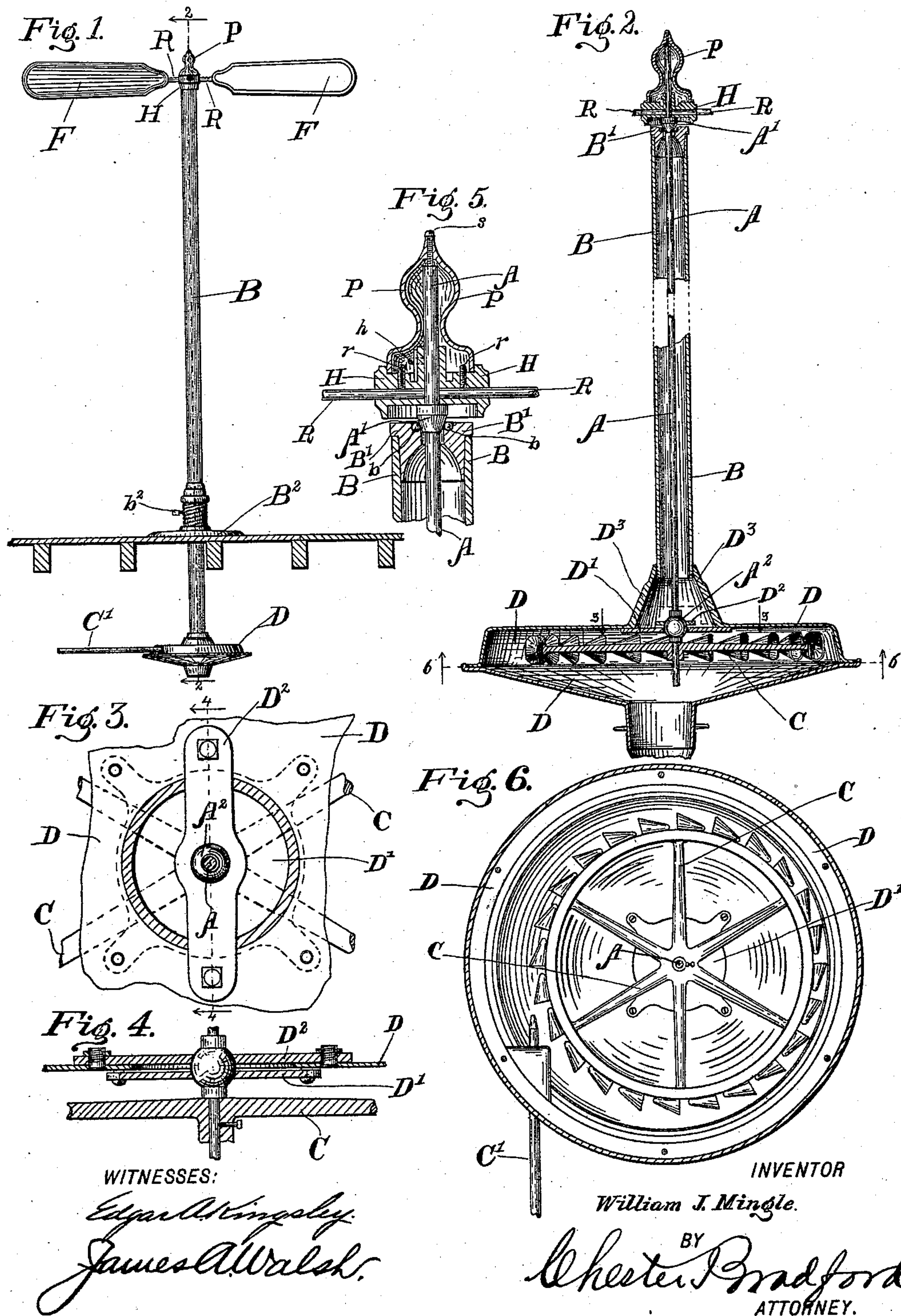


(No Model.)

W. J. MINGLE.  
WATER MOTOR FAN.

No. 572,558.

Patented Dec. 8, 1896.





# UNITED STATES PATENT OFFICE.

WILLIAM J. MINGLE, OF LANCASTER, PENNSYLVANIA, ASSIGNOR, BY MESNE ASSIGNMENTS, TO THE SPECIALTY MANUFACTURING COMPANY, OF INDIANAPOLIS, INDIANA.

## WATER-MOTOR FAN.

SPECIFICATION forming part of Letters Patent No. 572,558, dated December 8, 1896.

Application filed June 19, 1894. Serial No. 515,021. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM J. MINGLE, a citizen of the United States, residing at Lancaster, in the county of Lancaster and State of Pennsylvania, have invented certain new and useful Improvements in Water-Motor Fans, of which the following is a specification.

My present invention relates to that variety of fans which are employed to produce a circulation or movement of air; and it consists in certain improvements therein which will be first fully described, and then specifically pointed out in the claims.

Referring to the accompanying drawings, which are made a part hereof and on which similar letters of reference indicate similar parts, Figure 1 is a side elevation of a fan embodying my said invention as it appears set up and ready for use; Fig. 2, a central sectional view of the same, on an enlarged scale and with a part of the middle portion broken away, on the dotted line 2 2 in Fig. 1; Fig. 3, a detail view, on a still larger scale, as seen when looking downwardly from the dotted line 3 3 in Fig. 2; Fig. 4, a detail sectional view, on the same scale as Fig. 3, as seen from the dotted line 4 4; Fig. 5, a view similar to the upper end of Fig. 2, but on a larger scale; and Fig. 6, an under side plan, with the lower portion of the casing broken away, as seen from the dotted line 6 6 in Fig. 2.

In said drawings the portions marked A represent the shaft of the fan; B, a tubular casing inclosing said shaft; C, a water-wheel on the lower end of said shaft, and D the casing containing said water-wheel.

The shaft A has a bearing-block A', preferably of hardened steel, secured thereto, which rests in a suitable bearing B' at the upper end of the tube B, and in said bearing are preferably small antifriction-balls b, as shown most plainly in Fig. 5, upon which the lower conical side of the bearing-block A' rests and turns and by which the shaft and parts immediately attached thereto, including the fan-hub, are supported. As the supporting-bearing is at the upper end a small-sized shaft may be employed and steadiness of operation still maintained. A fan-hub H is

secured to the upper end of the shaft A, above the bearing-block A', by means of a set-screw h or otherwise, and in this hub are radial perforations to receive the rods R of the fan-wings F, and said rods are secured in said perforations by set-screws r. A cap P fits onto the hub H and covers and incloses its upper side, as well as the extreme upper end of the shaft A, to which latter it is secured by means of the screw s, the head of which forms the extreme point of this cap P, and the point of which enters a longitudinal screw-threaded perforation in the extreme upper end of said shaft A. The hub H itself extends over and is adapted to cover the bearing-block A' and the bearing in which it rests. For clearness of illustration these parts are separated somewhat in the drawings. Thus the working parts of this device are completely inclosed from the dust, while a convenient means is provided for lubrication, repair, or readjustment, it being only necessary when it is desired to obtain access to the set-screws h and r to remove the screw s, when the cap P can be readily lifted off and all said set-screws are exposed, and any desired manipulation can be readily effected. By loosening the set-screw h the head H can be raised, and thus access be had to the bearing-block A' and the parts by which it is carried, and by loosening the set-screws r the fan-wings may be adjusted as desired.

At the lower end of the structure a globe-shaped bearing A<sup>2</sup> is provided, which is secured between the spider or plate D' and cross-bar D<sup>2</sup>, which latter are secured, respectively, to the upper and lower sides of the central portion of the upper half of the casing D, as shown most plainly in Fig. 4. The openings to receive this globe-shaped bearing, as shown in said figure, are formed to fit on its outer surface, so that when the parts are screwed in place it is held between them, but, by reason of its globe shape, is permitted to assume any position required by the relative position of the shaft A. The bearing is thus "lined up" in assembling the parts without difficulty.

The water-wheel C is mounted on the lower end of the shaft A and within the case D and



is adapted to drive said shaft when water is applied thereto, which is usually done through the pipe C', leading from some suitable source of supply (not shown) to said wheel, as will be observed most plainly in Fig. 6. The center of the wheel-case and the axis of the shaft are not identical, and thus there is a greater space in the case on one side of the wheel than on the other, which facilitates the operation, leaving more room for the water at the point of entrance than elsewhere, so that it may readily escape from the wheel after having done its work.

The wheel-case D is of suitable size and shape to contain the water-wheel and is secured to the lower end of the tube B, being provided with an extension or hub D<sup>3</sup> for the purpose of making the attachment, as shown most plainly in Fig. 2. The whole structure is supported upon the floor (where the apparatus is to be used on a floor) by means of an ordinary flange B<sup>2</sup>, which engages with a suitable collar or projection on the tube B, or it may be rigidly secured to said tube by means of a set-screw b<sup>2</sup> or otherwise, as may be desired.

Having thus fully described my said invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a water-motor fan, the combination of the tubular casing for the vertical shaft,

the casing for the water-wheel on its lower end, said water-wheel secured to the lower end of said shaft and arranged horizontally in said casing, its center being somewhat to one side of the center of said casing, the water-inlet pipe arranged to discharge against said wheel at the side of said casing which is thus provided with the largest free space, the water-outlet, a fan on the upper end of said shaft, and a bearing between said upper end and the upper end of the tubular vertical casing, substantially as set forth.

2. In a water-motor fan, the combination, of the vertical tubular casing, and the horizontal cylindrical casing secured together, the fan-shaft mounted in said vertical casing by being hung from a bearing at its upper end, the water-wheel on the lower end of said shaft in said horizontal casing, the water-inlet and water-outlet, a fan mounted on the upper end of said shaft by means of a removable hub, and a universal bearing between said shaft and the casing at its lower end, all substantially as set forth.

In witness whereof I have hereunto set my hand and seal, at Indianapolis, Indiana, this 16th day of June, A. D. 1894.

WM. J. MINGLE. [L. S.]

Witnesses:

CHESTER BRADFORD,  
JAMES A. WALSH.