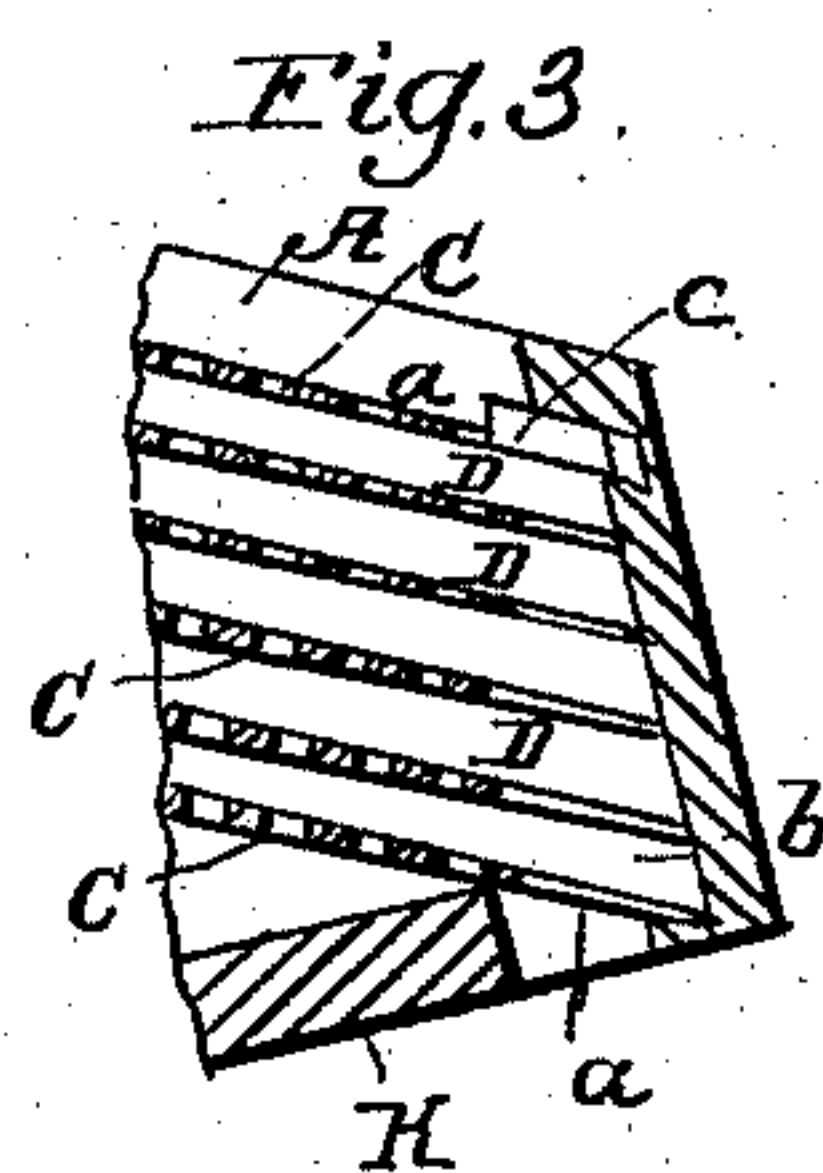
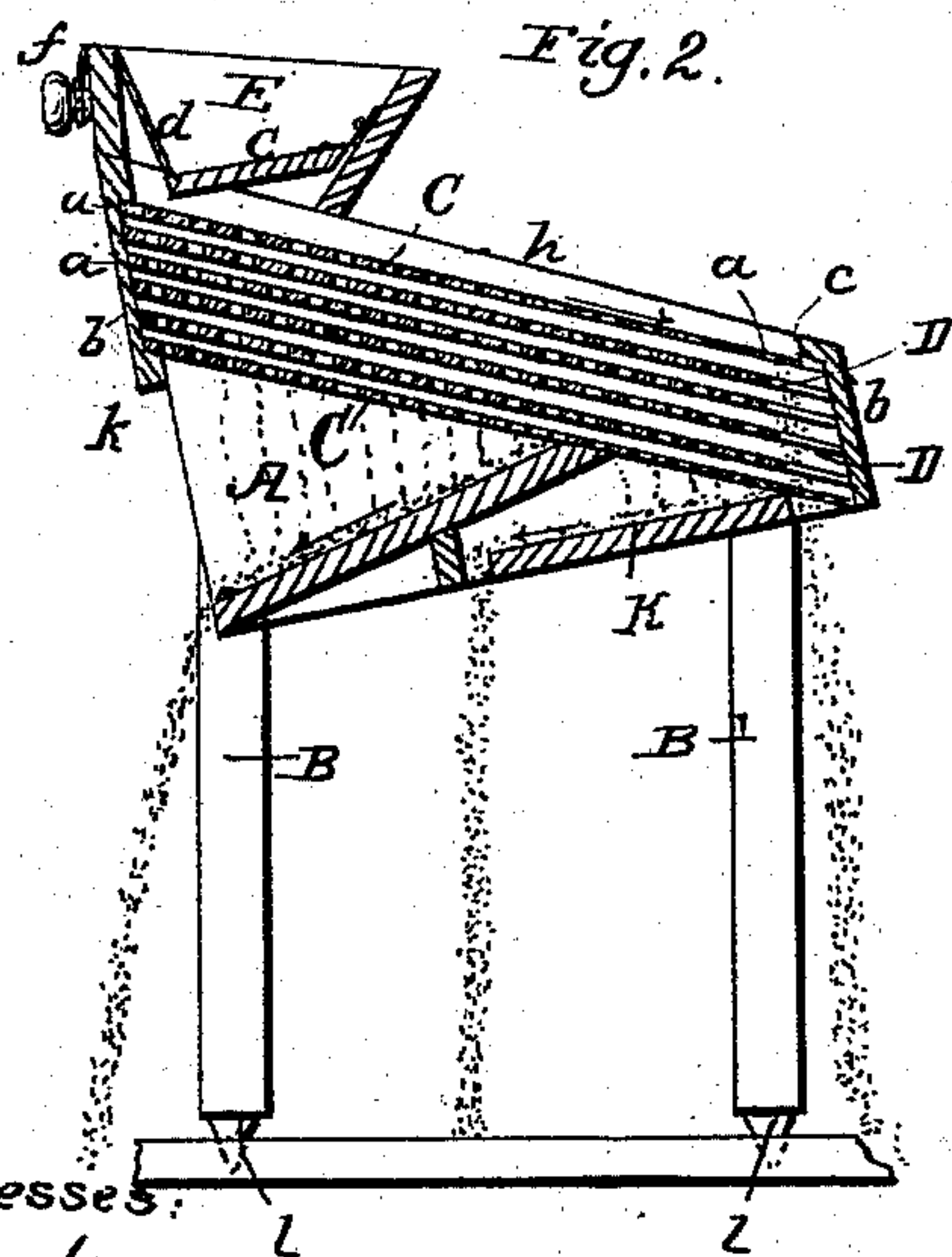
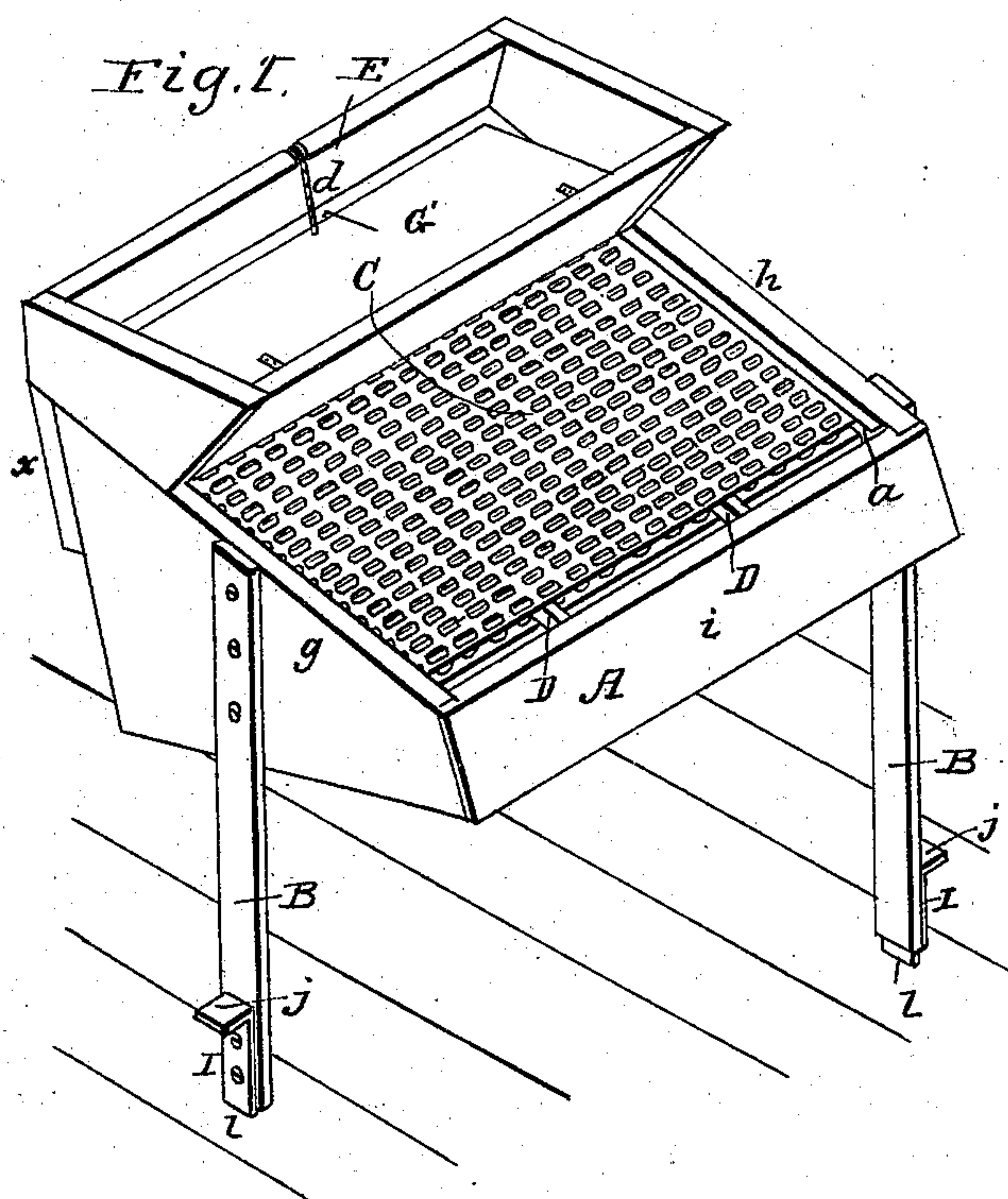


J. L. BOOTH.  
Grain Separator.

No. 36,830.

Patented Nov. 4, 1862.



Witnesses:  
R. H. Ogford  
J. Fraser.

Inventor:  
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# UNITED STATES PATENT OFFICE.

JONATHAN L. BOOTH, OF ROCHESTER, NEW YORK.

## IMPROVEMENT IN GRAIN-SEPARATORS.

Specification forming part of Letters Patent No. 36,830, dated November 4, 1862.

*To all whom it may concern:*

Be it known that I, JONATHAN L. BOOTH, of Rochester, in the county of Monroe and State of New York, have invented certain new and useful Improvements in Grain-Separators; 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 perspective view of my improved grain-separator; Fig. 2, a vertical section of the same; Fig. 3, a fragment in section, representing more particularly the manner of fastening the strips or slats that lock the screens in place.

Like letters designate corresponding parts in all the figures.

My invention is intended more particularly for separating the different kinds of mixed grain after the mass is winnowed—such, for instance, as wheat and oats—to accomplish which, as there is no chaff or foreign matter to remove, a fan is unnecessary.

A frame, A, supported by legs B B, is provided, made square or rectangular in outline, and composed of four sides, *g h i k*, as represented clearly in Fig. 1. The opposite side pieces, *g h*, at the ends of the hopper, and the back piece, *k*, under the hopper, are respectively provided with a set of inclined grooves, *a a a*, corresponding in position in each part of suitable number, and situated at suitable distances apart, in which grooves slide and rest, respectively, the edges of perforated metallic screens C C, (such as are frequently used for separating grain,) covering the whole opening of the frame, except at the discharge-end, which is left open to allow the grain to escape. Any number of these screens that may be found desirable may be employed, six being represented in the drawings. The grooves in the frame for the reception of the screens are merely the kerf of a saw, made sufficiently deep for the purpose. Those in the side pieces allow the screens to slide freely into their proper place, while those in the back piece, *k*, allow the rear edges to rest therein, thus supporting the screens at that part where the greatest strain comes from the weight of the seed from the hopper. This is necessary to prevent sagging or depression of the screens at the rear, in which case the grain will not spread evenly over the surface of the screens,

as is necessary for it to do in order to secure the proper effect, but will be directed down in a mass in the center. By the use of this arrangement the screens are easily inserted or removed, while they do not have to be tacked, nailed, or fastened rigidly to the sides of the frame, as is ordinarily done. The device is also exceedingly cheap, the square skeleton frame alone being employed.

In the shoes of fanning-mills ledges are generally used for supporting the screens and sieves; or, if grooves are employed, they are used only in the two opposite sides, and not in the rear, and they are generally made in separate pieces, secured to the sides of the shoe, which materially increases the cost and complication. To lock the screens still more securely and rigidly in place, and at the same time to firmly brace them against any strain, and to prevent any springing motion, I employ, at suitable positions between the sides of the frame, one or more sets of wooden strips or slats, D D, placed one above another between the screens in a vertical plane, extending from front to rear, and their ends resting, respectively, in grooves or channels *b b* of the front and rear pieces, Figs. 2 and 3, of just sufficient length and width to receive them. Thus arranged, when the whole are in place, I insert a wedge, *c*, in a corresponding hole in the discharge end of the frame, over the extremity of the upper slat, which wedge pressing thereon forces it down, so as to lock the screens firmly in place, and thus keep them in position at all times during the violent motion of the frame, whose action will presently be described. This is essential to keep the screens in place under the hopper, and to insure the proper effect, and also to prevent any springing motion or irregularity of the same; and not only this, but the arrangement serves to support them against any strain, keeps them always in a horizontal plane, so that the grain extends equally over the surface, and gives a rigidity and firmness to the whole that is necessary to the proper working of the device. By withdrawing the wedge and removing the end board any or all of the screens may be easily removed for repairing or otherwise.

In order to hold the upper and lower surface screens in place, they are respectively tacked to the upper and lower strips.

Over the raised or elevated end of the



screens is situated a receptacle or hopper, E, substantially as represented, having at the proper position therein a hinged adjustable diaphragm or lid, G, covering the whole length of the inside of the hopper or receptacle, but leaving a space transversely in the rear for the escape of the grain downward onto the screens. To the diaphragm is fastened the end of a cord or chain, *d*, extending upward over the edge of the hopper, and secured at the opposite end to a shaft or knob, *f*, on which it winds, thus adjusting the diaphragm so as to allow a greater or less flow from the hopper. Under the elevated ends of the screens is situated an inclined board, H, extending inward and upward sufficiently far in relation to the screens to collect and discharge all of the perfectly-cleaned grain that passes through the same unmixed, (which distance varies with the number of screens used, being represented in the drawings as about two-thirds the extent of said screens.) Below this board, discharging about midway of the frame, and extending forward to the discharge ends of the screens, is situated a similar inclined board, K, whose office is to collect and discharge the imperfectly-cleaned grain that passes through all of the screens in a mixed state. The inclination of both these boards is reversely that of the screens, as represented in Fig. 2.

The legs B B, on which the frame is mounted, are preferably situated two on one side and one on the other of the frame; but a larger number may be employed, if necessary. These legs are made as thin and light as is consistent with the requisite strength, in order to give them the greatest degree of spring or elasticity. To the bottom of each is secured a metallic foot, I, the lower end of which is made in a point, *l*, as represented, and the upper end bent into a right-angled tread-piece or flange, as represented at *j*. These metallic feet are for the purpose of fastening into the floor of the barn or other place where the apparatus is to be used.

The advantages of the arrangement above described are obvious. The separator is perfectly portable, and is ready for use at any time and in any place. To arrange it for working, all that is necessary to do is for the operator to apply his weight to the metallic feet I by pressing his foot on the tread-pieces *j j*, thus inserting the points into the floor at any place. The side of the frame is then grasped by the hands and vibrated forth and back, the elasticity of the legs allowing sufficient motion to accomplish the purpose de-

signed, and the action being easy, regular, and effective, and accomplished by easy labor. The arrangement is very simple and cheap. In addition to the frame itself receiving the motion necessary to screen and separate the grain, the receptacle or hopper, being applied directly thereto, receives the same motion, and the grain therein is stirred and fed regularly to the screens in the simplest and cheapest manner, and without any extra appliances for the purpose, as in ordinary arrangements. By the use of the hinged diaphragm G the discharge can be adjusted exactly to the intensity of the vibrations, and thus regulated to any kind or condition of the grain. The finer grain, as it is received on the screens from the hopper, passes through gradually till it reaches the reversely-inclined board H, where it is discharged perfectly separated. At the same time that which passes entirely through not separated (and which does not escape till beyond the projection of board H) is received on the lower inclined board, K, and discharged in the center under the frame, while the coarser refuse grain that is perfectly separated (such as oats) is thrown forward over the discharge ends of the screens. The grain is thus separated into three divisions—two at the opposite sides of the apparatus and one in the center, the latter only being imperfectly cleaned. This is then put in the hopper and run through again. This arrangement of the two reversely-inclined boards, in combination with the series of metallic screens, perfectly accomplishes the separation at the least expense of labor and time, the grain passing through the screens in such a manner that the proper deposits are received by each of the boards and discharged so that the different collections shall be separate.

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

The above-described apparatus, composed of the frame A, provided with hopper E, screens C, the standards B B B, and spurs *l l l*, so arranged that it may be secured to the floor at any place, in the manner shown, and operating by vibrations, substantially as herein set forth.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

J. L. BOOTH.

Witnesses:

J. FRASER,

R. F. OSGOOD.