

1,021,392.

J. WALDHEIM.
TYPE WRITING MACHINE.
APPLICATION FILED DEC. 5, 1911.

Patented Mar. 26, 1912.

4 SHEETS-SHEET 1.

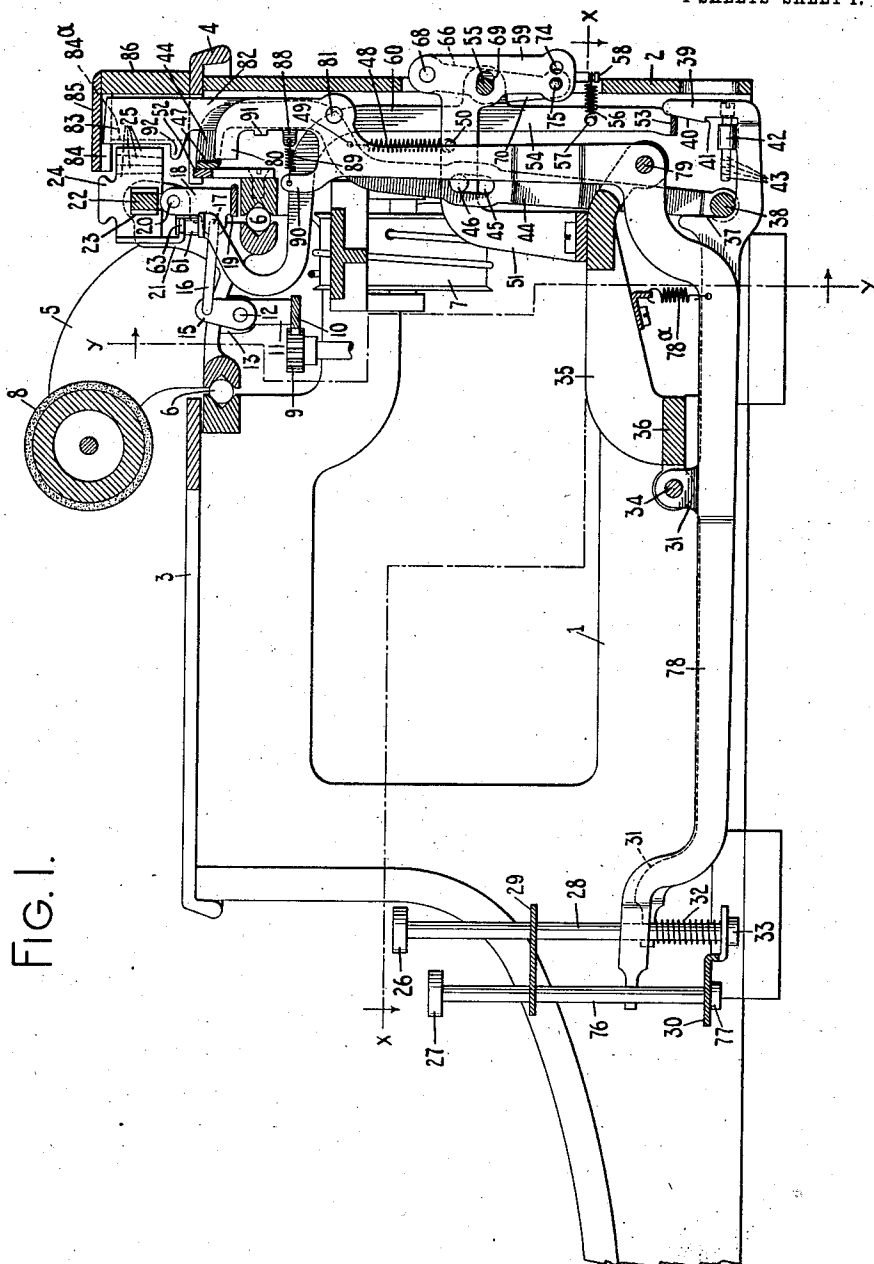


FIG. 1.

WITNESSES:

E. M. Wells.

Charles Smith

INVENTOR.

John Waldheim

By Jacob Felbel

HIS ATTORNEY

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4 SHEETS-SHEET 2.

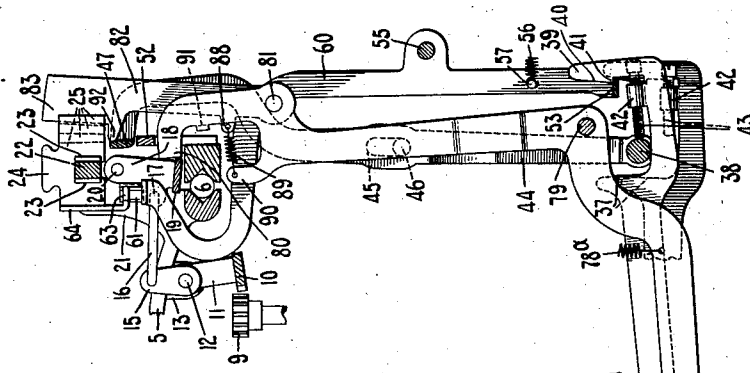


FIG. 2.

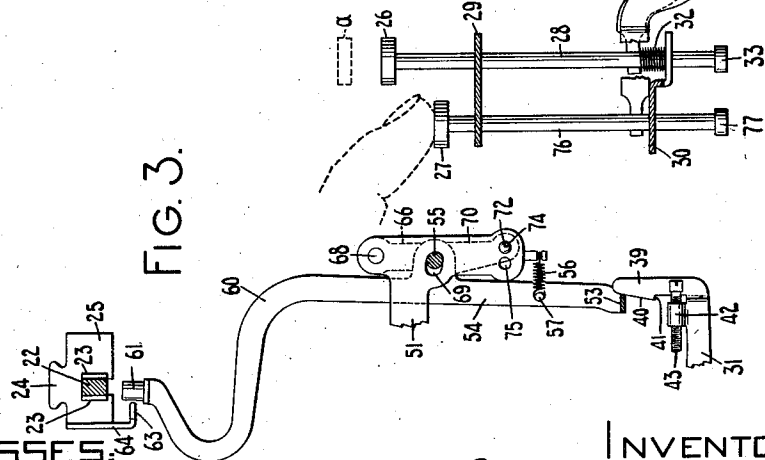


FIG. 3.

WITNESSES:
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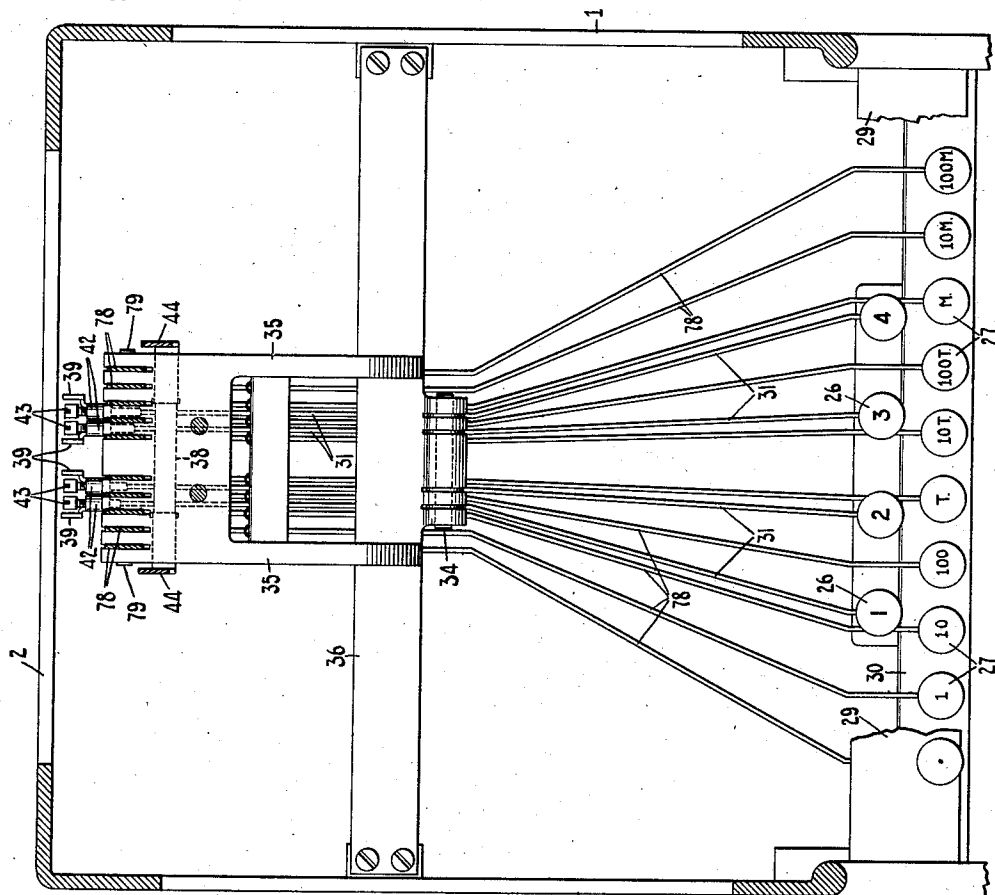
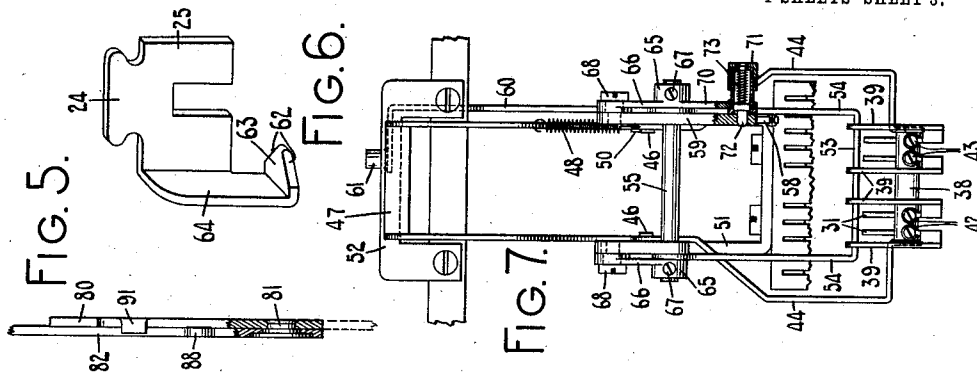
INVENTOR:
John Waldheim
By Jacobus
HIS ATTORNEY

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4 SHEETS-SHEET 3.



WITNESSES:

E. M. Wells
Charles Smith

FIG. 4.

INVENTOR:

John Waldheim
By Jacob F. Felt

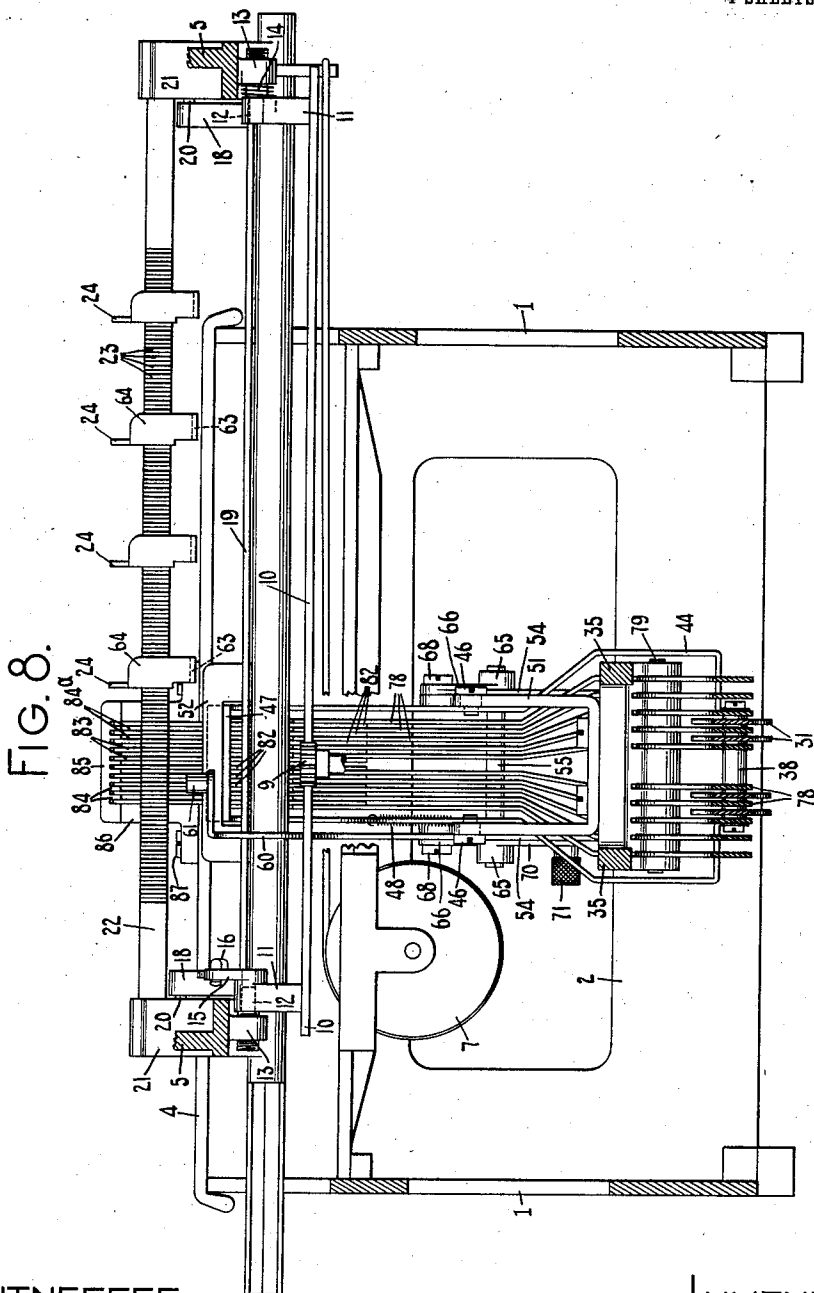
HIS ATTORNEY

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4 SHEETS-SHEET 4.



WITNESSES:

E. M. Wells.
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UNITED STATES PATENT OFFICE.

JOHN WALDHEIM, OF NEWARK, NEW JERSEY, ASSIGNOR, BY MESNE ASSIGNMENTS,
TO UNION TYPEWRITER COMPANY, OF JERSEY CITY, NEW JERSEY, A CORPORATION OF NEW JERSEY.

TYPE-WRITING MACHINE.

1,021,392.

Specification of Letters Patent.

Patented Mar. 26, 1912.

Application filed December 5, 1911. Serial No. 663,983.

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 relates to typewriting machines and more particularly to tabulating mechanism.

One of the main objects of my invention, generally stated, is to provide a comparatively simple and efficient tabulating mechanism by which any desired columnar position may be selected at will and by which any desired denominational position in a column may be selected so that the carriage may, after a single run, be arrested at any desired columnar field and at any desired denominational position within any selected columnar field.

A further object of my invention, generally stated, is to provide comparatively simple and efficient means whereby certain parts of the tabulating mechanism may be locked in the position to which the said part or parts may be set or moved under key control, and to automatically release the locking means before the completion of the tabulating operation.

A still further object of my invention, generally stated, is to provide means whereby the carriage releasing means controlled by the tabulating mechanism is normally rendered inoperative to release the carriage and is rendered operative by the preliminary actuation or setting of the column selecting mechanism.

Another object of my invention, stated in general terms, is to provide automatically operating locking means for a part of the tabulating mechanism and to automatically effect a release of the locking means by the travel of the carriage.

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

In the accompanying drawings, wherein like reference characters indicate corresponding parts in the various views, Figure

1 is a fragmentary, vertical fore and aft, sectional view of one form of typewriting machine embodying my invention. Fig. 2 is a fragmentary side elevation with parts in section, the view illustrating some of the parts as they are disposed in their actuated positions. Fig. 3 is a detail side elevation with parts in section, the view showing the parts as they appear when the pivot of the locking member has been shifted to render the automatically operating releasing means for the lock inoperative. Fig. 4 is a horizontal sectional view of the machine, the section being taken on the line $x-x$ of Fig. 1 and looking in the direction of the arrows at said line. Fig. 5 is an enlarged detail fragmentary front view of one of the denominational stop members and the actuating lever which carries it. Fig. 6 is a detail perspective view of one of the column stops. Fig. 7 is a detail fragmentary rear elevation of a part of the tabulator mechanism. Fig. 8 is a transverse, vertical, sectional view of the machine taken on the line $y-y$ of Fig. 1 and looking in the direction of the arrows at said line.

In the accompanying drawings I have shown only so much of a typewriting machine as may be necessary to arrive at an understanding of my invention.

I have illustrated my invention in the present instance embodied in a No. 15 Yost machine except in so far as the tabulating mechanism of that machine may be modified or replaced by features of the present invention; and except in so far as that machine may be modified to effect an embodiment of my present invention therein. Moreover, some of the parts of the typewriting machine are conventionally represented in order to simplify the showing. It should be understood, however, that the invention may be embodied in various styles of typewriting machines and that various changes may be made in the construction to facilitate such embodiment.

The present case is one of three companion applications filed by me of even date herewith, the other applications bearing Serial Numbers 663,982 and 663,984 respectively. Considered from certain broader aspects there are features in common in all three cases. The broader claims to features in common to all three applications are in-

cluded in case Serial No. 663,982, whereas any feature common alone to case Serial No. 663,984, and the present application are broadly claimed herein, the claims in case
 5 Serial No. 663,984 being restricted to features not disclosed in either of the other said companion applications. Nevertheless there are certain features disclosed in my case
 10 Serial No. 663,982 that are not claimed therein but are broadly claimed herein. Thus in the modification shown in Figs. 7 to 12 of my case Serial No. 663,982 a construction is illustrated wherein previously
 15 set or locked parts of the column selecting mechanism are automatically released by the travel of the carriage to enable such parts to be returned to normal position. This mechanism is not claimed in my case Serial
 20 No. 663,982 but is broadly claimed herein. The frame of the machine comprises side plates 1, a rear cross plate 2 and top plates 3 and 4. The usual printing instrumentalities (not shown) are employed. A carriage
 25 5 is mounted on anti-friction balls or rollers 6 to travel from side to side of the machine under the power applied thereto by a spring drum 7. The carriage carries a cylindrical platen 8 adapted to receive the impression
 30 of the types against the front face thereof. The usual escapement mechanism may be employed to control the step-by-step letter feed movement of the carriage. I have only shown so much of the escapement mechanism
 35 as may be necessary to arrive at an understanding of my invention. Thus the feed pinion 9 is cooperative with a feed rack 10, mounted on arms 11, pivoted at 12 to depending lugs 13 on the bottom of the carriage. A coiled spring 14 is connected at
 40 one end to one of the lugs 13 and at the opposite end to one of the depending arms 11, to force the feed rack into engagement with the feed pinion. A crank arm 15 extends upwardly from one of the arms 11 and is
 45 connected to a rearwardly extending link 16 which in turn is pivoted at its rear end, as at 17, to a depending arm 18 which constitutes one of the supporting arms of a release bar 19 which extends throughout the
 50 length of the carriage. The arms 18 are pivoted at 20 on bracket arms 21 which extend upwardly from the carriage and constitute a support for a column stop bar 22. It will thus be understood that the forward
 55 movement of the bar 19 will transmit movement through the link 16 to the feed rack, to effect a rearward movement of the feed rack, thereby disengaging it from the feed pinion. The column stop bar is provided with teeth
 60 23 on the front and rear sides thereof to provide interdental spaces for the reception of bifurcated column stops 24, one of said stops being shown in detail in Fig. 6. From an inspection of Figs. 1 and 2 it will be observed
 65 that the engaging portions 25 of the

column stops extend rearwardly varying distances from the column stop bar, the longer stop being situated at the right and the stop having the shortest engaging portion 25 being situated at the left of the series, so as to provide a series of graduated stops with which the denominational stops are adapted to be brought into cooperation, as will hereinafter more clearly appear. It
 70 will be understood that the column stops are mounted for individual adjustment to different positions along the column stop bar.

In the present instance, I have provided column selecting mechanism by which the desired columnar field where the carriage is to be arrested may be determined; and a denominational key may then be actuated to move the denominational stop controlled thereby a requisite distance to cooperate with the particular column stop to be
 75 brought into cooperation with the denominational stop, as determined by the operation of the column selecting mechanism. I will first describe the column selecting mechanism. This comprises a series of column selecting keys 26, four being shown in the present instance, and as appears from an inspection of Fig. 4, these keys are provided with index numerals "1," "2," "3" and "4." These keys are preferably arranged in the rear of denominational keys 27 and in the rear of the usual printing keys at the keyboard of the machine. Each column selecting key is provided with a key stem 28 which is guided in openings in guide
 80 plates 29 and 30. Each key stem 28 is slotted to receive the forward end of a lever 31 to provide a connection between each key stem 28 and its associated lever, by which the lever may be actuated. A coiled expansion spring 32 surrounds each key stem 28 and bears at its lower end against the plate 30 and at its upper end against the associated lever 31, thus tending to move the forward end of the lever upwardly and to restore the key stem and the parts connected therewith to normal position; the upward movement of the key stem being limited by an enlarged head 33 which engages the under face of the guide plate 30. The key levers 31 are fulcrumed on a pivot rod 34 carried by a frame 35, forming part of a cross bar 36 which is secured to the frame of the machine. The rear end of each lever 31 is provided with a stop face 37 with which a cross bar 38 cooperates, and by which the cross bar is limited in its forward movement. Each key actuated lever 31 also has an upwardly extended rear end 39 provided with an inclined face or cam 40 terminating at its lower end in an engaging nose or hook 41. Each extension 39 is off-set laterally from the body of the associated lever. Each lever 31 is likewise provided with a bearing 42 in the plane thereof, said
 85 90 95 100 105 110 115 120 125 130

bearing being interiorly threaded to receive a screw, arresting stop or contact device 43, which is adapted to cooperate at its forward end with the cross bar 38, as will hereinafter more clearly appear. The cross bar 38 constitutes part of a controlling device or arresting frame which includes upwardly extending arms 44 slotted at 45 to receive a fixed pivot 46. The upper ends of the side arms 44 are bent forwardly where they terminate in a cross bar 47. A contractile spring 48 is connected at one end, as at 49, to one of the side arms 44 of the arresting frame, whereas the other end of said spring is connected to a pin 50 which projects from one of the two bracket arms 51, by which the pivot 46 is supported. The spring 48 performs a two-fold function, *i. e.*, it normally maintains the arresting frame, comprising the cross bar 38, side arms 44 and cross bar 47, in the lowermost position where the upper ends of the slot 45 are seated on the pivot pin 46. It also exerts a pull on the frame to turn it around the pivot 46 to the position shown in Fig. 1, where the cross bar 38 is arrested by engaging the upright contact edges or stop faces 37 on the key actuated levers 31. When the parts are in normal position the cross bar 47 is positioned, as indicated in Fig. 1, in contact with a fixed stop 52 secured to the rear fixed rail which guides and supports the carriage. It will be seen that this stop 52, when the parts are disposed as indicated in Fig. 1, prevents a swinging movement of the frame around its pivot 46 in one direction, whereas the frame is prevented from swinging in the opposite direction by the cross bar 38 engaging the levers 31, at 37. It will be observed, however, that the frame is adapted to be lifted from the normal position by reason of the slots 45 in the side arms of the frame when a column selecting key 26 is depressed. The effect of depressing a column selecting key 26 is to shift the frame bodily upward to some such position as that indicated in Fig. 2. The shifting of the frame is effective to carry the cross bar 47 up out of contact with the stop 52, so as to enable the frame to swing forwardly at the upper end thereof, and to swing rearwardly at the lower end thereof. The upward movement of the frame is likewise effective to carry the cross bar 38 thereof out of cooperative relation with all of the screw stops 43, except the stop which is carried by the lever 31 of the particular column selecting key which has been depressed, as indicated in Fig. 2. The cross bar 38 is therefore free at this time to receive a rearward movement, when the frame as a whole is turned on the pivot 46 in a manner to be hereinafter described. The extent of this movement of the cross bar is determined by the position of the forward end of the par-

ticular arresting stop 43 which is carried by the lever of the depressed key. It will be seen that the forward ends of these different screw stops are arranged at progressively different distances from the front of the machine. Varied extents of rearward movement of the cross bar 38 from its normal or forward position may therefore be effected under control of these arresting stops, the particular stop which engages the cross bar limiting and thus determining its extent of movement. This extent of movement of the arresting frame determines the extent of forward movement which may be given to each of the denominational stops, and thereafter determines which particular column stop the denominational stops may be brought into cooperation with, as will hereinafter more clearly appear.

In order that the arresting frame may be held in the elevated or operative position when a column selecting key 26 is depressed, I have provided automatically operating locking means comprising a member 53 which is in the nature of a universal lock bar that extends between the two side arms 54, the latter being pivoted at 55 on the bracket arms 51. A contractile spring 56 is connected at one end to a pin 57 which projects laterally from one of the arms 54, the opposite end of said spring being connected to a pin 58 which is carried by a depending portion 59 of one of the bracket arms 51. The spring 56 exerts its force to cause the locking bar 53 to press against the inclined faces 40 on the levers 31, as indicated in Fig. 1. When any of the column selecting keys 26 is depressed, as indicated in Fig. 2, a corresponding lever 31 will be elevated at the rear end to shift the frame 38—44, etc., upwardly, in the manner described to bring the contact device 43, carried by said lever, into position for cooperation with the cross bar 38 of the machine frame. This same movement is effective to cam the locking bar forwardly against the power of the spring 56 until the engaging nose 41 on the lever has been cleared when the spring 56 will cause the locking bar to snap under the engaging nose on the actuated lever 31, thereby locking said lever against return movement. It is desirable to retain the parts thus locked until an actuation of the denominational stop mechanism has been effected and then to automatically release the locked column selecting means to enable the parts to be restored to normal position. This release is effected in the present instance at the first tabulating operation by extending one of the arms 54 of the locking frame upwardly and forwardly to provide a releasing arm 60. This arm is preferably provided with an anti-friction roller 61 at the upper end thereof, which roller is adapted to extend into the path of move-

ment of cam faces 62 formed on a rearwardly extending finger 63 projecting from a depending arm 64 formed on each of the column stops 24, as shown in detail in Fig. 6. These actuating fingers 63 on the various column stops extend rearwardly equal distances from their supporting arms 64, so that any of them is cooperative with the anti-friction roller 61 during the travel of the carriage and when the associated column stop reaches a position where engagement is effected between the cam carrying finger 63 and the anti-friction roller 61 on the releasing arm. A further movement of the carriage after such engagement has been effected is operative to cam the arm 60 rearwardly from the position shown in Fig. 2, thus moving the locking bar 53 forwardly to disengage it from the locked column selecting lever 31 and thereby enabling the associated spring 32 to restore the released lever 31 to normal position. As soon as the engaged actuating finger 63 on the column stop passes the anti-friction roller 61, the spring 56 is free to restore the locking frame to normal position where it is again disposed so as to engage the locking arm 39 on the next column selecting key lever, when the latter is actuated. I prefer to arrange the anti-friction roller 61 in such position that the finger 63 on each of the column stops will co-act with the roller and move the locking frame to the releasing position to trip off the lock at about the instant that the associated column stop is in position to cooperate with the decimal stop of the series of denominational stops, for purposes which will hereinafter more clearly appear.

It is sometimes desirable to render the means for automatically releasing the locking frame, just described, inoperative so that the carriage may travel indefinitely without affecting the release of the locking frame. In order to accomplish this result I have fixedly supported the pivot 55 of the locking frame in bearings 65 in two parallel links or arms 66, as will be seen upon reference to Figs. 1, 3 and 7. Screws 67 may be employed to secure the pivot rod 55 in the bearing 65. The parallel arms 66 are pivoted on shouldered pivot screws 68 which are received at their threaded ends in tapped openings in the bracket arms 51. The pivot rod 55 extends through slots 69 in the supporting bracket arms 51, so that the pivot rod is free to be shifted with the parallel links 66 from the position shown in Fig. 1 to that indicated in Fig. 3. In order to facilitate this change in the position of the pivot rod 55 and to maintain it against accidental displacement in either of the positions to which it may be shifted, I have provided a depending arm 70 on one of the parallel links 66. The lower end of this arm carries a knurled head 71 fixed to the outer

end of a sliding locking bolt 72. A coiled expansion spring 73 surrounds the bolt and is contained within a housing carried by the depending arm and bears at one end against the housing and at its opposite end against a collar on the bolt to force the locking bolt 72 into engagement in one or the other of two openings 74 and 75. In order to shift the pivot rod 55 from the position shown in Fig. 1, to the position shown in Fig. 3, it is merely necessary to withdraw the locking bolt 72 from the opening 75 against the pressure of the spring 73 and to shift the frame, comprising the parallel links 66 and pivot rod 55, by means of the knurled head 71, from the position shown in Fig. 1 to that indicated in Fig. 3. The spring 73 then becomes effective to move the locking bolt 72 into the opening 74, to retain the pivot carrying frame in the position to which it has been shifted. The effect of this movement of the pivot 55 is to move the arm 60 rearwardly to the position in Fig. 3, thus carrying the anti-friction roller 61 out of the path of the actuating fingers 63 on the column stops. It follows therefore that during the movement of the carriage, the actuating fingers are inoperative on the anti-friction roller and are ineffective to move the locking frame to the releasing position. It will be understood, nevertheless, that the locking frame is maintained in such position by its spring 56 that the bar 53 thereof is adapted to be engaged by the engaging arms 39 on the column selecting key actuated levers in the usual manner. It will be understood therefore that the depression of a column selecting key is effective to maintain the parts in such relation that the column selected by the depression of that particular key will continue to be used indefinitely. When, however, another column selecting key is depressed it is effective to cam the locking bar forwardly to the releasing position, thereby releasing the previously locked lever 31 and effecting an engagement between the subsequently actuated column selecting lever and the locking bar, so that the subsequently actuated lever will then be locked in operative position instead of the lever of the first depressed selecting key.

The denominational stop mechanism, and the means whereby different extents of fore and aft movement of each of the denominational stops is effected, as well as a release of the carriage, are yet to be described. The series of denominational keys 27 comprises, in the present instance, ten keys, each bearing an index character thereon, such as the characters ".", "1", "10", "100", "T", "10T", "100T", "M", "10M", "100M", which indicate respectively the decimal key, units keys, tens key, hundreds key, and so on. Each of these keys is provided with a

key stem 76 which is guided in the openings in the plates 29 and 30 and is provided with an enlarged head 77 at the lower end thereof to cooperate with the lower guide plate 30, to limit the upward movement of the key stem and the parts connected therewith. Each key stem 76 is slotted to receive the forward end of an angular lever or key controlled member 78, pivoted at 79 on a pivot rod which is carried by the bracket or frame 35. Each lever 78 is returned to normal position by a spring 78^a. The upwardly extending arm of each of these levers 78 is provided with a forwardly extending projection 80 which, when the parts are in normal position, is situated back of the cross bar 47 of the locking frame, so as to lock all of the levers 78 against actuation. The upright arm of each lever 78 has pivoted thereto at 81, a denominational stop carrier 82, which terminates in a denominational stop 83. The upper ends of these denominational stops are guided in grooves or interdental spaces between downwardly projecting teeth 84 on a guide plate 85, carried by a housing 86 which is fixed to the top plate of the machine by screws 87. The housing 86 carries forwardly projecting teeth 84^a arranged between the stops 83. The denominational stops are thus maintained separated and are guided in their movements fore and aft of the machine; the teeth 84 and 84^a resisting the lateral movement of the denominational stops when impact takes place between a column stop and the projected denominational stop. Each denominational stop carrier 82 has a forwardly extending projection 88 to which one end of a coiled contractile spring 89 is connected; the opposite end of said spring being connected to an arm or finger 90, carried by the associated denominational stop lever 78. From an inspection of Figs. 1 and 5 it will be seen that each denominational stop lever or key actuated member likewise has a laterally extending lug 91 thereon at its forward edge, and with which the associated denominational stop carrier 82 is adapted to engage, to limit the forward movement of the denominational stop carrier relatively to the key actuated lever which carries it. Each spring 89 therefore normally maintains the companion denominational stop carrier in engagement with the lug 91 on the associated lever 78, so that the stop carrier and lever move together as one part until the stop carrier is arrested, in a manner to be hereinafter described.

As hereinbefore explained, the cross bar 47 on the arresting frame is effected to prevent an actuation of a denominational key when the parts are in the normal position shown in Fig. 1. It becomes necessary therefore for the operator to first actuate a column selecting key 26 before the tabulator

can be actuated or the carriage released under the control of the tabulator. The effect of the depression of a column selecting key, as hereinbefore explained, is to elevate the arresting frame 38—44—47, thereby moving the cross bar 47 upwardly out of the path of the projections 80 on the denominational stop levers and into the path of projections 92 on the denominational stops or stop carriers, as indicated in Fig. 2. The projections 92 are integral parts of the denominational stops and may be regarded as parts thereof. This upward movement of the locking frame is likewise effective to carry the bar 47 out of engagement with the fixed stop 52 so that the arresting frame is no longer locked against pivotal movement by said fixed stop. The column selecting key having been depressed the parts are automatically locked in the positions indicated by the engagement of the locking bar 53 with the member 39 on the actuated column selecting lever 31, and the operator is free to actuate the desired denominational key 27. The effect of the depression of this key is to move the upright arm of the associated lever 78 forwardly, thereby projecting the extension 80 thereon through an opening in the fixed stop plate 52 and into engagement with the releasing bar or device 19, as shown in Fig. 2. This movement is effective to swing the bar 19 forwardly, thereby effecting a disengagement between the feed rack 10 and the feed pinion 9. This same depression of the selected denominational key is effective to produce a forward movement of the associated denominational stop carrier 82; by reason of the spring 89 which connects the denominational stop carrier with the actuated lever 78. This movement of the denominational stop carrier causes a swinging movement of the frame 38—44—47, by the engagement between the projection 92 on the denominational stop carrier and the cross bar 47 on the frame. This swinging movement of the frame around its pivot 46 continues until the cross bar 38 engages the contact device 43 carried by the lever 31 which is maintained locked in the operative position. This limits the pivotal movement of the frame and the frame arrests the denominational stop at the proper point in its forward movement where it is in a position to engage the particular column stop corresponding to the column selecting key which has been depressed. Thus, by referring to Fig. 2 it will be seen that the fourth column selecting key, or that which bears the index numeral 4 in Fig. 4, has been depressed from the dotted line position indicated at *a*, thereby locking the associated lever 31 in the operative position, as shown. This lever 31 carries a contact device 43 which extends forwardly farther than any of the other contact devices. It

follows therefore that the arresting frame 38—44—47, when under control of this particular column selecting key and contact device 43, will receive less swinging movement around its pivot 46 than when under control of any of the other column selecting keys and contact devices. It also follows that when a denominational key has been subsequently depressed, as shown in Fig. 2, the arresting frame including the cross bar 47, will be arrested in its pivotal movement in a position where it will effect an arrest in the forward movement of the associated denominational stop at a point where the latter is coöperative only with the right-hand or fourth column stop, provided with the longest rearwardly extending contact face 25, and that the denominational stop is maintained out of the paths of the contact faces of the remaining column stops. A depression of any of the other column selecting keys in a like manner operates to determine the extent of forward movement that may be given to each of the denominational stops, so that each denominational stop is coöperative with the particular column stop that corresponds to the column selecting key which has been depressed.

It will be seen that the construction is such that the operator is required to first select a columnar field, by the depression of one of the column selecting keys before the denominational stop mechanism can be actuated. Although if the operator is continuously using a single columnar field, the automatically actuated releasing mechanism for the locking frame may be rendered inoperative by shifting the pivot 55 to the position indicated in Fig. 3 and locking it in such position. Then the particular lever 31, which is controlled by the depressed column selecting key, will remain indefinitely in the locked position shown in Fig. 2, and the carriage will always be arrested in the same columnar field determined by the column selecting key. It will be understood, however, that the denominational position of arrest in this or any of the other selected columnar fields is determined by the particular denominational key actuated.

I have hereinbefore explained that the anti-friction roller 61 is preferably arranged in such position that the fingers 63 on each column stop will co-act with the roller and move the locking frame to the releasing position to trip off the lock, at about the instant that the associated column stop is in a position to coöperate with the decimal stop. By this arrangement I am enabled to bring about a coöperation between any denominational stop with any column stop before the locking frame 53—54—60 is released. However, the construction is such that a selected column stop cannot pass the entire group of denominational stops without automatically

releasing the locking frame. If, for example, the mechanism be used merely as a column selector, none of the denominational stops except the decimal stop will be employed, but at about the time the projected decimal stop co-acts with the selected column stop, the frame 53—54—60 will be actuated and the lock released.

From the foregoing description it will be understood that the frame comprising the cross bars 38 and 47 and side arms 44 constitutes a variably movable controlling device or arresting frame which determines the columnar field at which the carriage shall be arrested; that the extent of variable movement of this frame is determined by the individually operable column selecting keys carrying the contact devices 43; that this frame coöperating with the fixed stop 52 is normally interposed in the path of the actuating means for the stops and locks the stops and the carriage releasing means out of operation; that when said frame is moved upwardly by the actuation of a column selecting key, then the means by which the stops are actuated and a release of the carriage is effected, are automatically released or unlocked so that they are free to be actuated when a denominational key is depressed; that the locking frame comprising the cross bar 53, side arms 54 and arms 60 is controlled by a movement of the carriage to automatically effect a release of the locking frame from the engaged column selecting lever 31; that the construction is such that this locking frame may, at will, be rendered inoperative to automatically release the locking frame from engagement with the column selecting levers; that the construction is such that an actuation of one column selecting key is effective to automatically release the locking frame to disengage it from a previously locked column selecting lever; that both the keys 26 and 27 have a uniform extent of movement notwithstanding the fact that variably movable parts are controlled thereby; that when a denominational stop is arrested by the arresting frame the key actuated lever 78 continues its movement independently thereof; that each lever 78 and its companion part 82 constitute a two-part key actuated member or lever for actuating a denominational stop 83 and that there is a spring 89 which causes both parts of said member to move together and affords a movement of the part 78 independently of the part 82 when the latter is arrested by the arresting frame. It will also be seen that I have provided comparatively simple and efficient means whereby the mechanism may be used either as a column selecting mechanism, in which event the decimal key is depressed after the column selecting key has been operated, or the carriage may be arrested at any desired denominational posi-

tion within any selected columnar field after a single run of the carriage. Moreover, it will be seen that the carriage will also be arrested after a single run at the desired columnar field when the mechanism is used merely as a column selector.

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

1. In a typewriting machine, the combination of a carriage, column selecting mechanism, keys therefor, denominational selecting mechanism including key actuated levers, carriage releasing means, and automatically operating mechanism intermediate said key actuated levers and the carriage releasing means to render the carriage releasing means inoperative until an actuation of a column selecting key has been effected.

2. In a typewriting machine, the combination of a carriage, column selecting mechanism, keys therefor, denominational selecting mechanism including key actuated levers, carriage releasing means normally inoperative to release the carriage, and automatically operating means intermediate said key actuated levers and the carriage releasing means and controlled by an actuation of a key of the column selecting mechanism for rendering the carriage releasing means operative.

3. In a typewriting machine, the combination of a carriage, column selecting mechanism, keys therefor, denominational selecting mechanism including key actuated levers, means for releasing the carriage, said carriage releasing means comprising a device on which said key actuated levers are normally inoperative and automatically operating means for rendering said key actuated levers operative on said device when a key of the column selecting mechanism is actuated, whereby it is necessary to actuate the column selecting mechanism before an actuation of the denominational selecting mechanism is effective to release the carriage.

4. In a typewriting machine, the combination of a carriage, column selecting mechanism, keys therefor, denominational selecting mechanism including key actuated levers, carriage releasing means comprising a carriage releasing device on which said levers are operative, a blocking device intermediate said levers and device and normally interposed between said levers and device to prevent an actuation of said device, and means controlled by an actuation of any of said column selecting keys for moving said blocking device out of the path of said levers.

5. In a typewriting machine, the combination of a carriage, column stops, a coöperative stop, column selecting means, means for locking the column selecting means in the actuated position, and means controlled by

the travel of the carriage for releasing said locking means.

6. In a typewriting machine, the combination of a carriage, column stops, a coöperative stop, column selecting means, means for locking the column selecting means in the actuated position, and means operable by any of the column stops during the travel of the carriage for releasing said locking means.

7. In a typewriting machine, the combination of a carriage, tabulating mechanism, automatically operating means for locking a part of the tabulating mechanism in the operative position, automatically operating means for releasing the locked part, and means by which the automatically operating releasing means may at will be rendered inoperative.

8. In a typewriting machine, the combination of a carriage, column stops, a coöperative stop, column selecting means, means for locking the column selecting means in the actuated position, means controlled by the travel of the carriage for releasing said locking means, and means by which said releasing means may at will be rendered inoperative.

9. In a typewriting machine, the combination of a carriage, column stops, a coöperative stop, column selecting means, means for locking the column selecting means in the actuated position, means operable by any of the column stops during the travel of the carriage for releasing said locking means, and means by which said releasing means may at will be rendered inoperative.

10. In a typewriting machine, the combination of a carriage, column stops, a coöperative stop, column selecting means, means for locking the column selecting means in the actuated position, means operable by any of the column stops during the travel of the carriage for releasing said locking means, and means by which the releasing means may be moved and maintained out of the path of said column stops to render the releasing means inoperative.

11. In a typewriting machine, the combination of a carriage, tabulating mechanism comprising a series of key actuated levers, stop mechanism controlled thereby, a single movable locking device distinct from said stop mechanism and coöperative with said levers to lock them in the actuated position, and a contact device on the carriage which is coöperative with the locking device during the travel of the carriage to move it to a releasing position to release the locked lever.

12. In a typewriting machine, the combination of a carriage, tabulating mechanism comprising a series of key actuated levers, a movable locking device coöperative with said levers to lock them in the actuated position, and means controlled by

ated position, a contact device on the carriage which is coöperative with the locking device to move it to a releasing position to release the locked lever, and means for moving and maintaining said locking device out of coöperative relation with said contact device.

13. In a typewriting machine, the combination of a carriage, tabulating mechanism comprising a series of key actuated levers, a pivoted spring operated locking device coöperative with said levers to lock them in the actuated position, a contact device on the carriage which is coöperative with the locking device to move it to a releasing position to release the locked lever, and means for shifting the pivot of said locking device to move and maintain the locking device out of the path of said contact device.

14. In a typewriting machine and tabulating mechanism, the combination of a carriage, column selecting mechanism comprising a series of key actuated levers, a spring operated locking device coöperative with all of said levers to lock them in the actuated position, denominational tabulator mechanism, means controlled by an actuation of the denominational tabulator mechanism for releasing the carriage, and a contact device on the carriage coöperative with said locking device during the travel of the carriage to release the lever locked by said locking device, whereby an actuation of the column selecting mechanism may be effected and parts thereof automatically locked in the actuated position and a subsequent actuation of the denominational stop mechanism is effective to release the carriage, the travel of the latter releasing the locking device and enabling the column selecting mechanism to return to normal position.

15. In a typewriting machine, the combination of a carriage; tabulator mechanism comprising coöperative tabulator stops; selecting means for determining which of said stops shall be brought into coöperative relation; means for locking said selecting means in its selecting position; and automatically operating means for releasing the locking means when the carriage is in a position where the last digit of a number in a column is to be written.

16. In a typewriting machine, the combination of a carriage; tabulator mechanism comprising column selecting means including column stops and a coöperative stop; automatically operating means for locking the column selecting means in selecting position; and automatically operating means for releasing said locking means when the carriage is in a position where the last digit of a number in a column may be written.

17. In a typewriting machine, the combination of a carriage; tabulator mechanism comprising column and denominational

selecting means including a series of column stops and a series of denominational stops; column selecting means; automatically operating means for locking the column selecting means in a column selecting position whereby a given column stop and any of the series of denominational stops may be brought one in the path of the other; and automatically operating means for releasing said locking means when the carriage is in a position where the last digit of a number may be written in the selected columnar field.

18. In a typewriting machine, the combination of a carriage; and tabulating mechanism comprising a key controlled variably movable stop arresting frame, the position of which determines the columnar position of arrest of the carriage, a tabulator stop which is distinct from but co-acts directly with and is arrested in its movement to operative position by said frame, a key for said tabulator stop, and connections between said key and tabulator stop for connecting the same to move together and for affording a movement of the key independently of said tabulator stop.

19. In a typewriting machine, the combination of a carriage; and tabulating mechanism comprising a key controlled variably movable stop arresting frame, the position of which determines the columnar position of arrest of the carriage, and a tabulator stop which is distinct from but is arrested in its movement to operative position by said frame, the frame being normally out of the path of said tabulator stop and being brought into the path thereof by the key controlled means for said frame.

20. In a typewriting machine, the combination of a carriage; and tabulating mechanism comprising a series of independently movable tabulator stops, a key for each of said tabulator stops, connections between each key and its stop which cause each stop to move with its key and afford a movement of each key independently of its stop, and a key controlled variably movable arresting frame with which each of the stops directly coöperates and by which each of said tabulator stops is arrested in variable positions in the movement thereof to operative position depending on the arresting position of said frame to vary the position of arrest of the carriage.

21. In a typewriting machine, the combination of a carriage; and tabulating mechanism comprising coöperative tabulating stops, and a key controlled movable frame separate from said stops but controlling the relation between them, said frame receiving a single given extent of movement in one direction and a variable extent of movement in another direction to determine the point of arrest of the carriage.

22. In a typewriting machine, the combination of a carriage; and tabulating mechanism comprising a key controlled variably movable stop arresting frame, the position of which determines the columnar position of arrest of the carriage, and a tabulator stop which is distinct from but is arrested in its movement to operative position by said frame, the frame being normally out of the path of said tabulator stop and being brought into the path thereof by the key controlled means for said frame.

nation of a carriage, and tabulating mechanism comprising coöperative stops, keys for certain of said stops, connections between said keys and their stops for causing the
 5 keys and such stops to move together and for affording a movement of each key independently of its stop, a variably movable frame separate from said stops but operated directly thereon and moved by said
 10 stops, key controlled means for determining the variable extents of movement that said frame may receive, and a separate key for effecting variable extents of movement of the stops relatively to each other as deter-
 15 mined by the actuation of said key controlled means for the frame and thus varying the position of arrest of the carriage.

23. In a typewriting machine, the combination of a carriage; and tabulating mechanism comprising a series of column stops, a series of denominational stops, a variably movable arresting frame separate from said stops but operated directly thereon and moved by said stops and the movement of
 20 which determines the extent of relative movement that may be effected between the denominational and column stops and determines the columnar position of arrest of the carriage, key controlled means for determining the extent of movement that may be
 25 given to said frame, separate key controlled means for effecting a relative movement between the denominational and column stops, and intermediate connections between said
 30 last mentioned key controlled means and the stops which they control for causing the two to move together and to afford a movement of the key controlled means independently of such stops.

24. In a typewriting machine, the combination of a carriage; and tabulating mechanism comprising a series of column stops, a series of denomination stops, carriage releasing means, a variably movable
 40 frame that normally prevents an actuation of said carriage releasing means and determines the extent of relative movement that may be effected between the denominational stops and the column stops, key controlled means that move said frame to a
 45 position where it no longer prevents an actuation of the carriage releasing means and that determines the extent of movement that may be given to said frame, and means
 50 under control of separate keys for effecting a relative movement between the denominational and column stops and for actuating the carriage releasing means.

25. In a typewriting machine, the combination of a carriage, and tabulating mechanism comprising a key controlled
 55 variably movable stop arresting frame, the position of which determines the position of arrest of the carriage, a tabulator stop which is independent of but acts directly

upon and is arrested in its movement to operative position by said frame, and automatically operating means for locking the frame in abnormal position and for subsequently automatically releasing said locking means. 70

26. In a typewriting machine, the combination of a carriage; and tabulating mechanism comprising a key controlled
 75 variably movable stop arresting frame, the position of which determines the position of arrest of the carriage, a tabulator stop which is independent of but is arrested in its movement to operative position by said frame, the frame being normally out of the
 80 path of the stop and being brought into the path thereof by the key controlled means for said frame, automatically operating means for locking the frame in the path of said stop, and automatically operating
 85 means for releasing said locking means before a completion of the tabulating operation.

27. In a typewriting machine, the combination of a carriage, coöperative tabulator stops, a key controlled member having
 90 a fixed extent of movement, spring means for connecting said key controlled member and one of said tabulator stops to cause the two to move together, and means for
 95 arresting said last mentioned stop in variable positions in its movement into coöperative relation with its coöperating stops, the arrest of said variably movable stop being independent of said key controlled
 100 member.

28. In a typewriting machine, the combination of a carriage, a set of graduated column stops, a coöperative tabulating stop, a key controlled member, a spring for connecting
 105 said key controlled member and said coöperative stop to move together, and means for arresting the coöperative stop in variable positions in its movement into coöperative relation with the graduated
 110 column stops, the variable position of arrest of said coöperative stop being independent of said key controlled member and determining the columnar position of arrest of the carriage. 115

29. In a typewriting machine, the combination of a carriage, a set of graduated column stops, a set of denominational stops, a separate key controlled member for each
 120 of said denominational stops, a spring for connecting each key controlled member with a denominational stop to cause the two to move together, and means for arresting each denominational stop in variable positions in its movement into coöperative relation with said graduated column stops, so that all of the denominational stops will
 125 co-act with a given column stop determined by the variable position of arrest of said arresting means. 130

30. In a typewriting machine, the combination of a carriage, cooperative tabulator stops, a key controlled member having a fixed extent of movement, spring means for connecting said key controlled member and one of said tabulator stops to cause the two to move together, means for arresting said last mentioned stop in variable positions in its movement into cooperative relation with its cooperating stops, the arrest of said stop being independent of said key controlled member, keys for controlling said arresting means, and a separate key for controlling said key controlled member.

31. In a typewriting machine, the combination of a carriage, a set of graduated column stops, a cooperative tabulating stop, a key controlled member, a spring for connecting said key controlled member and said cooperative stop to move together, means for arresting the cooperative stop in variable positions in its movement into cooperative relation with the graduated column stops, the variable position of arrest of said cooperative stop being independent of said key controlled member and determining the columnar position of arrest of the carriage, keys for controlling said arresting means, and a separate key for controlling said key controlled member.

32. In a typewriting machine, the combination of a carriage, a set of graduated column stops, a set of denominational stops, a separate key controlled member for each of said denominational stops, a spring for connecting each key controlled member with a denominational stop to cause the two to move together, means for arresting each denominational stop in variable positions in its movement into cooperative relation with said graduated column stop, so that all of the denominational stops will co-act with a given column stop determined by the variable position of arrest of said arresting means, keys for controlling said arresting means, and separate denominational keys for actuating said key controlled members.

33. In a typewriting machine, the combination of a carriage, cooperative tabulator stops, a key controlled member having a fixed extent of movement, spring means for connecting said key controlled member and one of said tabulator stops to cause the two to move together, means for arresting said last mentioned stop in variable positions in its movement into cooperative relation with its cooperating stops, the arrest of said stop being independent of said key controlled member, and automatically operating means for locking said arresting means in the operative position.

34. In a typewriting machine, the combination of a carriage, a set of graduated column stops, a cooperative tabulating stop, a key controlled member, a spring for con-

necting said key controlled member and said cooperative stop to move together, means for arresting the cooperative stop in variable positions in its movement into cooperative relation with the graduated column stops, the variable position of arrest of said cooperative stop being independent of said key controlled member and determining the columnar position of arrest of the carriage, and automatically operating means for locking said arresting means in the operative position.

35. In a typewriting machine, the combination of a carriage, a set of graduated column stops, a set of denominational stops, a separate key controlled member for each of said denominational stops, a spring for connecting each key controlled member with a denominational stop to cause the two to move together, and means for arresting each denominational stop in variable positions in its movement into cooperative relation with said graduated column stops, so that all of the denominational stops will co-act with the column stop determined by the variable position of arrest of said arresting means, and automatically operating means for locking said arresting means in the operative position.

36. In a typewriting machine and tabulating mechanism, the combination of a carriage, graduated stops, a cooperative stop, a two piece key controlled actuating member for actuating said cooperative stop, one piece of said two-piece member being adapted to be arrested while the other piece continues its movement, and means for arresting said first mentioned piece in variable positions.

37. In a typewriting machine, the combination of a carriage, a series of graduated stops, a cooperative stop, a controlling device which is moved by said cooperative stop and controls the extent of movement of the cooperative stop into cooperative relation with said graduated stops, and key controlled means cooperative with said controlling device for variably limiting the said movement of the controlling device.

38. In a typewriting machine, the combination of a carriage, a set of graduated column stops, a set of cooperative denominational stops, a controlling device which is moved by each of said denominational stops and controls the extent of movement thereof, and key controlled column selecting means cooperative with said controlling device for variably limiting the said movement of the controlling device to thereby variably limit the extent of movement of all of the denominational stops into cooperative relation with the graduated column stops.

39. In a typewriting machine, the combination of a carriage, a series of graduated

stops, a coöperative stop, a controlling device which is moved by said coöperative stop and controls the extent of movement of the coöperative stop into coöperative relation with said graduated stops, key controlled means coöperative with said controlling device for variably limiting the said movement of the controlling device, and automatically operating means for locking the variable limiting means in operative position.

40. In a typewriting machine, the combination of a carriage, a set of graduated column stops, a set of coöperative denominational stops, a controlling device which is moved by each of said denominational stops and controls the extent of movement thereof, key controlled column selecting means coöperative with said controlling device for variably limiting the said movement of the controlling device to thereby variably limit the extent of movement of each of the denominational stops into coöperative relation with the graduated column stops, and automatically operating means for locking said key controlled column selecting means in operative position.

41. In a typewriting machine, the combination of a carriage, a series of graduated stops, a coöperative stop, a controlling device which is moved by said coöperative stop and controls the extent of movement of the coöperative stop into coöperative relation with said graduated stops, a series of keys, separate arresting stops controlled individually by said keys and coöperative with said controlling device, the different arresting stops being variably positioned to variably arrest said controlling device in said movement.

42. In a typewriting machine, the combination of a carriage, a set of graduated column stops, a set of coöperative denominational stops, a controlling device which is moved by each of said denominational stops and controls the extent of movement thereof, a series of independent variably disposed limiting stops coöperative with said controlling device for variably limiting the movement of said controlling device to thereby variably limit the extent of movement of each of the denominational stops into coöperative relation with the graduated column stops, and keys for controlling said limiting stops individually.

43. In a typewriting machine, the combination of a carriage; key controlled denominational and column selecting mechanism including denominational stops; carriage releasing means including an actuating arm controlled by an actuation of each denominational stop, and a member normally in the paths of said arms to render them inoperative to release the carriage and to prevent an actuation of the denominational stops;

and means controlled by an actuation of a column selecting key for rendering said denominational stops and carriage releasing means operative.

44. In a typewriting machine, the combination of a carriage, coöperative tabulator stops, a key controlled member having a fixed extent of movement, means for operatively connecting said key controlled member and one of said tabulator stops to cause the two to move together and to afford a movement of one independently of the other, and means for arresting said last mentioned stop in variable positions in its movement into coöperative relation with its coöperating stops, the arrest of said variably movable stop being independent of said key controlled member.

45. In a typewriting machine and tabulating mechanism, the combination of a carriage, a series of column stops of different lengths, a series of independently operable denominational stops, said column and denominational stops having variable extents of relative movement toward and away from each other, a variably movable frame, key actuated column selecting levers, and stops carried by said levers for arresting the variably movable frame in its movement to operated position and thus determining the extent of variable movement of said frame.

46. In a typewriting machine, the combination of a carriage, denominational selecting mechanism, column selecting mechanism including a variably movable member for determining the columnar position of arrest of the carriage, and means by which said variably movable member is moved a given extent in one direction by the column selecting mechanism and is moved variably in another direction by the denominational selecting mechanism.

47. In a typewriting machine, the combination of a carriage, denominational selecting mechanism, column selecting mechanism including a variably movable member for determining the columnar position of arrest of the carriage, means by which said variably movable member is moved by the column selecting mechanism and also by the denominational selecting mechanism, and means coöperative with said variably movable member when it is in normal position for locking the denominational selecting mechanism against actuation until the column selecting mechanism has been operated.

48. In a typewriting machine, the combination of a carriage, denominational selecting mechanism, column selecting mechanism including a variably movable member for determining the columnar position of arrest of the carriage, means whereby said variably movable member is moved by the column selecting mechanism and also by the denominational selecting mechanism, and a

stop with which said variably movable member normally coöperates to lock the denominational mechanism against actuation, the actuation of the column selecting mechanism and the movement of the variably movable member thereby effecting a release of the locking means to enable the denominational selecting mechanism to be actuated.

49. In a typewriting machine, the combination of a carriage; column selecting and denominational selecting mechanism including a tabulator stop that is variably movable to determine the columnar position of arrest of the carriage, and devices for determining the variable extent of movement of said stop; column selecting keys; separate denominational selecting keys; means for locking said devices in operative position; and means controlled by an actuation of a denominational key for releasing said locking means.

50. In a typewriting machine, the combination of a carriage; column selecting and denominational selecting mechanism including a tabulator stop that is variably movable to determine the columnar position of arrest of the carriage; and a series of independently movable arresting stops for arresting the movement of the tabulator stop to operative position; column selecting keys; separate denominational selecting keys; automatically operating means for locking said arresting stops individually in the operative position; and means controlled by an actuation of a denominational selecting key for releasing the locked arresting stop.

51. In a typewriting machine, the combination of a carriage; column selecting and denominational selecting mechanism including a tabulator stop that is variably movable to determine the columnar position of arrest of the carriage, and a series of inde-

pendently movable arresting stops for arresting the movement of the tabulator stop to operative position; column selecting keys; separate denominational selecting keys; automatically operating means for locking said arresting stops individually in the operative position; means controlled by an actuation of a denominational selecting key for releasing the locked arresting stop; and means also controlled by an actuation of a column selecting key for releasing said locked arresting stop.

52. In a typewriting machine, the combination of a carriage; key controlled column selecting mechanism including a series of arresting stops for determining the extent of movement of a part of said column selecting mechanism, key controlled denominational selecting mechanism; automatically operating means for locking said arresting stops in operative position; and means controlled by an actuation of a denominational key for releasing said locking means.

53. In a typewriting machine, the combination of a carriage; key controlled column selecting mechanism; key controlled denominational selecting mechanism; automatically operating means for locking the column selecting means in the actuated position; means controlled by an actuation of a column selecting key for releasing said locking means; and means also controlled by an actuation of a denominational key for bringing about a release of said locking means.

Signed at the borough of Manhattan, city of New York, in the county of New York, and State of New York, this 4th day of December A. D. 1911.

JOHN WALDHEIM.

Witnesses:

CHARLES E. SMITH,
M. F. HANNWEBER.