

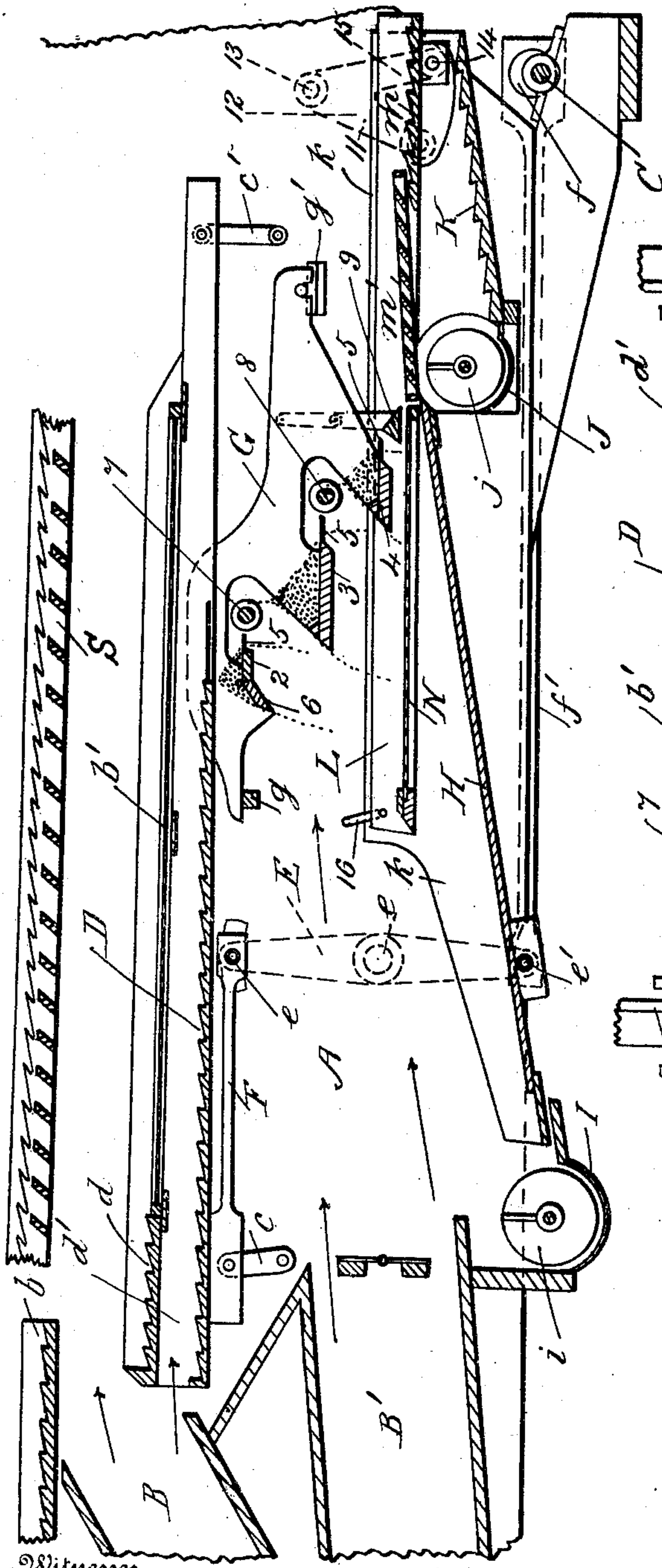
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CLEANING MECHANISM.

APPLICATION FILED OCT. 26, 1909.

990,803.

Patented Apr. 25, 1911.



Witnesses

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FIG. 1-

384

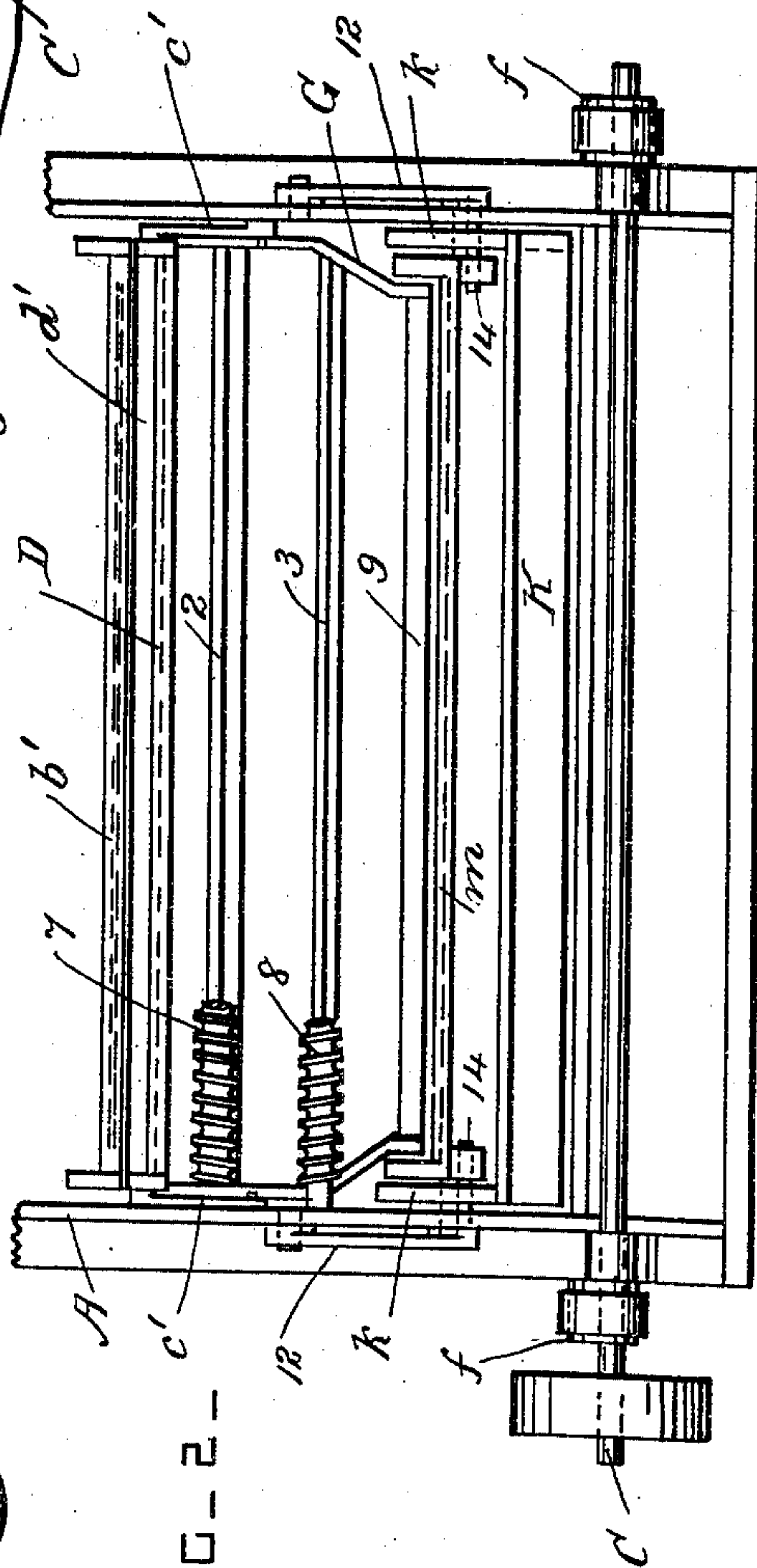


FIG. 2-

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# UNITED STATES PATENT OFFICE.

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CLEANING MECHANISM.

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Specification of Letters Patent.

Patented Apr. 25, 1911.

Application filed October 26, 1909. Serial No. 524,661.

*To all whom it may concern:*

Be it known that we, EZRA G. CLYMANS and ANDREW M. HESS, citizens of the United States, residing at Waynesboro, in the county of Franklin and State of Pennsylvania, have invented certain new and useful Improvements in Cleaning Mechanism; and we do hereby 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.

This invention relates to the cleaning mechanism of grain separators; and it consists in the novel construction and combination of the parts hereinafter fully described and claimed whereby the machine is enabled to clean many kinds of small seeds which are lighter than grain as well as the various kinds of grains for which such machines are usually constructed.

In the drawings, Figure 1 is a longitudinal section through the cleaning mechanism. Fig. 2 is an end view of the cleaning mechanism.

A is a portion of the casing of a grain separator of any approved construction. This separator is provided with a fan or blower of any approved kind which forces a blast of air rearwardly through the machine, in the direction of the straight arrows in the drawing, from the blast passages B and B'.

C is a driving shaft journaled at the rear end of the machine, and driven in any convenient manner. All the moving parts of the cleaning mechanism are driven from this shaft C.

D is a grain-bottom which receives the grain or other seeds from a grain-bottom *b*, and a chaffer S of any approved construction, together with dirt and other rubbish which requires to be removed. The grain-bottom D has shelf *d* at its front end adjacent to the blast passage B, and it is supported by pairs of similar arms *c* and *c'* at its front and rear respectively, said arms being pivoted in the casing A. The shelf *d* forms an open passage *d'* at the front or receiving end of the shoe through which the air is directed from the blast passage B.

A removable sieve or riddle *b'* is arranged over the grain-bottom D level with the shelf *d*, and its rear end is arranged over the

tailings-chute J hereinafter described. A sieve of large mesh or of small mesh may be used at this point according to the nature of the grain or seed, and the sieve may be taken out altogether, if desired.

The grain-bottom D together with its shelf and sieve is reciprocated longitudinally by means of two similar levers E arranged outside the casing A and pivoted to it by pivots *e* at their middle parts. The upper ends of the levers E are connected together by a pivot tube *e* and their lower ends are connected by a pivot tube *e'*.

F are two similar connecting-rods of resilient material which connect the pivot tube *e* with the grain-bottom D. The casing has suitable slots for the tube *e* to work in, and the connecting-rods F are arranged inside the casing. Eccentrics *f* are secured on the driving shaft C, and *f'* are eccentric-rods which connect the eccentrics *f* with the pivot tube *e'*.

The cleaning devices for heavy grain, such as wheat and barley, consist chiefly of a series of shelves 2, 3 and 4, arranged in a shoe or frame G in the form of steps. These shelves have each a row of teeth 5 at their rear edges, and the upper shelf 2 has a flap 6 hinged at its front side. This flap is supported in a horizontal position when heavy grain is being cleaned, and is let down to an inclined position, as shown, when small and light seeds are being cleaned. The shelves 2 and 3 have grooved rollers 7 and 8 respectively journaled in the frame A and arranged at their rear parts. The shoe G is supported in the frame A by a bar *g* and by brackets *g'*, but it may be supported in any other approved manner, and it may be provided with any approved mechanism for adjusting its position longitudinally with reference to the rollers 7 and 8, and it also may have any approved mechanism for jarring or vibrating it.

A triangular bar 9 is supported at the rear side of the lowest shelf, a grooved roller not being necessary at that point. This bar 9 is adjustable, and it is supported in any approved manner.

H is a forwardly and downwardly inclined gatherboard arranged under the cleaning-shelves and rollers for receiving the clean grain which drops from them.

I is the grain-chute at the lower end of



the gatherboard H, and *i* is a spiral conveyer of any approved construction arranged in the grain-chute I.

J is the tailings-chute arranged at the upper end of the gatherboard H close behind and under the triangular bar 9, and *j* is a spiral conveyer of any approved construction arranged in the tailings-chute.

K is a return gatherboard for tailings arranged in a downwardly and forwardly inclined position to the rear of the tailings-chute and delivering into it. The two gatherboards H and K have side plates *k* which secure them together.

The front end of the gatherboard H is supported by and pivoted to the pivot tube *e'* of the levers E, so that both gatherboards are reciprocated by the eccentrics *f* and their rods. The rear end portions of the side plates *k* of the gatherboards are pivoted to the front arms 11 of two similar bell-crank levers 12 which are pivoted to the frame A by pins 13.

L is a bottom which is suspended between the side plates *k*, and which delivers at the rear end of the machine. The rear end of the bottom L is pivoted by pins 14 to the rear arms 15 of the bell-crank levers 12. The bell-crank levers are arranged outside the casing, and the casing sides and the side plates *k* have suitable openings or slots for the pins 14 to project through.

The bottom L has a serrated plate *m* at its rear end, and *m'* is a screen formed of slats which is placed in the bottom L over the tailings-chute to prevent large fragments of rubbish, such as pieces of corn-stalk, from getting into the tailings-chute. The screen *m'* is removable, and when it is used it allows the tailings to fall into the tailings-chute, and works the large rubbish rearward onto the plate *m*.

The front end of the bottom L is suspended between the side plates *k* by two similar arms 16 which are pivoted to the casing A. The bottom L is reciprocated by the bell-crank levers which are arranged and provided so that while a tossing motion is imparted to the two gatherboards K and H, a tossing motion is imparted to the bottom L with its screen *m'* and plate *m*.

The motion of the eccentrics *f* is communicated to the front or left hand end portion of the gatherboard H. The arms E are vertical (as shown) when the eccentrics are at mid-stroke, and the arms 11, which support the rear end portions of the parts H and K, are inclined toward the front. When the parts H and K are moved forwardly, toward the left from the position shown, their rear end portions are moved upwardly to a greater extent than their front end portions. This tossing motion works the material forwardly to the left into the chutes I and J.

The arms 15 and 16 are inclined downwardly and rearwardly, when all the parts are in the position shown, but as the arms 16 are much shorter than the arms 15, the front end portion of the bottom L, which is supported by the arms 16, has a greater upward or tossing movement than its rear or right hand portion, and the material on the parts N and *m*, in said bottom, is worked rearwardly to the right hand.

N is a sieve or screen of fine mesh which is supported in the bottom L, over the gatherboard H and between it and the cleaning-shelves and rollers. This screen N is removable.

When heavy grain, such as wheat or barley, is being cleaned, a screen of large mesh may be placed above the grain-bottom D, if occasion requires it and according to the condition of the grain, or such screen may be dispensed with.

The grain-bottom D discharges the grain onto the top shelf, and the grain falls from one shelf to another, and is operated on by the rollers and the blast of air from the fan. Piles of grain, as indicated by the dotted lines, are formed on the shelves. The clean grain slides off the front sides of these piles and falls onto the gatherboard H. The dirt and some of the grain slides down the rear sides of the piles and is operated on by the teeth, the rollers and the blast of air from the fan, so that all the clean grain is finally delivered onto the gatherboard H. The dirt and the tailings, or unthreshed heads, are delivered into the tailings-chute, large pieces of rubbish being removed by the screen *m'*, as hereinbefore described.

The fine mesh screens *b'* and N are not required for grain which is heavier than the dirt and rubbish which is mixed with it. When small and light seeds are to be cleaned, such as timothy, flax, millet, or orchard grass, either or both of the screens *b'* or N are used, as such seeds are lighter and smaller than the dirt and rubbish mixed with them. The use of either or both of these screens depends upon the particular kind of seed, its condition, and the nature of its impurities. The very fine seeds pass through the mesh of the screens *b'* and N. When the screen N only is used the action of the shelves and grooved rollers is the same as hereinbefore described. The seeds which drop onto the screen N are worked through it and slide down the gatherboard H, and the impurities are worked to the rear and are delivered into the tailings-chute.

What we claim is:

1. In cleaning mechanism, the combination, with shelves arranged in the form of steps, cleaning devices arranged at the rear ends of the shelves, and means for delivering the material to be cleaned onto the top shelf of the series; of a reciprocatory gatherboard



provided with sides and arranged under the said shelves, a reciprocatory bottom arranged between the sides of the gatherboard and provided with a removable sieve to intercept  
 5 the material falling from the shelves to the gatherboard, and means for suspending the said gatherboard and bottom so that the gatherboard has a tossing motion which works the material resting on it toward the  
 10 front and the bottom and its sieve a tossing motion which works the material resting on them toward the rear.

2. In cleaning mechanism, the combination, with shelves arranged in the form of steps, cleaning devices arranged at the rear  
 15 edges of the shelves, and means for delivering the material to be screened onto the top shelf of the series; of a gatherboard arranged under the said shelves, pivoted bell-  
 20 crank levers having the rear end portion of the said gatherboard suspended from their front arms, means for supporting the front part of the said gatherboard, a bottom having its rear end portion pivoted to the rear  
 25 arms of the said bell-crank levers, driving devices for reciprocating the said gatherboard and bottom so that they deliver the material resting on them in opposite directions, and a removable sieve arranged in the said bot-  
 30 tom between the said shelves and gatherboard.

3. In cleaning mechanism, the combination, with shelves arranged in the form of steps, cleaning devices arranged at the rear  
 35 edges of the said shelves, a reciprocatory bottom for delivering the material to be cleaned onto the top shelf of the series, and means for supporting the said bottom; of pivoted levers having their upper ends operatively connect-  
 40 ed with the said bottom, a driving shaft journaled at the rear of the said parts, eccentrics and rods operatively connecting the said shaft with the lower ends of the said levers, a gatherboard arranged under the said  
 45 shelves and having its front end carried by

the said levers, pivoted bell-crank levers supporting the rear part of the said gatherboard, a reciprocatory bottom having its rear end carried by the said bell-crank levers, means for supporting the front part of the  
 50 last said bottom, and a removable sieve arranged in the last said bottom between the said shelves and gatherboard.

4. The combination, with a casing provided with an upper blast passage and a  
 55 lower blast passage, and grain cleaning devices arranged to receive blast from the lower blast passage; of a reciprocatory shoe arranged in the said casing between and be-  
 60 hind the said blast passages and provided with a single and substantially horizontal bottom for delivering the material to be cleaned to the said cleaning devices, said shoe having also a receiving shelf at its front  
 65 end and a blast passage between its said shelf and bottom, a feed bottom arranged above the upper blast passage and delivering the material to be cleaned onto the said shelf, and a removable sieve supported in  
 70 the said shoe level with the said shelf and extending over the cleaning devices and operating to remove certain coarse material.

5. The combination, with a feed-bottom, a chaffer, and grain-cleaning devices; of a reciprocatory shoe provided with a single and  
 75 substantially horizontal bottom for feeding the material from the said feed-bottom and chaffer to the grain-cleaning devices, and a sieve arranged in the said shoe between its bottom and the chaffer and extending over  
 80 the grain-cleaning devices and operating to prevent certain coarse material from being delivered to the cleaning devices.

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

EZRA G. CLYMANS.  
 ANDREW M. HESS.

Witnesses:

WM. G. EPPLEY,  
 WM. W. SHOEMAKER.