No. 612,243. Patented Oct. 11, 1898.

R. W. JESSUP.

SEPARATOR.

(Application filed Nov. 2, 1897.)

(No Model.)

Fig. 1.

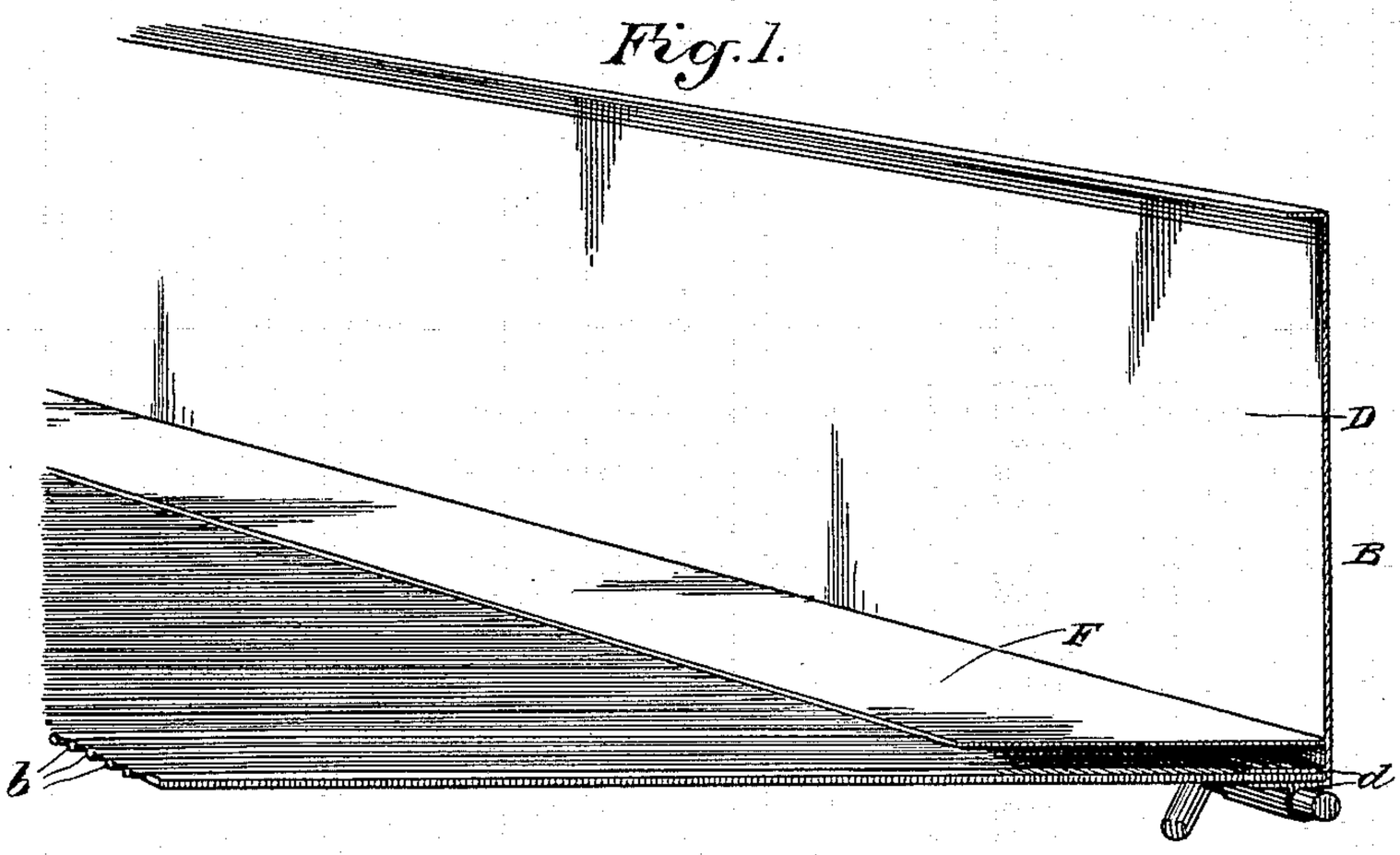
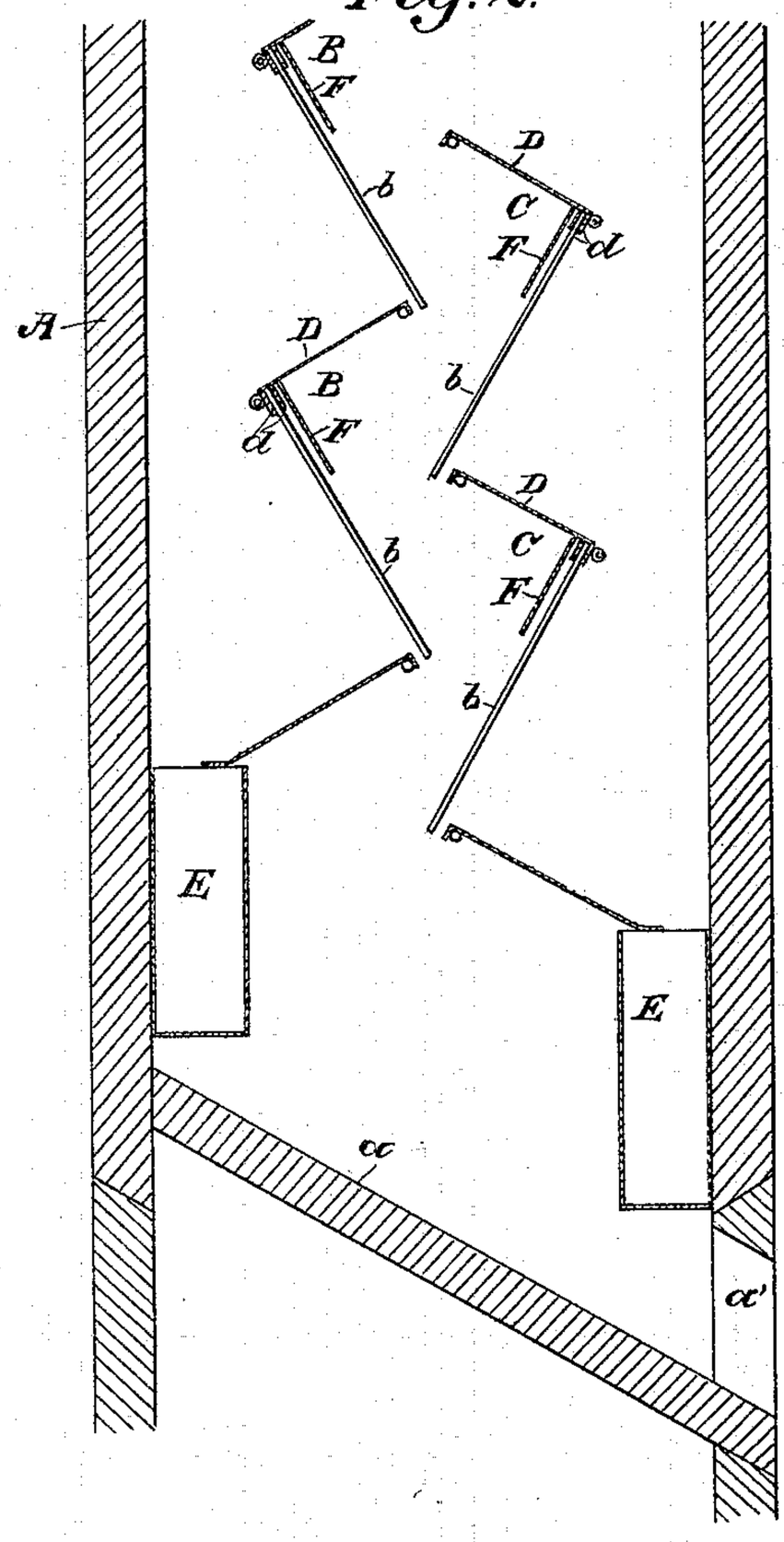


Fig. 2.



Witnesses
H. F. Ascheck
Walter H. Vane.

Inventor
Robert W. Jessup,
by Wm. F. Booth,
his Atty.

UNITED STATES PATENT OFFICE.

ROBERT W. JESSUP, OF SAN FRANCISCO, CALIFORNIA, ASSIGNOR OF ONE-HALF TO FAIRFAX H. WHEELAN, OF SAME PLACE.

SEPARATOR.

SPECIFICATION forming part of Letters Patent No. 612,243, dated October 11, 1898.

Application filed November 2, 1897. Serial No. 657,173. (No model.)

To all whom it may concern:

Be it known that I, ROBERT W. JESSUP, a citizen of the United States, residing in the city and county of San Francisco and State of California, have invented certain new and useful Improvements in Separators; and I do hereby declare the following to be a full, clear, and exact description of the same.

My invention relates to that class of separators employing screens arranged in series, and particularly adapted for what may be termed "grain separation," including small seeds. I refer especially to my previous patent, No. 576,195, dated February 2, 1897, and to a subsequent application for improvements in this line filed August 26, 1897, Serial No. 649,581, because my present invention consists in an improvement in the machine illustrated and claimed in said patent and application.

The essential feature of my separator, as is made clear by my former patent and application, is the peculiar screen composed of a number of parallel spaced needles having a fixed connection at one end and thence extending separate and independent to the other end and free at said end, the needles being pliant and springy and adapted to vibrate under the contact of the material and its passage over them. This springy pliancy, adapting the needles to vibrate, is of prime importance, recognized as such by me from the beginning, as is evidenced by my statement in Patent No. 576,195, heretofore mentioned: "I have found in practice that the directing-plates C should be arranged in such position as to deliver the material not too near the head of the screens, so that the best effect of the vibration and yielding of the needles may be had." This vibration results, as I have pointed out, not only directly in a more perfect separation, but also in keeping the screens clear and free by avoiding and preventing clogging. To clog the screen is to take from its efficiency in proportion to the extent of its filled spaces. The greater the vibration of the needles the greater the agitation of the stream of the material and the more tendency of the separating particles to fall through and to be forced through, thereby keeping the spaces clear. For this reason I suggested the practice of directing the stream of material not too near the fixed or rigid head of the screen, but, rather, far enough down toward the free ends of the needles to insure that degree of vibration necessary to perfect results. I have found, however, that while in many cases this suggestion carried out has met with satisfactory results there are cases (and these will multiply with the extent of the use) where particles of a particular size and shape that happen to deviate from the flow of the general stream of material fall upon the screen near the rigid heads of the needles. These particles are apt to lodge and wedge between the needles, and not being subject to a strong vibratory action of the needles they do not get the advantage of that clearing action, and being above the general flow of material they are not struck and urged downward by the other falling particles, so that they are apt to stay wedged between the needles at the point where they have happened to fall upon the screen. This chance lodging and wedging of these particles transfers the point of rigidity from the head of the needles to their own locality, and the needle will therefore be pliant and springy from the location only of the wedged particles down to its free end. Furthermore, the wedged particles press the needles more or less out of line, thus changing the spaces between the needles, and thereby preventing an accurate and satisfactory separation. The vibratory motion of the needles being impeded and lessened by the wedged particles, the screen clears itself with less facility, so that the evil once begun spreads and eventually will clog the entire screen.

The object of my present invention is to remedy this difficulty; and to this end my invention consists, essentially, in a guard, protector, or fender for the head of the screen, adapted to prevent any of the particles of the stream of material from falling upon said screen above the point of impact of the general flow of material and within that zone or portion determined by practice to have too little vibration to keep its spaces clear.

The accompanying drawings, to which reference is hereby made, will make my invention clear.

Figure 1 is a perspective view of one of my screens, showing the application thereto of the best form of guard or protector. Fig. 2 is a vertical section of my machine, showing an arrangement of my screens therein.

In the drawings I have not shown unnecessary details of the machine, it being sufficient to designate A as the box or casing, provided below with an inclined floor *a* and discharge *a'* for the main stream of material, and receptacles E, supposed to have suitable discharges and adapted to receive the streams of particles separated from the main stream. In the box or casing are located the opposing series of screens B and C, with their head or stop-plates D, this arrangement being the same as that shown in my pending application and substantially the same as that of my previous patent. The material is fed in above and is directed from one screen to the opposing screen and by this latter to the next screen on the first side, and so on, while the separated particles passing through the screen-spaces are kept in the side passages by plates D and are discharged separately from the main stream. In the relative arrangement of these screens will be seen my endeavor to direct the stream upon each screen far enough down from its head or upper end to insure the necessary vibration; but, as I have stated, some particles will fall nearer the head than desired, and under certain circumstances these will stick between the needles and begin a continuing mischief, as I have pointed out.

Each screen is composed, as I show in Fig. 1, of a number of parallel spaced needles *b*, securely fixed in a common head, such as the grooved flange *d* of plate D, and thence extending free and independent to the other end, having no connection at said other end whatever. These needles have a diameter small enough and a length sufficient and are of proper material to render them pliant, yielding, or springy under the impact and weight of the material discharged upon and flowing over them, so that they shall vibrate while in action, resulting in a better separation and in keeping their spaces clear.

My present invention contemplates, first, making all the material fall at such points in the screens that any particles that may chance to lodge between the needles will necessarily be subject to the cleaning action of the falling material, as well as to a strong vibratory action of the needles; secondly, protecting the head of the screen from chance particles that deviate from the general flow of material, so that no particles can fall upon that portion or zone found by practice to have too little vibratory action to keep the needles clear. This protection may be afforded by a plate or other fender arranged in any suitable manner or location relative to the screen which will keep the falling material from the portion to be guarded. It may be a plate approaching the screen at an angle or one parallel or approximately parallel therewith; but it must be independent of the needles, as they must have the vibration due to their full length. For the sake of illustration I have here shown the guard or protector in the shape of an imperforate plate F, extending over but independent of the heads of the needles, substantially parallel with them, and passing down to that transverse line in the length of the needles as is found in practice to begin that degree of pliancy and vibration necessary to the result. I have also shown the plate F as secured to plate D as a convenient though not necessary construction. This plate F prevents any grain from falling upon the head of the screen, where there is not enough vibration in the needles to clear themselves. The main stream falls on the needles at points below the guard, and any stray grains fall on the guard and flow down to join the main stream. Thus the too-little vibrative head of the screen cannot get clogged. Its more vibrative body and foot will not get clogged, and the whole screen keeps itself clear and free.

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

In a separator for grains and small seeds, the combination of a screen composed of parallel, spaced needles having a fixed connection at one end, and thence extending separate, independent and free, said needles being pliant and springy and adapted to vibrate under the impact of the grains or small seeds, a guard, protector or fender located and adapted to prevent any of the grains or small seeds from falling upon the upper portion of the screen, and a means, independent of said guard, protector or fender, for guiding the grains and small seeds so that they must strike directly upon the lower portion of the screen.

In witness whereof I have hereunto set my hand.

ROBERT W. JESSUP.

Witnesses:
D. B. RICHARDS,
WALTER F. VANE.