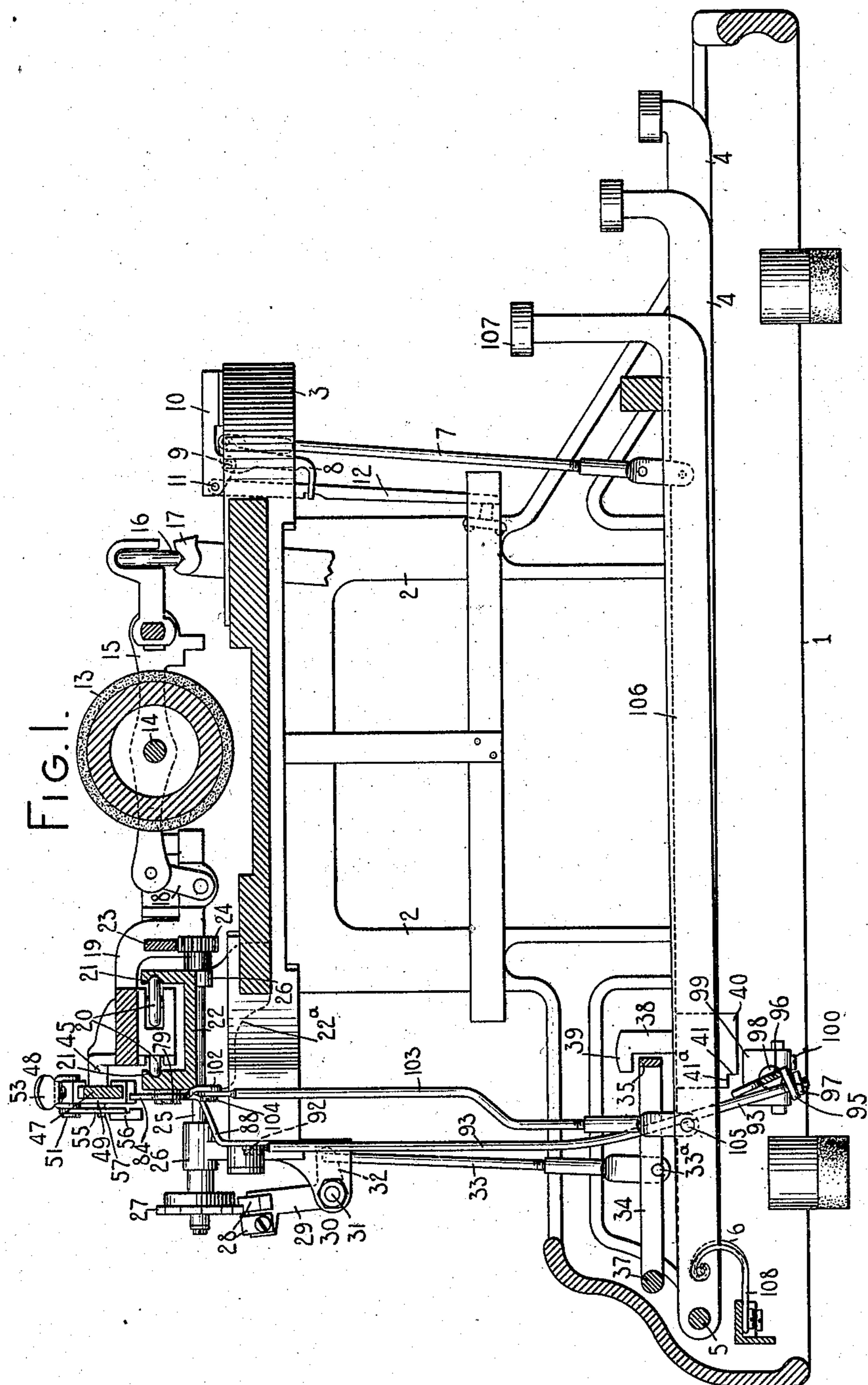


900,461.

O. WOODWARD.  
TYPE WRITING MACHINE.  
APPLICATION FILED JAN. 31, 1906.

Patented Oct. 6, 1908.  
3 SHEETS—SHEET 1.



WITNESSES:

*E. M. Wells.*  
*W. W. Pool.*

INVENTOR:

*Oscar Woodward*

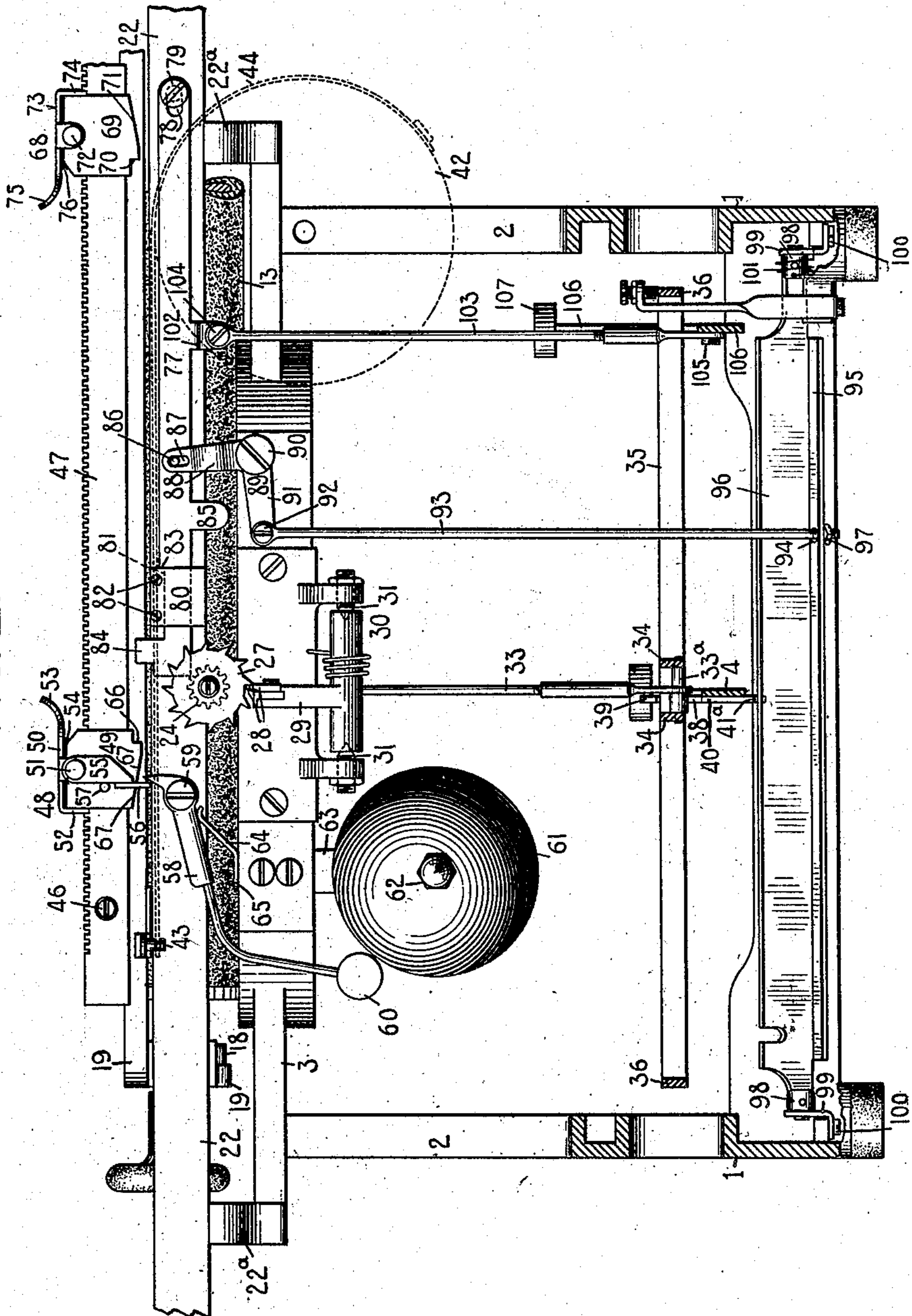
*By Jacob F. F. F.*  
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3 SHEETS—SHEET 2.

FIG. 2.



WITNESSES:

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INVENTOR:

Oscar Woodward

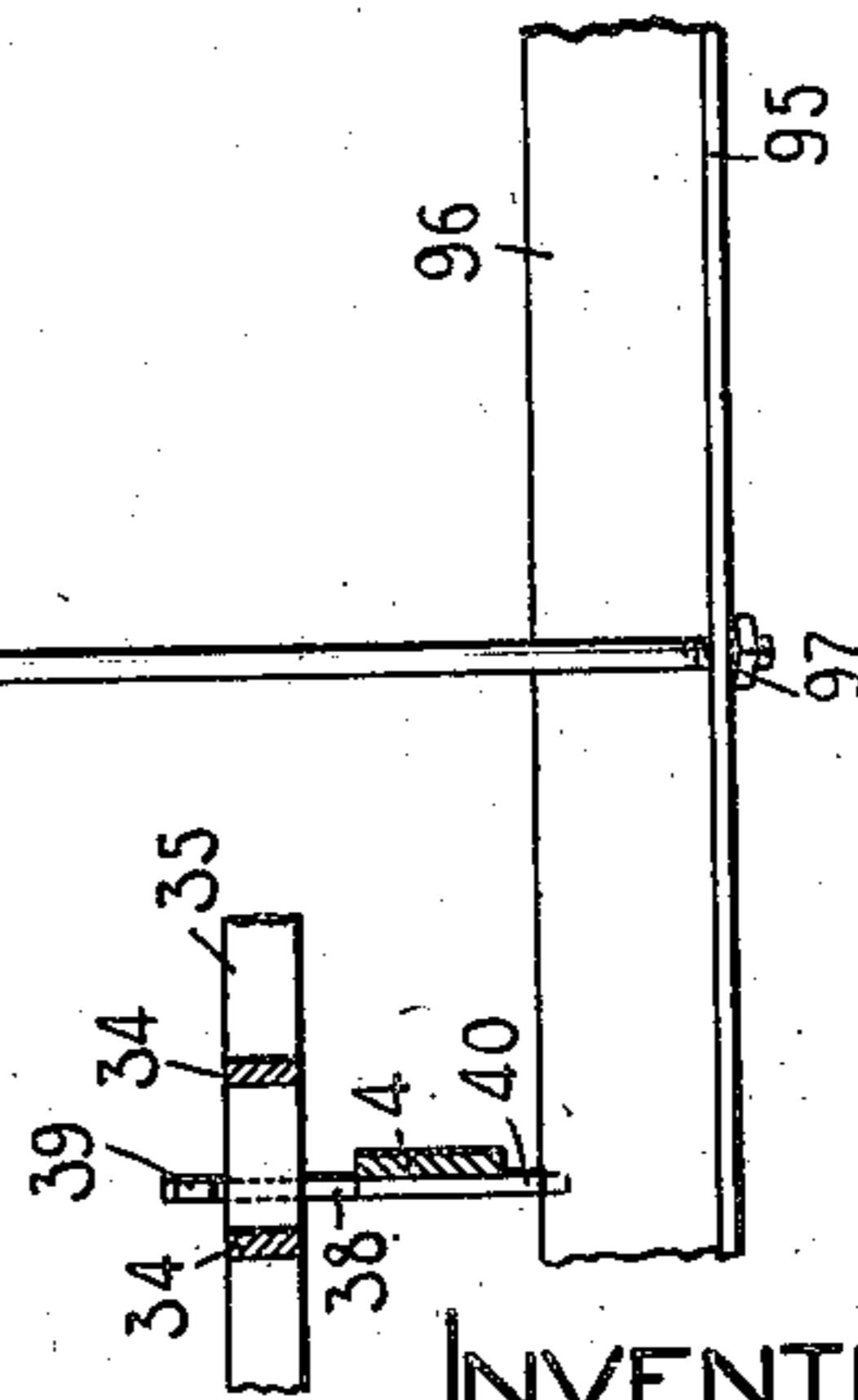
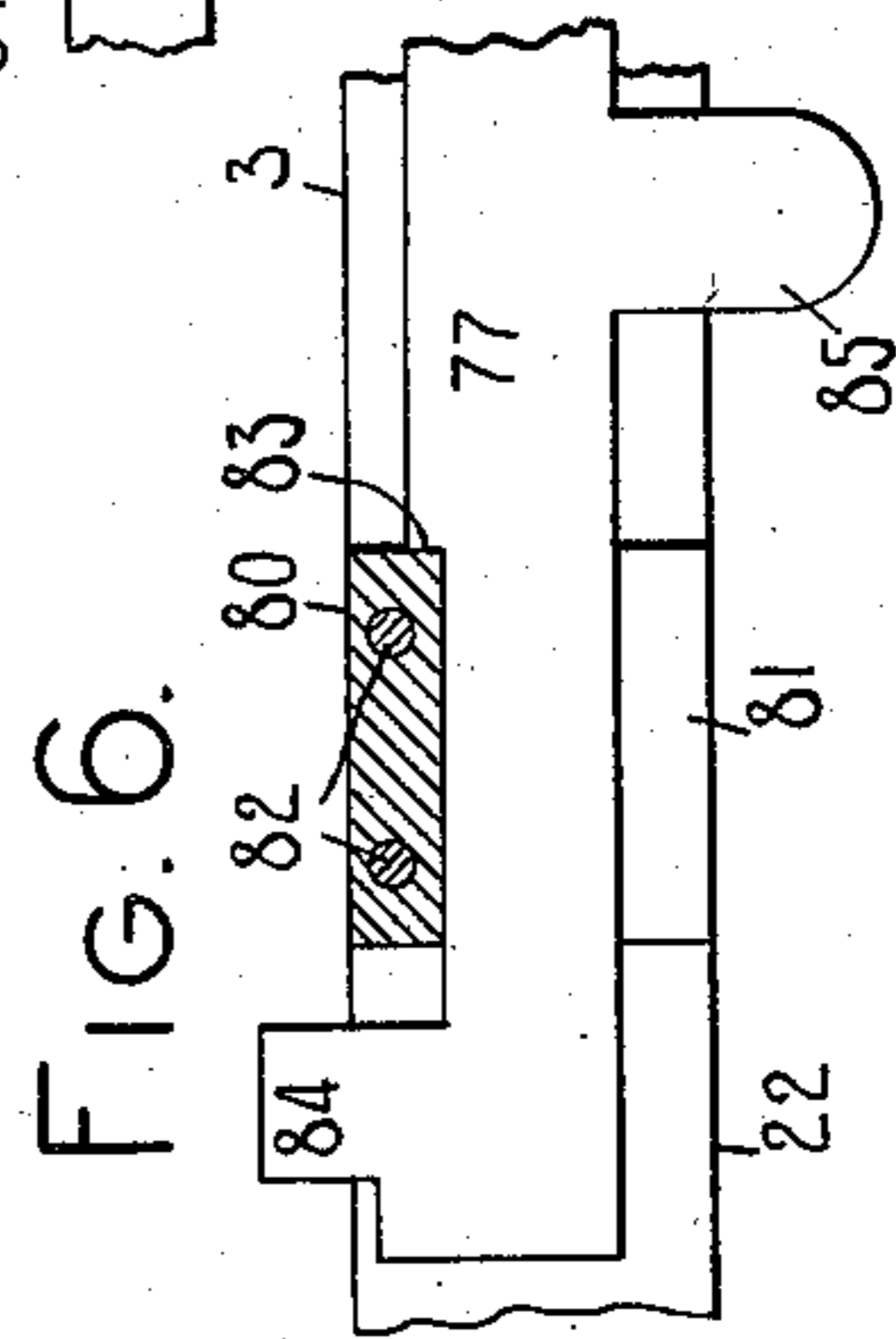
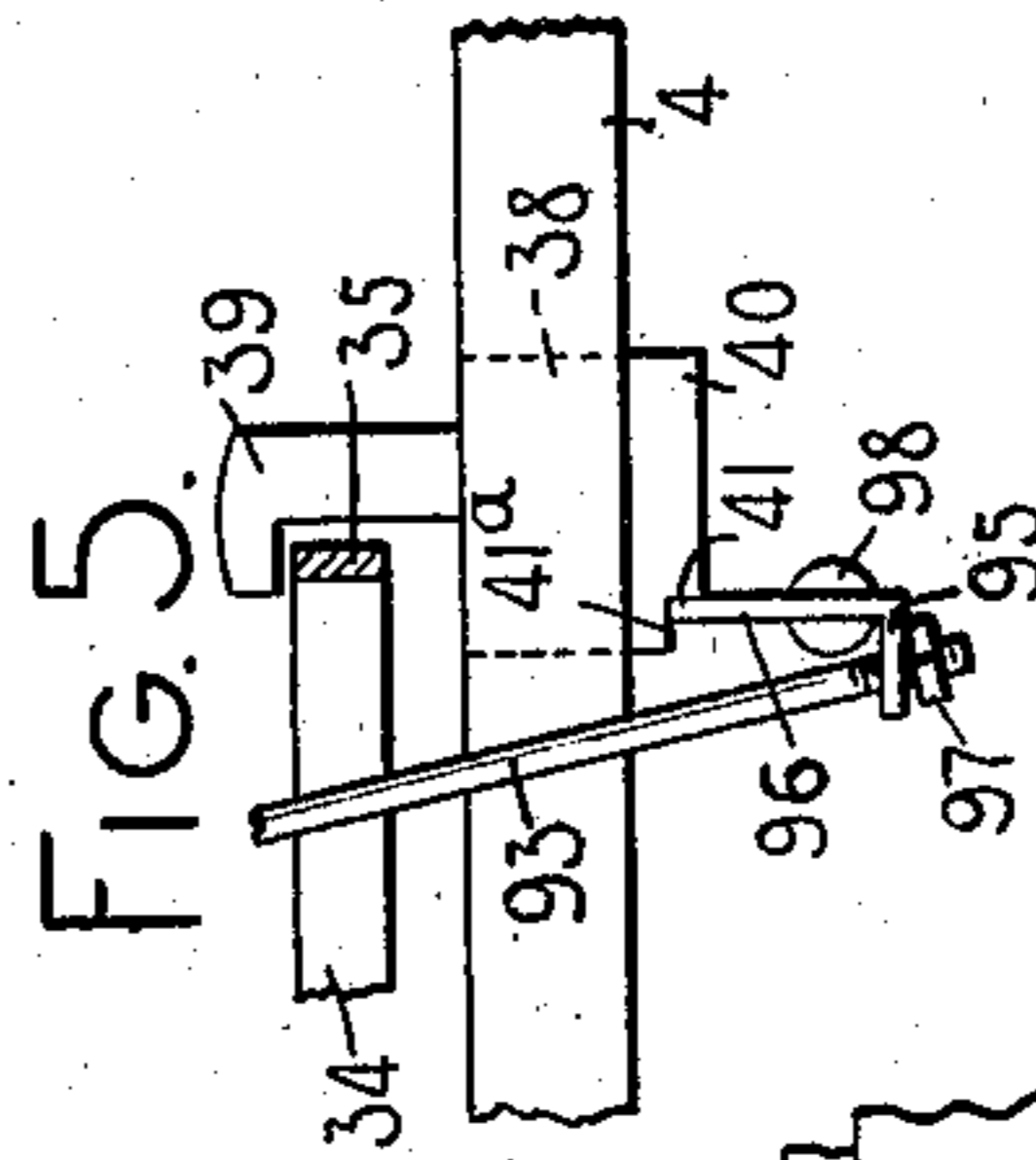
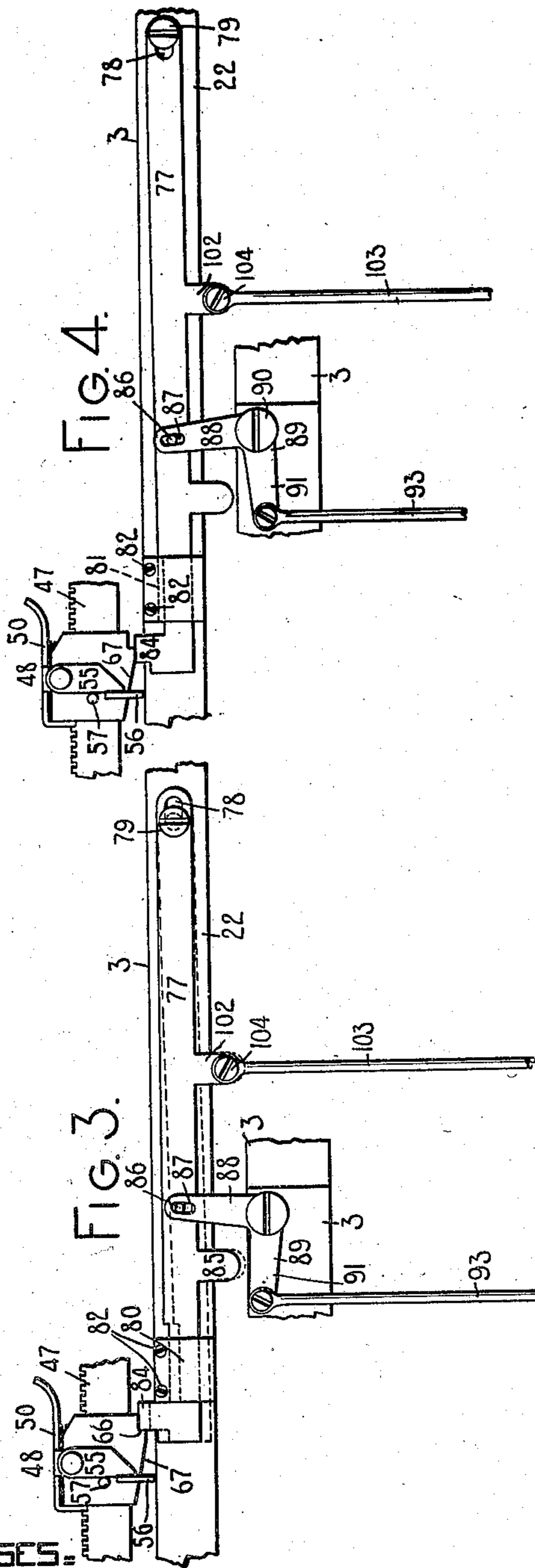
By Jacob Selby

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APPLICATION FILED JAN. 31, 1906.

Patented Oct. 6, 1908.  
3 SHEETS—SHEET 3.



WITNESSES:

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INVENTOR=

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By Jacob Selbel  
HIS ATTORNEY

# UNITED STATES PATENT OFFICE.

OSCAR WOODWARD, OF NEW YORK, N. Y., ASSIGNOR TO DENSMORE TYPEWRITER COMPANY,  
OF SYRACUSE, NEW YORK, A CORPORATION OF NEW YORK.

## TYPE-WRITING MACHINE.

No. 900,461.

Specification of Letters Patent.

Patented Oct. 6, 1908.

Application filed January 31, 1906. Serial No. 298,794.

*To all whom it may concern:*

Be it known that I, OSCAR WOODWARD, 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 more especially to line locks for typewriting machines and has for its main object to provide improved devices of the class specified.

To the above and other ends my invention consists in the features of construction, combinations of devices and arrangements of parts hereinafter fully described and particularly pointed out in the claims.

I have illustrated my invention as applied to a bottom-strike machine generally resembling one style of the Densmore typewriter, but it is to be understood that said invention may be adapted to other forms of writing machines.

In the accompanying drawings, Figure 1 is a vertical longitudinal sectional view, taken about centrally, of so much of a typewriting machine as is necessary to illustrate my invention. Fig. 2 is a fragmentary rear elevation of the machine, part of the base being shown sectioned away and other parts being omitted for the sake of clearness. Fig. 3 is a fragmentary rear elevation of parts of the line locking mechanism as they appear when in locking position. Fig. 4 is a fragmentary rear elevation of parts of the line locking mechanism as they appear after having been unlocked from locking position. Fig. 5 is a fragmentary side elevation of parts of the line locking mechanism positioned as in Fig. 3. Fig. 6 is an enlarged detail view, partly in section, of one of the parts of the line lock mechanism and its bearing.

Referring now to the drawings and more particularly to Figs. 1 and 2, the main frame of the machine is shown as comprising a base portion 1 and corner posts 2 which latter sustain a top plate 3. Key levers 4 are pivoted at 5 in the rear of the base, each key lever being provided with a restoring spring 6. Each key lever is connected by a link 7 with a sub-lever 8 which is pivoted at 9 in a type bar hanger 10, said hanger being one of a series arranged substantially in a circle on

the top plate, each being disposed radially of the printing point.

Pivoted at 11 in each hanger is a type bar 12 which is actuated in a known manner by its associate key lever 4, through the link 7 and sub-lever 8, and is caused to cooperate with the under side of a cylindrical platen 13 pivotally mounted at 14 in a platen frame 15, said platen frame being provided at its front with a roller 16 which is guided and supported by a shiftable track way 17. At its rear the platen frame is connected by links 18 (one of which is shown) with a carriage truck 19, the latter being provided with rollers 20 which cooperate with oppositely disposed grooves 21 in the sides of a stationary trough-like track way 22 supported by brackets 22<sup>a</sup> on the top plate.

Mounted on the carriage truck 19 is a carriage feed rack 23 which normally meshes with a feed pinion 24 fixed to the forward end of a shaft 25, said shaft turning in fixed bearings 26. Operatively connected with the rear end of the shaft 25 is an escapement wheel 27 and adapted to cooperate with the teeth of said escapement wheel are carriage feed dogs 28 mounted at the top of the vertically disposed arm 29 of a dog carrier 30 which is pivoted at 31 and is provided with a forwardly extending arm 32. A link 33 has its upper end pivotally connected with said forwardly extending arm 32, the lower end of said link cooperating with a pin 33<sup>a</sup> which engages a pair of parallel arms 34 extending rearwardly from a universal bar 35. The universal bar is disposed transversely above the key levers and is provided at its ends with rearwardly extending arms 36, the rear ends whereof are fixed to a transverse rock shaft 37, which is pivoted at its ends in the sides of the base. The arms 34 are also fixed to said rock shaft 37 and comprise, with the side arms 36, the rock shaft 37 and the universal bar 35, a universal bar frame.

Suitably secured, as by soldering, to each key lever 4, is a member 38, said member comprising an upwardly and rearwardly extending hook portion 39 which overhangs the universal bar 35 and a portion 40 which extends below the associate key lever and is notched or cut away to provide a vertical contact edge or stop 41 and a horizontal contact edge 41<sup>a</sup> for purposes presently to be described. When the key levers are depressed

to actuate the type bars, the associate hook portions 39 coact with the universal bar 35 to swing the latter downwardly about its pivots, thereby causing the feed dogs 28 to coöperate with the escapement wheel 27 in a known manner, so that as said universal bar returns to normal position the carriage, comprising the platen frame 15 and carriage truck 19, may be drawn one space leftward across the top plate under the influence of a carriage spring drum 42 with which a pin 43 extending downwardly from the carriage truck is connected by a band or strap 44. I have shown and thus far described certain improvements relating to the carriage and its associate parts, but these constitute in part the subject-matter of my application Serial No. 299,536 filed February 5th, 1906, and therefore are not claimed herein.

Projecting rearwardly from the carriage truck 19 at either side are lugs 45, and secured to these lugs by screws 46 is a rack bar 47 extending longitudinally of the carriage and provided on its upper face with a series of teeth a letter space distance apart. Said rack bar may be provided with the usual scale corresponding with the usual carriage scale. Mounted to slide lengthwise of the rack bar 47 is a contact or line stop 48 which comprises a body portion 49 partially surrounding the rack bar and a detent member 50, said detent member being pivoted at 51 to the body portion and being provided at one end with a locking tooth 52, adapted to engage the teeth of the rack bar, and at its other end with a finger portion 53. A coiled spring 54 is seated in a depression formed in the top of the body portion 49 and presses constantly against the under side of the detent member 50 at the side of the pivot 51 opposite from that of the tooth 52. Said spring 54 tends to maintain said tooth 52 in engagement with the teeth of the rack 47, thereby locking the contact or line stop in place. When it is desired to adjust the latter it is only necessary to depress the finger piece 53, thereby pressing the spring 54 and raising the tooth 52 out of engagement with the teeth of the rack bar 47, whereupon the line stop 48 may be slid along the rack bar to the desired position and locked thereat by releasing the finger piece 53.

Loosely pivoted to the line stop at 51 is a depending bell trip 55 which lies against the rear face of the body portion 49 of the line stop and is provided at its lower end with a contact portion 56 which is twisted rearwardly at right angles to the main part of the trip. A pin 57 projects rearwardly from the body portion 49 of the line stop in position to engage with the bell trip. A lever-like bell hammer 58 is pivoted at 59 to the rear of the track way 22, one arm of the bell hammer projecting upwardly in position to coöperate with the bell trip and the lower

arm of said hammer being provided with a head 60 which is adapted to coöperate with a bell 61 secured by a screw 62 to a lug 63 depending from the top plate of the machine. The head 60 is normally maintained out of contact with the bell by a spring rest 64 secured by a screw 65 to the top plate of the machine. The bottom of the body portion 49 of the line stop is cut away to provide a vertical contact face 66 and an upwardly sloping beveled face 67. The margin stop 68 is of similar construction to the line stop above described and comprises a body portion 69 formed with a contact face 70, oppositely disposed to the contact face 66, and with a beveled face 71. Pivoted at 72 to the body of the margin stop is a detent member 73 comprising a locking tooth 74 and a finger portion 75, said locking tooth being maintained in engagement with the rack bar 47 by a coiled spring 76 and said margin stop being adapted to be adjusted in a manner similar to that described in connection with the line stop 48.

The mechanism coöperating with the line and margin stops to arrest the carriage and with the former of said stops to lock the key levers against depression will now be described. A bar-like member 77 is arranged upon and longitudinally of the rear wall of the track way 22, said member, as shown in Figs. 2, 3 and 4 being provided with a slot 78 at its outer end which receives the shank of a headed screw 79, the latter engaging a threaded opening in the rear wall of the track way 22. The inner or, as viewed from the rear of the machine, left-hand portion of the member or bar 77 is guided and supported in a guide-block 80 which is provided with a slot 81 (Figs. 4 and 6) through which the bar 77 passes, said guide block being secured to the rear wall of the track way 22 by screws 82. Considering the bar 77 as viewed from the rear, it is cut away just to the right of the guide block 80 to provide a vertical contact edge 83, and to the left of the guide block said bar 77 is provided with an upwardly extending arm 84, the side edges of which are vertical and are adapted to be engaged by the contact face 66 of the line stop and the contact face 70 of the margin stop. To the right of the guide block 80 the bar 77 is provided with a depending limiting stop 85. To the right of the stop 85 a pin 86 projects rearwardly from the face of the bar 77, said pin projecting through an elongated slot 87 formed in and near the top of an upright arm 88 of a bell crank lever 89. The arm 88 is off-set rearwardly to enable the bell crank lever 89 to be pivoted at 90 to the top plate. The horizontally disposed arm 91 of said lever is pivotally connected at 92 with the upper end of a link 93. The link 93 extends downwardly and passes freely through an opening 94 in an angular lip 95 project-

ing rearwardly from a locking member or bar 96. The lower end of the link 93 is threaded and receives a nut 97 which is adapted to contact with the under side of the lip or flange 95 of the locking bar 96. By adjusting the nut 97 the locking bar may be timed or caused to cooperate properly with the key levers. Said locking bar extends from side to side of the machine beneath the key levers and is provided at its ends with pivotal portions 98 which are journaled in brackets 99 secured by screws 100 to the sides of the base. A wire spring 101 is coiled upon one of the pivotal portions of the locking bar (Fig. 2) and has one end fastened in the locking bar and the other end in the neighboring bracket 99. Said spring tends normally to maintain the bar 96 in the inoperative position indicated in Figs. 1 and 2, wherein it will be noted, said bar inclines towards the rear of the machine so that normally its upper edge will not interfere with the operation of the printing key levers 4. The effect of gravity and of the spring 101, which latter acts on the bell crank lever 89 through the bar 96 and link 93, tend to maintain said bell crank lever in the position indicated in Fig. 2. The bell crank lever, acting on the slidable bar 77 through the pin and slot connection, tends to maintain said bar in the longitudinal position indicated in said Fig. 2 wherein, it will be noted, the bar is at the extreme of its leftward movement, viewed from the rear, and with the vertical edge 83 engaging the guide block 80 and the right-hand end of the slot 78 contacting with the shank of the screw 79. The bar 77 is maintained with its upper edge in contact with the top of the slot 81 in the guide block in a manner presently to be described.

Referring now to the operation of the parts hereinbefore explained, it will be understood that the carriage will be moved step-by-step leftward across the top plate during printing operations until the contact portion 56 of the bell trip 55 engages the upwardly projecting arm of the bell hammer 58. The bell trip is prevented from yielding to the bell hammer by the pin 57 so that a further movement of the carriage leftward will raise the hammer portion 60 until the carriage has moved far enough to permit the upwardly projecting arm of the bell hammer to escape from the contact portion of the bell trip, whereupon the head 60 will fall against the bell 61 ringing the latter and giving warning of the approach to the end of the line. Further leftward movement of the carriage will bring the contact edge 66 of the line stop 48 against the arm 84 of the slidable bar 77 and will move said bar longitudinally rightward, as viewed from the rear. This movement of the bar will be communicated through the bell crank 89 to the link 93 to raise the latter, said link giving a ro-

tary movement to the locking bar 96 and swinging the latter to the locking position indicated in Fig. 5, wherein it will be observed that said locking bar is directly beneath the edge 41<sup>a</sup> of the hook member 38. Overthrow or an excessive movement of the locking bar is prevented by the vertical edge or stop 41 of said hook member 38, with which edge said locking bar contacts as soon as it reaches the vertical or locking position. When the locking bar or member 96 is in this position the slide bar or member 77 is in the position indicated in Fig. 3, wherein it will be observed that the arm 84 of the sliding bar is in contact with the guide block 80 which serves also as a stop to limit the movement of said bar 77. With the parts in the positions just described it will be understood that the key levers 4 are locked against depression, as the slightest movement will bring the contact edges 41<sup>a</sup> on said key levers into contact with the locking bar 95. It will also be understood that the carriage is locked against further movement in letter space direction, through the engagement of the line stop 48 with the sliding bar 77, which bar has now reached the limit of its travel in letter space direction.

In order that additional characters may be written if desired at the end of the line, after the line lock has been brought to operative position, I provide unlocking mechanism which will now be described. A lug 102 integral with the slide bar 77 is dependent from said slide bar between the bearing screw 79 and the pin 86. A vertically disposed link 103 has its upper end pivotally connected to said lug at 104, the lower end of said link being connected at 105 to a key lever 106 pivoted on the fulcrum rod 5 of the character key levers and extending fore and aft of the machine. The key lever 106 is provided at its forward end with a key button 107. The lever 106 is provided with a restoring spring 108, said spring tending to maintain said lever in the position indicated in Figs. 1 and 2, and said spring further acting on the slidable bar 77 through the link 103 to maintain said bar in the positions shown in Fig. 2 and in full lines in Fig. 3, with its upper edge in contact with the top of the slot in the guide block 80. When it is desired to release the printing key levers and the carriage from the line lock mechanism the unlocking or releasing key lever 106 is depressed and as it moves downward it will act through the link 103 on the slide bar 77 to swing the latter about the screw 79 as a pivot downwardly from the position indicated in full lines in Fig. 3 to the position indicated in dotted lines in said figure. The downward rotary movement of the bar 77 is limited by the contact of the lug 85 with the top plate 3. When in the dotted line position, it will be noted that the

slide bar 77 has been swung down out of engagement with the line stop 48. As soon as this disengagement occurs the spring 101, acting, through the locking bar 96, link 93, bell crank 89 and pin 86, upon the slide bar 77, will swing the latter inwardly or towards the left, viewed from the rear, to the position indicated in Fig. 4, in which it will be noted the top of the arm 84 lies up against the bottom of the line stop 48, but is not in position to prevent further movement of said line stop in letter space direction. The locking bar 95 has, by this operation, been swung rearwardly by its spring 101 far enough to permit the operation of the key levers 4 so that said key levers may be operated to cause their associate type bars to cooperate with the platen and the carriage will move a letter space distance at each operation of one of under the influence of the springs 101 and ward the top of the arm 84 will ride upward said key levers. As the carriage moves left-108 until the slidable and rotary bar 77 has along the inclined edge 67 of the line stop.25 been restored to the position indicated in Fig. 2.

When the line of writing has been completed the carriage is returned or restored from left to right across the top plate in the usual manner. During this return move-30 ment of the carriage, the inclined edge 67 of the line stop will act on the arm 84 of the bar 77 to press the latter against the tension of the spring 108 downward out of the path of said line stop, the pin and slot connection 86-87 permitting this downward return movement of the bar 77 without disturbing the locking bar 96 and its connections. After the line stop has passed the arm 8440 the bar 77 will be swung up under the influence of the spring 108 to normal position. The next operation that takes place during the return movement of the carriage is the engagement of the bell trip 55 with the hammer lever 58, said bell trip being swung about its pivot 51 by the lever 58 without said lever being affected. Thereafter the contact face 70 of the margin stop 58 will engage the arm 84 and as the edge 83 of the bar 77 is now in contact with the guide block 80, said arm 84 will not yield and the carriage will be arrested in proper position to begin a new line of writing.

If it should be desired to write within the55 margin, the key lever 106 may be depressed to draw down the lever 77 until the arm 84 disengages from the margin stop 68, whereupon the carriage may be moved still further rightward in order to write within the margin. After such operation the bar 77 will be automatically depressed by the cooperation between the inclined face 71 of the margin stop with the arm 84 during the movement of the carriage in printing direction.

It will be seen that I provide a line lock

mechanism that comprises few parts and which is simple in operation; that said line lock mechanism serves to lock the keys against depression and the carriage against movement in letter space direction; that I further provide means for unlocking said line locking mechanism to permit additional characters to be written; that I also provide means for arresting the carriage as it is returned from left to right in order to define the left-hand margin; and that I further provide means for permitting the further rightward movement of said carriage to enable writing to be done within the margin.

Various changes may be made in the construction and arrangements of the parts hereinbefore described without departing from the spirit and scope of my invention.

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

1. In a typewriting machine, the combination of type bars; key levers therefor; a carriage; step-by-step feeding devices therefor; a line stop on said carriage; a slidable bar cooperative with said line stop; a plurality of guides for said bar, said guides being fixed on the frame of the machine; a locking bar lying beneath the key levers and connected with said slidable bar, said locking bar being normally inoperative; and means for maintaining said slidable bar in position to cooperate with said line stop and for releasing said slidable bar from engagement with said line stop, said means including a spring-pressed key lever and a link connected at one end directly to said spring-pressed key lever and connected at the other end directly to said slidable bar.

2. In a typewriting machine, the combination of type bars; key levers for operating said type bars; a carriage; step-by-step feeding devices for said carriage; a universal bar operated by said key levers and connected with the carriage feeding devices; a rack bar on said carriage; a line stop adjustable on said rack bar; a bar mounted to slide on the frame of the machine; a bell crank lever pivoted to the frame and connected to said slidable bar; a link; a pivoted locking bar lying beneath the key levers and connected by said link with said bell crank lever; a spring acting on said locking bar and tending to maintain the latter inoperative and to press said slidable bar in a direction opposite to that in which the carriage is fed step-by-step, said line stop being cooperative with said slidable bar to arrest the carriage and to operate said locking bar; and means for releasing said slidable bar, said means comprising a releasing key lever and a link directly connected both to said slidable bar and to said releasing key lever.

3. In a typewriting machine, the combination of a carriage; type bars; key levers for operating said type bars; a line stop adjust-

able on the carriage; a bell trip pivoted to said line stop; a bell hammer pivoted on the machine frame and operable by said bell trip; a slidable bar on the machine frame operable by said line stop; a pair of fixed guides cooperative with said slidable bar, one of said guides serving also as a pivot for said bar; a pivoted locking bar disposed transversely of said key levers; connections between said slidable bar and said pivoted locking bar for operating the latter to lock the key levers, said slidable bar also serving as a stop cooperating with said line stop to arrest the movement of the carriage in the printing direction; and key operated means for giving a rotary movement to said slidable bar to release said carriage from said locking bar, one of said guides cooperating with said slidable bar to guide it during both its slidable and rotary movements.

4. In a typewriting machine, the combination of type bars; key levers for operating said type bars; a carriage; step-by-step feeding devices for said carriage; a universal bar operative by said key levers and connected with the carriage feeding devices; a rack bar on said carriage; a line stop adjustable on said rack bar; a margin stop adjustable on said rack bar; a bar mounted to slide on the frame of the machine; a pivoted locking bar lying beneath said key levers; connections comprising a bell crank lever and a link between said slidable bar and said locking bar; a spring tending to maintain said locking bar inoperative and to press said slidable bar in a direction opposite to that in which the carriage is fed step-by-step, said line stop being cooperative with said slidable bar to operate said locking bar and to arrest the carriage from movement in printing direction and said margin stop co-acting with said bar to arrest the carriage on its return movement; and means for moving said slidable bar to inoperative position, said means including a spring-pressed key lever and a link connected directly both to said spring-pressed key lever and to said slidable bar.

5. In a typewriting machine, the combination of type bars; key levers for operating said type bars; a carriage; step-by-step feeding devices for said carriage; a universal bar operative by said key levers and connected with the carriage feeding devices; a rack bar on said carriage; a line stop adjustable on said rack bar; a margin stop adjustable on said rack bar; a slidable bar mounted on the frame of the machine, said slidable bar being also capable of rotary movement; a locking bar pivoted to the frame of the machine beneath said key levers; connections between said locking bar and said slidable bar; means tending to maintain said locking bar inoperative and to

press said slidable bar in a direction opposite to that in which the carriage is fed step-by-step, said line stop being cooperative with said slidable bar to operate said locking bar and also to arrest the carriage; and key operated means for giving rotary movement to said slidable bar to unlock said locking bar and to free the carriage for further letter space movements, said slidable bar being cooperative with said margin stop to arrest the carriage on its return movement, said key operated means including a spring-pressed key lever and a link connected directly both to said spring-pressed key lever and to said slidable bar.

6. In a typewriting machine, the combination of type bars; key levers for operating said type bars; a carriage; step-by-step feeding devices for said carriage; a universal bar operative by said key levers and connected with the carriage feeding devices; a rack bar on said carriage; a line stop adjustable on said rack bar; a margin stop adjustable on said rack bar; a slidable bar mounted on the frame of the machine, said slidable bar being also capable of rotary movement; a locking bar pivoted to the frame of the machine beneath said key levers; connections between said locking bar and said slidable bar; means tending to maintain said locking bar inoperative and to press said slidable bar in a direction opposite to that in which the carriage is fed step-by-step, said line stop being cooperative with said slidable bar to operate said locking bar and also to arrest the carriage; and key operated means for giving rotary movement to said slidable bar to unlock said locking bar and to free the carriage for further letter space movements, said slidable bar being cooperative with said margin stop to arrest the carriage on its return movement and being further operable at such time by said key operated means to free the carriage for writing within the margin, said key operated means including a spring-pressed key lever and a link connected directly both to said spring-pressed key lever and to said slidable bar.

7. In a typewriting machine, the combination of a carriage; carriage feeding devices including a universal bar; type bars; key levers for operating said type bars arranged beneath said universal bar; hooks secured on said key levers and operative on said universal bar, said hooks being provided with stop portions extending below said key levers; a member for locking said key levers against depression; and means controlled by said carriage for operating said member, the stop portions on said hooks cooperating with said member to arrest it after it has reached locking position.

8. In a typewriting machine, the combina-

tion of a carriage, a fixed track-way on which said carriage moves, type bars, key levers therefor, a contact on the carriage, and line locking mechanism for said key levers  
 5 operative by said contact and comprising a bar slidably mounted on said track-way, a bearing block secured to said track-way and serving to guide and support said bar near one end and also to limit its longitudinal  
 10 movement in one direction, a locking bar disposed transversely of said key levers and co-operative therewith, a bell crank pivoted on the machine frame and directly connected with said slidable bar, and a link connected  
 15 at one end to said bell crank and at the other end to said locking bar.

9. In a typewriting machine, the combination of a carriage, type bars, key levers therefor, a contact on the carriage, and line  
 20 locking mechanism for said key levers operative by said contact and comprising a slidable and rotary bar, a locking bar coöperating with the key levers and connected with said slidable and rotary bar, and unlocking  
 25 mechanism for said key levers comprising a key lever and a link directly connected with said last mentioned key lever and with said slidable and rotary bar, said last mentioned key lever being operative to communicate

rotary movement to the slidable and rotary 30 bar.

10. In a typewriting machine, the combination of a carriage, type bars, key levers therefor, a contact on the carriage, a slidable and rotary bar on the machine frame movable in a longitudinal direction by said contact, a locking bar disposed transversely of said key levers, a bell crank pivotally connected with said slidable bar, a link directly connected with said bell crank and with said  
 40 locking bar, said bell crank and link operating said locking bar to lock the key levers, and unlocking mechanism for said key levers comprising a key lever and a link directly connected with said last named key lever and  
 45 with said slidable and rotary bar, said last named key lever being operative to communicate rotary movement to the slidable and rotary bar.

Signed at the borough of Manhattan, city 50 of New York, in the county of New York, and State of New York, this 30th day of January, A. D. 1906.

OSCAR WOODWARD.

Witnesses:

E. M. WELLS,  
 M. F. HANNWEBER.