E. YOUNG.

Grain Separator.

No. 46,044. Patented Jan'y 24, 1865.

Fig. 1.

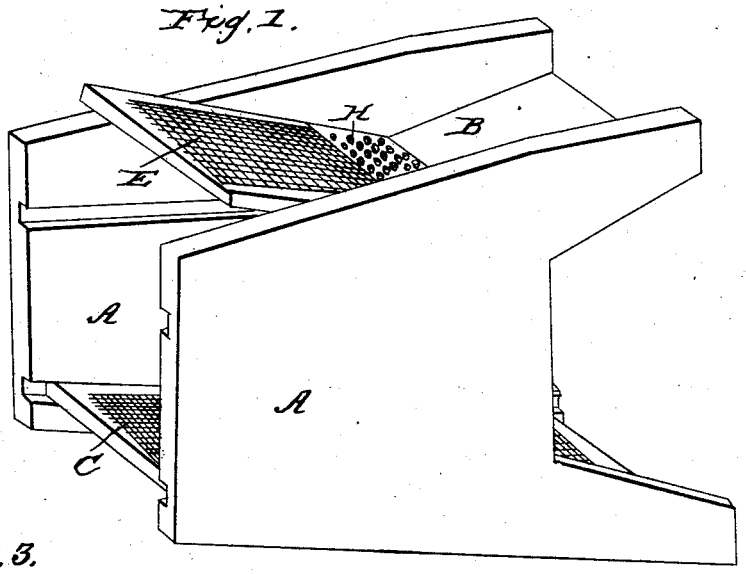


Fig. 3.

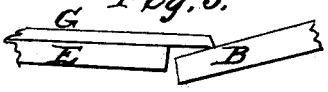
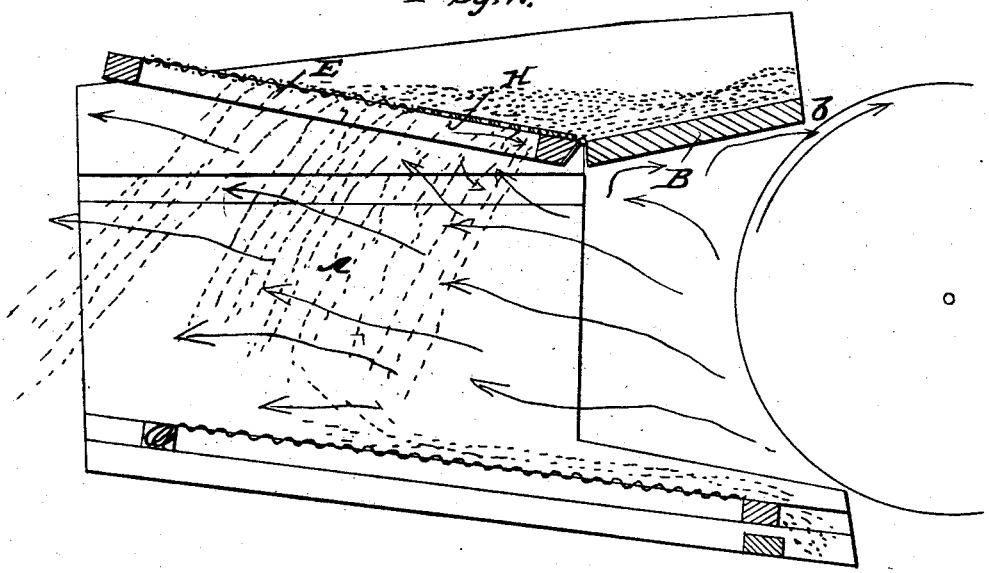


Fig. 2.



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UNITED STATES PATENT OFFICE.

ELIJAH YOUNGS, OF TUSCARORA, NEW YORK.

IMPROVEMENT IN GRAIN-SEPARATORS.

Specification forming part of Letters Patent No. **46,044**, dated January 24, 1865.

To all whom it may concern:

Be it known that I, ELIJAH YOUNGS, of Tuscarora, in the county of Livingston and State of New York, have invented a new and improved method of separating grains of different specific gravities, particularly chess, from wheat; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, in which—

Figure 1 is a perspective view of the shoe of a fanning-mill, arranged according to my method. Fig. 2 is a vertical longitudinal section of the same; and Fig. 3 is a section of one end of the upper screen and the chute-board, to which reference will be made further on.

The nature of my invention consists in so arranging the upper screen in reference to the chute-board that the grain will be passed through the sieve and separated by the blast, and also in so attaching the upper end of the sieve to the chute-board that the lower end of said sieve may be raised or lowered without changing the relation of the upper edge or end with the said chute-board.

That others may understand the construction and operation of my invention, I will more particularly describe it.

A A are the side pieces of the shoe of an ordinary fanning-mill. B is the chute-board. C is the lower or discharging screen. E is the upper or separating screen. All of these parts are constructed in any ordinary or suitable manner, the design being to enable me to adapt my improvement to any of the ordinary mills now in use without such an amount of change as shall make the cost a serious objection. I prefer, however, to use a screen at E, constructed according to the plan secured to me by Letters Patent dated June 30, 1863, with the exception of the projecting side strips, G, Fig. 3, which I either omit or do not allow them to project, for reasons hereinafter to be given.

The importance of a perfect separation of the impurities from the pure grain is daily becoming of greater moment and is more thoroughly appreciated by the agriculturists of the country.

The operation of my invention is as follows: When the fans of the mill are set in motion, air, being admitted at the central portion, has imparted to it a rapid rotary motion and a consequent centrifugal pressure, which causes it to seek an outlet in any direction where it may be found. The construction of the machine only permits it to escape in one direction—between the screens at the rear of the machine, as indicated by the red lines and arrows in Fig. 2; but it is obvious that as the fan passes the corner *b* of the chute-board, there being at that instant no pressure behind it, owing to the free escape of the air in that direction, a reaction or eddy will result, and a portion of the blast which is nearest the upper end of the screen E and chute-board will be drawn back, as shown by blue arrows. This action or return of the blast will cause a suction or current through the meshes of that end of the sieve from above and will perfectly account for a phenomenon, which I have frequently observed—viz., that chess or other light grain will be turned up endwise as they come over the openings of that end of the sieve and pass head first through.

By the use of the perforated metallic plate H, as described in the Letters Patent granted to me June 30, 1863, the action of the retrograde current is so much diminished as to render its effect imperceptible.

When mixed wheat and chess descends from the hopper upon the chute-board B, the wheat, being three times as heavy as chess, is arranged at the bottom of the mass by the agitation of the shoe and the chess on the top.

The sieve E, being elevated in the manner shown, forms with the chute-board a kind of trough, in which the grain is confined, and the rear end of the sieve is raised sufficiently high to prevent any of the grain from passing over it, the inclination being varied according to the feed of the hopper. Another and very important object to be attained is the increased distance which the grain has to fall after passing through the sieve E before reaching the discharging screen, the result being that the grain is longer in contact with the blast, and as a necessity the lighter substance is effected to a greater degree than the heavier. If any chess should pass through the sieve with the wheat, the distance it is required to fall will be so great that the blast will be sure to carry it clear of the mill. In the ordinary arrangement of sieves this is not possible, as the rear edges of the sieves

are nearer together than their forward ends, and there is no means of increasing the distance. By my arrangement the distance may be greater between the rear ends than between the forward ends. The natural arrangement spoken of causes the chess to seek the rear edge of the mass, where it finally passes through the sieve, and, being caught by the blast, is carried out of the mill, while the wheat, being, as said, about three times as heavy as chess, not only passes through the sieve first, but is less effected by the blast afterward, and this renders it possible to so arrange the discharging-screen C that the wheat shall all be caught upon its surface while the chess shall all be blown beyond its rear end and fall out of the mill or in a receptacle provided for it. These points are clearly shown in Fig. 2, where the wheat is represented by yellow, and the chess by brown, dots.

By the method of securing the sieve E in place as secured to me by my before-mentioned Letters Patent, I have found it difficult to prevent it from being moved away from the chute-board, thus leaving a space or crack through which the grain may fall. By the plan I then adopted that end of the sieve rested against the surface of the chute-board, supported by the projecting ends of the side pieces, G, Fig. 3; but it is obvious that if the sieve was elevated, so as to form an angle upward from the surface of the chute-board, that the edge of the sieve would be elevated, so as to form a wall which would retard the motion of the grain, or the edge of the sieve would be drawn away from the edge of the chute-board, as shown in Fig. 3. To obviate this defect I therefore propose simply to connect the sieve to the chute-board by means of a pair of hinges of any suitable kind—either of metal, leather, or other material—so that the two edges must necessarily always be in contact at their upper surface, and I can then also dispense with the use of set-screws, &c., to hold the upper or rear end of the sieve in proper position, a simple peg, nail, or string being all that is required for that purpose.

From the foregoing description it will be seen that in order to adapt my invention to any ordinary mill it will only be necessary to cut a strip from each side of the sieve, so that it will fit between the surfaces of the side pieces, A, instead of within the gains, and attach it to the chute-board by means of said hinges. If it be desirable to use the plate H, I cut away a sufficient space of the wire-gauze and nail the plate over the vacant space, securing the edges of the wire to the metal plate by bending the loose ends through some of the perforations.

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

1. So constructing and arranging the sieve E that it may be elevated at its rear end sufficiently to prevent any grain from passing over that end, substantially as and for the purpose set forth.

2. Connecting the sieve E to the chute-board by means of hinges, as set forth and described.

3. In combination with the vertically-adjustable sieve E, as described, the longitudinally-adjustable discharging screen C, as and for the purpose set forth.

ELIJAH YOUNGS.

Witnesses:

R. D. O. SMITH,

P. T. DODGE.