

Oct. 5, 1926.

1,602,345

M. A. EIBEN

DUST COLLECTOR

Filed April 14, 1926

4 Sheets-Sheet 1

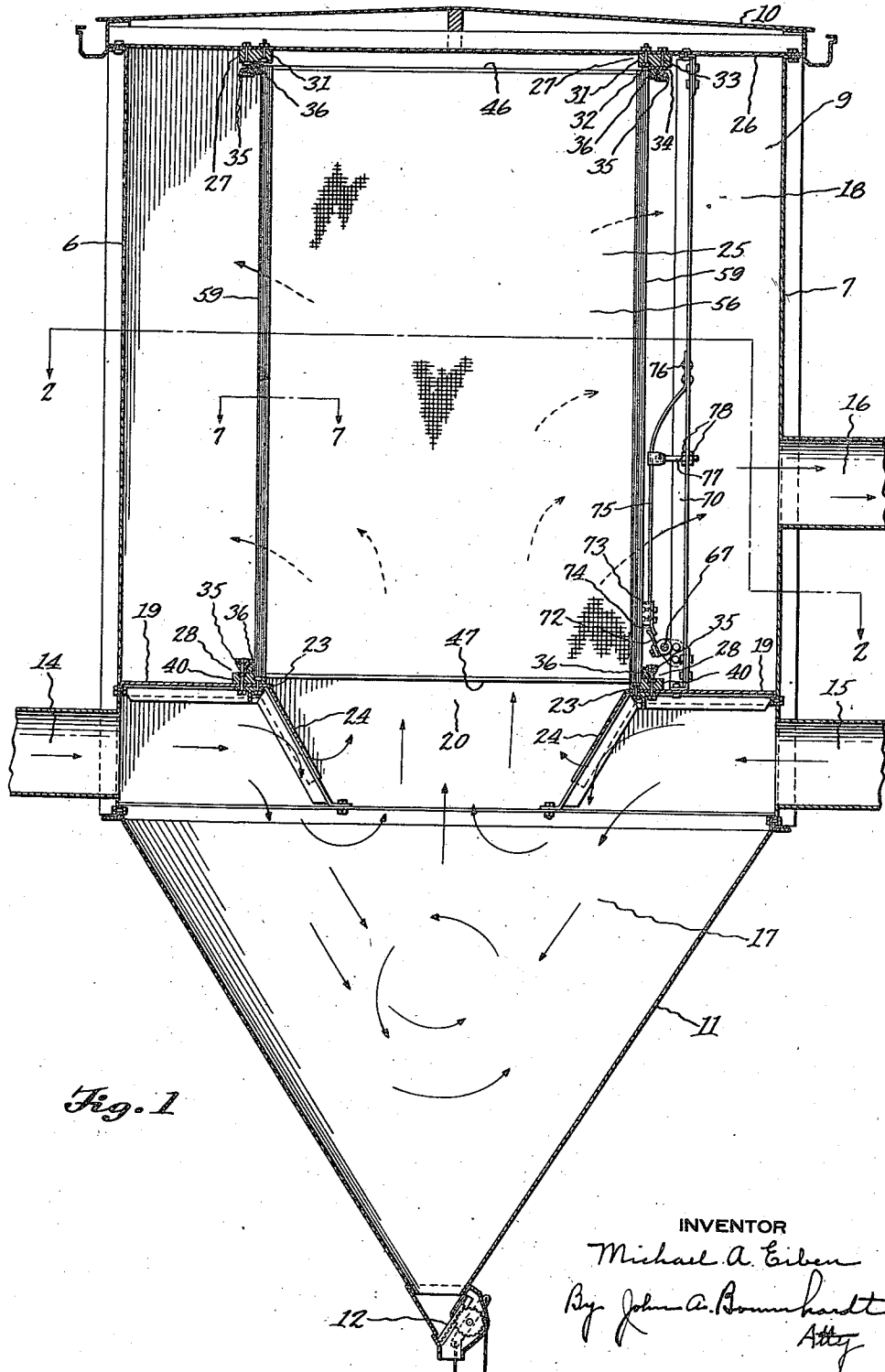


Fig. 1

INVENTOR

Michael A. Eiben

By John A. Bonnerhardt
Att'y

Oct. 5, 1926.

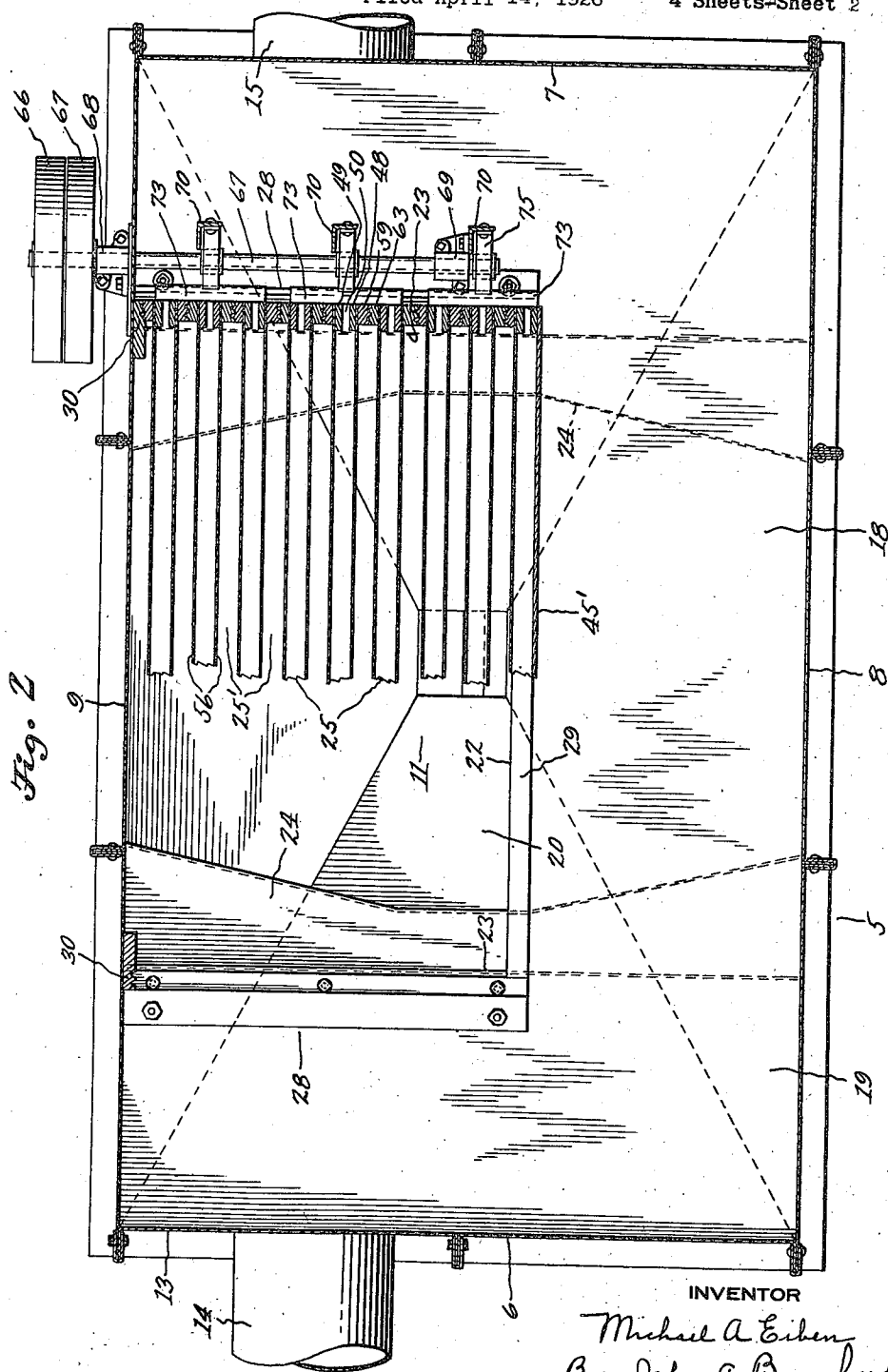
1,602,345

M. A. EIBEN

DUST COLLECTOR

Filed April 14, 1926

4 Sheets-Sheet 2



Oct. 5, 1926.

1,602,345

M. A. EIBEN

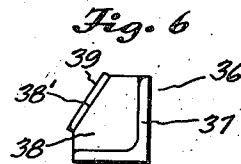
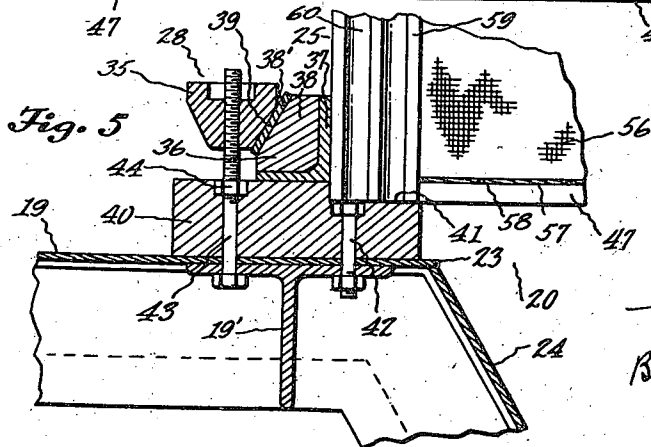
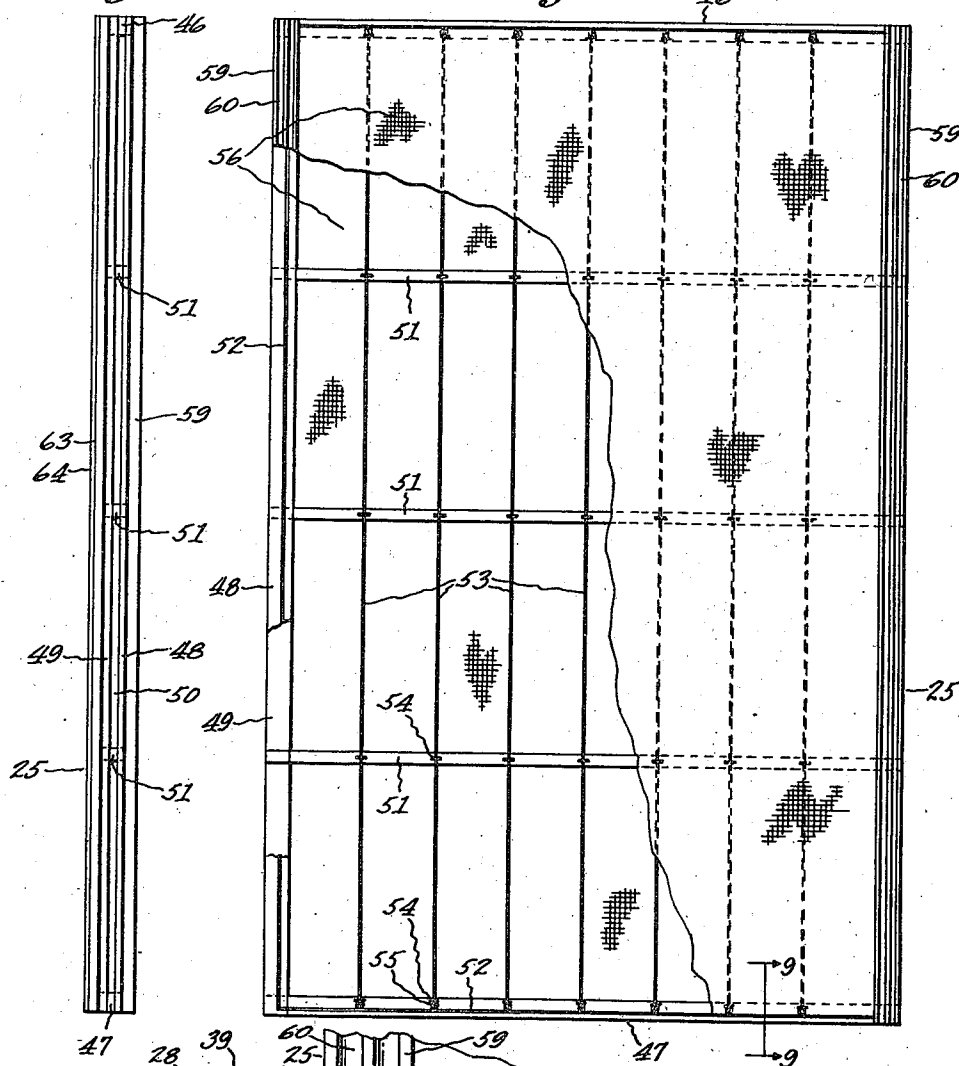
DUST COLLECTOR

Filed April 14, 1926

4 Sheets-Sheet 3

Fig. 4

Fig. 3



INVENTOR
Michael A. Eiben
By John A. Bonnhardt
Atty.

Oct. 5, 1926.

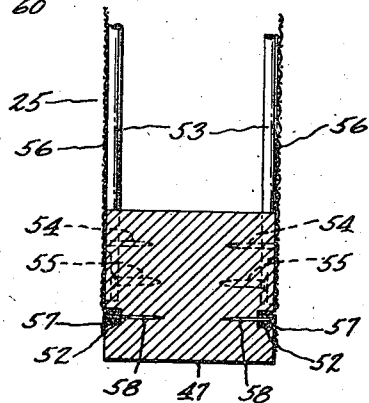
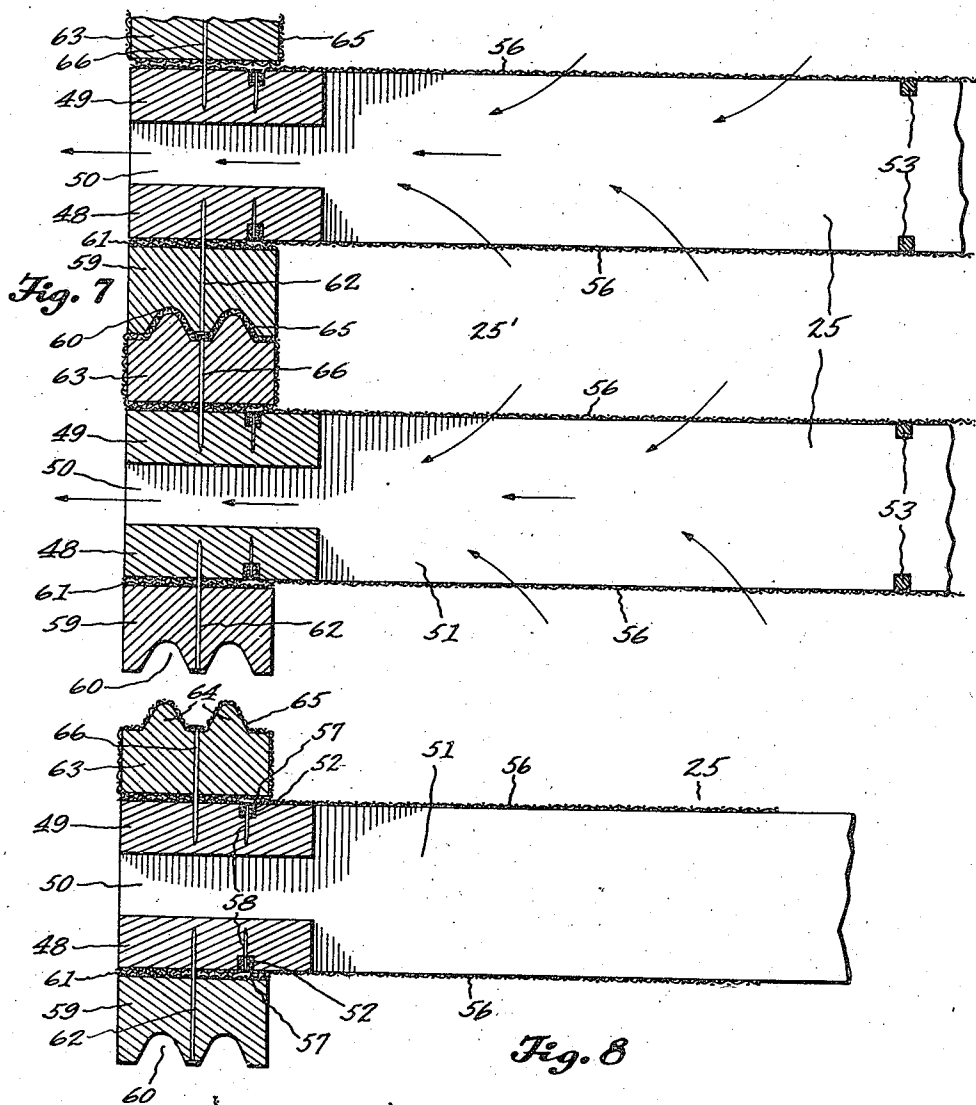
1,602,345

M. A. EIBEN

DUST COLLECTOR

Filed April 14, 1926

4 Sheets-Sheet 4



INVENTOR

Michael A. Eiben
By John A. Bommhardt
Atty.

Patented Oct. 5, 1926.

1,602,345

UNITED STATES PATENT OFFICE.

MICHAEL A. EIBEN, OF CLEVELAND, OHIO.

DUST COLLECTOR.

Application filed April 14, 1926. Serial No. 101,999.

This invention relates to new and useful improvements in dust collectors for cleaning dusty air, a dust collector of the dry process suction type having an outer housing with a plurality of air cleaning screens mounted within and means for jarring dust accumulations therefrom.

An object of the invention is to provide an improved arrangement of the screens and housing structure giving convenient access to the screens for inspection, cleaning or repairing.

Another object is to provide improved means for mounting the screens within the housing, permitting rapid and easy installation or removal for repairing.

Another object is to provide an improved screen structure materially increasing the low velocity air volume above the present type of dry process air cleaning cloth screens.

A further object is to provide means for joining the screens together in a cooperating gang. Other objects and features of the invention will be hereinafter pointed out and described.

In the accompanying drawings:—

Figure 1 is a vertical sectional view of the dust collector.

Figure 2 is an enlarged section on line 2—2 of Fig. 1.

Figure 3 is an enlarged detail of a screen with parts broken away.

Figure 4 is an edge view thereof.

Figure 5 is an enlarged sectional view of the screen mounting means.

Figure 6 is an end view of a screen retaining bar.

Figure 7 is an enlarged sectional view on line 7—7 of Fig. 1 showing a plurality of joined screen frames.

Figure 8 is a similar view showing a single screen frame.

Figure 9 is an enlarged sectional view on line 9—9 of Fig. 3.

Referring specifically to the drawings, 5 indicates generally the dust collector housing having side walls 6 and 7, front and rear walls 8 and 9 respectively, a roof 10 and hopper 11 with dumping gate 12. The side wall 6 has a removable panel 13 allowing access within, and a dusty air inlet 14, the opposite side wall 7 having a dusty air inlet 15 and clean air outlet 16. The structure is divided into a dusty air chamber 17 and clean air chamber 18 by a substan-

tially U-shaped platform or walkway 19 suitably mounted within the housing providing a rectangular shaped opening 20 therein adjacent the rear wall 9 with a front edge 22 and side edges 23. The dusty air cleaning screens to be hereinafter described, are mounted over opening 20. Baffle plates 24 are secured under platform 19 extending from front to rear of the housing along opening edges 23 with the baffle faces converging downwardly.

The clean air chamber 18 has a top 26 carrying on its under side spaced upper clamping means 27 cooperating for clamping the gang of screens 25 with lower spaced clamping means 28 secured to platform 19 adjacent opening edges 23. A wooden filler strip 29 is secured to platform 19 between the spaced clamping means 28. Grooved wooden spacing and filler strips 30 are secured to rear wall 9 extending vertically between screen clamping means 27 and 28.

The upper screen clamping means 27 comprises spaced wooden plates 31 bolted to the underside of top 26 by bolts and nuts 32 and bolts 33 and nuts 34. The bolts 33 are extra long for receiving threaded cone nuts 35 adapted to engage and force clamping bars 36 against the top sides of the screen frames, clamping the screens securely between. The clamping bars 36 comprise an angle iron 37 and beveled wooden filler 38 carrying a flat metal strip 39 on its beveled face 38'. The cone nut when drawn up against the angular metal strip 39 shifts the bar 36 against the screens.

The lower screen clamping means 28 comprises spaced wooden base plates 40, having screen supporting steps 41, secured by bolts and nuts 42 and bolts 43 and inset nuts 44 to platform 19 and T-iron braces 19'. Bolts 43 are extra long, receiving cone nuts 35 forcing clamping bars 36 against the lower sides of the screen frames, clamping the screens 25 securely between.

The screens 25 are preferably of wooden construction, each screen comprising solid top and bottom members 46 and 47 joined at the ends by vertical spaced side members 48 and 49 providing an opening 50 between at each side of the frame. Intermediate brace members 51 are joined to side members 48 and 49. A continuous square groove 52 is provided on both faces of members 46 and 47 and on the front and rear faces of side members 48 and 49 respectively. Vertically

spaced rods 53 are inset into the front and rear faces of members 46, 47 and 51, and secured by staples 54 thereon and nails 55 at the ends.

Each face of the frames 45 is covered with a screen cloth or fabric 56 of flannel or other close texture or weave, securely attached thereto by means of a heavy cord 57 pressing and locking the cloth 56 adjacent the edges into grooves 52 and secured with nails 58. The brace members 51 and rods 53 prevent the suction within the frame, created by a suction blower, not shown, from materially drawing and billowing the cloth together and thereby restricting their screening area and the air passage between. The outer face of the front screen of the gang is covered with light air tight boarding 45'.

Means for joining and spacing the screen frames 45 is provided by strips 59 with double grooved joint faces 60 and cloth strips 61 glued or otherwise suitably secured to the backs, secured to frame side members 48 by nails 62, the cloth providing an air tight packing between strips 63, having a joint face with tongues 64 and wrapped with cloth 65 secured to frame side members 49 by nails 66. The overlapping cloth 65 at the back of strip 63 provides an air tight packing between the side members 49. The cloth covered faces and tongues 64 of strips 63 are adapted to snugly engage the grooved faces 60 of strips 59 providing an air tight joint between the screen frames, preventing dust laden air drawn up between escaping into the clean air chamber.

The screens are mounted in the housing over platform opening 20 by stacking and aligning the screens 25 on base plate steps 41 with the joint tongue of the screen adjacent the rear wall 9 engaging the grooves of spacing strips 30 thereon, as shown in Fig. 2. The screens are pressed together and against the back, snugly engaging the frame tongue and groove joints together and the lower and upper clamping bars are then positioned and clamped against the screen frame sides by screwing up cone nuts 35. A clearance normally closed by bars 36 is provided between the screen tops and plates 31, allowing quick stacking of the screens, or removal sidewise of an intermediate screen from the stack for repairs.

Means for rapping the screens and jarring loose the dust accumulating on the cloth is provided comprising a shaft 67 driven by suitable means such as a driven pulley wheel 66 with idler 67' mounted thereon outside the housing. The shaft is journaled in bearing 68 mounted on housing back 9 and a bearing 69 mounted on a vertical standard 70 secured to platform 19 and top 26. Collars 71 mounted on shaft 67 carry fingers 72 adapted to engage arms 74 of rapping block (preferably of wood) 73 normally held

against the screen sides by tension of supporting springs 75 secured to standards 70 as at 76. The springs are held in adjustable tension by threaded arms 77 cleated thereto and adjustably mounted on standards 70 by lock nuts 78. Rotation of the shaft causes the fingers 72 to engage the block arms 74 swinging the blocks away from the screens and upon releasing the springs 75 throw the blocks back, sharply striking and jarring the screens.

During the operation of the dust collector, the suction blower through pipe 16 creates a suction or vacuum in the housing drawing from inlets 14 and 15 the dust laden air which impinges against the baffles 24 deflecting the heavier particles of dust into the hopper 11. The dusty air is deflected around baffles 24 and drawn up through platform opening 20 into spaces 25' between the screens 25 from where the air is drawn through cleansing cloths 56 into the interior of the screens, passing out through the open frame sides 50, as shown in Figs. 1, 2 and 7, into the clean air chamber 18 and out through outlet 16 to the suction blower. The dust accumulating on the cloths 56 is vibrated loose at intervals by rapping blocks 73, keeping the cloths (screens) clean and efficient, the suction blower being stopped while the rapping blocks are operating, and vice versa.

The ample spacing 25' between the screen cloths of each screen provides a low velocity of dusty air passing between the cloths, reducing the wear thereof by dust and grit particles carried by the air and allowing the dust to settle in the hopper with a minimum of agitation.

The screen frame structure with outlet openings at each side thereof allows a materially increased volume of air to pass through an air cleaning screen of this type which usually has only a single outlet at one side or the top, restricting the flow of air.

The platform or walkway about the screen gang allows easy and convenient access to the screens. With the suction fan located on the clean air outlet, no dust or abrasive may come into contact with the fan.

While I have shown and described one embodiment of my invention, obviously various changes in the details of construction and parts may be resorted to without departing from the spirit and scope of the appended claims.

I claim:

1. A dust collector comprising a housing having a hopper bottom, a platform therein over the hopper, said platform having an opening communicating with the hopper, an inlet for dusty air below the platform, an outlet for clean air above the platform, a set of screens supported on the platform

above said opening and extending from the platform to the top of the housing, and means to jar the screens, said platform being substantially U-shaped, to extend
5 around three sides of the opening.

2. In a dust collector, the combination of a housing having a hopper bottom, a platform in the housing dividing the same into dusty and clean air chambers, said platform
10 having an opening over the hopper, a set of screens mounted on the edge of the platform around said opening and extending from the platform to the top of the housing, and means to jar the screens.

3. In a dust collector, the combination with a housing and a platform therein dividing the housing into dusty and clean air chambers, said platform having an opening, screens supported by the platform over said
20 opening and extending from the platform to the top of the housing, and means carried by said platform and said top to removably clamp the screens in position.

4. In a dust collector, the combination
25 with screens, supports on which they are mounted, and means to clamp the screens to said supports comprising an inclined strip bearing against the screen frames, and bolts provided with tapered nuts having a wedge
30 bearing against said strips to wedge the same against the screen frame.

5. In a dust collector, the combination with screens, supports on which they are mounted, and means to clamp the screens to
35 said supports comprising an inclined strip bearing against the screen frames, and bolts provided with tapered nuts having a wedge bearing against said strips to wedge the same
40 against the screen frames, the supporting means including a platform and base plates thereon upon which the screens and said strips rest.

6. In a dust collector, the combination
45 of a housing, a platform therein having an opening, screens extending between the plat-

form and the top of the housing and across said opening, said platform extending around opposite sides of the opening, and means at opposite ends of the screens to clamp the same to the platform and to the
50 top of the housing.

7. In a dust collector, the combination of a housing, a platform therein having an opening, screens extending between the plat-
55 form and the top of the housing and across said opening, said platform extending around opposite sides of the opening, and means at opposite ends of the screens to clamp, the same to the platform and to the top of the housing, said means including removable
60 wedging devices mounted on the platform and the top of the housing and engaging opposite ends of the screen frames at the top and bottom thereof respectively.

8. In a dust collector, the combination of
65 a housing having a hopper bottom, a platform in the housing dividing the same into clean and dusty air chambers, said platform having an opening above the housing and having depending baffle plates around said
70 opening, screens mounted on the platform above said opening, and means to jar the screens, said baffle plates being arranged to direct dust down into the hopper.

9. In a dust collector, the combination of
75 a housing having a hopper bottom, a platform in the housing dividing the same into clean and dusty air chambers, said platform having an opening above the housing and having depending baffle plates around said
80 opening, screens mounted on the platform above said opening, and means to jar the screens, said baffle plates being arranged to direct dust down into the hopper, the
85 housing having dusty air inlets under the platform and directed toward said baffle plates.

In testimony whereof, I do affix my signature.

MICHAEL A. EIBEN.