

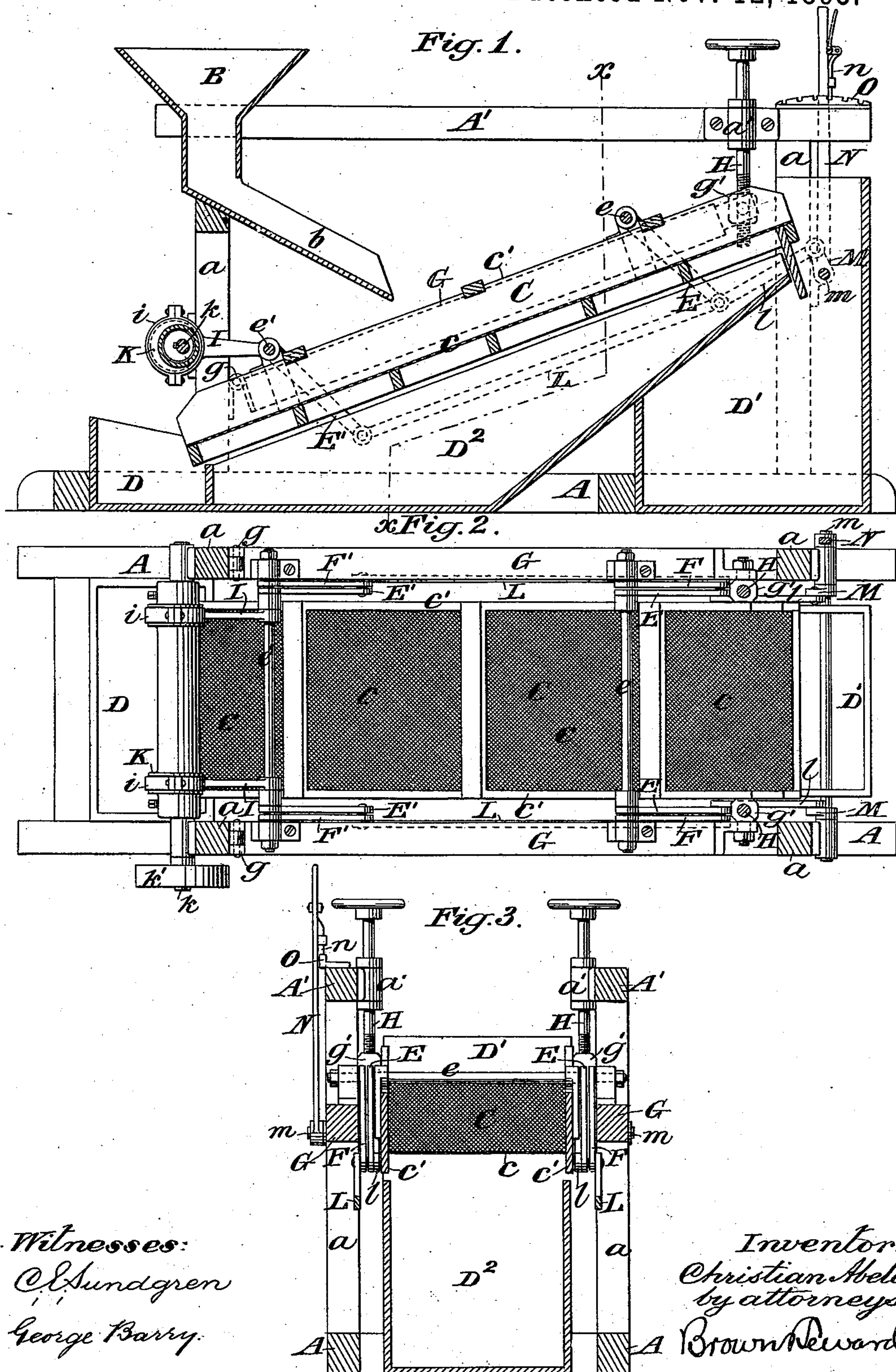
(No Model.)

2 Sheets—Sheet 1.

C. ABELE.  
SEPARATOR.

No. 549,699.

Patented Nov. 12, 1895.



(No Model.)

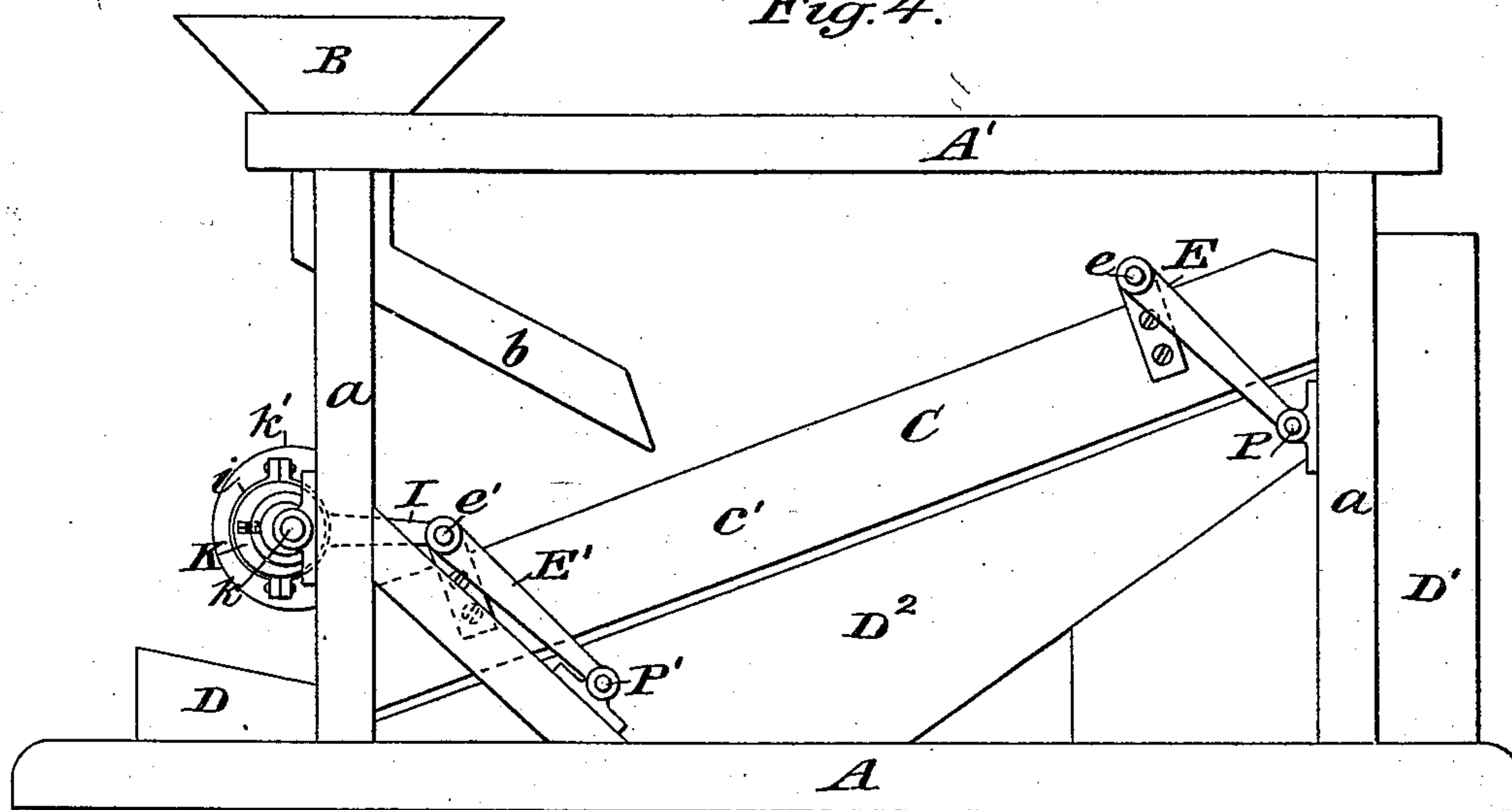
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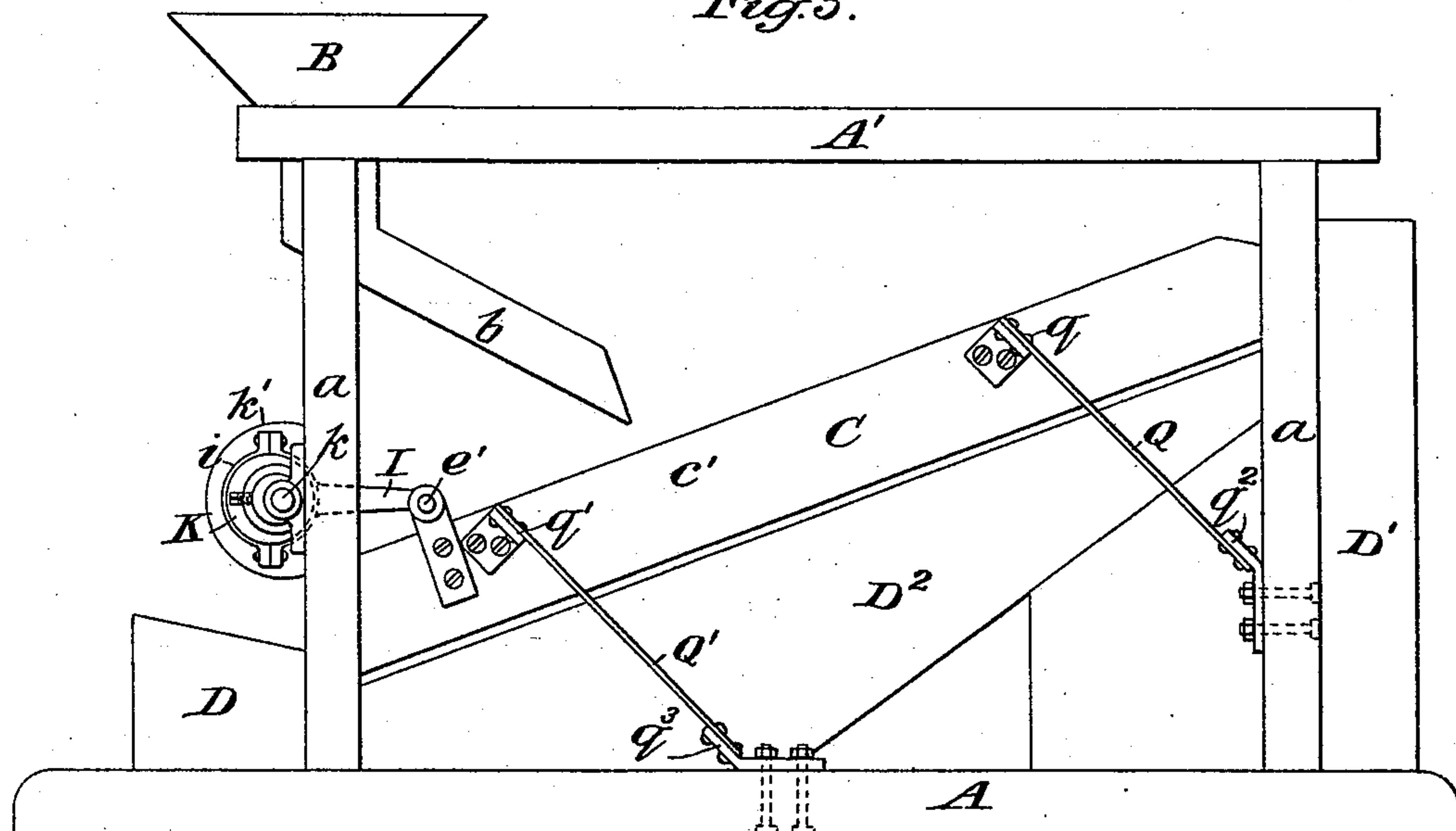
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*Fig. 4.*



*Fig. 5.*



Witnesses:  
O. Sundgren  
George Barry.

Inventor:  
Christian Abele  
by attorneys  
Brown & Howard



# UNITED STATES PATENT OFFICE.

CHRISTIAN ABELE, OF NEW YORK, N. Y.

## SEPARATOR.

SPECIFICATION forming part of Letters Patent No. 549,699, dated November 12, 1895.

Application filed November 3, 1894. Serial No. 527,820. (No model.)

*To all whom it may concern:*

Be it known that I, CHRISTIAN ABELE, of New York, in the county and State of New York, have invented a new and useful Improvement in Separators, of which the following is a specification.

My invention relates to an improvement in separators, in which the material to be operated upon is given repeated trajectory movements during its passage on an incline.

A practical embodiment of my invention is represented in the accompanying drawings, in which—

Figure 1 represents the machine in vertical longitudinal section. Fig. 2 is a plan view. Fig. 3 is a vertical transverse section on the line  $x x$  of Fig. 1, and Figs. 4 and 5 represent modified forms in side elevation.

The machine which I have here illustrated is particularly well adapted for separating the foreign substance from hops; but it may be used for general separating purposes, and I therefore wish it to be understood that I do not limit myself to the particular use named.

The frame of the machine consists of a bed piece or pieces A, uprights  $a$ , and an upper frame A', connected with the bed-frame A by the uprights. The particular form and structure of the frame is not material, excepting so far as it shall form a suitable and convenient support for the operative parts.

The material to be operated upon is fed from a hopper B through a tubular spout  $b$  onto a reciprocating inclined receiver C. The inclined receiver C is in the present instance provided with a screen-bottom  $c$  for the purpose of permitting dirt or dust to escape through the bottom; but if the separator be employed for material where there is no dust or fine waste to escape, it might be provided with an imperforate bottom. The said inclined receiver C is provided with low sides  $c'$ , and at its lower end discharges into a bin or receptacle D, while its upper end discharges into a bin or receptacle D', and such material as passes through the screen-bottom  $c$  is received into an intermediate bin D<sup>2</sup>.

The inclined receiver C is supported by two sets of arms E E', secured at their upper ends to rock-shafts  $e e'$ , respectively, the said rock-shafts  $e e'$  being mounted in suitable bearings secured to the sides  $c'$  of the inclined recep-

tacle C. At their lower ends the arms E and E' are pivotally secured to hangers F and F' depending from and hinged to bars G extending along the sides of the inclined receiver and hinged at one end, as at  $g$ , to the main supporting-frame. The opposite ends of the side bars G are supported by adjusting-screws H, which extend through sockets  $a'$  on the main frame and into nuts  $g'$  at the ends of the bars G. The screws H admit of adjusting the inclined receiver C to different degrees of inclination to suit the purposes in hand.

The inclined receiver C is operated by pitmen I, loosely engaged at one end with the rock-shaft  $e'$  and at their opposite ends secured by suitable straps  $i$ , of well known or approved form, to a double eccentric K, of well known or approved form, for imparting to the pitmen I different lengths of throw, as may be desired. The double eccentric K is secured to a rotary shaft  $k$ , driven by means of a pulley  $k'$  from a suitable source of power. (Not shown.)

The supporting-arms E E' extend from their rock-shafts  $e e'$  at an angle oblique to a plane perpendicular to the floor of the inclined receiver C and in such a direction that when the inclined receiver C is thrown from its normal position (shown in Fig. 1) its movement will be simultaneously upward and longitudinally, its motion in that direction being arrested suddenly at or about the time the supporting-arms reach their vertical position, so that the material on its bottom will have a tendency to be thrown from the point where the receiver is arrested in a trajectory line to the path through which the inclined receiver has traveled. Its return movement will, of course, be a retracing of its advance or upward movement; but as the material will be prevented from moving in a trajectory line at the return limit of its stroke by the bottom of the screen, the effect will be to throw the material rapidly upward along the bottom of the inclined receiver and finally out beyond its upper end into the bin D'. In its operation upon hops mixed with leaves and other foreign matter, the hops themselves will roll or slide down the bottom of the receiver farther than they are thrown upwardly, while the foreign matter will move down the bottom of the screen a less distance than it is thrown up-



wardly, the result being that the hops themselves will finally be discharged from the lower end of the inclined screen into the bin D, while the foreign material will creep step by step to the upper end of the receiver and finally be discharged therefrom into the bin D'.

For purposes of varying the lifting movement of the receiver upon its supporting-arms, I have provided for changing the obliquity of the supporting-arms E E' with respect to the plane perpendicular to the bottom of the receiver by connecting the lower ends of the arms E' E by connecting rods or bars L and connecting the lower ends of the upper arms E by a link *l* with a crank-arm M on a rock-shaft *m*, operated by a lever N, provided with a spring-dog *n*, adapted to engage any one of the series of notches in a rack-bar O. As the lever N is thrown in the one direction or the other, it will operate the crank-arm M and thereby change the obliquity of the supporting-arms E E'. As they approach more nearly to the perpendicular to the plane of the bottom of the receiver, the receiver will have less lift in its advance or upward movement, and as they recede farther from the said perpendicular the receiver will have the greater lift in its advance or upper movement.

In the form represented in Fig. 4 I have shown supporting-arms E E' as pivoted to fixed bearings P P' instead of to adjustable supports, as in the structure hereinabove described.

In the form shown in Fig. 5 I have shown in the place of the arms E E', pivotally secured to bearings at their opposite ends, arms Q and Q', formed of spring metal, fixed at their opposite ends, respectively, to the sides of the screen, as at *q q'*, and at their opposite ends to the framework, as at *q<sup>2</sup> q<sup>3</sup>*. In this instance the flexibility of the arms Q Q' is depended upon to permit the receiver to reciprocate under the impulse of its operating mechanism.

It is obvious that other slight changes might be resorted to in the form and arrangement of the several parts without departing from the spirit and scope of my invention. Hence I do not wish to limit myself strictly to the structure herein shown and described; but

What I claim is—

An inclined receiver or screen having its bottom free from obstructions and its upper and lower ends open for the free passage of the material being operated upon, means for imparting to the receiver or screen a succession of movements having a simultaneously upward and longitudinal direction and means for arresting such aforesaid movements at a point where the trajectory from that point will start in a direction away from and up along the plane of the bottom of the receiver or screen, substantially as set forth.

CHRISTIAN ABELE.

Witnesses:

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