D. O. HARSHMAN.

Grain-Separator.

No. 206,446. Patented July 30, 1878.

Fig. 1.

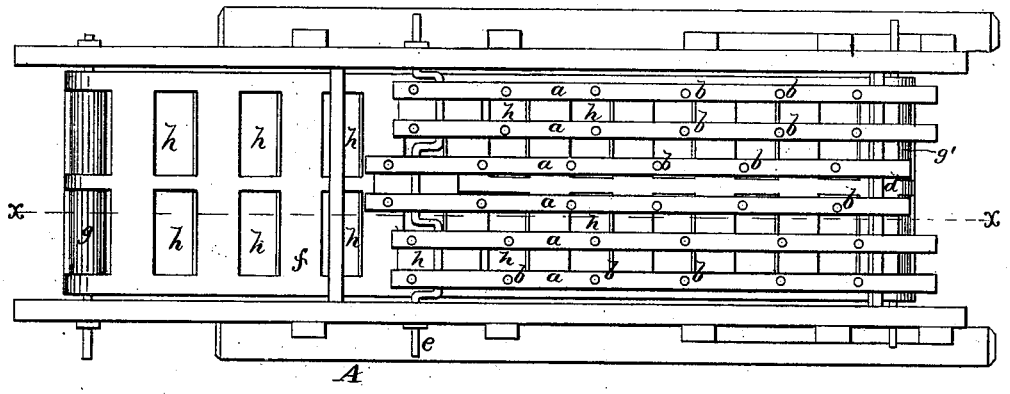


Fig. 2.

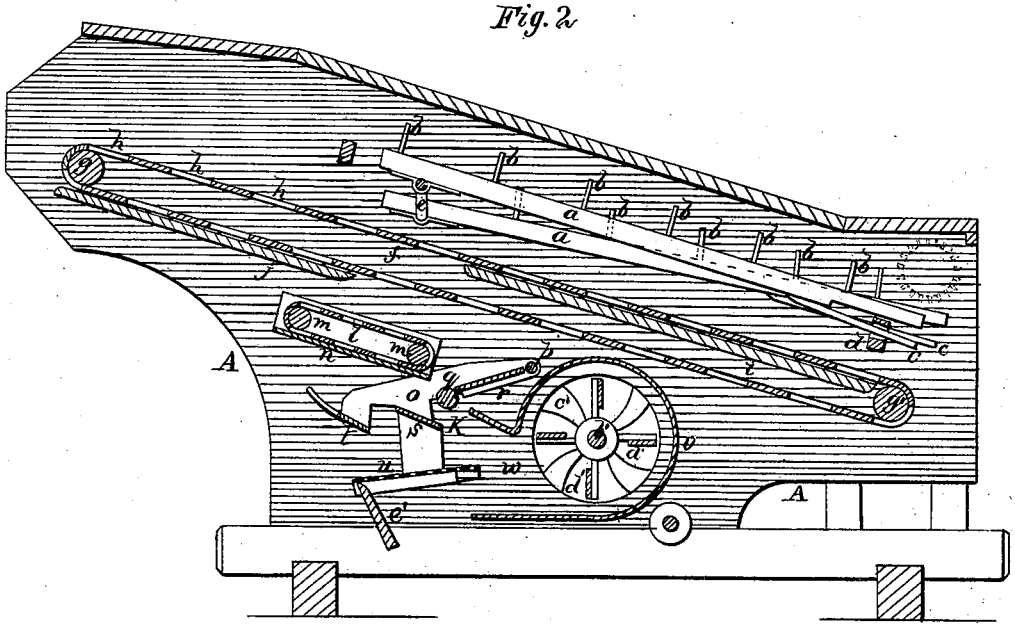
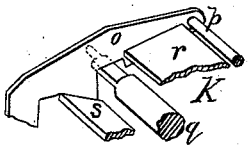


Fig. 3.



WITNESSES:

Henry N. Miller

C. Sedgwick

INVENTOR:

D. O. Harshman

BY Munn & Co

ATTORNEYS.

UNITED STATES PATENT OFFICE.

DANIEL O. HARSHMAN, OF SHANNON, ILLINOIS.

IMPROVEMENT IN GRAIN-SEPARATORS.

Specification forming part of Letters Patent No. **206,446**, dated July 30, 1878; application filed April 23, 1878.

To all whom it may concern:

Be it known that I, DANIEL O. HARSHMAN, of Shannon, in the county of Carroll and State of Illinois, have invented a new and Improved Thrashing-Machine, of which the following is a specification:

Figure 1 is a plan view of my improved thrashing-machine with the top removed to show the internal construction. Fig. 2 is a vertical longitudinal section taken on line *x x* in Fig. 1. Fig. 3 is a detail view of the shaking device.

Similar letters of reference indicate corresponding parts.

The invention is an improvement in that class of thrashing-machines in which a series of rakes having a reciprocating and rising-and-falling movement are employed in connection with an endless traveling apron or carrier.

My improvement relates to the combination and arrangement of parts, as hereinafter described and claimed.

Referring to the drawing, A is the frame of the thrasher, which contains a thrashing-cylinder of the usual construction. *a a* indicate a series of parallel rake-bars having teeth *b*, and supported at their lower ends by guide-bars *c*, that work in holes in a cross-bar, *d*. The upper ends of the rake-bars *a* are attached in pairs to the cranks of a shaft, *e*, whose rotation imparts to them a circular reciprocating motion, the several pairs rising and falling in succession alternately. The rake-bars *a* are inclined at a slight angle, and are about half the length of the endless apron or carrier *f*, over the lower end of which they are located. The said apron passes around rollers *g g'*, and its upper side travels in the upward direction. A board, *i*, is placed under the lower end of the upper portion of the apron, and a board, *j*, under the upper end of the lower portion. The aggregate length of the two boards *i j* is less than the length of the apron *f*, so that a clear space is left between them for passage of the grain. The upper ends of the rake-bars *a a* are directly over this space, between the boards *i j*, from which arrangement the following operation results:

The rake-bars *a* carry along the straw as it comes from the cylinder, and deliver it upon the apron F, directly over the space between the boards *i j*. In doing this they shake out a portion of the thrashed grain mingled with the straw, and it falls, through the holes *h* in the apron, upon the board *j*, and, being carried along by the apron and pushed off the upper edge of the board, drops upon the shaking-shoe *k*. The straw thus deposited on the apron *f* is by it carried upward and delivered at the end of the machine, and the grain still mingled with it as it leaves the rake will, in such movement, fall through the apron upon the board *j*, from which the downward movement of the apron will remove it, and thus cause it to be delivered upon shoe *k*. Below that portion of the apron *f* upon which the rakes deliver the straw is located a short apron, *l*, which travels in the same direction as the longer one. A board, *n*, is placed under said apron *l*. The chief function of the apron *l* is to intercept or receive such pieces of straw as may chance to fall through the carrier *f*, and, by carrying them toward the rear end of the machine, prevent them passing onto the shoe *k*. The said apron also carries back to the shoe *k* the grain which falls through it onto board *n*.

The shaking-shoe *k* consists of two similar side pieces, *o*, which are pivoted to the thrasher-frame at *p* and rest upon a shaft, *q*, which is journaled in the thrasher-frame A, and is flattened on two sides at each end, so that when it revolves it shakes the shoe.

Three grain-boards, *r s t*, are secured between the side pieces *o*. The board *r* is inclined downward toward the rear of the machine, and the boards *s t* incline downward toward the front of the machine, and all three of the boards are arranged to deliver the grain that falls on them to the screen *u*, which is supported by the side pieces *o*, and is inclined downward toward the rear of the machine. The board *t* is provided with rearwardly-projecting finger *t'*. A cylindrical fan-casing, *v*, is placed below the endless apron *f* in the frame A, and is provided with wide discharge-opening *w*, which is directed toward the screen *u* and grain-boards *s t*. A fan, *a'*, is placed in the casing *v*, and its shaft *b'* is journaled in apertured plates *c'*, that are secured to the sides of the frame A, over the circular openings *d'* at the end of the fan-casing. Below the rear end of the screen *u* there is a board, *e'*, for prevent-

ing the light seeds that drop through the screen from being blown into the grain that drops from the rear edge of the screen.

The great advantage claimed for my improvement is that grain of every sort may be separated from its straw, whether the straw be wet or dry.

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

1. In a thrashing-machine, the combination of the carrier or apron *f*, whose upper lay travels in an upward direction, and the grain-gathering boards *i j*, located, respectively, under the lower portion of the upper lay and upper portion of the lower lay of said carrier, and the rakes *a a*, the upper ends of which terminate over that portion of the carrier *f* which extends between the separated inner ends of boards *i j*, all as shown and described, for the purpose specified.

2. In a thrashing-machine, the combination, with the shoe *k*, the carrier *f*, and boards *i j*, of the short apron *l* and its board *n*, the latter two being located beneath that portion of the carrier which spans the space between the boards *i j*, as and for the purpose specified.

DANIEL OLIVER HARSHMAN.

Witnesses:
R. M. COOK,
PETER SPEENBURGH.