

(No Model.)

A. HUN-BERRY.
VENTILATING FAN.

No. 582,168.

Patented May 11, 1897.

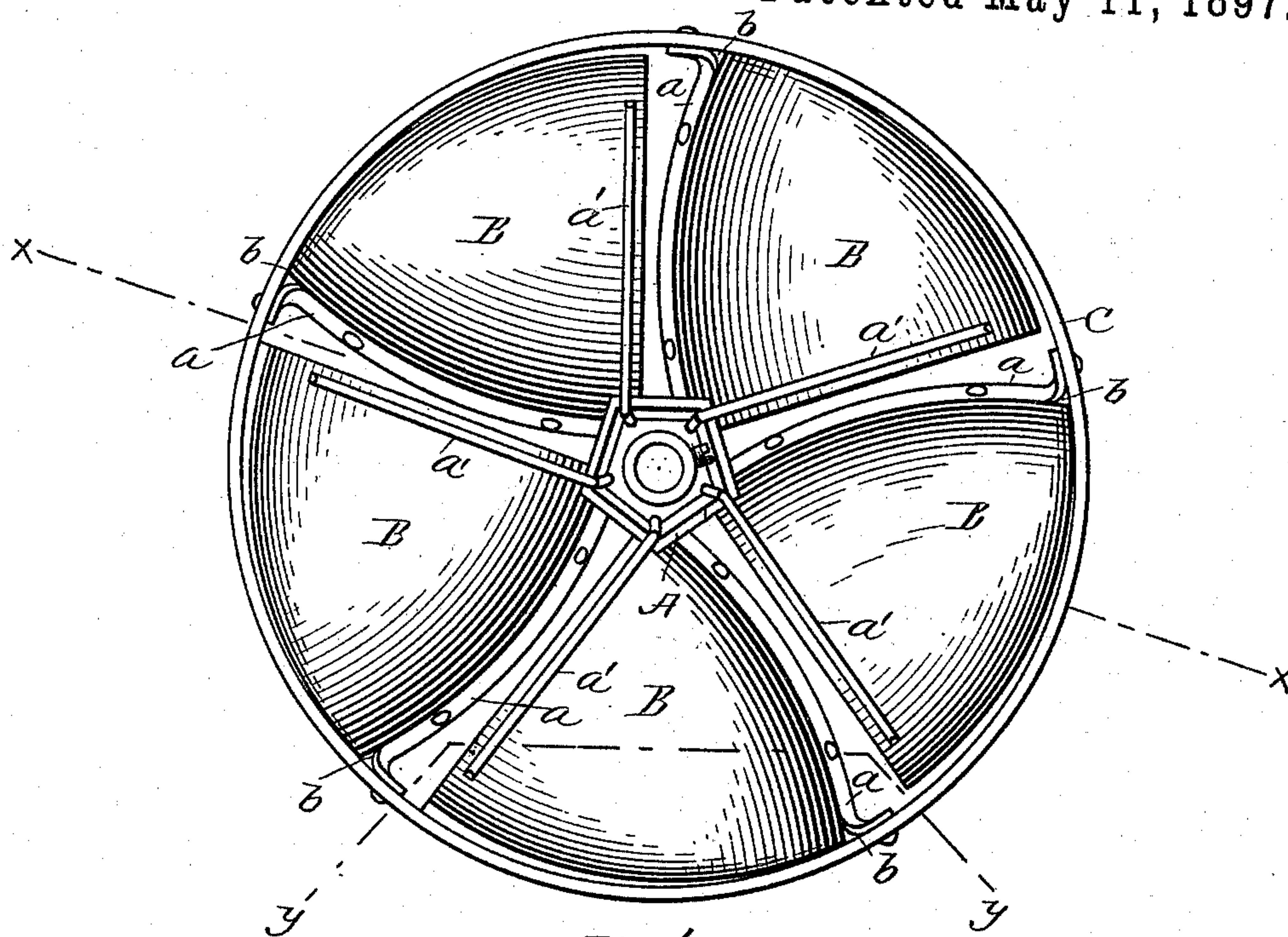


FIG. 1.

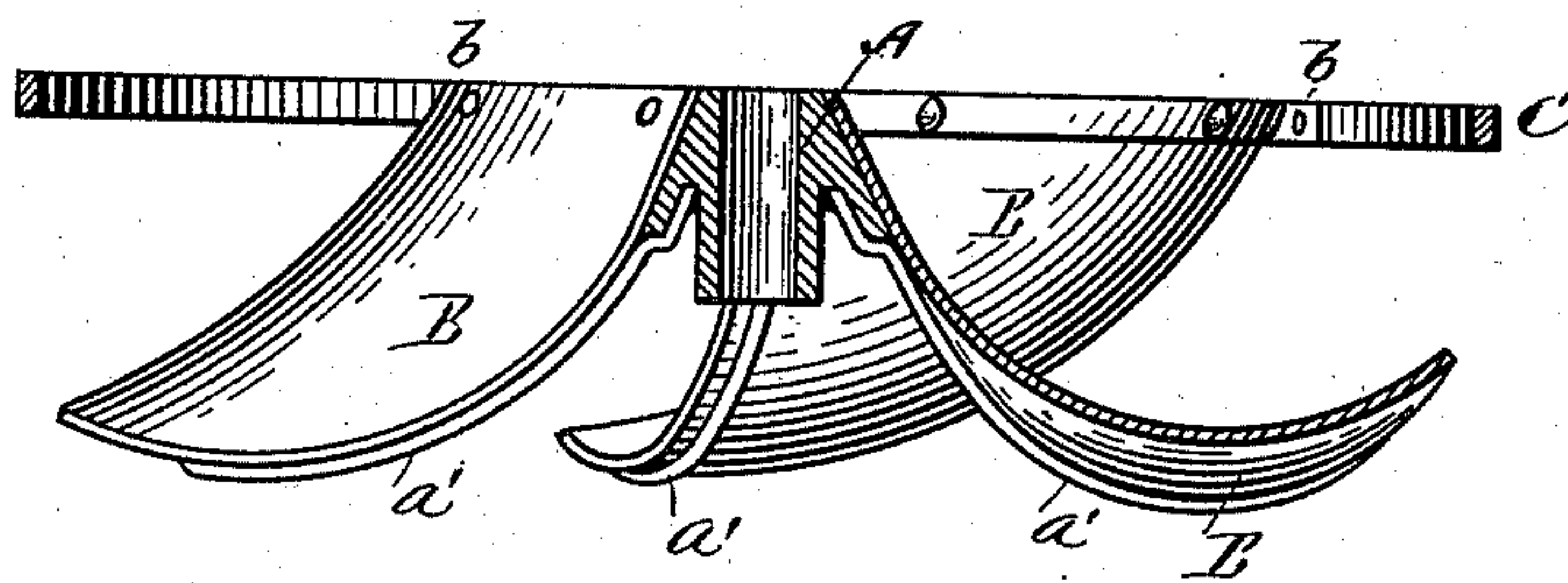


FIG. 2.

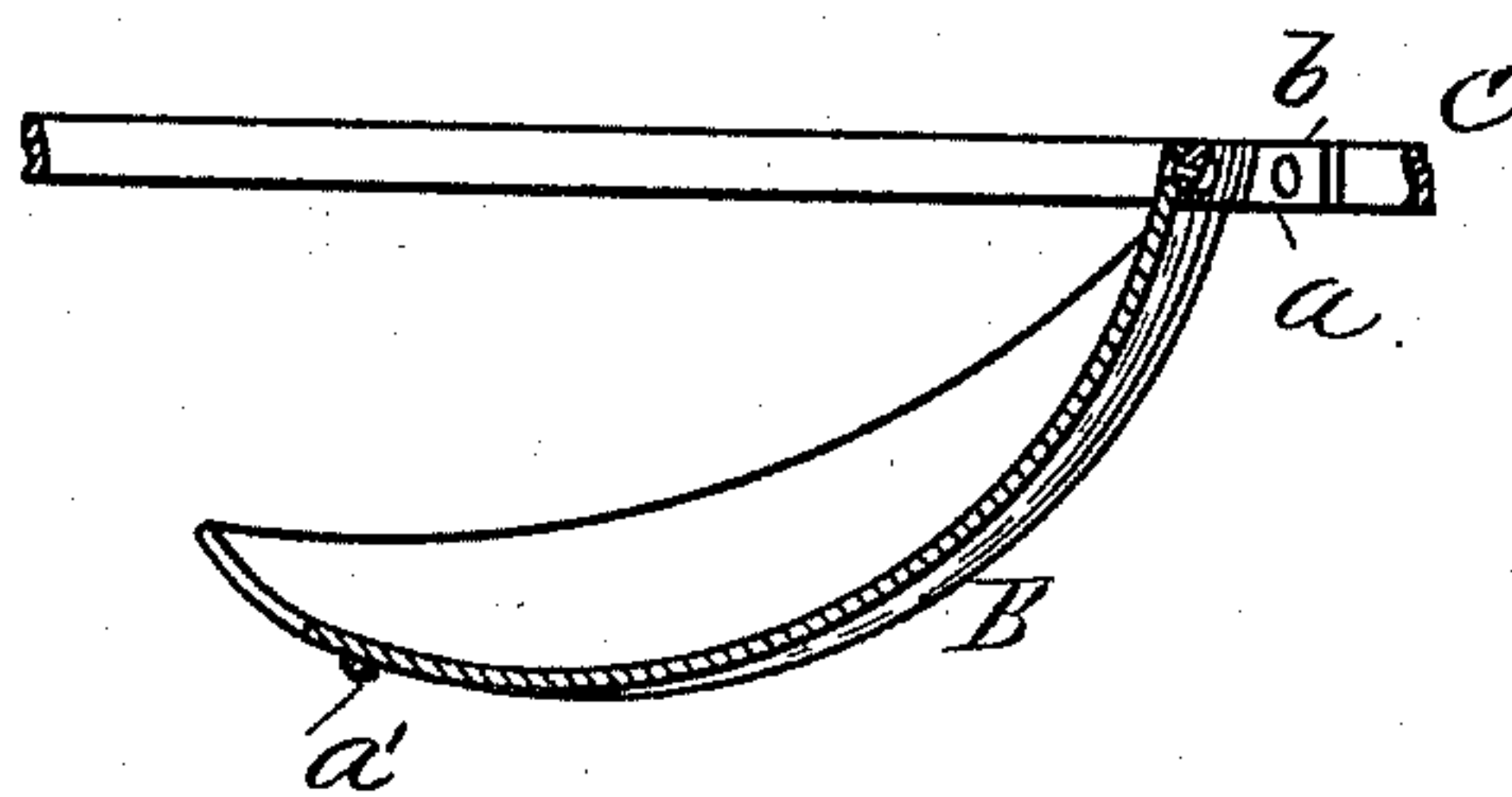


FIG. 3.

WITNESSES

Frank H. Parker,
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INVENTOR

Abraham Hun-Berry
By Geo. O. G. Brown
his attorney.

UNITED STATES PATENT OFFICE.

ABRAHAM HUN-BERRY, OF WALTHAM, MASSACHUSETTS.

VENTILATING-FAN.

SPECIFICATION forming part of Letters Patent No. 582,168, dated May 11, 1897.

Application filed August 9, 1896. Serial No. 558,756. (No model.)

To all whom it may concern:

Be it known that I, ABRAHAM HUN-BERRY, of Waltham, in the county of Middlesex and State of Massachusetts, have invented a new and useful Improvement in Ventilating-Fans, of which the following is a specification.

My invention relates to that class of fans in which there are a number of blades set radially upon a hub; and it consists in giving to those blades a curved or scoop-like shape, whereby they will move through the air with comparatively little resistance and at the same time will direct the air in the desired direction with comparatively little waste.

In the drawings I have shown one form of fan embodying my invention, Figure 1 being an elevation, and Fig. 2 a horizontal section on line *xx* of Fig. 1. Fig. 3 is a section on line *yy* of Fig. 1.

A is the hub, to which is attached a series of ribs *a a'*. B B are the blades, which are attached to the hub A and to the ribs *a a'*. In the form of fan shown the rear outer corners *b* are carried out to meet a rim C, which in this case makes the periphery of the fan and forms a part of its back face. This rim is useful for the purpose of bracing the fan in connection with the ribs *a*, maintaining the rear edges of the blades always in the same relation to each other, but when the blades are made of sufficiently stiff material or where a sufficient number of ribs *a'* are used with each blade the rim C may be dispensed with.

The blades, as shown, are composed of triangular pieces of sheet metal, which are given what may be called a "concavo-convex" or "curved" form, and are set radially upon the hub, but at an angle thereto, so that the advancing edge of each blade as the fan rotates enters and cuts the opposing air, a portion of which slides, as it were, through the fan without meeting with any material resistance or offering any material resistance to the rotation of the blade. Moreover, as the blade is "bellied," so to speak, the tendency of the air cut off by it is to pass back through the fan rather than escape out peripherally, as if by centrifugal force, and hence, except in locations where the pressure on the rear or flat side of the fan

is too great, this fan can be substituted for that class of fans in which a hood or cover is provided joining the blade with the rim. Under such circumstances there is, in fact, an increase of efficiency over the class of hooded fans, for when the blades are constructed as shown in the drawings and the escape of air from the rear of the wheel is substantially free the current of air which passes back through the fan will tend to draw in air through its open periphery, so that the volume of air moved through the fan will be greater than in a fan of corresponding diameter in which the periphery is closed. Thus I have found this fan a great improvement over all fans used for that class of work in which there is a comparatively free escape through the fan for the air moved by it.

It is evident that the exact shape of the blades is immaterial so long as they are "concavo-convex," by which term I mean that they are curved in at least two directions—*i. e.*, on the radial line of the fan and on a line substantially at right angles thereto—so that they are bellied substantially like the sail of a vessel in distinction from the blades of the ordinary flat or paddle-blade fans, in which the blades are made of flat surfaces arranged radially about a hub.

As shown, the rear outer corner of each blade is attached to the rib *a* near where it and the rim are attached together, but the blade and rim may be directly attached, if thought best.

I am aware of Letters Patent No. 507,253, granted to James Arthur October 24, 1893, for an improved fan and disclaim the invention therein described.

What I claim as my invention is—

1. The ventilating-fan above described, consisting of a series of concavo-convex blades mounted radially upon a hub, the outer ends of said blades being curved slightly toward the rear of the fan and yet being substantially open whereby a free passage of air through the periphery toward the center of the fan will be allowed, all as set forth.

2. The ventilating-fan above described consisting of a series of concavo-convex blades mounted radially upon a hub, in com-

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bination with a rim, each blade reaching out
to said rim and being connected thereto at
its rear outer corner, its outer edge lying at
an angle thereto whereby a peripheral open-
5 ing is provided for the passage of air, and
the air so received is directed toward the rear
face of the fan, all as set forth.

In testimony whereof I have hereunto set
my hand this 8th day of August, 1895.

ABRAHAM HUN-BERRY.

Witnesses:

GEORGE O. G. COALE,
EVA A. GUILD.