Sheet 1-3 Sheets.

J. Caldwell,

Water Wheel,

No. 3205. Patented Aug. 4, 1843.

Fig. 2

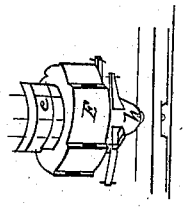
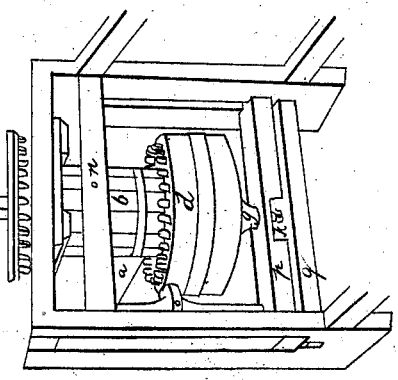


Fig. 3.

Fig. 1



Witnesses:
J. D. Bradley
C. F. Walker

Inventor:
John Caldwell

Sheet 2 - 3 Sheets

J. Caldwell,

Water Wheel,

No. 3,205. Patented Aug. 4, 1843.

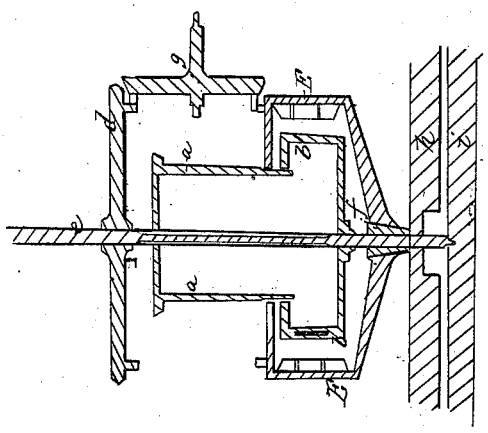


Fig. 4.

Witnesses:

S. D. Brumley

S. N. B. Wales

Inventor:

John Caldwell

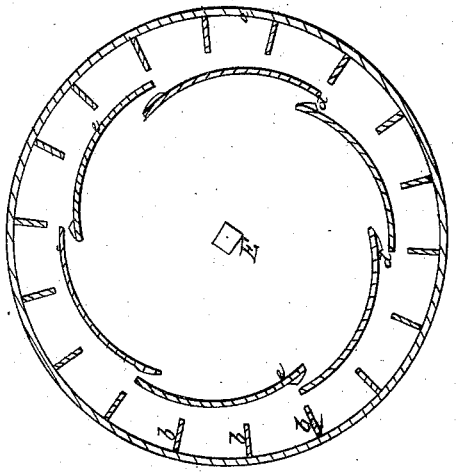
Sheet 3 - 3 Sheets.

J. Caldwell,

Water Wheel,

No. 3,205. Patented Aug. 4, 1843.

Fig: 5.



Witnesses

S. D. Bruce

S. H. B. Wiley

Inventor:

John Caldwell

UNITED STATES PATENT OFFICE.

JOHN CALDWELL, OF NORTHFIELD, MASSACHUSETTS.

IMPROVEMENT IN WATER-WHEELS.

Specification forming part of Letters Patent No. **3,205**, dated August 4, 1843.

To all whom it may concern:

Be it known that I, JOHN CALDWELL, of Northfield, in the county of Franklin and State of Massachusetts, have invented a new and Improved Water-Wheel; and I hereby declare that the following is an exact description.

My invention consists in the combination of the reaction-wheel and tub-wheel. When the common reaction water-wheel is turning at the utmost velocity which any given power of water can impart to it, the water, after being thus used, falls powerless from the apertures, having spent its entire force. When this reaction-wheel is more or less loaded by the propelling machinery, its velocity is diminished and the water gushes with more or less force (as the wheel is more or less retarded) from the apertures made for its escape. It is to save this wasted force that my invention is applied, and I endeavor to effect this purpose (as far as practicable) in the following manner: Outside of the reaction-wheel I place a tub-wheel, so that the water flying from the apertures of the inner or reaction wheel will strike the floats or buckets in the inner cylindrical surface of the outside or tub wheel.

My mode of construction is as follows: A tight conductor bringing the water from the floor (as exhibited at *a*, Fig. I, of the annexed drawings) terminates in a stationary cylinder, (as seen at *b*, Fig. I, and *c*, Fig. II.) This cylinder passes into the top of the tub-wheel *d*, Fig. I, and by a joint as tight as is consistent with a free revolution of the reaction-wheel enters the latter (as seen at *e*, Fig. II) and delivers the water into it. The outer or hub wheel, the outside of which is seen at *d*, Fig. I, has floats or buckets in its inner cylindrical surface, as seen at Fig. III. This outer or hub wheel revolves on a hollow shaft, as seen at *g*, Fig. I, and *h*, Fig. II, and through this hollow shaft the main shaft (seen at *i* and at *k*, Fig. I) revolves in an opposite direction. To this main shaft a cog-wheel (*m*, Fig. I) is firmly fixed, by means of which and another cog-wheel, the bearing of which is at *n*, the main shaft is geared to the tub-wheel, so that the inner or reaction wheel turns the main shaft, to which it is firmly fixed, while the outer or tub wheel aids the motion of this shaft by being geared to it. I would mention that the cog-wheel gearing the two together is omitted in Fig. I for the purpose of affording a fairer view of the machine. As the hub or hollow shaft on which the tub-wheel stands is short, I steady its motion and prevent its binding on the main shaft by having it run against a friction-roller, (as seen at *o*. Fig I.) As the wearing of the gudgions and steps might render a readjustment from time to time necessary, I have the bridge tree which sustains the tub-wheel *p*, as well as that on which the main shaft turns *q*, made capable of being raised more or less by keys or wedges.

I ought, perhaps, to explain that the hub or hollow shaft on which the tub-wheel is fixed (seen at *h*, Fig. II) is furnished with spokes or arms, to which the lower periphery of the tub-wheel is firmly affixed.

I make the reaction-wheel and the tub-wheel, including its hub or hollow shaft, of cast-iron, although the individual machine from which the annexed drawings were made had these parts constructed principally of wood. I make the main shaft of wrought-iron.

What I claim as my invention, and desire to secure by Letters Patent, is—

The combination of the tub-wheel and the reaction-wheel, in the manner and for the purposes hereinbefore specified.

JOHN CALDWELL.

Witnesses:

I. D. BRADLEY,

C. S. WALKER.