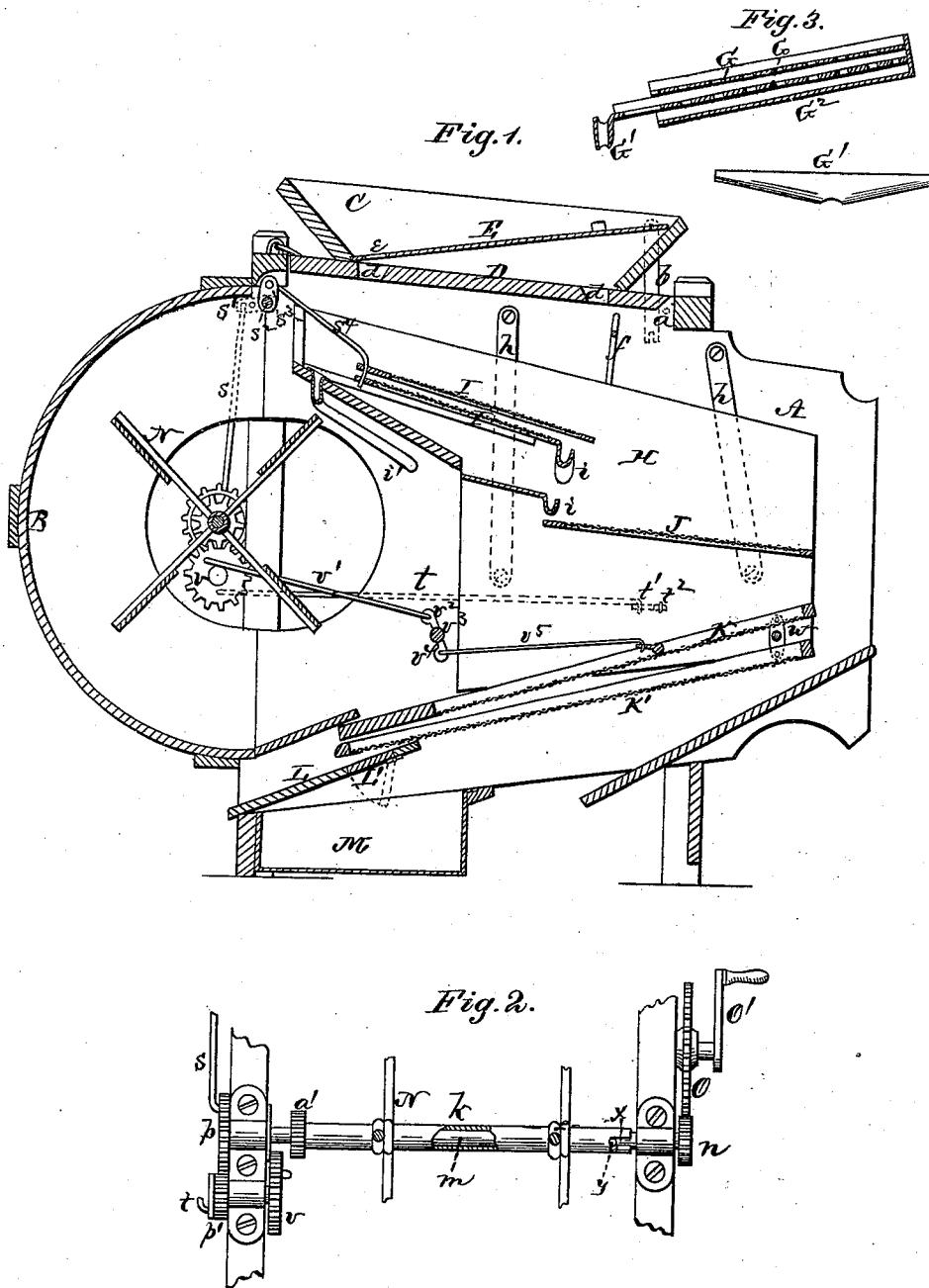


C. B. NICHOLS.
GRAIN-SEPARATOR.

No. 170,584.

Patented Nov. 30, 1875.



WITNESSES

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CHARLES B. NICHOLS, OF TROY, PENNSYLVANIA.

IMPROVEMENT IN GRAIN-SEPARATORS.

Specification forming part of Letters Patent No. **170,584**, dated November 30, 1875; application filed October 20, 1875.

To all whom it may concern:

Be it known that I, CHARLES B. NICHOLS, of Troy, in the county of Bradford and in the State of Pennsylvania, have invented certain new and useful Improvements in Grain-Separators and Fanning-Mills Combined; and 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, making a part of this specification.

The nature of my invention consists in the construction and arrangement of a grain-separator, as will be hereinafter more fully set forth.

In order to enable others skilled in the art to which my invention appertains to make and use the same, I will now proceed to describe its construction and operation, referring to the annexed drawing, in which—

Figure 1 is a longitudinal vertical section of my grain-separator. Fig. 2 is a view of the fan-shaft and gearing connected therewith. Fig. 3 is a longitudinal section of an oat and buckwheat screen used in connection with my separator.

A represents the frame of my grain-separator, constructed in any suitable manner to contain the various parts thereof. At the rear end of the frame is the ordinary fan-drum B, and in the top is the hopper C. This hopper is hinged at the rear end, and supported by resting on the frame A, or for certain purposes the front end of the hopper is supported upon hinged bars *b b* having their lower ends forked and resting on pins *a a*. The bottom D of the hopper C is made flat or level with a discharge-opening, *d*, at each end, and within the hopper is used a false inclined bottom, E, having an opening, *e*, at one end. When the hopper is down flat on the frame of the separator the inclined bottom E is placed so that its opening *e* will be directly over the rear discharge-opening of the hopper-bottom D, as represented in the drawing; but when the hopper is elevated at its front end the false bottom E will be turned around and the front discharge-opening in the hopper-bottom used. When the hopper is used in this position a double zinc screen, G G, shown in Fig. 3, is used, said double screen being inclined from the front

downward and rearward. The upper front end rests on a wire frame, *f*, attached to the shoe H, said shoe being suspended in the usual manner by spring-straps *h h*. The screens G are provided at their lower end with a spout, *G*¹, for carrying off oats and buckwheat, while the wheat falls down on an inclined board, *G*², and from thence onto the sieves I I in the top part of the shoe H. When the screens G are not used the grain falls directly onto the sieves I, and in either case from said sieves onto an intermediate sieve, J, as shown. The foul grain which does not pass through the sieves I is carried off through spouts *i i* either on the same or opposite sides of the fanning-mill. The oats and buckwheat passing over the screens G, when these are used, pass through the spout *G*¹, out through a spout, *i'*, as shown. From the intermediate sieve J the grain passes onto the bottom sieves K K', which grade the wheat into two qualities—No. 1 and No. 2. Under the lower end of the bottom sieve K' is an inclined board, L, with hinged valve L', which may be opened to convey the grain into a drawer, M, underneath, while the other quality of wheat is taken out in the usual manner. During the passage of the grain over and through these screens and sieves it is acted upon by a blast of air from the fan N within the drum B. This fan is constructed in the usual manner of a series of wings attached to radial arms; but in my case these radial arms project from a center tube, *k*, which is placed loosely on a shaft, *m*, and from this shaft motion is communicated to all the various parts of the mill. On one end of the shaft *m* is a pinion, *n*, that gears with a cog-wheel, O, mounted upon a stud, and provided with a crank, O', as shown, whereby motion is communicated to the shaft *m*. On the other end of the shaft *m* is a pinion, *p*, which gears with a pinion, *p'*, on the outer end of a short shaft below the fan-shaft *m*. In the pinion *p* is attached a pitman, *s*, which extends upward and connects with an arm, *s*¹, projecting from one end of a shaft, *s*², at the rear end of the frame. In the center of this shaft is another arm, *s*³, which, by a rod, *s*⁴, is connected with the sieves I, so as to give them an up and down reciprocating motion. This rod *s*⁴ is connected with the screens G also, when

said screens are used, so as to give them also the proper reciprocating motion. From the pinion p' a pitman, t , connects with an elbow-lever, t^1 , and the other end of said lever is, by a rod, t^2 , connected with the shoe H, so as to give the same the proper vibrating motion. On the inner end of the shaft which carries the pinion p' is another pinion, v , from which a rod or pitman, v^1 , connects with an arm, v^2 , projecting from a rock-shaft, v^3 , and another arm, v^4 , from said shaft is, by a rod, v^5 , connected with the sieve K. The frames of the two sieves K and K' are connected near their upper end by means of rocking arms w , whereby, as the sieve K is moved in one direction, the sieve K' will be moved in the opposite direction, and vice versa.

It will thus be seen that the various sieves have a reciprocating motion independent of the shaking or vibrating motion imparted to them by the movement of the shoe.

The fan-tube k has at one end a slot, x , which is placed over a pin, y , on the shaft m , so that the fan will be revolved directly by the motion of said shaft. This gives the fan a comparatively slow motion, as required in simply screening grain. For chaffing grain more wind is required, and to obtain the same without increasing the speed of the shaft m I provide the tube k at the opposite end from the slot x with a pinion, a' , and by moving the fan bodily endwise on the shaft the slot x is removed from off the pin y , and the pinion a' thrown in gear with the pinion or cog-wheel v , above described. By this means the fan is rotated from the shaft m through the medium of the gearing $p p'$, v , and a' , giving it a more rapid motion.

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

1. In a grain-separator, the hinged hopper C, provided with front and rear discharge-openings $d d$ and hinged bars $b b$, in combination with the pins $a a$, substantially as and for the purposes herein set forth.

2. The reversible inclined false bottom E, having opening e , in combination with the hinged hopper C, having front and rear discharge-openings, substantially as and for the purposes herein set forth.

3. The combination of the sieves K K', rocking arms $w w$ connecting the same, rod v^5 , rocking shaft v^3 with arms $v^2 v^4$, pitman v^1 , and pinion v , all substantially as and for the purposes herein set forth.

4. In a fanning-mill, the combination of the fan-shaft m and the fan N, provided with a central tube, k , placed loosely on the shaft and movable endwise thereon, for the purposes herein set forth.

5. The combination of the shaft m with pin y , movable fan N with center tube k , having slot x and pinion a' , and the gearing $p p' v$, substantially as and for the purposes herein set forth.

In testimony that I claim the foregoing I have hereunto set my hand this 16th day of October, 1875.

CHARLES B. NICHOLS.

Witnesses:

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