

M. HARMON.
DUST COLLECTOR.

No. 260,194.

Patented June 27, 1882.

Fig. 2.

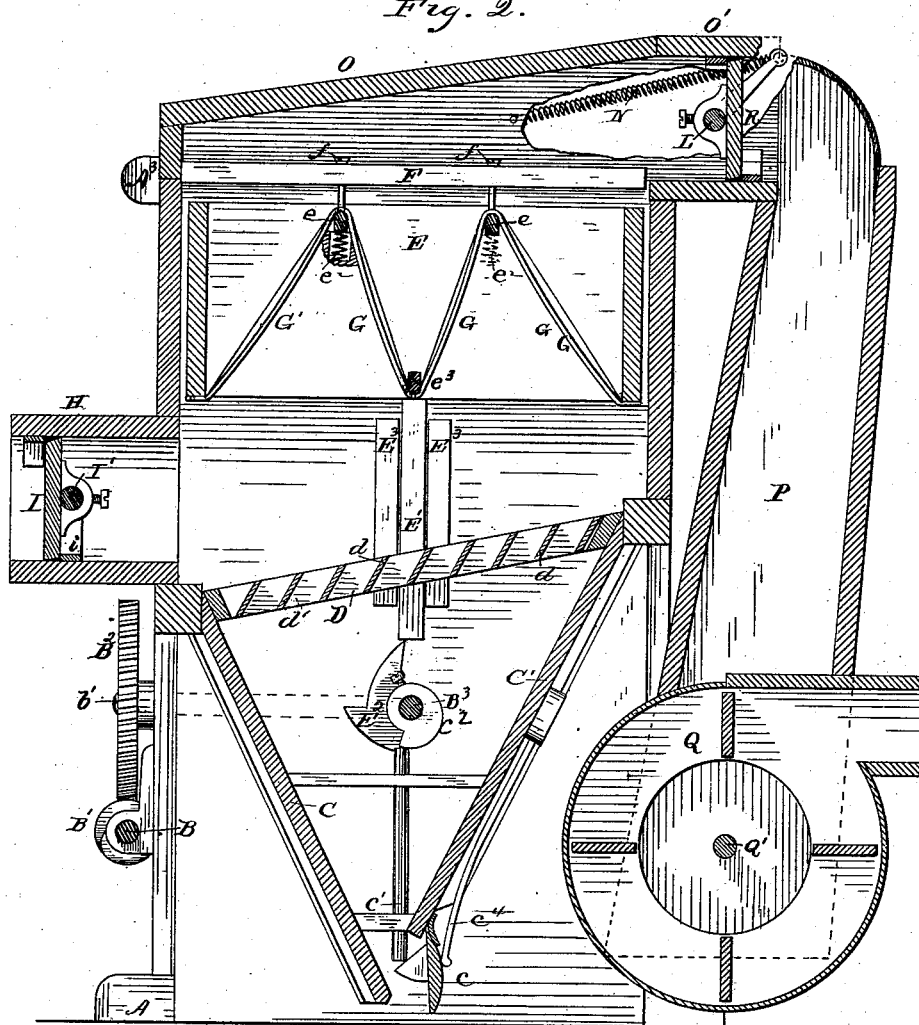


Fig. 5.

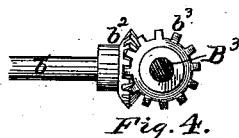
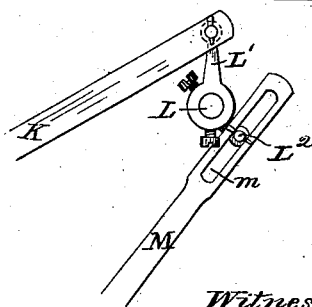
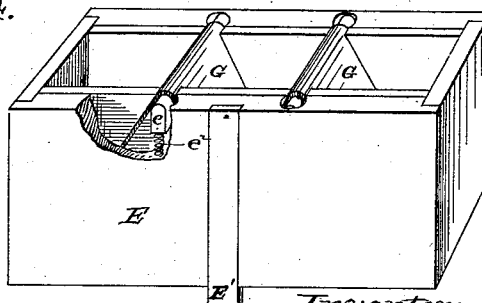


Fig. 3.



Witnesses:

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UNITED STATES PATENT OFFICE.

MILFORD HARMON, OF JACKSON, MICHIGAN.

DUST-COLLECTOR.

SPECIFICATION forming part of Letters Patent No. 260,194, dated June 27, 1882.

Application filed February 26, 1880.

To all whom it may concern:

Be it known that I, MILFORD HARMON, of Jackson, in the county of Jackson 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, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

Inasmuch as I have filed another application describing and claiming the novel features of the introducing, conducting, alternating, and discharging devices, it will not be necessary to herein describe in minute detail all of these various parts, this application pertaining more especially to the filtering-cloth and the mechanism immediately combined with it for the purpose of supporting, slackening, and tightening it. However, in order that the relation of these parts of the mechanism to the others may be readily understood, the following general description of the other parts is given.

Figure 1 is a perspective of a machine embodying my improvements. Fig. 2 is a vertical section not central. Fig. 3 is a view of one of the filters detached, a portion of the frame being broken away. Fig. 4 shows the bevel-wheels for operating the central cross-shaft from the counter-shaft. Fig. 5 is a detailed view of the two pitmen and upper rock-shaft.

A are posts, A' sills, A² girts, and A³ top pieces, of the supporting frame-work.

B is the main shaft, carrying a belt-pulley, b, and a worm, B', engaging with a wheel, B². Wheel B² rotates a counter-shaft, b', which in turn drives a shaft, B³, by bevel-wheels b² b³.

The interior of the machine is divided into an upper and a lower portion by a flooring or diaphragm, D d, preferably inclined, having inclined boards or slats d situated so as to receive more or less impact of the current of air; being arranged so that a portion of the surface of each shall be exposed to the air. Below this is a hopper, C C', having a valve, c, with which valve there is combined a spring, c', tending to hold it shut. The valve is opened by a pusher-rod, c', actuated by a cam, c², on shaft B³. This opening of the valve occurs when the hopper is to be emptied.

Above the diaphragm D d the filtering-chambers are arranged. In the drawings I have shown four chambers, two or more of which can receive dust simultaneously and can be simultaneously cleansed. Each filtering-chamber has walls of cloth, G G'. The walls of each chamber may be formed by a continuous cloth or by separate pieces of cloth supported on the bars e e at the top and bars e³ at the bottom. When a single strip of cloth is employed to form a chamber, as is the case shown in the drawings, it is fastened at its lower edges to a movable frame, and at an intermediate point passes over the upper supports, e. The cloths are supported in a frame having walls E. In the side walls are formed seats e' for the bars e and for springs e² beneath the bars. The springs tend to move the cloth-holder in such a way as to snap the cloth to remove the dust. The frame E E, carrying the cloth, can be lifted up by one or more sliding bars, E', operated by cam E² on shaft B³. After the cam escapes the frame comes down until it reaches the cleats or brackets E³, the descent resulting from gravity and the action of springs e².

The bars e are prevented from rising when the filter-frame is elevated. This is done by means of a cross-bar, F, and downwardly-projecting studs or screws f, immediately above the bars e. Of these bars F and sets of studs or screws as many may be employed as is necessary, I employing by preference one upon each side. While the filter-frames are being lifted the rods e engage with the lower ends of the studs f and are prevented from rising beyond a certain point, so that the cloth is left slack, as indicated in Fig. 2. When the frames fall the springs e² operate to suddenly bring the cloth back to its tense condition, imparting to it a jerk, which insures the instant removal of the dust from the under side.

A⁴ is a partition running vertically through the frame, dividing the same into compartments, in each of which is situated a filter-frame. The dust-laden air passes to the apartments alternately through a trunk, H, communicating with the dust-producing mechanism. The entrance to each chamber is controlled by means of a valve, I, and the exit orifice of each is controlled by a valve, R. These valves I and R are alternately opened and closed by means of

rock-shafts I' and L, connected by a pitman, K, and cranks L' and I². The shaft L is rocked by a pitman, M, the lower end of which is pivoted to a crank, b⁴, on shaft B².

5 m is a slot in the upper end of pitman M, by which it engages with a crank, L², on shaft L, and through the pitman M the oscillating motion is imparted to the two shafts I² and L. The air passes through the trunk H upward
10 through the filtering-chambers alternately, through the cloth walls G G', through the exit-orifices, and through an exhaust-trunk, P, to a fan, Q, on shaft Q'.

N is a spring adapted to return the rock-shaft L after being rocked by pitman M.

15 The machine is closed by a cover, O O', a portion of which is hinged.

It will be seen that the parts e and F operate as a frame to hold one part of the cloth, or of
20 the chamber formed thereby, stationary relatively to the lower part of the cloth, which is movable. The movable part is carried by the frame E, the bar e² being carried up and down with said frame. This frame, in its upward
25 movement, lifts the cloth, and thereby slackens it, and the springs tend to return the moving frame after it has been slackened, and tend to snap and tighten the fibers of the cloth. When the movable frame is at rest the springs operate
30 to preserve the proper tension of the fibers of the cloth, and if from changes of temperature or from other causes the fibers should be slackened the springs will operate to take up the slack and preserve the proper tension.

35 The diaphragm or partition D, having the inclined boards or slats d and openings d' between the slats, is so constructed and arranged as to receive more or less impact of the dust-laden air, which latter does not go directly
40 from the trunk to the dust-catching cloth. By this construction and arrangement the air is diverted from a direct course, and, further, as the air and dust strike the boards and slats d considerable of the dust—such as the heaviest—
45 will fall directly into the hopper immediately below. Therefore less dust is caused to impinge against the collecting-cloth.

The filtering-cloths and cloth-frames can be removed from the main frame, as the frames
50 which carry the cloths are supported loosely. When these are made thus removable the cloth and its moving frame can be repaired or replaced by others, if necessary.

I do not in this application claim any of the
55 patentable features herein shown or described, except those specifically set forth in the claims, as I prefer to claim said other features in another application which I have filed.

What I claim is—

60 1. In a dust-collector, the combination of a dust-intercepting cloth, a frame which holds one edge or part of the cloth or of the cham-

ber formed thereby stationary relatively to a movable part of the cloth, a frame connected to said movable part of the cloth, mechanism
65 which intermittently moves said frame toward the stationary part of the cloth to produce a slackening or loosening, and springs constructed independently of the movable frame to return the cloth to the tense condition, sub-
70 stantially as set forth.

2. In a dust-collector, the combination, with a dust-intercepting cloth having one part attached to a stationary frame or support and another part attached to a frame which moves
75 toward and from the fixed part of the cloth, of metallic springs constructed independently of the cloth-moving frame and arranged to tighten the fibers of the cloth, and devices which lift the cloth-moving frame to slacken
80 the cloth, substantially as set forth.

3. In a dust-collector, the combination, with a dust-intercepting cloth having one part attached to a stationary frame or support and another part which moves toward and from
85 the fixed part of the cloth, of metallic springs constructed independently of the cloth-moving frame and arranged to carry the movable part of the cloth away from the stationary part to tighten it, a rod or bar moving longi-
90 tudinally toward and from the stationary part of the cloth, and a cam engaging with said bar or rod to slacken the cloth on its support, substantially as set forth.

4. In a dust-collector, the combination of a
95 dust-intercepting cloth having a stationary part and a part vertically movable to dislodge the dust with a bar which supports the upper part of the cloth, and springs engaging with said bar and operating to return the cloth to
100 a tense condition, substantially as set forth.

5. In a dust-collector, the combination of a dust-intercepting cloth with a yielding rod from which said cloth is suspended, and the means which alternately slacken and tighten
105 the cloth to dislodge the dust therefrom, substantially as set forth.

6. In a dust-catcher, a filter-frame, E, fitting closely within the vertical inclosing-walls of the dust-catcher and rising and falling freely
110 therein, in combination with the cams and lugs which actuate said filter-frame, and the brackets below the frame for supporting it, arranged to permit said frame to be readily removed from the dust-intercepting chamber, substantially as
115 set forth.

In testimony that I claim the foregoing I have hereunto set my hand this 19th day of February, 1880.

MILFORD HARMON.

Witnesses:

J. C. BONNELL,
W. A. KING.