

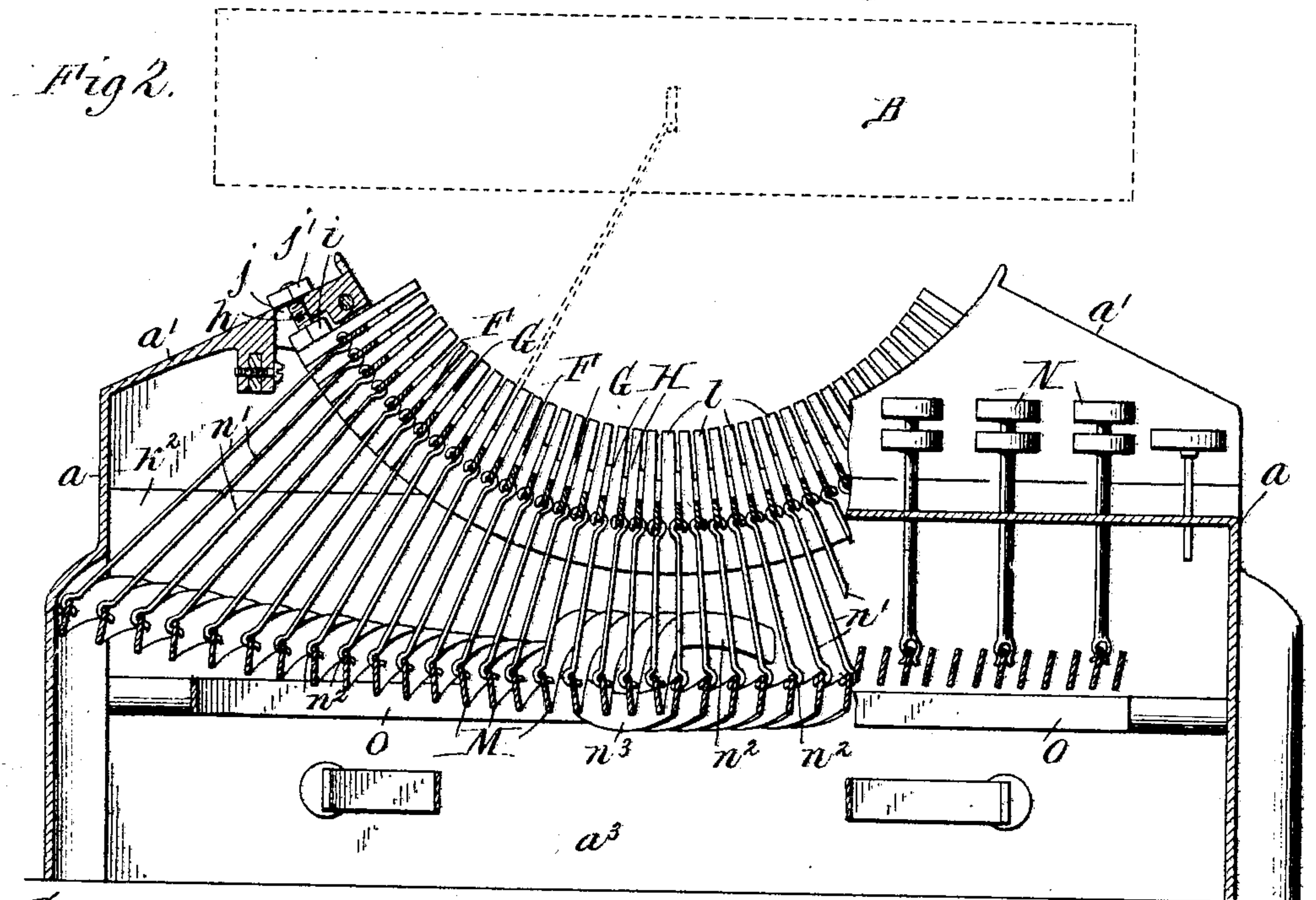
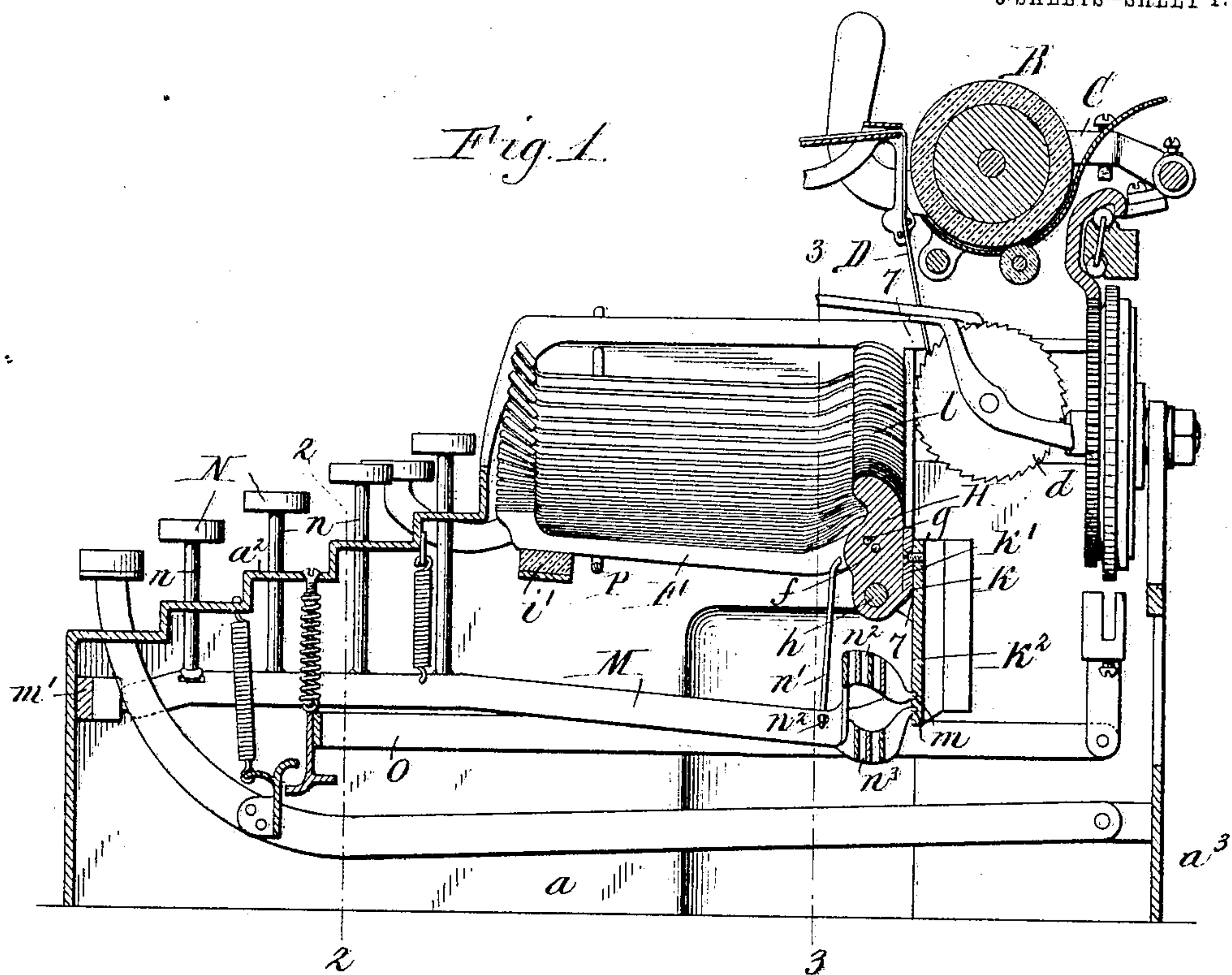
No. 771,782.

PATENTED OCT. 4, 1904.

E. G. LATTA.  
TYPE WRITING MACHINE.  
APPLICATION FILED AUG. 11, 1903.

NO MODEL.

3 SHEETS—SHEET 1.



E. A. Volk.

P. W. Turner.

*Witnesses:*

E. G. Latta Inventor.  
By Wilhelm Rimmer Attorneys.



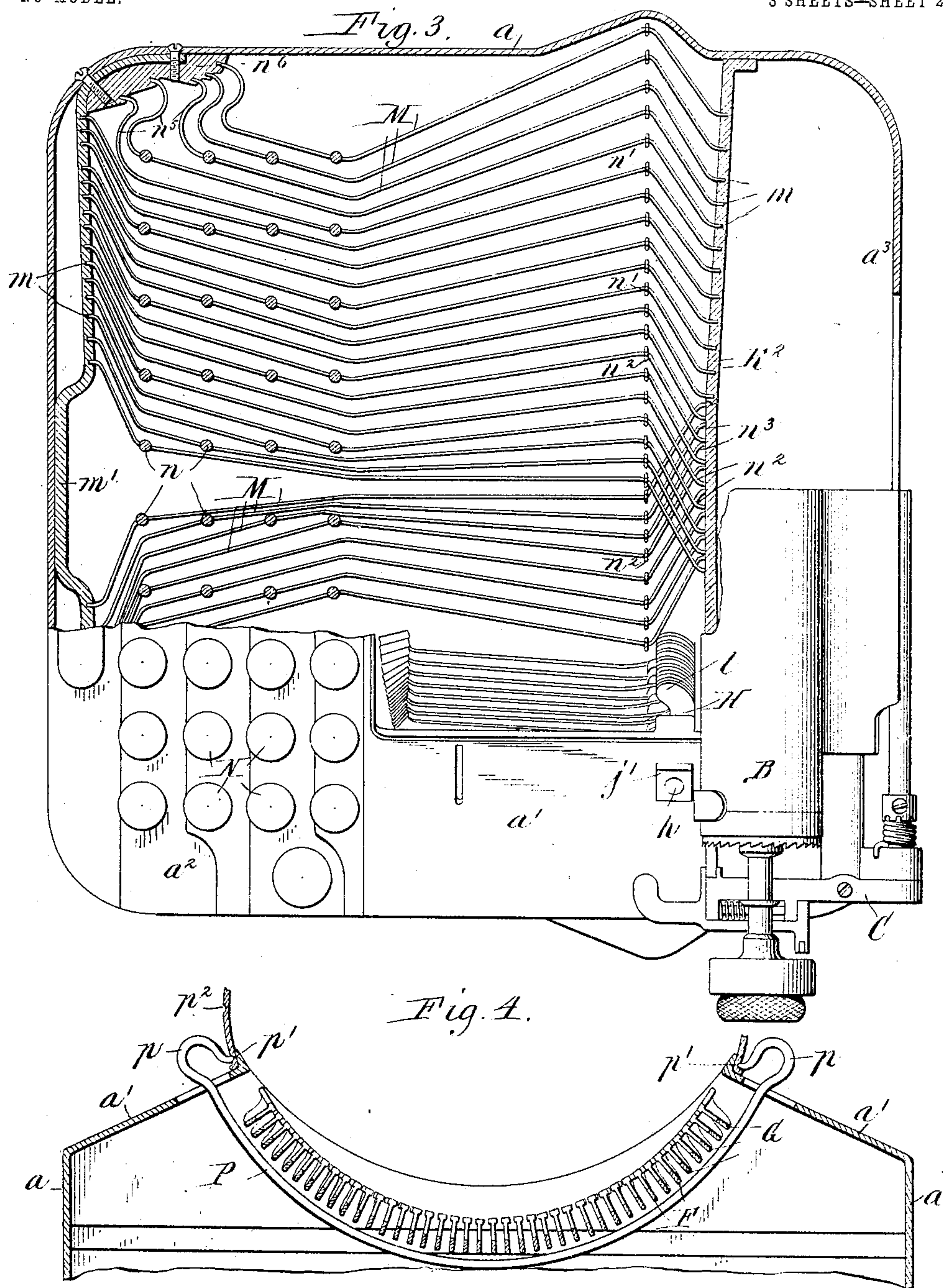
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3 SHEETS—SHEET 2.



Witnesses:  
E. A. Volk,  
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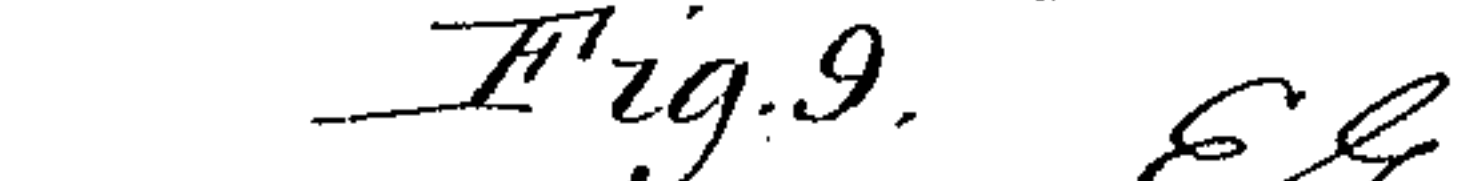
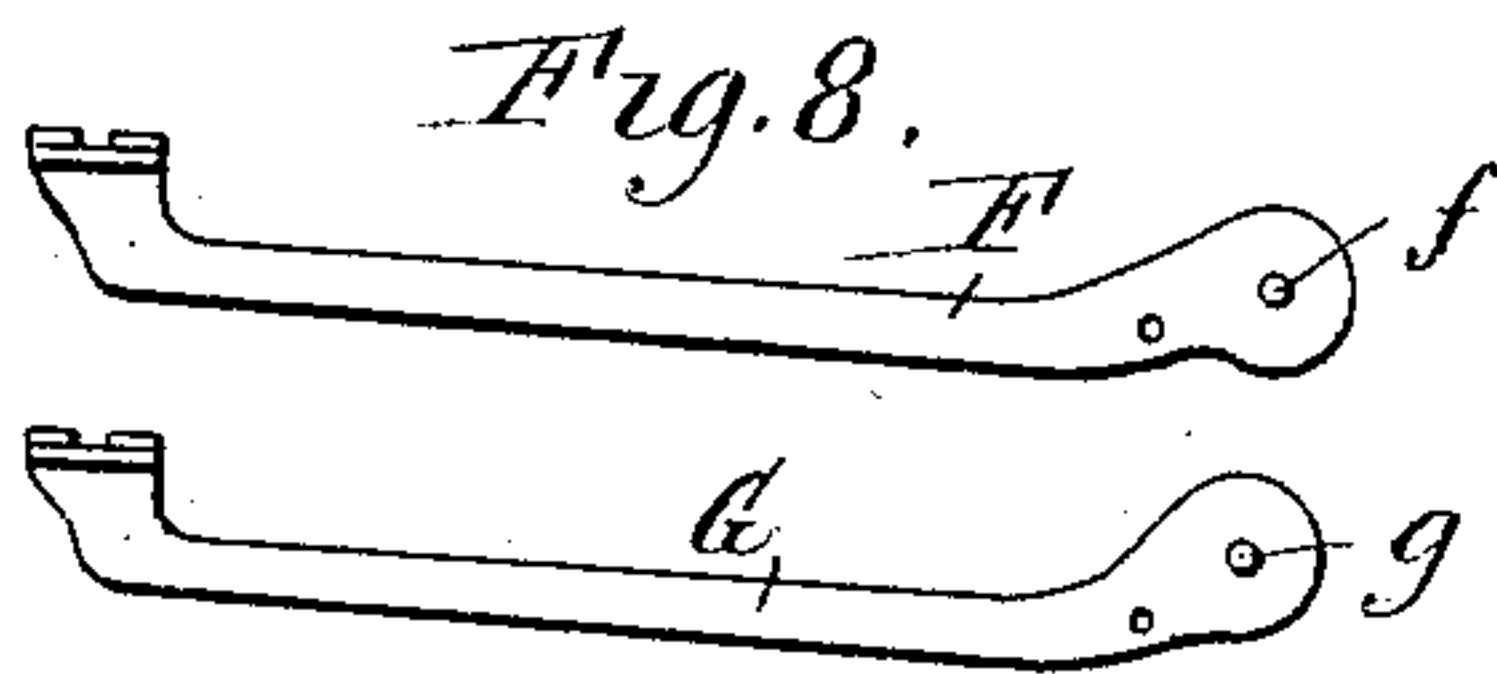
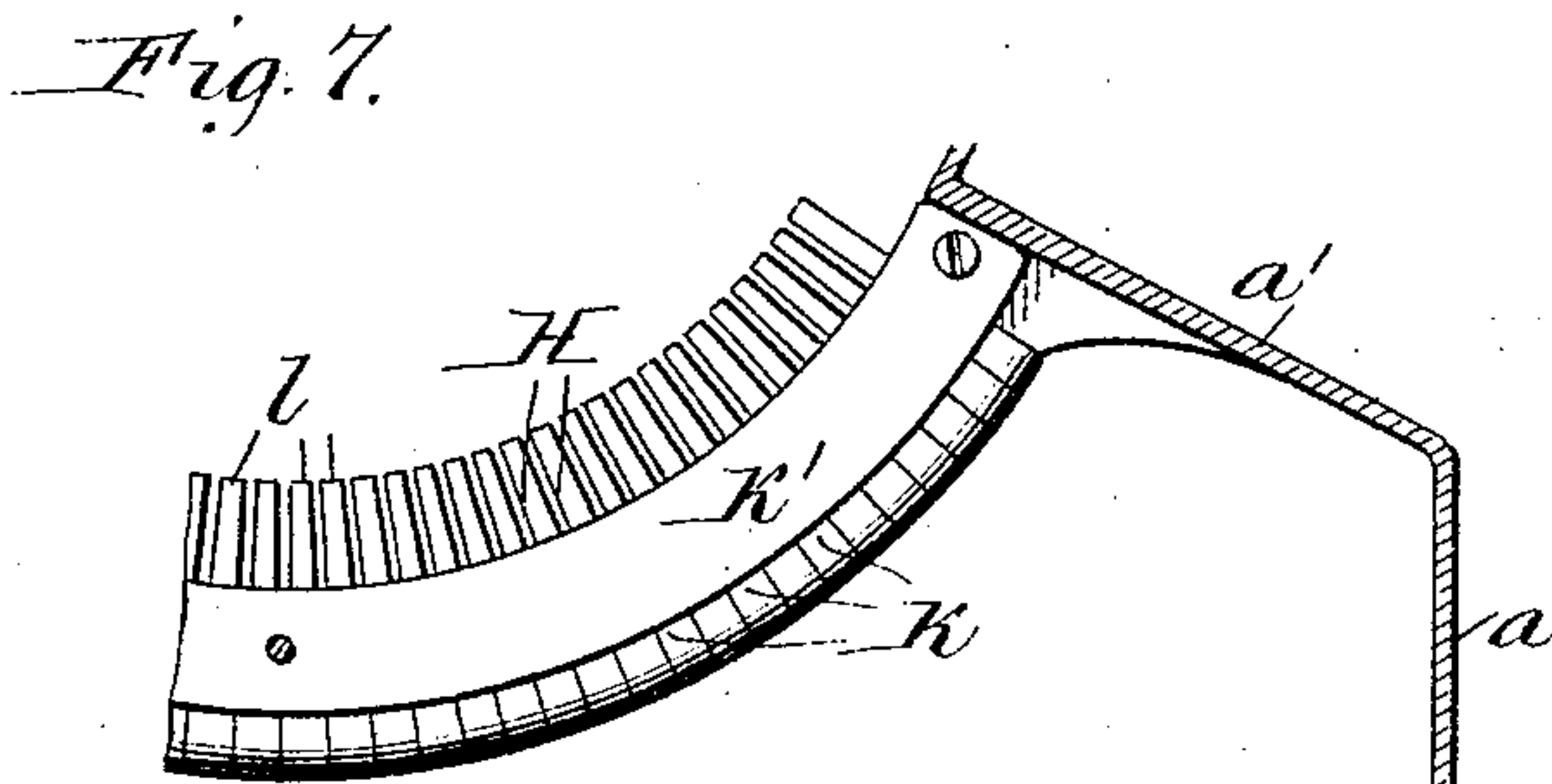
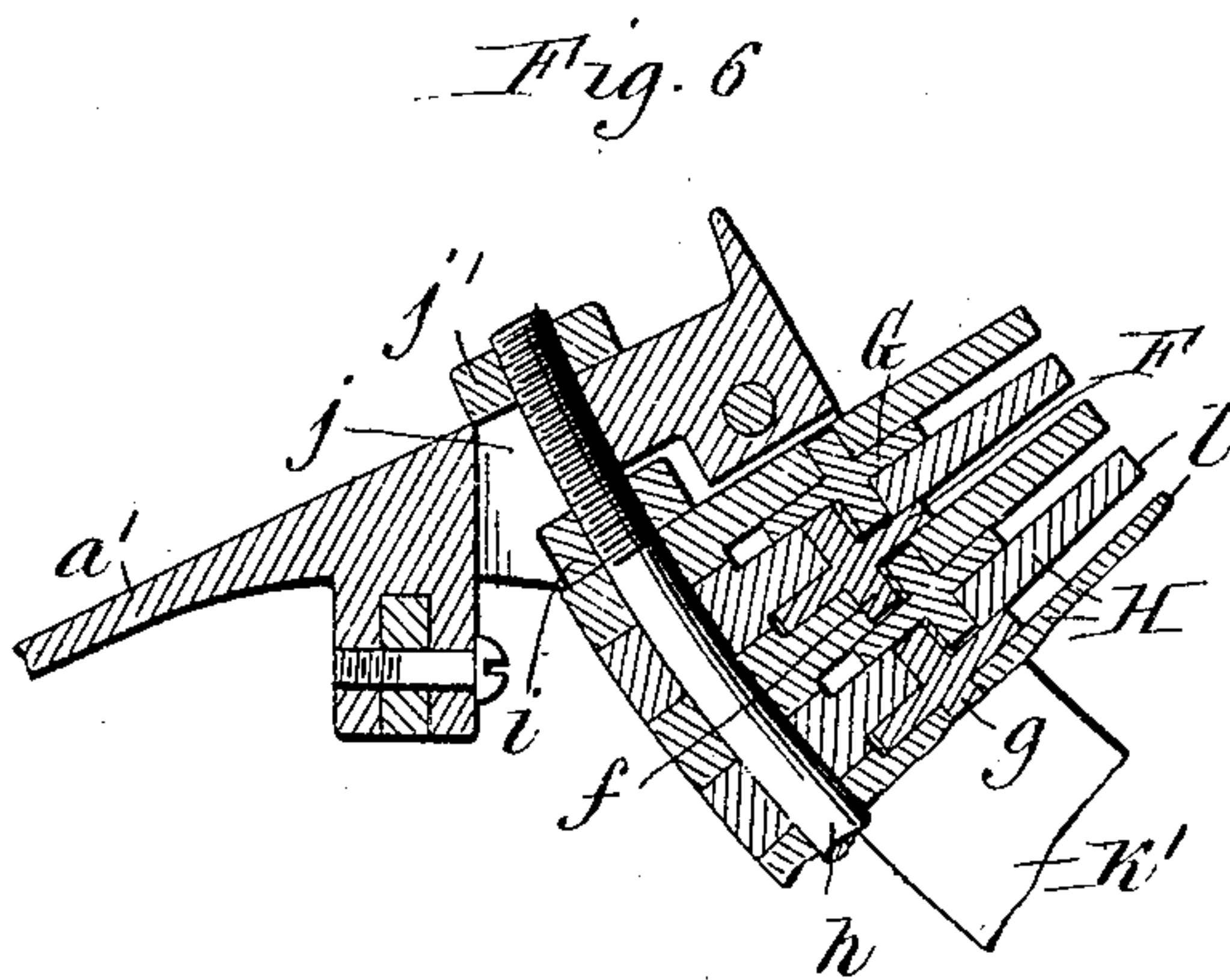
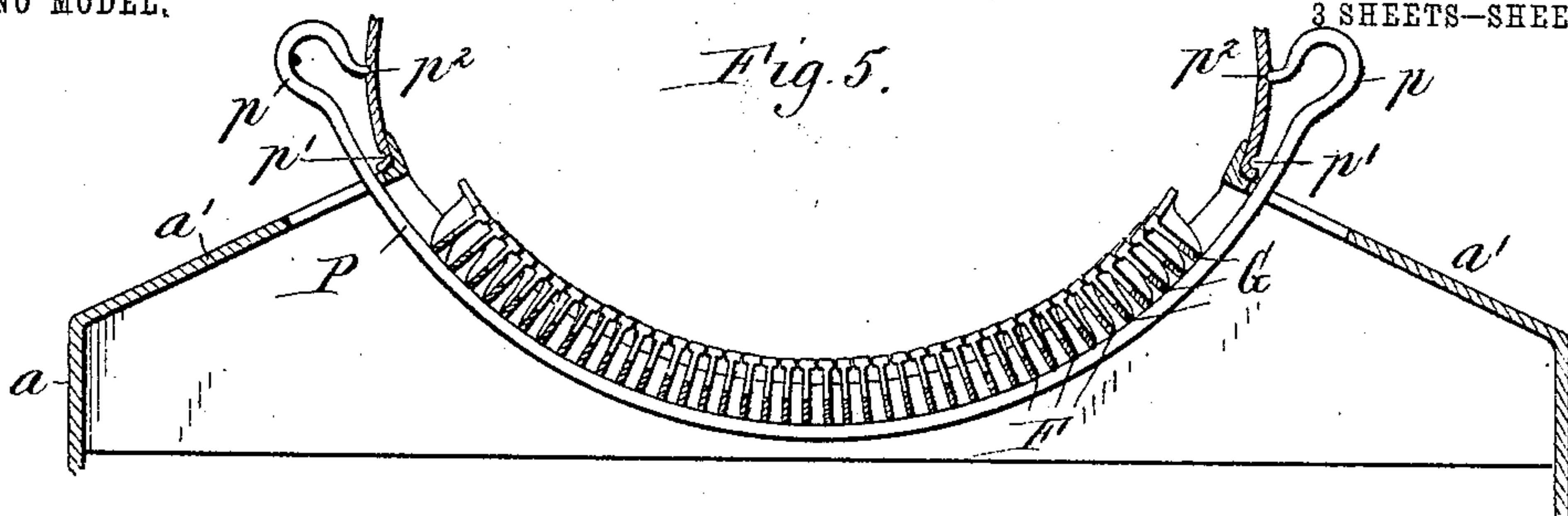
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NO MODEL.

3 SHEETS—SHEET 3.



Witnesses:  
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# UNITED STATES PATENT OFFICE.

EMMIT G. LATTA, OF FRIENDSHIP, NEW YORK.

## TYPE-WRITING MACHINE.

SPECIFICATION forming part of Letters Patent No. 771,782, dated October 4, 1904.

Application filed August 11, 1903. Serial No. 169,134. (No model.)

*To all whom it may concern:*

Be it known that I, EMMIT G. LATTA, a citizen of the United States, residing at Friendship, in the county of Allegany and State of New York, have invented new and useful Improvements in Type-Writing Machines, of which the following is a specification.

This invention relates more particularly to a type-bar action for type-writing machines of that kind known as "front-strike" or "visible-writing" machines in which the type-bars are arranged below the platen and are pivoted to swing upwardly and rearwardly to make the impression at the front side of the platen where the writing can be seen by the operator without moving the carriage or platen.

One object of the invention is to provide a type-bar action capable of standing long hard service without requiring adjustment.

Another object of the invention is to so construct and arrange the key-levers that they are substantially balanced on their pivots and apply the power to the type-bars in direct lines substantially in the planes in which the type-bars swing to make the impression.

Another object of the invention is to provide a strong and durable type-bar action for type-writers composed of the minimum number of parts of simple and inexpensive construction.

In the accompanying drawings, consisting of three sheets, Figure 1 is a vertical longitudinal sectional elevation of a type-writing machine embodying the invention, portions of the machine which are not necessary to an understanding of the invention being omitted. Fig. 2 is a transverse sectional elevation thereof, the right and left hand portions thereof being taken in lines 2-2 and 3-3, respectively, Fig. 1. Fig. 3 is a view thereof, part in plan and part in horizontal section. Fig. 4 is a fragmentary transverse section showing the supporting-rod for the type-bars with the type-bars in their normal position. Fig. 5 is a similar view showing the type-bars raised in position to be cleaned. Fig. 6 is a fragmentary section, on an enlarged scale, showing one end of the type-bar segment. Fig. 7 is a fragmentary transverse section in line 7-7,

Fig. 1, showing the type-bar segment and brace-plate. Figs. 8 and 9 are detached views of the long and short type-bars, respectively.

Like letters of reference refer to like parts in the several figures.

The main frame of the machine upon which the several operative parts are mounted may be of any suitable construction and preferably consists of upright sides  $a$ , which have inwardly-projecting upper portions  $a'$  and are connected at the front by a stepped portion  $a^2$ , constituting the base-plate of the keyboard, and at the back by an upright portion or plate  $a^3$ .

B represents the platen, which, as usual, is journaled to rotate upon a carriage C, which is mounted to travel laterally or crosswise of the machine and is moved intermittently or step by step by a power-driven feed mechanism.

D represents the ribbon, which is connected at its front end to a spool (not shown) arranged in front of the platen and at its rear end to a spool  $d$ , arranged below the platen. The ribbon passes substantially vertically in front of the platen in position to be engaged and carried against the platen by the type-bars.

The platen, carriage, and intermittent-feed mechanism therefor and the ribbon mechanism are preferably constructed and arranged as described in two copending applications for patents, one for a type-writing machine, filed August 3, 1903, Serial No. 168,190, and the other for type-writer carriage and bearings therefor, filed October 30, 1903, Serial No. 179,119; but these parts may be of any other suitable construction and arrangement.

F G represent the type-bars, which are arranged side by side in an arc below and in front of the platen and are pivoted at their rear ends to a curved segment, so as to swing upwardly and strike the printing-point at the front side of the platen. Each type-bar carries at its front or free end a type-head provided with two characters, one of which strikes the platen in the normal operation of the machine and the other of which is caused to strike the platen by shifting the latter downwardly, as described in my applica-



tion for the ribbon mechanism. Each type-bar is provided at its rear end with two trunnions or pivots which extend laterally from opposite sides of the type-bar. These pivots may  
 5 be made integral with the bar or separate therefrom and permanently attached thereto. The pivot ends of the type-bars are arranged between the separated bearing portions or plates H of the supporting-segment and are  
 10 made in two lengths arranged alternately. The pivots  $f$  for the long type-bars are journaled in suitable alined holes or seats in the segment-plates, and the pivots  $g$  for the short bars G are journaled in holes or seats in the  
 15 segment-plates, each arranged in a line extending outwardly from the hole or seat in the same plate for the pivot  $f$  of the adjacent long type-bar half-way between the normal position of the type-bar and the printing-  
 20 point on the platen. By this location of the short type-bar pivots the type-heads of the long and short type-bars rest side by side in the normal position of the type-bars and all strike the same center at the printing-point.  
 25 This is important with type-bars having more than one character, as it permits the offset type-heads of the bars at the ends of the segment to nest together in their normal position and permits a closer build than would be pos-  
 30 sible with any other arrangement of the type-bar pivots and permits each type-bar to have longer pivots—that is, each pivot can be equal in length to the width of the bearing-plate of the type-bar segment in which it is seated.  
 35 The type-bar segment consists of a series of separate plates H, which are arranged side by side and supported by a curved rod or bar  $h$ , which passes through alined holes in the lower or outer portions of the segment-plates. The  
 40 outer or lower portions of the segment-plates are of suitable thickness to bear against each other, while their inner or upper portions are reduced in thickness to form openings or slots for the type-bars. The adjacent side  
 45 faces of each pair of segment-plates which form the side walls of the intervening type-bar slot are parallel, and the pivot-seats in the adjacent segment-plates for each type-bar are preferably made at right angles to the  
 50 plane in which the type-bar swings in order to make a perfect bearing. A very good bearing is produced, however, if the pivot-seats are made at right angles to the radial planes extending from the printing-point on the platen  
 55 through the centers of the segment-plates. The segment-plates are strung on the supporting segment-bar  $h$  with the type-bars in place between the same and are securely clamped  
 60 together by nuts  $i$ , screwed on the threaded end portions of the segment-bar and bearing against the end segment-plates. The ends of the segment-bar  $h$  extend through holes or  
 slots  $j$  in the overhanging upper portions  $a'$  of the sides of the main frame and are held  
 65 in position by nuts  $j''$ , screwed on the thread-

ed ends of the segment-bar and bearing against the overhanging portions of the main frame. The holes  $j$ , through which the ends of the segment-bar extends, are elongated or  
 70 large enough to permit the segment-bar to be engaged in and disengaged from the same from below with the segment-plates in place thereon. The rear edges of the several seg-  
 75 ment-plates are preferably provided with hooks or projections  $k$ , Fig. 1, having inclined upper faces which hook under the lower beveled edge of a stationary brace-plate  
 80  $k'$ , which is curved concentric with the printing-point and is secured at its ends to the overhanging portions of the sides of the main frame and at its central portion to a transverse  
 85 vertical frame-plate or bar  $k^2$ , secured at its ends to the sides of the main frame. When the segment-bar is drawn in place by tightening the nuts  $j'$  at its ends, the hooks at the  
 90 rear edges of the segment-plates are all drawn up tightly against the lower edge of the curved brace-plate, which acts to hold the center of the segment against lateral displacement and to hold it in a true circular arc con-  
 95 centric with the printing-point. The segment-plates are provided at their inner or upper ends with extensions  $l$ , Fig. 1, which are reduced or cut away at their front edges, so  
 100 that the extensions practically extend upwardly and forwardly from the body portions of the segment-plates. These extensions form side supports for the type-bars at the time  
 105 when they strike the platen and prevent any lateral movement of the type-bars. By cutting away the front edges of the extensions the type-bars do not have any frictional contact  
 110 therewith except at the instant when they strike the platen. As both the segment-plates and type-bar pivots are made of hardened steel, they give long service before wearing  
 115 enough to materially effect the alinement or require adjustment. The free ends of the type-bars rest in their normal position on the usual curved cushioned support  $l'$ .

The key-levers M are arranged longitudinally of the machine below the type-bars and provided at their opposite ends with pivots  $m$ , on which they rock. The pivots at the front  
 120 ends of the levers are journaled in bearing holes or seats in a transverse front bearing-plate  $m'$ , which is secured to the front plate of the main frame, and the rear pivots are  
 125 journaled in seats in the transverse plate  $k^2$ , to which the central portion of the segment brace-plate is secured. Each of the key-levers consists of a flat strip of hard steel arranged on edge and having its body portion  
 130 between the ends offset or bent to opposite sides of the axial line passing through its end pivots. The key-levers are connected to finger-keys N, carried by suitable upright stems  $n$  of any suitable construction mounted to move vertically in holes in the base-plate of the  
 keyboard, each key being arranged directly



over the front offset portion of the key-lever, to which it is pivoted in any suitable manner at its lower end. The rear offset portion of each key-lever is connected to one of the type-bars by a connecting wire or rod  $n'$ . The upper ends of the connecting-rods  $n'$  are attached to the type-bars before the same are assembled in the segment, and the lower ends thereof are provided with reverse hooks  $n^2$ , Fig. 2, which detachably engage in holes in the key-levers. The front portions of the key-levers are connected to the base-plate of the keyboard by suitable coil-springs, one of which is shown in Fig. 1, which holds the key-levers in the normal position shown in the drawings. The key-levers receive power from the finger-keys on one side of their axial line and transmit power to the type-bars from the other side of the axial line by oscillating on their pivots. In the normal position of the key-levers their body portions nest together in substantially the same plane as shown in Figs. 2 and 3. The front portions of the key-levers are arranged in the same horizontal plane, so that they are all acted upon alike by the universal bar O, which extends transversely across the machine beneath the key-levers and operates the carriage-escapement as usual by the depression of any of the finger-keys. The rear parts of the levers join the type-bar-connecting rods at such points, either above or below the plane of the front ends of the levers, that the joint of each key-lever with its connecting-rod vibrates in a line substantially in the same radial plane as the type-bar to which it is connected swings. This arrangement practically prevents all cross strain on the pivoted parts of the type-bar action and insures an equal depression of the front parts of the levers. The key-levers which operate the type-bars on one half of the segment are arranged oppositely to those which operate the type-bars on the other half of the segment. On account of this arrangement some of the levers on each side nearest the center of the keyboard overlap or cross at their rear ends, as shown in Figs. 2 and 3. To permit the oscillation of these central levers, which cross, the rear ends  $n^3$  of one set of levers back of the connecting-rods are raised and the rear ends  $n^4$  of the other set are depressed, and the rear pivots of the crossing levers are arranged at their upper and lower edges and seated in pivot-holes arranged above and below the plane of the pivot-holes for the other levers. The front ends  $n^5$  of some of the levers at each side of the machine are bent backwardly and then forwardly, as shown in Fig. 3, to enable a close build. The front pivots of these side levers are seated in holes in blocks  $n^6$ , arranged at the front portions of the sides of the main frame. The lever-pivots are engaged in their seats by springing the ends of the levers together, and the pivots are re-

tained in their seats by the elasticity of the levers or their tendency to straighten. The levers are readily detached by springing their pivots out of the seats in the bearing-plates and turning the levers to disengage the same from the reverse-hooks at the lower ends of the connecting-rods and then moving the levers downwardly and unlocking them from their springs. The weight of each lever is substantially balanced on opposite sides of its axial line, so that only the inertia of the lever and tension of the retracting-spring has to be overcome in making the impression, and this with the direct lines of transmission make an exceedingly easy action. The elastic nature of the levers serves to cushion the blow on the finger-keys without additional springs or cushioning devices and makes the machine much less tiresome to operate.

In order to swing the rear ends of the key-levers at the ends of the segment in line with the radial planes of the type-bars to which they are connected without unduly widening the machine, the type-bar segment is arranged relatively low in the machine, so that the type-heads at the center of the segment are below the upper row of finger-keys and the opening in the front plate of the main frame. In this position it is difficult to reach and clean the type, and to overcome this objection and raise the type-heads up into a position in which they can be readily cleaned a curved supporting rod or wire P, Figs. 4 and 5, is provided. This supporting-rod is arranged below the front or free ends of the type-bars in rear of the stationary rest for the front ends of the type-bars. The supporting-rod is provided at its opposite ends with hooks  $p$ , which pass through slots in the overhanging side portions of the main frame and the ends of which engage in seats or depressions  $p'$   $p^2$ , formed in the main frame or a stationary cover-plate attached thereto and portions of which are shown in Figs. 4 and 5. In the normal position of the type-bars the hooks rest in their lower seats  $p'$  and the supporting-wire is beneath the type-bars. When it is desired to clean the type, the hooks at the ends of the supporting-rod are raised and engaged in their upper seats  $p^2$ . The elasticity of the rod retains the hooks in their seats. When the supporting-rod is raised to the upper position shown in Fig. 5, it operates to concentrate or crowd the type-heads together and supports the type-bars with their type-heads just in rear of the lower edge of the opening in the front plate of the frame, where they can be readily reached and cleaned with an ordinary brush. The supporting-rod is preferably curved in an arc of greater radius than the arc of the type-bars, and as the type-heads of the end type-bars are offset more than those of the central type-bars they are not spaced so far apart and the central type-heads are raised more than those at the ends.



The heads are therefore uniformly bunched together or all bear upon each other, so as to mutually brace each other against lateral strain.

5 I claim as my invention—

1. In a type-writing machine, the combination of a series of type-bars each having a fixed bearing-pivot on each side thereof, a segment comprising separate sections forming slots and bearings for the bars, the sections being united by direct contact on lines radial to the segment, and means for clamping the sections rigidly together, substantially as set forth.

15 2. In a type-writing machine, the combination of a series of type-bars each having a fixed bearing-pivot on each side thereof, a segment comprising a series of separable sections each forming one-half of a slot and a bearing for one pivot of each two adjoining bars, said segment-sections being of increased thickness outside of the pivot-bearings, and means for clamping the thickened ends of the sections rigidly together, substantially as set forth.

25 3. In a type-writing machine, the combination of a series of type-bars, a type-bar segment comprising separate sections having relatively thin inner bearing portions for the type-bars and relatively thick outer securing portions which contact with each other on substantially radial lines, and a curved supporting-rod passing through said securing portions, and means for clamping said segment-sections together on said supporting-rod, substantially as set forth.

35 4. In a type-writing machine, the combination of a segment comprising separate sections having relatively thin inner bearing portions and relatively thick outer securing portions which contact with each other on substantially radial lines, means for securing said sections rigidly together, and type-bars arranged between the bearing portions of the segments and each having a fixed bearing-pivot on each side thereof bearing in a hole in the bearing portion of the adjacent segment-section, substantially as set forth.

45 5. In a type-writing machine, the combination of a series of pivoted type-bars, and a supporting-segment comprising separate sections clamped together on radial lines and having the inner portions of their sides cut away to form radial slots for the bars, the inner ends of said sections extending inwardly beyond the type-bar bearings and being offset to form guides for the type-bars at the printing-point, substantially as set forth.

50 6. In a type-writing machine, the combination of a type-bar-supporting segment comprising separate sections, a clamping-bar passing through the outer ends of said sections, and a curved plate in rear of the sections having its outer edge concentric with the printing-point and interlocking with parts on the

sections to retain them in proper alinement, substantially as set forth.

7. In a type-writing machine, the combination of a series of type-bars, keys, and a series of operating-levers connected to said type-bars and keys consisting of strips of metal having a pivot at each end and offset on opposite sides of the pivot-line, substantially as set forth.

8. In a type-writing machine, a series of type-bar-operating levers arranged side by side having pivots at their ends, and having their central parts offset in opposite directions and arranged to nest together, substantially as set forth.

9. In a type-writing machine, the combination of a series of type-bar-operating levers arranged side by side, and having pivots at their ends with their front central portions arranged in the same plane and offset from the pivot-line, and having their rear central portions offset in the opposite direction from their front portions and arranged in a different plane, substantially as set forth.

10. In a type-writing machine, the combination of an upright type-bar segment, a series of pivoted type-bars, a series of type-bar-operating levers having reversed offset central portions with pivots at their ends, and arranged with their rear offset portions at different elevations so as to vibrate in substantially the same radial planes as the type-bars, substantially as set forth.

11. In a type-writing machine, the combination of an upright segment, a series of type-bars pivoted on said segment, two sets of type-bar-operating levers consisting of strips of metal pivoted at their front and rear ends, and their central portions being offset in opposite directions whereby the depression of the front parts of the levers causes the rear parts to swing upwardly and inwardly, substantially as set forth.

12. In a type-writing machine, the combination of an upright type-bar segment, a series of pivoted type-bars supported thereby, two sets of type-bar-operating levers consisting of strips of metal pivoted at their ends and their central portions being offset in opposite directions and arranged in the same plane, the levers at one side of the machine being arranged oppositely to those at the other side, and the crossing rear ends of the central levers being bent upwardly and downwardly, substantially as set forth.

13. In a type-writing machine, the combination of a series of levers pivotally supported at their ends, and having their central portions offset on each side of the pivot-line, keys resting on one of said offset parts, and type-bars resting on the other offset part whereby the weight of these parts is substantially balanced on the pivoted levers, substantially as set forth.

14. In a type-writing machine, the combination of a curved row of pivoted type-bars, and



a curved movable support acting to condense or bunch the ends of the bars and hold them in close contact for cleaning, substantially as set forth.

5 15. In a type-writing machine, the combination of a curved row of pivoted type-bars, and a curved support normally out of contact with the free ends of the bars, and adapted to be moved against the bars and concentrate them  
10 in a curve smaller than that of their normal position, substantially as set forth.

15 16. In a type-writing machine, the combination of an upright segment, a series of type-bars pivoted thereon and projecting horizontally in front thereof, and a curved support  
resting under the front ends of the type-bars and adapted to be raised to elevate the bars, substantially as set forth.

20 17. In a type-writing machine, the combination of a series of pivoted type-bars, a frame

supporting the same, and a type-bar-bunching device consisting of a curved piece of spring metal having ends adapted to spring into seats in the frame to retain the bunching device in either of two positions, substantially as set forth. 25

18. In a type-writing machine, the combination of an upright segment, a series of type-bars pivoted on and projecting in front thereof, a curved support adapted to condense the  
30 free ends of the type-bars and to move the central bars inwardly more than those at the ends of the segment, substantially as set forth.

Witness my hand this 7th day of August, 1903.

EMMIT G. LATTA.

Witnesses:

W. W. MILLER,

W. A. STEVENS.