

F. A. YOUNG.
TYPE WRITING MACHINE.
APPLICATION FILED JUNE 28, 1905.

990,940.

Patented May 2, 1911.

3 SHEETS-SHEET 1.

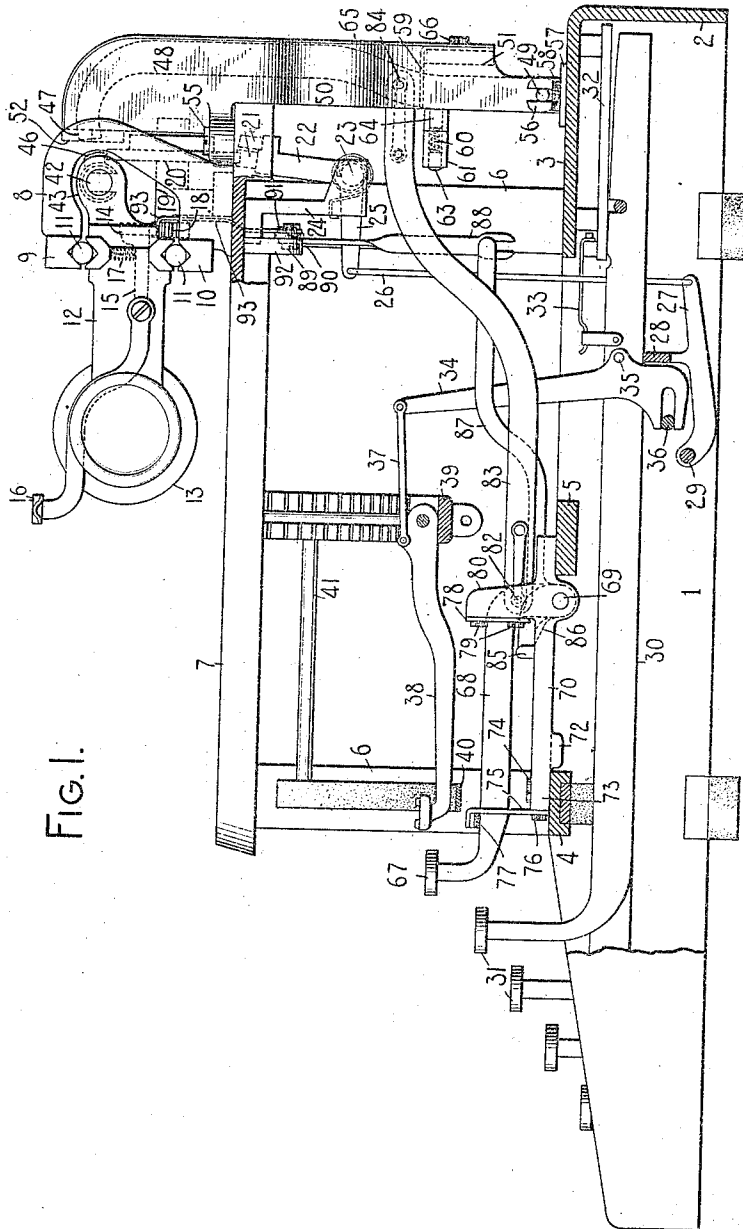


FIG. 1.

WITNESSES:

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R. H. Hother

INVENTOR

Frank A. Young

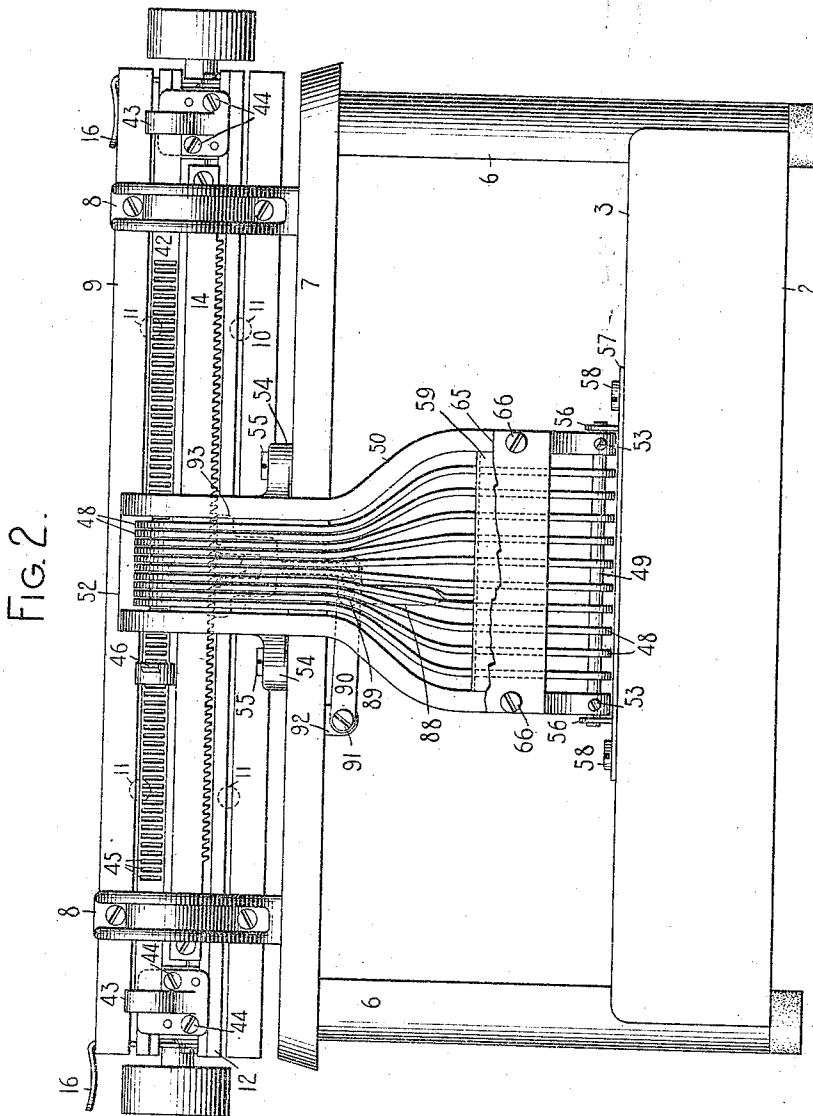
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3 SHEETS-SHEET 2.



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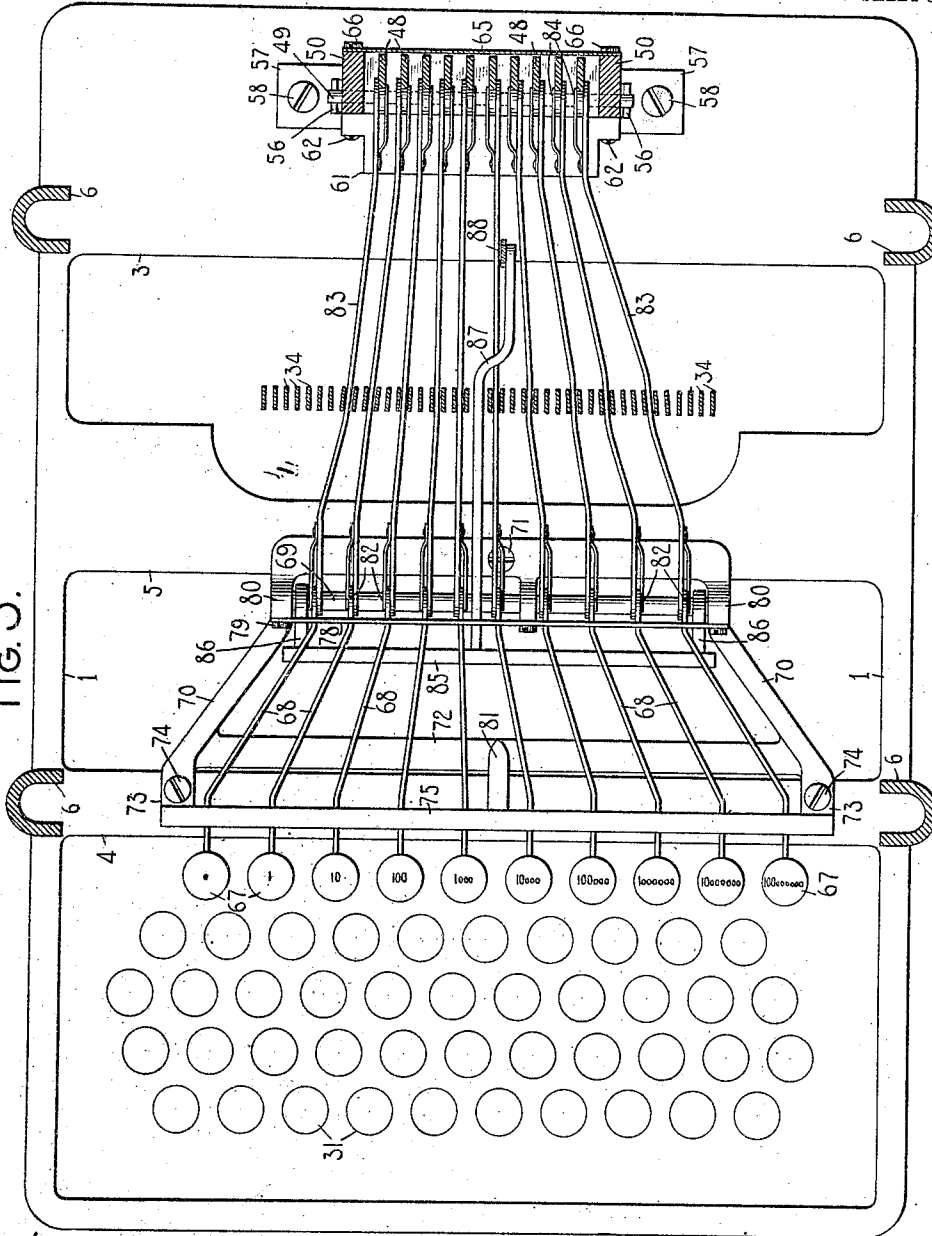
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3 SHEETS—SHEET 3.

FIG. 3.



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UNITED STATES PATENT OFFICE.

FRANK A. YOUNG, OF SYRACUSE, NEW YORK, ASSIGNOR TO THE MONARCH TYPE-WRITER COMPANY, OF SYRACUSE, NEW YORK, A CORPORATION OF NEW YORK.

TYPE-WRITING MACHINE.

990,940.

Specification of Letters Patent.

Patented May 2, 1911.

Application filed June 28, 1905. Serial No. 267,347.

To all whom it may concern:

Be it known that I, FRANK A. YOUNG, 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 more especially to tabulating mechanism for such machines.

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

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

In the accompanying drawings, Figure 1 is a right-hand side elevation of a typewriting machine having my invention embodied therein, different parts being shown in section on different planes as has been found convenient. Fig. 2 is a rear elevation of the typewriting machine. Fig. 3 is a top plan view of the tabulator key action in position on the machine, the upper part of the typewriter mechanism being removed.

I have shown my invention applied to a Monarch front-strike typewriter, but it will be obvious that with slight modification the mechanism is applicable to other styles of typewriting machines.

The main frame of the machine shown in the drawings, comprises a base portion having side plates 1, which are connected together at their rear ends by a back plate 2 and a shelf 3. Said side plates 1 are also connected together just back of the keyboard by a transverse frame bar 4, and intermediate said frame bar and the shelf 3, said side plates are also connected by a transverse frame bar 5. Posts 6 rising from the base portion of the frame support a top plate 7. Two posts or brackets 8, rising from said top plate, support an upper rail 9 grooved on its lower face and a lower rail 10 grooved on its upper face, the grooves in said rails constituting race ways for anti-friction balls or rollers 11 which run in co-operating race-ways in the rails of a carriage 12 which supports a platen 13. Said carriage is drawn across the machine by a

spring drum (not shown) and its motion is controlled by a feed mechanism comprising a feed rack bar 14, which is mounted on arms 15 which are pivoted at their forward ends in the carriage by means of short rock shafts, on the outer ends of which are mounted release keys 16. The arms 15 are engaged by compression springs 17 which tend to press the rack bar 14 downward into engagement with a feed pinion 18 which is mounted on the forward end of a shaft that is journaled in a bracket or housing 19. Said shaft at its rear end carries an escapement wheel 20 that is controlled by feed dogs 21 mounted on an arm 22 that is carried by a rock shaft 23, that is pivoted at its ends in a bracket 24 depending from the top plate 7. The arm 22 and rock shaft 23 constitute parts of a dog rocker which also comprises a forwardly extending arm 25 that is connected by a link 26 with an arm 27 connected with a universal bar 28. Said universal bar and arm form parts of a rock frame which also includes a rock shaft 29 pivoted at its ends in the side plates 1. The universal bar 28 lies beneath a series of character key levers 30 having character keys 31 mounted on their forward ends and pivoted at their rear ends on a pivot plate 32 mounted beneath the shelf 3. The key levers 30 are provided with returning springs 33. Sub-levers 34 are pivoted to the key levers at 35 and their slotted lower ends engage an abutment or frame rod 36. The upper ends of the sub-levers are connected by links 37 with front-strike type bars 38 which are pivotally mounted in any suitable manner in a segment 39. The free ends of the type bars 38 normally rest against a segmental cushion or pad 40 which is supported by the segment 39 by means of rods 41. The construction is such that when any character key 31 is depressed the corresponding sub-lever 34 is moved toward the rear of the machine and the type bar 38 is moved about its pivot to cause one of the types on the end thereof to strike against the front face of the platen 13.

The mechanism above referred to is old and well-known and so far as my invention is concerned it may be of any suitable construction.

My tabulator mechanism includes a tabulator bar 42 mounted on brackets 43 projecting toward the rear of the carriage 12 to

which they are secured by screws 44. The tabulator bar has the usual slots 45 formed in its front and rear faces a letter space distance apart. In order not to interfere with this tabulator bar and the stops mounted thereon, the brackets 8 which support the carriage rails are arched toward the rear of the machine in the manner shown in Fig. 1. One or more column stops 46 are adapted to be mounted on the tabulator bar 45. These column stops are, or may be, of ordinary construction, that is to say, they are of inverted U-shape and are formed with web portions adapted to enter the slots 45. Any of said stops may be placed in any of the said slots so that said stops are adjustable lengthwise of the tabulator bar to arrest the carriage at any desired letter space position.

The denomination stops consist of the upper ends 47 of a series of levers 48 which are pivoted at their lower ends on a stationary rod 49 just above the shelf 3. The levers 48 are levers of the third order. The levers 48 are mounted in a frame that is detachably secured to the main frame of the typewriter. Said frame comprises two upright side pieces 50 which are connected together at their lower ends by a cross-bar 51 and at their upper ends by a plate 52 secured, as by screws, to the front edges of the uprights 50 just to the rear of the path of the column stops 46. Each of the levers 48 is curved at its upper end toward the front of the machine and the forward ends of said levers play in and are guided by slots in the plate 52, said slots being spaced a letter space distance apart. Said upright frame pieces 50 are also connected together at their lower ends by the rod 49 which passes through said frame pieces and is secured in position by set screws 53, threaded through said uprights and engaging said rod. The uprights 50 are each formed with a bracket 54 projecting over the top plate 7 to which said brackets are secured by screws 55. In order to connect the lower ends of said uprights with the shelf 3, the projecting ends of the rod 49 lie in vertical slots in ears 56 projecting upward from a base plate 57 which lies on the shelf 3 and is secured thereto by screws 58. This form of connection with the shelf 3 is adapted only to prevent motion of the frame toward the front or the back of the machine, the frame being held rigidly in other respects by the screws 55 which clamp it to the top plate 7. This mode of connecting such a framework with the main framework of the machine has advantages over any other with which I am acquainted, in that it puts no strain on any part of the framework and at the same time requires no nice adjustment of parts. The screws 55 are spaced wide apart and prevent any lateral motion of the framework 50, and the rod 49 lying

in the slots in the ears 56 prevents motion in any other direction.

The levers 48 are guided near their lower ends by slots in a comb plate 59 which is secured to the cross-bar 51 and which projects toward the front of the machine, as shown in Fig. 1. Each of said levers 48 is provided with a returning spring 60 (Fig. 1). These returning springs are coiled compression springs seated in holes in a frame piece 61 which is secured to the forward faces of the upright frame pieces 50 by screws 62 (Fig. 3). Each of said springs presses at its forward end against a screw 63 threaded into the forward end of the hole, and the tension of said spring may be regulated by adjusting said screw. The rear end of each spring presses against a pin 64, the rear end of which engages the lever 48. If desired, a casing for the rear side of the tabulator stop mechanism may be provided, consisting of a plate 65 secured to the rear faces of the uprights 50 by screws 66. The upper ends of the levers 48 are spaced a letter space distance apart, but for convenience in operating said levers I prefer to spread their lower ends to a wider distance, as shown in Figs. 2 and 3.

The denominational stops are operated by a series of denominational tabulator keys 67 arranged in a tier or bank in the keyboard of the machine back of the character keys 31. Said keys 67 are mounted on the forward ends of a series of tabulator key levers 68 which are pivoted at their rear ends on a fixed rod 69 which is mounted in a stationary detachable frame 70. The frame 70 is four sided, having a rear transverse bar mounted on the cross-bar 5 of the main frame to which it is secured by a screw 71. Said frame has a forward transverse bar 72 lying just back of the bar 4 of the main frame, and said transverse frame bars are connected together by side bars as shown. Two ears or brackets 73; each, as shown in the present instance, being somewhat in the nature of an extension of one of the side bars of the frame, lie on top of the transverse bar 4 of the main frame, to which bar said ears are secured by screws 74. The forward ends of the key levers 68 are guided by a slotted plate 75 which is secured to the front of the ears 73 by screws 76. The upper edge of the plate 75 is bent over and supports a pad 77 for arresting the keys in normal position. The keys are guided near their rear ends by slots in a comb plate 78 which is secured by screws 79 to the forward faces of brackets 80 rising from the side bars of the frame 70. The comb plate 75 is supported near its middle by a bracket 81 projecting from the cross-bar 72.

The pivot rod 69 is mounted in the lower part of the frame 70 as shown in Fig. 1. In the present instance said bar is below the

level of the upper surfaces of the frame bars 4 and 5. Each of the key levers 68 is of the curved or angular form shown in Fig. 1; that is to say, each of said levers extends upward from the rod 69, thence forward through the comb plate 78. The construction is such that when one of the keys 67 is depressed, that portion of the lever 68 that stands above the rod 69 moves toward the front of the machine. Each of said levers has pivoted thereto at 82 at this forwardly moving portion thereof, a rearwardly extending link 83, the rear end of which is pivoted at 84 to one of the levers 48. The pivots 84 are some distance above the pivot rod 49 and in order to bring the links 83 to the proper elevation, said links are curved upwardly and rearwardly in the manner shown in Fig. 1. When one of the keys 67 is depressed, the link 83 is drawn toward the front of the machine and the corresponding lever 48 is rocked toward the front of the machine about its pivot 49, moving the stop end 47 thereof into the path of the column stop 46. When the key is released, the parts are restored to normal position by the spring 60, the motion of the parts being arrested by the key lever 68 coming in contact with the pad 77.

It will be noted that for the key action of my tabulating device I utilize the space above the character key levers and below the type bars. The links 83 extending toward the back of the machine pass between the upstanding sub-levers 34 in the manner shown in Fig. 3. As the tier of keys 67 is necessarily much wider than the back of denomination stops 47, the key levers 68 back of the comb plate 75 are bent toward the middle of the machine, thus fanning in, so that the pivots of said levers are closer together than the free ends thereof. The links 83 also converge, being closer together where they are connected with the levers 48 than where they are connected with the key levers 68; and as is best pointed out above, the levers 48 also converge toward their upper ends. This disparity in the respective widths of the series of stops and the series of keys that control them is thus distributed between the stop levers 48, the actuating links 83 and the key levers 68. Each of the links 83 where it passes between two of the sub-levers 34 may be bent as shown in Fig. 3, so that that particular part of the link does not depart so much from a straight fore and aft line as to interfere with the operation of said sub-levers.

In order to release the carriage when any tabulator key is depressed a universal bar 85 is provided lying beneath the series of key levers 68. Said universal bar is carried at its ends by arms 86 which are pivoted on the pivot rod 69. An arm 87 projects toward the rear of the machine from the mid-

dle of the universal bar 85 and the rear end of said arm 87 has a pin that projects into the slot in the lower end of a link 88, the upper end of which is pivoted at 89 to a lever 90, one end of which is pivoted at 91 to a bracket 92 depending from the top plate 7. The free end of said lever 90 has pivoted thereto the stem of a rack lifter 93 that projects through a suitable opening in the top plate 7. The upper end of said rack lifter is forked to embrace the reduced forward end of the housing 19 of the escapement wheel shaft. Each of the forks of the rack lifter 93 is bent toward the front of the machine and lies beneath the feed rack 14. The construction is such that when the universal bar 85 is depressed, by any of the key levers 68, the feed rack is lifted off of the pinion 18 and the carriage is then released from its escapement mechanism. When the tabulator key is released the arm 87 and the rack lifter drop by gravity to their normal position in which the arm 87 rests on the rear cross-bar of the frame 70. A certain amount of lost motion may be provided between the universal bar 85 and the key levers 68.

It will be seen from the foregoing that the denominational tabulator mechanism is adapted to be inserted into the typewriter proper and removed therefrom as a whole at will, particularly on account of the arrangement of the detachable bracket 70 and the tabulator key levers above the character key levers, and also on account of the arrangement of the connections between said tabulator key levers and the detachable brackets or supports containing the denominational stop levers.

It will be understood of course that not only may the tabulator mechanism as a whole be inserted in previously made machines in the hands of customers but it may, if desired, be incorporated in the machine in the first instance at the time of its building.

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

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

1. In a typewriting machine and tabulating mechanism, the combination with front strike type bars, printing key levers and upstanding parts operated by said key levers and arranged to operate said type bars, of a carriage; a column stop mounted on said carriage; a series of upstanding levers pivoted at their lower ends and having at their upper ends denominational stops standing back of the carriage and adapted to cooperate with said column stop; pull links connected to said levers intermediate their ends and extending toward the front of the machine; a series of angled key le-

vers having keys in the keyboard of the machine and connected with said pull links; and a detachable frame mounted above said printing key levers and having said angled key levers mounted therein, said links passing between said upstanding parts.

2. In a typewriting machine and tabulating mechanism, the combination of a main frame comprising a base portion and an upper portion; a carriage supported by said upper portion; a tabulator stop mounted on said carriage; a tabulator stop mechanism mounted on the main frame and comprising a detachable frame secured to said upper portion of the main frame and having pin and slot connection with said base portion of the main frame; and means for operating said tabulator stop mechanism.

3. In a typewriting machine and tabulating mechanism, the combination of a main frame comprising a base portion and an upper portion; a carriage; tabulator stop mechanism comprising a frame detachably secured to said upper portion of the main frame, and a connection between said detachable frame and said lower portion of the main frame, said connection being loose in an up and down direction but adapted to prevent motion of said detachable frame in a front and back direction.

4. In a typewriting machine and tabulating mechanism, the combination of a main frame comprising an upper portion or top plate and a base portion having a horizontal shelf extending back of said top plate; a carriage; a column stop mounted on said carriage; and a tabulator stop mechanism for said carriage comprising a frame extending up behind said top plate and connected at its lower end to the top of said shelf, levers mounted in said detachable frame and having at their upper ends denomination stops adapted to cooperate with said column stop; tabulator keys in the keyboard of the machine, and means connected with said levers above said shelf whereby said tabulator keys operate said levers.

5. In a typewriting machine, the combination with a main frame, a carriage, printing instrumentalities and character key levers mounted in said main frame, of a denominational tabulating mechanism comprising a detachable frame mounted on said main frame above said character key levers; a series of denominational key levers mounted in said detachable frame; a series of denomination stops; a frame in which said stops are mounted, said frame being detachably mounted on said main frame; and connections between said denominational key levers and said stops.

6. In a typewriting machine and tabulating mechanism, the combination of a series of type bars arranged to strike upwardly and rearwardly, a series of upstanding levers connected to said type bars for actuating the same, a series of horizontally arranged key levers connected to said upstanding levers, a paper carriage provided with a column stop, a series of denominational tabulator stop levers, a series of key levers arranged above the type bar actuating key levers, a series of connections between said series of tabulator key levers and said series of tabulator stop levers, said series of connections being constructed and arranged to pass between the pairs of said upstanding type bar actuating levers.

7. In a typewriting machine and tabulating mechanism, the combination of a series of type bars, means for actuating the same comprising a series of character key levers arranged in the base of the machine, a series of upstanding denominational tabulator stop levers, a detachable frame mounted above the character key levers, a series of key levers mounted in said detachable frame, and a series of connecting rods extending from said key levers to said series of denominational stop levers, the construction and arrangement being such that the denominational tabulator mechanism, comprising the upstanding denominational stop levers, the connecting rods and the key levers therefor, may be inserted into and removed from the machine.

8. In a typewriting machine, the combination of a type action comprising a series of character key levers and type bars operated by said key levers, a frame detachably mounted in the main frame of the typewriter above said character key levers, a series of angular tabulator key levers mounted in said detachable frame and having horizontal arms with depressible finger pieces arranged in a row in the keyboard of the machine and having also vertical arms, longitudinally movable connecting rods operated by the vertical arms of said angular key levers and extending therefrom toward the rear of the machine above the character key levers and between parts of the type action, and denominational tabulator stops operated by said connecting rods.

Signed at Syracuse, in the county of Onondaga and State of New York this 23d day of June A. D. 1905.

FRANK A. YOUNG.

Witnesses:

WM. SEARS,
S. W. CRANDALL.