No. 643,536. Patented Feb. 13, 1900.

A. J. ROBINSON.

MECHANICAL MOVEMENT.

(Application filed Sept. 20, 1897.)

(No Model.)

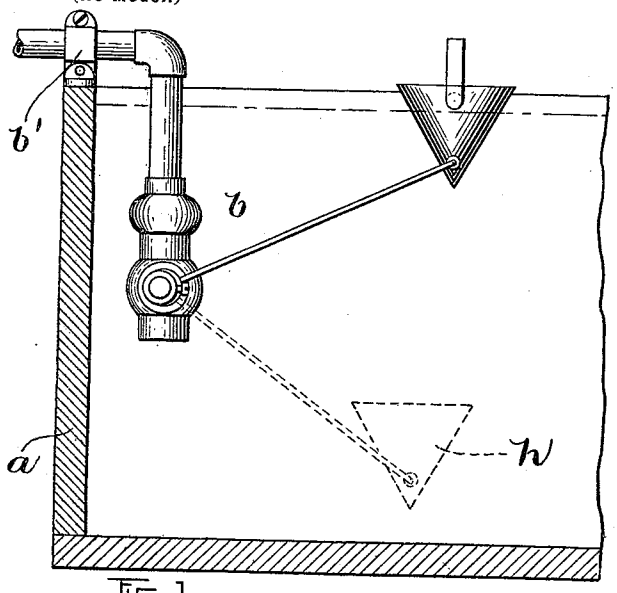

FIG. 1.

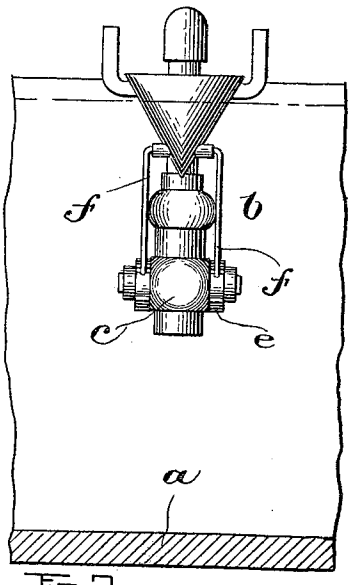

FIG. 2.

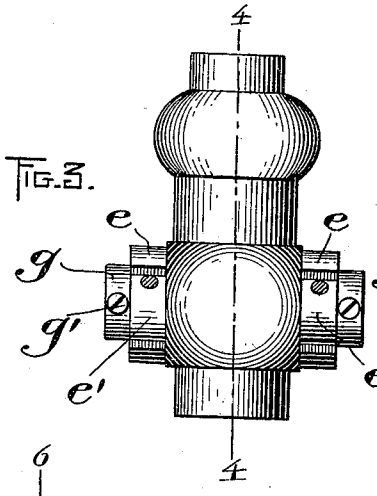

FIG. 3.

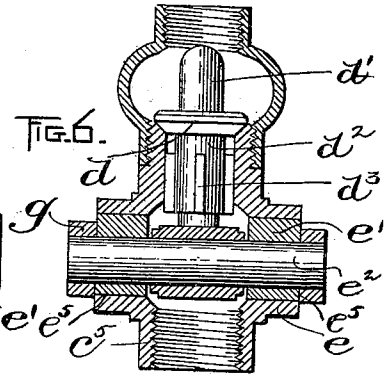

FIG. 6.

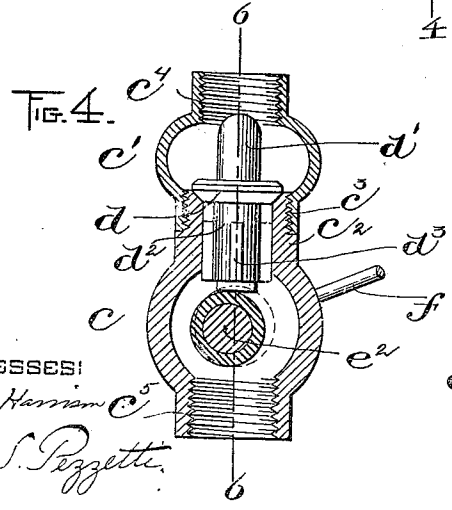

FIG. 4.

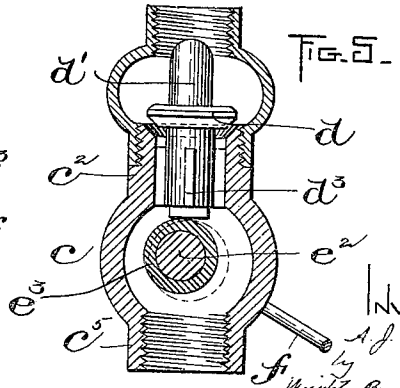

FIG. 5.

WITNESSES:
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INVENTOR:
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UNITED STATES PATENT OFFICE.

ANDREW J. ROBINSON, OF BOSTON, MASSACHUSETTS.

MECHANICAL MOVEMENT.

SPECIFICATION forming part of Letters Patent No. 643,536, dated February 13, 1900.

Application filed September 20, 1897. Serial No. 652,214. (No model.)

To all whom it may concern:

Be it known that I, ANDREW J. ROBINSON, of Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Mechanical Movements, of which the following is a specification.

This invention relates to means for imparting motion from an oscillatory part or member, such as a pivoted lever, which requires to be moved by a relatively-light pressure, to a rectilinearly-movable part or slide, such as a valve-stem, the movement of which is opposed by a relatively-heavy pressure.

The invention has for its object to provide a simple connection between the oscillatory part and the slide, whereby the friction involved in the conversion of a curvilinear movement of the lever into a rectilinear movement of the slide is reduced to the minimum and the force which produces the curvilinear movement is advantageously applied.

The invention consists in the improvements which I will now proceed to describe and claim.

Of the accompanying drawings, forming a part of this specification, Figure 1 represents in side elevation a water-supply apparatus of the float-lever or "ball-cock" type constructed in accordance with my invention. Fig. 2 is a front elevation of the same. Fig. 3 represents a front elevation of a portion of the apparatus detached from the tank. Fig. 4 is a vertical sectional view on the line 4 4 of Fig. 3. Fig. 5 is a view similar to Fig. 4, showing the valve raised to admit water. Fig. 6 is a vertical sectional view on the line 6 6 of Fig. 4.

The same letters of reference indicate the same parts in all the figures.

In the drawings, *e e* represent bearings which are rigidly connected to and are supported by a casing *b*, which is here shown as secured to the wall of a tank *a* by brackets *b'*.

e' e' represent disks fitted to turn freely in the bearings *e e*, the said bearings and disks being in line with each other, as shown, so that they have a common axis of rotation. Each disk is provided with a socket or bearing e^5, which is eccentric to the axis of rotation of the disks, the sockets e^5 being also in line with each other.

e^2 represents a cylindrical stud or spindle which is journaled loosely in the sockets or bearings e^5.

d^2 represents a slide or stem which is fitted to move rectilinearly in a fixed guide in the casing and supports a valve *d*, which is fitted to a valve-seat in the casing.

Means are provided for simultaneously rotating or turning the disks *e' e'* in their bearings, and thus giving the stud or spindle e^2 a lateral movement in the arc of a circle whose center is the axis of the said disks. I have here shown a lever having two arms or branches *f f* rigidly connected with the disks *e' e'* as the means for moving said disks, a float *h* being connected with the outer portion of the lever.

The slide or stem d^2 is arranged so that when the lever *f*, disks *e' e'*, and stud e^2 are moved from the position shown in Fig. 4 to that shown in Fig. 5, the stud being moved laterally in the arc of a circle, the slide will be moved rectilinearly in its guide to an extent determined by the movement of the stud, the slide being thus caused to perform any duty that may be required of it, such as the opening of the valve *d* against the liquid-pressure exerted upon it.

It will be seen that the freedom of the disks *e' e'* to rotate in their bearings and the freedom of the stud e^2 to rotate in its eccentric sockets or bearings in the disks practically eliminates friction in the conversion of the curvilinear movement of the disks and stud into rectilinear movement of the slide and in connection with the arrangement of the parts here shown enables a relatively-light force applied to the lever to overcome a much heavier force or pressure resisting the described movement of the slide.

The location of the stud between the two disks distributes the strain equally at opposite sides of the slide.

Endwise movement of the stud e^2 is prevented in this embodiment of my invention by collars *g g*, attached by screws *g' g'* to the

said stud. Slots or openings are here shown in the bearings *e e* to permit the swinging movements of the lever-arms *f*.

The end portions c^4 c^5 of the casing are shown as internally threaded for engagement with supply and discharge pipes.

The pressure of the liquid in the chamber *c'* of the casing tends to close the valve and also to hold it closed; but when the float descends by reason of the escape of the liquid from the tank *a* the disks *e'* are rotated in their bearings, thereby giving the stud e^2 a movement of translation in the direction required to open the valve and allow the flow of the water by the valves into the tank, the weight of the float being sufficient to overcome the pressure of the water against the supply side of the valve *d*.

I have shown a loose sleeve e^3 mounted on the stud e^2, the stem or slide d^2 bearing on said sleeve.

Preferably the disks *e'* are so adjusted that when the float has reached its highest point the valve-stem will be just out of contact with the sleeve e^3, thereby leaving the valve under the control of the water-pressure. This insures a secure seat for the valve and prevents any tendency to pounding.

d^3 d^3 represent guide-ribs formed on the stem or slide d^2, the outer edges of said ribs having a sliding fit on the guiding-wall of the casing.

Having thus explained my invention and described a way of constructing and using the same, although without having attempted to set forth all the forms in which it may be embodied or all the modes of its use, I declare that what I claim is—

The combination of two disks rotatively mounted in fixed bearings, said disks having sockets or bearings eccentrically formed therein, a stud loosely mounted in said sockets, means for simultaneously turning the disks in their bearings to impart a lateral movement to the stud, and a slide having a rectilinear movement in a suitable guide and arranged to be moved by the said movement of the stud.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, this 15th day of September, A. D. 1897.

ANDREW J. ROBINSON.

Witnesses:

H. L. ROBBINS,

C. C. STECHER.