(No Model.)

A. N. WOLF.

COMBINED DUST COLLECTOR AND ASPIRATOR.

No. 455,140. Patented June 30, 1891.

Fig. 1.

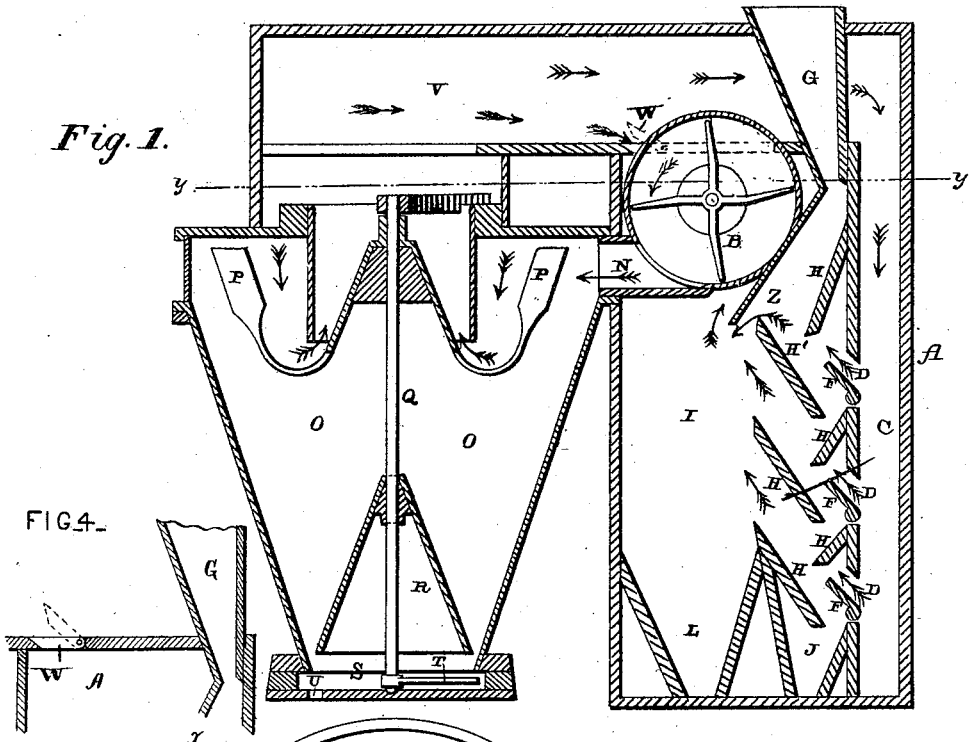


FIG. 4.

Fig. 2.

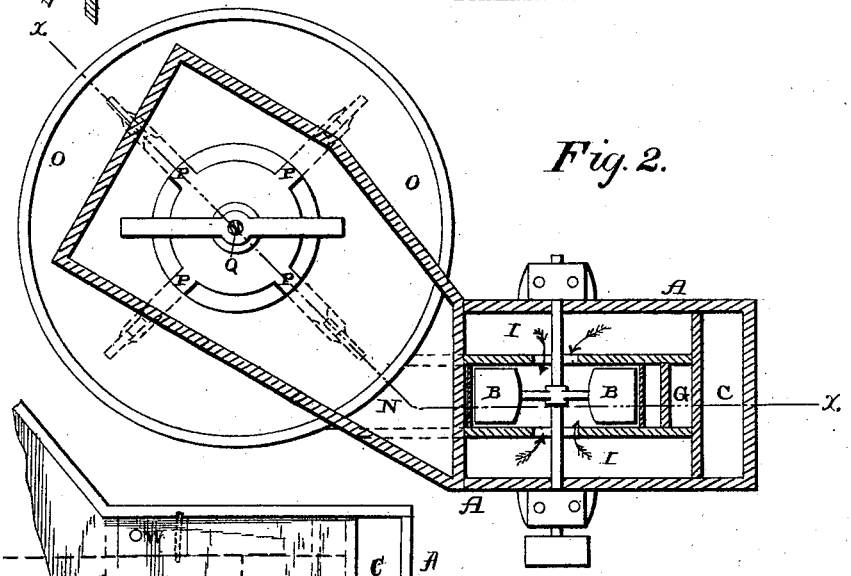
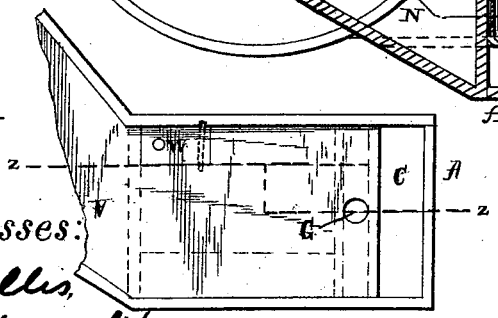


FIG. 3.



Witnesses:
E. P. Ellis,
J. M. Nesbit.

Inventor:
A. N. Wolf.
per Lehmann & Pattison,
attys

UNITED STATES PATENT OFFICE.

ABRAHAM N. WOLF, OF ALLENTOWN, PENNSYLVANIA.

COMBINED DUST-COLLECTOR AND ASPIRATOR.

SPECIFICATION forming part of Letters Patent No. 455,140, dated June 30, 1891.

Application filed August 19, 1890. Serial No. 362,427. (No model.)

To all whom it may concern:

Be it known that I, ABRAHAM N. WOLF, of Allentown, in the county of Lehigh and State of Pennsylvania, have invented certain new and useful Improvements in Combined Dust-Collectors and Aspirators; 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 improvements in combined dust-collectors and aspirators; and it consists in the combination and arrangement of parts, which will be fully described hereinafter, and particularly referred to in the claims.

The object of my invention is to construct a dust-collector in which the fan draws a current of air through the falling reduced material for the purpose of grading it, then forces it through a dust-collector around to the entrance to the grader, where it is caught by the suction of the fan and again drawn through the falling material to the fan, thus creating a continuous circuit of air through the grader, fan, and dust-collector, which will accomplish fine work at a slow speed.

Figure 1 is a vertical section of my machine, taken on dotted line *x x* of Fig. 2. Fig. 2 is a horizontal section of the same, taken on the dotted line *y y* of Fig. 1. Fig. 3 is a plan view of the right-hand end of the machine, the top and the grain-spout being removed. Fig. 4 is a vertical section of Fig. 3, taken on the dotted line *z z*.

A represents a suitable inclosing case, in the upper part of which is placed the fan B. Formed at one end of the frame is a vertical chamber C, which is provided with a series of openings D, having valves F, which act as regulators. As the reduced grain falls from the spout G it passes down through the aspirator Z, over the inclines H, and in falling it is struck by the currents of air which pass through the openings D. The aspirator consists of a channel or spout at the bottom of the spout G, and the incline H′ below it, which deflects the air up into the lower end of the said channel or spout, which causes the material to be blown against the inner wall of the said channel and pass around the upper end of the incline H′. These currents of air are caused by the fan forcing the air into the chamber C and then drawing it through the chamber I, in the lower part of which the hoppers J L, are formed. The air passes from the chamber I through the fan-case and through the passage N to the dust-collector O. From the dust-collector it passes to the chamber V, a portion of the air being drawn by the fan through the opening controlled by the valve W from the chamber V, while the greater part passes on to the chamber C, through the openings D to the chamber I. A portion of the air being drawn down from the chamber V, through the valve W, and up from the chamber I, it will be seen that counteracting currents are produced, which keep the fluffy material in the air until thoroughly cleansed, while at the same time a circulation of air is allowed around through the chamber C, openings D, chamber I, and fan-case to the dust-collector. By means of this construction it will be seen that the blast which passes through the openings D is regulated by the size of the opening controlled by valve W, for the reason that if a large amount of air passes through the said opening a smaller amount passes through the openings D, and vice versa. Unless the opening with valve W were provided, counteracting currents would not be produced, and hence the fluffy material would not be kept in the air sufficiently long to be thoroughly cleansed. The air in the chamber I forces the valve open, while the air which is being drawn through the valve tends to close it, and owing to this fact the valve will regulate the blast and the force of the counteracting currents. The currents of air cause the fluffy and light stock to be drawn through the chamber I back to the fan, while the good stock drops into the hopper J and the heavy stock is blown into the hopper L. The stock in the hopper J passes onto the sizing-roll, while the stock in the hopper L passes to the grade-roll. The dust being drawn directly from the top of the chamber I passes to the fan, from which it is discharged through the passage N into the dust-collector O. As the air enters the top of the dust-collector O laden with dust, it strikes against the revolving wings P, which are secured to the shaft Q,

journaled vertically in the collector, and which has the cone R secured thereto. The dust settles upon this cone, and is guided by it into the chamber S. From thence it is removed by the arm T, secured to the shaft Q, through the discharge U. The air, freed of its dust, passes from the top of the collector O into the chamber V. From thence it returns to the chamber I through the opening controlled by the valve W.

From the above it will be seen that the fan keeps up a constant current of air through the chambers C I, the dust-collector, and the aspirator without allowing a particle of material of any kind to be lost. The same air is used over and over, and hence no particle of material can possibly escape. A slower rate of speed than is generally employed can be used and a very fine grade of separation made.

Having thus described my invention, what I desire to secure by Letters Patent is—

1. In a machine of the character described, the combination of a dust-collector, a chamber at one side thereof, a feed-spout which deposits the grain into the said chamber, a vertical channel at the outer side of the chamber I, a chamber V, connecting the upper ends of the said vertical channel and the dust-collector, a fan and its casing, a passage connecting the fan and the dust-collector, and an opening connecting the fan and the chamber V, whereby counter-currents are formed, for the purpose described.

2. The combination of the dust-collector, the chamber I, the fan-case connecting their ends, the chamber C at one side of and having openings into the chamber I, a feed-spout emptying into the chamber I, a chamber V, connecting the upper ends of the dust-collector and the chamber C, an opening in the chamber V, which communicates with the interior of the fan-case, and a valve placed in the opening, whereby a continuous current and counter-currents are produced, substantially as described.

3. In a machine of the character described, a dust-collector having a revolving beater or arm, a casing A, which has an inner and an outer chamber, valved openings connecting the said chambers, a feed-channel in the upper end of the inner chamber, a fan-casing and fan in the upper end of the inner chamber, a chamber V, connecting the upper ends of the dust-collector and the said outer chamber, a channel connecting the fan-casing and the dust-collector tangentially, and a valved opening connecting the said inner chamber and the chamber V, the parts combined to operate substantially as shown.

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

ABRAHAM N. WOLF.

Witnesses:
C. C. SENSENBACH,
JAMES F. BUTZ.