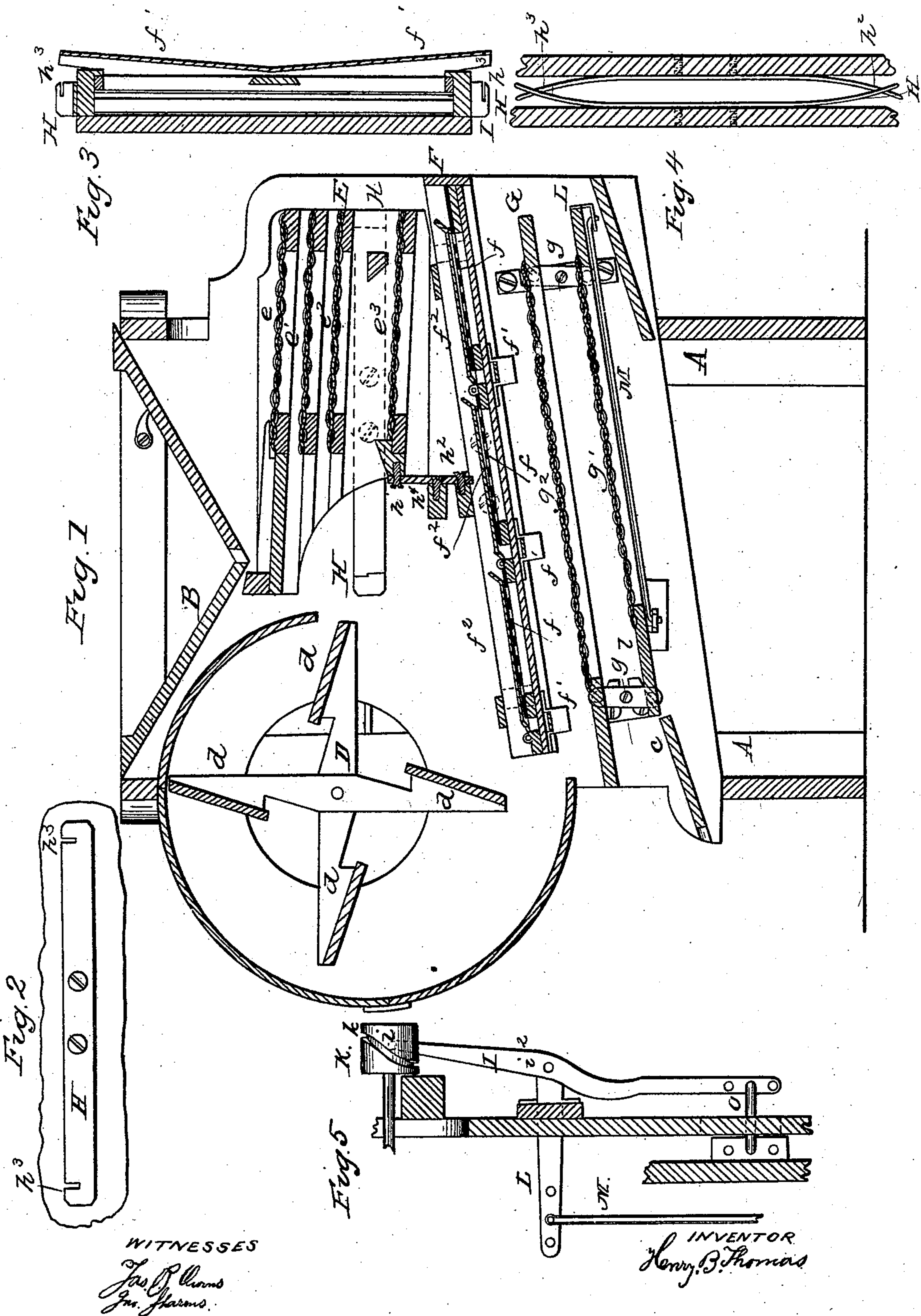


H. B. THOMAS.
Grain Winnow.

No. 41,872.

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UNITED STATES PATENT OFFICE.

HENRY B. THOMAS, OF CASCADE, IOWA.

IMPROVEMENT IN GRAIN-WINNOWERS.

Specification forming part of Letters Patent No. 41,872, dated March 8, 1864.

To all whom it may concern:

Be it known that I, HENRY B. THOMAS, of Cascade, in the county of Dubuque and State of Iowa, have invented certain new and Improved Devices to be used in Fan-Mills or Grain-Separators; and I hereby declare that the following is a full and sufficient description thereof, reference being had to the accompanying drawings, making part of the specification thereof.

Figure 1 is a longitudinal sectional elevation of the machine, front to rear of the riddles, through center, embracing the fan and chamber thereof; Fig. 2, an elevation of notched spring-plate for sustaining the riddles; Fig. 3, a side-to-side section of second shoe containing the perforate plate *f*, imperforate plates *f*², and double-inclined troughs *f*¹, for small seeds; Fig. 4, an edge view of the notched springs, locked together at the point of the crossing *a*, (*h*³); Fig. 5, a vertical view of the lever-arm I, pivoted on its center to give motion to the riddles.

The machine is of cubical form, having the hopper at the top; the horizontal fan-shaft on the rear side, F. The upper shoe, with its four riddles, open in front and rear for the passage of the fan-draft. The second shoe, with its three discharge-channels on each of the sides for the discharge of small seeds, has a perforate bottom and three hinged plates extending from side to side of the shoe and opening toward the rear. The perforate and hinged plates are so made as to be withdrawn from the frame by sliding both plates out together. Underneath the second shoe is arranged a pair of screens, G, mounted on the arms of a pair of rock-shafts, *g g*, and sustained at the four corners of the screens, each rock-shaft being arranged between the screens, and having bearings in the sides of the said machine, give to the screens a reciprocating motion from front to rear.

First. The invention respects the mode of suspending the upper and second shoe by means of the notched spring-plates attached to the sides of the plates or side boards of the mill, and also to the sides of the shoe.

The second feature of the invention respects the making of the second shoe with perforate plates combined with three overlapping hinged plates, *f*², for discharging small long seeds, as

oats, at the sides of the machine through certain discharge-channels, *f*; third, the arrangement and construction of the pair of reciprocating rock-shaft screens in the under part of the screens; fourth, the arrangement of certain devices for operating the several groups of screening apparatus.

Let A represent the frame of the machine; B, the hopper; C, the concave of the fan; D, the shaft for the vanes of the fan; E, the upper shoe, containing four riddles; F, the second or middle shoe; G, the frame of lower riddles, working on the rock-shaft *g g*; H, the notched springs, notched into each other; I, the pivoted lever-arm for communicating motion to the upper shoe, E; K, the channeled cam-piece for giving motion to all the riddles; L, the arm for operating the lower riddles; M, the connecting-rod between arm L and frame of the lower riddles; *b*, the pawl or catch for adjusting the opening of the hopper; *b*¹, the sliding side piece of the hopper for graduating the discharge; *c*, chute for the discharged grain; *d*, the vanes of the fan; *e e*¹ *e*² *e*³, the riddles of the upper shoe; *f*, perforate plates of shoe F; *f*¹, anticlinal discharge-channels for delivering oats and like seeds on the sides of the machine; *f*², overlapping hinged plates for carrying the oats and like seeds to the discharge-channels; *g*, shaft of the double rock-shaft screens; *g*¹ *g*², screens of the double rock-shaft; *h*³, notches for the interlocking of the springs used to mount the two several shoes E and F; *i*, projection on arm I working in the cam-channel *k*; *h*, pivot-screw for transmitting motion from shoe E to shoe F by means of the notched plate *h*⁴, having an open slot at each end for receiving loosely the screw-heads *h*¹ on its upper end and *h*² on its lower end, the former connected with and receiving motion from the upper shoe, while the latter imparts motion to the middle shoe, F. *k* is the channel in which plays the projection *i*. *i*² is the top of the shaft fastened to arm I, (shaft not shown in drawings,) the said shaft having the arm L firmly fastened to its lower part, and at right angles to said shaft. *l* is the lower screen frame-piece of the rock-shafts G.

There are some striking peculiarities in this machine which cause it to differ from all the machines in use. The first of these peculiarities is the devices of the mutually interlock-

ing of the notched springs H at the points h^3 , one spring being fastened to the side of the machine and the other to the side of the shoe. (See Fig. 4.) These springs afford a cheap construction for manufacturing, great facility for side motion in shaking the riddles, and easy removal from the machine by merely lifting the shoe out of its bearings.

Three upper riddles are of large meshes, intended to intercept grain-heads and straw and other large-sized foreign particles larger than grain, while the fourth, e^3 , has meshes a little smaller, but still larger than the grain.

The second shoe, F, is composed of the perforated plate f and hinged plates f^2 , and is designed to separate oats from wheat. The perforate plate is filled with round holes just large enough to let through the wheat, but the oats being longer, and the space between f and f^2 being too thin or narrow to allow this grain to tip upon end, it slides over the holes and finally falls into the trough f' , and thence is carried out at the sides of the machine. The point of novelty presented in this case consists in the combination of the perforate plate with the parallel hinged plates for the separation of oats from wheat.

The third peculiarity of this machine consists in the arrangement of a pair of screens, $g' g^2$, upon the arms of a pair of rock-shafts, $g g$, for the purpose of allowing grass-seed and fragments of grain to pass through the screens, while the meshes are too small to allow the wheat to pass through, and so the wheat is carried along by the shaking movement till it is finally discharged upon the chute c and thence upon the floor. Motion is communicated to the rock-shafts by the horizontal lever-arm L and connecting-rod M to the lower screen frame-piece l , by which the rock-shafts are vibrated longitudinally.

The fourth peculiarity of this machine consists in the peculiar device for transmitting

motion from the driving-shaft of the fan to the riddles, the same being a combination of the channeled cam-piece K, the double lever-arm or pivoted lever-arm I, and arm L, for operating shoes E and F and rock shafts G.

Operation: The machine being put in order, the grain thrashed is delivered into hopper B, the opening in the bottom having been duly adjusted. The grain falls upon the upper riddle, leaving most of its grain-heads and straw upon the first, and less upon the second, less still upon the third and fourth riddle, while the oats and small seeds and fragments of grain fall upon the compound screen $f f^2$, which separates the oats, as already described. The small seeds pass through the meshes of the screens, together with the fragments of broken grain, while the wheat, being too large, rolls down its surface and is discharged upon the chute c .

Having described the nature of the invention and the mode of using the same, what I claim as my invention, and desire to secure by Letters Patent, is—

1. The mode of suspending the upper and second shoe by means of the notched spring-plates H, attached to the sides of the mill and to the shoe, as seen in the drawings, Figs. 4 and 2.

2. The second shoe, having a perforate plate and three overlapping hinged plates for discharging small seeds at the sides of the machine through the discharge-channels, as arranged in relation to the pair of reciprocating rock shaft screens, in combination with the lever-arm L and connecting-rod M, substantially in the manner and for the purpose herein set forth.

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Witnesses:

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