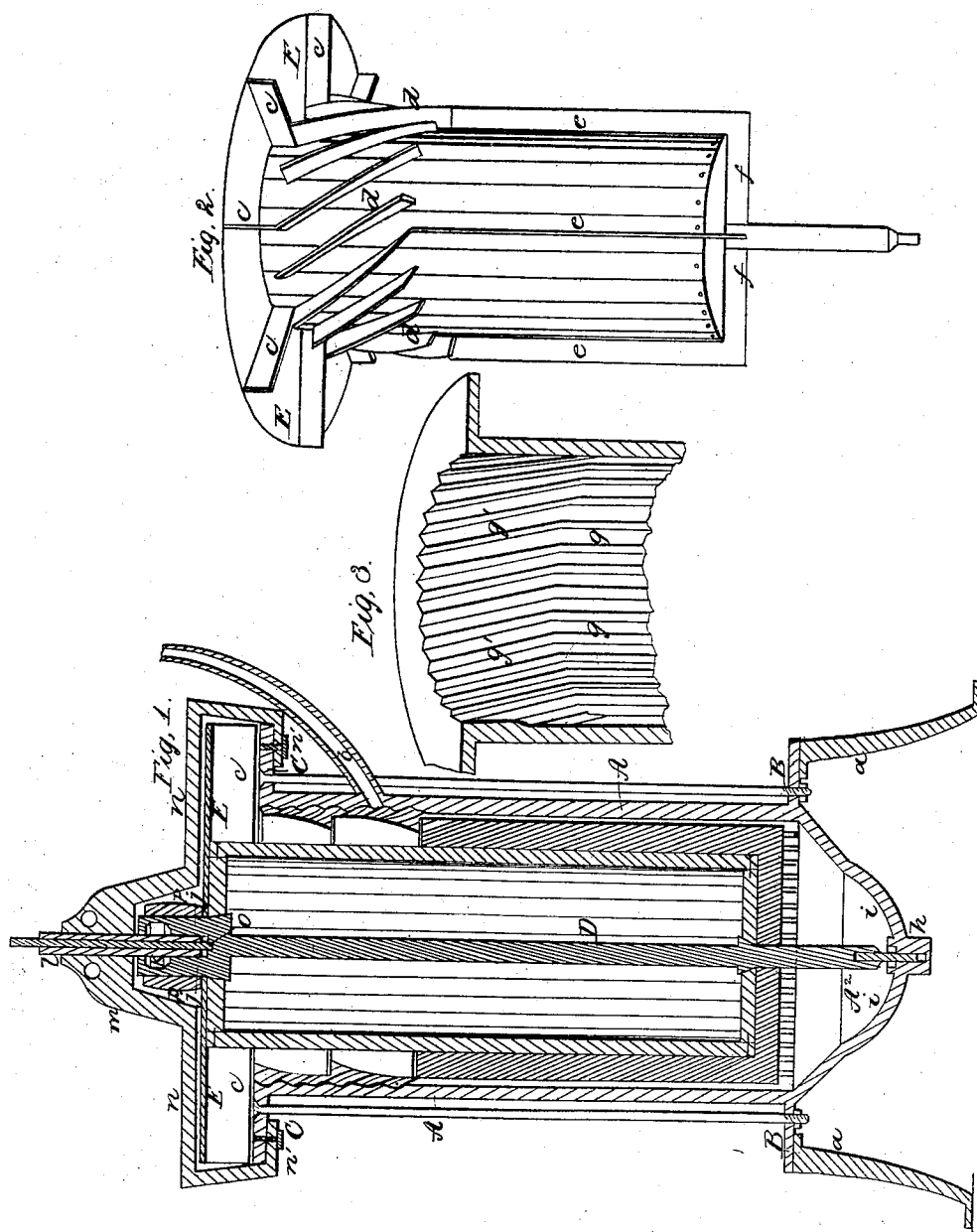


W. C. Grimes.
Smut Mill.

No. 1,110.

Patented Mar. 25, 1839.



UNITED STATES PATENT OFFICE.

WM. C. GRIMES, OF YORK, PENNSYLVANIA.

SMUT-MACHINE FOR SEPARATING SMUT AND OTHER FOREIGN MATTER FROM WHEAT AND OTHER GRAIN.

Specification of Letters Patent No. 1,110, dated March 25, 1839.

To all whom it may concern:

Be it known that I, WILLIAM C. GRIMES, of the borough of York, in the county of York and State of Pennsylvania, have invented a new and useful Machine for Separating Smut and other Foreign Matter from Wheat and other Small Grain, being of the kind usually denominated a "Smut-Machine;" and I do hereby declare that the following is a full and exact description thereof.

My smut machine is in its exterior form, and in its general construction similar to some other machines made for the same purpose, but in its particular arrangements, and in its action in separating the foreign matter from the grain, it presents, as I verily believe several features of entire novelty, and accomplishes the purpose intended in a more perfect manner than any machine heretofore constructed.

I employ, as in some other smut machines, two vertical cylinders, an interior and an exterior cylinder, the former being made to revolve within the latter. The grain to be cleaned is fed into the upper part of the machine through a suitable tube, and as it descends toward the bottom of the machine, it is beaten in such a manner as completely to separate the smut and other foreign matter, while from the peculiar construction of the two cylinders, a current of air is made to pass upward through the space between the two cylinders, with a degree of force sufficient to carry off all the foreign matter through an opening left for that purpose in the upper part of the machine, while the cleaned grain, from its superior gravity, descends, and passes out at the bottom of the apparatus.

Figure 1, in the accompanying drawing represents a vertical section of the machine through its axis. A, A, is the outer cylinder, which I make of cast iron, thirty four inches in length, and sixteen inches in its interior diameter, excepting at its lower end A', A', where, for a distance of about three inches, it is funnel formed, leaving an opening at A², of ten inches in diameter, through which the grain is delivered, and a current of wind passes up. At the point where the contraction of the cylinder commences, a flanch B, B, projects out to the distance of four inches, and to this is attached the legs a, a, which support the machine. A similar

flanch C, C, passes out at the upper end of the cylinder, between which and the cap-plate of the inner cylinder the smut, chaff, &c., escape. D, D, is the shaft upon which the inner cylinder revolves, the particular construction of which will be presently described. The grain is conducted into the machine through a tube b, b, which opens into the space between the two cylinders, seven inches from the top. The hopper is not shown.

Fig. 2, shows the inner cylinder, in perspective. It is thirty one inches in length, and thirteen in diameter; it rises two inches and a half above the outer cylinder. It may be formed of wood, and be covered with sheet iron. At its top is affixed a sheet iron disk, or cap plate E, E, twenty four inches in diameter, or extending out even with the flanch C, C. To the under side of this disk is attached eight wings, c, c, two and a fourth inches wide, and extending to its periphery; these traverse the space between the cap plate and the upper flanch of the outer cylinder. On the inner cylinder immediately below the wings c, c, there are sixteen strips of sheet iron, d, d, d, one and a fourth inches wide, and extending spirally down the cylinder to the distance of eight inches, they stand at an angle of twenty degrees with a vertical line. In the revolution of this cylinder the upper ends of the slips d, d, are in advance of the lower, or, as shown in the drawing, the motion being from right to left. From the point where these strips terminate, four others e, e, one inch in width, extend in a direct line to the lower end of the cylinder, and these I usually extend upon the lower end of the cylinder shaft, as shown at f, f. The wings and strips all radiate from the center.

Fig. 3, shows the manner in which I form ridges, g, on the interior of the outer cylinder, there being over its whole surface a succession of longitudinal ridges, rising one fourth of an inch from their base, at an angle of forty five degrees. From the top, to the distance of eight inches, these ridges run obliquely at about an angle of twelve degrees from a vertical line, as at g', g'; along this part I have found it necessary to make them considerably more obtuse than below, say about an angle of twenty degrees in their rise, instead of forty five; they cross, in direction, the strips d, d.

The lower journal, of the shaft D, D, works in a step *h*, on the middle of a bar, or rod, *i*, *i*, forming an inverted arch for that purpose; this is furnished with an oil cup, 5 duly protected from dust, &c., by a cap of leather, or otherwise. The arrangement constituting the gudgeon and bearing of the upper end of the shaft, is novel, and is shown in the section, Fig. 1. The shaft is 10 enlarged at *j*, *j*, and is cast so as to have within it a spherical, or other formed space *k*, which constitutes an oil chamber, and through this is drilled a hole to receive a tubular steel gudgeon *l*. This is held firmly 15 by being embraced between two stationary plates *m*, forming part of an iron fixture, or bar, *n*, *n*, which passes over the top of the machine, and is screwed at *n'*, *n'*, to the flanch C, C. The shaft D, revolves upon 20 the gudgeon *l*, the oil being retained by the chamber *k*; this gudgeon being hollow admits a fresh supply by filling it at any time, with perfect facility. Though the opening in the gudgeon *l*, I pass a rod the upper end 25 of which may operate on a shoe for feeding the grain through the tube *b*, *b*. The lower end of this rod is seen at *o*, where it is held by the shaft D. There is a whirl *p*, *p*, on the shaft for driving the cylinder, to which I 30 give about six hundred revolutions in a minute.

It will be manifest that the particular dimensions and proportions of the respective parts of this machine may be varied, while 35 the principle of its action, and the results obtained, will remain unchanged; but I have ascertained by careful experiment that the

foregoing proportions produce a very perfect action. The contraction of the lower portion of the outer cylinder; the number of 40 wings at the upper and lower parts of the inner one, the form and proportion of the ridges on the outer cylinder, and the velocity of rotation as described, all concurring to the accomplishment of the end in 45 view, the perfect cleaning of the grain by the beating process, and the production of such an upward current as shall carry all the foreign matter out at the top, and permit the grain to pass out at the bottom of the ma- 50 chine.

Having thus fully described the construction and operation of my said machine, what I claim as my invention, and desire to secure by Letters Patent is; 55

1. The manner of producing a strong upward current of air, by the combined action of the contraction of the lower end of the outer cylinder, the respective vanes, wings, or strips, and the enlargement of the upper 60 part of the machine for its escape, as set fourth, by means of which the foreign matter separated by the percussion is carried off, while the grain descends by its gravity.

2. I also claim the employment of a stationary journal in combination with the 65 spherical or other formed oil chamber in the shaft, by which the lubricating the journal is effected and a long continued supply of oil maintained.

WM. C. GRIMES.

Witnesses:

THOS. P. JONES,
LINTON THORN.