No. 806,779. PATENTED DEC. 12, 1905.

P. T. COFFIELD.

WATER MOTOR.

APPLICATION FILED NOV. 30, 1903.

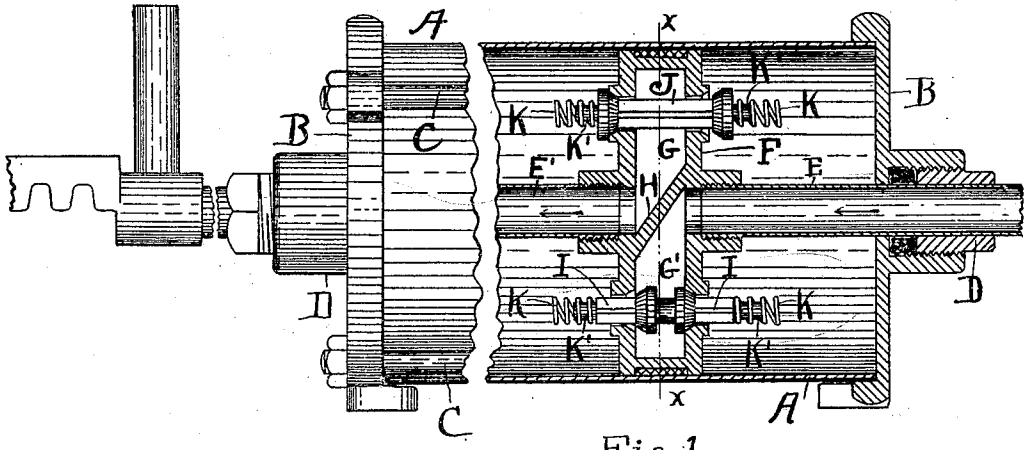


Fig. 1

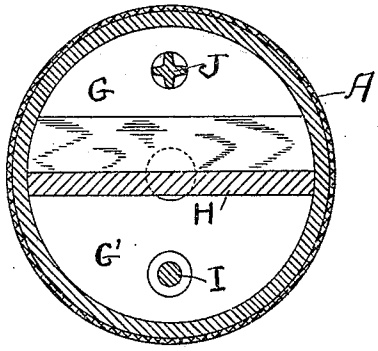


Fig. 2.

Witnesses:

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PETER T. COFFIELD, OF CHICAGO, ILLINOIS.

WATER-MOTOR.

No. 806,779. Specification of Letters Patent. Patented Dec. 12, 1905.

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REISSUED

To all whom it may concern:

Be it known that I, PETER T. COFFIELD, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Water-Motors; 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, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention relates to new and useful improvements in water-motors, and has for its object to provide a water-motor for driving light machinery—such, for example, as washing-machines, sewing-machines, &c.—and which is devoid of complexity and is highly efficient in its operation.

To the foregoing ends the invention consists in the construction of the piston and the valves through which the water is admitted alternately on opposite sides of the piston to impart thereto the necessary reciprocating movements.

Preceding a detail description of the invention, reference is made to the accompanying drawings, of which—

Figure 1 is an elevation, partly in section, showing my improved water-motor. Fig. 2 is a section on the line *x x* of Fig. 1.

In a detail description of the invention similar reference characters indicate corresponding parts.

A designates the cylinder, which is inclosed at its ends by bonnets B, which are rigidly secured in position by a suitable number of bolts C.

F designates a piston which is divided into non-communicating chambers G G′ by a partition-wall H, chamber G′ being the inlet-chamber to opposite sides of the piston and chamber G being the exhaust-chamber for opposite sides of said piston.

E and E′ are hollow piston-rods connected with the opposite sides of the piston, the former being the water-inlet pipe to the chamber G′ and the latter being the outlet-pipe from the exhaust-chamber G, as indicated by the arrows. These piston-rods pass through suitable stuffing-boxes D in the heads or bonnets of the cylinder, and from one of said pipes or piston-rods power is conveyed to the machine to be driven, said power being converted from reciprocating movement to a rotary movement in the usual manner.

I designates a spring-carrying inlet-valve which seats in the inner sides of the piston at opposite points and has its stems K′ projected through the walls of the piston and fitted with coil-springs K. The ends of said springs project or lie beyond the extreme ends of the valve-stems. J designates a spring-carrying exhaust-valve which seats against the outer opposite sides of the piston and which also has its stems K′ suitably projected and fitted with similar coil-springs K. The said valves are thrown off their seats by the ends of the valve-stems making contact with the cylinder-heads B B. As soon as said valves are thrown off their seats by said contact with the cylinder-heads they become balanced, the pressure on both sides of said valves being equal. The valve-springs having become compressed before the ends of the valve-stems make contact with the cylinder-heads throw said valves across to the opposite seats as soon as the valves become balanced, thereby reversing the motor. In other words, the springs impart the final movement to the valves after said valves have been given the initial movement by the ends of their stems making such contact. The source of initial power—for example, the water—enters the piston-rod E and passes into the chamber G′ and passes through one or the other of the openings of the valve I. As the piston is shown in Fig. 1 it is moving to the right and the valve I is unseated, so as to permit the water from the chamber G′, entering on the left side of said piston, to force said piston in its travel to the right. During the movement of the piston in that direction the chamber on the right of the piston exhausts through valve J, which, it will be observed, is off of its seat on the right side of said piston, and the said right-hand end of the cylinder will exhaust through chamber G and piston-rod E′. The excess of pressure on the left-hand end of said valve causes it to seat on that side. When the piston reaches the extreme limit of its movement to the right, the springs K on the stems of both valves will first make contact with the head or bonnet at that end of the piston and will compress and allow the valve-stems to make contact with the cylinder-heads and unseat the inlet-valve I from its seat in the right-hand side of the piston and to seat the ex

haust-valve J in the right-hand side of the piston, and vice versa. The pressure due to the incoming water through the inlet-valve to the right-hand side of the piston will cause a complete reversal of the valves. For example, the inlet-valve I will completely seat against the left-hand side of the piston and will open on the right-hand side, and the exhaust-valve J will open on the left-hand side of the piston and will close on the right-hand side. This operation is reversed at the end of each stroke of the piston.

Having described my invention, I claim—

In a water-motor, a cylinder having inclosing heads, a piston divided into two non-communicating chambers, hollow piston-rods communicating with said chambers, balanced exhaust-valves lying on the outside of one of said chambers and seating against the outer side of the piston, said exhaust-valves being connected to a common stem and having extensions beyond the valves, balanced inlet-valves located within the other chamber, said inlet-valves having stems projected on each side beyond the piston, coil-springs carried upon the stems of said exhaust and inlet valves and adapted to impart the final movement to the valves after said valves have been given their initial movement by the contact of their stems with the cylinder-heads, substantially as set forth.

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

PETER T. COFFIELD.

Witnesses:
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C. M. THEOBALD.