

(No Model.)

2 Sheets—Sheet 1.

A. H. BERRY.

FAN BLOWER.

No. 370,920.

Patented Oct. 4, 1887.

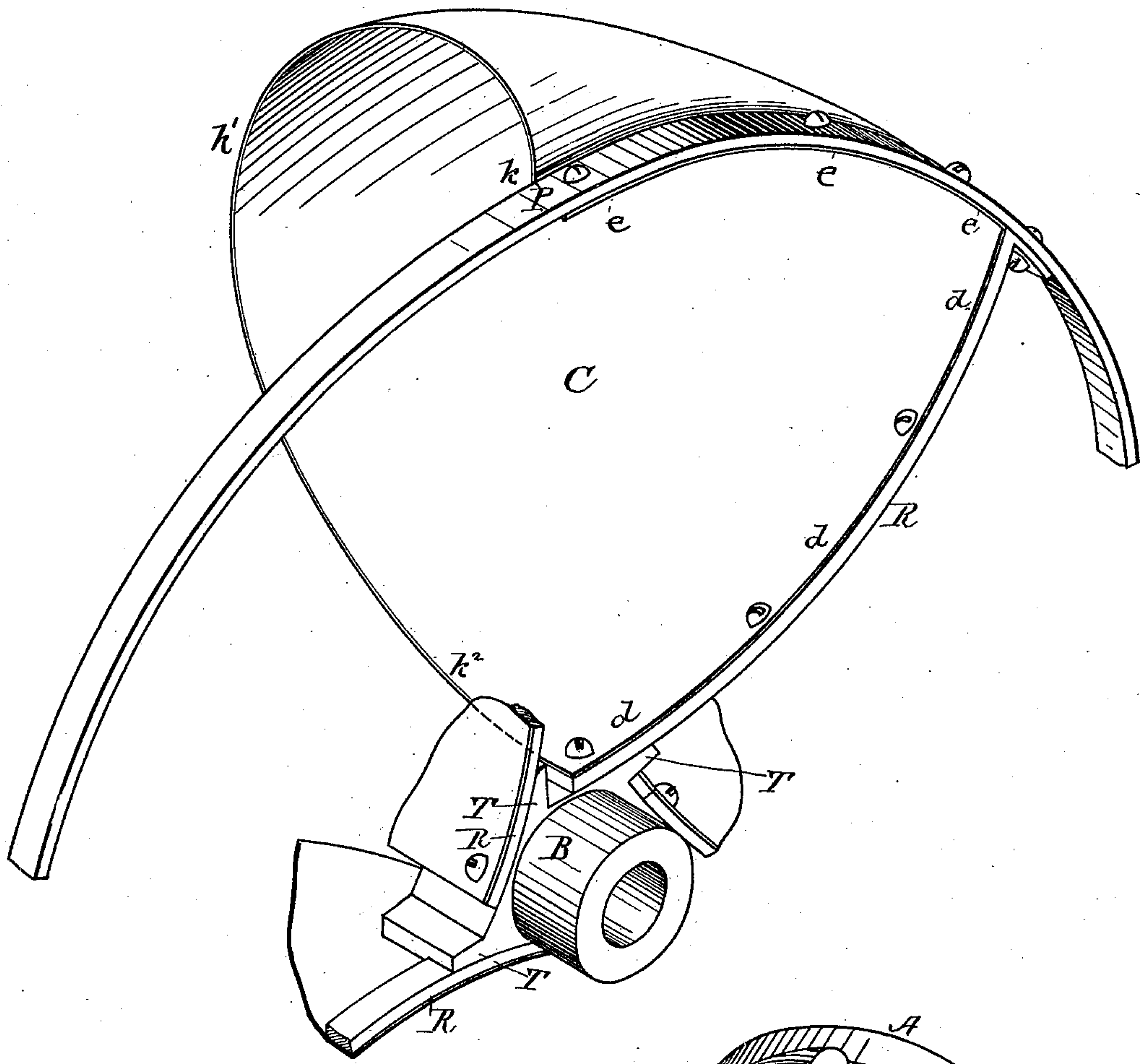


Fig. 2.

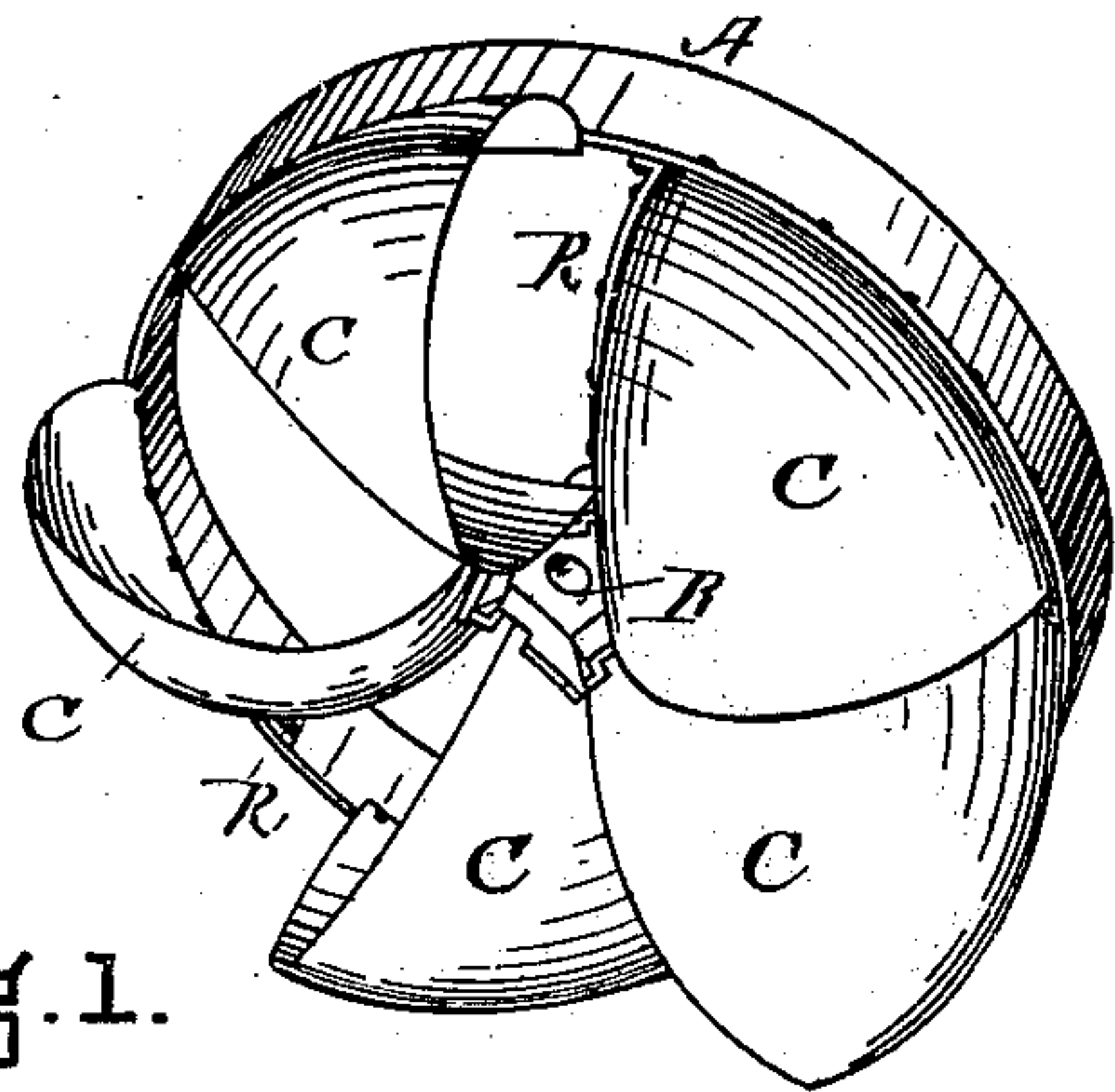


Fig. 1.

WITNESSES.

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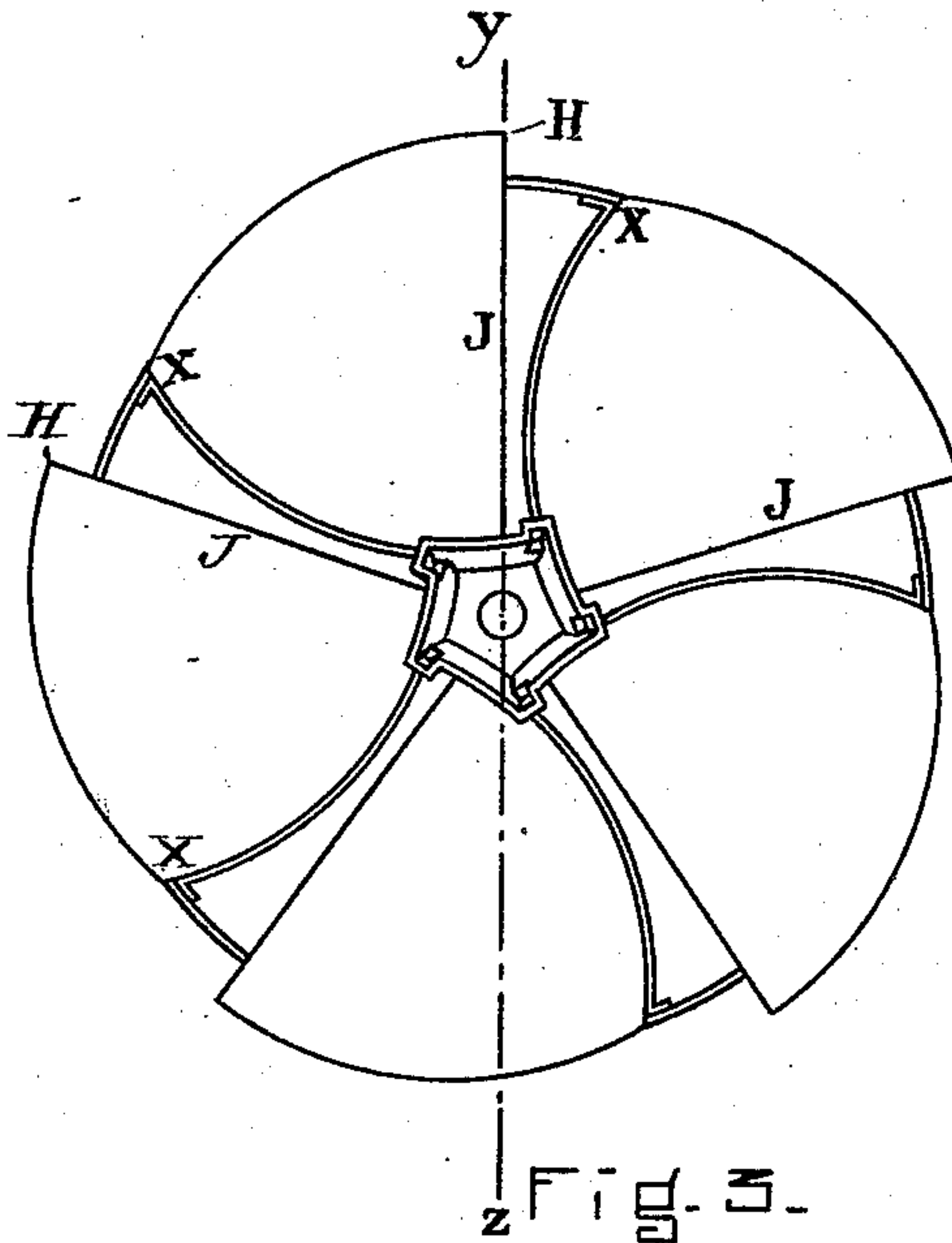


Fig. 3.

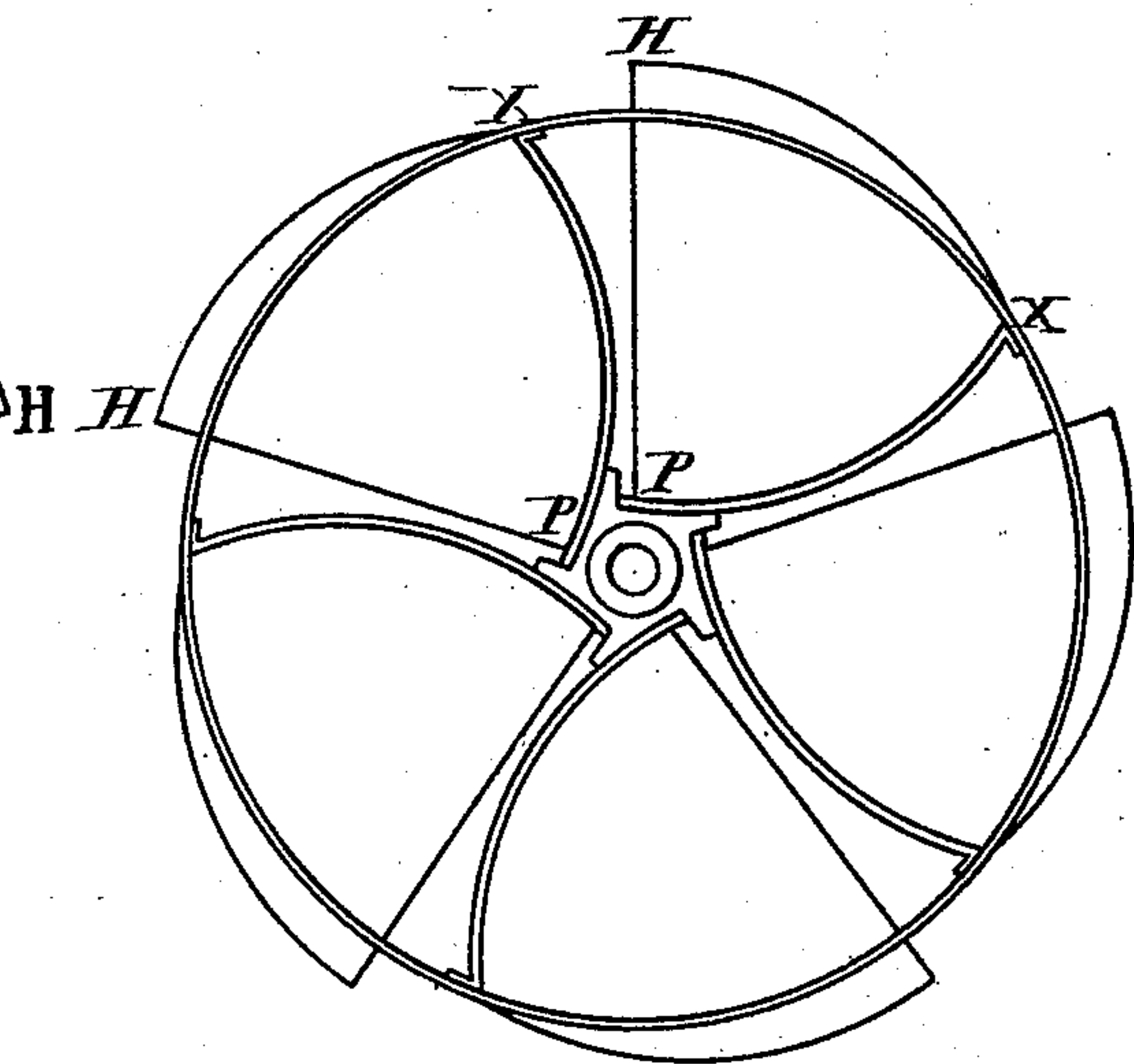


Fig. 4.

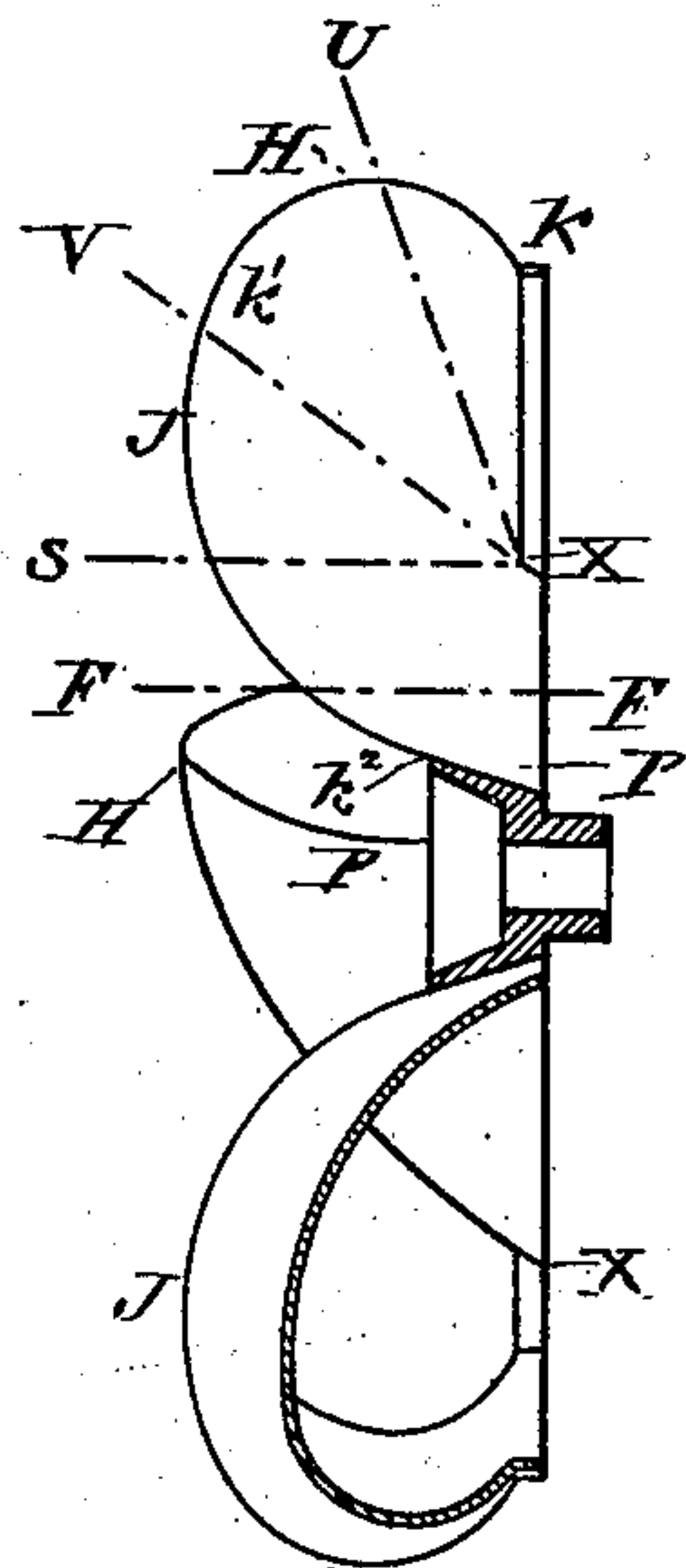


Fig. 5.

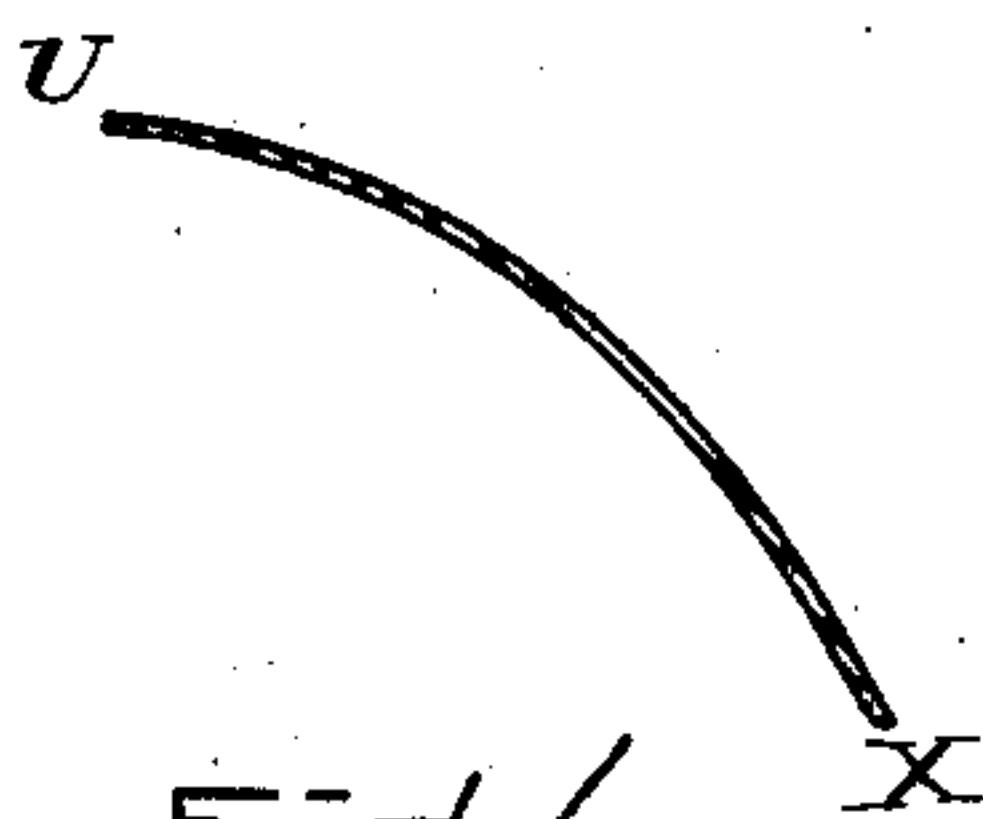


Fig. 6.

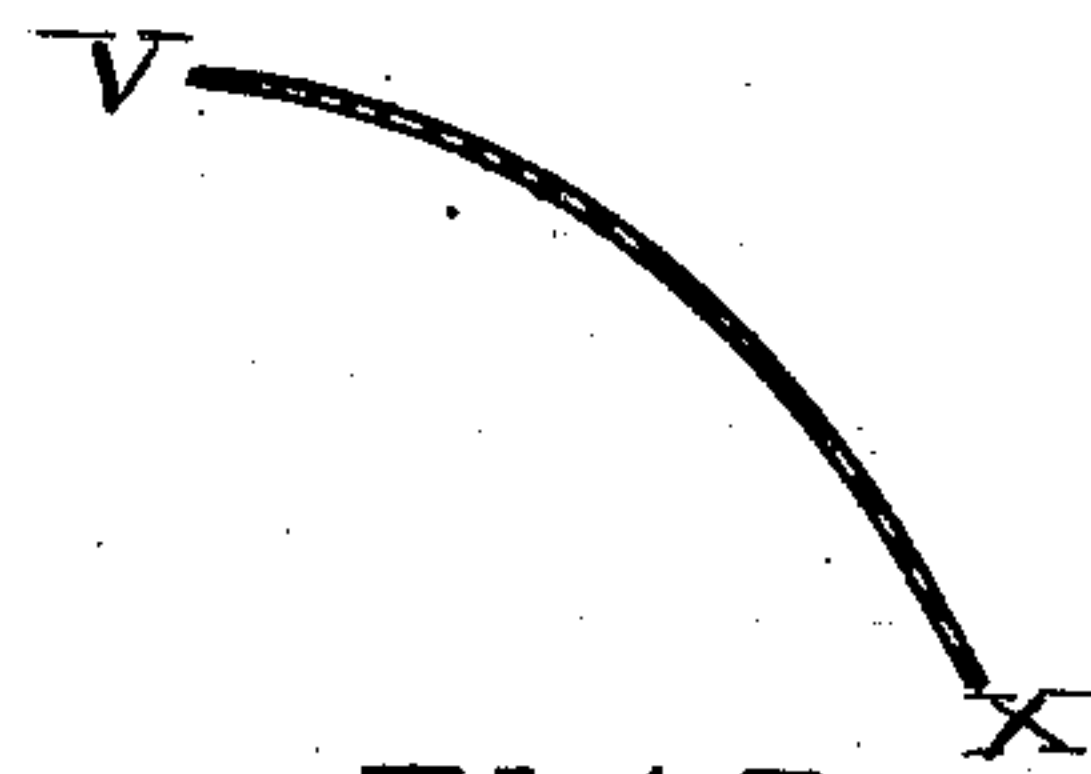


Fig. 7.

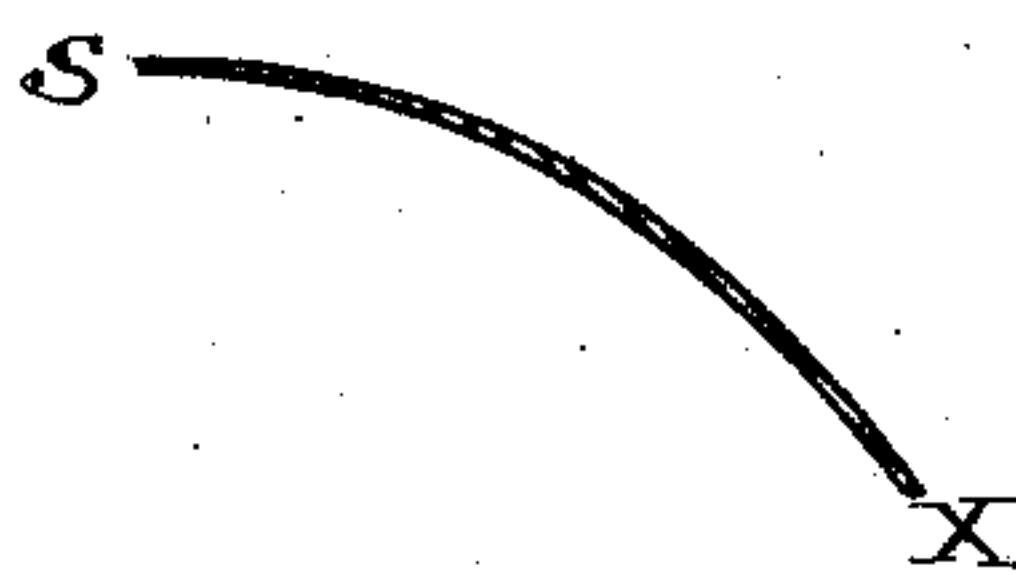


Fig. 8.

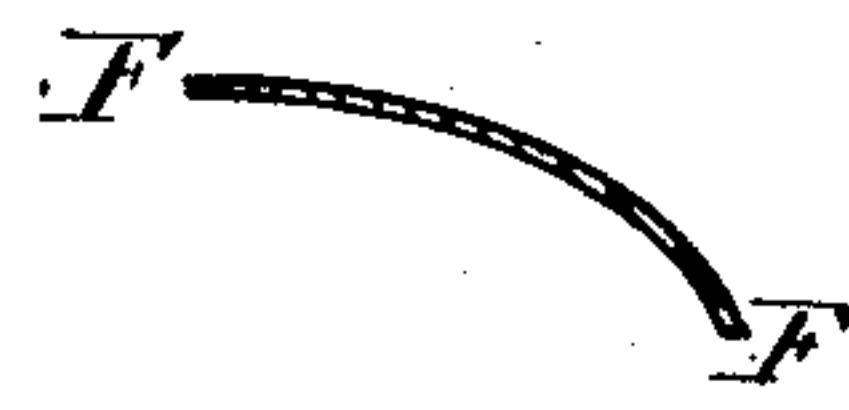


Fig. 9.

WITNESSES.

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UNITED STATES PATENT OFFICE.

A. HUN BERRY, OF BOSTON, MASSACHUSETTS.

FAN-BLOWER.

SPECIFICATION forming part of Letters Patent No. 370,920, dated October 4, 1887.

Application filed December 18, 1886. Serial No. 222,018. (No model.)

To all whom it may concern:

Be it known that I, A. HUN BERRY, a citizen of the United States, residing at Boston, in the county of Suffolk and State of Massachusetts, have invented a new and useful Improvement in Fan-Blowers, of which the following is a specification.

The object of my invention is to so construct, form, and arrange the blades of an air wheel or pump that in their rotation no counter or interfering currents can have place, and that the whole energy of the machine can be devoted to moving a mass of air in the direction required. This object I attain by the mechanism shown in the accompanying drawings, in which—

Figure 1 is a perspective view showing one of my air-wheels complete; and Fig. 2 is a view in perspective, more clearly showing the form and arrangement of one of the blades and its connection with the rim and hub. Fig. 3 is an elevation of the front face of the wheel. Fig. 4 is an elevation of the rear face of the wheel. Fig. 5 is a section through yz of Fig. 3. Fig. 6 is a section on line UX , Fig. 5. Fig. 7 is a section on line VX , Fig. 5. Fig. 8 is a section on line SX , Fig. 5. Fig. 9 is a section on line FF , Fig. 5.

In the drawings, Fig. 1, I have shown the air-wheel with five blades, although the number of blades may be varied to suit the particular conditions under which the device is to be used. That part of the wheel which serves as a frame-work for holding the blades consists of a hub, B. In this case said hub has five curved tangential faces, TT , to which faces the inner ends of the curved radial arms RR are attached by means of bolts or other suitable fastenings. The outer ends of the radial arms RR are secured to the rim A. In the wheel shown the radius of the arms RR is the same or about the same as that of the rim A.

The blade proper, C, is a compound warped surface having three edges, two of which, ddd eee , Fig. 2, are in the plane of the rim and radial arms RR , while the third edge, $kk'k^2$, is in a plane at about right angles to the face of the wheel. The surface of the blades at the edges ddd eee are made to fit the radial arms and the rim, and the edge $kk'k^2$ serves to

gather the air into the wheel. The three edges ddd , eee , and $kk'k^2$ are connected by easy curves, which give to the body of the blade a warped or concavo-convex form, as shown in Figs. 6, 7, 8, and 9, which are sections drawn through different parts of the blade.

It will be seen upon inspection of Figs. 3 and 4 that the outer portion of the blade from H to X is curved, beginning at the point H on the front edge of the blade, tangent to an arc described by the radius H L, thence curving backward to the point X and meeting the rim of the wheel. Between the points H and k , Fig. 5, the curves of the blade all begin at the front edge, tangent to arcs described by radii from the axis of the wheel L, and, gradually changing in curvature, at last coincide with the circular rim of the wheel, which will be the arc or circle described by the radius of the wheel. Between H and P, Fig. 5, the curves are more clearly shown by sections of one of the blades of my wheel taken on the lines UX , VX , SX , and FF , Fig. 5. The curves beginning at the points U, V, and S at the front of the blade are also tangent to arcs described by radii from the axis of the wheel and curve to the rear to the common point X, which is the point where the top edge, eee , and the rear edge, ddd , of the blade meet. Fig. 9 shows the curve of the blade on the line FF , which is parallel to SX . The curves shown in Figs. 6, 7, 8, and 9 are of a parabolic nature, with their vertices at the front of the blade, are of different degrees of curvature, and the uniting of them by curved lines will make a blade which can be described as a compound warped or concavo-convex form.

In my drawings I have shown the front or air-gathering edge, $kk'k^2$, in a plane at right angles to the rear face of the wheel; but it may be made at any angle by adding to or diminishing the distance between X and T, Fig. 3, as it may be desirable to diminish or increase the size of the passage between the blades without changing the number of blades. In either case the front or air-gathering edge, $kk'k^2$, of the blade should be tangent to the circles of rotation of the said front edge.

The shape of the gathering-edge of the blade $kk'k^2$, viewed in profile, as in Fig. 5, is not material to the efficiency of the wheel, except as

it will give a larger or smaller area of inlet; but as viewed at right angles to that position it is essential that this edge shall be at all points tangent to the circles of rotation or
 5 path described by the gathering-edge around the axis of the wheel, and not be merely at right angles to the front of the blade, for if the distance from the point J to X be diminished and the points k and P remain as they are
 10 shown the front or gathering edge can be at right angles to the front of the blade, but it will be angular to its direction around the axis of the wheel and cause the blade to drag through the air. If the distance from J to X
 15 be increased, the points k and P remaining as they are shown, the edge can still be at right angles to the front of the blade. The tendency then will be to deflect the air outward and away from the following blade; but if the gathering-edge is tangential to its direction around
 20 the axis of the wheel the distance from J to X may be increased or diminished, yet a cutting-edge will always be presented to the air, thus causing the least disturbance, and the curved
 25 body of the blade will carry the air through

the wheel without the violent changes of direction which have so retarding an effect on air in motion.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is— 30

1. A ventilating-wheel having blades made from triangular blanks secured at two of their edges, and bent substantially as described, so that no part of their surface is plane. 35

2. A ventilating-wheel made up of blades having two edges secured in the plane of the rear face of the wheel, and bent substantially as described, so that any line drawn upon the surface of the blade from the rear to the front
 40 edge will be curved.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, on this 14th day of December, A. D. 1886.

A. HUN BERRY.

Witnesses:

FRANK G. PARKER,
 MATTHEW M. BLUNT.