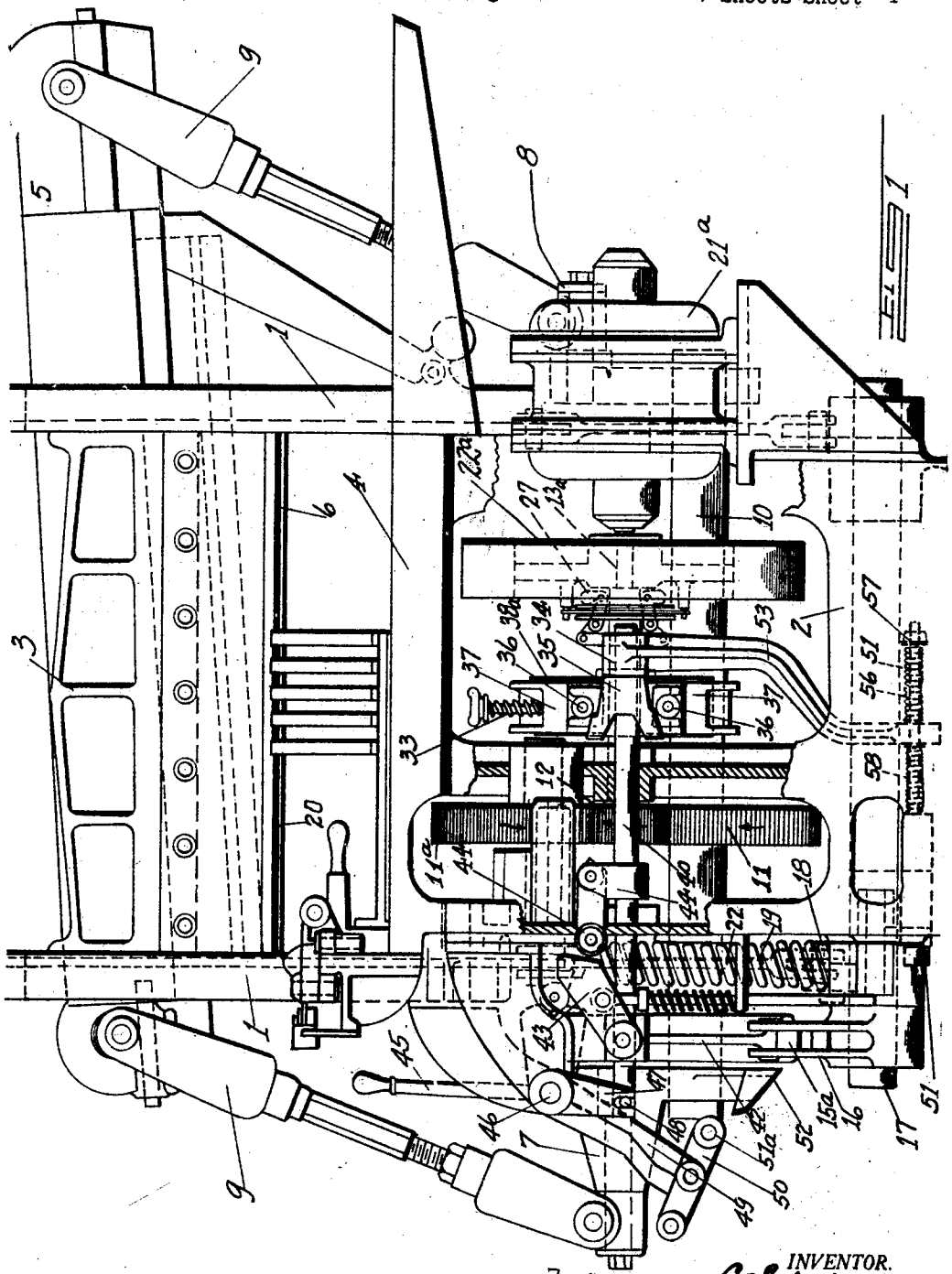
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PAPER CUTTING MACHINE

Filed Aug. 15, 1927 7 Sheets-Sheet 1

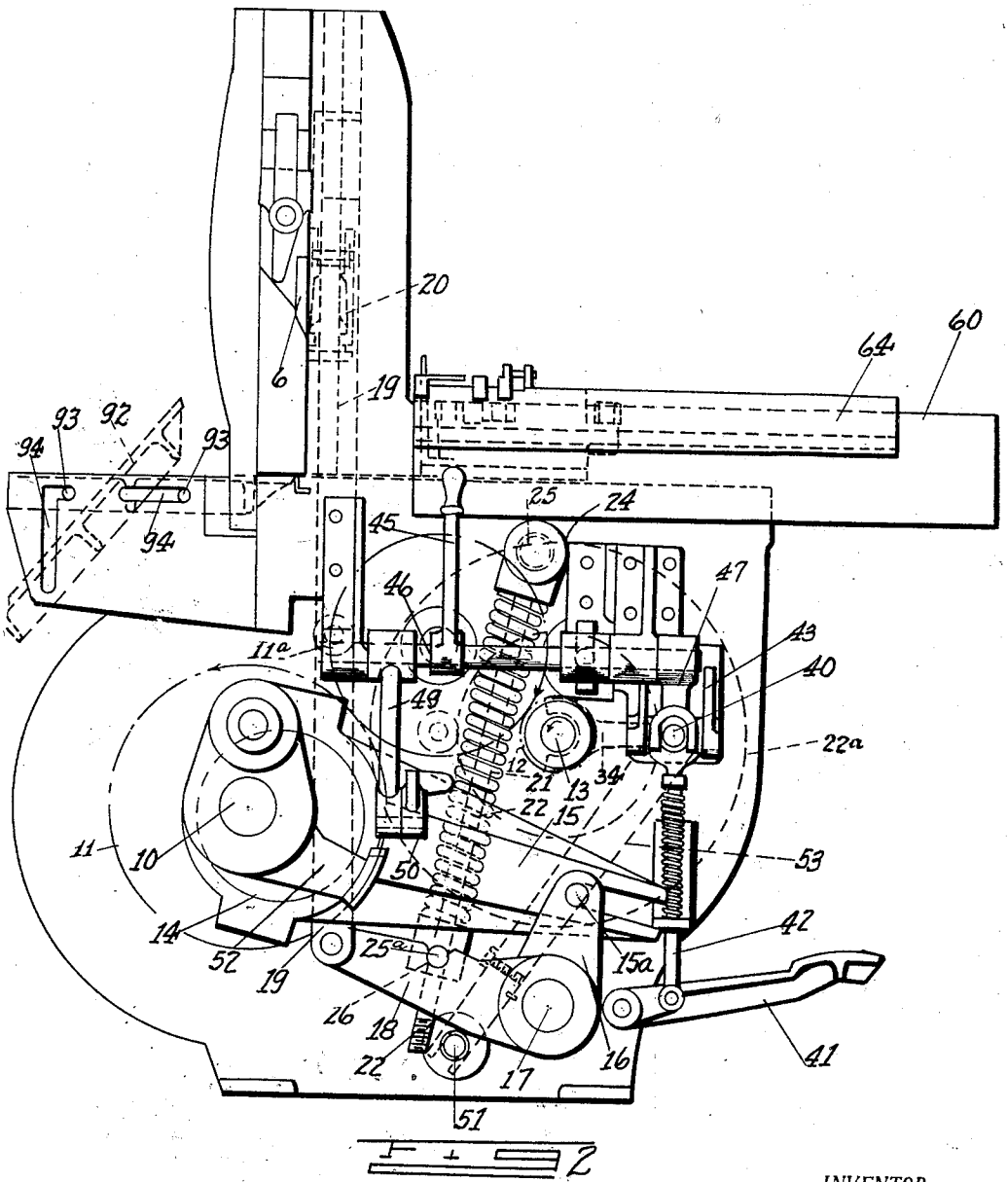


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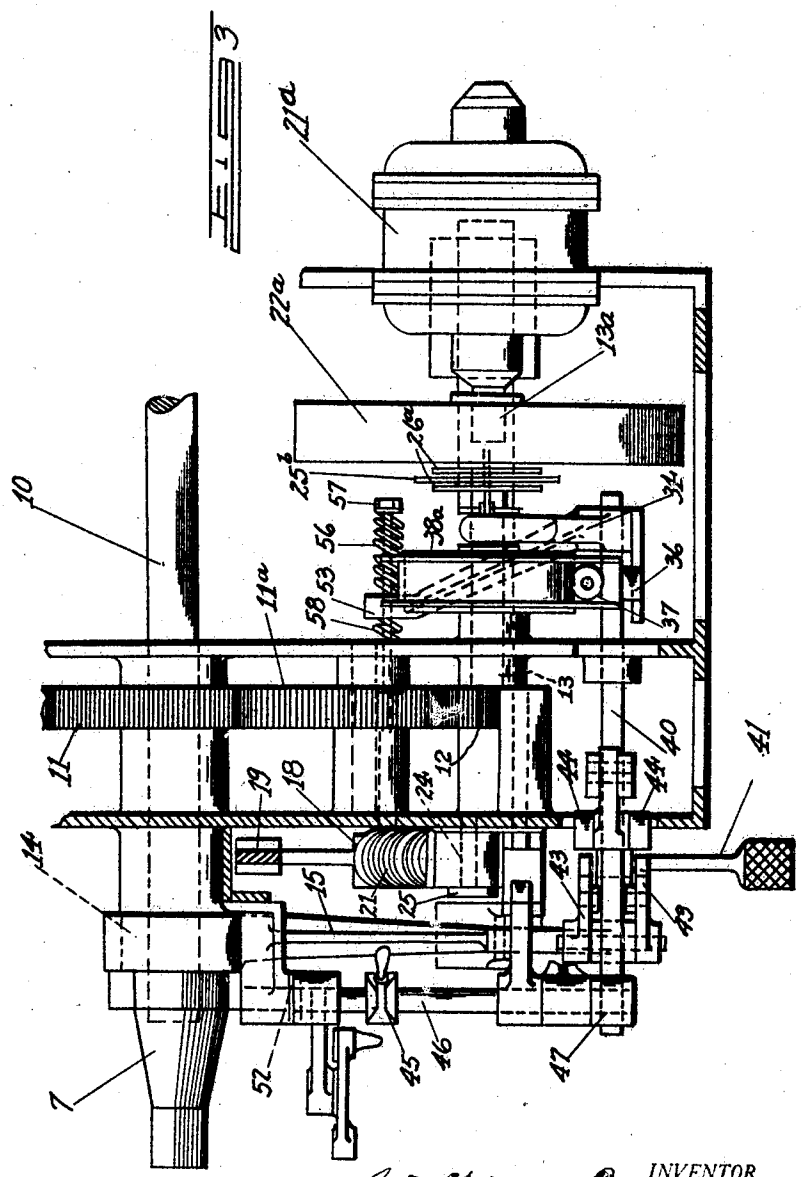


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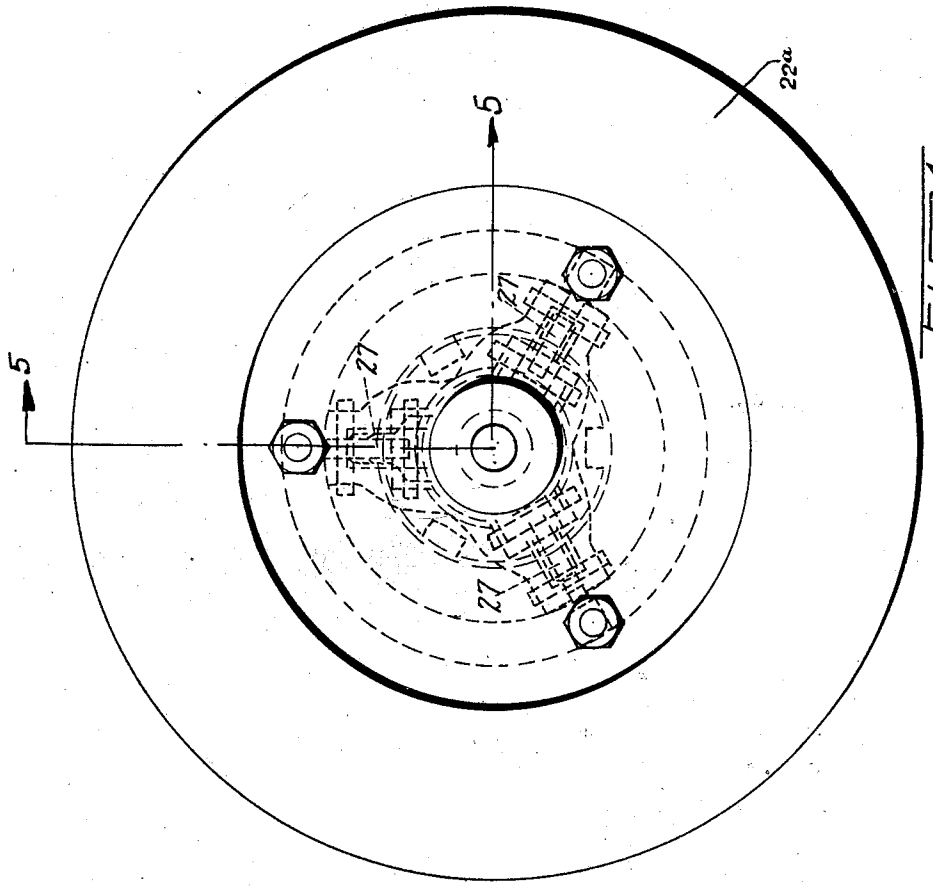


FIG 4

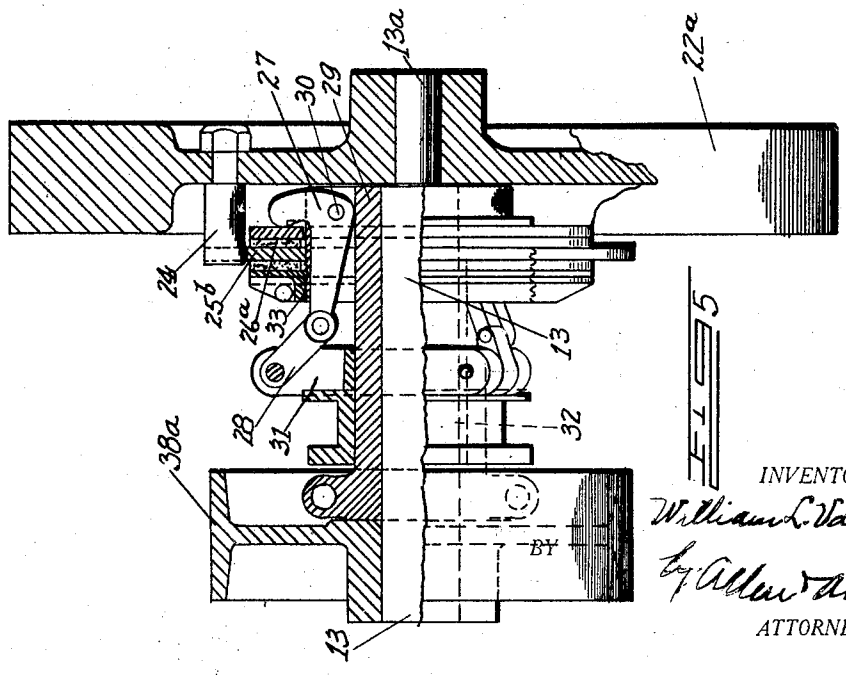


FIG 5

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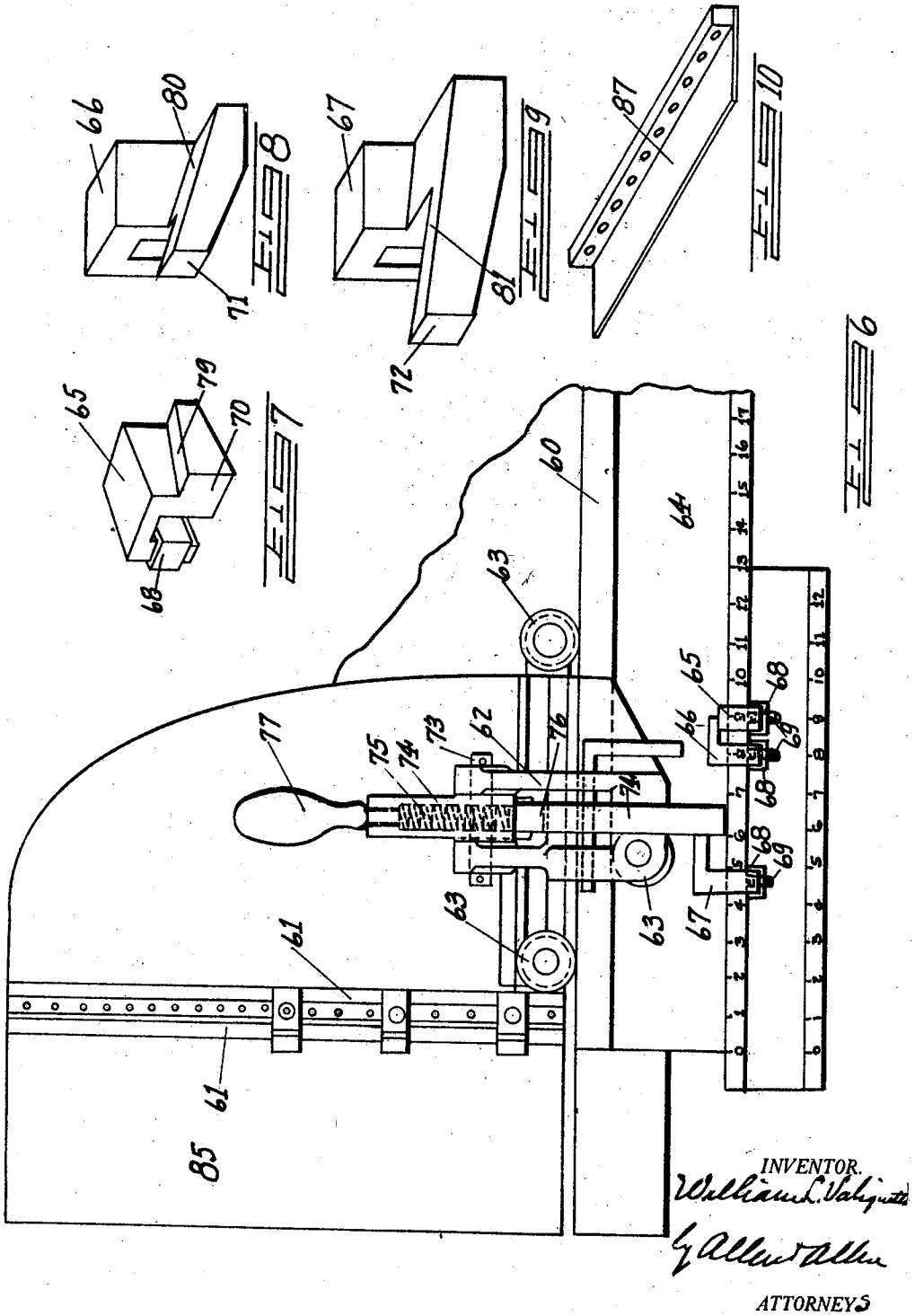


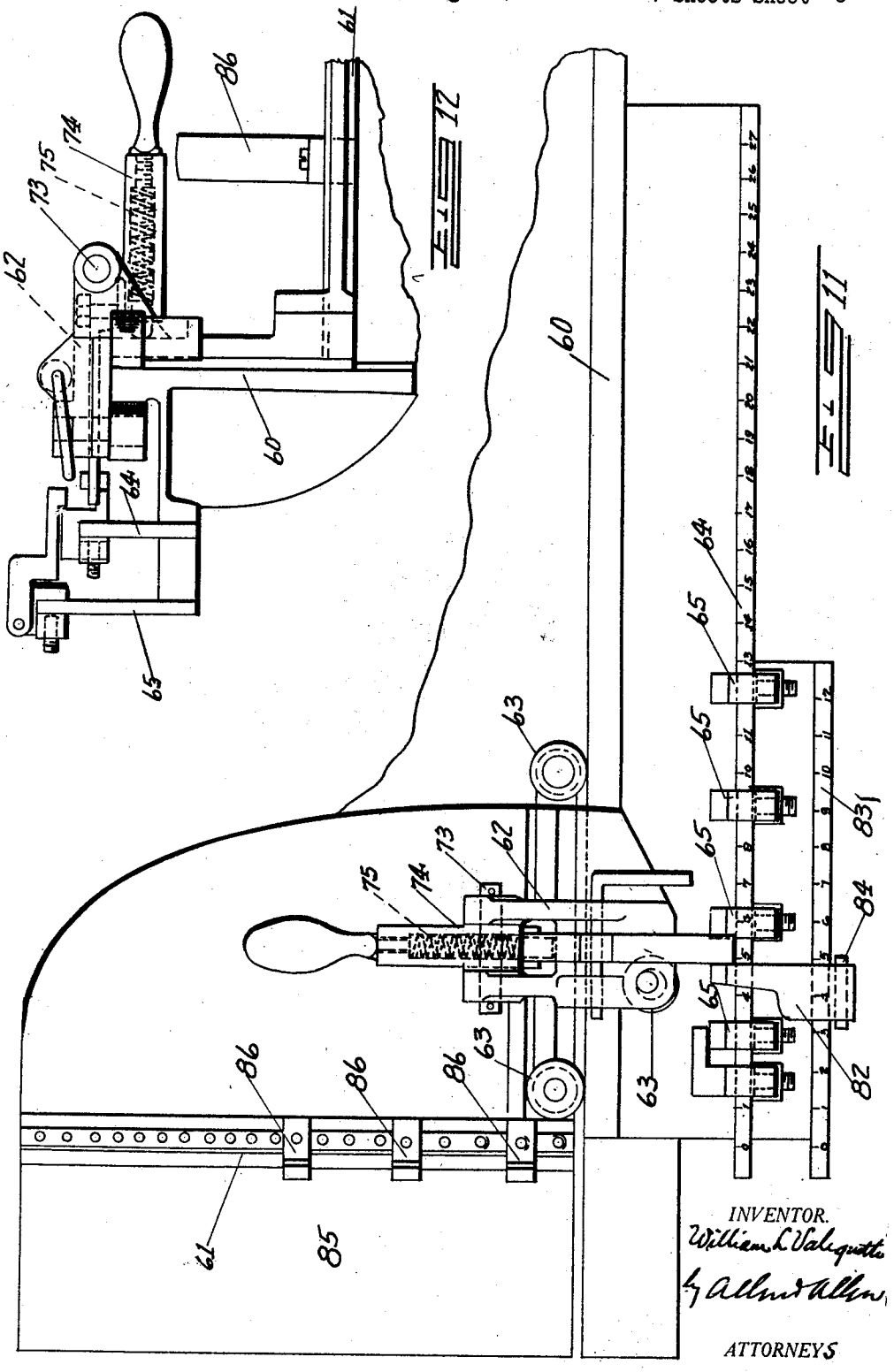
FIG 8 FIG 9 FIG 10 FIG 7 FIG 6

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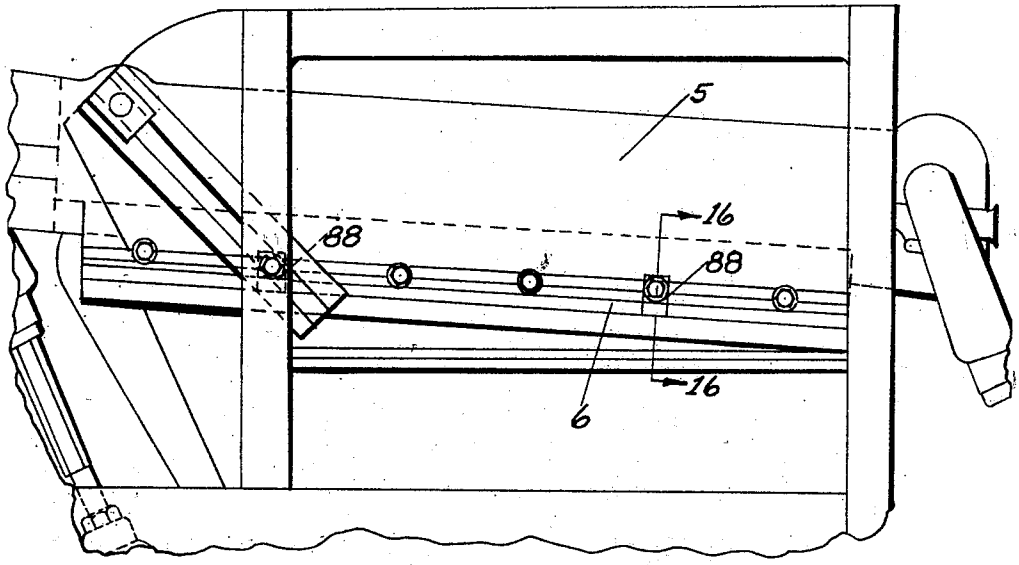


FIG 13

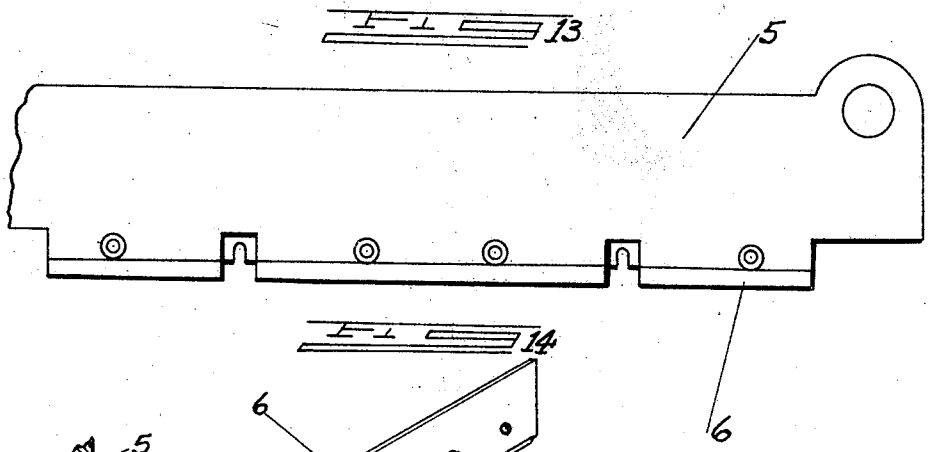


FIG 14

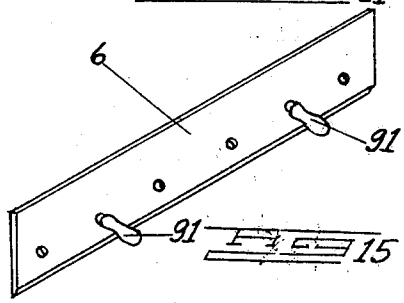


FIG 15

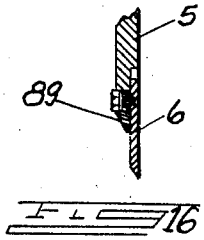


FIG 16

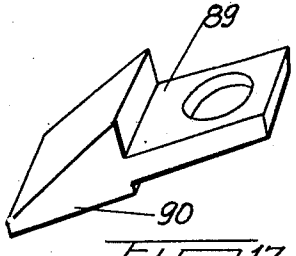


FIG 17

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UNITED STATES PATENT OFFICE

WILLIAM L. VALIQUETTE, OF DAYTON, OHIO, ASSIGNOR TO THE HARRIS-SEYBOLD-POTTER COMPANY, OF DAYTON, OHIO, A CORPORATION OF DELAWARE

PAPER-CUTTING MACHINE

Application filed August 15, 1927. Serial No. 213,040.

My invention relates to book trimming machines in which a single knife is employed for trimming the sides and ends of books and pamphlets and for splitting the packages into several parts, when they are printed in duplicate or triplicate and it embodies certain novel features of construction and operation to be hereinafter particularly pointed out and claimed.

One feature of improvement consists in the construction and operation of the clamp mechanism whereby the clamp for the paper pile may be actuated by spring tension which will be automatically varied for the various package, the spring being compressed by an eccentric actuated by the main driving mechanism while means are provided to serve as a safety stop to prevent any overthrow of the parts.

Another feature of improvement consists in the operation of the clutch devices for coupling the operating mechanism to the constantly running fly wheel, simultaneously with the release of the brake and the automatic means for disconnecting the clutch with each operation.

Provision is also made for the quick and ready attachment of the knife to the knife bar so that it can be readily and easily removed and replaced for sharpening or repairs.

In book trimming machines of the kind under consideration, the packages are usually fed to the trimming knife from the rear and one part of my improvements embodies a certain novel back and side gauge construction and the use of stops arranged so that the portion of the package for the front, the tail and the head cuts may be obtained by the location of the stops and for each cut the package may be quickly and accurately moved into the desired position for the particular trim desired, the stops being so designed and arranged that there will be no interference with each other.

Other features of novelty will be set forth more specifically in the description that follows and pointed out in the claims.

In the drawings:

Figure 1 is a front elevation of the machine with certain parts broken away.

Figure 2 is a side elevation of the same.

Figure 3 is a top plan view of operating mechanism taken underneath the table.

Figure 4 is an end view of the clutch operating mechanism.

Figure 5 is a section of same taken on the line 5—5 of Figure 4.

Figure 6 is a plan view of the back gauge devices.

Figures 7, 8 and 9 are perspective views of the three forms of back gauge stops.

Figure 10 is a perspective view of the plate used for splitting.

Figure 11 is a plan view of back gauge and stops used for splitting.

Figure 12 is an end elevation of the same.

Figure 13 is a rear elevation of the knife bar and knife.

Figure 14 is a front elevation of the knife bar and knife.

Figures 15 and 16 are perspective and sectional views of the cutting knife reduced in size.

Figure 17 is a perspective view of the clip for securing the knife.

The operating mechanism is mounted in side standards 1, 1 which with cross beams 2 and arch 3 make up a solid and substantial frame work on which is supported the operating table 4. The knife head 5 to which the cutting knife 6 is secured is actuated to give a shearing cut by cranks 7 and 8 coupled to the ends of the knife head by coupling yokes and rods 9, 9 with the cranks mounted on the crank shaft 10, driven by large gears 11 and 11[a] which are in a train and driven by a gear 12 on the end of the driving shaft 13 of the machine.

Mounted on the crank shaft 10 is an eccentric 14 carrying a forwardly projecting slotted arm 15 which engages a stud 15[a] on the end of an arm 16 secured on the rock shaft 17 journalled across the frame work. This rock shaft 17 carries at each end a rearwardly projecting arm 18 which is coupled by pull bars 19 with either end of the paper clamp 20 adapted to slide vertically in suitable guide ways in the frame work. The

clamp 20 is preferably of the well known flexible construction so that it will exert its pressure uniformly on piles of books to be trimmed. Pressure is applied to the clamp by the spring 21 mounted on the rod 22 which is pivotally secured at its upper end at 24 to the frame and supported on a stud 25. Projecting from the lower end of the rod 22 is a pin 25^a that is seated in a notch 26 in the arm 18 for transmitting the thrust of the spring.

It will be obvious from this construction that as the eccentric is turned to actuate the arm 15 the arm 18 will compress the spring and lift the clamp 20 to its maximum height and that with further movement of the eccentric, the spring will depress the arm 18 and cause the clamp to compress the paper pile and that for high packages of paper, the maximum compression will be obtained, the tension of the spring decreasing as the height of the paper pile decreases.

For starting and stopping the machine, I provide as follows: The fly wheel 22^a is mounted on the short shaft 13^a driven continuously by a motor 21^a or in any other suitable way as by belt and pulley.

Mounted on studs 24 projecting from the face of the fly wheel is the central friction disk 25^b which is engaged by the pair of slidably mounted friction disks 26^a, 26^a, in splines on a sleeve 29. The friction clutch is obtained by the action of three bell crank levers 27 which are equally spaced and pivoted by pins 30 on the sleeve 29 keyed on the shaft 13. The bell cranks or dogs 27 are actuated to compress the friction disks by a toggle link connection 28 with arms 31 on a grooved collar 32 slidably keyed on the sleeve 29. The friction disk assembly is held in position by a lock nut 33 screw threaded on the collar 29.

The clutch mechanism is actuated by a bifurcated arm 34 mounted on a shiftable counter shaft 40. The counter shaft also carries a spreader 35 which is adapted to engage rollers 36 on the ends of a brake band 37 which encircles the brake drum 38^a, thus releasing the brake when the clutch is thrown into engagement. When the clutch is disengaged, the brake band is caused to engage the brake drum by the spring 33.

The shaft 40 is arranged to be shifted by a foot treadle 41 pivoted in the base of the frame and connected by a rod 42 with a pivoted dog 43 which is brought to bear on a roller mounted in a collar 44 secured to the shaft 40. The shaft 40 is also shifted by a hand lever 45 on a rock shaft 46 which carries a bifurcated member 47 in engagement with a pin 48 secured to the shaft 40. This rock shaft 46 also carries an arm 49 carrying a stop member 50, the roller 51^a on this stop member when the clutch is shifted swings into the pathway of an arm 52 mounted on the main crank shaft 10 which carries the eccentric 14, whereby the shaft 40 and the clutch member is disconnected with each operation of the machine.

As a further safety provision to stop the machine with each operation, I provide a safety pin or rod 51 which is mounted to slide horizontally in the frame. This rod or pin 51 is engaged by a lever arm 53 extending downwardly from a collar 34 secured on the inner end of the shiftable shaft 40.

The engagement of the arm 53 with the pin 51 is a loose double spring engagement with a spring 56 bearing between the outer face of the arm and an adjusting nut 57 on the rod and a cushion spring 58 bearing between the inner face of the arm and the pin. The outer end of the safety pin 51 normally projects underneath the clamp actuating arm 18. When the clutch is thrown the spring 56 is compressed withdrawing the end of the rod and the spring 58 tends to return the safety pin and cause it to bear against the inner face of the arm 18 and as soon as the movement of the arm 18 raises the clamp to its upper position the pin is again projected underneath the arm so that the clamp is stopped from descending even in the event that the shifting of the rod 40 should fail to release the clutch or the brake band fail to operate. This provides a positive safety lock for the mechanism clamp and stops the operation whether the clutch is on or off.

In order to provide for the accurate trimming of books for the front edge and the top and bottom edges, which are ordinarily called the head and tail of the book, when a single knife is used, it is necessary to provide stops for the back gauge so that the books can be rapidly pushed into proper position.

The first cut is for the front edge, then the book is turned and the trimmed front edge is adjusted against the side gauge and the book is pushed up for the tail trim. The book is then turned over, adjusted with the trimmed edge against side and back gauge and the book pushed up into position for the head trim.

There are thus three positions at which the back gauge must be stopped to present the book for the successive trims.

This I accomplish in the following manner: Along the side of the table at right angles to the knife, mounted in fixed position is the side gauge 60. The movable back gauge 61 is mounted on a side carriage 62 provided with rollers 63 which run on the sides of the side gauge and carry the back gauge forward and back in accurate right-angled alignment with the side gauge and parallel to the knife. Secured in vertical position by the side of the side gauge is

a graduated plate 64. A series of stops 65, 66 and 67 shown in Figures 7, 8 and 9 are mounted on this graduated plate at the proper distances to stop the back gauge at the several positions for the successive trims. In order to obtain accuracy in the adjustment of these stops, a rectangular shim 68 is provided into which the set screws engage to clamp the stops in place. Each stop has a lateral side portion 70, forming the stop. For stop 66, this portion 71 extends out beyond the stop 70 so that these two stops can be placed together while the stop 67 has a still greater extension 72 so that it can be located close to the other two stops, with these three stops the faces 70, 71 and 72 can be located at any desired position from the knife. Pivotally mounted on the sliding carriage 62, on pivot pin 73 is bar 74, the outer end of which is designed to contact with the desired stop for locating the back gauge. This bar 74 is recessed at its inner end and carries a spring 75 which bears between the bottom of the recess and a pin 76 seated in the recess. This pin bears against the frame of the carriage. The bar 74 is provided with a handle 77 and by depressing the handle, the outer end of the finger of the bar will be raised. When in its normal position, the finger projects into the pathway of the stops. When the handle is depressed to permit the finger to pass any particular stop, the spring 75 will at once return the bar to normal position. The handle 77 is also used to shift the carriage and in order that with any back movement there may be no interference, the stop members are provided with inclined surfaces 79, 80 and 81 over which the stop finger slides.

For slitting pamphlets which have been printed in a plurality of sets in order to obtain the proper location for all the cuts required without interference for the stop positions, I make use of an additional stop member 82 which is mounted on a supplemental scale 83. This stop is pivoted on a pin 84 so that it can be swung up out of the way when the machine is not used for slitting. With this construction the back gauge can be stopped at any desired position.

First the front edge can be trimmed, then the tail and then successive cuts to separate the sets individually and the head of the last pamphlet then trimmed. If desired, trims can be made between each slitting operation as the stops can be placed very close together.

For carrying the books to be trimmed, I attach the cutting board 85 to the back gauge so that the cutting board will carry the books located thereon up to the knife. Upright fingers 86 are also mounted on the back gauge. When the cutting board is not required, I substitute therefor a narrow plate 87 to prevent displacement of the pamphlets when the back gauge is drawn back.

In paper cutting machines, it is frequently necessary to remove the cutting knife for sharpening or repairs and as the knife is usually clamped to the knife bar by bolts, when the bolts are withdrawn the knife which is usually quite heavy is apt to drop out and become damaged. I therefore provide as follows: The knife is secured in place by the usual bolts but I provide slots 88 for two of these bolt openings and secure in these slots a clip 89 (Fig. 17) which bears with its rear surface 90 against the knife. To remove the knife, the exposed bolt with its clip is removed and a handle 91 screwed into the knife. The knife bar is then lowered to the table which exposes the other slotted opening and a second handle is substituted for the bolt and clip. The other bolts are then removed and holding the knife by the two handles, the knife bar is raised and the knife is free to be removed by the handles passing through the slots. By reversing the operation, the knife can be readily replaced.

In order that the clippings may be readily removed, I provide the table immediately to the rear of the knife with a hinged section 92 which section is supported on pins 93 engaging in slots 94 in the side frame. This section 92 of the table can thus be dropped down into the position shown on dotted lines in Figure 2, leaving an opening for the paper clippings to drop through into a pan arranged to receive them.

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

1. In a paper cutter of the class described in combination with a reciprocating knife and means for reciprocating said knife to cut the paper, a reciprocating clamp for holding the paper to be cut, and resilient means to apply the pressure to said clamp, said reciprocating clamp having interconnecting mechanism for compressing said resilient means, said resilient means adapted to be compressed upon the withdrawal of the clamp from the paper, and said interconnecting mechanism comprising a pair of levers pivoted in axial alignment and movable in the same direction during the compressing operation.

2. A paper cutting machine having a cutting knife, a table for supporting the paper to be cut, and a clamp for clamping the paper, with resilient means for moving said clamp into clamping position, means for actuating said knife comprising a crank shaft with cranks thereon, and means connected with said shaft for raising said clamp and compressing said resilient means, said means comprising a pair of levers piv-

oted in axial alignment and movable in the same direction during the compressing operation.

3. In a paper cutting machine of the class described the combination with the main frame and a feed table mounted thereon, a knife mounted to reciprocate transversely over said table, of a stationary side gauge fixedly mounted adjacent the side edge of the table at right angles to the knife and a movable back gauge with a carriage to support same at right angles to the side gauge, said carriage mounted to slide on the side gauge and provided with a projecting finger pivoted thereto, an indicating scale plate mounted adjacent to and parallel with the side gauge over which said finger projects and a series of stops adjustably mounted on said scale plate at different distances from the knife to stop the movement of the back gauge at any desired point, and a cutting board forming part of said carriage.

4. In a paper cutting machine of the class described, the combination with the main frame and a feed table mounted thereon, a knife mounted to reciprocate transversely over said table, of a stationary side gauge fixedly mounted adjacent the side edge of the table at right angles to the knife and a movable back gauge with a carriage to support same at right angles to the side gauge, said carriage mounted to slide on the side gauge, a cutting board for books mounted on and movable with the carriage, a projecting finger bar pivotally mounted in said carriage with a handle therefor by which said carriage may be moved and the finger bar lifted to pass intermediate stops.

5. In a paper cutting machine of the class described, the combination with the main frame and a feed table mounted thereon, a knife mounted to reciprocate transversely over said table, of a stationary side gauge fixedly mounted adjacent the side edge of the table at right angles to the knife and a movable back gauge with a carriage to support same at right angles to the side gauge, said carriage mounted to slide on the side gauge, a cutting board for books mounted on and movable with the carriage a projecting finger bar pivotally mounted in said carriage with a handle therefor by which said carriage may be moved and the finger bar lifted to pass intermediate stops, with the several stops provided with inclined surfaces to permit the carriage to be returned without raising the finger.

6. In a paper cutting machine of the class described, the combination with the main frame and a feed table mounted thereon, a knife mounted to reciprocate transversely over said table, of a side gauge and a movable back gauge with a carriage to support same at right angles to the side gauge, said carriage provided with a projecting finger pivoted thereto, an indicating scale plate mounted adjacent to and parallel with the side gauge over which said finger projects and a series of stops adjustably mounted on said scale plate at different distances from the knife to stop the movement of the back gauge at any desired point and a second indicating scale plate mounted adjacent to the first plate with an adjustable stop thereon carrying a hinged portion adapted to cooperate with the other stops for slitting purposes.

7. In a paper cutter of the class described, in combination with a reciprocating knife and clamp and means for actuating them, a table for the books to be trimmed and a movable back gauge to shift the books into proper position and a cutting board with means for attaching same to the back gauge.

8. In a paper cutter provided with a knife bar, a cutting knife and bolts for securing the knife to the knife bar, a plurality of the bolt holes for said bolts being slotted, with means by which handles may be substituted for said bolts for holding the knife when said bolts are removed comprising said slotted openings which permit the ready removal and replacement of the knife.

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