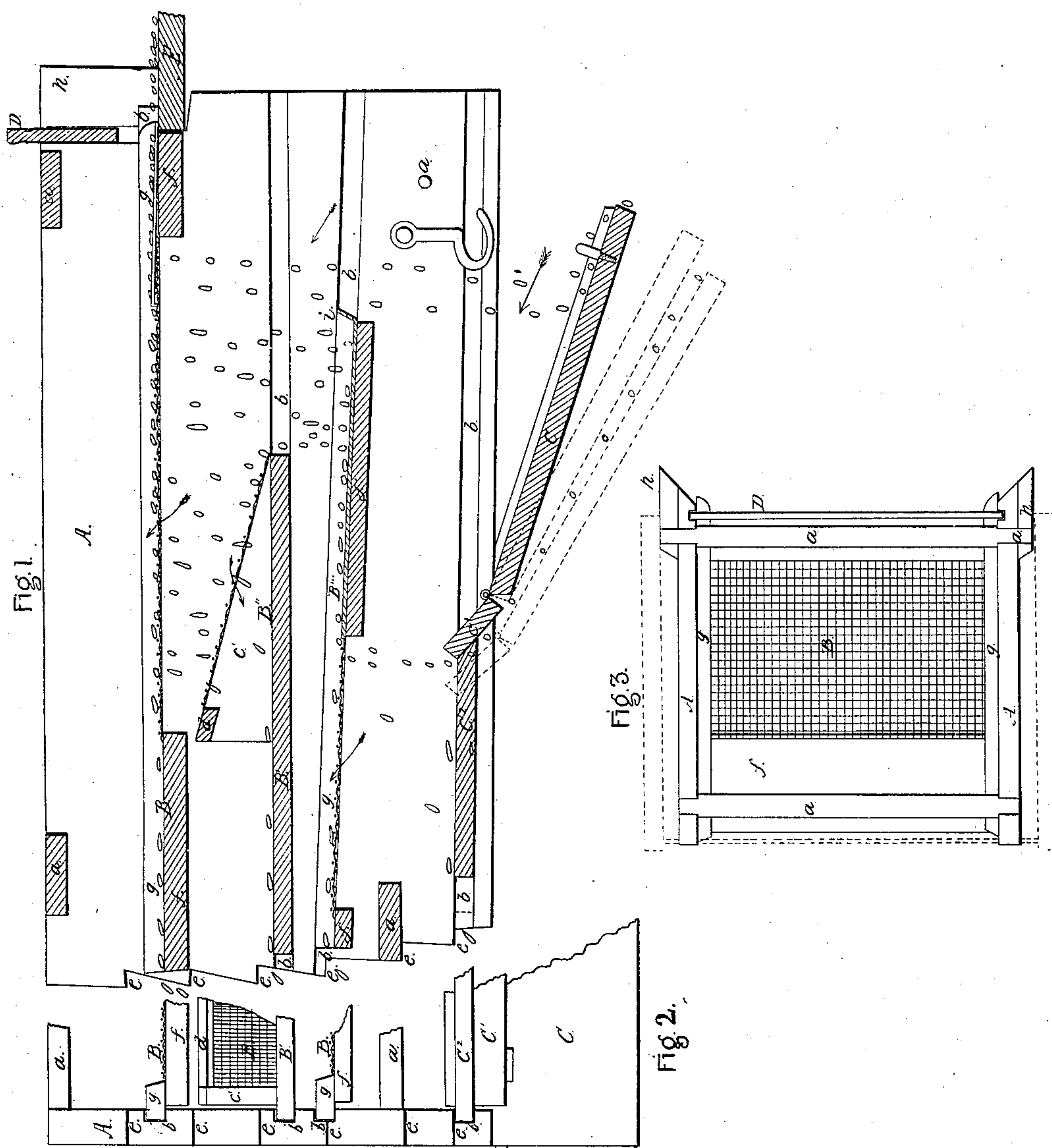


No. 40,995.

PATENTED DEC. 22, 1863.

J. F. & H. D. CUMMINGS.
GRAIN SEPARATOR.



Witnesses:

R. D. Smith
Wm. Jordan

Inventors:

J. F. & H. D. Cummings

UNITED STATES PATENT OFFICE.

JOHN F. CUMMINGS AND HENRY D. CUMMINGS, OF FREMONT, NEW YORK.

IMPROVEMENT IN GRAIN-SEPARATORS.

Specification forming part of Letters Patent No. 40,995, dated December 22, 1863.

To all whom it may concern:

Be it known that we, JOHN F. CUMMINGS and HENRY D. CUMMINGS, of Fremont, Steuben county, New York, have invented a new and improved mode of separating oats, chess, and cockle from wheat, also for separating oats from barley and buckwheat from oats; and we do hereby declare that the following is a full and exact description of such invention, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

The nature of our invention consists in providing an ordinary fanning-mill with a new arrangement—screens and other parts—for the more perfect separation of different kinds of grain.

That others skilled in the art may be enabled to understand and make our invention, we will particularly describe its operation and construction, referring to the accompanying drawings, in which—

Figure 1 is a vertical longitudinal section of the shoe. Fig. 2 is a rear end view of that part of the shoe shown in Fig. 1. Fig. 3 is a plan view of the shoe.

The shoe is constructed of any suitable material or dimensions. It consists of two side-boards, A A, connected by cross pieces or slats *a a*, and provided with grooves *b b*, in which the sieves B B' and wind-forcer C move. It is also provided with vertical grooves, in which the gate D is placed. The front end of the shoe is provided with a notch, in which the edge of the chute-board E of the fanning-mill is placed, by means of which that end of the shoe is supported and maintained in position. The rear end of the shoe is provided with a series of notches, *e*, one pair of which resting upon the cross-piece of the outer shoe, the sides of which are shown by the red lines in Fig. 3, support that end of the shoe A, and also give the required inclination to the sieves.

We construct our sieves by lapping the ends of the frame "cob-house fashion," as shown in Figs. 1 and 2, *f f* being the end pieces and *g g* the side strips. The end pieces may be long enough to rest in the grooves, or the side strips may project, as shown in Fig. 2, and run in the grooves. The advantages of this mode of construction are, first, ease, cheapness, and facility of manufacture, there being

no mortises, tenons, or scarfing; and, second, the side strips being higher than the end pieces, confine the grain to the surface of the sieve, where every kernel feels the action of the blast.

The wind-forcer is composed of a swing-board or flap, C, hinged to the narrow strip C', which is secured rigidly to the board C², which slides in the lower grooves of the shoe. During operation the flap C is let down so that it rests upon the bottom of the outer shoe, and thereby forces all of the blast to pass through or between the sieves. For convenience a hook and eye or other device is attached for the purpose of holding the flap C up in contact with the bottom of A. The blocks *h* are placed upon the outside of A to make the interior shoe fill out and fit the exterior one, as shown by the red lines of Fig. 3, and also to compel all of the grain to pass down over the sieves.

The upper sieve, B, may be constructed in any suitable way, but preferably in the manner heretofore described and shown in Figs. 1 and 2. The second screen is composed of the board B', the triangular sides *c'*, the cross-piece *d*, and the wire-gauze, forming an inclined screen longitudinally adjustable in the grooves, in which B' is placed. The third screen may be constructed in the same manner as the first, except that the front edge, *i*, is raised by having a strip of metal or a thin bar across it for the purpose of preventing any grain which falls upon its surface from bouncing or rolling over that edge. The grooves in which the third sieve slides are not parallel to the grooves of the upper sieve, but are slightly inclined, as shown in Fig. 1. All of the sieves, together with the wind-forcer and the gate D, are capable of adjustment in their respective grooves.

The foregoing description pertains to the construction of a secondary or interior shoe, containing the sieves, to be applied to old mills. When mills are constructed with this arrangement of sieves, they will be placed directly in the main shoe and the interior one dispensed with.

The operation of our invention is as follows: The shoe A is placed in the mill, the front end resting upon the chute-board E, and the rear end upon the cross-piece of the exterior shoe. The blocks *h* fill out to the sides of the exte-

rior shoe and prevent any side motion, while the upper screen, B, being advanced in its groove until it comes in contact with E, and secured at that point by a binding screw or other means, holds the shoe rigidly in place. When the machine is started, the gate D is regulated so as to admit the proper flow of seed upon the sieve. This is accomplished by raising or lowering it in its grooves. The seed, being "banked up" against the upper sides, flows under the gate upon the sieve in an even sheet covering its entire width, and securing a perfectly uniform action of the screen.

The operation of the gate D is of great value, as it is desirable not only to secure a uniform distribution of the seed, but it is also necessary to allow a more rapid flow when there are many oats or other light grain mixed with the wheat than the ordinary hopper and gate will admit. It is found in practice that when the grain is agitated upon the chute it arranges itself according to specific gravities—that is, the heaviest settle to the surface of the chute or sieve and are first passed through the sieve; consequently the grain which passes through the first few rows of meshes is the best and soundest, while that which passes farther down the sieve is the poorer and mixed with other grain. The third sieve is so adjusted as to allow all of this pure grain to fall past it upon the flap C, while all of the mixed is either caught upon its surface or upon the inclined or second sieve. The shoe A is so adjusted by raising or lowering its rear end that all of the wheat will fall through the meshes of the upper sieve and only oats or other impurities passed over the rear end, out of the machine. This mixed grain, which passes through the lower end of the screen, is received upon the inclined surface of the second screen. Here, it will be observed, the action of the blast is reversed, coming upon the top of the screen, which is composed of very long and narrow meshes, (see Fig. 2,) and forcing the light oats and shrunken wheat through

upon the board B', whence it passes out of the machine. All of the grain not passed through the second screen is returned to the front end, i, of the third screen, upon which the operation of the first screen is repeated, the wheat passing through the first meshes and caught upon the inclined side of C', which is adjusted for the purpose, while the oats fall upon the board C², or are passed over the end of the third screen, in either case passing out of the machine.

Having described our invention and its operation, what we claim as our invention is—

1. The frame of the sieve of a fanning-mill, constructed without mortises and tenons or scarfing, but by lapping the joints, substantially as set forth and described.

2. The return screen, (next below the upper one,) so placed that the blast is forced through it from the top, constructed and arranged substantially as described.

3. The wind-forcer composed of the flap C, the cut-off C', to which the flap C is hinged, and the sliding piece C², to which C' is originally attached, substantially as described, and for the purpose set forth.

4. The combination of the first, second, and third screens, B B' B'', when arranged substantially as described, either in the shoe A or in the shoe as originally constructed.

5. The combination of the first, second, and third screens, B B' B'', with the wind-forcer C C' C², when arranged substantially as described, either in the secondary shoe A or in the original shoe, during construction.

6. The combination of the first, second, and third screens, B B' B'', the wind-forcer C C' C², and the gate D, when arranged substantially as described, either in a secondary shoe, A, or in the original shoe, during construction.

JOHN F. CUMMINGS.

HENRY D. CUMMINGS.

Witnesses:

EZEKIEL RICE,
A. T. PARKHILL.