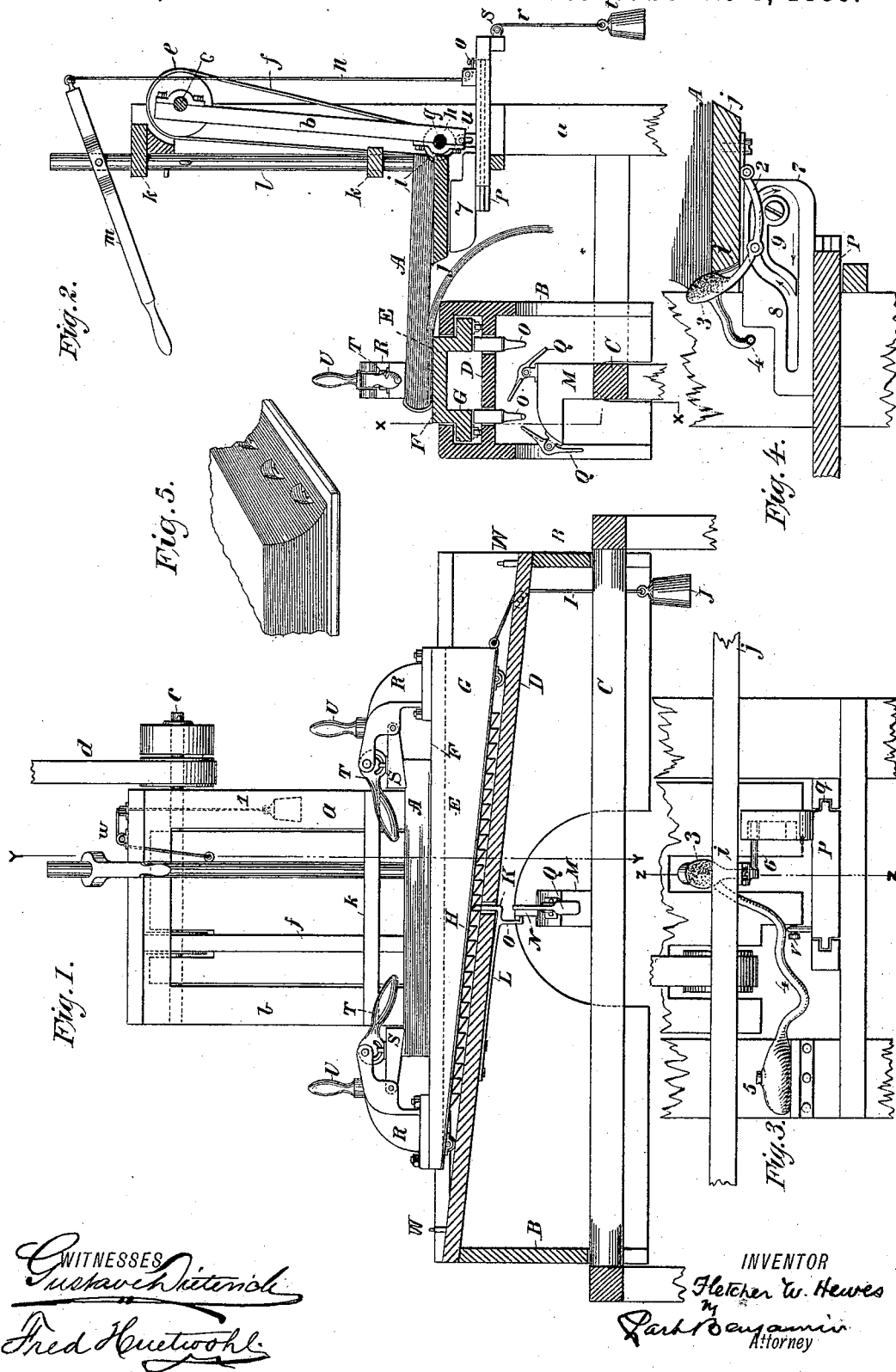


(No Model.)

F. W. HEWES.  
INDEXING MACHINE FOR BOOKS.

No. 343,175.

Patented June 8, 1886.



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## INDEXING-MACHINE FOR BOOKS.

SPECIFICATION forming part of Letters Patent No. 343,175, dated June 8, 1886.

Application filed June 24, 1885. Serial No. 169,632. (No model.)

*To all whom it may concern:*

Be it known that I, FLETCHER W. HEWES, of the city, county, and State of New York, have invented a new and useful Improvement in Indexing-Machines for Books, &c., of which the following is a specification.

My invention relates to a machine for producing in the edges of the leaves of a book nicks, grooves, or indentations wherein the finger may be inserted in order to open said book at certain predetermined places. The purpose of these indentations, suitably arranged, is to allow ready reference to the various subdivisions of the contents of the book without necessitating turning over the separate leaves or consulting the usual printed index.

My invention consists in the construction of the machine more particularly hereinafter set forth, which machine contains a device for holding said book, and for moving the same while so held, so as properly to present its edge at certain predetermined points to a cutter adapted to form the aforesaid nicks, indentations, or recesses; also a table which is arranged to enter between the leaves of said book, and to enable the same to be adjusted so that the indentations shall be made at proper predetermined points with reference to the thickness of the book; also a cutting mechanism for forming said indentations in suitable shape; also an inking or coloring device whereby the cut portions of the edges may be suitably colored, and also certain combinations of mechanism in detail hereinafter described.

In the accompanying drawings, Figure 1 is a front elevation of my improved indexing-machine, showing the vibrating book-support in longitudinal section on the line *xx* of Fig. 2. Fig. 2 is a vertical section of said machine on the line *yy* of Fig. 1. Fig. 3 is an enlarged front view of the inking or coloring device, table, and lower portion of the swinging frame, other parts being broken away. Fig. 4 is a vertical section on the line *zz* of Fig. 3. Fig. 5 represents a part of the edge of the book with the indexing indentations or recesses formed therein.

Similar letters of reference indicate like parts.

A is the book, upon the front edge of which

are to be formed indentations or recesses, as described.

B is a box-shaped frame, through apertures in the sides of which passes a supporting-bar, C, secured in the main framing. The frame B oscillates on the bar C, which is fixed.

In the frame B is an inclined plane, D.

E is a carriage having its lower side inclined to correspond to the plane D, and supported thereon. Said carriage is held to its course by interlocking flanges, and rests on rollers on said plane. The upper side, F, of said carriage, on which the book A is placed, is horizontal. The carriage E moves in a longitudinal opening in the upper side of frame B, and is provided with downwardly-projecting sides G, on the lower edges of which sides are secured toothed racks, one of which is shown at H. A cord, I, attached to the carriage E, passes over a pulley fixed in the plane D, and carries a weight, J, which weight tends to move the carriage along the plane D.

In the plane D are openings, through which pass upwardly-projecting arms K of springs L, which springs are secured on the lower side of plane D. One of said springs L is shown in Fig. 1. Said springs also have downwardly-projecting arms O.

Secured to the fixed bar C is a support, M, on which are two pivoted stops, Q. Each of said stops has a projecting side plate, as shown at N, Fig. 1.

On the upper side of the carriage E are brackets R, in which are pivoted bars S, and above these bars are pivoted eccentric levers T, having curved slots in which enter short pins secured to the upper side of said bars S. At U are handles rigidly fixed to the brackets R.

The operation of the aforesaid portion of my machine is as follows: The book A, being placed upon the carriage E, (which is previously moved over to the highest part of the inclined plane D,) is adjusted beneath the bars S, which are clamped down upon it by means of the eccentric levers T. The frame B may then be oscillated on the bar C, to bring the edge of the book up to the cutting mechanism, as will hereinafter be described. In order, however, that the indentations successively made by the cutter—as, for example, at *x*, *y*,

and *z*, Fig. 5—shall be produced at different places, as desired, longitudinally in the edge of the book, it is requisite that the book shall be moved longitudinally. This is automatically effected through the oscillation of the frame B in the following manner: Assuming the parts to be in the positions shown in Fig. 2, when the frame is swung outward (that is toward the left of the drawings) the arm O on the spring L meets the projecting side plate, N, of the pivoted stop Q and passes beneath said plate. In this way the arm O, and hence the spring L, is drawn downward, with the effect of moving the upwardly-projecting arm K from engagement with the rack H. Said arm K is thus held out of engagement with the rack until the arm O has passed from under the plate N, when the spring L throws the arm K into engagement again. Meanwhile, and during the time that the rack is released, the carriage is moved down the incline D by the action of the weight J. The timing of the mechanism is such that the carriage is, in the interval of disengagement, moved forward a space equal to one-half the interval between adjacent teeth of the rack. On the reverse movement (the inward oscillation) of the frame the arm O on the spring L passes freely over the stop Q; but then the arm on the other spring corresponding to L passes beneath the corresponding stop, Q, and the carriage is again released.

In order to prevent the carriage being always held from movement by one or the other of the catches being in engagement with its rack, I dispose these racks so that the teeth of one shall be opposite the intervals of the other, while the upwardly-projecting catch arms K remain in the same plane. The consequence is, that when one rack is released the carriage can move forward only a distance equal to half the space between adjacent teeth, because after it has traversed this distance the catch on the other rack will engage. It is not here necessary to describe this portion (the racks and catch mechanism) of the device in further detail, inasmuch as I do not claim the same as my invention herein.

Referring now to the cutting and inking devices and their mechanism, *a* is the main framing of the machine.

*b* is a frame swinging on the shaft *c*, to which motion is imparted by the belt *d*. On said shaft is a pulley, *e*, which, by a belt, *f*, actuates a shaft, *g*, in the lower part of the frame *b*. On said shaft is secured a rotary cutter, *h*, which preferably consists of a body portion carrying on its periphery a cutting-blade adapted to make a rounded indentation.

I do not herein limit myself to any special form of rotary cutter; but I prefer to employ the cutter which forms the subject-matter of a separate application for Letters Patent filed by me June 24, 1885, No. 169,632.

*j* is a table upon which the leaves of the book rest, as shown in Fig. 2, when the oscillating frame B is brought forward to present

the work to the action of the cutter. This table I term a "splitting-table." The book, on being placed upon it, is opened, so that the table enters between the leaves, some of which enter the space between said frame B and said table. In the rear edge of said table is a recess, *i*, into which the rotary cutter *h* enters when it is brought up to act upon the edge of the leaves of the book resting on said table. It will be apparent that the splitting-table *j* receives immediately above it the leaves which are to be cut, while the leaves which otherwise would lie beneath those indented pass into the space beneath the table.

Passing through transverse bars *k* of the frame is a presser-rod, *l*, to which is pivoted a hand-lever, *m*. To the end of said lever is attached a cord, *n*, which passes beneath a pulley secured to the frame of the machine, and finally is attached to a pin, *o*, on the upper side of a sliding table, *p*.

The table *p*, as more clearly shown in Fig. 3, is provided with ribs *q*, entering grooves in the frame, in which it slides horizontally. To the under side of said table is secured a cord, *r*, which passes over a pulley, *s*, fixed to the frame, and carries a weight, *t*, which weight tends to move the table *p* rearward, or to the right of the drawings, Fig. 2.

On the upper side of the table *p* is a slotted projection, *u*, in which enters a pin, *v*, upon the lower end of the swinging frame *b*.

The operation of the aforesaid parts is as follows: After the book has been moved up to and adjusted upon the splitting-table *j*, the presser-rod *l* is brought downward by means of the lever *m*. The lower end of said rod then pressing upon the edge clamps it firmly in place. A further downward movement of the lever *m* now draws upon the cord *n*, which, acting upon the sliding table *p*, moves the same forward, or to the left of the drawings, Fig. 2. As said table is connected by the slotted projection *u* and pin *v* with the lower end of the swinging frame, the latter is thus carried inwardly, and in this way the cutter, which is rapidly rotated, is brought into the recess *i* on the rear side of the table *j*, and into contact with the edge of the book, there producing the desired recess or indentation.

To the rod *l* is attached a cord, *w*, Fig. 1, which passes over fixed pulleys and supports a weight, 1. When the said lever is released, this weight raises the presser-rod *l*, and the weight *t*, also now free to act, draws the sliding table *p* rearward, or to the right of Fig. 2, and thus withdraws the cutter from the work.

In order to apply color to the newly-cut recesses, I employ the following device: Pivoted to the lower side of the table *j* is an upwardly-curved arm, 2, which carries a pad or sponge, 3, which pad may communicate by a pipe, 4, with a bulb, 5, containing coloring material. On the side of arm 2 is a pin, 6, which enters a cam-groove in the side of a plate, 7, which plate is secured to the upper side of the sliding table *p*. When the lever

*m* is brought down, the sliding table *p*, as already described, is moved inward. The pin 6 then traverses the straight portion 8 of the cam-groove in the plate 7, raising and passing under the end of the pivoted arm 9; but when the sliding table *p* is moved in the reverse direction or rearward, and thereby withdraws the cutter from the work, the plate 7 being also moved rearward, the pin 6 is compelled to traverse the higher portion of the groove, passing over the pivoted arm 9 in said groove in the direction of the arrow shown in Fig. 4 above said arm. The result of this is, that the pad-arm 2, and hence the pad, is lifted and the pad is caused to enter the recess *i* in the table *j*, and hence to meet the newly-cut surface, to which it applies coloring material. It will be observed that the carriage E descends on the inclined plane D in moving from left to right, and hence that the level of said carriage is constantly being lowered. The object of this is to compensate for the increasing number of leaves which are allowed to hang in the space between the table *j* and the frame B as the indentations or recesses are successively formed in the edge of the book. If the top of the carriage E remained on a constant level, the leaves would bend downward in extending from carriage to table *j*, and hence would become displaced at their edges, so that the cut would not be truly formed. It is of course necessary to determine a proper slope for the incline D to effect a suitable degree of lowering of the top of the carriage to cause the above-stated result. This can, however, easily be done once for all. Stops W are inserted in the plane D at such points as shall limit the extreme run of the carriage E, according to the work to be done.

I claim as my invention—

1. The combination, in an indexing-machine, of a fixed support for the edge of the book in which indentations are to be made, a rotating cutter, a movable support for said cutter, and mechanism, substantially as set forth, for moving said cutter into contact with the said edge, substantially as described.

2. The combination, in an indexing-machine, of a fixed support for the edge of the book in which indentations are to be made, a vertically-suspended frame, a rotary cutter supported in said frame, and mechanism, substantially as set forth, for moving said frame, and thereby bringing said cutter into contact with said edge, substantially as described.

3. The combination, in an indexing-machine, of a fixed support for the edge of the book in which indentations are to be made, a vertically-moving presser-rod, means, substantially as set forth, for reciprocating said rod, a vertically-suspended frame, a rotary cutter disposed in said frame, and means, substantially as set forth, for moving said frame, and thereby bringing said cutter into and out of contact with said edge, substantially as described.

4. The combination, in an indexing-machine, of a fixed support for the edge of the book in

which indentations are to be made, a vertically-suspended frame, a rotary cutter supported by said frame, a sliding table connected to the lower portion of said frame, and a means, substantially as set forth, of horizontally reciprocating said table, and thereby swinging said frame to carry the said cutter into and out of contact with the work, substantially as described.

5. The combination, in an indexing-machine, of the fixed support *j*, for the edge of the work, the swinging frame *b*, rotary cutter *h*, sliding table *p*, pin *v*, slotted projection *u*, pivoted lever *m*, means, substantially as set forth, for imparting motion from said lever *m* to said table *p*, and counter-weight *t*, attached to said table, substantially as described.

6. In an indexing-machine, an oscillating support for receiving the book to be operated upon, a fixed support for the edge of said book in which indentations are to be made, the said supports being separated by an interval or space to receive the leaves of said book lying beneath the intended lower limit of said cut, substantially as described.

7. In an indexing-machine, the combination of an oscillating support for the work, a clamping device for securing the work thereon, a fixed table toward and from which the said support is oscillated, and adapted to receive the edge of the work in which indentations are to be made, a vertically-reciprocating presser-rod above said edge, and a rotary cutter supported in rear of said table and adapted to meet and act upon said edge, substantially as described.

8. In an indexing-machine, a fixed support for the edge of the work, a swinging frame carrying a rotary cutter, mechanism, substantially as described, for swinging said frame, and so bringing said cutter into contact with the work, an inking or coloring pad supported on a pivoted arm, and intermediate mechanism, substantially as set forth, between said arm and the swinging frame, whereby, on the rearward movement of said frame, the said pad is brought into contact with the newly-cut surface, substantially as described.

9. In an indexing-machine, the combination of the fixed support *j*, swinging frame *b*, rotary cutter *h*, sliding table *p*, connecting device *u v*, cam-plate 7, pivoted pad 2 3, and projection 6 on the arm of said pad, entering the groove in said cam-plate, substantially as described.

10. In an indexing-machine, the coloring-pad 3, arm 2, sliding table *p*, cam-plate 7, projection 6, and means, substantially as set forth, for reciprocating said table, substantially as described.

11. In an indexing-machine, the fixed table *j*, coloring-pad 3, arm 2, pivoted to said table, cam-plate 7, containing a groove, and in said groove the pivoted arm 9, projection 6, and the sliding table *p*, substantially as described.

12. In an indexing-machine, the combination of the table *j*, presser-rod *l*, counterweighted lever *m*, swinging frame *b*, rotary cutter *h*,

sliding table *p*, connecting device *uv*, counterweight *t*, a connecting device, substantially as described, for imparting motion from the lever *m* to the table *p*, cam-plate 7, pad 3, supported on a pivoted arm, 2, and projection 6 on said arm, entering the groove in the cam-plate 7, substantially as described.

13. In an indexing-machine, the combination of a support containing an inclined plane, a movable carriage having a horizontal top surface and an inclined lower surface corresponding to and resting upon said plane, a clamping device for attaching the work to the upper side of said carriage, a fixed support for the edge of said work, and cutting mechanism, substantially as set forth, for operating on said edge, substantially as described.

14. In an indexing-machine, the combination of cutting mechanism, substantially as described, for forming indentations or recesses

in the edges of paper, and two horizontal supports, one being fixed and receiving the edge to be operated upon by the cutting mechanism, and the other receiving the body of the work and being laterally and vertically adjustable, substantially as described.

15. In an indexing-machine, the combination of mechanism, substantially as set forth, for forming indentations or recesses in the edges of paper, and two supports having horizontal upper surfaces, one support being fixed and receiving the edge to be operated upon by the cutting mechanism, and the other support receiving the body of the work, substantially as described.

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Witnesses:

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