

(No Model.)

J. P. VINAL.
WATER WHEEL.

No. 465,439.

Patented Dec. 15, 1891.

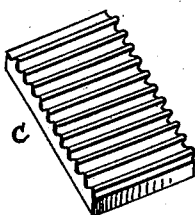


FIG. 1.

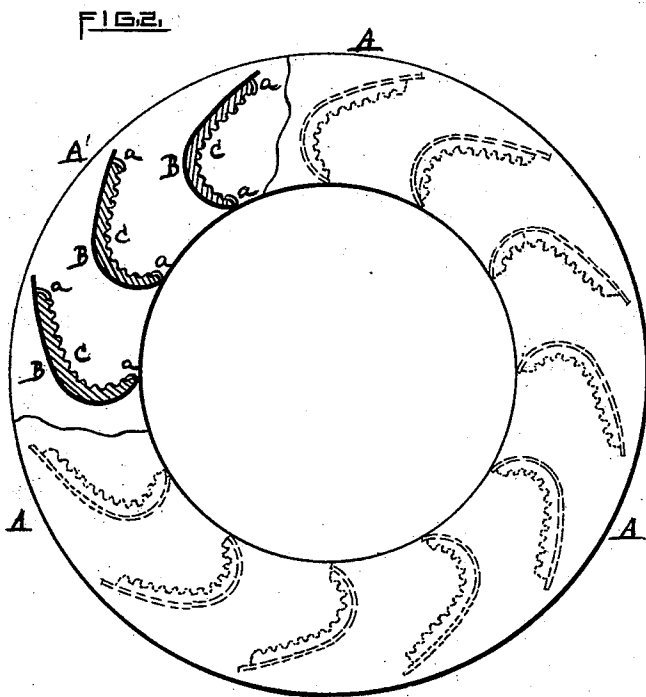


FIG. 2.

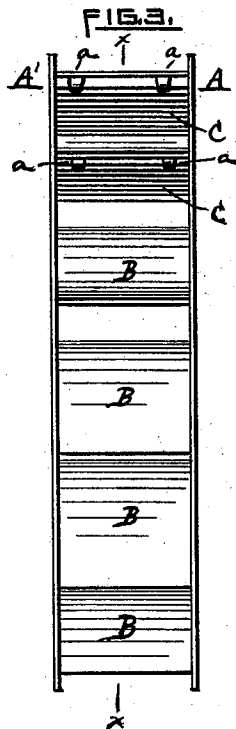


FIG. 3.

WITNESSES.

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JOHN P. VINAL, OF PROVIDENCE, RHODE ISLAND.

WATER-WHEEL.

SPECIFICATION forming part of Letters Patent No. 465,439, dated December 15, 1891.

Application filed March 30, 1891. Serial No. 387,030. (No model.)

To all whom it may concern:

Be it known that I, JOHN P. VINAL, of the city and county of Providence, in the State of Rhode Island, have invented a certain new and useful Improvement in Water-Wheels; and I declare the following to be a specification thereof, reference being had to the accompanying drawings.

Like letters indicate like parts.

10 Figure 1 is a perspective view of the corrugated india-rubber lining which is applied to the buckets of my improved wheel. Fig. 2 is a side view of my invention, partly in elevation and partly in section, on line *xx* of Fig. 3. Fig. 3 is a front elevation of my invention.

My invention relates to water-motors; and it consists in providing with a covering or lining of an elastic substance, which is impervious to water, that surface of the bucket of a water-wheel which receives the water-pressure.

25 In the drawings, A A' represent the circular sides of a water-wheel having a central annular space. They are made of any suitable material, preferably metal, and are parallel to each other. The buckets B, preferably metallic and curved, as shown in Fig. 2, extend from one side of the wheel to the other. 30 A lining of corrugated india-rubber C covers the inner or concave surface of each bucket B, and is secured in position by ear-pieces *a* extending from the edges of the bucket or in any other suitable manner.

35 The wheel shown in the drawings is revolved by jets of water under gravity-pressure, which are directed against the concave portions of the buckets from nozzles or other discharging devices located within the central annular openings of the wheel, the same not being illustrated in the drawings, because well known and not of the essence of my invention; but my improvement is equally ap-

plicable to any other kind of water-wheel and to all other forms of buckets or passages of water wheels or motors, and the forms shown in the drawings are selected only as a single instance of the application of my invention.

The essential feature of my invention is the india-rubber covering or lining C, which is applied to that surface of the bucket which receives the pressure of the water. Being flexible it readily conforms to the concavity or other shape of the bucket, and, moreover, is not rotted or injuriously affected by its exposure to water. While any elastic substance which is impervious to water may be used for this purpose, india-rubber is peculiarly adapted thereto. It presents a surface which furnishes great friction to whatever passes over it in contact. The water discharged against this india-rubber surface of a bucket takes a firmer hold and so imparts a greater pressure than when it is discharged against a smooth metallic surface over which to flow. This frictional surface, therefore, receives and tends to localize at the place of the original impact the full force of the water-pressure, thus yielding an increase of mechanical power. The corrugations being disposed at right angles to the direction of the water-currents increase the friction; but good results can be obtained if these corrugations are omitted and a rubber lining having a plane surface used instead.

I claim as a novel and useful invention and desire to secure by Letters Patent—

A water-wheel or motor having buckets or water-passages covered with india-rubber or other elastic water-proof material upon the surfaces which receive the pressure of the water, substantially as specified.

JOHN P. VINAL.

Witnesses:

WARREN R. PERCE,
DANIEL W. FINK.