

A. W. SMITH.  
TYPE WRITING MACHINE.  
APPLICATION FILED SEPT. 23, 1908.

974,836.

Patented Nov. 8, 1910.

3 SHEETS-SHEET 1.

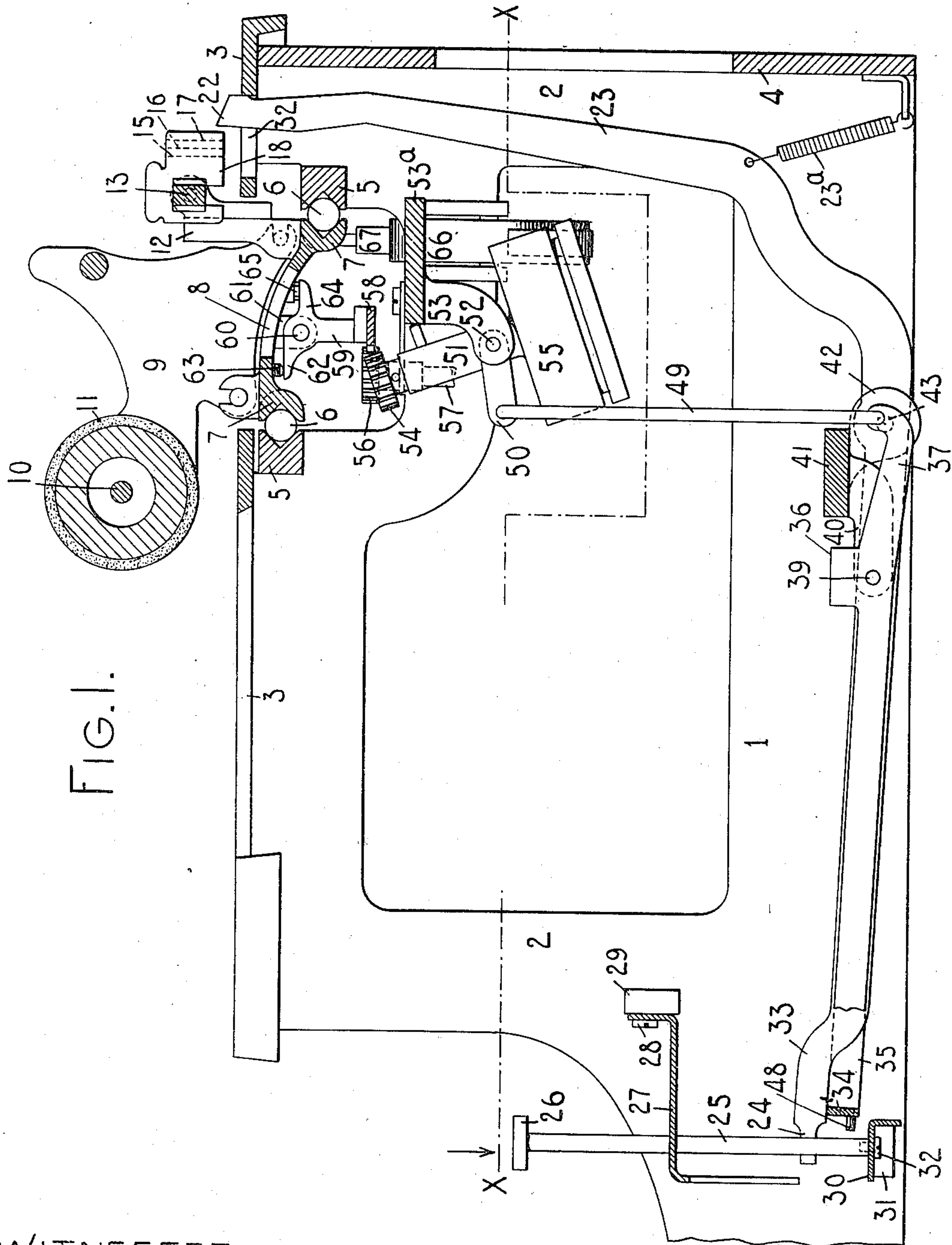


FIG. 1.

WITNESSES:

E. M. Wells.

Arthur W. Smith

INVENTOR:

Arthur W. Smith

By Jacob F. Felt

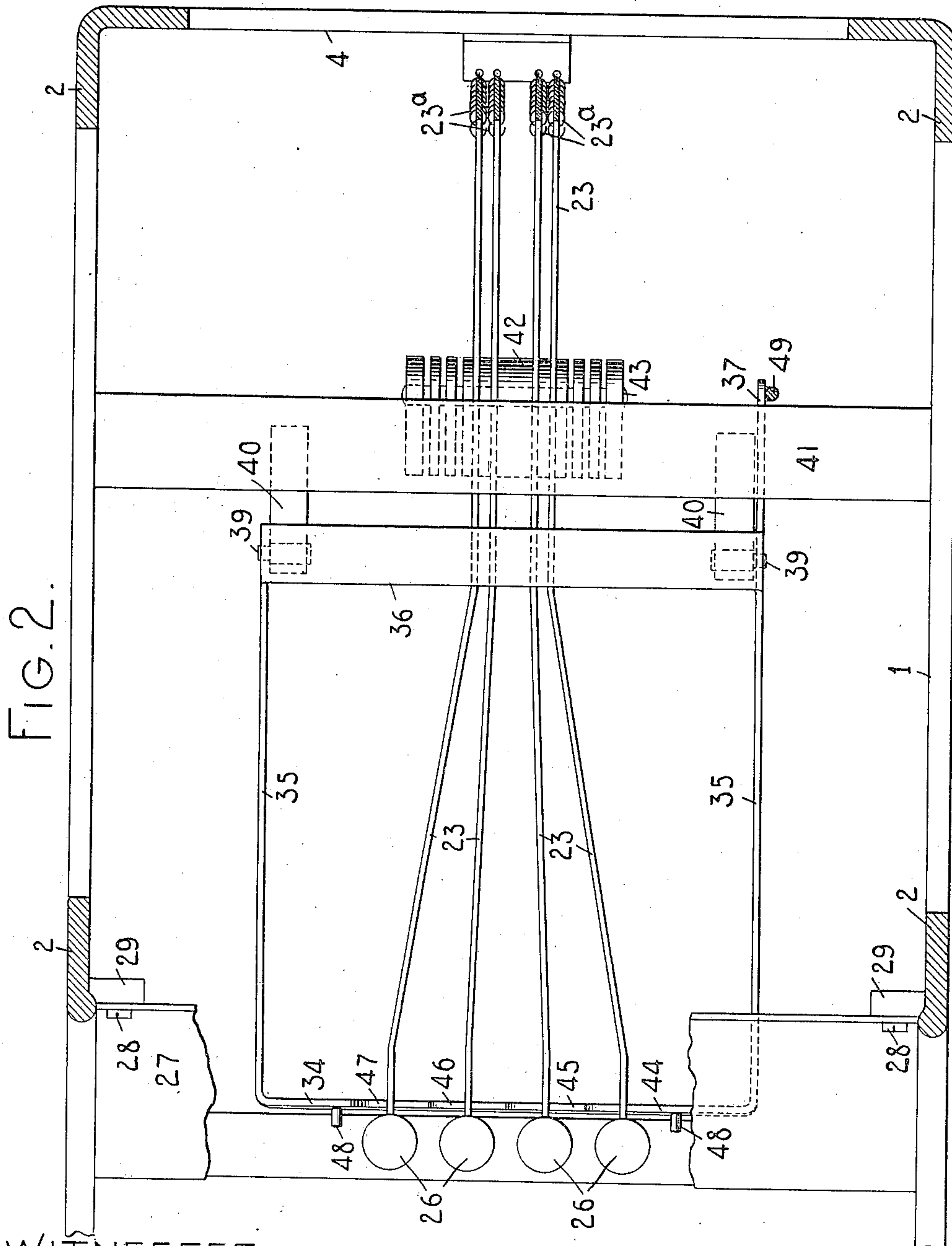
HIS ATTORNEY

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WITNESSES:

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3 SHEETS—SHEET 3.

FIG. 3.

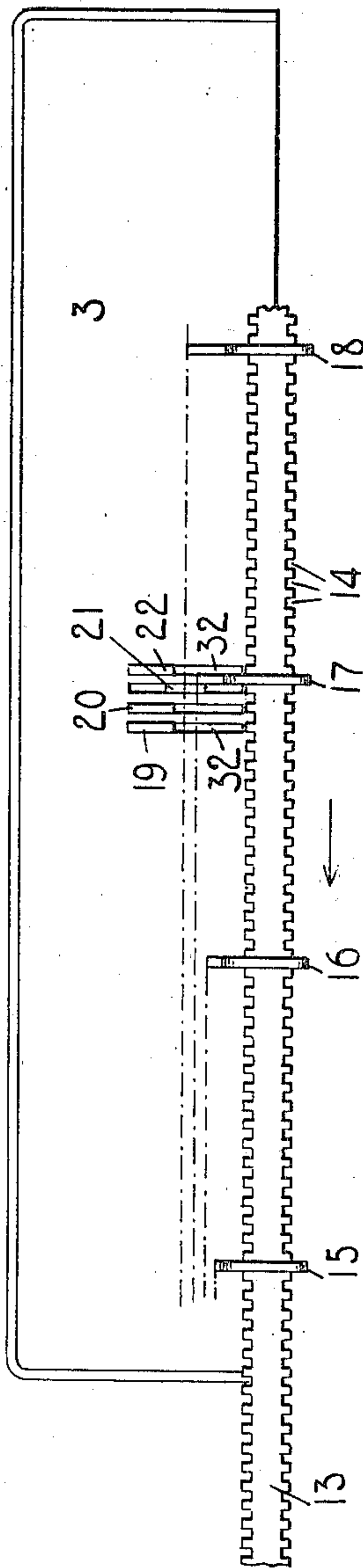
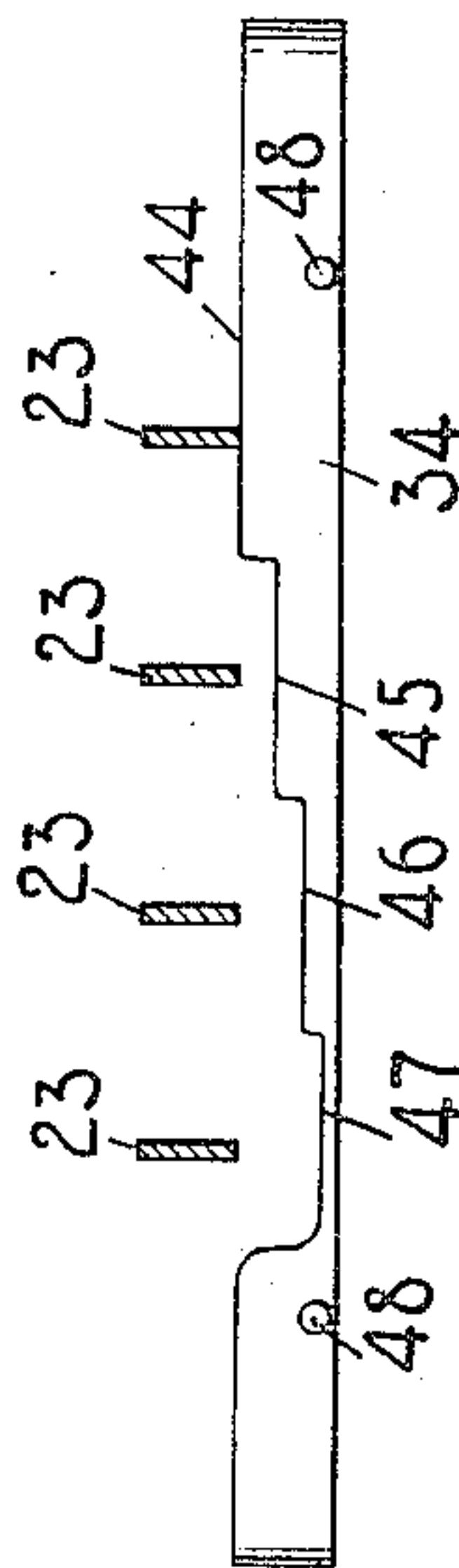
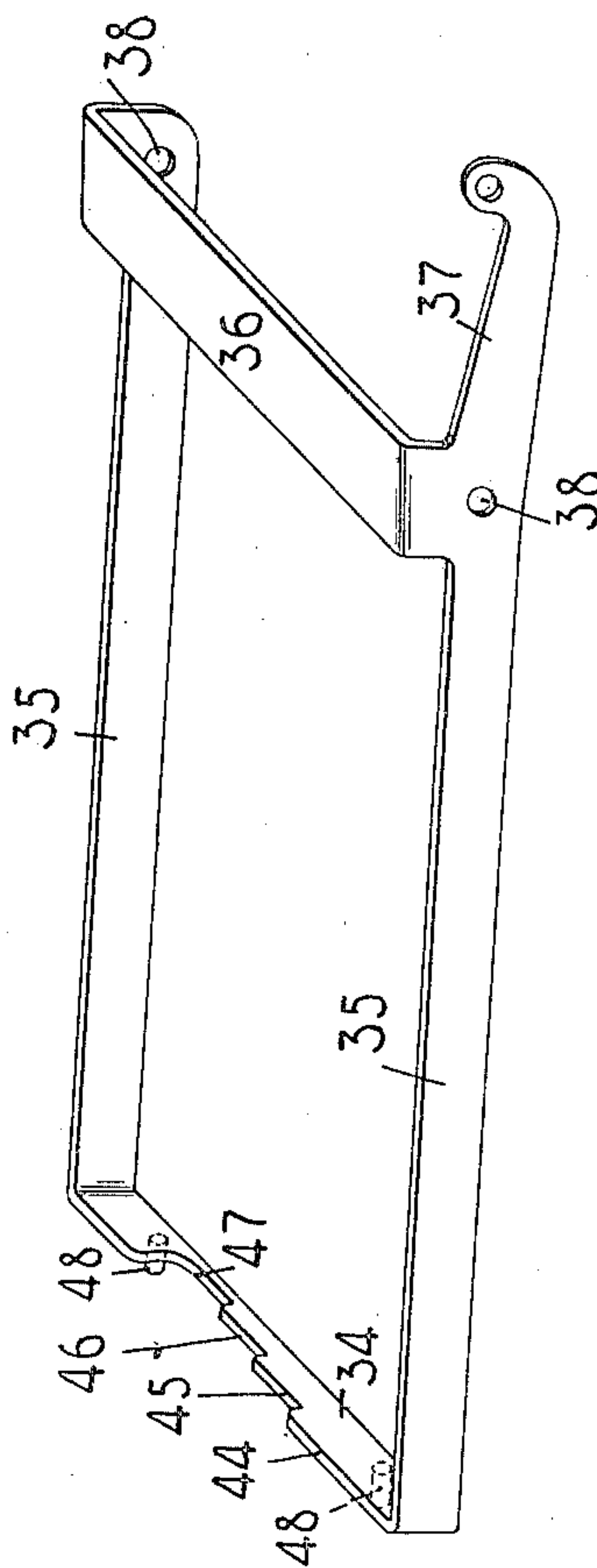


FIG. 4.



50



INVENTOR:

Arthur W. Smith

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# UNITED STATES PATENT OFFICE.

ARTHUR W. SMITH, OF NEW YORK, N. Y., ASSIGNOR TO YOST WRITING MACHINE COMPANY, OF ILION, NEW YORK, A CORPORATION OF NEW YORK.

## TYPE-WRITING MACHINE.

974,836.

Specification of Letters Patent.

Patented Nov. 8, 1910.

Application filed September 23, 1908. Serial No. 454,358.

*To all whom it may concern:*

Be it known that I, ARTHUR W. SMITH, citizen of the United States, and resident of the borough of Manhattan, city of New York, in the county of New York 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.

The object of my invention is to provide simple and efficient tabulating mechanism for arresting the carriage at any desired column without first arresting the carriage at preceding columnar fields.

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 to be hereinafter described and particularly pointed out in the appended claims.

In the accompanying drawings wherein like reference characters indicate corresponding parts in the various views, Figure 1 is a vertical front to rear sectional view of one form of typewriting machine embodying my invention, parts unnecessary to an understanding of my invention being omitted. Fig. 2 is a horizontal sectional view of the same taken on the line  $x-x$  of Fig. 1 and looking in the direction of the arrow at said line. Fig. 3 is a fragmentary detail plan view showing the stops and some of the associated parts. Fig. 4 is a detail front view partly in section showing the arrangement of the key levers and the universal bar of the releasing mechanism. Fig. 5 is a detail perspective view of the universal bar and part of the carriage releasing mechanism.

I have illustrated my invention in the present instance in a front-strike machine although it should be understood that the invention may be embodied in various styles of typewriting machines.

The frame of the machine comprises side plates 1 formed with corner posts 2 which support a top plate 3. A rear connecting plate 4 is connected to the side plates. The side plates support fixed guide rails 5 grooved on opposite sides thereof for co-operation with anti-friction balls or rollers

6 which are also received in oppositely disposed grooved rails or bars 7 forming part of a carriage truck 8 on which a platen frame 9 is supported. The platen frame has bearing openings which receive a platen shaft 10 that carries a cylindrical platen 11.

The construction of the carriage and the parts associated therewith are or may be essentially the same as those shown in the application of Oscar Woodward, Serial No. 362,734, filed March 16th, 1907. The carriage truck is provided with upwardly extending risers or lugs 12 which support a column stop bar 13 slotted on opposite sides thereof to provide interdental spaces 14 in which bifurcated column stops 15, 16, 17 and 18 are received. These column stops with their contact faces in different parallel planes are graduated, projecting rearwardly varying distances at the contact or stopping portions thereof as indicated in Fig. 3. Column selecting stops 19, 20, 21 and 22 are provided, each for coöperation with an individual column stop. In the present instance these column selecting stops 19 to 22 are formed as integral parts of four bell crank key levers 23, the stops consisting of the upper ends of the upright members of said bell crank key levers. The forward ends of these bell crank levers are reduced at 24 and extend through openings in key stems 25 provided at the upper ends thereof with column selecting key heads 26. The key stems are received and guided in openings in an angular plate 27 secured by screws 28 to inwardly projecting lugs 29 which extend from the frame of the machine. The lower ends of the key stems likewise extend through and are guided in openings in a guide plate 30 secured to inwardly extending lugs 31 on the side plates of the frame. Each key stem is tapped at its lower end to receive a headed screw 32 by which the key stems are prevented from being withdrawn from the guide plate 30. The forward horizontal end portions of the bell crank levers are fanned outwardly as indicated in Fig. 2 in order to provide sufficient space for the keys, although the stopping portions 19 to 22 of the levers are closely assembled as indicated in Fig. 3, and are guided in slots 32 in the top plate of the machine. The forward end portions of the bell crank levers are bent upwardly as indicated



at 33 and extend over a universal bar 34 for the carriage release mechanism. This universal bar is formed as a front cross bar of a rectangular frame having side arms 35 united by a rear cross bar 36 and provided with a rearwardly extending arm 37. The side arms 35 are apertured at 38 to receive pivots 39 projecting outwardly from brackets 40 extending downwardly and forwardly from a cross bar 41 carried by or formed as a part of the carriage frame. This cross bar carries or has formed as a part thereof a depending bearing portion 42 provided with slots in which the bell crank key levers are received, a pivot 43 extending through the bearing portion and through bearing openings in the bell crank levers to pivotally support the levers. The forward ends of the bell crank levers extend over the universal bar 34 and are arranged at the same elevation. The bar itself is step-shaped to provide contact faces 44, 45, 46 and 47 at varying distances from the series of key levers as clearly indicated in Fig. 4. Stop pins 48 extend forwardly from the universal bar for coöperation with the guide plate 30 to limit the universal bar and the parts connected therewith in the downward movement of the universal bar. An upwardly extending link 49 is connected to the rearwardly projecting arm 37 of the universal bar frame and to a forwardly projecting crank arm 50 of a swinging member 51 pivoted at 52 to a bracket 53 secured to a cross bar 53<sup>a</sup> fixed to the frame of the machine. The member 51 receives a shaft which turns therein and is provided at its upper end with a pinion 54 and at its lower end with a rotating device which turns within a drum 55 carried by or formed as a part of the device 51. This mechanism constitutes a combined carriage releasing and carriage retarding device and may be constructed in the manner shown and described in the application of Oscar Woodward, Serial No. 415,372, filed Feb. 11, 1908, although, so far as the present invention is concerned, any suitable carriage releasing mechanism may be employed. A feed pinion 56 is connected to the upper end of a shaft 57 connected at its lower end to suitable feed mechanism (not shown). The feed mechanism may be of the same general character as that disclosed in the application of Oscar Woodward, Serial No. 415,373, filed Feb. 11, 1908. The feed pinion 56 is adapted to mesh with a feed rack 58 carried by depending arms 59 pivoted at 60 to lugs 61 which project downwardly from the carriage truck. Forwardly extending arms 62 coöperate with screw stops 63 to limit the movement of the arms and the rack carried thereby in one direction. Rearwardly projecting arms 64 coöperate with leaf springs 65 by means of which the feed rack is nor-

mally pressed into engagement with its feed pinion 56.

An actuation of one of the column selecting keys 26 is effective to move the associated bell crank lever against the force of its restoring spring 23<sup>a</sup>. The effect of this is to move the associated column selecting stop forwardly a given distance into the path of the column stop 15, 16, 17 or 18 with which the particular column selecting stop which has been actuated co-acts. The extent of forward movement given to the different column selecting stops is determined by the universal bar 34 which is arrested through the coöperation of the stops 48 with the guide plate 30 and which arrests the actuated column selecting stop lever and the parts controlled thereby. Thus, for instance, if the column selecting key 26 controlling the column selecting stop 21 be actuated the effect will be to bring the lever for said stop (which is the second from the right) into contact with the face or stop 45 on the universal bar after a slight movement of the lever has taken place. As the forward end of the lever continues to descend it will carry the universal bar with it until the universal bar is arrested by the coöperation of the stops 48 with the guide plate 30. This arrest of the parts is effected when the column selecting stop 21 has been moved far enough forward to co-act with the column stop 17 as shown in Fig. 3, although it remains out of the path of the column stops 15 and 16 and when the carriage is released the columns controlled by the stops 15 and 16 will be skipped and the carriage arrested after a single run at the paper columnar field. It will be understood that the universal bar is not taken up by the actuation of the lever until the lever has received a partial movement to compensate for the difference in the throw of the different column selecting levers and so that the carriage releasing mechanism will not be actuated until at or about the time that the column selecting stop is interposed in the path of the column stop with which it co-acts. A depression of the column selecting key is effective to elevate the link 49, thus transmitting movement to the device 51 to turn it on its pivot 52, thus moving the pinion 54 into engagement with the feed rack and forcing the feed rack out of engagement with its pinion 56, thereby releasing the carriage from control of the escapement or step-by-step feed mechanism and placing it under control of the rotary carriage retarding device which rotates within the drum 55. When the carriage is thus released it will be moved by the power applied thereto by a spring drum 66 connected to the carriage by a band 67 and the carriage will continue to move from right to left until arrested by the coöperation of the



column selecting stop with the particular column stop with which it co-acts.

It will be observed that although there is a uniform extent of movement of the universal bar effected by all of the key levers, nevertheless, the stepped face of the universal bar provides differential mechanism whereby different extents of movement may be given to the column selecting stops before they are arrested by the universal bar and the means by which it is arrested. It will also be observed that each column selecting stop has a uniform or fixed extent of movement although the different column selecting stops move different distances and notwithstanding the movement of the column selecting stops and their actuating levers different distances the carriage is always released at the proper instant, at or about the time the stops are brought into operation. The construction is such that there is no liability of an overthrow, or movement of the selecting mechanism to a position other than that intended; each column selecting key controlling its individually operable column selecting stop and each of said stops being moved only a predetermined distance to co-act with its particular column stop.

Various changes may be made without departing from the spirit and scope of my invention.

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

1. In a typewriting machine, and in tabulating mechanism, the combination of a carriage, step-by-step feeding mechanism therefor, a set of column stops, a plurality of co-operating stops, each of said last recited stops being coöperative only with certain of said column stops to arrest the carriage in a predetermined columnar field after the carriage has been released from its step-by-step feeding mechanism, intermediate fields being skipped or passed, and variably-actuated carriage-releasing means.

2. In a typewriting machine and in tabulating mechanism, the combination of a carriage, step-by-step feeding mechanism therefor, a set of column stops having contact surfaces in different paths, a plurality of co-operating stops, each of said last recited stops being coöperative only with certain of said column stops to arrest the carriage in a predetermined columnar field after the carriage has been released from its step-by-step feeding mechanism, intermediate fields being skipped or passed, and variably-actuated carriage-releasing means.

3. In a typewriting machine and in tabulating mechanism, the combination of a carriage, step-by-step feeding mechanism therefor, a set of column stops, a plurality of co-operating stops having unvarying extents of movement, each of said last recited stops

being coöperative only with certain of said column stops to arrest the carriage in a predetermined columnar field after the carriage has been released from its step-by-step feeding mechanism, intermediate fields being skipped or passed, and variably-actuated carriage-releasing means.

4. In a typewriting machine and in tabulating mechanism, the combination of a carriage, step-by-step feeding mechanism therefor, a set of column stops, a plurality of co-operating stops, each of said last recited stops being coöperative only with certain of said column stops to arrest the carriage in a predetermined columnar field after the carriage has been released from its step-by-step feeding mechanism, intermediate fields being skipped or passed, keys for actuating said coöperating stops, a universal bar taken up at different points in the depressions of said keys depending upon the key actuated, and carriage releasing mechanism controlled by said universal bar, said universal bar and releasing mechanism enabling the carriage to be released at a substantially uniform period with reference to the bringing of the stops into coöperative relation irrespective of which of the stops are brought into coöperative relation.

5. In a typewriting machine and in tabulating mechanism, the combination of a carriage, step-by-step feeding mechanism therefor, a set of column stops, a plurality of co-operating stops, each of said last recited stops being coöperative only with certain of said column stops to arrest the carriage in a predetermined columnar field after the carriage has been released from its step-by-step feeding mechanism, intermediate fields being skipped or passed, keys for actuating said coöperating stops, a universal bar having a uniform extent of movement, said universal bar being taken up at different points in the actuation of said keys depending upon the key actuated, means for limiting the movement of the universal bar and thereby limiting the movement of the keys and the stops controlled thereby, and carriage releasing mechanism controlled by said universal bar, said universal bar and carriage releasing mechanism enabling the carriage to be released at a substantially uniform period with reference to the bringing of the stops into coöperative relation irrespective of which of the stops are brought into coöperative relation.

6. In a typewriting machine, and in tabulating mechanism, the combination of a carriage, step-by-step feeding mechanism therefor, a set of column stops, a plurality of co-operating stops, each of said last recited stops being coöperative only with certain of said column stops to arrest the carriage in a predetermined columnar field after the carriage has been released from its step-by-step



feeding mechanism, intermediate fields being skipped or passed, key controlled tabulator levers for actuating said cooperating stops, a universal bar actuated by said levers and having a uniform extent of movement, differential means whereby said universal bar is taken up at different points in the actuation of the different levers, means for limiting the movements of the universal bar and thereby limiting the movements of the different levers and the different stops controlled thereby, carriage releasing means controlled by said universal bar, said universal bar, differential means and carriage releasing means enabling the carriage to be released at a substantially uniform period with reference to the bringing of the stops into cooperative relation irrespective of which of the stops are brought into cooperative relation.

7. In a typewriting machine and in tabulating mechanism, the combination of a power-driven carriage, a series of graduated column stops carried thereby, a series of bell-crank key levers carrying stops movable different distances and each movable an unvarying distance and cooperative only with certain of said column stops, a universal bar movable a uniform distance by the different levers, the different levers taking the universal bar up at different periods in the operation thereof, and carriage releasing mechanism controlled by said universal bar.

8. In a typewriting machine and in tabulating mechanism, the combination of a power driven carriage, a series of graduated column stops carried thereby, a series of bell crank key levers carrying stops movable different distances and each movable an unvarying distance and cooperative only with certain of said column stops, a universal bar having a stepped shaped contact face with which said levers cooperate, and a carriage

releasing device controlled by said universal bar.

9. In a typewriting machine and in a tabulating mechanism, the combination of a power driven carriage, a series of graduated column stops carried thereby, a series of bell crank key levers carrying stops movable different distances and each movable an unvarying distance and cooperative only with certain of said column stops, a universal bar movable by said key levers a uniform distance by the different levers, the different levers taking the universal bar up at different periods in the operation thereof, carriage releasing mechanism controlled by said universal bar, and arresting means for limiting the movement of the universal bar, thereby arresting said levers and the stops controlled thereby.

10. In a typewriting machine and in a tabulating mechanism, the combination of a power driven carriage, a series of graduated column stops carried thereby, a series of bell crank key levers carrying stops movable different distances and each movable an unvarying distance and cooperative only with certain of said column stops, a universal bar having a stepped shaped contact face with which said levers cooperate, a carriage releasing device controlled by said universal bar, and arresting means for limiting the movement of the universal bar, thereby limiting the movements of the levers and the stops controlled thereby.

Signed at the borough of Manhattan, city of New York, in the county of New York and State of New York, this 22nd day of September A. D. 1908.

ARTHUR W. SMITH.

Witnesses:

CHARLES E. SMITH,  
E. M. WELLS.