

A. W. SMITH.
 TYPE WRITING MACHINE.
 APPLICATION FILED AUG. 17, 1912.

1,053,139.

Patented Feb. 11, 1913.
 2 SHEETS—SHEET 1.

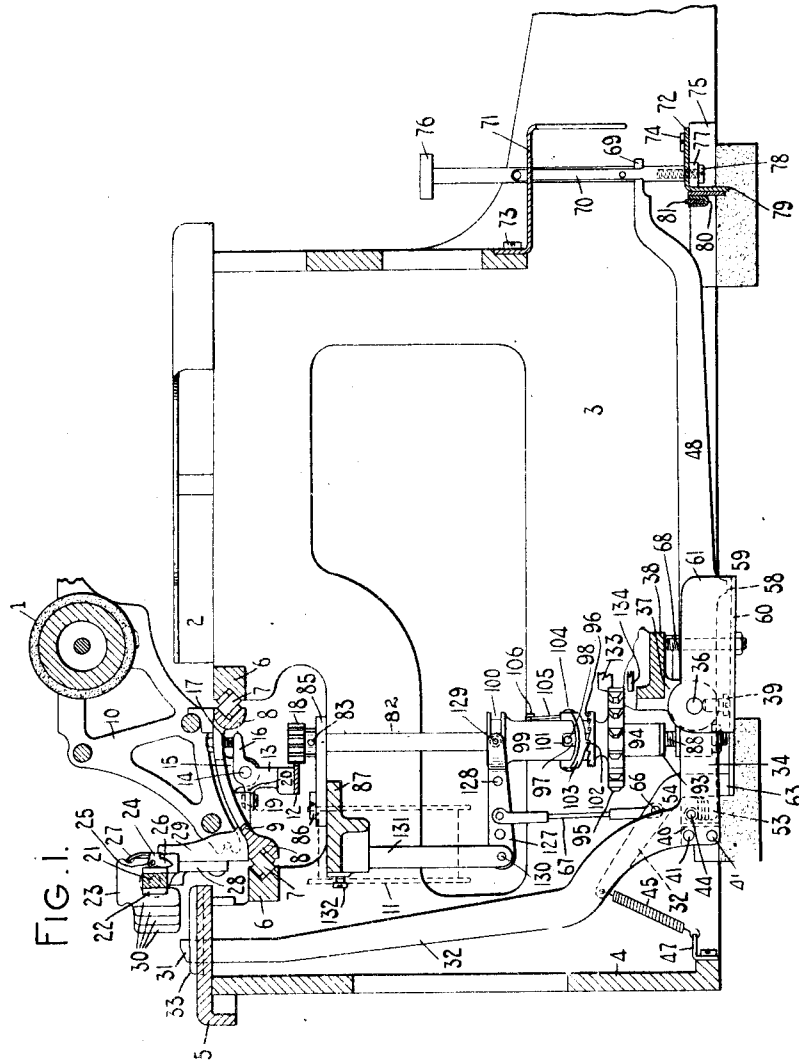


FIG. 1.

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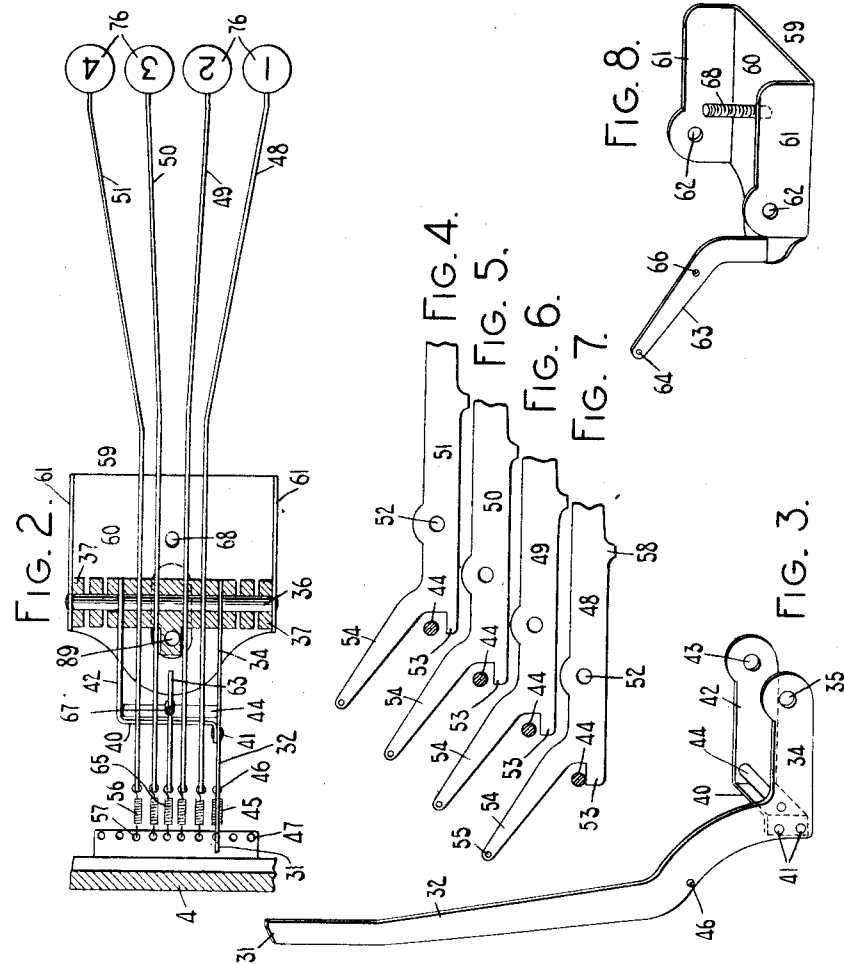
HIS ATTORNEY

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UNITED STATES PATENT OFFICE.

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TYPE-WRITING MACHINE.

1,053,139.

Specification of Letters Patent.

Patented Feb. 11, 1913.

Original application filed February 23, 1912, Serial No. 679,372. Divided and this application filed August 17, 1912. Serial No. 715,590.

To all whom it may concern:

Be it known that I, ARTHUR W. SMITH, citizen of the United States, and resident of the borough of Manhattan, city of New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Type-Writing Machines, of which the following is a specification.

My invention relates to typewriting machines and more particularly to tabulating mechanism.

The main object of the invention, generally stated, is to provide comparatively simple and efficient column selecting mechanism.

To the above and other ends, which will hereinafter appear, my invention consists in the features of construction, arrangements of parts, and combinations of devices set forth in the following description and particularly pointed out in the appended claims.

In the accompanying drawings wherein like reference characters indicate corresponding parts in the various views, Figure 1 is a fragmentary vertical fore and aft sectional view of a typewriting machine embodying my invention, only so much of the typewriting machine being shown as is necessary to an understanding of the invention. Fig. 2 is a detail plan view, partly in section, of the tabulator or column selecting mechanism. Fig. 3 is a detail perspective view of the column selecting stop and the frame which carries it. Figs. 4, 5, 6 and 7 are detail fragmentary side views, each showing the rear end portion of one of the column selecting key actuated levers and the universal bar with which it coöperates. Fig. 8 is a detail perspective view of the universal frame, by an actuation of which the carriage is released from the control of the escapement mechanism.

The present case is a division of my application Serial No. 679,372, filed February 23rd, 1912.

So far as this invention is concerned, the printing instrumentalities and the means for actuating the same may be of any suitable character.

The construction shown in the present instance, however, is embodied in a front strike typewriting machine in which a cylindrical platen 1 is carried by a suitable carriage and travels over the top plate 2 of the

machine from side to side thereof, and in which the types are intended to strike against the front face of the platen. The frame of the machine comprises side plates 3, a rear cross plate 4, the top plate 2 hereinbefore referred to, and a top plate 5. Fixed oppositely grooved guide rails 6 are secured to the side plates 3 of the frame and receive anti-friction rollers 7 which are likewise received in oppositely grooved rails 8 of a carriage truck 9. In this manner the carriage is supported for traveling movement from side to side of the machine. The truck 9 supports a platen frame 10 in which the platen 1 is mounted. The carriage is connected in the usual manner to a suitable spring drum 11 in the same general manner, for example, as in the No. 15 Yost machine. This spring drum is effective to move the carriage in a letter feed direction under control of the escapement mechanism. The escapement mechanism in the present instance comprises a feed rack 12 carried by depending arms 13 which are pivoted at 14 to lugs 15, which latter project downwardly from the truck 9. Forwardly extending arms 16, on the arms 13, are adapted to contact with set screws 17 and to limit the swinging movement of the rack forwardly into mesh or engagement with a feed pinion 18. A leaf-spring 19 bears upon a rearwardly projecting arm 20 on each of the arms 13, to normally maintain engagement between the feed rack and the pinion. The feed pinion 18 is controlled by a suitable escapement mechanism, as will hereinafter more clearly appear.

The tabulator mechanism comprises a column stop bar 21 provided with teeth 22 on opposite sides thereof. Column stops 23, which are preferably bifurcated flat sheet metal stops, are adapted to straddle the stop bar and to be received in the interdental spaces between the teeth 22 on the column stop bar, so that the column stops may be adjusted to different letter space positions throughout the length of the column stop bar. Each column stop carries a pivoted retaining device, designated as a whole by the reference numeral 24. Each of these devices is pivoted to its stop, as indicated at 25, and has an engaging portion 26 which is adapted to bear against the crown of an adjacent tooth 22 of the column stop bar when

the column stop is in position thereon, to prevent an accidental displacement of the column stop from the bar. Each retaining device 24 is formed with a spring extension 27 adapted to bear against the forward edge of the associated column stop and press the engaging portion 26 of the retaining device against the column stop bar with sufficient pressure to prevent the accidental displacement of the column stop from the bar. The column stop bar 21 is mounted on suitable brackets 28 secured to upwardly extending lugs 29 formed on the carriage truck near the ends thereof; it being understood that the column stop bar extends throughout, or substantially throughout, the length of the carriage. It will be observed that the engaging portions 30 of the column stops extend rearwardly different distances from the column stop bar and that four column stops of different length are shown in the present instance.

A single column selecting stop 31 is formed as a part of an upright arm or lever 32, and extends through a guide slot formed in a plate 33 carried by the top plate 5 of the machine. From an inspection of Fig. 3 it will be seen that the arm 32 is formed as an upward extension of an arm 34 apertured at 35 for cooperation with a pivot rod 36. This pivot rod is received in a depending portion, support or standard 37 of a cross bar 38 which is secured at its ends to the side plates 3 of the machine. The pivot rod 36 is secured in place in its bearing in the part 37 by a set screw 39. The lever 32—34 has a cross arm 40 riveted thereto at 41. The arm 40 is extended to form an arm 42 parallel with and similar to the arm 34. The arm 42 is likewise perforated as at 43, for cooperation with the pivot pin 36. A universal bar 44 extends between the two supporting arms 34 and 42 and is riveted at its ends to said arms. It will be seen that the stop carrying frame thus formed is pivotally supported on the pivot rod 36 to afford a swinging movement of the arm 32 fore and aft of the machine. A contractile spring 45 is connected at one end, as at 46, to the arm 32, and at its opposite end to a plate 47 fixed to the rear cross plate 4 of the frame. The power of this spring is exerted to normally maintain the stop 31, or upper engaging portion of the lever 32, in the position shown in Fig. 1 and out of the path of the column stops 23. Four column selecting actuated levers 48, 49, 50 and 51 are received and guided in slots in the supporting member 37 and are apertured at 52 for the reception of the pivot pin 36. The rear end portions of these levers are provided with engaging members 53 which extend beneath the universal bar 44 on the frame of the column selecting lever.

From an inspection of Figs. 4, 5, 6 and

7 it will be seen that the engaging portions 53 on the different column selecting levers are of different widths, considered vertically, and that the upwardly engaging faces therefore are normally arranged at varying distances from the universal bar 44. By this arrangement varying degrees of lost motion are provided between the different key actuated column selecting levers 48, 49, 50 and 51 and the universal bar 44, for purposes which will hereinafter more clearly appear. Each of these column selecting levers is also provided with an upwardly and rearwardly extending arm 54, apertured at 55 for cooperation with one end of a contractile spring 56 which is connected at its opposite end, as at 57, with the plate 47. Each of the column selecting key levers is also provided with a depending contact or engaging portion 58 which is adapted to cooperate with a universal carriage releasing device or member, designated as a whole by the reference numeral 59. This member comprises a plate-like cross-piece 60 and parallel side arms or ears 61 which are apertured at 62 for cooperation with the pivot pin 36, the arms 61 being received and guided in slots in the supporting member 37. A centrally disposed, upwardly and rearwardly directed lever arm 63 is riveted at its lower end to the cross plate 60 of this device in the rear of the pivot pin 36. The rear end of this arm is apertured at 64 for cooperation with one end of a contractile spring 65 which is connected at its opposite end to the plate 47. The arm 63 is also apertured at 66 for pivotal connection with a two-part link 67 by which the carriage is released from the control of the escapement mechanism and is simultaneously placed under control of the carriage retarding mechanism, as will hereinafter more clearly appear.

A set screw 68 is received in a tapped opening in the cross piece 60 and projects upwardly therefrom and is adapted to contact with the cross bar 38 when the parts are in the normal position, as shown in Fig. 1. From an inspection of this figure it will be seen that the engaging portions 58 on the key actuated column selecting levers normally extend above the cross plate 60 of the releasing device and are adapted to cooperate therewith at the last portion of the downward movement of the key actuated levers 48, 49, 50 and 51. This movement effects a turning movement of the member 59 on its pivot 36 to effect an upward movement of the arm 63. The same movement of the key-controlled lever is effective to bring about an engagement between the engaging portion 53 thereof and the universal bar 44 to effect a rocking movement of the lever 32, and to move the column selecting stop 31 forwardly a given distance, depending on

the particular key lever which is actuated. The extent of this forward movement of the stop 31 determines which column stop 23 the stop 31 will be brought into the path of. The forward end of each key controlled lever 48, 49, 50, 51 is provided with a reduced portion 69 which is received in a slotted portion of a key stem 70, which is guided in guide openings in upper and lower guide plates 71 and 72 respectively. The upper guide plate is secured to the frame of the machine by screws 73, whereas the lower guide plate is secured by screws 74 to inwardly projecting lugs 75 in the side plates of the frame.

From an inspection of Figs. 1 and 2 it will be seen that the upper end of each key stem is provided with a column selecting key 76, and that these keys bear column selecting indices such as the numerals "1", "2", "3" and "4", the lowest numeral "1" being on the left-hand key and indicating the first column, and the highest numeral "4" being on the right-hand key and indicating the fourth column. The lower end of each key stem has a washer 77 thereon which is held in place by a headed screw 78, received in a tapped opening in the lower end of the key stem. Each of these washers 77 is preferably made of fibrous material and is adapted to contact with the lower face of the plate 72, to limit the upward movement of its key stem and the parts controlled thereby. The plate 72 is bent downwardly at the rear portion thereof, as at 79, to form a support for a metallic casing 80, which is substantially U-shaped in cross section and is adapted to receive a felt pad 81 against which the lower edges of the key actuated levers 48, 49, 50 and 51 are adapted to bear to limit the downward movement thereof.

From an inspection of Fig. 1 it will be seen that the feed pinion 18 is fixed to an escapement wheel shaft 82 by a pin 83. This shaft receives a bearing at its upper end in a bracket 85, which latter is secured by screws 86 to a cross bar 87 fixed to the side plates of the machine. The shaft 82 is supported at its lower end by a pivot screw 88 received in a tapped opening 89 in the member 37. An outwardly projecting flange 93 which is operatively connected with the shaft 82 constitutes a support with which the hub 94 of an escapement wheel 95 co-operates. The escapement wheel turns freely on the shaft and is provided with ratchet-like clutch teeth 96 which extend upwardly therefrom. A spline 97 is fixed to the shaft 82 on opposite sides thereof by a pin 98 and bears at its lower end against the upper hub of the escapement wheel and within the line of the teeth 96 to prevent the escapement wheel from moving upwardly on the shaft 82.

A sleeve 99 surrounds the escapement wheel shaft 82 and is provided with a cir-

cumferential groove 100 therein. This sleeve 99 is slotted vertically on opposite sides as at 101 for the reception of the spline 97. This spline connection between the escapement wheel shaft 82 and the sleeve 99 is effective to lock the sleeve to rotate with the shaft although a vertical movement of the sleeve on the shaft may be effected. A clutch member or pawl 102 is formed on a yoke 103 which is pivoted at 104 on the sleeve 99. A light spring 105 is connected at one end to the yoke 103 and at its opposite end to the sleeve 99, by a screw 106. The force of this spring is exerted to turn the yoke 103 on its pivots to normally maintain the clutch tooth 102 in the lowermost or engaging position, and to maintain an engagement between the clutch tooth 102 and the clutch teeth 96 on the escapement wheel.

A release member 127 is in the form of two sheet metal strips riveted together at 128 and separated at the forward end to form a yoke. This yoke is provided with inwardly projecting pins 129 which are received in the circumferential groove 100 in the sleeve or clutch section 99. The rear end of this member 127 is pivoted at 130 to a depending pin 131 received at its upper end in an opening in the cross bar 87, and fixed therein by a set screw 132.

The parts are normally disposed, as indicated in Fig. 1. A depression of a column selecting key 76 is effective to move the corresponding actuating lever 48, 49, 50 or 51, thereby bringing the contact device 53 thereon into engagement with the universal bar 44. An upward swinging movement of this bar causes the arm 32 to be moved forwardly a distance corresponding to the particular column selecting key which has been actuated. The extent of forward movement of the stop portion 31 determines with which column stop the selecting stop 31 shall be brought into coöperation, and what columnar position the carriage will be arrested in. The depression of the column selecting key is likewise effective to turn the releasing device 59 on its pivot 36 to effect an upward movement of the link 67. This brings about an upward movement of the sleeve 99 from the position shown in Fig. 1. This movement of the sleeve effects a disengagement between the clutch members 102 and the coöperative clutch teeth 96 on the escapement wheel, thereby freeing the carriage from the control of the escapement wheel and the escapement dogs 133 and 134 that coöperate therewith.

From the foregoing description it will be understood that a depression of one of the column selecting keys 76 is effective to determine the columnar position of arrest of the carriage. If, for example, the first key from the left, bearing the index numeral "1" be

depressed, the stop 31 will receive the longest extent of forward movement to bring it into the path of the first or left-hand column stop 23, thus arresting the carriage in the first columnar position; whereas if the right-hand or fourth column selecting key 76 be depressed, the stop 31 will receive the shortest extent of forward movement so that it will be brought into the path of the engaging portion 30 on the fourth column stop, counting from left to right, thus enabling the first three column stops to pass the stop 31 and to effect an arrest of the carriage at the fourth columnar position.

It will be seen that the two universal bars 44 and 60 are pivoted on the same pivot rod 36 on which the column selecting levers turn; that these two universal bars are thus arranged on opposite sides of the fulcrum of said levers and are mounted for independent movement; that each of the levers 48, 49, 50 and 51 co-acts directly with both of said universal bars to move them in opposite directions, the universal bar 60 moving downwardly at the down stroke of a key and the universal bar 44 moving upwardly; that each of the key actuated levers 48, etc., acts on one universal bar as a lever of the first order and on the other universal bar as a lever of the second order; that the universal bar 60 forms part of a frame which constitutes in effect a lever of the first order for releasing the carriage, whereas the universal bar 44 and the frame, of which it forms part, constitute in effect a lever of the third order and of which the column selecting stop forms a part, and that the construction is such that the stop 31 may be given four extents of movement in but one direction from the normal position to coöperate with the column stops of different lengths.

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

1. In a typewriting machine and tabulating mechanism, the combination of a carriage, carriage releasing means, a variably movable column selecting stop, key actuated tabulator levers, and two independently movable universal bars arranged on opposite sides of the fulcrum of said levers and with which the levers directly co-act to move the universal bars in opposite directions at each stroke of a lever, the carriage releasing means being connected with one of said universal bars and the column selecting stop being connected with the other.

2. In a typewriting machine and tabulating mechanism, the combination of a carriage, carriage releasing means, a variably movable column selecting stop, key actuated column selecting levers and two independently movable universal bars arranged on opposite sides of the fulcrum of said levers and with which the levers directly co-

act to move the universal bars in opposite directions at each stroke of a lever, the carriage releasing means being connected with one of said universal bars and the column selecting stop being connected with the other, and said levers having varying extents of lost motion in their coöperation with the universal bar for said column selecting stop.

3. In a typewriting machine and tabulating mechanism, the combination of a carriage, carriage releasing means, a series of graduated column stops, a variably movable column selecting stop, key actuated tabulator levers, and two independently movable pivotally mounted universal bars with which the levers directly co-act, each lever acting as a lever of the first order on one universal bar and as a lever of the second order on the other universal bar, the carriage releasing means being connected with one of said universal bars and the column selecting stop being rigidly connected with the other of said universal bars.

4. In a typewriting machine and tabulating mechanism, the combination of a carriage, escapement mechanism therefor, a variably movable column selecting stop, key actuated tabulator levers, and two independently movable universal bars arranged on opposite sides of the fulcrum of said levers and with which the levers directly co-act to move one of said universal bars up and the other down at the depression of any of said levers, a clutch by which the carriage is placed under control of its escapement mechanism, and means for operatively connecting said clutch with one of said universal bars, the other of said bars being connected with the column selecting stop.

5. In a typewriting machine and tabulating mechanism, the combination of a carriage, escapement mechanism therefor, a clutch by which the carriage is placed under control of the escapement mechanism, a series of key actuated stop controlling tabulator levers, a universal bar arranged beneath said levers and with which the levers directly co-act, said universal bar being in the nature of a plate formed as an integral part of a pivoted frame which is in effect a lever of the first order, means for operatively connecting said universal bar and clutch to release the clutch and free the carriage when the universal bar is depressed, and adjustable means for limiting the return movement of said universal bar.

6. In a typewriting machine and tabulating mechanism, the combination of a carriage, escapement mechanism therefor, a clutch by which the carriage is placed under control of the escapement mechanism, a series of key actuated stop controlling tabulator levers, a universal bar arranged beneath said levers and with which the levers

directly co-act, said universal bar being in the nature of a plate formed as an integral part of a pivoted frame which is in effect a lever of the first order, an upwardly extending link which is connected with said universal bar, a lever controlled by said link, and means for operatively connecting said lever with said clutch to release the clutch on the depression of a key lever and free the carriage from control of the escapement mechanism.

7. In a typewriting machine, the combination of a power driven carriage, a series of graduated column stops carried thereby, a pivoted frame carrying a column selecting stop and a universal bar, a series of key actuated column selecting levers which are coöperative with said universal bar to effect varying extents of movement of said frame and varying extents of movement of the column selecting stop into the paths of the graduated column stops, a slotted support or standard in the slots in which the levers and portions of the frame are received and guided, and a single pivot rod carried by said support and on which the selecting levers and frame are pivoted.

8. In a typewriting machine, the combination of a power driven carriage, a series of graduated column stops carried thereby, a pivoted frame carrying a column selecting stop and a universal bar, and a series of key actuated column selecting levers which are coöperative directly with said universal bar to effect varying extents of movement of said frame and varying extents of movement of the column selecting stop into the paths of the graduated column stops, said key actuated column selecting levers having varying extents of lost motion in their coöperation with said universal bar.

9. In a typewriting machine, the combination of a power driven carriage, escapement mechanism therefor, a clutch which renders the escapement mechanism effective to control the carriage, a series of graduated column stops carried thereby, a pivoted frame carrying a column selecting stop and a universal bar, a series of key actuated column selecting levers which are coöperative with said universal bar to effect varying extents of movement of said frame and varying extents of movement of the column selecting stop into the paths of the graduated column stops, escapement mechanism, and separate means controlled by said column selecting key actuated levers for effecting a release of said clutch to free the carriage from control of the escapement mechanism when the pivoted frame is actuated.

10. In a typewriting machine, the combination of a power driven carriage, a series of graduated column stops carried thereby, a pivoted frame carrying a column selecting stop and a universal bar, a series of key

actuated column selecting levers which are coöperative with said universal bar to effect varying extents of movement of said frame and varying extents of movement of the column selecting stop into the paths of the graduated column stops, said key actuated column selecting levers having varying extents of lost motion in their coöperation with said universal bar, escapement mechanism, a second universal release bar or frame with which all of said column selecting key actuated levers coöperate, and connections from said release frame to the escapement mechanism for effecting a release of the carriage from control of the escapement mechanism.

11. In a typewriting machine, the combination of a power driven carriage, a series of graduated column stops carried thereby, a pivoted frame carrying a column selecting stop and a universal bar, a series of key actuated column selecting levers which are coöperative with said universal bar to effect varying extents of movement of said frame and varying extents of movement of the column selecting stop in but one direction from its normal position and into the paths of the graduated column stops, escapement mechanism, clutch mechanism which operatively connects the carriage with said escapement mechanism, a universal release bar or frame with which all of said key actuated column selecting levers coöperate, and intermediate connections between said release frame and said clutch mechanism.

12. In a typewriting machine, the combination of a carriage, column stops of different lengths carried thereby, a frame which is in the nature of a lever of the third order, a column selecting stop forming a rigid part of said frame, a universal bar which likewise forms a part of said frame, and a series of key actuated column selecting levers coöperative directly with said universal bar to move it variably and thus effect varying extents of movement of the column selecting stop into the path of a longer or shorter column stop depending on the particular selecting lever which is actuated, there being varying extents of lost motion between said levers and said universal bar.

13. In a typewriting machine, the combination of a carriage, column stops of different lengths carried thereby, a frame which is in the nature of a lever of the third order, a column selecting stop forming a rigid part of said frame, a universal bar which likewise forms a part of said frame, a series of key actuated column selecting levers coöperative directly with said universal bar to move it variably and thus effect varying extents of movement of the column selecting stop into the path of a longer or shorter column stop depending on the particular selecting lever which is actuated, there be-

ing varying extents of lost motion between said levers and said universal bar, a second independently movable universal bar arranged beneath said levers and with which the levers directly co-act, and carriage releasing means controlled by said second universal bar.

14. In a typewriting machine, the combination of a carriage, column stops of different lengths carried thereby, a frame which is in the nature of a lever of the third order, a column selecting stop forming a rigid part of said frame, a universal bar which likewise forms a part of said frame, a series of key actuated column selecting levers coöperative directly with said universal bar to move it variably and thus effect varying extents of movement of the column selecting stop into the path of a longer or shorter column stop depending on the particular se-

lecting lever which is actuated, there being varying extents of lost motion between said levers and said universal bar, a second independently movable universal bar arranged beneath said levers and with which the levers directly co-act, said second universal bar forming part of a frame which is in the nature of a lever of the first order, and a carriage releasing clutch with which said second universal bar is operatively connected.

Signed at the borough of Manhattan, city of New York, in the county of New York, and State of New York, this 16th day of August, A. D. 1912.

ARTHUR W. SMITH.

Witnesses:

E. M. WELLS,

M. F. HANNWEBER.