C. URKEWITZ.

WATER METER.

APPLICATION FILED FEB. 28, 1913.

1,100,635. Patented June 16, 1914.

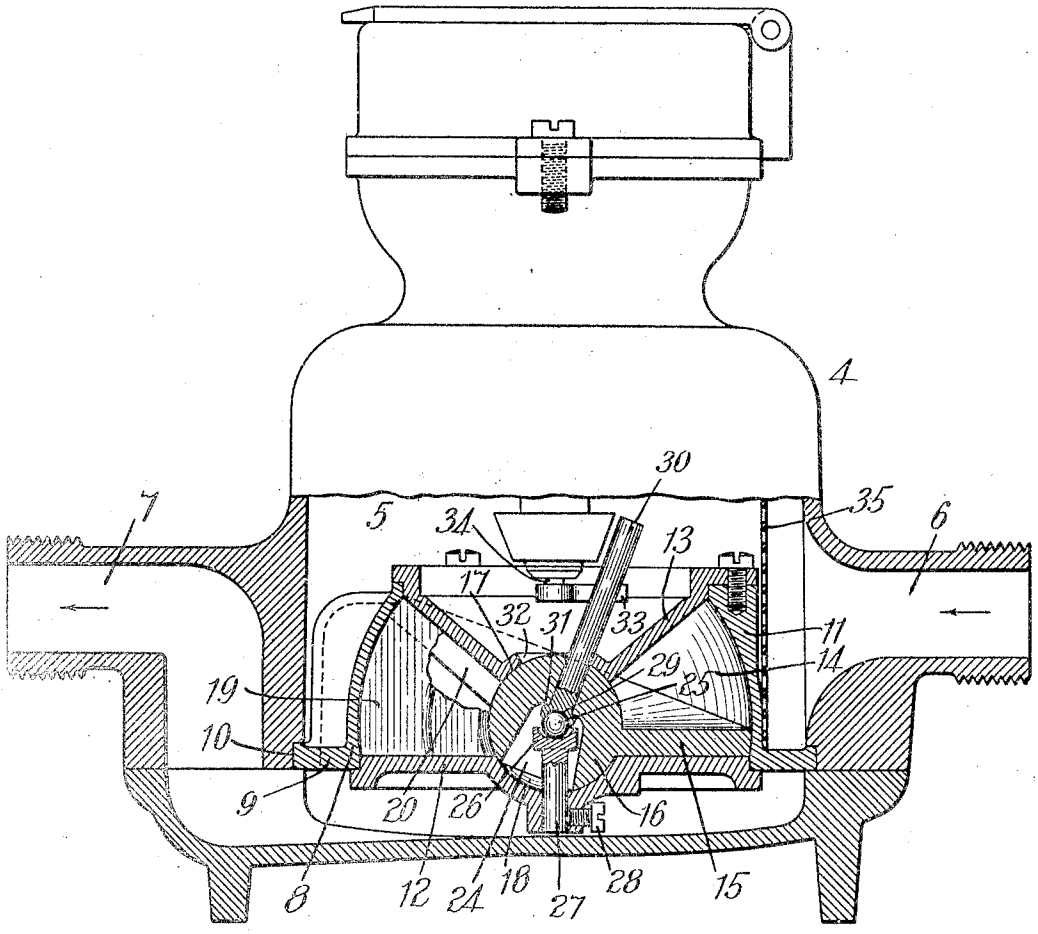


Fig. 1.

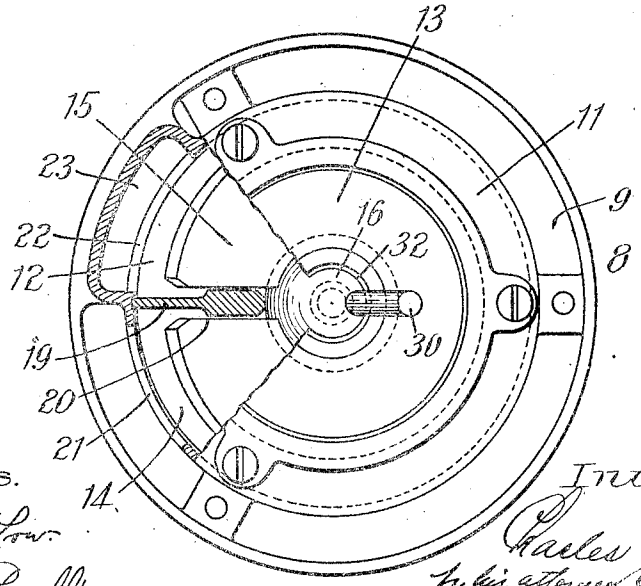


Fig. 2.

Witnesses.
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UNITED STATES PATENT OFFICE.

CHARLES URKEWITZ, OF CAMBRIDGE, MASSACHUSETTS.

WATER-METER.

1,100,635. Specification of Letters Patent. Patented June 16, 1914.

Application filed February 28, 1913. Serial No. 751,202.

To all whom it may concern:

Be it known that I, CHARLES URKEWITZ, a subject of the Czar of Russia, residing at Cambridge, in the county of Middlesex and State of Massachusetts, have invented new and useful Improvements in Water-Meters, of which the following is a specification.

This invention relates to improvements in water meters and particularly to that class of meters known as the disk meter in which the disk gyrates about a center. In meters of this character the disks are usually provided with a spherical center which constitutes the pivot for said disk, said disk being inclosed in a casing having concaved recesses adapted to engage and partially surround said spherical center portion. In this construction the contacting surfaces between said spherical center and the walls of the recess which support said disk are arranged slightly below the surface of said casing over which the water has to pass and consequently any sand or sediment in said water will naturally be directed between said contacting surfaces to injure or roughen said surfaces and thereby greatly reduce the efficiency of the meter.

The object of this invention is to provide a meter of the class described having a bearing arranged within the spherical center of the disk and sufficiently above the surface of the passage through which the water passes, to prevent the sand and sediment from said water from settling around and in contact therewith.

The invention consists in the combination and arrangement of parts whereby the above object and certain other objects hereinafter appearing are attained, as set forth in the following specification and particularly pointed out in the claims.

Referring to the drawings: Figure 1 is a sectional side elevation of a water meter embodying my invention. Fig. 2 is a detail plan view of the measuring disk casing with portions of said casing broken away to show the inlet and outlet orifices therefor.

Like numerals refer to like parts throughout the several views of the drawings.

In the drawings, 4 is the casing of a water meter of a well known construction and therefore requiring but little description, suffice it to say said casing is provided with the usual chamber 5 having an inlet 6 and an outlet 7, said inlet 6 entering said chamber at one side while the outlet 7 is connected therewith at the bottom.

The chamber 5 is separated or divided into two compartments by a disk casing 8 having an annular flange 9 which is arranged to fit an annular recess 10 in said casing 4. The inner casing 8 consists preferably of three parts, the spherical shaped side wall 11, the flat base 12 and the conical shaped top 13, all of said three parts together forming a chamber 14 which contains the conical measuring disk 15.

The disk 15 is provided with a spherically formed center 16 which is adapted to engage or project into concavities 17 and 18 in the top and base respectively, said spherical portion constituting a partition whereby the water passing into said chamber will be directed therearound. The spherical side wall is provided with the usual radial partition 19 which is adapted to project into a slot 20 in said disk, thus preventing said disk from rotating within said chamber.

The casing 8 is further provided with an inlet orifice 21 which is located upon one side of the partition 19 and an outlet orifice 22 located upon the opposite side and adjacent to said partition 20, the inlet orifice communicating directly with the portion of the chamber 5 above the annular flange 9, while the outlet orifice 22 communicates through a passage 23 with the lower portion of said chamber 5, that is, the portion below the flange 9.

The spherical member 16 of the disk 15 is recessed at 24 from the bottom face thereof upwardly to a point substantially beyond the center thereof and in said recess is located a ball 25 whose center is substantially coincident with the center of the spherical membr 16 or with the center of gyration of said disk and is supported in said relation by a ball cup 26, said ball cup having a cylindrical stem 27 extending downwardly and secured within a boss formed in the base 12 by a screw 28.

A second ball cup 29 is mounted within the spherical member 16 and is adapted to rest upon said ball 25. This cup is also provided with a cylindrical stem 30 which is smaller in diameter than the ball cup 29 and has a shoulder 31 which engages the inner end of the recess 24. Said stem 30

extends through said spherical member and projects laterally therefrom for a considerable distance through an opening 32 formed in the conical shaped member 13 and engages an arm 33 on the lower end of the spindle 34 connected with the reducing mechanism of the registering train, said registering train being constructed in a manner well known to those skilled in the art and being therefore not shown in the drawings.

There is preferably a slight clearance provided between the bottom surface of the spherical center 16 and the adjacent face of the concavity 18, consequently any sand or sediment which may be deposited by the water passing through said chamber 14 will be permitted to pass therethrough without becoming lodged therebetween and thus interfere with the movements of said disk and considerable sand and sediment may collect around the stem 27 within the concavity 18 without interfering with the movements of said disk or without coming in contact with the ball 25.

In the operation of the device the water enters through the inlet 6 passing through the usual screen 35 into the upper portion of the chamber 5 and thence through the inlet orifice 21 into the inner chamber 14. Assuming that the disk 15 is in the position illustrated in Fig. 1 the water is conducted into the chamber 14 through the inlet orifice 21 beneath said disk and around the spherical central portion 16 thereof from whence it is discharged through the outlet orifice 22. As the water approaches the opposite side of the chamber 14 at which point the lower face of said disk is in contact with the upper face of the flat base 12 the pressure of the water tends to lift said disk as it proceeds and gradually rolls the same about the flat upper face of the base 12. This movement causes what is known as the gyratory movement of said disk and of the stem 30 thereby imparting a rotary motion to the spindle 34 through the arm 33. As the water proceeds, entirely encircling the central spherical member 16, it is finally discharged through the outlet orifice 22 and by the passage of said current of water beneath said disk said disk will be rocked as hereinbefore stated to cause the portion thereof adjacent to the inlet orifice to move downwardly across said inlet orifice and thereby permit water entering the same to pass above said disk and as said current passes around said central member between the upper face of said disk and the lower face of the conical top 13 the action of the disk will be identical with that hereinbefore described relatively to the water passing therebeneath, said water being finally discharged through the same outlet orifice. By the action of said disk in moving from the top of the inlet orifice to the bottom causes a certain amount of water to be admitted at one or the other of the sides thereof which is measured or indicated by the mechanism connected with the spindle 34.

Having thus described my invention what I claim and desire by Letters Patent to secure is:

1. A disk meter having, in combination, a gyratory measuring disk provided with a recess adjacent the center of gyration thereof, a pivot for said disk including a ball arranged within said recess, the center of said ball being coincident with the center of gyration of said disk, and a pair of adjustable bearing members for said ball.

2. A disk meter having, in combination, a gyratory measuring disk comprising a spherical central member, a casing provided with recesses adapted to contain portions of said spherical member, and a ball freely mounted to rotate in any direction and to any extent within said central spherical member and constituting a pivot for said disk, the center of said ball being substantially coincident with the center of said spherical member.

3. A disk meter having, in combination, a gyratory measuring disk comprising a recessed spherical central member, a casing provided with recesses adapted to contain portions of said spherical member, and a pivot for said disk including a ball substantially concealed within the recess formed in said spherical member, the center of said ball being substantially coincident with the center of said spherical member and bearings for said ball in said casing and said disk respectively, said ball being freely mounted to rotate in any direction and to any extent.

4. A disk meter having, in combination, a gyratory measuring disk comprising a recessed spherical member, a casing adapted to inclose said disk and provided with recesses to partially contain said spherical central member, a ball constituting a pivot for said disk located within the recess formed in said central member, the center of said ball being coincident with the center of said member, a ball cup mounted in said casing and constituting a support for said disk, a second ball cup mounted in said disk to engage said ball, said second ball cup comprising a stem extending through and laterally from said central member, and mechanism adapted to be actuated by said stem during the gyratory movements of said disk.

5. A disk meter having, in combination, a gyratory measuring disk comprising a recessed spherical member, a casing adapted to inclose said disk and provided with recesses to partially contain said spherical central member, a ball located within the recess formed in said central member and

constituting a pivot for said disk, the center of said ball being substantially coincident with the center of said member, and a ball cup mounted in said disk, adapted to engage said ball and constituting the bearing member for said disk.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

CHARLES URKEWITZ.

Witnesses:

CHARLES S. GOODING,

SYDNEY E. TAFT.