No. 835,086. PATENTED NOV. 6, 1906.

W. D. WHITNEY.

MECHANICAL MOVEMENT.

APPLICATION FILED OCT. 17, 1905.

Fig. 1.

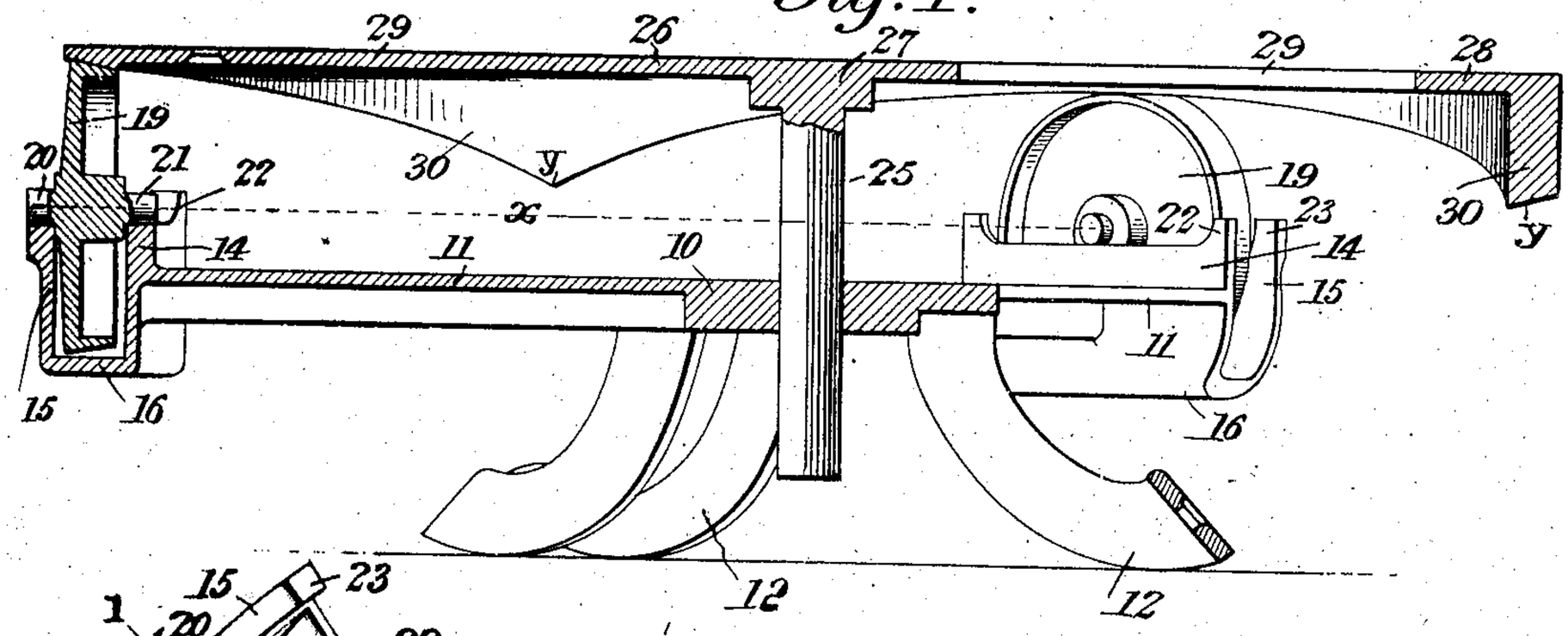
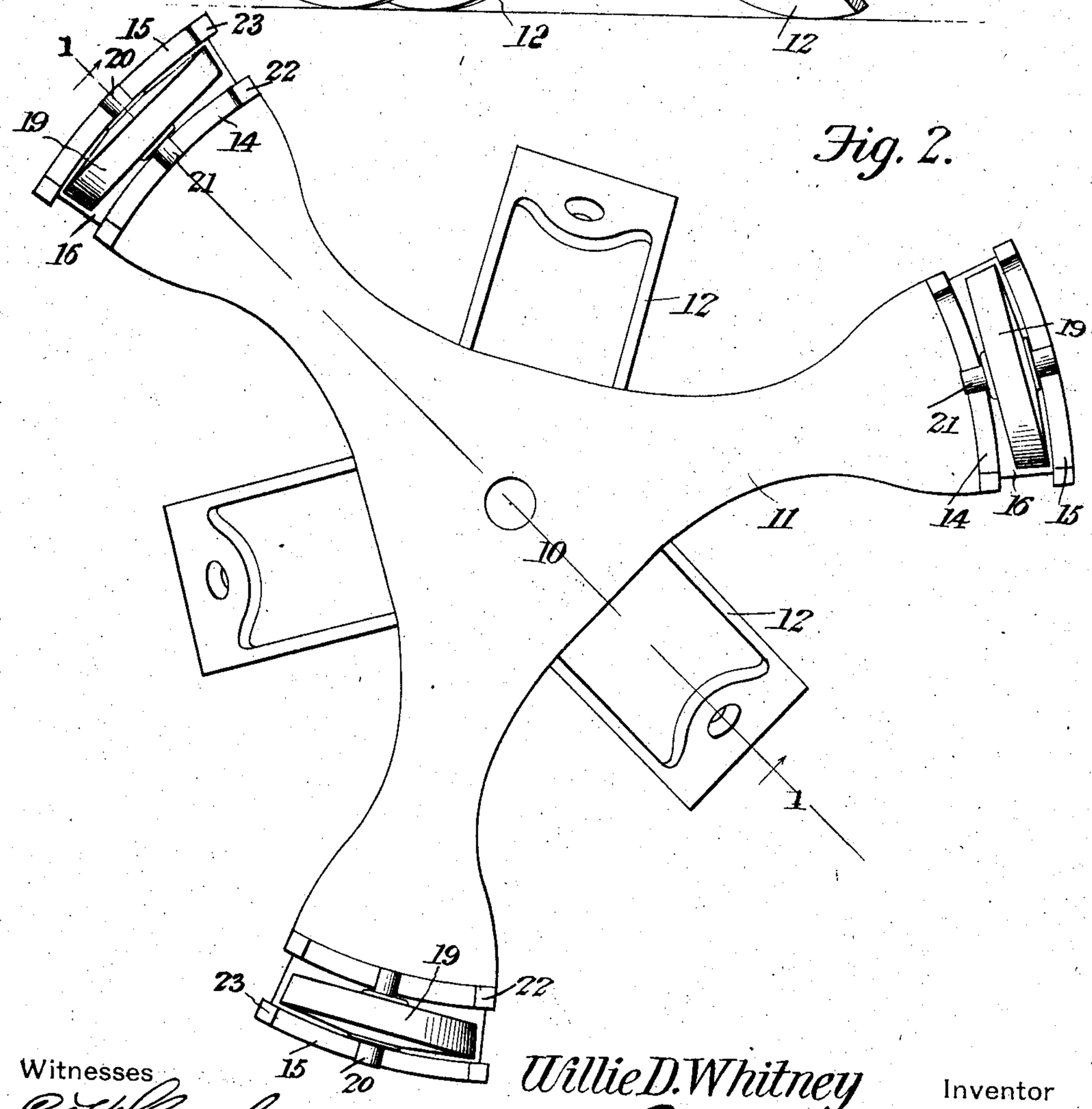


Fig. 2.



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MECHANICAL MOVEMENT.

No. 835,086. Specification of Letters Patent. Patented Nov. 6, 1906.

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To all whom it may concern:

Be it known that I, WILLIE D. WHITNEY, a citizen of the United States, residing at Holley, in the county of Orleans and State of New York, have invented a new and useful Mechanical Movement, of which the following is a specification.

This invention relates to mechanical movements, and has for its principal object to provide mechanism of simple construction whereby a simple oscillatory movement of a revolubly-mounted member in a horizontal plane may be transformed into vertical reciprocatory movement of such member.

A further object of the invention is to provide a device of this type in which the parts are free to automatically adjust themselves in case of excessive movement of the oscillatory member, and, further, to so construct the parts as to permit their operation with minimum frictional resistance and wear.

With these and other objects in view, as will more fully hereinafter appear, the invention consists in certain novel features of construction and arrangement of parts hereinafter fully described, illustrated in the accompanying drawings, and particularly pointed out in the appended claims, it being understood that various changes in the form, proportions, size, and minor details of the structure may be made without departing from the spirit or sacrificing any of the advantages of the invention.

In the accompanying drawings, Figure 1 is a sectional elevation of a mechanical movement constructed in accordance with the invention, the section being taken on the plane indicated by the line 1 1 of Fig. 2. Fig. 2 is a plan view of the lower portion of the mechanism, the oscillatory upper member being detached and the parts drawn to a somewhat larger scale.

Similar numerals of reference are employed to indicate corresponding parts throughout both figures of the drawings.

The base member 10 comprises a central hub having a plurality of equidistantly-spaced radially-extending arms 11, and from the bottom of the hub extend standards 12, which may rest on or be attached to supports of any desired construction. At the outer ends of each of the arms 11 is arranged a pair of spaced flanges 14 and 15, that are parallel with each other and are arranged on curved lines struck from the vertical axis of the member 10. The two flanges are formed integral with the arm and are connected to each other by a web 16, the web being cast with the flanges and forming in connection therewith a housing for the lower portion of a roller 19, that is provided with a pair of journals 20 and 21 on its outer and inner faces, respectively, the journal 20 resting on the flange 15 and the journal 21 on the flange 14. These journals are free to roll on the bearings-surfaces of the flanges and are held from displacement by upturned lugs 22 23, formed at the ends of said flanges, the inner faces of each pair of lugs 22 23 being on a radial line from the vertical axis of the member 10, while the periphery of the roller is tapered and is also arranged on lines that are radial from the vertical axis of the shaft 10 as viewed in plan. The horizontal axis of each roller and its two journals is designated by the dotted line x in Fig. 1, and the peripheries of the roll and the two journals 20 and 21 are arranged on lines that radiate from the point of intersection of its horizontal axial line and the vertical axial line of the member 10. The bearing-surfaces of the two flanges are also arranged on a radial line extending from this intersecting point, so that the bearing-surfaces of the inner flange 14 will be slightly higher than the bearing-surface of the outer flange 15, and the diameter of the outer journal 20 will be greater than the diameter of the inner journal 21.

Each roller is so mounted on its supporting-flanges as to permit free travel between the lugs or stops at the ends of the flanges and the axes of all of said rollers, and end journals will remain in a constant horizontal plane. The inner faces of the lugs are arranged on curved lines that merge into the horizontal supporting-surfaces of the flanges, so that the journals are free to turn in case the rollers travel the full limit of movement.

The member 10 is provided with a centrally-arranged opening for the reception of a vertically-disposed spindle 25, that depends from an upper oscillatory member 26, said member having a central hub portion 27 and a peripheral ring 28, the hub and ring being connected by spokes 29, or the head may constitute a part of a solid disk.

At the periphery of the ring 28 is a downwardly-extending cam-flange 30, the lower

face of which at all points throughout the cam-surface is arranged on a line that radiates from the point of intersection of the line *x* and the vertical axis of the member 10 and the spindle 25. This cam-flange 30 is divided into as many cam-sections as there are rollers 19, three in the present instance, and each of these cam-surfaces is of the same length as the others, the highest point of each cam being that shown in contact with the roller at the left of Fig. 1 and the lowest point being indicated at *y* in Fig. 1.

Under normal conditions the weight of the upper member 26 resting on the roller will cause said upper member to move by gravity until the points *y* of the cam are midway between each two rollers, and the parts will naturally tend to assume this position if left free. The surfaces in rolling contact bear a fixed proportional relation to each other—that is to say, the relation between the circumference of the journal 20 and the bearing-surface of the flange 15 is the same as the relation between the circumference of the roller 19 and the length of each one of the cam-faces, so that under ordinary conditions of use the oscillation of the upper member 26, which may be effected either manually or by suitable mechanism, will not bring either of the journals against the stop-lugs at the ends of the flanges. The points *y* of the cam-surfaces are arranged at one hundred and twenty degrees from each other, and the normal extent of oscillatory movement is through an arc approximately of one hundred degrees, so that the points *y* of the cams will not ride over the roller, and the journals of the latter will therefore play between the stopl-ugs without coming into contact therewith. In case of accidental excess of movement of the parts, however, no damage results, and the upper member may be revolved to an extent greater than one hundred and twenty degrees, so that the points *y* of the cam pass over the rollers; but in such cases the journals are merely driven against the stop-lugs and rotate against said lugs, the friction being of course increased, but not to such an extent as to result in any injurious wear.

The object sought to be obtained is transformation of the oscillatory movement of a revoluble member in a horizontal plane into vertical reciprocatory movement of the same member, and it will be seen that this may be effectively accomplished by oscillating such upper member 26, the member and its spindle 25 being raised and lowered to an extent proportioned to the angular movement of the said upper member.

The device forming the subject of the present invention while of value in connection with many different mechanisms is found of especial value in washing-machines of that general type in which the tub or one of the rubbing members receives both oscillatory and vertical reciprocatory movement.

Having thus described the invention, what is claimed is—

1. In a mechanical movement, a base member, and an upper member, the latter being arranged for oscillatory movement, around a vertical axis, and for vertical reciprocatory movement, there being cams arranged on the under side of said upper member, and rollers supported by the base member, and on which the cams rest, the extent of vertical play of the upper member being proportioned to the extent of oscillatory movement imparted thereto.

2. In a mechanical movement, a cam-carrying member arranged for oscillatory movement around a vertical axis, and means for imparting vertical reciprocatory movement thereto comprising a base having a plurality of pairs of spaced flanges, rollers having projecting journals resting on said flanges, the cams carried by said member resting on said rollers, the extent of vertical reciprocatory movement of the member being proportioned to the arc of oscillation.

3. In a mechanical movement, a base member provided with a plurality of pairs of flanges arranged at equal radial distances from the vertical axis of said member, said flanges being disposed on arcuate lines struck from said axis, rollers having journals resting on the flanges, an oscillatory member having cams that rest on said rollers, said oscillatory member having a pendent shaft or spindle extending through a guiding-opening in the base member.

4. In combination, a base member having a centrally-disposed vertical opening and provided with a plurality of pairs of flanges arranged on equidistant radial lines extending from the vertical axis of said opening, the ends of the flanges being provided with upturned lugs or stops, the inner faces of which are, also, on lines radiating from said axis, a plurality of rollers having journal members resting on the flanges, the axes of the rollers and their journals being in a common horizontal plane, and the peripheries of the rollers and journals being arranged on lines that radiate from the point of intersection of the vertical axis of the opening and the horizontal axes of the rollers and journals, an upper oscillatory member having cams that rest on the rollers, and a pendent spindle extending through the central opening of the base member.

5. In combination, a base member comprising a hub having a centrally-disposed opening and provided with a plurality of equidistantly-spaced radiating arms, vertical flanges arranged at the outer ends of the arms, said flanges being disposed in pairs and arranged on curved lines struck from the vertical axis of said opening, the ends of the

flanges being provided with upturned lugs or stops, the inner edges of which are also on lines radiating from said axis, a plurality of rollers arranged between the flanges and having projecting journals resting thereon, the axes of the journals and rollers being in a common horizontal plane that intersects the vertical axis of the opening, an upper member mounted for oscillatory movement and having a peripheral flange, the lower face of which is divided into cams of a number equal to the number of rollers, and a stem or spindle depending from the upper member and extending through said central opening, the active faces of the cams, the peripheries of the rollers and their journals, and the supporting-surfaces of the flanges being all arranged on lines that radiate from said intersecting point.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

WILLIE D. WHITNEY.

Witnesses:
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