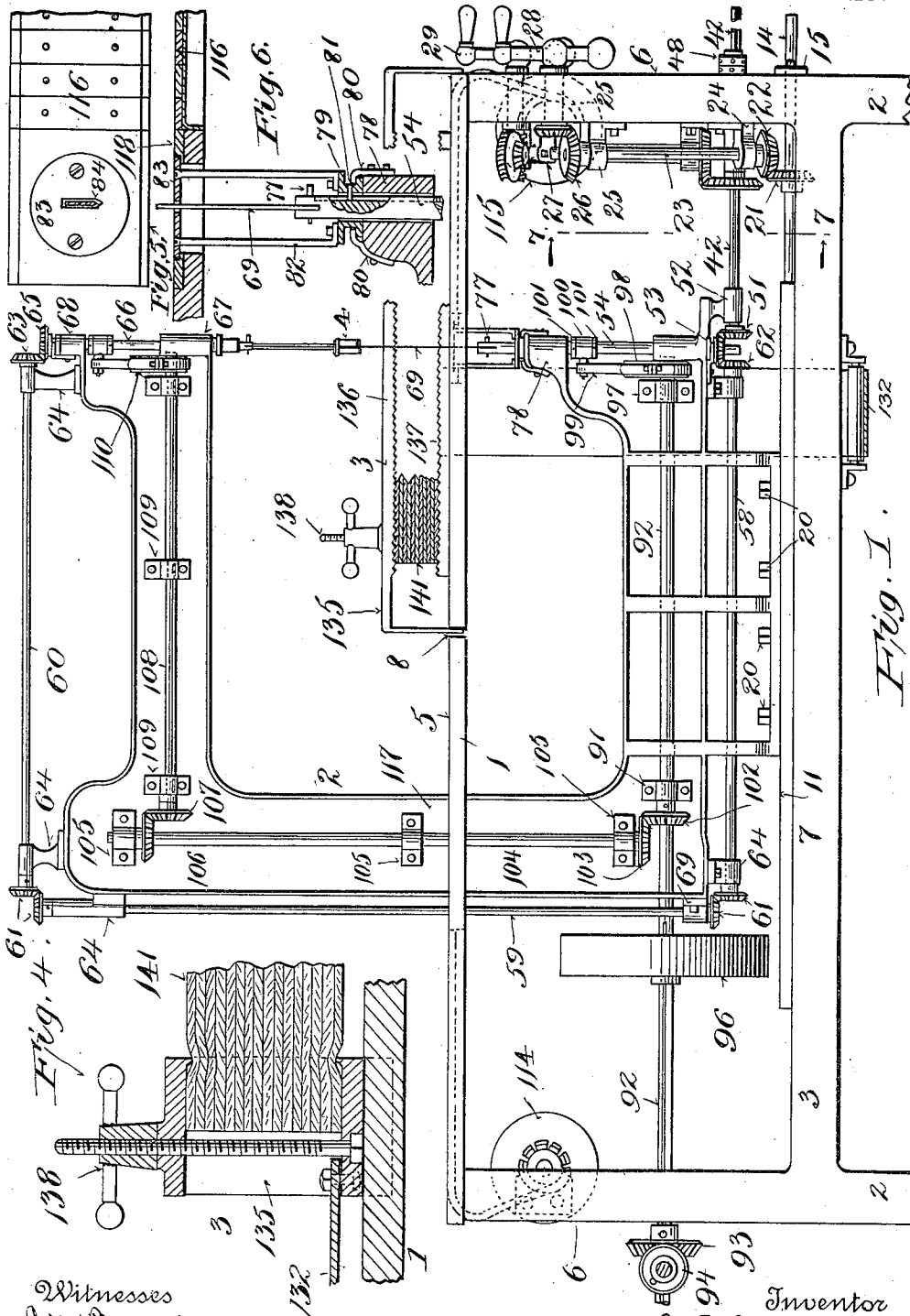


No. 824,948.

PATENTED JULY 3, 1906.

A. E. POLLOCK.
CUTTING MACHINE.
APPLICATION FILED SEPT. 23, 1905.

4 SHEETS—SHEET 1.



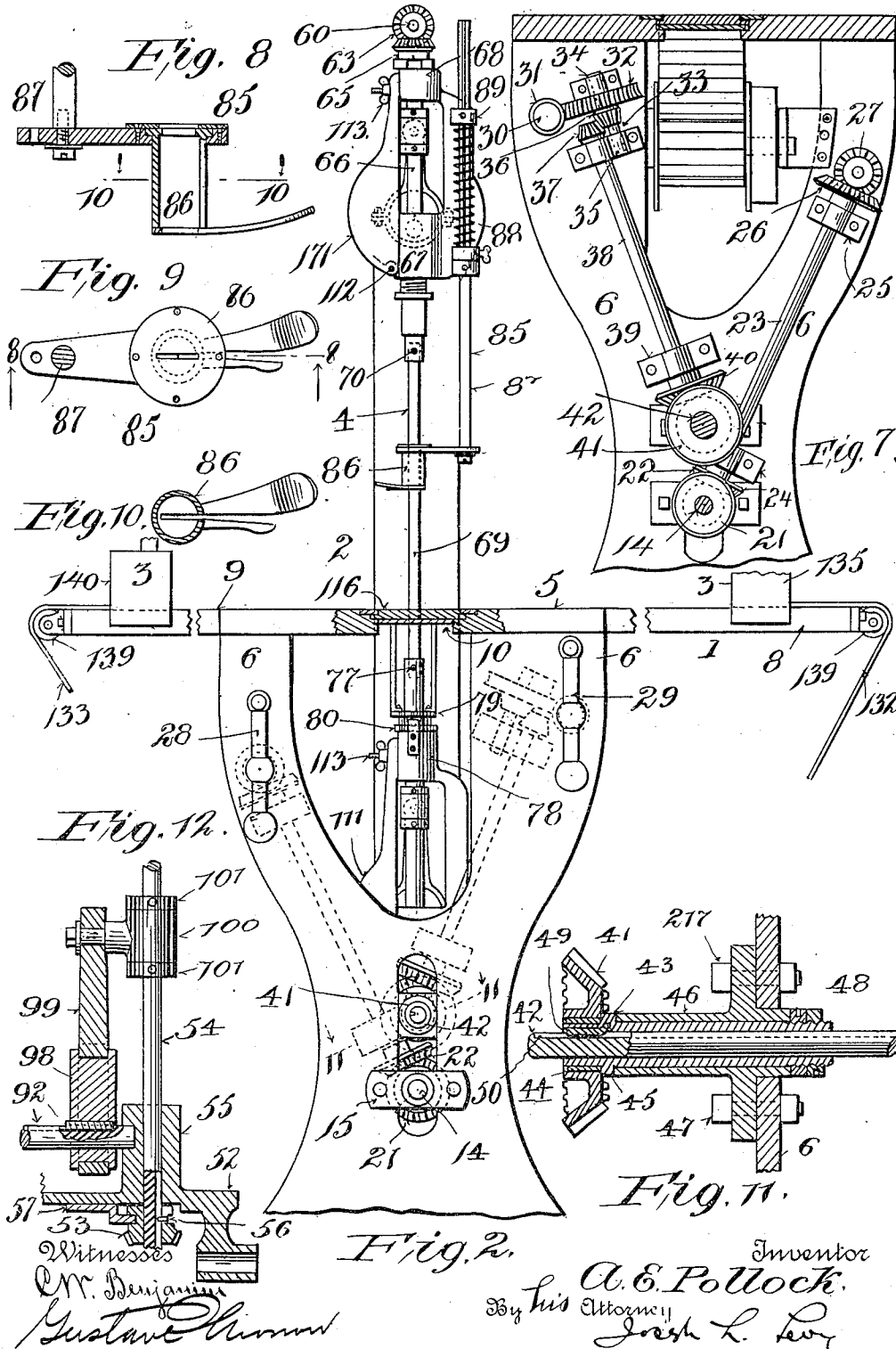
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CUTTING MACHINE.

APPLICATION FILED SEPT. 23, 1905.

4 SHEETS—SHEET 2.



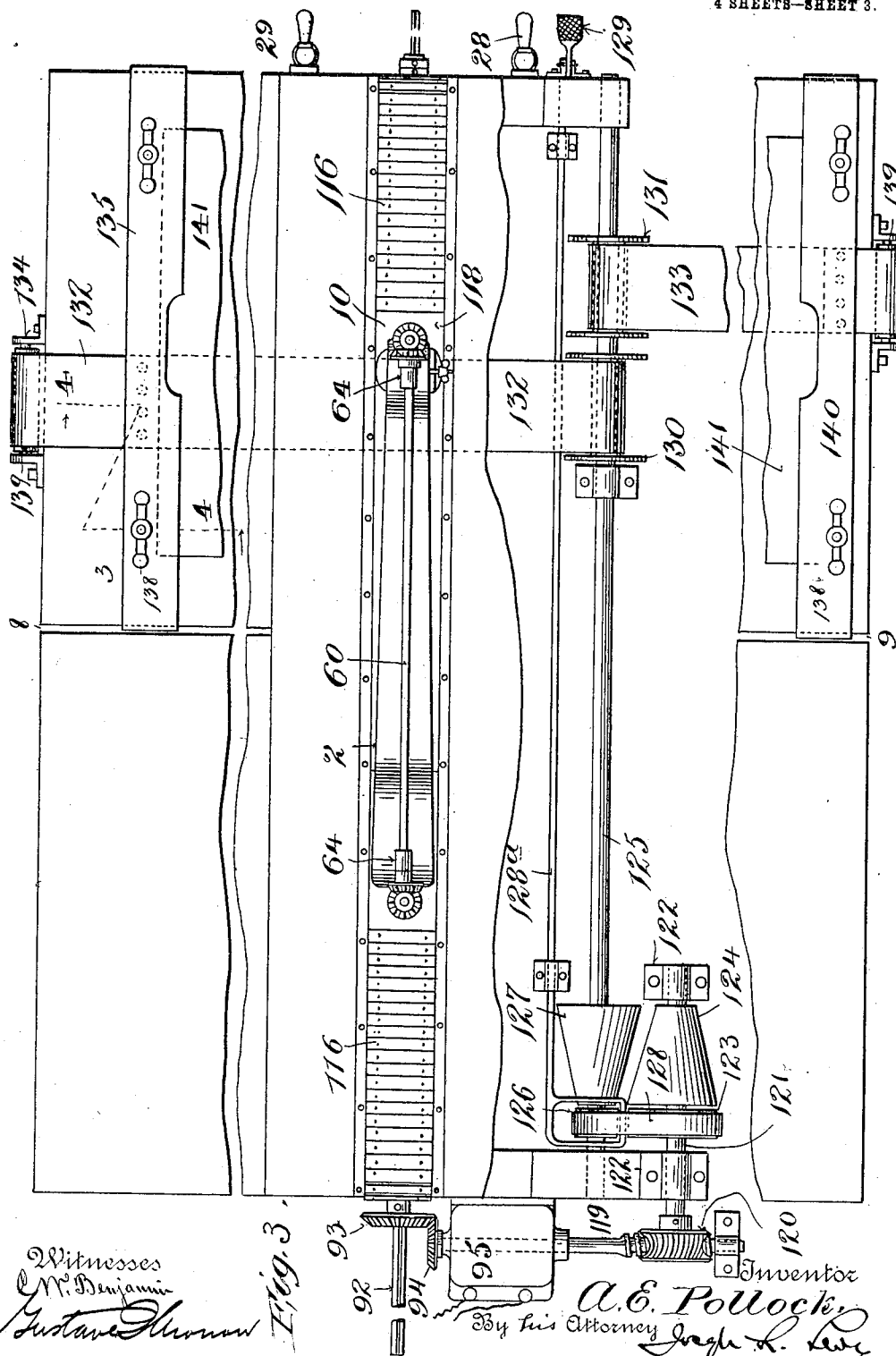
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4 SHEETS—SHEET 3.



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Fig. 3.

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4 SHEETS—SHEET 4.

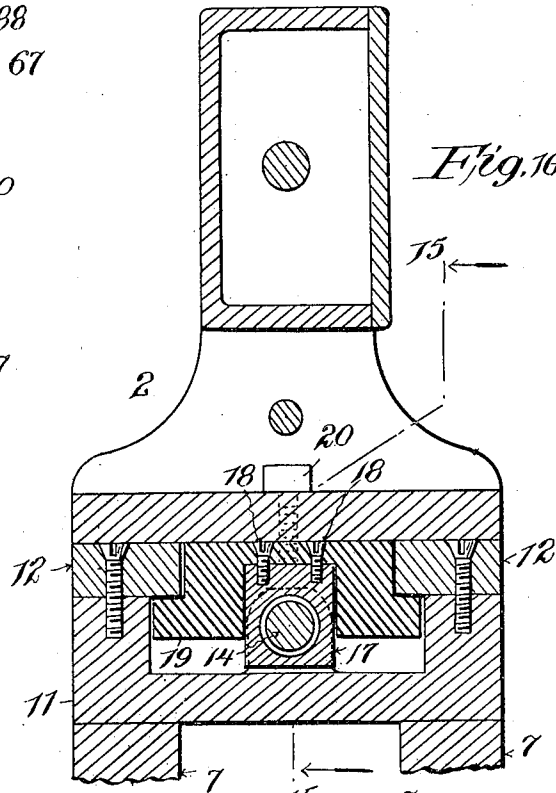
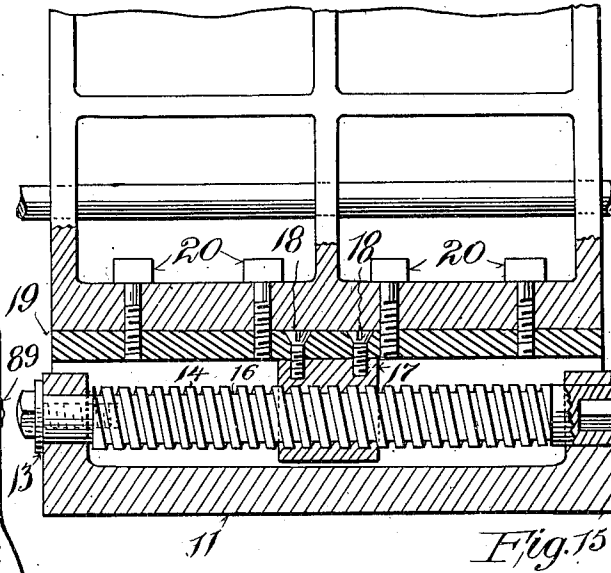
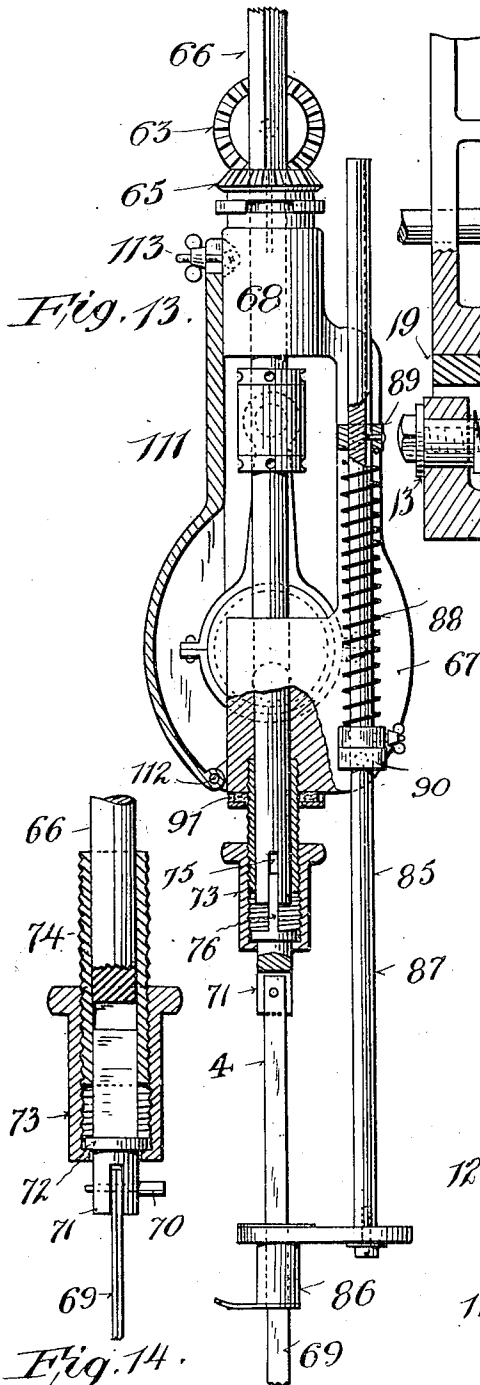


Fig. 14.

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UNITED STATES PATENT OFFICE.

ADOLPH E. POLLOCK, OF NEW YORK, N. Y.

CUTTING-MACHINE.

No. 824,948.

Specification of Letters Patent.

Patented July 3, 1906.

Application filed September 23, 1905. Serial No. 279,770.

To all whom it may concern:

Be it known that I, ADOLPH E. POLLOCK, a citizen of the United States, and a resident of the city, county, and State of New York, have invented certain new and useful Improvements in Cutting-Machines, of which the following is a specification.

The object of my invention is to provide a machine of this class that will operate so as to cut a large number of layers simultaneously and accurately. This object is accomplished by providing a machine with a cutter reciprocating in a frame movable transversely of the machine and a clamp which moves longitudinally of this machine, and in addition to these movements the cutter may be oscillated or rotated about its axis so as to cut curved lines accurately. The cutter may be of any suitable form, according to the material to be cut. If cloth be the material, the cutter preferably has a knife-edge and if wood be cut the cutter is provided with a saw-edge. In either case the operation of the machine is substantially the same. For a more particular description of one embodiment of my invention reference is to be had to the accompanying drawings, forming a part hereof, in which—

Figure 1 is a side elevation of my improved machine. Fig. 2 is an end elevation, certain parts being shown in section. Fig. 3 is a plan view. Fig. 4 is a sectional view taken on the line 4 4 of Fig. 3 looking in the direction of the arrows. Figs. 5 and 6 are enlarged plan and sectional views of parts of the table and cutting mechanism. Fig. 7 is a sectional view taken on the line 7 7 of Fig. 1 looking in the direction of the arrows. Figs. 8, 9, and 10 are enlarged views of the presser-foot, Fig. 8 being taken on the line 8 8 of Fig. 9 and Fig. 10 on the line 10 10 of Fig. 8. Fig. 11 is a sectional view taken on the line 11 11 of Fig. 2. Fig. 12 shows a portion of the reciprocating mechanism for the cutter. Figs. 13 and 14 show enlarged views of other parts of the cutting mechanism. Figs. 15 and 16 show enlarged views of the frame-shifting mechanism, Fig. 15 being taken on the line 15 15 of Fig. 16 looking in the direction of the arrows.

Throughout the various views of the drawings, similar reference characters designate similar parts.

The machine comprises a bed or table 1, a movable frame 2, movably mounted thereon, a clamp 3, slidably mounted on said table,

and a reciprocating cutter 4, mounted in said frame so as to have a turning and a reciprocating movement.

The table 1 consists of a horizontal bed 5, which is supported by legs 6, which legs may be given and suitable shape and rest upon the floor. For strength these legs are preferably united by a horizontally-disposed brace 7. For convenience, as will appear below, the body 5 is slotted longitudinally at 8 and 9 and transversely at 10. A guide 11 is fixedly mounted on the braces 7 in any suitable manner, as shown in Figs. 1 and 16. This guide 11 is provided with the slideways 12, which are so arranged and disposed as to be parallel with the braces 7, and on these slideways 12 rests the movable frame 2. This guide 11 is also provided with bearings 13 at each end, which bearings support a shaft 14, which runs parallel to the slideways 12 and which is also journaled at 15 in one of the legs 6. This shaft 14 is screw-threaded at 16, as indicated in Fig. 15, to engage a nut 17, fixed by screws 18 to the lower surface of the frame 2. The shaft 14 may be made of one integral piece, or the screw-threaded part 16 may be journaled in the guide 11 at each end in the bearing 13 and given any suitable connection with the remainder of the shaft. The precise construction of the shaft 14 is immaterial, providing it is mounted so as to rotate and have no movement in the direction of its axis.

The frame 2 has a guide 19, which takes under the slideways 12 and which is secured to the frame 2 by means of bolts 20 or any suitable means. For convenience the nut 17 is generally secured to the guide-block 19, although this may be varied, if desired.

The shaft 14 is rotated by means of a miter-gear 21, which meshes with a corresponding miter-gear 22 on a shaft 23, resting in bearings 24 and 25 on a leg 6 at the operator's end of the machine. At the other end of this shaft 23 is a similar beveled miter-gear 26, which meshes with a corresponding gear 27, that is fixedly mounted on a stud journaled in this leg 6, and this stud is provided with a handle 28, by means of which it may be rotated. Any rotation of the handle 28 causes a corresponding transverse movement of the frame 2 on the guide 11, as is apparent. A second handle 29 is fixed to the worm-shaft 30, which has a worm 31, that engages a worm-gear 32, mounted on a stud-shaft 33, journaled at 34 and 35, as shown in Fig. 7. This stud-shaft

33 is provided with a gear 36, which is fixedly mounted thereon and which meshes with the corresponding gear 37 on a shaft 38, one end of this shaft 38 being journaled in the bearing-block 35 and the other or lower end in a block 39. At the lower end of this shaft 38 is fixedly mounted a bevel-gear 40, which meshes with the corresponding gear 41, which is adapted to rotate a shaft 42 by the following means: The gear 41 is secured to a sleeve 43 by means of a washer 44 or other suitable mechanism and is given a tight fit, so that it has no angular movement with regard to the sleeve 43. At one end the sleeve 43 is provided with a collar 45, which abuts against a bearing 46, which is bolted to a leg 6 by means of bolts 47. This bearing 46 passes through the leg 6 and abuts against screw-collars 48, secured to the outer end of the sleeve 43. The sleeve 43 at or near its inner end is provided with a key 49, which slides in a keyway 50 in the shaft 42. From this description it is apparent that the gear 41 is mounted to have a rotating movement only, and the shaft 42 is mounted so as to have also a reciprocating movement in the direction of its axis, so that by merely turning the handle 29 the shaft 42 may be rotated and moved in the direction of its axis. The inner end of the shaft 42 is provided with a miter-gear 51, which rests just inside a projecting bearing 52, which is preferably integral with the frame 2, as shown in Fig. 1. This bearing 52 supports one end of the shaft 42 and is in actual alinement therewith. The shaft 42 is so mounted in the bearing 52 that it is only a rotating movement in said bearing.

The gear 51 meshes with the corresponding gear 53, slidably mounted upon a vertically-disposed shaft 54, which shaft 54 is journaled at its lower end in the bearing 55, as is apparent in Fig. 12. The miter-gear 53 is provided with an annular recess 56, which engages a projecting lug 57, secured to the frame 2, and this gear 53 is given a slot connection with the shaft 54, as indicated in this figure, for the purpose mentioned above. This connection, just described, causes the shaft 54 to have the same angular movement as the shaft 42, all of which may be imparted by rotating the handle 29. A series of suitably-mounted shafts 58, 59, and 60, which are connected to each other by means of miter-gears 61 and to the miter-gear 53 by means of a similar miter-gear 62, cause the same angular movement to be imparted to the miter-gear 63, fixed to the end of the shaft 60. The shafts 58, 59, and 60 are suitably journaled in blocks 64 and fixed to the frame 2.

The gear meshes with the corresponding gear 65, fixed on a shaft 66, mounted and journaled in a manner similar in all respects to the shaft 54, so that the shaft 66 may be

rotated by the gear 65 and have a reciprocating motion therethrough in the direction of its axis. The shaft 66 is journaled in lugs 67 and 68 on the frame 2.

The shafts 66 and 54 have the same axis and are united by a cutter-blade 69, which may be given any suitable form, according to the work it has to do. At the upper end the cutter 69 is provided with a perforation through which passes a pin 70, which also passes through a slotted plug 71 with a collar 72, which rests against the shoulder of a sleeve 73, which is screw-threaded in a bushing 74, which bushing is fixed to the shaft 66. The lower end of the shaft 66 is slotted at 75 to receive a corresponding shaft on the end of the plug 71. This construction forces the blade 69 to partake of the angular movement of the shaft 66. A similar but different connection holds the lower end of this blade 69 to the lower end of the shaft 54, as is apparent in Fig. 6, where the end of the shaft 54 is slotted, and the perforated lower end of the cutter 69 is held in this slot by means of a pin 77. It is not necessary to make the connection between the blade 69 and shaft 54 identical with the connection between this blade and the shaft 66, because the latter has to have the capacity for longitudinal adjustment so as to compensate for blades of various lengths or to put the blade under tension so as to prevent all bending or moving when operating the machine, which compensation is not necessary at more than one end of the blade.

The upper end of the shaft 54 passes through a bearing 78 in the frame 2, and which bearing has on its upper part a rotatably-mounted collar 79, provided with an annular recess, into which projects lugs 80, secured to the fixed part of the bearing 78, and this collar 79 has a pin 81, which enters the keyway in the shaft 54, so that this collar 79 has the same angular movement as the shaft 54.

The arms 82 are fixedly secured to the upper surface of the collar 79 and extend upwardly therefrom and parallel with the blade 69 to the rotary plate 83, to which they are fixedly secured. This plate 83 has a slot 84, through which the reciprocating knife 69 passes. By this means the plate 83 will always turn with the knife 69, so that it will never come in contact with this knife and produce torsional strains in it.

For convenience a presser-foot 85 is mounted parallel to and near the vertical shaft 66 in the bearing 67. This presser-foot 85 has the usual cylindrical toe 86, which surrounds the blade 69 and protects it in the usual manner. The shaft 87 of this presser-foot 85 is surrounded in part by a coiled spring 88, one end of which rests against the upper bearing 89 of this shaft and the lower against adjustably-mounted collars 90, so that the tension of the presser-foot upon the

material being cut may be varied to suit the volition of the operator. A key and a slot connection between the bearing 89 and the shaft 87 prevents any rotation of this presser-foot 85, whereby all liability to get out of alinement is obviated. To avoid all liability to accident from the collision between the bearing 67 and the sleeve 76 should the apparatus get out of order, a rubber or other washer 91 is preferably secured immediately under this bearing 67 and above the sleeve 76. The precise manner in which this washer 71 is secured is immaterial, provided it be securely and properly held.

15 The reciprocating movement of the cutter 4 or knife 69 is derived from a shaft 92, which runs parallel with the shafts 58 and 14 and above the same. This shaft 92 is slidably pivoted in the table of the machine at one end, and at the other it is rotatably, but not slidably, mounted in the frame 2. At the end in the table 6 it is provided with the bevel-gear 93, which has the usual pin-and-slot connection therewith, which gear meshes 20 with a corresponding gear 94 on the armature of a motor 95. It is not necessary to employ a motor for this purpose, as any other suitable source of power may be employed. However, for practical purposes an electric motor is found to give the best satisfaction. This 30 motor 95 is also geared, by means of a worm secured to the other end of its armature-shaft, to other mechanism of the machine, as will appear below.

35 The fly-wheel 96 is also mounted on a shaft 92 and preferably under the bed 5 and the table 1, so as to have the same angular movement as the shaft 92. This fly-wheel should be made heavy enough to insure a steady and reliable movement of this shaft. This shaft 40 92 is suitably journaled in bearings 97, and at its inner end it is provided with an eccentric 98, on which is the usual eccentric-strap 99, which is pivoted at its upper end to a sleeve 100, which is rotatably mounted on a shaft 54 and held by two fixed collars 101 against a sliding movement on this shaft 54, so that when the shaft 92 is rotated the shaft 54 is given a reciprocating movement in a vertical 50 direction. A miter-gear 102 is also mounted on this shaft 92, which gear engages with a corresponding gear 103 on the shaft 104, which shaft is journaled in blocks 105 and has at its upper end a second bevel miter-gear 106, which engages with the corresponding gear 107 on the shaft 108, journaled in bearings 109. The shaft 108 has an eccentric 110 secured to its inner end, which is identical with the eccentric 98 and connected in the same identical manner with the shaft 66, 60 so that when the shaft 92 is rotated the shafts 54 and 66 will reciprocate in unison and hold the cutting-blade 69 tight between them. As the eccentrics 99 and 110 are somewhat 65 exposed and liable to be interfered with by

dust from the cutting, it is preferable to encase as far as possible in covers 111, which covers are preferably pivoted at 112 at their lower ends, and a screw clamped at their upper ends, as shown at 113. The precise manner in which these covers are applied is immaterial, providing it is sufficient. 70

As the frame 2 slides in the slot 10 of the bed or table and as this frame 2 is to be made large and strong to be sufficiently rigid 75 to perform its function, it is necessary to provide some closing means to fill the part of the slot 10 unoccupied by the frame 2. This object is accomplished by placing two rollers 114 and 115, respectively, on the legs 6 and 80 immediately under the ends of these slots, which rollers are preferably the ordinary spring-rollers on which curtains are wound. Slats 116 are mounted on some flexible material and are wound on said rollers and secured to the frame 2. These slats 116 are so 85 mounted as to slide between the walls of the slot 10 and always fill the portions of this slot unoccupied by the frame 2.

Between the knife 69 and the vertical web 90 117 of the frame 2 it is not necessary to have a flexible construction for filling the slot 10, as this part is never bent. Therefore this portion is preferably filled by an ordinary plate 118, which extends sufficiently far to include 95 the pivotal plate 83.

The worm 119 on the armature-shaft of the motor 95 meshes with the worm-gear 120, fixed to a shaft 121, journaled at 122. Between the bearing 122 are located pulleys 123 100 and 124. The pulley 123 is an ordinary cylindrical pulley, and the pulley 124 is preferably a conical pulley.

Extending the length of the machine and parallel to the shaft 121 is a shaft 125, on 105 which are fixedly mounted a cylindrical loose pulley 126, which is opposite the pulley 123, and a cone-pulley 127, which is opposite the pulley 124. A belt 128 is so arranged as to pass either over the pulleys 123 and 126 or 110 the pulleys 124 and 127. The shaft 125 is mounted so as to have only a rotary movement. A belt-shifter 128^a of any suitable form is controlled by a treadle 129 at the end of the machine near the handles 28 and 29. 115 As the shifter is of any suitable form and mounted in any suitable manner, a detailed description is unnecessary.

On the shaft 25 and side by side are two rollers 130 and 131, respectively, and on these 120 rollers are wound two belts 132 and 133, respectively. The belt 132 passes under the bed 5 of the table and over a pulley 134 to a clamp 135. This clamp 135 consists of two bars 136 and 137, which are preferably rough- 125 ened at adjacent sides and united by bolts 138. The bar 136 is preferably bent outwardly at its limits to enter the slot 8 to overlap the end of the bed. The belt 133 passes over a roller 139 and engages a clamp 140, 130

which is identical in all respects with the clamp 135, so that a detailed description of it is unnecessary.

From the foregoing the portion of my device will be readily understood and will be as follows: Assuming the machine to be ready for operation, the fabric or material 141 is clamped, stretched, and firmly held between the clamps 135 and 140 and rests on the table or bed 5 of the machine. The motor 95 is then started, and through the gears 94 and 93 a shaft 92 causes the blade 69 to reciprocate in a vertical direction. Through the worm 119 and gear 120 and shaft 121 the pulley-wheel 123 revolves and causes the loose pulley 126 to revolve by means of a belt 128. The shaft 125 does not revolve. By pressing the foot-treadle 129, which treadle is spring-controlled, the belt-shifter 128^a causes the belt 128 to leave the pulley 123 and ride down upon the cone-pulley 124 and upon the cone-pulley 127, the amount the belt 128 is shifted depending upon the pressure of the treadle 129, so that the rotation of the shaft 125 can be varied considerably within the limits of the machine, the speed being reduced as the belt is shifted away from the pulleys 123 and 126 and increased as the belt approaches these pulleys, as is obvious. If the shaft 125 is revolved in one direction, the belt 132 is wound upon the spool 130 and the belt 133 is unwound from the spool 131. The spools 130 and 131 are made a little loose on the shaft 125, so as to enable them to slip whatever is necessary to compensate for the change in diameters of the spools as the belt is wound and unwound. These belts 132 and 133 one but not both at the same time draw over respective clamps, the clamp being drawn either toward the pulley 134 or the pulley 139, depending upon whether the belt 132 is being wound upon its spool 130 or the belt 133 upon its spool 131, the winding-belt being the controlling one at all times, the other simply serving to keep the fabrics in tension should such tension be necessary. The rotary movement of the blade 69 and the transverse reciprocating movement of the frame 2 are controlled and operated by means of the handles 29 and 28, respectively, which handles may be rotated in either direction, as desired by the operator, who is supposed to keep one hand on each while the machine is in operation. The presser-foot 85 is put on the goods before they are cut, and the spring 88 causes this foot to remain in place and under suitable tension, so that under no circumstances will the goods being cut be raised off the table 5 by the reciprocating movement of the cutter. In so far as the cutting is concerned it is immaterial in what direction the shaft 92 rotates in, as the reciprocations are identical in either case. The movement of the fabric, which is controlled by the shaft 125, depends upon the direction

of rotation of this shaft, as one belt is always wound and while the other is always unwound. For this reason it is necessary to reverse the direction in which the fabric is moved or fed to the cutter. The electrical connections for causing this reversal of the motor are so well understood that it is not necessary to illustrate them, and they are not shown in the drawings. If desired, the motor could always run in the same direction, and the direction of rotation of the shaft 125 could be controlled by mechanical means, such as cross-belts and duplicate sets of pulleys. As these are also well known to those skilled in the art, it is not necessary for me to describe them.

Having thus described my invention, what I claim is—

1. In a device of the class described, a table, a cutter, and means for supporting said cutter so that it may have a reciprocating motion in a line perpendicular to the plane of the table; means for causing this cutter to have a rotary motion, and mechanical means for positively moving the cutter transversely of the table.

2. In a device of the class described, a table, a cutter, and means for supporting said cutter so that it may have a reciprocating motion, means for providing the cutter with a rotary movement, means for giving the cutter a movement transversely of the table, and means for moving the material to be cut longitudinally of the table; whereby the material may be cut along any line either straight or curved.

3. In a device of the class described, a table, a reciprocating cutter, means for supporting the cutter so that it has a reciprocating movement in a line perpendicular to the plane of the table, means for providing a rotary movement while the cutter is rotating, and manually-controlled and mechanically-operated means for moving the cutter at its supports transversely of the machine.

4. In a device of the class described, a table, a reciprocating cutter, means for supporting the cutter so that it has a reciprocating movement, means for providing the cutter with a rotary movement, manually-controlled means for moving the cutter at its supports transversely of the machine, and a clamp with mechanically-operated and manually-controlled mechanism for moving said clamps longitudinally of the machine.

5. In a device of the class described, a table having a bed with transverse and longitudinal slots, said transverse slots being filled in part by a flexible slide.

6. In a device of the class described, a table having a transverse slot filled in part by a rigid slide, and in part by flexible slats and spring-actuated rollers on which said flexible parts may be wound or unwound.

7. In a device of the class described, a ta-

ble having a slotted bed and a cutter-carrying frame extending up through the slot in said bed, and means for sliding said frame in said slot.

5 8. In a device of the class described, a table having a slotted bed, guides under said bed and parallel with said slot, a cutter-carrying frame sliding on said guides and extending through said slots, and means for reciprocating said frame on said guides.

10 9. In a device of the class described, a table having a slotted bed, guides under and parallel with said slot, a cutter-carrying frame sliding on said guides and extending through the slot in said bed, a screw-threaded shaft rotatably mounted, a nut fixed to said frame and engaging said threads, and means for rotating said shaft whereby the frame may be reciprocated.

20 10. In a device of the class described, a table having a slot extending through said frame and resting on guides, said guides being attached to a table, and a series of slidably - mounted shafts extending through bearings in said table and resting in bearings in said frame, one of said shafts being adapted to give the cutter and frame a reciprocating movement; another of said shafts being adapted to give said cutter a rotary movement, and the third of said shafts being adapted to give the frame a reciprocating movement.

35 11. In a device of the class described, a table, a frame resting on a portion of said table, and a series of rotatably-mounted shafts having a sliding connection with said table.

40 12. In a device of the class described, a table having a reciprocating frame slidably mounted thereon, and a series of shafts rotatably-mounted on said frame, two of said

shafts having a reciprocating as well as a rotary movement, and adjustable means for causing said shafts to rotate, whereby a reciprocating cutter may be given a rotary movement about its axis.

45 13. In a device of the class described, a table, a cutter-carrying frame slidably mounted on said table, a reciprocating cutter moving above and through the body of said table, means for rotating said blade about its axis, 50 and means for causing a portion of said table to rotate with said blade, whereby all torsional strains on the blade are obviated.

14. In a device of the class described, a reciprocating shaft and screw-threaded bushing on said shaft, a slot in said shaft, a plug having a reduced portion entering said shaft, and a collar and sleeve adjustably mounted on said bushing and securing said plug in place, and a cutter secured to said plug. 60

15. In a device of the class described, a table, a pair of clamps resting on said table, the shaft extending under said table, rollers on said shaft, and belts connecting said clamps and rollers whereby the clamps may be 65 moved in either direction by winding one of said belts on its roller.

16. In a device of the class described, a table, a shaft extending under said table, means for rotating said shaft in either direction and varying the speed or rotation; a clamp on said table, and means for connecting said clamp with said shaft so that it may be moved in either direction in accordance with the rotation of said shaft. 70

Signed this 22d day of September, 1905. 75

ADOLPH E. POLLOCK.

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