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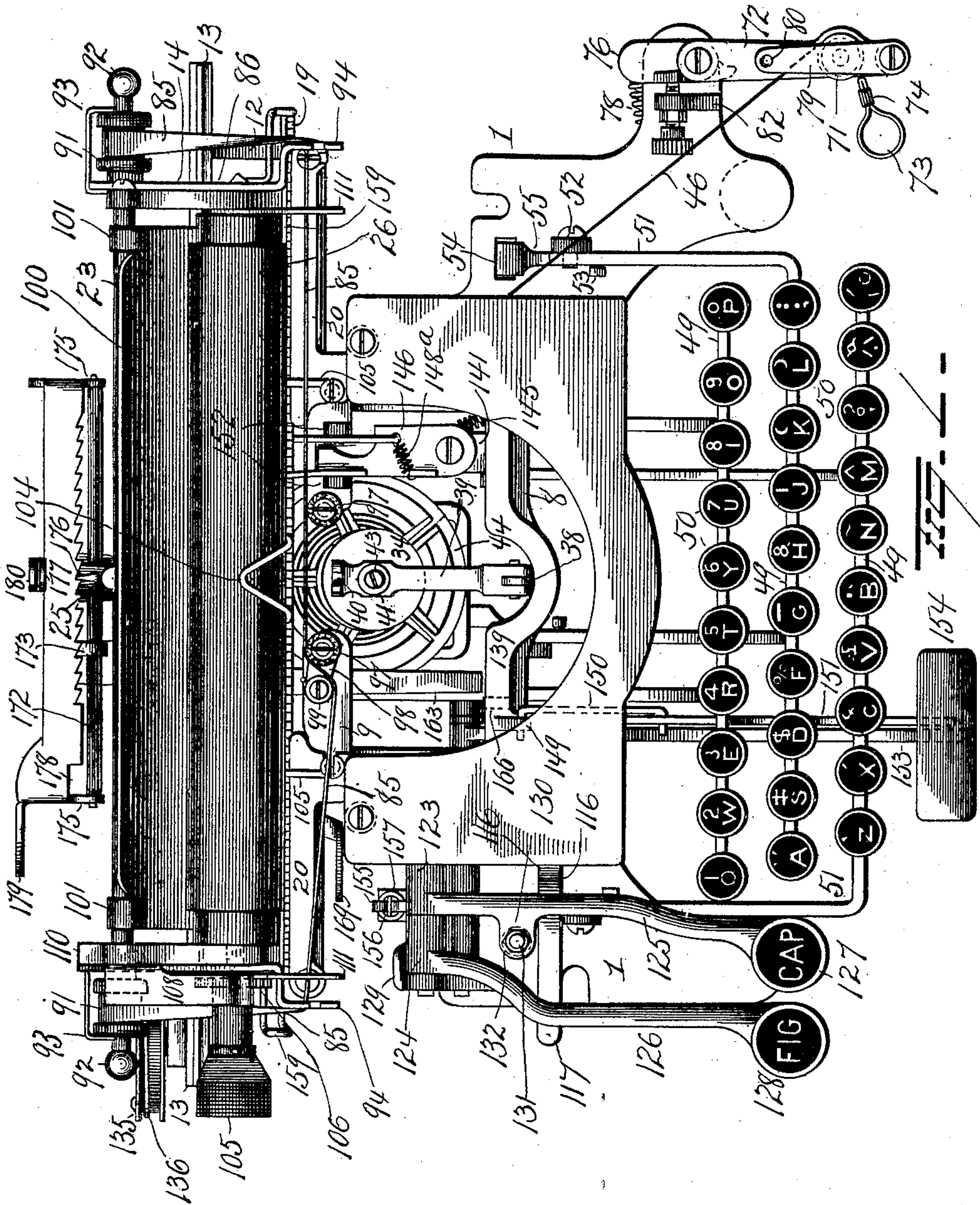
Patented May 28, 1901.

J. J. GREEN.  
TYPE WRITING MACHINE.

(Application filed Dec. 20, 1899.)

(No Model.)

5 Sheets—Sheet 1.



WITNESSES

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G. F. Downing

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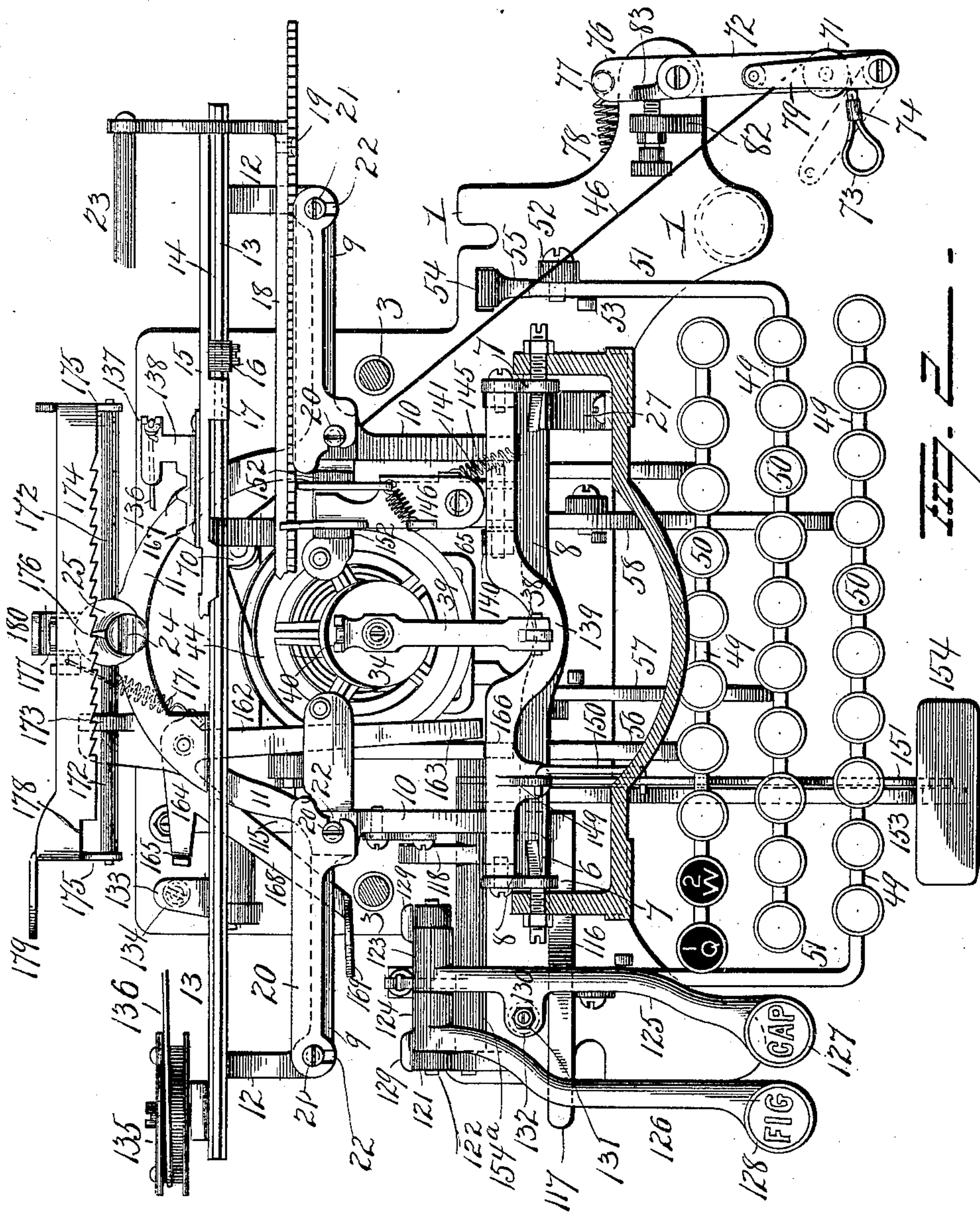
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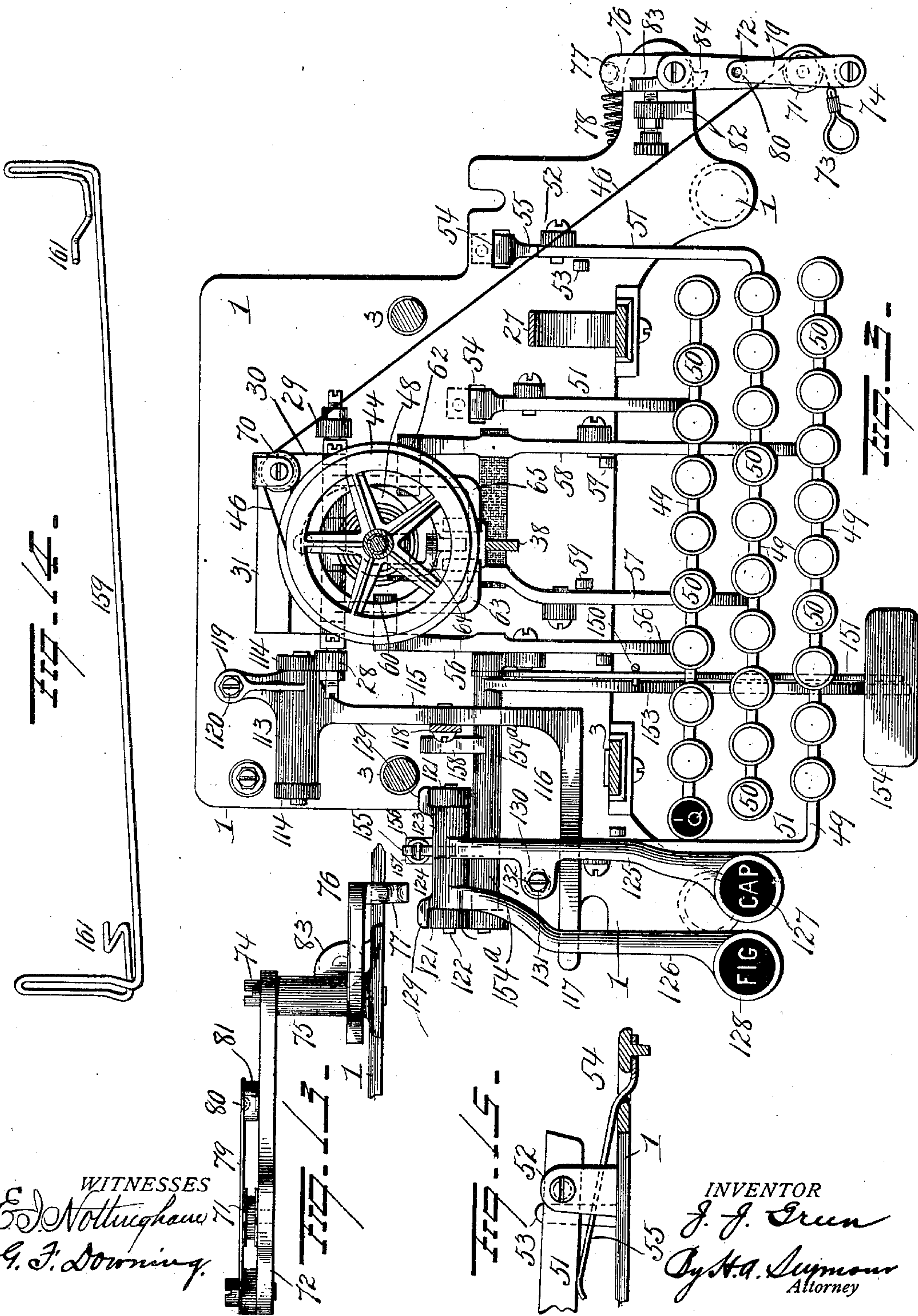
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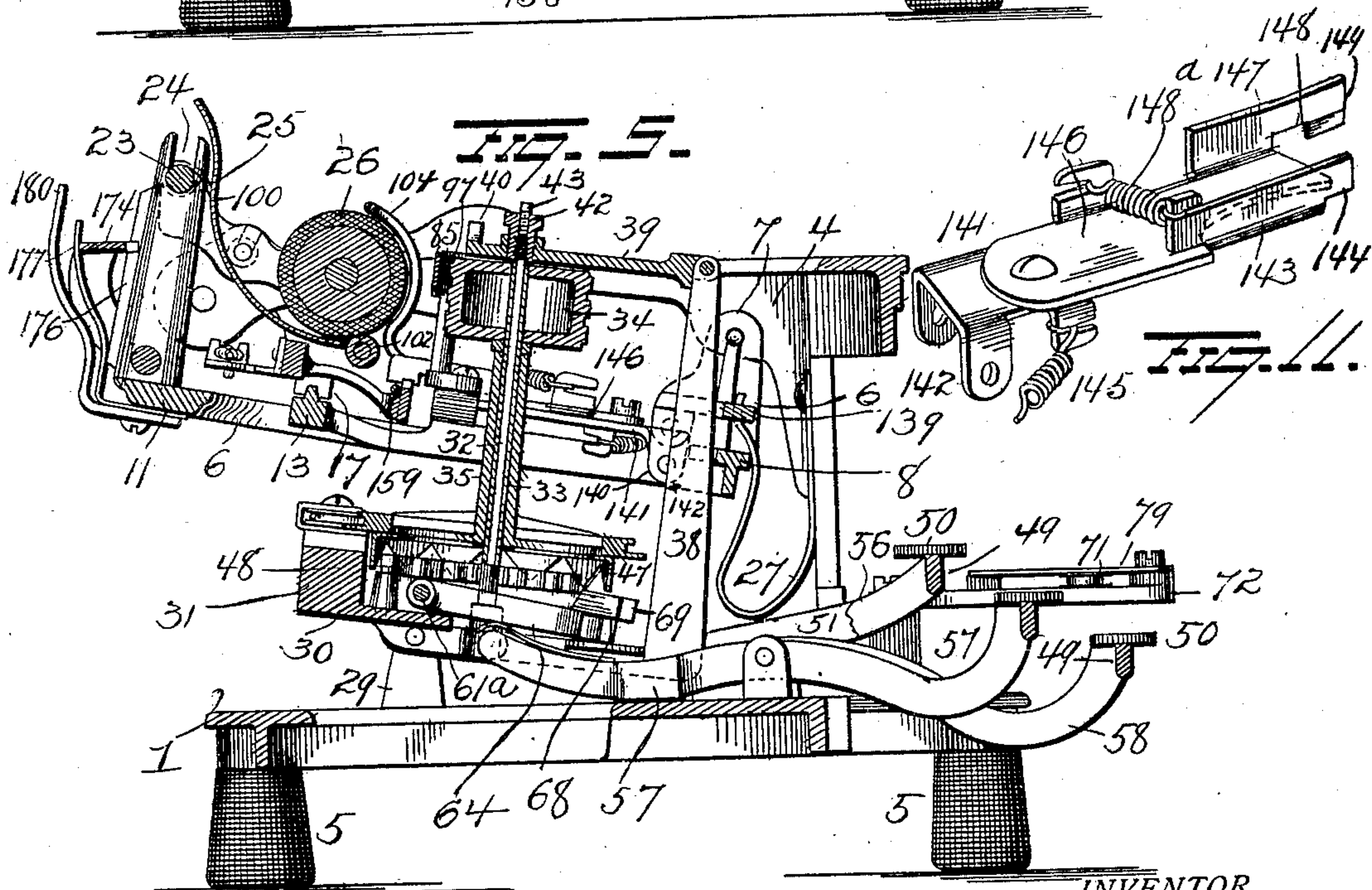
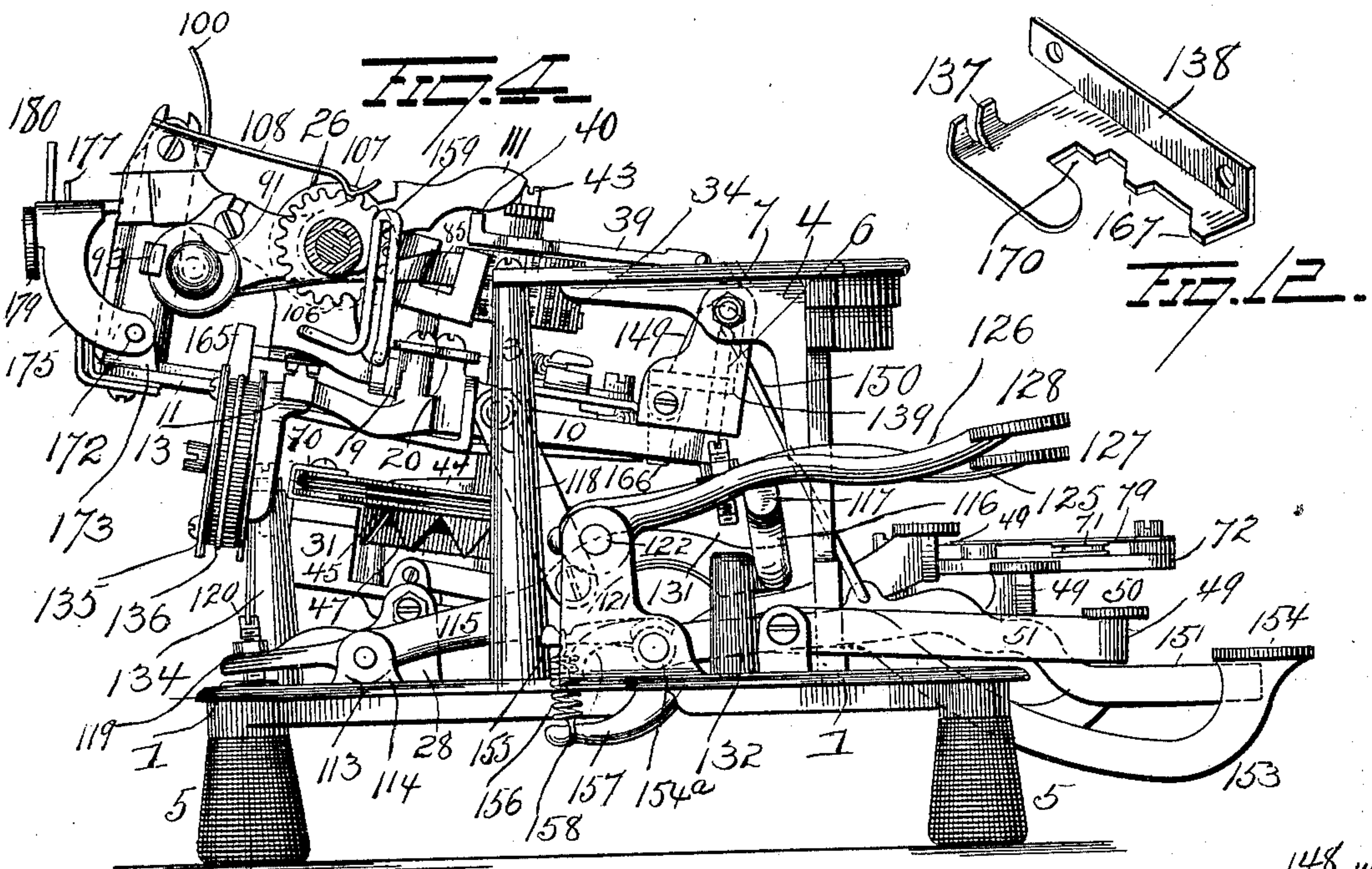
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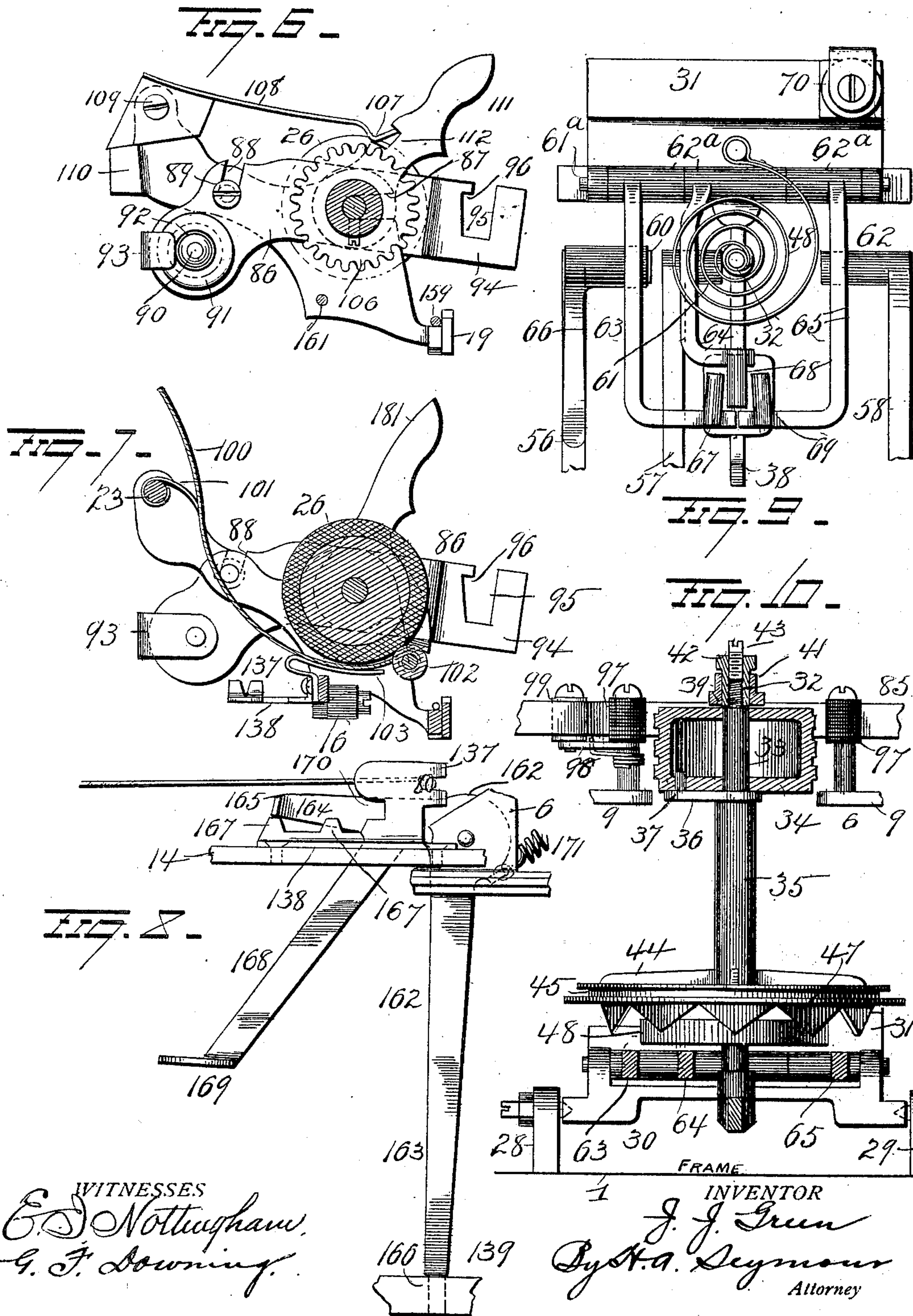
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(No Model.)

5 Sheets—Sheet 5.





# UNITED STATES PATENT OFFICE.

JOHN JAY GREEN, OF BOONTON, NEW JERSEY.

## TYPE-WRITING MACHINE.

SPECIFICATION forming part of Letters Patent No. 674,967, dated May 28, 1901.

Application filed December 20, 1899. Serial No. 741,035. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN JAY GREEN, of Boonton, in the county of Morris and State of New Jersey, have invented certain new and  
5 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  
10 use the same.

My invention relates to an improvement in type-writing machines, and more particularly to such as are known in the art as "index-wheel" machines, one object of the invention being to minimize the number of constituent parts of a type-writing machine and reduce the cost of manufacture without detracting from the efficiency of the machine, but, on the contrary, enhance its capacity,  
15 ease of manipulation, and its effectual execution of the functions required of a modern type-writing machine of the index-wheel type.

A further object is to so construct a type-writing machine of the index-wheel variety  
25 that a notched wheel shall coöperate with the type-carrier and manipulating devices in such manner as to assist in positioning the letters and then serving to positively lock the type-carrier in writing position.

30 A further object is to so construct a type-writing machine that a notched locking-wheel can be employed having a number of notches, which shall be equal to a part of the number of type characters.

35 A further object is to construct a simple and comparatively inexpensive type-writing machine in such manner that the writing shall be plainly visible during the operation of the machine.

40 A further object is to so construct and arrange a notched positioning and locking wheel for the type-carrier that the walls of each notch will so coöperate with actuating devices as to position and lock several different  
45 printing characters, according to the key-bar depressed by the operator.

A further object is to provide simple and efficient shifting devices for upper-case characters.

50 With these objects in view the invention consists in certain novel features of construction and combinations and arrangements

of parts, as hereinafter set forth, and pointed out in the claims.

In the accompanying drawings, Figure 1 55 is a plan view of a type-writing machine embodying my improvement. Fig. 2 is a plan view with some parts removed and other parts shown in section. Fig. 3 is a similar view with additional parts removed. Fig. 4 is a 60 side elevation. Fig. 5 is a transverse sectional view. Fig. 6 is an end view of the carriage. Fig. 7 is a transverse sectional view of the carriage. Fig. 8 is a detail view of devices for locking the parts against op- 65 eration when the carriage approaches the end of its travel. Figs. 9 and 10 are detail views showing the positioning and locking devices for the type-carrier. Fig. 11 is an enlarged detail view of the carriage ratchet 70 feed device. Fig. 12 is a detail view of a portion of the locking device shown in Fig. 8. Figs. 13, 14, and 15 are views illustrating certain other details of construction.

The main frame of the machine comprises 75 a fixed base 1, made in a single casting, and a top piece 2, supported by posts or uprights 3 and braced by integral brackets 4. The base is mounted on suitable legs or supports 5. The brackets 4 at the inner end of the 80 machine serve to support a pivoted frame 6, said frame having at its inner end upwardly-projecting ears 7, pivotally attached to said brackets. The pivoted frame comprises a front bar 8, a rear bar 9, of greater length than 85 the front bar, and parallel arms 10, spaced apart and connecting the bars 8 and 9 at points between their inner ends, and the intermediate portion 11 of the rear bar 9 is curved rearwardly for a purpose hereinaf- 90 ter to be explained. From the respective ends of the rear bar 9 of the pivoted frame arms 12 project rearwardly and are secured to or made integral with a track or rail 13 for the accommodation of the carriage 14. The 95 intermediate bar 15 of the carriage is provided with rollers 16, mounted to run on the head of the rail 13, and also with notched lugs 17 to receive said rib and prevent lateral play or displacement of the carriage. The 100 inner bar 18 of the carriage extends from end to end thereof and is disposed above the arms of the pivoted frame. To the inner bar 18 a ratchet-bar 19, having teeth on its upper edge,



is secured. Two plates 20 are removably secured to the pivoted frame and project at their rear edges partially over the ratchet-bar 19 to prevent vertical displacement of the carriage. To render the plates readily removable without completely withdrawing the screws 21, they are provided with elongated slots 22, through which said screws pass. The rear bar 23 of the carriage is mounted in a slot 24 in the upper end of a post 25, disposed on the curved intermediate portion 11 of the pivoted frame. By mounting the carriage as above explained its easy removal can be effected by loosening the screws 21, swinging the plates 20 from under the heads of said screws, and then lifting the carriage from its bearings. A platen-roller 26 is mounted at its ends in the ends of the carriage and co-operates with various devices hereinafter to be described for effecting the feed of the paper.

The pivoted frame is maintained normally in the position shown in Figs. 4 and 5 by means of a spring (or springs) 27. The spring 27 is made in the form of a hook or open loop and is secured at one end to one of the uprights of the rigid frame at the inner end of the machine, the other end of said spring bearing against the pivoted frame at a point below the fulcrum thereof.

Two short posts 28 29 project upwardly from the rigid base 1, near the rear portion thereof, and between said posts a carrier-frame 30 is pivotally supported rearwardly of its center. The rear end of the carrier-frame is made with an enlargement 31, which serves as a counterbalance for said frame and the parts carried thereby. A rod or shaft 32 is rigidly secured to the carrier-frame at a point inwardly from the fulcrum of said frame and projects upwardly some distance. Surrounding the rod or shaft 32, throughout the greater portion of its length, is a sleeve or tube 33, of brass or other suitable material. A type wheel or carrier 34 (having three rows of characters) is mounted on the brass sleeve 33 at the upper end thereof, and below said type-carrier an aluminium sleeve 35 is mounted to rotate with the brass sleeve or bushing 33. An arm 36 projects outwardly from the upper end of the sleeve 35 and is connected with the type-wheel by means of a pin 37, as clearly shown in Fig. 10. The inner end of the carrier-frame 30 is made with a standard 38, which projects upwardly to a point slightly above the plane of the type-carrier, and to the upper end of said standard an approximately horizontal arm 39 is pivotally connected. The free end of the arm 39 is made with a notched lug 40, which serves as a sight or indicator to assist the operator in locating the point of writing on the paper passing over the platen-roller, and thus enable him to make corrections and insertions accurately. The arm 39 is made near its free end with a perforated boss 41, into which a thimble 42 is inserted, and into the lower portion of said thimble the upper end of the rod or shaft 32

projects. The bore of the thimble is threaded for the reception of the threaded upper end of the shaft 32 and a small screw 43, which normally bears at its lower end against the upper end of said rod or shaft.

From the construction and arrangement of parts above described it will be seen that the shaft on which the type-wheel is mounted is supported at both ends and that when the carrier-frame 30 is moved to throw the type-wheel against the paper said supports will move in unison, and thus prevent all possibility of strain on the shaft 32, and in this way insure the continual accurate operation of printing devices.

An aluminium wheel 44 is made integral with the lower end of the aluminium sleeve 35 and is provided in its periphery with a groove 45 for the accommodation of a cord or chain 46. A ring 47, having teeth or projections, is secured to the under face of the wheel 44 and depends therefrom, said wheel having ten large teeth, and each tooth is made with beveled edges, the adjacent edges of two teeth co-operating to form inverted-V-shaped notches. The wheel 44 is maintained in and returned to its normal position by means of a convolute spring 48, one end of which is secured to the hub of the wheel and the other end to the pivoted carrier-frame 30, and said wheel 44 is operated and controlled for the purpose of rotating the type-wheel to position the characters thereon by means of devices the details of which will now be explained.

In front of the framework a series of key-bars 49 is disposed, each provided with a series of character keys or buttons 50. I prefer to employ three key-bars 49 and to secure ten character keys or buttons 50 to each key-bar, as shown in Figs. 1, 2, and 3. Each key-bar is provided with an arm 51, which projects over the base-frame 1 and pivotally supported near its end to a lug 52 on said base, as shown in Figs. 3 and 15. The base 1 is provided with lugs 53, disposed alongside the arms 51 to prevent lateral displacement of the same and of the key-bars. In rear of each arm 51 the base 1 is made with a hole 54, and in rear of said hole a lug depends from the under face of the base, as best shown in Fig. 15. One end of a spring 55 is passed through the hole 54 and is made with a perforation to receive the lug. The other end of each spring is located under and exerts an upward pressure against the arm 51 of one of the key-bars for the purpose of holding said key-bars in and returning them to their normal position after having been depressed.

Levers 56, 57, and 58 are pivotally supported between their ends by means of lugs located near the inner edge of the base 1 and are prevented from lateral displacement by means of lugs 59 on said base. The inner ends of the levers 56 57 58 are secured, respectively, to the key-bars 49, and at their other or rear ends they are provided with horizontal arms 60, 61, and 62, respectively, said



arms being preferably disposed in a line parallel with a horizontal line drawn transversely through the shaft 32, on which the type-wheel is mounted. Behind the shaft 32 a fixed shaft 61<sup>a</sup> is disposed and held between two lugs on the pivoted carrier-frame 30. (See Fig. 9.) Three sleeves 62<sup>a</sup> are mounted loosely on the shaft 61<sup>a</sup>, and from said sleeves arms 63 64 65 project toward the front of the machine and directly over the arms 60 61 62 of the levers 56 57 58, so as to be actuated by the latter. Springs 66, Fig. 9, may be secured to the levers 56 57 58 and adapted to act as a cushion between the arms thereon and the arms 63 64 65. The free ends of the last-mentioned arms are bent inwardly and provided, respectively, with dogs or enlargements 67 68 69, disposed under the toothed wheel 47 and adapted to coöperate therewith for positioning the type-wheel. The type-wheel is rotated by the movements of the hand of the operator through the medium of the cord or chain 46. This cord or chain is secured to and wound in the grooved periphery of the wheel 44, and from said wheel it passes over a pulley 70, mounted on the enlarged end of the pivoted carrier-frame 30, thence around a pulley 71, mounted on a pivoted arm 72, and provided at its free end with a leather loop 73 for the reception of the index-finger of the operator. The loop 73 is preferably provided with a movable ring or ferrule 74 for the purpose of adapting the loop to the finger of the operator. The arm 72 above referred to is provided at one end with a fixed sleeve 75, mounted loosely on a post projecting upwardly from the base 1, and from the lower end of said sleeve a short arm 76 projects, as shown in Fig. 13. The short arm 76 is provided with a lug or tooth 77 for the attachment of one end of a spring 78, the other end of which is attached to the base 1. The arm 72 is thus pivotally and yieldingly attached to the base and serves to prevent undue strain on the cord or chain, the toothed wheel, and the devices coöperating with the latter. A spring-plate 79 is secured to the free end of the arm 72 and projects over the pulley 71, so as to retain the latter in place and serve as a guide for the cord or chain 48. The free end of the spring-plate 79 is made with a teat 80 to engage a notched boss 81 on the arm 72. A lug 82 is cast on the base 1 adjacent to the short arm 76, and through this lug a horizontal thumb-screw passes, the free end of said screw abutting against a lug 83 on said arm 76. By these means the normal position of the arm 72 can be readily adjusted. The inward throw of the pivoted arm 72 is limited by the engagement of a lug 84 on the short arm 76 with the lug 82.

The operator will place the loop on his index-finger and then move his finger to desired character-key. In performing these movements the cord or chain 46 will be pulled and the grooved wheel rotated to move the type-wheel to bring the desired letter to or

approximately to writing position. The operator will now depress the key and, assuming that it is one of the keys on the central key-bar, motion will be transmitted to the central lever 57, and the latter will raise the arm 64 and cause the dog or enlargement 68 at the free end thereof to enter centrally between two teeth of the toothed ring 47 and become disposed at the juncture of the adjacent edges of said two teeth. Should the operator depress the key-bar nearest the machine-frame, the lever 56 will be operated and the arm 63 raised, so as to cause the dog or enlargement at the free end thereof to enter a notch between two teeth and engage a beveled edge of one of the teeth forming said notch at a point between the ends of said beveled edge. The pressure of the dog or enlargement 67 against the beveled edge of the tooth of the ring will act to turn said ring slightly farther than it was moved by the cord or chain to accurately position the type-wheel for the desired letter. This additional movement of the toothed wheel will continue while the dog or enlargement 67 is moving along the beveled edge of a tooth, the arrival of the dog or enlargement 67 at the angle formed by the juncture of the beveled edges of two adjacent teeth insuring the proper positioning of the type-wheel for the desired letter.

Should the operator depress the key-bar farthest removed from the machine-frame, the operations would be similar to those just described, the toothed wheel in this case being actuated through the medium of the lever 58, arm 65, and the dog or enlargement 69 on said arm, the dog or enlargement engaging a beveled edge of a tooth at the right-hand side of the notch between two teeth instead of at the left-hand side, as was the case with the dog or enlargement 67 on the arm 63, and thus the additional movement imparted by engagement of the dog 69 with the toothed wheel will be in a direction opposite to that imparted by the dog 67.

From the above description it will be seen that when the inner or outer key-bar is operated a slight additional movement will be imparted to the type-wheel in one direction or the other, according to the key-bar which is depressed.

If the intermediate key-bar is accurately operated, no additional movement will be imparted to the type-wheel; but should the operator not pull the cord quite far enough or slightly too far the dog on the intermediate arm 64 will engage the edge of a tooth at one side or the other of the notch formed by two teeth, and thus cause the wheel to have a slight additional movement to accurately position the desired letter.

It will be noticed that the dogs 67 68 69 engage the toothed wheel at a point some distance inwardly from the fulcrum of the carrier-frame 30, so that after the type-wheel shall have been set for writing position continued pressure on a key-bar will cause the



carrier-frame to be tilted and the type-wheel to be thrown toward the platen-roller for the purpose of printing upon the paper passing over said roller.

- 5 The inking-ribbon 85 is attached to and moves with the platen-carriage 14 and is supported and guided by means of devices which will now be described.

At respective ends of the carriage plates 10 86 are loosely mounted between their ends on the journals of the platen-roller, one of which journals is mounted in a hole in one end piece of the carriage and the other journal is mounted in an open slot 87 in the 15 other end piece of the carriage. The rear portion of each plate 86 is made with an open slot 88, through which a screw 89 passes and enters the carriage-frame. The rear ends of the plates 86 are provided with horizontal pintles 90, on which ribbon-reels 91 20 are mounted and provided with knobs 92 for turning them to run the ribbon from one reel to the other. Spring-tongues 93 bear against said reels and normally prevent them from 25 turning and also serve to prevent their displacement. The inner ends of the plates 86 are bent laterally and then inwardly toward the front of the machine to form arms 94, and each of these arms is made with an open slot 30 95, having one wall beveled to form a shoulder 96. The inking-ribbon is guided through the slots 95 and becoming disposed under the shoulders 96 will be prevented from upward displacement. By mounting the ribbon-carriers as above explained it will be seen that 35 they can be readily removed, together with the platen-roller, by merely loosening the screws 89, and it will also be seen that by the connection of the plates 86 with the carriage 40 by means of the screws 89 displacement of the platen-roller will be effectually prevented.

Inking-rollers 97 are mounted on the rear bar 9 of the pivoted frame 6 at respective 45 sides of the space through which the type-wheel passes for the purpose of keeping the ribbon supplied with ink. These inking-rollers are important, because, as above stated, the ribbon moves with the carriage, and if 50 some means for replenishing the ink to the ribbon were not provided the latter might become inefficient after a number of lines shall have been written. The ribbon will be made of a length several times that of the carriage, the surplus being wound on one or the other 55 of the reels. When a section of the ribbon shall have become worn out, the operator will wind it on one of the reels and simultaneously unwind a fresh section of ribbon from the other reel. The ribbon will be maintained 60 normally taut and away from the platen, so that the writing will be always visible, by means of a spring-actuated arm 98, carrying a roller 99, over which the ribbon passes, and by means of which the ribbon will be forced 65 against the inking-rollers.

The paper is conducted to the platen-roller by means of a sheet-metal guide-plate 100.

The guide-plate is secured to the rear bar of the carriage by means of tongues 101 and projects downwardly under the platen-roller, 70 terminating at a point somewhat beyond the axis of the roller, where it is provided with ears which constitute bearings for a feed-roller 102. The feed-roller is pressed against the platen-roller by means of a spring 103, se- 75 cured to the carriage and pressing upwardly against the sheet-metal guide-plate 100. To move the feed-roller away from the platen-roller to permit the free adjustment of the paper a lever 181 may be employed. The 80 paper is pressed neatly against the platen-roller at the center by means of a V-shaped loop 104, having arms 105, secured to the pivoted frame 6. The loop 104 partially embraces the platen-roller and holds the paper 85 or an envelop closely against the roller at the point of writing, the characters on the type-wheel passing through said loop when said wheel is thrown forward during the operation 90 of the machine.

For the purpose of feeding the paper one end of the platen-roller is provided with a knob 105, and for the purpose of accurately 95 regulating the line-spaces a ratchet device now to be described will be employed. A spur-wheel 106 is secured to a journal of the platen-roller and is adapted to be engaged by a tooth or shoulder 107 on a spring 108. The rear end of the spring 108 is provided with an arm or flange 109, attached to the carriage- 100 frame, and said arm or flange is made with a beveled end which rests on a shoulder or enlargement 110 on the carriage to insure the maintenance of proper tension of the spring. When it is desired to move the paper with- 105 out regard to the line-spacing, (as when a sheet is inserted for the purpose of making insertions or corrections,) the tooth or shoulder 107 should be moved out of contact with the spur-wheel. For this purpose an arm 111 110 is loosely mounted on a journal of the platen-roller and is provided with a notch 112 for the reception of the tooth or shoulder 107, as shown in Fig. 6. It is apparent that when the arm 111 is moved toward the end of the 115 spring the shoulder at the lower end of the notch in said arm will engage the beveled end of the tooth or shoulder 107 and cause said tooth or shoulder to rise out of engagement with the spur-wheel and its free end to enter 120 the notch 112, thus releasing the platen-roller and permitting it to be turned to feed the paper irrespective of the line-spacing.

With the parts of the machine in their normal position, as shown in the drawings, the 125 platen-roller is in position to permit the printing of the lower-case characters, which constitute the upper row of type on the type-wheel. To permit the printing of characters and figures of the two lower rows of type, the 130 platen-roller must be lowered, as is evident, and for this purpose the appliances now to be explained will be employed.

A sleeve 113 is loosely mounted between



two lugs 114, projecting upwardly from the base 1, near the rear end thereof, and from said sleeve a lever 115 projects toward the front of the base, said lever being provided  
 5 at its front end with an arm 116, which projects laterally beyond the machine-base, said arm being so bent as to cause the outer portion 119 thereof to be disposed on a higher plane than the inner portion and than the lever 115. The lever 115 is connected with  
 10 the pivoted frame 6 by means of a link 118, so that when said lever is depressed the pivoted frame carrying the platen-roller will be lowered. To afford ready adjustment for the  
 15 pivoted frame 6 and to maintain it in such position as to insure the maintenance of the accurate normal position of the platen-roller for lower-case characters, the sleeve 113 is provided with a rearwardly-projecting arm  
 20 119, through which a set-screw 120 is passed and adapted to rest on the base-frame 1. It is apparent that by adjusting this screw the normal elevation of the pivoted frame and platen-roller can be easily regulated.

Two ears 121 project upwardly from the base 1 in rear of the arm 116 and to one side of the lever 115. Between these ears the ends of a shaft 122 are secured, and upon said shaft two sleeves 123 124 are loosely mounted.  
 30 From the respective sleeves 123 124 key-levers 125 126 project, one of said levers being provided with a key 127, indicating capital letters, and the other lever being provided with a key 128, indicating figures, the key 127  
 35 having the letters "Cap" thereon and the key 128 having the letters "Fig." The upward movement of the key-levers 125 126 will be limited by the engagement of lugs 129 on the sleeves with the ears 121. The two key-le-  
 40 vers 125 126 project directly over the elevated portion 117 of the arm 116, and the lever 125 is provided between its ends with a lug 130, through which a vertically-disposed screw 131 passes. The screw 131 is adapted to engage  
 45 the upper end of a post 132 on the base 1 for the purpose of limiting the downward movement of the pivoted frame 6 and platen-roller when the key 127 is depressed, and thus dispose the platen-roller in position for printing  
 50 capitals. For printing figures the platen must descend still farther, and for limiting the downward movement of the pivoted frame 6 when the key 128 is depressed a lug 133 on the pivoted frame 6 is adapted to engage an  
 55 adjustable screw at the upper end of a post 134 on the base 1.

Having described the construction and operation of the printing mechanism and the devices which cooperate therewith, I will  
 60 now proceed to explain the manner of effecting and controlling the feed of the carriage.

A spring-actuated drum 135 is mounted on the rigid frame of the machine, and around this drum a cord 136 is wound, the free knot-  
 65 ted end of said cord being attached to a

notched arm 137, projecting from a plate 138, secured to the carriage.

A rocking bar 139 is disposed transversely on the pivoted frame and provided on its under face near one end with a depending lug 70 140, to which the spacing devices are connected. These comprise a plate 141, having ears 142 at one end, pivotally attached to the lug 140 on the rocking bar, and provided at  
 75 its other end with a flange 143, the outer end of which constitutes the fixed dog 144 to engage the ratchet-bar 19 on the carriage. A spring 145 is attached at one end to a lug depending from the plate 141 and at its other end to the pivoted frame 6. A plate 146 is 80 pivoted at its inner end to the plate 141, and at its outer end it is provided with a flange 147, which projects beyond the outer end of the plates 141 and 146, and is provided in its  
 85 lower edge with a notch 148, the portion of the flange beyond said notch forming a tooth 149 to engage the ratchet-bar 19. The plate 146, with its notched flange and tooth, constitutes the movable dog of the ratchet feed devices. The plates 141 and 146 are connect- 90 ed together beyond their pivotal connection by means of a spring 148<sup>a</sup>. The flanges of the plates 141 and 146 are disposed between and guided by lugs 152 on the pivoted frame.

The rocking bar 139 is provided with an 95 upwardly-projecting arm 149, to which one end of a rod or wire 150 is attached, the other end of said rod or wire being connected with a stepped lever 151, disposed under the key-levers and adapted to be operated by the same 100 when they are depressed. When a key-bar is depressed, motion will be transmitted through the lever 151 and rod 150 to the rocking bar 139, thus causing the latter to rock and force the plates 141 and 146 forwardly. 105 The result of these movements will be to cause the fixed dog on the plate 141 to engage a tooth of the ratchet-bar 19 and the pivoted dog to move out of engagement with said ratchet-bar. When the key-lever is re- 110 leased, the bar 139 will rock in the reverse direction, and thus move the fixed dog out of engagement with the ratchet-bar and the pivoted dog into engagement with a new tooth on said ratchet-bar, thus permitting the carriage 115 to feed a distance of one tooth.

An independent spacing-lever 153 is disposed alongside the stepped lever 151, and the latter is made of such length as to be dis- 120 posed under the finger-key 154 on said spacing-lever, so that when the latter is depressed motion will be imparted through the devices above described to the ratchet feed mechanism for the purpose of effecting the feed of the carriage for spaces between words. The spac- 125 ing-lever 153 is carried by a sleeve 154<sup>a</sup>, mounted between lugs on the base 1. The sleeve 154<sup>a</sup> is provided with an arm 155, to which one end of a spring 156 is attached, the other end of said spring being connected to 130



an arm 157 on the base 1 for the purpose of returning the spacing-lever. The upward movement of the spacing-lever is limited by the engagement of an arm 158 on the sleeve 5 154<sup>a</sup> with the base 1.

For the purpose of releasing the ratchet feed mechanism when it is desired to move the carriage freely I employ a rod or wire 159, disposed on the carriage under the dogs 10 of the ratchet mechanism. The ends of the rod or wire are bent to form loops 160, which serve as handles, and the free extremities of said rod or wire are bent to form pintles 161, pivotally mounted in the ends of the carriage. 15

In view of the bell usually employed for denoting the approach of the end of travel of the carriage I prefer to employ devices for positively locking the feed mechanism of the carriage, and these means will now be described. An arm 162, comprising a member 163 and a member 164, is pivotally attached at the juncture of said members to the pivoted frame 6. A finger-bar 168, made integral with the member 164, projects therefrom and is provided at its free end with a finger-key 169. The free end of the member 164 of arm 162 is made with an upwardly-projecting tooth 165, and the free end of the member 163 terminates normally to one side of a lug 166, depending from the rocking bar 139, in which position it is retained by means of a spring 171. The plate 138, hereinbefore referred to, attached to the carriage, is made 35 with a series of two or more beveled teeth 167 and with a notch or recess 170. With this construction and arrangement of parts when the carriage approaches the end of its travel the tooth 165 at the end of member 164 of arm 162 will ride upon the first beveled tooth 167 on the plate 138, and thus cause said arm 162 to turn on its fulcrum and the free end of the member 164 thereof to become disposed in line with the depending lug 45 166 on the rocking bar 139. This will lock the rocking bar against movement, and said rocking bar being actuated by the key-bars through the medium of the lever 151 and rod 150 these parts will also be locked, so that 50 when the member 163 of the arm 162 is in line with the lug 166 the keys, as well as the rocking bar, will be locked and the further operation of the machine will be positively prevented. Should it be desired, however, to 55 permit a few more letters, this may be accomplished by moving the arm 162 by means of the finger-bar 168 and permitting the carriage to move one tooth, when the tooth 165 on the member 164 of said arm will become 60 disposed between two teeth 167 on the plate. The carriage can now feed several spaces and until the parts again become locked by the engagement of the tooth 165 with the second tooth 167 on plate 138. The parts may 65 be again released in the manner above explained to permit the insertion of additional

letters, after which the tooth 165 will ride into the notch 170 of plate 138 and the further feeding of the carriage will be absolutely prevented. The carriage can be moved 70 one space farther by the hand and one letter printed by the operator manipulating the carriage-release key.

It now remains to describe the manner of regulating the margin to be left at the edge 75 of the paper.

A horizontal bar 172 is mounted to slide through a transverse hole near the base of the port 125 on the curved intermediate portion of the pivoted frame 6, and said rod also passes 80 through a perforated lug 173 to prevent possibility of lateral displacement. A ratchet-bar 174 (preferably of sheet metal) is provided at its ends with ears or arms 175, loosely attached to the ends of the bar 172. An elongated tooth 176 is provided on the post 125 85 and adapted to engage the ratchet-bar 174 to retain the latter at any desired adjustment, and the ratchet-bar is maintained in contact with said tooth by means of a spring 177, secured to the frame. One end of the ratchet-bar is made with a shoulder 178, against which the enlargement 110 on the carriage abuts to limit the return movement of the latter, and thus regulate the margin. One end of the 95 ratchet-bar is provided with a thumb-piece 179, by means of which to manipulate and adjust the same, and the backward movement of the ratchet-bar may be limited by means of an arm 180, fixed to the pivoted frame. 100

It will be observed that with my improved machine the writing is always clearly visible. A small number of parts is employed as compared with other machines of which I am aware, my improved machine comprising one 105 hundred and fifty separate pieces as against one thousand to two thousand five hundred constituting other machines. It is simple in construction, easy to operate, and it is accurate in the performance of its functions. 110

Numerous slight changes might be made in the details of construction of my invention without departing from the spirit thereof or limiting its scope, and hence I do not wish to limit myself to the precise details herein set 115 forth.

Having fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a type-writing machine, the combination with a shaft and a type-carrier connected therewith, of a toothed ring secured to the shaft, a series of dogs to engage the teeth of said wheel, all of said dogs arranged to be disposed between any two teeth of the toothed 125 ring, a series of key-bars corresponding in number to the series of dogs for operating the latter and means for rotating said shaft.

2. In a type-writing machine the combination with a shaft means for turning the same 130 and a type-wheel secured to said shaft, of a toothed wheel secured to the shaft and hav-



ing a number of teeth equal to a part of the number of characters on the type-carrier, a series of key-bars, each having a series of keys and a series of dogs corresponding in number with the key-bars and arranged to be actuated by them and all of said dogs arranged to be disposed between any two teeth of the toothed wheel.

3. In a type-writing machine, the combination of a shaft, a type-wheel carried thereby and means for rotating said shaft, of a toothed ring having a number of teeth equal to a part of the number of characters on the type-wheel, a series of dogs adapted to enter the notches between the teeth of the toothed ring and respectively engage the teeth at different points, and a separate key-bar for actuating each of said dogs.

4. In a type-writing machine, the combination with a shaft a type-wheel carried thereby and means for rotating said shaft, of a toothed ring secured to the shaft, a series of dogs arranged side by side and all the dogs of the series adapted to be simultaneously disposed under the space between any two teeth of said ring and key-bars connected with and adapted to actuate the respective dogs.

5. In a type-writing machine, the combination of a shaft, a type-wheel carried thereby and means for rotating said shaft, of a toothed ring secured to the shaft and having a number of teeth equal to a part of the number of characters on the type-wheel, a series of dogs, all of which are arranged to be disposed simultaneously between any two teeth of said ring and a separate key-bar for operating each dog.

6. In a type-writing machine, the combination with a shaft a type-wheel thereon and means for rotating the shaft, of a ring secured to the shaft having a number of depending teeth equal to a part of the number of characters on the type-wheel, a series of arms pivotally mounted on a common support and provided at their free ends with dogs arranged side by side, all of said dogs adapted to enter between any two teeth of said ring, a series of key-bars equal in number to said dogs and a lever connected with each key-bar and adapted to operate one of the arms to force the dog thereon into the toothed ring.

7. In a type-writing machine, the combination with a pivoted carrier-frame, a shaft secured at one end thereto and a type-wheel mounted on said shaft, of a standard on said carrier-frame, an arm pivoted to said standard and connected with the upper end of said shaft, a platen and means for tilting the carrier-frame to throw the type-wheel against the platen.

8. In a type-writing machine, the combination with a pivoted carrier-frame, a shaft secured at its lower end thereto, a type-wheel mounted on said shaft, a standard on said frame, an arm hinged to said standard and having a hole near its free end, a thimble disposed in said hole and adapted to receive the

threaded upper end of said shaft, a screw entering the end of said thimble and bearing on the shaft and means for tilting said carrier-frame.

9. In a type-writing machine, the combination with a shaft of a sleeve thereon, a type-wheel mounted on said shaft and secured to said sleeve, a grooved wheel at the lower end of said shaft, a cord for rotating said wheel and provided with a finger-loop, a ring having projections carried by said wheel, a series of dogs to engage said ring and key-bars for operating said dogs, the projections on said ring being spaced apart a distance sufficient to receive all of said dogs between any two of them simultaneously.

10. In a type-writing machine, the combination with a pivoted carrier-frame, a shaft secured at its lower end thereto, and a type-wheel mounted on said shaft, of a standard on said frame, an arm pivoted to said standard and connected with the upper end of the shaft, a platen behind the type-wheel and a sight or indicator at the free end of said pivoted arm.

11. In a type-writing machine, the combination with a fixed frame and a platen, of a counterbalanced carrier-frame on said fixed frame pivoted beyond its center, a type-wheel carried by the carrier-frame, means for rotating the type-wheel, key-bars and devices intermediate of the key-bars and pivoted carrier-frame for locking the type-wheel and tilting the carrier-frame to throw the type-wheel against the platen.

12. In a type-writing machine, the combination with a shaft and a type-wheel and a grooved wheel mounted to rotate together thereon, an arm pivoted between its ends to the frame, a spring attached at one end to said arm and at the other end to the frame, a pulley mounted on said arm, a key-bar having a series of finger-keys thereon, intermediate connections between the key-bar and type-wheel shaft for moving the latter, and a cord wound on said grooved wheel and passing over the pulley of the pivoted spring-retained arm, for rotating the type-wheel.

13. In a type-writing machine, the combination with fixed frame, a shaft, and a type-wheel and a grooved wheel mounted to rotate together on said shaft, of an arm pivoted to the frame, a spring connecting one end of said arm with the frame, an adjustable stop for said arm, a pulley mounted on said arm, a key-bar, intermediate connections between the key-bar and type-wheel shaft, a cord wound on said grooved wheel and passing over the pulley on the pivoted arm and a loop on said cord.

14. In a type-writing machine, the combination with a shaft, of a type-wheel and a grooved wheel mounted to rotate together on said shaft, a spring for retaining the type-wheel and returning it to normal position, a pivoted spring-retained arm, means for limiting the movements of said arm, a pulley on



said arm a cord wound on the grooved wheel and passing over said pulley and a loop on said cord.

15 In a type-writing machine, the combination with a shaft of a type-carrier and a wheel mounted to rotate together on said shaft, a spring for maintaining the type-carrier in and returning it to normal position, a spring-retained pivoted arm, a pulley mounted on said arm, a cord wound on said wheel  
10 and passing over said pulley, a spring-arm secured to the pivoted arm to retain the pulley in place and guide the cord and a loop on the end of said cord.

15 16. In a type-writing machine, the combination with a fixed frame, a paper-carrier, a tilting carrier-frame and a type-wheel carried by said tilting frame, of a key-bar having a series of keys thereon, a pivoted arm  
20 projecting from said key-bar, a spring secured to the base-frame and bearing against said arm and connections between said key-bar and tilting frame.

17. In a type-writing machine, the combination with a pivoted frame-shaft mounted  
25 on said pivoted frame and a type-carrier connected with said shaft, of a ring secured to the shaft and having a series of projections, means for turning said shaft, a pivoted arm

under said ring, a key and a lever having its inner end under said key and its forward end under said pivoted arm, whereby when the key is depressed, the lever will be forced upwardly and cooperate with the projections on the ring to position the type-carrier and turn  
30 the pivoted frame on its fulcrum. 35

18. In a type-writing machine, the combination with a shaft, a pivoted mounting for the lower end of said shaft, a type-carrier connected with the shaft, means for rotating the shaft, a ring secured to the shaft and having downward projections, a paper-carrier, a key, a pivoted arm under said ring, and a lever between the pivoted key and pivoted arm, whereby when the key is depressed the pivoted arm will be forced upwardly into engagement with said ring and cooperate with the projections thereon to position the type-carrier and throw the shaft forward to cause the type-carrier to print on the paper-carrier.  
40 45 50

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

JOHN JAY GREEN.

Witnesses:

HAROLD W. HOOVER,  
JNO. M. KING.