(No Model.)

# W. J. MINGLE.

## ROTARY FAN.

No. 378,710. Patented Feb. 28, 1888.

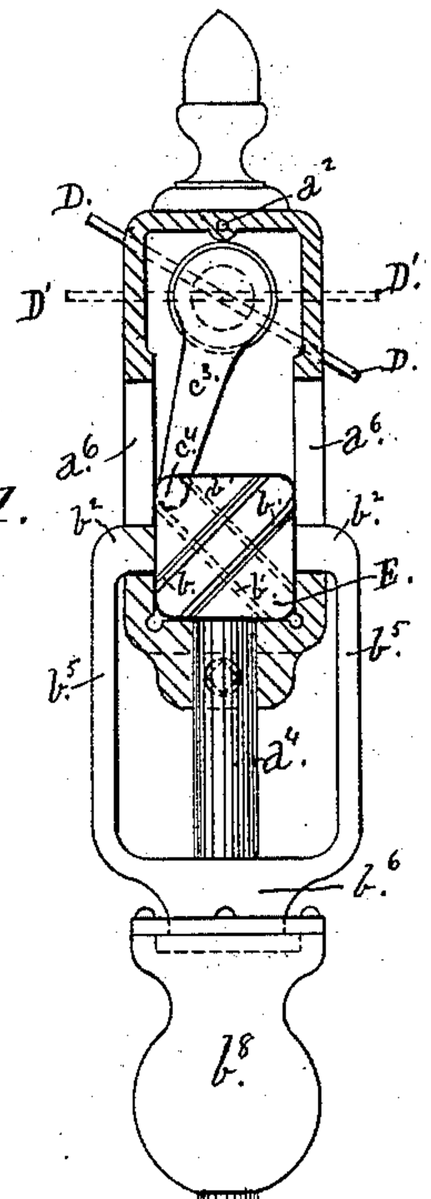


Fig. 1.

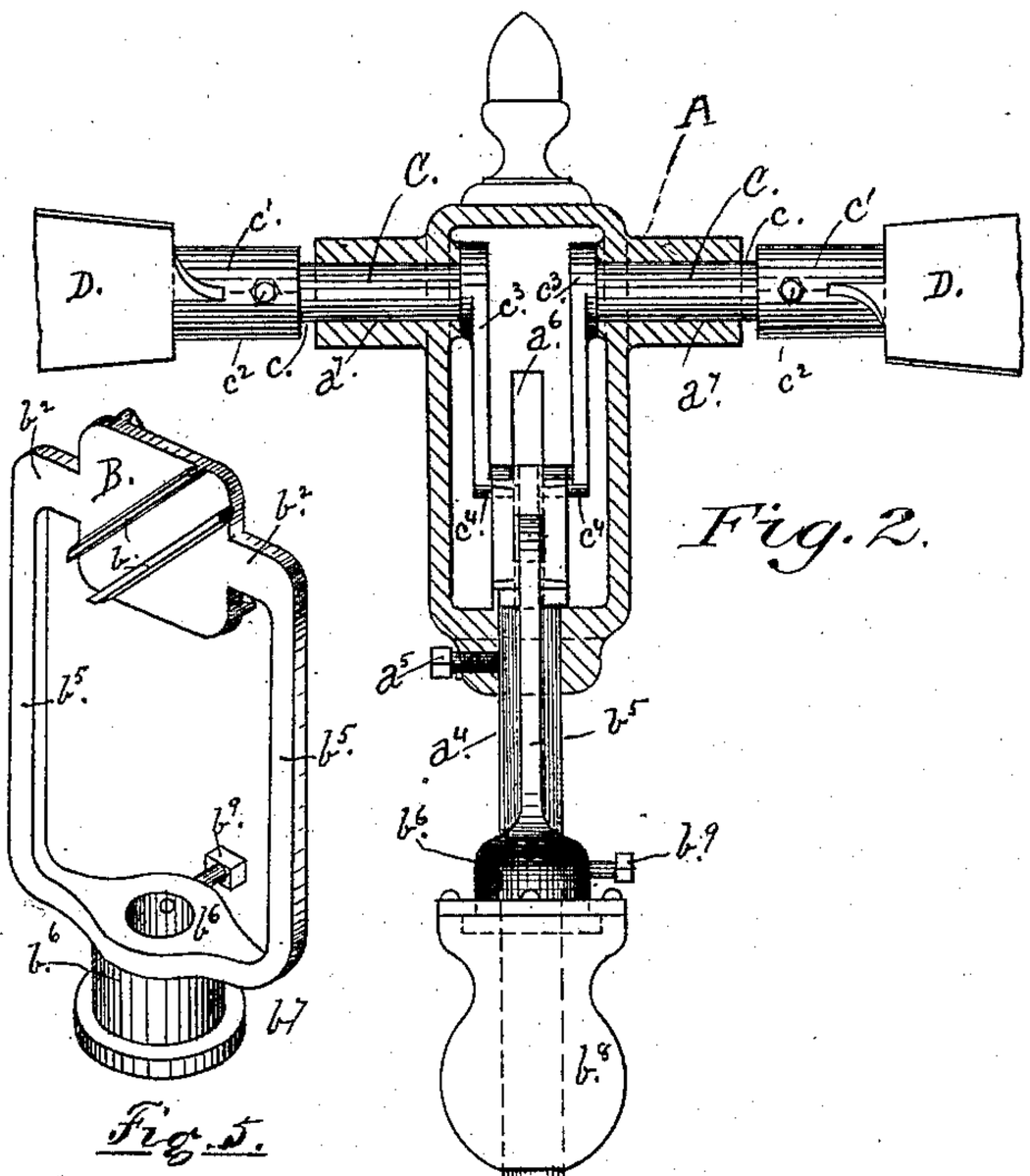


Fig. 5.

Fig. 2.

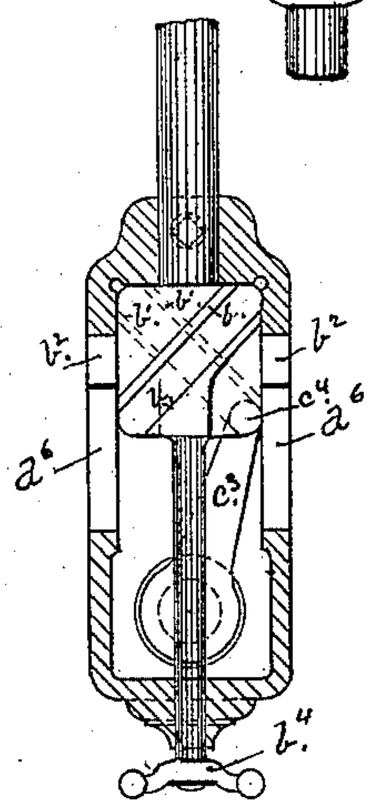


Fig. 3.

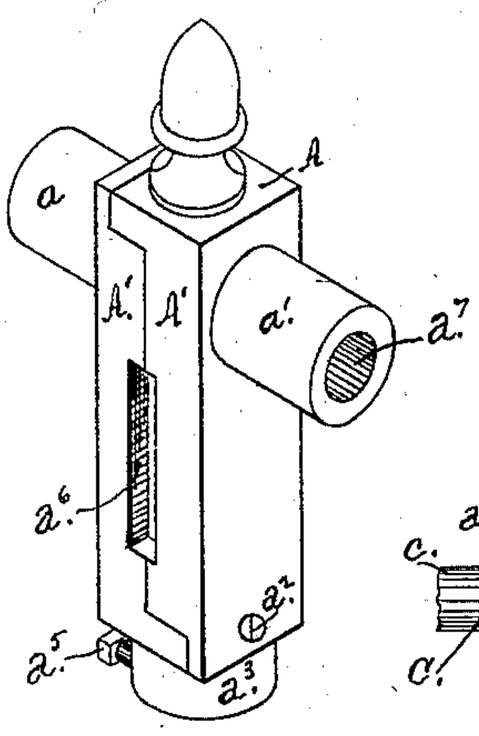


Fig. 6.

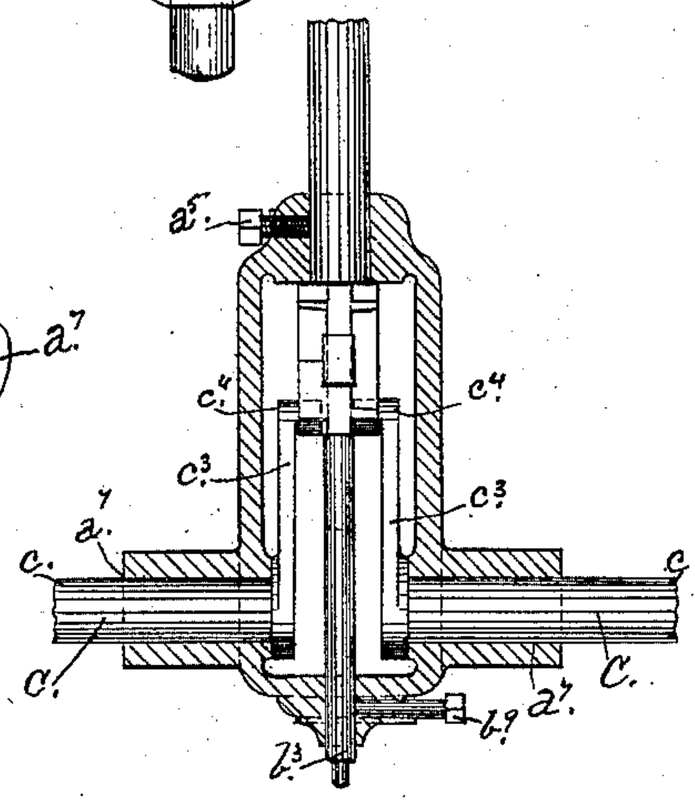


Fig. 4.

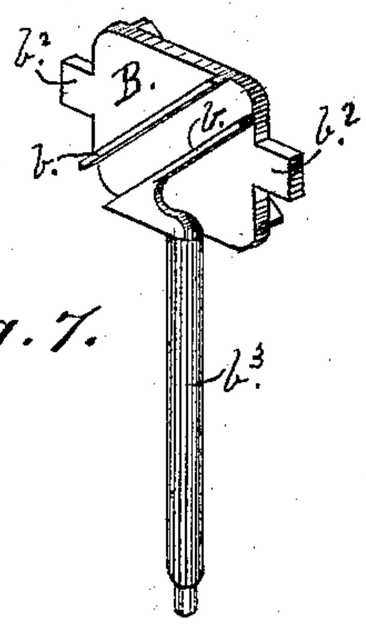


Fig. 7.

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# UNITED STATES PATENT OFFICE.

WILLIAM J. MINGLE, OF LANCASTER, PENNSYLVANIA.

## ROTARY FAN.

SPECIFICATION forming part of Letters Patent No. 378,710, dated February 28, 1888.

Application filed January 22, 1887. Serial No. 225,064. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM J. MINGLE, of Lancaster, in the county of Lancaster and State of Pennsylvania, have invented certain new and useful Improvements in Rotary Fans; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to that class of rotary fans which revolve in a horizontal plane, and especially to that class provided with a hand-piece and mechanism connecting it with the blades or wings, by which they are adjusted to any required angle without stopping their rotation or changing their speed, thus regulating amount of draft in an upward or downward direction, as desired.

Said invention especially relates to the specific form of adjustable mechanism, hereinafter fully described and illustrated in the following specification and the accompanying drawings, similar letters referring to similar parts throughout the several views.

The said mechanism is adapted for use on ceiling, side-wall, post, column, or pillar rotary fans.

My invention consists in the device hereinafter described, and pointed out in the claim.

In the drawings, Figure 1 represents a semi-sectional end view of Fig. 2, said Fig. 2 being a similar side view showing the device adapted for a post or column fan, Fig. 3 being a similar end and Fig. 4 being a like side view when adapted for an overhead or ceiling fan. Fig. 5 represents a detail view of the cross-head, and Fig. 6 a similar view of the body used in Figs. 1 and 2; Fig. 7, a detail view of the cross-head, Fig. 5, modified to suit Figs. 3 and 4.

In Fig. 6, A′ A′ designate the two sides with the hubs *a a′* attached, one to each, said sides being adapted to fit and be held together by the screws $a^2$, forming a body, A, to inclose and support the working mechanism. The hub $a^3$ on its lower end has an opening to fit the driving-shaft $a^4$, on which it is rigidly held by the set-screw $a^5$, as shown in Fig. 2. Through its sides opposite the hubs *a a′* are oblong slots $a^6$ $a^6$, and through said hubs are openings $a^7$ to receive the crank-shafts C.

B designates the vertical sliding cross-head, on each side of which are ribs *b b*, forming angular guide-slots, their inclination arranged in opposite directions on each of its sides, as indicated by dotted lines *b′ b′*. Lugs $b^2$ $b^2$ on each edge fit loosely in the slots $a^6$, and when said cross-head is adapted for Figs. 3 and 4 it has attached to its lower edge, rigidly or otherwise, the rod $b^3$, on the end of which swivels a handle, $b^4$, by which said rod is pushed up or pulled down at will. When adapted for Figs. 1 and 2, two vertical side pieces, $b^5$ $b^5$, rigidly connect the lugs $b^2$ $b^2$ with a slip-collar, $b^6$, having a flange, $b^7$, on its lower edge, to which the swivel-handle $b^8$ is attached to raise and lower the same. A set-screw, $b^9$, through this collar, pressing a leather washer against the driving-shaft, gives the desired friction.

The crank-shafts C C pass through the hubs *a a′*, and on their outer end, *c c*, fit the sockets *c′ c′* of the fan-blades D D, and in them are set-screws $c^2$ $c^2$, by which they are held in any position on said shafts desired. Fast on the inner ends of the aforesaid shafts are the crank-levers $c^3$ $c^3$, with journal-pins $c^4$ $c^4$ on the outer ends of the side opposite the shaft. Said pins $c^4$ $c^4$ are adapted to fit in the guide-slots formed by the ribs *b b*, and when in position in the body of the device with the fan-blades D attached and at such an angle as to depress the most air would be fully shown in Fig. 1. Where one side of said body and its crank and fan-blade are removed to more clearly show the internal arrangement of the operating mechanism, the cross-head B in this figure is in its lowest position, and the crank-pin $c^4$ consequently in the extreme upper left-hand end of the angular guide-track, as indicated by the dotted lines *b′ b′*. Now in pushing the said cross-head up the said pin $c^4$ slides in this inclined track to the lower right-hand end of said track, as at E, this movement causing the end of the crank to move from one side of the body to the other, partially rotating the shaft C in its bearing and changing the inclination of the fan-blade D in Fig. 1 to a horizontal position, (indicated by the dotted lines D′,) in which no air would be depressed at all, thus

allowing the operator, by simply grasping the swiveling handle and pushing up or pulling down, to adjust the fan-blades D to any desired position, thus controlling the currents of air, and this, too, when the said blades are revolving at full speed.

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

In an adjustable device for the blades of a rotary fan, the combination of the following elements: the sliding cross-head B, provided on its upper sides with angular guide-slots formed by the ribs *b b*, and arranged in opposite directions from each other, and its lower end connected with a swiveling handle, all as set forth, and the relatively-fixed body A, adapted to inclose the working parts of the device and fit the end of the driving-shaft, as set forth, and provided with hubs *a a'* on its sides forming bearings for the shafts C C, said shafts C C having blades D D attached, the inner ends of said shafts being provided with crank-levers $c^3$ $c^3$, and said crank-levers with pins $c^4$ $c^4$, as described, which are adapted to engage in the angular slots of the vertically-sliding cross-head aforesaid, whereby when this cross-head is raised or lowered by said swivel-handle said pins $c^4$ $c^4$ are adapted to travel in said angular slots from one edge to the other of said cross-head, as set forth, partially rotating the shafts C C, thus changing the inclination of the blades D D, substantially as set forth, and for the purpose described.

In testimony whereof I have hereunto subscribed my name in the presence of two subscribing witnesses.

WILLIAM J. MINGLE.

Witnesses:
W. J. FORDNEY,
J. S. BITNER.