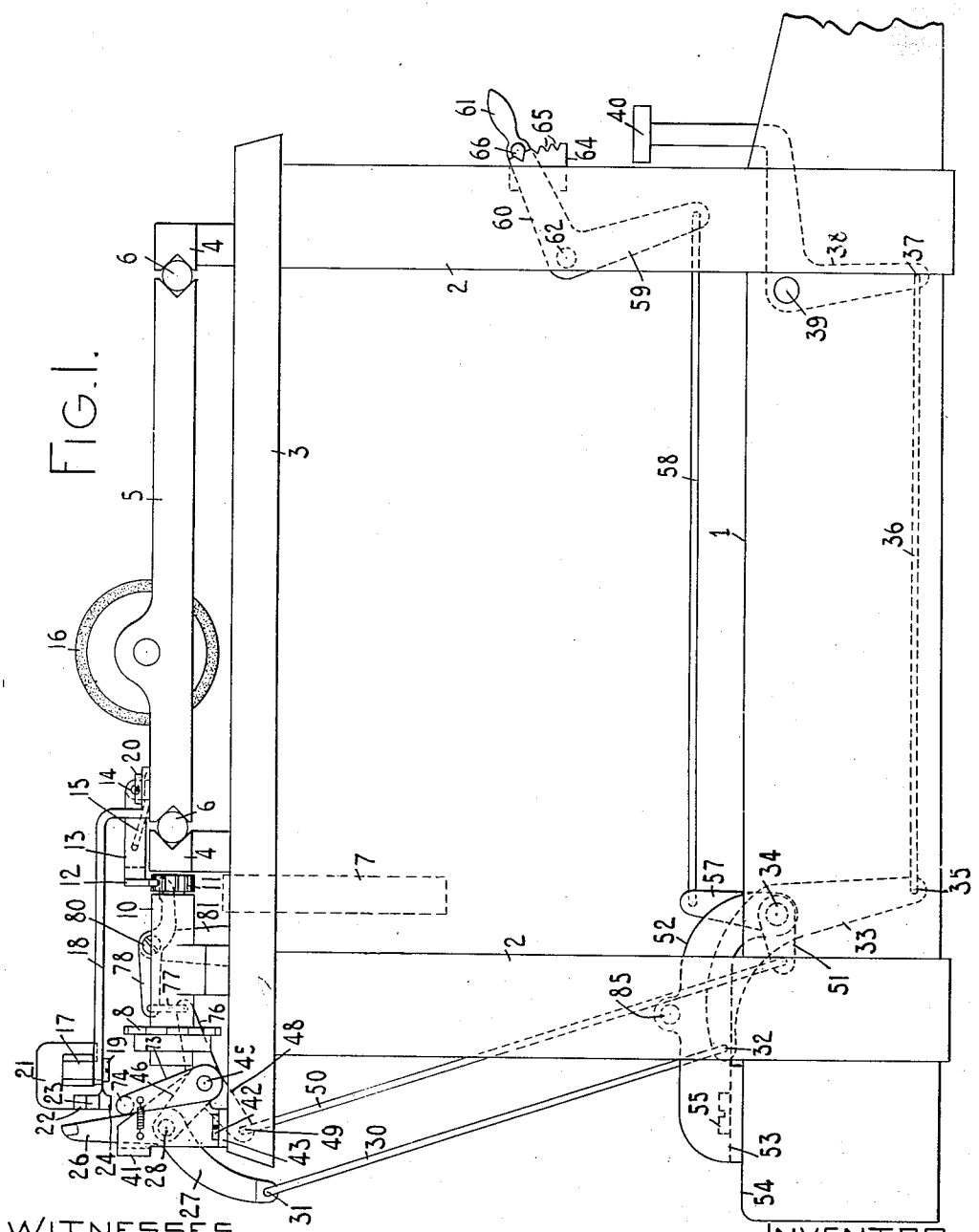


A. W. STEIGER.
 TYPE WRITING MACHINE.
 APPLICATION FILED NOV. 26, 1909.

948,486.

Patented Feb. 8, 1910.
 4 SHEETS—SHEET 1.



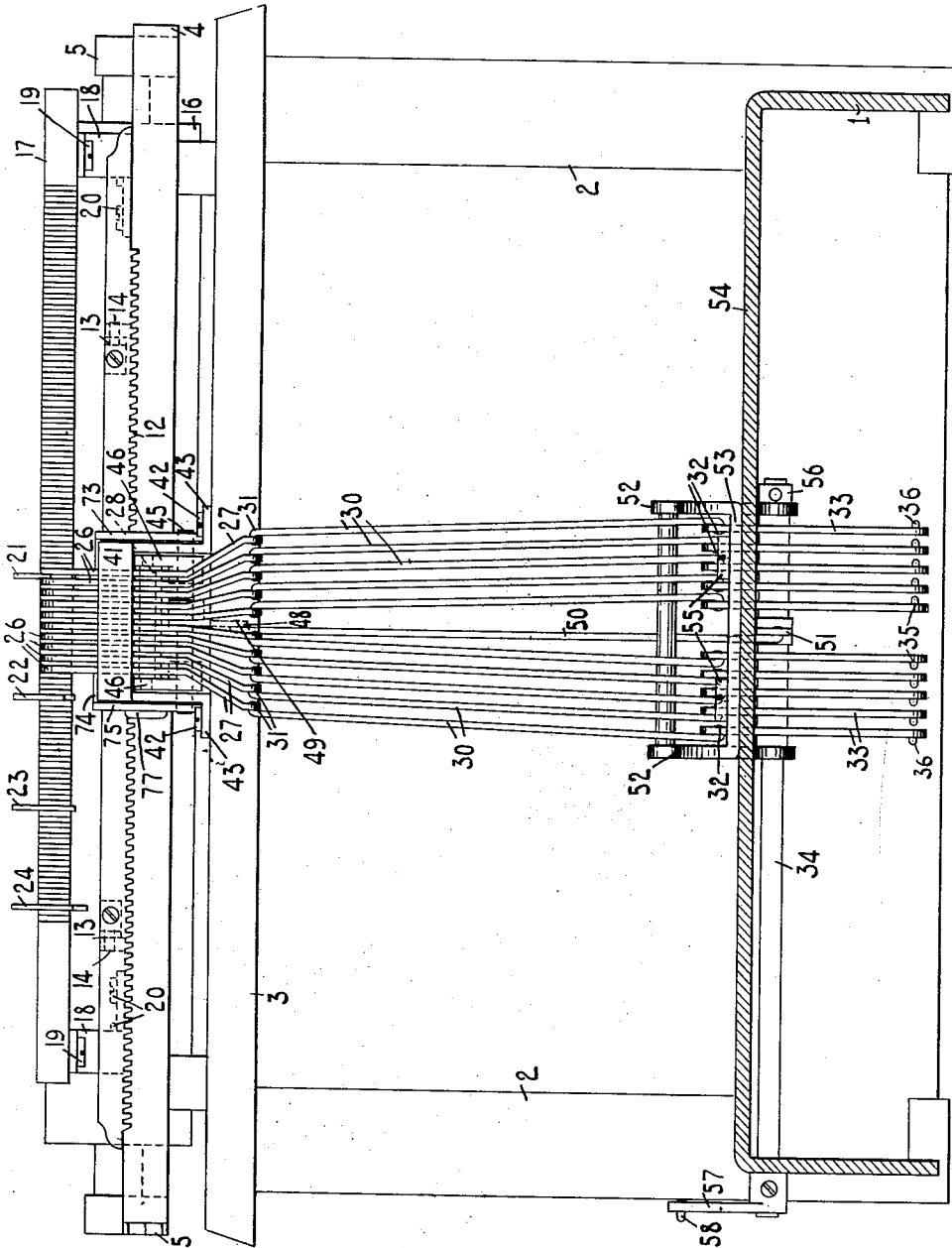
WITNESSES:
E. M. Wells
R. H. Strother

INVENTOR:
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 By *Jacob F. Fehle*
 HIS ATTORNEY

948,486.

Patented Feb. 8, 1910.

4 SHEETS—SHEET 2.



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FIG. 2.

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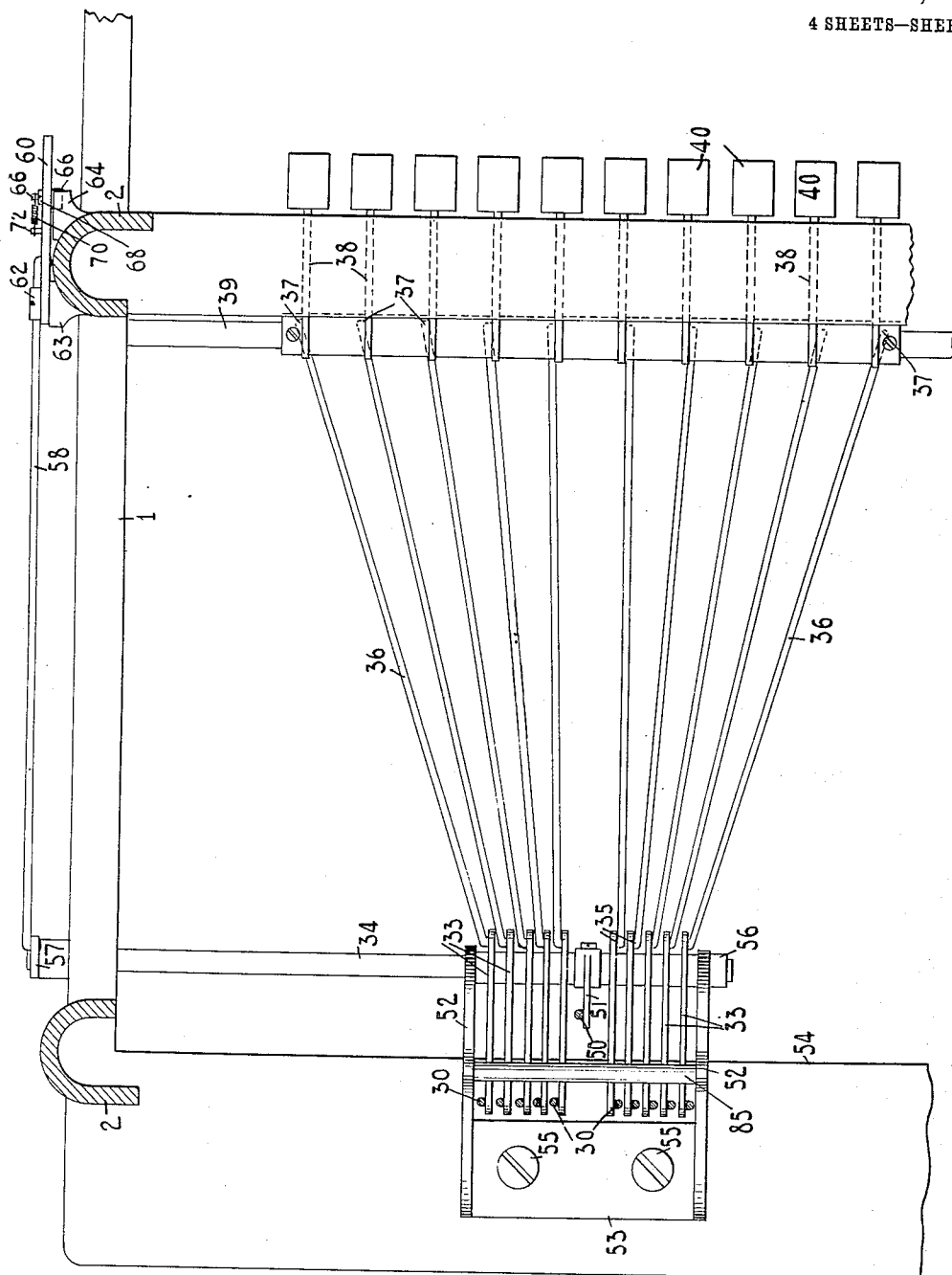
HIS ATTORNEY

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4 SHEETS—SHEET 3.



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FIG. 3.

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948,486.

Patented Feb. 8, 1910.

4 SHEETS—SHEET 4.

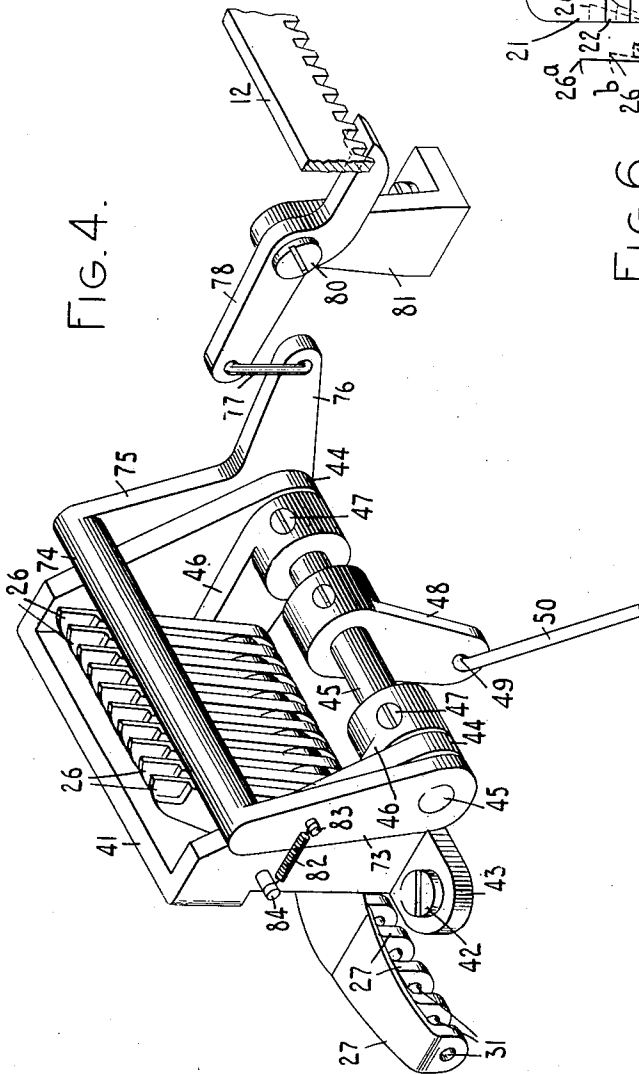


FIG. 4.

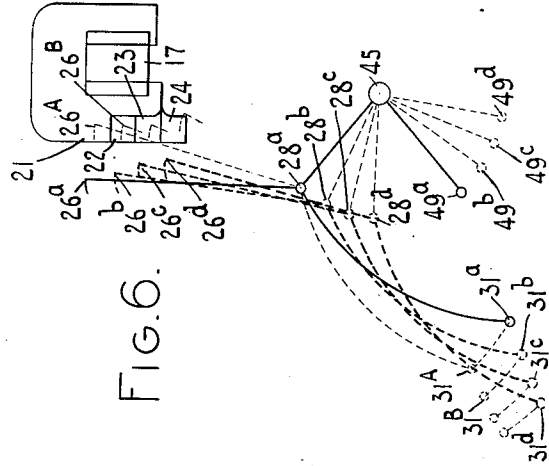


FIG. 6.

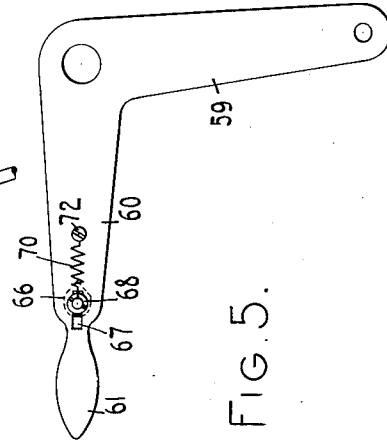


FIG. 5.

WITNESSES:

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UNITED STATES PATENT OFFICE.

ANDREW W. STEIGER, OF BRIDGEPORT, CONNECTICUT, ASSIGNOR TO UNION TYPE-WRITER COMPANY, OF JERSEY CITY, NEW JERSEY, A CORPORATION OF NEW JERSEY.

TYPE-WRITING MACHINE.

948,486.

Specification of Letters Patent.

Patented Feb. 8, 1910.

Application filed November 26, 1909. Serial No. 529,954

To all whom it may concern:

Be it known that I, ANDREW W. STEIGER, citizen of the United States, and resident of Bridgeport, in the county of Fairfield and State of Connecticut, 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 for such machines.

The principal object of my invention is to produce a combined denominational and column selecting tabulator that can be used either for the ordinary purposes of a denominational tabulator or for the ordinary purposes of a column selector or for both purposes at once, that is to say, to cause the carriage to move at a single operation to a selected denominational position in any selected one of a plurality of columns.

Another object is to provide such a tabulator so constructed that it can be set to act either as an ordinary denominational tabulator arranged to arrest the carriage at any denominational position in the first column that reaches the printing position or that can be set so as to skip any desired number of columns and to use succeeding columns only, this setting remaining fixed until the operator changes it.

To the above and other ends which will appear in the course of the description, my invention consists in certain features of construction and combinations and arrangements of parts all of which will be fully set forth herein and particularly pointed out in the claims.

In the accompanying drawings, Figure 1 is a side elevation of as much of a typewriting machine as is necessary to illustrate the application of my invention thereto, some of the parts of said typewriting machine being shown conventionally and others omitted. Fig. 2 is a rear elevation of the same. Fig. 3 is a top plan view of part of the base of the typewriter and of that part of the tabulating mechanism that is situated below the top plate, the upper part of the typewriter and tabulator being removed or sectioned away. Fig. 4 is an isometric view of the denominational stops, a fragment of the carriage feed rack and associated devices, parts of the typewriter and tabulating mechanism being omitted and parts broken

away. Fig. 5 is a side view of the hand lever that controls the selection of columns. Fig. 6 is a diagrammatic view illustrating the operation of the action of the column selecting devices on the denominational stops.

My invention is applicable or adaptable to typewriting machines generally and the drawings show only a conventional representation of the frame-work and carriage of a typewriter in which the printing instrumentalities are stationary and in which a roller platen is mounted on the carriage and carries the paper.

The main-frame of the machine is shown as comprising a base 1, corner posts 2 and a top plate 3. Stationary grooved rails 4 are supported by the top plate and a carriage 5 has a rectangular frame, the front and rear bars of which are formed with grooves which coöperate with grooves in the rails 4 to form race-ways, in which run anti-friction balls or rollers 6. The carriage is drawn across the machine by a spring drum 7 connected thereto in any usual or suitable manner and it is controlled in its step-by-step movements by an escapement mechanism of any suitable sort which is here shown as including an escapement wheel 8 mounted on the rear end of a shaft journaled in a bracket 10 secured to the top plate 3. Said shaft has on its forward end a pinion 11 that meshes with a feed rack 12 which is carried by arms 13 pivoted at 14 to the carriage 5 and normally held down by springs 15. This rack can be raised out of engagement with the pinion 11 in order to release the carriage from its escapement mechanism. A platen 16 is shown mounted in the carriage 5. The paper feed devices, printing mechanism, etc. are not shown but they may be of any usual or suitable sort.

The tabulator comprises a column stop bar 17 which is here shown as of the usual square cross section and formed in its forward and rear faces with the usual notches spaced a letter space distance apart. The bar 17 is mounted on arms 18 extending rearward from the carriage 5, said bar being secured to the arms 18 by means of screws 19 and said arms being secured to the carriage by means of screws 20.

I have shown four column stops 21, 22, 23 and 24, each of the ordinary bifurcated construction, adapted to be fitted over the

stop bar 17 in the usual way except that the parts of the several column stops that project toward the rear in position to be engaged by the cooperating stops, are made of different lengths, the left-hand column stop being the shortest and the others of successively greater length as shown in the drawings. These column stops are adapted to be engaged by denominational stops 26 consisting of the upwardly extending arms of a series of angled levers each of which in addition to the stop arm 26 comprises another arm 27 extending downward at an inclination toward the rear of the machine. All of these levers are pivoted at their angles on a cross rod 28 which is movably mounted in the machine as will appear more fully hereinafter. The actuating devices for the denominational stops include a series of links 30, and each of the lever arms 27 has one of these links pivoted thereto at 31 at the lower end of said lever arm. The links 30 extend downward at an inclination toward the front of the machine, their lower ends being pivoted at 32 to a series of levers 33 which are pivoted on a cross rod or shaft 34. Each of the levers 33 has a downwardly extending arm to which at 35 is pivoted the rear end of a link 36 which at its forward end is pivoted at 37 to the depending arm of an angular key lever 38 having a key 40 mounted on the end of its forwardly and upwardly directed arm. As shown in Fig. 3 the links 36 flare outward toward the front of the machine so as to space the keys 40 a suitable distance apart and said keys are arranged in a row at the back of the keyboard of the machine; that is to say, in a row just back of the rear row of printing keys. All of the levers 38 are pivoted on a cross rod 39 supported at its ends in the base 1 of the main frame. The construction is such that if any of the keys 40 be depressed the corresponding link 36 will operate the corresponding lever 33, which in turn through the link 30 will rock the stop lever 26, 27 and move the denominational stop arm 26 of said lever forward into the path of one of the column stops.

The support for the denominational stops and the devices immediately associated therewith, can be best understood by reference to Figs. 1 and 4. A bracket or frame 41 is mounted on the rear part of the top plate 3 by means of screws 42 passing through ears 43 bent off from said frame. This frame comprises two uprights, one at either side of the system of denominational stops, and a cross bar connecting said uprights at the rear of said stops. Each of the upright ends of the frame 41 is formed with a forwardly projecting arm 44 and in said arms a rock shaft 45 is pivotally mounted. Two arms 46 are rigidly mounted on said rock shaft by means of set screws 47 threaded through the

hubs of said arms and engaging said rock shaft. These arms are inside of the end pieces of the frame 41 and they extend at an inclination upward and toward the rear and they have the pivot rod 28 of the denominational stop levers rigidly mounted on their rear ends. The construction is such that this pivot rod can be moved in an arc of a circle by turning the rock shaft 45. Said rock shaft is controlled by an arm 48 rigidly mounted thereon and extending therefrom downward at an inclination toward the rear of the machine. Pivoted at 49 to the lower end of the arm 48 is a link 50, the lower end of which is pivoted to an arm 51 extending toward the rear of the machine from the shaft 34 on which the levers 33 are pivoted. The arm 51 is rigidly mounted on the shaft 34 in the midst of the system of levers 33, as shown in Fig. 3. This shaft is mounted or pivoted in arms 52 of a sheet metal frame which comprises a yoke part 53 that lies on the back shelf 54 which constitutes a part of the base 1 of the main frame, said yoke 53 being secured to the shelf by screws 55. The arms 52 extend forward and curve downward so as to bring the shaft 34 in front of the front edge of the shelf 54 and at a lower level than said shelf. The left-hand end of the shaft 34 has a collar 56 mounted thereon outside of the arm 52 to prevent endwise motion of said shaft. At its right-hand end the shaft 34 extends through the right-hand side plate of the base 1 of the main frame in which side plate said shaft is journaled. On the outside of said side plate said shaft has an upwardly extending arm 57 mounted thereon and said arm is connected by a horizontal link 58 with the downwardly extending arm 59 of a bell crank having a forwardly extending arm 60, the front end of which is formed into a handle 61. The lever 59, 60 is pivoted on a screw 62 threaded into a block 63 forming part of or secured to the right-hand front post 2 of the main frame. The construction is such that if the handle 61 be moved downward the pivot rod 28 will be moved downward in an arc with the shaft 45 as a center.

In order to retain the handle 61 in any one of its several positions, a block 64 is secured to the post 2 and this block has a series of notches 65 formed in its front face. Said notches are engaged by a beveled detent 66 mounted on the handle 61. This detent may be of any suitable construction, but as here shown it consists of a headed pin or bolt, the head of which is beveled as shown in Fig. 1 and the stem of which passes through an elongated slot 67 (Fig. 5) formed in the handle. The right-hand end of said stem is threaded to receive a nut 68 which retains the detent in position on the handle. Said detent is drawn toward the rear of the machine by means of a spring 130

70 connected at one end to the detent and at the other end to a screw 72 threaded into the handle or into the lever arm 60. The construction is such that the detent will hold the handle in any one of its several positions but said handle can be forced to any other of said positions, the detent snapping in and out of the notches 65. Four such notches are shown in the present instance to correspond in number to the four column stops.

In order to release the carriage when any denominational stop is operated, a frame is provided, said frame being mounted on the rock shaft 45 (Fig. 4). This frame comprises an arm 73 pivoted on the left-hand end of the shaft 45 outside of the frame 41, and said arm is connected by a cross bar 74 with another arm 75 pivoted on the other end of said shaft 45, the cross bar 74 lying in front of the denominational stops and serving as a universal bar operable by any of said stops. The universal bar frame comprises also a forwardly extending arm 76 that is connected by a short link 77 with the rear arm of a lever 78 of the first order, the forward arm of which lies just beneath the rack bar 12. The lever 78 is pivoted on a screw 80 threaded into a bracket 81 which is secured to the top plate 3 by means of a screw. The construction is such that when any denominational stop is operated the lever 78 is rocked about its pivot 80 and raises the rack bar 12 out of engagement with the pinion 11, thus releasing the carriage and allowing it to run free until it is arrested by the stops. The release mechanism is restored to normal position by means of a spring 82 which as here shown is connected at one end to a post 83 on the arm 73 and at the other end to a post 84 on the frame 41.

In order to limit the forward motion of the denominational stops when they are operated by the keys 40, any suitable means may be provided. As here shown, a stop bar 85 is mounted in the arms 52 above the levers 33 in position to prevent said levers from moving too far.

The operation of my tabulating mechanism consists in setting the handle 61 to the desired position and then operating the denominational keys 40 in the ordinary way. The parts are shown in Fig. 1 set so that any operated denominational stop will arrest the first column stop that reaches it. With the parts in this position the tabulator is set to operate as any ordinary denominational tabulator. In case it is not desired to do denominational work, some particular one of the denominational keys can be used as, for example, the one of lowest order, which in denominational work usually corresponds to the decimal point. When the handle 61 is moved from the position shown in Fig. 1 into the other three notches 65, the denominational stops operate

in the manner illustrated diagrammatically in Fig. 6. In this figure the column stop bar 17 is shown and the series of column stops 21, 22, 23 and 24. The other parts are diagrammatically represented and are designated in this figure by the same reference numerals as in the other figures of the drawings with the exponents a, b, c or d, according as the respective positions shown correspond to the positions of the handle 61 in Fig. 1 or to the position of said handle when the detent 66 is in the second, third or fourth notch 65 as the case may be. The position of any one of the denominational stops shown in Fig. 1 is indicated at 26^a. The corresponding position of the pivot rod 28 is shown at 28^a; that of the pivot 31 at 31^a and that of the pivot 49 at 49^a. The positions of the corresponding parts when the detent 66 is in the second notch 65 are represented by the same numerals but with the exponent b and so on. It will be seen that when the handle 61 is moved, each of the stop levers 26, 27 has the motion of a floating lever, the point 28 turning about the rock shaft 45 as a center and the point 31 turning about the pivot 32 as a center. The points 28^a, 28^b, 28^c and 28^d are therefore in the arc of a circle having the shaft 45 for its center and the points 31^a, 31^b, 31^c and 31^d are in the arc of a circle having the point 32 as a center. It will be seen that the effect of this on the operative end of the stop arm 26 is to move said end downward and a little toward the front of the machine. If, when the parts are in the first of these positions, a denominational key be operated, the point 31^a moves to 31^b and the point 26^a moves to 26^b where it arrests the first column stop 21. When the parts are in the second of said positions and a denominational key is operated, the point 31^b moves to 31^c and the point 26^b moves to 26^c where it is in position to arrest the second column stop 22 but where the first column stop 21 will pass over it. In the third position an operated denominational stop will arrest the third column stop 23, allowing the first two column stops 21 and 22 to pass over it; and when the parts are in the fourth position, in which the denominational stops are shown in Fig. 4, said denominational stops are only high enough to arrest the fourth column stop 24 and not the others.

It will be perceived that this device can be used as a simple column selector by always operating the denominational key of lowest order for example, and that by operating any selected denominational key the carriage can be brought at a single operation to any selected denominational position in any selected one of the four columns. It will also be perceived that in case most of the tabulating work has its beginning in a certain one of the columns, say, in the

third, then the handle 61 can be set in its third position and the keys 40 be operated after the ordinary manner of a denominational tabulator which will bring all of the tabulated work into the same column. If there is some unusual item that requires to be tabulated in another column, the handle 61 can be moved accordingly. In short, when the machine is set for a certain column this setting is retained until it is changed by an operation of the handle 61.

It will be perceived that the selection of columns is effected by shifting the support to which the denominational stops are pivoted; that the entire series or gang of denominational stops are shifted bodily to different positions corresponding to the different column stops; that the points 31 at which the actuating links 30 are connected to the denominational stops, partake of this shifting movement; and that the links 30 are also shifted, swinging about their lower ends 32.

It will be perceived that my tabulator is capable of quite a wide range of work and that at the same time it is simple in construction and efficient for all its purposes.

Various changes may be made in the details of construction and arrangement without departing from my invention.

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

1. In a typewriting machine and in tabulating mechanism, the combination of a carriage, a series of column stops having stop portions out of line with one another, a series of denominational stop levers for co-operation with said column stops, a support to which said levers are pivoted, means for shifting said support to any one of a plurality of positions to bring the entire series of denominational stop levers into register with any selected one of said stop portions of said column stops, and means for operating any one of said denominational stops to bring it into the path of the selected column stop.

2. In a typewriting machine and in tabulating mechanism, the combination of a carriage, a series of column stops having stop portions out of line with one another, a series of independently operable denominational stop levers, a movable support to which said stop levers are pivoted, and means for shifting said support to any one of a plurality of positions corresponding to the different column stops and for retaining said support in said positions.

3. In a typewriting machine and in tabulating mechanism, the combination of a carriage, a series of column stops having stop portions out of line with one another, a series of independently operable denominational stops, means for shifting said series of denominational stops as an entirety to

any one of a plurality of different positions corresponding to the different column stops, a universal bar arranged to be operated by said denominational stops in any of the positions to which they are shifted, and a carriage release device operated by said universal bar.

4. In a typewriting machine and in tabulating mechanism, the combination of a carriage, a series of column stops having stop portions out of line with one another, a series of denominational stop levers, a pivotally mounted support to which said stop levers are pivoted, a series of denominational keys, connections between said keys and said stop levers comprising links each pivoted at one end to one of said stop levers and at the other end to another part of said connections, and means for swinging said support about its pivot, thus moving each of said stop levers about two pivotal centers to bring said stop levers into different positions corresponding to the different column stops.

5. In a typewriting machine and in tabulating mechanism, the combination of a carriage, a series of column stops carried by said carriage, a series of denominational stop levers, a support movably mounted at the upper part of the machine and having said stop levers pivoted thereon, a series of denominational keys, connections from said keys to said stop levers including a series of links extending from said levers downward to the base of the machine, and means for moving said support to different positions corresponding to the different column stops.

6. In a typewriting machine and in tabulating mechanism, the combination of a carriage, a series of column stops having stop portions out of line with one another, a series of denominational stop levers, means for shifting said series of stop levers together to any one of a plurality of positions corresponding to the different column stops, means for operating any one of said levers to move it into the path of the selected column stop, a universal bar arranged to be operated by any of said stop levers, and a carriage release device operated by said universal bar.

7. In a typewriting machine and in tabulating mechanism, the combination of a carriage, a series of column stops, a frame detachably mounted on the frame of the machine, a support movably mounted in said detachable frame, a series of denominational stop levers pivoted to said movable support, means for setting said support to different positions in said detachable frame, and means for operating said denominational stop levers.

8. In a typewriting machine and in tabulating mechanism, the combination of a carriage, a series of column stops, a frame de-

tachably mounted on the frame of the machine, a support movably mounted in said detachable frame, a series of denominational stop levers pivoted to said movable support, 5 means for setting said support to different positions in said detachable frame, means for operating said denominational stop levers, a universal bar mounted in said detachable frame, and a carriage release device operated 10 by said universal bar.

9. In a typewriting machine and in tabulating mechanism, the combination of a carriage, a series of column stops having stop portions out of line with one another, a series of independently operable denominational stops, actuating devices for said denominational stops, and means for shifting the series of denominational stops bodily to different positions corresponding to the different column stops, the points at which the denominational stops are connected to their respective actuating devices partaking of the shifting motion. 15

10. In a typewriting machine and in tabulating mechanism, the combination of a carriage, a series of column stops having stop portions out of line with one another, a series of independently operable denominational stops, actuating devices for said denominational stops including a series of links each pivoted at one end to one of said 20

denominational stops and at the other end to another part, and means for shifting said series of denominational stops bodily to different positions corresponding to the different column stops, said links turning during such shifting about their pivots at said other ends. 35

11. In a typewriting machine and in tabulating mechanism, the combination of a carriage, a series of column stops at the upper rear part of the machine and having stop surfaces out of line with one another, a series of independently operable denominational stops, means including a part directly associated with said denominational stops for shifting the series or gang of stops as an entirety to different positions corresponding to the different column stops, a shiftable handle at the front of the machine, connections between said handle and said shifting part, and a detent for holding said handle in the position to which it is shifted or set. 40 45 50

Signed at the borough of Manhattan, city of New York, in the county of New York, and State of New York, this 24th day of November, A. D. 1909. 55

ANDREW W. STEIGER.

Witnesses:

E. M. WELLS,
M. F. HANNWEBER.