M. Gregg,

Water Wheel.

No. 109,891. Patented Dec. 6. 1870.

Fig 1

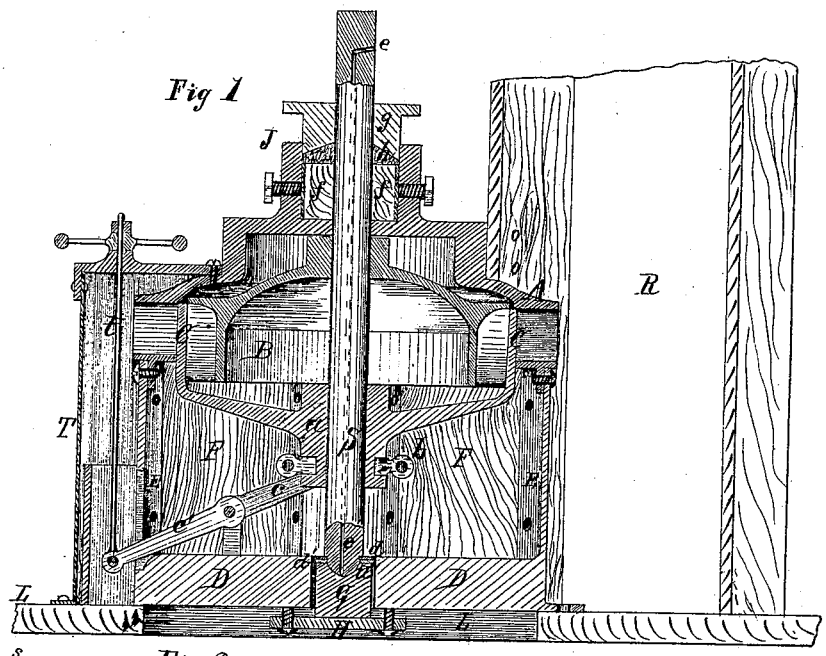


Fig 4.

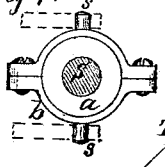


Fig. 2

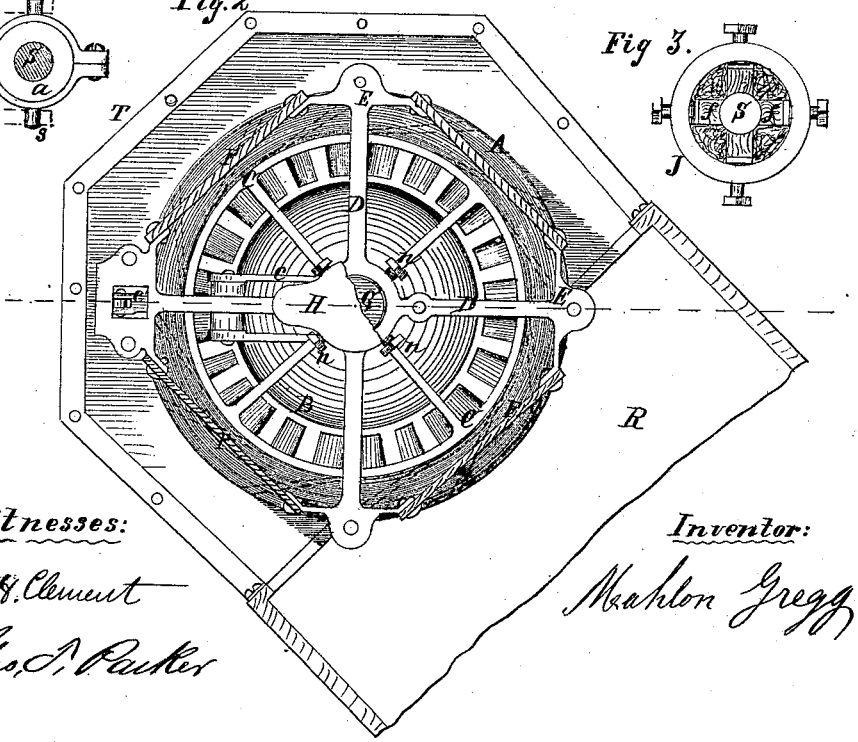


Fig 3.




Witnesses:

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MAHLON GREGG, OF ROCHESTER, NEW YORK.

Letters Patent No. 109,891, dated December 6, 1870.

## IMPROVEMENT IN WATER-WHEELS.

The Schedule referred to in these Letters Patent and making part of the same.

I, MAHLON GREGG, of Rochester, in the county of Monroe and State of New York, have invented certain Improvements in Water-Wheels, of which the following is a specification.

My invention relates to certain improvements upon my water-wheel patented July 13, 1869, and consists more especially in a novel mode of operating the gate, the arrangement of an inclosed space between the wheel and flume-bottom, and a removable and adjustable step and support.

In the drawing—

Figure 1 is a vertical central section of my invention.

Figure 2 is an inverted view, representing the bottom of the flume removed.

Figure 3 is a plan view of the upper bearing of the shaft.

The chute-case A is made in the usual form of wheels of this class, and the wheel B may be either a central or downward discharge, as desired, the latter form giving rather more power when used in connection with the annular gate C.

This annular gate is connected by suitable arms to a hub, *a*, which is fitted to slide upon the shaft S of the wheel.

The gate moves between the wheel and chute-case, and, by its vertical adjustment, controls the entrance of water to the wheel.

A groove is formed in the hub *a*, into which a loose sleeve, *b*, is fitted, and the latter is provided with spurs *s*, fig. 4, on opposite sides, upon which the arms *c* are pivoted.

These arms may be formed in one piece with *c'*, or they may be attached to a common axle, which has a bearing upon the bridge-tree D.

A screw-rod, *t*, or similar device, raises or lowers the end of the lever *c c'*, and consequently the sleeve *b* and gate C.

It will be observed, that, by means of the loose sleeve *b*, the gate is allowed to revolve with the wheel in the case of obstructions passing through it, or friction upon its periphery.

The chute-case A is supported some distance above the bottom L of the flume, upon two or more posts, E, to which the doors or partitions F are bolted.

A water-tight chamber is thus formed around the lower parts of the wheel, the whole resting above and upon the flume bottom, whereby access is easily had for repairs or adjustment, by removing one of the doors or manholes F, without the labor and expense of raising the wheel out of the flume.

This chamber acts also as a draught-box, creating a suction through the wheel, thus occasioning no loss of the "fall."

The step G, made in any of the ordinary forms, but preferably of metal, having a concave bearing for the shaft S, is supported in an opening in the bridge-tree D by a plate, H, which is attached to the bridge-tree by two or more bolts.

The step is adjusted laterally in any direction by the set-screws *n*, fig. 2.

It will thus be seen that the step-bearing may be wholly removed by means of the detachable support H, or adjusted vertically when worn down, and laterally when out of center.

The washers *d d'*, the former fast and the latter loose upon the shaft S, rest between a shoulder upon said shaft and the upper face of the step G, and form an auxiliary bearing for the former, and also prevent the water, which generally holds sand and other impurities in suspension, from reaching the concavity in the step.

To lubricate the step G, I provide a passage, *e*, through the shaft S, communicating at the upper end with the water in the flume, or with a suitable oil-reservoir, and opening into the step at the bottom.

This passage may be filled with pulverized charcoal, or some fibrous material, which shall filter or strain out the gritty matter in the water before reaching the step.

The upper bearing J of the shaft consists of the usual blocks *f*, fig. 3, adjustable by set-screws, arranged in a circular recess or stuffing-box, and the spaces between them packed with a suitable fibrous substance, which latter is also wrapped around the shaft above the blocks and compressed by the follower *g*.

The packing *h* may be saturated with oil, and the blocks *f* thus continually lubricated, while the silicious matter in the water that enters the bearing is removed by filtration through the packing.

It is economical and convenient, in many cases, to locate a water-wheel outside of the flume or penstock, as shown in the drawing.

To provide for such arrangement I surround the wheel with a case, T, which is bolted to and communicates with the flume R upon one side.

This case is considerably larger than the chute-case A, to allow free access of the water to all sides of the latter, and its upper side is secured to such chute-case at any point between the chutes and the bearing J, while its lower edge is bolted to the flume-bottom or support L.

By this means the water is kept entirely away from the bearing J.

Access may be had to the wheel through the penstock R, or through a manhole provided in the case T opposite a door, F.

What I claim as my invention is—

1. The compartment inclosed by the partitions F, between the chute-case A and the flume-bottom, whereby ready access may be had to the lower parts of the wheel, for the purposes set forth.

2. The annular gate C, operated from below the wheel in such a manner as to permit it to revolve with the wheel, for the purposes set forth.

MAHLON GREGG.

Witnesses:
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