J. H. CHASE.

Separating-Sieve.

No. 227,486. Patented May 11, 1880.

Fig: 1.

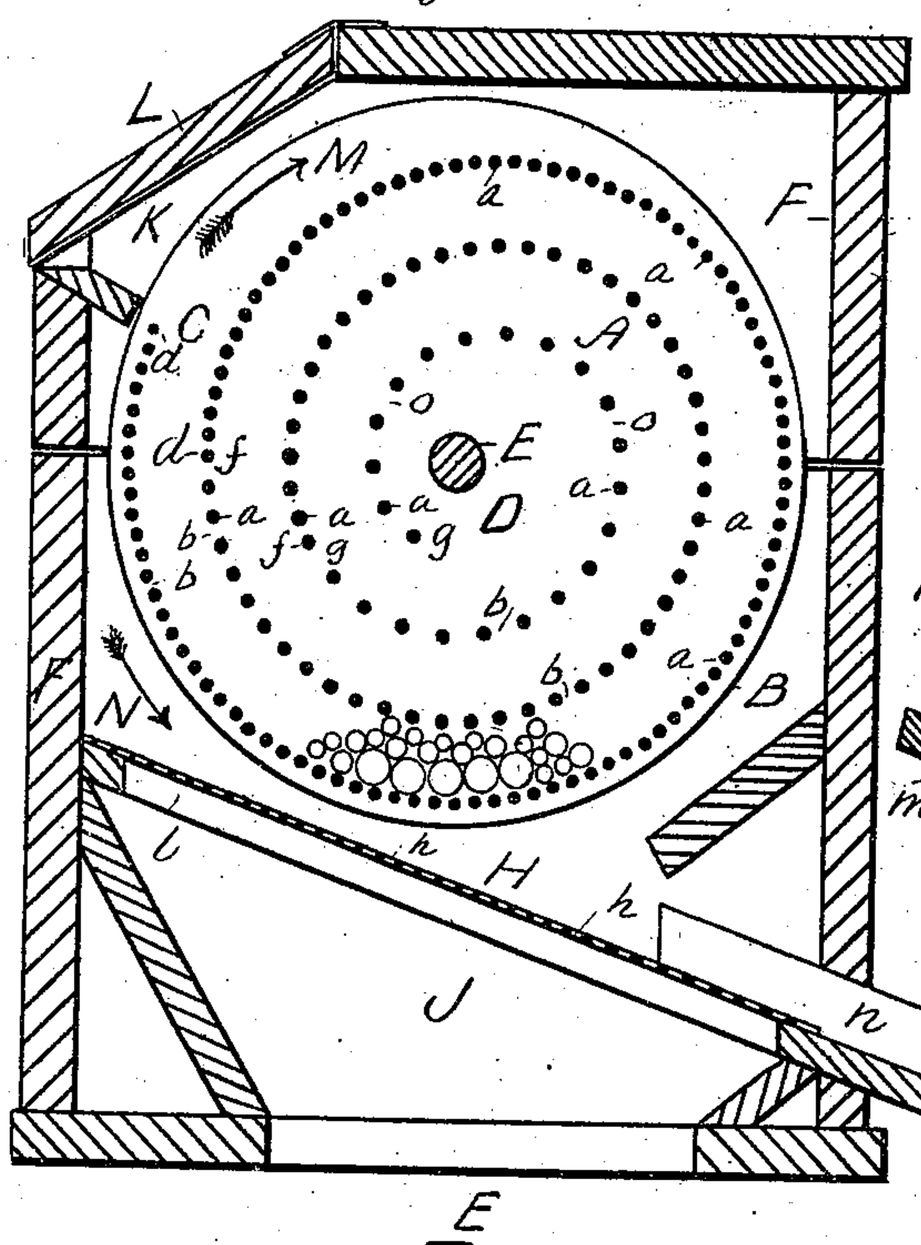


Fig: 2.

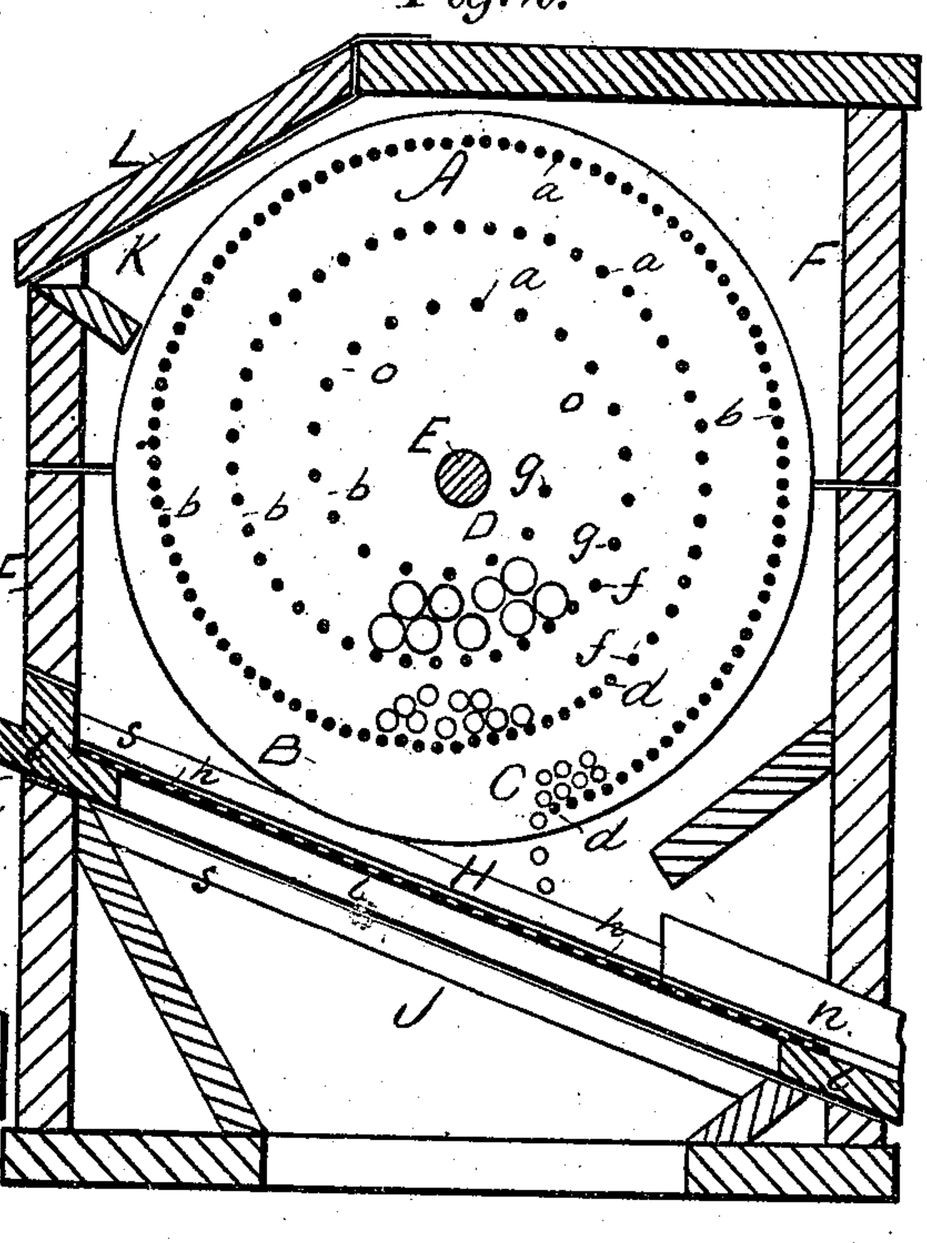


Fig: 3.

Fig: 4.

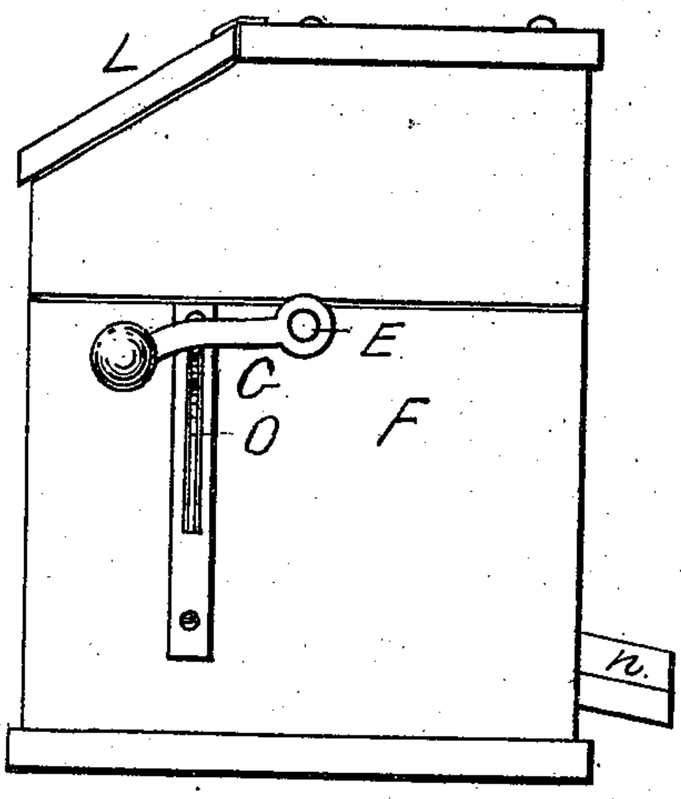


Fig: 5.

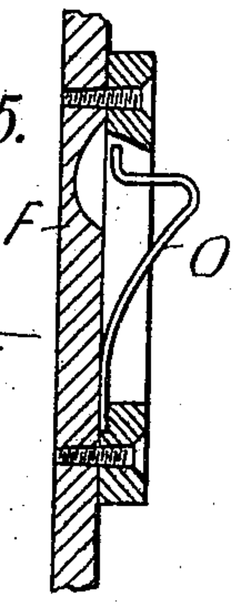
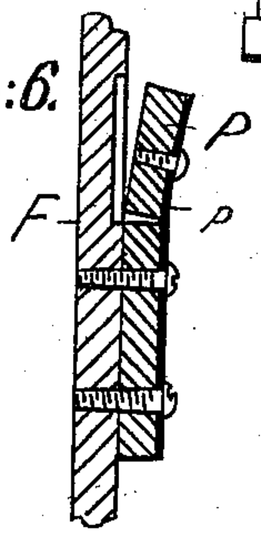


Fig: 6.



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UNITED STATES PATENT OFFICE.

J. HERBERT CHASE, OF CAMBRIDGE, MASSACHUSETTS.

SEPARATING-SIEVE.

SPECIFICATION forming part of Letters Patent No. 227,486, dated May 11, 1880.

Application filed February 19, 1880.

To all whom it may concern:

Be it known that I, J. HERBERT CHASE, of Cambridge, in the county of Middlesex and State of Massachusetts, have invented a certain new and useful Improvement in Separating-Sieves, of which the following is a specification.

This invention consists, first, in a convolute separating-sieve having two or more convolutions separated by a channel or space and provided with apertures, meshes, or perforations decreasing in size from its inner end toward its outer end, whereby, when said sieve is rotated about a horizontal axis in a direction corresponding with a prolongation of its outer end, matter composed of lumps, grains, or particles of various sizes placed therein will be sifted and separated into grades corresponding to the sizes of the meshes, apertures, or perforations, the coarser grades being retained by the inner convolutions of the sieve and the finer by the outer convolutions; second, in a convolute separating-sieve having two or more convolutions separated by a channel or space open at its outer end, said sieve being provided with apertures, meshes, or perforations decreasing in size from its inner toward its outer end, whereby, when said sieve is rotated about a horizontal axis in a direction corresponding with a prolongation of its outer end matter composed of lumps, grains, or particles of various sizes placed therein will be sifted and separated into grades corresponding to the sizes of the meshes, apertures, or perforations, the coarser grades being maintained by the inner convolutions and finer grades by the outer convolutions, and when said sieve is rotated in the opposite direction the various grades of the sifted and separated material will be successively discharged from the open end of the channel or space, all as will be more particularly hereinafter described and explained.

In the accompanying plate of drawings, the present improved separating-sieve is illustrated, Figures 1 and 2 being transverse vertical sections of the same, but showing the spiral sieve in two positions, the one position for receiving the material to be separated and the other for discharging the same after separation; Fig. 3, a plan view of the spiral sieve with its surrounding casing in horizontal section; Fig. 4, an elevation of one end of the casing, and Figs. 5 and 6 sectional views in detail.

In the drawings, A represents the spiral separating-sieve. This sieve, as shown, is made of a series of wire rods, *a*, which are arranged in parallel lines, leaving parallel openings *b* between them and between two parallel head-pieces, B B, to which they are secured in any suitable manner. This arrangement of wire rods *a* is such as to produce a chamber or channel which, from its outer end, C, which is open, to its inner end, D, is spiral in direction, and so runs about a common central or axial shaft, E, which shaft is continued to the outside of the head-pieces B, and by such continuations suspended horizontally in suitable bearings of a suitable support, shown in the present instance as a box, F, incasing the said sieve A, and in a manner to be rotated with the said head-pieces and said spiral sieve therein.

G is a crank-handle on one end of the shaft E, for convenience in turning it and parts attached to it, as aforesaid.

The spiral sieve A has an outer curve or circle from *d* to *d*, an inner curve or circle from *g* to *g*, and an intermediate curve or circle from *f* to *f*, the ends of each of which circles lap or pass by each other; but the several circles are continuations, however, of each other, as is well known with curves of circles having a spiral direction.

The openings in each of these circles *d*, *f*, and *g* vary in width, the openings of the outer circle being of a width narrower than those of the intermediate circle, *f*, and those of the intermediate circle, *f*, of a width narrower than those of the inner circle, *g*.

H is a flat wire screen having meshes or openings *h*, and attached to a frame, *l*, and located within the box or casing F, below the spiral sieve A, and so as to incline from one side of the box to the other.

In Fig. 2 the sieve H is adapted to be removed, so as to be slid in and out of guideways *s* and through the opening *m* in the box F, and in Fig. 1 the sieve is shown as secured

to the box F, and the sieve can be inclined to either side, as desired. This inclined sieve opens at its lower side to a spout, *n*, which projects from the casing in a line therewith; and under this sieve H is a chamber, J, for receiving whatever passes through its meshes.

K is an opening in the top of box F, and L a lid for closing the same, which opening is on the opposite side of the box to that having the spout *n*.

The use of the above-described sieve A is as follows: First, bring the open end C of the spiral sieve to the opening K of box, and holding it there, then pour into such open end of the sieve the material to be separated, and when this is completed rotate the spiral sieve several times in the direction of the arrow M, (shown in Fig. 1.) Under this rotation obviously all portions of the material placed in the sieve which in size are larger than the width of any of the openings in the spiral sieve will travel toward the central or axial shaft, E, and thus will be brought into the portion of the spiral covered by the inner circle from *g* to *g* having the widest openings *o*, and be there retained, and all portions of the material placed in the sieve which are larger than the width of the openings in the intermediate circle from *f* to *f* will be brought and placed in that portion of the spiral covered by such intermediate circle, and be there retained, and all portions of the material placed in the sieve wich are larger than the width of the openings in the outer circle from *d* to *d* will be brought and placed in that part of the spiral covered by such outer circle, and be there retained, and all portions of the material placed in the sieve which are smaller than the width of the openings in the outer circle from *d* to *d* will pass through such openings, and, falling upon the inclined sieve, be there again separated, the larger passing out at the spout and the smaller through the meshes of the sieve.

Having thus accomplished the separation and division of the material placed in the sieve, as aforesaid, the discharge of the contents of the spiral sieve is secured as follows: First stop the spiral sieve with its open end in the position of Fig. 1, and then rotate the sieve in an opposite direction to that above described—that is, in the direction of the arrow N of Fig. 1—and as such open end comes to its lowest position those portions of the material on the outer circle, *d d*, of the spiral sieve pass out and fall upon the inclined sieve, from which they escape at the spout *n*, and by continuing the rotation of the spiral sieve in this direction when the open end again comes to its lowest position the portions of the material in the intermediate circle of the spiral sieve pass out and fall upon the inclined sieve, from which they escape at the spout, and so on for the portions of the material on the inner circle of the spiral sieve.

O is a spring-stop secured to outside of casing F in position to make a rest for the crank-handle G of spiral sieve when the sieve is to be charged with material, as aforesaid. The spring-stop yields to the swing of the crank in the one direction to separate the material within the spiral sieve, as aforesaid, and thus does not interfere with such movement of the sieve, while in the movement of the sieve in the opposite direction to discharge it it can be readily and easily placed out of position of interference with such movement of the sieve.

Obviously the spiral sieve may have a series of curves or circles, more or less in number, and, again, the outer curve or circle may be closed in lieu of perforated, as described, in which case nothing could then escape from the sieve except when discharged, as aforesaid. Again, the outer end, C, of the sieve, in lieu of being left open, may be closed, and the sieve adapted to be discharged of its contents on its various circles by communication with the chamber or space of each circle or curve at the ends or end pieces, B B.

In Fig. 1 is shown the position within the sieve A of the several portions of material after being poured into the separator, and in Fig. 2 is shown the material as separated and the discharging of one portion of the material in the outer circle and the then position of the other portions of the material within the sieve.

Obviously a spiral sieve such as herein described may be made of wire-netting, perforated plate, or other material, instead of wire rods, as herein described, and the same is true, in substance, of the inclined wire screen or sieve.

The sieve H may be horizontal instead of inclined; but it is preferable to have it inclined, as it then secures an automatic delivery, as described, of all which falls upon it and does not pass through it.

The material to be separated can be put into the separator at one of its ends in the center part, D, an opening being arranged therefor, spouts being arranged at its other end in respective relation to the graded portions of the separator-sieve, so that the material when separated will pass out at its respective spout, and in such an arrangement the sieve should revolve on an axis suitably inclined.

In Fig. 6 is shown a view, in modification, of the stop O, P being the stop, secured by a spring-hinge, *p*, to the outside of casing, and operating in a similar manner to the stop O.

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

1. A convolute separating-sieve having two or more convolutions separated by a channel or space and provided with apertures, meshes, or perforations decreasing in size from its inner toward its outer end, substantially as and for the purpose set forth.

2. A convolute separating-sieve having two or more convolutions separated by a channel

or space open at its outer end, said sieve being provided with apertures, meshes, or perforations decreasing in size from its inner toward its outer end, substantially as described.

3. A convolute sieve, A, mounted on a horizontal axis and provided with apertures, meshes, or perforations decreasing in size from its inner toward its outer end, the box or casing F, and inclined sieve H, substantially as described.

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