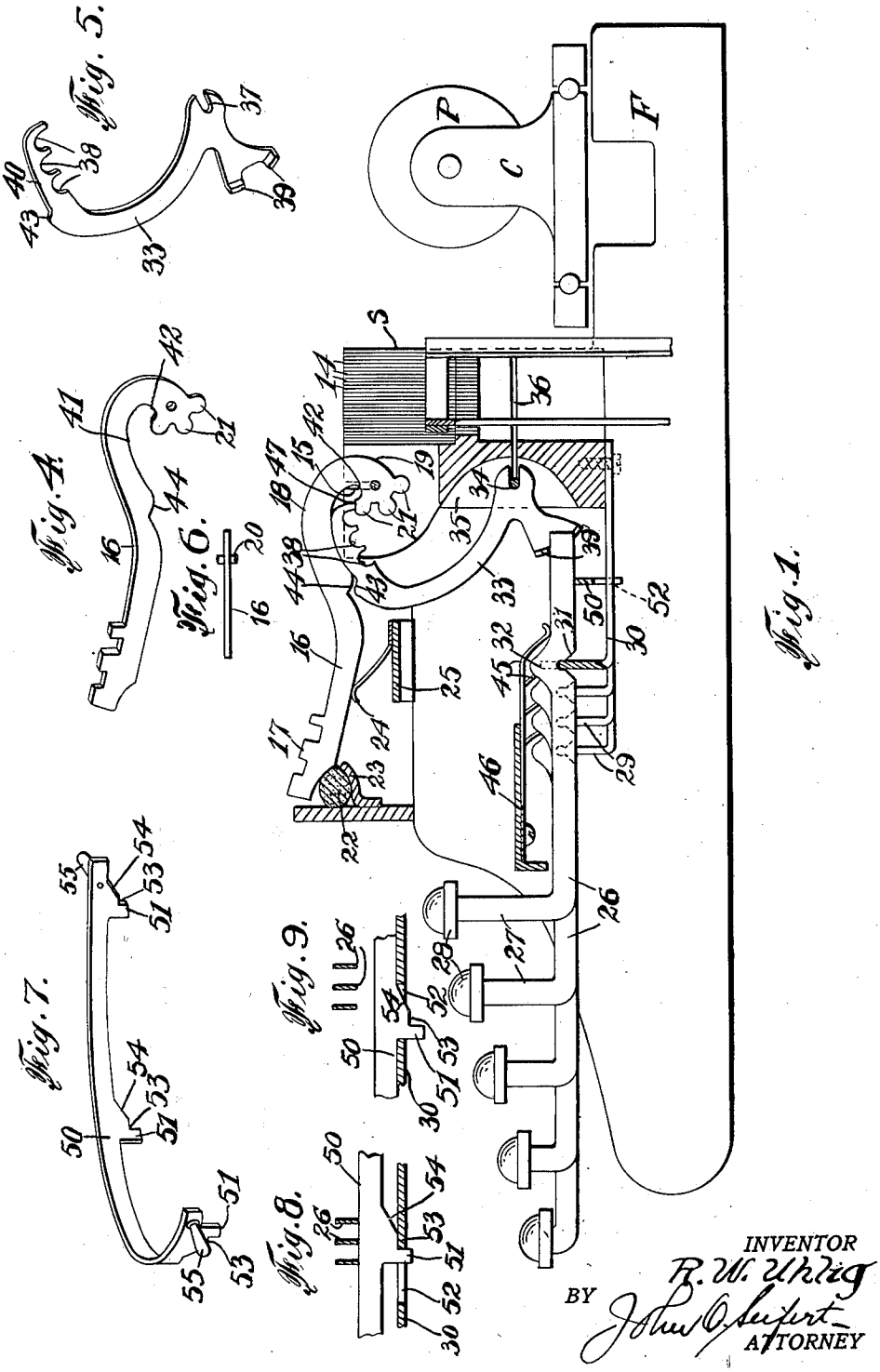
Dec. 10, 1929. R. W. UHLIG 1,738,677

TYPEWRITING MACHINE

Filed June 8, 1926 3 Sheets-Sheet 1



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TYPEWRITING MACHINE

Filed June 8, 1926 3 Sheets-Sheet 2

Fig. 2.

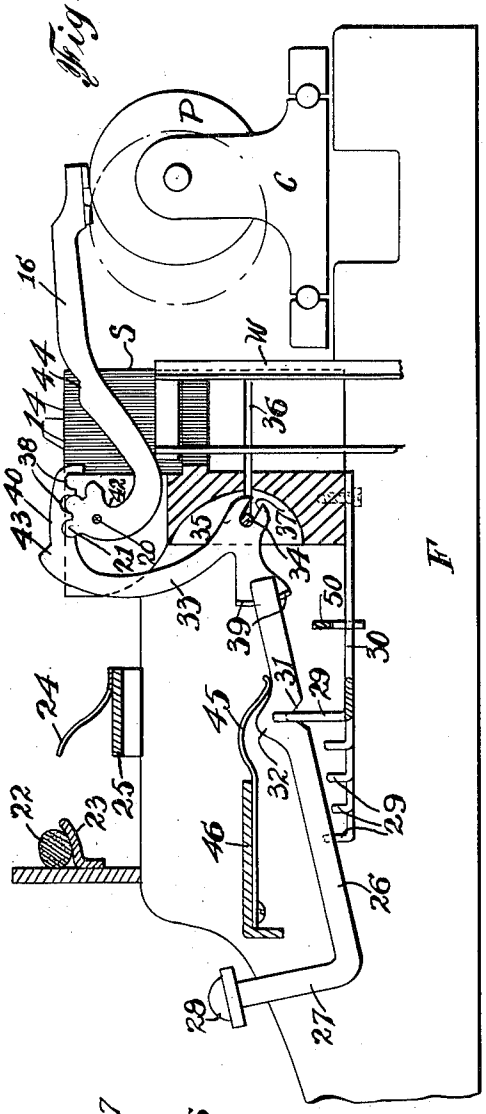


Fig. 11.

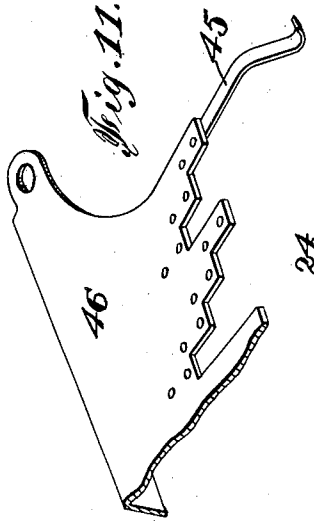


Fig. 12.

Fig. 10.

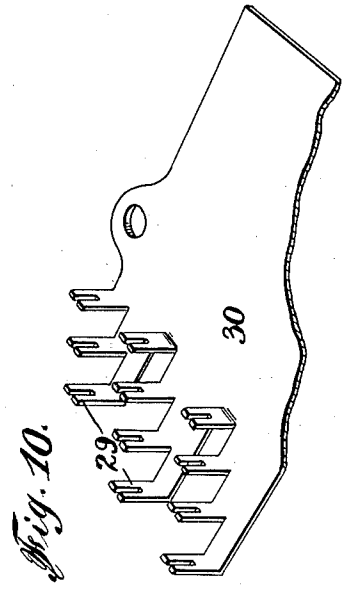
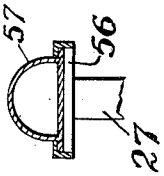


Fig. 13.



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TYPEWRITING MACHINE

Filed June 8, 1926 3 Sheets-Sheet 3

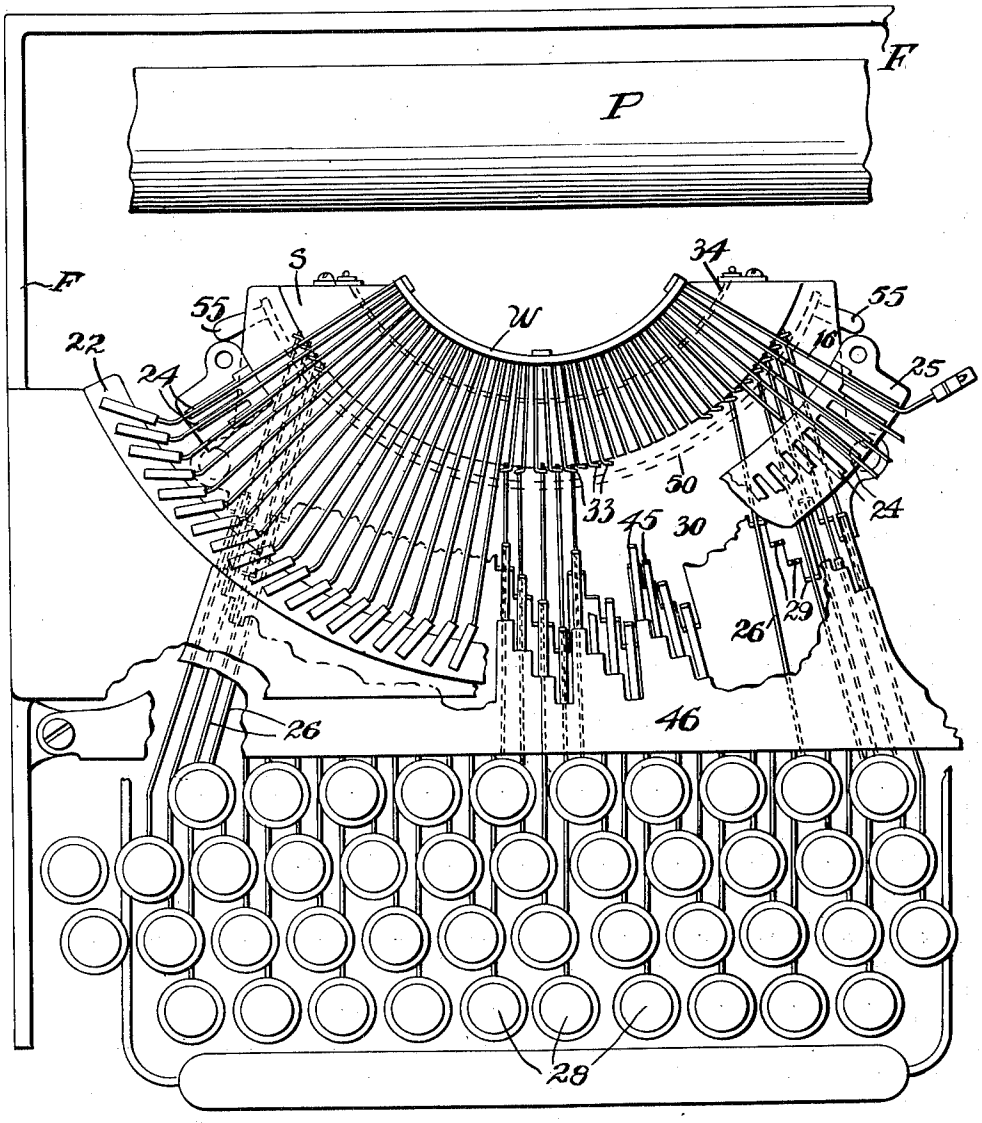

Fig. 3.

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UNITED STATES PATENT OFFICE

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TYPEWRITING MACHINE

Application filed June 8, 1926. Serial No. 114,380.

This invention relates to typewriting machines, and while it is applicable to what are termed visible typewriting machines in that type carrying bars strike against the paper on the platen with the writing within the vision of the operator, it is particularly applicable to typewriting machines of the down strike typebar class, and it is the primary object of the invention to provide an improved typebar action which is simple in structure in that the number of parts are reduced to a minimum, and thus enabling a compact construction and arrangement of parts.

It is a further object of the invention to provide a typebar action embodying three parts, a typebar, a key lever and an intermediate lever to operatively connect the key lever with and actuate the typebar, the parts being constructed and arranged whereby each of the parts may be individually removed and another part substituted therefor, and which also facilitates the alinement of the type on the typebar.

Another object of the invention relates to an improved fulcrum supporting means for the key levers in a typewriting machine.

A further object relates to an improved key adapted to be applied to various key operated means.

Other objects and advantages will hereinafter appear.

In the drawings accompanying and forming a part of this specification Figure 1 is a longitudinal sectional view taken substantially centrally through the machine and showing the parts in normal position, only so much of the machine being shown as is essential to an understanding of the invention.

Figure 2 is a view similar to Figure 1 but showing the positions the parts will assume when a typebar has been moved to printing position against the platen.

Figure 3 is a plan view with parts broken away to show the construction and arrangement of parts of the operative mechanism.

Figure 4 is a perspective view of a typebar forming a part of the present invention.

Figure 5 is a perspective view of a lever for connecting the key levers with the typebar and to actuate the latter through the operation of the key levers.

Figure 6 is an elevational view of the supporting end of a key lever to show the arrangement of a pivot pin carried thereby to pivotally support the typebar.

Figure 7 is a perspective view of an adjustable stop or abutment for the key levers to limit the downward movement of the ends of the levers opposite the casing.

Figure 8 is a detail sectional view of a portion of the stop bar shown in Figure 7 with the mounting thereof in relation to the key levers and showing the same in position to limit the downward movement of the rear ends of said levers.

Figure 9 is a view similar to Figure 8 but showing the stop bar adjusted to another position to permit of the downward movement of the rear ends of the key levers beyond their normal position.

Figure 10 is a perspective view of a portion of a plate arranged with posts upon which the key levers are fulcrumed.

Figure 11 is a perspective view of a portion of a plate arranged for the mounting of springs thereon to return the key levers to normal position.

Figure 12 is a perspective view of a portion of a resilient or yielding buffer for engagement of the typebars when returned to normal position of rest and which also serve to facilitate the initial movement of the typebars to the printing position, and

Figure 13 is a sectional side elevation showing an improved arrangement of finger key applied to the key levers.

In carrying out the invention there is provided a suitable framework (designated in a general way by F) arranged at the rear with the support for a carriage C to have longitudinal sliding movement transversely of the machine with a cylindrical platen P rotatably mounted in said carriage, means for letter spacing the platen carrying carriage actuated from a universal bar W actuated by the engagement of the typebars as they are moved to printing position on the platen being provided, as well as means to line space the platen and feed paper around the same, but as said

features do not constitute a part of the present invention illustration and description thereof is not deemed necessary.

A segment S is fixed in the framework in a suitable manner, said segment having radial slots 14 cut into the top thereof with a transverse arcuate recess 15 cut into the top of the segment transversely of the walls of the segment slots 14 to form seats for the pivot supports of typebars 16, as clearly shown in Figures 1 and 2. The typebars have a type carrying head 17 at one end, the opposite end being of irregular curved form first curving in a direction forwardly of the face of the type carried by the bar, as at 18, and then rearwardly, as at 19, with a pivot pin 20 fixed in an opening therein to extend from opposite sides of the typebar for engagement in a slot 15 in the opposite walls of a slot in the segment for pivotally supporting the typebars in said segment slots. The typebars at said end have circularly arranged cogs 21, there being three in number and of circular shape with the center of the radius of the pitch line of said cogs in the center of the pivot pin or support 20 of the typebars. In the normal position of rest of the type bars the ends of the typebars at the rear of the type carrying heads engage a cushion rest 22 arranged in the arc of a circle coincident with the curvature of the typebar carrying segment and supported upon a shelf 23 fixed to and within the front upright wall of the framework, the typebars also being supported intermediate the type carrying ends and pivot support by a yielding buffer in the form of spring fingers 24 arranged on a plate in the form of a comb (Figure 12) mounted upon a supporting member 25 fixed upon the framework. Said spring fingers not only serve to yieldingly support the typebars but also to facilitate the initial movement of the typebars from position of rest to the printing position against the platen.

The typebars are actuated by parallely arranged levers 26 having right angle portions 27 at the forward ends carrying finger keys 28. The key levers as shown are of variable length and by the arrangement of the right angle portions of different lengths the keys are arranged in parallel and banked rows. The key levers are pivotally supported or fulcrumed at a point intermediate their ends whereby the key ends of all of the levers are adapted to have a depressing movement or be depressed to an equal extent and the opposite ends an ascending movement of equal extent proportional to the depression of the key levers. For this purpose the levers are fulcrumed in bifurcations in the ends of vertical posts 29 bent upward at a right angle from a plate 30 fixed to the bottom and extending forwardly of the segment S. These posts are arranged in a plurality of series of four posts to each series and stepped forwardly as shown in Figures 2 and 10. The levers are each arranged with a V-recess 31 in the lower edge with a rounded portion at the juncture of the sides or bottom of the recess, said recess being located opposite to a laterally extended portion 32 of the levers. The levers by engaging between the legs of the bifurcation of the posts are prevented from having lateral or canting movement, and by the arrangement of the rounded portion at the bottom of the lever recess 31 in which the connecting portion of the bifurcation of the posts engages the levers are prevented from having longitudinal movement while at the same time permitting the same to have free rocking movement.

The key levers are connected to and actuate the typebars by means of intermediate levers 33 (Figures 1,2 and 5) pivotally mounted or fulcrumed upon a pivot rod 34 arranged in the segment S below and in parallel relation to the typebar pivot engaging recesses 15. The segment is arranged with slots 35 in the forward side and below the typebar engaging slots for the engagement of that portion of the levers 33 by which they are mounted upon the fulcrum rod 34. The recess in the segment S for the engagement of the fulcrum rod 34 is formed by cutting a slot 36 in the rear of the segment of less width than the diameter of the fulcrum rod and then rounding and enlarging the bottom of the slot by a rounded nose tool. The fulcrum rod is then engaged endwise into said slot and as the rod is of greater diameter than the width of the slot 36 it cannot be laterally displaced from said slot by any rearward force exerted thereon by the levers 33. To mount the levers on the fulcrum rod 34 a recess 37 is cut into the edge of the levers, said portions of the levers being engaged in the segment slots 35 and the lever recesses engaged over the fulcrum rod 34, as shown in Figures 1 and 2, lateral pressure upon the levers, hereinafter described, maintaining the same in position upon the fulcrum rod. The levers each having an arm extending upward from its fulcrum support forwardly of the typebar support and having a curved and rearwardly extending sector portion with notches or spaces 38 for engagement of the typebar cogs 21. The other arms of the levers are arranged with laterally extending and spaced ears 39 between which ears the ends of the key levers slidably engage. As the key end of the levers are depressed the ascending rear ends of the levers will rock the intermediate levers in an upward direction moving the sector portion of the levers rearwardly of and over the pivot support of the typebars and the notches 38 thereof into engagement with the typebar cogs moving the typebars from the Figure 1 to the Figure 2 position; that is, from normal position of rest to printing position upon the platen. The outer edge 40 of

the notched portion of the lever sector is of curved form to correspond with a curved edge portion 41 of the typebars and said curved portions of the levers and typebars are adapted to be in sliding engagement with the typebars in normal position of rest as shown in Figure 1. The curved portion 41 of the typebar with the first cog on the typebar forms a recess 42. During the initial movement of a lever 33 imparted thereto by a key lever the curved portion 40 of the levers will move along the curved portion 41 of the typebar until a shoulder 43 on the lever comes into engagement with a shoulder 44 on the typebar when the initial movement will be imparted to the typebar, this movement being facilitated through the tension of the buffers or spring fingers 24. When the end of the sector portion of the levers engages the typebar recess 42 the sector notches are moved into engagement with the typebar cogs thereby moving the typebar with an accelerated movement to the printing position on the platen. As the last typebar cog engages with the last notch 38 of the lever sector the rear wall of said notch will serve as an abutment for engagement with the cog and through the movement of the parts thereby forcibly impinge the typebar against the platen particularly adapting the machine for manifold writing. It will be noted that the notched portion of the lever sector engages over the cog end of the typebar at all times thereby maintaining the typebars seated in the recess 15. and said portion of the lever engaging in the slot of the segment S with its associated typebar is guided and at all times maintained in operative relation with the typebar. Return movement is imparted to the key levers and thereby to the typebars by springs 45 fixed to a plate 46 extending transversely of and above the key levers the free ends of the springs engaging with the levers at the side of the pivotal support thereof opposite to the keys and intermediate the fulcrum posts 29 and the connection of the levers with the intermediate levers. The end wall of the end notch 38 in the lever sector is flattened and the first cog of the typebar cogs has one side flattened or cut away and as the typebars are returned to position of rest these flattened portions are brought into engagement, as shown at 47 in Figure 1, thereby locking the typebars in position of rest and preventing any rebound of the typebars by the engagement thereof with the resilient buffers or spring fingers 24.

The downward movement of the rear ends of the key levers as well as the ascending or upward movement of the key ends of the levers is limited by an abutment or stop in the form of a bar 50 arranged in the arc of a circle (Figures 1 and 7) interposed between the rear ends of the levers and the fulcrum post carrying plate 30. The major portion of this stop bar is of a width less than the space between the levers and the plate 30 and to position the same so that it will serve as an abutment for engagement of the key levers and prevent the rear ends from moving downward beyond a horizontal plane with the key levers in normal position as shown in Figure 1, this bar is arranged at opposite ends and intermediate the ends with lugs or projections 51 to extend laterally from one edge and downwardly in operative position, as viewed in Figure 1, with the lugs engaging in openings 52 in the plate 30 elongated relative to the lugs with a shoulder 53 on the bar projections engaging upon the plate, as shown in Figure 8. The juncture of said shoulder 53 with the body of the bar is arranged at an angle 54 for a purpose to be hereinafter described. To facilitate the removal of the typebars or the typebar actuating levers 33 the stop bar 50 is adjusted longitudinally to the left, as viewed in Figures 3 and 8, which adjustment is facilitated by finger grips 55 at opposite ends of the bar. By this movement of the bar the shoulder 53 rides off from the plate 30 permitting the bar to move downwardly, this movement being gradual due to the incline portions 54 until the body portion of the bar rests upon the plate 30, as shown in Figure 9. In this position of the stop bar the key end of the lever may be raised sufficiently to impart movement to the levers 33 to move the same out of engagement with the first typebar cog when a typebar may be lifted upwardly out of the recesses 15, and to remove the lever it is only necessary to move the same forwardly disengaging it from the fulcrum rod 34. It will be obvious that a typebar or lever may be as readily replaced.

It will be noted that the typebar as it travels from its position of rest to the printing position on the platen travels substantially through an arc of 180 degree with the type ends striking downward on top of the platen and in order to bring the line of writing into the vision of the operator the machine is supported whereby the rear portion of the machine may be elevated or lowered variable distances and thereby change the focal position of the line of writing on the platen relative to the operator, said means constituting the subject-matter of invention of my copending application Serial No. 10,750. To facilitate the depressing of the key levers by the fingers said keys are arranged with convexedly formed caps. For this purpose a disk 56 is fixed to the ends of the angle portion of the levers (Figure 13). A member 57 having a convex surface and substantially of semi-spherical form is juxtaposed to the disk 56 with the flattened portion contiguous to said disk and secured thereto by an annular member of angle shape in cross section, said member engaging about and having a driving fit

with the periphery of the disk and the angle portion extending inwardly and over an annular flange extending laterally of the member 57. The member 57 is preferably made of suitable cushioning material, such as rubber, and may be of hollow form as shown.

Having thus described my invention I claim.

1. In a typewriting machine, a typebar pivotally supported at one end and having cogs circularly disposed about its pivoted end, said end portion of the typebar being arranged of arcuate form, a lever one arm of which is in the form of a sector with the outer edge arranged of arcuate form to correspond with and engage the arcuate portion of the typebar to impart the initial movement thereof to printing position and having notches in the inner edge opposite the arcuate portion adapted to be brought into engagement with the cogs of the typebar to impart the final movement of the typebar to printing position and move the typebar from printing position, and a key lever to actuate the sector lever.

2. In typewriting machines, a pivotally supported typebar having cogs circularly disposed about its pivotal support and an arcuate portion disposed oppositely to said cogs, an oscillatory lever arranged at one end with a laterally extending sector the outer edge of which is of arcuate form for engagement of the arcuate portion of the typebar to impart the initial movement of the typebar to printing position, and having notches in the inner edge of the arcuate portions for engagement of the typebar cogs to impart the final movement of the typebar to printing position and impart return movement to the typebar, and a key lever connected to said lever for actuating the same.

3. In typewriting machines, a typebar pivotally supported at one end and carrying a type head at the opposite end, a key lever operatively connected with the typebar, a fixed support for engagement of the type head carrying end and support of the typebar in its normal position of rest, and means intermediate said support and the pivotal support of the typebar for engagement of the typebar thereon previous to its engagement with the support to counterbalance the weight of the typebar and facilitate the imparting of the initial movement of the typebar to printing position.

4. In typewriting machines as claimed in claim 1, a fixed support for the engagement and support of the typebar in the normal position of rest thereof, a resilient buffer for engagement of the typebar thereon intermediate its ends previous to its engagement with the support to counterbalance the weight of the typebar and facilitate the starting of the typebar in its movement to printing position, said sector and a cog of the typebar being arranged to co-operate to hold the typebar against rebound as it engages the resilient buffer and support.

5. In typewriting machines, a fixed segment having radial slots arranged in a horizontally extending wall portion thereof and slots in the arcuate vertical wall of the segment below and in line with the first slots, typebars pivotally supported in said slots, each typebar having cogs disposed concentrically with the pivotal support thereof, levers pivotally supported in the vertical segment slots, one arm of each lever having a rearwardly extending notched sector arranged forwardly of the typebar support for engagement over and with the typebar cogs by a movement thereof in a direction toward the typebar to move the typebar to printing position and to return the typebar to position of rest by retrograde movement thereof, and key levers connected to the levers for actuating the same.

6. A typebar action for typewriting machines as claimed in claim 3, wherein the means for engagement of the typebars to counterbalance the typebars and facilitate the starting of the typebars to printing position, comprises spring fingers mounted on a fixed support.

7. In typewriting machines, a slotted segment, typebars pivotally mounted in the slots of the segment and arranged with cogs circularly disposed about the pivot support thereof, key levers, intermediate levers pivotally supported in slots of the segment intermediate the ends thereof, said levers being operatively connected at one end with the key levers and the opposite end arranged of arcuate form extending rearwardly and above the pivot ends of the typebars and having notches in the concave edge thereof, said lever sectors being normally positioned forward of the pivot supports of the typebars with the latter in position of rest and adapted to have rearward movement imparted thereto in a direction toward the pivot supports of the typebars to engage the notches thereof with the typebar cogs to move the typebars to printing position and to position of rest during the retrograde movement thereof, and operative to retain the typebars seated in the segment slots.

8. Typewriting machines as claimed in claim 5, wherein the pivot support of the levers in the segment slots below the typebar engaging slots comprises a rod extending transversely of the slots and in parallel relation to the pivotal support of the typebars, and the levers are arranged with recesses for engagement of said fulcrumed rod to mount the same thereon by the engagement of said levers into the lever slots of the segment.

9. Typewriting machines as claimed in claim 5, wherein the levers are fulcrumed on a rod extending transversely of the lever en-

gaging slots parallel to the pivot support of the typebars, the levers being arranged with recesses for engagement of said fulcrum rod by the engagement of the levers into the lever slots of the segment, and said levers having laterally projecting and spaced ears for the engagement of the key thereupon and arranged whereby the movement of the key levers exert a force thereon to maintain the levers in position on the fulcrum rod.

10. Typewriting machines as claimed in claim 13, wherein the key levers have recesses in the edge for engagement of the bifurcation of the fulcrum supports of the plate, springs engaging upon the levers at the side of the fulcrum support opposite to the key end of the levers to maintain the levers in operative relation to said supports, and means adjustably mounted on the fulcrum support carrying plate in the rear of the fulcrum supports operative in one position thereof to limit the upward movement of the key end of the levers and the descending movement of the opposite end of the levers and to permit of variable movement of the lever ends in another position thereof for the purpose specified.

11. In typewriting machines as claimed in claim 13, means adjustably mounted on the fulcrum support carrying plate below the end of the levers opposite to the keys, said means in one position thereof being operative to serve as a stop to limit the descending movement of said end of the levers, and in another position thereof to permit of variable descending movement thereof.

12. Typewriting machines as claimed in claim 13, wherein the key levers having recesses in the edge for engagement of the fulcrum supports, and a plate to extend transversely above the levers arranged with spring fingers for engagement upon the levers at the side of the fulcrum supports, opposite to the key end of the levers to maintain the levers in operative relation to said supports.

13. In typewriting machines, the combination with the frame, of a series of pivoted typebars, a plate fixed to and extending in a horizontal plane transversely of the framework having portions stamped therefrom and bent upward at a right angle to the body of the plate and having the ends bifurcated to constitute fulcrum supports, key levers fulcrumed intermediate the ends in the bifurcated portion of the fulcrum supports, and intermediate levers to operatively connect the key levers with the typebars.

14. Typewriting machines as claimed in claim 13, wherein the key levers have recesses in the edge for engagement of the bifurcation of the fulcrum supports of the plate, means mounted on the fulcrum carrying plate rearward of the fulcrum supports to limit the descending movement of the rear end of the key levers, a plate arranged above and extending transversely of the key levers forward of the fulcrum support thereof, and springs fixed to said plate adapted to engage the levers at the side of the fulcrum support opposite to the key end of the levers to maintain the levers in operative relation to said supports and to return the key levers to initial position.

Signed at New York city, in the county of New York and State of New York, this 20th day of May, 1926.

RICHARD W. UHLIG.

6

CERTIFICATE OF CORRECTION.

Patent No. 1,738,677. Granted December 10, 1929, to

RICHARD W. UHLIG.

It is hereby certified that the name of the assignee in the above numbered patent was erroneously written and printed as "Albert Voight", whereas said name should have been written and printed as "Albert Voigt", as shown by the records of assignments in this office; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 14th day of January, A. D. 1930.

M. J. Moore,
Acting Commissioner of Patents.

(Seal)