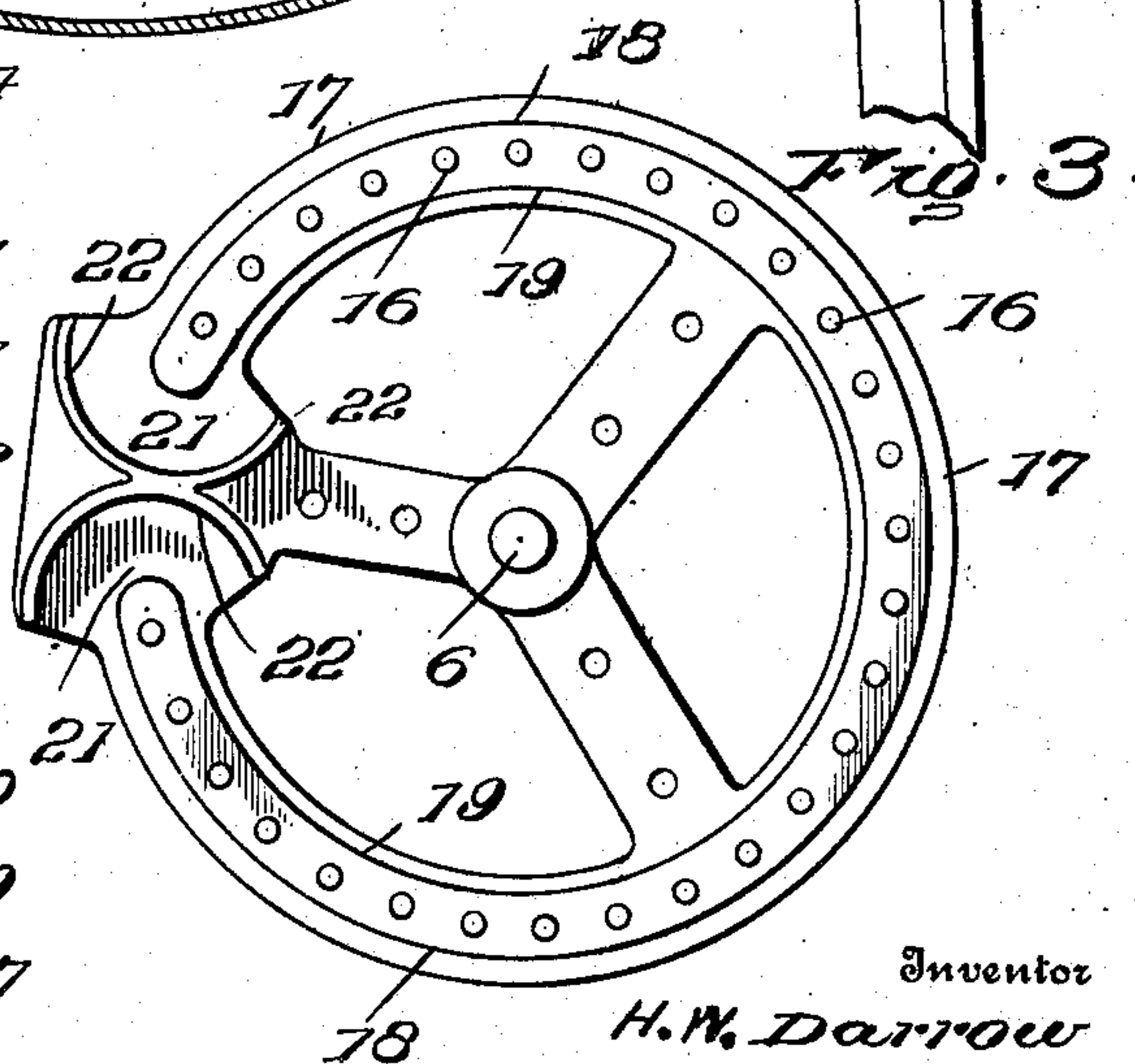
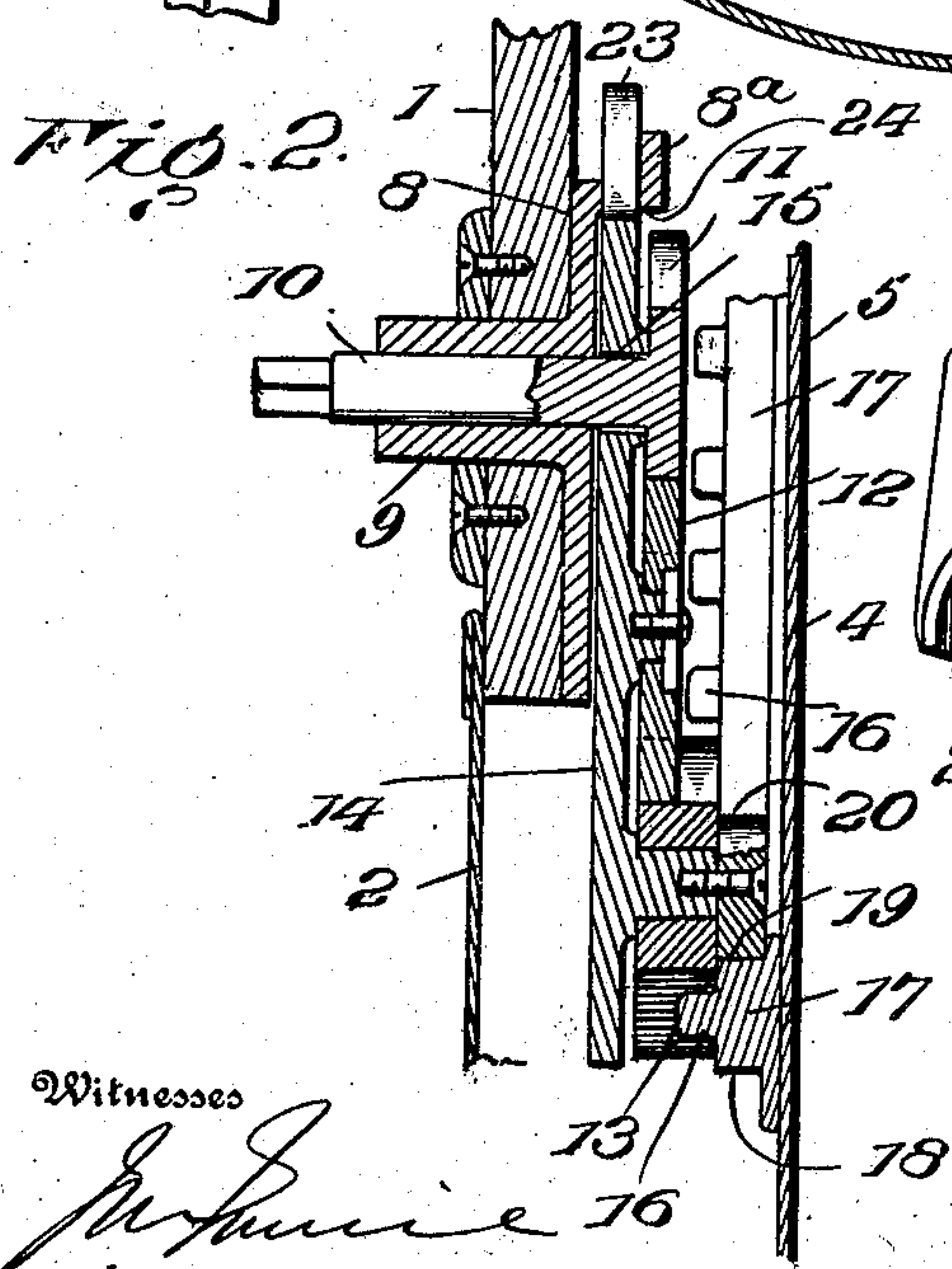


923,819.

Fig. 1. A detailed cross-sectional view of a mechanical device, likely a watch movement, showing a circular case with a hinged cover (1) and a complex internal gear train. The gear train includes a large gear (10) meshing with a smaller gear (11), which in turn meshes with a gear (12). A central gear (13) is also visible. The device is mounted on a base (14) and includes a winding mechanism (15) on the side. Various numbered parts (1-24) are labeled throughout the diagram.



Witnesses
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 W. P. Woodson.

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UNITED STATES PATENT OFFICE.

HENRY W. DARROW, OF CHICAGO, ILLINOIS, ASSIGNOR TO PARAGON MFG. CO., OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

GEARING FOR WASHING-MACHINES.

No. 923,819.

Specification of Letters Patent.

Patented June 8, 1909.

Application filed September 11, 1907. Serial No. 392,337.

To all whom it may concern:

Be it known that I, HENRY W. DARROW, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Gearing for Washing-Machines, of which the following is a specification.

This invention comprehends certain novel and useful improvements in gearing and is designed particularly for imparting an alternating rotary motion to the revoluble cylinder of a washing machine.

The invention has for its primary object an improved gearing which will impart to the clothes carrying cylinder an approximately complete revolution first in one direction and then in the reverse direction; while the driving shaft is being continuously rotated in but one direction; which will possess to a marked degree the characteristics of simplicity, durability, efficiency, and economy as to the cost of construction and also as to amount of space necessary for its location and operation, and which will permit the cylinder or drum to be readily removed.

With these and other objects in view as will more fully appear as the description proceeds, the invention consists in certain constructions, arrangements and combinations of the parts that I shall hereinafter fully describe and then point out the novel features in the appended claims.

For a full understanding of the invention, reference is to be had to the following description and accompanying drawings, in which:

Figure 1 is a vertical transverse section of a washing machine embodying my improved gearing; Fig. 2 is a detail transverse sectional view of a portion of the gearing; Fig. 3 is a detail face view of that portion of the gearing which is carried by one of the heads of the revoluble cylinder; Fig. 4 is a transverse sectional view of the washing machine, the section being taken in a plane close to that in which Fig. 1 is taken, but looking in the opposite direction. Fig. 5 is a detail view, partly in section of the supporting bracket, for a portion of the gearing; and, Fig. 6 is a detail perspective view of the swinging plate support that carries the driving gears.

Corresponding and like parts are referred

to in the following description and indicated in all the views of the drawings by the same reference characters.

Referring to the drawings, the numeral 1 designates the body of a washing machine, and 2 the tank or trough which forms a portion thereof. 3 designates a lid or cover for the said body portion of the machine.

The revoluble cylinder or clothes carrying drum 4 may be and preferably is constructed entirely of sheet metal, with the heads 5, and is journaled by means of the trunnions 6 in stirrups 7, the arrangement being such as to permit the ready withdrawal of the cylinder, as clearly illustrated in the drawings.

The bracket 8 is secured within the body portion 1 of the machine, at one end thereof and is preferably provided with an outwardly projecting tubular boss 9 in which the driving shaft 10 is journaled. This shaft may be rotated by means of a hand operable crank wheel, or by power of any kind, according as the machine is constructed for family or commercial use, the invention being applicable to both. The inner end of the driving shaft 10 carries a master pinion 11, which meshes with a pinion 12, and the latter in turn meshes with a pinion 13, both of the said pinions 12 and 13 being journaled on and carried by a plate support 14. The said plate 14 is formed with an aperture 15 by which it is swung from the same center as the actuating or driving shaft 10, being preferably slipped on said shaft preparatory to the insertion of the latter in the tubular bearing or boss 9 of the bracket 8.

The pinion 13 is preferably of double the thickness of the pinions 11 and 12 so as to project beyond the plane of the said pinions 11 and 12 and into meshing engagement with a circularly extending series of pins 16 projecting laterally from one of the heads of the cylinder 4. The pins 16 are preferably carried by and form integral parts of an annular plate 17 secured to one head of the cylinder 4 by screws, rivets, or other fastening devices and preferably formed with one of the trunnions 6 for the cylinder. In addition to the circular series of pins 16, the annulus 17 may be formed with circular outer and inner raised tracks 18 and 19, designed for a guiding and directing device in the form of a roller 20 which may be formed either as an integral part of the pinion 13 or as a separate part se-

cured to the bearing of said pinion. The annulus 17, which constitutes the driven gear element of the combination is also formed with two transverse channels or passages 21, as best seen in Fig. 3, said channels connecting together or establishing communication between the ends of the respective tracks 18 and 19, and separating the ends of the circular series of pins 16. Coacting with these lateral passages 21 are gear shifting tracks 22 which are formed on the annulus 17 and which preferably describe arcs of circles struck with the last or end pins of the series as centers. Preferably, the swinging plate support 14 for the driving gears is formed above its pivot or point of suspension with an upwardly projecting arm 23. The bracket 8 is provided with a laterally projecting flange 8^a; and said flange is formed with a guide slot 24, which accommodates the arm 23 and the ends of which constitute shoulders 25 and 26 against which the arm 23 is adapted to abut to limit the movement of the swinging plate 14 in either direction.

In the practical operation, the shaft 10 has a continuous motion imparted to it in one direction. The motion of the said shaft 10 is imparted by its pinion 11 to the intermediate idler pinion 12 and thence to the pinion 13. This last meshes with the pins 16 and thereby imparts a rotary motion to the clothes carrying cylinder 4. The continued motion of the shaft 11 and rotation of the pinion 13 will bring the latter to one end of the circular series of pins 16, and the pinion 13 will then be directed laterally through one of the passages 21 so as to shift from the inner circle of pins to the outer circle, or vice versa, as the case may be, to impart a reverse motion to the cylinder without changing the direction of rotation of the driving shaft 10, the plate support 14 being automatically swung or shifted at the same time. The roller or guiding device 20 is preferably provided, although I do not deem it an indispensable element, in order to more accurately guide the pinion 13 in its meshing engagement with the series of pins 16, because it is more practical to use it, as it tends to make the entrance of the pinion 13 into the circle of the pins, or exit from the circles to the outer side thereof more positive and accompanied by less noise and with a minimum of friction; it also enables the use of a small aperture or lateral passage to provide for the shaft of the pinion from the inner circle to the outer, or vice versa, and consequently gives a greater percentage of revolution in the traverse of the driven gear element. Furthermore, the tracks 18 and 19, in combination with the guide roller 20 insure smooth running and also prevent the driving gear from ever coming too close to the row of pins in the driven gear.

In addition to the above mentioned ad-

vantageous features, it will be seen from the foregoing description in connection with the accompanying drawings that I have provided means in a revoluble cylinder washing machine whereby an alternating rotary movement may be imparted to the cylinder by gearing located entirely within the machine, while at the same time, such gearing occupies no more space than would a single driving pinion and row of teeth or pins on one head of the cylinder without the automatically reversing features. The shoulders 25 and 26 limit the movement of the plate 14 which swings from the same center as the driving shaft 10 and assists in making the gearing positive or sure in its action and not liable to get out of order, the flange 8^a also assisting in producing this advantage in that it extends around the arm 23 and maintains the plate 14 swinging in one plane and prevents it from swinging outwardly at its lower end toward the pins 16 which would cause a binding action and strain, and injure the parts. The cylinder 4 may be very readily removed, it being only necessary in order to accomplish this to turn the same until the pinion 13 shall have been brought to the outer side of the circular series of pins.

Manifestly my invention is not limited to the round pins shown in the accompanying drawings, nor to the other illustrated proportions, constructions, and arrangements of the parts, various changes being permissible within the purview of my invention, and within the scope of the following claims.

Having thus described the invention, what is claimed as new is:

1. In gearing of the character described, the combination with a revoluble part and a support therefor, of a driving gear element carried by the revoluble part, a drive shaft journaled in the support, a pinion adapted to mesh with the driven gear element and arranged to impart an alternating rotary motion thereto, a swinging gear support on which said pinion is journaled, means for supporting the gear support with its pivot coincident with the axis of the drive shaft, said gear support being provided with an upwardly projecting arm, and a bracket formed with a guide slot accommodating said arm.

2. In gearing of the character described, the combination with a revoluble part and a support therefor, of a driven gear element secured to the revoluble part, a drive shaft journaled in the support, a pinion adapted to mesh with the driven gear element and arranged to impart an alternating rotary motion thereto, a swinging gear support on which said pinion is journaled, means for supporting the gear support with its pivot coincident with the axis of the drive shaft, said gear support being provided with an upwardly projecting arm, and a bracket formed

with a guide slot accommodating said arm and with shoulders against which said arm is adapted to abut to limit the movement of the gear support.

5 3. In gearing of the character described, the combination of a revoluble part and a support therefor, said support including journal bearings and the revoluble part being
10 provided with trunnions removably mounted within said bearings whereby the revoluble part may be removed from its support, of a driven gear element secured to said revoluble part and embodying a circular series of
15 pins and a raised track concentric with the series of pins, said gear element being formed with passages forming communication between the ends of the respective inner and
20 outer tracks, a drive shaft journaled in the support, a pinion mounted for meshing engagement with the series of pins, a guide

roller movable with said pinion and adapted to travel along the said tracks alternately and to pass through the lateral passages from one track to the other, for the purpose specified, a driving connection between said 25 pinion and the drive shaft, and means for supporting said pinion and guide roller, said supporting means being independent of the revoluble part whereby said part may be removed from its support upon the movement 30 of the guide roller and pinion upon the outer track without interference by the driven gear.

In testimony whereof I affix my signature in presence of two witnesses.

HENRY W. DARROW. [L. s.]

Witnesses:

HERVEY ROY DAILEY,
LEO S. THEIN.