W. F. EYSTER.
Water Motor.

No. 201,511. Patented March 19, 1878.

Fig. 1.

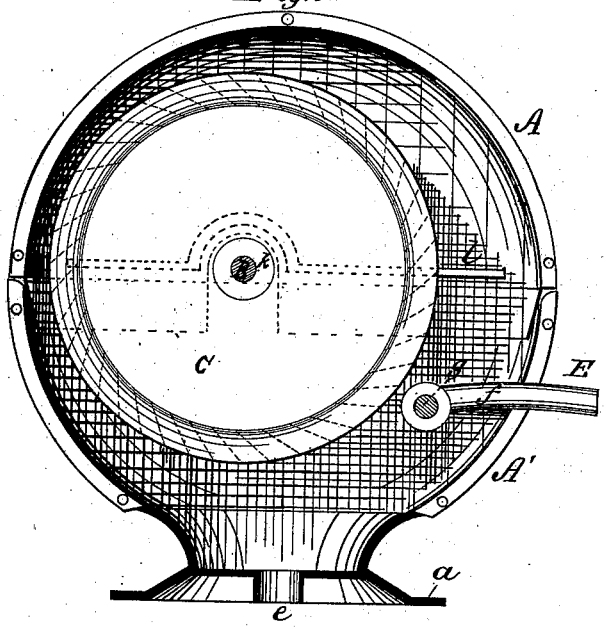


Fig. 2.

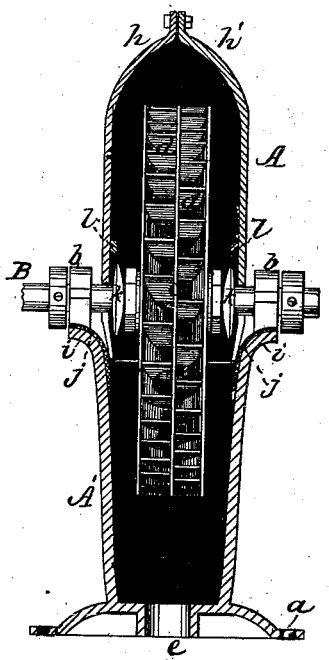


Fig. 3.

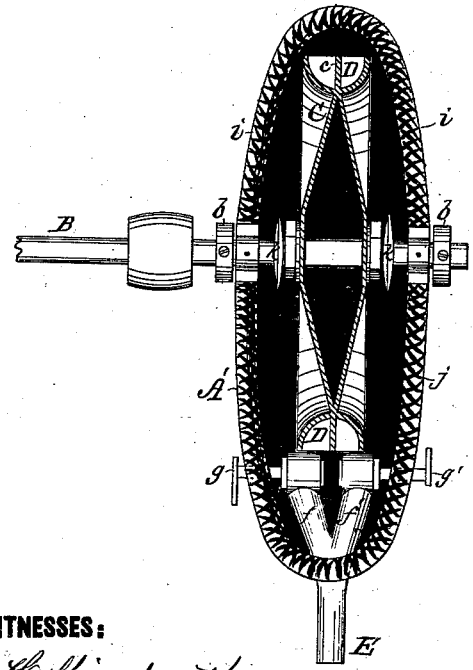
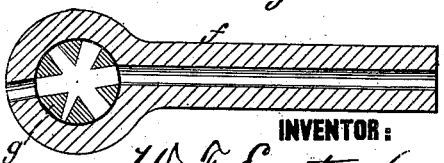


Fig. 4.



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UNITED STATES PATENT OFFICE.

WILBER F. EYSTER, OF CHAMBERSBURG, PENNSYLVANIA.

IMPROVEMENT IN WATER-MOTORS.

Specification forming part of Letters Patent No. **201,511**, dated March 19, 1878; application filed February 9, 1878.

To all whom it may concern:

Be it known that I, WILBER F. EYSTER, of Chambersburg, in the county of Franklin and State of Pennsylvania, have invented a new and Improved Water-Motor; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawing, forming part of this specification, in which—

Figure 1 is a side view of the device with one-half of the case removed. Fig. 2 is a vertical transverse section through the case. Fig. 3 is a plan view of the lower half of the case with the wheel in section. Fig. 4 is a detail sectional view of one of the nozzles, showing the different-sized channels in the plug-valve or stop-cock.

My invention relates to certain improvements upon that form of water-motor designed to be operated by the pressure of water from the street-mains, a tank upon the top of the house, or other suitable head, for the purpose of driving light-running machinery, such as sewing-machines, scroll-saws, &c.

The particular class of motors to which my invention belongs is that which employs a wheel having buckets upon its periphery, against which the stream of water is made to impinge to rotate the shaft upon which said wheel is placed.

My improvements consist in the peculiar construction of the wheel made of two convex disks, with a trough-shaped periphery, carrying two rows of buckets; in the construction of the case, which is divided horizontally, and arranged for easy separability of parts; and in the peculiar devices for preventing leakage at the joints, as hereinafter more fully described.

In the drawing, A A′ represent the outer case, containing the wheel, which case is divided horizontally through its center, and of which the lower half is provided with a flanged support, *a*, having screw-holes for securing the same. Upon the upper surface of the said lower half of the case are formed bearings *b b*, in which is journaled the shaft B, carrying the water-wheel. Said bearings are placed a little eccentrically to the case, so as to give room upon one side for the nozzles.

C is the wheel, which is rigidly fastened to the shaft. Said wheel is constructed of two convex disks, placed together, so as to be thick near the center and thin near the periphery, around which is secured a trough-like rim, D, having a partition, *c*, and upon each side thereof alternating buckets *d*.

I am aware that it is not new to provide a double row of buckets for a wheel of this kind, and that the body of the same has been stamped out of sheet metal, and finished with radial spokes and a trough-shaped rim; but my construction of wheel, it will be seen, has a long bearing upon its shaft, and hence is more stiffly connected thereto. Being made of sheet metal, it possesses the requisite lightness; and its sides being continuous surfaces instead of separate radial spokes, it moves freely without spattering and without retardation if the water should chance to rise above the trough-shaped rim.

This wheel, which is designed to be run solely by the percussive force of the water, and not by the weight of the same, receives its water from a supply-pipe, E, passing through the lower half of the case, and discharges its water into the bottom part of the case, whence it runs out through the exit-pipe *e*. After the supply-pipe passes into the case it then branches into two nozzles, *f f′*, one of which is in position to play upon one of the rows of buckets, and the other upon the other row. Each of these nozzles is provided with an independent plug-valve or cock, *g g′*, each of which has several ways or discharge-openings (see Fig. 4) in the same of different sizes, and which plugs extend through the side of the case to a position within convenient reach for operating the same. By turning these plugs a distance indicated by an index-hand and dial on the outside, the different sizes of discharge-apertures are brought into registration with the supply-pipe, and a solid and effective stream of varying sizes may thus be obtained, either of which may be used, according to the work required.

In constructing the upper half of the case, it is made of two pieces of sheet metal, *h h′*, struck up, united by screws or rivets, and galvanized. The said upper portion of the case is slotted to fit down over the ends of the shaft, and its lower edges all around are flanged inwardly, to pass into and fit nicely with the

outwardly-flared upper edge *i* of the lower case. To make this joint tight, a lining, *j*, of rubber is placed inside the flared lips of the lower half of the case, which causes the inner flange of the top part of the case to bind therewith and prevent leakage, and at the same time affords means for holding the top half of the case without other fastening device, and in such a manner as to permit it to be readily removed for inspection or repairs.

To prevent leakage through the bearings of the shaft, disks *k k* are rigidly fixed thereon between the wheel and said bearings; and to prevent the drippings from the upper half of the case from leaking out at the slots cut in the upper half of the case for the reception of the shaft, undercut strips or ledges *l* are arranged upon this part of the case upon each side above these points, which compel the water to drop down into the lower portion of the case.

Having thus described my invention, what I claim as new is—

1. The wheel constructed of plain convex sheet-metal disks, provided with a trough-shaped peripheral rim containing buckets, substantially as described.

2. The case divided horizontally, and having the lower half flared outwardly at its upper edge, and the upper half flanged or flared inwardly at its lower edge, combined with each other for easy removability, substantially as described.

3. The lower half of the case having its upper edge flared outwardly, and provided with a lining of rubber, combined with the upper half having an inward flange, to form a tight joint, substantially as described.

4. The wheel-shaft provided with disks *k k*, interposed between the wheel and the bearings of the shaft, to exclude the water from the latter, as described.

5. The upper half of a horizontally-divided case, made slotted to accommodate the shaft, and provided with undercut strips *l* about such slots and its lower edges, to keep the water from passing out at these points, as described.

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