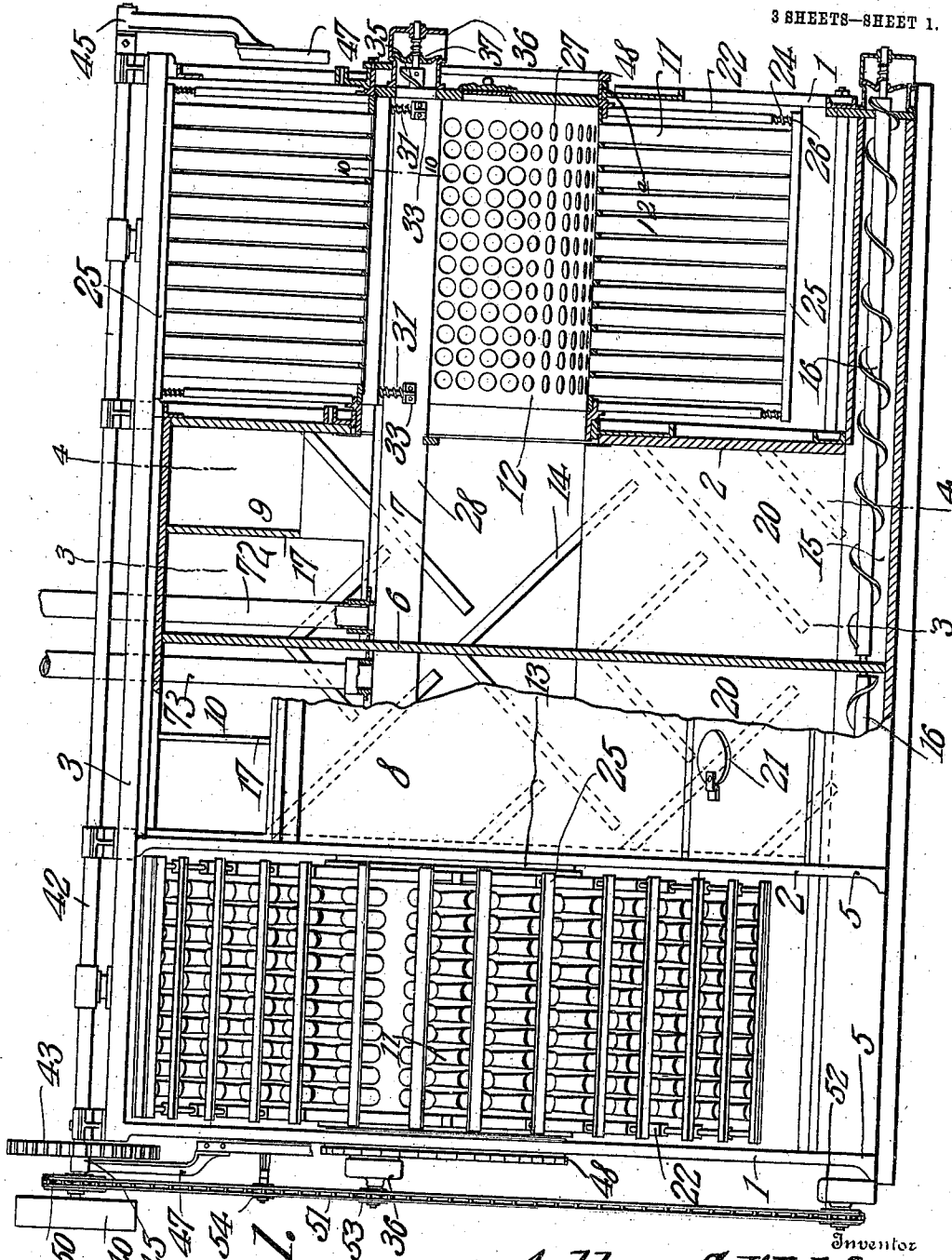


963,845.

A. S. WOLF.
DUST COLLECTOR.
APPLICATION FILED MAY 15, 1909.

Patented July 12, 1910.

3 SHEETS—SHEET 1.



Witnesses
[Signature]
M. A. Schmitt
Fig. 1.

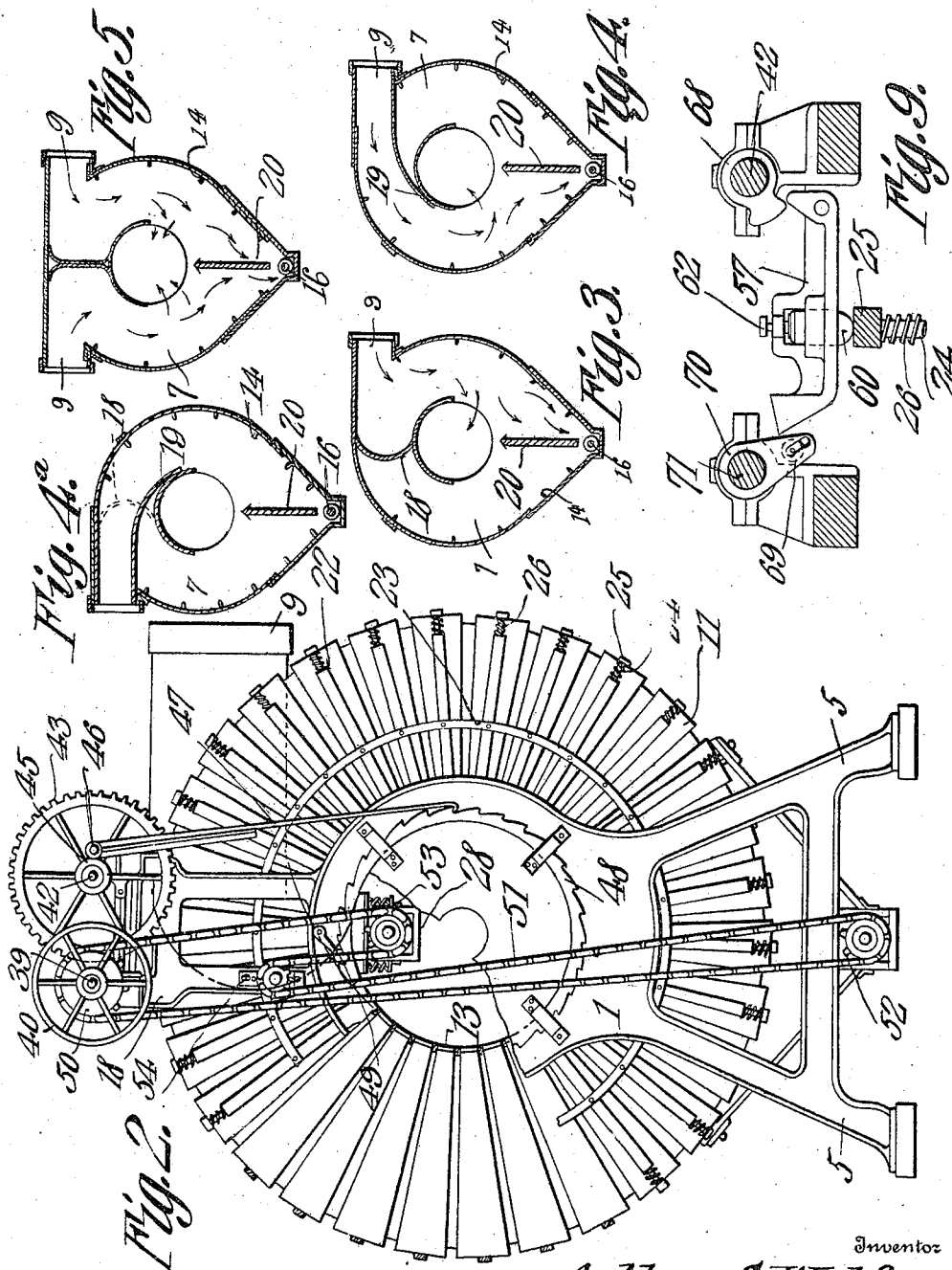
Inventor
Arthur S. Wolf.
By *[Signature]*
C. A. Snow & Co.
Attorneys

963,845.

A. S. WOLF.
DUST COLLECTOR.
APPLICATION FILED MAY 15, 1909.

Patented July 12, 1910.

3 SHEETS—SHEET 2



Witnesses

E. J. Kuntz
M. Schmidt

Inventor

Arthur S. Wolf.

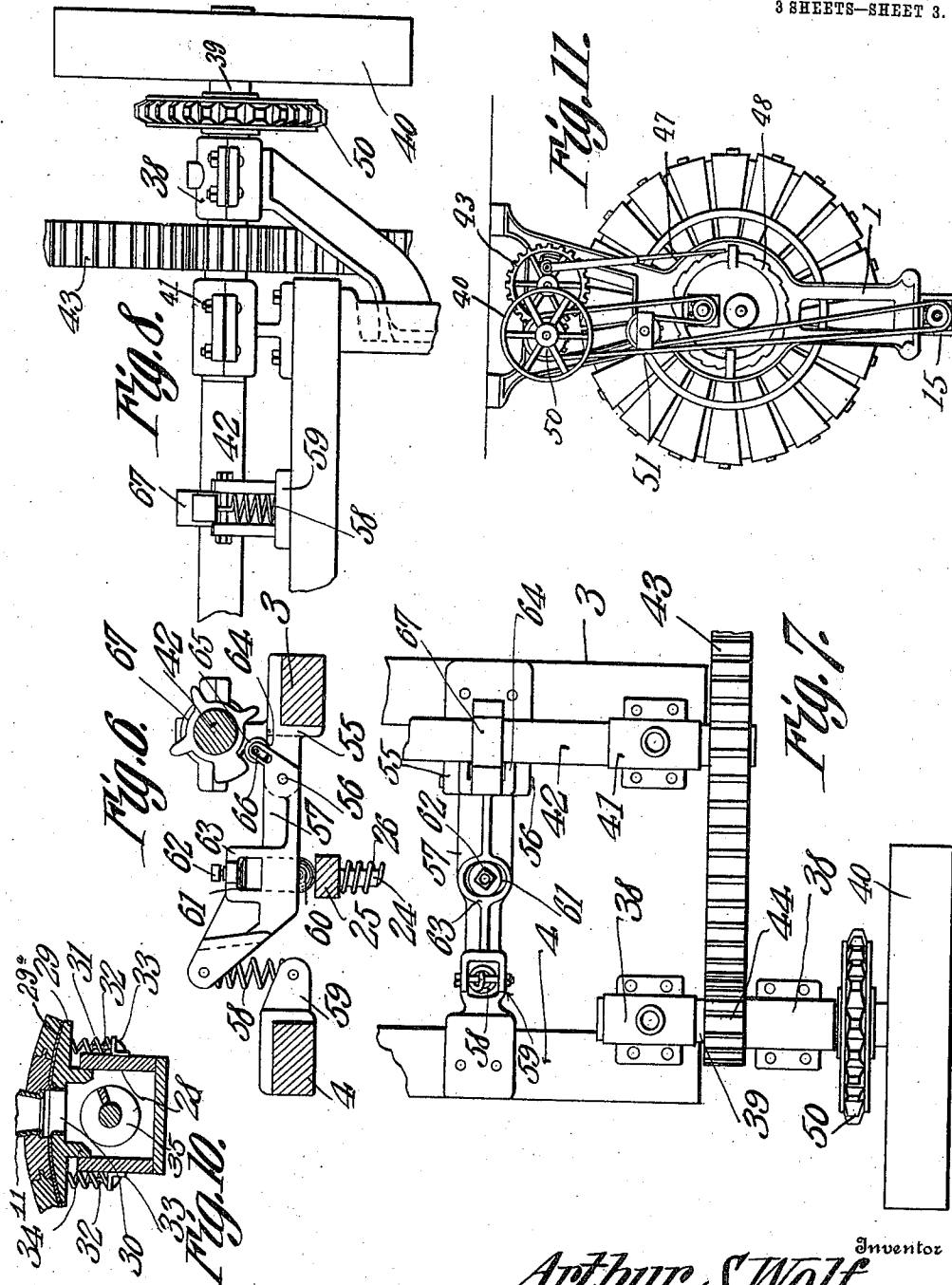
By *C. Snow & Co.*
Attorneys

963,845.

A. S. WOLF.
DUST COLLECTOR.
APPLICATION FILED MAY 15, 1909.

Patented July 12, 1910.

3 SHEETS—SHEET 3.



Witnesses
E. J. Smith
M. Schmidt

Inventor
Arthur S. Wolf.
By *C. A. Snow & Co.*
Attorneys

UNITED STATES PATENT OFFICE.

ARTHUR S. WOLF, OF CHAMBERSBURG, PENNSYLVANIA.

DUST-COLLECTOR.

963,845.

Specification of Letters Patent.

Patented July 12, 1910.

Application filed May 15, 1909. Serial No. 496,101.

To all whom it may concern:

Be it known that I, ARTHUR S. WOLF, a citizen of the United States, residing at Chambersburg, in the county of Franklin and State of Pennsylvania, have invented a new and useful Dust-Collector, of which the following is a specification.

This invention relates to improvements in dust collecting machines of that type shown in Patent No. 833,490 dated Oct. 16, 1906.

The objects of the present invention are to improve the general structure of the machine, and also to provide improved means for discharging the dust from the filtering tubes.

With the foregoing objects in view, the invention consists in a novel construction and arrangement of parts to be hereinafter described and claimed, reference being had to the drawings hereto annexed forming a part of this specification, in which drawings—

Figure 1 is a front elevation of the machine partly in section. Fig. 2 is an end view partly broken away. Figs. 3 to 5 are diagrammatic views illustrating the paths taken by the air currents in passing through the machine, Figs. 3 and 4 being sections taken on the lines 3—3 and 4—4 respectively of Fig. 1. Fig. 4^a is a section on the line 4—4 of Fig. 1 looking in the direction opposite to that of Fig. 4. Fig. 6 is a side elevation of the mechanism for agitating the filtering tubes. Fig. 7 is a plan view, and Fig. 8 an end view of said mechanism. Fig. 9 is a side elevation of a modification of the filtering tube agitating mechanism. Fig. 10 is an enlarged sectional detail on the line 10—10 of Fig. 1. Fig. 11 is an end view of a machine adapted to be suspended from a ceiling or other overhead support.

The supporting frame of the machine comprises end members 1 between which are disposed the end members 2 of a casing which receives the dust-laden air. The end members are connected at the top by cross timbers 3 and 4 respectively which form supports for certain parts to be presently described, and said members are supported on legs 5.

In Figs. 1 and 2 there is shown a machine having its end members arranged for support on a floor, and in Fig. 11 is shown a machine having its end members arranged

so that the machine may be suspended from a ceiling or other overhead support.

The casing formed by the end members 2 is divided by a central vertical partition 6 into two separate compartments 7 and 8 respectively. These compartments are independent of each other, and are entered respectively by flues 9 and 10 at their upper ends, said flues constituting the inlets for the dust-laden air. Each compartment communicates with a rotatable drum carrying filtering tubes 11. The drum of the compartment 7 is indicated at 12, and the drum of the compartment 8 at 13. By this arrangement a double machine is had in which respect it differs from the machine disclosed in the Patent No. 833,490 heretofore referred to. If a machine of smaller capacity is desired, the arrangement shown in said patent may be employed; or the machine may be constructed so as to constitute one-half of the structure shown in Figs. 1 and 2; viz., one of the compartments, and one of the drums.

The compartments 7 and 8 are of approximate ovate shape, and interiorly, upon the curved side walls thereof, are disposed inclined troughs or baffles 14 which serve to receive the comparatively heavy dust particles, and which will flow by gravity over the baffles to the bottom of the compartments, into a trough 15 containing a spiral conveyer 16. Each of the compartments is provided with the hereindescribed trough, and the conveyers of the respective troughs are so arranged that the dust is discharged from one of said troughs at one end of the machine, and from the other trough at the opposite end thereof, one of the conveyers being right-handed and the other conveyer left-handed. The compartments 7 and 8 also contain baffles for dividing the air currents, and causing them to take different paths in their travel to the drums. These baffles comprise a partition 17 which forms two separate passages in the inlets 9 and 10. In one of these passages is a baffle plate 18 which is arranged so as to direct the air to the front end of the casing. In the other passage is a baffle plate 19 which is arranged to direct the air to the rear of the casing. This arrangement of baffle plates is illustrated diagrammatically in Figs. 3 and 4. By this arrangement of partition and

baffle plates it will be seen that the air in passing to the drum is divided into two separate currents, one of them flowing to the front of the casing, and the other to the rear thereof. In the lower part of the compartments, above the trough 15, is mounted a vertically disposed deflecting member 20 which prevents the air from being whirled around in the compartments.

10 By providing the partition 17 and the baffle plates 18 and 19, the dust laden air is thrown against both sides of the deflector 20, thus giving both sides of the machine the same amount of work, the air entering the drum from both sides of the deflector. Without the partition and baffle plates, the air would be carried to one side of the deflector only, thus leaving that portion of the casing which is on the opposite side thereof idle. 15 The deflector allows the heavy particles (amounting to at least fifty per cent. of the entire mass of dust) to fall into the conveyor, whereas the lighter particles rise and enter the drums. It will be evident that inasmuch as this separation of the heavy from the light particles takes place on both sides of the deflector, a greater saving of the heavier particles is effected, which is important, as they can be ground into flour. 20 Without the deflector, the heavier particles would bank up on one side of the casing, and be gradually carried into the drums.

In Fig. 5 is shown a modification, the same consisting in providing each compartment with two inlets entering from opposite sides. The baffle plates are so arranged that the air currents are divided in the same manner as in the structure shown in Figs. 3 and 4. 35

40 The frame members 1, and the end members 2 of the compartments 7 and 8 are provided with bearings 12^a for the drums 12 and 13, the inner ends of which are open and in communication with the respective compartments. The outer ends of the drums are closed. Handholes fitted with suitable covers 21 are provided in order that access to the interior of the drums may be had. Each drum carries adjacent to its inner and outer ends radially extending spokes 50 22 which are disposed in pairs around the circumference of the drums, and which are connected by means of rings 23. The spokes are provided at their outer ends with reduced shouldered portions forming dowels 55 24 for the support of cross-bars 25, whereby said spokes are connected in pairs, the cross-bars being parallel to the axis of the drums. Springs 26 are coiled upon the dowels for the purpose of forcing the cross-bars normally in an outward direction. 60

The filtering tubes 11 are constructed of textile or other suitable porous and flexible material, and are preferably made tapering, 65 their outer ends being larger than their

inner ends. The drums are provided with perforations 27 having seats for wiring or other suitable fastening devices at the inner ends of the tubes. The latter are closed at their outer ends, and are secured to the cross-bars 25, which latter, being forced outwardly by the action of the springs 26, serve to hold the rows of filtering tubes tight and taut. 70

Extending lengthwise through the two drums and also through the compartments 75 7 and 8 is a trough 28, said trough being supported in the compartments so as to remain stationary with respect to the drums. The top of the trough is provided with a cover 29 which is apertured as indicated at 80 30, said apertures being so located that one row of filtering tubes may discharge there-through into the trough. The cover is yieldingly supported on the trough by means of springs 31 coiled around pins 32 rising from brackets 33 secured to the outer walls of the trough, said spring engaging the under side of the cover. Said side of the cover is also fitted with longitudinal cleats 34 fitting the inner surfaces of the side walls of the trough, and serving to guide the movement of the cover. Within the trough 28 is mounted a spiral conveyor 35 which operates to discharge the contents of the trough at one end into a suitable discharge bowl 36. 85 90 95 The discharge end of the trough is provided with a spring-closed valve 37.

The cross-bar 4, at one end of the machine, is provided with bearings 38 for a shaft 39 carrying a pulley 40 which may be driven from any suitable source of power. The cross-bar 3 is provided with a bearing 41 for a shaft 42 carrying a spur wheel 43 which meshes with a pinion 44 on the shaft 39. The shaft 42 extends across the machine to the other end thereof, and at each end of said shaft are cranks 45 provided with wrist-pins 46 to which are pivotally connected pawls 47 which are in engagement with ratchet wheels 48 secured to the outer ends of the drums. The number of teeth upon the ratchet wheels equals the number of pairs of spokes radiating from the drums, so that at each step or intermittent movement, the drums will be rotated or advanced to an extent equal to the distance between the spokes. The object of imparting this step by step movement to the drums is to bring one row of filtering tubes after the other in line with the apertures 30 in order to discharge the contents of said tubes into the trough 28. A pivoted dog 49 is provided which engages the ratchet wheels and prevents the drums from slipping back. The shaft 39 carries a sprocket wheel 50 which is connected by a chain 51 to sprocket wheels 52 and 53 respectively, on the shafts of the conveyers 16 and 35. The chain also passes over a suitably supported idler sprocket 54. 100 105 110 115 120 125 130

The mechanism for agitating the filtering tubes is illustrated in detail in Figs. 6, 7 and 8. On the cross-bar 3 is mounted a bracket 55 to which is pivoted at 56 a bar 57, the pivotal connection being made adjacent to one end of the bar. To the other end of the bar is connected one end of a coiled spring 58, the other end of which is fastened to a bracket 59 carried by the cross-bar 4. Intermediate its ends, the bar carries a buffer block 60 of rubber or other suitable yielding material held in place by a cap 61 engageable by a set screw 62 which is threaded through a yoke 63 on the bar, the latter being provided with an aperture to receive the block 60. From the pivoted end of the bar projects upwardly an arm 64 which is forked at its outer end, and carries between the branches of said forked end a roller 65. The axle of the roller is mounted in slots 66 made in the branches of the fork, in order that said roller may be adjusted. The roller extends into the path of a tappet wheel 67 mounted on the shaft 42.

In operation, the dust-laden air enters the compartments 7 and 8 through the inlets 9 and 10, and it passes from the compartment 7 into the filtering tubes carried by the drum 12, the air in the compartment 8 passing into the filtering tubes carried by the drum 13. In the meantime the two drums will be rotated intermittently by the pawl and ratchet mechanism described. The tappet wheel 67 is so set on the shaft 42 that the roller 65 is engaged, and the end of the bar 57 carrying said roller depressed, when one of the cross-bars 25 arrives in position below the block 60. The end of the bar 57 to which the spring 58 is connected is therefore raised so as to present no obstacle to the movement of the drums. As soon as the drums become stationary, the roller 64 is disengaged from the tappet wheel whereupon the bar 57 is pulled downwardly by the spring 58, and the block 60 strikes the cross-bar 25, whereby the latter is depressed against the tension of the spring 26. As soon as the tappet wheel again engages the roller 64 the bar 57 is again lifted whereupon the cross-bar 25 is released, and forced outwardly by the springs 26, thus stretching the material of which the filtering tubes are made with a sudden snap, whereby the particles of dust upon the inner surface of said tubes are dislodged, and they drop through the apertures 30 into the trough 28. The throw or movement of the pawls is considerably in excess of the length of the ratchet teeth by reason of which the drums will be at rest during the greater portion of the rotation of the shaft 42. The tappet wheel is so constructed that during this period of rest the arm will be lifted three times as hereindescribed. One of the tappet fingers is of such a width that the bar 57 will be

held elevated during the entire time the drum is moving. Each drum is provided with the hereindescribed mechanism for shaking or agitating the filtering tubes.

In the modified form of mechanism illustrated in Fig. 9 the bar 57 is engageable adjacent to its pivoted end by a tappet wheel 68, said tappet wheel being constructed so as to elevate the arm once every revolution of the shaft 42. The opposite end of the arm is in the path of a roller 69 carried by an arm 70 mounted on a shaft 71 which is the same as the shaft 39. Intermediate its ends, the bar carries a block 60 which engages the cross-bar 25 in the same manner as the mechanism already described. The tappet wheel 68 serves to lift the bar 57, and the roller 69 depresses the same, its function being the same as the spring 58.

The cover 29 is held pressed against the inner surface of the drums by means of the springs 31 whereby a dust-tight joint is effected, and at the same time, the cover is free to yield to any inequalities on the inner surface of the drums. The outer surface of the cover is inclined oppositely in the direction of its longitudinal edges, and said surface is also covered with a suitable cushioning material 29^a as clearly shown in Fig. 10.

The back draft pipe enters the casing according to the type of machine used. In the double machine shown in Figs. 1 and 2 one of such pipes, 72, enters the compartment 7, and another, 73, enters the compartment 8. These pipes are usually connected to the eye of the casing of the fan which supplies the impure air to the apparatus, and their function is to exhaust air from the trough, as is the usual practice in apparatus of the type described.

What is claimed is:

1. In a dust collector, a settling chamber, a filtering drum in communication therewith, a conveyer in the settling chamber, a partition in the chamber, a deflector in the chamber between the conveyer and the inlet end of the drum, and baffle plates on opposite sides of the partition for dividing the dust-laden air into separate currents, the baffles on one side of the partition being arranged to carry the air to the front end of the chamber against one side of the deflector, and the baffles on the other side of the partition being arranged to carry the air to the rear end of the chamber against the other side of the deflector, whereby the two currents of air enter the drum on opposite sides of its axis.

2. In a dust collector, a settling chamber, a filtering drum in communication therewith, a deflector in the settling chamber, extending to the inlet of the drum, means for conducting separate currents of dust laden air into the settling chamber, and baffles for carrying one of said currents to the front

end of the chamber against one side of the
deflector, and the other current to the rear
end of the chamber against the other side
of the deflector, whereby the two currents of
5 air enter the drum on opposite sides of its
axis.

In testimony that I claim the foregoing

as my own, I have hereto affixed my signature in the presence of two witnesses.

ARTHUR S. WOLF.

Witnesses:

W. SHERMAN GIBBS,
M. H. REHRIG.