

W. R. ECKART.  
WATER WHEEL BUCKET ATTACHMENT.  
APPLICATION FILED FEB. 14, 1908.

924,544.

Patented June 8, 1909.

Fig. 1.

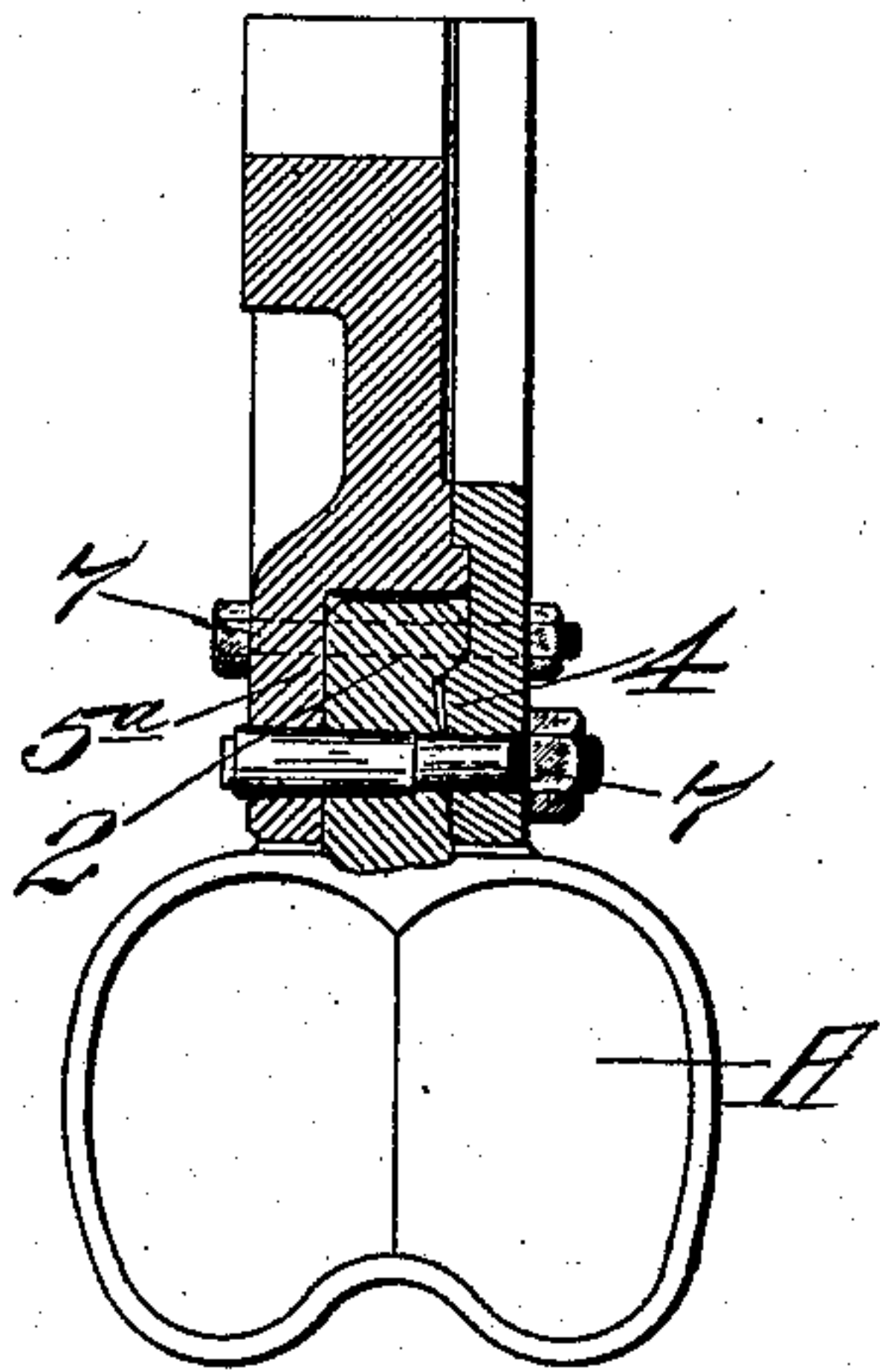


Fig. 2.

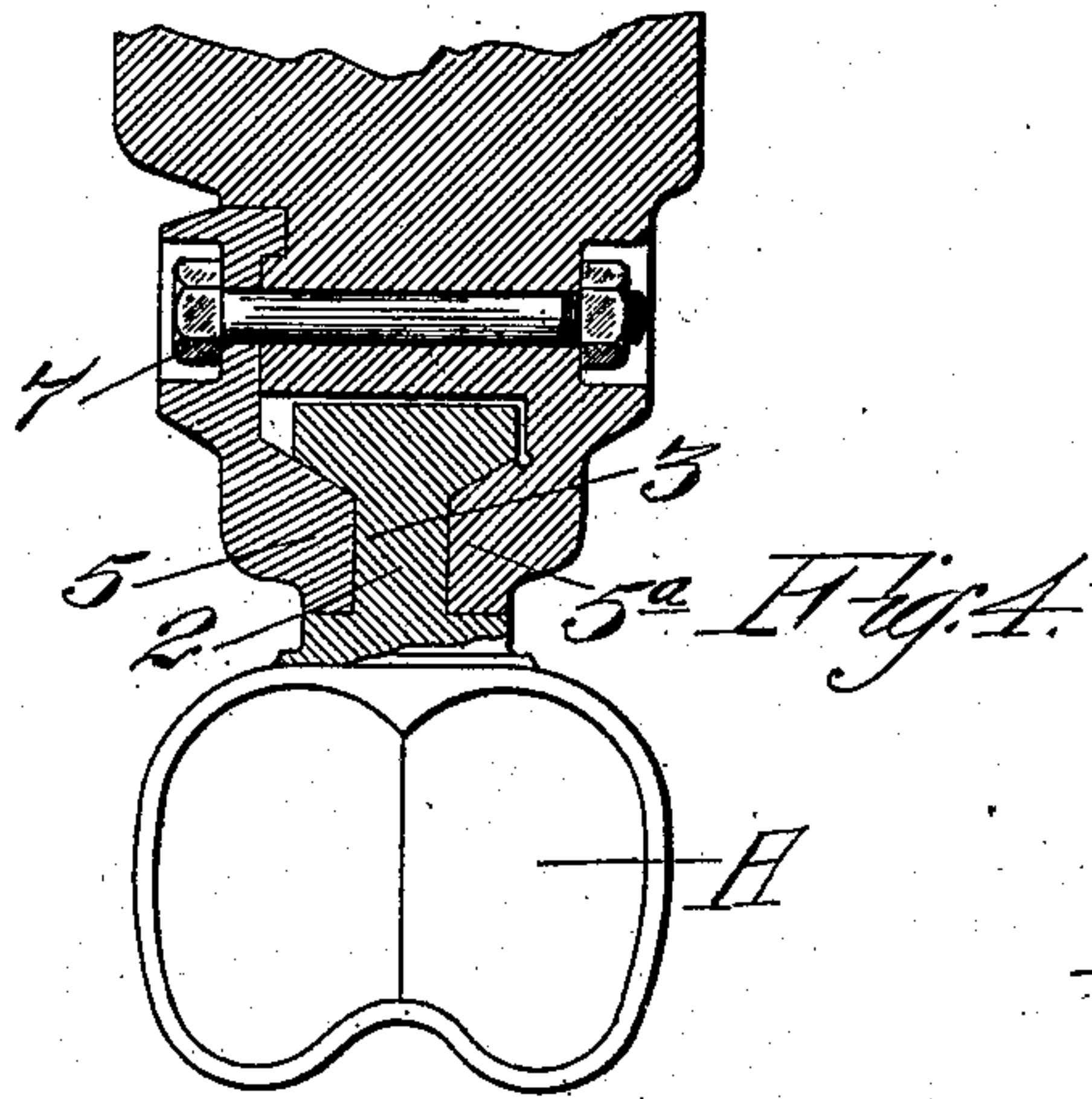
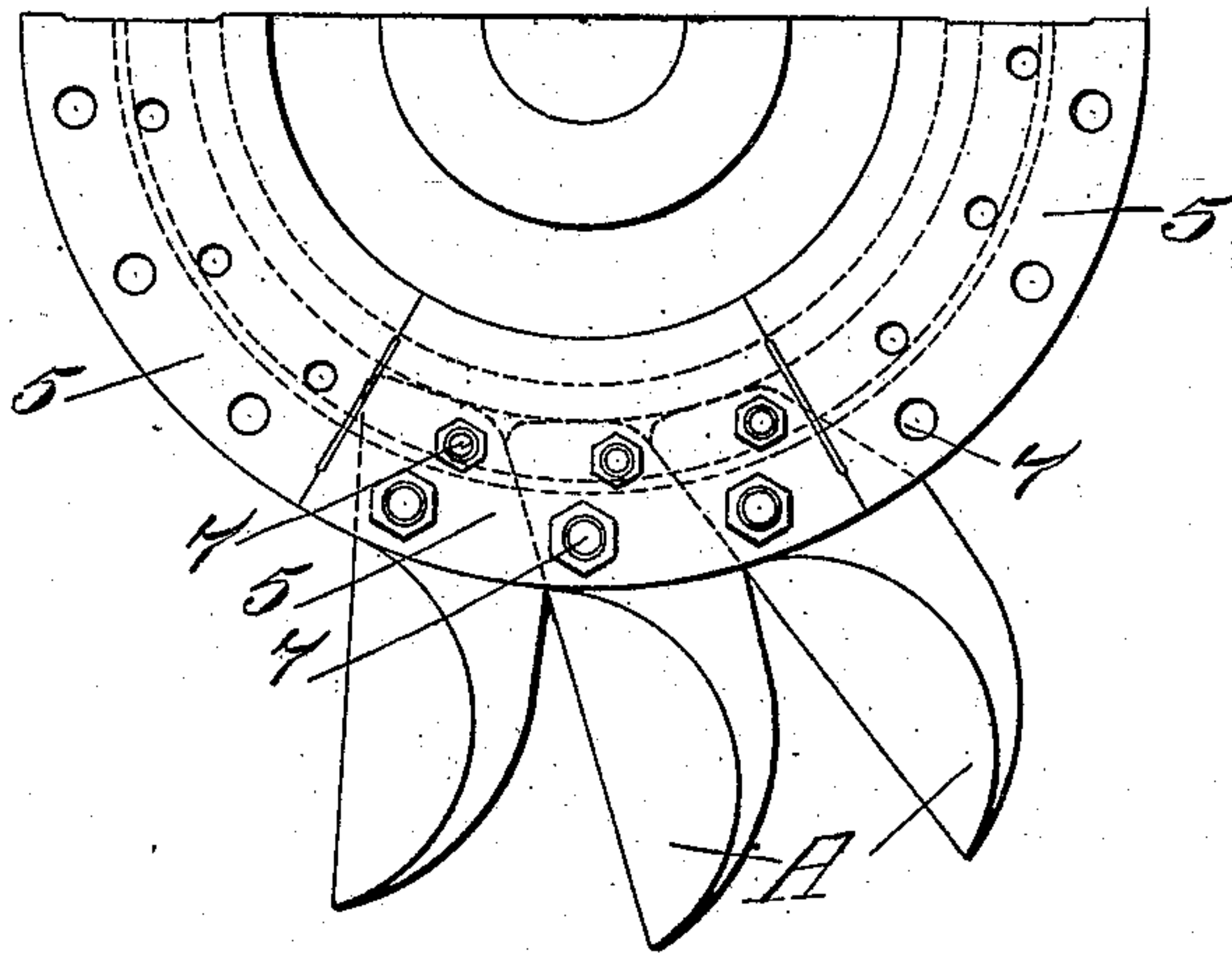
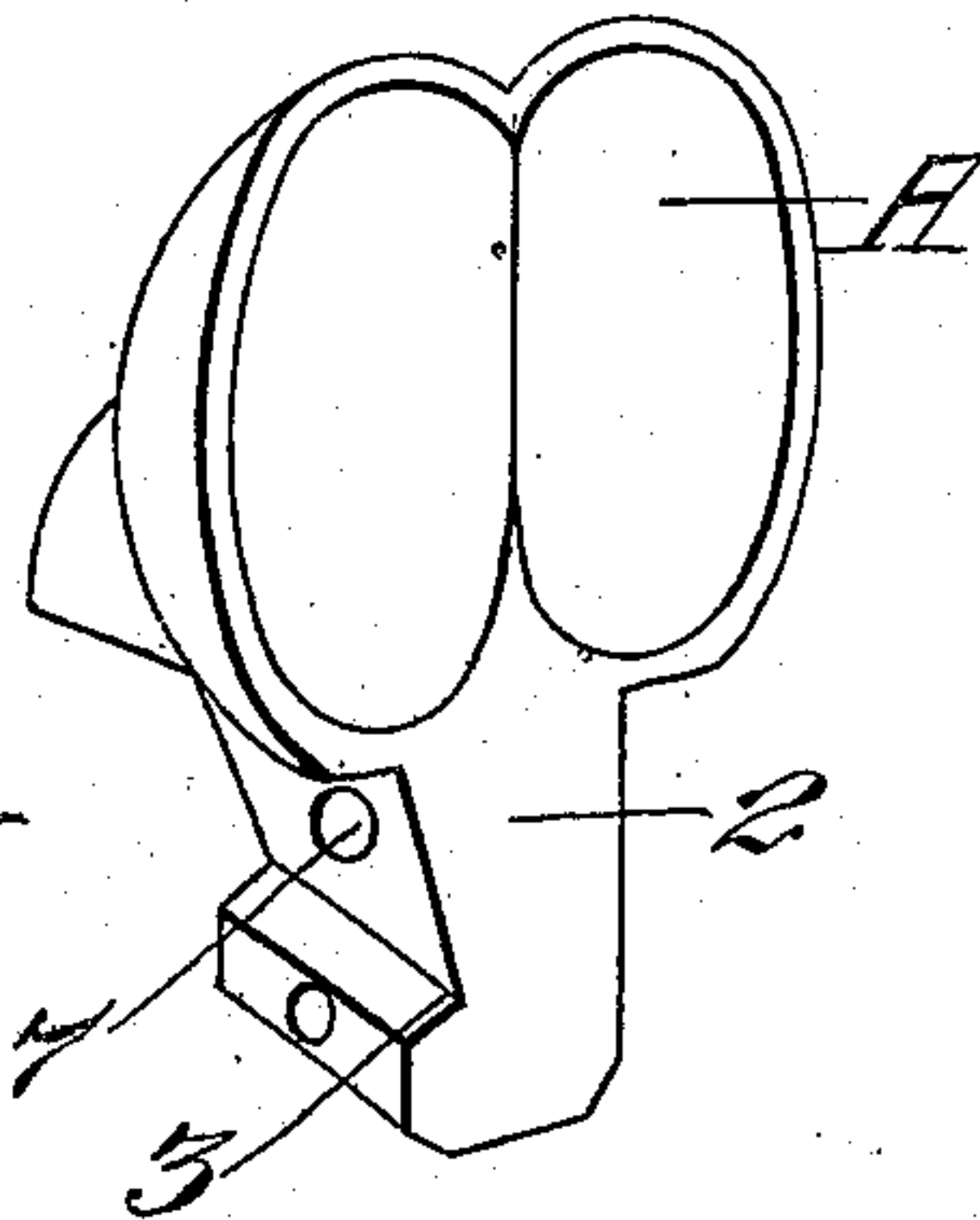


Fig. 3.



WITNESSES:

*J. H. Berg*  
*J. H. Berg*

INVENTOR

*William R. Eckart*  
BY *Geo. H. Strong*  
ATTORNEY



# UNITED STATES PATENT OFFICE.

WILLIAM R. ECKART, OF SAN FRANCISCO, CALIFORNIA.

## WATER-WHEEL-BUCKET ATTACHMENT.

No. 924,544.

Specification of Letters Patent.

Patented June 8, 1909.

Application filed February 14, 1908. Serial No. 415,879.

*To all whom it may concern:*

Be it known that I, WILLIAM R. ECKART, citizen of the United States, residing at the city and county of San Francisco and State of California, have invented new and useful Improvements in Water-Wheel-Bucket Attachments, of which the following is a specification.

My invention relates to a means for securely attaching the buckets of water-wheels of that class known as "impulse" or "tangential wheels".

It consists in the combination and arrangement of securing segments, and in details of construction which will be more fully explained by reference to the accompanying drawings, in which—

Figure 1 is a section of a wheel-rim and follower, showing a bucket and its interlocking lug. Fig. 2 is a side elevation of the same. Fig. 3 is a perspective view of the bucket. Fig. 4 is one modification of the interlock.

In the class of water-wheels which depend upon the impact of a jet of water under a high head, into buckets spaced and fixed to the rim of the wheel, and designed to utilize the energy of such jets of water, and when the wheels are made for large power delivery, great difficulty has been experienced in securing the buckets by previously known methods so that they will not become loose, break their bolts and fly off the wheel rim, wrecking the buckets and sometimes the whole wheel by the unbalanced strain thus set up.

It is the object of my invention to provide a means for overcoming this difficulty, and for firmly securing the buckets in place, and preventing them from flying off under centrifugal force even should the bolts break. For this purpose I have shown interlocking means for engaging the bucket lug with the rim flanges of the wheel.

In the drawings, A represents a form of bucket for this class of wheels, the buckets having lugs or projections 2 which extend inwardly, and by which the buckets are to be secured to the wheel. These lugs have offsets or channels made in them, as shown at 3, and these are engaged by corresponding parts 4 upon the rim sections 5, the two parts thus forming an interlock.

As shown in Figs. 1 and 2, one portion 5<sup>a</sup> of the rim section forms a unitary structure with the remainder of the wheel, and the

portions 5 are here shown in the form of short segments or followers, which may include one or more of the wheel buckets A.

In Figs. 1 and 2, I have shown the lugs 2 of the buckets as having grooves or channels 3 made in them, and the parts 5 have correspondingly shaped projections formed on their inner faces, and adapted to engage the grooves or channels of the bucket arms. These parts when put together are secured by bolts 7 which pass through the fixed portion of the rim, the shanks of the buckets and the supplemental segments or disks, the latter thus being drawn firmly into interlocking engagement with the shanks of one or more of the buckets, and the buckets are thus prevented from being disengaged and thrown off the wheel. The heads and nuts of the bolts may be countersunk so as to leave a substantially smooth surface of the rim sections and followers with no protuberances.

While I have here described the concaved portions of the interlock on the shanks, and the projecting engaging portions on the segments, it will be understood that these may be reversed, and that various forms of interlocking devices may be employed, producing in any case essentially the same result. One of such modifications is shown in Fig. 4 in which the shank or lug is made thicker at its junction with the bucket, and with locks upon each side.

It will be seen that this construction is very convenient in case of accidents happening to one or more buckets, as it is only necessary to disengage one of the followers to remove or replace the damaged bucket.

Having thus described my invention, what I claim and desire to secure by Letters Patent is—

1. In a tangential fluid impulse wheel, a continuous rim having a peripheral flange face in a plane transverse to the axis, independent buckets with radial shanks having surfaces upon one side to fit said rim flange, and projecting ribs along the inner ends of the opposite sides of the shanks, independent rim segments registering with the main rim flange, said segments having channels to receive the ribs of the bucket shanks, and projections to engage the channels formed between the rib and body of the bucket, and bolts securing the parts together.

2. An impulse wheel bucket having a shank with a side rib upon its inner edge

and a depressed groove between the rib and  
the bucket, a wheel having a rim face with  
which one side of the bucket shank engages,  
segments corresponding with the rim, having  
5 their inner surfaces formed to engage with  
the contiguous side of the bucket shank, and  
locking bolts by which the parts are seamed  
together.

In testimony whereof I have hereunto set  
my hand in presence of two subscribing wit- 10  
nesses.

WILLIAM R. ECKART.

Witnesses:

HENRY BOSTWICK,  
F. L. LEE.