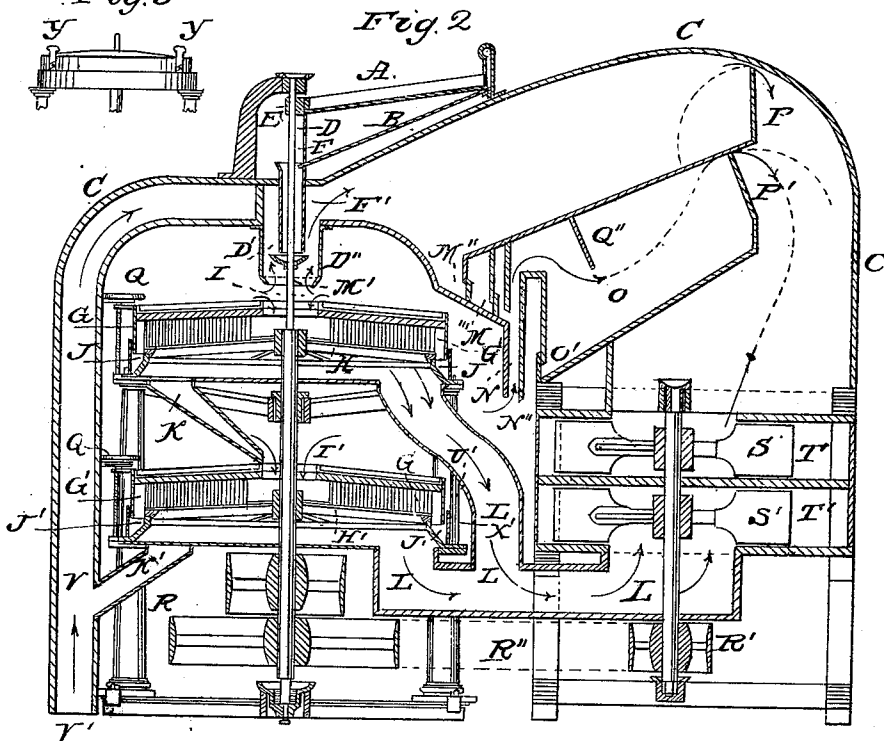
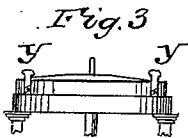
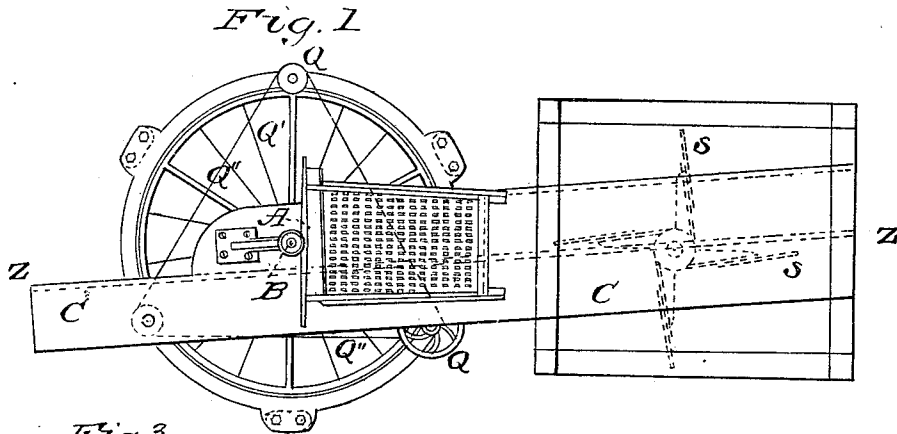


H. RICHMANN.
Grain Cleaner.

No. 91,270.

Patented June 15, 1869.



Witnesses
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HENRY RICHMANN, OF CINCINNATI, OHIO.

Letters Patent No. 91,270, dated June 15, 1869.

IMPROVEMENT IN GRAIN-SEPARATOR.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that I, HENRY RICHMANN, of Cincinnati, in the county of Hamilton, and State of Ohio, have invented a certain new and useful improved Grain-Separator; 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 part of this specification, in which—

Figure 1 is a top view of my improved grain-separator;

Figure 2 is a vertical section thereof; and

Figure 3 is a side elevation of the curbs U and X, containing the brush G and cloth-wheel H.

Similar letters refer to similar parts in the drawings.

A is a sieve, slightly inclined toward the shaft D, into which the wheat is put, and is suspended, as seen at fig. 2.

As the shaft D revolves, the eccentric E imparts to it an intermittent motion, which shakes the grain through into the trough B, from which it passes into the hopper F.

Any substances mixed with, and larger than the grains of wheat will pass over the sieve and into the spout A', by which it will be carried away from the machine.

D is a disk, which scatters the grain as it falls thereon, so that the air entering at M' may separate straw, cheat, and other lighter substances therefrom.

I and I' are hoppers which convey the grain successively to their respective scouring-apparatus.

G and G' are concave brushes for scouring the grain.

H and H' are cloth-wheels, with convex wire-gauze surfaces, and against which the concave brushes scour the wheat.

J and J' are annular chambers, between the cloth-wheels H and H' and the stationary curbs X and X'. They receive the wheat after it has been acted upon by the brushes, respectively. There is no means of communication between said annular chambers and the chambers underneath the wire gauze H H', which last receives whatever of refuse passes from the wheat by the action of the brushes through the wire gauze.

K is a conduit, which carries the wheat cleansed by the brushes G from the annular chamber J to the hopper I.

K' is a similar conduit, which carries the wheat, after being cleansed by the brushes G', into the delivery-chamber V.

L and L' are conduits, which carry the refuse that has passed through the convex screens H and H' respectively, into the chamber L'.

O O O is a frame-work, which encloses the winnowing-chambers.

Z Z, fig. 1, is a partition, dividing all that portion of the interior of the frame O O which is to the right of

the shaft D, fig. 2, into equal compartments. One of these compartments connects with the chamber V, the other connects with the mouth M'. These chambers are subdivided each in precisely the same way as the other, and each contains devices, divisions, partitions, and subdivisions similar to what is contained in the other, and performing analogous functions.

The chamber connecting with the mouth M', with its subdivisions, is the only one shown in the drawings.

Q Q Q are screw-bolts for adjusting the brushes G, as they become worn, to the wire-gauze surface of the cloth-wheels H H'. The heads of said bolts are connected by an endless chain, Q', so that they may be all adjusted at the same time, and consequently the brushes may be set more accurately than if the different bolts were moved separately.

Y, fig. 3, is a slide, which may be raised for the purpose of examining the brushes, with a view to their more accurate adjustment.

R R' are pulleys, and R'' a belt connecting them. The drum, or pulley R is larger than the pulley R', because it is desirable that the fans S S' should run much more rapidly than the brushes.

P P' are valves, adjustable from the exterior.

M and O are winnowing-chambers.

M'', M''', and O' are valves.

S and S' are fans.

T and T' are openings in the boxes which contain the fans S S', and through which the fans throw the refuse received by them from the machine.

The operation of my improved machine is as follows:

The wheat, and any foreign substances mixed with it, not larger than the grain of wheat, empties into the hopper F, and thence descends through the vertical cylinder F', until it comes into contact with the disk D, which is attached to and revolves with the shaft D, by which it is scattered through the cylinder D'.

A current of air enters the mouth M', the strength of which is graduated by the fan S and the valves P P', as hereinafter more fully explained. This current should be of sufficient strength to carry substances of less specific gravity than wheat from the cylinder D' into the chamber M.

The wheat will fall into the hopper I, and with it will fall more or less of cheat, smut, and other refuse, all of which, falling upon the convex gauze surface of the cloth-wheel H, will be carried in the direction of the periphery, and be subject to the action of the brushes G until it reaches the periphery. During this operation the loose dust, foss, and hull of the grain that is small enough, or made so by the action of the brushes against the wire gauze, will pass through the gauze, and be carried down the conduit L to the chamber L'.

In the mean time, the wheat having passed to the periphery, will fall into the annular chamber J, which

as may be seen from the drawing, has no communication with the dust and refuse that have passed through the wire gauze.

From the chamber J the wheat passes through the conduit K to the hopper I, where it goes through a process similar to that just described after entering the hopper I, the refuse passing, by means of the conduit L', to the chamber L", and the clean wheat passing out of the spout K' into the delivery-spout V.

From L" the refuse from L and L' is carried by the currents of air into the fan S', and by it thrown out at the opening T'.

A current of air ascends the delivery-spout V, to supply the partial vacuum created by the fan S'. The strength of this current is regulated by the valves, heretofore referred to, located in the appropriate chamber, which serve analogous purposes to the valves P P'. This current of air meets the falling wheat, and may be of such strength that it will carry any cheat, or other substances of less specific gravity than wheat, that remains or has been, by the above described process, mingled with it, up into the said chamber. The wheat in the mean time falls from the mouth V' into a place provided for it.

It will be seen that the area in the cylinder D" is smaller than in the chamber M, and in consequence the draught is stronger, the air being more compact than in the said chamber M, so that a portion of the material carried into the chamber M by the current of air entering the mouth M', after it has passed into the rarer medium of said chamber, will fall, the lighter portion being carried through the aperture where the valve P is shown in the drawing.

The portion that falls before reaching the valve P, composed of cheat, light wheat, &c., will, by virtue of the inclination of the surfaces with which it must come in contact, gather together at the valve M", and by its pressure against said valve, will open and pass through it to the valve M'", which will also be opened by the similar pressure; but when the valve M'" is thus opened, the current of air ascending from the mouth N', to supply the partial vacuum created by the fan S, will close the valve M", which will remain closed until the valve M'" closes, which it will do as soon as the pressure is removed from its inner side, by the material congregated between the said valves passing through.

As soon as the valve M'" is again closed, the pressure of the material collected at M" will reopen it, when the same operation will be gone over, the valves M" and M'" opening and closing alternately, and permitting the refuse material whose specific gravity is too great to pass through the valve P, to pass into the delivery N, where it will come in contact with a current of air, graduated by the valve P', which will again separate such material, carrying the lighter portions into the chamber O, the heavier passing out from the machine.

In order that the material carried up through the spout N may not, by reason of the impetus it has re-

ceived in such spout, be thrown directly through the chamber O, and out at the valve P' without being winnowed in said chamber, the brake O" is provided for that purpose. The current striking against it is broken, and the refuse carried by it separated through the chamber, the heavier portion falling to the valve O', and thence out from the machine, the lighter going through the valve P'. The portions of material that have passed through the valves P and P' pass together into the fan S, and is by it thrown out at the door T into some appropriate reservoir.

The material of less specific gravity than sound wheat that passes out of the conduit-spout K' into the delivery-pipe V, and is through it carried into the chambers similar to M and O, before referred to, but not shown in the drawings, there passes through operations precisely similar to that of the material entering the chamber M from the mouth M', the heavier portions of it emptying out of delivery-spouts similar to N and N", and the ultimate refuse passing into the fan S.

Having thus described my invention,

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

1. The combination of the concave brush G and convex perforated wire gauze H, when placed in a horizontal, or nearly horizontal position, substantially as and for the purpose described.
2. The mechanism set forth, for the purpose of forming a passage-way, L, for the dust after it has passed through the wire gauze, which passage-way is independent of and has no connection with the clean grain, substantially as and for the purpose described.
3. The mechanism set forth, for the purpose of forming the independent chamber J, substantially as and for the purpose described.
4. The mechanism described, for the purpose of equally and accurately adjusting the brushes G to the wire gauze on the cloth-wheel H, substantially as and for the purpose described.
5. The slide, or door Y, substantially as and for the purpose described.
6. The combination of the fan S and chambers J and L.
7. The sliding curb U and stationary curb X combined, substantially as and for the purpose described.
8. The combination of the sliding curb U, stationary curb X, and chamber J, substantially as and for the purpose described.
9. The combination of the sliding curb U, stationary curb X, brushes G, and wire gauze on cloth-wheel H, all substantially as shown and described.
10. The combination of the scouring-apparatus, composed of brushes G and wire gauze, with the winnowing-chambers O and M, substantially as shown and described.

HENRY RIOHMANN.

Witnesses:

JAMES MOORE,
M. B. PHILIPP.