

UNITED STATES PATENT OFFICE.

FRANCIS H. McELFRESH, OF TERRE HAUTE, INDIANA.

DUST-COLLECTOR.

SPECIFICATION forming part of Letters Patent No. 258,096, dated May 16, 1882.

Application filed August 4, 1880. (No model.)

To all whom it may concern:

Be it known that I, FRANCIS H. McELFRESH, of Terre Haute, in the county of Vigo and State of Indiana, have invented certain new and useful Improvements in Dust-Collectors; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention relates to improvements in dust-collectors of the general description set forth in a pending application for patent by Jonathan Mills, my special improvement consisting in the construction of parts hereinafter described and claimed.

Figure 1 of the drawings is a perspective view of a dust-reel containing my improvements. Fig. 2 is a central vertical longitudinal section of said reel. Fig. 3 is a vertical transverse section of the reel and frame.

A is the stationary frame-work of the machine.

S are parallel shafts mounted in bearings upon the frame A, and having rollers or pulleys B, which support and rotate the reel.

R is the reel, having the circular ribs *r*, resting on the rollers B, and the longitudinal rails *r'*.

F is the reel-cloth, secured to the inner faces of said ribs and rails.

H and H' are stationary or non-rotating heads arranged to close the ends of the reel and to give support to the interior hopper and the shafts *s*, *s'*, and *s''*.

C' and C² are the cant-boards, and C is the worm-chest of the hopper. The worm-chest extends outward beyond the head at one end of the reel and is provided with the discharge-spout I. The worm W is seen in Fig. 3.

D D' are rotating closing-strips consisting each of the shaft *s* and the flexible strips *a* secured thereto, as clearly seen in Fig. 3.

P P are annular strips of packing, made of any suitable material, and interposed between the stationary heads H and H' and the end rails, *r*, of the reel.

J J are brackets secured to the head H' and extending outward over the adjacent frame.

K K are threaded rods secured to the frame and passed through the ends of the brackets J. They thus support said head in place, and

being provided with the nuts *n* and *n'* afford means for adjusting the said head inward and outward with reference to the reel R. The opposite head, H, is permanently fixed to the frame by means of the connecting-plates *h* or otherwise.

O represents any form and size of aperture in one of the heads to receive a spout or other connection with the purifiers or stones, and E is a rotating brush arranged longitudinally within the hopper or still-air chamber in proximity to the cloth F to detach the dust accumulated thereon.

It will be understood that the reel described consists of two chambers separated by the hopper-boards C, C', and C². The chamber exterior to the hopper is called the "blast-chamber," and receives the blast from the purifiers through the passage O. The air escapes through the meshes of the cloth F, and the dust is deposited on the inner surface of said cloth. The chamber within the hopper is not exposed to the blast, and is called the "still-air chamber." In the rotations of the reel all parts of the cloth F are successively carried over the hopper, and the dust is therein detached by the rotating brush E. Falling into the worm-chest C, the dust is conveyed out by the worm W, and is discharged through the spout I.

In the apparatus on which this is an improvement, as stated, difficulties were encountered in completely closing the spaces between the margins of the cant-boards C and C' and the dust-cloth F, so as to obtain a suitable still-air space within the hopper for the proper settling of the dust therein. Another difficulty was encountered from the use of a knocker as a means of detaching the dust from the cloth within the still-air space. For the remedy of the former of these defects I have devised the rotating closing-strips D and D', each provided with a number of longitudinal wings, *a*, of flexible rubber, applied to the shaft *s* in the tangential relation shown. These closing-strips are each supported in position to bear constantly on both the cloth F and the adjacent cant-boards by two or more of the wings *a* at the same time, and are rotated by means of the belts *b*, or otherwise, positively at the same speed and in the same direction as the cloth against which they bear. Thus rotated,

they do not operate to force the dust into the meshes of the cloth or to pack the same upon the surface of the cloth by a rubbing action thereon. The dust is therefore free to be detached at the proper point, and the cloth is continually kept in condition to give proper escape to the air. These rotating packing-strips serve to perfectly cut off the space within the hopper from the blast, so that the dust therein detached all readily falls to the worm-chest.

Instead of a knocker as a means of detaching the dust accumulated on the cloth F on its passage through the blast-chamber, I employ a rotating brush, E, located, as shown, within the hopper and turned by the belt *b* in opposition to the direction of movement of the cloth. The knocker was found to act unequally on different parts of the surface of the cloth, and in some parts imperfectly, whereas it is desirable to the permanent and satisfactory operation of the reel that the cloth be perfectly and uniformly denuded of the dust at each rotation of the reel. This end is satisfactorily attained by the brush, which operates equally and completely at all points of the cloth successively exposed to its action.

In order to obtain a proper angle in which to locate the rotating closing-strips, and in order to take up as little space as possible with the hopper, and for other reasons, I have located said hopper and worm-chest at one side of the reel, as shown. I have also been led to make the entire heads of the reel stationary, as indicated, and to interpose the packing P between the heads and the end ribs, *r*, of the reel-frame.

In order to maintain close joints at the ends of the reel as the packing wears, one of the heads, as H', is made adjustable. To this end said head is provided with two or more iron brackets, J, rigidly secured thereto, and having apertures at their outer ends, by which they set over the threaded rods K, fixed to the frame. Said rods are provided with the set-nuts *n* and *n'*, by which means the head H' may obviously be set out or in at pleasure. The opposite head,

H, is rigidly secured to the frame by the joining-plates *h*, or otherwise. The hopper is preferably fixed permanently to the head H, and either sets into the head H' or is fitted movably within cleats on said head, or is provided with a yielding packing, by which the joint of said hopper, with the movable head H', may always be kept close.

The several shafts, *s*, *s'*, and *s''*, of the closing-strips D and D', the brush E, and the worm W are driven by pulleys *p p'* on said shafts and belts *b b*, leading therefrom to one or the other of the shafts S. The shafts S, which support and drive the reel, are connected by the belt *b'* and driven by the belt B'.

Having thus described my invention, I claim—

1. In a dust-collecting reel having within it a blast-chamber and a still-air chamber, separated by the inclosing boards of a hopper, the rotating closing-strips D D', arranged to simultaneously bear upon the hopper-boards and the traveling cloth to prevent the blast from entering the hopper, substantially as described.

2. The combination, with the traveling cloth and the still-air chamber, of the rotating brush E, arranged in contact with the cloth and within the still-air chamber, substantially as described, and for the purpose stated.

3. The combination, with the rotating reel R, having ribs *r*, of the non-rotating heads H H' and adjusting devices for regulating the relative positions of said reel and heads.

4. In combination with the frame A and reel R, the head H', provided with the brackets J, the threaded rods K, fixed frame, and the nuts *n* and *n'*, constructed, arranged, and operating substantially as described, and for the purposes set forth.

In testimony that I claim the foregoing as my invention I affix my signature in presence of two witnesses.

FRANCIS H. McELFRESH.

Witnesses:

DELOSS N. GOULD,
HENRY C. GILBERT.