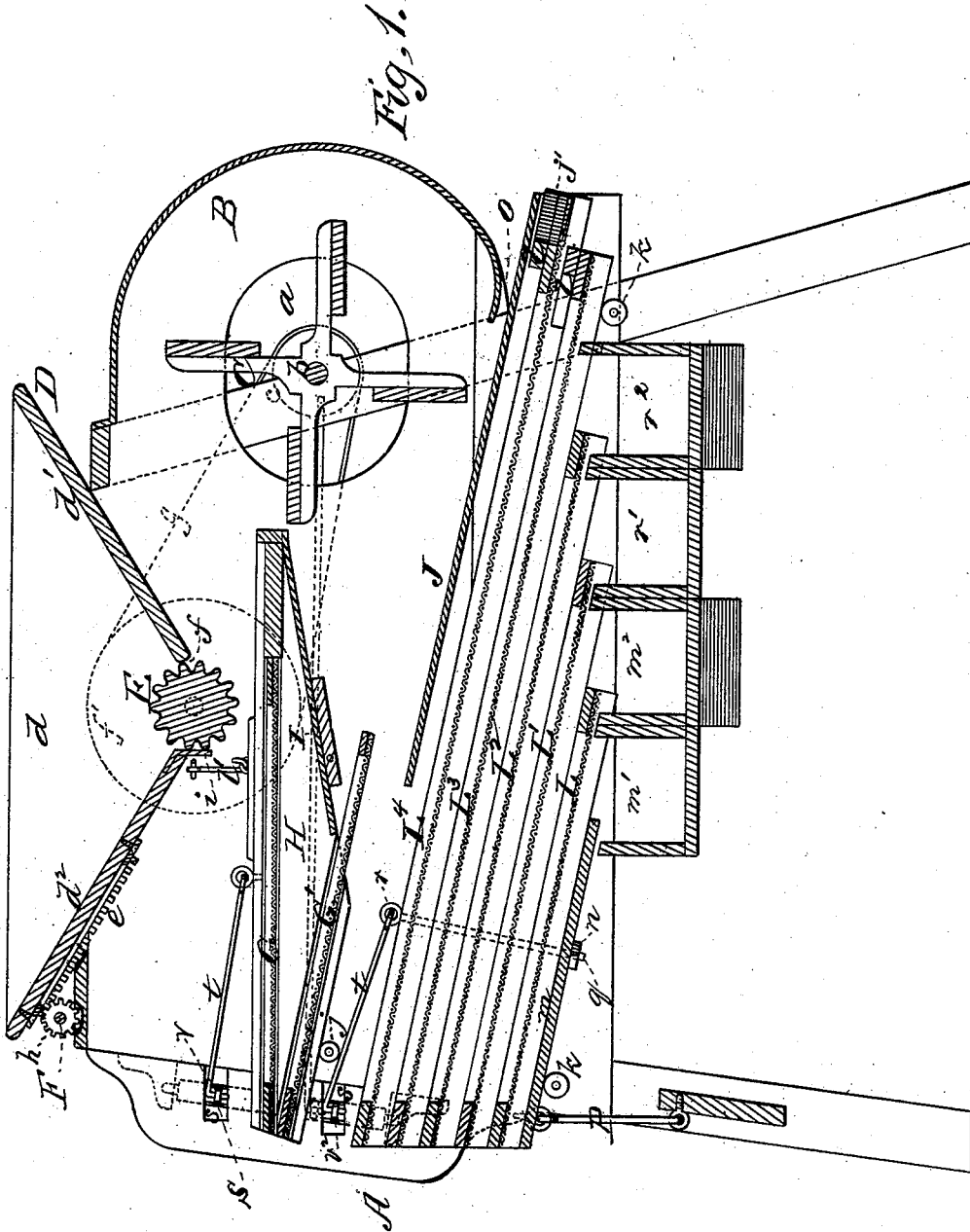


J. F. HATFIELD
Grain-Separators.

No. 211,571.

Patented Jan. 21, 1879.



WITNESSES
Villette Anderson.
F. J. Massi.

INVENTOR
James F. Hatfield.
by E. W. Anderson,
ATTORNEY

UNITED STATES PATENT OFFICE.

JAMES F. HATFIELD, OF DUBLIN, INDIANA.

IMPROVEMENT IN GRAIN-SEPARATORS.

Specification forming part of Letters Patent No. **211,571**, dated January 21, 1879; application filed October 12, 1878.

To all whom it may concern:

Be it known that I, JAMES F. HATFIELD, of Dublin, in the county of Wayne 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 longitudinal vertical section of my improved mill. Fig. 2 is a side view of a portion of the same. Fig. 3 is an end view thereof, and Fig. 4 is a detail view.

This invention has relation to improvements in fanning-mills for separating grain from chaff, and dividing the former by means of sieves of different mesh into various qualities.

The object of my invention is principally to simplify the working parts of the machine, and by thus increasing their lightness to add to the efficiency of the apparatus.

The nature of the invention will be clearly set forth hereinafter.

In the accompanying drawings, the letter A designates the casing of my improved fanning-mill, not differing essentially from those in common use. B indicates the fan-case, arranged at one end of the frame, and having therein a rotating blowing-fan, C, deriving its air-supply by indraft through openings *a* in the ends of the fan-case. Upon the ends of the shaft *b* of the fan is secured a pulley-wheel, *c*, the object of which will be hereinafter shown. D indicates a hopper, having vertical sides *d* and converging ends *d*¹ *d*², the latter, *d*², being sashed into the sides, and provided upon its under side with a metallic rack, *e*. The inclined ends form, with each other, a throat, *f*, through which the mixed grain and chaff pass to the separating-screens. The throat *f* is filled by a longitudinally-grooved roller, E, having its bearings in the sides of the casing, and provided upon its end with a driving-pulley, *f*¹. This pulley is connected to the pulley *c* on the end of the fan-shaft by an endless belt, *g*, which imparts rotary motion to the fan when the said feed-roller is actuated. F indicates a transverse shaft, hav-

ing its bearings in the frame, and provided with a pinion, *h*, engaging the rack *e* aforesaid. This shaft has upon its end a hand-wheel, *h*¹, by means of which the said shaft is conveniently rotated, and the opening between the feed-wheel and the sliding end *d*² increased or lessened at pleasure, in order to deliver the grain more or less rapidly to the screens below, or adapt said opening to allow grains of different sizes to pass downward to the screens, thus rendering the apparatus available in screening and fanning grain of different descriptions.

The slide *d*² is provided upon its lower edge with a metallic apron, *i*, that forces the grain and chaff automatically into the grooves of the feed-roller, and causes them to be delivered to the chaff-screens G G', arranged the one above the other in a light wooden or metallic shoe, H. The screen G is lower at its outer than at its inner end, while the screen G' is higher at its outer than at its inner end; consequently they converge outwardly toward each other. They are applied in ways formed in the sides of the shoe. They are also of different mesh and readily interchangeable, and their shoe rests upon the rollers *j*, so that during its reciprocations it moves easily and readily. The upper screen discharges its grain upon a metallic plate, I, whence it is directed to the lower screen, falling through which it is conducted by an inclined sheet-metal plate, J, secured to the casing, through an opening, *o*, in the end of said casing, and directed by the converging guides *j*¹ on said plate J into a suitable receptacle, the chaff and dust being blown out of the end of the apparatus farthest from the fan. Only the coarsest kinds of grain and foreign matters pass out of this opening, the finer grains, such as wheat and other cereals, passing down upon the lower series of screens, designated by the letter L L¹ L² L³ L⁴, in succession. These screens are composed each of a rectangular frame, to which are secured woven-wire screen material, and they are assembled in a shoe-like form by means of a through bolt or bolts, *g*, having at its upper end an eye, *r*, the said bolts passing through the side bars of the screen-frame, and having on their lower ends nuts *n*, by means of which the said frames are clamped together. The screens L L¹ L² L³

L^4 increase in length from below upward, as shown in Fig. 1, the lowest screen being provided with a solid bottom, m , terminating at a chute, m^1 , secured to the bottom of the frame, and discharging at the side thereof, the said screen L terminating at a second chute, m^2 , also secured to the frame, and discharging at its side opposite to the educt end of chute m^1 . The screens $L^1 L^2$ also terminate, respectively, at the chutes $r^1 r^2$, discharging at opposite sides of the frame, while the screens $L^3 L^4$ pass under the plate J out of the end of the casing. They terminate in an oblique end bar, upon which is formed or secured a raised rib or ledge, l , which causes the grain not passed through the sieve to be discharged at opposite sides of the machine. The mesh of these screens decreases from above downward, and they are supported by the anti-friction rollers k , upon which they readily and freely reciprocate.

The chaff-screen shoe is suspended by the hangers l^1 in its position in the casing, and is reciprocated from the pulleys upon the fan-shaft by means of the following mechanism, that also actuates the separating screens: An upright shaft, S , having two parallel arms, $v v^2$, projecting in one direction, and a third arm, v^1 , projecting in the other, is mounted in bearings at each side of the rear end of the casing. The arm v^1 is connected by a pitman, w , to the pulleys upon the ends of the fan-shaft, while the arms $v v^2$ project through slots s in the sides of the casing, and are connected by means of rods t , connecting with the eyes r of the clamping-rods, to the chaff-screen shoe and the assembled separating-screens, respectively, so that when the fan is actuated they receive a rapid reciprocatory motion. The separating-screens are alternately raised and lowered, thereby causing them to be jarred and preventing their becoming clogged up, by means of an angular metallic arm, P , pivoted to the frame and to the said screen, as shown in Fig. 1.

Grain and chaff or other foreign admixture are placed in the hopper and forced together into the machine. They are received on the chaff-screens and separated, the chaff being

blown out of the machine, and such of the grain as is not delivered to the separating-screens falls upon the plate J and passes out of the apparatus. Thus the largest grains are separated from the smaller, these latter falling upon the separating-screens below, each of which separates the next largest grains from the smaller and delivers them at a separate induct. Thus, if many varieties of the same or of different kinds of grain have become mixed from any cause, I am able to separate them, each kind or variety to itself.

By clamping the separating-screens together I am able to dispense with the usual cumbrous shoe in which said screens have been placed, and thus not only decrease the weight, but also the cost of construction of the apparatus.

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

1. The separating-screens $L L^1 L^2 L^3 L^4$, consisting each of a frame and a suitable reticulated material secured thereto, the said frames being clamped together in the form of a shoe by through-bolts having eyes formed at their upper ends, by which they are connected through links to the shafts S , substantially as specified.

2. In combination with the screens $L L^1 L^2 L^3 L^4$, assembled as described, the anti-friction pulleys k , supporting said screens, and the vibrating arm P , jarring said screen, substantially as specified.

3. The combination, with the chaff-screens $G G^1$ and the separating-screens suspended in a fan-mill casing, as shown, of the oscillating shafts S , each placed at the rear end of the mill at each side, and having the arms $v^1 v^2$ connected, respectively, to the chaff and separating screens, and the lower arm, v , connected to the fan-shaft, substantially as specified.

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

JAMES FREDRICK HATFIELD.

Witnesses:

D. M. COOPER,
CASPER GREEN.

1750