No. 678,480. Patented July 16, 1901.

T. W. GREEN.

IMPELLER FOR ROTARY BLOWERS.

(Application filed July 17, 1900.)

(No Model.)

Fig. 1.

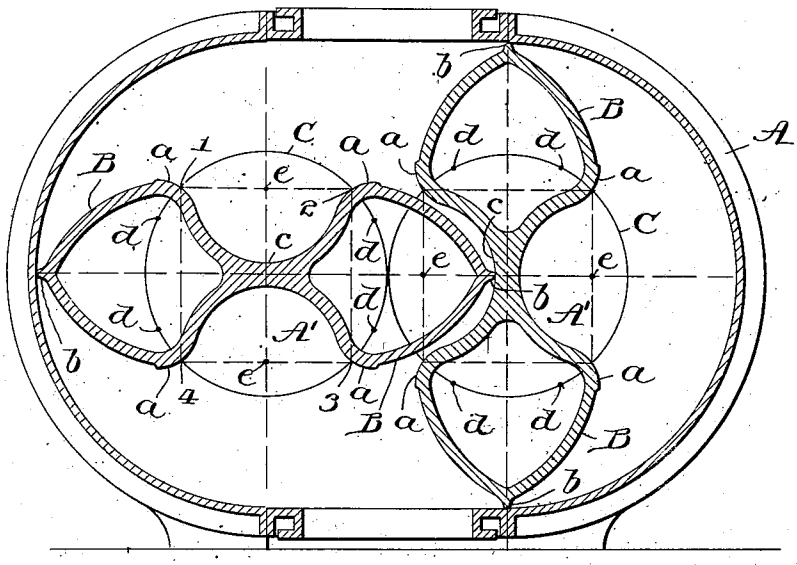
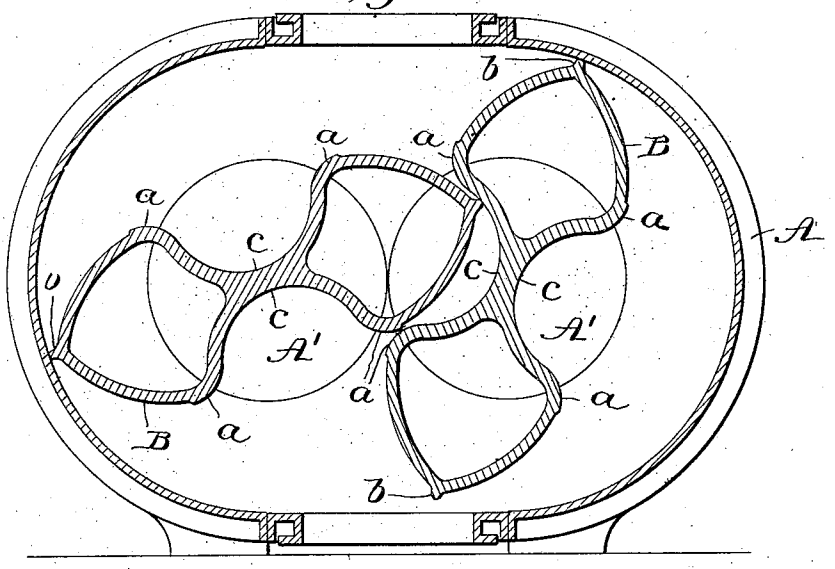


Fig. 2.



WITNESSES:

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THOMAS W. GREEN, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO THE WILBRAHAM BAKER BLOWER COMPANY, OF SAME PLACE.

IMPELLER FOR ROTARY BLOWERS.

SPECIFICATION forming part of Letters Patent No. 678,480, dated July 16, 1901.

Application filed July 17, 1900. Serial No. 23,873. (No model.)

To all whom it may concern:

Be it known that I, THOMAS W. GREEN, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented new and useful Improvements in the Impellers of Rotary Blowers, of which the following is a specification.

My invention relates to the impellers of rotary blowers or exhausters; and the object of my improvement is to make a secure lock or cut-off on the impellers with the least possible finishing of the parts and at the same time get the greatest inward reach to each impeller. To accomplish the desired result, the parts of each impeller that coöperate to make the cut-offs are formed to the shapes and in the manner hereinafter shown. The general construction of this class of blowers being well known, I have shown only the impellers and the case surrounding them.

In the accompanying drawings, Figure 1 is a vertical sectional view through the middle of the blower, showing the wings of one impeller at right angles to the wings of the other impeller and the lock or cut-off formed by the end of one impeller and the middle or waist portion of the opposite impeller. Fig. 2 is also a vertical sectional view through the middle of the blower, but with the impellers turned farther around and showing the end of the wing of the one impeller leaving the waist portion of the opposite impeller and the other parts commencing to form the lock or cut-off.

A is the outer casing, surrounding the impellers of the blower.

B B are the wings of the impellers.

A' A' are the circular end headpieces secured on the ends of the impellers. These end pieces are preferably cast separate from the wing portion, so that the locking portions of said impellers can be more easily finished.

a a are the finished segmental extensions of the impeller, operating together to form the cut-off at times when said cut-off is not being maintained by one of the extensions or ends *b* operating with one of the segmental waist portions *c* of the impellers. All of the segmental extensions *a* are finished to the arc of a circle having a diameter equal to one-fourth of the length of one of the sides of the largest square 1 2 3 4 that can be inscribed in the circles C C, whose diameters are equal to the distance between the centers of the driving-shafts upon which the impellers revolve. These circles C C correspond to the pitch-line of the gear-wheels used on machines of this class. To describe the circles upon which the arcs of the segmental extensions *a a* are struck, one point of the compass rests upon the circumference of the circle C at one of the points *d*. The circle upon which the waist or middle portions *c* of each impeller are finished is struck from one of the points *e* in the middle of one of the sides of the inscribed square, and the radius of this circle is obtained by finding the point where a circle struck from the point *e* would intersect the circle struck from the point *d*. When the waist portion of each impeller is formed to circles, as described, and the segmental extensions *a* are finished, as herein shown, two of these extensions *a* will operate together to form a lock or cut-off until one of the extensions or ends *b* of one of the impellers begins to coöperate with one of the segmental waist-lines *c* of the opposite impellers These parts will then in turn form the lock until two of the segmental extensions *a* begin again to coöperate, and so on the lock is continuously maintained by the segmental extensions *a* alternating with the parts *b* and the segmental waist-lines *c* of the impellers.

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

1. In a rotary blower, the combination of two coacting impeller-blades, each having oppositely-arranged locking parts and a lock intermediate said locking parts, all so constructed and arranged as to shape and length, that both sets of said oppositely-arranged locking parts may be out of engagement at the same time but that during such disengagement an engagement of the two impeller-blades will be maintained between said oppositely-arranged locking parts by the intermediate lock, after one set of the oppositely-arranged locking parts has been released and before the other set becomes engaged.

2. In a rotary blower, the combination of

two coacting impeller-blades having waist portions and provided with oppositely-arranged locking parts, which may be out of engagement at the same time, and locking parts on the ends of each impeller-blade, said locking parts being all so constructed and arranged as to shape and length, that a lock is maintained between the two impeller-blades by the engagement of the locking part on the end of one impeller-blade and the waist portion of the opposite impeller-blade during the time that the other locking parts of the blades are disengaged.

3. In a rotary blower, the combination of two coacting impeller-blades having waist portions, and provided with oppositely-disposed locking parts, and locking parts on the ends of each impeller-blade, said locking parts being so constructed and arranged, as to shape and length, that a lock will be maintained by the locking part on the end of one impeller-blade and the waist of the opposite impeller-blade, when the oppositely-disposed locking parts are out of locking position.

4. A rotary blower having each of the impellers provided with four segmental extensions *a*, said segmental extensions being formed to the arc of a circle having a radius equal to one-fourth of the length of the side of the greatest square that can be inscribed in a circle C, corresponding to the pitch-line of the gear-wheels, whereby the extensions on the opposite impellers operate together to form locks, and are capable of simultaneous disengagement, and the waist or middle portion of each impeller being finished to the arc of a circle that is struck from the point *e*, on the middle of the side of the inscribed square 1, 2, 3, 4, and has a radius equal to the distance from the point *e*, to the nearest points on one of the segmental extensions *a*, whereby the segmental waist-lines *c c*, coöperate with the extensions *b b*, to form a lock or cut-off during the interval when the segmental extensions *a a*, are not coöperating, substantially as shown and described.

In testimony whereof I affix my signature in presence of two witnesses.

THOMAS W. GREEN.

Witnesses:

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SAML. H. KIRKPATRICK.