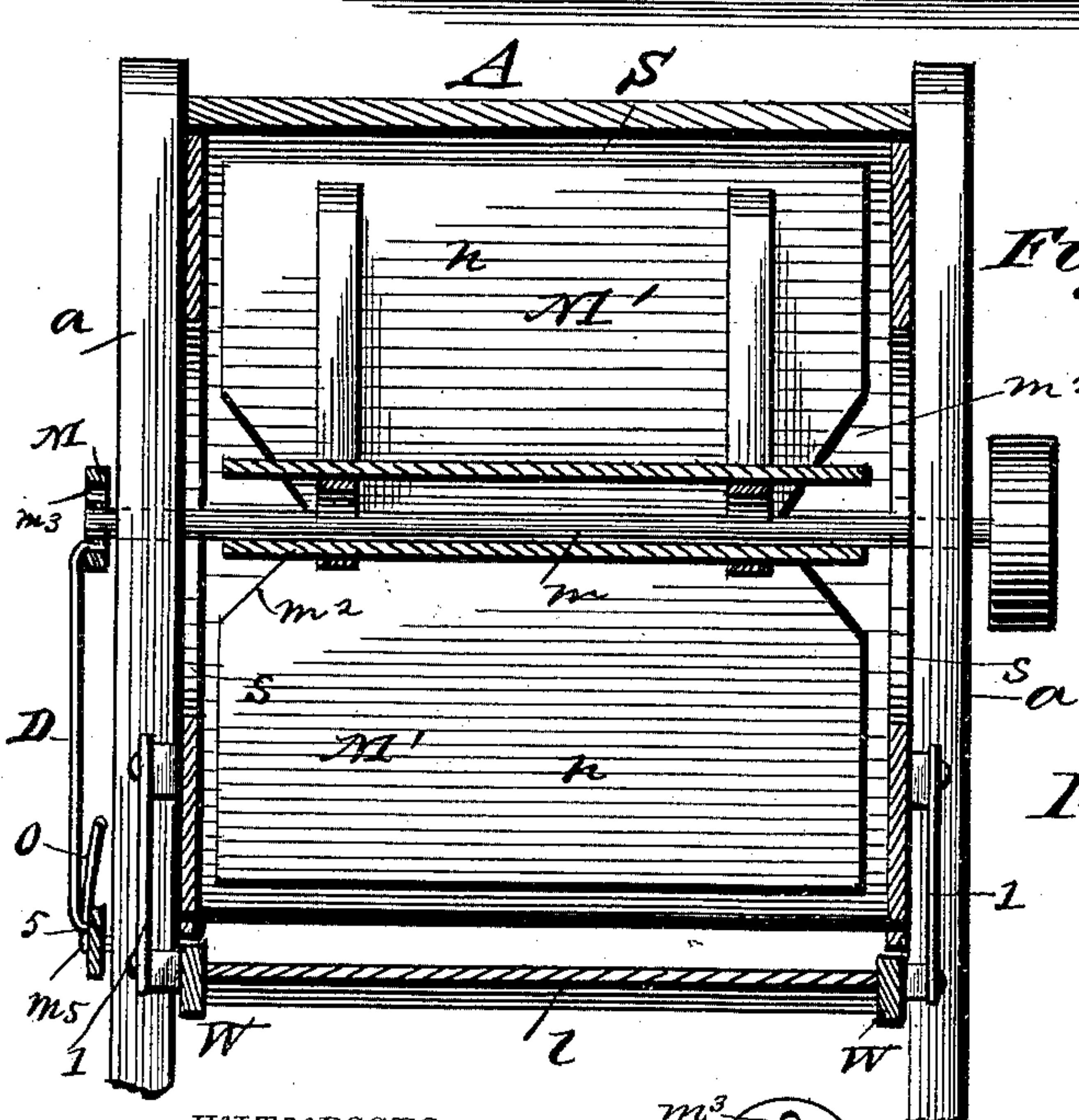
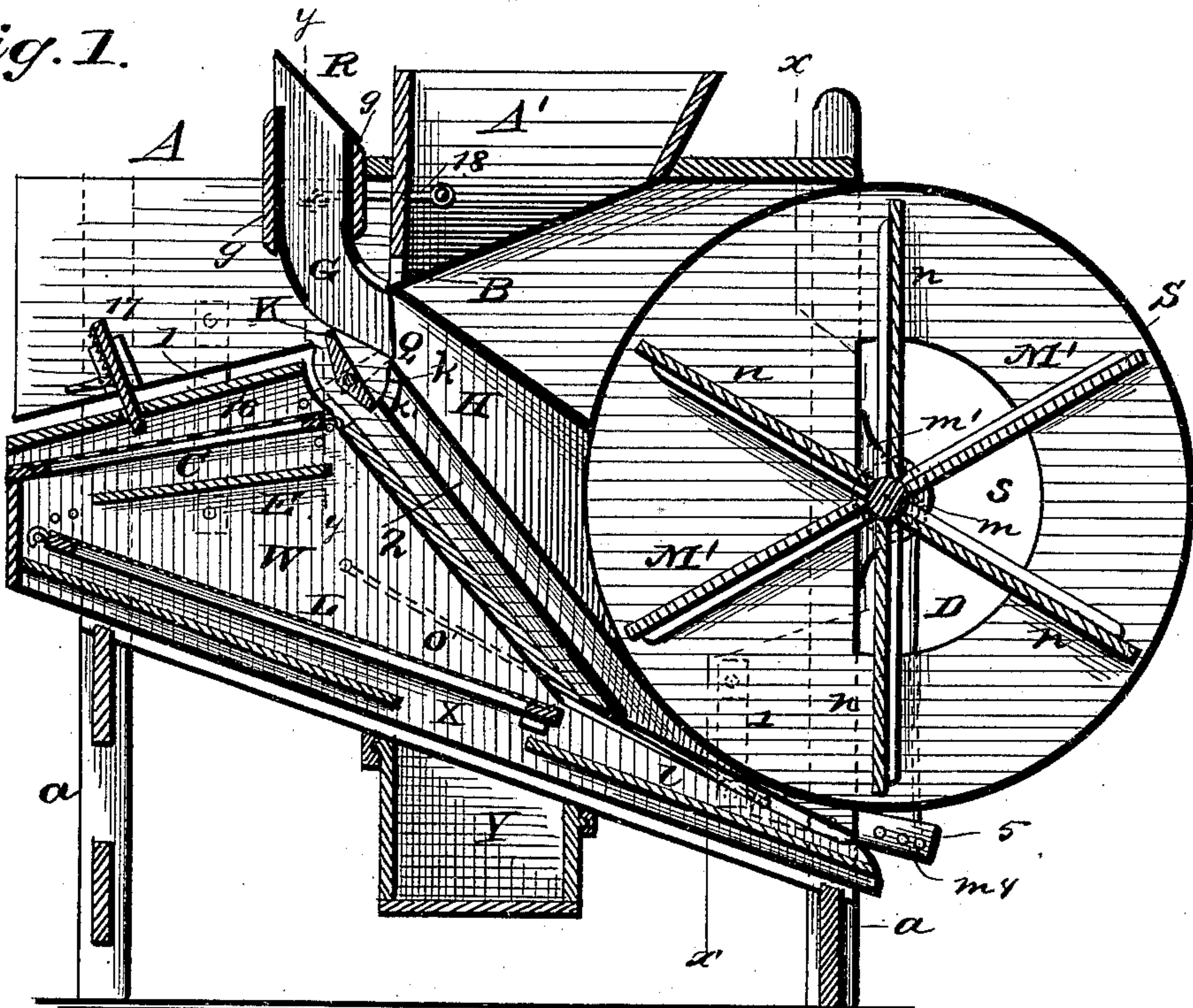


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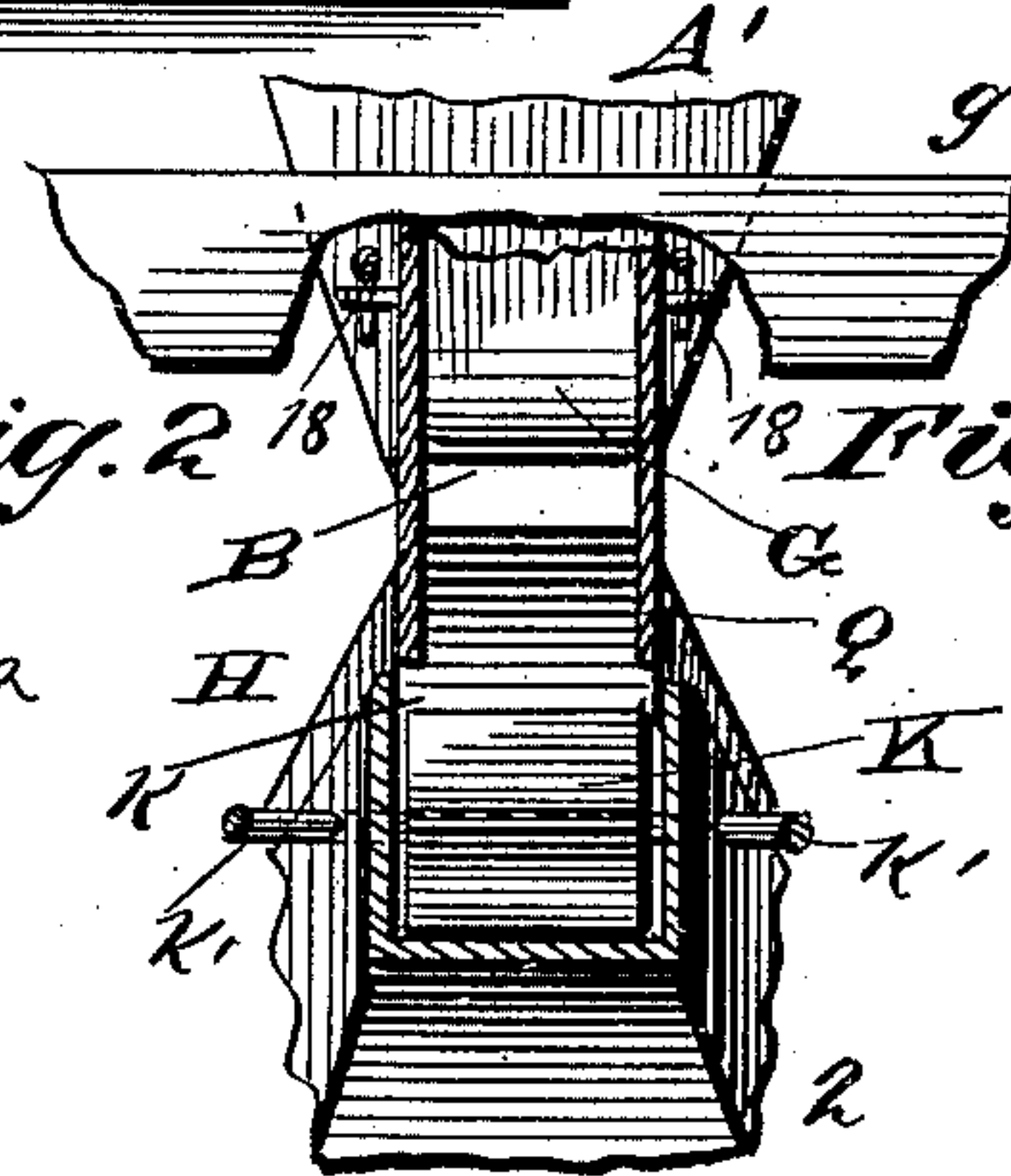
FANNING MILL.

Patented Feb. 28, 1888.

*Fig. 1.*



*Fig. 2*



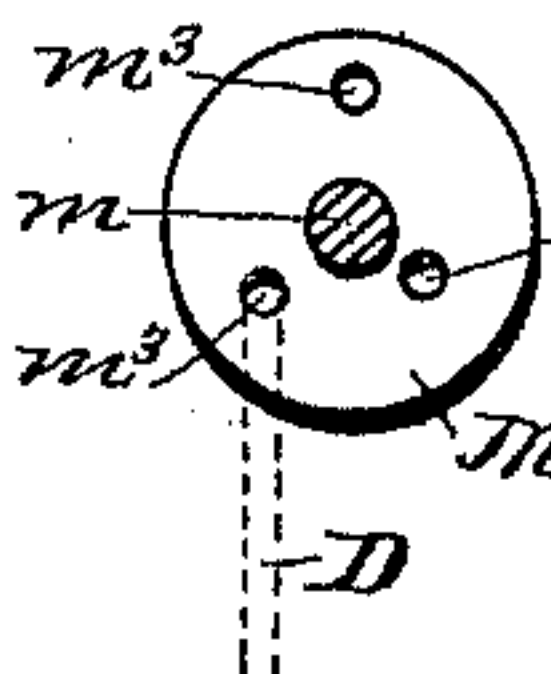
*Fig. 3.*

*Fig.4.*



*WITNESSES*

B. Fugitt.  
P. C. Rossi.



*Fig. 5.*

*INVENTOR.*

Ino. C. Constant,  
by Anderson Smith.  
his Attorneys.

(No Model.)

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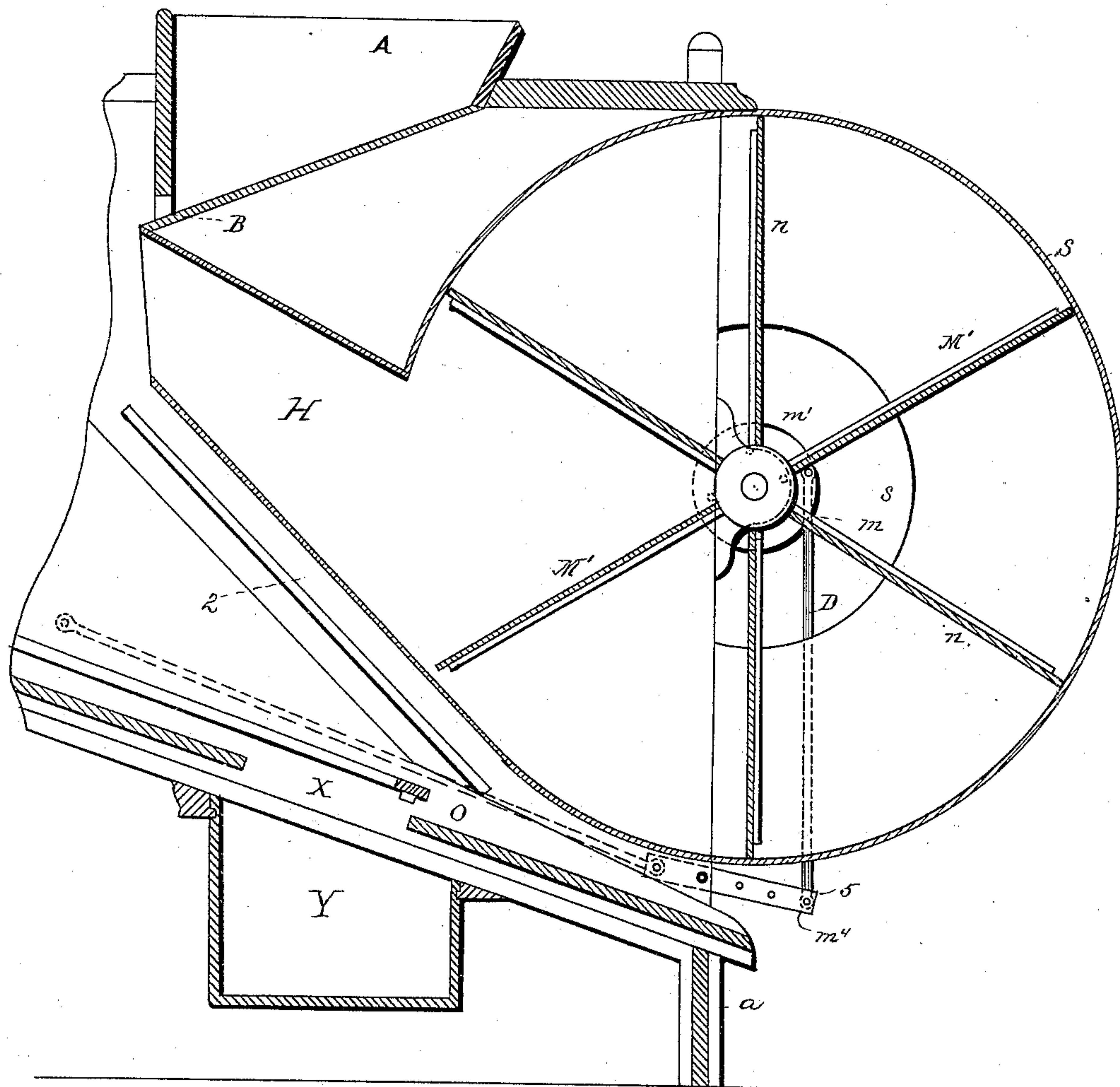
J. S. CONSTANT.

FANNING MILL.

No. 378,772.

Patented Feb. 28, 1888.

*Fig. 6.*



WITNESSES.

*W. B. Harris*  
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INVENTOR.

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# UNITED STATES PATENT OFFICE.

JOHN S. CONSTANT, OF WHITE PIGEON, MICHIGAN.

## FANNING-MILL.

SPECIFICATION forming part of Letters Patent No. 378,772, dated February 28, 1888.

Application filed October 8, 1886. Serial No. 215,687. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN S. CONSTANT, a citizen of the United States, residing at White Pigeon, in the county of St. Joseph and State of Michigan, 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 ap-  
10 pertains to make and use the same, reference being had to the accompanying drawings, and to letters or figures of reference marked thereon, which form a part of this specification.

Figure 1 is a central vertical longitudinal section of the machine. Fig. 2 is a transverse section on the line  $x x$  of Fig. 1. Fig. 3 is a detail sectional view on the line  $y y$  of Fig. 1. Fig. 4 is a detail detached view of the inner part or end of one of the screens. Fig. 5 is a detail side view of the operating-disk. Fig. 6 is a vertical longitudinal section showing more fully the mechanism operating the screen-shoe.

This invention relates to improvements in fanning-mills, the prime object being to conduct the grain or seed directly from the hopper into the air-separator, where it meets the blast just as it begins to fall and is rid of light particles and impurities more thoroughly.

30 The invention has for its further object to clean the grain by the air-blast alone, when so desired, or to cleanse it with the reciprocating screens in conjunction with the air-blast.

The invention consists in the construction and novel combination of parts hereinafter described, illustrated in the drawings, and pointed out in the claims.

Referring by letter to the accompanying drawings, A designates the frame of the mill, of which  $a a$  are the posts.

S is the fan-casing; H, the blast-chamber leading thence, and with its roof and floor converging to its opening Q into the vertical detachable air-separator chamber or flue G. The roof and floor of the blast-chamber both incline upward to the separator G, as shown. The fan-casing S has in its ends or heads the central openings,  $s$ .

50 M' is the fan, the shaft  $m$  of which passes through the said openings and is journaled in proper bearings,  $m'$ , secured to the frame A.

The said shaft is either rotated by means of a crank-handle or has a pulley secured upon it, and is thereby run by a belt from a pulley secured to any suitable source of power.

$nn$  are the blades or vanes of the fan. The said vanes have their outer edges in close approximation to the inner surface of the casing and have their inner edges secured to the shaft  $m$  for their entire length. The vanes have their side edges cut inward toward the shaft  $m$ , so that on each side a V-shaped notch,  $m^2$ , is made between opposite vanes, which notches are bisected by the shaft  $m$  and lie adjacent to the openings  $s$  in the casing.

The above construction produces a more constant and equable draft and prevents counter-currents, the air escaping through the blast-chamber H, in which the air is compressed as it moves toward the opening Q.

A' is the hopper, having its rear wall vertical, and communicating with the lower end of the said separator-chamber G through the opening B immediately above the opening Q of the blast and air-compressing chamber H, so that the blast will strike the grain just as it begins to fall from the hopper before it has acquired momentum, and will consequently exert more force to drive out light particles and impurities through the chamber G. The said separator-chamber slides into place between the clasps  $g g$  on the main frame and is released by the hook 18, which is pivoted on the side of the hopper and engages a staple on the side of the air separator-chamber.

R is a deflector-plate at the upper end of the separator-chamber, which plate stands outward at an angle of forty-five degrees from the inner side of the separator-chamber and overhangs said opening. The lower end of the separator-chamber G curves inward, and forms, below the opening Q, the upper and outer end of the grain-delivery channel or chute 2, which inclines downward and forward and discharges into any proper receptacle placed below the fan-case. The roof of said chute is formed by the floor of the blast-chamber.

$k$  is an opening in the floor of the grain-chute just below its upper end, for the purpose, when desired, of delivering the grain to the screens hereinafter described.



K is a door mounted upon the shaft  $k'$ , the ends of which are journaled in proper bearings in the sides of the grain-chute centrally with relation to the opening  $k$ . When said door is turned up, it closes the grain-chute and opens the upper part of the opening  $k$ , so that the grain will be delivered to the screens over the door K. When the door is closed, so as to open and make continuous the grain-chute, the screens are cut off and the grain is cleaned by the air alone; but when the door closes the grain-chute the separation by the blast is supplemented by that of the screens.

W is the screen shoe or frame, hung by four metal straps or hangers, 1 1, as shown in Fig. 2, to the casing of the mill, as shown, there being two straps secured near each end of the frame, one on each side thereof. The ends of the straps are secured to brace-blocks, which are bolted to the casing and to the sides of the screen-frame.

C is the upper coarse screen, and L the lower and finer one. The upper ends of the screens rest upon any of the pins  $c$  in the interior of the sides of the frame, so that the inclination of the screen can be varied at will. The upper ends of the screens are provided with hooks or other devices to engage said pins and prevent them from sliding down in the frame W. The upper coarse screen, C, discharges at its lower end out of the rear or tail of the machine into any proper receptacle. The lower and finer screen, L, discharges from its lower end onto a chute,  $l$ , made upon the floor of the screen-frame. All grain or particles small enough to pass through the meshes of the fine screen fall through an opening, X, in the floor of the screen-frame into a receptacle, Y, secured thereunder.

16 is a screen-covering board secured within the screen-frame above the screen C, and having a rather steeper inclination in the same direction—that is, rearward and downward.

17 is an adjustable grading-board which enters a transverse slot in the screen-cover 16, and may be set farther in or out. When using the air-separator G either alone or in conjunction with the screens, the said grading-board is pulled out sufficiently to allow the chaff to be driven over its upper edge and out of the machine, but to retain the light grain that may be blown out of the air separating chamber on the coarse screen C.

E is a chute secured in the screen-frame below and inclined similarly to the screen C. The said chute carries the grain falling through the meshes of the screen C to the rear end of the finer screen, L, which inclines forward and downward, as shown. The grain thus passes over the whole length of the screen L.

The mechanism for reciprocating the screen-frame is as follows: The fan-shaft  $m$  has on the extended end opposite that carrying the crank-handle or other means of rotation a disk, M, provided with holes  $m^3$  at different distances from its center. D is a connecting-rod having its upper end bent inward to engage in any one

of said holes and its lower end similarly bent to engage in one of the series of holes,  $m^4$ , at different distances from the pivotal point  $m^5$  of the vibrating bar 5, pivoted upon the post  $a$  of the main frame. The said holes  $m^4$  are on the outer arm of the bar 5, and its inner end is pivoted to an end of the shaker-bar O, the outer end of which is pivoted to the side of the screen frame or shoe.

As the fan and fan-shaft are rotated the disk M rotates therewith and moves the screen-frame twice backward and twice forward with each rotation, so that it has two double reciprocations for each rotation of the disk. This gives the screen-frame W a very rapid reciprocative movement, and one that is much more effective than a slower movement. When the link D, connecting the disk M with the bar 5, has its connection with the disk horizontally outward from the center of the latter, the connecting-rods 5 and O hold the screen-frame at the farthest point from the fan-case. When said connection is vertically either above or below said center, the screen-frame is consequently drawn in toward the fan-case. Therefore the screen-frame must reciprocate back and forth twice to each rotation of the disk. The grain can be thus cleaned by the air-separator alone by moving the door K to cut off the screens, as described, or by the separator and screens in conjunction.

When chaffing or cleaning coarse heavy material—such as trampled-out grain or seed—the air-separator G is detached and the chaff and impurities driven by the blast over the board 16 out of the machine.

The parts are so arranged in relation to each other that when the attachment of the rod D with said disk is on either side of the center of the shaft  $m$  the rod O is at the end of its forward reciprocation, so that the said rod O reciprocates twice in each direction for every rotation of the disk M.

Having described this invention, what I claim, and desire to secure by Letters Patent, is—

1. The combination of the hopper, the fan, the fan-casing, the blast-chamber running upward from the lower part of the fan-casing to a point immediately below the outer and lower corner of the hopper, the detachable separator-trunk having a vertical portion, an opening below said portion opposite the discharge-opening from the hopper, and a discharge-opening opposite said opening that receives from the hopper, and the adjustable door K, to regulate and direct the discharge from the separator, substantially as specified.

2. The combination of the fan, the fan-case receiving the draft through openings in its ends, the blast-chamber communicating with the fan-case, the detachable separator-case, the hopper having its discharge-opening vertically above the junction of the separator-case and the blast-chamber, and the pivoted door K, substantially as specified.

3. The combination of the fan, the fan-cas-



ing, the blast-chamber running upward from  
the lower part of the fan-casing and with its  
top and bottom converging upward, the hop-  
per having a discharge-opening into the upper  
5 end of the blast-chamber, the grain-discharge  
passages below the blast-chamber, the screens  
inclined oppositely to said passages and rear-  
ward therefrom, and the door pivoted in such  
position that it can be turned to direct the  
10 grain from the hopper either into said dis-  
charge-passage or on the said screens, substan-  
tially as specified.

4. The combination of the fan, the fan-case,

the upwardly-converging blast-chamber, the  
separator-trunk, the hopper discharging 15  
through the separator, the pivoted door to di-  
rect the grain, the cant-board 16, and the ad-  
justable detent-board 17, substantially as speci-  
fied.

In testimony whereof I affix my signature in 20  
presence of two witnesses.

JOHN S. CONSTANT.

Witnesses:

JOHN DRIESBACH,  
DAVID L. WHITE.