G. W. CLAYTON.

BLOWER-FAN.

No. 182,303. Patented Sept. 19, 1876.

Fig. 1

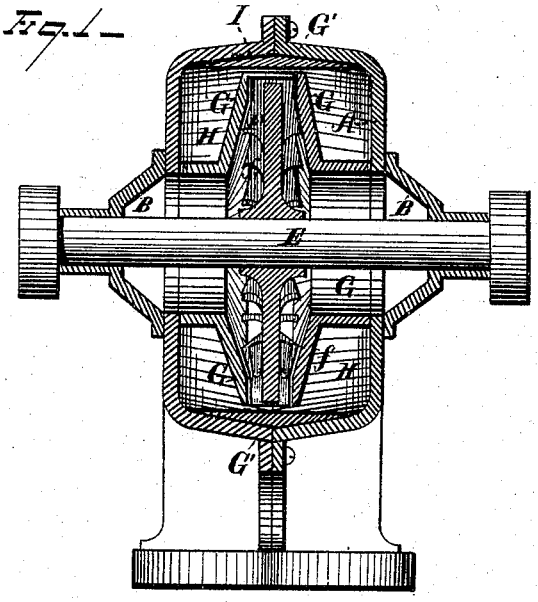
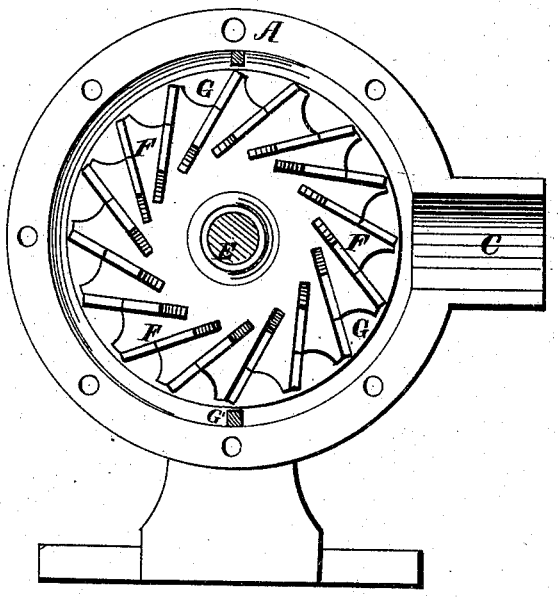


Fig. 2



WITNESSES

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UNITED STATES PATENT OFFICE.

GEORGE W. CLAYTON, OF CLEVELAND, OHIO.

IMPROVEMENT IN BLOWER-FANS.

Specification forming part of Letters Patent No. **182,303**, dated September 19, 1876; application filed March 9, 1876.

To all whom it may concern:

Be it known that I, GEORGE W. CLAYTON, of Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Blower-Fans, and also adapted for pumps; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use it, reference being had to the accompanying drawings, which form part of this specification.

My invention relates to an improvement in blower-fans, and adapted also for pumps.

My invention consists in the combination, with the revolving buckets or blades and the inclosing-case, of a disk, situated upon one or both sides of the said revolving buckets, which inclose between themselves and the fan-case an air-space or reservoir into which the air that is drawn into the fan is forced, and from which it emerges.

In the drawings, Figure 1 is a section of the fan by plane, containing the fan-shaft, showing parts in elevation; Fig. 2, a longitudinal section of the fan with one of the sides removed.

A is the fan-case. B are the eyes through which air is admitted; C, the port or spout through which the air is blown. F are the buckets or blades of the fan, driven by the shaft E. These buckets or blades are given the direction substantially as shown in Fig. 2 of the drawings, so that there may be no tendency for the air, in striking the fan-case, to rebound toward the eyes B. The throats of the buckets which receive the air from the eyes and permit it to pass through the outer end of the buckets or blades are hollowed out at *f*, so that the area of the said throats embraced between two succeeding buckets and the adjacent disk may be somewhat larger than the corresponding area at the end of the blade from which the air is expelled into the reservoir. The object of this construction is as follows: The outer end of the blade travels somewhat faster than the inner end. For this reason, it will deliver or expel air from its surfaces more rapidly than it would be received from an orifice or throat, *f*, of the same area. For this reason the throat is made somewhat larger. Moreover, if the blade F at its end can receive through the throat all of the air that can be expelled from the outer end of the blade, then there will be no tendency as the fan revolves to create a vacuum back of the blade, which would react upon the air in the reservoir to draw it back. Therefore, I make the throat *f* larger, so as to prevent this formation of a vacuum near the ends of the blades, by furnishing a ready and free supply of air from the eyes B. In order to admit of enlarging the throats *f*, the rear ends of the buckets or blades F are inclined outward, and the disks G are correspondingly inclined, so as to effect as close a fit as practicable.

G are disks attached rigidly to the fan-case A. These disks G fit in closely upon the fan-blades or buckets F. The disks extend outward nearly to the fan-case, terminating about the outer edges of the buckets. An annular space, G′, is therefore left between the periphery of the disk G and the fan-case A, and the disks G form, with the fan-case A, reservoirs H upon each side of the fan-wheel. These reservoirs communicate freely with the exit-port C.

The operation of the device is as follows: The fan-shaft is caused to revolve in the usual manner, carrying the blades or buckets with it. Air is thereby drawn into the eyes B and passes thence, between the disks G, through the enlarged throats *f*, outward, and is driven into the reservoir H by the centrifugal action of the fan leaves or buckets, from which it escapes through the exit-port C. It is apparent that this fan may be revolved with any degree of rapidity without any danger of its cutting off the free exit of the air, and causing the inclosed air to revolve around with the fan; for whatever air enters the eyes B is immediately thrown into the reservoirs H out of this action of the fan, and can escape therefrom through the exit-port C. Moreover, the enlarged throats *f* supply the buckets or leaves F to their full capacity, and thereby obviate any tendency to the formation of a vacuum near the ends of the buckets, back of the leaves, and consequently avoid any tendency of a back-suction from the reservoirs H; but, on the contrary, form a perfectly free and unimpeded passage into the eyes B, through the

machine, and out of the port C. In order to avoid any tendency of the air to revolve around within the chambers or reservoirs H, due to the centrifugal action of the levers F, I place one or more stops or barricades, I, across the said reservoirs, just beyond the peripheries of the disks G.

It is apparent that this device is equally applicable as a pump, and I do not, therefore, limit myself to its employment solely as a fan.

It is apparent that the form or shape of the reservoir H may be varied to any extent. The particular form or shape shown in the drawings forms no particular part of my invention. But I desire to have it particularly understood that my invention contemplates, broadly, the use of such a reservoir for the air, into which the air may be driven by the fan-leaves and escape through opening C.

What I claim is—

1. The fan, consisting of the combination, with the revolving buckets and the fan-case A, of disks G and reservoir or reservoirs H, substantially as and for the purpose described.

2. The combination, with the case A and fan-leaves F, broadened at their rear ends to admit of enlarged throats *f*, and disks G, made to conform to the shape of the said fan-leaves, substantially as and for the purpose described.

3. The combination, with the fan-leaves, the disks G, and case A, of barricades or stops I, substantially as and for the purpose described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

GEORGE W. CLAYTON.

Witnesses:

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