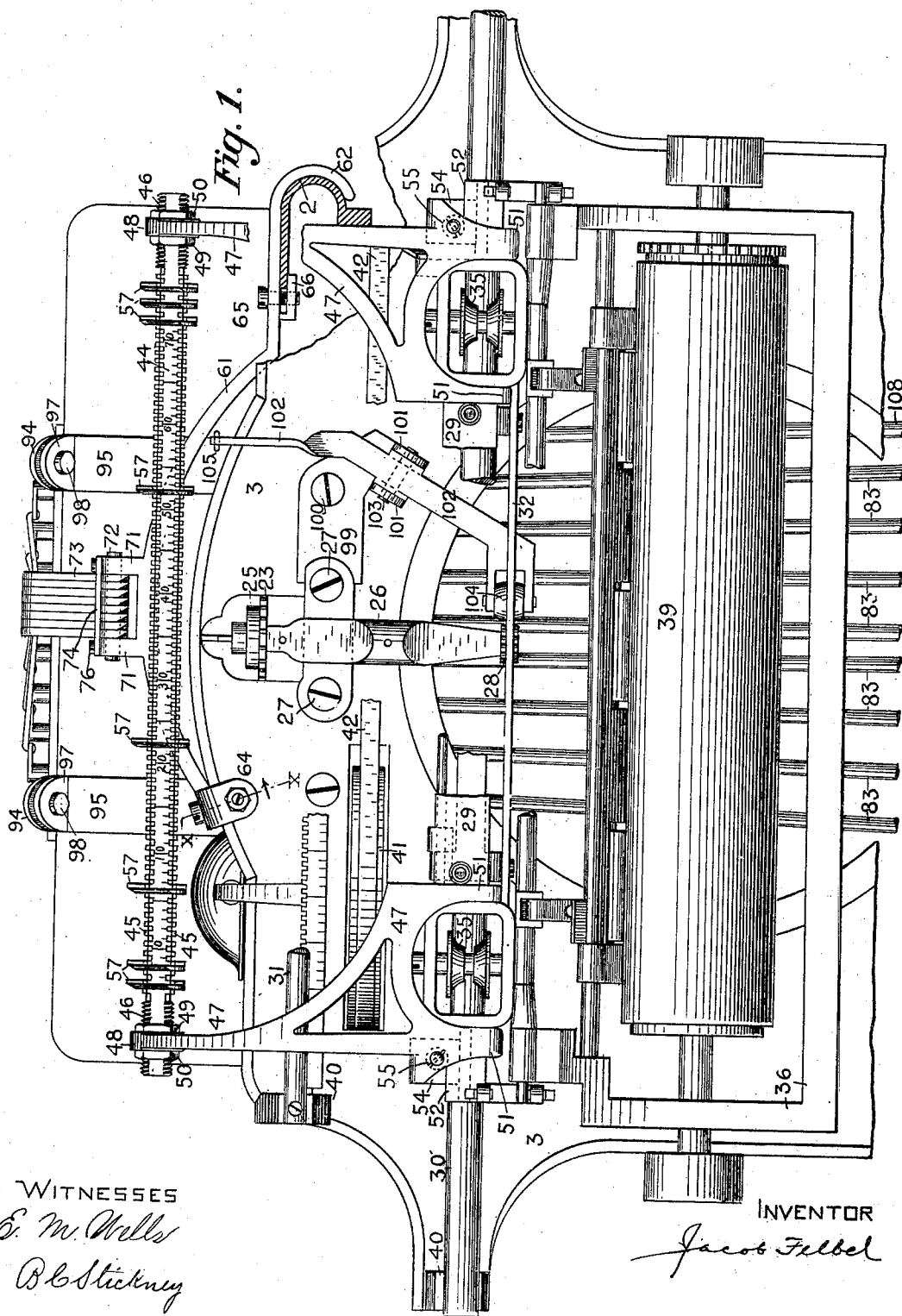


J. FELBEL.
TYPE WRITING MACHINE.

(Application filed Dec. 18, 1899.)

(No Model.)

9 Sheets—Sheet 1.



WITNESSES
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Patented Sept. 16, 1902.

J. FELBEL.
TYPE WRITING MACHINE.

(Application filed Dec. 18, 1899.)

(No Model.)

9 Sheets—Sheet 2.

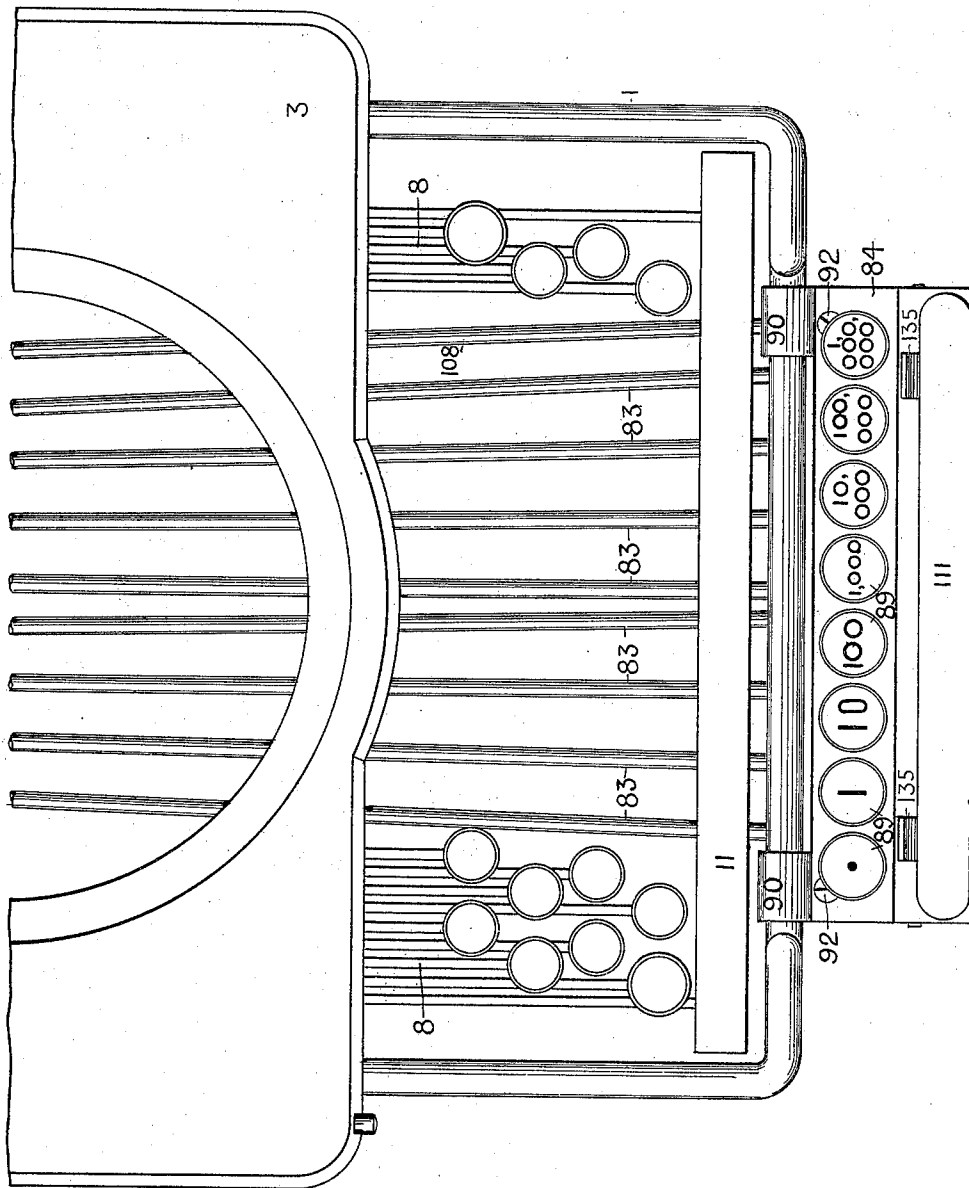


Fig. 2.

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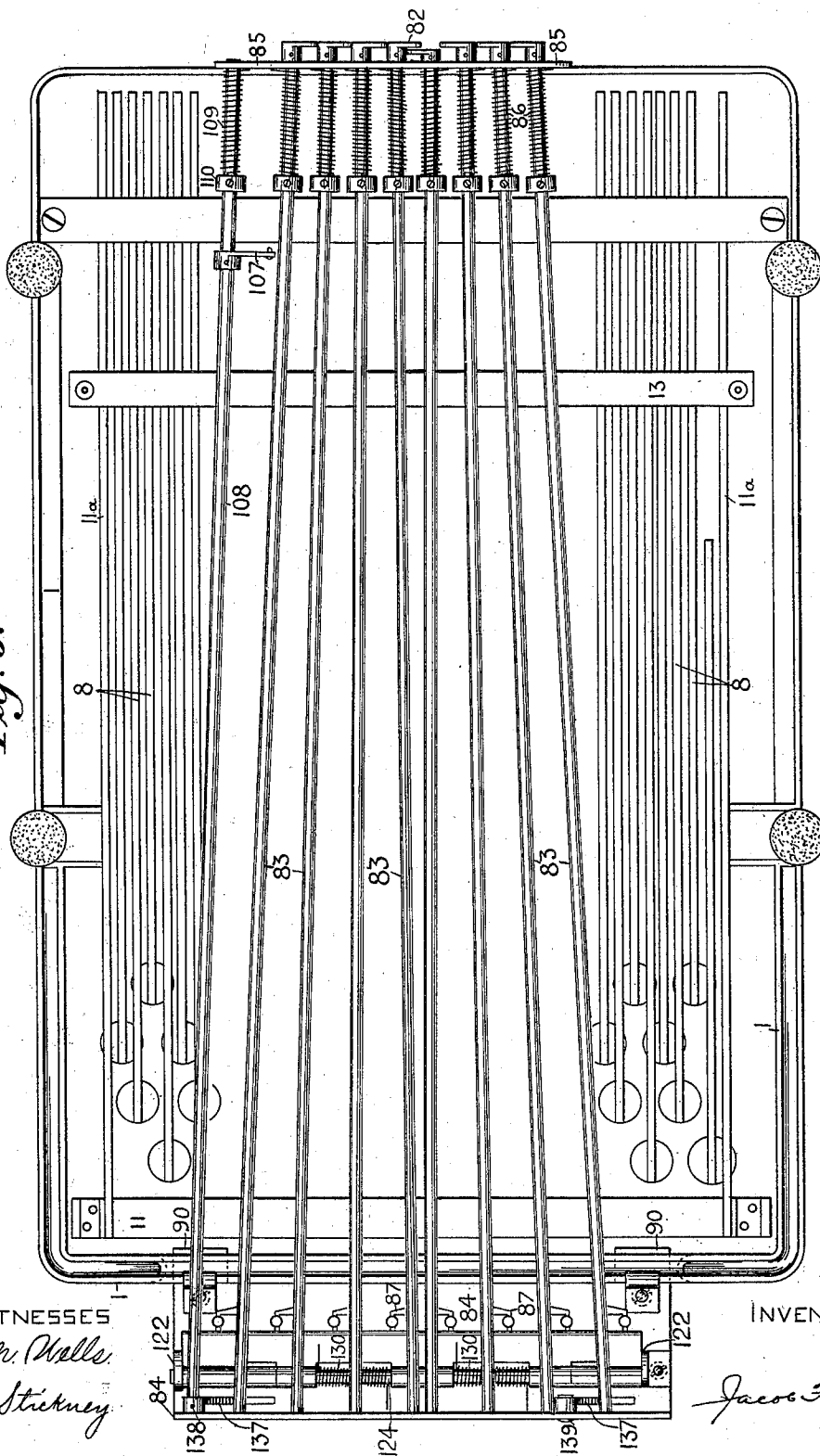
TYPE WRITING MACHINE.

(Application filed Dec. 18, 1899.)

(No Model.)

9 Sheets—Sheet 3.

Fig. 3.



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(Application filed Dec. 18, 1899.)

(No Model.)

9 Sheets—Sheet 4.

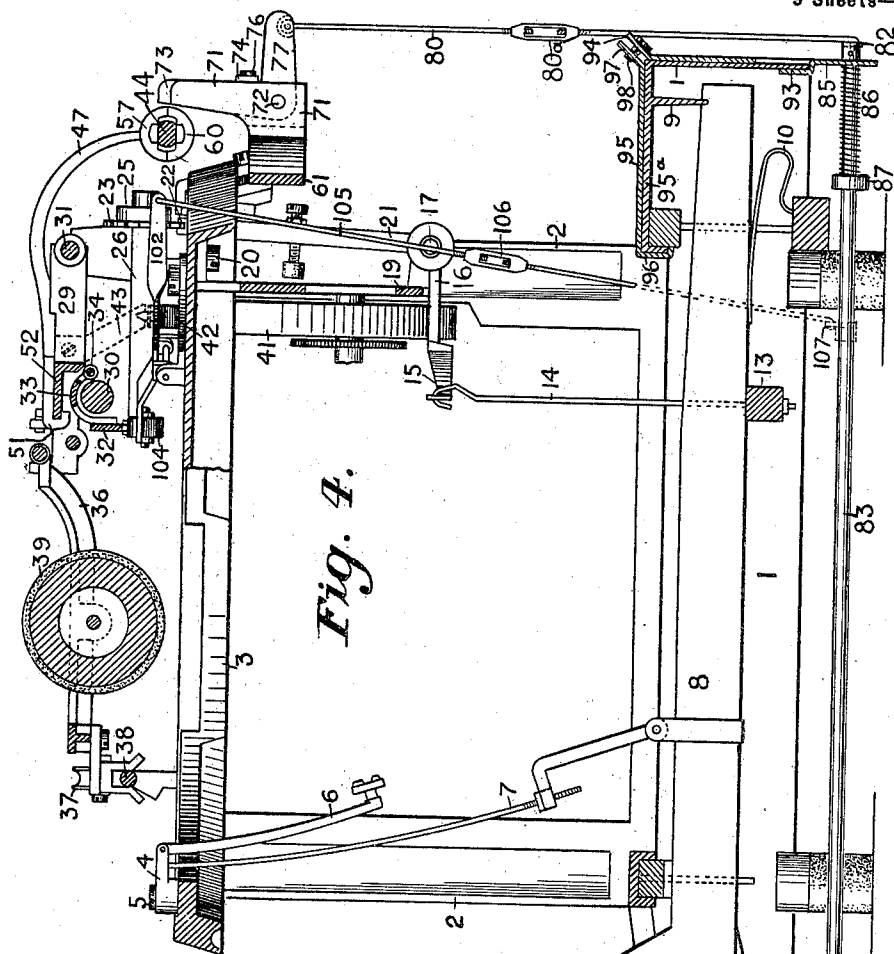


Fig. 4.

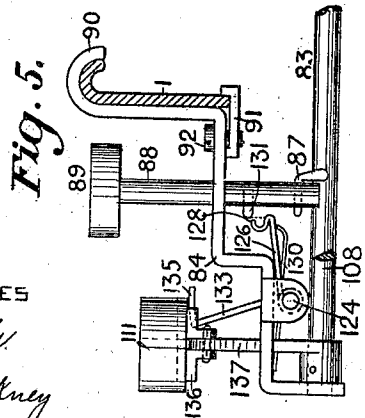


Fig. 5.

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TYPE WRITING MACHINE.
(Application filed Dec. 18, 1899.)

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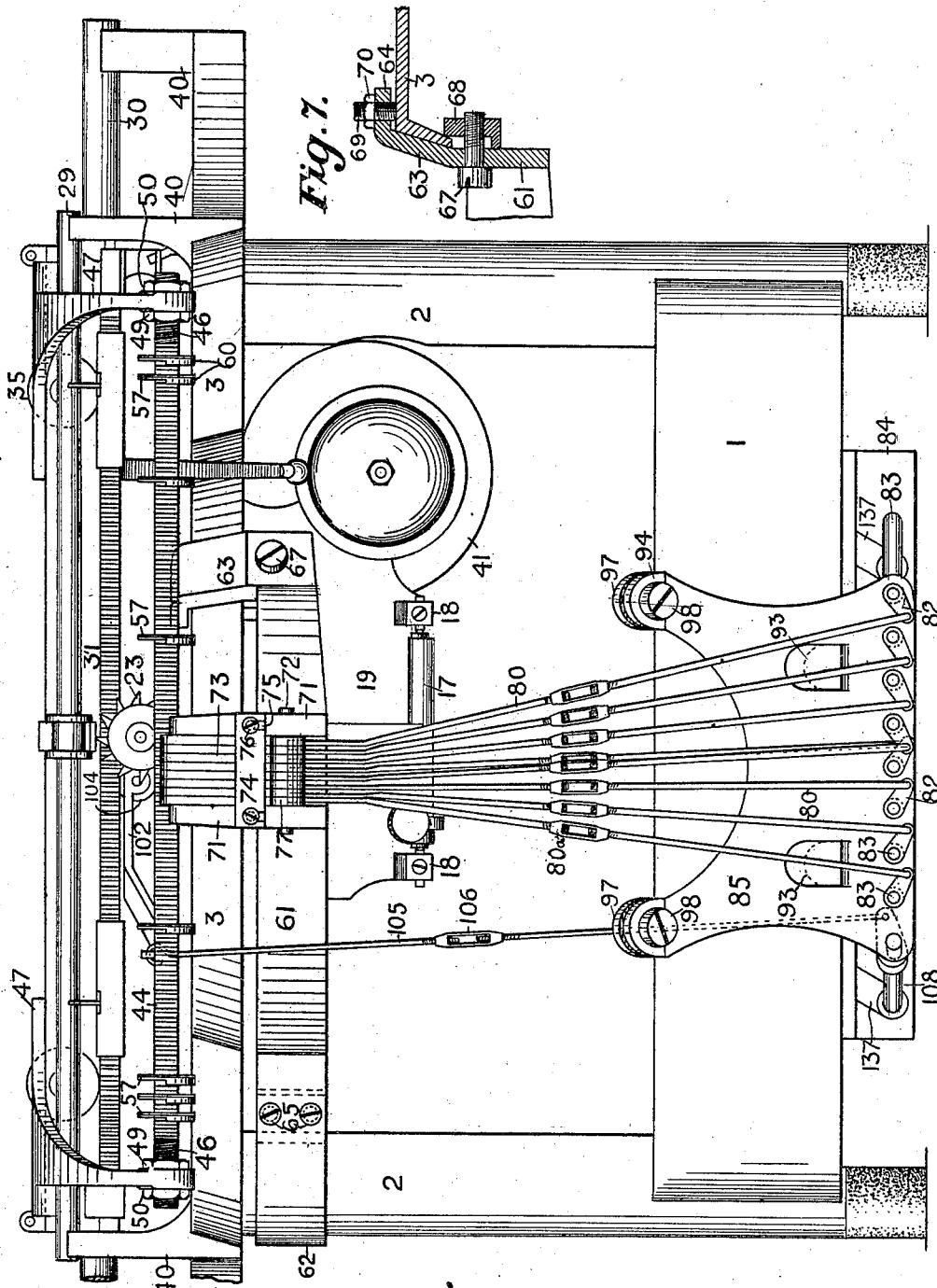


Fig. 7.

Fig. 6.

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TYPE WRITING MACHINE.

(Application filed Dec. 18, 1899.)

(No Model.)

9 Sheets—Sheet 6.

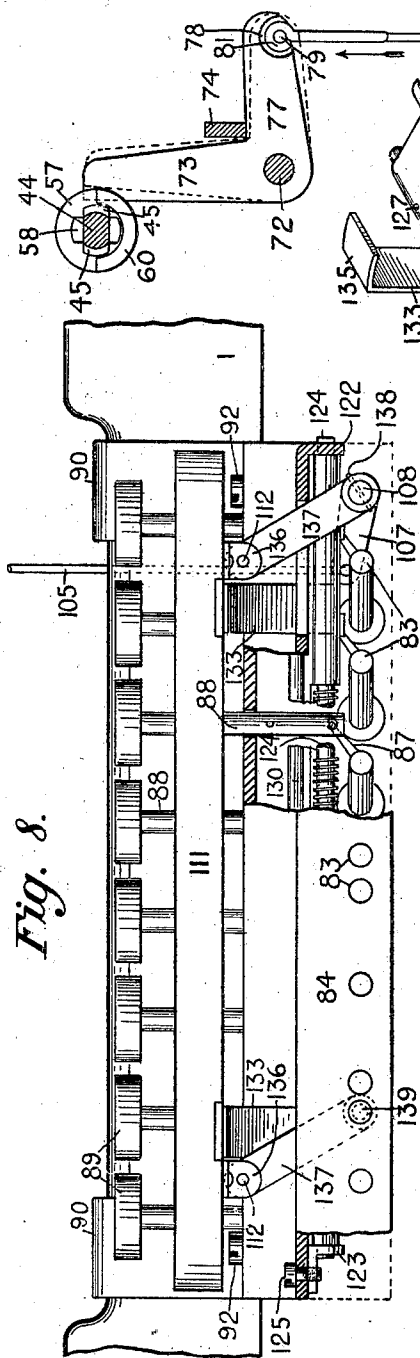
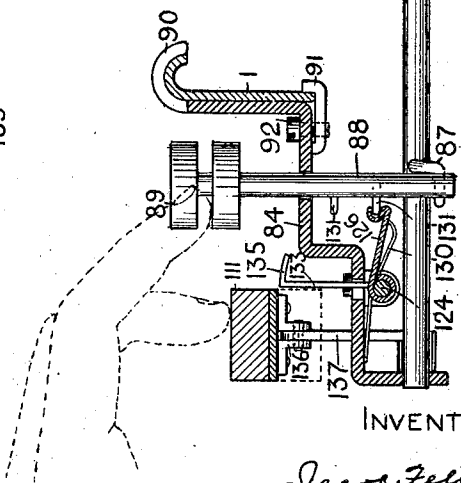


Fig. 8.

Fig. 10.

Fig. 9.



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(Application filed Dec. 18, 1899.)

(No Model.)

9 Sheets—Sheet 7.

Fig. 11.

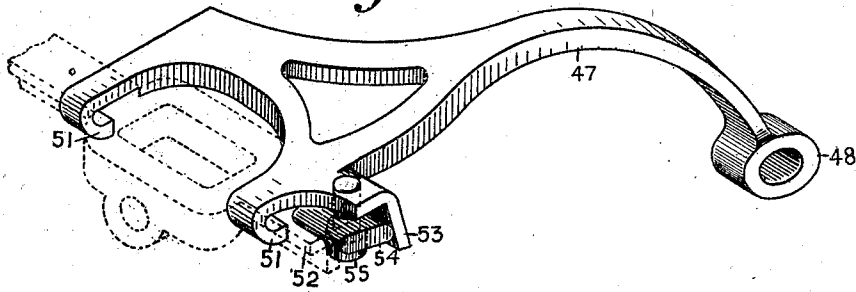


Fig. 22.

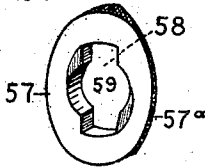


Fig. 12.

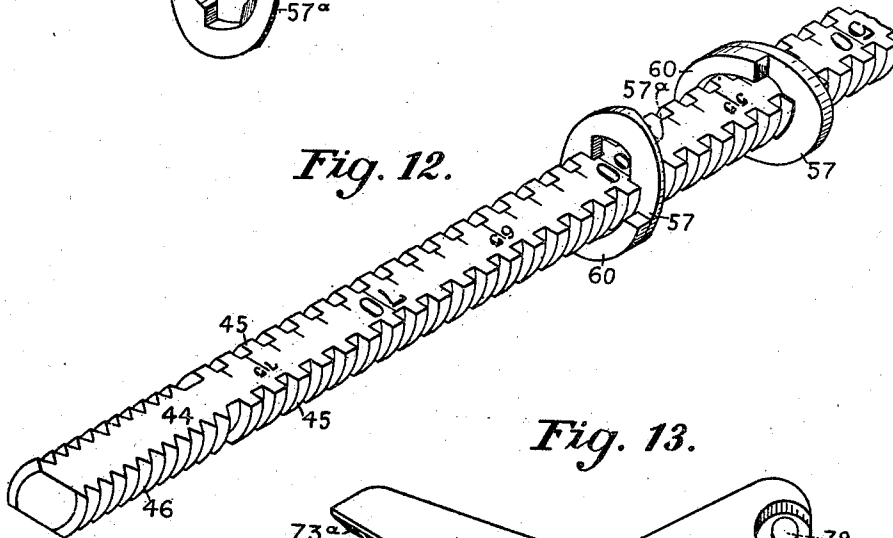
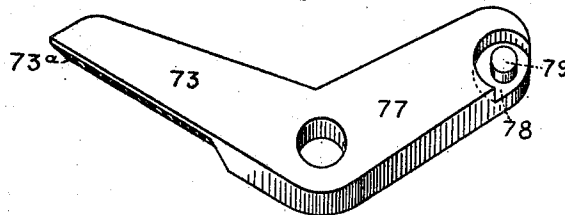


Fig. 13.



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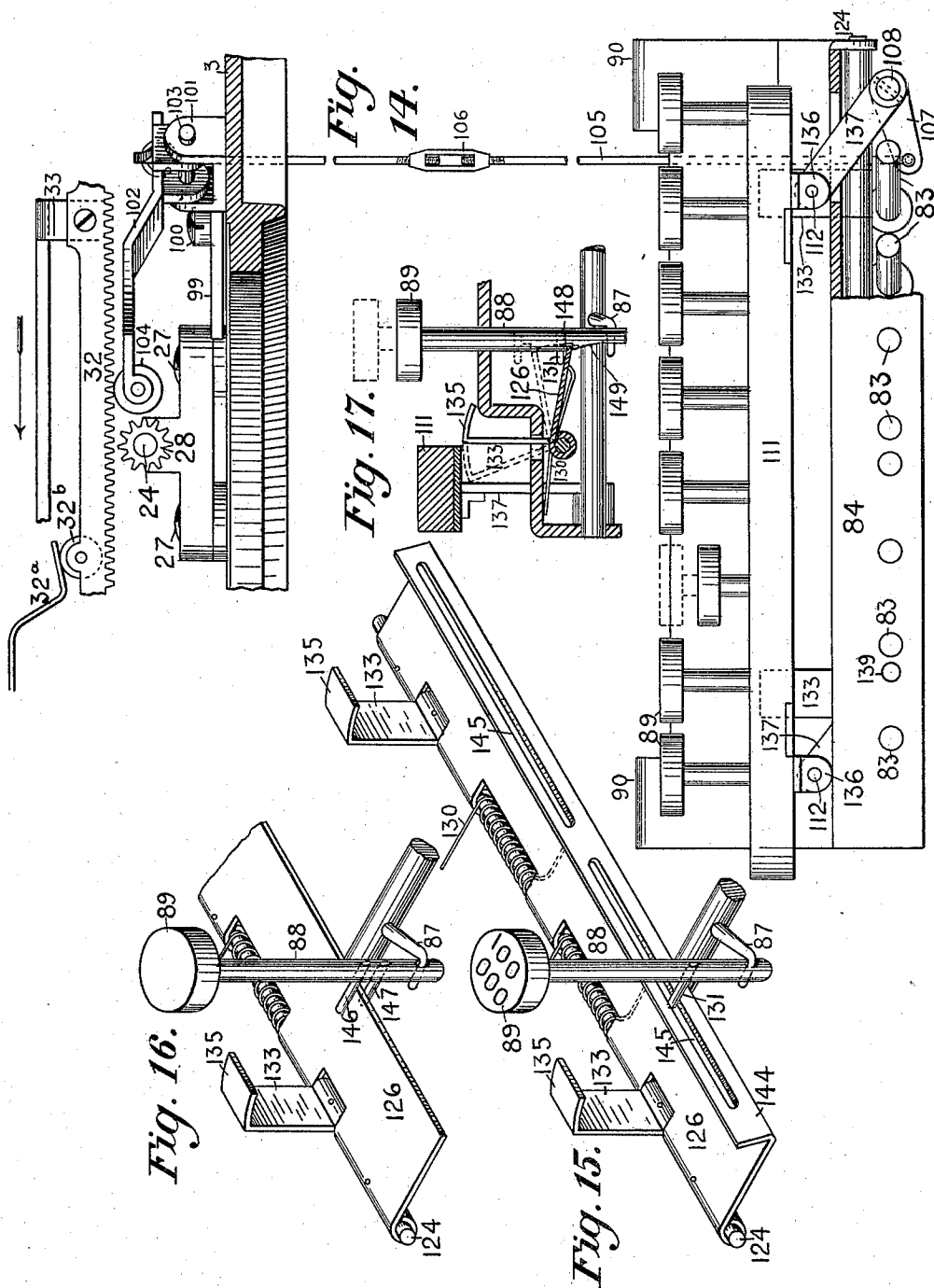
Jacob Felbel

J. FELBEL.
TYPE WRITING MACHINE.

(Application filed Dec. 18, 1899.)

(No Model.)

9 Sheets—Sheet 8.



WITNESSES:

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J. FELBEL.
TYPE WRITING MACHINE.

(Application filed Dec. 18, 1899.)

(No Model.)

9 Sheets—Sheet 9.

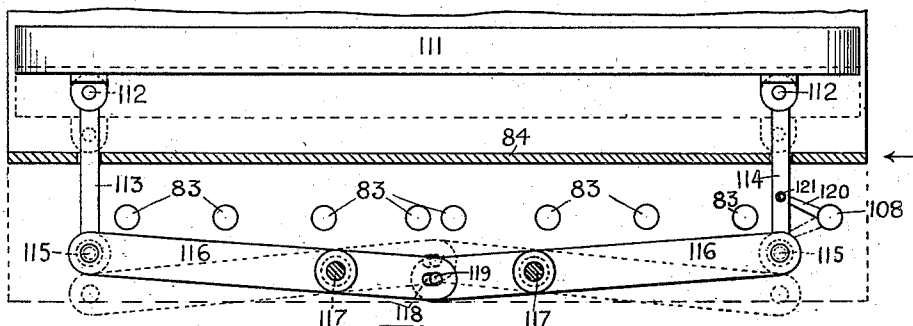


Fig. 18.

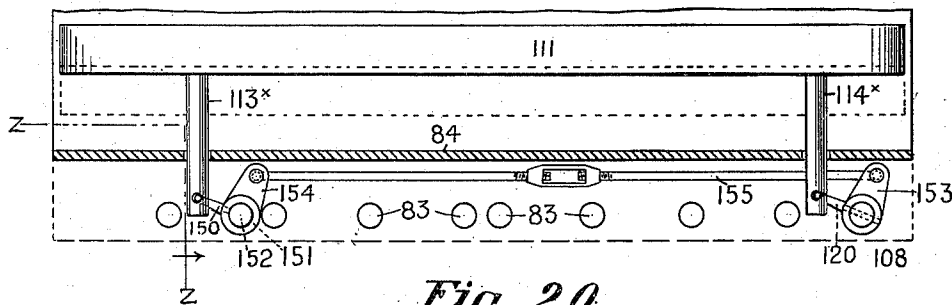


Fig. 20.

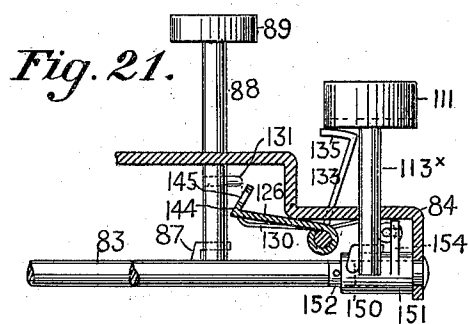


Fig. 21.

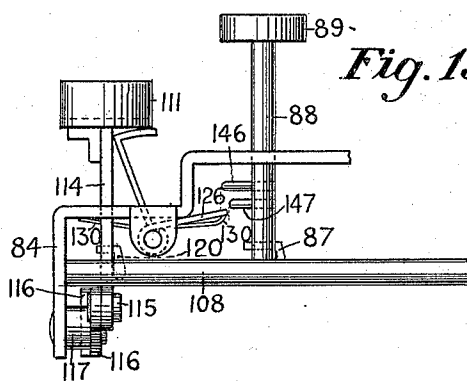


Fig. 19.

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UNITED STATES PATENT OFFICE.

JACOB FELBEL, OF NEW YORK, N. Y.

TYPE-WRITING MACHINE.

SPECIFICATION forming part of Letters Patent No. 709,088, dated September 16, 1902.

Application filed December 18, 1899. Serial No. 740,703. (No model.)

To all whom it may concern:

Be it known that I, JACOB FELBEL, a citizen of the United States, and a resident of the borough of Manhattan, in the 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.

10 The present invention relates to tabulating devices intended for use in conjunction with type-writing machines.

One object of the invention is to release the carriage from its controlling mechanism at any point in its forward traverse and to arrest the same either at a predetermined point or at given letter-space distances from said predetermined point.

Another object of the invention is to make the carriage release independent of the operation of the tabulator-blades, so that in case a mistake has been made in the setting of a tabulator-blade and the error has been discovered before the releasement of the carriage such error may be corrected before the carriage makes its excursion to the selected blade, thereby overcoming the objection existing to prior machines, wherein the blade is projected and the carriage released simultaneously by one stroke of the key and which necessitates a retraction of the carriage or a resetting of the stops in case an error has been made.

A further object is to provide means whereby it is impossible to release the carriage before one of the key-actuated blades has been set or moved to an arresting position.

Another object is to prevent the return to normal position of an operated denomination-key during the operation of the carriage-releasing mechanism.

Another object is to arrange a series of blade-operating or denomination keys relatively to the carriage-actuating key or keys, so that with the fingers of one hand the blade-operating key may first be actuated and subsequently the carriage-releasing key may be actuated.

Other objects will hereinafter more fully appear.

To these ends the invention consists of certain features of construction and combina-

tions of devices hereinafter described, and more particularly pointed out in the appended claims.

The preferred form of the invention is illustrated in the accompanying drawings, forming part of this specification, in which—

Figure 1 is a plan view, partly in section, of the rear portion of a type-writing machine in which the invention is embodied or to which it is attached. Fig. 2 is a plan view of the forward part of the machine shown in Fig. 1. Fig. 3 is a bottom view of the machine. Fig. 4 is a central longitudinal sectional view of the machine shown in Figs. 1, 2, and 3. Fig. 5 is an enlarged side elevation of a denomination-key and release-key and key-locking mechanism. Fig. 6 is a rear elevation of the machine. Fig. 7 is a detail sectional view upon the line X X in Fig. 1 looking in the direction of the arrow. Fig. 8 is a detail front elevation, partly in section, of the auxiliary or tabulator keyboard. Fig. 9 is a diagrammatic or skeleton side elevation, partly in section, and omitting practically all of the type-writing machine proper and illustrative of the operation of the tabulator mechanism. Fig. 10 is a perspective view of a key-lock. Fig. 11 is a perspective view of a rack-carrying bracket and means for attaching it to the paper-carriage. Fig. 12 is a perspective view of a rack or toothed rod. Fig. 13 is a perspective view of an arresting-lever or stop-blade adapted to coact with carriage-tappets. Fig. 14 is a front sectional elevation illustrating the action of the carriage-release mechanism. Fig. 15 is a perspective view of a modification of the key-lock, the parts being in their depressed or operative positions. Fig. 16 is a similar view of another modification. Fig. 17 is a sectional view of another modification. Fig. 18 is a front elevation, partly in section, of a release-key bar and means for securing parallelism of movement thereof. Fig. 19 is a side view of the devices shown in Figs. 16 and 18. Fig. 20 is a front view of another modification of the parallel movement for the key-bar. Fig. 21 is a side view, partly in section, on line Z Z of Fig. 20, showing in addition the locking mechanism illustrated at Fig. 15. Fig. 22 is a perspective view of a tappet.

In the several views certain parts are omit-

ted and others broken away for the sake of clearness.

The same part will be referred to in the drawings by the same numeral of reference.

1 is a base-frame; 2, columns or standards; 3, a top plate or type-ring attached to the standards 2; 4, a type-bar hanger attached to the type-ring 3 by a screw 5; 6, a type-bar pivoted in the hanger 4; 7, a connection between the type-bar 6 and the corresponding depressible key-lever 8; 9, a rib on which the key-levers 8 are fulcrumed; 10, springs holding the key-levers 8 in position against the rib 9; 11, the usual space-bar at the front of the keyboard 12; 13, a universal bar underlying the type-key levers 8 and the space-key levers 11; 14, vertical rods connecting the universal bar 13 with a transverse bar 15, which is attached to an arm 16, extending forwardly from a transverse rock-shaft 17 at the rear of the machine. The shaft 17 is journaled between lugs 18 of a back plate 19, which is attached to the top plate 3 by screws 20.

21 is a rocker-arm extending upwardly from the shaft 17 and carrying the usual escapement-dogs 22, which coact with an escapement-wheel 23. The escapement-wheel 23 is connected with a shaft 24 in any suitable way, as by a backing-ratchet in a casing 25. The shaft 24 is journaled in a housing 26, which is secured to the top plate 3 of the machine by screws 27. Upon the forward end of the shaft 24 is secured a pinion 28.

29 is a power-driven carriage moving to and fro transversely of the machine upon guide-rails 30 31.

32 is a rack adapted to mesh with the pinion 28 and carried by arms 33, which are pivoted at 34 to the carriage 29.

35 represents rollers on the carriage 29, which run upon the rail 30 in the usual manner.

36 is a platen-carrier connected with the carriage 29 in a known manner and provided with a roller 37, which runs upon a shift-rod 38.

39 is a platen journaled in the carrier 36. The rails 30 31 are secured to risers or standards 40 on the top plate 3.

41 is a spring-drum journaled upon a stud projecting forwardly from the back plate 19 aforesaid, and 42 is a flexible strap winding on and unwinding from the drum 41 and connected with an arm 43 on the carriage 29.

The above-described devices are to be found in the Remington No. 6 machine, in connection with which I have elected to illustrate the present invention; but it is to be remembered that my improvements are capable of use in connection with type-writing machines of other makes or description. Said improvements are illustrated as an attachment to an existing machine; but the invention is capable of being embodied in a machine when the same is originally built.

The tabulator mechanism shown in the drawings comprises a carriage-release key, a

system of arresting-blades, and a tappet or tappets, combined with actuating mechanism for the blades, the tappets being connected to and moving with the carriage 29 and the blades being mounted upon the fixed framework of the machine, this being the preferred arrangement of the parts. The tappet or stop carrier comprises a bar 44, which may be formed from a cylindrical rod by removing the metal at opposite sides thereof, so as to leave parallel faces, and the remaining circular or cylindrical portions are provided with teeth 45, which are opposite each other, as shown more clearly in Figs. 1 and 12, and the bottoms of the kerfs are also concentrically rounded, Fig. 12. The ends of the rod or rack 44 are provided with screw-threads 46. Brackets or arms 47 are firmly secured to the carriage 29 and extend rearwardly and downwardly of the machine and terminate in eyes 48, through which the threaded ends 46 aforesaid pass loosely.

49 50 are threaded nuts engaging with the screw-threads 46 at opposite sides of the eyes 48. By means of these nuts the rod 44 may be adjusted longitudinally of the carriage, or from right to left, and may then be firmly locked in the adjusted position. Each bracket 47 is formed with two hooks 51, adapted to engage over a horizontal flange or a T-bar 52 of the carriage 29, (see Figs. 4 and 11,) and is also formed with a downwardly-extending obliquely-arranged lug 53, whose forward face is in rear of the vertical flange of the bar 52 aforesaid. The hooks 51 are drawn firmly against the forward edge of the horizontal flange of the bar 52 by means of washers 54 and screws 55, the washers being loose upon the screws and the latter engaging with threaded holes in the brackets 47. The washers 54 catch under the rear horizontal flange of the T-bar and abut against the vertical flange of said T-bar 52 and also against the forward inclined face of the lug or ear 53, and hence exert a wedging or camming action as they are drawn upwardly by the screws 55. By this means the hooks 51 are drawn firmly against the forward edge of the horizontal flange of the bar 52, and the whole structure serves to secure the brackets 47 in place upon the paper-carriage. It will be observed that the bifurcated hooks 51 of each bracket 47 fit closely against the open frames of the carriage 29, within which the rollers 35 are journaled, and are thus prevented from having any motion endwise of said carriage. The tappets 57 are shown in the form of perforated metal disks, adapted to be securely held in position by the teeth 45 of the rod 44 and to be adjusted along said rod at will. The perforation 58 in the disk is of a length and form such that when the disk is turned to bring the greatest length of the perforation parallel with the plane faces of the rod the disk may be slid along the rod to any desired position and may then be turned to bring the greatest length of the slot

into an upright position, thus bringing the metal of the disk into the kerfs between the selected pairs of teeth 45. The slot 58 is rounded out at 59 in order to fit closely against the cylindrically-shaped bottoms of the said kerfs when in working position. The right-hand tappet 57 at Fig. 12 illustrates the position thereof when it is in readiness to be moved longitudinally of the rack or bar 44, and the left-hand tappet 57 at Fig. 12 illustrates the position thereof when it is locked between adjacent pairs of teeth 45. In order to prevent accidental displacement of the disk 57, said disk or tappet is provided with a weight 60, which hangs beneath the bar 44 when the tappet is caught between adjacent pairs of teeth 45. Other means may be employed for locking the tappets 57 in position. The bar 44 is preferably provided on its upper face with graduations opposite the kerfs, which graduations are marked to correspond with the usual scales on the carriage of the machine, the teeth 45 of the bar 44 being arranged at letter-space distance apart. So far as some of the principal features of my invention are concerned the tappets and rack or equivalent device may be of any other suitable construction. It is not essential in all forms of my invention that the tappets be mounted on the paper-carriage. For supporting the carriage-arresters a horizontal curved bar or bracket 61 is provided at one end with a hooked portion 62, which is adapted to fit around the curved standard 2 at the rear right-hand corner of the machine, (see Fig. 1,) and is also provided with a vertical arm 63, terminating in a horizontal flange 64, which is adapted to hang over the top plate 3 of the machine. (See Figs. 1 and 7.) A screw 65 passes loosely through a perforation in the straight portion of the hook 62 and engages with a threaded hole in a clamping-jaw 66, the screw serving to draw the jaw 66 toward the hook 62 and firmly clamp the straight or plane vertical wall of the standard 2 between the jaw and the hook. A screw 67 passes loosely through the vertical part of the arm 61 and engages with a threaded hole in a clamping-jaw 68 and serves to draw the jaw 68 toward the extension 63 to clamp the inclined flange of the top plate 3 therebetween. An adjusting-screw 67 engages with a threaded hole in the horizontal arm or flange 64 and is provided with a lock-nut 70. The bar 61 is provided with rearwardly-extending parallel ears 71. A round shaft 72 is suitably secured in the lugs or ears 71 and forms a common fulcrum-rod for a series of carriage-arresting blades or graded stops 73, which are arranged side by side in contact with each other and also in contact with the ears or lugs 71, the last being extended upwardly, as illustrated in Fig. 6, to embrace and support the blades 73. It will be observed that by means of the adjustment illustrated in detail at Fig. 7 the right-hand end of the bar or frame 61 at Fig. 6—that is, the end of said frame op-

posite the hooked end 62—may be raised or lowered as desired by manipulation of the screw 69, so as to bring the working faces of the tabulator-blades to the exact upright position required, and that by subsequent manipulation of the nut 70 and the screw 67 said bar or frame may be rigidly secured in the adjusted position. A bar 74 is adjustably attached to the uprights 71 by means of slots 75 and screws 76 and acts as a stop for the rearward and forward motions of the blades 73. The latter are adapted to rock forwardly upon the fulcrum-rod 72, and each has formed integrally therewith a rearwardly-extending horizontal arm or crank 77, which is recessed at 78 on one side and is formed or provided with a stud 79 in the center of the circular recess 78, Figs. 6, 9, and 13, the end face of said stud being substantially in the plane of the face of the arm 77. A series of vertical or upright links or thrust-rods 80 are formed at their upper ends with eyes 81, which fit over the studs 79, as indicated at Fig. 9. In assembling the bar 74 is not put in place until after the eyes 81 are all engaged with their studs 79, thus permitting each blade 73 and arm 77 to be swung out far enough to get the studs 79 clear of the other arms 77 and in a position in which eyes 81 can be placed thereover. When the bar 74 is in place, no arm 77 can swing far enough to allow of the disengagement of the corresponding eye 81 from its stud 79. The arms 77 thus serve to lock the eyes 81 in place. At their lower ends the connections 80 engage with eyes formed in crank-arms 82, which are provided upon the rear ends of horizontal forwardly-extending rock-shafts 83, a turnbuckle 80^a being provided for each two-part rod 80, so as to enable said rod to be nicely adjusted. The rock-shafts 83 are arranged below the type-key levers 8 and at their ends are journaled in horizontal perforations in front and rear removable brackets 84 85. Returning-springs 86 for the shafts and connected mechanism, including the blades 73, are coiled about the shafts and each attached at one end to a collar 87 on its shaft and at its other end to the bracket or plate 85. It will be observed in Fig. 6 that the crank-arms 82 point inwardly from the sides of the machine, and the springs 86 are arranged to rock the shafts 83, so as to return the crank-arms 82 to the position thereof shown at said figure. Near their forward ends the shafts 83 are provided with operating crank-arms 87, pointing outwardly from the central line of the machine. Vertical key-stems 88 are pivotally connected at their lower ends to the cranks 87, said stems being guided in vertical perforations in the bracket 84 and being also provided with finger-keys 89, arranged in line transversely of the machine and in front of the usual space-key 11 and also in front of the base-frame proper. The crank-arms 87 are so arranged upon the rock-shafts 83 as that the depression of any key 89 will rock the shaft to lift the

corresponding rear crank 82 from the position thereof shown in Fig. 6 to that shown in Fig. 9, and so raise the corresponding arm 77 until it is arrested by the stop 74, at which time the blade 73 will have been thrown forwardly of the machine and projected into the path of a tappet or stop 57 on the rod or bar 44 in position to arrest the tappet, and hence the tappet-carrier 44, together with the carriage, whenever the latter is released from the control of its escapement mechanism.

It will be observed that the connections 80, which approach one another closely at their upper ends, owing to the compact arrangement of the tabulator-blades to which they are attached, diverge or fan out at their lower ends to connect with their respective crank-arms, the latter being arranged substantially in line transversely of the machine and requiring more room than the tabulator-blades. It will further be noted that the horizontal rock-shafts upon each side of the central line of the machine are likewise spread or fanned out at their forward ends, so that the free ends of their crank-arms are located directly beneath their respective keys, which are preferably of about the size of the writing-machine keys and spaced at about equal distances thereto to facilitate the operation of the mechanism. The front bracket 84, above named, is formed of sheet metal bent both to form a pair of steps, as indicated in Figs. 4 and 5, and also to form a hook 90, which engages over the rounded top of the front of the frame 1. A clamping-jaw 91 is formed with a hook to engage under the lower edge of the said front bar of the frame 1, and a clamping-screw 92 passes through a perforation in the plate 84 and engages with a threaded perforation in the clamping-jaw 91, as indicated in Figs. 5 and 9, thus binding the bracket 84 to the frame of the machine. A hook 90, jaw 91, and screw 92 are placed at each end of the bracket 84, as indicated in Fig. 2. The vertical rear plate or bracket 85 is formed with upwardly-extending hooks 93 to engage in front of the rear vertical flange of the base of the machine and is also formed with oblique ears 94, extending upwardly and rearwardly of the machine. Horizontal straps 95 are formed with hooked ends 96 to catch over the forward portion of horizontal plate 95^a of the main frame, said straps lying on top of said plate 95^a and having upturned oblique ears 97, substantially parallel with and adjacent to the ears 94. Obliquely-arranged screws 98 pass loosely through perforations in the ears 94 and engage in threaded perforations in the ears 97 and draw the vertical plate 85 and the horizontal straps 95 toward the point of convergence of the two, thus obtaining a firm grip with the hooks 93 and 96 upon the frame of the machine. Inasmuch as the contiguous blades 73 are each preferably of a thickness equal to a letter-space feed of the carriage, it follows that the carriage may be arrested at different letter-space distances from any pre-

determined point; or, in other words, said blades form a series of graded stops for variably arresting the carriage. Said predetermined point may correspond to the position of the carriage when any tappet 57 thereon is in engagement with the left-hand or decimal-point blade 73. (Shown in Fig. 1.) As illustrated in Figs. 1 and 2, there are eight blades 73 and eight finger-keys 89. The latter are marked, beginning with the left-hand key, with the decimal-point and other characters indicating units, tens, hundreds, thousands, and so on, and hence are termed "denomination-keys." The left-hand blade 73 in Fig. 1 is preferably operated by the decimal-point key, the next by the units-key 89, and the third by the tens-key 89, and so on up to millions. The blades 73 are beveled at the left-hand edges at 73^a, and the tappets 57 are thinned at their rear edges, as indicated at 57^a in Fig. 12, the purpose being to permit or facilitate the projection or moving forward of any blade 73 when a tappet is nearly in line with any particular blade. In the Remington No. 6 machine one of the escapement-dogs has a stepping motion, being moved back against a stop by the tooth of the escapement-wheel 23, with which it reengages.

The following means are included in the tabulating mechanism for releasing the carriage 29 from the control of its escapement mechanism and to permit it to run forward under the influence of the spring-drum 41 until such time as a previously-operated stop-blade 73 shall be struck by a tappet 57, and thus arrest the carriage. To the top plate 3 of the machine a plate 99 is secured by a screw 100. The plate 99 is provided with upstanding ears or lugs 101, between which a lever 102 is pivoted upon a pin 103. The forward end of the lever 102 is parallel with the carriage escapement-rack 32 and is forked to receive the axis of a roller 104, which is journaled therein at right angles to the rack 32. Normally the roller 104 lies just below the teeth of the rack 32. The lever 102 is extended rearwardly beyond the top plate 3 and is there connected with a vertical rod 105, having a turnbuckle 106. The lower end of the rod 105 is connected to a crank-arm 107, which is fast on a horizontal rock-shaft 108, journaled in the front and rear brackets 84 85. A spring 109, coiled about the shaft 108, is fast at one end to a collar 110, secured upon the shaft, and at the other to the bracket 85 and is tensioned to lift the connecting-rod 105 and the rear end of the lever 102. At its forward end the shaft 108 is suitably connected with a horizontal bar or key 111, so that by means of the latter the shaft may be rocked to pull down the rod 105 and the rear end of the lever 102, thus raising the roller 104 against the teeth of the rack 32 and lifting the latter out of mesh with the pinion 28, thus releasing the carriage from the control of its escapement mechanism and permitting it to run forward until arrested

by the engagement of the coacting stop members. In the main views this release-key bar is shown connected to a pair of parallel links, one of which is fast to the rock-shaft 139.

5 These links give to the said bar a downward and endwise movement when struck; but inasmuch as some operators might prefer that the bar 111 descend vertically or without endwise movement I have provided means, as at
10 Figs. 18, 19, 20, and 21, for effecting such movement of said bar, and as the form shown at Figs. 18 and 19 may be designated as the preferred form I will now first describe the same and then hereinafter particularly describe the remaining forms or constructions.

As shown in Figs. 18 and 19, the release-key 111, which is in the form of a long bar extending in front of the keys 89 and parallel therewith and in proximity thereto, is
20 pivotally connected at 112 with two vertical links 113 114, which pass through and are guided by the bracket 84. At their lower ends the links 113 114 are pivoted at 115 to the free ends of meeting levers 116, which
25 are pivoted intermediate their ends at 117 on axes parallel with the pivots 112 115 and at right angles to the bar 111. One of the levers 116 is provided at its meeting end with a slot 118, with which engages a lateral pin
30 119, provided upon the inner end of the other lever, the levers thus being compelled to move together. The link 114 is connected with the shaft 108 aforesaid by a crank-arm 120, which engages a hole 121 in the link.
35 The arms of the levers 116, with which the links 113 114 are connected, are equal, whence it results that the key 111 has a parallel floating movement, as indicated in dotted lines at Fig. 18. The key-bar is preferably of a
40 length substantially equal to the length of the line of tabulating-keys, so that the forefinger and thumb may work one practically behind the other conveniently to any key struck.

45 In the operation it will be observed that a denomination-key 89 is first to be actuated, and then after the selected blade or stop has been brought to a carriage-arresting position the carriage-release key 111 is actuated to
50 free the carriage from its escapement mechanism and cause the first stop member thereon to the right of the projected blade to come into contact with and be arrested by such projected stop-blade. By reason of the disposition
55 of the carriage-release key in proximity to the series of denomination-keys the operator may use one finger to depress a denomination-key and may then conveniently employ another finger or thumb of the same
60 hand to operate the release-key, as illustrated in dotted lines at Fig. 9. Upon the arrest of the carriage at the desired distance from the point predetermined by the adjustment of the tap-
65 pet along the bar 44 the key 111 is released, and thereafter the depressed key 89 is also released, but not before the reengagement of the rack 32 with pinion 28. The rack 32 is

preferably returned into engagement with the pinion 28 by means of a spring 32^a, which is secured to the carriage 29 and which bears
70 upon a roller 32^b, connected to the said rack 32, all as indicated in Fig. 14. It will thus be seen that a stop-carrier, as 44, is adapted to move with the paper-carriage and is preferably secured thereon, that the carriage
75 positioning or tabulating mechanism also includes two coacting stop elements, one of which is borne by a stop-carrier having step-by-step movements, that one of said stop elements consists of an adjustable stop, as 57,
80 and that the other of said elements consists of a series of graded stops, as 73, the graduations corresponding in size or length or position to the letter-space movements of the carriage or step-by-step movements of the
85 stop-carrier, that one of said stop elements, preferably the stop 57, is adjustable in the direction of the step-by-step movements of the stop-carrier, and that preferably the latter carries said adjustable stop element. Ow-
90 ing to this arrangement a relative step-by-step movement occurs between said two stop elements at the letter-spacing movements of the paper-carriage, although in the normal position of the stop elements no contact or
95 engagement thereof takes place at said step-by-step movements. It will also be observed that means are provided for effecting different relative movements between the said two
100 stop elements in a direction transversely of their relative step-by-step movements, said different relative movements or positioning being produced by the operation of different
105 denomination-keys, and that by means of such operation one of said two stop elements is positioned for arresting the other element, and hence the stop-carrier and paper-carriage at varying distances from a predeter-
110 mined point in the travel of the latter according to the denomination-key operated and also according to the position to which the adjustable stop element is set. It will
115 further be seen that the tabulating mechanism includes independently-operable means, said means being preferably connected to and operable by an auxiliary key arranged in
120 proximity to the denomination-keys and parallel thereto for causing said two stop elements to move into engagement or contact, so as to position said carriage at the desired
125 point, said means also including mechanism for releasing both the stop-carrier and the paper-carriage from the control of the escapement mechanism of the latter, so that said engagement of the two stop elements after
130 the said relative positioning thereof by the denomination-key is effected by a single movement or excursion of one of the stop elements in the direction of its step-by-step movements.

In order to avoid the unintentional release of the carriage 29 before a tabulator-blade 73 has been operated, mechanism is provided for preventing the depression of the carriage-

release key 111 until such time as a denomination-key 89 shall have been depressed to project its tabulator-blade 73 into the path of a tappet. In order to also avoid the disengagement of the operated blade 73 from the arrested tappet prior to the reengagement of rack 32 with pinion 28, means are provided for locking any depressed key 89 against return movement until after the return movement of the key 111 has been so far completed as to permit of the reengagement of said rack with said pinion. In other words, means are provided for preventing simultaneous operation of the selecting and carriage-releasing mechanism. Such double locking mechanism may have several forms, of which one form is illustrated in Figs. 4, 5, 8, 9, and 10 and will now be described. The bracket 84 is formed or provided at its ends with two downwardly-extending lugs 122 123, in which a transverse horizontal pivot-shaft 124 is journaled below the carriage-release key 111. As shown in Fig. 8, the bracket 123 is attached to and removable from the bracket 84 by a screw 125, which passes loosely through a perforation in the bracket 84 and engages with a threaded hole in the bracket 123. The shaft 124 has a horizontal metal plate 126 fastened thereto, as by pins 127, the said plate being folded around the shaft. The plate 126 extends rearwardly from the shaft 124 and at its rear edge is bent back upon itself and then upwardly and rearwardly of the machine in a semicircle to form a channel or catch 128, which extends parallel to the row of key-stems 88 and in proximity thereto, so that it may coact with each of said stems. The plate 126 is cut away at 129 to provide space for springs 130, which are coiled about the shaft 124 and whose ends engage underneath the plate 126 and underneath the bracket 84, said springs being tensioned to lift the plate 126 to the position thereof shown in Fig. 5. Each of the vertical stems 88 is provided with a forwardly-extending pin or stud 131 of a length such that when the plate 126 is in normal position, Fig. 5, the end of the pin 131 will on the depression of a key 89 just clear the upper edge of the universal catch 128 and will strike against the bottom edge or folded portion of the plate 126, thus pushing the latter downwardly against the force of the springs 130 to the position shown in Fig. 9, at which time it will be noted that the upper edge or flange of the gutter or catch 128 has moved rearwardly to a point over the pin 131, so that it is not possible for the depressed key-stem 88 to return to normal position independently of the plate 126. The plate 126 is also cut away at 132 to provide space for vertically-disposed locking-arms 133, formed of sheet metal and folded about the shaft 124 and rigidly secured thereto by pins 134. The arms 133 pass through suitable openings in bracket 84. The upper ends 135 of the arms 133 are bent over rearwardly to form ledges or lips and are of such length that in the normal po-

sition of the key-bar 111 the lips 135 may pass thereunder. Preferably the extensions 135 are bent to a curve concentric to the axis of shaft 124. When the plate 126 is depressed at the operation of any key 89, the arms 133 and lips 135 are swung rearwardly, whereby the key 111 is unlocked or released, so that it may be operated to release the carriage. 75

From the foregoing description of the locking devices it will be seen that when the keys 89 and 111 and the plate 126 are in normal position the arms 133 and their lips or ledges 135 are underneath the key 111, and therefore serve as detents or stops for the latter, which cannot be depressed until the bar 126 has been depressed and the arms 133 have been thereby moved rearwardly by the depression of a key 89, as indicated in Fig. 9—that is to say, the carriage-release key is normally locked against independent depression until such time as a denomination-key 89 shall have been depressed to substantially the full extent of motion thereof and shall have brought its blade 73 into the path of a tappet 57, or, in other words, the stop-projecting mechanism, including the denomination-key 89, is combined with independently-operable carriage-releasing mechanism, including the key 111, and also with means, including the arms 133, for preventing the operation of the carriage-releasing mechanism until the stop or blade 73 has been projected. The carriage-release key 111 after thus being released from the control of the locking-arms 133 may be depressed to effect the rapid movement of the carriage to the point determined by the depressed denomination-key. In its downward movement said key 111 passes in front of the upright arms 133 and by this means locks or prevents their return movement under the tension of the spring 130, so that the plate 126 is maintained in its depressed or inactive position. At Fig. 9 it will be noted that the upper edge or lip of the groove 128 hooks over the pin 131 and locks the key-stem in its depressed position. In other words, upon the depression of the carriage-release key 111 neither the depressed tabulator-key 89 nor its associated stop 73 can be returned to normal position or to a position such as will effect a disengagement of the tappet 57 from blade 73 until after the return to normal position of the carriage-release key 111 and the consequent disengagement of the rear face thereof from the front face of the arms 133. The spring 86 of the depressed denomination-key 89 and the springs 130 may then restore the depressed denomination-key and the plate 126 to normal positions, thus disengaging the blade 73 from the tappet 57 and also moving the arms 133 to normal position under the carriage-release key 111 and causing the disengagement of the pin 131 and the lock or catch 128. It will be noted that the horizontal plate 126 and the vertical arm 133 move in unison or integrally and taken together form a bell-

crank, one arm whereof—viz., the plate 126—is provided with a catch for engaging the denomination-keys, and the other arm whereof—viz., the arm 133—is constructed to coact with the carriage-release key to prevent the return of said denomination-keys to normal position prior to the return of said release-key to normal position and also for preventing the operation of the carriage-release key until after a denomination-key shall be actuated.

The form of parallel or floating motion for the key 111 (shown in Figs. 3, 4, 5, 8, 9, and 14) will now be described. The carriage-release-key bar 111 is provided with downwardly-projecting ears 136, between which the ends of links 137 are pivoted at 112. The lower end of the right-hand link 137 is provided with an eye which fits upon the rock-shaft 108 aforesaid and is fastened thereto by a pin 138. The lower end of the left-hand link 137 is journaled upon a stud or shaft 139, which is fast in the bracket 84. Hence the bar 111, which connects the links 137, must have parallel movements.

In the modification illustrated at Figs. 15 and 21 the locking-plate 126 is formed with an upwardly and forwardly extending flange 144, which is slotted longitudinally at 145 to form a catch which is similar in operation and function to the catch 128 hereinbefore described, the pins 131 upon the key-stems 88 being normally above the slots 145 and passing down behind the upper edge of said slots and into engagement with the lower edges thereof and being engaged in the said slots or between the sides or edges thereof by the consequent turning of the plate 126 upon its hinge. It will be observed that Fig. 15 illustrates the parts in their depressed positions.

In the modification illustrated in Figs. 16 and 19 the plate 126 is left plane or flat, and the key-stems 88 are provided with unequal pins 146 147, of which the latter is the shorter and the lower. Upon the depression of a key the pin 147, which normally lies at a higher level than the plate 126, passes by the edge thereof; but the pin 146 strikes the upper surface of the plate 126 and moves it downwardly, and the plate during such turning motion enters between the pins 146 147, and so catches the key-stem.

In the modification illustrated at Fig. 17 the plate 126 is likewise plane or flat, and each key-stem 88 is provided with a transverse notch or groove 148 just below the pin 131, the said plate 126 being adapted to enter the said groove 148 upon the depression of the key and to hold the stem against return to normal position. In this modification the portion of each stem below the grooves 148 is cut out at 149 to provide clearance for the free edge of the plate 126 in its downward movement about the axis 124. In each of the several modifications shown at Figs. 15, 16, 17, 19, and 21 the arms 133 and stops

or ledges 135 are shown, and it will be understood that these coact with the carriage-release key 111 in the manner hereinbefore described to prevent the actuation thereof until after the depression of a denomination-key 89 and that arms 133 and key 111 lock the depressed denomination-key as above set forth.

In the modification illustrated at Figs. 20 and 21 the key-bar 111 has the stems 113^x 114^x rigidly secured thereto, and these stems pass through perforations in the bracket 84. The stem 114^x engages with the crank-arm 120 of shaft 108 in the manner before described, while the stem 113^x engages with a crank-arm 150 on a sleeve 151, which is journaled on a stud 152 in the bracket 84. The shaft 108 is provided with a crank-arm 153, and the sleeve 151 is provided with a similar arm 154, said arms 153 154 being preferably parallel with each other. An adjustable rod 155 connects the crank-arms 153 154, so as to cause them to move in unison. From the described construction it results that the key 111 has a parallel and purely vertical movement in this case also, as at Fig. 18.

Other modifications and changes may be resorted to without departing from the several features of invention covered by the concluding claims.

I have herein used the term "tappets" for the series of step-by-step movable and adjustable column-stops and have also employed the term "blades" for the set of denomination-stops mounted upon the framework of the machine; but I wish to be considered as not limited to any particular form or construction or arrangement of tappets or blades or of column and denomination stops so long as these devices are constructed and arranged to cooperate as stop members in a manner substantially the same as the devices herein shown and described and to produce the results obtained thereby.

It will be observed that many features of my invention are equally well adapted to adding-machines wherein a series of order or denomination wheels is used in connection with a variably-movable carriage which is adapted to proceed from order to order to effect an operative connection between the figure-keys and the order-wheels.

It will be observed that the release-key by which the carriage is made free to run to the selected and positioned denomination-stop is independent of the denomination-keys in the sense that it requires actuation additional to the depression or actuation of the selected denomination-key. In other words, instead of releasing the carriage in and by the act of depressing a denomination-key and setting the corresponding denomination-stop the work is divided and two operations are performed, to wit: First, the depression or actuation of the selected denomination-key and consequent setting of the selected stop, and, second, the actuation of the release-key and freeing of the

carriage from the hold of the letter-space mechanism, so that it may run rapidly to the positioned denomination-stop. Herein resides the broad idea or principle underlying my invention and which I mean to claim generically.

In the embodiment of my invention herein illustrated and described I have carried the invention further or have developed it to a higher degree than is necessarily implied in the foregoing statement by locating wholly outside the carriage the release-key by which said carriage is freed to run to the positioned denomination-stop. It will readily be seen that were said release-key mounted in or upon the paper-carriage and arranged to travel therewith the pressure necessarily applied and maintained to disengage and hold apart the members of the letter-space feed to enable the carriage to run to the positioned denomination-stop would inevitably retard the carriage or tend to prevent its running freely and rapidly to such stop. I have therefore shown and described as the preferred embodiment of my invention and as one possessing novelty and patentability over a construction responding to the broad terms of the statement above a construction in which the release-key referred to is mounted wholly outside the traveling paper-carriage, it being here shown directly in front of the keyboard, which is a convenient, though not a necessary, position. With the release-key thus wholly removed from the carriage it may be depressed or actuated to release the carriage and to maintain separation or disconnection of the members of the letter-space mechanism without in the slightest degree impeding or retarding the travel of the carriage to the selected and positioned denomination-stop. I mean, therefore, to claim not only the broader combination above indicated, but also and separately to claim such combination restricted to location of the release-key outside of the paper-carriage as being a further or higher development of my invention, possessing marked advantages over one in which the release-key is in or upon the carriage.

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

1. In a type-writing machine, the combination with type-operating mechanism and a power-driven carriage, of a tabulating mechanism including a series of column-stops and a set of independent denomination-stops, and also including independently-operable means for releasing the carriage after the positioning of the stop members.

2. In a type-writing machine, the combination with type-operating mechanism and a power-driven carriage, of a tabulating mechanism including a series of denomination-keys and a series of independently-movable stops connected thereto, and also including an independent release-key for the carriage, the construction and arrangement being such that any key may be operated to set its cor-

responding stop, and such that said release-key may then be operated to enable the carriage to move rapidly to the point determined by the setting of said stop.

3. In a type-writing machine, the combination with type-operating mechanism and a power-driven carriage, of a tabulating mechanism including an adjustable column-stop arranged upon the carriage and a series of denomination-stops arranged upon the frame of the machine, and keys for controlling said denomination-stops, and said tabulating mechanism also including an independently-operable carriage-release key arranged upon the frame of the machine.

4. In a type-writing machine, the combination with a carriage and a type-operating mechanism, including a keyboard, of a tabulating mechanism for said carriage comprising a series of denomination-stops, a tappet, and means extending to said keyboard for effecting relative positioning between the tappet and the denomination-stops, said tabulating mechanism also comprising auxiliary means extending from the carriage to the keyboard and operable independently of said positioning means, for causing a movement of the carriage independent of its escapement mechanism and so that it may be arrested by the engagement of said tappet with the selected stop and hence positioned at the desired point.

5. In a type-writing machine, the combination with a carriage and a type-operating mechanism, including a keyboard, of a tabulating mechanism for said carriage comprising a series of stops, a tappet, and a series of denomination-keys arranged in line at the keyboard and provided with means for effecting different relative positioning between said stops and said tappet, said tabulating mechanism also comprising independently-operable means extending to the keyboard for releasing said carriage and hence that portion of the tabulating mechanism moving therewith from the control of the carriage-escapement mechanism, so that the carriage may be positioned at the desired point by the engagement of said tappet with the selected stop, the construction and arrangement being such that said release movement may be effected subsequently to and independently of the operation of the selected denomination-key.

6. In a type-writing machine, the combination with a carriage and a type-operating mechanism, including a keyboard, of a tabulating mechanism for said carriage comprising a series of stops, an adjustable tappet, and a series of denomination-keys arranged at the keyboard and provided with means for effecting different relative positioning between said stops and said tappet, said tabulating mechanism also comprising an auxiliary key arranged in proximity to said denomination-keys and connected to means for releasing the carriage and hence that portion of the tabulating mechanism moving therewith from the

control of the carriage-escapement mechanism, so that one finger may be employed to operate any of said denomination-keys and so that another finger of the same hand may be employed to operate independently said auxiliary key so as to cause the carriage to be positioned at the desired point by the engagement of said tappet with the selected stop.

7. In a type-writing machine, the combination with a carriage and a type-operating mechanism including a keyboard, of a tabulating mechanism including an adjustable tappet, a series of independently-movable blades for arresting said tappet and carriage at variable distances from a point determined by the adjustment of said tappet, and a series of denomination-keys arranged in line at said keyboard and each connected to one of said blades but not adapted to release the carriage, said tabulating mechanism also including an auxiliary key extending parallel to said line of denomination-keys and connected to means for causing a release of said tappet together with said carriage from the control of the carriage-escapement mechanism.

8. In a type-writing machine, the combination with type-operating mechanism including a keyboard, of a carriage, a series of independently-movable stops, means for engaging the stops to arrest the carriage, a series of depressible finger-keys arranged at the keyboard and operatively connected to the said stops, and a key at the keyboard for releasing the carriage subsequent to the positioning of the selected stop.

9. In a type-writing machine, the combination of a carriage, a keyboard of the printing mechanism, a space-key arranged in front of the keyboard, and a tabulating mechanism, the latter including both a series of depressible denomination-keys arranged in line in front of said space-key, and an auxiliary carriage-release key arranged in front of said denomination-keys.

10. In a type-writing machine, the combination of a keyboard, a series of type-operating key-levers extending rearwardly therefrom, a carriage, a series of movable denomination-stops arranged upon the machine, means on the carriage for engaging the denomination-stops, and a series of horizontal rock-shafts arranged beneath said key-levers and extending rearwardly from the front of the machine and provided at their forward ends with depressible finger-keys and at their rear ends with means for operating the denomination-stops.

11. In a type-writing machine, the combination of a carriage, a tappet thereon, a system of tabulator-blades, a series of longitudinally-extending rock-shafts arranged in the base of the machine, means for enabling the rock-shafts to move the tabulator-blades, a crank-arm arranged at the end of each rock-shaft, and an upright key-stem for and pivotally mounted upon each of said crank-arms.

12. In a type-writing machine, the combination of a system of tabulator-blades, a tappet, a series of horizontal rock-shafts arranged longitudinally in the base of the machine, each rock-shaft being provided with a crank-arm at its rear end, links connecting the crank-arms to the blades, crank-arms provided at the front ends of the rock-shafts, and upright key-stems pivotally secured thereon.

13. In a type-writing machine, the combination of a carriage, a tappet thereon, a series of tabulator-blades mounted on the frame of the machine, a series of links connected at their upper ends to said tabulator-blades and diverging at their lower ends, a series of longitudinally-arranged horizontal rock-shafts provided at their rear ends with crank-arms, each of said crank-arms being pivotally connected to the lower end of one of said links, and said horizontal rock-shafts diverging at their forward ends, and a key-operated crank-arm secured to the forward end of each shaft.

14. In a type-writing machine, the combination of a paper-carriage, a bar thereon, a tappet adjustable along said bar, a series of vertical tabulator-blades pivoted on a fixed portion of the machine in proximity to said paper-carriage, each blade being provided with a crank-arm, a series of depressible keys arranged at the keyboard of the type-operating mechanism, and operative connections between said keys and said crank-arms, said connections including a series of horizontal longitudinally-extending rock-shafts arranged in the bottom of the machine.

15. In a type-writing machine, the combination of a paper-carriage, a bar thereon, a tappet adjustable along said bar, a series of tabulator-blades pivoted upon a fixed portion of the machine in proximity to said paper-carriage and each having a rearwardly-extending crank-arm, a series of links, the upper ends of which are connected to said crank-arms, and a series of key-operated horizontal rock-shafts extending longitudinally of the machine and connected at their rear ends to said links.

16. In a type-writing machine, the combination of a carriage, a bar thereon, a tappet adjustable along said bar, a series of vertical tabulator-blades pivoted on the frame of the machine and each provided with a horizontal crank-arm, a series of vertical links connected at their upper ends to the crank-arms, a series of rock-shafts extending longitudinally of the machine and provided at their rear ends with crank-arms which engage the lower ends of said links and also provided at their forward ends with crank-arms which are connected to vertical stem-keys, and a series of returning-springs.

17. In a type-writing machine, the combination with a carriage, of tabulating mechanism therefor, including a bar on said carriage, a tappet adjustable along said bar, a series of tabulator-blades pivoted upon a fixed portion of the machine, a series of depressible denomination-keys arranged at the keyboard

of the type-operating mechanism, and operative connections extending from said keys to said tabulator-blades, and also including a carriage-release key arranged in proximity to said denomination-keys.

18. In a type-writing machine, the combination of a bracket comprising a horizontal plate, as 84, a vertical plate having a hook 90, catching over the top of the front bar of the type-writer base, a clamp 91 engaging the lower edge of said front bar, screw 92, means on said bracket for pivotally supporting a series of rock-shafts, a series of perforations in said horizontal plate, a series of key-bearing stems arranged in said perforations and operatively connected to said rock-shafts, and connections from said rock-shafts to a series of stops adapted to engage stops on the paper-carriage.

19. In a type-writing machine, the combination of vertical plate 85, upwardly-extending hook 93 thereon, oblique ear 94 at the upper end of said plate, horizontal plate or strap 95 having an ear parallel to said oblique ear, means for drawing the ears toward each other, hook 96 on said horizontal plate, the hook on said vertical plate being constructed to engage the lower edge of the vertical flange of the base of the machine and the hook on said horizontal plate being constructed to engage a horizontal plate on said base, a series of horizontal perforations in said vertical plate, a series of key-operated rock-shafts journaled in said perforations, a series of tabulator-blades operatively connected to said rock-shafts, a carriage, and a tappet thereon.

20. In a type-writing machine, the combination of a carriage, a tappet thereon, a bracket, a series of tabulator-blades mounted on said bracket, and means for securing said bracket to the frame of the machine so that the bracket may be adjusted to bring the working faces of the tabulator-blades to a vertical position.

21. In a type-writing machine, the combination of a carriage, a tappet thereon, a bracket, tabulating-blades mounted thereon, means for securing said bracket to the frame of the machine so as to prevent movement thereof in a horizontal direction, and a leveling-screw for swinging the bracket up or down so as to adjust the blades to a vertical plane.

22. In a type-writing machine having a base, vertical columns thereon, a top plate supported on the columns, and a carriage traveling over the top plate, the combination of a bracket provided with a hook for engaging one of said columns and with an arm extending over said top plate, means for adjustably clamping the bracket to the column and to the top plate, a series of key-operated tabulator-blades supported on said bracket, and a tappet arranged upon the carriage for engaging the blades.

23. In a type-writing machine, the combination with a carriage, of opposite arms there-

on each provided with a perforation and the perforations being in the same axial line, a bar extending through said perforations, the ends of the bar being threaded and provided with nuts to bear against each of said arms upon opposite sides thereof, whereby the bar may be adjusted longitudinally and locked in its adjusted position, a tappet adjustable along the bar, and key-operated means for engaging the tappet to arrest the carriage.

24. In a type-writing machine, a bar formed from a cylindrical rod and having two parallel opposite plane faces extending longitudinally thereof, said faces being produced by cutting away the cylindrical bar upon opposite sides thereof, a series of teeth cut at letter-space intervals on said bar, and a tappet constructed to slide along said bar without engaging the teeth thereof and also constructed to be turned into engagement with said teeth.

25. In a type-writing machine, a bar formed from a cylindrical rod and having two parallel opposite plane faces extending longitudinally thereof, said faces being produced by cutting away the cylindrical bar upon opposite sides thereof, a series of teeth cut at letter-space intervals on said bar, and a tappet constructed to slide along said bar without engaging the teeth thereof and also constructed to be turned into engagement with said teeth, said tappet having a weighted portion to maintain it in such engaged or working position.

26. In a type-writing machine, the combination with a carriage, of a bracket provided with a hook and a wedging surface, a screw as 55, and a washer as 54, on the screw for engaging said wedging surface to clamp the bracket to the carriage.

27. In a type-writing machine, the combination of two meeting levers, each pivoted between its ends, means for engaging the levers to each other at their meeting ends, a link pivoted to the outer arm of each lever, means for guiding the links, and a key-bar connecting said links.

28. In a type-writing machine, the combination of two levers connected together to move in unison, a key-bar connected with said levers to have substantial parallel motion, a carriage, and a carriage-release mechanism connected to and operated by said parts.

29. In a type-writing machine, the combination of a longitudinally-extending rock-shaft, a transverse substantially parallel-motion key-bar mounted upon pivots extending parallel with said rock-shaft, means for enabling said key-bar to rock said shaft, and means for enabling said rock-shaft to release the carriage from the control of its letter-spacing devices.

30. In a type-writing machine, the combination of a carriage, a rack thereon, a lever for moving said rack to release the carriage, a rod connected at one end to said lever, a

rock-shaft, a crank-arm mounted on the rock-shaft and connected to the other end of said rod, and a key for actuating said rock-shaft.

31. In a type-writing machine, and in a tabulating mechanism, the combination of a carriage having tappets, a series of tabulating-blades on the frame, a bracket secured to the front of the machine, a series of depressible tabulating-keys guided in said bracket, and a carriage-release key arranged upon said bracket in front of said tabulating-keys.

32. In a type-writing and tabulating mechanism, the combination with a carriage having rollers 35 and open frames in which said rollers are journaled, of a pair of brackets 47, each provided with bifurcated hooks 51 which fit closely against said open frames, to prevent endwise movement of said brackets upon said carriage, said hooks being adapted to catch over a flange upon said carriage, means for drawing the hooks firmly against said flange, a transverse bar secured to the free ends of said brackets, and a series of tappets arranged upon the bar.

33. In a type-writing and tabulating mechanism, the combination with a carriage of a cylindrical bar flattened upon opposite sides and having teeth cut upon opposite round sides thereof, a tappet on said bar having a circular perforated portion 59, and slotted portions 58 on opposite sides thereof and communicating therewith, and stop mechanism engaging said tappet when in its normal position.

34. In a type-writing and tabulating mechanism, the combination with stop-projecting mechanism of independently-operable carriage-releasing mechanism and means for preventing the operation of the carriage-releasing mechanism until a stop has been projected.

35. In a type-writing machine, the combination with a carriage of a tabulating mechanism therefor, including a key which normally is incapable of releasing said carriage from the control of its escapement mechanism, said tabulating mechanism also including a series of denomination-keys, each of which is capable of projecting a denomination-stop and also of enabling the first-mentioned key to be subsequently operated to effect the release of said carriage, so that the projected stop may cause the carriage to be arrested after its release.

36. In a type-writing machine and in a tabulating mechanism, the combination of a carriage, a series of key-actuated denomination-stops, a series of column-stops for coacting therewith and predetermining the arresting position of said carriage, an independently-operable release-key mechanism controlling said series of column-stops, and means whereby the column-stops can be released only after the selected key-operated denomination-stop has been set or moved to operative position.

37. In a type-writing machine and in a tabulating mechanism, the combination of a carriage, a series of key-actuated denomination-stops, a series of column-stops adapted to co-operate therewith, and a release mechanism having an actuating-key at the type-writer keyboard adapted to be effective only after one of said denomination-stop keys has been actuated, and which when pressed upon and held releases both the carriage and the column-stops for a rapid movement, to position the carriage at the point predetermined by the selected denomination-stop.

38. In a type-writing machine, the combination with a carriage of a tabulating mechanism therefor, including a key which normally is incapable of being independently operated for releasing said carriage from the control of its escapement mechanism, said tabulating mechanism also including a series of denomination-keys and a device for enabling the first-mentioned key to be operated to effect the release of said carriage, said enabling device being common to all of said denomination-keys, whereby the first-mentioned key may be operated in conjunction with any of the denomination-keys to release the carriage so that it may be arrested at a point determined by the selected denomination-key.

39. In a type-writing machine and in a tabulating mechanism, a series of keys for controlling a series of denomination-stops, a carriage-releasing mechanism, and means for preventing actuation thereof until after one of the denomination-keys has been actuated.

40. In a type-writing machine, the combination of a carriage, a tabulating mechanism therefor having two keys one of which operates to release the carriage, and the other of which operates to project or move a carriage-stopping device, and means controlled by the stop-actuating key for retaining said carriage-release key in normal position until after the stop-actuating key has been actuated.

41. In a type-writing machine, the combination of a carriage, a normally locked release-key therefor, a system of independently-movable tabulating-stops, a tappet and a set of keys connected both to release said release-key and also to operate said system of tabulating-stops.

42. In a type-writing machine, the combination of a carriage, and a tabulating mechanism therefor having two keys, one of which operates to release the carriage and the other of which operates to project or move the carriage-stopping device, and means for preventing simultaneous operation of said keys.

43. In a type-writing machine, the combination with a carriage, of a tabulating mechanism therefor having a plurality of movable stops, a key connected to each of said stops, and a universal locking mechanism for retaining any operated key of said series in ab-

normal or operated position while said carriage is moving rapidly to the predetermined point.

44. In a type-writing machine, the combination of a carriage, and a tabulating mechanism therefor having two keys, one of which operates to release the carriage and the second of which operates to project or move the carriage-stopping device, and means for retaining said second key in its operated position while the said carriage-release key is moving from and returning to normal position.

45. In a type-writing machine and in a tabulating mechanism, a series of keys for controlling a series of denomination-stops, a carriage-releasing mechanism, means for preventing actuation thereof until after one of the denomination-keys has been actuated, and means for preventing the return of the denomination-key until after the return of the operated release-key.

46. In a type-writing machine, the combination of a carriage, a tappet, a coacting stop, a key for causing the relative movement of the tappet and the stop, means for releasing the carriage, and a lock for automatically preventing the return of said key to normal position during the operation of the carriage-releasing mechanism.

47. In a type-writing machine, the combination of a carriage, a system of tabulating-blades, a tappet, a series of keys for causing relative adjustment or positioning of said blades and tappet, carriage-releasing mechanism, and means common to all of said keys for automatically locking any operated key in its depressed position during the operation of the carriage-releasing mechanism.

48. In a type-writing machine, the combination of a carriage, a system of tabulating-blades, a tappet, a series of denomination-keys for operating said system, and a carriage-release key connected to automatically lock any of said keys in its operated position.

49. In a type-writing machine, the combination of a carriage, a system of tabulating-blades, a tappet, a series of denomination-keys for operating said system, and a release-key connected to automatically lock each of said keys in its operated position and on its return to normal position to automatically release said lock and denomination-key.

50. In a type-writing machine, the combination of a carriage, a tappet, a stop, a denomination-key for effecting the relative positioning of the tappet and the stop, a carriage-releasing key, a lock for holding said carriage-release key in its normal position, means controlled by the denomination-key for releasing said lock, and means for enabling said release-key when in its operated position to hold the denomination-key in its operated position.

51. In a type-writing machine, the combination of a carriage, a tappet, a stop, a denomination-key for effecting relative position-

ing of the stop and the tappet, a carriage-release key, a lock for holding said carriage-release key in its normal position, means controlled by the denomination-key for releasing said lock, and means for enabling said release-key when in its operated position to hold the tabulating-key in its operated position, said release-key being constructed upon the return thereof to normal position to automatically release said depressed denomination-key.

52. In a type-writing machine, the combination of a carriage, a system of tabulator-blades, a tappet, a series of denomination-keys for operating said system, a carriage-release key, a lock for holding said release-key in normal position, means operated by each of said denomination-keys to release said lock, and means for enabling said carriage-release key to hold each of said denomination-keys in its operated position, said denomination-key being constructed upon the return thereof to normal position to automatically release the operated denomination-key.

53. In a type-writing and tabulating mechanism, the combination of a carriage, a carriage-release key, a pivotally-mounted lock constructed to normally prevent movement of the key, an arm secured upon said lock, and a key for operating said arm.

54. In a type-writing and tabulating mechanism, the combination of a carriage, a carriage-release key, an upright arm pivotally mounted below the release-key, and constructed for engaging said key to prevent the operation thereof, a horizontal arm connected to said upright arm, and a key for operating said horizontal arm.

55. In a type-writing and tabulating mechanism, the combination of a denomination-key, a carriage, a carriage-release key, and a bell-crank, one arm whereof is constructed to normally prevent the operation of the release-key, and the other arm whereof is constructed to be operated by the denomination-key for the purpose of releasing the said release-key.

56. In a type-writing and tabulating mechanism, the combination of a carriage, a carriage-release key, a bell-crank comprising an upright arm constructed to normally prevent the operation of the release-key and a horizontal operating-arm, and a series of denomination-keys each provided with means for actuating said horizontal arm so as to release said release-key.

57. In a type-writing machine, the combination of a carriage, a system of tabulator-stops, a tappet, a series of denomination-keys arranged in line and connected to means for effecting relative positioning of the tabulator-stops and tappet, a release-key, a lock therefor, a pivoted universal arm or plate for releasing said lock, said universal arm being extended in a direction parallel with said denomination-keys, and means upon each denomination-key for actuating said universal arm.

58. In a type-writing machine, the combination of a carriage, a system of tabulator-blades, a tappet, a series of denomination-keys arranged in line transversely of the machine and provided with means for effecting relative adjustments of the tabulator-blades and tappet, a release-key bar arranged in front of said series of keys and extending parallel therewith, a lock pivoted below the release-key for normally preventing the operation of the same, said lock being provided with a universal arm or plate in rear of said pivot, and said universal arm extending in a direction parallel with said denomination-keys, and means upon each denomination-key for actuating said universal arm and lock.

59. In a type-writing and tabulating mechanism, the combination of a carriage, a carriage-release key, a lock therefor, a series of denomination-keys, and a release-bar for said lock as 126, said release-bar being common to all of said denomination-keys.

60. In a type-writing machine, the combination of a carriage, a stop, a tappet, key-actuated means for effecting relative positioning of the stop and tappet, a catch, means for enabling the key to engage the catch, carriage-releasing mechanism, and means for enabling said release mechanism to control the catch and prevent the return of the key to normal position during the operation of said release mechanism.

61. In a type-writing machine, the combination of a carriage, a system of tabulator-blades, a tappet, a series of finger-keys arranged in line and provided with means for effecting different relative positioning of the tabulator-blades and tappet, a universal catch, means for enabling any of said keys to engage the catch, carriage-releasing mechanism, and means for enabling the said carriage-release mechanism to control the catch and prevent the return of any key to normal position in advance of the return of the carriage-release mechanism to normal position.

62. In a type-writing machine, the combination of a carriage, a system of tabulator-blades, a tappet, a series of denomination-keys arranged in line and provided with means for effecting different relative adjustments of the tabulator-blades and tappet, a pivoted universal catch constructed to be engaged by each of said denomination-keys, said catch being provided with a detent-arm, and a carriage-release key constructed to engage said detent-arm to enable the catch to prevent the return of the said denomination-key to normal position.

63. In a type-writing machine, the combination of a carriage, a system of tabulator-blades, a tappet, a series of finger-keys arranged in line and provided with means for effecting different relative positioning of the tabulator-blades and tappet, a horizontally-arranged pivoted universal catch for engaging each of said finger-keys, said catch being provided with an upright arm, and a carriage-release key constructed to coact with said upright arm to enable the catch to prevent the return of the said finger-key to normal position.

64. In a type-writing machine, the combination of a carriage, a system of tabulating-blades, a tappet, a series of rearwardly-extending horizontal rock-shafts provided with means for effecting different relative positioning of the blades and the tappet, a crank-arm secured to the forward end of each rock-shaft, a vertical key-bearing stem pivotally secured to each crank-arm, a carriage-release key arranged in proximity to said series of keys, a pivoted arm arranged beneath said release-key to prevent the downward movement thereof, said arm being provided with a horizontal plate, and means upon each key-stem for engaging the plate to rock the arm and release the release-key.

65. In a type-writing machine, the combination of a series of key-bearing stems arranged in line, a horizontal bar arranged parallel with said series, a pivoted vertical arm as 133 arranged beneath the horizontal bar, to prevent the depression thereof, a horizontal plate secured to said arm and folded so as to form a channel along the edge thereof parallel and in proximity to said series of key-bearing stems, and a lateral projection upon each of said stems for entering said channel and actuating the plate.

66. In a type-writing machine, the combination of a series of key-bearing stems arranged in line, a horizontal bar arranged parallel with said series, a pivoted vertical arm as 133 arranged beneath the horizontal bar, to prevent the depression thereof, a horizontal plate secured to said arm and folded so as to form a channel along the edge thereof parallel and in proximity to said series of key-bearing stems, and a lateral projection upon each of said stems for entering said channel and actuating the plate, said horizontal bar when depressed being constructed to act as a stop to prevent the return to initial position of said vertical arm, plate and key-bearing stem.

67. In a type-writing machine, the combination of a power-driven carriage, a tappet, a series of movable tabulator-blades for coaction with said tappet to arrest said carriage at different distances from a predetermined point, a series of denomination-keys operatively connected with said blades, but not releasing said carriage, carriage-release mechanism, and a lock for said carriage-releasing mechanism, said lock being operatively connected with the said denomination-keys.

68. In a type-writing machine, the combination of a power-driven carriage, a tappet, a series of movable tabulator-blades for coaction with said tappet to arrest said carriage at different distances from a predetermined point, a series of denomination-keys operatively connected with said blades, but not releasing said carriage, carriage-release mechanism,

anism, and a lock for preventing disengagement of said blade and said tappet before the return to normal position of the carriage-releasing mechanism.

5 69. In a type-writing machine, the combination of a power-driven carriage, a tappet, a series of independently-movable denomination-stops for coaction with said tappet to arrest said carriage at different distances from
10 a predetermined point, a series of denomination-keys operatively connected with said stops, carriage-release mechanism independent of said stop-controlling devices, and a locking mechanism for preventing simultaneous
15 motion of any of said denomination-keys and said carriage-release mechanism.

70. In a type-writing machine, the combination of a power-driven carriage, a tappet connected to and moving with said carriage,
20 a series of independently-movable tabulator-blades mounted upon the machine-frame for coaction with said tappet to arrest said carriage at different distances from a predetermined point, a series of denomination-keys
25 operatively connected with said blades, key-actuated carriage-release mechanism, and a lock for said carriage-release key, said lock being operatively connected with said denomination-keys.

30 71. In a type-writing machine, the combination of a power-driven carriage, a tappet connected to and moving with said carriage, a key-operated blade or stop normally out of and movable into the path of said tappet,

key-actuated carriage-release mechanism, 35 and a lock for preventing disengagement of said blade and said tappet until after the release of the carriage-releasing mechanism.

72. In a type-writing machine, the combination of a power-driven carriage, a tappet 40 connected to and moving with said carriage, a series of movable tabulator-blades for coaction with said tappet to arrest said carriage at different distances from a predetermined point, a series of denomination-keys operatively 45 connected with said blades, key-actuated carriage-release mechanism, and locking mechanism for preventing simultaneous motion of said releasing-key and said denomination-keys. 50

73. In a type-writing machine and in a tabulating mechanism, the combination of a carriage having a tappet, and a coacting stop on the framework, a key connected to said stop, and a carriage-releasing mechanism, including 55 a key arranged in proximity to said controlling-key, whereby with one finger the stop may be set and with another the carriage may be released.

Signed in the borough of Manhattan, city of 60 New York, in the county of New York and State of New York, this 16th day of December, 1899.

JACOB FELBEL.

Witnesses:

E. M. WELLS,

B. C. STICKNEY.