

(No Model.)

J. B. PITCHFORD.
WATER WHEEL BUCKET.

No. 485,477.

Patented Nov. 1, 1892.

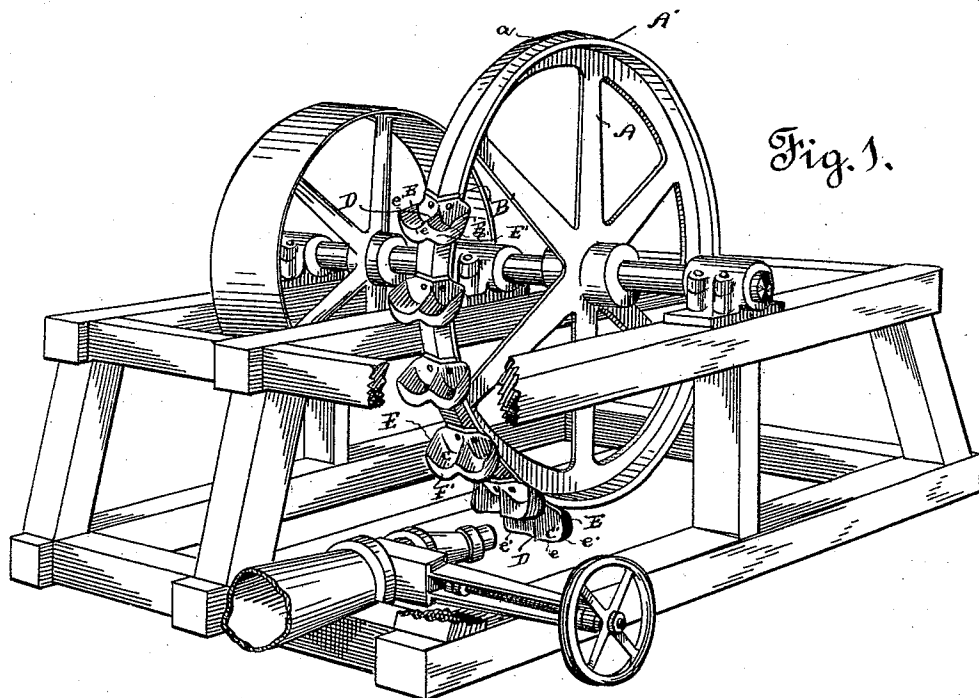


Fig. 1.

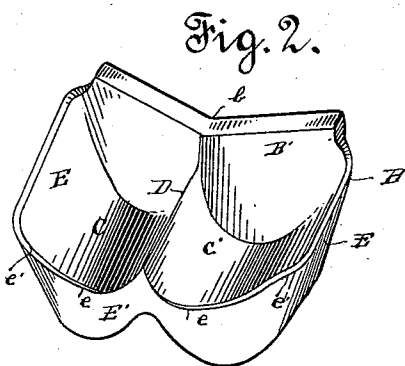


Fig. 2.

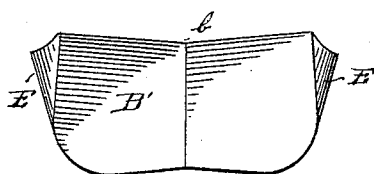


Fig. 3.

Witnesses.

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UNITED STATES PATENT OFFICE.

JOHN B. PITCHFORD, OF SAN FRANCISCO, CALIFORNIA.

WATER-WHEEL BUCKET.

SPECIFICATION forming part of Letters Patent No. 485,477, dated November 1, 1892.

Application filed October 19, 1891. Serial No. 409,123. (No model.)

To all whom it may concern:

Be it known that I, JOHN B. PITCHFORD, a citizen of the United States, residing at San Francisco, in the county of San Francisco and State of California, have invented certain new and useful Improvements in Water-Wheel Buckets; and I do hereby declare the following to be a full, clear, and exact description of said invention, such as will enable others skilled in the art to which it most nearly appertains to make, use, and practice the same.

My invention has relation to certain new and useful improvements in water-wheel buckets, and more particularly to that class known as "hurdy-gurdy" wheels, which derive their power from an impact stream or column of water delivered against the buckets secured to the periphery thereof, as will be hereinafter more fully set forth in the drawings and described and pointed out in the specification.

Practical use has demonstrated the fact that a large per cent. of the rotary force or power of the wheels is lost by reason of the fact that the front of the buckets are so constructed as to come in contact with the impact stream during rotation of the wheel, thus extracting a partial force of rotation, inasmuch as the face of the bucket must necessarily force its way through the impacting stream before receiving the same therein in order to impart rotation to the wheel, which contact with the solid water stream obviously detracts from the rotary force of the wheel, thus not fully gaining the entire driving power of the impact stream.

The object of my invention is to so construct the bucket as to allow for the complete utilization of the impact stream by providing against the bucket-face coming into contact with the propelling-jet, consequently gaining the now loss per cent. of power, and, further, in so constructing the rear wall as to permit of the perfect centering of the bucket upon the wheel-periphery, so that the apex of the bucket will be in true line with the periphery-center of the wheel, consequently insuring perfect centering of one bucket to the other, thereby bringing each in true line with one another. If perfect centering of the buckets to each other be not obtained on the wheel-

periphery, the impacting jet or stream naturally does not strike the true apex of the bucket and the full driving power or force of the stream is not obtained. These two features are the main objects sought after in all water-wheel buckets and which account for the loss per cent. of driving power—that is, there must be true centering of the buckets to the wheel-periphery and each other and unobstructed rotation of the same to the impact stream, so as not to divert partial driving force thereof.

Referring to the drawings forming a part of this specification, wherein similar letters of reference denote corresponding parts throughout the entire specification and several views, Figure 1 is a perspective view of a water-wheel provided with my improved bucket; Fig. 2, a detail view of the bucket removed from the wheel, and Fig. 3 a rear view in elevation.

The letter A indicates the water-wheel proper, the periphery A' of which inclines from the center ridge *a*, thus forming approximately in cross-section a V-shaped periphery. To said wheel is suitably secured the buckets B, the rear walls of which are formed so as to correspond with the wheel-periphery, the center ridge of which bears against the center of the rear wall B', thus insuring perfect centering of the bucket when secured to the wheel. The rear wall is approximately V-shaped. The bucket has its bottom formed into two curves C C', which meet in the central apex D, united to the rear wall B', the inner face of which inclines in accordance with the outer face thereof. The sides E E run at an incline from top to bottom and are united by the front wall E'. This wall is cut away, as shown at *e e*, so as to bring the front wall of the curved bottoms below the apex D, thus providing against undue contact with the impact stream—that is to say, I narrow or lessen the contacting-surface to the minimum amount of metal and at the same time preserve the requisite metal for discharge of the utilized water, but overcome liability of the propelling-stream impacting against the bucket-wall during rotation. By cutting away the front wall, as shown, the only contact-point with the impact stream is the outer end of

apex D, which is not sufficient interference to detract from rotation of wheel; but, as above stated, I preserve sufficient width of metal to allow for the discharge of the utilized water, as shown at *e'*. By inclining the rear wall of the buckets the rear walls of the curved bottoms are inclined, which allows free action to be given the utilized water within the sections. It will be observed that the apex D and center *b* of the inclined rear wall are in true line. Consequently when the bucket is secured to the wheel the apex and center of wheel-periphery will be perfectly centered. By inclining the periphery of the wheel from the center and rear wall of the bucket likewise I am enabled to secure each bucket in true line with each other and to the wheel-periphery without minute adjustment.

Inasmuch as the reactory flow or stream is not so solid as the impact stream or wall of water, but spreads itself more, it is necessary that the discharge-walls of the sections be enlarged. Consequently while the front wall of the bucket is cut away, so as to bring the same below the apex D, in order to overcome contact with the impact stream during rotation of wheel and prevent undue resistance to the movement thereof I still preserve sufficient width at point *e'* of the front wall to allow for the perfect discharge of the reactory

or utilized water from within the bottom sections at a point above the apex, as clearly shown in drawings.

By cutting away the front wall of the bucket, as shown, I not only provide against interference by contact with the impact stream during rotation of the wheel, but at the same time provide a lighter bucket and one which may be constructed at a less expense.

Having thus described my invention, what I claim as new, and desire to secure protection in by Letters Patent of the United States, is—

1. A water-wheel bucket having a V-shaped rear wall, a front wall cut away on each side of its central line, and curved bottoms connecting said front and rear walls.

2. A water-wheel bucket having front and rear walls and curved bottoms connecting the same, the said bottoms meeting in a central apex and having their outer ends extended to form discharge-walls, the rear wall being V-shaped and the front walls being cut away adjacent to the said central apex.

In testimony whereof I affix my signature in presence of two witnesses.

JOHN B. PITCHFORD.

Witnesses:

N. A. ACKER,
J. W. KEYS.