(No Model.) 2 Sheets—Sheet 1.

N. W. HOLT.

DUST COLLECTOR.

No. 347,243. Patented Aug. 10, 1886.

Fig. 1

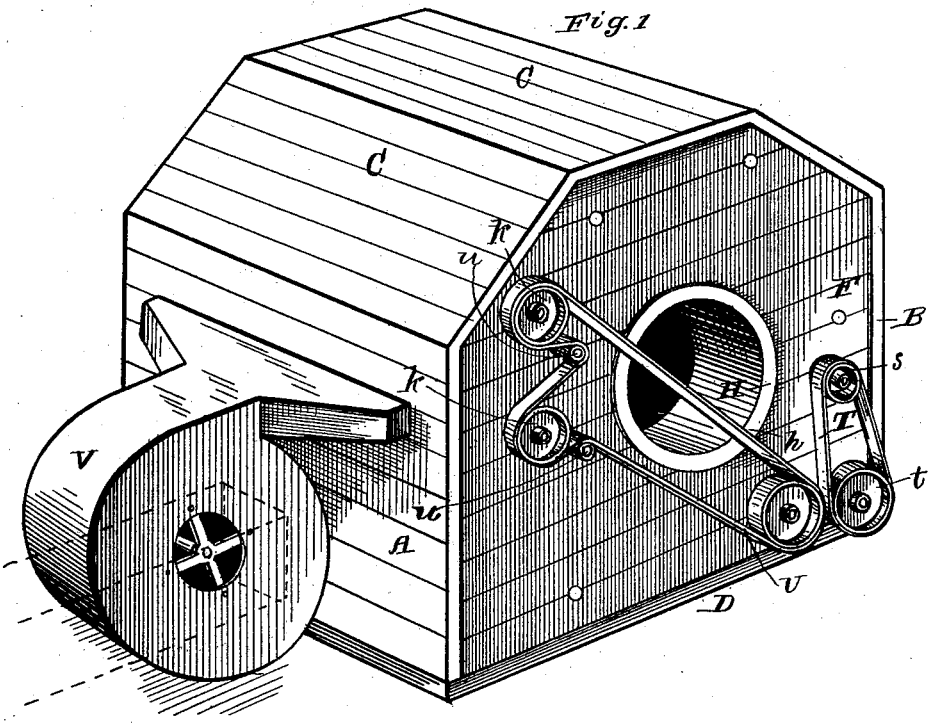
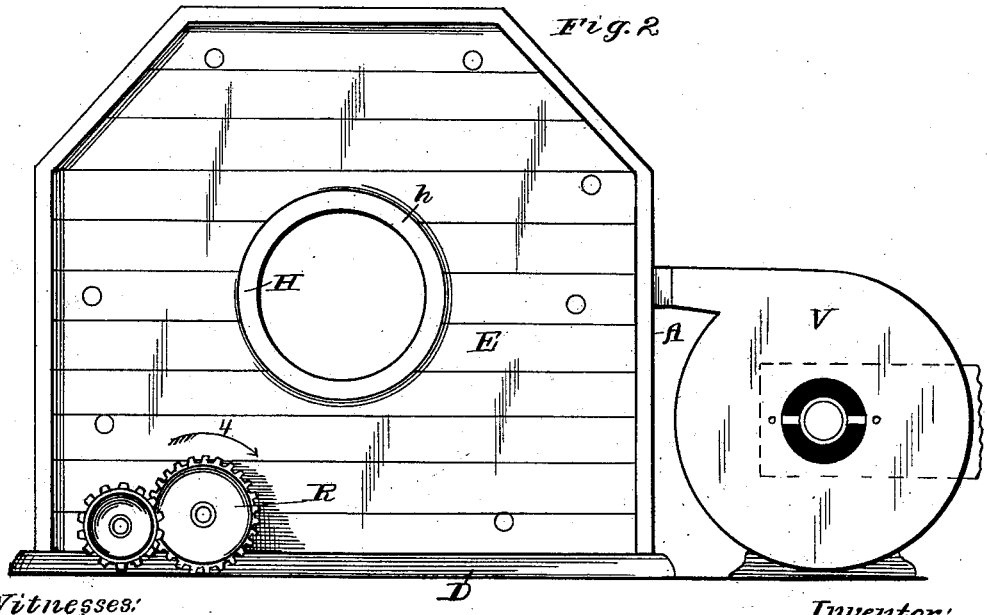


Fig. 2



Witnesses:
J. C. Turner
J. S. Barker

Inventor:
Noah W. Holt
by Doubleday & Bliss Atts

(No Model.)

2 Sheets—Sheet 2.

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Fig. 3

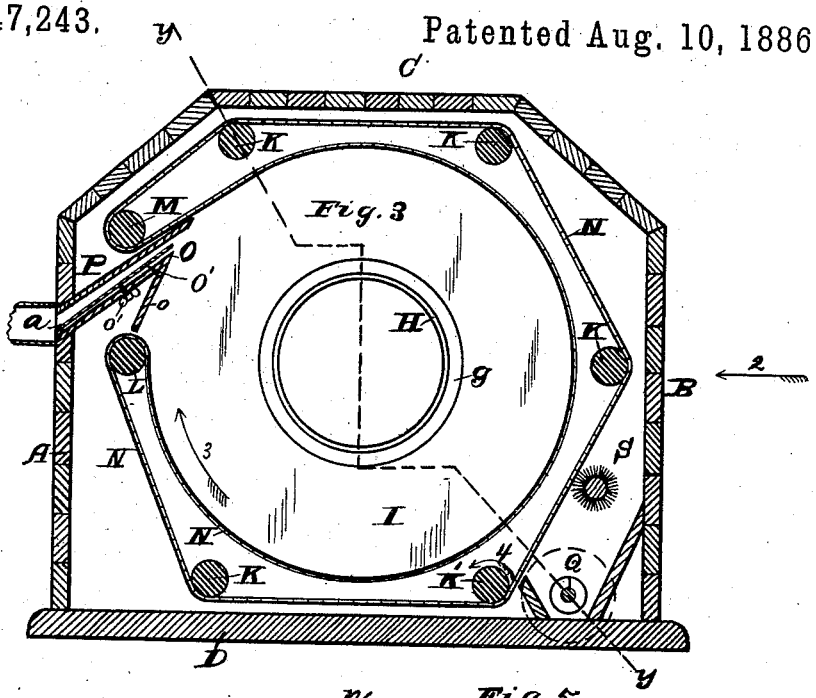


Fig. 5

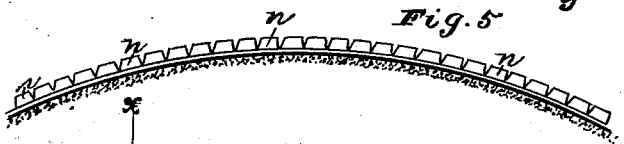
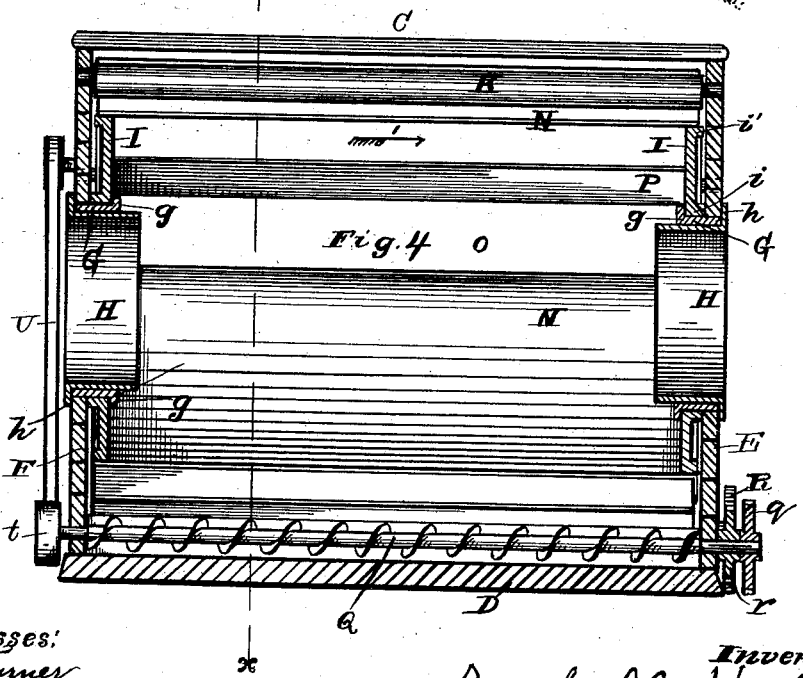


Fig. 4



Witnesses:
J. C. Turner
J. L. Barker.

Inventor:
Noah W. Holt
by Doubleday & Bliss Atty's.

UNITED STATES PATENT OFFICE.

NOAH W. HOLT, OF JACKSON, MICHIGAN, ASSIGNOR TO THE ACME DUST COLLECTOR AND WHEAT CLEANING COMPANY, OF SAME PLACE.

DUST-COLLECTOR.

SPECIFICATION forming part of Letters Patent No. 347,243, dated August 10, 1886.

Application filed October 7, 1885. Serial No. 179,257. (No model.)

To all whom it may concern:

Be it known that I, NOAH W. HOLT, a citizen of the United States, residing at Jackson, in the county of Jackson and State of Michigan, have invented certain new and useful Improvements in Dust-Collectors, of which the following is a specification, reference being had therein to the accompanying drawings.

Figure 1 is a perspective view of my improved machine. Fig. 2 is an end view. Fig. 3 is a transverse vertical section on line *x x*, Fig. 4, looking in the direction of arrow 1, the fan being omitted. Fig. 4 is a vertical section on line *y y*, Fig. 3, looking in the direction of arrow 2. Fig. 5 is a detail enlarged.

A B C D E F are the casing-walls, of which the front wall, A, is provided with a horizontal inlet-throat, *a*. (See Figs. 1, 3.) Each of the end walls, E F, is provided with a central circular opening, in which is firmly seated a ring or trunnion, G, having a flange, *g*, projecting outward from its inner end. By preference I employ short cylinder-sections H H within the hollow rings G G and projecting inward therefrom. The outer end or edge of each of these cylinder-sections may be provided with a flange, *h*, which overlaps the outer end or edge of the ring, where it may be secured to the casing by tacks or other equivalent means.

I I are rings, one at each end of the machine, mounted upon the hollow trunnions or rings G, so as to rotate freely. Each of these rings I is, by preference, flanged, as at *i i'*, and fits closely between the flanges *g g* and the adjacent end casing-walls.

K K L M are a series of rollers mounted at their ends in the end walls, so as to turn freely.

N is a belt doubled around the rollers L M, and fitting closely the peripheries of the rings I I, and also engaging with the outer faces of the rollers K K. It is of such length as to insure tension enough upon the rollers to permit its being driven readily by means of devices to be hereinafter described.

O P are chute-boards projecting inward from the front wall, A, of the casing, the upper board, P, being on a line about tangential to the rings I I. (See Fig. 3.)

o is a narrow strip of board or sheet metal, which, with the chute-boards O P, substantially closes the space between the doubled-over ends or portions of the belt, which pass around the rollers L M, thus completing the walls of the collecting-chamber, which, as will be readily understood, consists, essentially, of two flat sides or ends, I I, and the inclosing or surrounding belt and chute-boards.

Q is a conveyer arranged in a suitable trough or box at one lower corner of the machine, and carrying at its outer end a sprocket-wheel adapted to be connected with any suitable motor by means of a chain-belt.

R is a spur-gear on the outer end of one of the rollers K', and meshing with a spur-pinion, *r*, on the conveyer-shaft.

By an examination of Figs. 2, 3, and 4 it will be readily understood that the belt can be driven in the direction indicated by the arrow 3 by driving the roller K' in the direction indicated by arrow 4, Figs. 2 and 3.

S is a brush, the shaft of which is mounted in the end casing-walls and carries a band-pulley, *s*, which is connected with pulley *t* on the conveyer-shaft by a belt, T.

In order to insure a proper driving of the belt, I may employ a leather or chain belt, U, Fig. 1, driven by a pulley on one end of roller K', which has a positive motion imparted to it by the gears R *r*, and, when preferred, guide-pulleys *u u* may be mounted on the casing to make the belt U wrap the pulleys *k k* on the roller-shafts.

I propose to use a belt, N, of some closely-woven fabric, of either cotton or wool, with a nap adapted to intercept and collect dust from the dust-laden current of air entering through the throat *a*, and traveling in a curvilinear path around the inner surface of the drum, which is formed by the rings I I and their encircling-belt N. It is apparent that a belt of this character operates very differently from a stationary surface of bolting-cloth or other finely-reticulated material through which fine particles of dust can be readily driven by centrifugal action, and which is not, therefore, adapted to intercept and retain such pulverulent material as may be brought in contact therewith by an impinging air-current, as is the case with my belt. This dust-laden air-current will travel in said curvilinear path as

it is forced in from a fan, V, until the pressure compels the air to escape through the cylinder-sections H H. During this operation, the particles of dust will be caught by or lodged in the nap or fuzzy fibrous part of the fabric which projects inward from the inner surface of the drum; and, as will be readily understood, this deposit of the dust particles upon the inner surface of the drum will be materially assisted by centrifugal action, which will result from the dust-laden air-currents traveling the curvilinear path above referred to. It will be understood that the air-current, after thus impinging upon the inner curvilinear surface of the separating-chamber, passes out through the air-exits, but does not pass through the belt, except, perhaps, in such small quantities as may be permitted to go through by reason of the belt not being absolutely imperforate; but it will be seen that the operation of the machine is radically different from those in which the separation of the dust from the air is effected by means of a filtering-cloth; hence, whenever in this case I refer to the air as "impinging" upon the surface of the collecting-chamber, I use that word to point out the difference in operation which distinguishes this invention from that class of dust-collectors in which the air-current passes through the filtering medium.

The lower edge of the board or partition *o*, (see Fig. 3,) is arranged in close proximity to but at such distance from the roller L that the dust-coated belt can pass between the roller and the partition without scraping the dust from said belt; but the dust will be removed from the belt by the action of the brush S, and will fall thence into the conveyer-trough and be removed from the machine.

In order to prevent the belt N from being drawn inward and sagging down between the rings I, I propose to use a series of narrow stretcher strips or ribs, *n n*, (see Fig. 5,) extending substantially across the entire width of the belt and into close proximity to the inner faces of the end casing-walls. These ribs are narrower upon their outer than upon their inner faces, to facilitate their traversing the rollers; but these ribs may be semicircular in cross-section, or they may be right-angled in cross-section, and placed at such distance apart as will permit them to traverse the rollers.

I prefer to use a fabric which is so closely woven as to be substantially impervious to the passage of air under any such pressure as will ordinarily exist within the drum.

While I have shown and described the construction of machine which is the best adapted of any that I have knowledge for the carrying out of my invention, yet I do not wish to be limited thereby, because many modifications will readily suggest themselves to any one who is skilled in the art of making dust-collectors without departing from the spirit of my invention.

I am aware that the separation of fine dust from the air-currents in which it is held in suspension has been effected by passing the air-current through a filtering-surface which arrests the dust; also, by means of electrified surfaces which attract the dust particles as the air-current moves in contact with or in close proximity to such electrified surfaces; also, by forcing the air-current around the inside of a separating-chamber in a curvilinear path, whereby the dust particles are driven outward by centrifugal action, and thence through a narrow throat in the outer circular wall of the chamber; but my improved machine operates in a manner which is radically different from either of the above referred to collectors, because, among other things, the dust-laden air-current is caused to impinge upon the inner wall of the separating-chamber, which wall is of such material or character that it arrests and retains the impinging dust particles, while the air-current, freed from the dust, continues in its onward movement in a curvilinear path, having met with little or no resistance by reason of its having impinged upon or been deflected by the dust-collecting surface.

What I claim is—

1. In a dust-collector, a separating-chamber formed in part of a collecting-surface adapted to intercept and retain fine particles of dust, in combination with means for causing a dust-laden air-current to impinge upon said collecting-surface, and an air-exit through which air may pass without going through the collecting-surface, substantially as set forth.

2. In a dust-collector, the combination of a separating-chamber having a collecting-surface adapted to intercept and retain fine particles of dust, means for causing a dust-laden air-current to impinge upon said collecting-surface, an air-exit through which air may pass without going through the collecting-surface, and means for removing the dust from said collecting-surface, substantially as set forth.

3. In a dust-collector, the combination of a separating-chamber having a dust-collecting surface adapted to intercept and retain fine particles of dust, means for causing a dust-laden air-current to impinge upon said collecting-surface, an air-exit through which air may pass without going through the collecting-surface, means for moving the dust-collecting surface out of the path of the air-current, and a brush for removing the dust from the collecting-surface, substantially as set forth.

4. In a dust-collector, a separating-chamber having two flat sides, in combination with a flexible dust-collecting surface arranged in curvilinear form and connecting the flat sides and an air-exit through which air may pass without going through the collecting-surface, substantially as set forth.

5. In a dust-collector, a separating-chamber having two flat sides, in combination with

a moving endless dust-collecting surface partially inclosing the space between the flat sides and a chute for directing a dust-laden air-current through the uninclosed space between the sides of the chamber and the endless collecting-surface, substantially as set forth.

6. In a dust-collector, a separating-chamber having two flat sides provided with a central opening for the discharge of the air-current, in combination with a dust-collecting surface partially inclosing the space between the flat sides, rollers engaging with and moving the dust-collecting surface in a curvilinear path, and an air-exit through which air may pass without going through the collecting-surface, substantially as set forth.

7. In a dust-collector, a separating-chamber having circular flat sides and provided with central openings for the discharge of the air, in combination with supports about which the sides rotate, a flexible dust-collecting surface partially inclosing the space between the circular flat sides, and means for supporting and moving the surface in a curvilinear path, substantially as set forth.

8. In a dust-collector, a separating-chamber having flat sides, in combination with an endless flexible dust-collecting surface, stretcher-bars connected with the flexible collecting-surface, means for supporting and moving the collecting-surface in a curvilinear path, and means for causing a dust-laden air-current to impinge against the inner sides of the collecting-surface, substantially as set forth.

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

NOAH W. HOLT.

Witnesses:
GEO. S. BENNETT,
CHAS. F. KNAPP.