(No Model.) 5 Sheets—Sheet 1.

N. R. MARSHMAN & L. S. BURRIDGE.

TYPE WRITING MACHINE.

No. 565,171. Patented Aug. 4, 1896.

Fig. 1

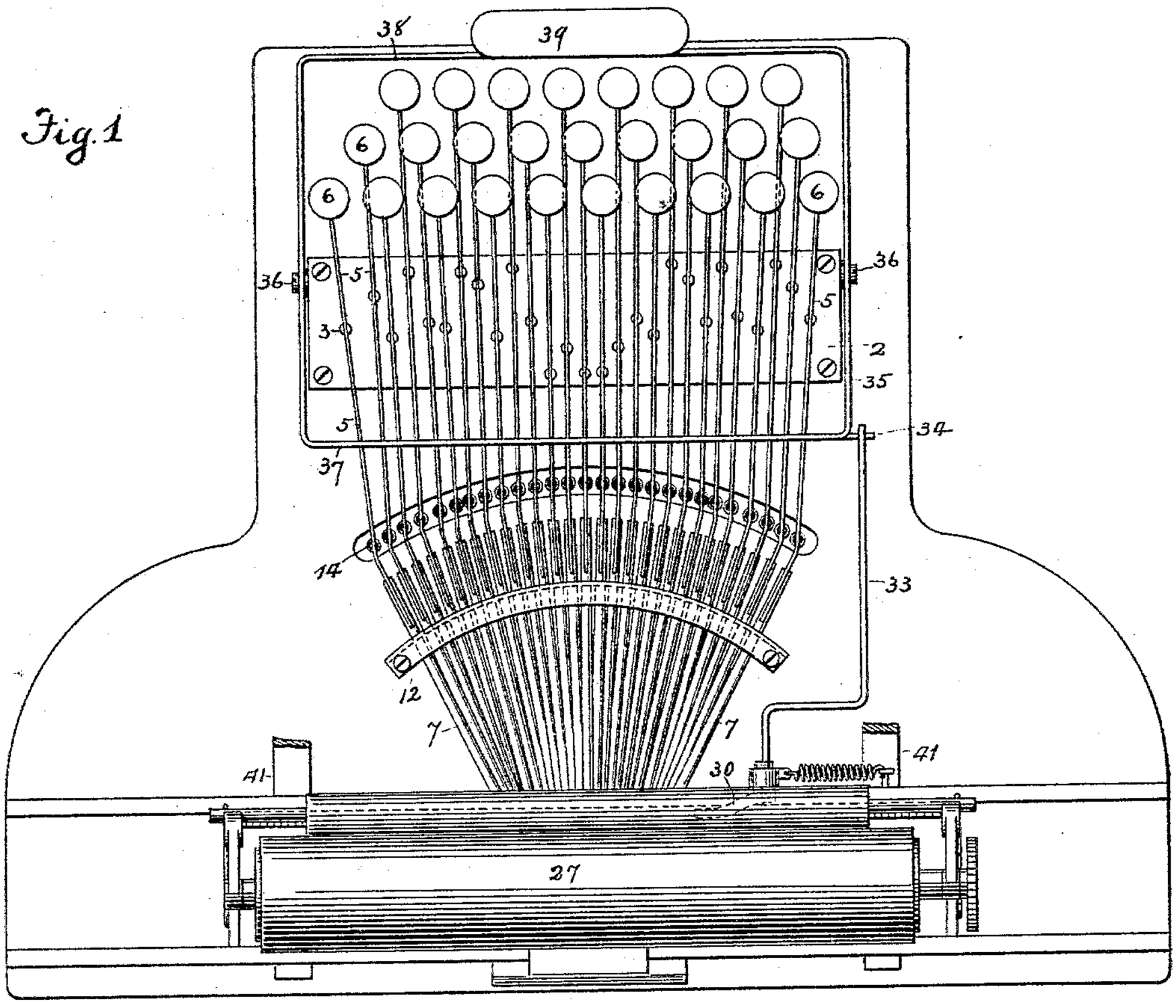
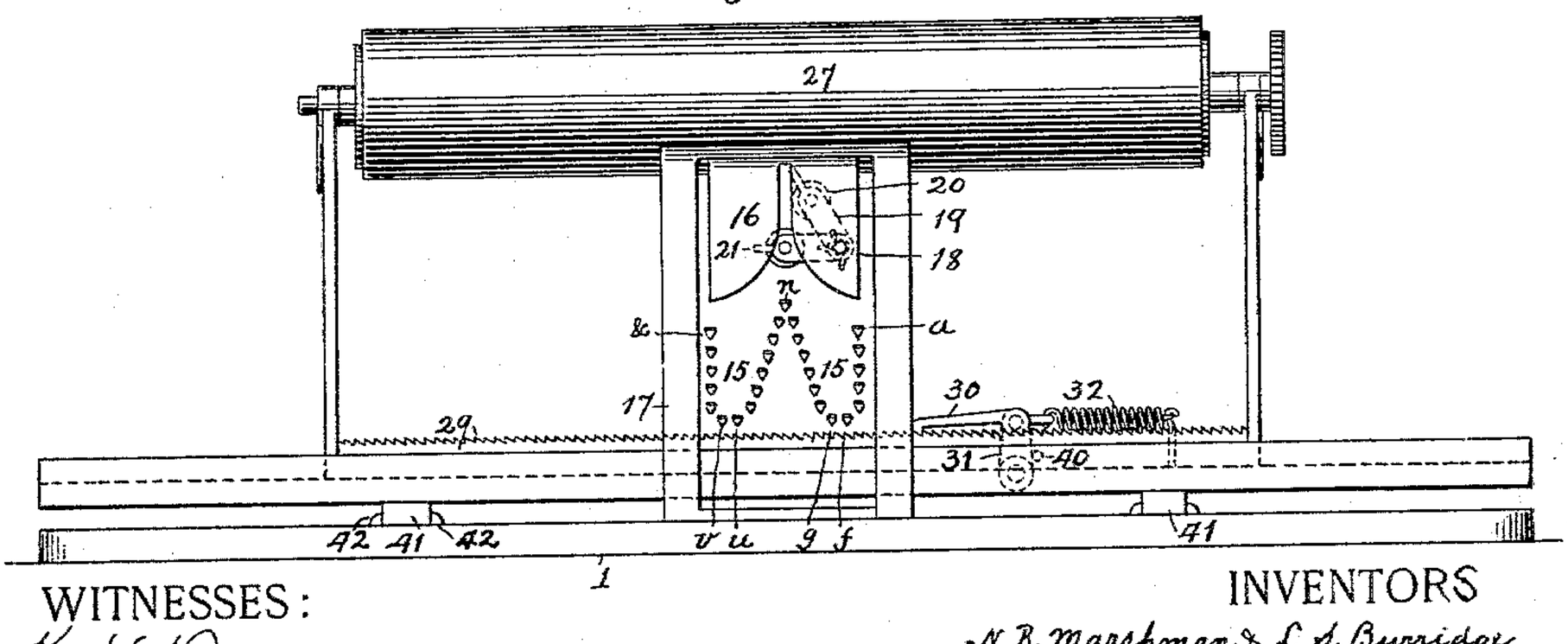


Fig. 2.



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By Attorney
Jacob Felbel

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N. R. MARSHMAN & L. S. BURRIDGE.

TYPE WRITING MACHINE.

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Fig. 3.

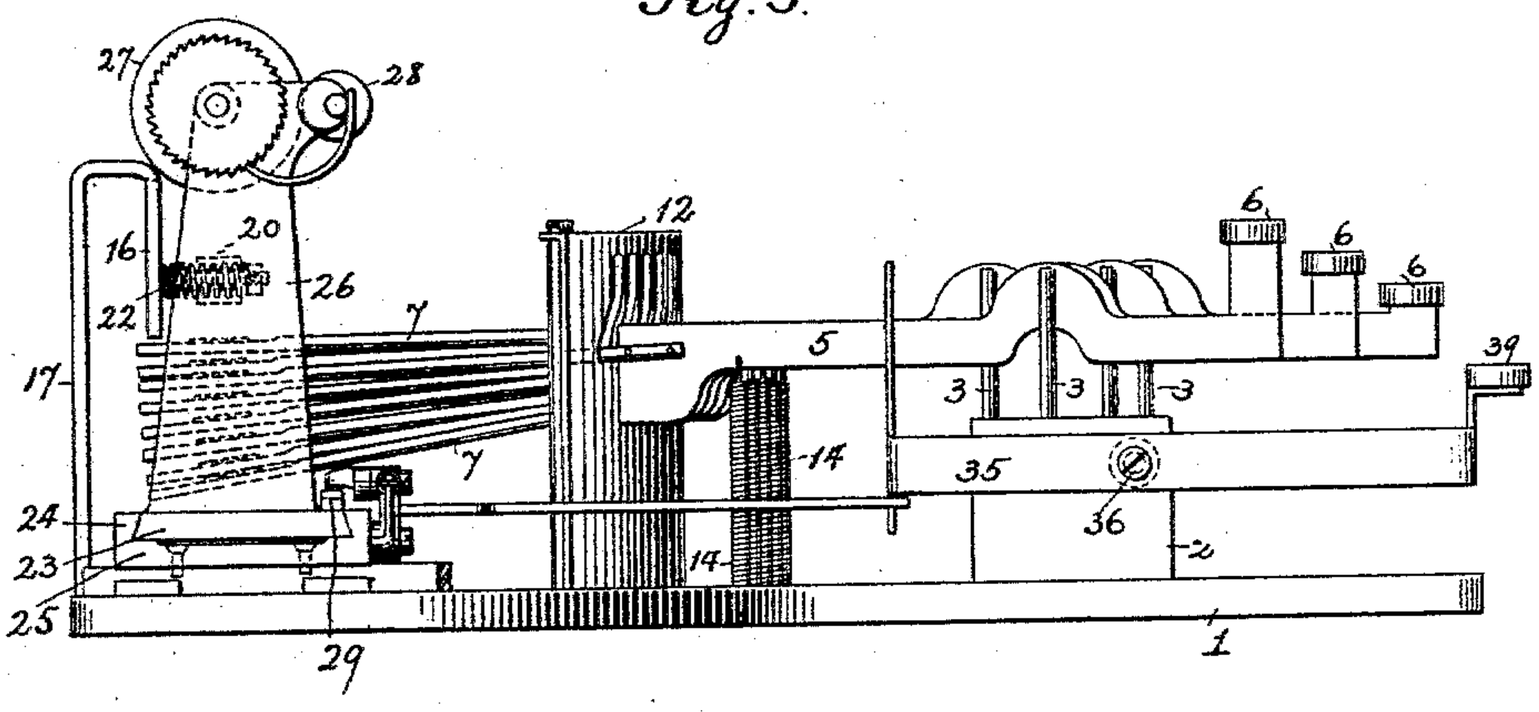


Fig. 4

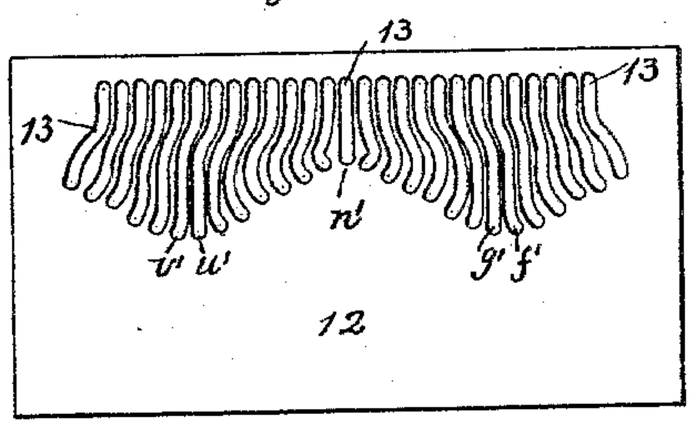
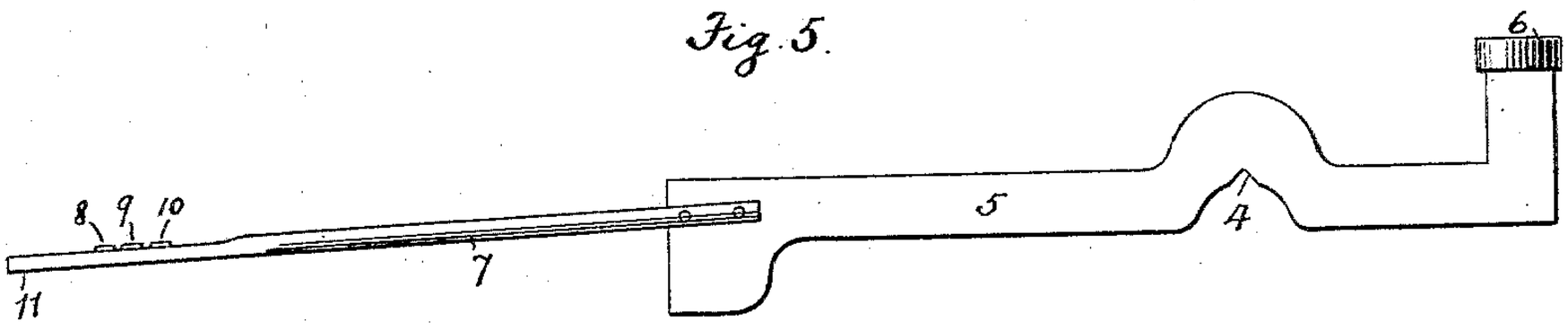


Fig. 5.



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TYPE WRITING MACHINE.

No. 565,171. Patented Aug. 4, 1896.

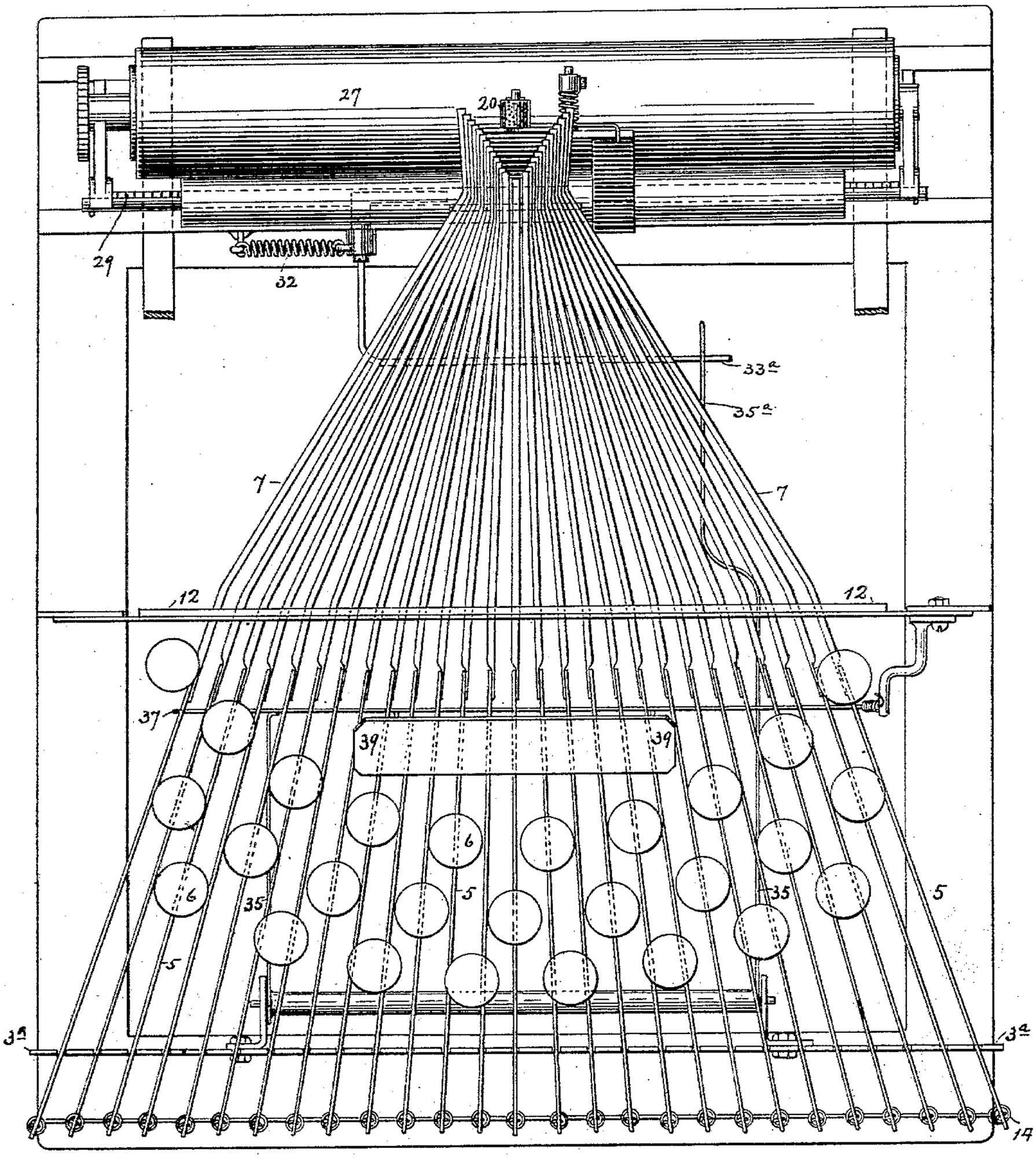

Fig. 6.

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TYPE WRITING MACHINE.

No. 565,171. Patented Aug. 4, 1896.

Fig. 7.

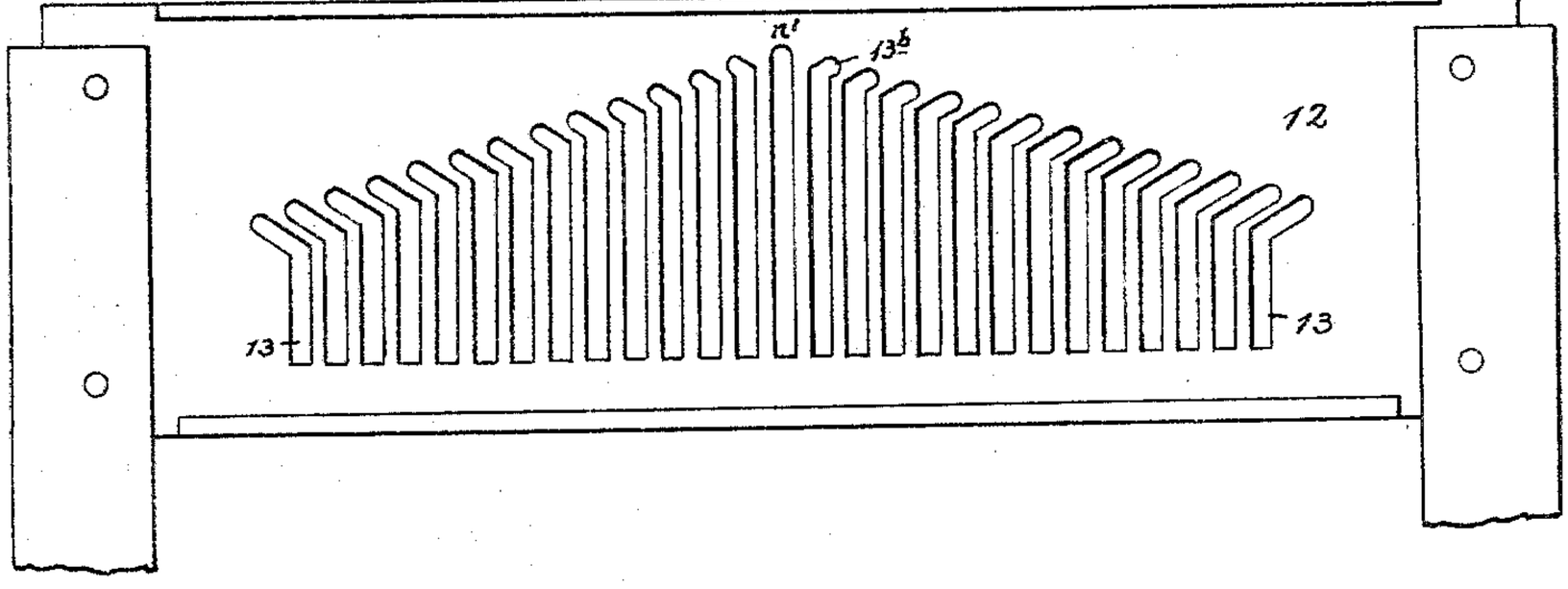


Fig. 8.

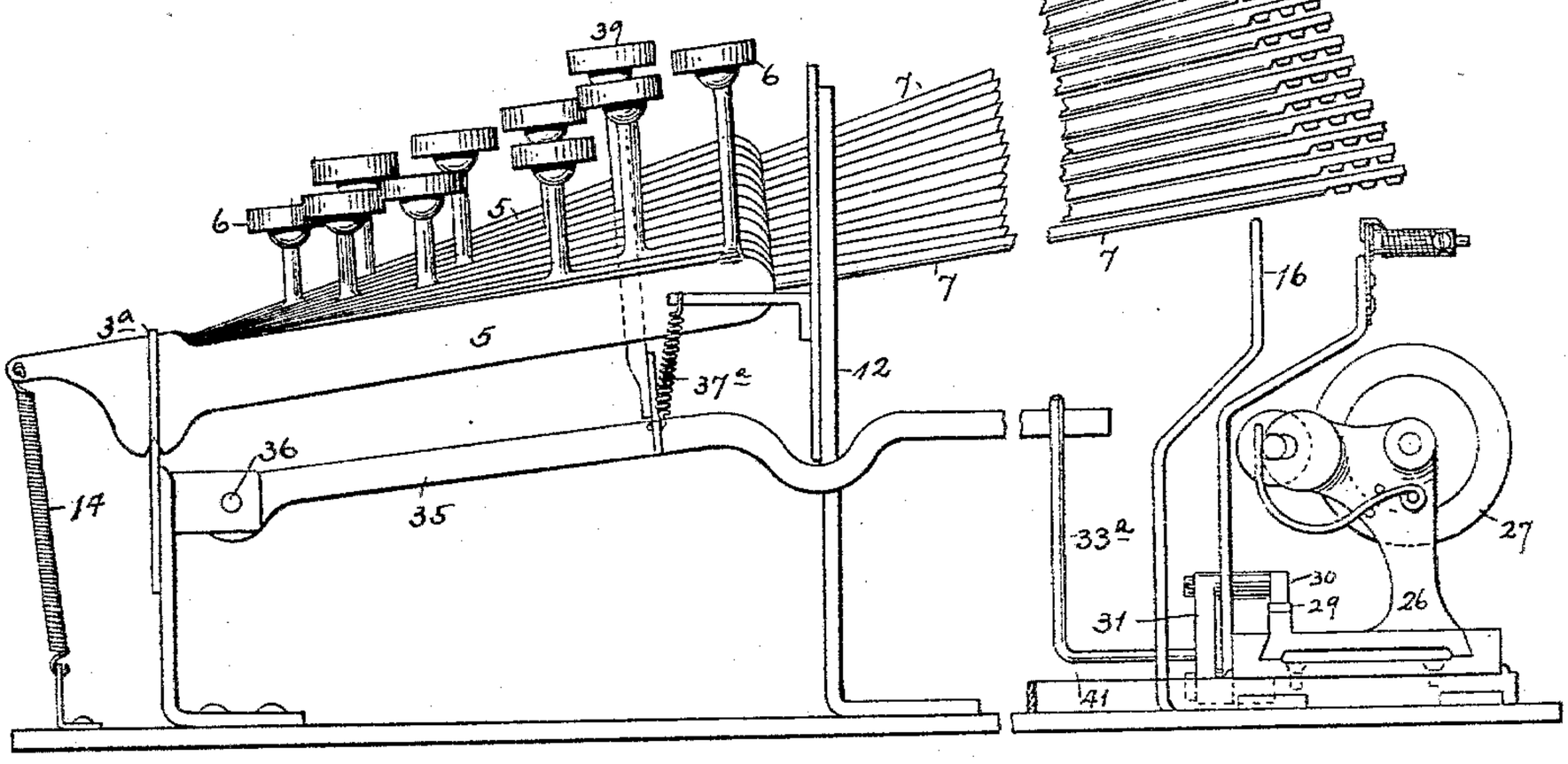
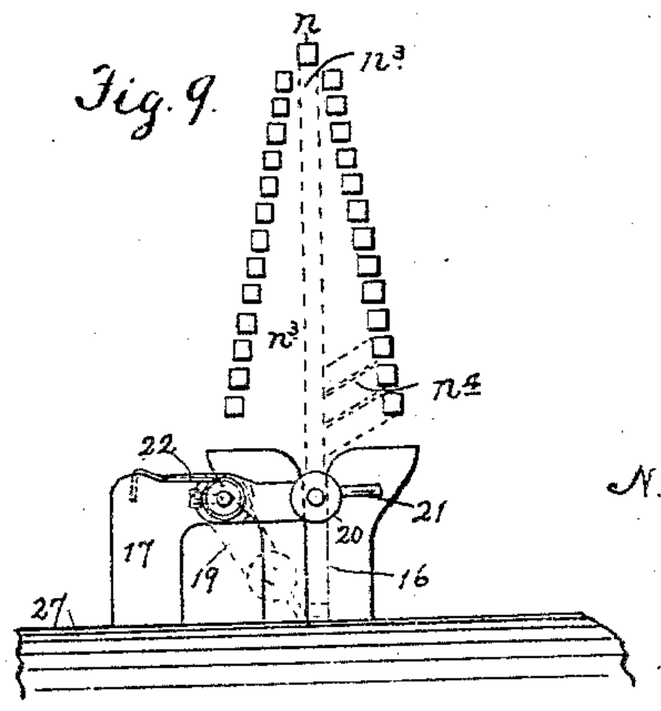


Fig. 9.



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TYPE WRITING MACHINE

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Fig. 10.

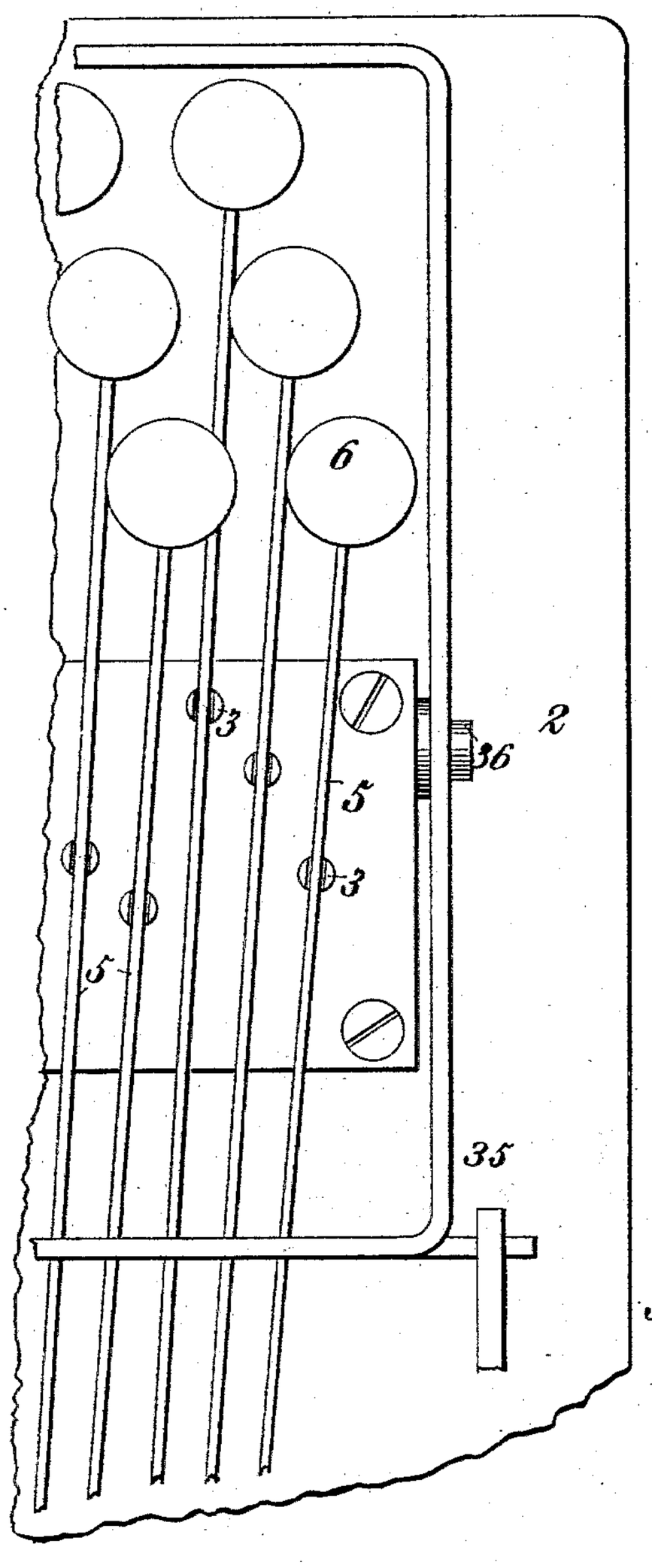
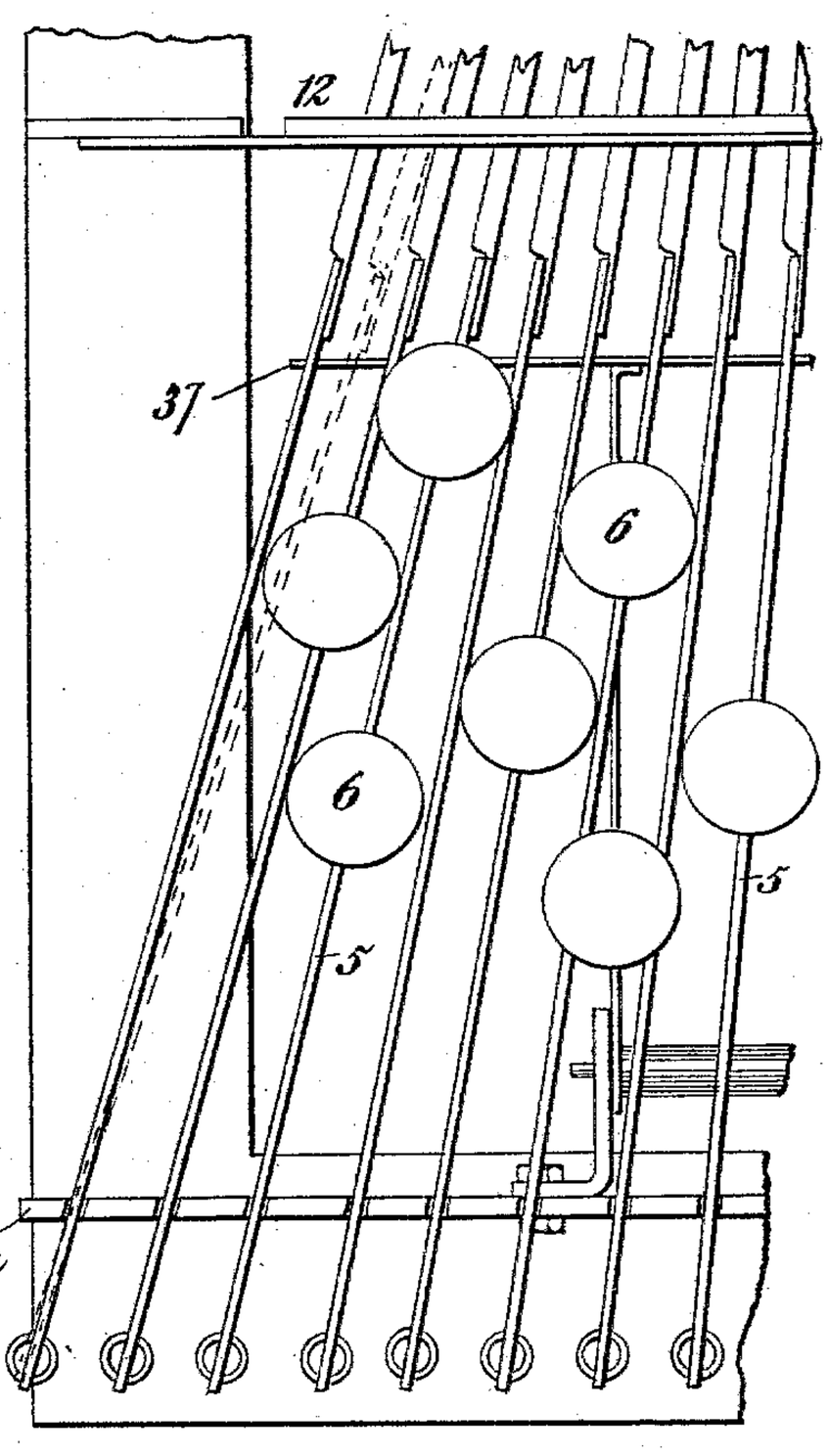


Fig. 11.



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UNITED STATES PATENT OFFICE.

NEWMAN R. MARSHMAN AND LEE S. BURRIDGE, OF NEW YORK, N. Y.,
ASSIGNORS TO HALBERT E. PAYNE, OF SAME PLACE.

TYPE-WRITING MACHINE.

SPECIFICATION forming part of Letters Patent No. 565,171, dated August 4, 1896.

Application filed October 11, 1895. Serial No. 565,341. (No model.)

To all whom it may concern:

Be it known that we, NEWMAN R. MARSHMAN and LEE S. BURRIDGE, citizens of the United States, and residents of New York city, in the county of New York and State of New York, have invented certain new and useful Improvements in Type-Writing Machines, of which the following is a specification.

Our main object is to provide a small, simple, and low-priced type-writer, but one capable of doing first-class work and operable with both hands in a manner similar to the larger high-priced standard machines.

In carrying out our improvements we connect the type bars or carriers directly with the keys, and employ guides or directing means for the type-bars. The said guides or directing means are preferably formed in a transverse plate arranged between the keys and the type ends of the carriers. After passing the guiding means in the transverse plate the type-carriers extend rearwardly either under or over the platen, according to whether the machine is of the bottom-strike plan or the top-strike plan. The type-carriers, between the guide-plate and the types, are bent or formed to converge, as they extend in the direction of the platen, and cause the grouping or nesting of the type-bearing ends of the carriers in the vicinity of the platen. The type-bars are preferably provided with a plurality of types and in connection therewith is used a shifting platen, all as will be hereinafter more fully described, in connection with other novel features.

Our improvements consist in various features of construction and arrangement, some of which have been referred to above, and all of which will be hereinafter more fully described, and particularly pointed out in the appended claims.

In the accompanying drawings, Figure 1 is a plan view of a type-writer embodying our improvements. Fig. 2 is a rear elevation of the same. Fig. 3 is a side elevation thereof. Fig. 4 is a plan of the guide-plate employed in the foregoing figures. Fig. 5 is a side elevation of one of the type-carriers and its attached key. Fig. 6 is a plan view of a type-writing machine, showing our improvements embodied therein in another form. Fig. 7 is a front elevation of the guide-plate employed in the last-mentioned machine. Fig. 8 is a side elevation of the machine shown at Fig. 6; and Fig. 9 is a detail view, taken at the rear of the machine, to illustrate the arrangement of the type-bars, the center guide, the inking-roller, &c. Fig. 10 is an enlarged plan view of a portion of the keyboard, &c., shown at Fig. 1; and Fig. 11 is a like view of the construction and arrangement shown at Fig. 6.

We will first describe the machine shown at Figs. 1 to 5, inclusive.

In the various views the same parts will be found designated by the same numerals of reference.

1 designates the bed-plate, upon the forward portion of which is secured a block or bracket 2, from which rise a series of vertically split or slotted fulcrum-posts 3, to receive each the fulcrum portion 4 of the type-carrier 5, 6, and 7.

The part 5 of each type-carrier is preferably made from sheet metal and is provided at its outer end with the finger-piece, button, or key 6. To the opposite end is preferably riveted the bar portion 7, bearing in this instance at near its free end three types 8, 9, and 10, arranged on the side of the bar. Beyond the types the bar is extended, as at 11, for a purpose which will hereinafter appear. The type portion is preferably made of a round wire rod. Since the type-bearing portion 7 and the sheet-metal key-bearing portion 5 are rigidly attached to each other, they may be regarded, as an entirety, as a key-bearing type-carrier; and also, since the type-carrier is made to work as a lever, it may be further designated as a "type-bearing key-lever," that is to say, a lever provided with a finger-key and also with a printing type or types. The lever may be of various orders, that shown in the views under consideration being a lever of the first order, the fulcrum being between the finger-key and the types. This order of lever is provided because the types are arranged to strike upwardly against the platen. If, however, the type-bearing key-lever should be arranged for striking down upon the platen, the finger-key would

be arranged between the fulcrum and the type-bearing end of the lever, as in Fig. 8, for example, where the levers are of the third class or order.

The type-bearing key-levers are loosely fulcrumed or mounted in or on the supports or fulcrum-posts 3, in order that they may have a slight lateral play or movement. (See Figs. 6, 10, and 11.) Between the ends of the carriers or key-levers is arranged a transverse guide-plate 12, which is secured to and rises from the bed-plate. This transverse guide-plate is provided with a series of vertical slots 13, one for each carrier or lever, and in which the round rod-like portion 7 thereof is adapted to work. As will be seen by reference to Fig. 4, these slots vary in shape and length on each side of the straight vertical central slot. The upper ends of all of the slots terminate in the same horizontal plane, and at this locality they are practically straight and parallel. From the upper portions the slots curve irregularly downwardly, and their curved or bent portions act to guide or deflect the bars laterally and direct them in their proper paths on the way to the platen.

Each carrier or lever is provided with a spring 14, which holds the rod portion 7 normally down at the bottom of its slot. Referring more particularly to Figs. 2 and 3, it will be seen that the rod portions 7 occupy different vertical and horizontal planes, and at Fig. 2 it will be observed that the grouping or disposition of the type ends of the rods is such that when viewed from the rear side of the machine their extremities exhibit a figure substantially in the form of the letter **W**. A further examination of this view will also disclose that on both the right and left hand sides there are five rods arranged one directly over the other perpendicularly to the platen and two rods at the lower right and left portions of the figure arranged side by side in the same horizontal plane. Moreover, that at the top of the figure, about centrally thereof, is a single rod, while extending diagonally down therefrom on either side is a column of six additional type rods or bars. Between the contiguous perpendicular and oblique columns or rows of rods on each side is a space or passage-way 15 for the type-rods of that side.

The **W** form of nesting or grouping shown at Fig. 2 is produced by the bends in the rods 7 and by the various lengths and arrangement of the slots 13. The rod *n*, standing highest in the series, occupies the shortest slot, as *n'*, and being directly in line with the impression-point this slot is made straight or parallel sided. The rods *f*, *g*, *u*, and *v*, standing lowermost in the series, occupy the longest slots *f'*, *g'*, *u'*, and *v'*. Twenty-seven rods and twenty-seven slots are shown, and each rod is shown provided with three types, as a capital letter, a small letter, and a numeral or punctuation mark or other sign. The lower-case letter is preferably arranged in the middle. The type-bearing ends of the rods 7 are preferably made triangular in cross-section, as shown, for the purpose of enabling the bars to more readily clear one another in their movements to and from the platen, and for the further purpose of admitting of the grouping of the bars in as small a space as possible, and thus reducing the key movement.

The extension 11 of each bar is adapted to coöperate with a central guide or directrix 16, depending from an arm or bracket 17, rising from the bed-plate. This center guide is made of a piece of sheet metal with a flaring mouth and with parallel sides, as shown more particularly at Fig. 2, whereby the ascending type-bar is caused readily to enter the mouth of the guide and then to be accurately directed by the parallel walls to the printing-point.

Pivoted at 18 on the center guide is an arm 19, bearing at its opposite end an inking-roller 20, whose vertical axis coincides with the vertical plane of the impression-point, so that the said roller may be struck by the types of the ascending bars and the necessary ink be thereby imparted to the types. The roller extends forwardly from the center guide and in the path of the types and is long enough to meet and ink all three of the types simultaneously. At the end of the arm 19 is a projection 21, against which bears the extension 11 of the type-rod at the printing moment, for the purpose of preventing the arm and the inking-roller from returning under the force of the spring 22 prior to the return of the type-bar. When the type-bar ascends and strikes the inking-roller the arm is vibrated and the inking-roller, carried up to the dotted-line position shown at Fig. 2, thus gradually swinging away from the types on the type-bar, which latter, ascending still farther to make the type-impression causes the extension of the type-bar to strike against the projection 21 on the under side of the arm and thus maintain the inking-roller in its upturned position until the type-bar is permitted to descend. As the type-bar descends the inking-roller returns simultaneously and automatically (by means of the spring 22) to its normal position. (Represented by the full lines of Fig. 2.)

The guide plate 12, as will be seen, is preferably made arc-shaped and struck from the printing-point as a center, which permits a closer grouping of the bars 7, the plate portions 5 being bent at their inner ends to radiate from the printing-point or aline with the radially-arranged slots 13 in the segmental guide-plate.

The paper-carriage may be of any desired construction. In the example shown there is a base-plate 23, adapted to slide in ways 24 in a shifting frame or support 25. From the base-plate 23 extends upwardly at each end a standard 26 to support a platen 27, feed-roller 28, and various other devices which

may be needed or desired in the complete machine. Running lengthwise of the bed-plate and secured thereto is a feed-rack 29, with which coöperates a feeding-pawl 30, pivoted to a rocker-arm 31 and having a compression-spring 32 for pulling the carriage along. From the rocker-arm extends forwardly a cranked arm 33, the free end of which rests upon an offset 34 on a quadrilateral lever-frame 35, pivoted at 36 to the block or bracket 2. The rear cross-bar 37 of said lever-frame overhangs the key-levers and constitutes the universal bar of the machine. To the front cross-bar 38 is attached a spacing-key 39. When a key-lever is depressed, the universal bar and the cranked arm are lifted and the driving-pawl 30 is moved one tooth of the rack toward the right, viewed from the front of the machine, the spring 33 stretching slightly at this time. When the key-lever is released, the spring operates to pull the pawl back and feed the carriage one step, this feed motion being limited by a fixed pin 40, which acts as a stop for the rocker-arm 31. When the spacing-key 39 is depressed and then released, the driving-pawl acts in a similar manner to feed the carriage.

The platen-carriage is adapted to move transversely in either direction from a central normal position, being mounted on slides 41, arranged at right angles to the base-plate 25, and having lateral guides 42, projecting upwardly from the bed-plate 1. To the slides may be attached any suitable key mechanism or handle for shifting the platen both rearwardly and forwardly. Any of the common means or constructions for shifting paper-carriages may be employed. Our present application does not relate to any improvement in this respect.

From what has already been said and from the following brief description of the mode of operation of the machine those skilled in the art will readily understand how to make and use a type-writing machine embodying our improvements.

When the finger 6 is pressed upon, the type-carrier is vibrated about the fulcrum post or support and the type-bearing end of the carrier is swung up to leave the impression of one of its types upon the paper on the platen, the type being preferably inked on its way thereto by the inking-roller, but, if desired, a ribbon may be substituted for the latter. In the ascent of the type the rod portion 7 is caused to follow the path laid out for it by the shape or contour of the slot which it occupies in the guide-plate. The central uppermost rod, as *n*, Fig. 2, swings straight up perpendicularly to the platen, while the rods on the right from *a* to *f* swing inwardly and upwardly, as do also the rods from & to *v*. The rods from *n* to *g* swing outwardly first and then inwardly and upwardly, and the rods from *n* to *u* also swing first outwardly and then inwardly and upwardly. The rods from *a* to *g* to *n* travel through the passage-way 15 on the right, (viewed from the rear,) while the rods from & to *u* to *n* travel through the passage-way 15 on the left in moving to and from the platen.

It will be observed that the side slots or guides are so disposed and shaped as that the initial movement of each rod is first toward the center of its passage-way 15, in order that it may escape contact with any rod which may be arranged above it, and in the return movement of the rod the reverse of this action takes place, so that while the rods are grouped together closely at their type-bearing ends they may move freely to and from the platen without contact or collision one with the other. It will be understood, of course, that when the finger-key is depressed the spring 14 is stretched, and when the key is released said spring returns the type-carrier to its normal position.

Referring now to Figs. 6 to 9, inclusive, it will be observed that the type-carriers are arranged to strike down upon the top of the platen, and that hence they are made in the form of a lever of the third order. It will also be observed that the type-carriers are grouped somewhat differently from those in the previously-referred-to figures, being, as shown at Fig. 9, arranged in a pyramidal or in an inverted-**V**-shaped form. In consequence of this disposition of the type-carriers the slots in the guide-plate are made or shaped somewhat differently from those shown at Fig. 4. Each type-carrier, as before, consists of a sheet-metal portion 5, a key 6, and a rod portion 7, bearing a plurality of types at its free end, and the portion 5 is fulcrumed upon a transverse vertically-arranged slotted plate 3^a and is capable of a slight sidewise movement in its slot or bearing to enable the type-bearing end of the rod to swing laterally in moving to and returning from the platen.

Extending transversely of the machine and secured to the bed-plate is a vertically-arranged guide-plate 12, having a number of slots 13, one for each type-carrier. As will be seen from Fig. 7, these guiding-slots are of gradually-decreasing length on each side of the central slot and are parallel for substantially their whole lengths. Each slot on each side of the central slot, as *n'*, is formed with a lateral bend 13^b, at the upper end of which the type-carrier 7 stands normally. These bends on each side of the center are substantially parallel, but of gradually-increasing length as they depart from the center. By this arrangement and formation of slots the type-carriers on each side of the center one are caused to first swing inwardly toward the center line n^3, Fig. 9, to escape adjacent bars, and then downwardly toward the platen. The central bar *n*, having a straight slot *n'*, travels perpendicularly to and from the platen. We have shown by the dotted lines n^3 the path of the central bar *n* and by other dotted lines n^4 the initial paths of a few

of the other type-bars. A spring 14 returns each type-bar to its normal position when the finger-key is released.

The paper-carriage may be constructed as before described and may be provided with a similar or other letter-spacing mechanism and with a like center guide 16 and inking mechanism.

In the machine under consideration the spacing-key 39, as shown at Fig. 6, is arranged back of the finger-keys or nearer the guide-plate and is attached to a universal bar 37, underlying the type-carriers and extending across the keyboard. To this universal bar is attached one end of a returning-spring 37^a, whose opposite end is attached to a bracket projecting forwardly from the guide-plate. The universal bar is part of a quadrilateral lever-frame 35, pivoted at 36 in brackets, and the right-hand bar of the lever-frame is prolonged at 35^a to extend back to an inclined bar 33^a, attached to the letter-space rocker-arm 31. When either a type-carrier or the spacing-key 39 is depressed, the arm 35^a depresses the arm 33^a and actuates the rocker-arm 31 and its spring-actuated driving-pawl in substantially the manner hereinbefore described.

While we have shown type-carriers provided with a plurality of types and a shifting platen, we do not wish to be limited to a machine of this description, since our improvements may be carried out in a machine wherein the type-bars have each only one type and where the platen is a non-shifting one, and also, while we have shown two modes or forms of grouping of the type-carriers, we do not wish to be limited specifically thereto unless otherwise indicated in the claims, since it will be apparent that numerous modifications in this respect may be made by those skilled in the art. We, however, regard the particular form of grouping shown at Fig. 2 as the best, since a smaller, lower, and more compact machine may thereby be made and one in which the keyboard may be more condensed or made narrower and more presentable, while at the same time the key movement may be made more nearly uniform for all of the type-carriers.

It will be observed that the type-bearing portions of the levers occupy different vertical and horizontal planes; that the guide-slots are of varying lengths, terminating variably at one end and substantially uniformly at the opposite end; that the type-bearing portions normally occupy the variably-terminating ends of the slots, and that the grouping in different planes is thereby determined, and that the slots are closely arranged and occupy a space or transverse area very much less than that occupied by the fulcrums of the levers, thereby assisting in the bunching of the type-bearing ends of the latter.

What we claim as new, and desire to secure by Letters Patent, is—

1. In a type-writing machine, the combination with a platen, of a series of swinging type-carriers grouped in different horizontal and different vertical planes at their type-bearing ends, and guides of different lengths for determining the planes of groupment of the type-bearing ends and for deflecting or moving them laterally when actuated to swing toward the platen; substantially as set forth.

2. In a type-writing machine, the combination with a platen, of a series of rigid, bent, and grouped type-bearing key-levers having lateral motion on their fulcra, and means for guiding the same arranged between the keys and the type-bearing portions of the lever; substantially as set forth.

3. In a type-writing machine, the combination with a platen, of a series of rigid, levers provided each with a finger-key and also with type, the said levers between their fulcra and their type-bearing ends being bent or pitched toward the plane of the printing-point and grouped in the vicinity of the latter, and a transverse guide-plate having means for deflecting the said bent, rigid, key and type-bearing levers; substantially as set forth.

4. In a type-writing machine, the combination with a platen, of a series of rigid fulcrumed and laterally-swinging type-carriers converging and grouped at their ends and terminating in different horizontal planes, and means for determining said planes and for individually guiding said type-carriers; substantially as set forth.

5. In a type-writing machine, the combination with a platen, of a series of rigid swinging type-carriers disposed substantially as set forth at their type-bearing ends and laterally movable on their fulcra, and a transverse plate provided with a series of guiding-slots for said type-carriers; substantially as set forth.

6. In a type-writing machine, the combination with a platen, of a series of rigid, laterally-movable type-carriers fulcrumed between their ends and provided with horizontally-arranged finger-keys at their outer ends and converged at their type-bearing ends and disposed in different horizontal planes on each side of a vertical plane passing through the impression-point, and means for moving the type-bearing ends of said carriers first into said vertical plane and then guiding the same therein to the impression-point; substantially as set forth.

7. In a type-writing machine, the combination with a platen, of a series of rigid, bent, laterally-movable key-levers bearing types at their sides and grouped substantially as set forth, and arranged in different horizontal and vertical planes at their type-bearing ends in the vicinity of the printing-point of the platen, a center guide common to all of said type-bearing key-levers, and a series of guides of different lengths, one for each type-bearing key-lever; substantially as set forth.

8. In a type-writing machine, the combina-

tion with a platen, of a center guide, a series of rigid type-bearing key-levers grouped substantially as set forth by bending between their fulcra and type ends and laterally movable on their fulcra, and a transverse slotted guide-plate; substantially as set forth.

9. In a type-writing machine, the combination with a platen, of a center guide, a series of rigid, bent, type-bearing key-levers grouped in different vertical and horizontal planes, and provided with extensions beyond the types adapted to said center guide; substantially as set forth.

10. In a type-writing machine, the combination with a platen, of a series of rigid type-bearing key-levers bent and grouped substantially as set forth and having lateral motion on their fulcra, and comprising a plate portion, and a rod type-bearing portion, and a transverse guide-plate having a series of slots for said rod portions; substantially as set forth.

11. In a type-writing machine, the combination with a platen, of a series of rigid type-bearing key-levers loosely mounted or laterally yielding on their fulcra, and bent at their type-bearing ends to form a group in the vicinity of the printing-point and means for forcing them bodily laterally in their swinging movements; substantially as set forth.

12. In a type-writing machine, the combination with a platen, of a series of swinging type-bearing key-levers, means for guiding the same, and an inking-roller mounted on a spring-actuated arm having a projection adapted to be engaged by the type-bearing ends of the key-levers; substantially as set forth.

13. In a type-writing machine, the combination with a shifting platen, of a series of rigid type-bearing key-levers bent grouped and guided substantially as set forth and laterally movable on their fulcra, and having each a plurality of types; substantially as set forth.

14. In a type-writing machine, a rigid type-bearing key-lever comprising a plate-like portion 5 having a fulcrum on which it is laterally movable and a finger-key, and a bent rod-like portion 7 having type at its free end; substantially as set forth.

15. In a type-writing machine, the combination of a platen, a transverse plate having a series of guide-slots of different lengths, the bottoms or rest ends of said slots terminating in different planes and the tops or printing ends of said slots terminating in substantially the same plane, and a series of swinging type-carriers grouped at their type-bearing ends in the vicinity of the impression-point, the said grouping being determined by the relative positions of said slots and their varying lengths; substantially as set forth.

Signed at New York city, in the county of New York, and State of New York, this 9th day of October, A. D. 1895.

NEWMAN R. MARSHMAN.
LEE S. BURRIDGE.

Witnesses:
HALBERT E. PAYNE,
D. S. RITTERBAND.