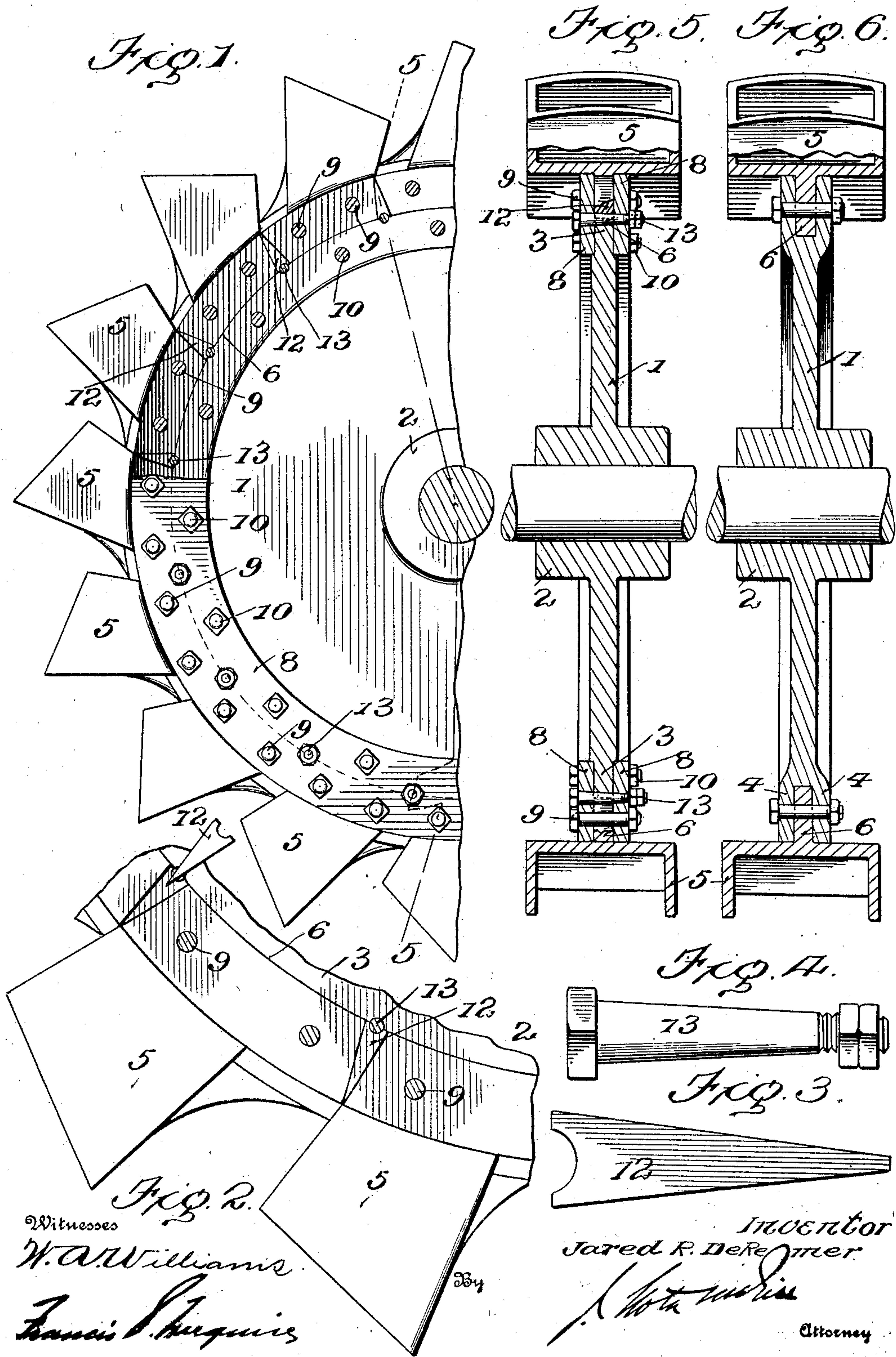


J. R. DE REMER.
WATER WHEEL.
APPLICATION FILED JAN. 2, 1909.

990,639.

Patented Apr. 25, 1911.



UNITED STATES PATENT OFFICE.

JARED R. DE REMER, OF GLENWOOD SPRINGS, COLORADO.

WATER-WHEEL.

990,639.

Specification of Letters Patent.

Patented Apr. 25, 1911.

Application filed January 2, 1909. Serial No. 470,518.

To all whom it may concern:

Be it known that I, JARED R. DE REMER, of Glenwood Springs, in the county of Garfield and State of Colorado, have invented certain new and useful Improvements in Water-Wheels; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

Heretofore considerable difficulty has arisen by reason of the buckets of water-wheels becoming loose, resulting frequently in their being torn off and causing no little damage.

The object of my present invention is to provide simple and highly efficient means for securely fastening buckets to water-wheels, and to readily compensate for any wear, thereby insuring the buckets being securely held to the wheel.

The invention will be hereinafter fully set forth and particularly pointed out in the claims.

In the accompanying drawings, Figure 1 is a view in side elevation of a portion of a wheel provided with my improvements. Fig. 2 is an enlarged fragmentary view. Fig. 3 shows the wedge. Fig. 4 the adjusting bolt. Fig. 5 is a transverse sectional view. Fig. 6 is a similar view showing a slight modification.

Referring to the drawings, 1 designates the disk of a water-wheel, said disk having at its center a hub 2 while at its periphery it is reduced to form a tongue 3 or is bifurcated to form two cheeks 4, as shown in Fig. 6. The buckets 5, which, interiorly, may be of any preferred form of construction, (but preferably in accordance with my invention as shown by Letters Patent No. 883,528,) are provided each with a tongue 6 extending from the base of the bucket, such tongues fitting against the periphery of tongue 3 of the wheel disk or against the periphery of the disk and between the cheeks 4. The latter arrangement suffices when the wheel is operating under low heads of water, the tongues of the several buckets being securely held by nutted bolts passed through them and also through the cheeks. But the arrangement shown in Fig. 5 is preferred, being specially adapted to high pressures. According to this preferred construction the tongues of the buckets when seated against the periphery of the tongue of the disk are

held between two parallel rings 8 by bolts 9 and said rings are secured against the sides of disk tongue 3 by bolts 10. The tongues of the buckets are curved or concaved longitudinally to conform to the contour of the wheel disk, and their ends are slightly beveled so that the tongues of the several buckets abut only at their outer edges.

To compensate for all wear by reason of the buckets becoming loose, I locate in the spaces between the adjacent ends of the tongues of the several buckets wedges 12, which serve to hold the buckets securely in line. If any wear occurs the wedges are tightened up by tapered bolts 13 which fit in concaved seats or cut-outs on the inner ends of the wedges and extend through openings in the side rings, or through openings in the cheeks when the form shown in Fig. 6 is employed. Thus by tightening the tapered bolts the wedges may be caused to firmly bind the several buckets and avoid the danger of their becoming loose.

The advantages of my improvements will be apparent to those skilled in the art.

By forming the disk 1 integral with the hub and securing the jaws of the bucket tongues against the periphery of the disk so that such tongues will fill the spaces between the retaining rings, the wheel as a whole is perfectly solid and no pockets are formed in which water may accumulate. In this way no unnecessary weight is placed upon the wheel, and I am enabled to overcome all unnecessary friction or splashing of water which would otherwise seriously retard the work of the wheel.

I claim as my invention:—

1. A water-wheel comprising a series of circularly-arranged buckets having spaces between their adjacent ends, wedges fitted in said spaces, and means for adjusting and holding said wedges.

2. A water-wheel comprising a disk, a series of buckets surrounding said disk and having tongues curved to conform to the periphery thereof with spaces between adjacent tongues, wedges within said spaces, members carried by said disk and between which said tongues and wedges are located, and tapered bolts passed through said members and engaging said wedges.

3. A water-wheel comprising a disk, a series of buckets surrounding said disk and having tongues curved to conform to the periphery thereof with spaces between ad-

5 jacent tongues, wedges within said spaces, said wedges having concaved cut-outs, opposite rings secured to said disk and between which said tongues and wedges are located, bolts holding said tongues to said rings, and tapered bolts passed through said rings and fitting in said cut-outs of the wedges.

10 4. In a water wheel, of the kind described, a series of buckets secured to the periphery of the rim thereof, the bases of said buckets having faces registering with similar faces of adjacent buckets, and expanding material inserted between said faces so as to effect rigid attachment of consecutive buckets by forcing them into a larger circle and cramping them against their rim attachments, as and for the purposes specified.

5. The combination with a water-wheel, of a series of buckets consecutively secured to the rim of said wheel, transverse pins extending through said rim, lugs on the buckets engaging with said pins, said lugs having registering faces with intervening spaces, and wedges in said spaces adapted to force the buckets radially outward and into cramping engagement with said pins. 20 25

In testimony whereof, I have signed this specification in the presence of two subscribing witnesses.

JARED R. DE REMER.

Witnesses:

N. J. DARROW,
SADIE KORN.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."
