

929,835.

H. CRUTCHLEY.
TYPE WRITING MACHINE.
APPLICATION FILED DEC. 7, 1908.

Patented Aug. 3, 1909.

2 SHEETS—SHEET 1

Fig. 1.

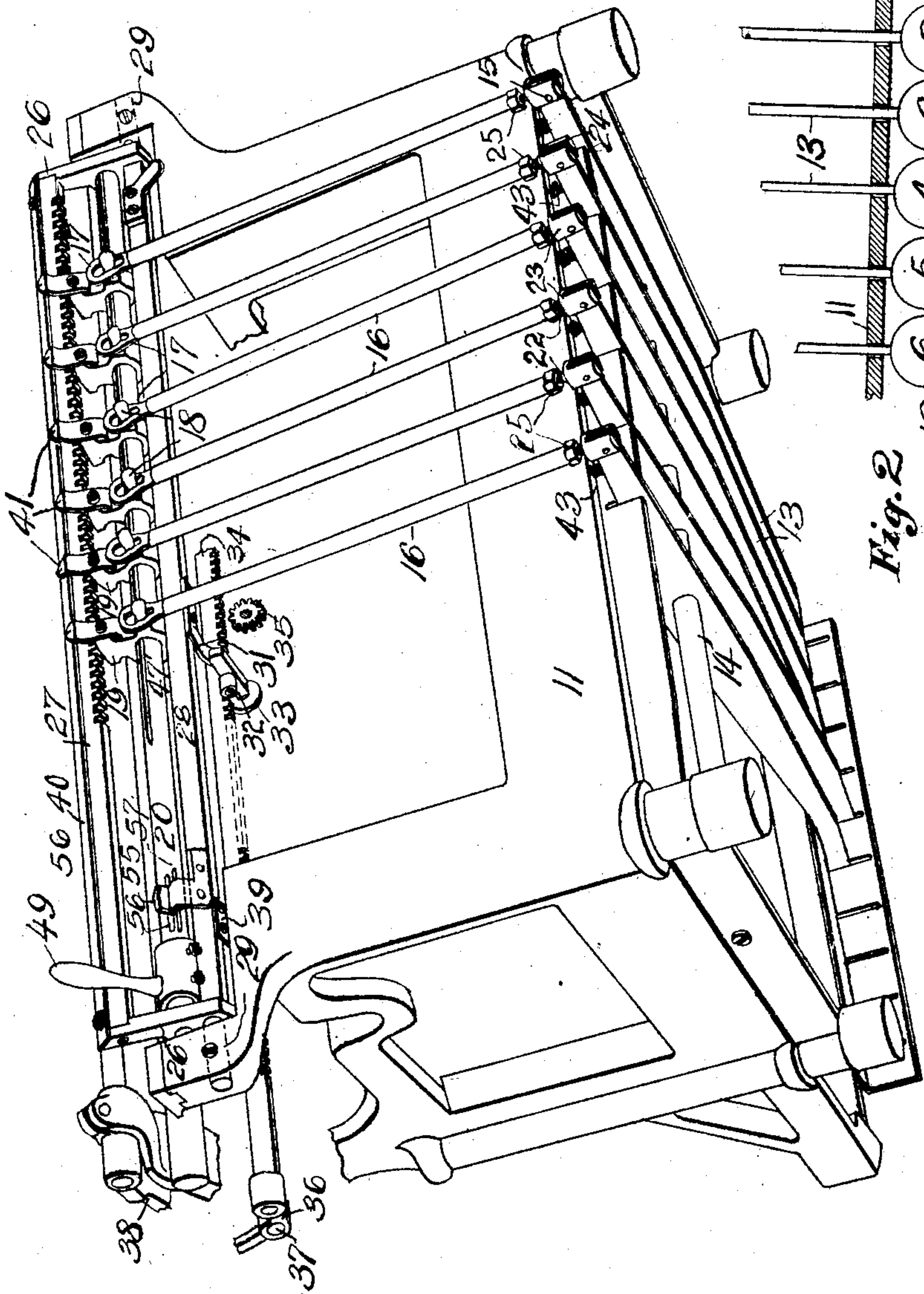
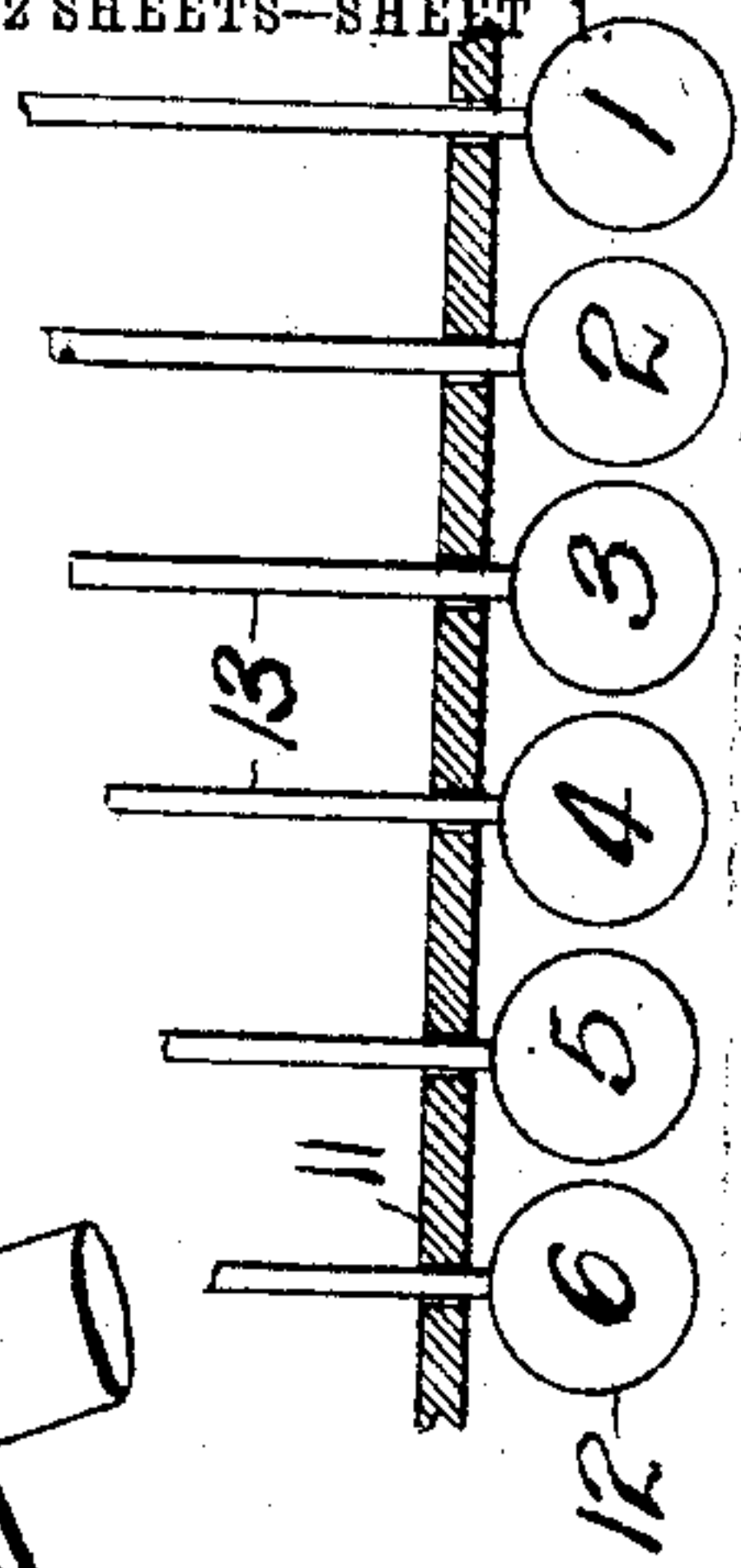


Fig. 2



Witnesses:

W. Fritz.

Frank H. N. Grant

Inventor:

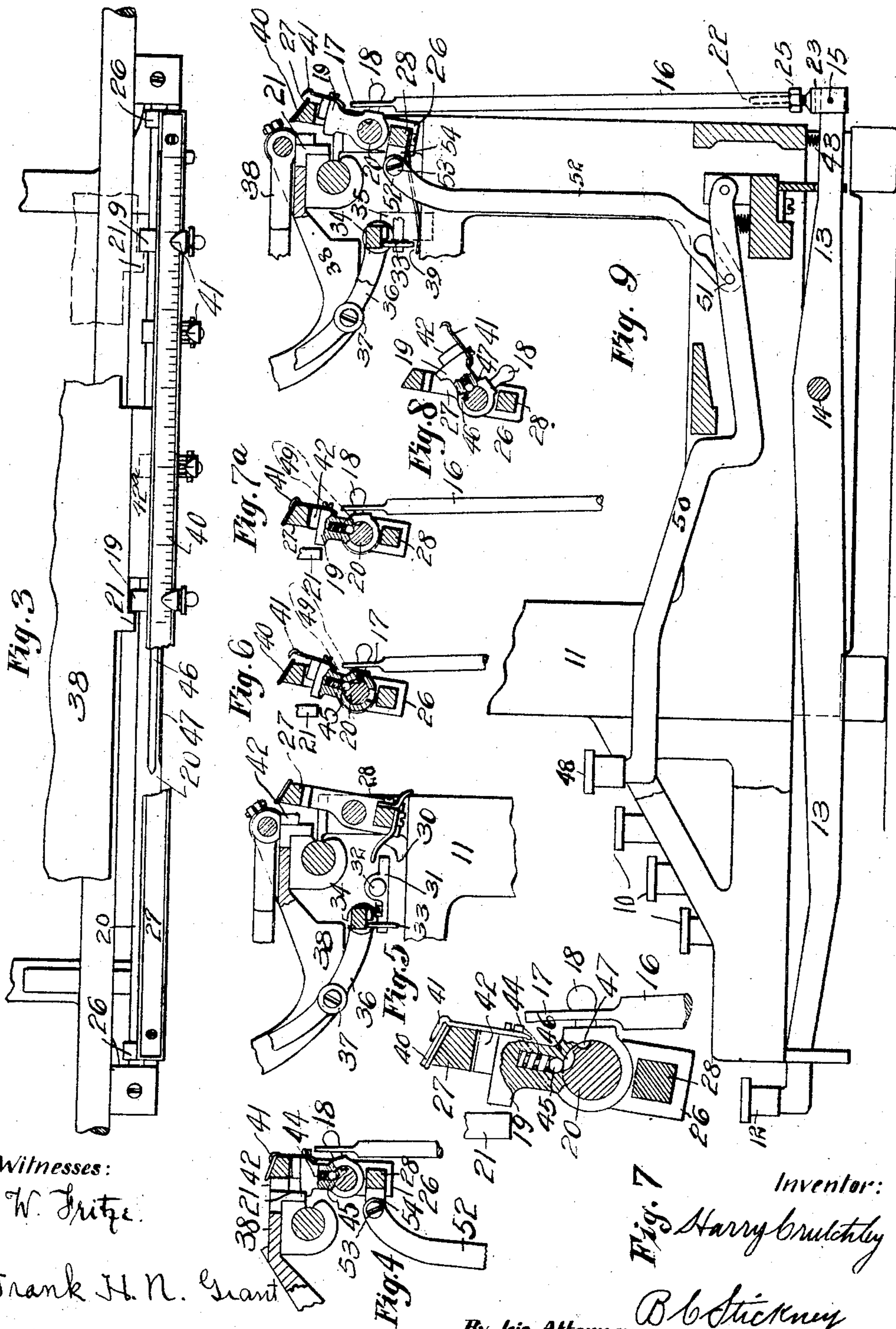
Harry Crutchley

By his Attorney B. C. Stickney

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Fig. 7 Harry Crutchley

By his Attorney. B. C. Stickney

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. 929,835.

Specification of Letters Patent.

Patented Aug. 3, 1909.

Application filed December 7, 1908. Serial No. 466,220.

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.

Instead of placing keys directly upon the column stops themselves, as in said patent, I mount them at the keyboard of the type-writing machine, upon the front ends of depressible levers; and to the rear ends of said levers I attach upstanding thrust rods, which at their upper ends are directly connected to the usual column stops, so that any key is enabled to set its associated stop into position for arresting the carriage; while said thrust rods are capable of sufficient lateral play to permit the necessary adjustment of the column stops along the usual rack.

When any key is depressed and its rod is thrust up, it serves not only to set the column stop forward to effective position, but also to rock the frame forward upon which column stops are mounted, thereby both bringing the selected stop into the path of the cooperating carriage stop and also releasing the carriage from the control of its

escapement mechanism. No movement of the remaining column stop keys occurs, however, since loose connections are provided between the keys and the column stops to permit one key to operate without affecting the others; such loose connections being preferably provided at the points of connection of the thrust rods with the column stops.

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 second column stop from the left having been set by its key and the carriage having been released to run until arrested by said stop. Fig. 2 is a 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 first stop in the series. Fig. 4 is a fragmentary sectional side elevation showing a column stop as turned by its key-operated thrust rod to 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 typewrit-

ing machine 11, is a row of column stop keys 12 numbered from right to left as seen at Fig. 2, to indicate first, second, third, fourth, fifth and sixth column stops. These keys are mounted upon 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, having at their upper ends eyes 17 to engage loosely 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; a nut 25 being provided to bind the parts together. The connection of the link 16 to the lever is sufficiently loose to permit considerable lateral play of the upper end of the link, to accommodate the adjustment of the column stop along the rod 20. 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. 1 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. 9, 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 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, limits 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, as seen at Fig. 1, 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 remains 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 at Fig. 1 that the eyes 17 in the thrust rod 16 are of sufficient length to permit free play of the arms 18 therein, due to the rocking of the frame 26, 27, 28. Each eye is preferably in the form of a key-hole slot, as shown, to enable the thrust rod to be cast off from the arm 18. This may be done by pressing forwardly upon the index 41 to swing the rocking frame to the Fig. 4 position, without lifting the thrust rod 16, so that the arm 18 is carried to the upper part of the key hole slot; whereupon the thrust rod 16 may be swung backwardly about the pivot 15 to release the rod from the column stop. Thereupon, the column stop may be swung down to the Fig. 8 position, to bring its tooth 42 out from the rack 27, so that the column stop is free to be slid along its supporting rod 20. It may then be turned up to bring the tooth 42 again into engagement with the rack; and by pressing forwardly upon the index 41 the parts may be again swung to the Fig. 4 position, and the thrust rod reconnected to the column stop. Each column stop may be adjusted along the rack through a range of ten or even more notches without cramping the rod 16 or lever 13; which is found in practice sufficient for the purpose. The rod 20 is usually provided with a second groove 47, into which the ball may spring when in the Fig. 8 position.

When it is desired to use the ordinary tabulator key 48 in place of the keys 12, a 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 in either Fig. 6 or Fig. 7^a position by any suitable detent, as for instance, a spring tooth 55 secured on the shaft 28, Fig. 1, and engaging either of two notches 56, 57 formed in the rod 20.

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 machine, the combination with a carriage having a dog, 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 stop, and connections to enable any selected key to set its stop into the path of said dog, said connections including parts movable laterally to accommodate the adjustment of the column stops along the path of travel of the carriage while the keys remain stationary.

2. In a typewriting machine, the combination with a carriage having a dog, 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 stop, and connections to enable any selected key to set its stop into the path of said dog, said connections including parts movable laterally to accommodate the adjustment of the column stops along the path of travel of the carriage, said stops mounted at the rear upper portion of the machine, and said connections pendent from said stops and extending forwardly beneath the machine to said keys.

3. In a typewriting machine having a carriage, a tabulating mechanism including, in combination, a dog on the carriage, a series of column stops upon the framework of the

machine adjustable independently of one another in the direction of travel of the carriage, and a series of independently operable keys having connections to said stops, said connections constructed to permit adjustment of the stops while the keys remain stationary.

4. In a typewriting machine having a carriage, a tabulating mechanism including, in combination, a dog on the carriage, a series of column stops upon the framework of the machine adjustable independently of one another in the direction of travel of the carriage, and a series of independently operable keys having connections to said stops, said connections including a set of links and a set of levers, the members of one of said sets movable laterally to accommodate the adjustment of the column stops.

5. In a typewriting machine having a carriage, a tabulating mechanism including, in combination, a dog on the carriage, a series of normally ineffective column stops upon the framework of the machine and independently adjustable in the direction of travel of the carriage, a series of key-operated levers, and links connecting said levers to said column stops to move any column stop into the path of said dog.

6. In a typewriting machine having a carriage, a tabulating mechanism including, in combination, a dog on the carriage, a series of normally ineffective column stops upon the framework of the machine and independently adjustable in the direction of travel of the carriage, a series of key-operated levers, and links connecting said levers to said column stops to move any column stop into the path of said dog, said levers mounted upon the framework of the machine, and said links capable of lateral vibration to accommodate the adjustment of the dogs along the path of the carriage.

7. In a typewriting machine, the combination with a carriage having a dog, 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 stop, connections to enable any selected key to set its stop into the path of said dog, said connections including parts movable laterally to accommodate the adjustment of the column stops along the path of travel of the carriage while the keys remain stationary, and carriage releasing mechanism operable by said keys.

8. In a typewriting machine, the combination with a carriage having a dog, 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 stop, connections to enable any selected key to set its stop into the path of said dog, said connections including parts movable laterally to accommodate the adjustment of the column

stops along the path of travel of the carriage, 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 having means upon the rocking frame to set said series of stops simultaneously to positions where they will be effective in succession upon the repeated rocking of said frame.

9. In a typewriting machine, the combination with a carriage having a dog, 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 stop, connections to enable any selected key to set its stop into the path of said dog, said connections including parts movable laterally to accommodate the adjustment of the column stops along the path of travel of the carriage, 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 having means upon the rocking frame to set said series of stops simultaneously to positions where they will be effective in succession upon the repeated rocking of said frame, loose connections being provided between the stops and said series of keys to permit the independent operation of the rocking frame by said auxiliary key.

10. In a typewriting machine having a carriage, a tabulating mechanism including, in combination, a dog on the carriage, a series of column stops upon the framework of the machine adjustable independently of one another in the direction of travel of the carriage, and a series of independently operable keys having connections to said stops, said connections including a set of links and a set of levers, the members of one of said sets movable laterally to accommodate the adjustment of the column stops, said links having key-hole slots in their ends, whereby they are detachably connected to handles projecting from said stops.

11. In a tabulating mechanism, the combination with a carriage, of a letter-feeding mechanism, a dog on the carriage, a rack on the framework of the machine, a series of column-stops adjustable along the rack and constructed to be held by the rack against displacement, 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 stops, said connections including parts that are movable to accommodate adjustment of the stops along the rack, each stop operated by its connected key, while the other stops remain out of effective position, and means rendered effective by pressure

upon any key for releasing the carriage from the control of the letter-feeding mechanism.

12. In a tabulating mechanism, the combination with a carriage, of a letter-feeding mechanism, a dog, a 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-pieces connected to said column-stops by connections which permit adjustment of the column-stops along the path of travel of the carriage while the keys remain stationary, 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 finger-pieces, and a carriage-releasing mechanism controlled by said bar.

13. In a tabulating mechanism, the combination with a carriage and a letter-feeding mechanism, of a dog, 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 stops to effective position; mechanical connections extending from said column-stops to independently operable keys and constructed to accommodate the adjustment of the stops in the direction of the travel of the carriage while the keys remain stationary.

14. In a tabulating mechanism, the combination with a carriage and a letter-feeding mechanism, of a dog, 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 stops to effective position; mechanical connections extending from said column-stops to independently operable keys and constructed to accommodate the adjustment of the stops in the direction of the travel of the carriage while the keys remain stationary, and a carriage releasing mechanism operable by said keys through said stops.

15. In a tabulating mechanism, the combination with a carriage and a letter-feeding mechanism, of a dog, a rocking frame including 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, means
5 preventing displacement of the column-stops along the bar while they are so held by said springs, and a key having a flexible connection to each stop to permit the adjustment of the latter along said bar, the stops
10 being movable by said keys to effective positions, and said frame being movable by pressure upon any of said keys.

16. In a tabulating mechanism, the combination with a carriage having a dog, of a
15 series of column-stops, a bar for the column-stops, means for holding each column-stop in either of two normal positions relatively to said dog, keys having flexible connections

to said stops to accommodate adjustment of the latter along the bar and to move any
20 stop from one normal position into a position to cooperate with said dog, and means to turn said bar; the latter connected to said stops to move them to the other of said normal positions, an auxiliary key, con-
25 nected to the column stops to move them simultaneously from the last-mentioned position into the path of said dog, and a carriage-releasing mechanism operated either by said auxiliary key or by any of the keys
30 of said series.

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Witnesses:

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