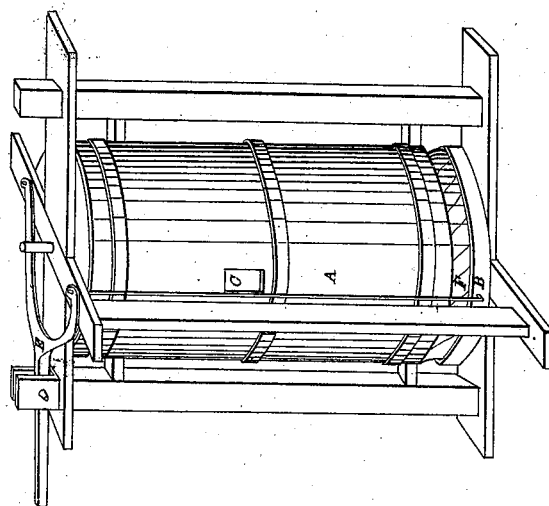
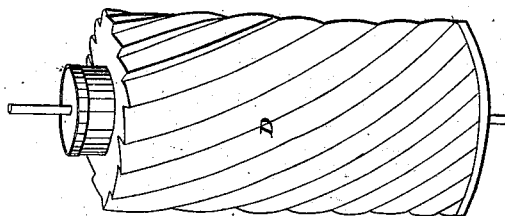


J. C. Green,
Water Wheel,
Nº 212, *Patented May 30, 1837.*



UNITED STATES PATENT OFFICE.

JOSEPH C. GREEN, OF FAYETTE, MAINE.

IMPROVEMENT IN SPIRAL-BUCKET WATER-WHEELS.

Specification forming part of Letters Patent No. 212, dated May 30, 1837.

To all whom it may concern:

Be it known that I, JOSEPH C. GREEN, of Fayette, in the county of Kennebec and State of Maine, have invented a new and useful Spiral-Cylinder Water-Wheel; and I do hereby declare that the following is a full and exact description thereof.

The nature of my invention consists in using a spirally-grooved cylindrical wheel entirely inclosed in a cylinder, so that the centrifugal force of the water may throw the power to the surface of the wheel. By having a head at one end of the cylinder to confine the pressure of the water and a discharging-vent at the other three distinct principles of action are obtained—viz., the force of the water as it strikes the wheel, the hydrostatic pressure down the inclined groove or vane, and the reaction produced by the discharge of the water against the atmosphere.

It further consists in using a ventilator for the purpose of regulating the discharge of water from the wheel, still retaining the force and pressure upon the wheel, so that the velocity may be diminished without a corresponding diminution of power.

To enable others skilled in the art to make and use my invention, I will proceed to describe its construction and operation.

For a wheel suitable for a grist-mill I lock two timbers of suitable size and about four feet long across each other at right angles. At each end of these cross-beams I erect posts about seven feet long and about five inches square, on the top of which I put cross-beams similar to those at the bottom. I then prepare a cylinder of two-inch plank bound with iron, of two feet diameter inside. I make this about five and one-half feet long, with a bottom. I saw this cylinder in two about five and one-half inches above the bottom and use the bottom part for a ventilator. The other part I place in the space between the above-mentioned posts, to which I secure it firmly, bringing the top of it up to the top cross-beams. I then fit a head closely into the top of the cylinder, having a hole in the center of it, in which may be fitted a metallic bushing to receive the top gudgeon of the wheel. I next prepare the cylindrical wheel by fixing gudgeons in a log of suitable size about five feet six inches long. The upper gudgeon must be made of suitable length and form to

couple with the mill-spindle. A few inches of the upper end of this log I turn down for the purpose of receiving the hoops necessary to confine the gudgeon. The remainder I fit to the inside of the cylinder, so it will turn freely in it. I then space off the circumference into twelve divisions and line them off spirally in a longitudinal direction, commencing at the top at an angle of about twenty-two degrees with a line of the gudgeons and increasing the obliquity until within one inch of the bottom, where it terminates at an angle of about sixty degrees. On these lines I cut out grooves or vanes, beginning at the top and cutting down five or six inches in depth, making the spaces as large as can be and allow sufficient strength to the vane, thus proceeding to the end of the line, where I bring them out to the surface as abruptly as possible. I place this wheel in the cylinder, passing the lower gudgeon through a hole in the center of the ventilator, which is placed at the bottom of the cylinder, and resting it in a step or header fixed in a bridge-tree lying just above the lower cross-beams. (This bridge-tree may be dispensed with in all cases where the wheel is not to be raised and lowered by a lighter.) I then put on the head and confine it down with the upper cross-beams, through which the upper gudgeon passes loosely. I attach two rods of iron to opposite sides of the ventilator, which pass up outside the cylinder and through the cross-beams and are connected with a forked lever, whose fulcrum rests on one of the cross-beams, or the lever may be connected with the ventilator in any other convenient mode for operating it, so as to regulate the discharge of water from the wheel or to stop it entirely at pleasure by bringing the upper edge of it hard up against the lower edge of the cylinder. I conduct the water into the cylinder through a penstock inserted in a narrow opening made about midway of the length of it and of sufficient size to admit about two-thirds the usual quantity of water used on a tub-wheel for the same purpose. The water should be directed into the cylinder at right angles with the center, and may be let in above or below the middle, according to circumstances. In a vertical wheel I should prefer to let it in below the middle, and in a horizontal wheel above it. Two or more gates

may be drawn upon this wheel, if desirable, by inserting each penstock as above directed.

For a horizontal wheel the whole apparatus is laid down in a horizontal position, the water being applied as above specified. When a crank is inserted for the head-gudgeon, the head of the cylinder may be made in two parts and also the head cross-beams, which may be bolted together, so as to form a box for the bearing of the crank to revolve in.

The wheel and cylinder may be made of any suitable materials and connected together in any convenient manner to produce the operation as specified.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The giving of the grooves or vanes of the wheel a greater obliquity at the discharging than at the receiving point.
2. The use of a head to the cylinder to confine the pressure of the water.
3. The use of a ventilator regulating the discharge of the water.

JOSEPH C. GREEN.

Witnesses:

HENRY W. OWEN,
JAMES CLARK.