Fredenburr & Andrews,

Water Wheel.

No. 96573. Patented Nov. 9. 1869.

Fig. 1.

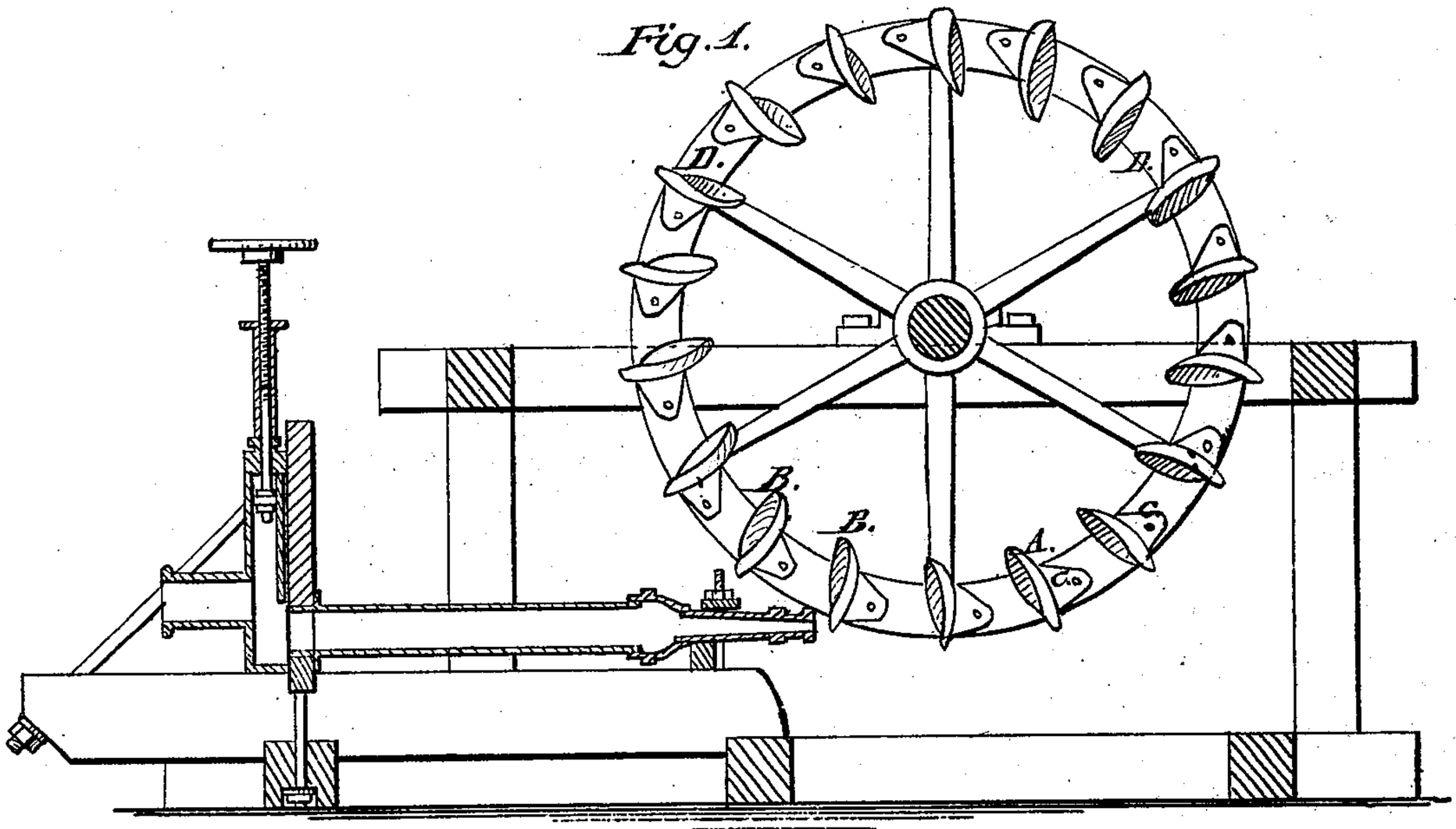
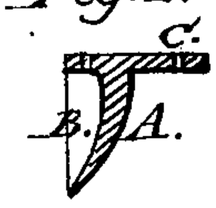
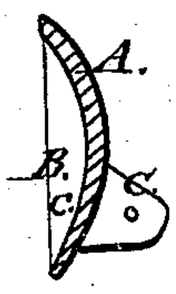


Fig. 2.





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Letters Patent No. 96,573, *dated November* 9, 1869.

IMPROVEMENT IN WATER-WHEELS.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that we, J. G. FREDENBURR and WILLIAM V. ANDREWS, of Newcastle, in the county of Placer, and State of California, have invented a new and useful Improvement in Water-Wheels; 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 make and use the same, reference being had to the accompanying drawing, forming part of this specification.

This invention relates to improvements in that class of wheels chiefly employed under very high heads of water, which is discharged against the buckets in small jets, through nozzles.

It consists in the form of the buckets, and the manner of connecting them to the rim of the wheel.

The faces of the buckets receiving the water represent spiral concaved forms, so shaped as to give the water, which is discharged against them when in the lowest position, first, an upward or radial direction, and then a lateral direction away from the wheel, calculated to utilize, as much as possible, the unspent force of the water, which is commonly lost in these wheels by the immediate escape after the impact, and also calculated to discharge the water away from the wheel, so as not to clog or impede its motion, all as hereinafter more fully described.

Figure 1 represents a side elevation of our improved wheel, and

Figure 2 represents vertical and transverse sections of the buckets.

Similar letters of reference indicate corresponding parts.

The buckets A are made of metal, preferably by casting, and have spiral concave faces, B, for the reception of the water, and flanges C, for securing to a plain rim, D, having suitable arms, and connected to a shaft.

The faces of the buckets range nearly radially, and are calculated to receive the water at their bottoms, and at the bottom of the wheel, (which revolves in a vertical plane,) from a direction parallel with the said plane, and deflect it upward to some extent, and then outward, giving it a spiral course, whereby a greater percentage of force is received from the water than when the faces of the buckets are made flat. The water is also prevented from reacting against the jet, and also from clogging the wheel.

A further advantage is also gained, of discharging the water away from the shaft and pulley, which are on the opposite side, thereby saving the expense of a bulkhead to keep the belt dry; and a still further advantage is, that in many cases, when the head is very high, the escaping water will be thrown so high as to be available for running directly into the batteries, for use there, without the employment of elevating-apparatus.

The buckets are secured to the rim by bolts, and these may have slotted holes in the rim, so as to permit adjusting buckets on the wheel with great exactness.

Having thus described our invention,

What we claim as new, and desire to secure by Letters Patent, is—

1. The buckets A, provided with the spiral concave faces B, and combined with the rim, substantially as specified.

2. The buckets, having faces formed as described, provided with flanges C, and secured to the rim, substantially as specified.

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