

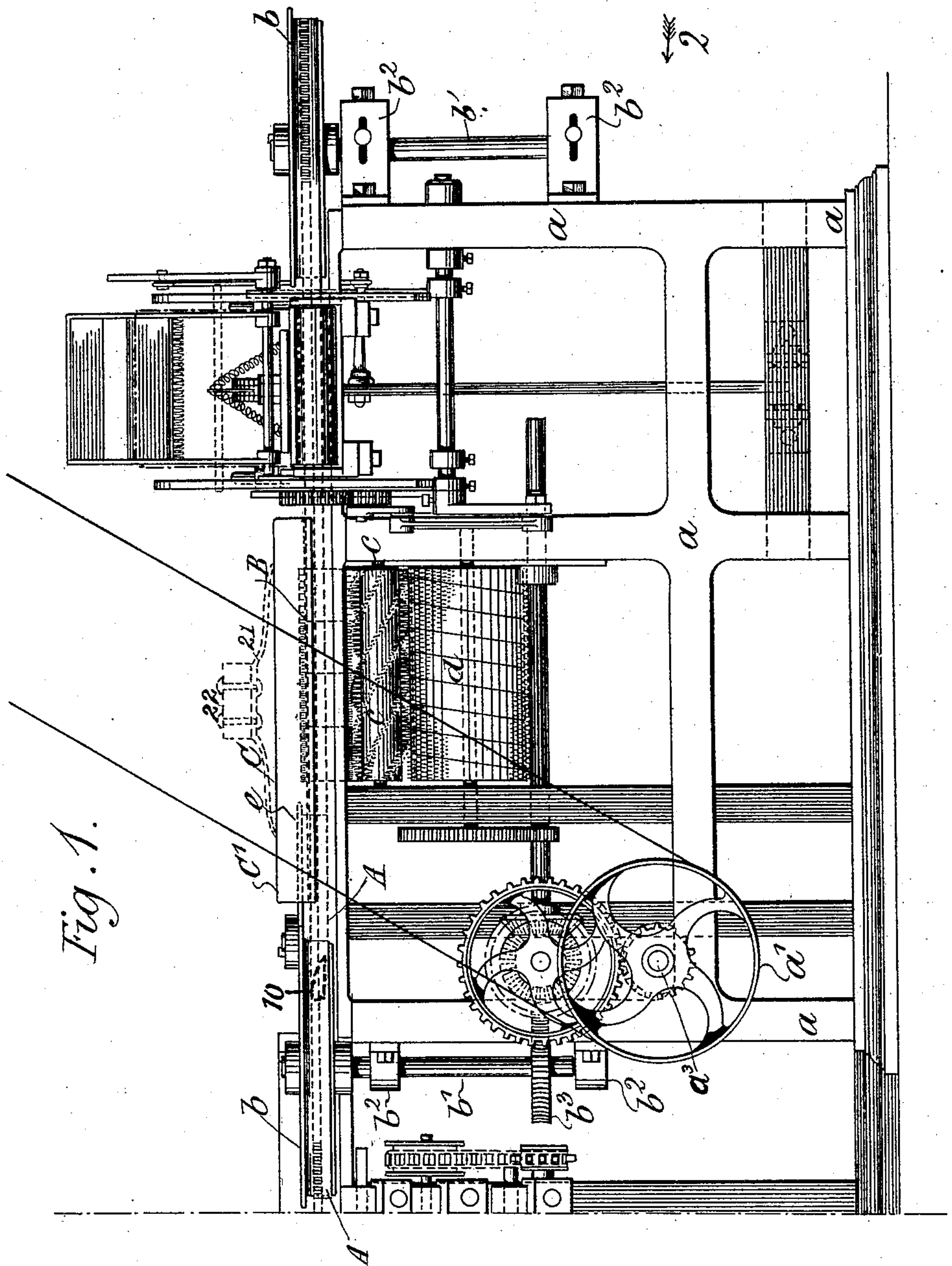
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8 Sheets—Sheet 1.

G. E. DONISTHORPE & T. BURROWS.  
MACHINE FOR COMBING FIBROUS MATERIALS.

No. 482,960.

Patented Sept. 20, 1892.



Witnesses.

Rey. C. Bowen  
J. Q. Wilson

Inventors

G. E. Donisthorpe  
Taylor Burrows  
By Whitman & Wilkinson  
Attorneys.

(No Model.)

8 Sheets—Sheet 2.

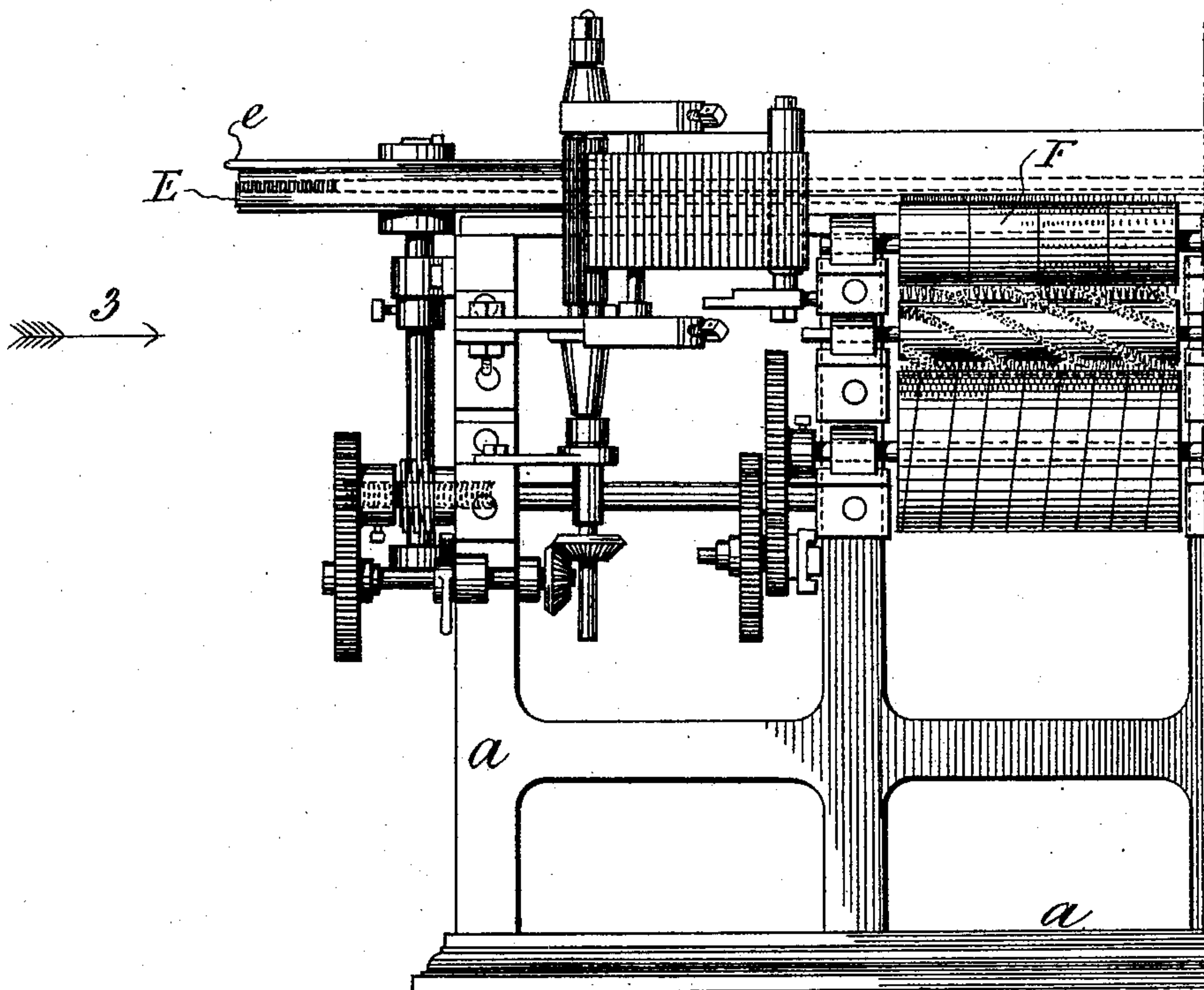
G. E. DONISTHORPE & T. BURROWS.

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*Fig. 1<sup>a</sup>*



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*L. C. Wilson*

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(No Model.)

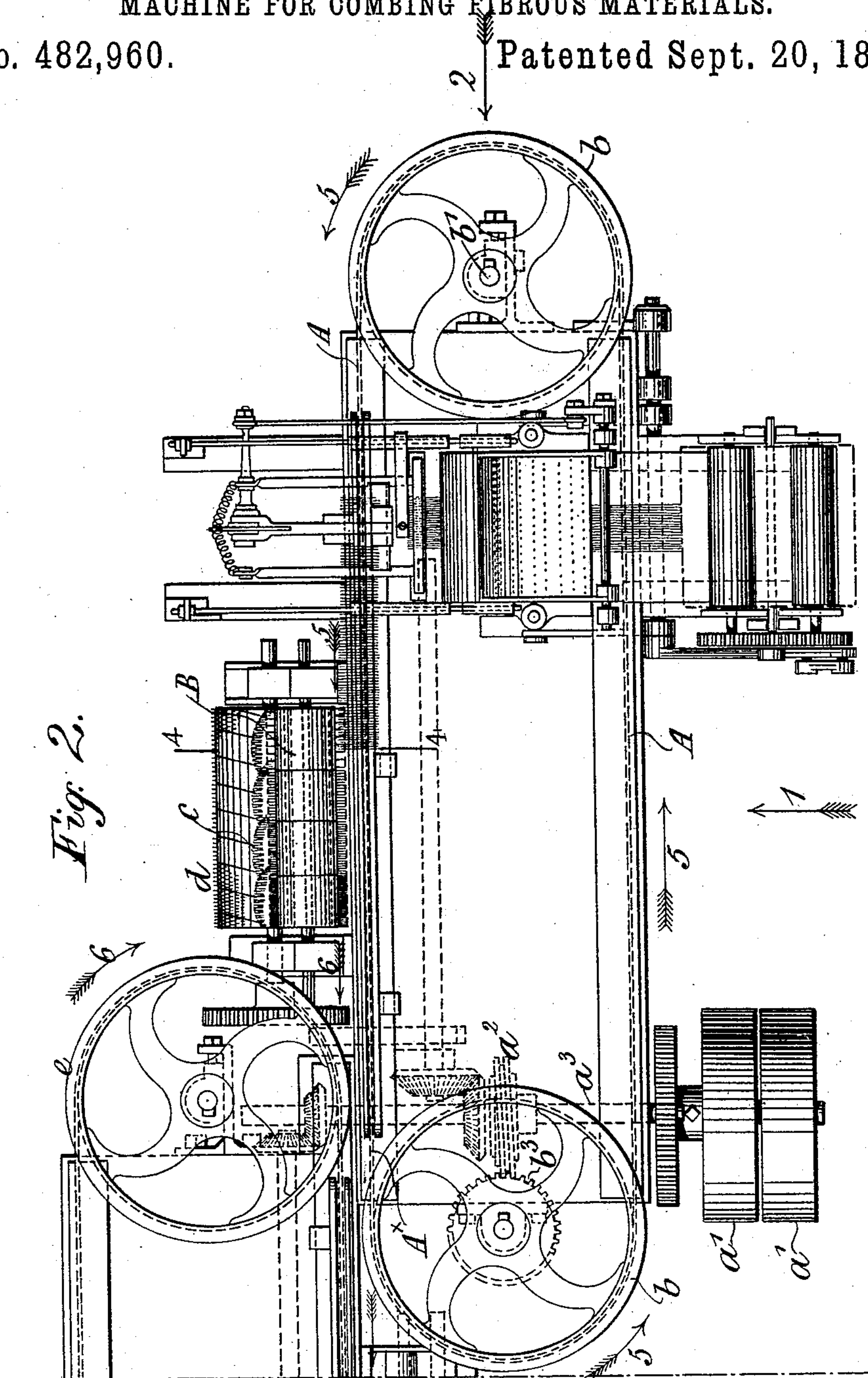
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G. E. DONISTHORPE & T. BURROWS.

# MACHINE FOR COMBING FIBROUS MATERIALS.

No. 482,960.

Patented Sept. 20, 1892.



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(No Model.)

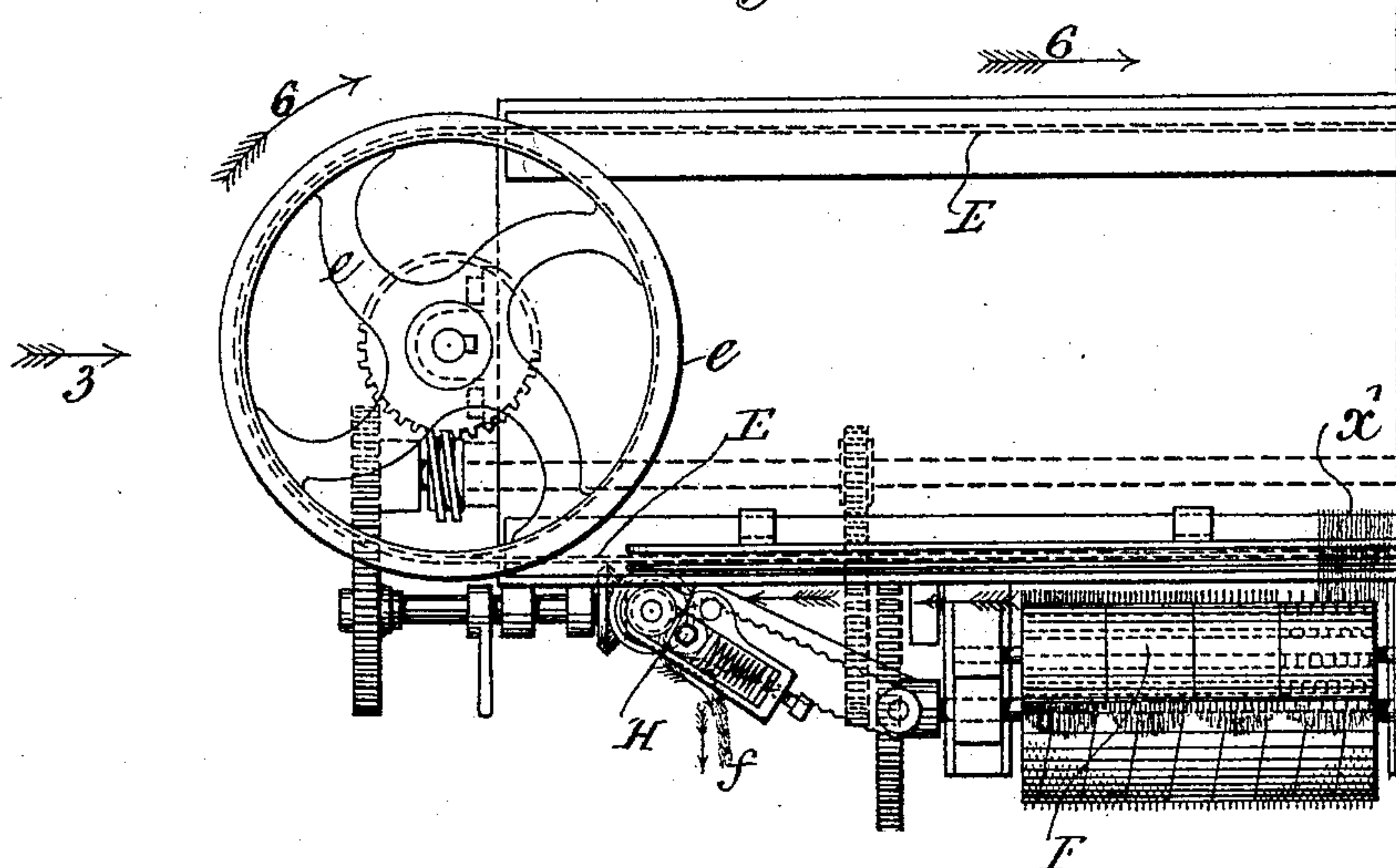
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MACHINE FOR COMBING FIBROUS MATERIALS.

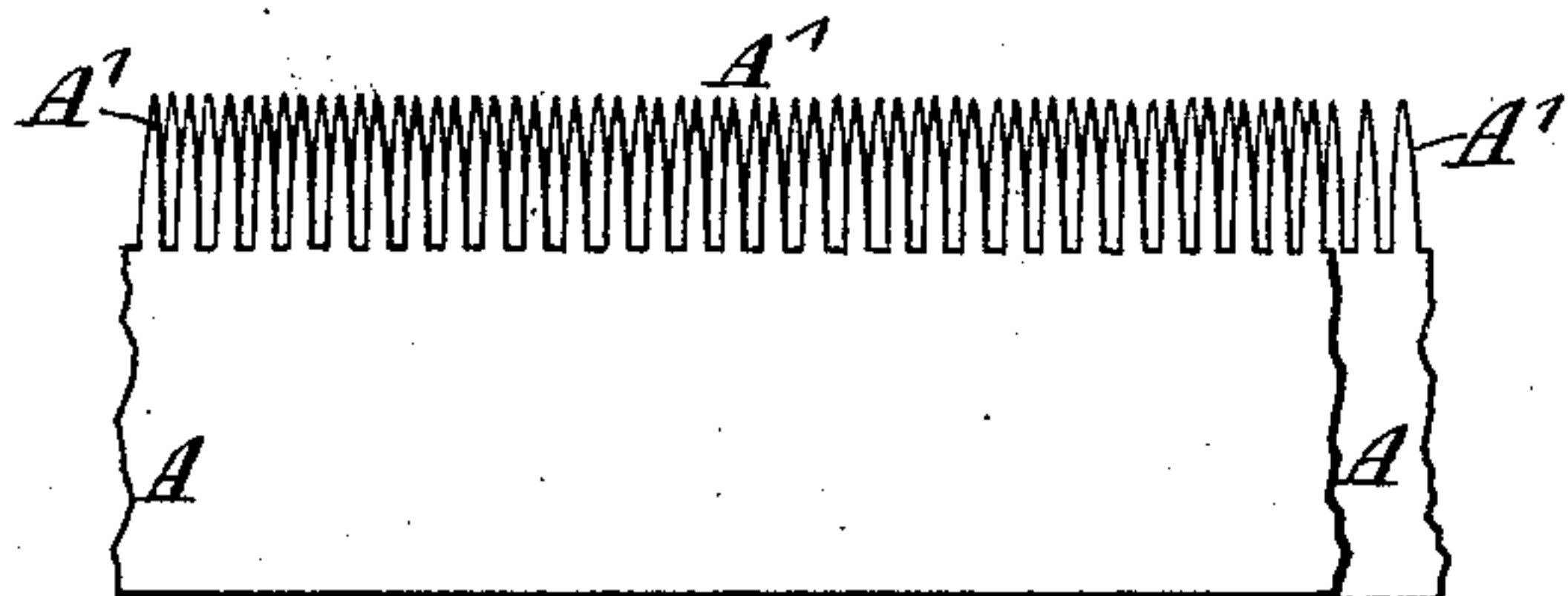
No. 482,960.

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*Fig. 2<sup>a</sup>*



*Fig. 3.*



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(No Model.)

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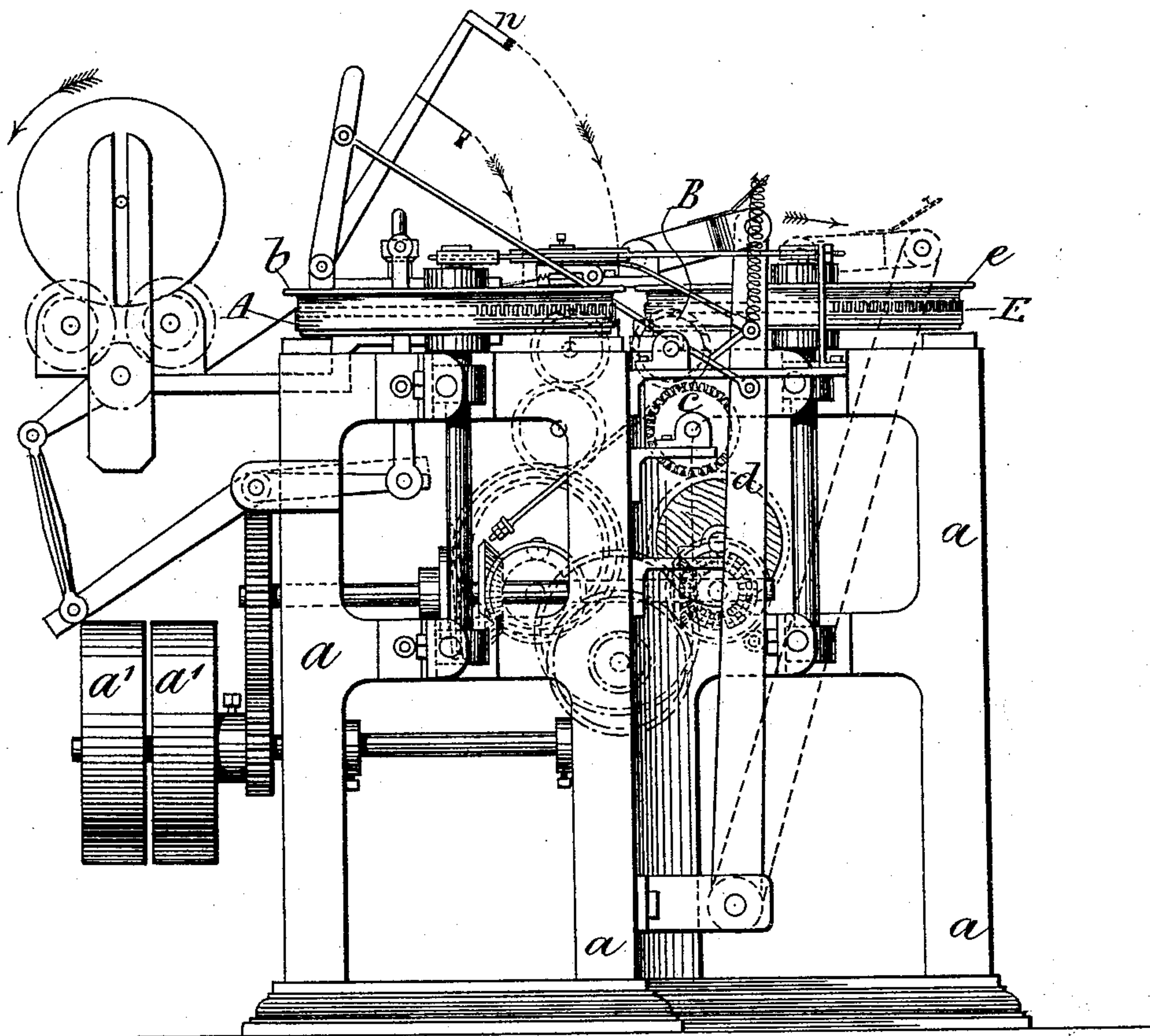
G. E. DONISTHORPE & T. BURROWS.

MACHINE FOR COMBING FIBROUS MATERIALS.

No. 482,960.

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*Fig. 4.*



*Witnesses.*

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(No Model.)

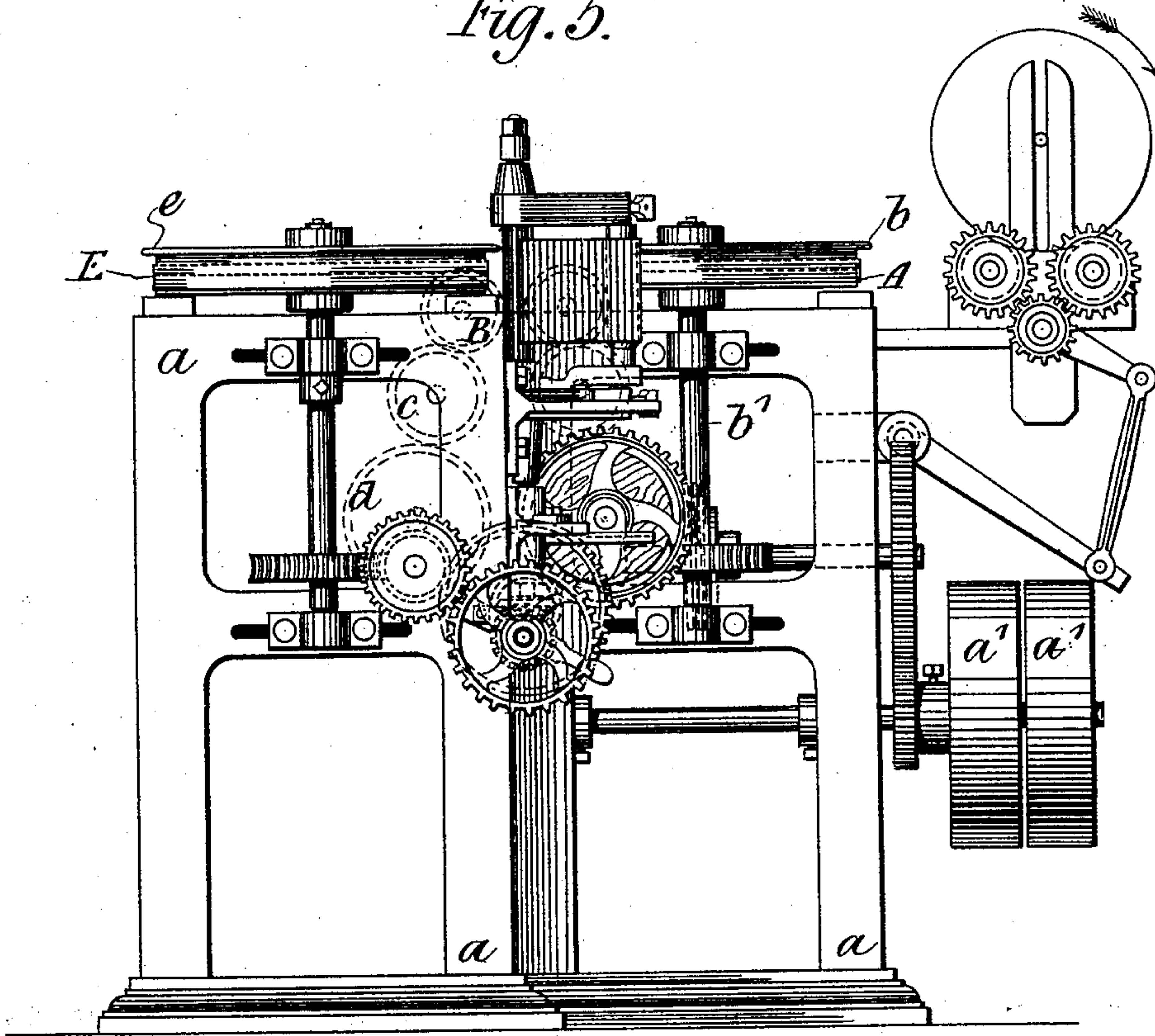
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Patented Sept. 20, 1892.

*Fig. 5.*



*Witnesses.*

Roy C. Bowen  
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(No Model.)

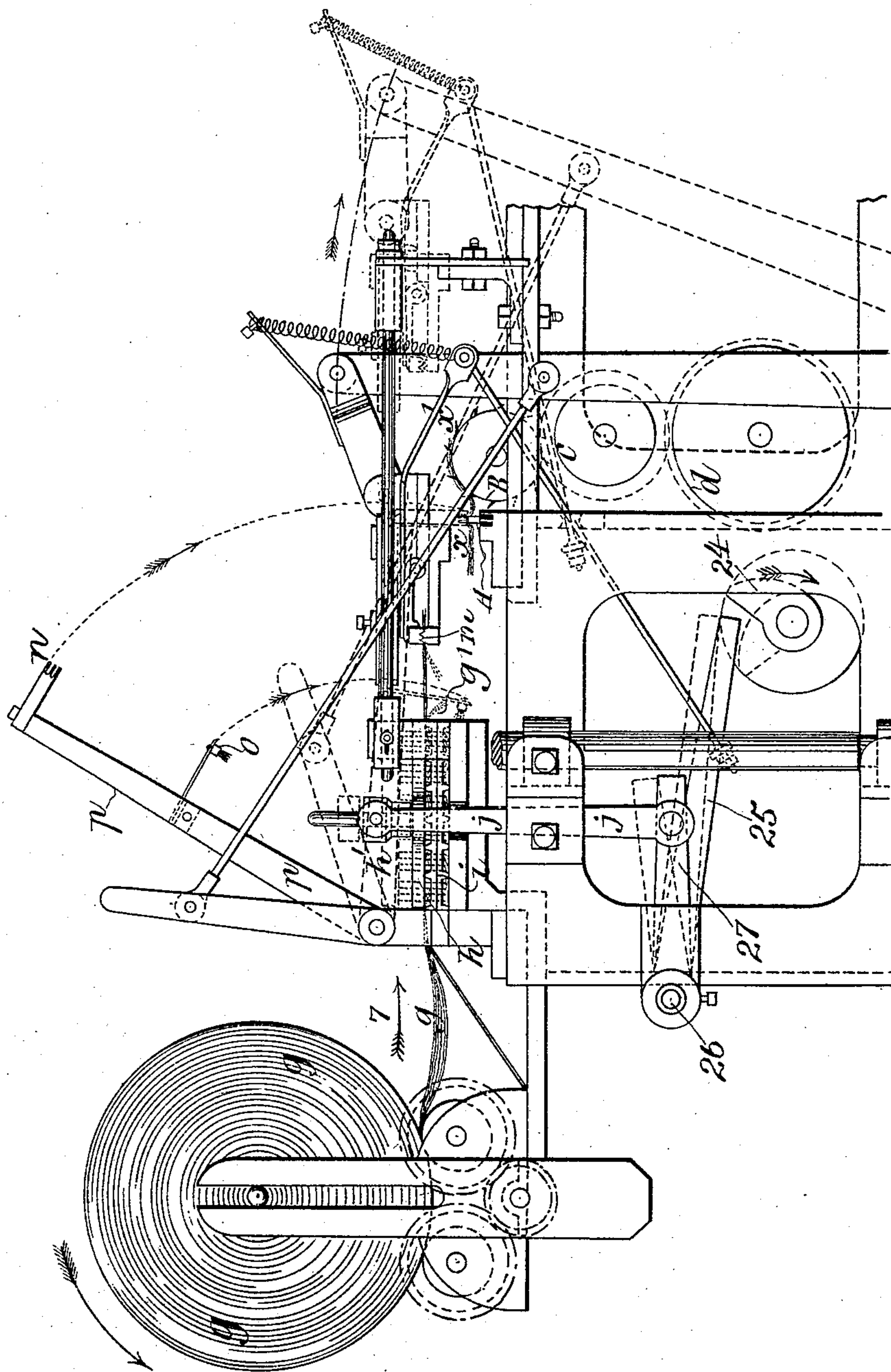
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Fig. 6.



Witnesses.

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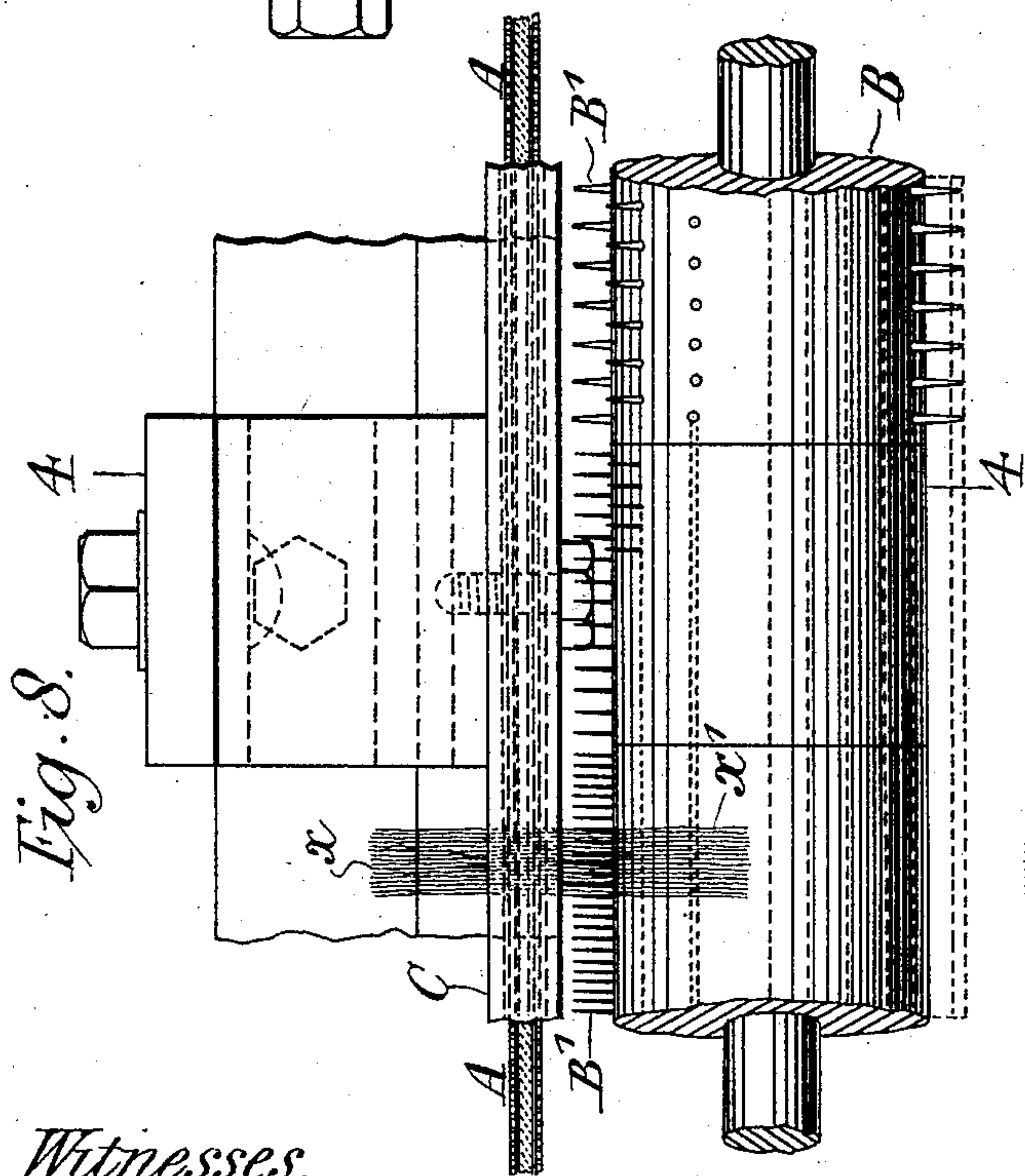
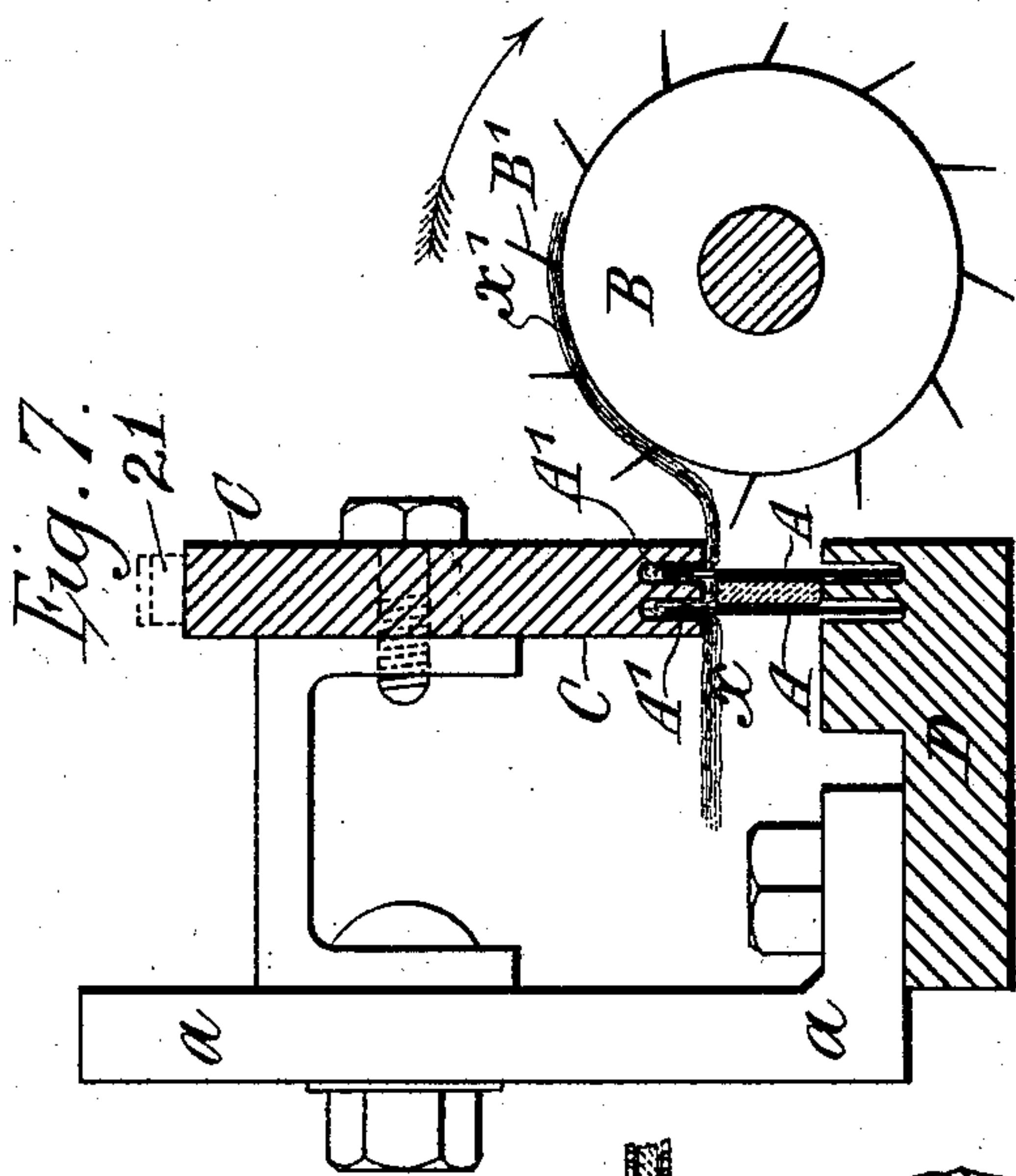
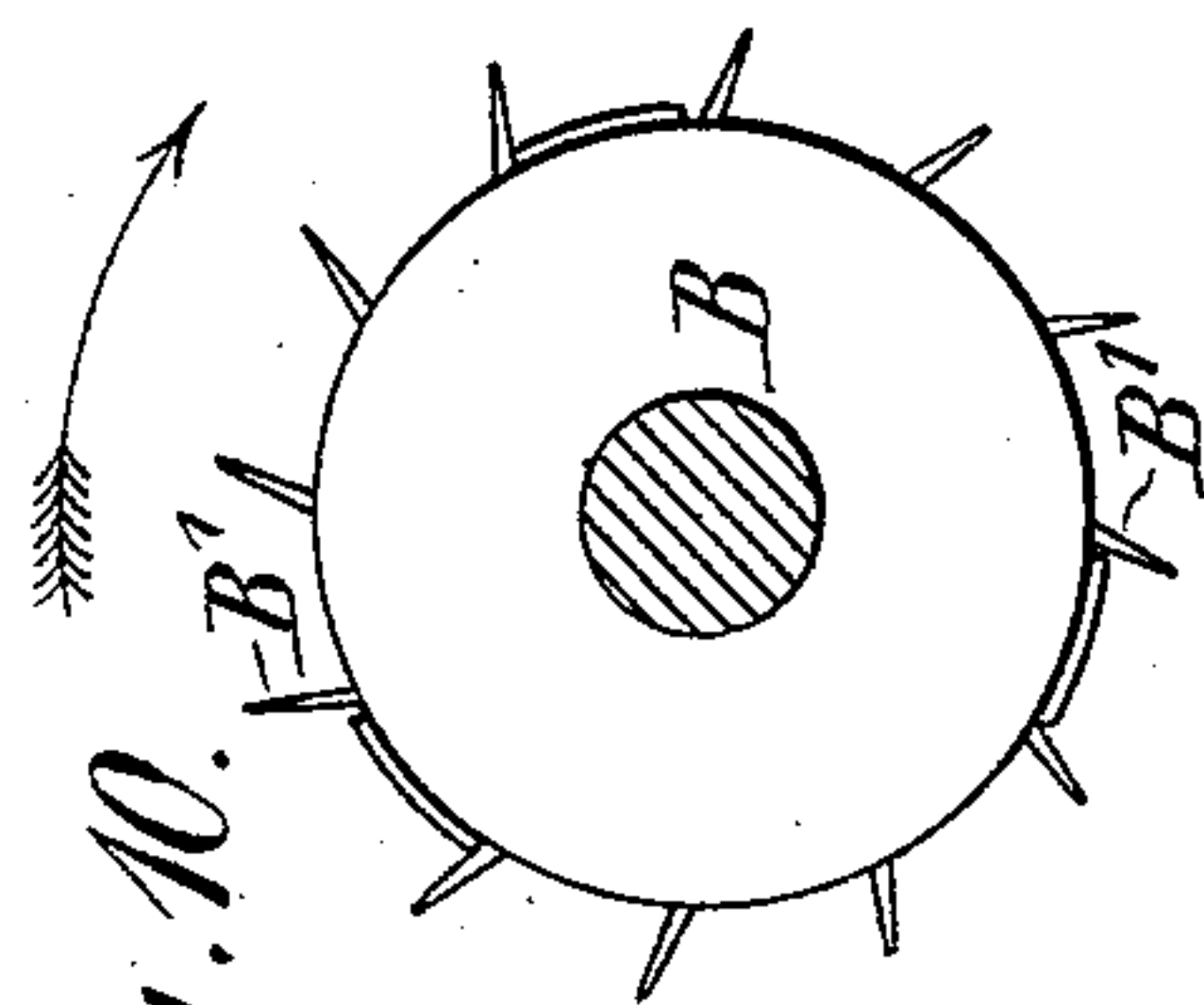
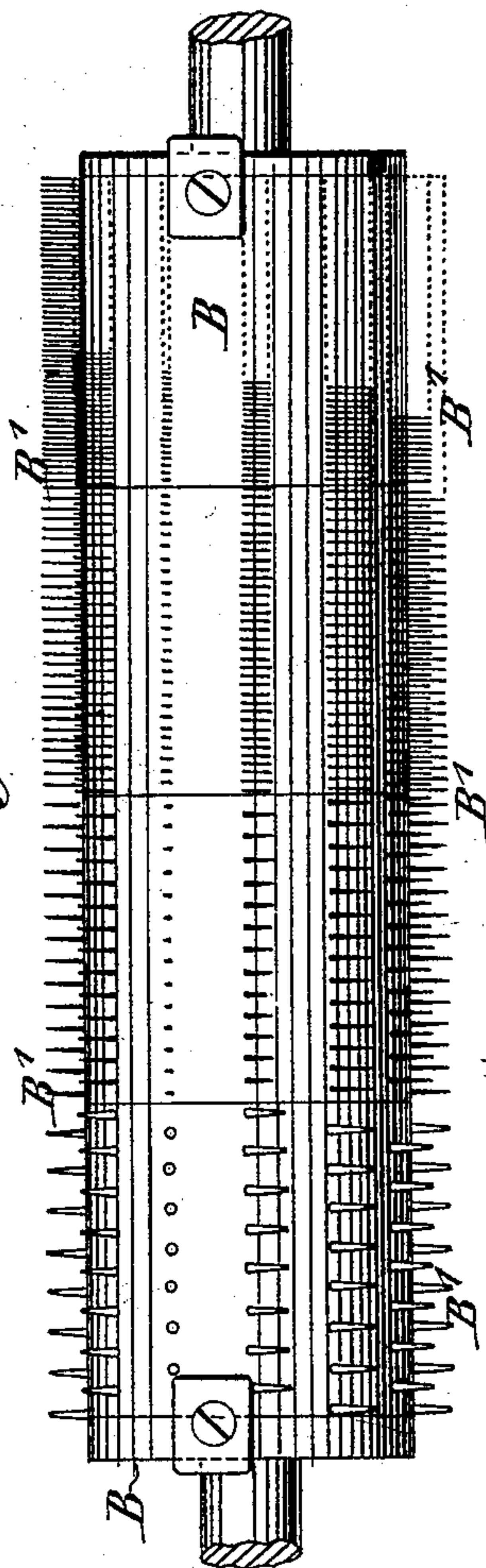


Fig. 9.



Witnesses.

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# UNITED STATES PATENT OFFICE.

GEORGE EDMUND DONISTHORPE AND TAYLOR BURROWS, OF LONDON,  
ENGLAND.

## MACHINE FOR COMBING FIBROUS MATERIALS.

SPECIFICATION forming part of Letters Patent No. 482,960, dated September 20, 1892.

Application filed January 21, 1892. Serial No. 418,820. (No model.)

*To all whom it may concern:*

Be it known that we, GEORGE EDMUND DONISTHORPE, merchant, residing at 12 Oat Lane, in the city of London, England, and TAYLOR BURROWS, engineer, residing at 88 Upper Kennington Lane, London, in the county of Surrey, England, subjects of the Queen of Great Britain, have invented certain new and useful Improvements in Machines for Combing Fibrous Materials, such as Wool, Flax, China-Grass, Silk Waste, &c., of which the following is a specification.

This invention relates to improvements in machines for combing fibrous materials, such as wool, flax, china-grass, silk waste, or the like, and we would here remark that our present machine will be found to be more advantageous for some fibers than for others. For instance, we consider our present invention more especially advantageous for fibers such as china-grass and flax.

Our present invention consists of a novel means of presenting one end of the fiber to the combing-roller or combing device, transferring such fiber to another similar part of the machine so as to present the other end of the fiber to a second combing-roller or combing device, and thereafter the fiber is drawn off (after being thus combed) in one continuous sliver, or as desired.

Furthermore, our present invention relates to a graded combing-roller or combing device having graduated comb pins or teeth thereon, and to the feeding device and other details, all of which will be hereinafter fully described, and finally pointed out in the claims.

We will now therefore proceed to describe our said invention with reference to the drawings hereunto annexed.

Figure 1 is a side elevation of the machine looking in the direction of the arrow 1, Fig. 2, one part of the machine—i. e., the finishing end—being “broken off” and shown in a separate view, Fig. 1<sup>a</sup>. Fig. 2 is a plan of the machine, the finishing end being again broken off and shown on a separate sheet at Fig. 2<sup>a</sup>. Fig. 3 is a side view of a piece of the traveling endless band or carrier, shown double, which carries along the lengths or tufts of fiber and presents the same to the action of the combing-rollers, such as Figs. 9 and 10.

Fig. 4 is an elevation of the feed end of the machine—i. e., looking in the direction of the arrows 2, Figs. 1 and 2. Fig. 5 is an elevation of the opposite end of the machine—i. e., looking in the direction of the arrows 3, Figs. 1<sup>a</sup> and 2<sup>a</sup>. Fig. 6 is an enlarged view, looking in the direction of the arrows 2, Figs. 1 and 2, of the feed-head and parts connected therewith, other parts of the machine being removed to illustrate more clearly the feed-head part. Fig. 7 is a cross-section, taken through the traveling bands or carriers and combing-roller on line 4 4, Figs. 2 and 8. Fig. 8 is a local and enlarged plan view of the combing-roller and adjacent parts, showing the relative position of said roller to the carrier-band which presents the material to be combed to the said roller. Fig. 9 is a separate enlarged plan view of the complete combing-roller, showing the graded comb teeth or pins thereon. Fig. 10 is an end view of said roller.

Similar letters of reference indicate corresponding parts throughout.

*a* is the supporting frame or standard, of any suitable construction, carrying the fast and loose pulleys *a' a'*, which actuate the trains of wheels and various moving parts of our machine carried in or on or supported by the said frame *a*.

*b b* are two large pulleys or drums mounted in a horizontal plane and revolved by the vertical axes *b' b'*, respectively, which are mounted in brackets, such as *b<sup>2</sup> b<sup>2</sup>*, on the frame *a*, (see Fig. 1,) the said axes *b'* being revolved by any suitable mechanism, such as the worm-wheel *a<sup>2</sup>* on the shaft *a<sup>3</sup>*, actuated by the pulley *a'*, gearing with the toothed wheel *b<sup>3</sup>* on the axis *b'*, as shown in Figs. 1 and 2. These drums or pulleys *B* are slowly revolved in the direction of the arrows 5, Fig. 2, and carry around with them the endless band or bands or other equivalent device, forming the traveling carrier *A*. This carrier consists, advantageously, of two endless steel or other metal bands, as shown, or one endless band only, or more than two, if desired, the upper edge of each such band *A* being formed with serrations or teeth *A'*, something like comb-teeth, into which teeth *A'* the fiber to be combed is intermittently pressed



down in tufts or lengths by the feed-head or feeding device, hereinafter described and set forth, or by any equivalent or suitable means.

As the material to be combed (or tufts of fiber) is pressed down across and into the teeth  $A'$  of the endless band  $A$ , the latter is caused to travel along in the direction of the arrows 5, Fig. 2, as previously explained, and carries the fiber along therewith toward the combing-roller  $B$ , which is mounted with its axis parallel or thereabout to the line of travel of the carrier-band  $A$  between the pulleys  $b$ . This comb-roller  $B$  is suitably revolved by convenient mechanism (not shown) at a slow or suitable speed and the comb teeth or pins  $B'$  of said roller  $B$  are advantageously graded, as shown, (or in any other equivalent manner,) so as to "humor" the fiber and not comb the same too violently at first, but gradually and steadily comb the fiber down to the degree of fineness required.

The combing-roller  $B$  is mounted, relatively, to the traveling band or carrier  $A$  in about the position shown in Figs. 1, 2, 4, 6, 7, and 8, and is cleaned by a brush  $c$  and "doffer"  $d$ , Figs. 1, 2, and 6, or in any similar or convenient manner.

The fiber deposited by the feed in the carrier-band  $A$  is carried along by the said traveling band  $A$  under the vertical pressing-plate  $C$ , Figs. 7 and 8, the lower edge of which is slotted longitudinally, so as to overlap outside and between the teeth on the two traveling bands  $A$ , (as shown in Fig. 7, or three separate plates to effect the same purpose may be used instead of one such plate, as  $C$ ), so that the fiber  $x$  is passed right down and "locked" or very securely held in the teeth  $A'$  of the carrier  $A$ . The lower edge of each band  $A$  travels in a slot or guide formed to receive the same in the bearing-plate  $D$ , Fig. 7, which is fixed or mounted in the frame  $a$ . The vertical pressing-plate  $C$  may be mounted with springs, as shown in dotted lines in Fig. 1, where 21 represents a spring and 22 a block, rigidly attached to the framework above the plate  $C$  and supporting the springs, so as to "give" or rise a little with any extra thickness of material in the traveling carrier  $A$ . The ends  $x'$  of the fiber  $x$ —i. e., the ends hanging outside of the band  $A$ —thus securely wedged in the said carrier  $A$  are now presented to the action of the combing-roller  $B$ , and first to the coarse open pins or teeth, and then as the carrier  $A$  continuously travels on to the finer and finer teeth till at the end of roller  $B$  the ends  $x'$  are all thoroughly combed and finished. The fiber  $x$ , with the end  $x'$  combed, now comes from under the end  $C'$ , Fig. 1, of the wedging or pressing-plate  $C$ , and is free to be lifted out of the teeth  $A'$  of the band  $A$ . The fiber is removed from the band  $A$  by mechanism well known in the art—such as the plow 10—and not shown herein. The combed end  $x'$  of the fiber  $x$  now falls onto and into the teeth of a second traveling band or carrier  $E$ , identical or equivalent in all re-

spects with the first carrier  $A$ . Said carrier  $E$  is carried around in the direction of the arrows 6 by the two drums or pulleys  $e e$ , revolved in a similar manner to  $b b$ , and in all other respects similar to  $A$ , this carrier  $E$  having teeth similar to the teeth  $A'$  on the carrier  $A$ , and supporting-plate similar to  $D$ , and depressing-plate similar to  $C$ , the object of this second carrier  $E$  being to present the now uncombed end of the fiber to the action of another combing-roller  $F$ , similar in all respects to  $B$  and kept clean also in a similar manner. The fiber  $x$  being lifted out of the first carrier  $A$  at the point  $A^x$ , Fig. 2, now falls into the teeth of the second comb  $E$ , the part already combed lying in the teeth and inside of the band  $E$ , while the now uncombed end hangs outside, and the latter is then presented to the action of the graded combing-roller  $F$  in the same manner as with the roller  $B$ , the fiber being so securely held in the carrier  $E$  (during the actual combing) as to withstand the pull or drag of the combing-roller  $F$  as with the first carrier  $A$  and roller  $B$ . After passing along the combing-roller  $F$  the fiber is now completely combed and finished from end to end and is then drawn off (at about the point marked  $H$ , Fig. 2<sup>a</sup>) in one continuous sliver  $f$ , by any well-known or suitable "drawing-off" mechanism, to which latter no claim is made, as the same is well known and well understood.

We will now proceed to describe (more particularly with reference to Fig. 6) the feed-head or feeding device. The material  $g$  to be combed is fed in the direction of the arrow 7 in beneath the plate  $h$ , and a tuft of said material  $g$  protrudes and hangs down at  $g'$ , Fig. 6. The pin-plate  $h$  carries a series of pins, which pass through the fiber  $g$  and enter corresponding holes or apertures in a kind of grid or perforated plate  $i$  below. The pin-plate  $h$  has a vertical up-and-down motion imparted thereto by the rod  $j$  at each side thereof, so as to tightly hold the fiber  $g$  and then leave the same free alternatively. This is effected by the cam 24, which is connected to the driving mechanism in any convenient way, which alternately raises and lowers the arm 25, which turns the rock-shaft 26 and the arm 27, keyed thereon, and so raises and lowers the arm  $j$ . Opposite the pin-plate  $h$  (on the inside end thereof) a nip-jaw  $m$  works, and is operated as follows: The nip-jaw  $m$  is brought close up to the pin-plate  $h$  and engages and nips hold of the tuft  $g'$ , hanging out. The pin-plate is now raised (to about the position shown at  $h'$ ) and the whole length of material  $g$  is drawn forward freely as the closed jaw  $m$  retires. As the jaw  $m$  retires still farther away from  $h$ , the latter is moved down and the material  $g$  is firmly held between  $h$  and  $i$ . The closed nip-jaw  $m$  still further retires and now tears out and away from  $g$  a length of the fiber leaving a tuft  $g'$  of the material protruding from  $h i$ , ready for the next approach of the nip-jaw  $m$ . The



nip-jaw *m* with the length of material *x* therein now retires right back to the limit of its backward motion, whereupon the nip-jaw is mechanically opened and the length of fiber  
 5 *x* is deposited onto the traveling band *A* and is pressed into the teeth of same by a dabbing-brush *n*, which at that moment descends, as shown in Fig. 6. The second brush *o* on the  
 10 dabbing-brush arm *p* serves to brush up and prepare the protruding end *g'*, ready for the nip-jaw *m* to seize on its next approach.

Having thus described and set forth our said invention, what we claim, and desire to secure by Letters Patent of the United States,  
 15 is—

1. In a combing-machine of the character described, the combination, with a suitable combing device, of an endless carrier for the fibrous material consisting of a plurality of  
 20 bands carrying parallel rows of teeth on their upper edges, and a compressor plate or plates fitting between said parallel rows of teeth, and adapted to hold said fibrous material between said teeth while it is being combed, substan-  
 25 tially as and for the purposes described.

2. In a combing-machine of the character described, the combination, with a suitable combing device, of an endless carrier for the fibrous material consisting of a plurality of  
 30 bands carrying parallel rows of teeth on their upper edges, and a compressor plate or plates fitting between said parallel rows of teeth, with springs at the back of said compressor-plate, the said compressor-plate and springs  
 35 being adapted to hold said fibrous material

between said teeth while it is being combed, substantially as and for the purposes described.

3. An apparatus for combing fibrous material, consisting, essentially, of two traveling  
 40 carriers, with means for holding said fibrous material on said carriers, and two combing-rollers, the first traveling carrier engaging the tufts of fibrous material near the center of  
 45 their length, and the first combing-roller combining the one end of said fibrous material, and the second carrier also engaging the tufts of fibrous material near the center of their  
 length and the second combing-roller combining the opposite end of said fibrous material,  
 50 substantially as described.

4. An apparatus for combing fibrous material, consisting, essentially, of a plurality of toothed carriers each carrying two parallel  
 55 rows of teeth, compressor-plates fitting between said rows of teeth for holding the fibrous material on said carriers, and two combing-rollers having graded teeth, the one roller adapted to comb the one end of the  
 60 tufts of fiber and the other roller adapted to comb the other end, substantially as and for the purposes described.

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