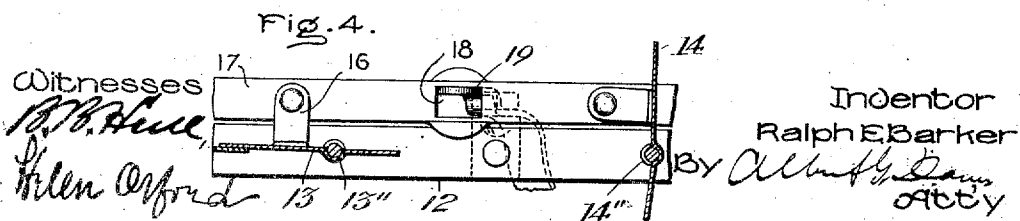
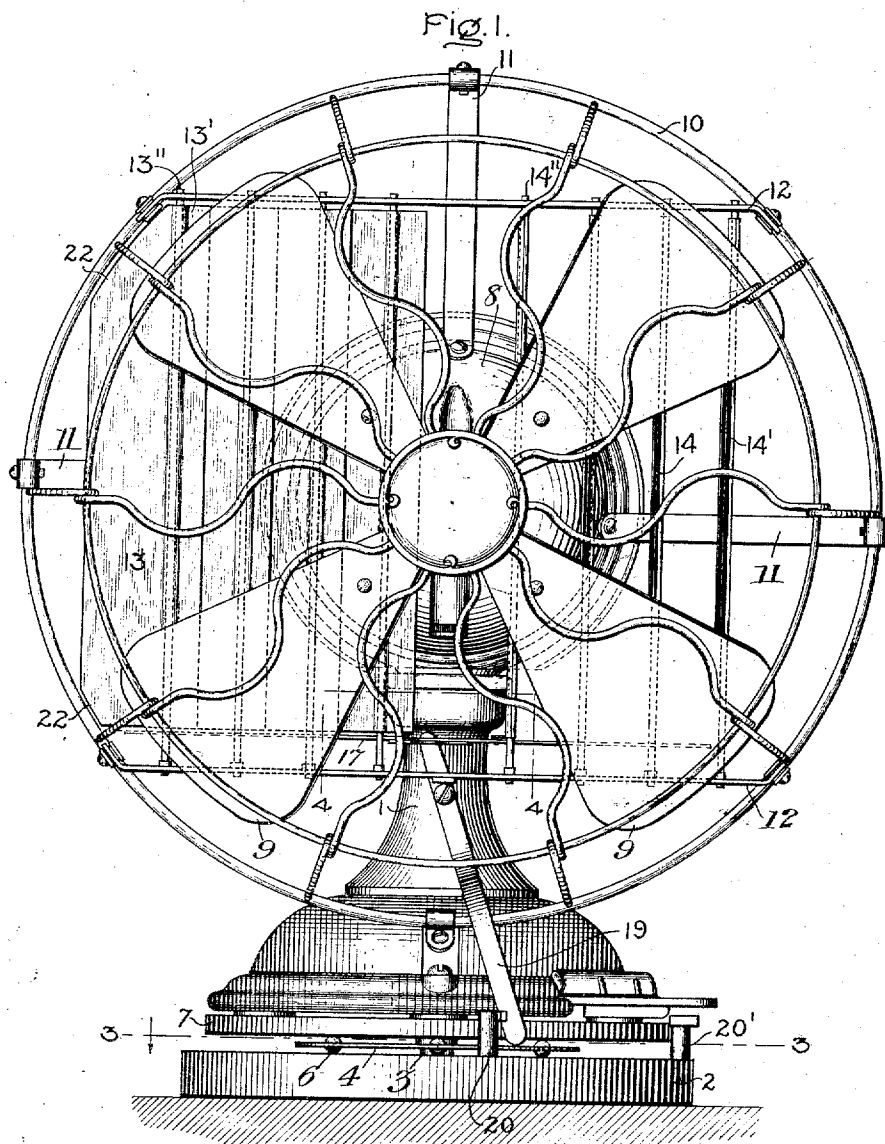


963,849.

Patented July 12, 1910.
 2 SHEETS—SHEET 1.

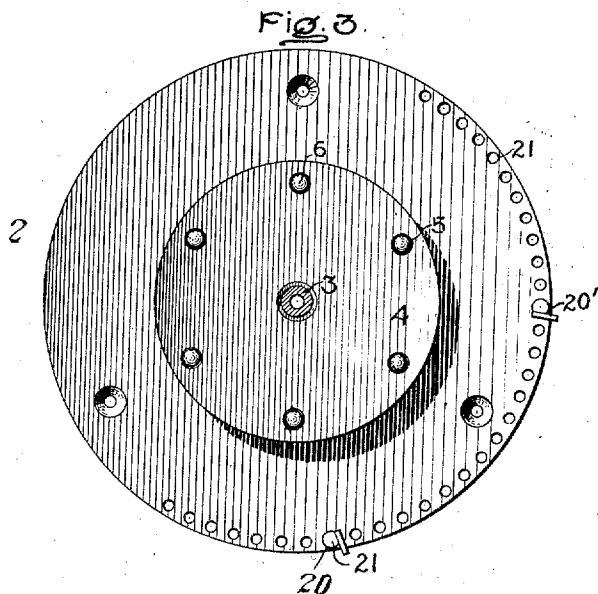
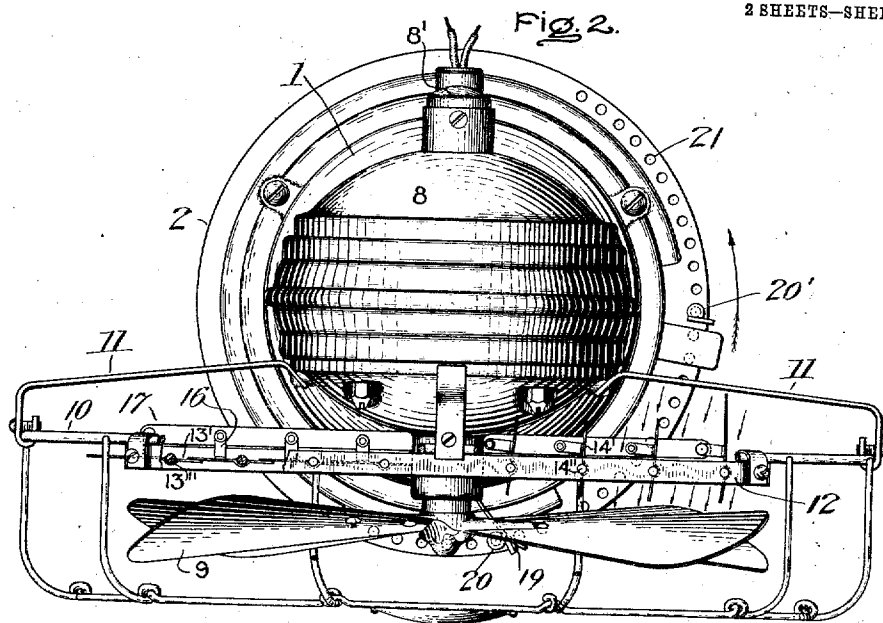


R. E. BARKER.
OSCILLATING FAN.
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963,849.

Patented July 12, 1910.

2 SHEETS—SHEET 2.



Witnesses

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UNITED STATES PATENT OFFICE.

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OSCILLATING FAN.

963,849.

Specification of Letters Patent.

Patented July 12, 1910.

Application filed November 29, 1902. Serial No. 133,176.

To all whom it may concern:

Be it known that I, RALPH E. BARKER, a citizen of the United States, residing at Lynn, county of Essex, State of Massachusetts, have invented certain new and useful Improvements in Oscillating Fans, of which the following is a specification.

The object of my invention is the production of an improved form of ventilating fan which is automatically oscillated by means of the action of the air currents produced by the fan.

My invention contemplates the use of two or more screens or dampers placed in the path of the air currents produced by the fan. The screens are placed one or more on each side of the axis of oscillation of the fan body and are so connected and arranged that each screen may be alternately closed to form a barrier in the path of the air current and opened to relieve the obstruction to the progress of the air current. Preferably the screens are placed back of the fan blades and are arranged so as to form a substantially air-tight barrier behind one half of the fan during the period of a half oscillation. The reaction between the other half of the fan and the air rotates the fan about its axis of oscillation. Means are provided for automatically opening the closed screen or damper at the completion of the desired movement of the fan in one direction and the closing of the open screen or damper on the other side to produce the movement of the fan in the opposite direction.

For a better understanding of my invention, reference may be had to the accompanying drawings in which I have illustrated one form of fan embodying my invention.

In the drawings Figure 1 is a front elevation; Fig. 2 is a plan view with parts broken away and in section; Fig. 3 is a section taken on the line 3-3 of Fig. 1; Fig. 4 is a detail taken on the line 4-4 of Fig. 1.

A fan-carrying post 1 is revolvably mounted on the base or support 2 by means of a shaft 3 which may be rigidly connected to one of these members and rotatably con-

nected to the other. Rotatably mounted on the shaft 3 between the base 2 and post 1 is a disk 4. Pockets 5 formed in this disk near its periphery receive balls 6. The balls 6 are held by the disk 4 between the base 2 and a bottom plate 7 on the post and serve to sustain the weight of the fan and to allow it to oscillate about the shaft 3 with a minimum amount of friction.

At the upper end of the post 1 an electric motor 8 is conventionally shown. At one end of the motor shaft 8', which is preferably perpendicular to the shaft 3, are located fan blades 9 of the usual construction. Surrounding the fan blades is the wire work guard frame 10 carried by supporting arms 11 extending from the motor casing and the post.

A pair of horizontal bars 12 are carried by the guard frame 10 and mounted in these bars 12 are the two screens or dampers 13 and 14. The two screens are formed of one or more pivoted blades 13', 14', respectively. These blades are similar and may be formed of sheet metal provided with stiffening members 13², 14² of wire, the said wire members being extended to form journals which are pivoted in the cross bars 12.

Each screen blade is provided at its bottom with an offset portion 16 which is pivotally connected to a reciprocating bar 17. The reciprocating bar 17 is provided at its middle point with an opening 18 in which the upper end of a lever 19 plays. The lever 19 is pivoted to the post 1 and is so shaped that its lower end is in position to be engaged by a pair of studs 20 mounted in holes 21 in the base piece 2.

The blades 13' and 14' are so connected to the bar 17 that when the blades of either screen are turned into position parallel to the bar 17 those forming the other screen are perpendicular thereto. As shown on the drawings when the blades of one set are turned parallel to the bar 17 their edges overlap, thus forming a substantially air-tight screen behind one half of the area swept by the fan blades.

Intead of shaping the screen or dampers to form an air-tight barrier, it will of course be understood that they could be constructed so as to form a considerable impediment to the passage of the air currents leading toward one side of the fan without entirely obstructing such currents, as with this construction the desired unbalanced effects upon the opposite sides of the fan would be secured and the desired oscillation of the fan produced.

The operation of my fan is as follows: In the position of the fan shown in Figs. 1 and 2 the blades 13' are set to form a closed screen and the blades 14' are set so as to oppose practically no resistance to the passage of the air currents induced by the fan. Assuming the fan to be rotating so as to move the air in the direction indicated by the small arrows in Fig. 2, then, by the ordinary laws of action and reaction, it will be seen that there is a force acting on the fan blades at the right as seen from the front of the fan tending to turn the fan in the direction indicated by the large arrow in Fig. 2, and since the screen 13 is set to form a closed barrier this force is unbalanced and the fan will rotate in the direction of the arrow. The fan will continue rotating until the lower end of the lever 19 engages the stud 20'. This will oscillate the lever 19 which by its engagement with the walls of the slot 18 will move the bar 17 so as to throw the fan blades 14' parallel to the bar 17, forming a closed screen on the right-hand side of the fan and opening the blades 13' as to no longer impede the passage of air to the fan on the left-hand side, whereupon the fan will begin to rotate in the opposite direction.

As is clearly shown in the drawings, the screen or damper blades 13' and 14' are not symmetrical with respect to their axes 13² and 14², the underlying side as viewed from the front of the fan being considerably narrower than the opposite side. By reason of this construction the action of the fan upon the blades when set to form a closed screen is to tend to hold them in the closed position. Instead of entirely shutting off the air supply on the closed side the screens or dampers may be arranged to merely reduce the flow at that side.

A plurality of holes 21 are formed in the base member 2 so that the distance between the studs 20 and 20' can be adjusted, and by that means the throw of the fan can be regulated. The outer deflector blades may be cut away as indicated at 22 in order to clear the guard frame.

While a fan may be constructed in which a pair of alternately opening and closing screens can be arranged in front of the fan,

the arrangement which I have shown in the drawings is to be preferred, as by its use a much better diffusion of air can be obtained than when deflecting guides or screens of any kind are placed in front of the fan. Moreover with my construction the unsightly appearance which has heretofore characterized fans of this general type is done away with. The fan which I have shown and described is easily and cheaply made and is of good mechanical construction.

The construction which I have illustrated and described is the best embodiment of my invention which is now known to me, but I do not intend to be limited to the exact form of construction shown and described as I consider many variations could be made without departing from the spirit of my invention.

Although the oscillating mechanism shown and described is especially useful in connection with electric fans, it is not limited to use in connection therewith as it can readily be applied to fans driven in other ways.

While the screens or dampers are preferably carried by the oscillating fan structure, it is not essential that this should be so, as if it is desirable they may be mounted on some fixed support.

What I claim as new and desire to secure by Letters Patent of the United States, is,—

1. In combination, a fan for producing air currents, and automatically actuated means for periodically stopping the flow of the air currents through a portion only of the space traversed by said air currents.

2. In combination, a fan for producing air currents, and automatically actuated means for periodically varying the proportion of air currents passing to different parts of the fan.

3. In combination, a fan for producing air currents, and automatically actuated means for alternately establishing a barrier across the path of a portion of the current produced by said fan to stop said portion of the current and again dis-establishing said barrier.

4. In combination, a fan rotating about an axis to produce air currents and automatically actuated means for alternately establishing a barrier at one side of said axis in the path of the currents produced by said fan to stop the currents at that side and again dis-establishing said barrier.

5. In combination, a fan rotating about an axis to produce air currents, and automatically actuated means for establishing and disestablishing a barrier in the path of the air currents produced by said fan alternately on opposite sides of said axis to

thereby unbalance the back thrust of the fan.

6. In combination, a fan for producing air currents, and automatically actuated means for alternately establishing and dis-

10 7. In combination, a fan rotating about an axis to produce air currents and adapted to oscillate about an axis substantially perpendicular to said first mentioned axis, and means for oscillating said fan about said

15 second named axis, said means comprising a pair of screens arranged one at each side of said first named axis, and means operated by the oscillation of the fan for opening and closing said screens alternately.

20 8. In combination, a support, a fan mounted to oscillate upon said support, a plurality of screens mounted in the path of the currents produced by said fan, and means for opening and closing said screens.

25 9. In combination, a support, a rotating fan pivotally mounted on said support, a plurality of screens placed in the path of the currents produced by said fan, and means controlled by the operation of the fan

30 for opening and closing said screens.

10. In combination, a base, a rotary fan mounted to oscillate on said base, a pair of screens placed in line with the air currents produced by said fan, and means controlled

35 by the fan for opening and closing the screens.

11. In combination, a base, a rotary fan mounted to oscillate upon said base, a pair of screens located in the path of the currents

40 produced by said fan, said screens being connected together so that when one screen is closed the other is open, and means for opening and closing said screens.

12. In combination, a base, a rotary fan

45 mounted to oscillate upon said base, a pair of screens located in the path of the air currents produced by said fan, said screens being connected together so that when one screen is open the other one is closed, and

50 automatically actuated means for operating said screens.

13. In combination, a base, a rotary fan mounted to oscillate upon said base, a pair

55 of screens located in the path of air currents produced by said fan, and means controlled by the oscillation of the fan for alternately opening one screen and closing the other.

14. In combination, a fan for producing

60 air currents, and stops limiting the pivotal movement of said blades whereby when the barrier is once established the air currents tend to maintain it.

15. In combination, a base, a rotary fan mounted to oscillate upon said base, a pair

70 of screens placed in the path of the currents produced by said fan, each of said screens consisting of one or more movable blades, the blades forming one screen being connected to those forming the other

75 screen so that when blades of one screen are turned to form a closed screen those of the other screen may be turned to form an open screen, and means controlled by the oscillations of the fan for periodically moving the

80 blades forming one screen from the open position to the closed position and then back to the open position.

16. In combination, a base, a support pivotally mounted on said base, a rotary fan

85 mounted on said support with its axis of rotation at an angle to the pivotal axis of the support, and automatically actuated means for creating a barrier in the path of the currents produced by the fan alternately

90 on opposite sides of the pivotal axis of the support.

17. The combination with a fan wheel revolving in a support mounted to oscillate, of

95 means located behind the fan wheel and controlled by the operation of the fan for periodically causing the air current set in motion by the fan wheel to act upon the latter to oscillate said support.

18. The combination with a fan mounted to oscillate about an axis, of means controlled by the oscillations of said fan for

100 periodically establishing a barrier in the path of the currents generated by the fan alternately on opposite sides of said axis to cause said fan to oscillate.

19. In combination, a fan for producing air currents, and means for periodically stopping the flow of the air currents through a portion only of the space traversed by

110 said air currents.

20. In combination, a fan for producing air currents, and means for periodically varying the proportion of air currents passing to the different parts of the fan.

115 21. In combination, a fan for producing air currents, and means for alternately establishing a barrier across the path of a portion of the current produced by said fan to stop said portion of the current and again

120 dis-establishing said barrier.

22. The combination, of a fan-wheel revolving in a support mounted to oscillate, and means located behind the fan-wheel and controlled by the operation of the fan for

125 periodically establishing a barrier on oppo-

site sides of the wheel axis alternately to cause the air current set in motion by the fan-wheel to act upon the latter and oscillate said support.

- 5 23. In combination, a fan rotating about an axis to produce air currents, and means for establishing and dis-establishing a barrier in the path of the air currents produced by said fan alternately on opposite sides of

said axis to thereby unbalance the back 10 thrust of the fan.

In witness whereof I have hereunto set my hand this twenty-fifth day of November, 1902.

RALPH E. BARKER.

Witnesses:

DUGALD McK. McKILLOP,
JOHN A. McMANUS.