

H. LAW.
 Clamp for Paper-Cutting Machine.
 No. 217.229. Patented July 8, 1879.

Fig. 1

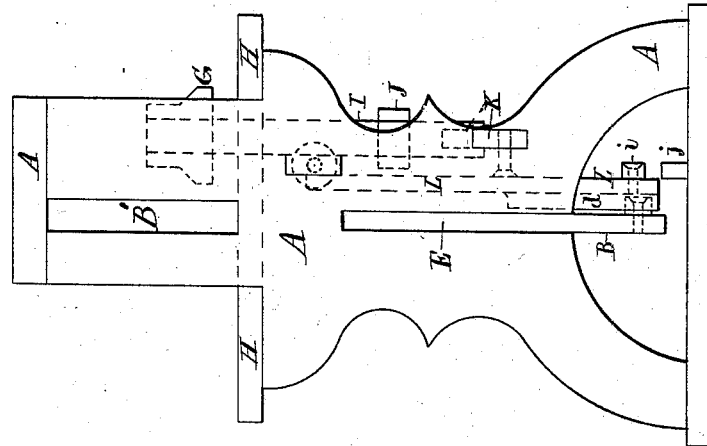


Fig. 3.

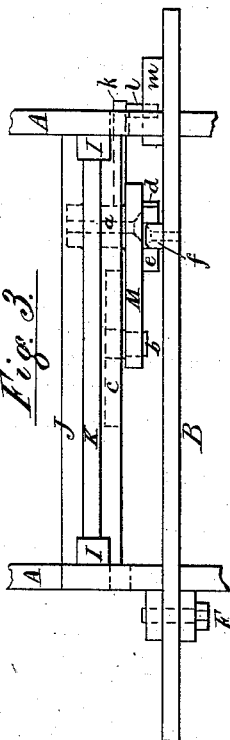
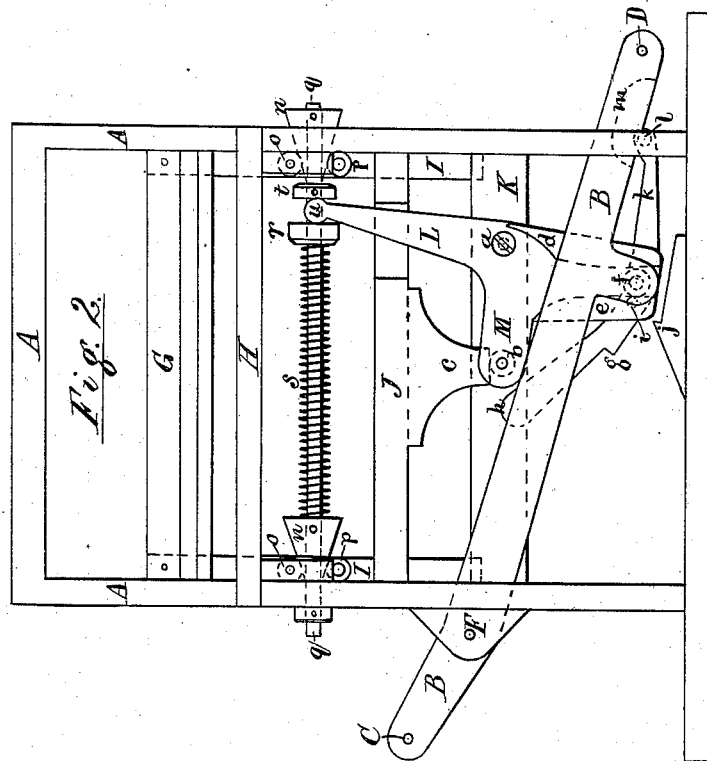


Fig. 2.



Attest:

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Henry Law, per
Thos. S. Coane, Atty.

UNITED STATES PATENT OFFICE.

HERVEY LAW, OF CHATHAM, NEW JERSEY.

IMPROVEMENT IN CLAMPS FOR PAPER-CUTTING MACHINES.

Specification forming part of Letters Patent No. **217,229**, dated July 8, 1879; application filed March 29, 1879.

To all whom it may concern:

Be it known that I, HERVEY LAW, of the town of Chatham, in the county of Morris and State of New Jersey, have invented a new and useful Improvement in Clamps for Paper-Cutting Machines, which improvement is fully described in the following specification.

My invention relates to an improvement in self-clamping devices for paper cutting machines; and consists in means for operating the clamp during the first movement or advance of the main cutting-lever or equivalent knife-operating mechanism, and a catch for automatically holding the clamp closed during the cut; also, in the use of wedges to draw down the clamp, in combination with a spring to compensate for the variations in the pile of paper; and it further consists in the combination, with the clamping devices, of an automatic lifter for raising the clamp by the movement of the main cutting-lever upon its return after the cut.

Figure 1 of the drawings is a side elevation of a cutting-machine; Fig. 2, a front elevation; and Fig. 3, a plan of the levers B and M.

A is the frame of the machine; B, the main lever, commonly used to actuate the cutting-knife, (not here shown,) which is guided by the slots B' in the main frame above the table H. The knife and all parts of the machine not connected with the clamp G are omitted from the drawings, and the lever B is shown pivoted at F upon the frame A, and in position prior to a cut. Its long arm is usually connected at D to mechanism for moving the lever, and the short arm at C to the knife in the slot B'.

The clamp G is shown secured by a frame or tie-bars, I, to a cross-bar, J, below the table H, upon which the work is laid to be cut, and another cross-bar, K, is placed between the frames A, below the bar J, to sustain an upright lever, L, one arm of which is moved by the lever B, and the other is arranged to close the clamp while the lever B advances to operate the knife, the clamp being closed by the movement of the lever L before the knife begins its cut, and the lever L and clamp being held in a fixed position during the cut by a pawl or catch, g, pivoted by a pin, i, to the lower end of the lever L, and arranged to en-

gage with a stop, j, until released by the descent of the lever B.

The pawl is loaded with a weight, h, to make it engage with the stop, and is provided with a projecting arm, k, having a pin, l, at its extremity, with which the lever B comes in contact as it descends after the cut, thus releasing the pawl from the stop j, and leaving the lever L at liberty to assume its initial position.

To operate the lever L during the first advance of the lever B, a roller, f, is secured to the side of the latter opposite the lever L, and two guides, d e, are provided upon the lever L, between which the roller f passes as the lever B advances.

One of the guides, d, receives the pressure of the roller as it advances from the initial position shown in the drawings in Fig. 2, and the lever L is thus moved to close the clamp. The other guide, e, receives the impulse of the roller upon the return of lever B, just as it releases the pawl g from the stop j, and restores the lever L and clamp to their initial positions unless a weight or counter-balance be used for that purpose.

The movement of the lever L is transmitted to the clamp by a pair of wedges, n n, secured to a rod, q, placed transversely of the frame A at the top of lever L, and moved by the latter to close the clamp.

The wedges are shown with their upper faces bearing against stationary rollers o o, secured to the frame A, and their lower sides against rollers p, secured to the frame I of the clamp, the rollers p and the clamp-frame being drawn downward by the advance of the wedges.

As it is evident that the movement of the lever L is the same at each stroke of the cutter, and as the pile of work to be cut may vary from a few sheets to several inches in height, some compensation is necessary to prevent the wedges from being moved the whole distance traveled by the lever L. This is secured by the interposition of a coiled spring, s, between the top of the lever and the base of the wedge farthest from it, a sliding collar, r, being fitted to the rod q to receive the pressure of the lever L and convey it to the spring s and wedge n. By this arrangement only so much of the lever's motion is conveyed to the wedges

as is necessary to close the clamp, the remainder being expended in compressing the spring, which, in turn, acts to hold the clamp firmly closed during the cut.

To raise the clamp after the cut I provide a lever, M, attached to the side of lever L, and having a pin, *b*, at its extremity, which bears against the lower side, *c*, of the cross-bar J. This lever M shares the movement of the lever L after the pawl *g* is released, and lifts the clamp to its initial position just as the wedges are drawn back by a collar, *t*, secured to rod *q* at the top of the lever L, opposite the collar *r*. By this construction, it will be seen that the lever L, with the lever M secured to it at right angles, effects all the desired movements of the clamp automatically, regardless of the amount of material placed upon the table, and that these movements are produced by the lever B before it has advanced sufficiently to make a cut upon the work clamped.

It is evident that a pawl or catch could be applied directly to the top of lever L or to the collar *r*, which has a predefinite movement; and I do not, therefore, limit myself to the precise arrangement shown for the holding of the clamp fast during the cut.

The clamp may be raised after the cut by a counter-balance, if preferred, attached to the auxiliary lever M, and the rod *q*, with its wedges, may also be drawn back after the cut by a cord and weight, or spring, if preferred, attached to the collar *r*. In such case the guide *e* and collar *t* could be dispensed with, as the spring acting upon the collar *r* would restore the lever L to its initial position at the close of each stroke. Such arrangements would throw less work upon the lever B, which is usually not carried downward with any other force than its own weight.

In machines where the knife is operated by

other means than a lever, B, my automatic clamp may be operated by any equivalent device adapted to move the lever L before the commencement of the cut or before the knife has entered the material any considerable amount.

I therefore claim my invention in the following manner:

1. The combination of the clamp G and lever B with mechanism, substantially as herein described, for actuating the clamp during the first portion of the lever's movement, and with a catch for locking the clamp until the return of the lever B after the completion of the cut.

2. The combination of the frame I, carrying the clamp G, with the frame A and the wedges *n n*, connected together and operating to close the clamp when advanced by suitable mechanism, substantially as herein set forth.

3. The combination of the clamp G, frame I, wedges *n n*, and rod *q* with the spring *s* and the collar *r*, for transmitting the movement of the operative mechanism to the wedges, substantially as herein set forth.

4. The lever L, provided with guide *d*, for closing the clamp during the first movement of the lever B, and operating in combination with the roller *f*, arranged upon the side of the lever B, for the purpose set forth.

5. The guide *e* upon the lever L, operating, in combination with the roller *f* and the auxiliary lever M, to raise the clamp after the cut, substantially as herein set forth.

In testimony that I claim the foregoing as my own I hereto subscribe my name in the presence of two witnesses.

HERVEY LAW.

Witnesses:

THOS. S. CRANE,
WM. L. BREATH.