

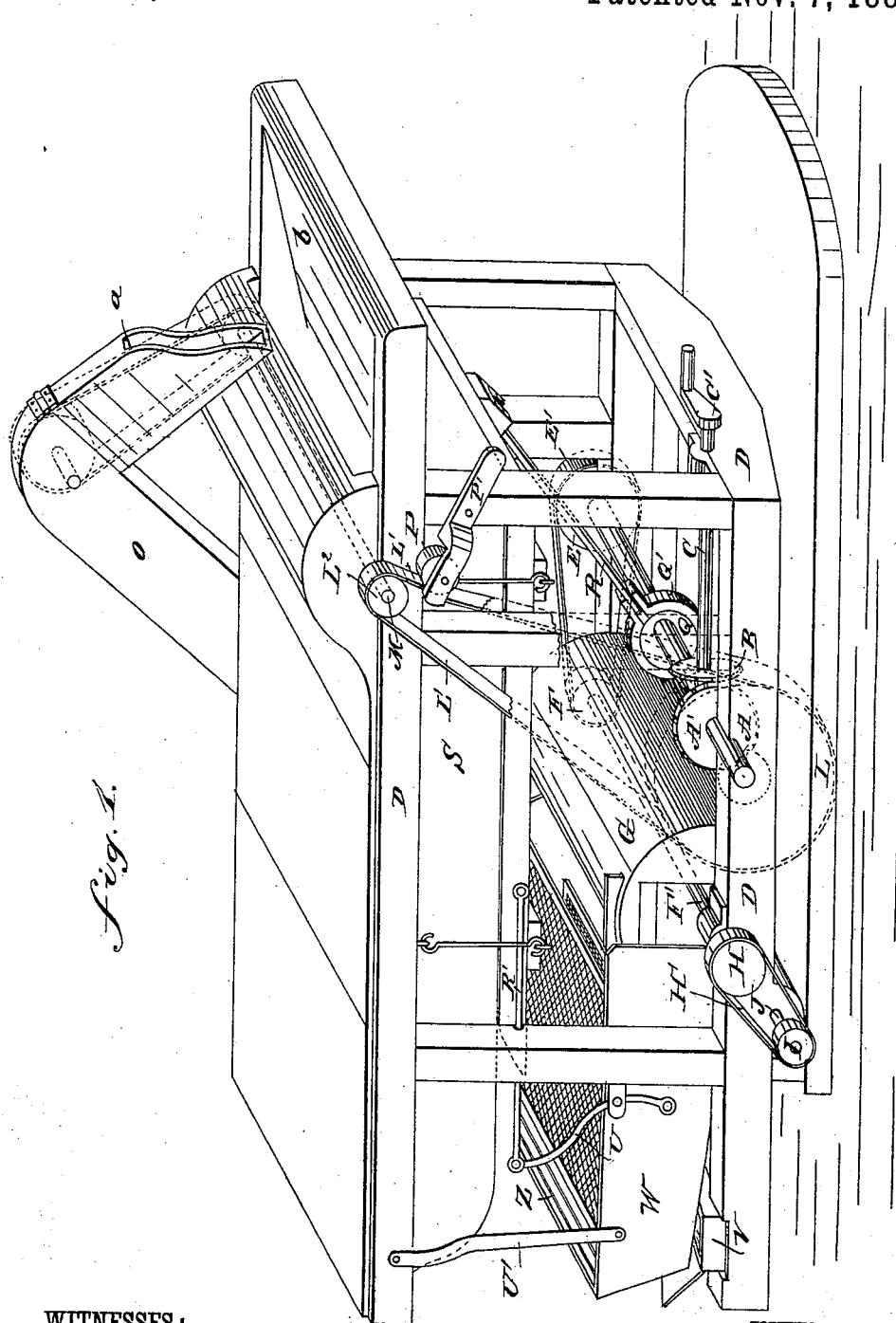
(No Model.)

2 Sheets—Sheet 1.

W. N. SMITH.  
GRAIN SEPARATOR.

No. 267,270.

Patented Nov. 7, 1882.



WITNESSES:

*Wm. Beyer*  
*C. Sedgwick*

INVENTOR:

*W. N. Smith*  
BY *Munn & Co*  
ATTORNEYS.

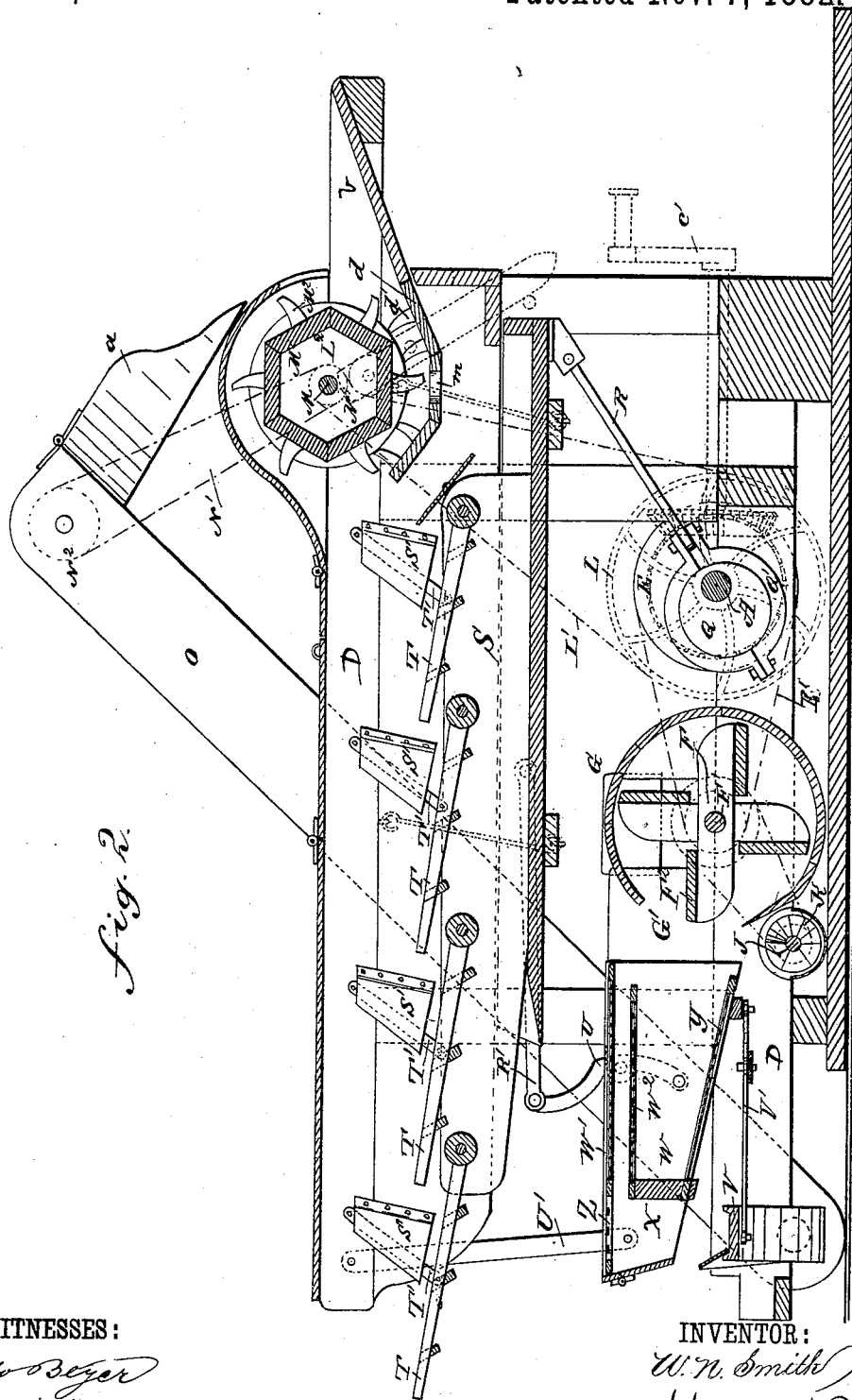
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# UNITED STATES PATENT OFFICE.

WILLIAM N. SMITH, OF BROOKFIELD, MICHIGAN.

## GRAIN-SEPARATOR.

SPECIFICATION forming part of Letters Patent No. 267,270, dated November 7, 1882.

Application filed August 1, 1882. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM N. SMITH, of Brookfield, in the county of Huron and State of Michigan, have invented a new and Improved Grain-Separator, of which the following is a full, clear, and exact description.

The object of my invention is to provide a new and improved separator for separating grain from chaff, and for cleaning all kinds of grains and seeds.

The invention consists in the peculiar construction and arrangement of parts as herein-after fully described, and pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar letters of reference indicate corresponding parts in both the figures.

Figure 1 is a perspective view of my improved grain-separator. Fig. 2 is a longitudinal sectional elevation of the same.

The characteristic feature of this machine is that a single driving-shaft is used to operate the entire mechanism, which driving-shaft is located in the front part of the machine and at the bottom of the same. This transverse horizontal shaft A, which is suitably journaled in the frame D, is provided at one end with a beveled cog-wheel, A', which engages in a beveled cog-wheel, B, at the end of a horizontal shaft, C, journaled in the frame D, which shaft C is provided at its outer end with a crank-handle, C', or a belt-pulley. At one end the shaft A is provided with a belt-pulley, E, over which a belt, E', passes, which also passes over a small driving-pulley, F, mounted on one end of the horizontal transverse shaft F', on which the blades F<sup>2</sup> of a fan or blower, G, are mounted. At its opposite end this shaft F' is provided with a belt-pulley, H, over which a belt, H', passes, which also passes over a belt-pulley, I, mounted on one end of a conveyer-shaft, J, on which shaft J the screw-blades of a conveyer, K, are mounted. On the shaft A is also mounted a belt-pulley, L, over which a belt, L', passes, which also passes over a belt-pulley, L<sup>2</sup>, mounted on one end of the shaft M of the thrashing or hulling cylinder M', provided with studs or prongs M<sup>2</sup>. On the opposite end of the shaft M is mounted a belt-pul-

ley, N, over which passes a belt, N', which also passes over a pulley, N<sup>2</sup>, at the upper end of an inclined elevator-shaft, O, containing an endless belt provided with cross-pieces or buckets, which belt passes over suitable pulleys in the elevator-shaft O.

A roller, P, pivoted in the outer end of a lever, P', hinged to the frame D, rests against the belt L', and can be used to tighten this belt by adjusting this lever P' in such a manner that the pulley P presses against the belt L' with a greater or less pressure. A wheel or disk, Q, is mounted eccentrically on the shaft A, and is surrounded by a ring, Q', connected by a rod, R, with a horizontally-vibrating frame, S, which is suitably hung in the frame D. In the vibrating frame S a series of shakers, T, are pivoted, and rods T', pivoted to these shakers, are also pivoted to the frame D, whereby, when the vibrating frame S is operated, the shakers T will be moved up and down. Metal boxes or pockets S' are placed over these rocking connecting-rods T'. The levers U, pivoted at or near the middle to the standards of the frame D, have the lower ends pivoted to a box, W, containing riddles W' and W<sup>2</sup>, which box W is suspended at the outer end on the frame D by means of rods U'. The upper ends of the levers U are connected by means of rods R' with the vibrating frame S.

An inclined transverse gutter or chute, V, is held below the outer end of the box W, and is reciprocated in the direction of its length by an angle-lever, V', connected with this chute V and with the box W. The lower end of this reciprocating chute V extends into the lower end of the inclined elevator or tube O. The bottom of the box W is formed with a riddle, Y; but near the outer end a transverse passage, X, is formed in the box W, through which the coarse particles of seeds, grain, &c., can fall directly through the coarser meshes of the sieve or riddle Z into the chute V.

The elevator O is provided at its upper end with a hinged spout, a, which conducts the grain, seeds, &c., raised by the elevator-belt upon the hopper b, from which they pass between the thrashing-cylinder M' and the concave d, provided with the studs or teeth d'.

The operation is as follows: The grain to be

thrashed, the seed to be cleaned, &c., is placed on the hopper *b*, and is acted upon by the thrashing or hulling cylinder *M'*, and the straw, chaff, &c., pass upon the shakers *T*, and  
 5 some of the seeds drop through the aperture *m* in the concave *d* upon the bottom of the vibrating frame *S*. The seeds, chaff, &c., contained in the straw or held on the shakers *T* will drop from the same, as the shakers are  
 10 continually agitated by the action of the eccentric *Q* on the rod *R*. The seeds, grain, &c., gradually move along the bottom of the vibrating frame *S* toward the rear end of the machine, and drop from the same upon the  
 15 riddle *W'*. Some parts pass through this riddle upon the riddle *W*<sup>2</sup>, and the finest particles—the seeds, &c.—drop through this riddle upon the riddle *Y*. The good grain or seeds drop from the lower end of the same into the  
 20 case of the screw-conveyer *K*, and by the same are carried to one side of the machine into a suitable box, bag, or receptacle, the fine dust, &c., falling through the perforations of the casing of the conveyer to the floor. The seeds  
 25 that have not been hulled and other coarse matter drop through the coarse sieve *Z* and over the end of the sieve *W*<sup>2</sup> upon the vibrating chute *V*, and by the same are conducted to the lower end of the elevator-casing  
 30 *O*, the belt of which passes them upward into the spout *a*, through which they pass on the hopper *b*, and then pass through the machine again in the manner described. While dropping from the riddle *W'* upon the  
 35 riddles *W*<sup>2</sup> and *Y* the seeds and other matter are exposed to a very powerful draft issuing from the longitudinal aperture *G'* of the blower *G*, which draft carries off the light particles and chaff, so that only the heavy, rich seeds  
 40 remain, which drop into the screw-conveyer *K*.

It will be seen that the movements of all the main parts of this separator are in the horizontal line of the machine, and that the same

is all derived from one main shaft located in the under forward part of the machine.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. In a separator, the combination, with the supporting-frame, the horizontally-vibrating frame *S*, of the shakers *T*, pivoted therein, and the rods *T'*, pivoted to these shakers and to the frame *D*, substantially as herein shown and described, and for the purpose set forth.

2. In a separator, the combination, with the frame *D* and the shaft *A*, of the eccentric disk *Q*, the sleeve *Q'*, the rod *R*, the frame *S*, the pivoted shakers *T*, and the rods *T'*, substantially as and for the purpose set forth.

3. In a separator, the combination, with the frame *S* and means, substantially as described, for vibrating the same, of the box *W*, provided with sieves *W'* *W*<sup>2</sup> *Z*, the rocking levers *U*, the connecting-rod *R'*, and the suspension-rod *U'*, substantially as and for the purpose set forth.

4. In a separator, the combination, with the frame *S* and means, substantially as shown and described, for vibrating the same, of the suspended box *W*, provided with the screens *W'* *W*<sup>2</sup> *Z*, the rocking levers *U*, the connecting-rod *R'*, the chute *V*, and the angle-lever *V'*, pivoted to the said box and chute, substantially as and for the purpose set forth.

5. In a separator, the combination, with the vibrating frame *S*, provided with the shakers *T*, the screen suspended box *W*, and the reciprocating chute *V*, of the conveyer *J*, arranged under the lower end of the said screen-box, the blower *G*, and mechanism, substantially as shown and described, for operating the whole from a single shaft, as and for the purpose set forth.

WILLIAM N. SMITH.

Witnesses:

OLIN PENGRA,  
 RICH. MARTINI.