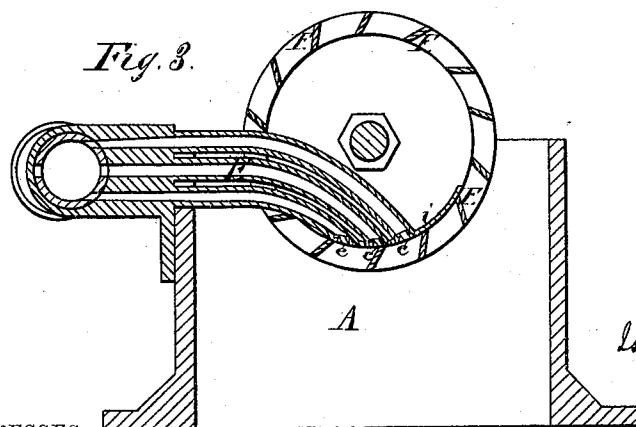
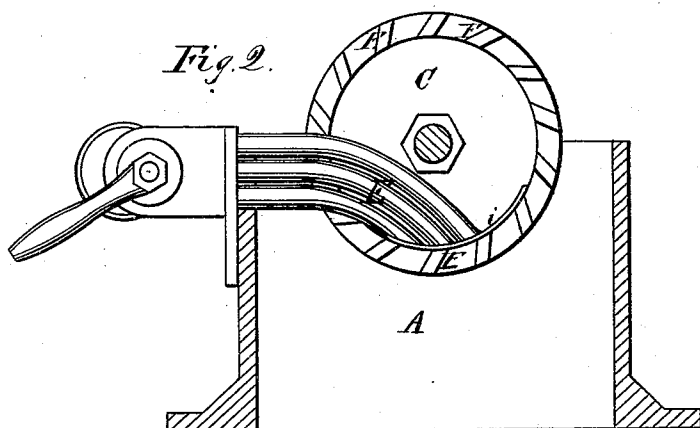
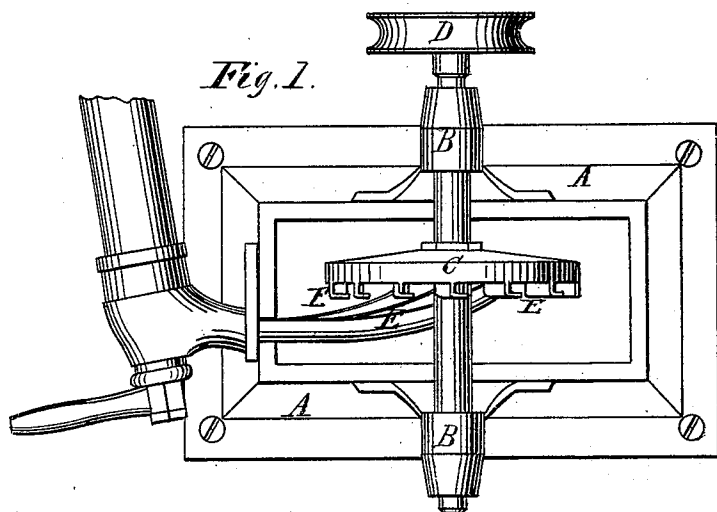


I. CRANDELL & S. P. BROWER.

WATER-MOTOR.

No. 178,737.

Patented June 13, 1876.



WITNESSES

M. F. Utley
W. G. Chaffee

By

Isaac Crandell
Samuel P. Brower
INVENTORS

By *Warren C. Stone*
Attorney

UNITED STATES PATENT OFFICE.

ISAAC CRANDELL AND SAMUEL P. BROWER, OF GLEN'S FALLS, NEW YORK,
ASSIGNORS OF ONE-HALF THEIR RIGHT TO FREDERICK J. P. CHITTY
AND ISAAC J. DAVIS, OF SAME PLACE.

IMPROVEMENT IN WATER-MOTORS.

Specification forming part of Letters Patent No. **178,737**, dated June 13, 1876; application filed
May 17, 1876.

To all whom it may concern:

Be it known that we, ISAAC CRANDELL and SAMUEL P. BROWER, of Glen's Falls, in the county of Warren and State of New York, have invented certain new and useful Improvements in Water-Motors; and we do hereby declare that the following is a full, clear, and exact description thereof, which 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.

Figure 1 of the drawings shows a plan of my invention, the cap of the casing being removed. Fig. 2 is a section showing the water-supply tubes and the water-wheel in elevation. Fig. 3 is a section of the terminus of the supply-tubes, and of the buckets.

A represents a casing or box adapted to be screwed or otherwise secured to a table or bench, from which a waste-pipe or drain of suitable character leads to carry off the water. Upon the sides of this box or in the upper edges thereof, suitable bearings B B are provided, in which the shaft of the water-wheel C is mounted. Upon the extremity of this shaft is secured a driving-pulley, D, for transmitting the power of the wheel to any desired point or mechanism. Leading through the side of the casing are a series of pipes, E, arranged in the same vertical plane, having their delivery regulated at about the angle shown, so that the water passing therethrough will strike the buckets nearly at right angles with the plane of the bottom thereof. It is obvious that these supply-pipes may be made of different diameters. There are also provided at the extremity of these pipes bushings *e e*, for the purpose of regulating, when desired, the amount of water admitted to the wheel.

Another means of regulating the quantity of water to be used is through the medium of a valve, which will form the subject of a separate application, by which the water from a single large supply-pipe may be shut off from any one or more of the pipes E. By the means referred to the most complete control

of the amount of water to be used is obtained, thus adapting a wheel of a given size to perform work of greatly-varying degrees of power without any waste of water whatever. This motor is intended for light work where there is a limited supply of water, and where it is important to economize the use of the same. F represents the buckets of the water-wheel made substantially in the form shown—that is to say, the bottom of the buckets are slightly curved in longitudinal section, and having sides so as to partially confine the water. These buckets are secured to the side of the rim of the wheel, and receive the force of the water from the pipe or pipes E, as before stated, at about right angles with the plane of their bottom. The application of the water is upon the under side of the wheel, making it what would be technically termed an "under-shot-wheel."

By constructing the wheel and buckets in the form shown, and applying the power as set forth, considerable power may be obtained from a wheel of small dimensions, and with a very small quantity of water, having no great degree of head—that is to say, the greatest available amount of power is obtained from a given small quantity of water, and this too, with a perfect clearance of the water from the wheel at a point where it is readily conducted away by the waste-pipe. A cover, however, is provided to the casing, which confines all of the water or spray from a rapid motion of the wheel, so that this motor may be used in any part of a dwelling for propelling sewing or other machinery without difficulty.

It will be observed that a shoe, *i*, is connected with the extremity of the pipes, and projects laterally within the rim of the wheel which is constructed for this purpose and thereby retains the pipes in their relative positions. It will also be observed that the ends of the pipes are bent inward to deliver the water properly to the buckets while constituting no obstruction to the revolution of the wheel.

Having thus fully described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. The wheel C consisting of a disk, from

one side of which project the slightly-curved buckets F, having sides so as to partially confine the water, the construction and operation being as described.

2. The combination, with the pipes E, of bushings, as and for the purposes specified.

3. The combination, with a series of supply-pipes and wheel, of the construction shown, of the supporting and guiding shoe, as set forth.

4. The combination, with the wheel shown, of bent pipes E, substantially as and for the purpose specified.

5. The combination, with the wheel shown,

of the series of pipes E, and a single regulating valve or cock for causing the water to flow through either one or more of the series of pipes, as set forth.

In testimony that we claim the foregoing as our own, we affix our signatures in the presence of two witnesses.

ISAAC CRANDELL.
SAMUEL P. BROWER.

Witnesses:

WM. A. WAIT,
A. W. MORGAN.