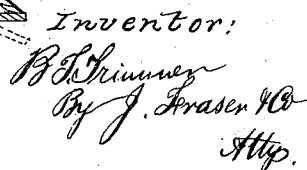


### Grain Cleaner and Separator.

Patented May 29, 1866.



# UNITED STATES PATENT OFFICE.

B. T. TRIMMER, OF ROCHESTER, NEW YORK.

## IMPROVEMENT IN GRAIN CLEANERS AND SEPARATORS.

Specification forming part of Letters Patent No. 55,179, dated May 29, 1866.

*To all whom it may concern:*

Be it known that I, B. T. TRIMMER, of Rochester, in the county of Monroe and State of New York, have invented certain new and useful Improvements in Machines for Cleaning Grain; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, making part of this specification.

Figure 1 is a longitudinal vertical section of my improved machine; Fig. 2, a transverse vertical section; Fig. 3, a horizontal cross-section of the dusting-cylinder; Fig. 4, a plan of the bottom plate of the dusting-cylinder; Fig. 5, a horizontal cross-section of the beater; Fig. 6, a view of the cam arrangement for operating the shoe.

Like letters of reference indicate corresponding parts in all the figures.

My improved machine is intended for separating, dusting, and scouring grain.

As represented in the drawings, A is a frame of suitable form for mounting the parts. In the upper end of this is a chamber, B, in which is situated an exhaust-fan, C, secured to a spindle, D, that passes centrally from top to bottom of the machine and rests in suitable bridge-trees *a a*, and is driven by a pulley and band either at the upper or lower end.

An induction air-opening, *b*, is made centrally in the top of the air-chamber, over which rests the mouth *c* of a trunk, E, substantially of the form shown most clearly in Fig. 1. The trunk has at a suitable position at the top a spout, F, resting over the shoe, (presently to be described,) and the continuation of this spout backward horizontally forms a draft-passage, *d*, having a valve, *f*, for closing its mouth at the extremity. At a suitable position the spout has a hopper, *e*, opening into it, which serves to receive the grain preparatory to its passing through the machine.

Beneath the draft-passage *d* is another similar passage, *g*, passing in an oblique direction downward and opening into the mouth *c* of the trunk over the fan-chamber; and further down in the opposite oblique direction is another passage, *h*, and still further a vertical passage, *i*, which forms the bottom of the trunk. The position of the passages are substantially as represented in Fig. 1, a turn or deflection being given at the points *k* and *l*, and the whole

uniting at the top in the single eduction-passage *g*.

Pockets *m* and *n* are provided in the positions shown in Fig. 1, having valves at the bottom, and a slide, *o*, is also provided at the point *k*, for cutting off or regulating the connection between the passages *h i*.

Beneath the fan-chamber, and inclosed by the casing J J, is a perforated chamber, G, in which revolves a beater, presently to be described. The top of this chamber has an induction-opening, *p*, at a suitable position to admit the grain, and its bottom has an eduction-spout, *q*, opening into the vertical draft-passage *i* near its lower end, by which the cleaned grain escapes.

Directly beneath the spout F is situated a shoe, H, of any ordinary or desirable form, provided with a screen or screens, *r*, and receiving a slight shaking motion by any desirable means, that represented being a strap, *s*, Fig. 6, connecting it with an eccentric or cam, *t*, secured to the spindle D. The lower or escape end of the shoe rests over a spout, *u*, Fig. 1, which opens into the induction-opening *p* in the top of the beater-chamber.

By this arrangement it will be perceived that the grain, in passing through the machine, will be subject to great action and cannot fail to be thoroughly cleaned. Being fed gradually into the hopper *e*, the great mass falls upon the shoe H, whose screens remove all coarse refuse, such as sticks, stones, &c. From the shoe it passes into the spout *u* and into the beater-chamber, where it is subject to great action, and such dust as it contains and is beaten from it is drawn upward through the opening *j*, both from the inside and outside of the beater-chamber, which are thus kept from clogging. On being thoroughly beaten the grain is driven outward by the centrifugal action of the beater through the spout *q*, where still another draft passes through it up the passage *i*. At the same time that this effect is produced much of the refuse, with some grain, will be drawn up the passage *d* at the moment the mass falls from the hopper onto the shoe. This refuse turns inward at *l* and escapes, with that which comes upward from the passage *h*, through the common passage *g* into the fan-chamber, whence the whole is expelled through the discharge *v*. The meeting of the two cur-

rents of air from *d* and *h* at *g* deadens the intensity of the draft at that point and allows the air to enter the fan-chamber in comparative quiet, so as to be more equally expelled and not overbalance that which comes up through *j* in the opposite direction.

The intensity of the draft is frequently very great to thoroughly clean very dirty grain, and in such case many of the lighter kernels are drawn over into the air-passages. In making the irregular turns at *k* and *l* it will be seen that the weight of the grain will cause the same to fall into the pockets *m* and *n*, while the lightness of the dust will allow it to be drawn into the fan-chamber. In this respect the irregularity of the air-passages will also assist in separating the grain.

I am aware that many arrangements are in use in which blast or draft passages are employed and in which pockets are also used to catch the blighted grains and grass-seed. I claim only my particular arrangement of the same, which I believe to be new.

The mass of grain, in passing from the beater-chamber outward through the spout *q*, strikes against the wall *w* of the passage *i*, thence to the floor *x*, and then passes into the escape-passage. The grain in this manner rebounds over the whole of the passage through which it falls, and thus is thoroughly distributed, so that the current of air acts with much better effect than would otherwise be the case. If the body of grain fell into the passage in a mass, it could not be thoroughly cleaned.

The method above described of giving the grain a circuitous route and subjecting it to a number of currents of air is of great benefit in thoroughly cleaning it. It will be seen that this is all accomplished simply by a shoe and a single fan.

The beater-chamber and beater are of peculiar construction. The heads *I I'* of the former are preferably made of cast-iron, of circular shape, and secured in place in any desirable manner. The form is shown most clearly in Fig. 4, which is a plan of the lower head. It is provided at the periphery with a groove, *a'*, which extends all the way round, except at the front, at *b'*, and rear, at *c'*, where open space is left sufficient, respectively, to insert any one of the sections of the cylinder (presently to be described) and to allow the grain to pass off at the trough *q*. In the top head this groove extends all the way around. In these grooves slide sections 1, 2, 3, &c., of the cylinder *K*. These sections correspond in width with that of the space *b'* of the bottom head. In order to introduce them to form the cylinder it is only necessary to insert the upper end in the upper groove in front, then push the lower end into the space *b'*, and then slide the section around in the groove to its proper place.

The advantage of this arrangement is that the cylinder, or any portion of it, can be easily repaired or replaced without removing the outer casing, *J J*, of the frame, and without

taking the machine apart, as would be the case if the cylinder were made entire, or if the sections could not be slid out of the grooves. It will be seen that I can reach in and slide the sections around to the front, when they readily come out. This is of very great advantage.

The sections may be made either of cast or sheet metal, and any desirable number may be employed. They are preferably provided with elongated perforations or openings *d' d' d'*, as shown most clearly in Fig. 3, through which the dust and finer seeds pass in the act of beating.

The beater consists simply of two disks, *M M*, secured fast to the spindle at suitable distance apart, and connected by angular wings *f' f' f'*. The disks are formed at their periphery into points or stars, having sides *g' h'* standing in opposite angles. The wings are secured to these sides in any desirable way.

The advantage of this arrangement is, that the wings can either all be set in one angle, as in black lines Fig. 5, or all in the other, as in red lines, or a portion may be set in one angle and a portion in the other. When set as in black lines they throw the grain outward, so that it escapes very readily through the spout *q*. When set as in red lines the tendency is to counterbalance the centrifugal action and retain the grain longer; and when set alternately the result is a variety of agitation, as the grain is indiscriminately thrown both outward and inward. This construction is very cheap and simple, as the disks can be cast.

Below the lower head is situated a spout or spouts, *N*, the object of which is to catch the refuse and seeds outside of the beater-chamber that are too heavy to be drawn up by the draft.

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

1. The special construction and arrangement of the machine, consisting, essentially, of the draft-passages *d g h i* of the trunk *E*, fan *C*, shoe *H*, beater-chamber *G*, and beater *M f*, arranged and operating substantially as and for the purpose herein set forth.

2. The combination and arrangement of the passages *d g h i*, uniting in a common discharge, having the turns or deflections *k l* and the pockets *m n*, the whole forming a trunk that is connected with the top and bottom of the machine in such a manner as to form a circuit through, substantially as described.

3. Exhausting both the inside and outside of the beater-cylinder by the single fan *C* operating above, the whole arranged substantially as herein specified.

4. Distributing the grain falling into the passage *i* from the trough *g* by the wall *w* and floor *x*, the whole arranged and combined as described.

5. Making the beater-cylinder in sections 1, 2, 3, &c., and using the same in combination with the grooves *a a'* and space *b'* of the heads *I I'*, so that said sections may be applied or

removed without removing the outer casing of the frame, substantially as specified.

6. Forming the disks M M of the beater with the star-points, having opposite sides  $g'$   $h'$  for attaching the wings  $f' f'$  in opposite angles, substantially as described.

In witness whereof I have hereunto signed

my name in the presence of two subscribing witnesses.

B. T. TRIMMER.

Witnesses:

R. F. OSGOOD,

J. A. DAVIS.