

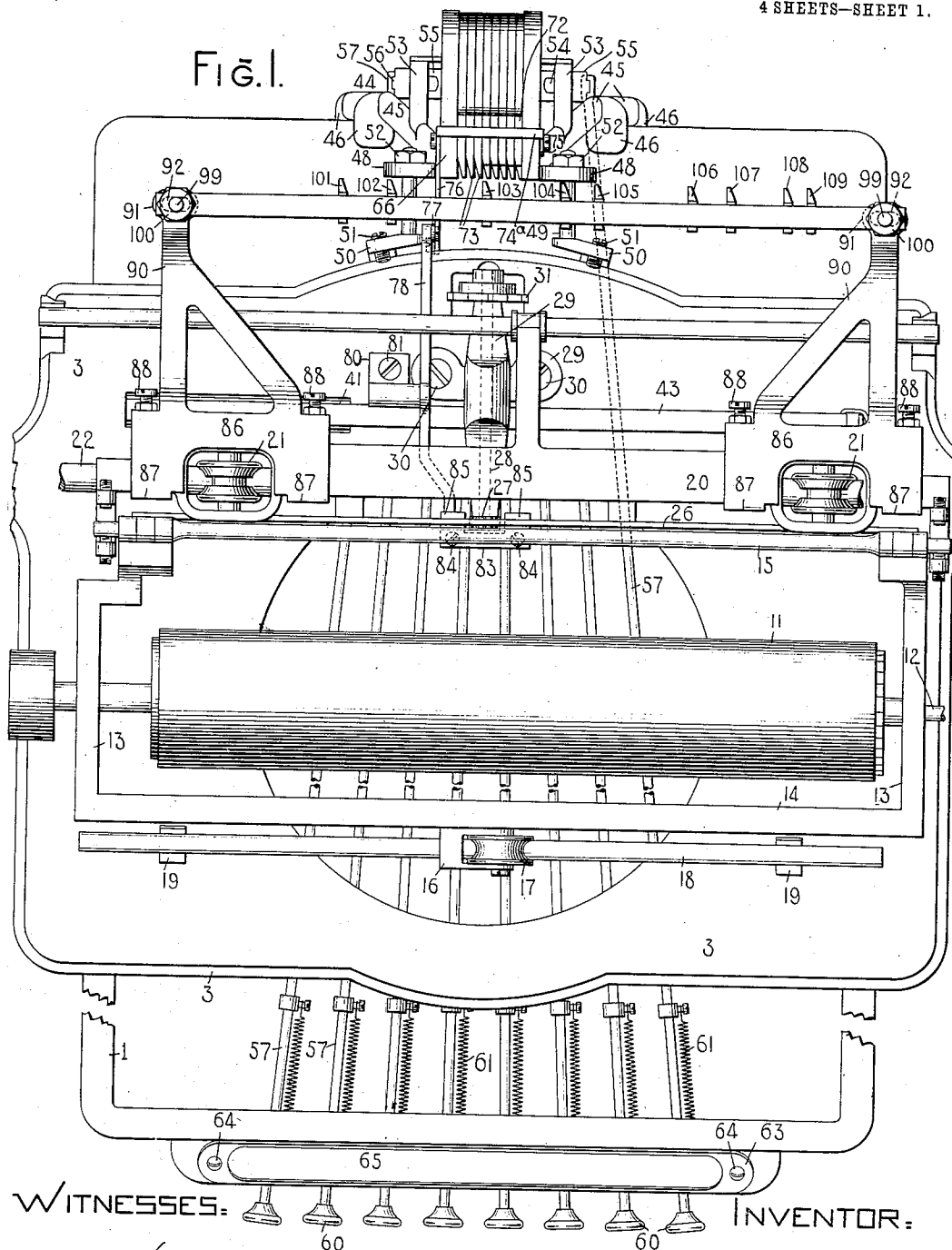
941,122.

C. B. YAW.
TYPE WRITING MACHINE.
APPLICATION FILED MAR. 17, 1906.

Patented Nov. 23, 1909.

4 SHEETS—SHEET 1.

FIG. 1.



WITNESSES:

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INVENTOR:

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By Jacob Fabel

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4 SHEETS—SHEET 2.

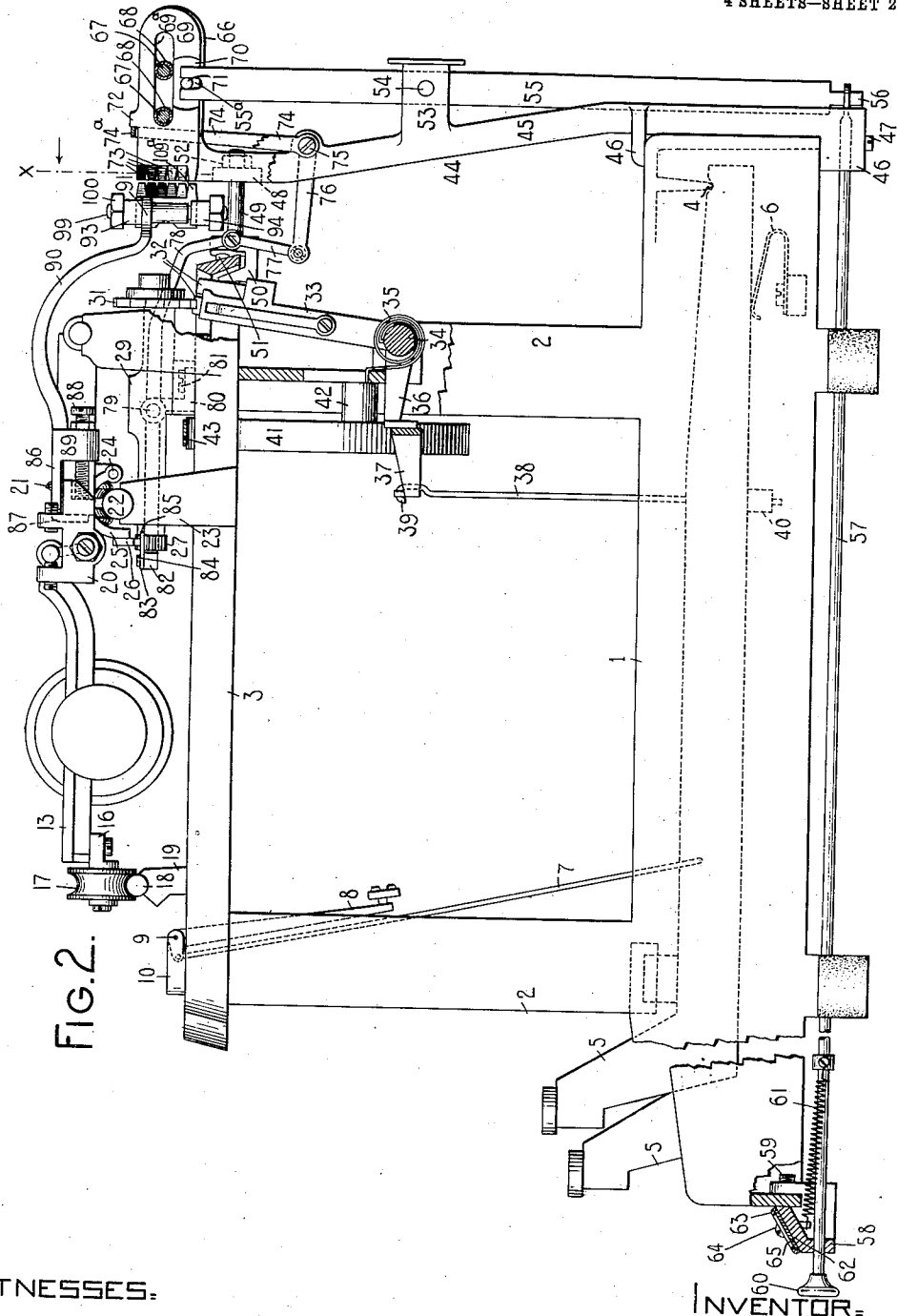


FIG. 2.

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4 SHEETS—SHEET 3.

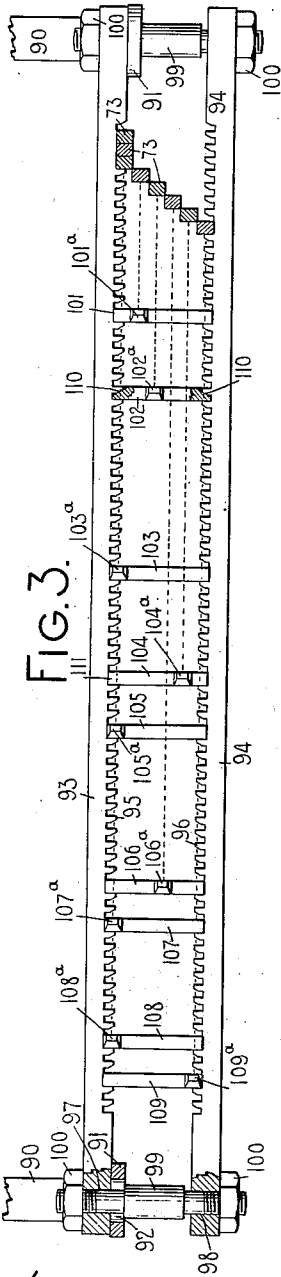


FIG. 3.

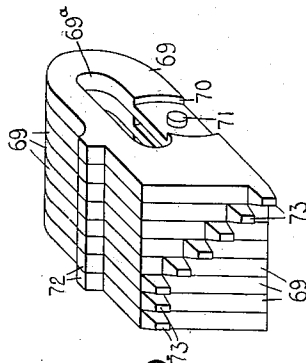


FIG. 5.

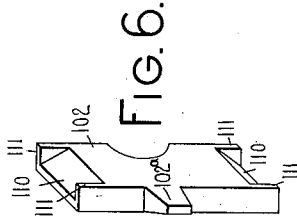
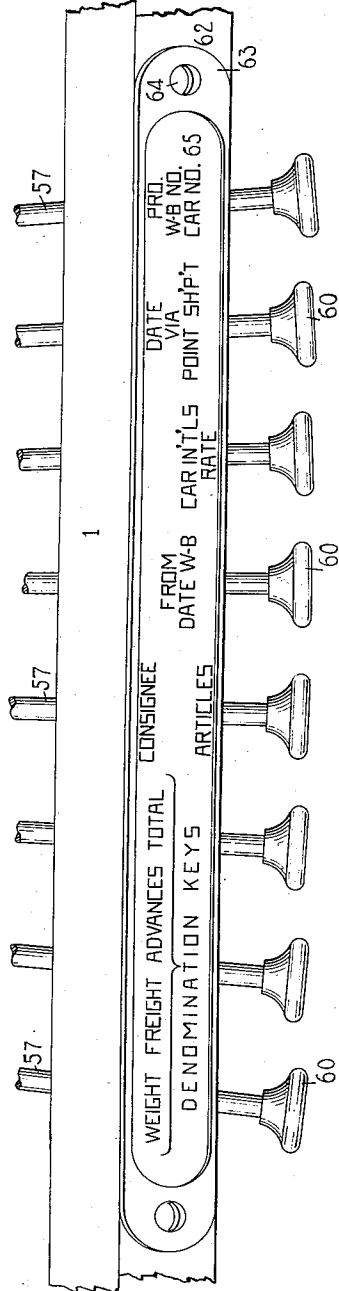


FIG. 6.

FIG. 4.



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4 SHEETS—SHEET 4.

FIG. 7.

112

CONSIGNEE -----		DATE -----		PRO. -----	
FROM -----		VIA. -----		W-B NO. -----	
DATE OF W-B		CAR INITIALS	POINT SH'PT	CAR NO.	
ARTICLES	WEIGHT	FREIGHT RATE	ADVANCES	TOTAL	

WITNESSES:

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INVENTOR:

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UNITED STATES PATENT OFFICE.

CLIO B. YAW, OF NEW YORK, N. Y., ASSIGNOR TO WYCKOFF, SEAMANS & BENEDICT, OF
ILION, NEW YORK, A CORPORATION OF NEW YORK.

TYPE-WRITING MACHINE.

941,122.

Specification of Letters Patent.

Patented Nov. 23, 1909.

Application filed March 17, 1906. Serial No. 306,538.

To all whom it may concern:

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

My invention relates to tabulating mechanism for typewriting machines and has for its main object to provide improved column selecting devices, whereby the traveling element or carriage of the typewriter may, after being freed or released from its step-by-step feeding mechanism, be arrested at a selected columnar position, intermediate columnar positions or fields being skipped or passed.

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

Column selecting devices as heretofore constructed comprise a series of stepped column stops having contact surfaces projecting different extents from the stop support. One or more coöperative stops have generally been associated with the stepped column stops, said coöperative stops being adapted to be moved different extents to engage one or another of the series of stepped stops to arrest the carriage at a desired columnar position. In constructions such as those just referred to, the extent to which a stop is moved determines the particular column stop with which the moved stop co-acts. It is obvious that in such constructions the parts must be closely adjusted to operate properly, and it is further obvious that the number of columns which may be made use of is comparatively limited because each column is selected by a different extent of movement of a stop member or members, said member or members being usually designed to coöperate with all of the column stops; or, if not, one or more of said coöperative stops being each movable to positions to intersect the path of a plurality of said stepped column stops, so as to be capable of co-acting with certain column stops with which said movable stops were not designed to coöperate.

By my improved construction I obviate the necessity of moving a stop different extents to coöperate with desired column stops, and in such improved construction, furthermore, the movable stops do not intersect the paths of any of the column stops with which they are not, at one time or another, designed to coöperate. This I do by arranging the contact surfaces of the column stops in different ranks or tiers and by arranging the operative stops in corresponding ranks or tiers. It will be apparent that all the coöperative stops may be moved to the same extent but being in different ranks will co-act only with the column stop or stops having contact surfaces in the same rank or tier, and that intermediate column stops having their contact surfaces in other and different ranks or tiers will be skipped or passed.

My invention is particularly useful in billing work, and in some of the machines to which my invention has been applied it has been designed for that class of work. In the drawings I illustrate such a construction designed for writing one form of railroad "way bill".

Although I have illustrated a particular arrangement of stops for a special form of work and the specification is chiefly devoted to describing and explaining this particular arrangement, it is to be understood that the invention is not limited to the construction shown. On the contrary, the invention is, so far as I am aware, broadly new and I desire to claim it broadly.

In the accompanying drawings, Figure 1 is a top plan view of a typewriting machine embodying my invention, parts being omitted and broken away. Fig. 2 is a side elevation of the machine, parts being omitted and broken away. Fig. 3 is a view taken on a plane represented by the line *x* in Fig. 2 and looking in the direction of the arrow in said Fig. 2. Said Fig. 3 is drawn to a larger scale than Fig. 2 and shows the column stop bar in rear elevation with the column stops mounted thereon, the contact portions of the stops, coöperative with said column stops, being shown in section. Fig. 4 is an enlarged fragmentary top plan view showing the forward ends of the tabulator keys, the bearing bar or plate of said keys,

and the tabulator scale plate on said bar. Fig. 5 is an enlarged perspective view of the set or battery of stops which cooperate with the column stops. Fig. 6 is an enlarged perspective view of one of the column stops. Fig. 7 is a fragmentary full-sized face view of a blank form or work sheet hereinafter termed a "way bill".

Referring more especially to Figs. 1 and 2 of the drawings, the main frame of the machine comprises a base 1, corner posts 2 and a top plate 3 sustained by said corner posts. Fulcrumed at 4 in the rear of the base are key levers 5, each key lever being provided with a restoring spring 6 and being connected by a link 7 with a type bar 8, said type bar being pivoted at 9 in a hanger 10 fixed to the top plate. The hangers 10 are circularly disposed on the top plate and the type bars are adapted, when actuated by their associate key levers, to cooperate with the bottom of a rotary cylindrical platen 11 having an axle 12 journaled in side bars 13 of a platen frame, said frame comprising, in addition to the side bars, a front bar 14 and a rear bar 15. Secured to the front bar 14 is a bearing block 16 in which is journaled a wheel 17, said wheel cooperating with a shiftable guide rail 18 which is fixed on arms 19 suitably supported on the frame of the machine. The platen frame is pivotally connected with a carriage truck 20 in which wheels 21 are journaled, said wheels cooperating with a guide rail 22 fixed to standards 23 rising from the top plate. The platen frame and carriage truck together constitute a carriage. Pivoted at 24 in the sides of the carriage truck are upwardly and forwardly curved arms 25 to the front ends whereof is suitably secured a carriage feed rack 26. The feed rack normally meshes with a feed pinion 27 which is fixed to the forward end of a horizontally disposed shaft 28, the shaft being journaled in a bracket 29 fixed to the top plate by screws 30. The rear end of the shaft 28 is operatively connected with an escapement wheel 31 cooperative with which are feed dogs 32 mounted at the top of a vertically disposed arm 33 of a pivoted and vibratory dog rocker 34. Said dog rocker is provided with a restoring spring 35 and has a horizontally disposed forwardly projecting arm 36 which carries a laterally disposed bar 37. Arms 38 are provided at their upper ends with hook portions 39, which hook over the ends of the bar 37. Carried at the lower ends of the arms 38 is a universal bar 40, said bar extending from side to side of the machine beneath the series of key levers 5 and being adapted to be actuated when any one of said key levers is operated. A spring drum 41, journaled at 42 on the frame of the machine, is connected by a band or strap 43 to the carriage truck, said spring drum constantly tending to draw the carriage left-

ward across the top plate. During the operation of the machine when any one of the key levers 5, or the spacing levers (not shown) is depressed, the carriage feeding devices cooperate in a known manner to permit the carriage to be drawn one letter space in printing direction by the spring drum 41. The machine as thus far described generally resembles the well known Remington typewriter and it is therefore not deemed necessary to describe the parts or explain their mode of operation at greater length.

Referring now to the tabulating devices, I have shown my improvements embodied in a detachable tabulating mechanism which generally resembles the well known Gorin tabulator. Although I prefer to make use of this general style of tabulator in carrying out my invention it is to be understood that the nature of the invention is such that it may be readily embodied in tabulating devices of other forms.

A supporting bracket 44 is mounted at the rear of the machine. Said bracket comprises side arms 45 which are provided with lugs or projections 46, said lugs embracing the rear of the base 1 of the main frame, and set screws 47 passing through the lower lugs and abutting against the bottom of the base, thereby aiding in maintaining the bracket 44 in fixed relation with the machine frame. Near their upper ends the side arms are provided with lateral lugs 48 through which pass horizontally disposed rods 49. The forward ends of said rods are fixed in bearing blocks 50 which are split to embrace the rim of the top plate at its rear, said bearing blocks being provided with set screws 51 which abut the rim of the top plate and hold said blocks 50 in fixed relation thereto. The rear ends of the rods 49 are threaded and receive nuts 52 which abut against the rear faces of the lateral lugs 48 of the bracket 44, the construction being such that the upper portion of said bracket is thereby held in fixed relation with the machine frame. Projecting rearwardly from the side arms 45 are lugs 53, which are connected by a rod 54, said rod serving as a fulcrum for a number of vibratory levers 55, eight of such levers being shown in the drawings. The lower arm of each lever is reduced at its end, as indicated at 56, and engages the perforated rear end of a horizontal push rod 57 which is disposed beneath the base of the machine and extends fore and aft thereof. The push rods 57 are disposed so that they fan laterally outward as they approach the front of the machine, and at the front thereof they bear in a bearing bracket or bar 58 which is secured by set screws 59 to the base frame. Each push rod is provided with a key button 60 and a restoring spring 61. The front of the bear-

ing bracket 58 has a beveled face 62 on which a scale plate or holder 63 is secured by screws 64. The holder 63 holds in place a scale 65, the markings of which will be described at greater length hereinafter. Projecting rearwardly from the upper ends of the side arms 45 of the supporting bracket 44 are lugs 66, said lugs being connected by two parallel horizontal rods 67, each of which supports a set of rollers 68 arranged side by side on said rods and independently rotatable thereon. The rollers serve as bearings for slidable blade-like stops 69 which are best seen in Fig. 5, said stops being formed with horizontal slots 69^a, the edges of which cooperate with the rollers 68. Eight of these blades or stop members 69 are shown, one for each of the levers 55 and keys 60 although it is to be understood that any desired number of stop members and connections may be employed. The stop members are arranged side by side and confined between the lugs 66 of the bearing bracket. Each stop member is recessed as indicated at 70 to receive the upper end of its associate vibratory lever 55. A stud 71 projects laterally from the bottom of each recess 70 and cooperates with a slot 55^a at the upper end of the associate vibratory lever 55, thereby operatively connecting the latter with the stop blade. The top edge of each stop 69 is provided with a lug 72 which cooperates with the carriage releasing mechanism presently to be described. The front edge of each stop is provided with a forwardly projecting stopping portion 73, the right side of which portion serves as a contact surface adapted to cooperate with one or more column stops, presently to be described, when the stops 69 are projected forwardly into working position by their actuating devices. As will be understood best from a consideration of Fig. 5, the stopping portions 73 are arranged in a plurality of ranks or tiers, such ranks or tiers in the present instance being at different elevations. The arrangement of the stopping portions may vary, but as herein shown the stopping portions of the three left-hand stops 69 are in the same rank or tier and all are cut by the same horizontal plane. The stopping portion of the fourth stop is in a separate rank or tier and is cut by a horizontal plane parallel with the plane of the first three stops but below said plane; the stopping portion of the fifth stop is in the rank next below that of the stopping portion of the fourth stop; the stopping portion of the fifth stop is in the rank next below that of the fourth; the stopping portion of the sixth stop is in the rank next below that of the fifth; the stopping portion of the seventh stop is in the rank next below that of the sixth, and the stopping portion of the eighth is in the rank next below that

of the seventh. Except for the arrangement of the stopping portions of the stops 69 in ranks or tiers as just explained, the tabulating mechanism as heretofore described may be of any suitable construction, the parts shown not differing materially in other respects from the corresponding parts of the Gorin tabulator.

The carriage releasing mechanism may be of any suitable construction. As herein shown it comprises a bar 74 shaped like an inverted U, pivoted at its ends at 75 on the side bars 45 of the supporting bracket 44 and extending across the tops of the stops 69, the crosswise portion 74^a of the bar 74 normally resting against the lugs 72. Integral with the left-hand side of the bar 74 and extending horizontally forward from the pivot thereof is an arm 76 which is pivotally connected at its forward end with a link 77 extending upwardly and connected at its top with a horizontally disposed lifting lever 78. Said lever 78 is fulcrumed at 79 in a bracket 80 which bracket is secured to the top plate 3 by a screw 81. The lifting lever extends forwardly at the left of the bracket 29 and at its forward end is bent laterally at right angles to the body portion of the lever, and extends rightward transversely of the machine in front of the escapement wheel 27, the transverse portion being represented by the numeral 82. A plate 83 is secured to the top of the lateral portion 82 of the lifting lever by screws 84, said plate being provided with rearwardly extending lifting shoes 85, one at each side of the escapement wheel 27 and normally lying just below and out of contact with the teeth of the feed rack 26. The construction is such that when any of the stops 69 is projected forwardly into operative position, the lug 72 of said stop actuates the train of releasing mechanism just described and causes the lifting shoes to swing the feed rack 26 upwardly about its pivots 24, thereby disconnecting said rack from the pinion 27 and freeing or releasing the carriage from its step-by-step feeding devices.

Referring now to the column stop devices with which the stops 69 cooperate, said devices may be mounted on the carriage of the machine in any suitable manner. Preferably I provide two brackets 86, one arranged at each side of the carriage truck 20. Each of said brackets is provided at its front with downwardly extending lips 87 which cooperate with the front face of the carriage truck 20, the brackets being fixedly attached to said truck by means of screws 88 which pass through downwardly extending lugs 89 at the rear of the carriage truck, as shown in Fig. 2. Each bracket is formed with a rearwardly and downwardly curved arm or extension 90. The rear ends of the arms 90 are slightly enlarged or spread as

indicated at 91 and are formed with slots 92. The arms 90 of the brackets carry a column stop bar which is best shown in Fig. 3. The stop bar comprises two independent portions or sections 93 and 94 arranged one above the other and toothed or serrated on their opposing faces as indicated at 95 and 96. The ends of the portions 93 and 94 are respectively provided with holes 97 and 98. Vertically disposed bolts 99 have their ends reduced and threaded, the upper end of each bolt passing through the slot 92 in the arm 90 and through the hole 97 in the part 93 of the stop bar and the lower end of said bolt passing through the hole 98 in the portion 94 of the stop bar. Binding nuts 100 cooperate with the threaded ends of the bolts 99 to maintain the parts of the stop bar in fixed relation with each other and with their supporting brackets, said nuts tending as they are tightened to draw the ends of said bars toward each other and to force the upper shoulder of each bolt 99 firmly against the portion 91 of the bracket arm 90.

Adjustable on the two-part stop bar are a plurality of column stops, nine of said stops being shown in the drawings and numbered from left to right respectively 101, 102, 103, 104, 105, 106, 107, 108 and 109. I have given these column stops different numbers for convenience of description, but they do not differ in construction save in respect of the locations of their contact surfaces. Fig. 6 illustrates in detail the second stop 102 and the description of this stop which follows is applicable generally to all of the others. The stop 102 is plate-like in form and is vertically disposed between the two parts 93 and 94 of the stop bar, the upper and lower edges of said stop being beveled as indicated at 110 to cooperate with the toothed portions of said stop bar. The bevels 110 do not extend entirely across the upper and lower edges of the stop so that a shoulder 111 is left at each end of each bevel, said shoulders being adapted to cooperate with the stop bar to prevent displacement of the stop fore and aft of the machine after the stop has once been assembled in position. The stop portion projects rearwardly from the back of each column stop and for convenience of reference these stop portions will be numbered from left to right respectively 101^a, 102^a, 103^a, 104^a, 105^a, 106^a, 107^a, 108^a and 109^a.

The stopping portions of the various column stops are arranged in ranks or tiers corresponding with the ranks or tiers in which their cooperating stops 69 have their stopping portions arranged. Consequently one or more of said column stops will have its stopping portion arranged at the top of the body of said stop in the first rank or tier, while others of the column stops will have their stopping portions arranged in the second, third, fourth, fifth and sixth ranks

or tiers which are successively at lower elevations or heights than the first rank or tier. The stopping portions are in the form of short lugs and have their right-hand faces beveled to readily clear their cooperating stops after having co-acted with the latter. In assembling the column stops on the stop bar one of the binding nuts 100 at each side of the latter may be loosened so that the column stops may be arranged between the two portions of the stop bar and in proper relation with each other and thereafter the binding nuts may be tightened, drawing the parts 93 and 94 of the stop bar together so as to secure the column stops firmly in place.

The arrangement of the column stops on the stop bar will depend in each case upon the particular form of work to which the machine is to be adapted in that particular case. In Fig. 7 of the drawings I have illustrated the particular form of work sheet, indicated by the reference character 112, for which the column stops were arranged as shown in Figs. 1 and 3. The blank form 112 is one style of what is commonly termed a railroad "way bill." The "way bill" shown comprises, as will be noted, four lines of print. The first line calls for the filling in of the name of the consignee; the date of shipment, that is the date of this way bill; and the "Pro" number. The second line requires to be filled in, the point "From" which the shipment is made; the line from this point by which or "Via" the shipment is made and the number of the way bill. The third line requires to be filled in the "Date of W. B.," that is the date of the way bill prior to the present one; the "Car in'tls.," that is the initials of the road to which the outgoing car belongs; the "Point of shipment," that is the original point from which the shipment was made; and the number of the outgoing car. The fourth printed line consists of the headings of a series of columns in which are to be enumerated the "Articles" shipped; their respective weights; the "Freight" charge, which is obtained by multiplying the weight by the rate; the "Rate;" the "Advances" made by the present carrier to prior carrying roads; and the "Total" which comprises the sum of the advances and the freight. It will be noted that the way bill shown requires the blanks in the first two lines to be filled in at the right of each printed direction; that the third line requires the blank to be filled in beneath the printed directions; and that the fourth line requires the blanks to be filled in beneath the printed directions. When a number of articles are shipped as is generally the case, these will be entered in columnar order, one under another, and their weights, freight charges, etc. will be also arranged in columnar order, so that this portion of the bill is preferably ruled in tabular form, as shown.

With the way bill in hand the tabulating scale may first be made out. One form of scale for the way bill illustrated is shown in Fig. 4 of the drawings, and has been given the reference numeral 65. The scale 65 having been arranged in place under the scale plate 63, the column stops may be readily arranged in requisite order and positioned on their stop bar by releasing the carriage and moving it leftward by hand until the usual carriage scale (not shown) indicates that the carriage has reached the point in its leftward travel at which the item to be written on the bill is to be begun. The tabulating key 60 that is to be used for that item may then be actuated, so as to project its associate stop 69. The binding nuts 100 having been sufficiently loosened, as previously explained, the column stop associated with the projected stop 69 is next placed on the stop bar in contact with said projected stop. This operation is repeated until the entire number of column stops have been arranged in place. I will describe in detail the manner of arranging the column stops for the first line of the way bill so that the procedure just outlined may be more clearly understood. The first item of the first line is the "Consignee." The name of the "consignee" is to be entered at the right of the printed word "Consignee," and, to be in proper relation, said name should begin at about the point "10" in the line of writing. The carriage, therefore, is released in the ordinary manner by actuating the usual release key (not shown) and said carriage is then moved down by hand to the point "10" on the carriage scale where it is arrested. Referring now to the tabulating scale 65, it will be noted that the term "Consignee" is associated with the fourth tabulating key 60 from the left-hand. The fourth key, therefore, is actuated to project the fourth stop 69 from the left, thereby bringing the associate stopping portion 73 into operative position. This particular stopping portion, it will be noted on an inspection of Fig. 5, is in the second rank or tier from the top. A column stop is therefore selected having a contact surface which is likewise in the second tier from the top. The column stop having its contact surface in this particular location is designated in the drawings by the reference character 101. This stop is adjusted in place on the stop bar with its portion 101^a in contact with the stopping portion 73 of the projected stop 69. It will be obvious that at subsequent operations of the fourth tabulating key 60 the fourth stop 69 will be projected, thereby causing the automatic release of the carriage from its feeding mechanism and permitting said carriage to move freely leftward until arrested by the coaction between the stopping portion 101^a of the stop 101 with the projected stop 69.

Referring again to the way bill, it will be

noted that the date in order to be in the proper place should be entered at about the point "35" in the line of writing. The carriage is therefore moved by hand to the point "35" on the carriage scale and arrested.

Referring now to the tabulating scale 65 it will be seen that the "Date" is associated with the seventh key 60. This key is next actuated, projecting the seventh stop 69 and bringing its stopping portion 73 into operative position. Said stopping portion, it will be noted, is in the next to the lowest rank or tier. Consequently a column stop is selected which has a corresponding stopping portion, said stop being represented in the drawings by the reference numeral 104. This stop is adjusted on the stop bar with its stopping portion 104^a in contact with the stopping portion 73 of the projected stop 69. Referring again to the way bill, it will be noted that the "Pro" number should be entered at about the point "65" in the line of writing. Consequently the carriage is next moved by hand until the carriage scale indicates that the point 65 has been reached. The appropriate key 60, in this case the eighth key, is next actuated, projecting the eighth stop 69 and bringing its stopping portion 73 to operative position, said stopping portion being in the last or bottom rank or tier. The corresponding column stop in this case is the stop 109 and therefore the stop 109 is adjusted on the stop bar in engagement with the projected eighth stop 69. The stops for the first line of the way bill having been adjusted in place as just described in detail, the stops for the second and third lines and for the fourth and subsequent lines are similarly adjusted, whereupon the binding nuts 100 are tightened and the tabulating mechanism is ready for use.

The general manner of operating the tabulating devices will be understood from explanations hereinbefore made. The fourth, seventh and eighth tabulating keys 60 are actuated in turn to bring the carriage to the proper points for filling in the blanks in the first line of the way bill. The actuation of the fourth key will operate to release the carriage from its step-by-step feeding mechanism and cause it to move freely or "jump" leftward until it is arrested by the coöperation between the fourth stop 69 and the column stop 101. After the consignee's name has been written, the actuation of the seventh tabulating key 60 causes the carriage to "jump" leftward until arrested by the co-operation of the seventh stop 69 with the column stop 104. From an inspection of Fig. 3 it will be noted that the column stops 102 and 103 may at the beginning of the second jump of the carriage be intermediate the projected stop 69 and the column stop 104. The stop portions of the stops 102 and 103, however, are in ranks or tiers which do not

correspond with the rank of the projected stop 69, both said intermediate stops being at higher elevations and out of the path of the projected stop 69. Consequently the intermediate column stops will not serve to arrest the carriage but will be skipped or passed during the free leftward movement of said carriage, and the latter will not be arrested until the stopping portion 104^a of the stop 104 engages the stopping portion 73 of the projected seventh stop 69. The "Date" blank of the first line having been filled by operating the printing key levers 5 in the usual manner, the eighth tabulating key is operated to project the eighth stop 69 and release the carriage, which will thereupon move freely leftward until arrested by the coöperation of the stopping portion 109^a of the column stop 109 with the stopping portion 73 of the projected stop 69. During this "jump" or free movement of the carriage, the column stops 105, 106, 107 and 108 will be skipped or passed, since the stopping portions of said column stops are in different ranks or tiers from the stopping portions of the projected stops 69. The blank spaces in the first line of the way bill having been filled or written the platen is line spaced in the usual manner and the carriage is restored to the right to enable the blank spaces in the second line to be filled. By reference to the tabulating scale 65 it will be noted that the keys 60 which are operated for this purpose are the fifth, seventh and eighth which will in turn operate to free the carriage and cause its arrest by the coöperation respectively of the fifth, seventh and eighth stops 69 with the column stops 102, 104 and 109. During this tabulating movement of the carriage various column stops will be skipped or passed in the manner hereinbefore explained. The second line having been written, the carriage is again line spaced and restored to the right and thereafter the third line of the way bill is filled in, the fifth, sixth, seventh and eighth tabulating keys 60 being operated for the purpose of causing the necessary tabulating movements of the carriage.

As has been stated the third line is filled in under the third line of printed items instead of at the side thereof as was done in the case of the first two lines of the bill. The vertical spacing of the items of the bill is preferably such that a single line space operation will be sufficient to turn the platen from the first to the second line, and two operations or movements of the line spacing mechanism will be sufficient to turn the platen from the second to the third line and also from the third to the fourth line. After the third line is filled in, the carriage is again line spaced and restored to the right to a position to begin the fourth line of writing on the way bill. The items on the fourth and subsequent lines are, as has been

stated, arranged in tabular form and comprise for the most part numbers of varying denominations. It is desirable, therefore, that the tabulating movements of the carriage for writing the fourth and subsequent lines that consist of numbers should be controlled by denomination stops. For this reason the first three stops 69, counting from the left, are arranged to operate as denomination stops in the usual manner and the column stops corresponding to the numerical items in the fourth and subsequent lines on the bill are coöperative with said first three stops. To explain their mode of coöperation clearly, the manner of writing the fourth line of the bill will be considered somewhat in detail. The number of articles, whatever it may happen to be, is written in figures, preferably near the left-hand margin of the bill, and then the fourth tabulating key 60 is operated to cause the release of the carriage and its subsequent arrest by the coöperation between the fourth stop 69 and the corresponding column stop 101. This arrest of the carriage, as we have previously seen, will occur at the point "10" on the carriage scale. Thereafter the name of the article as "Typewriters," "Cabinets" or the like, is written in. By reference to the way bill 112 it will be noted that the next item in the fourth line is "Weight".

Assuming the weight to be in three figures, the third tabulating key 60 may be actuated to project the third stop 69 and release the carriage, the latter subsequently being arrested by the coöperation between said third stop and the stop 103 which is the first stop counting from left to right which has its stopping portion in the same rank or tier as the projected third stop 69. If the weight of the article is represented by one less figure than was first assumed, the second key 60, of course, will be operated instead of the third; while if the weight be represented by a figure of a denomination two less than that first assumed the first key 60 will be operated. It will be understood, of course, that the machine may be equipped with any suitable number of denomination keys, stops and connections in accordance with the denominations of the numbers commonly met with in the style of work for which the machine is fitted up. The amount of the weight having been written in the second column of the fourth line, the appropriate denomination key, that is the first, second or third of the keys 60, is operated to release the carriage and cause its arrest by the coöperation of the appropriate stop 69 with the next column stop having a stopping portion in the top rank or tier, this being the stop 105. The amount of the freight having been filled in, the sixth tabulating key is next operated to project the sixth stop 69 to coöperate with the stop 106 to arrest

the carriage in the rate column. The amount written here usually being a decimal, and sometimes being omitted from the bill, the key to be operated is preferably not one of the denomination keys. The rate having been written, the carriage is again "jumped" and arrested in the "Advances" column by operating the appropriate denomination key, causing the associated stop of the latter to cooperate with the column stop 107. After the amount of "advances" is written the appropriate denomination key is operated to cause the associate stop 69 to cooperate with the column stop 108 to arrest the carriage so that the blank in the "Total" column may be properly filled. Thereafter the carriage is line spaced and restored to the right and the fifth and subsequent lines of the bill may be similarly filled in.

By providing column stops which may be arranged with their stopping portions in different ranks or tiers and associating with them cooperating stops, the stopping portions whereof are arranged in corresponding ranks or tiers, it will be seen that I produce an improved and novel tabulating and column selecting means which has distinct advantages over prior constructions. The stops which are movable to cooperate with the column stops have fixed extents of movement which never vary. Unlike prior constructions the movable stops cannot be moved, under the faulty operation of the devices, into positions to cooperate with any stops other than those with which they properly cooperate in the normal operation of the machine. In other words, the movable stops on the frame never cross the paths of any stops on the carriage other than those with which they are intended to co-act. Furthermore, since I do not depend upon varying extents of movement to select the columns, there is practically no limit to the number of columns which may be employed with my improved device, and however great the number of such columns said device will always operate with certainty to cause the arrest of the traveling element or carriage at the desired point.

It will be noted that by my invention I provide tabulator or column stops having contact surfaces projecting to the same extent from the stop support, this arrangement of the column stops being best seen in Fig. 2; that I provide a plurality or set of cooperating stops the ends whereof normally lie in substantially the same vertical plane, said stops being adapted to be projected from said plane unvarying and equal extents forwardly and being thereby brought to position to cooperate with certain only of said column stops, the movement of said cooperating stops being in a direction substantially at right angles to the vertical plane

that intersects all the contact surfaces or portions of the column or tabulator stops. It will be further noted that if planes be passed longitudinally of the column or tabulator stop bar or support and transversely of the machine so as to cut through the centers of the stop portions of the column or tabulator stops of each tier or rank, said planes will be parallel with each other and each of them will cut certain of said stop portions, which stop portions will not be cut by other of the parallel planes. Or differently stated, no single plane will cut through the middle of the stop portions of all the column or tabulator stops. In the present instance these parallel planes will be horizontal and they will also cut centrally the contact or stop portions of the corresponding cooperating stops. In other words, planes passed transversely of the machine through the centers of the stop portions of the cooperating stops will be parallel with each other, and will in the present instance be horizontal and coincident with the corresponding planes passed through the centers of the stop portions of the tabulator or column stops.

Moreover, when the carriage is at the right of the machine, as far from the left as it can be drawn, the column or tabulator stops on the stop bar or support all face the set of cooperative stops, and if the stop bar is on the carriage or traveling element, as is shown herein, the column or tabulator stop which is then next to, or proximately faces, the set of cooperative stops is the first stop from the left end of the stop bar. It will be understood, that the column or tabulator stops may be made to coact successively with stops of said set as the carriage travels toward the left, and that under certain conditions certain of the tabulator or column stops may be skipped during this travel of the carriage. For example, supposing all of the tabulator stops to be at the right of the set of cooperative stops and the fifth cooperative stop to be projected, in that case all of the tabulator stops in advance of that particular tabulator stop which is arranged to contact with the fifth cooperative stop will, during the leftward travel of the carriage, pass by the set of cooperative stops including the projected stop and the carriage will not be arrested until the particular tabulator stop specified comes into contact with the fifth or projected stop. Thus the construction and arrangement are such that a selected tabulator stop at any point behind or to the right of the first one of the series of tabulator stops may be made to co-act with its cooperative stop and effect the arrest of the carriage after it has been released from the step by step feeding mechanism without previous arrest of the carriage by co-action of complementary

stops in advance of the pair selected for action.

It will further be noted that by my invention I provide a series of column stops
5 arranged in different planes, by which is meant that corresponding parts of the column stops lie in different planes, and a series of cooperating stops arranged in planes
10 registering with the column stops; that a series of column stops are arranged to travel each in a different plane, by which is meant that corresponding points on them travel each in a different plane, and a series of cooperating stops arranged in planes registering
15 with the column stops, or planes which cut both the column stops and the cooperating stops, are combined with means for projecting said cooperating stops into the respective paths of travel of their associated column stops, the series of cooperating
20 stops being independently movable and being arranged in and movable in planes coincident with the planes containing the column stops, each of the movable stops cooperating only with the column stop arranged in the plane of movement of said
25 movable stop; and that the series of column stops are arranged in vertical series longitudinally of the carriage in different planes and travel in different horizontal planes co-
30 acting with a series of adjustable stops arranged in different horizontal planes corresponding to the planes of travel of the column stops, means being provided for projecting said cooperating stops independently
35 into contactive relationship with the associated column stops.

My invention is particularly adapted for tabulating work in which, to promote rapidity
40 of operation, it is desirable to skip columns frequently. This class of work includes various forms of billing, such as the way bill illustrated and described, statement work, and the like.

It will be clearly apparent to one having a knowledge of the art that the set of stops
69 may be arranged with their stopping portions in ranks or tiers disposed in a different manner from that shown.

It will be apparent that with the arrangement of the cooperating stops shown or with
50 a different arrangement thereof, the column or tabulating stops may be readily arranged to fit the device for other forms of work
55 than that shown and described; and that even for the same form of work and with the cooperating stops remaining unchanged, the column or tabulating stops may be susceptible of more than one arrangement. The
60 column or tabulating stops in the present instance are mounted on the traveling element or carriage and the cooperating stops are on the frame, but in the broad aspects of my invention it is of course not material
65 whether the tabulating or column stops be

on the traveling or stationary element so long as the set of cooperating stops are on the other of the two elements.

Various other changes may be effected within the scope of my invention.

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

1. In a typewriting machine and in a tabulating mechanism, the combination of a carriage; step-by-step feeding mechanism
75 therefor; a column stop support; a set of independently adjustable column stops having contact surfaces projecting to the same extent from said stop support; and a plurality of cooperating stops, said column stop
80 and said cooperating stops being variously arranged so that each of said last recited stops is cooperative only with certain of said column stops and serves by such cooperation to arrest the carriage, after it has been released from its step-by-step feeding mechanism, in predetermined columnar fields, any
85 intermediate fields being skipper or passed.

2. In a typewriting machine and in a tabulating mechanism, the combination of a
90 carriage; step-by-step feeding mechanism therefor; a set of independently adjustable column stops; and a plurality of cooperating stops having equal and unvarying extents of
95 movement, said column stops and said cooperating stops being variously arranged so that each of said last recited stops is cooperative only with certain of said column stops to arrest the carriage, after it has been released from its step-by-step feeding mechanism, in predetermined columnar fields, any
100 intermediate fields being skipped or passed.

3. In a typewriting machine and in a tabulating mechanism, the combination of a carriage; step-by-step feeding mechanism
105 therefor; a set of independently adjustable column stops; and a plurality of cooperating stops, the ends of which normally lie in substantially the same plane and are projective from said plane unvarying and equal
110 extents, said column stops and said cooperating stops being variously arranged so that each of said cooperating stops is brought to position to cooperate with certain only of said column stops to arrest the carriage, after it
115 has been released from its step-by-step feeding mechanism, in predetermined columnar fields, any intermediate fields being skipped or passed.

4. In a typewriting machine and in a tabulating mechanism, the combination of a
120 carriage; step-by-step feeding mechanism therefor; a column stop support; a set of independently adjustable column stops thereon, said column stops having contact surfaces projecting to the same extent from said
125 stop support; and a plurality of cooperating stops, the ends of which normally lie in substantially the same plane and are projective from said plane unvarying and equal ex- 130

tents, said column stops and said cooperating stops being variously arranged whereby said cooperating stops are brought to position to cooperate with certain only of said column stops to arrest the carriage, after it has been released from its step-by-step feeding mechanism, in predetermined columnar fields, any intermediate fields being skipped or passed.

5 In a typewriting machine and in a tabulating mechanism, the combination of a carriage; step-by-step feeding mechanism therefor; a set of independently adjustable column stops having contact faces that move in different paths; and a plurality of stops cooperative with said column stops when the carriage is released from its step-by-step feeding mechanism, the contact face of each of said last recited stops being cooperative with certain only of said column stops and being movable into cooperative position without intersecting the path of the contact face of any other of the column stops.

6 In a typewriting machine and in a tabulating mechanism, the combination of a carriage; step-by-step feeding mechanism therefor; a set of independently adjustable column stops having contact faces that move in different paths; and a set of stops cooperating with said column stops when the carriage is released from its step-by-step feeding mechanism, each of said last recited stops having a contact face cooperative with certain only of said column stops and being movable to and from operative position in a direction at an angle to a plane that cuts all of the contact surfaces of said column stops.

7 In a typewriting machine and in a tabulating mechanism, the combination of a carriage; step-by-step feeding mechanism therefor; a set of independently adjustable column stops having contact faces that move in different paths; and a set of stops cooperating with said column stops when the carriage is released from its step-by-step feeding mechanism, each of said last recited stops having a contact face cooperative with certain only of said column stops and being moved to and from operative position in a direction substantially at right angles to a plane that cuts or intersects the engaging faces of all said column stops.

8 In a typewriting machine and in a tabulating mechanism, the combination of a carriage; step-by-step feeding mechanism therefor; a set of independently adjustable column stops; and a set of stops cooperative with said column stops when the carriage is released from its step-by-step feeding mechanism, the contact faces of said last recited stops being cut centrally by parallel planes transverse of the machine.

9 In a typewriting machine and in a tabulating mechanism, the combination of a carriage; step-by-step feeding mechanism therefor; a set of independently adjustable

column stops; and a set of stops cooperative with said column stops when the carriage is released from its step-by-step feeding mechanism, the contact faces of the last recited stops being cut centrally by parallel planes transverse of the machine and lying in separate parallel planes fore and aft of the machine.

10 In a typewriting machine and in a tabulating mechanism, the combination of a carriage; step-by-step feeding mechanism therefor; a column stop support; a set of independently adjustable column stops thereon, the contact surfaces of said column stops being cut centrally by parallel planes longitudinal of said stop support; and a plurality of stops each cooperative with certain of said column stops when the carriage is released from its step-by-step feeding mechanism, the contact faces of said cooperative stops being cut respectively by the parallel planes of said column stops.

11 In a typewriting machine and in a tabulating mechanism, the combination of a carriage; step-by-step feeding mechanism therefor; a column stop support; a set of independently adjustable column stops thereon, the contact surfaces of said column stops being cut centrally by parallel planes longitudinal of said stop support; and a plurality of stops each cooperative with certain of said column stops when the carriage is released from its step-by-step feeding mechanism, the contact faces of said cooperative stops being cut centrally by parallel planes longitudinal of said stop support.

12 In a typewriting machine and in a tabulating mechanism, the combination of a carriage; step-by-step feeding mechanism therefor; a column stop support; a set of column stops thereon, the contact surfaces of said column stops being disposed in a plurality of ranks or tiers which extend through planes longitudinal of said stop support and parallel with each other; and a plurality of stops each cooperative with certain of said column stops when the carriage is released from its step-by-step feeding mechanism, said cooperative stops having contact surfaces disposed in a plurality of ranks or tiers which extend through planes longitudinal of the stop support and parallel with each other.

13 In a typewriting machine and in a tabulating mechanism, the combination of a carriage; step-by-step feeding mechanism therefor; a stop bar on said carriage; a set of column stops adjustable thereon, the contact surfaces of said column stops being centrally cut by parallel planes longitudinal of said stop bar; and a plurality of stops mounted on the frame of the machine and each movable into position to cooperate with certain of said column stops when the carriage is released from its step-by-step feed-

ing mechanism, the contact surfaces of said cooperative stops being centrally cut by parallel planes longitudinal of said column stop bar.

5 14. In a typewriting machine and in a tabulating mechanism, the combination of a carriage; step-by-step feeding mechanism therefor; a stop bar on said carriage; a set of column stops adjustable on said stop bar and having contact surfaces which are cut centrally by horizontal planes; and a plurality of stops mounted on the frame of the machine and each movable to cooperate with certain of said column stops when the carriage is released from its step-by-step feeding mechanism, the contact surfaces of said cooperative stops being cut centrally by horizontal planes.

15 15. In a typewriting machine and a tabulating mechanism, the combination of a carriage; step-by-step feeding mechanism therefor; means for releasing the carriage from said feeding mechanism; a stop bar on the carriage; a set of column stops adjustably mounted on said bar and having contact surfaces cut centrally by horizontal planes; a plurality of stop blades slidably mounted on the machine frame and each having a contact surface cooperative with certain only of said column stops, the contact surfaces of said stop blades being cut centrally by horizontal planes; and key actuated means for moving said stop blades to operative position and for actuating said carriage releasing means.

16. In a typewriting machine and in a tabulating mechanism, the combination of a carriage; step-by-step feeding mechanism therefor; means for releasing the carriage from said feeding mechanism; a stop bar on the carriage; a set of column stops adjustably mounted on said bar and having contact surfaces lying at different elevations; a supporting bracket mounted on the machine frame; a plurality of stop blades slidably mounted on said supporting bracket and each having a contact surface cooperative with certain only of said column stops, the contact surfaces of said stop blades lying at different elevations; a plurality of vibratory levers fulcrumed on said supporting bracket and each connected at one end with one of said stop blades; and a plurality of push rods slidable on the machine frame, each of said push rods being connected at one end with one of said vibratory levers and having key buttons at their other ends, each push rod serving to actuate one of said stop blades and the carriage releasing means.

17. In a typewriting machine and in a tabulating mechanism, the combination with a carriage, of a series of column stops having contact surfaces cut centrally by different parallel planes, and a series of cooperating stops, each adapted to cooperate with

certain only of said column stops, each of said cooperating stops having a contact surface movable to and from operative position in the plane of the contact surface of the corresponding column stop.

18. In a typewriting machine and in a tabulating mechanism, the combination with a carriage, of a series of column stops having contact surfaces arranged in different tiers, and a series of cooperating stops having contact surfaces arranged in corresponding tiers, certain of said tiers containing denomination stops.

19. In a typewriting machine and in a tabulating mechanism, the combination with a carriage, of a series of column stops having contact surfaces arranged in tiers, a series of cooperating stops each having a contact surface corresponding to one of said tiers, there being one only of said cooperating stops for each of certain of said tiers, and a set of denomination stops for another of said tiers.

20. In a typewriting machine and in a tabulating mechanism, the combination with the carriage and step-by-step feeding mechanism, of a stop-support with tabulator stops relatively adjustable thereon and projecting equal distances from the stop-support, a set of stops cooperative with said tabulator stops, and means to render a selected stop of said set of cooperative stops and a tabulator stop behind or to the right of the first tabulator stop of the series of tabulator stops effective to arrest the carriage after its release without prior arrest by tabulator stops arranged in advance of the selected tabulator stop.

21. In a typewriting machine and in a tabulating mechanism, the combination with the carriage and step-by-step feeding mechanism, of a stop support with tabulator stops thereon, said stop support being on the carriage and said stops projecting equal distances from the stop support and being relatively adjustable thereon, a set of stops cooperative with said tabulator stops, said set of stops being supported by the frame of the machine, and means to render a selected stop of said set of cooperative stops and a tabulator stop behind or to the right of the first tabulator stop of the series of tabulator stops effective to arrest the carriage after its release without prior arrest by tabulator stops arranged in advance of the selected tabulator stop.

22. In a typewriting machine and in a tabulating mechanism, the combination with the carriage and step-by-step feeding mechanism, of a stop support with tabulator stops thereon projecting equal distances from the stop support, said tabulator stops being relatively adjustable on said support, a set of stops cooperative with said tabulator stops, and means including a key actuated

device operative to render a selected stop of said set of coöperative stops and a tabulator stop behind or to the right of the first tabulator stop of the series of tabulator stops effective to arrest the carriage after its release without prior arrest by tabulator stops arranged in advance of the selected tabulator stop.

23. In a typewriting machine and in a tabulating mechanism, the combination with the carriage and step-by-step feeding mechanism, of a stop support with tabulator stops thereon, said stop support being on the carriage and said stops projecting equal distances from the stop support and being relatively adjustable thereon, a set of stops coöperative with said tabulator stops, said set of stops being supported by the frame of the machine, and means including a key actuated device operative to render a selected stop of said set of coöperative stops and a tabulator stop behind or to the right of the first tabulator stop of the series of tabulator stops effective to arrest the carriage after its release without prior arrest by tabulator stops arranged in advance of the selected tabulator stop.

24. In a typewriting machine and in a tabulating mechanism, the combination with the carriage and step-by-step feeding mechanism, of a stop support with tabulator stops relatively adjustable thereon, a set of stops subject to contact with the tabulator stops at equal distances from the stop support, and means to render a selected stop of said set of coöperative stops and a tabulator stop behind or to the right of the first tabulator stop of the series of tabulator stops effective to arrest the carriage after its release without prior arrest by tabulator stops arranged in advance of the selected tabulator stop.

25. In a typewriting machine and in a tabulating mechanism, the combination with the carriage and step-by-step feeding mechanism, of a stop support with tabulator stops relatively adjustable thereon, said stop support being on the carriage, a set of stops supported by the frame of the machine and subject to contact with the tabulator stops at equal distances from the stop support, and means to render a selected stop of said set of coöperative stops and a tabulator stop behind or to the right of the first tabulator stop of the series of tabulator stops effective to arrest the carriage after its release without prior arrest by tabulator stops arranged in advance of the selected tabulator stop.

26. In a typewriting machine and in a tabulating mechanism, the combination with the carriage and step-by-step feeding mechanism, of a stop support with tabulator stops thereon, said tabulator stops being relatively adjustable on said support, a set of stops subject to contact with the tabulator stops at equal distances from the stop support,

and means including a key actuated device operative to render a selected stop of said set of coöperative stops and a tabulator stop behind or to the right of the first tabulator stop of the series of tabulator stops effective to arrest the carriage after its release without prior arrest by tabulator stops arranged in advance of the selected tabulator stop.

27. In a typewriting machine and in a tabulating mechanism, the combination with the carriage and step-by-step feeding mechanism, of a stop support with tabulator stops thereon, said stop support being on the carriage and said tabulator stops being relatively adjustable on said stop support, a set of stops supported by the frame of the machine and subject to contact with the tabulator stops at equal distances from the stop support, and means including a key actuated device operative to render a selected stop of said set of coöperative stops and a tabulator stop behind or to the right of the first tabulator stop of the series of tabulator stops effective to arrest the carriage after its release without prior arrest by tabulator stops arranged in advance of the selected tabulator stop.

28. In a typewriting machine and in a tabulating mechanism, the combination with the carriage and step-by-step feeding mechanism, of a stop support with tabulator stops thereon projecting equal distances from the stop support and being relatively adjustable thereon, a set of stops subject to contact with the tabulator stops at equal distances from the stop support, and means to render a selected stop of said set of coöperative stops and a tabulator stop behind or to the right of the first tabulator stop of the series of tabulator stops effective to arrest the carriage after its release without prior arrest by tabulator stops arranged in advance of the selected tabulator stop.

29. In a typewriting machine and in a tabulating mechanism, the combination with the carriage and step-by-step feeding mechanism, of a stop support with tabulator stops thereon, said stop support being on the carriage and said stops projecting equal distances from the stop support and being relatively adjustable thereon, a set of stops supported by the frame of the machine and subject to contact with the tabulator stops at equal distances from the stop support, and means to render a selected stop of said set of coöperative stops and a tabulator stop behind or to the right of the first tabulator stop of the series of tabulator stops effective to arrest the carriage after its release without prior arrest by tabulator stops arranged in advance of the selected tabulator stop.

30. In a typewriting machine and in a tabulating mechanism, the combination with the carriage and step-by-step feeding mechanism, of a stop support with tabulator stops

thereon, said stop support being on the carriage and said stops projecting equal distances from the stop support and being relatively adjustable thereon, a set of stops supported by the frame of the machine and subject to contact with the tabulator stops at equal distances from the stop support, and means including a key actuated device operative to render a selected stop of said set of cooperative stops and a tabulator stop behind or to the right of the first tabulator stop of the series of tabulator stops effective to arrest the carriage after its release without prior arrest by tabulator stops arranged in advance of the selected tabulator stop.

31. In a typewriting machine and in a tabulating mechanism, the combination of a carriage, a series of independently adjustable column stops arranged in different planes, and a series of cooperating stops arranged in planes registering with the column stops.

32. In a typewriting machine and in a tabulating mechanism, the combination of a carriage, a series of column stops each arranged to travel in a different plane, and a series of cooperating stops arranged in planes registering with the column stops, and means for projecting said cooperating stops into the respective paths of travel of their associated column stops.

33. In a typewriting machine and in a tabulating mechanism, the combination of a carriage, a series of column stops arranged in different planes, and a series of independently movable cooperating stops arranged in and movable in planes coincident with planes containing the column stops, each of said movable stops cooperating only with the column stop arranged in the plane of movement of said movable stop.

34. In a typewriting machine and in a tabulating mechanism, the combination of a carriage, a series of column stops arranged in different planes longitudinally of the carriage, a series of cooperating stops also ar-

anged in different planes longitudinally of the carriage and opposing individually the individual stops composing the series of column stops, and means for projecting said cooperating stops independently into contactive relationship with their associated column stops.

35. In a typewriting machine and in a tabulating mechanism, the combination of a carriage, a series of column stops thereon arranged in vertical series and traveling in different horizontal planes, and a series of projectable cooperating stops arranged in different horizontal planes corresponding to the planes of travel of the column stops.

36. In a typewriting machine and in tabulating mechanism, the combination of a carriage, a stop bar, stops carried by said stop bar and having contact portions which project to equal extents but which have different paths of movement, arresting means cooperative with the contact portions of said stops, and key actuated means for controlling said arresting means to cooperate with said stops, said key actuated means determining which of said stops shall be brought into service.

37. In a typewriting machine and in tabulating mechanism, the combination of a carriage, a stop bar, stops carried by said stop bar and having contact portions which project to equal extents but which have different paths of movement, and key actuated arresting means cooperative with said stops and adapted to be interposed in the different paths of movement of said contact portions.

Signed at the borough of Manhattan, city of New York, in the county of New York, and State of New York, this 16th day of March, A. D. 1906.

CLIO B. YAW.

Witnesses:

E. M. WELLS,

M. F. HANNWEBER.