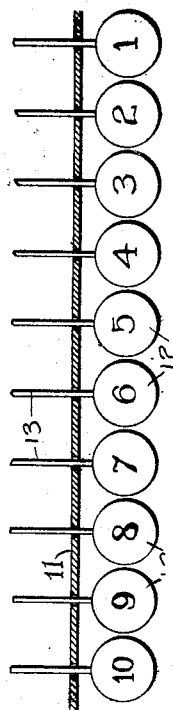


929,080.

2 SHEETS--SHEET 1.



John C. Kopf
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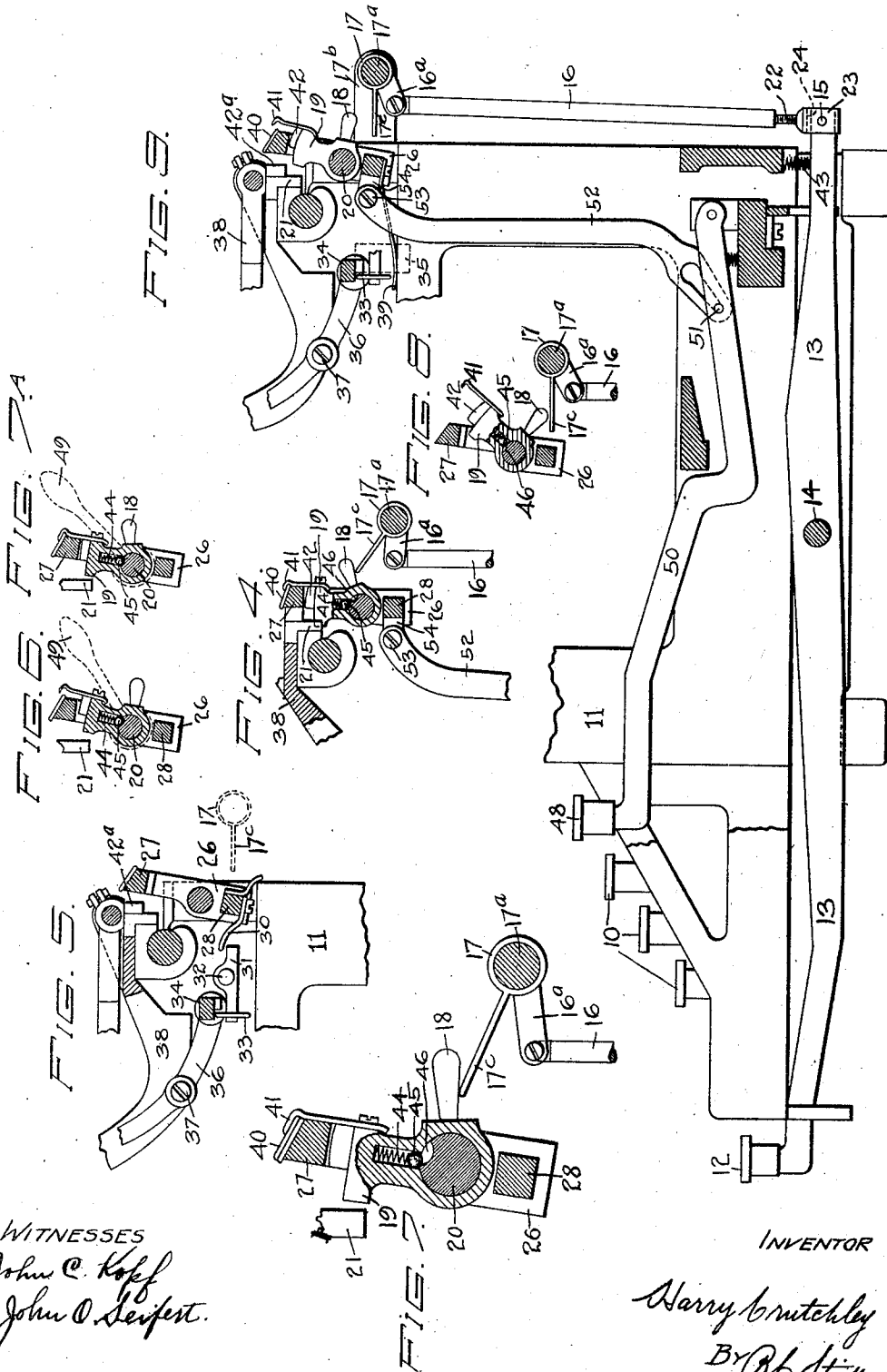
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H. CRUTCHLEY.
TYPE WRITING MACHINE.
APPLICATION FILED APR. 26, 1909.

929,080.

Patented July 27, 1909

2 SHEETS—SHEET 2.



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UNITED STATES PATENT OFFICE.

HARRY CRUTCHLEY, OF JERSEY CITY, NEW JERSEY, ASSIGNOR TO UNDERWOOD TYPE-WRITER COMPANY, OF NEW YORK, N. Y., A CORPORATION OF NEW JERSEY.

TYPE-WRITING MACHINE.

No. 929,080.

Specification of Letters Patent.

Patented July 27, 1909.

Application filed April 26, 1909. Serial No. 492,106.

To all whom it may concern:

Be it known that I, HARRY CRUTCHLEY, a citizen of the United States, residing in Jersey City, in the county of Hudson and State of New Jersey, have invented certain new and useful Improvements in Type-Writing Machines, of which the following is a specification.

This invention relates to tabulators of type-writing machines, and is in the nature of an improvement upon the devices disclosed in United States Letters Patent No. 850,839. In said patent, a series of column stops was mounted upon the framework of the machine, and a cooperating stop was mounted upon the carriage; all of the column stops being normally out of use and so mounted that by pressing upon any stop it could be moved into effective position. Mechanism was also provided to enable the carriage to be released simultaneously with the movement of the selected column stop to effective position.

One of the principal objects of the present invention is to provide a column-stop mechanism of this character which can readily be applied to existing machines, in which the column stop bar is placed at the rear side of the machine, although so far as certain features of this invention are concerned, the location of the column stop bar is not material.

Another object is to make it more convenient to operate the column stops.

According to the present improvements column-stop adjusting keys are mounted in a row at the front of the machine upon forward ends of depressible levers; and to the rear ends of said levers are attached upstanding thrust rods, and these at their upper ends are pivoted to a series of tumblers or stop operators, which are hinged end to end upon a horizontal shaft, which is fixed to the framework and extends along the usual series of column stops, each tumbler capable of setting its associated stop, so that another key is enabled to move its stop into position for arresting the carriage; while the stops are adjustable independently of one another along the usual rack, this adjustment being effected while the tumblers remain stationary; the stops being separated from the tumblers or operators, and each of the latter being of sufficient extent to admit of an adjustment of the stop within the range of about ten or twenty letter spaces.

When any key is depressed and its connected tumbler is rocked up, it serves not only to set the column stop forward to effective position, but also to rock forwardly the frame upon which the column stops are mounted, thereby both projecting the selected stop into the path of the cooperating carriage stop or dog and also releasing the carriage from the control of its escapement mechanism. No movement of the remaining column stops or keys occurs however, because the stops are separated from the tumblers, and hence can move forwardly independently thereof, so that one key can be operated without affecting the others.

When it is desired to use the tabulating mechanism in the ordinary way without skipping columns, all of the stops are set to effective positions by turning a shifter handle; and then the ordinary tabulator key may be employed in the usual manner instead of the skipping keys.

Other objects and advantages will hereinafter appear.

In the accompanying drawings, Figure 1 is a perspective rear view of an Underwood front strike writing machine equipped with the present improvements; the fifth column stop from the left having been set by its keys into position to arrest the carriage. Fig. 2 is a diagrammatic plan of the column-stop keyboard. Fig. 3 is a plan of the rear upper portion of the machine to illustrate the cooperation of the carriage stop with the column stops; the carriage being shown arrested by the fifth stop in the series. Fig. 4 is a fragmentary sectional side elevation, showing a column stop as turned by its tumbler in position to arrest the carriage. Fig. 5 is a fragmentary sectional elevation to show the relation of the column stop bar, the swinging frame of which it forms a part, the carriage and the carriage-releasing mechanism. Fig. 6 is a sectional elevation of the rocking frame on which the column stops are mounted and of one of the column stops in normal position. Fig. 7 is a similar view to show the column stop as partly rotated upon its rod toward the cooperating carriage stop, before the movement of the rocking frame begins. Fig. 7^a illustrates the manner of turning the column stop rod to bring all the stops into effective position whenever the usual tabulating key is depressed. Fig. 8 is a similar view, but showing the column stop

as swung downwardly clear of the rack for adjustment along the same. Fig. 9 is a part sectional side elevation of the typewriting machine showing the parts in normal positions.

In front of the keyboard 10 of a typewriting machine 11 is a row of column stop keys 12 numbered from right to left, as seen at Fig. 2, to indicate the successive column stops. These keys are mounted upon the front ends of levers 13 of the first order fulcrumed upon a transverse horizontal rod 14.

Pivoted at 15 to the rear ends of the levers are upstanding thrust rods 16, which at their upper ends are pivoted to ears 16^a provided upon tumblers 17, the latter pivoted end to end on a shaft 17^a fixed upon brackets 17^b secured to the machine frame 11; said shaft extending horizontally along the rear of the machine; each of said tumblers including a flap or bar portion 17^c; these bars being individually elevated by the thrust rods 16 to engage handles 18 provided upon column stops 19, the latter mounted upon a cylindrical rod 20 and capable of movement into the path of a cooperating stop 21 usually provided upon the carriage. Each link 16 is made extensible, its lower end being tapped to receive a threaded stem 22 projecting up from a pivoted piece 23, which is slotted at 24 to receive loosely the rear end of the lever 13.

The column stop rod 20 is mounted in the ends 26 of a rocking frame, which usually comprises an upper rack bar 27 and a bottom square shaft 28, said ends being rigidly connected by both the rack bar and the shaft. As usual, the frame is hinged upon gudgeons 29, Fig. 1, provided in the main frame of the machine, and the square shaft 28 carries an arm 30 to engage a lever 31 pivoted at 32 and having a roll 33 to lift a rack bar 34 from a pinion 35, Figs. 5 and 9, forming part of the carriage escapement mechanism; said rack bar being carried upon arms 36 hinged at 37 to the ends of the paper carriage 38, upon which the stop 21 is mounted. A spring 39 keeps the rocking frame normally tilted back to the position at Figs. 5 to 9. The rack 27 is usually provided with a scale 40, and each column stop has an index 41 to cooperate with said scale, as well as a tooth 42 to engage the rack 27.

Normally all of the column stops 19 are ineffective or out of use, as at Fig. 8; that is, they are in such positions that none of them can be swung by the rocking frame 26, 27, 28, far enough to get into the path of the carriage stop 21 before said frame is arrested by the engagement of the front face of the rack 27 with the usual leather pad or brake 42^a. But upon the depression of any selected key 12, the associated rod 16 is thrust up to rock its tumbler 17 and the connected column stop 19 is first tilted forwardly about the rod 20,

to the Fig. 7 position, while the frame 26, 27, 28 remains stationary. The index 41, however, limit this independent movement of the column stop; and further depression of the selected key 12, and consequent upward thrust of the rod 16, serves to swing the entire frame forwardly about the trunnions 29; the handle 18 thus serving as a crank whereby to turn said frame. By this movement of the column stop frame, the stop 19 is carried forwardly enough to be encountered by the carriage stop 21; and at the same time, the lever 31 is vibrated by the arm 30, and the rack 34 is lifted from the escapement pinion 35 to release the carriage, which, of course, is arrested by the engagement of 21 with 19. Upon releasing the key, the parts are returned to normal positions by springs 39, the rack 34 dropping by its own weight, and a spring 43 returning the key lever 13 to normal position.

During the operation just described, the tooth 42 of the stop remained in engagement with the rack 27. The compression spring 44, housed within the stop itself, presses a ball 45 into a groove 46 formed longitudinally in the top of the column stop rod 20, and tends always to return the column stop to the Fig. 6 position. During the movement of the column stop from the Fig. 6 to the Fig. 7 position, the ball is forced partly out of the groove 46, and there remains during the movement of the parts to the Fig. 4 position; but upon release of the key, the spring 44 turns the column stop back about the rod 20 to the normal Fig. 6 position.

It will be seen that each stop is adjustable to different points along its associated tumbler 17, so that the latter can operate the stop at any point within the range of several letter spaces or several notches of the column stop rack. The bars 17^c are shown abutting together endwise, so that each may afford a full range of adjustment of its associated stop. Each of the lifters 17^c stands normally far enough below the column stops, to permit the latter to be swung out of engagement with the rack and adjusted therealong. Any or all of the stops may move upwardly and forwardly independently of the underlying tumblers.

It will be seen at Fig. 1 that the set of thrust rods 16 is of considerably less width than the set of tumblers 17, the latter set being made of great width to accommodate an extra wide carriage. The tumblers at the ends of the shaft are provided with offset arms 47, each of which overlaps the adjoining tumbler, and at its inner end is bent to form an ear 16^a for the thrust rod. This provision of the overlapping arm 47 permits the extension of the set of tumblers beyond the set of thrust rods.

When it is desired to use the ordinary tabulator key 48 in place of the keys 12, a 130

handle 49, fixed upon the rod 20, is swung up to turn the rod 20 from the Fig. 6 position to the Fig. 7^a position, so that all stops are carried into position to be encountered by the carriage stop 21 when the frame 27 is swung forward and the carriage released. The key 48 will then be employed in the usual manner, this key being mounted upon a lever 50 having a pin-and-slot connection at 51 in a link 52, the latter pivoted at 53 to an ear 54 provided upon the shaft 28 of the rocking frame.

From the foregoing, it will be seen that when the handle 49 is thrust down to the Fig. 6 position, any key 12 may be manipulated to cause the carriage to be released, and then arrested by the column stop which is associated with the depressed key; all of the prior column stops being skipped during the run of the carriage; while when the handle 49 is thrust up, no skipping can be done, but the tabulator may be used in the ordinary way by employing either the key 48 or any of the keys 12.

The column stop rod 20 may be held frictionally or otherwise at either Fig. 6 or Fig. 7^a.

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

Having thus described my invention, I claim:

1. In a typewriting and tabulating machine, a column-stop selecting mechanism comprising, in combination with a power-driven carriage and an escapement mechanism, a series of keys, tumblers independently operable thereby, and a series of column stops associated with said tumblers respectively and each adjustable relatively to the carriage and to its tumbler, and normally out of effective position, but movable by its tumbler into carriage-arresting position independently of the remaining stops.

2. In a typewriting and tabulating machine, a column-stop selecting mechanism comprising, in combination with a power-driven carriage and an escapement mechanism, a series of keys, tumblers independently operable thereby, a series of column stops associated with said tumblers respectively and each adjustable relatively to the carriage and to its tumbler, and normally out of effective position, but movable by its tumbler into carriage-arresting position independently of the remaining stops, and carriage-releasing mechanism also operable by each of said tumblers.

3. In a typewriting and tabulating machine, a column-stop selecting mechanism, comprising, in combination with a power-driven carriage and an escapement mechanism, a series of keys, tumblers independently operable thereby and a series of column stops associated with said tumblers respec-

tively and each adjustable relatively to the carriage and to its tumbler, and normally out of effective position, but movable by its tumbler into carriage-arresting position independently of the remaining stops; each of said tumblers being extended in the direction of adjustment of its column stop, for operating the latter at its different adjustments.

4. In a typewriting and tabulating machine, the combination with a carriage, of a series of keys, a series of tumblers, one connected to each key, and a series of normally ineffective column stops, one associated with each tumbler, and all normally out of effective positions, said tumblers abutting end to end and extending along the series of column stops, and each of the latter adjustable in the direction of the run of the carriage to different points along its associated tumbler, each tumbler effective when operated by its key to set the selected column stop independently of the others into position to arrest the carriage.

5. In a typewriting and tabulating machine, the combination with a carriage, of a series of keys, a shaft, a series of independent tumblers loosely mounted end to end on said shaft, a series of connections from said tumblers to said keys, and a series of normally ineffective column stops, each of the latter adjustable along the carriage and having a part to be engaged by the corresponding tumbler when operated by the connected key, to set the column stop into carriage-arresting position independently of the other stops.

6. In a typewriting and tabulating machine, the combination with a carriage, of a series of keys, a shaft, a series of independent tumblers loosely mounted end to end on said shaft, a series of connections from said tumblers to said keys, and a series of normally ineffective column stops, each of the latter adjustable along the carriage and having a part to be engaged by the corresponding tumbler when operated by the connected key, to set the column stop into carriage-arresting position independently of the other stops; said keys mounted upon key levers, and the latter connected by links directly to said tumblers.

7. In a typewriting and tabulating machine, the combination with a carriage, of a series of keys, a shaft, a series of independent tumblers loosely mounted end to end on said shaft, a series of connections from said tumblers to said keys, and a series of normally ineffective column stops, each of the latter adjustable along the carriage and having a part to be engaged by the corresponding tumbler when operated by the connected key, to set the column stop into carriage-arresting position independently of the other stops; the width of the series of tumblers be-

ing greater than the width of the series of connections, and certain of said tumblers having overlapping extensions to which their connections are pivoted.

5 8. In a typewriting and tabulating machine, the combination with a carriage, of a series of keys, a shaft, a series of independent tumblers loosely mounted end to end on said shaft, a series of connections from said tumblers to said keys, a series of normally ineffective column stops, each of the latter adjustable along the carriage and having a part to be engaged by the corresponding tumbler when operated by the connected key, to set
10 the column stop into carriage-arresting position independently of the other stops, each tumbler comprising a hub portion to fit upon said shaft, and a laterally extended flap or bar portion to engage the column stop.

20 9. In a typewriting and tabulating machine, the combination with a carriage, of a series of column stops independently adjustable along the run of the carriage, and a series of column-stop operators extending along the series of column stops, one operator
25 associated with each stop, each of said operators of sufficient extent to permit adjustment of its column stop along both the rack and the operator while remaining under the control of the latter.

30 10. In a typewriting and tabulating machine, the combination with a carriage, of a series of column stops independently adjustable along the run of the carriage, a series of column-stop operators extending along the series of column stops, one operator associated with each stop, each of said operators of sufficient extent to permit adjustment of its column stop along both the rack and the operator while remaining under the control
40 of the latter, and independently operable keys connected to said operators to set any selected column stop independently of the other stops to carriage-arresting position.

45 11. In a typewriting and tabulating machine, the combination with a carriage, of a series of column stops independently adjustable along the run of the carriage, and a series of column-stop operators extending along the series of column stops, one operator associated with each stop, each of said operators of sufficient extent to permit adjustment of its column stop along both the rack and the operator while remaining under the control
50 of the latter; each of said operators in the form of a tumbler pivoted upon the framework and having a stop-operating portion adjoining the corresponding portion of the next tumbler.

60 12. In a typewriting and tabulating machine, the combination with a carriage, of a series of column stops independently adjustable along the run of the carriage, and a series of column-stop operators extending along the series of column stops, one operator as-

sociated with each stop, each of said operators of sufficient extent to permit adjustment of its column stop along both the rack and the operator while remaining under the control of the latter; each of said operators in the form of a tumbler pivoted upon the framework and having a stop-operating portion adjoining the corresponding portion of the next tumbler, and each connected by a link to a lever carrying a key.

75 13. In a typewriting and tabulating machine, the combination with a carriage, of a series of column stops independently adjustable along the run of the carriage, and a series of column-stop operators extending along the series of column stops, one operator associated with each stop, each of said operators of sufficient extent to permit adjustment of its column stop along both the rack and the operator while remaining under the control of the latter; each of said operators in the form of a tumbler pivoted upon the framework and having a stop-operating portion adjoining the corresponding portion of the next tumbler, and each connected by a link to a lever carrying a key; the tumblers forming a row extending along the carriage, and those tumblers at the ends of the row being provided with offset connections to the keys.

95 14. In a typewriting and tabulating mechanism, the combination with a carriage having a stop, of a series of column stops, a bar for supporting the column stops, a series of column-stop operators actuated by a series of keys, each column stop adjustable independently of the others along both its associated operator and said carriage, means to turn said bar, the latter connected to said column stops to move them all to effective positions, an auxiliary key to move all of the column stops simultaneously from the last-mentioned positions into the path of said carriage stop, and a carriage-releasing mechanism operated either by said auxiliary key or by any of the column stop keys.

110 15. In a typewriting and tabulating mechanism, the combination with a carriage having a stop, of a series of column stops, a bar for supporting the column stops, a series of column-stop operators actuated by a series of keys, each column stop adjustable independently of the others along both its associated operator and said carriage, means to turn said bar, the latter connected to said column stops to move them all to effective positions, an auxiliary key to move all of the column stops simultaneously from the last-mentioned positions into the path of said carriage stop, and a carriage-releasing mechanism operated either by said auxiliary key or by any of the column stop keys; said operators being disconnected from said column stops, to permit the described movements of the latter.

16. In a typewriting and tabulating mechanism, the combination with a power-driven carriage and a letter-feeding mechanism, of a carriage stop, a rocking frame, a bar extending parallel with the carriage, a carriage-releasing mechanism operable by said rocking frame, column stops upon and adjustable along said bar, individual springs normally holding said column stops in ineffective positions, a rack for the column stops, and a set of keys connected to tumblers or operators for setting each column stop independently of the others to effective position and simultaneously moving said frame to release the carriage; each column stop being adjustable along the rack independently of its operator.

17. In a typewriting machine, the combination with a carriage and a stop, of column stops adjustable independently of one another in the direction of travel of the carriage, a series of keys, connections to enable any selected key to set its column stop into the path of the first stop, each of said connections including a stop-operator constructed to operate its associated column stop at different adjustments of the latter along the rack, the column stop being adjustable independently of the operator; a movable frame upon which said column stops are mounted, an auxiliary key connected to said rocking frame to operate the latter independently of said series of keys, and means to shift said column stops simultaneously to positions where they will be effective in succession.

18. In a typewriting machine, the combination with a carriage having a stop, of a set of column stops adjustable independently of one another in the direction of travel of the carriage, a series of keys, one for each column stop, connections to enable any selected key to set its column stop into the path of said carriage stop, said connections including a stop-operator constructed to operate its associated column stop at different adjustments of the latter along the rack, the column stop being adjustable independently of the operator and separated therefrom, a rocking frame upon which said column stops are mounted, an auxiliary key connected to said rocking frame to operate the latter independently of said series of keys, and a finger-piece upon the rocking frame having means to set said series of column stops simultaneously to positions where they will be effective in succession upon the repeated rocking of said frame.

19. In a tabulating mechanism, the combination with a carriage, of a letter-feeding mechanism, a stop on the carriage, a rack on the framework of the machine, a series of column-stops adjustable along the rack, yielding means for holding each column-stop out of effective position while held by said rack, a series of keys mounted upon the

framework of the machine, connections extending from said keys to said column stops, said connections each including a stop-operator mounted upon the framework of the machine and constructed to operate its associated column stop at different adjustments of the latter along the rack, the column stop being adjustable independently of the operator, and means rendered effective by pressure upon any key for releasing the carriage from the control of the letter-feeding mechanism.

20. In a tabulating mechanism, the combination with a power-driven carriage and a letter-feeding mechanism, of a carriage stop, a movable bar, a series of column-stops adjustable along the bar, means for securing the column-stops against accidental displacement along said bar, means holding each column-stop out of effective position while so secured, finger-keys, connections from said keys to said column stops, each connection including a stop-operator mounted upon the framework of the machine and constructed to operate its associated column stop at different adjustments of the latter along the rack, the column stop being adjustable independently of the operator; each column stop movable upon said bar by its key into effective position independently of the other column-stops, said bar being movable by pressure upon any of said keys, and a carriage-releasing mechanism controlled by said bar.

21. In a tabulating mechanism, the combination with a carriage and a letter-feeding mechanism, of a carriage stop, a rack, a bar extending along said rack, a series of column-stops pivoted independently of one another upon said bar and adjustable therealong and having teeth, and rotatable about said pivots to engage and disengage their teeth with said rack, springs holding said column-stops normally out of effective positions while engaged by said rack, said bar being movable by pressure applied to any of said column stops for moving the column stops to effective position, and mechanical connections extending from said column-stops to independently operable keys, each of said mechanical connections including a stop operator mounted upon the framework of the machine and constructed to operate its associated column stop at different adjustments of the latter along the rack, the column stop being adjustable independently of the operator.

22. In a tabulating mechanism, the combination with a carriage and a letter-feeding mechanism, of a carriage stop, a rack, a bar extending along said rack, a series of column-stops pivoted independently of one another upon said bar and adjustable therealong and having teeth, and rotatable about said pivots to engage and disengage their teeth with said rack, springs holding said column-stops normally out of effective positions while engaged

by said rack, said bar being movable by pressure applied to any of said stops for moving the column stops to effective positions, mechanical connections extending from said column-stops to independently operable keys each of said mechanical connections including a stop-operator mounted upon the framework of the machine and constructed to operate its associated column stop at different

adjustments of the latter along the rack, the column stop being adjustable independently of the operator, and a carriage-releasing mechanism operable by said keys through said column stops. 10

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Witnesses:

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