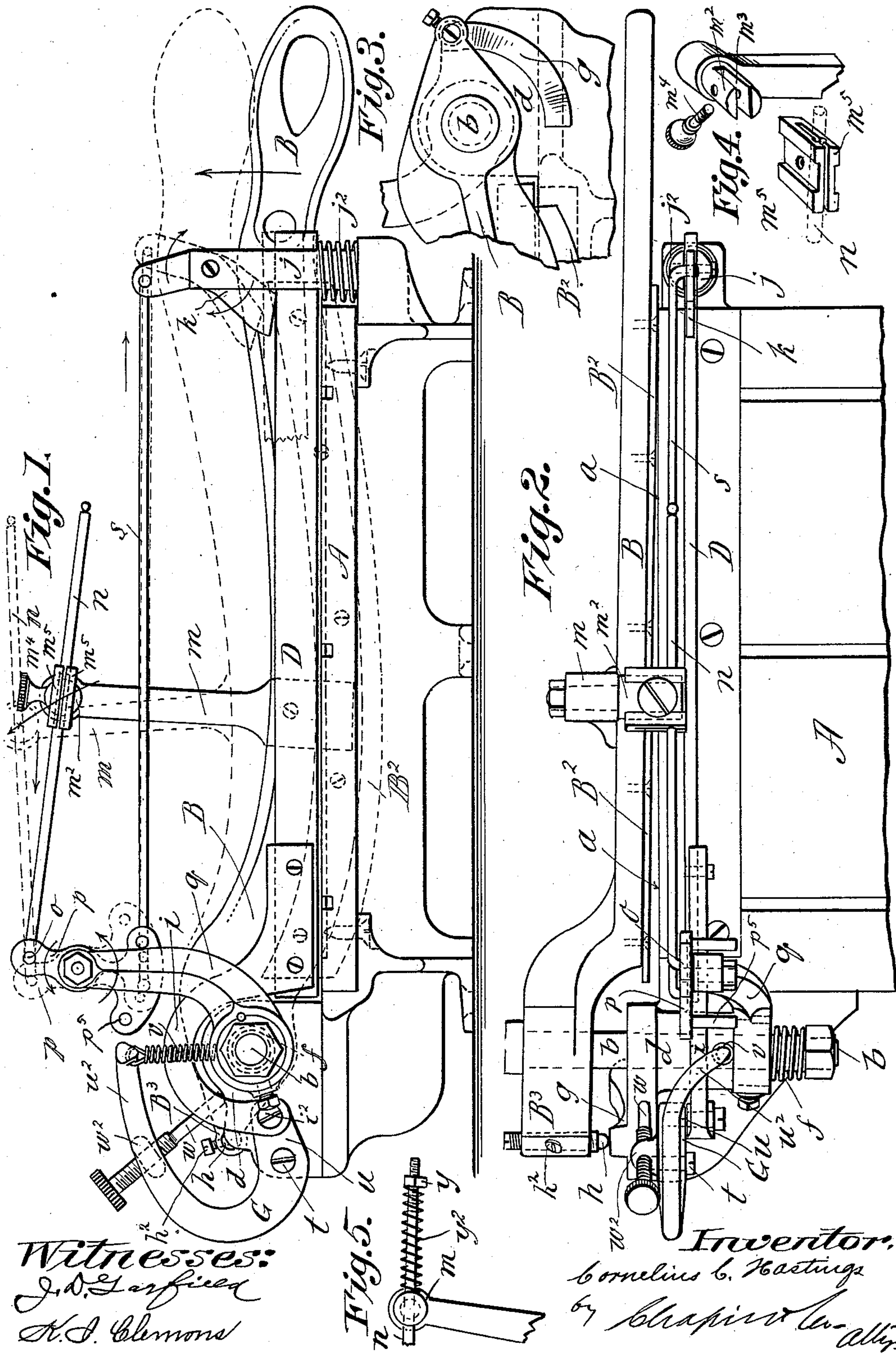


(No Model.)

C. C. HASTINGS.
PAPER CUTTING MACHINE.

No. 532,665.

Patented Jan. 15, 1895.



Witnesses:
J. D. Garfield
H. S. Clemons

Inventor,
Cornelius C. Hastings
by Chapin & Co. Attys.

UNITED STATES PATENT OFFICE.

CORNELIUS C. HASTINGS, OF SPRINGFIELD, MASSACHUSETTS, ASSIGNOR TO
THE MILTON BRADLEY COMPANY, OF SAME PLACE.

PAPER-CUTTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 532,665, dated January 15, 1895.

Application filed May 4, 1894. Serial No. 510,056. (No model.)

To all whom it may concern:

Be it known that I, CORNELIUS C. HASTINGS, a citizen of the United States, residing at Springfield, in the county of Hampden and State of Massachusetts, have invented new and useful Improvements in Paper-Cutting Machines, of which the following is a specification.

This invention relates to improvements in that class of cardboard or paper cutting machines which comprises a paper table, a knife having a swinging movement for a shearing cut at one edge of the table, and a clamp for bearing on the paper along a line near the edge of the table while the paper is being cut.

The invention has for its object to improve paper cutters of the class indicated, especially in respect of the government of the swinging knife so far as concerns control of the same within the limits of its transverse bodily play, and to provide an improved and novel construction of clamp device to hold the paper firmly along a line near the edge of the table which is automatically operative for its paper pressing and releasing action in consequence of, and in conjunction with, the movements of the knife; and the invention consists in constructions and combinations of parts, all substantially as will hereinafter fully appear and be set forth in the claims.

Reference is to be had to the accompanying drawings, in which—

Figure 1 is a front elevation of a paper cutter having the present improvements applied thereto. Fig. 2 is a plan view of the same, a portion, only, of the width of the paper supporting table being shown. (In these views, for the purposes of exhibiting the novel devices on a comparatively large scale, the machine is illustrated as considerably shorter than it is customary to construct them.) Fig. 3 is a rear side elevation of parts adjacent to the pivotal connection of the knife which will be hereinafter referred to. Fig. 4 is a perspective view of parts for effecting a sliding connection to be hereinafter referred to, while Fig. 5 is a perspective view to illustrate a modification of the sliding connection device, as will hereinafter appear.

In the drawings, A represents the table upon which the paper, cardboard, &c., which is to

be cut, is placed, *a* being the metal faced edge of the table in conjunction with which the knife, B, has its shearing action. The knife comprises the handled lever-arm, with the plane faced blade, B², and the rigid transversely and forwardly extended stud, or shaft, *b*, which has a close bearing within the smooth hole in the hub of the casting, *d*, at the corner of the table, for a rotational movement and also an axial play. This journaling of shaft, *b*, in hub of casting, *d*, constitutes the pivotal connection of the knife with the table.

The shaft, *b*, which slides endwise through the bearing hub of the casting, *d*, is set a little out of perpendicular to the shear edge, *a*, of the table so that the angle between the said table edge and the portion of the shaft which is to the rear thereof is slightly acute. The knife, B, is rigidly affixed to said shaft and at right angles thereto so that the knife, in its swing, moves in a plane (or in constantly laterally shifting planes for reasons which will hereinafter appear) which are slightly oblique to the table edge. Thus, when the blade is fully depressed, as seen in the plan view, Fig. 2, and a portion of the blade nearest the handle end of the knife lever is in sidewise contact with the shear edge of the table, the knife, from this place toward its pivot shaft, *b*, diverges from the table edge. The spring, *f*, exerts a forward drawing action on the shaft, *b*, so that the knife will be held forward as far as it is permitted, so as to move. Now, when the knife is swung upward and the spring causes shaft and knife to move forwardly, the extremity of the knife blade nearest the shaft will be drawn against the shear edge of the table. The edge of the blade cannot, by the spring, be drawn inwardly beyond the said edge of the table (so that on the downswing of the knife the blade edge would come on top of the metal, *e*, which forms the edge and top facing of the table, which over-riding by the knife would not only prevent the movement of the knife, but would injure both knife edge and such metallic facing) because of the provision of the fixed cam, *g*, which is as a part of the stationary casting, *d*, and of the projection, *h*, on the arm, B³, of the knife which is projected at its end oppo-

site from the handle beyond the shaft, *b*. This cam is also so graded that in co-operation with the abutment, *h*, on the arm, *B*³, of the knife it aids in duly carrying the blade
 5 away from the table so as to make the easy cutting movement without springing the blade; and the cam not only prevents the blade from cutting at its heel onto the top of the bed at the initial portion of the swing,
 10 but prevents too hard a shearing pressure,—as might be exerted by the spring, *f*,—of the blade against the other member of the shear,—the table edge, *a*,—during the cut.

When the blade is swung down, the suc-
 15 cessively advancing parts of the knife which come into shearing proximity to the edge of the table, cause the knife and its shaft, *b*, to be crowded rearwardly against the force of the spring, *f*, the said shaft moving longitudi-
 20 nally through its bearings, and also that when the knife has been swung entirely down the part of the blade nearest the handle is face-wise against the proximate table edge, while the length of the blade from its part in the
 25 shearing contact to its farther end has the aforementioned divergence from the table edge which is seen in a somewhat exaggerated degree in Fig. 2. The grade of the said cam, *a*, is such as will be understood from the fore-
 30 going, and on reference to the drawings, that as the knife is swung up for a new cut it and its shaft, *b*, may be permitted to have under the reaction of the spring, *f*, the bodily transverse movement inward to bring its end por-
 35 tion which is nearest its journal shaft into the proper shearing proximity to the edge of the table. The said projection, *h*, is preferably, and as shown, constituted by a screw which is adjustable transversely through the
 40 knife-arm, *B*, so that the limitation of the forward, or inward movement of the knife may be nicely regulated for obvious reasons and advantages.

*h*², represents a set screw which screws
 45 through the arm, *B*³, of the knife transversely of the length of, and against the, said screw, *h*, for more certainly locking the latter against any movement whereby its adjustment might be varied.

D represents the clamp-bar for holding the
 50 paper down firmly upon the table near the edge, *a*. This clamp-bar is automatically movable vertically by, and in consequence of, the movements of the knife, that is to say,
 55 when the knife is swung up for a new cut the clamp is released,—moved upwardly,—while when the knife commences its downswing to cut, the clamp-bar presses downwardly upon the paper.

Now the clamp-bar, *D*, as seen in the draw-
 60 ings has at its one end the semi-circular rigid extension, *i*, which freely arches the hub of the casting, *d*, and is pivoted, at *i*², to the support, *G*. The other end of the clamp-bar is
 65 fitted to play in the vertically slotted post, *j*, at the other end of the table. The spring, *j*², surrounds the post and underlies the ex-

trinity of the clamp-bar and exerts the lift-
 ing pressure thereupon. Within and at the upper part of the said slotted post, *j*, the lever, 70
 or dog, *k*, is pivotally hung intermediately between its ends, one end of the lever having in its swinging movement a forcing impinge-
 ment against the clamp-bar to depress it.

The clamp-bar, *D*, is depressed on the ini- 75
 tial portion of the downswing of the lever-knife, *B*, by reason of a peculiar medium of connection between the knife and bar—that is to say, it will be seen that on the knife, *B*,
 80 is an upright, *m*, having the transverse stud, *m*², which is slotted as at *m*³. A couple of blocks, *m*⁵, are embraced by the slotted stud and are held clamped together with a proper
 85 degree of pressure by the screw, *m*⁴. A rod, *n*, is extended through, and between, and sub-
 90 ject to the bind of, these pressure blocks, and has a pivotal connection at *o*, with one arm of a rocking lever, *p*, which is hung to swing
 upon the vertical fixed arm, *q*, which is sup-
 95 ported by, and is a part or fixture of, the cast-
 ing, *d*. To a lower member of this said lever, *p*, a rod, *s*, is connected, the other end of which
 is connected to the upper arm of the afore-
 said dog, *k*. When the lever knife, *B*, is
 100 swung up, as indicated by dotted lines in Fig. 1, and the upright, *m*, assumes the slanted po-
 sition indicated, the lever, *p*, and rod, *n*, as-
 sume the position also indicated by the dot-
 ted lines. Now as the knife commences to
 swing downward, the rod, *n*, rocks the lever, 100
p, which causes the rod, *s*, to swing the dog,
k, which forces down the clamp-bar. This is
 accomplished during a comparatively slight
 initial portion of the downswing of the knife;
 105 and when the dog, *k*, has been set down and
 the clamp-bar moved to its limit and the fur-
 ther movement of the lever, *p*, stopped, the
 further and final forcible swing of the knife
 to cut causes the pressure,—which had been
 110 up to this point exerted by the blocks, *m*⁵, *m*⁵,
 to move rod, *n*, as one therewith,—to be over-
 come and the said pressure blocks have a
 longitudinal movement along the rod as nec-
 115 essary in order not to prevent the completion
 of the stroke of the knife, and so again when
 the knife is upswung, blocks and rod first
 move as one until abutment, *p*⁵, of lever, *p*,
 strikes the edge of bracket arm, *q*, whereupon
 the further and final upswing of the knife
 causes blocks, *m*⁵, to move along over rod, *n*, 120
 toward the lever, *p*.

From the description and explanations
 hereinabove given, it appears that the paper
 cutting machine comprises the combination
 with the table and swinging shear knife, of a 125
 clamp-bar and a device for operating it to
 clamp, and a medium of yielding connection
 between the knife and clamp-operating de-
 vice which causes the knife and said device
 to swing as one during an initial portion of the 130
 shearing movement of the knife, and which,
 when the action of said clamp operating knife
 has been effected, permits the knife to have
 its further movement without effect on, or im-

pediment by, the said clamp or its operating device. Now this medium of yielding connection between the clamp operating device, (which is the lever-dog, *k*,) and arm, *m*, of the knife, B, in lieu of consisting of the rod, *s*, rocking-lever, *p*, having a limited extent of swing movement, the rod, *n*, and the pressure blocks, *m*⁵, *m*⁵, might embody some specifically different arrangement of parts for permitting, seasonably, the yielding of the part which for a time only causes parts, *n* and *m*, to move together, and such might be comprised in a form of connection, such as is seen in Fig. 5, wherein the rod has a sliding fit across and through the stud, *m*², of arm *m*, and is provided with the lug, or nut, *y*, between which and the arm, *m*, is the spring, *y*². Now in such a system of connection the other parts being substantially the same as seen in Fig. 1, when the lever, *p*, is swung to its limit through rod, *n*, the spring, *y*², is so stiff that the force in transmission to effect the movements of parts *p*, *s*, and *k*, will not insure its compression, but immediately the lever has swung so far as it is permitted, then in order that the further downward cutting movement of the knife may be permitted the rod, *n*, has a movement relative to the perforated stud, *m*², and the spring is accordingly compressed.

The clamp-bar has very slight movement at its portion nearer the pivot, *i*², and a constantly increasing extent of movement at all portions successively toward the end which is guided in the slotted post, *j*.

The aforementioned support, G, is comprised in a C-shaped lever which is pivotally hung at *t*, to the casting, *d*, and it is to the lower short arm, *u*, of this lever that the clamp-bar, D, has its aforementioned one-end pivotal connection, *i*². A spring, *v*, is applied between the upwardly curved and overhanging arm, *u*², of said lever, G, and the casting, *d*. It will be here observed that owing to the curved form of the said lever, G, the extremities of both its arms, *u* and *u*², swing at once in substantially the same direction. The spring, *v*, which draws downwardly on the upper lever-arm, *u*², causes the maintenance of the lower arm, *u*, in the lowest position into which such member may be swung by reason of the abutment between the member, *w*, of the lever and a stationary part of the machine, say, for instance, the said casting, *d*. The abutment member, just mentioned, is here shown as constituted by a knurled-headed screw which screws through the lug, *w*², on the side of the C-lever, G.

The pressure of the clamp-bar, D, is a yielding one, and an example of its action and utility will be presented. Thus, supposing the screw, *w*, is so adjusted that the lever-arm, *u*, will support the adjacent portion of the lower edge of the clamp-bar at one-sixteenth of an inch above the surface of the table when the knife is swung down and the clamp-bar is consequently depressed. Now, assume that when the said parts are raised

and a sheet, or sheets, of cardboard are placed under the clamp and upswung knife which is three thirty-seconds of an inch thick; then as the knife is swung down and the lever-dog, *k*, is operated the clamp-bar cannot go to its normal lower limit, but upon contacting with the paper it will exert a lifting pressure on the arm, *u*, the spring, *v*, stretching as the arm, *u*², is also raised, and the screw, *w*, slightly recedes, or eases off from its contact against the casting; and of course it is understood that by turning the screw, *w*, the normal position of the clamp-bar, D, may be varied so as to enable the mechanism to hold and cut stock of various thicknesses.

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

1. In a paper cutting machine, the combination with the table and swinging shear knife, and the clamp-bar, D, the lever on which one end of the clamp-bar is supported, the adjustable abutment provided on the lever for regulating the normal lower position of the clamp-bar-supporting-arm of said lever, and a medium of connection and engagement between the knife and clamp-bar whereby the movements of the knife will effect the clamping and unclamping of the bar, substantially as described.

2. In a paper cutting machine, the combination with the table, of the pivoted lever, G, having the abutment screw, *w*, and spring, *v*, the clamp-bar pivotally hung upon said lever, and means for imparting to the clamp-bar rising and lowering swinging movements, substantially as described.

3. In a paper cutting machine, the combination with the table having the bracket, or casting, *d*, of the C-shaped lever, G, pivotally hung upon said casting and having the spring adapted to depress both arms of said lever, and having the adjustable screw which constitutes an abutment for limiting the depression of said lever, the clamp-bar hung to the lower arm of said lever and means for imparting a slight vertical swinging movement to the said pivotally supported clamp-bar, substantially as described.

4. In a paper cutting machine, the combination with the table and vertically movable clamp-bar, of the dog or lever, *k*, mounted to have a depressing impingement against one end of the said bar, the knife having the arm, *m*, on which is supported the pressure blocks, *m*⁵, *m*⁵, the rocker-lever, *p*, to one end of which is connected the rod which is yieldingly embraced by said blocks, and to another arm of which rocker lever is connected the rod, *s*, which has its other end in connection with the said dog, *k*, substantially as described.

5. In a paper cutting machine, the combination with the table and vertically movable clamp-bar, of the dog, or lever, *k*, to operate said clamp-bar, the knife having the upright, *m*, with the bifurcated lateral stud, *m*², the pressure blocks embraced by the opposite

members of said stud, the rod fitted in ways through and between said blocks, the screw, m^4 , for regulating the pressure of the blocks upon the rod, the rock-lever, p , to which
 5 said rod, n , is connected and the rod, s , connected to the said rock-lever, and to said dog, k , substantially as described.

6. In a paper cutting machine, the combination with the table having the bracket, or
 10 casting, d , and vertically slotted post, j , the C-shaped lever, G , pivoted to the bracket and having the adjustable screw which constitutes a limiting abutment member for said lever, and the spring which exerts the de-
 15 pressing stress upon the lever, the clamp-bar, D , having at one end the curved extension which bridges the bracket, and which is pivotally hung upon an arm of said lever, G , the
 20 spring, j^2 , surrounding the slotted post and bearing upwardly on the bar, and a means for effecting the depression of the bar, substantially as described.

7. In a paper cutting machine, the combination with the table and swinging knife hav-
 25 ing the upright arm, m , provided with the pressure blocks and having the casting, d , on which is pivotally mounted the C-shaped lever, G , provided with spring, v , and adjustable abutment screw, the clamp-bar, D , hav-
 30 ing one end pivotally supported on the lower arm of lever, G , means for guiding the other

end of the bar in its vertical movements and the elevating spring, j^2 , the dog, k , rocker-lever, p , rod connecting said dog and rocker
 35 lever and the rod connected to said lever and having a portion of its length yieldingly embraced by said pressure blocks, substantially as described.

8. In a paper cutting machine, the combination with the table and the stationary cam, 40
 g , of the knife having the rigid angular sliding journal-shaft, b , and so mounted with its plane-faced blade slightly angular to the shear edge of the table, the extension arm, B^3 , of said knife having the adjustable abut- 45
 ment screws, h , coacting with said cam and the spring, f , all substantially as and for the purposes set forth.

9. In a paper cutting machine, the combination with the pivoted lever knife having 50
 arm, m , clamp and operating device therefor, the rod, s , for operating said device, the lever, p , pivotally hung on a fixed support and having the abutment stud, p^5 , the rod, n , pivoted
 55 to an arm of said lever, p , and having a yielding engagement with a member of the knife arm, m , substantially as described.

CORNELIUS C. HASTINGS.

Witnesses:

WM. S. BELLOWS,
 K. I. CLEMONS.