A. D. ASH.

Smut-Mills.

No. 136,356. Patented March 4, 1873.

Fig 1.

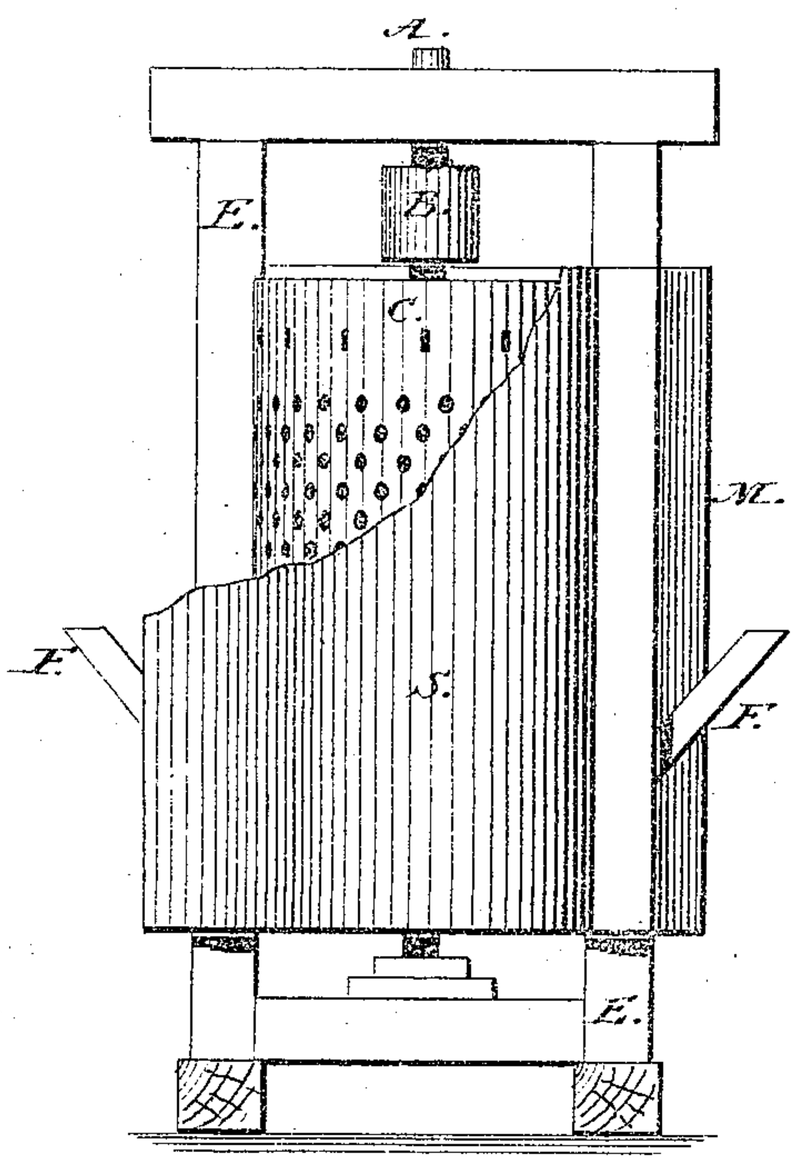


Fig 2.

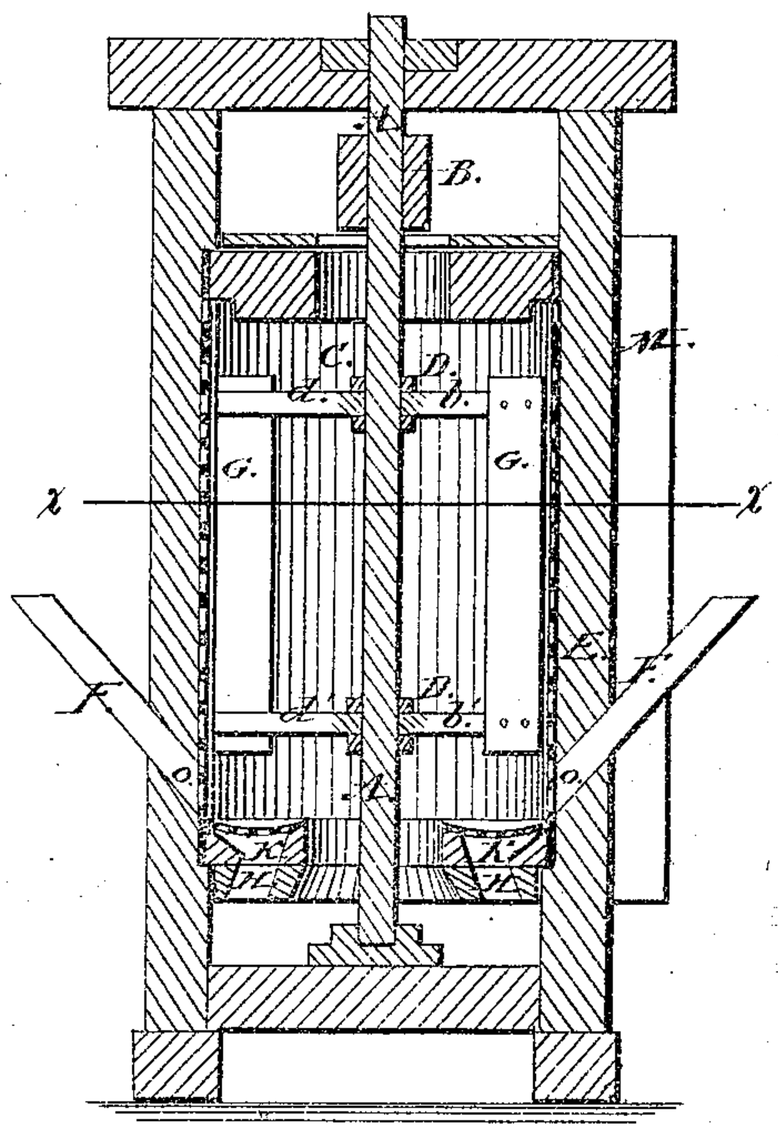
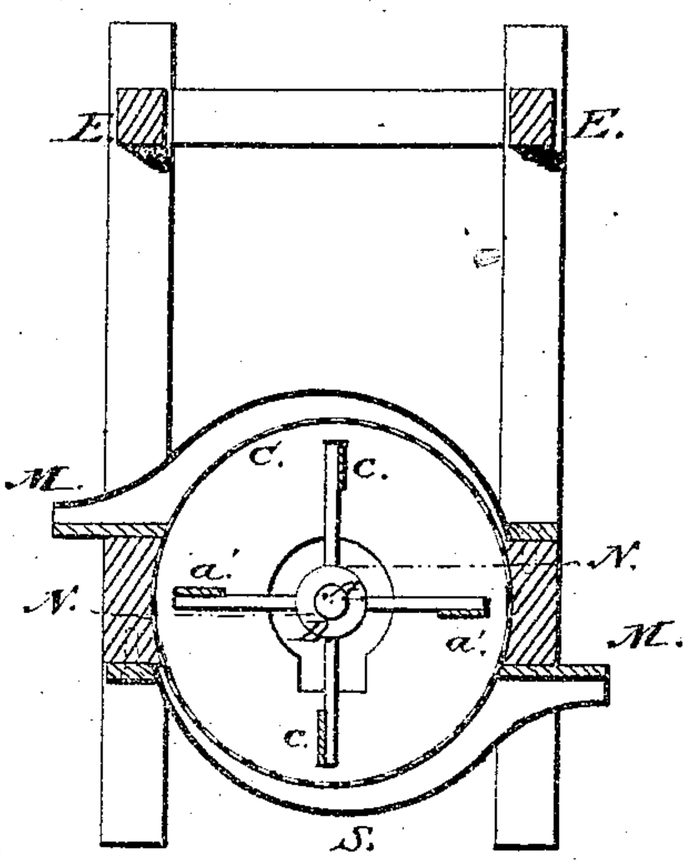


Fig 3.



Witnesses;
Z. Miller
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Inventor,
Amos D. Ash

UNITED STATES PATENT OFFICE.

AMOS D. ASH, OF SWAYNE COUNTY, NORTH CAROLINA, ASSIGNOR OF ONE-HALF HIS RIGHT TO JOSIAH CURTIS, OF KNOXVILLE, TENNESSEE.

IMPROVEMENT IN SMUT-MILLS.

Specification forming part of Letters Patent No. **136,356**, dated March 4, 1873.

To all whom it may concern:

Be it known that I, AMOS D. ASH, of the county of Swayne and State of North Carolina, have invented certain Improvements in Smut and Scouring Machines or Mills, of which the following is a specification:

My invention relates to certain improvements in smut-mills; and consists in those features more particularly hereinafter set forth and claimed. These improvements I have embodied in a machine which comprises a case or shield, around a perforated upright cylinder, containing upon a central perpendicular shaft wings or beaters so constructed and arranged that when driven with rapid rotation the wheat or other grain, which is fed from above, falls upon them, and being thereby agitated the lighter impurities are forced out by the blast. The shield or case around the perforated cylinder contains one or more longitudinal openings for the escapement of the chaff, smut, and other light material, which can thence be conveyed by pipes out of the building.

At the bottom of the chamber within the cylinder there is a concave sieve or separator for the escapement of the cockle and other heavy material, which is conveyed through openings below near the periphery of the cylinder. There is a central opening through the bottom of the cylinder around the shaft for the exit of the cleaned grain.

The lighter substances driven out by the blast through the longitudinal opening or openings at the side or sides of the shield or outer incasement may, in cleaning some kinds and conditions of grain, be otherwise driven out by the blast through one or more openings at the top, and in like manner be thence conveyed by pipes out of the building.

Thus the whole process of cleaning and scouring and separating is effected in one and the same chamber, while the wheat or other grain enters at a single opening in the top, and passing through it escapes at a single opening around the shaft in the center of the bottom. Simultaneously therewith the blast is effected by the rotation of the wings or beaters within the same chamber.

In the accompanying diagrams, Figure 1 is a front elevation of a machine embracing my invention; a portion of the outer casing or shield is cut away, showing a part of the perforated cylinder within. Fig. 2 is a vertical transverse section through the center; the line *x x* shows the section for Fig. 3. Fig. 3 is a horizontal section.

The frame E should be substantially made to prevent the vibrations from interfering with the workings of the mill. The cylinder C is perforated with round holes of a suitable size, which are about half an inch apart in each direction. It is made in two parts and united at the sides, where it is firmly secured to the frame. The vertical edges of the halves of the cylinder are slightly curved inward where they are fastened to the frame, as shown at N N in Fig. 3. This arrangement furnishes a slight obstruction to the gyrating grain, sufficient, however, to throw it back upon the wings or beaters for more efficient scouring. A shield, S, is constructed about each half, or may be made to nearly surround the whole, of the cylinder C, forming an outer case, with a small space between itself and the cylinder. The vertical edges of this shield or incasement S are turned outward, forming a longitudinal opening or mouth, M M, for the exit of the dust, smut, and light material blown out through the perforated cylinder C, and from this mouth M a pipe may convey such light material out of the building. In cleaning some kinds of grain, and under certain conditions, this dust and other light substance may be blown by the blast within the cylinder, otherwise out of one or more holes through the top, and in a similar manner be conveyed by a pipe out of the building. At the lower part of the chamber there is an opening at each side *o o*, through the cylinder C and frame E, for the escape of coarser material not easily forced through the perforations. Pipes or flues F F are attached to the frame for conducting away such coarser substances as escape through these openings *o o*. There is also a sieve or screen, K, at the bottom of the chamber in the cylinder, except about the shaft A, which is concaved or troughed, through which screen cockle and some other of the heavier impurities leave the grain, and the same is conveyed through spiral conducting-holes H H beneath. A is an upright shaft, passing down through the perforated cylinder

C. B is the driving-pulley, which may be hung upon the shaft either at the top or bottom for conveying motion to it. Upon that part of the shaft A, which is within the cylinder C, and firmly fixed to it, is a reel composed of two spiders, D D′, each with four arms, *a b c d* and *a′ b′ c′ d′*, to which are attached four wings or beaters, G G. These arms diverge horizontally from the shaft A at right angles thereto, and each arm is at a right angle to its neighbors. One spider, D, with its set of arms, *a b c d*, is placed upon that part of the shaft A which is near the top of the chamber within the cylinder. The other spider, D′, is placed upon that part of the shaft which is near the bottom of the chamber within the cylinder. The arms *a′ b′ c′ d′* of the lower spider D′ are not directly under those *a b c d* of the upper spider D, but are advanced about thirty degrees in the direction the shaft is to rotate, so that the direction of any given arm, as *a′* of the lower spider D′, is about one-third of a quarter circle in advance of the direction of the corresponding arm *a* of the upper spider D. The wings or beaters G G pass from the distal parts of the arms *a b c d* of the upper spider D to the corresponding advanced arms *a′ b′ c′ d′* of the lower spider D′, giving these wings or beaters, longitudinally, a twisting or spiral direction. These wings should be made to occupy about one-third of the distance from the inner surface of the cylinder to the shaft at the center, and so placed as to leave no more space between them and the inner surface of the cylinder than is required to permit a free motion.

When mills are required of only a moderate capacity the perforations need not cover the whole cylinder, in which case the shield S need not extend around the unperforated portion thereof. The shield, moreover, can be dispensed with when the lighter material is conveyed from the cylinder through top.

I do not claim a perforated cylinder as new, for I am aware that cylinders with slots have been in use before; but

I claim as my invention, and for which I wish to obtain Letters Patent—

1. In a smut machine or mill, the case or shield S, provided with a vertical opening or mouth, M, substantially as and for the purposes set forth.

2. In a smut machine or mill, the perforated bottom K, concaved or troughed from the central opening to the circumference, substantially as and for the purposes set forth.

3. The vertical edges N N of the parts of the cylinder in a smut-mill inverted so as to form the obstructions, substantially as and for the purposes set forth.

4. The combination, in a smut machine or mill, of the shield S and the bottom M and the inverted vertical edges N, as described, with the fan beaters or wings G G and perforated cylinder C, substantially as described, and for the purposes set forth

AMOS D. ASH.

Witnesses:
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