

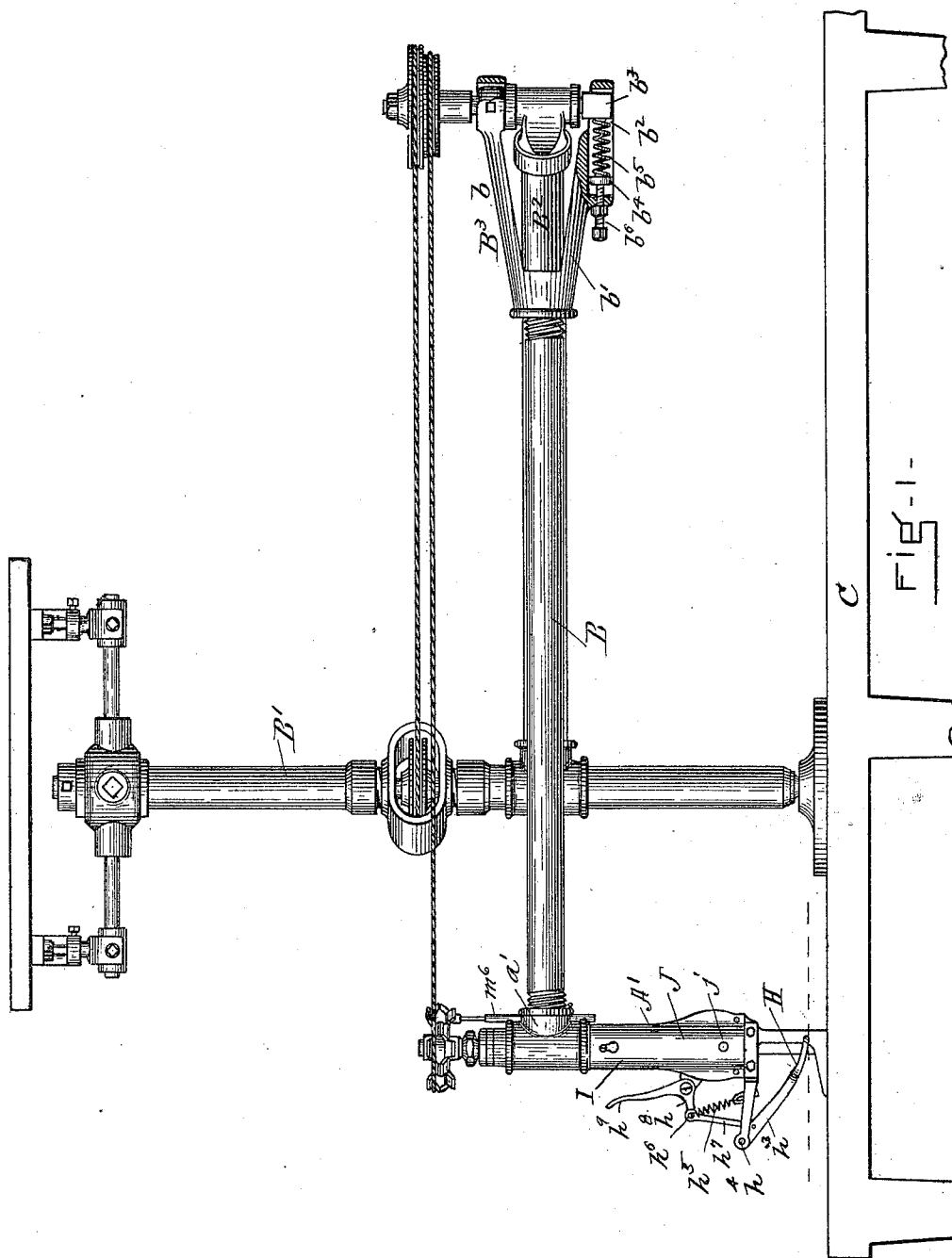
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5 Sheets—Sheet 1.

P. C. MORSE.
CLOTH CUTTING MACHINE.

No. 585,279.

Patented June 29, 1897.



WITNESSES

L. M. Dolan.
J. T. Butler.

INVENTOR

Paul C. Morse
by his atty
Charles A. Raymond

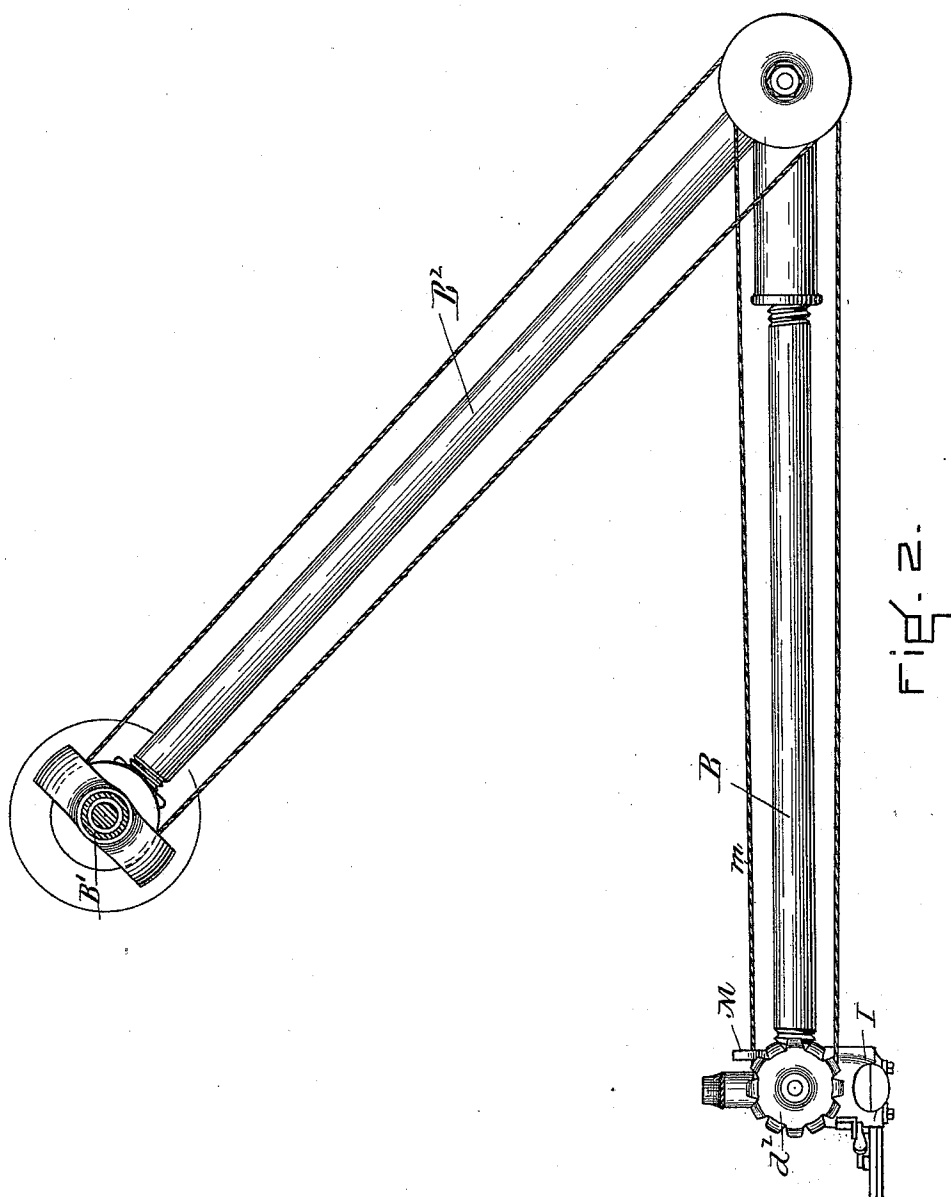
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WITNESSES

J. W. Dolan.
H. T. Butler.

INVENTOR

Preston C. Morse
by his attys
Clark & Raymond

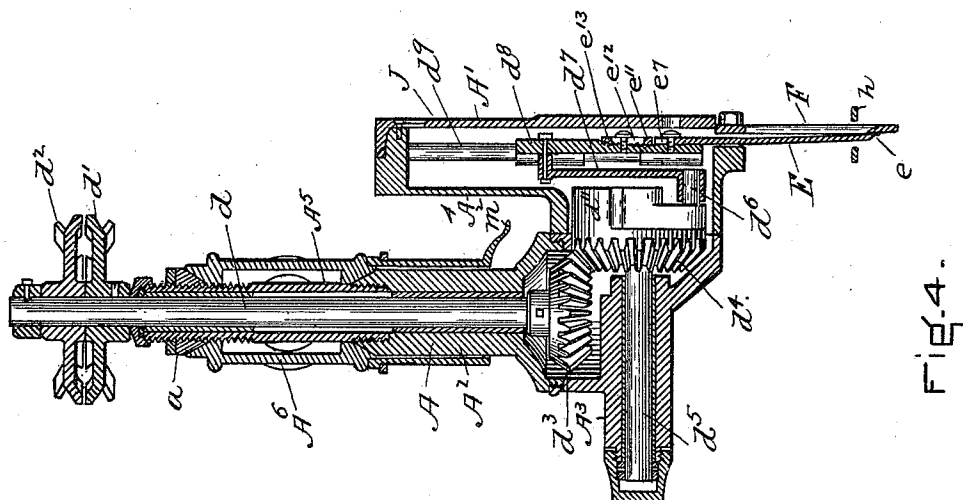
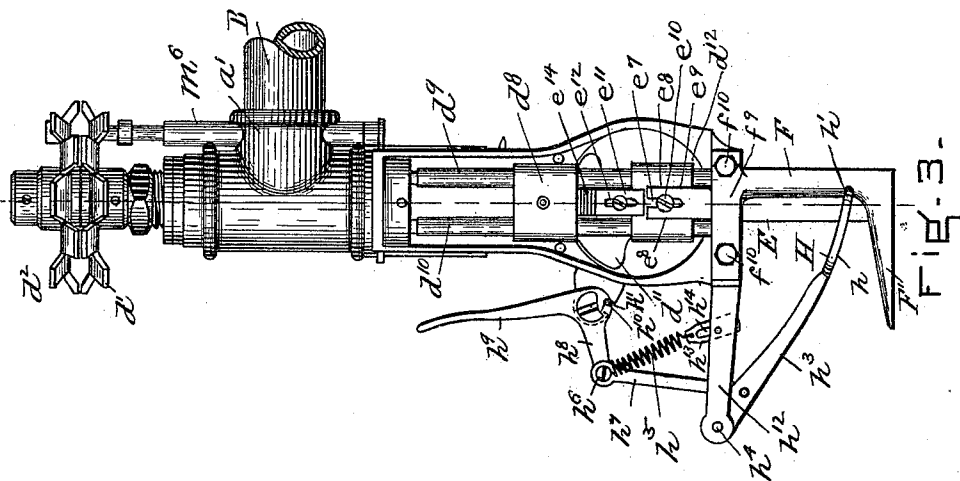
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Patented June 29, 1897.



WITNESSES

J. M. Dolan.
J. T. Butler.

INVENTOR

Pauline C. Moore
by her atty
Clarke & Raymond

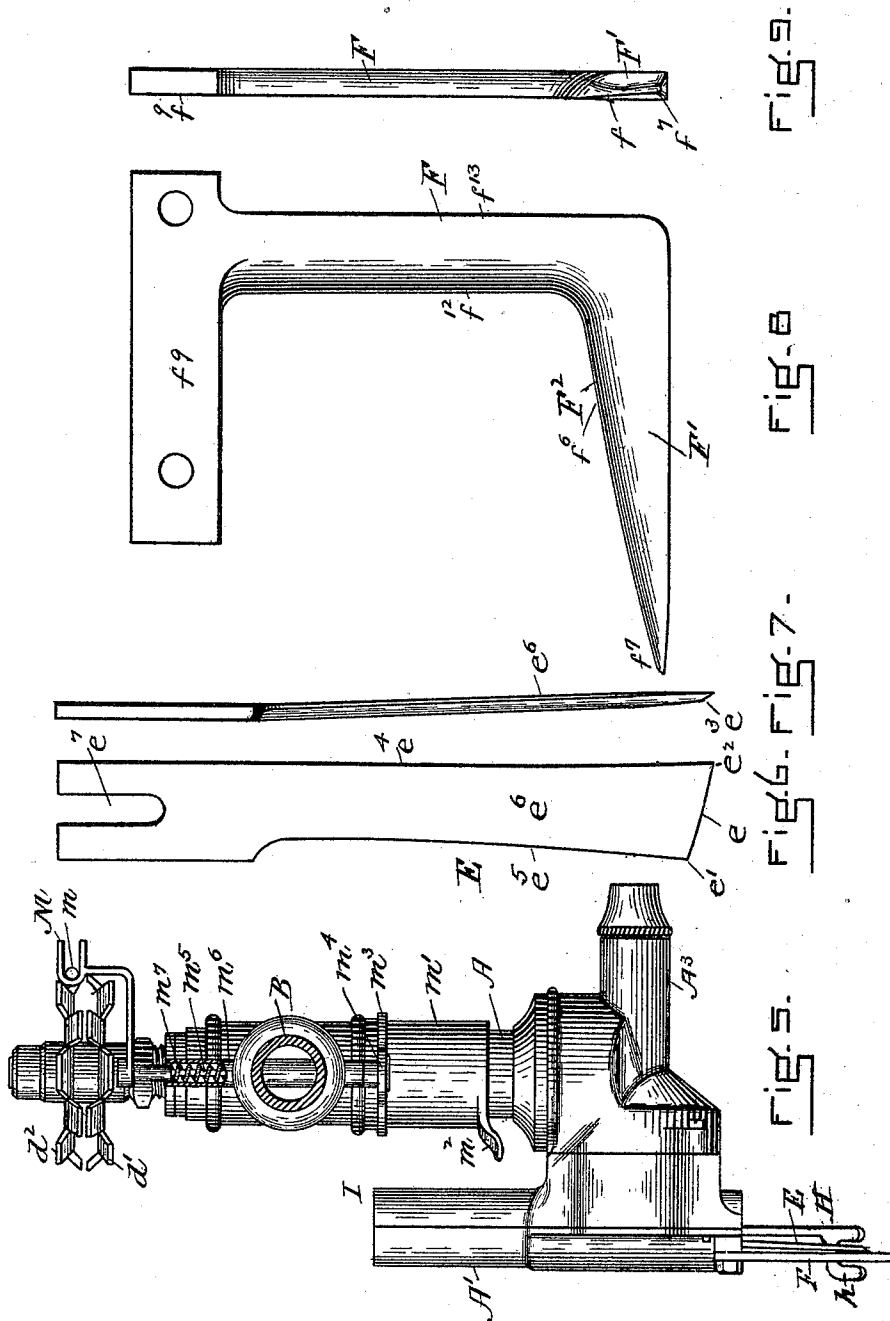
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WITNESSES

J. M. Dolan.
J. T. Butler.

INVENTOR

Paul C. Morse
by his atty
Charles E. Raymond

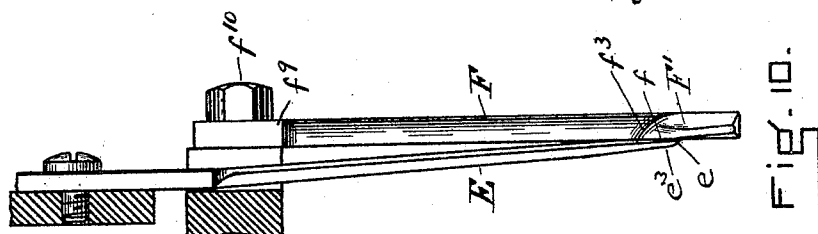
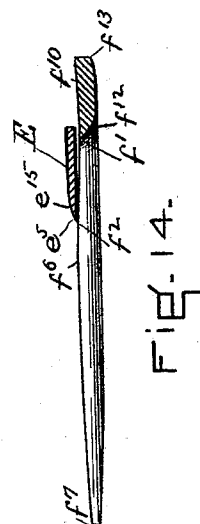
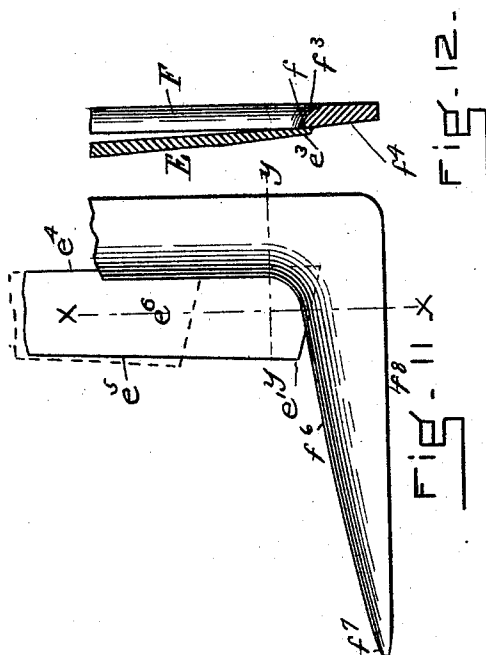
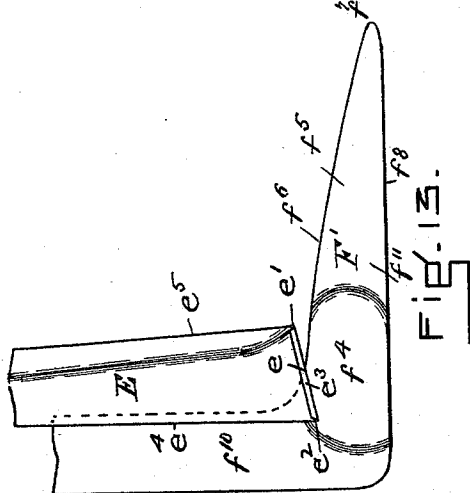
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5 Sheets—Sheet 5.

P. C. MORSE.
CLOTH CUTTING MACHINE.

No. 585,279.

Patented June 29, 1897.



WITNESSES

J. H. Dolan.
J. K. F. Butler.

INVENTOR

INVENTOR
 Paul C. Thomas
 by his attys
 Clarke & Raymond

UNITED STATES PATENT OFFICE.

PRESTON C. MORSE, OF NATICK, MASSACHUSETTS, ASSIGNOR TO THE
NATIONAL CLOTH CUTTER COMPANY, OF PORTLAND, MAINE.

CLOTH-CUTTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 585,279, dated June 29, 1897.

Application filed March 4, 1896. Serial No. 581,750. (No model.)

To all whom it may concern:

Be it known that I, PRESTON C. MORSE, a citizen of the United States, residing at Natick, in the county of Middlesex and State of Massachusetts, have invented a new and useful Improvement in Cloth-Cutters, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part of this specification, in explaining its nature.

The invention relates to the class of cloth-cutting machines which are movable over a table or bed upon which the cloth in layers or piles is held, and its objects are to increase the capacity of such machines in respect to the number of layers of material cut at one operation, the range of the machine in respect to the kind of goods operated upon, and the ease and certainty with which it may be guided and operated.

The first two objects are largely obtained by means of the peculiar cutting devices employed and the manner in which they are used. Briefly stated, they consist of a long narrow rest or foot attached to the frame of the machine by a thin vertical arm extending upward from the rear end of the rest or foot, the upper edge of the rest or foot having at its juncture with the vertical support a stationary shear cutter or blade and also a cloth-lifting incline extending downward from the lower edge of this cutter to the forward point of the foot or rest, and which stationary shear cutter or blade and vertical arm are combined with a long, narrow, rapidly-reciprocating cutter of large throw having a sharpened lower edge and so shaped, supported, and operated that its side at its rear lower corner is held in contact with a straight surface of the vertical arm during a large part of its reciprocation and until its cutting edge is brought into operative relation with the stationary shear cutter or blade, when the said reciprocating cutting edge coöperates therewith to make a shear cut like the shear cut of a pair of scissors—that is, a cut where the cutting edges of the blades have but a single advancing contact at and with the point of their intersection or crossing. The reciprocating cutter has a large range of movement in relation to the lifting and holding foot and lowers shear-

cutter in order that a large number of layers, as many as one hundred and fifty to two hundred of some kinds of material, may find room between the lifting-foot and the cutter. The lifting-foot serves to hold the material lifted from the bed during the operation of the reciprocating cutter and to maintain it against the thrust and shearing action of the same. The cutting mechanism may be said to have two cutting actions. The first is that which takes place during the greater part of the reciprocation of the cutter, when the cut is largely made by the direct thrust of the cutter into the assembled layers. The second action is that obtained at the time the reciprocating cutter begins to act with the stationary shear cutter or blade in cutting the lowermost layers of the material, when the reciprocating cutter and the stationary shear-cutter act in opposed relation to each other as shears and cut with a shearing cut, and it is largely owing to this last action of the cutting mechanism that the capacity and range of the machine are increased, as it is very essential that the lowermost layers always be cut and cut cleanly and accurately, for if they are not so cut the cutting-machine cannot be fed, the partially-severed lower layers acting to bar its movement, and of course the harder the material is to cut the more likely it is to give trouble at the lower layers, and I am informed that the previous cutting-machines of the market have in part failed to cut a large number of layers and certain kinds of fabric because of the inability of their cutting device to sever satisfactorily these lower layers.

The third object of the invention is obtained by the employment of the thin long foot or rest of the character specified, which lightly bears on the table or support and is moved beneath the goods with but little friction, by a yielding presser-foot which coöperates with the cutting mechanism, by the use of a guiding-handle located above and in line with the cutting devices, and by bringing into operative relation with such handle means for controlling at the will of the operator and by the hand used in guiding the machine the operation of the reciprocating knife, as well as the lifting of the presser-foot.

The invention also relates to various fea-

tures of organization and construction by which an improved result in respect to wear, avoidance of friction, and proper balancing of parts to prevent friction are obtained. The machine is suspended in any desirable way to permit of its easy and universal horizontal movements over the table or bed upon which the layers of material have been placed in following the lines of the pattern, which are generally marked in advance, upon the upper surface of the upper layer. I prefer to employ for this purpose the crane or jointed arms heretofore used with cutting-machines, one feature of my invention, however, relating to a minor improvement in the manner of connecting the outer arm with the inner, whereby an adjustable slight vertical yielding movement is permitted the cutting-machine.

I will now describe the machine in connection with the drawings thereof, wherein—

Figure 1 is a view in side elevation of the cutting-machine, its suspending devices, and the operating-bed upon which the material to be cut is supported. Fig. 2 is a view in plan of the cutting mechanism, its supporting-arms, and its actuating-belts. Fig. 3 is a view in side elevation, enlarged, of the cutting mechanism, a detachable portion of the front casing of the front section being removed to show the structure behind it. Fig. 4 is a view, enlarged, of the cutting mechanism in vertical section upon the dotted line of Fig. 3 with the detachable section of the casing restored. Fig. 5 is a view of the mechanism in rear elevation. Fig. 6 is a view in front elevation, enlarged, of the reciprocating cutter or blade. Fig. 7 is a view in end elevation thereof at the left hand of the machine. Fig. 8 is a view in front elevation, enlarged, of the foot, the shear-cutter, and the foot-holding arm. Fig. 9 is a view in left-end elevation thereof. Fig. 10 is a view in left-end elevation, enlarged, representing the relation between the reciprocating cutter or blade with the foot, shear-cutter, and arm. Fig. 11 is a view in front elevation of these parts. Fig. 12 is a view in vertical section upon the dotted line xx of Fig. 11. Fig. 13 is a view in rear elevation of the parts represented in Fig. 11. Fig. 14 is a view in horizontal section upon the dotted line yy of Fig. 11 and a plan of the parts below said line.

The machine housing or frame has two principal parts or sections—namely, the rear part or portion A, which supports the driving-shaft, the driving and driven pulleys, and the device or means connecting the machine with the outer end of the second arm of its jointed support, and the portion A', which provides a support for the reciprocating knife block or head and which is shaped upon its outer part to provide a handle in line with and above the cutting devices—by which the machine is held and guided. There is interposed between these two sections the connections between the main shaft and the reciprocating head or block. This construction

not only provides a desirable location for the reciprocating head or block and a satisfactory disposition and balancing of the weight of the machine in respect to the arm and in respect to the handle, but also a handle which is very desirably located for the purpose of the easy and correct guidance of the machine, as it brings the operator into such relation therewith that he can readily observe and follow the action of the cutter in respect to the line upon which it is cutting.

To understand the operation of the machine, it should be borne in mind that the material to be cut rests upon a table or bed and that the cutting-machine is moved by hand, generally upon lines marked upon the upper surface of the goods or material, and it should also be understood that during such movement of the cutting-machine the goods or material are lifted from the bed by the lifting-foot attached to the cutting-machine and which rests lightly upon the bed.

Any suitable mechanism for holding the cutting-machine and permitting it to be universally moved by the operator in horizontal directions may be used, and I have represented as a desirable means for accomplishing this purpose the horizontal arm B, which is connected with a vertical support B' by an intermediate horizontal arm B². (See Figs. 1 and 2.) The latter arm has a horizontal swinging movement upon an arc of which the support B' is the center. The arm B has a horizontal swinging movement upon the end of the arm B², and it is so attached to it that its outer end and the cutting-machine may have a slight vertical movement in relation to the bed C. The cutting-machine is attached to the end of the arm B in a manner to permit it to be turned upon a vertical axis. This way of supporting the cutting-machine is designed to provide it with a universal movement in a horizontal direction upon the bed C and to also support it so that it shall bear but lightly upon the bed, and therefore be readily moved by the operator.

The section A of the housing or frame of the machine supports a vertical driving-shaft d , having at its upper end the fast pulley d' and the loose pulley d^2 , and at its lower end a bevel-gear d^3 , which meshes with the bevel-gear d^4 on the horizontal shaft d^5 . This bevel-gear is connected by a crank-pin d^6 and connecting bar or link d^7 with a reciprocating cross-head d^8 , mounted upon the stationary rods d^9 d^{10} , supported by the section A' of the housing, and to which cross-head the upper end of the long narrow blade or cutter E is secured, the blade preferably being so attached to the cross-head as to be vertically adjustable thereon. The blade or cutter E thus has imparted to it a rapid reciprocating movement of very considerable length. Its lower or cutting edge e is preferably inclined from its forward corner e' downwardly and backwardly to the rear corner e^2 and is brought to the face side of the blade and made sharp

by the bevel e^3 upon its back side. The blade also, preferably, has the straight vertical rear edge e^4 and the slightly-inclined front edge e^5 , which, in effect, causes the cutting section or edge of the blade or cutter to be at its widest part, the corner e' being slightly in advance of the remainder of the forward edge e^5 . The blade is also made thinnest at the front or forward edge e^5 , especially toward the lower part of the blade, and this reduction in thickness is made upon the back side of the blade, the face e^6 of the blade being flat. The blade is also bent in its shank or upper end or held to throw its lowest section slightly forward or toward the arm F, carrying the foot F' , in order that it may always, upon the face adjacent to the rear corner e^2 , maintain a contact with the rear face f of the said arm during its entire reciprocation and until it reaches the stationary shear-cutter F^2 . The said shear-cutter F^2 extends from the corner f' of the foot to the point f^2 . Its cutting edge is turned laterally from its rear end inward to form a slight angle with the back face of the arm F and the front face of the reciprocating blade at its cutting edge e . It is sharpened by a beveled surface upon its outer side and by an undercut back face, the slight hollow f^4 being used for the purpose of forming this undercut edge. In other words, this cutting section of the foot is given the characteristics of a shear and coöperates, in connection with the reciprocating cutter, to make a shearing cut.

The foot has a forward extension f^5 , the upper edge f^6 of which is inclined downward to the point f^7 , and a lower edge f^8 , which is straight and narrow and is adapted to bear and ride lightly upon the surface of the bed.

The arm F has at its upper end a horizontal section f^9 in the nature of a cross-bar, which is integral with the rest of the arm and acts in connection with the fasteningscrews f^{10} to secure the foot to the frame or housing. This bar also spans the opening d^{12} , in which the cutter reciprocates.

A yielding presser H bears upon the upper surface of the goods or material at or near the point where the cutter enters and automatically adjusts itself to varying heights of material. This presser is useful in preventing the upper layer from being lifted out of place by the cutting-blade upon its upper movement, and it also operates to hold certain grades of goods together with light pressure while the cutter is acting. It preferably has a rounded under surface h and a forked end h' to span the cutter and foot-arm. It is preferably mounted or formed upon the end of a long arm h^3 , pivoted at h^4 to an arm which extends forward from the frame of the machine, and this long arm so pivoted provides the presser with a large range of vertical movement in order that it may accommodate itself to varying heights of the material to be cut. It is moved downward and held depressed by the spring h^5 , attached at one end to a sta-

tionary holder and at the other end to the pivot h^6 , which connects the link h^7 with an arm h^8 of a handle h^9 , the handle being thus connected with the presser, and it is located near the main handle I, by which the machine is grasped and moved.

I prefer that the presser-arm h^3 be pivoted in front of the presser, as by so doing the presser is drawn over the upper layer and has a less tendency to rumple it.

The handle I is formed by a portion of the housing which incloses the cross-head and supports the rods upon which it is moved, and it is directly over the cutter—that is, in the same vertical line therewith—and I consider that this is a very favorable point from which to direct and guide the machine, because it is near the point at which the cut is being made, and because it is in line with the cutter, and also because it enables the operator to take a position where he can readily see the marked line upon which the cutter is to be moved and at a point close to the cutting edge of the cutter.

The front section J of the housing is in the form of a removable cover-plate which covers the rods, cross-head, and upper part of the blade, and is secured to the remainder of the housing by screws to be easily detached. It has formed in it a hole j , with which the screw securing the blade to the cross-head may be brought into line, and through which it may be unscrewed and the blade removed for grinding without removing the plate. The blade is represented as having in its upper end or shank a recess e^7 , and as having also the straight edges e^8 , by which it is made to fit the recess e^9 in the cross-head. A fasteningscrew e^{10} , passing through the recess into the cross-head, locks the blade to it. This recess permits the blade to be adjusted on the cross-head as its lower edge is ground off, and to prevent it being forced upward I employ an adjustable backing or stop plate e^{11} , having a slot e^{12} and teeth or serrations e^{13} upon its back, which fit into the cross serrations or teeth e^{14} on the cross-head. These serrations serve to hold the stop-plate as against the vertical thrust of the knife and the screw serves to fasten it to the cross-head.

The bevel-gear d^4 has formed integral with it the counterbalance d^{11} , and it is arranged, preferably, between the bevel-gear d^3 and the cross-head, as this economizes space and permits it to carry the crank-pin d^6 , rendering another disk or separate crank-arm unnecessary. Its shaft d^5 extends from one side only and has a long bearing in the housing. (See Fig. 4.)

To start and stop the cutter, a belt-shipper M is employed, which is arranged to move the driving-belt m from one pulley to the other, according as it is desired to start or stop the operation of the cutter, and this belt-shipper is adapted to be actuated from a point close to the handle I, so that the operator can by the same hand not only guide

the cutting-machine but may also start and stop the operation of the cutting-knife. This result is represented as obtained by mounting a sleeve m' upon the housing to slide vertically thereon and providing it with an extension m^2 toward the handle I to be within reach of the hand grasping the handle and in a position to be operated by a downward movement of the hand upon said handle and to be held depressed by the hand while the machine is being moved by it. This sleeve is connected with the shipper by means of a collar m^3 , having an ear m^4 , to which is secured a rod m^5 , passing upward through a sleeve m^6 to the end of the arm of the shipper. This sleeve m^6 has a spring m^7 , which serves to hold when free the shipper in its highest position and in engagement with the loose pulley to permit the shipper to be moved downwardly by the operator to engage the belt with the fast pulley and to automatically return the belt from the fast to the loose pulley when it is released by the operator, the operator holding down the shipper in opposition to the stress of this spring to obtain the engagement of the belt with the fast pulley and the operation of the cutter.

I have represented the housing as made of the part A^2 , having an enlargement at its lower end and upon which the part A^3 , containing the bearing for the shaft d^5 , screws or is attached, and the part A^4 , providing the handle and supporting the guides for the cross-head, which is screwed or bolted to section A^3 . The part A^2 has screwed into its top a sleeve A^5 , and the support A^6 , which secures the machine to the end of the arm, surrounds this sleeve and has conical recesses to fit the conical upper end of the section A^2 and the conical lower end of a nut or head a at the upper end of this sleeve. This support has a lateral hollow extension a' , which screws upon the end of the said arm B, and the sleeve supporting the shipper may act as a pin for locking it to the end of the arm after it has been so screwed by passing through holes in this lateral extension and coinciding holes in the end of the arm. (See Fig. 5.)

The range of movement of the presser-foot is limited by the pin h^{10} on the handle h^9 and the sides h^{11} of the recess in the handle with which it comes into contact. The pressure with which the presser bears upon the material is adjusted by connecting its spring h^5 with the arm h^{12} by means of an adjustable plate h^{13} , having a slot h^{14} , through which a locking-screw passes and which plate is adapted to be moved upon the arm to vary the tension of the spring.

In use the cloth or other material to be cut is assembled in any desired number of thicknesses upon the bed or table C, the upper one having marked upon it the lines upon which the layers are to be cut. The machine is then moved to the beginning of a line and its foot arranged to extend under the lowest layer.

The presser-foot which has been held elevated is released to automatically close upon the upper surface of the pile. The operator holds and guides the machine with one hand by means of the handle I, the hand being so placed as to also control by the belt-shipper the operation of the cutter, and having started the cutter he moves the machine, which is practically entirely supported at the end of the arm B, upon the line desired, the cutter reciprocating very rapidly and severing the material by straight cuts, beginning at the top and ending in a shearing cut in connection with the shear cutter at the bottom, the foot lifting the material upon the line of the cut slightly and in advance of the cutting-point of the cutting devices as the machine is moved, the presser-foot holding the upper layers from being disarranged by the action of the knife and the vertical arm of the foot also spreading and holding spread the material upon the line of the cut. At any desired time the action of the cutter may be instantly stopped by releasing its start-motion, the releasing mechanism being constantly under the control of the operator as it travels with the machine.

A machine of this character has great capacity in respect to the number of thicknesses it may cut and also in respect to the quality of the material cut. It is guided with facility and has great range in respect to cutting curves and irregular lines, and it cuts the lowermost layers as perfectly as the uppermost.

It is desirable that the blade E be made thin upon its back from the front edge e^5 backward, or as represented at e^{15} , Fig. 14, and also that the arm F be made thin from its front edge f^{12} , or as represented at f^{13} , Fig. 14.

It is also desirable that the entire back face F^{10} of the arm F be straight and that the back face f^{11} of the foot be straight, excepting where hollow and made out of line to form the shear cutter. By thus shaping these parts they may be moved in the cut fabric with less friction upon the sides, and they also serve to cause the pressure of the cut sides to assist in maintaining the reciprocating cutter in contact with the surface f of the arm F and also its cutting edge in contact with the edge of the shear cutter. This effect is also increased by the point-forming bevel e^3 and by the slightly-inclined relation of the blade of the cutter E to the arm F, the said shaping and arrangement of parts tending to assist in maintaining the contact between the lower corner of the cutter and the back side of the arm, whereby the reciprocating cutter is sustained or supported in its reciprocation and prevented from swerving from a straight line, although at the end of its downward movement, when its cutting edge comes into contact with the shear cutter, its lower end is slightly moved backwardly by the action of the cutting edge of the stationary shear.

The arm B is connected at its rear end with

the arm B^2 by a two-armed connection B^3 , the upper arm b being pivoted to the support at the outer end of the arm B^2 in a manner to permit of a slight movement of the end of the arm B upon a vertical arc, and the lower arm b' being connected with said support by means of the slot B^2 therein, which spans a block b^3 , and with which block the arm b' has a forward and back yielding adjustment by means of a bearing block or piece b^4 , carried by the arm b' and held in contact with the block b^3 by means of a spring b^5 , the tension of which is regulated by the adjusting-screw b^6 , the spring b^5 and block b^4 being carried in a horizontal hole in the arm b' . By this construction the cutting-machine is floated, as it were, upon the compressed spring b^5 , and the extent of its buoyancy may be varied by varying the tension of the spring.

It is desirable that the foot and its holding-arm be located in front of the reciprocating cutter, as shown, as they then act additionally as a guard in protecting the fingers or the hand of the operator, it being customary to ascertain at times the location of the foot under the goods by hand.

It is understood that this invention may be used for cutting material of any kind and whether arranged in layers or not. It is not intended that the use of the words "cloth or fabric" shall have a limiting effect.

I consider the type of foot which I have described as the best, but do not intend to limit the invention to a foot of the shape specified, as it may be of a different shape and may have a portion upon the other side of the cutting devices, and the bottom of the foot may not be entirely straight and it may not bear continuously upon the bed. The stroke of the reciprocating blade may be varied to the number of thicknesses which it is desired to cut, and where that number is small its reciprocation might well be decreased, provided, of course, the machine is used exclusively for that or a less number of thicknesses.

It will be noticed that the cutting instrumentality is of a composite character, in that it combines two different principles of cutting, the plunger or reciprocating blade first acting unaided to cut a portion of the assembled layers by a plunging cut or dab and then acting to cut with a shearing cut, the upper cutter being converted into a shear cutter and being combined with a stationary shear cutter and continuing the cutting of the material therewith, not as a plunger cutter, but as one cutter of a pair of scissors engages the other—that is, with the shearing cut of scissors-blades. The device varies from scissors in construction, however, in that the lower shear-blade is always stationary and the upper reciprocating or plunging blade does not, during the scissors part of the cut, have a swinging movement on a pivot, but a direct movement toward the stationary shear cutter upon a vertical line, each part of the cutting

edge having the same extent of movement and being impelled by the same force. The power which maintains the front face of the cutting-blade near its lower rear corner in contact with the guiding-surface of the vertical arm during its plunging action also maintains its cutting edge in contact with the cutting edge of the stationary shear cutter while they are combined as shears, and the setting of the cutting edge of the stationary shear cutter at an angle to the rear face of said arm and to the front face of the plunger cutter enables the shearing relation between the cutting edge of the plunger cutter and the shear cutter to be established and maintained while the said cutting edge of the plunger cutter is passing by the cutting edge of the shear cutter.

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

1. In a cloth-cutting machine adapted to simultaneously cut a large number of assembled layers of cloth or other material, a cutting device or instrumentality comprising a lower stationary cutter having a scissors-shear cutting edge of the character specified, an upper reciprocating or plunging cutting-blade and means for providing said cutting-blade with a large range of vertical movement in respect to the lower stationary cutter whereby it is adapted to be moved downward from a point considerably above the lower cutter and to operate during said movement to cut material above the lower cutter by a plunging cut and is then brought by its further descent into operative relation with the lower cut, whereby the cutting of the lower layers of the material is continued by the conjoint action of the upper cutter and lower cutter then co-operating with each other to make a scissors cut, all as and for the purposes specified.

2. In a cloth-cutting machine the combination of the movable suspended frame, a lower cutter having a shear cutting edge of the character specified connected with the said frame to be movable therewith, an upper reciprocating or plunging cutting-blade carried by said frame and operated above the said lower cutter to cut or sever the material during a portion of its stroke toward said lower shear cutter and independent thereof, and also operated during the remainder of its stroke to cut said material in conjunction with said shear cutter and mechanism carried by said frame to operate and guide said upper cutting-blade, as and for the purposes set forth.

3. In a cloth-cutting machine, the combination of a movable suspended frame, devices for actuating the cutting mechanism carried thereby, a cutting instrumentality comprising a lower stationary cutter having a shear cutting edge connected with the frame to be movable therewith, a cloth-lifting foot in advance of said shear cutting edge having a lifting-surface in continuation thereof, an upper reciprocating plunging cutting-blade adapted to cut the material held by said foot and shear

cutting edge and also adapted during the remainder of its stroke to cut the material in conjunction with the shear cutter, as and for the purposes specified.

4. In a cloth-cutting machine, the combination of a movable suspended frame, devices for actuating the cutting mechanism carried thereby, a cutting instrumentality comprising a lower stationary cutter having a shear cutting edge connected with the frame to be movable therewith, a cloth-lifting foot in advance of said shear cutting edge having a lifting-surface in continuation thereof, an upper reciprocating plunging cutting-blade adapted to cut the material held by said foot and shear cutting edge and also adapted, during the remainder of its stroke, to cut the material in conjunction with the shear cutter, and a start-and-stop mechanism carried by said movable frame to start and stop the cutter-actuating mechanism.

5. In a movable cloth-cutting machine in combination with an upper reciprocating or plunger cutting-blade, the lower edge of which is inclined downwardly from its front end and sharpened, with an angular arm fastened at its upper end to the frame of the machine, having a face against which the cutter is held during its reciprocation, a shear cutting edge with which the cutting edge of the reciprocating cutter combines during the severing of the lowermost layers of the material, extending forward from the lower end of said arm and a lifting foot or section in continuation of said shear cutting edge, as and for the purposes described.

6. In a cloth-cutting machine the vertical arm F having a forwardly-extending foot at its lower end, the upper edge of which from its juncture with the vertical forward edge of said arm is sharpened and extends inward slightly to bear an angular relation with respect to the rear face of said arm, as and for the purposes set forth.

7. The combination in a cloth-cutting machine of the arm F, the shear cutter F² extending forward from its lower end and sharpened and bearing the relation to the arm specified, with a reciprocating cutter E having the movements in respect to the cutter, described, and the front face of which at its lower rear corner is held during its reciprocation against the rear face of the said arm until its cutting edge is brought into contact with the cutting edge of the shear cutter, as and for the purposes described.

8. In a cloth-cutting machine the combination of a shear cutter shaped as specified and having a guiding surface or face extending upward from its back end, with a reciprocating cutter E comprising a long, narrow, thin blade bent at or near its upper end to bring its lower end into inclined relation to the said guiding-surface, the lower edge of which is sharpened, and the front rear corner of which is held in contact with the said guiding-surface and its cutting edge brought into contact

and held in contact with the cutting edge of said shear cutter because of the bend in said blade, as and for the purposes described.

9. In a cloth-cutting machine the combination of a shear cutter having a guiding-surface extending upward therefrom from its back end, with a reciprocating plunging cutter having the movements in respect to the shear cutter specified, the lower edge of which is sharpened, the face of which at its lower rear corner bears in part upon said guiding-surface, the rear face of which is uncovered and beveled or inclined from its cutting edge upwardly and inwardly and whereby as the cutter is moved downwardly into the material it is held in contact with said guide and a shearing relation with the shear cutter is obtained by the pressure of the material upon the said rear surface.

10. In a cloth-cutting machine the combination of cloth-cutting instrumentalities comprising a stationary shear cutter and a vertically-reciprocating plunger cutter having a large throw, the frame of the machine having a long forward extension at or near its lower end, a yielding presser having a long forwardly-extending arm pivoted at its outer end to the forward end of said extension from the frame, and a spring to move said presser downward with a yielding stress, whereby it is adapted to bear upon the upper surface of the material and having a large range of movement, and whereby also it is adapted to be drawn over the surface of the material as the machine is moved in relation thereto.

11. The combination in a cloth-cutting machine of the cutting mechanism, the presser, its arm h^3 pivoted to the arm h^{12} attached to the frame of the machine to extend forward therefrom, the pivoted handle h^9 having an arm h^8 , the link h^7 and the spring h^5 .

12. The combination in a cloth-cutting machine of the cross-head having a recess for receiving the shank or upper end of the blade, the said blade having a vertical slot or recess therein, a fastening-screw passing through said recess into the cross-head and a back or stop plate adjustably secured to said cross-head above the knife-blade.

13. The combination in a cloth-cutting machine of the cross-head having a blade-holder and cross serrations, the cutting-blade, a stop-plate having a vertical slot and a serrated inner surface and means for fastening said stop-plate to the cross-head with the serrated parts of each interlocking as and for the purposes described.

14. The combination in a cloth-cutting machine of the rods d^9 , d^{10} , the cross-head mounted thereon, the blade secured to the said cross-head, a crank-pin and its operating-shaft and a connecting-rod connecting the crank-pin with the cross-head.

15. In a cloth-cutting machine the combination of a shaft having at its lower end a beveled gear d^3 , a beveled gear d^4 , its shaft d^5 extending beneath the beveled gear d^3 , and

which beveled gear d^4 is arranged between the first-named beveled gear d^3 and the cross-head, a crank-pin upon the rear face of said gear d^4 , a counterbalance carried by said last-named beveled gear, the cross-head, a blade or cutter attached thereto and a connecting-rod connecting the crank-pin with the cross-head.

16. In a movable cloth-cutting machine the combination of a handle by which the machine is guided located immediately over the cutting instrumentalities and in line therewith, a presser to bear upon the surface of the goods, a handle for moving the presser upward located in operative relation to the said guiding-handle, cutting instrumentalities, mechanism for actuating the said cutting instrumentalities and a device controlling the starting and stopping of said actuating mechanism also located in operative relation to said guiding-handle, as and for the purposes set forth.

17. The combination in a cloth-cutting machine of the handle by which the machine is guided, a housing adjacent to said handle, a vertically-movable sleeve m' upon said hous-

ing, its extension m^2 toward said guiding-handle, a belt-shifter and a rod connecting it with said movable sleeve.

18. The combination of the arm B^2 with the arm B and the interposed two-arm section B^3 , the upper arm b being pivoted as described and the lower arm having the slot b^2 , and a horizontally-supported spring-actuated bearing-piece to bear against a block held in said slot, as and for the purposes described.

19. The combination of the arm B^2 , the arm B and the connection B^3 having the arm b and the arm b' , the arm b being pivoted to the arm B^2 and the arm b' being connected therewith by means of a block entering a slot therein, and the adjustable yielding connection with said block carried by said arm comprising a movable bearing-piece b^4 , a spring b^5 and means for varying the tension of the spring, substantially as described.

PRESTON C. MORSE.

Witnesses:

F. F. RAYMOND, 2d,
ADAMS D. CLAFLIN.