L. O. STEVENS.

GRAIN GRADERS AND SCOURERS.

No. 183,339. Patented Oct. 17, 1876.

Fig. 1.

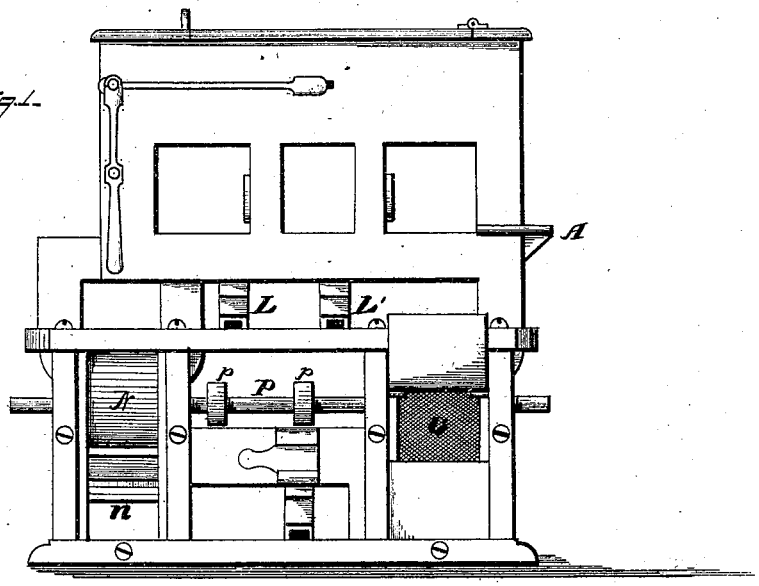
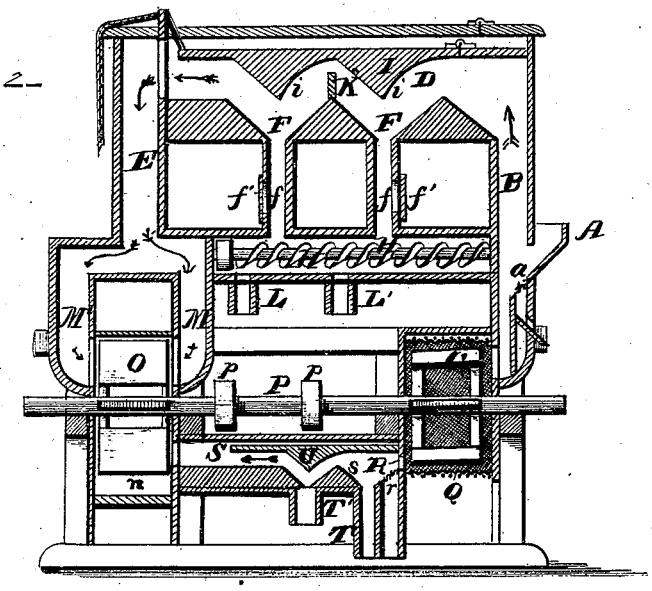


Fig. 2.



WITNESSES
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UNITED STATES PATENT OFFICE.

LUCIOUS O. STEVENS, OF BURLINGTON, IOWA, ASSIGNOR OF ONE-HALF HIS RIGHT TO RICHARD B. COMBS, OF SAME PLACE.

IMPROVEMENT IN GRAIN GRADERS AND SCOURERS.

Specification forming part of Letters Patent No. **183,339**, dated October 17, 1876; application filed June 17, 1876.

To all whom it may concern:

Be it known that I, LUCIOUS O. STEVENS, of Burlington, in the county of Des Moines and State of Iowa, have invented certain new and useful Improvements in Grain-Grader; and I do hereby declare that the following is a full, clear, and exact description thereof, which 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 letters of reference marked thereon, which form a part of this specification.

My invention relates to grain-graders, having as its object a machine which can be used not only for the ordinary mill purposes of grader, cleaner, and smutter combined, but may also answer the usual and more restricted requirements of a grader and cleaner alone in elevator purposes by disregarding the scourer.

My invention consists in the parts and combination of parts, as hereinafter described and claimed.

Referring to the drawings, Figure 1 is a side elevation, and Fig. 2 a longitudinal vertical sectional view, in which—

A is the feed-pipe at the receiving end of the machine, which passes at an inclined angle into same, and is provided with a perforated sand-screen, *a*, continuing said inclined plane, through which the earthy parts may the more easily find discharge. This feed-pipe leads into the receiving-spout B, the latter extending from the scourer C at the lower and angular portion of the machine up past the feed-pipe A into the grading-chamber D. This chamber is at right angles to such receiving-spout B, and is continued the length of the machine, finally connecting fully with the air-suction chamber E at its opposite extremity. Intermediate such connection, however, this grading-chamber is provided with one or more hoppers, F, said hoppers constructed with inclines at right angles to the vertical adjoining and incasing sides of the chamber, and having discharge-exits *f*, of parallelogram dimensions, which latter carry the grain to the conveyer H. Hinged to the interior, or otherwise suitably geared so as to vertically change its angle of inclination, swings the deflector I from the upper extremity of the grade-chamber, having one or more (or in any series) deflecting-plates, *i*, of counterpart construction to the hoppers, and adapted to fit into same in any degree of closeness, or to be freely raised from same, and thus afford respectively, in either instance, a smaller or larger throat-passage to such hoppers. To the apex of either hopper is secured a damper-plate, K, adjustable thereon in a plane parallel to the length of the grade-chamber, and operated by an exterior connecting leverage, so as to be easily worked. The conveyer is a spiral, revolving, as customary, upon a shaft actuated by band-pulley or otherwise, and from its action the grain passes into the discharge-outlets L L′, whence it is gathered by any means.

It will be observed that the discharges *f* of the hoppers have side vents *f′* of agreeable proportion, and adapted to catch dust and general débris of the clearing process during the descent of the grain into the conveyer.

The air-suction chamber E, connecting freely at its upper extremity with the grading-chamber, passes down along the end of the machine, and branches midway into two subdivisions, M M′, which latter respectively connect with the suction-fan chamber N. This chamber N has an outlet, *n*, at its lateral base, corresponding to outward revolution of the fan O, which latter is journaled on the lower horizontal shaft P, passing through the length of the machine, and actuated by band-pulleys *p p*. The opposite extremity of this actuating-shaft P sets in motion the scourer C, to which same is axled. This scourer has as its drum construction a metallic mesh, Q, or webbing, instead of being solid or with rods across same, whereby the dust is gotten rid of at an early stage of the proceedings.

Suitably connecting with the interior lateral base of the scourer is the spout R, provided with inclined sand-screen, *r*, and emptying into the lower air-chamber S. This latter chamber is provided with base-deflectors *s* and final discharge-ports T T′, which, acting in conjunction with the upper or top deflecting-plate U, separates the grain from the

chaff. The passage beyond this deflector or guard U is unobstructed into the outlet *n* before mentioned, acted upon by the suction-fan.

The operation of the foregoing-described mechanism is as follows: The machine being in blast, the grain is fed into the feed-pipe A, and thence delivered into the receiving-chamber B, where it is divided, part ascending into the grade-chamber, and the remaining heavy portion is passed down into the scourer, where same is acted upon, and from thence delivered into the lower air-chamber.

The sand-screen *a*, situated on an inclined plane in the feed-spout A, serves, by its angular location and dip, to more fully and easily clean the grain from the various impurities incident to same in its mill-delivering condition, and is thus more effective than if the screen were not thus inclined, but on a level plane.

The lower dust-screen *r* also frees the grain from disagreeable impurities as same comes from the scourer, thus delivering the clean grain only into the lower air-chamber S. Here the sound grain passes out through the discharge-port T, and, as a current of air passes up into this chamber through this discharge, the lighter portions of the scoured grain are carried up over the base-deflector *s*, and cast down by the upper guard-deflector U, whereby the grain in full is discharged at T′, while the chaff is passed on into the suction-fan outlet and finally dismissed.

But, as the former-mentioned lighter portion of the fed grain is received from the feed-pipe A in the receiving-chamber B, and, separating from the heavier portion, which latter passes into the scourer, the said lighter portion passes over into the grade-chamber D, and is there acted upon by the adjustable deflector, which prevents the grain from being carried over directly into the air-suction chamber. The peculiar and corresponding outlines of the deflector, adjustable in the throat of the hopper, controls the rapidity of the passing grain, and causes the various qualities to pass into the respective hoppers, and from thence into the conveying-chamber, where same is operated upon by the conveyer, and thence discharged. The damper-plate before alluded to in great measure regulates the proportion of the air-passage way leading from the grading-chamber into the air-suction chamber, and thus causes same to be subject to the will of the operator on the exterior, and controlled by suitable connecting mechanism.

It is evident that such a process insures a thorough cleaning and grading mill process, and brings about a result correspondingly good.

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

1. The adjustable deflecting-plate having two or more deflectors constructed with inclined sides and enlarged base-connections, substantially as and for the purpose described.

2. The combination, with the adjustable blast-damper, of the vertically-adjustable deflectors, same constructed with angularly-inclined sides, substantially as and for the purpose described.

3. The combination, with the upper blast-chamber, provided with adjustable deflectors, and the conveyer-chamber, of intermediate vertical spouts, constructed with lateral dust-passages, substantially as and for the purpose described.

4. The combination, with the adjustable deflector and damper, located between the plates of said deflector, of the discharge-spouts *f* situated within the air-chamber, substantially as and for the purpose described.

In testimony that I claim the foregoing as my own I affix my signature in presence of two witnesses.

LUCIOUS O. STEVENS.

Witnesses:

RICHARD B. COMBS,

ABRAHAM H. NICHOLS.