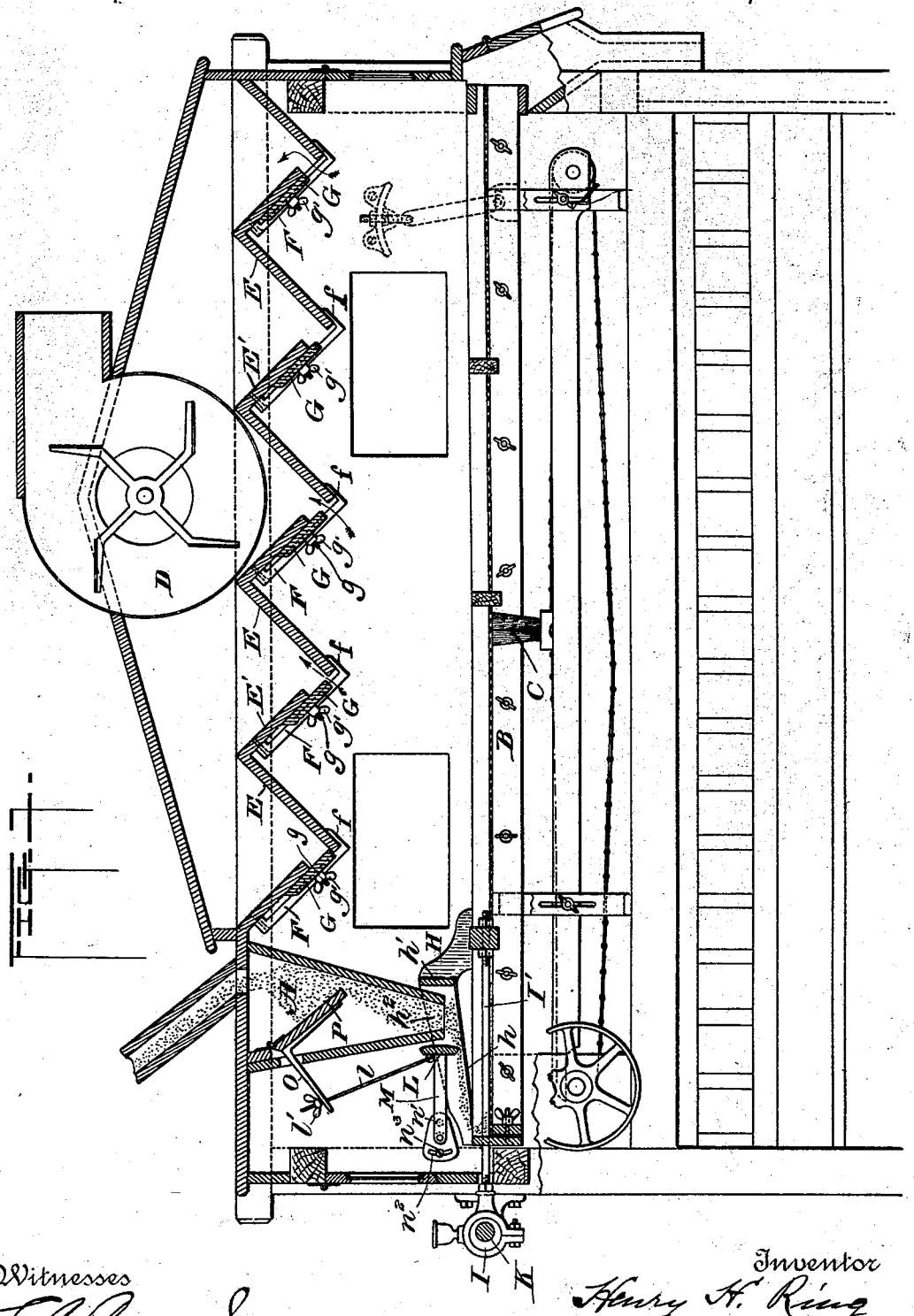
(No Model.) 2 Sheets—Sheet 1.

H. H. RING.

MIDDLINGS PURIFIER.

No. 508,979. Patented Nov. 21, 1893.



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(No Model.) 2 Sheets—Sheet 2.

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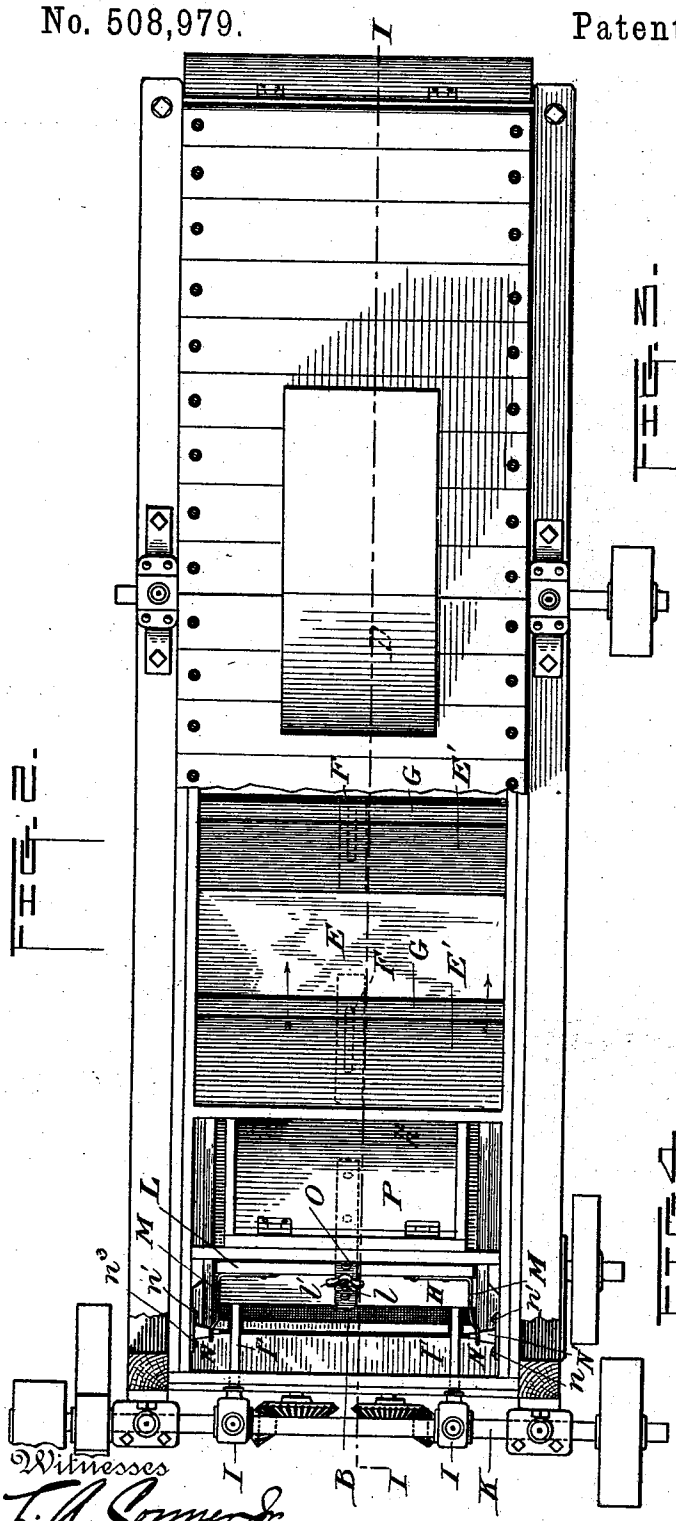

FIG. 2.

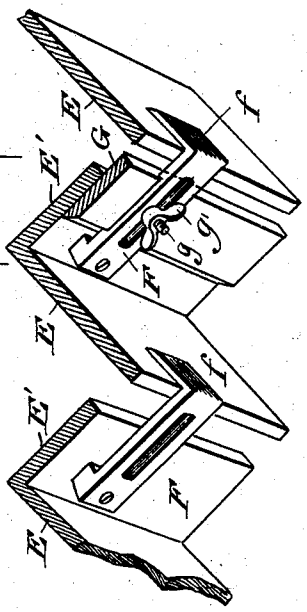

FIG. 3.

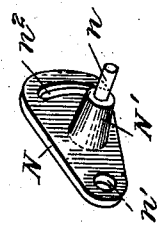

FIG. 4.

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UNITED STATES PATENT OFFICE.

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MIDDLINGS-PURIFIER.

SPECIFICATION forming part of Letters Patent No. 508,979, dated November 21, 1893.

Application filed February 2, 1893. Serial No. 460,747. (No model.)

To all whom it may concern:

Be it known that I, HENRY H. RING, a citizen of the United States, residing at Lairdsville, in the county of Lycoming and State of Pennsylvania, have invented certain new and useful Improvements in Middlings-Purifiers; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to grain separators or purifiers, but more particularly to a class of machines known in the art as shaking-bolts, and in which a fan or blower is employed for effecting a separation of the chaff, dust or other "foul" matter from the material.

In machines as heretofore constructed the partition boards and valves above the shaking-bolt or riddle are usually horizontal or so arranged as to permit dust and other foul matter to collect and accumulate to such an extent as to materially interfere with the operation of the machine, and the valve openings or outlets are of a uniform width or size and thereby permit a loss of valuable material resulting from a heavy blast with too free egress of the dust laden air for a certain distance immediately in the rear of the feed-hopper, so that the finer particles of middlings or other material are carried off with the foul matter.

The objects of my invention are principally to overcome these objections, which I accomplish by providing means for varying the size of the valve openings or outlets so as to have the openings increase in size successively from front to rear of the riddle, and by so arranging the slant-boards and valves of the partition dividing the dust collecting or air chamber as to prevent the lodgment of dust or other matter separated from the middlings or other material.

With these objects in view, the invention consists in certain improved features of construction and combinations of parts all as will be hereinafter described and particularly pointed out in the claims at the end of this description.

In the accompanying drawings, which are to be taken as a part of this specification, and in which similar letters of reference are used to denote similar parts of the machine, Figure 1 represents a vertical longitudinal sectional elevation of a machine embodying my invention the section being taken on line 1—1 of Fig. 2; Fig. 2 a plan of the same, with part broken away to show the interior construction. Fig. 3 is a detail sectional perspective view illustrating the construction of the inclined partition boards and valves interposed between the shaking-bolt and fan; and Fig. 4 is a detail showing one of the brackets with pivot pin or fulcrum for the pivoted arms of the adjustable feed-gate.

In the drawings I have illustrated my improvements applied to a middlings-purifier having the feed-hopper A, shaking-bolt B, traveling brush C, for clearing the meshes of the bolting cloth, and suction fan D, which parts may be arranged as shown or in any preferred manner.

E, E, denote a series of L-shaped boards which may have the right-angled portions E′, formed integrally therewith or secured thereto, and which when inverted and connected together as shown form a series of V-shaped pockets or chambers extending from front to rear of the machine below the fan D, with upper surfaces slanting or inclined at an angle of about forty-five degrees to the horizon.

F, F, denote longitudinally slotted plates, having right-angled portions *f*, which are secured to the slanting boards E, and extend upwardly therefrom on the lower side of the boards E′, to which their free ends are attached so as to connect the boards together. The depending edges of the boards E′ terminate a short distance above the depending edges of the boards E so as to provide openings or outlets between such depending portions for the egress of air and dust or other particles of matter which may be sucked up by the fan D.

G, G, denote a series of sliding gates or valves which are fitted to slide between the slotted plates F and the lower side or back of the slanting boards E′, and may be secured in any desired position by means of set screws or bolts and nuts *g*, *g′*; the depending edges of the boards E, being adapted to serve as

stops to limit the movement of the gates in closing. By the described connection the valves G, G, are sustained in proper position and guided in their movements by contact with the board and slotted plate so as to prevent canting, and being arranged on the under side of the board a free and unobstructed upper surface is presented so that no obstruction is formed for the collection or lodgment of dust or foul matter sucked up by the fan. The slides are so adjusted that the valve openings or outlets leading into the upper chamber gradually increase in size toward the rear of the machine, as shown in Fig. 1, so as to prevent the finer particles of the material passing over the finer meshes of the bolting cloth at the front from being sucked up and carried off with the dust laden air.

H, denotes a shaking-shoe which is located beneath the throat of the hopper A, and rigidly secured to the forward portion of the shaking-bolt or sieve. This shoe may consist of a flat metallic plate h, inclining slightly upward from the front end thereof toward the rear of the hopper, and having upturned back and sides h', h^2, after the manner of a scoop, so as to prevent the material from escaping at the back or sides thereof. This shoe may be rigidly secured to the side bars or frame pieces of the bolt B, in any proper manner, and is adapted to be reciprocated with the bolt by means of the eccentrics I, and rods I', connecting with the driven shaft K. By this means the sieve and shoe are both reciprocated by means of a single eccentric connection instead of being independently actuated, and the shoe being extended on a gentle incline from a point just back of the throat or outlet from the hopper to a comparatively considerable distance in front thereof a uniform and regular feed is secured and the meal or middlings is evenly spread over or delivered to the bolting cloth.

L, denotes a radially adjustable feed-gate or valve which extends transversely of the machine in proximity to the throat of the feed-hopper A, with its lower edge slightly above the surface of the shoe H, and which is supported upon the free ends of swinging bars M, which latter have their rear ends pivotally secured to studs n, projecting from the pivot plates or brackets N. The brackets N are preferably formed intermediate their ends with bosses N', carrying the pins n, so as to set the bars M, off from the brackets enough to clear the space between the same and the ends of the gate. The brackets N are pivoted at one end as indicated at n', Fig. 1, and provided at their opposite ends with curved slots n^2, struck upon the arc of a circle concentric with their pivots n'. Set screws n^3, passing through the curved slots n^2, into the side pieces of the machine permit the brackets to be adjusted upon their respective pivots so as to raise or lower the pivots of the bars M, for the purpose of raising or lowering either end of the gate, so as to secure a uniform depth of opening between the lower edge thereof and the surface of the feed-shoe or roller beneath the same, and thereby insure a uniform and even feed from end to end of the gate.

The discharge of the material through the throat of the hopper is automatically controlled by suspending the gate L, from adjusting rods l, connecting with arms or bars O, which project from a hinged pressure-board or gate P, through openings in the front wall of the hopper, so that the feed-gate may be made to rise or fall as the weight upon the pressure-board varies under the varying pressure of the grain within the hopper. The feed-gate may also be raised or lowered by means of the nuts l', upon the rods l. By these means the feed may be regulated and automatically controlled when the machine is in operation, and any irregularity of the feed caused by the canting of the feed-gate is avoided; the adjustments being secured so as to preserve a uniform depth of opening between the lower edge of the feed-gate and the surface of the shoe from end to end of the gate.

The air apparatus for producing a blast of air may consist of a fan as shown, or any of the means usually employed for such purposes, and if desired the machine may be used without a fan by connecting it with an air blast in another part of the room or building; such arrangement being the mechanical equivalent of the fan.

The feed-gate with shifting fulcrum and connected pressure-board for automatically regulating the feed from the hopper will form the subject matter of a separate application, and hence is not specifically claimed herein.

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent of the United States, is—

1. In a middlings purifier, the combination with the air and bolting chambers, of the intermediate valved-partition consisting of a series of oppositely inclined slant boards arranged so as to form a series of substantially V-shaped pockets or air chambers; the depending edge of one board of each pocket terminating slightly above the depending edge of the adjacent oppositely inclined board, so as to provide an opening in the bottom of the pocket; the independently adjustable sliding gates secured on the under sides of the narrower slant boards, and means for adjusting and securing said gates so as to gradually increase the size of the openings in the pockets successively from front to rear of the machine; the depending portions of the slant boards opposite said gates being adapted to serve as stops to limit the movement of the gates in closing; whereby the finer particles of the material passing over the finer meshes of the bolting cloth are prevented from being sucked up and carried off with the dust laden air, and a free and unobstructed upper surface is provided in the several pockets to prevent the collection or

lodgment of dust or other matter, substantially as described.

2. In a middlings purifier, the combination with the air and bolting chambers, of the valved-partition comprising a series of slant boards extending transversely of the machine and slanting downwardly successively in one direction, a corresponding series of boards slanting in an opposite direction having their upper edges secured to the upper edges of the first mentioned oppositely inclined series and their lower edges terminating slightly above the lower edges of the latter, so as to form a series of substantially V-shaped pockets with openings in the bottoms thereof, a series of independently adjustable sliding gates for controlling said openings secured on the under side of the narrower slant boards so as to move in a plane intersecting the oppositely inclined boards, and means for securing said gates in such position as to gradually increase the size of said openings successively from front to rear of the machine, whereby the upper surfaces of the several pockets are rendered free from obstructions so as to prevent the lodgment of dust or other foul matter separated from the middlings or other material, and the finer particles of the material passing over the finer meshes of the bolting cloth are prevented from being sucked up and carried off with the dust laden air, substantially as described.

3. In a middlings-purifier, the valved-partition comprising a series of inverted L-shaped boards arranged transversely of the machine so as to form a series of V-shaped pockets; the depending portions of the boards slanting in one direction terminating slightly above the depending portions which slant in the opposite direction, so as to form openings in the bottoms of the pockets; the longitudinally slotted plates or brackets secured to and connecting the depending portions of adjacent boards, the independent sliding gates interposed between said brackets and the shorter depending portions of the boards, and means for adjusting and securing said gates so as to vary the size of the openings in the pockets at will, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

HENRY H. RING.

Witnesses:
G. L. RAMIER,
J. RUSSEL SMITH.