(No Model.)

J. ARTHUR.

FAN.

No. 507,253. Patented Oct. 24, 1893.

Fig. 1.

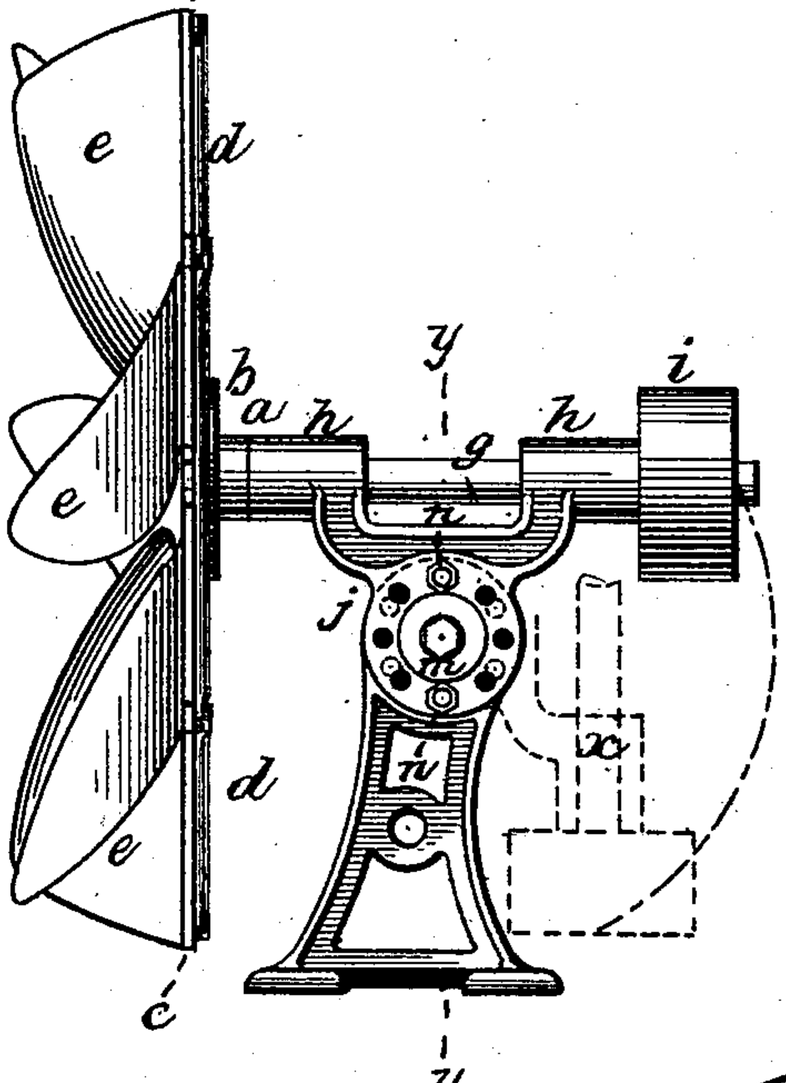


Fig. 2.

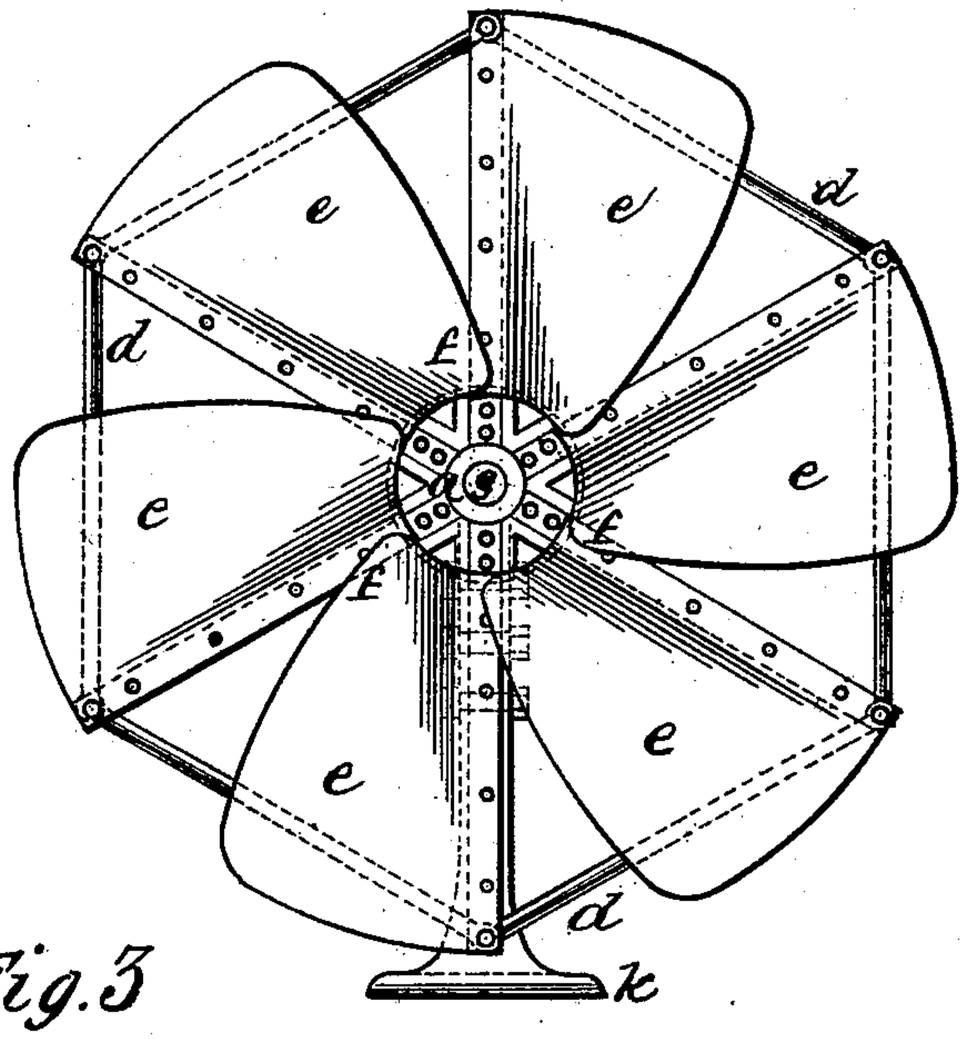


Fig. 3

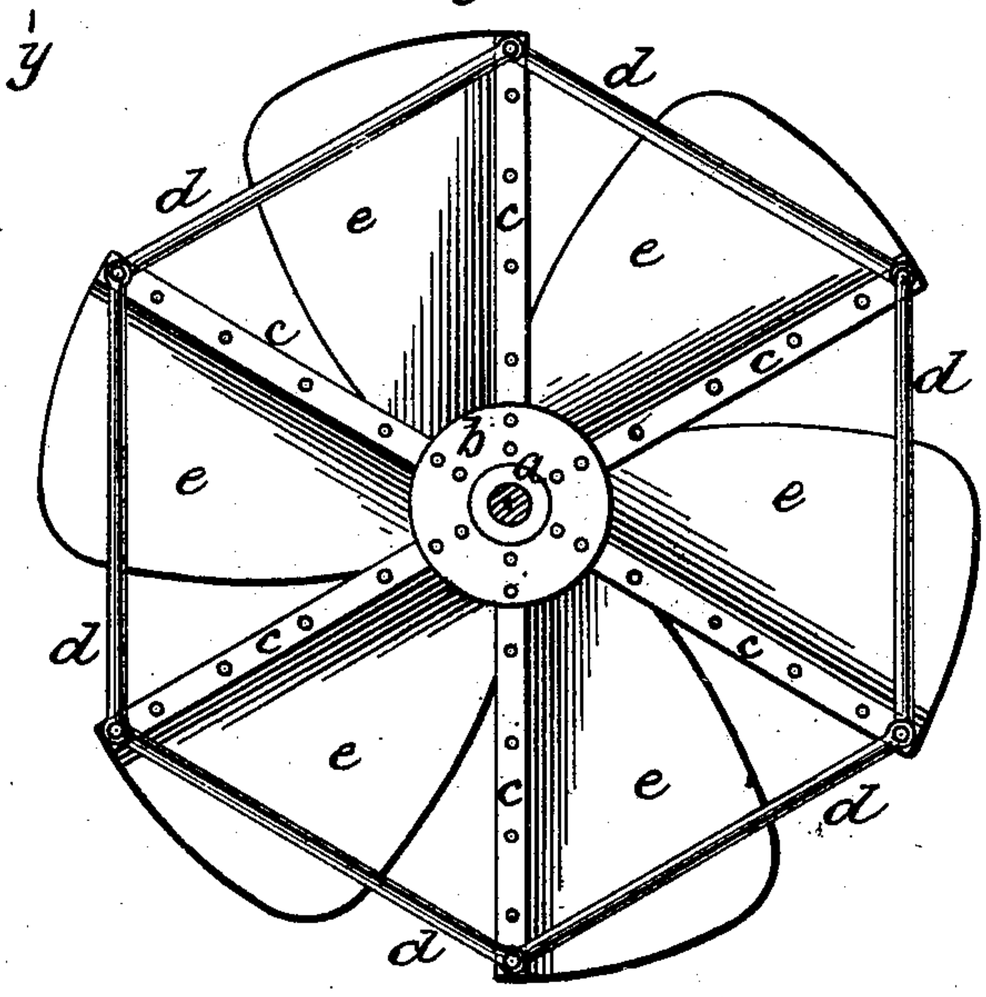


Fig. 4

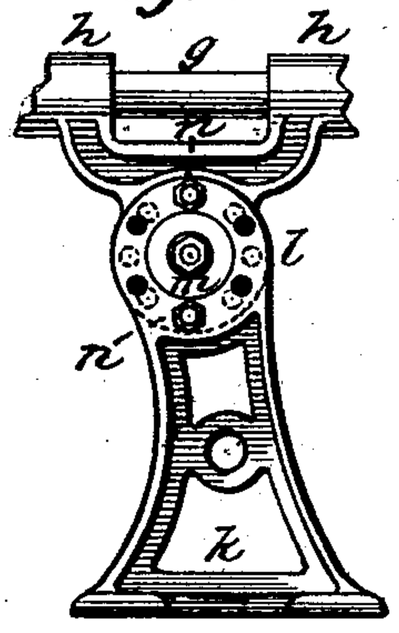
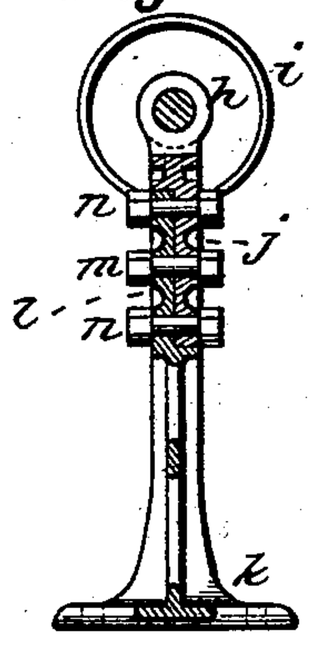


Fig. 5.



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SPECIFICATION forming part of Letters Patent No. 507,253, dated October 24, 1893.

Application filed August 3, 1892. Serial No. 442,035. (No model.)

To all whom it may concern:

Be it known that I, JAMES ARTHUR, a citizen of the United States, and a resident of Jersey City, county of Hudson, State of New Jersey, have invented certain new and useful Improvements in Fans, of which the following is a specification.

The rotary fan forming the subject matter of this invention embodies new features of construction, whereby it is made very strong and rigid and of light weight, being adapted to be carried in a light standard frame provided with an adjustable joint, by means of which the fan may be set and securely held at various angles, with its axis between vertical and horizontal positions.

The fan wheel consists of a flanged hub, light metal arms radially secured to the flange of the hub, straight rods connected to and bracing the ends of the arms, and vanes or blades made of sheet metal, bent into the desired form and fastened by means of rivets at one of their edges to the arms. These vanes are so shaped that the free part of the inner end of each one extends beyond or overlaps the fixed edge of the preceding one. Said overlapping parts of the vanes extend some distance from the center of the fan, and with the flange of the hub closes the central part of the fan wheel, thus overcoming the objection due to the central back draft produced by rotating fans having an open space at their central parts.

To enable the fan to be set in different angular positions the part of the frame provided with the bearings for the wheel shaft is connected to the base or lower part by a flat circular joint having a central pivot, and a series of holes in each part of the joint arranged concentrically to the pivot; the holes in the one part or member of the joint being greater in number than those in the other member, so that by a proper arrangement of the holes in the one member over or in line with the holes in the other member of the joint the fan may be set in any desired position, and securely held by bolts passed through the contiguous holes of the two members of the joint. But to describe my invention more particularly I will now refer to the accompanying drawings forming part of this specification, in which—

Figure 1 is a side elevation of my improved fan. Fig. 2 is a front view of the same. Fig. 3 is a rear view of the fan wheel. Fig. 4 shows the reverse side of the adjustable joint, and Fig. 5 is a transverse section of the frame through the center of the joint, on the line *y y* Fig. 1.

The hub *a*, of the fan wheel is provided with the flange *b*, in which are formed radial grooves, and the arms *c*, *c*, formed of flat bar metal, are by means of rivets secured in these grooves. The adjacent arms *c*, *c*, are connected together at their outer ends by the straight rods *d*, *d*, said rods being preferably made of round bar metal flattened and punctured at their ends to admit of their being readily secured to the ends of the arms *c*, *c*, by means of rivets. This arrangement of a central hub and bars of metal forms a light, strong, rigid, and cheap structure for carrying the vanes *e*, *e*, of the fan. These vanes are made of sheet metal having one straight side at which they are firmly secured by means of rivets to the arms *c*, *c*. These edges are the leading or forward edges of the fan and are by the flat arms *c*, *c*, greatly reinforced. All of the other boundary lines are of curvilinear form, the essential novelty in their shape being that their free ends *f*, *f*, extend over and beyond the inner ends of the straight edges of the adjacent vanes, as shown at Fig. 2, thus with the hub *a*, avoiding any opening at or near the center of the wheel for back draft action of air. The wheel is, by its hub *a*, secured to one end of the shaft *g*, which is fitted to rotate in the bearings *h*, *h*, of the frame, and to the other end of this shaft is secured the driving pulley *i*.

The frame is made in two parts and the bearings *h*, *h*, are integral with the upper part which also includes the member *j*, of the vertical flat circular joint or hinge. The lower part of the frame contains the base *k*, and the other member *l*, of the hinge. Each member of the hinge has a central hole through which is passed the pivot bolt *m*, and a series of holes concentric with the central holes, the number of holes in the one series being greater

than that in the other series. As shown in this particular case the member *j*, has six holes and the member *l*, has eight holes. This admits of the fan wheel shaft being set in seven different positions including the horizontal position shown in Figs. 1 and 2, and the vertical position shown by the dotted lines *x*, Fig. 1. Two pairs of holes in each of these seven positions are in alignment, and through such holes the bolts *n*, *n*, are passed, which, upon their nuts being screwed home firmly clamp the two members of the hinge together, thereby securely holding the fan in the angular position corresponding to the coinciding holes selected. In the horizontal position of the shaft the holes on the vertical diameter coincide, as shown in the drawings, and when the shaft is set in a vertical position the holes on the horizontal diameter will coincide. This exact and proportionate number of holes in the two members of the hinge is not material to this part of my invention, and the number of holes in the two series may be varied as desired.

In the drawings the device is shown as a standard fan, but it is evident that it may, by its base, be secured to a wall or ceiling, located in any desired place and set in any position.

Having now described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In a fan wheel, in combination, a central flanged hub, radial arms secured to the flange of the hub, straight bracing bars fastened to and connecting the outer ends of adjacent arms, and vanes secured at one of their radial edges to the arms, and having their other edges free.

2. In a fan wheel, in combination, a central flanged hub, radial arms secured to the hub, straight bracing bars fastened to and connecting the outer ends of adjacent arms, and curved vanes secured at one of their radial edges to the arms, each of said vanes having the free part of its inner end so formed as to project over the fixed part of the inner end of the adjacent vane, thereby closing the central part of the fan, as and for the purpose set forth.

In testimony that I claim the foregoing as my invention I have signed my name, in presence of two witnesses, this 1st day of August, 1892.

JAMES ARTHUR.

Witnesses:
JOHN F. ARTHUR,
DANL. ARTHUR.