

No. 895,996.

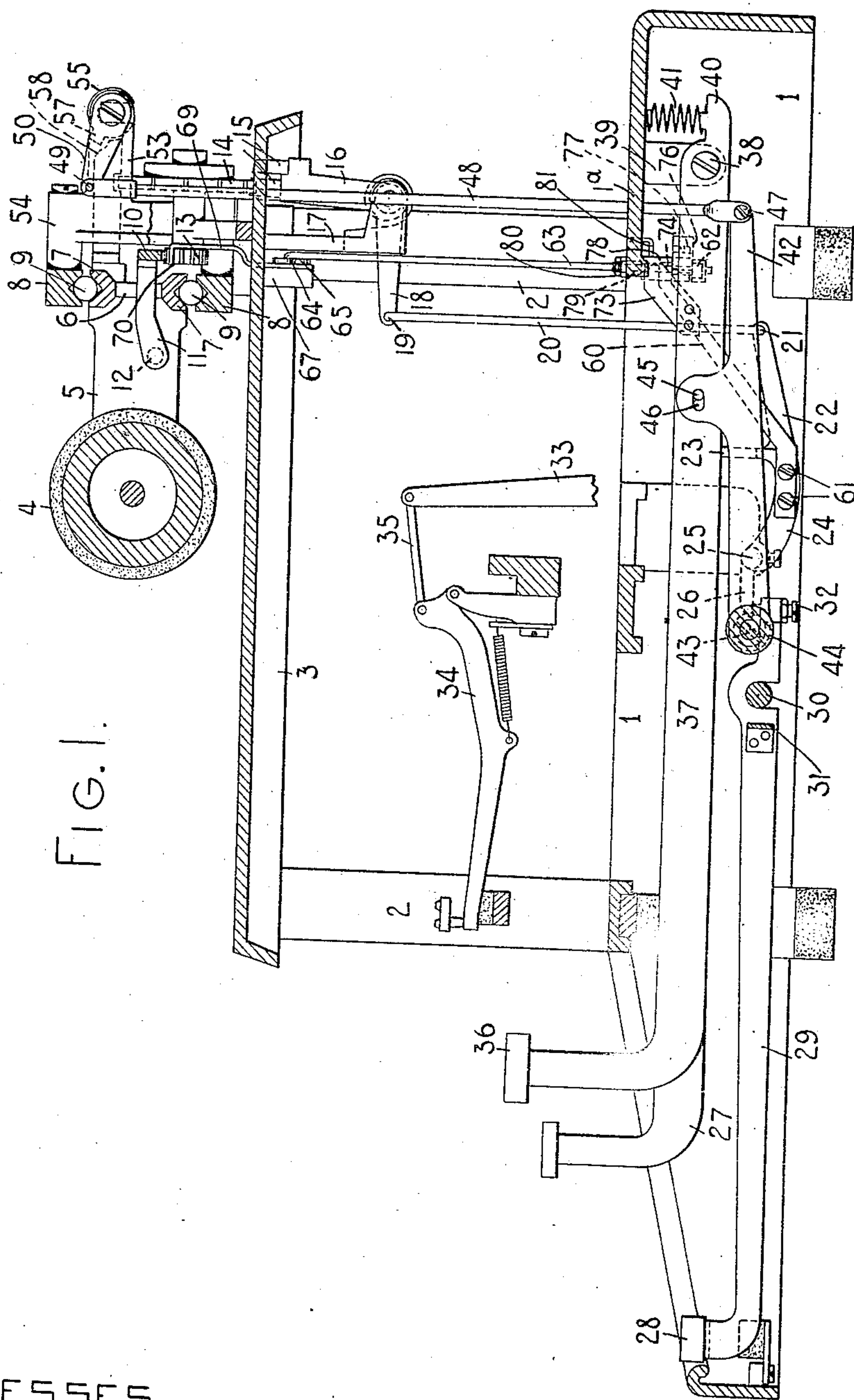
PATENTED AUG. 11, 1908.

J. FELBEL. PA  
TYPE WRITING MACHINE.

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APPLICATION FILED MAY 14, 1907.

5 SHEETS—SHEET 1.



WITNESSES:

M. F. Hammers

Charles F. Smith

INVENTOR

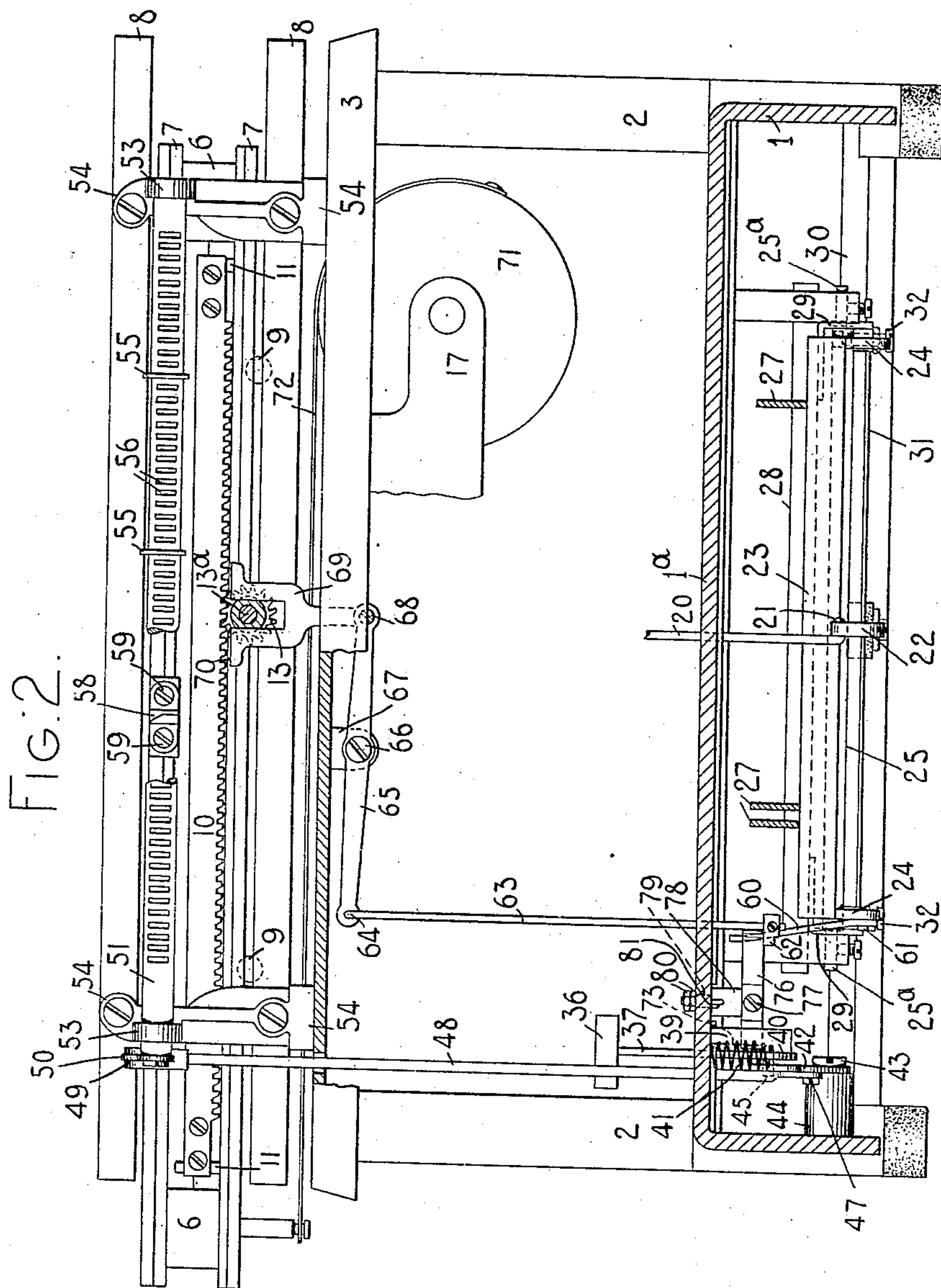
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5 SHEETS—SHEET 2.



WITNESSES:

*M. F. Hammer*  
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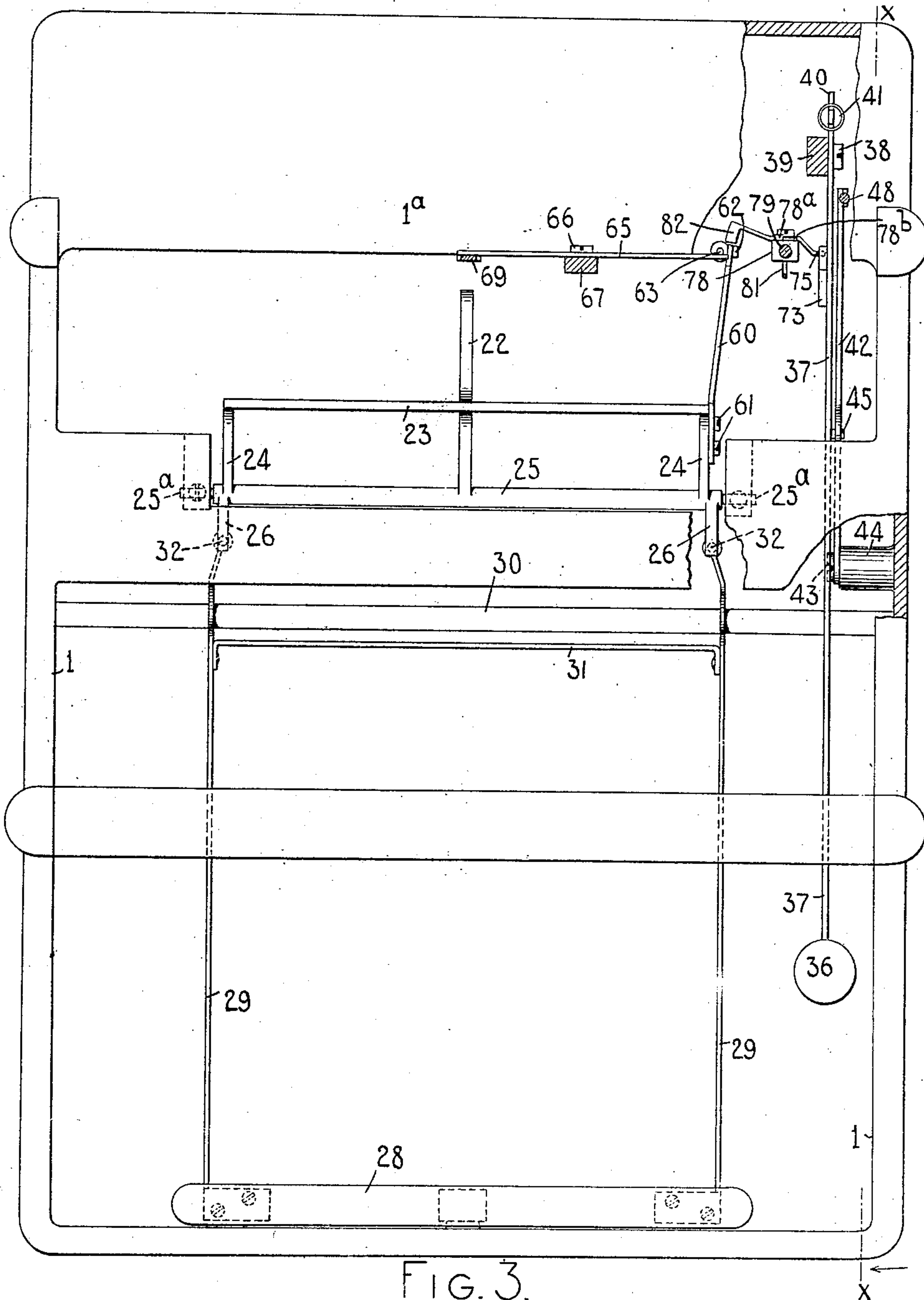
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5 SHEETS—SHEET 3.



WITNESSES.

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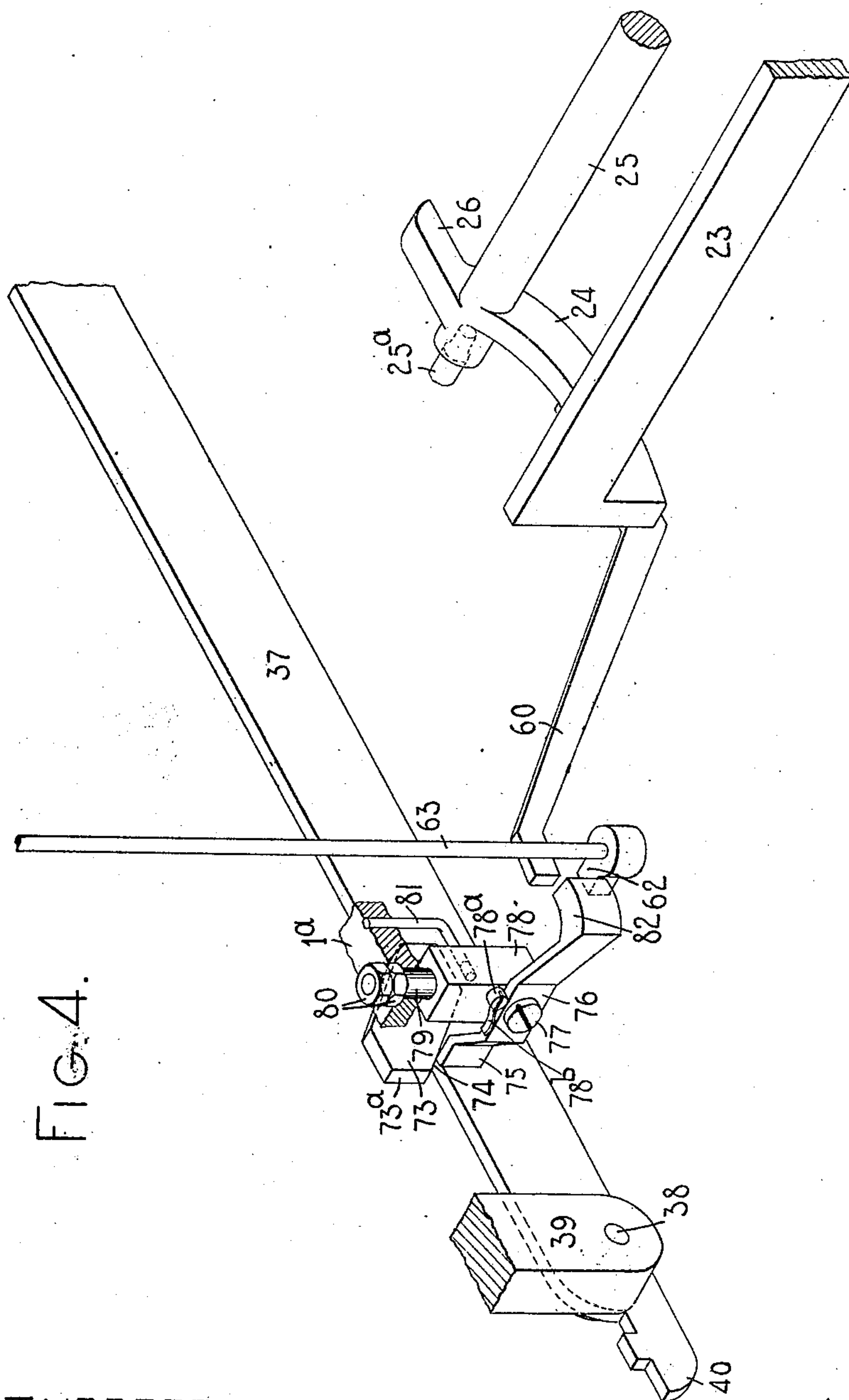
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5 SHEETS—SHEET 4.



WITNESSES:

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INVENTOR:

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6 SHEETS—SHEET 5.

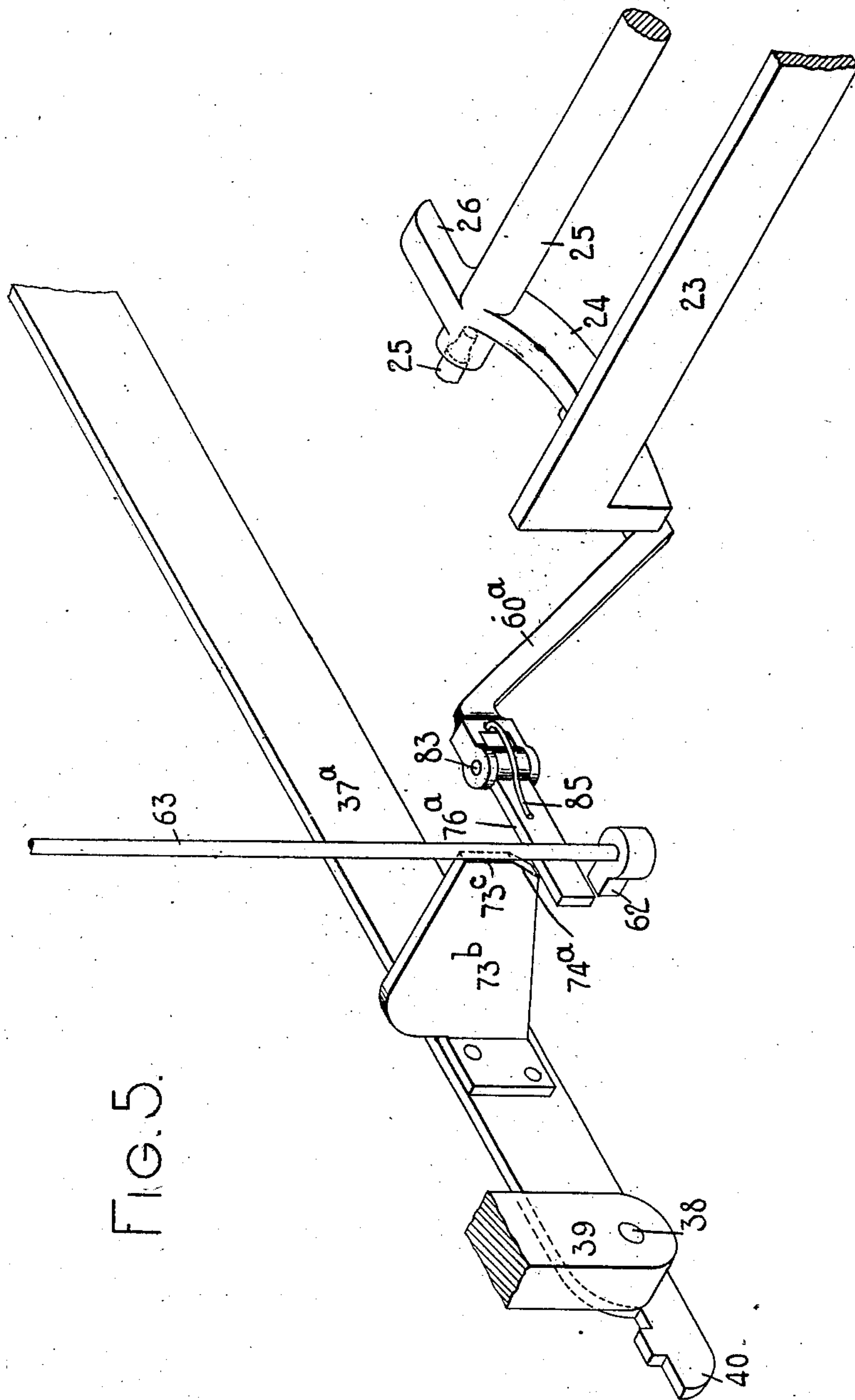


FIG. 5.

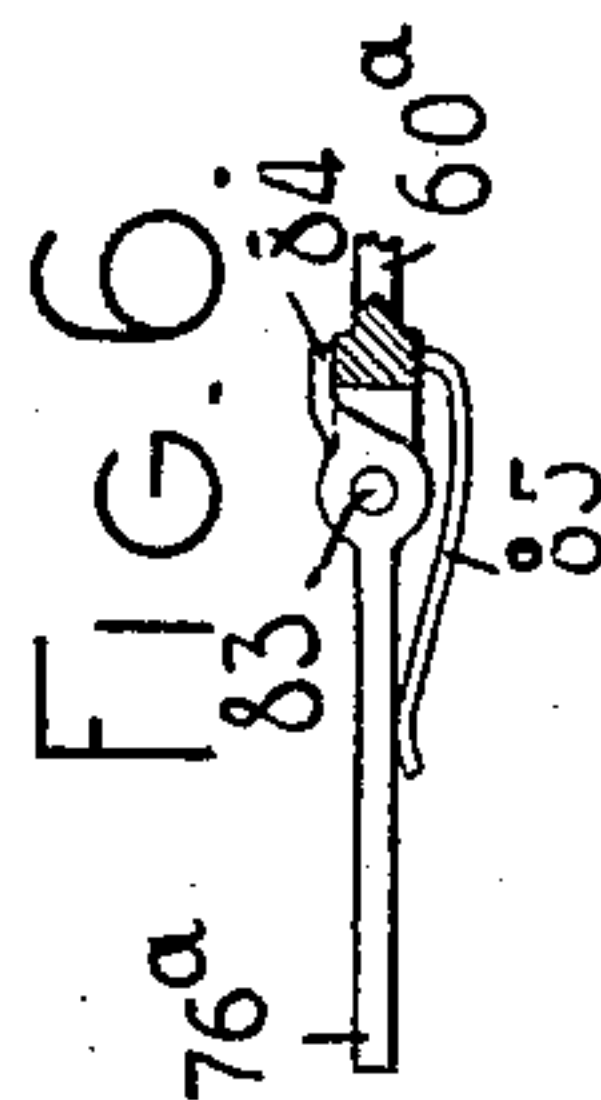


FIG. 6.

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INVENTOR:

*Jacob Felbel*



# UNITED STATES PATENT OFFICE.

JACOB FELBEL, OF NEW YORK, N. Y., ASSIGNOR TO UNION TYPEWRITER COMPANY, OF JERSEY CITY, NEW JERSEY, A CORPORATION OF NEW JERSEY.

## TYPE-WRITING MACHINE.

No. 895,996.

Specification of Letters Patent.

Patented Aug. 11, 1908.

Application filed May 14, 1907. Serial No. 373,539.

*To all whom it may concern:*

Be it known that I, JACOB FELBEL, citizen of the United States, and resident of the borough of Manhattan, city of New York, 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.

My invention relates to typewriting machines and more particularly to tabulating mechanism for such machines.

One of the main objects of my invention is to provide separate means at the keyboard of the machine; and preferably the ordinary space key of the machine, for effecting a release of the carriage after the tabulating mechanism has been operated.

To the above and other ends which will hereinafter appear my invention consists in the features of construction, arrangements of parts and combinations of devices described in the following specification and particularly pointed out in the accompanying claims.

In the accompanying drawings, wherein like reference characters indicate corresponding parts in the different views, Figure 1 is a vertical front to rear sectional view, taken on a line  $x-x$  in Fig. 3 and looking in the direction of the arrow at said line, of a typewriting machine equipped with the devices of my invention, parts of the typewriting machine being omitted. Fig. 2 is a rear elevation of the same, the rear cross-plate of the base and a portion of the top plate being sectioned away. Fig. 3 is a plan view of the machine with parts omitted and parts broken away. Fig. 4 is an enlarged detail perspective view showing portions of the means for effecting the release of the carriage through the space key. Fig. 5 is a like view of another form of construction embodying my invention. Fig. 6 is a fragmentary detail top plan view, partly in section of the switch shown in Fig. 5 and part of the member which carries it.

I have shown my invention applied to a Monarch machine, although it should be understood that the invention may be applied to other styles of writing machines.

The frame of the machine comprises a base 1 having a cover plate 1<sup>a</sup>, corner posts 2 and a top plate 3. A platen 4 is mounted in a carriage which comprises end plates 5 and a cross-bar 6 with oppositely disposed grooved tracks 7 formed thereon. Fixed tracks 8

have oppositely disposed grooved faces for coöperation with anti-friction balls 9 which are received between the grooved faces of the tracks 7 and 8 and support the carriage in its movement from side to side of the machine. A feed rack 10 is connected to the rear ends of arms 11 pivoted at 12 to the end plates 5 of the carriage. The feed rack meshes with a feed pinion 13 operatively connected through a shaft 13<sup>a</sup> to an escapement wheel 14 with which feed dogs 15 coöperate. The feed dogs are carried by a dog rocker 16 pivoted to a depending bracket plate 17 and provided with a forwardly extending arm 18 pivotally connected at 19 to a depending link 20. The lower end of the link is pivoted at 21 to a rearwardly extending arm 22 formed as a part of the universal bar frame which, as shown in Fig. 3, comprises the rearwardly extending arm 22, a universal bar 23, side arms 24, a rock shaft 25 pivoted at 25<sup>a</sup> and forwardly extending arms 26. The universal bar proper 23 extends beneath key levers 27 to be acted upon by the depression of any of said key levers and effect an operation of the escapement mechanism in the usual manner. A space key 28 is connected at its ends to forwardly extending arms 29 mounted to vibrate on a pivot rod 30, and connected by a cross-bar 31 secured at the rear end portions thereof. Each of the arms 29 extends rearwardly beyond the pivot rod 30 and is provided with a set screw 32 which is adapted to coöperate with its associated arm 26 on the universal bar frame. The space key or bar 28, the arms or levers 29 and the cross bar 31 constitute a rectangular space key frame. A depression of the space key is effective to rock the universal bar frame and thus actuate the escapement mechanism. Each of the key levers 27 is connected in the usual manner to a sub-lever 33, the upper end of which is connected to an upwardly and rearwardly striking type bar 34 by a pull link 35.

The construction thus far described is that embodied in the Monarch typewriter.

The tabulator key 36 at the keyboard of the machine is carried by a lever 37 pivoted at 38 to a depending stud or bracket 39 in the base of the machine and having a rearwardly extending arm 40, provided with a spring 41, by which the key lever and the parts connected therewith are restored to normal position. A sub-lever 42 is pivoted



at its forward end, as at 43, to a stud 44 inwardly projecting from the base of the machine. The sub-lever is connected to the tabulator key lever by a pin and slot connection, the pin 45 projecting from the side of the tabulator key lever and extending into the slot 46 in the sub-lever. The rear end of the sub-lever is pivotally connected at 47 to an upwardly extending link 48 which passes through openings in the cover plate 1<sup>a</sup> and in the top plate 3 and is pivotally connected at its upper end, as at 49, to a crank arm 50 secured to a rock shaft 51. The shaft 51 turns in bearings in bracket arms 53 which project rearwardly from brackets 54 to which the fixed carriage rails 8 are secured. The rock shaft 51 is provided with adjustable column or tabulator stops 55 bifurcated for engagement with slots 56 on the rock shaft. Each of the column stops has an engaging portion 57 for cooperation with a tabulator stop 58 secured by screws 59 to the carriage.

By depressing the tabulator key 36, the sub-lever 42 will be depressed, thereby pulling down on the link 48 and rocking the column stop bar or rock shaft 51 to bring the column stops into position where they are adapted to cooperate with the stop 58 on the carriage and to arrest the carriage at its proper columnar position when the carriage is released from its escapement mechanism.

In accordance with my present invention I provide separate means at the keyboard of the machine for effecting the release of the carriage after the tabulator stops have been brought into cooperative relation or into a relation where they will co-act to arrest the carriage after it is released, such separate means being actuated independently of the means for bringing the tabulator stops into cooperative relation. A bracket arm 60 projects upwardly and rearwardly from the right-hand end bar 24 of the universal bar frame to which said arm is secured by a screw 61. The rear free end of the arm 60 extends above a lateral projection 62 of a depending link or rod 63 which extends through an opening in the cover plate 1<sup>a</sup> by which the lower end of the rod is guided. The upper end of the rod 63 is pivotally connected at 64 to a lever 65 pivoted at 66 to a depending stud or bracket 67 which projects from the top plate of the machine. The inner end of the lever 65 is pivoted at 68 to a carriage releasing device 69 bifurcated as shown in Fig. 2 to straddle the bearing for the shaft 13<sup>a</sup> of the escapement wheel, the releasing device being bent forwardly at the upper end 70, as indicated in Fig. 1. The flat faces formed by the bent portions 70 extend on opposite sides of the feed pinion and beneath the feed rack, as shown in Fig. 1. It will be understood that when the rod 63 is moved downwardly, an upward movement will be transmitted to the inner end of the

lever 65 and the carriage releasing device 69 will be elevated to disengage the feed rack 10 from the feed pinion, thus releasing the carriage from its escapement mechanism and rendering it free to be moved in the direction of its feed by the usual spring drum 71 connected to the carriage by a strap or band 72. It will be understood that in the normal position of the parts shown in Fig. 4, for instance, there is sufficient space between the rear free end of the arm 60 and the member 62 to afford a movement of the universal bar frame and the arm 60 without actuating the carriage release, so that the carriage release mechanism is normally disconnected from the space key and the parts controlled thereby. The tabulator key lever 37 is provided with a cam 73, the inclined face 74 of which is adapted to cooperate with the right-hand end 75 of a so-called switch or lever 76. This lever is pivoted by a headed screw 77 to a block 78 and is normally pressed into contact with a stop pin 78<sup>a</sup> by a spring 78<sup>b</sup>. The block 78 is provided with a spindle 79 that is received in a bearing opening in the plate 1<sup>a</sup> and is threaded at its upper end for securement by nuts 80. The lowermost nut bears on the plate 1<sup>a</sup> and supports the block 78 in place, although it is free to turn on its vertical axis or spindle 79. The block is held in the normal position by a spring 81 secured at one end to the plate 1<sup>a</sup> and at the other end to the block.

From what has been said it will be understood that the lever or switch 76 has a pivotal movement in two directions, one movement being around its horizontal pivot 77 and the other movement being with the supporting block around the vertical pivot 79 of said block. The stop pin 78<sup>a</sup> projects from the block 78 and acts to limit the movement of the lever or switch 76 in one direction, but permits a downward movement of the inner end of the switch or lever from its normal position against the pressure of its returning spring 78<sup>b</sup>. When the tabulator key lever 37 is depressed the inclined face 74 of the cam carried thereby is brought into engagement with the right-hand end 75 of the switch lever. Downward movement of the end 75 is prevented by the engagement of the opposite arm of the lever with the stop 78<sup>a</sup>, so that the cam is effective to turn the switch or lever and the block which supports it around the vertical pivot 79 of said block. The effect of this movement is to interpose the filler or block-like end 82 of the switch between the rear free end of the arm 60 and the projection 62 on the link or rod 63, thus practically filling the space between these parts and eliminating the lost motion which normally exists between them. The parts are so arranged that the operative connection between the space key and the carriage releasing mechanism is formed when the tabulat-



ing stops are brought into coöperative relation by the depression of the tabulator key lever 37. When the switch-lever is thrown into working position, the end 75 is moved rearwardly beyond the cam face 74, so that said end takes a position against the rear vertical face 73<sup>a</sup> of the cam member 73 and at the lower portion thereof, and is held against said face by the returning spring 81 provided for the swivel-block 78. While pressure is still maintained on the tabulator key, to hold the stops interposed one in the path of another, the ordinary carriage space key 28 is depressed, thereby effecting a downward movement of the arm 60 connected to the universal bar frame, and the effect of this movement is to pull down the rod 63 through the intermediate switch 76 which at this time turns on its pivot 77, the end or arm 75 of the switch lever riding up on the vertical face or end 73<sup>a</sup> of the member 73 which keeps the filler 82 interposed during the carriage releasing movement. The pulling down on the rod 63 is effective to elevate the feed rack and thus release the carriage for rapid movement leftward. After the carriage has been arrested by the tabulating mechanism and the keys released, the key-actuated parts will be restored to their normal positions and the operative connection between the space key and the carriage releasing mechanism will be automatically broken by the block 78 returning to its normal position and withdrawing the switch from between the arm 60 and the projection 62, as shown in Fig. 4.

In the other form of construction shown in Figs. 5 and 6, the arm 60<sup>a</sup>, connected with the universal bar frame, is provided with a switch 76<sup>a</sup> pivoted thereto at 83 to turn on a vertically disposed axis. The switch has a projection 84 which bears against the arm 60<sup>a</sup> and limits the movement of the switch relatively to said arm in one direction. A spring 85 is carried by the arm 60<sup>a</sup> and bears at its free end against the switch to maintain it in the normal position, that is, to the left of the projection 62 on the pull rod 63 of the carriage releasing member, as seen in Fig. 5. The tabulator key lever 37<sup>a</sup> carries a laterally projecting cam 73<sup>b</sup> provided with an inclined face 74<sup>a</sup> which is adapted to coöperate with the switch 76<sup>a</sup> to turn it around its pivot 83 and to bring it into coöperation with the projection 62. Thus when the tabulator key lever 37<sup>a</sup> is depressed to bring the tabulator stops into coöperation, the cam 73 moves down with the key lever and cams the switch 76<sup>a</sup> to the right, (as the parts are shown in Fig. 5) thereby bringing the switch above the projection 62 and effecting an operative connection between the space key and the carriage releasing mechanism, so that when the space key is depressed the rod 63 will be pulled down by the switch 76<sup>a</sup> to elevate the feed rack and thus release the carriage from

the escapement mechanism. The end or vertical face 73<sup>c</sup> of the cam-piece holds the switch 76<sup>a</sup> over the projection 62 during the releasing movement.

From the foregoing description it will be understood that in both of the constructions described the switch 76 or 76<sup>a</sup> is adapted to travel with and independently of the part which carries it; that the operation of the tabulating devices effects said independent movement of the switch to bring about an operative mechanical connection between the space key lever and the carriage releasing mechanism; and that the release of the carriage is effected by the ordinary space key of the machine. Furthermore, it will be understood that it is necessary to actuate the tabulating mechanism to properly position the stops one in the path of another before the carriage can be released by the space key and to maintain the stops in such position by pressure exerted upon the tabulator key until the carriage has been released and arrested in the proper predetermined position.

It will be observed that I have provided a key actuated combined carriage spacing and carriage releasing mechanism; and that the carriage spacing function of this mechanism is constant or always operative but that the carriage releasing function is intermittent and dependent upon previous operation of the tabulating mechanism. It will also be observed that there is a break normally between the carriage releasing devices and the carriage spacing devices of this combined mechanism, but that this break is temporarily repaired, so to speak, by the operation of the key lever of the tabulating mechanism.

Any construction of tabulating mechanism, escapement mechanism and space key mechanism may be employed, and various changes may therefore be made without departing from my invention.

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

1. In a typewriting machine and tabulating mechanism, the combination of a carriage, escapement mechanism therefor, a space key for the escapement mechanism, a carriage releasing device, key controlled tabulating devices, a lost motion connection between said carriage releasing device and said space key, and automatically actuated mechanical means for taking up such lost motion and for effecting a close connection between said carriage release device and space key.

2. In a typewriting machine and tabulating mechanism, the combination of a carriage, escapement mechanism therefor, a space key for the escapement mechanism, a carriage releasing device, key controlled tabulating devices, a switch mounted to travel with and to move independently of the space key, said switch being operative to form a



connection between said space key and carriage releasing device, and means controlled by an actuation of the key controlled tabulating devices to throw said switch and render it operative to connect the space key and releasing device.

3. In a typewriting machine and tabulating mechanism, the combination of a carriage, key controlled tabulating devices, escapement mechanism for the carriage, a space key for said escapement mechanism, a pivoted frame which carries said space key, a switch pivoted to move with said frame and independently thereof, a carriage releasing device for releasing the carriage from the escapement mechanism, said releasing device being normally disconnected from said space key but adapted to be connected therewith by said switch, and automatically actuated means for moving said switch into operative position when the tabulating devices are actuated.

4. In a typewriting machine and tabulating mechanism, the combination of a carriage, key controlled tabulating devices, escapement mechanism for the carriage, a space key for said escapement mechanism, a pivoted frame which carries said space key, a switch pivoted to move with said frame and independently thereof, a carriage releasing device for releasing the carriage from the escapement mechanism, said releasing device being normally disconnected from said space key but adapted to be connected thereto by said switch, and an automatically actuated cam for controlling the independent movement of said switch into operative position when the tabulating key is actuated.

5. In a typewriting machine and tabulating mechanism, the combination of a carriage, tabulating devices, a key lever for controlling said tabulating devices, escapement mechanism for the carriage, a space key for actuating said escapement mechanism, a pivoted frame which carries said space key, a switch pivoted to move with and independently of said frame, a carriage releasing device for releasing the carriage from the escapement mechanism, said releasing device being normally inoperative by said space key but adapted to be operatively connected thereto by said switch, and a cam on said key lever for controlling the independent movement of said switch into operative position when the tabulating key lever is actuated.

6. In a typewriting machine and tabulating mechanism, the combination of a carriage, escapement mechanism therefor including a feed rack and pinion, a carriage releasing device cooperative with the feed rack to lift it out of engagement with the feed pinion, a space key, a pivoted switch operative to connect the space key with the carriage releasing device, tabulating devices, a key lever for controlling said tabulating devices, and a cam carried by said key lever for moving said switch.

7. In a typewriting machine and tabulating mechanism, the combination of a carriage, escapement mechanism therefor including a feed rack and pinion, a carriage releasing device to separate the rack and pinion and including a projection, carriage spacing mechanism, a pivoted switch normally out of engagement with said projection, and tabulating devices including a key adapted to move said switch into engagement with said projection so as to enable the carriage to be released by operation of the spacing mechanism.

8. In a typewriting machine and tabulating mechanism, the combination of a carriage, escapement mechanism therefor including a feed rack and pinion, a carriage releasing device to separate the rack and pinion and including a rack lifter, a lever therefor, a depending link and a projection on said link, carriage spacing mechanism including a universal bar and a rigid arm or extension therefrom, a pivoted switch normally out of engagement with said projection, and tabulating devices including a key controlling a cam for moving said switch into operative engagement with said projection so as to enable the carriage to be released by operation of the spacing mechanism.

9. The combination of a carriage, a tabulating mechanism including a key lever and a cam, carriage releasing mechanism normally inoperative, and a switch directly actuated by said cam to render the carriage releasing mechanism operative.

Signed at the borough of Manhattan, city, of New York, in the county of New York, and State of New York, this 8th day of May, A. D. 1907.

JACOB FELBEL.

Witnesses:

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M. F. HANMACHER.