

H. A. MEYER.  
MACHINE FOR CUTTING FABRICS.

(Application filed Apr. 13, 1901.)

(No Model.)

2 Sheets—Sheet 1.

Fig. 1.

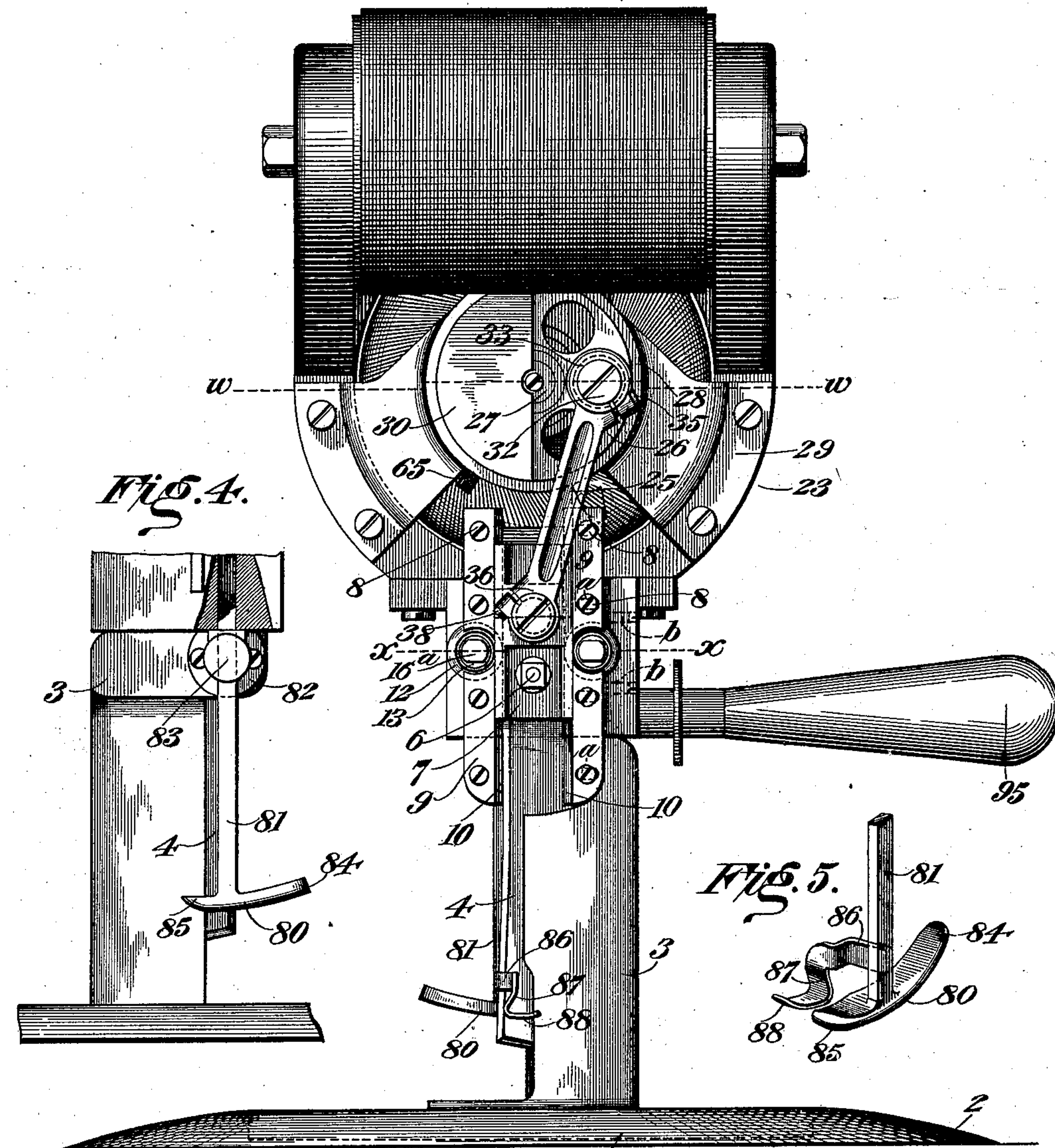


Fig. 4.

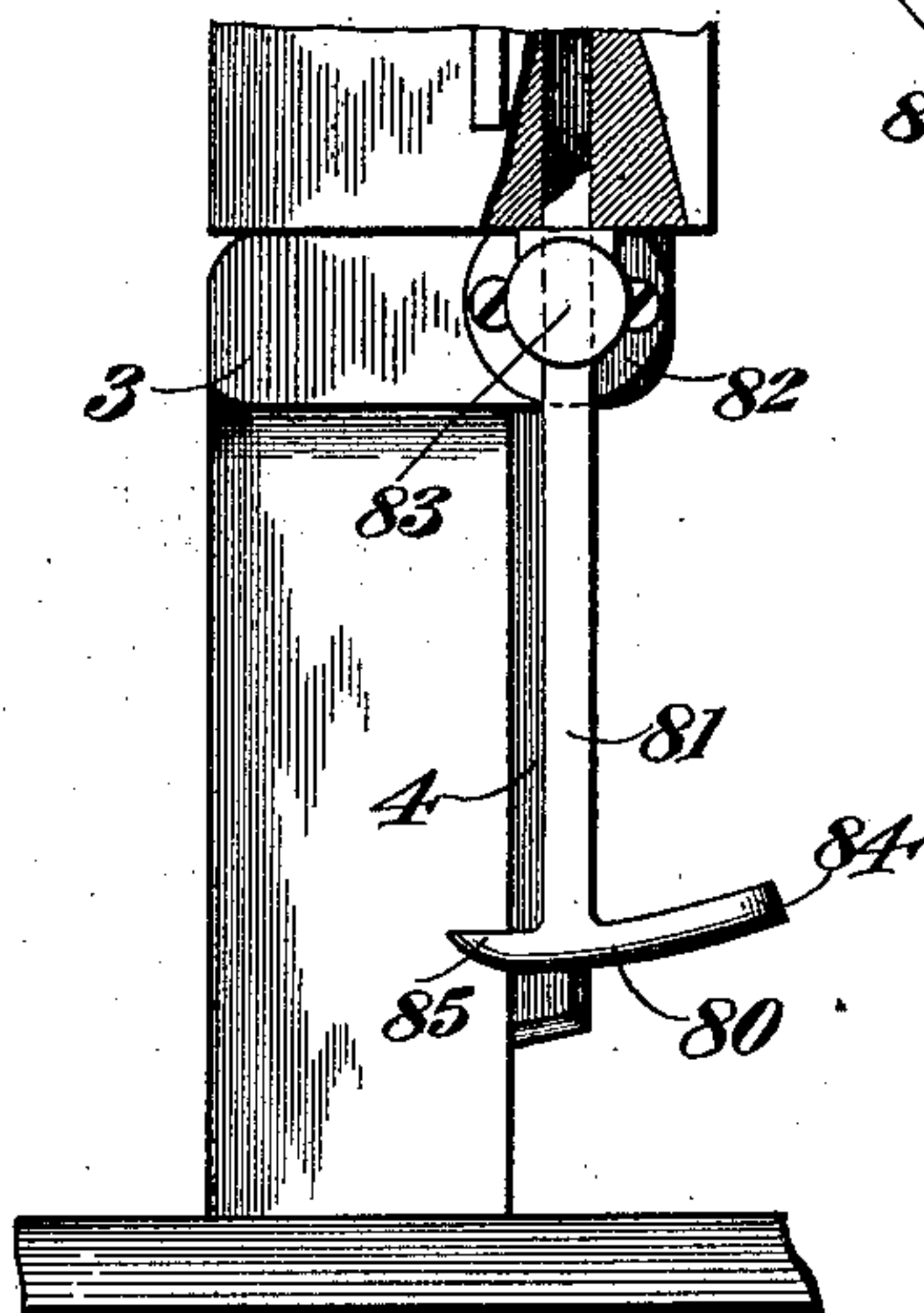


Fig. 5.

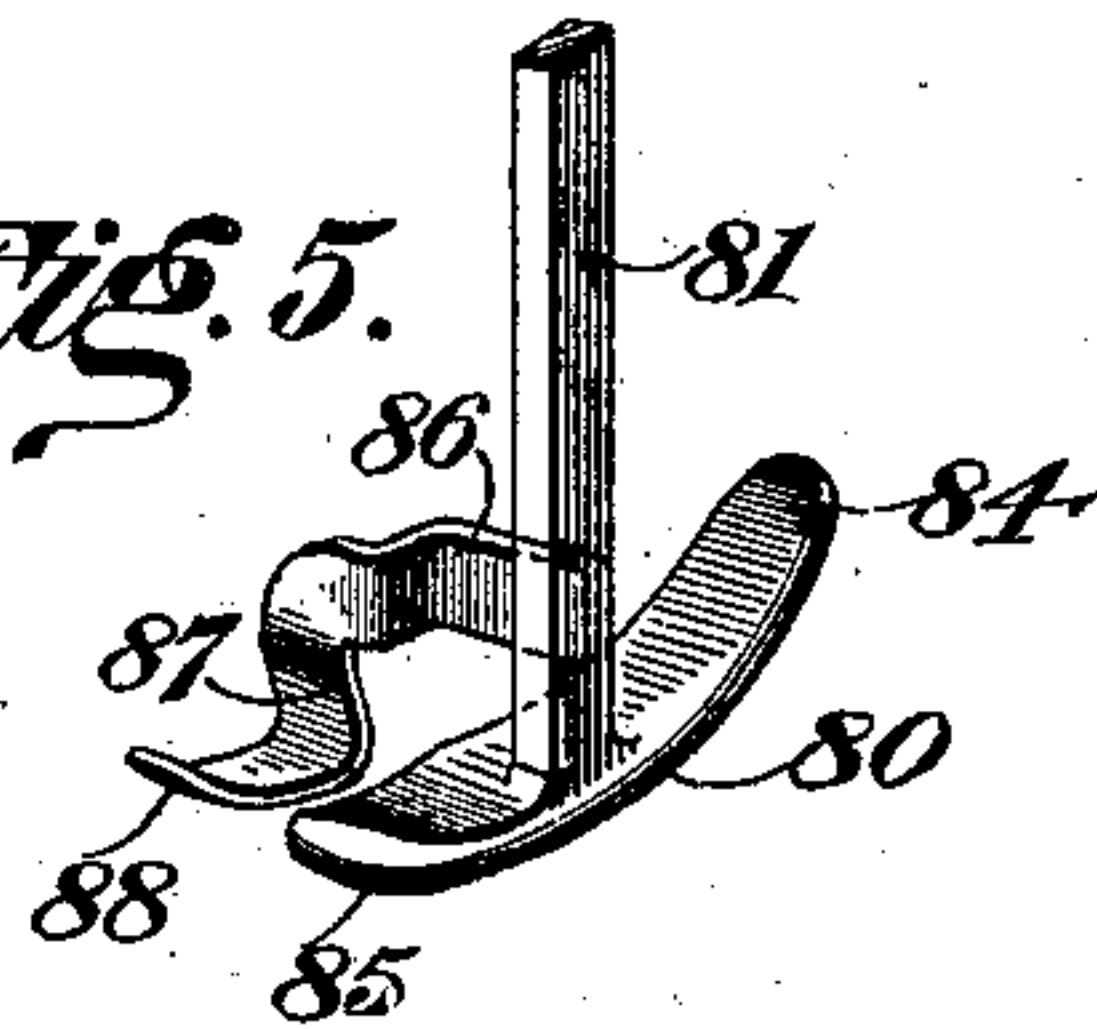
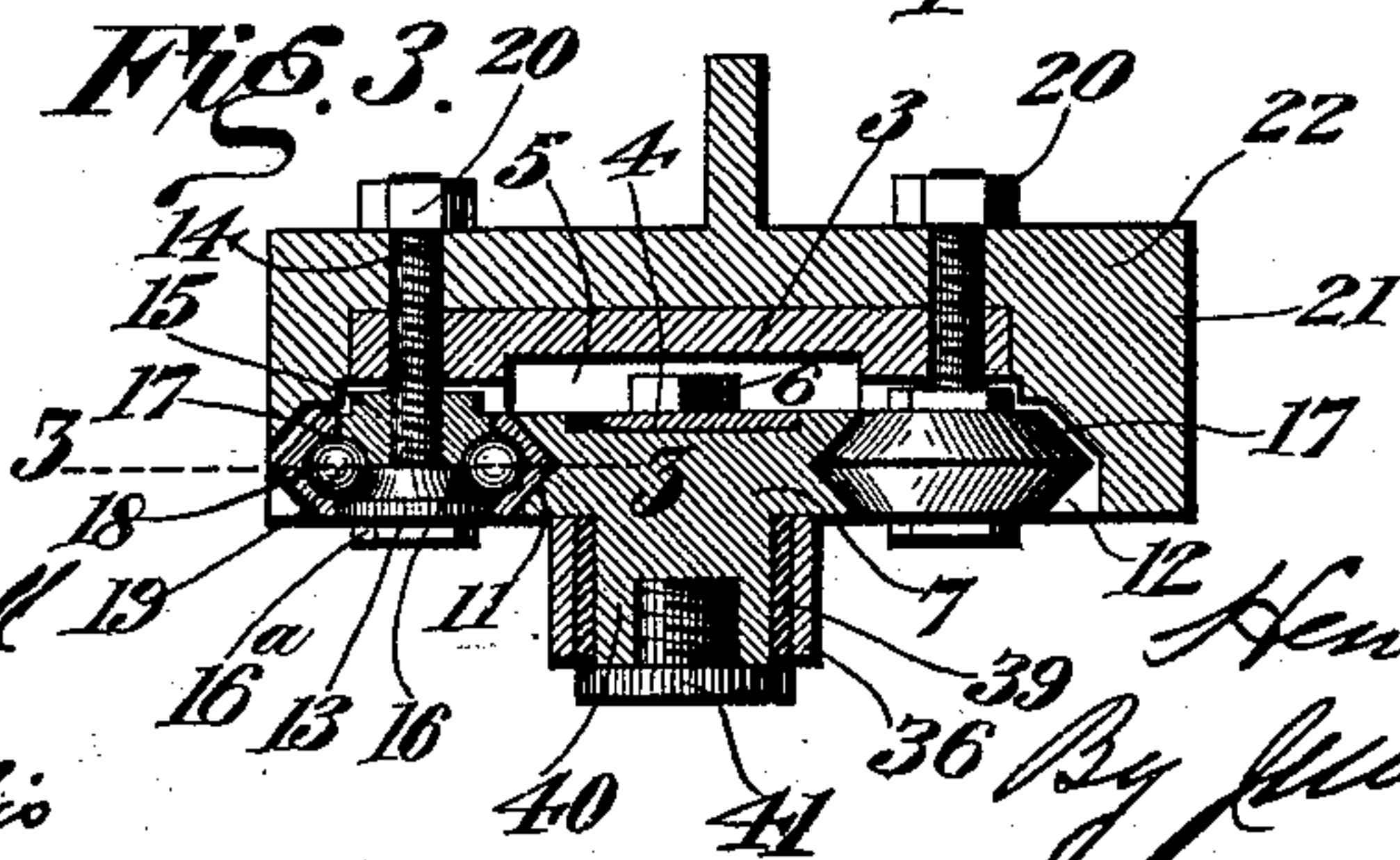


Fig. 3.



WITNESSES

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# UNITED STATES PATENT OFFICE.

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## MACHINE FOR CUTTING FABRICS.

SPECIFICATION forming part of Letters Patent No. 701,910, dated June 10, 1902.

Application filed April 13, 1901. Serial No. 55,729. (No model.)

*To all whom it may concern:*

Be it known that I, HENRY A. MEYER, a citizen of the United States, residing at Cincinnati, in the county of Hamilton and State of Ohio, have invented certain new and useful Improvements in Machines for Cutting Fabrics; 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.

This invention relates to machines for cutting textile fabrics or other material, and more especially to machines of the reciprocating-cutter type.

The principal objects of the invention are to provide a simple, easy-running, and practically noiseless machine; to hold the knife or cutter firmly to its work, especially when operating at high speeds; to prevent undue friction between the knife or its carrier and guide therefor, as well as tendency of the carrier to bind between the guides by reason of lateral thrust; to construct the parts in such manner that they may be readily replaced when worn or broken; to provide an improved device for holding the fabric or superimposed layers thereof down before the knife, and to improve generally upon machines of this character.

The invention will hereinafter be first fully described with reference to the accompanying drawings, which form a part of this specification, and then more particularly pointed out in the claims following this description.

In said drawings, in which corresponding parts in the several views are designated by like numerals of reference, Figure 1 is a side elevation of the machine, showing the vertically-reciprocating knife, together with the connections by which said knife is operated from the armature-shaft of the motor. Fig. 2 is a horizontal sectional view, partly broken away, taken through the armature-shaft and the driving connections thereon, on the line *w w* of Fig. 1. Fig. 3 is a horizontal sectional view on the line *x x* of Fig. 1. Fig. 4 is a part-sectional detail view of the machine, taken from the opposite side shown in Fig.

1, and indicating the general arrangement and location of the presser-foot for the fabric layers. Fig. 5 is a perspective view of the presser-foot to indicate more clearly the construction thereof. Fig. 6 shows separately in perspective the several parts or elements constituting the driving connections on one end of the armature-shaft, including the clutch member by which the said parts are caused to revolve with said shaft and the armature. Fig. 7 is a partial sectional view on the line *y y* of Fig. 2. Fig. 8 is an enlarged sectional view in detail of the wrist-pin on the driving-crank and connections with the knife-actuating pitman. Fig. 9 is a sectional view similar to Fig. 3, showing a slight modification. Fig. 10 is a detail sectional view on the line *z z*, Fig. 3.

Referring to the drawings by the reference-numerals, 1 represents the foot-plate, and 2 the cloth-lifting plate, of a fabric-cutting machine. Rising centrally from said base or foot-plate is an upright or standard 3, between the sides of which is arranged the vertically-reciprocating knife or cutter 4 of any desired form. The upper part of said standard 3 is slightly offset to one side and is grooved or channeled out at 5 to accommodate the movement of the upper part of the knife and its fastening 6 to the lower part of a vertically-sliding block or cross-head 7. It is very essential that the working or movements of the block or cross-head be effected most easily and without undue noise or friction, and hence I have provided a special form of guide therefor, as well as an easy bearing for each of its sides, the construction being such as to receive all side thrust of either the block or knife without binding or interruption to rapid working of either. Thus secured to the upper part of said standard on opposite sides of the groove or channel 5 therein by means of screws 8 or other similar fastenings are guide-plates 9 9, extending downwardly about one-half the height of the standard and reaching quite to or above the upper end of the latter. The inner vertical edge of each of said guide-plates is formed or provided with a double bevel 10, (see Fig. 9,) and the



two plates are arranged the proper distance apart to receive the said sliding block or cross-head 7 between them. The vertical edges of the block or cross-head are each  
 5 formed with a corresponding V-shaped groove 11, into which the beveled edges of the guide-plates 9 9 are snugly received, and it is evident that from this construction the said sliding block or cross-head will be truly and  
 10 evenly guided in its movements between the said plates. It is apparent, of course, that instead of the construction explained the edges of the block or cross-head could be beveled and the edges of the plates correspond-  
 15 ingly grooved with equally advantageous results, and it will also be understood that instead of forming these parts with corresponding substantially V-shaped beveled and grooved edges other equivalent forms could  
 20 be employed. In conjunction with the form of guide explained (although other guides could be employed in some instances) I preferably employ in connection with each of the vertical or working edges of the said sliding  
 25 block or cross-head a noiseless antifriction-bearing 12, which can be constructed in various ways, but preferably as herein shown, so as to derive the most delicate and accurate adjustments and also have the said bearings  
 30 assist in guiding the said sliding block or cross-head. Indeed in some instance I can dispense altogether with the beveled edges 10 of the guide-plates 9 and by increasing the number of the said bearings 12 can rely  
 35 entirely upon the latter, both as a guide and antifriction device. Preferably, however, I employ the construction herein shown and described, since I obtain thereby an increased strength and rigidity, besides a greater re-  
 40 sistance to side thrust either of the knife or the said block or cross-head. The said antifriction devices or auxiliary guides are each constituted by an outer ring 13, rigid or integral with a threaded bolt 14, which passes  
 45 through the standard at one side of the channel 5 therein, and a similar inner ring 15, screwed onto said bolt, the said rings being formed at their adjacent peripheral edges to provide a continuous outer groove 16 and  
 50 a rotatable shell or ring 17, inclosing said rings 13 and 15 and formed with an inner annular groove 18, the said grooves 16 and 18 forming between them a raceway, within which is arranged a series of balls 19, upon  
 55 which the outer shell 17 has its bearing. Each of the rings 13 and 15 is preferably formed with a rectangular projection 16<sup>a</sup> at its outer surface for the application of a suitable wrench for adjusting the parts. The said ro-  
 60 tatable shells or rings 17 are beveled outwardly to a V shape, so as to be received in the correspondingly-shaped grooves in the vertical edges of the block or cross-head 7, and it is evident that I have thus obtained a  
 65 most perfect means for the desired easy working and noiseless operation of the said block or cross-head. It will also be seen that by

means of the inner rings 15 I am enabled to adjust said bearings to a nicety, since the degree of friction on the balls is regulated by  
 70 tightening or loosening the said rings, as may be desired. The bolts 14 are securely held in place by means of nuts 20, screwing thereon at the opposite side of the standard or up-  
 75 right. It should be here remarked that the antifriction devices 12 are partially received and accommodated in the side portions 21 of the lower part of the bracket or shelf 22, upon  
 80 which the electric motor 23 is mounted, and that said bolts 14 also pass through said part of said bracket; but said construction is not at all essential and is only adopted in the  
 85 present instance for convenience and compactness. The said sliding block or cross-head 7 can be operated or reciprocated in different ways; but preferably I employ a pit-  
 90 man or connecting-rod 25 for this purpose, operated or actuated from a crank 26, carried at one end of the main or armature shaft 27 of the said electric motor 23. The crank 26  
 95 is partially received in a rim 28, formed on the motor-frame 29 at one side of the machine, and thus is said crank guided in its rotation. The latter device is made as light as possible, and it is also provided at the proper point  
 100 with a suitable weight 30 to increase its momentum and to derive the proper driving effect therefrom. It is highly important with this form of driving mechanism that the connection between the said crank and the pit-  
 105 man be perfectly tight, yet capable of quick action and easy working without noise or rattling of the parts. Hence I form integrally with the crank a screw-threaded crank-pin 31, upon which is fitted a removable or threaded  
 110 bushing 32, closed at the outer end by a cap 32<sup>a</sup>, adapted to receive a screw-driver or similar implement, the outer surface of said bushing being perfectly smooth or even. The upper end of the said pitman or connecting-rod 25  
 115 is formed with a split bearing 33, preferably having a split lining 34 to receive the wear, and said bearing 33 fits the bushing 32 and is adjusted to any degree of tightness by means of the screw 35, the said lining 34  
 120 readily conforming thereto. The lower end of the pitman or connecting-rod is provided with a similar split bearing 36 and an adjusting or tightening screw 38 therefor, as well as a split lining 39, the said bearing fitting  
 125 upon a pin 40, formed with and projecting from the outer side of the cross-head or block. A screw 41 serves to secure the said split bearing 36 in place upon the said pin 40, which latter is hollow and screw-threaded to  
 130 receive said screw. It will thus be seen that all wear between the upper end of said pitman or connecting-rod and the crank-pin 31 is borne by the lining 34 and the removable bushing 32 and that it is only necessary to replace one or the other of these parts whenever the connection finally becomes too loose or too much worn to be remedied by simple adjustments thereof. Thus, too, is obviated



the necessity of removing the entire crank either to replace it by another or to fit or provide the same with a new crank-pin, as would otherwise be necessary. It is also highly important in such a construction and arrangement of parts that the movable connection between the crank and pitman be thoroughly lubricated and which has been practically impossible hitherto on account of the injury to the fabric layers caused by leakage or escape of the oil or other lubricant. For this purpose I construct the said crank-pin 31 hollow, as shown at 44, the inner end thereof leading to and communicating with a cavity or recess 45, formed in the inner side or surface of the crank, and in both the opening 44 and the cavity or recess 45 I place a block or quantity of felt or other suitable material 46, packed in place and which is kept saturated with oil or other lubricant which finds its way to the different working surfaces through suitable openings 46<sup>a</sup> and 47, formed in the bushing 32, and the hollow crank-pin 31, respectively. The lubricant can also be injected into said openings from time to time, if desired, so as to also keep the felt properly saturated. In some instances I have found it sufficient to use said felt in the pin 31 only, in which case I then fill up or close the recess 45 with a plug of metal or any other suitable material which can be removed whenever it is desired to remove or replace the felt in the pin. If desired, I may use or employ a similar lubricating device for the lower end of the pitman or connecting-rod; but this is not necessary in most instances. It will be seen from the construction explained that the working of the machine is rendered most easy and perfect and that no injury to the fabric can possibly occur from leakage of the oil or lubricant. It is still further desirable in this class of machines that the main operating or armature shaft be most perfect in its running and also that the connections between the same and the driving devices proper be secure and reliable as well as capable of being taken apart and replaced whenever necessary or desired. For this purpose (see Fig. 2) I construct the armature-shaft 27 with an exterior screw-thread 50 for a suitable distance from its inner end, and I also preferably bore the shaft for a short distance from the end to provide a receptacle for a lubricant, which receptacle is closed by a screw-plug 51, and an opening 52<sup>a</sup> in the side of the shaft leads therefrom, and thus causes a spread of the lubricant over the working or engaging surfaces of the parts, as will appear. Screwing on the said inner end of the armature-shaft is a sleeve or clutch member 52, which is of suitable length and which is notched transversely on opposite sides at the inner end, as shown at 53, and into said notches are received corresponding interlocking projections 54, formed at the adjacent end of the core 55 of the revolving armature 56 of the motor 23. The sleeve or clutch member 52 projects somewhat beyond

the motor-frame and is formed for a suitable distance with an exterior screw-thread 57, by means of which the crank 26 is securely fastened in place upon said sleeve or clutch member to revolve therewith and with the armature-shaft and armature. In order to reduce the noise and friction of the parts to a minimum, I form the exterior surface of the said sleeve or clutch member with an annular groove 58, and I provide a circumferentially-divided bearing for the sleeve comprising two rings 59 and 60, each threaded exteriorly at 61 and screwing from opposite sides into a stationary ring 62<sup>a</sup>, seated in the rim 28 of the motor-frame, the said rings being so constructed on their inner surfaces at 62 as to form a groove 62<sup>b</sup>, which unites with groove 58 of the sleeve or clutch member to form a raceway for a series of antifriction-balls 63. The said stationary ring 62 is formed all the way through at one point with a threaded opening 63<sup>a</sup>, in which is inserted from each side a screw 64, the heads of which bear or impinge upon the outer surfaces of the rings 59 and 60, and thus absolutely prevent any backward turning of said rings while the shaft is turning. The rings 59 and 60 can each be unscrewed to any desired extent and again screwed up tightly by means of a suitable wrench or otherwise, and thus are they also the means for effecting the adjustment of the bearing, as is obvious. The ring 62<sup>a</sup> is held stationary by means of a set-screw 65, entering or passing through the rim 28 on the frame. A similar rim 66 is formed or provided in the motor-frame at the opposite end of the armature-shaft, and in which rim is also seated a ring 67, held stationary by a screw 68, the said ring having a groove 69 on its inner surface. Formed on said shaft at its outer end is a nut 70, and at this end also the shaft has an opening 71, having a screw 72 for clamping to the shaft a suitable grinding-wheel (not shown) for the knife. Arranged on said shaft also at this (outer) end is an outer beveled or conical ring 74 and inner ring 75 of similar construction, the two said rings being preferably separated by washers 76 and between them forming an annular groove 77, which unites with the groove 69 in ring 67 to form a raceway for antifriction-balls 78, and thus it will be seen that a similar bearing is also provided for the said outer end of the said main or armature shaft of the motor. It will be understood that the shaft can be screwed up more tightly in the sleeve or clutch member by application of a wrench to the said rigid nut 70, which latter is also an abutment for the said outer ring. The said rings 74 and 75 are confined in place between the end 77<sup>a</sup> of the armature-core and the said nut 70, and it is evident that when the armature is rotated the core thereof, as well as the armature-shaft, the sleeve or clutch member, and the crank all revolve therewith. It will also be seen that the working of the parts or elements is most easy and regular and that either or all of them can



be replaced by others when so far worn as to become unfit for further use. It is to be remarked, however, that in virtue of my improved construction and arrangement the longevity of each of the parts is greatly increased, and hence the entire machine is available for use for a considerably longer period of time than in most instances hitherto.

The numeral 80 denotes an improved presser-foot, which is carried at the lower end of a plate or bar 81, which is vertically adjustable in a guide 82 on one side of the standard 3, a set-screw 83 being employed to hold or secure the said plate or bar at different heights, according to the height of the fabric layers, upon which the presser-foot is made to rest or bear in an obvious manner. The main part 84 of the presser-foot is slightly curved upwardly and forwardly of the cutting edge of the knife, being thus substantially concaved on its upper surface and convex on its under surface. By this construction the said presser-foot serves also as a resistance on one side of the knife for small cuttings or particles, of cloth, which are carried upwardly by the knife or cutter in its reciprocations, thus avoiding clogging of the knife. The shorter portion 85 of the said main part of the presser-foot extends rearwardly of the knife, and thus is the severed cloth or fabric aided at this side of the knife to spread apart, so as not to buckle up and interfere with the proper working of said knife. Formed with or connected to the plate or bar 81, just above the said curved part 84 of the presser-foot, is a guard 86, extending across the front of the knife, thence rearwardly and downwardly at 87, and finally terminating in an auxiliary curved foot 88, corresponding to the portion 85 of the main presser-foot 80. The construction and arrangement of the said presser-foot as a whole give superior results hitherto unattainable with other forms in use, since in virtue of the peculiarly-curved formation of the said guard and auxiliary presser-foot a yielding resistance to the bulging of the fabric is derived, which better enables the cut or divided portions of the fabric to pass to opposite sides of the knife during the forward movement of the machine in the cutting operation.

The handle for the machine is indicated at 95, by means of which the machine is moved over the surface of the table or support for the fabric layers.

In order to adjust or compensate for any wear which may occur between the edges of the sliding block and the guide-plates 9 thereof, the screw-holes of one of the latter plates (to the right, Fig. 1) are elongated transversely, as shown at *a*, by which said plate can be moved inwardly and tightened in place in an obvious manner. After the plate is thus moved suitable screws *b* (shown in dotted lines) are adjusted inwardly to back up said plate at its outer edge. If desired, a suitable outer shield or guard can be em-

ployed to protect the working parts of the machine from dust and dirt; but I have not considered it necessary to illustrate the same herein.

It will be understood that the machine is susceptible of various modifications in details of construction and arrangement without departing from the scope of my invention.

I make no claim herein to the motor-driven shaft and its connections with the reciprocatory knife or tool, since these form the subject of a separate or divisional application filed June 12, 1901, and having Serial No. 68,103.

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent of the United States, is—

1. In a fabric-cutting machine, a foot-plate having a standard arising therefrom provided with confronting guideways, a block carrying a knife fitted between and engaging said guideways, auxiliary rotary guides for said block, and means for reciprocating the latter; substantially as described.

2. In a fabric-cutting machine, a foot-plate having a standard arising therefrom provided with confronting guideways, a block carrying a knife fitted between and engaging said guideways, auxiliary rotary guides for said block, antifriction-bearings for said rotary guides, and means for reciprocating the block; substantially as described.

3. In a fabric-cutting machine, a slideway, a reciprocatory block therein, the two having corresponding beveled and grooved guiding edges, rotary rings or shells also guiding the block, a knife carried by said block, and means for operating the block, substantially as described.

4. In a fabric-cutting machine, a slideway, a reciprocatory knife-carrying block therein, the two having interengaging beveled and grooved guiding edges, and auxiliary rotary guides for said block, substantially as described.

5. In a fabric-cutting machine, a slideway, a reciprocatory knife-carrying block therein, the two having corresponding beveled and grooved guiding edges, rotary auxiliary guides for said block, and antifriction-bearings for said guides, substantially as described.

6. In a fabric-cutting machine, a slideway, a reciprocatory knife-carrying block therein, the two having beveled and grooved guiding edges, and rotary auxiliary guides for the block comprising rings or shells constructed in conformity with the edges of said block, substantially as described.

7. In a fabric-cutting machine, a slideway, a reciprocatory block therein, the two having corresponding V-shaped beveled and grooved guiding edges, and rotary rings or shells also serving to guide the block and provided with ball-bearings, substantially as described.

8. In a fabric-cutting machine, the standard formed with the slideway, the guide-plates



at the sides of the latter having beveled guiding edges, a reciprocatory block in said slideway having correspondingly-grooved guiding edges, and antifriction-bearings also at the 5 sides of the slideway, said bearings each comprising a screw-bolt having an integral ring and an adjustable ring, the two constructed to form a groove, a series of balls seated in said groove, and an inclosing ring or shell 10 similarly grooved interiorly and beveled at the edge and received in the grooves of said block, substantially as described.

9. In a fabric-cutting machine, the standard formed with the slideway, the guide-plates 15 at the sides of the latter, a reciprocating block guided in said slideway between the plates, rotary auxiliary guides for said block, and an-

tifriction-bearings for said auxiliary guides, substantially as described.

10. In a fabric-cutting machine, a foot-plate 20 having a standard rising therefrom provided with confronting guideways, fixed rotatable devices located in said guideways, a reciprocatory knife-carrying block fitted between said guideways and engaging said rotary de- 25 vices, and a motor on said standard for reciprocating said block.

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

HENRY A. MEYER.

Witnesses:

J. SWEENEY,

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