

JAMES A. FAIRBANKS.
Water Wheels.

2 Sheets--Sheet 1.

No. 125,730.

Patented April 16, 1872.

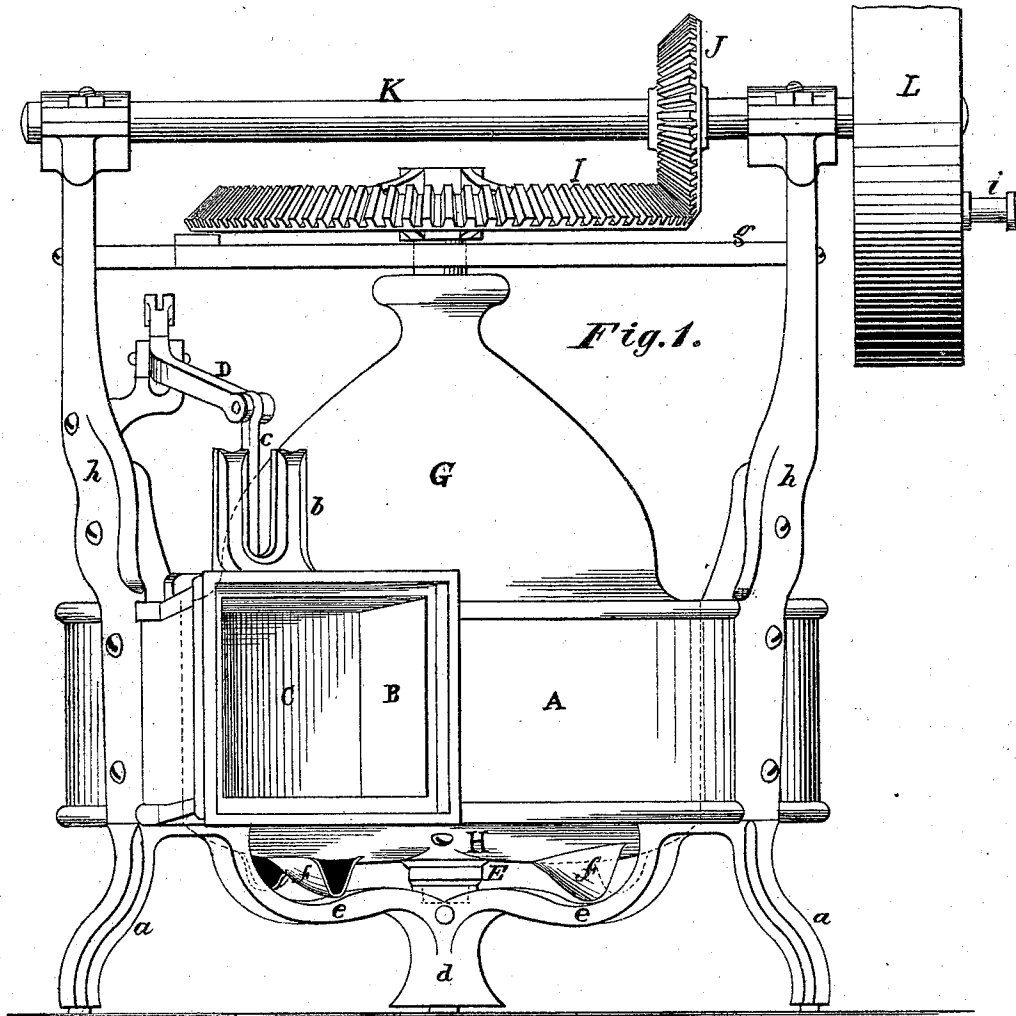
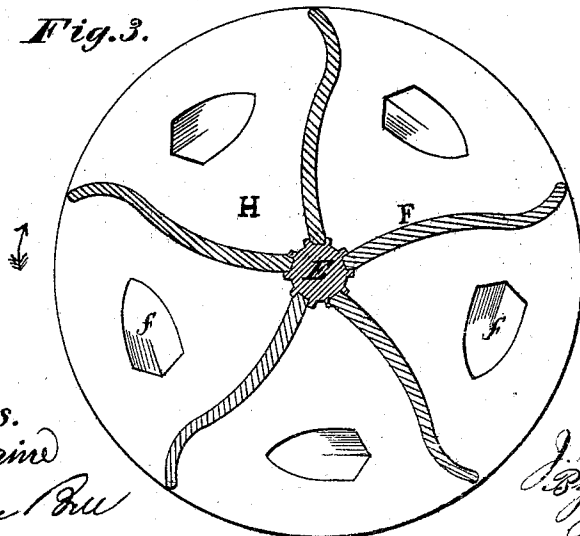


Fig. 3.



Witnesses.

H. L. Devine

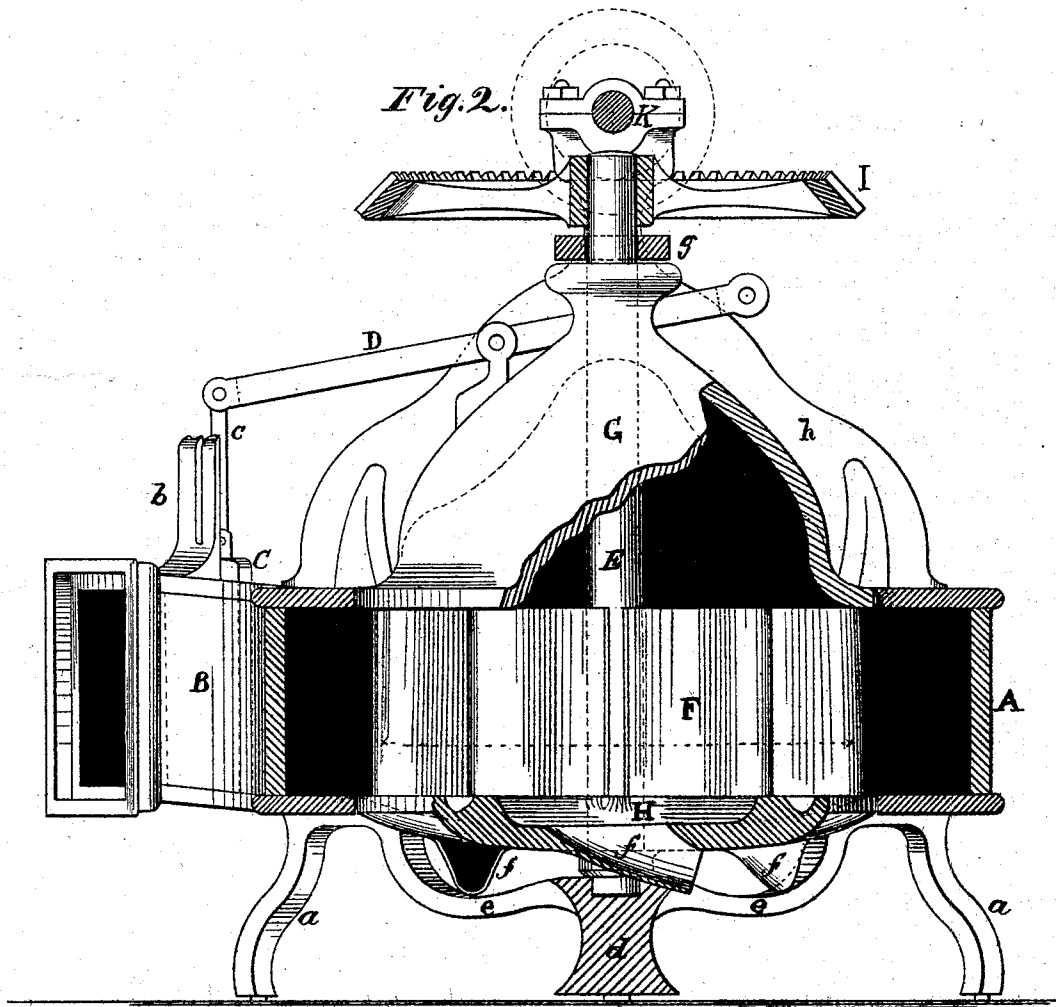
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2 Sheets--Sheet 2.

Patented April 16, 1872.



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UNITED STATES PATENT OFFICE.

JAMES A. FAIRBANKS, OF AUGUSTA, MAINE.

IMPROVEMENT IN WATER-WHEELS.

Specification forming part of Letters Patent No. 125,730, dated April 16, 1872.

Specification describing certain Improvements in Water-Wheels, invented by JAMES A. FAIRBANKS, of Augusta, in the county of Kennebec and State of Maine.

Figure 1, Sheet 1, is a front elevation of a water-wheel constructed according to my invention. Fig. 2, Sheet 2, is a vertical central section of the curb and gearing, the wheel being shown in side elevation, and the chamber above the wheel being in partial section, and partly broken away to disclose the interior. Fig. 3, Sheet 1, is a horizontal section of the wheel, the plane of section being indicated by the line *x x* of Fig. 2.

My invention comprises certain improvements in that class of water-wheels known as turbines; my object being to produce a wheel which shall be run without waste of water, and shall receive the water in the most effective manner, and impart the power to the mill machinery through the medium of simple gearing. The invention consists in the construction of the wheel and curb, and the combination of the gearing, all as hereinafter more fully described.

In the drawing, similar letters of reference indicate like parts in the several figures.

A represents the curb mounted on supports *aaa*, and provided with a pen-stock, B, in which is fitted a gate, C, adapted to slide in grooves in the pen-stock, and entering a transverse groove in the bottom. In this groove is an angular ridge, and in the bottom of the gate a corresponding groove is formed, so as to make a water-tight gate. On top the pen-stock is a guide, *b*, for the gate. The gate is operated from the upper floor of the mill by means of a rod connecting with one end of a lever, D, which at its opposite extremity is connected with the gate by a pitman, *c*. In practice the inner side of the pen-stock will be extended inward to the line of the circle in which the wheel revolves, so as to properly direct the water. The vertical shaft or spindle E of the wheel is supported in a bearing, *d*, which is secured in position by braces *ee* under the curb. This bearing is provided with the usual means for adjustment of the spindle. The buckets F are secured in any suitable manner to the shaft E, and also between the upper portion G and the bottom H of the wheel. The outer portions of the buckets are curved, as shown in Fig. 3, to prevent the inflowing water from

passing directly to the center of the wheel, and to receive the force of the water at a point where it will exert the most power. The upper portion of the wheel forms a hollow dome-shaped chamber, which, when the wheel is in motion, is constantly filled or partly filled with water, the weight of which gives strength and steadiness to the motion of the wheel. The bottom H of the wheel is slightly hollowed out between the buckets; and between the buckets are formed vents *ff* for the escape of the water. These vents should be made as near the outer edge of the wheel as is practicable, to secure the leverage, as it were. The vents extend below the bottom of the wheel, as shown, and are curved downward. The upper bearing of the shaft E is formed in a beam, *g*, fixed between suitable uprights *h h*. The shaft E is provided with a horizontal toothed wheel, I, which engages with a pinion, J, on a shaft, K, mounted in bearings on the uprights *h h*. In practice the shaft K is provided with two large wheels, L, which serve both as balance and band wheels. Adjustable crank-pins *i* may be employed.

The machinery I have described is all that is necessary in the basement of a mill, and is sufficient to perform all the work for which cumbersome and complicated mechanism is now often employed, and in a better manner. The material employed for the construction of the wheel will be cast and wrought iron.

The operation is as follows: When the gate is opened the water flows in, and a portion of it circles around the wheel in the curb, and imparts motion to the wheel by striking the curved ends of the buckets, while the remainder is forced up into the chamber G, and thence descends, giving strength and steadiness to the wheel, and passes out at the bottom vents, where all the water escapes, the balance-wheels regulating the speed and motion of the wheel, and producing sufficient momentum to overcome ordinary obstructions, as in sawing knotty timber.

I consider a statement of advantages unnecessary, as my improved wheel will recommend itself to mill-men on account of the economical principles on which it is constructed, both as regards simplicity of mechanism and utilization of power.

Having thus described my invention, what

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

1. The buckets F, curved in the arc of a large circle from the hub outwardly on their forward side, and in the arc of a smaller circle toward the rear, near the periphery of the wheel, as described, in combination with the bottom H provided with vents *f* located near the periphery, and with the inclosing-curb A made to permit the circulation of water around the wheel, substantially as and for the purposes set forth.

2. The water-chamber G forming part of the wheel as described, in combination with the

curved buckets F F, a bottom provided with vents, and curb A, substantially as described.

3. The combination of the wheels F G H, shaft E, curb A, gearing I J K L, and suitable supports and frame-work, substantially as herein described.

In testimony that I claim the above I have hereunto subscribed my name before two witnesses.

JAMES A. FAIRBANKS.

Witnesses:

M. TOZER,

T. H. KIMBALL.