

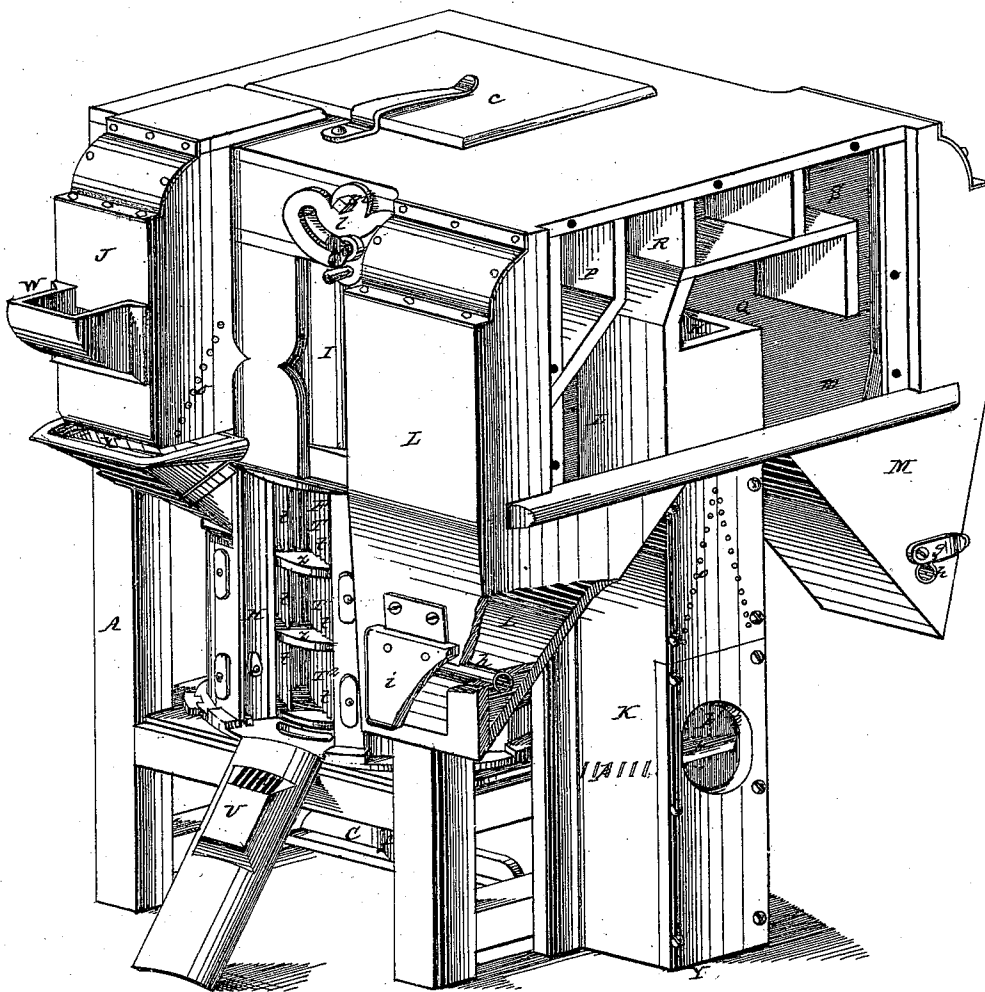
C. B. HORTON.

Improvement in Grain-Scourers and Separators.

No. 129,346.

Patented July 16, 1872.

Fig.1.



Witnesses.

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Fig.2.

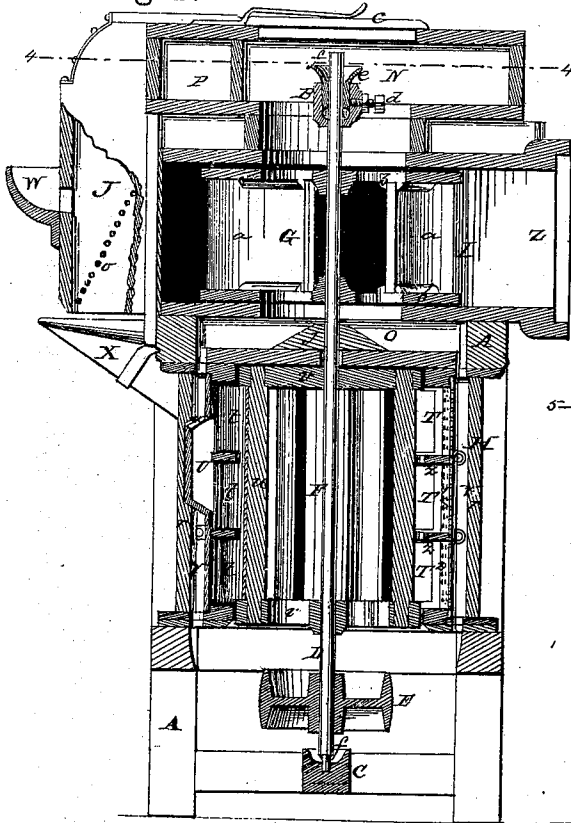


Fig.3.

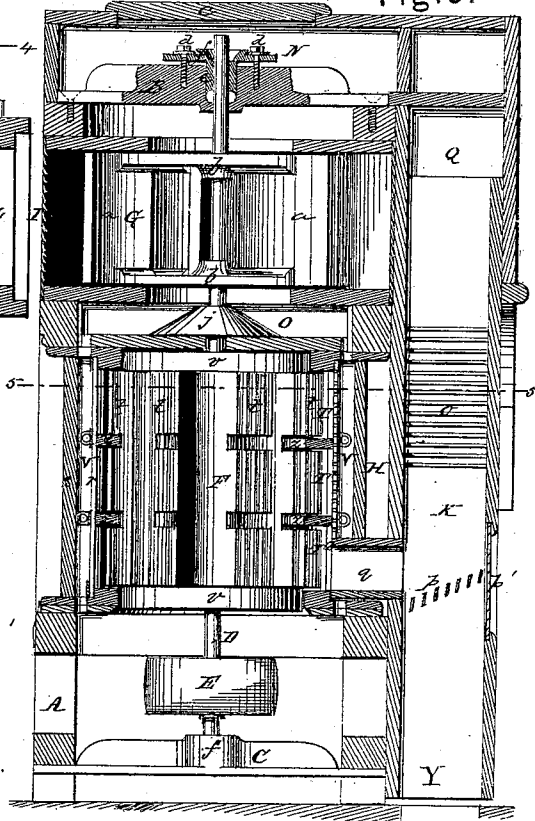


Fig.4.

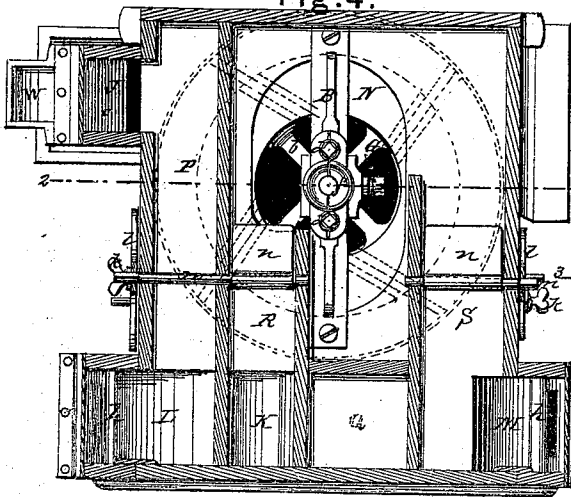
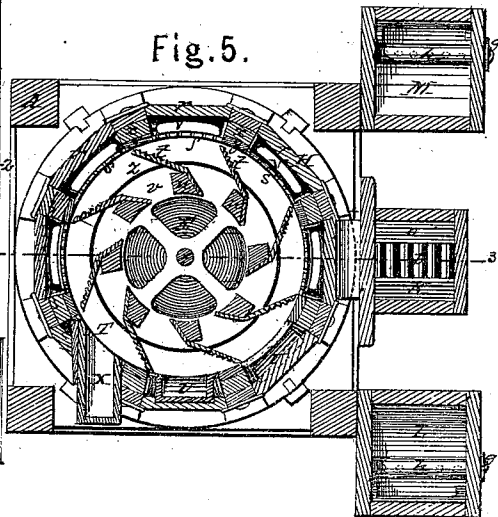


Fig.5.



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UNITED STATES PATENT OFFICE.

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IMPROVEMENT IN GRAIN SCOURERS AND SEPARATORS.

Specification forming part of Letters Patent No. 129,346, dated July 16, 1872.

Specification describing an Improved Grain-Scourer and Separator, invented by CHASE B. HORTON, of Waterloo, in the county of Seneca and State of New York.

The improved machine is termed "Horton's Turbine Grain Scourer and Separator." It is a low and compact upright machine for cleaning wheat, rye, and buckwheat.

The first part of my invention consists in the employment of scouring-chambers connected by separators of peculiar construction, which free the grain from dust after each scouring operation, as hereinafter more fully set forth. The second part of the invention consists in a peculiar construction of scouring-cylinder with tangential metallic rubbers. The third part of the invention consists in deflecting bars or flights in the leg of the final separator at the discharge from the scouring-case. The fourth part of the invention consists in a peculiar self-oiling bridge-tree for the upper end of the vertical shaft, the same being furnished with stuffing-box to prevent leakage. The fifth part of the invention consists in a peculiar construction of exhausting-fan for this use.

In the accompanying drawing, Figure 1 is a perspective view of a grain-cleaner illustrating the invention, portions being broken away and removed to expose the interior. Fig. 2 and Fig. 3 are central vertical sections on planes at right angles. Fig. 4 and Fig. 5 are horizontal sections on parallel planes. The line 2 2, Fig. 4, represents the plane of Fig. 2; 3 3, Fig. 5, the plane of Fig. 3; 4 4, Fig. 2, the plane of Fig. 4; and 5 5, Fig. 3, the plane of Fig. 5.

A represents a strong upright frame; B C, bridge-trees at the extremities of this frame; and D, a vertical shaft journaled therein. E represents the driving-pulley; F, the scouring-cylinder; and G, an exhausting-fan keyed on the shaft D. H represents the scouring-case, and I the fan-case. J K represent the main separating-chambers; L M, screenings-chambers; N O, dust spaces above and below the fan-case I, and communicating therewith; P Q, passages connecting the separating-chambers and screenings-chambers; and R S, passages connecting the latter and the dust-chamber N. T T' T'' represent scouring-chambers. U U' represent what are termed "curved sep-

arators," applied in the wall of the scouring-case, and serving primarily to connect the scouring-chambers. V V represent dust-chambers around the scouring-case, supplied with air through perforations at their lower ends, and communicating with the fan-case at their upper ends through perforations and the dust-place O. W represents the feeding-hopper; X, a second hopper receiving the grain from the first separator and discharging it into the first scouring-chamber; Y, the grain-discharge; and Z, the dust-discharge. The scouring-chambers T T' T'' are formed in the case H by horizontal rings or annular partitions *z* bolted to the metallic facings *y* of the posts or standards *x* of the same. The "curved separators" U U' are formed at proper height in or on plates applied as panels in the wall of the scouring-case. One is shown detached in Fig. 1. They consist of small chambers adapted to conduct the grain from one scouring-chamber to the next, and constructed with slitted inclined roofs *w* as screens. One or each of these panels may be secured by buttons and removable, as represented, to give access to the scouring-chambers. The scouring-cylinder F is composed of cast disks *v*, beveled longitudinal timbers *u*, and tangential metallic rubbers *t*, bolted to these timbers, and constructed with ribbed faces and notches to accommodate the partitions *z*. This scouring-cylinder operates as a blower, and thus coacts with the exhausting-fan G to create a compound blast of superior efficiency. The dust-chambers V are formed between the several posts or standards *x* of the scouring-case by the face plates or panels *s*, and outer close panels *r*. The last scouring-chamber T'' discharges into the final separator and discharge-leg K through a neck, *q*. To spread the grain as discharged through this neck, so that it shall be properly acted on by the blast, an inclined series of overlapping flat bars or flights, *p*, is arranged in said leg at this point. A glazed aperture or window, *p'*, may enable the inspection of this. In both the main separating-chambers J K screens *o* are formed by series of parallel rods, the surfaces being inclined in one direction or in V-form, as represented, to distribute the grain and screenings across the line of the blast.

The manner of arranging and connecting the separating-chambers and dust-chambers is clearly represented in Figs. 1 and 4. The

manner of forming each chamber and passage is a matter of variable mechanical detail. To regulate the blast in the respective separators valves *n* are arranged in the dust-passages R S and operated through shafts *m* and crank-disks *l*, on opposite sides of the machine, the latter being slotted and locked by clamp-screws *k*, passing therethrough. The dust-chamber O is furnished with a central deflecting-cone, *j*, to prevent any accumulation of dust around the shaft. The screenings-chambers L M are furnished with doors, *i*, through which to empty them and to secure the discharge of dust therefrom. Their lower extremities are traversed by tubes *h*, with perforations in their lower sides, and controlled by slides *g*, to admit air as required. The bridge-trees B C are each furnished with an oil-cup, *f*, for lubricating the journals of the shaft D and to prevent any escape of oil from the upper bearing. It is furnished with a stuffing-box, *e*, adjustably clamped by bolts *d*. An aperture in the top of the machine, closed by door *c*, gives access to this bearing. The fan G is composed of a pair of open cast disks, *b*, keyed on the shaft D, and wooden blades *a*, held in tangential grooves between said disks. It thus has a clear central space for the reception of dust, and operates in most effective manner. The machine, as a whole, may be built of wood and metal in the usual manner. The panels of the scouring-case are represented as of reticulated sheet metal. In practice I use longitudinal slats or strips of rolled iron, placed sufficiently apart to allow free escape of smut and dust. The rubbers I make of chilled cast-iron; but I do not limit myself in these particulars.

The operation of the machine is as follows: Motion being imparted to the shaft D by belt applied to its pulley E, a suction-blast of air is created by the fan through the dust-spaces N O, passages P Q R S, screenings-chambers L M, dust-chambers V, separators U U', scouring-chambers T T' T'', and separating-chambers J K. To this a forced blast, created by the rapid rotation of the cylinder F, is added, in the scouring-chambers, dust-chambers V, separators U U', and separating-chamber K. The grain is fed into the hopper W, and by it discharged into the first separating-chamber J. Here all the loose and light foreign matter is separated by the suction-blast and carried through the passage P to the screenings-chamber L. The partially-cleaned grain falls through into the hopper X and is delivered into the first of the series of scouring-chambers T T' T''. Here it is thoroughly smutted and scoured, and, as discharged through the successive separators U U', other light parti-

cles are removed. These, with the smut and dust, are forced and drawn into the dust-chambers V, and carried thence by the exhaust through the dust-space O into the fan-case I, and discharged at Z, outside of the mill, if desired. In each scouring-chamber the grain, cleaned from the separated particles, is supplied with fresh air and treated for an entire revolution, so that the improved machine has the effect of a series of single-chamber machines. From the scouring-chambers the grain passes with great force through the neck *q* into the final separating-chamber K, striking the flights *p*, by which it is spread and deflected upward, so that all dust and "cheat" shall be caught by the compound blast. This is carried through the passage Q to the screenings-chamber M. The heavy grain, being arrested by screen *o*, falls back and is discharged at Y. During the operation any dust which may pass into the screenings-chambers L M is drawn off through the passages R S and dust-space N into the fan-case I and discharged at Z. The operation is continuous, and is regulated by varying the feed and adjusting the blast-controlling valves *n g*.

The following is claimed as new:

1. The series of scouring-chambers T T' T'', connected by separators U U', constructed as described, for freeing the grain from dust after each scouring operation, substantially as shown and described.

2. The scouring-cylinder F, composed of disks *v*, beveled longitudinal bars *u*, and tangential-ribbed rubbers *t*, substantially as specified.

3. The flights *p*, arranged in the final separating-chamber K, and formed and operating as set forth.

4. The spreading-screens *o o*, composed of inclined series of parallel rods arranged in the wind-trunks J and K, as and for the purpose specified.

5. The combination and arrangement of the separating-chambers J K, screenings-chambers L M, passages P Q R S, dust-space N, and fan-case I, as and for the purposes set forth.

6. In an upright grain-cleaner a bearing for the upper end of the shaft D, having oil-cup *f* and a stuffing-box, *e*, to prevent leakage, substantially as herein shown and described.

7. In a grain-cleaner an annular rotary fan, composed of disks *b* and tangential blades *a*, substantially as herein shown, for the purpose specified.

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Witnesses:

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