

No. 693,609.

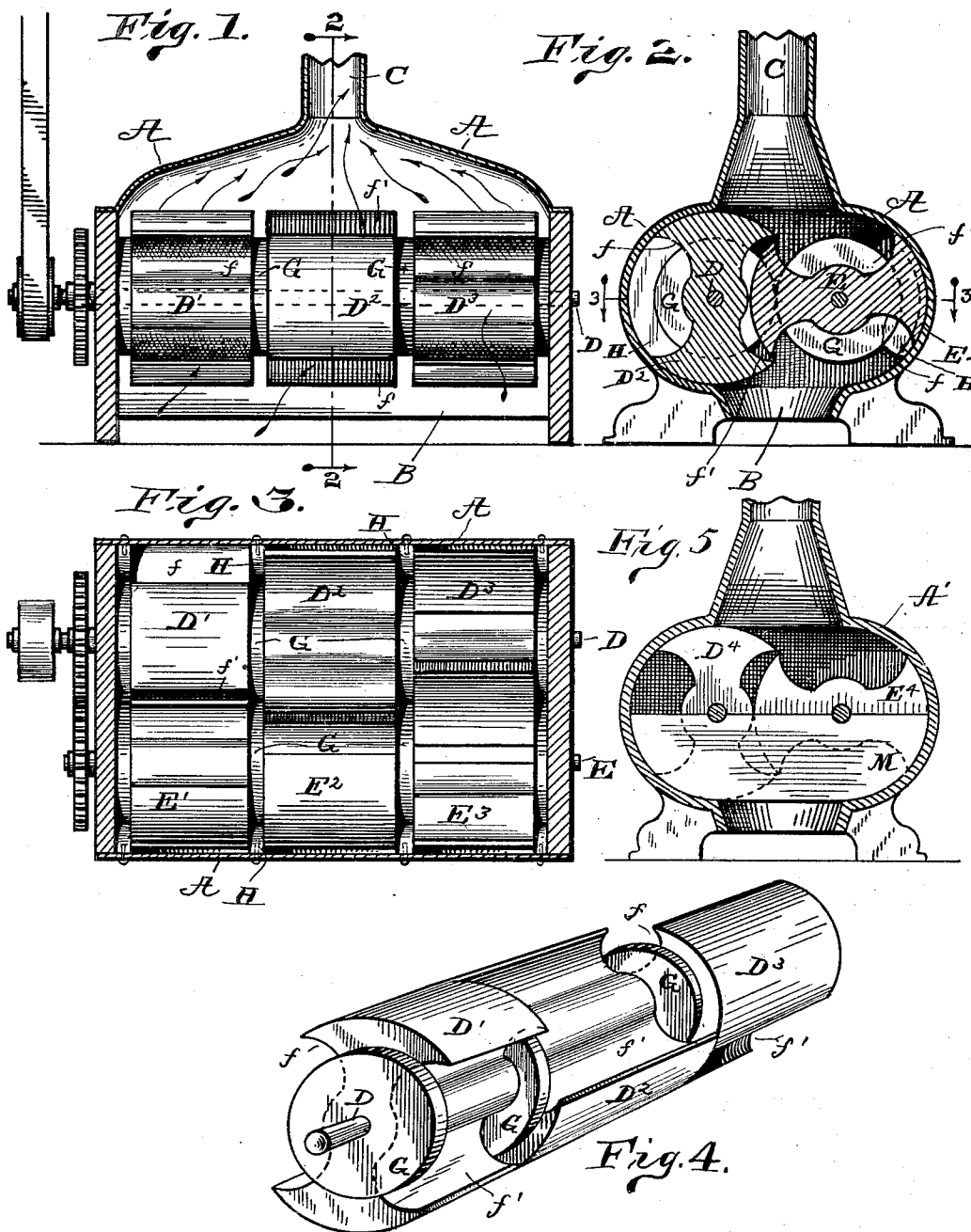
Patented Feb. 18, 1902.

J. KIRKWOOD.

ROTARY PUMP OR FORCE BLAST BLOWER.

(Application filed Apr. 11, 1901.)

(No Model.)



Witnesses:
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ROTARY PUMP OR FORCE-BLAST BLOWER.

SPECIFICATION forming part of Letters Patent No. 693,609, dated February 18, 1902.

Application filed April 11, 1901. Serial No. 55,436. (No model.)

To all whom it may concern:

Be it known that I, JOEL KIRKWOOD, a citizen of the United States, residing at Mauzy, in the county of Rush and State of Indiana, have invented certain new and useful Improvements in Rotary Pumps or Force-Blast Blowers, of which the following is a specification.

This invention relates to what are known as "pressure-blowers," in which duplex rotative pistons act in concert to absolutely drive out air which has been inclosed by them, and inasmuch as water or other fluids can be similarly acted upon the invention is applicable to engines for moving any kind of a fluid.

The invention will be described as an air-blower, with the understanding that it may be used as a pump for moving water and other liquids.

The rotary blower in which a pair of rotative pistons act together is a well-known mechanism, but owing to the fact that the air is carried in distinctly separated pockets from the supply to the discharge intervals must occur between the taking in of the air in said pockets and its discharge therefrom, and these intervals produce a broken unsteady discharge, which militates against the utility of the rotary blower for many purposes. Efforts have been made to shorten the intervals between the breaks in current by introducing a series of pairs of rotative pistons with pockets set to alternate, whereby as the pockets of one pair of pistons, for example, are about emptied the pockets of the next pair are only half emptied and those of the third pair are just beginning to empty. As many pairs might be used as desired, and the irregularities or "breaks" in the discharge could be reduced to inappreciable intervals. The trouble has been, however, to prevent the back discharge of a pocket in which the compression has commenced through the pocket which follows it in the adjacent piston; and the object of my invention is to provide a packing between the pairs of pistons which will prevent this back discharge.

I accomplish the objects of the invention by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a longitudinal vertical central section of a blower-case having three pairs of

rotative pistons with my improved packing between said pairs; Fig. 2, a transverse vertical section on the dotted line 2 2 of Fig. 1; Fig. 3, a horizontal section of the case through the line 3 3 of Fig. 2; Fig. 4, a perspective view of a shaft on which is mounted three cylinders; and Fig. 5, a section similar to Fig. 2, showing a modified form of packing.

Like letters of reference indicate like parts throughout these several views of the drawings.

A is the case, having the inlet B and the outlet C. The sides between the inlet and outlet are bored out on two separate centers to make an air-tight fit with the cylindrical sides of the rotative pistons, which are mounted on shafts D and E. The shafts D and E have bearings in the ends of the case and are located, respectively, at the centers above mentioned, around which the cylinders are bored. Mounted on the shaft D are the pistons D¹, D², and D³, and mounted on the shaft E are the like pistons E¹, E², and E³. Each of said pistons has cylindrical faces with longitudinal diametrically opposite pockets *f* and *f'*. As shown in Fig. 2, the pistons of each pair are of such shape as to pack against the case and also against their fellows, so that no air may leak around them or between them. Between the pairs of pistons is the packing ring or disk G, of somewhat less diameter than the greatest diameter of the pistons, thereby partially closing communication between the pockets of adjacent pistons on the same shaft. The back discharge will be prevented by projecting a flange H from the case inwardly, so as to make close contact with the packing-ring G. Said flange will be a segmental ring, the segment extending on either side of the horizontal diameter of the case a total distance approximating the quadrant of the circumference of bore of the case or piston. Extension below that I have found to be unnecessary, as the pocket will be taking air through the opening at the bottom of the case, and above that unnecessary, for the reason that the pocket will be discharging, if at all, into the discharge-outlet from the case.

As many pairs or sets of pistons packed as above described may be used as desired or required.

Fig. 5 shows a modification in which a sta-

tionary packing M extends across the lower half of the case A' and is applicable to small and light blowers.

It is believed that the invention, by reference to the accompanying drawings, will be readily understood without further explanation. The drawings show packing-rings and flanges between the ends of the outside pistons and the ends of the case; but such construction may be omitted and the pistons packed by contact with the case ends.

What I claim as new, and wish to secure by Letters Patent of the United States, is—

1. The herein-described pump comprising a cylinder containing two communicating segmental cylindrical chambers and induction and eduction ports communicating with said chambers, a plurality of pairs of rotative pistons having pockets with openings thereto approximating one-fourth of the circumferential area of the piston, packing rings or disks of less diameter than the greatest diameter of the pistons separating the pistons from each other, and segmental rings extending

from the walls of the case to the packing-rings and approximately of same area as that of the end of the pocket.

2. A cylinder having segmental cylindrical bores made on two centers, pistons with pockets mounted in pairs in said segmental bores, said bores emptying into chambers at top and bottom common to both having ingress and egress ports, into which chambers all of the pistons enter at each revolution thereof in order to take air or the like from this common chamber below and discharge it into a common chamber above, rings or disks partially separating the ends of adjacent pistons and flanges approximating quadrants of circles extending from the inside walls of the cylinder to the rings.

In witness whereof I have hereunto set my hand and seal, at Indianapolis, Indiana, this 11th day of March, A. D. 1901.

JOEL KIRKWOOD. [L. S.]

Witnesses:

JOSEPH A. MINTURN,
S. MAHLON UNGER.