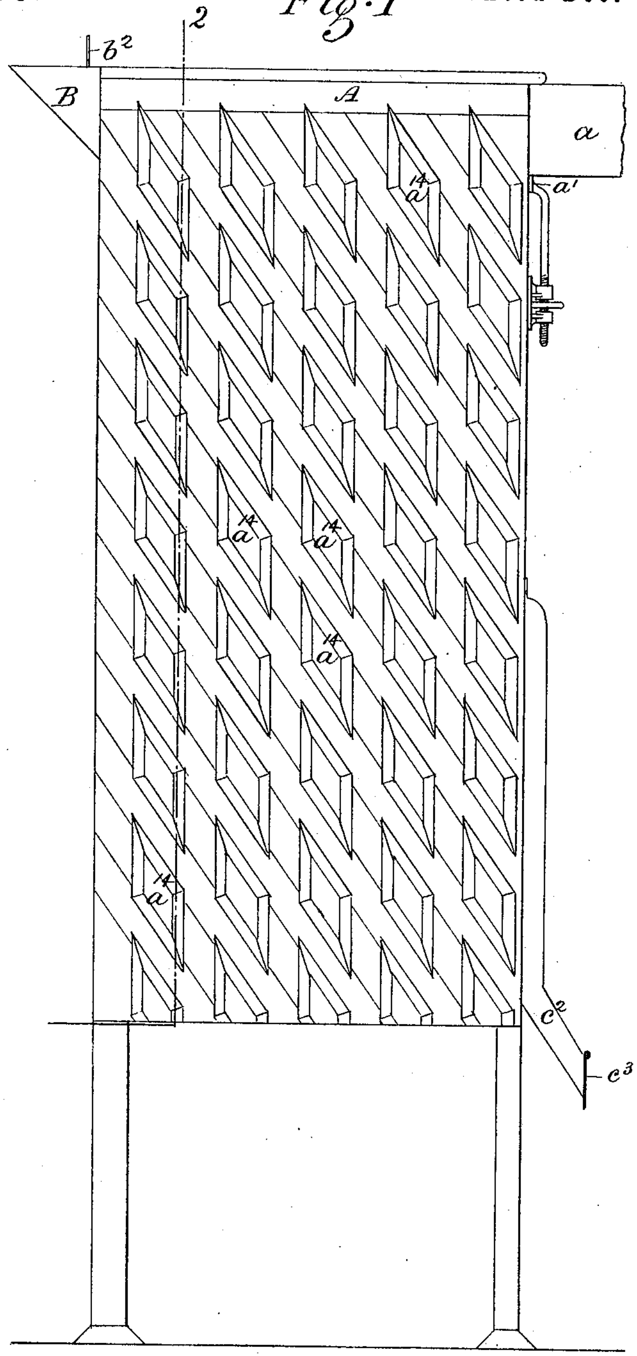
3 Sheets—Sheet 1.

C. HAGGENMACHER.

WINNOWING MACHINE.

No. 185,393. Patented Dec. 19, 1876.

Fig. 1



George Daur, Witness
A. H. Bath, witness

Carl Haggenmacher

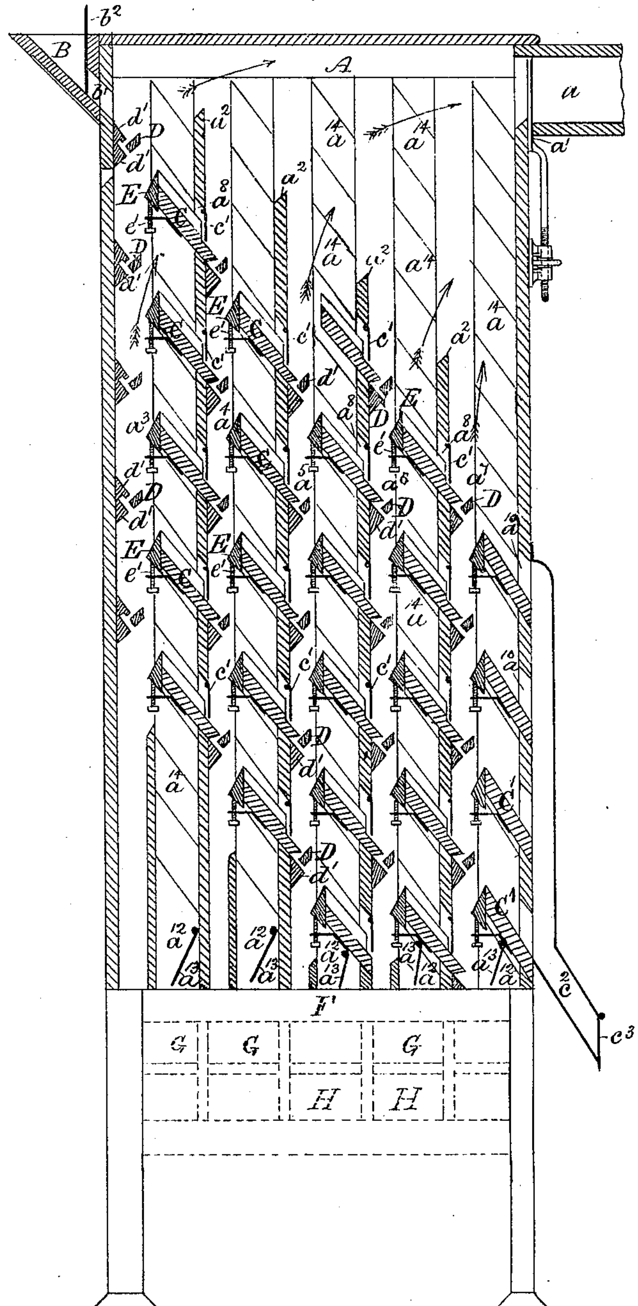
THE GRAPHIC CO. N.Y.

3 Sheets—Sheet 2.

C. HAGGENMACHER.

WINNOWING MACHINE.

No. 185,393. *Fig. 2* Patented Dec. 19, 1876.



George Sauer, Witness
Ch. H. Buck, witness

Carl Haggenmacher

THE GRAPHIC CO. N.Y.

C. HAGGENMACHER.

WINNOWING MACHINE.

No. 185,393. Patented Dec. 19, 1876.

Fig. 3

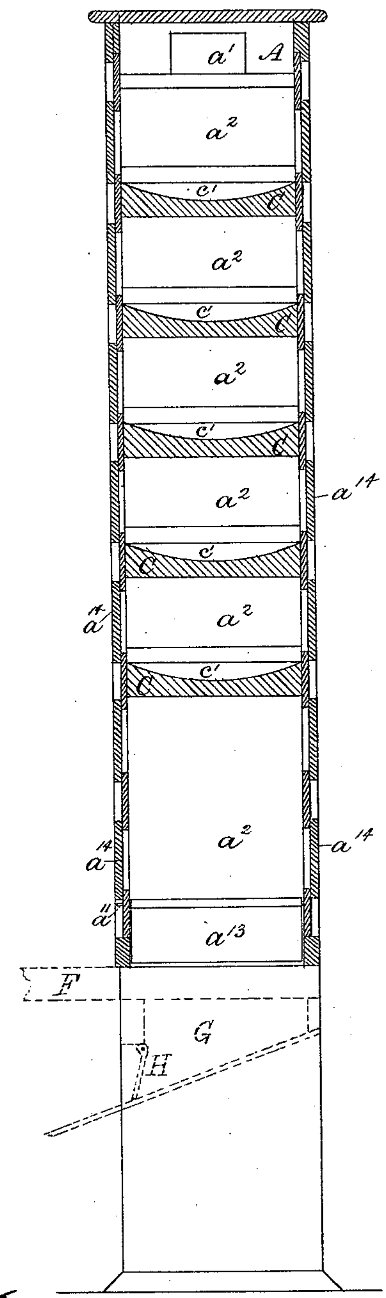
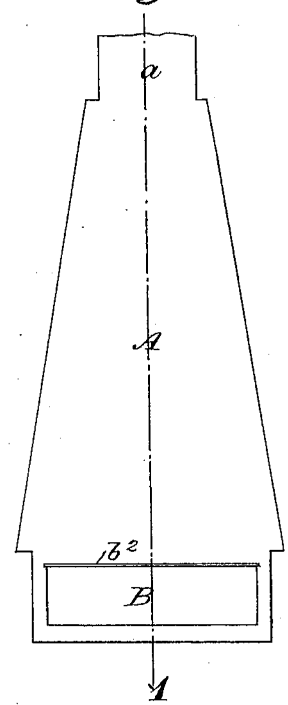


Fig. 4



George Davis, Witness
M. H. Bach witness

Carl Haggenmacher

UNITED STATES PATENT OFFICE.

CARL HAGGENMACHER, OF PESTH, HUNGARY.

IMPROVEMENT IN WINNOWING-MACHINES.

Specification forming part of Letters Patent No. **185,393**, dated December 19, 1876; application filed October 5, 1876.

To all whom it may concern:

Be it known that I, CARL HAGGENMACHER, director of the first ofen Pesth Steam-Mills Company, at Pesth, Hungary, in the Empire of Austria, have invented an improved combined machine for winnowing, cleaning, and sorting grit, grain, corn, and other seeds, which improvement is fully set forth in the following specification, reference being had to the accompanying drawings.

This machine consists of a box or chamber provided with a hopper at the upper part of one side, which hopper communicates with the interior of the said box or chamber by means of a passage which may be closed, or partly closed, as required, by a sliding shutter, termed the "grit-slide." The side of the box or chamber which is opposite to that at which the hopper is affixed, and is hereinafter termed the "exit side," is, by preference, made considerably narrower than the hopper side, so that the interior of the said box or chamber may be contracted as it recedes from that part. At the upper part of the exit side is an opening, through which a current of air is drawn or forced by means of a fan or other suitable apparatus. The said chamber is divided by vertical partitions (extending from the bottom nearly to the top) into several compartments. Openings are formed one above the other in each of the said partitions, and in the exit side of the box. At the lower part of the said openings inclined shelves, supported by the sides of the box or chamber, are fitted. The said shelves are inclined downward toward the exit side of the said box or chamber, and project into the compartments on each side of the said partitions. That part of each of the said openings which is not occupied by its shelf is closed by a hinged flap-valve. The shelves, which are fitted in the openings formed in the exit side of the said box or chamber, are provided with hinged flaps or valves; and the compartments formed by the vertical partitions are furnished at their lower parts with chutes or spouts, also provided with hinged flaps or valves, which are hereinafter termed "perfection-valves." In each of the said compartments inclined bars and ledges (hereinafter termed "grit-collecting receptacles") are fixed above the upper end of each shelf, a little distance apart, so as to leave narrow spaces between them. These bars and ledges break the fall of and collect the grit as it descends from one shelf to another. At the upper end of each of the inclined shelves aforesaid is mounted a "grit-divider," consisting of a bar, the upper edge of which is furnished with a strip of metal. The said grit-divider may be made capable of adjustment in vertical grooves formed in the sides of the said box or chamber; or it may be made stationary, and the grit-collecting receptacles be made adjustable.

Having now described the nature of the said invention, I will proceed to describe the manner in which the same is to be performed, reference being had to the accompanying drawing, and to the letters and figures marked thereon, the same letters and figures of reference being used to indicate the same parts in the several figures of the drawings.

Figure 1 is a side elevation. Fig. 2 is a vertical section taken on the line 1, Fig. 4. Fig. 3 is a vertical section taken on the line 2, Fig. 1; and Fig. 4 is a plan of the said machine.

A is the box or chamber. B is the hopper. b^1 is the passage forming the communication between the said hopper and chamber. b^2 is the grit-slide, by means of which the passage b^1 may be closed, or partly closed, as required. a is a pipe or passage, which communicates with a fan or other suitable exhausting apparatus, (not shown in the drawings,) by means of which a current of air is drawn through the machine. a^1 is a sliding shutter, by means of which the amount of air allowed to pass may be regulated. a^2 a^2 are the vertical partitions, by which the box or chamber A is divided into the compartments a^3 a^4 a^5 a^6 a^7. a^8 a^8 are the openings formed in the said partitions. C C are the inclined shelves fitted in the partitions a^2 a^2, the upper surface of each of which shelves is curved in transverse section, (see Fig. 3,) in order to cause the stream of grit to converge as it passes to the next compartment. c^1 c^1 are the hinged flaps or valves, which close that part of each of the openings

a^8 a^8 which is not occupied by its shelf. a^{10} a^{10} are the openings formed in the exit side of the box or chamber A. C′ C′ are the shelves fitted in the said openings. c^2 is the spout or chute, by which the grit passes from the said shelves out of the machine. c^3 is the flap or valve by which the said spout or chute is closed. D D are the bars, and d^1 d^1 the ledges, forming the grit-collecting receptacles. a^{12} a^{12} are chutes or spouts, which terminate the compartments a^3 a^4 a^5 a^6 a^7. a^{13} a^{13} are the perfection-valves, which are mounted on spindles, one of which is shown at a^{11}, Fig. 3, the ends of which spindles project from one side of the box or chamber A, and are provided with levers, or are squared to receive a key, by means of which they may be turned, and the said valves a^{13} a^{13} thereby caused to close, or partly close, the passages a^{12} a^{12}. a^{14} a^{14} are shutters, by removing which access may be gained to the interior of the machine, when necessary.

The grit-dividers consist of bars E E, which are capable of motion in vertical grooves formed in the sides of the box or chamber, and may be raised or lowered, as required, by means of screws e' e'.

Although I prefer the arrangement hereinbefore described for adjusting the grit-dividers, any other suitable mechanism may be used.

The action of this machine is as follows: Air is drawn through the machine by the fan or other apparatus, hereinbefore referred to. The current so drawn passes through each of the compartments a^3 a^4 a^5 a^6 a^7, as indicated by the arrows, with greater or less force, according to the sectional area of the different compartments, and according to the adjustment of the perfection-valves a^{13} a^{13} and the wind-slide a^1. The grit, sorted according to the size of the grains, proceeds from the cleansing-sieve, (not shown,) to be fixed at the top of the machine, into the hopper B, whence it passes to the grit-collecting receptacle D d', next below, in passing from which it meets the ascending current of air in the first compartment a^3, which current of air separates the lighter from the heavier particles, the latter falling into that one of the collecting-receptacles next below, and the former passing over the first of the grit-dividers E, onto the upper inclined shelf C, down which they pass through the opening a^8 in the first partition a^2, pushing open the hinged flap-valve c^1 in their passage to the compartment a^4, where they are collected by the next grit-collecting receptacle, and acted on by the current of air passing up the said compartment a^4. In this way the lighter particles or refuse grit pass from one compartment to another until they arrive at the last, when they pass from the machine by the exit-spout c^2, which forms the termination of the shelves C′ C′. The heavier particles of the grit, after being acted on in like manner by the current of air as they pass from each of the grit-collecting receptacles D d', pass downward out of the machine by the spouts or chutes a^{12} a^{12}. The grit is thus divided into as many different qualities as there are terminal spouts, each quality being received into a separate receptacle. (Not shown in the drawings.) Bran passes from the machine with the escaping current of air.

When it is required to cause a larger quantity of the grit to pass by the spouts or chutes a^{12} a^{12}, the currents of air passing up the compartments a^3 a^4 a^5 a^6 a^7 are decreased by partly closing the perfection-valves a^{13} a^{13}. The wind-slide a^1 is shifted according as the grit to be cleaned is fine or coarse.

Machines constructed as hereinbefore described are much cheaper, more compact in their construction, and more perfect in their action than the ordinary machines, the different qualities of grit, when sorted, being in about the following proportions: clean grit, ninety per cent.; refuse grit, eight per cent.; bran, two per cent.

The said machine may be constructed with any required number of shelves and compartments, one compartment only being sufficient in some cases. When the said machines are constructed with only one compartment, each of the inclined shelves terminates in a chute which projects from the exit side of the machine, and the hopper is affixed to the upper part of the opposite side, as shown in Figs. 1 and 2, the arrangements for causing a current of air to pass through the machine being similar to those described with reference to the aforesaid figures.

Instead of drawing air through the machine, as hereinbefore described, air may be forced through it by connecting the lower part of the said machine with a blowing apparatus, and arranging below the chutes a^{12} receptacles for the grit to pass into, the said receptacles being provided with sloping bottoms and self-closing valves, for the purpose of allowing the grit to run out. This arrangement is indicated in dotted lines in Figs. 2 and 3. F is the connection with the blowing apparatus. G G are the receptacles, and H H are the valves.

The machine hereinbefore described, if constructed on a larger scale, may be advantageously used for corn and all sorts of seeds.

Having thus described the nature of my invention and the manner in which the same is to be performed, I wish it to be understood that I do not limit myself to the precise details hereinbefore described, as the same may be varied without departing from the nature of the said invention; but

I claim as the said invention—

1. In machines for winnowing, cleaning, and sorting grit, grain, corn, or other seeds, the combination, with a suitable air forcing or drawing apparatus, of a series of vertical intercommunicating compartments, provided with inclined shelves and grit-dividers and

grit-collecting receptacles, the whole being arranged and combined for operation substantially as herein shown and set forth.

2. The grit-divider and the means for adjusting it, as herein shown and described—that is to say, an inclined shelf, at the upper part of which an adjustable bar or grit-divider is mounted, which bar forms a flange to the shelf, which is raised or lowered, and fixed at any required height by means of mechanism, as hereinbefore described.

CARL HAGGENMACHER.

Witnesses:
GEORGE DAUR,
M. H. BACH.