

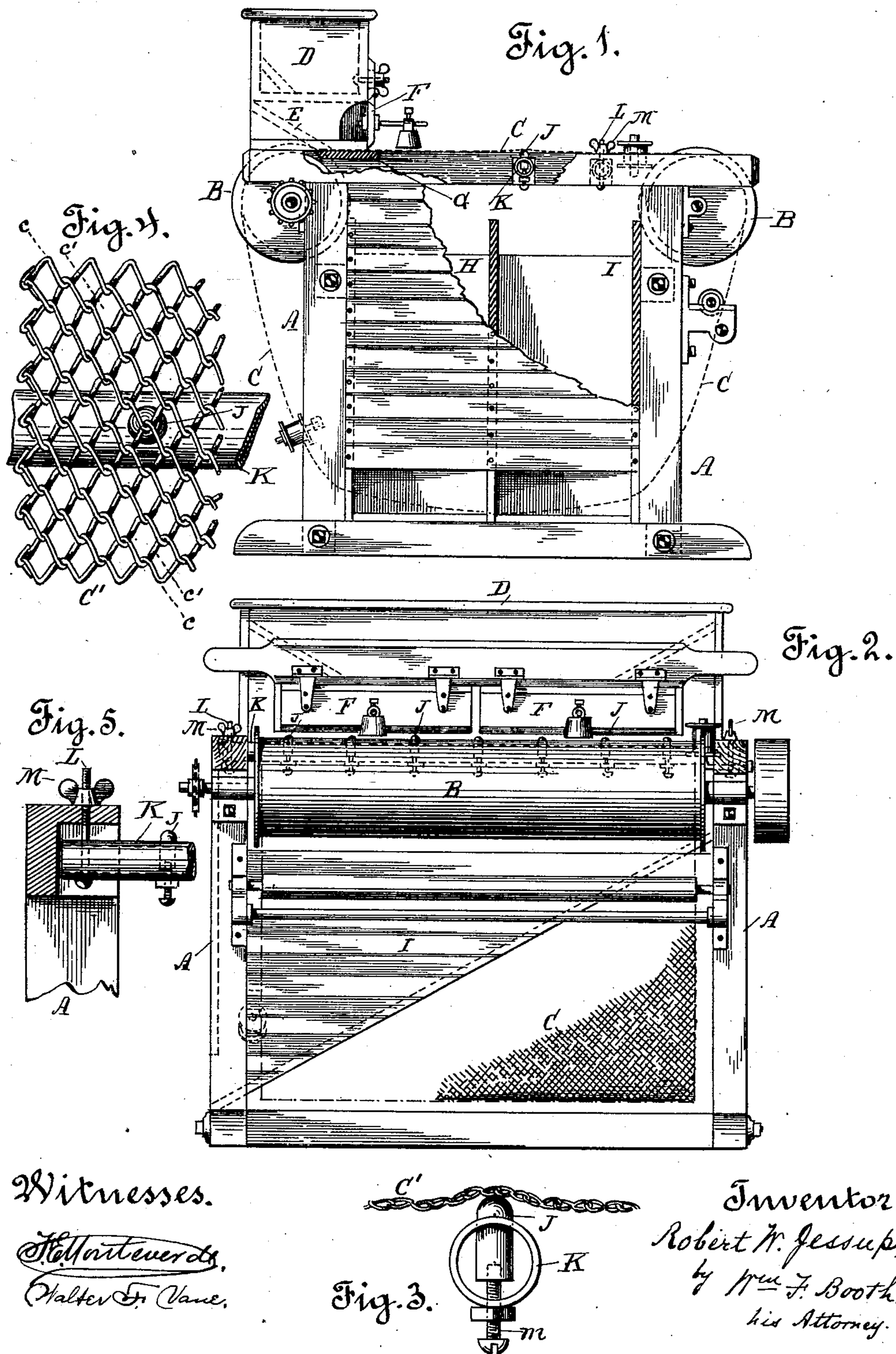
No. 672,982.

Patented Apr. 30, 1901.

R. W. JESSUP.
SEPARATOR.

(Application filed Sept. 4, 1900.)

(No Model.)



UNITED STATES PATENT OFFICE.

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

SEPARATOR.

SPECIFICATION forming part of Letters Patent No. 672,982, dated April 30, 1901.

Application filed September 4, 1900. Serial No. 28,929. (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, in the 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 in which a traveling screen is employed.

It consists in the novel combinations, arrangement, and construction of parts, which I shall hereinafter fully describe and claim.

The object of my invention is to obtain a more efficient separation than heretofore.

Referring to the accompanying drawings, Figure 1 is a side view of my separator, parts being broken away to show the interior. Fig. 2 is an end elevation. Fig. 3 is a detail showing the wire-mesh screen passing over an agitator-pin. Fig. 4 is a view showing the wire-mesh screen. Fig. 5 is an enlarged detail showing the adjustment of the bars carrying the agitator-pins.

A is the frame, in the upper portion of which are mounted the rollers B, over which travels the endless screen C.

D is the feed-hopper.

E is the feed-apron resting on the screen, and F is the weighted automatic gate of the hopper, which serves also as a spreader to evenly distribute the material upon the screen.

G is a table supported by the frame A and lying directly under the screen at the place of the feed of the material thereto. This table extends but a comparatively short distance in the direction of the travel of the screen and is succeeded by the delivery-chutes H and I, which lie transversely under the screen and are inclined, as shown in Fig. 2.

After the material to be separated is fed to the screen and is spread thereon by the gate F most of the smaller particles fall through as soon as the meshes in which they rest are clear of the table G; but in practice I find that a very appreciable percentage of material that is desirable to have pass through the meshes is carried over the foot of the machine. If, however, something is done to change the position of the particles on the

screen, many particles will pass through which otherwise would not. This change of position is best brought about by an agitation of the screen; but it is essential that this agitation shall be gentle and effected by gentle means. Too much agitation or a violent disturbance of the material causes too large a percentage of undesirable particles to pass through. I have found that the best agitation for my purpose can be effected by taking advantage of the traveling movement of the screen itself to cause it to be gently shaken by contact during its travel with stationary ridges, peaks, pins, buttons, or other bodies or points, which cause momentary and rapid deflections and returns of the screen from and to its plane of travel, thereby producing a trembling or vibration of the material that causes it to "walk" or "travel" on the screen, so that particles which may be bridging a mesh soon have because of this "walking" or "traveling" one end free of one side of the mesh-wall and fall through. Such stationary agitator-contacts I here show by J. In their best form they consist of round-headed pins or projections of any suitable material. Hard fiber will answer. They are located under the screen and may lie in planes parallel with the direction of travel of the screen or at right angles or obliquely thereto. I have here shown them as arranged transversely of the screen. They may be in any number and mounted in rows, one or more in number. The means for supporting them may be of any suitable character. A good way to carry them is that here shown—to wit, the bars K. There may be any number to a bar, and the number of bars may be varied to suit circumstances. For illustration I have here shown two bars. The agitator-contacts may be permanently fixed; but the better construction is one which provides for their adjustment to the plane of travel of the screen, whereby the contact of the traveling screen with them may be rendered more or less forcible, as circumstances may require, and thus provide for such variation in the agitation of the screen and the trembling or vibration of the material as may be found best. Such an adjustment may be a double one—to wit, one of each pin—as shown in Fig. 3, by means of the screw *m*, and

the other of the whole carrying-bar, as shown in Fig. 5, by means of the hangers or bolts L, which carry the bars K, which said hangers or bolts are provided with nuts M, by the turning of which the bars may be raised or lowered to set and there fix the agitator-contacts J in the position desired with relation to the plane of the travel of the screen. Either or both adjustments may be used, as circumstances require.

As I have before stated, most of the small particles fall through the screen when free of the table G; but many of them are carried on and would pass over the foot-roller, with straw-joints and undesirable material, if the traveling screen did not come in contact with the stationary agitators J; but this contact of the under surface of the screen with these agitators causes by the gentle agitation of the screen such a trembling or vibration of the material that the position of the particles will be changed; and very many of the small particles, which would otherwise be carried over, will be freed sufficiently to enable them to pass through the screen. Now as the material so separated is usually not of as high a grade as that which passes through without the assistance of the agitation (but is of a much better quality than the material carried over) I find it best to locate the agitator-contacts J far enough away from the table G to provide for the completion of the unaided separation (that by gravity alone) before the material is subjected to the effect of the screen agitation. In other words, in the best form of the device the separation by agitation is made to take place after a previous separation due to gravity alone. This enables me to keep the results separate, as I have shown in the drawings, by the provision of the first chute H for the first separation and a second chute I under the agitator-contacts for the second separation.

Although the screen to be used in my separator may consist of any material and be provided with any form of perforations, reticulations, or meshes such as go to make up what may be termed a "perforated" or a "meshed" screen in contradistinction to a spaced slatted carrier, the screen best adapted for the agitation required, whether such agitation be effected by stationary or moving agitators, is one of the constructions here shown in Fig. 4. By referring to Fig. 4 it will be seen that the screen C', which I deem the best suited for my purposes, is one composed of freely interlaced or interwoven wires. These wires are what are known as "spiral," and they freely interlace without other connection, thereby giving to the entire screen great flexibility and rendering it capable of freely bending in very narrow sections. In fact, its flexure can take place in each mesh-line, thereby making it possible to impart to it such impacts (whether due to the contact resulting from its own travel or to the positive blows of active devices) as may best be suited to

the work, both as to the degree of force of the impact and the location on the screen at which the impact is delivered or produced; but such a screen is particularly adapted for use with the stationary agitator-pins I have shown. The manner in which the spiral wires of screens interlock leaves the opposing surfaces composed of ridges *c* of the thickness of the wire, and intervening grooves *c'* of about the width of the mesh. The ridges and grooves are oblique to the length of the screen. The surface of this wire-mesh belt or screen having the form mentioned is particularly adapted by its structural unevenness to effect the necessary agitation of the screen by its mere traveling contact with the stationary agitators, over the round-headed tops of which its ridges or grooves gently rise and fall, thereby receiving upon each individual wire a mild impact, the effect of which is communicated to the screen. This impact is given inside the mesh or space, the wire rising as it passes over the agitator to a greater or less extent, according to the adjustment of the latter to the plane of the travel of the screen, and results in a continuous vibration of the screen and in an agitation of the material.

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

1. In a separator, the combination of a traveling screen, means for feeding the material thereto, a stationary table under and supporting the screen at the place of feed, whereby a first separation by gravity alone is effected, when the screen is clear of the table, and a means for agitating the screen, beyond the zone of the first separation, whereby a second separation is effected.

2. In a separator, the combination of a traveling screen, relatively stationary agitator-pins under the working portion of the screen, with which said pins, said screen, in traveling past, comes in contact, whereby it is agitated, and means for adjusting said pins, to vary the force of the contact of the screen therewith, and regulate the degree of agitation, consisting of the carrying-bars, the hanger-bolts, and the nuts on said bolts.

3. In a separator, the combination of a traveling screen, means for feeding the material thereto, a stationary table under and supporting the screen at the place of feed, to effect a first separation by gravity only, and relatively stationary agitator-pins under the working portion of the screen, beyond the zone of the first separation, with which said pins, the screen, in traveling past, comes in contact, whereby the screen is agitated, and a second separation is effected.

In witness whereof I have hereunto set my hand.

ROBERT W. JESSUP.

Witnesses:

WALTER F. VANE,
D. B. RICHARDS.