No. 666,449. Patented Jan. 22, 1901.

S. K. WHITE.

PAPER CUTTER.

(Application filed Apr. 7, 1898.)

(No Model.) 3 Sheets—Sheet 1.

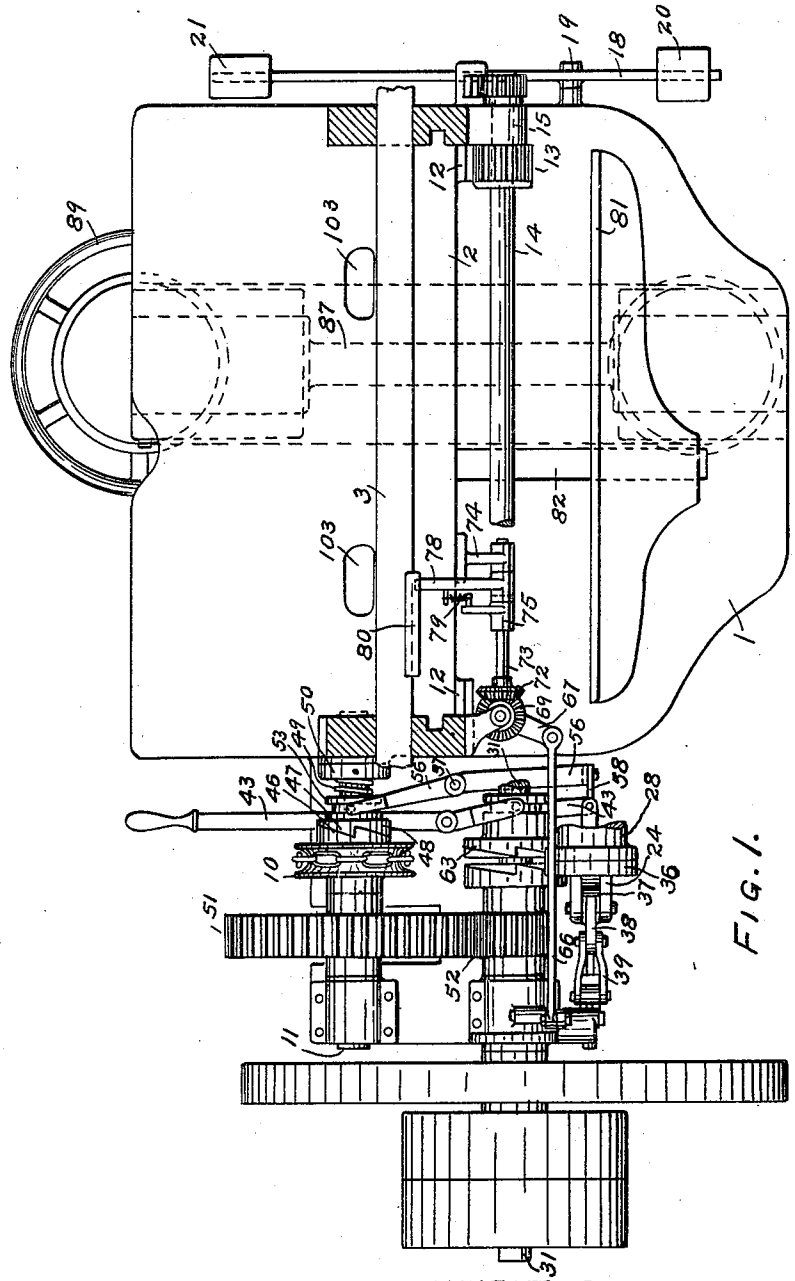


FIG. 1.

WITNESSES,

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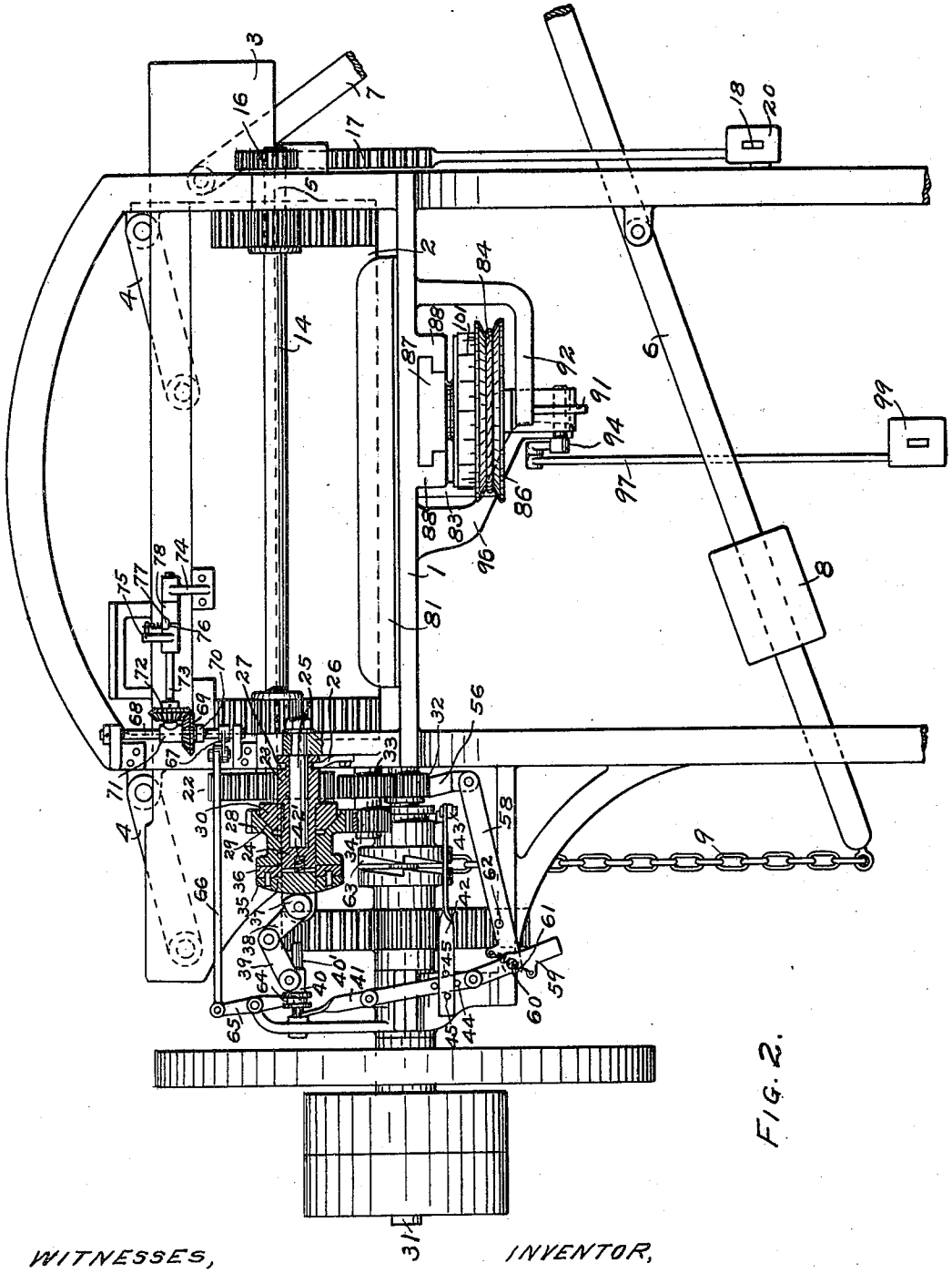


FIG. 2.

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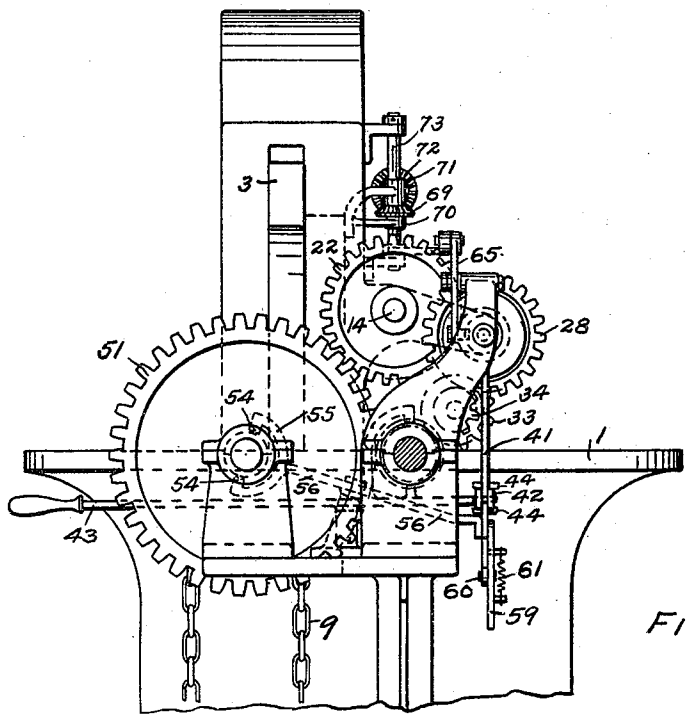


FIG. 3.

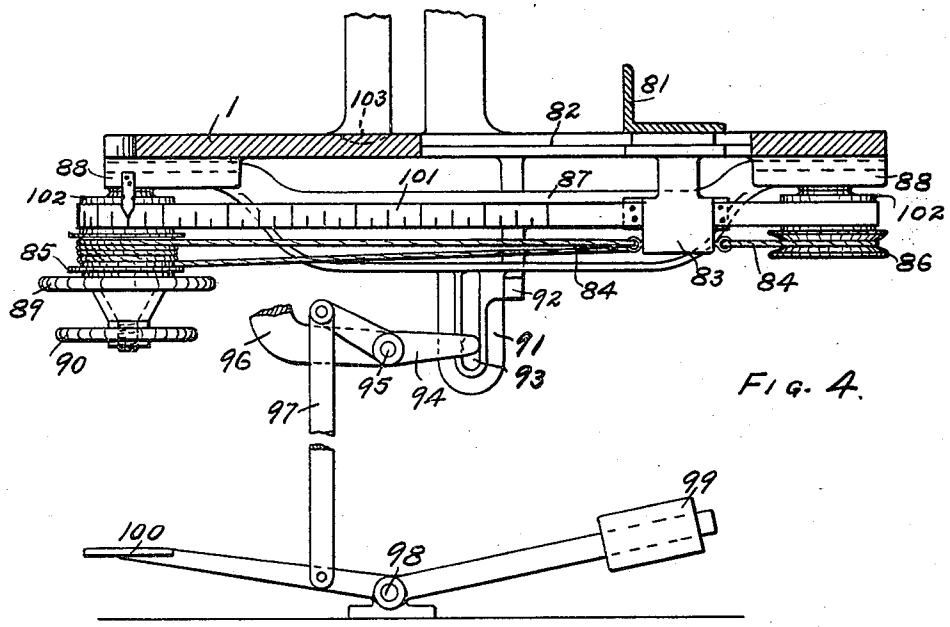


FIG. 4.

WITNESSES,

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UNITED STATES PATENT OFFICE.

SAMUEL K. WHITE, OF MYSTIC, CONNECTICUT, ASSIGNOR TO THE STANDARD MACHINERY COMPANY, OF SAME PLACE.

PAPER-CUTTER.

SPECIFICATION forming part of Letters Patent No. 666,449, dated January 22, 1901.

Application filed April 7, 1898. Serial No. 676,742. (No model.)

To all whom it may concern:

Be it known that I, SAMUEL K. WHITE, of Mystic, county of New London, and State of Connecticut, have invented certain new and useful Improvements in Paper-Cutters; and I do hereby declare the following specification, taken in connection with the accompanying drawings, forming a part of the same, to be a full, clear, and exact description thereof.

The invention relates to that class of paper-cutting machines in which a pile of sheets is supported upon a table and acted upon by a cutting-blade, the sheets being held during the cutting by a clamping-bar.

One object of the invention is to provide a simple and efficient means for regulating the pressure of the clamp upon the pile of sheets according to the resistance offered by the pile of sheets to the passage of the cutter-blade, so that the greater the resistance to the cutter the greater will be the pressure of the clamp upon the paper. This is accomplished by forcing the clamp onto the paper by the frictional connection therewith of a movable member and regulating the friction according to the resistance to the cutter, so that the friction will be increased as the resistance to the cutter increases. Any suitable form of frictional devices may be used, and the friction may be regulated by the resistance to the cutter in any suitable manner without departing from the invention, which resides in providing means which operate through friction to force the clamp upon the paper and means for regulating the friction according to the resistance offered to the cutter, without regard to the particular construction and arrangement of the mechanisms employed.

A further object of the invention is to provide means for enabling the operator to readily and conveniently remove the pile of sheets which has been acted upon by the cutter without destroying the adjustment of the back gage relative to the cutter. This is preferably accomplished by securing the gage to a slide which is normally held against a fixed stop and which may be moved to advance the gage and force the pile of sheets forward under the cutter and then quickly returned to its normal position. The means for adjusting the gage is preferably mounted upon the same slide with the gage, and said slide is preferably moved forward by a treadle and automatically returned when the treadle is released.

In order that the operator may conveniently grasp the front edge of the pile of sheets, one or two recesses are preferably formed in the table in front of the cutter, over which recesses the front edge of the pile of sheets may be moved, and these recesses form one feature of the present invention. This feature of invention may be used in combination with the forwardly-sliding back gage, or other means may be employed for moving the pile of sheets forward, or the pile of sheets may be moved by the hand, if desired.

In the accompanying drawings is shown a paper-cutter embodying the present improvements in their preferred form.

Figure 1 is a plan view. Fig. 2 is a rear side elevation. Fig. 3 is an end elevation with the end of the driving-shaft removed, and Fig. 4 is a sectional elevation of the means for operating the gage-slide.

Referring to the construction shown and to the drawings in detail, the machine is provided with the usual table 1 for supporting the material to be cut, the clamp 2, guided in the frame, as usual, and the knife-bar 3, connected to the frame by the links 5, as is common. The knife-bar is operated by a lever 6, connected to said bar by a link 7 and provided with a weight 8, which holds the knife-bar normally raised. The lever 6 is operated to draw the knife-bar down by means of a chain 9, which has its ends connected to the end of the lever and passes over a sprocket-wheel 10, mounted on a shaft 11, journaled in the frame.

The clamp 2 is provided with racks 12, which are engaged by pinions 13, secured to a shaft 14, mounted in bearings 15 at the rear of the clamp. A pinion 16 is secured to the end of shaft 14 and is engaged by a rack 17, the lower end of which is connected to a lever 18. The lever is pivoted at 19 and is provided with a weight 20, which acts through the connections described to hold the clamp 2 in its raised position. A treadle 21 is secured to

the lever 18, and by pressing upon this treadle the clamp may be brought down on the pile of sheets on the table.

In order that the pile of sheets on the table may be properly clamped and held, the pressure of the clamp upon the pile should increase as the resistance to the passage of the cutter increases. The means shown for accomplishing this result are as follows: A gear 22 is secured to the end of the shaft 14 and is engaged by a pinion 23 on a sleeve 24, mounted on a stud 25, and held thereon by a finger 26, which engages a groove 27 in said sleeve. A gear 28 is mounted to turn freely upon the sleeve 24 and is provided with a conical friction-surface 29, which is arranged to engage a corresponding surface on a disk 30, secured to sleeve 24. The gear 28 is driven from the main driving-shaft 31 through a pinion 32, secured thereto, which engages a gear 33, secured to a pinion 34, which engages gear 28. The gear 28 thus constitutes one form of movable member which may be frictionally connected with the clamping-bar to operate the same.

The sleeve 24 is provided beyond the hub of the gear 28 with a slot in which is mounted a block 35, connected to a disk 36, which surrounds the sleeve 24 and bears against the hub of gear 28. A cam 37 is pivoted in the slot and bears against the block 35. An arm 38, connected to the cam 37, is pivoted at one end to a link 39, the other end of which is pivoted to a slide 40, mounted to rotate on a stud 40'. By moving the slide 40 the cam 37 may be operated and the friction between the gear 28 and disk increased or released. A spring 42' keeps the block in engagement with the cam 37 and relieves the friction when the cam is moved to release said block. The slide 40 is moved to operate the cam 37 and throw in the friction through a lever 41, the upper end of which is arranged to engage said slide and the lower end of which is connected by means of a bar 42 with the clutch-shifting lever 43. The bar 42 is supported between two pins 44 on the lever 41 and is provided with two pins 45, which engage opposite sides of said lever. When the clutch-shifting lever is moved to throw in the mechanism for drawing down the cutter, the lever 41 is rocked to advance the slide 40 and force in the friction with sufficient pressure to carry the clamp down onto the pile of sheets. The lever 41 is also connected with the mechanism for operating the cutter, and the construction of said mechanism and the connections are such that the pressure between the members of the friction-clutch formed by the gear 28 and disk will be increased as the resistance to the cutter increases. This cutter-driving mechanism and the connections with lever 41 are as follows: The sprocket-wheel 10 is loosely mounted on the shaft 11 and is provided with inclined clutch-surfaces 46, which are engaged by clutch-surfaces 47 on a sleeve 48, keyed upon the shaft 11, but movable longitudinally thereon. The inclined clutch-faces are held in engagement by a spring 49, interposed between the sleeve 48 and a collar 50, secured to the shaft 11, and the sleeve 48 thus forms one form of yielding driver for the devices which operate the cutter-bar. A gear 51 is secured to shaft 11 and is engaged and driven by a pinion 52, loosely mounted upon the driving-shaft, but arranged to be clutched thereto. The sleeve 48 is provided with a groove 53, which is engaged by pins 54 on the ends of a yoke 55, formed on a lever 56, pivoted at 57 and having its rear end connected to a link 58. The link 58 forms one member of a toggle, the other link 59 of which is pivoted to the end of lever 41. The links 58 and 59 are pivoted together at 60 and are connected by a spring 61. The end of link 59 extends beyond the pivot 60 and is arranged to engage a pin 62 on link 58 when the toggle is straightened. The gear 52 has a clutch-face formed thereon which is engaged by a clutch-face on a sleeve 63, keyed to slide on said shaft and operated by the lever 43. When the clutch-sleeve 63 is moved into engagement, the sprocket-wheel 10 is driven by the engagement of the inclined surfaces 47 with the inclined surfaces 46, and the knife is drawn down to cut the pile of sheets. The movement of the lever 43 rocks the lever 41, as above described, and throws in the friction to move the clamp down upon the pile of sheets, the parts being so timed that the clamp engages the pile before the knife begins to act thereon. This movement of the lever 41 straightens the toggle formed by the links 58 and 59, and the spring 60 acts to hold said toggle straight. When the knife strikes the pile of sheets, the movement of the cutter-bar is resisted and the pull upon the chain 9 is increased, causing the inclined surfaces 46 to force the sleeve 48 back against the tension of the spring 49, and the distance the sleeve is forced back will vary with the resistance which the cutter meets as it passes through the pile of sheets. This movement of the sleeve 48 is transmitted through the lever 56, links 58 and 59, and lever 41 to the slide 40, the movement of which operates the cam 37 and forces the friction-surfaces between gear 28 and disk 30 more firmly together, and thus increases the friction. The greater the friction the greater will be the pressure of the clamp upon the pile of sheets. Thus the pressure of the clamp upon the pile will be regulated by the resistance to the cutter. After the cutter has passed through the pile of sheets the clutch-lever 43 is moved to throw the clutch-sleeve 63 out of engagement and the weight 8 returns the cutting-bar to its normal position. This movement of the lever 43 rocks lever 41 and breaks the toggle formed by the links 58 and 59, which drop down, as shown in Fig. 2. This movement of the le-

ver 41 does not release the friction acting on the clamp, and this friction is not released until the knife has cleared the top of the pile of sheets, when said friction is released by the following means: The slide 40 is provided with an annular groove 64, which is engaged by a pin on the end of a lever 65, the upper end of which is connected by a link 66 to the end of an arm 67. The arm 67 is secured to the end of a short vertical shaft 68, mounted in bearings secured to the frame. A bevel-gear 69 is keyed to slide upon the shaft 68 and is supported to the clamp-bar. The gear 69 is engaged by a bevel-gear 72, secured to a shaft 73, mounted in the arm 71, and a bracket 74. An arm 75, secured to shaft 73, is provided with a shoulder 76, which is arranged to be engaged by a shoulder 77 on an arm 78, loosely mounted on shaft 73, said shoulders being held in engagement by a spring 79, connecting said arms. The end of arm 78 is arranged in the path of a projection 80, secured to the knife-bar. As the knife-bar moves down the arm 78 will turn on the shaft 73 when struck by the projection 80 and allow said projection to pass. When the projection 80 strikes the arm 78 on the upstroke of the knife-bar, however, the shoulder 77 acts against shoulder 76 and the shaft 73 is rocked, thus drawing the slide 40 back and releasing the block 35. The spring 42′ then moves the block 35 back, and the clamp is free to return to its upper position under the influence of the weight 20.

In order that the pile of sheets may be conveniently removed by the operator after it has been operated upon by the cutter, means are provided for advancing the pile of sheets under the cutter. This means preferably consists of a pusher which may be advanced and quickly returned to its normal position. This pusher preferably forms the back gage, as well as the means for advancing the pile of sheets, although it will be understood that the back gage and pusher may be separate devices, if desired, and movable independently of each other. It is desirable that the adjustment or setting of the back gage with relation to the cutter should be maintained in order that the sheets formed by successive cuts may be the same size, and when the pusher and back gage are one and the same the gage is preferably secured to a slide which normally engages a fixed stop. The back gage is also preferably adjusted by moving said gage with relation to said slide. One embodiment of such preferred construction will now be described.

As shown in Figs. 1, 2, and 4, the back gage 81 is guided in ways 82, formed in the table 1, and is provided with a depending plate 83, to which are connected the ends of a cable 84, which is wound upon a drum 85 at the front of the machine and the rear loop of which passes over a pulley 86. The drum 85 and pulley 86 are mounted upon a slide 87, mounted in guides 88 on the under side of table 1. A hand-wheel 89 is secured to drum 85, and by turning this wheel the drum may be rotated to adjust the gage 81. A binding-wheel 90, mounted below the wheel 89, serves to clamp the drum in position after the gage has been adjusted. An arm 91 depends from the slide 87 and is arranged to engage a fixed stop 92, secured to the table 1. A slot 93 is formed in the arm 91 and is engaged by a pin on the end of one arm of a lever pivoted at 95 to a bracket 96, depending from the table 1. The other end of the lever is connected by a link 97 to a lever pivoted at 98 and provided with a weight 99 on the rear end and a treadle 100 at the front end. The parts stand normally in the position shown in Fig. 1, with the arm 91 forced against the stop 92 by the weight 99, and said slide being locked in position by the arm 94, which is nearly horizontal. After the pile of sheets has been cut the operator presses upon the treadle, thus rocking the lever 94 94′ and advancing the slide 87 and attached gage 81. When the operator releases the treadle 100, the weight 99 will immediately return the parts to their normal position.

A tape 101 may be connected to the plate 83 and pass over the drums 102, loosely mounted above the drum 85 and pulley 86, and may have a scale thereon to indicate the distance from the gage to the cutter.

In order that the operator may readily grasp the edge of the pile of sheets when it is advanced under the cutter by a pusher or by the hand, the table is provided with two recesses 103, into which the fingers or thumb may pass in grasping the pile of sheets.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The combination with a cutter-bar, of a clamp, a movable member frictionally connected with said clamp, and means for regulating the friction by the resistance to the cutter.

2. The combination with the cutter-bar, of a clamp, means embodying a friction-clutch for operating said clamp, and means for regulating the friction by the resistance to the cutter.

3. The combination with a cutter-bar, of a clamp, frictionally-driven means for operating said clamp, means for operating said cutter-bar, and means for regulating the friction from said cutter-bar-operating means.

4. The combination with a cutter-bar, of a clamp, means embodying a friction-clutch for operating said clamp, mechanism for operating said cutter-bar, means for simultaneously throwing said mechanism and clutch into operation, and means for regulating the action of the clutch by the resistance to the cutter.

5. The combination with a cutter-bar, of a clamp, means embodying a friction-clutch for operating said clamp, means for regulating the friction by the resistance to the cutter, and means for releasing the clutch by the cutter-bar.

6. The combination with a cutter-bar, of a

clamp, means embodying a friction-clutch for operating said clamp, means for operating said cutter-bar, a yielding driver therefor, and connections between said yielding driver and clutch.

7. The combination with a cutter-bar, of a clamp, means embodying a friction-clutch for operating said clamp, a cam for operating said clutch, and means for regulating the movement of said cam by the resistance to the cutter.

8. The combination with a cutter-bar, of a clamp, means embodying a friction-clutch for operating said clamp, mechanism for operating the cutter-bar, a clutch for throwing said mechanism into operation, a lever for shifting said latter clutch, connections between said lever and said friction-clutch, and means for regulating the friction of said friction-clutch by the resistance to the cutter.

9. The combination with a cutter-bar, of a clamp, means embodying a friction-clutch for operating said clamp, means for operating said cutter-bar embodying a yielding clutch-sleeve having inclined driving-surfaces, and connections between said sleeve and friction-clutch whereby the friction upon said clutch is controlled by the resistance to the cutter-bar.

10. The combination with the table and cutter-bar, of means for regulating the size of the sheets cut and for moving the pile of sheets under the cutter without altering the setting of said regulating means.

11. The combination with the table and cutter-bar, of a pusher in the rear of the cutter-bar for moving a pile of cut sheets under the cutter, a treadle for advancing said pusher, and means for automatically returning said pusher.

12. The combination with the table and cutter-bar, of a pusher in the rear of the cutter-bar for moving a pile of cut sheets under the cutter, a slide to which said pusher is adjustably secured, a stop for controlling the normal position of said slide, and means for advancing said slide and returning the same to its normal position.

13. The combination with the table and cutter-bar, of a back gage adjustable with relation to the cutter-bar, means for advancing said gage to push a pile of cut sheets under the cutter and returning said gage without altering the setting of said gage.

14. The combination with the table and cutter-bar, of a back gage, a treadle for advancing said gage to push a pile of cut sheets under the cutter, and means for returning said gage.

15. The combination with the table and cutter-bar, of a slide, a back gage adjustably connected with said slide, means for advancing said slide and returning the same to its normal position.

16. In a cutting-machine, the combination with the table and cutter-bar, of a back gage, a slide, means carried by said slide for adjusting said gage, and means for advancing said slide.

17. The combination with the table and cutter-bar, of a back gage, a slide, means carried by said slide for adjusting said gage, means for holding said slide normally in a fixed position and for advancing and returning said slide to its normal position.

18. In a cutting-machine, the combination with the table and cutter-bar, of a back gage, a slide, means carried by said slide for adjusting said gage, a fixed stop normally engaged by said slide, and means for advancing said slide.

19. The combination with the table and cutter-bar, of a back gage, a slide to which said gage is secured, a fixed stop for said slide, a treadle for advancing said slide, and means for automatically returning said slide.

20. The combination with the table and cutter-bar, of a back gage, a slide to which said gage is secured, a fixed stop for said slide, a slotted arm on said slide, a lever provided with a pin engaging said slot, and means for rocking said lever.

21. The combination with the cutter-bar, of a table for supporting a pile of sheets, one or more recesses in the table in front of the cutter-bar, a back gage, and means for moving the edge of the sheets over said recess or recesses without altering the setting of the back gage.

22. The combination with the cutter-bar, of a table for supporting a pile of sheets, one or more recesses in the table in front of said cutter-bar, a back gage, and means for advancing the back gage without altering the setting thereof to move the edge of the sheets over said recess or recesses.

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Witnesses:
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