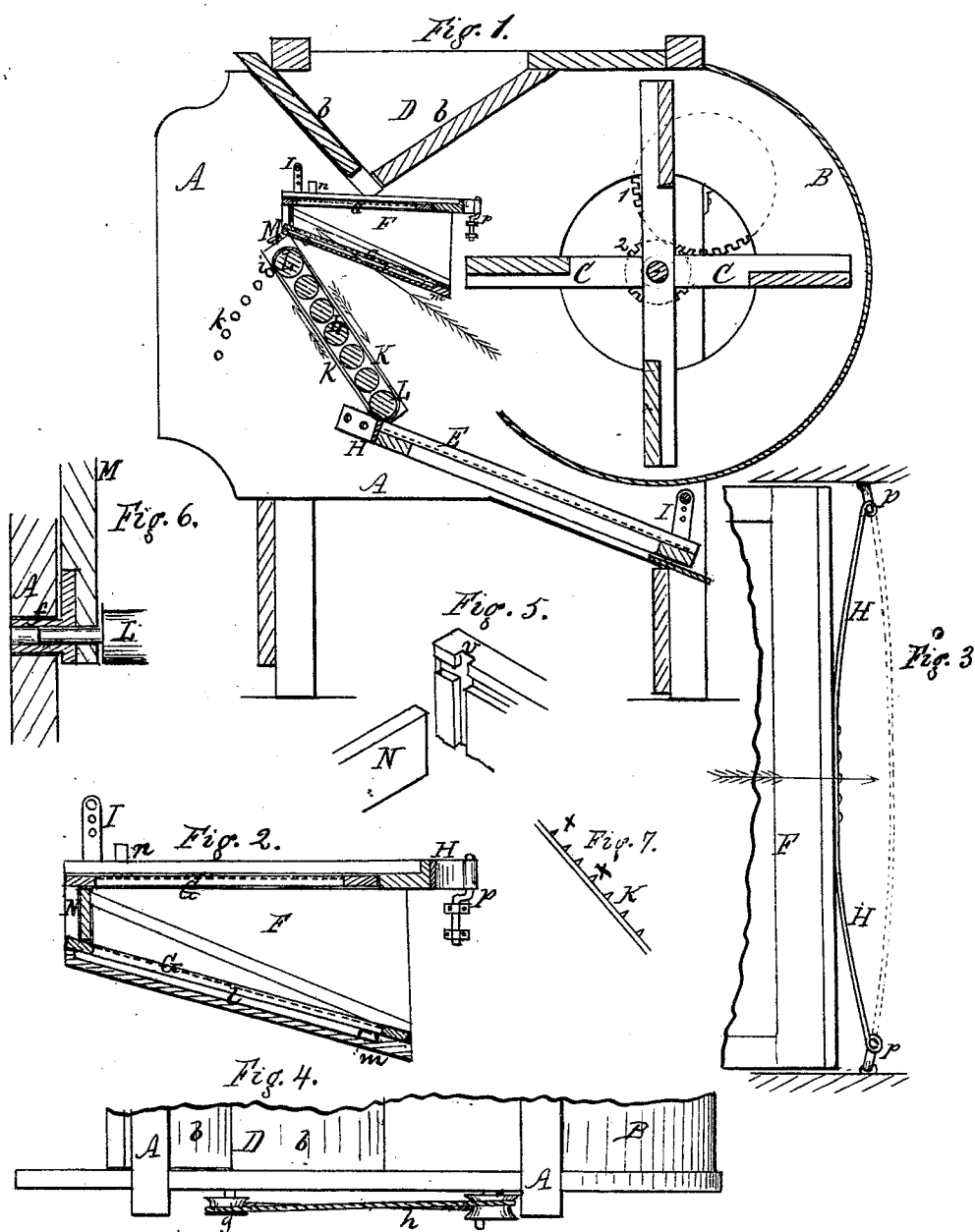


JOHN A. KRAKE.

Improvement in Grain-Cleaners.

No. 126,400.

Patented May 7, 1872.



Witnesses
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UNITED STATES PATENT OFFICE.

JOHN A. KRAKE, OF ALDEN, NEW YORK.

IMPROVEMENT IN GRAIN-CLEANERS.

Specification forming part of Letters Patent No. 126,400, dated May 7, 1872.

Specification describing a certain Improvement in Machines for Cleaning Grain, invented by JOHN A. KRAKE, of Alden, in the county of Erie and State of New York.

Nature of the Invention.

My invention consists in the arrangement of parts, as hereinafter described.

General Description.

In the drawing, Figure 1 is a central longitudinal section; Fig. 2, a section of the shoe and its screens; Fig. 3, a view of the shoe and spring; Fig. 4, a plan of one side of the machine; Figs. 5, 6, and 7, detail views.

A is the frame of the machine, B the fan-case, and C the fan, all of ordinary construction. The fan may be driven by gears 1 2, or by any desired means. D is the hopper. It differs from ordinary grain-hoppers in having two angular sides, *b b*, of V-form, which meet at the bottom, and extend from side to side of the machine. The long side extends down close to the upper surface of the screens, when in place, so as to discharge oats or other long grains lengthwise upon the screens to prevent them passing down through the meshes endwise. By means of this long angle of the hopper, extending from side to side of the machine, the volume of grain is passed to the screens over a greater surface, by which it is better distributed. In ordinary grain-mills there are four angular sides, which concentrate the grain in the center of the hopper, upon a plane bottom, and deliver it in a solid mass to the screens in the center, so that it is not well delivered. In my case the grain is perfectly distributed, and the movable slide in drawing out opens the same width from end to end, so as to feed evenly all the way. E is a screen, or equivalent, being in the frame beneath the hopper, and serving as the delivering-screen for the grain. When this screen is employed the shoe and screens F G G, shown in Fig. 2, are not used. They are used only as alternative forms, and either may be used at pleasure, and in some cases, perhaps, both may be employed. Both are hung in a similar manner, which is as follows: H is a flat spring, attached, in its center, to the induction or grain-receiving end of either the screen or the shoe, (said parts

standing, however, in opposite directions in the machine.) The ends of this spring may be attached to the frame by means of nails or screws, as in Fig. 1, or may be attached to hinges *p p*, as in Figs. 2 and 3; or they may be attached in any manner which allows a free vibration of the spring. The special object of the hinges, as shown in Figs. 2 and 3, is to allow the ends of the spring to work endwise to compensate for the throw in the vibration. These hinges are applied either to the screen or the shoe. The opposite or discharge end of the screen or shoe is hung upon pendent arms or rods I I, which are pivoted to the frame at the upper end, and may be of any desired or convenient construction or form. They have adjusting-holes to allow them to be raised or lowered. This end of the screen or shoe may be driven by any desired means. By this arrangement a compound motion is attained—viz., a simple backward and forward vibration in a longitudinal plane at the induction or receiving end, caused by the spring H, and a combined longitudinal and vertical motion at the eduction end, caused by the pendent arms I I. The longitudinal motion is caused by swinging back and forth, and the vertical motion is caused by the rise of the ends of the arms after passing the dead-point in either direction, as indicated by the arrow, Fig. 2. This compound motion is most effective for separating grain. It is desired that the end of the screen, where the mass of grain falls, shall have as easy a motion as possible, so as not to throw off the grain by tossing it up or down, or to produce rebound; while it is also desired that the discharge end shall have an active and positive motion, in order to properly work down the grain, distribute it over the surface, and discharge it. This is most effectively done by the combined horizontal and vertical vibrations. These vibrations distribute the mass and toss it up and down, so as to work it properly over the whole surface. By the compound motion the grain is tossed in such a manner as naturally to move in the proper direction, even without the aid of the blast.

I am aware that the combined horizontal and vertical vibration, produced by pendent rods, is not new, as it is shown in my patent

of November 27, 1855. Such, however, is not the equivalent of my present invention, as in that case both ends of the screen or shoe receives the combined motion; while in my present case but one end receives it, the other end having a straight forward and back motion, produced by the spring.

The spring has a special novelty, combined with the screen or shoe. It not only holds that end of the screen comparatively still, but it also reacts at both ends of the stroke and returns the screen to its usual position. Furthermore, it breaks the shock or jar at the extreme end of each stroke, and therefore gives ease to the movement, and prevents any violent motion to the grain. The spring also stiffens the screen, and prevents it from moving sidewise to strike the sides of the machine. It also prevents the momentum of the grain from affecting the screen as it strikes it.

Two springs might be used—one at each end of the screen or shoe—in which case the power might be applied at any point, and still no binding would ensue. The spring or springs might also be connected at the sides instead of the ends of the screen, so that the latter would swing crosswise of the machine.

K is an endless apron, which serves as a chute-board, situated over the induction end of the screen, or at any other desired point. It passes around a series of rollers, L L L, which have their bearings in swing-arms M M, fitting the sides of the machine. The journals of the lower roller pass through boxes *f f*, Fig. 6, attached to the swing-arms, so that the whole will remain concentric at whatever position the apron and rollers may be turned. The upper roller is also drawn up, to render the apron straight or taut, by means of screws located in the ends of the swing-arms.

One journal of the lower roller extends out through the side of the machine, and has a pulley, *g*, by which it receives motion through the band *h*. By this means the apron also receives motion, and may be run in either direction. The adjustment of the rollers and apron higher and lower may be produced by a bolt, *i*, which fits in any of a series of holes, *k k*, or by any other means.

I prefer to make the apron of rubber-cloth; but ordinary cloth or canvas, properly prepared, or any other suitable material, may be used. The surface may either be smooth, rough, ribbed, or otherwise prepared; or it may have points or spurs, as shown in Fig. 7, which may be necessary, under some circumstances, to carry off straws or other refuse which might otherwise fall down with the grain on the incline of the apron.

This apron serves a very important purpose. As the grain falls upon it it receives a revolving motion in either direction desired. In heavy grain the motion is upward, in order to carry off straws, sticks, &c., which

would fall with the grain, as shown by the arrows. In light seed the motion may be downward, in order to facilitate the passage of the seed downward and prevent it being blown over. This use of an endless apron is new so far as I am aware. The apron is also important in presenting a soft and yielding surface for the grain to fall upon, thereby preventing rebound and falling over, which is produced where a hard chute-board is used. The apron might be used separately and independent of the screen.

In addition to the ordinary channels or kerfs for the reception of the screens, the shoe F has a cross-channel, *v*, at the discharge end, Fig. 5, which receives one or more slats, N. This slat serves simply to close the air-space between the edges of the screens, or between the lower screen and the bottom of the shoe, thereby forcing the blast to pass upward through the meshes instead of escaping outward. It is readily changeable from one position to another between the screens. It may be applied in other places where screens are used, besides in a shoe.

The screens are held in the shoe by means of a key, *n*, which passes down through a slot therein. The bottom of the shoe beneath the screens is formed with a passage-way, *l*, for the escape of foul seed, and this passage-way or sheet communicates with a spout, *m*, which opens through the side of the machine.

Claims.

What I claim, and desire to secure by Letters Patent, is—

1. In a grain-cleaner or fanning-mill, I claim the combination of the adjustable endless revolving belt or apron K, provided with projecting points or spurs *x*, arranged and operating with the rollers L and shoe or screen, substantially as herein shown and set forth.

2. I claim, in combination with the spring H, the compensating hinges *p p*, or equivalent devices, applied either to the screen or shoe, and operating in the manner and for the purpose specified.

3. In a grain-cleaner or fanning-mill, I claim, in combination with the screens G G, one or more closing-slats or deflectors N, when arranged in the front end of the shoe, substantially as and for the purpose set forth.

4. In a grain-cleaner or fanning-mill, I claim the boxes *f f*, formed upon the swing-arms M, in combination with the rollers L and belt or apron K, constructed, arranged, and operating as and for the purpose set forth.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

JOHN A. KRAKE.

Witnesses:

R. F. OSGOOD,
ARCHD. BAINE.