S. CANBY.

Grain Winnower.

No. 9,913.

Patented Aug. 9, 1853.

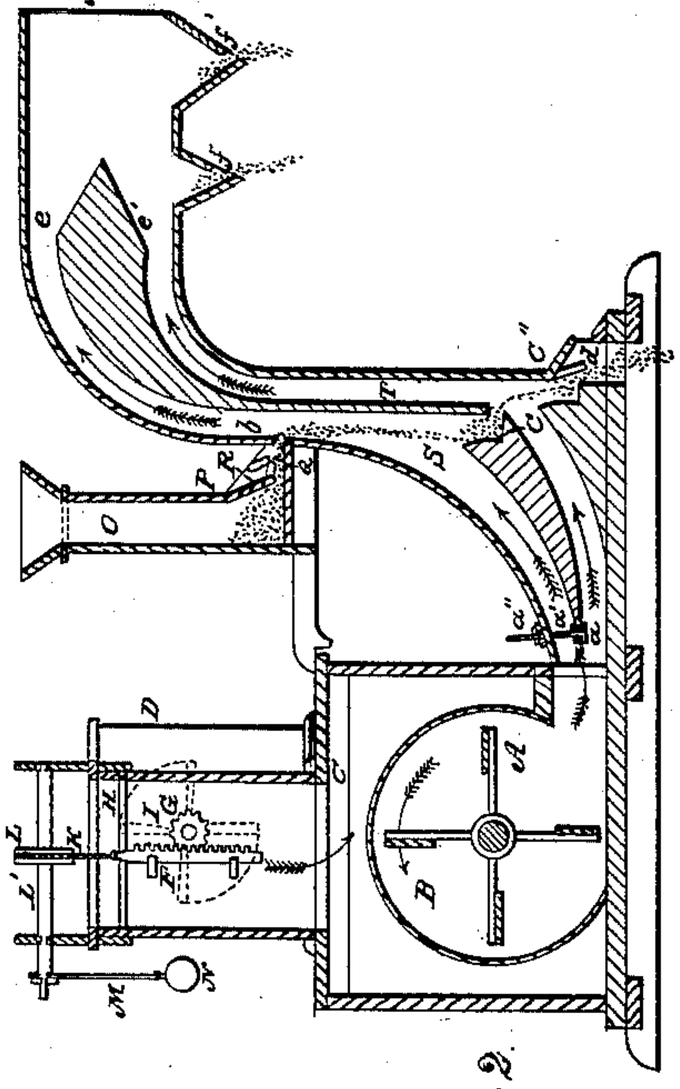

Fig. 2. Sectional View.

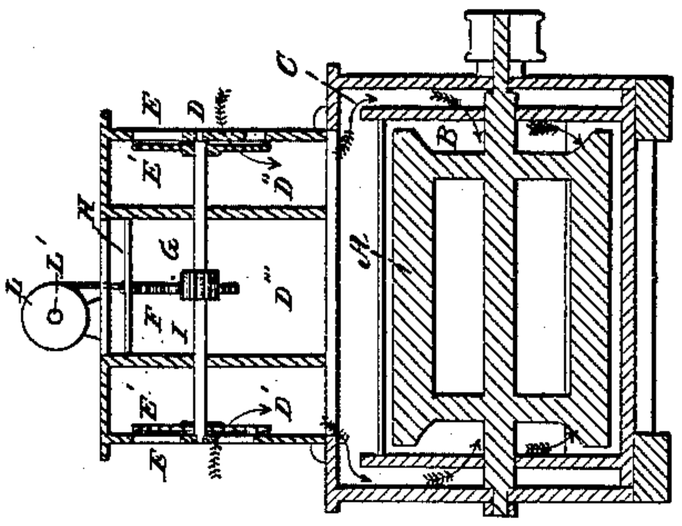

Fig. 4. Sectional View.

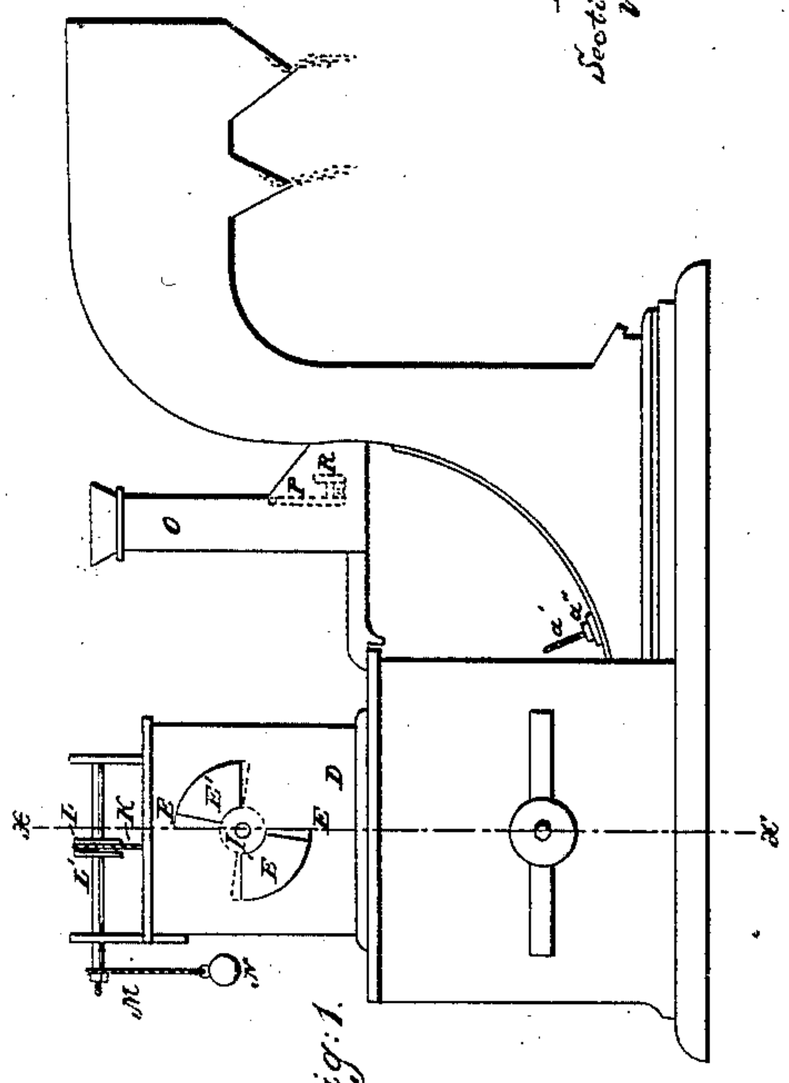

Fig. 1.

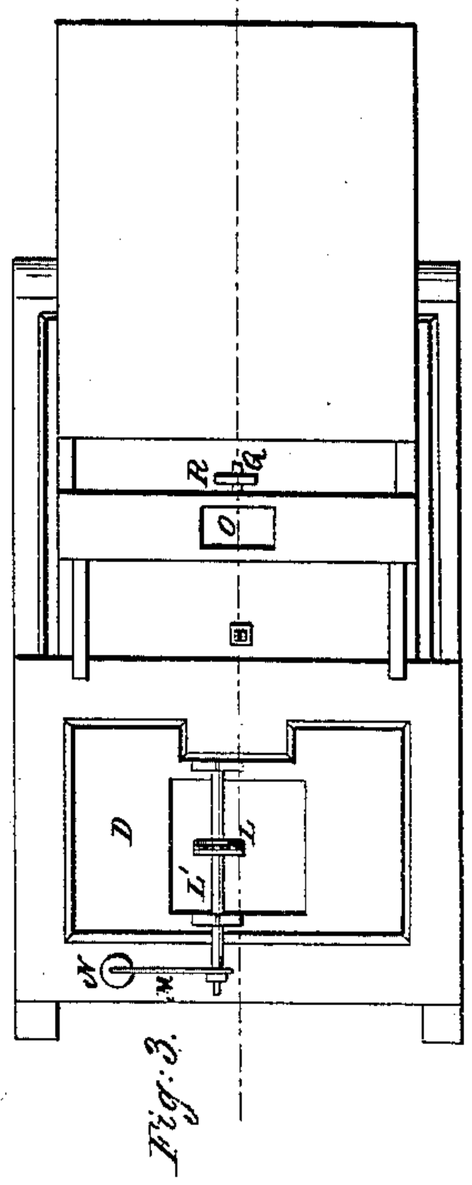

Fig. 3.

UNITED STATES PATENT OFFICE.

SAMUEL CANBY, OF ELLICOTTS MILLS, MARYLAND.

WINNOWER OF GRAIN.

Specification of Letters Patent No. 9,913, dated August 9, 1853.

To all whom it may concern:

Be it known that I, SAMUEL CANBY, of Ellicotts Mills, in the county of Baltimore and State of Maryland, have invented a new and useful Improvement in Winnowers; 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, forming part of this specification, in which—

Figure 1 is a side elevation of the machine. Fig. 2 is a vertical longitudinal section of the same. Fig. 3 is a plan of the machine, and Fig. 4 is a vertical section upon the line *x x* of Fig. 1.

Similar letters in the several figures refer to the same parts of the machine.

My invention relates to the manner of graduating the blast of a winnower so that it shall not be influenced by the irregularities of velocity to which the fan or blower may be subjected; and also, to the manner of delivering the grain to the action of the blast in the way best calculated to separate from it the light impurities; and further, to the arrangement of the blast channels, which successively and effectually cleanse the grain passing through them.

The nature of the first portion of my invention, which is similar in some respects to that of my patent dated December 28, 1852, consists in constructing above the fan chamber, and opening into it, a regulator consisting of three apartments, the sides of the exterior containing openings for the admission of the air, the central apartment being furnished with a piston suspended by a cord passed over an exterior pulley, and balanced by a weight at the extremity of a lever attached to the shaft of the suspending pulley; the under side of the piston being attached to a rack rod meshing into a pinion upon a shaft extending across the three apartments, and thus operating two valves in the extension chambers, and upon the same shaft as the pinion; so that the accurately balanced piston shall open the air passages as the blast is weakened, or diminish their extent when the blast becomes too strong.

The second part of my invention consists in arranging in the front part of the hopper a swinging door, which shall cause the grain to distribute itself evenly over the bottom of the hopper before raising the door and passing out, thereby causing the grain to flow in a uniform current into the first blast channel. And thirdly, my invention consists in passing the blast through two channels so arranged that the uniform current of grain entering the first, shall after being acted upon by the blast, pass steadily into the second blast, where the cleaning is completed; the amount of blast admitted into the several channels, being regulated by a swinging door at the entrance of the channels, so as to divide the blast according to the required amount of air for each channel.

In the drawings A is the fan, made to revolve in the chamber B; air being admitted through the passages C at the ends of the chamber, which passages communicate with the interior of the regulator D. This regulator consists of three apartments D′, D″, D‴, the exterior D′ D″ having in their sides the openings E through which air passes to the fan. In the central apartment D‴ is the piston H suspended by the cord K passed over the exterior pulley L, and balanced by the weight N, at the extremity of the lever M which is fastened to the shaft L′ of the pulley L. Fastened to the under side of the piston H is the rack rod F, which meshes into the pinion G upon the shaft I. On the same shaft and close to the sides of the exterior apartments D′ D″ are the valves E′ E″ which by the revolution of the shaft I can be made to cover the openings E either partially or entirely; or to leave them altogether open if desired. This arrangement of suspending the piston H and having it balanced by a weight N sufficient for the strength of blast required, renders the piston extremely sensitive to the least variation of blast, causing it to regulate the supply of air as will hereafter be fully shown.

O is the hopper having the swinging door P, upon the exterior of which is the screw Q, and weight R movable upon it. The object of this construction is to confine the grain when thrown in the hopper, until it has spread evenly over the bottom, when it will gradually raise the door P and pass out in a uniform current. The weight R regulates the resistance to the weight of the grain.

The winnowing portion of the machine is divided as seen in Fig. 2, into two channels

S and T, the amount of blast to be thrown into each being regulated by the swinging valve *a* operated by the screw *a'* and nut *a''*.

The operation of my machine is as follows: The weight N is first regulated to the amount of blast required; and R is also adjusted to the weight of the grain, beside which the valve *a* is arranged so as to divide the blast according to the nature of the grain. After these preliminary adjustments the machine is set in motion and the grain thrown into the hopper O, the door P will prevent its sudden rush and cause it to spread evenly over the bottom of the hopper, forcing up the door gradually, when it will descend uniformly through the aperture *b* into the passage S, where it meets the first blast, which passing through the uniform stream of grain carries off the light impurities, allowing the grain to fall upon the shelf *c*, where it passes in a regular stream into the channel T, receiving the second blast, which drives off in the direction of arrow 1 whatever light substance it may then contain, the grain falling completely cleaned on the shelf *c''*, whence it passes through the opening *d*. After the separation above described has taken place and the light substances are blown off in the direction of the arrows, the full force of the blast is felt until the points *e* and *e'* of the channels S and T are reached, when by reason of the widening of the mouth the blast is weakened causing the heavier particles carried with it to fall through the openings *f*, *f'*, the lighter issuing from the mouth *x*.

The operation of the regulator is as follows: The air passing through the openings E and C to the fan as above described, the fan A will by its revolution create a partial vacuum in the central chamber of the regulator, giving the piston H a tendency to descend because of pressure of the atmosphere on its exterior surface: this inclination is counteracted within the proper limit by the weight N, but when the blast becomes too great, the air below the piston becomes more rarefied causing the exterior pressure to overcome the weight N, and depress the piston, which movement operating on the shaft I moves the valves E' over the openings E, so as to admit no more air than, with the increased velocity of the fan, will give the requisite blast, thus restoring the equilibrium. On the other hand, should the fan move slowly and the blast become weakened, the pressure on the exterior surface of the piston is diminished and the weight N falls, elevating the piston, and enlarging the openings E, thus giving a greater supply of air to compensate for the diminished velocity of the fan.

The weight N it is evident is variable, for regulating the strength of the blast; for, if when the machine is in equilibrium, it be found that some of the grain is carried through the blast passages, the weight must be diminished; the contrary course must be taken if the blast be too weak. This affords the means of so regulating the blast as to carry off all substances lighter than the grain, which in some instances, where the difference of weight is but small, becomes a very delicate operation.

The extreme accuracy with which this regulator operates, is due entirely to the sensitiveness of the piston, caused by its suspension as described, whereby the smallest possible amount of friction is opposed to its movements, thus obviating the disadvantages of friction which renders my former patent to some extent defective.

The shelf *c''* causes the cleaned grain to bank up and press open the valve *d''*, so that air is prevented from passing off with the cleaned grain through the opening *d*.

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

The construction of the receiving and discharging passages for the grain; that is, the passage at door P, passage C, and passage C'', in the manner and for the purpose as set forth.

In testimony whereof I have hereunto signed my name before two subscribing witnesses.

SAML. CANBY.

Witnesses:
WM. P. ELLIOT,
ARTH. C. WATKINS.