

No. 755,634.

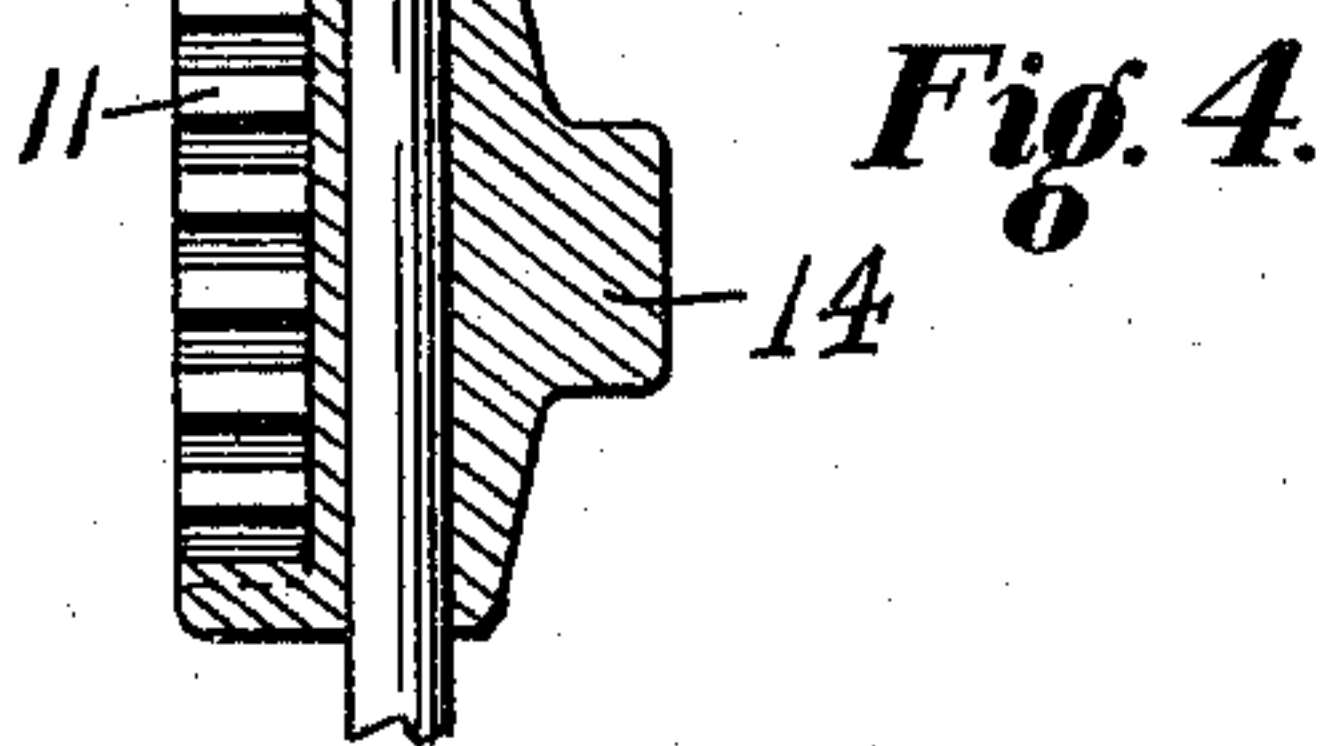
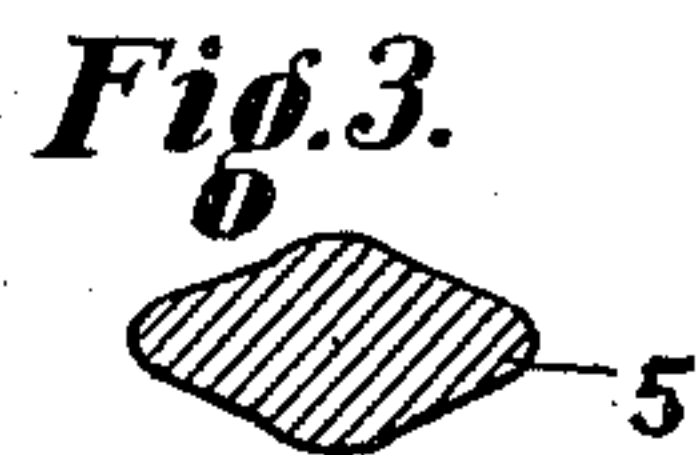
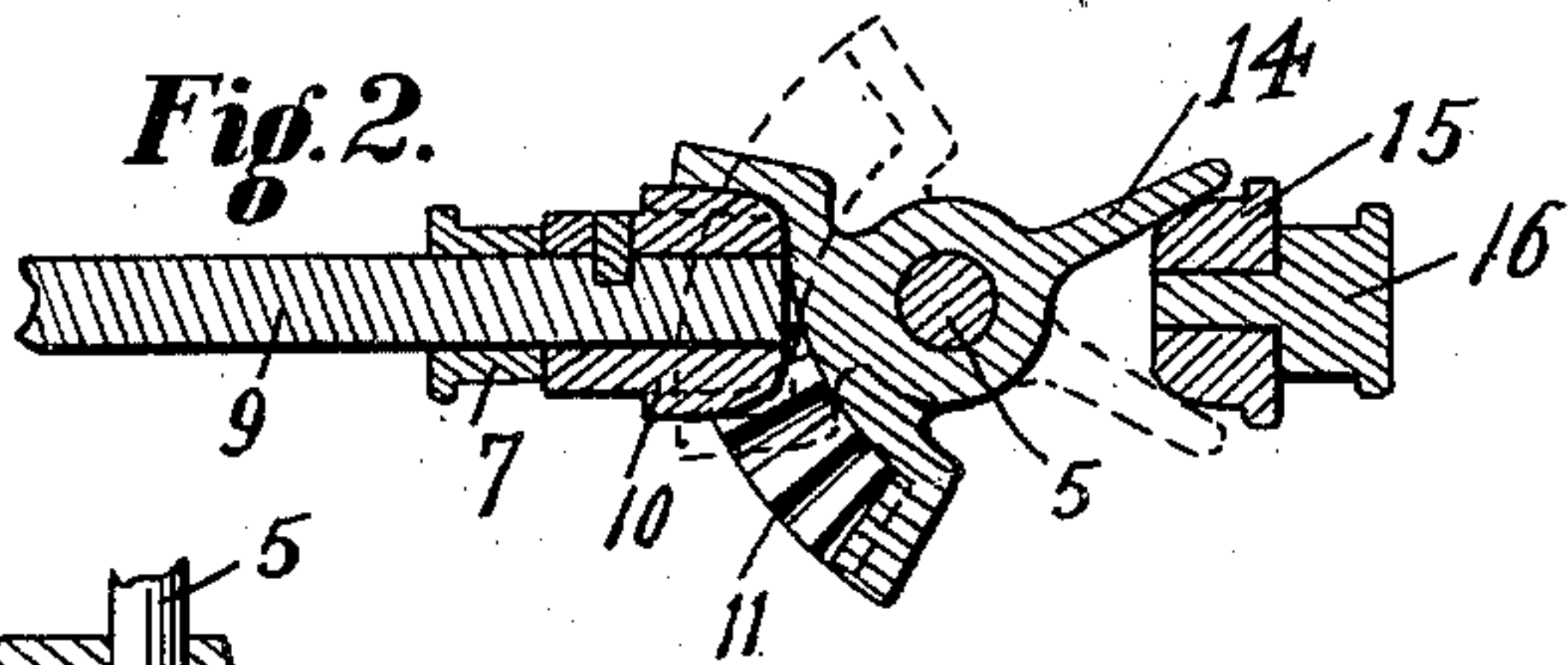
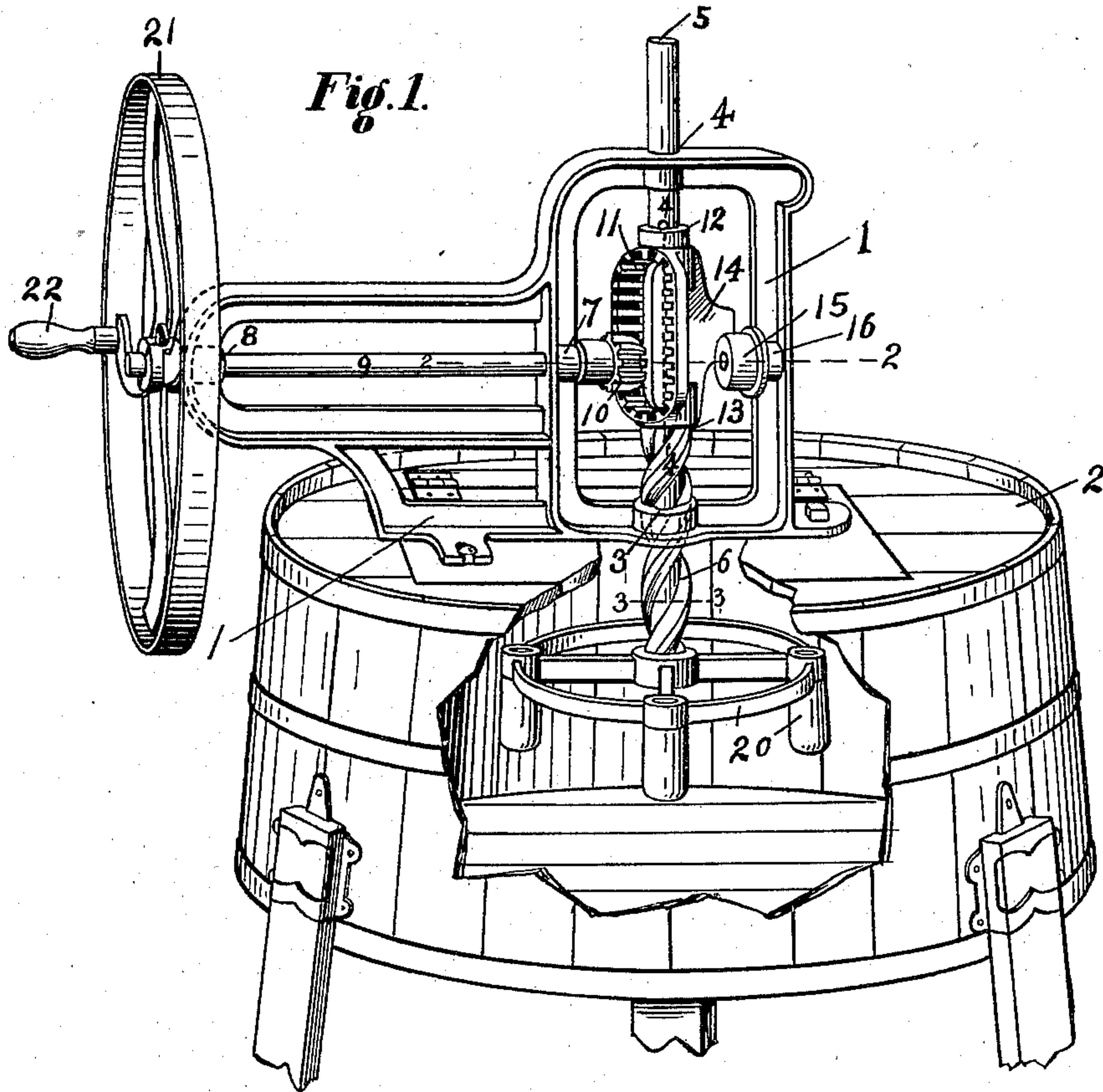
PATENTED MAR. 29, 1904.

J. DIETZ.
GEARING.

APPLICATION FILED MAY 27, 1903.

NO MODEL.

2 SHEETS—SHEET 1.



WITNESSES:
Ancha D. Muehlenhard
Florence M. Power.

John Dietz INVENTOR.
BY *James F. Rauscy*
HIS ATTORNEY.

No. 755,634.

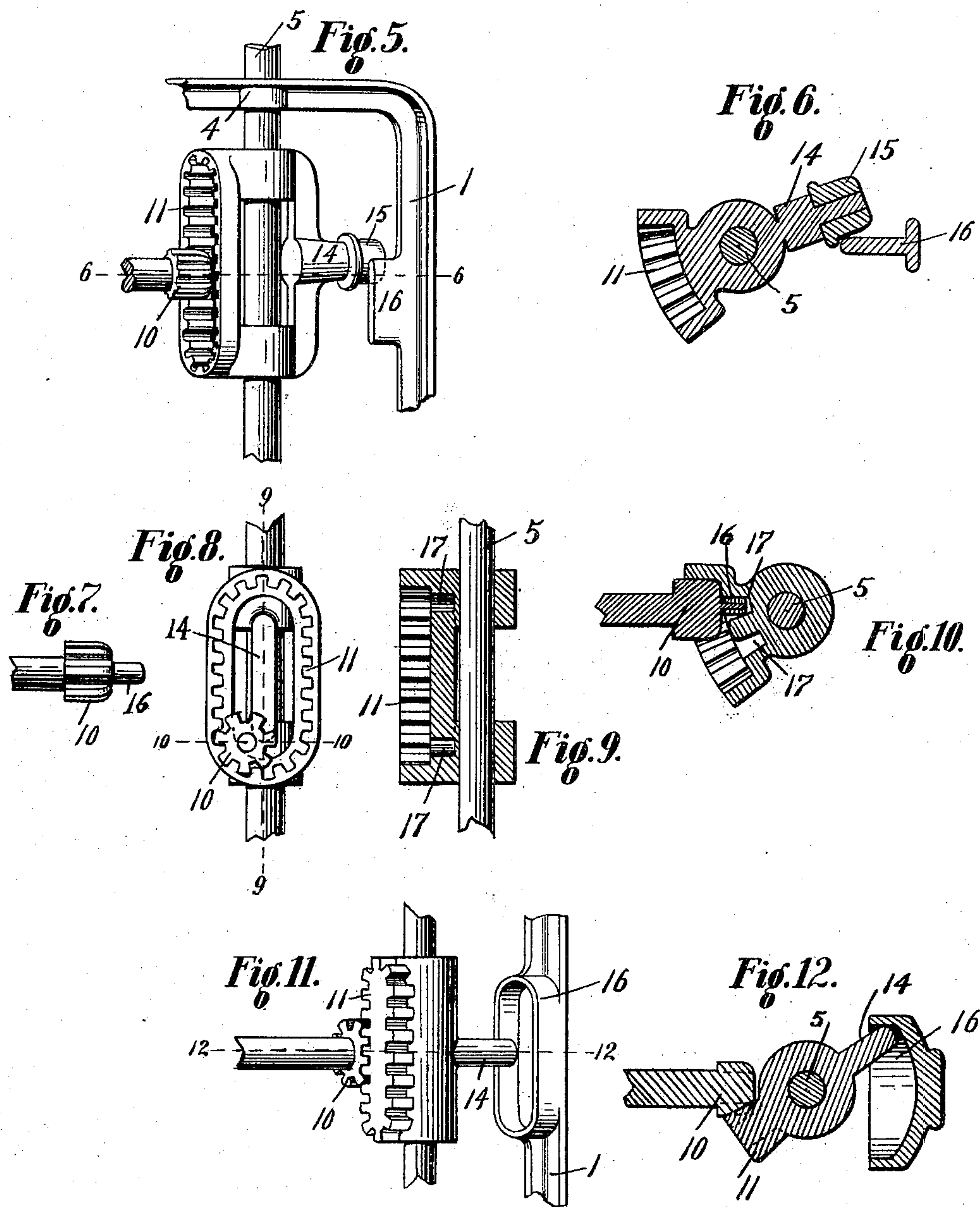
PATENTED MAR. 29, 1904.

J. DIETZ.
GEARING.

APPLICATION FILED MAY 27, 1903.

NO MODEL.

2 SHEETS—SHEET 2.



WITNESSES:

Amelia D. Muehlenhard
Florence M. Power.

INVENTOR.

John Dietz
BY James H. Ramsey
HIS ATTORNEY.

UNITED STATES PATENT OFFICE.

JOHN DIETZ, OF CINCINNATI, OHIO, ASSIGNOR TO CONRAD DIETZ, OF CINCINNATI, OHIO.

GEARING.

SPECIFICATION forming part of Letters Patent No. 755,634, dated March 29, 1904.

Application filed May 27, 1903. Serial No. 158,907. (No model.)

To all whom it may concern:

Be it known that I, JOHN DIETZ, a citizen of the United States, residing at Cincinnati, in the county of Hamilton and State of Ohio, have invented certain new and useful Improvements in Gearing, of which the following is a specification.

My invention relates to improvements in gearing for rotary washing-machines.

The object of my invention is to produce alternating reversible rotary and longitudinal movements of the driven shaft in washing-machines with the greatest possible ease and to reduce and minimize jarring at the points of reversal, as well as to simplify the construction and arrangement whereby it is rendered stronger and more durable and less expensive to manufacture.

My invention consists of a housing adapted to be mounted upon a washing-machine, said housing having therein a female spiral adapted to form a bearing and guide, a driven shaft journaled in said housing and having a male spiral thereon adapted to take into and engage said female spiral to rotate said driven shaft, a rack and rudder pivotally mounted upon said driven shaft and means for holding same from endwise movement thereon, a pinion adapted to engage said rack, and a guide adapted to engage said rudder and turn the rack in different positions to bring it in constant engagement with the pinion as it is rotated to drive said shaft in alternating reversible rotary and longitudinal directions.

My invention also consists in the details of construction, combination, and arrangements, as hereinafter more fully set forth and as particularly pointed out in the claims.

In the drawings, Figure 1 is a perspective view of my invention as applied to a washing-machine, a part thereof being broken away to show the interior. Fig. 2 is a horizontal section taken on line 2 2 of Fig. 1, the dotted lines showing the position of the rack and rudder when the driving-pinion has made a half-circuit of the rack. Fig. 3 is a cross-section of the driven shaft on line 3 3 of Fig. 1. Fig. 4 is a vertical section of the rack, driven shaft, and rudder on line 4 4 of Fig. 1. Fig. 5 is a

perspective view of a portion of the housing, showing the rudder on one side thereof with the roller mounted thereon. Fig. 6 is a horizontal section on line 6 6 of Fig. 5. Fig. 7 is a view in side elevation of the driving-pinion and guide on the end of the crank-shaft. Fig. 8 is a front or face view of the rack and adjacent parts, showing the rudder mounted near the rack and adapted to engage the guide shown in Fig. 7 as the pinion travels around within the rack. Fig. 9 is a vertical section on line 9 9 of Fig. 8. Fig. 10 is a horizontal section on line 10 10 of Fig. 8. Fig. 11 is a detail view showing a modified form of rack and guide to reverse the movement of the driven shaft. Fig. 12 is a section taken on line 12 12 of Fig. 11.

I prefer to construct my improved device substantially as follows: The housing 1 is formed with a suitable base which is secured to and mounted upon the clothes-receptacle 2. Said housing is provided, preferably at its bottom, with a female spiral 3 and at its top with a bearing 4 to receive the driven shaft 5, carrying the male spiral 6, which is adapted to engage and rotate within said female spiral. The housing is also provided with bearings 7 and 8 to receive and support the crank-shaft 9, carrying pinion 10, which engages and is adapted to actuate rack 11. Rack 11 is oblong in shape and consists of an endless row of cogs. It is pivotally mounted upon the driven shaft 5, preferably between bosses 12 and 13 above the male spiral. Its cogs are preferably extended inwardly, as shown in Fig. 1; but they may be extended outwardly, as shown in Fig. 11. Adjacent said rack I provide a rudder 14, adapted to move in unison with said rack and engage a guide 15, mounted upon a pin 16, said guide being preferably formed to revolve when in contact with said rudder during the operation.

The construction and arrangement of the rudder and guide may be modified—as, for instance, the guide may be elongated, as shown in Fig. 5, and the revolving roller mounted upon the rudder, as shown in Fig. 5, or the guide may consist of an elongated slot with

its ends closed and curved and the rudder formed circular in cross-section, as shown in Fig. 11.

Another modification consists of the construction shown in Figs. 7, 8, 9, and 10, in which the rudder is arranged near the cogs, with a guideway 17 formed around said rudder and in which the guide shown in Fig. 7 is adapted to move to turn the rudder in proper positions to hold the pinion in contact with the rack at all times while the pinion is being operated. It is immaterial which particular form is used, since the result obtained is the same, and the principle, as well as the substantial construction and arrangement of the parts, is practically the same, all of these various forms and arrangements falling within the scope and spirit of my invention.

The cogs upon the pinion are preferably tapered at the corners, so as to afford an easy mesh at the curved parts of the rack near the ends thereof.

The rudder engages the guide while the rack is being moved up and down, and it holds the rack in engagement with the pinion at all times.

It will be seen that the crank-shaft may be rotated in either direction and that the reversible movement of the driven shaft will take place without reversing the direction of the movement of the crank-shaft.

The clothes-rubbing devices 20 are attached to the lower end of the driven shaft, so that as the crank-wheel 21 is turned by the handle 22 the crank-shaft 9 and pinion 10, mounted upon the inner end thereof, are caused to rotate and move the rack and rudder up and down, which draws the driven shaft therewith, thereby giving the longitudinal movement, and by means of the male and female spirals the rotary movement, as above described, the reversal or alternating movements of the shaft being produced by the engagement of the pinion with the rack, over a part of which it travels in one direction and the other part in the opposite direction, and also the engagement of the rudder and guide. In the construction illustrated the clothes-rubbing devices are caused to move up and down, while at the same time revolving a part revolution and then reversing, thus causing a very thorough agitation and rubbing of the clothing.

As heretofore explained, my invention is capable of considerable modification without material departure from the scope of my invention, and for this reason I do not wish to be understood as limiting myself to the precise form or arrangement of the parts herein set forth.

I claim—

1. In a washing-machine, the combination of a housing, a driven shaft journaled in said housing, a female spiral in said housing, a male spiral on said driven shaft adapted to

take into and engage said female spiral to rotate the driven shaft, a rack and rudder pivotally mounted on said driven shaft, a pinion adapted to engage said rack, means for supporting and rotating said pinion, and a guide adapted to engage said rudder to turn said rack in different positions to hold it in engagement with the pinion as it is being rotated.

2. In a washing-machine, the combination of a housing, a driven shaft journaled therein, a female spiral in said housing, a male spiral on said driven shaft adapted to take into and engage said female spiral to rotate the driven shaft, a rack and rudder pivotally mounted on said driven shaft, a pinion adapted to engage said rack, means for supporting and rotating said pinion, and a revolving guide adapted to engage said rudder to turn said rack in different positions to hold it in engagement with the pinion as it is being rotated.

3. In a washing-machine, the combination of a housing, a driven shaft arranged and journaled vertically therein, a female spiral in said housing, a male spiral on said driven shaft adapted to take into and engage said female spiral to rotate the driven shaft, a rack and rudder pivotally mounted on said driven shaft, a pinion adapted to engage said rack, means for supporting and rotating said pinion, and a guide adapted to engage said rudder to turn said rack in different positions to hold it in engagement with the pinion as it is being rotated.

4. In a washing-machine, the combination of a housing, a driven shaft arranged and journaled vertically therein, a female spiral in said housing, a male spiral on said driven shaft adapted to take into and engage said female spiral to rotate the driven shaft, an elongated and endless rack and a rudder pivotally mounted on said driven shaft, a pinion adapted to engage said rack, means for supporting and rotating said pinion and a guide adapted to engage said rudder to turn said rack in different positions to hold it in engagement with the pinion as it is being rotated.

5. In a washing-machine, the combination of a housing, a driven shaft mounted in said housing, a male spiral on said driven shaft, a female spiral adapted to engage said male spiral to rotate the driven shaft, a rack on said driven shaft and a pinion adapted to engage said rack, means for rotating said pinion and means for holding said pinion and rack in engagement with each other.

6. In a washing-machine, the combination of a housing, a driven shaft journaled in said housing, a female spiral in said housing, a male spiral on said driven shaft adapted to take into and engage said female spiral, a rack on said driven shaft, a pinion adapted to engage and move said rack and a guide and rudder adapted to reverse the movements of said driven shaft.

7. In a washing-machine, a housing, a female spiral in said housing, a male spiral formed upon said driven shaft and adapted to take into said female spiral, a rack and rudder pivotally mounted upon said driven shaft, means for holding said rack and rudder from lengthwise movement upon said shaft, a pinion adapted to mesh with said rack and means for holding said rack and pinion in engagement with each other while the pinion is being rotated.

8. In a washing-machine, the combination of a housing a driven shaft journaled therein,

a female spiral in said housing, a male spiral on said driven shaft adapted to engage said female spiral, a rack and rudder on said driven shaft and a guide to engage said rudder whereby the rack and pinion are held in engagement with each other and reverse longitudinal and rotary movements are produced, without reversing the movement of the driving mechanism.

JOHN DIETZ.

Witnesses:

JAMES N. RAMSEY,
LOUIS E. DIETZ.