G. S. LEONARD.

FAN OR BLOWER.

APPLICATION FILED MAY 3, 1917.

1,328,679. Patented Jan. 20, 1920.

Fig. 1.

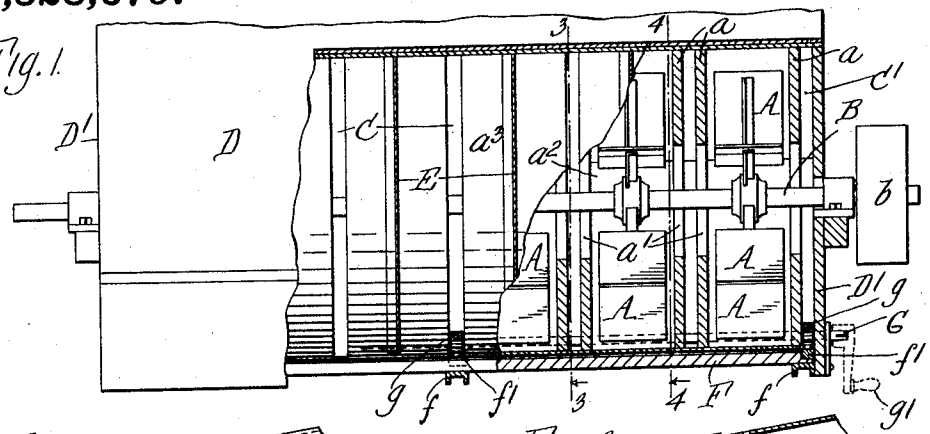


Fig. 2.

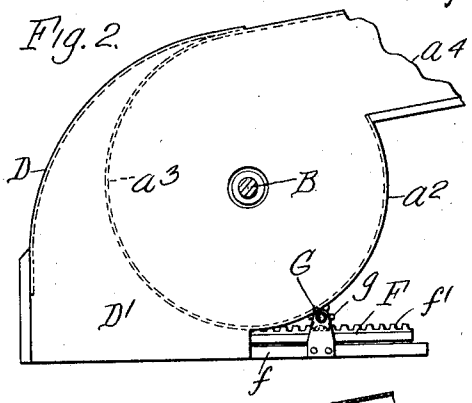


Fig. 3.

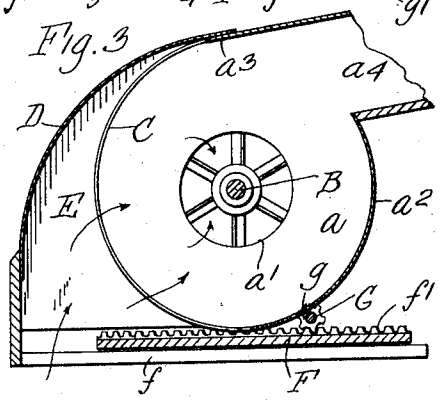


Fig. 4.

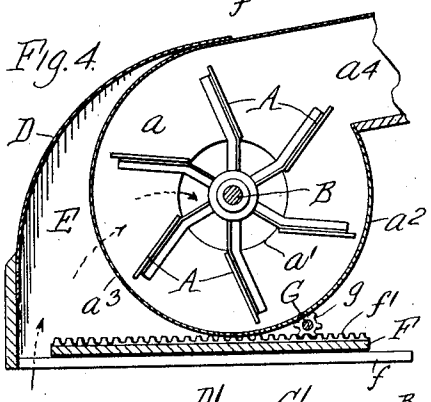


Fig. 5.

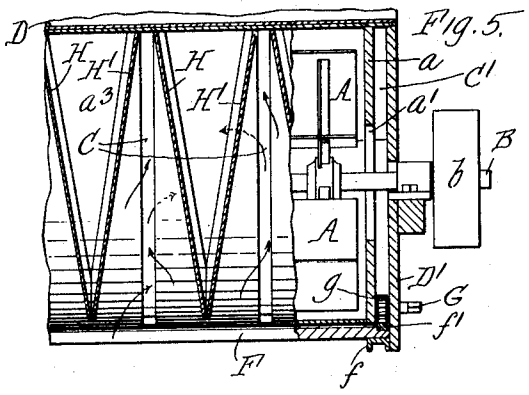
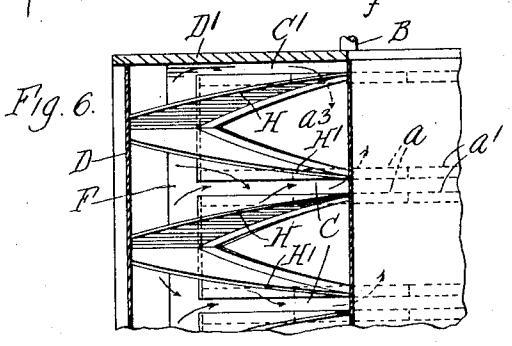


Fig. 6.



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UNITED STATES PATENT OFFICE.

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FAN OR BLOWER.

1,328,679. Specification of Letters Patent. Patented Jan. 20, 1920.

Application filed May 3, 1917. Serial No. 166,204.

To all whom it may concern:

Be it known that I, GEORGE S. LEONARD, a citizen of the United States, residing at Minneapolis, in the county of Hennepin and State of Minnesota, have invented a new and useful Improvement in Fans or Blowers, of which the following is a specification.

This invention relates to fans or blowers of the kind adapted to be used in connection with separating machines, threshing machines or analogous devices.

The objects of the invention are to provide a fan or blower of this kind of improved construction which is so made as to insure a uniform distribution of air throughout the entire width of a separating machine or analogous device; also to provide a blower which may be used out of doors, for example, in connection with the separating mechanism of a threshing machine, and which will not be affected by the direction or strength of the wind or air currents; also to provide an apparatus of this kind with means of improved construction for regulating the flow of air to the fan; also to improve the construction of fans of this kind in other respects hereinafter specified.

In the accompanying drawings:

Figure 1 is a front elevation of a fan or blower embodying the invention, partly broken away to show the interior thereof.

Fig. 2 is a side elevation thereof.

Figs. 3 and 4 are sectional elevations thereof on lines 3—3 and 4—4, respectively, Fig. 1.

Fig. 5 is a fragmentary sectional elevation of a fan or blower of modified construction.

Fig. 6 is a fragmentary sectional plan view thereof.

The fan or blower includes a plurality of sets of rotary fan blades A suitably mounted on a common shaft B which may be driven by means of a pulley *b*. Each set of blades is arranged in a fan blade compartment or housing comprising the usual side walls *a* having eyes or air inlets *a'*, a rear peripheral wall a^2 extending throughout the entire width of the fan, and front peripheral walls a^3 for each housing. The fan compartments are separated from each other to form air passages C through which the air may pass into the eyes *a'* of the fan compartments. a^4 represents the usual air outlets for the compartments. All of these parts may be of any usual or suitable construction, the arrangement of the fan blades and fan-blade compartments shown forming sectional fans of the centrifugal overshot type. Other arrangements of the fan blades and blade compartments may be employed, if desired.

The fan is provided with a hood or air inlet housing comprising a front curved wall D connected at one end with the peripheral walls of the fan-blade compartments, and side walls D' which are spaced slightly beyond the outer side walls *a* of the outer fan-blade compartments, thus forming air spaces or passages C' through which the incoming air must enter the eyes of the fan. The side walls D' being imperforate, prevent wind from entering into the eyes of the outer compartments and thus interfering with the uniformity of the air discharge from the fan. The bearings for the driving shaft B are mounted on the side walls D'. The open ends of the air passages C and C' communicate with the air inlet housing so that all the air entering the fan must pass through the housing. In order to prevent wind or external air currents from causing an unequal distribution of air to the various sets of fan blades, the housing is provided with a plurality of partitions E, each connecting the outer curved wall D of the hood and the front peripheral wall a^3 of a fan-blade compartment, thus dividing the air inlet housing into a number of air inlet compartments, corresponding in number, in the construction shown, to the number of air passages C C'. The air inlet housing is provided with an air inlet opening, that shown in the construction illustrated being arranged at the bottom of the housing B, and being in a substantially horizontal plane, so that wind or air currents cannot blow directly into the air inlet opening and thereby cause an unequal supply of air to the sets of fan blades.

Suitable means are provided for regulating the supply of air entering into the air inlet opening. In the construction shown for this purpose, a slide or damper F extending substantially from end to end of the fan is provided. This slide is supported and slides on beams *f* and may be adjusted for increasing or decreasing the air intake opening of the fan. Any suitable means for adjusting the slide may be provided. In the construction shown, the slide is provided with a plurality of rack bars *f'*, three being

shown in the construction illustrated, and an adjusting shaft or rod G provided with pinions g meshing with the rack bars f' is suitably journaled in the side walls D′ of the air intake housing. By rotating the shaft G, preferably by means of a removable handle g', the slide F can be moved forwardly or rearwardly to close or open the air intake opening of the fan.

The front wall D of the air inlet housing is so arranged relatively to the peripheral front walls a^3 of the compartments that the air space of the air intake housing decreases in size from the inlet to the upper portion thereof, thereby providing for a more uniform distribution of the air to the various portions of the air passages C and C′. By arranging the air inlet opening in a substantially horizontal plane, the intake of air to the fan is not in any way interfered with by the direction or velocity of the wind. The dividing walls E in the air inlet compartment insure a uniform distribution of air to all of the compartments of the fan, so that individual regulators for the several compartments are not necessary and a single slide or damper F may be employed.

In the construction shown in Figs. 5 and 6, the equal distribution of air to the several passages C C′ between the compartments is further insured by dividing the air inlet space into compartments by means of pairs of inclined partition walls H H′, these partition walls connecting the outer wall D of the air intake housing and the peripheral walls a^3 of the compartments and converging toward the intake opening of the fan. By means of this arrangement each air intake compartment is smaller than the space adjacent to the intake opening so that a uniform flow of air to the opening C between the compartments is insured.

I claim as my invention:

1. In a fan for delivering a current of air at a substantially uniform velocity throughout the width of said fan, the combination of a plurality of sets of fan blades arranged on a common shaft and spaced at intervals throughout the width of said fan, a series of compartments in which said blades are arranged, air inlet passages at both sides of each of said compartments, an air inlet housing which incloses one end and both sides of said series of compartments and with which each of said air passages communicates and through which the air supplied to said fan blades passes, said housing increasing in size toward one part thereof and having an air inlet opening in said part extending substantially throughout the width of said fan, and means movable lengthwise of said fan for regulating the size of said opening to control the supply of air to said housing.

2. In a fan, the combination of a plurality of sets of fan blades, a series of compartments in which said blades are arranged, air inlet passages at both sides of each of said compartments, an air inlet housing which incloses one end and both sides of said series of compartments and with which each of said air passages communicates and through which the air supplied to said fan blades passes, said air inlet housing being divided into a plurality of compartments, one compartment being provided for each of said air inlet passages.

3. In a fan, the combination of a plurality of sets of fan blades, a series of compartments in which said blades are arranged, air inlet passages at both sides of each of said compartments, a hood forming air inlet spaces communicating with each of said passages and having an inlet opening, and partition walls connecting said hood with said blade compartments and forming a plurality of air inlet compartments each of which terminates in said opening.

4. In a fan, the combination of a plurality of sets of fan blades, a series of compartments in which said blades are arranged, air inlet passages at both sides of each of said compartments, a hood forming air inlet spaces communicating with each of said passages and having an inlet opening, partition walls connecting said hood with said blade compartments and forming a plurality of air inlet compartments each of which terminates in said opening, and means for regulating the size of said opening.

5. In a fan, the combination of a plurality of sets of fan blades, a series of compartments in which said blades are arranged, air inlet passages at both sides of each of said compartments, an air inlet housing which incloses one end and both sides of said series of compartments and with which said air passages communicate, and having an air inlet opening, said housing being divided into a plurality of compartments, one compartment being provided for each of said air inlet passages, and each of said compartments communicating with said opening, and a slide for regulating the extent of said opening.

6. In a fan, the combination of a plurality of sets of fan blades, a series of compartments in which said blades are arranged, air inlet passages at both sides of each of said compartments, an air inlet housing which incloses one end and both sides of said series of compartments and with which each of said air passages communicates and through which the air supplied to said fan blades passes, said air inlet housing gradually increasing in size toward one side thereof and having an air inlet opening at the largest portion of said side and extending in a direction substantially parallel with the axis of said fan, and a slide which is

adjustable to regulate the size of said opening and which is movable in a direction substantially parallel with the axis of said fan.

7. In a fan, the combination of a plurality of fan blades, compartments in which said blades are arranged, air inlet passages for said compartments, an air inlet housing with which said passages communicate and which increases in size toward one side thereof and which has an inlet opening in said side and arranged in a substantially horizontal plane and extending substantially throughout the width of said fan, and regulating means movable in a direction substantially parallel to the axis of said blades for regulating the size of said opening.

8. In a fan, the combination of a plurality of fan blades, compartments in which said blades are arranged, air inlet passages for said compartments, an air inlet housing with which said passages communicate and having an air inlet opening, partitions dividing said air inlet housing into a plurality of compartments, each communicating with said opening and with one of said passages, and means for regulating the size of said opening.

9. In a fan, the combination of a plurality of fan blades, compartments in which said blades are arranged, air inlet passages for said compartments, an air inlet housing with which said passages communicate and having an air inlet opening, a plurality of partitions dividing said air inlet housing into a plurality of air inlet compartments, each communicating with said opening and with one of said air inlet passages, said compartments being of greatest cross-sectional area at said opening and decreasing in size toward the parts of the housing remote from said inlet opening.

10. In a fan, the combination of a plurality of fan blades, compartments in which said blades are arranged, air inlet passages for said compartments, an air inlet housing with which said passages communicate and having an air inlet opening, a plurality of partition walls dividing said air inlet housing into a plurality of air inlet compartments, each communicating with said opening and with one of said air inlet passages, said partition walls diverging and forming compartments which are of greatest cross-sectional area at the outlet opening and which decrease in size toward the parts of the housing remote from said inlet opening.

11. In a fan, the combination of a plurality of sets of fans, a series of compartments in which said fans are arranged, a common shaft on which said fans are secured and which extends through said compartments, air inlet openings in opposite sides of each of said compartments adjacent to the axes of said fans, air inlet passages at opposite sides of each of said compartments for conducting air to said openings, and a hood which partly surrounds said compartments and with which all of said air inlet passages communicate, said hood having a substantially horizontal air inlet opening extending substantially throughout the width of said hood and through which all the air supplied to said fans is drawn, said hood having the greatest cross-sectional area at said opening and decreasing in size toward the parts of the housing remote from said opening.

12. In a fan, the combination of a plurality of sets of fans, a series of compartments in which said fans are arranged, a common shaft on which said fans are secured and which extends through said compartments, air inlet openings in opposite sides of each of said compartments adjacent to the axes of said fans, air inlet passages at opposite sides of each of said compartments for conducting air to said openings, a hood which partly surrounds said compartments and with which all of said air inlet passages communicate, said hood having a substantially horizontal air inlet opening in the part thereof having the greatest cross-sectional area and extending substantially throughout the width of said hood and through which all the air supplied to said fans is drawn, and means movable lengthwise of said fan for regulating the opening of said hood so that the size of said opening is always uniform throughout its width.

Witness my hand, this 27 day of March, 1917.

GEORGE S. LEONARD.

Witnesses:
M. L. THOMAS,
S. L. MOSER.