J. F. HATFIELD.

GRAIN-SEPARATOR.

No. 192,505. Patented June 26, 1877.

Fig 1

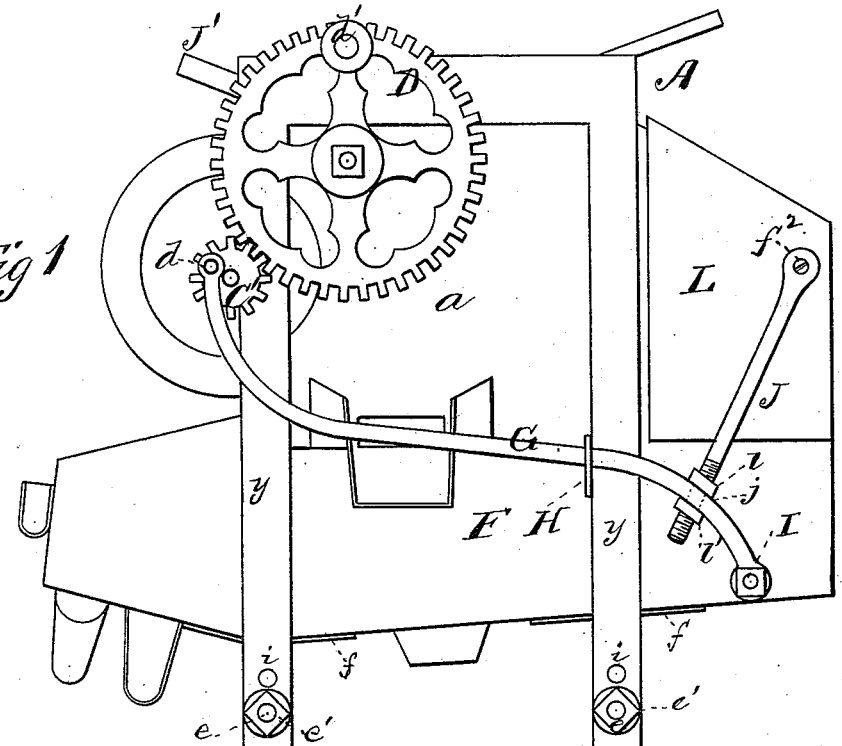
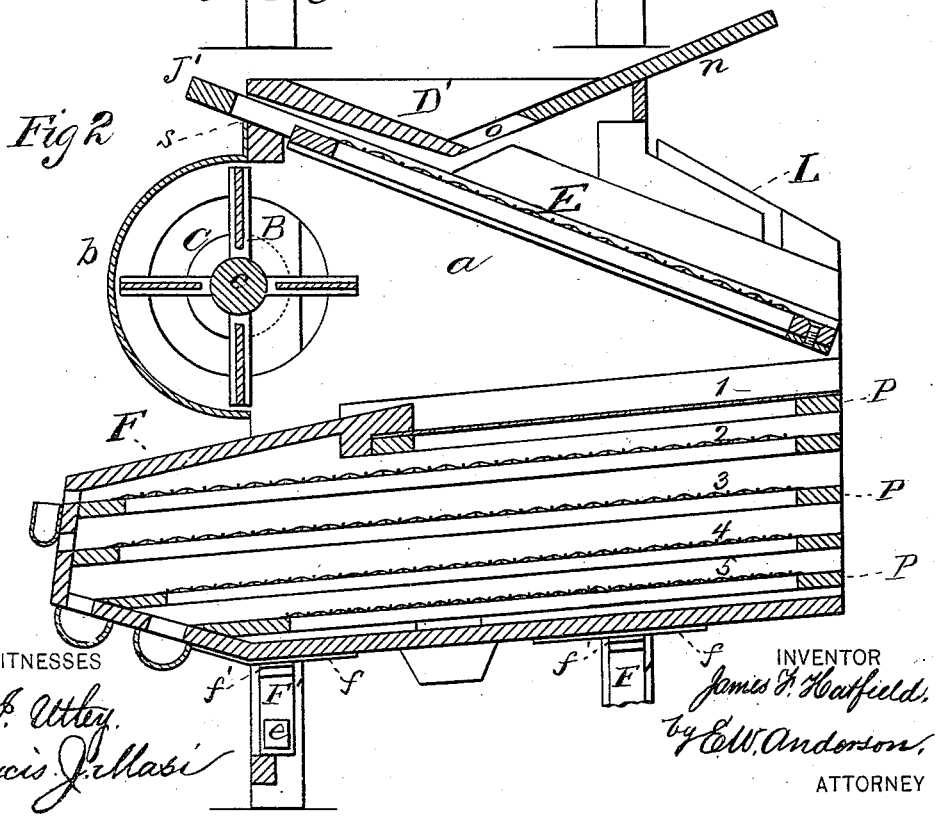


Fig 2



WITNESSES

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JAMES F. HATFIELD, OF LIZTON, INDIANA.

IMPROVEMENT IN GRAIN-SEPARATORS.

Specification forming part of Letters Patent No. **192,505**, dated June 26, 1877; application filed May 12, 1877.

To all whom it may concern:

Be it known that I, JAMES F. HATFIELD, of Lizton, in the county of Hendricks and State of Indiana, have invented a new and valuable Improvement in Fanning-Mills; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawings, making a part of this specification, and to the letters and figures of reference marked thereon.

Figure 1 of the drawings is a representation of a side view of my invention, and Fig. 2 is a longitudinal vertical section thereof.

This invention has relation to improvements in fanning-mills for separating chaff from the grain, and separating the latter into their several sizes and qualities.

The nature of my invention will be fully understood from the following description, and set forth in the claims.

In the annexed drawings, the letter A designates the main frame of my improved fanning-mill, that is supported upon suitable legs, has close sides *a* and a casing, *b*, of semi-cylindrical form at one end, within which is arranged a fan-wheel, B. The shaft *c* of this fan has its bearings in the uprights of the frame, and is provided upon one end with a disk, C, and on the other with a gear-wheel, C′, each having a wrist-pin, *d*, for a purpose hereinafter more fully set forth.

Rapid rotary motion is communicated to the fan through the medium of a large cog-wheel, D, that meshes with the gear-wheel C′, and is driven by a pulley and an endless belt connecting it with a suitable motor, or by means of the usual crank-arm *d′*. D′ represents a hopper of the usual well-known form, three sides of which are permanently secured to the frame, while the fourth side *n* is arranged in ways in its two parallel walls, and is adjustable relatively thereto for the purpose of increasing or lessening the size of the throat *o* and regulating the delivery of grain to the chaff-screen E, or for the purpose of cutting off the flow thereof altogether. F represents a preferably wooden box, that is arranged below the screen E, and has free longitudinal movement relative to the frame of the mill. This box has its vertical sides provided with grooves that are adapted to receive the frames P, over which are properly stretched the screens 1, 2, 3, 4, and 5. The meshes of each one of these screens decreases in size from screen 1 to screen 5, the former being the larger and the latter the smaller. These frames are readily removable, and, according to the nature of the grain to be cleaned and separated, one or more of them may be detached from the box, according to the necessities of each particular case. This box, as aforesaid, has free endwise movement relative to the frame. It is supported on brackets F′, that are vertically adjustable relative to the uprights of the frame, so that one end may be raised or lowered, or one end raised and the other lowered, for the purpose of hastening or delaying the passage of the grain over the surfaces of the screens according as the grain requires more or less cleansing. This adjustment is attained as follows: The uprights *y* aforesaid are provided with several spaced perforations, *i*, the one above the other; and the supports are secured to said uprights by means of a bolt, *e*, and nut *e′*. This bolt extends through the bracket and the upright, and, when the nut is applied thereto and forcibly set up, clamps the bracket and upright together. By shifting the bolt the adjustment above described will be readily accomplished, and the desired result attained. The under side of the box will be provided with plates *f* of metal that bear upon corresponding plates f^1 on the upper horizontal edge of the said brackets, so that friction will be reduced to a minimum. I may, however, use anti-friction rollers, either in the under side of the box or in the brackets, to accomplish the same purpose.

The box F aforesaid will have at its ends farthest from the fan-wheel a spindle, I, projecting out at right angles to the length of said box at each side thereof. These spindles are connected, respectively, with the disk C and cog-wheel C′ by means of a serpentine-shaped rod or pitman, G. These latter are applied in the customary manner to the wrist-pins *d d* of the cog-wheel C′ and disk C, and to the said spindles, and when motion is imparted to the fan-wheel a horizontally-recipro-

cating motion will be conveyed to the screens 1, 2, 3, 4, and 5 of the box F.

In order that a jarring motion may be imparted to the screens aforesaid, which will prevent them from becoming choked up, the rods G are passed through slotted plates H, that are situated nearest the spindles aforesaid, and which, at the downward motion of the end of said rods farthest from the spindles I, are converted into fulcrums, thus changing the functions of the said lever from those of a mere connecting-rod to those of a lever. By this means the box and its sieves are endowed not only with endwise movement, but also with a vertical vibration of a very quick nature, which, besides the sifting action attained by the reciprocatory motion, also produces a jarring motion, which, by throwing the grains from the sieve, prevents the meshes thereof from being choked up. The pitman-levers G are each provided, at a point between the plate H and the spindles I of the sieve-box F, with an eye, *j*, through which passes, at each side of the frame, a rod, J, each one of which is pivoted, by means of a bolt, f^2, to the frame L of the chaff-screen E aforesaid. This frame L is supported free from the screen-box F by the rigid rods J, and, like the said screen-box, has free endwise motion relative to the frame. The rods J being sufficiently rigid, the screen-frame will take part both in the endwise and vibratory movements of the box F; consequently it will be prevented from being choked up by the jarring thus produced. The end of the chaff-screen frame farthest from the fan-wheel is supported by the rods J, while its remaining end is provided with an extension, J′, that projects through a slot, *s*, in the end of the frame, upon the lower wall of which it has its fulcrum, and by which it is supported. The said screen may then be adjusted as to its end supported by rods J by rendering the said rods endwise adjustable. This is accomplished by threading the free ends of the said rods, and applying nuts *l l′*, respectively, above and below the eye of the pitman-levers aforesaid. By loosening one of these nuts and setting up the other, the end of the chaff-screen that is farthest from the hopper D′ may be raised or lowered, and the passage of the grain over the same accelerated or delayed, thereby subjecting it to the blast of the fan-wheel for a greater or less time, according to the necessities of each particular case. Each and every of the screens 1, 2, 3, 4, and 5 will be provided with separate and independent discharge-apertures, by means of which the various qualities of any one description of grain, where quality depends upon the size of the grain, may be delivered into separate sacks; or, where several kinds of grain differing in size the one from the other have become mixed, the said grains will be separated according to size.

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

1. The combination, in a fan-mill having the fan B, with disk C and gear-wheel C′, provided with wrist-pins *d*, of the curved rods G, spindles I, reciprocating screen-box F, the rods J, chaff-screen frame L, and slotted plates H, substantially as specified.

2. The combination, with the screen-box F and its slideway-brackets F′, of the vertically and endwise moving pitmen G and the fulcrum-plates H, substantially as specified.

3. The combination, with the screen-box F and its actuating-pitmen G, of the reciprocating screen-frame L J′ and the rods J, rigidly connected with pitmen G, and supporting one end of said frame from the pitmen, substantially as specified.

4. The chaff-screen frame L, having extension J′, in combination with the main frame A, having slots *s*, the vertically-adjustable rods J, pitmen G, and the screen-box F, substantially as specified.

In testimony that I claim the above invention I have hereunto subscribed my name in the presence of two witnesses.

JAMES FREDRICK HATFIELD.

Witnesses:

GEORGE L. LEAK,

JAMES E. SCOTT.