

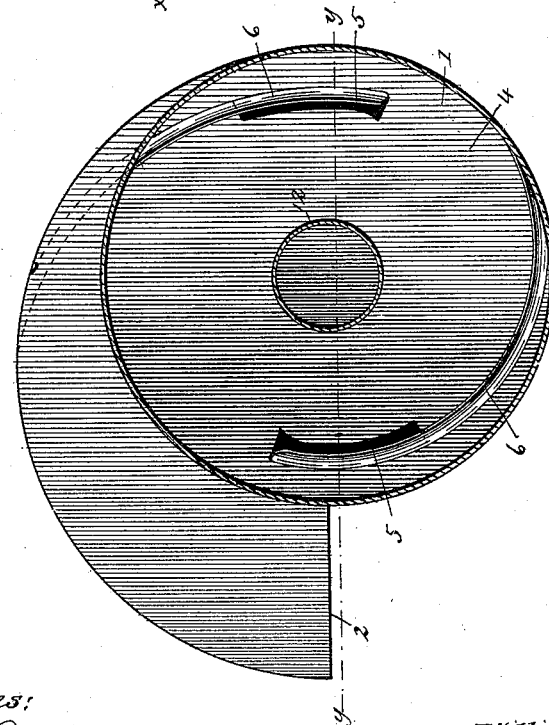
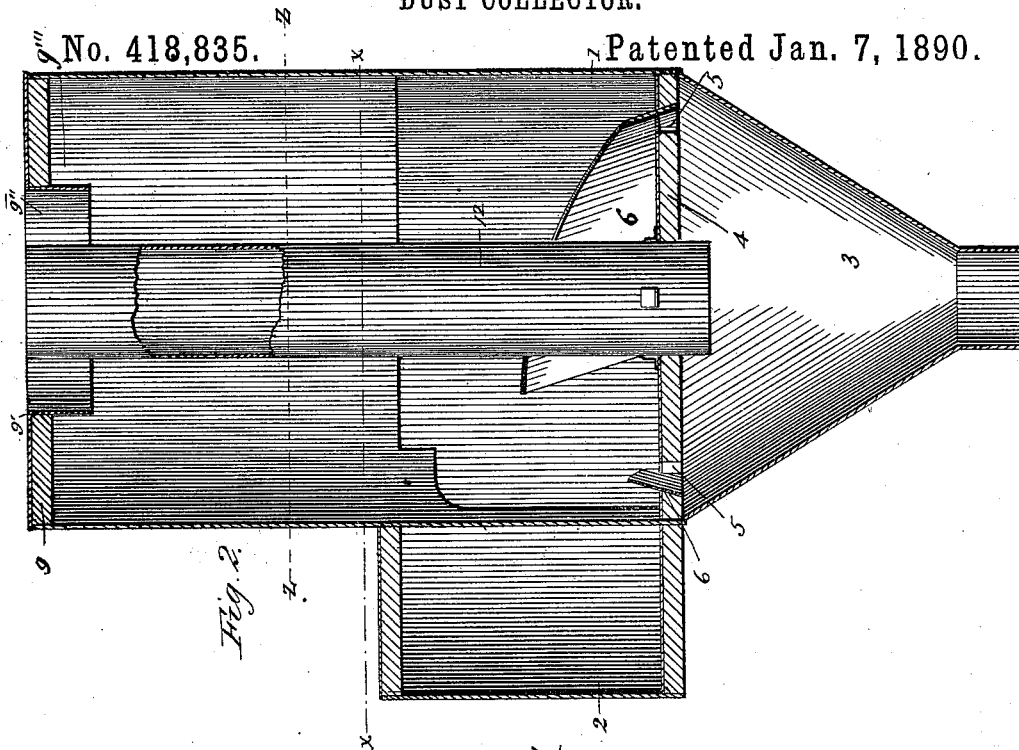
(No Model.)

3 Sheets—Sheet 1.

W. E. ALLINGTON.
DUST COLLECTOR.

No. 418,835.

Patented Jan. 7, 1890.



Witnesses:
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Parker & Stuard

Inventor:
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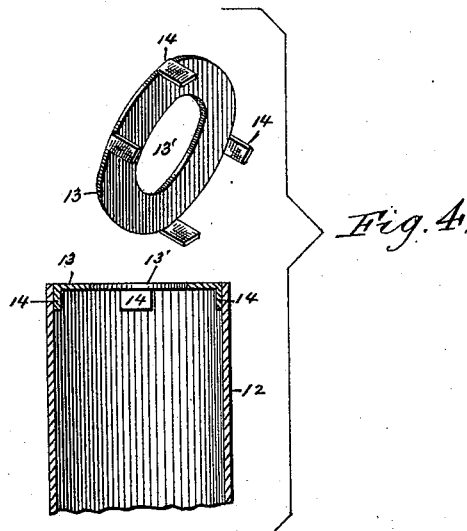
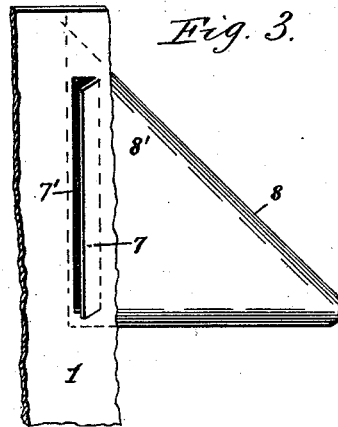
(No Model.)

3 Sheets—Sheet 2.

W. E. ALLINGTON.
DUST COLLECTOR.

No. 418,835.

Patented Jan. 7, 1890.



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(No Model.)

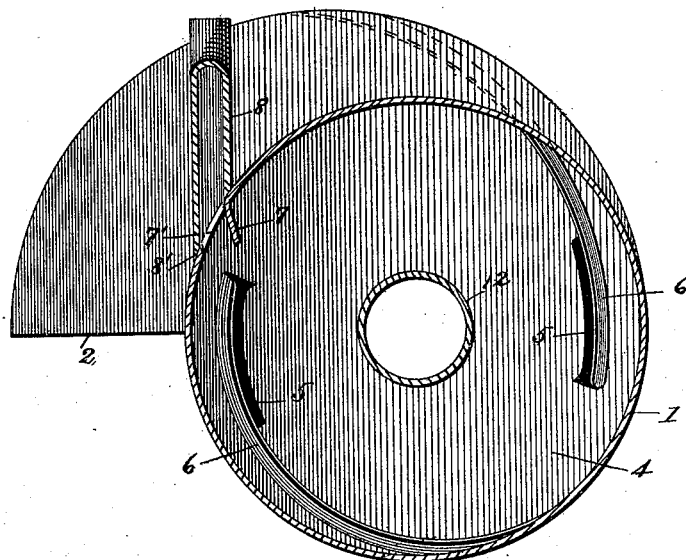
3 Sheets—Sheet 3.

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Fig. 5.



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UNITED STATES PATENT OFFICE.

WILLIAM E. ALLINGTON, OF EAST SAGINAW, MICHIGAN.

DUST-COLLECTOR.

SPECIFICATION forming part of Letters Patent No. 418,835, dated January 7, 1890.

Application filed January 27, 1888. Serial No. 262,134. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM E. ALLINGTON, a citizen of the United States, residing at East Saginaw, in the county of Saginaw and State of Michigan, have invented certain new and useful Improvements in Dust-Collectors; 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 appertains to make and use the same.

This invention relates to improvements in the class of machines which are employed in mills, factories, &c., for freeing the air from the dust, shavings, or other solid particles contained therein, and in which the dust-laden air receives a rapid rotative or whirling motion in the separating-chamber, whereby the dust or solid particles are driven out of the air-current and against the inner surface of the chamber by centrifugal force; and it consists in the construction and arrangement or combination of parts herein-after disclosed in the description, drawings, and claims.

The object of my invention is to produce a machine which will effect a perfect separation of the air and fine dust from the coarser dust, shavings, or other material, and also of the fine dust from the air, and effectually dispose of the same, and which will be simple in construction, compact, and easily understood and operated.

In the accompanying drawings, forming part of this specification, and wherein the same reference-numerals indicate the same parts, Figure 1 represents a horizontal section of my improved dust-collector on the line $x x$ of Fig. 2. Fig. 2 is a vertical section of the same on the line $y y$ of Fig. 1, the long relief-pipe being shown partly in side elevation and partly broken away. Fig. 3 is a broken perspective view of the casing of the separating-chamber, showing the vertical discharge-slot, and the inwardly-projecting lip formed therein, and the outlet-pipe leading from said discharge-slot. Fig. 4 is a broken and sectional view of the upper end of the long relief-pipe, with the annulus or collar in place therein, and also a perspective view of the annulus or collar removed therefrom.

Fig. 5 is a horizontal section on the line $z z$ of Fig. 2 of the casing of the separating-chamber, the inwardly-projecting lip, the vertical slot, and the small pipe for the discharge of the finer or lighter particles of dust.

In the drawings, 1 represents the cylindrical separating-chamber; 2, the external tangential inlet-spout for the dust-laden air entering said chamber from the machine from which the dust-laden air is discharged, and 3 the receptacle or hopper attached to the lower end of said separating-chamber for the reception of the heavier dust or other solid material delivered from said chamber. These parts are constructed of sheet metal or other suitable imperforate material.

The bottom 4 of the separating-chamber is formed with two diametrically-opposite circular-elongated discharge-openings 5 5, which are arranged at points intermediate of its circumference and periphery, whereby much less air and fine dust escape into the hopper than usual.

Attached to the inner surface of the casing of the chamber 1, some distance in front of the discharge-openings 5 5 and mounted upon the bottom 4 of said chamber, are two inwardly-curved rearwardly-extending slanting directing-flanges 6 6, which terminate at their rear ends in the outer walls of said discharge-openings. The lower edges of these directing-flanges are arranged at a greater distance from the center of the machine than their upper edges, thus making the space between them wider at the bottom than at the top, whereby the heavier materials are positively moved downward by centrifugal force and gravity over their inner faces and to their widened lower edges, and are thus guided to and delivered through the elongated discharge-openings 5 5 and into the hopper. The upper edges of the directing-flanges 6 6, as shown, gradually slope rearwardly, their front ends being the higher. This construction, in connection with the widened space or flare between their lower edges, enables them to receive a large body of the incoming dust-laden air at their higher ends, to gradually direct the same downward toward their lower edges, aided by centrifugal force and the gravity of the heavier particles, and to accurately

guide the same through the discharge-openings 5 5. These discharge-openings are curved to conform to the directing-flanges, are widest at their rear ends, and are of considerable length, so that the exit therethrough of the air-current carrying the heavier particles will not all occur at one point, and thus choking or filling up of said openings is entirely avoided. This result is also contributed to by the arrangement of the upper edges of the directing-flanges 6 6 at an inclination or slant toward the center of the separating-chamber or with their lower edges at a greater distance from said center than their upper edges, whereby, as is obvious, the particles of greatest specific gravity will be directed toward their lower edges, carried along their inner faces, and passed through said elongated discharge-openings with great accuracy and force, and thus the collection or separation of the heavier particles from the air and lighter or finer dust is greatly facilitated.

Above the slanting or inclined directing-flanges 6 6 and above the tangential inlet-spout 2 are formed in the casing of the separating-chamber 1 an inwardly-projecting vertical lip 7 and a vertical slot 7' for arresting and discharging the finer or lighter particles of dust, which, having been skimmed off from the rotating dust-laden air by said inwardly-projecting lip and passed through said slot, is conveyed away to any suitable receptacle through a small pipe 8, provided with a flared or flattened end 8', registering with said slot. Fitted in the upper end of the separating-chamber 1 is a top plate or cover 9, which is formed with a central purified-air outlet 9', and which may be made removable for access to the interior of the machine. Within said outlet 9' is secured a short pipe 9'', which extends down into the central portion of the chamber and forms a fine-dust-retaining space 9''' between its periphery and the upper part of the casing of said chamber, whereby the dust, instead of escaping with the air through the outlet 9', is skimmed from the air by the lip 7 and delivered through the vertical slot 7'.

Through the center of the bottom 4 of the separating-chamber 1 is passed a long relief-pipe 12, which extends downward a short distance into the hopper 3 and upward to a point about even with or above the purified-air outlet in the top plate or cover 9. The purpose or function of this long pipe 12 is to conduct the air that is forced into the hopper with the heavy dust or other material directly into the outer atmosphere, instead of passing the same back into the separating-chamber, as has heretofore been done in some of the machines of this class, whereby the usual draft of air up through the central portion of said chamber is lessened, and thus less fine dust is carried up toward the air-outlet in the top plate or or cover, and at the same time the hopper is relieved from undue air-pressure. If desired, the hopper may be omitted—as, for instance,

when the dust collector or separator proper is used in a dust room or vault and the dust is discharged directly into the same. In this instance the air that is forced into the dust room or vault with the heavy dust or other material will necessarily be under some pressure therein, the same as it is when the hopper is used, and hence it will seek an outlet into the outer atmosphere through the long relief-pipe. In the upper end of this long relief-pipe 12 is secured an annulus or collar 13, which is provided with a central discharge-opening 13' and with downwardly-projecting yielding or elastic strips 14, which enter the upper end of said pipe, hold said collar therein, and at the same time permit of its ready removal. By removing this annulus or collar from the relief-pipe and cutting its discharge-opening larger the machine can be adjusted—that is, in case the machine is throwing air out at the bottom of the hopper by enlarging said opening more air will escape from the hopper through the pipe and less will pass out from the bottom of said hopper.

It will be observed from the foregoing that my machine differs from formerly-constructed dust collectors or separators in that it contains no spiral or other deflector or deflectors attached to the inner surface of the casing of the separating-chamber, the heavier materials under treatment in my machine falling by their own gravity upon the bottom of the separating-chamber, where, owing to the centrifugal force imparted thereto, they are collected against the inner surfaces of the directing-flanges and delivered through the discharge-openings into the hopper; in that it contains no central opening or short pipe leading back from the hopper and delivering into the separating-chamber, the long relief-pipe of my machine passing entirely through the separating-chamber and delivering into the outer atmosphere; also, in my machine the superposed or additional separating-chamber sometimes employed for collecting very fine dust or other light material is dispensed with, the vertical slot and inwardly-projecting lip taking the place thereof and performing its function in a simpler manner and under a more cheap construction; also, in my machine the separating-chamber is cylindrical from end to end, with the tangential inlet-spout located at the lower end thereof, and thus sufficient height of space is afforded for the finer or lighter material to be thrown outward by centrifugal force against the inner surface of the separating-chamber to rise and be skimmed off and saved without being carried out by the air-current.

Having thus sufficiently described the construction, arrangement, and operation of the various parts of my invention to enable those skilled in the art to construct and use the same, what I claim as new is—

1. In a dust-collector, a separating-chamber provided with an external tangential inlet-

spout for dust-laden air, with an outlet for purified air, and with a bottom formed with circularly-elongated discharge-openings arranged intermediate of its periphery and center and provided with directing-flanges which terminate at their rear ends in the outer walls of said openings, substantially as and for the purpose described.

2. In a dust-collector, a separating-chamber provided with an external tangential inlet-spout for dust-laden air, with an outlet for purified air, and with a bottom formed with circularly-elongated discharge-openings arranged intermediate of its periphery and center and provided with directing-flanges which terminate at their rear ends in the outer walls of said openings, in combination with a hopper, substantially as and for the purpose described.

3. In a dust-collector, a separating-chamber provided with an external tangential inlet-spout for dust-laden air, with an outlet for purified air, and with a bottom formed with circularly-elongated discharge-openings arranged intermediate of its periphery and center and formed with their rear ends wider than their front ends and provided with directing-flanges which terminate at their rear ends in the outer walls of said openings, and which are arranged to form a wider space between them at their lower than at their upper edges, in combination with a hopper, substantially as and for the purpose described.

4. In a dust-collector, a separating-chamber provided with an external tangential inlet-spout for dust-laden air, with an outlet for purified air, and with a bottom formed with circularly-elongated discharge-openings arranged intermediate of its periphery and center and provided with directing-flanges which slope along their upper edges from front to rear, their front ends being the higher, which terminate at their rear ends in the outer walls of said openings, and which are arranged to form a wider space between them at their lower than at their upper edges, in combination with a hopper, substantially as and for the purpose described.

5. In a dust-collector, a single separating-chamber provided with a tangential inlet-spout, with a bottom having discharge-openings arranged intermediate of its periphery and center, with a top plate or cover formed with an outlet for purified air and having a short pipe secured in said outlet, and with a vertically-arranged slot for the discharge of fine dust, substantially as and for the purpose described.

6. In a dust-collector, a separating-chamber provided with a tangential inlet-spout, with a bottom having discharge-openings arranged intermediate of its periphery and center, with a top plate or cover formed with an outlet for purified air and having a short pipe secured in said outlet, with a vertically-

and with a pipe having a flared or flattened end registering with said slot, substantially as and for the purpose described.

7. In a dust-collector, a separating-chamber provided with a tangential inlet-spout, with an outlet for purified air, with a vertically-arranged slot and an inwardly-projecting lip, and with a bottom formed with discharge-openings and provided with directing-flanges which are constructed and arranged to form a wider space between them at their lower than at their upper edges, in combination with a hopper arranged beneath said separating-chamber, substantially as and for the purpose described.

8. In a dust-collector, the combination of a separating-chamber in which the dust-laden air receives a gyrating or whirling motion, with a relief-pipe which extends up through said chamber and delivers into the outer atmosphere, substantially as and for the purpose described.

9. In a dust-collector, the combination of a separating-chamber in which the dust-laden air receives a gyrating or whirling motion, and a receptacle or hopper arranged beneath and communicating with said chamber, with a relief-pipe which extends into said hopper, passes up through said chamber, and delivers into the outer atmosphere, substantially as and for the purpose described.

10. In a dust-collector, the combination, with a cylindrical separating-chamber provided with an external tangential inlet-spout and with a bottom, of a relief-pipe which extends up through said chamber and delivers into the outer atmosphere, substantially as and for the purpose described.

11. In a dust-collector, the combination, with a cylindrical separating-chamber provided with an external tangential inlet-spout and with a bottom, and a receptacle or hopper arranged beneath and communicating with said chamber, of a relief-pipe which extends into said hopper, passes up through said chamber, and delivers into the outer atmosphere, substantially as and for the purpose described.

12. In a dust-collector, the combination of a separating-chamber with a relief-pipe which extends up through and delivers outside of said chamber, and is provided at its upper end with a removable annulus or collar having a discharge-opening, substantially as and for the purpose described.

13. In a dust-collector, the combination of a separating-chamber and a hopper arranged beneath and communicating with the same, with a relief-pipe which extends into said hopper, passes up through and delivers outside of said chamber, and is provided at its upper end with a removable annulus or collar having a discharge-opening, substantially as and for the purpose described.

14. In a dust-collector, the combination of a separating-chamber and a hopper arranged

beneath and communicating with the same,
with a relief-pipe which extends into said
hopper, passes up through and delivers out-
side of said chamber, and is provided at its
5 upper end with a removable annulus or col-
lar having a discharge-opening and down-
wardly-projecting yielding or elastic strips,
substantially as and for the purpose de-
scribed.

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

WILLIAM E. ALLINGTON.

Witnesses:

EDWIN F. SAUNDERS,
ALFRED W. NEWTON.