

2 Sheets—Sheet 1.

SEPARATOR.

Patented Jan. 20, 1891.



Inventors,  
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(No Model.)

2 Sheets—Sheet 2.

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SEPARATOR.

No. 445,133.

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Fig. 3.

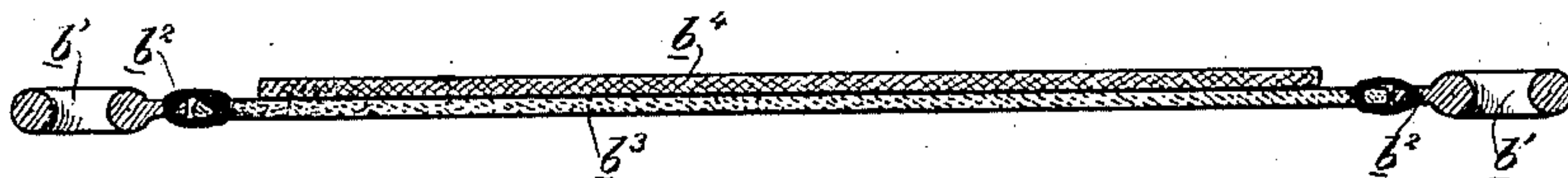
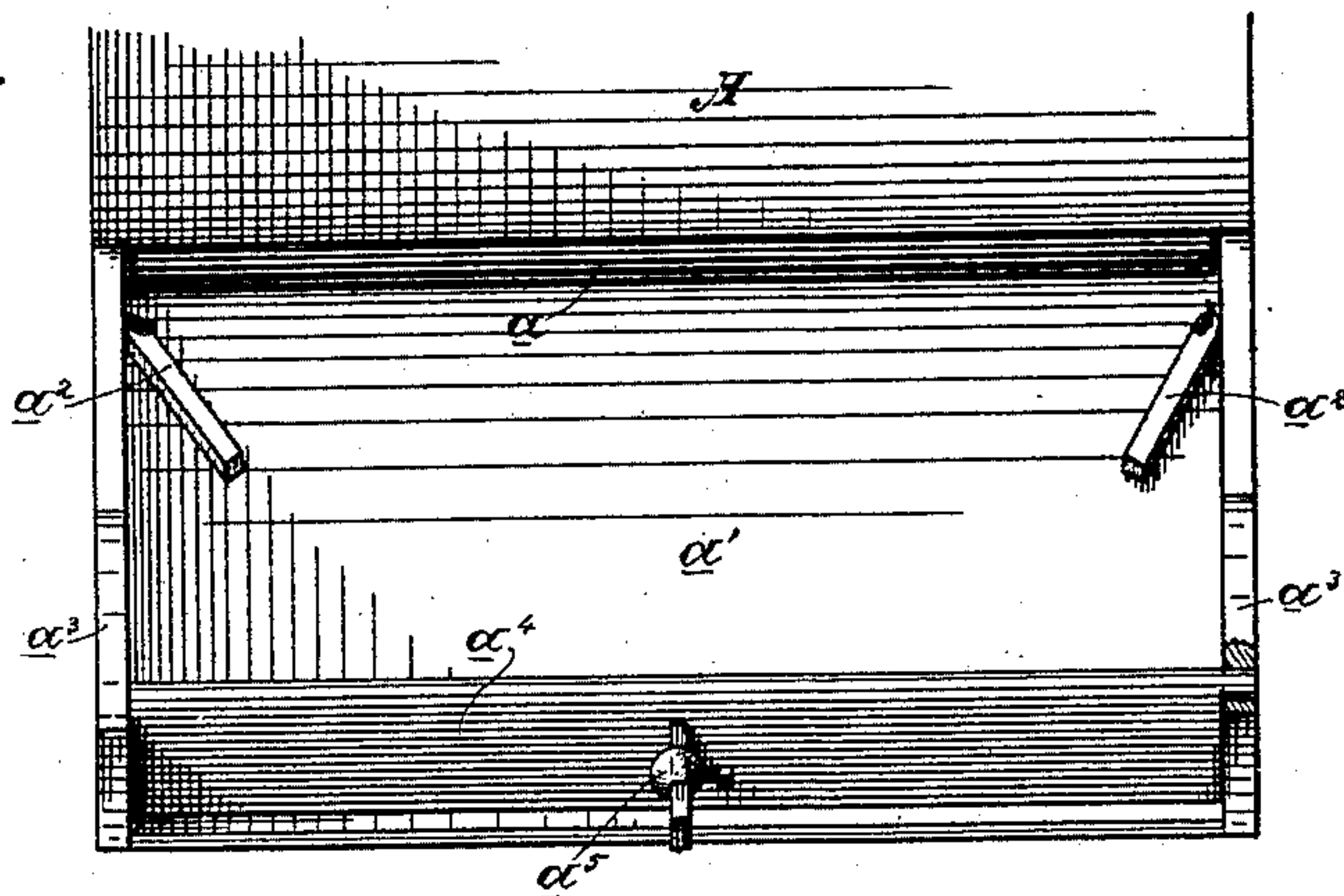


Fig. 4.

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# UNITED STATES PATENT OFFICE.

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ASSIGNORS OF ONE-THIRD TO T. J. PARSONS, OF SAME PLACE.

## SEPARATOR.

SPECIFICATION forming part of Letters Patent No. 445,133, dated January 20, 1891.

Application filed August 25, 1890. Serial No. 363,033. (No model.)

*To all whom it may concern:*

Be it known that we, AUSTIN COOK and WILLIAM L. HARVEY, citizens of the United States, residing in the city and county of San Francisco, State of California, have invented an Improvement in Separators; and we hereby declare the following to be a full, clear, and exact description of the same.

Our invention relates to the general class of separating-machines, and is especially adapted and intended for the separation of wild oats from cultivated oats, or any other grain or material.

Our invention consists in the novel constructions and arrangements of parts herein-after fully described, and specifically pointed out in the claims.

The object of our invention is to provide a machine which will effectively and thoroughly separate the wild from the cultivated oats, or from any other grain or material with which they may be mixed.

Referring to the accompanying drawings for a more complete explanation of our invention, Figure 1 is a vertical section of our machine, the frame-work supporting the several parts being omitted, as it is not necessary to a full understanding of the construction and operation of our devices. Fig. 2 is a detail view showing the construction of the endless separating-surface. Fig. 3 is a detail showing a portion of the hopper, its feed-board, feed-gate, and guide-cleats. Fig. 4 is a transverse sectional view showing the endless band  $b^3$ , the blanket  $b^4$ , and the side chains  $b^5$ .

A is the hopper into which the material is fed, said hopper having in its neck an ordinary feed-cylinder  $a$ , which directs the material upon a feed-board  $a'$ , having guide-cleats  $a^2$  at its upper portion, which may be made swinging or adjustable in order to regulate the width of the stream of material. This feed-board  $a'$  is provided with side guides  $a^3$  and with a swinging feed-gate  $a^4$ , held to place by a weighted arm  $a^5$ , the weight on which may be adjustable to regulate the pressure with which the gate is held closed and to determine the yielding of said gate under the pressure of the stream of material.

B is the first separating-table of the series. It consists of an endless traveling belt, constructed as will be presently described, mounted at each end upon drums  $b$ , and having an inclination, as shown, said belt having imparted to it a travel in the direction indicated by the arrow, and commonly termed an "up-hill travel." This belt lies under the feed-board  $a'$  and receives the material upon its surface from the end-gate  $a^4$ . Under the lower end of this first belt is a connecting-chute C, which has a directing-board  $c$ , with side guides  $c'$  and adjustable feed-gate  $c^2$ . Under this feed-board is the second table D of the series, said table being in the form of an endless belt mounted upon end drums  $d$  at an inclination, as shown, and having an up-hill travel, as indicated by the arrow.

Under the upper end of the first separator-belt B is a connecting-chute E, having at its lower portion a feed-board  $e$  with suitable side guides and feed-gate  $e'$ . Under this feed-board is the third separating-table F of the series in the form of an endless belt mounted upon end drums  $f$  at an inclination, as shown, and having an uphill travel, as indicated by the arrow. The feed-board  $e$  lies, also, under the upper end of the endless belt D, as is shown.

Under the lower end of the second belt D is a chute G, having in its lower portion an ordinary screw conveyer H. Under the lower end of the endless belt F is a chute I, having in its lower end an ordinary screw conveyer J, from which an elevator K extends upwardly to the hopper A above.

Under the upper end of the third endless belt F is a discharge-chute L.

Within the chute E is a revolving shaft M, having on opposite sides stiff bristles  $m$ , which are adapted to come in contact with the under surface of the traveling belt B, and to act both as a brush and a knocker therefor, whereby the material clinging to it is brushed or knocked off into the chute E.

Under the upper end of the second belt D is a similar combined brush and knocker N, and under the upper end of the third belt F is a revolving shaft O, having extending from its periphery a series of stout leather wings or



flaps *o*, which operate against the under surface of the belt *F* and act both as a scraper and a strong knocker to disengage the material clinging to its surface.

5 The endless belts *B*, *D*, and *F* are constructed peculiarly, as we shall now describe by reference to Fig. 2.

Endless side chains *b'* pass over sprocket-pulleys at each end; and the links of these chains at suitable intervals are provided with perforated lugs *b<sup>2</sup>* inwardly extending. To these chains is secured a woolen blanket *b<sup>4</sup>* in any suitable manner, the preferable way being as follows: To the lugs *b<sup>2</sup>* is firmly secured an endless band of some stout material, such as canvas or strong duck, and represented by *b<sup>3</sup>*. To this duck or canvas the woolen blanket *b<sup>4</sup>* is secured.

To the bases of the several side guides of the feed-boards are secured the flexible guard-flaps *P*, of blanket or other suitable material, which lie down on and form flanges for the sides of the belts.

The belts are kept taut by means of sliding boxes, in which their end drums are mounted, and operated by screws *Q*, and their inclination may be varied by any suitable means, as by a suspending-strap *R* at their lower ends, operated by winding on a shaft *r* above.

30 The operation of the machine is as follows: The separation is due to and is rendered possible by the physical characteristics of the surface of wild oats, which differ from those of cultivated oats and other material with which they are mixed. The former have a kind of beard projecting from one end, while the latter have none. This beard sticks into the blanket and holds the wild oats to it, while the cultivated oats or other smooth material slip down the surface of the blanket without sticking to it. The unseparated material is passed through the hopper *A*, and is suitably guided, directed, and regulated so that it falls upon the upwardly-traveling surface of the first belt *B* at a point approximately as shown in Fig. 1. The cultivated oats, on account of the incline of the belt, slip down the surface of the blanket without sticking to it and fall over its lower end into the chute *C*, by which they are again directed and fed onto the second blanket *D*, down the inclined surface of which they again slip and fall into the chute *G*, and are carried off by the conveyer *H*. The wild oats of the material fed to the blanket *B* stick to said blanket and are carried upwardly by it and over its upper end, where they are disconnected from said blanket by the combined brush and knocker *M* and fall down into and through the chute *E*. They thence are conveyed onto the third blanket *F*, and, again clinging to said blanket, are carried upwardly over its upper end, and being disconnected by the scraper and knocker *O*, fall into the discharge-chute *L*.  
65 Among the cultivated oats which pass over the lower end of the first blanket *B* there are some of the wild oats, and these, clinging to the sur-

face of the second blanket *D*, are carried upwardly over its upper end, and, being disconnected therefrom by the knocker and brush *N*, fall down upon the feed-board *e* and are fed to the third blanket *F*, together with those which come from the upper end of the first blanket *B*, as heretofore described. They are thence carried over the upper end of said blanket *F* and are discharged into the chute *L*. Among the wild oats which have been carried up over the upper ends of the blankets *B* and *D* are some cultivated oats, which have a chance to be separated by the third blanket *F*, over the lower end of which they slip into the chute *I*, and thence into conveyer *J*, and, as these may not be as clean as desired, they are carried up in elevator *K* to the hopper *A* again, and once more pass through the machine.

The object in constructing the belts as heretofore described is to get the rough surface which the blanket affords, in order to provide for the clinging to it of the bearded wild oats, and as the blanket may not be tough enough of itself to stand the strain and to bear the connections with the chains we use the stouter fabric of canvas or duck as a basis for the blanket, which thus keeps said blankets smooth and straight in its travel.

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

1. In an oat-separator, the combination of an endless blanket mounted at an inclination and having an uphill travel imparted to it, a feed-hopper above, a feed-board extending from said hopper over the blanket and having side guides, side guards carried by said guides and forming side flanges for the blanket, a receiver under the lower end of the blanket for the material which slides down over its lower end, and a receiver for the oats, which cling to it and are carried around its upper end, substantially as herein described.

2. In an oat-separator, the combination of the series of inclined blankets *B*, *D*, and *F*, each having an uphill travel, a feed device for directing the material upon the surface of the blanket *B*, a connecting-chute for directing the material from the lower end of blanket *B* onto the surface of blanket *D*, a connecting-chute for directing the material from the upper ends of blankets *B* and *D* onto the surface of blanket *F*, a receiving-chute for the material from the lower end of blanket *D*, a receiving-chute for the material from the lower end of blanket *F*, and a discharge-chute for the material from the upper end of blanket *F*, substantially as herein described.

3. In an oat-separator, the combination of the series of inclined blankets *B*, *D*, and *F*, each having an uphill travel, a feed device for directing the material upon the surface of the blanket *B*, a connecting-chute for directing the material from the lower end of blanket *B* onto the surface of blanket *D*, a connect-



ing-chute for directing the material from the upper ends of blankets B and D onto the surface of blanket F, a receiving-chute for the material from the lower end of blanket 5 D, a receiving-chute for the material from the lower end of blanket F, a discharge-chute for the material from the upper end of blanket F, and the brushes, knockers, or scrapers for disconnecting the material from under the 10 upper ends of said blankets, substantially as herein described.

4. In an oat-separator, the combination of

the endless traveling inclined blanket, the feed-board, the side guides of said board, and the flexible guards secured to said guides and 15 forming side flanges for the traveling blanket, substantially as herein described.

In witness whereof we have hereunto set our hands.

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WM. L. HARVEY.

Witnesses:

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F. J. MECKFESSEL.