(No Model.) 2 Sheets—Sheet 1.

G. N. MANSFIELD.

FANNING MILL.

No. 305,319. Patented Sept. 16, 1884.

Fig. 1.

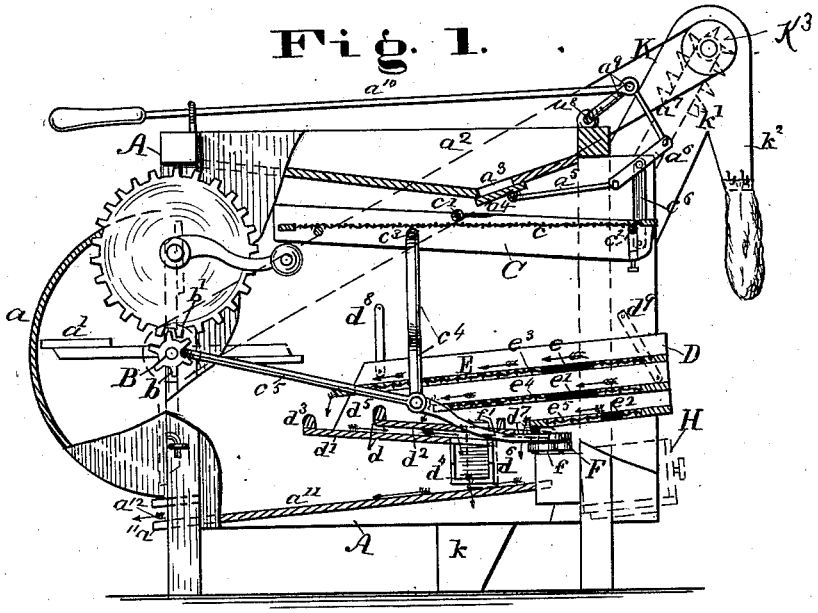
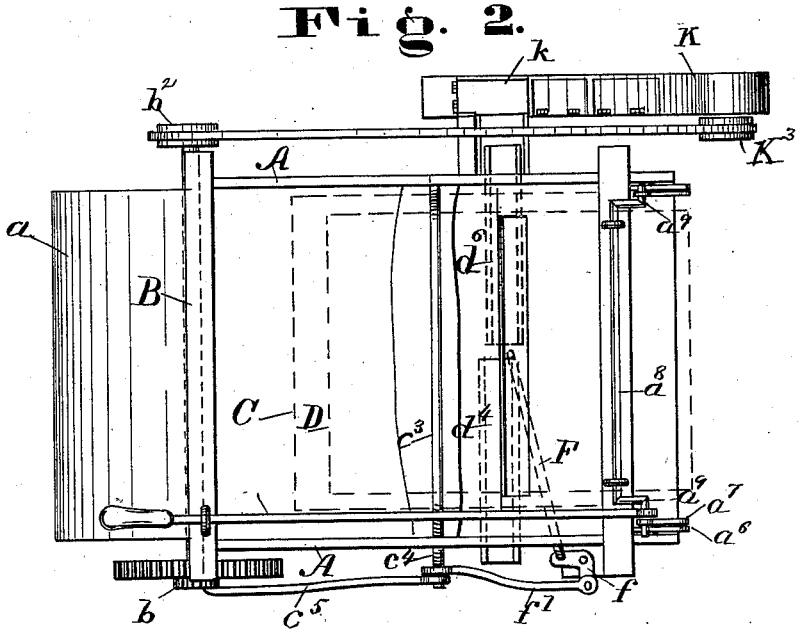


Fig. 2.



WITNESSES:
P. B. Inglis
O. M. Kramer

INVENTOR:
George N. Mansfield
By Robt. A. Lacey Attys

(No Model.) 2 Sheets—Sheet 2.

G. N. MANSFIELD.

FANNING MILL.

No. 305,319. Patented Sept. 16, 1884.

Fig. 3.

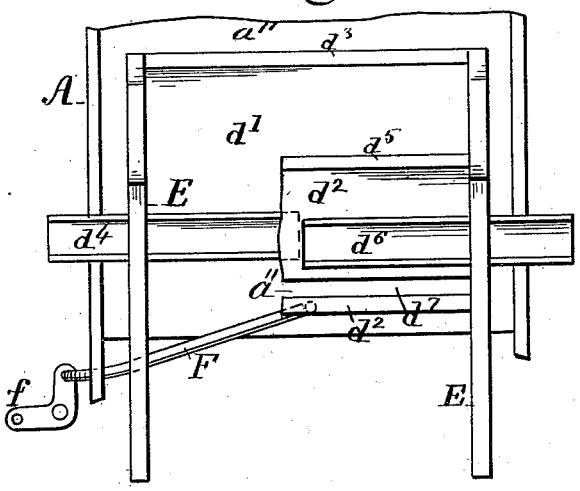


Fig. 4.

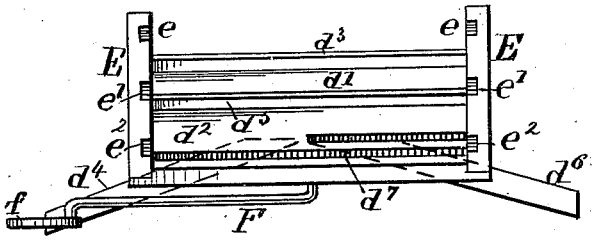
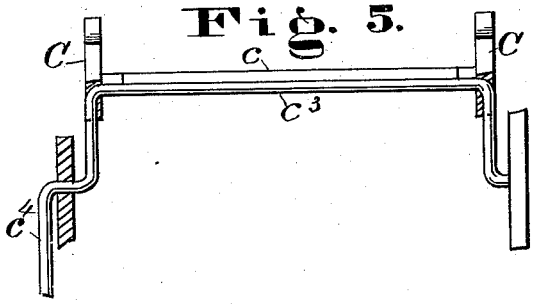


Fig. 5.



WITNESSES:
P. B. Turpin
O. M. Kramer

INVENTOR:
George N. Mansfield
By R. S. & A. P. Lacey Attys.

UNITED STATES PATENT OFFICE.

GEORGE NEWTON MANSFIELD, OF HILLSBOROUGH, ILLINOIS.

FANNING-MILL.

SPECIFICATION forming part of Letters Patent No. 305,319, dated September 16, 1884.

Application filed May 22, 1884. (No model.)

To all whom it may concern:

Be it known that I, GEORGE N. MANSFIELD, a citizen of the United States, residing at Hillsborough, in the county of Montgomery and State of Illinois, have invented certain new and useful Improvements in Fanning-Mills; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

The invention relates to that class of fanning-mills in which one or more sieves are set in motion (by suitable mechanism) below the hopper and behind the fan or blower; and its principal object is to construct mechanism by which the above-mentioned movements may be united in the same machine, some of the sieves therein being made to vibrate and others to reciprocate. An additional object is to attach a door to the feed-opening in the hopper in such manner that the feed may be readily controlled by simple mechanism within reach of the operator.

The invention consists in the novel construction and combination of parts, as will be hereinafter more fully described, and pointed out in the claims.

In the drawings accompanying and forming part of this specification, Figure 1 represents a side elevation of the machine, with the side largely broken away to show the construction and arrangement of the sieve-carriers and other internal parts. Fig. 2 is a plan view of the same, with the bottom of the hopper partly broken away to show the manner in which the upper carrier is supported by its actuating-rod. Fig. 3 is a partial plan view of the lower sieve-carrier, showing the connection of the spouts with the base-piece of said carrier. Fig. 4 is an end view of the same, showing the ways for the sieves and the junction of the rod that vibrates the carrier. Fig. 5 is a sectional view of the upper carrier, showing the connection and shape of its actuating-rod.

In the accompanying drawings, A represents the main frame of the fanning-mill, of the usual general shape and construction, of which a is the drum for the fan a', and a^2 the hopper, having the narrow feed-opening a^3 running transversely across the bottom.

a^4 is a rectangular door, to open and close the feed-opening a^3. The door a^4 has its ends (which slide in ways on the lower surface of the rear of the hopper) attached by links a^5 a^5 to the lower ends of the levers a^6 a^6, which are pivoted centrally on the inner surfaces of the sides of the frame A, near the top of the same, and have their upper ends connected by links a^7 a^7 to the ends of the transverse rod a^8. The said rod turns in proper bearings in the top of the frame A, just to the rear of the hopper, and has its ends a^9 a^9 bent upward at right angles, so as to form crank-connections with the links a^7 a^7.

a^{10} is a longitudinal rod or handle sliding in a proper support fixed to the top of the frame A, and joined by its rear end to one of the cranks a^9 of the rod a^8. By pulling and pushing on the handle the door a^4 may be respectively opened and closed.

a^{11} is the bottom of the frame A, inclining upward from the front of the same, and having but about three-fourths of its length, and a^{12} is a spout formed between the front edge of the bottom and a clip fixed horizontally to the frame a little distance above the bottom.

B is the actuating-shaft of the mill, having proper bearings in the frame A, and carrying on one end a pinion, b, centrally the fan or blower a', and on the other end the pulley b^2, for a purpose hereinafter mentioned. The pinion b is rotated by a gear-wheel and crank-handle, as shown, or by other proper means.

c is a rectangular sieve or screen carrier, having its sides joined at the front and rear ends by proper supports for the ends of the sieve or screen c. The carrier is provided across the top with a picker, c', which runs immediately below the feed-opening, and serves to clear the same of straw or other foreign materials which may descend from the hopper with the grain. The sieve c sets nearly horizontal, but may be raised or lowered at the rear end by making its support c^2 at that end vertically adjustable in the side of the carrier by thumb-screws, as shown.

c^3 is the rod or support for the front end of the screen-carrier, and bends downward at a right angle for an equal distance on both sides. It then bends horizontal again, so as to have proper bearings in the sides of the frame A. On the side of the latter upon which the pinion b is situated the rod c^3 bends at right angles downward, after passing through the side of the frame A, so as to form a crank-arm, c^4, which is connected by a rod or pitman, c^5, with the said pinion, the front end of the pitman joining the pinion eccentrically, so as to take motion from it and vibrate the crank-arm.

c^6 c^6 are equal and similar swinging arms, pivoted at their upper ends to the inner surfaces of the sides of the frame A and at their lower ends to the rear end of the carrier c.

D is the carrier for the lower screens, and is composed of the bottom d and two equal and similar sides, E E. The bottom d is composed of two transverse rectangular parts, d' and d^2. The former lies below the latter, and is provided along its front edge (which is just sufficiently to the rear of the fan a' for free motion) with the upward-extending clip d^3. The part d' inclines downward from its front edge, and has attached to and opening from its rear edge a spout, d^4, which inclines downward and at right angles outward, passing through one side of the main frame by a proper opening. The part d^2 inclines parallel to the part d', which lies below it, but has its front edge (which is provided with a clip, d^5, similar to the clip d^3) considerably to the rear of the front edge of the latter.

d^6 is a spout attached to and opening on the part d^2, near its rear edge. The said spout is similar to the spout d^4, but inclines to the opposite side of the main frame. The rear end of the part d^2 runs farther back than the spouts and the rear end of the part d', and has through it a transverse opening, d^7, entering into the space above the floor or bottom a^{11} of the main frame.

E E are the sides, properly attached to the edges of the bottom d and inclining upward and backward from their front ends, their rear ends lying considerably behind the rear edge of said bottom portion.

e, e', and e^2 are ways for the screens or sieves e^3, e^4, and e^5, respectively, the said ways all inclining downward from rear to front, and having smaller meshes from e^3 to e^5, the meshes of all being smaller than those of the sieve c. The ways e end in front over the inner end of the part d', so that any grain or seed passing over the inner edge of the sieve e^3 will pass along between the parts d' and d^2 on the upper surface of the former and be discharged through the spout d^4. The ways e' end over the inner or front end of the part d^2, so that anything passing over the inner edge of the sieve e^4 will be discharged through the spout d^6. The ways e^2 end over the opening d^7, so that anything coming from the sieve e^5 will descend to the bottom a^{11} of the main frame and be discharged through the spout a^{12} of the same. The carrier D is properly swung in the main frame by the arms d^8 d^8 at its front end and d^9 d^9 at its rear end, which are pivoted or otherwise properly attached at their upper ends to proper points on said frame.

F is a rod pivoted at its inner end to the central part of the rear edge of the bottom of the carrier D, and, running thence below said bottom and through the side of the main front, has its outer end pivoted to one arm of a horizontal bell-crank, f, which is pivoted to a proper projection on the outer surface of the side of the main frame.

f' is a connecting rod or link, having one end pivoted to the other arm of the bell-crank and its other end to the crank-arm c^4 of the rod c^3 in such manner that the rotation of the pinion b will oscillate the bell-crank and consequently vibrate the carrier D from side to side. The motion of the two carriers will thus differ, the upper one having a longitudinal reciprocating motion and the lower a lateral vibrating motion.

H is a box sliding in proper supports between the sides of the main frame, below the carriers, and serving to catch such seeds or other material as pass through all the sieves.

K is a grain carrier or elevator attached to the side of the machine, that carries the pulley b' and receives grain from the spout d^6 into the box k at its foot; and k' is the band, with attached buckets, to elevate the grain and let it fall through the rear depending branch k^2 of the elevator into bags attached to said branch by hooks or otherwise.

k^3 is a pulley on the upper shaft of the elevator, which pulley, in connection with pulley b' and proper band, runs the band k' and actuates the elevator. The elevator-band may be tightened, if necessary, by having the bearings of its upper shaft in boxes controlled by adjusting-screws. The elevator in practice would have one or more doors on its front surface through which to watch its operation.

The drum a of the mill may be provided with proper handles, and, if desirable, with horizontal ways on its ends for doors, to examine its interior. Similar ways and doors may be attached to the outer sides of the main frame opposite those on the drum. The drum is preferably secured by proper hooks on it fitting into staples on the main frame.

The different parts of the machine are operated as follows: The handle a^{10} is within easy reach of the man turning the driving-crank of the machine. By pushing the former the crank ends a^9 a^9 of the rod a^8 are depressed, and the lower ends of the pivoted levers a^6 a^6 consequently turned inward, which action, by means of the links a^5 a^5, slides the door a^4 over the feed-opening a^3 in the hopper. To open the door, the motion of the handle a^{10} is reversed, or the door may be only partially closed if it is desirable to make the feed slower.

The operation of the reciprocating carrier

has been hereinbefore fully explained, and also the operation of the vibrating carrier. Now, as link f', that drives the bell-crank f and reciprocating rod F, is pivoted by one end to the depending crank-arm c^4 of the rod c^3, and as both crank-arm and link are connected by the pitman c^5 to the pinion b, which drives the machine, the action of both carriers must be simultaneous, and as such action is important to perfect the fanning of the grain, the mechanism must make a perfect combination.

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

1. In a fanning-mill, the combination, with the upper reciprocating carrier and rod, c^3, provided with depending arm c^4, of the lower vibrating carrier, bell-crank f, links F and f', and pitman c^5, all constructed and arranged substantially as and for the purposes specified.

2. In a fanning-mill, the combination, with the frame A, provided with the bottom a^{11} and spout a^{12}, of the sieves e^3, e^4, and e^5, and carrier D, composed of two side parts, E E, provided with the ways $e\,e'\,e^2$ and two bottom parts, d' and d^2, the former provided with the spout d^4, and the latter with the spout d^6 and opening d^7, all constructed and arranged as shown and described.

3. The combination, in a fanning-mill, with the frame A and hopper a^2, provided with the feed-opening a^3, of a properly-shaped door, a^4, sliding in proper ways to open and close said feed-opening, links a^5 a^5, centrally-pivoted levers a^6 a^6, links a^7 a^7, oscillating rod a^8, provided with crank-arms a^9 a^9, and handle a^{10}, sliding in a proper support fixed to the top of frame A, and the hand-hold of which is in reaching distance from the driving-crank handle, all constructed and arranged as shown and described, for the purpose specified.

4. The combination, in a fanning-mill, of sieves e^3 e^4 e^5, each having its lower end projected in advance of the next lower sieve, the oppositely-inclined carrying-board d', provided with discharge-spout d^4, and having its upper end projected outward beyond that of sieve e^3, and the similarly-inclined board d^2, having discharge-openings d^7 and spout d^6, and having its upper end arranged about midway between the lower ends of sieves e^3 e^4, substantially as set forth.

In testimony whereof I affix my signature in presence of two witnesses.

GEORGE NEWTON MANSFIELD.

Witnesses:
ELI MILLER,
W. P. MARSHALL.