(No Model.)

P. MURRAY, Jr.

ROTARY FAN.

No. 377,573. Patented Feb. 7, 1888.

Fig. 1.

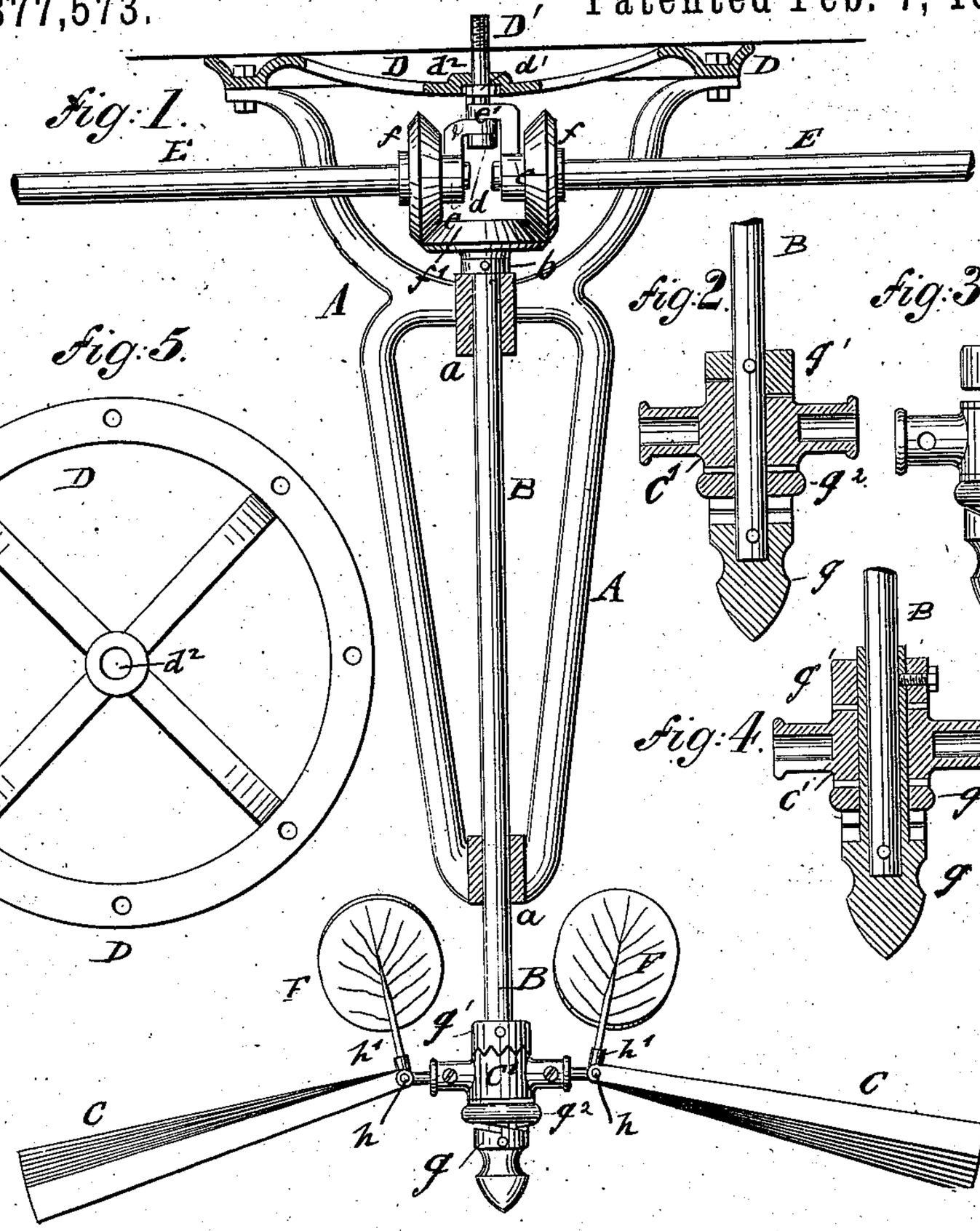


Fig. 2.

Fig. 3.

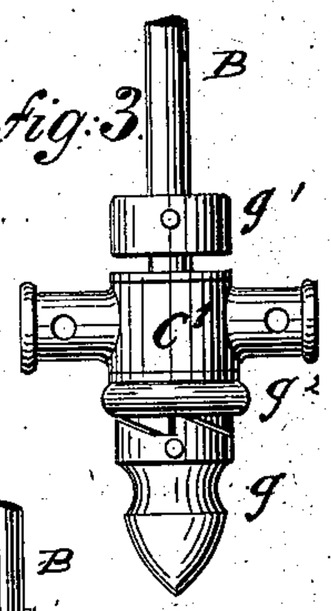


Fig. 4.

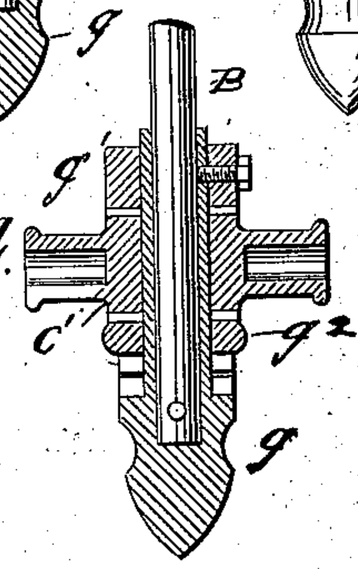


Fig. 5.

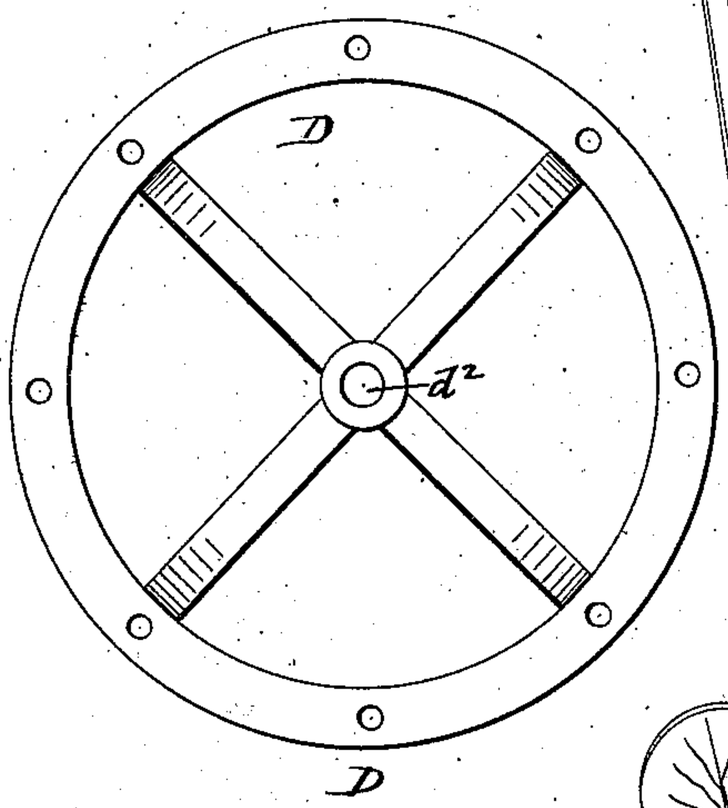


Fig. 6.

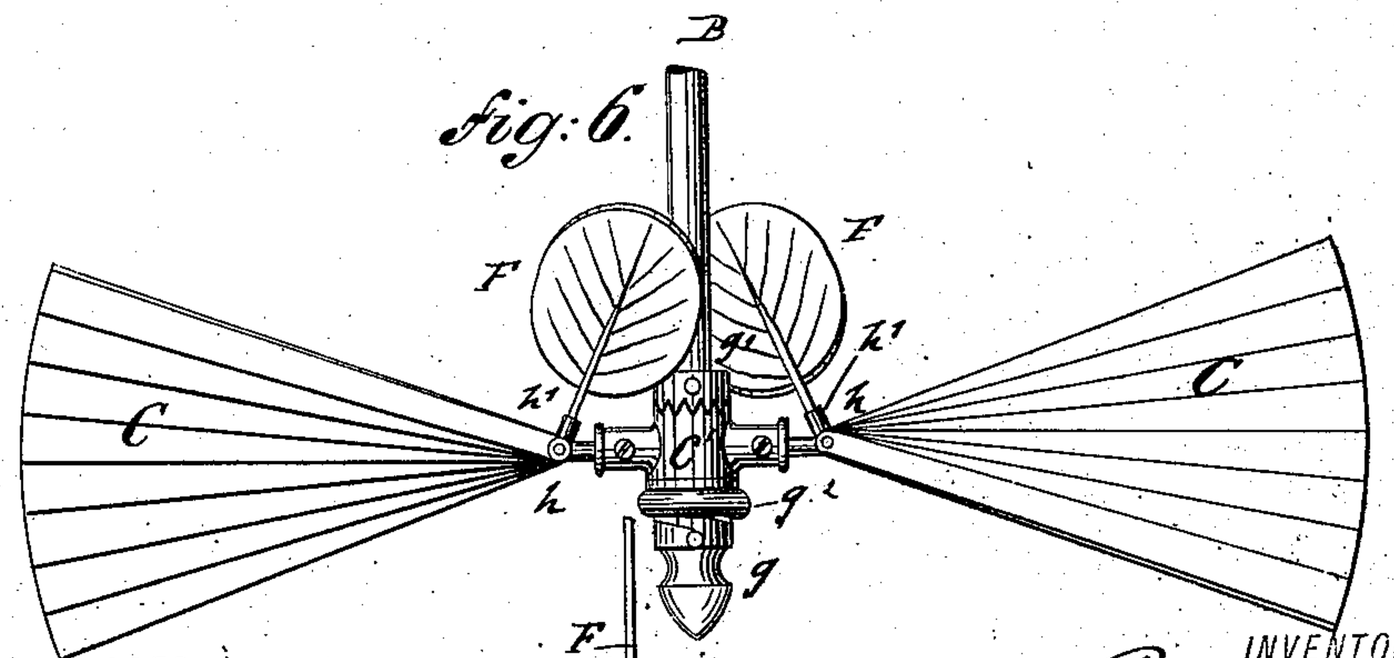
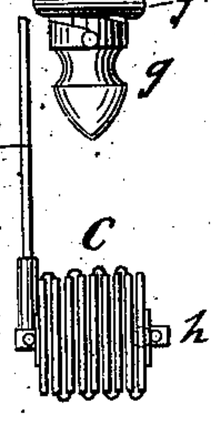


Fig. 7.



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PETER MURRAY, JR., OF NEWARK, NEW JERSEY.

ROTARY FAN.

SPECIFICATION forming part of Letters Patent No. 377,573, dated February 7, 1888.

Application filed March 31, 1887. Serial No. 233,137. (No model.)

To all whom it may concern:

Be it known that I, PETER MURRAY, Jr., of Newark, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Rotary Fans, of which the following is a specification.

This invention relates to an improved rotary fan of that class which is suspended from the ceiling for the purpose of agitating the air for ventilating and cooling purposes; and the invention consists of a rotary fan-shaft that is supported on bearings of a hanger-frame attached to the ceiling. The bearings of the driving-shaft are suspended from the center screw, by which also the base of the hanger-frame is attached to the ceiling. The hub of the fan is applied loosely to the fan-shaft and stopped or started by a clutch device. Each fan-section is formed of a number of thin pivoted blades and a flexible connecting-web, the sections being opened according to the speed imparted to the fan by smaller auxiliary fans applied at right angles to the outermost movable blade of the fan, while the opposite covering-blade is attached stationary to the hub of the fan. When the motion of the fan is stopped, the blades of the same fold up automatically, while the same are spread apart more or less by the resistance of the air to the auxiliary fans, according to the speed imparted to the fan.

In the accompanying drawings, Figure 1 represents a side elevation, partly in section, of my improved rotary fan. Figs. 2 and 4 are sections, and Fig. 3 a side elevation, of the clutch devices employed for throwing the loose hub of the fan in or out of gear with the fan-shaft. Fig. 5 is a detail bottom view of the base-frame, by which the hanger-frame of the fan-shaft is applied to the ceiling. Fig. 6 is a side view of the fan, the fan-sections being spread apart; and Fig. 7 is a detail end view of one folding section of the fan.

Similar letters of reference indicate corresponding parts.

Referring to the drawings, A represents the hanger-frame of my improved rotary fan; B, the fan-shaft, which is supported in bearings *a a* of the hanger-frame; and C, the fan, which is applied by a loose hub, C′, to the lower end of the fan-shaft. The upper end of the hanger-frame is applied by screws to a ring-shaped base, D, that is attached by a center screw, D′, to the ceiling, as shown in Fig. 1. The center screw, D′, supports the ring-shaped base-frame D by a fixed head, *d′*, which is fitted into a central socket, *d²*, of the base-frame D. The center screw, D′, is elongated below the head and provided with a second head, *d*, on which are supported, by eyes *e′ e′*, two hanger-bearings, *e e*, for the ends of the horizontal transmitting-shafts E. The shafts E are provided with beveled cog-wheels or friction-gears *f*, that mesh with a bevel-wheel, *f′*, at the upper end of the fan-shaft B and impart rotary motion to the latter. The hanger-bearings *e e* of the driving-shafts E E turn by the eyes *e′* at their upper ends on the lower part of the center screw, D′, so that the shafts E E may be arranged in line with each other, or at any suitable angle to each other, as required by the position of the fans. The upper end of the fan-shaft B rests by means of a collar, *b*, on the upper bearing, *a*.

To the lower end of the fan-shaft is applied a knob or handle, *g*, which is provided at its upper edge with teeth that engage a similarly-toothed lower edge of a loose ring, *g²*, upon which the smooth bottom edge of the loose fan-hub C′ rests. Above the fan-hub C′ the shaft B has a fixed collar, *g′*, the lower edge of which is notched or serrated, so as to engage the similarly notched or serrated upper edge of the fan-hub C′ when the latter is raised. This is accomplished by taking hold of the ring *g²*, so that by the motion of the fan-shaft the inclined teeth of the knob *g* move along the teeth of the ring, whereby the ring and hub are raised and the latter thrown into mesh with the fixed collar *g′*, so that the fan-hub C′ and fan C are carried along and rotated with the fan-shaft.

In place of the clutch just described the clutch device shown in Fig. 3 may be used, in which, in place of a notched or serrated collar, *g′*, a plain collar and intermediate frictional packing-ring is used.

In the modification shown in Fig. 4 the hub C′ is placed on a sleeve that extends over the fan-shaft and which is made integral with the knob *g*. Between the fan-hub and the knob *g* is interposed the toothed ring *g²*, in the same

manner as in Figs 2 and 3, by which the fan-hub C′ and fan C are raised or lowered, so as to mesh with the notched or serrated edge of the fixed collar *g′*. The fan C is made of two sections, each composed of a number of thin blades that are connected and covered by a web of suitable fabric. The fan-sections are secured to sockets of the fan-hub C′, the blades of each section being pivoted to a fixed pivot, *h*, one covering-blade of which is rigidly applied to said pivot, while the remaining blades and the opposite covering-blade swing loosely thereon.

To the inner end of the pivoted covering-blade of each section is rigidly applied, by means of a socket, *h′*, a disk-shaped auxiliary fan, F, which extends at right angles or nearly so from the fan-section, and which serves for the purpose of spreading the fan-section apart when rotary motion is imparted to the fan. This spreading-action is imparted by the resistance of the auxiliary fans to the air, which is sufficient to gradually lift the light blades of the fan-sections and spread them apart more or less, according to the speed imparted to the fan-shaft. When the motion of the fan is interrupted, the disk-shaped fans offer no resistance to the air, and the fan-sections automatically fold up by gravity toward the fixed covering-blades, as shown in Fig. 1.

This construction of fans has the advantage that when the fan is stopped the sections of the same take up but a small space, while when the fan is in motion they are spread apart and exert a powerful agitating action on the air.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. The combination of a base-frame, a center screw for attaching the same to the ceiling, said screw having two heads, a hanger-frame attached to the base-frame, hanger-bearings supported by eyes or sleeves on the lower head of the center screw, and motion-transmitting shafts supported in said bearings, substantially as set forth.

2. A rotary fan composed of two fan-sections, each being made of a fixed outer blade and pivoted blades connected by a web of suitable material, and of two disk-shaped fans attached to sockets of the outermost movable blades, so as to spread the blades of the fan-sections by the pressure of the air on said disk-shaped fans when the fan is in motion and drop the blades into a folded position when the fan is stopped, substantially as set forth.

In testimony that I claim the foregoing as my invention I have signed my name in presence of two subscribing witnesses.

PETER MURRAY, JR.

Witnesses:
SIDNEY MANN,
MARTIN PETRY.