

No. 669,293.

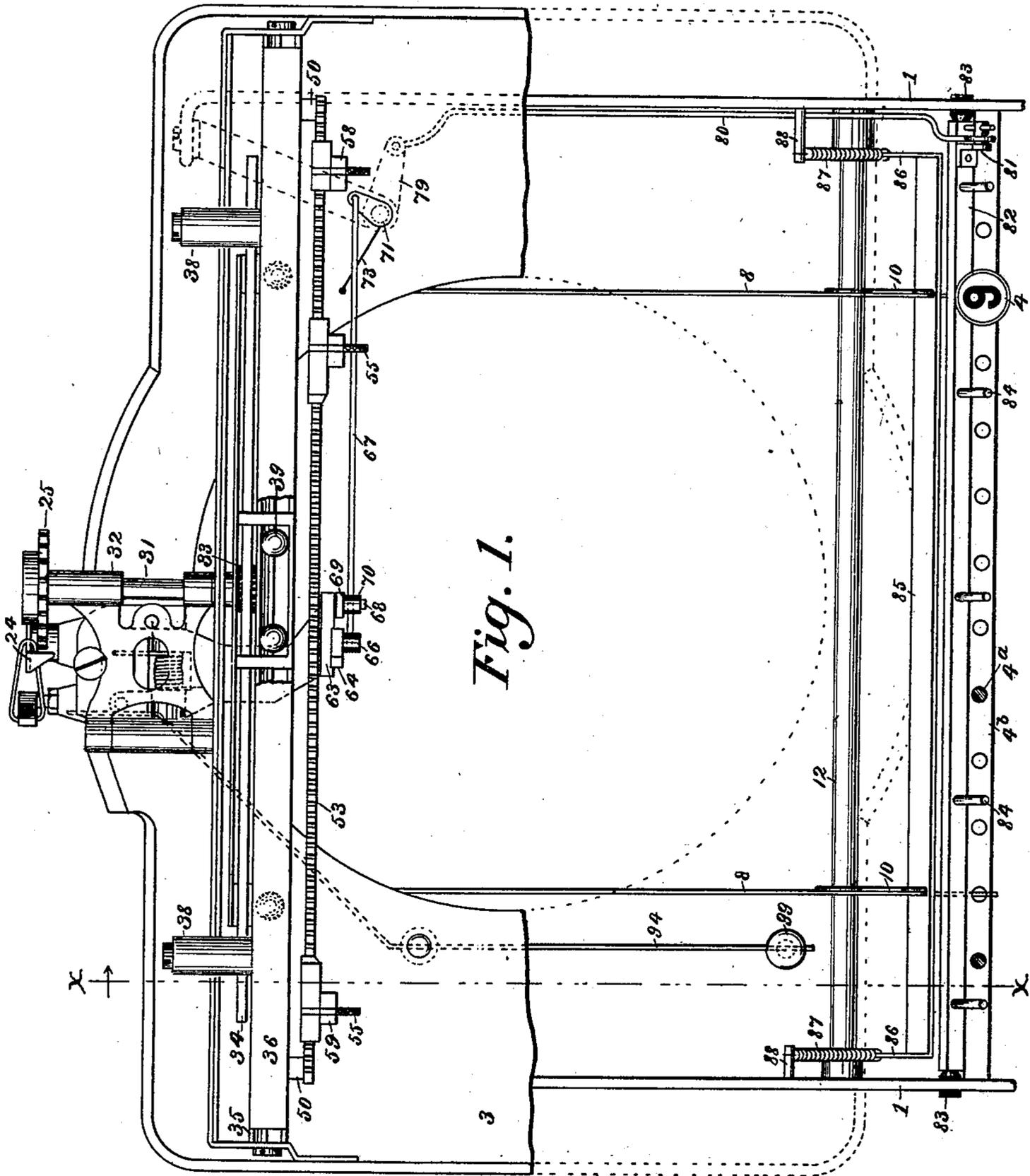
Patented Mar. 5, 1901.

C. D. WALLACE.  
TYPE WRITING MACHINE.

(Application filed Dec. 5, 1899.)

(No Model.)

3 Sheets—Sheet 1.



WITNESSES:

*B. B. Stickney*  
*Carl Erickson*

INVENTOR

*Casper D. Wallace*

by *James Falbel*

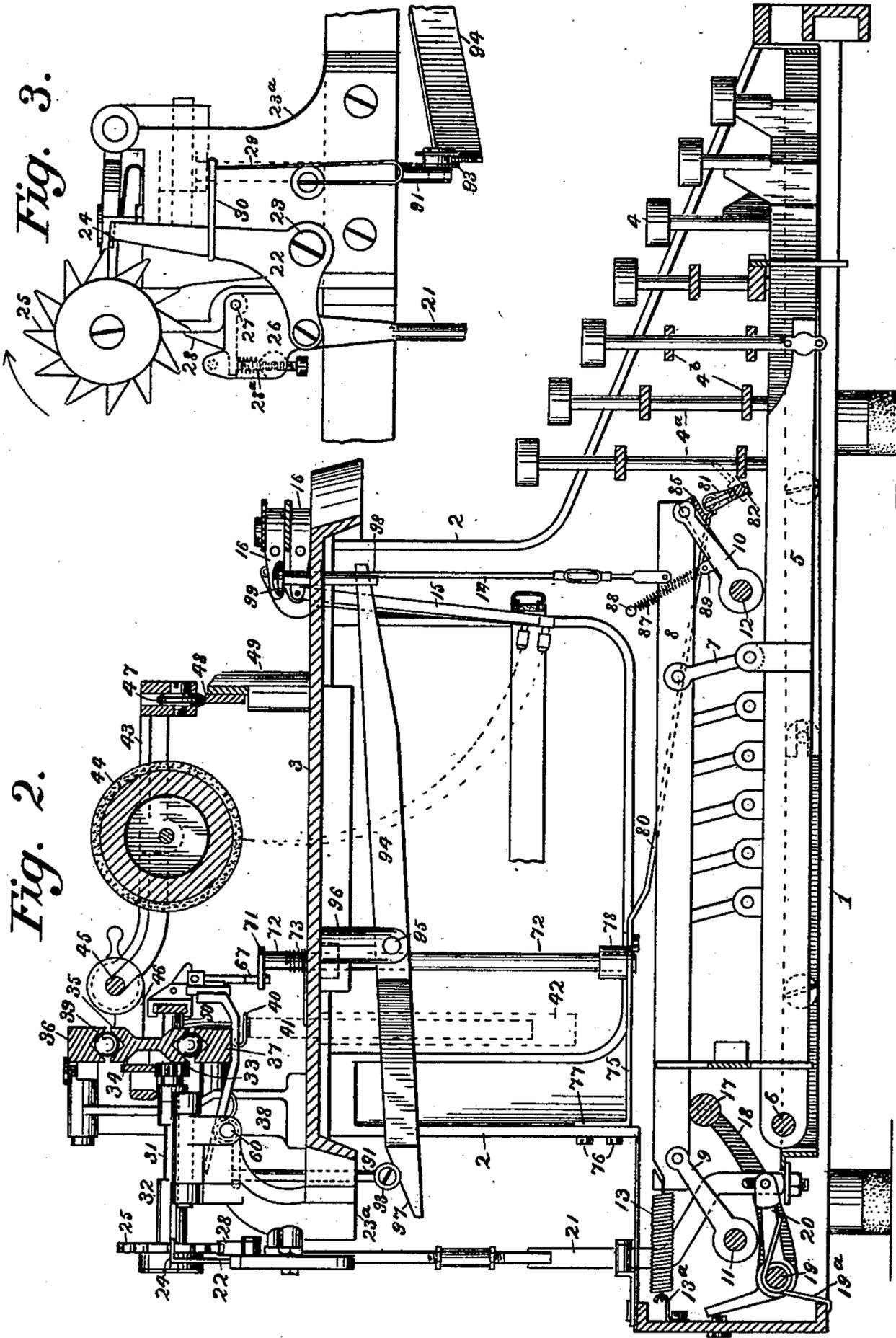
HIS ATTORNEY

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3 Sheets—Sheet 3.

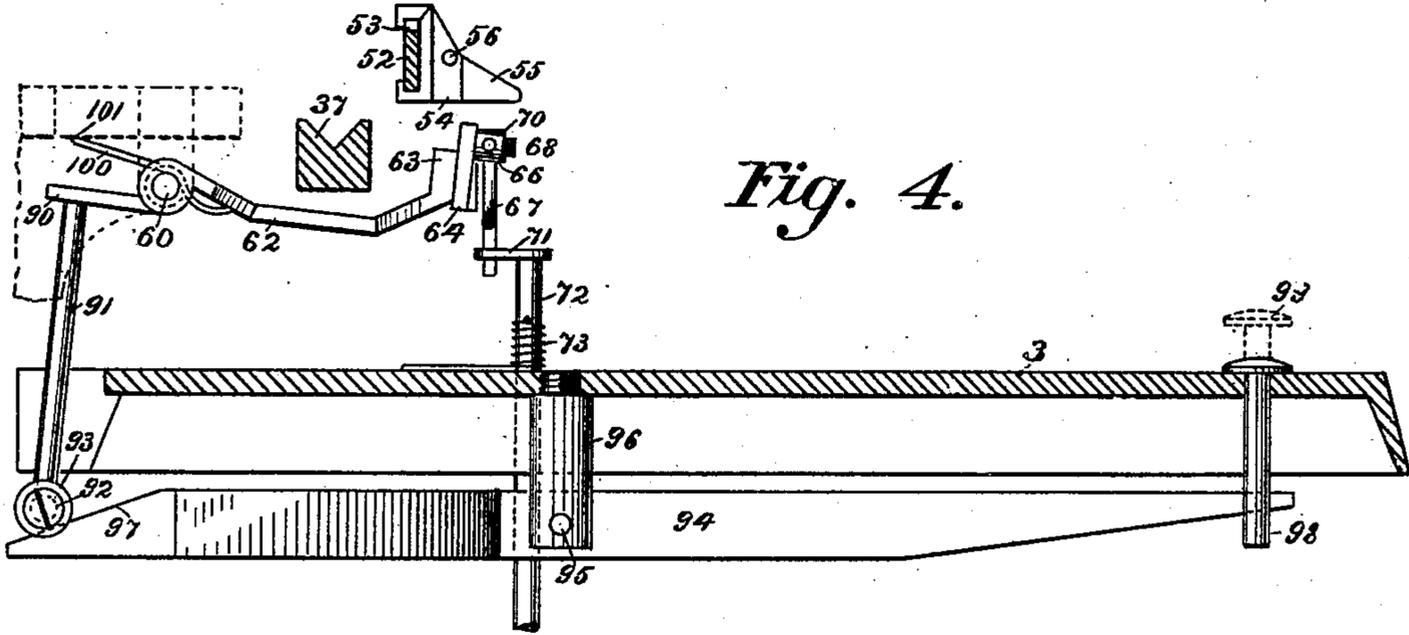


Fig. 4.

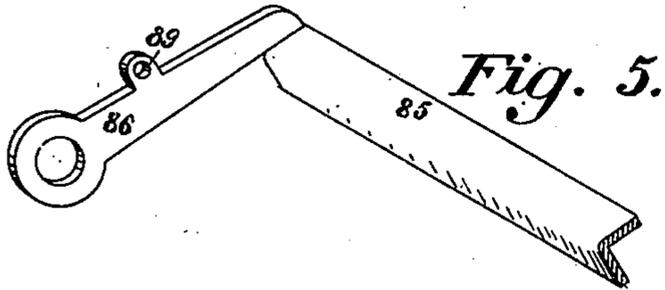


Fig. 5.

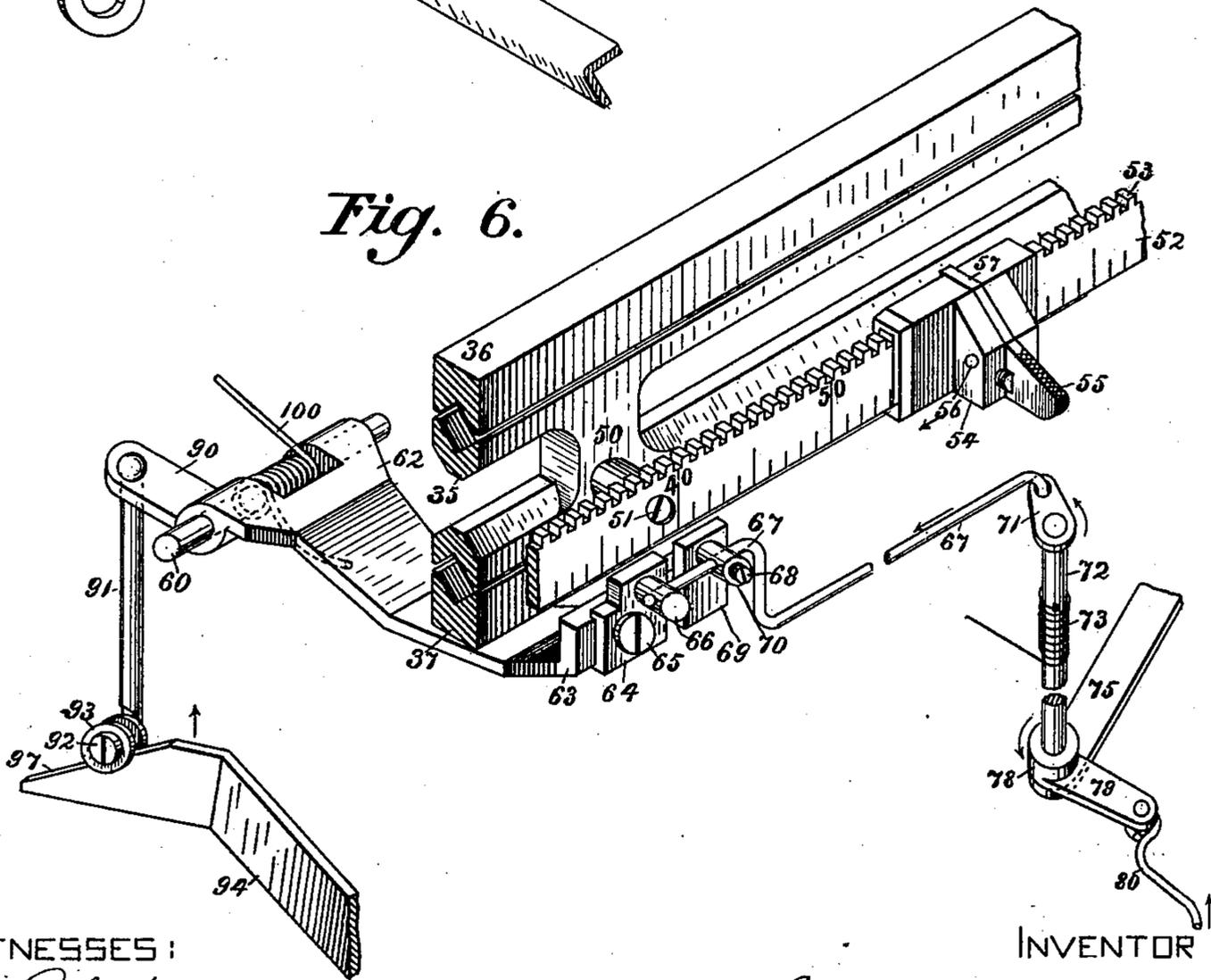


Fig. 6.

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# UNITED STATES PATENT OFFICE.

CASPER D. WALLACE, OF BRIDGEPORT, CONNECTICUT, ASSIGNOR TO THE AMERICAN WRITING MACHINE COMPANY, OF ILION, NEW YORK.

## TYPE-WRITING MACHINE.

SPECIFICATION forming part of Letters Patent No. 669,293, dated March 5, 1901.

Application filed December 5, 1899. Serial No. 739,235. (No model.)

*To all whom it may concern:*

Be it known that I, CASPER D. WALLACE, a citizen of the United States, and a resident of Bridgeport, in the county of Fairfield and State of Connecticut, have invented certain new and useful Improvements in Type-Writing Machines, of which the following is a specification.

My invention relates to line-locking mechanisms or means for preventing the writing of one character upon another at the end of a predetermined line; and its object is to simplify the construction and improve the operation thereof.

The invention consists of the various features of construction and combinations of devices hereinafter more fully described, and particularly pointed out in the appended claims.

In the accompanying drawings the mechanism is adapted to the type-writing machine shown and described in Letters Patent granted to me June 6, 1899, No. 626,354, and was devised as an improvement upon the line-locking mechanism therein shown.

Figure 1 is a partial plan view of the machine with certain parts broken away to disclose the mechanism below such parts. Fig. 2 is a vertical longitudinal section through the center of the machine, some of the parts being broken away or disconnected. Fig. 3 is an enlarged fragmentary rear view of the carriage-escapement mechanism, &c. Fig. 4 is an enlarged view of a portion of the devices shown in Fig. 2 and showing the carriage-releasing position of the line-locking mechanism. Fig. 5 is an enlarged perspective view of a portion of the locking-bail, and Fig. 6 is an enlarged perspective view of a portion of the line-locking mechanism and of the carriage.

In the various views like parts are designated by like numerals of reference.

1 designates the base of the machine, 2 the corner-posts, and 3 the top plate or type-ring. Finger-keys 4 are suitably connected to key-levers 5, some of the keys being rigidly secured upon the forward ends of the levers and others thereof being carried upon vertical stems 4<sup>a</sup>, which are guided in transversely-arranged perforated bars 4<sup>b</sup>. The key-levers

extend longitudinally of the machine and are arranged side by side and pivoted at their rear ends upon a common transverse fulcrum-rod 6. Each key-lever is connected by an upright link 7 to a horizontal bar 8, which is pivoted at its ends to the upper ends of a pair of obliquely-arranged links 9 10, the lower ends whereof are pivoted, respectively, upon transverse fulcrum-rods 11 and 12. By this construction the bar 8 is enabled to move vertically and endwise without tipping. From each draw-bar 8 a link 14 extends upwardly to the short arm of one of a series of circularly-arranged type-bars 15, journaled in brackets 16, secured to the type-ring 3. A spring 13, which is hooked at one end to the rear end of the draw-bar 8 and at the other end to a suitable catch 13<sup>a</sup>, fixed upon the framework, serves to return said bar 8, as well as the remainder of the type-operating mechanism, to normal position after operation.

Arranged beneath the transverse series of bars 8 (one bar 8 for each type-bar) is a cylindrical universal bar 17, which controls the letter-spacing mechanism, and is suitably secured upon the front ends of a pair of upwardly and forwardly curving crank-arms 18, the latter being fixed upon a transverse rock-shaft 19, which is suitably journaled in the base of the machine and is provided with a returning-spring 19<sup>a</sup>. Also fixed upon this rock-shaft is a forwardly-extending crank-arm 20, which is provided at its free end with a pin-and-slot connection to a vertical feed-rod 21. Near its upper end the rod 21 is pivoted to the horizontal arm of an escapement bell-crank 22, which is suitably pivoted at 23 to a bracket 23<sup>a</sup>, fixed upon the top plate 3. The upper end of the vertical arm of the bell-crank is provided with a rigid detent-dog 24, adapted to an escapement-wheel 25. The upper end of rod 21 is provided with an enlargement or plate 26, upon which is pivoted at 27 a stepping or feeding dog 28, arranged normally in engagement with the escapement-wheel 25 and provided with a spring 28<sup>a</sup>, by which it is given a tension toward the right or in opposition to the direction of movement of the escapement-wheel, so that upon being disengaged from the wheel-tooth by a downward movement of the rod 21 the said feed-

ing-dog is moved past the tooth by said spring. The feed-rod 21 is guided by means of the short arm of the bell-crank 22, and upon downward movement of the rod to withdraw the feeding-dog 28 from the escapement-wheel the dog 24 upon said bell-crank is caused to move into engagement with the escapement-wheel. The bell-crank is provided with a returning-spring 29, connected thereto by a link 30.

The escapement-wheel 25 is suitably secured upon the rear end of a horizontally-revolving shaft 31, which is journaled in a pivoted release-bracket 32 and carries at its forward end a pinion 33, in mesh with a rack 34, the latter being secured to a carriage-bar 35. Said bar 35 is provided with longitudinal ball-grooves in its upper and lower edges and works between stationary rails or tracks 36 37, one arranged over said carriage-bar 35 and the other under it. These rails are provided with corresponding ball-grooves upon the sides thereof which face the carriage-bar 35, and bearing-balls 39 are arranged in said grooves, whereby the carriage-bar is supported and guided.

A depending arm or hook 40 is fixed to the carriage-bar, and one end of a strap 41 is secured thereto, the other end being secured to a spring-barrel 42, (shown in dotted lines at Fig. 2,) whereby the carriage is drawn longitudinally in the letter-space direction and is caused to impart movement through the pinion and shaft to the escapement-wheel 25. A frame 43, carrying a platen 44, is pivoted at 45 to ears 46, provided upon the carriage-bar. The platen-frame is provided with a front roll 47, which runs upon a track 48, suitably supported upon a pair of standards 49, arranged upon the top plate.

In operation upon the depression of a key the lever 5 is vibrated about its fulcrum-rod 6, and by means of the link 7 pulls down the bar 8 and the connecting-rod 14, causing the type-bar to swing up until the type thereon strikes the paper on the platen. During the described operation of the type-moving mechanism the following operation of the letter-space mechanism takes place: The universal bar 17 is forced downwardly by the bar 8, causing the shaft 19 to rock and the arm 20 thereon to descend. The latter pulls down the feed-rod 21, causing the stepping-dog 28 pivoted thereon to be disengaged from the escapement-wheel 25. Simultaneously the bell-crank 22 is rocked by the rod 21, so that the dog 24 upon the bell-crank is moved into engagement with the escapement-wheel to prevent rotation thereof at this time. The dog 28 is moved by the spring 28<sup>a</sup> to a position to engage the succeeding escapement-tooth upon subsequent rotation of the wheel. Upon the relief of the finger-key from pressure the type-operating mechanism is returned to normal position by spring 13, the universal bar is lifted by spring 19<sup>a</sup>, and the bell-crank 22 is returned to normal position by

the spring 29, whereby the dog 24 is disconnected from the escapement-wheel and the latter is enabled to rotate to the extent of one tooth, permitting a movement of the shaft 31, pinion 33, rack 34, and carriage 35 in response to the tension of the spring-barrel 42.

Secured by screws 51 to lugs 50, formed upon the carriage-bar 35, is a bar 52 of the line-locking mechanism, the said bar being disposed in a vertical plane and provided with teeth 53 upon its upper edge and having corresponding letter-space graduations upon its lower edge. A contact or tappet 54 is arranged to slide upon this bar and is provided with a spring-pressed locking-lever 55, the latter being pivoted to the tappet at 56 and being provided with a tooth 57 for engaging the teeth upon the bar, so as to hold the tappet in any position to which it may be adjusted. The main purpose of the tappet is to effect the locking of the finger-keys at a predetermined point in the travel of the carriage or in the writing of a line. A second line-locking contact or tappet 58 is also arranged upon the bar. This tappet 58 enables the line to be locked a second time—that is to say, after the first tappet has locked the line and the line has been unlocked for a further movement of the carriage the line will be locked a second time as the carriage advances by the contact of the tappet 58 with the finger or plate 69. For the purpose of arresting the carriage at any predetermined point in its return movement, so as to regulate the left-hand margin upon the written page, an adjustable stop or tappet 59 is arranged upon said bar 52 and likewise provided with a locking-lever. In adjusting any tappet the lever 55 is depressed, lifting the tooth 57 clear of the teeth 53 in the rack-bar, whereupon the tappet may be moved along the bar.

The devices hereinbefore described are substantially the same in construction and operation as shown in my said patent.

Horizontally pivoted at 60 to the bracket 23<sup>a</sup> and extending forwardly beneath the lower carriage-rail 37 is a bent arm or plate 62, which is provided at its front end with a vertical ledge 63. An abutment or stop 64 is preferably secured to the ledge by a screw 65; but this abutment may, if desired, be formed integrally with the arm 62. Secured to the abutment 64 is a forwardly-projecting stud 66, having a horizontal perforation, in which one end of an endwise-movable bent rod 67 takes a bearing. Upon this rod is adjustably fixed a finger 69, preferably in the form of a vertical plate. This plate is provided with a stud 70, having a perforation for said rod in line with the perforation in the other stud. The stud 70 has a threaded hole formed in its end, in which is seated a screw 68 for binding the plate upon the rod. Hence the plate may be adjusted along the rod and secured in any position by the set-screw. This plate or finger 69 is arranged normally

in the path of the adjustable tappet 54, so that the movement of the carriage at any predetermined point in its letter-space travel may be communicated through the finger 69 to the rod 67. This rod is loosely pivoted or hooked at its right-hand end to a crank-arm 71, fixed upon the upper end of a vertical shaft 72. Around the latter is coiled a returning-spring 73, one end of which enters a hole in the shaft and the other end of which enters a hole in the top plate. The shaft is suitably journaled at its upper end in the top plate and at its lower end in a hole formed in the forward end of a horizontal bracket 75, which is fixed to the rear corner-post 2 by screws 76, which engage an angle-plate 77, formed on said bracket. A collar 78 is secured to the shaft near its lower end and serves to support the shaft upon the bracket. To this collar is fixed a horizontal crank-arm 79, which is connected by a bent link 80 to a crank-arm 81, fixed upon a transverse rock-shaft 82. The latter is preferably of oblong cross-section and is adapted to turn upon center screws 83, seated in the side walls of the base 1. Fixed at intervals upon the rock-shaft 82 is a series of projections or pins 84, which normally point upwardly and forwardly, but which may be swung rearwardly into the path of a transversely-arranged bar 85. The latter is preferably of L-section and is secured upon the upper ends of a pair of arms 86, which are pivoted at their lower ends upon the fulcrum-rod 12, the bar and the arms taken together forming a bail. The bar 85 is arranged in the path of movement of all of the links 10 and draw-bars 8 and is normally held up against said links by the tension of springs 87, one end of each of which catches over a pin 88, projecting inwardly from the side wall of the base and the other end whereof hooks into a hole formed in an ear 89 of said arm 86.

In operation of the line-locking mechanism after the adjustment of tappet 54 the keys are operated to cause the types to print and to feed the carriage by means of the described letter-spacing mechanism until the tappet 54 engages the finger 69 and moves it against the abutment 64, whereby further letter-spacing movement of the carriage is prevented. Hence in one sense the finger 69 may be regarded as a stop for the carriage, although the abutment 64 really serves as a stop for both the finger and carriage; but the principal function of the finger 69 is to prevent the movement of the types. During the movement of the finger 69 the rod 67 is carried thereby to the left, and by means of the crank-arm 71 causes a partial rotation of the vertical shaft 72, whereby the crank 79 is swung rearwardly, and through the link 80 and crank 81 the shaft 82 is rocked and the pins thereon are swung over rearwardly to the full-line position shown at Fig. 2, in which position they are in the path of movement of the bar 85, and hence prevent partially or wholly the movement not only of the bar 85,

but also of all of the series of bars 8, and hence the entire series of type-operating systems, so that no type can be moved against the platen by the operation of a key. It will thus be seen that the finger 69 is enabled to control the movement of the types—that is, to prevent the operation of the types by the keys. Upon the carriage being now returned to the right to begin a new line the spring 73 operates to restore to normal position the shaft 72 and all parts linked thereto, including the rock-shaft 82, as well as the finger 69, so that the keys and types may be operated freely until the same point is reached in the next line of writing, whereupon the line-locking operation is repeated.

If at any time after the types are locked it should be desired to write one or more additional letters in order to complete a word, the line-locking mechanism may be moved to a position to release both the carriage and types by means of the following devices: The stop-arm 62 is provided with a downward extension, comprising an arm 90 and a vertical rod 91, riveted thereto. To the lower end of the rod is secured a shouldered screw 92, upon which is mounted a grooved antifriction-roller 93. A bent lever 94 is pivoted between its ends at 95 to a stud 96, depending from the top plate, and is provided at its rear end with a cam-face 97, which works in the groove in said roller. The lever bears at its forward end a stem 98, which is passed down through a perforation in the top plate and is provided at its upper end with a key head or button 99. By a depression of the key the lever is vibrated upon its pivot, and the rear end thereof is moved upwardly, whereby the roller 93 is swung rearwardly about the axis 60, causing the arm 62 to vibrate and the forward end thereof to descend until the finger 69 is disengaged from the tappet, as illustrated at Fig. 4, whereby further letter-spacing movement of the carriage is permitted, and whereby the rod 67, shaft 72, and connections, including the shaft 82, are permitted to be restored to their normal or inoperative positions by the spring 73. Upon release of the key from pressure it is returned to normal position, together with the arm 62, by a spring 100, which is coiled about the axis 60 and bears at one end under the arm 62 and has a rearwardly-extending finger which bears up at its other end against the bracket 23<sup>a</sup> at a point 101. This spring causes the arm 62 to normally bear up against the under side of the lower guide-rail 37.

At the line-locking operation the carriage is arrested while making a letter-space movement by contact of finger 69 with abutment 64, and upon subsequent operation of the release-key 99 to effect a disengagement of the finger 69 from the tappet 54 the carriage is enabled to complete said letter-space movement, so that the succeeding tooth of wheel 25 is arrested by the stepping-dog 28. Hence the first letter printed after manipulation of

the release-key 99 falls upon the paper in the proper relation to the last letter printed, so that there is no liability of a space occurring between the two letters. As a means of securing this result the provision of an abutment, as 64, which has no movement in letter-space direction is a matter of importance, as it secures a positive arrest of the carriage without liability of undue movement thereof, which might occur through springing of the parts or backlash in the joints of the mechanism and which would cause a space to appear between the last letter printed before the line-locking operation and the first letter printed after said release. While the abutment 64 has the necessary rigidity, still it is easily movable in a direction transversely of the carriage travel, so as to permit disengagement between it and the tappet 54. It will further be noted that although the abutment is immovable in letter-space direction, yet the tappet is enabled when moving in letter-space direction to operate mechanism for controlling the movement of the types. At the same time both the type-controlling finger 69 and the carriage-controlling abutment 65 can be moved simultaneously out of the path of the tappet 54, so as to effect both a release of the carriage and a release of the types. It will be further noted that the type-controlling mechanism can be moved to working position by the application of very little power, which is a matter of importance, as otherwise the movement of the paper-carriage would be rendered sluggish, and hence the final type impression made before the locking of the keys would fall upon the paper in a false position. The provision of an adjustment for the plate 69 upon the rod 67 is also important, as it enables the plate to be set to the right position to secure the exact movement of the rock-shaft 82 required. The bar 85 being arranged to move always whenever a character-key is struck, the former should be made as light as possible, so as not to add unduly to the touch of the machine. At the same time this bar must be made as strong as possible to resist flexure under a heavy blow. It being difficult to make the bar 85 sufficiently light and strong, I have found that by using the rock-shaft having the upwardly-projecting pins thereon the bar 85 may be firmly supported or sustained against bending or distortion when the line is locked and a heavy blow is struck upon a key, and in consequence of the use of the said supporting devices I am enabled to make the bar 85 considerably lighter in weight than it would be possible to make it without their use.

It will be noted that I have provided a series of projections arranged normally out of the path of movement of the bar 85, together with means controlled by the paper-carriage for automatically moving the projections into the path of said bar, whereby the same is arrested and the movement of the types to

the platen is thereby prevented. It is not essential that the constantly-moving bar 85 be arranged at the precise point in the type-actions illustrated, so long as a series of projections are arranged normally out of its path and are adapted to be moved into its path by the movement of the carriage.

While I prefer to use the invention in the form herein described and illustrated, nevertheless many changes may be made in the details of construction in adapting the improvement to other machines without departing from the gist of the invention.

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

1. In a type-writing machine and in a line-locking mechanism, the combination with the type-bar actions of a comparatively thin bar or plate arranged to be moved with said type-bar actions, and means normally stationary and out of the path of movement of said plate or bar and means for moving said first-mentioned means into the path of the latter so as not only to prevent the operation of the type-bar actions but also to support and sustain any excessive pressure upon said bar or plate which might cause the same to be distorted.

2. In a type-writing machine and in a line-locking mechanism, the combination with the type-actions, including the draw-bars mounted upon obliquely-arranged links, of a bar or plate adapted to be moved by the last-mentioned devices whenever the keys are actuated, a rocking bar carrying a series of pins adapted to arrest and sustain said plate and also lock the key-actions, a paper-carriage having an adjustable tappet, and means on the framework, between said tappet and said rock-shaft, for communicating motion to the latter, to cause the pins to move into the path of said plate.

3. In a type-writing machine and in a line-locking mechanism, the combination of the carriage, a tappet suitably mounted thereon, a rock-shaft as 82 arranged transversely of the machine and provided with means for stopping the movement of the type-bar mechanism, a crank-arm as 81 secured to said rock-shaft, a link as 80 pivoted at one end to said crank-arm and at the other end to another crank-arm as 79, the latter being fixed to the lower end of a vertical shaft as 72, a crank-arm as 71 fixed to the upper end of said vertical shaft, and a rod as 67 connected at one end to said crank-arm 71 and provided at its other end with a finger arranged in the path of the tappet.

4. In a type-writing machine and in a line-locking mechanism, the combination of a suitably-supported movable bar as 85, means for moving said bar at every type movement, a series of projections as 84 arranged normally out of the path of movement of said bar 85, a carriage, and means operable by a movement of said carriage for automatically moving said projections 84 into the path of

said bar 85, whereby the movement of the types to the platen is prevented.

5. In a type-writing machine and in a line-locking mechanism, the combination of a bar as 85 arranged transversely of the machine and adapted to be moved at every type movement, a rock-shaft as 82 arranged parallel with said bar 85 and in proximity thereto, a series of pins projecting from said rock-shaft 82 and arranged normally out of the path of said bar 85, a carriage, and means operable by said carriage for rocking said shaft 82 so as to move said pins into the path of said bar 85 and thereby arrest it so that movement of the types to the platen is prevented.

6. In a type-writing machine and in a line-locking mechanism, the combination of a universal bar as 17 of the carriage-escapement mechanism, a bar as 85 arranged transversely of the machine, a series of type-bar-operating draw-bars as 8 each of which is constructed to operate both of said bars 17 and 85, a rock-shaft as 82 arranged parallel with said bar 85 and in proximity thereto, a series of pins projecting from said rock-shaft 82 and normally arranged out of the path of said bar 85, a carriage, and means operable by a movement of said carriage for rocking said shaft 82 so as to bring said pins into the path of said bar 85 and thereby arrest it, so that movement of the types to the platen is prevented.

7. In a type-writing machine and in a line-locking mechanism, the combination with type-operating mechanism, including key-levers 5, links 7, bars 8, links 9 and 10, fulcrum-rods 11 and 12, connecting-rods 14, and type-bars 15, of a pair of arms 86 mounted upon fulcrum-rod 12, transverse bar 85 fixed upon the free ends of said arms, a carriage, and means operable by a movement of said carriage for intercepting said bar 85 and thereby preventing the normal movement thereof and hence of the said type-operating mechanism.

8. In a type-writing machine and in a line-locking mechanism, the combination of key-levers 5, links 7, bars 8, links 9 and 10, fulcrum-rods 11 and 12, connecting-rods 14, type-bars 15, arms 86 mounted upon fulcrum-rod 12, transverse bar 85 fixed upon the free ends of said arms 86, rock-shaft 82 arranged parallel with bar 85 and provided with a series of projections 84, a platen-carriage, and means actuable by a movement of said carriage for moving said rock-shaft 82 so as to bring the projections 84 into the path of the bar 85 and thereby prevent movement thereof and hence of the types to the platen.

9. In a type-writing machine and in a line-locking mechanism, the combination of a carriage, a tappet adjustable thereon, an abutment suitably supported upon the frame of the machine, a movable finger arranged in the path of said tappet and in proximity to said abutment and adapted to be moved by said tappet against said abutment, means for regulating the extent of movement of said

finger, and means connected to said finger for controlling the movement of the types.

10. In a type-writing machine and in a line-locking mechanism, the combination of a carriage, a tappet adjustable thereon, an arm as 62 pivoted upon the frame of the machine so as to swing transversely of the carriage travel, a finger as 69 controlled by said arm and movable relatively thereto, a rod upon which said finger is secured, and means connected to said rod for controlling the movements of the types.

11. In a type-writing machine and in a line-locking mechanism, the combination of a carriage, a tappet adjustable thereon, a spring-pressed arm as 62 pivoted upon the frame of the machine so as to move transversely of the carriage travel, an abutment as 64 fixed upon the free end of said arm, a stud as 66 provided with a transverse perforation and fixed upon said abutment, a rod as 67 having a bearing in said perforation, a finger as 69 adjustably secured upon said rod and adapted to be moved against said abutment by said tappet, and means connected to said rod for controlling the movement of the types.

12. In a type-writing machine and in a line-locking mechanism, the combination of key-levers 5, links 7, bars 8, links 9 and 10, fulcrum-rods 11 and 12, connecting-rods 14, type-bars 15, arms 86 mounted upon fulcrum-rod 12, transverse bar 85 fixed upon the free ends of said arms, rock-shaft 82 arranged parallel with said bar 85 and provided with a series of projections 84, crank-arm 81 secured to said rock-shaft 82, link 80 pivoted at one end to said crank-arm 81 and at the other end to crank-arm 79, the latter being fixed upon the lower end of vertical shaft 72, crank-arm 71 fixed to the upper end of said vertical shaft, rod 67 connected at one end to said crank-arm 71 and provided at its other end with a finger arranged in the path of a tappet suitably mounted upon a carriage.

13. In a type-writing machine and in a line-locking mechanism, the combination of key-levers 5, links 7, bars 8, links 9 and 10, fulcrum-rods 11 and 12, connecting-rods 14, type-bars 15, arms 86 mounted upon fulcrum-rod 12, transverse bar 85 fixed upon the free ends of said arms, rock-shaft 82 arranged parallel with said bar and provided with a series of projections 84, crank-arm 81, secured to rock-shaft 82, link 80 pivoted at one end to crank-arm 81 and at the other end to crank-arm 79, the latter being fixed upon the lower end of vertical shaft 72, crank-arm 71 fixed to the upper end of said vertical shaft, rod 67 connected at one end to said crank-arm 71 and provided at its other end with a finger arranged in the path of a tappet suitably mounted upon a carriage, pivoted arm 62 upon which said finger is suitably supported, and an abutment arranged upon said arm and adapted to coact with said tappet to arrest the carriage.

14. In a type-writing machine and in a line-

locking mechanism, the combination of a carriage, an adjustable tappet arranged thereupon, a lever as 94 pivoted between its ends upon the frame of the machine and provided  
5 at one end with a key, and at its opposite end with a cam adapted to engage an extension as 91 of a horizontally-extending arm as 62, which is suitably pivoted upon the frame of the machine, an abutment formed or provided  
10 upon the free end of said arm 62 and adapted to coact with the adjustable tappet, a finger arranged in proximity to said abutment and means connected with said finger for arrest-

ing the type-bar mechanism, said finger being controlled by said arm 62 through said key, 15 whereby said key may be operated to cause said arm 62 to release both said abutment and said finger from said tappet.

Signed at Bridgeport, in the county of Fairfield and State of Connecticut, this 2d day of 20 December, A. D. 1899.

CASPER D. WALLACE.

Witnesses:

F. M. HORTON,  
E. M. BLIGHT.