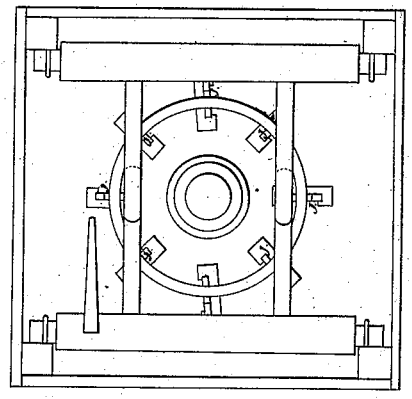
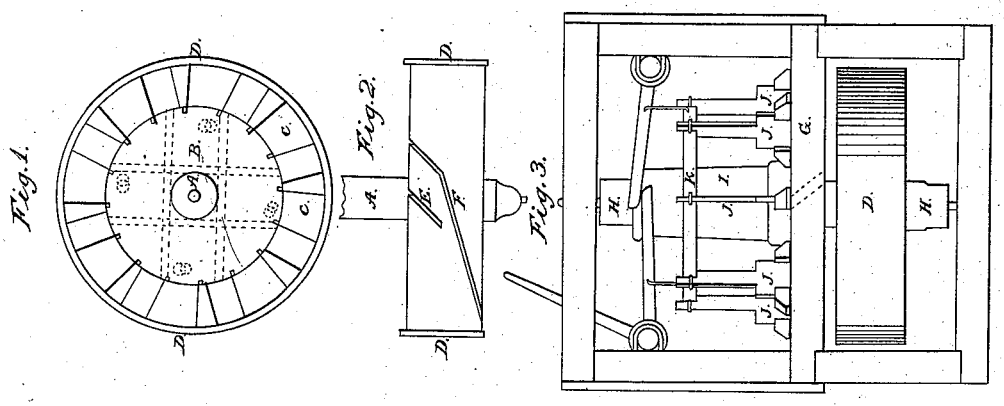
Parker & Engle,

Water Wheel,

No. 329. Patented July 29, 1837.

Fig. 4.





UNITED STATES PATENT OFFICE.

CLAYTON PARKER AND ROBERT W. ENGLE, OF WAYNE TOWNSHIP, WARREN COUNTY, OHIO.

IMPROVEMENT IN THE CONSTRUCTION OF WATER-WHEELS.

Specification forming part of Letters Patent No. **329**, dated July 31, 1837.

To all whom it may concern:

Be it known that we, CLAYTON PARKER and ROBERT W. ENGLE, of the township of Wayne, in the county of Warren and State of Ohio, have invented an Improved Water-Wheel, which water-wheel is propelled mainly on the undershot principle, and which revolves horizontally, having its shaft vertical, of which the following is a specification.

Figure 1 in the accompanying drawings is a top view of this wheel and is drawn from one eight feet in diameter, but it may be made less or more. A is the shaft surrounded by a drum B, which is hollow and constitutes the center of the wheel. It is formed by mortising three arms, eighteen inches wide and three inches thick, through the shaft. Upon these arms we frame two sets of cants measuring three by six inches. These we cover above and below with inch plank and surround the whole by stout staves, which completes the drum or inner part of the wheel, which is about two feet deep. Through the flank forming the upper side of this drum we make small holes between the arms near to the shaft to admit air into the respective spaces, and on its under side near its periphery we also make openings for the discharge of water from these spaces. These holes may be about one by two and a half inches, and they are cut very obliquely in such a direction as that the motion of the wheel shall cause the water to pass directly out of them, while, also, it will run smoothly over any backwater which may be below it. The buckets C C C in a wheel of this size may be sixteen in number. Their ends pass into grooves in the staves forming the periphery of the drum, and also into grooves in the hooped rim D D. They form an angle of forty-five degrees with the plane of the wheel and reach down about one-half its depth, or about one foot. At this point one half of them terminate, but the other half continue down to the under side of the wheel; but instead of an angle of forty-five degrees; these lower portions form an angle with the plane of the wheel of about fifteen degrees only. Eight of the buckets, therefore, have an angle at about their middles, as shown in Fig. 2, where E E are the narrow and F F the wide buckets. The acute angle formed by the openings on the lower side of the wheel causes it to run much more smoothly in backwater and to deliver that which passes through it more readily than it otherwise would.

Figs. 3 and 4 are side and top views of the apparatus, showing the penstock which stands above the wheel, but having one of its sides removed to show its interior arrangement. The bottom G of this penstock, which forms a sheeting over the wheel, should be from four to six inches thick, and through this the chutes are to be made by which the water is admitted upon the wheel. These chutes may vary in number according to the head or quantity of water; but there will usually be from four to eight of them standing directly over the circle of buckets. These chutes are to be equal to the buckets in length and from four to six inches in width. They are cut through at an angle of forty-five degrees, so that the water may strike at right angles upon the buckets. Each chute is furnished with a gate, by which the opening may be closed and the quantity of water passing through them may be regulated. H is the shaft of the wheel which passes up through an opening in the bottom of the flume and is surrounded by a stationary tube I, affixed firmly to the bottom of the flume and rising to such height as to prevent the water flowing over and escaping through the center opening. J J J are the gates which close the chutes. From these gates shafts or stems rise above the water and are attached to a hoop K, by the raising or lowering of which by any suitable mechanical contrivance the gates are all simultaneously opened or closed.

We usually line the lower sides of the chutes with a thin guide-board extending down from the bottom of the penstock to within an inch of the buckets, and also put a similar projecting lining on the inner end of each chute, especially when the wheel has to run more than its depth in backwater. This lining should be so fixed as to prevent the water from striking upon the buckets for about an inch toward the shafts, as the part of the wheel through which the water passes will then be supplied with air down the shaft, thereby permitting the head-water to pass smoothly out at the bottom of the wheel without creating any suction.

Having thus fully described the construc-

tion of our water-wheel and its appendages, we hereby claim as our invention and wish to secure by Letters Patent—

1. The giving to that part of the water-wheel which is within the buckets the form of a hollow drum provided with openings in its upper and lower heads, made in the manner and for the purposes set forth.

2. The raising or closing the gates of all the chutes simultaneously, substantially in the manner described.

3. The plan of continuing one half of our buckets down for about one-half only of the depth of the wheel and the forming of an elbow in the other half of our buckets half-way down our wheel, thereby causing it to receive its main propelling power on the undershot principle and to operate well in backwater.

CLAYTON PARKER.
ROBERT W. ENGLE.

Witnesses:
J. M. HADDEN,
JESSE APPELTON.