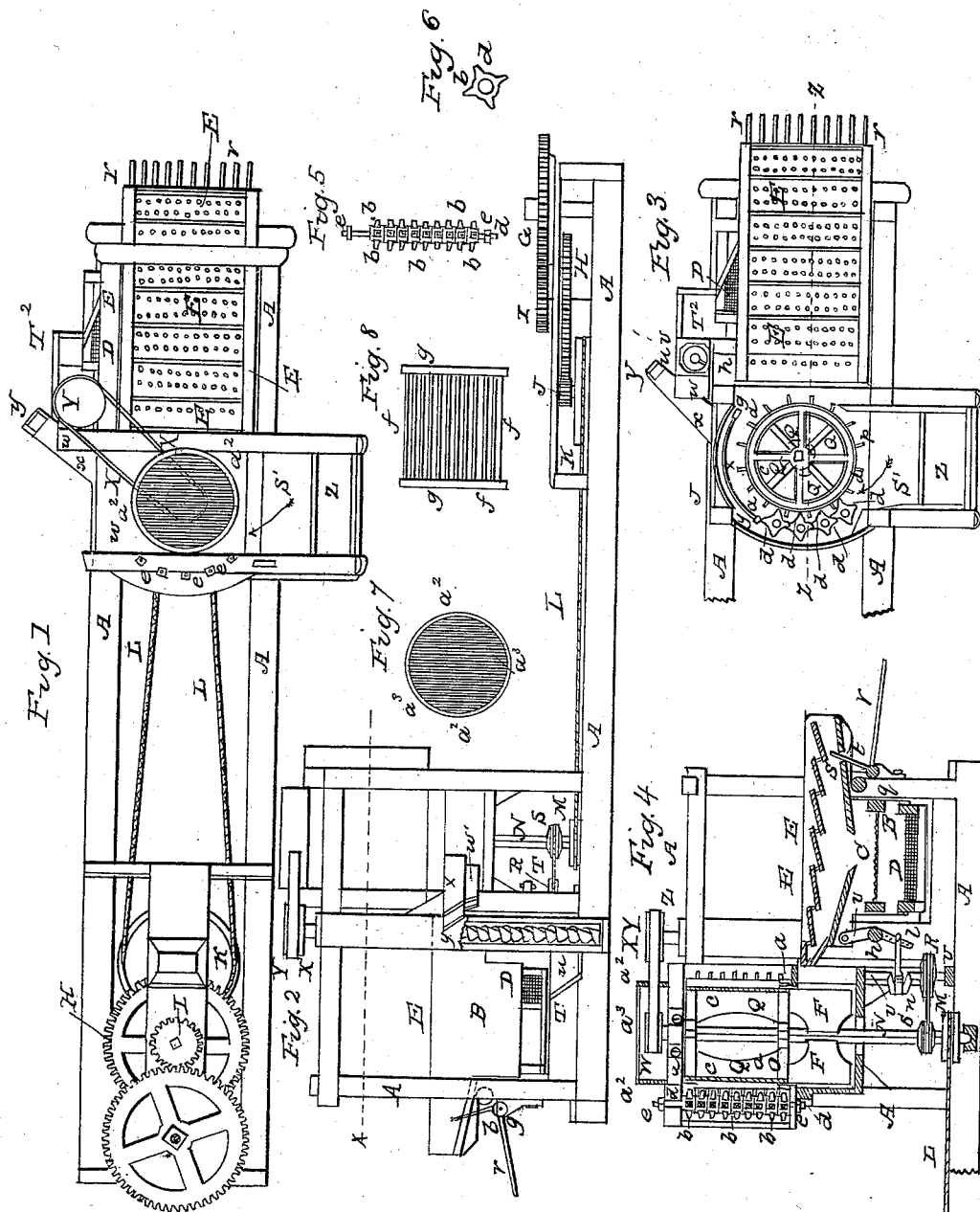


E. S. SNYDER.
Thrashing Machine.

No. 7,430.

Patented June 11, 1850.



UNITED STATES PATENT OFFICE.

ELISHA S. SNYDER, OF CHARLESTOWN, VIRGINIA.

IMPROVEMENT IN THRASHING-MACHINES.

Specification forming part of Letters Patent No. 7,420, dated June 11, 1850.

To all whom it may concern:

Be it known that I, ELISHA S. SNYDER, of Charlestown, Jefferson county, and State of Virginia, have invented a new and useful improvement, being a Machine for Thrashing, Separating, Winnowing, Elevating, and Bagging Grain; and I do hereby declare the following to be a full, clear, and exact description of the construction and operation thereof, reference being had to the annexed drawings, making part of this specification.

Figure 1 a top view or plan of the machine. Fig. 2 is a side elevation of the same, the elevator being exposed. Fig. 3 is a horizontal section on the dotted plane *xx* of Fig. 2. Fig. 4 is a vertical longitudinal section on the dotted plane *zz* of Fig. 3. Fig. 5 is an elevation of one of the rods of adjustable teeth detached from the concave, in order to show the relative position of teeth thereon. Fig. 6 is a plan of one of the teeth. Fig. 7 is a plan of the wire guard, to cover the opening in the cylinder and fan-case. Fig. 8 is a plan of the curved spring rack or grating.

Similar letters on the several figures refer to corresponding parts.

The frame A, the shoe B, containing the riddle and screen C D and separator E, the fan F, the cog-wheels G H, and pinions I J, and pulley K, constituting the propelling power, and the endless band L and driving-pulley M on the cylinder-shaft N, may be made and arranged as represented or in any other convenient way.

The improvements that I have invented consist in making the thrashing-cylinder with curved wings inside the cylinder and moving with it, and so formed as to act as a fan for the purpose of drawing the dust from the hopper, wherein the feeder stands, and from the upper part of the machine, and blowing or forcing it out with the chaff, or through a suitable way formed in some convenient part of the machine, and for forcing currents of air through the spaces between the ordinary riddle and screen, to carry off the dust, chaff, and other filth mixed with the wheat as the latter passes through the separator and riddle and over the screen, the air being drawn in at one end of the cylinder and forced out at the other end, and thence driven horizontally or obliquely, or in any required direction through the separating and cleaning part of the machine; also,

in forming the concave in which the cylinder revolves of adjustable star or other shaped teeth, perforated in the center and strung upon rods secured in the timbers of the frame by nuts or other means, so that when a point or protuberance of any one of the teeth wears off or becomes broken it can be turned on the rod and again secured by the nuts. Likewise, in forming a spring-grating for separating the straw from the grain before passing onto the separator, and arranging the same in the space between the concave and the separator; also, the manner of combining and arranging a rock-shaft, arms, and connecting-rod for increasing or diminishing the motion of the shoe containing the separator; also, the arrangement of a vibrating rack at the end of the separator for throwing the straw off at the rear of the machine; also, combining an elevator with the separator for raising and dropping the grain after leaving the screen into an inclined spout, where it is subjected to the action of another current of air, by which the remaining dust is blown from it previous to its descent into the bag or receiver; and, also, in the employment of a wire guard or screen to prevent the entrance of straw, sticks, stones, and other extraneous matters into the center of the cylinder.

The cylinder for thrashing the grain from the straw is composed of two open or skeleton heads, O O, having any required number of beaters, P, arranged over their peripheries and let into notches in the same, and secured thereto by strong iron bands or rings *a*, and armed with teeth or pins in the usual manner, and lined on the inside by a cylinder of sheet-iron, *c*, wood, or other suitable material, open at both ends, in which the curved wings Q are placed and secured for producing the currents of air through the same, and thence through the separator E, the shaft N passing through the center of said heads O and turning in bearings or a cross-sill and a cap of the frame, and being provided with suitable pulleys, M S, to receive the band L, leading to the propelling-power, and a band, T, leading to a pulley, R, on the crank-shaft U, for shaking the separator E, and a pulley, W, for a strap, X, that leads to a pulley, Y, on the upper end of the elevator-shaft Z. The concave in which the cylinder revolves, and between which the straw is carried by the rotation of the cylinder, may

be said to consist of a series of star or other shaped teeth, *b*, having openings in their center, and strung or secured upon rods *d*, arranged in a circle concentric to that of the cylinder in such manner as to present alternate concave and convex surfaces, against which the straw is forced and carried over the entire surface thereof, by which a complete and thorough separation of the grain from the straw is produced without breaking or injuring the grain. These peculiar-shaped teeth *b* are confined upon the rods *d* in such manner as to admit of being adjusted or turned should it so happen that one of the points or protuberances thereon shall have been broken or worn off, in order to supply its place by another point or protuberance, by simply loosening the nut on the rod *d*, on which it is confined, and turning the tooth till another point or protuberance thereon shall project adjacent to the cylinder, and thus the protuberances of the concave are always regular and uniform in relation to the pins of the beaters *P*, which are made to pass between the spaces formed horizontally by the points or protuberances of the teeth. The ends of the rods *d*, on which the adjustive teeth are confined, are provided with screw-threads, to receive nuts or burrs *e*, which respectively screw upon and against the top and bottom of the casing of the concave, by which the teeth *b* are held thereon, one upon and against the other, so that they cannot be deranged or turned on the rod by the resistance of the straw during the operation. This peculiarly-constructed concave of many-pointed or star-shaped adjustive teeth possesses advantages that may be readily seen, and presents a surface in connection with the thrashing-cylinder that cannot fail to effect a complete separation of the grain from the straw, and at the same time clear itself of obstructions, and prevents any straw accumulating around the teeth thereof.

The spring-grating for partially separating the grain from the straw before passing on to the separator consists of a series of wire curved rods or bars, *f*, arranged parallel to each other, and having their ends secured into bars or strips *g*. This spring grating or rack is placed in the cylinder-case, or space between the cylinder and separator, in such a manner as to present a spring-concave adjacent to the cylinder, against which the straw and grain are thrown by the cylinder after having been thrashed, by which the grain is partially separated from the straw, (instead of passing the whole mass on to the separator, as heretofore,) by which the separation of the grain from the straw is rendered more effectual and in less time than is usually required, the spring-grating being so arranged in connection with the concave of adjustive teeth as to partially separate the grain from the straw before being thrown upon the vibrating separator. This feature in the machine—viz., that of producing a partial separation of the grain from the straw in its passage to the vibrating separator—

is deemed important and useful, as it not only facilitates the separation, but saves much of the grain that otherwise would pass off at the end of the separator with the straw.

The manner of increasing and diminishing the motion of the separator, in order to throw or feed the straw over its inclined perforated and grated bars faster or slower, according to the state thereof, is produced as follows, to wit: I arrange a rock-shaft, *h*, horizontally and transversely beneath the inner end of the separator *E*, (whose gudgeons turn in bearings in the frame,) and connected to the separator by two arms, *i*, projecting therefrom near the ends thereof, and from the center of said rock-shaft there projects downward an arm, *j*, provided with holes, to which is attached, by a pin, *l*, a connecting-rod, *m*, which is fixed to and receives a vibratory motion from a crank, *n*, on a shaft, *U*, secured in bearings in the frame nearly midway between the axis of the thrashing-cylinder and rock-shaft *h*, there being also a pulley, *R*, on said crank-shaft *U*, to receive a band, *T*, from the pulley *s* on the cylinder-shaft *N*. It will be apparent that by withdrawing the pin *l* and moving the end of the connecting-rod nearer to or farther from the rock-shaft *h*, and securing the pin *l* in any one of the holes in the arm *j*, that the sweep or movement of the arms *i* will be increased or diminished, and thus will the vibratory movement of the separator be increased or diminished to accomplish the object before mentioned, the increased or diminished movement of the separator corresponding in its effect to the condition of the straw, and necessarily facilitates a thorough separation.

The vibrating hand or rake placed directly below the discharging end of the separator, for the purpose of throwing the straw to a distance from the end of the same, consists of a shaft or bar, *q*, placed horizontally and transversely at the end of the frame and secured in bearings fixed thereto, from which project outwardly fingers or bars *r* of a suitable length; and from this shaft also projects upward through a mortise, *s*, in the bottom board of the separator, an arm, *t*, which serves as an attachment thereto, by which the shaft is rocked as the separator is vibrated.

The elevator *u*, combined with the separator, is placed vertically in a suitable case, *v*, in such a position as to receive the grain as it is discharged from the inclined screen *D*, and elevate it to a branch discharging-spout, *w*, to the mouth *w'*, Fig. 2, of which the bag or grain-receiver is attached. Intersecting this discharging-spout *w* there is a horizontal spout, *x*, leading from the fan-case below the cylinder, through which a current of air constantly passes, meeting the grain as it is discharged, and subjecting it to another effectual blowing or cleaning, by which all the remaining dust and lighter particles are blown through the opening *y* into the air, while the grain descends to the bag through an opening in the spout *w'*. The shaft *z* of the conveyer or elevator *u*, ex-

tending upward to receive a pulley, Y, around which the band X, leading from the pulley W, on the upper end of the cylinder-shaft, passes to communicate motion to the conveyer or elevator *u*.

In order to prevent the entrance of straw, sticks, and other substances to the interior of the thrashing-cylinder, which might by accident be thrown upon the top during the operation of the machine, and at the same time not impede the admission of air therein for the purpose stated, I place over the opening in the case, directly over the upper end of the cylinder, a wire screen, consisting of a circular hoop, *a*², provided with parallel wire rods *a*³, said hoop being sufficiently deep to allow the pulley W to revolve therein, the strap therefrom passing through slits in said hoop, and leading to the pulley Y.

The operation of the several parts having been described in connection with the construction thereof, a few words will suffice in order to a more clear understanding of the same. The machine being put in motion by any adequate power applied to the gears G H I K L, the feeder standing in the hopper Z takes a bundle of straw and unties it, and places it upon the inclined conducting-board S' and feeds it to the cylinder of beaters, which, revolving at a quick speed, strikes and carries it through and between the teeth of the concave, and thence throws it violently against the spring-concave, by which the grain, after having been severed from the straw, is partly separated from the straw and chaff, and by the rotation of the cylinder is thrown upon the separator, where it is separated in

the usual manner and dropped upon the riddle and screen, and subjected to a full current of wind down through the cylinder by the curved wings and from the fan, when it is discharged into the trough T² to be elevated, and subjected to another current of wind directly from the fan F in its descent to the bag or receiver.

Having thus described the construction and operation of my machine, what I claim as my invention, and desire to secure by Letters Patent, is—

1. Surrounding the twisted wings with an imperforated case, and placing the same inside the thrashing-cylinder, the whole revolving together in the manner and for the purpose set forth.

2. Constructing the concave of adjustable star or other shaped teeth attached to rods fastened to the frame, substantially as described and set forth in the specification.

Disclaimer.—I am aware that such teeth have been used in the throat of a feeding apparatus of a corn-sheller to aid in feeding, and therefore I only claim them when used for the rubbing-surface of the concave.

3. Placing the curved spring-rack between the concave of adjustable teeth and the vibrating separator in the manner and for the purpose described.

In testimony whereof I have hereunto signed my name before two subscribing witnesses.

ELISHA S. SNYDER.

Witnesses:

WM. P. ELLIOT,
LUND WASHINGTON.