3 Sheets—Sheet 1.

S. STONE.

Grain-Separators.

No. 205,150. Patented June 18, 1878.

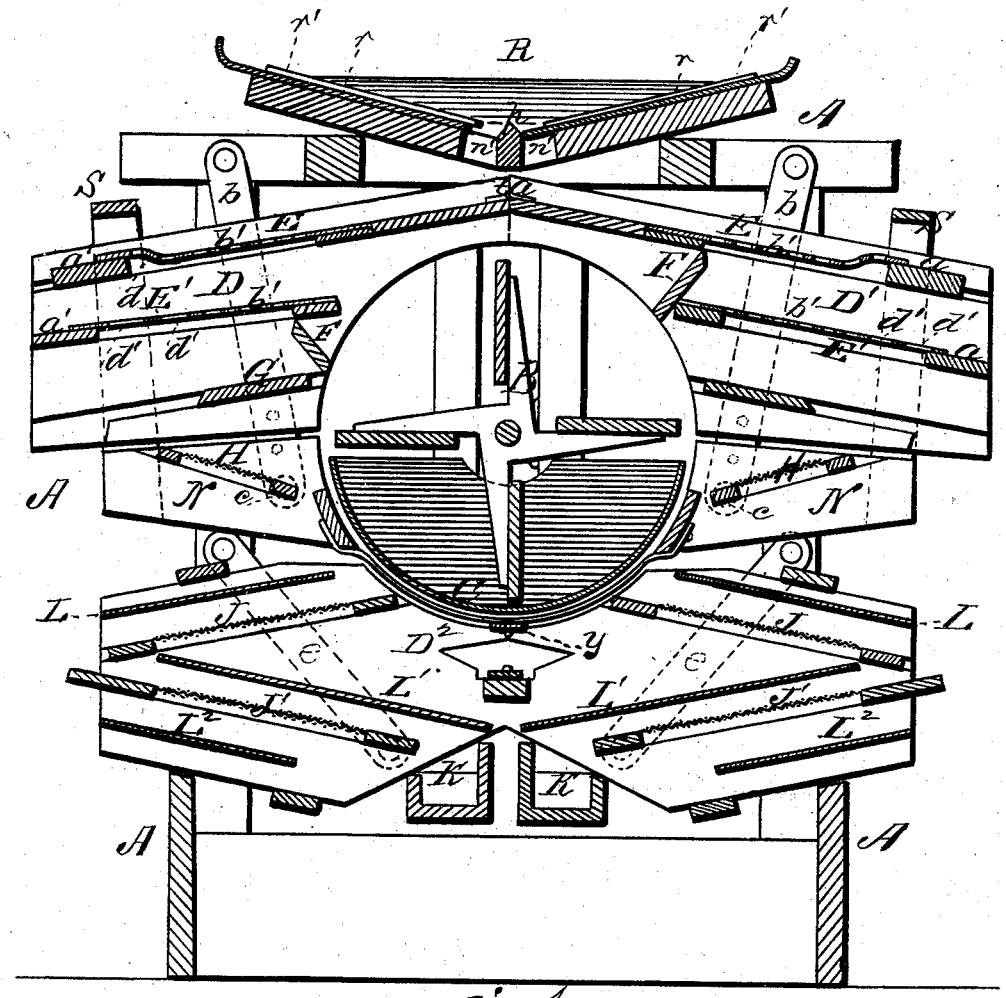

Fig. 1.

WITNESSES.
E. A. Bates
F. J. Masi,

INVENTOR
Sargeant Stone,
by E. W. Anderson
ATTORNEY

3 Sheets—Sheet 2.

S. STONE.

Grain-Separators.

No. 205,150. **Patented June 18, 1878.**

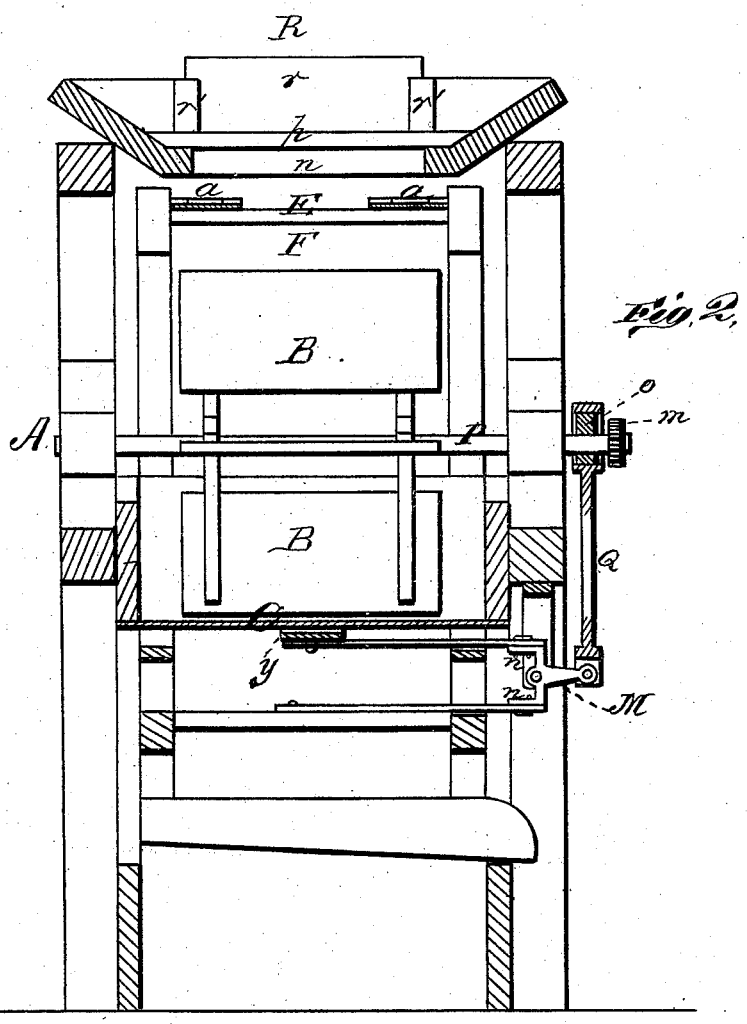

Fig. 2.

WITNESSES
E. H. Bates
F. J. Masi

INVENTOR
Sargeant Stone,
by Ell. Anderson
ATTORNEY

3 Sheets—Sheet 3.

S. STONE.

Grain-Separators.

No. 205,150. Patented June 18, 1878.

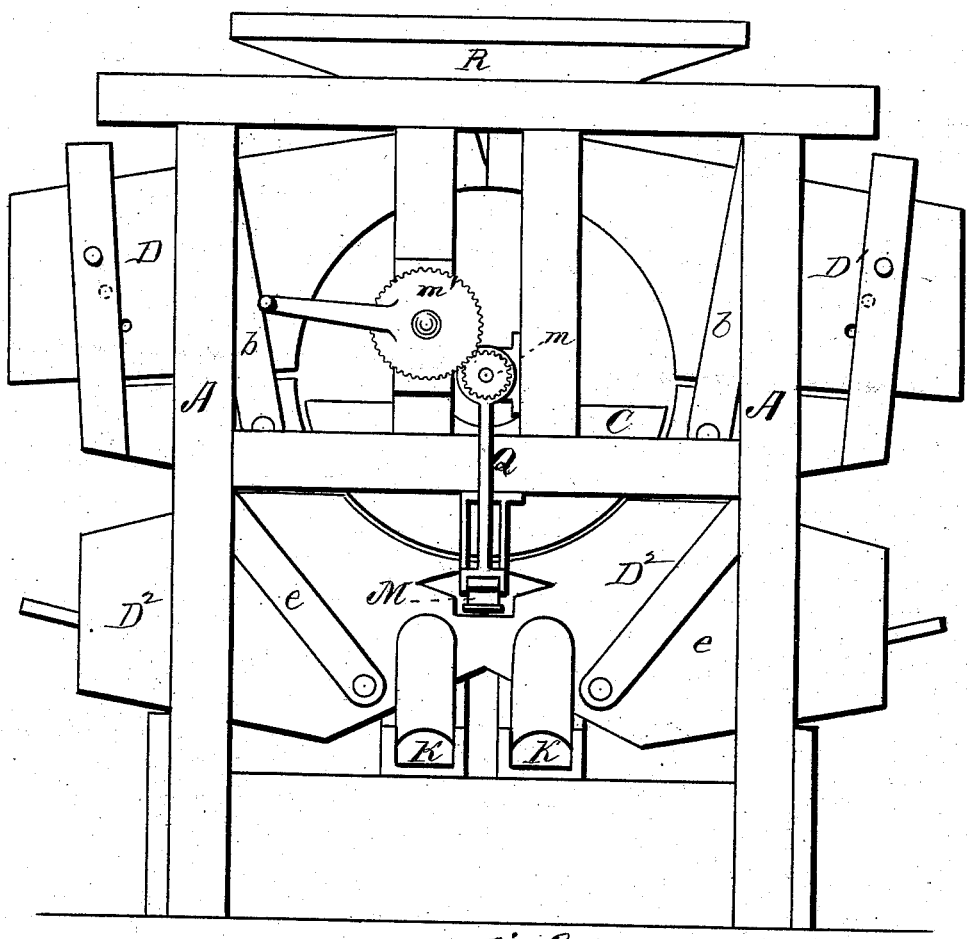

Fig. 3.

WITNESSES
E. H. Bates
F. J. Masi.

INVENTOR
Sargeant Stone
by E. W. Anderson
ATTORNEY

UNITED STATES PATENT OFFICE.

SARGEANT STONE, OF FARIBAULT, MINN., ASSIGNOR OF ONE-HALF HIS RIGHT TO ORIN H. AMY AND CHAS. W. ANDREWS, OF SAME PLACE.

IMPROVEMENT IN GRAIN-SEPARATORS.

Specification forming part of Letters Patent No. **205,150**, dated June 18, 1878; application filed February 23, 1878.

To all whom it may concern:

Be it known that I, SARGEANT STONE, of Faribault, in the State of Minnesota, have invented a new and valuable Improvement in Double Fanning-Mills; 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, making a part of this specification, and to the letters and figures of reference marked thereon.

Figure 1 of the drawings is a representation of a central vertical longitudinal section of this invention. Fig. 2 is a vertical cross-section of the same. Fig. 3 is a side view, showing the operating mechanism.

This invention has relation to improvements in fanning-mills for cleaning grain.

The nature of the invention consists in combining, with a centrally-arranged internal fan-wheel blowing in opposite directions, the independently-adjustable vibrating screen-shoes, hinged together over the fan and arranged on opposite sides thereof, to receive the double blast.

It also consists in the combination, with a centrally-arranged fan, of two vibrating shoes, hinged together and provided with independently arranged and adjusted deflectors and screens, substantially as specified.

It also consists in combining, with two rigidly-coupled screen-shoes suspended from the fan-frame and two flexibly-coupled shoes resting thereon, a raised bridge upon each of the rigidly-coupled sections straddling the flexible sections, and an adjusting-pin extending through the posts of said bridge into one of a series of perforations in the said shoes.

It also consists in a double fan-mill, consisting of a central internal fan and concave independently-adjustable screen-shoes bridging the fan and receiving opposite blasts therefrom, the vibrating screen-shoes supporting the adjustable shoes, and connected by a rigid coupling under the fan-case, the lower double shoe under the fan carrying the discharge-chutes, said shoe being suspended from the frame by hangers and vibrated transversely in the direction of the axis of the fan-shaft by a lever mechanism connected to the coupling aforesaid and to the middle of the double shoe, as will be fully explained hereinafter.

In the annexed drawings, the letter A designates the frame of my improved grain-fan, having journaled therein, at the middle of its length, a fan, B, of the usual construction, the lower half of which is inclosed within a semi-cylindrical casing, C. D D^1 represent the upper shoes, arranged one at each side of the fan B, in inclined positions, and connected together at their adjoining ends by the hinges *a*. These shoes are supported by the shoes N, which are connected together by means of a rigid coupling, *y*, extending under the fan-case, and are suspended from the frame by the pivoted hangers *b*.

In the shoes D D^1 there are two spaced sieves, E E′. These are composed each of a frame, *a′*, and of a perforated sheet-metal plate, *b′*, the perforations being of polygonal form, and are passed into grooves in the inner faces of the shoe-walls.

The upper sieve-frame has at its outer end a raised swell, *c′*, which is carried along its sides, as shown at *d*, a certain distance. The sieves, being nailed or otherwise secured to the swell and its lateral prolongations, are made slightly concave transversely, as shown in Fig. 1, the effect of which is to catch the grain, which otherwise would escape at the lower end of the sieve.

The sieve E′ also consists of a frame and of a perforated plate, the perforations at the outer edge being of large size, as shown at *d′*, Fig. 1, for the purpose of separating the coarser grains from the chaff. At the inner ends of the sieves E E′, in rear of the fan, is a deflector-plate, F, arranged in an inclined position between them, so that when the blast is in use the air-current is directed under the lower one. The action of the fan being to direct the blast outward both ways, the cleaning effect of the separator is doubled. Below the screen E′ is an inclined board, G, which directs the grain outward, so that it falls upon an inclined screen, H, of the coupled shoes N, and is again carried inward under the casing C of the fan.

Between the screen E′ and the board G on the front side of said fan is a deflector-plate,

F′, that directs the blast over the screen E′ aforesaid in the space between it and the top screen E. Beneath the shoes D D^1 is a third shoe, D^2, extending from end to end of the frame, and suspended therefrom by means of the hangers *e*. This shoe is entirely independent of the upper shoes, and is provided at each side of the casing of the fan with the screens J J′, the first of which extends downward from the casing aforesaid to the outer edge of the frame, and the latter from the edge of the frame, each to an independent inclined spout, K, at the lower portion of the frame. Above the screens J J′, and under the screen J′, are arranged the boards, lettered, respectively, L L^1 L^2, parallel to the screens, above and below which they are placed.

The screen L extends from the front edge of the shoe D^2 nearly as far back as the screen J, and the screen L^1 from the same point backward beyond the contiguous spout K. The grain, upon falling from the screens H, is received upon the screens J, escaping through the meshes of which, it drops upon the screens J^1, and is directed to the spouts K. The principal portion of the cockle and other light impurities not carried off by the blast falls directly upon the board L, which carries them out of the machine, the remaining portion falling through the screens upon the boards L^1 L^2, and being delivered upon the ground in the space between and at each side of the said spouts K thereby.

The shoes D, D^1, and D^2 are agitated simultaneously and in opposite directions, as follows: A furcated lever, M, fulcrumed on the frame, and having its branches *n* secured the one to the coupling *y* of the shoes N and the other to the middle portion of the lower shoe, is given a vibrating movement from an eccentric, *o*, on the fan-shaft P by means of a pitman, Q. The fan-shaft is provided with a gear-wheel, *m*, with which a master-wheel, *m′*, operated by suitable mechanisms, engages; or, instead of the gear *m*, I may use a pulley to actuate the fan.

The hopper R is of the usual form, but is provided with a raised angular partition, *p*, dividing the aperture in its bottom into two independent openings, *n′*, closed by independent doors *r*, sliding in ways *r′* in the hopper sides. The openings *n′* are directly over the inclined sieves E E, and the grain is discharged therefrom at each side of the ridge *t*. By closing one of the slides *r*, one side of the machine may be used to the exclusion of the other.

The shoes D D^1 are adjusted to lessen or increase the inclination of the screens E E′, as follows: The shoes N are each provided near their outer ends with a raised bridge, S, through and under which the shoes D D^1 respectively project. These upper shoes, being hinged together at their contiguous ends and being independent of the lower shoes N, may be adjusted to give a desired inclination to the sieves E E′, and the adjustment maintained when obtained by passing a pin through the bridge into the sides of the said upper shoes D D^1, as shown at *x*, Fig. 3, a number of spaced perforations, arranged in an arc of a circle with the hinge *a* as a center, being made in the said sides for the purpose.

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

1. In a fanning-mill, the combination, with a centrally-arranged internal fan-wheel blowing in opposite directions, of the independently-adjustable vibrating screen-shoes, hinged together over the fan and arranged on opposite sides of the same, to receive the double blast, substantially as specified.

2. The combination, with a centrally-arranged fan, of two vibrating shoes, hinged together and provided with independently arranged and adjusted deflectors and screens, substantially as specified.

3. The combination, with the rigidly-coupled shoes N suspended from the fan-frame, and the flexibly-coupled shoes D D^1 supported thereby, of the bridges S, rigidly secured to the shoes N and straddling the shoes D D^1, and the adjusting-pins *x*, and the perforations in the said shoes D D^1, substantially as specified.

4. The double fanning-mill, consisting of the central fan B and concave C, the independently-adjustable screen-shoes D D^1, bridging the fan and receiving blasts therefrom in opposite directions, the screen-shoes N, supporting the sections D D^1, suspended from the fan-frame and connected by a coupling, *y*, under the concave, and the lower double shoe D^2, extending under the fan, as set forth.

5. The combination, with the hinged independently-adjusted shoes D D^1, the suspended shoe-sections N below and supporting the same, the lower double shoe D^2, an intermediate fan and case, and the rigid coupling *y*, extending under the fan and connecting the sections N of the forked vertically-vibrating lever M, connected at its lower end to shoe D and at its upper end to the coupling *y*, substantially as specified.

In testimony that I claim the above I have hereunto subscribed my name in the presence of two witnesses.

SARGEANT STONE.

Witnesses:
E. F. BEAUMONT,
S. W. CLARK.