No. 751,606. PATENTED FEB. 9, 1904.

H. F. BRAMMER.

MECHANICAL MOVEMENT.

APPLICATION FILED NOV. 25, 1901.

NO MODEL. 2 SHEETS—SHEET 1.

Fig. 1.

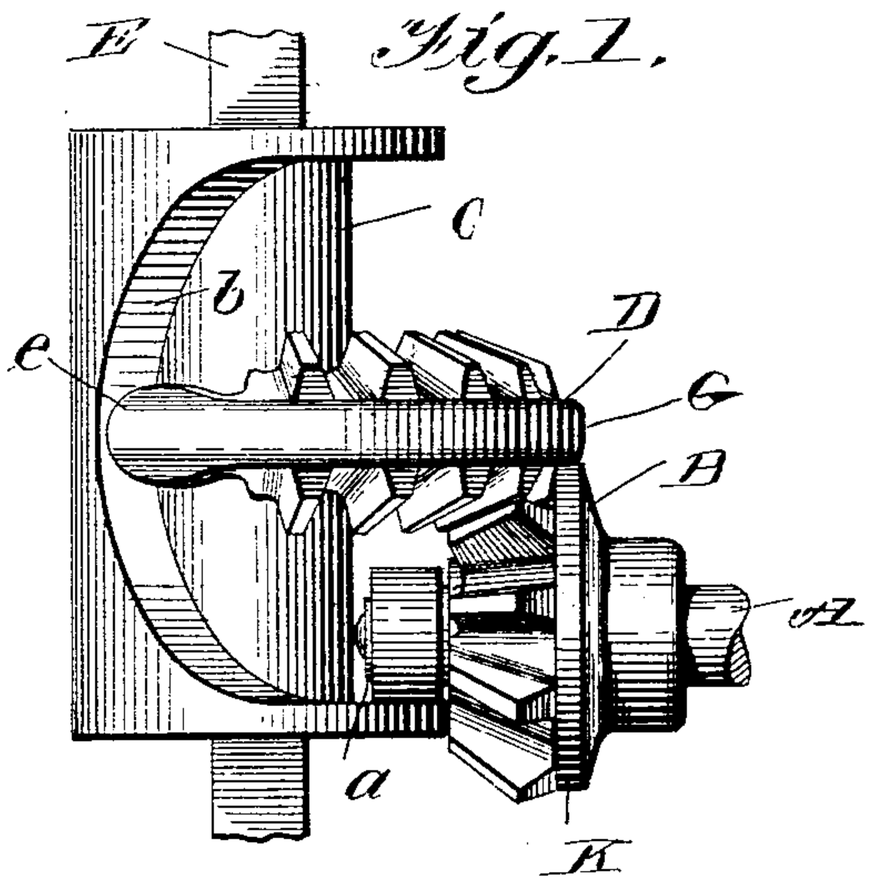


Fig. 2.

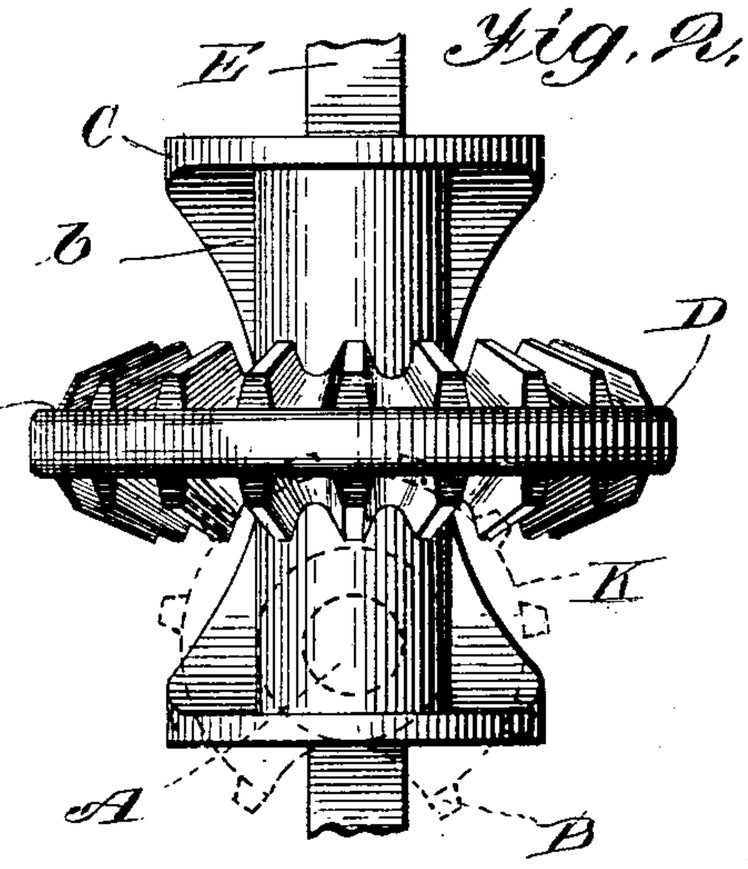


Fig. 3.

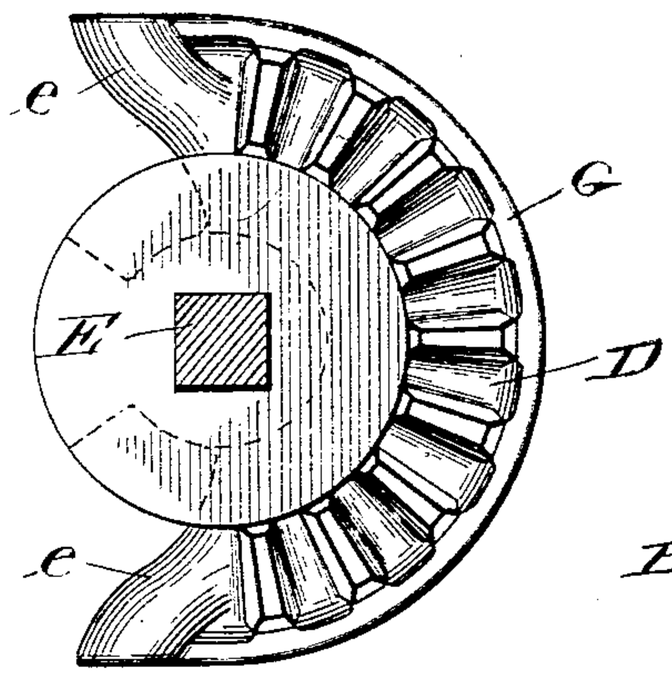


Fig. 4.

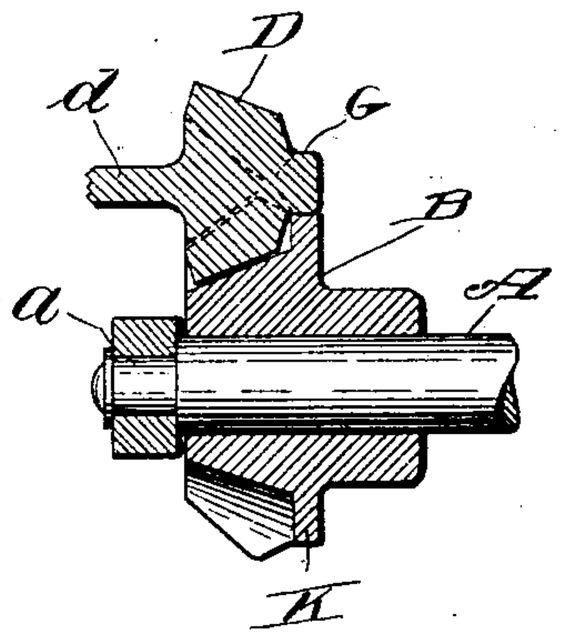
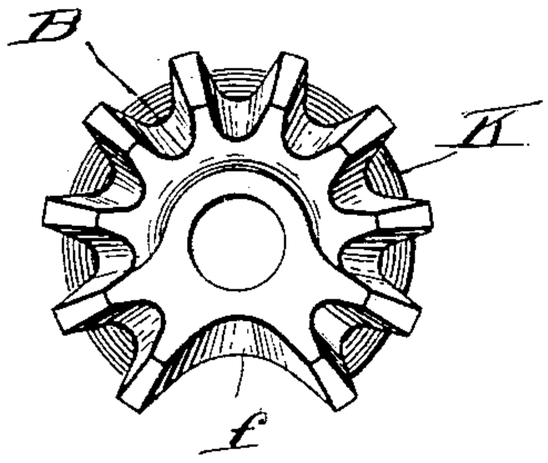


Fig. 5.



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MECHANICAL MOVEMENT.

APPLICATION FILED NOV. 25, 1901.

NO MODEL. 2 SHEETS—SHEET 2.

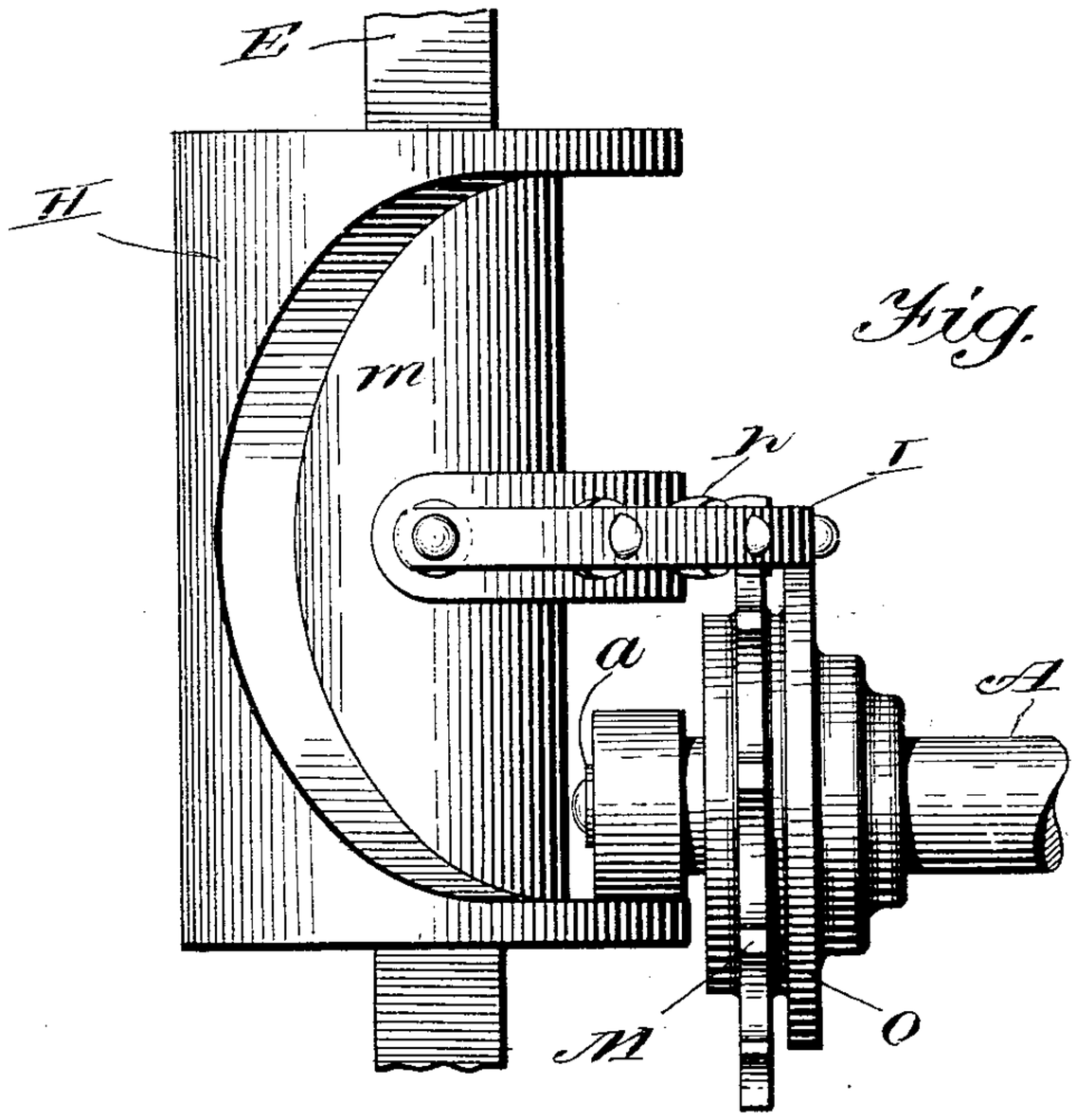


Fig. 6.

Fig. 7.

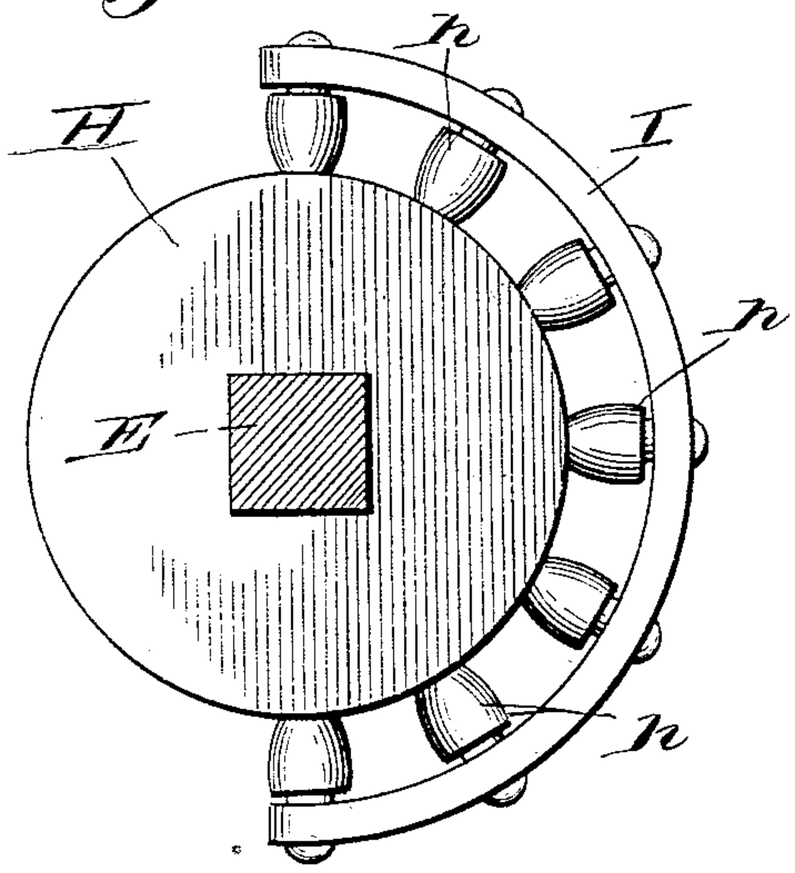
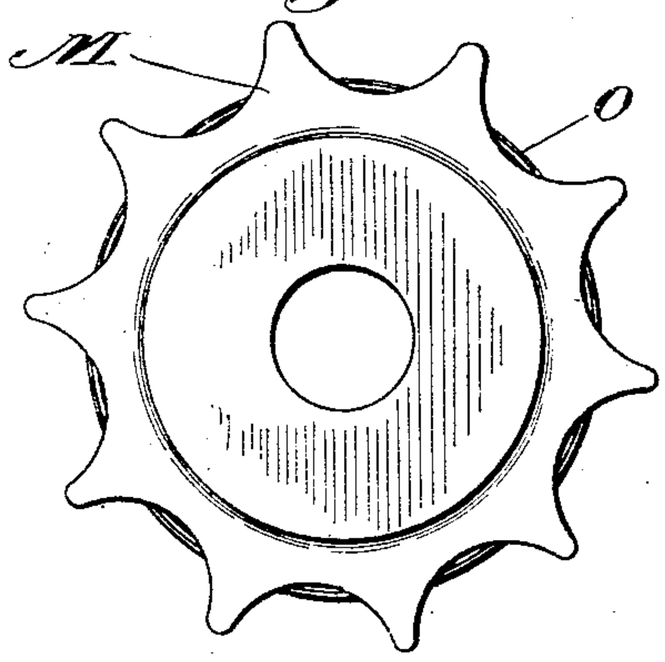


Fig. 8.



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No. 751,606. Patented February 9, 1904.

UNITED STATES PATENT OFFICE.

HENRY F. BRAMMER, OF DAVENPORT, IOWA.

MECHANICAL MOVEMENT.

SPECIFICATION forming part of Letters Patent No. 751,606, dated February 9, 1904.

Application filed November 25, 1901. Serial No. 83,579. (No model.)

To all whom it may concern:

Be it known that I, HENRY F. BRAMMER, a citizen of the United States, and a resident of Davenport, Scott county, Iowa, have invented certain new and useful Improvements in Mechanical Movements, of which the following is a full, clear, and exact description.

My invention relates more particularly to the gearing used in washing-machines for converting the continuously-revolving movement of the drive-shaft into a rotary reciprocal movement of the stirrer-shaft, and is especially applicable to the class of movements of which that illustrated and described in Letters Patent of the United States granted to John Schroeder, March 12, 1895, No. 535,465, is a type.

The object of my invention is to prevent the rattling which occurs while the upper segment of the pinion on the drive-shaft is engaging the gearing on the sliding cylinder and also to reduce the frictional contact of the teeth of said pinion and cylinder, and thereby make the operation of the same easier. This I accomplish by the means hereinafter fully described, and as particularly pointed out in the claim.

In the drawings, Figure 1 is a side elevation of the drive-pinion, the end portion of the drive-shaft to which it is secured, the cylinder, the portion of the stirrer-shaft on which it has a sliding engagement. Fig. 2 is a side elevation of said cylinder from a point of view at right angles to that shown in Fig. 1. Fig. 3 is a plan view of said cylinder. Fig. 4 is a longitudinal central section through said drive-pinion and a portion of a cylinder engaged thereby. Fig. 5 is a front view of said pinion. Fig. 6 is a modified form of my invention. Figs. 7 and 8 are plan views of the rack and pinion of said modification.

In the drawings, A represents the continuously-revolving drive-shaft; B, the drive-pinion, secured thereon in such position that the end *a* of said shaft extends beyond the same.

C represents a cylinder having a segmental rack D, and E represents a shaft, the axial plane of which is at right angles to that of said drive-shaft and upon which the cylinder has a longitudinally reciprocal or sliding movement. Cylinder C has an elliptical depressed area *b* made in its circumferential side, and the segmental rack D is supported by and made integral with a web *d*, projecting at an angle from the center of said depressed area *b* in the plane of its major axis. The rack D (illustrated in the first five figures of the drawings) comprises a double row of equidistant beveled teeth or cogs, one of which faces upward and the other of which faces downward, back to back, and are connected at each end by an enlarged tooth *e*, which is arranged in the radial plane of the foci of the ends of the depressed area *b*, intersected by the major axis. My invention contemplates the connecting or the outer ends of the teeth of the rack by a segment-rim G, extending from end tooth *e* to end tooth *e* of the rack centrally between the two rows. The width of this rim is such that it leaves exposed about half of the outer ends of the teeth of both rows, and the plane of the longitudinal upper and lower edges of the rim are preferably at right angles to the axial plane of the cylinder.

The pinion B is beveled to properly engage with the rack D and is provided with an enlarged space *f* between two of its teeth for the purpose of enabling it to properly engage the enlarged end teeth *e* of the rack. Immediately back of the ends of the teeth of the pinion farthest from the cylinder the boss thereof is provided with an integral circumferential flange K, which is of such diameter as to leave but about one-half of the adjacent end of the teeth exposed. This flange is cut away at X back of the enlarged space of the pinion, so as to accommodate the engagement therewith of the enlarged end teeth *e* of the rack E of the cylinder.

In operation the pinion is held in engagement with the teeth of the rack of the cylinder by the engagement of the extended end *a* of the drive-shaft with the side walls of the elliptical depressed area *b* and moves said cylinder in one direction when the latter is in its elevated position on the shaft E by the engagement of its upper segment with the undermost row of teeth of the rack, and then when the end of said undermost row of teeth is reached and the weight of the cylinder (com-

bined with the engagement of the enlarged end teeth *e* by the enlarged space of the pinion) causes it to move to the limit of its downward movement and reverse and move in the opposite direction by virtue of the engagement of its lower segment with the upper row of the teeth of the rack. When the opposite end of said upper row of teeth is reached, the engagement of the adjacent end tooth *e* by the pinion lifts the cylinder to the limit of its upper movement and completes the cycle of its rotary reciprocation, and so on. While thus engaged, the periphery of the circumferential flange K engages and has rolling contact with the edges of the rim G and when the upper segment of the pinion is being engaged by the rack supports the cylinder in its upper position, so that the teeth of said parts are free to noiselessly engage and operate with such diminished friction as to greatly lessen the amount of power necessary to operate or continuously revolve the drive-shaft. When the cylinder is in its downward position, it is supported by the engagement of the extended end *a* of shaft A with the walls of the elliptical depressed area, and the engagement of the flange K and rim G results in the expenditure of less friction between the teeth of said pinion and the cylinder. Thus during the entire cycle of movement of said cylinder the operation of the gearing is greatly improved.

In Fig. 6 I show a modified form of my invention. In this modification the cylinder H is provided with a single row of equidistant antifriction rollers or pegs *h* instead of a rack comprising a double row of teeth or cogs, as hereinbefore described. These antifriction-pegs are arranged in the plane of the major axis of the depressed elliptical area *m* of the cylinder, and the end pegs thereof project in radial alinement with the foci of the curved ends of said area. The outer ends of these pegs are connected by a segmental rim I, the width of which is less than the diameter of said pegs and the longitudinal upper and lower edges of which are at an angle to the axial plane of the cylinder. Engaging the pegs of this cylinder is a spur-wheel M, and back of the teeth of said wheel it is provided with a circumferential flange O, the diameter of which is less than the periphery of said wheel, so as to leave part of the adjacent ends of the teeth of the same exposed.

The operation of the modification just described is the same as the operation of the gearing hereinbefore described, and shown in the first five figures of the drawings, and results in a comparatively noiselessly-operating mechanism with the friction between the engaging parts greatly reduced.

What I claim as new is—

The combination with a continuously-revolving shaft, a pinion thereon beyond which the contiguous end of said shaft extends and having an enlarged space between two of its teeth, a circumferential flange next the rear end of the teeth of said pinion of a diameter less than the greatest diameter of the periphery of said teeth, of a rotary reciprocal cylinder having an elliptical-shaped depressed area in its circumference, a shaft transverse to the axis of said pinion upon which said cylinder has sliding movement, a segmental rack comprising a double row of teeth or cogs projecting centrally from said depressed area in the plane of the major axis of the same having enlarged teeth connecting the ends of said double row of cogs or teeth, and a segmental tread or rim with which the flange on said pinion has rolling contact when said pinion and rack are in mesh.

HENRY F. BRAMMER.

Witnesses:
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