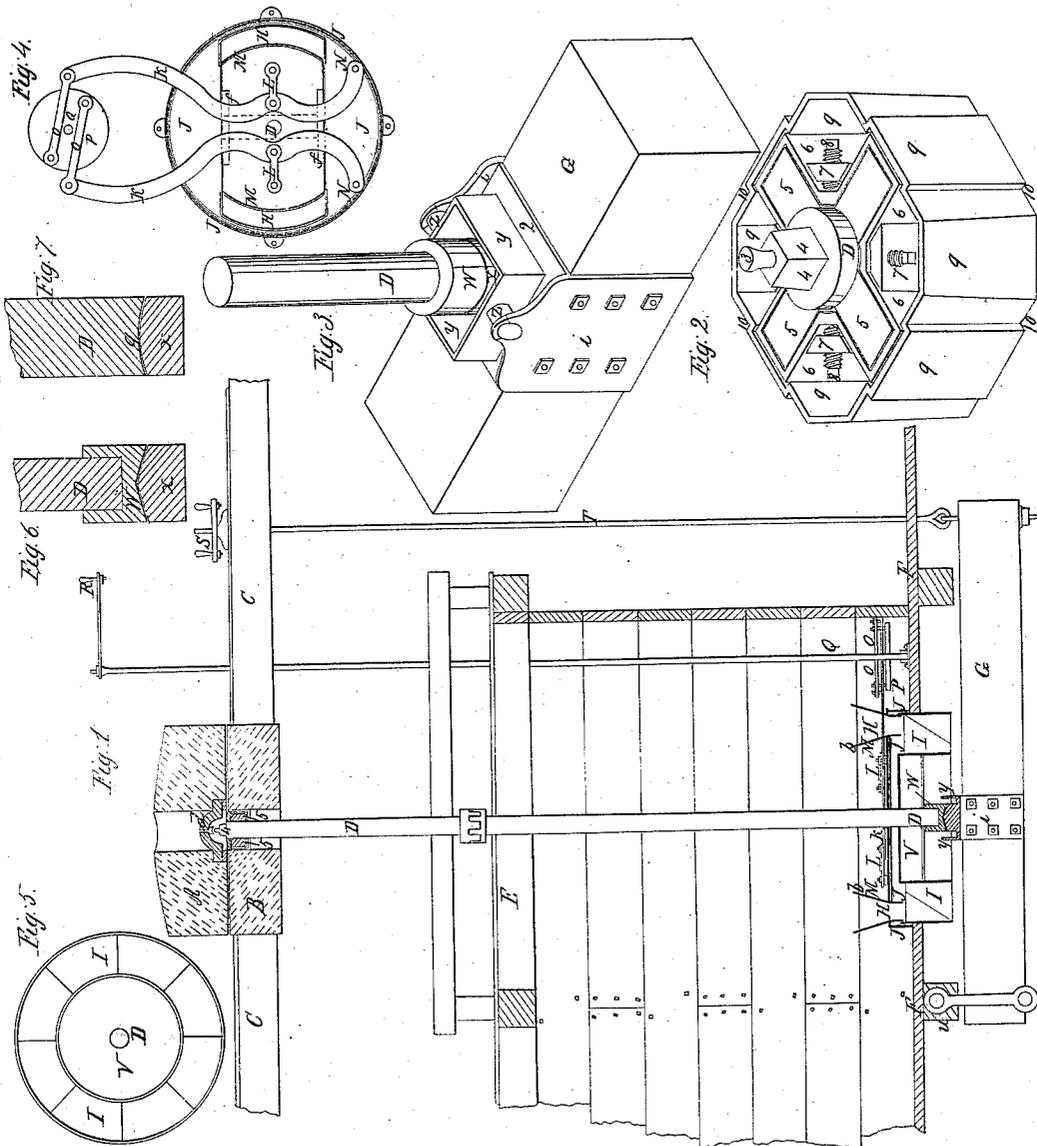


M. B. Ashley,

Water Wheel,

N<sup>o</sup> 7522.

Patented July 30, 1850.



# UNITED STATES PATENT OFFICE.

MARCIUS B. ASHLEY, OF WATERTOWN, NEW YORK.

## IMPROVEMENT IN DIRECTING WATER UPON WATER-WHEELS.

Specification forming part of Letters Patent No. 7,522, dated July 30, 1850.

*To all whom it may concern:*

Be it known that I, MARCIUS B. ASHLEY, of Watertown, in the county of Jefferson and State of New York, have invented a new and useful Improvement on Water-Wheels and the Manner of Plumbing the Shafts of the Same; and I hereby do declare that the following is a full, clear, and exact description, reference being had to the annexed drawings, forming a part of this specification, in which—

Figure 1 is a vertical section. Fig. 2 is a perspective view of the trammimg collar or box. Fig. 3 is a perspective view of the shaft-step and the shaft boot or collar. Fig. 4 is a top view of the cover of the wheel with the water-drafts open. Fig. 5 is a top view of the wheel. Fig. 6 is a vertical section of the shaft-boot. Fig. 7 is a view of the old shaft-step and cup *g* in the shaft.

The same letters refer to like parts.

The nature of my invention consists of three parts: first, the providing of a trammimg or plumbing collar or box in the interior of the bed or lower stone, whereby the shaft can be plumbed at any time by the miller far more conveniently than by any plan heretofore used; second, the construction and mode of operating the water-gates; third, the collar or boot of the shaft to make it run always on a center and to be easily repaired, &c.

To enable others skilled in the art to make and use my invention, I will proceed to describe its construction and operation.

A is the upper stone or runner.

B is the bed-stone.

C C is the mill-floor.

D is the wheel-shaft.

E is one side of the water-flume, and F the bottom planking of the same.

G is the bridge-tree or beam that supports the shaft. On the bridge-tree I secure a saddle *i i* on each side, which are united together by a plate 2.

Z Z are bolts or axles, which pass through the saddles and support a box Y Y. This box is supported about half an inch above the plate 2, and the said box is thus arranged and employed for the purpose of holding a supply of water to keep the metal of the running machinery therein cool and to lessen the friction.

X is the step or bearing of the shaft. It is secured in the box *y*.

W is a collar, or, as it is technically termed, "a boot." It is fixed on the lower end of the shaft and is bored or cast with a recess on its bottom of a true conical shape, as represented in Fig. 6, the center being the apex of the same, and the center of the shaft is on a line with it. This boot is preferred to be made of composition metal, and it can be placed on and taken off the shaft with great facility. This boot sits on and revolves on the step X, which is made of a form to coincide with the cup or conical chamber of the said boot. This form of the step and boot-cup keeps the shaft always truly centered upon its bearing below, and this is a very important object in grist-mills. If the cup of the boot should wear untrue or anything become deranged about it, it can easily be rectified or a new one put in by lowering the bridge-tree by turning the nut-wheel S and depressing the step-supporting rod T, thus making the bridge-tree swing down on its swivel-joint at *u*; but this part of depressing the bridge-tree not being new need not be further described. The old plan or the one in common use is to form a cup of an oval form *g* in the shaft to run upon the step. When it wears untrue the whole shaft has to be taken out.

To obviate the employment of extra shafting and gear-wheels, I secure the runner-stone direct to the shaft. By this arrangement it is positively necessary that the shaft should always be kept perfectly plumb for grinding. To accomplish this object, I employ a trammimg or plumbing collar or box constructed and arranged as particularly represented in Figs. 1 and 2.

3 is a pivot connected to the shaft D.

4 is a square part of the shaft to receive the driver *d*, Fig. 1.

9 is a cast-iron bush, made with projections 10 on its sides to fit into the hole of the stone, which has recesses to receive the projections; but wooden wedges are employed to key it perfectly true to the stone.

7 7 are four vertical flanges cast with or made perfectly secure to the bottom of the bush 9. Inside of this outside bush I place my trammimg or plumbing collar. It is made of the form of a cross, with an outside shell or casing 6, made of cast metal, its bottom being also metal, making a box, which is packed with wood 5 5. The shaft D passes

through a central opening in collar or tramming-box, which is fitted nicely around the said shaft. This tramming or plumbing collar or box is placed around the shaft inside of the outer bush 9, with the set-screws 8 8 passing through the vertical flanges 7 7 between the arms of the tramming-box, pressing against it, as represented in Fig. 2. If the shaft should get out of line or plumb, it can at once and very easily be trammed by the miller by turning any one of more of the set-screws 8 for that purpose, the which screws pressing against the tramming-box will make it guide the shaft to the plumb-line. I do not employ any gearing to get up the speed on the runner, but place the stone on the top of the shaft and get up the speed on the wheel. It is therefore positively necessary that there should be some convenient contrivance and arrangement to enable the miller to keep the shaft always perfectly plumb. This I accomplish by my tramming-box, as described.

The manner in which I construct and operate my water-gates to admit the water to the wheel is described as follows, reference being had principally to Figs. 1 and 4.

J J is the cover-plate of the wheel. (Fig. 5 being a top view of the wheel, I represents the buckets and V the shaft-plate.)

H H are the openings or drafts to admit the water to the wheel. They are formed as represented to receive the water from the flume in a perpendicular line from above, but admit it to the wheel at the outer edge of the buckets, as represented in Fig. 1.

M M are movable gates to increase or diminish the diameter of the openings H. The openings are now represented fully open. The gates are composed of flat plates, each sliding on part of the wheel-cover and with upright projecting flanges *b* or sides convex on the inside, as distinctly represented in the

drawings referred to. These gates are retained snugly down by the plates, sliding under small guide-flanges *f f*.

L L are small arms or pivot-joints which unite the gates M with two tong-levers K K, which are secured to the cover J by pivot-joints N. The levers K are connected to a wheel P by arms O O working on pivot-joints.

Q is a vertical rod or axis of the wheel P, and by turning the handle R the wheel operates the levers R, which by the arms L move the gates M and increase or diminish the diameter of the said openings. By employing a pinion on the lower end of the rod Q and using racks on the inner sides of the arms O the levers K could be operated in the same way to actuate the gates simultaneously. This simple manner of constructing and operating the gates is of great advantage to regulate in the most accurate manner the supply of water to the wheel to give it a uniform speed. The form of the openings and the admission of the water to the outer rim of the wheel applies the gravity of the water to that part which will exert the greatest leverage. A plate is made to cover the eye of the stone and forms a lid to the tramming-box. When the miller dresses the stone, this tramming-box affords him a most convenient mode of plumbing the shaft. No wheel with a vertical shaft, has such a box, so far as is known to the subscriber.

Having thus explained my invention, I claim—

The adjustable vertical water mouths or openings, arranged in combination with the outer or longest edge of the buckets, as described, whereby the greatest effect is obtained.

MARCIUS B. ASHLEY.

Witnesses:

SARDIS ALLEN,  
GEO. SMITH.