(No Model.)

C. KASPAR.

GRAIN SEPARATOR.

No. 343,324. Patented June 8, 1886.

Fig. 1.

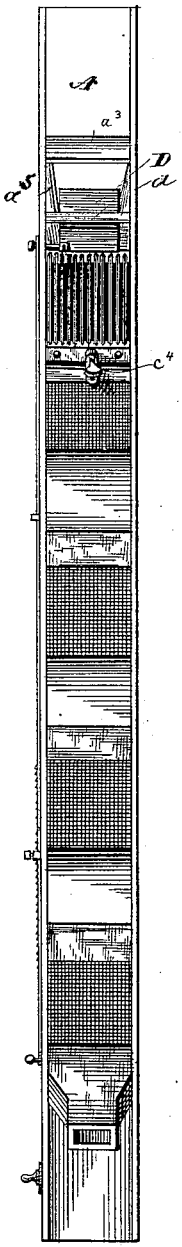


Fig. 2.

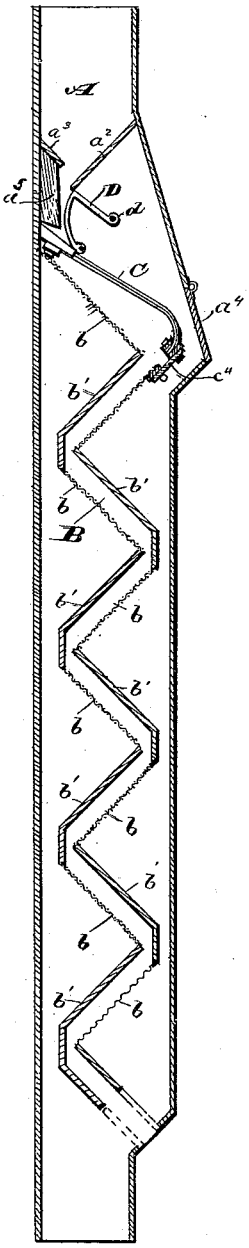
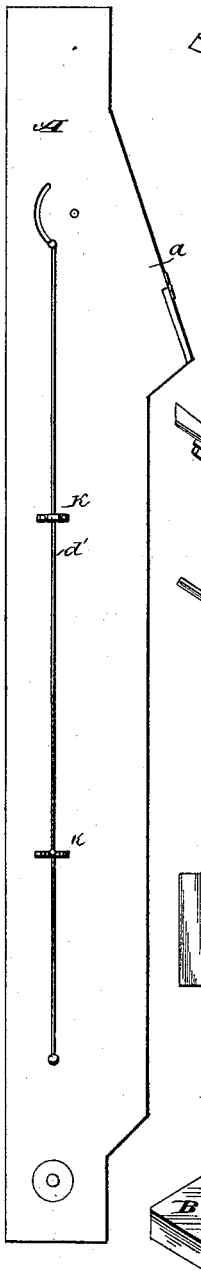


Fig. 3.



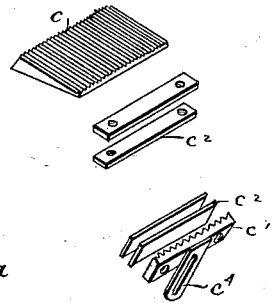


Fig. 6.

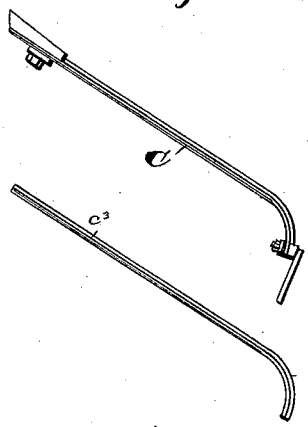
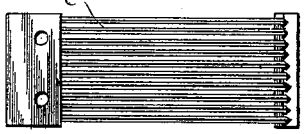


Fig. 5.



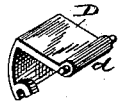


Fig. 4.

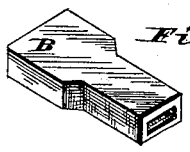


Fig. 7.

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UNITED STATES PATENT OFFICE.

CHRISTIAN KASPAR, OF CLEVELAND, OHIO.

GRAIN-SEPARATOR.

SPECIFICATION forming part of Letters Patent No. 343,324, dated June 8, 1886.

Application filed February 6, 1886. Serial No. 190,981. (No model.)

To all whom it may concern:

Be it known that I, CHRISTIAN KASPAR, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Grain-Separators; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to improvements in grain-separators, and is generally adaptable to all kinds of grain; but the structure here presented is more especially designed for cleaning oats.

The object of the invention is to produce a cheap and effective separator for cleaning oats and other cereals.

The invention consists in the construction and combination of parts, as hereinafter fully described, and particularly pointed out in the claims.

In the accompanying drawings, Figure 1 is a vertical section of my improved cleaner on line *x x*, Fig. 2. Fig. 2 is a vertical section of the same on line *y y*, Fig. 1. Fig. 3 is a side view showing a rod for operating the gate which controls the flow of grain through the cleaner, and shown in perspective in Fig. 4. Fig. 5 is a plan view of my improved grate, and Fig. 6 the details thereof. Fig. 7 is a detail of the lower part of the zigzag channel B.

A represents the case or box part of my cleaner, which is rectangular in its body portion, and has an enlargement, *a*, at its top, to make room for the interior mechanism located at that point. This case is made of greater or less length, according to the height of the building or the space it occupies; but the higher it is made the better the work, as will be seen farther on. Extending through this case from top to bottom is a zigzag channel, B, the upper end of which connects with the mouth of the case, and the lower end terminates in a spout that passes out through the case a short distance from its bottom. The sections or steps of the channel B are formed about at right angles to each other, and their lower sides are provided with wire screens *b*, while their upper sides, *b'*, have closed covers smooth on their upper surfaces. By this arrangement the grain, in its descent through the channel, is dashed successively as it reaches each angle against an inclined screen, while the siftings are thrown upon the back of the next succeeding screen below. These siftings are carried to both sides of the grain-channel, and, often striking the smooth surfaces of the backs of the steps, drop to the bottom of the case through the narrow unobstructed space intervening between the angles of the channel B and the sides of the case, both front and rear.

The channel B is made as wide as the cleaner-box, to the sides of which it is secured, but shallow, so as to expose the grain in its descent through the cleaner as much as possible to the cleansing-surfaces of the successive screens.

At the upper end of the channel B, I place a grate, C, arranged to cover the upper section of the said channel in its entire length and breadth. This grate may be struck up from a slotted plate of sheet metal; but I prefer the construction here shown. This construction involves a corrugated casting, *c*, a plain bottom clamping-plate, *c'*, and a leather or other flexible packing, c^2, at each end, with a series of bars or angle-iron, c^3, or other suitable forms, bent as shown, and secured by means of bolts between the plates above described.

It will be observed that by constructing the grate of parallel bars angular in cross-section and arranging them as shown they present a sharp angle to the plane of the grate, whereby their inclined sides are utilized to carry the grain laterally and direct it downward through the spaces between the bars. These bars, furthermore, are arranged longitudinally and as near together as may be found practicable with different kinds of grain. If the grain is small, the grate should be finer than when it is coarse. To clean oats, the proper space between the bars is about five thirty-seconds of an inch. The bars should be highly polished, so as to facilitate the distribution and discharge of the grain as it is delivered upon the grate. They are curved at their lower ends, so as to clean themselves of sticks, nails, and the like, which, in sliding down the open spaces between the bars, will strike against the inner clamping-bar and be tilted and

thrown out, thus avoiding clogging at this point and the obstruction of the grate which might occur if the bars were straight.

When in position, the grate forms the cover of the upper section or step of the grain-channel. Its upper end rests freely against the wall of the outside box or case, and its lower end adjustable at the angle of the channel, where a slotted strap, c^4, and set-screw or other suitable device is employed to adjust that end more or less vertically, as may be required. It has been found that different elevations are required, according to the quantity of oats flowing through the cleaner. If the flow is heavy, the grate should be raised, which operates to scatter the stream to the sides and so spread it that it will run through the grate before it reaches the end. A slight difference in adjustment makes a great difference in the action of the grate. There is a constant tendency in the grain, when it strikes the grate, to get "wild" and fly down its smooth surface and over its curved end into the waste-channel below, instead of gravitating, as it naturally should, through the openings into the channel designed for it. This tendency has to be overcome and controlled by the adjustment of the screen to the pitch required to do perfect work. A door, a^4, is provided in the upper part of the shell for easy access to the adjusting mechanism.

D is a segmental gate, provided with pivots d and a rod, d', outside the box, for controlling it. If desired, however, this gate may be substituted by a slide or other equivalent device, the form not being material so long as it performs the desired function. When closed, the lower edge of the gate rests snugly against the inner edge of the upper plate of the grate, or it may rest on it, and its upper side is covered by a deflector, a^2, arranged inside the box or case A, to direct and deliver the grain to the top of the grate. Opposite the deflector a^2 is an inclined ledge or projection, a^3, intended to take a part of the pressure of the grain above and retard its flow to the opening beneath. Small guides a^5, set at a slight inclination to the wall of the case, are placed just below the ledge a^3 and in front of gate D, to direct the grain more centrally in its downward flow, it being desirable to get perfect control of the grain before it passes onto the screen. The gate is of somewhat less width than the screen, and when the grain passes through it spreads quickly and distributes itself evenly over the screen, provided the proper adjustment has first been made.

I have described a cleaner which is especially adapted to cleaning oats, and designed to be used in stables, barns, and the like to clean oats preparatory to feeding.

It will be observed that the operation of cleaning is automatic, and that the gravity of the grain alone is depended on to perform the required work. The same machine can be employed with other cereals, and may be adopted in mills, elevators, and other places where for any reason it is desirable to clean grain preparatory to grinding, selling, or other purpose. The action in buildings where the distance from top to bottom is great is especially satisfactory, as in that case not only all the loose dust and dirt is thrown off, but the grain itself, by dashing from screen to screen, and by frictional contact in the volume itself, is rubbed perfectly clean and smooth.

The rod d' is secured to the case A by small keepers k, and has a serrated edge near its lower end to lock in the lower keeper, and a set-screw to fix the limit of adjustment, whereby the gate is held at any desired elevation and prevented from being farther opened without changing the set screw.

The lower end of channel B is narrowed on both sides, so as to allow the dirt which descends the front dirt-passage of the case to pass by it and be deposited at the bottom of the box.

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

1. In a grain-separator, the case A, formed with enlargement a near its top, and deflector a^2, in combination with inclosed screens forming zigzag grain-channel B, fixed rigidly in the sides of the case, the grate C, located in the enlargement a, and adjustable at its lower end to regulate the speed of the grain flowing over it, and the gate D, operating between the grate and the deflector a^2, substantially as set forth.

2. In a grain-separator, the case A, formed with enlargement a, deflector a^2, ledge a^3, and guides a^5, in combination with inclosed screens forming a zigzag grain channel, B, a grate, C, occupying the enlargement a, and gate D, located between the deflector a^2 and grate C, and narrower than said grate, substantially as set forth.

3. In a grain-separator, the inclined grate comprising longitudinal bars angular in cross-section, of uniform size throughout their length, set with an angle in the plane of the grate-surface, and curved downward at their lower ends, as shown, and a cross-piece connecting said bars at their curved ends, substantially as set forth.

4. In a grain-separator, a grate comprising longitudinal parallel bars angular in cross-section and bent at one end, as shown, in combination with serrated top plates and plain lower clamping-plates and packing, substantially as set forth.

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