May 10, 1932. F. M. BRACKETT ET AL 1,858,033

TRIMMING MACHINE

Filed Dec. 16, 1929 4 Sheets-Sheet 1

Fig. 1.

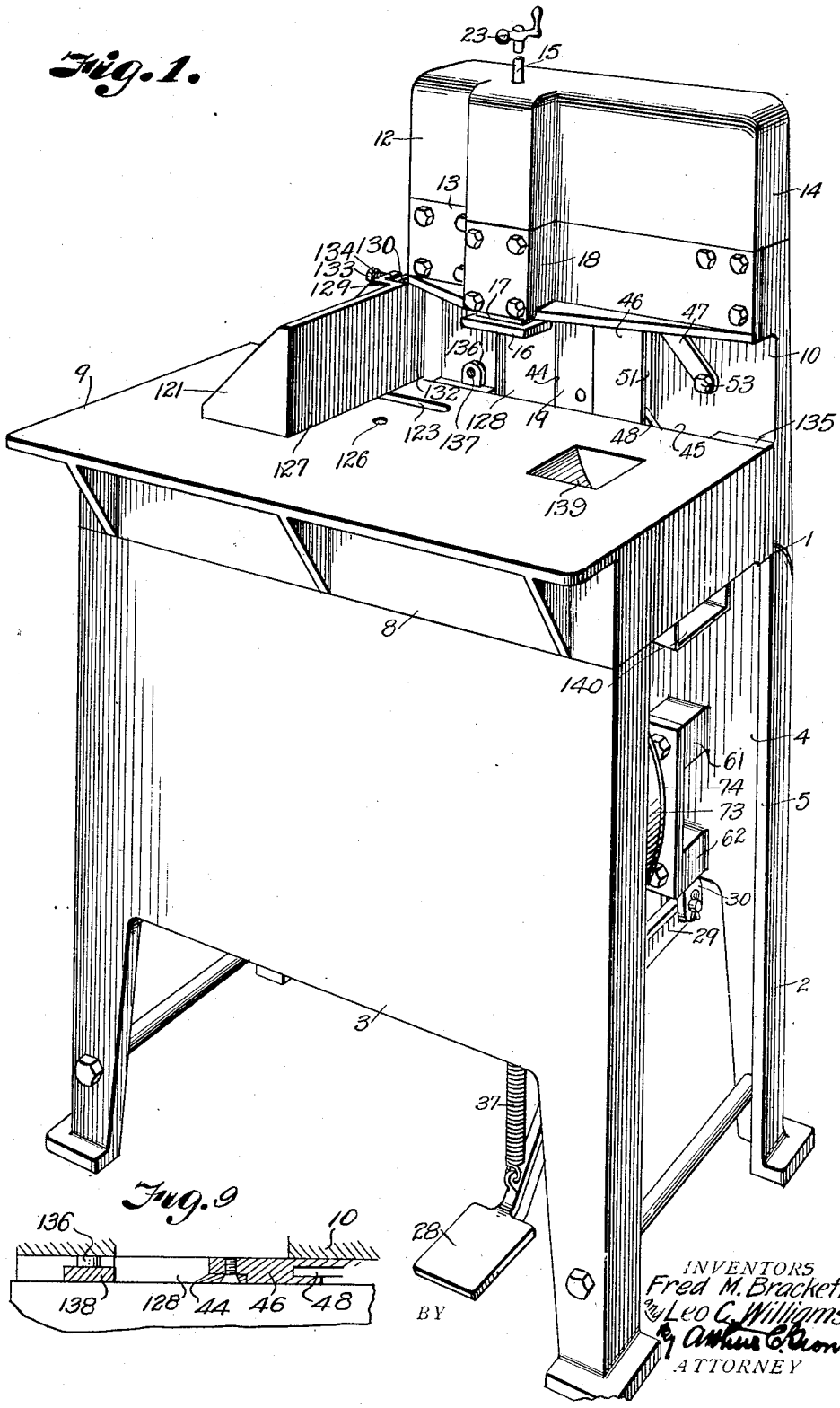


Fig. 9




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TRIMMING MACHINE

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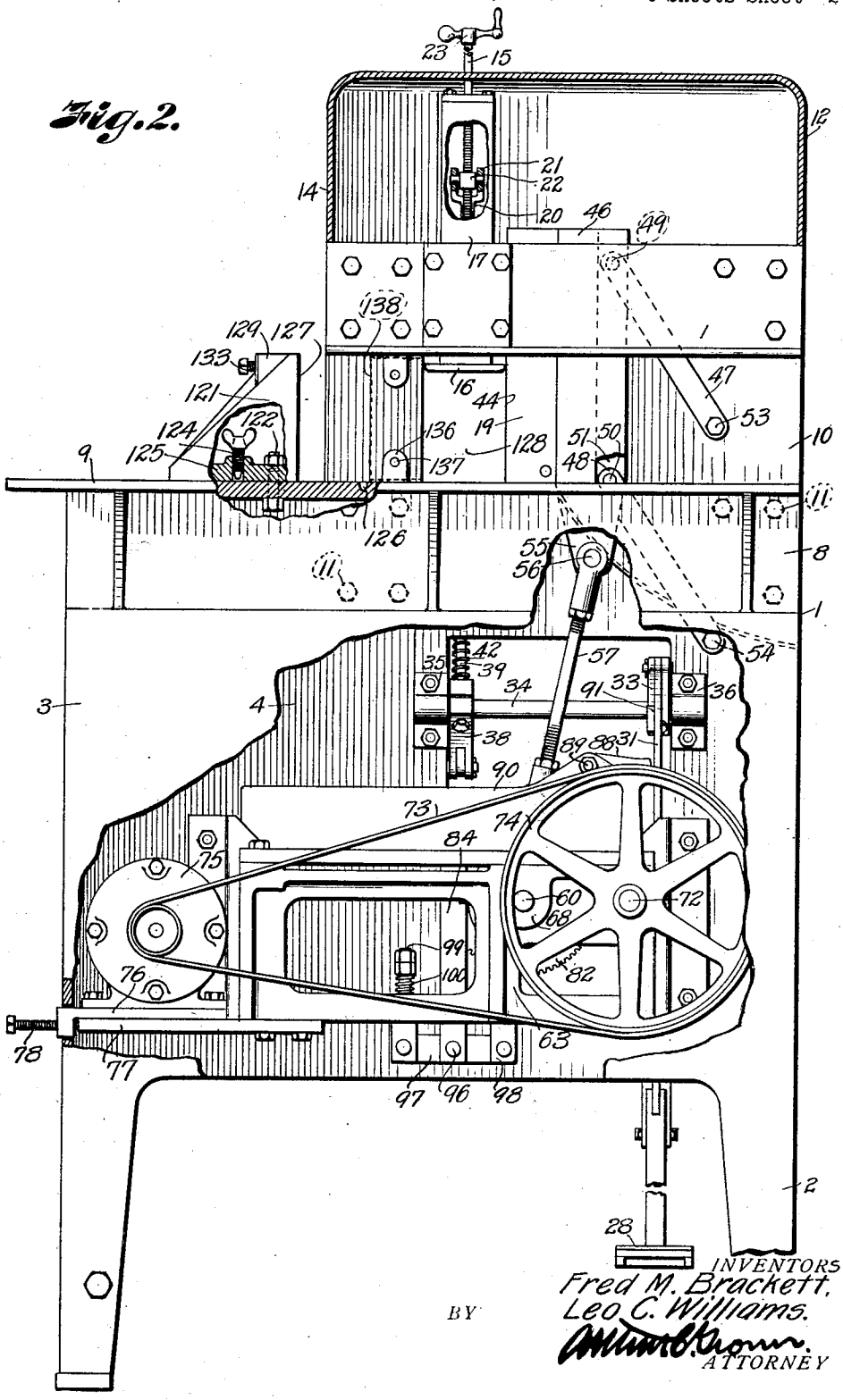
Fig. 2.

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TRIMMING MACHINE

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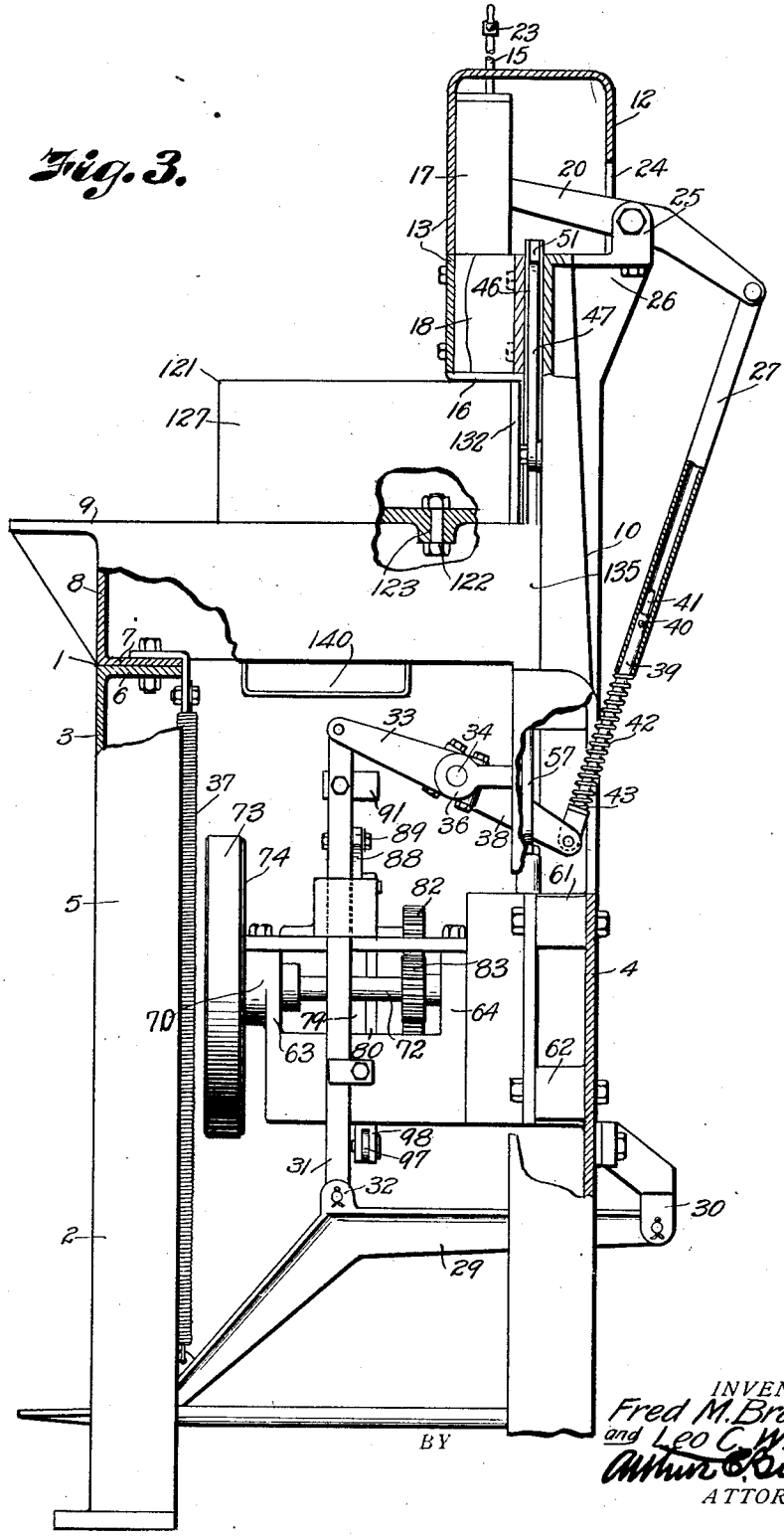
Fig. 3.

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TRIMMING MACHINE

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Fig. 4.

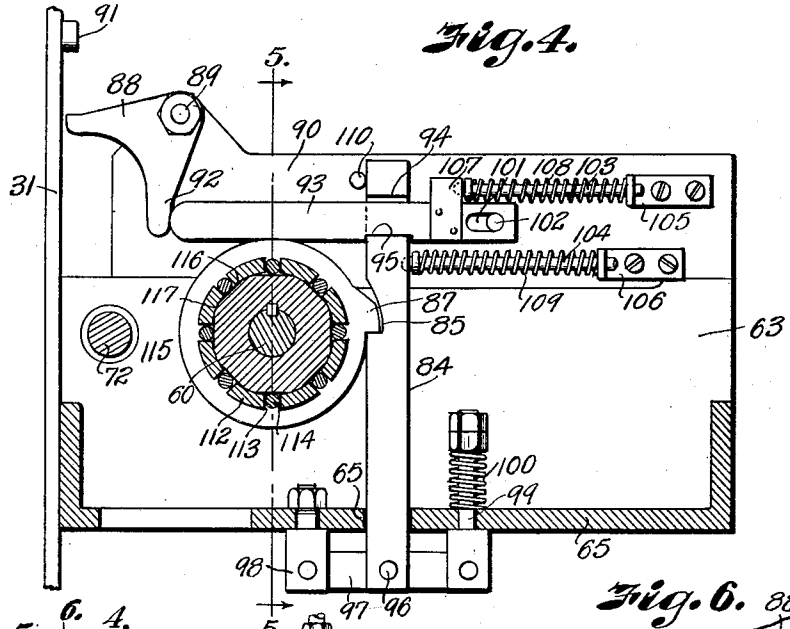



Fig. 5.

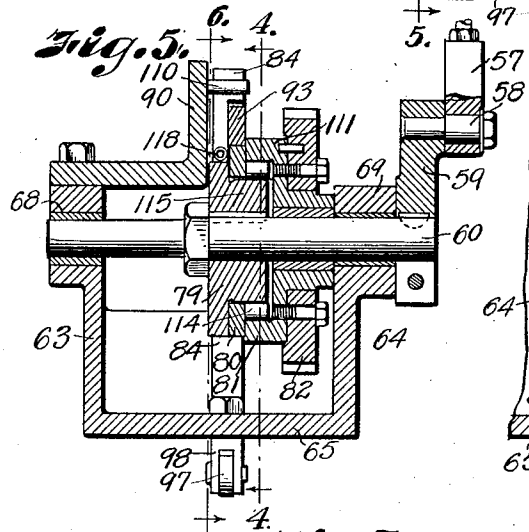
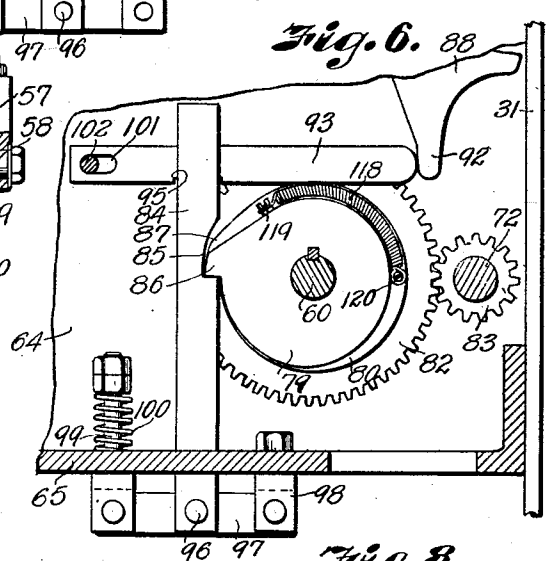



Fig. 6.




6. Fig. 7.

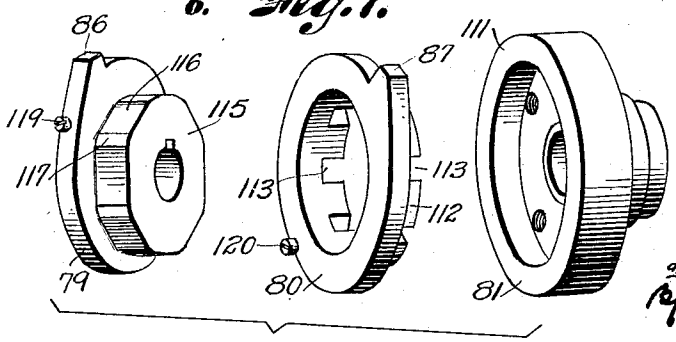
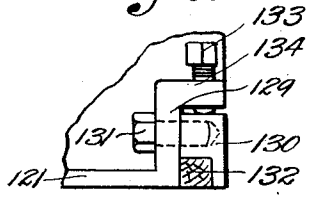



Fig. 8.

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Patented May 10, 1932 1,858,033

# UNITED STATES PATENT OFFICE

FRED M. BRACKETT AND LEO C. WILLIAMS, OF TOPEKA, KANSAS, ASSIGNORS TO THE BRACKETT STRIPPING MACHINE CO., OF TOPEKA, KANSAS, A COPARTNERSHIP CONSISTING OF EDWARD M. BRACKETT AND FRED M. BRACKETT

## TRIMMING MACHINE

Application filed December 16, 1929. Serial No. 414,426.

Our invention relates to trimming machines and has for its principal object to trim the ends of strips projecting from upper or lower edges of signatures and the like.

In making magazines, pamphlets, books and the like, strips may be attached to a side edge of one or more leaves for attaching the leaves to a signature. A continuous strip employed for attaching one trimmed signature to another in a series of books is severed between the books, and the ends of the strips project beyond the trimmed ends of the signatures and books.

It is a difficult matter to trim off the ends of the strips flush with the ends of the books and frequently the strips are left incompletely trimmed and form unsightly projections in the finished books.

Further objects of our invention are to facilitate the trimming of strip ends of the character described, to assure trimming the strip ends flush with the trimmed ends of the books and to hold the books firmly in suitable position to receive the operation of the trimming mechanism.

One of the difficulties involved in trimming the ends of strips of the character described, pertains to the adjustment of a book to the frame of a cutter so that the knife may pass across the end of the book in the proper path for trimming the end of the strip flush with the end of the book.

Further objects of our invention therefore are to facilitate adjustment of a book in a cutting frame to receive the operation of a trimming knife, to automatically effect the operation of a knife when the book has been clamped in receiving position, and to assure proper operation of the several clamping and cutting elements for effecting the cut.

A group of connected signatures may be trimmed closed or open, and a further object of the invention is to facilitate positioning of connected signatures in either closed or open condition for trimming the ends of signature-connecting strips.

In accomplishing these and other objects of our invention, we have provided improved details of structure, the preferred forms of which are illustrated in the accompanying drawings, wherein:

Fig. 1 is a perspective view of a machine constructed in accordance with our invention.

Fig. 2 is a front view partly in section of the machine.

Fig. 3 is a side view of the apparatus, parts of post flanges and walls being broken away to better illustrate construction.

Fig. 4 is a transverse section of operating mechanism on the line 4—4, Fig. 5.

Fig. 5 is a section from front to back of operating mechanism on the line 5—5, Fig. 4.

Fig. 6 is a fragmentary section on the line 6—6, Fig. 5.

Fig. 7 is a perspective view of the clutch members in disassembled position.

Fig. 8 is an enlarged detail fragmentary section of a book guide, illustrating means for adjustably supporting a knife-engaging wooden block.

Fig. 9 is a fragmentary cross section showing a guide plate mounted with its front face in the plane of the front face of the knife.

Referring in detail to the drawings:

1 designates a supporting frame including legs 2 and front and back walls 3 and 4 spaced from the floor to form a housing. The legs are angle members, one flange of each merging with one of the walls 3 and 4, and other flanges such as 5 projecting laterally across the ends of the frame to a limited extent to leave the ends of the housing open.

Inwardly extending horizontal flanges 6 on the upper ends of the walls form ledges or seats to receive inwardly projecting horizontal flanges 7 at the lower ends of walls 8 of a top member including a platform or shelf 9 forming a table top for the support.

A guide plate 10 is fixed to the rear wall 4 by bolts 11 and projects upwardly from the table and extends from the right end edge thereof laterally beyond the center line, Fig. 2. A hood or cover plate 12 projects forwardly from the upper edge of the guide plate and a plate 13 depending from the front edge of the cover has a lower edge spaced substantially from the surface of the table.

The vertical edges of the plate 13 are connected with the edges of the plate 10 by side walls 14 to form an upper housing for purposes presently described of which the plates 10 and 13 are rear and front walls respectively.

The lower housing is adapted to accommodate actuating mechanism and the upper housing forms a cover for book-retaining and strip-cutting mechanism which will be particularly described.

Slidable in an opening in the cover 12 is a rod 15 fixed to a book-retaining clamp plate 16 mounted on the lower end of a rectangular case 17 slidably guided between the front wall 13 and side guides 18 fixed to said wall. The case is adapted to be moved downwardly against a book adjusted on the table as later described to clamp the same in position for trimming the strips therein.

The guides retain the clamp in a vertical path spaced forwardly from the wall 10 to permit a knife blade 19 to swing between the clamp and the wall for trimming the projecting end of the strip.

The clamp is actuated by a lever 20 having a yoke 21 on its front end pivotally mounted on a block 22 screwthreaded on the rod 15 whereby the block may be moved along the rod for varying the position of the path in which the clamp plate 16 moves, thus adapting the clamp to retain books of different thicknesses. The rod may be rotated by a handle 23 for adjusting the position of the block 22 thereon.

The lever 20 projects forwardly through a vertically elongated slot 24 in the cover 12 and is pivotally mounted on ears 25 of a rigid bracket 26 fixed to the main support. A tubular bar or sleeve 27 having its outer end pivoted to the rear projecting end of the lever is operable by a pedal 28 through members presently described for moving the clamp downwardly toward the table.

The pedal comprises a bar having a horizontally extending rear portion 29 pivoted to a depending ear-like bracket 30 fixed to the frame and when depressed, the pedal operates downwardly on a bar 31 pivoted to the pedal at 32 and having an upper end pivotally connected to an arm 33 keyed to a rock shaft 34 mounted in brackets 35 and 36 fixed to the rear wall 4. A spring 37 anchored to the upper edge flange 6 of the front wall retracts the pedal and clamp.

An arm 38 fixed to the shaft 34 projects oppositely from the arm 33, and a rod 39 pivoted to the arm 38 extends into the lower end of the tube 27 and is provided with a transverse pin 40 having opposite ends projecting outwardly through slots 41 in the tube whereby the rod 39 has limited movement longitudinally in the tube.

A coil spring 42 sleeved on the rod 39 having opposite ends anchored respectively against the ends of the tube 27 and a shoulder 43 on the rod tends to withdraw the rod from the tube and acts as a cushion for yieldingly restraining the movement of the rod into the tube.

When the pedal is depressed the tube and rod are moved upwardly to press the clamp downwardly toward the table, the spring having sufficient resistance to tend to stop the rod when the plate 16 is in clamping relation with the book. Further depression of the pedal is permitted, however, after the book is clamped, and the pedal is adapted to effect operation of knife-actuating means when depressed beyond book-clamping position as presently described.

The knife blade 19 comprises a relatively broad and long member having a cutting edge 44 extending vertically in rest position adjacent the clamp and is adapted to swing in an arcuate path back of the clamp transversely of the machine in a slot 45 in the table top 9 as indicated in Fig. 1. The blade is fixed to the advancing edge portions of a backing member 46.

The backing member is supported and retained in the desired path of travel by links 47 and 48 having front ends pivotally connected respectively at 49 and 50 in a groove 51 formed in the rear edge of the backing member and rear ends pivoted on bolts 53 and 54 attached respectively to the wall 10 and the rear wall 4 of the supporting frame.

A depending ear 55 on the backing member 46 has a pivot pin 56 on which is mounted a reciprocating rod or pitman 57 having its lower end pivoted by a pin 58 in the end of a crank 59 keyed to a shaft 60 mounted in the lower housing as presently described.

The rod 57 is adjustable as to length for varying the path in which the knife swings.

Fixed to the rear wall 4 of the lower housing adjacent opposite side edges thereof are lugs 61 and 62 supporting a frame including side walls 63 and 64 parallel with the wall 4 and an integral bottom 65.

Bearings 68 and 69 in the sides 63 and 64 of the frame rotatably support the shaft 60. Bearings 70 in the sides support a shaft 72 in the same horizontal plane as the shaft 60, and spaced laterally therefrom as shown in Fig. 2.

The shaft 72 is constantly rotated during use of the machine by a belt 73 running on a pulley 74 on the shaft 72 and operated by a motor 75 mounted on a plate 76 slidable on a shelf 77 attached to the bottom plate 65 of the frame. The motor plate is moved by a screw 78 for shifting the motor to loosen or tighten the belt.

Intermittent driving connection of the shaft 72 with the shaft 60 is effected by clutch members 79, 80 and 81, and a large gear 82 keyed to the clutch member 81 which is freely rotatable on the shaft 60. The gear is

meshed with a drive pinion 83 on the shaft 72.

The clutches are rendered effective and disconnected, and the intermittent operation of the cutter actuating mechanism is controlled by a latching bar 84 provided with a notch 85 in which teeth 86 and 87 of the clutch members 79 and 80 are normally engaged, and a latch-releasing lever 88 mounted on a pin 89 fixed to a plate 90 bolted to the plate 63.

The lever 88 comprises a bell crank having an arm projecting in the vertical path of a finger 91 on the pedal bar 31, which moves the bell crank to cause its other arm 92 to engage the outer end of a horizontally reciprocating latch releasing bar 93 slidable in a slot 94 in the upper end portion of the latch 84 and having a notch 95 in its lower edge engaging the latch.

The lower end of the latch extends through a slot in the bottom 65 of the frame and is pivotally mounted on a pin 96 in a horizontal bar 97 having one end pivoted to an ear 98 depending from the bottom 65.

The opposite end of the bar 97 is pivoted to a bolt 99 extending slidably through the bottom 65 and a spring 100 bearing oppositely against the bottom and the head of the bolt cushions downward movement of the latch as later described.

The bar 93 has an elongated slot 101 for slidable movement on a pin 102 mounted on the frame plate 90. Rods 103 and 104 having outer ends guided in perforate ears of brackets 105 and 106 on the plate 90 and opposite ends fixed respectively in a lateral lug 107 on the bar 93 and in the latch 84 are urged by springs 108 and 109 respectively to return the bar 93 to position for receiving the influence of the bell crank and returning the latch 84 to normal vertical position.

The latch 84 when shifted laterally by the bar 93 and then returned by the spring 108 is stopped by a pin 110.

The clutch member 81 fixed to the constantly rotated gear includes a ring-like sleeve portion 111 forming a recess in the member to receive a flange 112 projecting from one face of the clutch member 80 and the flange 112 is provided with recesses 113 to receive rollers 114. The clutch member 79 is keyed to the shaft 60, and has a boss 115 projecting through the member 80, and having a periphery provided with flat relatively low portions 116 and intermediate high points 117.

The rollers 114 located in the recesses 113 are moved radially outwardly thereof into clutching frictional engagement with the ring when the member 80 rotates to cause the high points 117 to engage the rollers, and bring about driving relation between the shaft 72 and the shaft 60.

The inner face of the member 79 outside of the boss slides over the outer face of the member 80, and the teeth 86 and 87 of the two members are adapted to engage in the notch of the latch coincidently to restrain the members.

A spring 118 having one end anchored to a screw 119 in the periphery of the member 79 and the other end anchored to a screw 120 in the outer face of the member 80 tends to move the member 80 relative to the member 79.

When the latch 84 is shifted by operation of the pedal, and the clutch members 79 and 80 are released, the spring 118 anchored by the member 79 due to the inertia thereof, causes the member 80 to advance and shift the rollers into clutching relation with the gear-supported ring 111. Rotative motion is thus transmitted to the clutch member 79 and shaft 60, to rotate the crank and cause the knife to swing across the table.

The bar 93 is located adjacent the clutch members 79 and 80, and in the path of the teeth 86 and 87 or either of them, whereby the teeth encounter and bear upwardly against the bar when members are near the end of a rotation, and release the bar from the latch 84, to permit the spring 109 to return the latch to normal position. The latch notch 85 is therefore relocated in tooth-receiving position before the clutch members have completed a rotation, and stop the members to prevent repetition of the clutching and knife-actuating operation.

Means for locating a book to be operated upon by the knife include a side guide 121 having a depending bolt 122 slidable in a slot 123 in the table. A screw 124 movable in the bottom 125 of the guide is adapted to be inserted in a recess 126 in the table for retaining the guide in fixed position with the vertical face 127 thereof aligned with a side edge of an opening 128 in the upper housing wall 10 provided to receive ends cut from strips.

The guide 121 has a rearwardly projecting vertical edge flange 129, and a clamp 130 pivotally mounted on the flange by a stud 131 retains a wooden block 132 against the flange in the vertical plane of the knife edge to receive the same. An adjusting screw 133 in an ear 134 on the edge of the flange bears against the clamp to vary the inclination of the block according to the inclination of the knife edge due to reduction of upper or lower portions in the sharpening process.

The wooden block thus forms a backing member to support strip ends and receive the slicing strip of the knife edge; when the guide 121 is suitably located.

The guide may be withdrawn, when opened books are to be trimmed having portions extending in the area normally occupied by the guide.

The housing wall 10 is spaced from the

table by spacer blocks 135. Ears 136 on the blocks have openings 137 to receive bolts for attaching a guide plate 138 thereto having a front face lying in the vertical plane of the front face of the knife to cooperate with the knife to form a rear guide to receive the end edges of opposite portions of an opened book.

In Fig. 1 the machine is shown with the guide plate removed from the ears 136 to permit the guide 121 to be moved over the table and spacing blocks into operating position.

An opening 139 is formed in the table top into which the projecting ends of strips may extend when a group of signatures is being joggled to justify the end edges thereof, and a chute 140 below the opening is adapted to conduct away fragments of paper and the like falling from the signatures being prepared for mounting in the machine.

In using a machine constructed as described, the suitable guides are located and adjusted to promote accurate feeding of the signatures, and the lever yoke is adjusted on the threaded rod 15 according to the thickness of the signatures fed. The extent of travel of the clamping rod 15 is constant, and the clamp 16 must therefore start at a lower position in order to reach clamping position when a relatively thin signature or group of signatures is located on the table below the clamp.

A signature having been placed in correct position on the table, the pedal is depressed, and the spring 42 bearing against the end of the tubular bar 27 effects depression of the clamping rod 15 and the clamp plate 16 to engage the signature and latch the same to the table.

Further depression of the pedal causes the lug on the pedal bar to engage the bell crank lever and effect lateral shifting of the bar 93 to shift the latch 84 and release the clutch members.

The clutch member 79 remains momentarily unmoved due to the fact that it is keyed to the shaft 60. The member 80 is impelled by the spring 118 to rotate, and shifts the rollers to the high points on the member 79, thereby setting up clutching relation between the gear-connected member 81 and the member 79. Driving connection is thus set up between the constantly rotating shaft 72 and the shaft 60, and the crank 59 is rotated to operate the knife-swinging bar 57.

The edge of the knife moves in an arc across the edges of the signature and confers a slicing operation on the projecting ends of the strips.

Before a cycle of swinging of the knife is completed, one or other of the clutch members 79 and 80 has rotated sufficiently to bring its tooth into wiping engagement with the bottom edge of the bar 93, the tooth acting as a cam to lift the bar on its pivot pin 102, and effect release of the latch 84 therefrom.

The latch is returned by the spring 109 to clutch-latching position in time to receive and stop the clutch members and suspend swinging operation of the knife until the clutch members are again released by another operation of the pedal. The latching bar 84 may move slightly vertically due to pivotal mounting thereof on the pivoted bar 97, to yield to the shock of receiving and stopping the clutch, the shock being absorbed by the spring 100, as suggested in Fig. 4. The bar 93 is returned by the spring 108 to normal position, and incidentally bears against the bell crank lever to return the same to position for operation by the lug on the pedal bar.

The knife-operating member 57 may be shortened or lengthened to assure engagement of the knife edge with the block 132. The knife swings a constant distance across the table. Due to reduction of the knife when sharpened, the cutting edge thereof may not reach the block. The member 57 may be shortened, thus setting the knife closer to the block in starting or rest position, so that it will move further toward the block when operated.

What we claim and desire to secure by Letters Patent is:

1. In a trimming machine, a support, a member for clamping a book to the support, a knife, knife actuating means including a normally idle shaft and a constantly rotating shaft, means including a pedal for operating the clamping member, a bar pivoted to the pedal, and means including said bar automatically rendered effective upon operation of the pedal for effecting driving connection between the shafts.

2. In a book trimming machine, a support, a clamp for retaining a book in position to be trimmed, means including a pedal and a crank connected with the pedal and the clamp for operating the clamp, a knife, knife operating means including a constantly moving shaft and an intermittently movable shaft, and means responsive to movement of the pedal for effecting driving connection between the shafts.

3. In a book trimming machine including a support, a clamp for retaining a book in position to be trimmed, and means including a pedal and a crank connected with the pedal and the clamp for operating the clamp, a knife, knife operating means including a constantly moving shaft and an intermittently movable shaft, means including a spring-pressed clutch member for effecting driving connection between the shafts, and means operated by the pedal for rendering said clutch member effective.

4. In a book trimming machine including a support, a clamp for retaining a book in

position to be trimmed, means including a pedal, a crank, and a link connecting the pedal with the crank for operating the clamp, a knife, knife operating means including a constantly moving shaft and an intermittently movable shaft, said link comprising a tubular bar, a rod slidable in the bar, and a spring on the rod bearing against the end of the bar, and means responsive to movement of the pedal for effecting driving connection between the shafts.

5. In a machine of the character described, a support, a clamp, clamp guiding means on the support, clamp operating means including a rod fixed to the clamp, a lever having a yoke adjustable on the rod for changing the path through which the clamp moves, a pedal, and a link connecting the pedal to the crank, said link comprising a tubular bar pivoted to the lever, a rod pivoted to the pedal and slidable in the bar, and a coil spring sleeved on the rod and bearing oppositely against the pedal and the bar, a knife, knife operating means including normally disengaged clutch members, said spring being adapted to operate the clamp upon limited depression of the pedal, continued depression of the pedal tending to compress the spring, and means effective upon compression of the spring for effecting driving connection between said clutch members.

6. In a machine of the character described for trimming strip ends from a book, including a table, book-clamping means and cutting means including a knife, a guide supported by the table having a book-receiving face located in the plane of the book-receiving face of the knife for cooperation with the knife for effecting location of the book for applying the knife to the strip.

7. A book trimming machine including a support, a knife having a vertically extending cutting edge movable transversely of the support, knife supporting means including a pair of arms pivoted to the support, and means including an operating rod for moving the knife, said rod being adjustable to vary the path in which the knife moves.

8. In a trimming machine including a support, a knife having a vertically extending cutting edge, and means for moving the knife including means for retaining the edge of the knife in vertical position, means including a block and a bracket supporting the block for receiving the edge of the knife at the outward limit of its travel, and means for adjusting the block to variations in the inclination of the edge of the knife.

9. In a trimming machine including a support having a slot, and a knife movable in the slot, a guide on the support above said slot having a book-receiving outer face aligned with the book-receiving outer face of the knife.

10. In a trimming machine including a support, a knife having a vertically extending cutting edge movable transversely of the support and an outer face forming a book guide, a bracket on the support spaced transversely of the support from the path of the knife edge, and a guide plate removably mounted on the bracket with the outer face of the plate in the plane of the outer face of the knife.

11. In a book trimming machine, a support having a slot, a knife having a vertically extending cutting edge movable in the slot, a pair of arms pivotally mounted on the support and pivoted to the knife, and a rod pivoted to the lower end of the knife for moving the knife.

12. In a book trimming machine, a frame including a table to support a book, a knife having a vertically extending cutting edge having pivotal mounting on the frame to swing in an arcuate path adjacent one edge of the table, and a block movably mounted on the table in the path of the knife to receive the edge of the knife, and means for fixing the block in knife-receiving position.

In testimony whereof we affix our signatures.

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LEO C. WILLIAMS.