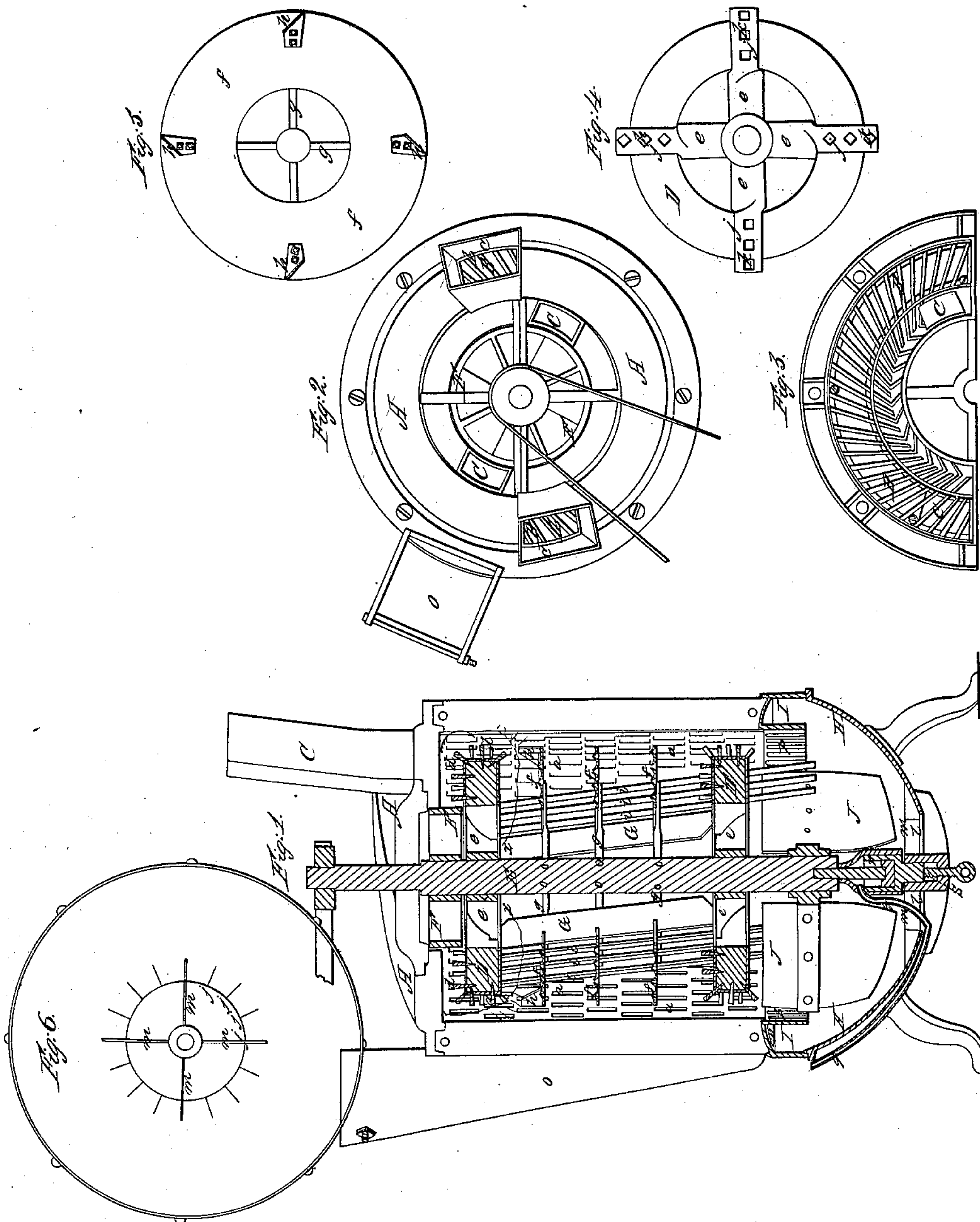


L. Smith
Smut Mill

N^o 7,090.

Patented Feb. 12, 1850.



UNITED STATES PATENT OFFICE.

LEONARD SMITH, OF TROY, NEW YORK.

SMUT-MACHINE.

Specification of Letters Patent No. 7,090, dated February 12, 1850.

To all whom it may concern:

Be it known that I, LEONARD SMITH, of Troy, in the county of Rensselaer and State of New York, have invented a new and Improved Mode of Constructing Smut-Machines for Cleaning Grain; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawings, making a part of this specification, in which—

Figure 1, is a vertical section taken through the center of the whole machine, Fig. 2, the top view, Fig. 3, a view of half of the top plate taken from the under side and grate attached thereto, Fig. 4, a view of the top rubber which has combined therewith blowers and also represents the manner of arranging the beaters, and Fig. 5 a view of one of the scourers with an arrangement of draft floats attached. The same letters indicate like parts in all the figures.

The nature of my invention consists in the so arranging the machine that the blowers and whole scouring machinery is combined and arranged in the same casing and rendered a complete machine in itself for pulverizing the smut, scouring and separating the smut, chaff and other foreign matter, and acting on the fiber ends of the kernel where smut and other dirt is most likely to gather.

The construction is as follows: I employ an outside casing of sheet metal perforated with elongated openings (*a a*) attached to frame work; the top contains two inclined scrolls (*A, A*) which are hollow on the inside and has an opening (*b*) and a spout (*c*) leading therefrom for the discharge of chaff, smut, smut balls &c., immediately after its entering the machine through the grate (*B*) which is placed under the hollow scroll, and on the same plane with the top of the machine. This top is intended to discharge all light foreign matter that is loose and mixed with the grain as it enters the top of the machine and is carried under the grate and at the same time takes away and discharges all the smut that may be broken by the time it arrives at the edge of the rubber immediately under the grate and scroll, the grate forms a surface for the grain to operate against for the purpose of scouring while at the same time the filth

passes through into the scroll and out at the spout, *C*, and by this operation dispenses with a fanning mill frequently used in mills for like purposes.

(*e, e,*) are openings in the top for the admission of the grain which falls on the circular metal sheathed wooden rubber (*D*), said rubber is attached permanently to the revolving shaft (*E*) and is filled with spikes (*d d*) on the top and edge; there is another of these rubbers (*D'*) which is placed lower on the shaft. The center of the top of the machine is left open for the space of about ten inches, and admits a fan-wheel (*F*) the arms of which is placed at an angle of about sixty degrees more or less from the perpendicular line which constitutes blowers. The arms (*e, e,*) of the rubbers (*D, D'*) are so arranged as to constitute the same manner of blower as (*F*), the fans in the upper rubber standing in the same line of angle and direction as in (*F*), and those in the lower rubber being arranged precisely the same as the upper with the exception that the fans are set in a reverse position of angle from the upper. Between the rubbers I employ scourers (*f, f, f,*) constructed of sheet metal and punched full of holes with the bur of the holes on the upper side, these scourers are left open in the center to about the same space as the rubbers and are supported by arms (*g g,*) secured permanently in the shaft (*F*).

(*h, h,*) are draft floats secured to the scourers when cleaning buck-wheat or damp grain; these floats may be used in any number that may be thought best on one or all of the scourers; in the drawing I have represented four, which constitute the usual number used on a scourer. The floats, *h*, are to be set with more or less draft, causing the grain to be thrown inwardly toward the center, and by the centrifugal force from the rotation of the scourers the grain is scoured and brought back again to the outside surface of the machine, thus the grain passes from the outside of the machine toward the center and back again which forces the grain to traverse over more surface and do its work better and retain the grain in the machine a greater length of time. And at the same time the floats may be set one to throw the grain inwardly, and one to throw it outwardly as may be necessary and there-

by causing a more severe action upon the grain, by the force of the grain from one float to the other.

I employ vertical square beaters (*i, i, i,*) secured in the arms (*j, j,*) which arms are extended from the fans in the rubbers, said arms also constituting the support of the rubbers; the beaters are placed alternately, so that the edges and sides are made to traverse in the line of the revolving motion, as represented in the openings (*k, k,*) for the reception of the beaters.

(*G, G,*) are vertical fans, set into the inner edge of the scourers and their ends secured to the upper and lower rubbers respectively.

The bottom of the machine (*H*) is formed in a concave bowl form with an opening (*l*) in the bottom, and arms (*m, m,*) extending across the same, for the rest and support of the shaft, said arms extend into the interior of the concave and form ledges or winged projections on the edge of the opening of the same; similar wings *j j* are placed between the arms, these serve the purpose of distributing the grain and admitting free circulation of air through it, on its discharge from the machine. See Fig. 6, *j, j, j,* which shows the ledges or wings aforesaid.

The upper edge of the concave bottom is surrounded by an air chamber (*I,*) which has one or more openings as represented at (*n,*) for the discharge of smut, chaff, &c., through the discharge spouts (*o,*) which is blown out by the fans (*J, J,*) the inside of the air chamber at (*p,*) is fluted next to the fans for the purpose of assisting in breaking the smut balls and more thoroughly scouring and cleaning the grain. The air chamber may be forced in different ways around the machines and have as many places for the discharge of foreign matter as may be deemed necessary according to the size of the machine and the quantity of grain to be cleaned per hour.

(*q*) is a tube leading into the oil cup (*r*) that receives the lower end of and constitutes the bearing of the shaft.

(*s*) is a screw in the bottom coming in contact with the oil cup for the purpose of raising and lowering the inside of the machine, and change the space between the upper rubber and the grate or upper part of the machine for the purpose of securing the most proper action on the grain as some is more filthy it requires closer rubbing than other.

The operation being as follows: The cylinder is driven at the speed of about five hundred revolutions per minute. The grain is let in at the openings (*c, c,* Fig. 2) in the top and drop upon the rubber (*D,*) this first operation in connection with the grates, (*B, B*) gives it the first scouring and separates the chaff, smut, smut balls and other

light substances from the grain, which has its escape through the grates and is led off by the spiral scrolls through the spouts (*c c,* Fig. 1). The grain next falls below the rubber, when it is caught by the beaters and thrown against the outside casing and in its reaction falls upon the scourers (*f f f*), in this operation the grain is kept constantly turning by means of the beaters as they strike in different angles in consequence of their relative positions; thus it is beat and scoured successively in its descent to the lower rubber, and all the smut and fine dirt which is separated from the grain is thrown off through openings (*a, a,*) in the outside casing by the vertical fans (*G G*). The machine being supplied with air through the top and bottom by the fans as described. In case of cleaning buckwheat or damp grain, I employ the draft floats (*h, h,*) which are set so as to throw the grain inwardly and retain it on the scourers for a greater length of time than it otherwise would, and more thoroughly scour it. The grain in passing from the lower rubber to the bottom of the machine is operated upon by the beaters and fans (*J, J,*) and is beat against the flutes (*p, p,*) on the air chamber, and receives its last scouring, destroying any smut balls that may remain unbroken; and the grain receives a thorough scouring. The fans (*J, J,*) receive their supply of air through the bottom of the concave where the grain has its discharge from the machine, and the smut, chaff, &c., which is latterly disengaged from the grain is blown into the air chamber (*I,*) is carried round and discharged through the openings in the air chamber (*n,*) to the discharge spouts, *o*. It will be readily seen that the light substances which are capable of being blown out by the current cannot escape with the grain, as the current of air which supplies the fans (*J, J,*) is taken in at the bottom where the grain is discharged, thus securing a current of air through the grain, as it is discharged from the machine in an opposite course, i. e., the air passes in through the grain while the grain passes out, and then passes through the grain the second time, to the air chamber. The space between the fans and bottom immediately under the air chamber (*I,*) gives free space for the grain to scatter after being latterly beat and threshed against the flutes of the air chamber, and consequently gives free circulation of the current of air through it, and perfectly separating all substances capable of being blown out by the fans. The concave bottom gathers the grain and also gives proper direction to the dirt which is blown out through the chamber (*I,*) and the projections separate the grain as it leaves the bottom allowing the blast to pass through it.

Having thus described and represented the construction and operation of my new and improved smut machine for cleaning grain, what I claim therein as new and desire to secure by Letters Patent, is—

1. The grates (B, B,) in the top of the machine in combination with the scrolls or spiral chambers A, A, and spouts C, C, for discharging smut and other light materials carried up by the blast as set forth.

2. I claim the chamber (I) at the bottom of the cylinder which concentrates and gives free discharge to all foreign matter to be separated from the grain by the blast in the last stage of operation of the machine in the manner described and represented.

3. I claim in combination with the con-

cave bottom which gathers the grain for its discharge from the machine. The distributors *j j* Fig. 6, which gives direction in the discharge of the grain separated from the foreign matter by the blast.

4. I claim the draft floats *h, h, h, h*, Fig. 5, in combination with the scouring surfaces *f f* for cleaning buckwheat as set forth.

The whole being constructed, arranged and operating substantially in the manner and for the purpose set forth and made known.

LEONARD SMITH.

Witnesses:

E. L. BRUNDAGE,
SAML. C. HYDE.