

D. PEASE, Jr.

Smut Machine.

No. 5,314.

Patented Oct. 2, 1847.

Fig. 1,

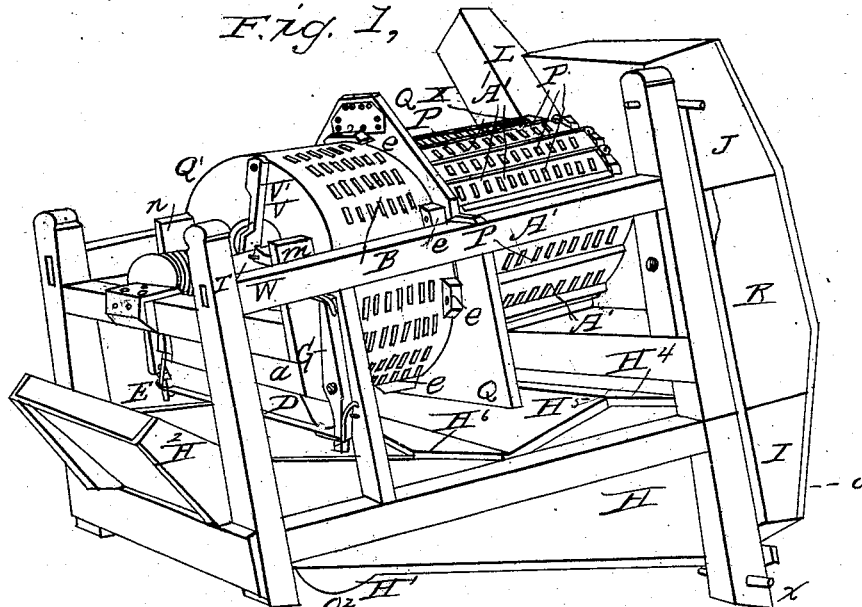


Fig. 2,

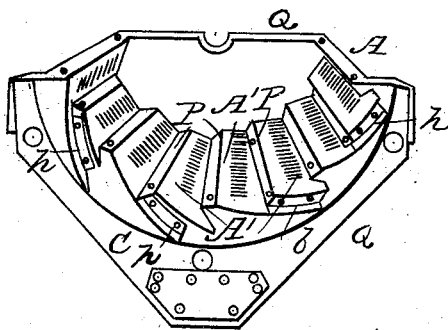


Fig. 3,

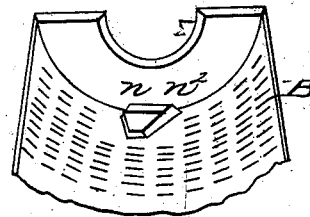
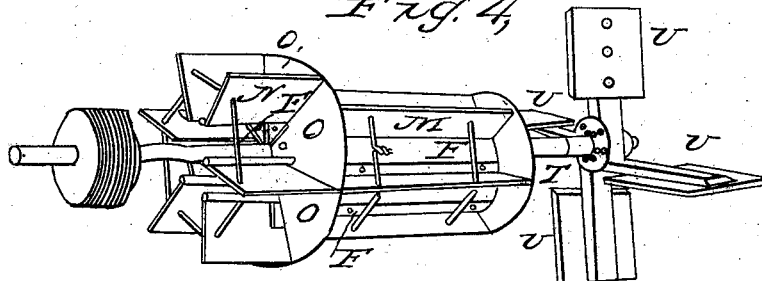


Fig. 4,



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Fig. 5,

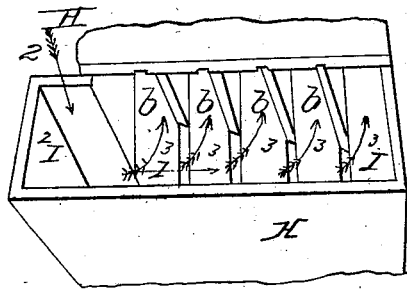


Fig. 6,

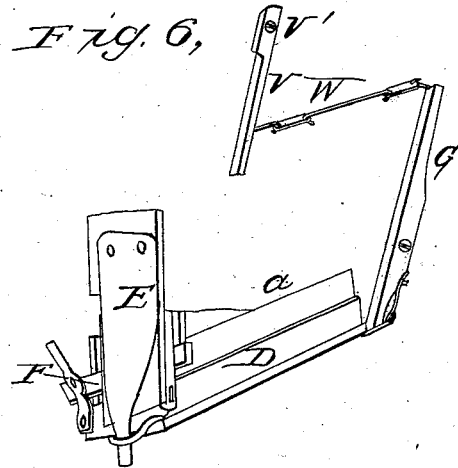


Fig. 6,

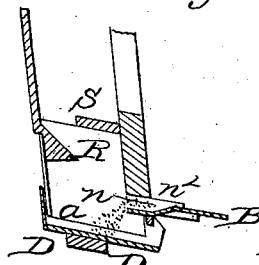


Fig. 8,

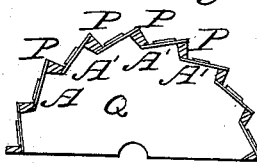


Fig. 9,

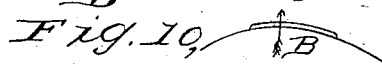
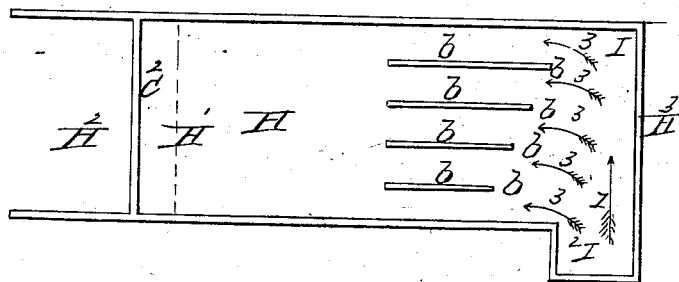


Fig. 7,



UNITED STATES PATENT OFFICE.

DAN PEASE, JR., OF FLOYD, NEW YORK.

SMUT-MACHINE.

Specification of Letters Patent No. 5,314, dated October 2, 1847.

To all whom it may concern:

Be it known that I, DAN PEASE, JR., of the town of Floyd, in the county of Oneida and State of New York, have invented a new and useful Improvement in Smut-Machines, 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. Fig. 2, is a perspective view of the inside of the upper half of the ribbed portion of the perforated stationary cylinder. Fig. 3, is a perspective view of the interior of the lower portion of the larger or plain cylinder, showing the opening through which the grain is discharged. Fig. 4, is a perspective view of the shaft—the wide beaters—narrow beaters, fan, and driving pulley. Fig. 5, perspective view of the interior part of the wind spout looking down from behind showing the ends of the partitions taken at the dotted line *x x* of Fig. 1. Fig. 6, is a perspective view of the end of the spreader where the spring is attached. Fig. 7, is a vertical transverse section of ditto. Fig. 8, is a cross section of the ribbed cylinder. Fig. 9, is a longitudinal section of one of the discharge apertures in the cylindrical case and plates. Fig. 10, is a cross section of ditto. Fig. 11, is a horizontal section of the wind spout drawn on the dotted line *o, o*, of Fig. 1.

Similar letters refer to corresponding parts in the figures.

The frame of this machine, for containing and supporting the several parts of the machine, hereafter described, is made by framing together suitable timbers of the requisite size and strength for the purpose intended—one end being elevated above the other for the purpose of giving the cylinder the required elevation.

The inclined perforated case in which the grain is cleaned is composed of two parts, A and B. The part A in which the grain is first received and in which it is subjected to the first beating operation is composed of a number of parallel strips of wood P nailed to heads Q fixed in the frame—to which strips, are nailed plates A' of sheet iron, having a number of parallel openings in each plate punched outwardly for the free

escape and discharge of the dirt as separated from the grain. The plates project over and beyond the inner ends of the strips of wood about two inches, said projecting portions not being perforated and every alternate plate is made to extend to the inner surface of the case B. These projecting ends which are marked *h* are for the purpose of directing the wind from the large part of the case into the small part. The object of making use of the parallel strips of wood P, in the formation of the outside of this case is to form abrupt ledges for the grain to be thrown against by the centrifugal action of the revolving wings in order to break the smut kernels. An opening X for the introduction of the grain to the interior of the case is made in the top. The lower segment of the case is made in a similar manner, excepting that it has no opening in it like that marked X. There is, however, an opening left in the upper head of this lower segment, into which the inclined spout L is introduced, through which a blast is created by the revolving of the beaters M, N, for carrying off the smut and dirt from the grain through said spout. The head Q between the two sections of the cylinder A, B, is made of inch boards in two parts, having a round opening in the same the diameter of the smaller portion A, of the case into which it is inserted, said head being fastened to the end of the larger portion B of the cylinder or case by means of blocks *e* fastened to the outside of the case B, into which screws passing through the head Q are inserted. The larger portion of the case B, in which the scouring process is continued, and in which the blast is created by the large wings N is made of smooth sheet iron punched on the inside, outwardly, in oblong openings, through which the air is driven, together with the smut that is scoured, from the grain. The head of this portion of the cylinder is of the same diameter as its interior, having a round opening in its center about one third its diameter, for the passage of air to the interior of the case. This portion of the case, like that above described, is made in two parts, each a semi-circle—the lower half secured to the frame by pins, or other

means—the upper segment or half of the cylinder being held down upon the lower half by means of notches in the heads, into which the buttons *l* turn. In the lower end of the bottom half of the cylinder is an opening *n*, through which the grain is discharged into the receiver *a*, and thence to the vibrating spreader *D* and thence to the wind spout *H*, said opening *n* being provided with an oblique guide plate *n*² for guiding the grain out of the cylinder into the receiver *a*. The receiver *a* is an oblong chamber formed against the lower end of the cylinder open at the top and bottom and pivoted on the inside with a triangular guard *R*, and a rectangular guard *S*, so arranged, as represented in Fig. 7, as to prevent the grain escaping upward through the receiver—the grain striking against the said guards and rebounding to the bottom, while the grain which may escape through the central opening of the case passes through the space between the guards to the bottom.

A vibrating or shaking spreader *D* is arranged below the lower or open end of the receiver *a*. This spreader is made of sheet metal in the form of an inclined spout, having three of its sides turned upward nearly at right angles with the bottom—the lower side being open for the discharge of the grain—suspended at one end by straps to the receiver and at the other end to a lever, from which it receives its motion—a spring *E* being connected by its lower end to the spreader, and by its upper end to the receiver for drawing it back, when moved by the aforesaid lever.

A case *J*, *K*, for the fan to revolve in for creating a blast through the wind spout *H* is constructed against the outside of the upper part of the frame in two parts; which case is connected with the spout *H* at *I* being a continuation of the spout. The part *K* of the case is attached to the frame permanently. The part *J* is made in the form of a cap and is removable at pleasure. The wind spout extends from the fan case to and beyond the lower or rear end of the frame. The end *I* that joins to the lower end of the case *K* is made about three inches wider than the part *H* forming a chamber *I*² for the reception of the air driven into it by the fan, which revolves toward it in the direction of the arrow No. 2 Fig. 5 and which causes the air to have a direction transversely from the chamber *I*² to the side *I* opposite in the direction of arrow No. 1 Fig. 5 when it spreads and passes through the spaces between the partitions *b* in the spout *H* in the direction of the arrows No. 3. These partitions are designed to direct the air through the spout *H* in a broad even column, filling the whole spout, having an equal pressure. The par-

titions are made of a trapezoidal form, arranged in such a manner, that the space between their inclined edges *b* and the end *H*³ of the wind spout will form a trapezoid—or in other words the partition nearest the chamber *I*² will be farthest from the end of the wind spout and the other partitions, gradually approaching the end of the wind spout as they recede from the chamber *I*² as is more clearly represented in Fig. 11. The object in thus arranging the said partitions, the one in advance of the adjacent one, as described above and represented in Fig. 11 is for the purpose of procuring a wide and even current of air lengthwise the spout from a narrow fan revolving cross-wise over it—each partition arresting the proportion of the air that it is designed should pass between it and the next parallel partition. The bottom of the wind spout extends toward the discharging end of the cylinder horizontally until it is near the opening *O*² in the same, through which the cleaned grain is to pass—it then descends at *H*¹ toward said opening at an angle of about 35 degrees. It then rises toward the rear end of the frame at *H*² through which it is extended at an angle of about 45 degrees above the sides of the spout. Over this end of the spout the chess and other light stuff are blown. The top of the wind spout is made as follows. It extends horizontally over the upper ends of the partitions from the fan case, past the ends of the partitions at *H*⁴—it then slopes downward toward the discharging end at an angle of about 30 degrees, until the spout is reduced about one third its depth as at *H*⁵—the top is then extended horizontally at *H*⁶ toward the discharging end until it reaches nearly over the slit in the bottom, through which the grain descends—the rest is open on top. The object in thus contracting the depth of the spout is to condense the air and cause it to spread transversely and escape in a broad even sheet.

The shaft *T*, for carrying the cylinder with its narrow wings, and the wide wings at the end of the cylinder, and the fan, and driving pulley, is composed of a cylindrical bar of iron of the requisite diameter and length made to turn in suitable boxes in the frame. The fan *V*, for driving the wind through the wind spout, is made in the usual manner and attached to the shaft.

The narrow wings *M* for beating the grain against the ledges in the case *A*, are nailed to strips of wood *P* Fig. 8 which are again nailed to the cylinder—said strips of wood being extended beyond the lower end of the cylinder into the part of the case *B*, to which strip the wide wings *N*, are also nailed. Against the upper end of the cylinder is fastened a circular head of such diam-

eter as to extend to the outer edges of the wings M. Segment plates O are inserted between the wide wings, nailed to the lower end of the cylinder, forming a circular head
 5 extending to the outer edges of the wings, to prevent the wind after passing into the case over the said head from returning to the spaces between the large wings, consequently causing the wind to pass toward the
 10 upper end of the case A. The wings M and N, are braced by a wire F, passing through the wings, forming a polygonal brace whose two loose ends are twisted together forming a strong support for the
 15 wings to prevent them from being thrown off by centrifugal force. The object of making the wings that revolve in the ribbed portion of the case, smaller than the wings that revolve in the larger and smoother case B, is, to reduce the velocity of the wings to prevent breaking the grain. The larger wings having a greater velocity, will not break the grain, as the portion of the case in which they revolve is smoother than the
 20 portion A. Another effect produced by the use of the large wings, is to force the wind and particles of smut through the openings in the smooth part of the case B, and also into the smaller or ribbed part of the case
 25 A, the wind passing over the aforesaid projecting ends $\frac{1}{2}$ of the plates, which are made to form wind guides—every guide or wing p , or every alternate wing or guide being extended from the edges of the ribs to near
 30 the inner circumference, or smooth surface of the larger portion of the case, and thus made to serve the purpose of guides,—a portion of the wind and smut being forced through the aforesaid openings in the plates, and a portion of the wind being forced out
 40 of the case through the inclined spout, carrying with it the chaff &c. The apertures in the plates and cylinders are punched outwardly from the interior of the case in the manner represented in the drawings at Figs. 1, 9, and 10 with a sharp edged thin wedge-like tool, which will indent the metal, forming oblong depressions having a thin perforation in the middle of each, through which
 45 the wind, smut, and dust pass. These depressions are thus made for the purpose of forming receptacles for the grain, into which it inclines as it is driven round in the cylinder by the wings producing more friction than in cylinders made with even, regular surfaces, besides rendering the machine more durable and producing better conductors for the dust and dirt and not liable to wear away so fast around the issues.

60 I intend in some cases where there is but little hard smut, to make the whole length of the cylinder like that described in part B, Fig. 1—(this mode being sufficient to take out the soft smut) omitting the part repre-

sented at A Fig. 1—the machine being made cheaper in this way.

The air is admitted to the fan case through a trunk or tube leading to the exterior of the building, excluding the air of the room in which the machine is placed from the fan—otherwise the air entering the fan would carry in with it dust and smut, a portion of which would be apt to descend with the grain.

The machine being put in motion by the application of any convenient power to the driving pulley, the grain to be cleaned is introduced to the interior of the case through the aperture X—it is then met, or struck by the wings M, and thrown against the plates
 75 A' of the ribbed part of the cylinder—it then rebounds toward the wings, and is again struck by them, and thrown against the plates, and in this manner the beating operation is continued until the grain arrives at the smooth part B, wherein it is forced round with great velocity until it arrives at the discharge aperture n , through which it passes to the receiver a , and into the spreader D, which has a longitudinal vibratory motion which spreads it in a broad even sheet, as it descends through the wind spout H—when it passes through a blast of wind from the fan V and is cleaned—the motion of the spreader D being produced by
 80 the lever G, which is connected to the lower portion of a suspended vibrating bar V by means of a connecting wire W, said bar being attached to the head of the cylinder by a pin v' , and resting against an eccentric or cam on the shaft which produces, when revolving, the required vibratory motion.

What I claim as my invention and desire to secure by Letters Patent, is—

1. The peculiar construction of the case
 105 A B as described, being made in two sections A B the one of small diameter with ribs P and perforated plates A' extended beyond the ribs, forming wind guides, the other section B large and smooth, in the
 110 manner and for the purpose described in combination with the revolving cylinder of large and small wings M N corresponding thereto, constructed, arranged, and operated in the manner and for the purpose herein
 115 set forth.

2. I claim the manner of arranging the openings for the discharge of the smut with the sloped sides as herein described, protruding outwardly from the interior of the
 120 cylinder, as described and represented at Figs. 9 and 10, in combination with the smooth beaters.

3. I also claim the construction of the receiver a , having the triangular and rectangular guards R, S, and the oblique space between them in combination with the vibrating spreader D, arranged and operated

in the manner and for the purpose described.

4. I likewise claim constructing the spout H, with parallel vertical partitions *b*, set in
5 advance of each other in the manner described for the purpose of distributing the wind from the narrow fan in a broad sheet

in the spout before reaching the grain in its descent from the spreader as before described.

DAN PEASE, JR.

Witnesses:

WM. P. ELLIOT,
DAVID B. ROGERS.