J. BENNER.

Smut Machine.

No. 5,289. Patented Sept. 11, 1847.

Fig. 2

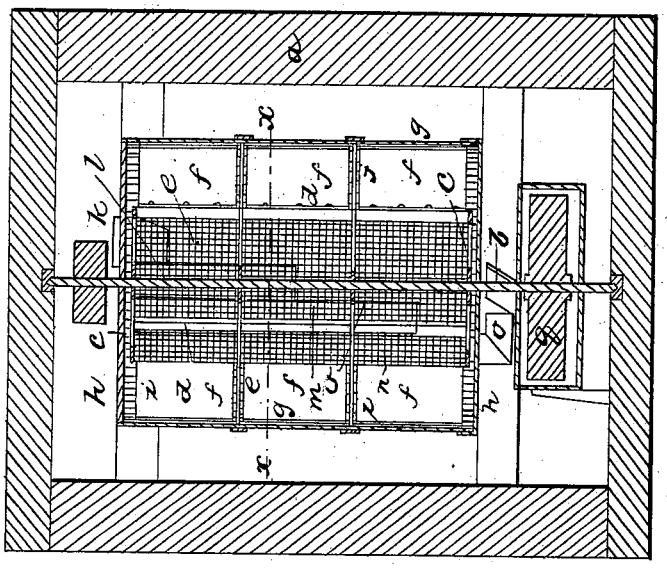


Fig. 3. x x

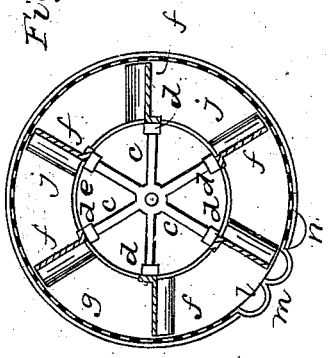
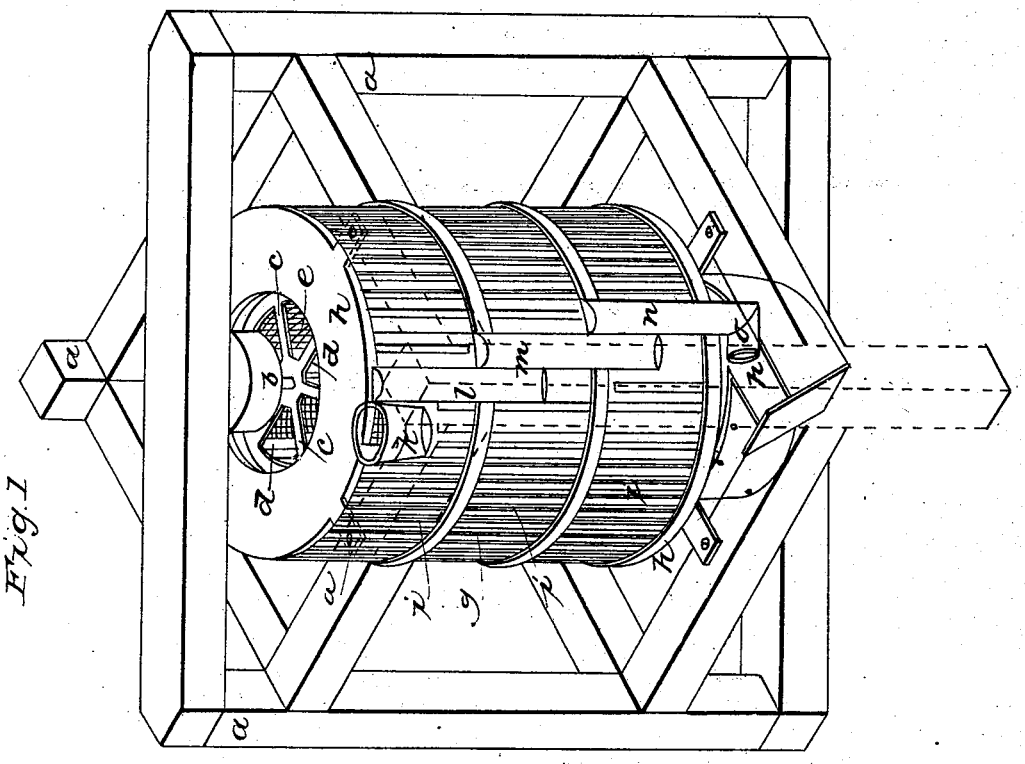


Fig. 1



UNITED STATES PATENT OFFICE.

JACOB BENNER, OF LIBERTY, PENNSYLVANIA.

SMUT-MACHINE.

Specification of Letters Patent No. 5,289, dated September 11, 1847.

To all whom it may concern:

Be it known that I, JACOB BENNER, of Liberty, in the county of Tioga and State of Pennsylvania, have invented a new and useful Improvement in Smut-Machines for Cleaning Grain, and that the following is a full, clear, and exact description of the principle or character which distinguishes it from all other things before known and of the manner of making, constructing and using the same, reference being had to the accompanying drawings, making part of this specification, in which—

Figure 1 is a perspective view of the machine; Fig. 2, a vertical section; and Fig. 3, a horizontal section taken at the line (X X) of Fig. 2.

The same letters indicate like parts in all the figures.

Machines for cleaning grain have long since been made with beaters projecting from a vertical shaft rotating within a circular case composed of bars placed at such distance apart as to leave a free discharge for dust and other impurities, but not large enough to permit the escape of the grain—air being admitted to the case by centrifugal force to aid in the discharge of the impurities. But in these machines, the grain, which is fed in at the top and discharged at the bottom, passes through the machine too rapidly to be thoroughly cleaned, and to remedy this evil various plans have been essayed which have either failed to accomplish the desired object, or have accomplished it at such cost of time and power as to be of very little practical use. But by my improvement I attain this desired end by simple and efficient means, and the nature of my invention consists in dividing the case into several compartments one above the other by means of horizontal rings that extend from the inner periphery of the case to a wire gauze or perforated cylinder surrounding and attached to the shaft, the beaters being attached to and projecting from this perforated cylinder and made to rotate within the compartments between the horizontal rings—when this is combined with a system or set of feeding or discharging tubes connected with the outer case, the first to discharge the grain in the upper or first compartment which is there acted upon by the first set of beaters, carried entirely around and discharged by centrifugal force into the second tube through an aperture the whole height of the compartment—this discharges the grain into the second compartment in the same manner as it was fed into the first, and after being acted upon in this second compartment by the second set of beaters and carried around it is discharged into the third tube which delivers it to the third compartment, and so on to the end where it is discharged from the lower end of the last tube in a trough or spout leading from a fan blower on the lower end of the shaft of the beaters. In this way the grain undergoes a succession of beating operations in passing from one chamber or compartment to another in succession, the beating operation in each being aided by the outward current of air that enters the wire gauge or perforated cylinder at each end and which is forced out by centrifugal force through the apertures of the casing carrying out with it the impurities that have been beaten out, and finally the remaining dust, smut, &c., is discharged and carried off by the current of air from the fan blower which crosses the grain as it falls.

In the accompanying drawing (*a*) represents a suitable frame which may be of any desired construction, and (*b*) a vertical shaft with a pulley at the upper end. with which it is driven by a belt from some first mover. Toward each end of this shaft (and at intermediate points within) it is provided with a set of arms (*c*, *c*) which are connected together by bars (*d*) over which is secured a cylinder (*e*) made of wire gauze or perforated sheet metal to permit air to pass through freely; and to the outer surface of this perforated cylinder are attached a series of sets of beaters (*f*) each set consisting of one beater for each bar (*d*) composing the frame of the cylinder. They are made of sheet metal properly secured to the perforated or wire gauze cylinder and to the bars (*d*). They project from this cylinder in a radial direction sufficiently to come within a working distance of the outer case, and their length is such as to work freely between the rings forming the compartments, and instead of being placed in a plane with the shaft they are placed obliquely thereto, the lower end being forward in the direction of the shafts rotation for the purpose of throwing up the grain

when beating it and thereby preventing it from settling by gravity on the lower ring or partition of each compartment.

The outer casing (*g*) is composed of vertical bars placed at such distances apart as to leave spaces between them which will not permit the escape of the grain and yet leave a free discharge for dust and other impurities, these bars are connected at each end to the rings (*h*, *h*) each having a hole in the middle of about the diameter of the inner periphery of the wire gauze cylinder for the free admission of the currents of air induced by the rotation of the beaters, as above stated; and the length of this case is divided into three compartments (*i*, *i*, *i*) by two rings (*j*, *j*) similar to the rings (*h*, *h*) and placed between the sets of beaters, so as to have one set of beaters for each compartment. To the outside of this casing there is a set of tubes (*k*), (*l*), (*m*), and (*n*). The one (*k*) is hopper shaped at the upper end and opens into the first compartment (*i*) (see red lines in Fig. 2) near the top thereof to supply the grain to be cleaned, and as it enters it is carried around by the beaters, which by their inclination prevent it from falling on the first ring (*j*) and by centrifugal action throw it against the bars of the outer casing to beat out the impurities which are blown out through the spaces between the bars by the outward current of air, and in this way the grain is gradually carried around and then forced through an aperture (see red lines in Fig. 2) the whole height of the chamber into the second tube (*l*) which delivers it into the second compartment (*i*) in the same manner as it was delivered in the first, and after undergoing a like operation as in the first it is discharged into the third tube (*m*) to be delivered into the third compartment (*i*) to undergo a third operation, and from this it is discharged into the third tube (*m*) the lower or delivery end of which is bent as at (*o*) in the direction of the spout (*p*) of a fan blower (*q*) attached to the lower end of a shaft (*b*) and below the casing, so that the current of air induced by the rotation of this fan shall carry off the remaining impurities from the grain as it is delivered from the tube or spout (*n*).

This machine may be made with any desired number of compartments to subject the grain to a succession of operations, and the bars of the outer casing may be made in any desired form or manner according to any of the known plans of smut machines.

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

1. Making the outer case of the machine in several compartments, one above the other with the sets of beaters playing within them, substantially as described, in combination with the tubes or spouts attached to the periphery of and opening into the outer casing to conduct the grain from one compartment to another in succession, substantially as described.

2. And I also claim in combination with a casing so constructed as above claimed, the beaters attached to the periphery of a perforated or wire gauze cylinder open at both ends that the rotation of the beaters may induce a current or currents of air outwards to discharge the dust and other impurities through the apertures between the bars of the outer case, and to aid in delivering the grain to the conducting tubes, substantially as described.

JACOB BENNER.

Witnesses:
O. P. Browne,
James H. Keller.