

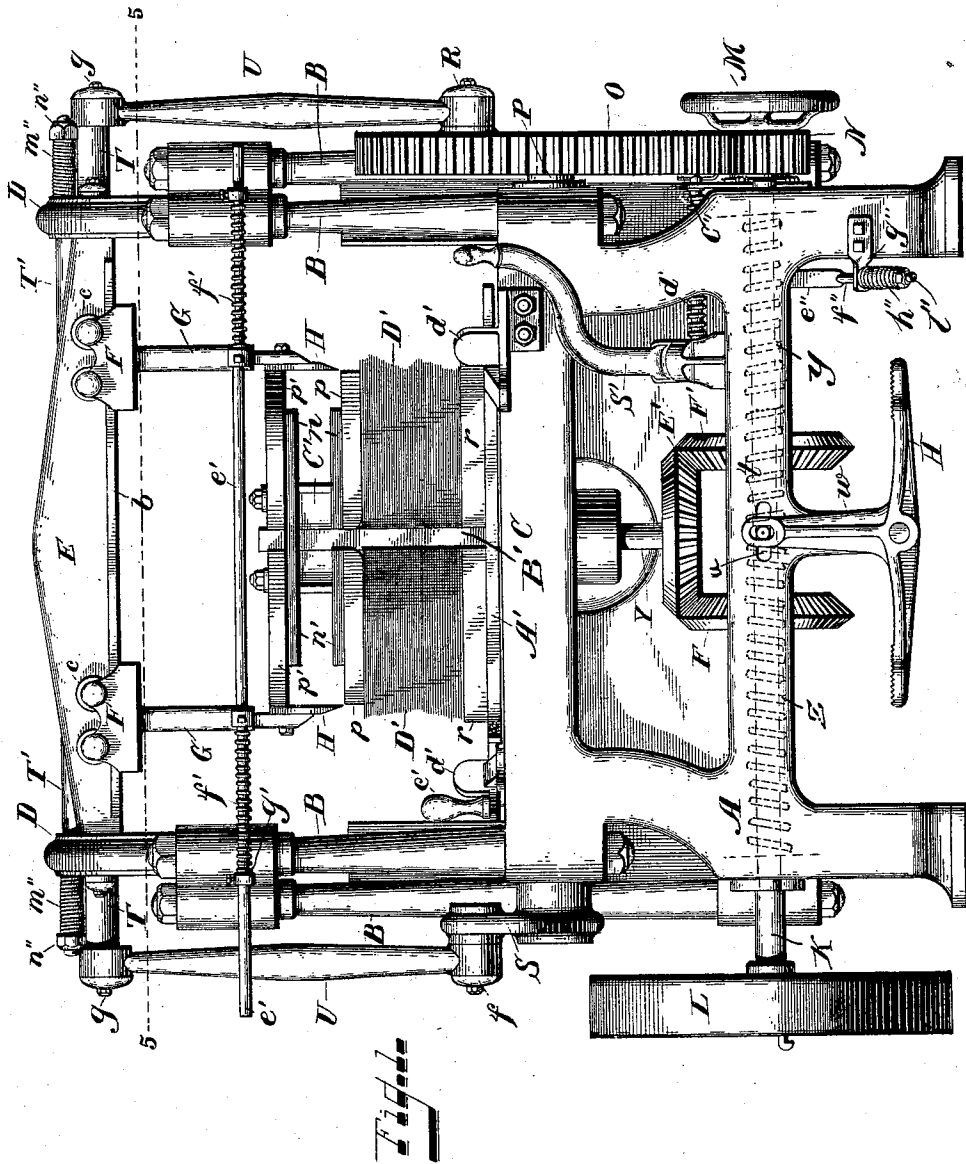
(No Model.)

5 Sheets—Sheet 1.

C. SEYBOLD.
PAPER TRIMMING MACHINE.

No. 594,490.

Patented Nov. 30, 1897.



Witnesses

Bernard Hausfeld.
H. S. Edwards.

Inventor
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Attorney

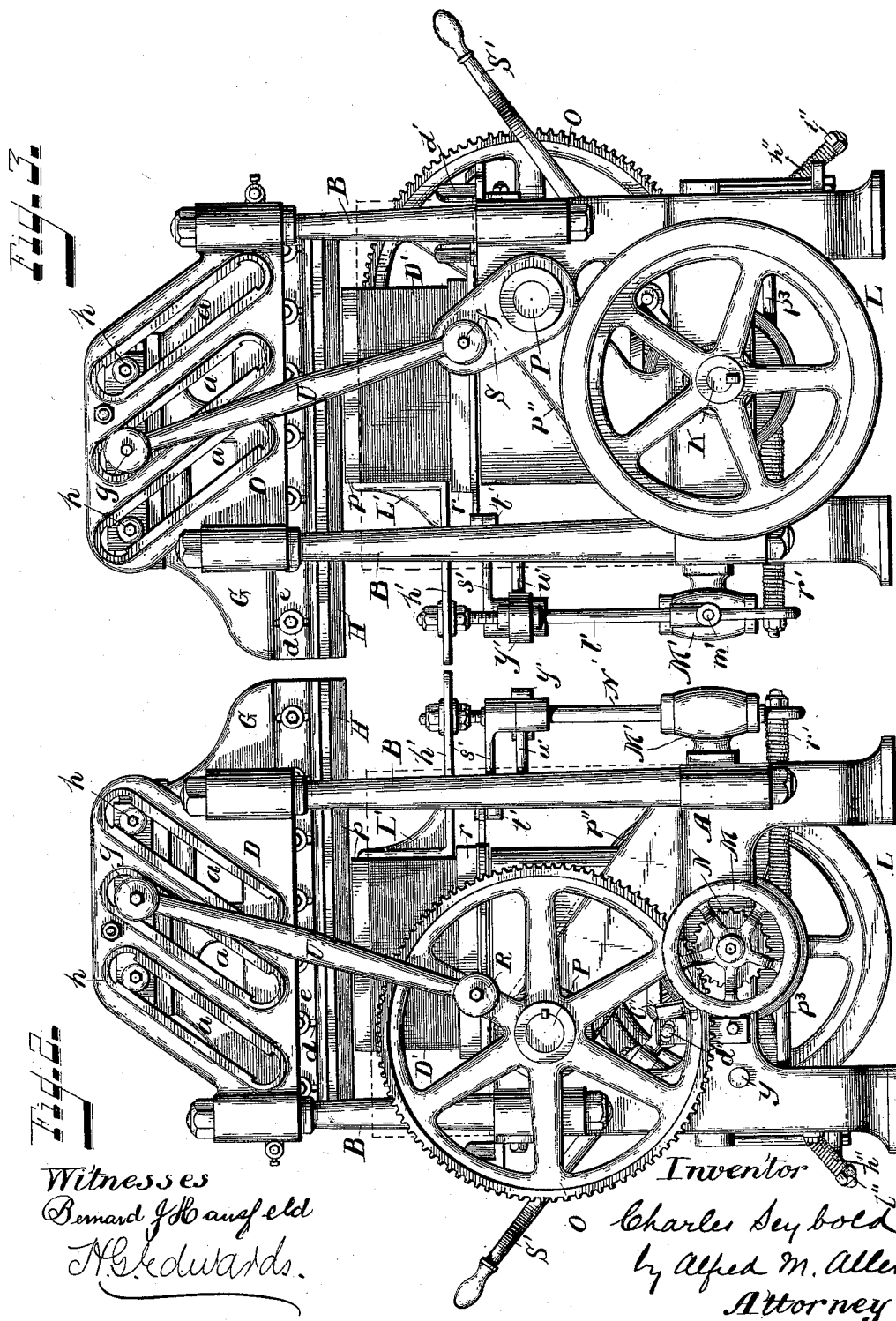
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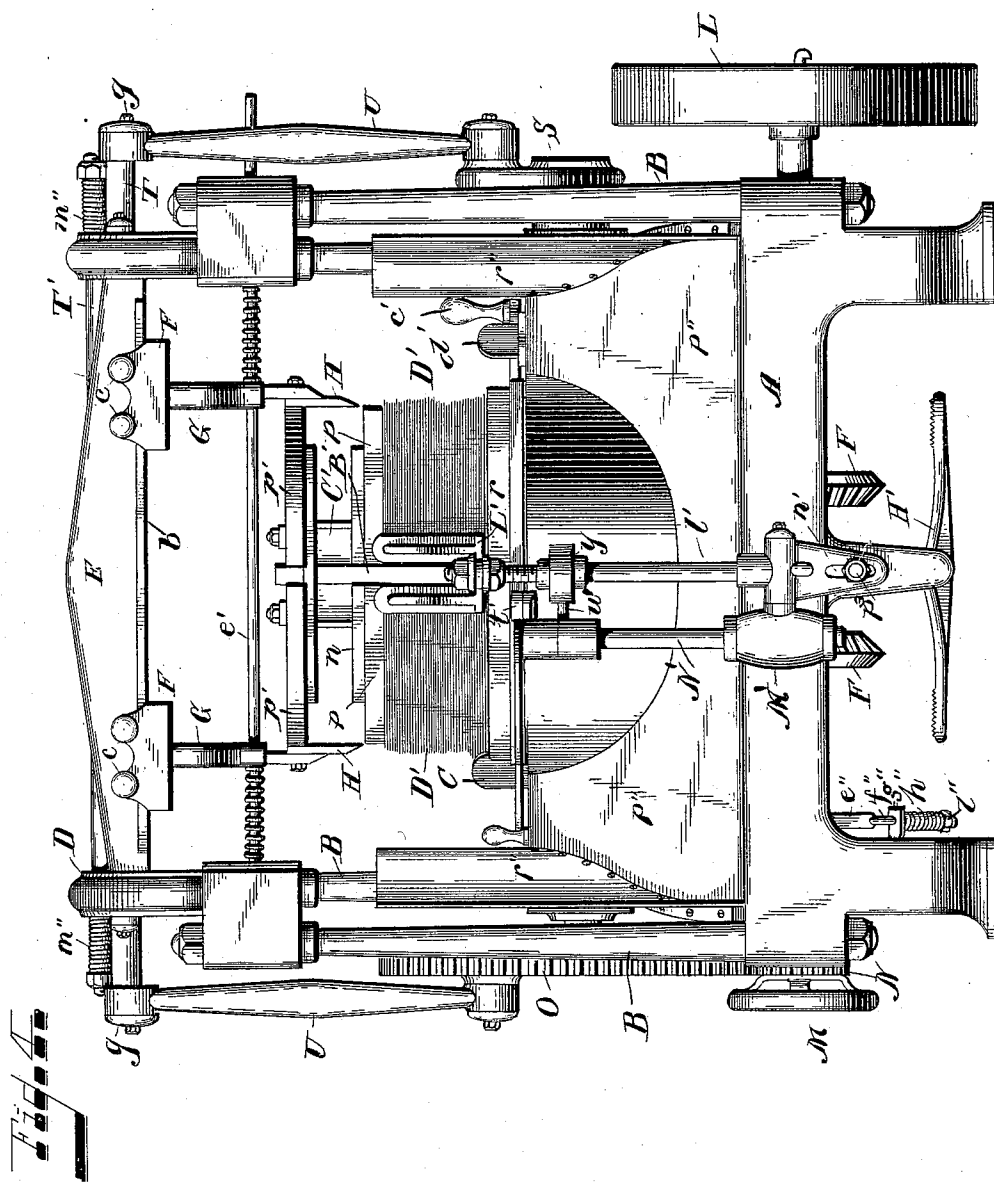
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5 Sheets—Sheet 3.

C. SEYBOLD.
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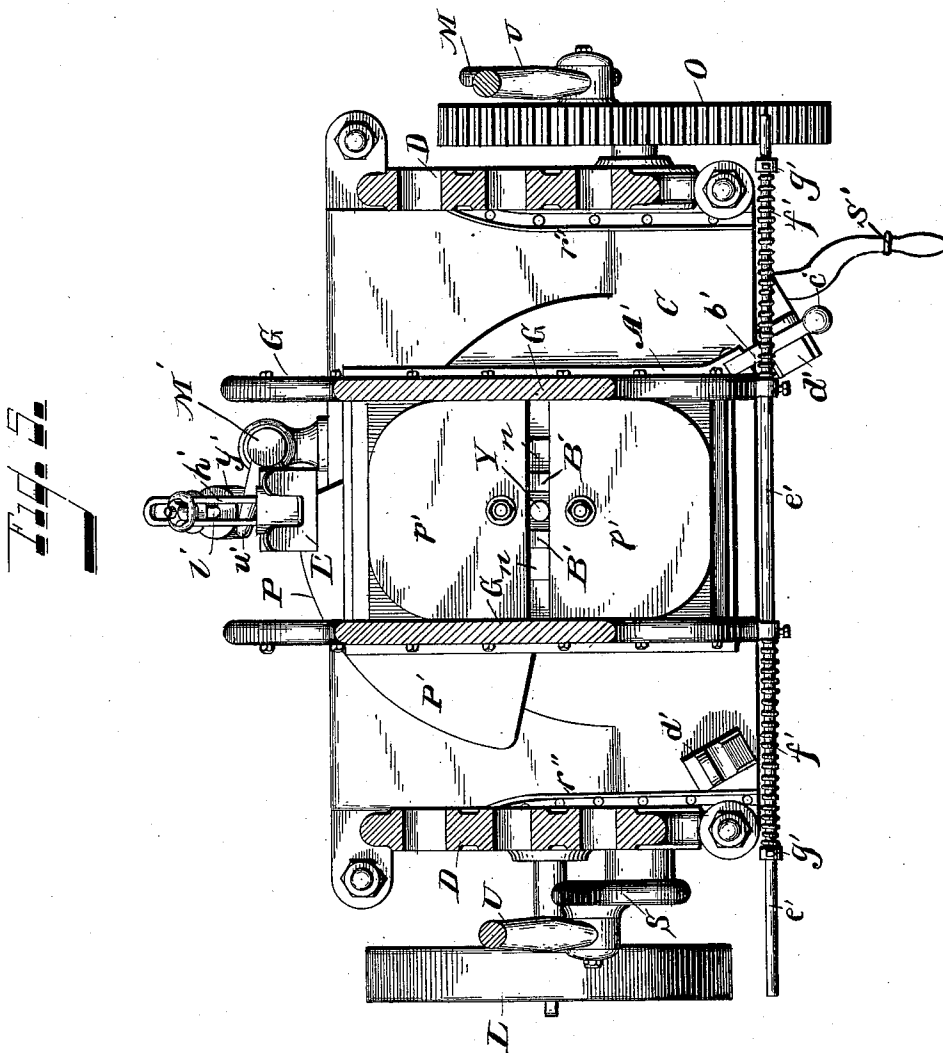
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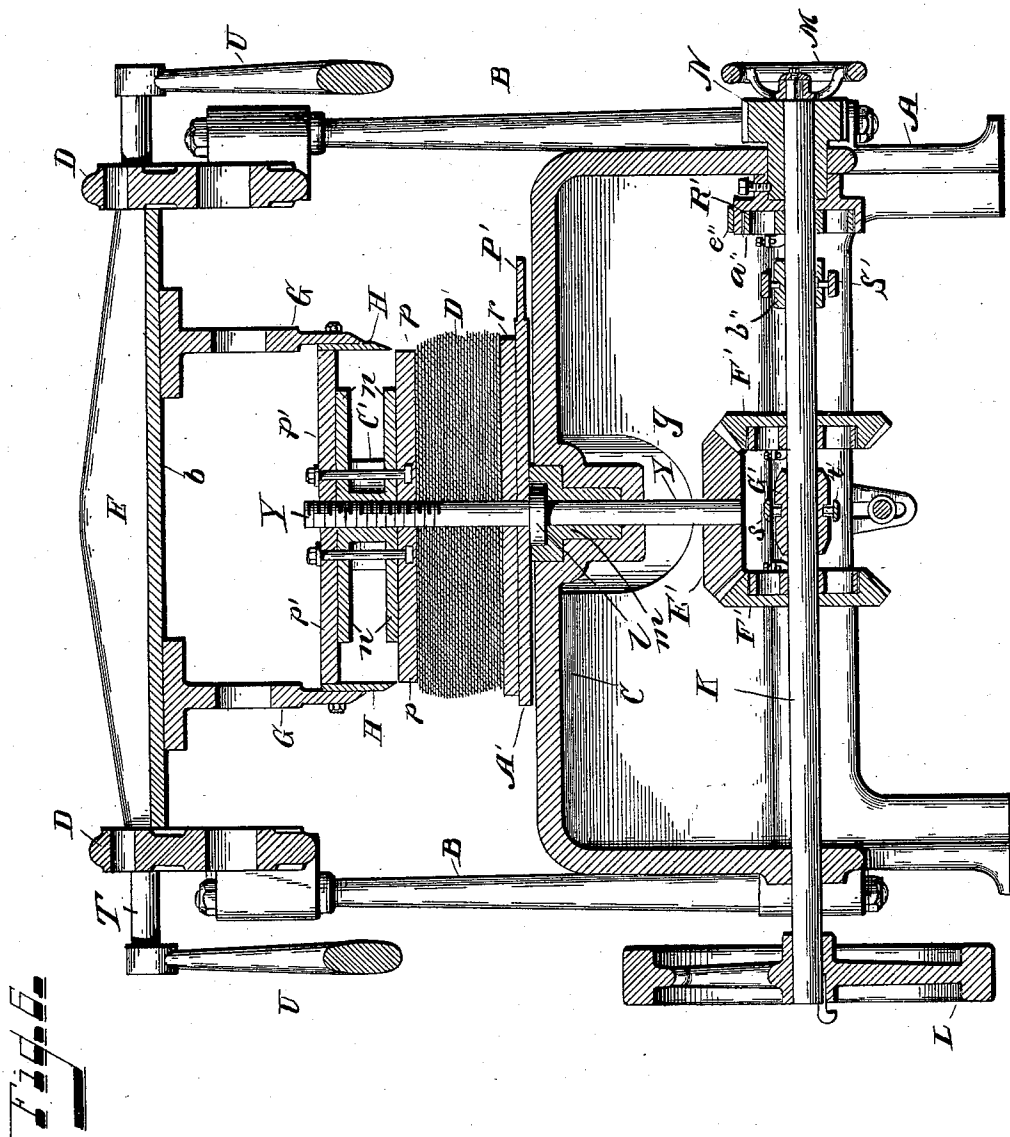
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5 Sheets—Sheet 5.

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UNITED STATES PATENT OFFICE.

CHARLES SEYBOLD, OF DAYTON, OHIO, ASSIGNOR TO THE SEYBOLD MACHINE COMPANY, OF SAME PLACE.

PAPER-TRIMMING MACHINE.

SPECIFICATION forming part of Letters Patent No. 594,490, dated November 30, 1897.

Application filed June 19, 1897. Serial No. 641,515. (No model.)

To all whom it may concern:

Be it known that I, CHARLES SEYBOLD, a citizen of the United States, residing at Dayton, in the county of Montgomery and State of Ohio, have invented certain new and useful Improvements in Paper-Trimming Machines, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification.

My invention relates to machines for trimming the edges of piles of paper—such as books, pamphlets, circulars, posters, and the like.

Heretofore in machines designed for this purpose but a single cutting-knife has been employed, necessitating four operations of the knife with four stoppages and four turns of the clamp-plates to bring the untrimmed edges of the bundles successively within the stroke of the knife. Moreover, as each exposed edge of the bundle in such older machines has to be brought into the pathway of the knife it has not been possible to supply a gage and fix the bundles in the exact position required between the clamp-plates for holding the bundles during the trimming operations. The exact position of the bundles on the clamp devices has heretofore been determined by guesswork, the position being fixed by measuring with the eye as nearly as possible.

The principal features of my invention, therefore, consist in the entire reorganization of such machines, whereby two of the edges of the bundles of paper may be simultaneously trimmed, thus necessitating but a single turn of the bundles to bring all the uncut edges within the strokes of the knives. This I accomplish by that certain novel construction and arrangement of parts to be hereinafter more particularly pointed out and claimed, whereby I am enabled to employ two cutting-knives acting automatically and simultaneously in planes parallel to each other to trim two edges at a time and in which a gage is provided for the adjustment of the bundles of paper in the exact position required, arranged to automatically move out of the way as the clamp-plates carrying the books or pamphlets are turned to bring the

remaining uncut edges within the stroke of knives. There are also sundry other features of novelty and utility, which will be particularly pointed out as the mechanism is hereinafter described and claimed.

In the drawings, Figure 1 is a front elevation of my improved machine. Figs. 2 and 3 are respectively right and left side elevations thereof. Fig. 4 is a rear elevation of same. Fig. 5 is a horizontal section taken on lines 5 5 of Fig. 1, and Fig. 6 is a central vertical section of same.

The operating mechanism is mounted in a suitable solid and substantial framework A, consisting of side standards B B and bed-plate C. Securely bolted on top of the side standards B B are the head-blocks D D, provided with diagonal slots *a a*.

E is the knife-bed, a solid substantial metal bar provided with horizontal tracks or guides *b b*, upon which are mounted in rollers *c c* the knife-carriages F F, to the depending side plates G G of which are secured the cutting-knives H H, the knives being adjustably secured in vertical slots *d d* therein by the bolts *e e*, thus giving a vertical adjustment for the knives within the limits of the slots.

K is the main driving-shaft of the machine, journaled from side to side in the framework and provided with driving-pulley L at one end and a hand-wheel M at the other keyed thereto. Mounted loosely on this driving-shaft at one end and operated by friction-clutch, to be hereinafter described, is the gear N, which meshes with the large gear-wheel O, mounted on and keyed to the shaft P, which is journaled in the framework from side to side. The gear-wheel O carries a stud R, and the shaft P at the other end the crank-arm S, with stud *f*, both studs being at the same distance from the center of the shaft and coupled with the arms T T by connecting-rods U U, pivoted thereto. The coupling-studs on the outer ends of these connecting-rods, by which the arms T T are pivoted and retained by caps and bolts *g g* to the connecting-rods U U, are formed eccentrically on the ends of the arms T T, which arms pass through the central slots *a a* in the head-blocks D D and are rigidly secured in any suitable way to the ends of the knife-bed E.

The knife-bed also carries stud-rollers $h h$ at each end, which take into the outer slots a in the head-blocks and which serve to steady the movement of the knife-bed and knives. It will be evident from this construction so far described that as the shaft P is rotated by the gearing $N O$ the knife mechanism will be reciprocated with a downward shearing cut guided by the diagonal slots in the head-blocks.

In use, as the connecting mechanism for one of the knives may wear more than the other and as it is evident that the best results can be obtained by providing for an absolutely-uniform pull on each end of the knife-bed, I couple, as above described, the arms $T T$ by eccentric-studs thereon to the connecting-rods $U U$, so that should either end of the knife connections work loose or wear by loosening the connection with the knife-bed the proper arm T may be turned slightly in the recess and thus take up any wear that may occur.

For clamping and holding the paper to be cut I provide as follows:

Y is the clamp-screw, held in a vertical position by a washer l , set in a recess in the sleeve m , which sleeve is held in place within a suitable depression in the bed-plate C . Secured to this sleeve m is the horizontal clamp-table A' , the clamp-table being thus journaled on the sleeve in the bed-plate, so as to be capable of rotation, as hereinafter described, but unaffected by any movement of the clamp-screw.

Mounted on the clamp-table A' are two vertical guide-rods $B' B'$, between which the clamp-plate C' travels up and down on the clamp-screw as the same is rotated in either direction. The clamp-plate C' is provided with upper and lower flat horizontal plates $n n$, upon which are secured, by bolts or otherwise, the pattern plates or boards $p p p' p'$, these pattern-plates being made of varying sizes to conform to the varying sizes of the books to be trimmed, and the upper pattern-plates $p' p'$ being the exact counterparts of the lower set $p p$. A form plate or board r is also secured to the clamp-table A' , upon which the books or bundles of paper $D' D'$ rest during the trimming operation.

Mounted on the lower end of the clamp-screw Y is a horizontal miter-gear E' , which meshes with corresponding miter-gears $F' F'$, mounted loosely on the main driving-shaft K .

G' is a clutch-collar feathered on the shaft so as to slide in either direction and provided with a circumferential recess s , engaged by the bifurcated ends of a clutch-bar t , which bar passes horizontally through slot u in the front cross-beam of the frame, where it is engaged by the upper end of the vertical arm w of the foot-treadle H' , pivoted to a downward extension of the frame cross-beam. The clutch-bar t is further supported by the horizontal rod y , passing through a proper opening in same and connected to the end frames, which rod carries spiral springs $z z$, bearing

between the end frames and the clutch-bar t , to return and keep the bar and clutch-collar G' in its normal central position midway between the two miter-gears $F' F'$. It will be evident from this construction that a downward pressure on either end of the foot-treadle will shift the clutch-collar G' to couple the corresponding miter-gear to the main shaft and rotate the clamp-screw Y to raise or lower the clamp-plate C' , as may be desired.

Hinged at one corner of the clamp-table is a lever-bar b' , provided with a handle c' , by means of which the clamp-table and the piles of paper may be turned quarter-way around, when at rest, the lever and table being held stationary in the lugs $d' d'$, bolted to the bed-plate in front at each corner.

The operator having placed two books or bundles of paper in the clamp with the uncut edges outward, pattern-boards $p p$ and $p' p'$ are selected of a size required for the trimmed books. The upper patterns $p' p'$ form gage-blocks for the cutting-knives in the following manner: As already described, the knife-carriages and knives are mounted on the knife-bed E to move horizontally. Passing horizontally through each of the depending knife-plates $G G$ and serving as a lateral guide therefor is the rod e' . Surrounding this rod are the spiral springs $f' f'$, bearing between the knife-plates and the collars $g' g'$, adjustable along the rods, to vary the tension of the springs, by set-screws. The effect of these springs is to press the knives into close contact with the upper pattern-boards $p' p'$ of the clamp. Now when the knife-actuating mechanism is set in operation and the side edges of the books have been cut and trimmed the operator raises the handle c' and swings the clamp-table one-quarter of a turn to bring the other uncut edges under the knives, locking the table in its secured position, as above described. In order to accomplish this turning of the clamp-table, it is necessary that the cutting-knives should recede from their position in contact with the pattern-boards $p' p'$. For this reason the corners of these pattern-boards are rounded, as shown in Fig. 5, and as the clamp-table is turned the pattern-boards press back the knives under the pressure of the springs $f' f'$, the spring-pressure causing the knives to take position with the turning of the clamp-table in contact with the end edges of the pattern in position to form the second cut. Thus no matter what the size or shape of the patterns the knives automatically adjust themselves for any pattern selected. It will be seen that not only can two books or packages be trimmed simultaneously, but that the trimming is accomplished with a single turn of the table and two operations of the knives, a saving of fifty per cent. in time and labor over all machines where a single knife is employed. But not only in this is my present machine of great advantage and utility, but the cuts may be made with absolute accuracy

and uniformity, and the position of the uncut books with reference to the cutting-knives may be accurately fixed without guesswork by means of the gage now to be described.

5 Heretofore there has been no room for a gage for placing the packages in the clamp in the machines in which a single knife is employed, for four quarter-turns must be given to the paper in such machines to bring each edge under the knife; but with my machine, inasmuch as two side cuts are made simultaneously and only a single quarter-turn is necessary, a gage can be provided at the rear of the cutting-table.

15 L' is a gage-block provided with two vertical faces, one for each book or package. Extending back horizontally from the rear lower edge of this block is a slotted arm h' for the adjustable attachment of a gage-block to a vertical rod l', which rod is hinged to swing in a vertical plane on the stud m', extending out from the boss m', secured to the frame. The lower end of this rod l' is slotted at n' to receive the end of a rod p³, connected with the front cross-beam of a frame and carrying a spiral spring r', whose tendency is to keep the rod l' and gage-block L' in a vertical position, but to allow the rod l' to swing on its pivot. Journaled in the boss M' is a vertical shaft or rod N', carrying on its upper end an inwardly-extending arm s', provided with a roller t'.

The rear side and edge of the clamp-table A' is provided with a cam-plate P', as shown in Fig. 5, the cam being provided with such a curve that the moment the clamp-table A' is shifted to turn the paper the cam-surface will contact with the roller t' and rotate the shaft N'.

40 Underneath the arm s' is another arm u' on the shaft N', which bears against a friction-roller y' on the rod l', so that the rotation of the shaft N' will swing back the rod l' and the gage-block L' away from a position to interfere with the shifting of the clamp-table, the gage being returned to its normal position by the pressure of the spring r' as soon as the cam-surface has passed the roller t'. As already stated, the gage can be adjusted for any desired sized book or package of paper, and the operator in adjusting the books for the clamps has an accurate gage with the gage-block and the vertical guide-rods B' B' of the clamp.

55 For starting the machine I mount on the main driving-shaft K the pulley R', secured by set-screws to the gear N. Within this pulley and keyed to the shaft K is a split band a', expanded in the usual way to couple the pulley and gear N to the driving shaft by the sliding feathered clutch-collar b'', provided with a circumferential groove and engaged by the bifurcated ends of the hand-lever S', pivoted in a suitable support on the frame. 65 It is evident that when the machine is started one revolution of the gear O will cause one reciprocation of the cutting-knives, and as it

is then necessary to stop the machine in order to shift the clamp-table I secure the beveled lug c'' to the inner edge of the rim of the gear O, which with each revolution of the gear-wheel strikes against the rod d'', connected with the lower end of the hand-lever S', so as to shift the clutch and disconnect the gear N from the driving-shaft K. In order to insure the instant stopping of this gear at the end of each knife-stroke, I pass over the outer face of the pulley R' the friction-band e'', secured to the frame at one end and to the rod f'' at the other. This rod passes through its supporting-bracket g'' and carries a spiral spring h'' on its outer end bearing between the bracket and an adjustable nut i'' thereon, so that there is a constant tension on the pulley R', and the moment the friction-clutch is released any momentum of the gearing is instantly stopped.

In order to prevent any springing of the supporting-standards B B of the frame and to brace and sustain same, I pass the rod T' through the head-blocks D D from side to side and mount on the ends thereof strong spiral springs m'' m'', bearing between the sides of the head-blocks and the adjustable nuts n'' n'' on the rods, so that tension may always be maintained between the side supports.

In order that the shavings of paper trimmed from the edges of the books may not pile up on the operating-table and interfere with and clog the operating mechanism, I slope off the bed-plate toward the base of the frame, as shown at p'' p'', and I also provide a sheet-metal guard r'' r'' on each side of the bed-plate, so that the shavings will be carried down off the rear of the machine.

The operation of the machine and its many advantages will be sufficiently manifest from the foregoing description.

For the purpose of adjusting the knives by hand I provide the hand-wheel M, which is keyed to the driving-shaft K, so that before the power is applied by belt to the driving-pulley L the knives can be raised and lowered by turning the hand-wheel, or a loose and tight pulley can be used instead of a single driving-pulley L.

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

1. A book-trimming machine, provided with a number of cutting-knives, arranged in parallel planes, and mounted to reciprocate when the clamp is rotated, with means for actuating the knives to cut the paper, and a rotatable clamp for holding the paper bundles during the operation, with mechanism for rotating same, substantially as shown and described.

2. A book-trimming machine, provided with a number of vertically-operating cutting-knives, arranged in parallel planes, and mounted to reciprocate when the clamp is rotated, with means for actuating the knives

to cut the paper, and a clamp for holding the paper, with mechanism for turning same, to bring the parallel edges of the paper within the stroke of the knives, and means for holding the knives in a fixed position during the operation, substantially as shown and described.

3. A paper-trimming machine, provided with a vertically-operating knife-bed, and a pair of cutting-knives hung thereon in parallel planes and movable laterally, means for holding said knives in a fixed position during operation, an oscillating clamp for holding the paper and for bringing the parallel edges of the paper within the stroke of the knives, and mechanism for actuating said knife-bed to trim the paper, substantially as shown and described.

4. In a paper-trimming machine, provided with a vertically-operating knife-bed having lateral guide-tracks thereon, the combination, with knife-carriages mounted on said tracks to slide laterally, and cutting-knives arranged in parallel planes thereon, of an oscillating clamp for holding the paper, with pattern-block thereon, and springs to keep said knives in contact with said pattern, means for oscillating said clamp horizontally, and mechanism for actuating said knives, substantially as shown and described.

5. In a paper-trimming machine, the combination, with a pair of vertically-acting and laterally-sliding cutting-knives, of a horizontally-oscillating clamp-table, with screw-operated clamp-plate thereon, provided with upper and lower sets of pattern-boards, the upper set of patterns serving as a means for adjusting the cutting-knives between the cuts, substantially as shown and described.

6. In a paper-trimming machine, the combination, with a knife-bed, provided with laterally-shiftable cutting-knives, of a clamp-table, with screw-operated clamp-plate thereon provided with an upper and lower set of pattern-boards, mechanism for shifting said clamp to turn the paper at the end of each stroke, and means for holding said knives and their supporting-plates in contact with the pattern-boards during operation, but to yield during the turning of the clamp, substantially as shown and described.

7. In a paper-trimming machine, the combination, with a rotatable clamp for the paper bundles, of a gage for the accurate adjustment of the paper in the clamp, and a cam contacting with said gage to move same out of the way during the rotation of the clamp, substantially as shown and described.

8. In a paper-trimming machine, the combination, with a rotatable clamp for the paper bundles, of a spring-pressed gage for the accurate adjustment of the paper in the clamp, and a cam on the clamp contacting with said gage to move same out of the way during the rotation of the clamp, substantially as shown and described.

9. In a paper-trimming machine, the combination, with a rotatable clamp for the paper bundles, and a pair of cutting-knives arranged to act in parallel planes, of a spring-pressed gage for the accurate adjustment of the paper in the clamp, and a cam on the clamp contacting with said gage to move same out of the way during the rotation of the clamp, substantially as shown and described.

10. In a paper-trimming machine, the combination, with a rotatable clamp for the paper bundles, of a gage-block, and hinged rod to which said gage is attached, a spring acting on said rod to keep the gage in position, with cam on the clamp, and connecting mechanism between said cam and hinged rod, whereby the movement of the clamp in turning the paper will cause said hinged rod and gage to swing away from the clamp to permit its rotation, substantially as shown and described.

11. In a paper-trimming machine, a frame-work for the operating mechanism, side standards, with head-blocks mounted thereon, within which the knife mechanism works, and rod passing through said head-blocks, with adjustable nuts on the outer ends thereof, and springs bearing between said nuts and the outer faces of the head-blocks to maintain and support the side standards and take up any wear thereon, substantially as shown and described.

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