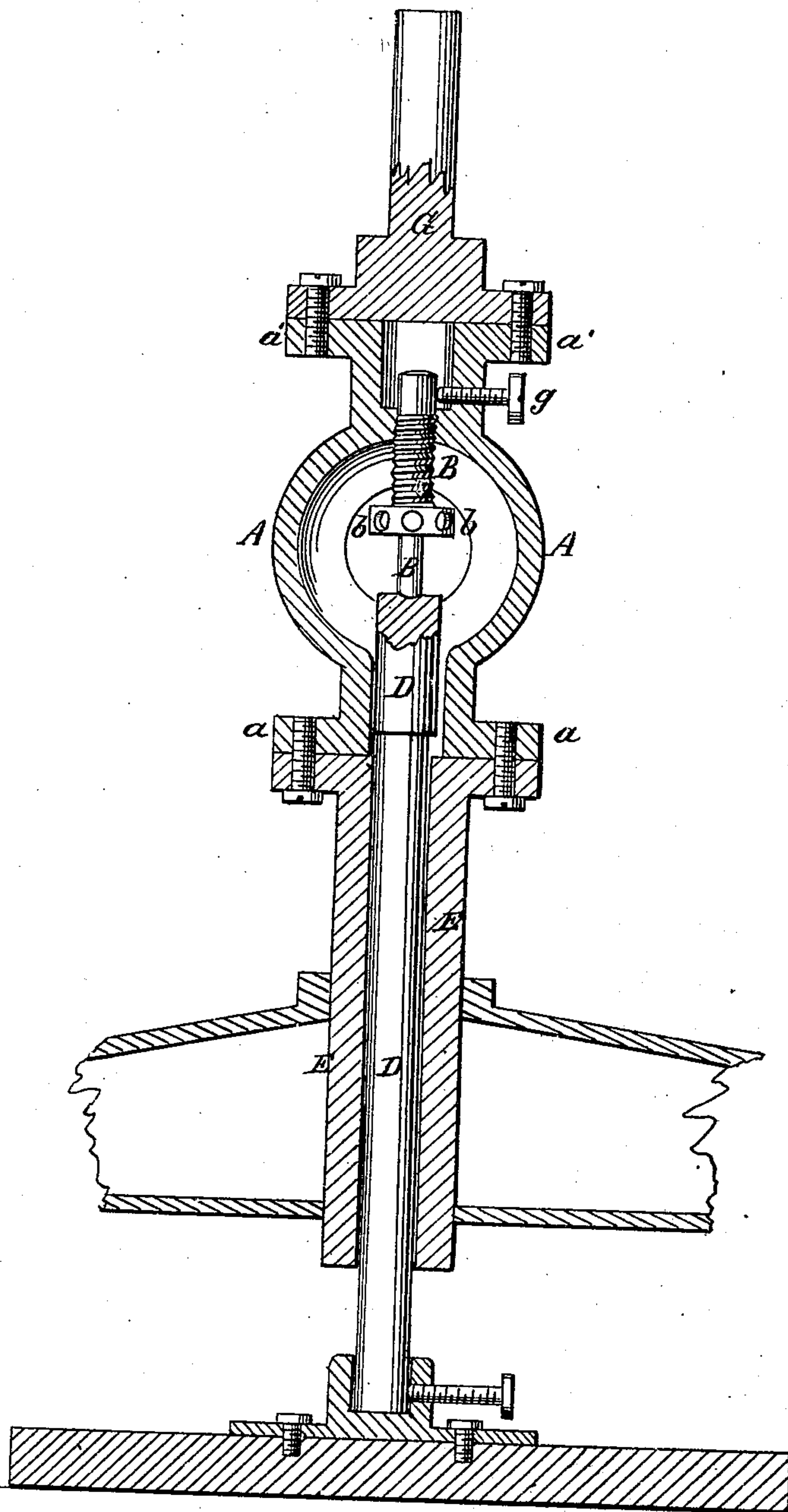


No. 28,622.

PATENTED JUNE 5, 1860.

A. WARREN & E. DAMON.
HANGING TURBINE WHEELS.



Witnesses
J. W. Coombs.
R. S. Spruce.

Inventor *A. Warren & E. Damon*
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Atty.

UNITED STATES PATENT OFFICE.

ALONZO WARREN AND E. DAMON, JR., OF BOSTON, MASSACHUSETTS.

HANGING TURBINE-WHEELS.

Specification of Letters Patent No. 28,622, dated June 5, 1860.

To all whom it may concern:

Be it known that we, ALONZO WARREN and E. DAMON, Jr., both of Boston, in the county of Suffolk and State of Massachusetts, have invented a new and Improved Shaft for Hanging Turbine-Wheels; and we do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, making a part of this specification, in which the figure represents a vertical diametrical section taken through the globe coupling and hollow shafts.

The object of this invention is to dispense with the long inside shaft generally used in hollow shafts, at the same time, to leave the top of the shaft free from any adjusting apparatus, besides making the whole simple, free from derangement, and less expensive.

Our invention consists in a novel combination of a hollow spindle shaft with globular enlargement, adjustable step and stationary shaft arranged and operating in the manner as will be hereinafter described and represented, whereby a very short hollow shaft may be used, adding on the top the necessary length of solid shaft. In consequence of thus using a short shaft, there will be less trembling when the parts are in operation, and the parts may be kept well lubricated and in good working order for a great while.

To enable those skilled in the art to fully understand our invention, we will proceed to describe its construction and operation.

In the drawings, A is a hollow spherical enlargement having short necks with flanges a , a' , above and below it and a hole passing clear through it. In the top of this globe coupling is tapped an adjusting screw B, with a perforated flange b , by which the screw is turned, access being obtained to the flange b , through holes that are made in the sides of the globe A. The lower end of the

screw pin B, below the flange or wheel b is pointed, and is stepped in the end of the stationary shaft or supporting column D, which is made concave to receive the end of the adjusting screw, and to hold oil to keep the point well lubricated.

To the lower flange of the globe A, the hollow shaft E, is bolted, and to this hollow shaft the turbine wheel is attached as indicated in red lines, (Fig. 1).

On top of the globe the solid spindle G, is bolted to the flange a' , the axis of which is in a perpendicular line with the axis of the fixed shaft D. It will thus be seen that the spindle G, carrying the turbines instead of being stepped at its lower end, is supported on a stationary shaft at a point above the upper rim of the wheel, at which point provision is made not only for keeping the spindle well oiled but for adjusting the same so as to raise or depress the wheel. The adjusting screw B is fixed at any desired point by a set screw g , that passes through the neck of the globular enlargement A. We are thus enabled to use a short hollow shaft, to which may be coupled a spindle of any desirable length, and at the same time have the spindle stepped in a shaft at a point elevated above the wheel, which point may be kept well oiled as above shown so that the parts may be kept in a good working order.

Having thus described our invention, what we claim as new, and desire to secure by Letters Patent is—

The globe-coupling, A, in combination with the adjustable screw step B, the same being used for a vertical turbine shaft in the manner herein set forth.

ALONZO WARREN.
E. DAMON, JR.

Witnesses:

H. WARE,
A. S. CUSHMAN.