

No. 694,073.

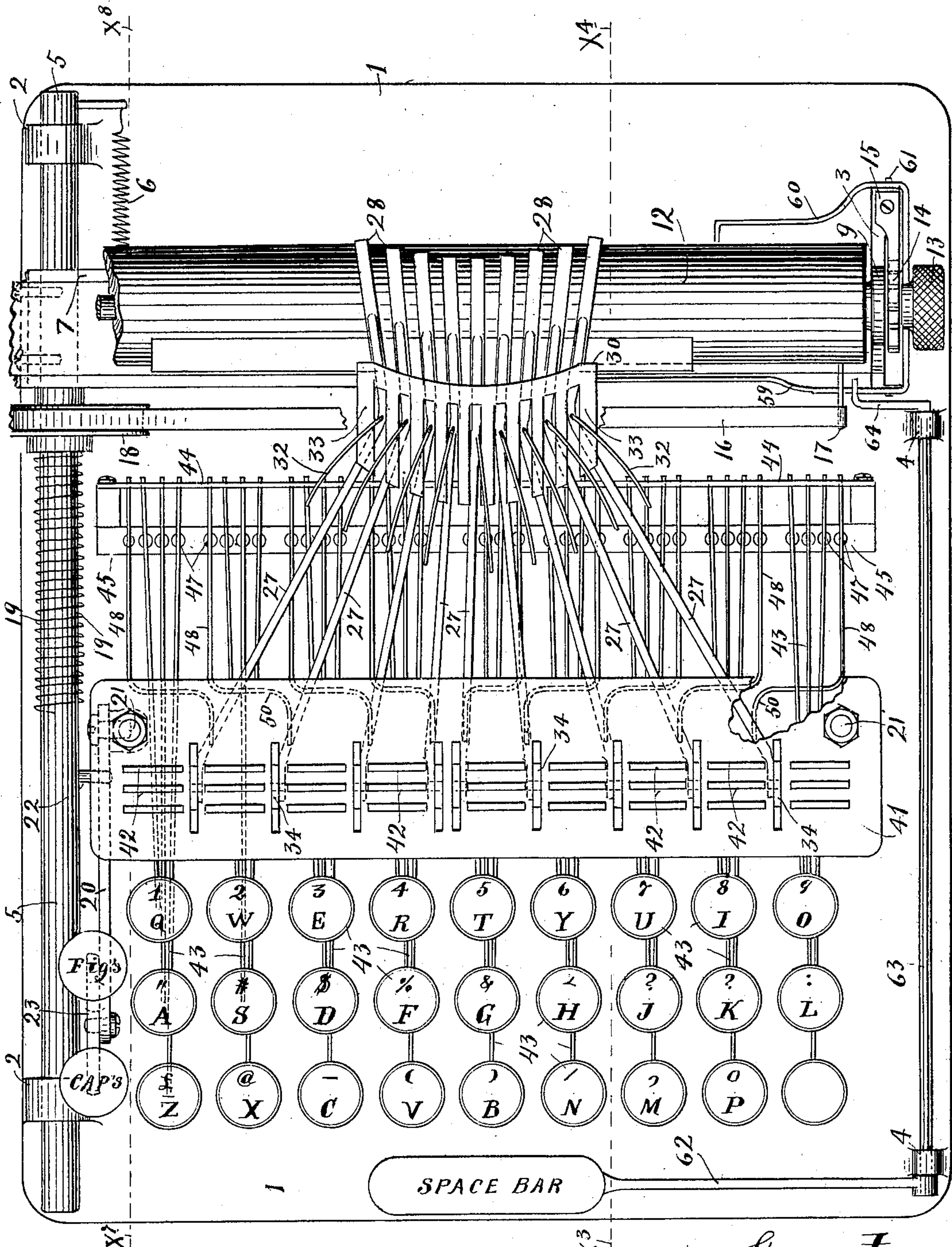
Patented Feb. 25, 1902.

C. E. PETERSON.
TYPE WRITING MACHINE.

(Application filed Oct. 4, 1900. Renewed Dec. 20, 1901.)

(No Model.)

5 Sheets—Sheet 1.



Witnesses
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Fig. 1.

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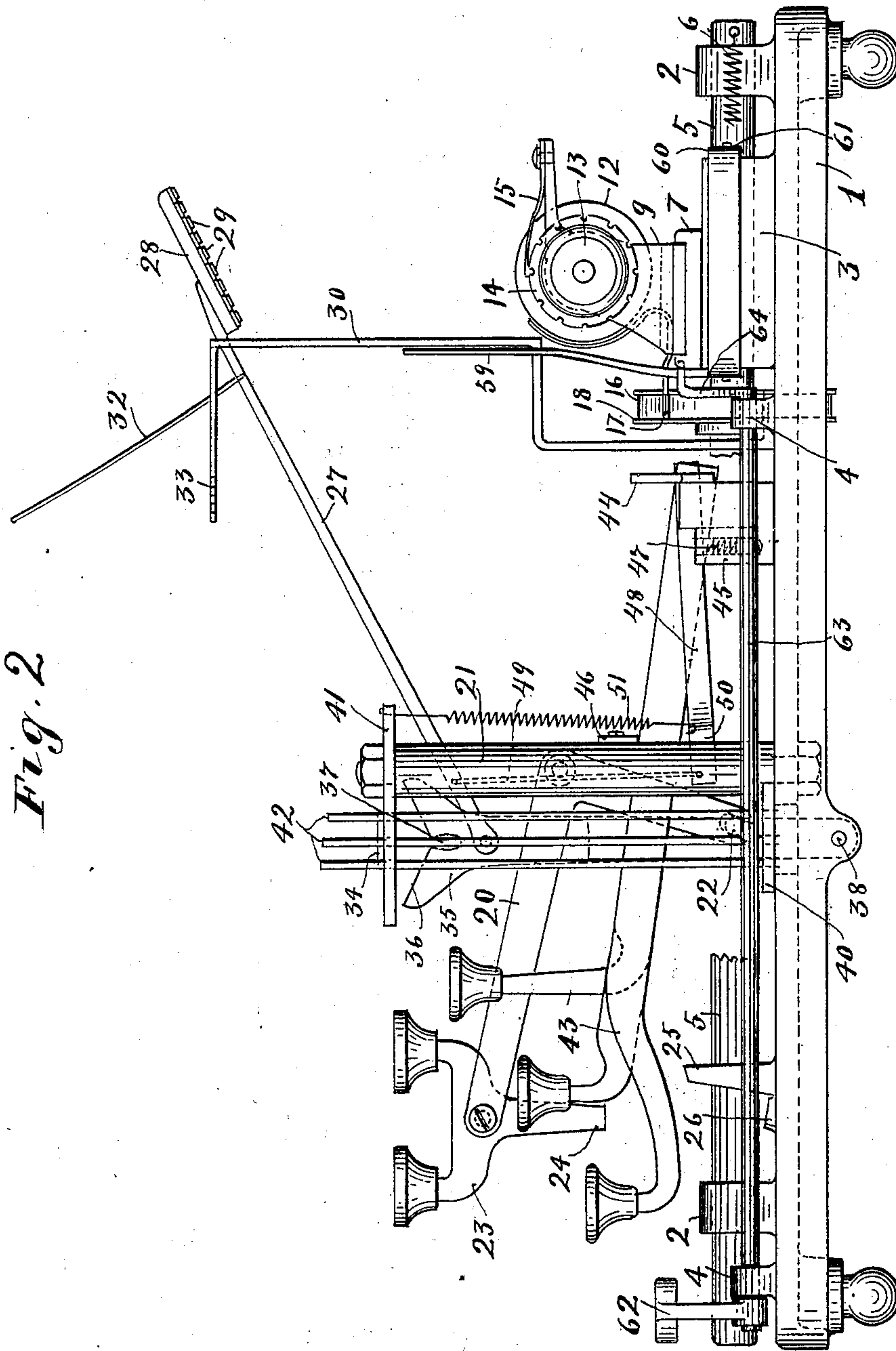


Fig. 2

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Fig. 7.

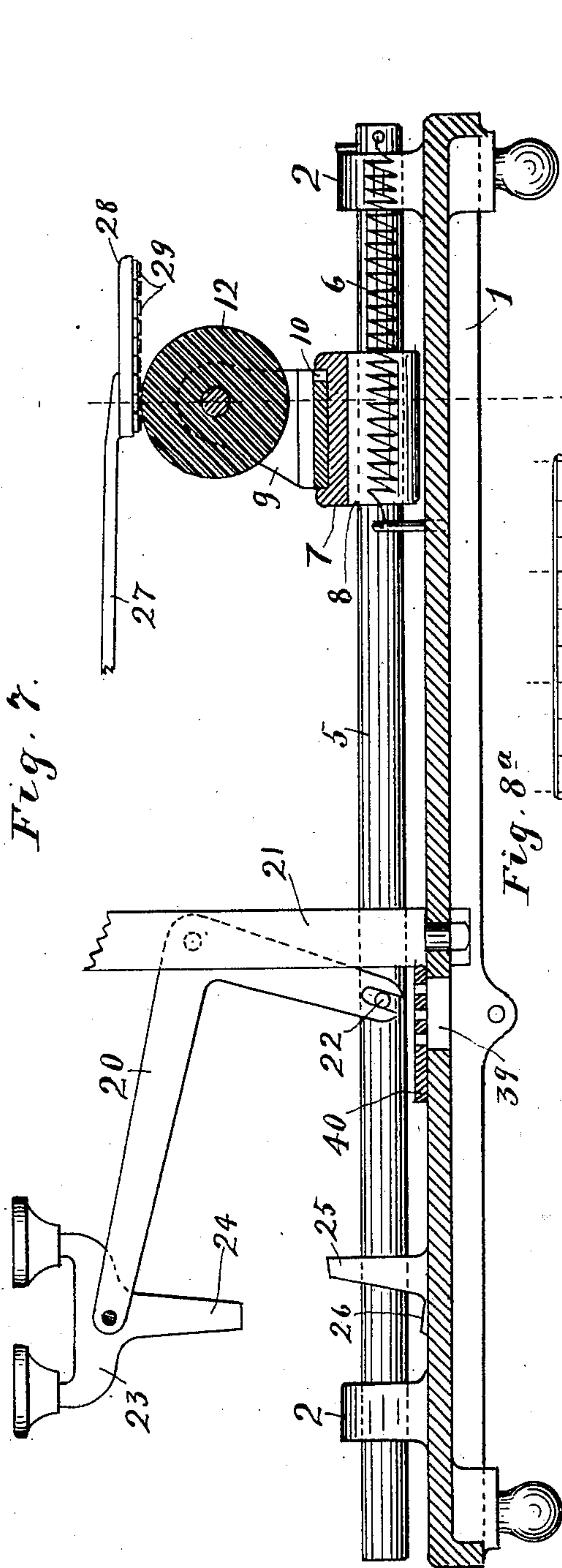


Fig. 8^a

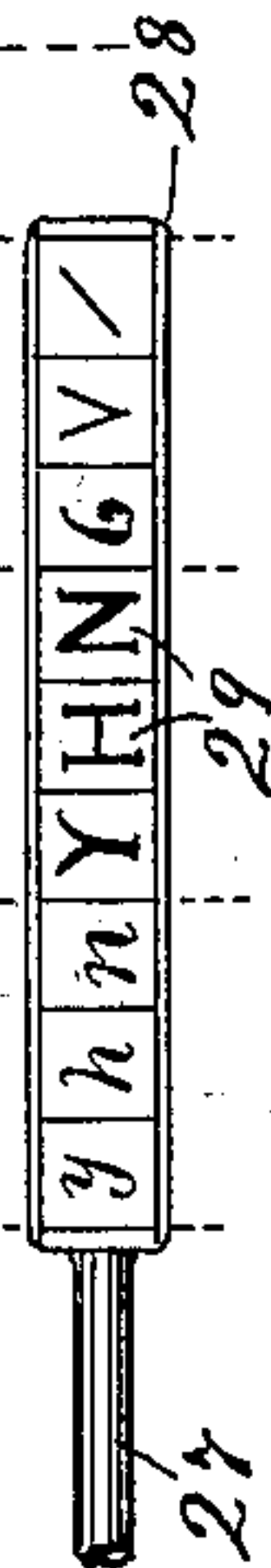
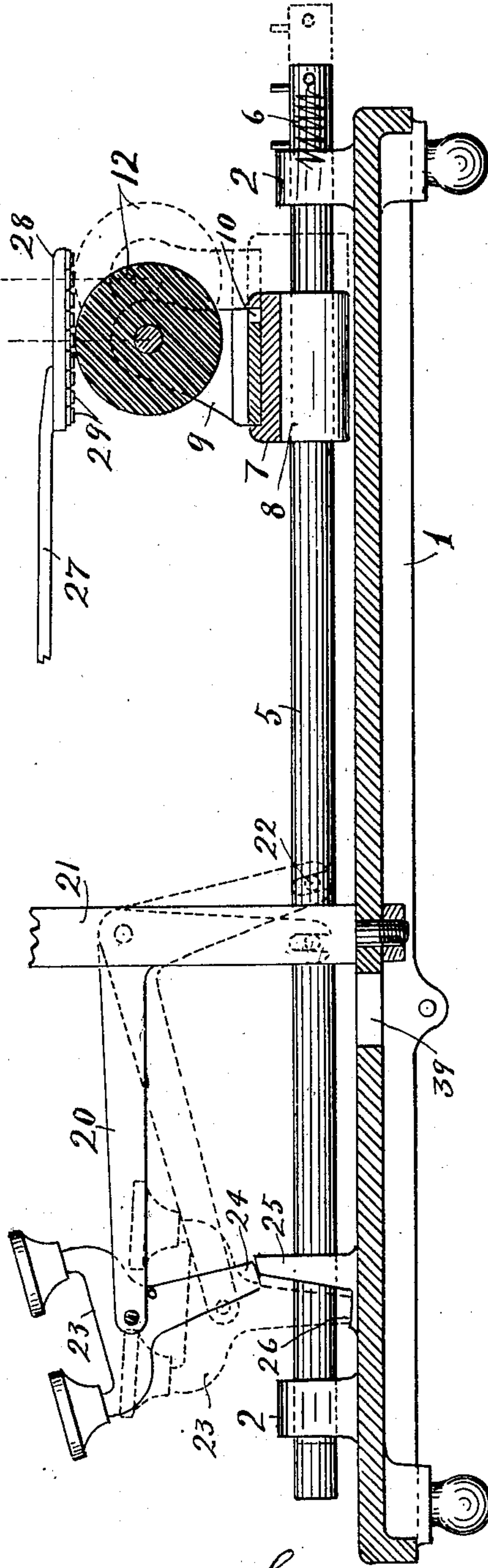


Fig. 8.



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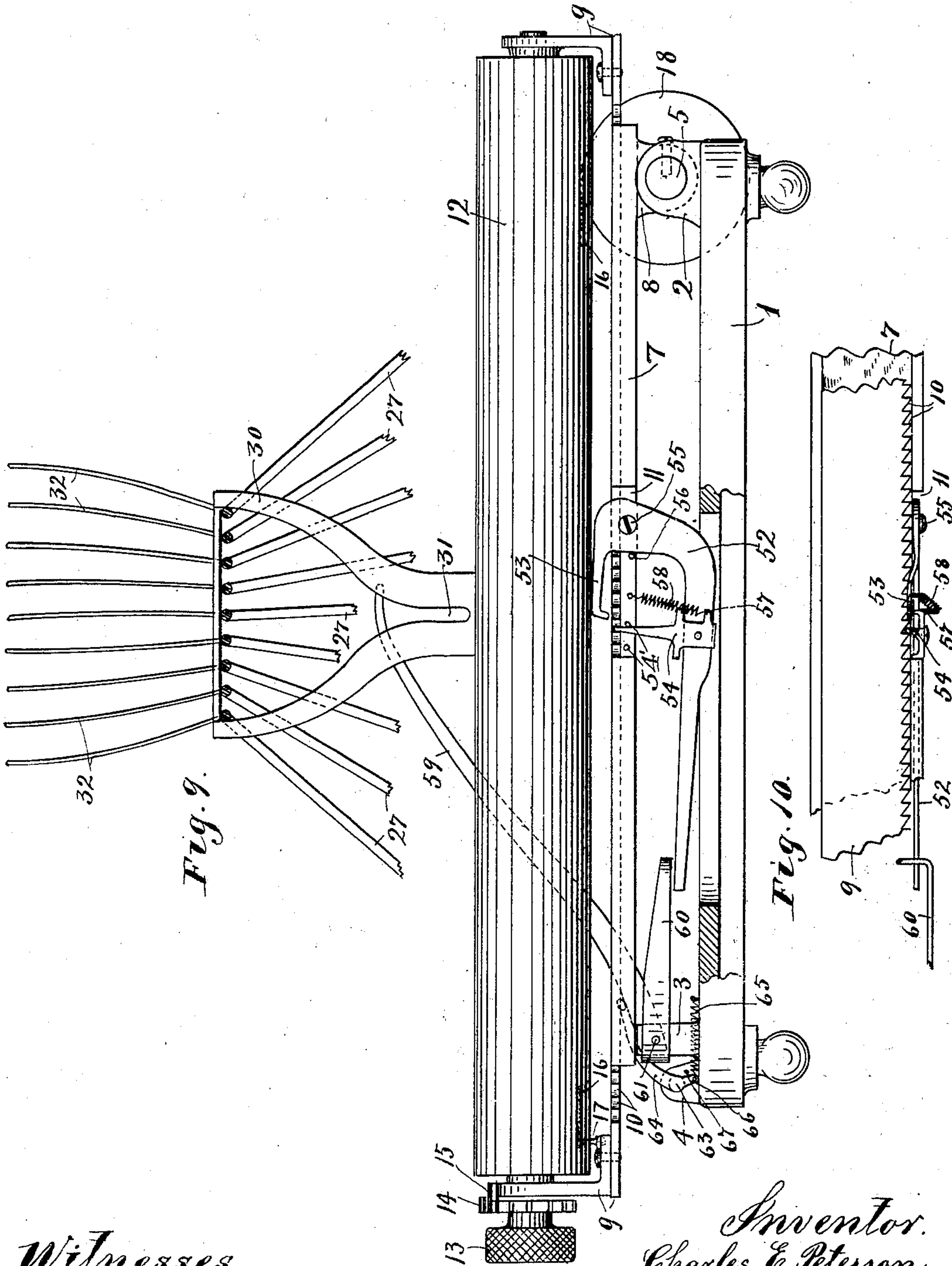
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5 Sheets—Sheet 5.



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UNITED STATES PATENT OFFICE.

CHARLES E. PETERSON, OF MINNEAPOLIS, MINNESOTA.

TYPE-WRITING MACHINE.

SPECIFICATION forming part of Letters Patent No. 694,073, dated February 25, 1902.

Application filed October 4, 1900. Renewed December 20, 1901. Serial No. 86,710. (No model.)

To all whom it may concern:

Be it known that I, CHARLES E. PETERSON, a citizen of the United States, residing at Minneapolis, in the county of Hennepin and State of Minnesota, have invented certain new and useful Improvements in Type - Writing Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My present invention has for its object to provide a simple and efficient type-writer of small cost.

To the above ends the invention consists of the novel devices and combinations of devices hereinafter described and defined in the claims.

The following is a brief statement of the more important features of my present invention.

The type-bars, which are mounted for swinging movement to produce the impressions, are pivoted, with nine type arranged in three groups of three type each, with the several groups appropriated to different classes of character. For instance, the first group may be appropriated to lower-case letters, the second group to upper-case letters, and the third group to figures and certain other characters. In principle the number of groups of type and the number of type in each group may be increased or decreased; but the arrangement above given seems to be the most advantageous. The platen-carriage is adjustable into any one of three positions, so as to bring the platen into the zone of movement of any one of the three groups of type on the actuated type-bar. This shifting adjustment of the platen-carriage may be given in any suitable way, but is best accomplished by a shifting-key and connections of novel construction, to be hereinafter described. Each type-bar is mounted on a shifting fulcrum, which is movable into any one of three positions to project the type-bar more or less and to thereby bring into action on the platen any one of the three type of the particular group into whose zone of movement the platen-roller is set. Shifting fulcrums for the type-bars are best afforded by vibrating

fulcrum-cams arranged in a series or group and spaced apart transversely of the machine.

The character-keys are arranged in groups of three, one group for each type-bar and fulcrum-cam. In the best arrangement of the mechanism each character-key operates a slide or reciprocating part, and the slides for a given group of three keys are arranged in corresponding groups, with the members spaced apart and located at different distances from the platen. The three slides of a given group are arranged for a differential cam action on the same vibrating fulcrum-cam, so that the particular slide which is depressed will project the type-bar more or less, according to the location of the slide with respect to the platen. Connections are also provided, of course, whereby the depression of any key of the group will give to the type-bar appropriated to that group its impression-stroke, and it will also of course be understood that it is during this impression-stroke that the so-called "fulcrum-cam" is shifted to variably project the type-bar. Other but minor novel features of construction will appear in the detail description.

The invention is illustrated in the accompanying drawings, wherein like characters indicate like parts throughout the several views.

Figure 1 is a plan view, with some parts broken away, showing a type-writer embodying my several features of improvement. Fig. 2 is a right-side elevation of the type-writer with some parts broken away. Figs. 3 and 4 are vertical sections taken on the line $x^3 x^4$ of Fig. 1, some parts being broken away and other parts being removed, said views illustrating different positions of the parts shown. Fig. 5 is a detail view taken approximately on the line $x^5 x^5$ of Fig. 3, some parts being broken away. Fig. 6 is a section taken on the line $x^6 x^6$ of Fig. 5, some parts being removed. Figs. 7 and 8 are vertical sections taken on the line $x^7 x^8$ of Fig. 1, some parts being broken away and other parts being removed, said views illustrating different positions of certain of the parts shown. Fig. 8^a is a detail view looking at the face of a type-holder and type held thereby, the type being represented by the characters which they will print instead of by the type as they

actually appear. Fig. 9 is a rear elevation of the type-writer, some parts being broken away and others removed; and Fig. 10 is a detail in plan showing a portion of the platen-carriage and its supporting-guide and showing also the carriage-feed escapement.

The bed-plate 1 of a type-writer, as shown, has cast integral with it a pair of plunger-guides 2, rest-lugs 3, and a pair of bearing-lugs 4, which parts project vertically from the top of said bed-plate 1 and serve purposes to be hereinafter noted. A sliding plunger 5 is loosely mounted in the plunger-guides 2 for a limited sliding movement from front to rear of the bed-plate 1, the same, as shown, being yieldingly held forward to its limit by a coiled spring 6, attached thereto and to the bed-plate 1. A carriage-support, which, as shown, is in the form of a transversely-extended bar 7, has a lug 8 at its left-hand end, which is rigidly secured on the plunger 5. The right-hand end of the supporting-bar 7 rests loosely upon and slides over the rest-lug 3, and on its upper face it is grooved to receive and form a runway for the base-bar of the platen-carriage 9. Unless otherwise stated "right" and "left" are herein given with respect to Fig. 1. At its rear edge the base-bar of the platen-carriage is provided with ratchet-teeth 10, and the rear central portion of the bar 7 is cut away at 11 to expose certain of the ratchet-teeth 10. The platen-carriage 9 is provided with an ordinary platen-roller 12, which, as shown, has an ordinary operating-knob 13 and notched retaining-wheel 14, with the latter of which a retaining-pawl 15 on the carriage 9 coöperates in the ordinary manner. The platen-carriage is yieldingly drawn toward the left, substantially as in standard machines, by means of a flexible strap 16, secured at one end, as shown, to a pin projection 17 from said carriage and secured at its other end to a spring-turned feed-wheel 18, loosely mounted on the plunger 5. As shown, the feed-wheel 18 is subject to a torsion-spring 19, secured thereto at one end and to the plunger 5 at its other end.

The novel device for shifting the platen-carriage into different adjustments from front to rear of the machine involves in its best form a bell-crank 20, pivoted at its elbow to the left-hand member of a pair of posts 21, rising from the bed-plate 1. The lower arm of this bell-crank is shown as connected to the sliding plunger 5 by a slot-and-pin connection 22. To the free end of said bell-crank is pivoted a double-headed key 23, provided with a depending finger 24, which is adapted for engagement with either one of a pair of stops 25 26, that rise to different heights from the bed-plate 1. Normally the parts stand as indicated in Figs. 2 and 7. When the forward head of the key 23 is struck and the bell-crank 20 depressed, the finger 24 engages the stop 25, and by the movement of the plunger 5 and support 7 the platen-carriage and platen are moved into the position

indicated by full lines in Fig. 8. On the other hand, when the inner or rear head of the shifting-key 23 is struck and the bell-crank 20 depressed the stop-finger 24 will be thrown into contact with the lower stop 26 and the platen-carriage and platen will be moved into the extreme positions indicated by dotted lines in Fig. 8.

The type-bars 27 are provided at their free ends with longitudinally-extended type-holders 28, in which the type 29, nine in number, are suitably secured. At their forward ends the type-bars 27 are pivotally fulcrumed each to one of the fulcrum-cams. The free ends of the type-bars 27 are embraced by a yoke-like guide 30, which has downwardly-converging cam-surfaces terminating in a centrally-depending alining-channel 31. The alining-channel 31 is of such width that it will admit to the printing-point only one type-bar at a time and will accurately aline the depressed bar. The type-bars are provided forward of the type-heads 28 with upwardly-projecting guide-fingers 32, which work through suitable guides afforded by a guide-comb 33, shown as formed integral with the prongs of the alining-guide and serving also as a stop against which the type-bars are normally pressed. The guide-fingers 32 extend on such lines that they freely permit the type-bars to be directed to the impression-point under the action of the alining-guide 30 and they serve to positively guide the type-bars back to their proper normal positions under the upward movements of the said type-bar.

The so-called "fulcrum-cams" to which the forward ends of the type-bars are pivoted, are in the preferred construction afforded by vibrating cam-supporting arms 34 provided with laterally-offset cam-plates 35, formed on their upper edges with converging cam-surfaces 36, that terminate in a lock notch or depression 37. As shown, the vibrating arms 34 are pivoted at their lower ends on a common rod 38, suitably supported from depending side flanges of the bed-plate 1. The bed-plate 1 is shown as cut away at 39 to afford clearance for the vibrating arms 34, and the said arms work freely in elongated seats formed in a pair of spacing-plates 40 and 41, the former of which is shown as secured to the bed-plate 1 and the latter to the upper end of the pair of posts 21. The cam-engaging slides 42, which, as above stated, are arranged in groups of three, are mounted to slide vertically through suitable seats formed in the spacing-plates 40 and 41, and they are provided with cam-engaging shoulders 42'. One or the other of the cam-surfaces 36 or the lock-notch 37 of a particular fulcrum-cam always stands directly under the shoulders 42' of the three slides 42 of the corresponding group.

The character-keys 43 are spaced apart by a pair of spacing-combs 44 and 45, both suitably supported from the bed-plate 1 and the

former serving as a fulcrum for the said keys. The keys are yieldingly held upward against a stop-bar 46, supported by the pair of posts 21, by light coiled springs 47, suitably seated in the lower spacing-comb 45. The key-levers are shown as passed each through a suitable seat formed one in each of the slides 42, as best shown in Fig. 5, and the said slides are cut away to afford clearance for the other two keys of the group. For each group of three keys there is a bail 48, the free end of which is connected, as shown, by a light link 49 to the corresponding type-bar 27. The bails 48 are, like the keys 43, spaced apart by the spacing-combs 44 and 45 and are fulcrumed on the said comb 44. Each bail 48 has a laterally-offset portion 50, which directly underlies the key-levers 43 of the corresponding group. Light coiled springs 51, which, as shown, are attached at their upper ends to the upper spacing-plate 41, are attached at their lower ends to the bails 48 and yieldingly hold the said bails, and consequently the type-bars, in their extreme uppermost positions.

The feed-escapement for controlling the movements of the platen-carriage comprises a bell-crank lever 52, the shorter arm 53 of which serves as the lock-pawl member of the escapement, and a slip-pawl 54, pivoted to the main arm of the said lever 52. The bell-crank lever 52 is pivoted to the supporting-bar 7, as shown at 55, in position for its pawl members to engage the ratchet-teeth 10 of the carriage where exposed at the gap 11 of said bar 7. As shown, the slip-pawl 54 is limited to a vibration between stops 54' on the bar 7. The pawl 54 is loosely pivoted to the bell-crank 52, so that it is free for sufficient lateral movement at its free end to slip over the ratchet-teeth 10 under the return movement of the carriage. As shown in Figs. 9 and 10, the slip-pawl 54 has a projection 57, which is located eccentric to and is also offset laterally outward from the pivotal connection between said pawl 54 and bell-crank 52. A light coiled spring 58, connected to the bar 7 and to the outer end of the pawl projection 57, yieldingly holds the bell-crank 52 upward, as limited by a stop 56 on the bar 7 or elsewhere, and further tends to hold the upper end of the said slip-pawl 54 in engagement with the ratchet-teeth 10 and against the left-hand stop 54', as viewed in Fig. 9. It may be here noted, however, that normally the greater tension of the carriage-feed spring 19 forces the upper end of said pawl 54 against the right-hand member of the said stops 54'. It is of course understood that whenever the free end of the long arm of the bell-crank 52 is depressed the escapement will be actuated.

The escapement-trip, which in this machine is actuated directly by the depressed type-bar instead of being operated directly by the depressed key, as in prior machines, is shown as in the form of a bail 59 60, which embraces the rest-lug 3 of the bed-plate 1 and is piv-

oted thereto, as shown at 61. The free end of the forward and longer arm 59 of the trip-bail extends close to the guide-yoke 30 and stands in the path of the depressed type-bar a considerable distance above the lower extremity of the contracted alining-channel 31. The outer and shorter arm 60 of the said trip-bail overlies the free end of the longer arm of the escapement bell-crank 52. Hence whenever a type-bar is depressed or makes its impression-stroke the arms of the trip-bail 59 60 will be depressed and the escapement will be actuated.

The space-bar 62 is secured to the forward end of a rock-shaft 63, which is mounted in the bearing-lugs 4 on the bed-plate 1. At its rear end the rock-shaft 63 is provided with an inwardly-projecting arm 64, the free end of which is offset and overlies the inner arm 59 of the trip-bail, so that when the space-bar is depressed the escapement will be actuated in the same manner as when a type-bar is depressed. The space-bar is yieldingly held upward in any suitable way; but, as shown, this is accomplished by a light coiled spring 65, secured at one end to the bed-plate and at its other end to a short arm 66 on the rear end of the rock-shaft 63, which arm is normally held against a stop 67 by the said spring.

In the illustration given the inking device has been omitted, inasmuch as the same forms no part of my present invention; but it will of course be understood that any suitable inking device may be employed.

Operation: The following is a summary of the operation: When lower-case letters are to be imprinted, the platen-carriage and the shifting-key are left in their normal positions. If the section-line $x^3 x^4$ (marked on Fig. 1) be noted, it will be seen that of the bank of keys shown in Figs. 3 and 4 the longest, the shortest, and the intermediate keys are those which if depressed while the platen is in its normal adjustment will respectively cause to be imprinted the lower-case letters "n," "y," and "h." Now directing attention to the detail view, Fig. 8^a, it will be seen that these letters, respectively, are the rearward, the forward, and the intermediate characters of the forward group of type of the corresponding type-bar. With this arrangement it follows that when the longest character-key of the said group is depressed, as shown in Fig. 3, the forward slide 42 will be drawn downward, and its shoulder 42' will engage the forward cam-surface 36 of the corresponding vibrating fulcrum-cam, thereby rocking said fulcrum-cam forward until the said shoulder 42' enters the lock-notch 37, thereby temporarily locking the said fulcrum-cam against movement in either direction. By this movement of the fulcrum-cam the corresponding type-bar is drawn forward, so that the character "n" will be brought to the impression-point on the platen-roller. Again, when the shortest member of the group of keys is depressed, as

shown in Fig. 4, the fulcrum - cam will be moved rearward to its extreme position and the type-bar will be projected, so that the letter "y" will be brought to the impression-point on the platen-roller. It will of course be understood that when the intermediate key of the group is depressed the fulcrum-cam will be moved under a similar action to its intermediate position, thereby projecting the type-bar in such position that the letter "h" will be brought to the impression-point on the platen-roller. Attention is here called to the fact that the vibrating fulcrum-cam has no normal position, properly speaking, but will remain set in the position in which it is left until again acted upon by the depression of a slide 42, the shoulder 42' of which stands out of line with the lock-notch 37. From this it follows that if the same character be struck twice in succession a second movement of the fulcrum-cam is not required. It is of course evident that when the shifting-key 23 is depressed, as indicated by full lines in Fig. 8 and in a manner already described, the platen-roller will be thrown to its intermediate adjustment, in which position it stands within the zone of movement of the intermediate group of type, embracing in the illustration given in Fig. 8 the capital letters "Y," "H," and "N." It will also of course be further understood that when the shifting-key 23 is operated as indicated by dotted lines in Fig. 8 and as already fully described the platen-roller will be shifted to its rear-most adjustment, in which position it will stand within the zone of movement of the group of characters "G," "A," and "Z." The manner in which the other movements of the various parts of the type-writer are given has already been clearly stated.

What I claim, and desire to secure by Letters Patent of the United States, is as follows:

1. In a type-writer, the combination with a type-bar having several type, of a vibrating cam serving as a shiftable fulcrum for said type-bar, a group of independently-mounted slides, operating on said cams, to shift said type-bar, and a corresponding group of keys for actuating said slides, substantially as described.

2. In a type-writer, the combination with a type-bar having several type, of a vibrating cam-arm serving as a shiftable fulcrum for said type-bar, and provided at its free end with diverging cam-surfaces, and a group of keys provided with parts which stand at different distances from the impression-point, and, when the keys are depressed, engage one or

the other of said diverging cam-surfaces and shift said type-bar, substantially as described.

3. In a type-writer, the combination with a type-bar having several type of a vibrating cam-arm serving as a shiftable fulcrum for said type-bar and provided at its free end with an alining-notch and diverging cam-surfaces, a group of independently-mounted slides located at different distances from the impression-point and operating on said cam-surfaces to position the selected type and with said alining-notch to aline said selected type, and a corresponding group of keys for actuating said slides, substantially as described.

4. In a type-writer, the combination with a type-bar having several type, of a vibrating cam affording a shiftable fulcrum for said type-bar, which cam is adapted to remain wherever last set, and a group of character-keys having a differential action on said cam, substantially as described.

5. In a type-writer, the combination with a type-bar, having several type, of a vibrating cam-arm serving as a shiftable fulcrum for said type-bar and having a lock-notch with diverging cam-surfaces, a group of character-keys, and a corresponding group of key-actuated slides located side by side and at different distances from the impression-point, for a differential action on the cam-surfaces and for locking engageable with the lock-notch of said vibrating cam-arm, to select and position the type, substantially as described.

6. In a type-writer, the combination with a platen, of an alining-guide, a plurality of type-bars cooperating with said guide and provided with guiding-fingers, and a series of finger-guides located side by side and through which the fingers of said type-bars work, substantially as described.

7. The combination with a platen, of an alining-guide, and a plurality of type-bars movable on different lines to and from the impression-point, said type-bars having projecting guide-fingers, and finger-guides through which said guide-fingers work, said guide-fingers permitting the alining movements of the bars, under the impression-stroke, and serving to guide said bars back to normal positions, the one standing out of the path of movement of the other, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

CHARLES E. PETERSON.

Witnesses:

ANNE S. READ,
F. D. MERCHANT.