

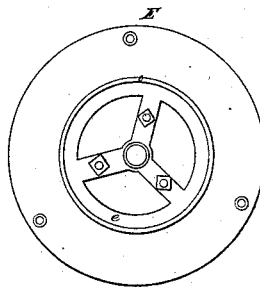
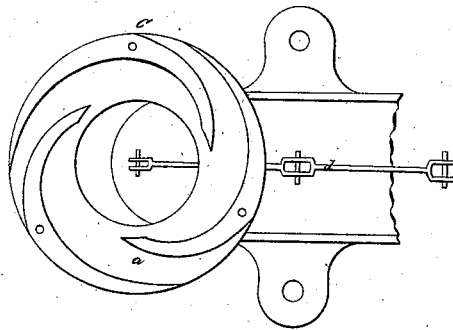
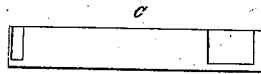
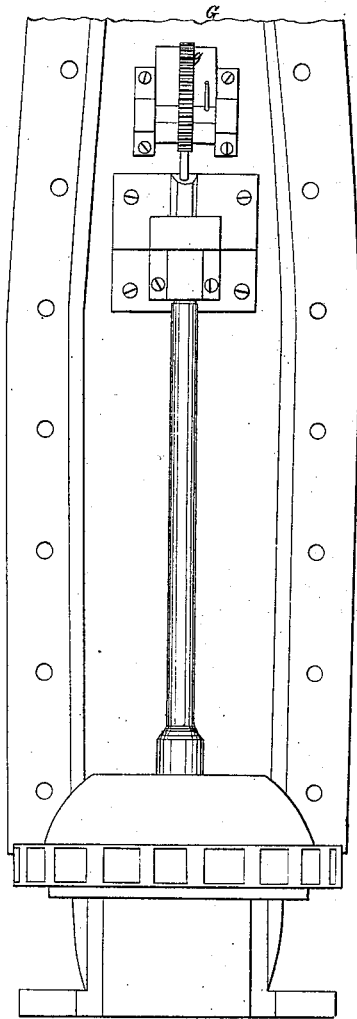
Sheet 1-2 Sheets

H. Vandewater

Water Wheel

N<sup>o</sup> 5785

Patented Sep. 19, 1848.

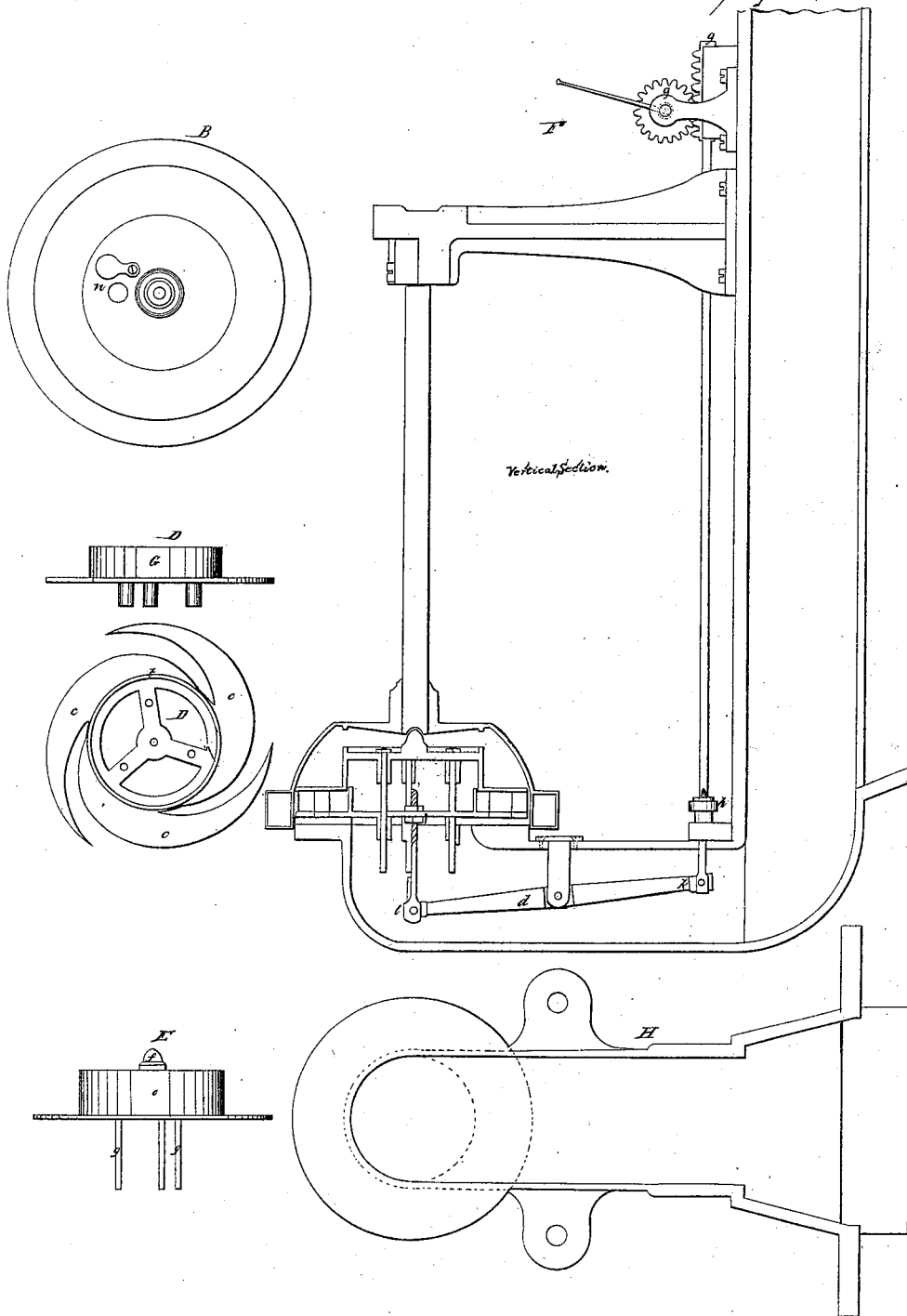


H. Vandewater

Water Wheel,

No. 5,785.

Patented Sep. 19, 1848.



# UNITED STATES PATENT OFFICE.

HENRY VAN DEWATER, OF PHILADELPHIA COUNTY, PENNSYLVANIA.

## IMPROVEMENT IN CHUTES AND WATER-WHEELS.

Specification forming part of Letters Patent No. 5,785, dated September 19, 1848.

*To all whom it may concern:*

Be it known that I, HENRY VAN DEWATER, of the county of Philadelphia, State of Pennsylvania, have invented a new and useful Improvement on the Scotch Mortar Water-Wheel; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawings, making a part of this specification, in which—

Figure A is a plan of the wheel; Fig. B, the cap of the wheel; Figs. C C, a plan and elevation of the pitch, with the diverging flues for the passage of the water; Figs. D D, a plan and elevation of the gate, with the diverging wings fitting into the flues of the pitch; Figs. E E, a plan and elevation of the pitch-cap, with step and pivot upon which the wheel revolves, with the guide-rods for the gate; and Fig. F, a vertical section through the wheel, flume, and forebay, showing the position of the lever which raises and depresses the gate, with a side view of the shaft-head, wheel, and rack for opening and shutting the gate. Fig. G is a front elevation of the whole machine. Fig. H is a plan of the flume.

I construct the whole machine of iron, the forebay G being cast with holes for bolts or screws to attach it to either a wood or stone dam and in one piece with the flume H. Upon the wheel end of the flume I construct a stationary pitch C of a diameter less than the internal diameter of the wheel, which is secured to the flange or rim of the flume, the circular opening in the center being less than the area of the flume, but greater than the sum total of the areas of the discharging-apertures. The face of the pitch is divided into three diverging flues *a a a*, Fig. C, through which the water passes from the opening in the center to the outer circle of the pitch, which is in close connection with the inner circle of the wheel revolving round it, the outer end of the flues being contracted to an aperture corresponding to the size of the openings between the buckets in the wheel and directed in a course at right angles to the face of the bucket.

To admit or shut off the water, I construct a cylindrical gate D inside of the pitch, hav-

ing an inner circle *b* the whole depth of the pitch and so fitted as to close the apertures or flues on the inside with diverging wings *c c c*, fitting into the flues, extending from the inner circle to the extremities of the flues and letting the water under the gate and into the wheel. This gate is moved by the lever *d* upward or downward to regulate the supply by increasing or diminishing the apertures in the pitch. The pitch containing the gate is covered by a cap E, attached to the divisions of the flues, and has an upright cylindrical curb *o* on the inner side inclosing the rim of the gate. A narrow flange *e e* projects from the inner side of the curb, with arms to the center supporting the socket or step in which the pivot *f* is fixed, upon which the wheel revolves, and to which arms the guide-rods *g g g* are attached to steady the movement of the gate. The lever *d* is worked by a wheel and rack *g*, Fig. G, attached to the upper part of the front of the forebay, the rack being connected with the lever-rod passing through a packing-box *h* on the top of the flume to one arm of the lever *k*, and the other arm of the lever connecting with the gate-rod at *l*. The wheel is so constructed as to take the direct action of the water upon the face of the buckets *m m* in a line as near as possible at a right angle to their plane and to retain the action as long as there is any propelling-power in its motion by lengthening the face of the bucket until it falls into a line with the periphery of the wheel. The reaction of the water is increased by making the back of the bucket of an ogee shape. The buckets have their inner points directed backward, contrary to the motion of the wheel. The water is received from the inside and discharged on the outside in a tangent to the outer circle. The entire wheel is of cast-iron, with a hollow spherical cap, the upper surface flattened, with a projecting socket on the exterior to receive the shaft, and a box on the interior or under surface to admit the pivot upon which the wheel revolves. The cap is entirely hollow, without any arms or stays to oppose or retard the motion by creating back-water, the cup shape allowing the water rushing up from below against the inner surface to lift the wheel, thereby diminishing the fric-

tion upon the pivot. The cap is furnished with an armhole and cover *n* to take out any obstruction that may get in by accident. The head of the shaft runs in a box formed in an arm projecting from and secured to the front of the forebay.

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

The entire shape, construction, and operation of the gate, with the method of moving it and regulating the supply of water by the lever *d*.

HENRY VAN DEWATER.

Witnesses:

CARVER & HALL,

TH. THIERRY.