

No. 647,055.

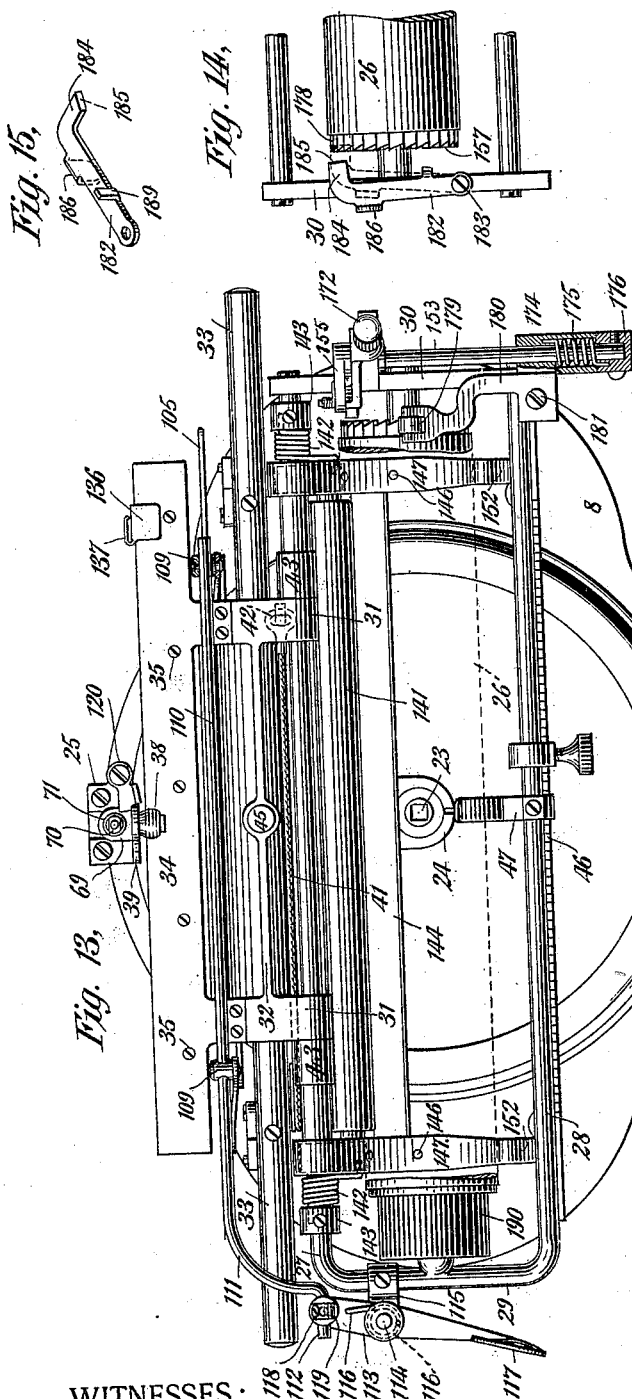
Patented Apr. 10, 1900.

C. D. WALLACE.
TYPE WRITING MACHINE.

(Application filed June 15, 1895.)

(No Model.)

5 Sheets—Sheet 3.



WITNESSES :

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Casper D. Wallace
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Fig. 18,

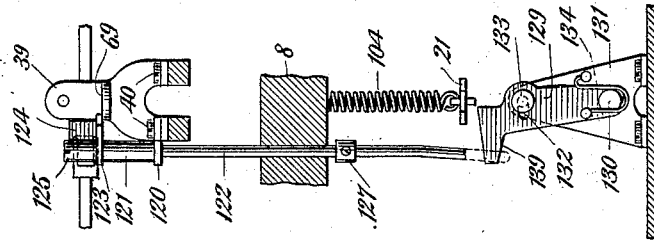


Fig. 17,

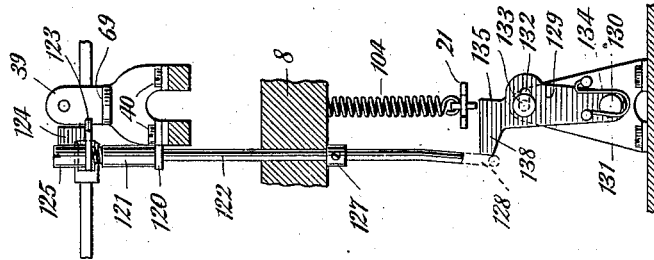


Fig. 16,

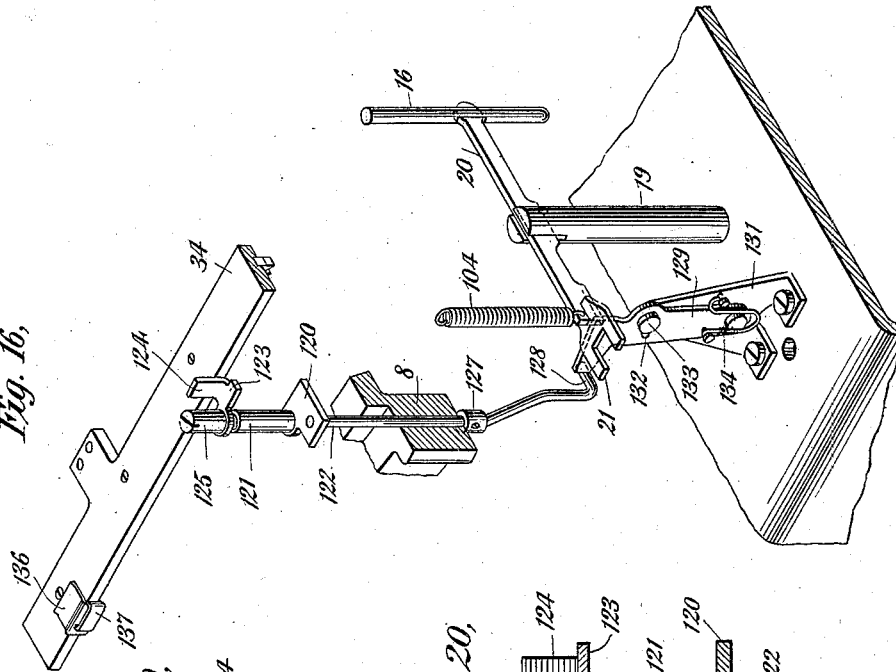


Fig. 19,

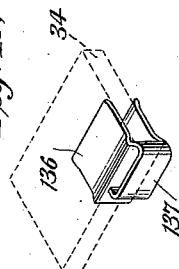
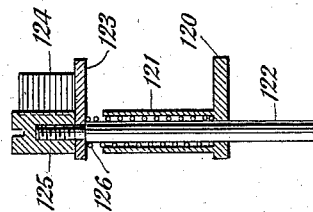


Fig. 20,



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5 Sheets—Sheet 5.

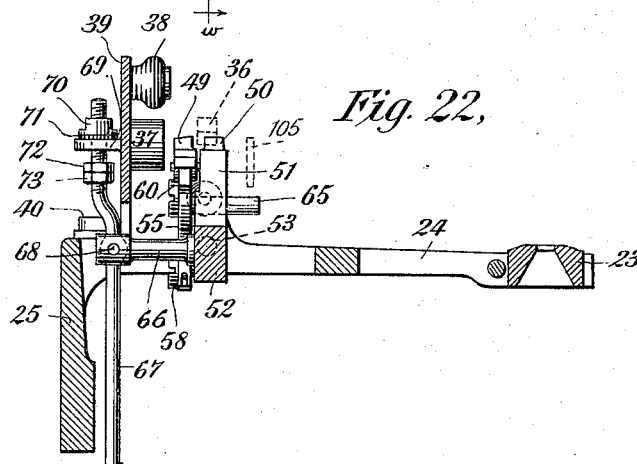
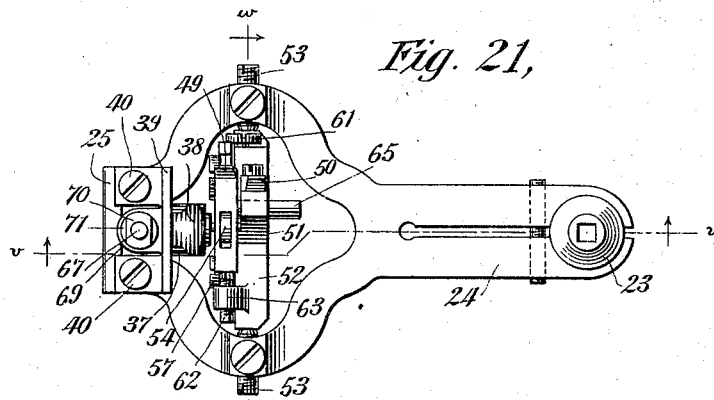
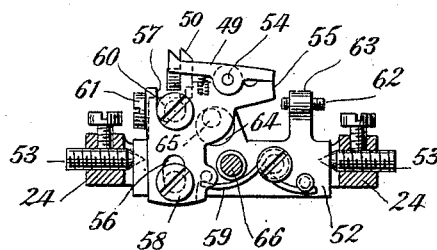


Fig. 23.



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UNITED STATES PATENT OFFICE.

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

TYPE-WRITING MACHINE.

SPECIFICATION forming part of Letters Patent No. 647,055, dated April 10, 1900.

Application filed June 15, 1895. Serial No. 552,893. (No model.)

To all whom it may concern:

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

My improvements in type-writing machines relate to line spacing and regulating mechanism, to paper-carriage-releasing mechanism, to means for locking the platen for the purpose of adjusting the paper, to paper-feeding mechanism, to means for locking the line or the printing and feeding mechanisms and for unlocking the same for the printing of additional characters, to means for preventing undue movements of the dogs in rapid writing, to means for picking up the dogs at any desired point in the stroke of the type-bars and keys, and to the space-key mechanism.

My improvements consist in the various features of construction and combinations of devices hereinafter more fully described, and particularly pointed out in the appended claims.

In the accompanying drawings, Figure 1 is a central longitudinal vertical section of a type-writing machine embodying my improvements. Fig. 2 is an enlarged detail perspective view of one end of the paper-feeding mechanism. Fig. 3 is a vertical section taken at the line *z z* of Fig. 1 and looking in the direction of the arrows thereat. Fig. 4 is a perspective detail view of the space-key guide and guard. Fig. 5 is a rear elevation of the machine, partly in section and partly broken away, to show the means for actuating the dogs and for locking said means, the section being taken at the line *x x* of Fig. 1. Fig. 6 is an enlarged sectional view of the divided connecting-rod which actuates the dogs and of the means for regulating the length thereof and for controlling the picking-up or initial movement of the dogs by the printing mechanism. Fig. 7 is a dissected perspective view, enlarged, showing portions of the line spacing and regulating devices. Fig. 8 is a vertical section taken at the line *y y* of Fig. 7. Figs. 9, 10, and 11 are end views of the line spacing and regulating devices at different positions.

Fig. 12 is a view similar to Fig. 11, but showing the driving-pawl at the end of its spacing movement. Fig. 13 is a top plan view of the machine, omitting the keyboard and showing the platen partly broken away and partly in skeleton. Fig. 14 is a bottom plan view of the platen carrier or carriage to show the platen-locking device, which is shown also in end view at Figs. 11 and 12. Fig. 15 is a perspective view of the platen-locking device. Fig. 16 is a skeleton perspective view of the line-locking mechanism. Fig. 17 is a rear elevation of the same in the locking position. Fig. 18 is a like view showing the mode of unlocking the mechanism. Fig. 19 is a perspective view of the adjustable slide or actuator of the line-locking mechanism and a section of the rack-bar support therefor. Fig. 20 is an enlarged vertical section to show the construction at the upper end of the line-locking rod or stem. Figs. 21, 22, and 23 are views of the escapement-dogs and their connected parts, Fig. 23 being a section on the line *w w* and Fig. 22 on the line *v v* of Fig. 21.

In the various views the same parts will be found designated by the same numerals of reference.

The machine illustrated is that known as the "Yost" type-writer and to which I have applied my improvements in practice. Some of them, however, may be used with equal advantage in machines of other construction, form, or design, and hence I do not wish to be limited to their employment in a machine of the description illustrated.

Before describing my improvements in detail I shall first describe generally the construction of the machine to which they are shown as applied.

Beneath the bed-plate 1 are arranged key-levers 2, which are of the first order, having each a depending fulcrum-pin 3 and each a stem-key 4 at its outer end. The inner end of the lever is connected to a vertically-arranged thrust-rod 5, which at its upper end is connected to a lever 6, pivoted at 7 in the top plate 8. A type-bar 9 is pivoted at 10 to the lower inner end of the lever 6 and is also pivoted at 11 to the lower outer end of a link 12, which is fulcrumed at 13 on a central circular stand or support.

Each thrust or connecting rod 5 is provided between its ends with a finger or projection 14. The connecting-rods are vertically arranged in circular form, and the fingers or projections 14 all radiate from the center of the circle. Upon these radiating fingers rests a circular universal bar or ring 15, having a hub or depression at its center in which rests the lower end of a vertical spindle 16, which is guided in the bracket 17.

Pivoted at 18 on a post 19 is a horizontal lever 20, connected at its inner end to the spindle 16 and formed or provided at its outer end with a fork 21, which is connected by means and in a manner hereinafter explained to the escapement-dogs. The types rest normally against a circular inking-pad 22, and when a key-stem is depressed through the connections described the type passes from the pad to the paper on the platen, passing first through a center guide 23 at the forward end of an arm or bracket 24, having a downwardly-extending member 25 integral therewith and attached to the top plate 8.

The platen 26 is mounted rotatively in a frame or carrier consisting of the back bar 27, the front bar 28, the left-hand side bar 29, and the right-hand side bar 30.

The back bar 27 passes through eyes 31, projecting forwardly from a slide or carriage 32, which is mounted to embrace and travel upon the fixed guide-rod 33. The said eyes form the bearings and the said bar 27 the pivot or pintle of a hinge-joint, whereby the platen-carrier may be turned or swung up for inspection or correction of the work, &c.

To the slide or carriage 32, at its rear side, is attached a bar or plate 34, on the under side of which is attached by screws 35 a feed-rack 36. The rearmost edge of the bar or plate 34 passes between a stud or roller 37 and a roller 38, both mounted in a small bracket 39, attached by screws 40 to the bracket 24. The carriage is propelled by the usual spring-driven drum, (not shown,) to which one end of a cord or chain 41 is attached, the other end being attached, as at 42, to the carriage or slide 32, which is held in fixed position relatively to the platen-carrier by collars 43 on the bar 27.

Hinged upon the back bar 27 is a paper-table 44, which strikes upon a rubber button 45 on the slide 32 when the platen-carrier is turned up for exposure of the work. The front side of the platen-carrier is provided with a roller, which travels upon a track or way 46, which roller is mounted in a fixed bracket 47, arranged centrally of the front bar 28 and provided with a curved paper-guide 48 and a pointer for use in connection with the usual scale on the front of the track or way.

The feed-rack 36 is engaged by the escapement-dogs 49 and 50, the former being the loose or feeding dog and the latter the rigid or detaining dog. The detaining-dog is attached to an arm 51, formed integral with a

rock-bar 52, supported at its ends in the bracket 24 by conically-pointed screws 53. The feeding-dog is pivoted at 54 upon a plate 55 and is provided underneath with a small coiled spring, whereby the dog may vibrate or bob in and out of the teeth of the feed-rack during the retraction of the carriage without moving the plate 55. This plate is slotted vertically at 56 and 57. A screw 58 passes through the slot 56 and serves as a pivot for said plate, which is provided with a spring 59, attached at one end to a screw in the rocking bar or trunnion and bearing at its free end on the lower side of the plate. A screw 60 passes through the upper slot 57 and engages with the said rocker-arm. The said slots in the plate enable the latter to be moved vertically up and down, and in such movements the plate is guided by the heads and bodies of the screws. The pivotal movement of the plate about the lower screw 58 is limited toward the left (considered from the back of the machine) by a screw-head 61 at the lower end of the arm 51, extending up from the rocker-bar, the screw-head being adjustable, whereby the throw or vibration in this direction may be easily regulated. The pivotal movement of the plate toward the right (considered from the back of the machine) is limited and controlled by the point of a screw 62, arranged horizontally in a lug 63, rising from the rocker-bar. The spring 59 serves not only to vibrate the plate toward the left against the screw-head 61 during the spacing movement, but also to return the plate and the dog thereupon after the plate has been depressed and the force applied for that purpose has been released.

Projecting horizontally forward and through an opening 64 in the upright arm of the rocker-bar 52 is a pin 65, adapted to be acted upon to cause the depression of the plate by the release-key mechanism, to be presently described. This construction generally or in the main is the invention of G. B. Webb and is set forth in his application filed March 27, 1894, Serial No. 505,284.

The following description will relate more particularly to the various improvements made by me.

Projecting horizontally rearwardly from the rocker-bar or trunnion is an arm 66, which is bifurcated at its free end to receive the upper portion of a rod 67, which is fastened thereto by a pin 68. The uppermost end of said rod is screw-threaded and passes through an opening in an ear 69 on the back of the small bracket 39. On the rod above said ear is a nut 70, faced with a leather washer 71, and on the rod below said ear is another nut 72, which may be backed by a set-nut 73. The rod 67 has a forward bend at its lower portion to pass in through an opening in the back shield-plate 74, and the lowermost end of said rod is screw-threaded, as shown at 75. Upon this threaded end of the rod is an elongated nut 76, having a flange 77, faced with

a leather washer 78. A lock-nut 79 is adapted to hold the device 76 at any point to which it may be adjusted. Below the rod 67 and in line therewith is another shorter rod 80, which bears at its lowermost end against a spring 81 and which is threaded at its upper end, as at 82. A turnbuckle or threaded coupling 83 serves to connect together the two rods 67 and 80 and in an adjustable manner. At the lower end of the rod 80 is an eye 84 to receive the rear end of a lever 85, which is pivoted at 86 upon a long space-key lever 87 and bears or is fulcrumed at its forward end upon a depending slotted pin 88. The adjustment of the space-key mechanism is effected by the turnbuckle, which pulls up or lets down only the lower section of the divided rod.

The space-key lever 87, which lies centrally of the machine, is pivoted at 89 in lugs attached to the back flange of the bed-plate and is there provided with a return-spring 90. At the forward end of the space-key lever is provided an upright stud 91, which bears at its upper end a cushion 92, of felt or other suitable material, which strikes against the under side of the base-plate and arrests the return movement of the space-key lever in a noiseless manner.

Riveted on the sides of the front extremity of the space-key lever are two L-shaped parallel bars or plates 93, which at their upper ends branch outwardly, as at 94, Fig. 3, and are connected to the space key or head 95. At the junction of the horizontal and vertical portions of the L-shaped bars is riveted a downwardly-projecting piece 96, which slides and is guided in a slot 97 at the lower end of a guide-piece 98, having lateral arms 99, by which it is attached by screws 100 to the front flange of the base-plate. The upper portions of the parallel bars 93 pass through and are guided by a slot 101 at the upper end of the guide-piece. By this means the forward end of the space-key lever is prevented from swinging sidewise and from being bent or distorted out of operative condition and is also prevented from being moved laterally to a position where it would interfere with the operation of the adjacent key-levers.

For the purpose of limiting the downward movement of the space-key and its lever two pins or posts 102 are screwed into the top of the base-plate and are provided at their upper ends with felt or other suitable cushions 103, against which the said space-key strikes. These cushions 103 serve to lessen the noise when the space-key is stopped and at the same time afford a soft or yielding resistance to the finger. When the space-key is depressed, the lever 85 is carried down therewith and in turn pulls down the divided or sectional connecting-rod 67 80 the required distance to vibrate the feed-dog 49 out of the rack and the detaining-dog into the rack, the said rod acting first upon the rocker-arm 66 and the rocker-bar 52, whereby the paper-carriage may be spaced the distance of one tooth or

letter when the space-key is released. The main object of combining the lever 85 with the space-key lever is to obtain the requisite amount of motion to effect the desired movements of the dogs, which motion, in view of the position of the divided connecting-rod relatively to the space-key-lever pivot, could not be obtained directly from said lever.

The fork 21 of the universal lever embraces the shank of the elongated nut 76, which serves as a contact for said lever and by means of which the dogs may be actuated when the rear end of the lever is depressed by the movement of a character-key. By the employment of the device 76, which is vertically adjustable, as explained, the dogs may be picked up or actuated at any desired time in the downstroke of the finger-key and in the printing-stroke of the type-bar. By referring to Fig. 1 it will be observed that the fork 21 stands some distance above the contacting-point of the device 76, and hence it will be seen that the lever 20 and the parts connected thereto—that is to say, the universal bar, the connecting-rod, the type-bar, and the finger-key—will move some distance or have some lost motion before the dogs are picked up or actuated, which is desirable, and by adjusting the contact or projection 76 this lost motion may easily be varied, if desired. When the fork strikes the leather-faced flange, the divided connecting-rod is pushed down, the dog holder or bar rocked, the feed-dog swung rearwardly out of the rack, and the detaining-dog swung into the rack. When the finger-key is released, the spring 81 returns the rod and the dogs to their normal positions, but the feeding-dog enters the next notch or tooth in the rack and the feed of the carriage a letter-space distance occurs. The universal lever is preferably provided with a separate return-spring 104. The return movement of the divided rod is limited by the striking of the nut 72 against the ear 69.

The leather-faced nut 70 is so adjusted that in the down or printing movement of the divided rod it strikes the upper side of the ear only when the keys are worked at high speed, and when said nut strikes said ear or stop the rearward vibration of the dogs is arrested. In rapid writing heretofore the inertia of the parts would carry the feeding-dog rearwardly too far, which seriously interfered with the desired rapid writing and the quality of the work, for the farther back the dog moved the more time it required to return, and thus the manipulation of the keys and the speed of the machine were interfered with. By providing the nut 70 on the connecting-rod to act on the fixed stop 69 means are supplied for preventing the dog from moving unduly through the rack-bar by inertia, and thereby retarding the speed of the machine.

The connecting-rod from the universal lever and from the space-key lever of course need not be divided or made in two parts unless it

be desired to provide for fine and perfect adjustment, which may be accomplished with the aid of the turnbuckle, and so far as some of my improvements are concerned this dog-actuating rod may be made in one piece.

I shall now describe the release-key mechanism. Overhanging the pin 65 is a long thin release-bar 105, which is pivotally connected at 106 to the free horizontal ends of the two bell-cranks 107, pivoted at 108 on the back of the slide or carriage 32. To the opposite vertical ends of the bell-cranks are loosely or pivotally attached supports or bearings 109, in transverse holes in which is secured by screws a long slender rod 110, which is arranged directly over the release-bar and which has a forward bend at 111 at its left-hand end to bring one end of said rod in line or coincident with the hinge line or axis of vibration of the platen-carriage. At this locality the rod 110 is bent laterally to provide a horizontal pivot 112 for the release-key lever 113, which is pivoted vertically at 114 to a bracket 115, attached to the left-hand bar 29 of the platen-carriage. A spring 116 surrounds the pivot 114 and is connected thereto at one end and at the other end to said lever, which at its outer end is bent upwardly or shaped to form a finger-piece 117. The rear end of the release-key lever is provided with a small vertically pivoted or swiveled stand or boss 118, which is bifurcated and through holes in the forks or members of which passes the pivot 112. Between the forks and firmly secured upon said pivot is a collar 119, against which the forks bear and by means of which the rod 111 may be moved longitudinally. When the finger end of the release-key is pressed toward the end bar 29, the opposite end is swung outwardly and carries with it the rod 111, which in turn acts to vibrate the bell-cranks and cause the release-bar 105 to descend upon and press down the pin 65, which being connected to the plate that carries the feeding-dog operates to move the latter down out of engagement with the feed-rack, thus releasing the carriage from the escapement mechanism and enabling the driving-spring to run the carriage rapidly toward the left and the operator to push or pull the carriage toward the right while the hand is on the release-key. When the latter is released, its spring 116 operates to return the release-key mechanism to its normal condition, and during this action the spring 59 operates to return the feeding-dog into engagement with the rack.

One great advantage in pivoting the release-key to the rod 110 at the hinge-line of the platen-carrier is that the carriage may be released while the platen-carrier is down in working position, or is in the upright dotted-line position shown at Fig. 1, or is at any intermediate position, thus greatly facilitating the work of the operator. The release-key mechanism may, however, be used with differently constructed and operating dogs.

I shall now describe the line-locking mech-

anism. A small plate or bracket 120 is screwed upon the arm or bracket 39, which plate is provided with an upright tubular portion 121, through which passes a rod 122, that passes also through bearings in the top plate 8. The said rod is threaded and shouldered at its upper end; and upon said shoulder rests a crank-arm 123, having an upwardly-projecting contact portion 124, said arm being held firmly in position upon said rod by a nut 125. Within the tube 121 and surrounding the rod 122 is a coiled spring 126, the upper end of which bears against the under side of the crank-arm and serves to return said arm and its rod after depression. A collar 127 on said rod strikes against the top plate and limits the upward movement of said rod. The lower end of said rod is bent forwardly and is formed or provided with a crank-arm 128, which stands normally against the side of a plate or arm 129, pivoted at 130 in a stand 131, secured to the bed-plate. Between its ends the plate or arm is slotted at 132, and through this slot passes a screw or pin 133 for limiting the vibrations of the plate toward the right by the crank-pin 128 and toward the left by a spring 134, attached at one end to the plate and at the other end to the bracket. The plate lies under the universal lever 20, and when said plate is moved toward the right (viewed from the back of the machine) the upper end of the plate offers an obstruction to the downward movement of said universal lever and prevents the type-bar from printing and the feeding-dog from leaving the rack. The right-hand side of the upper end of the vibratory plate is cut away or notched, as at 135, and when this portion of the plate registers with the universal lever (which is the normal condition of the parts) the latter may be depressed to its full extent and the printing and feeding mechanisms actuated. The vibratory locking-plate 129 is moved automatically to its locking position (shown at Fig. 17) by the partial rotation of the rocking rod 122, which is effected by a contact-piece or operator 136, mounted adjustably upon the rack-bar plate 34. This contact-piece consists, preferably, of a U-shaped piece of sheet metal whose jaws are adapted to be sprung on the rear side or edge of the rack-bar plate to grip the same with sufficient force to rock the rod 122 without disturbance of its position on said plate. The said contact-piece is preferably formed with an integral strip 137, which is bent back onto the rear side of the device and is curved or rounded at its forward contacting end.

In operation when the forward end of the contact-piece strikes against the contact portion 124 of the crank-arm the rod 122 is turned slightly in its bearings and the arm 128 swung around and toward the right to force the upper end of the locking-plate 129 in the same direction, thereby causing its uppermost end to come into the path of depression of the universal lever and effecting the locking or

stoppage of the printing and feeding mechanisms.

If it should be desired to add one or more letters to the line, this may be accomplished by pressing down upon the nut 125 with the fingers, and thereby forcing down the rod 122 to a position such that the arm 128 passes below the laterally-projecting contact portion 138 of the locking-plate, whereupon the spring 134 operates to throw said plate toward the left, as illustrated at Fig. 18. While the rod is thus held down another letter may be struck and a feed of the carriage obtained. As soon as the pressure is released the spring 126 returns the rod to its normal position, and in the upward movement of the rod the arm 128 rides against the inclined or cam face 139 of the locking-plate and vibrates the latter toward the right to the position shown at Fig. 17, thus locking the line again. If it should be desired to add another letter, the rod may be depressed as before. If desired, however, two or three letters may be added to the line while the rod is held down. The machine illustrated is constructed to permit the addition of three letters to the line, after which the contact-piece 136 strikes against the bracket 39 and stops the letter-feed of the carriage. The contact-piece is not, however, adapted to act as a carriage-stop in the forward rapid movements of the carriage when the release-key mechanism is actuated, as the frictional grip of the contact-piece is insufficient to resist the power of the carriage-driving spring when thus released. If the contact device be set to lock the line or key-levers before the end of the full carriage travel and the operator should release the carriage for rapid advancement for a full-line travel, the contact-piece upon striking the bracket 39 would be arrested, and during the remainder of the travel of the carriage the rack-bar plate would slide therethrough. Of course the contact-piece may be fitted to be adjusted on a series of teeth or notches or holes, as common in prior machines, so that it may serve also as a positive check to the carriage advancement at all times; but I prefer a construction in which the contact-piece is so mounted as that when arrested it may permit the continued movement of the carriage under the unrestrained movement of the driving-spring, as thereby the arresting-bracket 39 is relieved of shock or strain.

The plate 34 may be graduated on top or on its rear edge to facilitate the adjustment of the contact-piece at any point in the travel of the carriage; but this is not necessary, as the adjustment may be readily effected by running the carriage to the desired point on the front scale and then sliding the contact-piece forward until the crank-arm 123 is vibrated. Thereafter the lines will all be locked at the same point until a new adjustment is effected. The contact-piece may of course be of other shape, design, or construction.

I shall now describe the paper-feeding mechanism.

Pivotaly hung upon the back bar 27 of the platen-carrier is an arm, bracket, or hanger 140, to the lower forward end of which is journaled one end of a feed or pressure roller 141, the opposite end of which is journaled in a like arm, bracket, or hanger, also pivoted upon said back bar. Since the construction at each end is the same, a description of one will suffice for both. The hanger 140 is provided with a spring 142, which is coiled about the back bar and connected at one end to the hanger and at the other end to a collar 143, fast on the back bar. The tension of this spring serves to keep the feed-roller pressed normally in contact with the platen.

144 designates a paper holder, blade, or bar which extends practically the whole length of the platen and which at each end is retained in a loop or pocket 145, preferably riveted, as at 146, to a sheet-metal support 147, which is curved intermediate its ends to conform substantially to the curvature of the platen. The rear upper part of the said support has a downward bend 148, forming thereby a substantially U-shaped portion, the legs of which embrace the front and rear sides of the hanger. The downwardly-bent portion or leg 148 is formed with a slot 149, through which enters a screw 150, whose shank passes into a threaded hole in the rear side of the hanger, whereby the device as a whole is mounted adjustably upon said hanger. The leg 148 lies squarely in contact with the rear side of the hanger; but the leg 151 preferably stands a slight distance away from the front side of the hanger. The forward portion of the hanger may be provided with an outwardly-bent extension 152, if desired.

The support 147 is preferably made of springy sheet metal and is so mounted that the blade has a normal spring-pressure against the platen. As will be seen, this support also serves the purpose of a guide for directing the paper around the front of the platen.

One object of the present construction is to mount the feed-roller and the paper-blade in such a manner as that each may have a motion independent of the other. Heretofore the paper-blade (which is in many instances also the platen-scale) was generally so connected to the feed-roller as that the two moved together on the same vibratory hanger or support, and owing to this arrangement the paper-blade, being farther from the pivot of the hanger or support, would move a greater distance away from the platen than the feed-roller when the paper was introduced between the feed-roller and the platen, and hence the paper-blade would fail to hold or press the paper against the platen if several thicknesses of paper were used. In the present construction the movement of the feed-roller away from the platen upon the introduction of the paper has no effect whatsoever

upon the paper-blade, and vice versa. When the paper enters the bite of the feed-roller and the platen, the hangers vibrate rearwardly slightly and the feed-roller moves away from the platen, but not so the blade. When the paper enters the bite of the blade and the platen, the blade then moves away independently; but both of these devices exert a pressure against the paper. When at the end of the page the paper leaves the bite of the feed-roller and the platen, the feed-roller and the hangers will vibrate back and cause the roller to contact with the platen; but this action does not affect in any wise the paper-blade, which still holds the paper to the platen, thereby enabling the writing to be continued practically to the bottom edge of the sheet. When the paper leaves the bite of the blade and the platen, the blade then springs back into contact with the surface of the platen. Thus it will be seen that the paper-blade acts to hold the paper to or against the platen after the paper leaves the feed-roller (both being on the same side of the printing-point) and that where several sheets or thicknesses are used the blade cannot go farther away from the platen than the feed-roller, and hence must always contact with the paper when the paper is between the feed-roller and the platen, thereby holding or supporting the paper against or in proper relationship to the platen in the vicinity of the impression-point and enabling the best printing results to be produced. Various changes in details of construction may be made without departing from the gist of this part of my invention, and I therefore do not wish to be limited altogether to the mounting of the paper-blade on springs, which are also paper-guides, nor to the precise mode of mounting shown and described, as the paper-blade may be otherwise supported and pressed.

I shall now describe the line spacing and regulating mechanisms.

153 is a rock-shaft having at its forward end a handle 154 and at its rear end a crank-arm 155. Pivoted at the free inwardly-projecting end of the crank-arm is a driving-pawl 156, the operative end of which depends to engage with the radially-cut ratchet-teeth of the wheel 157, fastened at the right-hand end of the platen. The pivot 158 of the pawl is passed through a bearing in the crank-arm and is elongated to receive a coiled spring 159, one end of which is attached thereto and the other end to the crank-arm. This spring tends to throw the lower operative end of the pawl into engagement with the radial teeth of the ratchet-wheel. The upper end of the driving-pawl is formed with a slanting part 160 on its right-hand side or edge, and this portion of the pawl is adapted to contact normally with the inclined face 161 of the adjustable line-space regulator 162, which is in plate-like form, and at its lower end is provided with a forwardly-extending tubular portion 163, which passes through a hole at

164 in an arm or bracket 165, preferably formed integral with the right-hand side bar 30 of the platen-carrier. The line-space-regulator plate is also formed or provided above said tubular portion with an arc-shaped slot 166, which embraces a pin 167, projecting rearwardly from the arm 165; and the said line-space regulator is formed at its upper end with a forwardly-projecting offset 168 to provide a housing or bearing for a catch device, consisting of a detent 169, a stem 170, a surrounding spring 171, and a milled cap or finger-piece 172, screwed onto the upper end of the stem. The detent 169 is adapted to engage with either one of three notches 173, formed at the upper end of the arm 165, whereby the line-space regulator may be held in any one of three positions for the purpose of determining the extent of revolution of the platen, as will be presently more fully explained. These notches may be numbered 1, 2, and 3, as shown, so as to indicate to the operator that when the detent is in notch No. 1 the platen will be rotated the distance of one notch or tooth of its ratchet-wheel, when in notch No. 2 the distance of two teeth, and when in notch No. 3 the distance of three teeth.

The rock or crank shaft 153 is supported at its forward end in a tubular bearing 174, formed with the end bar 30, and at its rear end in the tubular boss 163 of the line-space regulator. A coil-spring 175 surrounds the forward end of the rock-shaft in the forward bearing 174 and is connected thereto at one end and at the other end to the hub 176 of the handle 154, which is secured to the rock-shaft by a set-screw. This spring has a constant tension or tendency to turn the rock-shaft in the direction of travel of the hands of a clock or to swing the handle 154 inwardly toward the center of the machine and the crank-arm 155 in the reverse direction, or outwardly.

By referring to Fig. 9 the mechanism is shown in its normal position in full lines and the regulator is set for effecting single-line spacing of the platen or, in other words, for moving the platen the distance of one notch or tooth of its ratchet-wheel. When the handle is swung to the dotted-line position of said figure, the crank-arm and driving-pawl are thrown inwardly, and the latter passes into engagement with a tooth on the ratchet-wheel, as illustrated by the dotted lines. When this engagement has been effected, the handle is moved farther toward the right, and in this additional movement the platen is turned one notch or line-space. This turning movement is regulated or determined by a fixed pin 177, projecting inwardly from the end bar 30, against the beveled face of which the back of the driving-pawl comes to a stop or bearing. In other words, at the completion of the spacing movement the lower wedge-shaped end or toe of the pawl is jammed or wedged between the

ratchet-wheel and the said projection, and thus the turning of the platen is arrested or checked. When the handle is released, the spring 175 operates to rock the shaft in the reverse direction, during which the crank-arm rises and the inclined or cam back 160 of the pawl strikes against the inclined face 161 of the line-space regulator and the pawl is independently vibrated or rocked about its own pivot until the said inclined back 160 comes to a full bearing or seat against the inclined face 161. During this return movement the uppermost end of the pawl strikes first against the upper end of the face portion 161, which being stationary and operating as an abutment then acts to turn the pawl about its own pivot during the remainder of the rocking of the shaft and causes its toe or operative end to part company with the ratchet-wheel, thus leaving the platen free to be rotated by hand in forward or in backward direction, as may be desired. At Fig. 10 the detent is in the second notch and the mechanism is adjusted for double-line spacing, while at Fig. 11 the detent is shown in the third notch and the mechanism so set as that the platen may be turned the distance of three line-spaces or three teeth of the ratchet-wheel. In all three positions it will be observed that the point or toe of the driving-pawl is engaged with the ratchet-wheel in substantially the same time relatively to the throw of the handle—that is to say, when the handle is swung in a given length of arc in each instance the pawl will engage the ratchet-wheel, as illustrated by dotted lines, Figs. 9, 10, and 11. This capacity of the pawl to engage in practically the same time, whether for one, two, or three spaces, and in substantially the same handle movement is of advantage to the operator, since the resistance of the platen to rotation is always felt at about the same time, whatever the number of spaces to which it is to be moved. Of course after such engagement of the pawl the handle must be vibrated farther to the right for two line-spaces than for one space and farther for three line-spaces than for two.

As will be observed, the handle stands in different positions when the detent is in the different notches, the rock-shaft, with its crank-arm and handle, turning with the regulator as the latter is moved from space to space. When the detent is moved from notch 3 toward notch 1, the handle swings outwardly, and when the detent is moved from notch 1 toward notch 3 the handle is swung in the opposite direction, the crank-arm, however, always following the direction of movement of the regulator, which, as will be understood, is limited in its vibrations by the pin and slot.

On the periphery of the ratchet-wheel is cut a series of depressions 178, parallel with the axis of the platen and equal in number to the ratchet-teeth or depressions at the end of the ratchet-wheel with which the pawl engages. The depressions 178 are preferably

concave or rounded to match a section of the small roller 179, which is mounted on a pivot in the free forked end of a plate-spring 180, attached by a screw 181 to a lug formed integral with the end bar 30. This spring-pressed roller serves to hold the platen normally against accidental rotation, but permits it to be freely rotated by force in either direction.

I shall now describe the platen-locking device. This contrivance is made in the form of an arm 182, which is pivoted at one end at 183 on the under side of the end bar 30 and provided at its opposite end with a laterally-projecting portion 184, the extremity of which is beveled, as at 185. Between the ends of the arm is a depending finger-piece 186, by which the arm may be conveniently pushed toward the platen and the beveled end moved into engagement with the ratchet-teeth on the end of the platen, the same teeth with which the pawl engages. These teeth are eutradially of the center of the ratchet-wheel and are also cut with a bevel, as shown at 187. When the projection 184 is pushed into engagement with said teeth, it occupies the position shown at Fig. 11, the beveled end of the projection matching the beveled face of a tooth and the ledge-like portion of a tooth underneath bearing against the under side of the said dog or projection. When the dog is in the position shown at Fig. 11, the platen is locked against backward rotation, and hence the paper may be conveniently adjusted on the rubber-covered platen, using both hands therefor, and without any risk whatsoever of the platen turning with the paper.

The platen may be unlocked either by swinging the dog back to its normal position by hand or automatically by turning the platen forward by hand or by the line-spacing devices. The automatic release of the platen takes place in this wise: After the paper has been adjusted or squared to feed straight usually one or more line-space movements are made to bring the desired portion of the paper to the printing-plane, and in this line spacing movement the dog is disengaged from the ratchet-wheel by the simple rotation thereof by the driving-pawl, the beveled side 187 of the tooth of the ratchet-wheel operating during this descent to wedge or force the dog out of the vertical plane of the ratchet-wheel; but for the purpose of insuring a total and safe clearance of the dog from the ratchet-wheel it is given a further outward movement by the lowered beveled end or back 188 of the pawl, which in its descending movement to rotate the platen strikes against the beveled end of the dog and drives or wedges it back or outwardly a further distance and to a safe position. The outward movement of the dog is limited by a stop 189 on the arm, which contacts with the inner side of the end bar. The beveled back 188 of the pawl pushes the dog 182 outwardly just before the completion of the throw of said pawl and just as it is

about to become wedged itself between the projection 177 and the ratchet-wheel, as illustrated at Fig. 12. Of course the dog may be disengaged from the ratchet-wheel by turning the platen forward itself by means of its hand-wheel 190; but this mode of disengagement would not move said dog outwardly as far as it is moved when the line-spacing handle is actuated and the pawl is enabled to cooperate with said dog. The platen dog or lock is omitted from Figs. 9 and 10 for the sake of clearness, and in these figures, as well as Figs. 11 and 12, the ratchet-teeth illustrated are those which lie on the rear side of the axis of the platen, or on that side on which is located the driving-pawl.

Various changes in detail construction and arrangement may be made without departing from the essence of the several features of my improvements, many of which are adapted to be used in machines of other design or general construction.

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

1. In a type-writing machine, the combination of a paper-carriage having a feed-rack, spacing-dogs, a rocking holder or trunnion therefor, a rocker-arm attached thereto, and a vertical actuating-rod connected to said arm and bearing a stop, and a fixed abutment or lug therefor; substantially as set forth.

2. In a type-writing machine, the combination of a paper-carriage having a feed-rack, spacing-dogs, a rocking holder or trunnion therefor, a rocker-arm, and a vertical actuating-rod threaded at its upper end, a threaded nut thereupon to serve as a stop, and a lug or abutment for said nut to strike against; substantially as set forth.

3. In a type-writing machine, the combination of a dog-actuating rod having a threaded portion, an elongated threaded nut thereon to serve as an abutment, and longitudinally adjustable without altering the adjustment or length of said rod and a forked universal lever having a lost motion before it contacts with said nut; substantially as set forth.

4. In a type-writing machine, the combination of a dog-holder, a two-part actuating-rod therefor having an intermediate coupling for adjusting the lower member only, a spring for pressing said rod upwardly, a stop for limiting its upward movement, and a compound space-key lever, 85, 87 arranged as described, connected to said lower member; substantially as set forth.

5. In a type-writing machine, the combination with the dogs and their connections, of the space-key lever 87 pivoted at the rear of the machine, a supplemental lever 85 pivoted on the main lever between its key and its fulcrum and connected at its rear end to the lower end of the dog-actuating rod, and a fulcrum for said supplemental lever 85 arranged at the forward end thereof and between the pivot of said supplemental lever and the forward end

of the main lever 87; substantially as set forth.

6. In a type-writing machine, the combination of a space-key lever provided at its outer end at each side with an L-shaped bar having at its upper end an outward branch attached to the space-key head, and a slotted guide-bracket for said bars; substantially as set forth.

7. In a type-writing machine, the combination of a space-key lever having a finger-piece or head, and a base-plate having padded posts rising from the upper side of said base-plate to stop the downward movement of said finger-piece or head; substantially as set forth.

8. In a type-writing machine, the combination with a feed rack and dog, of a release-bar movable with the paper-carriage, a pair of bell-cranks to which said bar is pivotally attached, an actuating-rod also attached to said bell-cranks, and a release-key, attached to the paper-carriage, for moving said rod endwise and thereby causing the release-bar to disengage the dog; substantially as set forth.

9. In a type-writing machine, the combination of a feed-rack, a depressible dog, a release-bar, a pair of bell-cranks attached thereto at their horizontal arms, an actuating-rod pivotally connected to the vertical arms of said bell-cranks, and a key-lever pivotally connected to said actuating-rod; substantially as set forth.

10. In a type-writing machine, the combination with a feed-rack and depressible dog, of a release-bar, a pair of bell-cranks, an actuating-rod having a swiveled connection to the vertical arms of said bell-cranks, and a spring-actuated lever having a swiveled connection to said actuating-rod; substantially as set forth.

11. In a type-writing machine, the combination with a feed-rack and dog, of a release-bar, a pair of bell-cranks, an actuating-rod, and a spring-actuated lever on the carriage pivotally connected to the end of said rod; substantially as set forth.

12. In a type-writing machine, the combination of a paper-carriage having a hinge movement, a feed-rack, a depressible dog, a release-bar, means for moving said bar, including an actuating-rod, one end of which terminates coincident with the hinge-line of the carriage, and a key-lever attached to said carriage and connected to the said termination of said actuating-rod; substantially as set forth.

13. In a type-writing machine, the combination of a paper-carriage having a hinge movement, a feed-rack, a depressible dog, a depressible release-bar, an actuating-rod connected thereto and terminating in a horizontal pivotal portion coincident with the hinge-line of the paper-carriage, and a key-lever connected to said horizontal pivotal portion and to the paper-carriage; substantially as set forth.

14. In a type-writing machine, the combination of a paper-carriage having a hinge movement, a feed-rack, a depressible dog, a release-bar, bell-cranks, an actuating-rod having a horizontal pivotal portion in line with the hinge of the paper-carriage, a vertically-pivoted spring-actuated lever attached to the paper-carriage and connected to said horizontal pivotal portion of said actuating-rod; substantially as set forth.

15. In a type-writing machine, the combination of a hinged paper-carriage, a release-bar, bell-cranks, an actuating-rod terminating in a horizontal pivot in line with the hinge of the paper-carriage and a spring-actuated lever having a vertical pivot and attached to said carriage, and having also a swiveled stand or boss perforated to receive the horizontal pivotal portion of the actuating-rod; substantially as set forth.

16. In a type-writing machine, the combination of a hinged paper-carriage and a release-key mechanism comprising an actuating-rod and a key-lever, said rod and key-lever having a horizontal pivotal connection in line with the hinge of the paper-carriage; substantially as set forth.

17. In a type-writing machine, the combination of a part connected to the printing mechanism and which moves always when said mechanism is actuated, a stop to arrest said part, a rotatory crank-shaft adapted also to slide independently, and means on the carriage adapted to turn said crank-shaft.

18. In a type-writing machine, the combination with the universal bar, the universal lever actuated by said bar, and the escapement devices actuated by said universal lever, of a plate or arm arranged beneath said universal lever and normally out of the path thereof, means on the frame for moving said plate or arm into the path of vibration of said lever and for also releasing it by a special manipulation of said means solely, and an adjustable device connected to the paper-carriage for actuating said means; substantially as set forth.

19. In a type-writing machine, the combination with the universal lever of the printing and feeding mechanisms, a pivoted plate or arm normally out of the path thereof, an independent vibratory crank on the frame for swinging said plate or arm, said crank being capable of an independent movement to disengage said plate or arm and release said universal lever, and means connected with the paper-carriage for vibrating said crank; substantially as set forth.

20. In a type-writing machine, the combination with the universal lever of the printing and feeding mechanisms, of a pivoted spring-actuated plate or arm normally out of the path thereof, an independent crank-shaft vertically pivoted in the frame and having two cranks, and a contact or operator connected with the paper-carriage; substantially as set forth.

21. In a type-writing machine, the combination with the universal lever of the printing and feeding mechanisms, of an arm or plate normally out of the path thereof, a device on the frame to be brought into action by the movement of the paper-carriage for moving said arm or plate into the path of said lever, and thereby locking the printing and feeding mechanisms, said device being independently movable to release said arm or plate, and a spring for returning said plate or arm to its normal position, whereby the printing and feeding mechanisms are unlocked to permit the addition of another character; substantially as set forth.

22. In a type-writing machine, the combination with the universal lever of the printing and feeding mechanisms, of an arm or plate normally out of the path thereof, an oscillatory crank-shaft having an arm adapted to move said arm or plate into the path of said lever and lock the printing and feeding mechanisms, the said crank-shaft being also adapted to be moved longitudinally alone to release the said plate or arm, and a spring for returning the latter to its normal position and thereby releasing the printing and feeding mechanisms; substantially as set forth.

23. In a type-writing machine, the combination with the universal lever of the printing and feeding mechanisms, of a pivoted spring-actuated arm or plate, a depressible independent spring-actuated oscillatory crank-shaft having a crank at its lower end adapted, when the shaft is turned, to swing said arm or plate and lock the universal lever and the printing and feeding mechanisms connected thereto, and also adapted, when said shaft is depressed alone, to release said plate or arm to permit its spring to restore it to its normal position and thereby unlock the printing and feeding mechanisms; substantially as set forth.

24. In a type-writing machine, the combination of the universal lever of the printing and feeding mechanisms, of a pivoted spring-actuated arm or plate therefor normally out of the path of said lever and having a cam-face, a spring-pressed depressible rod adapted to turn in bearings in the framework and having a crank to actuate said plate or arm, and means on the paper-carriage for turning said rod; substantially as set forth.

25. In a type-writing machine, the combination with the universal lever of the printing and feeding mechanisms, of a pivoted spring-actuated plate or arm having a notch or cut-away, a laterally-projecting portion, and a cam-face, a vertically-arranged depressible rod adapted to turn in bearings in the framework and having at its lower end a crank and at its upper end a crank, an adjustable actuator on the paper-carriage for turning said rod and causing the spring-actuated arm or plate to arrest the vibration of the universal lever, a head or key for depressing said rod and enabling the plate or arm to return

to its normal position, and a spring for moving said rod upwardly and at the same time vibrating the plate or arm back to its locking position through the cooperation of said crank and cam-face; substantially as set forth.

26. In a type-writing machine, the combination with the universal lever of the printing and feeding mechanisms, of a pivoted arm or plate normally out of the path thereof, means on the framework for vibrating said plate or arm to its locking position, said means being actuated by a device on the carriage, a stop for limiting said vibratory movement, a spring for returning said plate or arm when released from its actuating means, and a stop for limiting the return movement of said plate or arm; substantially as set forth.

27. In a type-writing machine, the combination with the universal lever of the printing and feeding mechanisms, of a pivoted spring-actuated plate or arm provided with a stopping means, a rod adapted to turn and also to slide in bearings in the framework and having at its lower end a crank adapted to move said plate or arm and having at its upper end another crank, an adjustable actuating device on the paper-carriage adapted to strike the upper crank-arm, a spring for moving said rod upwardly, and a stop for limiting its upward movement; substantially as set forth.

28. In a type-writing machine, and in a line-locking mechanism, an adjustable frictionally-held actuator on the paper-carriage; substantially as set forth.

29. In a type-writing machine, and in a line-locking mechanism, a U-shaped actuator having spring-jaws and adjustably mounted upon the paper-carriage; substantially as set forth.

30. In a type-writing machine, the combination of the universal lever, the stop therefor, the depressible and rocking rod having two cranks, and the U-shaped spring-gripping adjustable actuator on the paper-carriage; substantially as set forth.

31. In a type-writing machine, the combination of a moving part connected to the printing mechanism, a pivoted and spring-pressed stop adapted to arrest said part, a device on the framework adapted to move said stop to its locking position, and also adapted to be disengaged from said stop to permit it to return to its normal position, and a part on the carriage adapted to move said stop-actuating device; substantially as set forth.

32. In a type-writing machine, the combination of a moving part connected to the printing mechanism, a stop to arrest said part, an independent device on the framework adapted to move said stop, a part on the carriage adapted to move said device, the said stop and the said device being so related and arranged that upon an independent movement of the latter the stop may return to its normal position and release the moving part; substantially as set forth.

33. In a type-writing machine, the combination of a moving part connected to the printing mechanism, a stop adapted to arrest said part, a device on the framework adapted to move said stop and separably related thereto, and a part on the carriage adapted to move said device; substantially as set forth.

34. In a type-writing machine, the combination of a moving part connected to the printing mechanism, a pivoted spring-actuated stop to arrest said part, a rocking arm separably engaging with said stop and adapted to move and to also release the same, and an adjustable part on the paper-carriage for moving said rocking arm; substantially as set forth.

35. In a type-writing machine, the combination with a platen, of a pressure-roller and a pressure-blade connected together and arranged adjacent to each other and both on the same side of the printing-point of the platen and each mounted for movement independently of the other and both adapted to press the paper against the platen; substantially as set forth.

36. In a type-writing machine, the combination with a platen, of brackets or hangers, and a roller and a paper-blade both connected together and arranged on the same side of the printing-point of the platen but each mounted for movement independently of the other and each independently spring-pressed so as to press the paper against the platen; substantially as set forth.

37. In a type-writing machine, the combination with a platen, of a roller journaled in spring-pressed hangers or brackets, supports mounted on said hangers or brackets, and a paper-blade secured to said supports and having pressure against the platen; substantially as set forth.

38. In a type-writing machine, the combination with a platen, of a roller journaled in spring-pressed hangers or brackets, sheet-metal springy supports secured thereto, and a pressure paper-blade connected to said supports; substantially as set forth.

39. In a type-writing machine, the combination with a platen, of a roller journaled in spring-pressed hangers or brackets, sheet-metal springy supports adjustably attached thereto, and a pressure paper-blade connected to said supports; substantially as set forth.

40. In a type-writing machine, the combination with a platen, of a roller journaled in spring-pressed hangers or brackets, combined springs and paper-guides mounted on said hangers or brackets, and a pressure paper-blade connected to said combined springs and paper-guides; substantially as set forth.

41. In a type-writing machine, the combination with a platen, of a roller journaled in spring-pressed hangers or brackets, combined springs and paper-guides attached thereto and capable of independent movement, and a pressure paper-blade attached to said combined springs and guides; substantially as set forth.

42. In a type-writing machine, the combination with a platen, of a roller journaled in spring-pressed hangers or brackets, combined springs and paper-guides consisting of the portions 147, 148 and 151, and a pressure paper-blade attached to the portions 147; substantially as set forth.

43. In a type-writing machine, the combination with a platen having a ratchet-wheel, of a spring-pressed rock-shaft having at one end a handle and at its other end a crank, a driving-pawl pivoted to said crank and provided with a spring, and a stop or abutment for said pawl; substantially as set forth.

44. In a type-writing machine, the combination with a platen having a ratchet-wheel, of a spring-actuated rock-shaft having at one end a handle and at its other end a crank, a driving-pawl pivoted upon said crank and provided with a spring, and an adjustable stop or abutment for said pawl; substantially as set forth.

45. In a type-writing machine, the combination with a platen having a ratchet-wheel, of a spring-actuated rock-shaft having a handle and a crank, a pawl pivoted on said crank, and means for turning the said pawl about its own pivot at the end of the return movement of the rock-shaft; substantially as set forth.

46. In a type-writing machine, the combination with a platen having a ratchet-wheel, of a spring-actuated rock-shaft having a handle and a crank, a pawl pivoted to said crank, a spring acting normally to force the driving end of the pawl toward the ratchet-wheel, and a stop or abutment for turning said pawl about its own pivot and against the tension of said spring during the return movement of the rock-shaft; substantially as set forth.

47. In a type-writing machine, the combination with a platen having a ratchet-wheel, of a spring-actuated rock-shaft having a handle and a crank, a pawl pivoted to said crank and depending therefrom, a spring tending normally to press the lower end of said pawl toward the ratchet-wheel, and an adjustable stop or abutment to receive the upper portion of said pivoted pawl and to vibrate it about its own pivot on the return stroke; substantially as set forth.

48. In a type-writing machine, the combination with a platen having a ratchet-wheel, a rock-shaft having a handle and a crank, a pawl pivoted to the crank between its ends, and formed with an inclined back, and an adjustable regulator having a face or portion adapted to act upon the inclined back of the pawl to vibrate it on its return stroke and to stop it; substantially as set forth.

49. In a type-writing machine, the combination with a platen having a ratchet-wheel, of a rock-shaft having a handle and a crank, a spring-pressed pawl pivoted upon said crank, and a pivoted line-space regulator adapted to be set in a plurality of positions; substantially as set forth.

50. In a type-writing machine, the combination with a platen having a ratchet-wheel, of a rock-shaft having a handle and a crank, a spring-pressed pawl pivoted to said crank, a line-space regulator pivoted axially of said rock-shaft and provided with a spring-acting detent adapted to a plurality of notches in a fixed part; substantially as set forth.

51. In a type-writing machine, the combination with a platen having a ratchet-wheel, of a spring-actuated rock-shaft having a handle and a crank, a spring-pressed pawl pivoted to said crank, a fixed arm having a series of notches, a line-space regulator pivoted upon said rock-shaft, means for limiting its pivotal movements, and a spring-detent on said regulator adapted to engage with any of the notches on said arm; substantially as set forth.

52. In a type-writing machine, the combination with a platen having a ratchet-wheel, a spring-actuated rock-shaft having a handle and a crank, a spring-pressed pawl pivoted to said crank and having an inclined back, and a line-space regulator having an inclined face; substantially as set forth.

53. In a type-writing machine, the combination with a platen having a ratchet-wheel, a spring-actuated rock-shaft having a handle and a crank, a spring-pressed pawl pivoted thereto, and a pivoted line-space regulator against which said pawl bears, the line-space regulator being adjustable to a plurality of positions, and in its adjustments carrying therewith the said pawl and the said rock-shaft with its handle and crank; substantially as set forth.

54. In a type-writing machine, the combination with a platen having a ratchet-wheel, of an arm extending upwardly from the platen-carrier end bar and provided with a series of notches, a line-space regulator comprising a plate 162, a tubular portion 163, adapted to a perforation 164 in said arm, and also a spring-detent, a rock-shaft having a bearing in said platen-carrier end bar and also in said tubular portion 163, a handle on one end of said rock-shaft, a crank on the other end thereof, a spring for said rock-shaft, and a driving-pawl pivoted between its ends upon said crank and provided with a spring; substantially as set forth.

55. In a type-writing machine, and in a line-spacing mechanism, the combination of a pivoted spring-pressed driving-pawl having an inclined back, and an adjustable regulator therefor consisting essentially of a vibratory plate having an inclined face and a spring-catch for holding it in various positions; substantially as set forth.

56. In a type-writing machine, the combination with a platen having a ratchet-wheel, of a stop projecting inwardly from the platen-carrier end bar toward the ratchet-wheel and terminating directly opposite its downcoming teeth, a rock-shaft provided at one end with a handle and at its opposite end with a

crank-arm, and a depending driving-pawl pivoted to said crank-arm and adapted to directly enter the space formed between the inner end of said stop and the teeth of said ratchet-wheel at the end of its line-spacing throw; as set forth.

57. In a type-writing machine, the combination with a platen having a ratchet-wheel, of a stop, a rock-shaft having a handle and a crank, a driving-pawl constructed and arranged to be jammed between said ratchet-wheel and said stop at the end of its line-spacing movement, and having at its upper end an inclined back adapted to cooperate with an adjustable line-space regulator on its return movement; substantially as set forth.

58. In a type-writing machine, the combination with a platen, a ratchet-wheel, a holder or detent and a normally-disengaged driving-pawl, of a normally-free dog or lock adapted to engage with the teeth of said ratchet-wheel and prevent backward rotation of said platen during adjustment of the paper thereon; substantially as set forth.

59. In a type-writing machine, the combination with a platen, a ratchet-wheel, a holder or detent and a normally-disengaged driving-pawl, of a normally-free pivoted dog or lock adapted to engage the teeth of said ratchet-wheel, and hold the platen against backward rotation; substantially as set forth.

60. In a type-writing machine, the combination with a platen, a ratchet-wheel, a holder or detent and a normally-disengaged driving-pawl, of an arm pivoted on the platen-carrier and provided with a normally-free dog, finger-piece, and a stop; substantially as set forth.

61. In a type-writing machine, the combination with a platen having a ratchet-wheel with radially-cut and beveled teeth, a holder or detent and a normally-disengaged driving-pawl, of a normally-free pivoted locking-dog having a beveled end; substantially as set forth.

62. In a type-writing machine, the combination with a platen having a ratchet-wheel provided with radial and beveled teeth, of a normally-free beveled dog adapted to hold the platen against backward rotation and to be automatically cast off and disconnected from said ratchet-wheel when the platen is rotated in forward direction; substantially as set forth.

63. In a type-writing machine, the combination with a platen having a ratchet-wheel, of a normally-free locking-dog arranged to be moved into engagement therewith to hold the platen against backward rotation, and constructed and arranged to be automatically dis-

engaged therefrom when the platen is turned in a forward direction; substantially as set forth.

64. In a type-writing machine, the combination with a platen having a ratchet-wheel provided with radial teeth and inclined faces, of a locking-dog having a beveled end, and a driving-pawl having a beveled toe adapted to act thereupon and move it away from the ratchet-wheel during the line-spacing movement; substantially as set forth.

65. In a type-writing machine, the combination with a platen, of a ratchet-wheel connected thereto and having peripheral notches and radial teeth, a platen-check adapted to cooperate with said peripheral notches, and a driving-pawl adapted to cooperate with said radial teeth; substantially as set forth.

66. In a type-writing machine, the combination with a platen, of a ratchet-wheel connected thereto and having peripheral notches and radial and inclined teeth, a spring-pressed platen-check adapted to the notches, a platen-lock adapted to the teeth, and a driving-pawl also adapted to the teeth to rotate the platen and to act on the platen-lock to move it clear of the said teeth; substantially as set forth.

67. In a type-writing machine, the combination with the rocker-bar and the vibratory plate 55 having a feeding-dog, of the arm 51 on the rocker-bar, the screw-head 61 on said arm, the lug 63 on the rocker-bar, and the screw 62 in said lug; substantially as set forth.

68. A writing-machine line-spacing mechanism comprising in its construction a platen having ratchet-teeth at one end, a shaft having a hand-lever and having a spring for operating it in one direction and also having an arm provided with a pawl to engage the teeth of the platen, and means for adjusting the normal position of the pawl relatively to the arm of the shaft; substantially as set forth.

69. A writing-machine line-spacing mechanism comprising in its construction a platen having ratchet-teeth at one end, a shaft having a hand-lever and having a spring for operating it in one direction and also having an arm provided with a pawl to engage the teeth of the platen, and a plate provided with a lug to engage a portion of the pawl, said plate being adjustably mounted on the shaft; substantially as set forth.

Signed at Bridgeport, in the county of Fairfield and State of Connecticut, this 10th day of June, A. D. 1895.

CASPER D. WALLACE.

Witnesses:

F. H. MASTERSON,
L. B. POWE.