

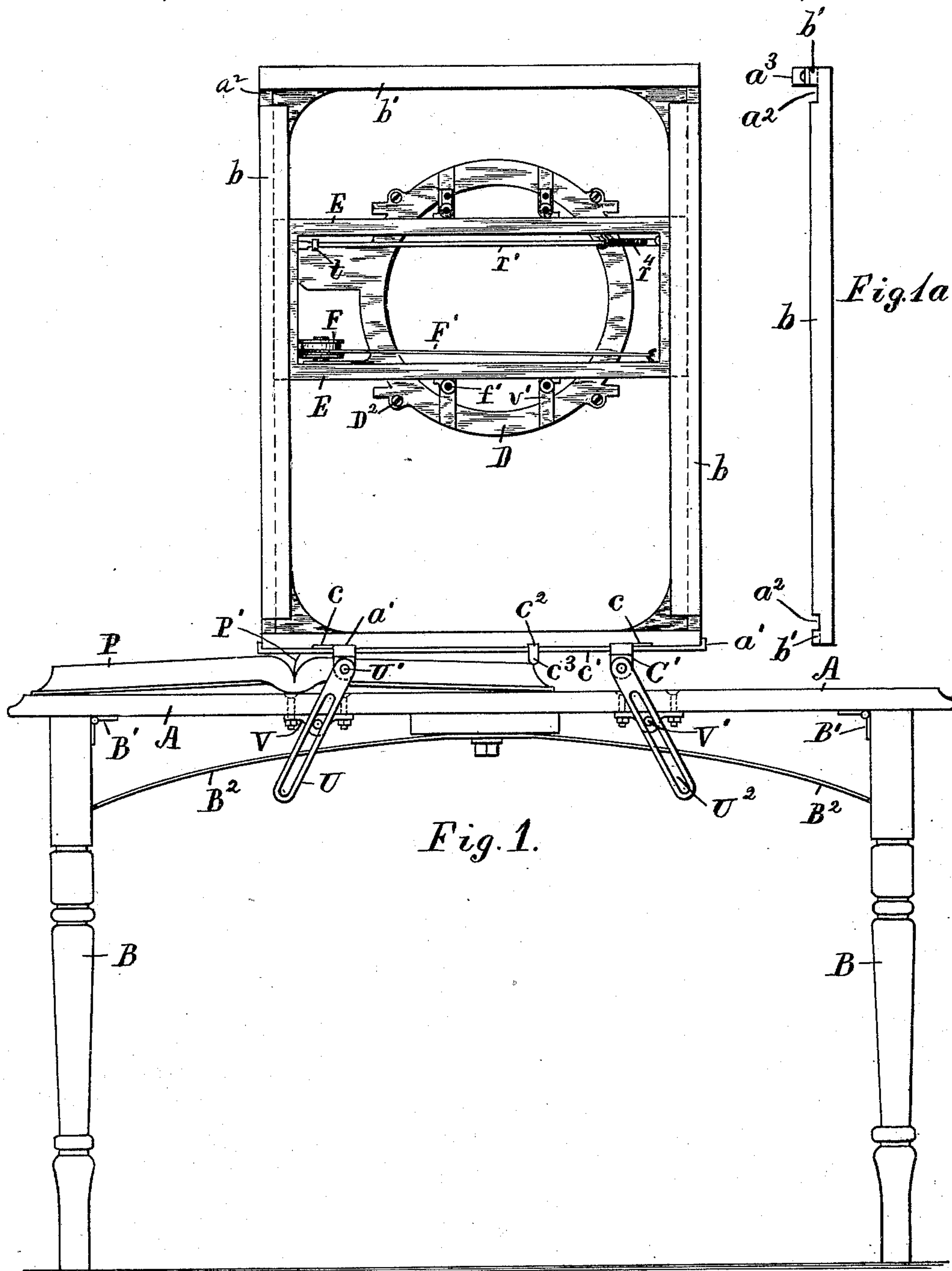
(No Model.)

5 Sheets—Sheet 1.

J. M. CRARY.  
TYPE WRITING MACHINE.

No. 477,517.

Patented June 21, 1892.



Attest:  
J. Van Kester  
Edw. Kinsey

Inventor  
J. M. Crary, per  
Crane & Miller, attys.

(No Model.)

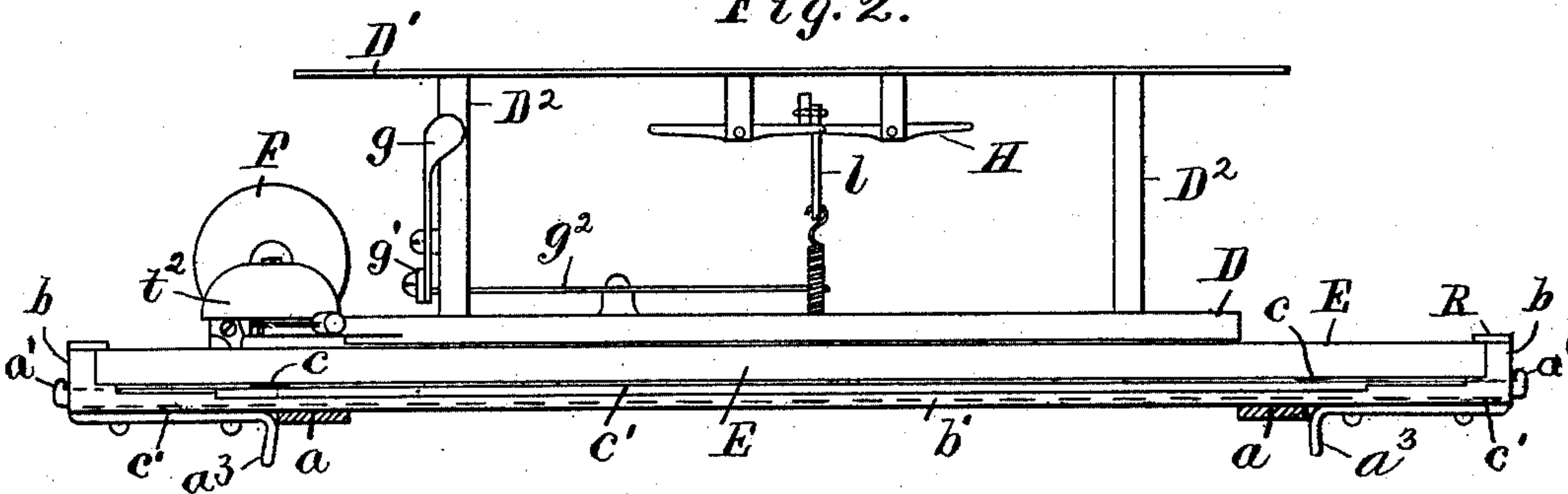
5 Sheets—Sheet 2.

J. M. CRARY.  
TYPE WRITING MACHINE.

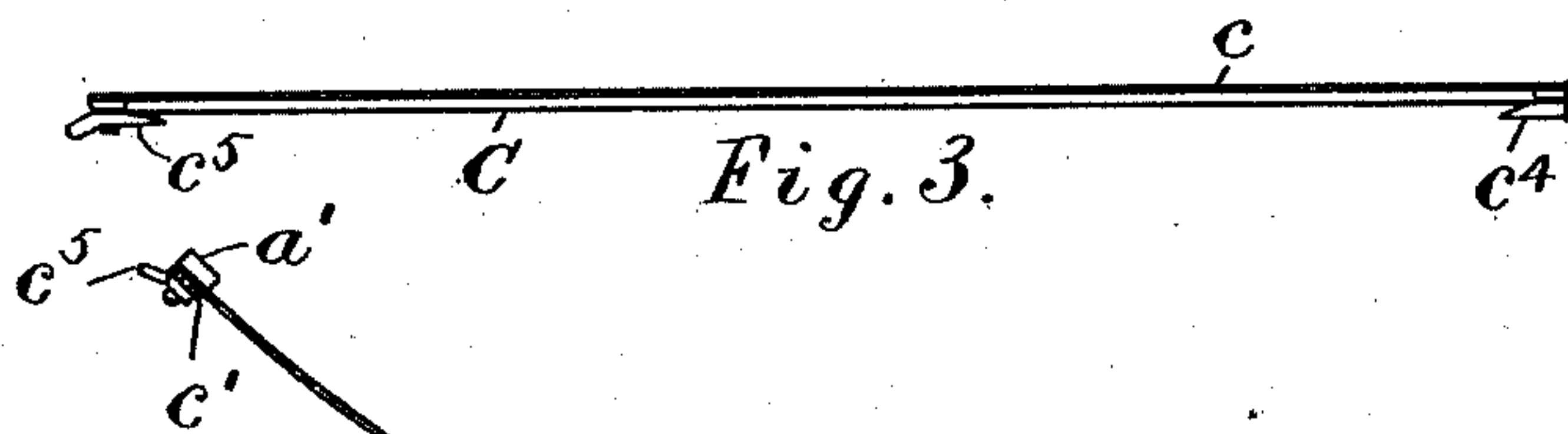
No. 477,517.

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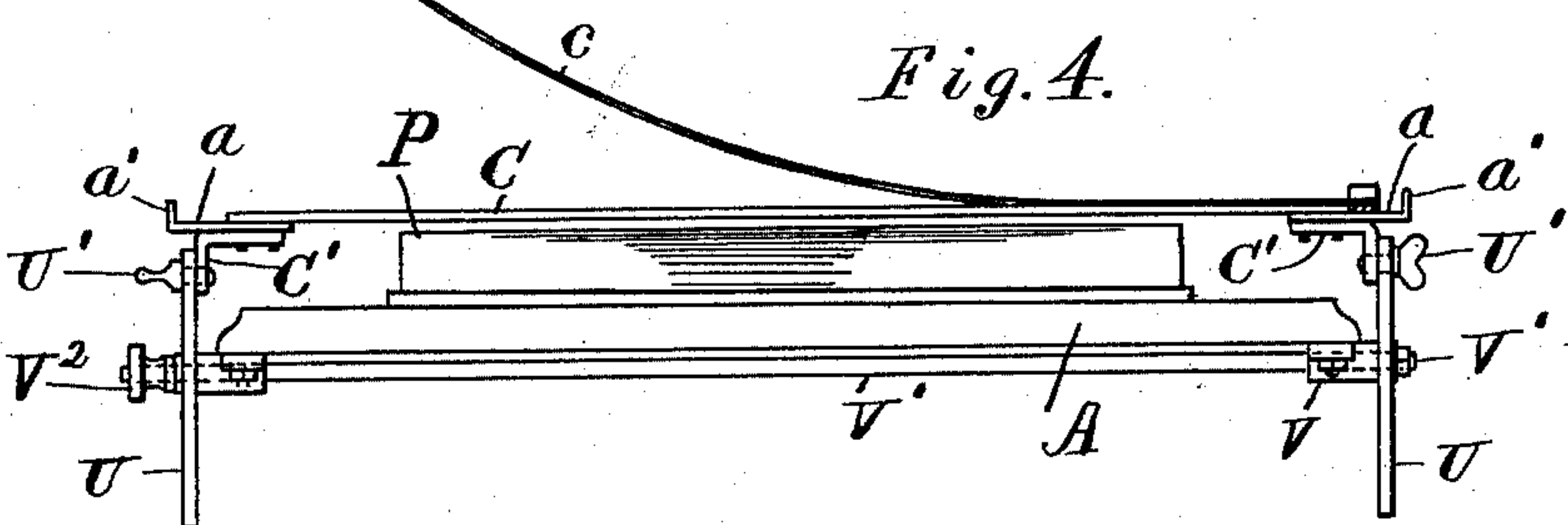
*Fig. 2.*



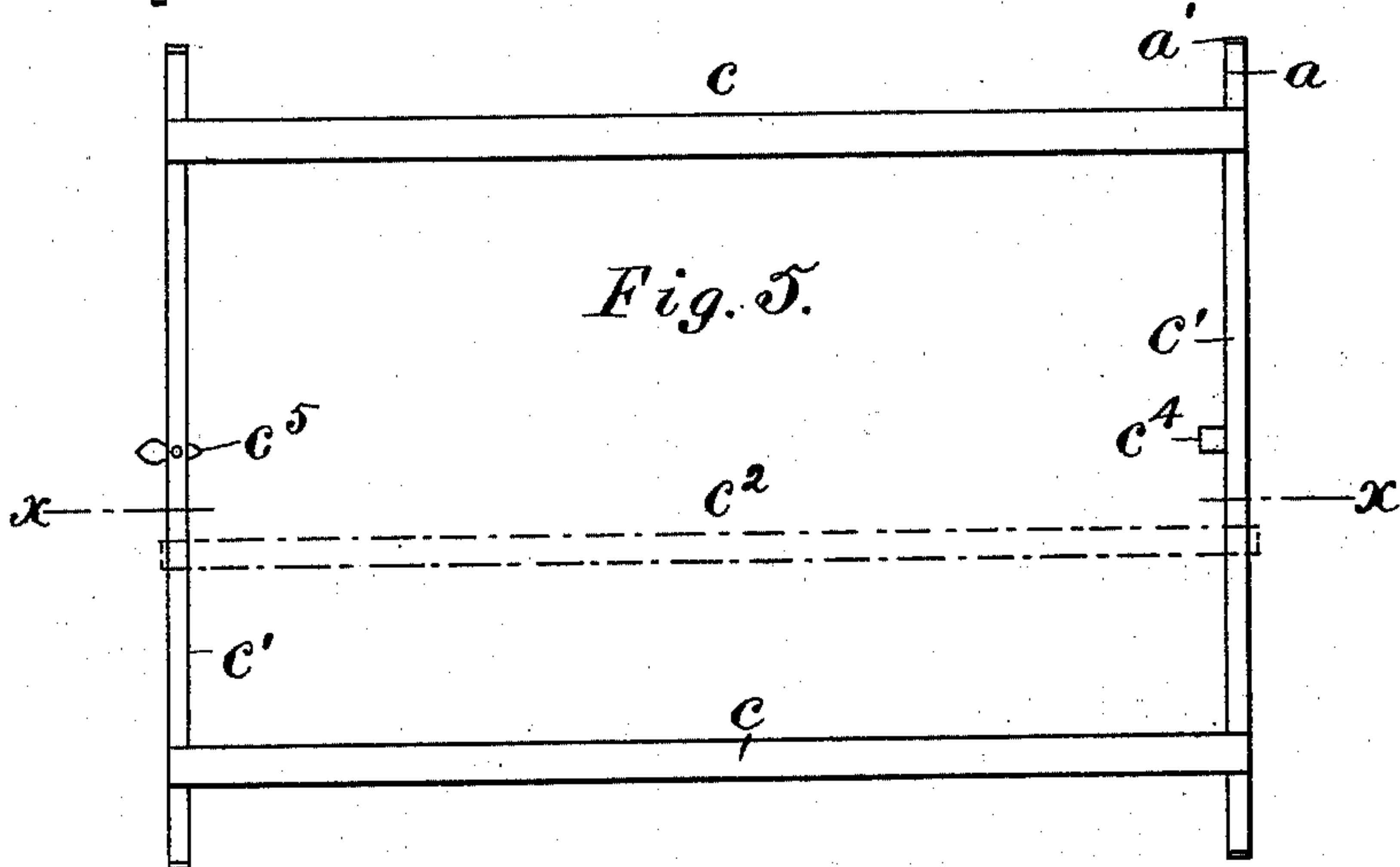
*Fig. 3.*



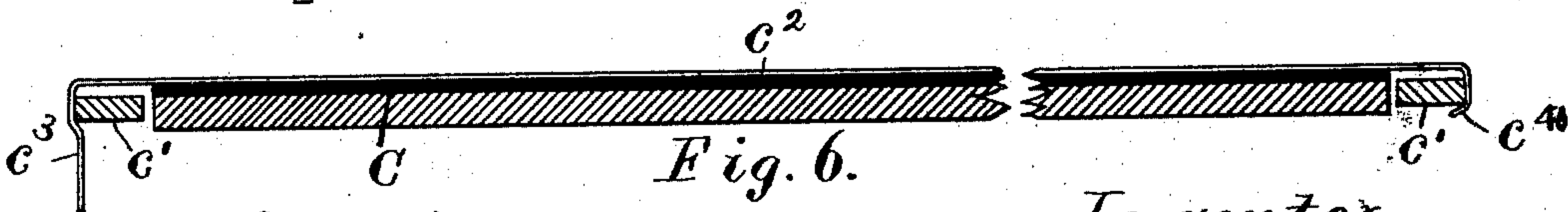
*Fig. 4.*



*Fig. 5.*



*Fig. 6.*



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(No Model.)

5 Sheets—Sheet 3.

J. M. CRARY.  
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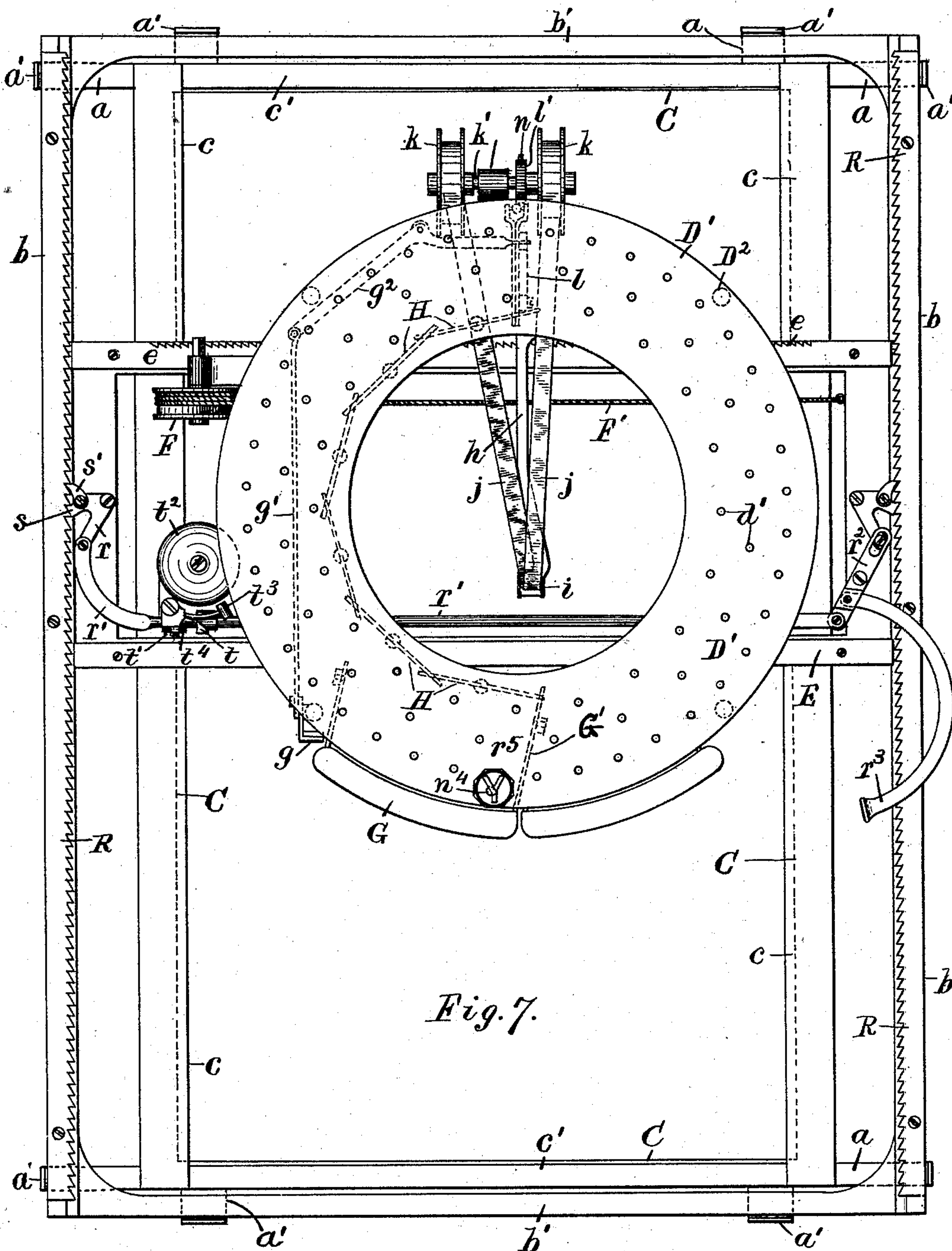


Fig. 7.

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J. M. CRARY.  
TYPE WRITING MACHINE.

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Fig. 8.

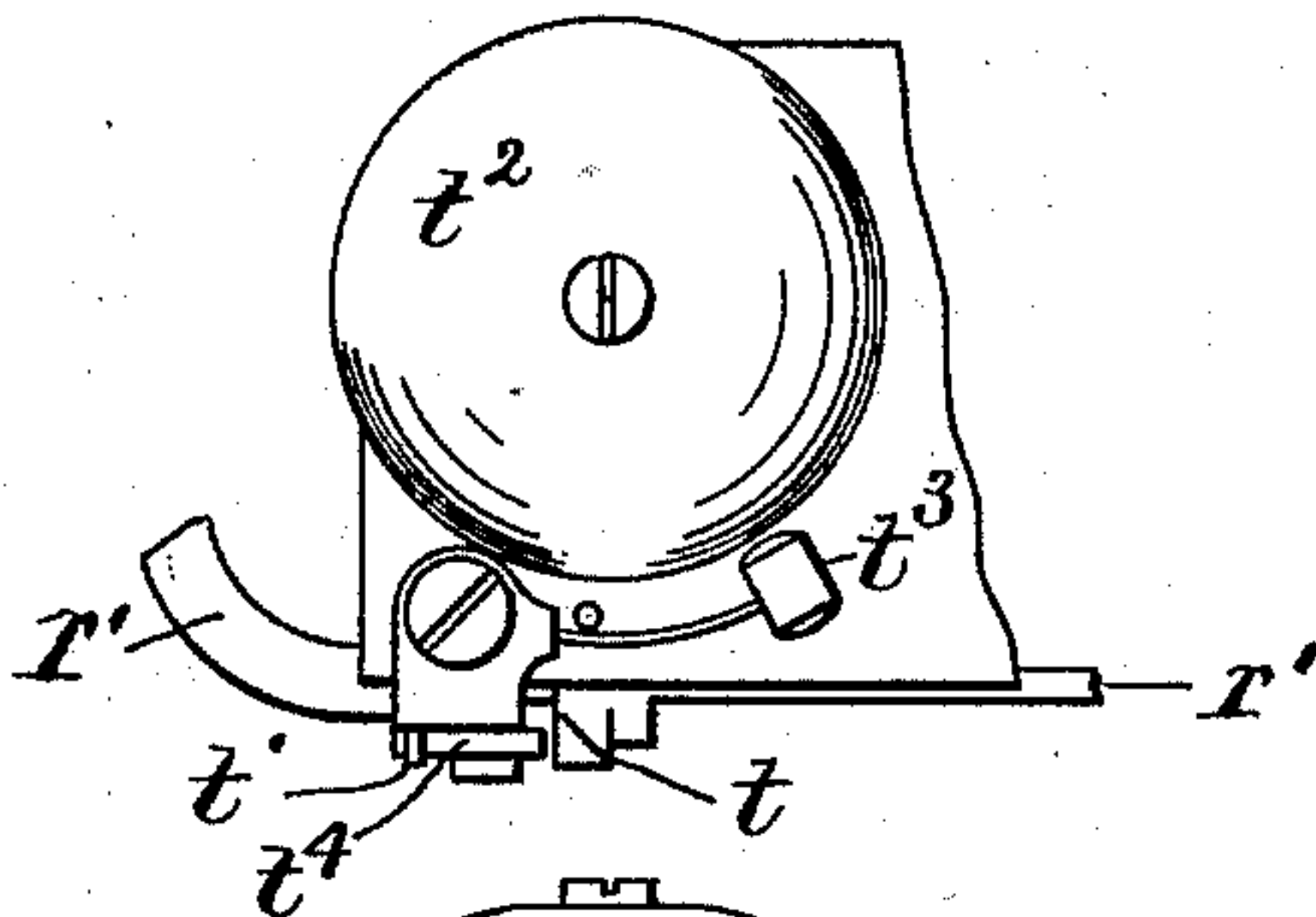


Fig. 9.

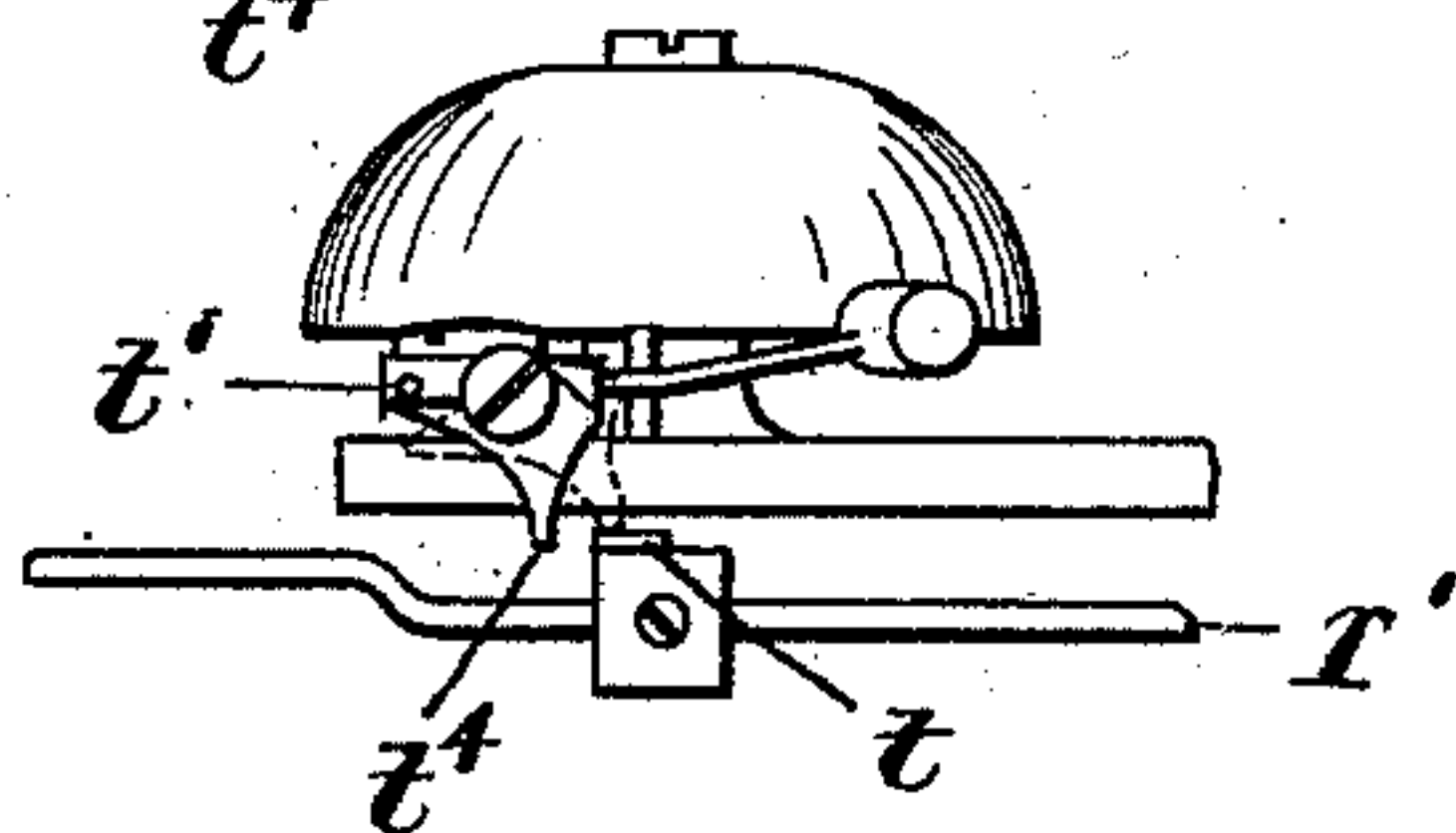


Fig. 10.

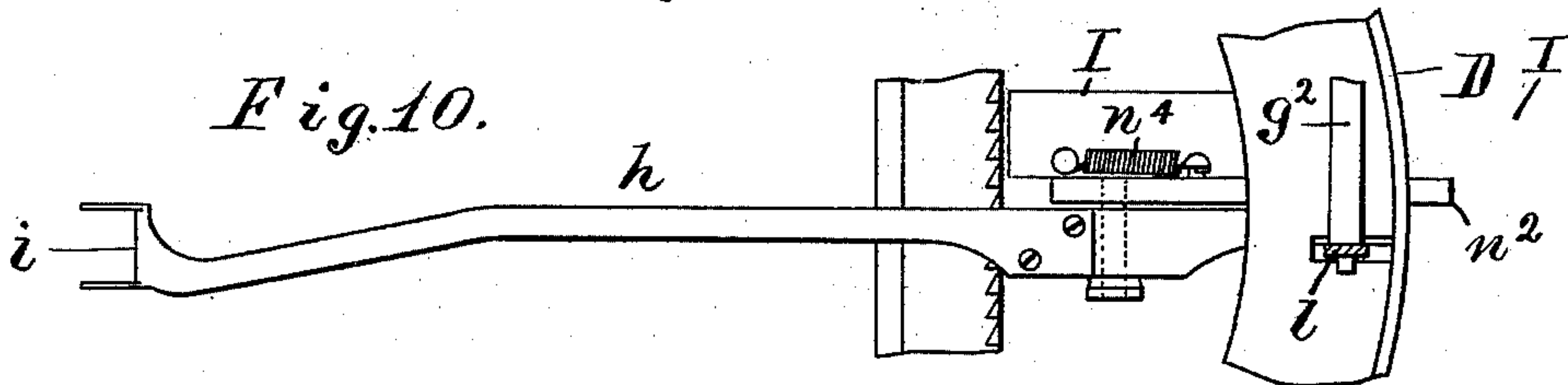


Fig. 11.

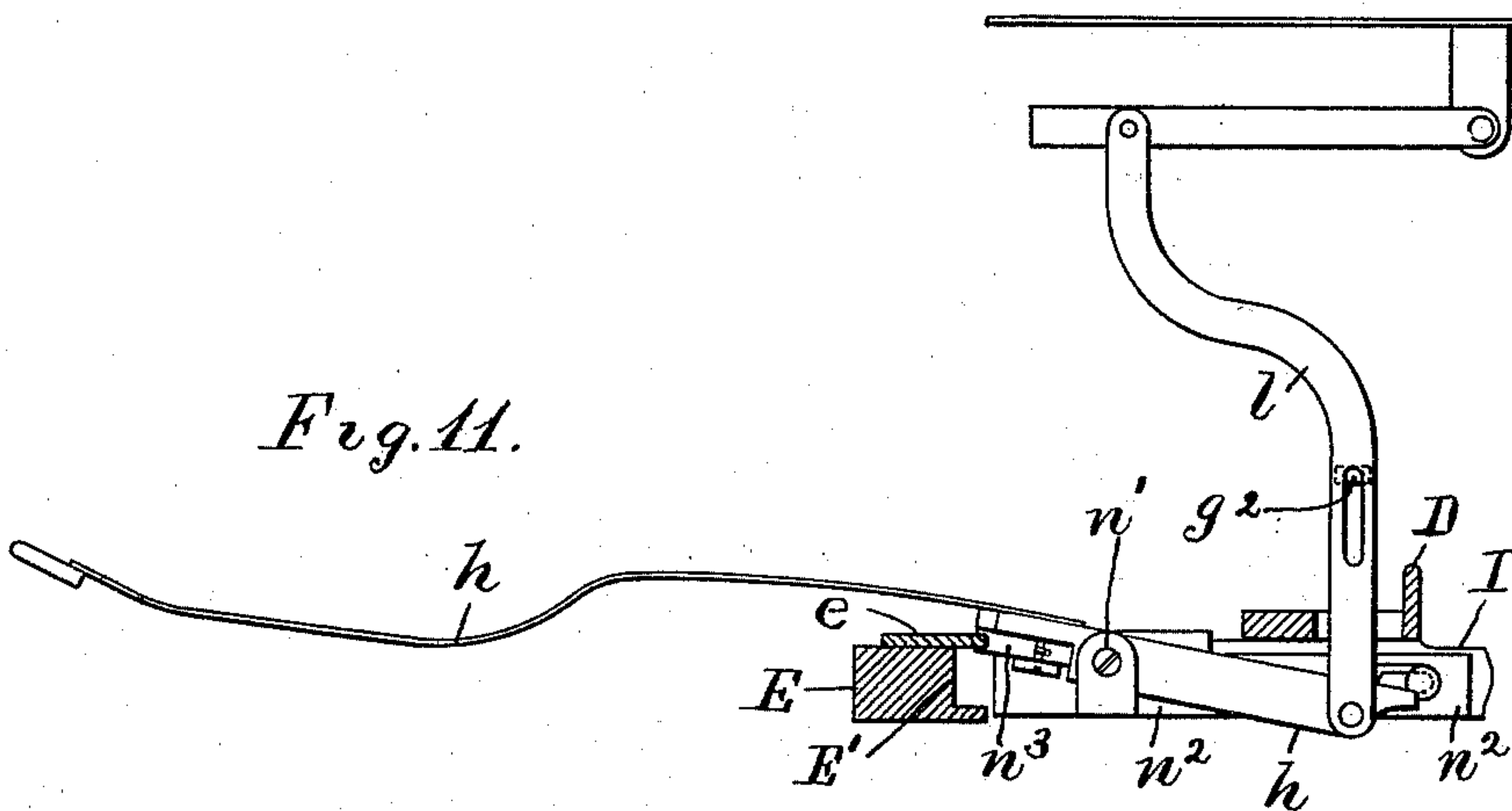
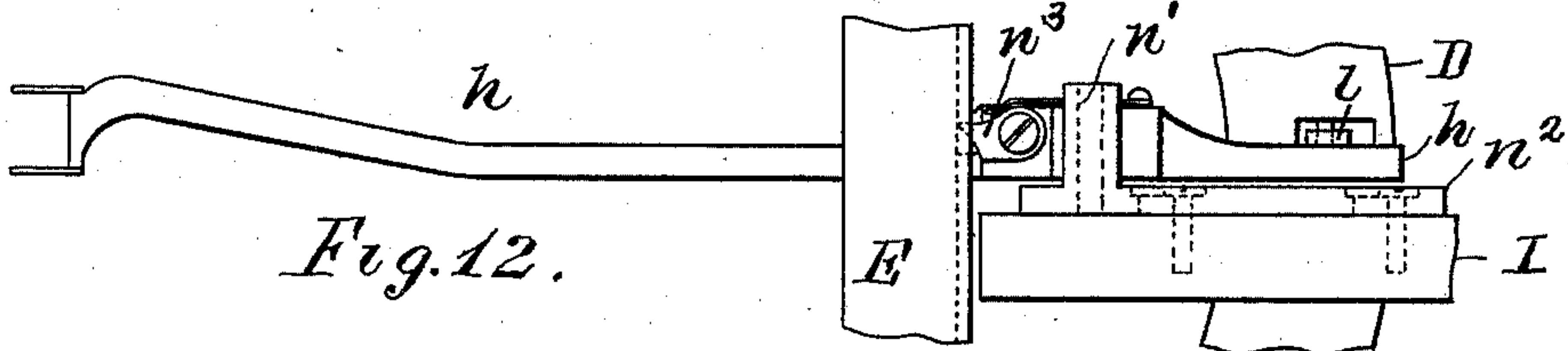


Fig. 12.



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(No Model.)

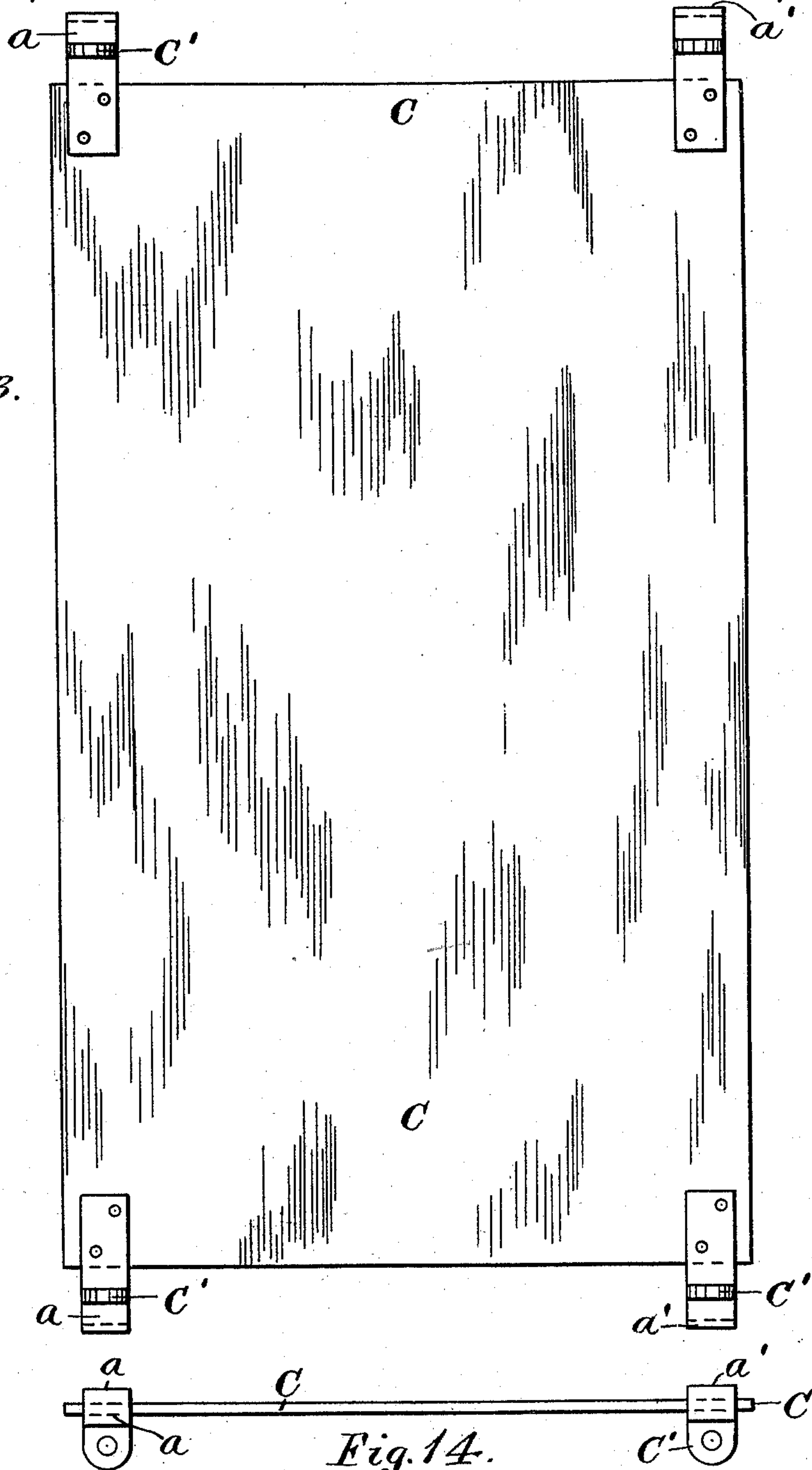
5 Sheets—Sheet 5.

J. M. CRARY.  
TYPE WRITING MACHINE.

No. 477,517.

Patented June 21, 1892.

*Fig. 13.*



*Fig. 14.*

*Attest:*

*L. Lee.*  
*Edw. T. Kinsey*

*Inventor.*

*J. M. Crary, per*  
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# UNITED STATES PATENT OFFICE.

JOSEPH M. CRARY, OF JERSEY CITY, NEW JERSEY.

## TYPE-WRITING MACHINE.

SPECIFICATION forming part of Letters Patent No. 477,517, dated June 21, 1892.

Application filed November 13, 1891. Serial No. 411,773. (No model.)

*To all whom it may concern:*

Be it known that I, JOSEPH M. CRARY, a citizen of the United States, residing at Jersey City, Hudson county, New Jersey, have invented certain new and useful Improvements in Type-Writing Machines, fully described and represented in the following specification and the accompanying drawings, forming a part of the same.

This invention relates to an apparatus which is intended particularly for printing in large books of record, in which case the type mechanism is made to move longitudinally and transversely upon a suitable bed-frame over the page of the book and is therefore especially useful in offices of record where it is required to make entries in such books.

In the annexed drawings, Figure 1 is a front elevation of the apparatus attached to a table, with the bed-frame and printing device turned upward. Fig. 1<sup>a</sup> is an edge view of the bed-frame. Fig. 2 is a front elevation of the platen, bed-frame, and type mechanism, excepting the type-keys, to exhibit the other parts more clearly. Fig. 3 is a transverse section of the platen and clamping-frame on line *xx* in Fig. 5. Fig. 4 is an end view of the table A, with the platen attached thereto and the clamping-frame applied partly to the platen. Fig. 5 is a plan of the clamping-frame, and Fig. 6 is a cross-section of the clamping-frame and platen with the movable strip applied thereto. Fig. 7 is a plan of the bed-frame and type mechanism upon a larger scale, with all but one of the type-keys removed. Fig. 8 is a plan, and Fig. 9 an elevation, of the bell-ringing devices. Fig. 10 is a plan, and Fig. 11 an elevation, of the devices for retracting the spacing-lever. Fig. 12 is a view of the under side of the parts shown in Fig. 10. Fig. 13 is a plan of the under side of the platen, and Fig. 14 an end view of the platen, a side view of the platen being clearly shown at C in Fig. 4.

A is a table, which may be provided with legs B, jointed to the table by hinges B' and braced when in use by a spring B<sup>2</sup>.

C is the platen, consisting of a flat plate of rectangular form, as shown in Fig. 13, and C' are four ears upon the same, to which links U are jointed by clamping-screws U'.

V are bearings attached to the table, and V'

rods extended through the same and through slots U<sup>2</sup> in the links. The platen, by means of the links, is adjustable to the thickness of the book upon the table and is then fixed rigidly by the clamp-nuts V<sup>2</sup>.

Where a portable table is not desired, any stationary table may be used to support the book-printing device, and the links may in such case be used independently of the tie-rods by setting them at any suitable angle with the platen, to sustain the latter at a suitable height above the table to suit the thickness of the book, the links when adjusted being clamped rigidly to the ears C' by the screws U'. The links with such construction merely rest by their ends upon the table-top which supports the book, but serve as adjustable legs to set the platen above the table-top at a suitable distance to place the book beneath the platen.

The remainder of the apparatus is supported wholly upon the platen, the latter being provided at opposite ends or sides with seats *a* to fit the bed-frame *b b'*. The seats *a* are preferably formed with fittings or hooks *a'*, against which the bars *b* or *b'* of the bed-frame may be turned, as upon a hinge, as shown in Fig. 1, when adjusting the paper upon the platen. The paper-clamps, as shown in Figs. 3 to 5, inclusive, consist of elastic strips *c*, fitted to rest upon two opposite edges of the platen and connected at their ends by tie-bars *c'*, the ends of which can be projected beyond the strips to serve as seats, having hooks *a'*, like the seats upon the platen. An additional clamp *c*<sup>2</sup> (shown in Fig. 6 and in dotted lines in Fig. 5) consists in a loose strip, with a hook *c*<sup>40</sup> at one end to engage one of the tie-bars *c'*, and a bent ear *c*<sup>3</sup> at the opposite end to spring elastically over the tie-bar. Such adjustable clamping-strip may be applied to one edge of the leaf or sheet of paper when the latter does not extend across the platen, as shown in Fig. 1, where the book P is shown with one leaf P' extended over the top of the platen (with the surface of which it coincides with the drawing) and the clamping-strip *c*<sup>2</sup> adjusted to clasp its edge. One tie-bar is provided with a fixed catch *c*<sup>4</sup> and the other with a button *c*<sup>5</sup>, which fit beneath the front and rear edges of the platen.

In Fig. 7 the frame *b b'* is shown resting



upon the seats *a*, (formed on the platen and tie-bars *c'*), with a carriage fitted to the bars *b* of the bed-frame and a type mechanism fitted movably to the carriage. The type mechanism is of the class shown in my application, Serial No. 376,606, filed January 3, 1891, and consists in two circular plates *D* and *D'*, connected by posts *D*<sup>2</sup>. The type-bars are hinged upon the plate *D*, with a key-rod *n*<sup>4</sup> pivoted to each bar and provided at the top with a key or button *n*<sup>5</sup>. Three circular rows of holes *d'* are shown in the plate *D'* in Fig. 7, and a circular series of the type-bars would in practice be hinged to the plate *D*, and their key-rods would be extended through the holes *d'* and operate upon the spacing-levers *H*.

In Fig. 1 the under side of the bed-frame, the carriage, (lettered *E* in Fig. 1,) and the plate *D* are shown as they would appear when the frame is turned upward, as upon hinges, on the seats *a*, (shown at the upper end of Fig. 7,) the usual spring-drum *F* being shown fixed to the plate *D*, with a cord *F'*, attached to the opposite end of the carriage *E*.

In Fig. 7 the carriage *E* is shown with a rack *e* affixed rigidly to its upper edge to operate with a pawl in feeding the type mechanism along the carriage when each key *r'* is depressed. For line-spacing the carriage is propelled within the bed-frame by pawls *s'*, fitted to racks *R* upon the bars *b* of the frame. The pawls are pivoted upon bent arms *r*, which are also pivoted upon the opposite ends of the carriage adjacent to the racks *R*. The arms *r* are connected by a link *r'*, the link being connected directly to one of the arms and indirectly to the other through a reversing-lever *r*<sup>2</sup>, the link thus operating to separate or press both arms outward simultaneously, as shown in the drawings. The two pawls are extended upward in the drawings, and dogs *s* are shown formed upon the arms below the pivots of the pawls to engage with the teeth of the rack when the arms are fully separated. A detachable handle *r*<sup>3</sup> is attached removably to the lever *r*<sup>2</sup>, and a movement of such handle to the right operates to draw the dogs *s* out of the rack-teeth and to shift the pawls downward a single space. A spring *r*<sup>4</sup> is attached at one end to the carriage *E* and at the other end to the rod *r'*, as shown in Fig. 1, to reverse the rod *r'* when thus actuated, which again separates the arms *r*, and by the engagement of the pawls with the teeth in the racks moves the carriage downward in the bed-frame, as desired. A stud *t* is attached by an adjustable collar to the rod *r'* and operates to trip the hammer *t*<sup>3</sup> of an alarm-bell *t*<sup>2</sup>. A pendent dog *t*<sup>4</sup> is attached to the hammer-arm near its fulcrum, as shown in Fig. 9, and is held from turning in one direction by a pin *t'*. The bell and hammer move with the plate *D*, carrying the type mechanism, and the dog *t*<sup>4</sup> thus engages the stud *t*, and, being held from turning by the pin *t'*, is moved by the stud to ring the bell. A spacing-lever *h* (see Figs. 7, 10, 11,

and 12) is provided to actuate the feed-pawls and to raise the ribbon from the paper after each type movement. The under side of the spacing-lever is provided with feed-pawls *n*<sup>3</sup>, which operate in a manner already well known, and the spacing-lever itself is adapted for retraction from the rack *E*, so that the operator may at the end of each line restore the type mechanism to its initial position. A slide *n*<sup>2</sup> is fitted movably upon a bearing *I* upon the plate *D* and is pressed normally toward the rack by a spring *n*<sup>4</sup>, and the spacing-lever *h* is pivoted to such slide by a screw *n'* to hold the pawls normally in engagement with the rack *E*. A thumb-piece *g* is shown pivoted to one of the posts *D*<sup>2</sup> at the left side of the plate *V'* in Fig. 7 and is connected by a rod *g'* and lever *g*<sup>2</sup> with a link *l*, which operates to retract the slide *n*<sup>2</sup> when the thumb-piece is pressed toward the post. When the slide bearing the pawl *n*<sup>3</sup> is thus retracted from the rack, the type mechanism may be moved again to the commencement of a line, the dog *t*<sup>4</sup> turning freely as it slips over the stud *t* in its reversing movement. The spacing-lever *h* is shown in Fig. 7 provided with a ribbon-guide *i* upon its outer end and a ribbon *j* extended over the same from two spools *k*. The spools may be alternately coupled by suitable clutching mechanism to a spindle *k'*, carrying a ratchet-wheel *l'*, which is moved by a pawl *n* at each reciprocation of the spacing-lever *h*.

Two spacing-keys *G* are shown at the front side of the plate *D'* in Fig. 7, one of which is shown connected by an arm *G'* and a series of levers *H* with the link *l*.

The type-keys are in practice constructed to operate upon the spacing-levers *H*, but their connection is not shown in the drawings, as it forms no part of the present invention and is shown and described in my former application, No. 376,606, filed January 3, 1891, and allowed December 2, 1891.

The ribbon-pawl *n* is actuated at each impulse of the spacing-lever by a lever *I'*, pivoted upon the bearing *I* and formed of arms of unequal length, so that when its longer end is depressed by the spacing-lever its shorter end moves the pawl a very minute distance. The ratchet-wheel *l'* is made with very fine teeth, and the ribbon is thus moved a very slight distance each time the spacing-lever is reciprocated by the key-rods or the space-bars *G*.

In my former application, Serial No. 376,606, I connected the feed-pawl directly with the spacing-lever; but I have introduced the lever *I'* into the construction shown herein to reduce the movement of the feed, which could not be readily accomplished where the pawl was attached directly to the spacing-lever.

To operate the devices already described with the portable table shown in Fig. 1, the clamp-nuts *V*<sup>2</sup> are loosened and the platen is raised sufficiently to introduce a portion of the book beneath the same upon the table-top, as shown at *P* in Figs. 1 and 4. The links



U are then adjusted and clamped to hold the platen close to the top of the book. The leaf upon which the printing is required is then laid flat upon the platen and the clamping-frame then applied and secured by the catch  $c^4$  and button  $c^5$ , one of the strips  $c$  pressing upon the leaf close to the fold in the book. The adjustable clamping-strip  $c^2$  is then applied to the edge of the leaf, and the bed-frame  $b b'$  is then laid upon the seats  $a$ . If the paper requires readjustment at any time while printing on the same, the bed-frame and the type mechanism may be turned upon any of the seats, as on a hinge, as shown in Fig. 1. The bed-frame when thus supported upon the platen holds the carriage E in a proper relation to move the type mechanism longitudinally—that is, up and down the printed page—while the plate D with the type mechanism is movable transversely to the page upon the carriage. After writing each line the handle  $r^3$  is pressed once to the right to actuate the line-spacing mechanism, the dogs  $s$  serving to lock the carriage fast after each movement of the pawls  $s'$ . To write upon the full depth of the platen, (from the upper to the lower edge of the same, to which the letter C is applied in Fig. 7,) the bars  $b'$  are formed wholly below the under side of the carriage E. The carriage is thus enabled to slide over these bars at the upper and lower ends of its movement and the type impression may thus be brought close to the edges of the platen. To impart firmness to the carriage during the actuation of the type-keys, the under side of the carriage is preferably fitted to touch the clamping-strips  $c$ , and it thus rests securely upon such strips. This construction is shown in Fig. 2, where the seats  $a$ , which project from the lower end of the platen, are shown in section with their hooks  $a'$  removed and the strips  $c$  resting upon the upper surface of the platen in contact with the under side of the carriage E. To facilitate the adjustment of the bed-frame upon the seats  $a$ , guides  $a^3$  are projected downward from one or both ends of the bars  $b'$ , as shown, adjacent to the seats  $a$  in Fig. 2. The tie-bars  $c'$  extend, as shown in Figs. 4 and 7, along the upper and lower edges of the platen C and are projected at the corners through notches  $a^2$  in the undersides of the bars  $b$ , which notches are seen most perfectly in Fig. 1<sup>a</sup>. In Fig. 2 the tie-bars  $c'$  are represented in dotted lines extending laterally through the notches in the bars  $b$ , with the hooks  $a'$  upon their ends at the outer sides of the bars. The desired strength is imparted to the bars  $b$  by their projection below the surface of the platen upon which the printing impression is made, as indicated where the reference-letter  $b$  is applied between the notches  $a^2$  in Fig. 1. It will thus be seen that the bars  $b$  and  $b'$  both project below the surface of the platen and entirely below the printing impression, in order that the carriage may lie very close to the

surface of the platen and may move over the upper and lower ends of the bed-frame in printing adjacent to the upper and lower ends of the paper, which may be laid upon the platen. The racks R upon the bars B and the arms  $r$ , carrying dogs and pawls, as above described, constitute a line-spacing mechanism by which the carriage is moved upon the bed-frame at the pleasure of the operator, and it is immaterial to the operation of my book-printing devices what class of line-spacing mechanism be used for this purpose. The feed for spacing the letters is actuated by the movement of all the type-keys in the usual manner and operates, in connection with the rack  $e$  and pawls  $n^3$ , to move the type-mechanism transversely across the platen, and, in conjunction with the line-spacing mechanism, adapts the type mechanism to print upon its entire surface.

Having thus set forth the nature of the invention, what is claimed herein is—

1. In a type-writer, the combination, with a table and its supports, of a flat platen adjustable to and from the table-top, type mechanism, and means supported wholly upon the platen for moving the type mechanism transversely and longitudinally over the platen, as and for the purpose set forth.

2. In a type-writer, the combination, with a table and its supports, of a flat platen adjustable to and from the table-top and provided with seats, a bed-frame supported removably upon said seats, and type mechanism, with means for moving the same longitudinally and transversely upon the bed-frame, substantially as set forth.

3. In a type-writer, the combination, with a table and its supports, of a flat platen adjustable to and from the table-top, a clamping-frame resting upon the platen, seats upon the platen and clamping-frame, a bed-frame adapted to hinge upon said seats, and type mechanism and means for moving the same longitudinally and transversely upon the bed-frame, substantially as herein set forth.

4. In a type-writer, the combination, with a table and its supports, of a flat platen adjustable to and from the table-top with seats attached to the platen below its top surface, a rectangular bed-frame surrounding the platen and supported upon said seats with the top of each end of the frame below the top of the platen and the sides of the frame partly below the top of the platen, and type mechanism, with means for moving the same longitudinally and transversely upon the bed-frame, as and for the purpose set forth.

5. The combination, with a supporting-table, of a flat platen adjustable to and from the table-top to support a leaf of the book, clamping-strips extending over the edges of the platen and connected by tie-bars, and a movable clamping-strip adjustable upon the said bars over the surface of the platen, and type mechanism sustained upon the tie-bars and



adjustable longitudinally and transversely over the platen, as and for the purpose set forth.

6. In a type-writer, the combination, with a supporting bed-frame having a carriage movable longitudinally therein and having type mechanism movable transversely upon the carriage, of the racks R upon the opposite edges of the frame and the arms r, connected by link r' and pivoted at the opposite ends of the carriage and provided with the fixed dogs s and the pivoted pawls s', with springs for pressing the pawls into the racks, substantially as set forth.

7. In a type-writer, the combination, with a supporting-bed frame having a carriage movable longitudinally thereon and having type mechanism movable transversely upon the carriage, of the racks R upon the opposite edges of the frame, the arms r, carrying the dogs s and pawls s', as set forth, and the rod r', connected directly to one of the arms and indirectly to the other by the lever r<sup>2</sup>, as and for the purpose set forth.

8. In a type-writer, the combination, with a supporting-bed frame having a carriage movable longitudinally thereon and having type mechanism movable transversely upon the carriage, of the racks R upon the opposite edges of the frame, the arms r, carrying the dogs s and pawls s', as set forth, and the rod r', connected directly to one of the arms and indirectly to the other by the lever r<sup>2</sup>, having the handle r<sup>3</sup>, attached removably thereto, as set forth.

9. In a type-writer, the combination, with a carriage and a type mechanism movable thereon, of a bell t<sup>2</sup> and the hammer t<sup>3</sup>, movable with the type mechanism, the hammer having near its fulcrum the pendent dog t<sup>4</sup> and pin t', and the carriage being provided with the stud t, affixed adjustably in the path of the dog t<sup>4</sup>, as herein set forth.

10. The combination, with the carriage of a type-writing machine, of a plate with type mechanism movable upon the carriage, a feed-rack fixed upon the carriage, a slide movable upon the plate with spring to press it toward the feed-rack, a spacing-lever with pawl fitted to the feed-rack, and means for retracting the slide when reversing the carriage, substantially as set forth.

11. In a type-writer, the combination, with a flat platen and type mechanism supported by the platen and movable longitudinally and transversely over the same, of links attached to the platen and adjustable to the thickness of a book upon a table-top, substantially as set forth.

12. In a type-writer, the combination, with a flat platen and type mechanism supported by the platen and movable longitudinally and transversely over the same, of the ears C', attached to the platen, and the links U, attached thereto by clamping-screws and operated as adjustable legs to set the platen to the thickness of a book upon a table-top, substantially as set forth.

13. In a type-writer, the combination, with a flat platen and type mechanism supported by the platen and movable longitudinally and transversely over the same, of ears attached to the platen, and links jointed thereto by clamping - screws, tie-rods connecting such links, and a table with bearings to receive such tie-rods, as set forth.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

JOSEPH M. CRARY.

Witnesses:

THOS. S. CRANE,  
L. LEE.