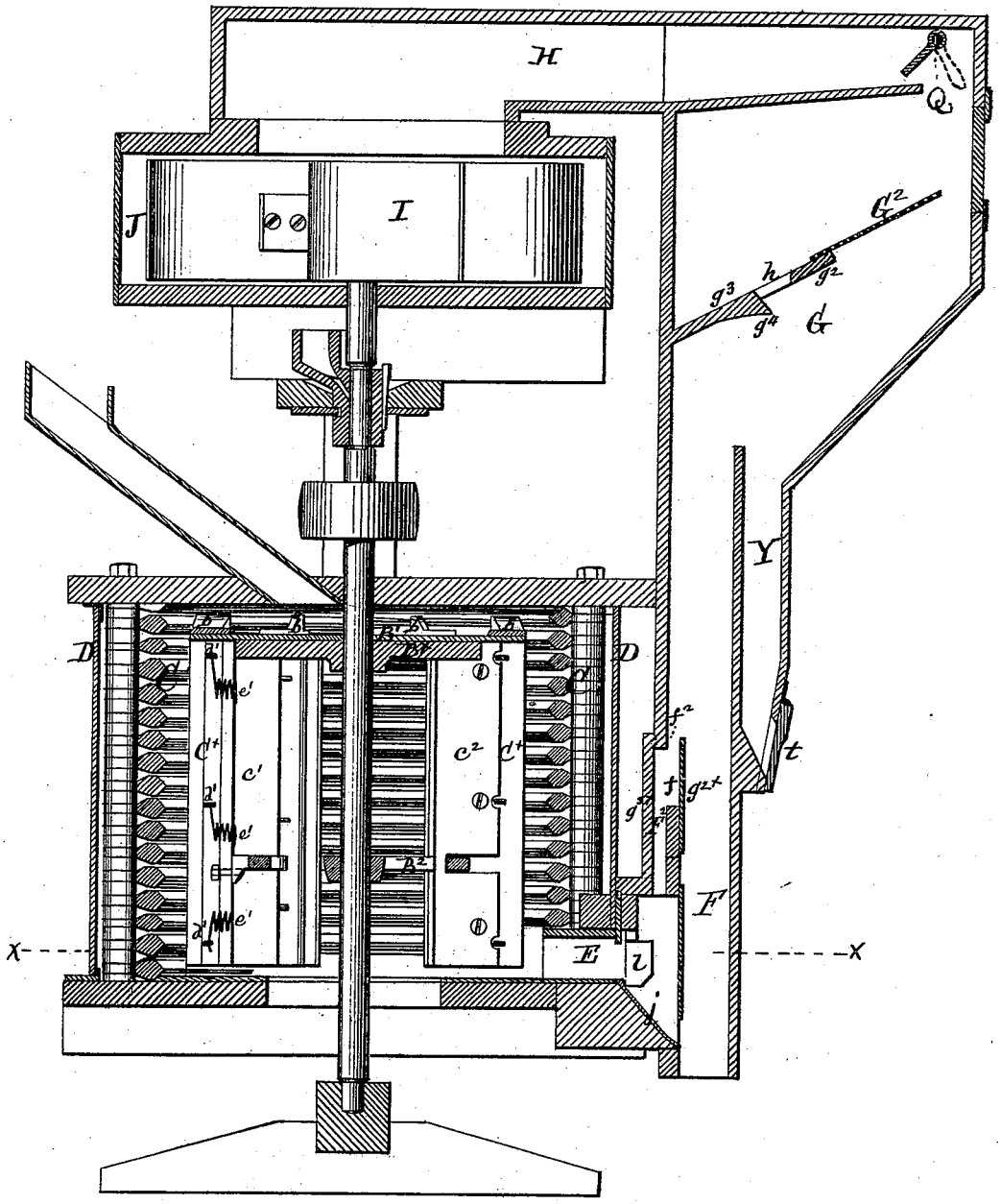
2 Sheets--Sheet 1.

D. PEASE.

Smut-Machine.

No. 169,289. Fig. 1 Patented Oct. 26, 1875.



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Fred Fischer

Dan Pease
by his Attorneys
Brown & Allen

2 Sheets--Sheet 2.

D. PEASE.

Smut-Machine.

No. 169,289. Patented Oct. 26, 1875.

Fig: 2

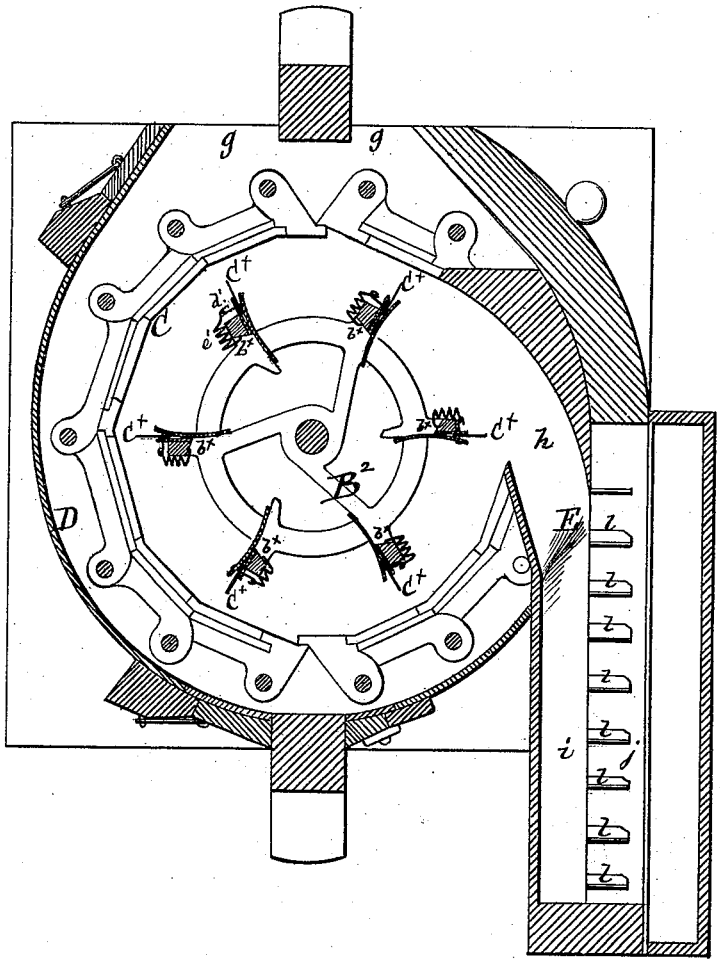


Fig: 3

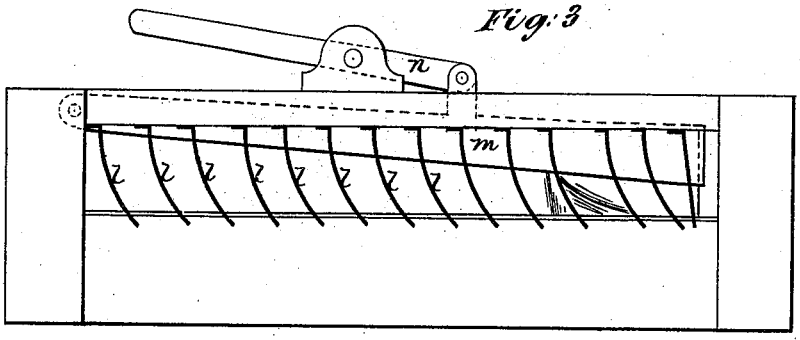
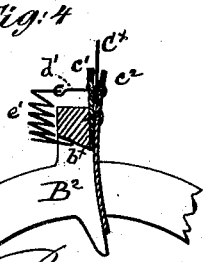


Fig: 4



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UNITED STATES PATENT OFFICE.

DAN PEASE, OF FLOYD, NEW YORK.

IMPROVEMENT IN SMUT-MACHINES.

Specification forming part of Letters Patent No. **169,289**, dated October 26, 1875; application filed June 11, 1875.

To all whom it may concern:

Be it known that I, DAN PEASE, of Floyd, in the county of Oneida and State of New York, have invented certain 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 accompanying drawing, which forms part of this specification.

My invention relates to certain improvements on those for which Letters Patent No. 118,048 were granted to me under date of August 15, 1871.

The invention consists, first, in the combination, with the suction-chamber, of a screen, made of wire-cloth, for the purpose of weakening the draft passing through the machine, and thereby preventing the chess and other light grains from being carried through the flues with the dust, smut, and other light particles.

The invention consists further in the combination, with the spreader, of a suction-flue, for the purpose of preventing the air which passes through the machine with the grain from interfering with or obstructing the operation of the current of air drawn through the flues by the fan-wheel.

The invention consists further in a novel construction of the revolving cylinder, and of elastic wings attached thereto, whereby the current of air is equalized, and the grain is acted upon in a uniform manner throughout the cylinder, and the action of the wings is such as to prevent bruising or injuring the grain.

In the accompanying drawing, Figure 1 is a central vertical section of a machine constructed according to my invention. Fig. 2 is a horizontal section taken in the line *x x* of Fig. 1. Fig. 3 is a detail view of the spreader. Fig. 4 is a detail sectional view of a portion of the revolving cylinder.

The frame A of the machine may be of any suitable construction. The general external form and construction are similar to that shown in my patent of August 15, 1871. The stationary cylinder C is composed of links or bars of the same construction as those described in my patent of November 2, 1869, No. 96,476, which bars are so connected as to leave spaces between them for the discharge of dust. Outside of the stationary cylinder is a case or shell, D, similar to that shown in my patent of August 15, 1871, and provided with openings *g g* for the discharge of dust, as described in said patent. E is a horizontal conduit, communicating with the stationary cylinder by an opening, *h*, and having its bottom inclined in two sections, *i* and *j*, with the section *i* provided with an upright edge. Close to the edge are suspended a series of transverse plates, *l*, serving as spreaders. A pivoted plate, *m*, operated by a lever, *n*, is arranged in front of the plates *l*, so that it may be raised or lowered to enlarge or reduce the size of the openings between said plates near the opening *h*. Above the incline *i* are suspended elastic plates or springs, arranged to be raised or lowered, by means of set-screws, to produce the desired spread of the grain. The parts described above are substantially the same in their construction and operation as those described and shown in my patent of August 15, 1871, with the exception of the stationary cylinder C, which, as before stated, is constructed as in my patent of 1869. The lower end of the incline *j* discharges the grain directly into the flue F, which is upright, and connects at its upper end with the suction-chamber G, which is enlarged, as shown in Fig. 1, and communicates with a horizontal box, H, below which the fan I is arranged in a case, J.

In smut-machines, as heretofore constructed, according to my patents, some difficulty has been experienced in consequence of the "chess" being carried up into the chamber G by the current passing up the flue F. To obviate this difficulty I provide a screen, G^2, arranged in an inclined position in the chamber G, and extending nearly to the outer side thereof.

The lower edge of the screen G^2 is attached to a board, g^2, which extends entirely across the chamber at such a distance from another inclined board, g^3, as to leave a slot-like opening, *h*, between the contiguous edges of said boards. On the under side of the board g^3, at the upper edge, is a rib or bar, g^4, the under side of which is beveled or inclined, as shown in Fig. 1. As the current passes up the flue

F into the chamber G, carrying with it the chaff and light impurities, the screen G^2 has a tendency to weaken said current, so that if there should be any chess carried up the flue into the chamber, the greater portion thereof will abut against the screen G^2 and fall into a spout, Y, and upon a valve, *t*, whence it may fall out by its own weight, as described in my patent aforesaid. In case there should be any particles of chess lighter than the rest pass beyond and above the screen, they will fall by their own weight and pass through the slot-like opening *h* and fall into the spout Y. The rib or bar g^4 has a tendency to deflect the current downward and prevent the chess from being carried through the slot-like opening *h*, while, at the same time, it allows a portion of the air to pass through said opening and co-operate with the screen to weaken the current and prevent the chess from being carried beyond the screen.

In my patent of August 15, 1871, in order to reduce the work of the fan and utilize the current of air escaping with the grain and chaff from the cylinder C, I employed a slanting plate behind the spreaders *l* and above the incline *j*, and the air passing out of the cylinder with the grain escaped up the slanting plate and through an opening in rear of the flue F. This arrangement interfered with the current passing up the flue F, and did not fully answer the desired purpose.

In my present invention I dispense with said slanting plate, and also with the opening referred to, and I use for the same purpose a suction-flue constructed as follows: In the flue F, just above where the incline *j* discharges the grain, is an opening or slot, *f*, running the entire width of the flue. Above the upper edge of this opening or slot the flue F is larger from front to back than below said slot. On the inner side of the flue F is a metal plate, g^2, which extends from the lower edge of the slot to a short distance above its upper edge, leaving a channel or opening, f^2, between the upper edge of the slot and the upper edge of the plate. On the side of the flue F toward the inside of the machine I place a board, g^3, having cleats or bars at its ends to cause it to stand out from the rear side of the flue F. This board, thus arranged, forms a flue, F^2, communicating with the flue F, through the slot *f* and channel f^2, and having its open lower end immediately over the spreaders *l* and incline *j*. As the current created by the fan passes up the flue F a suction is created through the flue F^2, so that as the air escapes from the cylinder with the grain it is drawn up through the suction-flue F^2 into the flue F, where it is enlarged for that purpose, combining with the current passing through said flue F, and not retarding or interfering with the same, while the grain rolls down the incline *j* and is discharged as before described.

In smut-machines constructed according to my former patents the revolving cylinder has usually been made solid, or with solid heads, and provided with wings running lengthwise, and also extending below the cylinder and made wider below than on the sides. When so constructed they caused a very strong current upward from where the wings extended below the cylinder, the object of which was to keep the smut-balls from passing down until they were broken, and escape through the openings in the stationary cylinder. This arrangement proved very useful in some cases, especially when the grain had been thrashed by hand. At the present time, however, most of the thrashing is done by machinery, and in the process of thrashing many kernels of grain are mashed or partially broken, rendering them much lighter than the unbroken kernels, so that, when passed through the smut-machine, they were held up by a strong current of air until they were broken up and passed through the openings provided for the escape of smut and dust.

To remedy this defect is the object of the present improvements in the revolving cylinder, which I construct as follows: The upper head B^1 is made solid, and is provided with clearers *b*. These clearers are fully described in one of my former patents, and do not require special description here. The lower head B^2 is of skeleton construction, and is attached to the shaft which carries the upper head, but is smaller in diameter than said upper head. On the under side of the upper head is secured a circular board or plate, $B^\times$, of the same diameter as the skeleton-head B^2. To the edges of the board or plate $B^\times$, and of the skeleton-head B^2, are attached a number of ribs or cleats, $b^\times$, which may be secured to the heads by means of bolts and nuts, as shown, or in any other suitable manner. To each of these ribs or cleats $b^\times$ I attach two metal plates, c^1 c^2, by means of screws or bolts passing through the plates and into the rib. The back-plate c^1 is somewhat wider than the space taken up by the rib, and the front plate c^2 is considerably wider, and extends inward between the heads, toward the center of the cylinder, in a direction which is partly radial and partly tangential, because said plate is slightly bent about midway of its width, so as to make it slightly concave for its entire length. The plates c^1 c^2 are so attached to the rib $b^\times$ as to leave a tapering or V-shaped space between them for the reception of the elastic wing, which consists of a plate or strip of metal, $C^\times$, placed between the front and back plates. It is attached between said plates by means of hooks *d'*, each of which passes through holes in the plates and in the wing, and is secured by hooking its rear end over the projecting end of a spring, *e'*, on the rear side of the rib $b^\times$. The spring *e'* is formed of a piece of wire or other metal, one end of which is secured to the rib, to hold it in place, and the other end is free for engagement with the hook *d'*. By this means the hooks may be readily removed when it is desired to take out the wing to replace it, or for any other

purpose. The holes in the wings, through which the hooks pass, are punched through from one side, which causes a burr on the other side. This burr bears against the surface of the back plate c^1, and thus allows an elastic vibration of the wing between the two plates c^1 c^2, as the cylinder revolves. The lower end of the wing $C^\times$ is bent in a forward direction, as shown, for the purpose of preventing the grain from falling to the bottom in too much of a direct line. The skeleton-head is placed in such a position that the elastic wings and attached plates extend somewhat below it. This allows the air to pass freely into the lower end of the stationary cylinder, where more air is required than in the upper part, which upper part is supplied with air through the skeleton-head. This construction of the revolving cylinder prevents a strong upward current, such as I have referred to as being objectionable in my former patents, and causes a uniform treatment of the grain throughout the cylinder. The light stuff passing out with the wheat is taken out by the separator, and the broken kernels are carried up with the screenings. By making the wings elastic, they operate upon the grain in a gentle manner, as they are allowed to yield and vibrate between the plates c^1 c^2, and therefore do not strike the grain with such force as rigid beaters, and, consequently, will bear more velocity without breaking the grain. As the cylinder revolves, the concave form of the front plates c^2 prevents the grain from being carried toward the center, but tends to throw it outward against the stationary cylinder, while the bent lower edge of the elastic wing prevents the grain from falling too rapidly to the bottom, and causes it to be discharged outward instead of downward, and at the same time adds to the durability of the wing. The chamber G is provided with a damper or draft regulator, Q, for regulating the draft passing said chamber and flues to the fan-case.

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

1. The combination of the chamber G, provided with a slot or opening, h, the screen G^2, and the inclined boards g^2 g^3, substantially as and for the purpose shown and described.

2. The combination, with the spreader and separator-flue, of the suction-flue F^2, substantially as and for the purpose shown and described.

3. The combination, with the revolving cylinder, of the elastic wings $C^\times$, constructed, arranged, and operating substantially as and for the purpose shown and described.

DAN PEASE.

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