(No Model.)

F. P. SMITH.

ROTATING FAN OR BLOWER.

No. 509,143. Patented Nov. 21, 1893.

FIG. 1.

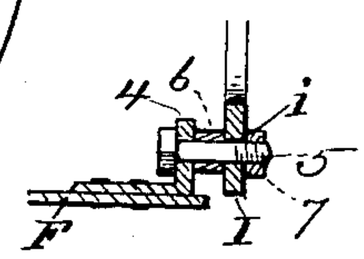

FIG. 3.

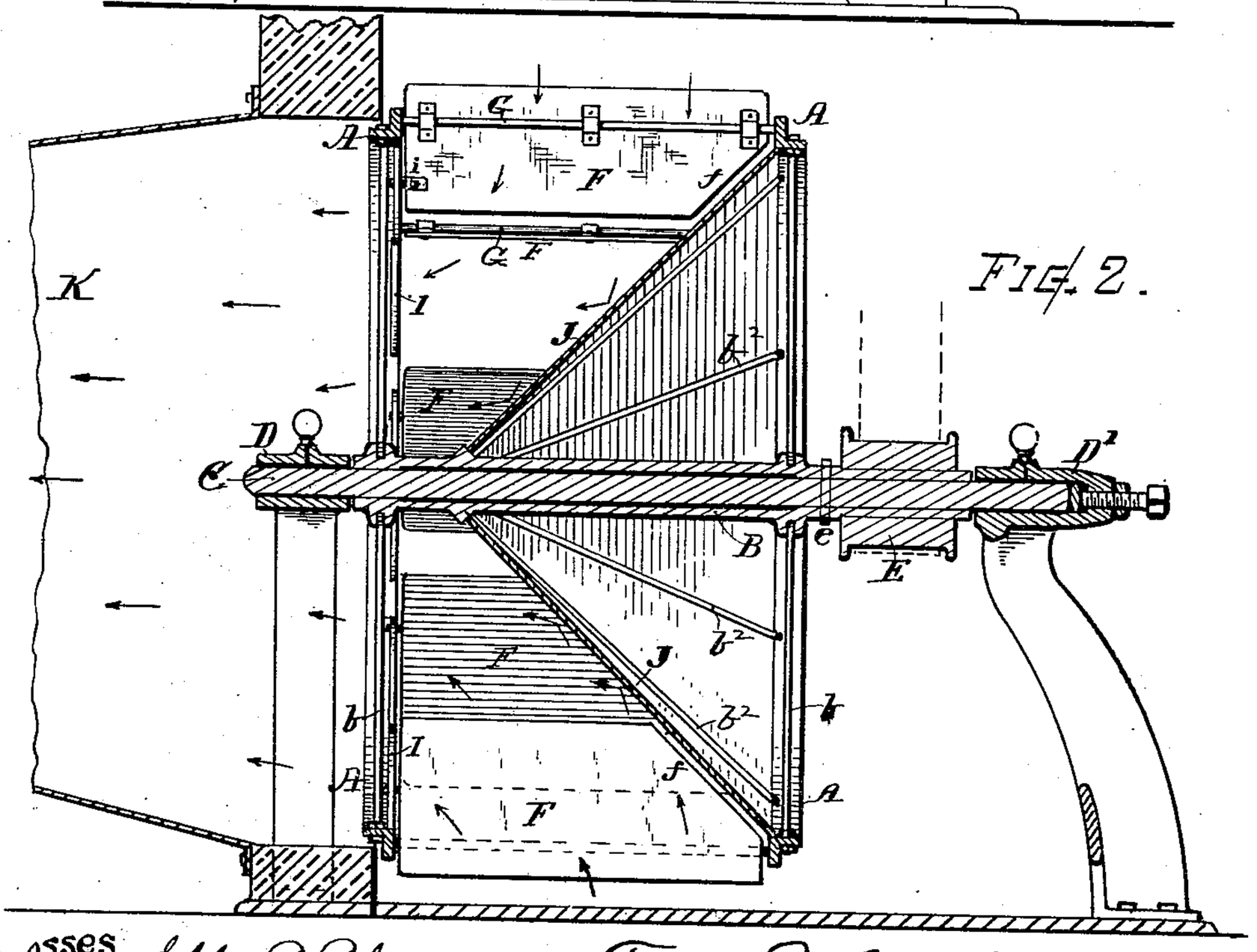

FIG. 2.

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ROTATING FAN OR BLOWER.

SPECIFICATION forming part of Letters Patent No. 509,143, dated November 21, 1893.

Application filed December 27, 1892. Serial No. 456,352. (No model.)

To all whom it may concern:

Be it known that I, FRED P. SMITH, a citizen of the United States, residing at Worcester, in the county of Worcester and State of Massachusetts, have invented a new and useful Rotating Fan or Blower, of which the following, together with the accompanying drawings, is a specification sufficiently full, clear, and exact to enable persons skilled in the art to which this invention appertains to make and use the same.

The object of my present invention is to provide an efficient and economically constructed rotating fan or blower adapted for use in the heating and ventilation of buildings, for inducing air currents in the flues, and for other general purposes for which power blowers are employed. Another object is to afford means of the character described for adjusting the fans to suit different situations and conditions of use. These objects I attain by mechanism constructed and organized for operation as illustrated in the drawings, wherein—

Figure 1 represents an end view of a blowing apparatus employing my invention. Fig. 2 is a vertical section of the same, and Fig. 3 is a detail view showing one means for attaching the fan to its brace.

Referring to parts A A denote two annular rims or circles of similar diameter which are arranged at the desired distance apart and supported on a center sleeve or body B by radial rods or spokes *b*, the inner ends of which are best screwed into the hubs or bosses formed on the body and their outer ends passed through flanges or ears formed on the rims and there retained by nuts screwed onto the threaded ends of the rods at either side of the flange. An axle or shaft C passes through the body sleeve and is mounted in suitable bearings D D′ for free rotation. The sleeve B is preferably fixed to the shaft by a spline, pin or set-screw at *e*. In any instance desired, the sleeve could be fitted to rotate on the axle. A pulley or gear E is provided for driving or rotating the wheel; or an electric or other motor may in some instances be provided therefor. About the periphery of the wheel, between the rims A A, there are arranged a series of fans or blades F formed of suitable thin material, and supported on rods G that extend from one rim to the other parallel with the main axis, and have their ends rigidly fixed in connection with said rims. The fans are disposed in positions angular to radial planes passing through their respective support-rods, the outer edges projecting to cut into the air as they revolve, and their inner portions extending inward so as to deflect the air to the central part of the wheel. A series of semicircles or braces I are fixed to one of the rims A and provided with a series of holes or suitable means *i* whereby the fan F can be attached thereto and sustained at the required degree of angular relation, or the inclination changed to meet the circumstances and conditions of use at different times or in different situations. The attachment can be made as shown in Fig. 3 by an ear 4 and bolt 5 having thereon a shoulder or sleeve 6 and nut 7, or by any other suitable means whereby retention of the fan to the brace is effected.

One side of the blower-wheel is open within the annular rim, and is arranged adjacent to the windway or mouth of the blast-flue or chamber K. The other side is closed by a coned sheet or guard partition J, the peripheral edge of which is fitted against the rim A from which it tapers inward at an angle of forty-five degrees, more or less, the apex of the cone meeting the central body at or near the opposite side of the wheel, as indicated in Fig. 2, thus stopping the passage of air outward and forming a deflector about the center that directs the incoming air toward the blast flue mouth. The cone sheet is best arranged on and supported by the inclined rods b^2. The corners of the fans are cut off, as at *f*, to afford space for the cone.

In operation, the blower-wheel is rapidly rotated in the direction indicated by the arrow on Fig. 1, and the inclined fans cut into the air about its periphery and gather it into the center of the wheel where it is deflected into the blast-flue by the cone surface, as indicated by the pointers.

The construction is such that the apparatus can be practically made in large sizes as re-

quired for moving large volumes of air, as in the ventilation of buildings, mines and other analogous usages.

If the conditions under which the blower is to be used make it desirable to run the wheel in opposite direction from that indicated, it can be readily done by simply reversing the wheel and shifting or changing the angular adjustment of the fans.

I claim as my invention herein, to be secured by Letters Patent—

1. The rotatable blower-wheel having about its periphery a series of blades or fans supported between the peripheral rims said blades being longitudinally parallel with the main axis, and disposed in positions angular to the radial planes from the main axis through the respective blades, and with their outer edges advanced for cutting the air and deflecting it toward the central axis, substantially as set forth.

2. The rotatable blower-wheel comprising a central shaft or axis, with two fan-supporting parts mounted thereon, having radial spokes and annular rims, said wheel provided about its periphery with a series of longitudinal blades or fans pivotally supported on rods that extend from one rim to the other, a series of semi-circles or braces attached to one of said rims having facilities for the attachment and adjustment of the blades at different positions in connection with said braces, for changing the angular inclination of said blades in relation to the radial planes passing through their respective axes, substantially as and for the purpose set forth.

3. The rotatable blower-wheel provided about its periphery with a series of blades or fans supported between the annular peripheral rims and severally disposed in angular positions relatively to the radius of the wheel, in combination with a non-perforated inwardly tapering cone completely filling one end of the wheel within the annular rim and extending inward to meet the central body or shaft near the opposite side of the wheel, said opposite side having an open space within its annular rim, substantially as and for the purpose set forth.

4. In a rotatable blower-wheel the combination, substantially as described, of the central body or sleeve, the annular rims, the radial rods connecting said rims and body, the diagonal rods extending from near one end of said body to the opposite peripheral rim, the conical sheet or guard partition arranged on said diagonal rods, the angular blades or fans, their supporting rods disposed between said rims, the fan-braces or semi-circles and means for securing said fans thereto at different positions of angular adjustment, for the purpose set forth.

Witness my hand this 19th day of December, A. D. 1892.

FRED P. SMITH.

Witnesses:
CHAS. H. BURLEIGH,
ELLA P. BLENUS.