No. 676,786.

Patented June 18, 1901.

H. M. TURNER.

ROTARY FAN.

(Application filed Jan. 7, 1901.)

(No Model.)

2 Sheets—Sheet 1.

Fig. 1.

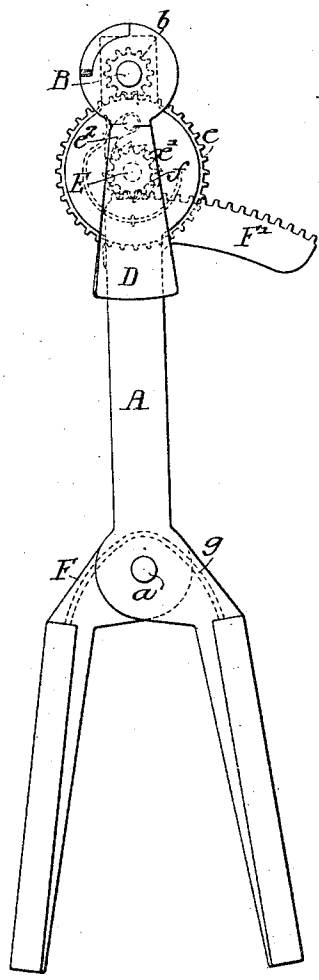


Fig. 3.

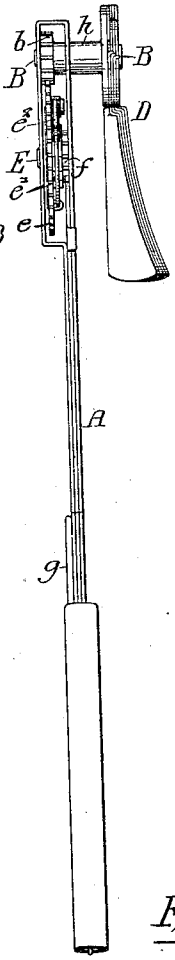


Fig. 2.

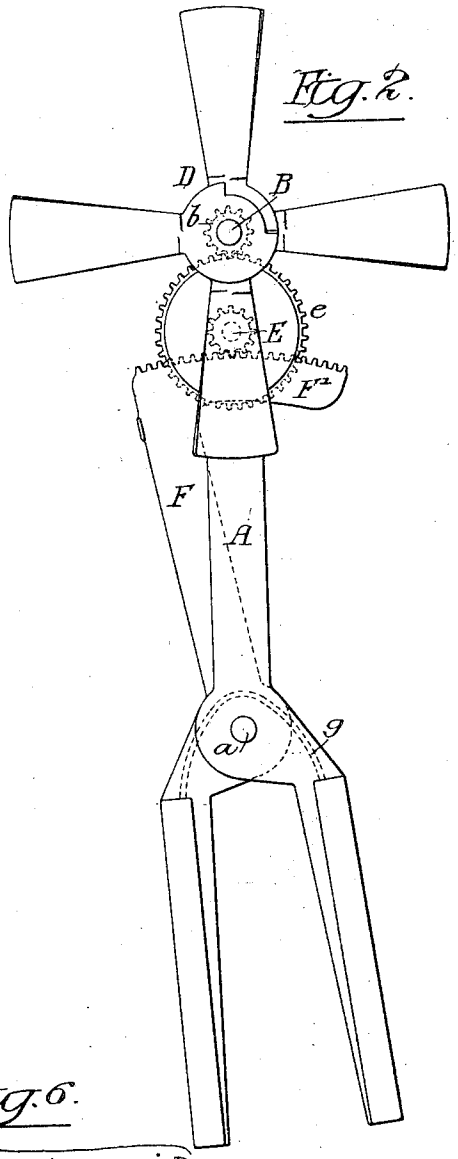
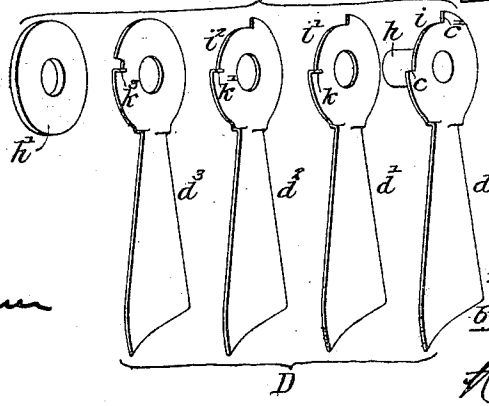


Fig. 6.



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Inventor:-

Harrison M. Turner

by his Attorneys:-

Howson & Howson

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No. 676,786. Patented June 18, 1901.

H. M. TURNER.

ROTARY FAN.

(Application filed Jan. 7, 1901.)

(No Model.) 2 Sheets—Sheet 2.

Fig. 4.

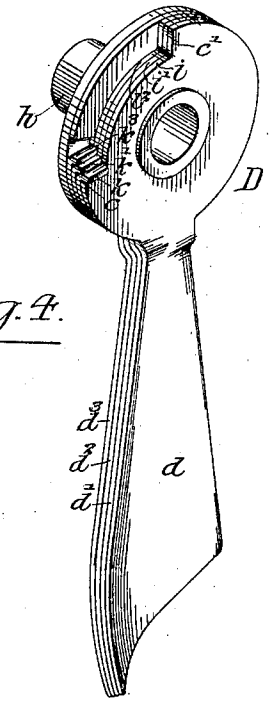


Fig. 5.

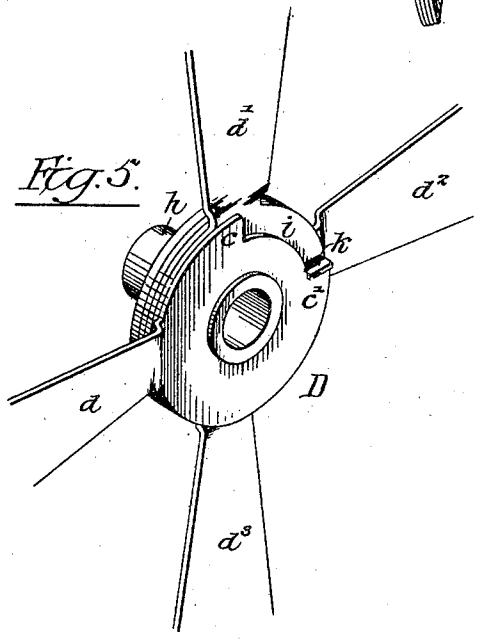
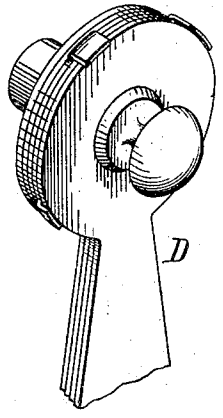


Fig. 7.



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UNITED STATES PATENT OFFICE.

HARRISON M. TURNER, OF BIRMINGHAM, ALABAMA.

ROTARY FAN.

SPECIFICATION forming part of Letters Patent No. 676,786, dated June 18, 1901.

Application filed January 7, 1901. Serial No. 42,402. (No model.)

To all whom it may concern:

Be it known that I, HARRISON M. TURNER, a citizen of the United States, and a resident of Birmingham, Jefferson county, Alabama, have invented certain Improvements in Rotary Fans, of which the following is a specification.

The object of my invention is to provide an automatically opening and closing rotary fan in which the blades automatically open when the fan is rotated and close when the rotation ceases.

In the accompanying drawings, Figure 1 is a side view of my improved fan, showing the blades closed. Fig. 2 is a view similar to Fig. 1, showing the blades open. Fig. 3 is a side view of Fig. 1. Fig. 4 is a perspective view of the fan closed and detached from the operating mechanism. Fig. 5 is a perspective view of a portion of the fan open. Fig. 6 is a perspective view showing the blades of the fan detached, and Fig. 7 is a view illustrating a modification.

My invention relates particularly to hand-operated fans; but it will be understood that the invention may be applied to power-operated fans as well without departing from my invention.

A is an arm shaped at its lower end to conform to a hand-grip, and in the upper end of this arm is a bearing for the spindle B, upon which the fan D is mounted. On this spindle is a gear-wheel b, meshing with a gear-wheel e, loose on the shaft E. On this shaft is a ratchet-wheel e', and on the gear-wheel is a spring-pawl e^2, engaging the ratchet-wheel, so that when the shaft E is moved in one direction it will turn the gear-wheel e, but when moved in the opposite direction the pawl will allow the shaft to turn independently of said gear-wheel.

On the shaft E is a pinion f, with which engages a segment F', carried by an arm F, pivoted at a to the arm A. The lower portion of each arm is so designed as to be readily grasped by the hand. A spring g, attached to each arm, tends to force the arms apart. The ends of the springs in the present instance extend into sockets in the arms.

It will be seen that when the arms are grasped by the hand and drawn together the rack on the arm F will turn the shaft E a number of times during each stroke, causing the gear-wheel e to move forward, and this gear-wheel will in turn drive the fan-shaft at a high speed, the pawls allowing the arm to be drawn back to its normal position by the spring g, so that it will be seen that the fan-shaft can be rotated in one direction by the intermittent movement of the hand.

On the fan-shaft is a fan D, above mentioned. This fan in the present instance has four blades d d' d^2 d^3. d is the fixed blade and has a tubular shaft h, on which the loose blades d' d^2 d^3 are mounted. A disk h' is secured to the shaft h by soldering or other means and holds the loose blades in position on said shaft, so that while the blades are free to revolve on their shaft either to the open or closed position they cannot move longitudinally thereon. The hub of the blade d is notched at i, and the hub of the blade d' is notched at i' and has a lip k, which engages the shoulder c on the hub of the blade d when closed and the shoulder c' of said blade when opened. The blade d^2 is notched at i^2 and has a lip k', which engages the blade d' in a similar manner to the lip k engaging the blade d. The blade d^3 is simply notched sufficiently to allow the lip k^3 to be bent up from the body of the blade, and this lip k^3 engages the blade d^2 in the manner above described in reference to the blade d', so that it will be seen that when the fan is set in motion and the blade d is rotated in one direction it will pick up the blade d' when it is at right angles to the blade d and in turn will pick up the blades d^2 and d^3 in like order; but as soon as the fan stops or is turned in the reverse direction the blades collapse to the position shown in Figs. 1, 3, and 4.

In Fig. 7 I have shown a modification in which there are simply projections or lips on the several blades of the fan, and the hubs in this instance are not slotted, as shown in Fig. 5, the first lip or lug striking against the blade which is fixed to the shaft.

It will be understood that while I have shown a four-bladed fan the fan may have two or more blades, as desired, and the fan can be readily attached to a power-driven shaft instead of the hand-operated mechan-

ism shown without departing from my invention.

The fan D is simply held to the shaft B by friction in the present instance, so that it can be readily removed, if desired; but it may be secured to the shaft by a key or set-screw or other means of fastening.

I claim as my invention—

1. The combination in a fan, of a shaft, means for imparting continued rotating movement to said shaft, and two or more blades normally closed together when at rest and so mounted on the shaft that when the latter is rotated in one direction the blades will automatically open and when the rotation of the shaft ceases the blades will automatically close, substantially as described.

2. The combination in a fan, of a shaft, means for imparting continued rotating movement to said shaft, two or more blades, one blade being secured to the shaft and the other blade or blades being loosely mounted thereon, and means for engaging said fixed blade with the said loosely-mounted blade or blades as it is rotated, so that when the shaft rotates the fixed blade in one direction the fan will be opened, and when the rotation ceases the fan will close, substantially as described.

3. The combination in a rotary fan, of a shaft, means for driving said shaft, a blade fixed to the shaft, and two or more blades loose on the shaft, each of said blades having a lip engaging an adjoining blade and so arranged that when the shaft with the fixed blade is turned by the driving mechanism in one direction it will pick up the other blades in rotation, substantially as described.

4. The combination in a rotary fan, of a blade having a shaft secured thereto, the hub of said blade being notched, a second blade mounted loosely on the said shaft and also notched and having a lip extending into the notch of the first-mentioned blade, and a third blade also notched and having a lip extending into the notch of the second blade, a fourth blade having a lip extending into the notch in the third blade, and means for confining the loose blades on the shaft, said blades being so arranged that as the first blade is turned it will pick up the other blades in rotation, substantially as described.

5. The combination in a rotary fan, of a shaft, means for revolving said shaft, a blade fixed to said shaft and having a notch in its hub, a disk also secured to said shaft, a series of blades mounted loosely on the shaft between the fixed blade and the disk, the hub of each of said loose blades also being notched, and lips on the loose blades whereby as the fixed blade is rotated the loose blades will be picked up in rotation, substantially as described.

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

HARRISON M. TURNER.

Witnesses:
WILL. A. BARR,
H. HAYES AIKENS.