2 Sheets—Sheet 1

J. S. BODGE.

Grain Separator.

No. 51,687. Patented Dec. 26, 1865.

Fig. 1.

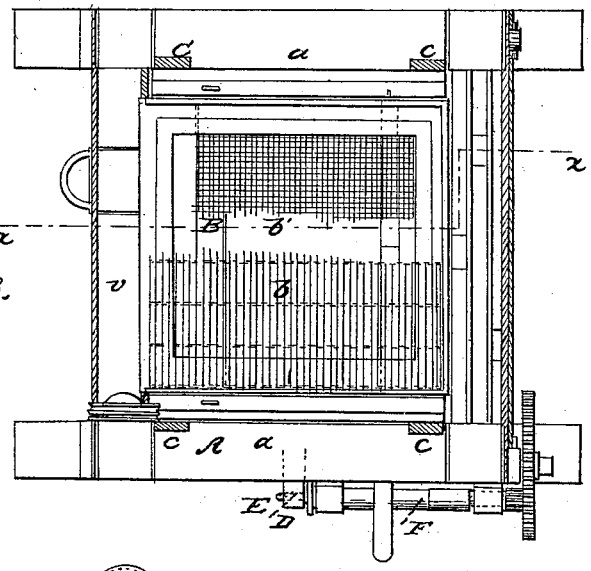


Fig 3.

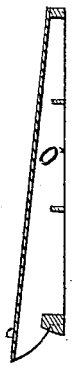
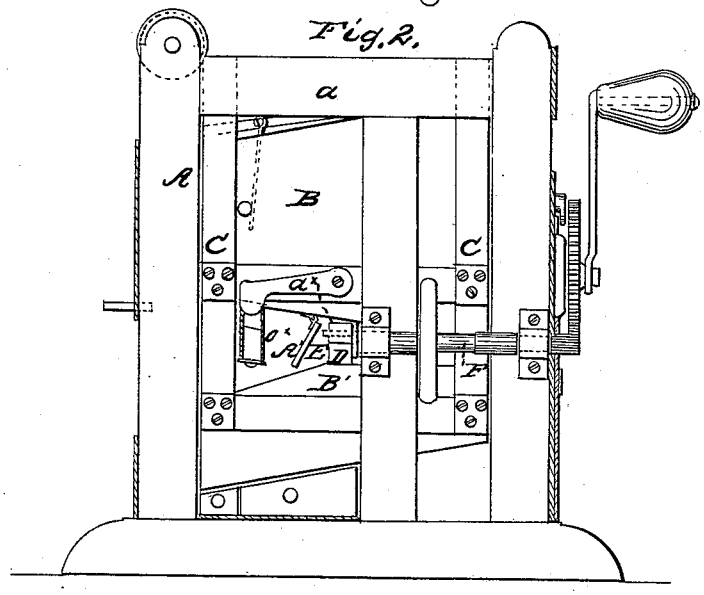


Fig. 2.



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2 Sheets—Sheet 2.

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Grain Separator.

No. 51,687.

Patented Dec. 26, 1865.

Fig. 4.

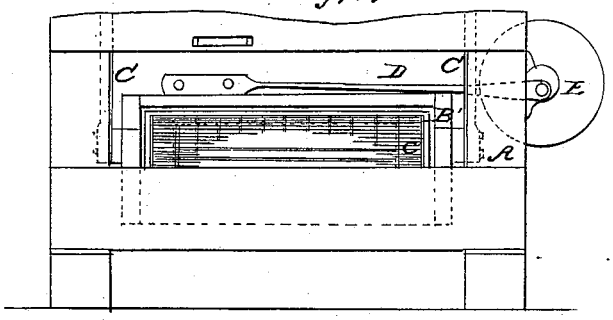


Fig. 6.

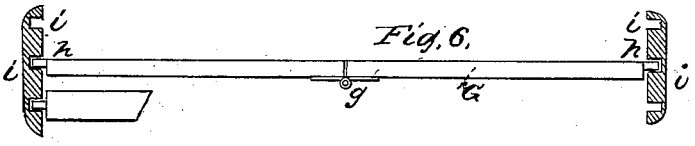


Fig. 3.

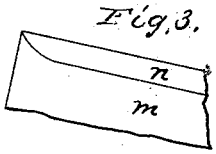


Fig. 9.

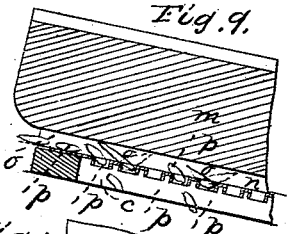


Fig. 10.

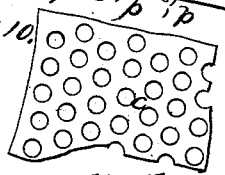


Fig. 11.

Fig. 5.

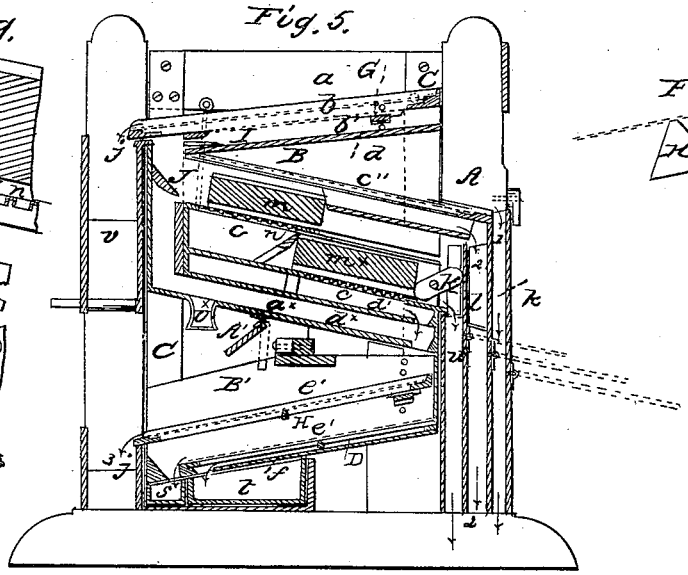
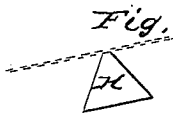


Fig. 7.



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UNITED STATES PATENT OFFICE.

JOHN S. BODGE, OF BATH, NEW YORK.

IMPROVEMENT IN GRAIN-SEPARATORS.

Specification forming part of Letters Patent No. **51,687**, dated December 26, 1865.

To all whom it may concern:

Be it known that I, JOHN S. BODGE, of Bath, in the county of Steuben and State of New York, have invented a new and Improved Grain and Seed Separator; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable those skilled in the art to make and use the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1, Sheet No. 1, is a plan or top view of my invention, a portion of the upper screen being broken away; Fig. 2, a side elevation of the same; Fig. 3, a detached longitudinal section of a spout pertaining to the same; Fig. 4, Sheet No. 2, a front elevation of the lower portion of the invention; Fig. 5, a vertical section of the same, taken in the line *x x*, Fig. 1; Fig 6, an enlarged detached view of a folding or jointed bar or screen rest pertaining to the same; Fig. 7, a detached longitudinal section of a portion of a screen pertaining to the same; Figs. 8, 9, 10, and 11, enlarged detached sections of parts pertaining to the same.

Similar letters of reference indicate corresponding parts.

This invention relates to certain improvements on a grain-separator for which Letters Patent were granted to me, bearing date November 10, 1863; and it consists in certain modifications and additions, hereinafter fully set forth, whereby the efficiency of the original machine is greatly augmented.

A represents the framing of the machine, of rectangular form, and having two shoes, B B′, placed in it, one above the other, and both attached to elastic pendants C, the upper ends of which are secured to the upper cross-bars, *a*, of the framing. The two shoes are operated by one and the same flexible connecting-rod D, the latter being attached to the lower shoe, B′, as shown in Fig. 4, and the rod D being operated from a crank, E, on a shaft, F, at one side of the framing A. By this arrangement it will be seen that the lower shoe will have a greater length of vibration than the upper one. The upper shoe, B, is provided with screens *b b′ c c′ c″* and chutes *d d′*, the two screens *b b′* and the chute *d* underneath it having a reverse inclination to the screens *c c′* and chutes *d′*, as shown clearly in Fig. 5. The lower shoe, B′, is provided with screens *e e′*, having the same inclination or parallel with the screens *b b′* of the upper shoe, B. A chute, *f*, is underneath the screen *e′*. The screens are placed in their respective shoes, and are made of such a width as to have a certain degree of lateral play in the shoes, (see Fig. 4,) and thereby effectually prevent the choking or clogging up of the screens—a contingency which would otherwise be likely to occur. The rear and elevated ends of the screens rest on bars G, which are jointed at their centers, as shown at *g* in Fig. 6, and have their ends provided with tenons *h*, which are fitted in openings *i* in the sides of the shoe. A series of these openings, *i*, are made in the sides of the shoe, one above the other, and by means of the joints in the bars G they may be very readily adjusted higher or lower, to suit the degree of inclination it may be desired to give the screens. This will be fully understood by referring to Fig. 6. The lower or depressed ends of the screens *b e* rest on fixed portions *j* of the framing, so as to bear or drag thereon and prevent the screens from rebounding and keeping motion with the shoes, (see Fig. 5,) thereby greatly aiding the screening operation.

The screens have bars H bearing against their under surface. (See Fig. 7.) These bars are of triangular form in their transverse section, and they are for the screens to vibrate on and cause the grain to be thrown upward, so that the short oats will fall heavy end downward and be tripped by the transverse wires or warp of the screens and turned parallel with long mesh, so that they pass between and through the screens. These bars also prevent the screens from sagging and cause the grain to be spread evenly over their entire surfaces.

I represents a sliding or hinged feed-board, which is placed in the chute *d* near its lower or depressed end, as shown in Fig. 5. By means of this feed-board I can, by closing the same, carry all the grain as well as the screenings and fine impurities which pass through the screens *b′* direct to the lower screens in the shoe B; or by opening the same the fine impurities which pass through the screens *b′* will be allowed to pass upon a grass-seed screen, *c″*, and the screenings conveyed into

a pocket, *k*, (see arrows 1,) while the grass-seed which passes through the screen is conveyed into another pocket, *l*. (See arrows 2.) The sound or valuable grain passes off from the lower end of screen *b'* and falls upon the screen *c*, passing down between the same and a plate or board, *m*, the under surface of which is kept at a proper height above the upper surface of *c* by means of cleats *n*, which rest on the sides of the screen.

The screen *c* may be composed of wood or other suitable material having holes bored in it, the wood being of sufficient thickness to admit of the holes being of a requisite depth; or the screen *c* may be constructed of sheet metal punched so that a burr will project down all around the lower edges of the hole and cause the holes to be of a requisite depth.

The plate or board *m* prevents the oats passing through the screen *c*, as it will not allow them to tip up sufficiently to do so, and this result is materially aided by the depth of the holes in the screen *c*, as will be fully understood by referring to Fig. 9, *o* representing oats, and *p* wheat. The wheat, being short, can readily pass through *c;* but only short oats can pass through it, which, together with small or imperfect wheat, are separated from the sound wheat in a lower shoe, B', by screen *e*, the sound wheat passing off from the same, as indicated by arrow 3, while the small wheat and oats pass through *e* and fall upon a screen, *e'*, the oats passing into a receptacle, *s*, (see arrow 4,) and the wheat which, passes through *e'* into a receptacle, *t*. The oats which cannot pass through the screen *c* are conveyed into a pocket, *u*, and the wheat and short oats which pass through *c* are conveyed upon a similar screen, *c'*, having a plate or board, $m^{\times}$, over it, where a second operation like the first is gone through with. The plates or board $m\ m^{\times}$ are smoothly rounded at the upper edges of their under sides to facilitate the passage of the grain between them and the screens below.

In consequence of the shoes B B' being attached to the springs or elastic pendants C, one above the other, the upper shoe, containing the screens *c c'* and plates $m\ m^{\times}$, has a soft or easy motion compared with the lower shoe. This is necessary in order to prevent the grain or wheat passing over the screens *c c'*, and to cause the screens in the lower shoe to have sufficient motion to prevent them from filling up.

J is a valve placed in the upper shoe and in such a position as to be in or near the path of the falling grain from the chute *d*, to conduct the grain to the screen *c*. By adjusting this valve J the amount of feed may always be ascertained, for if large a portion will escape down upon a chute, $d^{\times}$, and enter and discharge through a trough or spout, $o^{\times}$, where it will be seen by the operator, so that he may adjust the feed accordingly. The plate or board *m*, in case any large grain or foreign substances pass underneath it, will be allowed to rise to admit of their escape into the pocket *u*. This elevating of the plate or board *m* will admit of some oats passing through the upper screen, *n*, and hence the necessity of having two plates or boards, $m\ m^{\times}$, and two screens, *c c'*. Pease and large foreign substances pass off from the upper screen, *b*, into a pocket, *v*.

K represents buttons arranged so as to bear upon the screen *c* and retain the same in proper position, as shown clearly in Fig. 5.

In my previous patented device the screens *c c'* were formed with a burr at their front sides only, or, in other words, the holes in said screens were not made of an equal depth, and hence long oats would frequently pass through them. This difficulty is fully obviated by my present improvement.

The diameter of the holes in the screens *c* or *c'* may be about two-fifths of the length of the oat, and the depth of said holes may be from one-third to one-fourth the length of the oat. The idea is to leave ample room between the boards $m\ m^{\times}$ and the screens to allow the oats and other grain to vibrate and rise upon its ends freely, and thus prevent clogging and choking; but while the grain is thus allowed free play between the board and screen, the holes are made so deep that in the event of an end of the oat getting therein its walls or sides shall constitute an abutment to prevent said oat from going through the screen while standing in an inclined position. Hence relative dimensions may have to be varied to conform to grain of different size.

A' represents a board which is hinged to the lower part of the shoe B, as shown at $a^{\times}$ in Fig. 5. By turning this board A' down between the upper parts of the sides of the lower shoe, B', a connection will be formed between the two shoes and a rigid motion communicated from the lower to the upper shoe, which is necessary in cleaning and separating flaxseed, in order to prevent the flaxseed from sticking fast in the screen used for its separation in the upper shoe.

For cleaning seed the grain-screens are taken out and seed-screens put into the shoes.

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

1. The jointed bars G, for the rear portions of the screens to rest upon to admit of the ready varying of the inclination of the screens, as set forth.

2. The combination, with a screw or riddle adapted to move independently of its shoe, of the triangular bar H, so constructed and located as to confine the vibratory movement of the screen above the place which it occupies when at rest, or, in other words, prevent the sagging or depression of the screen while in operation, substantially as described.

3. In combination with the board *m* or $m^{\times}$, or other device to prevent the longer grain from assuming a vertical position under the circumstances herein set forth, a sieve or riddle whose apertures or openings are made of

a certain determinate depth with a view to prevent the longer grain from passing through the sieve in any of the inclined positions into which it may be thrown by the movement of the sieve, substantially as described.

4. The valve J, arranged within the shoe B and in relation with the screen *c*, substantially as and for the purpose specified.

5. The hinged board A′, arranged, substantially as shown, to form a connection between the two shoes B B′ when required.

JOHN S. BODGE.

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