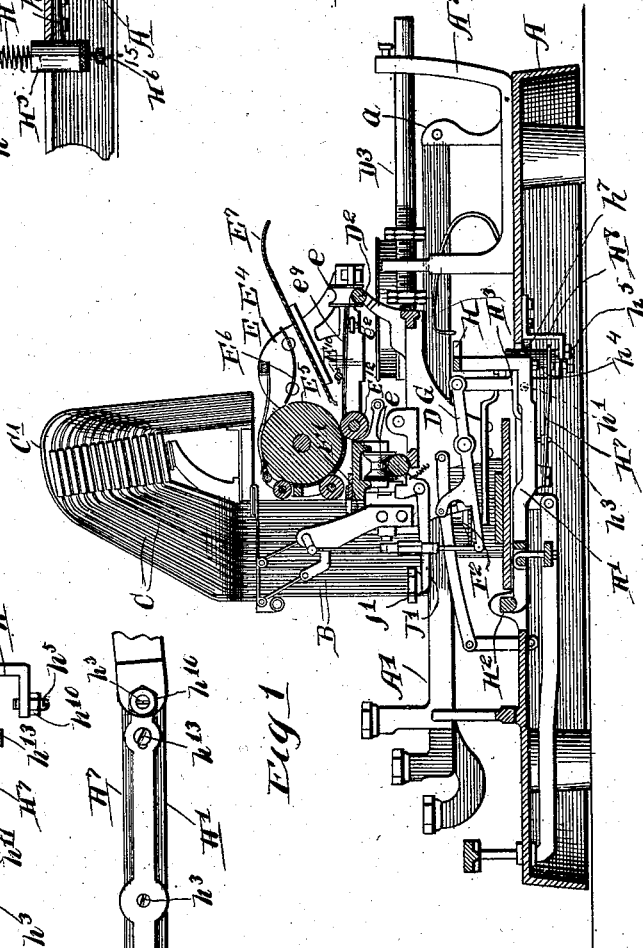
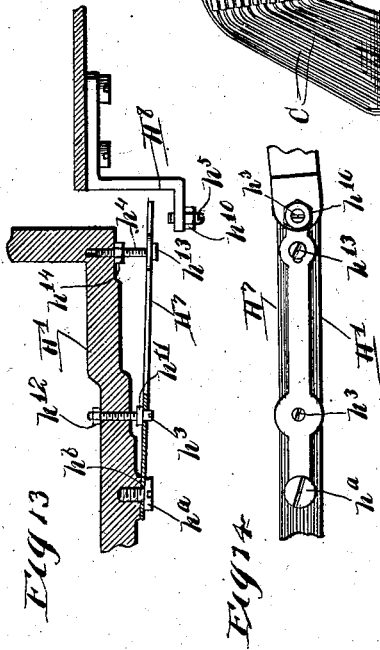
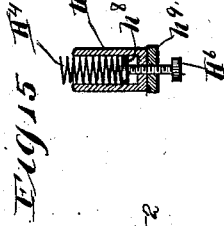
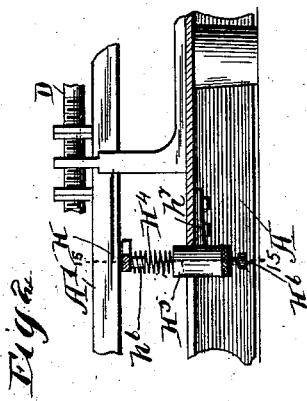


H. CROSS & G. J. GRIFFITHS.
TYPE WRITING MACHINE.
APPLICATION FILED JULY 24, 1901.

NO MODEL.

3 SHEETS—SHEET 1.



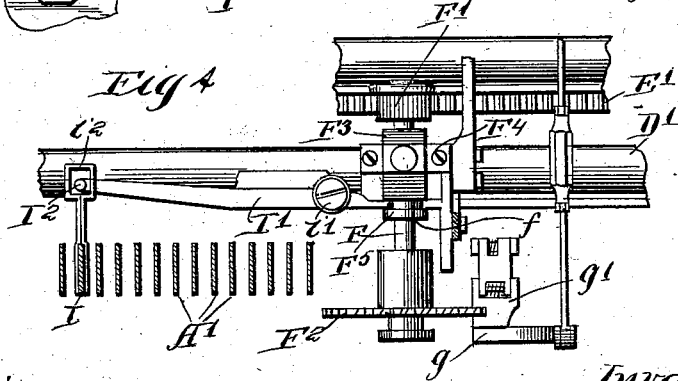
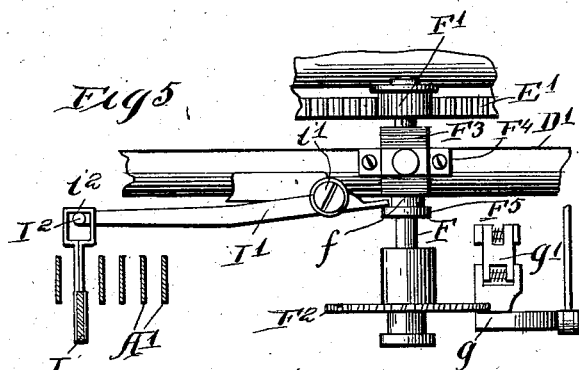
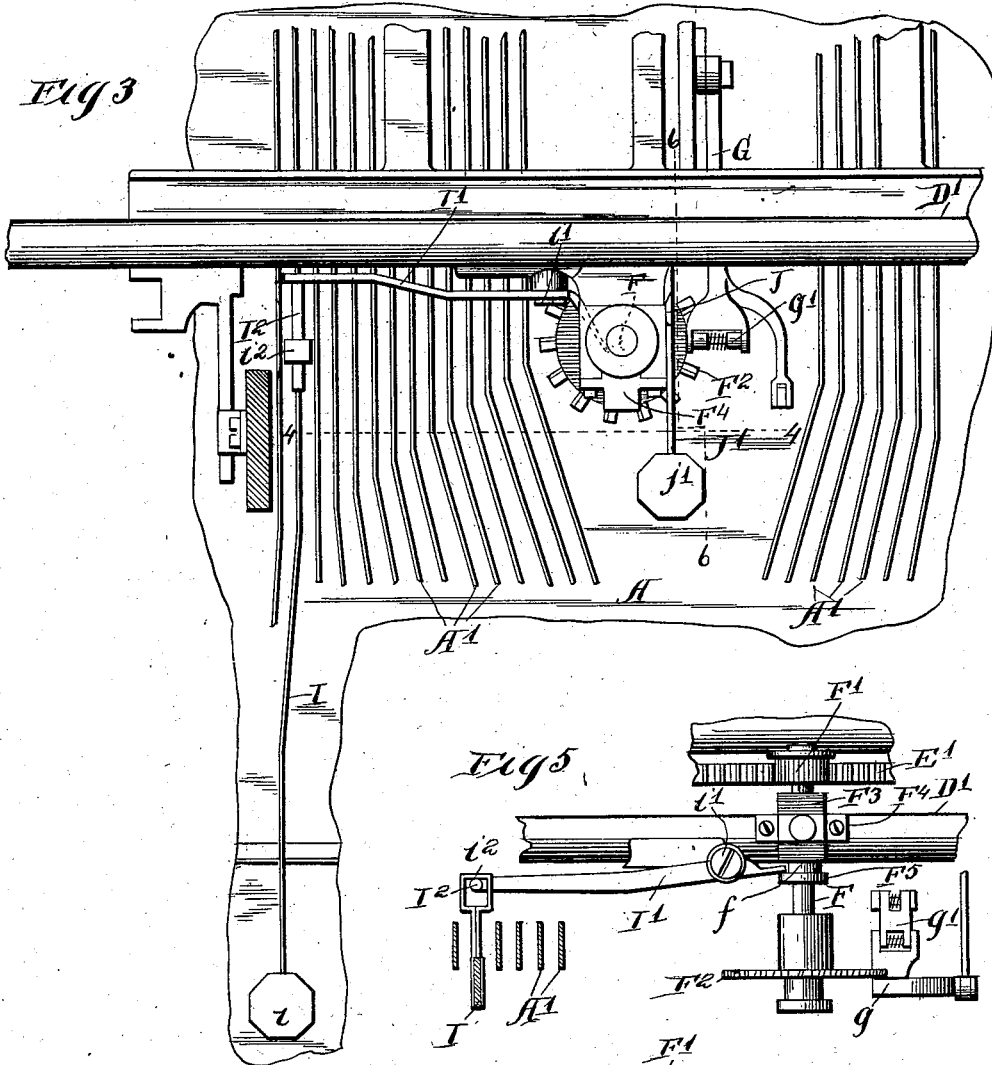
Witnesses:
 Carl H. Crawford
 William K. Hall

Inventors:
 Harry Cross
 George J. Griffiths
 by *Booker Brown* their Attorneys

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3 SHEETS—SHEET 2.



Witnesses:
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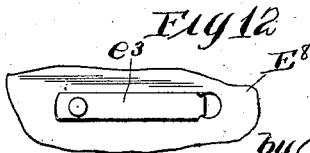
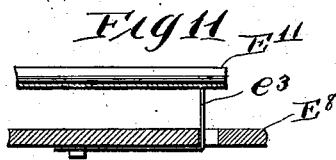
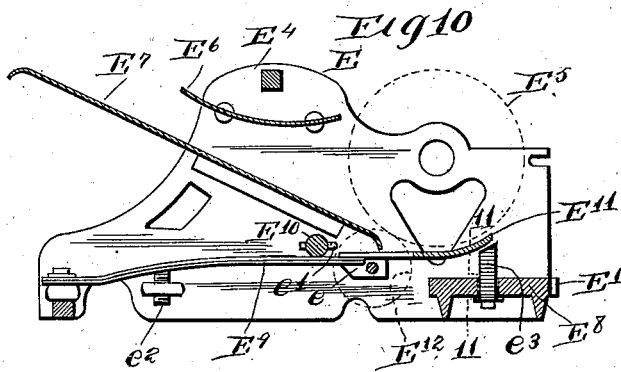
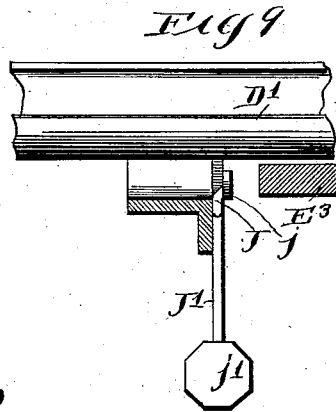
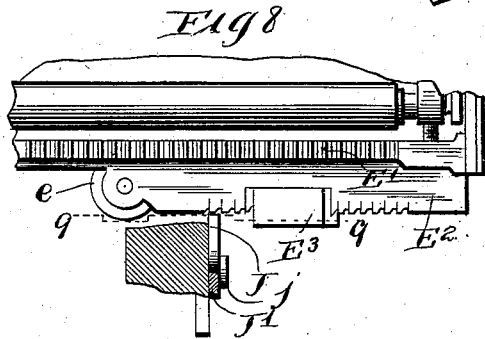
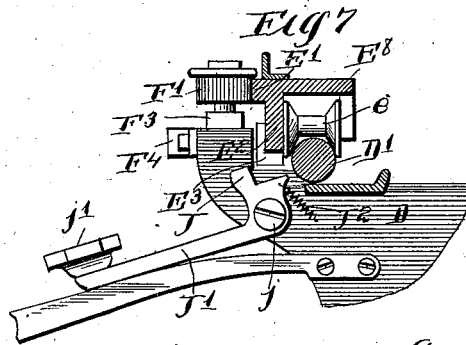
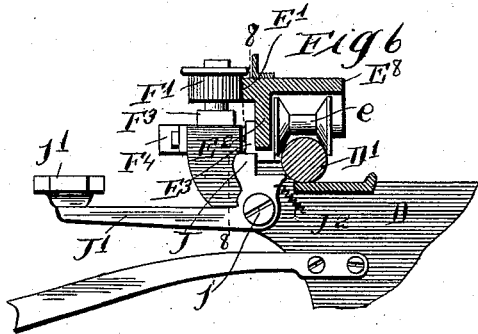
H. CROSS & G. J. GRIFFITHS,

TYPE WRITING MACHINE.

APPLICATION FILED JULY 24, 1901.

NO MODEL.

3 SHEETS—SHEET 3.



Witnesses:
 Carl M. Crawford
 William L. Hall

Inventors:
 Harry Cross
 George J. Griffiths
 by Robert Brown their Attorneys

UNITED STATES PATENT OFFICE.

HARRY CROSS AND GEORGE J. GRIFFITHS, OF WOODSTOCK, ILLINOIS,
ASSIGNORS TO THE OLIVER TYPEWRITER COMPANY, OF CHICAGO,
ILLINOIS, A CORPORATION OF ILLINOIS.

TYPE-WRITING MACHINE.

SPECIFICATION forming part of Letters Patent No. 724,671, dated April 7, 1903.

Application filed July 24, 1901. Serial No. 69,480. (No model.)

To all whom it may concern:

Be it known that we, HARRY CROSS and GEORGE J. GRIFFITHS, of Woodstock, in the county of McHenry and State of Illinois, have
5 invented certain new and useful Improvements in Type-Writing Machines; and we do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and
10 to the letters of reference marked thereon, which form a part of this specification.

This invention relates to improvements in type-writing machines; and it relates, first, to an improved key-lever and connection
15 thereof with the escapement mechanism constructed to effect the printing of a character without actuation of the escapement mechanism and hereinafter termed a "dead key;"
20 secondly, to an improved right-hand marginal stop mechanism, and, thirdly, to devices for cushioning the impact of the key-levers in the downward throw thereof and for returning the universal bar and the key-levers to their uppermost positions.

25 The several features of the invention are herein shown as applied to the Oliver type-writing machine, though it will be apparent that some of the features of the invention may be adapted for application to other types
30 of machines.

The invention consists in the matters hereinafter set forth, and more particularly pointed out in the appended claims.

In the drawings, Figure 1 is a vertical section of an Oliver type-writing machine embodying our invention. Fig. 2 is a detail showing the spring for raising the universal bar and the keys to their uppermost positions. Fig. 3 is a plan view of a fragment of the machine designed to show our improved dead key and the connections between the same and the escapement mechanism and showing also parts of the right-hand stop mechanism. Fig. 4 is a transverse vertical section on line
35 4 4 of Fig. 3. Fig. 5 is a similar section with the operative parts of the invention in changed positions. Fig. 6 is a detail section in line 6 6 of Fig. 3. Fig. 7 is a like section with the parts in changed positions. Fig. 8 is a
45 vertical detail section on line 8 8 of Fig. 6.

Fig. 9 is a plan view on line 9 9 of Fig. 8. Fig. 10 is a cross-section taken through the carriage near one end thereof, showing an auxiliary spring for supporting the lower paper-guide. Fig. 11 is a section on line 11 11
55 of Fig. 10. Fig. 12 is a bottom view of a fragment of the rack, showing the means of fastening the auxiliary spring in place. Fig. 13 is a vertical section taken through the central longitudinal member of the universal-bar
60 frame and adjacent parts, illustrating a cushioning or buffer spring which limits the depression of the universal-bar frame and key-levers. Fig. 14 is a bottom plan view of the parts shown in Fig. 13. Fig. 15 is a fragmentary
65 vertical section on line 15 15 of Fig. 2.

In said drawings only such parts of the type-writing machine are illustrated as are essential to an understanding of the application of the several features of the invention
70 thereto. We will first refer to the general construction of the machine shown and will thereafter explain the parts constituting our present improvements.

The general construction of the machine is
75 like that shown in the prior United States Letters Patent to Oliver, No. 599,863, granted March 1, 1898.

As shown in said drawings, A designates the base of the machine, and A' A' a plurality of key-levers which are pivoted at their rear ends to standards *a*, rising from the base, and are connected by upright links B with U-shaped type-bars C, Figs. 9 and 10, such as are employed in said Oliver type-writing
80 machine:

D designates as a whole a shifting frame on which the carriage (designated as a whole by the letter E) rests. Said shifting frame is provided with transverse guide-bars D², on which travel the supporting wheels or rollers
85 *e* of the carriage, and with a rearwardly-extending guide rod or stem D³, which slides in a vertical guide A², rising from the rear of the base-plate A. The forward part of the
90 shifting frame is supported by devices for this purpose—such, for instance, as are shown in the prior United States Letters Patent to Oliver, referred to.

F designates a vertical escape-wheel shaft 100

located near the center of the machine and mounted on the front of the shifting frame D. Said shaft F is provided at its upper end with a gear-pinion F', adapted to engage a rack-bar E' on the carriage. The shaft carries at its lower end an escape-wheel F². The upper end of the shaft passes through a block F³, located in a guide-bracket F⁴, connected with the shifting frame.

G designates an oscillatory escapement-lever, Fig. 3, which extends from the front to the rear of the machine and is pivoted to the front of the shifting frame D to swing in a vertical plane. The forward end of the lever is located at one side of and adjacent to the escape-wheel F² and carries stiff and limber pawls *g g'*, which are adapted for engagement with the escape-wheel F² as the lever is oscillated to permit the escapement-wheel to turn under the impulse imparted thereto by the carriage-actuating spring in the manner set forth in said prior patent to Oliver.

H designates a transversely-arranged vertically-movable space-bar located beneath and adapted for actuation by all the key-levers and which constitutes part of an oscillating frame, which is formed by means of said space-bar, a rock-shaft H², arranged parallel therewith at the front part of the machine, and a plurality of arms which rigidly connect the said rock-shaft with the space-bar. One of said arms is located near the center of the machine and is shown in Fig. 1 of the drawings, being therein indicated by the letter H'. The escape-lever G is connected with the rear part of the oscillating frame by a slotted yoke H³, which is pivoted at its upper end to and depends from the said lever, and the slot of which is arranged horizontally and adapted to receive a stud *h'*, (shown in dotted lines in Fig. 1,) which is affixed to said arm H' of the space-bar frame. Through the medium of the slotted yoke vertical movement of the space-bar is transmitted directly to the escape-lever, and backward-and-forward movement of said lever with the shifting frame is permitted by said slotted yoke without affecting the action of the escape devices.

The space-bar H is thrown upward into contact with the key-levers by means of an expansively-acting spiral lifting-spring H⁴, which is arranged vertically beneath said space-bar and bears against the same at its upper end. The said upper end of the spring H⁴ is held in place by engagement with a depending stud *h⁵* on the space-bar. The lower end of the said spring is contained within an upright upwardly-opening cylindrical casing H⁵, attached to the base-plate by means of a bracket-arm *h⁷* on the casing, which is secured by screws to the bottom surface of the frame, as more clearly shown in Fig. 2. To provide for adjustment of the tension of the coiled lifting-spring H⁴, a follower-plate *h⁸* is located within the cylin-

dric casing H⁵ between the lower end of the spring and the bottom wall of the casing, and an adjusting-screw H⁶ is inserted upwardly through the said bottom wall of the casing, so as to bear upwardly against said follower, said adjusting-screw being provided with a jam-nut *h⁹*, which bears against the said bottom wall of the casing and holds the screw from shifting in position when adjusted to vary the tension of the spring.

Provision is made for cushioning the space-bar frame, or, in other words, for yieldingly arresting the downward movement of the space-bar frame when a key or the space-key is depressed, as follows: Such cushioning device consists of a straight leaf-spring H⁷, attached to the central arm H' of the space-bar frame, as shown in Figs. 1, 13, and 14, and projecting rearwardly and downwardly from its point of attachment to said arm. Said arm H' terminates at its rear end in a vertical part which rises to the space-bar H, which is considerably above the level of the main part of said arm, and the spring H⁷ projects at its free end beyond or to the rear of the vertical part of the said arm. Said spring is secured at its forward end to the bottom surface of the arm H' by means of a headed screw *h^a*, which passes through the spring and enters the said arm, the latter being provided with a seat *h^b* for the spring, which seat is downwardly and rearwardly inclined to give an inclined position to the spring. Provision is made for adjusting the tension of the spring and the vertical position of the rear or free end thereof, consisting of two bolts *h³ h⁴*, which have screw-threaded engagement with the arm H' and engage apertures in the spring.

H⁸ designates a depending bracket provided with an adjustable stop *h³*, having the form of a screw, which passes upwardly through the horizontal extremity of the arm and is adapted for engagement with the free end of the cushioning-spring H⁷, the said screw *h⁵* having a jam-nut *h¹⁰*. When a key-lever or the space-key is depressed, before the limit of depression is reached the rear end of the spring H⁷ comes into contact with the stop-screw *h⁵* and yieldingly arrests or cushions the movement of the descending part. The bolt *h³*, which is located between the attaching-screw *h³* and the rear end of the arm H', is adjustable in the said arm and is provided above the spring with an enlargement or collar *h¹¹*, forming a downwardly-facing shoulder, against which the spring bears. Conveniently the lower end of said bolt *h³* passes through the aperture formed therefor in the spring, Fig. 14, and is provided with a slot for a screw-driver, so that the bolt may be easily adjusted in the frame-arms H'. Said bolt *h³* is also preferably provided above the arm H', through which it passes, with a jam-nut *h¹²* to hold the bolt from turning when adjusted. The bolt *h⁴* is located near the rear end of the arm H' and engages the spring

near the free end of the same. Said bolt h^4 passes through the aperture made therefor in the spring and is provided at its lower end with a head h^{13} , which serves to limit the downward movement of the free end of the spring. Said bolt h^4 is also provided with a jam-nut h^{14} , which bears against the arm H' to hold the bolt from turning when adjusted.

The bolts h^3 h^4 , arranged as described, serve to enable the tension of the spring or, in other words, the resistance afforded thereby to the depression of the space-bar when the spring strikes the stop h^5 to be varied or adjusted as desired, and said bolts also aid in adjusting the free end of the spring vertically, so that it will strike the stop h^5 at an earlier or later point in the depression of the space-key and may therefore be made to operate through a greater or less portion of the downward movement of the space-bar, as required, for the best results in the operation of the machine. The adjustment of the stop h^5 also affects the time and duration of the cushioning action of the spring. Manifestly if the bolt h^3 be adjusted downwardly the spring will press more forcibly downward on the head of the bolt h^4 and the spring will act with greater pressure or resistance when it first strikes the said stop h^5 . The same result will be produced by adjusting the bolt h^4 upwardly; but such adjustment will lift the end of the spring and result in the same striking the stop h^5 at a lower point in the downward movement of the space-bar. In adjusting the spring, for instance, the bolt h^4 may first be adjusted to make the spring strike the stop at the desired point in the descent of the space-bar and the bolt h^3 then adjusted to give the desired tension in the spring. Such adjustment of the bolt h^3 will slightly change the vertical position of the end of the spring, and the stop h^5 may then be adjusted to compensate therefor.

Referring now to the dead key and its connection with the escapement mechanism, which forms one feature of our invention, these parts are made as follows: I, Figs. 3, 4, and 5, designates a key-lever carrying a key i and which is connected with one of the upright links B for operating one of the type-levers. Said key-lever, so far as its function of actuating its connected type-bar is concerned, is made like and operates in the same manner as the other key-levers, and depression thereof oscillates the space-bar H and raises the front end of the lever G and the connected pawls. Means are provided, however, which are set in operation by the depression of the said key-lever I for elevating the escape-wheel at the same time the pawls are raised, and thereby retaining these parts in engagement, so as to prevent the usual operation of the escapement mechanism. The means for effecting this result are made as follows:

I' designates a horizontal vertically-reciprocatory lever, which is pivoted near one end

thereof on a pivot-stud i' , affixed to the front part of the shifting frame D. The inner end of said lever is bent obliquely and is adapted to engage a groove f in a collar F^5 , affixed to the shaft below the guide-block F^3 . The outer end of said lever I' is provided with a forwardly-projecting arm I^2 , located above the key-levers and which passes through and has engagement with a loop i^2 , which is attached to and is elevated above the key-lever I. With this construction it will be seen that when the key-lever I is depressed it acts through the space-bar frame to raise the front end of the escape-lever and pawls carried thereby, which in the like operation of the other key-levers disengages said pawls from the escape-wheel and permits the carriage to move one step. The escape-wheel shaft, however, in the operation of the dead key-lever is raised by means of the lever I' a sufficient distance to prevent disengagement of the pawls from the escape-wheel. The position of rest of the dead key-lever and the associated parts embraced in this feature of our invention are shown in Fig. 4, while in Fig. 5 the key-lever is shown as depressed and the escape-wheel and the shaft elevated to correspond with the elevation of the escape-lever and pawls carried thereby. The purpose of said construction is to enable accents and like characters—such as the acute, grave, and circumflex accents—to be printed immediately over letters, it being obvious that no spacing movement of the carriage can take place between the printing of the letter and the character when the latter is to be placed immediately over the letter.

Referring now to the construction of the right-hand stop mechanism, which constitutes another feature of our invention, these parts are shown in Figs. 6 to 9 and are made as follows: On the front of the carriage-frame and at the right-hand end thereof is located a depending longitudinal flange E^2 , and on said flange is movably secured a sliding line stop-lug E^3 , which is adapted to be adjusted longitudinally of the flange by engagement of a tooth thereon with a series of notches on the lower edge of the flange in the manner set forth in the said prior patent to Oliver, above referred to. Said stop-lug is adapted for contact with an arm J on the shifting frame located normally in the path of the said lug, but which is adapted to be swung forwardly therefrom to permit the carriage to pass beyond a certain point determined by the adjusted position of the lug on the carriage and which determines the width of the right-hand margin of the paper. The arm J is formed on or connected rigidly with a lever J', which is pivoted on a stud j , affixed to a forwardly-projecting part of the shifting frame D, located at one side of and adjacent to the escapement-wheel shaft, between the escapement-wheel and pinion on said shaft. Said lever J' is provided with a key j' , by which it may be conveniently manipulated. The lever is

normally held in its retracted position, with the arm J thereof in the path of the stop-lug E³, by means of a spiral contractile spring J², connected at one end with the shifting frame and at its other end with a lug on said arm. The flange E³ is provided with a graduated scale, as shown in Fig. 8, by which the lug may be set thereon to give a certain width of margin at the right-hand side of said printed page. After the lug has been set for a given width of margin the carriage will be stopped by contact of the arm J with the stop-lug E³ as the carriage approaches the end of the line. If it should be desired, however, to print a letter, letters, or a word beyond the margin determined by the position of said stop-lug, the lever J' is swung downwardly, which swings the arm J out of the path of said stop-lug and permits the carriage to move beyond said arm or to the end of its maximum travel, if desired. The normal position of the arm and lever are shown in Fig. 6, while the parts are shown in Fig. 7 in position to permit the stop-lug to pass the arm J. Moreover, the depression of the lever J' to move the arm J out of the path of the stop-lug E³ permits the carriage to be removed from the machine without removal from the carriage-frame of the line stop-lug, as heretofore necessary in machines of this class.

In Figs. 10, 11, and 12 we have shown a supplemental or auxiliary spring located beneath the lower paper-guide for the platen and intended to support the same when feeding extra heavy paper or cards through the carriage. As shown in said figures, E⁴ designates one of the end plates of the carriage in which the shaft of the platen E⁵ (indicated in dotted lines) is mounted. E⁶ E⁷ designate upper and lower paper-guides attached to the end plates of the carriage, whereby the paper is guided toward and from the platen in entering and leaving the machine. E¹² designates a presser-roller which is located beneath the platen (indicated in dotted lines in Fig. 10) and which engages the paper after it leaves the lower paper-guide E⁷. The devices whereby the presser-roller E¹² is mounted on the carriage-frame are substantially like those shown in the prior patent to Oliver, before mentioned. The shaft of said roller is mounted at its ends in blocks e, which are attached to the forward and free extremities of horizontally-arranged spring-arms E⁹, one located at each end of the carriage. Said spring-arms are attached at their rear ends to the carriage-frame in any suitable manner and project forwardly toward the platen. Said spring-arms act to press the roller firmly against the platen. The roller is released from contact with the platen by means of a rock-shaft E¹⁰, which is mounted in the end plates of the carriage and extends longitudinally thereof above the spring-arms. Said rock-shaft is provided near its ends with cam arms or lugs e', which are located over said spring-arms and are adapted to act upon the spring-arms

in a manner to depress the same when the rock-shaft is turned or rotated in a direction to carry the cams or lugs against said spring-arms. E¹¹ designates a guide-plate attached to the forward ends of the spring-arms and extending forwardly and upwardly from the pressure-roller E¹² for guiding the paper under the platen as it leaves the roller. The tension of said spring-arms is varied by means of screw-studs e², which pass upwardly through lugs on the end plates of the carriage and engage the under faces of said arms. e³ designates one of the supplemental or auxiliary springs referred to. Said spring e³ is attached to the rack-bar E⁸ of the carriage, on the under side thereof, with its end projecting upwardly through an opening in said rack-bar in position to act upwardly against and support the forward or free edge of the guide-plate E¹¹. The said supplemental springs are located normally out of contact with said guide-plate; but said guide-plate is adapted when a heavy sheet of paper or cardboard is inserted between the same and the platen to press or force the guide-plate into contact with the upper ends of the springs, whereby said springs act in conjunction with the spring-arms E⁹ to hold the guide-plate pressed against the paper between the same and the platen to hold said paper in frictional contact with the platen, and thereby insure its movement with the platen. The pressure of the plate E¹¹ toward the platen required to insure the proper feeding action or movement of the paper with the platen is greater in the case of a thick sheet or a plurality of sheets than in the case of sheets of ordinary thickness, and the supplemental springs described act to give the additional pressure required when the plate E¹¹ is forced away from the platen by the presence between it and the platen of a thick sheet or a thick mass of thin sheets without interfering with the usual action of the said plate in feeding sheets of ordinary thickness or a few of such sheets.

It is obvious that many changes may be made in the details of construction above described without departing from the spirit of our invention, and we do not wish to be limited to such details except as hereinafter made the subject of specific claims.

We claim as our invention—

1. The combination with the key-levers of a type-writer; type-bars connected with and actuated by said levers, a paper-carriage and an escapement mechanism actuated by the depression of said key-levers for imparting a step-by-step movement to said carriage and embracing an oscillatory escape-lever and a toothed part which moves in unison with the carriage and the teeth of which are adapted for engagement with the escape-lever, said toothed part of the escape mechanism being capable of movement with the escape-lever, of means connecting one of said key-levers with the toothed part of the escapement mechanism, whereby actuation of said lever to de-

press its type-bar produces movement of said toothed part with the escape-lever and prevents operation of the escapement mechanism.

2. The combination with the key-levers of
5 a type-writer, type-bars connected with and actuated by said levers and a paper-carriage, of an escapement mechanism embracing a ro-
tative shaft provided with a pinion adapted for engagement with the rack-bar of the car-
riage and with an escape-wheel, an escape-
10 lever provided with a pawl adapted to engage the escape-wheel to permit the turning of the shaft step by step, said escape-wheel being movable in a direction endwise of the shaft,
15 connections between the key-levers and the escape-lever for oscillating the latter, and means connecting one of said key-levers with the escape-wheel adapted to effect the move-
ment of said wheel with said pawl when the
20 said lever is depressed to prevent operation of the escapement mechanism at such time.

3. The combination with the key-levers of a type-writer, type-bars connected with and actuated by said levers, a paper-carriage and
25 an escapement mechanism for imparting to the carriage a step-by-step movement comprising a rack-bar on the carriage and a ro-
tative and vertically-movable shaft provided with a pinion adapted for engagement with
30 the said rack-bar and with an escape-wheel, a vertically-oscillatory lever provided with a pawl adapted to engage said escape-wheel, connection between said escape-lever and key-
levers for actuating the escapement mechan-
35 ism upon the depression of the keys, and a lever pivoted between its ends and having connection at one end with the escape-shaft and at its other end with one of said key-levers.

4. The combination with a carriage provided with a line-stop, of a key-lever which is pivoted to the machine-frame by means of a pivot-pin which is generally parallel with the path of travel of the carriage, and is provided with a rigid arm movable into and out
45 of the path of said line-stop and the carriage, said lever terminating at its forward end in the region of the keyboard and being adapted to be depressed to move the rigid arm thereof out of the path of said line-stop, and a spring applied to said key-lever and acting to hold said rigid arm yieldingly in the path
50 of said line-stop.

5. The combination with a paper-carriage,
55 a line-stop comprising a depending notched flange on the carriage, and a stop-block having adjustable sliding engagement with said flange, of a pivoted lever provided with a rigid arm which stands normally in the path
60 of said block, and a spring for yieldingly holding said arm in the path of said block.

6. The combination with a paper-carriage, a line-stop comprising a depending notched flange on the carriage, a stop-block having
65 adjustable sliding engagement with said flange, of a key-lever pivoted on the machine-frame and provided with a rigid arm which

rests normally in the path of said block, and a spring applied to hold said key-lever in its elevated position and the said arm in the
70 path of said block.

7. The combination with a paper-carriage, of a line-stop comprising a depending notched flange on the carriage, and a stop-block having adjustable sliding engagement with said
75 flange, a lever pivoted to the carriage-supporting frame and provided with a rigid arm which extends into the path of said block, a spring applied to the arm for holding it in the path of the block, and a key on the outer
80 end of the lever.

8. In a type-writer, the combination with key-levers, type-bars connected with and actuated by said levers, and a space-bar located transversely beneath said key-levers, of an
85 expansively-acting spiral spring located beneath said space-bar between the same and the base of the machine, a cylindrical, open-topped casing attached to the frame within which the lower end of the spring is inserted
90 and held, and a set-screw inserted through the bottom wall of the casing and bearing upwardly on the spring for adjusting the tension of the same.

9. In a type-writer, the combination with
95 key-levers, type-bars connected with and actuated by said key-levers, and a space-bar which is pivotally connected with the machine-frame and is located transversely beneath the key-levers, of a spiral spring acting
100 upwardly against the space-bar, an upwardly-opening casing attached to the machine-base adapted to receive the lower end of said spring, a follower in the casing, and a set-
105 screw inserted through the bottom of said casing and acting on the said follower to adjust the tension of the spring.

10. In a type-writer, the combination with key-levers, type-bars connected with and actuated by said key-levers, a pivoted space-
110 bar located transversely beneath said key-levers, a flat spring carried by said space-bar, and an adjustable stop on the machine-frame with which said spring comes into contact in the latter part of the descent of the bar.
115

11. In a type-writer, the combination with key-levers, type-bars connected with and actuated by said key-levers, and a bar pivotally located beneath said key-levers, of a flat spring attached at one end to said bar, a stop
120 on the frame for contact with said spring and adjusting means whereby the free end of said spring may be raised or lowered with respect to the bar, and the tension of the spring may be varied.
125

12. In a type-writer, the combination with the space-bar frame, of a flat spring attached at one end to said frame and adapted for contact at its opposite end with a stop on the machine-frame and adjusting means for the
130 spring embracing two bolts which have adjustable connection with the space-bar frame, one of said bolts being adapted to bear downwardly and the other upwardly on the spring.

13. In a type-writer, the combination with a space-bar, of a flat spring attached at one end to the space-bar frame, and adapted for engagement at its free end with a stop on the machine - frame, an adjusting - bolt which passes through the spring near its free end and has screw-threaded engagement with the space-bar frame and provided with a head beneath the spring, and a second adjusting-bolt which has screw-threaded engagement with the space-bar frame and acts downwardly on the spring at a point between the first-mentioned bolt and the end of the spring which is secured to the space-bar frame.
14. In a type-writer, the combination with a space-bar frame, of a flat spring attached at one end to the space-bar frame, a vertically-adjustable stop on the machine-frame adapted for contact with the free end of said spring, a vertically-adjustable bolt on the space-bar frame engaging the lower surface of the spring near its free end, and a second vertically-adjustable bolt on the space-bar frame arranged to bear downwardly on said spring at a point between the bolt first referred to and the end of the spring which is attached to said space-bar frame.
15. The combination with a carriage and a platen mounted therein, of a presser-roller located beneath and pressing upwardly against

the platen, spring-arms attached to the carriage and provided at their free ends with a bearing for said presser-roller, a guide-plate attached to the spring-arms and arranged to guide the paper after it leaves the roller, and auxiliary springs attached to the carriage and adapted to bear upwardly against said guide-plate when the latter is depressed away from the platen.

16. The combination with a carriage and a platen mounted therein, of a guide-plate, spring-arms supporting said guide-plate and holding the same adjacent to the platen, and auxiliary springs having longitudinal parts which are attached to a longitudinal frame member of the carriage, and parts which are bent at right angles to the longitudinal parts and which extend through apertures in said frame member with their ends in position for contact with said guide-plate when the same is thrown away from the platen.

In testimony that we claim the foregoing as our invention we affix our signatures, in presence of two witnesses, this 20th day of July, A. D. 1901.

HARRY CROSS.
GEORGE J. GRIFFITHS.

Witnesses:
D. R. JOSLYN,
EMIL ARNOLD.