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FIG. 1.

A detailed cross-sectional view of a mechanical device, possibly a pump or a valve assembly. The device features a central vertical shaft with multiple gears and valves. A large circular component (7) is positioned at the bottom, connected to a horizontal shaft (6). Fluid enters from the left (3) and exits to the right (4). Internal components are labeled with numbers 1 through 32, indicating various parts like gears, valves, and structural elements. The device is housed within a complex, multi-layered casing.

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GEARING.

1,060,814.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, WILLIAM C. BURGUM, of Pittsburgh, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Gearing, of which the following is a specification.

In the accompanying drawings I have shown my invention in connection with a water meter of the disk type and while my invention relates to meters of this class, the present invention more particularly relates to a speed reducing mechanism designed for operating registering devices of various kinds and for other purposes wherever it is desired to employ a speed reducing gearing.

Among the objects of the present invention are, to provide a new and improved speed reducing gearing; a new and improved mechanism for operating registering devices of meters; and to provide a water meter of the disk type in which the speed reducing gearing is inclosed and separated from the water passing through the meter.

In the accompanying drawing which illustrates an application of my invention, Figure 1 is a central vertical section of a water-meter of the disk type embodying my invention; Fig. 2, is an enlarged sectional view of the speed reducing gearing, the section being taken on line II—II of Fig. 3, and Fig. 3 a part plan and a part sectional view taken on line III—III of Fig. 2.

Referring to the drawing 2 designates a disk housing formed with an inlet 3 and an outlet 4. Located in housing 2 and designed to operate within a disk chamber 5, in the usual manner, is a circular disk 6. This disk is supported by a ball 7, the latter carrying a post or pin 8 which projects from the disk chamber 5 and engages arms 9 carried on the lower end of a shaft 10. Shaft 10 extends through a conical member 11 carried by a cap 12, and is provided on its upper end with a disk 13 having an arm 14.

Mounted on the disk-housing 2 is a casing 15. Casing 15 is preferably of the form shown and comprises a cross-wall 16 dividing the interior of the casing into a lower chamber 17 and an upper chamber 18. The top of the upper chamber is closed by a cap 19 which latter, in the form shown, is designed to carry a registering mechanism 20

and a stuffing box 21. Closed chamber 18 is designed to contain a speed reducing gearing and a sufficient quantity of oil is indicated by the numeral 22 to enable the contained gearing or a portion thereof to run in the oil. By thus inclosing and separating the speed reducing gearing from the meter mechanism proper, water passing through the meter is kept away from said gearing.

The cross wall or partition 16 carries a stuffing-box 23 through which projects the lower portion of a shaft 24. Shaft 24 carries at its lower end a disk-member 25 having an arm 26. Arm 26 is adapted to engage the arm 14 as the latter is rotated by means of its shaft 10.

The speed reducing mechanism or gearing for transmitting the motion of the shaft 10 to a shaft 27 of the registering mechanism constitutes an important and characteristic feature of the present invention. As illustrated and as preferred this mechanism comprises, in addition to the shaft 24, a pair of toothed members or disks arranged in different planes. As shown these toothed members 28 and 29 are supported by arms 30 and 31 of a hanger 32 and are both mounted on a shaft 33. The walls of the notches or cavities intervening the teeth of members 28 and 29 are arcuate to conform to the shape or curvature of driving members presently to be referred to.

Shaft 24 on its exterior and at its upper end is arcuate or circumferential and is enlarged as shown at 34 which enlarged portion is cut away as indicated by the numerals 35 and 36 substantially to the center of the shaft to form driving members for the toothed members 28 and 29. Each of the driving members, formed by cutting away the shaft, as clearly shown by the drawing, is substantially semi-circular and is adapted to alternately make rolling contact with the teeth of the said members and the center of the shaft is almost in line with the outer edges of the teeth of members 28 and 29, thereby having the driving power at substantially the center of the shaft and providing a construction capable of being run at a high rate of speed. The enlarged portion of the shaft is arranged in relation to said toothed members in such a manner that two full or uncut portions of the shaft

will, upon rotation of the shaft, alternately mesh with the teeth of the respective members 28 and 29 and thus lock said members.

The teeth 28 and 29 during part of the revolution of the shaft 24 are not driven by the driving members 35, 36; hence there is lost motion of the shaft. When the teeth of member 28 are driven, the driving member 36 of the teeth of member 29 merely rolls or revolves in the spaces or cavities between the teeth of the member 29 without driving the member, and the member 36 acts similarly when the teeth of member 29 are being driven. By reason of the fact that one of the drive members is in a cavity of one of the members 28 and 29, while the shaft 24 is revolving and the members 28 and 29 are motionless and locked, any appreciable backward movement of said members 28 and 29 and transmission thereof to the registering parts is avoided which is essential in a device of this kind. This locking feature is also true relative to the driven members 40 and 41, and their driving members 38, 39.

The shaft 33 is very similar to shaft 24, being formed with a corresponding enlarged upper end 37 and cut away at 38 and 39. Shaft 33 is designed to revolve a second pair of gears or toothed members 40 and 41. As shown members 40 and 41 are in the form of hollow flat disks with their teeth formed on the inner circumferences thereof. These members are mounted on and adapted to revolve the shaft 27 of the registering mechanism.

The number of teeth on the toothed members are so proportioned as to obtain a very considerable reduction in movement or a great difference between the number of revolutions of the shaft 27 and the driving shaft 10. As illustrated the members 28 and 29 are each provided with nine teeth and the members 40 and 41 with twelve teeth, therefore every complete rotation of the shaft 27 will require one hundred and eight rotations of the shaft 10.

What I claim is:

1. In a speed reducing gearing, a rotatable shaft provided with a driving member having an arcuate face curved concentric

with the axis of the shaft, a rotatable member arranged in driving relation to the driving member and provided with teeth and intervening notches, said driving member engaging said notches, and the walls of said notches conforming in curvature to the arcuate face of the driving member.

2. In a speed reducing gearing, a rotatable shaft provided with a driving member having a substantially semi-circular face curved concentric with the axis of the shaft and a substantially flat face, a rotatable member arranged in driving relation to the driving member and provided with teeth and intervening notches, said driving member engaging said notches and the walls of said notches conforming in curvature to the substantially semi-circular face of the driving member.

3. In speed-reducing gearing, a rotatable shaft provided with a plurality of driving members, each member having an arcuate face, a rotatable member arranged in driving relation to said driving members and having teeth in the planes of said driving members providing intervening notches, said driving members engaging said notches, and the walls of said notches conforming in curvature to the arcuate faces of the driving members.

4. In speed-reducing gearing, a rotatable shaft provided with a plurality of driving members, each member having a substantially semi-circular face, a rotatable member arranged in driving relation to the driving members and having teeth in the planes of said driving members providing intervening notches, the teeth in the several planes being out of alinement with each other, said driving members engaging said notches, and the walls of said notches conforming in curvature to the substantially semi-circular faces of the driving members.

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

WILLIAM CHARLES BURGUM.

Witnesses:

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