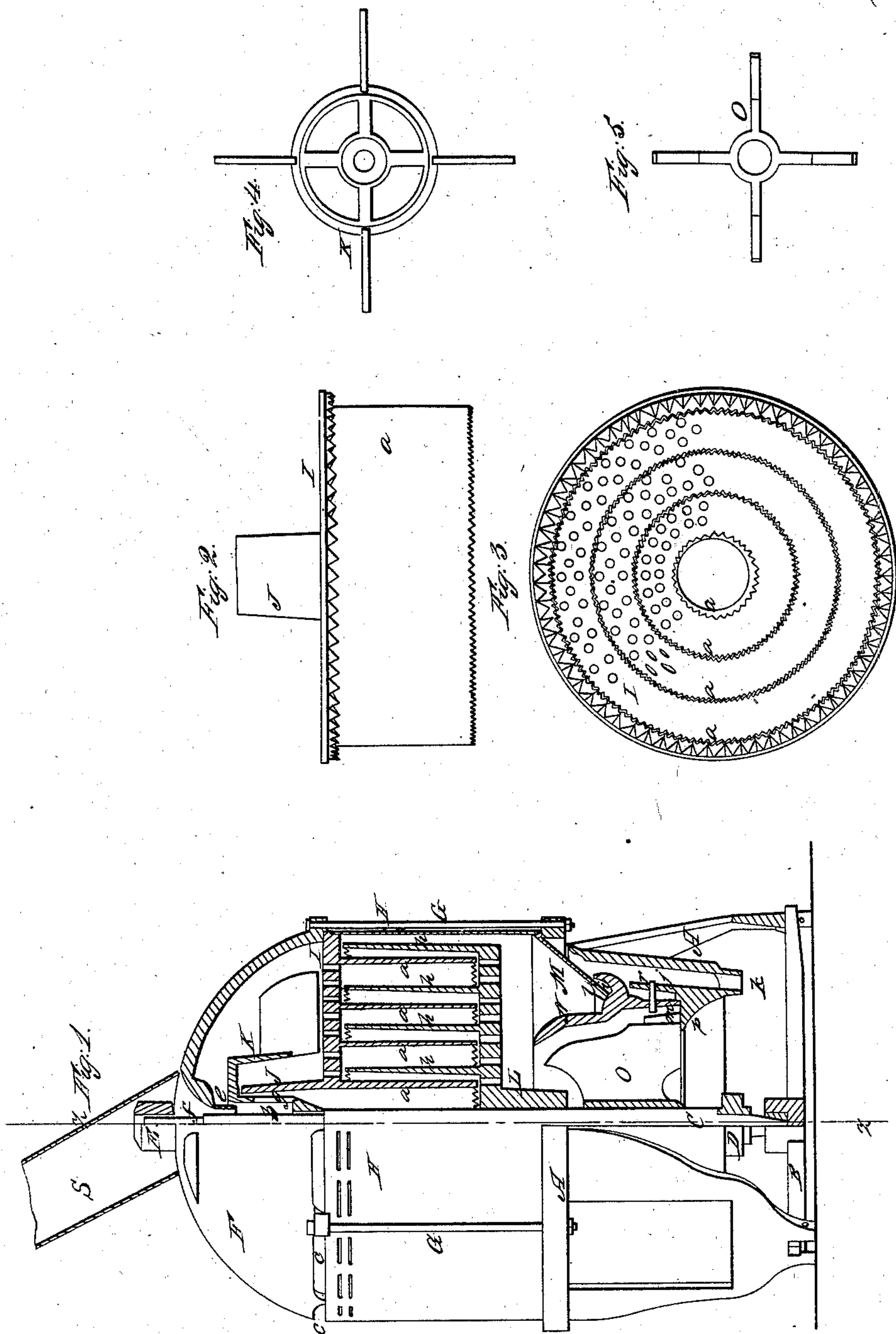


W. Zimmerman.

Smut Mill.

N<sup>o</sup> 16,897.

Patented Mar. 24, 1857.





# UNITED STATES PATENT OFFICE.

WILLIAM ZIMMERMAN, OF QUINCY, ILLINOIS.

## SMUT-MACHINE.

Specification of Letters Patent No. 16,897, dated March 24, 1857.

*To all whom it may concern:*

Be it known that I, WILLIAM ZIMMERMAN, of Quincy, in the county of Adams and State of Illinois, have invented a new and useful  
5 Smut-Machine, which may be used upright, inclined, or horizontally; and I do hereby declare that the same is described and represented in the following specification and drawings.

10 To enable others skilled in the art to make and use my invention I will proceed to describe its construction, use and operation referring to the drawings in which the same letters indicate like parts in each of the  
15 figures.

Figure 1, is an elevation of my smut machine the left half showing the exterior and the right a section of the interior which is separated from the exterior by the line *z, z*.  
20 Fig. 2, is an elevation of the disk I and cylinders attached thereto. The other figures will be referred to in the specification.

The nature of my invention consists in a series of stationary and revolving cylinders  
25 arranged on disks, from their center outward, roughened on both sides, so as to scour and clean the grain as it passes between them successively.

In the accompanying drawings A, is the  
30 base or stand to which the other parts are connected or fastened; this stand consists of a circular rim provided with three legs which may be made in the form represented in the drawing or otherwise, each leg being  
35 provided with a score to which the ends of the arms of the triangular or three armed bridge-tree B, are fitted and supported by pins so that either or all the arms may be raised by placing wedges between them and  
40 the pins which support them.

The bridge tree B, is provided with a hub for the step of the shaft C, which shaft is provided with a pulley D, to which a belt may be applied to operate the machine. The  
45 upper end of the shaft C, turns in the hub E, on the tap F, which tap rests upon the stationary part of the machine and is connected and fastened to the stand A, by the bolts G, G, as represented in the drawing.

50 The cylindrical case H, rests on the stand A, and supports the stationary disk I which is fitted to rest upon it and is confined by the top F as shown in the drawing. The disk I is perforated as shown in Fig. 3, which is a  
55 plan of the under side representing the four concentric cylinders *a, a*, which are fastened

to it and fluted both inside and out and notched at their lower ends as represented in Fig. 1.

The cylinder J, is fastened to the top of the disk I and extends up around the hub *b*,  
60 of the fan K, which is provided with four floats as represented in Fig. 4, to draw the dust etc. from the grain up through the holes or slots in the disk I and blow it out  
65 through the openings *c, c*, between the top F and the disk I. The hub *b*, is made hollow and flaring at the top, so as to receive the grain from the hub *e*, on the under side of  
70 the top F, there being several openings through the top into the hub *e*, one of which is represented at *f* Fig. 1. The fan K, is fastened to the shaft C, and its hollow hub  
75 *b*, has several openings in it, one of which is shown at *g*, through which the grain passes into the cylinder J, and down around the shaft C. The disk L, is fastened to the shaft C, and is perforated like the disk I, and has  
80 four concentric cylinders *h, h*, fastened to its upper surface as represented in Fig. 1, which are fluted inside and out and notched at the top, and made a little flaring or largest at  
85 the top as represented so as to facilitate the rising of the grain by centrifugal force as the cylinders revolve; so as to throw it over the top of each cylinder in succession and  
90 it descends between the outside cylinder *h*, and the case H, onto the inverted cone M and into the trough *i* below it and as it fills up between the cone M, and cylinder N, the  
95 weight of the grain presses it out under the lower edge of the cone M, so that it falls over the outer edge of the trough *i*, into the trough *j*, and passes through the spouts *k*, out of the machine. The cone M rests upon  
the base A and is connected by projections *l*,  
to the bottom of the trough *i* so as to support said trough and the cylinder N which  
is open at the top as represented.

The projections *m*, on the lower edge of  
100 the cylinder N are fitted to a recess in the interior flange *p* on the inside of the trough *j*, and pins like the one represented at *r*, are put through the projections and the inside of the trough *j*, so as to fasten them  
105 together and hold them in their proper places. The outside of the circular trough *j*, extends up nearly to the under side of the base A, as represented, and is made to raise and lower to suit the blast. The fan O, Fig.  
110 5, is fastened to the shaft C, and drives a blast of air through between the projections



$m$ , and across the top of the trough  $j$ , so as to separate the dust from the grain and carry it out of the machine between the top of the trough  $j$ , and the base A. This fan  
5 draws the dust through the holes or slots, in the disk L above it.

The inclined spout S is fastened to the top F so as to conduct the grain into the opening  $f$ , so that it descends through the  
10 hubs  $e$ , and  $b$ , passing out of the latter through the opening  $g$ , into the cylinder J through which it descends around the shaft C, to the disk L; and as the holes in the disks I, and L, are too small to allow the  
15 grain to pass through; the pressure of the grain above, and in the cylinder J, aided by the motion of the disk L and cylinders  $h$ ,  $h$ , and the centrifugal force derived from such motion causes the grain to rise and de-  
20 scend alternately while the fluted cylinders  $a$  and  $h$ , scour it, until it escapes below the outer cylinder H, onto the cone M and trough  $i$ , and as it accumulates between M and N the jar or tremor of the machine will  
25 cause it to rise outside and under the cone M and fall through the blast from the fan O into the trough  $j$ , and pass out of the machine through the spouts  $k$ . The blast from the fan O separates the dust and refuse  
30 matter which has been scoured from the grain, and carries it through the opening between the top of the trough  $j$ , and the underside of the base A, out of the machine.

I have represented a smaller space be-  
35 tween the outside of the stationary cylinders and the inside of the rotating cylinders where the grain rises in the process of scouring than between the outside of the revolving cylinders and the inside of the stationary  
40 ones where the grain descends; but these spaces may be varied to suit the size of the grain to be cleaned, and the amount of scouring required to clean it; but they should not be reduced so as to crush the grain or break  
45 it during the process, and the inside of the stationary cylinders may be made slightly conical if preferred.

I think my machines may be made cheap-  
est of cast iron, but they may be made of  
50 cast or wrought metal, or part of each, and if the cylinders  $a$ ,  $a$ , and  $h$ ,  $h$ , are made of

wrought metal they may be perforated in each direction with a sharp punch, so as to form roughened surfaces of burs on each side to act upon the grain as it passes through  
55 the machine. If the cylinders  $a$ ,  $a$ , and  $h$ ,  $h$  are made of cast metal they may be cast with flutes in them on both sides already for service.

Some of the advantages of this machine  
60 may be enumerated as follows: The upper fan separates the dust from the grain as it enters the machine and while it is operated upon or during the process of scouring; and the lower fan separates the dust during the  
65 process and after it is scoured also. This machine will answer to run in an upright inclined or horizontal position as may be most desirable, if there is sufficient depth or height of grain in the supply spout S which  
70 supply spout should be made more perpendicular as the machine is inclined. I believe however that the grain will pass through this machine without any aid, from the pressure of the grain in the supply  
75 spout; whether the machine is operated in a perpendicular, inclined or horizontal position.

I believe I have described the construction operation and use of my invention, so as  
80 to enable any person skilled in the art to make and use it; I will now specify what I desire to secure by Letters Patent.

I wish it distinctly understood that I do not claim such devices as are represented and  
85 described in the patent granted to Howlett and Walker, May 9th, 1846. But

I claim—

A series of stationary and revolving cylinders arranged on disks or their equiva-  
90 lents, from the center outward substantially as described for the purposes set forth.

I wish it distinctly understood that I dis-  
claim the devices covered by the patent granted to R. M. Dempsey December 18th  
95 1849 as I make no claim to such devices.

WILLIAM ZIMMERMAN.

Witnesses.

JOHN P. CADOGAN,  
JOHN CLEAVELAND, Jr.,  
C. M. WOODS.