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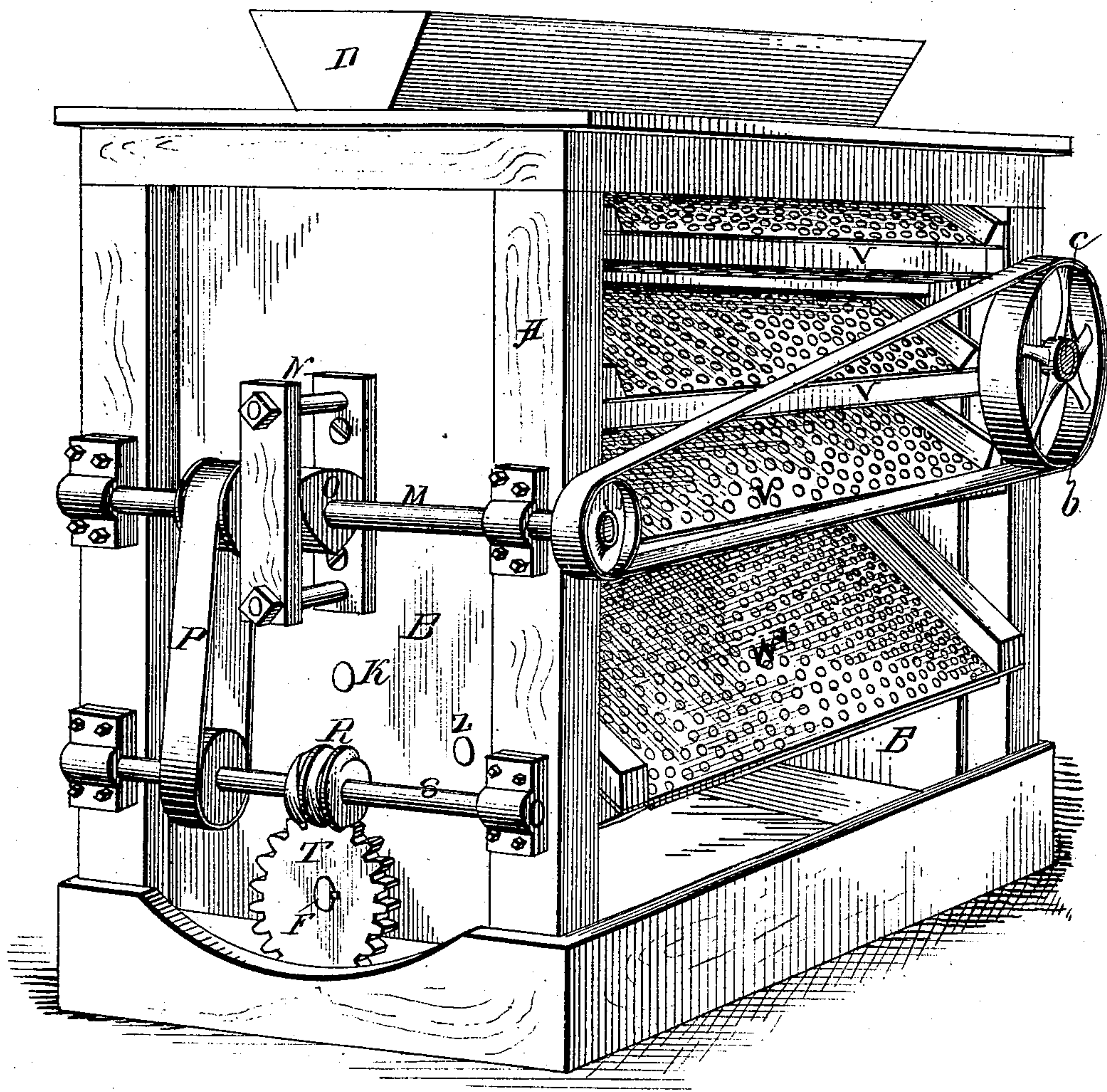
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L. MORGAN.
GRAIN SEPARATOR.

No. 253,550.

Patented Feb. 14, 1882.

Fig. 1.



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(No Model.)

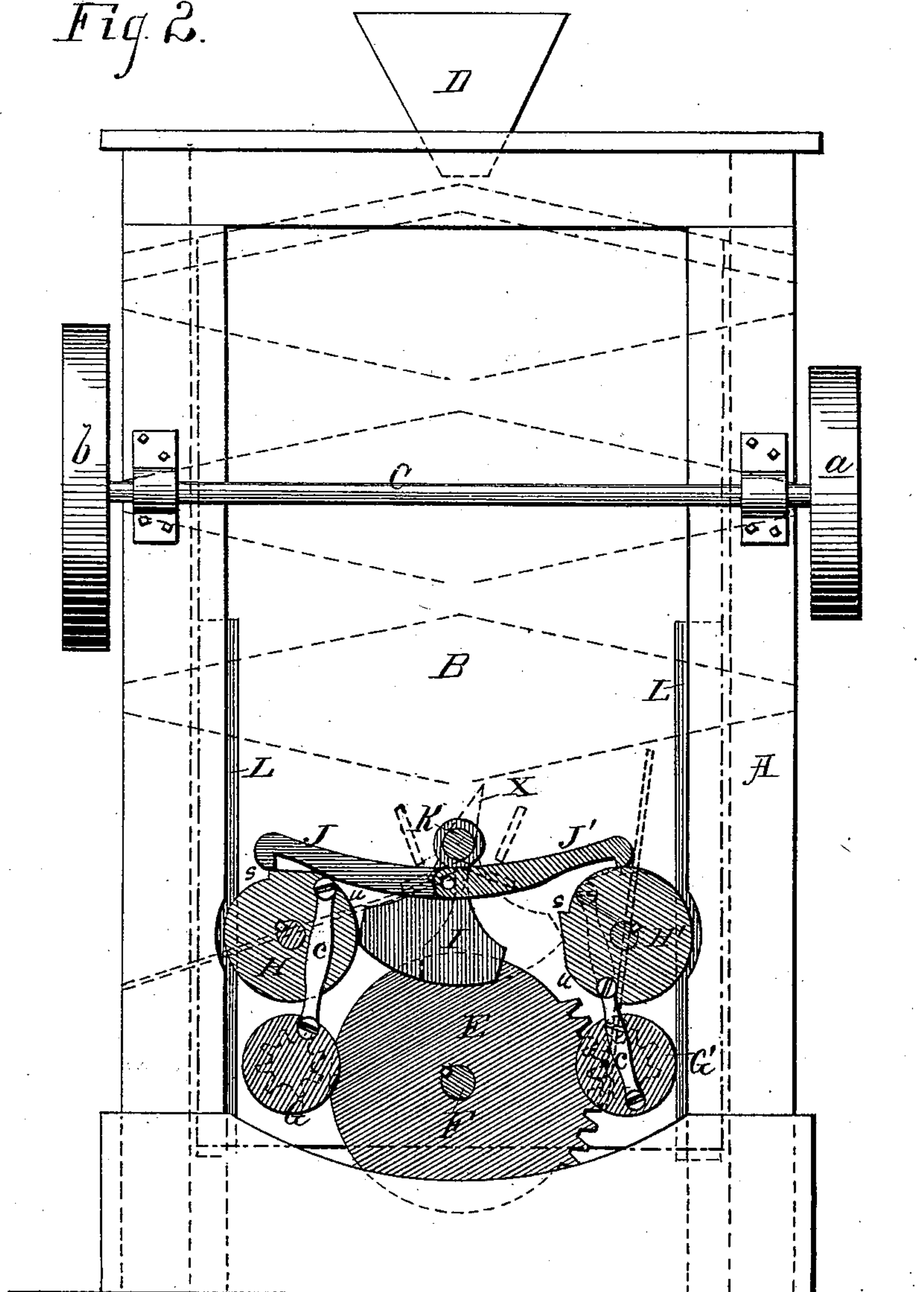
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Fig. 2.



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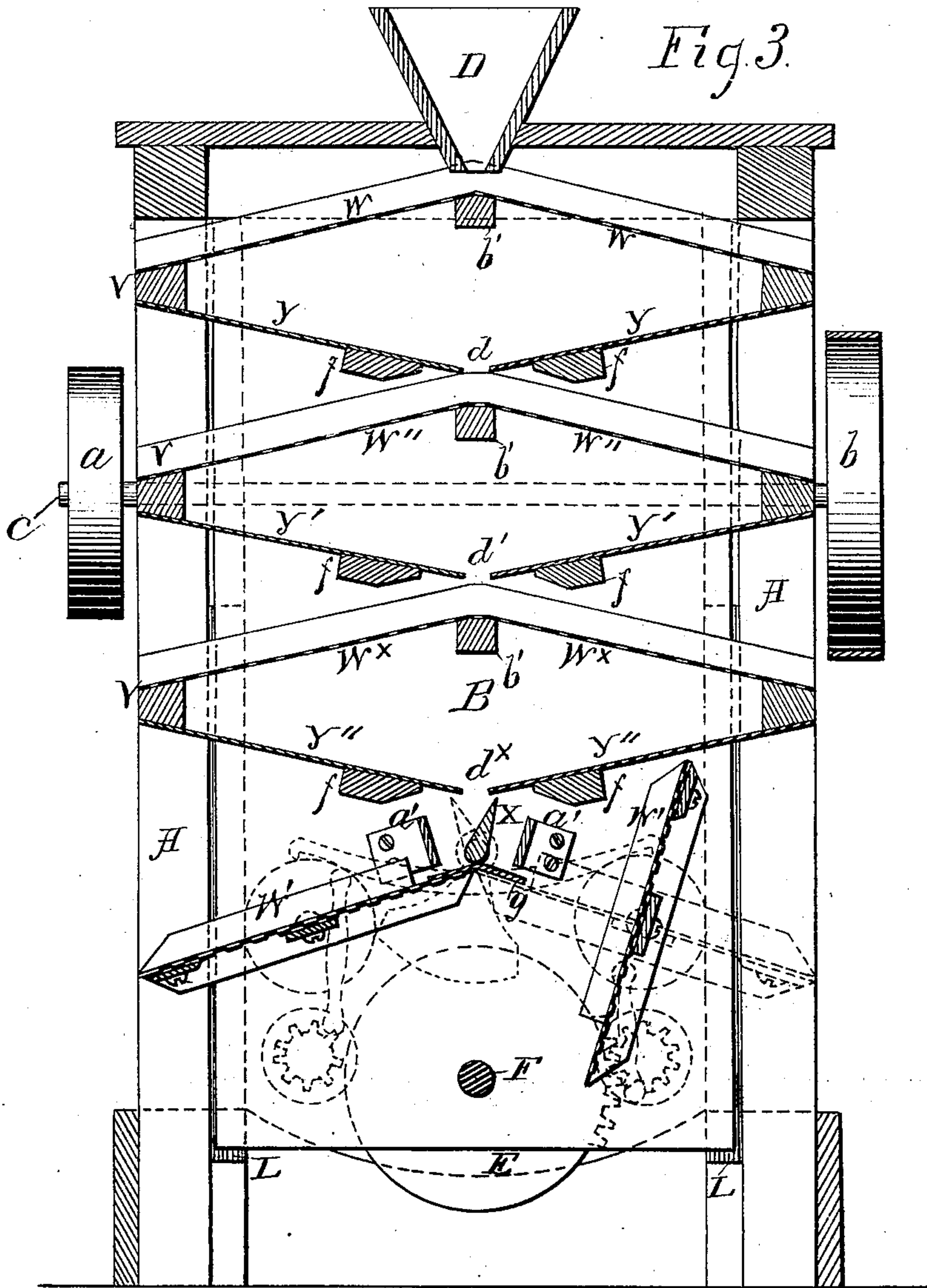
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L. MORGAN.
GRAIN SEPARATOR.

No. 253,550.

Patented Feb. 14, 1882.



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UNITED STATES PATENT OFFICE.

LYMAN MORGAN, OF PORT WASHINGTON, WISCONSIN.

GRAIN-SEPARATOR.

SPECIFICATION forming part of Letters Patent No. 253,550, dated February 14, 1882.

Application filed December 9, 1881. (No model.)

To all whom it may concern:

Be it known that I, LYMAN MORGAN, of Port Washington, in the county of Ozaukee and State of Wisconsin, have invented certain new and useful Improvements in Grain-Separators; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it pertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

My invention relates to grain-separators, or that class of machines which are used to separate wheat or any other grain from the seeds of weeds and other impurities preparatory to grinding.

My invention consists of a novel and greatly-improved construction, arrangement, and combination of the parts of such a machine, whereby the separation desired is accomplished with greater speed, convenience, and certainty.

Similar letters of reference are used to denote like parts throughout the accompanying drawings, in which—

Figure 1 is a view in perspective of my improved machine. Fig. 2 is an end elevation thereof, and Fig. 3 is a transverse vertical section of the same.

A represents the rectangular frame-work of my machine, to the interior of which the shaking frame B is suspended by vibrating pendulum-straps L L, Fig. 2, placed at each of the four corners, and so constructed and attached as to permit a free horizontal reciprocating movement in the direction of its length by frame B for a sufficient distance to shake the riddles properly, and at the same time hold the frame firmly from displacement in other directions.

To the frame-work A is attached, at the top, a hopper, D, placed lengthwise at the center of the machine and opening near the apex of the roof-shaped riddles or screens W W. The upper pair of screens, W W, are formed with large perforations, so as to carry off the coarsest impurities over their sides at V into any proper receptacle arranged for their reception, the grain and remaining impurities passing through the same.

Y Y are floors, inclining downward and inward, which conduct the material falling through the screens W W above them toward the opening d, which is situated directly over the apex of a second pair of screens, W'' W'', with smaller perforations than the upper pair, and which serve in a similar way to remove a finer grade of impurities. The grain falling through screens W'' W'' is conducted by the inclined floors Y' Y' to the apex of another set of screens, W^x W^x, which are usually sufficient to remove all impurities not smaller than the grain to be cleaned, though any required number of screens may be used, and the grain falling through screens W^x remains to be cleaned from cockle, fine seeds, and dirt so small as to pass through any screen with the wheat and so large that the wheat passes through with them. To separate this latter class of impurities I employ the inclined tables W' W', which, instead of being perforated, are indented with shallow hemispherical or cup-shaped depressions, which serve to catch and hold the cockle-seeds and other fine impurities, but permit the longer berries of grain to roll down over their edges into properly-placed receptacles. The method by which these small seed-separators are operated constitutes an important feature of my invention, and I will now proceed to explain it.

At one end of the frame A is placed a shaft, C, journaled in bearings attached to the frame, Fig. 2. On one end is a pulley, a, for connection with the driving-power, and on the other the pulley b, which by means of a belt transmits motion to the shaft M, which by means of the triangular cam O, acting on the slotted connection N, serves to agitate or shake the screens, the inclined floors Y Y·Y' Y' Y'' Y'', and the inclined tables W W W'' W'' W^x W^x and W' W', all of which are attached to shaking frame B. The shaft M, by means of a small pulley and belt, P, serves to drive the shaft S, which at its center is provided with a worm, R, that drives worm-wheel T, attached to shaft F. The shaft F extends through to the opposite end of the machine, and is there provided with the fractional gear-wheel E. The shaft F is journaled in bearings attached to frame B and moves therewith, the worm-wheel T,

which is keyed fast on the shaft F, sliding sufficiently upon the worm R to permit this. To frame B are also attached two small spur-gears, G G', turning on fixed supports placed one on each side of fractional gear-wheel E, and so proportioned as to be turned one complete revolution by the passage of the fractional gear.

H H' are two eccentrics, shaped as shown in Fig. 2, and provided with the projecting catches s s and projections u u. The eccentrics H H' are by means of crank-pins and connecting-rods c c connected with the spur-gears G G'. The cranks on the spur-gears are the shorter, so that while the spur-gears perform a complete revolution the eccentrics are caused to perform a partial revolution, reverse, and return to their former position.

K is a shaft journaled in bearings attached to shaking frame B, and running through it from end to end. To it is attached the long vibrating tongue X, which, as it is turned one way or the other, serves to direct the course of the grain falling through the opening d^x over one of the tables W' or the opposite one. The depending arm I is keyed to the shaft K, and to it are pivoted the links J J', located and attached as shown in Fig. 2, and provided with notches at their extremities, which rest easily upon the rims of the eccentrics H H' and permit the hooks s s to engage them, as will be hereinafter explained. The tables W' W' are attached to and mounted upon journals, which permit of the tables being tilted in the manner shown in Fig. 3, and the eccentrics H H' are keyed to the journals and serve to perform the tilting described.

My invention is designed to operate as follows: The grain to be cleaned (which is usually wheat) is fed into the hopper D and falls in a wide thin stream over the inclined screens W W. The part falling through strikes the inclined floors Y Y, by which it is conducted to the opening d, where it again falls over similar but finer screens, W'' W''. The part falling through the latter is conducted by the inclined floors Y' Y' to the opening d', where it again falls over the still finer screens, W^x W^x. The part passing through these latter then is conducted in a similar manner to the opening d^x, through which it falls, and is by means of the tilting tongue X deflected and thrown over either the right or left hand table W'. The frame B and the screens and indented tables are being constantly shaken endwise by the action of the cam O. The coarser impurities are emptied over the outer edges of the screens, as before described, while the smaller seeds and particles of dirt are caught in the depressions or pockets in the face of tables W' W', which, by reason of their shallowness, refuse lodgment for the grain, that consequently falls off at the outer edge of the

tables W' W' in a cleaned condition. In a short time the indentations would become filled and the tables useless for the purposes designed; but as the intermittent gear E strikes the spur-gear G' it revolves it and causes the eccentric H' to turn sufficiently to tilt the corresponding table W' sufficiently, as shown in Fig. 3, to empty out all the detained seeds and dirt, and put it in a condition for further use and return it to its original condition. Immediately preceding its full return the notched hook s catches the notch on the end of link J' and pulls the arm I over toward the right, thus throwing the tongue X over toward the left and causing the stream of grain to fall over the right-hand or cleaned table. When the arm I is drawn over to the proper point the projection u on the eccentric H' lifts the link J' out of contact with hook s, and the parts mentioned remain in place until the next revolution of intermittent gear E is accomplished. The gear G, eccentric H, link J, and left-hand table W' act in a similar manner, the tables tipping alternately to clean themselves, and the stream of grain being directed alternately from side to side.

It is not necessary that the precise number of tables or screens or the precise method of attaching the driving mechanism shown by me should be used; but I have given the construction which I prefer.

I claim—

1. In a grain-separator, the combination of one or more sets of screens, W, W'', &c., with the automatic tilting indented table W', arranged to catch the smaller impurities and detain and empty them automatically during the movement of the machine, and mechanism suitable for operating the same, substantially as and for the purposes set forth.
2. In a grain-separator, the combination of the two tilting indented tables W' W' and the vibrating tongue X, serving to direct the stream of grain over each alternately, substantially as and for the purposes set forth.
3. The combination of the intermittent gear E, spur-gears G G', eccentrics H H', links J J', and arm I, tongue X, and links c c, substantially as and for the purposes set forth.
4. The combination of shaft S, worm R, worm-wheel T, intermittent gear E, spur-gears G and G', eccentrics H and H', connecting-rods c c, arm I, links J and J', tilting indented tables W' W', and tongue X, substantially as and for the purposes set forth.

In testimony that I claim the foregoing as my own I affix my signature in presence of two witnesses.

LYMAN MORGAN.

Witnesses:

E. H. BOTTUM,
F. H. BOTTUM.