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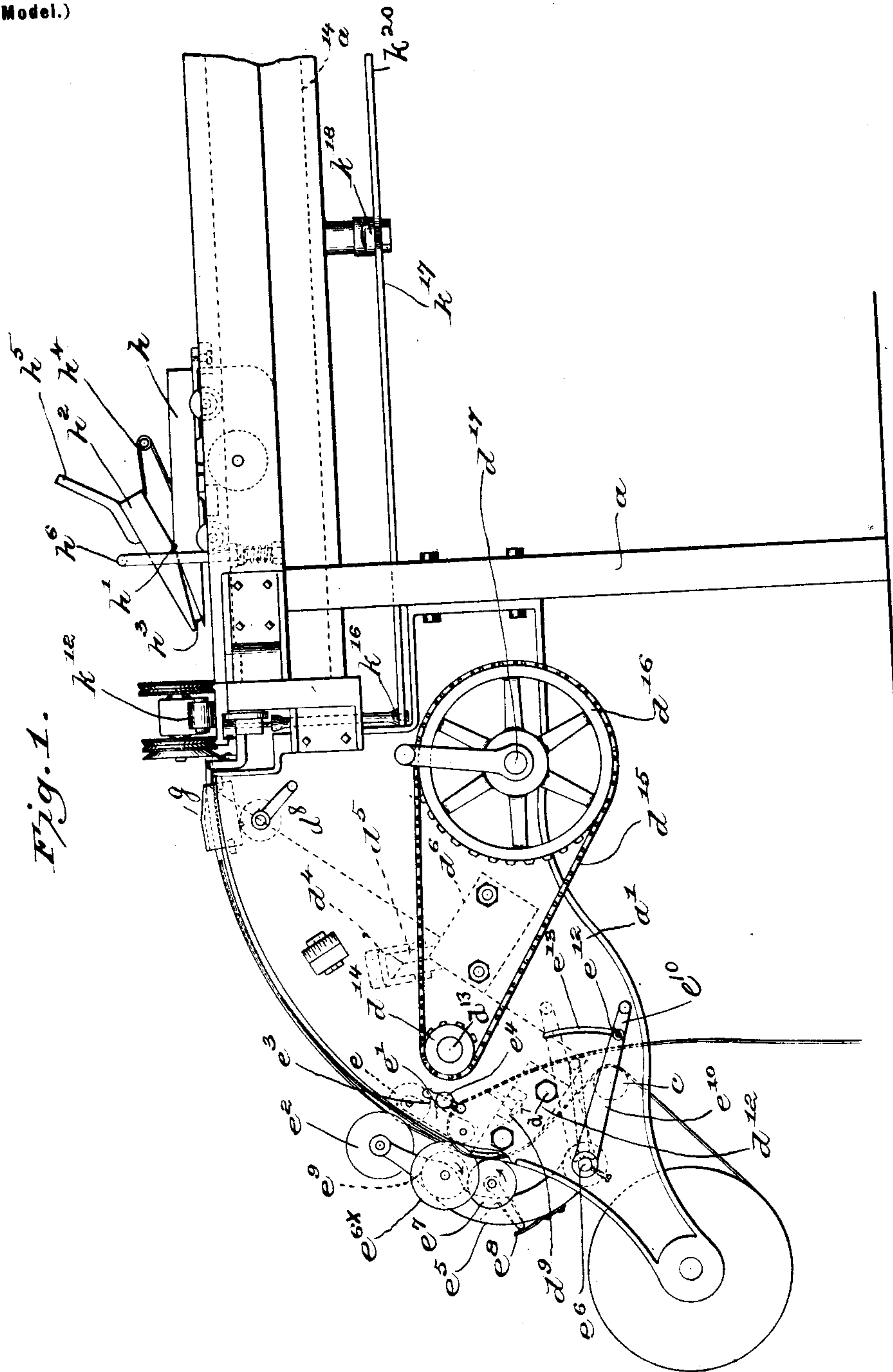
Patented July 9, 1901.

C. N. COLPITTS.
CLOTH CUTTING AND FOLDING MACHINE.

(Application filed Aug. 3, 1900.)

3 Sheets—Sheet 1.

(No Model.)



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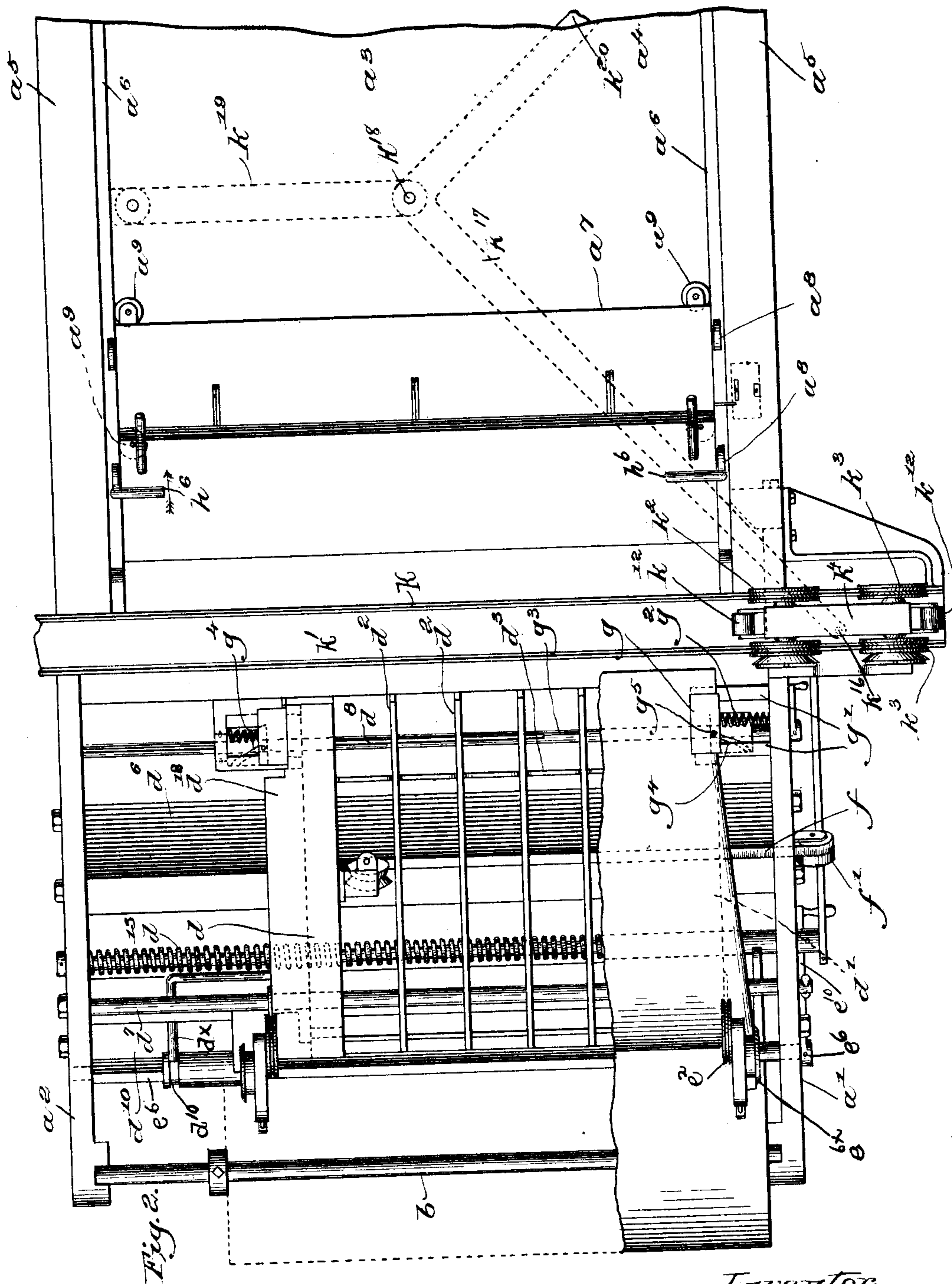
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3 Sheets—Sheet 2.

(No Model.)



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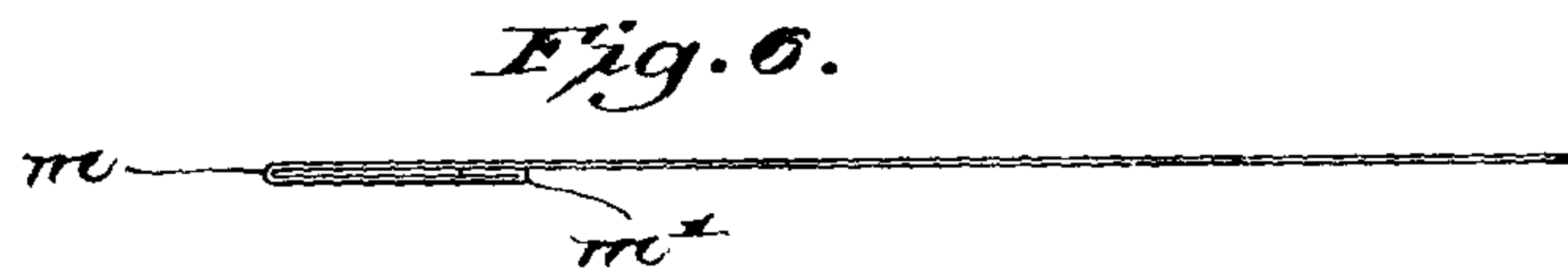
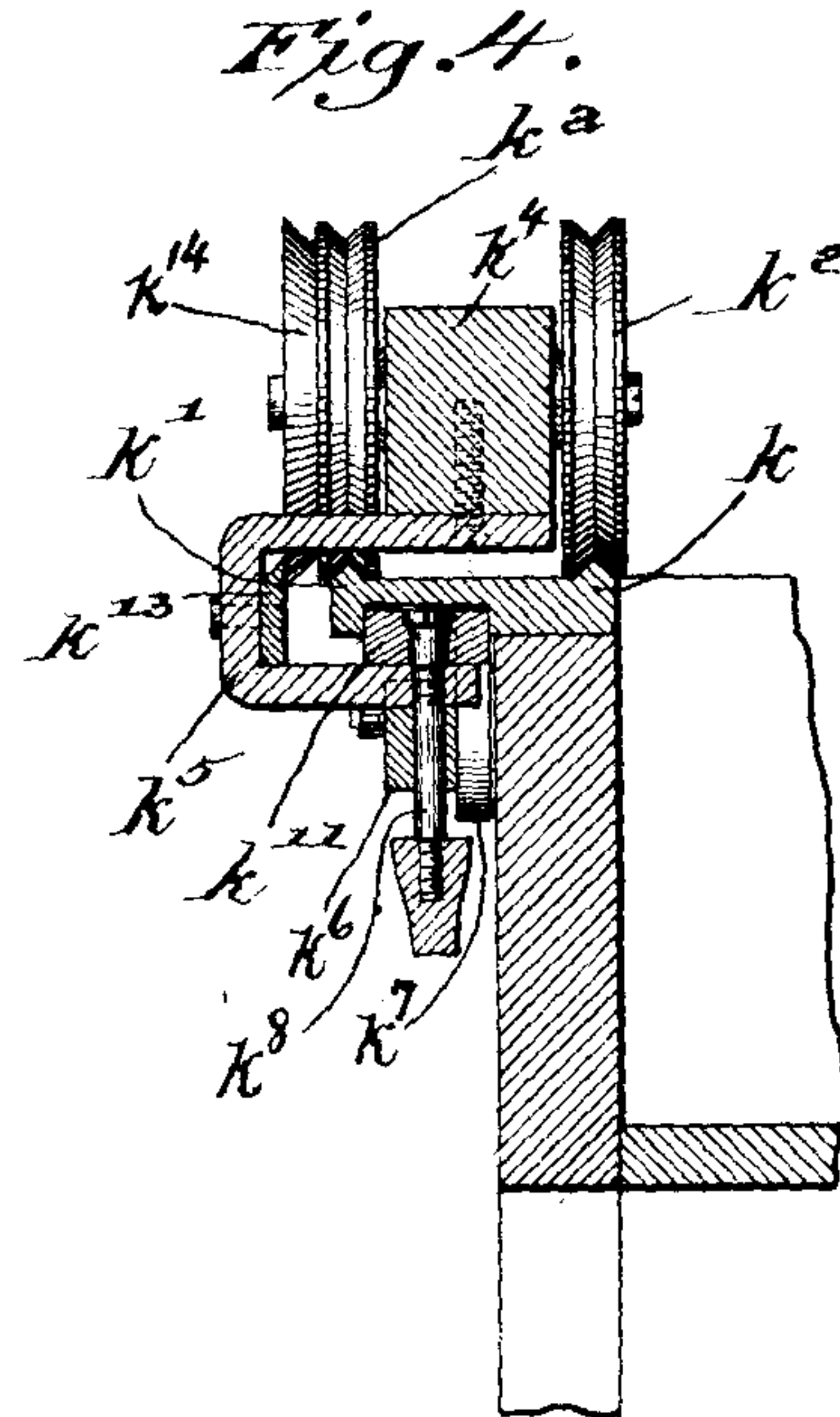
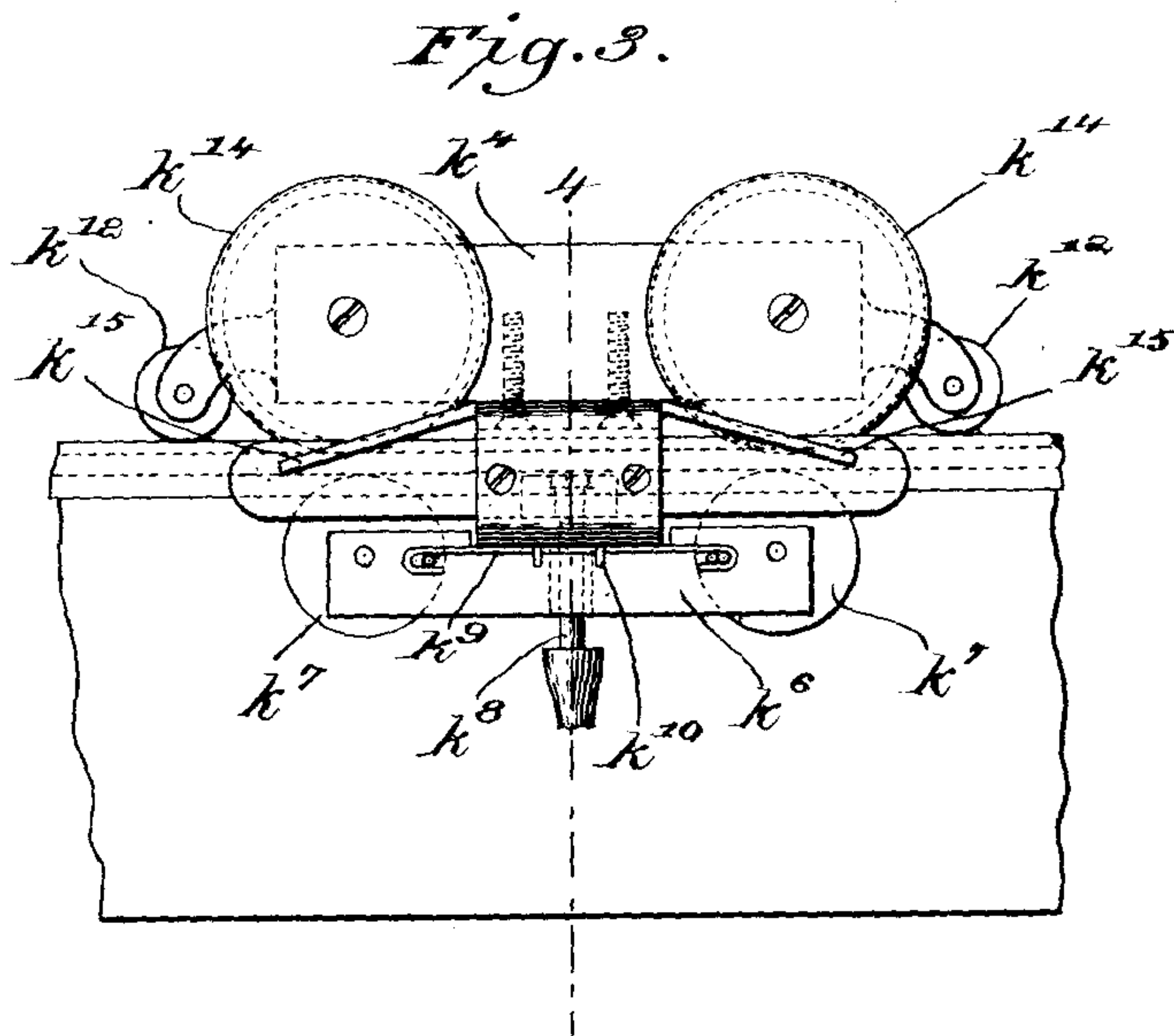
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(Application filed Aug. 3, 1900.)

(No Model.)

3 Sheets—Sheet 3.



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UNITED STATES PATENT OFFICE.

CALVIN N. COLPITTS, OF BOSTON, MASSACHUSETTS, ASSIGNOR TO AMERICAN SHADE MACHINE COMPANY, OF SAME PLACE AND PORTLAND, MAINE.

CLOTH CUTTING AND FOLDING MACHINE.

SPECIFICATION forming part of Letters Patent No. 678,099, dated July 9, 1901.

Application filed August 3, 1900. Serial No. 25,792. (No model.)

To all whom it may concern:

Be it known that I, CALVIN N. COLPITTS, a citizen of the United States, residing at Boston, county of Suffolk, State of Massachusetts, have invented an Improvement in Machines for Making Shades, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

My invention is a machine for making window-shades, whereby the material of which the shades are to be made has its edges accurately and neatly trimmed, creased and folded over, and cut into proper lengths.

The mechanism herein embodied comprises, in general terms, a framework sustaining a suitable shaft to support the roll of shade material, a table or support for the shade material, said table being preferably made so that it may be adjusted as to its width, that a shade of any desired width may be made, and suitable adjustable cutting and creasing devices to trim and crease the shade material longitudinally.

The machine further contains a carriage provided with cutting and creasing devices, said carriage being moved transversely of the shade material while the latter is at rest to thereby crease the material to define the lines of fold for the hem at the lower end of the shade and to also cut the shade material into proper lengths for the shade which it is desired to produce.

The machine has a receiving-table located at a lower level than the table which sustains the material while being creased and trimmed longitudinally, said receiving-table receiving on it the individual shades cut from the shade material.

The shade material is fed through the machine by a feeding mechanism or device which engages the end of the shade material and draws the same through the machine, and preferably the cutters for trimming the edge of the material are made in the form of disks, and they are rotated in a direction opposite the movement of the shade material by or through devices—such, for instance, as rollers—which derive their motion from the moving shade material.

In the drawings, in which I have illustrated one embodiment of my invention, Figure 1 is a side elevation thereof partly broken away. Fig. 2 is a top plan view thereof. Fig. 3 is an enlarged detailed inside elevation of the transverse cutter and creaser. Fig. 4 is a central vertical cross-section thereof on the line 4 4, Fig. 3. Figs. 5 and 6 are edge views of the end of a shade, showing how it is creased and pulled.

It will be understood that the framework and general character of the machine may be of any shape or construction suitable for the purpose, and, as herein shown, the machine is mounted on a pedestal or base *a*, to which is secured the framework, consisting of side pieces or castings *a'* *a*² and an end receiving-table *a*³.

The fabric is mounted at the end of the machine on a rod or roll receiver *b* and is thence passed under a tension-roll *c* and thence up over the extension-table mentioned, which is herein shown as composed of a movable side piece or block *d* and a stationary piece or block *d'*, between which are slat-like supports *d*², connected together by flexible straps *d*³, so as to permit of expansion and contraction to accommodate shades of different widths. At its under side the block *d* carries a bracket *d*⁴, in which is a guide-roller *d*⁵, adapted to run on the guide herein shown as consisting of the upper corner of a transverse brace *d*⁶, extending between the side frames. The extension-table is also slidingly mounted on a rod *d*⁷ at one end and on a rod *d*⁸ at the other end, and at its rear end it has a guide-roll *d*⁹, which travels in a groove or track *d*¹⁰, provided with a transverse end brace *d*¹². The table is extended and contracted by the heavy screw-rod *d*¹³, which works in the block *d*, and at its projecting end is provided with a sprocket-pinion *d*¹⁴, operated by a sprocket-chain *d*¹⁵ and wheel *d*¹⁶, journaled at *d*¹⁷ into end frame *a'*.

By means of the construction above explained the table is extended accurately and evenly without possibility of binding or getting out of parallelism at its edges. The outer edges of the blocks *d* *d'* are substantially parallel, one of said edges being shown by full and the other by dotted lines in Fig. 2, the

edge shown by dotted lines being covered by the infolded cut edge of the shade material. The blocks $d d'$, having the parallel edges described, are recessed to receive creasing-wheels e , which contact with the under side of the shade material, the slots receiving the creasing-wheels being made in the blocks at a slight distance from their side edges, to thereby sustain the material which is to be cut or trimmed outside the creases formed by the creasing-wheels while the trimming is being effected by disk cutters, and the distance between each disk cutter and the creasing device next to it equals the width of material to be turned inwardly upon the body of the shade material to form proper side edges. The material which is wasted by the trimming operation passes from the machine to the floor. The creasing-wheels e are mounted in the free ends of arms e' , pivoted on the said block, which, when the wheels are to contact with and sustain the shade material to be creased, are held up in engagement with the material by means of the convexed side of a rod e^3 , having a suitable handle e^4 , a flattened side of said rod when opposite the arms e' permitting the wheels e to occupy their inoperative position. Coöperating with the creasing-wheels e are other creasing-wheels e^2 , represented as carried by arms e^5 , the wheels e^2 contacting with the outer side of the shade material directly opposite the wheels e . The arms e^5 are mounted on a rod e^6 , extended across the machine, one of said arms being movable in unison with, say, the block d , forming part of the expansible table or support for the shade material, so that whenever the said table is adjusted in the direction of its width to provide for cutting from shade material a shade of any desired width the creasing device may also be moved away from the like creasing device operative with the stationary block d' .

I have located near each creasing device, and preferably to act in advance of it, a trimming device, represented as a disk cutter e^{6x} , said cutters being represented as deriving their rotary movement by or through rollers e^7 , which may be held normally in pressing engagement with the shade material by springs e^8 .

The rolls e^7 bear on hubs e^9 of the disk cutters, and thereby serve to rotate the cutters in an opposite direction to the movement of the cloth when the latter is pulled forward by the operator.

The arms e^5 are adjusted in position or turned entirely out of engagement with the table by means of a crank e^{10} , adjustable by a set-screw e^{12} in a slot e^{13} .

A measuring-tape f is secured to the movable block d and passes over a spring-drum or other winding device f' on a fixed part of the frame for the purpose of measuring the width of shade to be cut from the wider shade material.

The shaft e^6 is splined and the hub of the

arm e^5 , carrying the creasing-wheel e^2 , coacting with the creasing-wheel e of the movable block d , is connected with said block through a bent arm d^x , so that when the block is moved the arm causes the hub of said arm to be slid on said shaft, the hub of the arm, as herein represented, having a groove d^{10} , in which one end of the arm d^x enters. The shade material having been trimmed and creased, the portion of the material between the lines in which it is creased and the cut edges are turned under the straight parallel edges of the plates $d d'$ in order that the side edges of the shades may be finished, and to do this I have provided a turning device, represented as jaws g , of substantially U shape, said jaws embracing the edges of the blocks and folding the edge of the shade material about said edges. These jaws are mounted to be slid toward and from the said edges on guides g' , and the jaws are held in their operating position by springs g^2 . The guides are moved away from the edges of the blocks, as when the material is being introduced in the machine by means of cam-hubs g^4 , carried by rods g^3 , said hubs coöperating with pins g^5 , extended from the under sides of the jaws.

To feed the shade material through the machine, I have provided the feeding device, represented as a carriage a^7 , having wheels a^8 , which run on suitable tracks or grooves a^6 , at opposite edges of a receiving-table a^3 , the surface of which is located in such a plane that the shade material having been cut into shade lengths may drop by gravity upon said table, the surface of the table representing a sort of box. The carriage has, preferably, guide-wheels a^9 , which run against the inner sides of the tracks on which the wheels a^8 run. This carriage is composed, as shown, of a base-plate h and a rocking jaw h^2 , movable about centers at h' , the jaw h^2 having, preferably, suitable teeth, as h^3 , at its forward edge, the jaw being closed upon the plate normally by suitable springs h^4 . This feeding device is adapted to engage the leading end of the shade material preferably from one to its other edge, to thereby prevent any tendency to wrinkle the material as the carriage is moved to draw the material over the table having the blocks $d d'$ as the shade material is being creased and trimmed. The jaw h^2 is provided with suitable tripping devices, shown as arms h^5 , projecting in the path of spring-trips h^6 , which are free to swing in the direction only of the arrow, Fig. 2, the result being that when the carriage is moved rearwardly or toward the left, Fig. 1, its arms h^5 will come into engagement with the overhanging portions of the trips h^6 , and thereby automatically open the jaw h^2 in position to receive a projecting end of the shade material, and as the carriage is moved still farther to the left, Fig. 1, so as to slightly encompass the end of the shade material, the arms h^5 will pass beyond the trips h^6 , thereby permitting the springs h^4 imme-

diately to close the jaws in engagement with the shade material, whereupon the carriage is moved to the right, during which movement the engagement of the arms h^5 with the trips h^6 simply swings the latter back out of the way as the carriage passes. Having drawn forward the requisite amount of shade material to make a shade of the desired length, the carriage is stopped and the transverse cutter and creaser is operated. The latter is shown in detail in Figs. 3 and 4, where it will be seen that parallel creasing-tracks k k' are provided, extending across the machine between the extension-table and the receiving-table, and on these tracks are mounted, preferably, opposite pairs of creasing-wheels k^2 k^3 , journaled in the ends of a carrier k^4 , which is supported on a U-shaped bracket k^5 , to the lower side of which is yieldingly held a block or carrier k^6 , which supports guide-wheels k^7 and is itself guided and held up against the bracket k^5 by a spring k^9 , supported by pins k^{10} , tripping into or projecting from said bracket. Above the bracket is a horizontal guide-roller k^{11} , traveling in a track on the under side of the creasing-tracks. Between the creasing-rolls and preferably at the ends of the carrier k^4 are presser-rolls k^{12} , which serve to press the material down firmly between the tracks k k' , so as to provide slack material in advance of the operation of the transverse creasing-wheels k^2 k^3 , to thereby enable the creasing-wheels properly to make sharp creases without straining and tearing the material. At its rear inner side the bracket k^5 is provided with a knife or cutting-plate k^{13} , with which cutting-wheels k^{14} cooperate, and preferably the bracket k^5 also supports guide-flanges k^{15} , which serve to direct the shade material as the carriage is moved back and forth across the machine. The post k^8 extends down beneath the tables mentioned and is pivoted at k^{16} to the free end of an operating-lever k^{17} , mounted at k^{18} on a swinging link k^{19} on the under side of the receiving-table a^3 and having its opposite end k^{20} projecting at one side of said table in position for the operator to grasp. When the required amount of shade material has been drawn off the roll by the pulling-carriage, the operator simply moves the handle or lever k^{20} quickly to the left, Fig. 2, thereby driving the carriage across the machine, the material being picked up by carriage-guide k^{15} on said carriage and instantly severed by the cooperating cutting edges k^{14} k^{13} and simultaneously creased at m m' (see Fig. 5) in order that it may be subsequently folded, as shown in Fig. 6. The carriage is arranged to cut in passing across the machine in either direction. As soon as the shade has been severed and creased it drops at once into the chamber at the upper side of the receiving-table a^3 , the operator having released the forward end thereof by opening the jaw h^2 .

I have already in the course of the description of the construction of my machine suf-

ficiently described the operation thereof, and it will be understood that the primary purpose of my present machine is to provide means for making a shade with accuracy and neatness.

By providing the disk cutters, which are positively rotated by the moving fabric in a direction opposite the movement of the shade material, the latter being meanwhile held down tightly against the adjacent surface of the table, there is no possibility of ragged edges, such as might result from a slitting-knife, and also the shade material is necessarily cut with absolute evenness and in a straight line, because there is no chance for it to shift laterally or waver as it is being cut, and also the same is true of the creasing thereof, inasmuch as the construction which I have provided for expanding the width of the table insures that the creasing edges of the latter will be maintained in absolute parallelism. So, also, the provision of the pulling-carriage, which avoids the danger of manual handling of the shade material, makes it certain that the shade material will be pulled evenly, having first been automatically engaged simultaneously at a plurality of points from edge to edge thereof. The pulling-carriage is maintained in accurate position as it moves along the receiving-table, so that there is no liability of twisting or distorting the shade material as the latter is being pulled forward, and the position and arrangement of the transverse cutter make it possible to sever the shade material while it is yet pulled out straight and even by the pulling-carriage. The result is that the opposite edges of the shade are absolutely parallel, the folds thereof perfectly even and uniform, and the bottom hem is exactly square relatively to said edges and is also even and uniform.

The above-mentioned points of superiority in the resulting shade tend largely to do away with the liability of the shade winding up faster on one edge than on the other, as is so apt to occur in use.

Also my invention not only produces a superior shade, but there is no liability thereof to mistakes, and thereby a considerable saving in material results to the user, while at the same time the making of shades is facilitated, being rendered extremely simple, rapid, and inexpensive.

It will be understood that I do not limit myself to the various parts and arrangements thereof as are herein shown and described, inasmuch as various changes are included in the scope of my claims and I may employ any known equivalent devices for any of the devices herein represented.

Having described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a machine for making window-shades, a table or support to receive the material to be creased and trimmed, opposite arms, each carrying disk cutters for simultaneously

trimming the opposite edges of the material, said arms also carrying friction-rolls normally pressed in driving engagement with the fabric and with said cutting-disks for positively rotating the latter, means for adjusting said arms toward and from said table, means for creasing and folding the longitudinal edges of the material, and means for creasing transversely the hem end of the material.

2. In a machine for making window-shades, a table or support to receive the material to be creased and trimmed, opposite arms each carrying disk cutters for simultaneously trimming the opposite edges of the material, said arms also carrying friction-rolls normally pressed in driving engagement with the fabric and with said cutting-disks for positively rotating the latter, and means for adjusting said arms toward and from said table, said arms also being respectively provided with creasing devices mounted thereon beyond said cutting-disks, said creasing devices being nearer each other than said cutting-disks, and cooperating creasing devices mounted on said table to operate beneath the shade material.

3. In a machine for making window-shades, a table or support to receive the material to be creased and trimmed, opposite arms each carrying disk cutters for simultaneously trimming the opposite edges of the material, said arms also carrying friction-rolls normally pressed in driving engagement with the fabric and with said cutting-disks for positively rotating the latter, and means for adjusting said arms toward and from said table, said arms being also respectively provided with creasing devices mounted thereon beyond said cutting-disks, said creasing devices being nearer each other than said cutting-disks, and cooperating creasing devices mounted on said table to operate beneath the shade material, and means for adjusting said under creasing device outward or inward relatively to the table.

4. In a machine for making window-shades, a table or support to receive the material to be creased and trimmed, opposite arms each carrying disk cutters for simultaneously trimming the opposite edges of the material, said arms also carrying means driving the cutters in a direction opposed to the travel of the fabric, and means for adjusting said arms toward and from said table, said table being laterally extensible, and means for maintaining the opposite side edges thereof in true parallelism, said means comprising a transverse guide-track extending between the sides of the machine and a guide-wheel mounted on the movable part of said table and traveling on said track, and a screw-rod mounted in the frame of the machine and having threaded engagement with the movable part of the table.

5. In a machine for making window-shades, a table for supporting the shade material to be trimmed and creased at its opposite edges,

trimming devices and creasing devices for simultaneously operating on the opposite edges of the material, a pulling-carriage having means for gripping the material, tracks therefor extending longitudinally of said table at the forward end thereof, a transverse cutter and creaser at the end of said table between the same and said pulling-carriage, and means for operating said transverse cutter and creaser to cut off and crease lengths of the shade material.

6. In a machine for making window-shades, a table for supporting the shade material to be trimmed and creased at its opposite edges, trimming devices and creasing devices for operating on the opposite edges of the material, a receiving-table in longitudinal alinement with said first-mentioned table, a pulling-carriage mounted to travel on said tracks and adapted to engage the end of the shade material and pull the same longitudinally over said table, creasing-tracks between said two tables, and creasing and transverse-cutting devices movable transversely of the shade material on said creasing-tracks, and means for operating the same.

7. In a machine for making window-shades, a table for supporting the shade material to be trimmed and creased at its opposite edges, trimming devices and creasing devices for simultaneously operating on the opposite edges of the material, a receiving-table in longitudinal alinement with said first-mentioned table, a pulling-carriage mounted to travel on said tracks and adapted to engage the end of the shade material from one side thereof to the other for pulling the same evenly and uniformly at all points, creasing-tracks between said two tables, a creasing and transverse-cutting device for traveling on said creasing-tracks and means for operating the same, said first-mentioned table having at its edges means to inturn the cut edges of the material about the edges of said table, and means cooperating with said table to inturn the cut edges of the shade material.

8. In a machine for making window-shades, a table for supporting the shade material to be trimmed and creased at its opposite edges, trimming devices and creasing devices for operating on the opposite edges of the material, transverse-creasing tracks, a carriage traveling on said tracks, and provided with creasing devices cooperating with said tracks for providing in said material creases for the bottom hem of the window-shade, said carriage also having cutting mechanism for severing the material parallel to said creases.

9. In a machine for making window-shades, a table for supporting the shade material to be trimmed and creased at its opposite edges, trimming devices and creasing devices for simultaneously operating on the opposite edges of the material, transverse-creasing tracks at the front end of said table, a carriage traveling on said tracks, said carriage being provided with creasing-wheels cooperating with

said tracks for providing in said material creases for the bottom hem of the window-shade, said carriage also having cutting mechanism for severing the material parallel to said creases, said carriage having guide-flanges for picking up and directing the shade material to said cutting mechanism as the latter is directed across the machine.

10. In a machine for making window-shades, a table for supporting the shade material to be trimmed and creased at its opposite edges, trimming devices and creasing devices for simultaneously operating on the opposite edges of the material, transverse-creasing tracks at the front end of said table, a carriage traveling on said tracks, said carriage being provided with creasing-wheels cooperating with said tracks for providing in said material creases for the bottom hem of the window-shade, said carriage also having cutting mechanism for severing the material parallel to said creases, and yielding means normally lifting said carriage toward said track but yielding to permit varying thicknesses of material to be creased between said creasing wheels and tracks.

11. In a machine for making window-shades, a table for receiving the shade material, creasing and trimming mechanism for longitudinally creasing and trimming the material as it passes along said table, mechanism at the end of said table for transversely creasing and severing said previously longitudinally creased and trimmed material, and a receiving-table occupying a plane below the same for receiving in succession a stack of creased and severed shades.

12. In a machine for making window-shades, a table for receiving the shade material, creasing and trimming mechanism for longitudinally creasing and trimming the material as it passes along said table, mechanism at the end of said table for transversely creasing and severing said previously longitudinally creased and trimmed material, a pulling-carriage, guide-tracks therefor extending longitudinally of said table, said pulling-carriage having separable jaws extending transversely of the machine and normally held in biting engagement with each other for retaining the shade material as the latter is being pulled along thereby, and tripping means for automatically opening said jaws to engage the adjacent end of the shade material as said jaws reach the proper position at said transverse creasing and severing mechanism.

13. In a machine for making shades, means to sustain the shade material, feeding means to engage and draw said material over said sustaining means, means to trim longitudinally the shade material at its opposite edges, means to crease said material parallel with its cut edges, a carriage having means to crease and cut said material transversely to define the hem-lines and the end of the shade, and means to move said carriage that the

creasing and cutting means mounted thereon may act while the material is held by said feeding means.

14. In a machine for making window-shades, feeding means to grasp and move the shade material in the direction of its length, a disk cutter, means to rotate the same in a direction opposite the travel of the shade material through the machine, said cutter trimming the edge of the shade material, and means for creasing the edge of the material as thus trimmed.

15. In a machine for making window-shades, a table or support for the material, means to draw the same in the direction of its length over said table or support, a disk cutter, and means actuated by the moving material to rotate the disk cutter in a direction opposite the travel of the shade material through the machine and means for creasing the longitudinal edges of the material, and means for transversely creasing the material for a hem.

16. In a machine of the class described, parallel raised tracks to sustain the shade material which is to be creased transversely, a carriage having creasing-wheels, and a presser-roll, said roll acting in advance of the creasing-wheels to form slack in the shade material that the creasing-wheels may act to crease the material without straining or cutting the same.

17. In a machine of the class described, parallel tracks to sustain the material to be creased transversely, combined with a carriage having at each end a pair of creasing-wheels, and a presser-roll, whereby said creasing-wheels may act in either direction of movement of the carriage.

18. A machine for making shades, comprising in its construction means to trim longitudinally the shade material at its opposite edges, means forming part of the machine to simultaneously crease said material parallel with its cut edges, and means forming part of the machine to crease said material transversely to define the hem-lines.

19. In a machine for making shades, means to trim longitudinally the opposite edges of the shade material, means forming part of the machine to simultaneously crease said material parallel with its cut edges, and means forming part of the machine to crease and cut said material transversely to define the hem for the end of the shade.

20. In a machine for making shades, means to trim longitudinally the shade material at its opposite edges, means forming part of the machine to simultaneously crease said material parallel with its cut edges, means forming part of the machine to form a plurality of parallel creases transverse to the material, and means to sever the material transversely parallel to its transverse creases, said creases defining the width of the hem for the bottom of the shade.

21. In a machine for making window-

shades, means to support the shade material, means to trim the edges of said material, means to crease the material parallel with its cut edges, means to turn the cut edges of the material over upon the body of the shade material, means to cut the material transversely into curtain lengths and to crease the material transversely to provide for making the bottom hem of the shade.

22. In a machine for making window-shades, means to support the shade material, feeding means to engage the end of the material and to draw it over said support for a distance corresponding with the length of the curtain desired, creasing, trimming and turning means operating to trim, crease and turn the edges of the material, and means to crease and cut the material transversely, the transverse creases defining the hem at the lower end of the shade.

23. In a machine of the class described, a support for the shade material, devices to overturn the opposite edges of the shade material upon the body thereof, and means to

move said turning devices oppositely away from the edges of the support for the introduction of the shade material preparatory to turning the edges of the material.

24. In a machine of the class described, a support for the shade material, devices to overturn the opposite edges of the shade material upon the body thereof, means to move said turning devices oppositely away from the edges of the support for the introduction of the shade material preparatory to turning the edges of the material, and means to move the turning devices toward the support for the shade material that said devices may cause the shade material to embrace the edges of the support.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

CALVIN N. COLPITTS.

Witnesses:

GEO. H. MAXWELL,
MARGARET A. DUNN.