J. A. WOODWARD.

Smut Machine.

No. 22,395. Patented Dec. 21, 1858.

Fig. 2

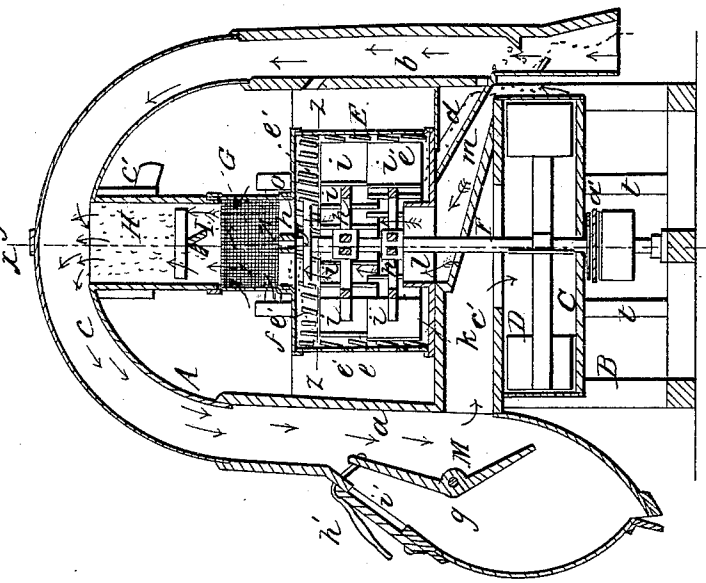


Fig. 3

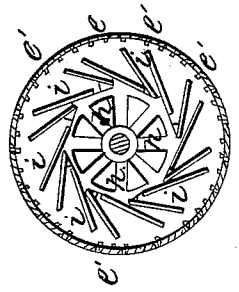
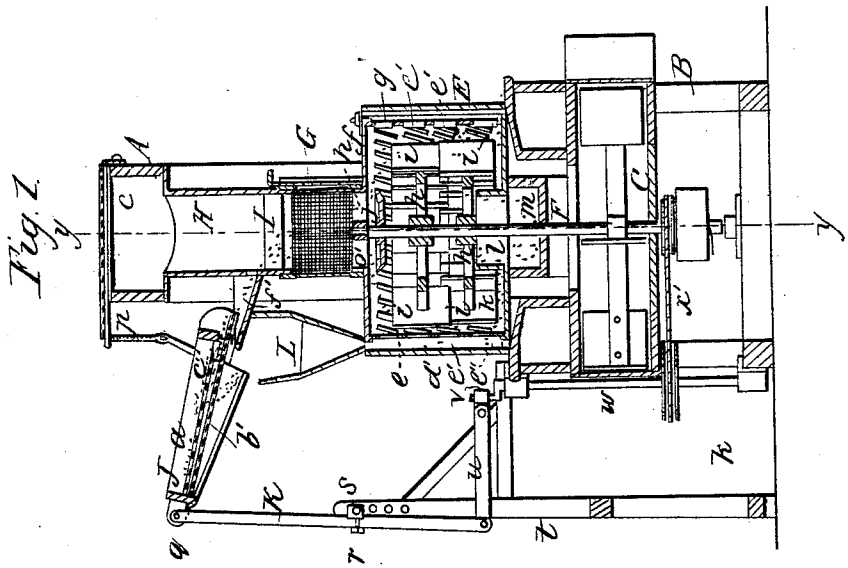


Fig. 1



UNITED STATES PATENT OFFICE.

J. A. WOODWARD, OF BURLINGTON, IOWA.

SMUT-MACHINE.

Specification of Letters Patent No. 22,395, dated December 21, 1858.

To all whom it may concern:

Be it known that I, J. A. WOODWARD, of Burlington, in the county of Des Moines and State of Iowa, have invented certain new and useful Improvements in Smut-Machines; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the annexed drawings, making a part of this specification, in which—

Figure 1, is a vertical central section of my invention taken in the line *x*, *x*, Fig. 2. Fig. 2, is also a vertical central section of do, taken in the line *y*, *y*, Fig. 1, the two planes of section crossing each other at right angles. Fig. 3, is a detached horizontal section of the scouring device, taken in the line *z*, *z*, Fig. 2.

Similar letters of reference indicate corresponding parts in the several figures:

This invention relates to certain improvements on a smut mill and separator which was formerly patented by me, the Letters Patent bearing date October 20th, 1837.

The object of the within described invention is to effect a more thorough separation than formerly of the dust and other foreign substances from the grain before the latter is brought in contact with the scourers, and also to augment to a very considerable degree the efficiency of the scouring device, as well as the part designed for the separation of the light or imperfect grain from the offal or foreign matter.

To enable those skilled in the art to fully understand and construct my invention I will proceed to describe it.

A, represents a curved blast spout which may be described as having two parallel and vertical sides *a*, *b*, connected at their upper ends by a semi-circular portion *c*. The lower parts of the sides *a*, *b*, are connected to the opposite sides of a framing B, which has a fan box C, placed in it containing a fan D, of usual construction. The side *a*, of the spout A, communicates with the upper part of the fan box by a horizontal spout *c'*, and the other side *b*, of the spout A, communicates by means of an inclined spout *d*, with the lower part of a scourer E, which is placed on the top of the framing B.

The scourer E, is formed of a sheet metal case or cylinder *e*, which is punched so as to form oblique or inclined rectangular openings *e'*, the burs being allowed to project inward so as to form a corrugated surface as well as a perforated one. The perforations extend around the cylinder in horizontal rows, one above the other and extend from the bottom to the top of the case or cylinder. The case or cylinder is provided with a top plate *f*, which is secured on the case or cylinder by screw rods *g*, which pass through ears attached to the plate *f*, and down through the top plate of the framing.

F, is a vertical shaft which passes centrally through the framing B, and through the cylinder *e*. The fan D, is attached to the shaft F, and to the shaft F, within the case or cylinder *e*, two sets of horizontal arms *h*, *h*, are attached, said arms having oblique blades or wings *i*, which form beaters at their ends, or they may be described as having a tangential position as shown clearly in Fig. 3. One set of arms *h*, is placed above the other as shown in Figs. 1 and 2, and to the shaft F, above the upper set of arms *h*, a circular plate *j*, is placed, said plate having a slightly concave upper surface.

The bottom R, of the scourer E, has a circular opening *l*, at its center and an inclined spout *m*, leads therefrom and at the center of the top plate *f*, of the cylinder or case *e*, a circular opening *n*, is made, said opening having a flange *o*, around it on which a wire cloth cylinder G, is placed. The upper part of the wire cloth cylinder G, communicates with a cylinder H, and the upper part of cylinder H, communicates with the part *c*, of the spout A. Within the cylinder H, and just above the wire cloth cylinder G, a V-shaped parting or deflecting bar I, is placed.

J, is a shoe one end of which is attached by a strap *p*, to the part *c* of the spout A, the opposite end being attached by a joint *q*, to the upper end of a bar K, which is attached by a set screw *r*, to a rock shaft *s*, fitted between uprights *t*, *t*. The lower end of the bar K, is connected by a pitman *u*, with a crank *v*, at the upper end of a vertical shaft *w*, said shaft being rotated by a belt *x'*, from the shaft F. The shoe J, is provided with two screens *a'*, *b'*, one being placed over the other. The screen *a'*, is quite coarse sufficiently so to allow the grain to pass through but not large foreign substances. The screen *a'*, has a spout *c''*, which discharges at one side of the shoe. The screen *b'*, below *a'*, is sufficiently fine to prevent the grain passing through it, but cockle

and fine seeds pass through it and are discharged into a hopper L, which conducts said cockle and seed into the space between the case or cylinder *e*, of the scourer, and a plate or side piece *d'*, the cockle and seed passing through an opening *e''*, into the fan box C. The screen *b'*, communicates with the cylinder H, by a spout *f'*.

Within the side *a*, of the blast spout A, a wing or gate M, is placed, said wing or gate extending the whole width of the part *a*, and having its parts at each end of its axis *g*, placed rather obliquely with each other as shown clearly in Fig. 2. This wing or gate is placed directly opposite the spout *c'*, and has a strap *h'*, attached to its upper end. A door *i'*, is placed in the part *a*, of the spout A, directly opposite the upper part of the wing or gate M.

The operation is as follows: Power is applied to the shaft F, in any proper way, and a rotary motion is communicated therefrom to the shaft *w*, which by means of the crank *v*, and connecting rod *u*, gives a vibrating movement to the bar K, and shoe J. The grain to be cleaned falls on the screen *a'*, of the shoe J, and passes through said screen, the large foreign substances passing off through spout *c''*. The grain cannot pass through screen *b'*, but is conducted by it into the cylinder H, and it falls into scourer E, being divided in its descent by the bar I.

The cockle and fine seed passes off the inclined bottom of the shoe into hopper L, and thence through the opening *e''*, into the fan box C. The fan D, causes a blast to pass vertically upward through the spout *w*, and scourer E, as indicated by the black arrows and the same fan also causes a blast to pass through the spout A, as indicated by the red arrows, a current also passing through the wire cloth cylinder G, upward through cylinder H, into the part *c*, of the blast spout A. The grain therefore it will be seen is subjected to a blast as it descends into the scourer and the bar I, divides or scatters the grain in its descent so that the blast, which will have a whirling motion in the wire cloth cylinder owing to the junction of the upward current from the scourer, will effectually take up all light foreign substances into the spout A. The grain therefore as it enters the scourer E, will be deprived of all loose dirt and smut which is an important feature as it lightens the work of the scourer and prevents the same from grinding the smut and dirt into the eye of the grain. The grain is acted upon by the wings or beaters *i*, in a very effectual manner, the position of the beaters acting in a very direct manner against the grain, so as to subject it to the greatest possible amount of attrition without breaking or injuring it, the dirt and smut passing through the perforations *e'*, and passing down into the fan box through the opening *e''*. The cleaned grain passes down the spout *d*, into the lower part *b*, of the spout A, where it is subjected to a second blast, and falls from part *b*, in a perfectly clean state. All light grain is carried by the blast down into the part *a*, of the spout, the better portion escaping through a flap *a''*, at its lower end and the lighter portion passing through the spout *c'*, into the fan box C, from which all dust and smut is ejected. It will be seen that by adjusting the wing or gate M, the light grain may be separated more or less closely as desired and that the strength of the blast A, may be modified as desired by adjusting the door *i*.

I do not claim the curved blast spout A,—nor do I claim broadly a scouring device connected therewith, for such may be seen in the patented case of mine formerly alluded to; but,

Having thus described my invention what I claim as new and desire to secure by Letters Patent, is,

The arrangement of the wire cloth cylinder G, scourer E, deflecting or separating bar I, spout *f'*, and shoe J, as and for the purpose set forth.

J. A. WOODWARD.

Witnesses:
C. McGINNISS,
PLATT SHERRELL.