

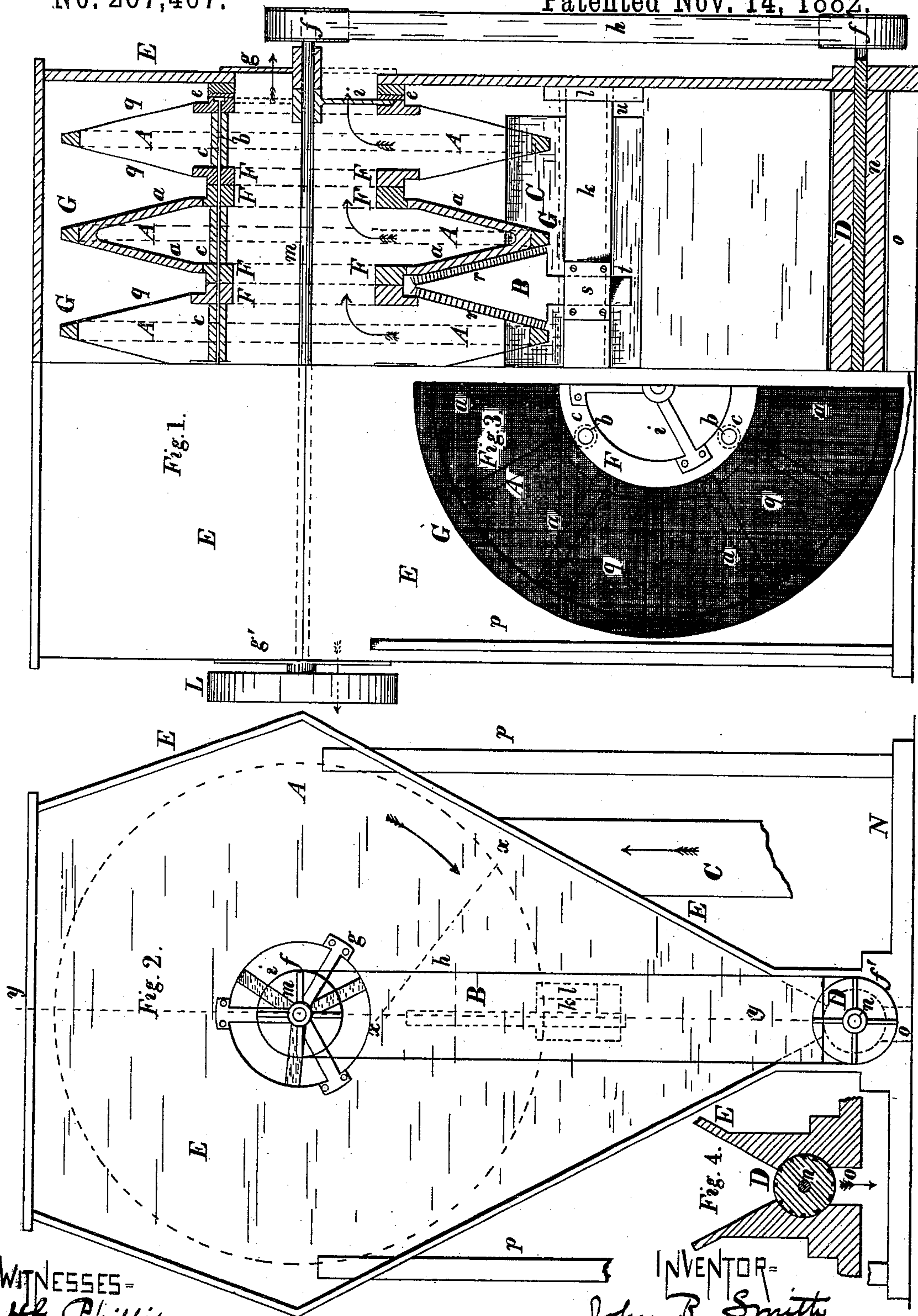
(No Model.)

J. R. SMITH.

DUST COLLECTOR FOR FLOUR MILLS.

No. 267,467.

Patented Nov. 14, 1882.



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# UNITED STATES PATENT OFFICE.

JOHN R. SMITH, OF ROCHESTER, NEW YORK.

## DUST-COLLECTOR FOR FLOUR-MILLS.

SPECIFICATION forming part of Letters Patent No. 267,467, dated November 14, 1882.

Application filed April 10, 1882. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN R. SMITH, of Rochester, Monroe county, New York, have invented an Improved Dust-Collector for Flour-Mills, of which the following is a specification, reference being had to the accompanying drawings.

My improved dust-collector is represented in the accompanying drawings, in which Figure 1 is a partial side elevation and a partial central vertical section on the line *y y*, Fig. 2. Fig. 2 is an end elevation. Fig. 3 is an end view of one of the rotary screens. Fig. 4 is a transverse section through the discharge-valve.

In the accompanying drawings of my improved dust-collector, A A A represent a series of rotary screens; B, the brushes; C, the inlet-spout through which the dust-laden air enters; D, the discharge-valve, and E E E the exterior casing of the machine.

My improved dust-collector consists of a series of rotating circular screens having inclined sides, arranged to revolve on a common shaft within a closed chamber which receives the dust-laden air, the arrangement being such that the dust is retained on the exterior surface of the screens, from which it is removed by stationary brushes, while the purified air escapes through the meshes of the screens into their center, and is discharged at one or both of their ends.

The rotary screens consist of inner rings or collars, F, and outer rings, G. The outer rings, G, are supported from the inner rings by the radial arms *a a*, which are mortised or otherwise secured in or to the inner rings, while the outer rings are screwed or bolted to their extremities. The arms *a a* are double, or made V-shaped, as shown in the sectional view in Fig. 1, their inner ends being attached to the two collars F F, with which each of the screens is provided. The collars F F of the whole series of screens are attached together by rods *b b*, which pass lengthwise through them, being provided with a head at one end and a thread and nut at the other. Three or more of these rods may be used, according to the judgment of the constructor or the size of the apparatus. The rods *b b* pass through thimbles *c c*, Figs. 1 and 3, by which the two collars F F of each screen are maintained at the proper distance from each other. The rings G G and collars F F are

preferably made of wood, on account of lightness, and for convenience of the attachment of the cloth *q*, with which each section is covered. The rings or collars may, however, be made of light metal, wooden strips being attached to them, to which the cloth may be tacked. Any preferred number of these circular screens, being bolted together by the rods *b*, are supported on the shaft *m* by the spiders *i*. Rotary motion is imparted to the shaft by means of a belt running over the pulley L. The shaft revolves in journals at the center of the spiders or cross-bars *g g'*, the arms of which extend across the opening in the sides of the casing E, through which the purified air escapes, their ends being fastened to the casing at the edges of the opening. After the screens have been bolted together and attached to the shaft, I prefer to turn them all up true in a lathe, the sides of the arms *a a* being trued up at the same time, so that the cloth, when applied, shall fit smoothly over the arms.

When the machine is in operation the screens rotate continuously, and in order to free the cloth from the dust which deposits on the exterior of the screens I employ a series of brushes, one of which is shown at B, Fig. 1. The brush B is supported in any convenient way on the cross-bar *k*—as, for instance, by inserting its stem *t* in an opening in the cap *s*, fastened to the cross-bar. The brush B is provided with bristles *r* on its opposite faces, which are inclined toward each other, being arranged parallel with the exterior surface of the screens, so that each brush cleans the opposite sides of the circumferential grooves between each separate screen. As the brushes wear away they may be moved upward, so as to keep the bristles in contact with the cloth of the screen, either by adjusting each separate brush upward by sliding the stem *t* in the cap *s*, or by adjusting all the brushes upward at once by raising the bar *k* by inserting wedges below it at *u*, Fig. 1, in the bottom of the slot in the block *l*, which is fastened to the inside of the casing E and receives the end of the cross-bar. As the dust is removed from the screens by the brushes it falls downward, being guided by the hopper-shaped sides of the casing, to the valve D, by which it is delivered to the discharge-spout *o*. The valve D is driven from



the shaft *m* by the pulleys *f f'* and belt *h*, being arranged to rotate in a circular chamber formed in the base *N* of the machine below the center of the hopper. The valve consists of a shaft,  
 5 *n*, inserted into the cylindrical valve-body, which is provided with a series of longitudinal grooves, in which the dust is carried around by the rotation of the valve and delivered into the discharge-spout *o*.

10 The screens and the valve may be rotated in either direction, it being, in fact, preferable to reverse the direction of rotation occasionally, when the machine is in operation, by means of a twisted belt or other device, as after the  
 15 screens have revolved in one direction for a length of time the brushes become slightly bent in that direction, and on reversing the motion their action, in cleaning the cloth, will be found to be very much more effective.

20 It is obvious that my improved dust-catching balloon may be arranged with its axis vertical instead of horizontal, in which case the brushes would be preferably arranged at an angle to a radius of the balloon, as indicated  
 25 by the dotted line *xx* in Fig. 2, for the purpose of sweeping off any accumulation of dust upon the screens into the case.

At each end of the balloon a ring of felt or other suitable packing is interposed between  
 30 the end collar, *F*, and the casing to prevent the escape of the air at this point.

In the drawings I have represented the cloth as inclined at an angle with the axis of the shaft, the circumferential grooves running around  
 35 the exterior of the balloon being *V*-shaped, with the point of the *V* toward the longitudinal axis of the balloon. This is the form of construction which I prefer, as, among other advantages, the brushes, being inclined at an angle  
 40 with each other corresponding with the angle between the arms *a a*, may be adjusted to compensate for wear by being moved toward the axis of the balloon. It is obvious, however, that the cloth may be arranged in parallel

planes at right angles with the axis of rotation 45 of the balloon, the brushes in this case being made adjustable lengthwise of the axis in any convenient manner.

The operation of my improved dust-collector will be readily understood from the foregoing 50 description and drawings. The balloon and the discharge-valve being set in motion, the dust-laden air from any machine or apparatus in the mill enters the casing through the spout  
 C, and, circulating about the balloon, passes 55 through the cloth forming the sides of the circumferential grooves around it, depositing the dust on the cloth, from which it is removed by the action of the brushes as the balloon rotates, being finally discharged from the ma- 60 chine by the valve at the lower part of the apparatus. The air is discharged from the openings at one or both ends of the casing entirely purified from dust.

I claim—

1. The combination of a rotating dust-catching balloon, provided with circumferential cloth-covered grooves, with stationary brushes arranged to clean the cloth, substantially as  
 65 and for the purposes set forth. 70

2. The combination of a rotating dust-catching balloon, provided with circumferential cloth-covered grooves, with the casing *E*, inlet-spout *C*, and brushes *B*, adapted to clean the cloth at the sides of the grooves, substantially  
 75 as described.

3. The combination of a rotating dust-catching balloon, provided with circumferential cloth-covered grooves, with the casing *E*, inlet-spout *C*, brushes *B*, and discharge-valve *D*, 80 substantially as described.

4. The combination of the outer and inner rings, *F* and *G*, cloth *g*, thimbles *c*, arms *a a*, and bolts *b*, substantially as described.

JOHN R. SMITH.

Witnesses:

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