

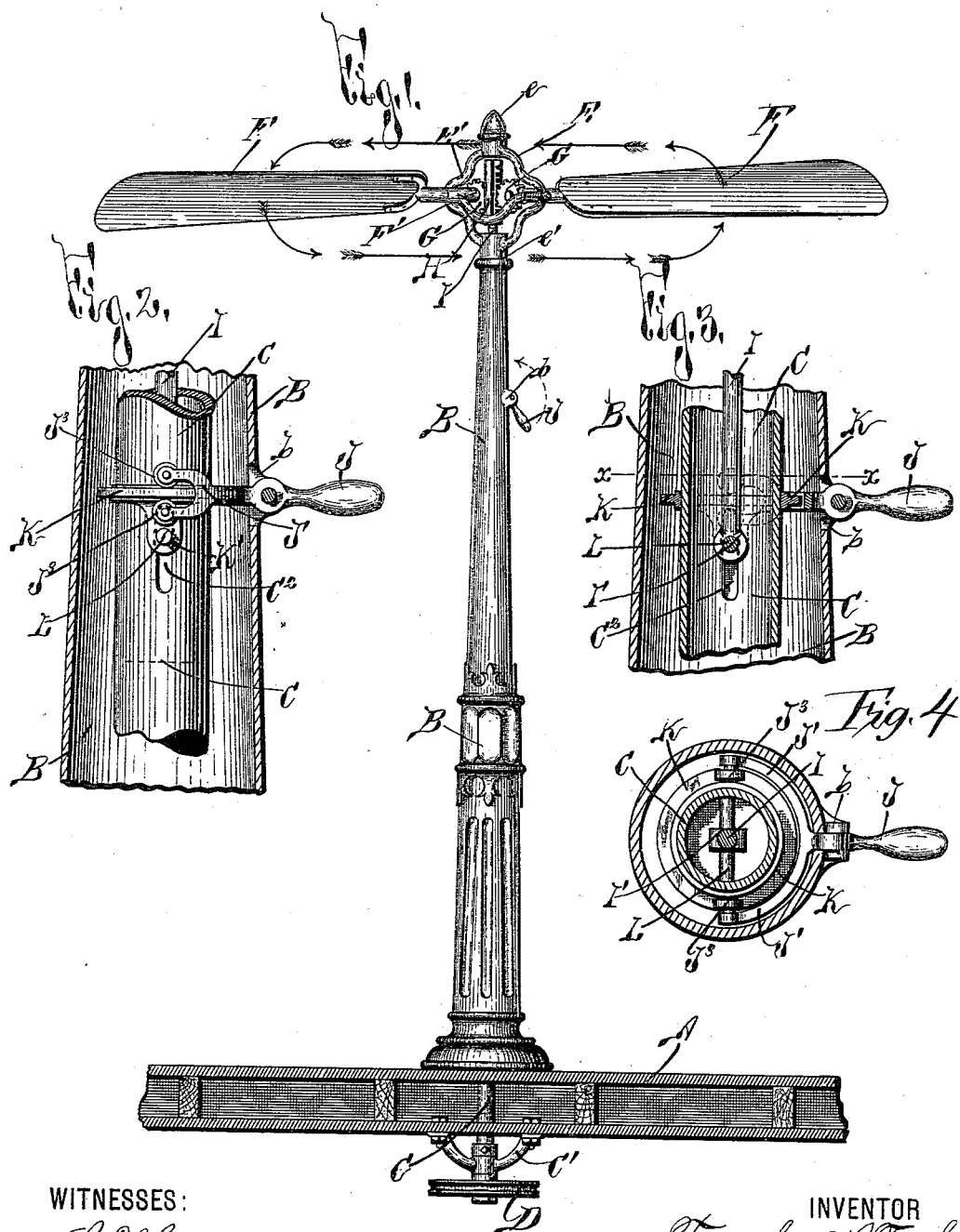
(No Model.)

2 Sheets—Sheet 1.

F. W. TUERK, Jr.
FAN.

No. 420,024.

Patented Jan. 21, 1890.



WITNESSES:

C. E. Tomlinson
H. Parsons

INVENTOR

INVENTOR
Frederick W. Tuerk, Jr.
BY

BY

George W. Hey
ATTORNEY.

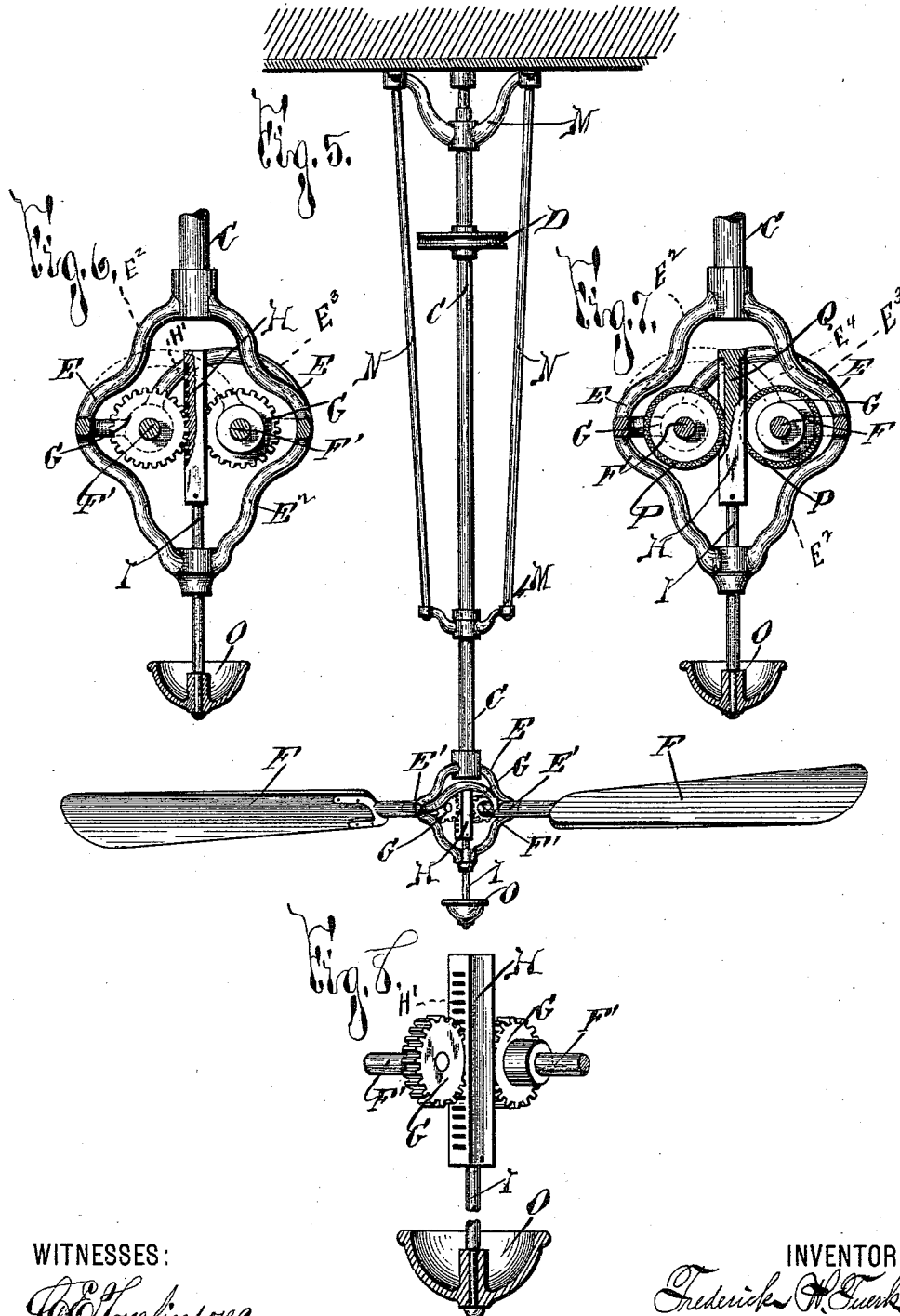
(No Model.)

2 Sheets—Sheet 2.

F. W. TUEBK, Jr.
FAN.

No. 420,024.

Patented Jan. 21, 1890.



WITNESSES:

W. C. Tomlinson
A. Parsons

INVENTOR

Fredrick W. Tuebk, Jr.

BY

George H. Heg
ATTORNEY

UNITED STATES PATENT OFFICE.

FREDERICK W. TUERK, JR., OF SYRACUSE, NEW YORK, ASSIGNOR OF TWO-THIRDS TO JAMES C. HUNTER, OF SAME PLACE, AND JOHN HUNTER, OF STERLING VALLEY, NEW YORK.

FAN.

SPECIFICATION forming part of Letters Patent No. 420,024, dated January 21, 1890.

Application filed March 8, 1889. Serial No. 302,396. (No model.)

To all whom it may concern:

Be it known that I, FREDERICK W. TUERK, Jr., of Syracuse, in the county of Onondaga, in the State of New York, have invented new and useful Improvements in Fans, of which the following, taken in connection with the accompanying drawings, is a full, clear, and exact description.

My invention relates to improvements in fans, and has for its object the production of a simple and effective construction of fan, which is neat and attractive in appearance, and is especially effective and efficient in operation; and to this end it consists, essentially, in a peculiar construction of supporting-bracket for the fan-blades, a novel construction of mechanism for axially rotating the fan-blades, and in the detail, construction, and arrangement of the parts, all as hereinafter more particularly described, and pointed out in the claims.

In describing my invention reference is had to the accompanying drawings, forming a part of this specification, in which like letters indicate corresponding parts in all the views.

Figure 1 is an elevation of an ordinary columnar fan which is driven from below. Fig. 2 is an enlarged detail, partly in section, illustrating in elevation the means for moving an interior rod or bar which is connected to the rod or rack for turning the fan arms or blades. Fig. 3 is an enlarged vertical section of the parts shown in elevation in Fig. 2. Fig. 4 is an enlarged horizontal section taken on line *x x*, Fig. 3, further illustrating the construction of the parts shown in Figs. 2 and 3. Fig. 5 is an elevation of a pendent fan supported upon a bracket or the ceiling of a room. Fig. 6 is an enlarged detail of the lower part of the construction of fan illustrated in Fig. 5, clearly showing the relative construction and arrangement of the disks provided on the inside of the fan blades or arms and the interposed rack for actuating the same. Fig. 7 is a like enlarged detail view, partly in section, illustrating a modified form of the means for turning the fan arms or blades, and Fig. 8 is an enlarged perspective of the rack and spur gears for turning the fan-blades.

Mounted on the floor A or other suitable support is the hollow column or standard B, of suitable material and desirable form, which may be made highly ornamental and attractive in appearance.

Running vertically through the column or standard B is the hollow tube or shaft C, which is preferably, as illustrated, projected through the floor, and is supported at its lower end beneath the floor by a bracket C' of suitable form and construction. Secured beneath the floor A to the lower extremity of said tube or shaft C is the wheel D, to which power is applied from any suitable source, not necessary to indicate or describe in this invention, and by means of which the tube or shaft is driven at the desired speed. Secured to the opposite upper end of the shaft C is the bracket E, of any desirable form and construction, to support the fan blades or arms F, which are also of desirable form and construction, and are preferably provided at their inner ends with a spindle F', journaled in the journal-bearings E' of the bracket E. This bracket E is preferably composed of the main portion E², consisting of like bars inclosing a central opening having its central portion of greater width than its extremities. Supported by said main portion E² are the before-mentioned bearings E', which are rendered extremely rigid by means of bracing-bars E³, which, as shown in the drawings, extend on either side of said bearings in a line parallel with the main body E² and then extend inwardly and connect with said body. As seen in the drawings, the bearings E' are arranged on opposite sides of the center of the main supporting-body E², and the portion of the bracing-rods immediately opposite to said bearings are curved upward, so as to allow the easy entrance of the disk-wheels G, for axially rotating the fan-blades, as will be presently set forth. It will thus be seen that the upwardly-curved portions of the bracing-arms E³ form openings E⁴ in the supporting-frame of the fan, into which said gears are easily inserted, and that said arms partially incase said gears. This particular construction of bracket is extremely light, enables the parts of the fan to be readily as-

sembled, the fan-blade from one side and its actuating-gear from the opposite side, and effects great rigidity of the parts by thoroughly bracing said bearings E'.

5 The bracket E may be provided with a cap e, to present an ornamental appearance, and the lower part of said bracket is preferably provided with a hub e' above the top of the column B, which prevents the entrance of
10 dust and dirt into said column.

On the inner ends of the spindles F' are secured the gear or disk wheels G, and interposed between said gear or disk wheels is the operating-piece for rotating the fan-blades,
15 which piece preferably consists of a rack or bar H, secured to a rod I, of suitable form and construction, passing down the hollow tube for a sufficient distance.

It will be observed that as the shaft C is
20 rotated, as described, the bracket E is also rotated, rotating the fan-blades, and the rack H interposed between the gears G, secured to the separate fan-blades. At a suitable distance from the top of the column or standard
25 B, I provide the lug or lugs b, to which is pivoted the lever J, operated up or down to raise or lower the operating piece or rack H.

The lever J extends to the interior of the standard B, and is formed at its inner end
30 with a yoke J', (shown in Figs. 2 and 4,) which spans around a collar K, sliding rectilinearly on said tube C. The collar K is provided with lugs K' on the outside of the tube C, to which is secured a pin L, which is passed
35 through a slot C² in the tube C, and is also secured to an enlargement or hub I' of the rod I, thus locking said collar K to the rod I and allowing a rectilinear movement of the collar by means of the slot C². The yoke J'
40 is provided with the rollers or studs J³, arranged in pairs at each extremity and impinging or riding upon the upper and lower face of the collar K. When the parts are in the position illustrated in Fig. 2, the lever J
45 is in a horizontal position, and the pin L is midway in the slot C², and the blades are at their midway adjustment. As the handle is depressed to the position illustrated in Fig. 1 and the blades are revolved in the direction
50 indicated by the arrows, the air will be forced downward, creating a considerable movement in the air of the room. As the handle is raised to the horizontal position the throw of the blades will be gradually decreased and
55 the air forced upward with less motion until the blades revolve without agitating the air. As the handle is raised to its uppermost position the blades will be rotated part way around, according to the ratio of the racks
60 and the gears, and the air will be forced upward. This ratio is preferably of such a degree as to change the blades just opposite from their position when the handle is down, so that the blades when the handle is up will
65 throw the air upward with exactly the same force with which they force the air downward when the handle is down.

To so change the blades that the air is thrown upward or downward, as desired, or so that the blades are rotated without agitating the air, is a feature of great advantage,
70 and by revolving the fan-blades when in their horizontal position a room may be cleared of flies without occasioning any draft therein. As the tube C and the rod I are continually
75 rotating, it will of course be seen that there will be a slight friction between the studs or rollers J³ and the bearing-faces of the collar K; but as I preferably use rollers J³, I reduce this friction to a minimum, and the rack is
80 readily operated by the movable rod or strap connected thereto without stopping the action of the fan. This forms a feature of great advantage, since at any time, without changing the speed with which the blades are rotated,
85 the same can be readily shifted so as to vary the force with which they agitate the air, or they can be operated to throw the air either upward or downward, as desired; or the blades can be operated to revolve without agitating
90 the air.

It will be understood that the handle of the pivoted lever J is preferably of sufficient weight to counterbalance the collar K and the yoke J', so that there shall be no tendency of the said lever in either direction; but
95 that the parts by counterbalancing shall cause the lever J to remain in any position to which it is operated.

In Fig. 5 I have shown the actuating rod
100 or shaft C supported in brackets M and M', connected together by tie rods or straps N, with one of these brackets M bolted or otherwise secured to the ceiling or other support, so that the shaft C hangs pendent therefrom.
105 In this construction the bracket E is secured to the lower extremity of the shaft C, and the same is revolved by means of a pulley D, secured to said shaft above the bracket E. The paddles or blades of the fan are in this case
110 arranged exactly as previously described, and the bracket E is of the same form and construction to that also previously described, with the exception that the hub e' of the bracket, through which passes the rod secured
115 to the rack, is at the top instead of the bottom of said bracket.

By reference to the drawings, especially Figs. 6, 7, and 8, it will be apparent that the peculiar construction of my fan causes the
120 spindles F' to be offset from each other, or to be on either side of a perpendicular drawn through the center of the fan, and by this means the fans are not exactly radial, but are in lines on either side of the center, and
125 preferably parallel with each other, which construction allows the operating-piece or the rack or bar to be interposed between the disk or gear wheels for the purpose of rotating the fans in the same direction to change the
130 throw thereof.

As shown in the drawings, and especially in Figs. 5 and 6, the rack H is provided with side walls H' at the edges of its teeth, which

walls lap over the sides of the teeth formed upon the gear-wheels. Experience has demonstrated that in order to produce the best results the fan-blades should be revolved with great ease, as when the same are adjusted when being quickly rotated there should be no liability of injury to the operator. I have also found that in order to insure easy movement of the rack it is absolutely necessary that the same be retained in its designed position, and that when the fan is being revolved the centrifugal force has a constant tendency to disengage said rack, especially if the parts are not closely fitted. These side walls H', which bear against the opposite sides of the separate gears G effectually prevent the disengagement of the said rack and gears, and thus insure its perfect operation and easy movement up and down, which is a feature of great advantage. Moreover, by the use of the side walls I obviate guiding the bracket at its upper part, which, as the same has an up-and-down movement, would be a feature of considerable disadvantage, necessitating additional cost and greater friction in operation.

As shown in Figs. 6, 7, and 8, an oil-cup O is loosely mounted on the lower extremity of the rod I, so as to be free to turn readily thereon. By grasping the cup O the rack H may be readily raised or lowered, partly revolving the gears G in precisely the same manner previously described, and as the cup is loose upon the lower end of the rod I the hand of the operator holds said cup stationary while the rod I is revolved with the fan, thus allowing the blades of the fan to be varied without stopping their motion.

In Fig. 7 I have shown secured to the inner ends of the spindle E of the fan-blades two disk wheels, which are provided on their peripheries with a band of rubber or other flexible material. In this case the operating-piece H consists of a flat bar, which is interposed between the two peripheries of the disk wheels, and is so arranged that the band P, of flexible material, is slightly compressed, so that by raising or lowering the bar H by the raising or lowering the rod I, secured thereto, the friction between the contacted surfaces of said bar and the bands P is sufficient to rotate the wheels G.

The operation of my invention will be readily perceived from the foregoing, and it will be understood that instead of two blades arranged oppositely to each other, as shown, more than two might be used which would be at an angle with each other, by forming the rack or bar so that the same would be provided with a face bearing against the gear or wheel provided upon the inner ends of the fan-blades. It will be understood that if desired the fan-blades might be provided with plain disk wheels, the peripheries of which should contact with an interposed bar of flexible material, whereby sufficient friction would be obtained to rotate the disks by the raising

or lowering of the said bar of flexible material. It is obvious that there are also other changes and relative constructions and arrangements of the parts other than those described and shown, which might be used without departing from the spirit of my invention.

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

1. In a fan, the combination of the frame E, having a bearing E' on one side of said frame, and having a cut-out or opening E⁴ in said frame directly opposite to said bearing E', with a gear adapted to enter said opening and be incased in said frame, a spindle provided on said gear and journaled in the bearing E', a fan-blade secured to said spindle, and a rack engaging said gear for revolving said fan-blade, substantially as specified.

2. In a frame for fans, the combination of the main body E² on either side of a central opening, the separate bearings E', projecting laterally from said main body and arranged one on each side thereof and on opposite sides of the center, and the bracing-arms E³ on either side of said portion E² and extending upwardly from one of said bearings E', then downwardly and inwardly to the main body, substantially as and for the purpose set forth.

3. In a fan, the combination of the main body E² of the frame, having a central opening, separate bearings E', projecting laterally from said main body and arranged one on either side thereof and on opposite sides of the center, and bracing-arms E³ on either side of said main portion and extending upwardly from said bearings and then downwardly and inwardly to the said main body, with a gear adapted to be mounted in said opening of said frame and beneath the upward or curving portion of the bracing-arm E³, a spindle provided on said gear and adapted to be journaled in the bearing opposite to said upwardly-curved portion of said bracing-arm, and a fan-blade secured to said spindle, substantially as and for the purpose set forth.

4. In a fan, the combination of a frame, fan-blades on opposite sides of said frame, gears secured to the inner ends of said fan-blade for rotating them axially, a rack engaging said gears and provided with the side walls lapping upon the gears for preventing twisting and displacement of the said rack, and a depending rod or bar for operating said rack, substantially as and for the purpose set forth.

5. In a fan, the combination of the main body E² of the supporting-frame, bearings E', arranged on opposite sides of the center and on either side of said frame, and bracing-arms extending upwardly from said bearings and then downwardly and inwardly to the said main body, gears mounted beneath said upwardly-extending portion of the bracing-arms, spindles provided on said gears and journaled in the bearings E' opposite to the upturned portion of the bracing-arms, fan-blades secured to said spindles, and an operating-

rack interposed between said gears and provided with side walls for lapping upon the opposite sides of said gears and preventing displacement of the rack, substantially as and
5 for the purpose set forth.

6. In a fan, the combination of a tube or hollow shaft having fan-blades secured thereto, wheels secured on the inner ends of the fan-blades, a projecting rod having its upper
10 end provided with means, substantially as described, for rotating the said wheels, a collar sliding on the outside of said tube and secured to said projecting rod, and an oscillating handle for operating said collar, substantially as and for the purpose specified.
15

7. In combination, revoluble fan-blades, a hollow shaft for rotating said blades, a sliding operating-piece connected, substantially as described, to axially rotate said blades, a
20 rod projecting from said operating-piece, a loose collar on the outside of said shaft, a pin connecting said rod and collar, and a slot in the shaft for allowing the movement of said connecting-pin when the fan-blades are axially rotated, substantially as and for the purpose specified.
25

8. In combination, the blades of a fan, a shaft for rotating said blades, wheels secured to the adjacent ends of said fan-blades, an operating-piece H for rotating said wheels, a
30 depending rod I, sliding rectilinearly in a cavity in the operating-shaft for the fan-blades, a collar sliding up and down loosely upon the actuating-shaft, said collar being connected, substantially as described, to the
35 rod I, and an oscillating lever provided with oppositely-arranged bearing-points contacting with the top and bottom faces of said sliding collar, substantially as and for the purpose specified.
40

In testimony whereof I have hereunto signed my name, in the presence of two attesting witnesses, at Syracuse, in the county of Onondaga, in the State of New York, this 6th day of March, 1889.

FREDERICK W. TUERK, JR.

Witnesses:

A. E. PARSONS,
CLARK H. NORTON.