





*Bradford Stetson.**Anti-Friction Bearing.*

No. 119,424.

Patented Sep. 26, 1871.

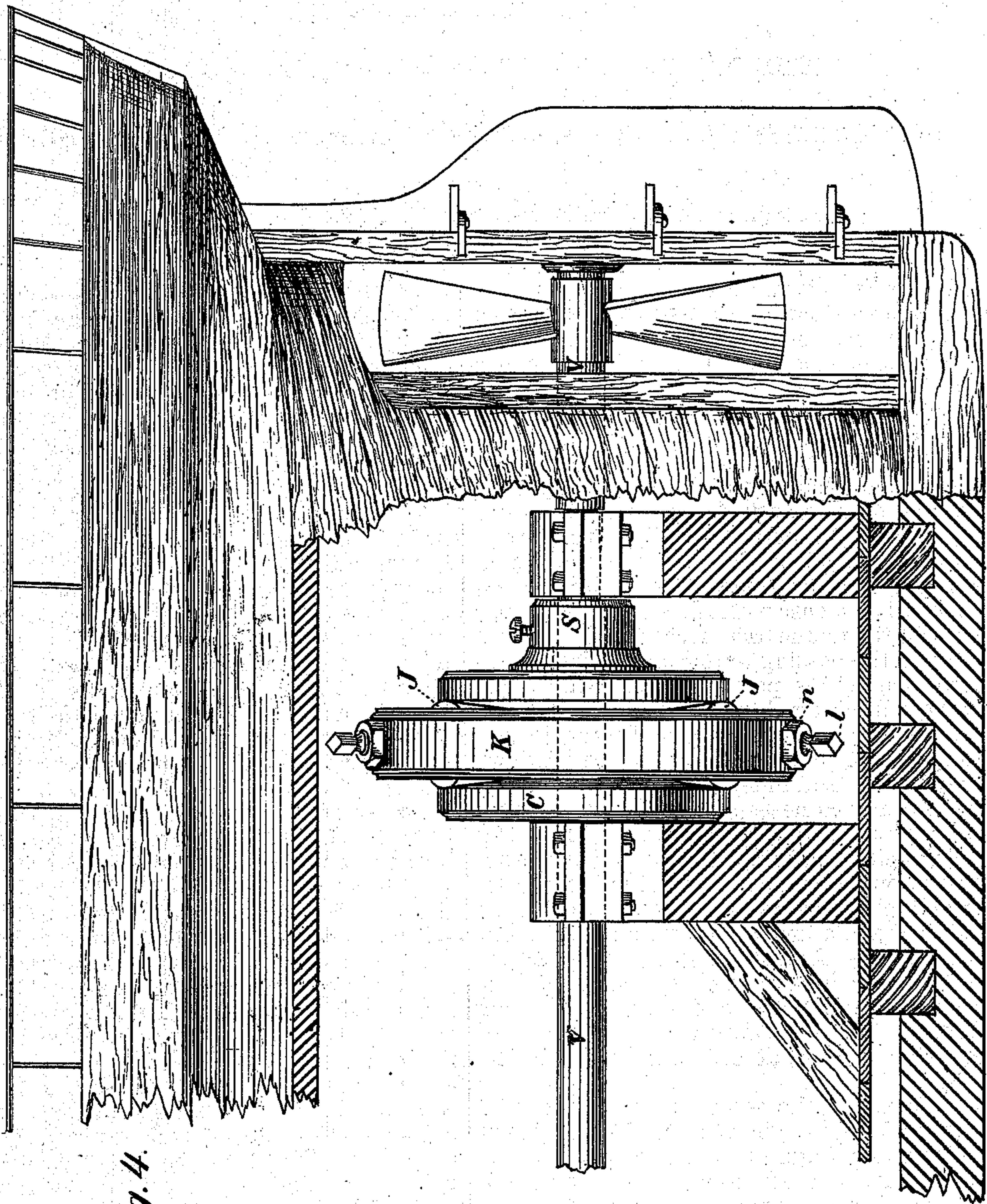


Fig. 4.

Witnesses:  
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# UNITED STATES PATENT OFFICE.

BRADFORD STETSON, OF UXBRIDGE, MASSACHUSETTS.

## IMPROVEMENT IN ANTI-FRICTION BEARINGS OF WATER-WHEELS.

Specification forming part of Letters Patent No. 119,424, dated September 26, 1871.

*To all whom it may concern:*

Be it known that I, BRADFORD STETSON, of Uxbridge, in the county of Worcester and State of Massachusetts, have, as I believe, invented new and useful Improvements in Anti-Friction Bearings for Water-Wheels and other heavy rotating machines; and I do hereby declare the following to be a full and exact description of the same, reference being had to the drawing that accompanies and forms a part of this specification.

I denominate the invention anti-friction thrust-bearings. The object of my invention is to provide a device for hanging water-wheels in a manner that will dispense with the step beneath, and thus avoid the undue friction occasioned by sand and dirt in the passing water; and, moreover, to open up a more free passage for the water after it has been discharged from the wheel; and, further, to provide against the great friction in connection with horizontal shafting, upon which there may be, besides and independent of the ordinary bearings rendered necessary by specific gravity, much longitudinal strain or pressure, as in the case of propeller-shafts in vessels moved by screws. My invention, in its application to water-wheels, consists in placing above the wheel an apparatus to sustain it and allow it free horizontal rotation, the construction thereof being such as to reduce friction to the minimum, and to secure ready adjustment of both wheel and its perpendicular shaft, and suitable provisions for lubrication, as hereinafter more fully described and as illustrated by the drawing.

In the drawing, the second sheet, Fig. 4, will exhibit my device applied to a horizontal screw-propeller shaft; Figure 1, side elevation of a water-wheel curb and my apparatus for supporting the wheel in its normal position upon the top of said curb; Fig. 2, plan of the parts on which the wheel is suspended, instead of the step beneath; Fig. 3, sectional view of the parts embraced in my device cut on line *x x*; Fig. 4, my device applied to a propeller-shaft.

*a* represents the curb surrounding the wheel, which rotates within; *B*, the shaft to which the wheel is attached; *C*, a pedestal resting upon the curb *A*, being provided at its upper portion with a wide flange, whose upper face is in the central portion; horizontal and around this a sloping surface, as illustrated in Fig. 3, there being in the center an opening just sufficient to receive the

shaft *B* and allow it to turn easily therein. This pedestal *C* or base upon which my anti-friction bearing is supported should have suitable fastenings and attachments to the curb *A*. *D*, the upper central horizontal surface of the pedestal *C*; *E*, the sloping surface surrounding the above; *F*, a sheath-truck, whose position is illustrated by Figs. 2 and 3 of the drawing; *g*, an annular groove in the upper surface of *F*; *h*, pins, three in number, inserted horizontally in the truck *F*, each having a small hole or channel running longitudinally through it, (see Figs. 2 and 3;) *i*, passages leading from groove *g* to the channels through the pins *h*; *J*, small wheels, three in number, slightly conical, as illustrated in the drawing, and resting upon the surface *E* of the pedestal *C*, around upon which they continually roll when the apparatus is in use; *K*, an annular plane-sided frame or shield arranged as exhibited in Figs. 2 and 3; *l*, a screw, with threads upon that part which passes through the walls of shield *K*; *m*, a portion of *l*, which is of plain spindle form; *n*, a set-nut to keep the screw *l* from turning; *o*, a hole drilled in the larger end of the wheels *J*, receiving the spindle *m*; *p*, a hole drilled in the smaller end of the said wheels *J* sufficient to receive the pins *h*; *s*, a cap embracing the shaft *B* and resting upon the wheels *J*, (see Fig. 3;) *t*, a set-screw, fastening firmly the said cap *s* to the wheel-shaft *B*; *u*, an opening down through the cap *s*, leading to the groove *g*; *V*, propeller-shaft. The under surface of cap *S* is made to correspond to the conical form of the wheels *J*. (See Fig. 3.) As the wheel is suspended to the shaft *B*, its whole weight will rest on the wheels *J*, which is as intended, the thickness of the truck *F* being gauged accordingly. The openings *o* and *p* will allow the wheels *J* to rotate freely upon the spindles *m* and pins *h*.

In operation, the parts being in position as illustrated and described, the water being turned on, the wheel rotates, and with it the shaft *B* and the cap *s*, the pedestal *C* remaining stationary, being firmly fixed to the curb *A*. As the motions above described take place, the cap *s*, resting with all the weight of the water-wheel and shaft upon the wheels *J*, will cause them to roll upon the surface *E*, and they will carry along the shield *K* and truck *F*, the said wheels turning or rotating on spindles *m* and pins *h*. The truck *F*, being such in thickness as not to receive the weight of the suspended wheel, and the wheels *J* required simply to roll



upon a plane surface, the friction will be rendered very slight and the device be properly denominated an anti-friction bearing. The cone-shape of the wheels J provides for adjustment through the screws *l*, so as to make the bearing equal on all the said wheels. Oil poured into the channel *u* will find its way into the grooves *g*, lubricating all the parts in proximity, and some of it passing through the openings *i* into the tubular pins *h* will find its way into the space in the wheels J, in which run the spindles *m* and pins *h*, and supply all needed lubrication there.

I make no claim to any part or any combination or arrangement of parts shown in United States Patent No. 12,097; but

What I do claim, and desire to secure by Letters Patent, is—

1. The friction-roller, inner-support ring F, as

provided with the friction-roller pivots or journals *h*, the annular groove *g*, and the passages *i* leading from said groove into and through the pivots or journals *h*.

2. In combination with the inner-support ring F, the oil-groove *g*, ducts *i*, and pivots *h*, the outer ring K and its series of screw-pivots and clamp-nuts, all arranged and operating as set forth, with the friction-rollers J arranged between the rings K F and employed to support a water-wheel or other shaft, as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

BRADFORD STETSON.

Witnesses:

GEO. W. HOBBS,  
HANNIBAL WHITMORE.

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