A. PLAGMAN.

GEARING.

APPLICATION FILED SEPT. 30, 1912.

1,053,868.

Patented Feb. 18, 1913.

2 SHEETS—SHEET 1.

Fig. 1.

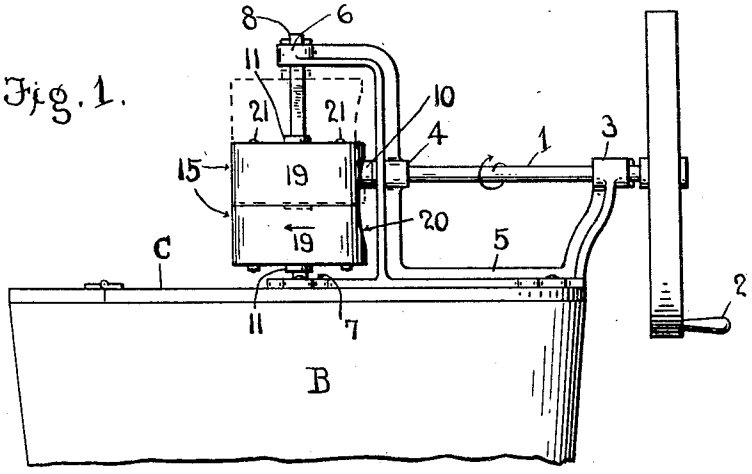


Fig. 2.

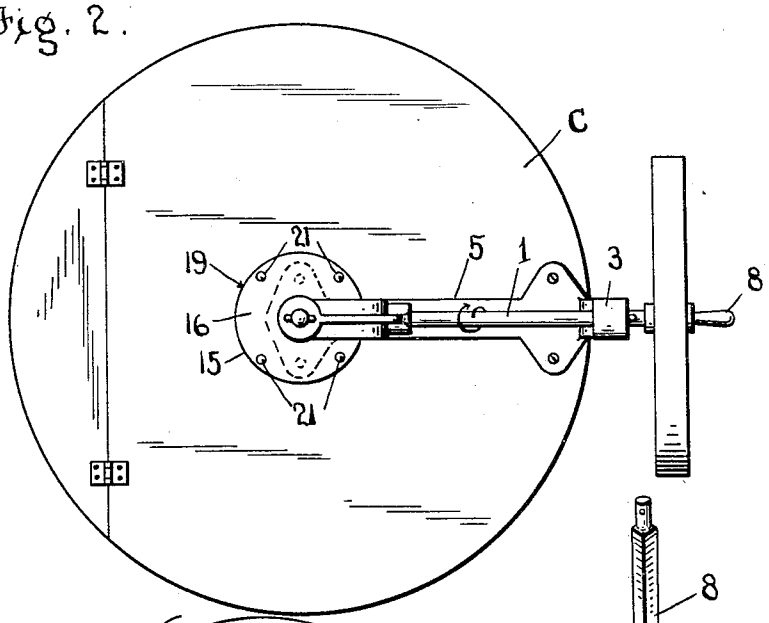


Fig. 5

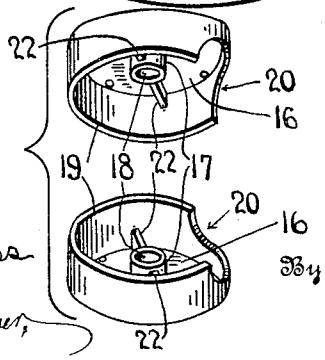
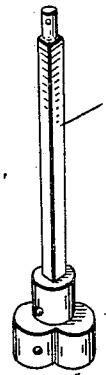


Fig. 6.



Witnesses

L. B. James

M. L. Gallamer

Inventor

Adolph Plagman

By H. B. Wilson & Co

Attorneys

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2 SHEETS—SHEET 2.

Fig. 3.

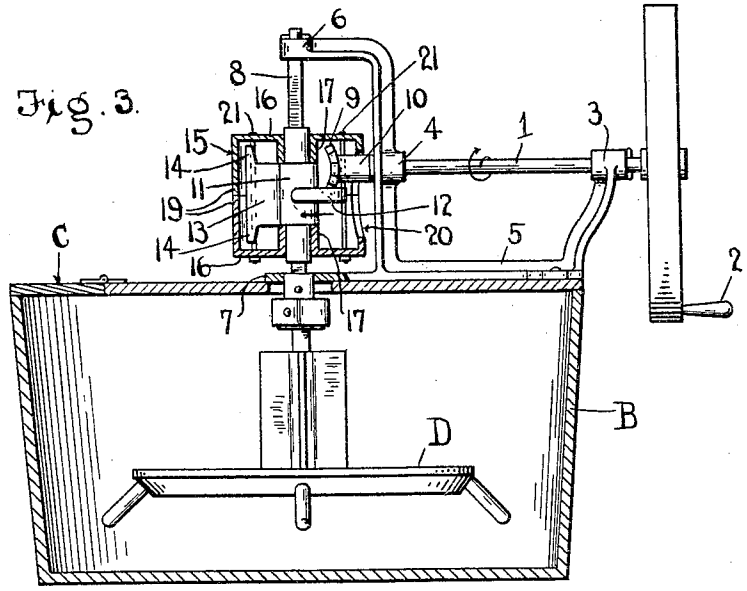


Fig. 4.

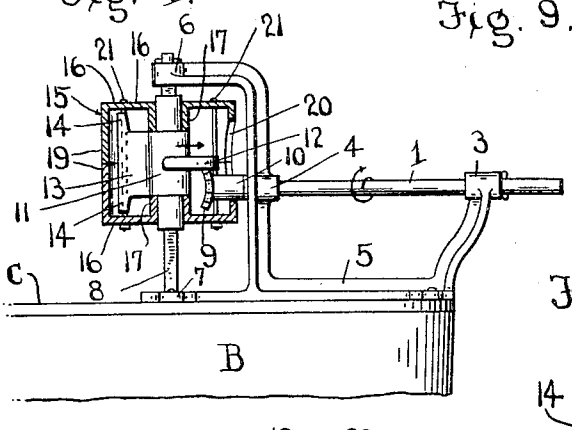


Fig. 9.

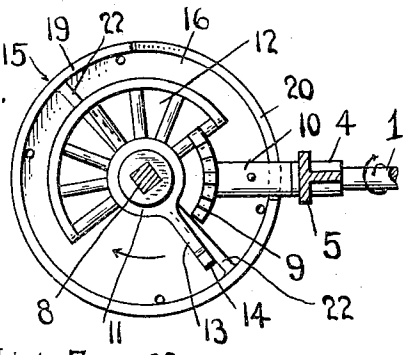


Fig. 7.

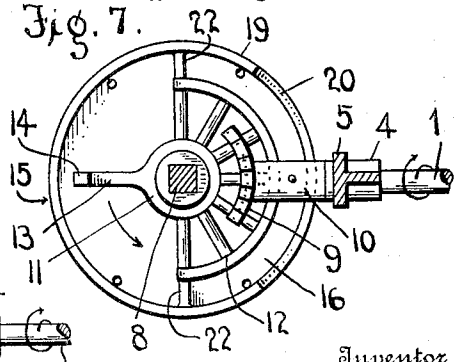
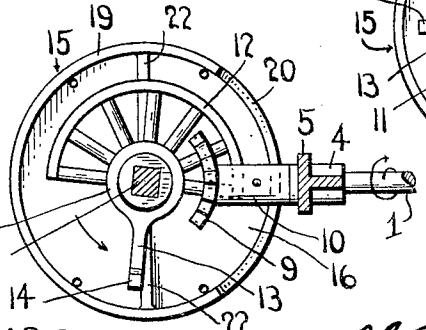


Fig. 8.



Inventor

Adolph Plagman

Witnesses

L. B. James

N. L. Coleman

By A. B. Wilson & Co

Attorneys

COLUMBIA PLANOGRAPH CO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

ADOLPH PLAGMAN, OF DAVENPORT, IOWA.

GEARING.

1,053,868. Specification of Letters Patent. Patented Feb. 18, 1913.

Application filed September 30, 1912. Serial No. 723,251.

To all whom it may concern:

Be it known that I, ADOLPH PLAGMAN, a citizen of the United States, residing at Davenport, in the county of Scott and State of Iowa, have invented certain new and useful Improvements in Gearing; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to machine elements, and more especially to alternating gearing; and the object of the same is to produce a driving mechanism for actuating the dasher of a washing machine, churn, or the like so that rotary motion imparted to the driving shaft is converted into rotary reciprocatory motion of the dasher. This object is carried out by constructing the gearing in the manner hereinafter more fully described and claimed, and as shown in the drawings wherein—

Figure 1 is a side elevation and Fig. 2 a plan view of this device attached to a washing machine body. Fig. 3 is a central vertical transverse section with the mid-length of the sector standing below the driving gear, and Fig. 4 is a similar section of the upper portion only of Fig. 3, but with the mid-length of the sector standing above the driving gear—the oscillating parts in these two views moving in the direction of the arrows therein. Fig. 5 is a perspective view of the two cups forming the casing, slightly separated from each other; and Fig. 6 is a perspective detail of the driven shaft. Figs. 7, 8 and 9 are enlarged plan views of the lower cup or half of the casing, with the mechanism therein—the parts in Fig. 7 being positioned the same as they are illustrated in Fig. 3 with the sector below the driving gear and moving in the direction of the arrow, the parts in Fig. 8 being illustrated in position where the projections on the fin have struck the ribs within the casing and the latter is about to move, and the parts in Fig. 9 being illustrated in position where the projections have turned the casing so that the edge of the opening in the latter has struck the hub of the driving gear and the latter will now travel around the end of the sector so that the sector will rise and begin its movement in the opposite direction as indicated by the arrow in this view.

In the drawings I have shown this improved gearing as applied to the dasher of a washing machine, although it might be a churn, but it is to be understood that this is merely one application of the idea whose broad principle is the conversion of rotary motion in one direction into a rotary reciprocatory motion or an oscillatory motion of a driven shaft standing at right angles to the drive shaft.

In the illustration herewith, the letter B designates the body of the machine which would be the tub of a washing machine or churn and the letter D designates the dasher whose shaft is mounted through the tub cover C, while the drive shaft is mounted in suitable bearings thereon as shown. In another application of my invention these elements might be replaced by others as the necessities of the case would require, and instead of a crank handle for manually rotating the drive shaft, it might be driven by power as will be clearly understood.

No novelty is claimed for the parts thus far described.

Coming now more particularly to the details of the present invention, the numeral 1 designates the drive shaft having in the present instance a crank handle 2 at its outer end, and the shaft is journaled in bearings 3 and 4 in a metallic spider or framework 5 which is secured upon the cover C of the machine so that the drive shaft will stand horizontal. The frame work also carries other bearings 6 and 7 in which is journaled a dasher or driven shaft 8 whose body is squared or angular as shown and whose lower end carries the dasher D.

Fast on the inner end of the drive shaft 1 is the driving gear or pinion 9 having a pronounced hub 10 which stands inside the upright of the framework as shown.

Slidably mounted on the driven shaft 8 is the hub 11 of the driven member, this hub being squared or made angular internally so as to fit slidably upon the shaft but cause the rotation thereof when it is turned. The driven element is a gear sector 12 extending about half way around said hub 11 and having its teeth engaging those of the driving gear 9; and rigidly connected with this sector and its hub is what I will call a "fin" standing upright or parallel with the axis of the hub and on a line opposite the center of the chord across the inner end of said sector. This fin 13 has projections 14 at its upper and lower ends for a purpose to appear.

The gearing is inclosed by a pair of cups 15 which are alike and may be cast in the same mold. Each has a flat bottom or "head" 16 at whose center is a boss 17 pierced with a round hole 18 of sufficient size to rotate upon the hub 11, and a cylindrical wall 19 rising from the periphery of said head and cut out at one side with a large notch 20; and the two cups when put in place are held together by a plurality of through bolts 21 standing just inside their walls 19, and their notches 20 register with each other so as to produce quite a large opening at one side of the shell or casing thus formed. Internally each cup is also provided with a pair of cross ribs 22 standing in alinement with each other on opposite sides of its boss 17 and occupying a position diametrically across the cup at right angles to a radial line which would intersect the center of its notch 20. The casing thus formed by the connected cups is of less height than the distance between the bearings 6 and 7 at the upper and lower ends of the driven shaft 8, and internally its bosses 17 are spaced so as to engage the ends of the driven hub 11 and its heads 16 are spaced so as to inclose the outer end of the fin 13 including its projections 14.

The parts are by preference constructed entirely of such metal as will not rust, or might be made of iron suitably treated with this end in view; and the details other than as herein described are unimportant, as also are their exact shape and size.

When assembled as shown in Fig. 3, the operation of this device is as follows: Rotary motion being imparted to the drive shaft 1 by means of the crank handle 2 or otherwise, the driving gear 9 engaging the sector 12 causes the latter to rotate, and the angular bore of its hub causes the driven shaft 8 and dasher D to rotate as will be understood. Just as the driving gear 9 comes to one extremity of the sector 12, the projections 14 on the fin 13 strike the ribs 22 within the casing and one edge of the opening formed by the registering notches 20 in the cups or members of this casing strikes the hub 10 of the driving gear 9 as in Fig. 9. The casing cannot rotate any farther in this direction nor can the fin and the hub of the driven member; therefore the sector ceases its movement in this direction, and the driving gear 9, continuing to rotate, passes around this end of the sector so that its teeth engage the under-side of the teeth in the sector 12 and cause the latter to rise and move in the opposite direction. When the other end of the toothed sector 12 comes over the driving gear 9, the operation is repeated excepting that the driving gear passes out from under the sector 12, around its other end, and into engagement with the upper side of its teeth, and begins its return movement from the point of starting. Meanwhile, each time the sector moved up and down it of course carried its hub 11 with it, but as said hub is slidably mounted on the driven shaft 8, the latter was rotated whether the hub rose or fell. The result is that an oscillatory reciprocatory motion is imparted to the dasher shaft and dasher, and the reverse in its direction of rotation is automatically affected.

I consider it a point of advantage to have the gear entirely inclosed within a casing, both because the operator and the work are protected thereby from spattering grease, and because the gears and therefore the machine will not become clogged by clothing or other articles accidentally getting into their teeth. The opening formed by the registering notches 20 must be of a height sufficient to permit the vertical movement of parts and of a width sufficient to permit the lateral movement thereof, but otherwise the cups or members of the casing may be of any desired size and in fact of almost any desired shape although I prefer that shown in the drawings.

It will not be necessary to amplify details, such for instance the character of the bearings or the exact nature of the gear teeth, and as suggested above I do not wish to be limited to the application of this gearing to the dasher shaft of a washing machine.

What is claimed as new is;

1. The combination with a framework having bearings, a horizontal driving shaft journaled in certain of the bearings, and a driving gear having a hub fast on the shaft; of an upright driven shaft journaled in other bearings in said framework and having an angular body between them, a driven sector engaging said driving gear and having a hub with an angular bore slidably mounted on said driven shaft, said hub being provided with a fin projecting rigidly from the center of the chord of said sector and having upright projections, and devices against which said projections strike when the driving gear reaches the extremities of the driven sector.

2. The combination with a framework having bearings, a horizontal driving shaft journaled in certain of the bearings, and a driving gear having a hub fast on the shaft; of an upright driven shaft journaled in other bearings in said framework and having an angular body between them, a driven sector engaging said driving gear and having a hub with an angular bore slidably mounted on said driven shaft, said hub being provided with a fin projecting rigidly from the center of the chord of said sector and having upright projections, a drum-shaped casing loosely mounted on the driven shaft around said gears and having an opening loosely inclosing the hub of the driving gear, said

casing having ribs struck by the projections on said driven sector when the driving gear reaches the extremities thereof.

3. The combination with a driving shaft, a gear fast thereon, a driven shaft having an angular body, a hub slidably mounted on the body of this shaft and having a toothed sector engaged by said driving gear, a fin projecting from it at the center of the chord of said sector, and projections at the upper and lower ends of said fin; of a drum-shaped casing mounted loosely on the driven shaft and having an opening inclosing the hub of said driving gear, its edges adapted to strike the hub thereof as the driven shaft is oscillated, the casing also having internal fixed ribs struck by said projections when the gear reaches the extremities of the sector, said casing being made up of two cup-shaped members having their open ends together and notched in their edges to produce such opening, and through bolts connecting the bottoms of said cups.

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

ADOLPH PLAGMAN.

Witnesses:
JOS. JIRUS,
HAROLD HANSEN.