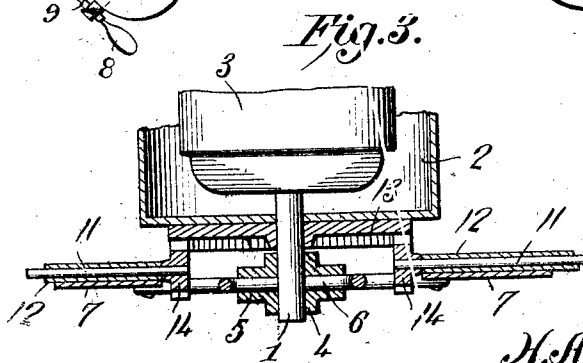
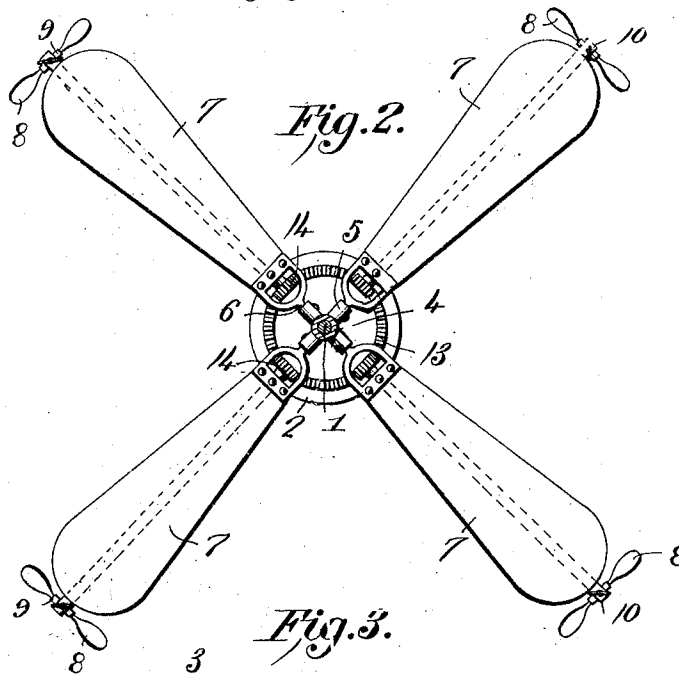
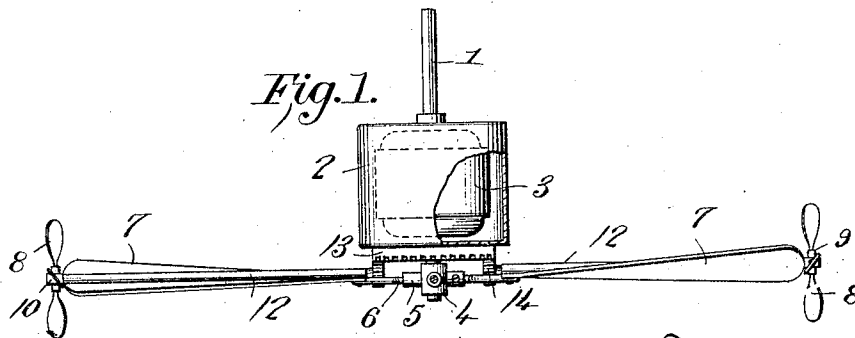


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FAN.
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To all whom it may concern:

Be it known that I, HENRY A. HAPPICH, Jr., a citizen of the United States of America, residing at New Orleans, in the parish of Orleans and State of Louisiana, have invented new and useful Improvements in Fans, of which the following is a specification.

This invention relates to improvements in fans and has particular application to motor driven fans.

In carrying out the present invention, it is my purpose to provide a fan which will have a relatively large air forcing capacity as compared with fans now in general use and whereby the air will be forced laterally as well as forwardly of the driving motor of the fan.

Furthermore, I aim to provide a fan which will embody among other features a plurality of blades radiating from a common axis, and a number of blades carried by each of the blades first mentioned and radiating from a common axis at right angles to the axis of the first blades, each group of blades constituting in effect a fan unit and operating to throw or force the air laterally of the fan motor as well as forwardly thereof.

With the above and other objects in view, the invention consists in the construction, combination and arrangement of parts hereinafter set forth in and falling within the scope of the claims.

In the accompanying drawing: Figure 1 is a side elevation of a fan constructed in accordance with the present invention. Fig. 2 is a plan view thereof. Fig. 3 is a fragmentary sectional view of the same, parts being shown in elevation.

In the present instance, I have shown the fan utilized as a ceiling fan. It is to be understood, however, that the invention in its useful application is not limited to any particular type of fan as the same may be employed as a wall or portable fan.

Referring now to the accompanying drawing in detail, the numeral 1 designates a hanger shaft adapted to have one end fastened to the ceiling while the other end carries a casing 2. Arranged within the casing 2 is the fan driving motor 3 which in the present instance, is in the form of an electric motor having the armature shaft thereof extending outwardly of the lower portion of the casing 2. Keyed or otherwise

secured to the projecting end of the armature shaft is a collar 4 provided with radially extending sockets 5. Suitably fastened within each socket 5 is the shank 6 of a blade 7, four blades being shown in this embodiment of my invention, and all of such blades radiating from a common axis. These blades 7, it will be noted, have a helical pitch and act to force or throw the air forwardly of the motor in one direction.

In order to throw the air outwardly or radially of the path of movement of the blades 7, so that the fan, when in operation, will throw the air laterally of the fan motor as well as forwardly or outwardly thereof, I arrange at the free end of each blade 7, a plurality of blades 8, radiating from a common axis at right angles to the axis of the first blades, that is the blades 7. The blades 8 at the outer extremity of each blade 7 are carried by radial sockets 9 on the collar 10 keyed upon one end of a shaft 11 extending along the length of the respective blades 7 approximately centrally of the width thereof and on one side of such blade, a sleeve or the like 12 encircling the shaft and being secured to the same side of the blades 7. These sleeves 12 form bearings for the respective shafts and it may be here stated that other forms of bearings may be employed in lieu of the sleeves 12 without departing from the spirit of this invention. Disposed concentrically of the armature shaft and suitably fastened to the casing 2 at the lower end thereof or otherwise supported is a crown gear 13 with which mesh pinions 14 keyed to the free ends of the tubular shaft 11 at the inner ends of the blades 7.

From the foregoing description taken in connection with the accompanying drawing, the construction and mode of operation of my improved fan will be readily apparent. When the driving motor is in operation, the fan blades 7 rotate and force the air downwardly or forwardly of the driving motor, while the blades 8 at the outer ends of the blades 7, due to the pinions 14 meshing with the crown gear 13, throw the air laterally of the fan motor or in a direction at right angles to the direction of movement of the air under the action of the blades 7.

It will be seen that I have provided a fan of relatively great capacity as compared with that class of fans heretofore construct-

ed, and furthermore, it will be seen that my improved fan is the essence of simplicity, efficiency and durability and may be manufactured and sold at a minimum cost.

While I have herein shown and described one particular form of my invention by way of illustration, it is to be understood that I do not limit or confine myself to the precise details of construction herein described and delineated, as modification and variation may be made within the scope of the claims and without departing from the spirit of the invention.

I claim:

1. A fan comprising a plurality of blades radiating from a common axis, and a plurality of blades carried by each of the first blades and radiating from a common axis at right angles to the axis of the first blades whereby the last-named blades may be rotated in a path at right angles to the path of movement of the first blades.

2. A fan comprising a plurality of blades radiating from a common axis, a plurality of blades carried by each of the first blades and radiating from a common axis at right angles to the axis of the first blades whereby the last-named blades may be driven or rotated in a path at right angles to the path of movement of the first blades, and means common to all of said blades for driving the same.

3. A fan comprising a plurality of blades radiating from a common axis, a plurality of blades carried by each of the first blades and radiating from a common axis at right angles to the axis of the first blades whereby

the last-named blades may be rotated at right angles to the path of movement of the first blades, and means common to all of said blades for driving the same, said means comprising a driving motor for driving the first blades, and a crown gear and pinions meshing therewith for driving the second-named blades.

4. A fan comprising a plurality of blades radiating from a common axis, and a plurality of blades arranged at the outer ends of each of the first blades and radiating from a common axis at right angles to the axis of the first blades, driving shafts for the last-mentioned blades and carried by the first-mentioned blades, and means common to all of said blades for driving the same.

5. The combination with a casing and a driving motor therein having a shaft extending beyond the casing, a fan comprising a plurality of blades radiating from said shaft, and a plurality of blades arranged at the outer ends of each of the first blades and radiating from a common axis at right angles to the shaft supporting the first blades, driving shafts for the last-mentioned blades, a crown gear carried by said casing, and pinions carried by said last-mentioned shafts and meshing with said gear whereby in the rotation of the first-mentioned blades under the action of the motor movement will be imparted to the last-mentioned blades.

In testimony whereof I affix my signature in presence of two witnesses.

HENRY A. HAPPICH, JR.

Witnesses:

WM. B. KOHLMAN,
JOSEPH V. ADEINA.