

(No Model.)

2 Sheets—Sheet 1.

W. M. COFFMAN.

CURRENT WHEEL.

No. 304,173.

Patented Aug. 26, 1884.

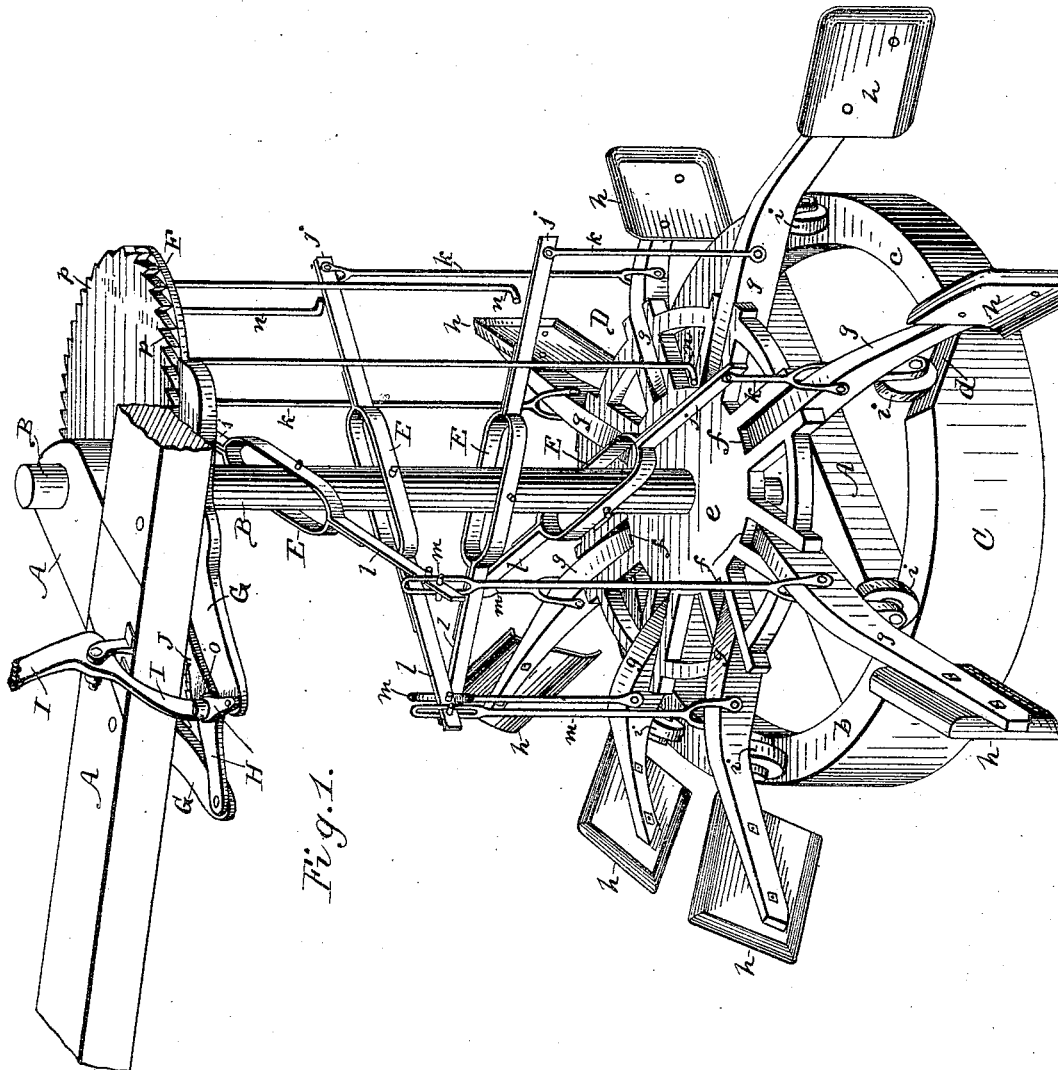


Fig. 1.

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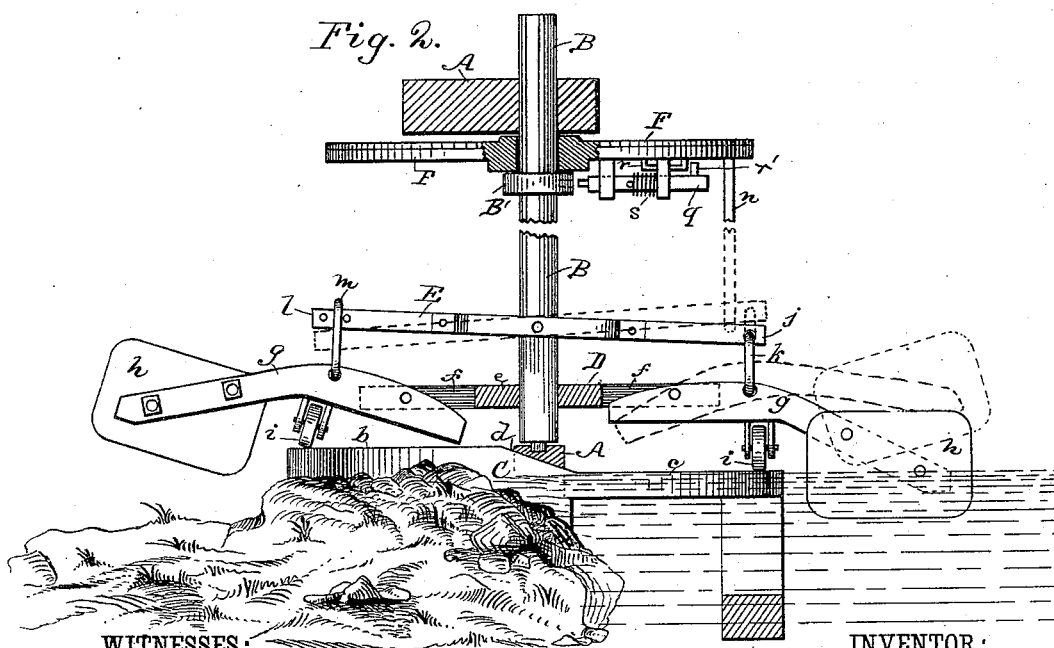
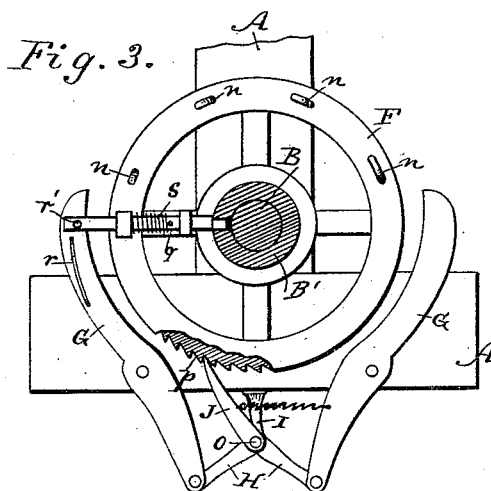
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# UNITED STATES PATENT OFFICE.

WALTER M. COFFMAN, OF ROANOKE, VIRGINIA.

## CURRENT-WHEEL.

SPECIFICATION forming part of Letters Patent No. 304,173, dated August 26, 1884.

Application filed June 13, 1884. (No model.)

*To all whom it may concern:*

Be it known that I, WALTER M. COFFMAN, of Roanoke, in the county of Roanoke and State of Virginia, have invented a new and useful Improvement in Current-Wheels, of which the following is a full, clear, and exact description, reference being had to the annexed drawings, forming part of this specification.

This invention relates to horizontal current-wheels; and it consists of the construction hereinafter described and claimed.

In the drawings, Figure 1 is a perspective view of my invention. Fig. 2 is an elevation in section and partly broken away, and Fig. 3 is a detail view of the brake mechanism inverted.

A indicates the supporting-frame of the wheel, and B is a vertical shaft journaled in the frame and carrying the wheel. At the lower part of the frame, surrounding the shaft B, is a circular track, C, having the portion *c* thereof which is to be arranged next to the current of water set lower than the remaining portion, *b*, and provided with inclines *d*, leading up to said portion *b*.

The wheel D consists of a hub, *e*, having radial slots *f*, in which are pivoted arms *g*, carrying buckets *h*. The arms are inclined downward at their outer ends, and are supported near their transverse centers on the track C by means of rollers *i*, attached to the said arms. The buckets *h* consist of broad concavo-convex plates secured in an approximately vertical position to the outer ends of the arms.

To the vertical shaft B are pivoted at different elevations a series of levers, E, each of which has its ends connected to two oppositely-arranged arms, *g*. The ends *j* of the levers E, which are all contiguous to one another, are connected to the corresponding arms, *g*, by rods *k*, the ends of which are pivoted to the said levers and arms, while the ends *l* of the levers E are connected to the corresponding arms, *g*, by rods *m*, which are slotted longitudinally to receive said ends *l* and allow the same to be oscillated therein without moving the arms *g* to which said rods *m* are connected. The object of this construction is to allow the ends *j* of the levers E to be raised for elevating the arms *g*, which are connected thereto,

to a position for holding their buckets out of the water when it is desired to stop the motion of the wheel. For thus elevating the ends *j* of the levers E, a disk or wheel, F, is loosely mounted on the upper end of the shaft B, and is provided with pendent hooks *n*, of lengths corresponding to the elevations of the said ends *j*, so that they may be placed in engagement with said ends to support the arms *g*, connected thereto above the water. It will be understood that the arms *g* are elevated by the portion *b* of the track C as the wheel revolves, so that if the disk F is moved by hand until the hooks *n* are over said portion *b*, and is then held by a brake, the movement of the wheel will carry said arms into engagement with said hooks and then move said disk and hooks (the brake being removed) round to a position over the portion *c* of the track. The hooks will thus support the arms, which they have engaged, above the portion *c* of the track, with the buckets out of the water, enabling the wheel by the aid of the brake to be brought to a stand. As soon as the wheel stops with its buckets out of the water, the current ceases to act on the same, and the wheel may remain idle as long as may be desired. When it is desired to start the wheel again, the disk F only needs to be turned backward sufficiently to allow the arms *g* in engagement with the hooks to drop off the same into the water. The hooks are made of different lengths in their horizontal portions, as shown in Fig. 3, and these portions are slightly inclined downward to ease the buckets into the water, and to allow them to fall one by one when the hooks are withdrawn, to allow the wheel to start off gradually.

The brake consists of two curved levers, G, which are pivoted to the frame on opposite sides of the disk F in such manner that they may partly embrace the periphery of the disk. The two levers G are connected together by a toggle-lever, H, to the center or main joint, *o*, of which lever H is connected still another lever, I, which is fulcrumed on the frame A. To the toggle-lever at *o* is also connected a pawl, J, which is adapted to operate the disk F by ratchet-teeth *p* on the disk. When the toggle-lever is moved toward the disk F by the proper movement of the hand-lever I, the brakes G are moved out of contact with the

said disk, and the pawl J is forced against a tooth of said disk, causing the latter to revolve in a backward direction. A slight backward movement of the disk is sufficient to withdraw the hooks *n* from under the levers E.

In order to connect the disk F with the shaft B, a spring-catch, *q*, is supported on the disk, and is adapted to engage the shaft by a recess therein, or in a collar, B', thereon. The disk F is thus adapted to revolve with the wheel D, so that the hooks *n* shall not engage the levers E when not desired. When the wheel D is in motion, the brakes G are free from the disk F, and when the brakes are applied to the disk the disk continues to move until the spring-catch *q* comes round to a guard, *r*, on one of the brakes. This guard consists of a bent rod or flange, which acts as a cam on a pin, *r'*, in the outer end of the catch *q*, and which has the effect of drawing the catch out of contact with the shaft B against the tension of spring *s*. The disk, being thus disengaged from the shaft, is brought to a stand by the brakes G, thus causing the levers E to run onto the hooks *n*, by which they are kept suspended, so that when they come round again to the water the current cannot act upon the buckets, and the wheel stops. The proper action of the pawl J disengages the hooks from the levers and causes the catch *q* to re-engage the shaft.

What I claim is—

1. The combination, with the pivoted arms carrying buckets, of the levers pivoted centrally to the wheel-shaft at different elevations and connected at opposite ends to two of said arms each, the connecting-rods for connecting said levers with said arms, one of each pair of

said rods being slotted to form a movable connection with its proper lever, for the purpose specified, and the pendent hooks for engaging said levers to elevate the arms and buckets above the water, substantially as shown and described.

2. The combination, with the vertical shaft of the wheel and the connected pivoted arms and levers, of the disk loosely mounted on the upper end of said shaft, and having pendent hooks secured thereto, and adapted to be moved to cause the said hooks to engage the ends of said levers to hold the arms and buckets above water, substantially as shown and described.

3. The combination, with the bucket-wheel, and with the disk having ratchet-teeth thereon, and devices connecting said wheel and disk, of the brake-levers engaging the periphery of said disk, the toggle-lever connecting said brake-levers together, a pawl connected to the toggle-lever and engaging the teeth of the disk, and a hand-lever for operating the toggle-lever to cause the pawl and brake-levers to act upon the disk in turn, substantially as shown and described.

4. The combination, with the bucket-wheel, and with the disk and brake-levers, of the spring-catch secured to the disk and connecting the disk to the wheel-shaft, and adapted to engage a part of one of the brake-levers to disengage the disk from said shaft, substantially as shown and described.

WALTER M. COFFMAN.

Witnesses:

GEO. T. RHODES,  
A. S. ASBERRY.