

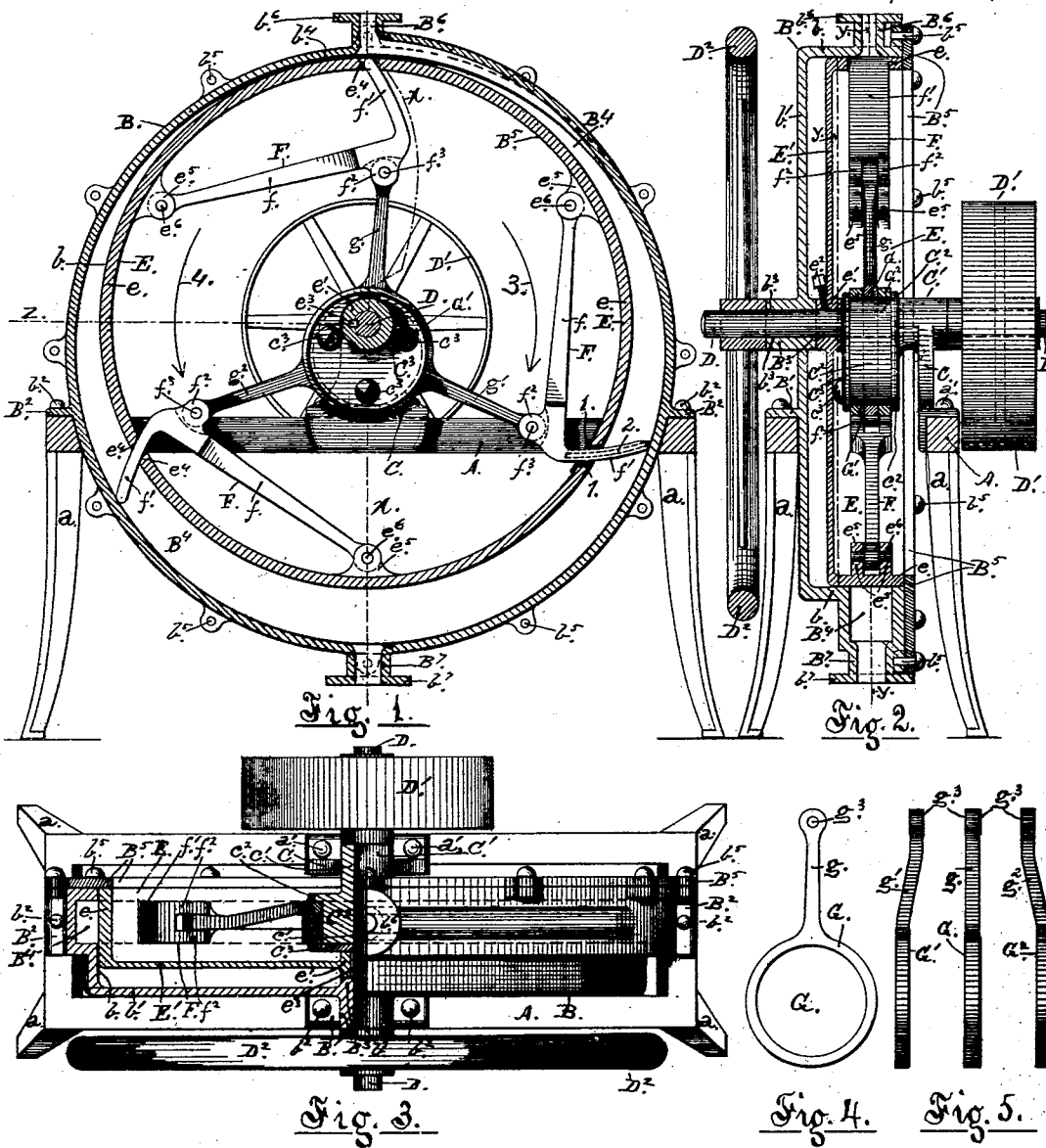
(No Model.)

2 Sheets—Sheet 1.

S. B. MINNICH.
ROTARY BLOWER.

No. 573,609.

Patented Dec. 22, 1896.



Witnesses:

Grant Johnson

Edwin M. Brooks

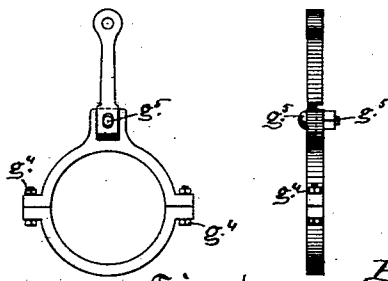


Fig. 6.

Inventor

Simon B. Minnich

By

Daniel H. Kerr,
his Attorney.

(No Model.)

2 Sheets—Sheet 2.

S. B. MINNICH.
ROTARY BLOWER.

No. 573,609.

Patented Dec. 22, 1896.

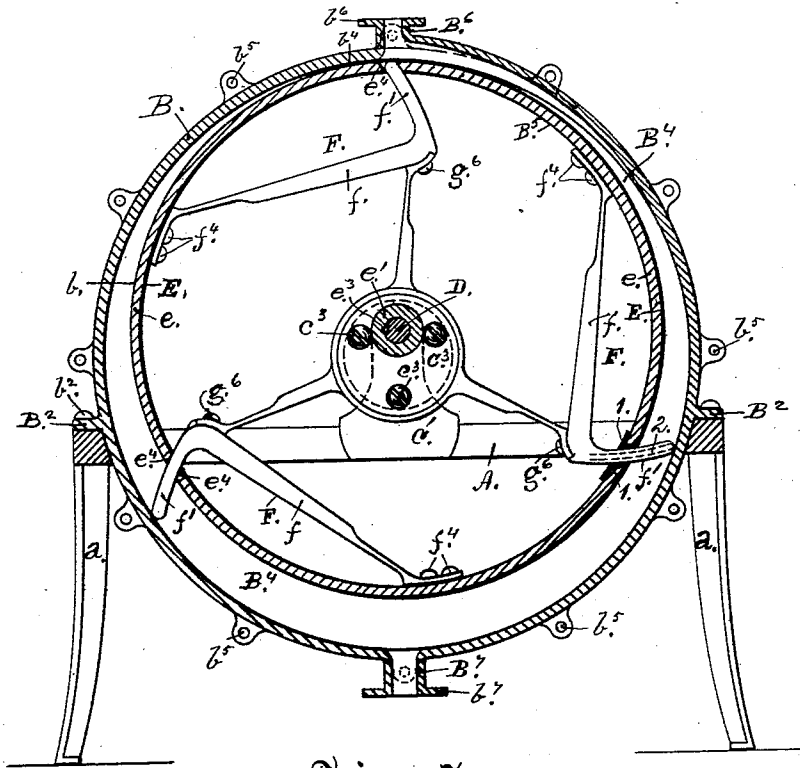


Fig. 7.

Witnesses:

S. Frank Johnston
Co. Emile Urban

Inventor:

Simon B. Minnich.

By *Samuel H. Herr.*
Attorney.

UNITED STATES PATENT OFFICE.

SIMON B. MINNICH, OF LANDISVILLE, PENNSYLVANIA, ASSIGNOR TO MARY -
C. MINNICH, OF SAME PLACE.

ROTARY BLOWER.

SPECIFICATION forming part of Letters Patent No. 573,609, dated December 22, 1896.

Application filed August 3, 1892. Serial No. 442,021. (No model.)

To all whom it may concern:

Be it known that I, SIMON B. MINNICH, of Landisville, in the county of Lancaster and State of Pennsylvania, have invented certain
5 new and useful Improvements in a Rotary Pump or Engine; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable
10 others skilled in the art to which it appertains to make and use the same.

This invention relates to a mechanical movement of that class in which a circular or cylindrical rim having arms or wings pivoted thereto and movable out and in through
15 transverse slots in its peripheral wall is made to revolve eccentrically within a stationary or fixed rim having a greater diameter, so that the convex face of the revolving rim will constantly be in close contact at a given point
20 with the concaved face of the stationary rim, while the outer ends of said arms will ride continually against the concaved face of said stationary rim.

The object of the invention is the reduction
25 of friction or wearing points to a minimum in a mechanical movement to be used in the construction of rotary pressure-blowers, exhaust-fans, rotary pumps, rotary engines, and excavators.

30 The purposes of the invention are attained by the mechanism illustrated in the accompanying drawings, in which similar letters refer to similar parts throughout the several views, and in which—

35 Figure 1 is a longitudinal vertical section, practically on the line *y y y* in Fig. 2, of a mechanical device embodying the elements of this invention; Fig. 2, a sectional view from the right of the portion, completed, which lies
40 practically to the left of the line *x x* in Fig. 1; Fig. 3, a top view of Fig. 1, completed, but the portion above the line *z* to the center in Fig. 1 removed; Fig. 4, a plan in elevation of the central eccentric strap and rod detached;
45 Fig. 5, end elevations of the three eccentric straps and rods detached and shown in plan in Fig. 4; Fig. 6, a plan and elevation of an eccentric strap and rod, both being adjustable. Fig. 7 is a sectional elevation similar
50 to Fig. 1, showing a modification of the device, in which the rear ends of the bars of the

curved arms, as well as the forward ends of the eccentric-rods, are made flexible or bending and rigidly affixed or secured in place.

In the drawings, A designates any suitable
55 frame, resting on legs *a* and adapted to support the elements of the invention now to be described.

B designates a case or shell, being in form a circular dish, having a peripheral wall *b*
60 rising perpendicularly from the edge, integral therewith, a circular disk or body *b'*, forming the back or bottom of said shell or dish. From the outside of the back *b'*, as well as from the outside of the wall *b*, project, at pre-
65 scribed points, lugs *B'*, *B*², and *B*³, adapted to rest on the frame A and to be secured thereto by screws or bolts *b*², as shown. At the center, on each side of the back *b'*, are boss-projections *B*³, having an axial bore *b*³ to form a
70 bearing in which to journal one end of the main or driving shaft, to be hereinafter described. The inner or concaved face of the wall *b* is turned off or smoothly finished, adapting it to receive, closely fitting, the outside
75 surface or convex face of the revolving rim, yet to be described.

*B*⁴ designates a circular recess formed circumferentially in the wall *b*, having a greater diameter and having one point of its inner
80 concaved face flush or tangent with the concaved face of said wall *b*, as at *b*⁴, and its greatest depth at the opposite end of the diameter starting from said point, and having
85 been turned out or finished on the inside is adapted to have moving therein, closely fitting and filling the same, the pivoted arms or wings yet to be described, and this recess constitutes the stationary rim mentioned in the opening paragraph. Against the open
90 face of the case is fitted an annular plate *B*⁵, secured thereto by screws *b*⁵ and forming a centrally-projecting flange, against which is adapted to bear the edge of the before-mentioned revolving rim placed within said case.
95 Near the point of tangency or coincidence *b*⁴, before mentioned, is a tubular projection *B*⁶ of the outer stationary case provided with an attaching-flange *b*⁶ about its upper end and at its lower end with an opening into a port-
100 way on one side leading into the recess *B*⁴, as shown on the right in Figs. 1 and 3, while op-

posite, opening from the wider portion of said recess, is a larger tubular projection B^7 , provided at its extremity with an attaching-flange b^7 , either of which openings may serve
 5 as inlet or outlet port according as the device is used as an engine or as a pressure-blower or force-pump:

C designates a pillow-block or standard having its base secured to the frame A by bolts
 10 or screws a' and having at its upper end a cylindrical block or body C' , having through its axis in line with the axial bore b^3 , before mentioned, a bore c' , constituting the bearing adapted to have journaled therein the
 15 other end of the driving-shaft before mentioned. To the inner end of this cylindrical block is attached a side of the required eccentric C^2 , having about the attached side an outwardly-projecting rib or flange c^2 to keep
 20 the eccentric-straps (yet to be described) on this side confined to said eccentric, and on the other side of the eccentric is a circular disk or follower-plate C^3 , secured by screws c^3 to keep said eccentric-straps confined to
 25 the eccentric on this side, while the shaft orifice or bearing c' is extended through said eccentric and follower.

Through the bearing-orifices b^3 and C' , before mentioned, is journaled the main or driving-shaft D, having secured thereto, between
 30 the bearing b^3 and the eccentric-follower C^3 , the hub of the revoluble rim yet to be described, and to one end of said shaft is secured a belt or driving-pulley D' , while to its
 35 other end is secured a balance or fly wheel D^2 to steady the motion of the operating device.

E designates the before-mentioned revoluble body having a cylindrical rim or peripheral wall e integral with and rising perpendicularly from the edge of a circular disk E' , provided at its center with a hub e' , secured
 40 to the main shaft by set-screws, one being shown at e^2 , Fig. 2, or by a key e^3 , seated in said shaft and hub, Figs. 1 and 3. The convex surface of this peripheral rim is turned off, smoothly finished, to fit closely as it revolves to the concaved face of the wall b , before
 45 mentioned, and has transversely through its body at prescribed intervals perforations or slots e^4 , adapted to have movable there-through the curved ends of the pivoted arms
 50 or wings before mentioned, but yet to be described; and projecting in pairs from said wall are ears or lugs e^5 , each pair provided
 55 with a pivot-pin e^6 , adapting said pair to have pivoted thereto the rear end of one of said arms or wings; while the forward edge of this revolving rim e is adapted to ride closely
 60 against the inwardly-projecting flange of the plate B^5 , before mentioned.

F designates an arm or wing comprising a beam or bar f and a curved or bent portion f' , the latter having its lower end secured to
 65 the forward end of said beam or bar, which has its rear end pivoted to a pair of the ears or lugs e^5 by means of the pin e^6 having been

passed through said ears and the said rear end, while near its forward end said beam or bar is provided with lugs or ears f^2 , provided
 70 with a pin f^3 , thus adapting said end to have pivoted thereto the outer end of an eccentric-rod yet to be described. The curvature of the portion f' is determined by radii taken
 75 from the pivot-center at e^6 to the edges of the slot through which said portion passes, while its width extends from side to side of the recess B^4 , before mentioned, and it is adapted
 80 to completely fill the variable area of said recess without rubbing or friction. Three such arms or wings are used in the present
 85 construction, but this number may be increased or diminished without departing from my invention. It will here be observed that the orifices or slots in the rim through which
 90 the portions f' move may be bushed, and the portions on their side and top edges provided with packing-strips to prevent leakage or to take up lost motion, as is indicated by solid and dotted lines, respectively, at 1 and
 2 in Fig. 1.

Eccentric-straps G, G' , and G^2 are applied to the eccentric C^2 , before mentioned, and are secured in position thereon by having
 95 the follower-plate C^3 , secured to the side of the eccentric by means of the screws c^3 having been screwed home, while the rods g , g' , and g^2 of said straps are so shaped or bent,
 100 Fig. 5, as to bring their extreme ends all in the same plane, and said ends, having been provided with eyes g^3 , are pivoted to the ears or lugs f^2 of the arms, by means of the pins f^3 having been passed through said ears and eyes. In this instance the eccentric straps
 105 and rods are shown to be integral or made in one piece, but they may be made in parts so as to be adjustable, as shown in Fig. 6, where screws or bolts and nuts g^4 and g^5 are used to hold the respective parts together. In this case the screws c^3 will be dispensed
 110 with, for the follower-plate and eccentric may be made in one piece.

In cases where a small eccentricity will be required the eccentric-rods, hereinbefore shown as having their outer ends pivoted to
 115 the bars of the curved arms, may be made flexible or bending and have said ends rigidly affixed to said bars, as by screws g^6 , and the bars themselves may be made flexible or bending at their rear ends and have said
 120 ends rigidly affixed, as by screws f^4 , to the revoluble body E, instead of being pivoted thereto. (See Fig. 7.)

Now, the several parts occupying the several positions indicated in the drawings, an
 125 inspection of Fig. 1 shows that, revolving the body E in either direction, the arms F will practically remain in a relatively stationary position, and the portions f' will move out and in through the peripheral slots e^4 without
 130 pressure against their edges and will completely fill the transverse area of the recess B^4 without rubbing against its sides or concaved face; that, using the tube B^6 to induct

water, steam, or other agent under pressure, said agent, bearing against the wing portions f' , will rotate the body E in the direction indicated by the arrow 3, and the device will be a rotary engine, the tube B' being the exhaust-port; that, applying power to the pulley D' to rotate the body E in the direction indicated by the arrow 4 and using the tube B' as the inlet-port, the device will be a pressure-blower or force-pump, accordingly as air or water is inducted, the tube B⁶ being the outlet-port, and that, cutting away and removing the shell B to the circumferential edge of the revolving rim of the body E, placing it in a horizontal position with the lower end put forward and the projecting wings f' used as shovels or scrapers, the device may be used as an excavator, the wings f' clearing themselves from adhering particles of earth as they move backward through the orifices in the rim, the edges of said orifices acting as wipers.

I am aware that a patent, No. 147,623, was granted on February 17, 1874, to William I. Ellis for machinery for forcing and exhausting air, in which machinery peripheral surface fans or pistons are end-hinged to an inner cylinder and are made to oscillate through openings therein by means of radial rods connecting them with a crank-arm on a shaft which rotates said cylinder.

Having thus described the invention and set forth its operation and application, what

I consider new, and desire to secure by Letters Patent, is—

The hereinbefore-described rotary pump or engine comprising the following instrumentalities: a revoluble body, having a cylindrical rim or circular peripheral wall; transverse slots, at prescribed intervals, through said wall; curved wings or arms, movable out and in, through said slots; beams or bars, having their forward ends rigidly secured to the inner ends of said curved arms, and their rear ends joined to said revoluble body, an eccentric, placed within the revoluble body, having its focus in the axis of revolution, and a side rigidly secured to a pillow-block fixed in position; a shaft-bearing secured to the upper end of said pillow-block, and extended through the focus of said eccentric; a main or driving shaft journaled in said bearing, and having securely attached thereto the center of the revoluble body; eccentric-straps, sleeved on the eccentric; and, eccentric-rods, having one end securely affixed to said straps, and the other end joined to the bars of the curved wings, all substantially as described and for the purpose set forth.

In testimony whereof I have hereunto subscribed my name in the presence of two subscribing witnesses.

SIMON B. MINNICH.

Witnesses:

EDWIN BOOKMYER,
DANL. H. HERR.