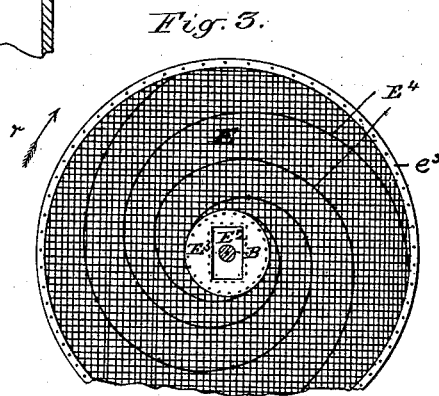
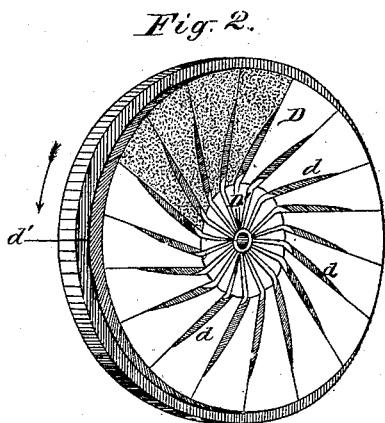
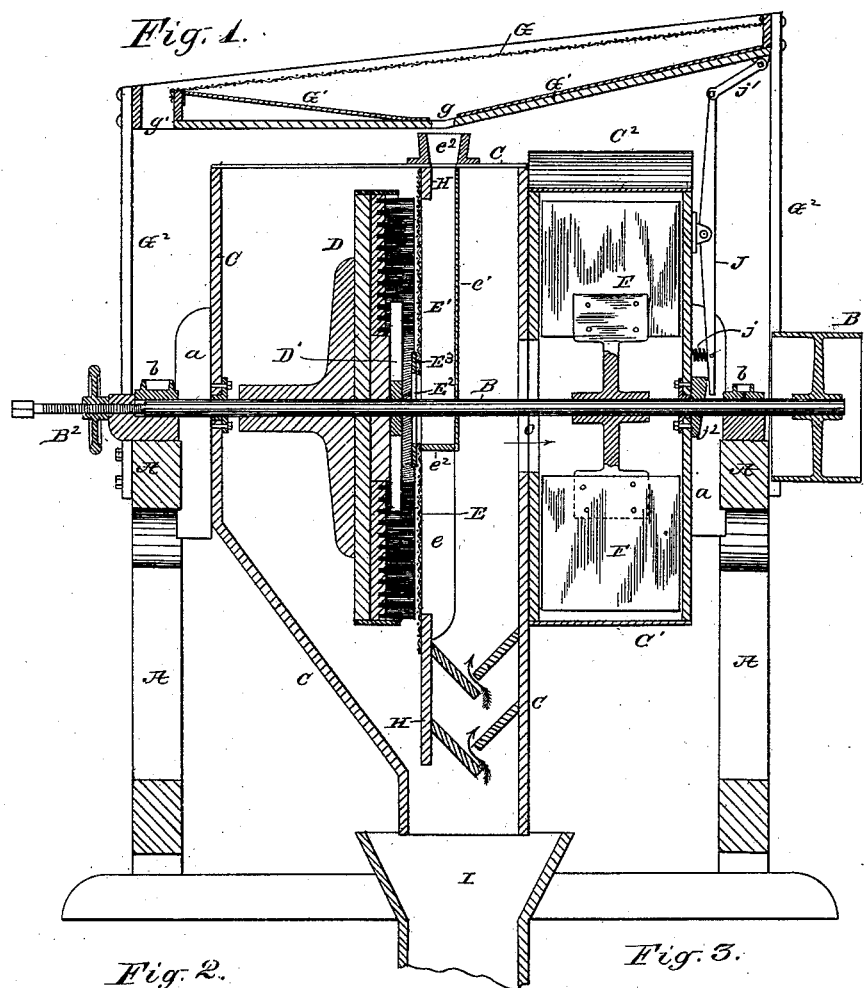


L. GATHMANN.  
GRAIN CLEANER.

No. 267,072.

Patented Nov. 7, 1882.



WITNESSES—  
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C. Clarence Poole.

INVENTOR—  
Louis Gathmann  
per W. E. Dayton  
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(No Model.)

2 Sheets—Sheet 2.

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Fig. 4.

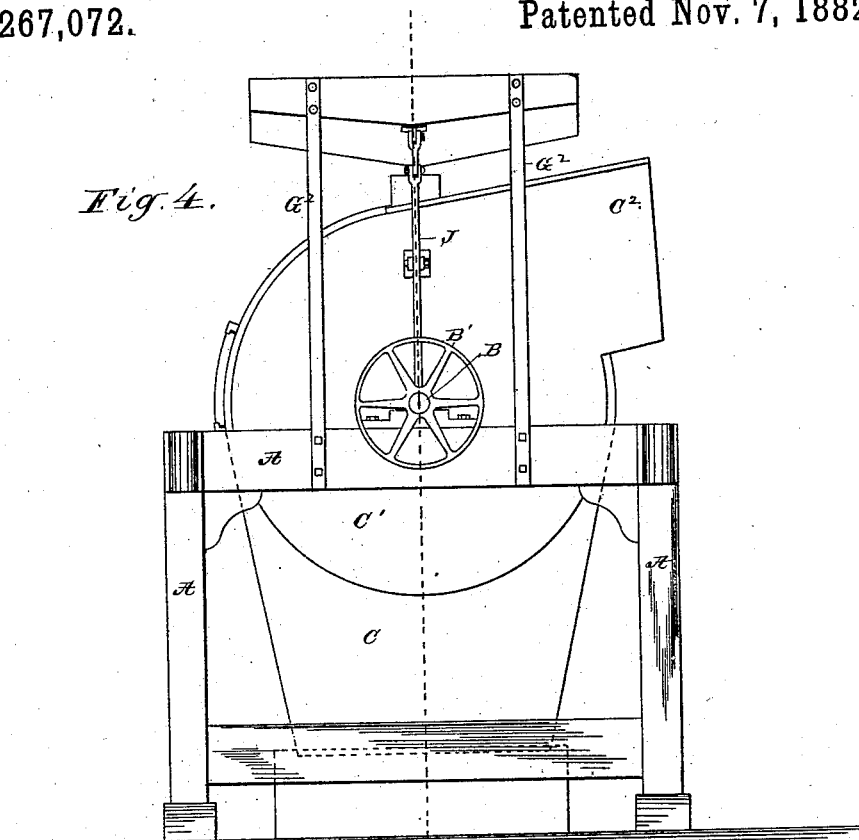


Fig. 5.

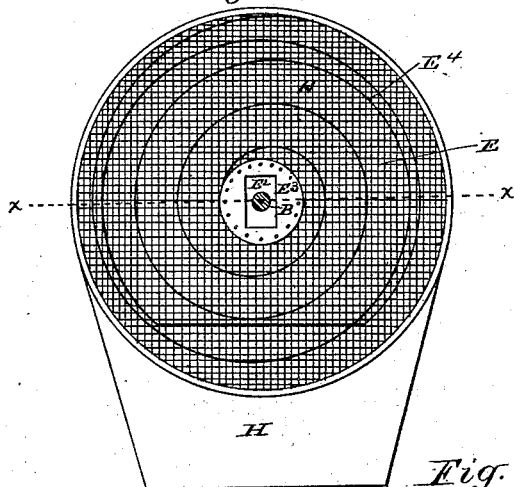


Fig. 6.

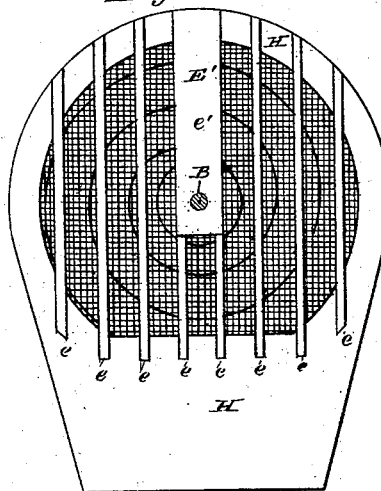
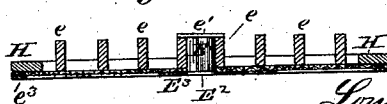


Fig. 7.



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# UNITED STATES PATENT OFFICE.

LOUIS GATHMANN, OF CHICAGO, ILLINOIS.

## GRAIN-CLEANER.

SPECIFICATION forming part of Letters Patent No. 267,072, dated November 7, 1882.

Application filed August 11, 1882. (No model.)

*To all whom it may concern:*

Be it known that I, LOUIS GATHMANN, of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Grain-Cleaners; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention relates to disk-brush grain-cleaners wherein a disk-brush is opposed to a perforated working-face—as, for example, of wire-netting.

The invention consists in the several features of construction which are hereinafter set forth, and defined in the appended claims.

In the accompanying drawings, Figure 1 is a vertical section of my improved machine, taken through the axis of the rotating parts. Fig. 2 is a detached view in perspective of the rotating disk-brush. Fig. 3 is a fragmentary front elevation of a stationary disk or working-face opposed to the brush shown in Fig. 2. Fig. 4 is an end elevation of the machine. Fig. 5 is a front elevation of the wire-netting to which the disk-brush is opposed, showing a modification in certain respects of the view presented in Fig. 3. Fig. 6 is a rear elevation of the wire-netting and its supports, and Fig. 7 is a horizontal section taken through  $xx$  of Fig. 5.

A is a frame of the machine, which supports the shaft B in bearings  $b$ , and also sustains the housing C C' and the elevated screen G. The housing C C' is supported from the frame, as here shown, by the blocking  $a$ , rigidly fastened to the frame and to the housing, so that the latter is immovably held in place. Said housing is divided into three chambers—one inclosing the brush, a second inclosing the fan, and the third intermediate chamber, through which the dirt from the grain in the action of the machine, and escaping through the perforated face to which the brush is opposed, passes to the fan-chamber.

D is the brush, rigidly secured to the rotating shaft B, and F is the fan, similarly secured to the same shaft. Said brush D is constructed with its bristles or filaments arranged preferably in a compact mass, or so at least as to fur-

nish a close working-face, and they are also preferably inclined backward with reference to the direction of motion of said brush, as illustrated in Fig. 2, and as described in a former patent granted to me. The working-face E, to which the brush D is opposed, is perforated, and consists, as here shown, of a wire-netting supported within the housing C by a fixed board or partition, H, having a circular aperture of about the size of the brush-face, and additionally supported by the vertical slats  $e$ , arranged parallel with each other and at such distance apart as will adequately sustain the netting E substantially in a true vertical plane. The material fed to the brush enters through a spout, E', formed by inclosing the space between the two central uprights or slats,  $e$ , by a backing,  $e'$ , and a bottom piece,  $e''$ , (clearly indicated in Figs. 1 and 7,) and opening opposite the center of the brush through a passage, E<sup>2</sup>.

The machine, as here shown, is provided with a screen, G, mounted above the housing in any suitable frame, sustained by elastic wooden arms, G<sup>2</sup>, which permit the screen to be vibrated by means of the lever J and its connections, operated by a spring,  $j'$ , and a cam,  $j$ , (shown in Fig. 1,) or by other suitable means. The grain which passes through the screen G falls upon the cant-board G' and escapes by the passage  $g$  into the spout E', already described. Straw and other substances which fall over the tail of the screen G escape by the passage  $g'$ , and are spouted off in the usual manner.

The novel features of the machine herein shown relate to the construction of the perforated working-face E, and to the combination, with a ribbed perforated opposing face, of a brush, D, having its bristles inclined rearwardly with reference to the direction of its motion. Said novel features of construction in the perforated face E consist in the provision thereupon of one or more spiral, or, more accurately, convolute, prominences or ribs, E<sup>4</sup>, Figs. 3 and 5. As here shown such ribs consist of a heavy wire or wires secured to that face of the netting E which is in contact with the brush, and arranged to proceed outward in the spiral or convolute direction from the center to the circumference of such working-face, in the direction of movement of the brush

indicated by the arrows *r*. The object and effect of such convolute rib or ribs on the perforated working-face is to more perfectly regulate or control the retention of the grain under the action of the brush-face.

In a brush grain-cleaner it is very often desirable that the brush shall be set so as to bear very lightly upon the grain or its opposing face, in order to more perfectly act upon the ends of the kernels. When the machine is so set, and particularly in that form of the machine herein shown, wherein the axis of the brush is horizontal, there is obviously a tendency on the part of the grain to escape beneath the brush by its weight before it shall have been sufficiently acted upon. By providing the opposing face *E* with the convolute ribs *E*<sup>4</sup> it is evident that the grain will be prevented from thus falling, and will be carried about by the brush between adjacent ribs and discharged more or less uniformly at all points of the periphery.

In Fig. 3 I have shown three of such ribs, arranged and directed to each make one circuit of the face *E*; but in Fig. 5 I have shown only a single wire or rib, arranged to make several circuits of said face *E*, to which it is attached, and therefore calculated to retain the grain for a correspondingly greater number of revolutions of the brush. It is not expected, of course, that the grain will never be carried over the ribs; but the general effect desired and above described will be obtained.

While I desire that my claims shall be understood as covering a perforated face provided with one or more convolute ribs in combination with any form of disk-brush, I prefer that said brush shall have its bristles set rearwardly inclined with reference to its direction of motion, as shown in Fig. 2. The advantage of this construction of the brush, when opposed to the face *E*, having a rib or ribs, *E*<sup>4</sup>, as described, is found in this fact—to wit, that by the inclination of the bristles in the direction and manner described such bristles will yield in passing over the ribs, and may spring outward after such passage, so as to give a substantially uniform action of the brush over the entire surface of the opposing face, by which means I am able to obtain a perfectly efficient and uniform action of the brush, even though the latter be set so as to work very lightly on the grain. On the other hand, the brush may be set to press with any desired degree of force against the opposing face with the same uniformity of action, and at the same time without forcing the kernels of grain into the body of the brush.

In the case of a face *E* having ribs on its surface, used in connection with an opposing brush having its bristles set vertical to the brush-back, there is an especial tendency of the grain to get into the body of the brush, because wherever the bristles encounter the ribs their outer ends are retarded, an opening made in the brush calculated to freely admit

the grain, and as the bristles thus retarded escape or override the ribs they catch the grain in the opening of the brush-face thus produced. Experience has shown that such a brush will in this manner become filled on its face with grain and greatly impaired or rendered useless, and also that the objectionable effect is produced of holding the grain thus caught partly protruding from the brush-face, so that in being carried about in this position the grain is ground off and the product spoiled.

The rib or ribs *E*<sup>4</sup> may obviously be produced in the face of the wire-netting by pressing the latter so as to give it a spirally-corrugated surface, and such corrugations may be numerous and close to each other, if preferred. So far as the peculiar action or advantage of the inclined bristles of the brush in combination with a corrugated or ribbed surface is concerned, it is also immaterial whether said ribs or corrugations make several circuits of the face *E* or are nearly or quite radial.

The action of the fan is to induce a current of air from the brush-chamber through the perforations of the working-face *E*, and to thereby abstract the dirt the moment it is detached from the grain being cleaned. By the arrangement of the slats or supports *e* in the vertical direction shown there is no opportunity for the dirt thus drawn through the netting *E* to lodge on said slats, as there would be if they were horizontal. Said slats are preferably made thin, so as to obstruct as few of the perforations of the netting *E* as possible, and in order to give uniform support to the netting they are located close to each other, or, say, at a distance of two inches apart. By this means the netting is amply sustained in substantially a perfect plane.

The brush *D* is provided in its working-face with the furrows *d*, cut or otherwise produced in the body of the brush-face, and preferably arranged on a rearward draft, as shown in Fig. 2 of the drawings, whereby they operate somewhat in the manner of a fan and draw a current of air through the passage *E*<sup>1</sup> *E*<sup>2</sup>, and to force the same outward through all the parts of the opposing face *E*, in this manner re-enforcing the action of the fan *F* and insuring a more uniform distribution of the air-current over the entire area of the opposing perforated face. To this end said furrows *d* preferably extend about half-way from the central depressed space or bosom of the brush to its circumference. Said furrows also produce the usual effect of distributing the grain to different parts of the faces by which it is to be acted upon.

Adjusting devices by which the brush may be set more or less closely to the opposing face *E* are shown at *B*<sup>2</sup>, and are of a familiar construction. The netting *E* is shown as being secured on its outer margin to the fixed board *H*, and as having a central apertured metal plate, *E*<sup>3</sup>, fastened to the wire-netting *E* and

to the wooden parts in the rear of said netting. The convolute wire may be understood as being fastened to the wire E by clinched staples or short pieces of binding-wire applied to fasten the wire E<sup>4</sup> to individual wires of the netting E, or it may be attached in any other approved manner. When the face E is of perforated sheet metal, for example, the wire E<sup>4</sup> may be soldered thereto.

10 The ribs or prominences E<sup>4</sup> are herein shown as extending from the central plate, E<sup>3</sup>, to the margin of the netting E. They may obviously terminate short of these points, if preferred, the phrase from "center to circumference" in  
15 the following claim being employed not to express the extent but only the direction of said wires or prominences.

I claim as my invention—

20 1. In a disk-brush grain-cleaner, the combination, with an opposing disk-brush, of a perforated working-face provided with one or more convolute ribs running from center to circum-

ference in the direction of motion of the brush, substantially as described, and for the purposes set forth.

25 2. In a disk-brush grain-cleaner, the combination, with a perforated working-face provided with one or more ribs, of a disk-brush having its bristles rearwardly inclined with reference to the direction of its rotary motion, substantially as described, and for the purposes set forth.

30 3. In a disk-brush grain-cleaner, the combination of a perforated working-face, E, having one or more spiral or convolute ribs, E<sup>4</sup>, and a disk-brush having furrows *d* in its working-face, substantially as described.

In testimony that I claim the foregoing as my invention I affix my signature in presence of two witnesses.

LOUIS GATHMANN.

Witnesses:

M. E. DAYTON,  
JESSE COX, Jr.