A. T. BROWN.

TYPE WRITING MACHINE.

APPLICATION FILED JUNE 3, 1907.

939,587.

Patented Nov. 9, 1909.

4 SHEETS—SHEET 1.

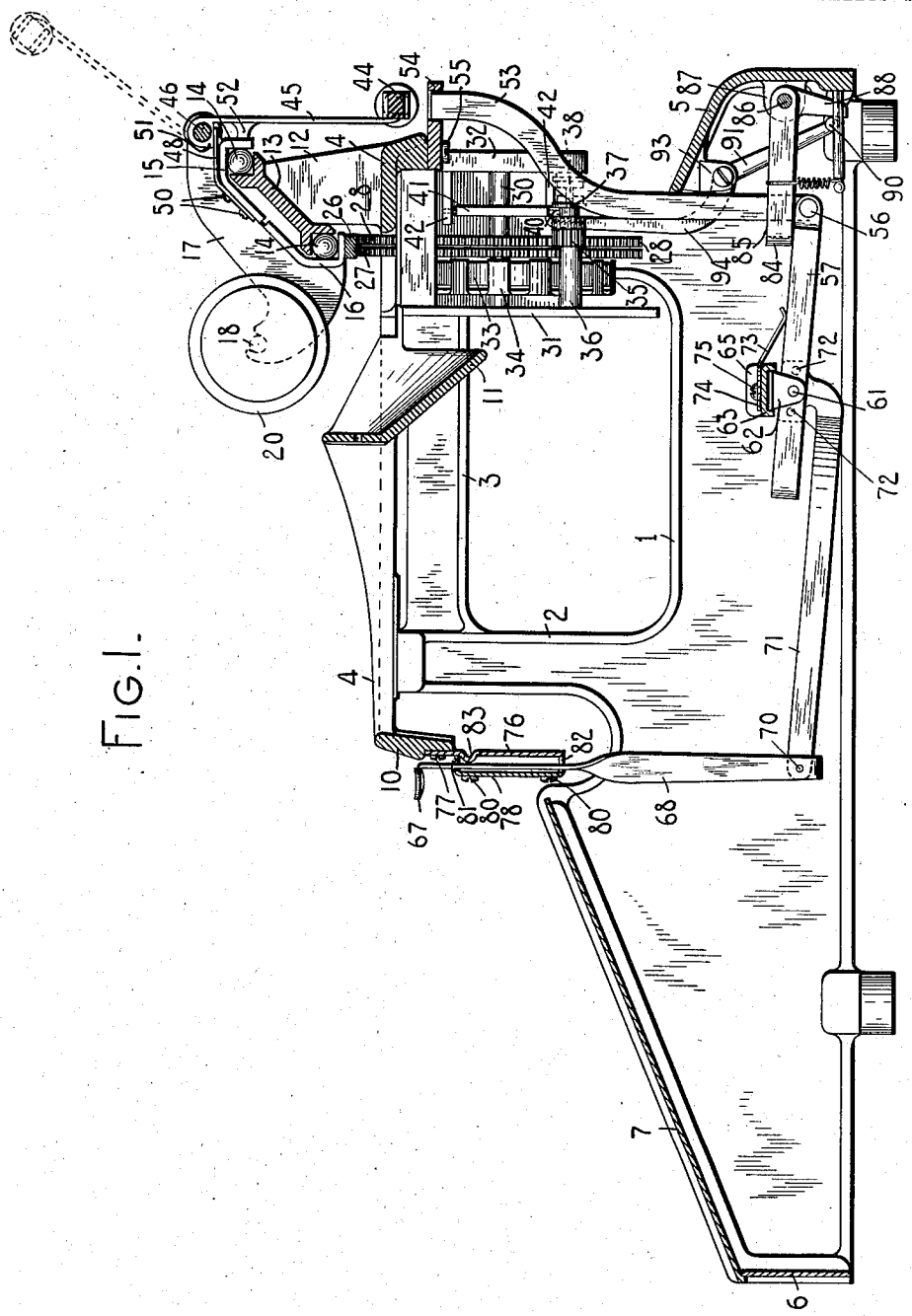

FIG. 1.

WITNESSES:

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INVENTOR

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BY

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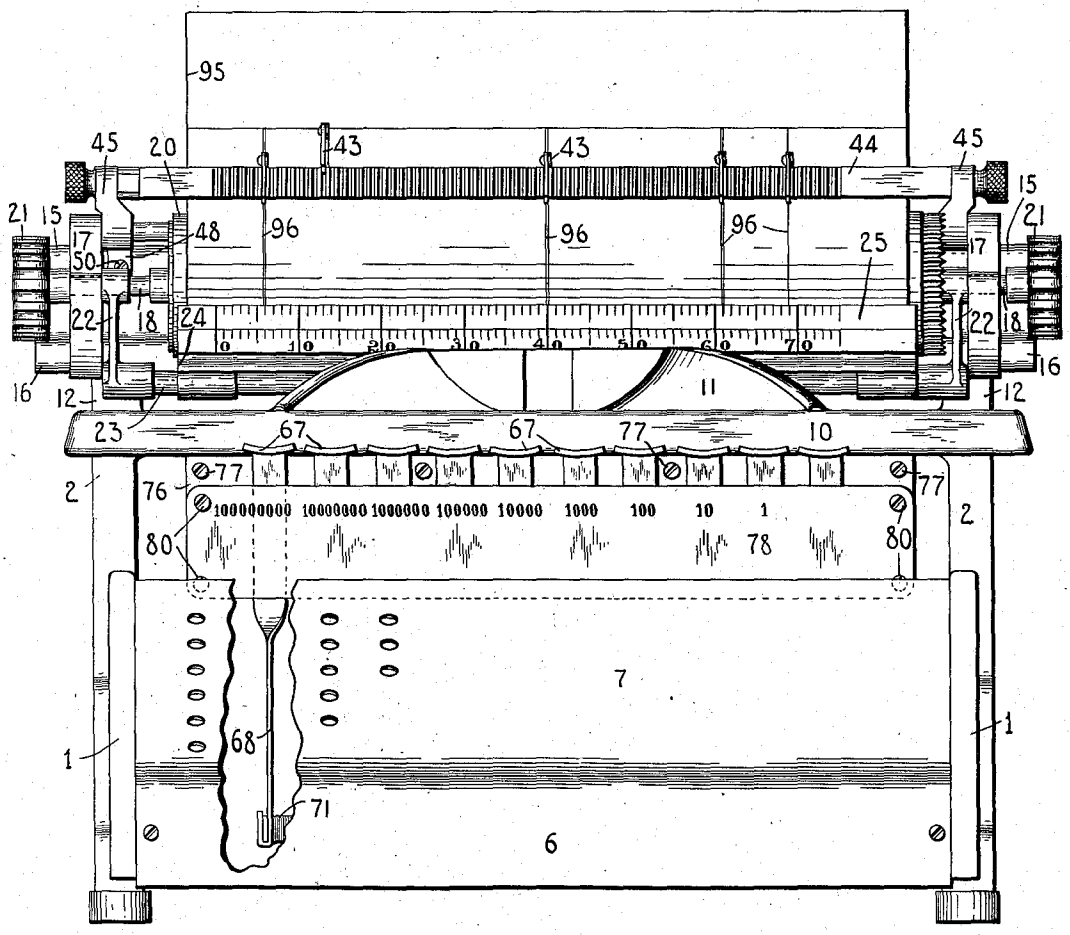
4 SHEETS—SHEET 2.

FIG. 2.



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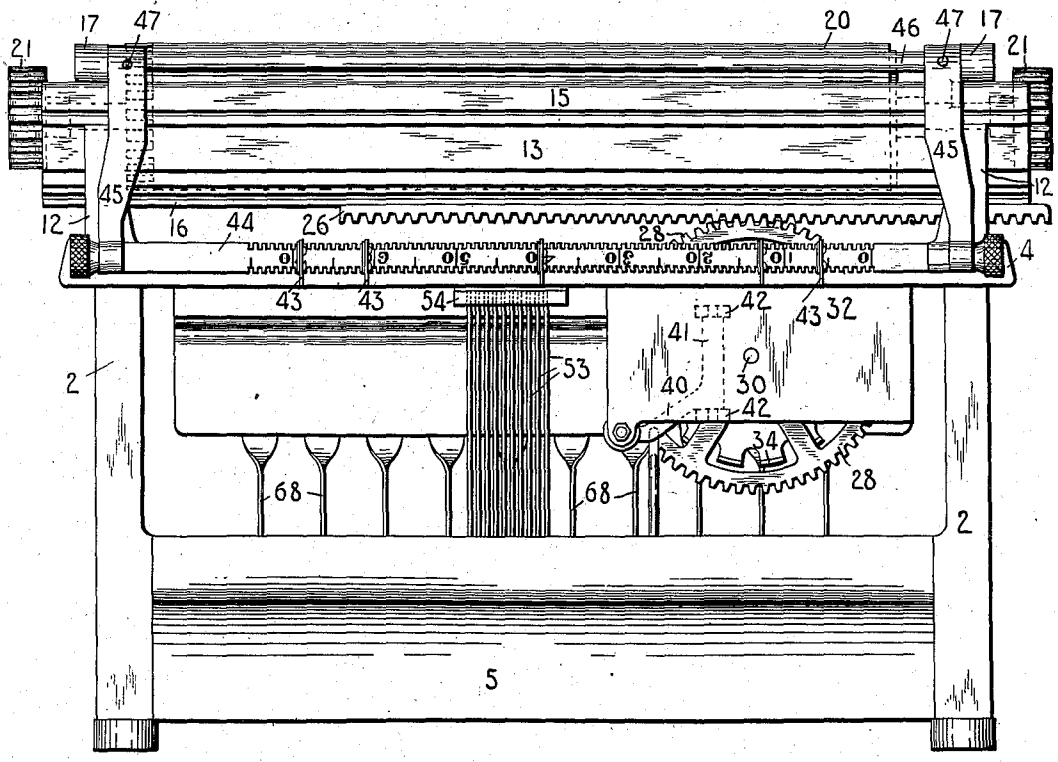
4 SHEETS—SHEET 3.

FIG. 3.



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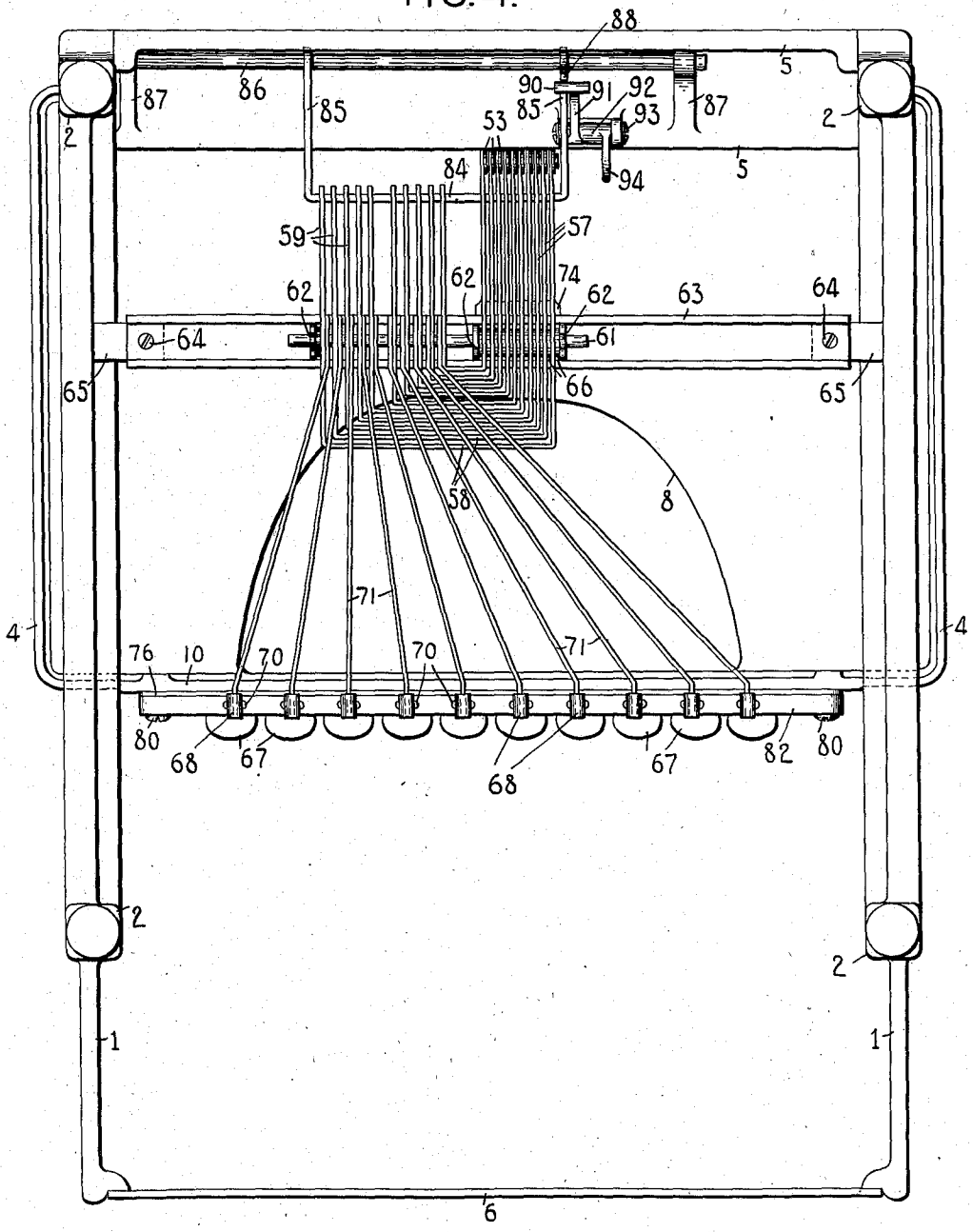
4 SHEETS—SHEET 4.

FIG. 4.



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UNITED STATES PATENT OFFICE.

ALEXANDER T. BROWN, OF SYRACUSE, NEW YORK.

TYPE-WRITING MACHINE.

939,587. Specification of Letters Patent. Patented Nov. 9, 1909.

Application filed June 3, 1907. Serial No. 377,082.

To all whom it may concern:

Be it known that I, ALEXANDER T. BROWN, a citizen of the United States, and resident of Syracuse, in the county of Onondaga and State of New York, have invented certain new and useful Improvements in Type-Writing Machines, of which the following is a specification.

My invention relates to typewriting machines and especially to tabulator mechanism for such machines.

My invention has for its principal object to provide an improved denominational tabulator for typewriting machines.

My invention has for a further object to provide means for facilitating the setting of the column stops.

My invention has for a further object to provide means whereby the column stops may be set by direct reference to the paper in the machine without necessity for the use of any scales.

To these and other objects which will appear hereinafter, 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 I have shown my invention applied to a front-strike typewriting machine, only so much of said machine being shown, however, as is necessary to illustrate my invention.

In said drawings, Figure 1 is a front to rear vertical sectional view of the typewriting machine having my invention embodied therein. Fig. 2 is a front elevation of the same. Fig. 3 is a rear elevation of the same. Fig. 4 is a bottom view of the same.

In all the views parts have been omitted and in some of them parts are shown broken away or in section.

My invention is applicable to typewriting machines generally. The main frame of the machine shown in the drawings comprises side plates 1 having cast integral therewith corner posts 2, the posts on each side of the machine being connected together near their upper ends by an integral bar 3. The side plates are connected together at their tops by a top plate 4 secured to the upper ends of the posts 2 and at the base of the machine the side plates are connected by a back plate 5, a front plate 6 and a plate 7 through openings in which the stems of the printing keys project. The top plate has an opening 8 through which the type bars strike, said opening being closed across the front by a cross bar 10 cast integral with the top plate. At the rear of the opening 8 the top plate is formed into a dust shield 11 to protect the type bar bearings from dust and grit falling upon the front face of the platen. I have not deemed it necessary to illustrate the type action in this case, as, so far as the present invention is concerned, said type action may be of any suitable construction.

Standards 12 rising from the top plate support a stationary carriage rail 13 set at an inclination upward and toward the back of the machine and having in its opposite edges grooves forming ball races for anti-friction balls 14 which coöperate with rails 15 and 16 forming parts of the carriage. Said rails are connected at their ends to end pieces 17 which support the axle or shaft 18 of the roller platen 20. On the ends of said platen axle are mounted the usual finger wheels 21. The precise manner in which the platen is mounted in the carriage is immaterial so far as the present invention is concerned, but it will be seen by reference to Fig. 1 that the shaft 18 rests in notches in the end pieces 17 of the carriage and by reference to Fig. 2 it will be seen that the shaft is journaled in a platen frame and comprises end bars 22 connected together beneath the platen by a longitudinally extending rod 23. This rod supports a paper apron 24 which at its forward edge carries the platen and carriage scale 25. These parts have not been fully shown for the reason that they may be of any suitable construction as far as the present invention is concerned.

The carriage feed devices comprise a feed rack 26 secured to the under side of the lower carriage rail 16 and meshing with two gear wheels 27 and 28 which are mounted on a shaft 30 journaled at its forward and rear ends respectively in frame plates 31 and 32 constituting parts of a frame secured to and depending from the top plate. The gear wheel 27 is connected in any suitable manner with a spring 33 mounted in a spring drum 34 concentric with the shaft 30 and this spring and gear drive the carriage toward the left. The motion of said carriage is controlled by the gear wheel 28 which meshes with a pinion 35 rotatably mounted on a shaft 36 jour-

naled at its ends in the frame plates 31 and 32. The rear face of the pinion 35 is formed with ratchet clutch teeth as shown in Fig. 1, said clutch teeth normally meshing with corresponding teeth on a sleeve 37 slidably mounted on the shaft 36 but impelled to rotate with said shaft by a tooth 38 that plays in a corresponding slot in the sleeve 37. Said sleeve 37 is pressed toward the front of the machine by a spring (not shown). The construction is such that when said sleeve is in its normal position with its clutch teeth in engagement with the clutch teeth on the pinion 35, the carriage will force the shaft 36 to rotate when said carriage moves toward the left, but said carriage may be drawn toward the right without rotating the shaft 36, the ratchet clutch teeth yielding when the motion is in this direction. The escapement wheel may be mounted on the shaft 36 or geared to said shaft and the escapement may be of any suitable construction and may be operated in any suitable manner when the printing keys and the space key of the machine are operated. The construction of the parts is also such that if the sleeve 37 be moved toward the rear of the machine so as to disengage the ratchet clutch, then the carriage is free to move in either direction without turning the shaft 36 or the escapement wheel. In order to thus release the carriage the sleeve 37 is formed as shown in Fig. 1 with a peripheral groove into which projects the end of an arm 40 (Figs. 1 and 2) said arm projecting from or forming part of a vertically disposed rocking member 41 pivoted at its upper and lower ends in brackets 42 projecting toward the front of the machine from the frame plate 32. So far as my invention is concerned, however, the carriage may be fed and the release be effected by any suitable means.

The tabulator mechanism comprises one or more column stops 43 which are mounted on and are adjustable longitudinally of a rack or column stop bar 44 which at its ends is mounted on arms 45 depending from the upper rear part of the carriage, so that the bar 44 hangs at about the level of the top plate. The arms 45 are so mounted on the carriage as to be capable of swinging to the positions shown in dotted lines in Fig. 1, or still further to the positions shown in Fig. 2 so as to bring the stop bar or rack 44 to a more accessible position for the purpose of adjusting the stops and also in order to bring said stop bar to a position where the stops can be adjusted with direct reference to the paper in the machine without the necessity for referring to any scale. This may be brought about by any one of a variety of constructions, but I prefer the construction shown in the drawings. As shown, the arms 45 are mounted on a rock shaft 46 to which said arms are rigidly secured by pins 47 passing through the hubs of the arms and through the shaft. Said shaft 46 passes through the end pieces 17 of the carriage with freedom to rotate therein, and the arms 45, contacting with the inner faces of said end pieces, prevent longitudinal motion of the shaft. Said shaft 46, arms 45 and bar 44 constitute a swinging frame that normally stands in the position shown in Fig. 3 and shown in full lines in Fig. 1. In order to hold the frame in this position a flat spring 48 is secured by screws 50 to the upper carriage rail 15 and said spring presses up against the under side of the hub of one of the arms 45. This hub is formed with a nose 51 so that when the swinging frame is in its normal position the spring pressing against this nose tends to hold it in normal position, but by the time the frame has been swung to the position shown in dotted lines in Fig. 1 the spring either becomes neutral or tends to throw the frame still farther toward the front of the machine.

The motion of the swinging frame under the impulse of the spring 48 is limited by stop lugs 52 formed on the arms 45 contacting with the rear face of the upper carriage rail 15. The rack or stop bar 44 is of the usual construction, that is to say, it is substantially square in cross section and is formed on two opposite sides with a series of cross cuts or slots spaced a letter space distance apart and the column stops 43 are made of U-shape so as to straddle the bar and so as to be inserted in any desired pair of these opposite slots. In Fig. 3 I have shown the rear face of the bar graduated with graduations corresponding to the carriage and platen scale 25, but in some instances these graduations may be omitted. It will be noted that in the normal position of the bar the numerals of the scale are inverted, so that said numerals are in the proper position to be read when the bar is swung to the position shown in dotted lines in Fig. 1.

The coöperating tabulator stops consist in the present instance of the upper ends of a series of upstanding bars 53 having the form shown in Figs. 1 and 3. The upper ends of these bars come up behind the top plate 4 where they are guided in suitable slots formed in a guide plate 54, which plate is horizontally disposed and is secured by screws 55 to the under side of the rear flange of the top plate. The bars 53 are curved toward the front of the machine and then downward so as to pass in front of the rear frame plate 5, bringing the lower ends of said bars inside of the base of the machine. Each of said bars has its lower end pivoted at 56 to the rear end of the right-hand branch 57 of one of a series of yoke-shaped frames; each of which comprises besides the

arm or branch 57 a yoke bar 58 and a left-hand branch or arm 59. These yoke frames are nested as shown in Fig. 4 and they are all pivoted on a rod 61 mounted in ears 62 depending from a cross bar 63 which at its ends is secured by screws 64 to brackets 65 projecting inward from the side plates 1.

In order to space the yoke frames apart the arms 57 thereof have washers 66 strung on the rod 61 between the several arms. One purpose of the yoke frames is to give wide bearings for the arms 57 which are in effect lever arms. Another purpose of these yoke frames is to reverse the order of the keys with relation to the denomination stops. Denominational tabulators as ordinarily constructed heretofore have usually had the key corresponding to the decimal point at the extreme left of the series of keys and the key corresponding to the highest denomination at the extreme right, this being the reverse of the order of the digits and decimal point as actually written on the paper. It is desirable to make the order of the keys the reverse to that just recited so as to bring said keys into the natural order in which the numbers are written. To this end the keys are connected with the left hand branches 59 of the yoke frames, these branches being arranged in the reverse order to the branches 57 to which the stops are connected.

The tabulator keys 67 are arranged in or near the key-board of the machine, being disposed in a transverse row back of and a little above the rear row of printing keys. Said keys 67 have long key stems 68, said stems, as shown in the present instance, being made of sheet metal and the keys consisting of the forwardly bent upper ends of the stems. Each of the key stems 68 is pivoted at 70 to the forward end of a lever arm 71, the rear end of which forms part of or is rigidly secured to one of the branches 59 of the nested yoke frames. As shown in the present instance, the lever arms 71 are secured to the arms 59 by rivets 72. The arms 71 have their forward ends disposed in any convenient way across the machine so as to coöperate properly with the keys, and said lever arms fan inward toward their rear ends, as shown in Fig. 4, so as to connect properly with the arms 59. The lever arms 71 lie beneath the yoke frames as shown in Figs. 1 and 4, the rear end of each of said arms extending upward to the point where it is connected with the arm 59. A space is thus left between the several yoke bars 58 and the several lever arms 71 so that when any key is depressed and its corresponding yoke bar 58 is also depressed there is space enough for the downward motion of said yoke bar without striking the lever arms 71 connected with those keys that have not been operated.

It will be perceived that each key is connected with a lever arm 71 which is rigidly connected with a yoke frame 59, 58, 57 and that the rear end of the arm 57 has a tabulator stop connected therewith. Each of the arms 57 is therefore in effect a rearwardly extending arm of a lever of the first order, the corresponding lever arm 71 being the forwardly extending arm of the same lever. The construction is such that when any key 67 is depressed the corresponding stop bar 53 is elevated vertically into the path of the column stops 43. It will also be perceived that these levers of the first order are crossed, each one crossing all of the others so that the rearwardly extending arms of said levers which are connected with the stops are arranged in an order the reverse of that of the forwardly extending arms which are connected with the keys.

The tabulator stops and their connections are restored to and retained in normal position by a series of leaf springs 73 which press downward on the upper edges of the arms 57. As shown in the present instance these springs are formed for convenience as fingers projecting from a plate 74 of spring metal secured to the upper surface of the cross bar 63 by screws 75.

The key stems 68 are guided by a device of novel construction which comprises a plate 76 secured by screws 77 to the cross bar 10 of the top plate. Another plate 78 is secured by screws 80 to the front face of the plate 76 and said plate 78 has its upper and lower edges bent toward the rear of the machine to form upper and lower flanges 81 and 82 which contact with the plate 76 and space the two plates apart. The key stems come up between the plates 78 and 76 and are guided in suitable notches cut in the flanges 81 and 82, as shown in Fig. 1. The edges of these notches prevent motion of the key stems toward the right or left and the bottoms of the notches prevent motion of the key stems toward the front of the machine. Motion of said key stems toward the rear of the machine is prevented by a rib 83 struck up from the plate 76 and extending across the entire series of keys. It will be obvious that the flange 82 may be formed either by bending the lower edge of the plate 78 toward the rear or by bending the lower edge of the plate 76 toward the front. The guiding devices just described are preferably arranged to coöperate with the key stems having their flat sides toward the front and rear of the machine, but below said guiding devices said key stems are twisted through about a quarter turn so as to connect properly with the lever arms 71. It will be seen that the denomination stops and their keys and connections are all built into the machine but all of these parts are very readily detachable from the machine. The keys and

their guides may be removed by simply removing the screws 77. The levers connecting the key stems with the bars 53 may be removed by removing the screws 65 which secure the bar 63 in place. With these two parts freed from the framework then this entire part of the mechanism may be dropped out of the machine from below and the guide plate 54 may be removed, if desired, by removing the screws 55. There will thus remain in the machine none of the tabulator mechanism except the swinging rack which is not ordinarily removed from the machine. When the tabulator mechanism is removed from the machine a plain plate of sheet metal may be substituted for the plate 76, for the sake of appearance, if desired. The denominational values of the several keys are indicated by numerals or other characters printed or otherwise impressed on the front face of the plate 78 as indicated in Fig. 2 where it will be seen that these keys are arranged in their natural order instead of in the reverse order as has been usual heretofore.

In order to release the carriage when any tabulator key is depressed, a universal bar 84 is provided, said universal bar lying across all of the arms 57 and 59 near the rear ends thereof. I prefer to arrange the universal bar across both the arms 57 and 59 so that said universal bar will be properly operated in case there should be any yielding in the yoke frames when a key is depressed as there is more resistance offered to the operation of the universal bar than there is to the operation of the tabulator stop itself. Said universal bar is carried by arms 85 mounted on a shaft 86 that is mounted in ears or lugs 87 projecting from the end piece 5 of the main frame. One of the arms 85 has projecting downwardly therefrom a lever arm 88 which is adapted to coöperate with a cross piece or wrist pin 90 projecting from a lever arm 91 which in turn projects from a hub or short rock shaft 92 pivoted in ears 93 projecting from the frame piece 5. An arm 94 projecting upward from the rock shaft or hub 92 has its upper end standing just in front of the arm 40 of the carriage release device. The construction is such that when any tabulator key is operated the universal bar 84 is raised and the arm 94 is moved toward the rear of the machine, carrying with it the arm 40 and the sleeve 37 and moving the clutch teeth on said sleeve out of engagement with the clutch teeth on the pinion 35, thus releasing the carriage; and when said key is released the sleeve 37 is pressed toward the front of the machine by its spring, bringing the clutch teeth again into engagement and thus restoring the carriage to the control of the escapement. It will, of course, be understood that by the same depression of the key one of the bars 53 is moved upward into the path of the column stops to arrest the carriage.

The construction of the parts is such as to make it convenient to adjust the column stops 43 by direct reference to the paper itself. The manner in which this may be done is illustrated in Fig. 2 where a sheet of paper 95 is shown in place in the machine and having lines 96 ruled thereon defining columns. The rack 44 is swung forward toward the front of the machine and the paper thrust beneath and behind it between the arms 45. The column stops are then set on the rack or bar 44 to correspond with the lines 96 as shown in Fig. 2. As here shown one of these lines happens to come at the sixth letter space position on the scale 25, another at the fortieth, another at the sixty-first and another at the sixty-ninth letter space position. Another column stop is shown in the act of being inserted at the thirteenth letter space position, although there is no ruled line on the paper at this position. It will, of course, be understood that the stops may be set by reference directly to the paper whether there be ruled lines or not.

In Fig. 3 the column stops are shown swung back to their operative position and set as shown in Fig. 2. In this figure it will be seen that the column stop corresponding to letter space position forty has just been arrested by the denomination stop corresponding to the decimal point, which brings letter-space position forty to the printing point, as shown in Fig. 2. The arrangement is such that when any column stop is set as shown in Fig. 2 at a certain letter space position the tabulator key and denomination stop corresponding to the decimal point will bring that letter space position of the paper to the printing point. It will be obvious that by moving the denomination stops one way or the other any other one of said stops might be arranged to bring the point at which the column stop is set to the printing point.

In case the tabulator is used for writing amounts in United States money, the entire series of denomination stops might be moved two letter spaces toward the right-hand of the operator, or toward the left as seen in Fig. 3, with the result that when any tabulator key was depressed and the sum in United States money was written, the units of cents would come to the point on the paper at which the column stop had been set. As far as I am aware it is broadly new to provide any means for bringing the paper in the machine into such relation with the tabulator stops as to enable the operator to set said stops by direct reference to the paper and I wish certain of my claims directed to this feature to be understood as

covering any form of tabulating device in which the stops may be moved from their normal position to a position where they may be set by reference to the paper itself or in which by any other means the paper in the machine and said column stops may be brought into such relation as to enable said column stops to be set by direct reference to the paper. It is, of course, conceivable that this might be brought about by means differing widely from that here shown, and I regard all such means as being within the scope of my invention.

It will be understood, of course, that the swinging rack is useful in itself aside from the setting of the stops directly by the paper. The rack bar 44 as shown in the present case is provided with a scale corresponding to the platen scale 25 and the stops may be set by reference to this scale if preferred. Even when the stops are set in this manner the swinging rack feature makes the setting of the stops a much more convenient operation than it has usually been heretofore.

I contemplate a construction in which arms similar to the arms 45 support a bar on which are mounted the margin and line lock stops. This construction is claimed specifically in another application of mine, filed June 10th, 1907, Serial No. 378,271, but some of the claims of the present case are intended to be broad enough to cover said construction. In other words, some of the claims in the present case are intended to be broad enough to cover not only tabulator stop mechanism, but also other forms of carriage stop mechanism.

It will be understood that my invention comprises features which are of use independently or in other relations than those here shown, and also that various changes may be made in the details of construction and arrangement without departing from my invention.

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

1. In a typewriting machine, the combination of a carriage, an adjustable carriage stop, a carriage stop bar on which said carriage stop is adjustably mounted, said stop bar being normally in relatively inaccessible position, and supporting means for said bar arranged to allow the bar to be moved to an abnormal and more accessible position to afford access to said stop.

2. In a typewriting machine, the combination of a platen, a carriage stop bar mounted behind said platen, a stop adjustably mounted on said bar, supporting means for said bar arranged to allow the bar to be elevated to afford access to said stops from the front of the machine.

3. In a typewriting machine, the combination of a carriage, a carriage stop, and a bar mounted on said carriage and carrying said stop, said bar being mounted to be swung toward the front of the machine when it is desired to have access to said stop.

4. In a typewriting machine, the combination of a carriage, a carriage stop, a stop carrier on which said stop is adjustably mounted, a coöperating stop with which said carriage stop coöperates to arrest the carriage when said stop carrier is in normal position, said stop carrier being movable to a more accessible position when it is desired to adjust said carriage stop.

5. In a typewriting machine, the combination of a carriage, a stop bar mounted on said carriage by pivoted arms and normally hanging down behind said carriage but capable of being swung up to a more accessible position, and one or more stops adjustably mounted on said bar.

6. In a typewriting machine, the combination of a carriage, a carriage stop bar mounted on pivoted arms and adapted to be swung from its normal position, and a detent for holding said stop bar in its normal position.

7. In a typewriting machine, the combination of a carriage, a carriage stop bar mounted on pivoted arms and adapted to be swung away from its normal position, spring means for holding said stop bar in its normal position, and means for limiting the motion of said stop bar under the impulse of said spring means.

8. In a typewriting machine, the combination of a paper carriage, a bar movably mounted on the rear part of said carriage, one or more carriage stops mounted on and adjustable along said bar, one or more coöperating stops, and means whereby said bar may be moved toward the front of the machine to a more accessible position.

9. In a typewriting machine, the combination of a paper carriage, a frame pivotally mounted on said carriage and comprising a stop bar, one or more carriage stops adjustably mounted on said bar, and one or more coöperating stops, the construction and arrangement being such that said frame may be swung on its pivot to move said stop bar from its normal position to a more accessible position when it is desired to adjust said stop or stops.

10. In a typewriting machine, the combination of a carriage, one or more adjustable stops for arresting said carriage, and means for bringing said stops and the paper in the machine into such relation that said stop or stops may be adjusted by direct reference to the paper.

11. In a typewriting machine, the combination of a paper carriage, means on said carriage for supporting the paper to be written on, one or more carriage stops adjustably mounted on said carriage, and

means for bringing the paper on said carriage and said stop or stops into such relation that said stop or stops may be adjusted by direct reference to said paper.

12. In a typewriting machine, the combination of a paper carriage, a stop bar mounted by pivoted arms on said paper carriage, one or more carriage stops adjustably mounted on said bar, and one or more coöperating stops, the construction and arrangement being such that said bar may be swung to a position where said stop or stops may be adjusted by direct reference to the paper carried by said carriage.

13. In a typewriting machine, the combination of a paper carriage, a frame mounted on said carriage, one or more carriage stops adjustably mounted on said frame, one or more coöperating stops, and means whereby said frame may be moved on said carriage to a position where said carriage stop or stops may be adjusted by direct reference to the paper carried by said carriage.

14. In a typewriting machine and in tabulating mechanism, the combination of a series of tabulator stops, a series of tabulator keys, and connections between said stops and keys comprising a nested series of pivoted yokes each having a lever arm extending toward the rear of the machine and connected with a stop and also a lever arm extending toward the front of the machine and connected with a key.

15. In a typewriting machine and in tabulating mechanism, the combination of a series of tabulator stops, a series of tabulator keys, and connections between said stops and keys comprising a nested series of pivoted yokes each having a lever arm extending from one branch of said yoke toward the rear of the machine and connected with a stop and also a lever arm extending from the other branch of the yoke toward the front of the machine and connected with a key, whereby the order of the keys is the reverse of the order of the stops, the left-hand key being connected with the right-hand stop.

16. In a typewriting machine and in tabulating mechanism, the combination of a series of tabulator stops, a series of keys, and connections between said keys and stops comprising a series of levers of the first order, said levers being crossed so that the arms thereof that are connected with the stops are in an order the reverse of that of the arms connected with the keys.

17. In a typewriting machine and in tabulating mechanism, the combination of a series of tabulator keys in the keyboard of the machine, a series of horizontally disposed levers of the first order arranged in the base of the machine and having their forwardly extending arms connected with said keys, and a series of upstanding bars connected to the rearwardly extending arms of said levers, whereby said bars are moved longitudinally upward when a key is depressed, the upper ends of said bars constituting tabulator stops.

18. In a typewriting machine and in tabulating mechanism, the combination of a series of tabulator keys in the keyboard of the machine, a series of horizontally disposed levers of the first order arranged in the base of the machine and having their forwardly extending arms connected with said keys, and a series of upstanding bars connected to the rearwardly extending arms of said levers, whereby said bars are moved longitudinally upward when a key is depressed, the upper ends of said bars constituting tabulator stops, and said levers being crossed to reverse the order of the keys.

19. In a typewriting machine and in tabulating mechanism, the combination with a carriage and carriage feed devices, of a series of tabulator stops, a series of keys for said stops, connections between said keys and stops comprising a nested series of yoke shaped frames, a universal bar lying across both arms of each of said frames, and a carriage release device operated by said universal bar.

20. In a typewriting machine, the combination of a system of keys having stems, a guide for said stems comprising two plates spaced apart and having said key stems lying between them, one of said plates having one of its edges bent to form a flange and said flange having notches in which said key stems lie, and tabulator devices operated by said keys.

21. In a typewriting machine, the combination of a system of keys having stems and a guide for said stems comprising two plates spaced apart and having said key stems lying between them, one of said plates having one of its edges bent to form a flange and said flange having notches in which said key stems lie, and one of said plates having a rib to contact with one side of each of said key stems, and tabulator devices operated by said keys.

22. In a typewriting machine and in tabulator mechanism, the combination of a series of more than two denomination stops, keys for operating said stops, and connections between said keys and stops comprising levers crossed in such fashion as to bring the ends of said levers to which the stops are connected into an order the reverse of that in which the keys are arranged.

Signed at Syracuse, in the county of Onondaga and State of New York this 29 day of May A. D. 1907.

ALEXANDER T. BROWN.

Witnesses:
CHARLES E. TOMLINSON,
JOHN A. PROSS.