

No. 624,031.

Patented May 2, 1899.

A. H. HERRON.

GEARING FOR WASHING MACHINES.

(Application filed Mar. 6, 1899.)

(No Model.)

2 Sheets—Sheet 1.

Fig. 1.

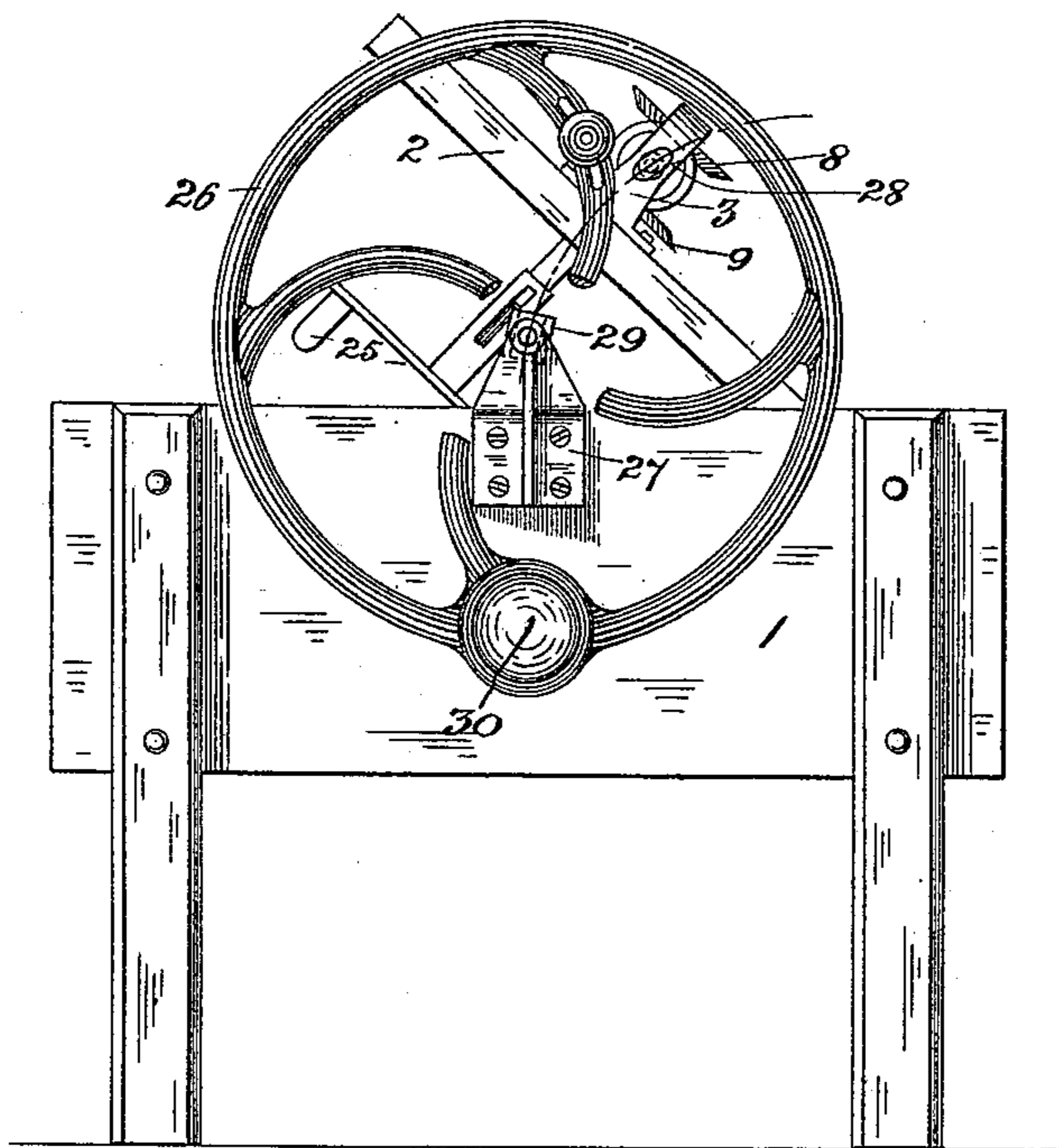
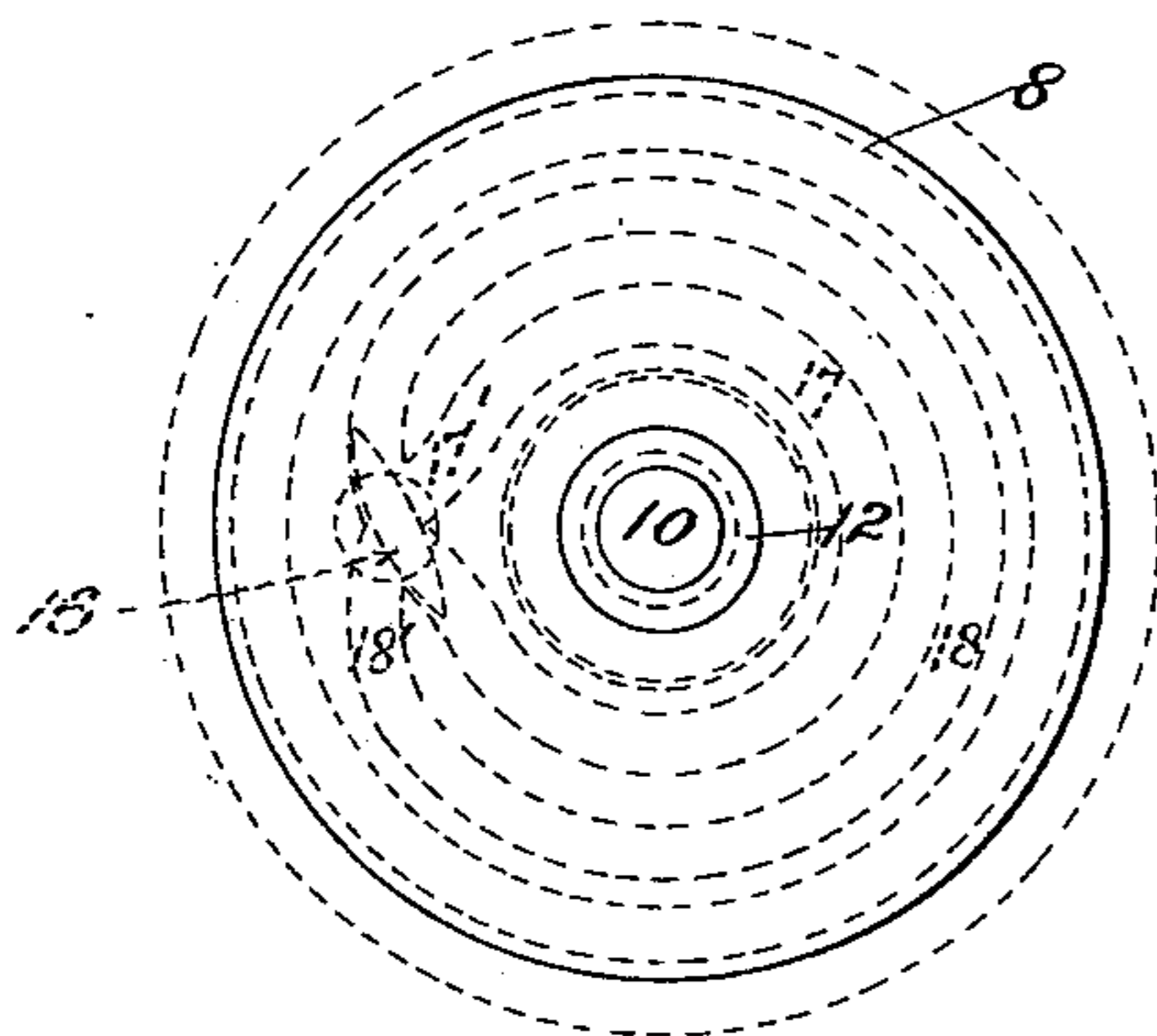
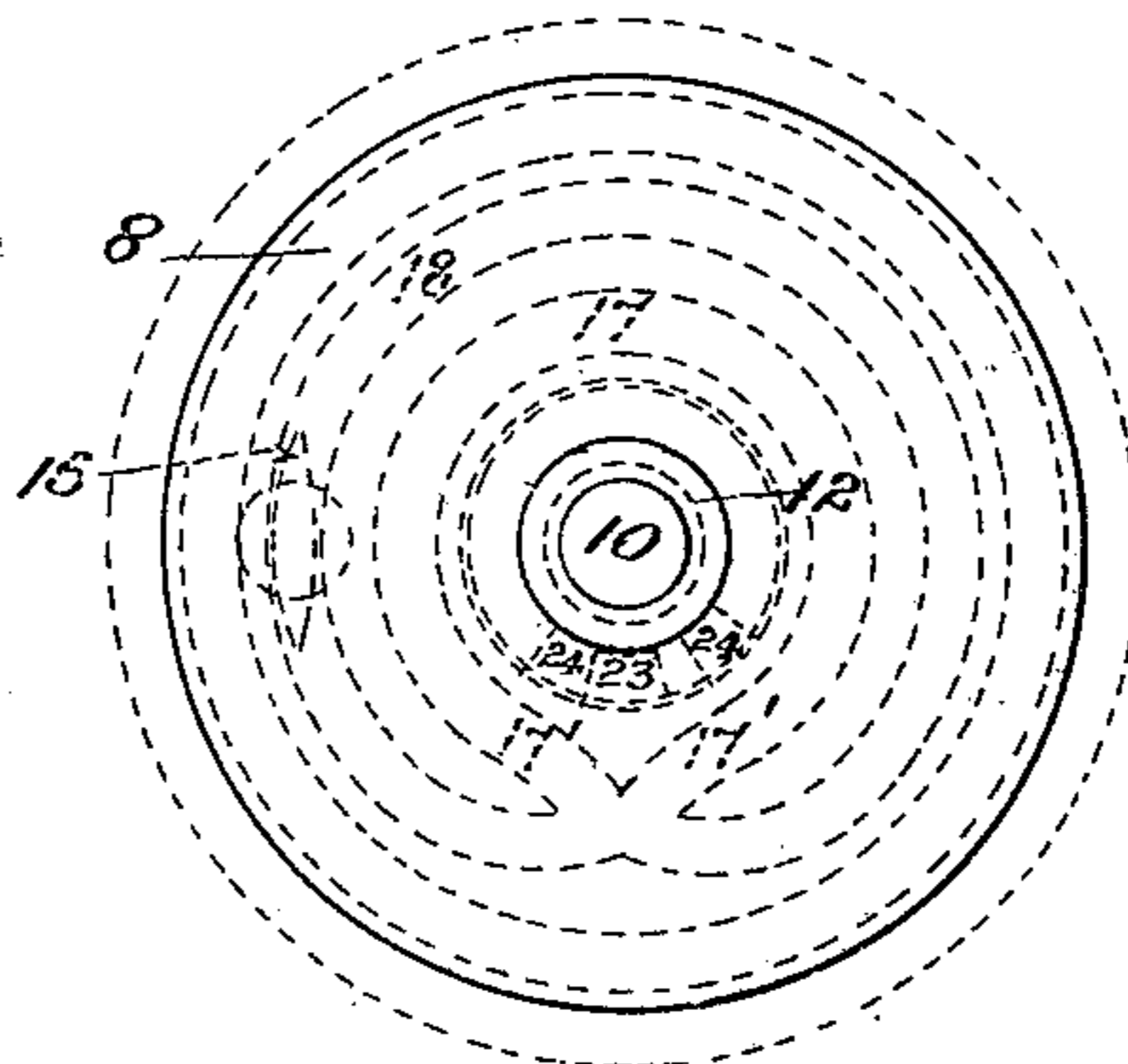


Fig. 7.



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Fig. 8.



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2 Sheets—Sheet 2.

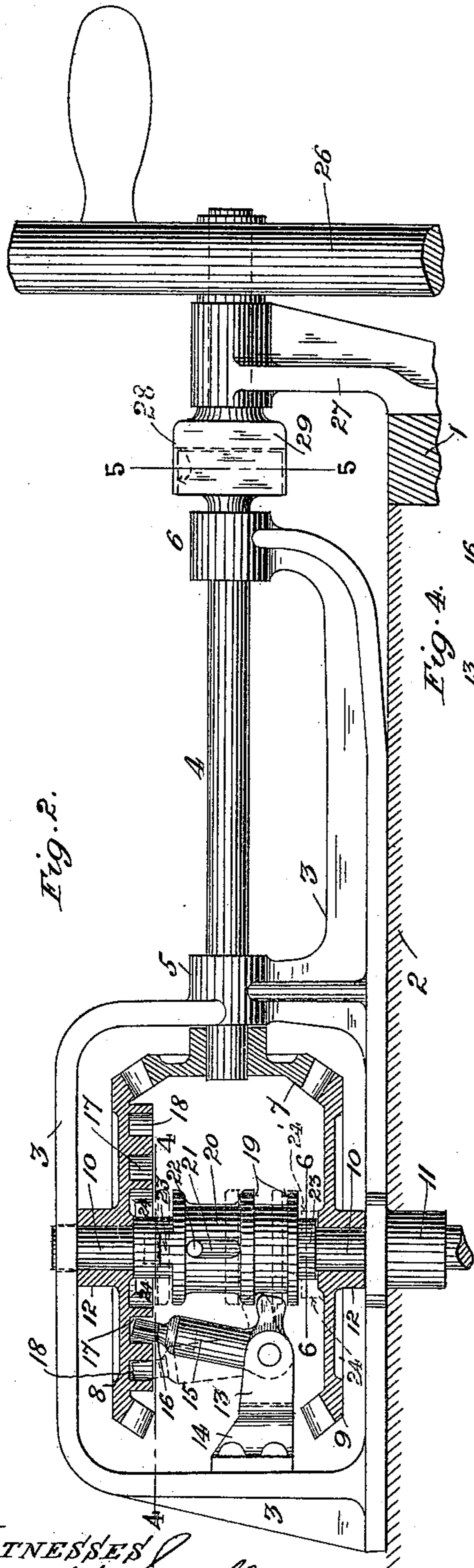


Fig. 2.

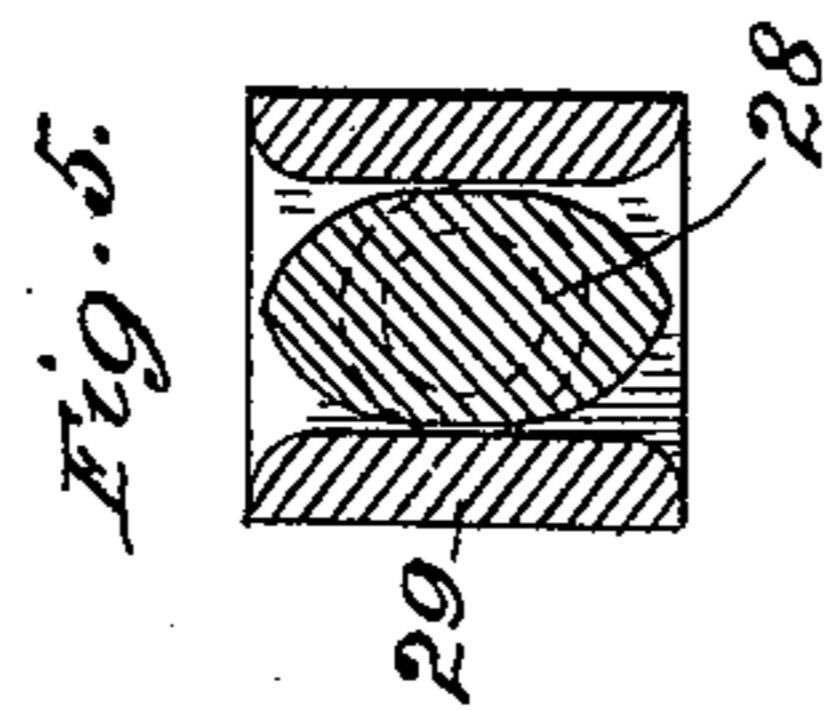


Fig. 5.

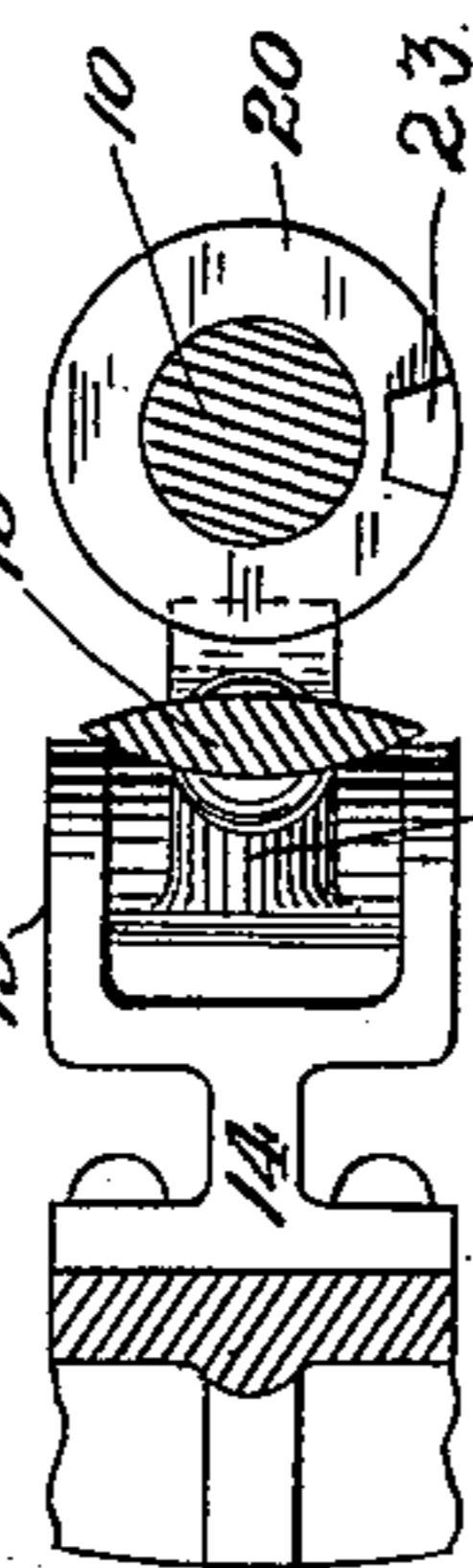


Fig. 4.

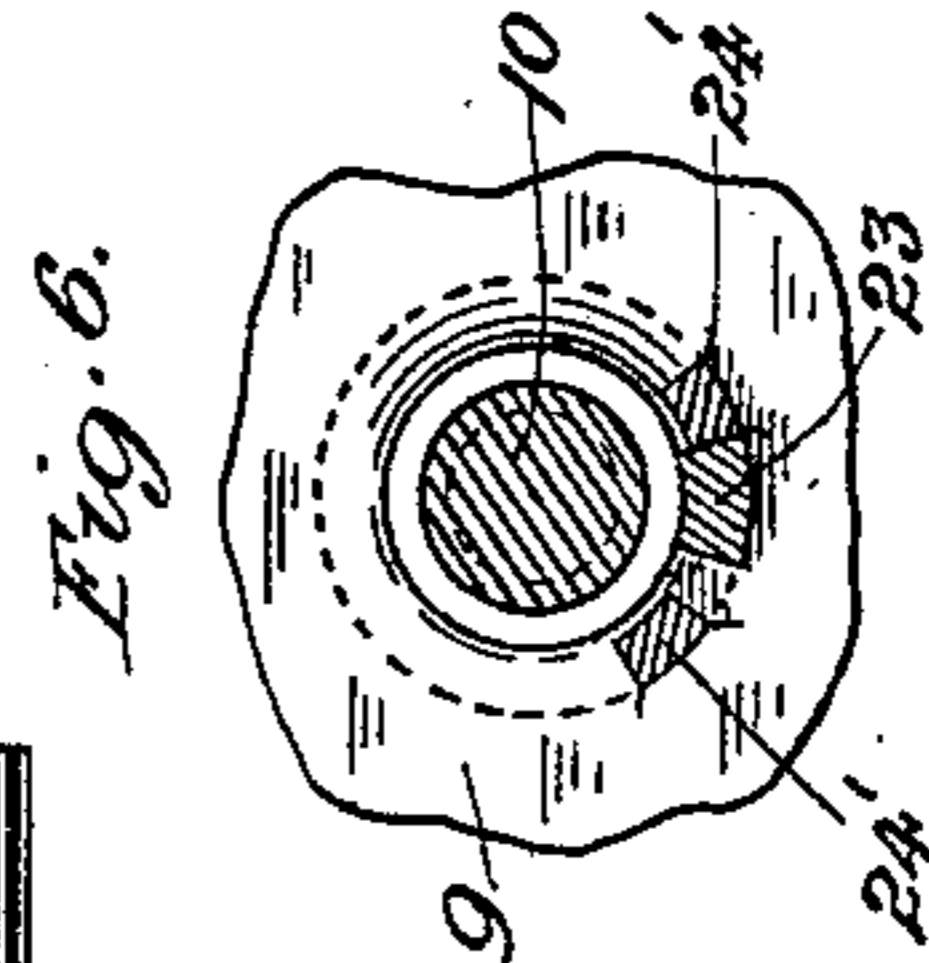
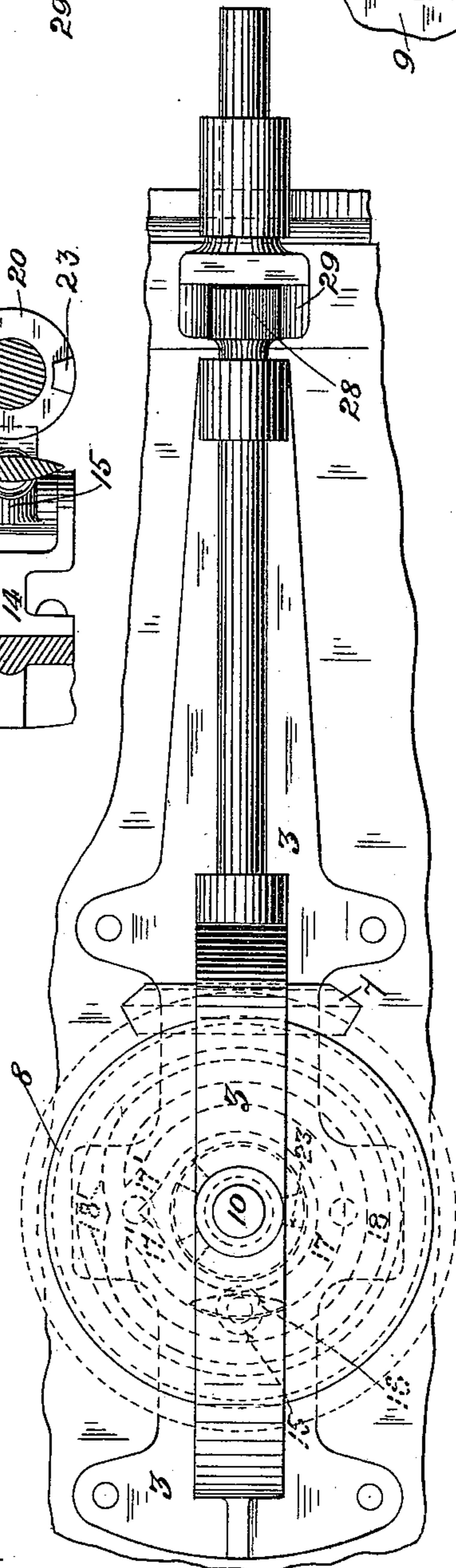


Fig. 6.

Fig. 3.



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UNITED STATES PATENT OFFICE.

AL H. HERRON, OF ST. LOUIS, MISSOURI, ASSIGNOR TO THE ANTHONY WAYNE MANUFACTURING COMPANY, OF SAME PLACE.

GEARING FOR WASHING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 624,031, dated May 2, 1899.

Application filed March 6, 1899. Serial No. 707,942. (No model.)

To all whom it may concern:

Be it known that I, AL H. HERRON, a citizen of the United States, residing at St. Louis, State of Missouri, have invented certain new and useful Improvements in Gearing for Washing-Machines, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part hereof.

My invention has relation to improvements in gearing for washing-machines; and it consists in the novel arrangement and combination of parts more fully set forth in the specification and pointed out in the claims.

Referring to the drawings, Figure 1 is a side elevation of a washing-machine with lid partly swung open and showing my improvements attached thereto, the center of the hand-wheel being broken away. Fig. 2 is a side elevation of the supporting-frame for the reversing-gear mechanism, showing the gear-wheels in section and the tub broken away. Fig. 3 is a top plan view of Fig. 2. Fig. 4 is a section on line 4 4 of Fig. 2. Fig. 5 is a section on line 5 5 of Fig. 2. Fig. 6 is a section on line 6 6 of Fig. 2. Fig. 7 is a top plan view of the upper gear-wheel, showing in dotted lines the contours of the grooves or tracks on the under side thereof and showing the block carried at the upper end of the bell-crank clutch-shifting lever at the mouth of the inner track; and Fig. 8 is a similar view showing the block in the outer track.

My present invention has relation to that class of washing-machines in which a rotary agitator or rubber is employed to rub the clothes against the inner walls of the tub, the object of the present device being to produce a simple, noiseless, and effective reversing mechanism by which the rotation of such rubber is reversed.

A further object is to construct a reversing mechanism which will contain a minimum number of parts.

A further object is to produce a special form of coupling between the shaft of the reversing mechanism and the shaft of the operating-wheel, all as will more fully appear in the detailed description of the invention, which is as follows:

Referring to the drawings, 1 represents a tub or receptacle provided with a hinged top or lid 2, the tub being old and of a prevailing form and no claim being made therefor in the present case. Mounted transversely across the lid and adapted to open therewith is a frame 3 for the support of the gearing of the reversing mechanism. The latter comprises a rotatable operating-shaft 4, passing through bearings 5 6, the inner end of the shaft having secured thereto a bevel-pinion 7, meshing simultaneously with an upper and lower bevel gear-wheel 8 and 9, respectively, the said gear-wheels being mounted loosely at opposite ends of a vertical rubber-supporting shaft 10, mounted in the frame 3, the lower end of the shaft passing through a basal tubular hub or collar 11, depending from the bottom of the frame and passing through the lid 2. Each gear-wheel is provided with a hub 12, loosely embracing the shaft, as best seen in Fig. 2.

Pivoted between suitable lugs or ears 13, projecting from an arm 14, secured on the inside of the frame 3 and oscillating in a plane parallel to the axis of rotation of the shaft 4, is a bell-crank 15, at the free end of whose long arm is pivotally mounted a block 16, substantially elliptical in cross-section, said block being adapted to traverse during the rotation of the gear-wheels 8 9 the concentric grooves or tracks 17 18, disposed along the inner face of the gear 8, the short arm of said bell-crank operating against the rings or collars 19, formed along the peripheral surface of a shifting clutch 20, loosely mounted on the shaft 10. The clutch is free to shift longitudinally along the shaft 10 a distance sufficient to permit its opposite ends to alternately engage the gears 8 9, as presently to be described, the longitudinal movement being possible by virtue of the longitudinal slot 21, formed in the peripheral wall thereof, the clutch being caused to rotate with the shaft 10 by the pin 22, projecting therefrom and engaging the side walls of the slot 21, through which said pin passes. Projecting at each end of the clutch is a lug 23, (the lugs being in line with one another,) the upper lug being forced, when the clutch is shifted upwardly, between the

blocks 24 24, disposed along the under surface of the upper gear-wheel, and the lower lug being forced, when the clutch is shifted downwardly, between two similar blocks 24' 5 24', disposed along the upper surface of the lower gear-wheel. As the shaft 4, however, rotates constantly in one direction, the alternate engagement of the clutch first with one gear 8 and then with the other gear 9 will 10 impart an alternating rotary motion to the shaft 10 and to the rubber 25, slidingly secured to a stem carried at the lower end thereof within the tub, as usual.

The manner of shifting the clutch is as follows: The vertical walls of the open end of the inner concentric groove 17 of the upper gear-wheel 8 terminate in a reverse curve 17', the direction of which is such as to be substantially a continuation of the curvature 20 formed in the outer vertical wall of the exterior groove 18 adjacent to the open mouth of the inner groove. As the gear-wheel 8 rotates the block 16 will pass from the inner to the outer groove, being directed therein by 25 the reverse curvature 17' at the open mouth of the inner groove, and as it traverses the outer groove the block will as it comes opposite the mouth of the inner groove be directed therein by the inward curvature 18' of the 30 outer wall of the outer groove, the block traveling alternately in the inner and outer grooves. While it travels in the inner groove it will rock the bell-crank lever inwardly, or so as to cause the short arm thereof to drop 35 and force the sliding clutch into engagement with the lower gear-wheel 9. As it passes into the outer groove it will rock the bell-crank outwardly, or in the opposite direction, forcing the clutch into engagement with the upper gear-wheel 8. (See Figs. 2 and 6.) The 40 alternate engagement of the clutch respectively with the upper and lower gear-wheels will cause the shaft 10, by which the clutch is carried, to rotate first in one direction and 45 then in the opposite direction, the main shaft 4 rotating all the time in but one direction.

The outer end of the shaft 4 is coupled to the shaft of the driving or hand wheel 26, which is mounted in a bearing or bracket 27 50 on the adjacent side wall of the tub as follows: Carried at the free end of the shaft 4 is a coupling-head 28, having curved side walls tapering at each end, the head 28 being adapted (when the shaft has been turned to 55 give the block the proper direction) to enter the channel-block 29, secured at the inner end of the wheel-shaft. The wheel 26 is provided with a counterweight 30 to swing the wheel (when released) in such a position as 60 to turn the shaft thereof sufficiently to bring the opening of the channel-block in proper direction to receive the coupling-head 28 as the lid is being closed. In closing the lid the channel-block will be in proper position 65 to receive the coupling-head 28, provided the operator has taken care to turn the shaft 4 of the latter sufficiently to enable the head to

enter from the tapering end. (See Fig. 1.) The advantage of the present construction is that the lid and frame carried by it can be 70 opened without the necessity of raising the wheel 26, which under the old forms of construction was carried directly by the shaft 4 instead of being mounted on a separate bracket at the side of the tub. 75

No claim is herein made to the rubber or the manner of mounting the same, as this feature is old and forms no part of my present invention.

The present reversing mechanism is perfectly noiseless and works with a minimum amount of friction. It is readily assembled or taken apart and may be built at comparatively low cost. By mounting the operating wheel or crank at the side of the machine 85 much weight is thus removed from the lid, making it easier to open or close the latter. It is apparent that minor changes might be made in the details of the device without departing from the spirit of my invention. It 90 is apparent that the shaft 4 may be turned in either direction without effecting the operation of the reversing-gear.

While the improved gearing is here described as applied to washing-machines, it is 95 to be understood that I do not limit its application thereto, as the same may be used on churns, ice-cream freezers, and other machines which require an alternating rotary motion. 100

Having described my invention, what I claim is—

1. In an alternating rotary mechanism, a suitable frame, a driven shaft carried by the frame, bevel gear-wheels loosely mounted on 105 said shaft, a shifting clutch carried by said shaft and adapted to alternately engage with the gear-wheels, a bevel-pinion simultaneously meshing with both gear-wheels, an operating-shaft to which said pinion is secured, 110 means for rotating said operating-shaft, and suitable devices actuated from one of the gear-wheels, for shifting the clutch along the driven shaft, substantially as set forth.

2. In an alternating rotary mechanism, a 115 suitable frame, a driven shaft carried by the frame, bevel gear-wheels loosely mounted on said shaft, a shifting clutch mounted on the said shaft between the gear-wheels and adapted to rotate with the shaft, a bevel-pinion 120 simultaneously meshing with both gear-wheels, an operating-shaft to which said pinion is secured, means for rotating said operating-shaft, a bell-crank lever pivoted between the gear-wheels and having one arm coöperating 125 with the clutch, the second arm of the bell-crank being adapted to be tilted by one of the wheels whereby the clutch is brought alternately into engagement first with one gear-wheel and then with the other, substantially 130 as set forth.

3. In an alternating rotary mechanism, a suitable frame, a driven shaft carried by the frame, bevel gear-wheels loosely mounted on

said shaft, a shifting clutch mounted on the driven shaft between the gear-wheels, and rotating with said shaft, a bevel-pinion simultaneously meshing with both gear-wheels, an operating-shaft for said pinion, means for imparting rotation to said shaft, a bell-crank lever pivoted to the frame between the gear-wheels, and having a short arm engaging the clutch, a block pivoted at the free end of the long arm, concentric grooves or tracks formed along the inner surface of one of the gear-wheels for the reception of the block, the grooves opening into one another, and the parts operating substantially as and for the purpose set forth.

4. In a reversing mechanism, a gear-wheel having formed along one face thereof two concentric grooves or tracks, the inner groove opening into the outer one along a reverse curve bounding the side walls of the groove, and the outer groove opening into the adjacent mouth of the inner groove thus formed, by an inner curvature bounding the outer side wall of the outer groove, substantially as set forth.

5. In an alternating rotary mechanism, reversing-gear mechanism, a shaft for said mechanism, a coupling-head at the outer end of the shaft, a wheel or crank-arm, a channel-block carried by the shaft of the wheel and adapted to receive the coupling-head, thereby connecting the parts together, substantially as set forth.

6. In an alternating rotary mechanism, a frame, an operating-shaft, a coupling-head having tapering ends, carried at the outer end of said shaft, a wheel mounted at the side of the frame, a channel-block at the inner end of the wheel-shaft for receiving the coupling-head, and a counterweight carried by the wheel for rotating the latter to a position to turn its shaft to bring the groove of the channel-block in line of the arc described by the coupling-head, to receive the latter, without material friction, substantially as set forth.

7. In a reversing mechanism a driven shaft, gear-wheels loosely mounted on the same, one of said wheels having a series of concentric grooves or tracks, a pivoted bell-crank lever having a long and short arm, a block pivoted at the free end of the long arm and having tapering ends, the block being adapted to traverse the grooves aforesaid during the rotation of the gear-wheels, and a clutch adapted to be actuated by the short arm of the bell-crank during the rocking of the latter as the block traverses first the inner and then the outer groove or track, substantially as set forth.

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

AL H. HERRON.

Witnesses:

EMIL STAREK,
GEORGE L. BELFRY.