

(No Model.)

M. N. LAUFENBURG.
GRAIN SEPARATOR AND CLEANER.

No. 416,464.

Patented Dec. 3, 1889.

Fig. 1.

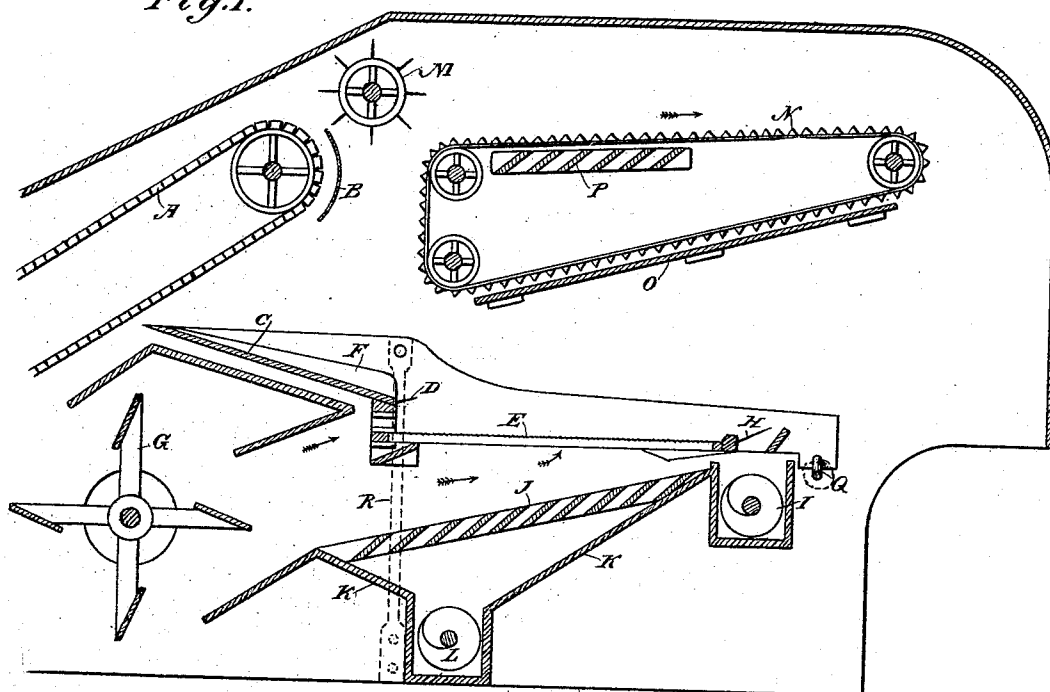
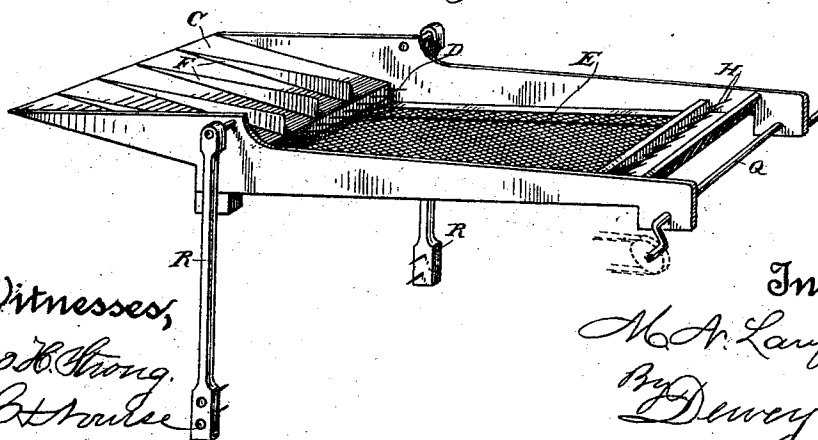


Fig. 2.



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UNITED STATES PATENT OFFICE.

MICHAEL N. LAUFENBURG, OF STOCKTON, CALIFORNIA, ASSIGNOR TO THE STOCKTON COMBINED HARVESTER AND AGRICULTURAL WORKS, OF SAME PLACE.

GRAIN SEPARATOR AND CLEANER.

SPECIFICATION forming part of Letters Patent No. 416,464, dated December 3, 1889.

Application filed March 15, 1888. Serial No. 267,276. (No model.)

To all whom it may concern:

Be it known that I, MICHAEL N. LAUFENBURG, of Stockton, San Joaquin county, State of California, have invented an Improvement
5 in a Grain Separator and Cleaner; and I hereby declare the following to be a full, clear, and exact description of the same.

My invention relates to an apparatus for more perfectly separating and cleaning grain;
10 and it consists in the constructions and combinations of devices which I shall hereinafter fully describe and claim.

Referring to the accompanying drawings for a more complete explanation of my invention, Figure 1 is a longitudinal vertical
15 section of the rear end of the thrasher and separator, showing this cleaning mechanism. Fig. 2 is a perspective view of the shoe.

My invention is intended to separate from
20 the grain as much as possible of the straw and lighter chaff, so as to reduce the work of the supplemental cleaner.

A is a carrier-belt upon which the straw and grain are delivered from the thrashing-cylinder and by which they are brought up
25 to a point where the grain falls from the upper end of the carrier-belt, and is directed by the curved board B, so that it falls upon the inclined table C, from the lower rear edge of
30 which it is delivered through the projecting wire fingers D upon the screen E. The receiving-table C is divided by vertical triangular partitions F into channels of greater or less
35 width, and the object of this division is to prevent the grain after falling upon the table from sliding to one side or the other when the machine stands or travels upon inclined
40 ground, and this insures the grain being distributed pretty evenly over the screen E when it falls upon it. The projecting wire fingers D serve to hold up the chaff and short straw
45 which may fall with the grain, so as to give the grain a chance to fall first upon the screen, and also to enable the blast of air from the fan G to act upon this chaff and carry it toward the rear end of the shoe, where it is again lifted and directed outward by the wire
50 fingers H, the object being to keep this light chaff and short straw as high as possible and allow the grain to fall upon the screen by its

greater weight, where it can be acted upon by the air-blast from below, and while the heads and coarser waste matter pass off from the screen E the grain, mixed with oats, barley, and small impurities, will fall through
55 the screen. Any heads which may be contained in the grain will pass off the rear of the screen E, through the fingers H, and fall into the conveying auger-spout I, by which they are delivered into a return-elevator,
60 which carries them back to the thrashing-cylinder in the usual manner, and the chaff will be blown out over the rear end, this being the ordinary construction for thrashing-machines.

After the grain has fallen through the screen E it may still carry with it some chaff, straw-joints, and light material, which it is desirable to separate, so as not to burden the final
70 cleaner with too much of this work. I therefore fix a series of backwardly-inclined leaves or shutters J beneath the screen E, the general direction of the frame in which these leaves are fixed being upward and backward.
75 Beneath these leaves or shutters is a sort of hopper having the inclined bottoms K, which converge toward the auger-spout L, the incline being sufficient so that the grain falling upon it will at once slide down into the auger-spout, and from this point the auger conveys
80 the grain to one side and delivers it to an elevator, by which it is carried to a supplemental cleaner.

By the use of the frame of inclined leaves or shutters J the light material which may pass
85 through the screen E will be prevented from dropping directly into the carrying-auger L, where it would have a tendency to clog the work, and the blast of air which is delivered directly through the spouts between the screen
90 E and the leaves or shutters J will carry this light material out from the rear end, where it will either fall into the auger-spout I or be carried entirely out of the rear of the machine, there being a sufficient space between
95 the rear end of the screen E and the rear end of the shutter-frame for this purpose. The shutters also give a wavy or ruffled movement to the air, which gradually checks its motions where it passes over the shutters, so that
100

the strong blast which first enters below the screen E is decreased toward the rear, and so moderated as not to blow grain over. The angle of the shutters may be adjusted to suit the work and the strength of the blast, and will give the latter a gradually-decreasing force.

The straw which is brought up by the carrier A along with the grain is lifted and separated from the grain by the revolving picker M in the usual manner, and it falls upon the straw-carrying belt N, which is composed of open slats, that carry the straw backward, discharging it at the rear of the machine in the manner usual to this class of machines. Beneath the return or lower portion of this belt is the closed inclined bottom O, which is designed to receive any grain which, being entangled with the straw, has been carried backward upon the straw-carrier, and it will fall through while the straw is passing over the length of this carrier. This inclined bottom and the dragging of the carrier-slats over it bring such grain back and deliver it upon the front end of the screen E. Beneath the upper and outwardly-traveling part of the straw-carrier belt N, I have fixed a frame having upwardly and backwardly inclined shutters P, which are constructed similarly to the shutters J, the purpose being to prevent the straw, which generally drops with the ends down, from readily falling from the upper part of the belt, and being dragged back and eventually clogging the carrier with straw, weeds, &c., which roll up together and form masses or bunches.

The design of this whole apparatus is to effect a preliminary and rough cleaning, so that the grain will be delivered to the supplemental cleaner with as little as possible of the worthless chaff, and the cleaner will thus be relieved of a great deal of its work. It also separates the grain more perfectly from the straw, and prevents its being carried over with the straw and lost, at the same time preventing the straw from falling through and choking the return carrier or screen.

The shoe in which the screen E is fixed extends forward beneath the carrier-belt A, and the table C is fixed to it so as to be oscillated with the shoe. The rear end of the shoe is connected with a crank Q, and the shaft of this crank has a pulley upon one end, which is driven by a belt from any one of the rotating shafts of the machine which may be convenient for the purpose. The motion of this crank gives the rear end of the shoe a rising

and falling circular motion of considerable rapidity, the tendency of which is to lift everything upon its surface, and gives it an upwardly as well as a horizontally shaking motion. It has been customary in this class of end-shake shoes or screens to suspend the front or receiving end of the shoe by hangers from above, and the motion of this end of the shoe is then made backward and forward on a concave or downwardly-moving arc. In my invention I support the receiving end of the shoe upon elastic arms R, the upper ends of which are connected with the shoe by pins, while the lower ends are secured to the sides of the machine by bolts or other means. These arms are usually made of wood, and the central portion is thin enough to allow them to bend backward and forward with the motion given to the shoe by the crank Q, and, as they are fastened below, the upper ends describe an arc which is convex upwardly, thus lifting the receiving end of the shoe slightly, which action being similar to that of the rear end of the shoe, although in a much smaller degree, is more favorable to the proper separation of the grain from the chaff than when this end is suspended from above.

It will be manifest that the table C may be made separate from the shoe, and may have an independent shaking motion, or it may be stationary; but in either case the channels formed on its surface by the vertical partitions are indispensable to the performance of good work upon inclined or rolling ground, as they prevent the sieves from being overloaded upon one side and running empty on the other.

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

A grain-cleaner consisting of a shoe with a separating-screen fixed therein, and a mechanism whereby a shaking movement of the shoe is produced, a fan with guides, whereby the blast is directed above, beneath, and through the screen, in combination with a rack composed of transverse backwardly-inclining shutters fixed below the line of blast and forming the bottom of the air-passage, so that the blast will impinge upon the upper edges of the rack, substantially as herein described.

In witness whereof I have hereunto set my hand.

MICHAEL N. LAUFENBURG.

Witnesses:

GEO. H. STRONG,
S. H. NOURSE.