(No Model.)

J. T. & A. E. SMITH.

GRAIN SEPARATOR.

No. 347,391. Patented Aug. 17, 1886.

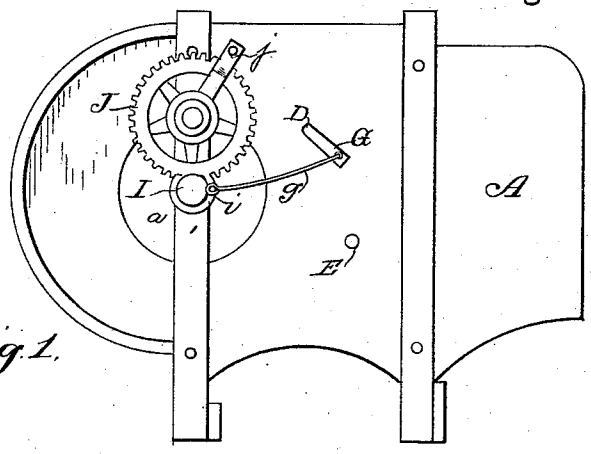


Fig. 1.

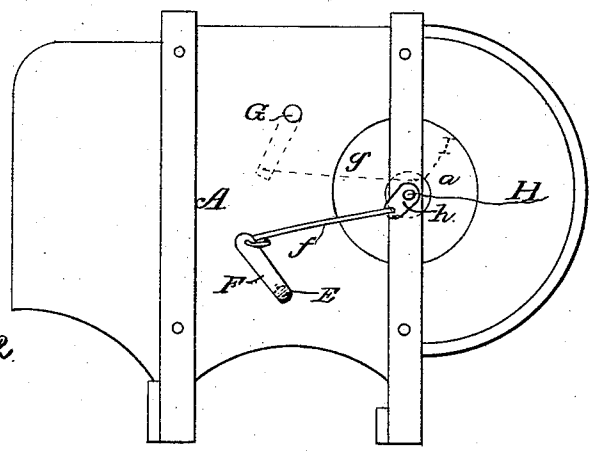


Fig. 2.

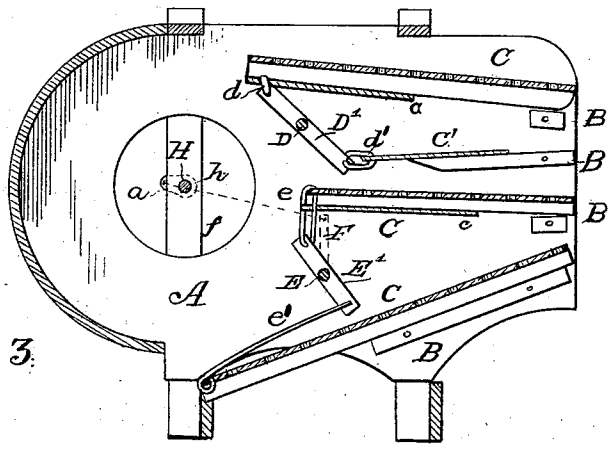


Fig. 3.

Witnesses
Susie R. Seiler.
R. N. Bishop.

Inventors
Jerome T. Smith
Albert E. Smith
By their Attorneys
R. V. & H. Lacey

N. PETERS, Photo-Lithographer, Washington, D. C.

UNITED STATES PATENT OFFICE.

JEROME T. SMITH AND ALBERT E. SMITH, OF SCOTLAND, DAK. TER.

GRAIN-SEPARATOR.

SPECIFICATION forming part of Letters Patent No. 347,391, dated August 17, 1886.

Application filed February 25, 1886. Serial No. 193,127. (No model.)

To all whom it may concern:

Be it known that we, JEROME T. SMITH and ALBERT E. SMITH, citizens of the United States, residing at Scotland, in the county of Bon Homme and Territory of Dakota, have invented certain new and useful Improvements in Grain-Separators; and we do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

Our invention relates to grain-separators; and it consists in the novel features hereinafter more fully set forth and claimed, reference being had to the accompanying drawings, in which—

Figure 1 is a side view of the machine ready for use. Fig. 2 is a view of the opposite side. Fig. 3 is a longitudinal section.

The side boards, A, of the casing have coincident openings near the ends through which the fan (not shown) draws its supply of air in the usual manner. Guides B are secured to the sides of the casing near the rear end. These guides are arranged one above another, as shown, and support the rear of a series of screens, C, and a return-board, C′, rock-shafts D and E, journaled in the side of the casing between the upper screen and return-board, and the lower pair of screens have arms D′ E′, respectively secured thereto, which are straight and extend on each side of the respective shafts in diametrically-opposite directions, and which normally occupy an inclined position. Links *d d′* and *e e′* connect the ends of the arms D′ E′, respectively, with the front or inner ends of the screens or board adjacent thereto, substantially as shown. The upper ends of the arms have a direct pivotal connection with the rearwardly-inclined screens immediately above them by means of the links *d* and *e* only in such manner that there is no vertical play between said screens, so as to toss the grain up into the blast for chaffing and dusting it, and said arms, and the lower ends of the arms are flexibly connected with the forwardly-inclined return-board and screen immediately below them by the links *d′ e′*, respectively, in such manner that there is a certain amount of play which will permit the lower ends of the arms to move to and fro during their vibratory movement without lifting the board and screen off their supports or guides B, and simply effect a reciprocating movement thereof, so that the grain will be returned without tossing.

The upper end of the link *d* is rigidly connected with the sieve and its deflecting-board *c;* but the upper end of the link *e* is connected both to the screen and deflecting-board, in such manner that it has no up-and-down movement relative thereto, and its lower end is pivotally connected with the end of the arm E′, as previously noted.

The arms D′ and E′ normally rest at an incline to a vertical line, and being mounted midway of their ends on rock-shafts have both ends moving in arcs of circles. During such motion the arms vibrate to and from planes passing horizontally through the rock-shafts in a manner well understood, by reason of the pivotal connection between the upper ends of the arms and the screens immediately above them, and by the flexible connection between their lower ends and the lower deflector and screen the former will receive a to-and-fro and up-and-down motion, while the latter will receive a to-and-fro movement only.

It is evident that there may be as many of the arms D′ E′ on the rock-shafts D E as may be found necessary to give the required steadiness to the device.

The screens C may be perforated in the usual way, and graduated to effect a separation of the grain in a manner well understood. The upper screens of each pair have a deflecting-board, *c*, rigidly secured beneath, and moving with them, which extends from the front edge rearwardly about half-way of the screens. The purpose of these deflecting-boards is to carry the grain from one screen to the next lower screen. The lower plate of the upper pair of screens is preferably imperforate, and is designed simply to be used as a return-board or carrier to direct the grain from the upper screen onto the top of the lower pair of screens.

An arm, F, of the outer end of the shaft E is connected with a crank, *h*, on the fan-shaft H by a pitman, *f*. A similar arm, G, on the

end of the shaft D, is connected with a wrist-pin, *i*, of the pinion I, on the opposite end of the fan-shaft, by a pitman, *g*.

A gear-wheel, J, meshing with the pinion, has a handle, *j*, by which motion may be imparted to the operating parts of the machine.

The grain, as it falls from one screen to the next lower, will be exposed to a blast of air sufficient to remove the chaff and such light foreign substance.

The up-and-down and to-and-fro movement of the upper or rearwardly-inclined screens of each pair of the series of screens thoroughly agitates the grain, and effects a loosening of any particles which may adhere thereto in a much better way than if said screens were simply moved to and fro.

Having thus described our invention, what we claim, and desire to secure by Letters Patent, is—

A grain-separator comprising the upper screen, the return-board beneath it, two screens, one below the other, beneath the return-board, deflecting-boards secured beneath and moving with the upper and middle screens, guides supporting the screens and return-board, and two rock-shafts having each oppositely-extending inclined arms, those of the upper shaft being pivotally connected with the upper screen and flexibly connected with the return-board, and the arms of the lower shaft being pivotally connected with the middle screen and flexibly connected with the lowest screen, substantially as and for the purpose set forth.

In testimony whereof we affix our signatures in presence of two witnesses.

JEROME T. SMITH.
ALBERT E. SMITH.

Witnesses:
H. A. ORMISTON,
J. M. JOHNSTON.