BECKER & HARVEY.

Thrashing Machine.

No. 21,111. Patented Aug. 10, 1858

Fig: 1.

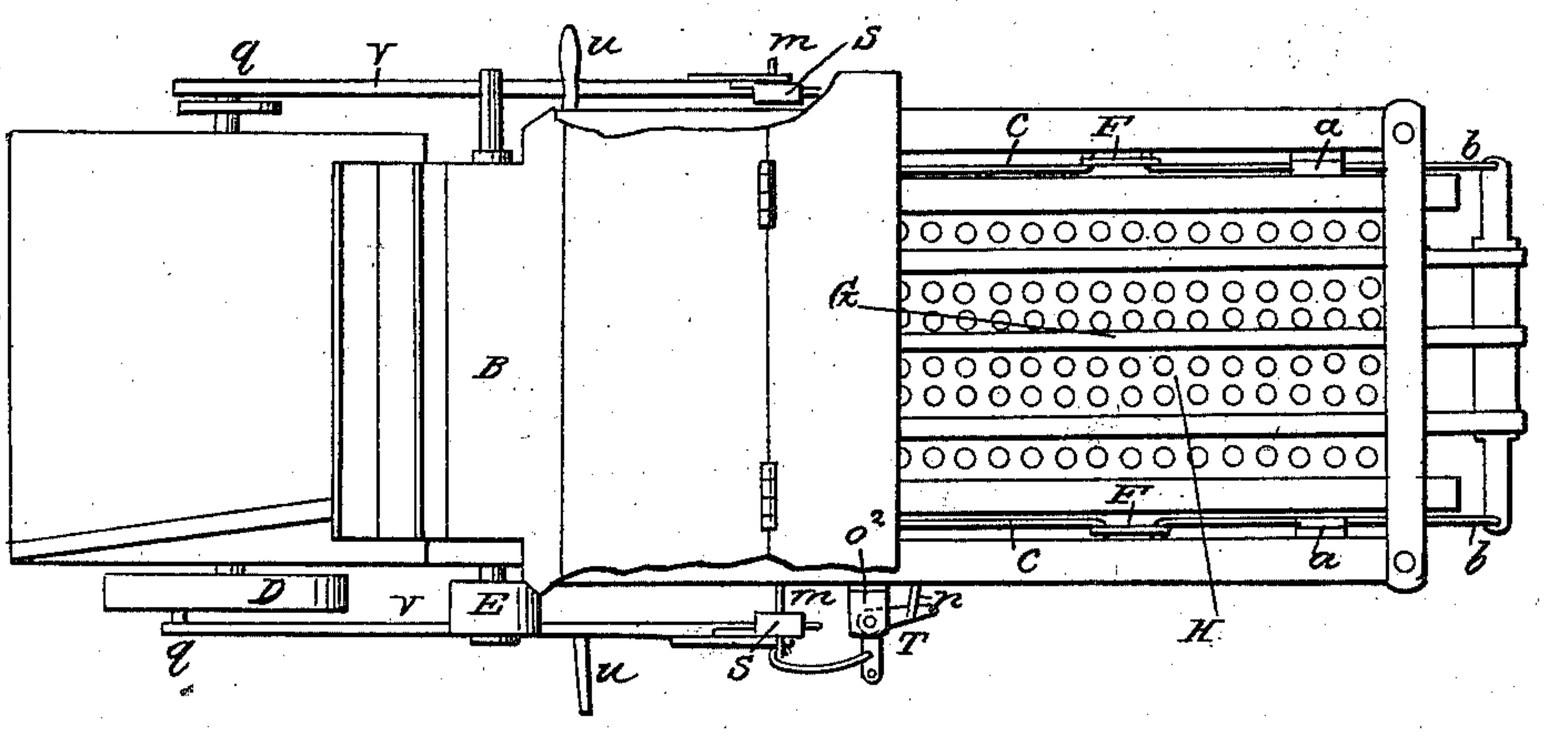


Fig: 2.

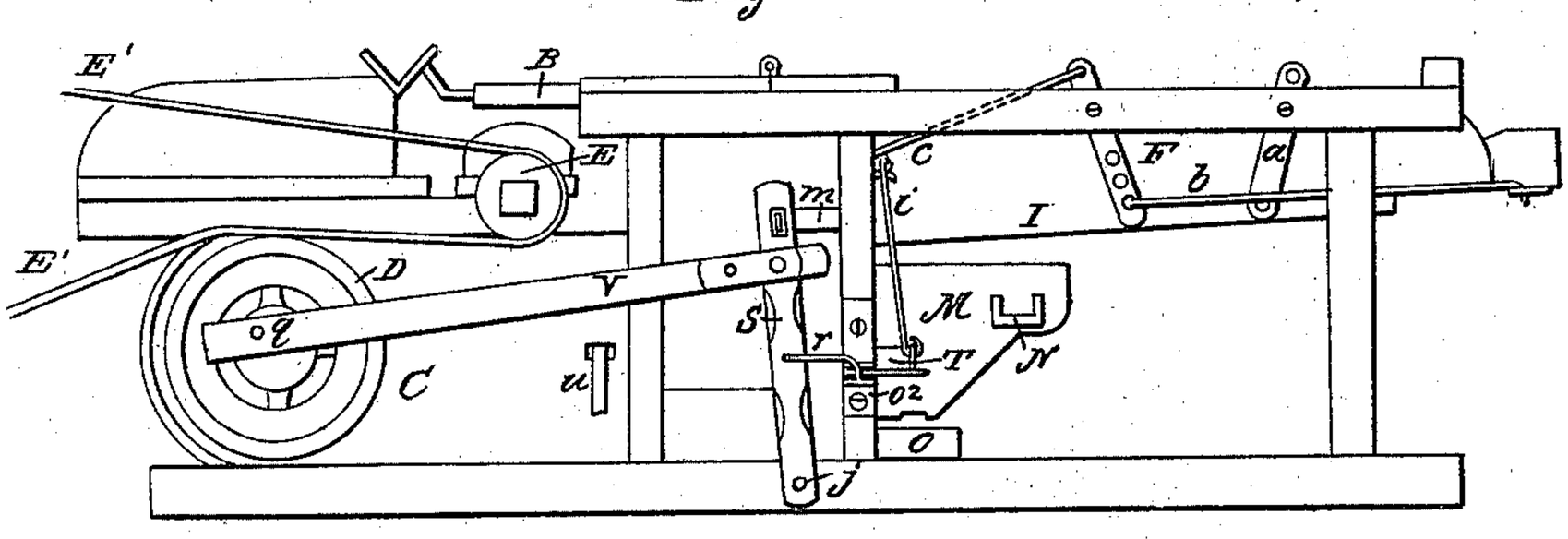
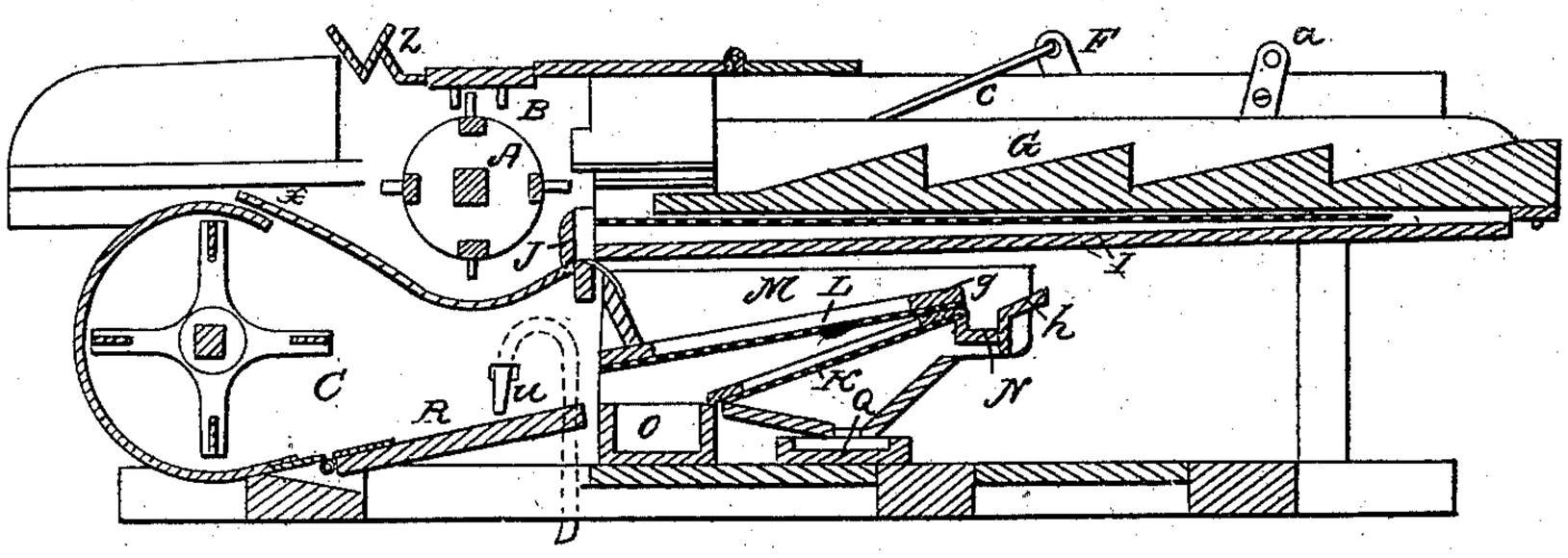


Fig: 3.



UNITED STATES PATENT OFFICE.

J. M. HARVEY, OF AMSTERDAM, AND N. J. BECKER, OF FLORIDA, NEW YORK.

IMPROVEMENT IN MACHINES FOR THRASHING AND SEPARATING GRAIN.

Specification forming part of Letters Patent No. **21,111**, dated August 10, 1858.

To all whom it may concern:

Be it known that we, J. M. HARVEY, of Amsterdam, in the county of Montgomery, and N. J. BECKER, of Florida, in the State of New York, have invented a new and useful Improvement in Grain Thrashing and Separating Machines Combined; and we do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming a part of this specification, in which—

Figure 1 represents a plan or top view of our improved combined grain thrashing and separating machine; Fig. 2, a side view of the same; Fig. 3, a vertical longitudinal section thereof.

Similar letters of reference in each of the several figures indicate corresponding parts.

The nature of our invention consists, first, in a novel combination or arrangement of parts operating in unison for actuating the thrashing-cylinder, blast-fan, straw-carrier, and separating-screens by one and the same main driving belt or band in a positive and advantageous manner, as hereinafter described. It consists, second, in a novel mode or arrangement of means for changing the direction of the blast relatively to operative portions of the separator and traverse of the grain through the machine to suit heavy or light grades of grain; and it consists, third, in causing the reciprocating perforated bed and conducting-board of the straw-carrier to give an accelerated motion to the serrated bar-frame of the carrier simultaneously with the travel of the bed, but in reverse directions to it, for the more effectual separation of grain in the straw and escape of it to the conducting-board of the separator and for the more regular and rapid discharge of the straw.

To enable others skilled in the art to make and use our invention, we will proceed to describe its construction and operation.

A represents the revolving thrashing-cylinder; B, the stationary concave; C, the blast-fan; D, the driving-pulley on the fan-shaft, and E the driving-pulley on the thrashing-cylinder shaft; E′, a main driving-band passing from the "horse-power" over the top of the pulley D and round the pulley E.

G H I is the straw-carrier. The perforated bed-plate H and under inclined grain-conducting board I of this carrier reciprocate together in the usual manner lengthwise of the machine, this portion of the carrier being hung on pendent arms *a a*, pivoted to the frame and capable of being raised or lowered to suit requirements.

The serrated-bar portion G, the function of which is, as well understood, to take the straw and propel it to the delivery end of the machine and prevent its return backward with the back motion of the bed-plate H, is made simultaneously to reciprocate with the bed-plate in reverse directions to the movements of the latter, and preferably with an accelerated motion or increase of stroke thereto, (adjustable at pleasure,) by means of double rocking beams F F, having upper and lower arms of unequal length, the longer arms being connected by rods *b b* with the serrated-bar portion G, and the shorter arms of said beams being driven by rods *c c* from the bed-plate division of the carrier. This arrangement insures simultaneous action of the serrated bars and bed-plate at their turn of stroke, so as to avoid stoppage of the straw, prevents the straw from being carried back on the return of the bed-plate H, and by the accelerated stroke or motion of the serrated bars relatively to the bed-plate serves to open the straw by the bed-plate and bars acting above and below on the straw with different velocities and gives a freer escape for detached grain from among the straw to the conducting-board I, and also avoids "mounting" of the straw and facilitates its escape.

J is a foot-board at the lower end of the inclined conducting-board I for the grain to strike against as it descends. This foot-board may have a series of bars or a grating projecting from it to serve to spread the grain uniformly onto the separator.

K L M N represent the separator. The screens K L are both attached to the same frame M and vibrate together. The screen L is the primary screen and is set slightly inclined, so as to cause the grain to work toward its forward end *g*. This screen terminates over a spout or chute N, which has a

guard-board *h*, and serves to receive and conduct off the tailings and other foreign substances which are too heavy to be blown out through the forward end of the machine by the blast of the fan. The screen K is the secondary screen, and is set inclining downward from the forward end of the primary screen toward the rear end of the same, terminating over a box O, into which the cleaned grain empties. Below the secondary screen an inclined board or boards is or are arranged to conduct seed passing through the secondary screen to a receiving-box, chute, or spout Q. The secondary screen serves for separating the "timothy" and all small seed from the wheat before it empties into the box O, and such small seed is husbanded or separately connected by its deposit in the box Q. The whole separator is hinged at its rear end, so as to admit of a universal or free motion being given it, and is supported by side straps *i i* at its forward end, that admit of lateral vibration.

S S are side arms to give the necessary reciprocating motion to the straw-carrier and to vibrate the separator. These arms are pivoted to the frame at *j* and have in gear with them above, in a manner which admits of vertical play or looseness, horizontal brackets *m m*, which project from the sides of the straw-carrier.

T is a horizontal jointed elbow-lever. It is pivoted to a horizontal bracket *o'* of the main frame, and one of its ends is connected to the bottom of the separator by a link *n* and its other end to the lower end of one of the vertical swinging arms S, above the pivot *j*, by means of a link *p*.

V V are "pitmen" pivoted to the swinging arms S S and serving to drive them, said pitmen being in gear with crank-pins *q q*, connected with the fan-pulley D or fan-pulley shaft.

The pulley E of the thrashing-cylinder and pulley D of the fan are so situated relatively to each other and the driving-wheel of the horse-power that the main belt E', which passes round the pulley E, bears and is made to act on a portion of the periphery of the fan-pulley D in its passage over it, as shown. Thus it will be seen when the band E' is set in motion both the fan and thrashing-cylinder are rotated by it and a positive motion communicated at the same time by pitmen V V, swinging arms S S, and elbow-lever T, with their immediate connections, to the straw-carrier and separator in directions at right angles to each other. The necessity of a secondary belt to the fan is avoided and friction, expense, and inconvenience thereby reduced; also, any foreign hard substance or obstacle getting into the fan or onto or in the straw-carrier and separator or in the way of the immediate devices which operate these parts is prevented from causing breaking by the light frictional driving-bearing of the belt on the pulley D, that actuates the fan, straw-carrier, and separator, as compared with the frictional bearing produced by a belt passing round a pulley for the same purposes, the light frictional bearing of the belt here produced being sufficient to actuate the fan, straw-carrier, and separator when a proper resistance is offered, but insufficient and causing a ready "slip" of the fan-pulley against the belt when any extraordinary resistance is presented that endangers breakage if the parts continue to operate. At the same time the thrashing-cylinder is regularly driven by the same belt with "slipping" provision to meet its requirements without affecting or causing slip to the other operating portions of the machine.

The thrashing-cylinder shaft and fan-shaft are shown extended on both sides of the machine, so that a duplicate band-and-pulley arrangement—one on each side—may be used, if desired, or the fan and thrashing-cylinder pulleys be situated on either side at pleasure, according to the position of the machine to the horse-power, &c.

The wind-board R of the fan is hinged at its lower back edge and held by straps *u u* at its upper front end or edge, so that the operator, by pulling on or slackening out the straps *u u*, can move said board at will into a position to direct the blast toward any desired point on the shoe or sieves of the separator or on the grain before it falls on the sieves, which latter is sometimes necessary in cleaning heavy grain, while for cleaning light grain it is or may be necessary to direct the blast below the sieves the whole length to blow out the chaff without carrying grain along with it.

To protect the operator from the choking effects of the dust consequent on "feeding in" and incidental to the thrashing of the grain, an opening *x* is made under the feed-table and communicating with the race of the thrashing-cylinder below and another opening *z* or spout-outlet above the feeding-throat, for the purpose of discharging the dust in such manner as that in its escape it will not fly in the face of the operator or blind him.

What we claim as our invention, and desire to secure by Letters Patent, is—

1. The combination of the swinging arm or arms S S, straw-carrier brackets or projections *m m*, elbow-lever T, connecting by links *n p* the swinging arm S to the separator, pitmen V V, operated by crank-pin from the fan-shaft to drive the swinging arm S, and fan and thrashing-cylinder pulleys D E, arranged substantially as described and driven by the same band or belt, as herein set forth.

2. We do not claim the combination of a reciprocating or independently-moving perforated straw-carrier with a stationary bed-plate, but so gearing the serrated-bar frame G to the perforated bed-plate H and conduct-

ing-board I that said latter portion shall give an accelerated motion to the bar-frame G simultaneously with but in reverse directions to the travel of the bed-plate, essentially as and for the purposes set forth.

3. Providing the feeding-throat of the thrasher or thrasher-concave with a dust spout or outlet *z* above and furnishing the cylinder-race with a dust-passage *x* in front under the feed-table, as shown and described.

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N. J. BECKER.

Witnesses:
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EDM. F. BROWN.