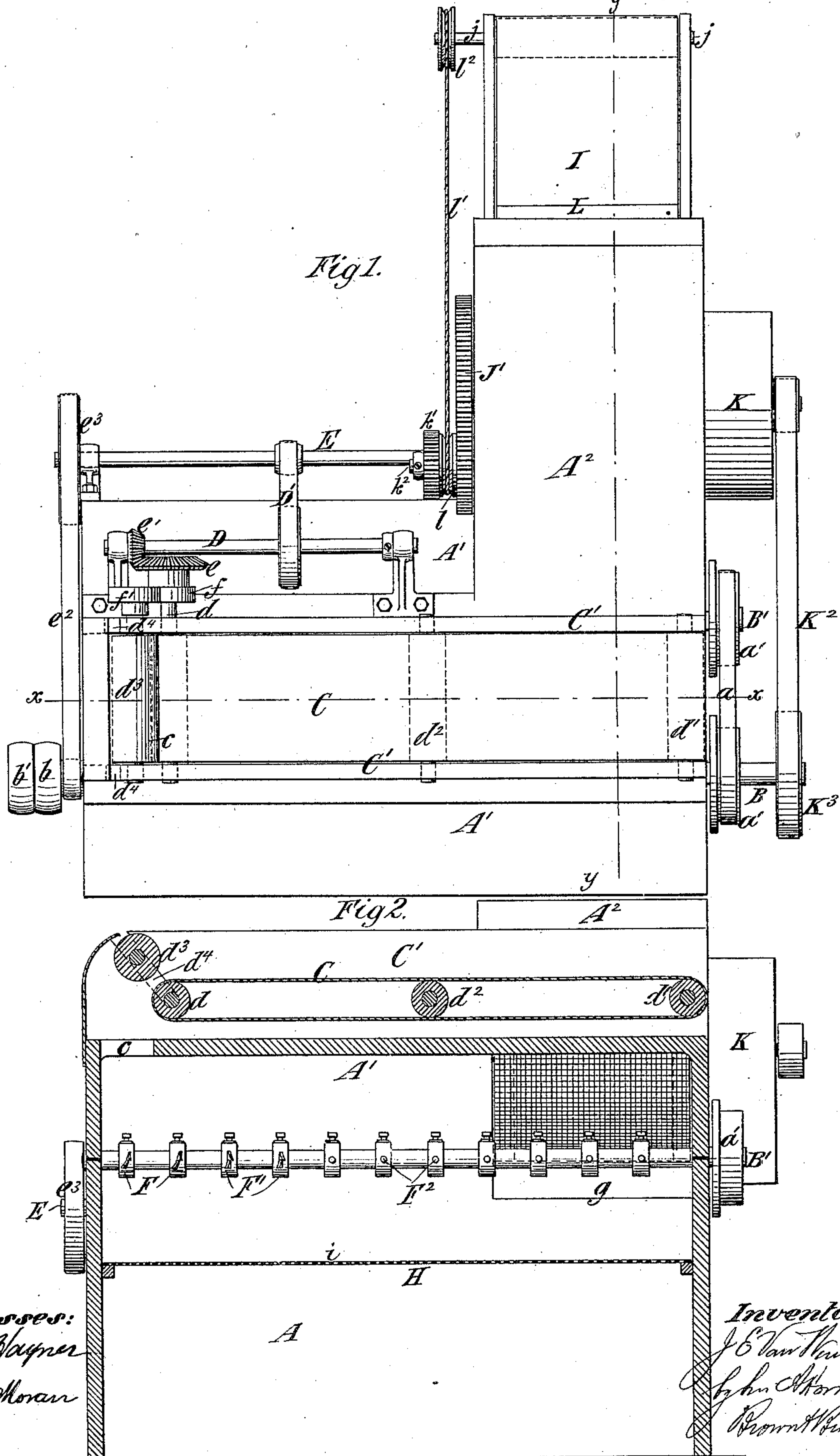


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OPENER AND CLEANER FOR FIBROUS MATERIALS.

No. 299,297.

Patented May 27, 1884.

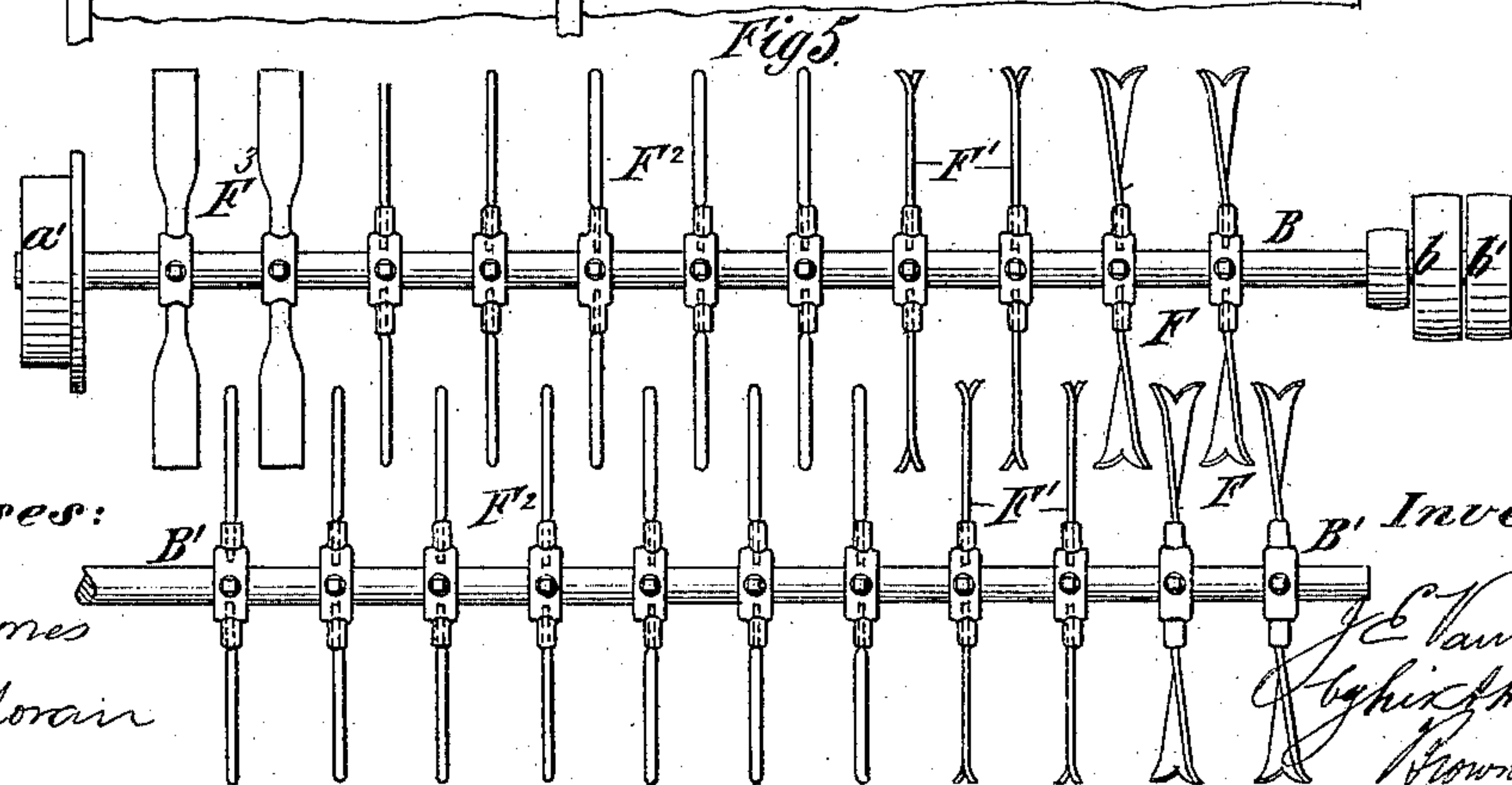
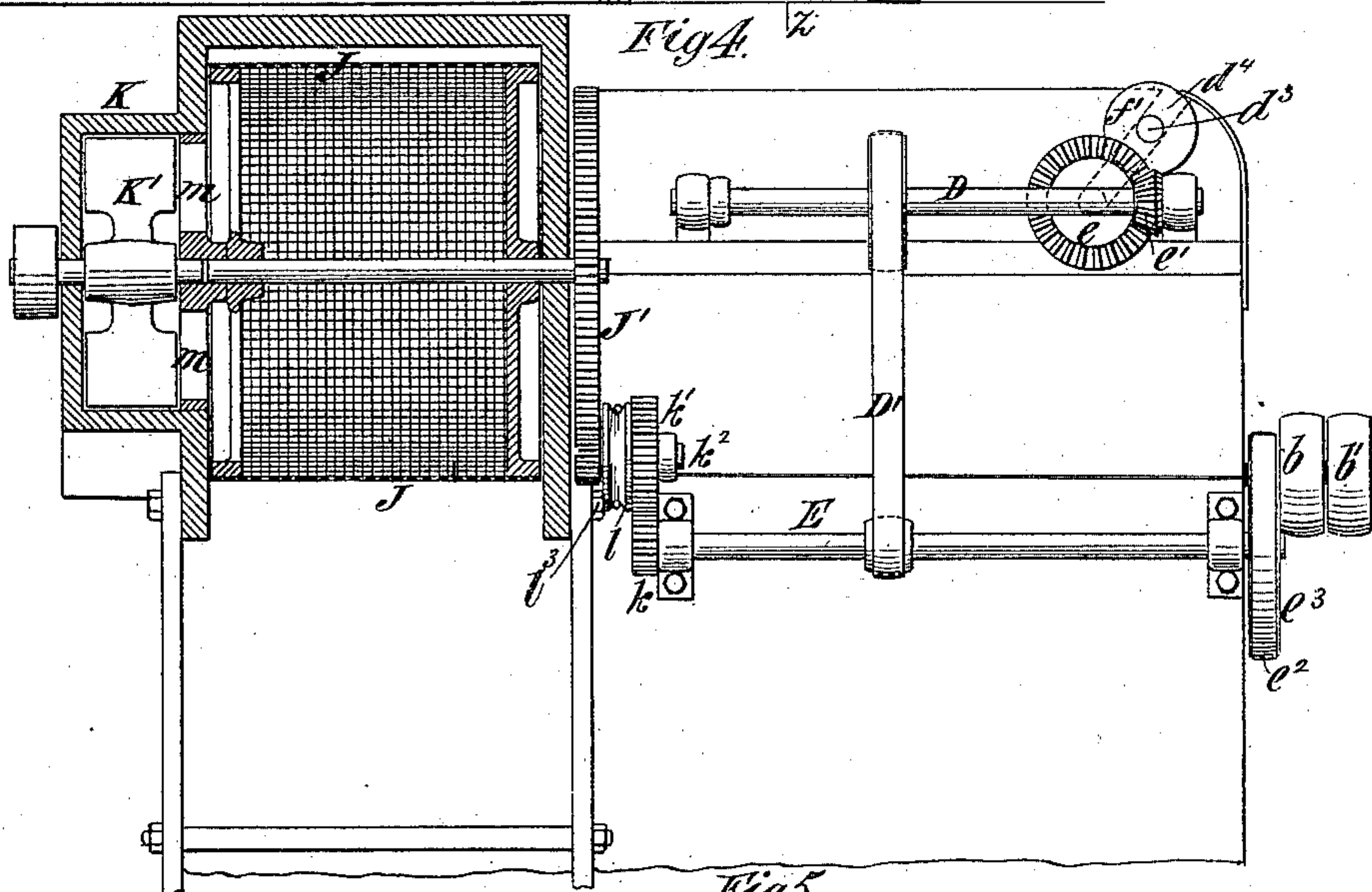
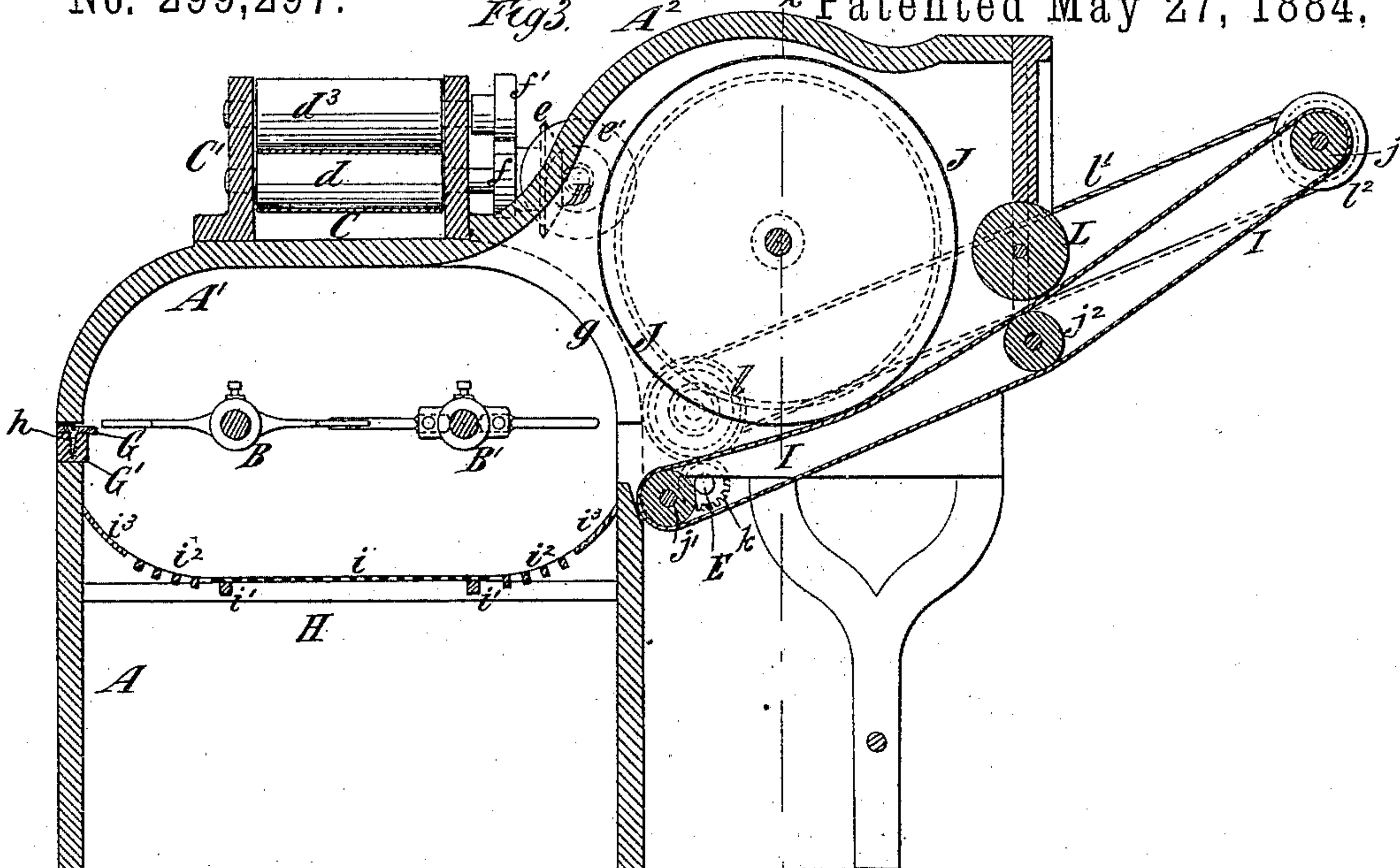


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Fig. 3. A<sup>2</sup> Patented May 27, 1884.



Witnesses:  
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Inventor:

J. E. Van Winkle  
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# UNITED STATES PATENT OFFICE.

JOHN E. VAN WINKLE, OF PATERSON, NEW JERSEY.

## OPENER AND CLEANER FOR FIBROUS MATERIALS.

SPECIFICATION forming part of Letters Patent No. 299,297, dated May 27, 1884.

Application filed January 2, 1883. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN E. VAN WINKLE, of the city of Paterson, in the county of Passaic and State of New Jersey, have invented  
5 a new and useful Improvement in Openers and Cleaners for Fibrous Materials, of which the following is a specification.

My invention principally relates to the class of machines for opening and cleaning cotton  
10 and other fibrous materials which comprises two or more rotary shafts provided with beaters which beat and open the fibrous materials, a delivery-apron, and a rotary screen or perforated or reticulated cylinder, between which  
15 and said apron the opened materials are delivered, and a vacuum fan or exhauster for exhausting air from said screen or cylinder; but certain features of my invention may be embodied in machines which do not comprise  
20 all these features.

The invention consists in a novel arrangement and combination, with the beater shafts and their casing, of a feeding-apron and feeding-rollers, and in the combination, with a casing and the beater-shafts, of beaters of different  
25 forms arranged in a novel manner, all of which features are hereinafter more fully described, and illustrated in the accompanying drawings.

30 In the drawings, Figure 1 represents a plan of my improved machine. Fig. 2 represents a vertical section on the dotted line *x x*, Fig. 1. Fig. 3 represents a vertical section on the dotted line *y y*, Fig. 1. Fig. 4 represents a  
35 vertical section and partial elevation on the dotted line *z z*, Fig. 3; and Fig. 5 represents a plan of the beater-shaft and beaters.

Similar letters of reference designate corresponding parts in all the figures.

40 A designates the lower portion of the casing of the machine, A' designates the upper portion or hood thereof, and A<sup>2</sup> designates the casing for the rotary screen, hereinafter described. This casing may consist of a wood or  
45 cast-iron frame, closed in so as to form a casing which is approximately air-tight.

B B' designate the beater-shafts, which are connected or geared together at one end by a belt, *a*, and pulleys *a'*, so as to rotate in the  
50 same direction, and at the other end the shaft B is provided with fast and loose pulleys *b b'*, for the reception of a driving-belt. The beater-shaft B, therefore, forms the driving-shaft of the machine.

At one end of the upper portion or hood, 55 A', is an inlet or feed opening, *c*, and above and on top of the hood is a feeding-apron, C, which works in a trough or receptacle, C'. The apron C is supported by rollers *d d'* and an intermediate roller or idler, *d<sup>2</sup>*, as best  
60 shown in Fig. 2, and at the end where the feed-opening *c* is situated there is a fourth or upper roller, *d<sup>3</sup>*, the journals of which play in slots *d<sup>4</sup>* in the sides of the trough C'. The roller *d<sup>3</sup>* rests with its weight upon the cotton  
65 or other fibrous material on the apron C, and rises and falls slightly to accommodate itself to irregularities in the amount of cotton on the apron. Nearly all the air which enters the casing A' enters with the fibrous materials  
70 and the combination of the apron and rollers gives a much more regular feed of air and fibrous materials than is possible with a hand-feed.

Upon the shaft of the apron-roller *d* is a 75 bevel-wheel, *e*, and a friction-wheel, *f*, and upon the shaft of the upper or "gravity" roller, *d<sup>3</sup>*, is a corresponding friction-wheel, *f'*, engaging with the wheel *f*. When the quantity of material on the apron C is sufficient to raise  
80 the gravity-roller *d<sup>3</sup>* in its bearings, the latter will rotate by frictional contact with the material alone. When, however, the quantity of material on the apron is not sufficient to so  
85 raise the said-roller, it will be rotated by the friction-wheels *f f'*, and the loose locks of material will be prevented from piling up behind the roller, as might be the case if the roller remained stationary. The rotation of  
90 the roller *d<sup>3</sup>* by the wheels *f f'*, when the quantity of material on the apron C is insufficient to raise the said roller, conduces to an even and uniform feed of material. The arrangement of the feeding-trough C' and feeding-  
95 apron C on the top of the casing and lengthwise of and parallel with the casing and beater-shafts is very desirable, because it economizes space, and also because the feeding-trough and apron can then be made of great length, thus  
100 affording ample opportunity for the attendant to evenly distribute the material over the apron after throwing it thereon and before it reaches the feeding-opening *c*.

D designates a shaft which carries a bevel-pinion, *e'*, engaging with the bevel-wheel *e*,  
105 and which receives motion by a belt, D', from a second shaft, E. The shaft E is driven by a belt, *e<sup>2</sup>*, from the driving-shaft B, said belt



passing over a pulley,  $e^3$ , on said shaft E. At the opposite end of the casing from the feed-opening  $c$  is the delivery-opening  $g$ , and the cotton entering at  $c$  all has to pass to the opening  $g$ , which is on the side opposite the shaft B.

Upon the shafts B B' are beaters, which not only beat and open the cotton or other fibrous materials, but which also cause the same with the air to pass from the feed-opening  $c$  to the delivery-opening  $g$ . The peculiar forms and arrangement of the beaters is shown in Fig. 5. At the entrance or feeding end of each shaft are secured one or more beaters, F, which are shaped somewhat like a propeller, their blades being spiral, so that they will feed or move the cotton or other material and the air with it toward the delivery end of the machine.

Following the beaters F, are beaters F', one or more of which are secured on each shaft. The beaters F' tend to open the materials, and also aid in feeding the same along. Following the beaters F' are straight-armed beaters F<sup>2</sup>, which perform effectively the work of opening the materials not already opened or loosened, and the beaters F<sup>2</sup> are continued to the end of the shaft B'. On the end of the shaft B are one, two, or more broad-bladed beaters, F<sup>3</sup>, the purpose of which is to throw the opened cotton or other materials across the casing and within range of the beaters F<sup>2</sup> on the shaft B', which throw the opened material into the delivery-opening  $g$ . The peculiar arrangement of beaters on the shafts B B' produces a positive feed of the materials through the machine and insures their being uniformly and thoroughly beaten and cleaned.

In Fig. 3 I have shown a scutching-blade, G, in conjunction with which the beaters act. This scutching-blade is secured to the top of a timber, G', in the wood casing by means of screws  $h$  or other devices, and projects nearly to the circle described by the ends of the beaters. When the one edge of the said blade becomes worn round and is no longer effective, I remove the hood A' and take out or loosen the screws  $h$ , or other devices which secure the blade, and I then reverse the blade or change it end for end, and bring the opposite edge, which is sharp and effective, into a position for use. If the frame of the machine were of iron, this separate blade G might be dispensed with, and the frame constructed so as to serve the purpose of a scutching-blade.

In the lower part, A, of the casing, and below the beaters, is arranged the grid or screen H. Usually the grid employed in connection with the two beater-shafts has been composed of two segments, which are of approximately the same curvature as the circle described by the ends of the beaters, but of a slightly greater radius. When thus constructed, the beaters on the shaft B tend to throw the cotton or other materials upward and against the shaft B', which prevents the beaters on the latter shaft from working effectively. To prevent

this, I make the grid approximately flat below and between the two shafts, and then both sets of beaters can work effectively. The grid here shown is composed of a central or middle portion,  $i$ , made of perforated sheet metal, and supported upon bars  $i'$  and several longitudinal bars,  $i^2$ , at each side of the portion  $i$ . The two curved edge portions  $i^3$  may be solid or perforated.

I designates the delivery-apron, extending from the delivery-opening  $g$ , and mounted on rollers  $j j'$  and an intermediate roller,  $j^2$ . The shaft E has upon its end a pinion,  $k$ , which gears into and drives a toothed wheel,  $k'$ , mounted on a stud,  $k^2$ . Attached to the wheel  $k'$  is a pulley,  $l$ , from which a belt,  $l'$ , extends to a pulley,  $l^2$ , on the shaft of the apron-roller  $j$ , and thereby operates the apron.

J designates a rotary screen or a perforated or reticulated cylinder arranged over the apron I, and between it and the apron the cleaned and opened materials are delivered.

Upon the shaft of the screen or cylinder J is a gear-wheel, J', and attached to and rotating with the wheel  $k'$  and pulley  $l$  is a pinion,  $l^3$ , which engages with the wheel J' and drives the screen J.

At the side of the casing A<sup>2</sup> of the screen J is a blower-casing, K, which communicates by openings  $m$  with the interior of the screen, and contains an exhaust-fan, K', which is driven by a belt, K<sup>2</sup>, from a pulley, K<sup>3</sup>, on the shaft B. The opening in the casing A<sup>2</sup> through which the apron I passes is closed by a roller, L, below which the opened and cleaned materials pass as they are delivered by the apron.

It will be observed that inasmuch as all the movable parts of the machine are driven from the shaft B, only one driving-belt from the line-shafting to the machine is necessary.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The combination, with the casing provided with a feed-opening in the top at one end and a delivery-opening at the other end, of beater-shafts and beaters arranged in said casing, mechanism for rotating said beater-shafts, a feeding trough or receptacle arranged on top of said casing lengthwise thereof and parallel with the beater-shafts, a feeding-apron in said trough or receptacle, and means for operating said apron, a roller above said apron at the feeding-opening, and bearings for said roller, which permit of its rising and falling as the quantity of material on the feeding-apron varies, substantially as herein described.

2. The combination, with the casing provided with a feeding-opening at one end and a delivery-opening at the other end, of the beater-shafts B B', mechanism for rotating said shafts, the beaters F F' F<sup>2</sup> F<sup>3</sup> on the shaft B, and the beaters F F' F<sup>2</sup> on the shaft B', substantially as herein described.

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