No. 756,224. PATENTED APR. 5, 1904.

W. C. FAWKES.

WASHING MACHINE.

APPLICATION FILED NOV. 17, 1903.

NO MODEL. 2 SHEETS—SHEET 1.

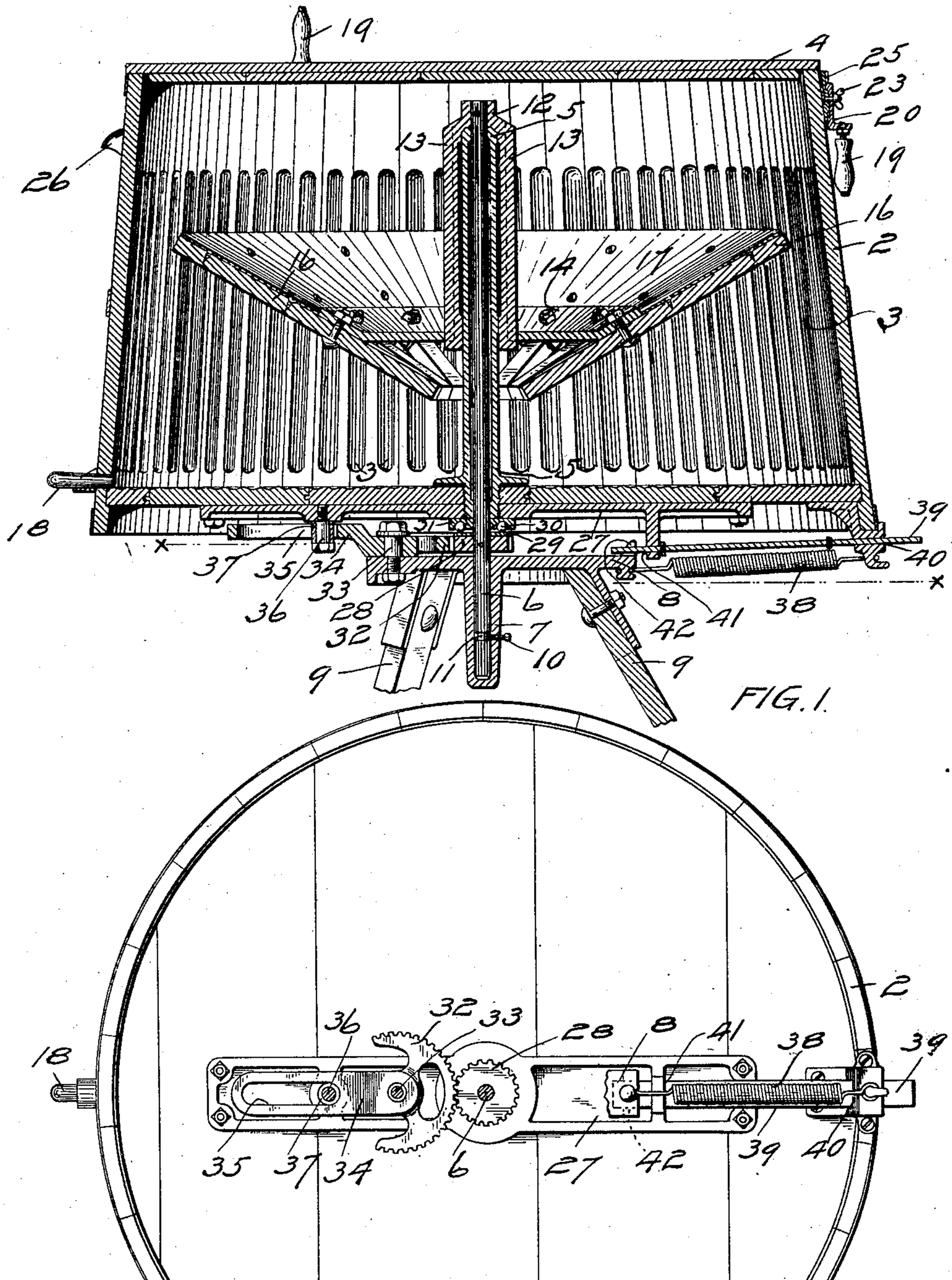

FIG. 1.

FIG. 2.

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NO MODEL. 2 SHEETS—SHEET 2.

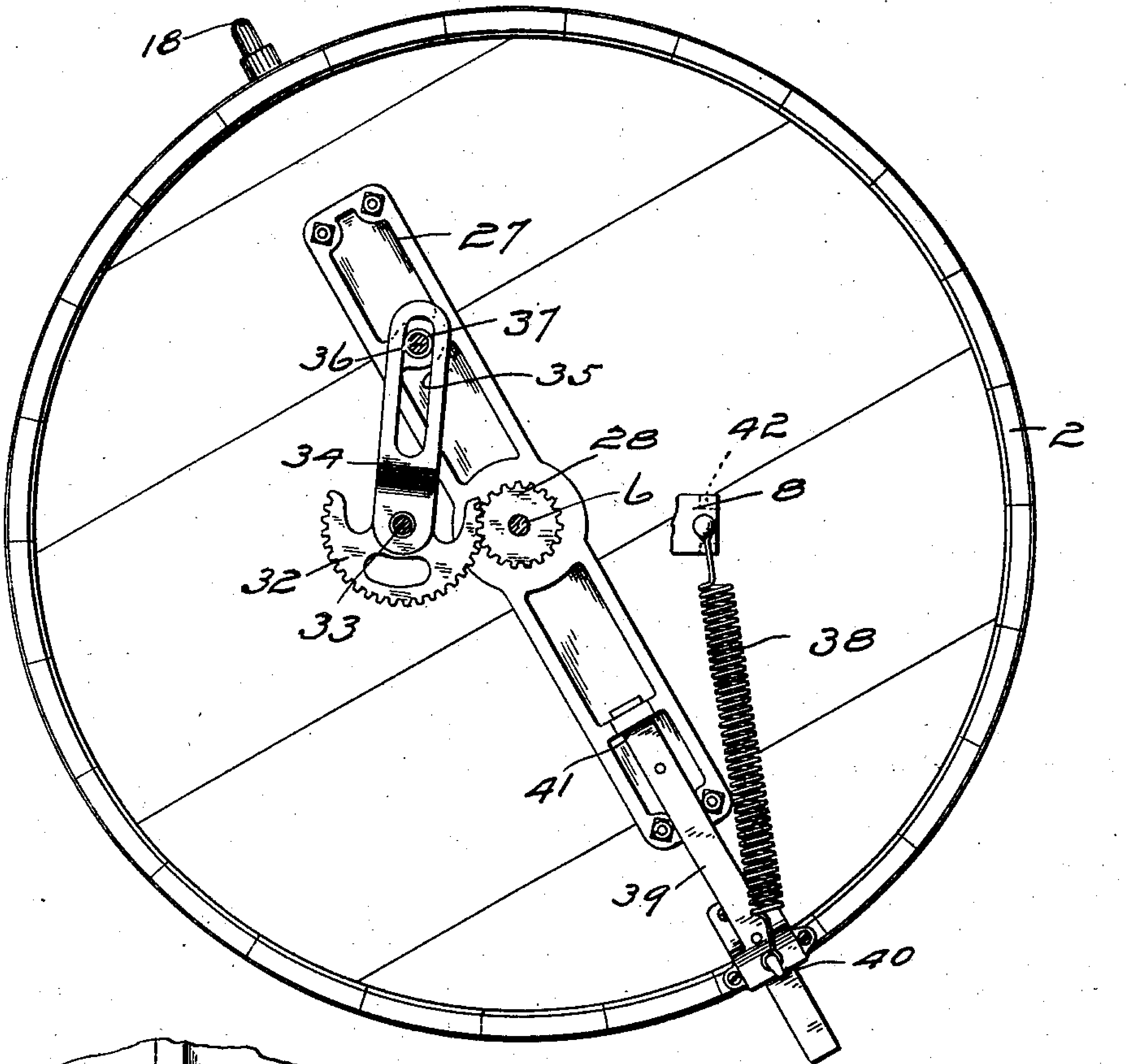

FIG. 3

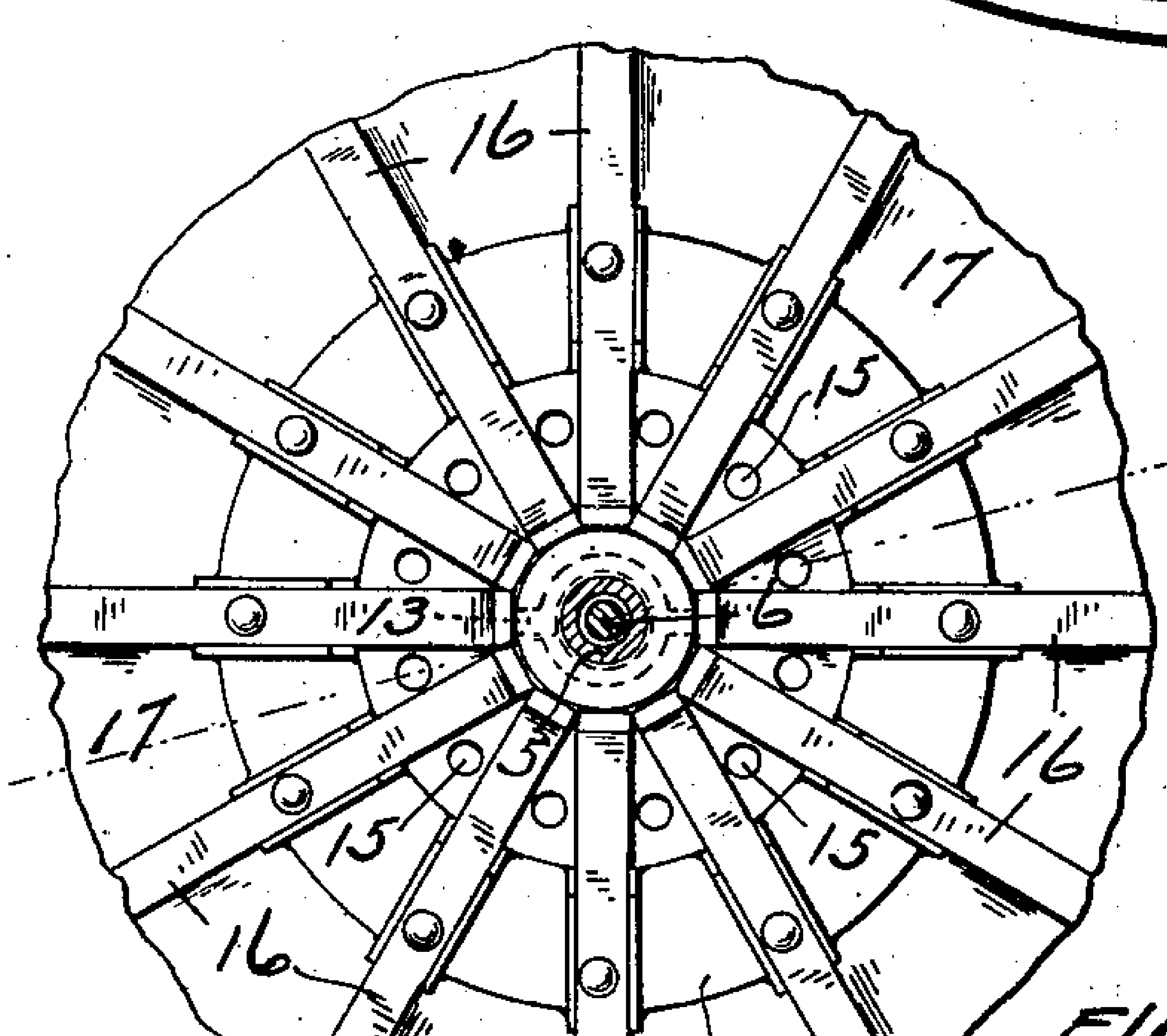

FIG. 4

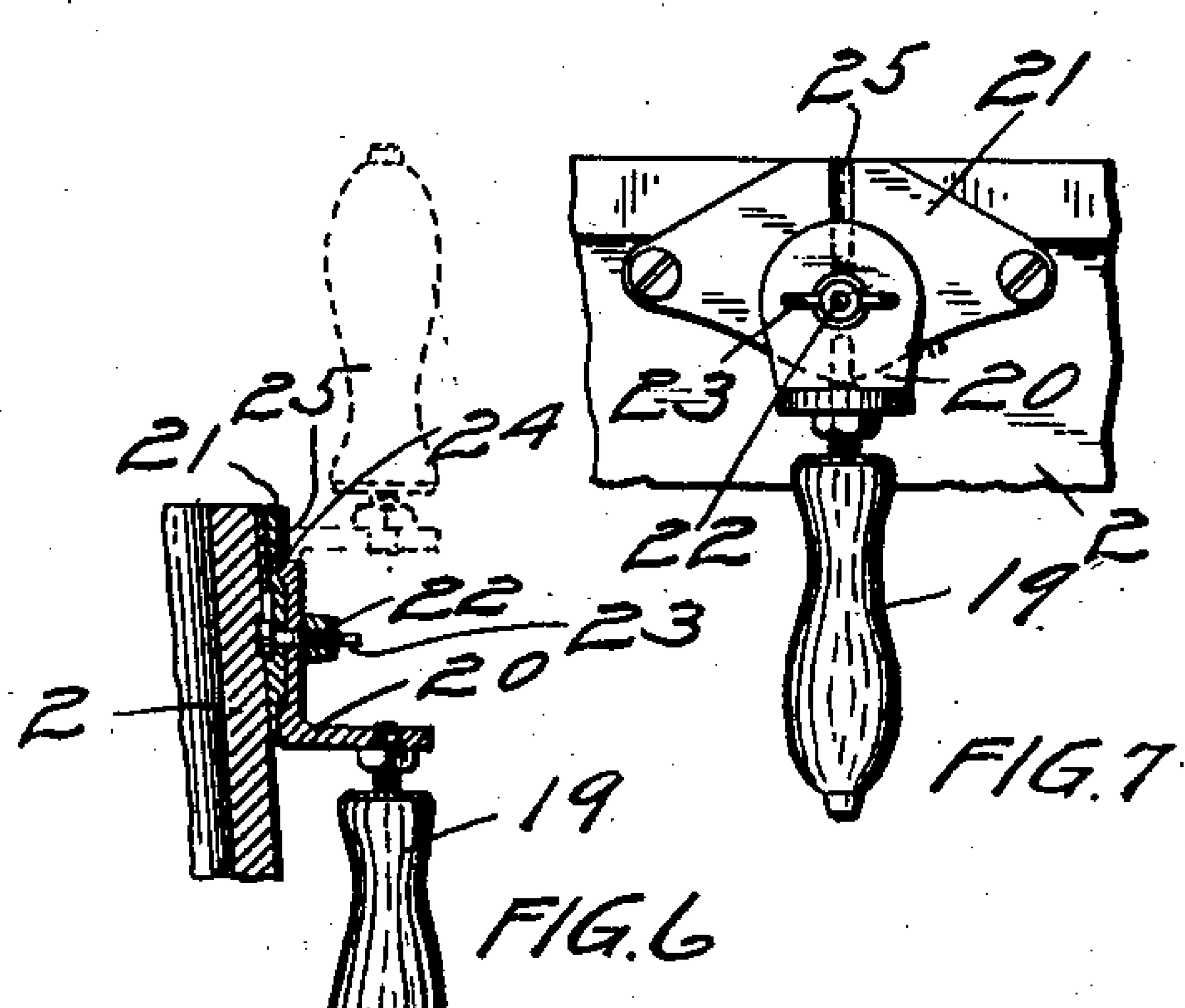

FIG. 6

FIG. 7

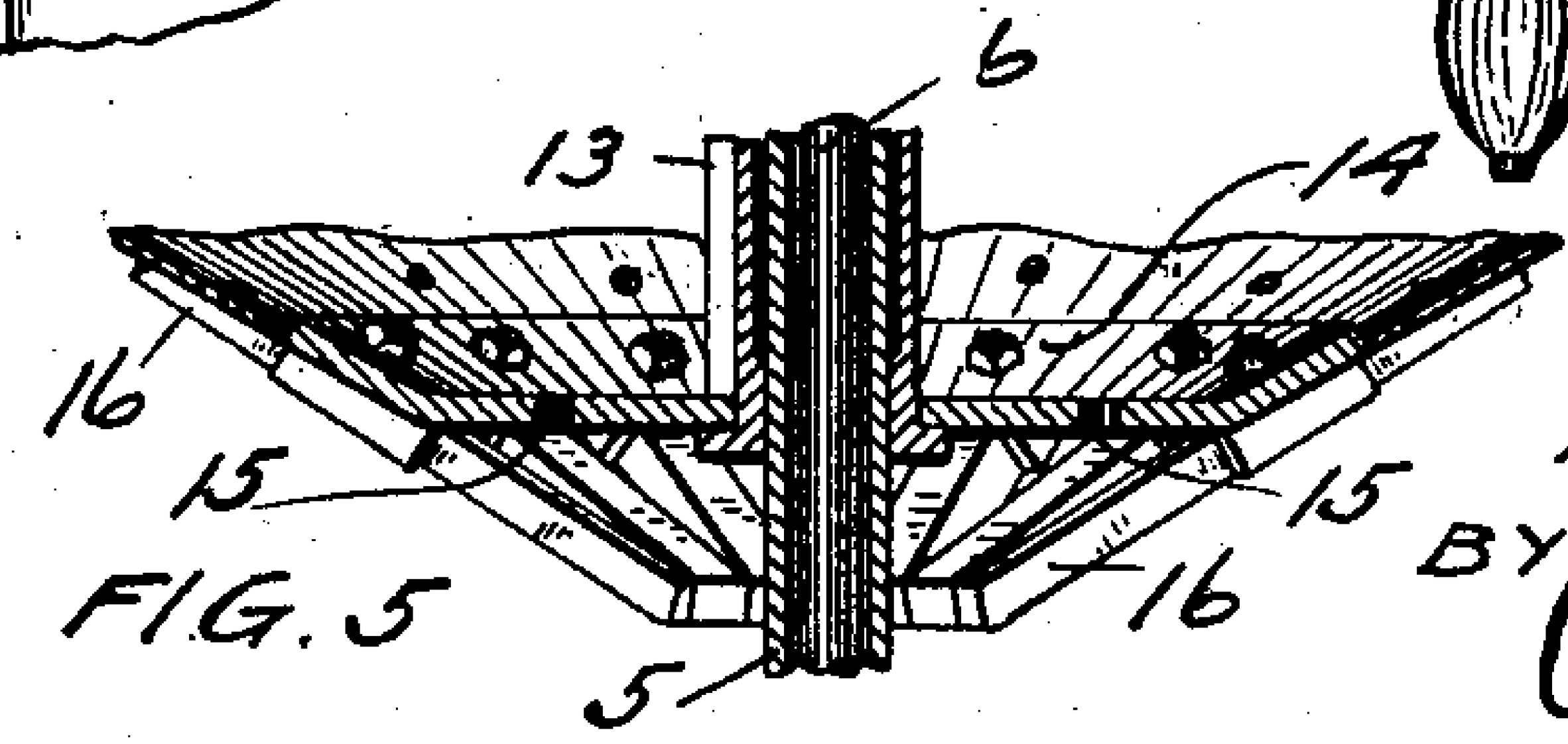

FIG. 5

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No. 756,224. Patented April 5, 1904.

UNITED STATES PATENT OFFICE.

WILBERT C. FAWKES, OF MINNEAPOLIS, MINNESOTA.

WASHING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 756,224, dated April 5, 1904.

Application filed November 17, 1903. Serial No. 181,472. (No model.)

To all whom it may concern:

Be it known that I, WILBERT C. FAWKES, of Minneapolis, Hennepin county, Minnesota, have invented certain new and useful Improvements in Washing-Machines, of which the following is a specification.

My invention relates to washing-machines of the rotary reciprocating type; and the object of the invention is to provide a double acting or oscillating machine in which the tub will move in one direction and the rubber head or disk in the other direction, thereby greatly increasing the efficiency of the machine.

A further object is to provide an easy-running machine and one in which there will be no danger of the clothes becoming wound on any moving part during the operation of washing.

A further object is to provide a washing-machine of simple but strong and durable construction which when not in use for washing purposes can be utilized as a table.

Other objects of the invention will appear from the following detailed description.

The invention consists generally in various constructions and combinations, all as hereinafter described, and particularly pointed out in the claims.

In the accompanying drawings, forming part of this specification, Figure 1 is a vertical section of a washing-machine embodying my invention. Fig. 2 is a section on the line *x x* of Fig. 1 looking at the bottom of the machine and showing the tub in its normal position. Fig. 3 is a similar view showing the tub swung to the limit of its movement in one direction. Fig. 4 is a view looking at the under side of the rubber head or disk. Fig. 5 is a vertical section of the same. Figs. 6 and 7 are details of the drop-handles that are provided near the top of the tub.

In the drawings, 2 represents a washing-machine tub of the ordinary construction, having the usual corrugations 3 on its inner surface.

4 is a cover fitting snugly into the open top of the tub and adapted when the machine is not in use for washing purposes to serve as a table-top, as will hereinafter appear. A hollow standard 5 is centrally mounted within said tub, within which is a shaft 6, that extends down through the bottom of the tub into a hollow stud 7, that depends from a casting 8, that is mounted upon legs 9, which serve to support the machine. A socket in the standard 7 is preferably provided with a suitable lubricant into which the lower end of the shaft 6 is inserted, and a set-screw 10 is provided in said stud and arranged to enter an annular groove 11 in said shaft and lock the upper and lower portions of the machine together. The upper end of the shaft projects through and above the upper end of the standard 5 and is there pinned to a sleeve 12, that incloses the upper portion of the standard and rests thereon and is provided with vertical wings or flanges 13. When this sleeve has been secured to the upper end of the shaft and the lower end of the shaft has been fastened within the standard 7, the tub will be securely locked upon the legs and accidental separation thereof prevented.

Upon the sleeve 12 I provide a rubber head or device, preferably in the form of an inverted cone and consisting of a casting 14, loosely mounted on the sleeve 12 and having slots to receive the flanges 13, and prevented thereby from rotating, but permitted to slide vertically and automatically yield to the position of the clothes. This casting is provided with a series of perforations 15, and on its under side I arrange a series of bars 16, that are upwardly inclined from their inner toward their outer ends and radiate from the center of said casting, being suitably secured thereto by bolts or other suitable means. The outer ends of the bars 16 are near the wall of the tub, and I prefer to provide a sheet-metal plate 17 over said bars between their outer ends and said casting to form a close floor to prevent the water and small articles of clothing from passing up between the bars, the upward inclination of said bars serving to direct the water and clothes to the periphery of the rubber-head, where they will be engaged by the moving walls of the tub. The water will be forced to flow up over the outer edge of the rubber-head and down upon the casting and from thence through the perforations therein

to the bottom of the tub, spaces being provided between the inner ends of the bars 16 to allow the escape of the water that has collected above the rubber-head. This construction of the rubber head or disk will cause currents of water to be established within the tub, flowing from the bottom up along the under side of the rubber-head to its periphery, thence down over the plate 17 and through the perforations in the central casting and back to the bottom of the tub. The conical form of the rubber-head will cause the clothes to move from the center toward the periphery of the tub, where they will be engaged between the oppositely-moving surfaces of the tub and head, the water forced through the fabric, and the dirt effectually removed.

A suitable draw-off plug 18 is provided in the bottom of the tub, and near the top thereof I provide handles for convenience in imparting a reciprocating rotary movement of the tub. The handles are arranged a suitable distance apart to be conveniently grasped by the operator, and each handle consists of a grip part 19, mounted on a bracket 20, that is pivoted on a plate 21 by means of a bolt 22 and a thumb-nut 23. The bracket 20 is provided with a rib 24, adapted to enter a groove 25 in the plate 21 when the handle is swung around to its raised position above the level of the top of the tub. When so raised, the handle is in position to be grasped by the operator, and the thumb-screw is tightened to lock the handle and prevent it from being accidentally moved out of place. When the machine is not in use for washing purposes, the thumb-screw may be loosened and the handle swung down to the position indicated by full lines in Figs. 6 and 7, where it will be below the level of the tub and will not interfere in any way with the use of the top as a table. I also prefer to provide handles 26 on the side of the tub, one of which is shown in Fig. 1, by means of which the tub may be lifted from place to place.

Secured upon the bottom of the tub is a casting 27, through which the standard 5 and the shaft 6 pass. Upon the shaft 6 below the casting 27 I provide a pinion 28, between which and the casting is a ball-bearing consisting of a plate 29, balls 30, and a cup 31, having a runway within which the balls are arranged, said cup bearing upon the under side of the casting 27, while the plate 29 rest upon said pinion. This ball-bearing between the tub and the base of the machine insures an easy operation of the tub to and fro during the operation of washing. A quadrant 32 is provided on one side of the pinion 28, having teeth in engagement with the teeth of said pinion and secured to the casting 8 by means of a pivot-pin 33. An arm 34 is provided on the quadrant 32, having a longitudinal slot 35, adapted to receive a pin 36, that is mounted in the casting 27 and provided with anti-friction-rollers 37. The pinion 28 being secured on the shaft 6 and the sleeve 12, carrying the rubber-head, being also secured on said shaft and the quadrant in engagement with said pinion being pivoted on the base of the machine and having sliding connection with the tub, it is evident that when the tub is oscillated in one direction that the rubber-head will be moved a corresponding distance in the other direction, and the clothes between them will be subjected to a thorough rubbing and cleansing.

I prefer to provide a coil-spring 38, connected at one end to the tub and at its other end to the casting 8, and said spring is put under tension by the oscillation of the tub in either direction and serves to overcome the inertia of the tub when it has been moved to the limit of its oscillation in one direction and begins its return stroke. To lock the tub against oscillation when not in use as a washing-machine, I provide a bar 39, suitably supported in guides 40 and 41 and adapted to move into the path of lugs 42 on the casting 8, thereby locking the tub against rotation.

The operation of my improved washing-machine is as follows: The water and clothes having been placed in the tub the operator will grasp the handles and oscillate the tub to and fro. As the tub moves in one direction the mechanism connecting the rubber-head with the tub will cause said head to move in the opposite direction, so that the periphery of the head and the corrugated walls of the tub will coöperate and act upon the clothes to remove the dirt. The rubber-head will adjust itself automatically by gravity upon its supporting-sleeve, rising and falling accordingly as the position of water and clothes change in the tub. Its outwardly-inclined walls will cause the clothes to be directed toward the walls of the tub, and its vertical movement will cause a squeezing action on the clothes that will facilitate the washing operation. The coil-spring 38 will regulate the distance the tub oscillates to and fro from a given point, and as the spring is put under tension and its resistance to the movement of the tub increases the leverage of the pin 36 on the quadrant will be increased. When, therefore, the operator sets the tub in motion, the resistance to its movement will increase toward the limit of its stroke in each direction; but I am able to counteract in a measure this increased resistance by providing means for increasing the leverage on the pivoted quadrant.

I claim as my invention—

1. In a washing-machine, the combination, with an oscillating tub and a rubber-head provided therein and arranged to oscillate in a direction opposite to the movement of said tub and to slide vertically on its support and adjust

itself to the position of the clothes, said rubber-head being in the form of an inverted cone with its outer edge near the wall of said tub and comprising a centrally-arranged member provided with a series of holes, and bars secured intermediate to their ends at intervals on said member and radiating outwardly and upwardly therefrom, and means for closing the openings between said bars.

2. In a washing-machine, the combination, with a rotating reciprocating tub, of a rubber-head provided therein and having a corresponding movement in the opposite direction, said rubber-head being in the form of an inverted cone, with its outer edge near the wall of said tub and comprising a centrally-arranged casting having a series of perforations, a series of bars radiating outwardly from said casting and an imperforate plate connecting said bars and extending from said casting to the outer edge of said head.

3. In a washing-machine, the combination, with a rotating reciprocating tub provided with a hollow centrally-arranged standard, a shaft arranged within said standard, a sleeve secured to the upper end of said shaft and inclosing said standard, and having longitudinal guiding-flanges, a rubber-head having slots to receive said flanges and adapted to slide vertically on said sleeve and rotate therewith, means supporting the lower end of said shaft and a mechanism interposed between said shaft and tub whereby when said tub is moved in one direction said shaft and rubber-head will be moved a corresponding distance in the other direction.

4. In a washing-machine, the combination, with a tub having a rotary reciprocating movement, of a shaft centrally arranged therein, a rubber-head connected with said shaft, a pinion secured on said shaft below said tub, a quadrant pivoted independently of said tub near said pinion and having its teeth in engagement therewith, an arm provided on said quadrant and having a longitudinal slot and a pin provided on the under side of said tub and adapted to enter said slot, for the purpose specified.

5. In a washing-machine, the combination, with a rotating reciprocating tub, of a shaft centrally arranged therein and projecting below the same, a casting having suitable legs wherein said shaft is supported, a rubber-head provided within said tub and connected with said shaft, a pinion secured on said shaft below said tub, a quadrant having its teeth in engagement with said pinion and pivoted on said casting, and provided with a slotted arm located within the circumference of the tub and a pin provided on the under side of said tub and adapted to enter said slot.

In witness whereof I have hereunto set my hand this 13th day of November, A. D. 1903.

WILBERT C. FAWKES.

In presence of—
RICHARD PAUL,
M. HAGERTY.