

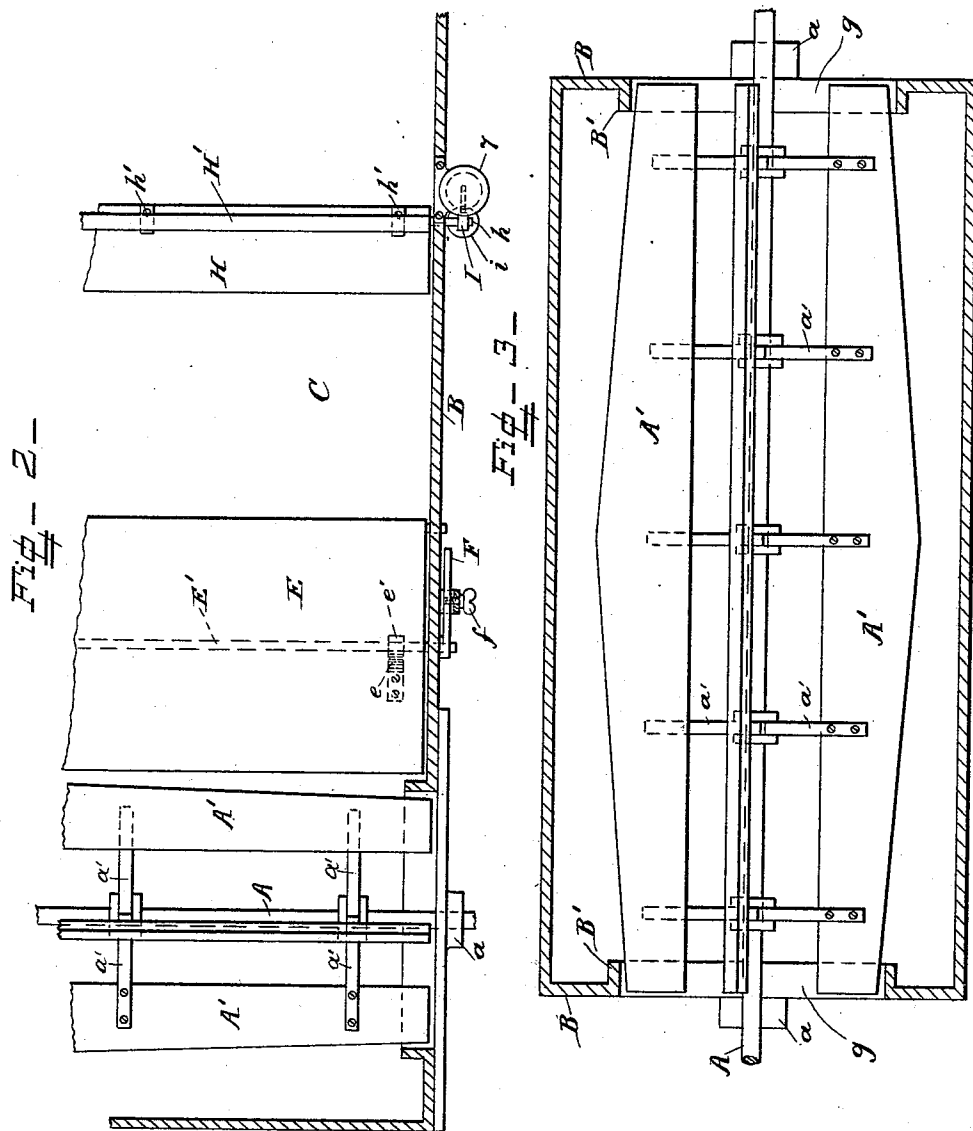
(No Model.)

2 Sheets—Sheet 2.

F. F. LANDIS.
FAN BLOWER.

No. 449,743.

Patented Apr. 7, 1891.



WITNESSES
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FRANK. F. LANDIS, OF WAYNESBOROUGH, PENNSYLVANIA.

FAN-BLOWER.

SPECIFICATION forming part of Letters Patent No. 449,743, dated April 7, 1891.

Application filed November 8, 1890. Serial No. 370,798. (No model.)

To all whom it may concern:

Be it known that I, FRANK. F. LANDIS, a citizen of the United States, residing at Waynesborough, in the county of Franklin and State of Pennsylvania, have invented certain new and useful Improvements in Fan-Blowers; 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 appertains to make and use the same.

This invention relates to fan-blowers, and more particularly to those used in connection with grain-separators.

This invention consists in the novel construction and combination of the parts hereinafter fully described and claimed, whereby the amount of the blast is rendered practically uniform and of equal volume and pressure at all points of the outlet-passage.

In the drawings, Figure 1 is a longitudinal section through the blower. Fig. 2 is a part plan view of the same. Fig. 3 is an end view of the blower.

A is the fan-shaft, adapted to be rapidly revolved in the bearings *a*, secured to the sides of the fan-casing B, and *a'* are arms secured to the shaft A for supporting the fan-blades A'.

C is the main outlet-passage, and D is an auxiliary outlet-passage, for the blast of air from the fan. In a grain-separator the outlet-passage C delivers its blast of air to the under side of the main screen and removes the chaff from the wheat, and the outlet passage D delivers its blast to the cleaning devices for removing the tailings from the wheat.

E is the deflecting-board pivoted, at the junction of the two delivery-passages C and D. A rack *e* is secured to the board E, and *e'* is a toothed segment secured on the revolvable shaft E' for raising or lowering the board E and distributing the blast of air between the two delivery-passages in any proportion found most advantageous in the working of the machine.

F is a handle for turning the shaft E', and *f* is a screw for holding it in any desired position.

As the fan is very long when used in a separator, the blades are made with inclined edges, so that the fan is larger in diameter at

the center than at the ends. The centrifugal force of the fan being thus made greater at the center, and the inclination of the edges of the blades being arranged proportional to the increasing distance of the center portions of the blades from the inlet-openings *g* in the sides of the casing, the air is driven off in equal volumes from all points of the length of the blades.

B' are flanges, which project inwardly around the inlet-openings *g* and the ordinary circular vortex back-currents at the end of the fan, due to the usual clearance-spaces between the ends of the blades and the casing, are prevented. These vortex currents are formed in the following manner: A pressure of air exists inside the casing while the fan is revolving and the air is forced through the ordinary clearance-space between the ends of the fan-blades and the casing. This air is redrawn in the center of the fan and the fan is partly fed from its own delivery. When, however, the outer periphery of the ends of the blades projects within the inlet-opening no air can escape, because the pressure of air at the outer periphery of the blades close to the casing is the same as the pressure everywhere else around the fan inside the casing.

The fan-blades drive before them a blast of air of equal pressure and volume at all points across the entrance to the delivery-passages, and not strong in the center and weak at the sides, as is usually the case with most fans.

H is a regulating-valve extending across the main delivery-passage C and secured upon the shaft *h*, which is journaled in the sides of the said passage. H' is a longitudinal wind-vane secured to the said valve H by the brackets *h'*. The valve H is pivoted in the lower part of the main passage with its longest side toward the blower. The valve H has beveled upper and lower sides, so as to present a sharp edge to the blast, and when the pressure of the blast is at its minimum the valve lies parallel with the axis of the delivery-passage. The wind-vane is preferably triangular in cross-section, and is arranged at a right angle to the valve, so that the blast may bear against one of its flat sides.

I is a vertical lever secured to the end of the shaft *h* outside the delivery-passage, and

i is an adjustable weight sliding upon the said rod and provided with a pin 3, adapted to engage with the notches *i'* in the said lever.

5 When the pressure of the blast in the main delivery-passage is increased by lowering the deflecting-board, or by increasing the speed of the fan, the increased pressure of the blast against the vane *H'* turns the shaft, and the
10 blast then operates upon the valve by blowing against its under side. This motion of the shaft also raises the weight *i*, which acts with increasing leverage upon the shaft as it rises and retards the closing of the delivery-
15 passage by the valve to the minimum area, as indicated by the dotted lines in Fig. 1. The pressure of the blast delivered through the main passage C is therefore rendered practically uniform, and the desired limits
20 of maximum and minimum pressure may be regulated by sliding the weight upon the lever I and fastening it at that distance from the center of the shaft which is found to give the desired result. An adjustable spring or
25 other equivalent device might be used instead of the weight.

The lever I is provided with a projecting arm 4, and 5 is a rod which pivotally connects the said arm with the piston 6, which slides
30 loosely in the dash-pot cylinder 7. The cylinder contains air, which is forced from one side of the piston to the other when the valve H is moved. This dash-pot prevents all unsteadiness of action in the movement of the
35 valve and relieves it from its natural tendency to set up a vibrating pendulum motion under the action of the blast.

What I claim is—

1. The combination, with a fan-casing provided with inlet-openings at each side, of a
40 revoluble fan journaled inside the said casing and having the outer periphery of the ends of its blades projecting within the said inlet-openings, whereby the formation of cir-
45 cular vortex currents at the ends of the fan is prevented and the volume and pressure of the blast are equalized all across the fan.

2. The combination, with a fan-casing provided with inlet-openings at each side and

inwardly-projecting flanges encircling the
50 said openings, of a fan journaled inside the said casing and having the outer periphery of the ends of its blades projecting within the inlet-openings in close proximity to the said
55 flanges, substantially as and for the purpose set forth.

3. The combination, with a fan-casing provided with an inlet-opening, of a revoluble fan having the outer periphery of its blades
60 projecting into the said opening to prevent the escape of air past the ends of the blades, substantially as set forth.

4. The combination, with a blower, of a pivoted valve extending across the main air-
65 discharge passage and normally lying in line with its axis, a wind-vane secured to the said valve and arranged crosswise of the said passage, and an adjustable controlling device—
70 such as a weighted lever—for retarding the closing of the said valve by the blast, substantially as set forth.

5. The combination, with a blower provided with air-discharge passages, an adjustable de-
75 flecting-board for distributing the air between the said passages, of a pivoted valve extending across one of the said passages and normally lying in line with its axis, a wind-vane
80 secured to the said valve and arranged crosswise of the said passage, and an adjustable controlling device—such as a weighted lever—
85 for retarding the closing of the said valve by the blast, substantially as set forth.

6. The combination, with a blower, of a valve pivoted in the main air-discharge pas-
90 sage of the blower, a wind-vane secured to the said valve and adapted to partially close it when the pressure of the blast is increased, an adjustable controlling device—such as a
95 weighted lever—for retarding the closing of the valve by the blast, and a dash-pot operatively connected with the said valve for steady-
ing its action, substantially as set forth.

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

FRANK. F. LANDIS.

Witnesses:

HERBERT W. T. JENNER,
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