G. W. MARTIN.

BY-PASS DRAFT FAN.

APPLICATION FILED FEB. 5, 1919.

1,315,028.

Patented Sept. 2, 1919.

2 SHEETS—SHEET 1.

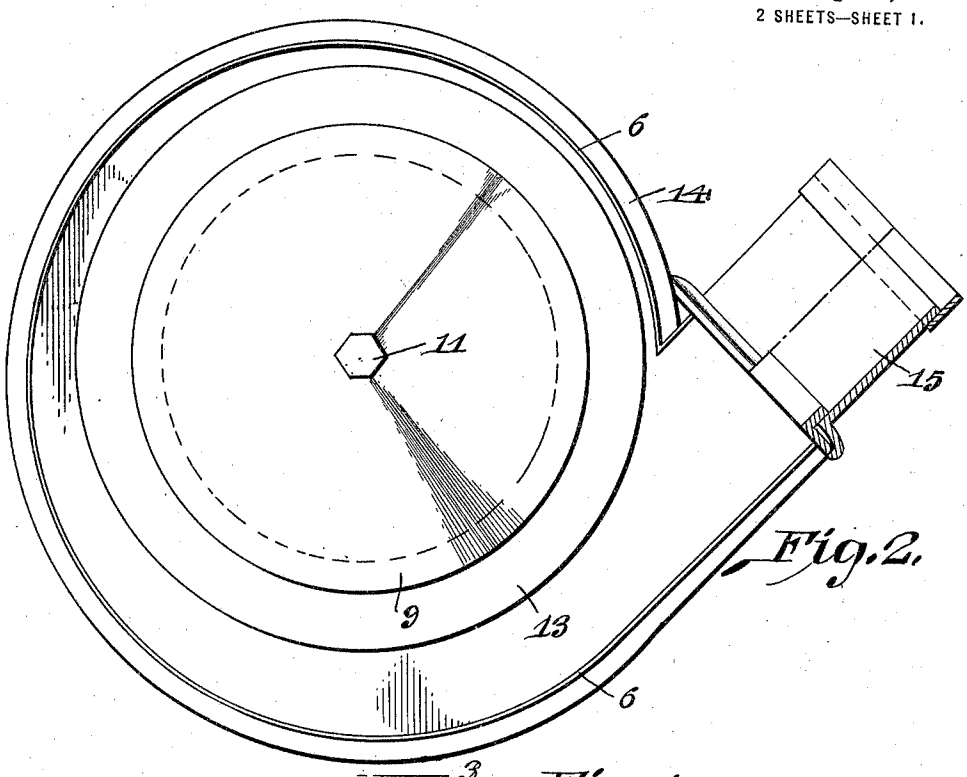


Fig. 2.

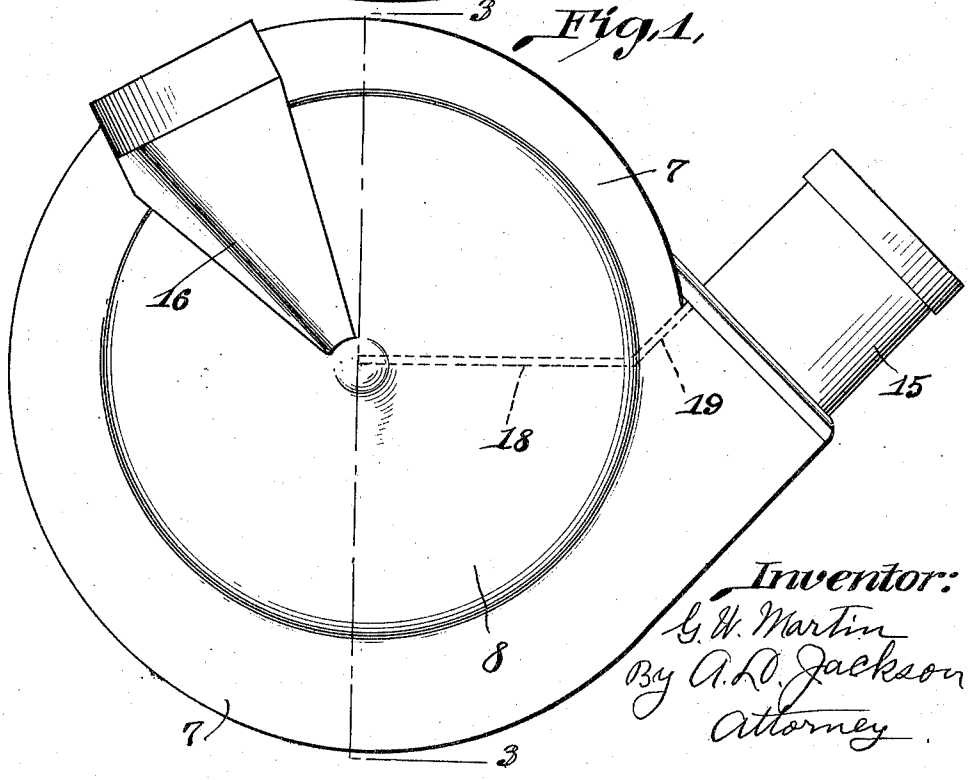


Fig. 1.

Inventor:
G. W. Martin
By A. D. Jackson
Attorney.

THE COLUMBIA PLANOGRAPH CO., WASHINGTON, D. C.

G. W. MARTIN.

BY-PASS DRAFT FAN.

APPLICATION FILED FEB. 5, 1919.

1,315,028.

Patented Sept. 2, 1919.

2 SHEETS—SHEET 2.

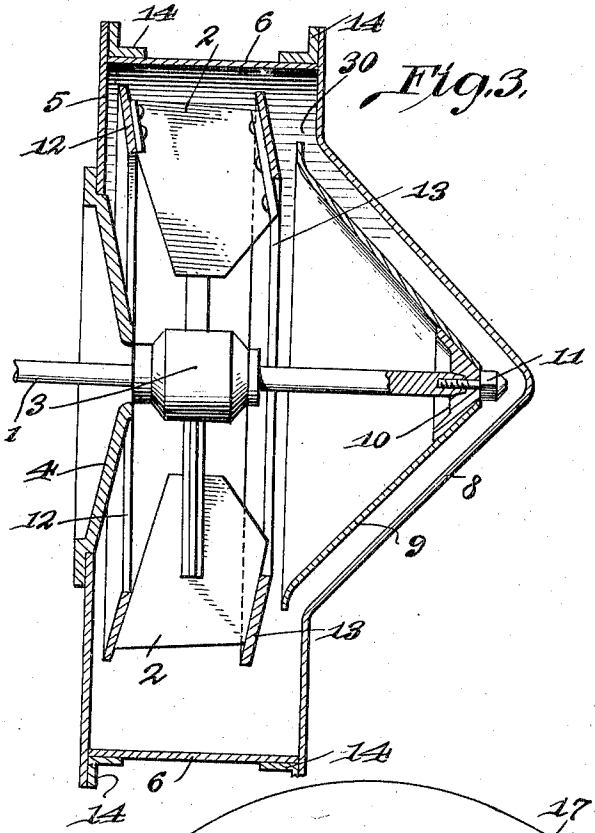


Fig. 3.

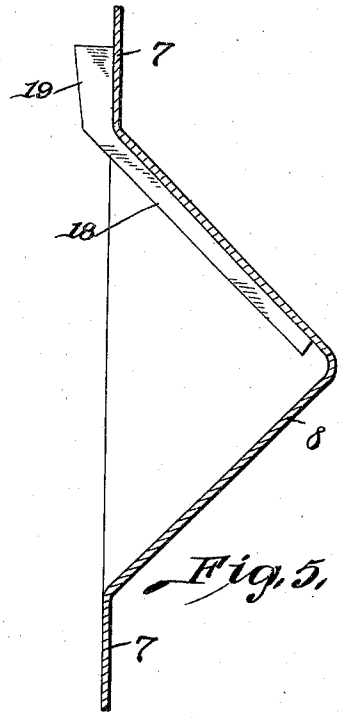


Fig. 5.

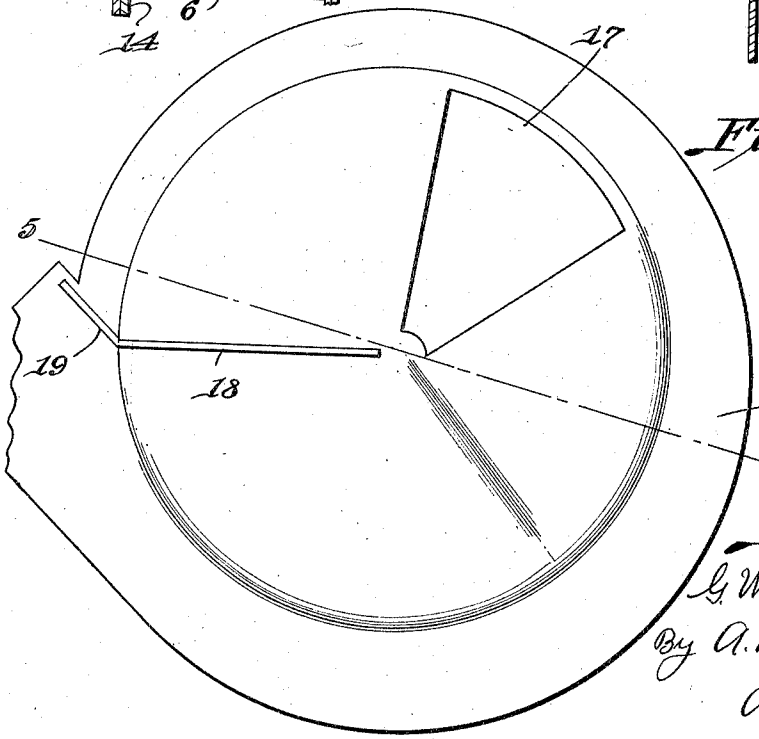


Fig. 4.

Inventor:
G. W. Martin,
By A. D. Jackson,
Attorney.

THE COLUMBIA PLANOGRAPH CO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

GEORGE W. MARTIN, OF FORT WORTH, TEXAS, ASSIGNOR TO OIL MILL MACHINERY & MANUFACTURING CO., OF FORT WORTH, TEXAS, A CORPORATION OF TEXAS.

BY-PASS DRAFT-FAN.

1,315,028. Specification of Letters Patent. Patented Sept. 2, 1919.

Application filed February 5, 1919. Serial No. 275,190.

To all whom it may concern:

Be it known that I, GEORGE W. MARTIN, a citizen of the United States of America, residing at Forth Worth, in the county of Tarrant and State of Texas, have invented a new and Improved By-Pass Draft-Fan, of which the following is a specification.

My invention relates to draft fans and more particularly to by-pass fans; and the object is to provide fans for general purposes of pneumatic conveyers for handling seed cotton, cotton seed, lint, hair, peanuts, rice bran, and other articles, the principal object being to provide fans which will not strike the material passing therethrough with the blades of the fans and which will not otherwise batter or hammer the material which is passing through the fans. One of the objects is to utilize air in its most powerful form,—air in spiral revolutions or rotations and cyclonic in effect. Other objects and advantages will be fully explained in the following description and the invention will be more particularly pointed out in the claims.

Reference is had to the accompanying drawings which form a part of this application.

Figure 1 is a side elevation of the improved fan. Fig. 2 is an interior elevation, the conical side of the casing being removed. Fig. 3 is a vertical section, taken on the line 3—3 of Fig. 1. Fig. 4 is an interior elevation of the conical side of the casing, showing the position of the air cut-off. Fig. 5 is a section of the conical side of the casing, taken on the line 5—5 of Fig. 4.

Similar characters of reference are used to indicate the same parts throughout the several views.

The improved fan is provided with a shaft 1 and a fan having blades 2 and a hub 3 on which the blades are mounted. The back casing of the fan consists of a truncated conical casting 4 and a flat sheet metal ring plate 5. The peripheral part of the casing 6 is somewhat in the form of a geometrical spiral, or it is a progressive curve. The front part 7 of the casing has a cone-shaped portion 8 which houses a baffle cone 9 and coöperates therewith. The baffle cone 9 is made rigid with the fan shaft 1 by a conical casting 10 and a screw bolt 11. The end of the shaft 1 is somewhat conical and the screw bolt 11 clamps the casting rigidly on the shaft 1 and the cone 9 is riveted to the casting 10. The fan is provided with a rear baffle 12 and a front baffle 13 which are in form truncated cones and the fan blades are riveted to the baffles. The casing of the fan is braced by curved angle bars 14 which are bolted to the member 6 and to the side frame members 5 and 7.

The cone-baffle 9 must be spaced from the fan and an annular space must be provided between the fan baffle 13 unobstructed by anything connecting the cone baffle to the baffle 13. The cone baffle must cover a sufficient portion of the baffle to prevent material from passing to the fan blades. The cone baffle must be properly spaced from the cone 8 and the space between these two members will be different for different materials, being greater for some materials and less for other materials. The fan is provided with an outlet or discharge 15 for connection with a suitable flue. The fan is provided with an intake 16 which is connected to the intake opening 17 in the cone 8. An angular air cut-off 18 is riveted to the conical side of the casing, having an angular portion 19 connected to the part 7 of the casing. The air cut-off must be properly located relative to the cone baffle 9.

The effect of the air entering into the cone against the cone baffle 9 is to multiply the force of the air and make it cyclonic in effect. The air in passing about the cone baffle is like the air in a funnel-shaped tornado, and, commencing near the apex of the cone, grows in intensity as it passes toward the base of the cone to be discharged through the outlet 15. The air cut-off 18 and 19 directs the material and air out through the discharge outlet 15. The admission of air is entirely through the cone 8 and all material to be moved also enters through the cone 8 and none of the material to be moved ever touches the fan blades.

The material entering through inlet 16 cannot pass the flow or current of air at the point 30 into the wheel blades. The fan wheel forces the air into the cone 9 and the air is deflected by expansion and passes out at the base of the cone or point 30, mak-

ing at this point 30 the strongest current of air. This accomplishes both purposes, that is, preventing the material from striking and damaging the blades of the fan wheel, and protecting the material from being damaged by the blades of the fan.

Various changes in the sizes, proportions, construction, and arrangement of the several parts may be made without departing from the spirit of my invention.

What I claim is:—

1. A by-pass fan comprising revolving fan blades provided with a shaft, a discharge outlet for the fan, conical members, one revolving with the fan and the other stationary, forming a conical by-pass at one side of the fan communicating with said outlet, a cut-off intercepting said by-pass for directing material and air to said outlet and an inlet communicating with said by-pass.

2. A by-pass fan comprising revolving fan blades and a shaft therefor, conical members at one side of said fan forming a conical by-pass, a baffle between said conical members and the fan blades for preventing material from entering the path of the fan blades, a discharge outlet for the fan, and an inlet communicating with said by-pass.

3. A by-pass draft fan comprising revolving fan blades and a shaft therefor, a casing for the fan provided with a discharge outlet and having a conical casing member on one side, a baffle cone rigid with said shaft and spaced from said conical casing member, an air cut-off intercepting the space between said cone baffle and conical casing, for directing material and air to said outlet, and an inlet communicating with the space between said baffle cone and said conical casing member.

4. A by-pass fan comprising revolving fan blades and a shaft therefor, a discharge outlet for said fan, conical members, one stationary and the other revolving with said shaft, forming a conical by-pass at one side of said fan communicating with said outlet, a baffle moving with said blades for preventing passing material from entering the path of the fan blades, and an inlet communicating with said conical by-pass.

5. A by-pass draft fan comprising revolving fan blades and a shaft therefor, a casing for said fan provided with a discharge outlet and having a conical member on one side, a blade baffle attached to said blades, a baffle cone rigid with said shaft and spaced at close proximity from said blade baffle and from said conical casing member, and an inlet communicating with the space between said baffle cone and said conical casing member.

6. A by-pass draft fan comprising revolving fan blades and a shaft therefor, a casing for said fan provided with a discharge outlet and having a conical casing member on one side, a baffle cone rigid with said shaft and conforming in contour with said conical casing member and spaced therefrom and coöperating therewith, and an inlet communicating with the space between said cone and said conical casing member.

7. A by-pass draft fan comprising revolving fan blades and shaft therefor, a casing for said fan having a cone shaped member on one side, a truncated cone baffle attached to said blades, a baffle cone rigid with said shaft and spaced from said truncated cone baffle and spaced from the conical side member of said casing, an inlet communicating with the space between said cone and conical casing member, and a discharge outlet for said fan.

8. A by-pass fan comprising a casing, a shaft journaled in said casing, a fan rigid with said shaft and provided with blades, rear and front baffles attached to said blades, a conveyer cone rigid with said shaft and having its base spaced from said front baffle but terminating in close proximity thereto, a cone shaped casing for one side of said fan conforming in contour to said conveyer cone and spaced therefrom, an intake opening into the space between said conveyer cone and conical casing member, and an outlet for discharging material from the fan.

9. A by-pass fan comprising revolving fan blades and a shaft therefor, a discharge outlet for said fan, conical members, one stationary and the other revolving with said shaft, forming a conical by-pass at one side of said fan communicating with said outlet, a baffle moving with said blades for preventing passing material from entering the path of the fan blades, a cut-off adjacent to said outlet intercepting said by-pass for directing material to said outlet, and an inlet communicating with said conical by-pass.

10. A by-pass fan comprising revolving fan blades and a shaft therefor, a blade baffle attached to said blades, a discharge outlet for said fan, a cone baffle rigid at its apex with said shaft and terminating at its base near said blade baffle but spaced therefrom, a conical casing member conforming in contour with said cone baffle but spaced therefrom and forming therewith a conical by-pass communicating with said outlet, and an inlet leading through said conical casing member into said by-pass.

11. A by-pass fan comprising revolving fan blades and a shaft therefor, a blade baffle attached to said blade, a discharge outlet for said fan, a cone baffle rigid at its apex with said shaft and terminating at its base near said blade baffle but spaced

therefrom and terminating with a curved edge in the base, a conical casing member conforming in contour with said cone baffle but spaced therefrom and forming therewith a conical by-pass communicating with said outlet, an angular cut-off attached to said conical casing member and intercepting said by-pass for directing material to said outlet, and an inlet leading through said conical casing member into said by-pass.

In testimony whereof I set my hand this 18th day of January, 1919.

GEORGE W. MARTIN.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."