

(No Model.)

3 Sheets—Sheet 1.

J. G. PLOWMAN & H. E. KITTELL.
GRAIN CLEANER.

No. 520,333.

Patented May 22, 1894.

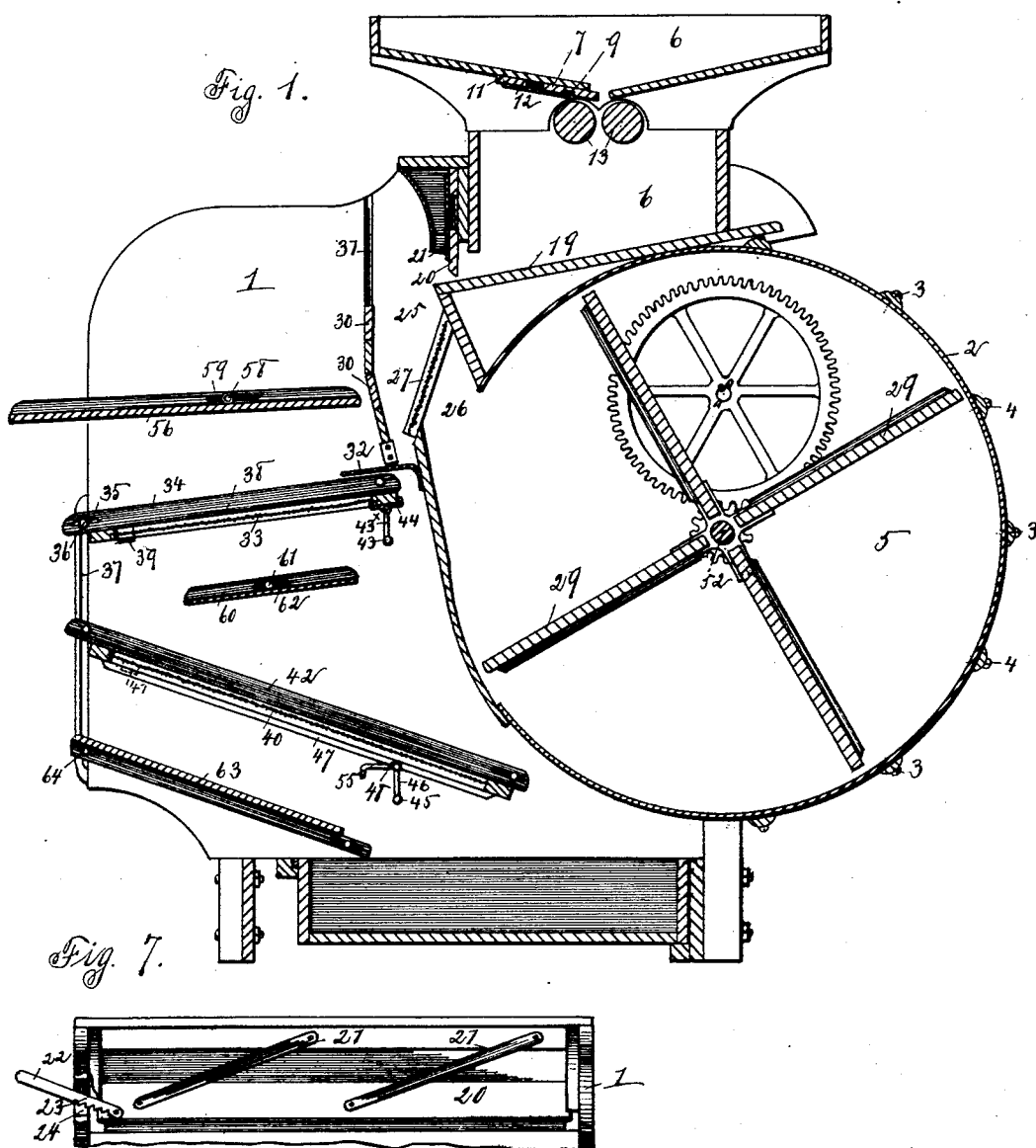


Fig. 7.

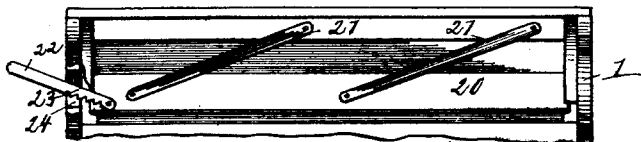
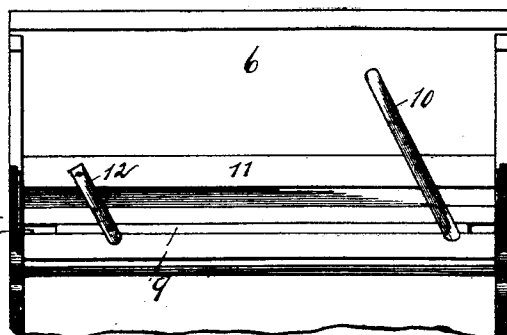


Fig. 8.



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Fig. 2.

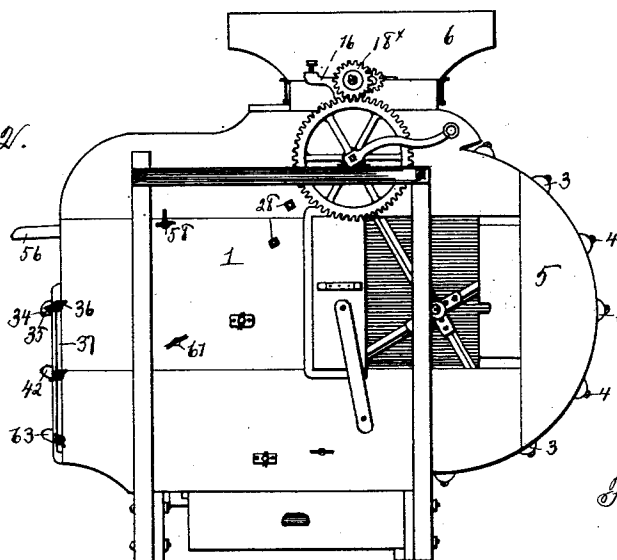


Fig. 5.

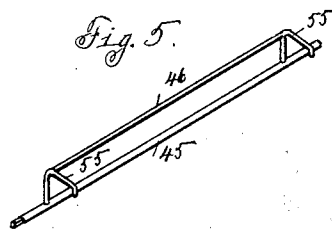


Fig. 4.

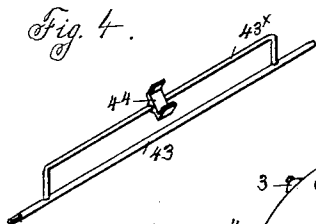


Fig. 3.

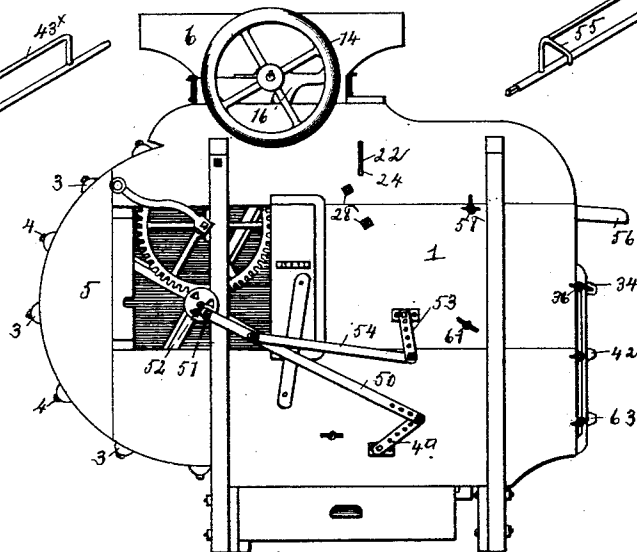
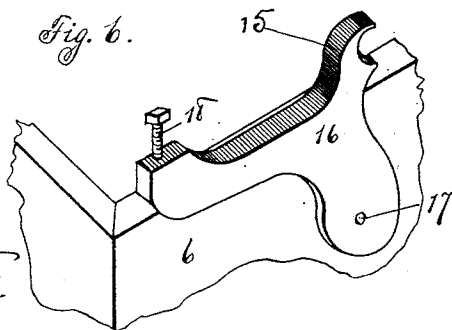


Fig. 6.



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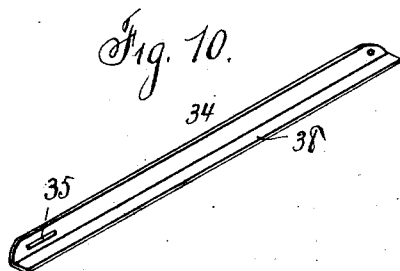
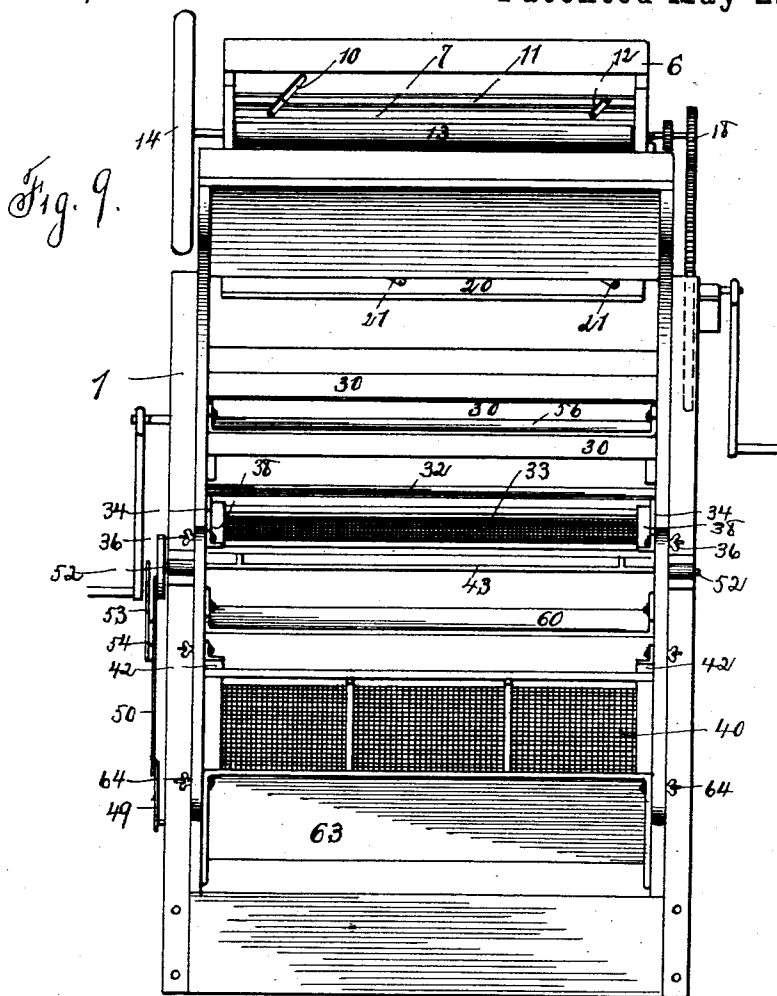
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UNITED STATES PATENT OFFICE.

JOSEPH G. PLOWMAN AND HENRY E. KITTELL, OF WHITE PIGEON,
MICHIGAN.

GRAIN-CLEANER.

SPECIFICATION forming part of Letters Patent No. 520,333, dated May 22, 1894.

Application filed October 30, 1893. Serial No. 489,490. (No model.)

To all whom it may concern:

Be it known that we, JOSEPH G. PLOWMAN and HENRY E. KITTELL, citizens of the United States, and residents of White Pigeon, in the county of St. Joseph and State of Michigan, have invented certain new and useful Improvements in Grain-Cleaners; 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 figures of reference marked thereon, which form a part of this specification.

Figure 1 is a vertical longitudinal section of a grain cleaner, embodying our invention. Fig. 2 is a side elevation of the same. Fig. 3 is a similar view as seen from the opposite side. Figs. 4 and 5 are detail perspective views of the shakers for the sieve and screen respectively. Fig. 6 is a detail view, showing the movable bearing for the crushing roller, and Figs. 7 and 8 are detail views, showing the respective hopper gates with their operating devices. Fig. 9 is an end view of the cleaner and Fig. 10 is a detail view of one of the cheek pieces.

This invention has relation to certain new and useful improvements in grain cleaners, and it consists in the novel construction and combination of parts all as hereinafter described and pointed out in the appended claims.

The object of the invention is to improve the general construction and arrangement of parts whereby the efficiency of the machine is increased, and its operation facilitated all as will fully hereinafter appear.

Referring to the accompanying drawings, the numeral 1 designates the frame of the machine, which is of such construction as to provide suitable support for the various parts.

2 designates the drum, or fan casing, which is preferably made of flexible sheet metal, such as galvanized iron, bent into proper form, and stiffened by transverse bars or cleats 3 which also secure the drum or casing in place by means of screws 4, which enter the drum heads 5. These screws can be readily removed, and the drum flattened out in order to secure greater compactness and convenience in shipping.

6 designates a removable hopper, formed in two parts, supported one upon the other, as shown.

7 is the gate of the hopper 6, arranged to slide in suitable ways or guides, and having therein a transverse groove 8 in which is arranged to slide endwise a strip 9.

10 is a combined lever and handle, pivoted at its intermediate portion to a cleat 11 on the under side of the hopper, and at its lower end connected to said strip 9.

12 is a link or lever also connected to the strip 9 and cleat 11.

By the operation of the lever handle 10, the gate may be opened evenly across the hopper bottom, there being sufficient friction of the parts to hold the gate at any point.

Journalled transversely of the machine, in close parallel relation to each other, and immediately underneath the opening formed by opening the gate 7, are a pair of rubber, or other yielding and intergearing rollers, 13. These rollers receive the grain from the hopper and act to crush any lumps of dirt which may be present therein, and also poor kernels of grain, especially poor beans, when the machine is used for the purpose of cleaning beans. After being crushed, the separation is much more easily and thoroughly effected. On the end of the driving roller of the pair is a balance wheel 14, which adds to the momentum and crushing force of the rollers. The boxes 15 for one of said rollers are carried by a bracket or casting 16, pivoted to the hopper frame at 17, and having a set screw 18 which engages the hopper frame. By means of this screw this roller may be adjusted toward or away from the other to suit the character of the grain being treated. Said rollers are driven by a pinion 18^x which meshes with the driving gear of the fan shaft.

19 is the permanent hopper into which fits the removable hopper 6. The lower portion of the hopper 6 below the rollers 13, has no bottom so that the material run through the rollers falls onto the bottom of the hopper 19.

20 is the gate to hopper 19, arranged to discharge at the lower rear portion of said hopper. Said gate is supported by pivoted parallel oblique links 21, 21, connected at their upper portions to the hopper and at their lower portions to the said gate. 22 is the

handle lever connected to said gate and projecting out through the side of the machine. A pull on this handle opens the gate, as will be readily seen, while a push closes the gate.

5 On the under edge of said handle lever are a series of teeth or notches 23, arranged to engage with a small plate 24, and this holds the gate open to any desired degree.

25 is the grading chamber into which the 10 grain falls from the hopper 19. The blast enters this chamber through a transverse opening 26, in the drum or fan casing at the lower portion of said chamber. Said opening 26, is protected by a wire screen 27, which

15 is held in place by means of bolts through the end portions of the screen frame and through the sides of the machine, and secured by thumb nuts 28, which draw the frame into grooves therefor in the frame.

20 As the grain falls from the hopper 19, it is met and partially suspended by the upward blast from the fans 29, through the opening 26, and the lighter parts and particles are blown out through the rear of the chamber

25 25. Said chamber is partially closed at the rear by means of a series of closely fitting slats 30, superposed one upon another in edgewise position, and held and working in grooves 31 in the sides of the chamber. The

30 light parts or particles are blown out over these slats, and by removing one or more of them, or by inserting additional ones, the depth of the grading chamber, and the consequent point of discharge of the light matter 35 may be regulated to suit the nature of the substance being cleaned. The grain or heavy matter from the hopper 19 falls onto the board 32 and the upper sieve 33.

34, designates adjustable cheek pieces for 40 the sieve 33, one piece being provided at each side of the machine. Said pieces are pivoted at their inner portions to the sides of the mill. In the rear portions of said pieces are slots 35, engaged by thumb bolts 36, which also 45 work in elongated guides or slots 37 at the rear side portions of the frame. The slots 35 it will be observed permit the bolts 36 to move up and down in the guides 37, and thereby permit the adjustment of the cheek pieces to 50 different degrees of inclination. These cheek pieces have horizontal inwardly projecting flanges 38, and serve to keep grain, seed, &c., from getting between the sides of the mill and the sides of the sieve and thereby causing the sieve to wedge or stick.

The rear or outer end of the sieve 33 is supported by means of lugs 39 depending from said cheek pieces. Below the sieve 33, and inclined oppositely thereto, is a screen 40, 60 supported at the rear by lugs 41, similar to the lugs 39, and having cheek pieces 42 similar to the pieces 34, with the exception that the slots therein, (corresponding to slots 35 in pieces 34) are at the forward ends instead 65 of the rear.

43 is the shake rod for the sieve 33, said rod

being extended transversely across the mill and having a bail 43* on which is hinged a clasp 44. As the sieve is shoved in over the lugs 39, and under the cheek pieces 34, it 70 passes onto the clasp 44 and pushes the clasp up into position to receive its end bar, which is held thereby. The working motion given the rod 43 by the means hereinafter described, is such as to give a very effective movement 75 to the sieve, throwing it forward and downward, preventing the grain from passing off the sieve too rapidly.

45 is the shake rod for the screen 40, said rod having a bail 46. In the under side of 80 the bars 47 of the screen frame are notches 48, which as the said screen is shoved to place, over the lugs 41, and under cheek pieces 42, engage the bail 46. It will be observed that we do away with shoes and shake frames, the 85 sieve and screen being the only parts which move under the action of the shake rods 43 and 45. On one end of the rod 45 is an upwardly and forwardly extending arm 49, having an adjustable connection with one end of 90 a pitman 50, which at its other end is connected to a crank pin 51, on the end of the fan shaft 52. On the end of the rod 43 is a downwardly extending arm 53, which has an adjustable connection with one end of a le- 95 ver 54, the other end of which is connected to the pitman 50. Inasmuch as the shake rod 45 is attached to the operating mechanism above its axis, while the rod 43 is connected thereto below its axis, it will be apparent 100 that the two screens have directly opposite movements at all times, whereby the vibration of one counteracts the vibration of the other, and prevents all excessive vibration of the mill as a whole. 105

55 are rocker arms on the bail 46. When the connection between the rod 45 and the pitman is correctly adjusted, the rocking of said rod raises said rockers so as to throw them against the under side of the lateral 110 frame pieces of the screen 40, causing them to knock said screen up and down, and thereby keep it clear.

56 is a guard or shield which is supported above the sieve 33. Said shield is supported 115 by bolts 58 which engage slots 59 in the lateral portions of the shield, which arrangement permits the shield to be moved forward or backward, or to swing it up or down to adjust it to the grading chamber when one or more 120 of the slats 30 are removed.

60 is an adjustable deflector, situated between the sieve 33 and the screen 40. By means of thumb bolt 61 engaging a slot 62 in the lateral pieces thereof, the deflector may 125 be tilted to the desired degree, and in this manner control the delivery of the grain onto the screen 40.

63 is an adjustable tail board, adjusted to any desired inclination by means of thumb 130 bolts 64 engaging the slots or guides 37, before described.

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

1. In a grain cleaner, the combination of a
5 permanent hopper 19 having an inclined bottom, and a vertically sliding gate at its lower rear portion, a removable hopper 6 having its bottom and discharge considerably above the inclined bottom of the said stationary hopper,
10 an extension on said removable hopper fitting said permanent hopper, and the rollers underneath the discharge of said removable hopper, substantially as specified.

2. In a grain cleaner, the hopper 19 having
15 the gate 20 at its lower rear portion, the vertical grading chute into which the grain falls from said gate, the upwardly directed blast opening 26 into said chute, the screen guarding said opening, the series of superposed removable slats forming the front wall of said
20 chute, the grain board 32 at the bottom of said chute, the guard 56, the sieve 33, the screen 40 and means for imparting opposite vibratory movements to said sieve and screen, substantially as specified.

3. In a grain cleaner, the hopper 19 having a vertically sliding gate 20, a pair of parallel, oblique links 21 connected each at one end to the hopper and at the other end to said gate,
30 a lever handle 22 connected directly to said gate and projecting out through the side of the machine, a series of teeth or notches 23 on the under side of said lever handle, and a plate 24 on the frame designed to be engaged
35 by said teeth or notches, substantially as specified.

4. In a grain cleaner, the grading chamber 25, a transverse upward opening 26 from the blast chamber into the lower portion of the grading chamber, the wire screen 27 protecting said opening 26, and a series of edgewise disposed, superposed, removable slats, forming the rear wall of said chamber 25, substantially as specified.

5. In a grain cleaner, the combination of the
45 sieve 33, its pivotal and vertically adjustable cheek pieces 34 having horizontal flanges 38, and sieve supporting lugs 39, the oppositely inclined screen 40 below said sieve, its cheek pieces 42 similar to the pieces 34, the shake
50 rod 43, its bail, a clasp 44 hinged to the said bail and arranged to engage with the sieve 33, the shake rod 45, its bail 46, adapted to engage with the screen 40, the rocker arms 55 on said bail, and means connected to the said
55 rods 43 and 45 for imparting an opposite vibratory movement to said sieve and screen, substantially as specified.

6. In a grain cleaner, the combination of the screen 40, its notched bars 47, the shake rod
60 45, its bail 46, engaged by the notches in said bars, the rocker arms 55 on said bail, and means for operating said shake rod, substantially as specified.

In testimony whereof we affix our signatures 65 in presence of two witnesses.

JOSEPH G. PLOWMAN.
HENRY E. KITTELL.

Witnesses:

ELIAS REED,
SAMUEL SPEESE.