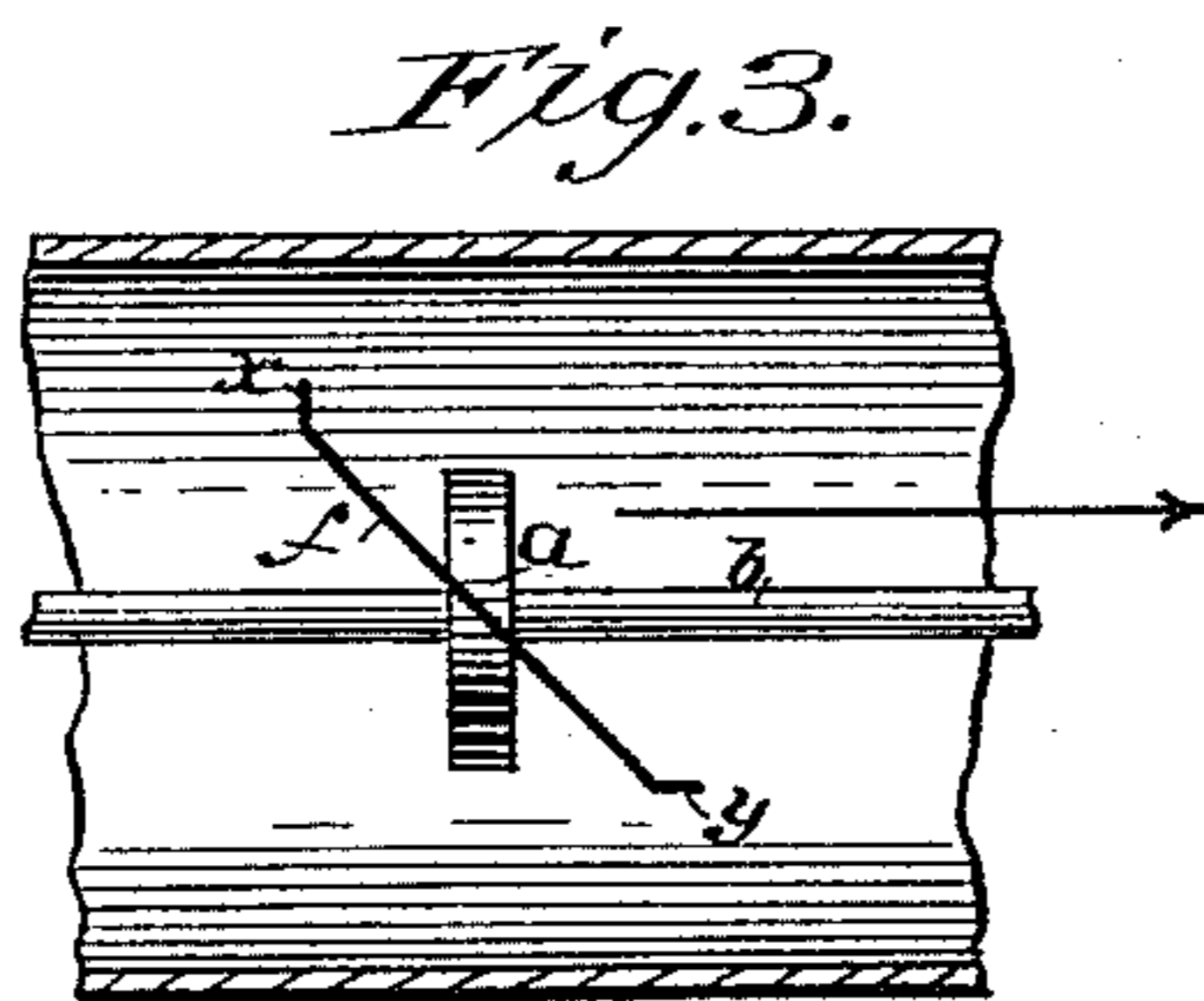
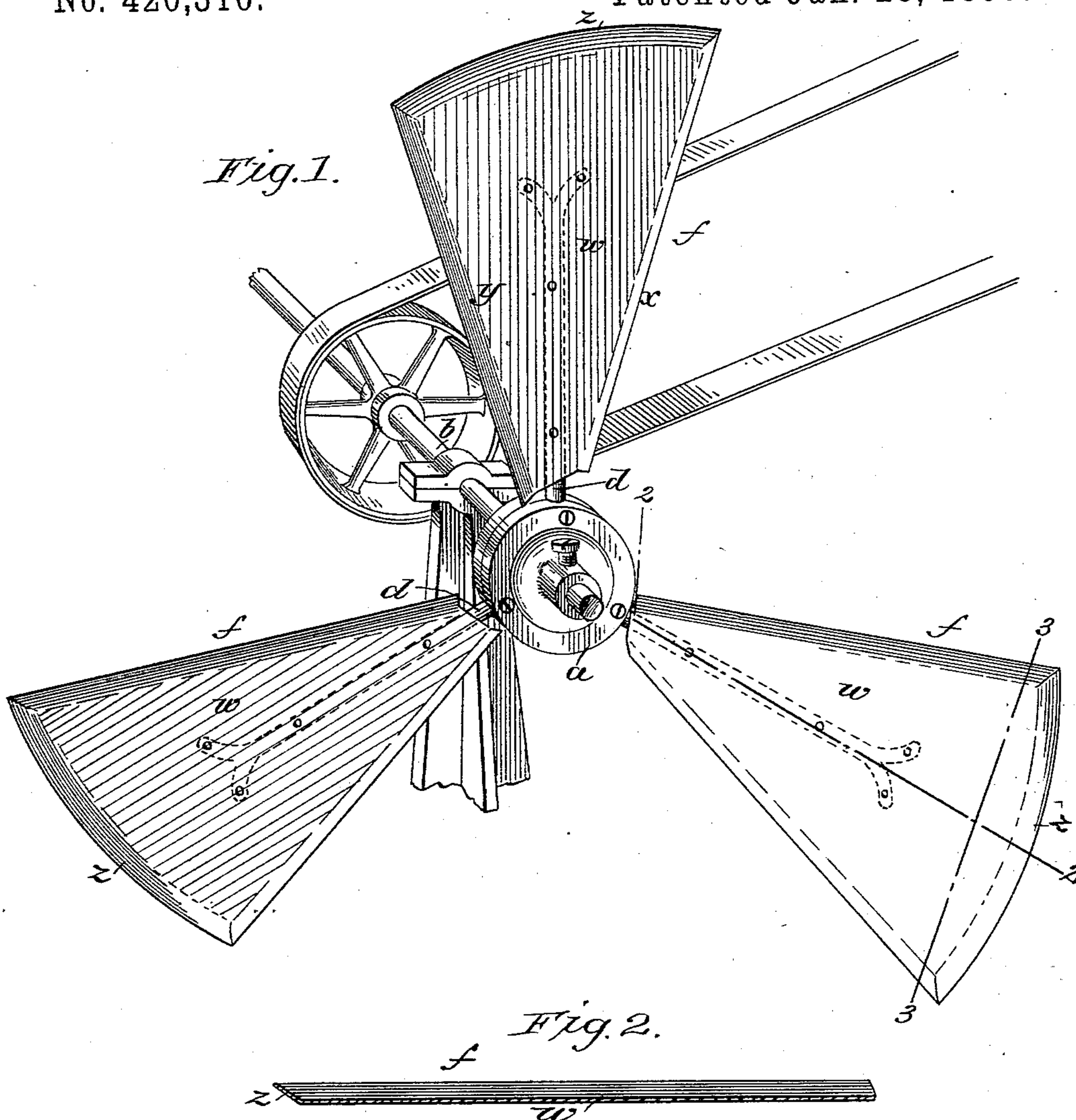


(No Model.)

B. F. PERKINS.
ROTARY FAN.

No. 420,310.

Patented Jan. 28, 1890.



Witnesses:

J. D. Garfield
Wm. J. Bellows

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UNITED STATES PATENT OFFICE.

BENJAMIN F. PERKINS, OF HOLYOKE, MASSACHUSETTS.

ROTARY FAN.

SPECIFICATION forming part of Letters Patent No. 420,310, dated January 28, 1890.

Application filed June 25, 1889. Serial No. 315,526. (No model.)

To all whom it may concern:

Be it known that I, BENJAMIN F. PERKINS, a citizen of the United States, residing at Holyoke, in the county of Hampden and State of Massachusetts, have invented new and useful Improvements in Rotary Fans, of which the following is a specification.

This invention relates to improvements in rotary fans, the purpose thereof being to secure an improved construction of blade, whereby such blade is of the utmost strength and rigidity, and whereby in the use of the fan the greatest possible air-current may be produced; and the invention consists in a rotary fan having peculiarly-formed blades, all substantially as will hereinafter more fully appear, and be set forth in the claims.

In the accompanying drawings, in which a fan constructed in accordance with this invention is illustrated, Figure 1 is a perspective view of the fan. Fig. 2 is a longitudinal sectional view of one of the blades; and Fig. 3 is a view in the nature of a diagram to illustrate the air-forcing action of a fan-blade with relation to the length of the usual cylindrical casing, which in this figure is also shown, the same in Fig. 1 having been omitted.

The fan A comprises a hub *a*, mounted on the driving or driven shaft *b*, the arms *d*, radially projecting from said hub, and the fan blades or wings *f*, secured on said radial arms and arranged in a plane oblique both to the axis and the plane of rotation of the fan. Each blade is of quite a slight width at its end near the hub, whence it widens to its outer end, which end is preferably of arc form, as shown. Both side and outer end portions of the fan-blade are bent to one side angularly to the plane of the intermediate and major portion *w* of the blade, the turned-up forward edge portion *x* of the blade, as particularly shown in the view, Fig. 3, standing and moving substantially in or parallel with the plane of rotation of the fan, while the turned-up portion *y* at the rear edge of the blade stands at a still greater angle to the plane of rotation of the fan than does the blade proper, or, in other words, it stands at

or nearly at a right angle to the plane of rotation of the fan.

With reference to Fig. 3 it will be seen on noting the formation of the fan-blades and their relation to the axis and plane of rotation of the fan and to the longitudinal passage through the cylindrical fan-closing casing, the axis of which is coincident with that of the fan, that the forward edge portion *x* of each blade, being inclined into the plane of rotation, sharply cuts the air, permitting an unobstructed and easy movement. The inclined side of the blade then forces the air outwardly toward the open end of the cylinder, and, instead of a considerable portion of the air propelled by said obliquely-arranged fan-blade being sheared off obliquely against the inner side of the inclosing cylindrical casing by the rearward edge *y* of the blade inclined into the direction of the axis and at right angles to the plane of rotation, the air is forced out of the cylinder in a direction substantially parallel with the axial line of the fan, and the turned-up end portion *z* of the blade, the inclination of which tends toward the plane of rotation, as does the forward edge *x*, renders the blade the better adapted to cleave the air in its forward rotary motion and insures a gradual guiding of the air upon the propelling portion of the blade comprised in the said intermediate portion *w* and the rearwardly-inclined edge *y*.

Besides the increased efficiency of the blade for the purpose of forcing air, due to the blade being formed from a single piece of metal having its edge portions at its sides and outer end turned up, from such construction also ensues a greatly-increased rigidity of the blade, and under such construction the blades may be made of very thin sheet metal and yet possess such stiffness as will withstand all pressure to which they may be subjected.

What I claim as my invention is—

1. A rotary fan having its blades set obliquely to its axis and having the forward longitudinal edge portion of each blade turned toward or into the plane of rotation of the

fan, and having its rear edge turned at a greater angle to the plane of rotation than is the principal intermediate portion of the blade, substantially as described, and for the purpose set forth.

5 2. A rotary fan having its blades set obliquely to its axis, and having the forward longitudinal edge portion and end portion of each blade turned toward or into the plane of

rotation of the fan, and having its rear edge 10 turned at a greater angle to the plane of rotation than is the principal intermediate portion of the blade, substantially as described, for the purpose set forth.

BENJAMIN F. PERKINS.

Witnesses:

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