washing machine body, 11 the agitator, and 12 the agitator shaft. These parts are of the ordinary construction, and are illustrated and described herein solely for the purpose of showing one of the various ways that my improved gearing device may be practically and successfully used.

Supported on top of the machine body is the rotatable power shaft 13 having a crank 14 attached thereto, whereby it may be operated by hand. Fixed to the shaft 13 is a beveled pinion 15. Mounted upon the washing machine body is a short upright rotatable shaft 16 having a small beveled pinion 17 fixed thereto in mesh with the pinion 15, and also having a large beveled pinion 18 fixed thereto. Rotatably mounted upon the shaft 13 is a sleeve 19 having fixed thereto a beveled pinion 20 and a balance wheel 21, the pinion 20 being in mesh with the pinion 18. By means of this arrangement, it is obvious that when the crank 14 is rotated, the shaft 13 will be rotated at the same speed as the crank, and the balance wheel 21 will be rotated at an increased speed, and said balance wheel will continue the rotation of the power shaft 13 after the operator ceases to apply power to the crank.

The means for converting the rotary motion of the power shaft 13 into an alternating rotary motion as applied to the a gitator shaft 12, comprises the following mechanisms: Fixed to the shaft 13 is a block 22 having flat sides. This block is connected by means of two links 23 with a bracket hereinafter described. These links 23 are pivoted to the block 22 and to a part of said bracket in such manner that the bracket is permitted to swing vertically through a limited arc. This bracket comprises a back 24 having slots 25 at its upper and lower end portions, to receive the links 23 which are pivoted therein by means of the pivot pins 26. At the sides of the bracket are two curved arms 27 which arms have forward edges 28 of concave shape as clearly shown in Fig. 1. At or near the central portion of the bracket is a horizontally extended plate 29 having a slot 30 therein, through which the block 22 is extended. This slot is of such size and shape as to permit the bracket to swing on the links 23, but it prevents the bracket from rotating relative to the block 22. At the forward edge of the plate 29 is a series of rollers 31 spaced apart and arranged in segmental form, said series of rollers comprising slightly more than a half circle. This device for converting the motion of the shaft 13 into an alternating rotary motion is all inclosed in a gear casing 32, into which the shaft 13 is extended, and said shaft 13 is provided with a hub 33 having a series of projecting rollers or pins 34 on the part of its periphery that is adjacent to the crank. The other end of the

hub projects slightly beyond the projections or rollers 34, for purposes hereinafter made clear. These projections or rollers 34 are so arranged on the hub that they will mesh with the rollers 31 on the plate 29. The parts of this mechanism for transmitting motion from the shaft 13 to the shaft 12 are so proportioned and arranged that they will operate as follows: Assuming the device to be in the position illustrated in Figs. 1 and 2—that is to say, with the hub 33 below the rollers 31, then when the shaft 13 is rotated, the shaft 13 will be turned, together with the block and bracket attached to it, until one of the concave edges 28 of the bracket strikes upon the part of the hub 33 that extends beyond the rollers or pins 34. This will cause the bracket to swing downwardly on the links 23 until the rollers 31 are below the hub 33. The said concave edge 28 will however, keep the rollers or pins on the hub in mesh with the rollers on the bracket and as the rotary motion of the shaft 13 is continued, the shaft 12 will then be turned in an opposite direction with the hub 13 traveling on top of the rollers 31, and when said hub engages the concave edge 28 of the opposite side of the bracket, it will cause the bracket to be elevated and thereby permit the hub 33 to pass under the bracket. In this way, an alternating rotary motion is applied to the shaft 12. Furthermore, the said shaft 12 is not moved up and down, but the only up and down movement is that of the bracket, which is connected to the shaft 12 by means of the links 23, and which is caused to move up and down by the engagement of the hub 33 with the concave edges 28.

The pins or rollers 34 on the hub 33 are always in engagement with the rollers 31, and the rollers 31 when moved in one direction, are on top of the hub, and when moved in the other direction are below it. The arms 27 on which the concave edges 28 are formed, will yield immediately when engaged by the hub 23, and hence, there is no shock or jar when said concave edges strike the hub, but the movement is smooth and regular. By having the balance wheel loosely mounted upon the power shaft, I accomplish several advantageous results. First, I dispense with the necessity of an extra shaft and bearing for the balance wheel, and—second, the balance wheel itself serves to protect the beveled gear wheels so that it is not necessary to provide an extra casing to contain them.

In the accompanying drawings, I have shown the improved gearing device as applied to a washing machine. Obviously, the same gearing device may be advantageously used in connection with any sort of a device in which it is desirable to convert a continuous rotary motion into an alternating rotary motion, and to provide a balance wheel arranged to rotate at an increased speed for continuing and equalizing the motion of the first shaft.

The rollers 31 perform the function of a segmental rack, and various forms of segmental racks may be substituted, either with or without rollers, in place of the rollers herein shown. In some of the accompanying claims, I use the term "segmental rack" to include either the roller arrangement shown in the drawings, or any mechanism that is equivalent thereto.

I claim as my invention:

1. In a device of the class described, the combination of a shaft, means for applying a continuous rotary motion to it, a second shaft at right angles to the first, links pivoted to the second shaft, a bracket carried by the links, arms on said bracket having concave edges to serve as guides, a segmental rack carried by said bracket, and a hub on the first shaft provided with pins to co-act with the segmental rack, said parts being so arranged that when the segmental rack is turned to position with one end adjacent to the said hub, the hub will engage the concave edges of the said arms and thus cause the bracket to swing on its supporting links to position where the segmental rack will be on the opposite side of the said hub, so that a further rotation of the hub will cause the second shaft to rotate in an opposite direction.

2. In a device of the class described, the combination of a horizontally arranged shaft, a hub thereon, pins on the hub, a vertically arranged shaft, a block fixed to the vertically arranged shaft, two links pivoted to the block, a bracket pivoted to said links, said bracket having a slot therein through which the said block on the shaft is extended, a segmental rack fixed to the bracket to co-act with the teeth on the hub, and two arms carried by the bracket having curved edges designed to engage the hub, and to cause up and down movements of the bracket when either end of the segmental rack is adjacent to the said hub.

3. In a device of the class described, the combination of a horizontally arranged shaft, a hub fixed thereto and having pins on its periphery near one end, a vertically arranged shaft, a block fixed to the vertically arranged shaft, and having flat sides, two links pivoted to said block and extended in a direction away from the horizontally arranged shaft, a bracket pivoted to said links and having two curved arms fixed thereto, and extended in a direction toward the horizontally arranged shaft, the forward ends of said curved arms being made concave from their upper to their lower ends, a plate fixed to said bracket and having a slot therein to receive said block, and a segmental rack fixed to the edge of said plate, said rack being designed to mesh with the pins on the hub, and the concave forward edges of said arms being designed to

engage that portion of the periphery of the hub that extends beyond said pins, for the purposes stated.

4. In a device of the class described, the combination of a shaft, means for applying a continuous rotary motion to the shaft, a second shaft at right-angles to the first, a bracket adjacent to the second shaft, arms on said bracket having concave edges to serve as guides, means for supporting said bracket and for permitting it to move up and down to a limited extent, a segmental rack carried by said bracket, and a hub on the first shaft provided with pins to co-act with the segmental rack, said hub being designed to engage the concave edges of the bracket when the bracket is at the opposite limits of its movement, said concave edges being so shaped that when thus engaged by the hub, the bracket will move either up or down to permit the hub to return on the side of the segmental rack opposite from the one just traversed by it.

Des Moines, Iowa, March 21, 1908.

ALEXANDER FERDINAND VICTOR.

Witnesses:

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E. H. BERNINE.