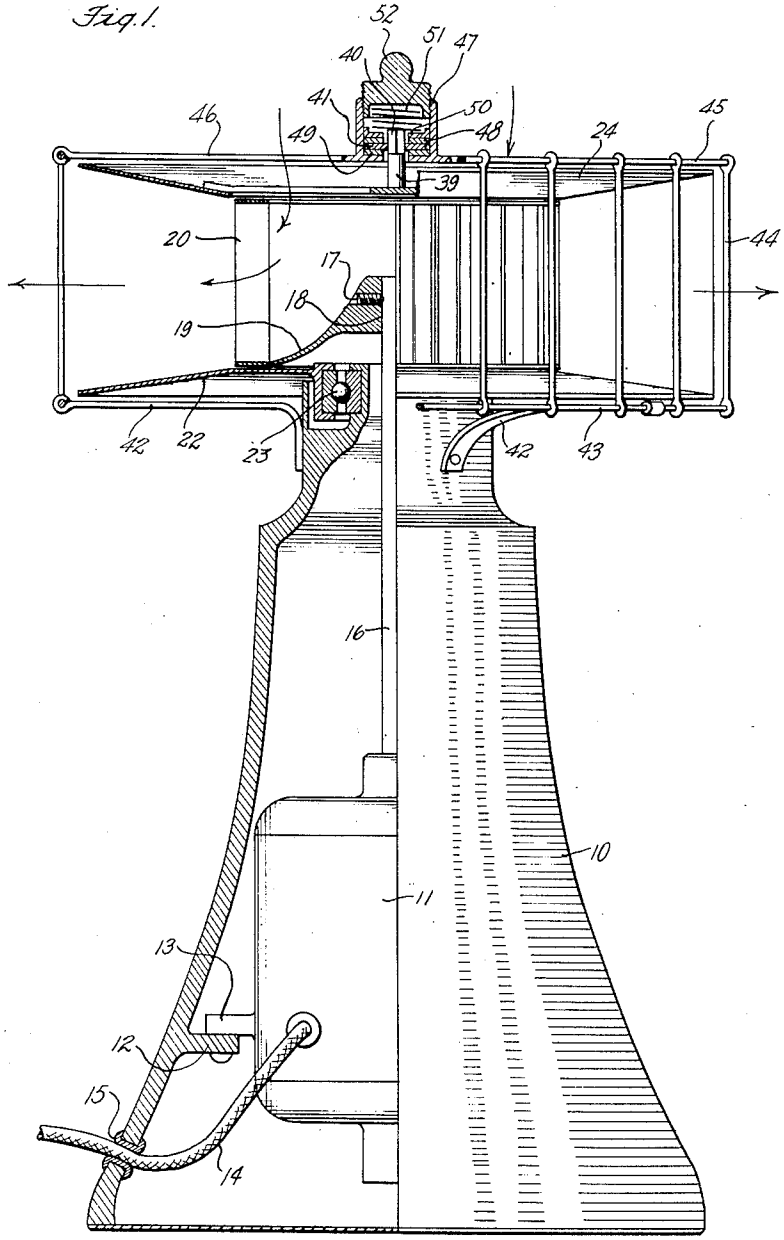
Oct. 14, 1930. J. D. STROBELL 1,778,046

FAN CONSTRUCTION

Filed Aug. 13, 1927 2 Sheets-Sheet 1

Fig. 1.



John D. Strobell INVENTOR

BY

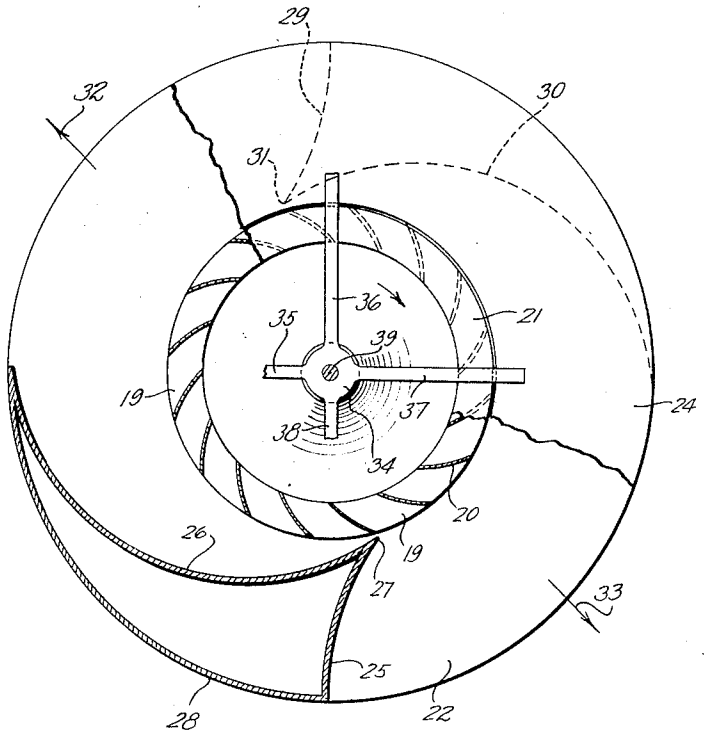
Robert S. Blair ATTORNEY

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Fig. 2.



John D. Strobell INVENTOR

BY

Robert L. Blair ATTORNEY

Patented Oct. 14, 1930

1,778,046

UNITED STATES PATENT OFFICE

JOHN D. STROBELL, OF NEW HAVEN, CONNECTICUT, ASSIGNOR TO THE SAFETY CAR HEATING & LIGHTING COMPANY, A CORPORATION OF NEW JERSEY

FAN CONSTRUCTION

Application filed August 13, 1927. Serial No. 212,678.

This invention relates to fan construction. One of the objects thereof is to provide a highly satisfactory fan for use upon a table or a desk or the like. Another object is to provide a fan having means for controlling and directing the air discharged therefrom in an efficient manner. Another object is to provide a fan having a wide range of action. Another object is to provide a construction of the above nature in which the discharge of air is conveniently controlled. Another object is to provide a fan of the above nature which is of simple and rugged construction. Another object is to provide a construction of the above nature which is small and compact and of neat appearance. Other objects will be in part obvious or in part pointed out hereinafter.

The invention accordingly consists in the features of construction, combinations of elements, and arrangements of parts as will be exemplified in the structure to be hereinafter described and the scope of the application of which will be indicated in the following claims.

In the accompanying drawings in which is shown one of the various possible embodiments of this invention,

Figure 1 is a side view of the construction showing one half in elevation and the other half in section, and

Figure 2 is a top view with parts broken away to better show the construction.

Similar reference characters refer to similar parts in both views of the drawings.

Referring now to the drawing in detail, the fan is mounted upon a base or standard 10 which is adapted to stand, in the upright position shown in Figure 1, upon a table or desk or the like. The standard 10 is hollow, and mounted therein with its axis vertical, is an electric motor 11. The motor is conveniently supported by means of coacting brackets 12 and 13 positioned upon the inner side of the standard and projecting outwardly from the motor casing respectively. The lead wires for the motor are shown at 14, passing outwardly through an opening 15 adjacent the bottom of the standard; it will be understood that the motor may be provided with a suitable switching device and rheostat or the like for controlling its speed of rotation.

The motor shaft 16 has its bearings in the motor casing 11 and projects upwardly through and from the upper end of the standard 10. Fastened to the shaft 16 adjacent the upper end thereof, as by means of suitable set screws 17, is the hub 18 of a fan. This fan comprises a bottom downwardly curving circular plate 19 which is shown herein as formed integrally with the hub 18; adjacent the periphery of the plate 19 are a plurality of vertically extending curved blades 20 which are shown more clearly in Figure 2, these blades being joined together at their upper ends by an annular metal plate 21. The blades 20 are rotated by the shaft 16 about the vertical axis of the shaft and their action, in conjunction with the bottom plate 19, is to draw air downwardly from above the fan and discharge the air radially, as is indicated by the arrows in Figure 1. The fan thus tends to discharge a blast of air radially in all directions.

Beneath the fan is positioned a circular plate 22 which is rotatably mounted upon the upper end of the standard 10 preferably by means of a ball bearing 23. Above the fan is an annular plate 24 which corresponds in shape to the outer portion of the plate 22. Positioned between the connecting plates 22 and 24 exterior of the fan blades 20 are vertical plates or walls which are thus positioned in the path of the discharge from the fan. These vertical walls or plates are preferably shaped as is shown in Figure 2, comprising a curved wall 25 and a curved wall 26 which are joined together at an edge 27 adjacent to the fan blades and extend therefrom to the periphery of the plates 22 and 24. The outer ends of the plates or walls 25 and 26 are preferably joined by a plate or wall 28 which corresponds in curvature to the periphery of the plates 22 and 24. Diametrically opposite the plates 25 and 26 are positioned similarly shaped plates 29 and 30 which meet in an edge 31 and which are preferably joined by a plate similar to the plate 28.

The action of the plates 25, 26, 29 and 30

is to divide the discharge of the fan into two substantially diametrically opposite streams or currents of air, one leaving the fan as indicated by the arrow 32 in Figure 2 and the other as indicated by the arrow 33. The parts 22 and 24, with the vertical curved walls 25, 26, 29 and 30 thus constitute a deflecting device which guides the discharge of the fan in a predetermined manner, and this deflector is rotatable, upon the bearing 23, about the fan axis.

As is best shown in Figure 2, the central opening of the annular plate member 24 is bridged by a frame-work consisting of a central part 34 which is positioned in line with the fan axis, and a plurality of radial arms 35, 36, 37 and 38. Projecting upwardly from the part 34 is a spindle 39 having a squared upper end 40 (see Figure 1) upon which is mounted, to rotate therewith, a metal disk 41. About the periphery of the deflector is mounted a suitable guard supported by brackets 42 which are fastened to the standard 10. This guard comprises, for example, a lower peripheral wire or rod 43, vertical wires or rods 44, an upper peripheral wire or rod 45, and top cross members 46. Supported at the center of the cross members 46 of the guard is a cup-shaped part 47 into which the spindle 39 projects and in which the disk 41 is positioned. Also within the cup-shaped part 47 are two rings 48 and 49 of friction material such as leather, for example, the ring 48 being positioned above the disk 41 and the ring 49 being positioned therebeneath. Above the upper friction member 48 is a metal plate 50 against which bears a spring 51. The spring 51 is held beneath a cap 52 which is threaded into the part 47 and may be adjusted, by threading inwardly or outwardly, to adjust the compression of the spring 51.

Considering more particularly the action of the deflector, as has been described above, it divides the discharge of the fan into two substantially diametrically opposite currents of air, and it is rotatably mounted by the bearing 23. As the fan rotates, the air discharged therefrom, striking against the walls 25, 26, 29 and 30 of the deflector, rotates the deflector. Thus the two currents of air discharged horizontally are rotated or revolved about the axis of the fan. The movement of the deflector is restrained by the action of the friction members 48 and 49 upon the disk 41. The speed of rotation of the deflector and hence the speed of rotating movement of the currents of air, may be adjusted by adjusting the spring 51, by means of the cap 52, to alter the restraining force upon the disk 41. If it is desired that the blast of air remain stationary instead of revolving, the spring 51 may be compressed until the friction device holds the deflector stationary. When the two currents of air are stationary, their directions are conveniently adjusted by simply turning the deflector about its axis by hand.

When the spring 51 is properly adjusted, the deflector rotates at a predetermined rate of speed about the axis of the fan and in the direction of rotation of the fan. The propulsion of the deflector is accomplished principally by the discharged air striking against the walls 25 and 29. It is to be understood that the shape of the walls 25, 26, 29 and 30 may be varied and also that the number of pairs of walls corresponding to the pair made up of the walls 25 and 26 may be increased if desired. If the deflector is provided with another pair of these walls between the plates 22 and 24, the discharge of the fan is divided into three streams instead of two.

From the foregoing, it will be seen that there is herein provided a construction which achieves the objects of this invention and accomplishes important advantages. The fan is simple in construction and very compact and presents a favorable appearance when in operation upon a table or desk or the like. It is to be understood, however, that the various features of the invention are not limited to use in a fan of this particular type.

As many possible embodiments may be made of the above invention and as many changes might be made in the embodiment above set forth, it is to be understood that all matter hereinbefore set forth or shown in the accompanying drawing is to be interpreted as illustrative and not in a limiting sense.

I claim:

1. In fan construction, in combination, a support, an air propelling member mounted thereon to rotate about an upright axis and adapted to discharge air radially, means for driving said member, a deflector rotatably mounted independently of said propelling member on said support about said upright axis and having parts positioned in the path of the discharge from said fan adapted to guide the discharged air in a predetermined stream directed substantially horizontally, and means for rotating said deflector.

2. In fan construction, in combination, a support, an air propelling member mounted thereon to rotate about an upright axis and adapted to discharge air radially, means for driving said member, and a deflector rotatably mounted independently of said propelling member on said support about said upright axis and having parts positioned in the path of the discharge from said fan adapted to guide the discharged air in a predetermined stream directed substantially horizontally, said deflector being rotated by the discharged air.

3. In fan construction, in combination, a support, an air propelling member mounted thereon to rotate about an upright axis and

adapted to discharge air radially, means for driving said member, a deflector rotatably mounted independently of said propelling member on said support about said upright axis and having parts positioned in the path of the discharge from said fan adapted to guide the discharged air in a predetermined stream directed substantially horizontally, said deflector being rotated by the discharged air, and friction means for controlling the speed of rotation of said deflector.

4. In fan construction, in combination, a support, a fan mounted thereon to rotate about an upright axis and adapted to discharge air radially, means for driving said fan, a deflector rotatably mounted upon said support comprising two laterally extending plates spaced one above the other and between which the fan discharge passes, and curved upright walls extending between said plates adapted to divide the fan discharge into a plurality of spaced radially directed streams of air.

5. In fan construction, in combination, a support, a fan mounted thereon to rotate about an upright axis and adapted to discharge air radially, means for driving said fan, a deflector rotatably mounted upon said support comprising two laterally extending plates spaced one above the other and between which the fan discharge passes, and curved upright walls extending between said plates adapted to divide the fan discharge into a plurality of spaced radially directed streams of air, said upright walls being so shaped that the fan discharge striking against them rotates said deflector thereby to revolve said spaced streams of air.

6. In fan construction, in combination, a rotating fan, and moving deflecting means positioned in the path of discharge from said fan and independently mounted to rotate about said fan and having two surfaces making an angle with each other for breaking up the discharge from said fan, said surfaces being related to the discharge from said fan so as to cause said deflecting means to be rotated, thereby producing a revolving current of air.

7. In fan construction, in combination, an air disturbing member rotating about an axis and adapted to discharge air substantially radially throughout its periphery, means independently rotatable about said axis, deflecting means carried by said rotatable means, said deflecting means being positioned peripherally of said member and being shaped so that air radially discharged from said member impinges thereon and causes rotation thereof.

8. In fan construction, in combination, an air disturbing member rotating about an axis and adapted to discharge air substantially radially throughout its periphery, means independently rotatable about said axis, deflecting means carried by said rotatable means, said deflecting means being positioned peripherally of said member and being shaped so that air radially discharged from said member impinges thereon and causes rotation thereof, and means for controlling the speed of rotation of said rotatable means.

9. In fan construction, in combination, a fan rotating about an axis and adapted to discharge air substantially radially throughout its periphery, a pair of spaced annular members between which said fan rotates and adapted to guide air discharged therefrom, and means rotatable about the axis of said annular members and in the space therebetween for producing from the discharge of said fan a revolving current of air.

10. In fan construction, in combination, a fan rotating about an axis and adapted to discharge air substantially radially throughout its periphery, a pair of spaced annular members between which said fan rotates and adapted to guide air discharged therefrom, and a plurality of means rotatable about the axis of said annular members and in the space therebetween for producing from the discharge of said fan a plurality of revolving currents of air, one of said means being shaped to be rotated by air discharged from said fan.

11. In fan construction, in combination, a fan rotating about an axis and adapted to discharge air substantially radially throughout its periphery, a pair of spaced annular members between which said fan rotates and adapted to guide air discharged therefrom, means mounting one of said annular members for rotation substantially about its axis, and means carried by said rotatable member and extending into the space between said two annular members for breaking up the peripheral discharge from said fan.

12. In fan construction, in combination, a fan rotating about an axis and adapted to discharge air substantially radially throughout its periphery, a pair of spaced annular members between which said fan rotates and adapted to guide air discharged therefrom, means mounting one of said annular members for rotation substantially about its axis, and means carried by said rotatable member and extending into the space between said two annular members, said last-mentioned means being shaped so that air impinging thereon causes rotation thereof and of said rotatable annular member.

13. In fan construction, in combination, an air disturbing member mounted to rotate about a fixed axis to effect an initial movement of air and adapted to discharge said air in a substantially radial direction with respect to said axis, and deflecting means adapted to rotate independently about said axis to produce a rotating blast of air.

14. In fan construction, in combination, an air disturbing member mounted to rotate about a fixed axis to effect an initial movement of air and adapted to discharge air from its periphery in a plurality of streams, and independently rotatable deflecting means adapted to restrict the discharge from said member to a predetermined current and to revolve said current about said fixed axis.

15. In fan construction, in combination, an air disturbing member mounted to rotate about a fixed axis to effect an initial movement of air and adapted to discharge air substantially centrifugally throughout its periphery, and independently rotatable deflecting means adapted to divide the discharge from said member into a plurality of spaced currents of air and adapted to revolve said currents of air about said fixed axis.

16. In fan construction, in combination, an air disturbing member mounted to rotate about a fixed axis to effect an initial movement of air and adapted to discharge said air in a substantially radial direction with respect to said axis, and independently rotatable deflecting means adapted to direct said radial discharge into a plurality of spaced radially directed air currents and adapted to revolve said air currents about the said fixed axis.

In testimony whereof, I have signed my name to this specification this 2d day of August, 1927.

JOHN D. STROBELL.

CERTIFICATE OF CORRECTION.

Patent No. 1,778,046. Granted October 14, 1930, to

JOHN D. STROBELL.

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows: Page 1, line 82, for "the connecting" read and connecting the; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 16th day of December, A. D. 1930.

M. J. Moore,
Acting Commissioner of Patents.

(Seal)

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