(No Model.)

2 Sheets—Sheet 1.

A. C. & W. F. BOEHNING.

DUST AND SHAVING COLLECTOR.

No. 375,983. Patented Jan. 3, 1888.

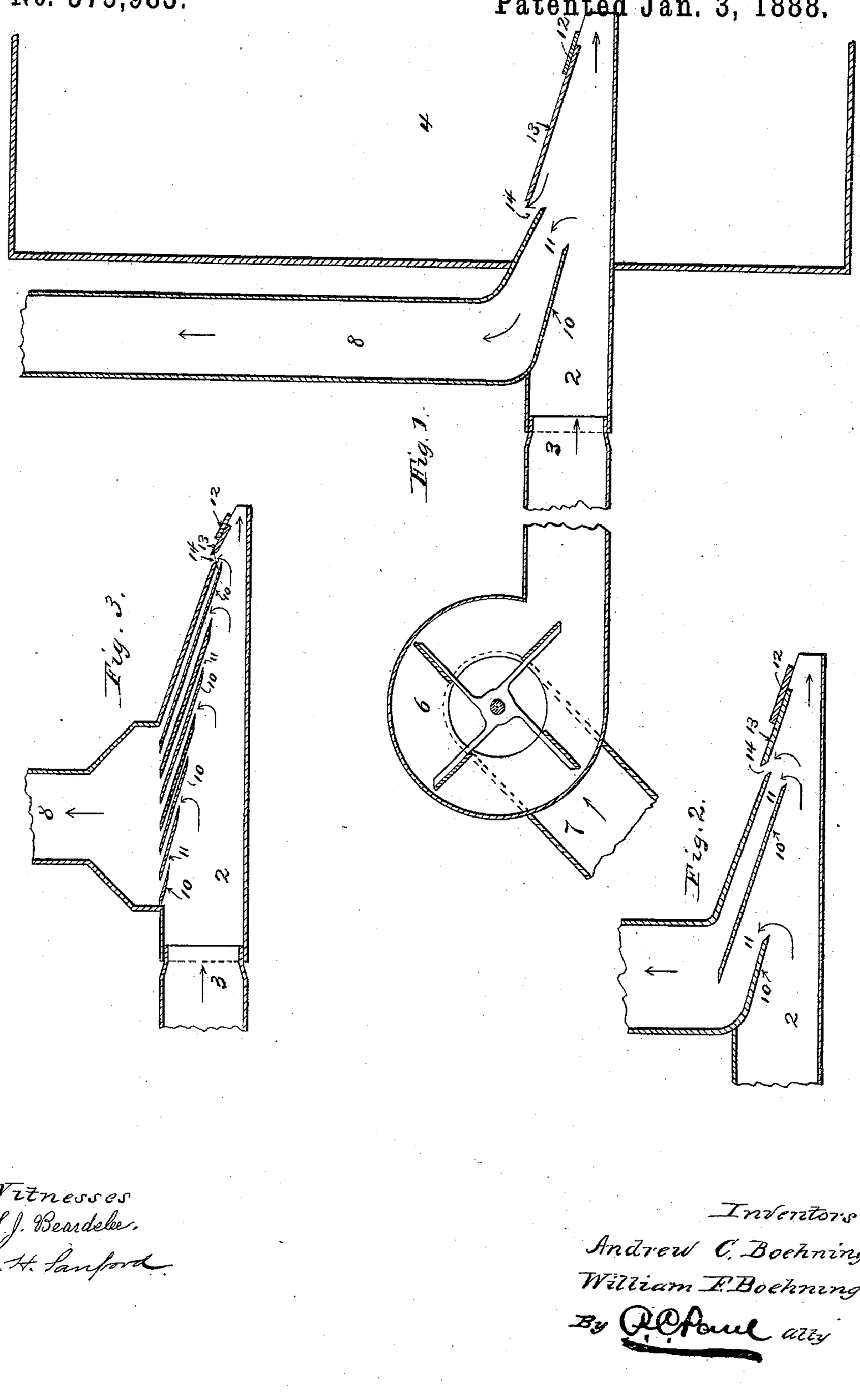

Fig. 1.

Fig. 3.

Fig. 2.

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(No Model.)

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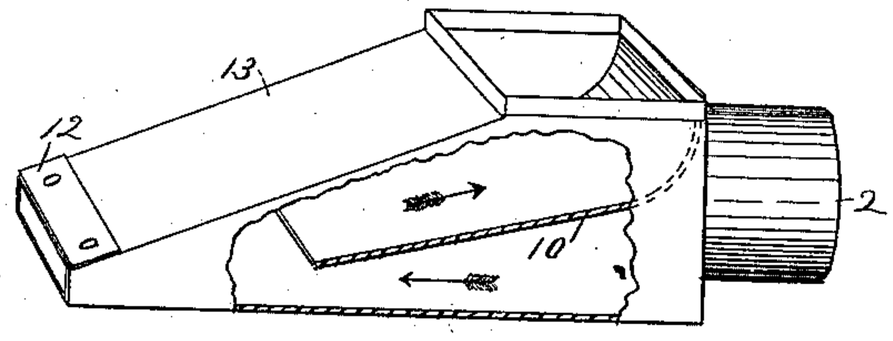
Fig. 4.



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UNITED STATES PATENT OFFICE.

ANDREW C. BOEHNING AND WILLIAM F. BOEHNING, OF MINNEAPOLIS, MINNESOTA.

DUST AND SHAVINGS COLLECTOR.

SPECIFICATION forming part of Letters Patent No. 375,983, dated January 3, 1888.

Application filed July 18, 1887. Serial No. 244,585. (No model.)

To all whom it may concern:

Be it known that we, ANDREW C. BOEHNING and WILLIAM F. BOEHNING, of Minneapolis, in the county of Hennepin and State of Minnesota, have invented certain new and useful Improvements in Dust and Shavings Collectors, of which the following is a specification.

Our invention relates to improvements in devices designed to be used in connection with a blast-fan for the purpose of separating from a current of air sawdust, shavings, chaff, or other light material and depositing it in a suitable receptacle while allowing the purified air to escape; and the object that we have in view is to provide a simple and inexpensive device that may be readily applied to the ordinary fans that are employed in saw-mills, planing-mills, elevators, and other places to collect the sawdust, shavings, and other material and blow it through suitable conveyers to a dust-room or other receptacle.

The invention consists, generally, in the construction and combination hereinafter described, and particularly pointed out in the claims.

In the accompanying drawings, forming a part of this specification, Figure 1 is a vertical section showing one form of device and its arrangement in connection with a blast-fan, conveyer, and dust-receptacle. Fig. 2 is a detail section of our collector, showing a slightly-modified arrangement of the deflecting-plates. Fig. 3 is a detail section showing another arrangement of the deflecting-plates. Fig. 4 is a perspective view partly broken away to show the arrangement of the deflecting-plate.

In the drawings, 6 represents an ordinary suction and blast fan provided with an in-take pipe, 7, connected with the open center of its case. This pipe may be arranged in any of the well-known ways with an open mouth that is in proximity to wood-working machinery or to an aspirating trunk or chamber of wheat-cleaning or other machinery; or it may be connected in the ordinary way with a middlings-purifier.

No invention is claimed in the fan itself or in its connection with the devices with which it is usually employed. We intend it to represent any fan that is used for creating a suction, and thereby causing a current of air laden with dust, shavings, chaff, bran, or other light material to pass into the fan-case and be blown out through the exit-pipe on the other side of the fan.

3 represents a suitable conveyer or conductor, that is connected with the exit-opening of the fan-case and extends to any desired point, for the purpose of conducting the air current and the material carried thereby to the point where the dust-collector is located.

4 represents a suitable dust-receptacle or dust-room in which it is desired to deposit the material that is carried by the air-current. This receptacle is preferably air tight, or substantially so, and forms a dead-air space into which the material carried by the air-current is forced while the air-current freed from such material is allowed to escape in the manner hereinafter described.

2 represents a suitable tube, constructed of any material and any desired form, that is joined to the conductor 3, hereinbefore described, so as to form a continuation thereof, and projects into the dust-receptacle 4. The tube 2 is preferably provided within the dust-receptacle with a contracted discharge-opening, preferably formed by contracting the end of the tube. We have here shown the top of the tube within the receptacle provided with an inclined wall, 13, leaving only a narrow opening at the inner end of the tube. Any other equivalent might, however, be used. The tube 2 is also provided, preferably, at a point near the dust-receptacle with an opening for the discharge of the air. This opening will for convenience usually be arranged in the top wall of the tube 2. A ventilating pipe or tube, 8, is joined to the tube 2 over this opening and extends to any convenient point. This pipe is used merely for convenience in conducting the escaping current of air to any convenient point where it may be discharged. The operation of the dust-collector is the same whether this tube is used or not, and where it is no objection to have the air discharged directly from the tube 2 the pipe 8 may be omitted. A deflecting-plate, 10, is arranged in the tube 2 opposite the air-discharge opening and extends toward the center of the tube and toward its discharge end, forming an opening, 11, through

which the air escapes from the tube 3 through the opening in its wall into the tube 8. The inner end of the tube 2 is also preferably provided with a slide, 12, by means of which the area of the discharge-opening may be contracted when desired. An opening, 14, may be formed in the inclined wall 13 at a point near the inner end of the deflecting-plate 10. This opening, however, is not essential to the operation of the device, and may be omitted when desired. When this opening is used, the parts of the wall 13 are preferably not in line with each other, the upper end of the lower section of the wall being above the lower end of the upper section, for the purpose hereinafter set forth. The collector may be made of any suitable shape and size and of any suitable material.

The operation of the device is substantially as follows: A current of air, carrying with it dust, shavings, or other light material, is drawn into the fan 6 and blown through the conductor 3 into the tube 2. The dust-receptacle forms a dead-air space, into which the air-current is prevented from entering by reason of the confined body of air within said receptacle E. As the air-current enters the contracted space under the deflecting-plate 10, its force is increased, and the dust, shavings, &c., carried by it are projected through the open end of the tube 2. The air-current is expanded after it passes the lower end of the plate 10 and passes into the tube 8 and escapes. A portion of the finer material strikes against the inclined wall 13, and is carried along the under surface of said wall toward the tube 8 by what may be termed the "outer" or least forcible part of the air current. It moves up this wall to the opening 14, and passes through this opening into the dust-receptacle 4.

In Fig. 2 I have shown the collector provided with two deflecting-plates, 10, and in Fig. 3 I have shown it provided with a series of said plates. The operation in these cases is similar to that already described, except that the current of air is partially contracted by each of the deflecting-plates, a portion of it escapes through the opening above each plate, and the remainder is further contracted, and then expanded as it passes each of the other places, until, finally, all or substantially all of the air has escaped, while the material carried by the air-current passes into the receptacle. It will be seen that as the opening for the escape of the air is at the upper side of the tube 2 the portion of the air-current that is freest from the dust will be that which will first be expanded as it passes the plate 10. As the current is gradually expanded, it lets go, as it were, of the dust or other material which is held by gravity toward the bottom of the tube, and is carried by its inertia through the open end of the tube into the dust-receptacle.

As hereinbefore stated, this device may be used in connection with any machinery or apparatus where it is desired to separate light particles of material, such as before mentioned, from a blast of air, and we do not confine ourselves to its use in connection with any particular apparatus. We prefer to manufacture the collector itself (by which we mean the device shown in Figs. 2 and 3, or a similar portion of the apparatus shown in Fig. 1) separately, and then apply it in connection with a blast-fan and dust-receptacle wherever it is desired.

We claim as our invention—

1. The dust-collector herein described, consisting of the tube 2, having a contracted discharge-opening, and having an opening in its wall for the discharge of the purified air, and an inclined deflecting-plate, 10, arranged in said tube 2 and extending toward its discharge end.

2. The dust-collector herein described, consisting of the tube 2, having a contracted end and provided with the opening 14 therein, the tube 8, connected with said tube 2, and a deflecting-plate, 10, arranged in said tube 2 and extending from the lower end of said tube 8 toward the contracted opening of the tube 2, substantially as described.

3. The combination, with the fan 6 and the conveyer 3, of the dust-receptacle 4, the tube 2, connected with said conveyer 3, extending into said dust-receptacle and provided with a discharge-opening within said receptacle and with an opening in its wall for the discharge of the purified air, and a deflecting plate, 10, arranged in said tube 2 opposite the opening in the wall and extending toward the discharge end of the tube 2, substantially as described.

4. The combination, with the fan 6 and conveyer 3, of the dust-receptacle 4, and the tube 2, provided within said receptacle, with a contracted discharge-opening, the tube 8, connected with the upper side of said tube 2, and an inclined deflecting-plate, 10, arranged in said tube 2 below the end of said tube 8 and extending toward the discharge end of the tube 2, substantially as described.

5. The combination, in a dust-collector, with the tube 2, provided with a contracted discharge-opening, of the tube 8, connected with the said tube 2, and a series of deflecting-plates, 10, arranged in said tube 2, below said tube 8, substantially as described.

6. The dust-collector herein described, comprising a suitable tube, 2, having a discharge-opening for the escape of dust or other material, an opening in its wall for the escape of the purified air, and an inclined deflecting-plate arranged in said tube opposite said opening and extending toward its discharging end, substantially as described.

In testimony whereof we have hereunto set our hands this 9th day of July, 1887.

ANDREW C. BOEHNING.
WILLIAM F. BOEHNING.

In presence of—
A. C. PAUL,
R. H. SANFORD.