

No. 652,241.

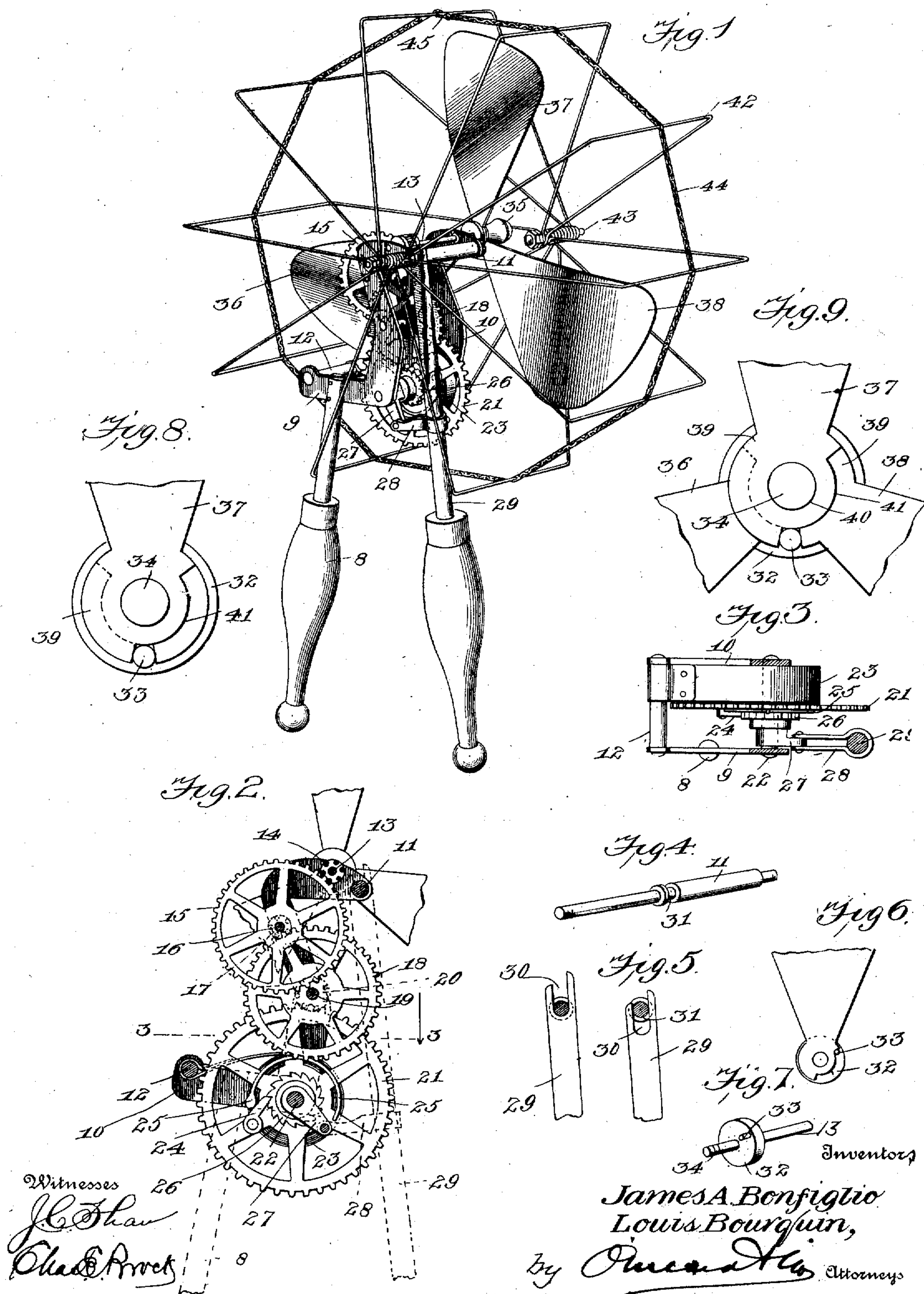
Patented June 26, 1900.

J. A. BONFIGLIO & L. BOURQUIN.

ROTARY HAND FAN.

(Application filed Oct. 28, 1899.)

(No Model.)



UNITED STATES PATENT OFFICE.

JAMES ALBANY BONFIGLIO AND LOUIS BOURQUIN, OF NEW ORLEANS,
LOUISIANA, ASSIGNORS TO VINCENT GRAY, OF SAME PLACE.

ROTARY HAND-FAN.

SPECIFICATION forming part of Letters Patent No. 652,241, dated June 26, 1900.

Application filed October 28, 1899. Serial No. 735,047. (No model.)

To all whom it may concern.

Be it known that we, JAMES ALBANY BONFIGLIO and LOUIS BOURQUIN, citizens of the United States, residing at New Orleans, in the parish of Orleans and State of Louisiana, have invented a new and useful Rotary Hand-Fan, of which the following is a specification.

This invention relates to rotary fans, and more particularly to that class of such fans which are adapted to be held in the hand, the object of the invention being to provide an improved fan of this class capable of being rapidly and continuously rotated by compression of the hand in which it is held in which the fan-blades are protected when in use by a cage and in which the blades and cage may be folded into a reduced compass when not in use.

With this object in view the invention consists in the improved construction, arrangement, and combination of the various parts of such a fan, which will now be fully described, the particular points of novelty being specifically set forth in the appended claims.

In order to enable others skilled in the art to which the invention most nearly appertains to make and use the same, we will now proceed to describe its construction and operation, reference being had to the accompanying drawings, forming part hereof, in which—

Figure 1 is a rear perspective view of a fan constructed in accordance with this invention. Fig. 2 is a view, partly in section and partly in elevation, showing the train of gearing, one side of its frame, and parts of the fan-blades, other parts being shown in dotted lines. Fig. 3 is a detail sectional view on the plane indicated by the broken lines 3 3 of Fig. 2. Fig. 4 is a detail perspective view of the main supporting-shaft of the cage detached. Fig. 5 is a detail view of the upper end of the operating-handle in two positions. Fig. 6 is a view in elevation of the end of the fan-shaft with one fan-blade thereon. Fig. 7 is a detail perspective view of the fan-shaft detached. Fig. 8 is a view similar to Fig. 6 with all of the fan-blades on the shaft and in their folded or closed position. Fig. 9 is a similar view with the fan-blades spread open.

Referring to the drawings by numerals, 8

indicates a handle to which is secured a metal plate 9, which, with a duplicate plate 10 and connecting cross-bars 11 and 12, forms the framework in which is supported a train of gearing comprising the fan-shaft 13, carrying a lantern-pinion 14, engaged by a gear-wheel 15 on a shaft 16, carrying a lantern-pinion 17, engaged by a gear-wheel 18 on a shaft 19, carrying a lantern-pinion 20, engaged by a gear-wheel 21 on a shaft 22, driven by a spring 23, secured at its inner end to said shaft and at its outer end to the cross-bar 12. The gear-wheel 21 is loose on the shaft 22 and is provided with a pawl 24, held by a spring 25 in engagement with a ratchet-wheel 26, rigidly secured on the shaft, so that when the shaft is turned in one direction by the spring it will revolve the gear-wheel; but when turned in the opposite direction to wind the spring the gear-wheel will not be turned.

Secured to the shaft 22 is a crank-arm 27, to which is pivotally connected a bar 28, projecting from a second handle 29, slotted at its inner end, as at 30, and slidably pivoted on the cross-bar 11, working in an annular groove 31 in the cross-bar, as specifically shown in Fig. 5.

The fan-shaft 13 is provided with a disk or collar 32 outside of the frame of the gearing, from which projects an eccentrically-located pin 33, and the outer end of the shaft is threaded, as at 34, to receive a milled nut 35.

36, 37, and 38 indicate the fan-blades, which are each provided at its inner end with a disk or hub 39, having a central opening 40 to fit upon the shaft, the periphery of each hub being cut away, as at 41. The cut-away portion is on the arc of a circle which includes the pin 33, so that the movement of the fan-blades is limited by the extent of such cut-away portion. In the construction of the blades these portions are so cut away that the end of the movement of each blade in one direction is at the proper point to bring the blades into coincidence, as in Fig. 8, in which positions the blades are folded into the lateral space of one blade, and at the end of their movement in the opposite direction the blades are extended in a proper position for use, as in Fig. 9, the opposite end walls of each cut-away portion serving as stops when

they contact with the pin 33. By turning up the milled nut 35 against the blades they are rigidly secured in either position, being clamped thereby between the nut and the disk or collar 32.

The fan is inclosed in a cage composed of wire bails 42, pivotally secured at one end upon an extension of the cross-bar 11 and at the opposite end upon a bolt or threaded pin 43, the bails being connected by chains 44, one section of which is provided with a hook 45, whereby two adjacent bails at the top may be disconnected and those on the opposite sides folded down so as to occupy less space for convenience and economy in storage or transportation.

In the operation of the fan the spring is normally wound up far enough to exert a continuous pull on the gearing to rotate the fan, but is held against rotation by the crank-arm and its connection with bar 28 and handle 29. So long as handle 29 is permitted to move outward the fan will rotate, and this outward movement is limited by the connection just described. When the handle 29 is pressed inward the crank-arm is moved, causing the shaft 22 to move backward and the spring to be further wound up. When the handle is released, the spring rotates the shaft 22 and the fan through the train of gearing until the outward limit of movement of the handle is reached, when it may again be pressed inward as often as desired to cause continued rotation of the fan. The fan will continue its rotation during the inward movements of the handle. The handle 29 being rigid with the bar 28 must move longitudinally on its pivot as it is oscillated thereon, and this motion is provided for, as before described, by its notched or forked pivotal end, as illustrated in Fig. 5, the handle pivotal connection being shown on the right hand of said figure at the end of the inward movement and on the left at the end of the outward movement. As the handle turns shaft 22 during the inward movement the pawl 24 slides backward over the teeth of the ratchet-wheel, engaging other teeth and preventing any interference with the forward movement of the train of gearing.

By means of the construction described we have provided for the continuous rotation of the fan, the compact folding of the fan-blades into small compass, and the folding of the cage. The mechanism is simple, cheap, durable, and effective, and the complete device light in weight and neat in appearance.

Having thus fully described the invention, what we claim as new, and desire to secure by Letters Patent of the United States, is—

1. In a rotary hand-fan, the combination

with a frame and a train of gearing therein comprising a fan-shaft and a spring-impelled shaft, of a handle fixed to the frame, a handle slidably pivoted to the frame, a rigid bar projecting laterally from the movable handle, and a crank-arm rigidly fixed to the spring-shaft and pivotally connected to the laterally-projecting bar, substantially as described.

2. In a rotary hand-fan, the combination with a frame and a train of gearing therein comprising a fan-shaft and a spring-impelled shaft, of a handle fixed to the frame, a cross-bar in the frame, a handle having a forked inner end embracing said cross-bar as a pivot and slidable thereon, a rigid bar on the last-named handle, and a crank-arm rigidly secured on the spring-shaft and pivotally connected to the laterally-projecting bar, substantially as described.

3. In a rotary hand-fan, the combination with a train of gearing in a frame and comprising a fan-shaft at one end and a spring-impelled shaft at the other, of a fixed handle, a loose gear-wheel of the train on the spring-shaft, a ratchet-wheel rigid on the spring-shaft, a spring-pawl on the loose gear-wheel engaging the ratchet-wheel, a crank-arm fixed on the spring-shaft, a handle slidably pivoted to the frame, and a rigid bar projecting from the handle and pivotally connected to the crank-arm, substantially as described.

4. In a rotary hand-fan, the combination with the fan-shaft, of a collar or disk fixed thereon, an eccentrically-located pin projecting outwardly from said disk and parallel with the shaft, a series of fan-blades pivotally mounted on the shaft outside of the disk and provided with curved spaces in the same arc as the pin, and means for clamping the blades to the disk or collar, substantially as described.

5. In a rotary hand-fan, the combination with the fan-shaft, of a collar or disk fixed thereon, an eccentrically-located pin projecting outwardly from said disk and parallel with the shaft, a series of fan-blades pivotally mounted on the shaft outside of the disk and provided with curved spaces in the same arc as the pin, and having end walls which serve, by contact with the pin, to limit the pivotal movement of the fan-blades on the shaft to the space between their folded and spread positions, and a clamp-nut on the shaft for rigidly securing the blades in either adjustment, substantially as described.

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Witnesses:

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