

No. 618,991.

Patented Feb. 7, 1899.

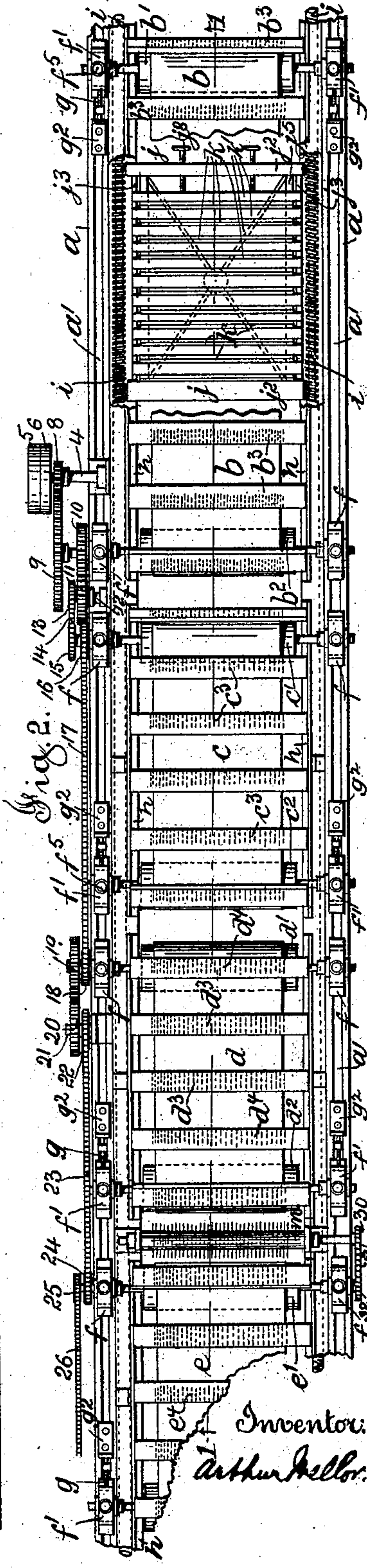
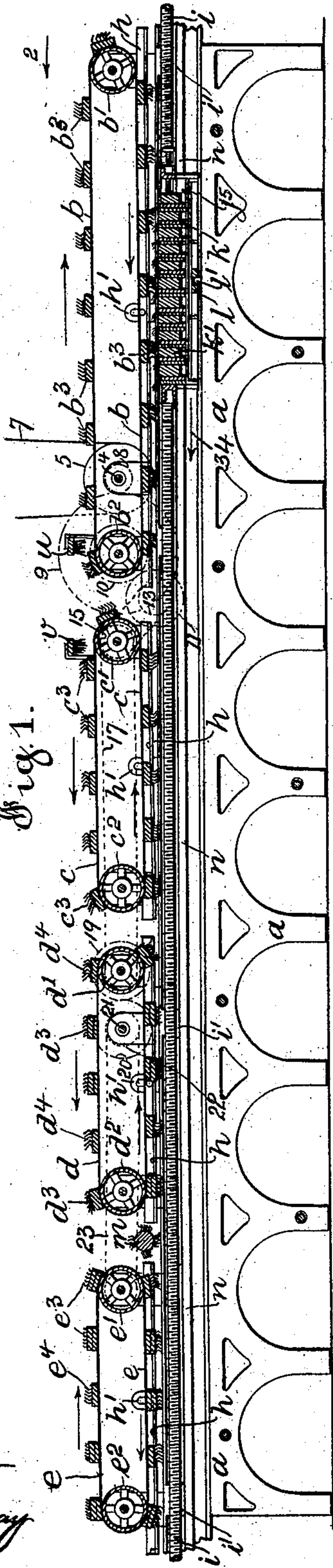
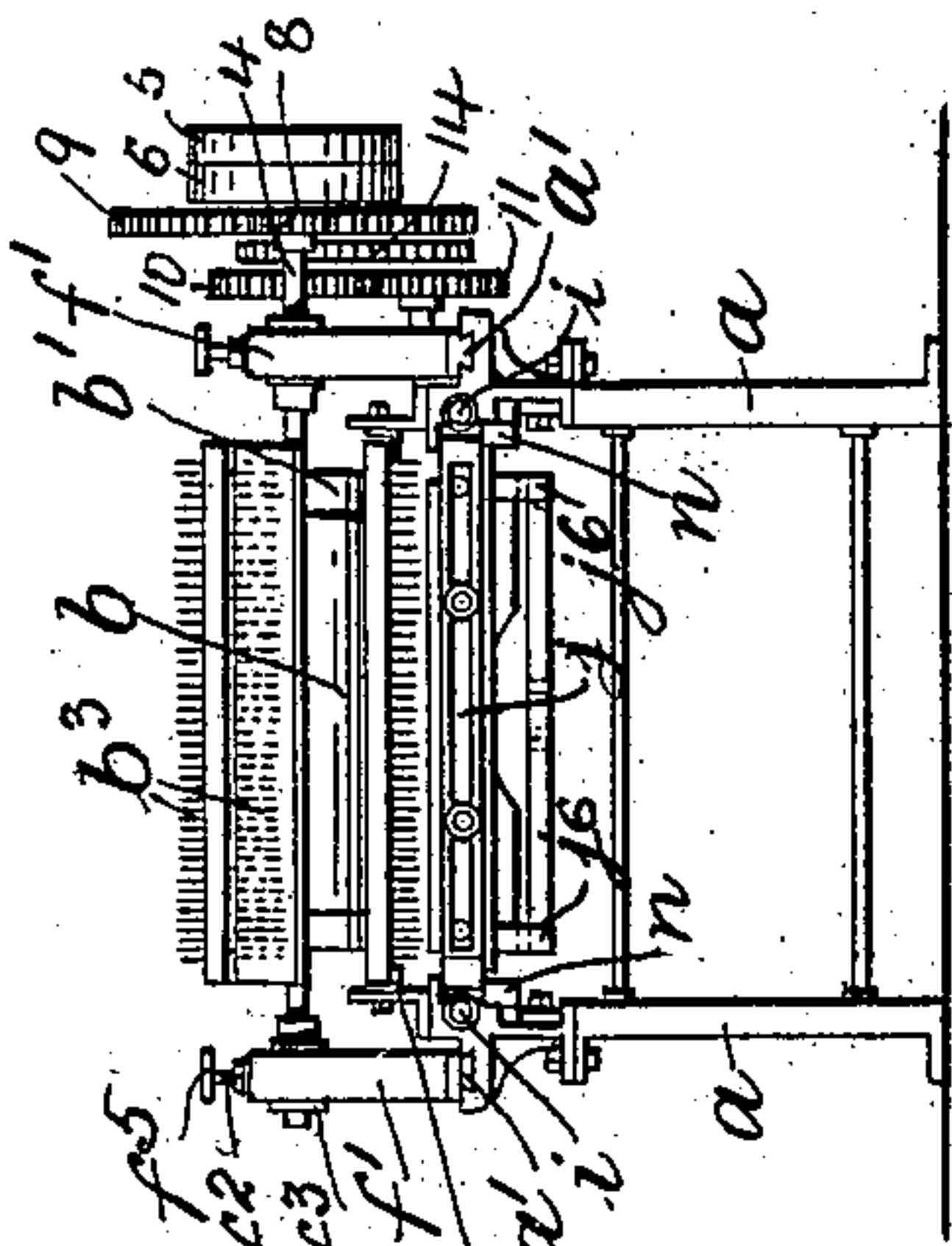
A. MELLOR.

MACHINERY FOR DRESSING SILK, FLAX, &c.

(Application filed July 15, 1898.)

(No Model.)

3 Sheets—Sheet 1.



Witnesses:
Joseph Beaumont
Harry Edward Howbray

Inventor:
Arthur Mellor.

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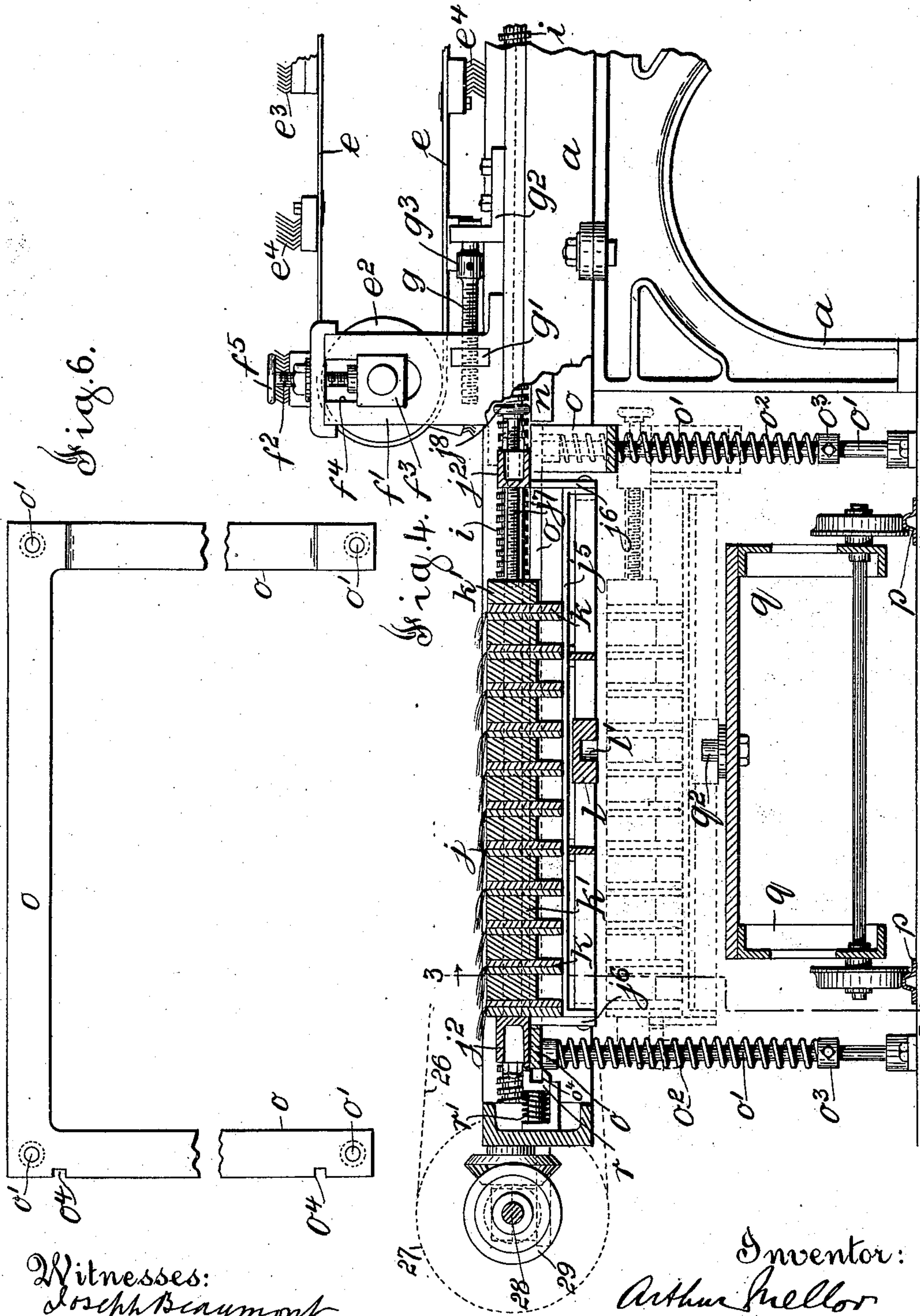
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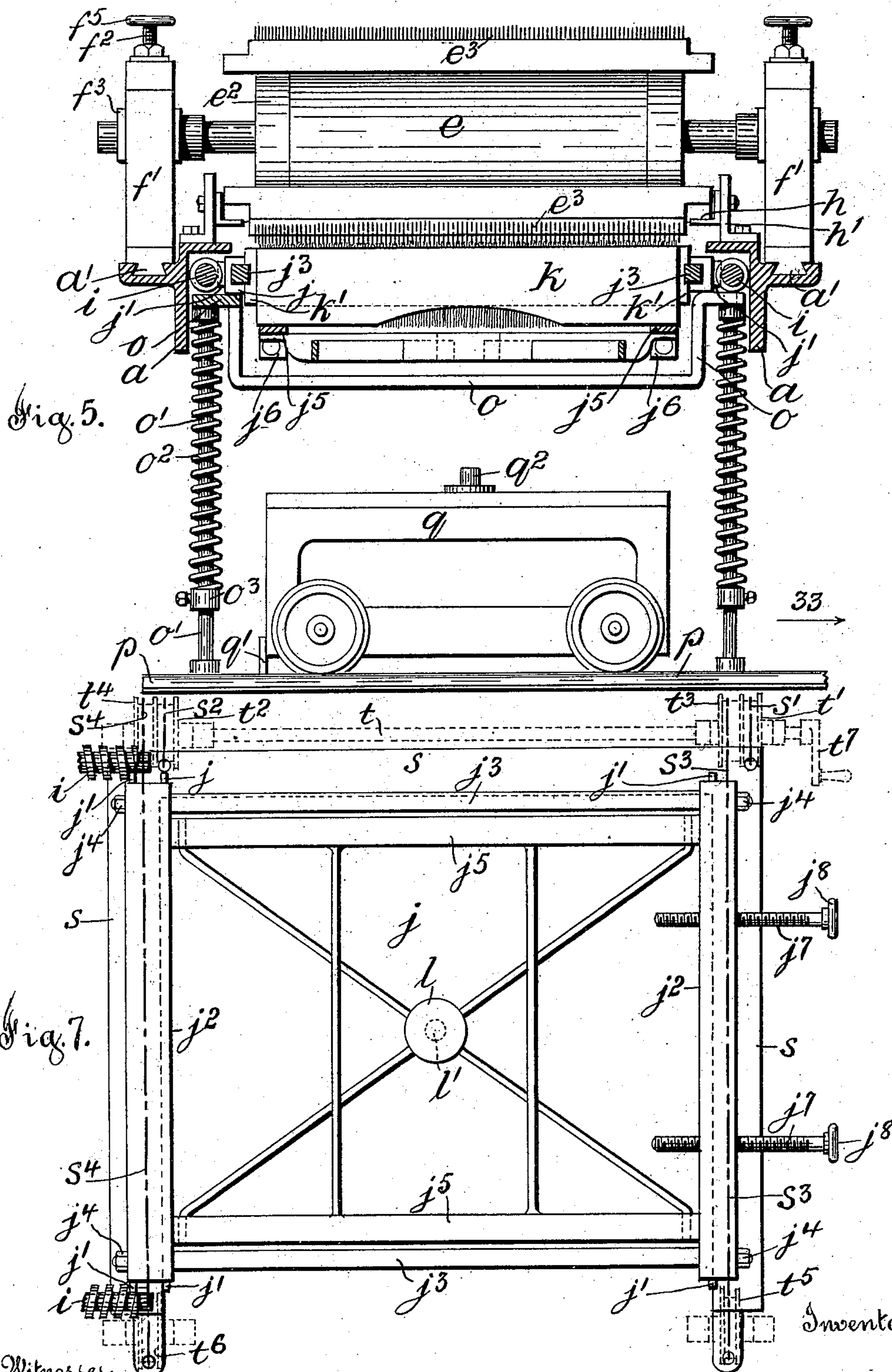
A. MELLOR.

MACHINERY FOR DRESSING SILK, FLAX, &c.

(Application filed July 15, 1898.)

3 Sheets—Sheet 3.

(No Model.)



Witnesses:
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UNITED STATES PATENT OFFICE.

ARTHUR MELLOR, OF MACCLESFIELD, ENGLAND.

MACHINERY FOR DRESSING SILK, FLAX, &c.

SPECIFICATION forming part of Letters Patent No. 618,991, dated February 7, 1899.

Application filed July 15, 1898. Serial No. 686,024. (No model.)

To all whom it may concern:

Be it known that I, ARTHUR MELLOR, a subject of the Queen of Great Britain, residing at Stanley Mount, Crompton road, Macclesfield, in the county of Chester, England, have invented certain new and useful Improvements in Machinery for Dressing Silk, China-Grass, Flax, and Like Fibers; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to apparatus on what is known as the "flat-machine" principle for dressingsilk, china-grass, flax, and like fibers, but more particularly silk.

The ordinary flat silk-dressing machine comprises a single endless sheet or belt carrying a series of combs and traveling horizontally around a pair of rollers. Heretofore the frame containing the boards of silk filling to be dressed has had to be brought into position under the traveling belt of combs and then raised up vertically by the dresser to the proper height and adjusted to a nicety to bring the fibers into contact with the combs and give the depth of combing required. The adjustment of the filling-board frame with respect to the combs necessitates the exercise of great care and skill on the part of the dresser and takes up considerable time, as the frame must be lowered each time to reverse the fillings and then raised up again and readjusted for each separate dressing. This construction of silk-dressing machine restricts the output of work.

The object of my invention is to give an extended and graduated range of dressing or a succession of dressings at one operation or in once passing through the machine and to automatically or mechanically feed the filling-board frames forward horizontally through the machine to comb and dress the fibers, the productive capacity of the machine thus being largely increased and enabling cheaper and less labor to be employed in attending same.

My invention consists in the novel construction, operation, and combination of parts for the purpose above stated, as will be herein after fully described.

Referring to the drawings, Figure 1 is a lon-

gitudinal sectional elevation, taken on line 1 1 of Fig. 2, of my improved silk-dressing machine, the feeding and delivery ends of same being omitted. Fig. 2 is a plan view of Fig. 1, a portion of the first endless sheet of combs and some of the framework being broken away to show more clearly the manner of traversing the filling-board frame through the machine. Fig. 3 is an elevation of the feeding end of the machine, looking in the direction of arrow 2, Fig. 1. Fig. 4 is an enlarged longitudinal elevation, partly in section, of the delivery end of the machine, showing the apparatus for discharging the frame of filling-boards from the machine. Fig. 5 is a transverse sectional elevation taken on line 3 3 of Fig. 4. Fig. 6 is a plan of the discharging-platform. Fig. 7 is a plan of the filling-board frame and platform at the feeding end of machine, showing in dotted lines the apparatus for raising the platform and frame to feed the latter to the machine.

The same letters and numerals refer to corresponding parts throughout.

In the accompanying drawings letters *a a* denote the side frames of the machine, above which are arranged in successive order one behind the other four endless belts or sheets *b, c, d, and e*, passing around rollers *b' b'*, *c' c'*, *d' d'*, and *e' e'*, respectively, and having secured to their surfaces transverse bars of wood clothed with metallic teeth, the teeth on the belts *b* and *c* being long and forming combs *b³ c³* and those on the belts *d* and *e* being varied between short teeth or cards *d³ e³* and long teeth or combs *d⁴ e⁴*, the number of cards *d³ e³* being in excess of the combs *d⁴ e⁴*, which are introduced after every second or third card.

The shafts of the several rollers are journaled in bearings in standards or brackets at each side of the machine, those standards denoted by letter *f* being bolted to the side frames *a a*, while those denoted by letter *f'* are adapted to be slid laterally in dovetailed grooves *a' a'* in frames *a a* by screws *g*, which work through nuts *g'*, fitted in sockets in said brackets, and are attached to brackets *g²*, bolted to the side frames *a a*. The screws *g* are provided with bosses or enlarged heads *g³*, having radial openings therein to receive pins or keys by which the screws are rotated

in one direction or the other to adjust the brackets f' and the corresponding rollers for the purpose of taking up the slack of the webbings or belts and maintaining them at the proper tension.

Whereas in the present silk-dressing machines the single belt or webbing, with combs attached, is arranged on a horizontal plane, in my improved machine the endless belts $b c d e$ or, as shown in Fig. 1, the belts $b c e$ are arranged to incline slightly from front to rear, the front roller of each pair of belt-carrying rollers being raised a little higher than the rear roller, each of which is adapted to be adjusted vertically to the greatest nicety and to give the angles required by means of screws f^2 , working through nuts in the top plate of the standards $f f'$ and attached to sliding blocks f^3 , engaging the sides of slots f^4 in the said standards, the blocks f^3 forming the bearings in which the belt-carrying rollers are journaled. The screws f^2 are provided with hand-wheels f^5 by which to actuate same. The endless belt d is shown horizontal in Fig. 1; but the arrangement of one of the belts horizontally or of each of them at an angle is a matter of judgment on the part of the skilled dresser, who can adjust each endless belt as he considers necessary to give the best results on the quality of fiber being dealt with.

The ends of the transverse bars of combs and cards and combs when the endless belts are traveling along under the rollers engage with and slide along side rails $h h$, of which there are two to each endless belt, each rail being supported by and secured to brackets h' , (of which only the central ones can be seen,) bolted to the side frames $a a$. Each bracket is provided with a vertical slot, so that the said rails can be adjusted to the same angles as the endless belts. In half-circular bearings i' , situated at intervals apart along-side the inner face of each frame a , are journaled or supported screws $i i$, one of which is right-handed and the other left-handed, these screws extending under the endless belts $b c d e$ from end to end of the machine. Into the spaces between the threads of the screws are adapted to enter and to be engaged by said threads projections or lugs j' on each side of a rectangular frame j , comprising two cross-bars $j^2 j^2$, secured rigidly together by square side bolts $j^3 j^3$ and nuts j^4 , and which is similar to the frames at present employed for holding the boards filled with fillings of fiber. The filling-boards, consisting of two boards hinged together bookwise, as heretofore, are represented at k . The filling of silk from the filling-engine is placed between the pairs of boards and the latter closed, the projecting portion of filling being that which is to be dressed. These boards k are placed in the frame j intermediate of blocks k' , which are recessed at their ends to fit on the square side bolts $j^3 j^3$, which support them and along which they can be slid. The filling-boards k

rest on supports $j^5 j^5$, secured at each side of the frame j to lugs j^6 , extending downward from the cross-bars $j^2 j^2$, and when a full complement of such boards has been placed into the frame j they are firmly secured therein and nipped tightly between the blocks k' by means of screws $j^7 j^7$, screwed through the rear cross-bar of the frame and actuated by hand-wheels $j^8 j^8$. Secured to the under side of frame j is a central boss l , having an opening l' on its under side for the purpose hereinafter described.

Motion is imparted to the machine in manner following. The numeral 4 denotes the first-motion shaft, journaled in bearings in a bracket bolted to the framework a and having mounted thereon fast and loose pulleys 5 6. The said shaft is driven by strap 7, passing around the fast pulley, and communicates motion through pinion 8, fast on shaft 4, to a spur-wheel 9, secured on the extended end of the shaft of roller b^2 , which rotates said roller and traverses the endless belt b around the rollers $b' b^2$ in the direction of the arrows. On the said roller-shaft is also secured a toothed gear 10, meshing with a toothed gear 11 on a stud-shaft 12, which carries a chain-wheel 13, deriving motion through said toothed gear and communicating it by chain 14 to chain-wheel 15 on the shaft of roller c' , whereby said roller is driven and traverses the endless belt c around rollers $c' c^2$ in the direction of the arrows—that is to say, in a contrary direction to the first endless belt b . A second chain-wheel 16 conveys motion from the shaft of roller c' by chain 17 to a chain-wheel 18 on the shaft of roller d' , thus driving said roller and traversing the endless belt d around rollers $d' d^2$ in the same direction as the endless belt c , as indicated by the arrows. From the shaft of roller d' motion is transmitted by spur-wheels 19 20 to stud-shaft 21, whereon is secured a chain-wheel 22, which by means of chain 23 gives rotary motion to a chain-wheel 24 on the shaft of roller e' , thereby rotating said roller and traversing the endless belt e around the rollers $e' e^2$ in a contrary direction to the endless belts $c d$ and in the same direction as the belt b , as indicated by arrows. A second chain-wheel 25 is mounted on the shaft of roller e' , which by chain 26 transmits rotary motion to a large chain-wheel 27, (see Fig. 4,) mounted on the end of a cross-shaft 28, supported in bearings at the rear or delivery end of the machine, and whereon are secured beveled wheels 29, (one only being shown,) which mesh with bevels fast on the ends of the screws $i i$. The rotary motion given to the cross-shaft 28 rotates the screws $i i$ at a very slow speed to traverse the frame j through the machine.

Intermediate of the two endless belts $d e$ and supported in brackets bolted to the frames $a a$ is a roller m , clothed partially or wholly with fine teeth, or it may be covered with stiff bristles, such roller having a chain-

wheel 30 on one end of its shaft, which by chain 31 receives rotary motion from chain-wheel 32 on the shaft of roller c' .

Between the endless belt e and the cross-shaft 28 there is ample space allowed for the reception of the frame j and for its discharge from the machine. When the frame j engages the screws i i at the feeding end of the machine, it rests upon and slides along fixed ways n n , secured to the inner faces of the side frames a a just below the screws i i . These ways extend longitudinally from the feeding to the delivery end of the machine, terminating close to a movable platform o , forming a continuation of said ways and of sufficient size to hold the whole of frame j . The platform o is three-sided, one side being omitted to admit of the withdrawal of the frame j therefrom, while the side nearest the machine is bent or U-shaped to give sufficient clearance for the depth of frame j to allow it to pass onto the platform. Into openings formed through each corner of the platform o enter the ends of pillars or spindles o' , secured to the base of the machine or to the floor. Surrounding said spindles are strong spiral springs o^2 , confined between the under side of the platform o and collars o^3 , secured on the pillars, the combined force or resistance to compression of said springs being rather less than the weight of frame j and platform o together, in order that when the frame is wholly on the platform and the latter released they will descend gently against the resistance of the springs. At the delivery end of the machine and at right angles thereto are laid lines p , whereon is adapted to be propelled a carriage q , which prior to discharging a frame from the machine is wheeled under the platform o and into abutment with a stop-piece q' or stop-pieces, which determine its position centrally of the platform o or frame j . The platform o is held in its highest position—that is, level with the ways n n —by sliding bolts, of which one only is shown at r in Fig. 4, these entering recesses o^4 in the rear side of the platform and engaging with the under side of said platform. When the frame j is traversed by the screws i i fully onto the platform o , as shown at Fig. 4, the end of the frame abuts against the end of each bolt r and forces it clear of the platform, as shown, whereupon the platform, with the frame j thereon, descends until arrested by the stud q^2 , secured to the top of the carriage q in the center thereof, which enters the opening l' in the boss l on the frame and supports the frame in the position shown in dotted line in Fig. 4. The carriage is now wheeled from under the machine in the direction of the arrow 33, Fig. 5, thus withdrawing the frame from the platform o , which is thereupon forced back to its normal position by the extension of the springs o^2 . Each bolt r on the platform o falling clear thereof is forced back to its original position by spring r' , and on the platform being returned to its highest position it bears

against the inclined end of each bolt and forces them back until it is level with the ways n n , when the bolts are shot forward by the springs r' and reengage the under side of the platform. At the feeding end of the machine there is a similar platform s , Fig. 7, adapted to slide up and down on pillars, as in the case of platform o . This said platform s is suspended from the ends of four chains s' s^2 s^3 s^4 , represented by strong broken lines, which are attached to winding pulleys or drums t' t^2 t^3 t^4 , fast on a side shaft t , the chains s^3 s^4 passing over the feeding end of the machine and around guide-pulleys t^5 t^6 to the opposite side of the platform. The shaft t is provided with a handle t^7 , by which to rotate it to wind up or lower the platform.

The action of the machine is as follows: The boards k , containing the silk filling, which is inserted between each pair of boards in the ordinary way, having been placed in the frame j and nipped tightly together by the action of the screws j' j' , the said frame is conveyed by a carriage in all respects similar to carriage q onto the platform s , which has been lowered to receive it. The said platform, with the frame j thereon, is now raised until the frame is brought level with the ways n n , and the lugs j' being engaged by the threads of screws i i the frame commences to travel endwise into the machine in the direction of arrow 34, gradually leaving the platform s and sliding on the ways n n , upon which it is finally supported. As the fibers projecting from the boards k come into contact with the combs b^3 on the endless belt b , which are traveling in the same direction, but at a quicker speed, they are laid hold of by said combs and drawn through them, thereby combing them thoroughly on one side in traveling the length of the belt b . As the combs are farther away from the frame j at the front end than at the rear end of the belt b , the silk filling is more gradually and gently combed and dressed than would be the case if the combs traveled in a horizontal plane, and consequently they do not damage or injure the fibers. The fibers removed from the fillings by the combs b^3 are pressed down to the base of the combs by a brush u , secured at each end to brackets bolted to the side standards supporting roller b^2 . Each projecting tuft of filling in the frame j in passing clear of the combs b^3 is naturally elevated or drawn over by such combs as they travel around the bend of roller b^2 , and therefore when such projecting fibers reach the endless belt c , which is traveling in the contrary direction, the combs c^3 thereon lay hold of the opposite sides of the tufts, which are thus combed or dressed a second time, but on the reverse sides. The fibers removed by the combs c^3 from the fillings of silk are pressed down to the root of the combs by brush v , secured at each end to brackets bolted to the standards supporting roller c' .

The position of the projecting dressed or combed fibers is not changed in passing from

the endless belt *c* to the endless belt *d*, and they therefore pass forward and are met by and drawn through the cards *d*³ on said belt, such cards removing the "nibs" or rough places or bits in or on the dressed or combed fibers. The carding of the fibers for this purpose is preferably relieved at intervals by the introduction of the combs *d*⁴ on belt *d*, which also serve to remove any loose fibers remaining in the dressed fillings or turned up by the cards, the same also applying in the case of endless belt *e*. On passing from belt *d* the tufts of filling are turned over or reversed by the rotary action of the clothed roller *m* in order that the cards *e*³ on belt *e* may act upon the fibers from the opposite sides to card and remove the nibs or rough places missed by the cards *d*³.

By the employment of two sets of endless combs and two sets of endless cards arranged as described and in successive order to follow one upon another and by traveling the fillings of fiber to be dressed horizontally under and in contact with said combing and carding surfaces a complete dressing is given to the fibers in once passing through the machine and a much larger quantity than heretofore can thus be dealt with and continuously fed to the machine, whereby the productive capacity of flat silk-dressing machines is considerably increased. Cheap or unskilled labor can be more largely employed to mind the machine and very little noil or waste is made.

When the frame *j* has been traversed beyond the belt *e* and fully onto the discharging-platform *o*, the latter is released and deposits said frame on the carriage *q*, as before described, such carriage then being wheeled away on the lines *p* to a second machine arranged alongside the one described, but the opposite way about, so that the frame *j* can be conveyed straight across from the delivery end of one machine to the feeding end of the other. The fillings of fiber are reversed, as ordinarily, to present the uncombed or undressed portion to the combs and cards after the first half has been sufficiently dressed.

The stud *q'* on the carriage *q* admits of the frame *j* being turned around thereon in transit from one machine to another ready for presentation to the second machine.

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

1. In a fiber-dressing machine, the combination, with a supporting-frame, a pair of rollers, an endless traveling belt or web, and transverse bars carried by the said belt and provided with dressing devices; of means for elevating one of the said rollers thereby placing the belt at an angle, rails *h* carried by the said frame and supporting all the bars on one-half of the belt, means for setting the said rails at an angle corresponding to that of the belt, horizontal guides, a frame for holding

the filling-boards, and traversing mechanism for moving the said frame along the said guides in contact with the dressing devices, substantially as set forth.

2. In a fiber-dressing machine, the combination, with longitudinal guides, means for dressing the fiber, filling-boards for holding the fiber, and a frame for holding the filling-boards slidable on said guides; of a spring-supported platform arranged at one end of the said guides, and locking devices normally preventing the said platform from descending when the frame first passes onto it, substantially as set forth.

3. In a fiber-dressing machine, the combination, with longitudinal guides, means for dressing the fiber, filling-boards for holding the fiber, and a frame for holding the filling-boards slidable on the said guides; of a spring-supported platform arranged at one end of the said guides, retractible spring-pressed locking devices normally preventing the said platform from descending when the frame first passes onto it, and means for retracting the said locking devices automatically when the frame arrives at the termination of its longitudinal movement thereby permitting the said frame and platform to descend automatically, substantially as set forth.

4. The combination, with a movable frame for holding the filling-boards, said frame being provided with clamping devices for the boards and means for engaging with the longitudinal traversing mechanism of a fiber-dressing machine; of a traveling carriage for conveying the said frame to and from the said machine, means for lowering the said frame onto the said carriage, and a pivot arranged between the said frame and carriage and supporting the said frame when lowered onto the said carriage and permitting it to be revolved thereon, substantially as set forth.

5. The combination, with a series of endless traveling belts of combs and cards arranged in successive order and some or all at slight angles to the horizontal or line of traverse of the fibers and means for traversing the fillings of fiber horizontally through the machine in contact with the combing and then with the carding surfaces, of means for pressing the fibers combed out of the fillings down to the base or roots of the combs, and for reversing the fillings or tufts in passing from one endless belt of cards to another to present the opposite side of such tufts to the second carding-surface all arranged, operating and being operated in the manner and by the means substantially as herein shown and described.

In testimony whereof I affix my signature in presence of two witnesses.

ARTHUR MELLOR.

Witnesses:

JOSEPH BEAUMONT,

HARRY EDWARD MOWBRAY.