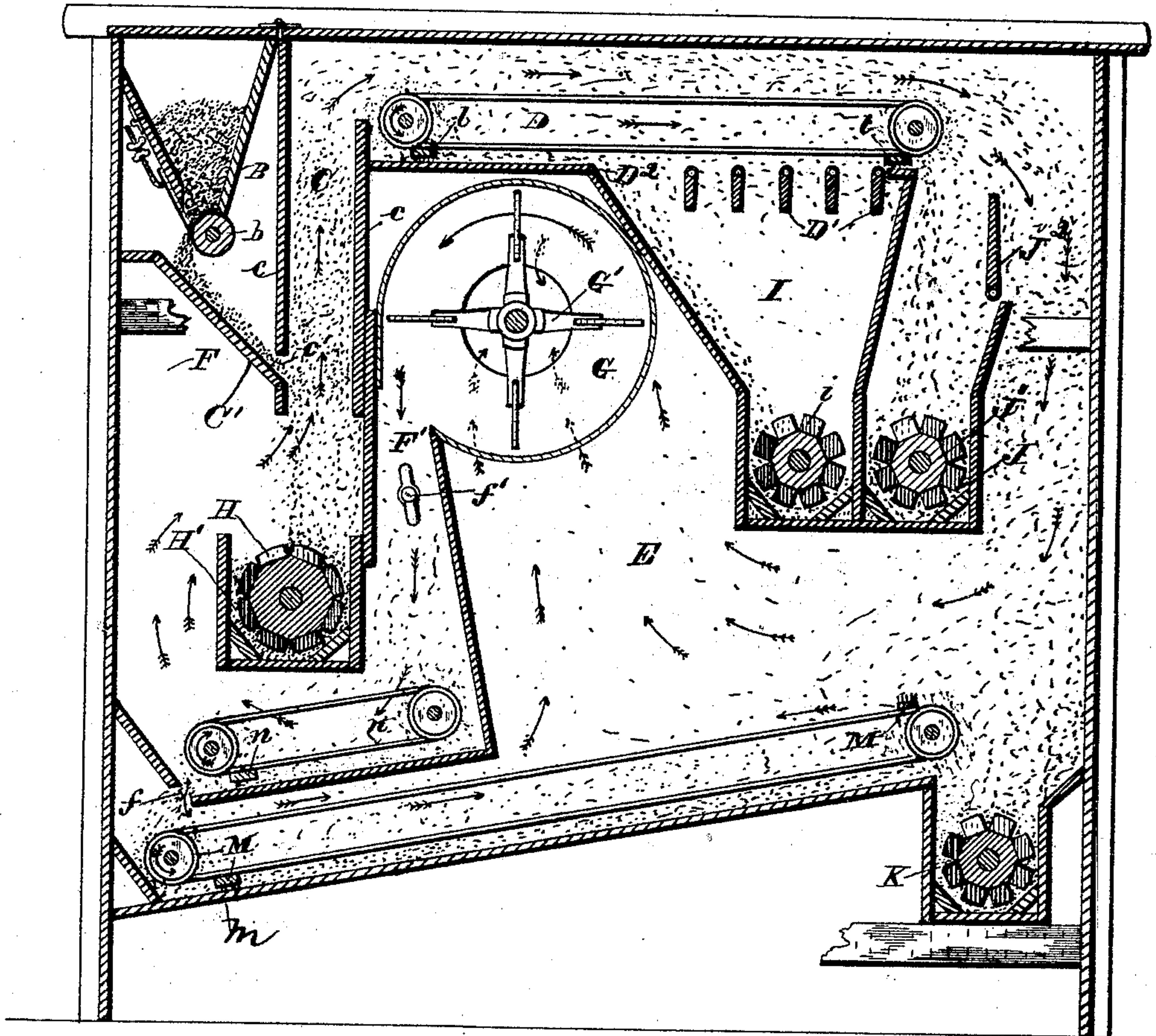


(No Model.)

C. A. BARNARD.  
COMBINED PURIFYING AND DUST COLLECTING MACHINE FOR GRAIN, &c.  
No. 460,078.

Patented Sept. 22, 1891.



WITNESSES

C. W. Sewell,  
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INVENTOR

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# UNITED STATES PATENT OFFICE.

CHARLES A. BARNARD, OF MOLINE, ILLINOIS, ASSIGNOR TO THE BARNARD  
& LEAS MANUFACTURING COMPANY, OF SAME PLACE.

COMBINED PURIFYING AND DUST-COLLECTING MACHINE FOR GRAIN, &c.

SPECIFICATION forming part of Letters Patent No. 460,078, dated September 22, 1891.

Application filed June 22, 1891. Serial No. 397,070. (No model.)

*To all whom it may concern:*

Be it known that I, CHARLES A. BARNARD, of Moline, in the county of Rock Island and State of Illinois, have invented certain new and useful Improvements in Self-Contained Air-Belt Purifiers and Dust-Collectors; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawing, and to the letters of reference marked thereon, which forms part of this specification.

This invention is a combined purifying and dust-collecting machine for grain, &c., and is an improvement upon the machine for which Letters Patent of the United States No. 455,270 were granted to H. A. and C. A. Barnard the 30th day of June, 1891; and its object is to simplify the construction and to increase the number of gradings of the material which can be made by one operation of the material; and it consists in the novel construction and combination of parts hereinafter clearly described and claimed.

The accompanying drawing represents a vertical longitudinal sectional view of my improved machine.

Referring to the drawing by letters, B designates the feed-hopper, having a feed-roll *b*.

D is a settling-chamber in the upper part of the machine, having an approximately flat bottom, which is cleaned by traveling brushes or scrapers *l l*, mounted on endless belts running over pulleys on shafts journaled in the main frame at the opposite ends of said chamber.

F is a small dust-settling chamber below hopper B and communicating at top through an air-separating device or trunk with chamber D.

H' is a conveyer-trough in chamber F below hopper B, into which the material delivered from the hopper will fall and be carried out of the machine by conveyer H'.

E is a large dust-chamber below chamber D and extending under chamber F, communicating at top with the rear end of chamber D and at its lower opposite end with chamber F through an opening *f* in the bottom thereof.

*n n* are brushes mounted on endless belts running over pulleys on shafts at the bottom

of chamber F and adapted to scrape matters deposited thereon into chamber E through opening *f*, and M M are traveling brushes for cleaning the bottom of chamber E, similarly mounted and adapted to sweep the material deposited on the bottom of chamber E into a conveyer-trough K, whence it is carried out of the machine.

G is a fan-chamber located below chamber D and above and to the inside of chamber F, and communicating with the latter through a passage F', and also communicating with chamber E, and G' is a fan therein, which, when driven by any suitable power, will create a circulation of air through chamber F up through the air-separating device into chamber D, thence into chamber E back to the fan-chamber, while a secondary air-current will be established from chamber F into chamber E through opening *f* back to the fan-chamber, the air-currents being indicated by the arrows.

All the aforementioned parts are constructed and adapted to operate substantially as shown and described in the patent aforesaid, and I will now give a detailed description of the improvements.

Above trough H' is a vertical air-trunk C, formed by the vertical transverse boards *c c*, through which trunk communication is established between chambers F and D.

C' is an inclined board below hopper B, adapted to catch the material delivered from the hopper and direct it through an opening *c'* into trunk C, through which it falls into trough H', being subjected in falling to the action of the air-current passing upwardly through said trunk, the dust and lighter grades of material being carried up into chamber D.

Below the rear end of chamber D is a bin I, in the bottom of which is a conveyer *i*. The bin is closed at sides, end, and bottom, and its top is formed by the bottom of chamber D, which is here formed of a number of adjustable valves or transverse boards D' D', which can be adjusted so as to close the top of the bin or opened, as desired. An opening D<sup>2</sup> is, however, left at the center of the floor, so that material deposited to the left of said



opening will be swept into the bin whether the valves be closed or not.

Beside bin I is formed another smaller bin or receptacle J, having conveyer J' in its bottom, and any material swept off the valves when they are closed will fall into bin J. A large adjustable valve or board J<sup>2</sup> is pivoted to the upper edge of the rear side of bin J and can be adjusted as indicated, so as to increase the width of the top of bin and narrow the passage between chambers D and E, as indicated in the drawings.

The force or volume of the air-current is regulated by a valve f' in passage F' or other convenient position.

In operation, the fan is started and air-circuits established, as indicated. The material is then fed from the hopper and distributed into the trunk C, where the first separation takes place. The heaviest material, falling into trough H', is conveyed out of the machine. The lighter materials and dust, &c., are carried up over into chamber D. In turning into chamber D from trunk C the second-grade material falls onto the floor of said chamber and is swept into bin I. The third grade of material falls onto valves D' and into the mouth of bin J, so that two separate grades are delivered from bins I J, and by regulating valves D' the miller can regulate the quantity of material collected in chamber I, as the heaviest is deposited nearest trunk C, and only the lightest material will pass over the valves, where it will be caught in bin J, and by adjusting valve J<sup>2</sup> the quality thereof can be further regulated, so that eventually when it is properly adjusted only dust and fluffy matters escape into chamber E, where they are deposited, having time to settle, owing to the large area of said chamber and are eventually carried out by conveyer K. Before the air returns to the separating-trunk, however, it is forced downward into chamber F, where it is caused to move almost in a complete circle, so that the dust will be deposited therein and returned through opening f into chamber E, to be eventually discharged by conveyer K. By this construction the material is separated by the action of gravity into four grades, and the air thoroughly purified before returning it to the first separating-trunk.

Having described my invention, what I claim as new, and desire to secure by Letters Patent thereon, is—

1. The combination of the hopper, the vertical air-trunk beside the same, the dust-chamber below the trunk, the settling-chamber above and to one side thereof, communicating with the dust-chamber through said trunk and the fan-chamber communicating with the settling and dust chambers, a trough in the dust-chamber for receiving the material falling through the trunk, and a fan, all substantially as specified.

2. The combination of the air-trunk, the dust-chamber below the same communicating

therewith, a settling-chamber communicating with said trunk and having a receiving-bin at its end opposite the trunk, and a regulating-valve at top of said bin, and a fan-chamber and fan for creating an endless air-current through the dust-chamber, trunk, and settling-chamber, substantially as described.

3. The combination of the settling-chamber, the bin below the bottom thereof, the traveling brushes in the bottom of the chamber, and the series of regulating-valves in the mouth of the bin forming part of the floor of the chamber, with the dust-chamber, fan-chamber, fan, and air-trunk, substantially as described.

4. The combination of the settling-chamber, the pair of bins below and near one end thereof, the dust-chamber below said settling-chamber, communicating therewith at the end adjoining the bins, a separating device communicating with said settling-chamber at the end opposite the bins, and a fan-chamber communicating with said separating device and dust-chamber, and the fan therein, substantially as and for the purpose specified.

5. In a combined grader, purifier, and dust-collector, the combination of the settling-chamber, the bin below the rear end of the same, the dust-chamber and air-trunk communicating with said settling-chamber at its opposite ends, the fan-chamber communicating with both the dust-chamber and air-trunk, the traveling brushes in said settling and dust chambers, and the conveyers in the bin and dust-chamber, substantially as described.

6. The combination of the settling-chamber, the pair of bins below and near one end thereof, a dust-chamber below the settling-chamber, communicating therewith, a separating device communicating with said chamber, and a fan-chamber communicating with the separating device and dust-chamber, and a fan therein, the brushes in said dust and settling chambers, and the conveyers in said bins, substantially as specified.

7. The combination of the hopper, the vertical air-trunk beside the same, the dust-settling chamber below the trunk, the settling-chamber above and to one side thereof, communicating with the dust-chamber through said trunk, a receiving-bin at the end of said dust-chamber, a valve at the top thereof, a second dust-chamber below the settling-chamber, a fan-chamber communicating with both dust-chambers, and means for removing the matters collected in the chambers and bin, substantially as specified.

8. In a combined grader, purifier, and dust-collector, the vertical air-trunk, a dust-chamber below the same, a trough in said chamber adapted to receive material falling through said trunk, a settling-chamber above and to one side of the trunk, communicating therewith, a receiving-bin below said chamber, the valves in the top thereof forming part of the floor of said chamber, a second dust-chamber below said bin, communicating with the set-



ting-chamber, a fan-chamber communicating with both dust-chambers, and a fan therein, substantially as set forth.

5 9. In a combined purifier, grader, and dust-collector, the combination of the hopper, separating-trunk beside the same, the dust-chamber below the trunk, the receiving - trough therein, the settling-chamber above and to one side of said trunk, a pair of bins at the opposite end of and below said settling-chamber, receiving material deposited therein, the valves for said bins, a second dust-collecting chamber below said bins, communicating with

said settling-chamber, the fan-chamber communicating with both dust-chambers, the fan, 15 and means for removing deposited matters from the chambers, bins, and trough, all substantially as and for the purpose described.

In testimony that I claim the foregoing as my own I affix my signature in presence of two 20 witnesses.

CHARLES A. BARNARD.

Witnesses:

WM. C. BENNETT,  
LUTE H. PIKE.