

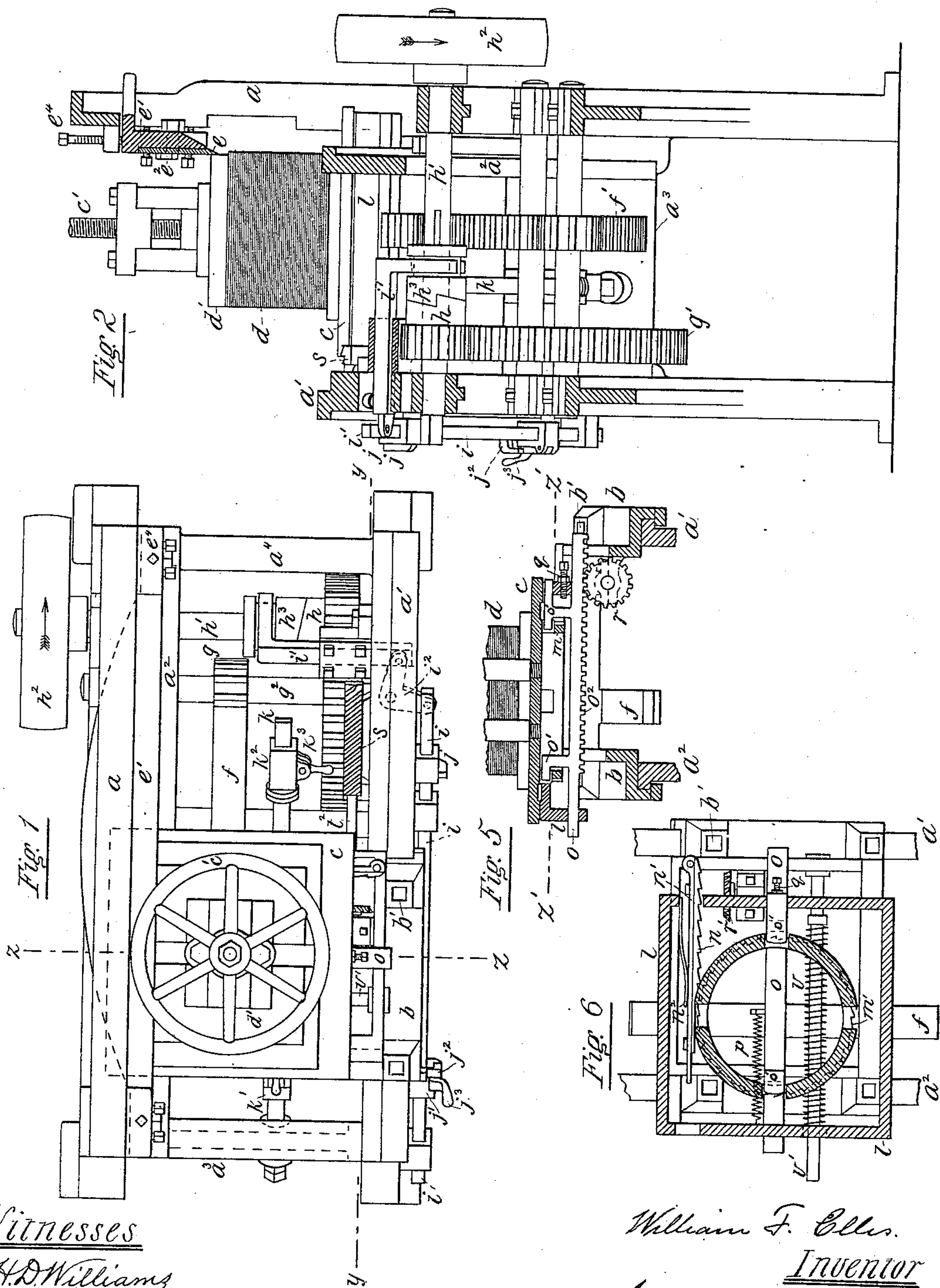
(No Model.)

2 Sheets—Sheet 1.

W. F. ELLIS.
BOOK CUTTING MACHINE.

No. 336,304.

Patented Feb. 16, 1886.



Witnesses

H. D. Williams
Edwin S. Roy.

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Inventor
per Alfred Sheddock
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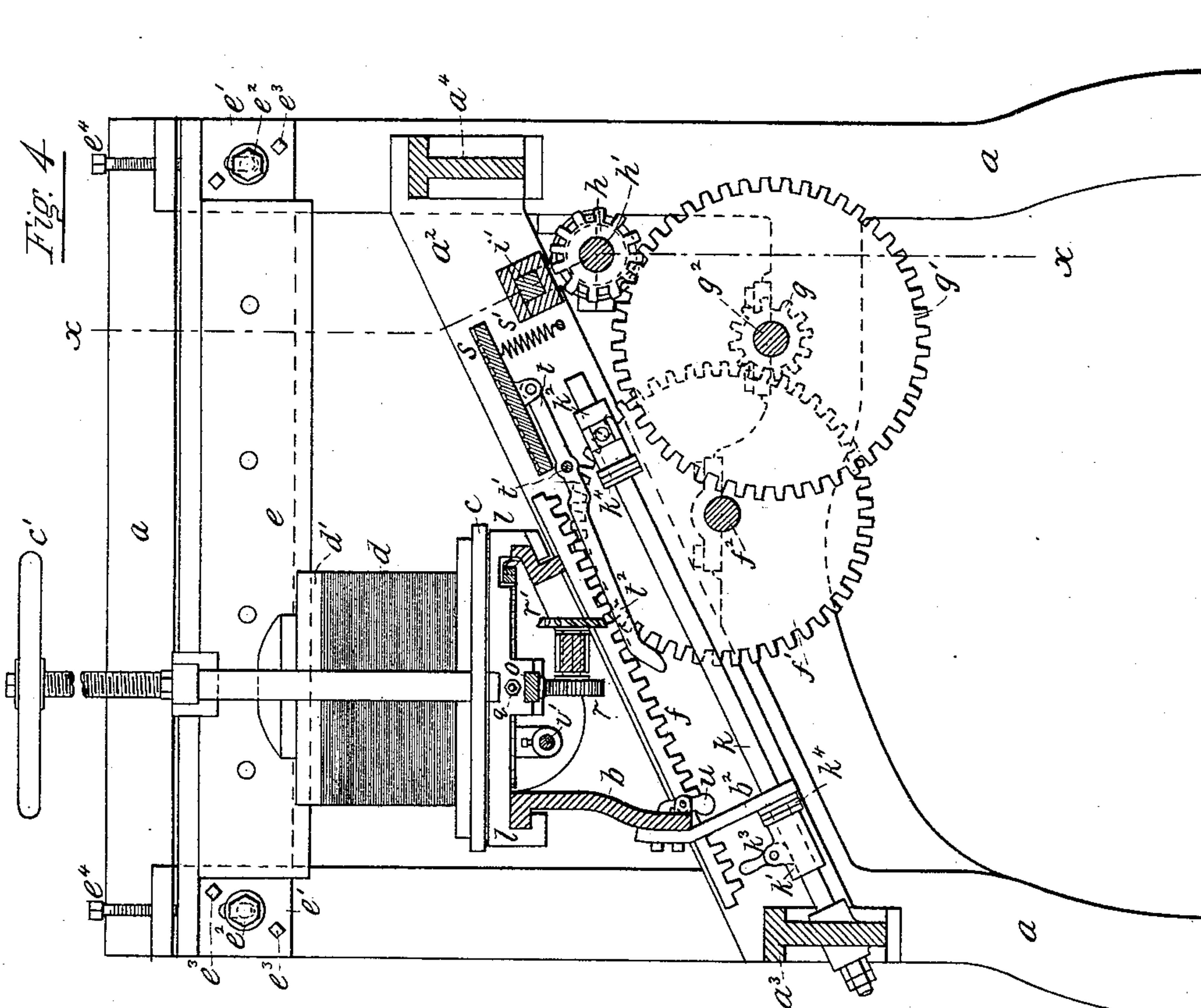
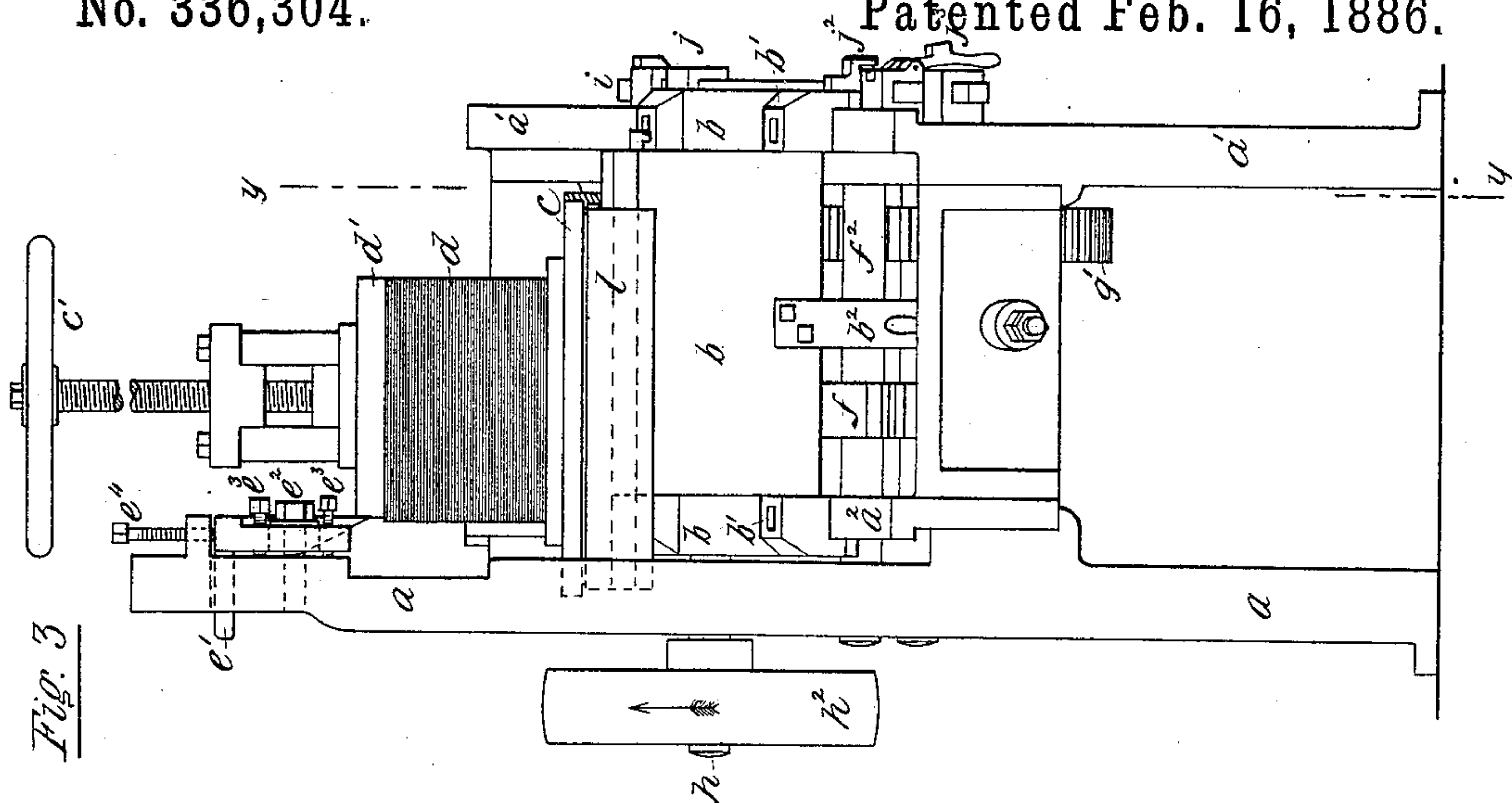
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UNITED STATES PATENT OFFICE.

WILLIAM F. ELLIS, OF NEW YORK, N. Y.

BOOK-CUTTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 336,304, dated February 16, 1886.

Application filed July 24, 1885. Serial No. 172,537. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM F. ELLIS, a citizen of the United States, residing at New York, county and State of New York, have
5 invented certain new and useful Improvements in Book-Cutting Machines, of which the following is a specification.

This invention embraces certain improvements in that class of book-cutting machines
10 in which the books are clamped to a bed constructed to be moved in an inclined direction against a stationary knife having its face vertical and its cutting-edge horizontal, and has for its object to make such machines automatic
15 in action, and to generally improve their construction, as will be fully set forth, reference being had to the accompanying drawings, in which—

Figure 1, Sheet 1, is a plan view of my improved automatic book-cutting machine. Fig.
20 2, Sheet 1, is a vertical transverse section on the line $x x$, Fig. 4. Fig. 3, Sheet 2, is an end view. Fig. 4, Sheet 2, is a longitudinal section on the line $y y$, Figs. 1 and 3. Fig. 5, Sheet
25 1, is a vertical section of the traveling bed, taken on the line $z z$, Fig. 1. Fig. 6, Sheet 1, is a horizontal section of the same, taken on the line $z' z'$, Fig. 5.

The main frame comprises the side pieces,
30 aa' , the inclined guide-pieces a^2 , and the transverse connecting-girders $a^3 a^4$. The upper surfaces of the inclined guide-piece a^2 and the top side piece, a' , are in one plane, and on them is fitted to slide the traveling bed b ,
35 which carries the horizontal cutting-table c , on which the pile or piles of books d is or are clamped in the ordinary manner. The parts of the bed b , which bear on the inclined guides of the frame, are provided with oil-chambers
40 $b' b'$, in which a lubricant with a suitable packing is placed. The knife e is attached to the upper part of the side piece, a , with its face vertical and its edge in a horizontal position, by being secured by screws or bolts to the
45 knife-holder e' , adjustably connected to the piece a by the holding-bolts e^2 and tilting bolts or set-screws $e^3 e^3$, which pass through the holder e' and butt against the face of the side piece, a . The object of these set-screws
50 $e^3 e^3$ is to provide a means for adjusting the face of the knife e , so that its cutting-edge

shall have the proper clearance, and its horizontal adjustment is accomplished by manipulating the bolts or set-screws $e^4 e^4$, which pass through flanges on the side piece, a , and butt
55 against the top of the knife-holder e' .

The edges of the pile or piles of books are trimmed by causing the traveling bed b to move up in the inclined guides of the main frame by a system of gearing, comprising the
60 rack f , secured to the under side of the bed b , the gear-wheel f' on the shaft f^2 , meshing therein, the pinion g , the wheel g' on the shaft g^2 , and the pinion h , fitted to run loosely on the driving-shaft h' , on which shaft is secured
65 the driving-pulley h^2 . This pinion h is provided with clutch-teeth, shaped to fit into the teeth of the clutch h^3 , which slides on the shaft h' , and on a spline secured thereon. When the bed b reaches its highest position, the
70 clutch h^3 is thrown out of gear with the pinion h , and the bed b slides by gravity down its inclined guides, and is caused to automatically move up and down its guides by means of the following devices: A bar, i , is fitted to slide
75 in bearings on the outside of the side piece, a' , of the frame, its upper end being connected to the clutch-bar i' by means of the bell-crank lever i^2 . On the bar i are held the two blocks j and j' , adapted by means of set-screws to be clamped
80 in any desired position, and projecting down from the bed b is an arm, j^2 , which, by striking the block j when the bed reaches its upper position, moves the bar i , and, through the bell-crank lever i^2 and clutch-bar i' , throws the
85 clutch h^3 out of gear, thus allowing the bed b to fall, the driving-shaft continually rotating in one direction, as indicated by the arrow on the pulley h^2 . In the block j' is pivoted the latch j^3 , which, when placed in upward position,
90 as shown in Figs. 1 and 2, is struck by the arm j^2 when the bed b descends, thereby imparting an opposite movement to the bar i , and throwing the clutch h^3 in gear with the pinion h , thus causing the bed to again ascend. This
95 up-and-down movement of the bed continues as long as the latch j^3 is in the position above indicated, and when it is desired to have the bed stop in its lower position, for the purpose of clamping another batch of books thereon,
100 which is generally after four full movements have been made, the latch j^3 is thrown down,

as indicated in Fig. 3, allowing the arm j^2 to pass clear of the block j' .

To start up the machine, the bar i is pulled down, and the latch j^3 is then moved up, as in Figs. 1 and 2, if it is required to make more than one cut automatically.

A buffing device is provided to arrest the bed in its two extreme positions, consisting of a bar, k , provided with two adjustable blocks, k' and k^2 , adapted to be firmly clamped in any position thereon by means of cam-shaped clamping-grippers k^3 , pivoted in jaws on the blocks k' and k^2 , and provided with handles, by which they may be readily operated in adjusting the blocks in the desired positions, the grippers k^3 being so shaped that they lock the blocks more rigidly on the rod k as the pressure applied to the blocks increases. These blocks k' and k^2 are provided at their opposed faces with cushioning-springs k^4 k^4 , against which strikes the arm b^2 , attached to the bed b , the upper spring k^4 having for its function, principally, to start the bed downward after the wooden cutting-blocks placed under the piles of books d has come in contact with the knife e .

The next, and perhaps most important, feature of the invention is the method of automatically moving the pile of books away from the knife after a cut has been made, and rotating it so as to present another side of the books to the knife to be acted upon during the succeeding upward movement of the bed b . This is accomplished by fitting a frame, l , on the top of the bed b , to slide transversely thereon, and fitting in this frame l the rotating table c , on which the piles of books d are directly clamped, in the usual manner, by the hand wheel and clamping device c' . On the under side of the table c is an annular bearing, m , fitted into an opening in the top of the frame l , and on the lower end of this bearing are formed the ratchet-teeth m' , into which meshes the ratchet-rack n , adjustably secured to the bar n' , pivoted to the sliding bed b , and held against the teeth m' by means of the springs n^2 . In square bearings in the frame l is held the locking-bar o , provided with two projecting lugs, o' o' , adapted to catch in two diametrically-opposite openings of four equidistant openings formed in the annular bearing m on the table c , said locking-bar o being moved and held forward, so as to retain the table m in any of its four positions, by the spring p , and the set-screw q , secured in the frame l , determines the backward limit of the bar o . On the under side of the bar o are formed the rack-teeth o^2 , into which meshes the pinion r , secured to a shaft rotating in a bearing on the bed b , and to the other end of this shaft is fixed the bevel-wheel r' , having inclined teeth, which mesh into the inclined teeth of the rack s . This rack s is fitted to slide in vertical guides on the inside of the side frame, a' , and is connected to one end of the lever t , pivoted at t' to the side frame, a' , the other end, t^2 , of this lever t being formed as shown, so that its upper side is

parallel with the guides on the main frame, upon which the bed b slides, when the rack s is in its upward position, and this device is actuated by the weighted latch u , pivoted to the bed b .

The operation of this part of the machine is as follows: As the bed b moves up on the main frame, carrying the pile of books d against the knife e , the weighted latch u comes in contact with the end t^2 of the lever t , and leaves the lever t and rack s in the position shown in Fig. 4, said rack being held down by the spring s' , and the bevel-wheel r' moves over the top of the rack without coming in contact therewith. Now, as soon as the cut is finished and the bed b commences to fall down, the latch u comes in contact with the part t^2 of the lever t , and pushes this end of it down, thus raising the rack s , so that it meshes with the bevel-wheel r' , causing said wheel r' and pinion r to rotate until the latch u leaves the lever t , allowing the spring s' to pull the rack down away from the bevel-wheel r' . By this rotation of the pinion r the locking-bar o is first drawn back and releases the table c . The frame l is then moved away from the knife e by the locking-bar o coming in contact with the set-screw q , and the table c is rotated one-quarter of a revolution by the ratchet-teeth on the table working in the teeth of the ratchet-rack n . Before the bed b reaches its lower position the rack s leaves the bevel-wheel r' , and the locking-bar is moved forward by its spring p , and firmly locks the table with another side of the books presented to the knife e , the sliding frame l with its attached parts being then moved forward by means of the spring v , placed between a lug on the sliding frame l and a collar on the bar v' , which bar is secured to the bed b . During this movement the ratchet-teeth m' slide over the teeth of the ratchet-rack n . This forward movement of the frame l and piles of books d is arrested by a block, d' , of wood on the top of the books coming against the face of the knife. This block d' constitutes the pattern, and is of the exact size of the pile of books when trimmed.

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

1. In a book-cutting machine in which the book-carrying bed is moved to and from a stationary knife, in combination, the inclined guides of the main frame, the bed sliding thereon, operating-gearing for moving the bed up the inclined guides, and a shipping device consisting of a sliding bar connected to the clutch on the driving-shaft of the operating-gear, and provided with adjustable blocks, against which a projection on the bed comes in contact when in its two extreme positions, substantially as and for the purpose set forth.

2. In a book-cutting machine, in combination, a longitudinally-moving bed, a fixed knife, a transversely-moving frame carried by the bed, a rotating table carried by the frame, and operating devices, substantially as de-

scribed, whereby the frame is moved away from the face of the knife and the table partly rotated as the bed moves away from the cutting-edge of the knife.

5 3. In a book-cutting machine, in combination, the rotating table *c*, having bearing *m* and ratchet-teeth *m'*, the frame *l*, the locking-bar *o*, the sliding bed *b*, and the spring-acting ratchet-rack *n*, substantially as set forth.

10 4. In a book-cutting machine, in combination, the table *c*, the frame *l*, the locking-bar *o*, provided with teeth *o*², the pinion *r*, the sliding bed *b*, and means, substantially as described, for actuating the locking-bar *o* through
15 the medium of the pinion *r*, as and for the purpose set forth.

5. In a book-cutting machine, in combination, the sliding bed *b*, the weighted latch *u*, carried thereby, the lever *t*, the vertically-
20 movable rack *s*, with inclined teeth, the bevel-wheel *r'*, with correspondingly-inclined teeth, the pinion *r*, and the rack-teeth *o*², carried by the transversely-sliding frame *l*, substantially
as and for the purpose set forth.

25 6. In a book-cutting machine, in combina-

tion, the rotating table *c*, provided with ratchet-wheel *m'*, the frame *l*, the spring-acting locking-bar *o*, provided with teeth *o*², the sliding bed *b*, the spring-acting ratchet-rack *n*, pivoted to the bed *b*, the pinion *r*, bevel-
30 wheel *r'*, rack *s*, lever *t*, weighted latch *u*, carried by the bed, and the spring *v*, substantially as set forth.

7. In a book-cutting machine, in combination, the sliding bed *b* and its inclined guides, 35 the actuating-gearing provided with a clutch for raising the bed up the inclined guides, the bar *i*, connected to the clutch-bar, the adjustable block *j*, and adjustable block *j'*, provided with a latch-stop, *j*³, and arm *j*², projecting
40 from the bed *b*, substantially as and for the purpose set forth.

In testimony whereof I have hereunto set my hand at New York, county and State of New York, this 21st day of July, 1885.

WILLIAM F. ELLIS.

Witnesses:

CORNELIUS W. BOGERT,
H. D. WILLIAMS.