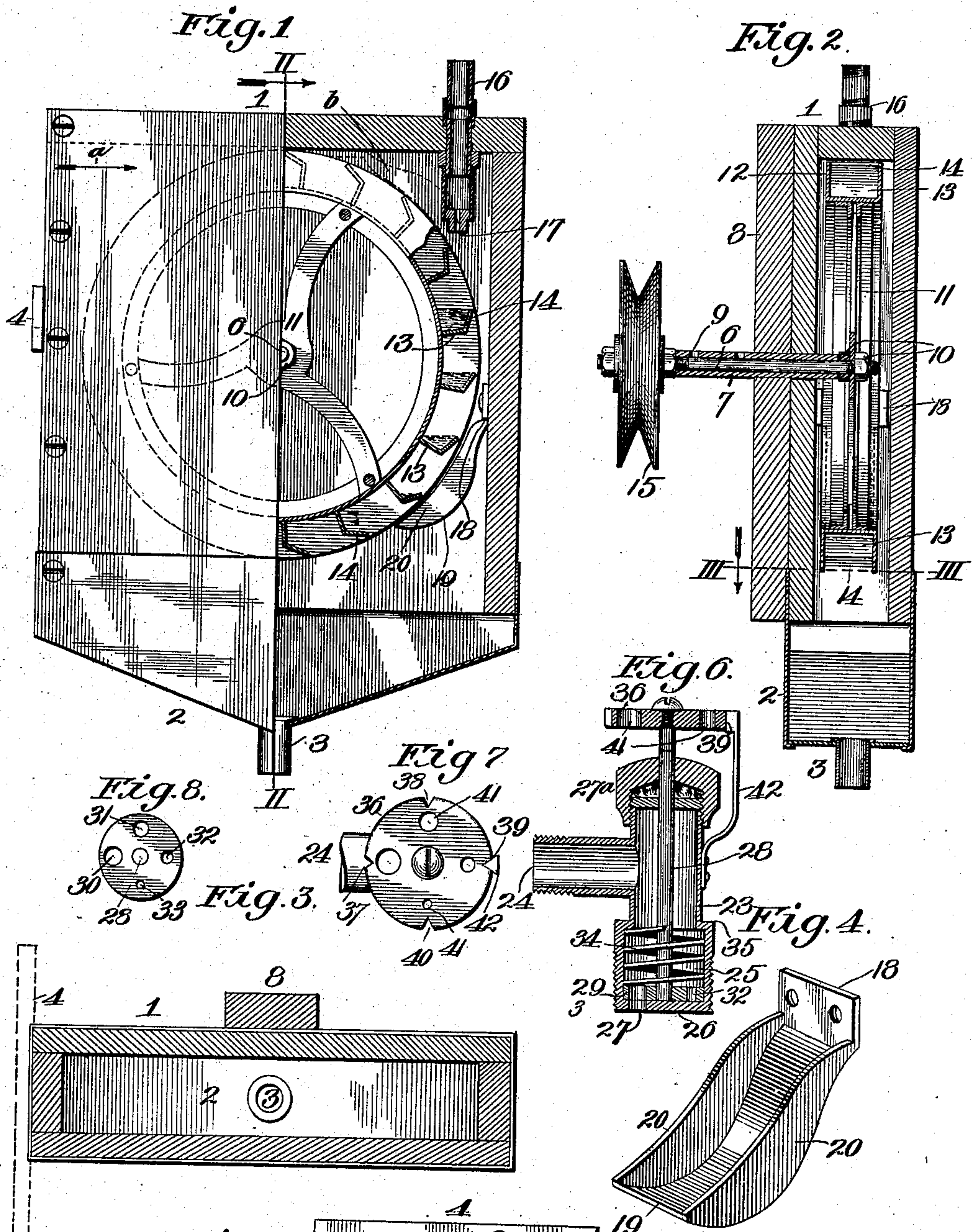


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WATER MOTOR.
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911.697.

Patented Feb. 9, 1909.



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WATER-MOTOR.

No. 911,697.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, ANDREW G. BAUM, a citizen of the United States, residing at Kansas City, in the county of Jackson and State of Missouri, have invented certain new and useful Improvements in Water-Motors of which the following is a specification.

My invention relates to water motors and more especially to that class comprising a casing having an inlet opening and an exit opening, a shaft journaled in the casing and a wheel on the shaft provided with peripheral buckets to successively receive the water from the inlet opening, and my object is to produce a motor of this general character provided with means for compounding the leverage of the water on the wheel for the purpose of increasing the speed and therefore the power generated by the same.

A further object is to provide means for varying the diameter and therefore the impelling force of the jet of water striking the buckets.

With these general objects in view the invention consists in certain novel and peculiar features of construction and organization as hereinafter described and claimed; and in order that it may be fully understood reference is to be had to the accompanying drawing, in which—

Figure 1, represents a water motor embodying my invention partly in side view and partly in central vertical section. Fig. 2, is a vertical section taken on the line II—II of Fig. 1. Fig. 3, is a horizontal section taken on the line III—III of Fig. 2. Fig. 4, is an enlarged detail perspective view of the deflecting cup. Fig. 5, is a detail view of the hanger plate. Fig. 6, is a central vertical section of a modified form of nozzle. Fig. 7, is a plan view of the same. Fig. 8 is a bottom plan view of the valve for varying the diameter of the jet of water.

In the said drawings, 1 indicates a casing of suitable material provided by preference with a tapering bottom 2, having a drain tube 3 at its lower end.

4 indicates the hanger for the purpose of supporting the motor, the same being secured to one edge of the casing and having notches 5 in its lower side for engagement with headed pins, not shown, carried by any suitable support, such for instance as the woodwork of a building, near a faucet.

6 is a shaft having its ends threaded by preference, journaled in a sleeve 7 projecting into the casing through one wall thereof, and 9 are holes in said sleeve through which oil may be introduced for the lubrication of the shaft.

10 are nuts on the inner end of the shaft for the purpose of securing thereon near the inner end of the sleeve, the water wheel; said wheel being of any suitable type though preferably consisting of spokes and a peripheral trough 12, the trough having its outer side open and being partitioned by a plurality of angle plates consisting of the substantially radial portions 13 and the outer portions 14, the latter when contiguous to the front edge of the casing, projecting upwardly. Secured upon the opposite end of the shaft is a pulley 15 adapted to be connected by a belt, not shown, with the washing machine or other machinery adapted to be driven by the motor.

16 indicates a nozzle of any suitable or preferred type, extending downward into the casing above the buckets whose outer sides project upwardly, the lower end of said nozzle terminating in a tip 17 having a jet-orifice of small diameter in order that, by decreasing the diameter of the stream of water supplied to the nozzle from the faucet in any suitable manner, a pressure will be generated in the nozzle which will project the water with great force directly down upon the wheel and into the buckets thereof as they successively assume positions vertically below said nozzle, the impelling force of such jet of water being sufficient to revolve the wheel at a high rate of speed.

For the purpose of compounding or increasing the leverage on the wheel in order that it may overcome greater resistance in the machine to be operated, I have provided what I term a deflecting cup, the same being secured to the front wall or side of the casing immediately below the buckets in line with the nozzle. This deflecting cup by preference consists of the base portion secured flatly against said wall, the downwardly and inwardly curved bottom, and the side walls projecting upwardly from the bottom and extending by preference from the base to the inner end of the bottom, the upper edges of the side walls being disposed contiguous to the periphery of the

wheel and concentrically thereof, while the bottom is preferably struck on a curve of smaller diameter in order that water striking thereon shall be deflected toward the opposite wall of the casing in substantially a horizontal line. The cup furthermore is preferably of slightly less width than the trough of the wheel in order that substantially all of the water entering the cup shall be deflected therefrom into the buckets as they successively pass.

In practice the water is discharged with such force and in such quantity that the buckets are instantly filled and therefore supplement the impact of the jet with the weight of the water in the buckets in effecting the rotation of the wheel, which rotation being exceedingly rapid, through the action of centrifugal force and the natural tendency of the water to overflow from the buckets when they pass below the horizontal plane of their axis of motion, throws said water with great force into the deflecting cup and is instantly deflected by the latter as hereinbefore explained and in substantially the direction indicated by the contiguous arrows Fig. 1, the water being thus reprojected with great force into the bucket from which it was discharged in the action above described.

It will be readily understood that when the wheel is heavily loaded, *i. e.* has considerable resistance to overcome, it will naturally rotate at a slower speed than when lightly loaded or not loaded at all, which speed being less than that at which the water is projected from the nozzle is also less than that by which the water is projected from the deflecting cup. As a result the projection of the water from the latter onto the wheel coöperates with the original impact of the water, in overcoming such resistance and enabling the wheel to perform its work smoothly and efficiently and at greater speed than is produced by depending alone on the jet from the nozzle.

When the wheel has practically no resistance or is loaded lightly, its speed will be correspondingly increased. If desired the nozzle may be disposed horizontally in line with the upper portion of the wheel as indicated by the arrow *a* and the deflector be disposed as indicated by the dotted lines *b*. With this arrangement the power would be augmented more than it is with the nozzle depending and the cup disposed vertically below the same for the reason that the deflecting cup would discharge the water into the buckets in such position that they would remain charged for a longer period, in other words, there would be more buckets charged with water on the descending side of the wheel than as shown in Fig. 1. The drain tube 3 is of sufficient capacity or diameter to

prevent water accumulating in the bottom of the casing and possibly submerging the lower part of the wheel and introducing resistance to its movement.

To adapt the motor to operate at variable speeds, I have provided a nozzle having a plurality of jet orifices of different diameter which can be used as a substitute for that already described. This second form of nozzle consists of the body portion 23 having a stem 24 projecting laterally therefrom. The discharge end of the nozzle is preferably enlarged as at 25 and has a bottom 26 having an opening 27 of preferably greater diameter than the largest jet-orifice as hereinafter explained.

Extending axially through the packing box 27^a on the upper end thereof, is a valve stem 28 and secured to the lower end of said stem and resting with a water-tight relation on the bottom 26, is a valve 29, having a series of openings 30, 31, 32, and 33 of varying diameters, and each of which is adapted to register with the opening 27 in the bottom 26. A coil spring 34 presses at its opposite ends against a shoulder 35 of the nozzle and the valve 29, so as to hold the latter squarely against the bottom 26.

36 indicates a disk handle on the upper end of the stem 28 and provided with V-shaped notches 37, 38, 39 and 40 in its periphery and contiguous to said notches and of diminishing diameter are holes 41 as shown, so as to indicate to the operator when the toothed spring arm 42 carried by the nozzle is engaged with any particular notch, that the jet orifice of the valve corresponding to such notch, is registering with the opening 27 in the bottom of the nozzle. The operator can thus tell the size of the jet that is being discharged onto the wheel, it being obvious that the largest jet operates the wheel at the slowest speed. In the operation of this valve the spring catch 42 automatically engages and releases the disk handle as will be readily understood.

From the above description it will be apparent that I have produced a water motor embodying the features of advantage enumerated as desirable.

Having thus described the invention what I claim as new and desire to secure by Letters Patent, is:—

1. In a water motor, the combination of a casing having an exit opening, a water wheel mounted therein and provided with peripheral buckets the periphery of the wheel projecting close to the sides of the casing, a nozzle projecting into the casing and disposed eccentrically of the wheel beyond the periphery of the same, and a deflector within the casing below the plane of the axis of the wheel arranged to receive the water discharged from the peripheral buckets and re-

turn the same thereto, the periphery of the wheel projecting between the nozzle and the deflector.

2. A water motor comprising a casing
5 having an exit opening, a nozzle secured in said casing, a water wheel mounted in the casing and having its periphery projected across the end of the nozzle close to the side of the casing, and a deflecting cup having a
10 base portion secured to the wall of the casing below the plane of the axis of the wheel, a downwardly and inwardly curved bottom depending from said base portion, and side

walls extending from the base portion to the periphery of the wheel and having their 15 edges curved concentrically therewith, the width of the cup being less than that of the wheel and the bottom of the cup following a curve of less diameter than the sides.

In testimony whereof I affix my signature, 20 in the presence of two witnesses.

ANDREW G. BAUM.

Witnesses:

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G. Y. THORPE.