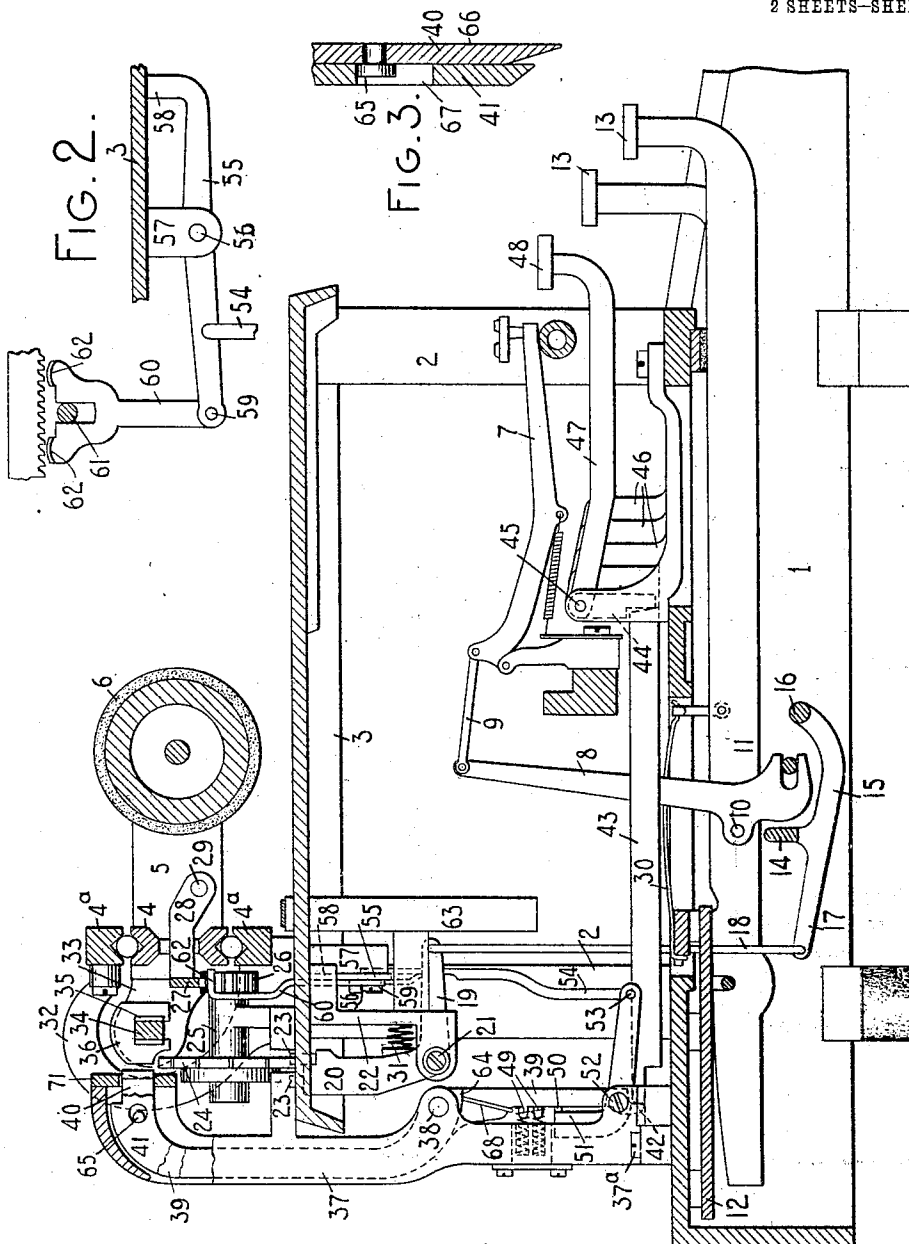


H. H. STEELE.
TYPE WRITING MACHINE.
APPLICATION FILED JAN. 16, 1913.

1,064,392.

Patented June 10, 1913.

2 SHEETS—SHEET 1.



WITNESSES:

E. M. Wells

Wm. B. Smith

FIG. 1.

INVENTOR:

Herbert H. Steele

By Jacob Felber

HIS ATTORNEY

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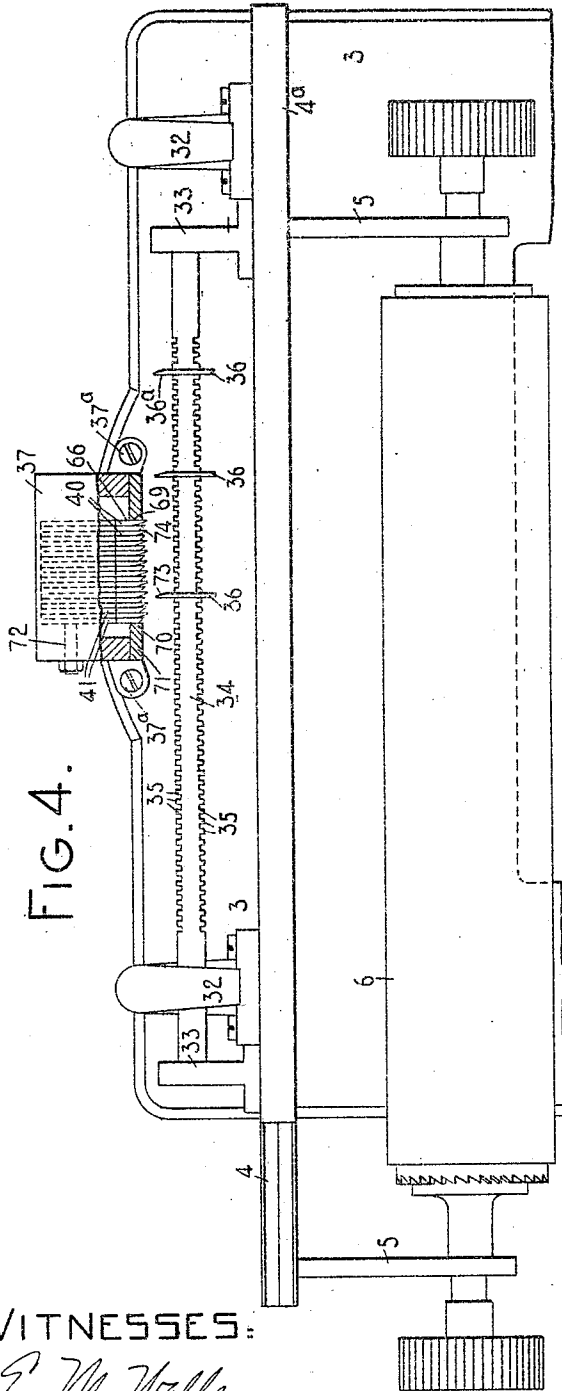
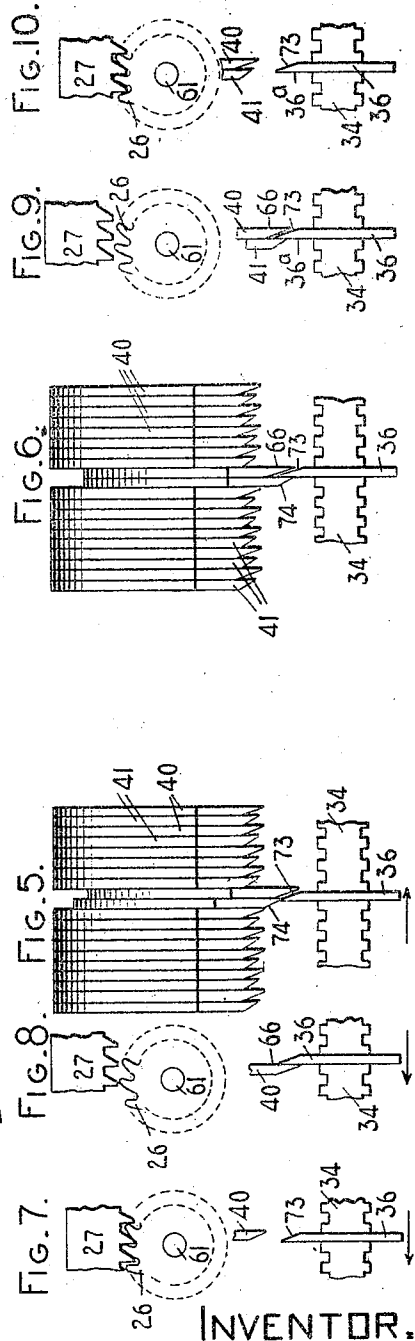


FIG. 4.

WITNESSES:

E. M. Wells.
Wm. Smith



INVENTOR.

Herbert H. Steele
By Jacob F. Felt
HIS ATTORNEY

UNITED STATES PATENT OFFICE.

HERBERT H. STEELE, OF MARCELLUS, NEW YORK, ASSIGNOR TO THE MONARCH TYPE-
WRITER COMPANY, OF SYRACUSE, NEW YORK, A CORPORATION OF NEW YORK.

TYPE-WRITING MACHINE.

1,064,392.

Specification of Letters Patent.

Patented June 10, 1913.

Application filed January 16, 1913. Serial No. 742,341.

To all whom it may concern:

Be it known that I, HERBERT H. STEELE, citizen of the United States, and resident of Marcellus, 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 particularly to tabulating mechanism.

One of the objects of my invention is to provide a comparatively simple and efficient two-way tabulator by which a tabulating operation may be effected by a backward movement of the carriage, as well as by a forward movement thereof in the direction of its feed.

Another object of my invention is to provide novel means by which the carriage may be arrested at the same letter space position, whether a backward or forward tabulation is effected.

A further object of my invention is to provide novel means for holding the carriage against movement which would tend to separate the tabulator stops when an arrest of the carriage is effected by said stops.

A still further object of my invention is to provide means of the character specified above that may be readily embodied in existing styles of typewriting machines without modifying, or materially modifying, the structural features of said machines as they now exist.

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

In the accompanying drawings wherein like reference characters indicate like parts: Figure 1 is a fragmentary vertical fore and aft sectional view of one form of typewriting machine embodying my invention. Fig. 2 is a detail fragmentary front elevation, with parts in section, of a portion of the carriage releasing means and some of the associated parts. Fig. 3 is a fragmentary enlarged detail transverse sectional view of one of the denominational stops and its associated latch. Fig. 4 is a fragmentary plan

view, with parts in section, the view showing a portion of the tabulator mechanism and some of the associated parts. Figs. 5 and 6 are enlarged detail diagrammatic plan views of the tabulator stops. Figs. 7, 8, 9 and 10 are fragmentary diagrammatic views of certain of the tabulator stops, the feed pinion and feed rack, the different views showing the parts disposed as they appear under different conditions of use.

I have shown my invention embodied in the present instance in the Monarch machine in which the invention may be readily included without modifying, or materially modifying, the structural features of that machine as they now exist. It should be understood, however, that the invention may be embodied in various styles of typewriting machines.

The frame of the machine comprises a base 1, corner posts 2 and top plate 3. The carriage comprises a cross or slide bar 4 from which end bars 5 project forwardly to support a rotative platen 6. The slide bar 4 of the carriage is supported by anti-friction balls or rollers which are received in oppositely grooved guide ways in the slide bar, and are also received in oppositely grooved guide rails 4^a fixedly supported on the top plate of the machine, so that the carriage may travel from side to side of the machine over the top plate.

Upwardly and rearwardly striking type bars 7 are segmentally arranged and adapted to strike against the front face of the platen. These type bars are connected to sub-levers 8 by intermediate actuating links 9. Each sub-lever 8 is pivoted at 10 to a key lever 11 which is fulcrumed at its upper rear edge portion against a fulcrum plate 12 and extends forwardly to the keyboard of the machine where it is provided with a finger key 13.

A universal bar 14 extends beneath the series of key levers and is carried by a frame 15 formed with a rock shaft 16 which is pivoted in the base of the machine. A rearwardly projecting arm 17 extends from this frame and is connected to an upwardly extending link 18 which in turn is connected to a forwardly projecting arm 19 of a dog rocker 20. This dog rocker is pivoted at 21 to a bracket 22 secured to the top plate of the machine. The upwardly extending

arm of the dog rocker carries feed dogs 23 which coöperate with an escapement wheel 24. The escapement wheel is connected in the usual manner with an escapement wheel shaft that rotates in a bearing 25 fixed to the top plate of the machine. The forward end of the escapement wheel shaft carries a feed pinion 26 with which a feed rack 27 meshes. The feed rack is supported by arms 28 pivoted at 29 to the carriage. Returning springs 30 are connected with the key levers and the parts connected therewith to return them to normal position after the keys have been depressed, and a returning spring 31 is effective to return the dog rocker and associated parts to normal position.

Curved bracket arms 32 are supported on the top plate of the machine and constitute supports for the fixed guide rails 4^a. Rearwardly projecting bracket arms 33 extend from the carriage in line with the openings in the curved bracket arms and constitute supports for a column stop bar 34. This stop bar has teeth 35 projecting from the front and rear sides thereof for the reception of bifurcated flat sheet metal column stops 36 in the interdental spaces between the teeth 35. The column stops are thus held against lateral play or movement on the column stop bar and in the different positions to which they may be adjusted along the bar. A tabulator frame 37 is fixedly connected to the frame of the machine in the usual manner by screws 37^a and supports a pivot rod 38 on which denominational stop carrying levers 39 are pivoted, said levers extending forwardly at the upper ends thereof to form denominational stops 40. These denominational stop levers and the stops carried thereby are maintained spaced apart by devices 41 which in the present instance constitute latching means or devices, as will hereinafter more clearly appear. The lower end 42 of each denominational stop lever co-acts with a slide bar 43 which extends, and is guided for movement, fore and aft of the machine. Each slide bar, at its forward end, co-acts with a depending crank arm 44 fixed to a rock shaft 45 supported in upwardly extending bracket arms 46. Each rock shaft 45 has a forwardly extending arm 47 fixed thereto, the arm carrying a denominational key 48 at its forward end. It will be understood, therefore, that a depression of a denominational key is effective to move the associated bar 42 rearwardly, thereby transmitting a pivotal movement to the corresponding denominational stop lever 39 to move the corresponding denominational stop 40 into the path of the column stops 36. The usual returning springs 49 coöperate with the denominational stop levers to return them and the parts associated therewith to the normal position. A universal bar 50 extends across

the series of denominational stop levers 39 at the rear thereof and below the pivot 38. This universal bar is supported on arms 51 which are pivoted at 52 to the tabulator frame 37. One of the arms 51 is extended forwardly where pivotal connection is made at 53 with an upwardly extending link 54. The upper end of this link 54 is connected to a lever 55 pivoted at 56 to a depending bracket 57 which extends from the top plate 3 of the machine. One end of the lever is bent upwardly to form a stop 58 which co-operates with the top plate of the machine to limit the movement of the parts in one direction. The opposite end of the lever 55 is pivoted at 59 to an upwardly extending carriage releasing device 60 guided in its vertical movement by the escapement wheel shaft 61. Contact shoes 62 project forwardly from the releasing device and extend beneath the feed rack 27 so that an elevation of the releasing device 60 from the position shown in Fig. 2 is effective to elevate the feed rack and disengage it from the feed pinion. It will be understood, therefore, that a release of the carriage is effected at each actuation of a denominational stop as the latter is projected into the path of the column stop, and that at such time the carriage is free to be moved from right to left under the power of its spring drum 63 which is connected to the carriage in the usual manner.

The construction thus far described is similar to that embodied in the Monarch machine except that the spacing devices 41 usually employed in the Monarch machine are of a different character from those shown in the accompanying drawings, the usual spacing devices not being in the nature of latching means or devices. In the present instance I substitute for the ordinary spacing means employed between the denominational stop levers a series of latching devices 41 which conform substantially in outline to the upper portions of the denominational stop levers, the latches 41 terminating at their lower ends at 64. These latches alternate with the denominational stops and are pivoted on the pivot rod 38 for movement fore and aft of the machine in the same general direction as the denominational stops. As will be seen more clearly from an inspection of Fig. 3, each of the denominational stops 40 has a laterally extending pin or projection 65 extending from the back face thereof. I refer to the back face of each denominational stop to distinguish it from the front face 66 of the stop with which the column stops co-act at a forward tabulating operation effected during the travel of the carriage from right to left in the direction of its feed. Each pin or projection 65 is received in a slot or opening 67 in the adjacent left-hand latch 41. This

opening or slot is of a sufficient extent to afford a limited independent movement between the latch 41 and its associated denominational stop, for purposes which will hereinafter more clearly appear.

As will be understood from an inspection of Fig. 1, each latch 41 has fixedly connected thereto, and projecting from its lower edge, a depending wire spring 68, the lower end of which is bent to engage around the rear edge of the associated denominational stop lever 39. The power of each spring 68 is exerted to force the associated latch forwardly until it is arrested by the rear wall of the slot 67 therein engaging the pin or projection 65 on the associated denominational stop, as shown in Figs. 1 and 3. Each spring 68 therefore tends to normally maintain this relation between a latch and its associated denominational stop. It will be seen that each latch is located on the back or left-hand side of the associated denominational stop, so that in the arrest of the carriage by a denominational stop in the movement of the carriage from right to left the latches do not come into operation. From an inspection of Fig. 4 it will be understood that the series of denominational stops 40 and series of latches 41 are arranged adjacent one another and occupy a space between a contact edge 69 and a contact edge 70 of a front plate 71 fixed to the tabulator frame. The contact edges 69 and 70 resist a movement of the stops and latches in opposite directions. An adjusting screw 72 is received in a tapped opening in the left-hand side of the tabulator frame 37 and bears at its inner end against the left-hand latch 41, as shown in Fig. 4. This screw is effective to take up any undue play or lateral motion between the series of denominational stops and the series of latches 41, although these parts are rather loosely disposed in the frame to provide sufficient freedom of fore and aft movement between the parts.

In a forward tabulating movement the parts co-act in the usual manner and the denominational stops, through their front contact faces 66, co-act with the front faces 36 of the column stops 36 to arrest the carriage. As will be understood from an inspection of Figs. 7 and 8, a movement of a denominational stop into operative position is effective to release the carriage by disengaging the feed rack 27 from the feed pinion 26. At the time that the carriage is arrested in its forward movement by the co-operation of a column stop with the projected denominational stop 40, the parts appear as represented in Fig. 8. On a comparison of this figure with Fig. 7, which shows the positions of the parts after the denominational stop has been withdrawn from its projected position shown in Fig.

8, it will be seen that the movement of the feed rack back into mesh with the feed pinion from the Fig. 8 to the Fig. 7 position will afford a "drop" of the carriage for a distance corresponding substantially to the thickness of one of the denominational or column stops. This "drop" of the carriage has no particular effect on the operation of the tabulator in the ordinary tabulating operation in which the carriage moves from right to left to the point of arrest except that it enables the stops to clear one another, as will be understood from an inspection of Figs. 7 and 10. It will be seen from a consideration of these figures that if the same denominational stop is immediately actuated after a "drop" has been effected and the parts are positioned as shown, then the projected denominational stop is in a position to co-act with the next succeeding column stop, as it is intended it should. This clearing of the stops, therefore, is effected by the "drop" of the carriage described above.

In the operation of the devices for reverse or backward tabulation, a denominational key is depressed, thereby projecting the corresponding denominational stop forward with its rear face presented for coöperation with the rear face of the first column stop to the left. The operator then moves the carriage to the right with one hand, while maintaining the denominational key depressed with the other, until the carriage is arrested by the coöperation of the rear face of the first column stop with the rear face of the projected denominational stop. During this movement of the parts the beveled face 73 of the column stop co-acts with the beveled face 74 of the projected latch 41, as shown in Fig. 5, and forces the latch rearwardly around its pivot against the force of the spring 68 of the latch. As soon as the column stop has cleared the beveled face 74 on the projected latch, the spring 68 of said latch is effective to move it forwardly on the left-hand side or back of the column stop, as shown in Fig. 6. This locks the column stop and projected denominational stop together, preventing a movement of the carriage in the direction of its feed, it being understood that the feed rack is maintained released at this time by the depression of the denominational key. The carriage being held at this time, as shown in Fig. 6, by the engagement of the latch 41 with the column stop, said latch will restrain the carriage against movement in the direction of its feed, and will retain it in the same letter space position that the carriage would be arrested in by the coöperation of the same denominational stop with the same column stop in a final arrest of the carriage by a forward tabulation, through the movement of the carriage from right to left. This is

due to the fact that in the forward tabulation the carriage receives a "drop" from the position indicated in Fig. 8 to that shown in Fig. 7 during the reengagement of the feed rack with the pinion, whereas such "drop" is not effected during the backward tabulation. At the termination of the backward tabulation of the carriage the parts will be maintained in the position indicated in Fig. 9 until pressure is released on the denominational key. When pressure is released on the key the denominational stop and its latch will move back to normal position together. The feed rack will reengage the feed pinion at the first part of this return movement of the denominational stop and its latch and before the latch has become disengaged from the column stop. In other words, at the first part of the return movement of the denominational stop and latch, the feed rack 27 engages the feed pinion 26, and this engagement is effected before the column stop is released from control of the projected latch. The effect, therefore, is to restrain the carriage against movement in the direction of its feed until such time as a reengagement of the rack with its feed pinion has been effected when there can be no such "drop" of the carriage as is provided during the reengagement of the rack and pinion during the forward tabulation.

Fig. 7 shows the parts as they appear after the arrest of the carriage during a forward tabulation, whereas Fig. 10 shows the parts as they appear after an arrest of the carriage effected by a backward tabulation. It will be seen that in each case the denominational stop 40 and the column stop 36 bear the same relation so that in each instance the carriage is arrested at the same letter space position, assuming of course that the same denominational stop is employed to co-act with the same column stop. In one case the front faces of the denominational and column stops co-act to arrest the carriage, although the final position of the carriage at this time is not attained until the denominational stop is withdrawn and the "drop" of the carriage has been effected. In the other case the rear faces of the denominational column stops co-act to arrest the carriage and there is no such "drop" of the carriage from this position of arrest.

While I have described the use of the latching device in a construction intended primarily to afford backward as well as forward tabulating operations, it should be understood that the latching device is effective wherever it is desirable to prevent a separation of two cooperating contacting tabulator stops through a movement of the carriage. It will be understood, therefore, that various changes may be made without departing from the spirit and scope of

my invention and that certain parts of the mechanism may be employed without others.

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

1. In a typewriting machine, the combination of a carriage; and tabulating mechanism comprising means by which an arrest of the carriage at the same letter space position may be effected whether the carriage be moved from left to right or from right to left, said means including cooperative stops which are held on their supports against lateral play and which cooperate with each other on opposite sides to effect an arrest of the carriage.

2. In a typewriting machine, the combination of a carriage; and tabulating mechanism comprising means by which an arrest of the carriage at the same letter space position may be effected whether the carriage be moved from left to right or from right to left, said means including a column stop carried by the carriage and held against lateral movement thereon, and a cooperative key controlled stop carried by the frame of the machine, and held against lateral movement thereon.

3. In a typewriting machine, the combination of a carriage; and tabulating mechanism comprising means by which an arrest of the carriage at the same letter space position may be effected whether the carriage be moved from left to right or from right to left, said means including cooperative stops, and means by which a drop of the carriage is afforded for a distance corresponding substantially to the thickness of one of said stops after the arrest of the carriage by said stops in the movement of the carriage from right to left.

4. In a typewriting machine, the combination of a carriage; escapement mechanism therefor; and tabulating mechanism comprising means by which an arrest of the carriage at the same letter space position may be effected whether the carriage be moved from left to right or from right to left, said means including cooperative stops, means for effecting a release of the carriage from control of the escapement mechanism when the stops are brought into cooperative relation, and means by which a drop of the carriage is afforded for a distance corresponding substantially to the thickness of one of said stops after the arrest of the carriage by said stops in the movement of the carriage from right to left and by the restoration of the carriage to the control of the escapement mechanism.

5. In a typewriting machine, the combination of a carriage; escapement mechanism therefor; and tabulating mechanism comprising means for releasing the carriage from control of the escapement mechanism

when the tabulating mechanism is actuated, means by which an arrest of the carriage at the same letter space position may be effected whether the carriage be moved from left to right or from right to left, said last mentioned means including coöperative stops which coöperate with each other on opposite sides to effect an arrest of the carriage, and means for holding the carriage against movement in the direction of its feed when the stops are engaged to arrest the carriage in its movement from left to right and until the carriage has been restored to control of the escapement mechanism.

6. In a typewriting machine, the combination of a carriage; escapement mechanism therefor; and tabulating mechanism comprising means for releasing the carriage from control of the escapement mechanism when the tabulating mechanism is actuated, means by which an arrest of the carriage at the same letter space position may be effected whether the carriage be moved from left to right or from right to left, said last mentioned means including coöperative stops, means by which a drop of the carriage is afforded for a distance corresponding substantially to the thickness of one of said stops after the arrest of the carriage by said stops in the movement of the carriage from right to left, and means for holding the carriage against movement in the direction of its feed when the stops are engaged to arrest the carriage in its movement from left to right and until the carriage has been restored to control of the escapement mechanism.

7. In a typewriting machine, the combination of a carriage; and tabulating mechanism comprising means by which an arrest of the carriage at the same letter space position may be effected whether the carriage be moved from left to right or from right to left, said means including a series of denominational stops, and a series of column stops, each series of stops being held against lateral play on the part that carries it and each denominational stop being coöperative with each column stop on both sides thereof.

8. In a typewriting machine, the combination of a carriage; and tabulating mechanism comprising means by which an arrest of the carriage at the same letter space position may be effected whether the carriage be moved from left to right or from right to left, said means including a series of denominational stops carried by the frame of the machine and held against lateral movement thereon, and a series of column stops carried by the carriage and held against lateral movement thereon, each denominational stop coöperating with each column stop on both sides thereof.

9. In a typewriting machine, the combination of a carriage; and tabulating mechanism comprising means by which an arrest of the carriage at the same letter space position may be effected whether the carriage be moved from left to right or from right to left, said last mentioned means including coöperative stops which coöperate with each other on

nation of a carriage; and tabulating mechanism comprising means by which an arrest of the carriage at the same letter space position may be effected whether the carriage be moved from left to right or from right to left, said means including a series of denominational stops, a series of column stops, each denominational stop being coöperative with each column stop on both sides thereof, and means by which a drop of the carriage is afforded for a distance corresponding substantially to the thickness of one of said stops after the arrest of the carriage by the stops in the movement of the carriage from right to left.

10. In a typewriting machine, the combination of a carriage; and tabulating mechanism comprising means by which an arrest of the carriage at the same letter space position may be effected whether the carriage be moved from left to right or from right to left, said means including a series of denominational stops carried by the frame of the machine and held against lateral movement thereon, a series of column stops carried by the carriage and held against lateral movement thereon, each denominational stop coöperating with each column stop on both sides thereof, and means by which a drop of the carriage is afforded for a distance corresponding substantially to the thickness of one of said stops after the arrest of the carriage by the stops in the movement of the carriage from right to left.

11. In a typewriting machine, the combination of a carriage; escapement mechanism therefor; and tabulating mechanism comprising means for releasing the carriage from control of the escapement mechanism when the tabulating mechanism is actuated, means by which an arrest of the carriage at the same letter space position may be effected whether the carriage be moved from left to right or from right to left, said last mentioned means including a series of denominational stops, a series of column stops, and means for holding the carriage against movement in the direction of its feed when a column stop is engaged by a denominational stop to arrest the carriage in its movement from left to right and until the carriage has been restored to control of the escapement mechanism.

12. In a typewriting machine, the combination of a carriage; escapement mechanism therefor; and tabulating mechanism comprising means for releasing the carriage from control of the escapement mechanism when the tabulating mechanism is actuated, means by which an arrest of the carriage at the same letter space position may be effected whether the carriage be moved from left to right or from right to left, said last mentioned means including coöperative stops which coöperate with each other on

opposite sides to effect an arrest of the carriage, means for affording a drop of the carriage for a distance corresponding substantially to the thickness of one of said stops after the arrest of the carriage by said stops in one direction, and means for preventing such drop of the carriage after an arrest of the carriage by said stops in the movement of the carriage in the opposite direction.

13. In a typewriting machine, the combination of a carriage; escapement mechanism; carriage releasing means; and tabulating mechanism controlling said carriage releasing means and comprising tabulator stops cooperative to arrest the carriage during a backward movement thereof in a direction opposite to that of its feed, and means for preventing a movement of the carriage in the direction of its feed when said stops cooperate to arrest the backward movement of the carriage and the carriage is released from the escapement mechanism and until the carriage is restored to the control of the escapement mechanism.

14. In a typewriting machine, the combination of a carriage, feed mechanism therefor, feed release mechanism, a series of column stops, a series of key actuated denominational stops, and a series of latching devices movable simultaneously with said key actuated denominational stops and also independently thereof.

15. In a typewriting machine, the combination of a carriage; and tabulating mechanism comprising cooperative tabulating stops, one of which is key controlled and movable by its key into and out of cooperative relation with the other of said stops, and a latching device movable with said key controlled stop and cooperative with the other stop only when the stops are brought into cooperation by a movement of the carriage in a direction opposite to that of its feed, the latching device when engaged preventing a movement of the carriage in the direction of its feed.

16. In a typewriting machine, the combination of a carriage; and tabulating mechanism comprising cooperative tabulating stops, one of which is key controlled and movable by its key into and out of cooperative relation with the other of said stops, a latching device cooperative with the other stop only when the stops are brought into cooperation by a movement of the carriage in a direction opposite to that of its feed, the latching device when engaged preventing a movement of the carriage in the direction of its feed, and means by which the return movement of the key controlled stop to normal position is effective to disengage said latching device from said other stop.

17. In a typewriting machine, the combination of a carriage; and tabulating mechanism

comprising cooperative tabulating stops, one of which is key controlled and movable by its key into and out of cooperative relation with the other of said stops, and a latching device movable with and independently of said key controlled stop, the independent movement of said latching device being in the same general direction as the movement of said key controlled stop.

18. In a typewriting machine, the combination of a carriage, feed mechanism therefor, feed release mechanism, a series of column stops, a series of key actuated denominational stops, and a series of spring-pressed latching devices alternating with said denominational stops and movable therewith at key strokes and also independently thereof when struck by the column stops.

19. In a typewriting machine, the combination of a carriage; and tabulating mechanism comprising a column stop, a key controlled denominational stop, a latching device cooperative with said column stop only when the carriage is arrested by said stops during a movement of the carriage in a direction opposite to that of its feed, the engagement of the latching device preventing a movement of the carriage in the direction of its feed, and means by which the movement of the denominational stop into and out of operative position effects corresponding movements of said latching device.

20. In a typewriting machine, the combination of a carriage; and tabulating mechanism comprising cooperative stops one movable into and out of cooperative relation with another, movable latching means for preventing one of said stops from moving away from the other in the direction of the travel of the carriage when the stops are brought into cooperation, and means controlled by said movable stop for controlling the movement of the latching means into and out of operative position.

21. In a typewriting machine, the combination of a carriage; and tabulating mechanism comprising cooperative stops one movable into and out of cooperative relation with another, and a latching device having its engaging portion on the back face of one of said stops and cooperative with the other stop only when the backs of both stops are brought into cooperation during a backward tabulating operation.

22. In a typewriting machine, the combination of a carriage; and tabulating mechanism comprising cooperative stops one movable into and out of cooperative relation with another, movable latching means for preventing one of said stops from moving away from the other in the direction of the travel of the carriage when the stops are brought into cooperation, and a lost-motion connection between said movable stop and said latching means to cause the two to move

together and to afford a limited movement of one independently of the other.

23. In a typewriting machine, the combination of a carriage; and tabulating mechanism comprising a tabulator stop, a key controlled coöperative tabulator stop, a spring pressed latching device for locking the stops together when they are brought into coöperation, and a pin and slot connection between said key controlled stop and said latching device for controlling the movement of the latching device out of operative position and for affording a limited movement of one independently of the other.

24. In a typewriting machine, the combination of a carriage; and tabulating mechanism comprising a tabulator stop, a key controlled coöperative tabulator stop, a spring pressed latching device having its engaging portion at the back face of the key controlled stop for locking the stops together only when they are brought into coöperation by a backward tabulating operation, and a pin and slot connection between said key controlled stop and said latching device for controlling the movement of the latching device out of operative position and for affording a limited movement of one independently of the other.

25. In a typewriting machine, the combination of a carriage; and tabulating mechanism comprising a key controlled denominational stop, a coöperative column stop, a latching device for locking the denominational and column stops together when they are brought into coöperation, and a lost motion connection between said denomination stop and latching device to cause the two to move together and to afford a limited movement of one independently of the other.

26. In a typewriting machine, the combination of a carriage; and tabulating mechanism comprising a key controlled denominational stop, a coöperative column stop, a spring pressed latching device for locking the denominational and column stops together when they are brought into coöperation by a backward tabulation, and a pin and slot connection between said denominational stop and latching device for controlling the movement of the latching device out of operative position and for affording a limited movement of one independently of the other.

27. In a typewriting machine, the combination of a carriage; and tabulating mechanism comprising a series of column stops, a series of key controlled pivoted denominational stops, a series of pivoted latching devices interposed between said denominational stops and alternating therewith, said latching device coöperating with the column stops to lock a column stop and a projected denominational stop together, and means for operatively connecting each latching device

with its associated denominational stop to be moved thereby into and out of coöperative relation with a column stop.

28. In a typewriting machine, the combination of a carriage; and tabulating mechanism comprising coöperative tabulating stops, one of which is key controlled and movable by its key into and out of coöperative relation with the other of said stops, and a latching device movable with and independently of said key controlled stop, the independent movement of said latching device being in the same general direction as said key controlled stop; carriage escapement mechanism; carriage releasing means controlled by the movement of said key controlled stop; and means for affording a drop of the carriage for a distance corresponding substantially to the thickness of one of said stops when the carriage is returned to control of the escapement mechanism and is unrestrained by said latching device.

29. In a typewriting machine, the combination of a carriage; tabulating mechanism comprising a column stop, a denominational stop, and a latching device coöperative with one of said stops only when the carriage is arrested by said stops during a movement of the carriage in a direction opposite to that of its feed, the engagement of the latching device preventing a movement of the carriage in the direction of its feed; carriage escapement mechanism; carriage releasing means controlled by the movement of said key controlled stop; and means for affording a drop of the carriage for a distance corresponding substantially to the thickness of one of said stops when the carriage is returned to control of the escapement mechanism and is unrestrained by said latching device.

30. In a typewriting machine, the combination of a carriage; tabulating mechanism comprising a column stop, a key controlled denominational stop, a latching device coöperative with said column stop only when the carriage is arrested by said stops during a movement of the carriage in a direction opposite to that of its feed, the engagement of the latching device preventing a movement of the carriage in the direction of its feed, and means by which the movement of the denominational stop into and out of operative position effects corresponding movements of said latching device, said last mentioned means including means for affording a movement of the latching device independently of the denominational stop; carriage escapement mechanism; carriage releasing means controlled by the movement of said key controlled stop, and means for affording a drop of the carriage for a distance corresponding substantially to the thickness of one of said stops when the car-

riage is returned to control of the escapement mechanism and is unrestrained by said latching device.

31. In a typewriting machine, the combination of a carriage; tabulating mechanism comprising coöperative stops one movable into and out of coöperative relation with another; movable latching means for preventing one of said stops from moving away from the other in the direction of the travel of the carriage when the stops are brought into coöperation, and means controlled by said movable stop for controlling the movement of the latching means into and out of operative position, said last mentioned means including means for affording a movement of said latching means independently of the movable stop; carriage escapement mechanism; carriage releasing means controlled by the movement of said key controlled stop; and means for affording a drop of the carriage for a distance corresponding substantially to the thickness of one of said stops when the carriage is returned to control of the escapement mechanism and is unrestrained by said latching means.

32. In a typewriting machine, the combination of a carriage; tabulating mechanism comprising coöperative stops, one movable into and out of coöperative relation with another, a latching device having its engaging portion of the back face of one of said stops and coöperative with the other stop only when the backs of both stops are brought into coöperation during a backward tabulating operation, and means for moving said latching device into and out of operative position, said last mentioned means including means for affording a movement of said latching device independently of the movable stop; carriage escapement mechanism; carriage releasing means controlled by the movement of said key controlled stop; and means for affording a drop of the carriage for a distance corresponding substantially to the thickness of one of said stops when the carriage is returned to control of the escapement mechanism and is unrestrained by said latching device.

33. In a typewriting machine, the combination of a carriage; tabulating mechanism comprising a tabulator stop, a key controlled coöperative tabulator stop, a spring pressed latching device for locking the stops together when they are brought into coöperation, and a pin and slot connection between said key controlled stop and said latching device for controlling the move-

ment of the latching device out of operative position and for affording a limited movement of one independently of the other; carriage escapement mechanism; carriage releasing means controlled by the movement of said key controlled stop; and means for affording a drop of the carriage for a distance corresponding substantially to the thickness of one of said stops when the carriage is returned to control of the escapement mechanism and is unrestrained by said latching device.

34. In a typewriting machine, the combination of a carriage; tabulating mechanism comprising a key controlled denominational stop, a coöperative column stop, a spring pressed latching device for locking the denominational and column stops together when they are brought into coöperation by a backward tabulation, and a pin and slot connection between said denominational stop and latching device for controlling the movement of the latching device out of operative position and for affording a limited movement of one independently of the other; carriage escapement mechanism; carriage releasing means controlled by the movement of said denominational stop; and means for affording a drop of the carriage for a distance corresponding substantially to the thickness of one of said stops when the carriage is returned to control of the escapement mechanism and is unrestrained by said latching device.

35. In a typewriting machine, the combination of a carriage; escapement mechanism therefor; carriage releasing means; and tabulating mechanism comprising tabulator stops coöperative to arrest the carriage during its movement from right to left and from left to right, means for restraining the carriage against movement from right to left when the carriage is arrested by said stops during a movement of the carriage from left to right, and means for affording a drop of the carriage for a distance corresponding substantially to the thickness of one of said stops when the carriage is returned to control of the escapement mechanism and is free from restraint by said restraining means.

Signed at Syracuse, in the county of Onondaga, and State of New York, this 14th day of January, A. D. 1913.

HERBERT H. STEELE.

Witnesses:

BISIN G. KETTRELL,
HARRY BARRY.