B. C. STICKNEY.

TYPE WRITING MACHINE.

APPLICATION FILED JULY 16, 1903.

953,447.

Patented Mar. 29, 1910.

2 SHEETS—SHEET 1.

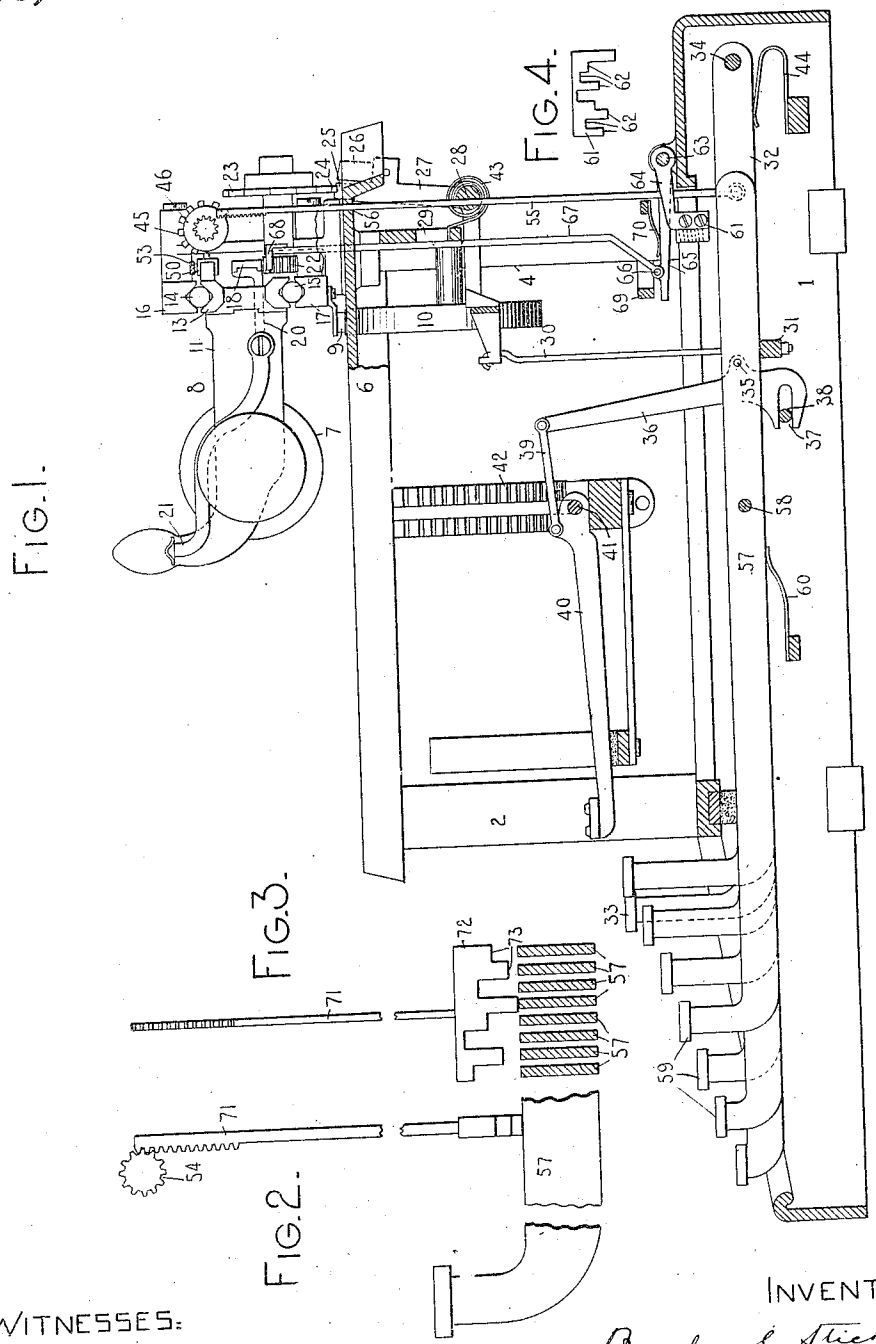

FIG. 1.

FIG. 4.

FIG. 3.

FIG. 2.

WITNESSES:

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E. M. Wells

INVENTOR:

Burnham C. Stickney

by Jacob Feibel

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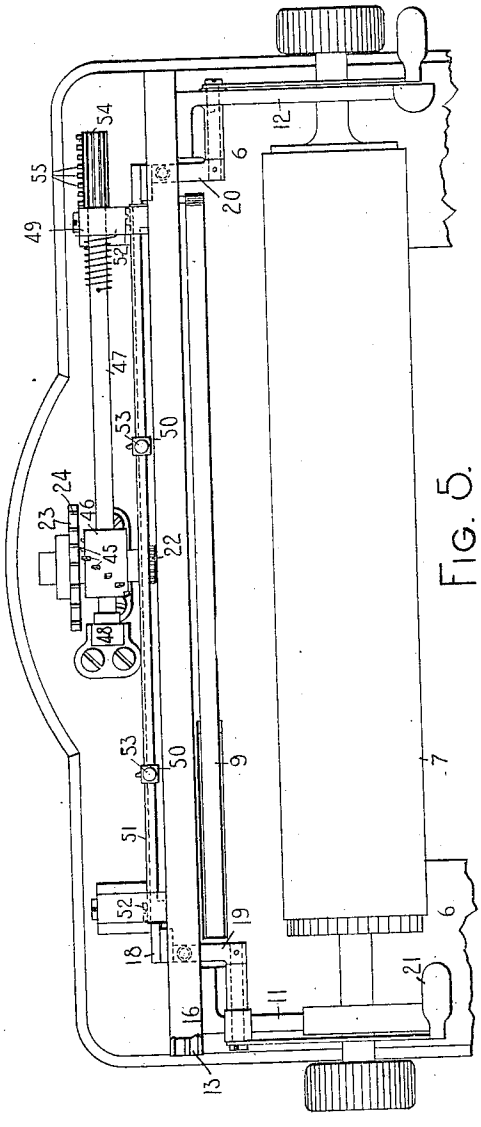

FIG. 5.

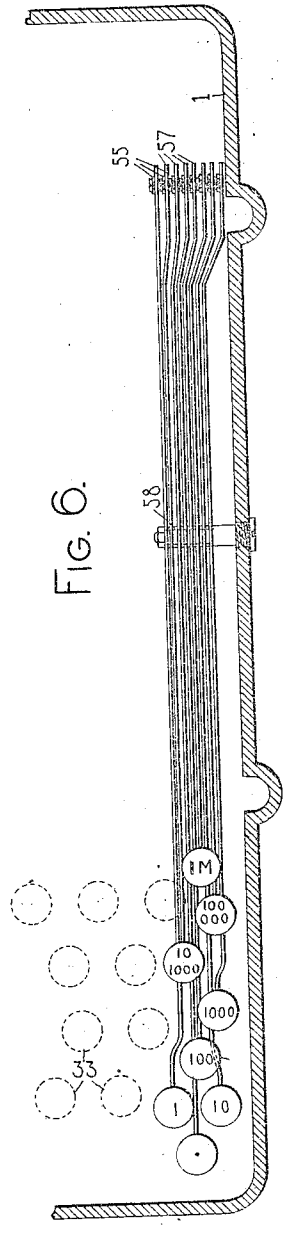

FIG. 6.

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UNITED STATES PATENT OFFICE.

BURNHAM C. STICKNEY, OF ELIZABETH, NEW JERSEY, ASSIGNOR TO UNION TYPE-WRITER COMPANY, OF JERSEY CITY, NEW JERSEY, A CORPORATION OF NEW JERSEY.

TYPE-WRITING MACHINE.

953,447. Specification of Letters Patent. **Patented Mar. 29, 1910.**

Application filed July 16, 1903. Serial No. 165,734.

To all whom it may concern:

Be it known that I, BURNHAM C. STICKNEY, citizen of the United States, and resident of Elizabeth, in the county of Union and State of New Jersey, have invented certain new and useful Improvements in Type-Writing Machines, of which the following is a specification.

This invention relates to tabulators such as used in typewriting and other machines, and its objects are to simplify and improve the construction and operation of the tabulating mechanism and particularly the means for adjusting the denomination stops.

My invention consists in certain combinations of devices, features of construction and arrangements of parts, all as will be hereinafter set forth and particularly pointed out in the concluding claims.

In the drawings forming part of this specification, Figure 1 is a longitudinal vertical section taken about centrally of a front strike typewriting machine embodying my present improvements in one form. Fig. 2 is a side elevation and Fig. 3 a front elevation of a modification of a part of the denomination stop controlling mechanism. Fig. 4 is an elevation of a stepped stop bar. Fig. 5 is a plan of the upper rear portion of the machine. Fig. 6 is a sectional plan showing particularly the denomination stop levers at the right-hand portion of the base of the machine.

In the several views, like signs denote like parts.

The framework comprises a base 1, front corner posts 2, rear corner posts 4, and a top plate 6. Over the latter runs a platen 7, mounted in a carriage 8, connected by a strap 9, (Fig. 2) to a propelling spring drum 10. The carriage comprises side bars 11 and 12, united by a rear bar 13, which by balls 14 and 15 is supported between upper and lower guide rails 16 and 17, its movements being controlled by a letter-spacing rack 18 mounted upon the carriage by means of arms 19 and 20 (the former being extended forwardly to form a release key 21) and meshing with a pinion 22, with which is associated an escapement wheel 23 having teeth 24 which coöperate with feeding and detent dogs 25 and 26. Said dogs are mounted upon a rocker 27, pivoted at 28 in a hanger 29, and having a forwardly extending forked arm, from the forward ends whereof depend hooks 30, attached at their lower ends to a universal bar 31. Said universal bar extends horizontally and transversely beneath a set of horizontal levers 32, bearing keys 33, and extending from the keyboard to the rear of the base 1, where they are pivoted upon a fulcrum rod 34. To each lever is pivoted at 35 an upright lever 36, forked at its lower end at 37 to embrace a common transverse fulcrum rod 38, and connected at its uper end by a link 39 to one of a series of type bars 40, which are pivoted upon a fulcrum rod 41 mounted in a segment 42, and are adapted to be swung upwardly and rearwardly against the platen. At each key stroke the lever 36 is vibrated rearwardly and through the link 39 pulls the type bar up to print, while the key lever 32 presses down the universal bar 31 and through the described mechanism, vibrates the dog rocker, so that upon the return movement of the key the carriage is fed forward one space by the power of the spring 10. Springs 43 and 44 are provided for returning the dog rocker and the key lever or type action to normal position.

Denomination stops 45 are formed or arranged in a helical series upon a cylindrical head 46, which is fixed upon a shaft 47, journaled at its inner end in a standard 48 secured to the top plate of the machine, and at its outer end in one of the standards 49 which support the carriage rails. The working face of each of said stops is placed at a letter space from the plane in which the adjoining stop lies. The series of stops preferably begins at the top front side of the cylinder and extends around the rear side of the same. The foremost stop is used for the decimal point, the next for units, the next for tens, and so on. Upon the carriage is mounted a set of column stops 50, for coöperation with the denomination stops, the column stops being adjustable along a bar 51 which extends longitudinally of the carriage or in the direction of the run thereof, and is secured thereto by screws 52. The column stops may be secured by screws 53, although other forms of column stops and bars or racks may be adopted. The column stops are normally clear of the denomination stops, but the latter are rotatable about the axis 47, so that any column stop may engage any selected denomination stop to arrest the carriage. The left-hand end of

the rock shaft 47 is prolonged beyond its bearing, and thereupon is mounted a long pinion 54. In mesh with the latter are vertical racks 55, which normally stand below and clear of the pinion, but any one of which may be thrust up to rotate the same, said racks being guided at their upper portions in a slot 56 cut in the top plate. At their lower ends said racks are pivoted to levers 57 which are pivoted between their ends upon a stud 58 projecting inwardly from the side of the base 1, and extend forwardly to the keyboard of the machine and bear denomination keys 59. Beneath the levers are provided returning springs 60. By the depression of any key, its rack may be thrust up, and through the pinion the set of denomination stops may be rotated.

For arresting the several key levers at different points during the rotation of the denomination stops, I provide a stop bar 61, extending transversely across the levers, and provided upon its under side with a stepped series of stops 62, one stop for each lever, each stop being at such a height as to be engaged by its lever during the stop-adjusting movement thereof as soon as the corresponding denomination stop is in or nearly in position to engage a column stop and arrest the carriage. The irregular order of the stops is due to the preferred arrangement of the denomination keys, which are placed at the side of the key board in seven tiers, as seen at Figs. 1 and 6, the decimal point being in the foremost tier, the units and tens in the second tier, the hundreds in the third, and so on. By reason of this arrangement, the levers fall in irregular order, and the stop bar is formed accordingly.

A carriage-releasing mechanism which is operable by the denomination keys comprises a rock shaft 63, extending horizontally across the machine in rear of the denomination racks 55, and having an arm or arms 64 projecting forwardly and attached to the denomination stop bar 61, so that when a denomination key lever contacts with the latter, a limited upward movement thereof may be produced, and the shaft rocked. At the middle portion of the machine, a forwardly extending rock arm 65 may be provided upon said rock shaft 63, and to its end may be pivoted at 66 the lower end of an upwardly extending thrust rod 67, which may carry at its top a shoe or plate 68, beneath the carriage escapement rack 18, so that when the shaft is rocked, said arm 65 may be lifted and through the rod 67 the escapement rack may be raised clear of the pinion 22, and the carriage left free to run rapidly under the influence of its propelling spring 10. A stop 69 may be provided for limiting the rocking movement of the shaft 63, and this movement need be very slight, so that but little motion of the denomination stops may take place during the carriage-releasing operation. A spring 70 may be provided for returning the shaft 63 and its connections to normal position.

In operation, the column stops 50 are adjusted along the bar 51 to locate the columns upon the page of writing, the stops being secured by the screws 53. Then supposing the number "294" is to be written, the key marked "100" at Fig. 5 is depressed, and its rack 55 is thrust up to engage and rotate the pinion 54, together with the shaft 47 and the denomination stop cylinder 46, until the fourth denomination stop thereon is rotated to position to engage the column stop. At this moment the lever 57 contacts with the overlying stop 62 upon the stop bar 61, and lifts the latter slightly, but not sufficiently to move said denomination stop to an ineffective position; and by such movement the shaft 63 is rocked, the arm 64 lifted, the rod 67 raised and the shoe 68 caused to lift the rack 18 free of the pinion 22, whereupon the carriage runs along under the influence of its spring 10 until the first column stop thereon contacts with said denomination stop, to arrest the carriage. Thereupon the denomination key is released by the operator, the carriage rack 18 reengages its pinion, and the other parts return to normal position. The operator then strikes the type key for "2," which prints in the hundreds column, and then the keys for "9" and "4." Then a tabulating key is selected corresponding to the denomination of the number to be written in the succeeding column, and the operation is repeated.

In the form shown at Figs. 2 and 3, a single rack 71 is used to rotate the pinion 54, and this rack at its lower end is attached directly to a bar 72, which overlies the rear ends of the denomination stop levers 57, so that by depressing any key, the rear end of the lever is lifted and said bar thrust up together with its rack, and thereby the pinion is rotated. To vary the movement of said bar for the different keys, it is formed upon its under side with a graduated series of steps 73, which have an irregular arrangement for reasons heretofore explained, so that the lever contacting with the lowest stop effects the greatest movement of the bar, rack, pinion and denomination stop cylinder, thus bringing into effective position the "millions" stop; while the lever beneath the highest step moves the bar the least, and brings into play the "decimal" stop. When this form of the invention is used, the bar 61 and its appurtenances are used for releasing the carriage.

Other variations may be resorted to within the scope of my invention, and portions of my improvements may be used without others.

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

1. In a typewriting and tabulating mechanism, the combination with a carriage, of a column stop, a spiral series of denomination stops, a pinion connected to said series of denomination stops, a series of racks for engaging said pinion, and a series of denomination keys operatively associated with said racks.

2. In a typewriting and tabulating mechanism, the combination with a carriage of a column stop, a spiral series of denomination stops, a pinion rigid with one of said column stop and denomination stop elements, a series of racks for engaging said pinion, a series of denomination keys, one for each rack, and a stepped stop bar for said keys.

3. In a typewriting and tabulating mechanism, the combination with a carriage of a column stop upon the carriage, a spiral series of denomination stops upon the framework, a pinion connected to said denomination stops, a series of racks for operating said pinion, a series of keys for operating said racks, and a series of key stops.

4. In a typewriting and tabulating mechanism, the combination with a carriage of a column stop upon the carriage, a spiral series of denomination stops upon the framework, a pinion connected to said denomination stops, a series of upright racks normally disconnected from said pinion, a series of key-bearing levers to which said racks are connected at their lower ends, and a series of stops for said levers and racks.

5. In a typewriting and tabulating mechanism, the combination with a carriage of a column stop upon the carriage, a spiral series of denomination stops upon the framework, a pinion connected to said denomination stops, a series of upright racks normally disconnected from said pinion and standing below the same, a series of key-bearing levers to which said racks are connected at their lower ends, and a series of stops for said levers and racks.

6. In a typewriting and tabulating mechanism, the combination with a carriage of a column stop upon the carriage, a spiral series of denomination stops upon the framework, a pinion connected to said denomination stops, a series of upright racks normally disconnected from said pinion and standing below the same, a series of key bearing levers to which said racks are connected at their lower ends, and a series of stops for said levers and racks.

7. In a typewriting and tabulating mechanism, the combination with a carriage of a column stop, a series of denomination stops, means for effecting rotative adjustment of said series of denomination stops to different positions, and means for releasing the carriage at about the termination of the adjustment of said series of denomination stops, said releasing means including a series of stops for determining the extent of adjustment of said denomination stops.

8. In a typewriting and tabulating mechanism, the combination with a power-driven carriage of a column stop, a spiral series of denomination stops, a pinion connected to said series of denomination stops, a series of racks for engaging said pinion, a series of denomination keys operatively associated with said racks, and a carriage releasing mechanism including a universal bar operable by any of said keys.

9. In a typewriting and tabulating mechanism, the combination with a power-driven carriage of a column stop, a spiral series of denomination stops, means, including a series of denomination keys and a series of stops, for effecting rotation of said series of denomination stops, said series of stops being independent of but capable of limited movement by said keys, and a carriage releasing mechanism operable by the movement of said stops.

10. In a typewriting and tabulating mechanism, the combination with a power-driven carriage of a column stop, a spiral series of denomination stops, a pinion rigid with one of said column stop and denomination stop elements, a series of racks for engaging said pinion, a series of denomination keys, one for each rack, a stepped stop bar for said keys, and a carriage releasing device operable by a movement of said stop bar.

11. In a typewriting and tabulating mechanism, the combination with a power-driven carriage of a column stop, a spiral series of denomination stops, a pinion connected to said denomination stops, a series of keys for operating said pinion, means, including a stepped member, for enabling different adjustments of said pinion and denomination stops by said keys, and a carriage-releaser operable by said stepped member.

12. In a typewriting and tabulating mechanism, the combination with a power-driven carriage of a column stop upon the carriage, a spiral series of denomination stops upon the framework, a pinion connected to said denomination stops, a series of racks for operating said pinion, a series of keys for operating said racks, a series of key stops, and a carriage releasing mechanism called into action by the keys upon contact of the latter with said stops.

13. In a typewriting and tabulating mechanism, the combination with a power-driven carriage of a column stop upon the carriage, a spiral series of denomination stops upon the framework, a pinion connected to said denomination stops, a series of upright racks normally disconnected from said pinion, a series of key bearing levers to which said.

racks are connected at their lower ends, a series of stops for said levers and racks, said stops being provided upon a bar which is mounted for a swinging movement, a stop for said bar, and a carriage releaser operable by said bar.

14. In a typewriting and tabulating mechanism, the combination with a power-driven carriage of a column stop upon the carriage, a spiral series of denomination stops upon the framework, a pinion connected to said denomination stops, a series of upright racks normally disconnected from said pinion and standing below the same, a series of key bearing levers of the first order to which said racks are connected at their lower ends, a series of stops for said levers and racks, said stops being provided upon a bar which is mounted for a swinging movement, a stop for said bar, and a carriage releaser operable by said bar, said carriage releaser including a rod pivoted at its lower end upon said bar and at its upper end provided with a shoe for lifting the rack from the escapement mechanism.

15. In a typewriting and tabulating mechanism, the combination with a power-driven carriage of a column stop upon the carriage, a spiral series of denomination stops upon the framework, a pinion connected to said denomination stops, a series of upright racks normally disconnected from said pinion and standing below the same, a series of key bearing levers of the first order to which said racks are connected at their lower ends, a series of stops for said levers and racks, said stops being provided upon a bar which is mounted for a swinging movement, a stop for said bar, and a carriage releaser operable by said bar, said carriage releaser including a rod pivoted at its lower end upon said bar and at its upper end provided with a shoe for lifting the rack from the escapement mechanism, and said bar being mounted upon a rock shaft which extends transversely of the machine, an arm upon said rock shaft, a thrust rod extending upwardly from said arm, a shoe carried upon the upper end of said thrust rod for lifting the rack, and a spring for returning said rock shaft to normal position.

16. In a typewriting and tabulating mechanism, the combination with a power-driven escapement controlled carriage of a column stop, a series of denomination stops, means for effecting rotative adjustment of said series of denomination stops to different positions, means for releasing the carriage at about the termination of the adjustment of said series of denomination stops, said releasing means including a series of determining stops for determining the extent of adjustment of said denomination stops, a stop for said series of determining stops, and a returning spring for said series of determining stops.

Signed at the borough of Manhattan, city of New York, in the county of New York and State of New York, this 15th day of July, A. D. 1903.

BURNHAM C. STICKNEY.

Witnesses:
K. V. Donovan,
E. M. Wells.