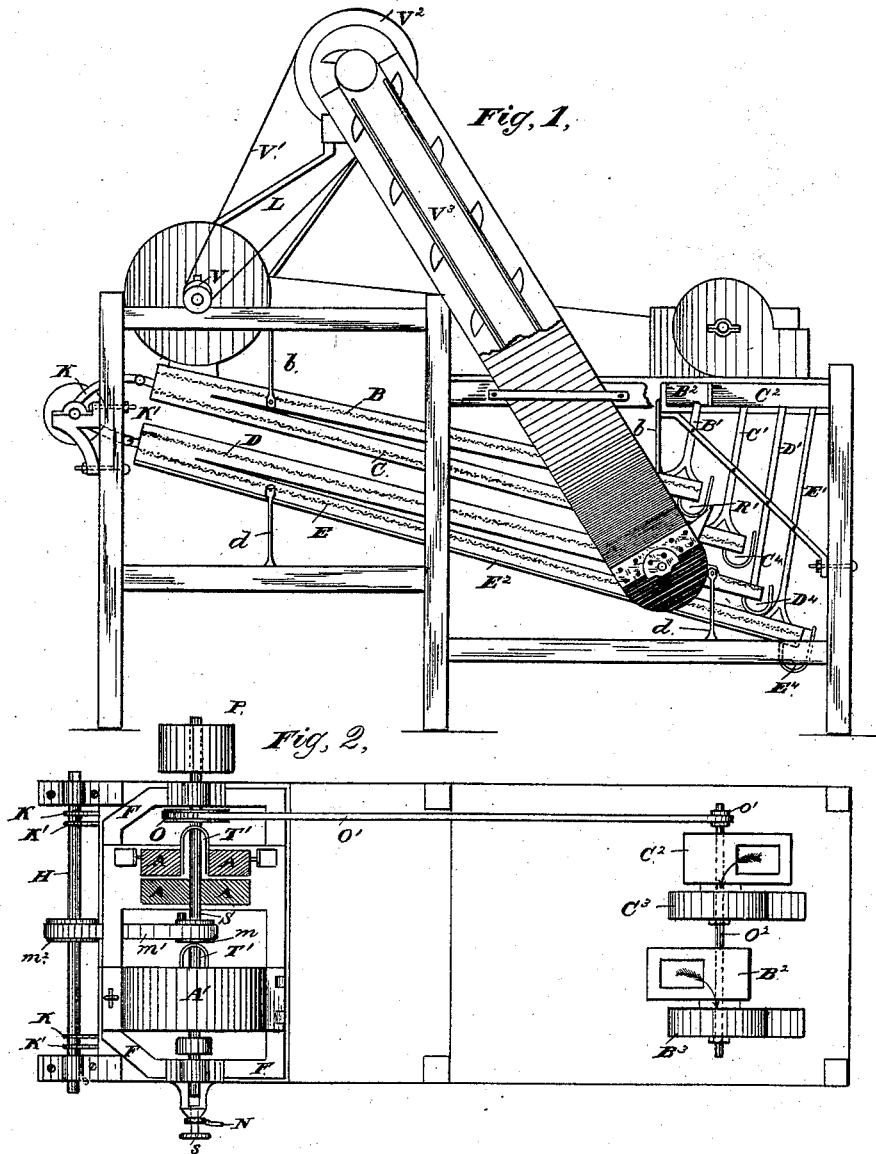


D. D., Z. C. & R. A. BREWSTER.  
Apparatus for Manufacturing Buckwheat Flour.

No. 219,683.

Patented Sept. 16, 1879.



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Fig. 3,

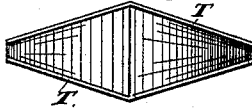


Fig. 4,

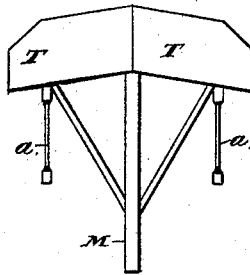


Fig. 5,

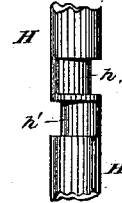


Fig. 6,

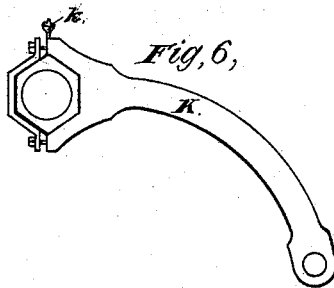


Fig. 7,

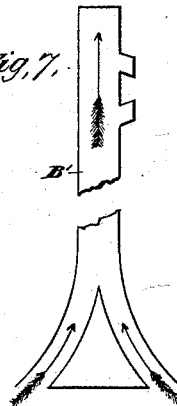
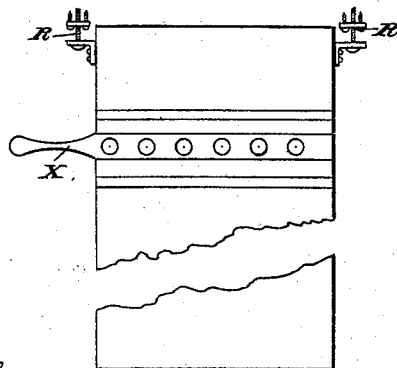


Fig. 8,



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# UNITED STATES PATENT OFFICE.

DANIEL D. BREWSTER, ZENO C. BREWSTER, AND ROSCOE A. BREWSTER,  
OF UNADILLA, NEW YORK.

## IMPROVEMENT IN APPARATUS FOR MANUFACTURING BUCKWHEAT-FLOUR.

Specification forming part of Letters Patent No. **219,683**, dated September 16, 1879; application filed February 26, 1879.

*To all whom it may concern:*

Be it known that we, DANIEL D. BREWSTER, ZENO C. BREWSTER, and ROSCOE A. BREWSTER, of Unadilla, in the county of Otsego and State of New York, have invented a certain new and Improved Apparatus for Manufacturing Buckwheat-Flour, of which the following is a specification.

It is desirable to hull buckwheat before grinding it. In any process of hulling there must be more or less breaking of the meats into finer and coarser particles, and more in proportion to the thoroughness of the hulling operation.

Our invention relates to an apparatus for treating buckwheat by cracking, hulling, and grading same, then purifying with independent and variable air-currents, as hereinafter fully described.

In order that our invention may be fully understood, we will proceed to describe the same with reference to the accompanying drawings, in which—

Figure 1 is a side view of the apparatus. Fig. 2 is a top view thereof. Fig. 3 is a top view of a vibrating shoe or hopper for feeding the burrs. Fig. 4 is a front view of the same. Fig. 5 is a plan of a part of the counter-shaft, showing the double eccentrics employed to vibrate the screens. Fig. 6 is a side view of an arm employed to transmit motion from the eccentrics to the screens. Fig. 7 is a side view of the extremities of one of the suction-tubes hereinafter described. Fig. 8 is a front view of the same. Figs. 3 to 8, inclusive, are on a larger scale than Figs. 1 and 2.

A A represent the cracking and hulling burrs, (of which we use one, two, or more pairs, according to the capacity of the apparatus,) mounted on a shaft or spindle, S, driven by a pulley, P. In Fig. 2 one pair of burrs is shown in section with the curb or casing omitted. In the other place the curb A' is shown in position.

B C D E are the screens, mounted in pairs, as shown, so that B and C move together, being suspended by hangers *b b*, and D E move together on the elastic supports *d d*. The screens B C are arranged to move in one di-

rection, while the screens D E move in the opposite direction, any tendency to vibrating or swinging motion in the frame of the machine being thus effectually avoided. Screen B is the coarsest; C, somewhat finer; D, finer, and E the finest.

The grain is received in vibrating shoes T T, which deliver it to the burrs A A through spouts T' T'. The said shoes are supported from the burr-curbs by springs *a a*, and receive a vibratory motion through the medium of stems M, actuated by contact of a knocker or ratchet on one side of the pulley *m* on the main shaft S. The pulley *m* is connected by a belt, *m*<sup>1</sup>, with a larger pulley, *m*<sup>2</sup>, on a counter-shaft, H, which carries two pairs of opposite eccentrics *h h'* *h h'*, as shown in Fig. 5, connected with the respective pairs of screens by rods K K', one eccentric, *h*, of each pair being connected by the rods K to the upper pair of screens, B C, and the other eccentrics, *h'* *h'*, by rods K', to the lower screens, D E. The straps of rods K and K' are provided with oilers *k*, as shown in Fig. 6.

F F represent different parts of an iron frame and bearings to support the burrs and driving shaft or spindle S. *s* is a temper-screw, employed for adjusting the stones, and is secured by a jam-nut, N, in customary manner.

V is a pulley on the main shaft, connecting, by a belt, V<sup>1</sup>, to a pulley, V<sup>2</sup>, of an elevator, V<sup>3</sup>, employed to return the tailings to the burrs to be reground.

At the lower ends of the screens B C D E are conducting-tubes B<sup>1</sup> C<sup>1</sup> D<sup>1</sup> E<sup>1</sup>, the first two and the last one of which are branched, as shown in Fig. 1 and on a larger scale in Fig. 7. The tubes are suspended by screw-hangers R R, as shown in Fig. 8, to admit of accurately regulating the distance of their receiving-mouths from the screens. Each of the tubes is provided with an air-damper, X, to further regulate the force and effect of the suction. The lower ends of the tubes may be made with one, two, or three mouths, as preferred.

A pulley, O, on the main shaft connects, by belt O<sup>1</sup>, with a small pulley, o', on the shaft O<sup>2</sup> of the fans B<sup>3</sup> and C<sup>3</sup>. The suction-tube

B<sup>1</sup> discharges into a separate chest, B<sup>2</sup>, connected with the fan B<sup>3</sup>. The suction-tubes C<sup>1</sup> D<sup>1</sup> E<sup>1</sup> discharge into a common chest, C<sup>2</sup>, connected with the fan C<sup>3</sup>. The offal or bran drawn up through the tube B<sup>1</sup> consists of coarse hulls only. That taken up by the successive tubes C<sup>1</sup> D<sup>1</sup> E<sup>1</sup> is light shucks of different sizes and parts of the inside bran which the flour is incased in.

Nothing is subjected to the air-suction until it is first graded by the screens, and while on the lower end of each screen each grade passes under a blast, or through the blast, as the air is drawn up through the screen and carries up the offal with it. The vibration of the screens to move the grain down over them throws all the light bran up from the screen or on top of the grain where the blast is strongest.

Each screen grades out a different size of meats, and each grade of meats is subjected to a different strength of blast to purify it. The meats which are coarse enough to pass over the screen B, and sufficiently heavy to resist the action of the suction-tube B<sup>1</sup>, are conducted, by a spout, R', to the elevator V<sup>3</sup>, which raises them to a point from which they slide down a spout, L, to the most convenient pair of burrs to be reground, passing into the burrs with the fresh grain.

The meats which pass through the screen B and over the screen C are purified by the draft of suction-tube C<sup>1</sup>, and then drop into the spout C<sup>4</sup>, which discharges them at the side of the machine. The next finer grade from the screen D is discharged by the spout D<sup>4</sup> in like manner, and the next finer, passing over the screen E, drop into the spout E<sup>4</sup>.

The flour which passes through the screen E is conducted by the screen-board E<sup>2</sup> to the same spout, E<sup>4</sup>, so that this spout carries two grades of the finest meats, only one of which is subjected to the blast. These appliances will be seen to afford the graded meats passing over the screens one, two, or three chances for purification, according to their fineness, and by the use of separate suction-tubes and separate graduating appliances in each we

subject the coarsest meats to the strongest blast, the finest meats to the lightest blast, and the intermediate meats to a blast of intermediate strength, as each grade passes over the screens and under the suction-tubes, wherever it screens to, with the exception of the last, which, being flour, is carried out below the blast, as before explained, so as to avoid waste.

In some sizes of refiners the spouts C<sup>4</sup>, D<sup>4</sup>, and E<sup>4</sup> deliver the refined grain on one side of the machine and in others on both sides. The meats from all the said spouts come together to be ground and bolted by appliances in common use in the manufacture of flour, their previous separation being for the purpose of subjecting them to purifying blasts, graduated in strength according to their fineness.

Having thus described our invention, the following is what we claim as new and desire to secure by Letters Patent:

1. An apparatus for treating buckwheat, consisting, essentially, of suitable cracking and hulling devices, a vertical series of screens for grading the product, and a series of air spouts or tubes connected with the lower ends of the respective screens, and provided with separate valves or dampers to graduate the force of the current in the said spouts independently, as hereinbefore set forth.

2. The combination of suitable cracking and hulling burrs A A, vibrating screens B C D E, arranged in vertical series and mounted to operate in pairs, air spouts or tubes B<sup>1</sup> C<sup>1</sup> D<sup>1</sup> E<sup>1</sup>, connecting with the lower ends of the screens, an independent discharge for each of the screens, and independent valves or dampers X to regulate the suction of air through said tubes, substantially as and for the purpose set forth.

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