Nov. 16, 1937. C. GABRIELSON ET AL 2,099,011

TYPEWRITING MACHINE

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Fig. 1.

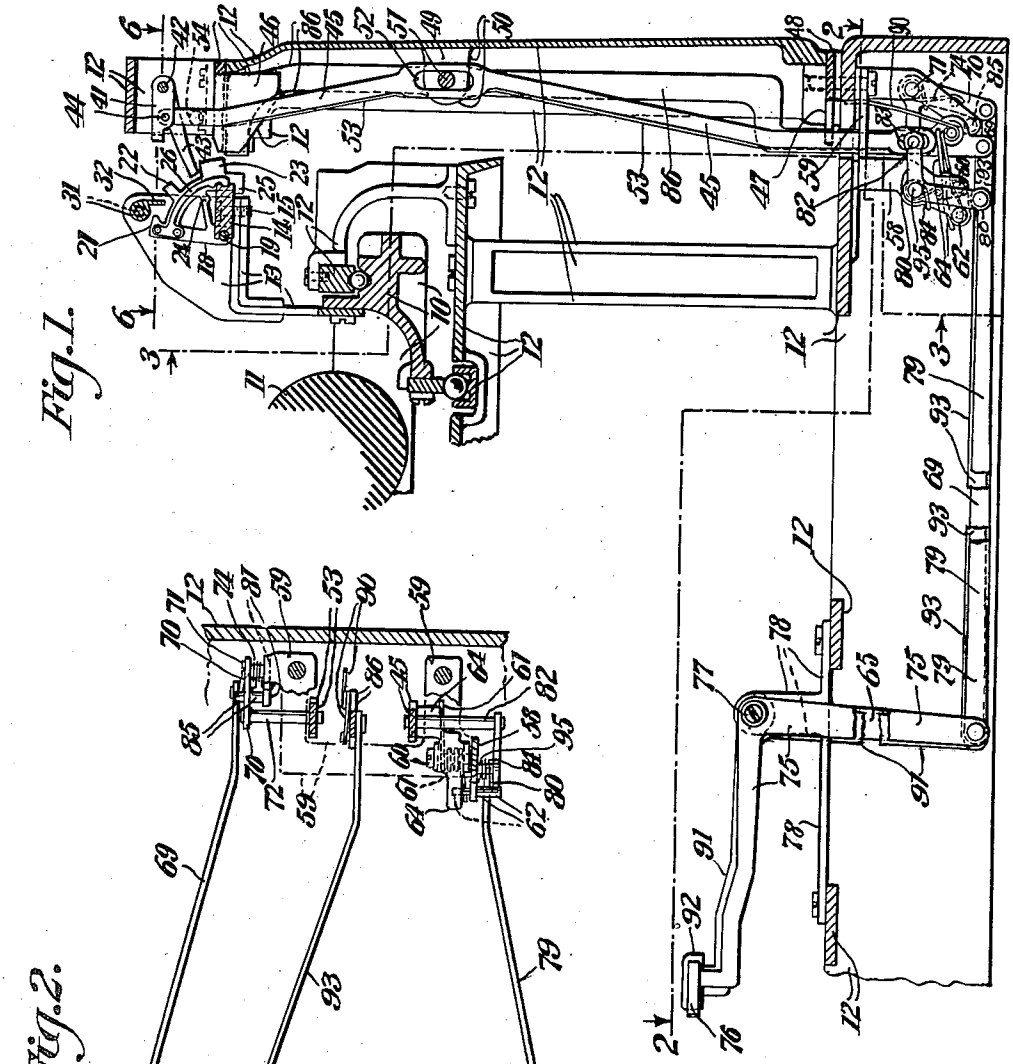


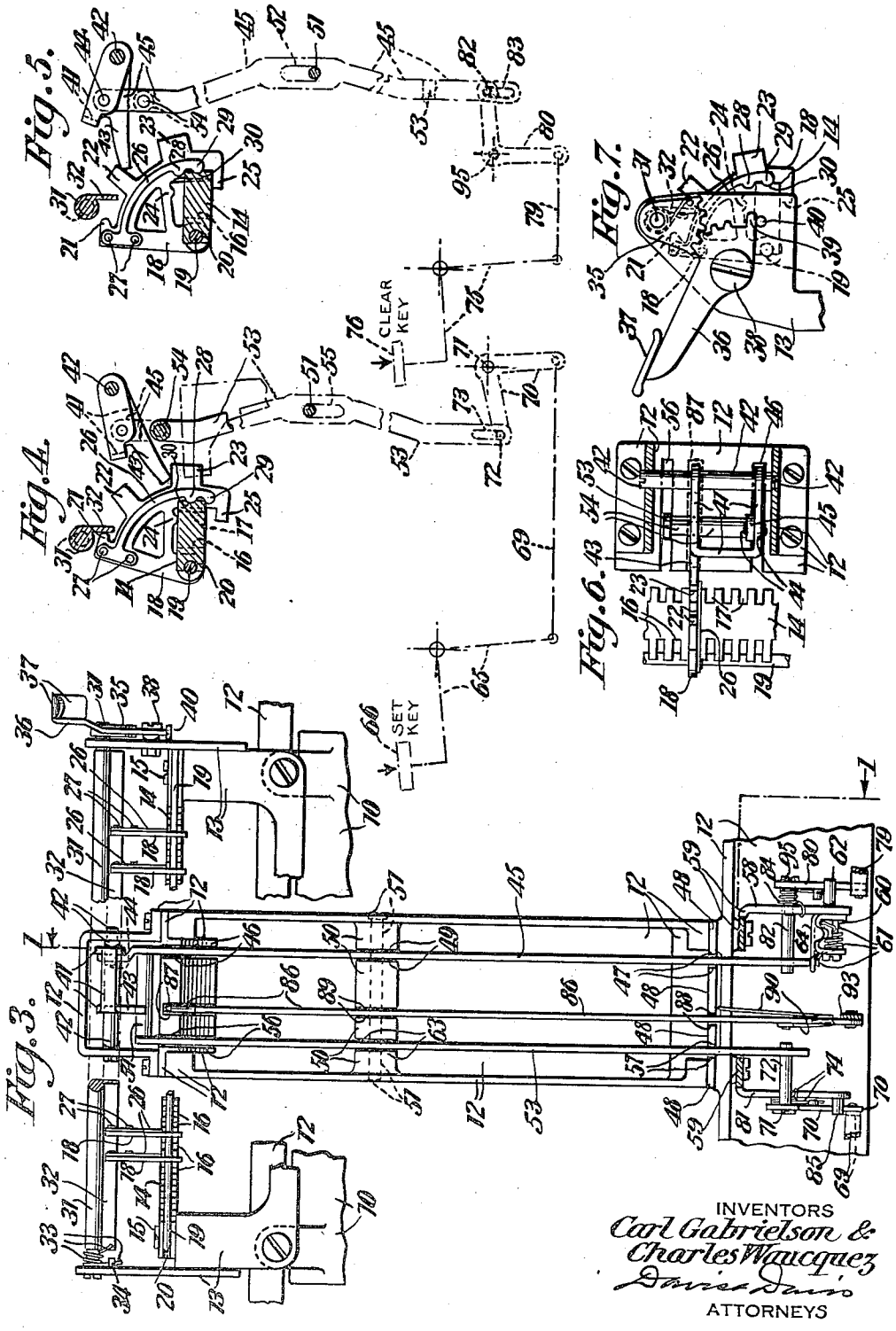
Fig. 2.

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2,099,011

TYPEWRITING MACHINE

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13 Claims. (Cl. 197—179)

This invention relates to improvements in typewriting machines and more particularly to the tabulating mechanism of such machines.

The principal object of the invention is to provide a typewriting machine having an improved key-set tabulating mechanism.

A further object of the invention is to provide in a tabulating mechanism simple and efficient key-controlled means whereby column stops for a traveling carriage may be either individually and selectively set in operative and inoperative or cleared position or may all be simultaneously set in inoperative or cleared position.

Another object of the invention is to provide an improved construction of the settable column stops, and of the mounting for said stops, of a key-set tabulating mechanism.

Another object of the invention is to provide an improved construction of column stops, column stop mounting means, and key-controlled setting means for the column stops.

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

In the accompanying drawings, which illustrate the preferred embodiment of the invention:

Fig. 1 is a fragmentary sectional view of a typewriting machine having the invention embodied therein, the section being taken on the line 1—1 of Fig. 3, and the parts of the stop setting means being shown in neutral or idle position;

Fig. 2 is a fragmentary sectional view of the machine taken on the line 2—2 of Fig. 1;

Fig. 3 is a fragmentary sectional view of the machine taken on the line 3—3 of Fig. 1, certain parts being broken away for clarity of illustration of the stop setting means;

Figs. 4 and 5 are detail views illustrating, respectively, the setting of a column stop individually in operative position, and the setting of a column stop individually in inoperative or cleared position;

Fig. 6 is a detail sectional view taken approximately on the line 6—6 of Fig. 1; and

Fig. 7 is a detail view showing in elevation part of the right hand end of the platen carriage.

The invention has been shown embodied in an L. C. Smith typewriting machine, only so much of this known machine as is necessary for a clear understanding of the present invention having been illustrated in the drawings. The platen carriage 10 of the machine supports the platen 11 and is mounted, as usual, on the stationary main framework 12 of the machine to travel back and forth transversely of the machine and to be letter spaced from right to left under control of the usual carriage escapement mechanism (not shown). The carriage of the machine is releasable from control of said escapement mechanism by the usual escapement release or carriage release mechanism (not shown) for running or tabulating jump movements of the carriage from right to left. Adjacent opposite ends of the carriage, and fixedly held to the carriage, are two brackets 13 which support the respective ends of a column stop carrying bar 14 with said bar extending horizontally transversely of the machine. The stop bar, at each end thereof, is fixedly held to the adjacent bracket 13 by a screw 15. Excepting the construction of the stop bar 14, the parts above mentioned are constructed substantially as in the L. C. Smith machine referred to above, and substantially as shown in the prior Patent No. 1,826,763, granted October 13, 1931. The improvements will now be described.

The stop bar 14 is of oblong cross-section and is held to brackets 13 with its two wider faces disposed in superposed horizontal planes. Formed in the front edge of the bar is a series of column stop spacing and guiding grooves or slots 16 each extending vertically entirely across the front face or edge of the bar. Formed in the rear edge of the bar is a corresponding series of column stop spacing and guiding grooves or slots 17 each of which extends vertically entirely across the rear face or edge of the bar, each slot 17 being directly opposite a different one of the slots 16. The slots of each series are spaced a letter space apart, and there is one slot 16 and an opposed slot 17 for each letter space position of the platen carriage. Settable column stops 18, one stop for each letter space position of the carriage, are rockably mounted on the stop bar, certain of the stops 18 being omitted from the drawings for clarity of illustration.

A stationary pivot rod 19 for the series of stops 18 extends horizontally transversely of the machine across all of the slots 16 and is fixedly held in an undercut groove 20 formed in the front face of the stop bar 14. Each stop 18 comprises a toothed sheet metal sector pivoted on rod 19 and guided in an opposed pair of the slots 16 and 17, the toothed arcuate edge of each sector having three teeth 21, 22 and 23. Each sector-like stop 18 is provided, between its pivot and its toothed edge, in its lower edge with a

clearance recess or notch for the stop bar, which recess or notch permits limited rocking of the stop about its pivot relatively to the bar and also provides limiting stop or abutment portions 24 and 25 on the column stop spaced apart for engagement of said portion 24 with the top face of bar 14 to limit rocking of the stop rearward and downward about its pivot and for engagement of said portion 25 with the bottom face of bar 14 to limit rocking of the stop forward and upward about its pivot. Portions 24 and 25 of each stop are arranged to engage the respective ones of said bar faces between the inner ends of the pair of opposed slots 16 and 17 in which the stop is guided and rocks. The toothed edges of stops 18 face in general rearwardly and upwardly in the machine.

When a stop 18 is rocked in one direction to the limit permitted by abutment 24 it is in its operative position, and when the stop is rocked in the opposite direction to the limit permitted by abutment 25 it is in its inoperative position. To releasably hold the stop in either of said positions when shifted thereinto, each stop has at one of its side faces a resilient latch finger 26, which finger is fixedly held at one of its ends to the stop at 27 and has adjacent its other and free end two forwardly extending projections 28 and 29 having rounded end edges alternatively engageable in a longitudinal groove 30 formed in the rear edge or face of stop bar 14. Projection 28 is adapted to snap into groove 30 when abutment 24 engages the top face of bar 14, and projection 29 is adapted to snap into groove 30 when abutment 25 engages the bottom face of bar 14, as is best shown in Figs. 1, 4, 5 and 7.

There is provided on the platen carriage key-controlled means operable to rock simultaneously into inoperative position all column stops 18 which are in operative position when said key-controlled means is actuated. There is also provided on the machine frame key-controlled means whereby any selected column stop may be rocked independently of the other column stops from either its operative position or inoperative position to the other one of said two positions. The aforesaid key-controlled means on the carriage and the aforesaid key-controlled means on the machine frame will now be described.

Extending horizontally transversely of the machine above bar 14 and journalled in the brackets 13 fixed to the platen carriage, is a rock shaft 31 having a pendent rigid fin 32 extending therealong, which fin extends down between teeth 21 and 22 of the stops 18. A spring 33 coiled about shaft 31 adjacent one end of the shaft has its ends engaged with the fin 32 and with a projection 34 on one of the brackets 13 to normally urge the shaft and fin into, and hold them in, the position shown in the drawings. At the opposite end of shaft 31 there is fixed on the shaft a sector gear 35 the teeth of which mesh with the teeth of the sector gear arm of a two-arm key lever 36, the other arm of which key lever is formed with a key 37. Key lever 36 is pivoted on the adjacent bracket 13 at 38 to rock up and down about a horizontal axis which extends transversely of the machine. The sector gear arm of lever 36 is provided with a stop finger 39 which is normally engaged over a stop pin 40 held to the adjacent bracket 13, said stop finger and pin serving to arrest return movement of the key lever, rock shaft and rock shaft fin by spring 33 with the said parts positioned as shown in the drawings. Upon depression of key 37, all operatively set ones of the stops 18 will be rocked into inoperatively set position by the resultant forward and upward movement (clockwise movement as viewed in Fig. 4) of fin 32, and the stops will remain inoperatively set upon return or upward movement of key 37 (as is obvious from Figs. 5 and 7, for example), the spacing apart of teeth 21 and 22 being sufficient to permit any stop to rock from operative to inoperative position or vice versa without rocking fin 32 from normal position, and also being such that both operatively and inoperatively set stops may travel with the carriage without obstruction of carriage travel by reason of teeth 21 and 22 engaging the fin 32.

The stop setting means on the machine frame whereby individual column stops may be set in operative position or in inoperative position, as desired, will now be described. Said means comprises an individual stop setter or setting device rockably mounted on the machine frame to swing about an axis which extends horizontally transversely of the machine, which device is engageable with but a single column stop at a time and is engageable with the respective column stops at a letter space position of the carriage which is different for each column stop. Said setter or device comprises a yoke 41 the legs of which are pivoted at their rear ends on a fixed pin 42 which extends horizontally transversely of the machine and is stationarily mounted in the framework 12 of the machine above and rearward of stop bar 14. The cross-bar of the yoke is to the front of the yoke pivot but rearward of the teeth of the sector-like column stops 18. One leg of the yoke is formed with a stop-setting finger 43 which extends forward beyond the yoke cross-bar.

By the following key-controlled means, the stop setter 41—43 is rockable by key-applied force into either the position shown in Fig. 4 or the position shown in Fig. 5 and is automatically returned from either of said positions (upon release of the key-applied force), to an idle or normal neutral position intermediate said two positions, which idle or neutral position of the setter is that in which it is shown in Figs. 1 and 3. Forward of the yoke pivot 42 there is pivotally held at 44 to the right hand leg of yoke 41 the upper end of a vertically disposed and vertically reciprocable rigid link 45. Link 45 is guided adjacent its upper end in a slot 46 in framework 12, is guided adjacent its lower end in a slot 47 in a guide comb 48 held to framework 12, and substantially midway its ends said link is guided in a slot 49 in a boss 50 formed on the framework 12. A pin 51 extends horizontally transversely of the machine through slotted boss 50 and is stationarily held therein. Link 45 has a vertical guide slot 52 therein through which pin 51 extends to guide the link substantially vertically and to limit up and down movement of the link relatively to the pin and the framework 12, said pin, in the idle neutral position of the setter 41—43, extending through slot 52 midway the ends of the slot as shown in Fig. 1. To the left of and opposite link 45 is a second vertically disposed and reciprocable rigid link 53 held in parallelism with link 45 by a rigid cross-pin or cross-rod 54 which extends horizontally transversely of the machine from the upper end of link 53 to link 45 below the pivoted upper end of the latter link and is fixedly held to both said links. Link 53 is guided similarly to link 45, having a vertical guide slot 55 through which pin 51 extends and also being guided adjacent its upper end in

a slot 56 in framework 12, guided adjacent its lower end in a slot 57 in guide comb 48, and guided also in a slot 63 in boss 50. Links 45 and 53 and their cross-connecting rod 54 form a rigid upstanding link device pivotally held at its upper end to stop setter 41—43 and guided for substantially vertical reciprocation within positively fixed limits.

Said stop setter and link device are normally urged downwardly by gravitational force. To the pendent arm 58 of a bracket 59 fixedly held to framework 12, there is pivoted, on a pivot 60 held to said bracket arm, a fore-and-aft extending stop lever 64 which is normally urged about its pivot in counterclockwise direction as viewed in Fig. 1 by a spring 61 into the position shown in Figs. 1 and 3, in which position a stop pin 62, extending through and fixedly held in bracket arm 58, engages under the forward arm of the stop lever and downward movement of setter 41—43 and the link device 45—53—54 under gravitational force is stopped (with the setter in neutral position) by the engagement of the rear arm of the stop lever under the lower end of link 45. While the strength of spring 61 is such that stop lever 64 stops downward movement of the stop setter and link device under gravitational force upon arrival of the stop setter at its neutral position, the said spring-urged stop lever 64 permits the link device to be positively pulled downward into the position shown in Fig. 4 and also serves to restore the link device and stop setter to the idle position shown in Figs. 1 and 3 upon release of the force applied to pull the link device and stop setter down into the position of Fig. 4.

The following spring-returned key-actuated mechanism is provided for shifting the stop setter and link device from the position of Figs. 1 and 3 into the position of Fig. 4. A bellcrank key lever 65, having a forwardly extending arm bearing a key 66 and also having a pendent arm, is fulcrumed on a pivot screw 67 to rock about a horizontal axis extending transversely of the machine, said screw extending horizontally transversely of the machine through a bracket 68 fixedly held to framework 12, in which bracket the screw is threaded. The pendent arm of bellcrank key lever 65 is connected by a fore-and-aft extending rigid link 69 to the pendent arm of a bellcrank lever 70. Lever 70 is pivotally supported at 71 on a pendent arm 81 of bracket 59 to rock about a horizontal axis extending transversely of the machine, and has a forwardly extending arm which is provided with a pin 72 which extends horizontally transversely of the machine through a closed vertical slot 73 formed in link 53 adjacent the lower end of said link. Bellcrank 70 is normally urged about its pivot in one direction (clockwise direction as viewed in Fig. 1) by a return spring 74 into the position shown in Figs. 1, 2 and 3 in which said spring holds key lever 65 and bellcrank 70 in normal position, with pin 72 midway the upper and lower ends of slot 73 and with the pendent arm of bellcrank 70 rocked forward against a stop pin 85 projecting from arm 81.

The following spring-returned key-actuated mechanism is provided for shifting the stop setter and link device from the position of Figs. 1 and 3 into the position of Fig. 5. A bellcrank key lever 75, similar to key lever 65 and bearing a key 76 on its forwardly extending arm, is fulcrumed on a pivot screw 77 to rock about a horizontal axis extending transversely of the machine, said screw extending horizontally transversely of the machine through a bracket 78 fixedly held to framework 12, in which bracket the screw is threaded. The pendent arm of key lever 75 is connected by a fore-and-aft extending rigid link 79 to the pendent arm of a bellcrank lever 80. Lever 80 is pivotally supported at 95 on the pendent arm 58 of bracket 59 to rock about an axis extending horizontally transversely of the machine, and has a rearwardly extending arm which is provided with a pin 82 which extends horizontally transversely of the machine through a closed vertical slot 83 (similar to and opposite slot 73) formed in link 45 adjacent the lower end of said link. Bellcrank 80 is normally urged about its pivot in one direction (clockwise direction as viewed in Fig. 1) by a return spring 84 into the position shown in Figs. 1, 2 and 3 in which said spring holds key lever 75 and bellcrank 80 in normal position, with pin 82 midway the upper and lower ends of slot 83 and with the pendent arm of bellcrank 80 rocked forward against the stop pin 62 carried by bracket arm 58.

The lost-motion pin-and-slot connections between the link device 45—53—54 and the two key-actuated spring-returned mechanisms last above described permit shifting of the link device by either of said key-actuated mechanisms without imparting movement to the other one of said key-actuated mechanisms.

The thickness transversely of the machine of finger 43 of the stop setter 41—43 is substantially equal to that of each column stop 18, and in each letter space position of travel of the carriage a different stop 18 is located in the same vertical fore-and-aft plane through the machine in which the finger 43 lies. The spacing apart of teeth 22 and 23 of each stop 18 is such that, during travel of the carriage when the stop setter is in neutral position, tooth 22 of each stop will pass above finger 43 and tooth 23 of each stop will pass below finger 43 whether the stop be set in operative position or in inoperative position. Said spacing apart of teeth 22 and 23 of each stop is also such that, when the carriage is in a letter space position, the stop for that position of the carriage is rockable downwardly into operatively set position by the action of finger 43 on tooth 23 (as shown in Fig. 4) upon depression of key 66, or is rockable upwardly into inoperatively set position by the action of finger 43 on tooth 22 (as shown in Fig. 5) upon depression of key 76, and said stop, after release of pressure on either of said keys, will remain in that position into which it was shifted by the depression of the key.

When, and only when, any stop 18 is in its operatively set position, tooth 23 of the stop will travel with the carriage in a path in which said tooth is adapted to abut a settable counter stop 86 mounted on the framework 12. Counter stop 86 comprises an upstanding stop lever pivoted intermediate its ends on pin 51 and guided in a slot 87 in framework 12, guided in a slot 88 in comb 48, and guided in a slot 89 in boss 50. The upper, or stop tooth engaging end of stop lever 86 is normally held retracted in slot 87 out of the path of teeth 23 of operatively set stops 18 by means of a return spring 90 for the stop lever, and is rockable into said path of tooth travel by means of a bellcrank key lever 91. Key lever 91 has two forwardly extending arms bearing a key 92, and also has a pendent arm which is connected by a rigid fore-and-aft extending

link 93 with the lower end of counter stop lever 86. Bellcrank key lever 91 has a hub which is journalled on the inner ends of the pivot screws 67 and 77. Counter stop 86, upon actuation thereof into set position, preferably actuates the escapement release mechanism of the machine to release the carriage for a tabulating running or "jump" travel from right to left through means similar to that shown in the prior patent hereinbefore mentioned. The upper end of stop 86 normally abuts at its rear edge the rear end of slot 87. A suitable return spring 94 is provided for key lever 91.

What we claim is:

1. A typewriting machine having a tabulating mechanism which comprises two rockable stop setters and a series of independently rockable column stops, each of which stops comprises a toothed sector having three teeth, said series of stops and one of said stop setters being mounted to travel in unison relatively to the other stop setter with said one stop setter extending into one of the two tooth spaces between the teeth of each said stop, said one stop setter being rockable to simultaneously set in inoperative position all operatively set ones of the stops, and the other stop setter being rockable to individually set the stops in either operative or inoperative position and being normally held in an idle position in which it extends into the other tooth space of each one of said stops at a different point in the relative travel between said stop setter and the series of stops.

2. A typewriting machine having a tabulating mechanism comprising a series of traveling column stops each comprising a toothed sector and pivoted to rock independently of all the others about an axis parallel to the path of travel of the series of stops into inoperatively and operatively set positions, a non-traveling stop setter pivoted to rock about an axis parallel to the path of travel of the series of stops and normally urged into an idle position in which the stops are successively registrable therewith, whether operatively or inoperatively set, with said setter extending into a given tooth space of the registered stop which is the same for all stops, said stop setter when shifted in different directions from idle position and returned thereto being adapted to set a stop registered therewith in different ones of its set positions and leave it there.

3. A typewriting machine as claimed in claim 2, wherein there is provided a second stop setter which is mounted to travel with the series of stops and rock about an axis parallel to the path of travel of the series of stops, which second stop setter extends into another tooth space of all stops, and is normally urged into an idle position from which it is rockably shiftable in one direction only, in shifting from which idle position the second stop setter will inoperatively set all operatively set stops, and in returning to which idle position the second stop setter will leave all of the stops inoperatively set.

4. A typewriting machine as claimed in claim 2, wherein there is provided a non-traveling counterstop for the column stops, and key-controlled means for shifting said counterstop from a normal idle position out of the path of travel of both operatively and inoperatively set column stops into an operative position in which the counterstop is in the path of travel of a tooth of each of the operatively set ones only of the column stops.

5. A typewriting machine having a tabulating mechanism comprising a series of settable column stops arranged side by side and each comprising a toothed sector pivoted to swing independently of all the others into operatively and inoperatively set positions, means maintained in the same tooth space of all stops and operable to set the latter in inoperative position, and means operable in another tooth space of the stops, and in that tooth space of only one stop at a time, to set and leave any one of the stops in either operative position or in inoperative position as desired.

6. A typewriting machine having a tabulating mechanism comprising a column stop carrying bar slotted at opposite edges of the bar, a series of column stops each comprising a toothed sector pivotally held to said bar adjacent one of said slotted edges of the bar to rock relatively to the bar between operatively and inoperatively set positions and each guided in two of said slots at different ones of said opposite slotted edges of the bar, and means coactive with the teeth of said stops for operatively and inoperatively setting said stops.

7. A typewriting machine having a tabulating mechanism comprising a column stop carrying bar slotted at opposite edges of the bar, a series of column stops each comprising a toothed sector pivotally held to said bar adjacent one of said slotted edges of the bar to rock relatively to the bar between operatively and inoperatively set positions and each guided in two of said slots at different ones of said opposite slotted edges of the bar, means coactive with the teeth of said stops for setting said stops in operative and inoperative position, and a counterstop settable to coact with a given tooth of each operatively set stop.

8. In a typewriting machine, tabulating mechanism comprising two key-actuated spring-returned means mounted on the frame of the machine, a platen carriage mounted to travel relatively to the frame of the machine, a series of settable column stops mounted to travel with the carriage and for shifting independently of each other relatively to the carriage into operatively and inoperatively set positions, means on the main frame oppositely shiftable by said two key-actuated means from a normal idle position to which said oppositely shiftable means is automatically returned upon spring-return of each of said key-actuated means, said oppositely shiftable means and said stops being coactive for setting said stops one at a time by said means in operative position upon actuation of one of said key-actuated means and in inoperative position upon actuation of the other key-actuated means, said oppositely shiftable means comprising a pivoted stop setter and a link device pendent from said setter and connected with both said key-actuated means for longitudinal movement thereby in opposite directions from a normal idle position, a spring-urged lever normally urged upward under said link device and supporting the latter with said link device and stop setter in normal idle position, and a stop against which said lever is normally spring urged.

9. In a typewriting machine having a platen carriage which travels back and forth on the frame of the machine, tabulating mechanism for the carriage comprising a series of column stops mounted side by side for rocking of each stop independently of all the others about an axis which is parallel to the path of travel of the carriage into operatively set and inoperatively set posi-

tions in each of which the stop will remain until positively rocked therefrom, each stop having a pair of opposed abutments spaced apart around its axis, and a setter for said stops mounted for rocking of said setter in each of two opposite directions about a second axis parallel to the first-mentioned axis out of a normal idle position of the setter into which the setter is normally urged, said stop setter and series of stops being mounted one on the carriage of the machine and the other on the frame of the machine for presentation of said stops one at a time to the setter with the setter interposed between the spaced abutments of the stop presented thereto for rocking of the presented stop alone by the setter from either of the two set positions of the stop to the other, the presented stop being rockable into its different set positions by thrust of the setter against different ones of the stop abutments during rocking movement of the setter in different directions from the idle position of the setter, and each stop having the pair of abutments thereon so spaced about the stop axis that the setter is ineffective throughout the return movement of the setter to idle position to exert thrust on either of said abutments of a stop presented to the setter.

10. A typewriting machine of the kind having tabulating mechanism for arresting a traveling platen carriage of the machine in any selected one or more of the letter-space feed positions of the carriage, wherein said tabulating mechanism comprises a stop carrying bar slotted at two opposite edges of the bar, a stop pivot member held to the bar and extending across the slots at one edge of the bar, a series of stops pivoted on said pivot member and each guided in a different pair of said slots, one slot of each pair at each of said edges of the bar, said slots and stops being so arranged and of such number that there is one stop for each letter-space feed position of the carriage, each stop having two spaced and opposed abutments engageable with said bar to arrest rocking of the stop about said pivot member with said stop in operatively and inoperatively set positions, detent means carried by each stop and coactive with said bar to detain each stop in either operatively or inoperatively set position, means coactive in each letter space feed position of the carriage with a different and single one only of said series of stops to rock that stop to either operatively or inoperatively set position and leave it there, and counter stop means for coaction with operatively set ones of said series of stops to arrest the carriage in letter space feed positions determined as to number and position by operatively set ones of said series of stops.

11. A typewriting machine as claimed in claim 10, wherein the means coactive in each letter space feed position of the carriage with a different and single one only of said series of stops comprises a stop setter normally urged into an intermediate idle position from which it is oppositely rockable about an axis parallel to said stop pivot member, and wherein each stop of said series of stops has two opposed abutments spaced about said pivot member for thrust by said setter upon different ones of said abutments to respectively operatively and inoperatively set the stop and leave it so set, the operative or inoperative setting of the stop being dependent upon the direction of rocking of the setter about its axis.

12. A typewriting machine as claimed in claim 10, wherein there is provided a universal stop setter rockable about an axis which is parallel to the pivot member for said series of stops, which stop setter is normally urged into an idle position from which it is rockable about said axis to inoperatively set all operatively set stops of the series of stops and leave them so inoperatively set, and each stop of said series of stops is provided with an abutment presented at all letter space feed positions of the carriage for thrust of said universal stop setter against said abutment to rock the stop to inoperatively set position, if said stop be operatively set, during rocking of the universal setter out of its idle position.

13. In a typewriting machine having a traveling platen carriage mounted on its frame and a series of column stops mounted on the carriage for individual shifting to operative and inoperative positions, stop-setting means for said stops comprising a pair of bellcrank key levers fulcrumed on the machine frame and each having a forwardly extending key-bearing arm and a pendent arm, a pair of links each pivoted to the pendent arm of a different one of the respective key levers and extending rearward therefrom, a pair of bellcrank sub-levers fulcrumed on the frame and each having a pendent arm, each of said links being pivoted at its rear end to the pendent arm of a different one of said bellcrank sub-levers, one of said sub-levers having a forwardly extending arm and the other having a rearwardly extending arm, and means on the frame connected with the two last-mentioned arms of the sub-levers for shifting of said means in opposite directions from a normal idle position upon depression of the key-bearing arm of different ones of the key levers, said last-mentioned means being effective on each column stop, in a position of travel of the carriage which is different for each stop, to set the stops individually into operative or inoperative position and leave them there, the position into which a stop is set and left by said last-mentioned means being dependent upon which one of the bellcrank key levers is actuated to set the stop.

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