

H. Law.
Paper Cutting Mach.

N^o 83,513.

Patented Oct. 27, 1868.

Fig. 1.

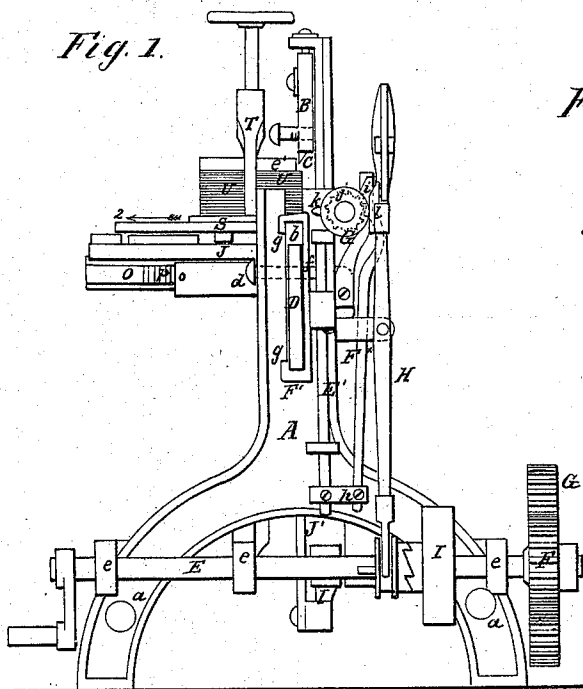


Fig. 3.

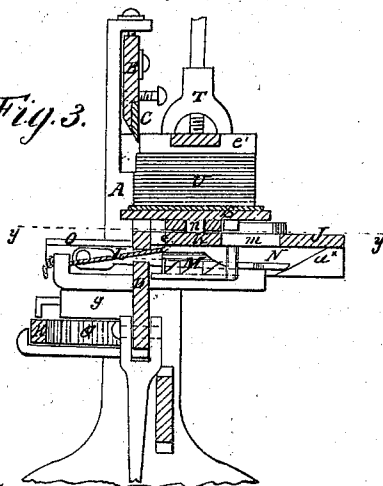


Fig. 4.

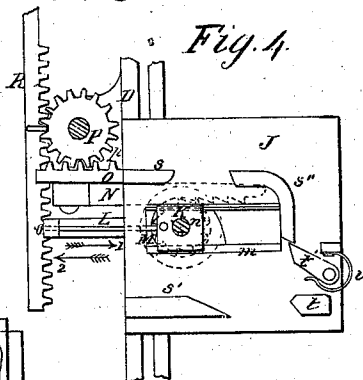


Fig. 2.

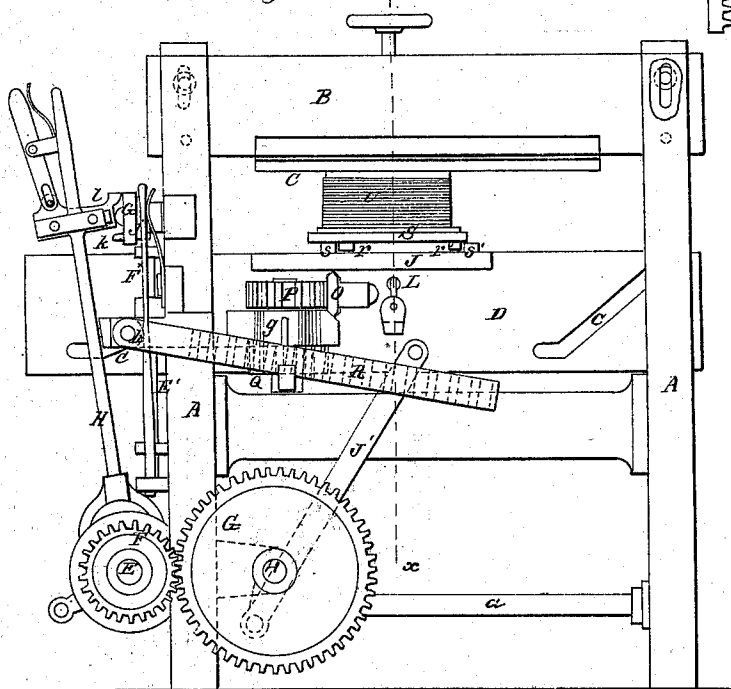
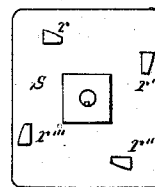


Fig. 5.



Witnesses

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HERVEY LAW, OF CHATHAM, NEW JERSEY.

Letters Patent No. 83,513, dated October 27, 1868.

IMPROVEMENT IN MACHINES FOR CUTTING PAPER.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that I, HERVEY LAW, of Chatham, in the county of Morris, and State of New Jersey, have invented a new and improved Machine for Trimming Books; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable those skilled in the art to make and use the same, reference being had to the accompanying drawings, forming part of this specification.

This invention relates to a new and improved machine for trimming books, and it consists in a peculiar construction and arrangement of parts, whereby two piles of books may be cut or trimmed at one operation, and in a perfect manner, so that no finishing or retrimming with scissors or knife will be required, and the parts made to operate automatically throughout.

In the accompanying sheet of drawings—

Figure 1 is a side elevation of my invention.

Figure 2, a rear elevation of the same.

Figure 3, a transverse vertical section of the same, taken in the line *x x*, fig. 2.

Figure 4, a horizontal section of the same, taken in the line *y y*, fig. 3.

Figure 5, a detached inverted plan of the clamp-bed pertaining to the same.

Similar letters of reference indicate corresponding parts.

The framing of the machine is composed of two up-rights, *A A*, connected at their lower parts by cross-rods, *a*, and at their upper parts by a horizontal bar, *B*, to which a knife, *C*, is attached, and secured in any proper manner, the cutting-edge of the knife extending down below the lower edge of the bar *B*, the latter being rendered adjustable by any proper means, to compensate for the wear of the knife.

Each upright, *A*, has a vertical slot, *b*, made in it, and in these slots a bar, *D*, is fitted, and allowed to move freely, said bar having two slots, *c c*, made in it, the main portions of which are inclined, and at the same angle, and consequently are parallel with each other.

The lower portions of the slots *c c* are horizontal, as shown clearly in fig. 2.

Through these slots pins *d d* pass, said pins extending horizontally through the uprights *A A*, and serving as guides to the bar *D*.

E represents a driving-shaft, which is fitted in suitable bearings, *e*, at the lower part of the framing, and has a pinion, *F*, at one end of it, which pinion gears into a wheel, *G*, on a shaft, *H*, which is parallel with the shaft *E*, the inner end of the latter being provided with a crank, *I*, which is connected by a pitman, *J*, with the bar *D*. (See, more particularly, fig. 3.)

By this means an up-and-down oblique movement is given the bar *D*, in a direction corresponding to the inclination of the slots *c c*, and at the termination of

the upward oblique movement of the bar *D*, a short horizontal movement is given said bar, owing to the lower horizontal portions of said slots.

The object of this short horizontal movement of bar *D* will be presently explained.

To the outer side of one of the uprights *A*, there are attached bearings for a vertical-sliding rod or shaft, *E'*, which is operated from the bar *D* by means of a loop, *F'*, attached to shaft *E'*, and in which loop one end of the bar *D* is fitted, said loop being composed of an upright strip, *f*, having a hook, *g*, at its upper and lower end, as shown clearly in fig. 1, the hooks *g g* being sufficiently far apart to admit of a certain degree of play of the bar *D* between them, before the shaft *E'* is actuated.

To the lower end of the shaft *E'* there is attached an arm, *h*, in which the lower end of a shaft, *F''*, is secured, said shaft having a number of teeth, *i*, at its upper end, which, when the shaft *E'* is forced down by the bar *D*, engage with a ratchet, *j*, at the inner side of a wheel, *G'*, and turn said wheel, *G'*, a certain distance, the teeth *i*, when the shaft *E'* is drawn upward by bar *D*, passing over the teeth of the ratchet without turning it.

The wheel *G'* has a projection, *k*, at its outer side, which, when the wheel *G'* has been turned a certain distance, comes in contact with a yielding arm, *l*, on a clutch-lever, *H*, and disconnects a driving-pulley, *I*, from the shaft *E'*, thereby stopping the motion of the machine at the precise time when required.

J represents a bed, which projects horizontally from the bar *D*, and is permanently attached thereto.

In this bed, *J*, there is an oblong slot, *m*, in which a slide, *K*, is fitted, said slide having an elastic cord or spring, *L*, attached, which has a tendency to keep the slide at the end of the slot *m* nearest the bar *D*. (See figs. 3 and 4.)

In this slide, *K*, there is fitted a vertical shaft, *n*, having a ratchet-wheel, *M*, on its lower part, underneath the bed *J*; and *N* is a rack, which passes transversely through the bar *D*, and is pivoted to a slide, *O*, which is fitted and works in a proper bearing, *o*, underneath the bed *J*, and has rack-teeth, *p*, at one side of it, into which a pinion, *P*, gears, said pinion being at the upper end of a shaft, having its bearing, *q*, at the side of bar *D*, the lower end of said shaft having a pinion, *Q*, upon it, into which a rack, *R*, gears, the latter being pivoted at one end to the framing of the machine, as shown at *h* in fig. 2.

This rack, *R*, has teeth set at different angles, to accommodate itself to the different positions of pinion *Q*, as it rises and falls with the bar *D*.

By means of the gearing above described, in connection with the movement of the bed *D*, a reciprocating movement is given the rack *N* and slide *O*, and the rack, when moving in the direction indicated by

arrow 1, turns the ratchet-wheel M, which is stationary when the slide and rack are moved in the opposite direction, indicated by arrow 2.

S is a bed, which is fitted on the shaft *n* of wheel M, so as to turn with it, and on this bed there is a clamp, T, by which the two piles of books U U are firmly secured in position, back to back, as shown in fig. 1.

At the under surface of the bed S there are four pendent projections, *r r' r'' r'''*, all of which are shown in fig. 5, and on the upper surface of the fixed bed J there are three projections, *s s' s''*, all of which are shown in fig. 4, the projections *s s' s''* being straight strips or bars, parallel with each other, and bevelled at one end, and *s''* being curved, so that one portion will be at right angles to the other.

Besides these projections *s s' s''* on the fixed table, there is what I term a trip, composed of a rigid strip, *t*, and a pivoted one, *t'*, the latter having a spring, *u*, bearing against it, to keep its free or disengaged end thrown toward the centre of the bed, as shown in fig. 4.

The operation of the device is as follows: The driving-shaft E is operated by any convenient power, a driving-belt passing over the pulley I; and when said pulley is connected with the shaft E, by a proper adjustment of the clutch-lever H, an up-and-down movement is given the bar D, in an oblique direction, owing to two oblique guide-slots *c c* and the pins *d*.

As the bar D moves upward, one side of a top block, *e*, under the clamp T, bears against the knife C, and the latter, by an oblique cut, caused by the oblique movement of bar D, takes off one side of two piles, U, of the books, the horizontal cut of the bar D, at the termination of the oblique cut, causing the paper to be entirely cut or completely cut through, thereby obviating the necessity of any after-work, in the way of retrimming. This horizontal cut, therefore, is of considerable importance.

When the bar D commences to descend, the bed S, and consequently the piles of books, are moved backward from the bar D, in the direction indicated by arrow 2, through the media of the rack R, wheels P Q, rack N, and ratchet-wheel M, the latter not being allowed to turn, as the bed S cannot turn, the projections *r r'* of said bed being between or at the inner sides of the projections S S' of the fixed bed J; but when the projection *r* reaches the outer end of *s*, the bed S is immediately turned a quarter revolution, the projection *r'''* passing around *s''*, which serves as a guide, and the part *t'* of the trip arrests the movement of the projection *r'''*, and prevents the bed S from turning too far, thereby causing a quarter revolution of the bed only at each turning-movement.

By this arrangement, a new or uncut side of the paper is presented to the knife at each upward movement of the bar D and paper.

As soon as the bed S is turned, the rack N is thrown up free from the ratchet M, in consequence of the end of said rack coming in contact with an inclined plane, *a*, at the under side of the bed J, and the spring L

draws the bed S toward the bar D, until the side of a block, *e*, is brought in contact with the side of knife C, and a succeeding cut is effected.

I would remark, that the projections *s s'* on the bed J should be of such a length as to admit of the bed receding sufficiently far to accommodate books of the largest size.

By this means, books of the largest and smallest size may be trimmed by the machine.

As the bar D is moved upward, the rack N is moved outward, so that it will be in readiness, as before, to be moved inward, to throw back and turn the bed S, at the succeeding downward movement of the bar D.

At the termination of each fourth movement of the bed S, each time it has completed an entire revolution, and the two piles U U of paper trimmed each at three sides, the machine is stopped, in consequence of the projection *k* of wheel G' actuating the clutch-lever H, said wheel G' being turned a quarter revolution each time the bar D descends, and hence making an entire revolution with the bed S.

This automatic arrangement for stopping the machine prevents any unnecessary waste of time, and indicates at once to the attendant the time for removing the cut books or paper, and applying uncut books or paper to the bed S.

I claim as new, and desire to secure by Letters Patent—

1. In machines for trimming books, the turning of the bed S, on which the paper is cut, by the receding movement of the bed from the knife, after the completion of each cut, so as to present an uncut side of the pile of paper or books to the knife at each upward movement of the bed, substantially as set forth.

2. Giving the bed S, and consequently the paper to be cut, a lateral horizontal movement at the termination of its upward oblique movement, in order to effect a clean cut, substantially as shown and described.

3. The automatic mechanism, substantially as shown and described, for operating the clutch-lever H, and stopping the machine at the completion of the cutting of the four sides of the paper or piles of books on bed S, as set forth.

4. The pendent projections *r r' r'' r'''* at the under side of the bed S, in connection with the projections *s s'* on the upper surface of the fixed bed J, for the purpose of holding the bed S in proper position relatively with the knife C, when the paper is being cut, and also when receding from the knife, and at the same time admit of the bed being turned at the proper moment, substantially as set forth.

5. The trip, on the fixed bed J, composed of the fixed part *t*, the pivoted part *t'*, and the spring *u*, when used in connection with the projections on the beds S J, and arranged to operate in connection therewith, substantially as and for the purpose set forth.

HERVEY LAW.

Witnesses:

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