No. 809,391. PATENTED JAN. 9, 1906.

L. C. NEFF.

TYPE WRITING MACHINE.

APPLICATION FILED MAR. 14, 1904.

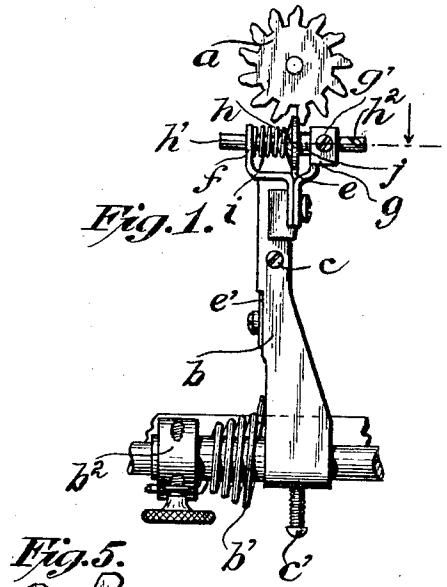

Fig. 1.

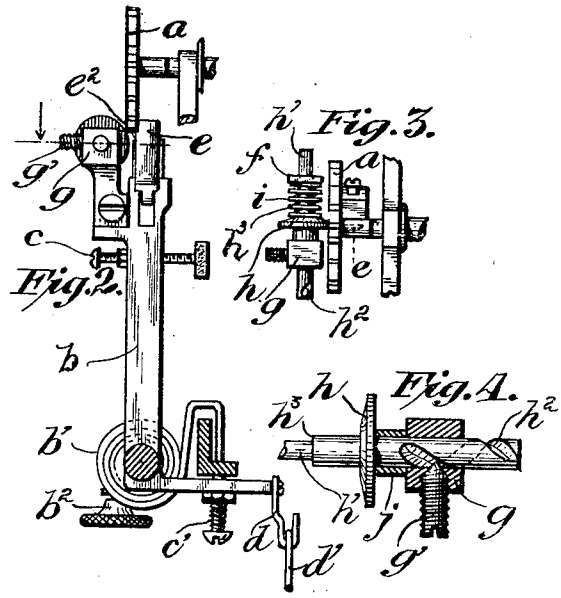

Fig. 2.

Fig. 3.

Fig. 4.

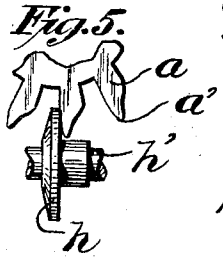

Fig. 5.

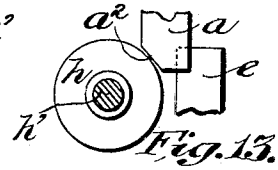

Fig. 13.

Fig. 14.

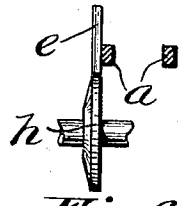

Fig. 6.

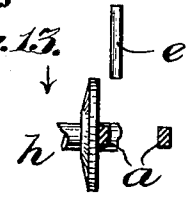

Fig. 7.

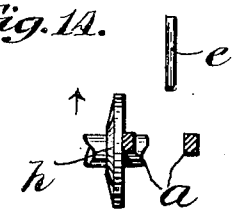

Fig. 8.

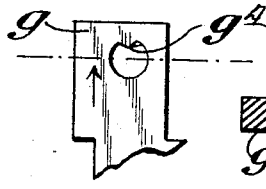

Fig. 9.

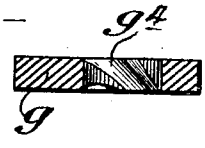

Fig. 10.

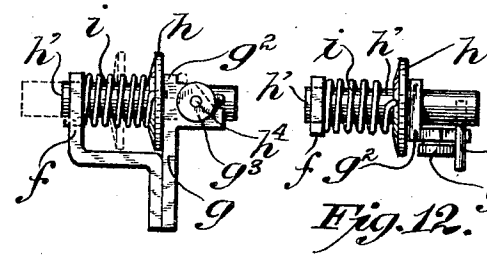

Fig. 11.

Fig. 12.

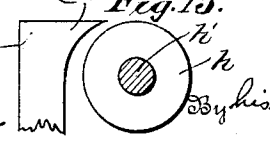

Fig. 15.

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UNITED STATES PATENT OFFICE.

LOUIS C. NEFF, OF NEW YORK, N. Y.

TYPE-WRITING MACHINE.

No. 809,391. Specification of Letters Patent. Patented Jan. 9, 1906.

Application filed March 14, 1904. Serial No. 198,033.

To all whom it may concern.

Be it known that I, LOUIS C. NEFF, a citizen of the United States, residing in the borough of Brooklyn, city of New York, county of Kings, and State of New York, have invented certain new and useful Improvements in Type-Writing Machines, of which the following is a specification, reference being had therein to the accompanying drawings, which form a part thereof.

My invention relates to type-writing machines, and more particularly to the carriage-feed mechanism thereof.

The main object of the invention is to provide a carriage-feed mechanism for type-writing machines wherein the detaining member and the spacing member may both be carried in their entirety upon the rocker-arm or vibratory member and the said spacing member will be so constructed and arranged as to be controlled during the printing interval and the feeding interval by the movement thereof relative to and in conjunction with the resulting pressure thereon from the carriage-controlling mechanism.

A further object is to provide such a mechanism wherein the initial movement of the spacing member to permit the feed of the carriage will be coincident with the reversal of the direction of movement of the vibratory member and with the resultant reversal of the direction of pressure thereon from the carriage-controlling mechanism, wherein the continued movement of said member will permit a rapid yet continuous feed of the carriage and an even and noiseless movement thereof and wherein a substantially constant load on the finger-keys will be maintained during the printing interval.

A still further object is to provide such a mechanism wherein the feed of the carriage may be limited to a portion of a letter-space and controlled by the movement of the vibratory member to facilitate the correction or justification of copy.

A still further object is to provide such a mechanism wherein the movement of the spacing member relative to and in conjunction with the carriage-controlling mechanism will react upon the vibratory member in a manner to induce or aid in the return of the said vibratory member simultaneously with the feed of the carriage, and thus insure a certain degree of coördination between the printing and the carriage-feed mechanism.

A still further object is to provide such a mechanism wherein the movement of the spacing member thereof during the spacing interval will be positive—that is to say, not dependent upon opposed spring tensions—thus permitting a construction and an arrangement of parts which in use will not require a fine adjustment relative to other parts of or spring tensions on the machine.

A still further object is to provide such a mechanism wherein the spacing member will be operative to initiate the feeding movement of the carriage instantly upon the reversal of the direction of movement of said vibratory member irrespective of the extent of the direct movement thereof requisite to permit the imprint of the type.

A still further object is to provide such a mechanism wherein the parts will be simple in construction and compact in arrangement, which will be durable and efficient in use and which when once assembled will be adapted to meet the requirements of general use and of the various classes and styles of operators without further adjustment or regulation; and a still further object is to provide such a mechanism wherein the detaining member and spacing member may be set well apart without liability of the carriage-controlling mechanism escaping therefrom in a manner to occasion a double spacing thereof.

The invention consists, primarily, in providing in a type-writing machine a carriage-feed mechanism comprising a carriage-controlling mechanism, a vibratory member, a detaining member, and a rotary spacing member carried thereby, the axis of said spacing member being substantially at right angles to the contact-face thereof; means whereby pressure from the engagement of the carriage-controlling mechanism with said spacing member during the direct movement of said vibratory member holds said spacing member stationary and said spacing member is permitted to rotate instantly upon the initial reversal of movement of said vibratory member, such rotation of said spacing member permitting axial movement thereof; means whereby said spacing member is restored to its normal position after each spacing, and connections between said vibratory member and the several key-levers whereby said detaining member and said spacing member are caused to successively engage said carriage-controlling mechanism, and in such

other novel features of construction and arrangement of parts as are hereinafter set forth and described, and more particularly pointed out in the claims hereto appended.

Referring to the drawings, Figure 1 is a rear elevation of a carriage-feed mechanism embodying the preferred form of my invention. Fig. 2 is a side elevation thereof. Fig. 3 is a plan view thereof. Fig. 4 is an enlarged view of the spacing member, showing the means by which the rotation of said member permits axial movement thereof. Fig. 5 is an enlarged view of the spacing member in connection with the rack member of the carriage-controlling mechanism, illustrating one construction of the contacting face of said rack member. Figs. 6, 7, and 8 are diagrammatic views showing, respectively, the relation of the several parts when at rest at the limit of the direct movement of the vibratory member and at the instant of the reversal of the direction of movement of said vibratory member. Fig. 9 is a modification of the means by which the rotation of the spacing member permits axial movement thereof. Fig. 10 is an enlarged sectional view thereof. Figs. 11 and 12 illustrate a still further modification of such means, showing a back elevation and a plan thereof, respectively. Fig. 13 is an enlarged view illustrating a desirable construction of the rack member of the carriage-controlling mechanism. Fig. 14 is a side view of the rotary spacing-member support, showing the means whereby the spacing-member-returning spring may be tensioned in assembling the device; and Fig. 15 is a side view of the preferred form of spacing and detaining members, on an enlarged scale.

Like letters refer to like parts throughout the several views.

In the accompanying drawings I have shown my invention as applied to a well-known type of wheel and rocker-arm mechanism and will describe it more particularly in connection therewith, although it is capable of adaptation with but slight mechanical variation to various constructions of feed mechanisms employing a rack member and a dog-support, one of which is movable relative to and across the other.

The spacing member, as will more fully appear hereinafter, is operative largely through pressure thereon from the "carriage-controlling mechanism," which term contemplates not only the star-wheel or other rack member but the mainspring of the carriage. (Not shown.)

Mounted below the wheel or rack member a in hangers carried by the frame of the machine is the vibratory member or rocker-arm b, provided with the usual retracting-spring b' and its tensioning means b^2, buffers c and c' for limiting the extent of vibration of said arm in each direction, and a cross-bar d, by means of which said rocker-arm is connected by the links d' to the universal bar (not shown) and actuated by the several key-levers. (Also not shown.) Mounted on the said vibratory member b is the detaining member e, adapted to normally engage the rack member a and hold the carriage-controlling mechanism stationary. The construction and function of this detaining member being well known to this art will not be herein described beyond that it is pivotally mounted on said rocker-arm, is provided with a spring e' to cause it to fly backward upon its release from engagement with the rack member into position to more readily engage the succeeding tooth thereof upon its return movement, and preferably is provided with an extension e^2, which follows the periphery of the spacing member h to prevent the rack member skipping during the spacing interval or printing interval. This invention relates more particularly, however, to the construction of the spacing member and in its arrangement in relation to these other or equivalent elements. The said spacing member is carried by a yoke formed by angular plates f g, mounted on the vibratory member b, having oppositely-disposed bearings therein. Preferably this member comprises an annular flange h, made integrally with an axle or shaft h', the axis of which is substantially at right angles to the contact-face of said flange. This axle is mounted in the bearings in the plates f g and is free to both rotate and move axially therein, as will more fully appear hereinafter. In feeding the carriage the extent of movement of the spacing member must be definite, and in this type of spacing member various means for limiting the axial movement thereof in conjunction with the plate f may be employed. Preferably, however, I provide the shaft h' with a shoulder h^3, formed by turning the end thereof down in such relation to the said plate that the axial movement of said shaft and its flange will be limited to one-half a letter-space.

The detaining member e and the spacing member h are reciprocated by the vibratory member b, so as to alternately engage the rack member of the carriage-controlling mechanism. During this operation the pressure of the carriage-spring tends to give said spacing member axial movement; but through the frictional engagement between said rack member and said spacing member the movement of the vibratory member controls the direction of this pressure in a manner to tend to rotate said spacing member. To utilize this pressure in controlling the spacing member, I provide means whereby the tendency of said spacing member to rotate thereunder during the direct movement of the vibratory member will prevent axial movement of said rotary spacing member and instantly with the reversal of the direction of movement of said vibratory member

will permit said spacing member to rotate and move axially under the reversed direction of pressure thereon. I may also after the initiation of the feeding interval take advantage of the normal direct pressure from the carriage-controlling mechanism to expedite the feed. In the preferred form of the invention this means takes the form of a winding way h^2, passing about the shaft or axle h', the pitch of or the number of such winds per inch regulating to a great extent the speed of operation of the spacing member. Carried by the plate g and seated in said way h^2 is a guide-pin g', which to permit the regulation of the relation of the said pin and the walls of the way is preferably screw-threaded above its point-bearing. The pin g' and the walls of the way h^2 constitute opposed bearings, one of which is graduated and movable relative to the other, and which through the rotation of the spacing member h control the feed of said member through the pressure thereon from the carriage-controlling mechanism.

In Figs. 11 and 12 I show a modification of the spacing member h, which differs from the preferred form in the following respects: The shaft h' is provided with a bearing-pin h^4, which in addition to controlling the movement of the said spacing member h, as heretofore described, limits the amount of its feed by contact with the shoulder g^2, formed on the yoke-plate g. This plate is provided with an opposed bearing with which the pin h^4 contacts and by reason of which the tendency of said shaft to rotate in one direction serves to prevent movement thereof and its rotation in the opposite direction permits an axial feed thereof. To minimize friction at this point, which is desirable owing to the long radius on which the pin h^4 acts, this bearing may, if desired, comprise a small antifriction-roller g^3, with the periphery of which the pin h^4 engages. In Figs. 9 and 10 I show a still further modification relating to this feature of my invention, appertaining more particularly, however, to mechanical details by which the pin g' is dispensed with and a fixed guide g^4, corresponding in pitch with the way h^2, is broached or otherwise formed integrally with the yoke-plate g.

In each of the forms of the invention described means for returning the spacing member h to normal after disengagement with the rack member a is provided, preferably consisting of the spring i, which is adapted to rotate the shaft h'. This spring is of very light tension, as merely power enough to overcome the friction on the various bearings is required for this purpose. To facilitate the adjustment of this spring in assembling, I provide the plate f with concentric openings f', adapted, respectively, to receive the end of the spring i. A torsion-spring is desirable as giving the proper reversal of movement of the flange h with a compact structure, and, furthermore, as producing a slight cushioning effect toward the end of the feeding interval. The normal position of the spacing member may be fixed by the collar j on the axle or shaft h', as shown in Figs. 1 to 4, inclusive, or by engagement of said flange with the plate g, as shown in Figs. 11 and 12. The above is the sole function of the spring i, and while I have shown a torsion-spring in the drawings any spring acting axially or torsionally of said shaft would so operate. Preferably the arrangement of these parts is such as to bring the spacing member into alinement with the detaining member, with the result that the disengagement of the one and the engagement of the other occurs upon the same plane, avoiding that drop which tends in practice to vary the load on the key-levers and which might tend to prevent the balancing of parts hereinafter referred to.

In Figs. 5 and 13 I have shown two forms of rack-member teeth, which are applicable in connection with the spacing mechanism heretofore described. Each of these is designed to occasion what may be termed a "variable" radial contact between the flange h and the rack member, first to insure stability upon the direct movement of the vibratory member; second, to expedite the feeding movement after the initiation thereof. Incident to each of these constructions is the absence of corners, which would tend to contact with the spacing member, and, as has been demonstrated, to break and chip thereon. The form shown in Fig. 5 varies from the ordinary star-wheel in having the contact-face of each tooth scarfed off toward the point, as at a', so that the teeth when on a vertical plane will contact with the flange adjacent to its periphery and the scarfed portion will engage the flange near the axle h' immediately after the initial feed. The form shown in Fig. 13 consists of a widened tooth with one corner scarfed off laterally, as at a^2, which scarfed portion extends substantially tangentially of the spacing member, with the result substantially as above except that the variance in the radial contact results from the movement of the vibratory member and that the detaining member need not be provided with the extension e'.

The operation of my carriage-feed mechanism, as illustrated in the accompanying drawings, is substantially as follows: With the depression of each key-lever the vibratory member or rocker-arm b is reciprocated, thus disengaging the rack member a of the carriage-controlling mechanism and the detaining member e, which normally are as shown in Fig. 6, and transferring the pressure therefrom to the spacing member h. The faces of said members being parallel insures a perfectly smooth even action without jar or noise. This transfer is accomplished with-

out permitting the rack member to escape from the spacing member through the extension e' on the detaining member in the construction shown in Figs. 1 to 5, inclusive, or through the increased width and scarfed corner of the rack member in the construction shown in Fig. 13. Both of these constructions insure a substantially simultaneous disengagement of the rack member from the detaining member and engagement thereof with the spacing member and a quick reversal of the operation during the spacing interval, thus permitting said members to be well set apart to insure proper clearance. Further direct movement of said vibratory member results in such a frictional engagement of the rack member and flange h as results in so diverting the pressure of the carriage-controlling mechanism as to tend to turn this flange upon its axis in the direction of the arrow, Fig. 7. This action, through the way h^2 and pin g', Figs. 1 to 4, or fixed guide g^4, Figs. 9 and 10, and pin h^4 and roller g^3, Figs. 11 and 12, or other opposed bearings, tends to force the spacing member and carriage-controlling mechanism backward, a tendency which is opposed by the same degree of pressure causing it, (or by the collar j or plate g,) thus producing a balanced condition, resulting in the maintenance of the carriage stationary during the printing interval or the entire direct movement of the vibratory member. Instantly upon the reversal of the direction of movement of said vibratory member and substantially simultaneously with the imprint of the type, irrespective of the extent of this direct movement, the direction of pressure from the rack member a upon the spacing member h is reversed, as indicated by the arrow in Fig. 8, thus tending to rotate the member h in the opposite direction. In the preferred form of the invention this rotation of the flange h and its shaft or axle h' permits the carriage to feed forward, the way h^2 following the guide-pin g' to permit both rotary and axial movement. The number of winds per inch of the way h^2 will of course regulate the extent of rotation required to permit a definite quantity of feed, the fewer the winds or less the pitch of said way the greater being the speed of feed.

I have found that in use the above rotary axial-movement relieves the flange h from radial pressure to an extent to occasion the continued feed of the spacing member largely through the direct pressure thereon from the carriage-controlling mechanism, the rotation of said member being after the initiation of the feed merely incidental to the continuance thereof. I have also found that through continued rotation under direct pressure the radial travel of the flange h tends to be greater than the movement of the vibratory member, so that the engagement thereof with the rack member a occasions a reaction upon the said vibratory member which tends to restore the parts to their former position, thus aiding in causing the vibratory member to act uniformly with the imprint of the type and also rendering a light tension on the retracting-spring feasible.

In the preferred form of the invention the shoulder h^3 serves to limit the quantity of axial feed of the spacing member, which preferably is, as stated heretofore, a half of a letter-space only, to enable an operator by using the space-bar with a slight double touch to cause the said spacing member, and hence the carriage, to feed forward a half-space while under the control of said spacing member, thus permitting the splitting of spaces to facilitate the correction of copy.

The slight resistance due to the friction between the pin g' and the walls of the way h^2 is sufficient, in conjunction with the tensioning of the spring i, to avoid a decided drop of the spacing member during the feeding interval, thus eliminating to a limited extent the noise incident to the carriage-feed.

The spring i is tensioned by the forward feed of the member h and immediately upon the disengagement of the rack member a from said spacing member restores said spacing member to its normal position. In restoring the spacing member to its former position said spring causes it to rotate in a direction opposite to that in feeding, not only bringing the flange to rest on the same plane as the detaining member e, but giving it all the rotary movement required to take up all looseness due to structural inequalities of or wear on the opposed bearing-faces, permitting the feed, thus avoiding movement coextensive with such looseness upon the engagement of the said spacing member h with the rack member a. In the preferred form of the invention the pin g' may be adjusted to take up such wear or looseness, if desired; but the action of the spring i is such as to always bring the opposed bearings in contact, as above described, irrespective of the quantity of such wear or looseness, whether these faces comprise the side of the way h^2 and pin g', Figs. 1 to 4, or the fixed guide g^4, Figs. 9 and 10, or of the pin h^4 and the roller g^3, Figs. 11 and 12.

In the modification shown in Fig. 5 the first engagement of the wheel a with the spacing member h is adjacent to the periphery of the latter above the scarfed end of the tooth, which insures the application of the pressure prior to the initial feed upon a long radius. After the initiation of the feed the wheel turns so as to bring the scarfed end into action adjacent to the axle or shaft h' or upon a short radius, thus minimizing the pressure due to movement of the vibratory member and causing the direct pressure herein referred to to act substantially along the axis of the spacing member, which accelerates the

feed through the elimination of friction between these members due to the rotation of the said flange.

In the modification shown in Fig. 13 the upper part of the scarfed portion a' of the rack member first engages the flange upon a long radius, and this radius shortens in proportion to the extent of such engagement. This form of rack member also avoids that breaking or chipping of corners incidental to a square rack, presenting, as it does, a contact-face extending along a line tangential to the periphery of the flange. The first of these rack members is adapted solely to a wheel machine, while the latter is suitable both for a wheel and for a straight-rack machine.

In the modification shown in Figs. 11 and 12 the mode of operation is substantially as heretofore described. Under pressure thereon, due to the direct movement of the vibratory member b, the pin h^4 is forced downward upon the graduated opposed bearing, the periphery of the roller g^3. Upon the reversal of this pressure the pin h^4 rises and follows the periphery of said roller through the feeding movement until it overrides said roller and contacts with the shoulder g^2, which limits the feed of said spacing member and the carriage-controlling mechanism while under its control. It will be observed that this mode of operation is substantially identical with that of the preferred form, as the spring i in this form also will always maintain that contact between the pin h^4 and the roller g^3 necessary to avoid looseness and that the diameter of the roller g^3 corresponds with the pitch of the way h^2. The detaining member e operates in the usual manner to insure a reëngagement with the rack member a.

In all forms of the invention heretofore described the spacing member h is held perfectly stationary during the direct movement of the vibratory member b, and by reason of its contact-face being on the same plane as that of the detaining member the carriage is not permitted to move until the end of such direct movement as ordinarily limited by the buffer c, which is coincident, or substantially so, with the imprint of the type. Immediately upon the initial return movement of said vibratory member the spacing member becomes operative and, as heretofore described, both permits the rapid, even, and continuous feed of the carriage and aids in the return of the vibratory member. The spring b' is used principally to cause a quick initiation of the return of the rocker-arm or vibratory member. The buffer c' acts in the usual way to limit the extent of holding contact of the rack member with the detaining member e.

The proper disengagement of the spacing member from the rack member results from the speed of escapement in conjunction with the contour of the flange h of the spacing member, it being quite immaterial whether the spacing member be set into the detaining member e or the rack member broadened to compensate for the gap between the tops of the members h and e.

Inasmuch as the spacing member is operative at the instant of imprint of the type, it is apparent that the speed of escapement is coextensive with that of the operator, so that a uniform adjustment is in practice suitable for various styles and classes of operators and neither a double spacing nor a piling of type is possible.

It is not my intention to limit the invention to the precise details herein shown and described, as it is apparent that such may be varied without departing from the spirit and scope of my invention. I believe it to be new to provide a rotary spacing member having its contact-face at substantially right angles to its axis and means whereby its tendency to rotate in one direction will hold it stationary and its rotation in the reverse direction will permit it to move axially to accomplish the feed and intend herein to claim such broadly.

Having described the invention, what I claim as new, and desire to have protected by Letters Patent, is—

1. In a type-writing machine, a carriage-feed mechanism comprising a carriage-controlling mechanism, a vibratory member, a detaining member and a rotary spacing member carried thereby, the axis of said spacing member being substantially at right angles to the contact-face thereof, means whereby pressure from the engagement of the carriage-controlling mechanism with said spacing member during the direct movement of said vibratory member holds said spacing member stationary and said spacing member is permitted to rotate instantly upon the initial reversal of movement of said vibratory member, such rotation of said spacing member permitting axial movement thereof, means whereby said spacing member is restored to its normal position after each spacing and connections between said vibratory member and the several key-levers whereby said detaining member and said spacing member are caused to successively engage said carriage-controlling mechanism.

2. In a type-writing machine, a carriage-feed mechanism comprising a carriage-controlling mechanism, a vibratory member, a detaining member and a rotary spacing member consisting of a flange and an axle or shaft therefor extending at substantially right angles to the contact-face thereof, carried by said vibratory member, opposed bearings carried respectively by said vibratory member and said shaft whereby pressure from the engagement of the carriage-controlling mechanism with said spacing member during the direct movement of said vibratory member,

holds said spacing member stationary, and said spacing member is permitted to rotate instantly upon the initial reversal of movement of said vibratory member, such rotation of said spacing member permitting axial movement thereof, a spring whereby said spacing member is restored to its normal position after each spacing, and connections between said vibratory member and the several key-levers whereby said detaining member and said spacing member are caused to successively engage said carriage-controlling mechanism.

3. In a type-writing machine, a carriage-feed mechanism comprising a carriage-controlling mechanism, a vibratory member, a detaining member and a rotary spacing member consisting of a flange and an axle or shaft therefor extending at substantially right angles to the contact-face thereof, carried by said vibratory member, opposed bearings carried respectively by said vibratory member and said shaft whereby pressure from the engagement of the carriage-controlling mechanism with said spacing member, during the direct movement of said vibratory member, holds said spacing member stationary, and said spacing member is permitted to rotate instantly upon the initial reversal of movement of said vibratory member, said rotation of said spacing member permitting axial movement thereof, means whereby the axial movement of said spacing member is limited to a portion of a letter-space, a spring whereby said spacing member is restored to its normal position after each spacing, and connections between said vibratory member and the several key-levers whereby said detaining member and said spacing member are caused to successively engage said carriage-controlling mechanism.

4. In a type-writing machine, a carriage-feed mechanism comprising a carriage-controlling mechanism, a vibratory member, a detaining member and a rotary spacing member consisting of a flange and an axle or shaft therefor extending at substantially right angles to the contact-face thereof, carried by said vibratory member, opposed bearings carried by said vibratory member and said shaft respectively whereby pressure from the engagement of the carriage-controlling mechanism with said spacing member during the direct movement of said vibratory member holds said spacing member stationary and said spacing member is permitted to rotate instantly upon the initial reversal of movement of said vibratory member, such rotation of said spacing member permitting axial movement thereof, a spring adapted to rotate said shaft whereby said spacing member is restored to its normal position after each spacing and said opposed bearings are forced into intimate contact with each other, and connections between said vibratory member and the several key-levers whereby said detaining member and said spacing member are caused to successively engage said carriage-controlling mechanism.

5. In a type-writing machine, a carriage-feed mechanism comprising a carriage-controlling mechanism, a vibratory member, a detaining member and a rotary spacing member consisting of a flange and an axle or shaft therefor extending at substantially right angles to the contact-face thereof, carried by said vibratory member, opposed bearings carried respectively by said vibratory member and said shaft whereby pressure from the engagement of the carriage-controlling mechanism with said spacing member during the direct movement of said vibratory member, holds the spacing member stationary, and said spacing member is permitted to rotate instantly upon the initial reversal of movement of said vibratory member, such rotation permitting axial movement thereof, a spring whereby said spacing member is restored to its normal position after each spacing, said carriage-controlling mechanism comprising a rack member, the teeth of which present contact-faces to said spacing member on different planes whereby engagement of said parts will be at different radii during the printing and the spacing intervals, and connections between said vibratory member and the several key-levers, whereby said detaining member and said spacing member are caused to successively engage said carriage-controlling-mechanism rack member.

6. In a type-writing machine, a carriage-feed mechanism comprising a carriage-controlling mechanism, a vibratory member, a yoke carried thereby having oppositely-disposed bearings therein, a detaining member mounted on said vibratory member, a spacing member comprising a flange and an axle or shaft having a winding way therein mounted in said bearings and extending at substantially right angles to the contact-face of said flange, a guide carried by said yoke and engaging said way whereby pressure from the engagement of the carriage-controlling mechanism with said spacing member during the direct movement of said vibratory member holds said spacing member stationary, and said spacing member is permitted to rotate instantly upon the initial reversal of movement of said vibratory member, such rotation of said spacing member permitting axial movement thereof, a spring whereby said spacing member is restored to its normal position after each spacing, and connections between said vibratory member and the several key-levers whereby said detaining member and said spacing member are caused to successively engage said carriage-controlling mechanism.

7. In a type-writing machine, a carriage-feed mechanism comprising a carriage-con-

trolling mechanism, a vibratory member, a yoke carried thereby having oppositely-disposed bearings therein, a detaining member mounted on said vibratory member, a spacing member comprising a flange and an axle or shaft therefor having a winding way therein, mounted in said bearings and extending at substantially right angles to the contact-face of said flange, a guide comprising a screw-threaded point-bearing carried by said yoke and engaging said way whereby pressure from the engagement of the carriage-controlling mechanism with said spacing member during the direct movement of said vibratory member holds said spacing member stationary, and said spacing member is permitted to rotate instantly upon the initial reversal of movement of said vibratory member, such rotation of said spacing member permitting axial movement thereof, a spring whereby said spacing member is restored to its normal position after each spacing, and connections between said vibratory member and the several key-levers, whereby said detaining member and said spacing member are caused to successively engage said carriage-controlling mechanism.

8. In a type-writing machine, a carriage-feed mechanism comprising a carriage-controlling mechanism, a vibratory member, a yoke carried thereby having oppositely-disposed bearings therein, a detaining member mounted on said vibratory member, a spacing member comprising a flange and an axle or shaft having a winding way therein mounted in said bearings and extending at substantially right angles to the contact-face of said flange, a guide carried by said yoke engaging said way whereby pressure from the engagement of said carriage-controlling mechanism with said spacing member during the direct movement of said vibratory member holds said spacing member stationary and said spacing member is permitted to rotate instantly upon the initial reversal of movement of said vibratory member, such rotation of said spacing member permitting axial movement thereof, means whereby axial movement of said spacing member is limited to a portion of a letter-space, a spring whereby said spacing member is restored to its normal position after each spacing, and connections between said vibratory member and the several key-levers whereby said detaining member and said spacing member are caused to successively engage said carriage-controlling mechanism.

9. In a type-writing machine, a carriage-feed mechanism comprising a carriage-controlling mechanism, a vibratory member, a detaining member and a rotary spacing member consisting of a flange and an axle or shaft therefor extending at substantially right angles to the contact-face thereof, carried by said vibratory member, opposed bearings carried respectively by said vibratory member and said shaft whereby pressure from the engagement of the carriage-controlling mechanism with said spacing member during the direct movement of said vibratory member holds said spacing member stationary, and said spacing member is permitted to rotate instantly upon the initial reversal of movement of said vibratory member, such rotation of said spacing member permitting axial movement thereof, a spring whereby said spacing member is restored to its normal position after each spacing and connections between said vibratory member and the several key-levers whereby said detaining member and said spacing member are caused to successively engage said carriage-controlling mechanism, said detaining member being provided with an extension alined with and following the top periphery of said spacing member.

In witness whereof I have hereunto affixed my signature, this 11th day of March, 1904, in the presence of two witnesses.

LOUIS C. NEFF.

Witnesses:
WM. H. BLAIN,
F. T. WENTWORTH.