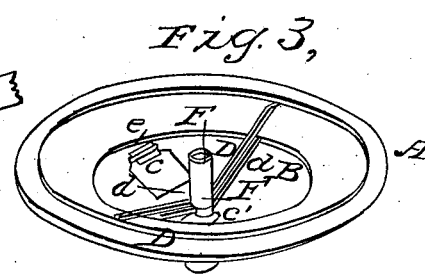
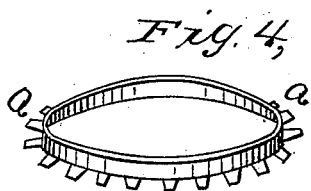
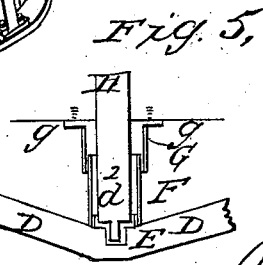
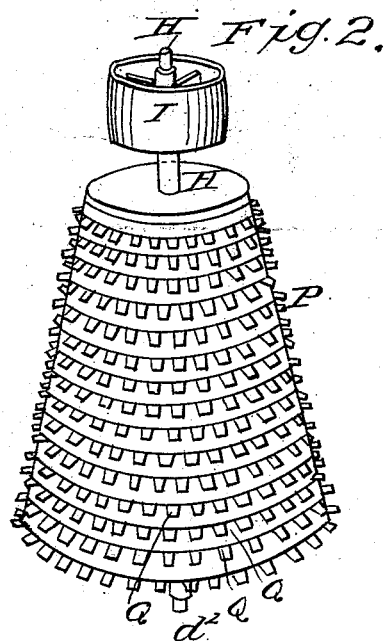
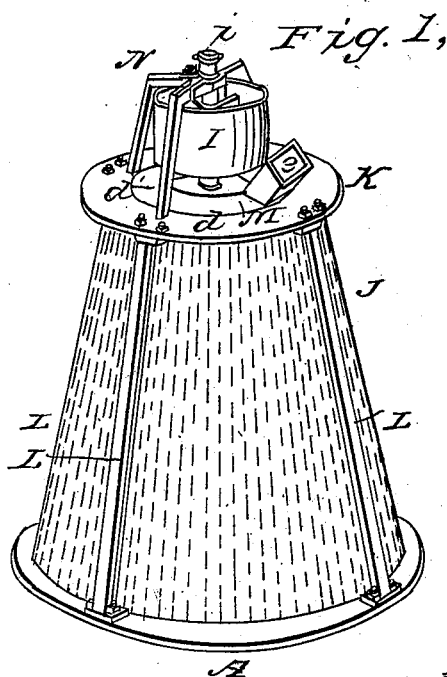


J. E. WRATTEN.

Smut Machine.

No. 5,122.

Patented May 15, 1847.



# UNITED STATES PATENT OFFICE.

JAMES EDW. WRATTEN, OF RUSH, NEW YORK.

## SMUT-MACHINE.

Specification of Letters Patent No. 5,122, dated May 15, 1847.

*To all whom it may concern:*

Be it known that I, JAMES EDWARD WRATTEN, of the town of Rush, in the county of Monroe and State of New York, have invented a new and useful Improvement in Smut-Machines for Smutting or Cleaning Wheat and other Kinds of Grain, which is described as follows, reference being had to the annexed drawings of the same, making part of this specification.

Figure 1 is a perspective view of the machine as prepared for use. Fig. 2 is a perspective view of the frustum of a cone, or "rubber," as usually called, and the rings of sheet iron teeth, or rubbers, for rubbing off the smut from the grain secured to the convex surface of the rubber; and of the shaft and pulley by which it is revolved within the hollow perforated stationary frustum of a cone—or "concave" as it is generally termed. Fig. 3 is a perspective view of the interior or concave surface of the inverted conical bottom or base of the concave and bridge or stirrup for supporting the oil cup into which the foot of the shaft is stepped. Fig. 4 is a perspective view of one of the rings of sheet iron beaters detached from the revolving frustum of a cone. Fig. 5 is a vertical section of the oil cup tube or guard and lower end of the shaft.

As I intend to confine my claim to the manner of constructing the revolving frustum of a cone rubber (which is the most important part of the machine) I shall hereafter give a particular description of that part, and a general description of the other parts. But before doing this I will give an outline of the principles of the machine which I have attempted to improve.

The smut machine that I propose to make and use should have a conical form, in order that the grain in its descent and passage through the machine, should be kept as much as possible on the surface of the revolving rubber where the rubbing must be done. Millers have heretofore depended too much upon the roughness of the inside of their concaves, and hence their failures. The "concave" should be smooth instead of rough and the perforations made from the outside and left smooth and the pieces removed from the perforations. The "cylinder" should be armed or covered with

such formed rubbers that will not grow dull, but on the contrary sharper by use. It should revolve about 450 revolutions per minute instead of 600 or 700 times as is usual in common smut machines, for the slow speed saves grain from being cut, and reduces the power required to propel the machine. The teeth should also be so formed and arranged that they can be easily made or repaired and be durable and economical.

The "concave" should be so formed and punched that it will admit the most air, discharge the most dust, and be the most durable. When the "concave" is left rough inside, as is common, the roughness, hinders the free discharge of the dust; and beside, when the roughness of the punching on the inside of the concave wears off, it leaves the holes too large, and the grain will escape through them, and then the concave becomes useless; but, if it be left smooth on the inside, as mine is intended to be, such would not be the consequence. In forming the apertures for the discharge of the dirt the pieces should be entirely cut out which will render the concave more durable and produce freer discharges. The bottom of the concave should be funnel shaped, instead of flat or horizontal. A smut machine with a flat bottom and small discharge aperture therein, requires four times the power to drive it, than one with an open funnel shaped bottom. In the flat bottomed machine with a small discharge aperture near the circumference the grain is forced out in a mixed condition with the smut by the revolving of the rubber. It is found in practice that the wheat in its passage down through the ordinary smut machine carries with it a great portion of smut and dirt, and when the whole arrives at the bottom of the rubber, the rubber rolls the wheat and dirt together in concentric circles before it passes out at the discharge opening, and, as is often the case, and especially if the grain be damp, it often looks worse after passing through the machine, than before it entered it.

Currents of air are necessary to be produced through the perforations in the case or concave simultaneously with the rubbing operation.

Take either one of the above properties

away from my machine and the machine will be defective, which will be evident to practical millers.

In the annexed drawings similar letters refer corresponding parts.

15 A is the bed plate or concave base or bottom cast with a circular opening in the center.

10 B is the movable funnel shaped cover for closing said opening in the base for discharging the grain.

C is the door in said funnel shaped cover for the purpose of gaining access to the oil cup and collar for oiling the shaft or spindle.

15 C' is an opening in the center through which the grain is discharged.

20 D is the bridge or stirrup for supporting the oil cup cast with the stirrup and base plate.

E is the oil cup into which the foot  $d^2$  of the spindle is stepped.

25 F is the sliding sheet iron tube or guard for preventing the grain dust, or dirt, or smut getting into the oil cup—notched in the lower end so as to fit over the arms  $d$  of the stirrup D and made of the requisite diameter to encircle the oil cup to which it is fitted tight and to enter a circular hollow cap secured to the bottom or base of the revolving frustum of a cone rubber and of such length that it will slip up over the shaft and inside the aforesaid cap attached to the rubber when gaining access to the oil cup for examining the foot of the spindle or the condition of the step—to introduce oil or for any other purpose.

G is said cap and  $g$  the flange by which it is secured to the rubber by screws or bolts.

40 H is the shaft of the rubber.

I is the pulley by which it is turned.

45 J is the concave made of sheet iron in tapered segments perforated over the surfaces in oblong openings about  $\frac{3}{4}$  inch long by  $\frac{1}{16}$  wide for the escape of the smut and other dirt being left smooth for the free discharge of the same.

K is the top of the concave made in the form of a circular flat ring.

50 L are cast iron ribs bolted to the upper side of the base and the under side of the top and including the concave.

55 M is a concentric ring made of two cast iron semi-circles flanged and bolted to the cap as at  $d'$  Fig. 1 having an oblong opening in one of the semi-circular plates into which is fitted a flaring pipe as represented at  $e$  Fig. 1 which receives the spout that conducts the grain to the rubber and concave.

60 N is a skeleton frame cast with the top plate the case containing a box in the center of the top of said frame in which the upper end of the shaft turns covered by a lid  $i$  to keep out the dust.

The revolving frustum of a cone rubber P for separating the smut from the grain is made in the following manner. The bottom or lower end should be made of wood or other more suitable material about 26 inches in diameter for an ordinary machine—its sloped sides, which are likewise made of wood, about 29 inches long and top or upper end about 14 inches diameter, secured well together and to the shaft. Before putting on the sheet iron covering (a section of which is seen at Fig. 4) the top or upper head must be fixed on the shaft in such manner that its upper surface shall be about one inch below the under side of the top of the case or concave and the bottom or lower head about one inch above the concave base of the case, in order that the machine may have a free discharge all around the bottom of the rubber said heads being covered with sheet iron or tin to protect them from injury from the action of the grain. The outer covering is composed of sheet iron rings Q of horizontal teeth, as represented at Q Fig. 4, of tapered form and reduced diameters from bottom to top. Each ring of teeth is made from a strip of sheet iron of the required length to encircle the body of the rubber for which it is intended about 24 inches wide. The strip is then cut into teeth 14 inches long—leaving 1 inch wide uncut to serve as a covering and protection for the wood of the frustum of a cone around which it is to be nailed fast. The said teeth are cut out from the sides of the strips being  $\frac{3}{8}$  of an inch wide at the points or outer ends and  $\frac{5}{8}$  of an inch wide at the basis or parts joined to the rings and are 14 inches apart. The teeth are bent or turned outward so as to stand horizontal when the rings are nailed to the body forming an obtuse angle with the flat surfaces of the rings. The rings are put on the wood frustum of a cone with their edges close together gradually diminishing in diameter from bottom to top. The revolving rubber when finished as represented at Fig. 2 must be placed in the stationary concave represented in Fig. 1 leaving a space of about  $\frac{3}{4}$  of an inch between the points of the teeth and the inside of the concave all around.

Radical wings on the shaft to produce a flowing operation in this case will not be necessary as the flat teeth will produce this effect.

The rubber is turned by pulleys and band by the application of any convenient power to the upper end of the shaft.

The grain is introduced in the usual manner at top, through the inclined spout  $e$ . The horizontal pyramidal shaped sheet iron teeth cut the smut from the grain as it passes from the top to the bottom among the teeth and at the same time produce a sufficient blast within the concave to blow

the smut and dust and dirt from the concave through the oblong apertures therein, while the grain descends and passes from the concave through the funnel shaped bottom being cleaned of whatever smut or dirt may chance to be with it by means of a common fan arranged in any convenient way below the rubber and concave.

It will be understood of course that the size and materials of which the machine is composed will be varied at the pleasure of the constructor.

What I particularly claim as my inven-

tion and improvement in this smut machine is—

The mode of making the rubber P substantially as above described—that is to say, covering the external convex surface of the frustum of a cone with sheet iron rings of trapezoidal shaped teeth combined and arranged and operating in the manner and for the purpose herein set forth.

JAMES E. WRATTEN.

Witnesses:

JOSEPH WOODGATE,  
JOSHUA F. RUNLET.