

May 22, 1928.

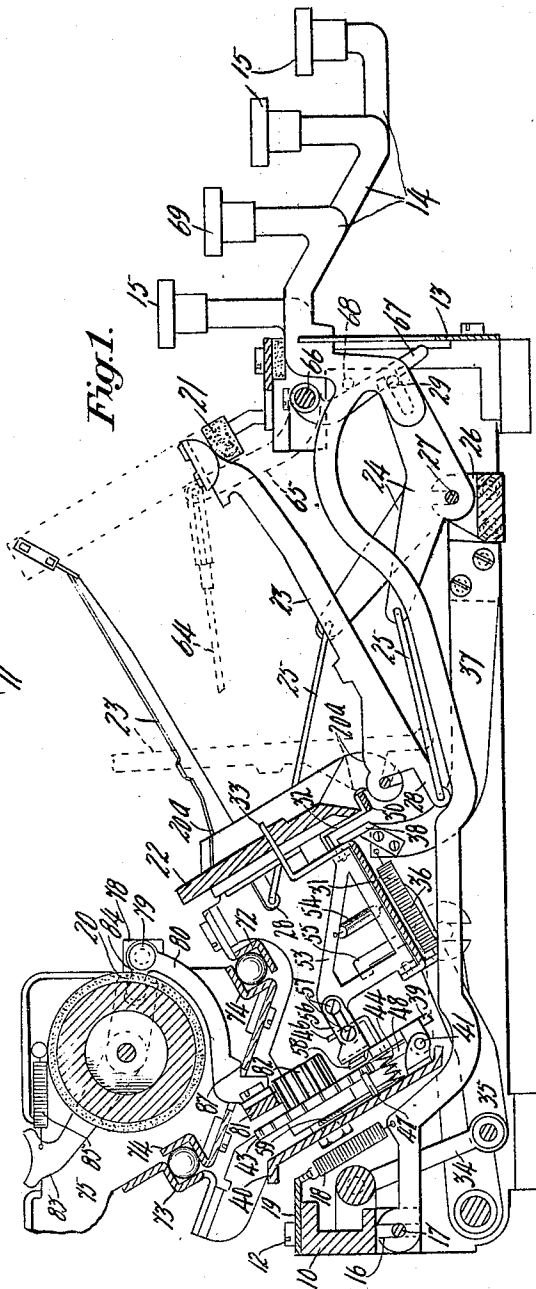
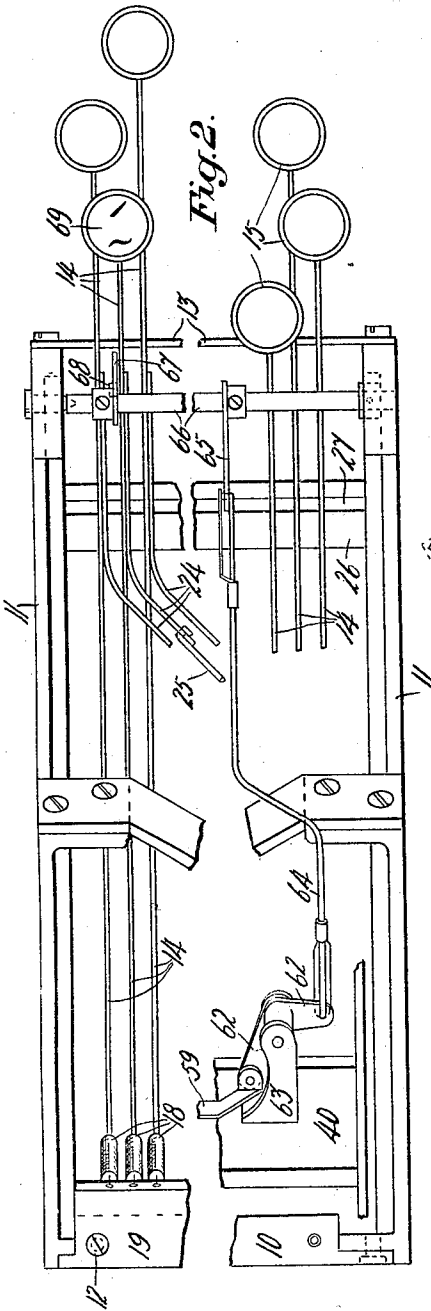
1,670,513

A. G. F. KUROWSKI

TYPEWRITING MACHINE

Filed March 11, 1924

2 Sheets-Sheet 1



Inventor:
Alfred G. Krowatzki
by O. B. Stickney
Attorney

May 22, 1928.

1,670,513

A. G. F. KUROWSKI

TYPEWRITING MACHINE

Filed March 11, 1924

2 Sheets-Sheet 2

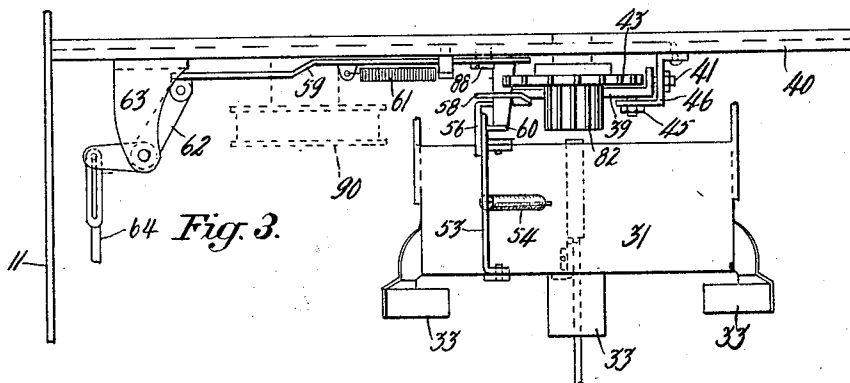
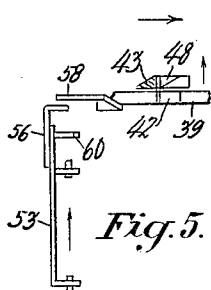
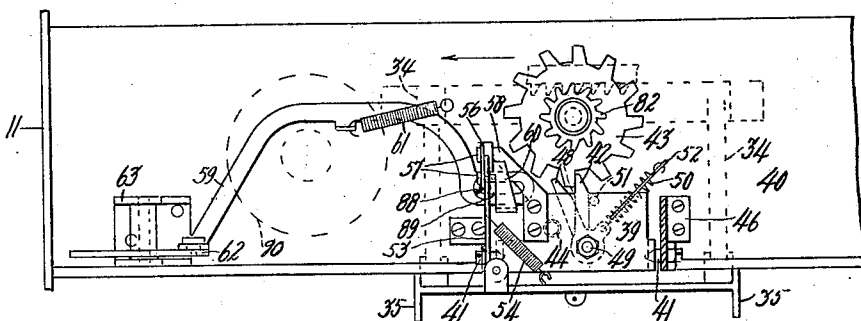


Fig. 4.



UNITED STATES PATENT OFFICE.

ALFRED G. F. KUROWSKI, OF BROOKLYN, NEW YORK, ASSIGNOR TO UNDERWOOD ELLIOTT FISHER COMPANY, OF NEW YORK, N. Y., A CORPORATION OF DELAWARE.

TYPEWRITING MACHINE.

Application filed March 11, 1924. Serial No. 698,369.

This invention relates to typewriting machines, and, with respect to its more specific features, to silent-key mechanism, that is, mechanism for disconnecting certain keys from the escapement mechanism, whereby to prevent feeding of the carriage during the operation of such key or keys, while the ribbon-mechanism continues to be operated thereby.

10 A feature of the invention is the provision of a silent-key mechanism that is capable of adjustment in order that it may be connected with any selected key, regardless of the position of that key in the key-board.

Another feature is the provision in such mechanism of means moving with the universal bar, for transmitting its movement to the escapement mechanism, and normally in operative position to operate the escapement mechanism when the universal bar is moved in printing, and moved out of operative position by the operation of a selected key, thereby to silence such key.

25 Another feature is the provision of means moving with the universal bar for transmitting the movement of said bar to the escapement mechanism, thereby to feed the carriage, and capable of adjustment to insure correct engagement between said means and the escapement mechanism.

Other features and advantages will herein-after appear.

In the accompanying drawings,

35 Figure 1 is a longitudinal, vertical section at approximately the center of the machine.

Figure 2 is a partial plan view, with the center portion broken away.

40 Figure 3 is a fragmentary view of the carriage-feeding elements, looking from above.

Figure 4 is a front elevation of Figure 3.

45 Figures 5, 6, 7 and 8 are diagrammatic views to illustrate the several movements of the parts during the operation of the normal key, and during the operation of a silent key.

Figure 9 is a fragmentary side view showing the connection between the ribbon-vibrator and the universal-bar carrying frame.

50 The present embodiment of the invention is shown in connection with a typewriting machine of the character shown and described in my co-pending application, Serial No. 697,476, filed March 7, 1924. Said machine includes a suitable frame comprising

a back bar 10, side plates 11 and a front plate 13, connected together in any suitable manner to form a substantial rectangular frame. The back bar 10 is slotted longitudinally on its under face to receive a fulcrum-rod 17, and it is slotted transversely at suitable intervals to receive the key-levers 14, said levers being notched or slotted as indicated at 16 to engage the fulcrum-rod. The key-levers are arranged alongside of each other in parallel relation, and they are normally pressed upward by means of coil-springs 18, a spring being provided for each lever. The springs are arranged between the key-levers and a tension-plate 19 secured to the back bar 10 by means of screws 12. The front plate 13 is vertically slotted at its upper edge to provide a comb, between the teeth of which the key-levers extend, and each lever has an upturned portion at its forward end provided with a key-cap 15.

The typing system includes a platen 20, a type-bar rest 21, and a segment 22, which carries a series of type-bars 23, the parts forming the usual basket. The system is tilted, to bring the type-bar rest at about the level of the platen, and the type-bars incline forwardly and rearwardly in rest and printing positions. Each type-bar is connected to the corresponding key-lever by a bell-crank 24, and a link 25. The bell-cranks 24 are pivoted on a common support 26. The support is slotted longitudinally to receive a fulcrum-rod 27, and it is slotted transversely at suitable intervals to receive the bell-cranks. The links 25 connect the transmitting arms of the bell-cranks to operating arms or heels 28 on the type-bars, and each bell-crank is slidably connected to its key-lever by a pin-and-slot connection, indicated at 29.

The universal bar 30 is suspended within a groove at the rear of the segment, in a position such that it will be first engaged by the type-bars as they reach a vertical position, as indicated in dotted lines in Figure 1. Each type-bar is provided with an extension 20^a on its rear edge and near the fulcrum-rod, for engaging the universal bar when the type-bar attains the above-mentioned position, and the movement of each type-bar is untrammelled until it reaches the vertical. A swinging plate 31 is arranged behind the segment, and is connected to the universal bar by forwardly-extend-

ing arms 32. The plate is supported in its swinging movement by a lug 33 extending upwardly and forwardly from the plate through a guide-opening in the segment, and by links 34 pivoted to the rear bar 10 and to arms 35 extending rearward from the swinging plate. This plate 31 is normally drawn forward by a spring 36, arranged between the plate and a fixed bracket 37 connected with the common support for the bell-cranks, and it is limited in its forward movement by a stop 38 on said bracket.

The escapement device may be of usual construction, comprising, in the present instance, a rocker 39 mounted to rock on a back plate 40 of the carriage-shift frame, the rocking connection being indicated at 41. The rocker is provided at its upper edge with a single tooth 42, which serves as a holding dog for the teeth of the escapement-wheel 43. The rocker is spring-pressed forwardly by a compression-spring 44, arranged between it and the back plate, and it is moved rearwardly by means, to be presently described, mounted upon the swinging plate 31, and normally in position to transmit the movement of the universal bar to the escapement-rocker.

The forward movement of the rocker under the influence of the spring is limited by means of an adjustable stop 45 mounted upon a bracket 46 secured to the back plate of the carriage-shift frame, and the rearward movement of the rocker is limited by a stop-pin 47, also on the back plate. A stepping dog 48, in the form of an elbow-lever, is pivotally mounted upon the rocker at 49, and a spring 50 is connected with the dog. The stepping arm of the dog, that is, the arm which engages the escapement-wheel, is limited in its movement under the influence of the carriage by a stop 51 on the rocker, and the spring is arranged between the rocker and the other arm.

The means for transmitting the movement of the universal bar to the escapement includes a swinging member 53, which is pivotally mounted on the swinging plate 31, near one end thereof. This member extends transversely of the plate 31, and it is normally held erect, and in position to transmit the movement of the universal bar to the escapement-rocker, by means of a spring 54, arranged between the member and the swinging plate. The movement of the member under the influence of the spring is limited by a stop 55 on the plate, and the member acts as an abutment between the universal bar and the escapement-rocker to transmit the movement of the bar to the rocker.

Referring to Figure 1, it will be seen that the member is substantially a right angle triangle, the base seated on the swinging plate and the side facing the back plate of

the carriage-shift frame. At this angle of the member, an adjustable shoe 56 is arranged, said shoe being capable of adjustment toward and from the escapement-rocker by means of screws 57 passing through a slot in the shoe and engaging the member 53. The shoe 56 is positioned to abut, when it moves rearwardly, the free end of an arm 58, secured to the front face of the escapement-rocker. It will be evident that, when the shoe strikes the arm 58 in its rearward movement, the escapement-rocker will be rocked rearwardly, thus operating to feed the carriage.

In typewriting machines designed for printing certain languages, it is desirable that there be no feed of the carriage with certain keys, which operate the type-bars printing certain characters, as, for instance, accent-indications and the like. In order to permit the printing of such characters without feeding of the carriage, the keys printing the characters are made silent, that is, mechanism is operated thereby which prevents the universal bar actuating the escapement during the movement of such keys and type-bars. In the present instance, the member 53 is provided, to be moved by certain selected keys, out of operative position to transmit the movement of the universal bar to the escapement-rocker. In order to move the member out of operative position, a link 59 is mounted to slide on the back plate of the carriage-shift-frame, above mentioned, and the link carries, adjacent the member 53, a finger 60 which is in position to engage the member adjacent the shoe. The finger is at that face of the member adjacent the spring, and, when the link is moved in the opposite direction, the member will be moved against the tension of the spring into inoperative position, that is, out of position to engage the arm 58 when the universal bar moves rearwardly.

The link is normally held out of engagement with the member 53 by a spring 61, arranged between the same and the back plate, and is moved in the opposite direction by means of an elbow-lever 62, pivoted on a bracket 63 extending forward from the back plate. The link is pivoted to one of the arms of the elbow-lever, and a link 64 is connected with the other arm. This link extends forwardly to a connection with a radial arm 65 on a shaft 66, which is journaled in bearings in the side plates 11 of the frame, and near the front plate 13. The shaft 66 extends above all of the key-levers, and mechanism is provided for permitting any selected key to oscillate the shaft to move the member 53 into inoperative position.

The silent key may be in any part of the keyboard, and preferably it is arranged adjacent that character, or to those charac-

ters, with which it co-operates. Wherever arranged, as for instance in the position occupied by the key 69, a cam-finger 67 is mounted on the shaft 66 adjacent the lever of the key. This finger has a bearing encircling the shaft, and movable longitudinally thereof, and held in adjusted position by means of a set-screw, as shown. A pin 68 is connected with the selected key-lever, for engaging the edge of the cam-finger. Referring to Figure 1, it will be noticed that the cam-finger inclines forwardly toward its lower end, so that the pin tends to oscillate the shaft to move the link 59 in the direction to cause it to swing the member 53 out of operative position.

It will be evident from the description that the operating mechanism for the shaft, that is, the means for operatively connecting the silent key to the shaft and to the member 53, may be arranged adjacent any key on the keyboard, or any number of keys. Since this adjustment may be made at any time, it is not necessary to vary from a stock pattern in incorporating the silent-key mechanism. To connect the silent mechanism with any key, it is only necessary to adjust the cam-finger adjacent thereto, and to connect the pin therewith, each key-lever being provided with a hole to receive the pin 68. With this arrangement any selected key or any number of keys may be made silent. When the silent key is depressed, the shaft 66 is oscillated, the link 59 is moved against the resistance of the spring, and the member 53 is swung out of position to engage the arm 58, so that the escapement mechanism is not operated to feed the carriage. The link 59 is guided at the end adjacent the member 53, and limited in its movement, by a screw 88 connected to the back plate, the screw engaging a slot 89 in the end of the link.

The movement of the several parts when a regular key is operated, and when a silent key is operated, is shown in Figures 5 to 8, Figures 5 and 6 showing the operation with the ordinary key, and Figures 7 and 8 showing the operation with the silent key. When the member 53 is moved rearwardly with the parts in the position of Figures 5 and 6, it will engage the arm 58 and swing the rocker, to move the stepping dog out of the plane of the escapement-wheel, and to bring the holding dog into said plane. On the return movement of the key-lever, the advancing teeth of the escapement-wheel will engage the stepping dog 48, which is meanwhile held in the dotted-line position of Figure 4 by the spring 50, and will swing the dog to the right of Figure 4 and into engagement with the stop 51, at which time the movement of the carriage under the influence of the drum 90 will be stopped.

When, however, the member 53 is swung

from the position of Figure 7, to that of Figure 8, by the operation of the silent key, said member will not engage the arm 58, there will be no movement of the escapement-wheel rocker, and, as a consequence, no feed of the carriage.

Referring to Figure 4, it will be noticed that the end of the spring 50 remote from the stepping dog is connected with a fixed bracket 52 on the rocker, and the arrangement of the bracket, the pivot 49 of the stepping dog, and the connected arm of the stepping dog, is such that, when the stepping dog is out of the plane of the escapement-wheel and not engaged by the teeth thereof, the parts will occupy the dotted-line position of Figure 4. That is, the spring will be in alignment with the arm of the stepping dog to which it is connected and will hold the stepping dog in the dotted-line position of Figure 4. When so held, the stepping dog is in position to be engaged by the escapement-wheel when it is moved into the plane thereof, and the carriage feeds, while at the same time it offers little or no resistance to the return movement of the carriage. The extent of the swinging movement of the stepping dog under the influence of the spring 50 and its ultimate position, when free from the escapement-wheel, is determined by the arrangement of the spring.

The arrangement of the parts above described permits the stepping dog to swing freely in the direction in which it is moved during the return of the carriage, and the clicking noise, resulting from the engagement of the stepping dog with the escapement-wheel during such return movement of the carriage, is greatly reduced, or entirely eliminated.

The carriage moves on a pair of fixed rails 72 and 73, which co-operate with similar rails 74 on the carriage. The rails 74 are connected at their ends by plates 75 which support the platen 20. Each end plate has a forwardly-extending lug or ear 78, and levers 80 are pivoted to the ears, as indicated at 79. The levers extend downwardly and rearwardly through openings in the carriage-base-plate, and the lower ends thereof are connected with the carriage-feed rack 81, engaging the escapement-pinion 82. A finger-lever 83 is pivoted on the platen-shaft, the forward end thereof being movably connected with a short arm 84 forming a part of the lever 80. When the finger-lever is depressed, the levers 80 will be rocked in a direction to raise the feed-rack 81, to release it from the pinion 82. The rack is normally held in engagement with the pinion by a spring 85 arranged between the lever 83 and the adjacent end plate. To limit the movement of the levers 80 under the influence of the spring 85, they are formed with stop faces 87, which strike the upper face of the

carriage-base-plate adjacent the openings through which the levers pass, thereby to limit the downward movement of the levers.

The ribbon-vibrating mechanism may be like that disclosed in my co-pending application, Serial No. 710,528, filed May 2, 1924.

Said ribbon-vibrating mechanism may comprise a bracket 95, fixed on the face of the back plate 40, which bracket supports the pivotal end of a ribbon-vibrator-lever 96, extending forward nearly to the rear face of the type-bar segment 22, where its free end is connected to a ribbon-carrier 97 slidably mounted upon a stationary type-guide 98 secured to the type-bar segment 22.

The vibrator-lever 96 is actuated by a toggle-link 99 pivotally connected in a slotted lug 100 on the plate or universal-bar carrier 31, and is arranged to raise the ribbon-vibrator-lever 96 and the ribbon-carrier 97 to cover the printing field of the type by a ribbon 101 each time the carrier is actuated by a type-bar.

From the foregoing, it will be understood that the universal-bar carrier or supporting frame 31 is provided with two brackets or extensions, the pivoted extension 53 and the lug or extension 100; and that the pivoted extension 53 may be swung laterally by some of the keys, so that the ribbon may be vibrated by the universal bar through the medium of the extension 100 without actuating the escapement mechanism.

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 an escapement and a key-actuated universal bar, of means moving with the universal bar normally in position to transmit the movement of the bar to the escapement, and means including a rock-shaft having a cam-arm engaged by the operation of a selected key to shift said transmitting means into inoperative position during the operation of said key.

2. In a typewriting machine, the combination with an escapement and a key-actuated universal bar, of means normally in position to transmit the movement of the bar to the escapement, and adjustable to determine the extent of movement of the escapement under the impulse of the universal bar, a rock-shaft operatively connected to shift said transmitting means out of operative position, and a cam adjustable along said shaft and transversely of the keyboard to convey a rocking movement to said shaft, from the depression of any predetermined key.

3. In a typewriting machine, the combination with an escapement and a key-actuated universal bar, of means moving with the uni-

versal bar normally in position to transmit the movement of the bar to the escapement, and adjustable to determine the extent of movement of the escapement under the impulse of the universal bar, a rock-shaft operatively connected to shift said transmitting means out of operative position, and a cam on said shaft engageable by a selected key to convey a rocking movement to said shaft, said cam being adjustable upon said shaft to determine the extent of movement thereof.

4. In a typewriting machine, the combination with a carriage and a key-actuated type-bar, of a carriage-feeding mechanism including an escapement-rocker, a universal bar driven by the type-bar in typing, a carrier for the universal bar and movable therewith, an intermediary on the carrier having an interruptive connection to the escapement-rocker, and a rock-shaft having a connection to the intermediary, said shaft having a cam engageable by the key to impart movement to the intermediary and deflect the driving transmission of the universal bar from the escapement-rocker.

5. In a typewriting machine, the combination with an escapement, a key-actuated universal bar, and a vibratory frame for the universal bar, of means mounted upon said frame independent of the escapement and normally spring held in position at right angles to the frame to transmit the movement of the bar and frame to the escapement, means to shift said transmitting means against the tension of the spring and out of operative position to the escapement, and means for operatively connecting said shifting means to a selected key, said last-mentioned means including a shaft and a cam thereon for engagement by the key.

6. In a typewriting machine, the combination with a carriage having a carriage-feeding mechanism that includes an escapement-rocker, of typing elements including type-bars and key-levers provided with keys to form a keyboard, a universal bar operated by each type-bar in typing, a carrier for the universal bar to be vibrated therewith, a member pivoted upon the carrier normally in operative alignment to vibrate the escapement-rocker at each movement of the universal bar, a rock-shaft mounted over the key-levers adjacent to the keyboard, an arm carried by the rock-shaft adjacent to a selected key, means carried by said key to engage said arm and rock the shaft, and a train of connections between the rock-shaft and said member on the carrier whereby said member will be deflected out of alignment with the escapement-rocker to silence the carriage-feeding mechanism when a selected key is depressed to type.

7. In a typewriting machine, the combination with a carriage-feeding mechanism and a type-bar actuated by a universal bar op-

erable from a keyboard, of a carrier for the universal bar including a frame movable therewith, a ribbon-vibrator, means carried by said frame to operate said ribbon-vibrator in unison with the universal bar, means carried by said frame to normally operate the carriage-feeding mechanism in unison with the ribbon-vibrator, a rock-shaft adjacent the keyboard, connections intermediate the rock-shaft and carriage-feeding-actuating means, and a cam on the rock-shaft operable by a selected key to silence the carriage-feeding-actuating means without silencing the ribbon-vibrator in typing.

ALFRED G. F. KUROWSKI.