J. WALDHEIM.

TYPE WRITING MACHINE.

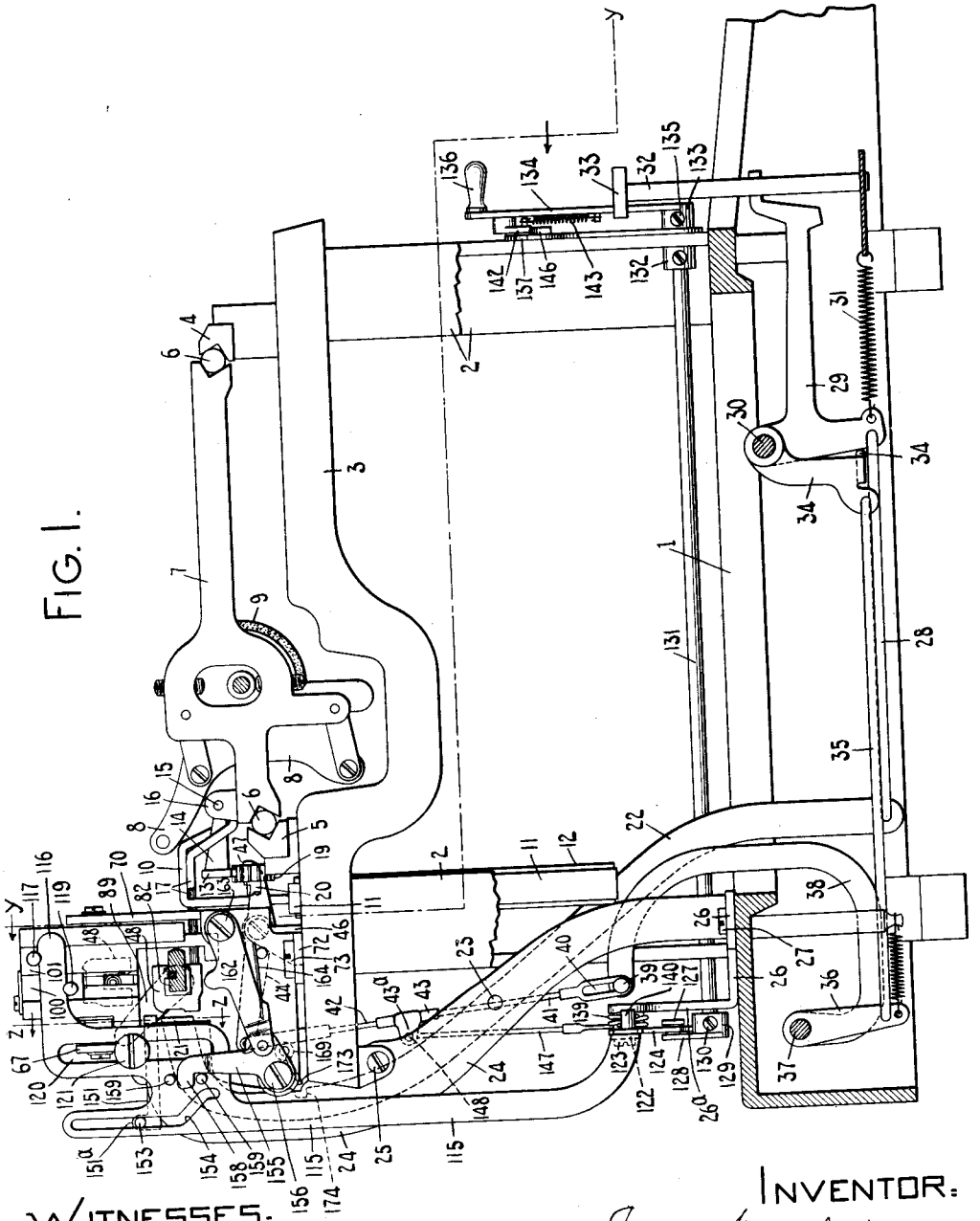
APPLICATION FILED JUNE 7, 1912.

1,066,443.

Patented July 1, 1913.

4 SHEETS—SHEET 1.

FIG. 1.



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4 SHEETS—SHEET 2.

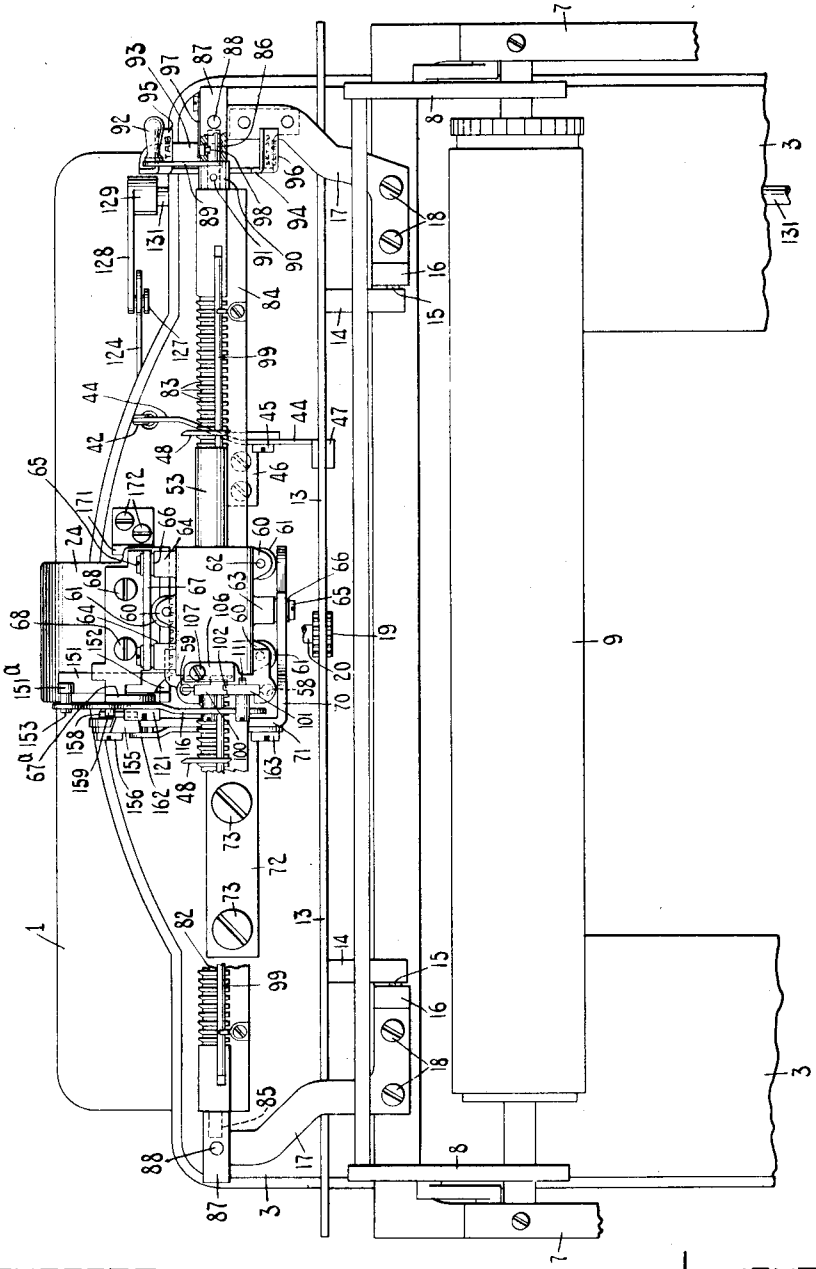

FIG. 2.

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4 SHEETS—SHEET 3.

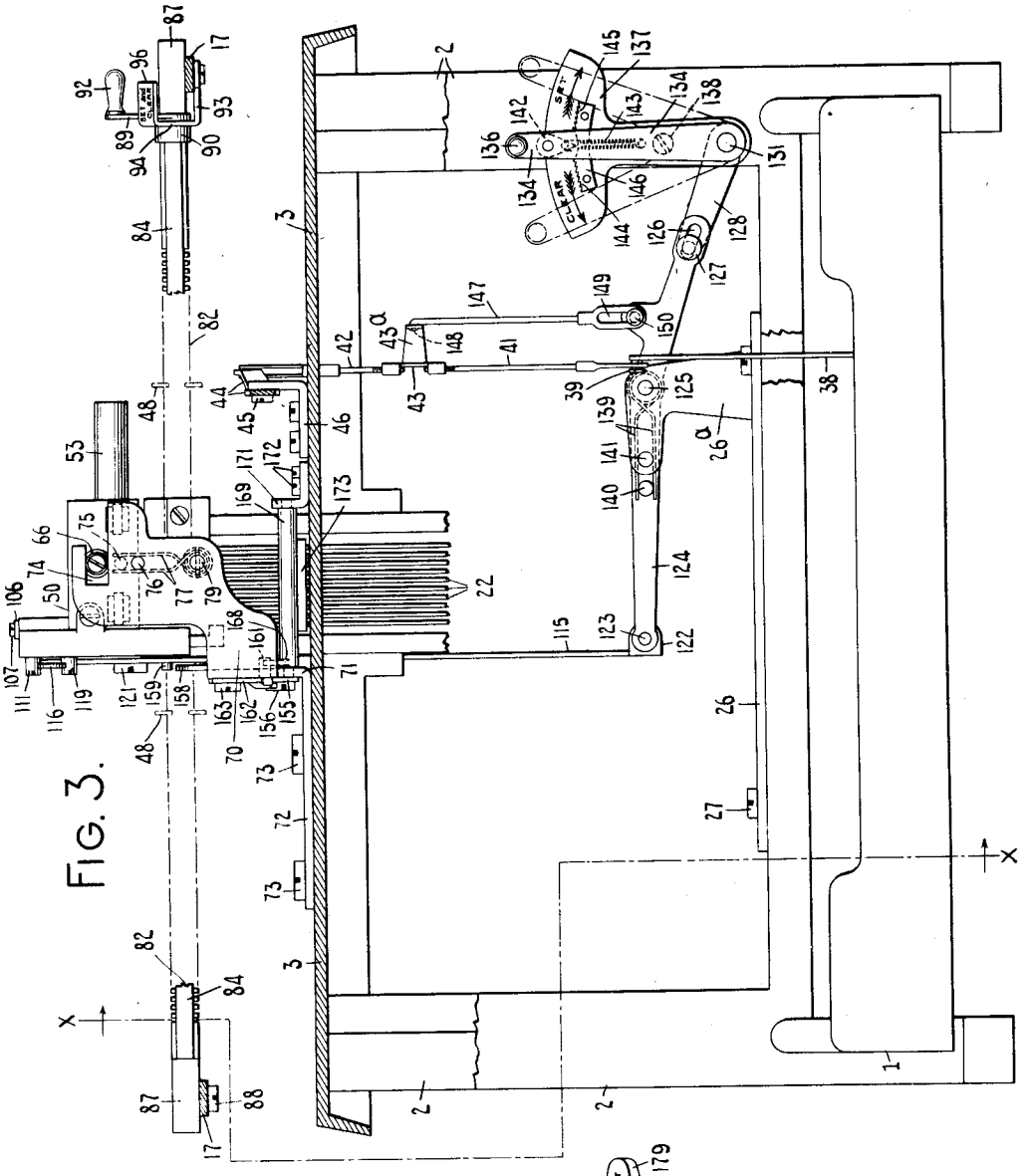

FIG. 3.

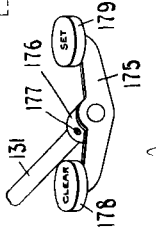

FIG. 8.

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4 SHEETS—SHEET 4.

FIG. 5.

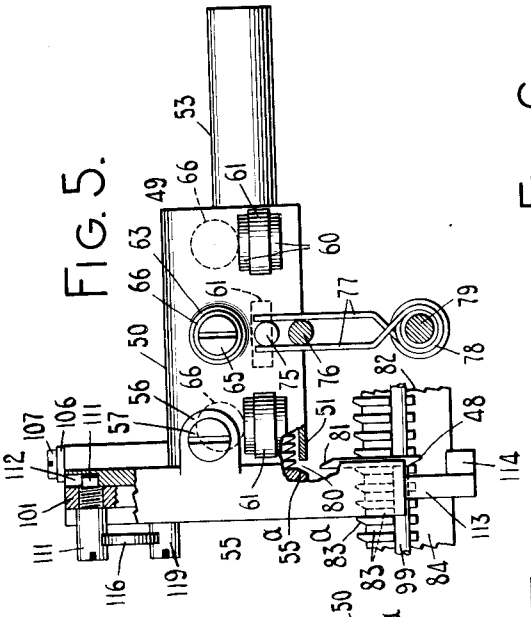


FIG. 6.

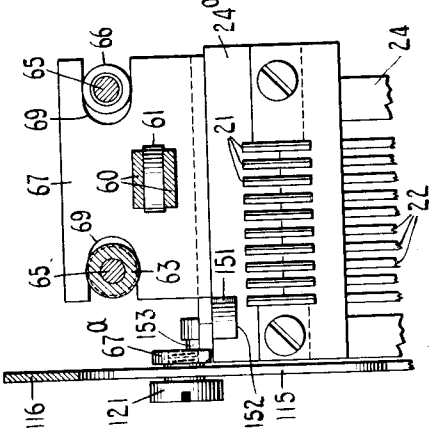


FIG. 7.

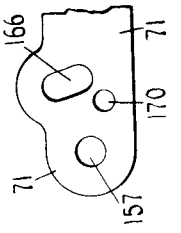
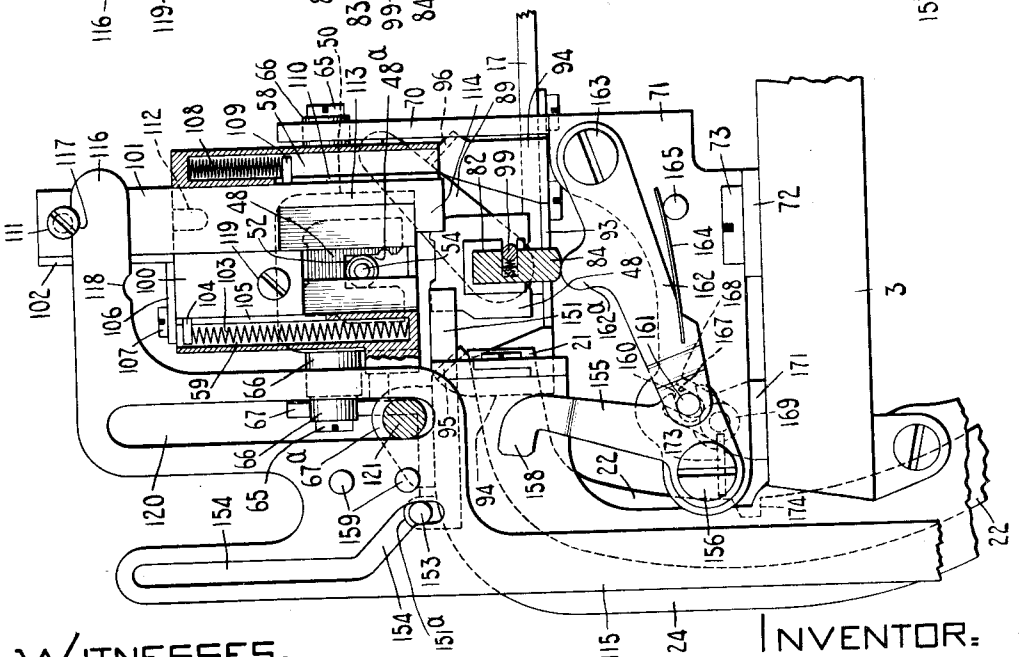


FIG. 4.



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UNITED STATES PATENT OFFICE.

JOHN WALDHEIM, OF NEWARK, NEW JERSEY, ASSIGNOR, BY MESNE ASSIGNMENTS, TO REMINGTON TYPEWRITER COMPANY, OF ILION, NEW YORK, A CORPORATION OF NEW YORK.

TYPE-WRITING MACHINE.

1,066,443. Specification of Letters Patent. Patented July 1, 1913.

Application filed June 7, 1912. Serial No. 702,375.

To all whom it may concern:

Be it known that I, JOHN WALDHEIM, citizen of the United States, and resident of Newark, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Type-Writing Machines, of which the following is a specification.

My invention particularly relates to key-set tabulating mechanism for typewriting machines, said mechanism embodying a stop magazine; and the general object of the invention is to provide improved mechanism of the character specified.

More specifically one object of the invention is to provide for an adjustment and arrangement of the settable tabulator stops which will minimize the danger of breakage of said stops during tabulating operations.

Another object is to provide for controlling the stop receiving element or bar so that it may be positioned to bring all the set stops simultaneously to position to coöperate with the co-acting or frame stop or stops. In the present instance the stop receiving bar is rotatable on its own axis from normal position to a position in which the stops are set on it by operating a setting key, said stop bar being afterward rotated back to normal position, the set stops rotating with it.

Another object is to provide for locking the stop-setting or ejecting and stop-retracting devices against operation when the stop receiving bar is in normal position.

Another object is to lock the co-acting or frame stop or stops against operation when the stop receiving bar is in abnormal position.

Another object is to provide a self-adjusting stop magazine, holder or container, the position of which automatically varies with variations in the dimensions of the teeth or notches of the stop receiving bar, due to imperfections in manufacture.

Another object is to provide a single key and connections, which key is operative at will either to set the stops on the stop receiving bar or to retract the set stops from the stop receiving bar into the magazine.

Other objects will hereinafter appear.

To the above ends my invention consists in the features of construction, combinations of devices and arrangements of parts hereinafter described and particularly pointed out in the claims.

My invention is shown herein as embodied in a No. 11 Remington typewriting machine but as will be apparent the invention may readily be adapted in whole or in part to other styles of writing machines.

In the accompanying drawings, Figure 1 is a vertical sectional view of a No. 11 typewriting machine embodying my invention, parts of the machine being omitted, the section being taken on planes indicated by the broken dotted line in Fig. 3. Fig. 2 is a fragmentary plan view showing the upper rear portion of said machine. Fig. 3 is a vertical transverse sectional view taken on planes indicated by the broken dotted line *y*—*y* in Fig. 1 and looking in the direction of the arrows at said line. Fig. 4 is a fragmentary vertical sectional view of the stop magazine, the stop controlling devices and associated parts, the view corresponding with Fig. 1 but omitting parts shown in said figure, showing other parts in different positions, and still other parts being broken away for clearness of illustration. Fig. 5 is a front elevation, partly in section, of the stop magazine detached, some of the associated parts also being shown. Fig. 6 is a vertical sectional view, taken on the plane indicated by the dotted line *z*—*z* of Fig. 1 and looking in the direction of the arrows at said line. Fig. 7 is a fragmentary end elevation of a part hereinafter referred to as a supporting bracket. Fig. 8 is a perspective view of a modification.

As appears from Fig. 1, the main frame of the machine comprises a base 1, posts 2 and a top plate 3, above which are fixed grooved guide rails 4 and 5, said guide rails coöperating through anti-friction balls 6 with the grooved front and rear bars of a carriage truck 7, which supports and has connected with it a shiftable frame 8 in which is mounted a rotary platen 9. The machine is of the front-strike style, and the printing instrumentalities (not shown) are of the kind common to the No. 11 Remington machine and coöperate with the front face of said platen 9. Fixed to the truck 7 is an arm 10 connected by a band 11 with a carriage motor or spring drum 12 which constantly urges leftward the platen carriage,

said carriage comprising the truck 7 and the platen frame 8 on which the platen is supported. The letter spacing movements of the carriage are controlled by the usual or other suitable escapement devices, said devices comprising a feed rack 13 mounted on arms 14 pivoted at 15 to ears 16 of brackets 17, said brackets, as shown in Fig. 2, being secured by screws 18 to the rear part of the truck 7. The rack 13 is normally maintained in spring pressed engagement with a feed pinion 19 secured to the forward end of a shaft 20 with which are operatively connected escapement wheels, not shown, said wheels coöperating with an escapement dog, as is well understood, the dog aforesaid being actuated from the usual printing keys and the space bar of the machine.

Coöperative with the key-set tabulator stops to be hereinafter described are denominational stops 21, said stops being at the forward upper ends of stop levers 22, the stops 21 and levers 22 being preferably integral. The levers 22 are fulcrumed at 23 to a frame 24 detachably secured at 25 to the top plate 3, the lower end of said frame 24 being locked to a bracket 26 fastened by screws 27 to the rear of the base 1 (Fig. 3). The lower ends of the levers 22 are connected by links 28 with bell cranks 29 fulcrumed on a fixed bar 30 and provided with restoring springs 31. Said bell cranks are operative by vertically movable key stems 32, each provided at its top with a button or tabulator key 33. The bell cranks 29 preferably operate carriage releasing devices comprising a universal bar or bail 34 arranged behind the depending portions of the bell cranks 29 and bearing loosely on the rod or bar 30. A link 35 connects the releasing bail 34 with a crank arm 36 fixed to a rock shaft 37 on which is also secured an angular member 38 provided with a pin 39 engaging in a slot 40 in the lower part 41 of the two-part link which further includes an upper part 42, the parts 41 and 42 being adjustably connected by a turn buckle 43. The upper end of the two-part link is connected to a releasing lever 44, fulcrumed at 45 to an angular bracket 46 secured to the top plate, said releasing lever extending horizontally forward and being provided with a shoe or lifter 47 which underlies the feed rack 19 and is adapted at each tabulating operation to swing upward, due to the actuation received from the universal bar through the train of connections above described. Upward movement of the shoe 47 lifts the feed rack 13 out of mesh with the feed pinion 19, thereby freeing or releasing the carriage for a tabulating run.

The denominational stops 21 are adapted to coöperate with column stops 48 of which there are preferably provided a number corresponding with the greatest number of columns for which the machine is adapted. The column stops are housed in a magazine or container 49, shown detached in Fig. 5, said magazine comprising a body portion 50 shaped like an inverted U and provided with a floor plate 51. Within the body 50 the column stops are mounted on a rod or bar 52 (Fig. 4) which extends through said body 50 and is secured at its inner end in an extension or barrel 53 which contains a spring operative on a follower that constantly presses the column stops leftward along the supporting rod 52, the free end of said rod being provided with a spring plug 54, which yields to permit the ejection or retraction of the column stops one at a time. The spring pressed follower and the internal construction of the magazine are not herein disclosed as they substantially correspond with the construction shown in the patent of Herbert H. Steele, No. 1,037,076, granted August 27, 1912, and are not claimed *per se* by me, being the invention of the said Steele. The head of the magazine, however, differs in detail from that disclosed in the application of Steele aforesaid and will be more particularly described. Said head, preferably a casting, is designated by the numeral 55, and is provided with lateral ears 56 which embrace the sides of the body 50 and are secured thereto by screws 57. The head is grooved vertically to provide tracks or guide ways for the slidable ejecting and retracting devices hereinafter described, and forward of the grooved track-ways is provided with a circular hole or depression 58 closed at the top, a corresponding depression 59 closed at the bottom being provided in the head at the rear of the track-ways (Fig. 4). The magazine, comprising the body 50, barrel 53 and head 55, is movably mounted on the frame of the machine so that it is adapted to yield transversely of the machine or in the direction of the carriage movement in both directions. It will be normally maintained in a central position by spring controlling means. In other words, the magazine is slidably mounted and is spring pressed.

Referring specifically to the mounting of the magazine, the body 50 is provided at its front side with two pairs of ears 60 and at its rear side with a single pair of ears 60. Each pair of ears receives between its members a small wheel or roller 61 pivoted at 62 and adapted to rotate in a horizontal plane. Pivoted on the body 50 and projecting from its front side between the pairs of ears 60 is a lug 63, two corresponding lugs 64 being provided at the rear side of the body, each lug receiving a bearing screw 65 on which is pivoted a small wheel or roller 66 and is adapted to rotate in a vertical plane. To support and coöperate with the rollers 61 and 66 at the rear side there is provided an

angular bearing plate 67, best shown in Figs. 2 and 6, said bearing plate being secured to the top or head of the supporting bracket 24 by screws 68, the front vertical face of the bracket 67 being in the same plane as the front of a slotted guide plate 24ª through which the denominational stops are projected. The guide plate 67 is provided with open slots 69 in which the rear rollers 66 engage and bear, while the rear roller 61 is adapted to bear against the front face of said plate 67. At the front side of the magazine a bearing plate 70 is provided, said bearing plate being bent off laterally from the vertical or upstanding portion 71 of a supporting bracket which further includes a foot portion 72 secured to the top plate 3 by screws 73. The plate 70, as appears in Fig. 3, is provided with a slot 74 in which engages the forward roller 66 but the forward roller 61 bears against the rear vertical face of said guide plate. As appears from Figs. 3 and 5, a stud or pin 75 projects forward from the magazine body 50, while below it a stud 76 projects rearward from the guide plate 70. Embracing the studs are the upstanding parallel arms or portions 77 of a centering and restoring spring, the body 78 whereof is coiled around a supporting screw 79 secured to the plate 70. The construction is such, it will be observed, that the magazine, confined between the plates 70 and 67, is capable of horizontal movement in the direction of the carriage movement, but is held from up and down movement by the coöperation of the rollers 66 with the guide slots 69 and 74, while fore and aft horizontal movement is prevented by the engagement of the rollers 61 with the vertical faces or walls of the plates 67 and 70. The spring arms 77 cooperate with the studs 75 and 76 to maintain the magazine in a central normal position. If the magazine is pushed slightly toward the left, the left-hand spring arm 77 will be flexed by the stud 75 and will operate when leftward pressure on the magazine is removed to restore the magazine while the right-hand arm 77 performs the same functions when the magazine is displaced toward the right. The result is that the magazine may yield slightly to vary the position of the entrance or slotway 80 (Fig. 5) which is formed between the floor plate 51 and the beveled edge 55ª of the head 55. This slotway 80 provides the opening or mouth through which the column stops are ejected from the magazine on to the stop bar and through which said column stops are retracted from the stop bar into the magazine when the stop bar is to be cleared. The result will be that if the ejected or retracted column stop should not be in exact register with the slot-way, which may happen because of inequalities in the construction of the parts or in the cutting of the stop bar teeth, the magazine will adjust itself to compensate for such inequalities or irregularities. The top edge of each stop 48 is beveled, as indicated at 81, so that if during retraction the bevel 81 contacts with the floor plate 51, the magazine will be forced slightly rightward until the slot therein is in register with the stop wheel. On the other hand, if the upper edge of the slot should contact with the beveled edge 55ª, the magazine will be forced toward the left to the necessary extent.

When ejected from the magazine, as hereinafter described, the column or tabulator stops 48 are adapted to be received by and set on the stop receiving element or stop bar 82, which is grooved to receive stop receiving notches 83 a letter space distance apart, these notches being U-shaped and extending around three sides of the bar, the fourth side of the bar forming a projection 84 which is smooth and free from notches or depressions (Figs. 4 and 5). The stop bar 82 is arranged below the stop magazine and at its ends is provided with pintles 85 and 86 which bear rotatively in holes or depressions formed in blocks 87 secured at 88 to the brackets 17. The construction is such that the stop bar is confined between the blocks and is thus held from endwise movement but may rotate on its pintles to a limited extent. Manual means are provided for giving this rotary movement or adjustment to the stop bar, said means comprising a crank arm 89 (Figs. 2, 3 and 4) having a hub 90 riveted at 91 to the pintle 86 between the block 87 and the body of the stop bar. At its other end the crank arm 89 is provided with a finger piece or handle 92. To limit the movement of the stop bar, devices are provided to coöperate with the crank arm 89 comprising a bracket 93 screwed to the underside of the right-hand bracket 17 and having upturned ears 94 diverging upwardly at opposite sides of the pintle 86, the rear ear terminating in an extension or tab 95 and the front ear in an extension or tab 96. The extensions 95 and 96 are horizontally disposed but have inclined faces, which may be marked with suitable indicating marks as for example the rear tab may be marked "Tab" for "tabulator," and the front tab may be marked "Set" and "Clear." When the handle 92 is pushed rearward, as in Figs. 1 and 2, the crank arm 89 will co-act with the tab 95, indicating that the stop bar is adjusted to position the stops for tabulating operations, while when the crank arm is pulled forward until it engages with the edge of the tab 96, as in Fig. 4, it indicates that the stop bar is arranged to permit of the setting on or removal of the column stops. Those portions of the notches 83 which are

uppermost at this time are beveled as indicated at 83ª to provide a flaring mouth to receive column stops as they move downward from the magazine. A detent spring device 97 is secured to the right-hand block 87 (Fig. 2) and coöperates with flat faces 98 on the pintle 86 to maintain the stop bar set or adjusted either in the normal position shown in Figs. 1 and 2 or in the abnormal or stop-setting and clearing position shown in Fig. 4. When the stop bar is set as in Fig. 4, the smooth extension 84 is lowermost, while the grooved or notched portion of the bar is uppermost and in position to coöperate with the notches 48ª in the stops 48, when the stops are ejected or moved downward on and set on the stop bar. As in the Steele application aforesaid, a spring pressed locking rod 99 may be provided on the stop bar to hold the set stops thereon. When the stops have been ejected by devices hereinafter described, the handle or key 92 is pushed rearward, turning the stop bar and column stop set thereon to the position shown in Fig. 1 where the set stops are adapted to coöperate with the projected denomination stops. In prior constructions where the magazine has been above the stop bar and the coöperating or denominational stops have been at the rear of the stop bar the ejected stops were liable to be bent or broken as a result of the impact against the coöperating stop, the break taking place at the upper rear portion of the stop where its horizontal branch and its rear vertical branch join, the lower end of the rear vertical branch being without any anchorage or connection to the body of the stop. By the present construction it will be observed, the stop, after it has been ejected and set, is turned so that the face that co-acts with the denominational stop is joined or connected at both its top and at its bottom with portions of the stop which fit into grooves on the stop bar, thus providing a much stronger stop and one which is reinforced at both top and bottom against bending or breakage.

In order to eject and retract the column stops, devices are provided which are controlled by a single key or finger piece. Said devices comprise an ejector, setter or slide block 100 and a retractor or slide block 101. The blocks 100 and 101 are seated in and reciprocate in the grooved ways in the head 55, as has been described. Normally the bottom of the ejector overlies the left-hand column stop on the magazine and will when operated engage said stop and force it downward. The ejecting and retracting devices or blocks are interseated one in the other, as indicated at 102 (Fig. 2), thereby providing greater security against displacement. Each device is provided with a separate restoring spring. The spring 103 for the ejector 100 is seated in the depression 59 and at its upper end engages a pin 104 projecting laterally from said ejector, said pin being adapted to play in a slot 105. A plate 106, secured by a screw 107 to the top of the head 55 limits upward movement of the ejector. The spring 108 of the retractor is seated in the depression 58 in the head 55 and bears at its lower end against a pin 109 projecting laterally from the block 101 and playing in a slot 110 in the head. A screw pin or stop 111 projects from the right-hand face of the block 101 near its top (Figs. 2 and 5) and engages in the bottom of a groove 112 in the head to limit downward movement of the retractor 101. Said retractor is provided with a downward extension 113 terminating in a head or retracting device proper 114 which normally is lower than the bottom of the set column stops and underlies their path forward of the stop bar. The springs 103 and 108 normally maintain their respective slide blocks or devices against their limiting stops, such normal position of the parts being shown in Fig. 1.

The train of devices for actuating the stop ejector and the stop retractor comprises a slidable element or actuator designated as a whole by the numeral 115. Said actuator is arranged at the left of the ejector and retractor and extends downward at the rear of the top plate. At its upper end it has a forwardly projecting portion or finger 116 which is formed at its top edge with a depression 117, engaging which is the head or body portion of the screw pin 111 which projects laterally leftward from the device 101, as shown in Fig. 5. The lower edge of the finger 116 is provided with a notch or depression 118 with which normally engages a screw pin 119 on the ejector 100. Behind the finger 116 the actuator 115 is enlarged to provide a plate-like head which is formed with a vertical guide slot 120, said guide slot coöperating with a headed screw 121 secured to an ear 67ª turned upward from the left-hand end of the horizontal portion of the bearing plate or bracket 67 (Figs. 4 and 5). The actuator is thus adapted to move freely up and down but is held against lateral displacement and maintained in position to coöperate with the screws or devices 111 and 119. Furthermore by reason of the sliding connection between the actuator and the screw pins 111 and 119, the yielding movements of the stop magazine 49 are not obstructed since the actuator may either move slightly laterally behind the head of the screw 121 participating in such yielding movements or else the screw pins will slide transversely of the actuator and over the depressions 117 and 118 therein. The lower end of the actuator 115 terminates in a laterally bent ear 122 (Fig. 3) which is pivotally connected at 123 with a lever 124 fulcrumed between its ends at 125

on an ear 26ª projecting upward from the bracket 26. The right-hand arm of the lever 124 is formed with an elongated slot 126 which engages with a headed pin 127 on a crank arm 128. Said crank arm, as shown in Fig. 1, is provided with a hub 129 secured by a set screw 130 to the rear end of the horizontally disposed and forwardly extending rock shaft 131, said rock shaft at its rear end portion bearing in the right-hand rear post 2 and at its forward end in a flange of the right-hand front post 2. A collar 132 is secured to the shaft behind said flange, preventing forward displacement of the rock shaft, while rearward displacement thereof is prevented by the hub 133 of a crank arm 134, said crank arm being secured in place by a set screw 135. The crank arm 134 at its upper end is provided with a handle, finger piece or key 136 for rocking the rock shaft in either direction and moving the actuator 115 up or down by the train of connections above described. On the rock shaft and confined between the front corner post and the hub 133 is an indicating plate 137, said plate being secured by a screw 138 to the corner post and being provided at its upper end with indicating marks such as the word "Clear" and an arrow at the left of the crank arm 134, and the word "Set" and an arrow at the right of said crank arm. The crank arm 134 is normally upright and disposed midway of the indicating plate, being maintained in this position by a spring 139 which surrounds the fulcrum or screw 125 and has parallel arms which embrace a pin 140 on the lever 124 and a pin 141 on the ear 26ª. Said spring 139 operates both as a centering and restoring spring. Normally it coöperates with the pins 140 and 141, as shown in Fig. 3, to maintain the crank arm 134 vertical and the connected parts in the relationships shown. If the crank arm is moved to the left the upper branch of the spring 139 will be flexed and will later operate to restore the parts to normal position, while the lower branch of said spring will be flexed when the crank arm is moved from normal position toward the right.

Preferably full stroke devices are provided in association with the stop setting and clearing key 136, said devices comprising a depending pawl or detent 142 pivoted at the rear face of the crank arm 134 and provided with a spring 143 which tends to maintain said pawl vertical. The pawl cooperates with sets of oppositely disposed teeth 144 and 145 formed in the top of a plate 146 secured at the front of the indicating plate 137. When the key 136 is pushed leftward the pawl 142 engages the teeth 144 and prevents return movement of the key until its full stroke has been completed and it has been moved leftward past the teeth 144. The reverse operation takes place when the key 136 is pushed to the right and the pawl 142 engages with the teeth 145.

Following up the train of devices controlled by the key 136 it will be observed that when the key is actuated toward the right, that is, to set stops as indicated by the plate 137, the crank arm 128 will be raised, acting on the lever 124 to depress its inner end and lower the actuator 115. As the actuator is lowered the finger 116, acting on the pin 119, will force the ejector 100 downward, causing said ejector to engage the top of the left-hand column stop 48 in the magazine, forcing said stop past the spring plug 54 and down on to the stop bar 82. Of course as a preliminary it will be understood that the handle 92 has been pulled forward, turning the stop bar to stop receiving position and that the carriage has been spaced along until the appropriate notch or seat on the stop bar is in register with the entrance 80 to the magazine. Following the ejection, the key 136 is released and the parts will be restored to normal position by the springs 103 and 139. Thereafter it is only necessary to space the carriage to a position where it is desired to eject the next column stop and set it on the stop bar, whereupon the key 136 is again actuated toward the left and the operations above outlined are repeated. It will be understood that during stop-ejecting operations the stop retractor 101 will not be affected. In stop retracting operations the key 136 is actuated toward the left, lowering the crank arm 128 and causing it to lift the inner arm of the lever 124, said lever in turn lifting the actuator 115, which acts against the screw 111, causing it to lift the retractor 101, the head 114 thereof engaging with the overlying column stop 82 and forcing said column stop off the stop bar and through the slot or mouth 80 into the stop magazine. During ejecting and retracting operations, the stop in moving from the container element to the stop receiving element and vice versa, may operate to effect a relative movement between said elements to bring the container mouth and stop notches into proper register.

In order to facilitate stop retracting operations, means are provided preferably under the control of the key 136 for automatically releasing the carriage from the control of its escapement devices so that it may run freely leftward under the impulse of the carriage motor, other means being provided under the control of said key for automatically projecting a special stop to coöperate with the column stops to arrest them in turn under and in register with the slot 80 in the magazine. By employing the automatic means aforesaid and now to be described in detail, it is only necessary, in

order to clear the stop bar of column stops, successively to actuate the key 136 toward the left or in stop retracting direction a sufficient number of times, the number, of course, depending on the number of column stops set on the stop bar. For automatically releasing the carriage from the key 136 it is only necessary to provide a connection between the lever 124 and the two-part link 41, 42. Said connection comprises a link 147 (Figs. 1 and 3) which is pivotally connected at its upper end at 148 to an ear 43ª on the turn buckle 43 which connects the parts 41 and 42. The lower end of the link 147 is provided with a slot 149 which is engaged by a headed pin 150 on the right-hand arm of the lever 124. The construction is such that when the key 136 is moved rightward in stop setting operations, the right-hand arm of the lever 124 will be swung upward, lifting the pin 150, said pin traversing the slot 149 without actuating the link 147. When, however, the key 136 is actuated toward the left from normal position to clear the stops, the crank arm 128 will operate to swing the right arm of the lever 124 downward, causing the pin 150 to pull down the link 147 which in turn will actuate the link 41 and raise the shoe 47, said shoe operating to raise the feed rack 13 from the pinion 19, thereby releasing the carriage. It will be understood further that when, actuated by the link 147 and key 136, the two-part link 41, 42 is pulled down, the slot 40 at the lower end of the part 41 will move downward over the pin 39 and will not affect the member 38 nor any of the other connections up to and including the universal releasing bail or bar 34. On the other hand, when the carriage is released by the operation of said bail 34 acting through the member 38 and link 41, 42, said link, as it moves downward, will carry with it the link 147, which, however, will move idly, the slot 149 moving down along the pin 150 without affecting the lever 124 and connected parts.

The special arresting stop heretofore referred to, which is automatically operated from the key 136, is designated as 151. As appears in Figs. 1, 2, 4 and 6, said stop is in the form of a rectangular block which is slidably mounted in a groove or depression 152 cut or formed in the top of the head of the tabulator supporting frame 24 and extending from front to rear at the left-hand side of said head. The left-hand end of the horizontal portion of the bracket or device 67 overlies the stop 151 and prevents accidental upward displacement thereof. The right-hand vertical face of the forward end portion of the stop 151, which is its working face, overlies and is in the same vertical plane as the working face of the decimal stop of the set of denominational stops 21. At its rear end the stop 151 is provided with an upstanding lug 151ª which carries a leftwardly extending pin or stud 153, said pin engaging in a slot 154 at the rear of the head of the actuator 115. Said slot comprises a long, vertical portion or dwell, an inclined or cam portion connected with the lower end of said dwell, and a short, vertical portion or dwell connected with the lower end of the cam portion. Normally the stud 153 engages about midway of the long dwell in the slot 154 as shown in Fig. 1, the result being that when the actuator is pulled down for the purpose of ejecting column stops, the special stop 151 will not be affected. During the first part of the stop retracting operation the actuator 115 moves upward and the lower portion of the long dwell will move up past the stud 153 so that the special stop 151 will not be affected until the bottom of said dwell is reached. During this first portion of the upward movement of the actuator it will operate to raise from the stop bar 82 that one of the column stops 48 which is in position for retraction, and when the cam portion of the slot 154 begins to act on the stud 153 to cam forward the stop 151, the column stop 48 that is being retracted will have been raised off the stop bar 82. During further upward movement of the actuator 115 the column stop will continue to rise and be retracted within the magazine while simultaneously the special stop 151 will be forced forward by the cam slot 154, the forward movement continuing until the dwell in the slot 154 below the cam portion is reached. During this camming operation, fore and aft displacement of the head of the actuator 115 will be prevented by the screw 121 acting against the rear edge of the slot 120. By this camming operation, the special stop 151 is projected into the path of the column stops 48 that remain on the stop bar 82. The parts are proportioned and adjusted so that the release of the carriage through the lifting of the feed rack 13 will begin as the special stop enters the field of the column stops, the result being that when the carriage is automatically released by the action of the link 147 on the link 41, 42, the special stop 151 will have been projected forward into operative position. Thus it will be seen that a clearing or leftward actuation of the key 136 operates to lift or retract a column stop 48, to project the special stop 151, and to release the carriage, enabling the next column stop 48 to be brought into contactive engagement with the stop 151, thereby arresting the carriage. When the key 136 is released and restored to operative position the special stop 151 will be retracted to normal position, disengaging from the co-acting column stop 48 which will be left underlying and in register with the mouth 80 of the

stop magazine. A second leftward actuation of the key 136 will cause the retracting head 114 to lift the last mentioned column stop from the stop bar and retract it into the magazine while concurrently the special stop 151 will be projected forward to the Fig. 4 position and the carriage released to bring the next column stop on the stop bar into co-active engagement with said stop 151; and so on. It will be apparent that it is only necessary in order to entirely clear the stop bar of column stops to actuate the key 136 toward the left a sufficient number of times, thus preparing the stop bar for the reception of a differently arranged or adjusted series of column stops.

Owing to the fact that the stop bar 82 is rotatable by hand to two positions, there is the possibility that the operator will neglect, after having set the settable column stops on said stop bar, to turn the bar back from the Fig. 4 to the Fig. 1 position, prior to beginning tabulating operations. On the other hand, there is also the possibility that the operator might neglect or forget to turn the stop bar from normal to abnormal position prior to beginning a stop retracting or stop setting operation. In order to prevent such possible faulty operations of the mechanism, devices are provided in the nature of checks or preventive means, which devices are automatically controlled from the stop bar 82 itself. The checking devices comprise means for locking the denominational stops against operation when the stop bar 82 is in the abnormal or Fig. 4 position; and also for locking the actuator against movement when the stop bar 82 is in the normal or Fig. 1 position, the sets of checking or locking devices operating in alternation. The checking devices aforesaid are illustrated in Figs. 1 to 4 and 7 and comprise a lever 155 pivoted on a screw 156 secured in a hole 157 tapped into the rear end of the bracket portion 71. The main arm of said lever normally extends straight upward and terminates in a rearwardly bent engaging portion or locking device 158 which normally is disposed between two locking devices or studs 159 projecting leftward from the head of the actuator 115. Forward of its fulcrum the lever 155 is provided with an open-mouth slot 160 which is engaged by a pin or stud 161 projecting laterally rightward from the end of an arm or lever 162, said arm inclining forward and upward and being pivoted at 163 on the bracket portion 71. The rear end portion of the arm 162 which carries the stud 161 is off-set to the left so as to overlie the slotted portion of the lever 155, said lever being confined between the off-set portion of the arm 162 and the face of the bracket portion 71. A leaf spring 164 fixed to the arm 162 cooperates with a stud 165 on the bracket portion 71 to maintain the locking device 158 normally in operative position between the studs 159. Rearward movement of the lever 155 and upward movement of the lever 162 are limited by the engagement of the lever 155 with the lower stud 159. The spring 164 constantly tends to maintain the parts in the Fig. 1 position and operates to restore them to normal position after they have been actuated as presently to be described. The stud 161 projects rightward through a slot 166 in the bracket portion 71, said slot affording play for the stud, which engages at its inner end in a slot 167 formed in a crank arm 168 on a rock shaft 169, extending transversely of the denominational levers 22. Said rock shaft is reduced at its ends and the left-hand reduced end thereof bears in a hole 170 formed in the bracket portion 71 while the right-hand end of said rock shaft 169 bears in an angular bracket 171 secured by screws 172 to the top plate 3. The rock shaft 169 is provided with a downwardly and rearwardly inclined fin or rib 173 which normally registers with a series of notches 174 cut in the forward edges of the denominational levers 22, said notches forming in effect a groove extending transversely of the gang or set of levers 22. The train of devices comprising the levers 162 and 155 and the rock shaft 169 are adapted to be automatically actuated by the rounded end of the projection 84 of the stop bar 82 which is adapted to act on a rounded projection or nose 162^a on the lever 162.

With the locking devices in normal position as shown in Fig. 1 the movement of the denominational levers will not be interfered with by the locking rib 173, since the notches 174 in register therewith are deep enough to permit complete forward movements of said denominational levers. The actuator 115, however, will be locked at this time against actuation for if an ejecting operation be attempted, the upper stud 159 will contact with the upper end of the locking device 158; while similarly an upward or retracting operation of said actuator 115 will be prevented by the lower stud 159 engaging with the under edge of the locking device 158. When, however, the finger piece or key 92 is pulled forward, turning the stop bar 82 from the normal position to the abnormal position shown in Fig. 4, the extension 84, acting against the nose 162^a, will overcome the spring 164 and swing the arm 162 downward, causing the stud 161 to swing the lever 155 forward and turning the rock shaft 169 on its axis. The forward movement of the lever 155 carries the locking device 158 out of the path of the studs 159, thereby releasing or unlocking the actuator 115 so that it may be operated from the key 136. The rotary turning movement

aforesaid of the rock shaft 169 concurrently swings the rib 173 to a horizontal position where it is out of register with the notches 174 and is close to the forward edges of the levers 22. Consequently, if it be attempted to actuate one of the tabulator keys 33, while the stop bar 82 is in abnormal position, the parts will be locked, since very slight motion will bring the actuated lever 22 into engagement with the rib 173 which will prevent operation. The locking device 158 will remain out of operation and the rib or locking device 173 will remain in operative position so long as the stop bar 82 is in stop receiving position; but when the desired number of column stops have been adjusted on said stop bar and the same is turned back to normal position, the extension 84 will release the nose 162^a, and concurrently the spring 164 will swing back the locking device 158 to operative position and will lower the locking rib 173 to inoperative position in register with the notches 174, thus locking the actuator 115 against operation and freeing the tabulating mechanism so that it may be used for spacing the carriage in accordance with the adjustment of the column stops 48 set on the bar 82.

It is to be understood that parts of the invention as above described may be used without other parts, and also that various changes of construction, arrangement and mode of operation may be effected without departing from the spirit and scope of my present invention. For example, in Fig. 8, there are shown modified means for controlling the rock shaft 131. In the Fig. 8 construction, instead of the lever 134 which is swingable in opposite directions from a central normal position, there is substituted a rocking frame or lever 175 which has a hub 176 secured by a screw 177 to the forward end of the rock shaft 131. The opposite arms of said lever 175 are provided with keys 178 and 179, the top of the left-hand key 178 being provided with an indicating device such as the word "Clear", while the right-hand key 179 bears the word "Set." By pressing the setting key 179 the shaft 131 is rocked toward the right and operates on the crank arm 128 as originally described to actuate the stop setting mechanism. On the other hand, an operation of the left-hand or clearing key 178 rocks the shaft 131 in the opposite direction and is effective, as heretofore described, to actuate the stop clearing mechanism.

It will be understood that by my present invention there is provided in tabulating mechanism for typewriting machines the combination of a carriage or traveling element, a stationary element, in the present instance the frame of the machine, and a self-adjusting stop container on one of said elements, in the present instance said self-adjusting container being on the stationary element; that said container carries or has mounted on it or housed within it one or a plurality of tabulator stops; that the self-adjusting container is in the present instance spring mounted; that a stop container is provided which is mounted to have a movement from a normal position; that means, in the present instance spring means, are provided for automatically restoring said container to normal position after it has been displaced therefrom; that devices, in the present instance mounted to move with the container, are provided which may be actuated by key controlled connections for ejecting a tabulator stop or stops from the container on to a stop receiving element or device or toothed stop bar and retracting them into the container from said stop receiving device or stop bar; that automatic adjusting means, in the present instance the container-centering and -restoring spring devices, are provided for bringing the container and said device or stop bar into register, that is, for bringing the opening or mouth of said container into register or substantial alinement with the stop seats or notches or spaces between the teeth of the stop bar; that as a result the container may move on its support lengthwise of the stop bar during the ejecting movement of one of the tabulator stops from the container on to the stop bar or vice versa, that is, during the retracting movement of said stop from the stop bar into the container; that a tabulator stop and a stop container are combined with means for affording movement of said container through the instrumentality of said stop; that such movement takes place when the devices for actuating or retracting a tabulator stop are operated; that a relative movement between the container element and the stop receiving element is afforded by means acting through the tabulator stop in moving from one of said elements to the other, the result being that said elements may be brought into proper register or alinement; that the stop bar in the present instance underlies the container which has a horizontal movement lengthwise of said stop bar in two directions but is prevented from moving transversely of the stop bar either vertical or horizontal; that the container in the present instance is associated with roller bearing devices which facilitate its automatic movements and guide and support it during such movements; that the stop ejecting and retracting devices or slide blocks have sliding connections with the key controlled actuating devices, or more specifically with the actuator 115, said connections being automatically variable to compensate for the automatic yielding movements of the container or magazine which may take

place during stop ejecting and stop retracting operations; that said actuator is movable or operative at will in opposite directions from a central normal position; that it has a part or finger between parts or projections or screw pins of the stop ejecting and stop retracting slides; that said actuator is provided with a double acting restoring spring which moves it back to the central position after it has been operated either up or down therefrom; that when the actuator is operated for stop retracting purposes, the carriage is concurrently released; that said actuator has a connection with an arresting device or stop, in the present instance the part 151, which connection is effective to actuate said arresting stop automatically during stop retracting operations but not during stop ejecting operations; that a tabulator or column stop is combined with two independently operated stops, said independent stops in the present instance being the decimal stop and the arresting stop 151, and with means for locking one of said independent stops while the other is free to be operated; that the stop which is locked depends on the position of the tabulator or column stop itself, that is, when the column stop is arranged for tabulating, the decimal stop is free and the arresting stop locked by reason of the fact that the actuator 115 that controls said arresting stop is locked, while when the column stop is turned into position for retraction or for setting on the stop bar the arresting stop is free and the decimal stop is locked; that the toothed stop bar or stop receiving element is rotatable or settable into and out of normal position; that in the normal position of said bar the stops which may be set up thereon are adapted for tabulating operations; that at this time said bar is not adapted to receive stops from the magazine or to permit the retraction of stops into the magazine, while when said bar is turned to abnormal position the stop receiving and retracting operations may be performed but not tabulating operations; that accordingly check devices or locks are provided which are alternately operative, one lock, that for the ejecting and retracting mechanism, being normally effective, while the other lock, for the coöperating or denominational stops, is normally ineffective; that the lock for the stop ejector or setter is directly effective on the actuator, this same lock serving also for the retracting mechanism or retractor; that a full stroke device is provided for the key set tabulating mechanism, said device comprising a single pawl and a double rack; that said pawl is spring mounted on a key member having a central normal position; that two racks are provided for coöperation with the pawl, said rack being arranged at opposite sides of said key member; and that said pawl coöperates with one rack when the key member is moved in one direction and with the other rack when said key member is moved in the opposite direction.

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

1. In a typewriting machine and in tabulating mechanism, the combination of a carriage or traveling element, a frame or stationary element, and a self-adjusting tabulator stop container on one of said elements.

2. In a typewriting machine and in tabulating mechanism, the combination of a traveling carriage, a toothed stop bar thereon, a container movably mounted on the frame of the machine and provided with a slot or stop opening, stops in said container, stop transferring mechanism, and spring means permitting movement of said container in opposite directions from a central normal position so as to enable said slot to be brought into register with the spaces between the teeth of said stop bar during stop transferring operations.

3. In a typewriting machine and in tabulating mechanism, the combination with a carriage or traveling element and a frame or stationary element, of a plurality of tabulator stops, and a spring mounted container for said stops mounted on one of said elements.

4. In a typewriting machine and in tabulating mechanism, the combination with a carriage or traveling element and a frame or stationary element, of a plurality of tabulator stops, a container for said stops movably mounted on one of said elements and having a normal position thereon, and means for automatically restoring said container to normal position after it has been displaced therefrom.

5. In a typewriting machine and in tabulating mechanism, the combination of a carriage, a stop receiving element thereon, a plurality of tabulator stops, a self-adjusting container for said stops mounted on the frame of the machine, and means for ejecting said stops from said container on to said stop receiving element.

6. In a typewriting machine and in tabulating mechanism, the combination with a carriage or traveling element and a frame or stationary element, of a stop container on one of said elements, a stop receiving device on the other element, and automatic adjusting means for bringing said container and said device into register.

7. In a typewriting machine and in tabulating mechanism, the combination with a carriage or traveling element and a frame or stationary element, of a stop supporting element provided with an entrance-way, a stop receiving device provided with a stop seat, and automatically operating means for

bringing into substantial alinement said entrance-way and said seat.

8. In a typewriting machine and in tabulating mechanism, the combination with a carriage or traveling element and a frame or supporting element, of a stop supporting element provided with an entrance-way, a stop receiving device provided with a stop seat, automatically operating means for bringing into substantial alinement said entrance-way and said seat, a tabulator stop, means for moving said stop from one to the other of said supporting element and receiving device through said entrance-way, and means for affording an automatic variation in the position of said entrance-way during the movement of said stop.

9. In a typewriting machine and in tabulating mechanism, the combination with a carriage or traveling element and a frame or stationary element, of a stop supporting element provided with an entrance-way, a stop receiving device provided with a stop seat, automatically operating means for bringing into substantial alinement said entrance-way and said seat, a tabulator stop, means for moving said stop back and forth between said supporting element and receiving device through said entrance-way, and means for affording an automatic variation in the position of said entrance-way during the back and forth movements of said stop, said means operating to restore said entrance-way to normal position after the passage of said stop.

10. In a typewriting machine and in tabulating mechanism, the combination with a traveling element or carriage and a frame or stationary element, of a tabulator stop, a stop container therefor on one of said elements, an underlying stop bar on the other element, said container being provided with an entrance-way, and means for affording automatic self-adjusting movements of said container on its support lengthwise of said stop bar during the movement of a stop from the container to the stop bar and vice versa.

11. In a typewriting machine and in tabulating mechanism, the combination with a traveling element or carriage and a frame or stationary element, of a tabulator stop, a stop container therefor on one of said elements, a stop bar on the other element underlying said container, and means for affording horizontal movement of said container lengthwise of said stop bar and for preventing vertical movement of said container and also horizontal movement thereof transversely of said stop bar.

12. In a typewriting machine and in tabulating mechanism, the combination with a traveling element or carriage and a frame or stationary element; of a tabulator stop; a stop container therefor on one of said elements; a stop bar on the other element underlying said container; and means for affording horizontal movement of said container lengthwise of said stop bar and for preventing vertical movement of said container and also horizontal movement thereof transversely of said stop bar, said means comprising roller devices on said container and coöperative guide ways on the stationary element.

13. In a typewriting machine and tabulating mechanism, the combination with a traveling element or carriage and a frame or stationary element; of a tabulator stop; a stop container therefor on one of said elements; a stop bar on the other element underlying said container; and means for affording horizontal movement of said container lengthwise of said stop bar and for preventing vertical movement of said container and also horizontal movement thereof transversely of said stop bar, said means comprising sets of guides at opposite sides of said container and sets of rollers coöperative with said guides, one set of rollers and guides affording movement of said container in a horizontal straight path and preventing vertical movement of said container and another set of rollers and guides preventing horizontal movement of said container at an angle to said straight path.

14. In a typewriting machine and in tabulating mechanism, the combination with a traveling element or carriage and a frame or stationary element; of a tabulator stop; a stop container therefor on one of said elements; a stop bar on the other element underlying said container; and means for affording horizontal movement of said container lengthwise of said stop bar and for preventing vertical movement of said container and also horizontal movement thereof transversely of said stop bar, said means comprising guide plates at opposite sides of said container, and roller devices coöperative with said guide plates.

15. In a typewriting machine and in tabulating mechanism, the combination with a traveling element or carriage and a frame or stationary element; of a tabulator stop; a stop container therefor on one of said elements; a stop bar on the other element underlying said container; and means for affording horizontal movement of said container lengthwise of said stop bar and for preventing vertical movement of said container and also horizontal movement thereof transversely of said stop bar, said means comprising slotted plates arranged fore and aft of said container, and rollers on said container coöperating with the slots in said plates.

16. In a typewriting machine and in tab-

ulating mechanism, the combination with a traveling element or carriage and a frame or stationary element; of a tabulator stop; a stop container therefor on one of said elements; a stop bar on the other element underlying said container; means for affording horizontal movement of said container lengthwise of said stop bar and for preventing vertical movement of said container and also horizontal movement thereof transversely of said stop bar, said means comprising slotted plates arranged fore and aft of said container, and rollers on said container coöperating with the slots in said plates; and spring means for permitting movement of said container relatively to said plates and for restoring said container to normal position after such movement.

17. In a typewriting machine and in tabulating mechanism, the combination with a traveling element or carriage and a frame or stationary element; of a tabulator stop; a stop container therefor on one of said elements; a stop bar on the other element underlying said container; means for affording horizontal movement of said container lengthwise of said stop bar and for preventing vertical movement of said container and also horizontal movement thereof transversely of said stop bar, said means comprising slotted plates arranged fore and aft of said container, and rollers on said container coöperating with the slots in said plates; and a centering spring for maintaining said container in a central normal position and for permitting movement of said container in either direction relatively to said slotted plates.

18. In a typewriting machine and in tabulating mechanism, the combination with a traveling element or carriage and a frame or stationary element; of a tabulator stop; a stop container therefor on one of said elements; a stop bar on the other element underlying said container; and means for affording horizontal movement of said container lengthwise of said stop bar and for preventing vertical movement of said container and also horizontal movement thereof transversely of said stop bar, said means comprising slotted plates arranged fore and aft of said container, and rollers on said container coöperating with the slots in said plates, and further comprising other rollers on said container coöperative with the inner faces of said guide plates.

19. In a typewriting machine and in tabulating mechanism, the combination of a tabulator stop, a stop container, and means for affording movement of said container through the instrumentality of said tabulator stop.

20. In a typewriting machine and in tabulating mechanism, the combination of a tabulator stop, a stop container, stop ejecting devices, and means for affording movement of said container by said tabulator stop during stop ejecting operations.

21. In a typewriting machine and in tabulating mechanism, the combination of a tabulator stop, a stop container, stop retracting devices, and means for affording movement of said container by said stop during stop retracting operations.

22. In a typewriting machine and in tabulating mechanism, the combination of a tabulator stop, a stop container element, a stop receiving element, means for moving said tabulator stop from one of said elements to the other, and means for affording relative movement between said elements during the operation of said first named means.

23. In a typewriting machine and in tabulating mechanism, the combination of a tabulator stop, a stop container element, a stop receiving element, means for moving said tabulator stop from one of said elements to the other, and means acting through said tabulator stop for causing relative movement between said elements during the operation of said first named means.

24. In a typewriting machine and in tabulating mechanism, the combination with a carriage or traveling element and a frame or stationary element, of a tabulator stop container, and roller bearing devices for supporting and guiding said container on one of said elements.

25. In a typewriting machine and in tabulating mechanism, the combination with a carriage element and a stationary element, of a tabulator stop container movably mounted on one of said elements, and controlling devices for permitting movement of said container in two directions and for restoring it to an intermediate normal position after such movements, said devices comprising parallel spring arms, a projection on said container, and a projection on the element on which said container is mounted, the spring arms embracing between them said projections.

26. In a typewriting machine and in tabulating mechanism the combination of tabulator stops, a stop magazine therefore provided with a slotted entrance way, a notched stop receiving bar, and compensating means for compensating for inequalities in the notches in said bar and enabling tabulator stops to be ejected and retracted through said slotted entrance way in a substantially straight path.

27. In a typewriting machine and in tabulating mechanism, the combination of a yieldingly mounted stop magazine, stop ejecting and retracting devices, and key connections for operating the same, said con-

nections being automatically variable to compensate for the yielding movements of said magazine.

28. In a typewriting machine and in tabulating mechanism, the combination of a yieldingly mounted stop magazine, stop ejecting and retracting devices, and key connections for operating the same, said connections slidably engaging with said stop ejecting and retracting devices.

29. In a typewriting machine and in tabulating mechanism, the combination of a stop setting device, a stop retracting device, a single key, and connections between said key and said devices, said key and said connections having a single normal position and said key being in a position to actuate either of said devices when said key is operable.

30. In a typewriting machine and in tabulating mechanism, the combination of a stop setting device, a stop retracting device, and a single train of connections having a single normal position and controlled by a single key for actuating said devices.

31. In a typewriting machine and in tabulating mechanism, the combination of a stop setting device, a stop retracting device, a single key, and connections between said key and said devices, said key being movable in one direction for operating said setting device and in another direction for operating said retracting device.

32. In a typewriting machine and in tabulating mechanism, the combination of a stop setting device, a stop retracting device, a single key, and connections between said key and said devices, said key having a single normal position from which it is actuated both for stop setting and for stop retracting.

33. In a typewriting machine and in tabulating mechanism, the combination of a stop setting device, a stop retracting device, and a single train of key actuated connections for actuating said devices, said connections having a single normal position.

34. In a typewriting machine and in tabulating mechanism, the combination of a stop setting device, a stop retracting device, and key actuated connections operative in different directions for actuating said devices.

35. In a typewriting machine and in tabulating mechanism, the combination of a stop setting device, a stop retracting device, a single actuator, and means for operating said actuator at will for operating said setting device or said retracting device, said means having a single normal position.

36. In a typewriting machine and in tabulating mechanism, the combination of a stop setting device, a stop retracting device, a single actuator for said devices, and means for at will actuating said actuator in opposite directions.

37. In a typewriting machine and in tabulating mechanism, the combination of a stop setting device, a stop retracting device, a single actuator for said devices, and a single train of connections for operating said actuator in one direction to operate said setting device and in the opposite direction for operating said retracting device.

38. In a typewriting machine and in tabulating mechanism, the combination of a settable stop, a setting device, a retracting device, a single actuator between said devices, and means for at will moving said actuator in either of two directions to operate one or the other of said devices.

39. In a typewriting machine and in tabulating mechanism, the combination of a stop setting device, a stop retracting device, a slidable actuator having a single normal position, and means for reciprocating said actuator at will either up or down.

40. In a typewriting machine and in tabulating mechanism, the combination of a stop setting device, a stop retracting device, a slidable actuator having a single normal position, and means for reciprocating said actuator at will either up or down, the downward movement actuating the stop setting device independently of the retracting device and the upward movement actuating the retracting device independently of the stop setting device.

41. In a typewriting machine and in tabulating mechanism, the combination of a stop setting device, a controlling spring therefor, a stop retracting device, a stop retractor controlling spring, a single actuator for said devices, and a separate spring for controlling said actuator, said actuator being oppositely movable, and said separate spring being double acting and operating to restore said actuator to normal position from both the opposite abnormal positions to which said actuator may be moved.

42. In a typewriting machine and in tabulating mechanism, the combination of a stop setting device, a stop retracting device, a single actuator normally engaging with both said devices, and means for moving said actuator at will in either of two directions for actuating either said setting device or said retracting device.

43. In a typewriting machine and in tabulating mechanism, the combination of a stop setting device, a stop retracting device, a single actuator normally engaging with both said devices, and means for moving said actuator at will in either of two directions for actuating either said setting device or said retracting device, the operation of one of said devices remaining quiescent while the other is being actuated.

44. In a typewriting machine and in tabulating mechanism, the combination of a stop setting device having a single normal posi-

tion, a stop retracting device having a single normal position, an actuator for said device having a single normal position, and means for operating said actuator to operate either of said devices at will.

45. In a typewriting machine and in tabulating mechanism, the combination of a stop setting device having a single normal position, a stop retracting device having a single normal position, an actuator for said device having a single normal position, and means for operating said actuator to operate either of said devices at will, the movement of the setting device being independent of movement of the retracting device and vice versa.

46. In a typewriting machine and in tabulating mechanism, the combination of a stop setting device, a stop retracting device, springs constantly tending to move said devices in opposite directions, a single actuator for said devices, and a double acting spring for said actuator.

47. In a typewriting machine and in tabulating mechanism, the combination of a stop setting device, a stop retracting device, springs constantly tending to move said devices in opposite directions, a single actuator for said devices, and key controlled connections to said actuator, said connections including a lever, a rock shaft, a crank arm connected to said lever, and means for turning said crank arm in opposite directions from a single normal position.

48. In a typewriting machine and in tabulating mechanism, the combination of a releasable carriage, a stop setting device, a stop retracting device, springs constantly tending to move said devices in opposite directions, a single actuator for said devices, and key controlled connections to said actuator, said connections including a lever, a rock shaft, a crank arm connected to said lever, a finger piece connected to said crank arm, and a double acting spring connected to said lever.

49. In a typewriting machine and in tabulating mechanism, the combination of a yieldably mounted stop magazine, column stops therein, stop ejecting and retracting devices yieldingly mounted on said magazine, and actuating connections for said devices supported on the frame of the machine and variably engageable with said devices to compensate for any movement thereof due to their yielding mounting.

50. In a typewriting machine and in tabulating mechanism, the combination of a releasable carriage, a stop setting device, a stop retracting device, springs constantly tending to move said devices in opposite directions, a single actuator for said devices, key controlled connections to said actuator, said connections including a lever, a rock shaft, a crank arm connected to said lever, a finger piece connected to said crank arm, a double acting spring connected to said lever, and carriage releasing devices connected to said lever.

51. In a typewriting machine and in tabulating mechanism, the combination of a releasable carriage, a stop setting device, a stop retracting device, a single actuator for said devices, key controlled connections to said actuator including a lever movable in two directions from a central normal position, and carriage releasing devices connected to said lever and operative thereby when said lever acts to move said stop retracting device.

52. In a typewriting machine and in tabulating mechanism, the combination of a releasable carriage, a stop setting device, a stop retracting device, a single actuator for said devices, key controlled connections to said actuator including a lever movable in two directions from a central normal position, and carriage releasing devices connected to said lever and operative thereby when said lever acts to move said stop retracting device, said releasing devices having a lost motion connection with said lever and remaining quiescent when said lever is actuated for stop setting operations.

53. In a typewriting machine and in tabulating mechanism, the combination of a releasable carriage, a stop setting device, a stop retracting device, a single actuator for said devices, key controlled connections to said actuator including a double acting lever movable in two directions from a central normal position, and carriage releasing devices including a releasing lever and a link connected thereto and having a lost motion connection with said double acting lever, said double acting lever when moved in one direction actuating said link and when moved in the other direction being ineffective on said link.

54. In a typewriting machine and in tabulating mechanism, the combination of a releasable carriage, a settable stop, a coöperative stop, a stop setting device, a stop retracting device, a single actuator for said devices, key controlled connections to said actuator including a double acting lever, carriage releasing devices including a releasing link, a tabulator key operative to move said coöperative stop and to actuate said releasing link, and a second link connected to said releasing link and having a lost motion connection with said lever.

55. In a typewriting machine and in tabulating mechanism, the combination of a carriage; releasable carriage feeding mechanism; a settable stop; a coöperative stop lever; stop setting and retracting devices for said settable stop; a single actuator for said devices; key controlled connections to said actuator including a double acting le-

ver; a tabulator key; connections from said key to said coöperative stop including a bell crank and a link; a releasing lever operative to release the carriage from the control of its feeding mechanism; devices operative on said releasing lever from said bell crank including a rock shaft, and a releasing link having a lost motion connection with said rock shaft; and a second link connected to said releasing link and having a lost motion connection with said double acting lever.

56. In a typewriting machine and in tabulating mechanism, the combination of a carriage; releasable carriage feeding mechanism; a settable stop; a coöperative stop lever; stop setting and retracting devices for said settable stop; a single actuator for said devices; key controlled connections to said actuator including a double acting lever; a tabulator key; connections from said key to said coöperative stop including a bell crank and a link; a releasing lever operative to release said carriage from the control of its feeding mechanism; devices operative on said releasing lever from said bell crank including a rock shaft, and a releasing link having a lost motion connection with said rock shaft; a second link connected to said releasing link and having a lost motion connection with said double acting lever, and an arresting stop operative by said actuator during stop retracting operations.

57. In a typewriting machine and in tabulating mechanism, the combination of a settable stop, a stop setting device, a stop retracting device, a single key, connections between said key and said devices, and an arresting stop, said key being movable in one direction for operating said setting device and in another direction for operating said retracting device and said arresting stop.

58. In a typewriting machine and in tabulating mechanism, the combination of a releasable carriage, a settable stop, a stop setting device, a stop retracting device, a single key, connections between said key and said devices, and an arresting stop, said key being movable in one direction for operating said setting device and in another direction for operating said retracting device and arresting stop and concurrently for releasing said carriage.

59. In a typewriting machine and in tabulating mechanism, the combination of a releasable carriage, a settable stop, a stop setting device, a stop retracting device, an arresting stop, and a single train of key actuated connections operative to actuate said retracting device, said arresting stop, and concurrently to release said carriage, said train being also operative to actuate said setting device only.

60. In a typewriting machine and in tabulating mechanism, the combination of a releasable carriage, a settable stop, a stop setting device, a stop retracting device, an arresting stop, a single actuator, and means for operating said actuator at will to operate said retracting device, said arresting stop and at the same time to release said carriage or to operate said setting device alone.

61. In a typewriting machine and in tabulating mechanism, the combination of a stop setting device, a stop retracting device, a single actuator for said devices, a single train of connections for operating said actuator in one direction to operate said setting device and in the opposite direction for operating said retracting device, and an arresting stop operative by said actuator during stop retracting operations.

62. In a typewriting machine and in tabulating mechanism, the combination of a settable stop, a stop setter, a stop retractor, devices projecting from said setter and from said retractor, a single actuator between said devices, an arresting stop, and means for at will moving said actuator in either of two directions to operate one or the other of said setter and retractor devices, movement of said actuator in one direction also operating said arresting stop.

63. In a typewriting machine and in tabulating mechanism, the combination of a settable stop, a stop setter, a stop retractor, devices projecting from said setter and from said retractor, a single actuator between said devices and provided with a cam, an arresting stop operative by said cam, and means for at will moving said actuator in either of two directions to operate one or the other of said setter and retractor devices, movement of said actuator in one direction also operating through said cam to move said arresting stop to operative position.

64. In a typewriting machine and in tabulating mechanism, the combination of a settable stop, a setting device, a retracting device, a slidable actuator between said devices, a slidable arresting stop having a pin and slot connection with said actuator, and means for at will moving said actuator in either of two directions, the movement of said actuator in one direction operating said setting device alone and the movement of said actuator in the opposite direction operating said retracting device and said slidable stop.

65. In a typewriting machine and in tabulating mechanism, the combination of a releasable carriage, a settable stop, a setting device, a retracting device, a slidable actuator between said devices, a slidable arresting stop having a pin and slot connection with said actuator, and means for at will moving said actuator in either of two directions, the movement of said actuator in one direction operating said setting device alone and the movement of said actuator in the

opposite direction operating said retracting device and said slidable stop, and concurrently operating to release the carriage.

66. In a typewriting machine and in tabulating mechanism, the combination of a releasable carriage, a settable stop, a vertical reciprocatory stop setting device, a vertical reciprocatory stop retracting device, a single actuator between said devices, a horizontally slidable arresting stop connected to said actuator, and means for at will moving said actuator vertically in either of two directions, the downward movement of said actuator operating said setting device alone and the upward movement of said actuator operating said retracting device and said arresting stop and concurrently effecting the release of said carriage.

67. In a typewriting machine and in tabulating mechanism, the combination of a carriage or traveling element, a frame or stationary element, a stop container on one of said elements, a stop receiving device on the other element, a tabulator stop, means for moving said stop back and forth between said container and said receiving device, a coöperative stop, and means for affording movement of said stop receiving device to vary its relationship with said container and said coöperative stop.

68. In a typewriting machine and in tabulating mechanism, the combination of a traveling element, a stationary element, a stop container on one element, a stop receiving device on the other element, a tabulator stop, means for moving said stop back and forth between said container and said device, a coöperating stop, and means for affording an axial turning movement of said device after it has received said tabulator stop to adapt it for coöperation with said cooperating stop.

69. In a typewriting machine and in tabulating mechanism, the combination of a traveling element, a stationary element, a stop container on one element, a toothed stop bar on the other element; a tabulator stop, means for moving said stop back and forth between said container and said stop bar, and means for adjusting said stop bar to bring the teeth thereon into stop receiving position with respect to said container and also for adjusting said stop bar so that its teeth are out of stop receiving position.

70. In a typewriting machine and in tabulating mechanism, the combination of a traveling element, a stationary element, a stop container on one element, a stop receiving device on the other element, a tabulator stop, means for moving said stop back and forth between said container and said receiving device, and means for affording movement of said receiving device to move it into stop receiving position and out of position where the tabulator stop can cooperate with the coöperating stop and also for affording the contrary movement of said stop receiving device.

71. In a typewriting machine and in tabulating mechanism, the combination of a traveling element, a stationary element, a stop container on one element, a stop receiving device on the other element, a tabulator stop, means for moving said stop back and forth between said container and said device, a coöperating stop, and means for affording a turning movement of said stop receiving device independently of movement of both said elements.

72. In a typewriting machine and in tabulating mechanism, the combination of a traveling element, a stationary element, a stop container on one element, a toothed stop bar on the other element, a tabulator stop, means for moving said stop back and forth between said container and said stop bar, and means for moving said stop bar independently of both said elements so that the teeth on said stop bar are brought into and out of stop receiving position.

73. In a typewriting machine and in tabulating mechanism, the combination of a stop container, tabulator stops therein, stop ejecting and retracting devices, a pivotally mounted stop receiving bar, a finger piece fixed to said bar for turning it into and out of stop receiving position, and devices for limiting the turning movements of said bar, said devices comprising a bracket provided with ears or tabs with which said finger piece coöperates.

74. In a typewriting machine and in tabulating mechanism, the combination of a stop container, tabulator stops therein, stop ejecting and retracting devices, a pivotally mounted stop receiving bar, a finger piece fixed to said bar for turning it into and out of stop receiving position, and devices for limiting the turning movements of said bar, said devices comprising a bracket provided with ears or tabs with which said finger piece coöoperates, said tabs being provided with indicating marks to show the positions in which said bar is.

75. In a typewriting machine and in tabulating mechanism, the combination of a stop container, tabulator stops therein, stop ejecting and retracting devices, a pivotally mounted stop receiving bar, a finger piece fixed to said bar for turning it into and out of stop receiving position, devices for limiting the turning movements of said bar, said devices comprising a bracket provided with ears or tabs with which said finger piece cooperates, said tabs being provided with indicating marks to show the positions in which said bar is, and detent devices for retaining said bar in adjusted positions.

76. In a typewriting machine and in tabulating mechanism, the combination of a ro-

tary stop bar, a tabulator stop comprising parallel portions and a connecting portion, a coöperative stop, key controlled setting devices for setting said stop on said stop bar when said stop bar has been rotated to one position, and means for affording turning movements of said bar to another position to bring the connecting portion of said tabulator stop into position for coöperation with said coöperative stop.

77. In a typewriting machine and in tabulating mechanism, the combination of a settable stop, key actuated stop setting devices, a lock for preventing the operation of said devices to set said stop, and means operating automatically to render said lock inoperative.

78. In a typewriting machine and in tabulating mechanism, the combination of a settable stop, a stop setter, a key controlled actuator therefor, a lock coöperative with said actuator, and means operating automatically to render said lock inoperative.

79. In a typewriting machine and in tabulating mechanism, the combination of a settable stop, key actuated stop setting devices, a lock for said devices, a stop receiving element, and means controlled thereby for rendering said lock inoperative.

80. In a typewriting machine and in tabulating mechanism, the combination of a settable stop, key actuated stop setting devices, a lock for said devices, a stop receiving element, means for adjusting said stop receiving element, and means controlled automatically by said last named means for rendering said lock inoperative.

81. In a typewriting machine and in tabulating mechanism, the combination of a settable stop, key actuated stop setting devices, a lock for said devices, a stop receiving element, a spring for maintaining said lock in operation, and an adjustable stop receiving element, said element being adapted during adjusting operations to overcome said spring.

82. In a typewriting machine and in tabulating mechanism, the combination of a settable tabulator stop, key actuated stop retracting devices, a lock for said devices, and means operating automatically to render said lock inoperative.

83. In a typewriting machine and in tabulating mechanism, the combination of a settable tabulator stop, key actuated stop retracting devices, a lock for said devices, a stop receiving element, and means controlled thereby for rendering said lock inoperative.

84. In a typewriting machine and in tabulating mechanism, the combination of a settable tabulator stop, key actuated stop retracting devices, a lock for said devices, a stop receiving element, means for adjusting said stop receiving element, and means operative automatically by said last named means for rendering said lock inoperative.

85. In a typewriting machine and in tabulating mechanism, the combination of a settable tabulator stop, key actuated stop setting and stop retracting devices, a lock therefor, and means operating automatically to render said lock inoperative.

86. In a typewriting machine and in tabulating mechanism, the combination of a settable tabulator stop, a stop setter, a stop retractor, a key controlled actuator for said setter and said retractor, a lock coöperative with said actuator, and means operating automatically to render said lock inoperative.

87. In a typewriting machine and in tabulating mechanism, the combination of a settable tabulator stop, a stop setter, a stop retractor, a key controlled actuator for said setter and said retractor, a lock coöperative with said actuator, a stop receiving element, means for adjusting said element in position to receive the settable stop when said stop setter is operated and for enabling said stop to be retracted when said retractor is operated, and means controlled automatically by said adjusting means for rendering said lock inoperative.

88. In a typewriting machine and in key set tabulating mechanism, a lock normally effective to prevent the operation of said key set mechanism.

89. In a typewriting machine and in tabulating mechanism, the combination of a settable tabulator stop, a stop setter, a stop retractor, a key controlled actuator for said setter and said retractor, a locking lever normally interposed between coöperative locking devices on said actuator, a stop receiving element, manual means for rotating said element into and out of stop receiving position, and connections to said locking lever operative from said manual means.

90. In a typewriting machine and in tabulating mechanism, the combination of a settable tabulator stop, a stop setter, a stop retractor, a key controlled actuator for said setter and said retractor, a locking lever normally interposed between coöperative locking devices on said actuator, a stop receiving element, manual means for rotating said element into and out of stop receiving position, and connections to said locking lever operative from said manual means, said connections comprising a spring pressed lever loosely connected to said locking lever and operative directly from said stop receiving element when the latter is moved by said manual means.

91. In a typewriting machine and in tabulating mechanism, the combination of a settable tabulator stop, a stop setter, a stop retractor, a key controlled actuator for said

setter and said retractor, a locking lever normally interposed between coöperative locking devices on said actuator, a rotary stop bar, manual means for turning said bar into and out of stop receiving position, and a spring pressed lever connected with said locking lever and movable by said stop bar during rotary movements of said stop bar.

92. In a typewriting machine and in tabulating mechanism, the combination of a settable tabulator stop, a stop setter, a stop retractor, a key controlled actuator for said setter and said retractor, a locking lever normally interposed between coöperative locking devices on said actuator, a rotary stop bar, manual means for turning said bar into and out of stop receiving position, and a spring pressed lever connected to said locking lever and normally maintaining the same in operative position, said spring pressed lever being controlled directly by said stop bar and movable by the latter to an abnormal position to hold said locking lever out of operation.

93. In a typewriting machine and in tabulating mechanism, the combination of a settable tabulator stop, a stop setter, a stop retractor, a key controlled actuator for said setter and said retractor, said actuator being movable in opposite directions to selectively actuate at will said setter and said retractor, a lock normally coöperative with said actuator to prevent movement of the same in either direction, a stop receiving bar adjustable into and out of stop receiving position, and means controlled automatically by said bar during such movements to render said lock inoperative and free said actuator.

94. In a typewriting machine and in tabulating mechanism, the combination of a settable tabulator stop, a coöperative stop, means for setting said settable stop, means for moving said settable stop to operative position after it has been set, and means for rendering said coöperative stop inoperative until said settable stop has been moved to its operative position.

95. In a typewriting machine and in tabulating mechanism, the combination of a settable tabulator stop, a coöperative stop, means for setting said settable stop, means for moving said settable stop to operative position after it has been set, and means for rendering said setting means inoperative while said settable stop is in operative position for tabulating.

96. In a typewriting machine and in tabulating mechanism, the combination of a tabulator stop, a stop container, a stop receiving element, a coöperative stop, means for transferring said tabulator stop back and forth between said stop container and stop receiving element, means for moving said stop receiving elements to bring said tabulator stop to operative position for tabulating, and means for rendering said transferring means inoperative while the tabulator stop is in said operative position.

97. In a typewriting machine and in tabulating mechanism, the combination of a tabulator stop, a stop receiving element, a key controlled coöperative stop, manual means for at will adjusting said stop receiving element in and out of stop receiving position, and a lock for said coöperative stop controlled by said manual means.

98. In a typewriting machine and in tabulating mechanism, the combination of a tabulator stop, a stop receiving element, key controlled coöperative stops, manual means for at will setting said stop receiving element in and out of stop receiving position, and a lock for said coöperative stop, said lock being normally ineffective but rendered operative automatically when said stop receiving element is adjusted in stop receiving position.

99. In a typewriting machine and in tabulating mechanism, the combination of a column stop, a rotary stop bar, key controlled denominational stops, manual means for at will setting said stop bar in and out of stop receiving position, and a lock for said denominational stops, said lock being normally ineffective but rendered operative automatically when said stop bar is turned to set it in stop receiving position.

100. In a typewriting machine and in tabulating mechanism, the combination of a tabulator stop, a stop receiving element, a set of key controlled denominational stops, manual means for at will adjusting said stop receiving element into and out of stop receiving position, and a lock for said denominational stops controlled by said manual means.

101. In a typewriting machine and in tabulating mechanism, the combination of a tabulator stop, stop setting mechanism, a key controlled coöperative stop, a lock for said stop setting mechanism, a lock for said coöperative stop, and means for rendering said locks alternately operative.

102. In a typewriting machine and in tabulating mechanism, the combination of a tabulator stop, stop setting mechanism, a normally effective lock for said mechanism, a coöperative stop, a normally inoperative lock for said coöperative stop, and means for rendering the first named lock inoperative and for concurrently rendering the second named lock operative.

103. In a typewriting machine and in tabulating mechanism, the combination of a tabulator stop, a stop receiving element, setting mechanism for setting said stop on said element, a lock for said setting mechanism, a coöperative stop, a lock for said coöpera-

tive stop, and means controlled by said element for actuating said locks.

104. In a typewriting machine and in tabulating mechanism, the combination of a tabulator stop, a stop receiving element, setting mechanism for setting said stop on said element, a lock for said setting mechanism, a coöperative stop, a lock for said coöperative stop, and means controlled by said element for actuating said locks, said means rendering one of said locks operative and concurrently rendering the other lock inoperative.

105. In a typewriting machine and in tabulating mechanism, the combination of a settable tabulator stop, a stop bar, setting mechanism for setting said stop on said bar, a key controlled coöperative stop, a lock for said setting mechanism, a lock for said coöperative stop, and means controlled by said stop bar for actuating said locks.

106. In a typewriting machine and in tabulating mechanism, the combination of a settable tabulator stop, a stop bar rotatable into and out of stop receiving position, setting mechanism for setting said stop on said bar, a key controlled coöperative stop, a lock for said setting mechanism, a lock for said coöperative stop, and means operating automatically during rotary movements of said stop bar for throwing said locks into and out of operative position.

107. In a typewriting machine and in tabulating mechanism, the combination of a settable tabulator stop, a stop bar rotatable into and out of stop receiving position, setting mechanism for setting said stop on said bar, a key controlled coöperative stop, a lock for said setting mechanism, a lock for said coöperative stop, and means operating automatically during rotary movements of said stop bar for rendering inoperative the first named lock while the second named lock is concurrently rendered operative.

108. In a typewriting machine and in tabulating mechanism, the combination of a settable tabulator stop, a stop setter, a key controlled actuator therefor, a lock coöperative with said actuator, a coöperative stop, a lock therefor, and means operating automatically to render one of said locks operative and concurrently to render the other of said locks inoperative.

109. In a typewriting machine and in tabulating mechanism, the combination of a settable tabulator stop, a stop setter, a stop retractor, a key controlled actuator for said setter and said retractor, a lock coöperative with said actuator, a coöperative stop, a lock therefor, and means operating automatically to render one of said locks operative and concurrently to render the other of said locks inoperative.

110. In a typewriting machine and in tabulating mechanism, the combination of a settable tabulator stop, a stop setter, a stop retractor, a key controlled actuator for said setter and said retractor, a lock coöperative with said actuator, a stop receiving element, means for adjusting said element in position to receive the settable stop when said stop setter is operated and to enable said stop to be retracted when said retractor is operated, a key controlled stop coöperative with said settable tabulator stop, a normally ineffective lock for said key controlled stop, and means controlled automatically by said adjusting means for actuating said locks.

111. In a typewriting machine and in tabulating mechanism, the combination of a settable tabulator stop, a stop setter, a stop retractor, a key controlled actuator for said setter and said retractor, a lock coöperative with said actuator, a stop receiving element, means for adjusting said element in position to receive the settable stop when said stop setter is operated and to enable said stop to be retracted when said retractor is operated, a key controlled stop coöperative with said settable tabulator stop, a lock for said key controlled stop, said lock being normally ineffective, and means controlled automatically by said adjusting means for actuating said locks, said automatic means operating to render the first named lock ineffective and concurrently to render the second named lock effective.

112. In a typewriting machine and in tabulating mechanism, the combination of a stop bar, a plurality of tabulator stops, a stop magazine for said tabulator stops arranged at one side of said stop bar, a key-controlled coöperative stop arranged at another side of said stop bar, stop setting and retracting mechanism, manual means for turning said stop bar into and out of normal position, said stop bar when in abnormal position being arranged for stop setting and retracting operations and when in normal position being adapted for tabulating operations, a lock for said setting and retracting mechanism, a lock for said key-controlled stop, and means operative by said manual means for controlling said locks.

113. In a typewriting machine and in tabulating mechanism, the combination of a stop bar, a plurality of tabulator stops, a stop magazine for said tabulator stops arranged at one side of said stop bar, a key controlled coöperative stop arranged at another side of said stop bar, stop setting and retracting mechanism, manual means for turning said stop bar into and out of normal position, said stop bar normally being adapted for tabulating operations but when in abnormal position being arranged for stop setting and retracting operations, a lock for said mechanism, a lock for said key controlled stop, the first named lock being normally effective and the second named lock

being normally inoperative, and means operative by said manual means for rendering the first named lock inoperative and concurrently rendering effective the second named lock.

114. In a typewriting machine and in tabulating mechanism, the combination of a tabular stop receiving element, means for affording movement of said element into and out of stop receiving position, and means comprising a tabulator locking device for notifying the operator when said element is in stop receiving position.

115. In a typewriting machine and in tabulating mechanism, the combination of tabular stops, a tabulator stop receiving element, means for affording movement of said element into and out of stop receiving position, and means comprising a tabulator locking device for notifying the operator when said stops are in inoperative position.

116. In a typewriting machine and in tabulating mechanism, the combination of a tabulator stop receiving element, means for affording movement of said element into and out of stop receiving position, and means comprising a tabulator locking device for notifying the operator when said element is in stop receiving position and also when said element is out of stop receiving position.

117. In a typewriting machine and in tabulating mechanism, the combination of a tabulator stop receiving element, means for affording movement of said element into and out of stop receiving position, tabulator keys, and means comprising a locking device associated with said keys for indicating when said element is in stop receiving position.

118. In a typewriting machine and in tabulating mechanism, the combination of a tabulator stop receiving element, means for affording movement of said element into and out of stop receiving position, key controlled stop setting mechanism, and checking means comprising a locking device associated with said mechanism for indicating when said element is out of stop receiving position.

119. In a typewriting machine and in tabulating mechanism, the combination of a stop bar, a column stop, two stops independently coöperative with the column stop, and means for locking one of said coöperative stops while the other is free to be operated.

120. In a typewriting machine and in tabulating mechanism, the combination of a stop bar, a column stop which can be set in either of two positions, two independently operative stops coöperative with said column stop, and means for locking one of said stops while the other is free to be operated, the one locked depending on the position of the column stop.

121. In a typewriting machine and in tabulating mechanism, the combination of a tabulator stop, a stop container, a stop bar, the stop having a one-sided bevel on the face opposite the container and the container being provided with stop receiving notches which opposite the stop are beveled on one side, and means for moving said stop from the container to the stop bar, the bevels on the stop and on the stop bar acting as guiding means for said stop during its movement from the container to the stop bar.

122. In a typewriting machine and in tabulating mechanism, the combination of a tabulator stop, the lower end whereof has a bevel at one side, a stop container, a stop bar underlying said container and provided with a series of teeth between which said stop is adapted to be received, each tooth having a bevel at one side of its upper part, and means for moving said stop from the container to the stop bar, the bevels on the stop and on the stop receiving teeth acting as guiding means for said stop.

Signed in the borough of Manhattan, city of New York, in the county of New York, and State of New York, this 6th day of June, A. D. 1912.

JOHN WALDHEIM

Witnesses:
CHARLES E. SMITH,
E. M. WELLS.