

Jan. 2, 1923.

W. M. FARGUSON.
GRAIN CLEANING MACHINE.
FILED MAR. 14, 1921.

1,440,726.

2 SHEETS—SHEET 1.

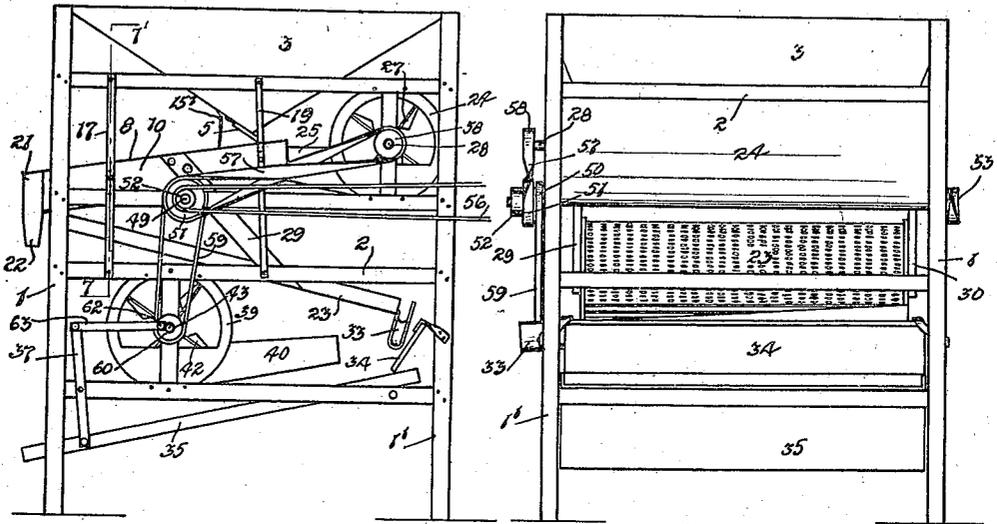


FIG. 1

FIG. 2

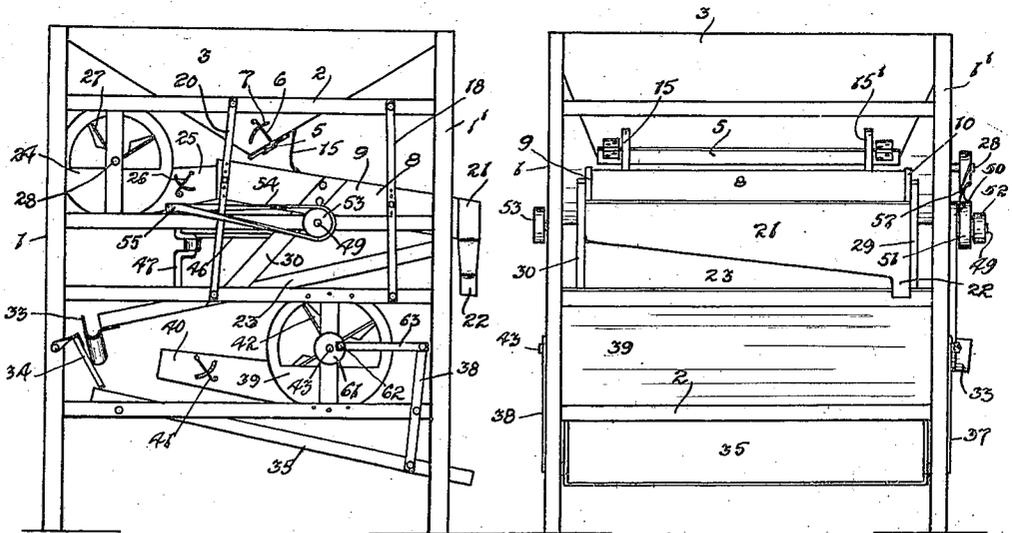


FIG. 3

FIG. 4

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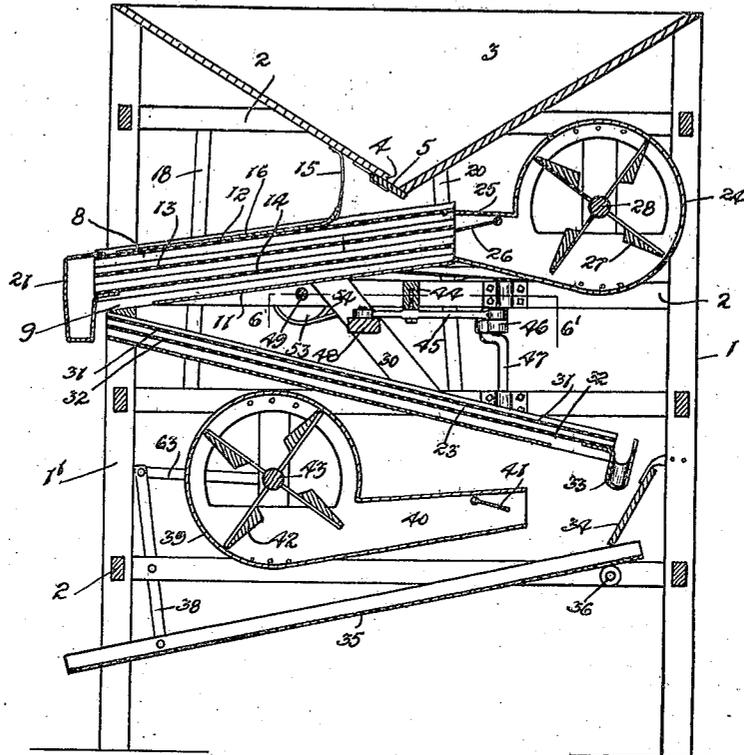


Fig. 5

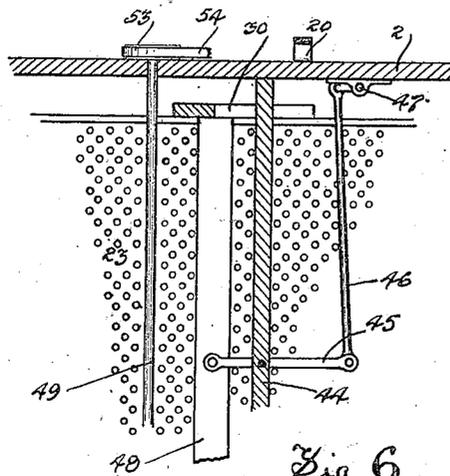


Fig. 6

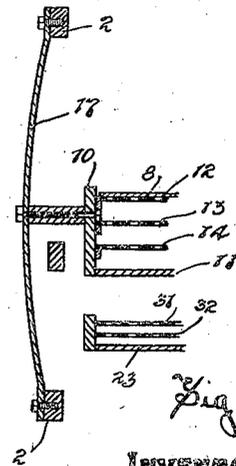


Fig. 7

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Patented Jan. 2, 1923.

UNITED STATES PATENT OFFICE.

WILLIAM M. FERGUSON, OF BRANDON, MANITOBA, CANADA.

GRAIN-CLEANING MACHINE.

Application filed March 14, 1921. Serial No. 451,936.

To all whom it may concern:

Be it known that I, WILLIAM M. FERGUSON, of the city of Brandon, in the Province of Manitoba, Canada, have invented certain new and useful Improvements in Grain-Cleaning Machines, of which the following is the specification.

The invention relates to improvements in grain cleaning machines and an object of the invention is to provide a comparatively large capacity machine which will affectively clean grain, separating wild oats, obnoxious seeds, chaff, straw etc. from the good grain such as wheat.

A further object of the invention is to arrange the machine so that the separation is effected for the greater part by air blast.

A further object is to construct the machine in a simple, durable and easily operated manner.

With the above more important objects in view the invention consists essentially in the arrangement and construction of parts hereinafter more particularly described and later pointed out in the appended claims, reference being had to the accompanying drawings in which:—

Figures 1 and 3 are views of the opposite sides of the machine.

Figures 2 and 4 are views of the front and rear end of the machine respectively.

Fig. 5 is an enlarged vertical sectional view longitudinally through the machine.

Fig. 6 is a horizontal sectional view through the machine at 6—6' Fig. 5.

Fig. 7 is an enlarged detailed vertical sectional view at 7—7' Fig. 1.

In the drawings like characters of reference indicate corresponding parts in the several figures.

The frame or body 1 of the machine is of ordinary construction presenting the customary corner legs 1' connected by suitably disposed side beams or struts 2 and carrying at the top a suitable hopper 3 fitted with an outlet opening 4 which is controlled by a hinged gate 5. In the present instance the gate is adjusted by the end lever 6 permanently connected to the gate with the point of connection axially aligned with the hinges and the lever extends over a toothed segment 7 secured to the end of the hopper.

In a location immediately beneath the gate

I locate an upper shoe 8 which is formed from side boards 9 and 10, a bottom board 11 and a gang of screens, the individual members of the gang of screens being indicated at 12, 13 and 14. The screens are suitably spaced and are disposed one directly above the other and extend forwardly beyond the forward end of the machine as best shown in Fig. 5.

To the hopper I secure a pair of straps 15 and 15' which extend downwardly towards the upper screen but terminate clear of the same and to the lower ends of the said straps I attach an apron 16 such as of oil-cloth which lies on the top face of the top screen, the arrangement being such that the grain fed onto and passing over the top screen is held down by the apron. The top shoe is supported for lateral vibratory movement by pairs of front and rear side springs 17 and 18, 19 and 20, the springs having their upper and lower ends attached to the beams 2 and their central portions fastened to the sides of the shoe. To the front end of the shoe I attach an enclosed side delivery chute 21 having an inclined bottom which feeds the material delivered to the chute through a side discharge spout 22.

Here it will be noticed that the bottom of the shoe terminates somewhat back from the forward end of the lowermost screen 14 so that the material caught by the bottom board will be delivered downwardly within the machine on to the lower shoe 23.

Immediately to the rear of the upper shoe and beneath the hopper I locate a fan casing 24 provided with a blast spout 25 which opens to the rear end of the top shoe and is fitted with a controlling valve 26. Within the casing I mount a fan 27 carried by the fan shaft 28, the said shaft being suitably mounted in side bearings carried by the sides of the machine. This fan is driven as later explained so that it will effect an air blast through the spout and into the upper shoe.

Here it will be observed also that the top shoe inclines downwardly in passing forwardly and that the lower shoe has the forward end elevated so that it inclines downwardly in passing rearwardly. The forward end of the lower shoe is suitably carried by the forward end of the upper shoe and the rear end is supported by side bars

29 and 30 from the top shoe. According to this arrangement, when the top shoe is laterally agitated within the frame the bottom shoe moves with it.

5 The lower shoe is of the same construction as the upper shoe but it has only two screens 31 and 32, the material delivered over these screens being caught and discharged to the side by an end chute 33. The
10 material passing through the latter screens and caught by the bottom board of the under shoe is discharged over the end of the bottom board and in a falling stream onto an inclined cross deflecting board 34 carried
15 by the machine frame, the deflecting board being spaced clear of the chute 33 and having the lower edge delivering on to the inclined deflecting pan 35. The rear end of the deflecting pan is carried by rollers 36
20 whilst the front end is supported by swinging arms 37 and 38 pivotally carried by the machine frame. Between the under screen and the pan I locate a second or lower fan casing 39 which is provided with a rear-
25 wardly directed blast spout 40 supplied with a controlling valve 41 and the rear end of the spout is directed towards the inclined cross board 34 so that the blast from the fan strikes the board and passes through the
30 stream of material falling from the lower chute.

42 is a fan within the casing 39, the said fan being carried by the cross shaft 43, the ends of which are suitably mounted in the
35 machine frame. More or less centrally of the machine in a location beneath the top shoe I locate a cross beam 44 which carries a pivot lever 45, the rear end of which is connected by a cross rod 46 to the crank of a
40 vertically disposed crank shaft 47 suitably mounted in bearings provided on the side of the machine. The forward end of the lever 45 is pivotally attached to a cross bar 48 extending between the side bars 29 and 30.

45 The above arrangement effects in the driving of the crank shaft the alternate lateral shifting of the bar 48 and the consequent lateral vibratory movement of the upper and lower shoes.

50 49 is the main driving shaft of the machine which has the ends suitably carried in the sides of the machine frame and it is provided at the front side of the machine with three pulleys 50, 51 and 52 and at the
55 rear side with a single pulley 53. The pulley 53 is connected by a crossed driving belt 54 to a pulley 55 secured to the upper end of the crank shaft. A driving belt 56 is connected to the pulley 50, this belt being driven
60 by an engine (not shown). The pulley 51 is connected by a crossed belt 57 to a driving pulley 58 secured to the fan shaft 28 and the pulley 50 is connected by a belt 59 to a driving pulley 60 secured to the fan shaft 43.
65 The shaft 43 is supplied with a disc or wheel

61 similar to the pulley 60, the said pulley and wheel being at opposite ends of the said shaft and the said wheel and pulley are both fitted with eccentric pins 62 connected by means of connecting bars 63 to the upper
70 ends of the levers 37 and 38.

From the above connections it will be apparent that by driving the shaft 49 I rotate the fans, laterally agitate the shoes and give the pan a forward and back reciprocating
75 movement.

When the machine is working the grain to be cleaned is placed in the hopper and the gate 5 is properly set. The grain discharged onto the top shoe undergoes an initial separation effected by the combined effort of the
80 screens and the air blast from the fan 27. The material too large to pass through the screens passes over the screens into the chute 21 and the lighter material is caught in the
85 blast from the fan and blown ahead between the screens and delivered also into the said chute.

The material initially separated in the top shoe and caught by the board 11 is discharged
90 by said board onto the lower shoe and here undergoes a second separation, the material which is too large to pass through the screens of the under shoe being caught and delivered to the side by the chute 33. The separated
95 material or that passing through the latter screens is delivered by the bottom board of the under shoe in a falling stream, the said stream dropping for the greater part on to the deflecting board 34. The blast
100 from the fan 42 operating on the stream of grain falling from the lower shoe, carries any light material out of the falling stream and discharges it at the back of the machine and in this connection I might mention that
105 by permitting the falling stream to impinge or drop on to the inclined board 34 I give the blast of the fan a good chance to operate effectively, as the grain is momentarily arrested by the board and the air blast from
110 the fan has a good opportunity to catch the lighter material and sweep it up over the upper edge of the board 34. The material delivered on to the pan 35 is accordingly cleaned grain and it is discharged by the
115 pan at the front end of the machine.

What I claim as my invention is:—

1. A grain cleaning machine comprising upper and lower screen shoes, means supporting said shoes for lateral movement in a
120 horizontal plane, connecting bars extending between the sides of said shoes, a cross bar extending between said connecting bars, a lever mounted intermediate of its ends on a vertical pivot and connected at one end to
125 said cross bar and a vertical shaft provided with a crank connected to the remaining end of the lever.

2. A grain cleaning machine comprising upper and lower screen shoes, a lever mount- 130

ed intermediate of its ends on a vertical
pivot and having one end thereof pivotally
connected with both of said shoes to impart
lateral movement thereto, a vertically dis-
posed shaft provided with a crank and a
link extending between said crank and the
remaining end of the lever.

Signed at Brandon this 3rd day of Jan-
uary, 1921.

WILLIAM M. FARGUSON.

In the presence of:—

R. G. MACDONALD,
ALICE E. PUGSLEY.