

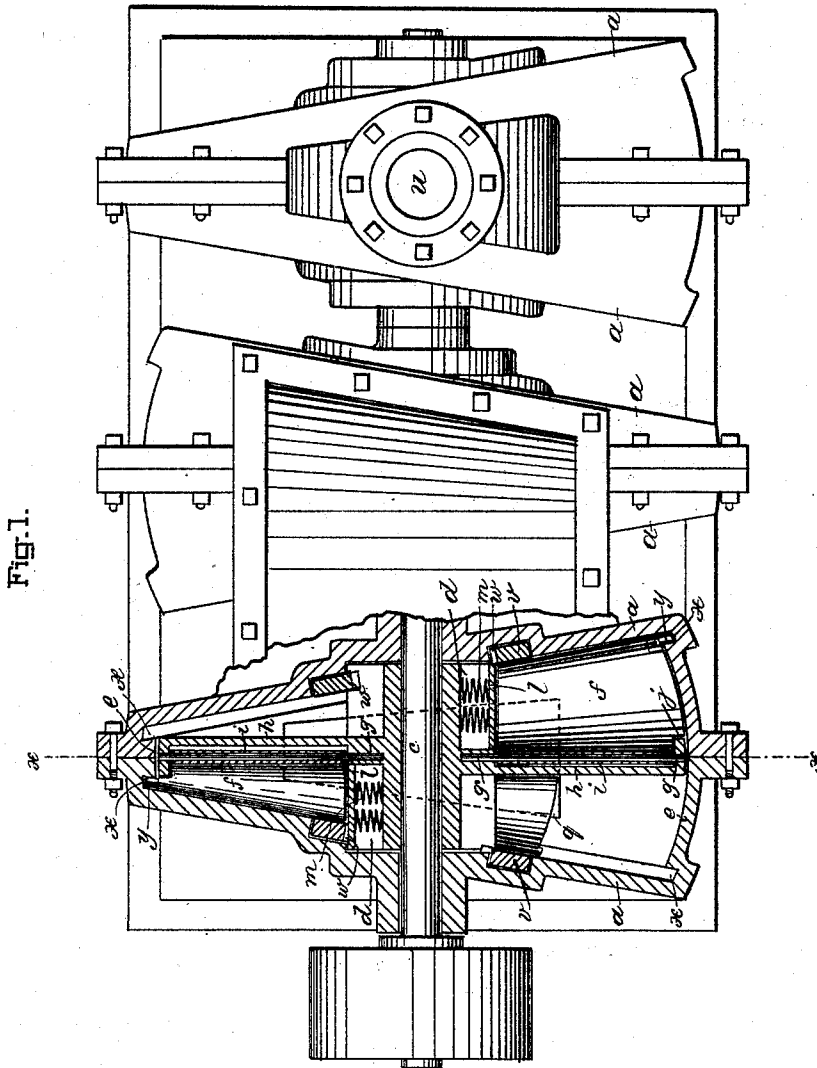
(Model.)

3 Sheets—Sheet 1.

J. W. WILSON.
POSITIVE PRESSURE BLOWER.

No. 497,109.

Patented May 9, 1893.



INVENTOR:

WITNESSES:

W. J. Morgan
Wilfred. J. Earl

John W. Wilson.
By A. O. Thayer.
att'y.

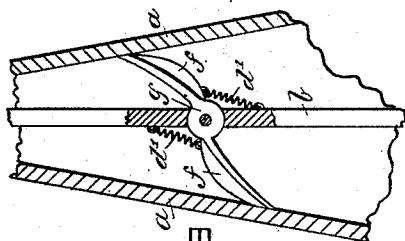
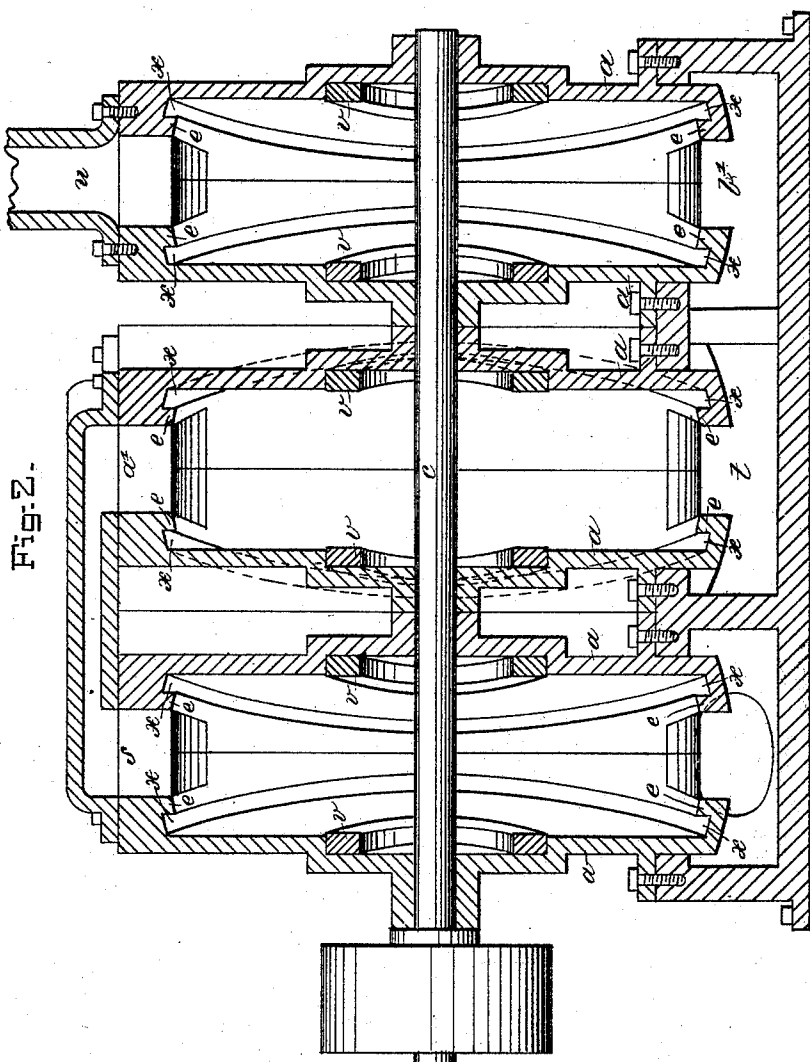
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Patented May 9, 1893.



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(Model.)

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Fig. 3

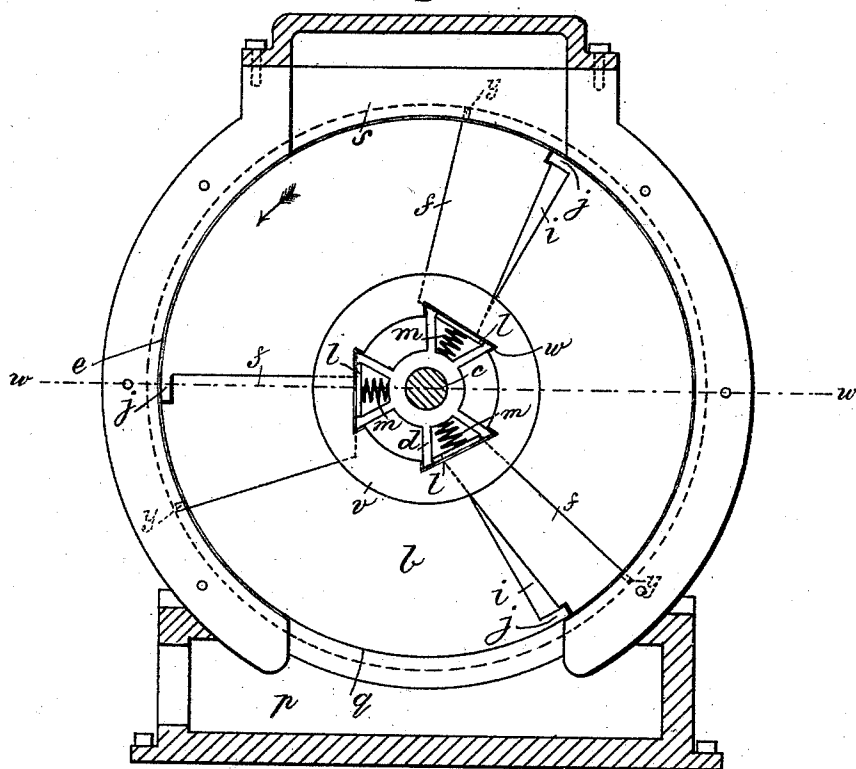


Fig-4.

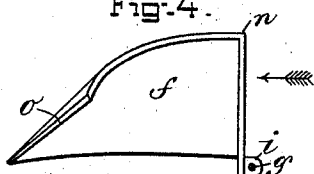


Fig. 5.

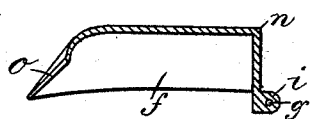


Fig: 6.

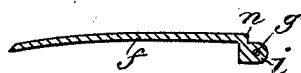


Fig-7.

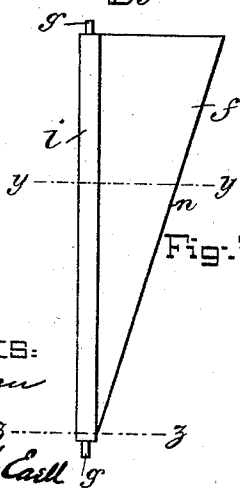


Fig. 8

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UNITED STATES PATENT OFFICE.

JOHN W. WILSON, OF BROOKLYN, NEW YORK.

POSITIVE-PRESSURE BLOWER.

SPECIFICATION forming part of Letters Patent No. 497,109, dated May 9, 1893.

Application filed March 14, 1890. Renewed September 29, 1892. Serial No. 447,241. (Model.)

To all whom it may concern:

Be it known that I, JOHN W. WILSON, a citizen of the United States, and a resident of Brooklyn, in the county of Kings and State of New York, have invented new and useful Improvements in Positive-Pressure Blowers, of which the following is a specification.

My invention consists essentially of taper wings pivoted on the side of a disk or equivalent frame radially to its axis and working within a space which in one of the diameters of the case is of triangular form so that the wings open against the air admitted at or a little in advance of the wider side and expel the air from and close so as to pass the narrower side in advance of which at a suitable point the discharge pipe is connected making a very simple and efficient blower, all as hereinafter fully described reference being made to the accompanying drawings in which—

Figure 1, is partly a plan view and partly a horizontal section (line $w-w$, Fig. 3) of a compound blower constructed according to my invention. Fig. 2, is a vertical section of the case in the plane of the shaft. Fig. 3, is partly an end elevation of the blower with one of the sides of the case removed, and partly a section on line $x-x$, Fig. 1. Fig. 4, is an end view, and Figs. 5, and 6, are transverse sections of one of the wings on the lines $y-y$, and $z-z$, respectively of Fig. 7. Fig. 7, is a side elevation of a wing as seen in the direction indicated by the arrow Fig. 5. Fig. 8, is a detail in section of the disk and end view of a wing. Fig. 9, is a diagram indicating a double wing arrangement that may be used in some cases.

In Figs. 1 and 2, I represent a compound arrangement comprising a series of three duplex blowers in one machine to illustrate the feasibility of the apparatus for combining a number of individual machines in series when it is desired to obtain high pressure but each one of the series may of course be used separately, and each blower may if desired consist of only one unit of what I call the duplex construction although the latter is much preferable for the cost of the duplex arrangement is but little more than that of the simple form while the capacity is double that of the single arrangement. At the middle of the space between the sides a , of the inclosing case having the triangular and parallel cross sections

at right angles to each other as represented in Figs. 1 and 2 the former being preferably horizontal and the latter vertical, is a disk b in a vertical plane and carried on the shaft c by the hub d , said disk fitting at the periphery as close as is feasible to the rim e , of the case, said rim being curved as the section of a hollow sphere of the same radius as that of the disk. In each of the two parts of the space between sides a , thus separated from each other, the disk carries preferably three wings f , on the radial pivots g , located at equal distances apart and in the middle plane of the disk which has offsets h , forming grooves of suitable depth for reception of the pivot hubs i , of the wings through which the pivot rods g , are fitted, said rods having their support at the outer end in the rim lug j , of the disk, and at the inner end in the hub d . The wings of the opposite sides of the disk are preferably located intermediately to each other. The outer ends of the wings are curved same as the curvature of the rim and therefore work closely to it while turning on their pivots, but the inner ends are shaped at right angles to the pivots and the hub is made with a flat face for each wing, with which said ends have close contact throughout their range and to take up any slack that may occur said faces are provided with a loose follow piece l , with one or more springs m , under it to hold it in contact with the end of the wing.

In Figs. 4 and 8 which show an inner end view of a wing it will be seen that it is L shaped and therefore presents two corresponding lines of bearing to the follow plates, against both of which the plate is pressed by the springs so that the plate is prevented from tilting under the end of the wing and is retained in its proper plane.

In the end view of the wing Fig. 4, the middle transverse section Fig. 5, the section of the wing end Fig. 6, and side view of Fig. 7, it will be seen that the wing tapers on the line n , from the inner to the outer end correspondingly with the most contracted part of the angle between the side of the case and the disk or thereabout as seen in the upper left hand corner of Fig. 1, through which the wings pass when closed against the side of the disk as shown in Fig. 8, and edge o , is

similarly tapered but in a different and to some extent reverse direction and such as will run in close contact with the inside of the side *a*, of the case when passing through the wider space below the shaft in said figure the wing then being open to take effect on the air which enters from the space *p*, in the bottom of the case through the opening *q*, which terminates circumferentially of the case at or a little short of the widest portion of the wing space and from the upper side the air escapes through a corresponding passage *s*, terminating a little short of the narrowest part of the wing space; in this example said passage discharges into the receiving side of the next blower of the series at *a'*, and therefrom it is delivered into the space *t*, in the base of the machine and thence into the suction side of the third blower of the series at *b'* and is finally discharged through the spout *u*.

To prevent the wings from rubbing and wearing on the sides *a*, of the case I have provided a ring *v*, in an annular recess in each side and surrounding the hub, which ring projects at the inside slightly beyond the inside of the case and bears the wings free of the sides and it rotates with them, being impelled by the hub with the angles of which it connects by notches in the inner edge as shown at *w* Figs. 1 and 3. Owing to the oblique planes of the rings they only engage with the angles of the hubs in the part of their course which is through the narrower portion of the wing space. The bearings of the wings on the rings keep them in position, but they may have special means provided to insure their retention in their grooves.

It is to be understood that the wings are to have their radial dimensions sufficiently greater than the width of the wing spaces of the case to prevent opening so wide in the widest, part of the wing space as to get stalled between the pivot and the ring whereon the outer edge bears and thus be prevented from closing as they enter the narrower part of the wing space, which they might if too narrow. As the rings run with the edges of the wings bearing against them it will be seen that the closing of the wings is not obstructed by friction of the edges of the wings on the sides of the case as they would be without the rings.

While the resistance of the air on the wings may be depended on to open the wings and keep them open it may in some cases be desirable to have other more positive means for the purpose and I have provided the grooves *X* in the rim of the case parallel with the sides and have made the wings with the guide stud *y*, to run in the grooves, which keeps them always open against the rings but I may employ springs as *d'* Fig. 8.

For the simplest form of the blower the disk may have only one side provided with wings and the case have only one wing space but the double arrangement is best. If the wings of the opposite sides of the disk be placed directly opposite to each other the disk may be

an open or skeleton frame merely to carry the wings it being unnecessary then to have a close partition between the wing spaces, and with such a skeleton frame double acting wings composing two single wings one for each space constructed together in one device may be used as represented in Fig. 9, the part of one side being in advance of the other and working in advance at the pivot and the other part behind, but in this case stronger springs *d'*, would have to be employed as the opening of the wings would be dependent entirely on them because back pressure of the air would balance on the two parts of the wing. Like other machines of this character the apparatus is alike useful as a pump for pumping water also as a meter or a motor to be impelled by any fluid substance forced through it reversely to the direction of its operation as a blower or pump.

The wings will wear tight against the outer rim of the case owing to the centrifugal action of the wings, and the joints in the inner ends being kept tight by the follow plates *l*, together render the blower capable of high efficiency as a pressure blower.

I claim—

1. The combination of the rotating disk, taper wings pivoted on the disk radially to its axis, and the inclosing case having one side oblique to the axis of the disk, said case having inlet and outlet openings at or about the wide and narrow parts of the wing space substantially as described.

2. The combination of the rotating disk, taper wings pivoted on the disk radially to its axis, and the inclosing case having one side oblique to the axis of the disk and the rim curved in the plane of the axis of the disk on the same radius as the radius of the disk, and also having the inlet and outlet passages substantially as described.

3. The combination of the rotating disk, taper wings pivoted on the disk, radially to its axis, and the inclosing case having both sides oblique to the axis of the disk, and the rim curved in the planes of the axis of the disk on the same radius as the radius of the disk, and also having the inlet and outlet passages substantially as described.

4. The combination of the rotating disk, taper wings pivoted on the side of the disk radially to its axis, and the inclosing case having one side oblique to the axis of the disk, and the rim curved in the planes of the axis of the disk on the same radius as the radius of the disk, said wing having the outer ends correspondingly curved and the inner ends fitted to hub faces perpendicular to the axis of the wing substantially as described.

5. The combination of the rotating disk, taper wings pivoted on the side of the disk radially to its axis, the inclosing case having one side oblique to the axis of the disk, and the rotating bearing ring for the wings in the recess in the oblique side of the case, substantially as described.

6. The combination of the rotating disk, taper wings pivoted on the side of the disk radially to its axis, the inclosing case having one side oblique to the axis of the disk, and
5 the rotating bearing ring for the wings in the recess in the oblique side and coupled with the hub for being rotated thereby substantially as described.

7. The combination of the rotating disk,
10 taper wings pivoted on the side of the disk radially to its axis, the inclosing case having one side oblique to the axis of the disk and the packing plates in the hub and bearing against the inner ends of the wings substan-
15 tially as described.

8. The combination of the rotating disk,

taper wings pivoted on the side of the disk radially to its axis, the inclosing case having one side oblique to the axis of the disk, the
20 guide channel in the rim parallel to said oblique side of the case, and the guide studs of the wings engaging said channel substantially as described.

In testimony that I claim the foregoing as my invention I have signed my name, in pres-
25 ence of two witnesses, this 1st day of March, 1890.

JOHN W. WILSON.

Witnesses:

W. J. MORGAN,
W. B. EARLL.